

2008 Jeep Liberty
FACTORY REPAIR MANUAL

GENERAL INFORMATION

Jeep (Gasoline) - 1988-11

CHANGE OIL/OIL LIFE MONITOR

NOTE: To determine the appropriate reset procedure, refer to **CHANGE OIL/OIL LIFE MONITOR RESET INDEX.**

CHANGE OIL/OIL LIFE MONITOR RESET INDEX

Model & Year	Reset Procedure
Commander	
2008-10	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>
Compass	
2008-11	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>
Grand Cherokee	
2008-11	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>
Liberty	
2008-11	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>
Patriot	
2008-11	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>
Wrangler	
2008-11	<u>Change Oil/Oil Life Monitor Reset - Procedure 1</u>

CHANGE OIL/OIL LIFE MONITOR RESET - PROCEDURE 1

1. Turn ignition on, with engine off.
2. Fully depress the accelerator pedal, slowly, 3 times within 10 seconds.
3. Turn ignition switch to OFF/LOCK position.

NOTE: If indicator message illuminates when engine is started, repeat the reset procedure.

EMISS MAINT INDICATOR LIGHT

NOTE: To determine the appropriate reset procedure, refer to **EMISS MAINT INDICATOR LIGHT RESET INDEX.**

EMISS MAINT INDICATOR LIGHT RESET INDEX

Model & Year	Reset Procedure
Cherokee	
1988-90	<u>Emiss Maint Indicator Light Reset - Procedure 1</u>

Comanche	
1988-90	<u>Emiss Maint Indicator Light Reset - Procedure 1</u>
Wagoneer	
1988-90	<u>Emiss Maint Indicator Light Reset - Procedure 1</u>
Wrangler	
1988-90	<u>Emiss Maint Indicator Light Reset - Procedure 1</u>

EMISS MAINT INDICATOR LIGHT RESET - PROCEDURE 1

1. Vehicles are equipped with a EMISS MAINT indicator light on the instrument cluster. This light will come on one time at 82,500 miles to alert driver that emission service is required. At this time, oxygen sensor and PCV valve must be replaced and all other emission components should be inspected, and serviced or replaced as necessary.
2. The Service Reminder Indicator (SRI) timer is located under dash, near accelerator pedal or to right of steering column. Timer cannot be reset. To turn off light, timer must be replaced or disconnected. Since timer and sensor are interdependent, if timer should fail prematurely, oxygen sensor should be replaced at same time to preserve correct replacement interval.
3. To replace timer on Cherokee, Comanche and Wagoneer models, remove cruise control module (if equipped). Remove timer mounting screws. Disconnect electrical connector. On Wrangler models, remove timer mounting screws. Disconnect electrical connector. To install, reverse removal procedure.

MAINT REQD INDICATOR LIGHT

NOTE: To determine the appropriate reset procedure, refer to **MAINT REQD INDICATOR LIGHT RESET INDEX**.

MAINT REQD INDICATOR LIGHT RESET INDEX

Model & Year	Reset Procedure
Cherokee	
1991-92	<u>Maint Reqd Indicator Light Reset - Procedure 1</u>
Comanche	
1991-92	<u>Maint Reqd Indicator Light Reset - Procedure 1</u>
Grand Cherokee	
1993	<u>Maint Reqd Indicator Light Reset - Procedure 1</u>
Wrangler	
1991-92	<u>Maint Reqd Indicator Light Reset - Procedure 1</u>

MAINT REQD INDICATOR LIGHT RESET - PROCEDURE 1

Vehicles may be equipped with a MAINT REQD on the instrument cluster. This light will come on one time at 82,500 miles to alert driver that emission service is required. At this time, oxygen sensor must be replaced and all other emission components should be inspected, and serviced or replaced as necessary. Chrysler's Diagnostic Readout Box (DRB-II) tester is required to reset the service reminder indicator system.

Using DRB-II tester, access SELECT SYSTEMS. Select appropriate engine. Select with or without A/C. Select FUEL & IGNITION. Select ADJUSTMENTS. Select RESET SRI LIGHT. Reset SRI light. When DRB-II is finished resetting light, DRB-II display will read SRI LIGHT IS RESET.

PERFORM SERVICE MESSAGE

NOTE: To determine the appropriate reset procedure, refer to PERFORM SERVICE MESSAGE RESET INDEX.

PERFORM SERVICE MESSAGE RESET INDEX

Model & Year	Reset Procedure
Grand Cherokee	
1994-98	<u>Perform Service Message Reset - Procedure 1</u>
1999-07	<u>Perform Service Message Reset - Procedure 2</u>
Liberty	
2003-07	<u>Perform Service Message Reset - Procedure 2</u>

PERFORM SERVICE MESSAGE RESET - PROCEDURE 1

This vehicle may be equipped with an optional Vehicle Information Center (VIC). A PERFORM SERVICE message is displayed when "miles/kms to service" is zero, indicating that regular service and maintenance is due. To reset counter, turn ignition on, then press SELECT button momentarily, then press and hold SET button for at least 2 seconds.

PERFORM SERVICE MESSAGE RESET - PROCEDURE 2

1. The Electronic Vehicle Information Center (EVIC) displays a PERFORM SERVICE message when distance to service interval has been reached, indicating that regular service and maintenance is due. After performing necessary services, reset service distance by selecting a distance to service interval.
2. To program EVIC, turn ignition switch to ON position. Depress and release MENU push button until SERVICE INTV. = is displayed. Press and release STEP button to step through available options. The last selected distance option displayed becomes the service interval at which the PERFORM SERVICE message will be displayed.
3. If a new distance interval is selected, RESET SERVICE DISTANCE? with a yes or no option. When YES is selected, the accumulated distance since the last previous PERFORM SERVICE message will be reset to zero because the service interval has been changed. When NO is selected, the distance until the next PERFORM SERVICE message is reduced by the accumulated distance since the last previous message.
4. EVIC exits programming mode and returns to its normal operation mode when the C/T button is depressed or when the end of the programmable feature menu list is reached, whichever occurs first.

TIRE PRESSURE MONITOR SYSTEM (TPMS)

NOTE: To determine the appropriate reset procedure, refer to TPMS RESET INDEX.

TPMS RESET INDEX

Model & Year	Reset Procedure
Commander	
2006-10	<u>TPMS Reset - Procedure 1</u>
Compass	
2007-11	<u>TPMS Reset - Procedure 1</u>
Grand Cherokee	
2002-04	<u>TPMS Reset - Procedure 2</u>
2005-11	<u>TPMS Reset - Procedure 1</u>
Liberty	
2002-04	<u>TPMS Reset - Procedure 2</u>
2005-11	<u>TPMS Reset - Procedure 1</u>
Patriot	
2007-11	<u>TPMS Reset - Procedure 1</u>
Wrangler	
2007-11	<u>TPMS Reset - Procedure 1</u>

TPMS RESET - PROCEDURE 1

NOTE: Using an RF signal, each sensor transmits tire pressure data approximately once every minute. Each sensor's (transmitter) broadcast is uniquely coded so that the WCM can monitor the state of each of the sensors on the 4 rotating road wheels. The WCM automatically learns and stores the sensor's ID while driving after a sensor has been replaced. There is no formal retraining procedure necessary.

Once the vehicle has remained stationary for more than 20 minutes, drive vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time, the system will learn the new sensor ID.

TPMS RESET - PROCEDURE 2

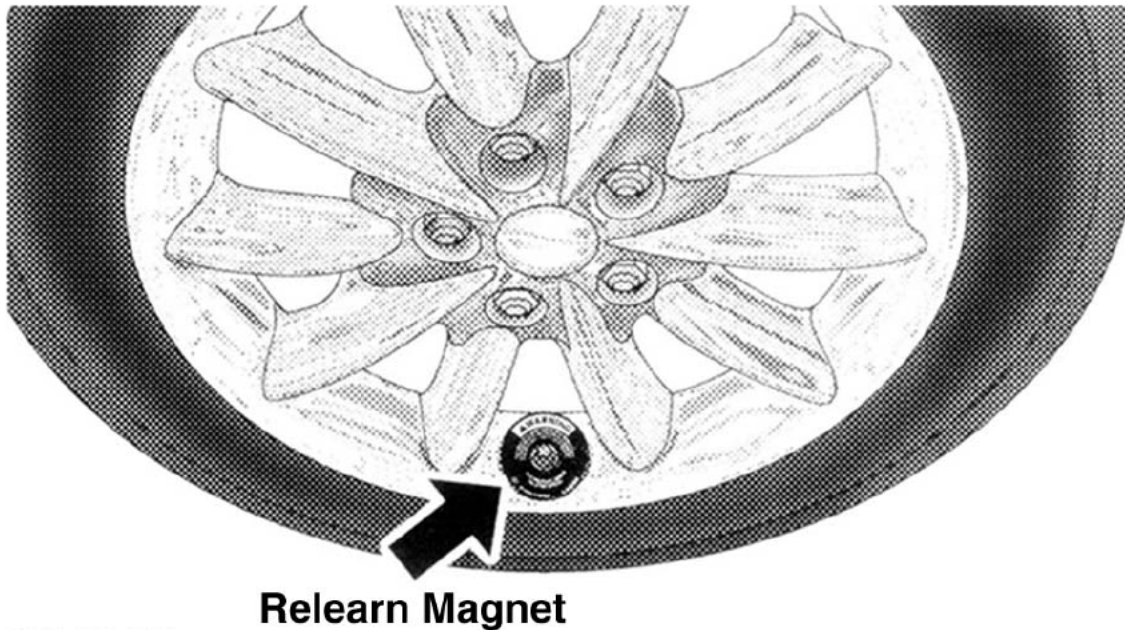
NOTE: Use the following procedure to retrain all 4 road wheel tire pressure sensors. No attempt should be made to retrain individual sensors.

1. Retrieve Relearn Magnet (8821).
2. Press MENU Button on EVIC until "RETRAIN TIRE SENSORS - NO" is displayed.
3. Press STEP button to select "YES".

NOTE: There is a 60-second timer for training the first sensor, and a 30-second timer between training the remaining sensors. If either of these timers expire, the EVIC will abort the training procedure.

NOTE: If at any time the EVIC display reads "TRAINING ABORTED", move the vehicle ahead at least one foot and repeat the entire retraining procedure.

4. Press MENU button to start retraining. Display will read "TRAIN LEFT FRONT TIRE". The order for retraining all 5 sensors is:
 - Left Front.
 - Right Front.
 - Right Rear.
 - Left Rear.
 - Spare (if so equipped).
5. Starting at left front tire, place relearn magnet over valve stem. See **Fig. 1**. Within approximately 5 seconds, vehicle horn will chirp indicating training complete at that particular sensor. Remove the magnet.
6. Repeat this step on remaining sensors as indicated by EVIC until all TPM sensors positions are trained.
7. Once EVIC displays "TRAINING COMPLETE", pressing either STEP, C/T, RESET or MENU button will exit training routine.



Relearn Magnet

G00170162

Fig. 1: Placing Training Magnet Around Valve Stem
Courtesy of DAIMLERCHRYSLER CORPORATION

2008 BRAKES

ABS - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>C1000</u>	BRAKE PEDAL SWITCH 1 CIRCUIT PERFORMANCE
<u>C1008</u>	BRAKE FLUID LEVEL CIRCUIT HIGH
<u>C100A</u>	LEFT FRONT WHEEL SPEED SENSOR CIRCUIT
<u>C1011</u>	LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C1014</u>	LEFT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1015</u>	RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT
<u>C101C</u>	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C101F</u>	RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1020</u>	LEFT REAR WHEEL SPEED SENSOR CIRCUIT
<u>C1027</u>	LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C102A</u>	LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C102B</u>	RIGHT REAR WHEEL SPEED SENSOR CIRCUIT
<u>C1032</u>	RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C1035</u>	RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1041</u>	LEFT FRONT TONE WHEEL PERFORMANCE
<u>C1042</u>	RIGHT FRONT TONE WHEEL PERFORMANCE
<u>C1043</u>	LEFT REAR TONE WHEEL PERFORMANCE
<u>C1044</u>	RIGHT REAR TONE WHEEL PERFORMANCE
<u>C1073</u>	ABS PUMP MOTOR CONTROL CIRCUIT
<u>C1074</u>	ABS PUMP MOTOR CONTROL CIRCUIT PERFORMANCE
<u>C1078</u>	TIRE REVOLUTIONS RANGE PERFORMANCE
<u>C107B</u>	WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C107C</u>	BRAKE PEDAL SWITCH 1/2 STUCK
<u>C1086</u>	ABS SYSTEM CONTROL TOO LONG
<u>C1090</u>	ABS BRAKE LAMP CONTROL CIRCUIT LOW
<u>C1091</u>	ABS BRAKE LAMP CONTROL CIRCUIT HIGH
<u>C1219</u>	STEERING ANGLE SENSOR ERRATIC PERFORMANCE
<u>C121A</u>	STEERING ANGLE SENSOR NOT INITIALIZED
<u>C121C</u>	TORQUE REQUEST SIGNAL DENIED
<u>C121D</u>	BRAKE PRESSURE SENSOR CIRCUIT
<u>C121E</u>	BRAKE PRESSURE SENSOR COMPARATIVE PERFORMANCE
<u>C1231</u>	DRIVE TEST: STEERING ANGLE SENSOR
<u>C1232</u>	DRIVE TEST: PRESSURE SENSOR
<u>C1234</u>	DRIVE TEST: SENSOR CLUSTER INSTALLATION

<u>C1238</u>	DRIVE TEST: UNSUCCESSFUL
<u>C1239</u>	EMISSIONS ROLLS TEST ACTIVE
<u>C123B</u>	ESP SYSTEM CONTROL TOO LONG
<u>C123C</u>	DYNAMICS SENSOR MOUNTING/INSTALLATION PERFORMANCE
<u>C123F</u>	STEERING ANGLE SENSOR COMPARATIVE PERFORMANCE
<u>C1240</u>	STEERING ANGLE SENSOR OVERTRAVEL PERFORMANCE
<u>C1243</u>	G SENSOR NOT INITIALIZED
<u>C2100</u>	BATTERY VOLTAGE LOW
<u>C2101</u>	BATTERY VOLTAGE HIGH
<u>C2105</u>	ABS VALVE SUPPLY VOLTAGE CIRCUIT LOW
<u>C2114</u>	DYNAMICS SENSOR SUPPLY VOLTAGE LOW
<u>C2115</u>	DYNAMICS SENSOR SUPPLY VOLTAGE HIGH
<u>C2116</u>	ABS PUMP MOTOR SUPPLY LOW VOLTAGE
<u>C2200</u>	ANTI-LOCK BRAKE MODULE INTERNAL
<u>C2202</u>	ORIGINAL VIN MISMATCH/MISSING
<u>C2204</u>	DYNAMICS SENSOR INTERNAL
<u>C2205</u>	STEERING ANGLE SENSOR INTERNAL
<u>C2206</u>	VEHICLE CONFIGURATION MISMATCH
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0125</u>	LOST COMMUNICATION WITH DYNAMICS SENSOR
<u>U0126</u>	LOST COMMUNICATION WITH STEERING ANGLE SENSOR
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0401</u>	IMPLAUSIBLE DATA RECEIVED FROM ECM/PCM
<u>U0429</u>	IMPLAUSIBLE DATA RECEIVED FROM SCM
<u>U1003</u>	ESP CAN C BUS PERFORMANCE
<u>U1501</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM ECM/PCM
<u>U1502</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM TCM
<u>U1503</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM FCM

ABS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

ABS INTERMITTENT CONDITION

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Diagnostic Test

1. PERFORM ABS INTERMITTENT CONDITION TEST

NOTE: The conditions that set the DTC are not present at this time. The following list may help in identifying the intermittent condition.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Refer to any Technical Service Bulletins (TSBs) that may apply.

Review the scan tool Environmental Data (EV Data). If possible, try to duplicate the conditions under which the DTC set.

Turn the ignition off.

Visually inspect the related wire harness. Disconnect all the related harness connectors. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals.

Wiggle the wires while checking for shorts and open circuits.

Perform a voltage drop test on the related circuits between the suspected inoperative component and the Anti-Lock Brake Module.

Inspect and clean all PCM, ABS, engine, and chassis grounds that are related to the most current DTC.

If numerous trouble codes were set, use a wire schematic and look for any common ground or supply circuits

For any Relay DTCs, actuate the Relay with the scan tool and wiggle the related wire harness to try to interrupt the actuation.

Use the scan tool to perform a System Test if one applies to failing component.

A co-pilot, data recorder, or lab scope should be used to help diagnose intermittent conditions.

Were any problems found during the above inspections?

Yes

Perform the necessary repairs.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1000-BRAKE PEDAL SWITCH 1 CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Diagnostic Test

1. ENGINE DTCS PRESENT

With the scan tool, read Engine DTCs.

Are there any Engine DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

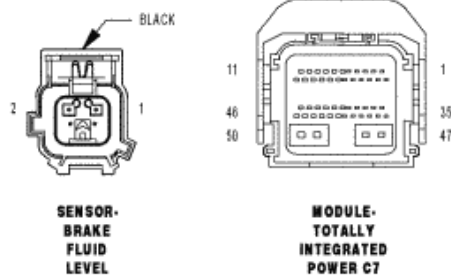
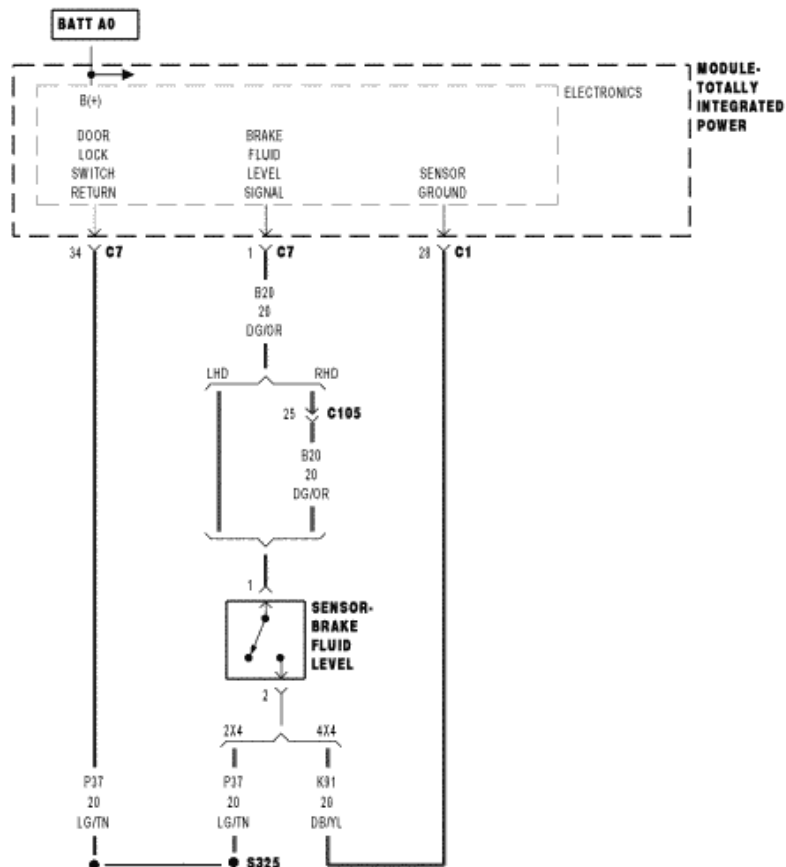
No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits.

Perform **POWERTRAIN VERIFICATION TEST** .

C1008-BRAKE FLUID LEVEL CIRCUIT HIGH

Circuit Schematic



81d044b2

Fig. 1: Brake Fluid Level Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module indicates that the Brake Fluid Level Circuit is open and greater than 4.9 volts for more then 5 seconds.

Possible Causes

Possible Causes
(B20) BRAKE FLUID LEVEL SWITCH SIGNAL CIRCUIT OPEN BRAKE FLUID LEVEL SWITCH INTERNAL FAILURE (P37)/(K91) SENSOR GROUND CIRCUIT OPEN TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **BRAKE FLUID LEVEL SWITCH SIGNAL VOLTAGE ABOVE 4.9 VOLTS**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read Brake Fluid Level Switch Signal voltage.

Is the voltage above 4.9 volts?

Yes

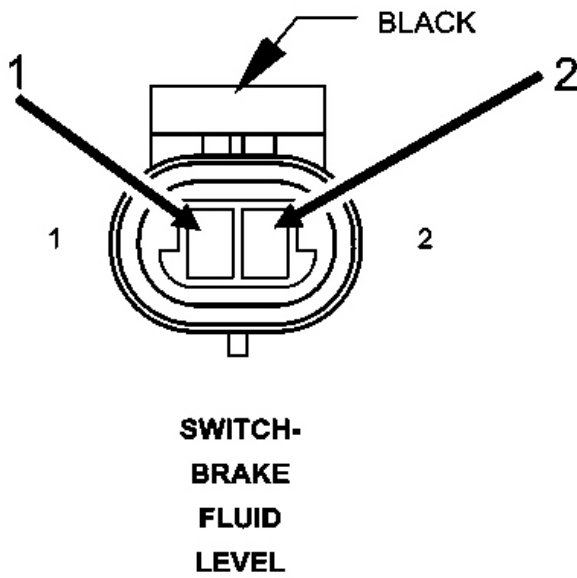
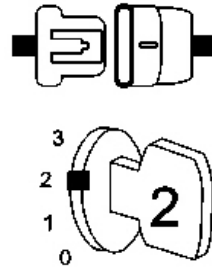
Go To 2.

No

Perform the ABS INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. **BRAKE FLUID LEVEL SWITCH INTERNAL FAILURE**



81662855

Fig. 2: Checking Brake Fluid Level Signal Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect a jumper wire between the (B20) Brake Fluid Level signal circuit and the (P37)/(K91) Brake Fluid Level ground circuit in the Brake Fluid Level Switch harness connector

Turn the ignition on.

With the scan tool, read the Brake Fluid Level Switch voltage

Is the voltage below 1.0 volt?

Yes

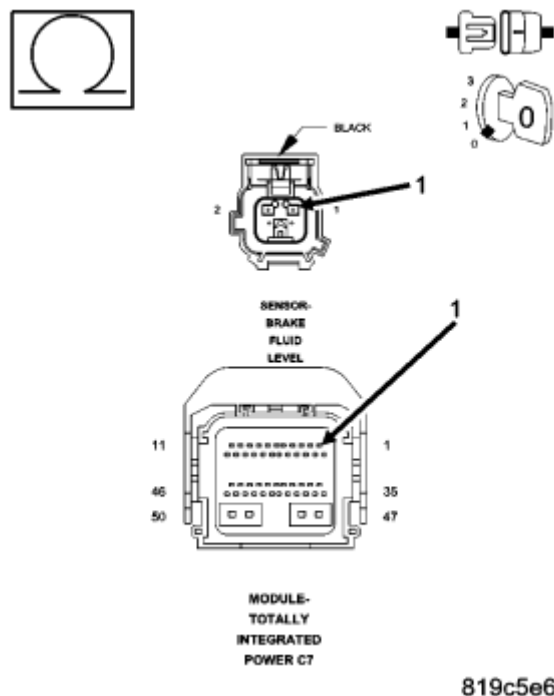
Replace the Brake Fluid Level Switch in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. (B20) BRAKE FLUID LEVEL SWITCH CIRCUIT OPEN



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Fig. 3: Measuring Resistance Of (B20) Brake Fluid Level Signal Circuit Between Brake Fluid Level Switch Harness Connector And TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Brake Fluid Level Switch.

Disconnect the TIPM harness connector.

Measure the resistance of the (B20) Brake Fluid Level signal circuit between the Brake Fluid Level Switch harness connector and the TIPM harness connector.

Is the resistance below 5 ohms?

Yes

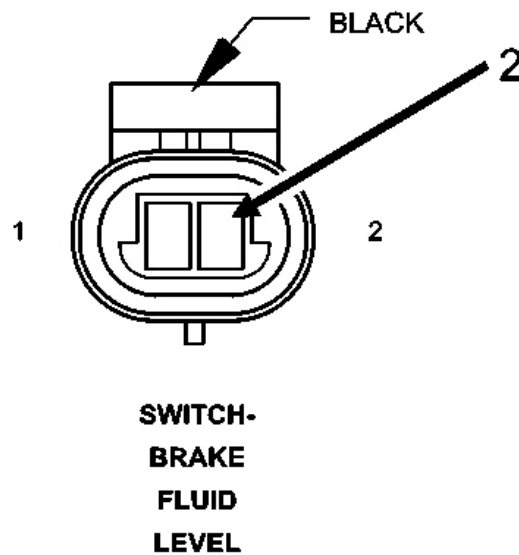
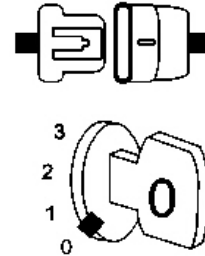
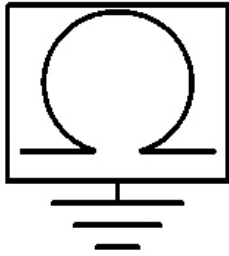
Go To 4.

No

Repair the open in the (B20) Brake Fluid Level Switch signal circuit.

Perform **ABS VERIFICATION TEST**.

4. **(P37)/(K91) SENSOR GROUND CIRCUIT OPEN**



8166285d

Fig. 4: Measuring Resistance Of (Z905) Brake Fluid Level Switch Ground Circuit Between Brake Fluid Level Switch Harness Connector And Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Brake Fluid Level Switch harness connector.

Reconnect the TIPM harness connector.

Measure the resistance of the (P37)/(K91) Brake Fluid Level Switch ground circuit between the Brake Fluid Level Switch harness connector and ground.

Is the resistance below 5.0 ohms?

Yes

Replace and program the Totally Integrated Power Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

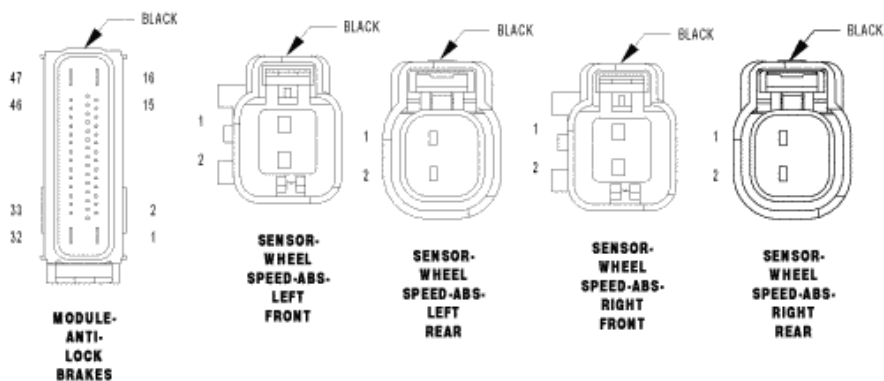
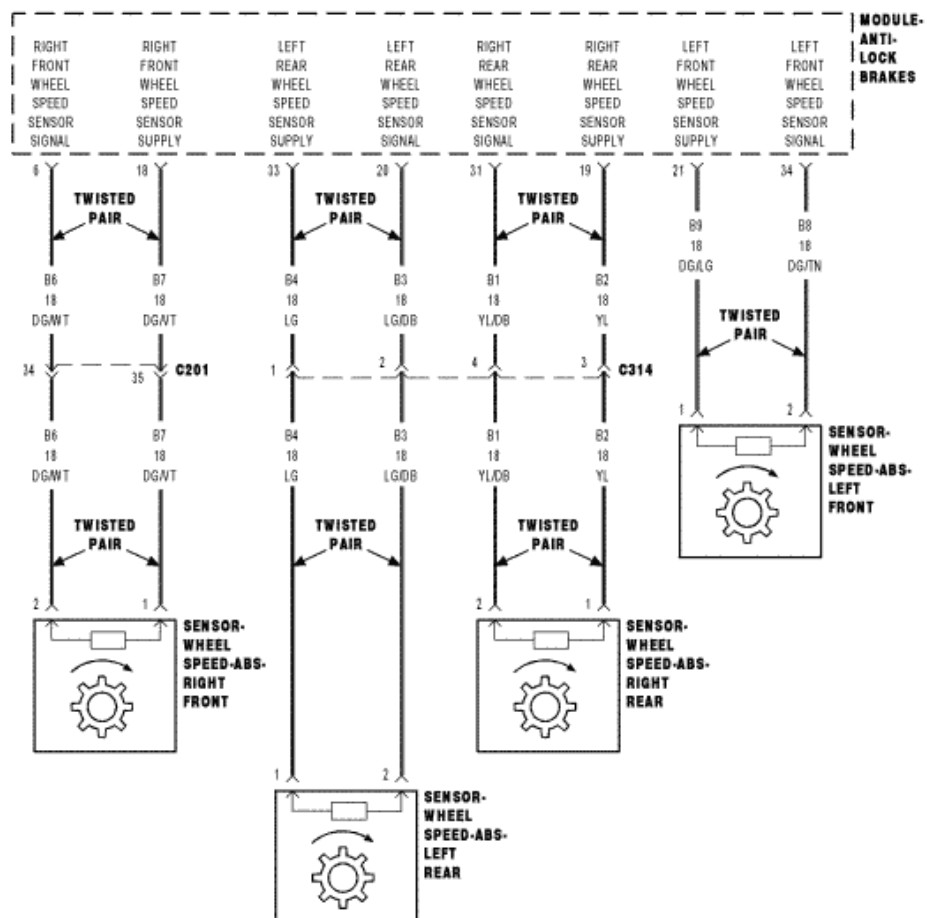
No

Repair the open or high resistance in the (P37)/(K91) Sensor ground circuit.

Perform **ABS VERIFICATION TEST**.

C100A-LEFT FRONT WHEEL SPEED SENSOR CIRCUIT

Circuit Schematic



81d04601

Fig. 5: Wheel Speed Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Left Front Wheel Speed Sensor circuit fails the diagnostic test.

Possible Causes

Possible Causes
CONNECTOR/TERMINAL DAMAGE (B9) LEFT FRONT WSS SUPPLY CIRCUIT SHORTED TO VOLTAGE, GROUND OR OPEN (B8) LEFT FRONT WSS SIGNAL CIRCUIT SHORTED TO VOLTAGE, GROUND, OR OPEN (B8) LEFT FRONT WSS SIGNAL CIRCUIT AND (B9) LEFT FRONT WSS SUPPLY CIRCUIT SHORTED TOGETHER LEFT FRONT WSS ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C100A-LEFT FRONT WHEEL SPEED SENSOR CIRCUIT**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

With the scan tool, read DTCs.

Does the scan tool display: C100A-LEFT FRONT WHEEL SPEED SENSOR CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. **CHECK CONNECTOR/TERMINAL FOR DAMAGE**

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector, Left Front WSS, and Left Front WSS harness connector.

Is the Left Front WSS or any of the connectors/terminals damaged?

Yes

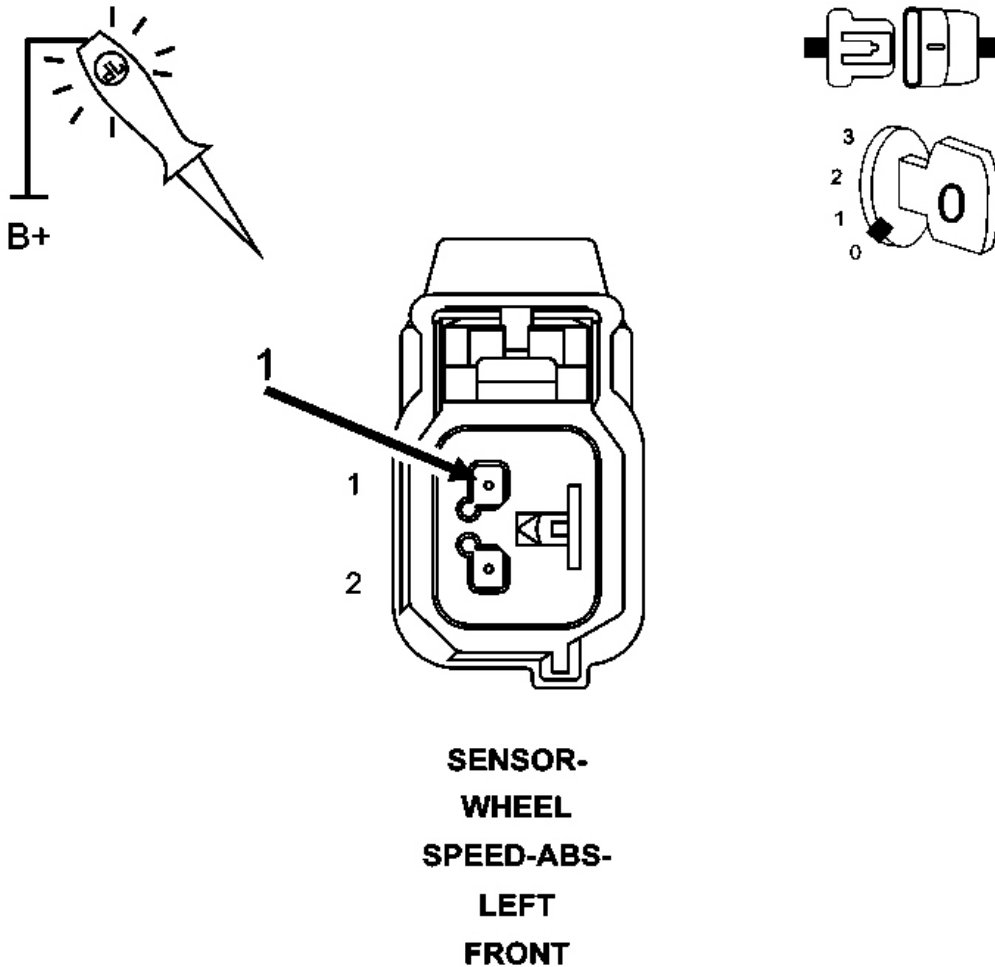
Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. **CHECK (B9) LEFT FRONT WSS SUPPLY CIRCUIT SHORT TO GROUND**



816acfd

Fig. 6: Checking Left Front Wheel Speed Sensor Supply Circuit Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left Front WSS harness connector.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B9) Left Front WSS Supply circuit.

Does the test light illuminate brightly?

Yes

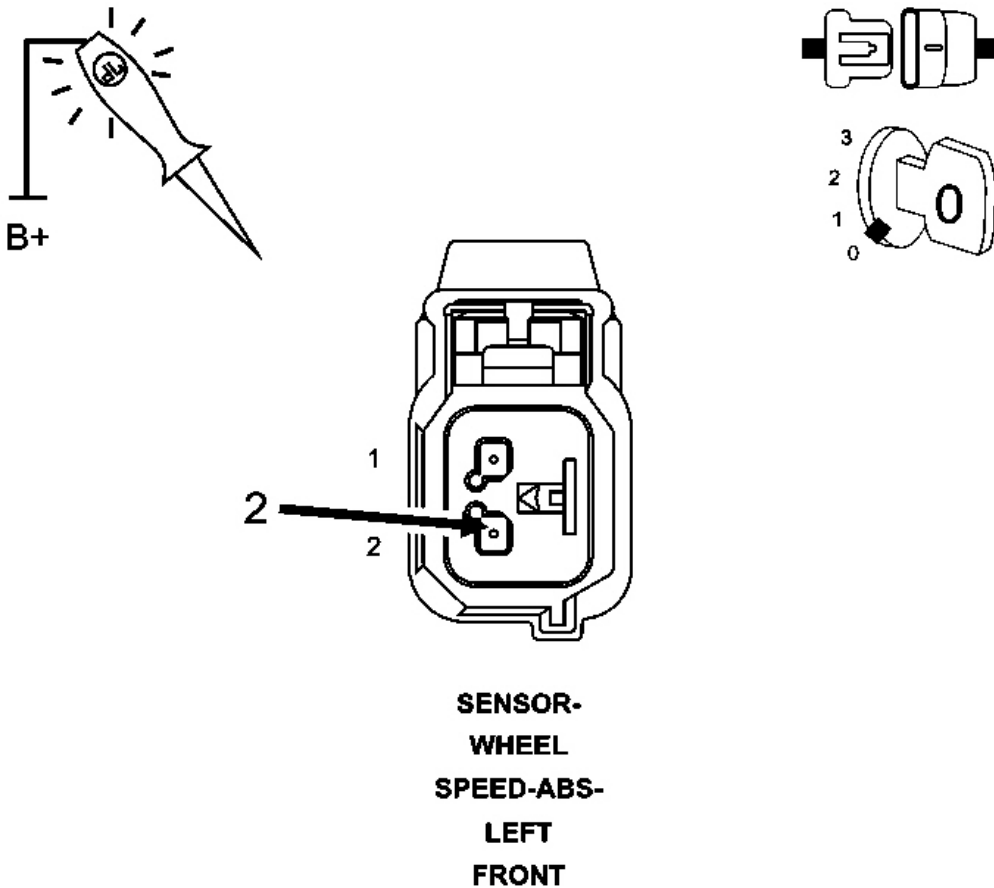
Repair the (B9) Left Front WSS Supply circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (B8) LEFT FRONT WSS SIGNAL CIRCUIT SHORT TO GROUND



816acfe8

Fig. 7: Checking Left Front Wheel Speed Sensor Signal Circuit Short To Ground
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, probe the (B8) Left Front WSS Signal circuit.

Does the test light illuminate brightly?

Yes

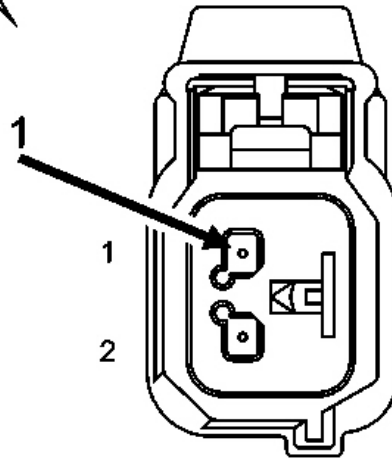
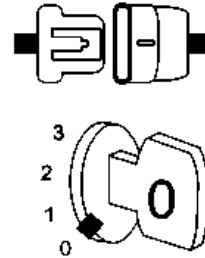
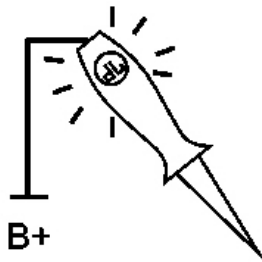
Repair the (B8) Left Front WSS Signal circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK (B9) LEFT FRONT WSS SUPPLY CIRCUIT OPEN



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
FRONT**

816acfd

Fig. 8: Checking Left Front Wheel Speed Sensor Supply Circuit Short To Ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B9) Left Front WSS Supply circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B9) Left Front WSS Supply circuit.

Does the test light illuminate brightly

Yes

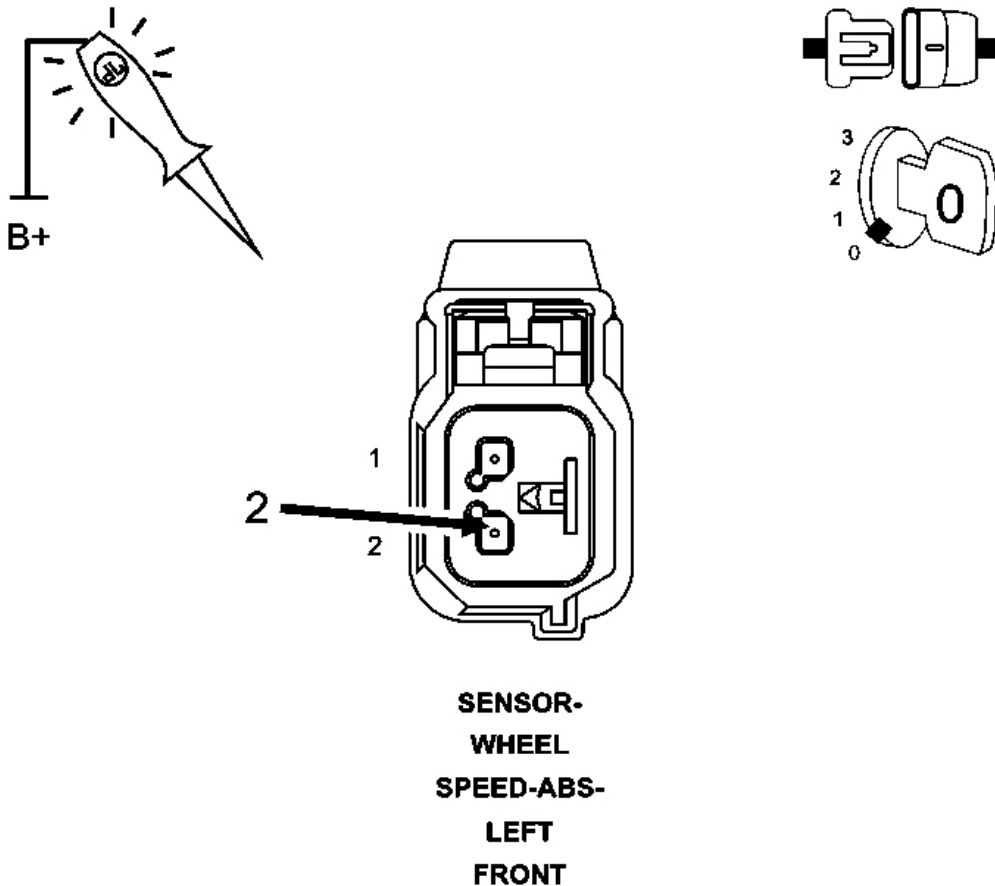
Go To 6.

No

Repair the (B9) Left Front WSS Supply circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. **CHECK (B8) LEFT FRONT WSS SIGNAL CIRCUIT OPEN**



816acfe8

Fig. 9: Checking Left Front Wheel Speed Sensor Signal Circuit Short To Ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B8) Left Front WSS Signal circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B8) Left Front WSS Signal circuit.

Does the test light illuminate brightly?

Yes

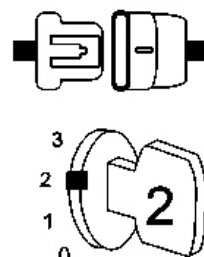
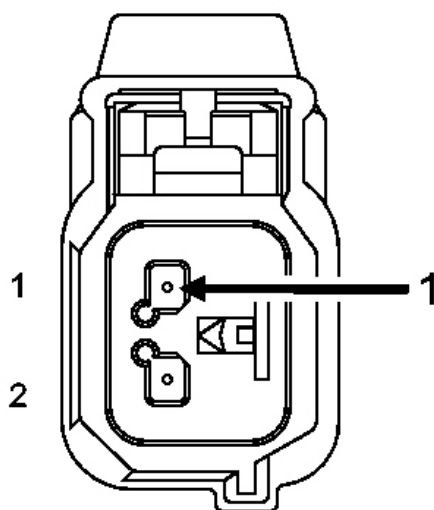
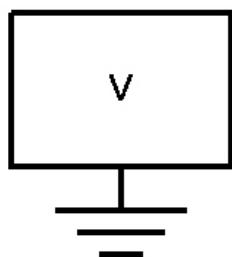
Go To 7.

No

Repair the (B8) Left Front WSS Signal circuit for an open.

Perform **ABS VERIFICATION TEST**.

7. CHECK (B9) LEFT FRONT WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
FRONT**

814eb204

Fig. 10: Checking Left Front WSS Supply Circuit

Courtesy of CHRYSLER LLC

Turn the ignition on.

Remove all jumper wires.

Measure the voltage between the (B9) Left Front WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

Repair the (B9) Left Front WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. CHECK (B8) LEFT FRONT WSS SIGNAL CIRCUIT SHORT TO VOLTAGE

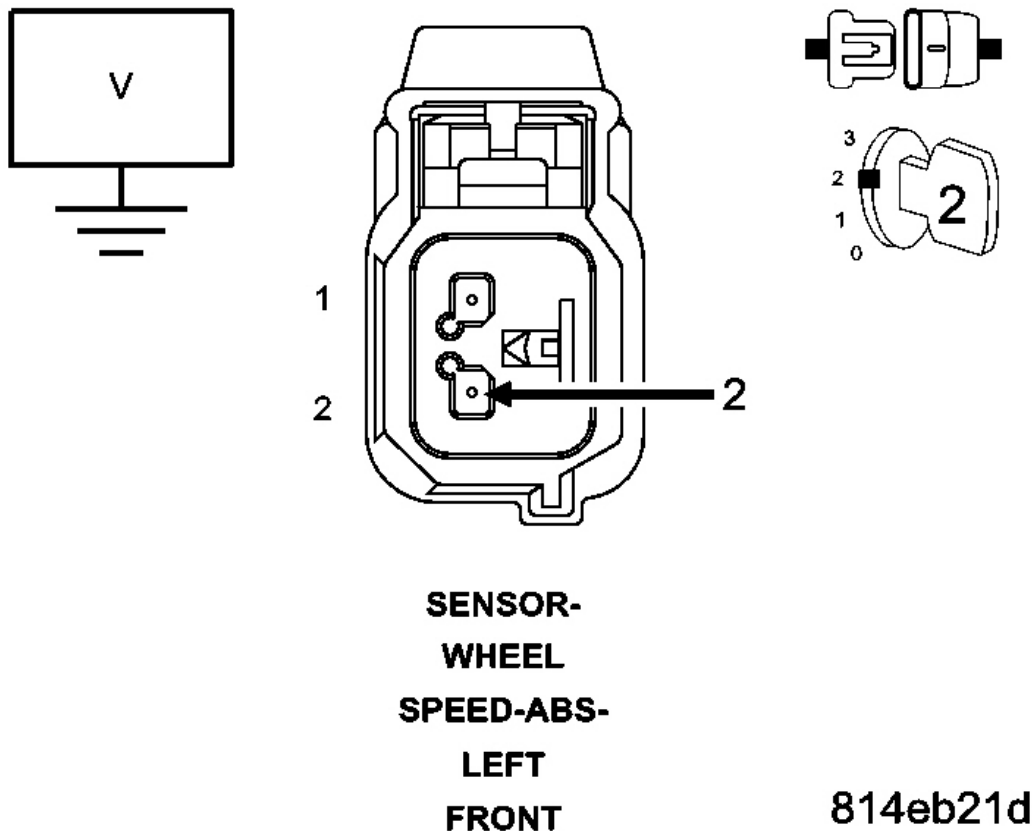


Fig. 11: Checking Left Front Wheel Speed Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Measure the voltage between the (B8) Left Front WSS Signal circuit and ground.

Is the voltage above one volt?

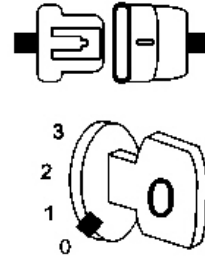
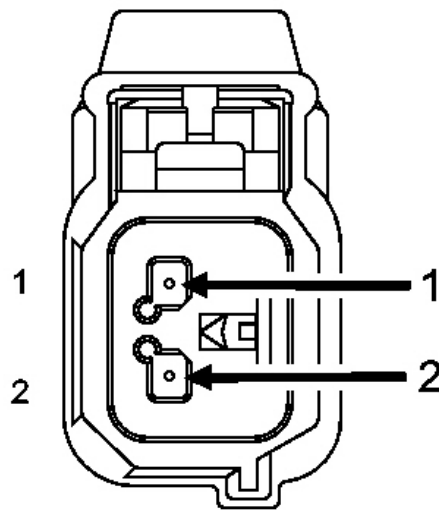
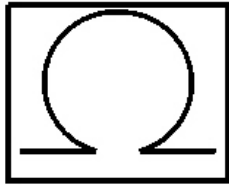
Yes

Repair the (B8) Left Front WSS Signal circuit for a short to voltage.
Perform **ABS VERIFICATION TEST**.

No

Go To 9.

9. **CHECK (B8) LEFT FRONT WSS SIGNAL CIRCUIT AND (B9) LEFT FRONT WSS SUPPLY CIRCUIT SHORT TOGETHER**



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
FRONT**

814eb1de

Fig. 12: Checking Left Front Wheel Speed Sensor Signal Circuit & Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (B8) Left Front WSS Signal circuit and the (B9) Left Front WSS Supply circuit.

Is the resistance above 5.0 ohms?

Yes

Go To step 10.

No

Repair the (B8) Left Front WSS Signal circuit and the (B9) Left Front WSS Supply circuit for a short together.

Perform **ABS VERIFICATION TEST**.

10. **LEFT FRONT WHEEL SPEED SENSOR**

Replace the Left Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

With the scan tool, read ABS DTCs.

Did DTC C100A-LEFT FRONT WHEEL SPEED SENSOR CIRCUIT reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1011-LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Left Front Wheel Speed Sensor (WSS) Signal is intermittently missing while vehicle speed is above 40 km/h (25 mph) or erratic wheel speed signal during acceleration or sensed wheel speed is different from other wheels.

Possible Causes

Possible Causes
LEFT FRONT WSS LOOSE - B8, B9 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
LEFT FRONT TONE WHEEL DAMAGE
LEFT FRONT WHEEL/ BEARING DAMAGE
IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES
LEFT FRONT WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC C1011-LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

NOTE: If DTC C100A Left Front Wheel Speed Sensor Circuit is present it must be repaired before continuing.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1011-LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK LEFT FRONT WSS LOOSENESS, INSPECT B8, B9 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Left Front WSS, and Left Front WSS harness connector

Inspect the Left Front WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B8) Left Front WSS Signal and (B9) Left Front WSS Supply circuits between the Left Front WSS and Anti-Lock Brake Module for damage.

Is the Left Front WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK LEFT FRONT WHEEL SPEED SENSOR FOR DAMAGE

Remove the Left Front Wheel Speed Sensor

Inspect the Left Front Wheel Speed Sensor face for damage.

Is the Left Front Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK LEFT FRONT TONE WHEEL/BEARING FOR DAMAGE

Inspect the Left Front Tone Wheel/Bearing for damage, missing teeth, cracks, corrosion or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Left Front Tone Wheel/Bearing damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK LEFT FRONT WHEEL BEARING FOR DAMAGE

Inspect the Left Front wheel bearing for excessive runout or clearance.

NOTE: Refer to the appropriate service information, if necessary, for procedures or specifications.

Is the Left Front Wheel Bearing Damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. LEFT FRONT WHEEL SPEED SENSOR

Replace the Left Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read ABS DTCs.

Did DTC C1011-LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1014-LEFT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

When the Left Front Wheel Speed Sensor (WSS) Signal reading is different from the readings received from the other WSS's at a vehicle speed above 40 km/h (25 mph). The Anti-Lock Brake Module compares WSS readings from side-to-side on an axle and front-to-rear.

Possible Causes

Possible Causes
LEFT FRONT WSS LOOSE - B8, B9 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES
LEFT FRONT TONE WHEEL/BEARING DAMAGE
LEFT FRONT WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C1014-LEFT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read DTCs.

Does the scan tool display: C1014-LEFT FRONT WHEEL SPEED COMPARATIVE

PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK LEFT FRONT WSS LOOSENESS, INSPECT B8, B9 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Left Front WSS, and Left Front WSS harness connector.

Inspect the Left Front WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B8) Left Front WSS Signal and (B9) Left Front WSS Supply circuits between the Left Front WSS and Anti-Lock Brake Module for damage.

Is the Left Front WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK LEFT FRONT WHEEL SPEED SENSOR FOR DAMAGE

Remove the Left Front Wheel Speed Sensor

Inspect the Left Front Wheel Speed Sensor face for damage.

Is the Left Front Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK LEFT FRONT TONE WHEEL/BEARING FOR DAMAGE

Inspect the Left Front Tone Wheel/Bearing for damage, missing teeth, cracks, corrosion or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Left Front Tone Wheel/Bearing damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. LEFT FRONT WHEEL SPEED SENSOR

Replace the Left Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read ABS DTCs.

Did DTC C1014-LEFT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

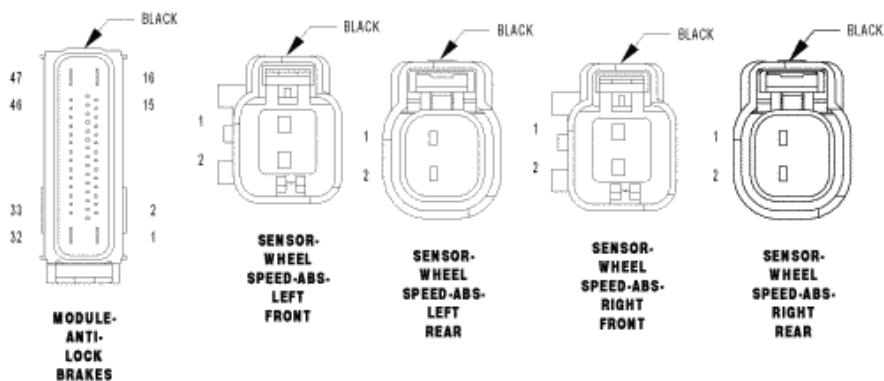
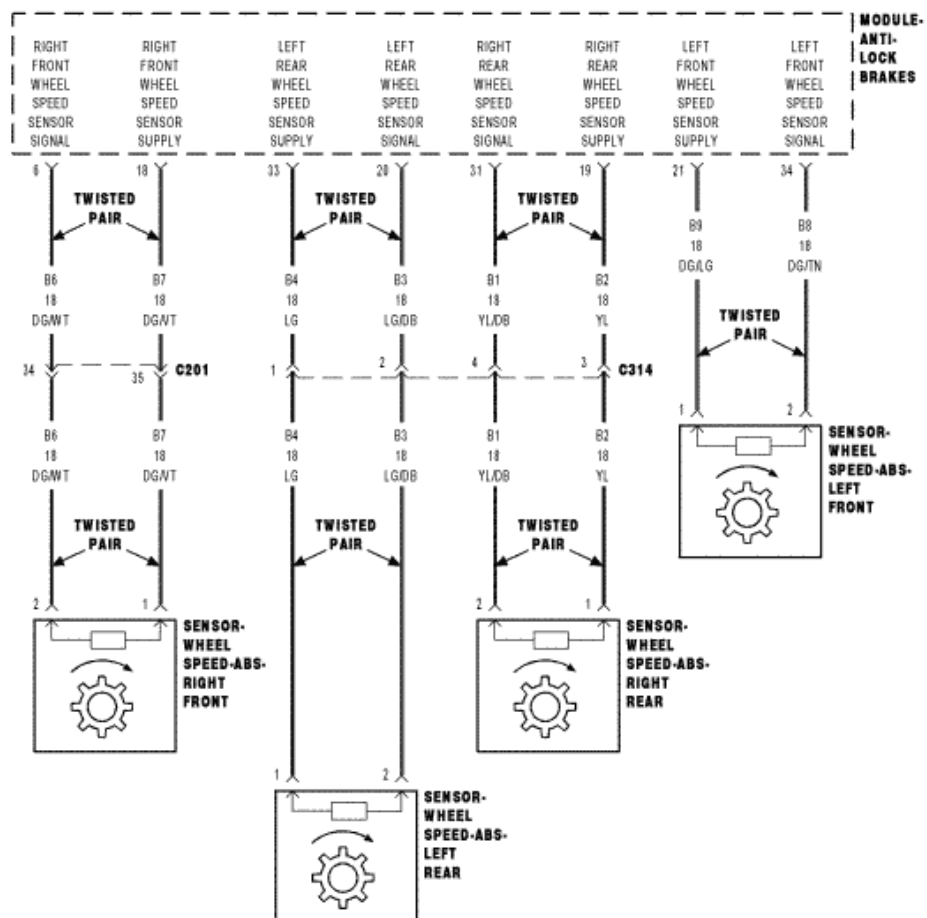
Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1015-RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT

Circuit Schematic



81d04601

Fig. 13: Wheel Speed Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Right Front Wheel Speed Sensor circuit fails the diagnostic test.

Possible Causes

Possible Causes
CONNECTOR/TERMINAL DAMAGE (B7) RIGHT FRONT WSS SUPPLY CIRCUIT SHORTED TO VOLTAGE, GROUND OR OPEN (B6) RIGHT FRONT WSS SIGNAL CIRCUIT SHORTED TO VOLTAGE, GROUND, OR OPEN (B6) RIGHT FRONT WSS SIGNAL CIRCUIT AND (B7) RIGHT FRONT WSS SUPPLY CIRCUIT SHORTED TOGETHER RIGHT FRONT WSS ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C1015-RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

With the scan tool, read DTCs.

Does the scan tool display: C1015-RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector, Right Front WSS, and Right Front WSS harness connector.

Is the Right Front WSS or any of the connectors/terminals damaged?

Yes

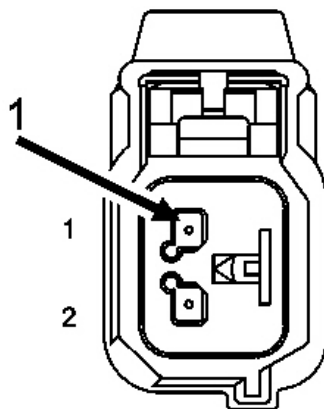
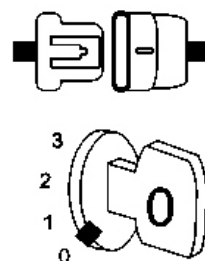
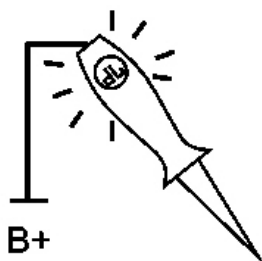
Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. CHECK (B7) RIGHT FRONT WSS SUPPLY CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add05

Fig. 14: Checking Right Front Wheel Speed Sensor Supply Circuit For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right Front WSS harness connector.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B7) Right Front WSS Supply circuit.

Does the test light illuminate brightly?

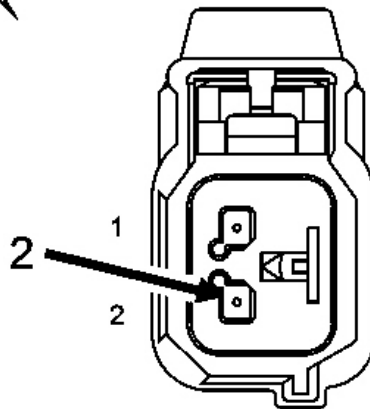
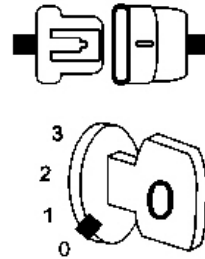
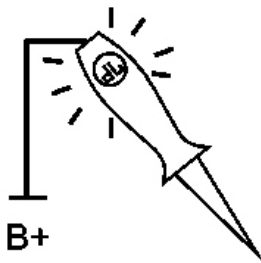
Yes

Repair the (B7) Right Front WSS Supply circuit for a short to ground.
Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (B6) RIGHT FRONT WSS SIGNAL CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add08

Using a 12-volt test light connected to 12-volts, probe the (B6) Right Front WSS Signal circuit.

Does the test light illuminate brightly?

Yes

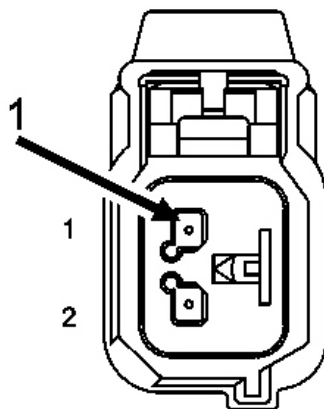
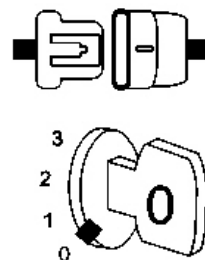
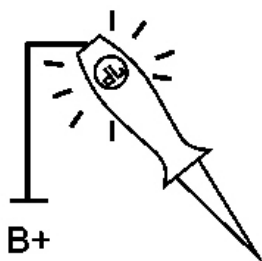
Repair the (B6) Right Front WSS Signal circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK (B7) RIGHT FRONT WSS SUPPLY CIRCUIT OPEN



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add05

Fig. 16: Checking Right Front Wheel Speed Sensor Supply Circuit For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B7) Right Front WSS Supply circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B7) Right Front WSS Supply circuit.

Does the test light illuminate brightly

Yes

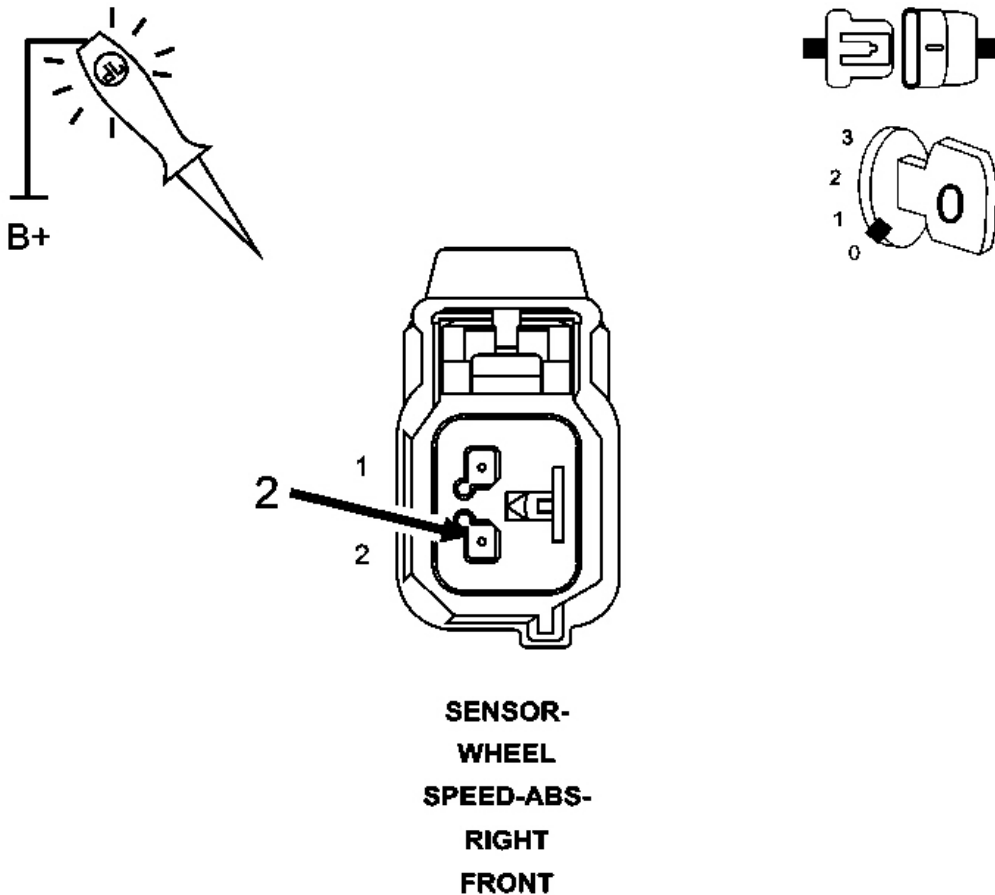
Go To 6.

No

Repair the (B7) Right Front WSS Supply circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. **CHECK (B6) RIGHT FRONT WSS SIGNAL CIRCUIT OPEN**



816add08

Fig. 17: Checking Right Front Wheel Speed Sensor Signal Circuit Short To ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B6) Right Front WSS Signal circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B6) Right Front WSS Signal circuit.

Does the test light illuminate brightly?

Yes

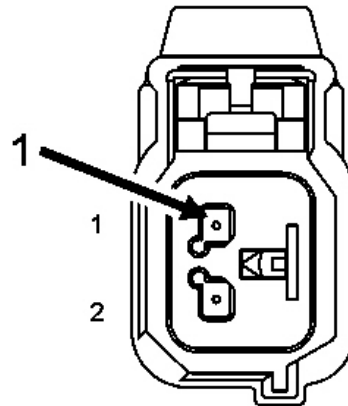
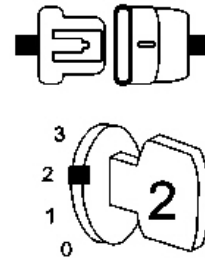
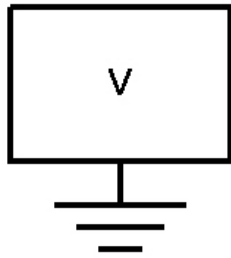
Go To 7.

No

Repair the (B6) Right Front WSS Signal circuit for an open.

Perform **ABS VERIFICATION TEST**.

7. CHECK (B7) RIGHT FRONT WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add04

Fig. 18: Checking Right Front Wheel Speed Sensor Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Remove all jumper wires.

Measure the voltage between the (B7) Right Front WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

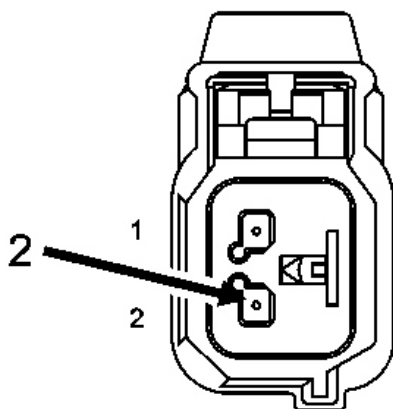
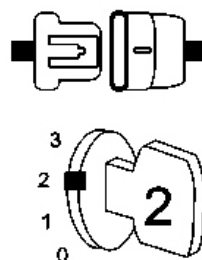
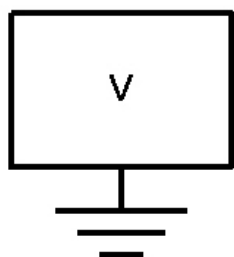
Repair the (B7) Right Front WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. CHECK (B6) RIGHT FRONT WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add07

Fig. 19: Measuring Voltage Between Right Front WSS Signal Circuit And Ground
Courtesy of CHRYSLER LLC

Measure the voltage between the (B6) Right Front WSS Signal circuit and ground.

Is the voltage above one volt?

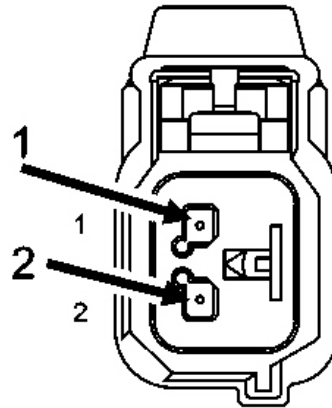
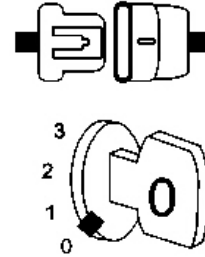
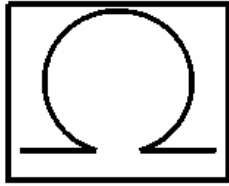
Yes

Repair the (B6) Right Front WSS Signal circuit for a short to voltage.
Perform **ABS VERIFICATION TEST**.

No

Go To 9.

9. **CHECK (B6) RIGHT FRONT WSS SIGNAL CIRCUIT AND (B7) RIGHT FRONT WSS SUPPLY CIRCUIT SHORT TOGETHER**



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

816add0a

Fig. 20: Measuring Resistance Between Right Front WSS Signal Circuit And Right Front WSS 12 Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (B6) Right Front WSS Signal circuit and the (B7) Right Front WSS Supply circuit.

Is the resistance above 5.0 ohms?

Yes

Go To 10.

No

Repair the (B6) Right Front WSS Signal circuit and the (B7) Right Front WSS Supply circuit for a short together.

Perform **ABS VERIFICATION TEST**.

10. **RIGHT FRONT WHEEL SPEED SENSOR**

Replace the Right Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

With the scan tool, read ABS DTCs.

Did DTC C1015-RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C101C-RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Right Front Wheel Speed Sensor (WSS) Signal is intermittently missing while vehicle speed is above 40 km/h (25 mph) or erratic wheel speed signal during acceleration or sensed wheel speed is different from other wheels.

Possible Causes

Possible Causes
RIGHT FRONT WSS LOOSE - B6, B7 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
RIGHT FRONT TONE WHEEL DAMAGE
RIGHT FRONT WHEEL/BEARING DAMAGE
IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES
RIGHT FRONT WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC C101C-RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

NOTE: If DTC C1015-Right Front Wheel Speed Sensor Circuit is present it must be repaired before continuing.

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C101C-RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. **CHECK WHEEL SPEED SENSOR SIGNALS**

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Refer to the **ABS INTERMITTENT CONDITION.**

3. **CHECK FOR IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES**

Turn the ignition off.

Check and adjust the Right Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 4.

4. **CHECK RIGHT FRONT WSS LOOSENESS, INSPECT B6, B7 CIRCUITS/TERMINALS FOR DAMAGE**

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Right Front WSS, and Right Front WSS harness connector

Inspect the Right Front WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B6) Right Front WSS Signal and (B7) Right Front WSS Supply circuits between the Right Front WSS and Anti-Lock Brake Module for damage.

Is the Right Front WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK RIGHT FRONT WHEEL SPEED SENSOR FOR DAMAGE

Remove the Right Front Wheel Speed Sensor

Inspect the Right Front Wheel Speed Sensor face for damage.

Is the Right Front Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK RIGHT FRONT TONE WHEEL/BEARING FOR DAMAGE

Inspect the Right Front Tone Wheel/Bearing for damage, missing teeth, cracks, corrosion or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Right Front Tone Wheel/Bearing damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK RIGHT FRONT WHEEL BEARING FOR DAMAGE

Inspect the Right Front wheel bearing for excessive runout or clearance.

NOTE: Refer to the appropriate service information, if necessary, for procedures or specifications.

Is the Right Front Wheel Bearing Damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. RIGHT FRONT WHEEL SPEED SENSOR

Replace the Right Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read ABS DTCs.

Did DTC C101C-RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C101F-RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Right Front Wheel Speed Sensor (WSS) reading is different from the readings received from the other sensors at a vehicle speed above 40 km/h (25 mph). The Anti-Lock Brake Module compares WSS readings from side-to-side on an axle and front-to-rear.

Possible Causes

Possible Causes
RIGHT FRONT WSS LOOSE - B6, B7 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES
RIGHT FRONT TONE WHEEL/BEARING DAMAGE
RIGHT FRONT WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C101F-RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read DTCs.

Does the scan tool display: C101F-RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: **If graph shows periodic dropouts pay close attention to the tone wheel.**

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION.**

3. CHECK FOR IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Right Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK RIGHT FRONT WSS LOOSENESS, INSPECT B6, B7 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Right Front WSS, and Right Front WSS harness connector

Inspect the Right Front WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B6) Right Front WSS Signal and (B7) Right Front WSS Supply circuits between the Right Front WSS and Anti-Lock Brake Module for damage.

Is the Right Front WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK RIGHT FRONT WHEEL SPEED SENSOR FOR DAMAGE

Remove the Right Front Wheel Speed Sensor

Inspect the Right Front Wheel Speed Sensor face for damage.

Is the Right Front Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK RIGHT FRONT TONE WHEEL/BEARING FOR DAMAGE

Inspect the Right Front Tone Wheel/Bearing for damage, missing teeth, cracks, corrosion or looseness.

NOTE: **The Tone Wheel teeth should be perfectly square, not bent, or nicked.**

Is the Right Front Tone Wheel/Bearing damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. RIGHT FRONT WHEEL SPEED SENSOR

Replace the Right Front Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read ABS DTCs.

Did DTC C101F-RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

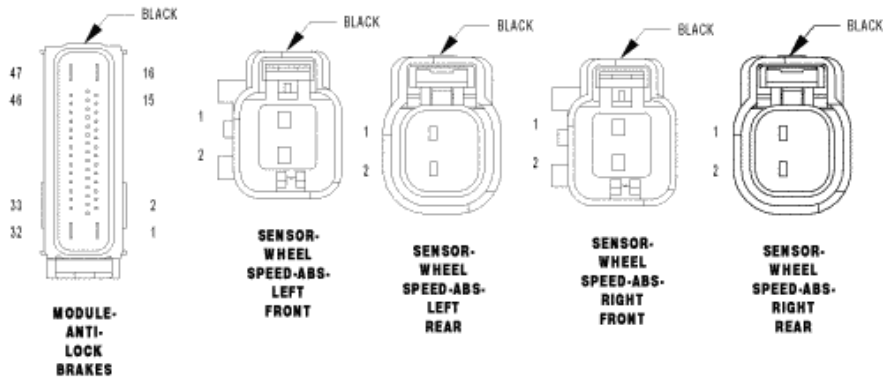
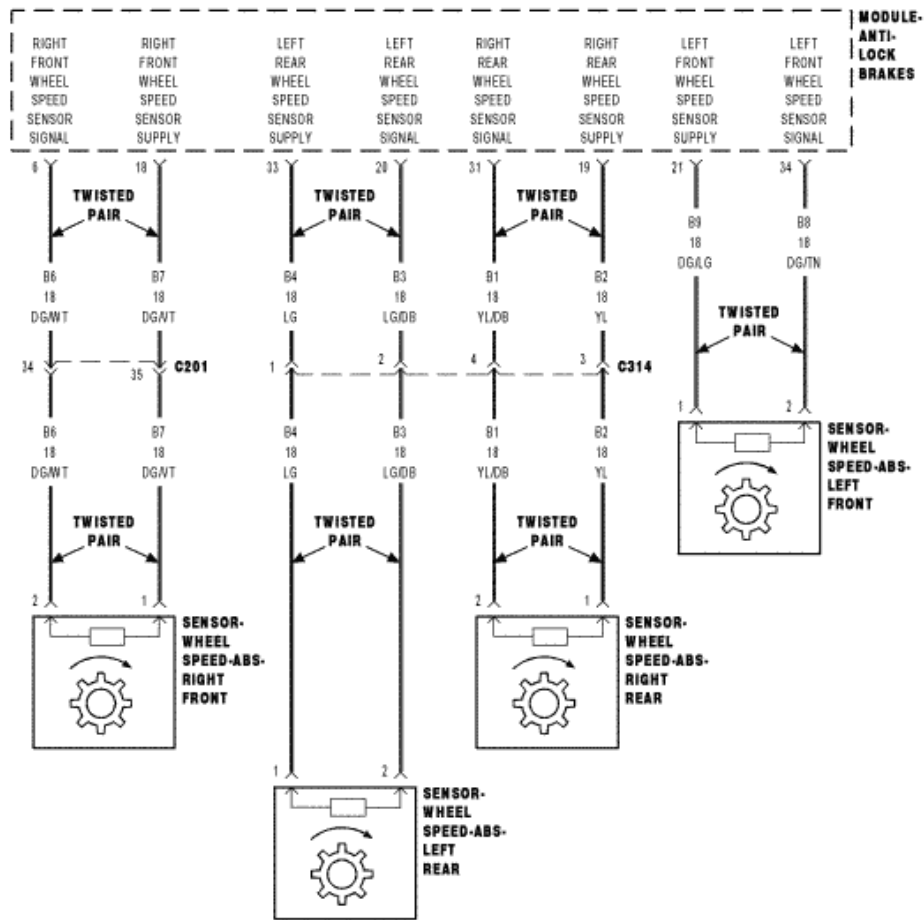
Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1020-LEFT REAR WHEEL SPEED SENSOR CIRCUIT

Circuit Schematic



81404601

Fig. 21: Wheel Speed Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Left Rear Wheel Speed Sensor circuit fails the diagnostic test.

Possible Causes

Possible Causes
CONNECTOR/TERMINAL DAMAGE (B4) LEFT REAR WSS SUPPLY CIRCUIT SHORTED TO VOLTAGE, GROUND OR OPEN (B3) LEFT REAR WSS SIGNAL CIRCUIT SHORTED TO VOLTAGE, GROUND, OR OPEN (B3) LEFT REAR WSS SIGNAL CIRCUIT AND (B4) LEFT REAR WSS SUPPLY CIRCUIT SHORTED TOGETHER LEFT REAR WSS ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C1020-LEFT REAR WHEEL SPEED SENSOR CIRCUIT**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

With the scan tool, read DTCs.

Does the scan tool display: C1020-LEFT REAR WHEEL SPEED SENSOR CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector, Left Rear WSS, and Left Rear WSS harness connector.

Is the Left Rear WSS or any of the connectors/terminals damaged?

Yes

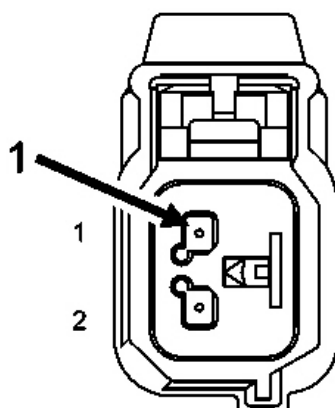
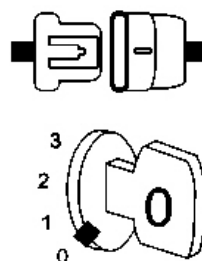
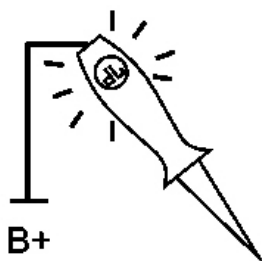
Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK (B4) LEFT REAR WSS SUPPLY CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add52

Fig. 22: Checking Left Rear Wheel Speed Sensor Supply Circuit For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left Rear WSS harness connector.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B4) Left Rear WSS Supply circuit.

Does the test light illuminate brightly?

Yes

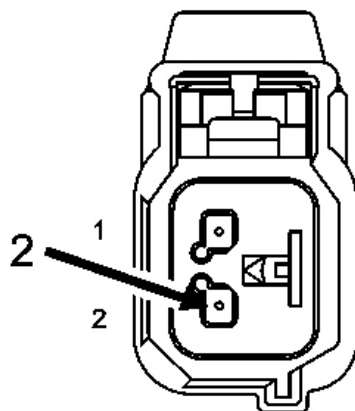
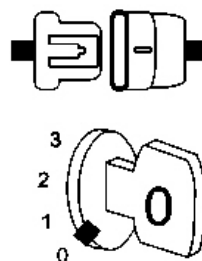
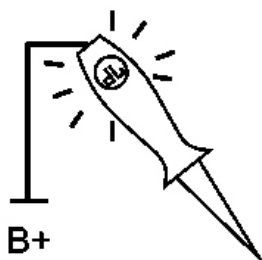
Repair the (B4) Left Rear WSS Supply circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (B3) LEFT REAR WSS SIGNAL CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add54

Using a 12-volt test light connected to 12-volts, probe the (B3) Left Rear WSS Signal circuit.

Does the test light illuminate brightly?

Yes

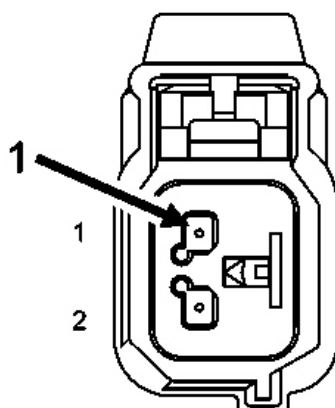
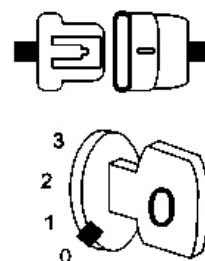
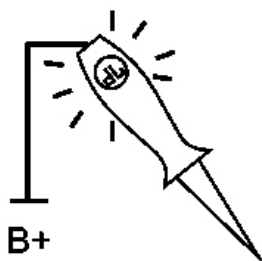
Repair the (B3) Left Rear WSS Signal circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK (B4) LEFT REAR WSS SUPPLY CIRCUIT OPEN



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add52

Fig. 24: Checking Left Rear Wheel Speed Sensor Supply Circuit For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B4) Left Rear WSS Supply circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B4) Left Rear WSS Supply circuit.

Does the test light illuminate brightly

Yes

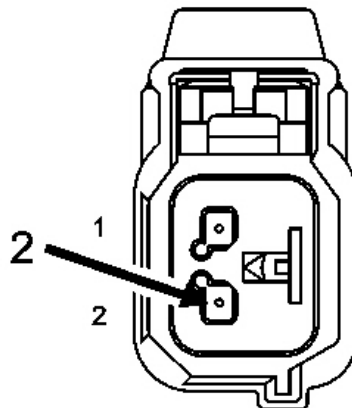
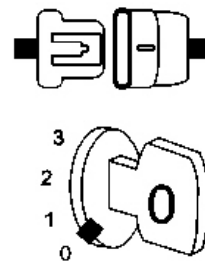
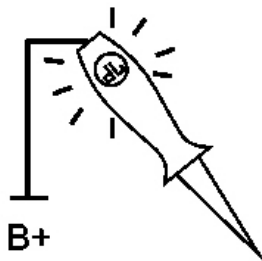
Go To 6.

No

Repair the (B4) Left Rear WSS Supply circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. **CHECK (B3) LEFT REAR WSS SIGNAL CIRCUIT OPEN**



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add54

Fig. 25: Checking Left Rear Wheel Speed Sensor Signal Circuit For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B3) Left Rear WSS Signal circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B3) Left Rear WSS Signal circuit.

Does the test light illuminate brightly?

Yes

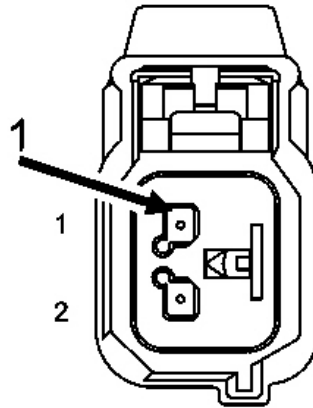
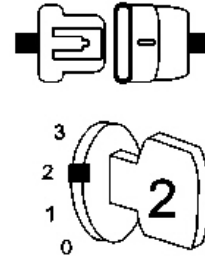
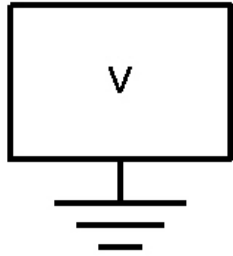
Go To 7.

No

Repair the (B3) Left Rear WSS Signal circuit for an open.

Perform **ABS VERIFICATION TEST**.

7. CHECK (B4) LEFT REAR WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add50

Fig. 26: Checking Left Rear Wheel Speed Sensor Supply Circuit Voltage
Courtesy of CHRYSLER LLC

Turn the ignition on.

Remove all jumper wires.

Measure the voltage between the (B4) Left Rear WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

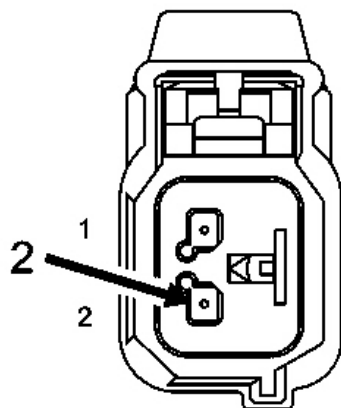
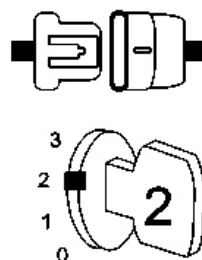
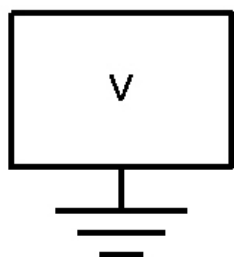
Repair the (B4) Left Rear WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. CHECK (B3) LEFT REAR WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add53

Fig. 27: Measuring Voltage Between Left Rear WSS Signal Circuit And Ground
Courtesy of CHRYSLER LLC

Measure the voltage between the (B3) Left Rear WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

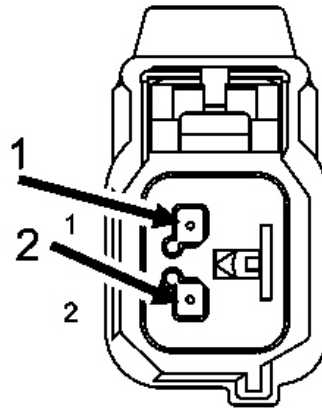
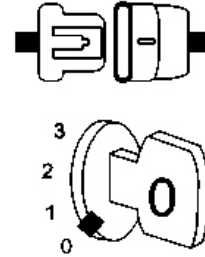
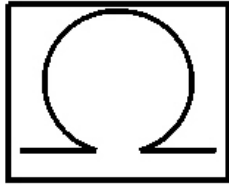
Repair the (B3) Left Rear WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 9.

9. **CHECK (B3) LEFT REAR WSS SIGNAL CIRCUIT AND (B4) LEFT REAR WSS SUPPLY CIRCUIT SHORT TOGETHER**



**SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR**

816add56

Fig. 28: Measuring Resistance Between Left Rear WSS Signal Circuit And Left Rear WSS Supply Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (B3) Left Rear WSS Signal circuit and the (B4) Left Rear WSS Supply circuit.

Is the resistance above 5.0 ohms?

Yes

Go To step 10.

No

Repair the (B3) Left Rear WSS Signal circuit and the (B4) Left Rear WSS Supply circuit for a short together.

Perform **ABS VERIFICATION TEST**.

10. **LEFT REAR WHEEL SPEED SENSOR**

Replace the Left Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

With the scan tool, read ABS DTCs.

Did DTC C1020-LEFT REAR WHEEL SPEED SENSOR CIRCUIT reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1027-LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Left Rear Wheel Speed Sensor (WSS) Signal is intermittently missing while vehicle speed is above 40 km/h (25 mph) or erratic wheel speed signal during acceleration or sensed wheel speed is different from other wheels.

Possible Causes

Possible Causes
LEFT REAR WSS LOOSE - B3, B4 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
LEFT REAR TONE WHEEL DAMAGE
LEFT REAR WHEEL BEARING DAMAGE
AXLE SHAFT FASTENER HARDWARE
IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES
LEFT REAR WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C1027-LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE**

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1027-LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Refer to the **ABS INTERMITTENT CONDITION.**

3. CHECK FOR IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper

specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK LEFT REAR WSS LOOSENESS, INSPECT B4, B5 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Left Rear WSS, and Left Rear WSS harness connector

Inspect the Left Rear WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B3) Left Rear WSS Signal and (B4) Left Rear WSS Supply circuits between the Left Rear WSS and Anti-Lock Brake Module for damage.

Is the Left Rear WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 6.

6. CHECK LEFT REAR WHEEL SPEED SENSOR FOR DAMAGE

Remove the Left Rear Wheel Speed Sensor

Inspect the Left Rear Wheel Speed Sensor face for damage.

Is the Left Rear Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST.**

No

Go To 7.

7. CHECK LEFT REAR TONE WHEEL FOR DAMAGE

Inspect the Left Rear Tone Wheel for damage, missing teeth, cracks, corrosion or looseness.

NOTE: **The Tone Wheel teeth should be perfectly square, not bent, or nicked.**

Is the Left Rear Tone Wheel damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 8.

8. CHECK LEFT REAR WHEEL BEARING FOR DAMAGE

Inspect the Left Rear wheel bearing for excessive runout or clearance.

NOTE: **Refer to the appropriate service information, if necessary, for procedures or specifications.**

Is the Left Rear Wheel Bearing Damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 9.

9. LEFT REAR WHEEL SPEED SENSOR

Replace the Left Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST.**

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be**

met.

With the scan tool, read ABS DTCs.

Did DTC C1027-LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C102A-LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

When the Left Rear Wheel Speed Sensor (WSS) reading is different from the readings received from the other sensors at a vehicle speed above 40 km/h (25 mph). The Anti-Lock Brake Module compares WSS readings from side-to-side on an axle and front-to-rear.

Possible Causes

Possible Causes
LEFT REAR WSS LOOSE - B3, B4 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES
LEFT REAR TONE WHEEL DAMAGE
AXLE SHAFT FASTENER HARDWARE
LEFT REAR WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC C102A-LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C102A-LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires. Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK LEFT REAR WSS LOOSENESS, INSPECT B3, B4 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Left Rear WSS, and Left Rear WSS harness connector.

Inspect the Left Rear WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B3) Left Rear WSS Signal and (B4) Left Rear WSS Supply circuits between the Left Rear WSS and Anti-Lock Brake Module for damage.

Is the Left Rear WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK LEFT REAR WHEEL SPEED SENSOR FOR DAMAGE

Remove the Left Rear Wheel Speed Sensor

Inspect the Left Rear Wheel Speed Sensor face for damage.

Is the Left Rear Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK LEFT REAR TONE WHEEL FOR DAMAGE

Inspect the Left Rear Tone Wheel for damage, missing teeth, cracks, corrosion or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Left Rear Tone Wheel damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. LEFT REAR WHEEL SPEED SENSOR

Replace the Left Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read ABS DTCs.

Did DTC C102A-LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

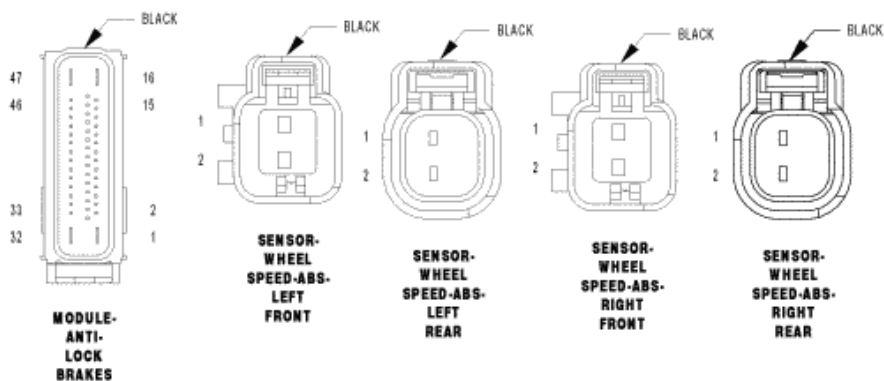
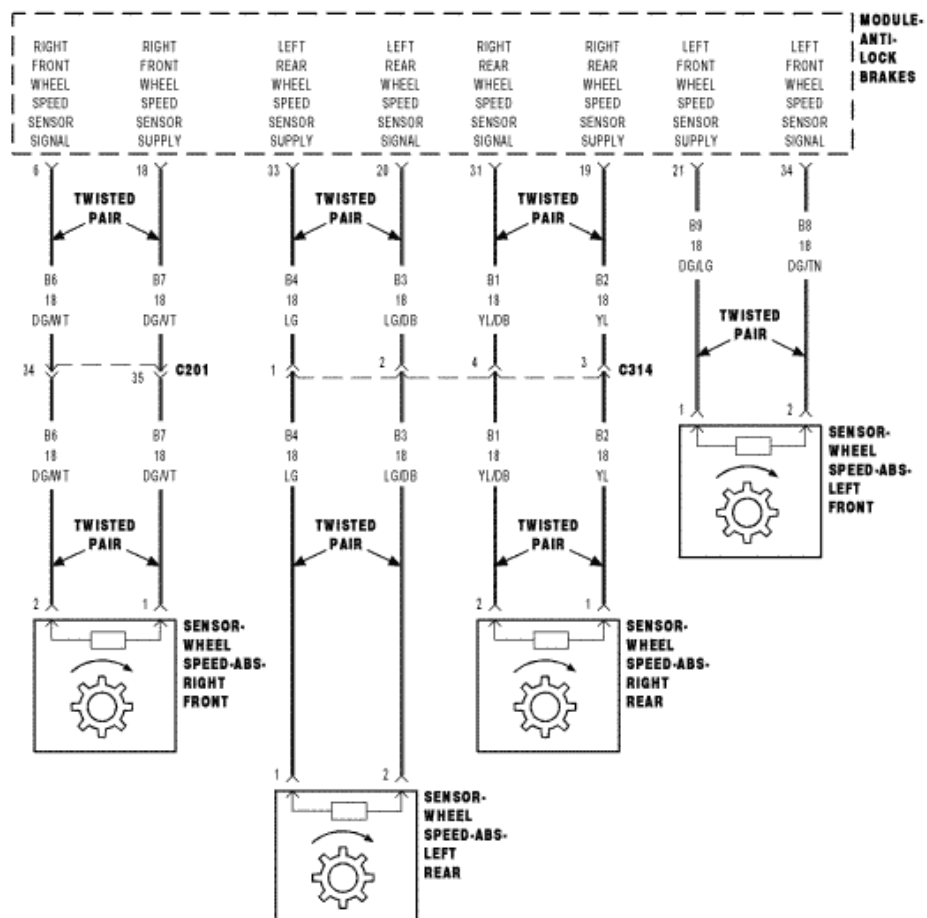
Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C102B-RIGHT REAR WHEEL SPEED SENSOR CIRCUIT

Circuit Schematic



81d04601

Fig. 29: Wheel Speed Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Right Rear Wheel Speed Sensor circuit fails the diagnostic test.

Possible Causes

Possible Causes
CONNECTOR/TERMINAL DAMAGE (B2) RIGHT REAR WSS SUPPLY CIRCUIT SHORTED TO VOLTAGE, GROUND OR OPEN (B1) RIGHT REAR WSS SIGNAL CIRCUIT SHORTED TO VOLTAGE, GROUND, OR OPEN (B1) RIGHT REAR WSS SIGNAL CIRCUIT AND (B2) RIGHT REAR WSS SUPPLY CIRCUIT SHORTED TOGETHER RIGHT REAR WSS ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C102B-RIGHT REAR WHEEL SPEED SENSOR CIRCUIT**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

With the scan tool, read DTCs

Does the scan tool display: C102B-RIGHT REAR WHEEL SPEED SENSOR CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector, Right Rear WSS, and Right Rear WSS harness connector.

Is the Left Rear WSS or any of the connectors/terminals damaged?

Yes

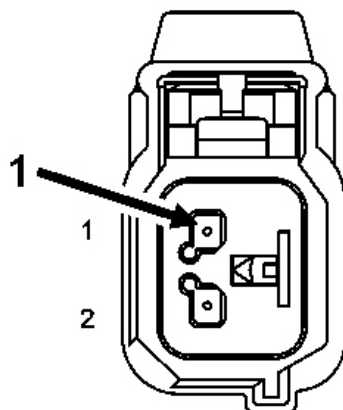
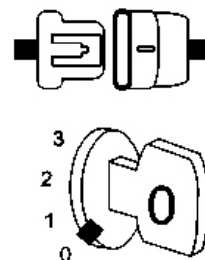
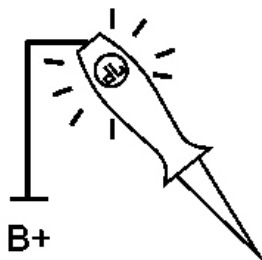
Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. CHECK (B2) RIGHT REAR WSS SUPPLY CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add70

Fig. 30: Checking Right Rear Wheel Speed Sensor Supply Circuit For An Open Or Short To Ground

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right Rear WSS harness connector.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B2) Right Rear WSS Supply circuit.

Does the test light illuminate brightly?

Yes

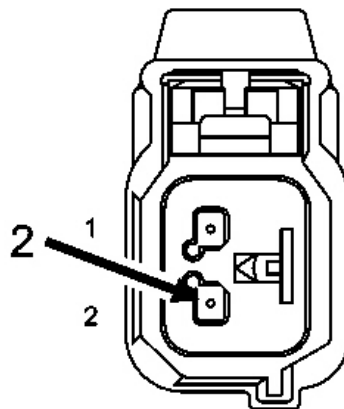
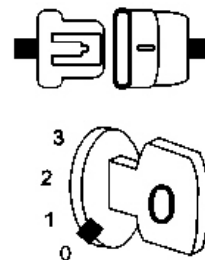
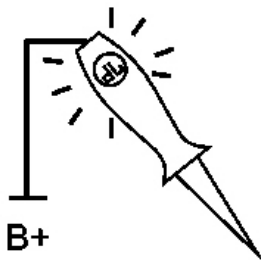
Repair the (B2) Right Rear WSS Supply circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (B1) RIGHT REAR WSS SIGNAL CIRCUIT SHORT TO GROUND



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add72

Fig. 31: Checking Right Rear Wheel Speed Sensor Signal Circuit For An Open Or Short To Ground

Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, probe the (B1) Right Rear WSS Signal circuit.

Does the test light illuminate brightly?

Yes

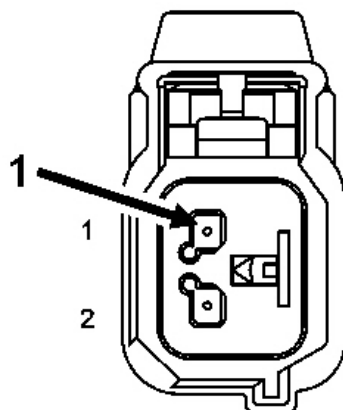
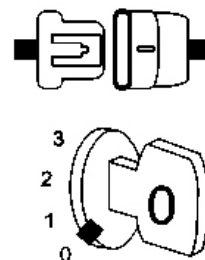
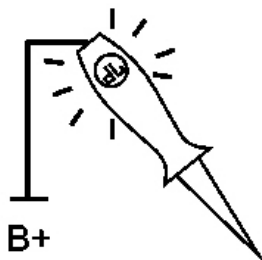
Repair the (B1) Right Rear WSS Signal circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. **CHECK (B2) RIGHT REAR WSS SUPPLY CIRCUIT OPEN**



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add70

Fig. 32: Checking Right Rear Wheel Speed Sensor Supply Circuit For An Open Or Short To Ground

Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B2) Right Rear WSS Supply circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B2) Right Rear WSS Supply circuit.

Does the test light illuminate brightly

Yes

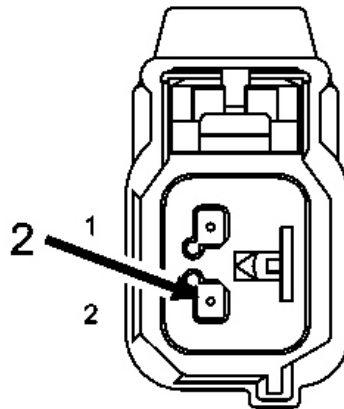
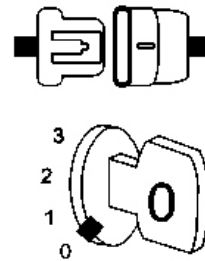
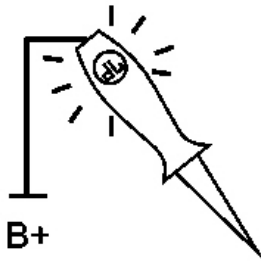
Go To 6.

No

Repair the (B2) Right Rear WSS Supply circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. **CHECK (B1) RIGHT REAR WSS SIGNAL CIRCUIT OPEN**



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add72

Fig. 33: Checking Right Rear Wheel Speed Sensor Signal Circuit For An Open Or Short To Ground

Courtesy of CHRYSLER LLC

Connect a jumper wire between ground and the (B1) Right Rear WSS Signal circuit in the Anti-Lock Brakes Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (B1) Right Rear WSS Signal circuit.

Does the test light illuminate brightly?

Yes

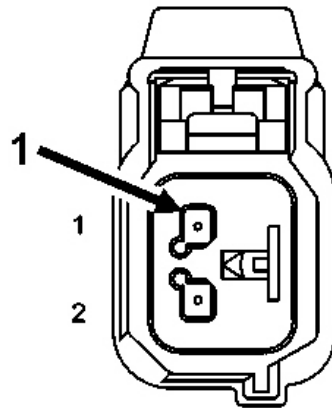
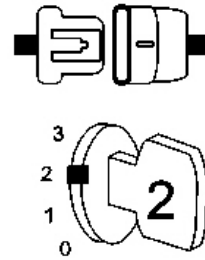
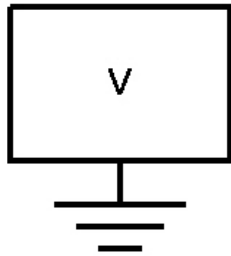
Go To 7.

No

Repair the (B1) Right Rear WSS Signal circuit for an open.

Perform **ABS VERIFICATION TEST**.

7. CHECK (B2) RIGHT REAR WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add6e

Fig. 34: Measuring Voltage Of Right Rear WSS 12 Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Remove all jumper wires.

Measure the voltage between the (B2) Right Rear WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

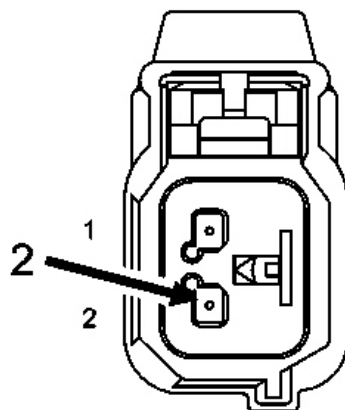
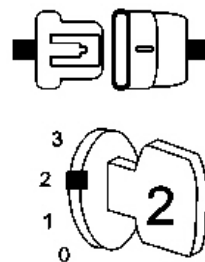
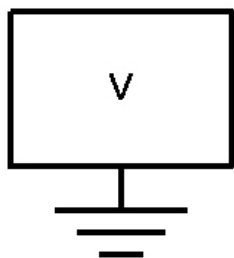
Repair the (B2) Right Rear WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. CHECK (B1) RIGHT REAR WSS SIGNAL CIRCUIT SHORT TO VOLTAGE



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add71

Fig. 35: Measuring Voltage Between Right Rear WSS Signal Circuit And Ground
Courtesy of CHRYSLER LLC

Measure the voltage between the (B1) Right Rear WSS Signal circuit and ground.

Is the voltage above one volt?

Yes

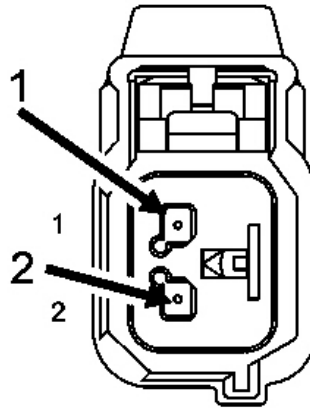
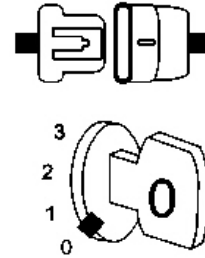
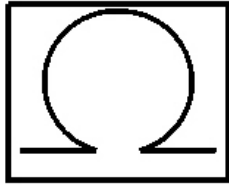
Repair the (B1) Right Rear WSS Signal circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 9.

9. **CHECK (B1) RIGHT REAR WSS SIGNAL CIRCUIT AND (B2) RIGHT REAR WSS SUPPLY CIRCUIT SHORT TOGETHER**



**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR**

816add74

Fig. 36: Measuring Resistance Between Right Rear WSS Signal Circuit And Right Rear WSS Supply Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (B1) Right Rear WSS Signal circuit and the (B2) Right Rear WSS Supply circuit.

Is the resistance above 5.0 ohms?

Yes

Go To step 10.

No

Repair the (B1) Right Rear WSS Signal circuit and the (B2) Right Rear WSS Supply circuit for a short together.

Perform **ABS VERIFICATION TEST**.

10. RIGHT REAR WHEEL SPEED SENSOR

Replace the Right Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

With the scan tool, read ABS DTCs.

Did DTC C102B-RIGHT REAR WHEEL SPEED SENSOR CIRCUIT reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1032-RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Right Rear Wheel Speed Sensor (WSS) Signal is intermittently missing while vehicle speed is above 40 km/h (25 mph) or erratic wheel speed signal during acceleration or sensed wheel speed is different from other wheels.

Possible Causes

Possible Causes
RIGHT REAR WSS LOOSE - B1, B2 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
RIGHT REAR TONE WHEEL DAMAGE
RIGHT REAR WHEEL BEARING DAMAGE
AXLE SHAFT FASTENER HARDWARE
IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES
RIGHT REAR WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR DTC C1032-RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE**

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1032-RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure. See **DIAGNOSIS AND TESTING**.

3. CHECK FOR IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Right Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK RIGHT REAR WSS LOOSENESS, INSPECT B1, B2 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Inspect the Anti-Lock Brake Module harness connector, Right Rear WSS, and Right Rear WSS harness connector.

Inspect the Right Rear WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B1) Right Rear WSS Signal and (B2) Right Rear WSS Supply circuits between the Right Rear WSS and Anti-Lock Brake Module for damage.

Is the Right Rear WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK RIGHT REAR WHEEL SPEED SENSOR FOR DAMAGE

Remove the Right Rear Wheel Speed Sensor.

Inspect the Right Rear Wheel Speed Sensor face for damage.

Is the Right Rear Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK RIGHT REAR TONE WHEEL FOR DAMAGE

Inspect the Right Rear Tone Wheel for damage, missing teeth, cracks, corrosion or looseness.

NOTE: **The Tone Wheel teeth should be perfectly square, not bent, or nicked.**

Is the Right Rear Tone Wheel damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. CHECK RIGHT REAR WHEEL BEARING FOR DAMAGE

Inspect the Right Rear wheel bearing for excessive runout or clearance.

NOTE: **Refer to the appropriate service information, if necessary, for procedures or specifications.**

Is the Right Rear Wheel Bearing Damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 9.

9. RIGHT REAR WHEEL SPEED SENSOR

Replace the Right Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read ABS DTCs.

Did DTC C1032-RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1035-RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

When the Right Rear Wheel Speed Sensor (WSS) reading is different from the readings received from the other sensors at a vehicle speed above 40 km/h (25 mph). The Anti-Lock Brake Module compares WSS readings from side-to-side on an axle and front-to-rear.

Possible Causes

Possible Causes
RIGHT REAR WSS LOOSE - B1, B2 CIRCUITS/CONNECTOR/TERMINAL DAMAGE
IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES
RIGHT REAR TONE WHEEL/BEARING DAMAGE
AXLE SHAFT FASTENER HARDWARE
RIGHT REAR WSS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC C1035-RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1035-RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION.**

3. CHECK FOR IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Right Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK RIGHT REAR WSS LOOSENESS, INSPECT B1, B2 CIRCUITS/TERMINALS FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals

Inspect the Anti-Lock Brake Module harness connector, Right Rear WSS, and Right Rear WSS harness connector

Inspect the Right Rear WSS for looseness, excessive corrosion and not properly fastened.

Inspect the (B1) Right Rear WSS Signal and (B2) Right Rear WSS Supply circuits between the Right Rear WSS and Anti-Lock Brake Module for damage.

Is the Right Rear WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. CHECK RIGHT REAR WHEEL SPEED SENSOR FOR DAMAGE

Remove the Right Rear Wheel Speed Sensor.

Inspect the Right Rear Wheel Speed Sensor face for damage.

Is the Right Rear Wheel Speed Sensor damaged?

Yes

Replace sensor and hub assembly.

Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK RIGHT REAR TONE WHEEL/BEARING FOR DAMAGE

Inspect the Right Rear Tone Wheel/Bearing for damage, missing teeth, cracks, corrosion or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Right Rear Tone Wheel/Bearing damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. RIGHT REAR WHEEL SPEED SENSOR

Replace the Right Rear Wheel Speed Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read ABS DTCs.

Did DTC C1035-RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

C1041-LEFT FRONT TONE WHEEL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Anti-Lock Brake Module detects periodic drops of a WSS signal.

Possible Causes

Possible Causes
LEFT FRONT TONE WHEEL/BEARING DAMAGE
IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES
DIRT, METAL, DAMAGED TONE WHEEL/SENSOR

Diagnostic Test

1. CHECK FOR A DTC C1041-LEFT FRONT TONE WHEEL PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, read DTCs.

Record DTC and Freeze Frame information.

With the scan tool, erase DTCs.

Cycle the ignition switch off then on.

CAUTION: Ensure brake capability is available before road testing.

Test drive the vehicle in a straight line to 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1041-LEFT FRONT TONE WHEEL PERFORMANCE active?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK THE LEFT FRONT TONE WHEEL/BEARING FOR DAMAGE

NOTE: Check the tone wheel teeth for missing teeth, cracks, or looseness. Teeth should be perfectly square, not bent, or nicked.

Check the Left Front Tone Wheel/Bearing for damage.

Check the Left Front Tone Wheel for dirt.

Was the tone wheel dirty?

Yes

Clean tone wheel and sensor. Clear codes and retest.

Perform **ABS VERIFICATION TEST**.

No

Replace the Left Front Tone Wheel/Bearing in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1042-RIGHT FRONT TONE WHEEL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

When the Anti-Lock Brake Module detects periodic drops of a Wheel Speed Sensor (WSS) signal.

Possible Causes

Possible Causes
DIRTY TONE WHEEL/SENSOR
IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES
RIGHT FRONT TONE WHEEL/BEARING DAMAGE

Diagnostic Test

1. CHECK FOR A DTC C1042-RIGHT FRONT TONE WHEEL PERFORMANCE

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read DTCs.

Record DTC and Freeze Frame information.

With the scan tool, erase DTCs.

Cycle the ignition switch off then on.

CAUTION: Ensure brake capability is available before road testing.

Test drive the vehicle in a straight line to 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs.

Does the scan tool display: C1042-RIGHT FRONT TONE WHEEL PERFORMANCE?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Front WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER RIGHT FRONT TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Right Front Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Front Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK THE RIGHT FRONT TONE WHEEL/BEARING FOR DAMAGE

NOTE: Check the tone wheel teeth for missing teeth, cracks, or looseness. Teeth should be perfectly square, not bent, or nicked.

Check the Right Front Tone Wheel/Bearing for damage.

Check the Right Front Tone Wheel for dirt.

Was the tone wheel dirty?

Yes

Clean tone wheel and sensor. Clear codes and retest.

Perform **ABS VERIFICATION TEST**.

No

Replace the Right Front Tone Wheel/Bearing in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1043-LEFT REAR TONE WHEEL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:

When the Anti-Lock Brake Module detects periodic drops of a Wheel Speed Sensor (WSS) signal.

Possible Causes

Possible Causes
DIRTY TONE WHEEL/SENSOR IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES AXLE SHAFT FASTENER HARDWARE LEFT REAR TONE WHEEL/BEARING DAMAGE

Diagnostic Test

1. CHECK FOR A DTC C1043-LEFT REAR TONE WHEEL PERFORMANCE

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, read DTCs.

Record DTC and Freeze Frame information.

With the scan tool, erase DTCs.

Cycle the ignition switch off then on.

CAUTION: Ensure brake capability is available before road testing.

Test drive the vehicle in a straight line to 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.**

With the scan tool, read DTCs.

Does the scan tool display: C1043-LEFT REAR TONE WHEEL PERFORMANCE?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: **If graph shows periodic dropouts pay close attention to the tone wheel.**

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Left Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER LEFT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Left Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Left Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK THE LEFT REAR TONE WHEEL/BEARING FOR DAMAGE

NOTE: Check the tone wheel teeth for missing teeth, cracks, or looseness. Teeth should be perfectly square, not bent, or nicked.

Check the Left Rear Tone Wheel/Bearing for damage.

Check the Left Rear Tone Wheel for dirt.

Was the tone wheel dirty?

Yes

Clean tone wheel and sensor. Clear codes and retest.

Perform **ABS VERIFICATION TEST**.

No

Replace the Left Rear Tone Wheel/Bearing in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

When the Anti-Lock Brake Module detects periodic drops of a Wheel Speed Sensor (WSS) signal.

Possible Causes

Possible Causes
DIRTY TONE WHEEL/SENSOR IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES AXLE SHAFT FASTENER HARDWARE RIGHT REAR TONE WHEEL/BEARING DAMAGE

Diagnostic Test

1. **CHECK FOR A DTC C1044-RIGHT REAR TONE WHEEL PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read DTCs.

Record DTC and Freeze Frame information.

With the scan tool, erase DTCs.

Cycle the ignition switch off then on.

CAUTION: Ensure brake capability is available before road testing.

Test drive the vehicle in a straight line to 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be**

met.

With the scan tool, read DTCs.

Does the scan tool display: C1044-RIGHT REAR TONE WHEEL PERFORMANCE?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

NOTE: If graph shows periodic dropouts pay close attention to the tone wheel.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is the Right Rear WSS speed showing 0 km/h (0 mph) or not matching other wheels or showing erratic behavior?

Yes

Go To 3.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

3. CHECK FOR IMPROPER RIGHT REAR TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Right Rear Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Right Rear Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS

Inspect the axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

No

Go To 5.

5. CHECK THE RIGHT REAR TONE WHEEL FOR DAMAGE

NOTE: Check the tone wheel teeth for missing teeth, cracks, or looseness. Teeth should be perfectly square, not bent, or nicked.

Check the Right Rear Tone Wheel for damage.

Check the Right Rear Tone Wheel for dirt.

Was the tone wheel dirty?

Yes

Clean tone wheel and sensor. Clear codes and retest.

Perform **ABS VERIFICATION TEST**.

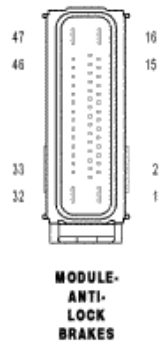
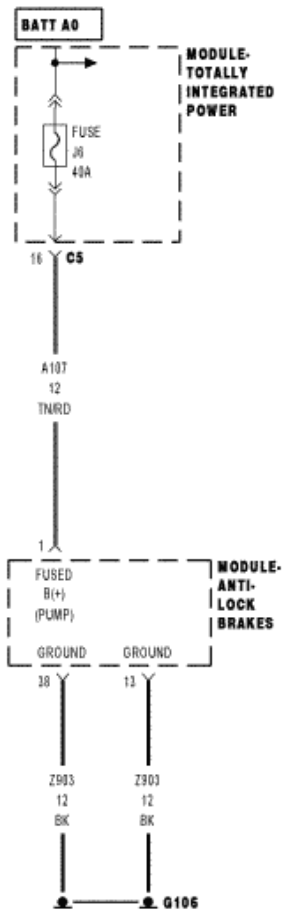
No

Replace the Right Rear Tone Wheel in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1073-ABS PUMP MOTOR CONTROL CIRCUIT

Circuit Schematic



81d0b12

Fig. 37: ABS Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the ABS Pump Motor is activated.

Set Conditions

- **Set Condition:**

The ABM detects low pump motor feedback voltage with actuation of the pump motor relay.

Possible Causes

Possible Causes
BLOWN PUMP FUSE WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE HIGH RESISTANCE IN B+ CIRCUITS HIGH RESISTANCE IN GROUND CIRCUITS INTEGRATED CONTROL UNIT

Diagnostic Test

1. **CHECK FOR A DTC C1073-ABS PUMP MOTOR CONTROL CIRCUIT**

NOTE: This DTC must be active for the results of this test to be valid. If present, diagnose and repair DTC C2116-ABS PUMP MOTOR SUPPLY LOW VOLTAGE before diagnosing this DTC.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

Road test the vehicle over 40 km/h (25 mph).

NOTE: Vehicle must be driven above 40 km/h (25 mph) for set conditions to be met.

With the scan tool, read DTCs

NOTE: The Anti-Lock Brake Module must sense ALL 4 wheels at 12 km/h (7.5 mph) before it will extinguish the ABS indicators.

Does the scan tool display: C1073-ABS PUMP MOTOR CONTROL CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Turn the ignition off.

Visually inspect the related wiring harness. Look for any pinched, chafed, pierced, and partially broken wires.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK THE ABS PUMP MOTOR FUSED B+ FOR AN OPEN

Turn the ignition off.

Remove and visually inspect the ABS Pump Motor B+ fuse.

Is the ABS Pump Motor B+ fuse open?

Yes

Go To 4.

No

Go To 6.

4. CHECK THE (A107) FUSED B(+) FOR A SHORT TO GROUND

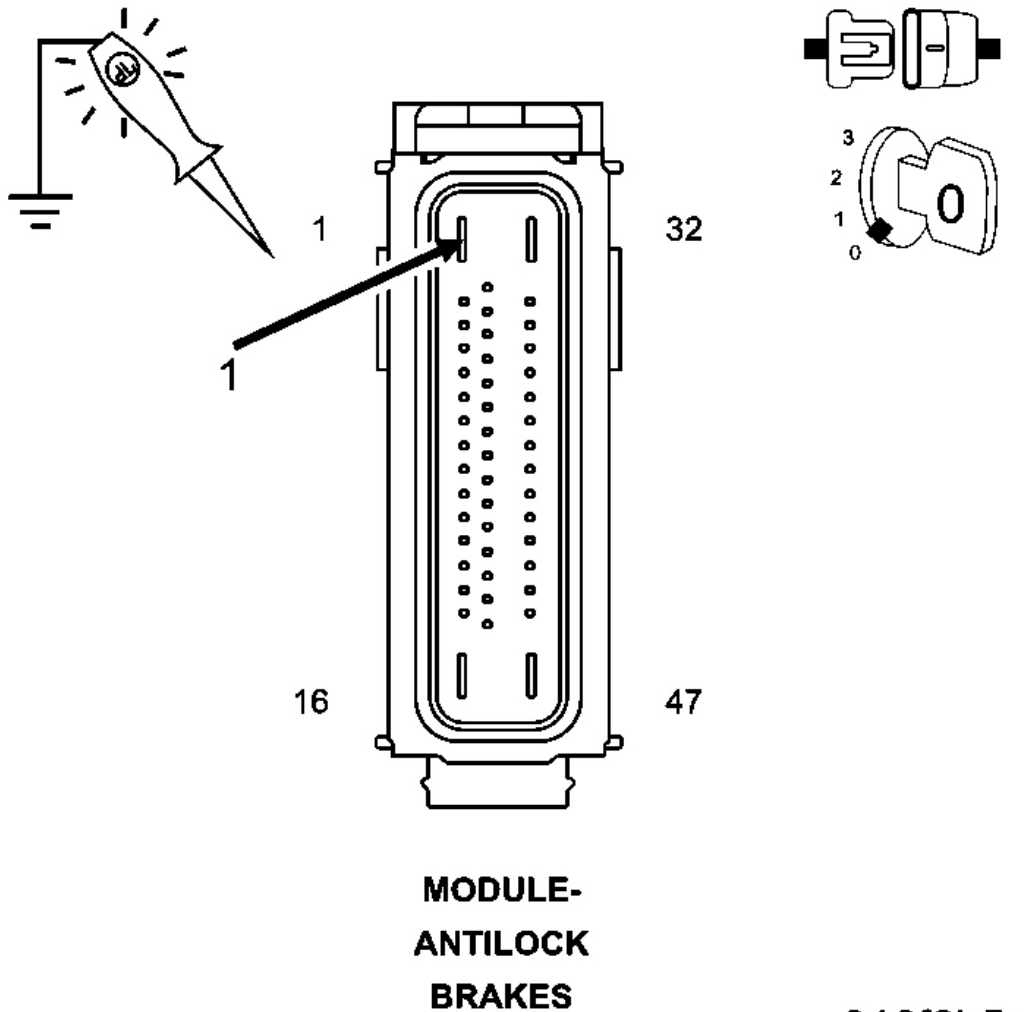


Fig. 38: Checking Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (A107) Fused B+ circuit.

Does the test light illuminate brightly?

Yes

Repair the (A107) Fused B(+) circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK THE (A107) FUSED B(+) CIRCUIT

Turn the ignition off.

Visually inspect the (A107) Fused B(+) circuit in the wiring harness.

Look for any signs of intermittent short to ground.

Is the wiring harness OK?

Yes

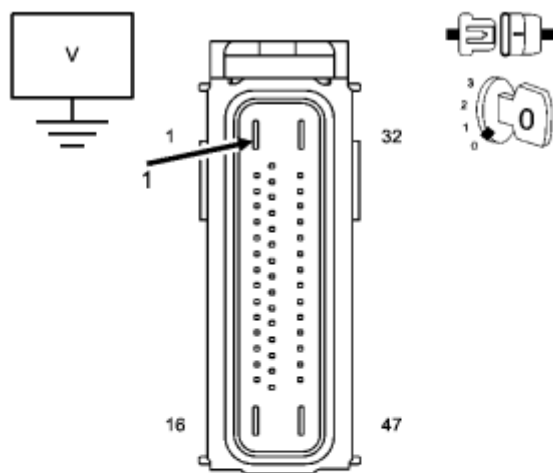
Go To 6.

No

Repair the (A107) Fused B(+) circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

6. CHECK THE VOLTAGE ON THE (A107) FUSED B(+) CIRCUIT



**MODULE-
ANTI-
LOCK
BRAKES
(ESP)**

Fig. 39: Measuring The Voltage Of The Fused Circuit In The Anti-Lock Brake Module Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Measure the voltage of the (A107) Fused B(+) circuit in the Anti-Lock Brake Module harness connector.

Is the voltage above 10 volts?

Yes

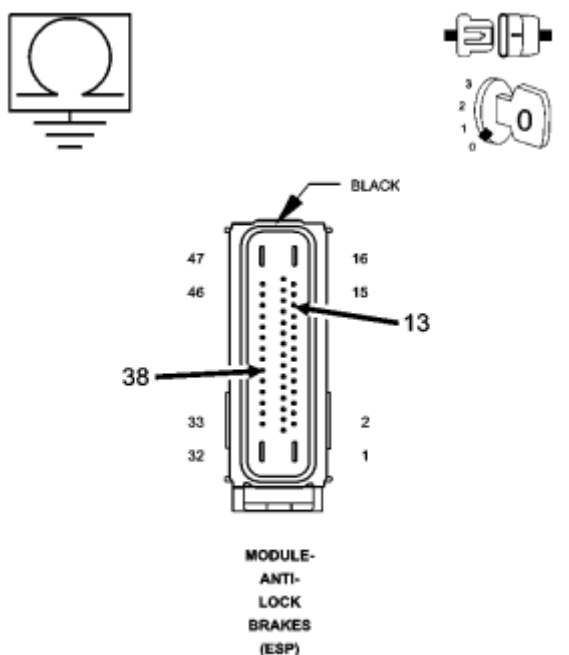
Go To 7.

No

Repair the (A107) Fused B(+) circuit for an open.

Perform **ABS VERIFICATION TEST**.

7. CHECK THE (Z903) GROUND CIRCUIT FOR AN OPEN



81d0fbc0

Fig. 40: Measuring The Resistance Of The Ground Circuit Between The Anti-Lock Brake Module Harness Connector And Ground

Courtesy of CHRYSLER LLC

Measure the resistance of the (Z903) Ground circuit between the Anti-Lock Brake Module harness

connector and ground

Is the resistance below 5.0 ohms?

Yes

Replace the ICU per service information.

Perform **ABS VERIFICATION TEST**.

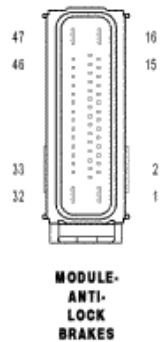
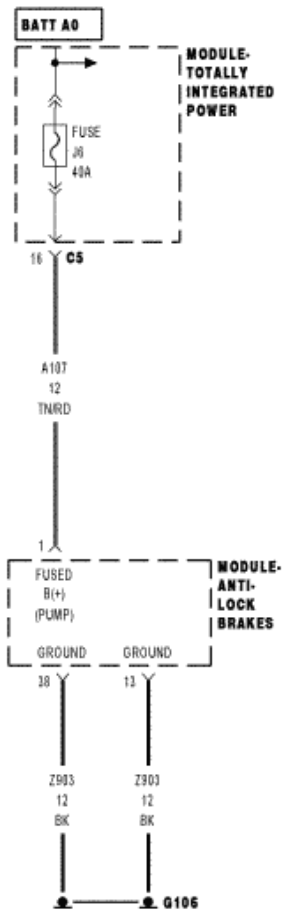
No

Repair the high resistance in the (Z903) Ground circuit.

Perform **ABS VERIFICATION TEST**.

C1074-ABS PUMP MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



81d0b12

Fig. 41: ABS Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous

Set Conditions

- **Set Condition:**

The ABM detects low pump motor feedback voltage with actuation of the pump motor relay.

Possible Causes

Possible Causes
BLOWN PUMP FUSE HIGH RESISTANCE IN B+ CIRCUITS HIGH RESISTANCE IN GROUND CIRCUITS INTEGRATED CONTROL UNIT

Diagnostic Test

1. **CHECK FOR A DTC C1074-ABS PUMP MOTOR CONTROL CIRCUIT PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

Road test the vehicle over 10 km/h (7 mph).

NOTE: **Vehicle must be driven above 10 km/h (7 mph) for set conditions to be meet.**

With the scan tool, read DTCs.

Does the scan tool display: C1074-ABS PUMP MOTOR CONTROL CIRCUIT PERFORMANCE?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK THE ABS PUMP MOTOR FUSED B+ FOR AN OPEN

Turn the ignition off.

Remove and visually inspect the ABS Pump Motor B+ fuse.

Is the ABS Pump Motor B+ fuse open?

Yes

Go To 3.

No

Go To 5.

3. CHECK THE (A107) FUSED B(+) FOR A SHORT TO GROUND

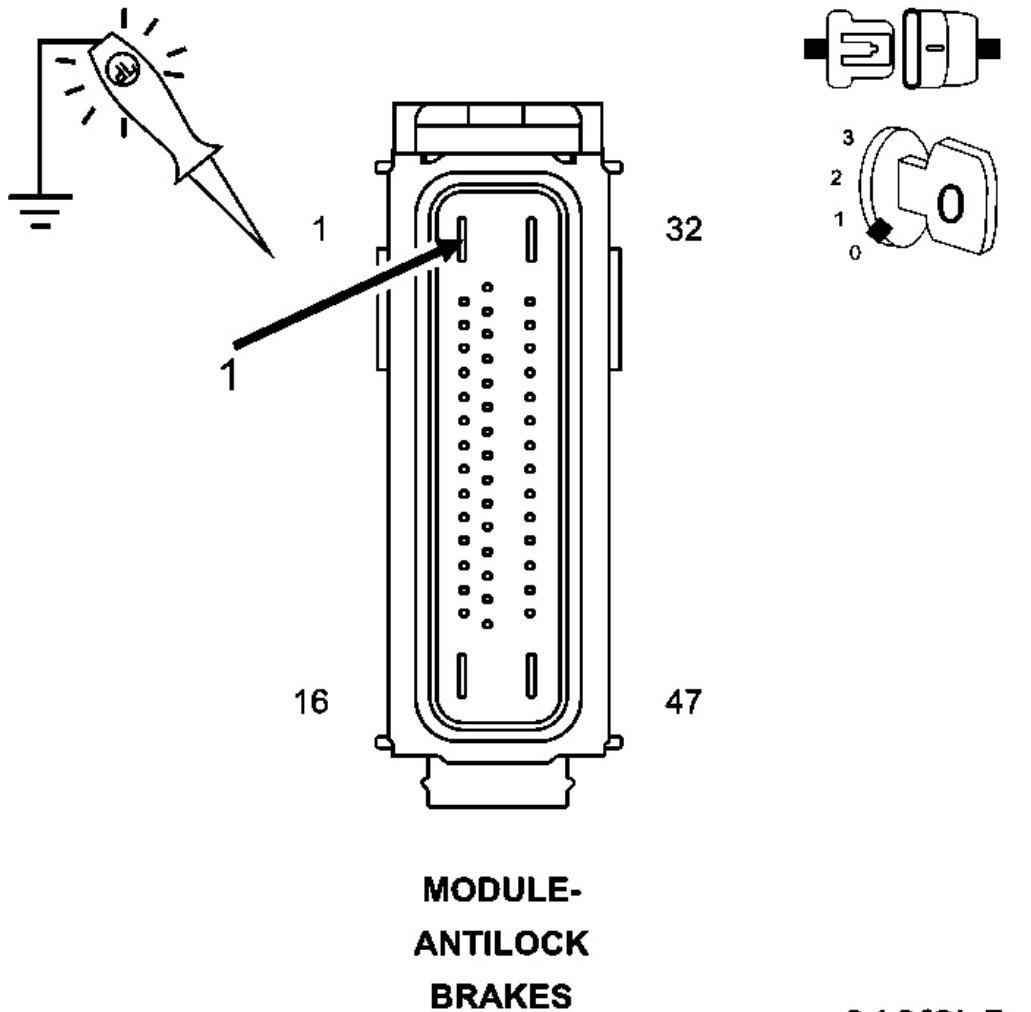


Fig. 42: Checking Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Using a 12-volt test light connected to 12-volts, probe the (A107) Fused B+ circuit.

Does the test light illuminate brightly?

Yes

Repair the (A921) Fused B(+) circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK THE (A107) FUSED B(+) CIRCUIT

Turn the ignition off.

Visually inspect the (A107) Fused B(+) circuit in the wiring harness.

Look for any signs of intermittent short to ground.

Is the wiring harness OK?

Yes

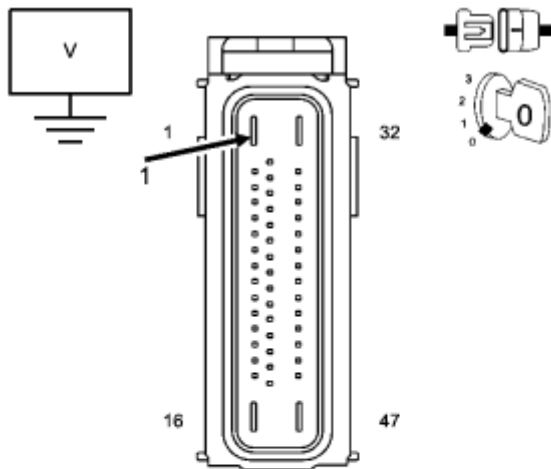
Go To 5.

No

Repair the (A107) Fused B(+) circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

5. CHECK THE VOLTAGE ON THE (A107) FUSED B(+) CIRCUIT



**MODULE-
ANTI-
LOCK
BRAKES
(ESP)**

Fig. 43: Measuring The Voltage Of The Fused Circuit In The Anti-Lock Brake Module Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Measure the voltage of the (A107) Fused B(+) circuit in the Anti-Lock Brake Module harness connector.

Is the voltage above 10 volts?

Yes

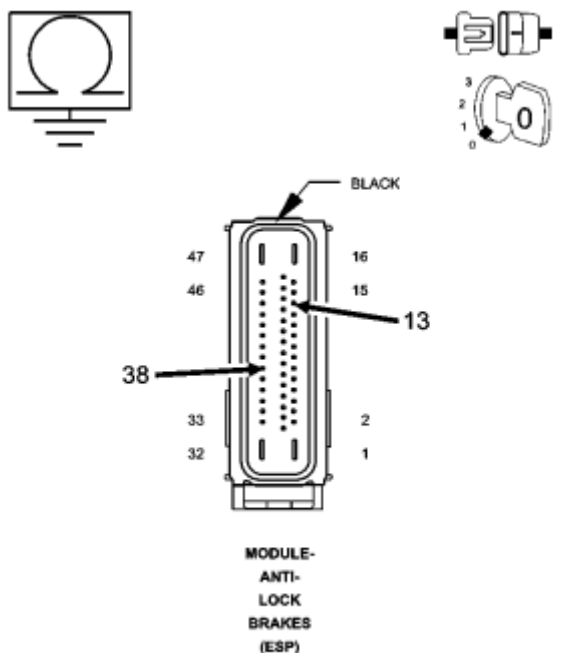
Go To 6.

No

Repair the (A107) Fused B(+) circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. CHECK THE (Z903) GROUND CIRCUITS FOR AN OPEN



81d0fbc0

Fig. 44: Measuring The Resistance Of The Ground Circuit Between The Anti-Lock Brake Module Harness Connector And Ground

Courtesy of CHRYSLER LLC

Measure the resistance of the (Z903) Ground circuits between the Anti-Lock Brake Module harness

connector and ground

Is the resistance below 5.0 ohms?

Yes

Replace the ICU per service information.

Perform **ABS VERIFICATION TEST**.

No

Repair the high resistance in the affected circuit.

Perform **ABS VERIFICATION TEST**.

C1078-TIRE REVOLUTIONS RANGE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

On key up.

Set Conditions

• **Set Condition:**

A comparison between the tire circumference value contained in the EEPROM and the tire circumference value received on the CAN bus. Programmed value for tire size is not within acceptable range.

Possible Causes

Possible Causes
INCORRECT VALUE PROGRAMMED INTO TIPM ENGINE CONTROL MODULE

Diagnostic Test

1. INCORRECT VALUE PROGRAMMED INTO TIPM

TIRE SIZE	BODY STYLE	ENGINE SIZE	SALES CODE	TIRE CIRCUMFERENCE (MM)
P225/75R 16 BSW				

GOODYEAR ALL SEASON	KK	ALL	TRY	2251
P235/65R 17 VSB GOODYEAR AS PERF	KK	ALL	TUP	2226
P235/70R 16 BSW GOODYEAR ALL SEASON	KK	ALL	TSE	2208
P235/60R 18 BSW GOODYEAR PERF	KK	ALL	TU2	2229
P235/60R 18 BSW GOODYEAR PERF	KK	ALL	TVA	2223
P235/70R 16 BSW GOODYEAR ALL TERRAIN	KK	ALL	TSN	2214
P235/65R 17 BSW BFG ALL SEASON	KK	ALL	TCC	2214
T175/90D 17 MINI SPARE	KK	ALL	TBC	2270

Verify the correct Tire/wheel information is programmed in the TIPM.

Is the correct value programmed in the TIPM according to the chart?

Yes

Test complete.

Perform **ABS VERIFICATION TEST**.

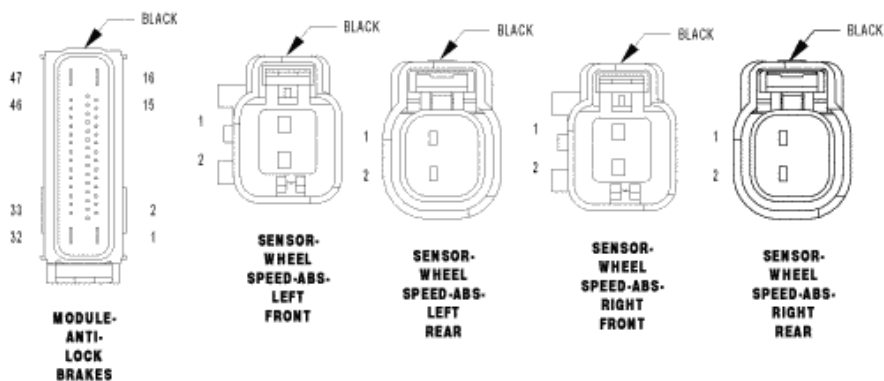
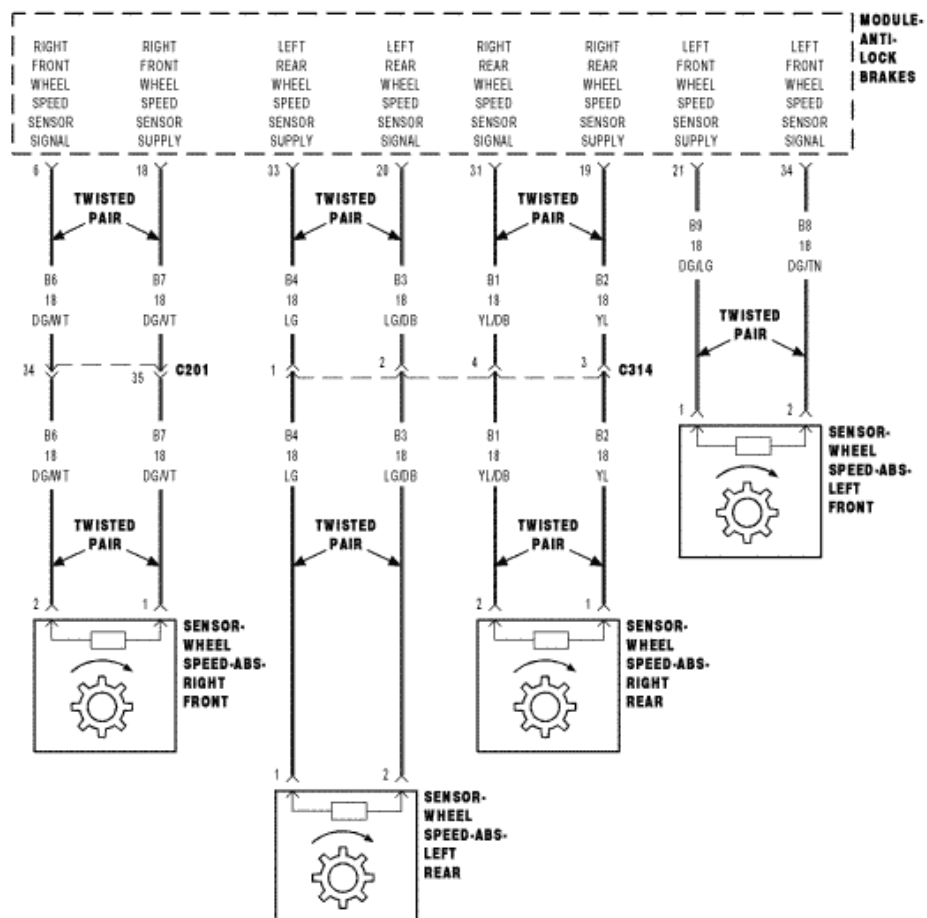
No

Program the correct Tire/Wheel information in the TIPM.

Perform **ABS VERIFICATION TEST**.

C107B-WHEEL SPEED COMPARATIVE PERFORMANCE

Circuit Schematic



81d04601

Fig. 45: Wheel Speed Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

When one or more WSS reading is different from the readings received from the other WSS's. The Anti-Lock Brake Module compares WSS readings from side-to-side on an axle and front-to-rear above 40 km/h (25 mph).

Possible Causes

Possible Causes
WSS LOOSE - SIGNAL SUPPLY CIRCUITS/CONNECTOR/TERMINAL DAMAGE
TONE WHEEL DAMAGE
WSS - INTERNAL FAULT
IMPROPER LEFT FRONT TIRE PRESSURE/MISMATCHED TIRES
ANTI-LOCK BRAKE MODULE - INTERNAL FAULT

Diagnostic Test

1. **CHECK FOR DTC C107B-WHEEL SPEED COMPARATIVE PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

CAUTION: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be meet.**

With the scan tool, read DTCs.

NOTE: **The Anti-Lock Brake Module must sense ALL 4 wheels at 12 km/h (7.5 mph) before it will extinguish the ABS indicators.**

Does the scan tool display: C107B-WHEEL SPEED COMPARATIVE PERFORMANCE?

Yes

Go To 3.

No

Go To 2.

2. CHECK WHEEL SPEED SENSOR SIGNALS

Turn the ignition on.

With the scan tool, monitor and graph ALL the WSS speeds and compare graph while an assistant drives the vehicle.

Slowly accelerate as straight as possible from a stop to 40 km/h (25 mph).

Is one or more WSS speeds showing 0 km/h (0 mph) or not matching other wheel speeds?

Yes

Go To 3.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

3. CHECK FOR IMPROPER TIRE PRESSURE/MISMATCHED TIRES

Turn the ignition off.

Check and adjust the Tire pressure.

Check and adjust all other tire pressures.

Inspect for mismatched tires on vehicle.

Is the Tire improperly inflated or mismatched tires on vehicle?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 4.

4. **CHECK REAR AXLE SHAFT FASTENER HARDWARE FOR LOOSENESS**

Inspect the rear axle shaft fastener for looseness, and not properly fastened. Tighten fastener to proper specification as required.

Was the Axle Shaft fastener loose?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. **CHECK WSS LOOSENESS, INSPECT SIGNAL SUPPLY CIRCUITS/CONNECTORS/TERMINALS FOR DAMAGE**

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector and each WSS harness connector that didn't match other wheel speeds for looseness and not properly fastened.

Inspect each WSS Signal and WSS Supply circuits between each WSS and Anti-Lock Brake Module for damage.

Is any WSS loose or any of the wiring/connectors/terminals damaged?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 6.

6. **CHECK EACH TONE WHEEL FOR DAMAGE**

Turn the ignition off.

Inspect each Tone Wheel for damage, missing teeth, cracks, or looseness.

NOTE: The Tone Wheel teeth should be perfectly square, not bent, or nicked.

Is the Tone Wheels damaged?

Yes

Repair as necessary.
Perform **ABS VERIFICATION TEST**.

No

Replace the Anti-Lock Brake Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

C107C-BRAKE PEDAL SWITCH 1/2 STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

• **Set Condition:**

When monitoring for brake stuck condition detected or a mismatch between brake switch signal received and internal pressure sensor.

Possible Causes

Possible Causes
BRAKE SWITCH POWERTRAIN CONTROL MODULE (ECM/PCM) CAN BUS ANTI-LOCK BRAKE MODULE (ABM)

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: If present, diagnose and repair any Engine or CAN bus related DTCs

before diagnosing this DTC.

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Road test the vehicle over 40 km/h (25 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. BRAKE SWITCH STATUS

Turn the ignition on, vehicle in park and the brake pedal not depressed.

With the scan tool, read Brake Switch status.

Does Brake Switch display not pressed?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. STOP LAMP SWITCH

NOTE: Inspect the related Fuse and Relay.

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connector.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 circuit terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit?

Yes

Go To 4.

No

Verify that there is good pin to terminal contact in the Switch and Control Module connectors. If OK, replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B15) BRAKE SIGNAL 1 CIRCUIT OPEN

Turn the ignition off.

Disconnect the C3 ECM/ECM/PCM harness connector.

CAUTION: Do not probe the ECM/PCM harness connectors. Probing the ECM/PCM harness connectors will damage the ECM/PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (B15) Brake Signal 1 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND

Measure the resistance between ground and the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (ECM/PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (ECM/PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

C1086-ABS SYSTEM CONTROL TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During an ABS event.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects a lack of response from a wheel speed sensor.

Possible Causes

Possible Causes
WHEEL SPEED SENSOR AND/OR IMPLAUSIBLE RELATED DTCs PRESENT
HYDRAULIC / BRAKE SYSTEM COMPONENT INSTALLATION
INTEGRATED CONTROL UNIT

Diagnostic Test

1. **CHECK IF WHEEL SPEED SENSOR AND/OR IMPLAUSIBLE RELATED DTCs ARE PRESENT**

Turn the ignition on.

With the scan tool, read ABS DTCs.

Are any other WHEEL SPEED SENSOR AND/OR IMPLAUSIBLE RELATED DTCs present?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

Perform **ABS VERIFICATION TEST**.

No

Go To 2.

2. **CHECK HYDRAULIC SYSTEM & BRAKE SYSTEM COMPONENT INSTALLATION & FUNCTION**

Verify that the Anti-Lock Brakes Module and Hydraulic Control Unit are properly installed.

Verify that the hydraulic system is properly filled and bled.

Verify that the brake system components are installed and functioning properly.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Replace the Integrated Control Unit in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1090-ABS BRAKE LAMP CONTROL CIRCUIT LOW

Circuit Schematic

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

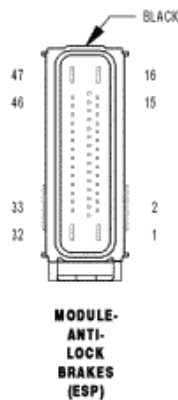
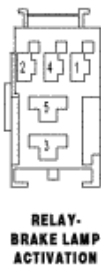
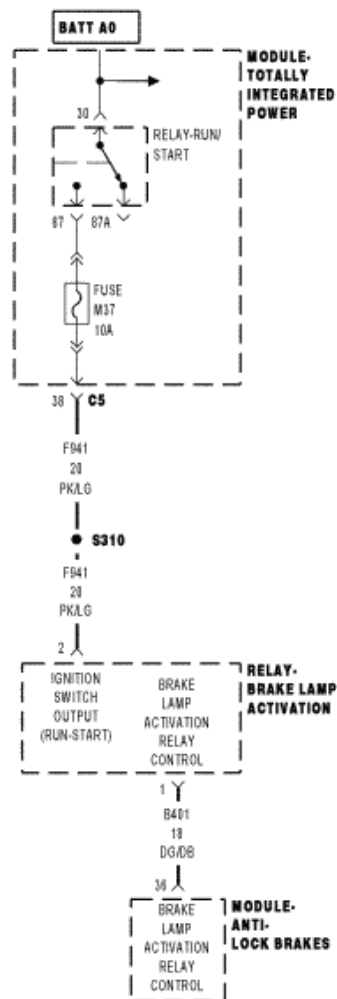


Fig. 46: ABS Brake Lamp Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

When monitoring the Brake Lamp Activation Relay Control circuit the module detects a short to ground.

Possible Causes

Possible Causes
(B401) BRAKE LAMP ACTIVATION RELAY CONTROL OPEN OR SHORTED TO GROUND BLOWN FUSE (F941) FUSED RUN/START RELAY OUTPUT OPEN OR SHORTED TO GROUND BRAKE LAMP ACTIVATION RELAY ANTI-LOCK BRAKE MODULE (ABM)

Diagnostic Test

1. CHECK FOR DTC C1090-ABS BRAKE LAMP CONTROL CIRCUIT LOW

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Start Engine.

Apply brake pedal firmly with at least 80 bar (1160 psi.).

With the scan tool, read DTCs.

Does the scan tool display: C1090-ABS BRAKE LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector and the Brake Lamp Activation Relay harness connector.

Is the Anti-Lock Brake Module or any of the connectors/terminals damaged?

Yes

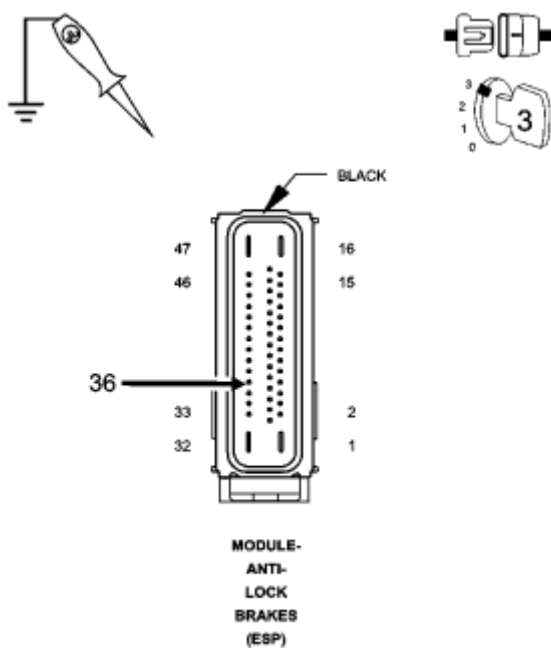
Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. CHECK (B401) BRAKE LAMP ACTIVATION RELAY CONTROL SHORTED TO GROUND



81d958cd

Fig. 47: Probing The Brake Lamp Activation Relay Control Circuit At The Anti-Lock Brake Module Harness Connector Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module

Start the engine.

Using a 12-volt test light connected to ground, probe the (B401) Brake Lamp Activation Relay Control Circuit at the Anti-Lock Brake Module harness connector.

Does the test light illuminate brightly?

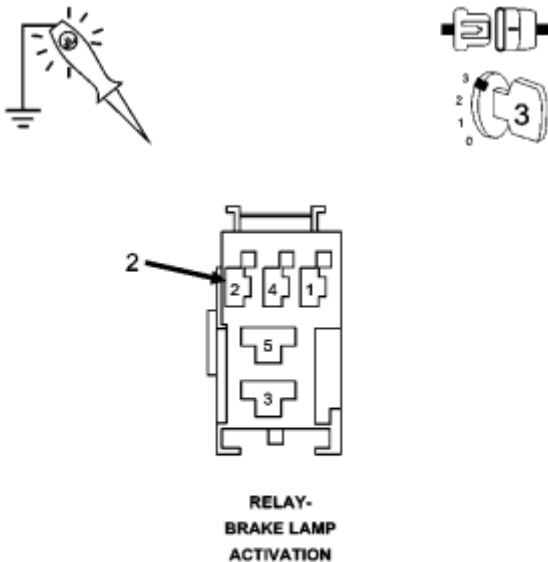
Yes

Replace the Anti-Lock Brake Module in accordance with the service information.
Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (F941) FUSED RUN/START RELAY OUTPUT



81d63b79

Fig. 48: Using 12-Volt Test Light Connected To Ground To Probe (A924) Fused B+ Circuit At Brake Lamp Activation Relay Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Brake Lamp Activation Relay.

Start the engine.

Using a 12-volt test light connected to ground, probe the (F941) Fused Run/Start Relay Output Circuit at the Brake Lamp Activation Relay harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Check for open Fuse, if ok repair open or short to ground in the (F941) Fused Run/Start Relay Output Circuit or short to ground in (B401) Brake Lamp Activation Relay Control circuit.

Perform **ABS VERIFICATION TEST**.

5. BRAKE LAMP ACTIVATION RELAY

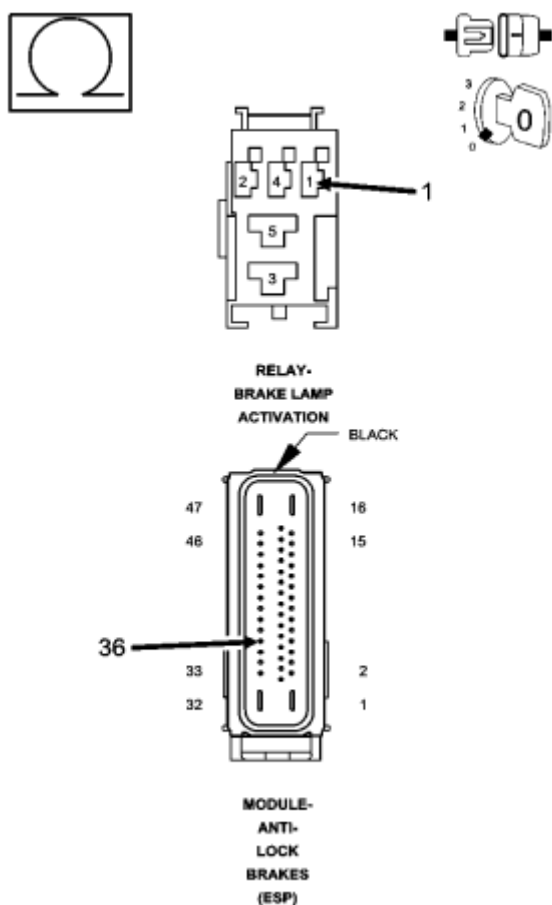


Fig. 49: Measuring The Resistance Of The Brake Lamp Activation Relay Control Circuit Between The Brake Lamp Activation Relay And The Anti-Lock Brake Module
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (B401) Brake Lamp Activation Relay Control Circuit between the Brake

Lamp Activation relay and the Anti-Lock Brake Module.

Is the resistance 5 ohms ?

Yes

Replace the Brake Lamp Activation Relay in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

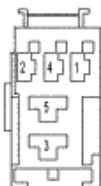
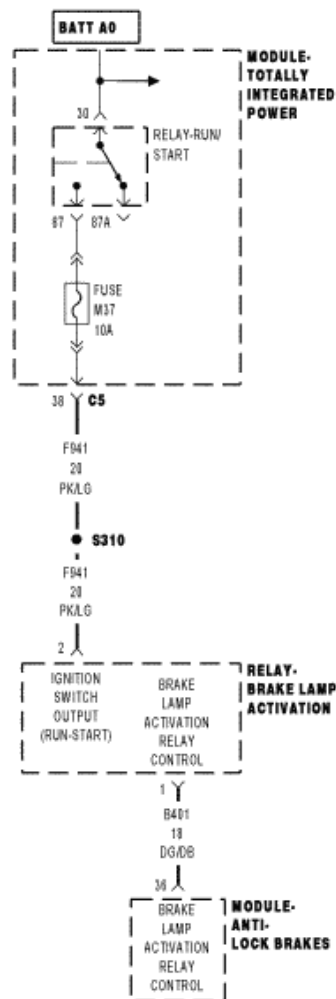
Repair open in the (B401) Brake Lamp Activation Relay Control circuit.

Perform **ABS VERIFICATION TEST**.

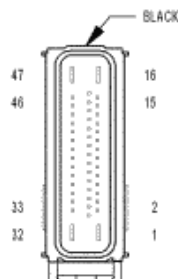
C1091-ABS BRAKE LAMP CONTROL CIRCUIT HIGH

Circuit Schematic

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .



RELAY-BRAKE LAMP ACTIVATION



MODULE-ANTI-LOCK BRAKES (ESP)

01400c10

Fig. 50: ABS Brake Lamp Control Circuit Schematic
Courtesy of CHRYSLER LLC

Monitor Conditions

When Monitored:

Continuous monitoring.

When Set:

When monitoring the Brake Lamp Activation Relay Control circuit the module detects a short to B+.

Possible Causes

Possible Causes
(B401) BRAKE LAMP ACTIVATION RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE BRAKE LAMP ACTIVATION RELAY ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC C1091-ABS BRAKE LAMP CONTROL CIRCUIT HIGH

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Start the engine.

Apply brake pedal firmly with at least 80 bar (1160 psi.).

With the scan tool, read DTCs.

Does the scan tool display: C1091-ABS BRAKE LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK CONNECTOR/TERMINAL FOR DAMAGE

NOTE: Check all terminals for broken, bent, pushed out, or corroded terminals.

Turn the ignition off.

Inspect the Anti-Lock Brake Module harness connector and the Brake Lamp Activation Relay harness

connector.

Is the Anti-Lock Brake Module or any of the connectors/terminals damaged?

Yes

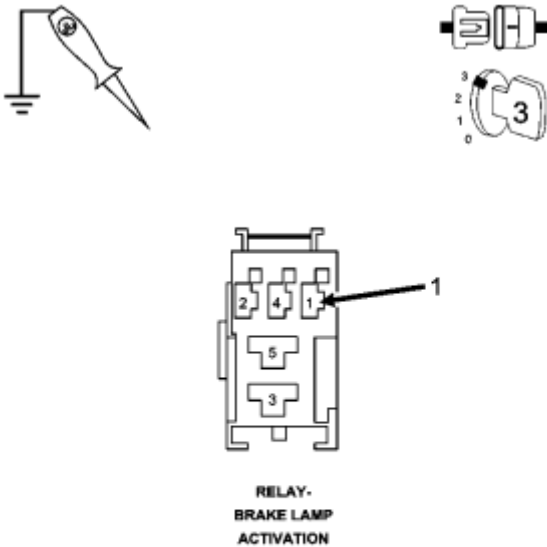
Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK (B401) BRAKE LAMP ACTIVATION RELAY CONTROL SHORTED TO VOLTAGE



81d6399a

Fig. 51: Probing The Brake Lamp Activation Relay Control At The Brake Lamp Activation Relay Harness Connector Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Anti-Lock Brake Module

Disconnect the Brake Lamp Activation Relay.

Start the engine.

Using a 12-volt test light connected to ground, probe the (B401) Brake Lamp Activation Relay Control at

the Brake Lamp Activation Relay harness connector.

Does the test light illuminate brightly?

Yes

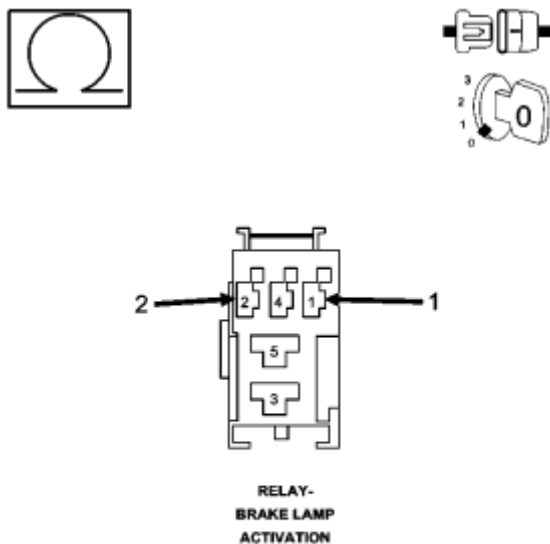
Repair the short to voltage in the (B401) Brake Lamp Activation Relay Control Circuit

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. BRAKE LAMP ACTIVATION RELAY



81d6399e

Fig. 52: Measuring Resistance Across Relay Between (B122) Brake Lamp Activation Relay Control Circuit And ((A924) Fused B+ Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance across the relay between the (B401) Brake Lamp Activation Relay Control Circuit and the (F941) Fused Run/Start Relay Output Circuit.

Is the resistance 75 ohms $\pm$ 5 ohms?

Yes

Replace the Anti-Lock Brake Module in accordance with the service information.
Perform **ABS VERIFICATION TEST**.

No

Replace the Brake Lamp Activation Relay in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

C1219-STEERING ANGLE SENSOR ERRATIC PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

• **Set Condition:**

If the Anti-Lock Brake Module detects that the calculated steering wheel angle and the actual steering angle disagree.

Possible Causes

Possible Causes
VEHICLE DAMAGE STEERING COLUMN / INTERMEDIATE SHAFT DAMAGE STEERING ANGLE SENSOR LOOSE STEERING ANGLE SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. PERFORM TEST DRIVE & VERIFY DTC IS STILL ACTIVE

NOTE: **If present, diagnose and repair DTC C123F-STEERING ANGLE SENSOR COMPARATIVE PERFORMANCE before diagnosing this DTC.**

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: To avoid personal injury or death, check brake capability is available before road testing.

Test drive the vehicle by driving straight at a velocity between 10 and 25 km/hr (6 and 15 mph.) for 1 minute.

Park the vehicle.

Turn the steering wheel from stop to stop.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK STEERING ANGLE SENSOR OUTPUT

Start the engine.

Center the steering wheel.

With the scan tool, read the Steering Angle Sensor Position.

Is the Steering Angle Sensor Position within $\pm 15^\circ$?

Yes

Go To 3.

No

Go To 5.

3. INSPECT VEHICLE, STEERING COLUMN, & INTERMEDIATE SHAFT FOR DAMAGE

NOTE: If possible, check vehicle repair history for collision damage. ABS module

must be reinitialized after repair.

Turn the ignition off.

Inspect the vehicle for damage causing tracking problems.

Inspect the steering column and intermediate shaft for damage.

Were any problems found?

Yes

Repair as necessary and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK STEERING ANGLE SENSOR INSTALLATION

WARNING: To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Proper Steering Angle Sensor installation is crucial for proper operation.

Verify that the Steering Angle Sensor is properly installed.

Is the Steering Angle Sensor properly installed?

Yes

Go To 5.

No

Repair as necessary and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

5. **CHECK STEERING ANGLE SENSOR OUTPUT WHILE ROTATING THE STEERING WHEEL**

With the scan tool, read the Steering Angle Sensor Position while rotating the steering wheel to the right and then to the left. The Steering Angle Sensor Position should decrease when rotating the steering wheel to the right and increase when rotating the steering wheel to the left.

Did the steering angle change accordingly?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Replace the Steering Angle Sensor in accordance with the Service Information and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

C121A-STEERING ANGLE SENSOR NOT INITIALIZED

Circuit Schematic

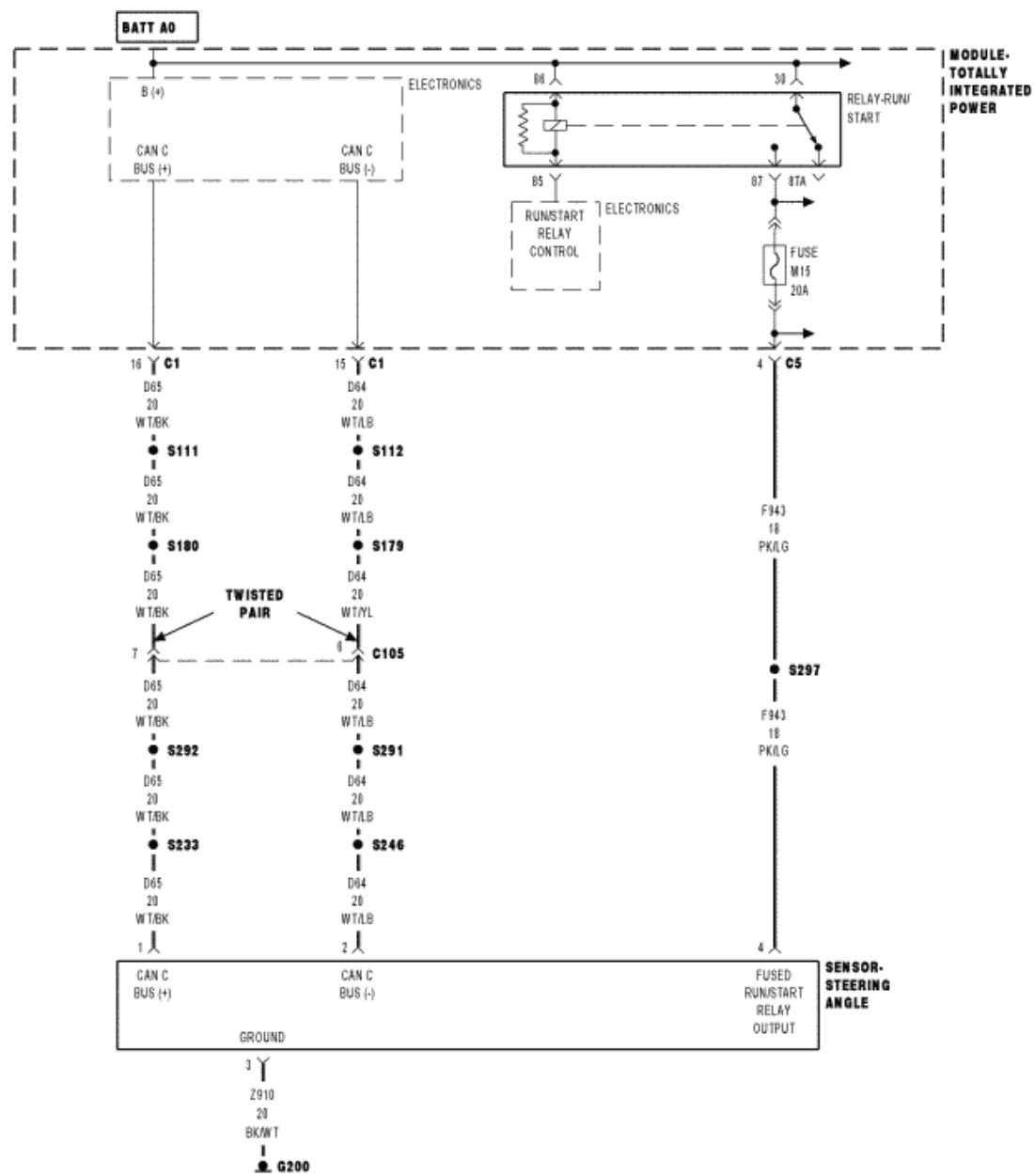


Fig. 53: Steering Angle Sensor circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

When the Anti-Lock Brake Module detects the Steering Angle Sensor reporting a non initialized status failure after an initialization occurred.

Possible Causes

Possible Causes
(F943) FUSED B(+) CIRCUIT OPEN (Z910) GROUND CIRCUIT OPEN STEERING CONTROL MODULE

Diagnostic Test

1. **CHECK FOR A DTC C121A-STEERING ANGLE SENSOR NOT INITIALIZED**

NOTE: If present, diagnose and repair DTC C1219-STEERING ANGLE SENSOR ERRATIC PERFORMANCE, or C1240-STEERING ANGLE SENSOR OVERTRAVEL PERFORMANCE before diagnosing this DTC.

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Road test the vehicle over 30 km/h (19 mph) for at least 30 seconds.

With the scan tool, read and record DTCs.

Does the scan tool display: C121A-STEERING ANGLE SENSOR NOT INITIALIZED?

Yes

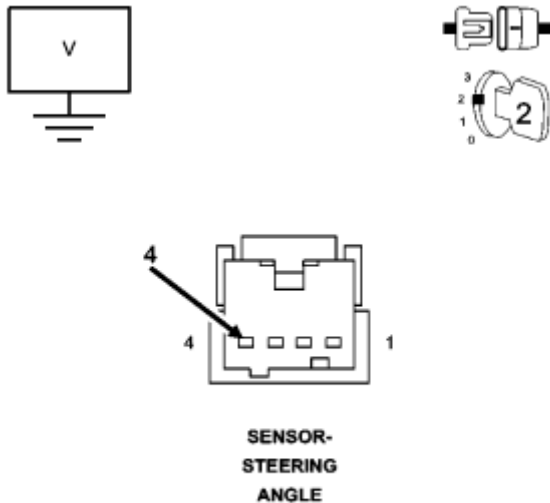
Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK THE VOLTAGE ON THE (F943) FUSED B(+) CIRCUIT



8182e61e

Fig. 54: Measuring Voltage Of Fused Ignition Switch Output (Run-ACC) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Steering Control Module harness connector.

Turn the ignition on.

Measure the voltage of the (F943) Fused B(+) circuit.

Is the voltage above 10 volts?

Yes

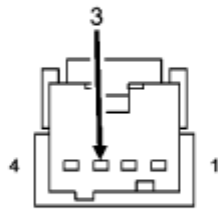
Go To 3.

No

Repair the (F943) Fused B(+) circuit for an open.

Perform **ABS VERIFICATION TEST**.

3. CHECK THE RESISTANCE OF THE (Z910) GROUND CIRCUIT



SENSOR-
STEERING
ANGLE

8182e643

Fig. 55: Checking Ground Circuit For High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Steering Control Module harness connector.

Measure the resistance between the (Z910) Ground circuit and ground.

Is the resistance below 5.0 ohms?

Yes

Replace the Steering Control Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Repair the (Z910) Ground circuit for an open.
Perform **ABS VERIFICATION TEST**.

C121C-TORQUE REQUEST SIGNAL DENIED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the engine running and RPM greater than 360.

Set Conditions

- **Set Condition:**

When the Powertrain Control Module indicates, for an extended period of time, that engine management relevant for Automatic Yaw Control/Traction Control System control can not be accomplished.

Possible Causes

Possible Causes
ANTI-LOCK BRAKE MODULE
POWERTRAIN CONTROL MODULE

Diagnostic Test

1. CHECK FOR A DTC C121C-TORQUE REQUEST SIGNAL DENIED

NOTE: This DTC must be active for the results of this test to be valid and this DTC may set while driving under severe load conditions.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Cycle the ignition switch from off to on.

Start Engine.

With the scan tool, read and record DTCs and monitor ESP Torque Request status.

Does the scan tool display: C121C-TORQUE REQUEST SIGNAL DENIED?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure. See **DIAGNOSIS AND TESTING**.

2. CHECK THE POWERTRAIN DTCS

With the scan tool, read and record Powertrain DTCs.

Were any Powertrain related DTCs found?

Yes

Repair the Powertrain System in accordance with the Service Information.

No

Go To 3.

3. ESP TORQUE REQUEST SIGNAL

Engine started.

With the scan tool, read the Allow ESP Torque Request status bit.

Was the Allow ESP Torque Request showing NOT set?

Yes

Replace the Powertrain Module in accordance with the Service Information.

No

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C121D-BRAKE PRESSURE SENSOR CIRCUIT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

When the Anti-Lock Brake Module indicates that the Brake Pressure Sensor Signal is out of range.

Possible Causes

Possible Causes
AIR IN BRAKE SYSTEM/WORN MECHANICAL COMPONENTS
ECU INTERNAL FAILURE
HCU INTERNAL FAILURE

Diagnostic Test

1. CHECK FOR A DTC C121D-BRAKE PRESSURE SENSOR CIRCUIT

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Start the engine.

Slowly depress and release the brake pedal.

With the scan tool, read and record DTCs.

Does the scan tool display: C121D-BRAKE PRESSURE SENSOR CIRCUIT?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. HCU/ECU ISOLATION

Turn the ignition off.

Separate the ECU from the HCU.

With the scan tool, monitor brake pressure.

Does the scan tool display brake pressure above 218 bar (3162 psi)?

Yes

Replace the HCU in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Replace the ECU in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

C121E-BRAKE PRESSURE SENSOR COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continues monitoring.

Set Conditions

- **Set Condition:**

When the Anti-Lock Brake Module indicates that the Brake Pressure Sensor Signal is out of range.

Possible Causes

Possible Causes
ECU INTERNAL FAILURE HCU INTERNAL FAILURE

Diagnostic Test

1. **CHECK FOR A DTC C121E-BRAKE PRESSURE SENSOR COMPARATIVE PERFORMANCE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Start the engine.

Depress and release the brake pedal.

With the scan tool, read and record DTCs.

Does the scan tool display: C121E-BRAKE PRESSURE SENSOR COMPARATIVE PERFORMANCE?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. HCU/ECU ISOLATION

Turn the ignition off.

Separate the ECU from the HCU.

With the scan tool, monitor brake pressure.

Does the scan tool display brake pressure above 218 bar (3162 psi)?

Yes

Replace the HCU in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Replace the ECU in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1231-DRIVE TEST: STEERING ANGLE SENSOR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the Drive Test.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects implausible Steering Angle Sensor data.

Possible Causes

Possible Causes
STEERING ANGLE SENSOR INSTALLATION
STEERING ANGLE SENSOR
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **CHECK FOR A DTC C1231-DRIVE TEST: STEERING ANGLE SENSOR**

NOTE: **This DTC must be active for the results of this test to be valid.**

NOTE: **If any of the following DTCs are present they must be repaired before continuing.**

DTC C1219-STEERING ANGLE SENSOR ERRATIC PERFORMANCE

DTC C123F-STEERING ANGLE SENSOR COMPARATIVE PERFORMANCE

DTC C1240-STEERING ANGLE SENSOR ANGLE OVERTRAVEL PERFORMANCE

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

Perform ECU initialization with drive test. Perform **ABS VERIFICATION TEST**.

NOTE: The drive test requires a 90° turn.

Start the engine.

With the scan tool, read and record DTCs.

Does the scan tool display: C1231-DRIVE TEST: STEERING ANGLE SENSOR?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. VERIFY THAT THE STEERING ANGLE SENSOR IS ACTIVE ON THE BUS

With the scan tool, select Steering Control Module.

Verify that the Steering Angle Sensor is active on the bus.

Is the Steering Angle Sensor active on the bus?

Yes

Go To 3.

No

Refer to **DIAGNOSIS AND TESTING** for No Response related diagnostic procedures.

3. CHECK STEERING ANGLE

Turn steering wheel so wheels point in a straight ahead position.

With scan tool check steering angle.

Is the Steering Angle reading within ± 15 degrees?

Yes

Go To 4.

No

Go To 5.

4. CHECK STEERING ANGLE CHANGE

Turn steering wheel so wheels point in a straight ahead position.

With scan tool check steering angle.

Slowly rotate steering wheel while looking for a smooth change. The degrees will decrease to the right and increase when rotating steering wheel to the left.

Did the steering angle change accordingly?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Replace the Steering Angle Sensor in accordance with the Service Information and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

5. CHECK STEERING ANGLE SENSOR INSTALLATION

WARNING: To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Proper Steering Angle Sensor installation is crucial for proper operation.

Turn the ignition off.

Verify that the Steering Angle Sensor is properly installed. Refer to **INSTALLATION** .

Is the Steering Angle Sensor properly installed?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Repair as necessary and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

C1232-DRIVE TEST: PRESSURE SENSOR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the Drive Test.

Set Conditions

- **Set Condition:**

If the Pressure Sensor fails to activate.

Possible Causes

Possible Causes
HYDRAULIC / BRAKE SYSTEM COMPONENT INSTALLATION
INTEGRATED CONTROL UNIT
PRESSURE SENSOR (HYDRAULIC CONTROL UNIT)
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **CHECK FOR A DTC C1232-DRIVE TEST: PRESSURE SENSOR**

NOTE: **If present, diagnose and repair all other DTCs before diagnosing this DTC.
This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

Perform ECU initialization with drive test. Perform **ABS VERIFICATION TEST**.

Start the engine.

With the scan tool, read and record DTCs.

Does the scan tool display: C1232-DRIVE TEST: PRESSURE SENSOR?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. **CHECK HYDRAULIC SYSTEM & BRAKE SYSTEM COMPONENT INSTALLATION & FUNCTION**

Verify that the Anti-Lock Brakes Module and Hydraulic Control Unit are properly installed.

Verify that the hydraulic system is properly filled and bled.

Verify that the brake system components are installed and functioning properly.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Clean contacts in HCU first if problem reoccurs replace the Integrated Control Unit in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C1234-DRIVE TEST: SENSOR CLUSTER INSTALLATION

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the Drive Test.

Set Conditions

• **Set Condition:**

If the Anti-Lock Brakes Module detects implausible Dynamics Sensor data.

Possible Causes

Possible Causes

DYNAMICS SENSOR INSTALLATION
DYNAMICS SENSOR
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. CHECK FOR A DTC C1234-DRIVE TEST: SENSOR CLUSTER INSTALLATION

NOTE: **If present, diagnose and repair all other DTCs before diagnosing this DTC.
This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

Perform ECU initialization with drive test. Perform **ABS VERIFICATION TEST**.

Start the engine.

With the scan tool, read and record DTCs.

Does the scan tool display: C1234-DRIVE TEST: SENSOR CLUSTER INSTALLATION?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK THE DYNAMICS SENSOR INSTALLATION

NOTE: **Dynamics Sensor installation and mounting bolt torque is crucial for
proper operation.**

Turn the ignition off.

Check the Dynamics Sensor for damaged, modified, and bent mounting brackets.

Check the Dynamics Sensor mounting bolts for a loose or over tightened condition.

Were any problems found?

Yes

Repair as necessary.
Perform **ABS VERIFICATION TEST**.

No

Replace the Dynamics Sensor in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

C1238-DRIVE TEST: UNSUCCESSFUL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the Drive Test.

Set Conditions

• **Set Condition:**

If the Anti-Lock Brakes Module detects a fault with the Steering Angle Sensor, the Pressure Sensor, or the Dynamics Sensor.

Possible Causes

Possible Causes
STEERING ANGLE SENSOR PRESSURE SENSOR DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. DIAGNOSE & REPAIR ALL DTCs

Repair

Diagnose and repair all DTCs.

C1239-EMISSIONS ROLLS TEST ACTIVE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Theory Of Operation

The functional effects are that the output signal for all wheel speeds mimic the wheel with the highest wheel speed.

This DTC sets when the Emissions Rolls Test is active.

Close out the Emissions Rolls Test though the Gateway Module.

C123B-ESP SYSTEM CONTROL TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

When the Anti-Lock Brake Module indicates ESP control lasting longer the 10 seconds.

Possible Causes

Possible Causes
HYDRAULIC/BRAKE ISSUE
DYNAMICS SENSOR
INTEGRATED CONTROL MODULE
STEERING ANGLE SENSOR
WHEEL ALIGNMENT

Diagnostic Test

1. CHECK FOR A DTC C123B-ESP SYSTEM CONTROL TOO LONG

NOTE: If other DTCs are set they must be repaired before continuing. To help in the service of the ESP System, it is recommend speaking to the customer to find out what type of environment they were driving in when the ESP

concern took place, heavy rain, snow or ice. This should be considered normal operation and no repair is necessary. This DTC may set while driving under excessive driving conditions.

Turn the ignition on.

Perform ECU initialization with drive test. Perform ABS VERIFICATION TEST.

NOTE: Drive test must be performed correctly for ECU to initialize.

Cycle the ignition switch from off to on.

Did the ECU initialization/drive test pass?

Yes

Go To 2.

No

Refer to associated drive test diagnostic procedure.

Refer to the DTC list. See DIAGNOSIS AND TESTING.

2. CHECK STEERING ANGLE SIGNAL

Turn steering wheel so wheels point in a straight ahead position.

With scan tool read Steering Angle Sensor Signal.

Is the Steering Angle reading within ± 6 degrees?

Yes

Go To 4.

No

Go To 3.

3. CHECK STEERING ANGLE INSTALLATION AND WHEEL ALIGNMENT

NOTE: Proper Steering Angle Sensor installation is crucial for proper operation.

Turn the ignition off.

Inspect the vehicle for damage causing tracking problems or steering wheel misalignment.

Inspect the steering column and intermediate shaft for damage.

Verify that the Steering Angle Sensor is properly installed.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Replace the Steering Angle Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

4. CHECK HYDRAULIC SYSTEM & BRAKE SYSTEM COMPONENT INSTALLATION & FUNCTION

Verify that the Anti-Lock Brakes Module and Hydraulic Control Unit are properly installed.

Verify that the hydraulic system is properly filled and bled.

Verify that the brake system components are installed and functioning properly.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. REPLACE THE INTEGRATED CONTROL MODULE & VERIFY IF THE DTC IS STILL ACTIVE

Replace the Integrated Control Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Connect all previously disconnected components and connectors.

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 20 km/h (6 and 12 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Replace the Dynamics Sensor in accordance with the Service Information.

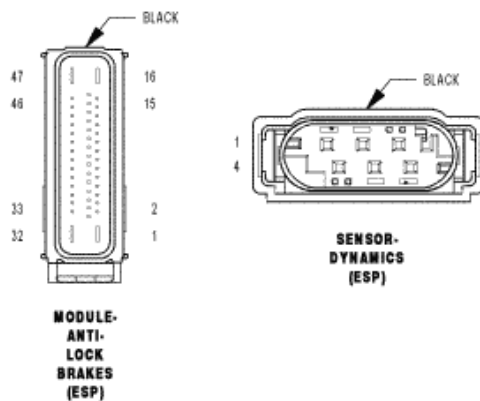
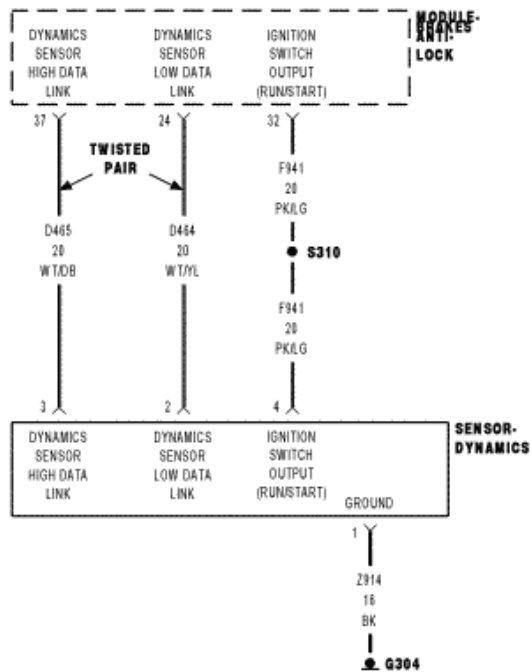
Perform **ABS VERIFICATION TEST**.

No

Test complete.

C123C-DYNAMICS SENSOR MOUNTING/INSTALLATION PERFORMANCE

Circuit Schematic



81d0#51

Fig. 56: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

After initialization and no under voltage condition.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects implausible Dynamics Sensor values.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE
DYNAMICS SENSOR INSTALLATION
DYNAMICS SENSOR
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: If present, diagnose and repair DTC C2114-DYNAMICS SENSOR SUPPLY VOLTAGE LOW or DTC C2115-DYNAMICS SENSOR SUPPLY VOLTAGE HIGH before diagnosing this DTC.

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 20 km/h (6 and 12 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION.**

2. CHECK THE DYNAMICS SENSOR INSTALLATION

NOTE: **Dynamics Sensor installation and mounting bolt torque is crucial for proper operation.**

Turn the ignition off.

Check the Dynamics Sensor to ensure properly oriented in vehicle with connector rearward in vehicle behind the park brake sled on center tunnel.

Check the Dynamics Sensor mounting bolts for a loose or over tightened condition.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Visually inspect the related wiring harness. Look for any pinched, chafed, pierced, and partially broken wires.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. **REPLACE DYNAMICS SENSOR & VERIFY IF DTC IS STILL ACTIVE**

Replace the Dynamics Sensor in accordance with the Service Information. Perform ABS VERIFICATION TEST. See **STANDARD PROCEDURE**.

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.

Perform **ABS VERIFICATION TEST**.

C123F-STEERING ANGLE SENSOR COMPARATIVE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During continuous driving.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects that either the calculated steering wheel angle offset or the steering wheel angle signal measured output is implausible or has the wrong sign.

Possible Causes

Possible Causes
VEHICLE DAMAGE STEERING COLUMN / INTERMEDIATE SHAFT DAMAGE STEERING WHEEL ALIGNMENT STEERING ANGLE SENSOR LOOSE STEERING ANGLE SENSOR IMPROPERLY INSTALLED (WRONG MOUNTING POSITION) STEERING ANGLE SENSOR ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. PERFORM TEST DRIVE & VERIFY DTC IS STILL ACTIVE

NOTE: If present, diagnose and repair DTC C1219-STEERING ANGLE SENSOR ERRATIC PERFORMANCE, C121A-STEERING ANGLE SENSOR NOT INITIALIZED, or C1240-STEERING ANGLE SENSOR OVERTRAVEL PERFORMANCE before diagnosing this DTC.

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: To avoid personal injury or death, check brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION.**

2. INSPECT VEHICLE, STEERING COLUMN, & INTERMEDIATE SHAFT FOR DAMAGE

NOTE: If possible, check vehicle repair history for collision damage.

Turn the ignition off.

Inspect the vehicle for damage causing tracking problems or steering wheel misalignment.

Inspect the steering column and intermediate shaft for damage.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST.**

No

Go To 3.

3. CHECK STEERING ANGLE SENSOR OUTPUT

Start the engine.

Turn the steering wheel so wheels point in a straight ahead position.

With the scan tool, read the Steering Angle Sensor position.

Is the Steering Angle Sensor Position within $\pm 15^\circ$ degrees?

Yes

Go To 5.

No

Go To 4.

4. **CHECK STEERING ANGLE SENSOR INSTALLATION**

WARNING: To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Proper Steering Angle Sensor installation is crucial for proper operation.

Verify that the Steering Angle Sensor is properly installed.

Is the Steering Angle Sensor properly installed?

Yes

Go To 5.

No

Repair as necessary and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

5. **CHECK STEERING ANGLE SENSOR OUTPUT WHILE ROTATING THE STEERING WHEEL**

With the scan tool, read the Steering Angle Sensor position while rotating the steering wheel to the right and then to the left. The Steering Angle Sensor position should decrease when rotating the steering wheel to the right and increase when rotating the steering wheel to the left.

Did the steering angle change accordingly?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Replace the Steering Angle Sensor in accordance with the Service Information and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform the ABS VERIFICATION TEST. See **STANDARD PROCEDURE**.

C1240-STEERING ANGLE SENSOR OVERTRAVEL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With ignition on, but not if a CAN time out failure is detected.

Or, if a fault is detected by the Steering Angle Sensor.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects that the absolute value of the measured steering wheel angle is greater than 720 degrees.

Possible Causes

Possible Causes
VEHICLE DAMAGE STEERING COLUMN / INTERMEDIATE SHAFT DAMAGE STEERING WHEEL ALIGNMENT STEERING ANGLE SENSOR LOOSE STEERING ANGLE SENSOR IMPROPERLY INSTALLED (WRONG MOUNTING POSITION) STEERING ANGLE SENSOR

Diagnostic Test

1. PERFORM TEST DRIVE & VERIFY DTC IS STILL ACTIVE

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

Turn steering wheel from lock to lock.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK STEERING ANGLE SENSOR OUTPUT

Start the engine.

Center the steering wheel.

With the scan tool, read the Steering Angle Sensor Position.

Is the Steering Angle Sensor Position within $\pm 15^\circ$?

Yes

Go To 4.

No

Go To 3.

3. INSPECT VEHICLE, STEERING COLUMN, & INTERMEDIATE SHAFT FOR DAMAGE

NOTE: **If possible, check vehicle repair history for collision damage.**

Turn the ignition off.

Inspect the vehicle for damage causing tracking problems or steering wheel misalignment.

Inspect the steering column and intermediate shaft for damage.

Center the steering wheel.

With the scan tool, read the Steering Angle Sensor Position.

Is the Steering Angle Sensor Position within $\pm 15^\circ$?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. **CHECK STEERING ANGLE CHANGE**

Turn steering wheel so wheels point in a straight ahead position.

With scan tool check steering angle if reading travels to 720 degrees while rotating wheel from lock to lock.

NOTE: Sensor damage can occur if wheel is turned over 720 degrees.

Rotate steering wheel to the right and the degrees will decrease and rotate steering wheel to the left and the degrees will increase.

Did the steering angle change accordingly and display less than 720 degrees from lock to lock?

Yes

Go To 5.

No

Replace the Steering Angle Sensor in accordance with the Service Information and clear offsets by initializing ECU with wheels pointing straight ahead.

Perform **ABS VERIFICATION TEST**.

5. **CHECK STEERING ANGLE SENSOR INSTALLATION**

WARNING: To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Proper Steering Angle Sensor installation is crucial for proper operation.

Verify that the Steering Angle Sensor is properly installed. Refer to **INSTALLATION** .

Is the Steering Angle Sensor properly installed?

Yes

Replace the Steering Angle Sensor and clear offsets by initializing ECU with wheels pointing straight ahead, in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Repair as necessary and clear offsets by initializing ECU with wheels pointing straight ahead.
Perform **ABS VERIFICATION TEST**.

C1243-G SENSOR NOT INITIALIZED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Once after ignition on.

Set Conditions

- **Set Condition:**

If the stored zero point calibration value of the longitudinal acceleration sensor is invalid.

Possible Causes

Possible Causes
DYNAMICS SENSOR NOT CALIBRATED
DYNAMICS SENSOR
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. PERFORM ECU INITIALIZATION

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: To avoid personal injury or death, check brake capability is available before road testing.

Perform ECU initialization with drive test. Perform **ABS VERIFICATION TEST**.

NOTE: The ECU Initialization process must include driving the vehicle into a 90° turn.

Park the vehicle.

Go To 2.

2. **VERIFY IF DTC IS STILL ACTIVE**

Cycle the ignition switch.

WARNING: To avoid personal injury or death, check brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

NOTE: Vehicles without a Dynamics Sensor replace Anti-Lock Brake Module.

Replace the Dynamics Sensor or Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

C2100-BATTERY VOLTAGE LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brake Module detects system voltage is below 9.3 volts.

Possible Causes

Possible Causes
DTCS IN THE ECM/PCM CHARGING SYSTEM FAILURE ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **DTCS IN THE PCM**

NOTE: **This DTC must be active for the results of this test to be valid.**

NOTE: **Light will be on and not set a DTC when battery voltage is below 9.3 volts and no wheel speed.**

Turn the ignition on.

With the scan tool, read and record DTCs from the PCM.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Start the engine.

Road test the vehicle over 6 km/h (3.4 mph).

NOTE: **Vehicle must be driven above 6 km/h (3.4 mph) for set conditions to be met.**

With the scan tool, read and record DTCs.

With the scan tool read DTCs from the PCM.

Are any charging system codes present?

Yes

Repair the charging system DTC in the PCM.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 2.

2. CHARGING SYSTEM FAILURE

Start the engine.

Connect voltmeter to vehicle battery.

Is the vehicle battery voltage under 9.3 volts?

No

Go To 3.

Yes

Repair the charging system per service information.

Perform **ABS VERIFICATION TEST**.

3. CHARGING POWER SUPPLY VOLTAGE

With a scan tool read Power Supply Voltage.

Is Power Supply Voltage under 9.3 volts?

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brake Module detects system voltage is above 16.8 volts.

Possible Causes

Possible Causes
DTCs IN THE PCM ANTI-LOCK BRAKES MODULE CHARGING SYSTEM FAILURE

Diagnostic Test

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read and record DTCs from the PCM.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Start the engine.

With the scan tool, read and record DTCs.

With the scan tool read DTCs from the PCM.

Are any charging system codes present?

Yes

Repair the charging system DTC in the PCM.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 1.

CHARGING SYSTEM FAILURE

Start the engine.

Connect voltmeter to vehicle battery.

Is the vehicle battery voltage over 16.8 volts?

No

Go To 2.

Yes

Repair the charging system per service information.

Perform **ABS VERIFICATION TEST**.

CHARGING POWER SUPPLY VOLTAGE

With a scan tool read Power Supply Voltage.

Is Power Supply Voltage over 16.8 volts?

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

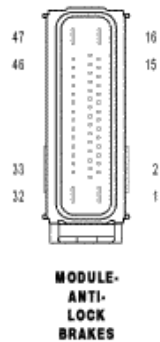
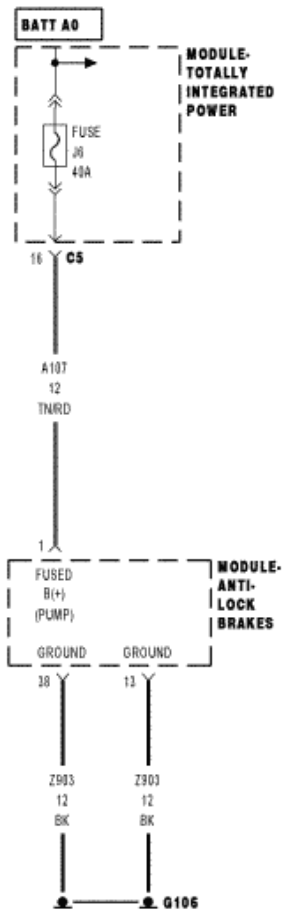
Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

C2105-ABS VALVE SUPPLY VOLTAGE CIRCUIT LOW

Circuit Schematic



81d0b12

Fig. 57: ABS Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:

The monitor function test the supply voltage of the valves via the valve feedback lines. If three or more valve response faults occur simultaneously or battery voltage and relay voltage differ by 0.8 volts for 500 mSec, a DTC is set.

Possible Causes

Possible Causes
LOW VOLTAGE AT THE ABM ABM INTERNAL

Diagnostic Test

1. LOW VOLTAGE AT THE ABM

With the scan tool read ABS Valve Feed and Power Supply Voltage in the ABM and compare the two reading to actual battery voltage from a voltmeter.

NOTE: **Battery must be fully charged.**

Are all readings within .8 of a volt?

Yes

Replace the ABM per service information.
Perform **ABS VERIFICATION TEST**.

No

Go To 2.

2. ABM INTERNAL

Turn key off.

Disconnect the ABM harness connector.

NOTE: **Check connector - Clean/repair as necessary.**

Turn key on, engine off.

With a test light check (A111) and (A107) Fused B+ output.

Is test light bright like when connected to the battery?

Yes

Replace the ABM per service information.

Perform **ABS VERIFICATION TEST**.

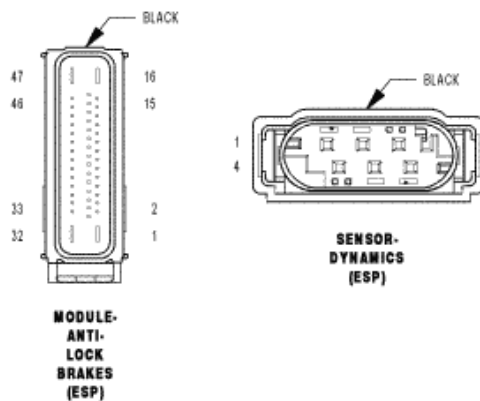
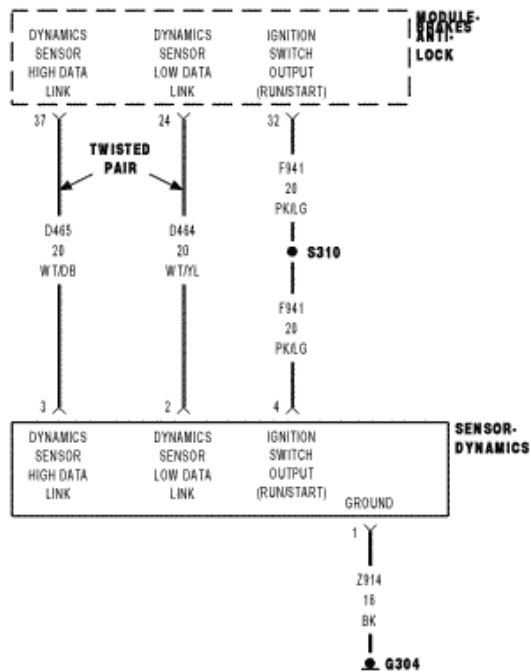
No

Repair the high resistance in the circuits.

Perform **ABS VERIFICATION TEST**.

C2114-DYNAMICS SENSOR SUPPLY VOLTAGE LOW

Circuit Schematic



81d0#51

Fig. 58: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

The Anti-Lock Brake Module detects less than 6.5 volts being supplied to the dynamics sensor.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE (F941) DYNAMICS SENSOR SUPPLY CIRCUIT OPEN OR HIGH RESISTANCE (Z914) DYNAMICS SENSOR GROUND CIRCUIT OPEN OR HIGH RESISTANCE DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.
Refer to the **ABS INTERMITTENT CONDITION.**

2. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Turn the ignition off.

Check all related wiring for pinched, chafed, pierced, and partially broken wires.

Check all related connectors for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

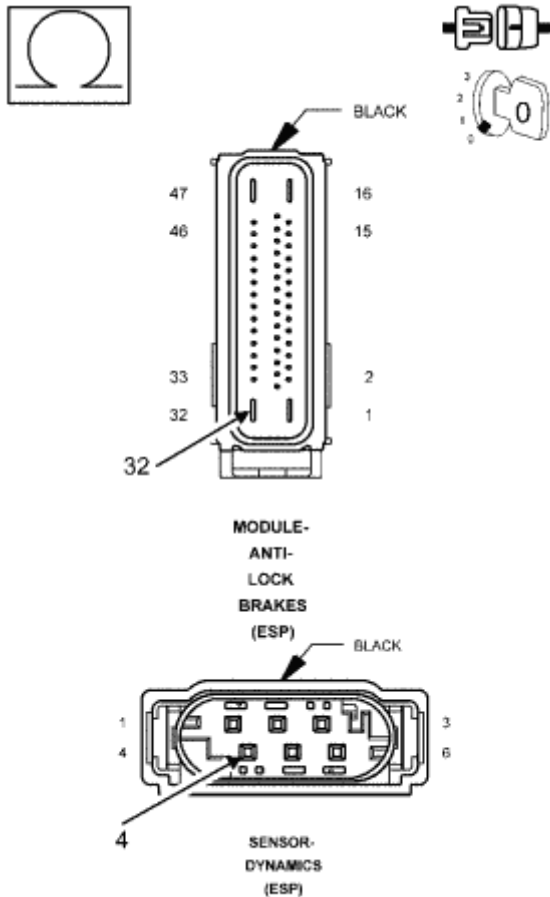
Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK (F941) DYNAMICS SENSOR SUPPLY CIRCUIT & (Z914) DYNAMICS SENSOR GROUND CIRCUIT FUNCTION



81d0ff61

Fig. 59: Measuring The Voltage Between The Dynamics Sensor Supply Circuit And The Dynamics Sensor Ground Circuit

Courtesy of CHRYSLER LLC

Disconnect the Dynamics Sensor harness connector.

Turn the ignition on.

Measure the voltage between the (F941) Dynamics Sensor Supply Circuit and the (Z914) Dynamics Sensor Ground Circuit.

Is the voltage above 6.5 volts?

Yes

Replace the Dynamics Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. **CHECK (F941) DYNAMICS SENSOR SUPPLY CIRCUIT FOR OPEN OR HIGH RESISTANCE**

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, probe the (F941) Dynamics Sensor Supply circuit.

Does the test light illuminate as brightly as when connected directly to B+?

Yes

Go To 5.

No

Repair the (F941) Dynamics Sensor Supply circuit for open or high resistance.

Perform **ABS VERIFICATION TEST**.

5. **CHECK (Z914) DYNAMICS SENSOR GROUND CIRCUIT FOR OPEN OR HIGH RESISTANCE**

Using a 12-volt test light connected to B+, probe the (Z914) Dynamics Sensor Ground circuit.

Does the test light illuminate brightly?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

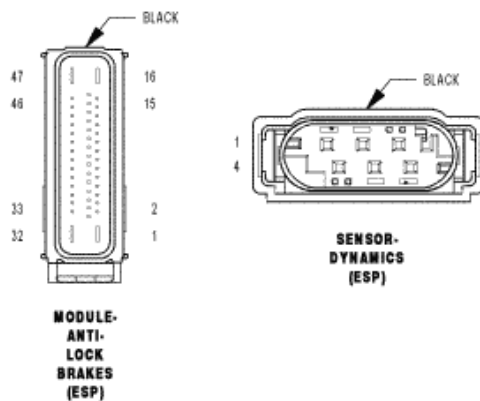
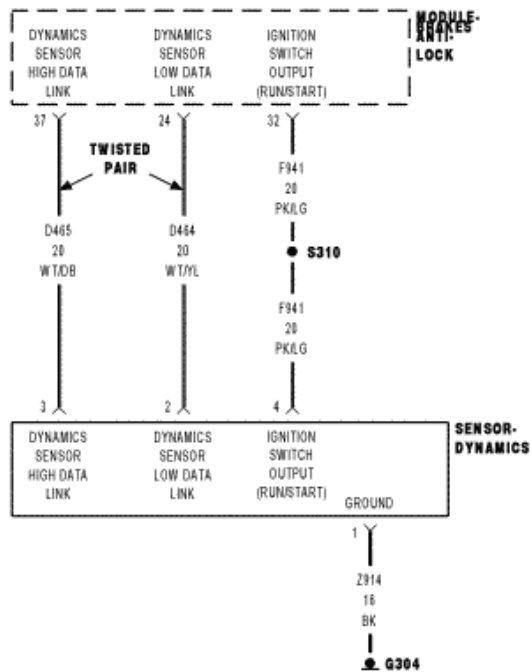
No

Repair the (Z914) Dynamics Sensor Ground circuit for open or high resistance.

Perform **ABS VERIFICATION TEST**.

C2115-DYNAMICS SENSOR SUPPLY VOLTAGE HIGH

Circuit Schematic



81d0#51

Fig. 60: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Upon ignition on, prior to switching the (F941) Dynamics Sensor Supply circuit power on.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects a voltage supplied to the Dynamics Sensor greater than 19.5 volts.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE (F941) DYNAMICS SENSOR SUPPLY CIRCUIT SHORTED TO VOLTAGE DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.
Refer to the **ABS INTERMITTENT CONDITION**.

2. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Turn the ignition off.

Check all related wiring for pinched, chafed, pierced, and partially broken wires.

Check all related connectors for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK (F941) DYNAMICS SENSOR SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE

Disconnect the Anti-Lock Brakes Module harness connector.

Turn the ignition on.

Connect volt meter and measure the voltage of the (F941) Dynamics Sensor Supply Circuit.

Is the voltage above 19.5 volts?

Yes

Replace the Dynamics Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK (F941) DYNAMICS SENSOR SUPPLY CIRCUIT FOR OPEN OR HIGH RESISTANCE

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, probe the (F941) Dynamics Sensor Supply circuit.

Does the test light illuminate as brightly as when connected directly to B+?

Yes

Go To 5.

No

Repair the (F941) Dynamics Sensor Supply circuit for open or high resistance.

Perform **ABS VERIFICATION TEST**.

5. CHECK (Z914) DYNAMICS SENSOR GROUND CIRCUIT FOR OPEN OR HIGH RESISTANCE

Using a 12-volt test light connected to B+, probe the (Z914) Dynamics Sensor Ground circuit.

Does the test light illuminate brightly?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

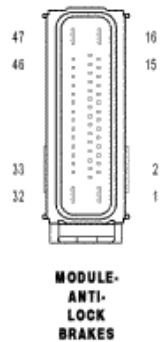
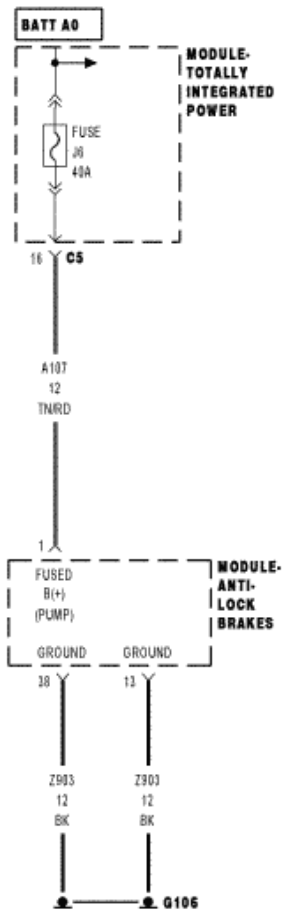
No

Repair the (Z914) Dynamics Sensor Ground circuit for open or high resistance.

Perform **ABS VERIFICATION TEST**.

C2116-ABS PUMP MOTOR SUPPLY LOW VOLTAGE

Circuit Schematic



81d0b12

Fig. 61: ABS Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the ABS Pump Motor deactivated, but not if supply voltage faults are detected.

Or, if the control is switched off.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects either a low voltage condition when the ABS Pump Motor is activated or deactivated or a high voltage condition when the ABS Pump Motor is deactivated.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE
ABS PUMP MOTOR FUSE OPEN
(A107) FUSED B(+) CIRCUIT SHORTED TO GROUND, OPEN, OR HIGH RESISTANCE
(Z903) GROUND CIRCUIT OPEN, OR HIGH RESISTANCE
ANTI-LOCK BRAKES MODULE
PUMP MOTOR (HYDRAULIC CONTROL UNIT)

Diagnostic Test

1. **CHECK FOR A DTC C2116-ABS PUMP MOTOR SUPPLY LOW VOLTAGE**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

Road test the vehicle over 40 km/h (25 mph).

NOTE: **Vehicle must be driven above 40 km/h (25 mph) for set conditions to be meet.**

With the scan tool, read DTCs.

Does the scan tool display: C2116-ABS PUMP MOTOR SUPPLY LOW VOLTAGE?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Turn the ignition off.

Visually inspect the Anti-Lock Brakes Module harness connector and wiring harness for damage.

Check all related wiring for pinched, chafed, pierced, and partially broken wires.

Check all related connectors for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK ABS PUMP MOTOR FUSE

Remove and visually inspect the ABS Pump Motor fuse.

Is the fuse open?

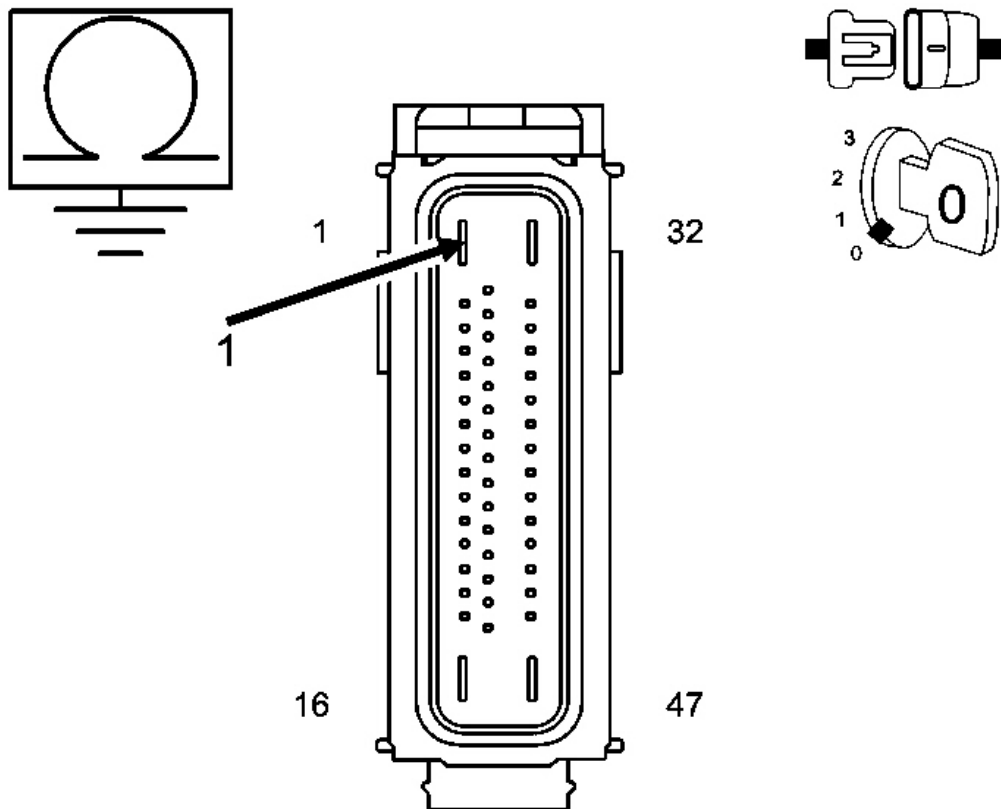
Yes

Go To 4.

No

Go To 5.

4. CHECK (A107) FUSED B(+) CIRCUIT FOR A SHORT TO GROUND



**MODULE-
ANTILOCK
BRAKES**

816f6b5a

Fig. 62: Checking Fused B(+) Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the Anti-Lock Brakes Module harness connector.

Measure the resistance of the (A107) Fused B(+) circuit between ground and the Anti-Lock Brakes Module harness connector.

Is the resistance below 10k ohms?

Yes

Repair the (A107) Fused B(+) circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK (A107) FUSED B(+) CIRCUIT FOR AN OPEN OR HIGH RESISTANCE

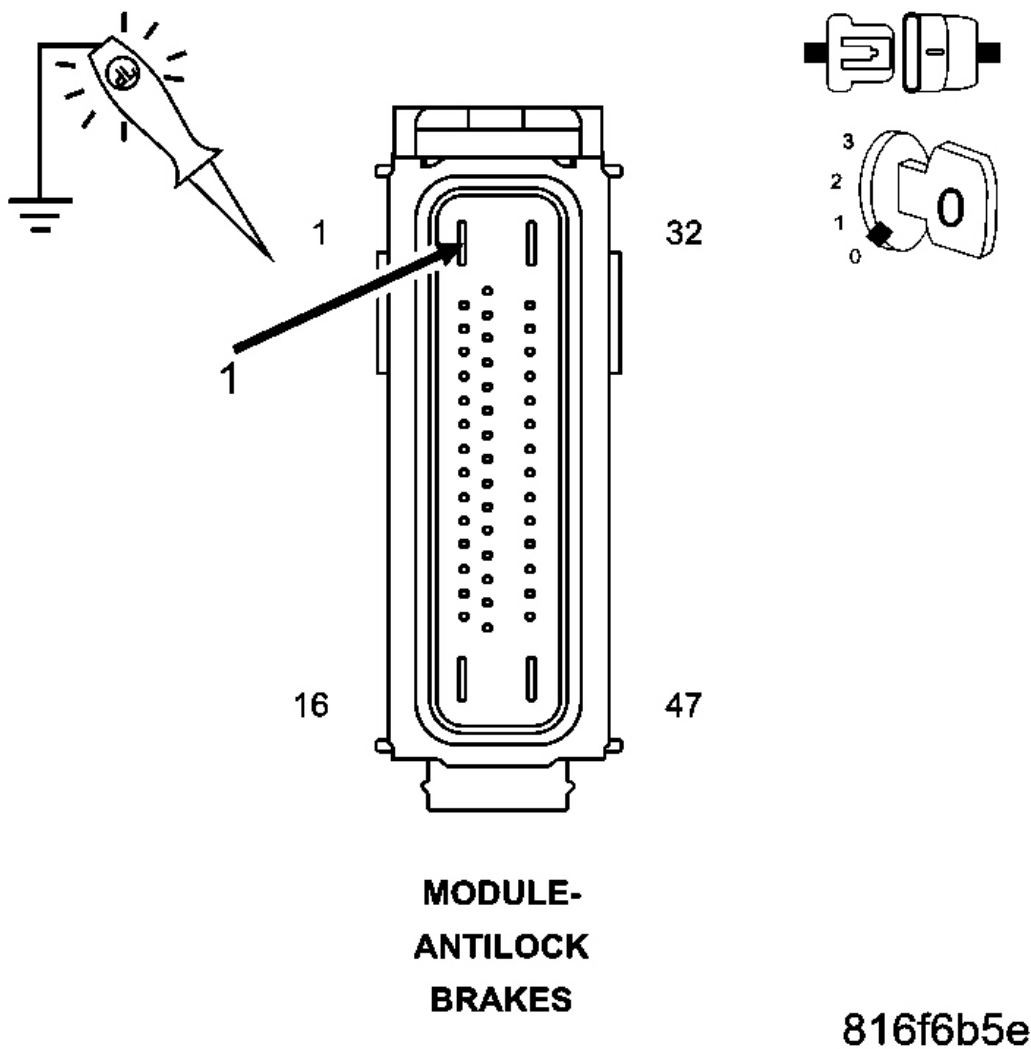


Fig. 63: Checking Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Replace the ABS Pump Motor fuse.

Using a 12-volt test light connected to ground, probe the (A107) Fused B(+) circuit.

NOTE: **The test light should illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

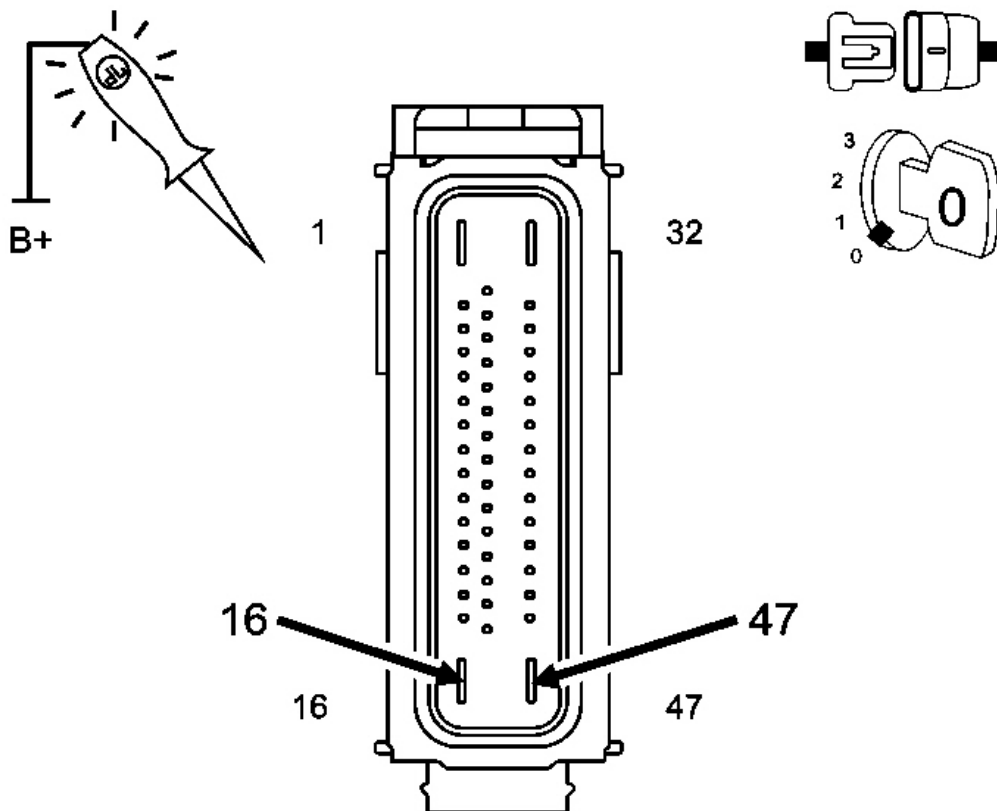
Go To 6.

No

Repair the (A107) Fused B(+) circuit for an open or high resistance.

Perform **ABS VERIFICATION TEST**.

6. CHECK (Z903) GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE



**MODULE-
ANTILOCK
BRAKES**

81700845

Fig. 64: Checking Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12 volts, probe the (Z903) Ground circuit.

NOTE: The test light should illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly on both circuits?

Yes

Go To 7.

No

Repair (Z903) circuit for an open or high resistance.

Perform **ABS VERIFICATION TEST**.

7. REPLACE ANTI-LOCK BRAKES MODULE & VERIFY IF DTC IS STILL ACTIVE

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Turn the ignition on.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Replace the Hydraulic Control Unit in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

C2200-ANTI-LOCK BRAKE MODULE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on. The Anti-Lock Brake Module monitors its internal microprocessors for correct operation.

Set Conditions

- **Set Condition:**

If the Anti-lock brake module detects an internal fault, the DTC is set.

Possible Causes

Possible Causes
ABM - INTERNAL FAULT

Diagnostic Test

1. ABM INTERNAL FAILURE DTC PRESENT

Turn the ignition on.

With the scan tool, read DTCs.

With the scan tool, erase DTCs.

Turn the ignition off.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display ANTI-LOCK BRAKE MODULE INTERNAL FAILURE?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Perform the ABS Intermittent Condition diagnostic procedure.
Refer to the **ABS INTERMITTENT CONDITION**.

C2202-ORIGINAL VIN MISMATCH/MISSING

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At power up, VIN is read off the CAN bus.

Set Conditions

- **Set Condition:**

The VIN stored in the ABM does not match the VIN read off of the CAN bus.

Possible Causes

Possible Causes
ABM MOVED FROM DIFFERENT VEHICLE WRONG VIN PROGRAMMED INTO VEHICLE

Diagnostic Test

1. CHECK FOR A DTC C2202-ORIGINAL VIN MISMATCH/MISSING

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

Perform ECU initialization with drive test. Perform **ABS VERIFICATION TEST**.

Start the engine.

With the scan tool, read and record DTCs.

Does the scan tool display: C2202-ORIGINAL VIN MISMATCH/MISSING?

Yes

Go To 2.

No

ABM has learned new VIN.

Perform **ABS VERIFICATION TEST**.

2. WRONG VIN PROGRAMMED INTO VEHICLE

Is the VIN stored in the ABM and PCM the same?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

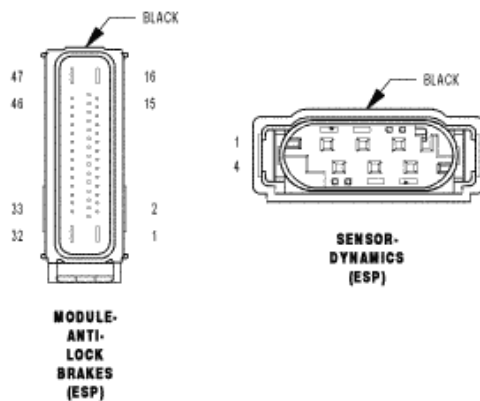
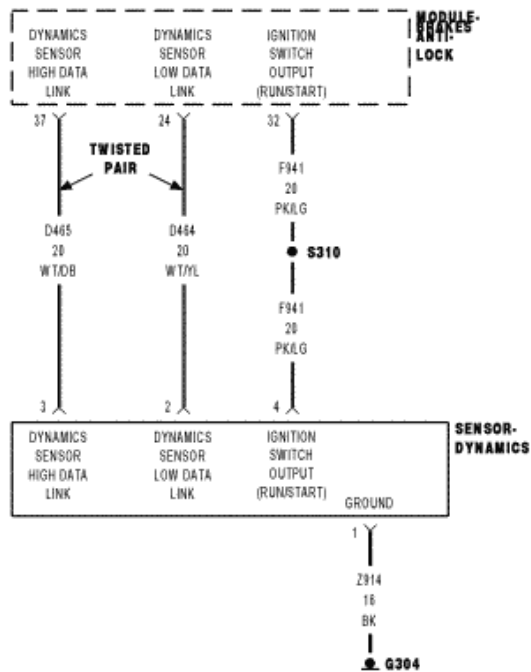
No

Reprogram the VIN per service information.

Perform **ABS VERIFICATION TEST**.

C2204-DYNAMICS SENSOR INTERNAL

Circuit Schematic



81d0#51

Fig. 65: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously monitored.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects that the Lateral Sensor or Yaw sensor signal sent from the Dynamics sensor is out of range or implausible at standstill and with speed.

Possible Causes

Possible Causes
DYNAMICS SENSOR INSTALLATION DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 20 km/h (6 and 12 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK THE DYNAMICS SENSOR INSTALLATION

NOTE: Dynamics Sensor installation and mounting bolt torque is crucial for proper operation.

Turn the ignition off.

Check the Dynamics Sensor to ensure properly oriented in vehicle with connector rearward in vehicle behind the park brake sled on center tunnel.

Check the Dynamics Sensor mounting bolts for a loose or over tightened condition.

Were any problems found?

Yes

Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. DYNAMICS SENSOR

Connect all previously disconnected components and connectors.

WARNING: Ensure brake capability is available before road testing.

Replace the Dynamics Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

Did DTC C2204-DYNAMICS SENSOR INTERNAL reset?

Yes

Replace the Anti-Lock Brake Module
Perform **ABS VERIFICATION TEST**.

No

Repair is complete.

C2205-STEERING ANGLE SENSOR INTERNAL

Circuit Schematic

Monitor Conditions

When Monitored:

With ignition on, but not if supply voltage faults are detected.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects that the Steering Angle Sensor sends an internal failure message.

Possible Causes

Possible Causes
STEERING ANGLE SENSOR

Diagnostic Test

1. **CHECK FOR A DTC C2205-STEERING ANGLE SENSOR INTERNAL**

NOTE: **This DTC must be active for the results of this test to be valid.**

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

WARNING: Ensure brake capability is available before road testing.

Start the vehicle and turn the wheel from lock to lock.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

Park the vehicle.

With the scan tool, read and record DTCs.

Does the scan tool display: C2205-STEERING ANGLE SENSOR INTERNAL?

Yes

Replace the Steering Angle Sensor in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

No

Refer to the INTERMITTENT CONDITION diagnostic procedure.
Perform **ABS VERIFICATION TEST**.

C2206-VEHICLE CONFIGURATION MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Anti-Lock Brake Module detects the signal from the gateway module relevant for vehicle characteristic is missing or does not match for a period greater than the specified fault duration.

Possible Causes

Possible Causes
TIPM / PCM NOT CONFIGURED CORRECTLY ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR A DTC C2206-VEHICLE CONFIGURATION MISMATCH

NOTE: This DTC must be active for the results of this test to be valid.

NOTE: This DTC will be active when a new module is installed until initialization is performed.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, read and record Freeze Frame information.

With the scan tool, erase DTCs.

Perform ECU initialization on ABM. Perform **ABS VERIFICATION TEST**.

Cycle the ignition switch from off to on.

With the scan tool, read and record DTCs.

Does the scan tool display: C2206-VEHICLE CONFIGURATION MISMATCH?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. VERIFY THAT THE TIPM/PCM IS CONFIGURED CORRECTLY

Turn the ignition on.

Check the following data to verify the TIPM/PCM is configured correctly. Engine Displacement (PCM), XWD 4x4, all Wheel Drive, (TIPM), Vehicle Line (TIPM), Transference type 0= 253 1=256.

NOTE: **The DTC will be active when a new controller is installed until initialization is performed.**

Was the TIPM/PCM configured correctly?

Yes

Replace the Anti-Lock Brake Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Reprogram the appropriate module.

Perform **ABS VERIFICATION TEST** or **POWERTRAIN VERIFICATION TEST** .

U0002-CAN C BUS OFF PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

The Anti-Lock Brake Module detects a corrupt CAN C Bus message.

Possible Causes

Possible Causes
(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND
(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND
(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE
(D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE
(D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT
ANTILOCK BRAKE MODULE
POWERTRAIN CONTROL MODULE
ENGINE CONTROL MODULE (DIESEL ONLY)
TRANSMISSION CONTROL MODULE
STEERING ANGLE SENSOR
AUTOMATIC SWAY BAR SYSTEM MODULE
WIRELESS CONTROL MODULE
OCCUPANT RESTRAINT CONTROLLER MODULE
OCCUPANT CLASSIFICATION MODULE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. ANTILOCK BRAKE MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Anti-Lock Brake Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 3.

No

Inspect the wiring and connectors for damage or shorted circuits in accordance with the service information. If ok, replace and program the Anti-Lock Brake Module in accordance with the service information.

Perform **ABS VERIFICATION TEST**.

3. POWERTRAIN CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Powertrain Control Module C1 harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 4.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Powertrain Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. ENGINE CONTROL MODULE (DIESEL ONLY) - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Engine Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 5.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the

Engine Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

5. TRANSMISSION CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Transmission Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 6.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Transmission Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

6. STEERING ANGLE SENSOR - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Steering Angle Sensor harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 7.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Steering Angle Sensor in accordance with the service information.

Perform **ABS VERIFICATION TEST**.

7. AUTOMATIC SWAY BAR SYSTEM MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Automatic Sway Bar System Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 8.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Automatic Sway Bar System Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

8. WIRELESS CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Wireless Control Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 9.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Wireless Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

9. **OCCUPANT RESTRAINT CONTROLLER MODULE - INTERNAL SHORT**

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Occupant Restraint Controller Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 10.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Restraint Controller Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

10. OCCUPANT CLASSIFICATION MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Occupant Classification Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTCs.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 11.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Classification Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

11. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

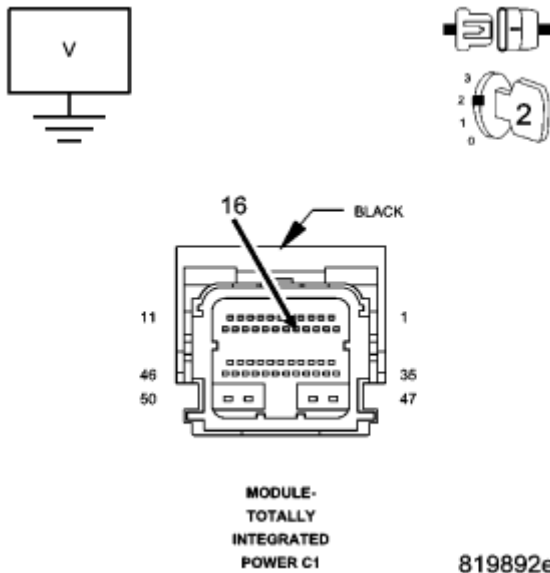


Fig. 67: Checking Voltage Between CAN C Bus (+) Circuit & Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Totally Integrated Power Module C1 harness connector.

Turn the ignition on.

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is there any voltage present?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 12.

12. (D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE

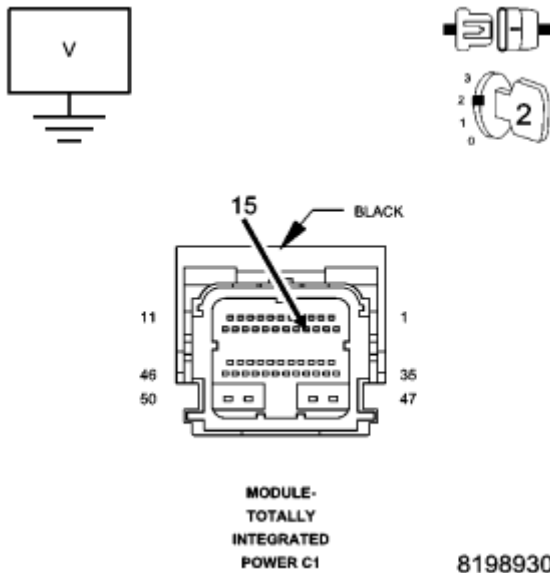


Fig. 68: Measuring Voltage Between CAN C Bus (-) Circuit & Ground
 Courtesy of CHRYSLER LLC

Measure the voltage between the (D64) CAN C Bus (-) circuit and ground.

Is there any voltage present?

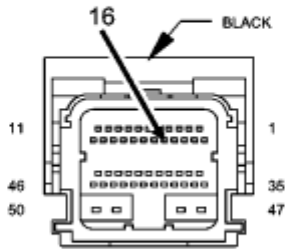
Yes

Repair the (D64) CAN C Bus (-) circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 13.

13. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND**



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198930f

Fig. 69: Checking CAN C Bus (+) Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D65) CAN C Bus (+) circuit.

Is any resistance present?

Yes

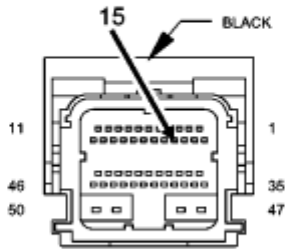
Repair the (D65) CAN C Bus (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 14.

14. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198931a

Fig. 70: Measuring Resistance Between Ground & CAN C Bus (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is any resistance present?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 15.

15. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT**

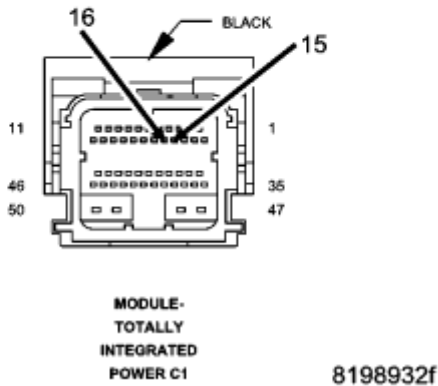


Fig. 71: Checking Resistance Between CAN C Bus (+) Circuit & CAN C Bus (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (D65) CAN C Bus (+) circuit and the (D64) CAN C Bus (-) circuit.

Is any resistance present?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to the (D64) CAN C Bus (-) circuit.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Totally Integrated Power Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

U0100-LOST COMMUNICATION WITH ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module fails to receive bus messages from the ECM or PCM for approximately 500 ms.

Possible Causes

Possible Causes
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
ECM OR PCM POWER AND GROUND
ECM OR PCM
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Verify the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires. Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX**.

No

Go To 3.

3. VERIFY THAT THE ECM OR PCM IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the ECM or PCM is active on the bus.

Is the ECM or PCM active on the bus?

Yes

Go To 4.

No

Perform ***STORED LOST COMMUNICATION DTCS** .

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the ECM or PCM?

Yes

Replace/update the ECM or PCM in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Anti-Lock Brakes Module in accordance with the service information.

Perform **ABS VERIFICATION TEST**.

U0101-LOST COMMUNICATION WITH TCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- Set Condition:**

If the Anti-Lock Brakes Module fails to receive bus messages from the TCM for approximately 500 ms.

Possible Causes

Possible Causes
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
TCM POWER AND GROUND
PCM DTCs PRESENT
TCM
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. VERIFY DTC IS ACTIVE

- NOTE:

Verify the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.
- NOTE:

If present, diagnose and repair DTC U0002-CAN C BUS OFF PERFORMANCE, DTC or DTC U1502-IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM TIPM before diagnosing this DTC.

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

Perform ***STORED LOST COMMUNICATION DTCS** .

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX**.

No

Go To 3.

3. VERIFY THAT THE TCM IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the TCM is active on the bus.

Is the TCM active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSTIC CODE INDEX** for a no response test procedure.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the TCM?

Yes

Replace/update the TCM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

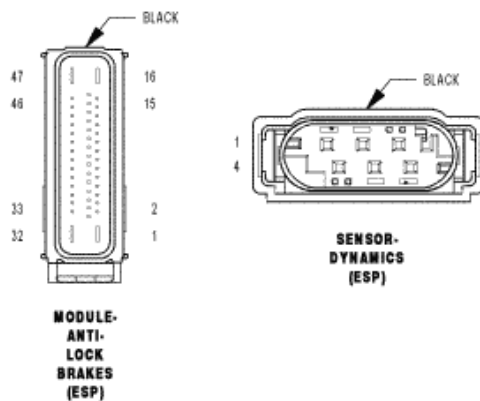
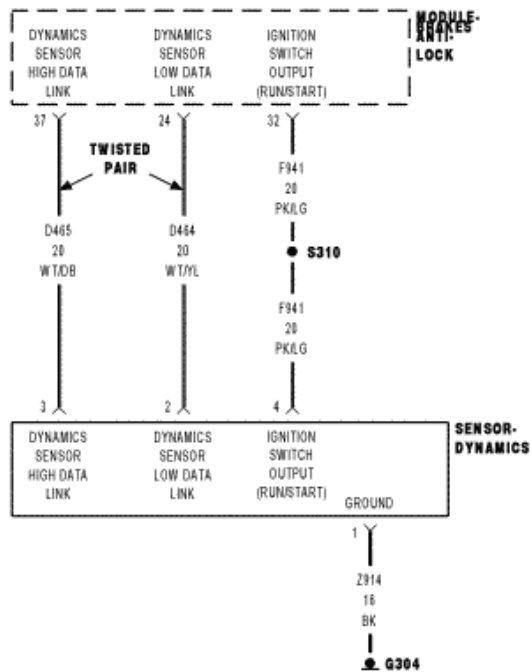
No

Replace the Anti-Lock Brakes Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0125-LOST COMMUNICATION WITH DYNAMICS SENSOR

Circuit Schematic



81d0#51

Fig. 72: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuous monitoring.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module fails to receive bus messages from the Dynamics Sensor.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT SHORTED TO GROUND, SHORTED TO VOLTAGE, OR OPEN (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT SHORTED TO GROUND, SHORTED TO VOLTAGE, OR OPEN DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: If present, diagnose and repair DTC C2114-DYNAMICS SENSOR SUPPLY VOLTAGE LOW or DTC C2115-DYNAMICS SENSOR SUPPLY VOLTAGE HIGH before proceeding.

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS

Visually inspect the related wiring harness. Look for any pinched, chafed, pierced, and partially broken wires.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

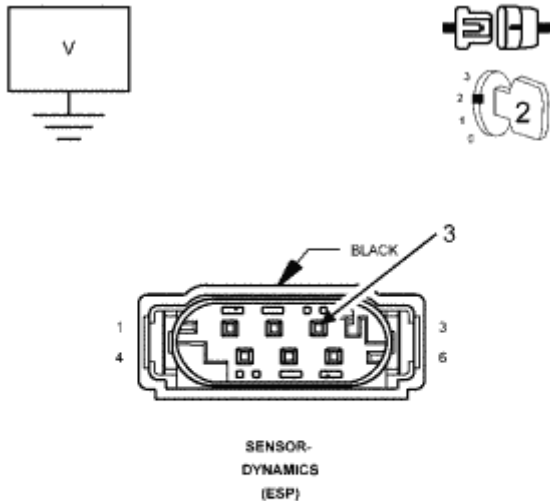
Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR A SHORT TO VOLTAGE



81d16324

Fig. 73: Measuring The Voltage Of The Dynamics Sensor High Data Link Circuit
Courtesy of CHRYSLER LLC

Disconnect the Anti-Lock Brakes Module harness connector.

Disconnect the Dynamics Sensor harness connector.

Turn the ignition on.

Measure the voltage of the (D465) Dynamics Sensor High Data Link circuit.

Is there any voltage present?

Yes

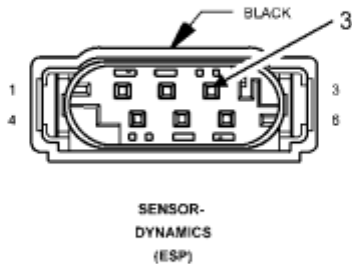
Repair the (D465) Dynamics Sensor High Data Link circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. **CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR A SHORT TO GROUND**



81d16331

Fig. 74: Measuring The Resistance Of The Dynamics Sensor High Data Link Circuit Between Ground And The Dynamics Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (D465) Dynamics Sensor High Data Link circuit between ground and the Dynamics Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

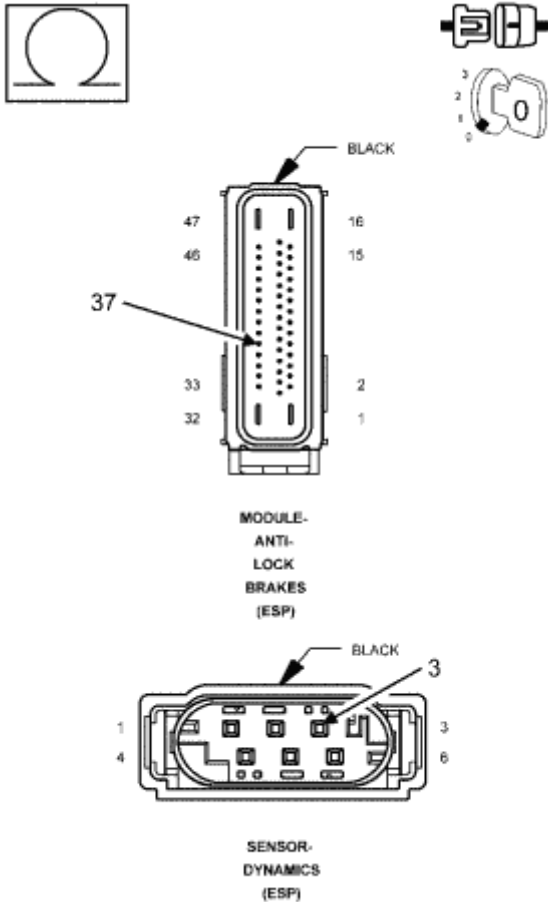
Repair the (D465) Dynamics Sensor High Data Link circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. **CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR AN OPEN**



81d16335

Fig. 75: Measuring The Resistance Of The Dynamics Sensor High Data Link Circuit Between The Dynamics Sensor Harness Connector And The Anti-Lock Brakes Module Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D465) Dynamics Sensor High Data Link circuit between the Dynamics Sensor harness connector and the Anti-Lock Brakes Module harness connector.

Is the resistance below 5.0 ohms?

Yes

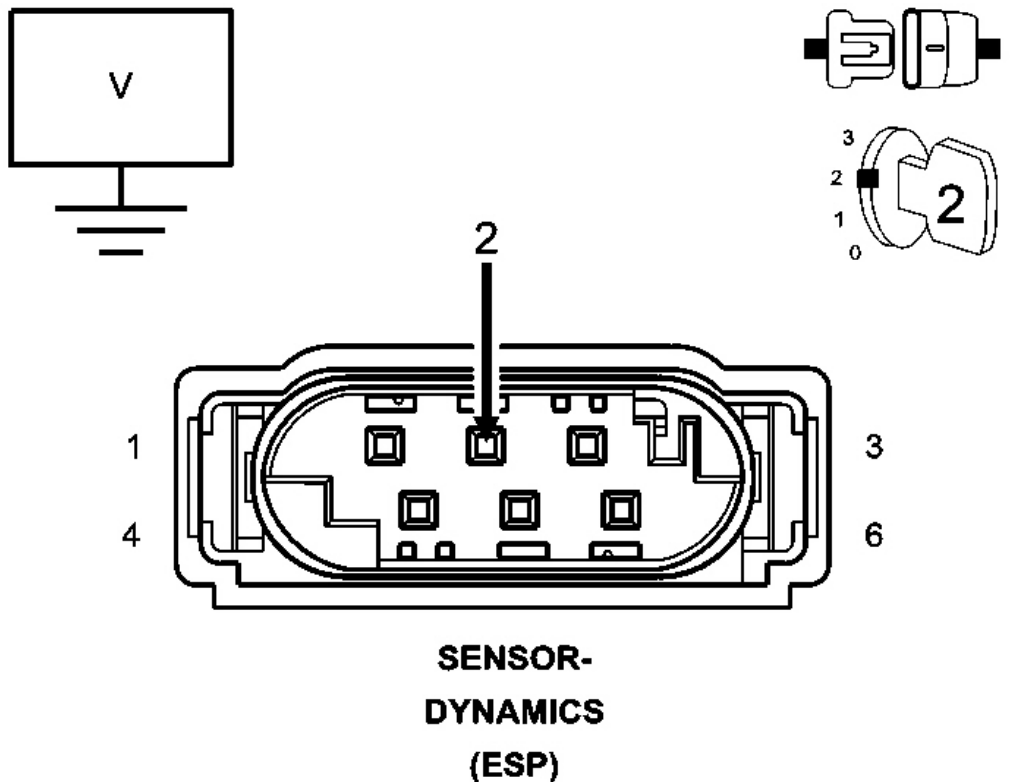
Go To 6.

No

Repair the (D465) Dynamics Sensor High Data Link circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR A SHORT TO VOLTAGE



814f0405

Fig. 76: Checking Dynamics Sensor High Data Link Circuit For Short To Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage of the (D464) Dynamics Sensor Low Data Link circuit.

Is there any voltage present?

Yes

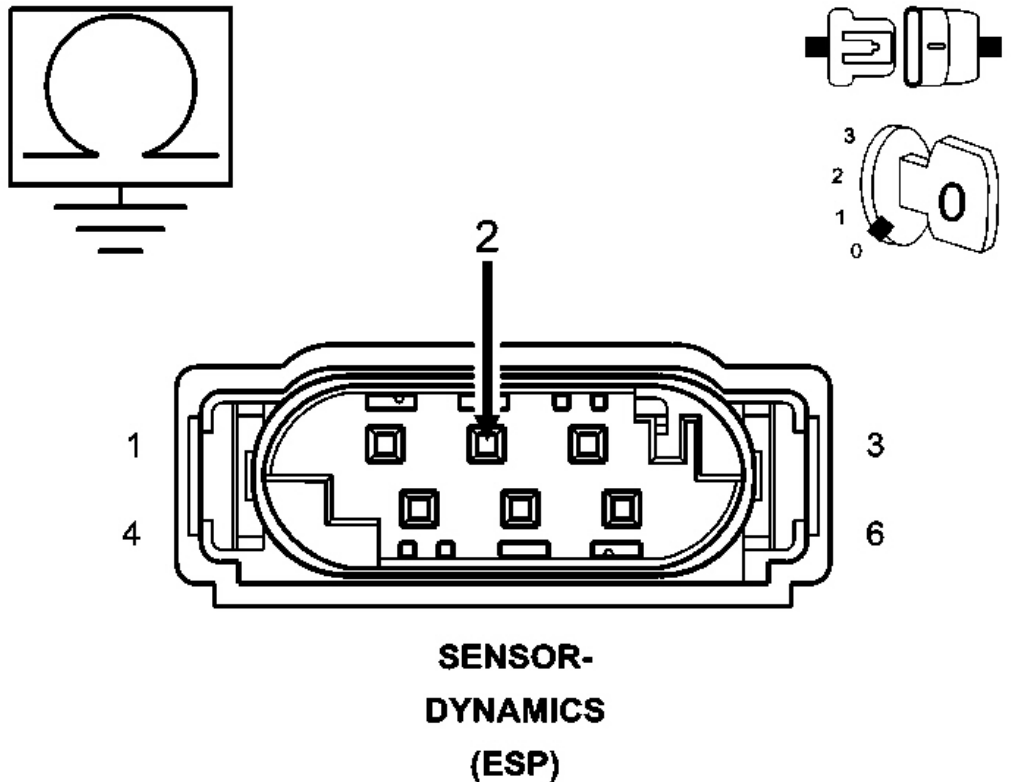
Repair the (D464) Dynamics Sensor Low Data Link circuit for a short to voltage.
 Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR A SHORT TO

GROUND



814f0412

Fig. 77: Checking Dynamics Sensor High Data Link Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (D464) Dynamics Sensor Low Data Link circuit between ground and the Dynamics Sensor harness connector.

Is the resistance below 5.0 ohms?

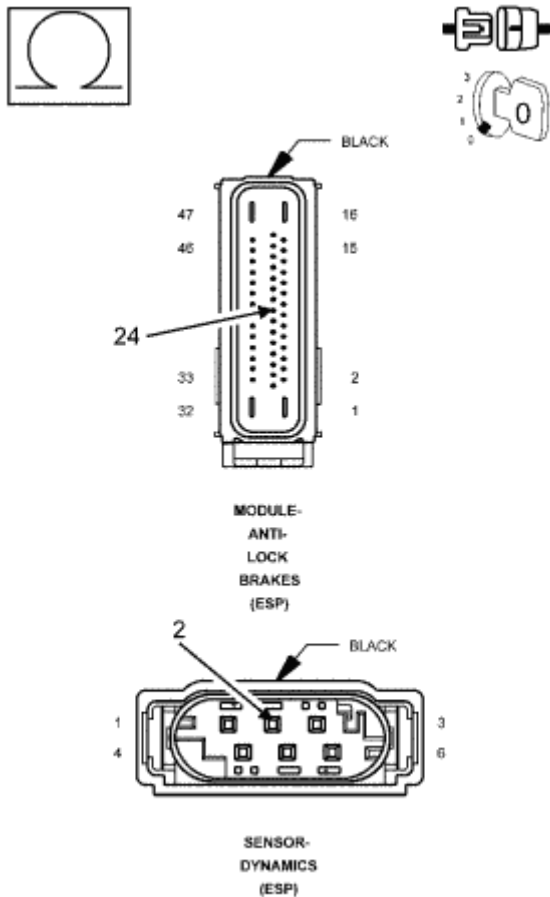
Yes

Repair the (D464) Dynamics Sensor Low Data Link circuit for a short to ground.
Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. **CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR AN OPEN**



81d16361

Fig. 78: Measuring The Resistance Of The Dynamics Sensor Low Data Link Circuit Between The Dynamics Sensor Harness Connector And The Anti-Lock Brakes Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D464) Dynamics Sensor Low Data Link circuit between the Dynamics Sensor harness connector and the Anti-Lock Brakes Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Dynamics Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Repair the (D464) Dynamics Sensor Low Data Link circuit for an open.

Perform ABS VERIFICATION TEST.

U0126-LOST COMMUNICATION WITH STEERING ANGLE SENSOR

Circuit Schematic

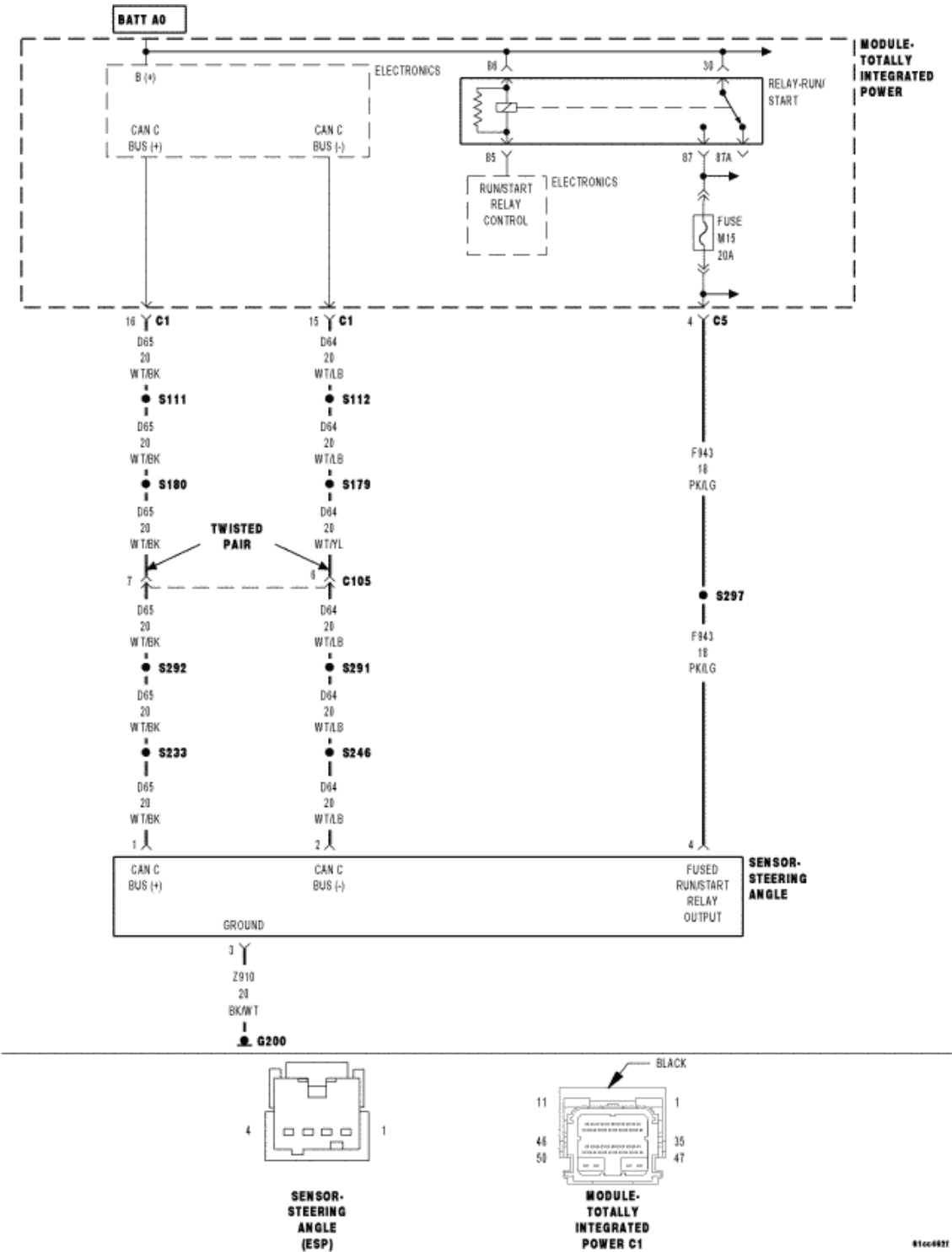


Fig. 79: Steering Angle Sensor circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- Set Condition:**

If the Anti-Lock Brakes Module fails to receive bus messages from the Steering Angle Sensor for approximately 500 ms.

Possible Causes

Possible Causes
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
STEERING ANGLE SENSOR POWER AND GROUND
STEERING ANGLE SENSOR
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX**.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. VERIFY THAT THE STEERING ANGLE SENSOR IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the Steering Angle Sensor is active on the bus.

Is the Steering Angle Sensor active on the bus?

Yes

Go To 4.

No

Refer to ***STORED LOST COMMUNICATION DTCS** .

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCs**

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the STEERING ANGLE SENSOR?

Yes

Replace/update the Steering Angle Sensor in accordance with the service information.
Perform **ABS VERIFICATION TEST**.

No

Replace the Anti-Lock Brakes Module in accordance with the service information.
Perform **ABS VERIFICATION TEST**.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed
- TIPM is configured correctly

Set Conditions

• **Set Condition:**

Bus messages not received from the Totally Integrated Power Module (TIPM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
TIPM NOT CONFIGURED CORRECTLY
TOTALLY INTEGRATED CONTROL MODULE

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS** .

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN B or C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. VERIFY THAT THE TIPM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the TIPM is active on the bus.

Is the TIPM active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSIS AND TESTING** for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the TIPM?

Yes

Replace/update the Front Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace/update the module that set this DTC in accordance with the service information

Perform **BODY VERIFICATION TEST - VER 1** .

U0401-IMPLAUSIBLE DATA RECEIVED FROM ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on.

Set Conditions

• **Set Condition:**

When the Anti-Lock Brake Module detects an incorrect CAN message from the Engine Module.

Possible Causes

Possible Causes
ABM CAN BUS DTCS ENGINE DTCS ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK FOR DTC U0401-IMPLAUSIBLE DATA RECEIVED FROM ECM/PCM

NOTE: This DTC must be active for the results of this test to be valid.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition switch from off to on.

With the scan tool, read DTCs.

Does the scan tool display: U0401-IMPLAUSIBLE DATA RECEIVED FROM ECM/PCM?

Yes

Go To 2.

No

Perform the ABS Intermittent Condition diagnostic procedure.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK IF TIPM CAN BUS DTCs ARE PRESENT

With the scan tool, read TIPM DTCs.

Are there any TIPM CAN BUS DTCs present?

Yes

Refer to the appropriate diagnostic. See **DIAGNOSIS AND TESTING**.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. CHECK IF ENGINE DTCs ARE PRESENT

With the scan tool, read Engine DTCs.

Are there any Engine DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and diagnose the appropriate symptom.

Perform **ABS VERIFICATION TEST**.

No

Using the schematics as a guide, check the Anti-Lock Brake Module pins, terminals, and connectors for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the Anti-Lock Brake Module per the Service Information.

Perform **ABS VERIFICATION TEST**.

U0429-IMPLAUSIBLE DATA RECEIVED FROM SCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With ignition on, but not if low voltage is detected.

Or, if a CAN Bus off event is detected.

Set Conditions

• **Set Condition:**

If the Anti-Lock Brakes Module detects either the sequence or integrity of the Steering Angle Sensor messages is invalid.

Possible Causes

Possible Causes
CAN C BUS CIRCUIT(S) SHORTED LOAD TOO HIGH ON CAN C BUS STEERING ANGLE SENSOR DTCs PRESENT ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. CHECK IF COMMUNICATION RELATED DTCs ARE PRESENT

Turn the ignition on.

With the scan tool, read ABS DTCs.

Are any Communication related DTCs present?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

Perform **ABS VERIFICATION TEST**.

No

Go To 2.

2. CHECK IF OTHER STEERING ANGLE SENSOR RELATED DTCs ARE PRESENT

With the scan tool, read ABS DTCs.

Are any other STEERING ANGLE SENSOR DTCs present?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

Perform **ABS VERIFICATION TEST**.

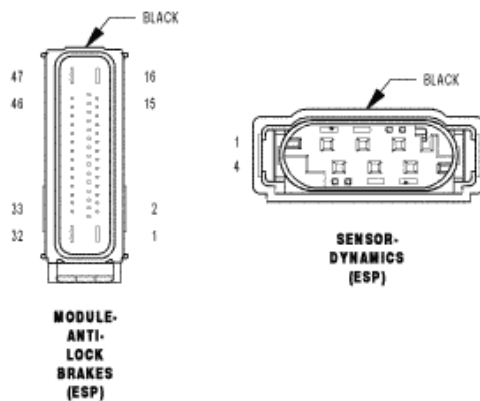
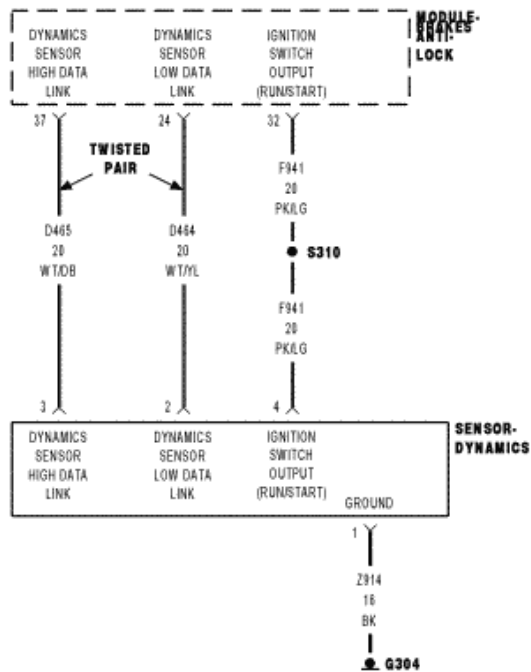
No

Replace the Steering Angle Sensor in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

U1003-ESP CAN C BUS PERFORMANCE

Circuit Schematic



81d0#51

Fig. 80: Dynamics Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects too many CAN Bus off events on the Dynamics Sensor Data Link circuits.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT SHORTED TO GROUND, VOLTAGE, OR OPEN (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT SHORTED TO GROUND, VOLTAGE, OR OPEN DYNAMICS SENSOR ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires. Refer to the **ABS INTERMITTENT CONDITION**.

2. **INSPECT RELATED WIRING HARNESS, TERMINALS, & CONNECTORS**

Visually inspect the related wiring harness. Look for any pinched, chafed, pierced, and partially broken wires.

Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, and corroded terminals.

Were any problems found?

Yes

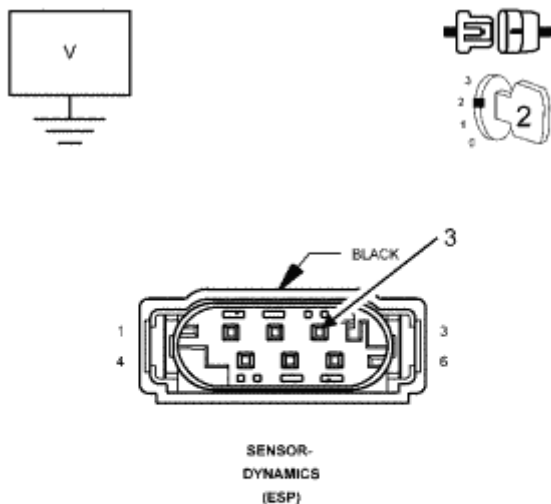
Repair as necessary.

Perform **ABS VERIFICATION TEST**.

No

Go To 3.

3. **CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR A SHORT TO VOLTAGE**



81d16324

Fig. 81: Measuring The Voltage Of The Dynamics Sensor High Data Link Circuit
Courtesy of CHRYSLER LLC

Disconnect the Anti-Lock Brakes Module harness connector.

Disconnect the Dynamics Sensor harness connector.

Turn the ignition on.

Measure the voltage of the (D465) Dynamics Sensor High Data Link circuit.

Is there any voltage present?

Yes

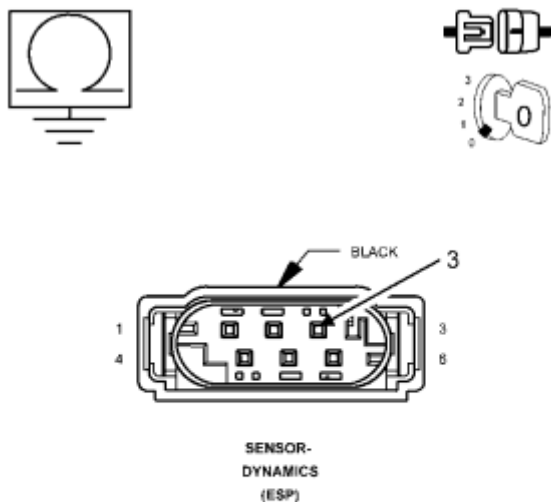
Repair the (D465) Dynamics Sensor High Data Link circuit for a short to voltage.

Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. **CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR A SHORT TO GROUND**



81d16331

Fig. 82: Measuring The Resistance Of The Dynamics Sensor High Data Link Circuit Between Ground And The Dynamics Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (D465) Dynamics Sensor High Data Link circuit between ground and the Dynamics Sensor harness connector.

Is the resistance below 5.0 ohms?

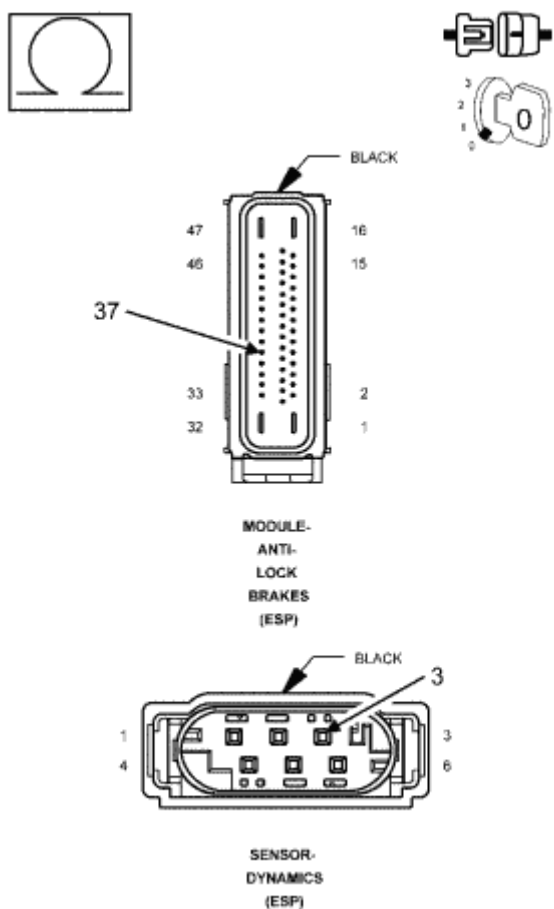
Yes

Repair the (D465) Dynamics Sensor High Data Link circuit for a short to ground.
Perform **ABS VERIFICATION TEST**.

No

Go To 5.

5. CHECK THE (D465) DYNAMICS SENSOR HIGH DATA LINK CIRCUIT FOR AN OPEN



81d16335

Fig. 83: Measuring The Resistance Of The Dynamics Sensor High Data Link Circuit Between The Dynamics Sensor Harness Connector And The Anti-Lock Brakes Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D465) Dynamics Sensor High Data Link circuit between the Dynamics

Sensor harness connector and the Anti-Lock Brakes Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the (D465) Dynamics Sensor High Data Link circuit for an open.

Perform **ABS VERIFICATION TEST**.

6. CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR A SHORT TO VOLTAGE

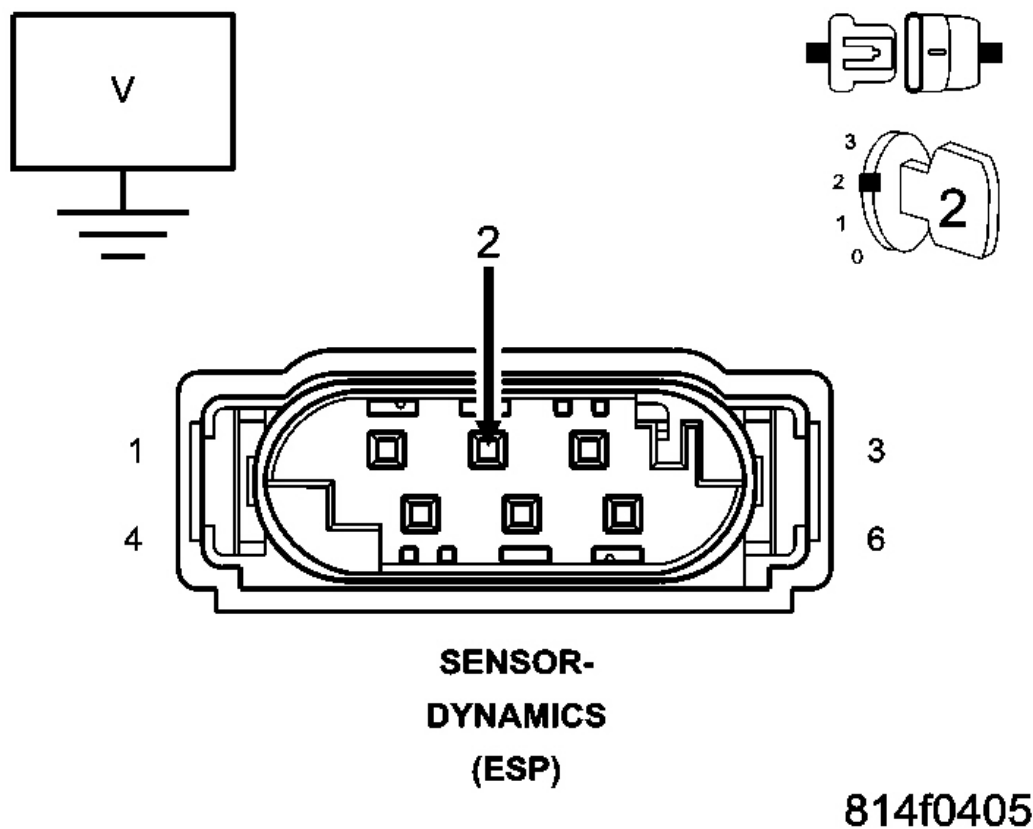


Fig. 84: Checking Dynamics Sensor High Data Link Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage of the (D464) Dynamics Sensor Low Data Link circuit.

Is there any voltage present?

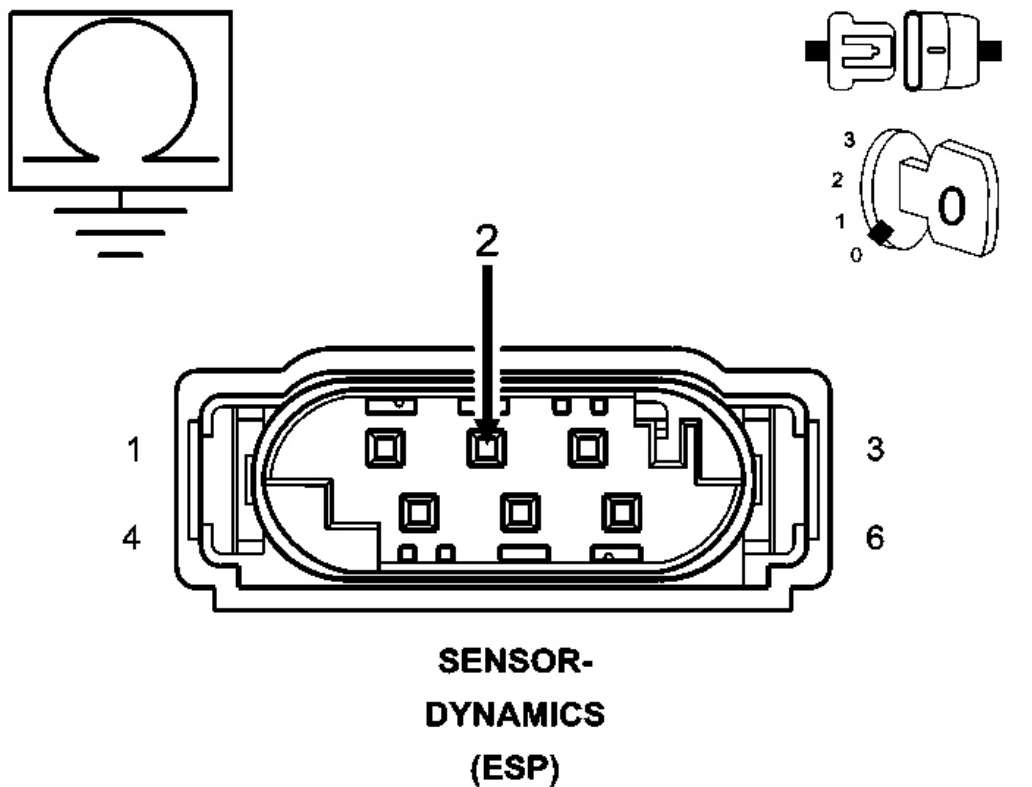
Yes

Repair the (D464) Dynamics Sensor Low Data Link circuit for a short to voltage.
Perform **ABS VERIFICATION TEST**.

No

Go To 7.

7. CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR A SHORT TO GROUND



814f0412

Fig. 85: Checking Dynamics Sensor High Data Link Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (D464) Dynamics Sensor Low Data Link circuit between ground and the Dynamics Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

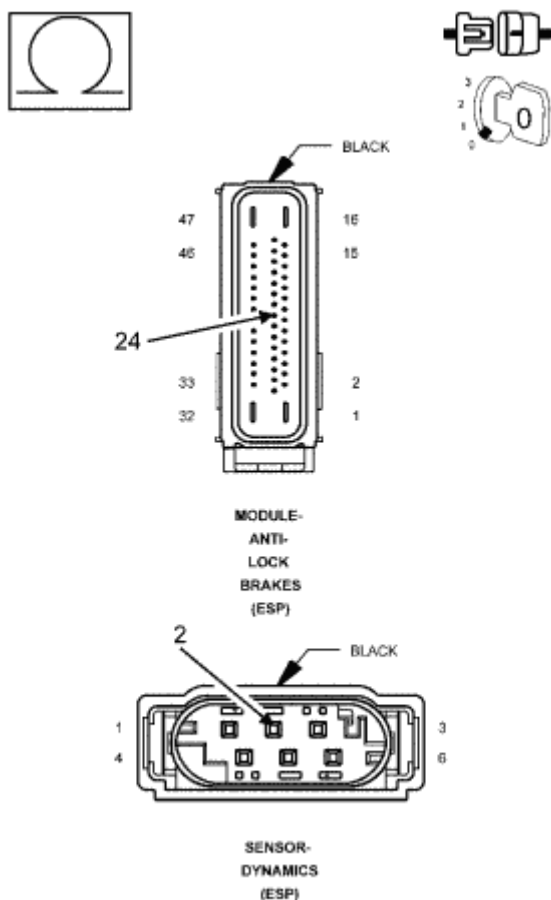
Repair the (D464) Dynamics Sensor Low Data Link circuit for a short to ground.

Perform **ABS VERIFICATION TEST**.

No

Go To 8.

8. **CHECK THE (D464) DYNAMICS SENSOR LOW DATA LINK CIRCUIT FOR AN OPEN**



81d16361

Fig. 86: Measuring The Resistance Of The Dynamics Sensor Low Data Link Circuit Between The

Dynamics Sensor Harness Connector And The Anti-Lock Brakes Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D464) Dynamics Sensor Low Data Link circuit between the Dynamics Sensor harness connector and the Anti-Lock Brakes Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the (D464) Dynamics Sensor Low Data Link circuit for an open.

Perform **ABS VERIFICATION TEST**.

9. REPLACE DYNAMICS SENSOR & VERIFY IF DTC IS STILL ACTIVE

Replace the Dynamics Sensor in accordance with the Service Information. Perform ABS VERIFICATION TEST. See **STANDARD PROCEDURE**.

Turn the ignition on.

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

WARNING: Ensure brake capability is available before road testing.

Test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

Park the vehicle.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

No

Test Complete.
Perform **ABS VERIFICATION TEST**.

U1501-IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously, with ignition on.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects bus messages from the Engine Control Module (ECM) or Powertrain Control Module (PCM) are of improper data length.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
ECM OR PCM DTCs PRESENT
ECM OR PCM
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX**.

No

Go To 3.

3. CHECK IF ECM OR PCM DTCs ARE PRESENT

With the scan tool, read ECM or PCM DTCs.

Are any DTCs present?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** .
Perform **ABS VERIFICATION TEST**.

No

Go To 4.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the ECM or PCM?

Yes

Replace/update the ECM or PCM in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

Perform **ABS VERIFICATION TEST**.

No

Using the schematics as a guide, check the Anti-Lock Brakes Module pins, terminals, and connectors for corrosion, damage, and terminal push out. Pay particular attention to all Communication circuits. If no problems are found, replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

U1502-IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM TCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously, with ignition on.

Set Conditions

- **Set Condition:**

If the Anti-Lock Brakes Module detects bus messages from the Transmission Control Module (TCM) are of improper data length.

Possible Causes

Possible Causes
WIRING HARNESS, TERMINAL, CONNECTOR DAMAGE
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
TCM DTCs PRESENT
TCM
ANTI-LOCK BRAKES MODULE

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read and record ABS DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase ABS DTCs.

Cycle the ignition switch.

With the scan tool, read ABS DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Refer to the **ABS INTERMITTENT CONDITION**.

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs**

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX**.

No

Go To 3.

3. **CHECK IF TCM DTCs ARE PRESENT**

With the scan tool, read TCM DTCs.

Are any TCM DTCs present?

Yes

Diagnose and repair the DTC(s).
Perform **42RLE TRANSMISSION VERIFICATION TEST** .

No

Using the schematics as a guide, check the Anti-Lock Brakes Module pins, terminals, and connectors for corrosion, damage, and terminal push out. Pay particular attention to all Communication circuits. If no problems are found, replace the Anti-Lock Brakes Module in accordance with the Service Information.
Perform **ABS VERIFICATION TEST**.

U1503-IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM FCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on.

Set Conditions

- **Set Condition:**

When the Anti-Lock Brake Module detects an incorrect CAN message from the Totally Integrated Power Module (TIPM).

Possible Causes

Possible Causes
TIPM CAN BUS DTCS
ANTI-LOCK BRAKE MODULE

Diagnostic Test

1. CHECK IF TIPM CAN BUS DTCs ARE PRESENT

With the scan tool, read TIPM DTCs.

Are there any TIPM CAN BUS DTCs present?

Yes

Refer to **ELECTRONIC CONTROL MODULES - ELECTRICAL DIAGNOSTICS** and diagnose the appropriate symptom.

Perform **ABS VERIFICATION TEST**.

No

Replace the Anti-Lock Brakes Module in accordance with the Service Information.

Perform **ABS VERIFICATION TEST**.

STANDARD PROCEDURE

ABS VERIFICATION TEST

Diagnostic Test

1. ABS VERIFICATION TEST

WARNING: To avoid personal injury or death, check brake capability is available before road testing.

NOTE: If the ABM (Anti-Lock Brake Module), SAS (Steering Angle Sensor), Dynamics Sensor was replaced, it must be initialized using the scan tool. If not initialized, the ABS indicator will flash continuously with no DTCs. To initialize the ABM and clear offsets have wheels pointing straight ahead and follow the directions on the scan tool. The drive test requires a 90° turn. If the Dynamics Sensor was replaced, test drive the vehicle by turning the vehicle left or right in a curving manner at a velocity between 10 and 25 km/h (6 and 15 mph).

1. Turn the ignition off.
2. Connect all previously disconnected components and connectors.
3. Verify all accessories are turned off and the battery is fully charged.
4. Verify that the ignition is on, with the scan tool, erase all Diagnostic Trouble Codes from All modules. Start the engine and allow it to run for 2 minutes and fully operate the system that was indicating the failure.
5. Turn the ignition off and wait 5 seconds. Turn the ignition on and using the scan tool, read DTCs from all modules.
6. If any Diagnostic Trouble Codes are present, return to symptom list and trouble shoot new or recurring symptom.

NOTE: For Sensor Signal and Pump Motor faults, the ABM must sense all 4 wheels at 12 km/h (7.5

mph) before it will extinguish the ABS indicator.

7. If there are no DTCs present after turning ignition on, road test the vehicle for at least 5 minutes. Perform several anti-lock braking stops.

8. Again, with the scan tool read DTCs. If any DTCs are present, refer to DIAGNOSTIC CODE INDEX in the applicable article for the diagnostic test procedure and troubleshoot the new or recurring symptom.

9. If there are no Diagnostic Trouble Codes (DTCs) present, and the customer's concern can no longer be duplicated, the repair is complete.

Are any DTCs present or is the original concern still present?

Yes

Repair is not complete, refer to appropriate symptom.

No

Repair is complete.

2008 BRAKES

ABS - Service Information - Liberty

ABS - SERVICE INFORMATION

DESCRIPTION

ABS

The purpose of the antilock brake system (ABS) is to prevent wheel lockup under braking conditions on virtually any type of road surface. Antilock braking is desirable because a vehicle that is stopped without locking the wheels retains directional stability and some steering capability. This allows the driver to retain greater control of the vehicle during braking.

ANTILOCK BRAKE SYSTEM WITH TRACTION CONTROL

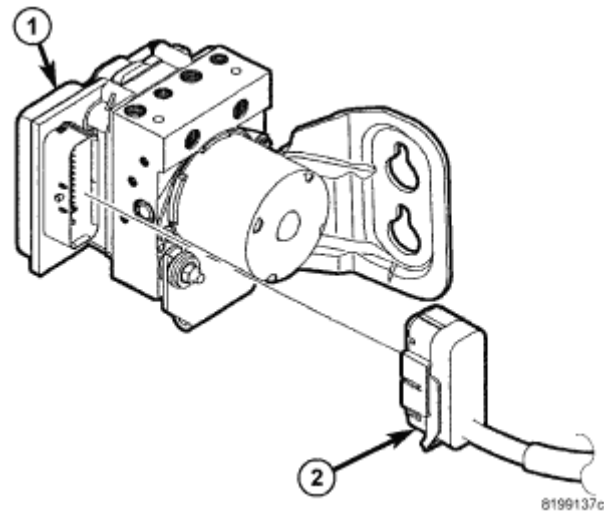


Fig. 1: ABM WIRING CONNECTOR

Courtesy of CHRYSLER LLC

This vehicle uses an antilock brake system designated System 8. For this vehicle, the antilock brake system comes standard with Electronic Stability Program (ESP) and All-Speed Traction Control.

This antilock brake system uses components of the base brake system, but also features the following components:

- Integrated Control Unit (ICU) - Hydraulic Control Unit (HCU) and Antilock Brake Module (ABM)
- Wheel Speed Sensors (WSS) - Four sensors (one at each wheel)

The is made up of the Hydraulic Control Unit (HCU) and the Antilock Brake Module (ABM). For additional information on these components, see **DESCRIPTION** for Hydraulic Control Unit (HCU). Refer to **DESCRIPTION** for Antilock Brake Module (ABM).

ALL-SPEED TRACTION CONTROL

The TCS is an all-speed traction control system that functions up to the maximum allowed vehicle speed. TCS enhances vehicle stability and mobility by reducing wheel spin when accelerating on slippery surfaces. TCS controls wheel spin by applying the brakes and/or reducing engine power.

BRAKE ASSIST SYSTEM (BAS)

The BAS is designed to optimize the vehicle's braking capability during emergency braking maneuvers. The system detects an emergency braking situation by sensing the rate and amount of brake application and then applies optimum pressure to the brakes. This can help reduce braking distances. The BAS complements the antilock brake system (ABS). Applying the brakes very quickly results in the best BAS assistance.

ELECTRONIC ROLL MITIGATION (ERM)

This system anticipates the potential for wheel lift by monitoring the driver's steering wheel input and the speed of the vehicle. When ERM determines that the rate of change of the steering wheel angle and vehicle's speed are sufficient to potentially cause wheel lift, it applies the appropriate brake and may reduce engine power to lessen the chance that wheel lift will occur. ERM will only intervene during very severe or evasive driving maneuvers.

ERM can only reduce the chance of wheel lift occurring during severe or evasive driving maneuvers. It can not prevent wheel lift due to other factors such as road conditions, leaving the roadway or striking objects or other vehicles.

ELECTRONIC STABILITY PROGRAM (ESP)

The ESP system enhances directional control and stability of the vehicle under various driving conditions. ESP corrects for over/under steering of the vehicle by applying the brake of the appropriate wheel to assist in counteracting the over/under steer condition. Engine power may also be reduced to help the vehicle maintain the desired path. ESP uses sensors in the vehicle to determine the vehicle path intended by the driver and compares it to the actual path of the vehicle. When the actual path does not match the intended path, ESP applies the brake of the appropriate wheel to assist in counteracting the oversteer or understeer condition

Oversteer - when the vehicle is turning more than appropriate for the steering wheel position.

Understeer - when the vehicle is turning less than appropriate for the steering wheel position.

The "ESP/TCS Indicator Light" located in the instrument cluster, starts to flash as soon as the tires lose traction and the ESP system becomes active. The "ESP/TCS Indicator Light" also flashes when TCS is active.

ELECTRONIC VARIABLE BRAKE PROPORTIONING

Vehicles equipped with ABS use EVBP to balance front-to-rear braking. The EVBP is used in place of a rear brake proportioning valve. The EVBP system controls the slip of the rear wheels during braking at low to moderate deceleration, up until the point where ABS control is necessary. The brake pressure at the rear wheels is controlled by using the inlet and outlet valves located in the hydraulic control unit (HCU).

EVBP activation should not be perceptible by the customer because there is no pump motor noise and almost no brake pedal feedback.

OPERATION

ANTILOCK BRAKE SYSTEM WITH TRACTION CONTROL

ABS

There are a few performance characteristics of the Antilock Brake System (ABS) that may at first seem abnormal, but in fact are normal. These characteristics are described below.

NORMAL BRAKING

Under normal braking conditions, the ABS functions the same as a standard base brake system with a front/rear split master cylinder and conventional vacuum assist.

ABS BRAKING

ABS operation is available at all vehicle speeds above 5-8 km/h (3-5 mph). If a wheel locking tendency is detected during a brake application, the brake system enters the ABS mode. During ABS braking, hydraulic pressure in the four wheel circuits is modulated to prevent any wheel from locking. Each wheel circuit is designed with a set of electric solenoids to allow wheel lockup which may be perceived at the very end of an ABS stop and is considered normal.

During an ABS event, the Integrated Control Unit (ICU) regulates hydraulic pressure at all 4 of the vehicle's wheels.

The hydraulic pressure at each front wheel is controlled independently (relative to the amount of slip at each wheel) in order to maximize the braking force generated by the front brakes. The rear wheels are controlled such that the hydraulic pressure at either rear wheel does not exceed that of the highest slip rear wheel in order to maintain vehicle stability.

The system can build and release pressure at each wheel, depending on signals generated by the Wheel Speed Sensors (WSS) at each wheel and received at the Antilock Brake Module (ABM).

NOISE AND BRAKE PEDAL FEEL

During ABS braking, some brake pedal movement may be felt. In addition, ABS braking will create ticking, popping, or groaning noises heard by the driver. This is normal and is due to pressurized fluid being transferred between the master cylinder and the brakes. If ABS operation occurs during hard braking, some pulsation may be felt in the vehicle body due to fore and aft movement of the suspension as brake pressures are modulated.

At the end of an ABS stop, ABS is turned off when the vehicle is slowed to a speed of 5-6 km/h (3-4 mph). There may be a slight brake pedal drop anytime that the ABS is deactivated, such as at the end of the stop when the vehicle speed is less than 5 km/h (3 mph) or during an ABS stop where ABS is no longer required. These conditions exist when a vehicle is being stopped on a road surface with patches of ice, loose gravel, or sand on it. Also, stopping a vehicle on a bumpy road surface activates ABS because of the wheel hop caused by the bumps.

TIRE NOISE AND MARKS

Although the ABS system prevents complete wheel lockup, some wheel slip is desired in order to achieve optimum braking performance. Wheel slip is defined as follows: 0 percent slip means the wheel is rolling freely and 100 percent slip means the wheel is fully locked. During brake pressure modulation, wheel slip is allowed to reach up to 25-30 percent. This means that the wheel rolling velocity is 25-30 percent less than that of a free rolling wheel at a given vehicle speed. This slip may result in some tire chirping, depending on the road surface. This sound should not be interpreted as total wheel lockup.

Complete wheel lockup normally leaves black tire marks on dry pavement. The ABS will not leave dark black tire marks since the wheel never reaches a fully locked condition. However, tire marks may be noticeable as light patched marks.

START-UP AND DRIVE-OFF CYCLES

When the ignition is turned on, a popping sound and a slight brake pedal movement may be noticed. The ABS warning lamp will also be on for up to 5 seconds after the ignition is turned on.

When the vehicle is first driven off, a humming may be heard or felt by the driver at approximately 12-25 mph (20-40 km/h). All of these conditions are a normal function of ABS as the system is performing a diagnosis check.

PREMATURE ABS CYCLING

Symptoms of premature ABS cycling include: clicking sounds from the solenoid valves; pump/motor running; and pulsations in the brake pedal. Premature ABS cycling can occur at any braking rate of the vehicle and on any type of road surface. Neither the red BRAKE indicator lamp, nor the amber ABS indicator lamp, illuminate and no fault codes are stored in the ABM.

Premature ABS cycling is a condition that needs to be correctly assessed when diagnosing problems with the antilock brake system. It may be necessary to use a scan tool to detect and verify premature ABS cycling.

Check the following common causes when diagnosing premature ABS cycling: damaged wheel bearings (causing tone wheel issues); damaged wheel bearing housings where wheel speed sensors mount; and loose wheel speed sensor mounting bolts.

After diagnosing the defective component, repair or replace it as required. When the component repair or replacement is completed, test drive the vehicle to verify that premature ABS cycling has been corrected.

ALL-SPEED TRACTION CONTROL

Traction control systems sense impending wheel spin based on a model of the rate of change of wheel speed under normal traction conditions. The All-Speed Traction Control uses signals from the same wheel speed sensors as ABS to determine when to apply the brakes to one or more wheels and when to reduce engine torque output using the Electronic Throttle Control (ETC) to prevent wheel slip during acceleration. Throttle control makes the vehicle less reliant on brake application alone to maintain traction, increasing the operating speed range and more closely modulates speed, resulting in smoother operation. With All-Speed Traction Control reducing engine torque as well as applying the brakes, it is possible to achieve almost seamless torque application at the wheels.

If the wheel slip is severe enough to require throttle intervention, All-Speed Traction Control will reduce engine torque and sometimes upshift the transmission to avoid the condition. In milliseconds, All-Speed Traction Control interrogates the engine control system to determine the current torque output, determines how much the torque output the current conditions will allow, and signals this requirement to the engine control system, which reduces the torque by partially closing the throttle. With execution of the torque reduction, the brake system reduces brake pressure to make the transition smooth, while maintaining forward progress. By reducing engine power, braking effectiveness is maintained and the system can operate throughout the normal vehicle speed range. That is why the system is identified as providing "all-speed" traction control.

With AWD, where front-wheel slip can occur, the degree of throttle intervention is relatively less than with rear-wheel drive. The difference in speed capability and the degree of throttle intervention between rear-wheel drive and all-wheel drive is due to the fact that non-driven front wheels on a rear-wheel drive vehicle give the system an accurate vehicle speed reference on which to base responses. With AWD, the possibility that the front wheels may also be slipping makes appropriate corrective action more difficult to determine, thus limiting the effective speed range. Offsetting this is the fact that loss of traction is less likely with AWD because torque is transmitted through all four wheels to begin with. In actual driving situations on snow or ice, the rear-wheel drive and AWD systems respond in essentially the same way up to the 45 mph (72 km/h) limit of the AWD system.

ELECTRONIC STABILITY PROGRAM (ESP)

To determine whether the car is responding properly to cornering commands, ESP uses steering wheel angle, yaw (turning) rate and lateral acceleration sensors (combined into Dynamics Sensor). Using signals from these sensors, in addition to individual wheel speed sensor signals, the system determines appropriate brake and throttle actions. Once initiated, ESP operates much like All-Speed Traction Control, except that the goal is directional stability. If the vehicle yaw response, or rate of turning, is inconsistent with the steering angle and vehicle speed indications, the ESP system applies the brakes and, if necessary closes the throttle, to restore control. This occurs whether the vehicle is turning too rapidly (oversteering) or not rapidly enough (understeering).

TSC (Trailer Sway Control)

TSC uses sensors in the vehicle to recognize an excessively swaying trailer and will take the appropriate actions to attempt to stop the sway. The system may reduce engine power and apply the brake of the appropriate wheel (s) to counteract the sway of the trailer. TSC will become active automatically once an excessively swaying trailer is recognized. No driver action is required.

ELECTRONIC VARIABLE BRAKE PROPORTIONING

Upon entry into EVBP the inlet valve for the rear brake circuit is switched ON so that the fluid supply from the master cylinder is shut off. In order to decrease the rear brake pressure, the outlet valve for the rear brake circuit is pulsed. This allows fluid to enter the Low Pressure Accumulator (LPA) in the Hydraulic Control Unit (HCU) resulting in a drop in fluid pressure to the rear brakes. In order to increase the rear brake pressure, the outlet valve is switched off and the inlet valve is pulsed. This increases the pressure to the rear brakes. This back-and-forth process will continue until the required slip difference is obtained. At the end of EVBP braking (brakes released) the fluid in the LPA drains back to the master cylinder by switching on the ESV valve.

The EVBP will remain functional during many ABS fault modes. If both the red BRAKE and amber ABS

warning indicators are illuminated, the EVBP may not be functioning.

DIAGNOSIS AND TESTING

ANTILOCK BRAKING SYSTEM

The ABS brake system performs several self-tests every time the ignition switch is turned on and the vehicle is driven. The ABM monitors the systems input and output circuits to verify the system is operating correctly. If the on board diagnostic system senses that a circuit is malfunctioning the system will set a trouble code in its memory.

NOTE: An audible noise may be heard during the self-test. This noise should be considered normal.

NOTE: The scan tool is used to diagnose the ABS system.

STANDARD PROCEDURE

ABS BRAKE BLEEDING

ABS system bleeding requires conventional bleeding methods plus use of a scan tool. The procedure involves performing a base brake bleeding, followed by use of the scan tool to cycle and bleed the HCU pump and solenoids. A second base brake bleeding procedure is then required to remove any air remaining in the system.

- 1. Perform base brake bleeding. See STANDARD PROCEDURE . .
- 2. Connect scan tool to the Data Link Connector.
- 3. Select ANTILOCK BRAKES, followed by MISCELLANEOUS, then ABS BRAKES. Follow the instructions displayed. When scan tool displays TEST COMPLETE, disconnect scan tool and proceed.
- 4. Perform base brake bleeding a second time. See STANDARD PROCEDURE .
- 5. Top off master cylinder fluid level and verify proper brake operation before moving vehicle.

SPECIFICATIONS

ABS BRAKES

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
ICU to ICU bracket fastener	12	-	106
(HCU) Hydraulic Control Unit Brake Lines	20	-	180
(ABM) Antilock Brake Module Mounting Screws	2	-	16
Wheel Speed Sensors Front Mounting Bolt	8	-	71

Wheel Speed Sensor Rear Mounting Bolt	9	-	80
Dynamics Sensor Nuts	9	-	80
ICU bracket bolt to vehicle	10	-	85
ICU bracket nut to vehicle	10	-	85

ELECTRICAL

DESCRIPTION

REAR WHEEL SPEED SENSOR

A wheel speed sensor is used at each wheel. The front sensors are mounted to the steering knuckles. Front tone wheels are internal to the front bearing. The rear sensors are mounted at the outboard end of the axle. Tone wheels are mounted to the outboard ends of the front and rear axle shafts. The gear type tone wheel serves as the trigger mechanism for each sensor.

OPERATION

REAR WHEEL SPEED SENSOR

The sensors convert wheel speed into a small digital signal. The ABM sends 12 volts to the sensors. The sensor has an internal magneto resistance bridge that alters the voltage and amperage of the signal circuit. This voltage and amperage is changed by magnetic induction when the toothed tone wheel passes the wheel speed sensor. This digital signal is sent to the ABM. The ABM measures the voltage and amperage of the digital signal for each wheel.

SENSOR-WHEEL SPEED-FRONT

REMOVAL

SENSOR-WHEEL SPEED-FRONT

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the caliper adapter. Refer to **REMOVAL** .

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

4. Remove the disc brake rotor. Refer to **REMOVAL** .

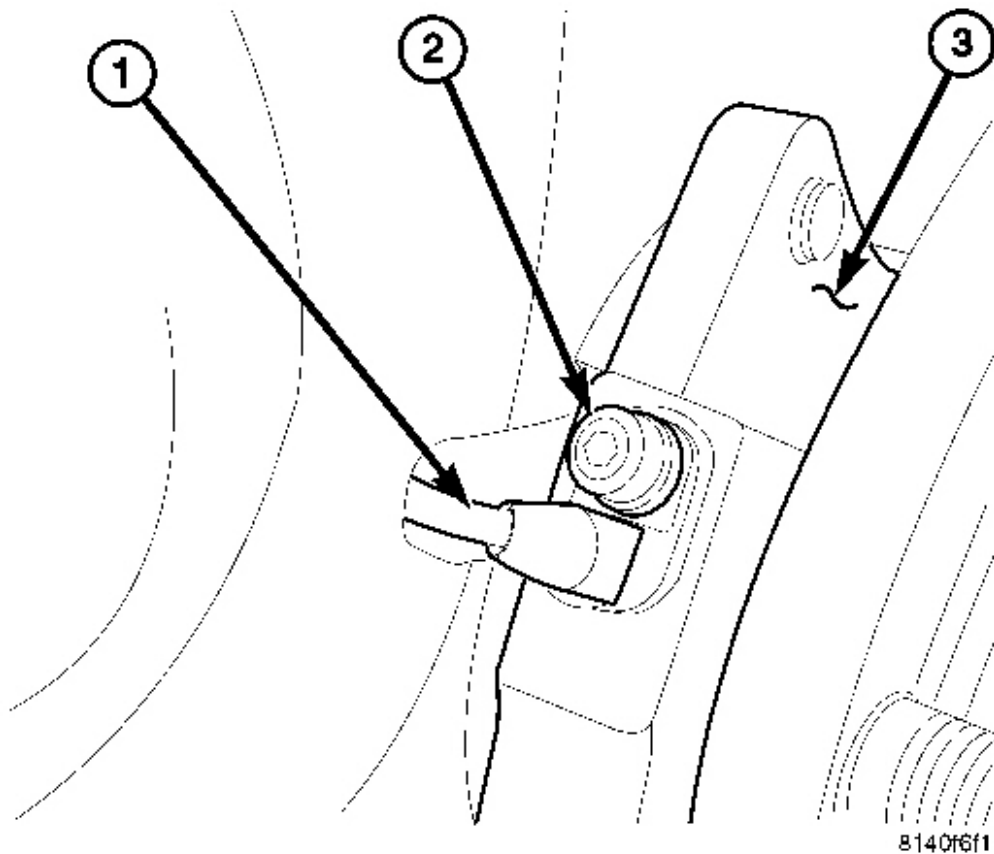


Fig. 2: Removing/Installing Wheel Speed Sensor
Courtesy of CHRYSLER LLC

5. Remove the wheel speed sensor mounting bolt (2) to the hub (3).
6. Remove the wheel speed sensor wire (1) from the hub/bearing and through the brake shield.
7. Remove the wheel speed sensor wire hold down clips.
8. Remove the locking connector at the wheel liner from the sensor connector.
9. Remove the wheel speed sensor from the vehicle.

INSTALLATION

SENSOR-WHEEL SPEED-FRONT

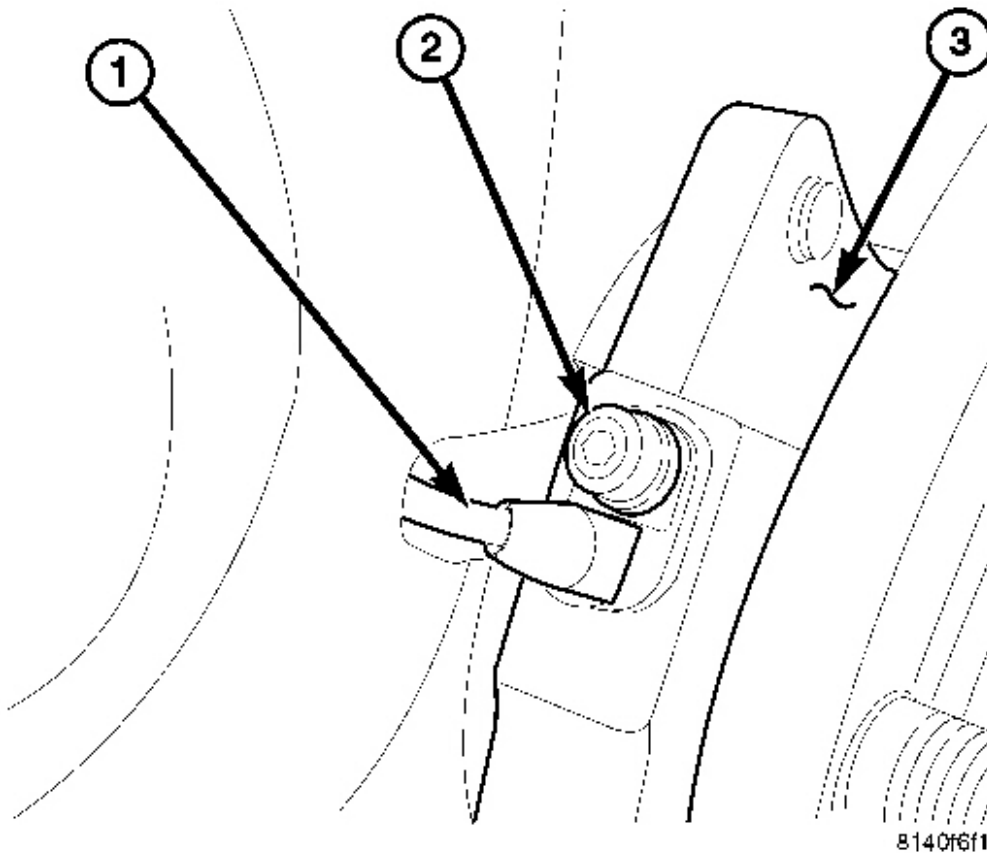


Fig. 3: Removing/Installing Wheel Speed Sensor
Courtesy of CHRYSLER LLC

NOTE: When installing, do not rotate sensor, as this may cause the sensor to rub on the tone ring and be damaged.

1. Install the wheel speed sensor to the vehicle.
2. Install the wheel speed sensor (1) through the brake shield and to the hub/bearing (3).
3. Install the wheel speed sensor wire hold down routing clips.
4. Install the wheel speed sensor mounting bolt (2) to the hub (3). Tighten the mounting bolt to 8 N.m (71 in. lbs.).
5. Install the disc brake rotor. Refer to **INSTALLATION**.
6. Install the disc brake caliper adapter. Refer to **INSTALLATION**.
7. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE**.

SENSOR- WHEEL SPEED-REAR

REMOVAL

SENSOR-WHEEL SPEED-REAR

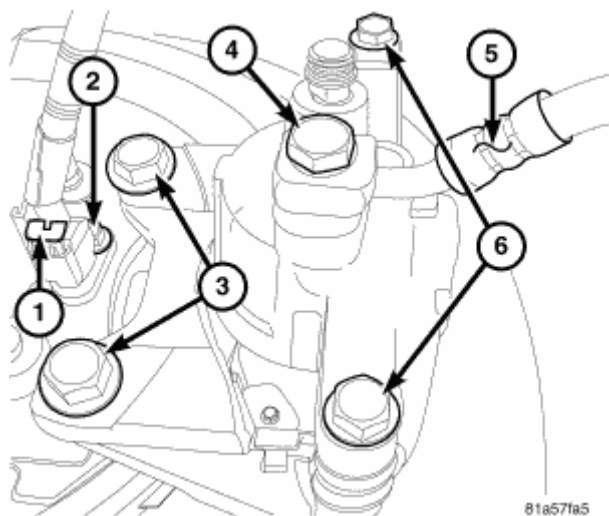


Fig. 4: CALIPER MOUNT
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Disengage the locking tab connector (1).
3. Disconnect the wheel speed sensor electrical connector (1).
4. Remove the wheel speed sensor mounting bolt (2) from the rear support plate.
5. Remove the wheel speed sensor from the support plate.

INSTALLATION

SENSOR-WHEEL SPEED-REAR

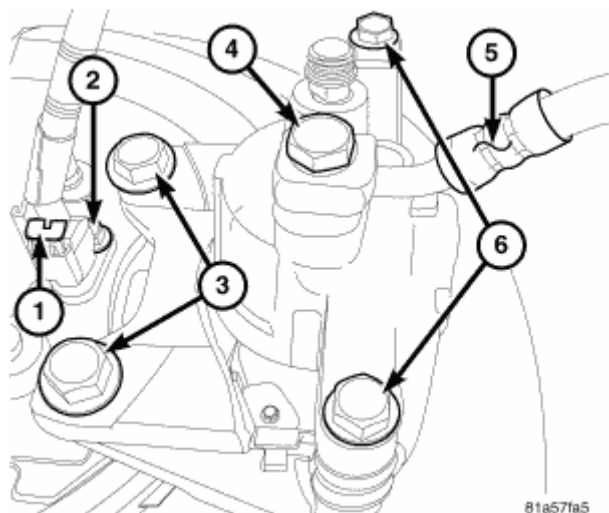


Fig. 5: CALIPER MOUNT
Courtesy of CHRYSLER LLC

1. Insert the wheel speed sensor through the support plate.
2. Tighten the wheel speed sensor bolt (2) to 9 N.m (80 in. lbs.).
3. Secure the wheel speed sensor wire to the routing clips. Verify that the sensor wire is secure and clear of the rotating components.
4. Reconnect the wheel speed sensor electrical connector (1).

NOTE: **Make sure the connector locking tab is fully engaged and locked in position.**

5. Lower the vehicle.

SENSOR-DYNAMICS

DESCRIPTION

SENSOR - DYNAMICS

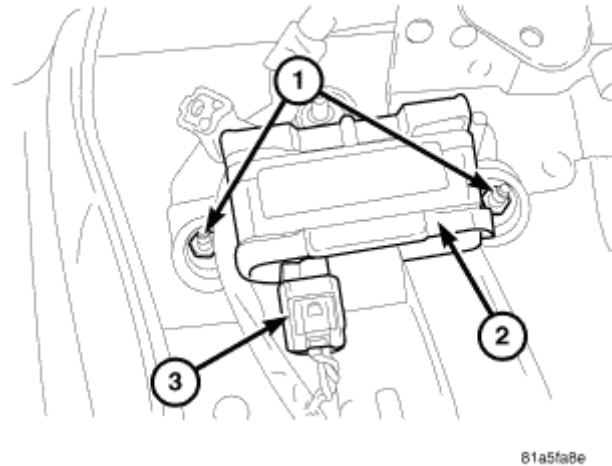


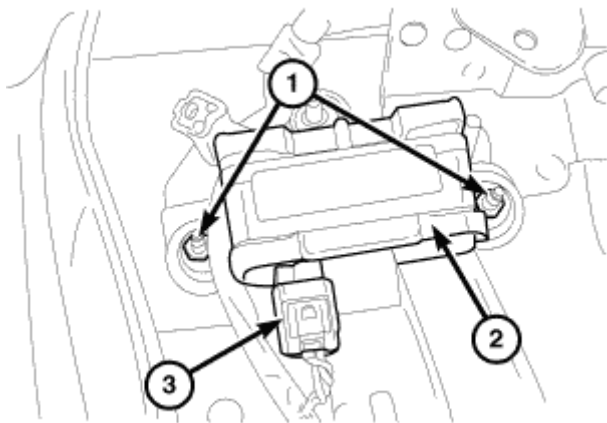
Fig. 6: DYNAMICS SENSOR
Courtesy of CHRYSLER LLC

The Yaw Rate and Lateral Acceleration Sensors are housed into one unit known as the Dynamics Sensor (2). The sensor is used to measure side-to-side (Lateral) motion and vehicle rotational sensing (how fast the vehicle is turning - Yaw).

Yaw and Lateral Acceleration Sensors cannot be serviced separately. The entire Dynamics Sensor (2) must be replaced when necessary.

REMOVAL

SENSOR-DYNAMICS



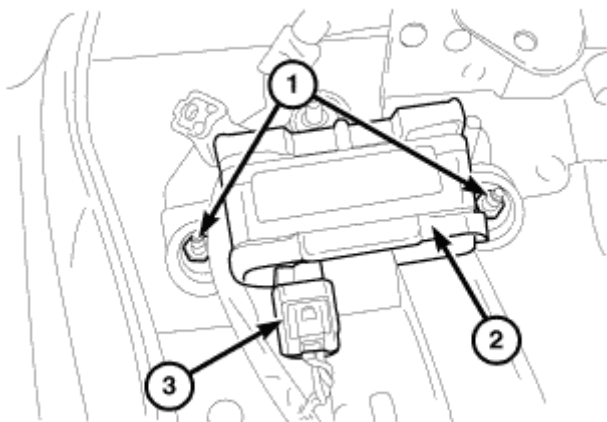
81a5fa8e

Fig. 7: DYNAMICS SENSOR
Courtesy of CHRYSLER LLC

1. Remove the center console. Refer to **REMOVAL** .
2. Disconnect electrical connector (3) from the dynamics sensor (2).
3. Remove the two nuts (1) securing the sensor to the floor.
4. Remove the sensor (2).

INSTALLATION

SENSOR-DYNAMICS



81a5fa8e

Fig. 8: DYNAMICS SENSOR
Courtesy of CHRYSLER LLC

1. Install the dynamics sensor (2) to the vehicle.
2. Install the electrical connector (3) making sure that the connector is fully seated into the sensor (2)
3. Install the two retaining nuts (1) and tighten to 9 N.m (80 in. lbs.).

4. Install the floor console. Refer to **INSTALLATION** .

SENSOR-STEERING ANGLE

DESCRIPTION

SENSOR-STEERING ANGLE

NOTE: **Steering angle sensor is part of the airbag clockspring and is not serviced separately from the clockspring.**

Under transient cornering conditions the lateral acceleration sensor does not measure the true sway force on the car. In order to compensate for this the system uses the driver's steering command (Steering angle sensor) and vehicle speed to estimate the true sway force. This signal is matched with the lateral acceleration sensor signal to ensure a significantly-reduced transient sway of the vehicle body.

REMOVAL

SENSOR-STEERING ANGLE

NOTE: **Steering angle sensor is part of the airbag clockspring and is not serviced separately from the clockspring.**

1. For removal of the steering angle sensor, refer to **REMOVAL** .

INSTALLATION

SENSOR-STEERING ANGLE

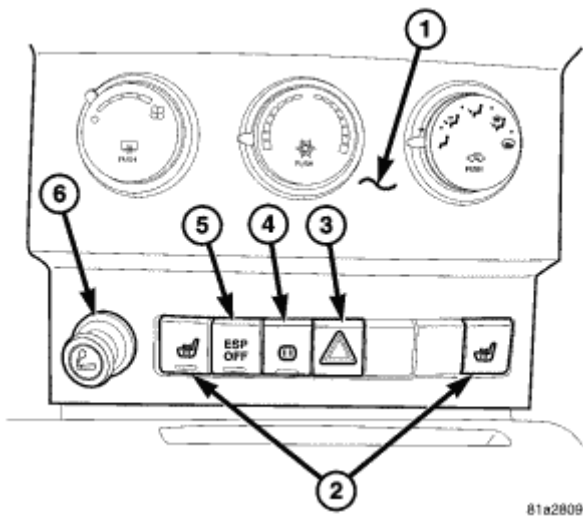
NOTE: **Steering angle sensor is part of the airbag clockspring and is not serviced separately from the clockspring.**

1. For installation of the steering angle sensor, refer to **INSTALLATION** .

ESP SWITCH

DESCRIPTION

SWITCH - ESP



81a28090

Fig. 9: Identifying Instrument Panel Switches
Courtesy of CHRYSLER LLC

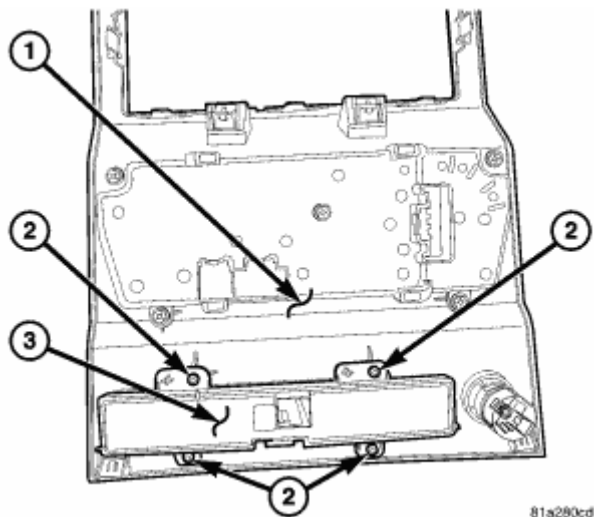
The ESP switch (5) is located in the center stack (1) of the instrument panel. If the switch is damaged or inoperative, the complete accessory switch bank assembly must be replaced.

REMOVAL

SWITCH - ESP

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The ESP switch is integral to the accessory switch bank and cannot be serviced separately. The complete accessory switch bank assembly must be replaced.



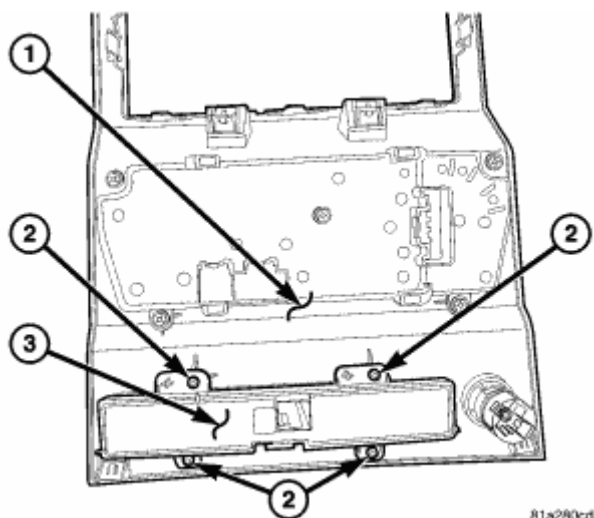
81a290cd

Fig. 10: SWITCH BANK REMOVAL
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the center bezel from the instrument panel. Refer to **REMOVAL** .
3. Remove the four screws (2) that secure the accessory switch bank (3) to the back of the center bezel (1) and remove the switch bank.

INSTALLATION

SWITCH - ESP



81a290cd

Fig. 11: SWITCH BANK REMOVAL
 Courtesy of CHRYSLER LLC

NOTE: There are different accessory switch banks available based on the option content of the vehicle. Ensure the switch pod being installed matches the vehicle options.

1. Position the accessory switch bank (3) onto the back of the instrument panel center bezel (1).
2. Install the four screws (2) that secure the accessory switch bank to the center bezel. Tighten the screws to 2 N.m (17 in. lbs.).
3. Install the center bezel onto the instrument panel. Refer to **INSTALLATION** .
4. Connect the battery negative cable.
5. Verify ESP system operation.

HYDRAULIC/MECHANICAL

HCU (HYDRAULIC CONTROL UNIT)

DESCRIPTION

HYDRAULIC CONTROL UNIT

The HCU consists of a valve body, pump motor, and pressure sensor.

OPERATION

HYDRAULIC CONTROL UNIT

Accumulators in the valve body store extra fluid released to the system for ABS mode operation. The pump is used to clear the accumulators of brake fluid and is operated by a DC type motor. The motor is controlled by the ABM.

The valves modulate brake pressure during antilock braking and are controlled by the ABM.

The HCU provides four channel pressure control to the front and rear brakes. Two channels control the rear wheel brakes individually. The two remaining channels control the front wheel brakes individually.

During antilock braking, the solenoid valves are opened and closed as needed. The valves are not static. They are cycled rapidly and continuously to modulate pressure and control wheel slip and deceleration.

During normal braking, the HCU solenoid valves and pump are not activated. The master cylinder and power booster operate the same as a vehicle without an ABS brake system.

During antilock braking, solenoid valve pressure modulation occurs in three stages, pressure increase, pressure hold, and pressure decrease. The valves are all contained in the valve body portion of the HCU.

PRESSURE DECREASE

The outlet valve is opened and the inlet valve is closed during the pressure decrease cycle.

A pressure decrease cycle is initiated when speed sensor signals indicate high wheel slip at one or more wheels. At this point, the ABM closes the inlet then opens the outlet valve, which also opens the return circuit to the accumulators. Fluid pressure is allowed to bleed off (decrease) as needed to prevent wheel lock.

Once the period of high wheel slip has ended, the ABM closes the outlet valve and begins a pressure increase or hold cycle as needed.

PRESSURE HOLD

Both solenoid valves are closed in the pressure hold cycle. Fluid apply pressure in the control channel is maintained at a constant rate. The ABM maintains the hold cycle until sensor inputs indicate a pressure change is necessary.

PRESSURE INCREASE

The inlet valve is open and the outlet valve is closed during the pressure increase cycle. The pressure increase cycle is used to counteract unequal wheel speeds. This cycle controls re-application of fluid apply pressure due to changing road surfaces or wheel speed.

REMOVAL

HYDRAULIC CONTROL UNIT

1. Install prop rod on the brake pedal to keep pressure on the brake system.
2. Remove negative battery cable from the battery.
3. Pull up on the ICU harness connector release and remove connector.

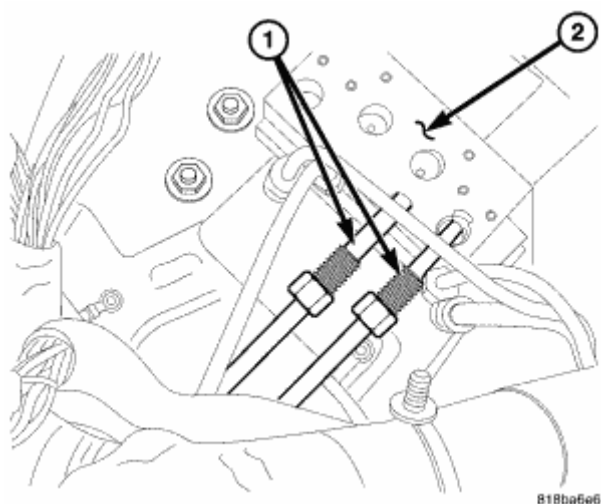


Fig. 12: HCU LINES

Courtesy of CHRYSLER LLC

4. Remove brake lines (1) from the ICU (2).

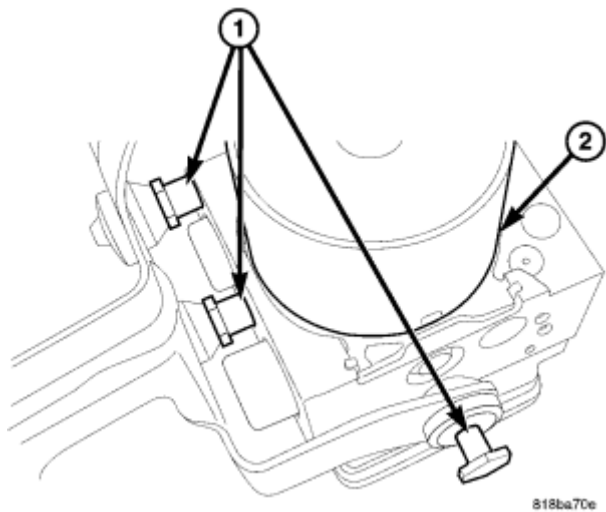


Fig. 13: ABM BRACKET
 Courtesy of CHRYSLER LLC

5. Remove the bolt attaching the bracket to the ICU unit (2) by pulling the unit from the bracket (1).

DISASSEMBLY

HYDRAULIC CONTROL UNIT

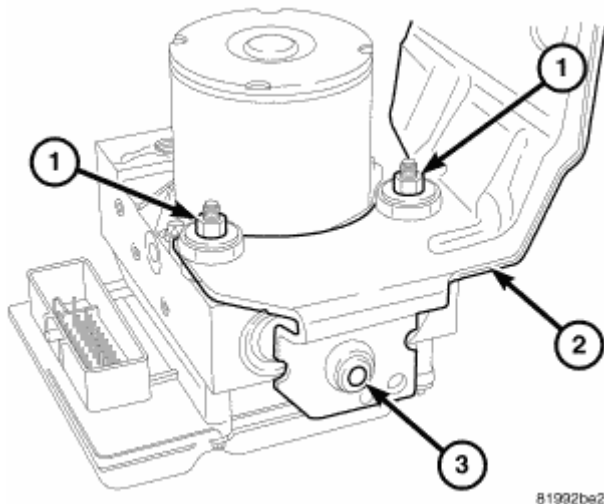
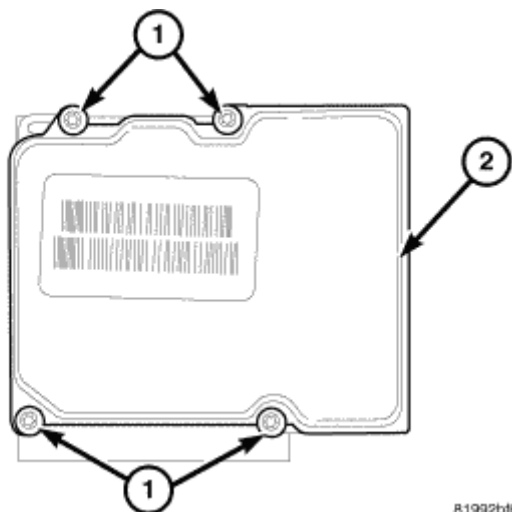


Fig. 14: ICU MOUNTING BRACKET
 Courtesy of CHRYSLER LLC

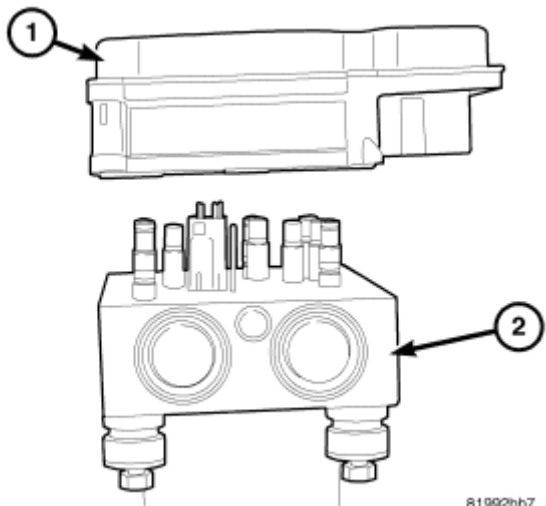
1. If the mounting bracket (2) needs to be removed from the HCU, loosen the two mounting nuts (1), then slide the mounting bracket off the two grommets and mounting pin (3).



81992b16

Fig. 15: ABM MOUNTING SCREWS (W/ESP)
 Courtesy of CHRYSLER LLC

2. Remove four screws (1) attaching antilock brake module (ABM) (2) to hydraulic control unit (HCU).



81992b7

Fig. 16: REMOVE/INSTALL ABM
 Courtesy of CHRYSLER LLC

CAUTION: When removing ABM from HCU, be sure to completely separate the two components (approximately 38 mm (1.5 inches)) before removing ABM. Otherwise, damage to the pressure sensor will result requiring HCU replacement.

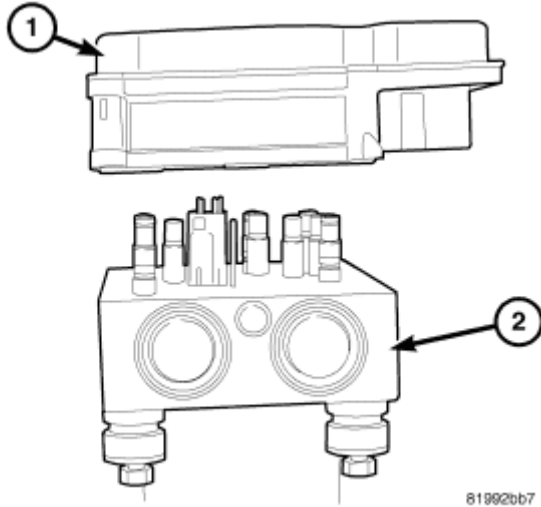
3. Slide ABM (1) off HCU (2).

ASSEMBLY

HYDRAULIC CONTROL UNIT

CAUTION: Inspect seal around mating edge of ABM to ensure seal is in good shape.

1. Clean any debris off the mating surfaces of the antilock brake module (ABM) and hydraulic control unit (HCU).



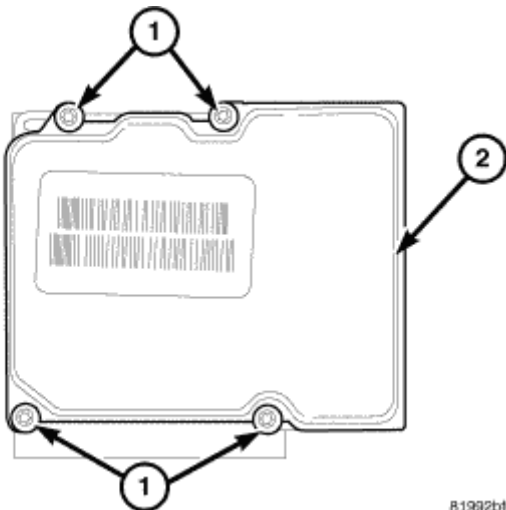
81992bb7

Fig. 17: REMOVE/INSTALL ABM

Courtesy of CHRYSLER LLC

CAUTION: When installing ABM to HCU, care must be taken not to damage the pressure sensor. If damaged, HCU replacement is necessary.

2. Align ABM (1) solenoids and pump/motor wiring with HCU (2) valves and wiring passage. Slide ABM onto HCU.



81992b16

Fig. 18: ABM MOUNTING SCREWS (W/ESP)

Courtesy of CHRYSLER LLC

3. Install four screws (1) attaching ABM to HCU. Tighten mounting screws to 6 N.m (53 in. lbs.).

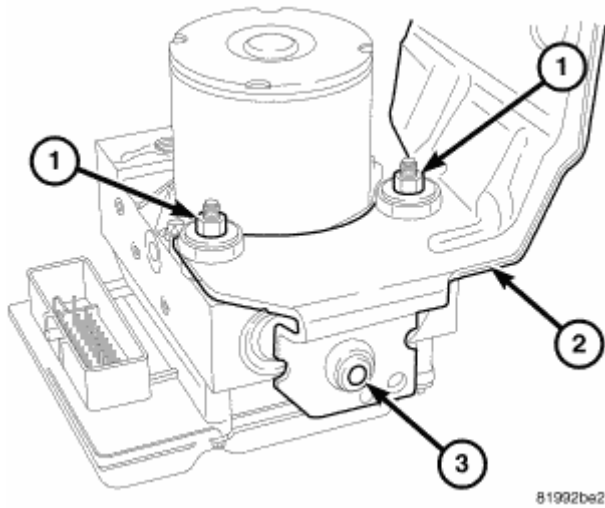


Fig. 19: ICU MOUNTING BRACKET
Courtesy of CHRYSLER LLC

4. If the mounting bracket (2) needs to be installed on the HCU, slide the mounting bracket grommet over the mounting pin (3) and two grommet cutouts over the grommets on the HCU mounted studs. Tighten the mounting nuts to 8 N.m (71 in. lbs.)
5. Install the HCU in the vehicle. Refer to **INSTALLATION**.

INSTALLATION

HYDRAULIC CONTROL UNIT

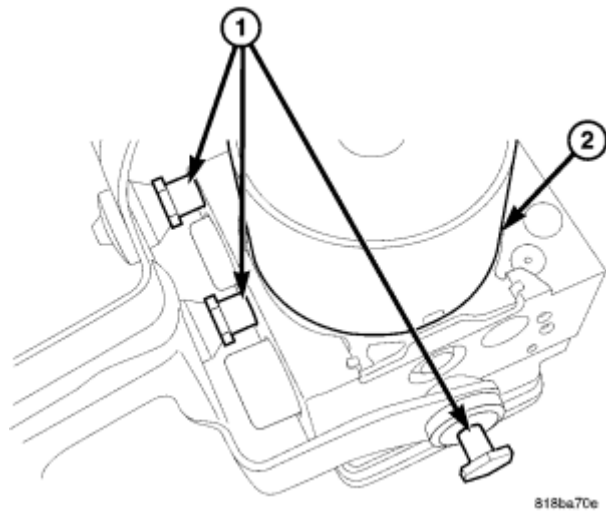


Fig. 20: ABM BRACKET
Courtesy of CHRYSLER LLC

NOTE: If the ABM module is being replaced with a new ABM module it must be

reprogrammed with the use of a scan tool.

1. Install ABM (2) on the mounting bracket rubber pockets (1).

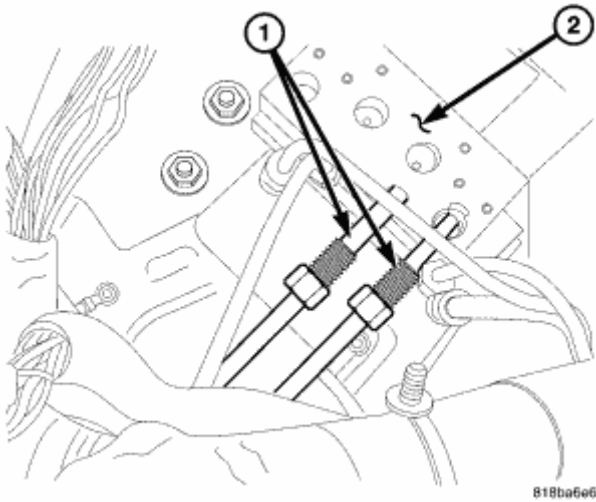


Fig. 21: HCU LINES

Courtesy of CHRYSLER LLC

2. Install brake lines to the ABM (2) and tighten to 20 N.m (180 in. lbs.).
3. Install wiring harness connector to the ABM and push down on the release to secure the connector.
4. Install negative battery cable to the battery.
5. Bleed ABS brake system. See **STANDARD PROCEDURE**.

2008 ACCESSORIES AND EQUIPMENT

Audio/Video Systems - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1401</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1402</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1403</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1405</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1406</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1407</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1409</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140A</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140B</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B140D</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140E</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140F</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1420</u>	AUDIO CASSETTE ERROR/INOPERABLE CASSETTE
<u>B1421</u>	AUDIO CD READ ERROR/INOPERABLE DISC
<u>B1422</u>	AUDIO DVD READ ERROR/INOPERABLE DISC
<u>B1423</u>	VES DVD READ ERROR/INOPERABLE DISC
<u>B1424</u>	IMPROPER DVD-WRONG REGION
<u>B1429</u>	RADIO DISPLAY HIGH TEMPERATURE
<u>B142A</u>	RADIO UNIT HIGH TEMPERATURE
<u>B142C</u>	VES VIDEO SCREEN DISCONNECTED
<u>B142D</u>	AUDIO ANTENNA NOT CONNECTED
<u>B142E</u>	GPS ANTENNA NOT CONNECTED
<u>B142F</u>	SATELLITE RADIO ANTENNA NOT CONNECTED
<u>B1460</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1461</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1462</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1463</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1464</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1465</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1466</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1467</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1468</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1469</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146A</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

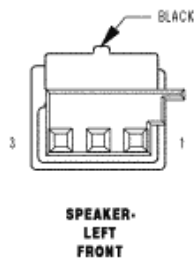
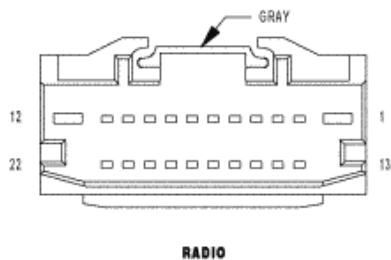
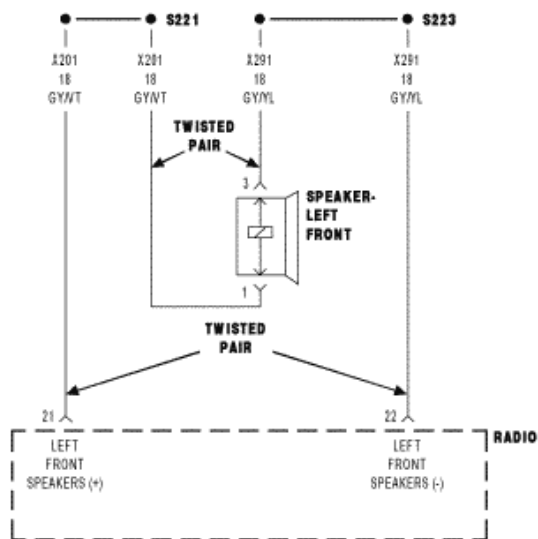
<u>B146B</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B146C</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B146D</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B146E</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146F</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1470</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1471</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1472</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1473</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1474</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1475</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1476</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1477</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1478</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1479</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B147A</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B147B</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B147C</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B147D</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B2222</u>	SATELLITE RADIO RECEIVER INTERNAL
<u>U0019</u>	CAN INTERIOR BUS(+)/(-) CIRCUIT
<u>U0020</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0195</u>	LOST COMMUNICATION WITH SDAR
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE MODULE
<u>U0199</u>	LOST COMMUNICATION WITH DRIVERS DOOR MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE

AUDIO/VIDEO SYSTEMS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



01940215

Fig. 1: Front Left Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND
(X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

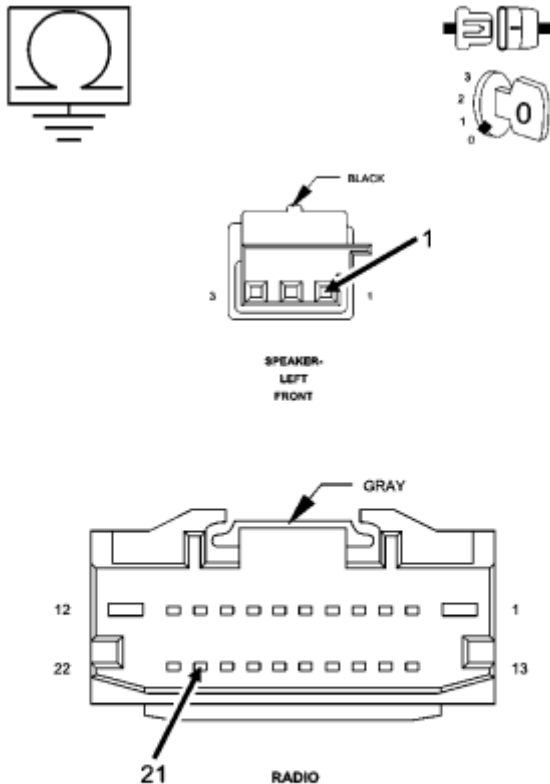
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND**



819c0219

Fig. 2: Measuring Resistance Between Ground And Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Left Audio Speaker harness connector.

Measure the resistance between ground and the (X201) Left Front Speakers (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

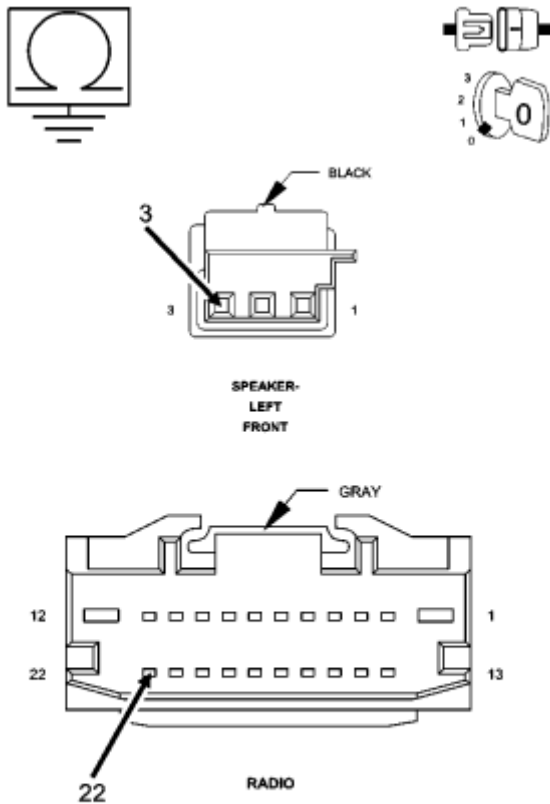
Repair the (X201) Left Front Speakers (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND



819c022c

Fig. 3: Measuring Resistance Between Ground And Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X291) Left Front Speakers (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X291) Left Front Speakers (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. SPEAKER

Connect the Radio harness connector.

With the Front Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Front Left Audio Speaker in accordance with the service information.

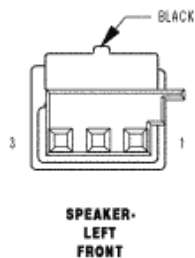
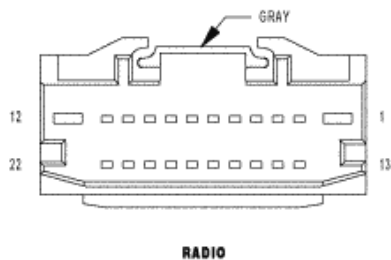
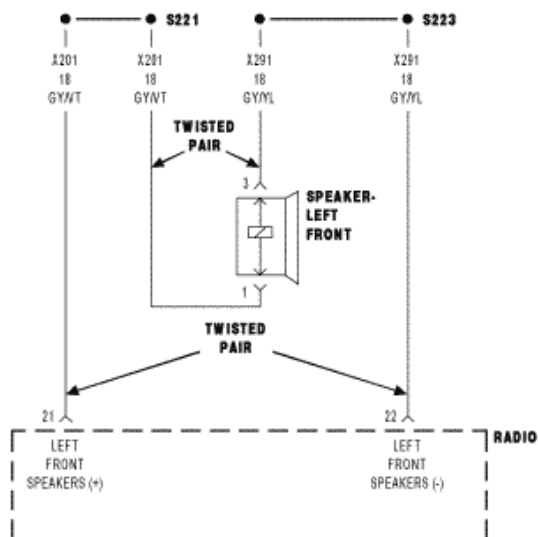
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1402-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



01940215

Fig. 4: Front Left Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE
(X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B1402-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

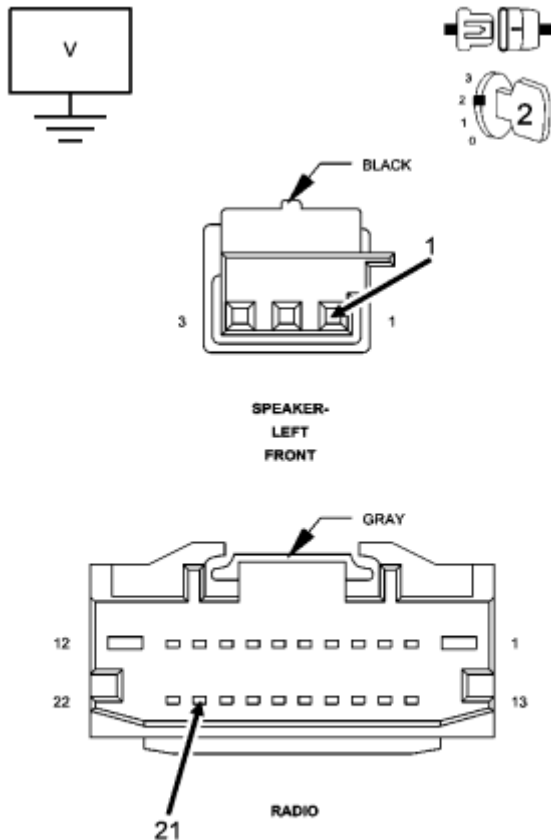
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE



819c027b

Fig. 5: Measuring Voltage Of Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Left Front Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X201) Left Front Speakers (+) circuit.

Is the voltage above 10.0 volts?

Yes

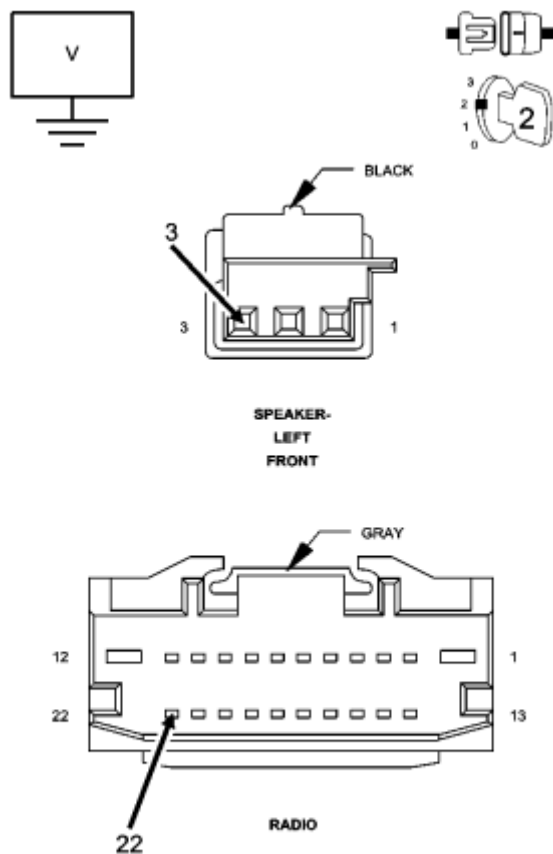
Repair the (X201) Left Front Speakers (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE



819c0283

Fig. 6: Measuring Voltage On Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X291) Left Front Speakers (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X291) Left Front Speakers (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

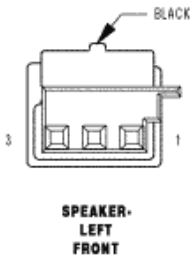
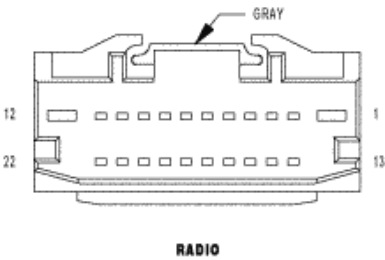
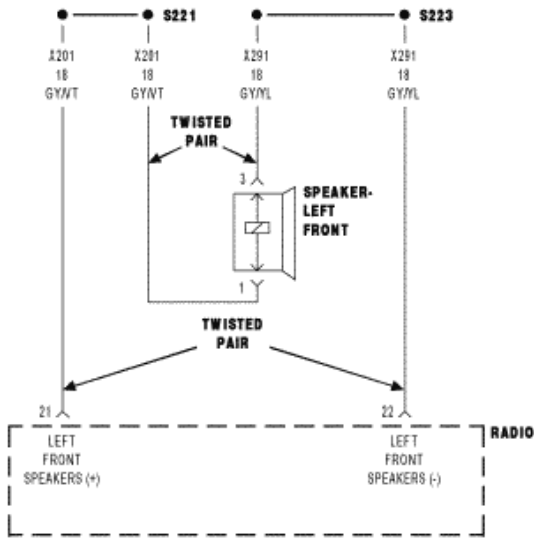


Fig. 7: Front Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT OPEN (X291) LEFT FRONT SPEAKERS (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

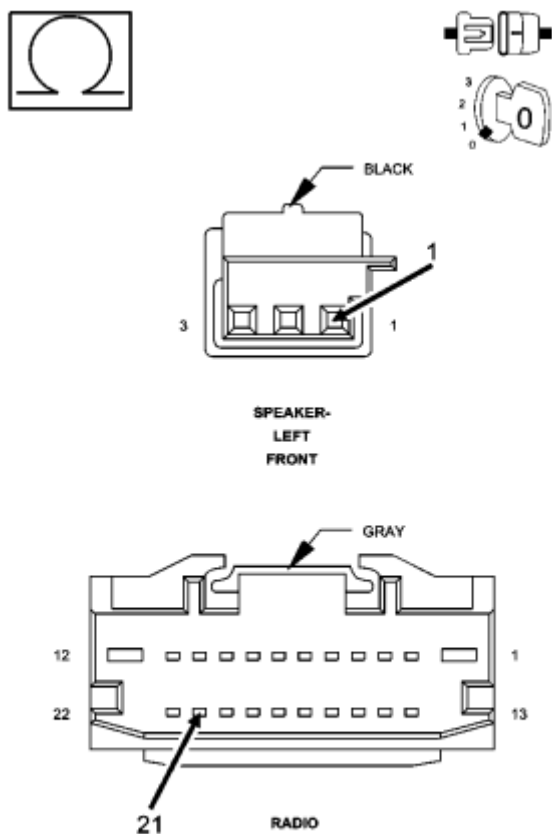
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X201) LEFT FRONT SPEAKERS (+) CIRCUIT OPEN



819c052f

Fig. 8: Measuring Resistance Of Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Left Audio Speaker harness connector.

Measure the resistance of the (X201) Left Front Speakers (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

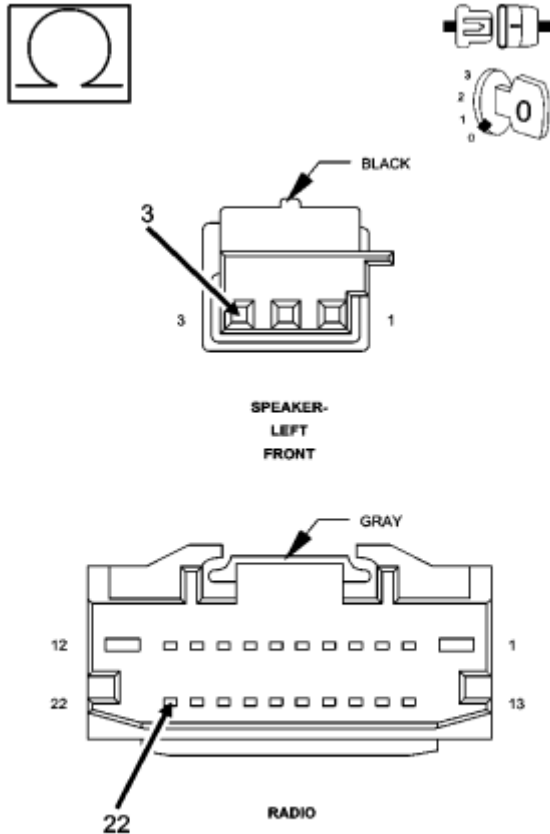
Go To 3.

No

Repair the (X201) Left Front Speakers (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT OPEN



819c0552

Fig. 9: Measuring Resistance Of Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X291) Left Front Speakers (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X291) Left Front Speakers (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Front Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Front Left Audio Speaker in accordance with the service information.

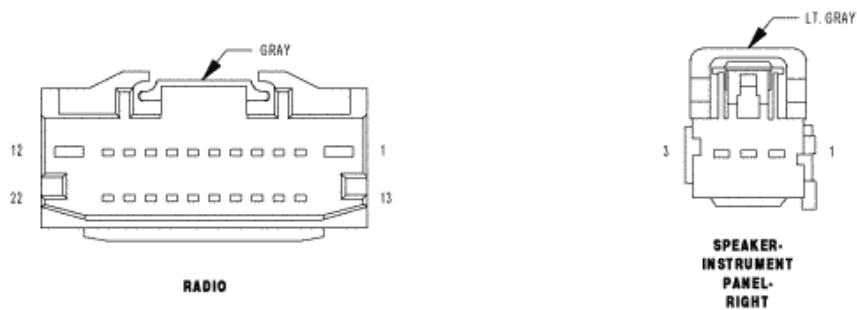
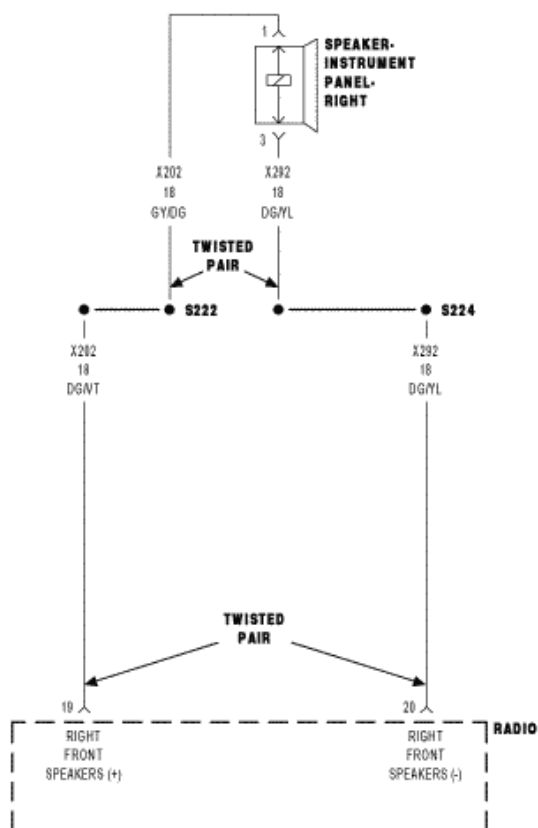
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



019c057c

Fig. 10: Front Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND
(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

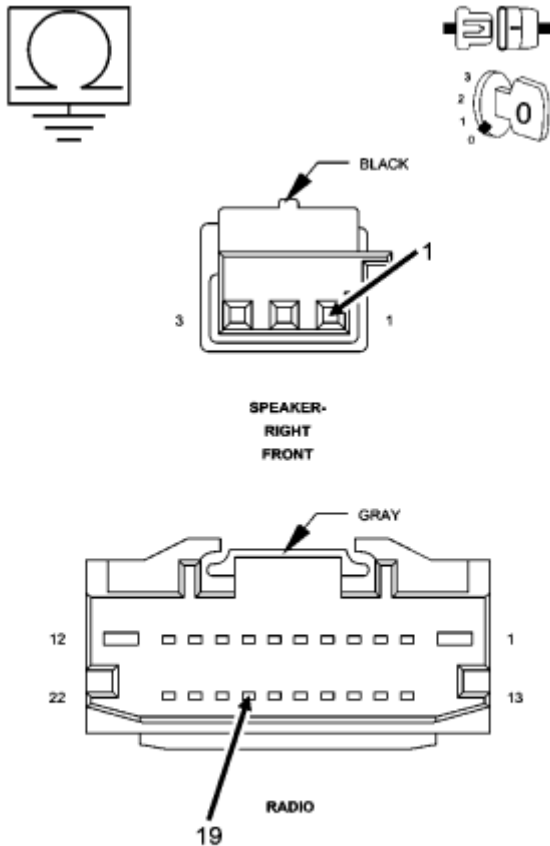
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND**



819c0581

Fig. 11: Measuring Resistance Between Ground And Right Front Speakers Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Right Audio Speaker harness connector.

Measure the resistance between ground and the (X202) Right Front Speakers (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

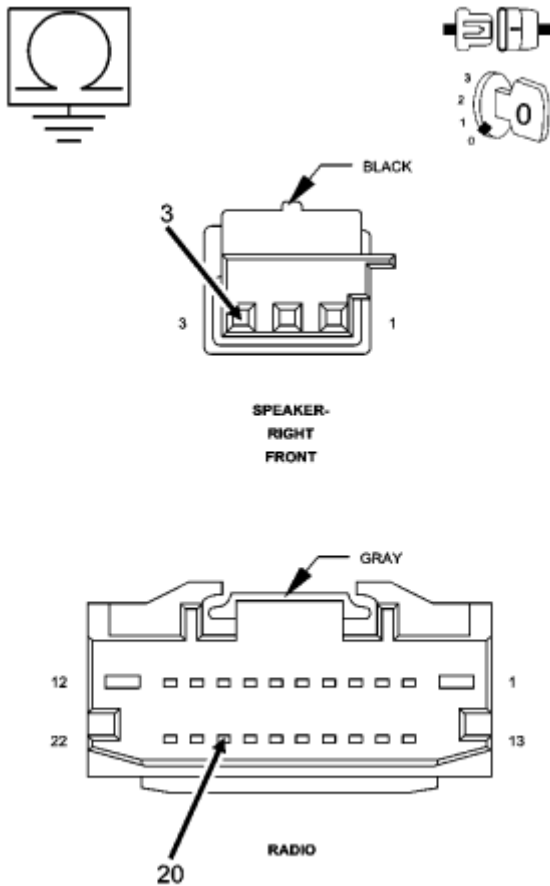
Repair the (X202) Right Front Speakers (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND



819c0593

Fig. 12: Measuring Resistance Between Ground And Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X292) Right Front Speakers (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X292) Right Front Speakers (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. SPEAKER

Connect the Radio harness connector.

With the Front Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Front Right Audio Speaker in accordance with the service information.

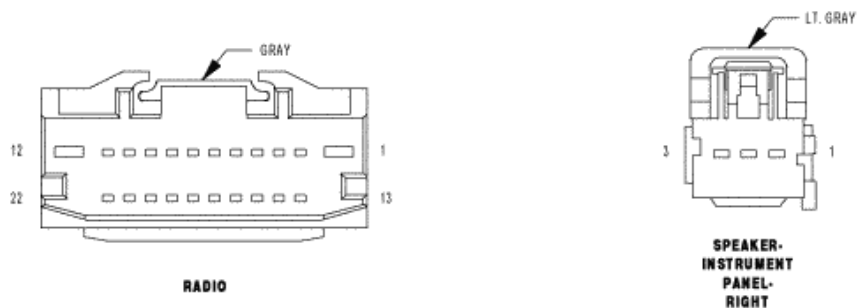
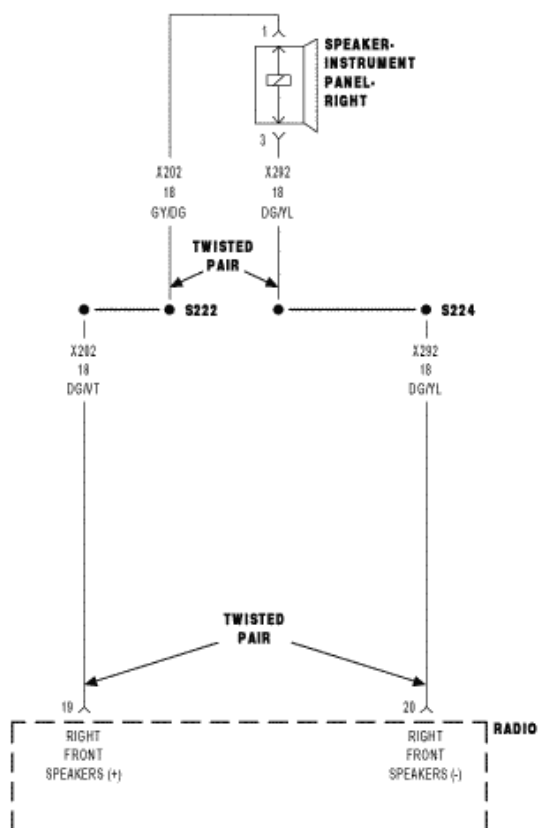
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1406-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c057c

Fig. 13: Front Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE
(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B1406-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

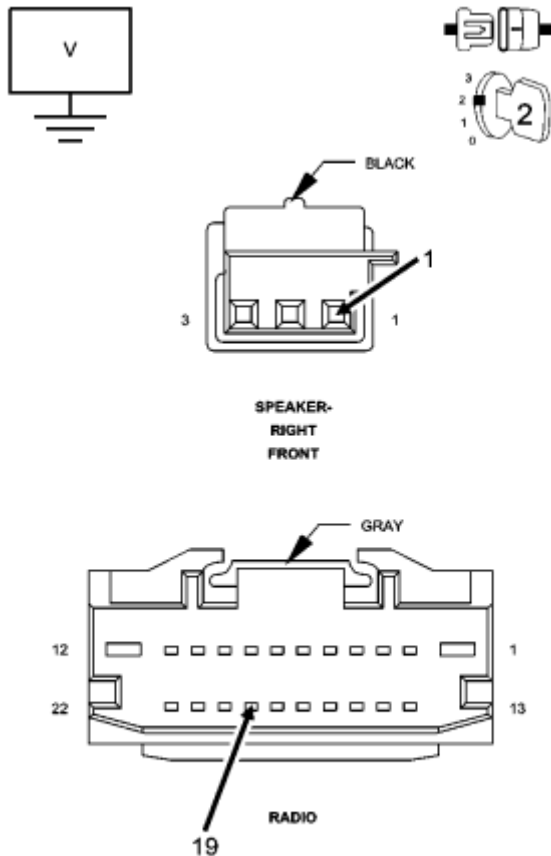
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE



819c073b

Fig. 14: Measuring Voltage On Right Front Speakers (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Right Front Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X202) Right Front Speakers (+) circuit.

Is the voltage above 10.0 volts?

Yes

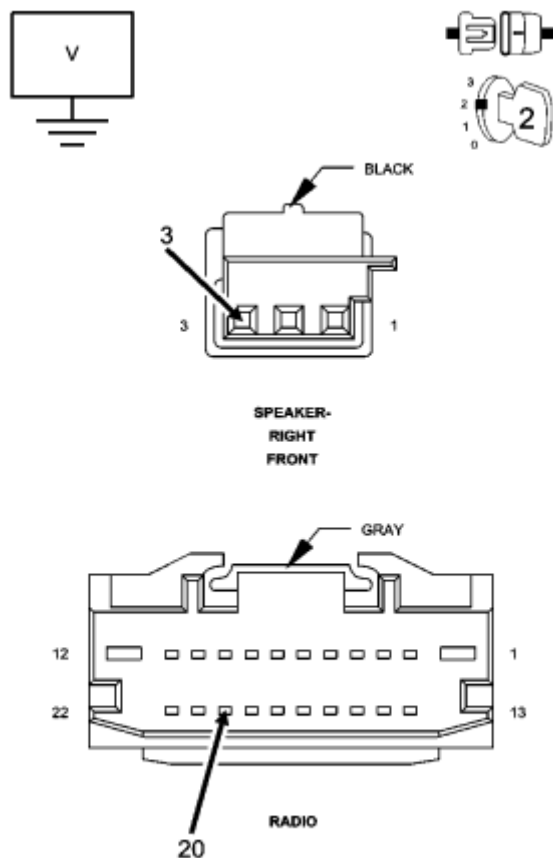
Repair the (X202) Right Front Speakers (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE



819c0746

Fig. 15: Measuring Voltage On Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X292) Right Front Speakers (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X292) Right Front Speakers (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

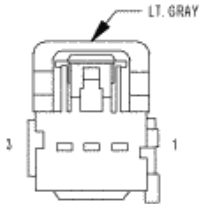
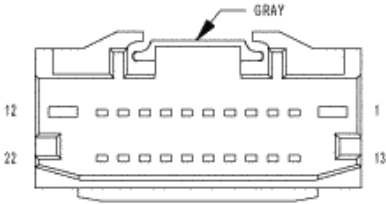
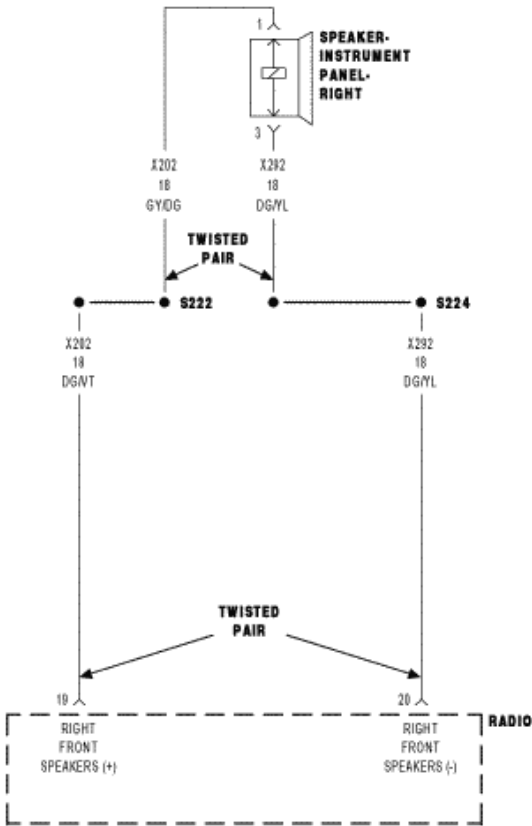


Fig. 16: Front Right Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT OPEN (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

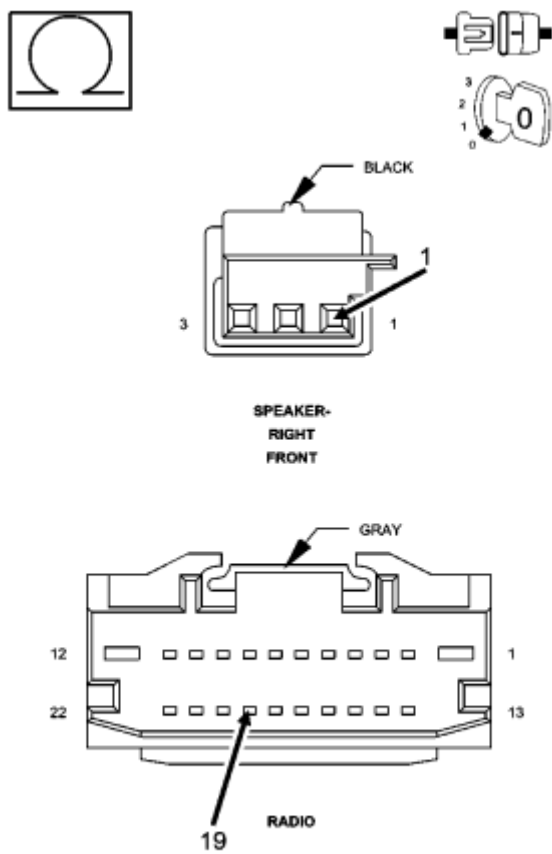
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X202) RIGHT FRONT SPEAKERS (+) CIRCUIT OPEN



819c074d

Fig. 17: Measuring Resistance Of Right Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Right Audio Speaker harness connector.

Measure the resistance of the (X202) Right Front Speakers (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

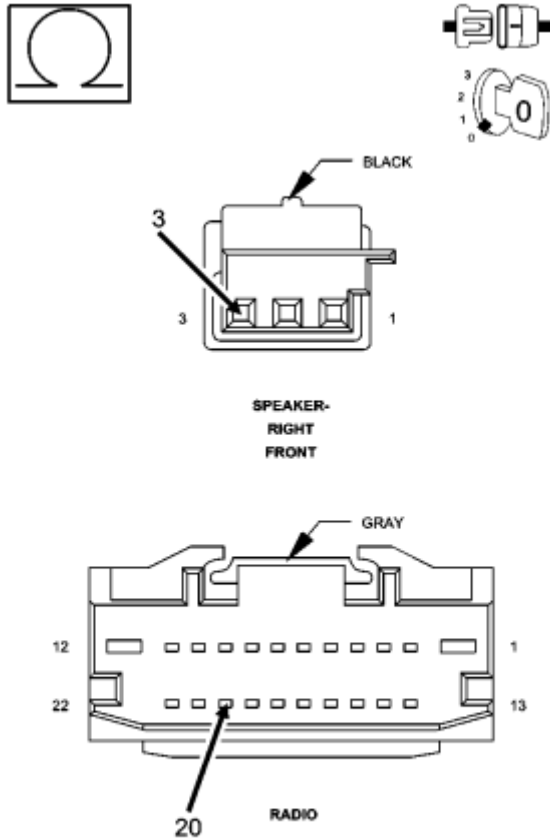
Go To 3.

No

Repair the (X202) Right Front Speakers (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT OPEN**



819c0751

Fig. 18: Measuring Resistance Of Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X292) Right Front Speakers (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X292) Right Front Speakers (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Front Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Front Right Audio Speaker in accordance with the service information.

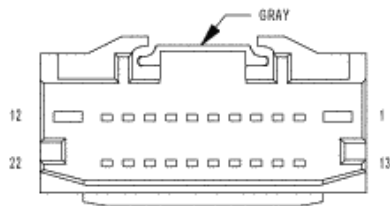
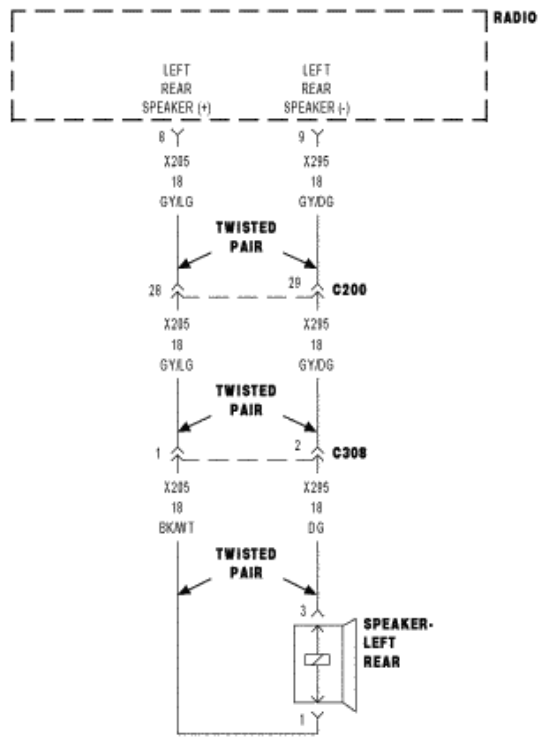
Perform **BODY VERIFICATION TEST - VER 1** .

No

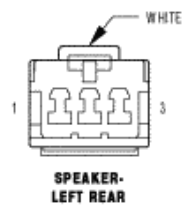
Test Complete.

B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



RADIO



SPEAKER-LEFT REAR

013c0000

Fig. 19: Rear Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

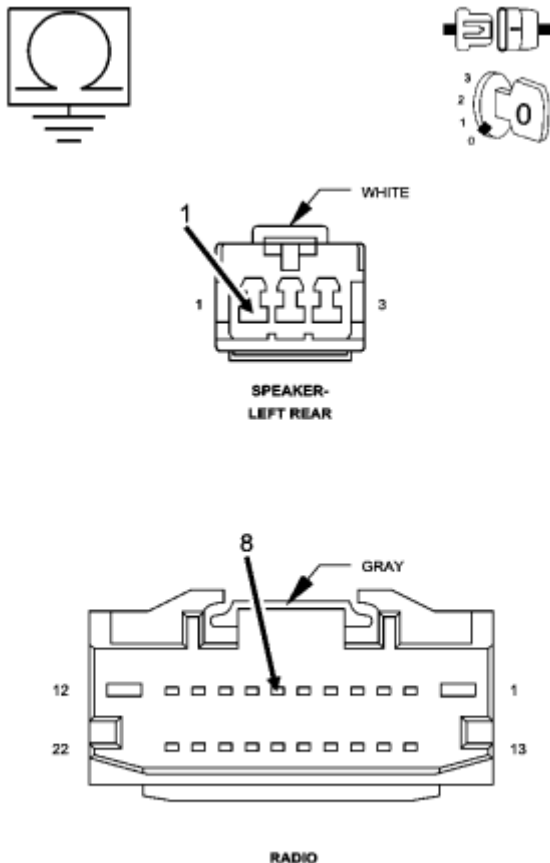
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND**



819c08f2

Fig. 20: Measuring Resistance Between Ground And Left Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Left Audio Speaker harness connector.

Measure the resistance between ground and the (X205) Left Rear Speaker (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

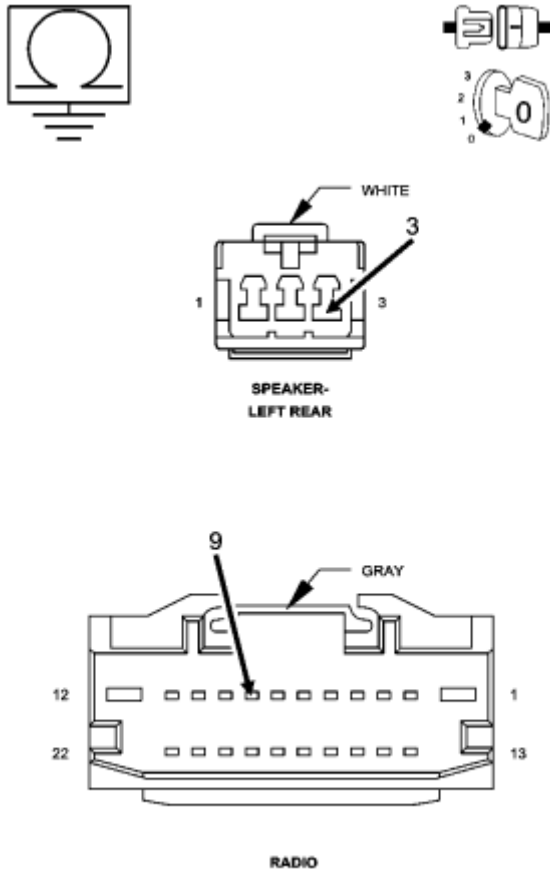
Repair the (X205) Left Rear Speaker (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND



819c0904

Fig. 21: Measuring Resistance Between Ground And Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X295) Left Rear Speaker (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X295) Left Rear Speaker (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Rear Left Audio Speaker in accordance with the service information.

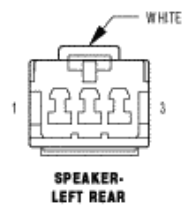
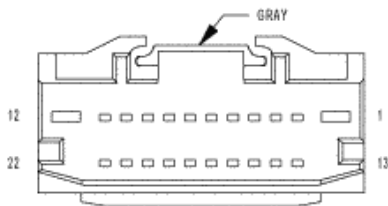
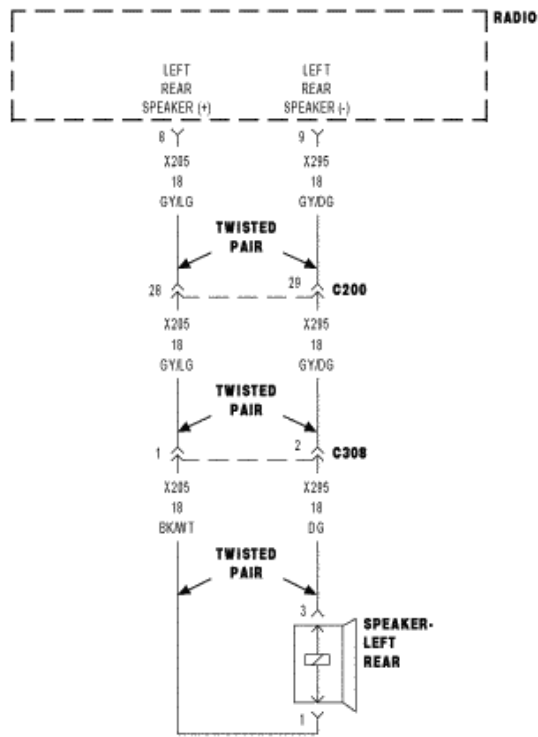
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B140A-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



013c0000

Fig. 22: Rear Left Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE
(X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B140A-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

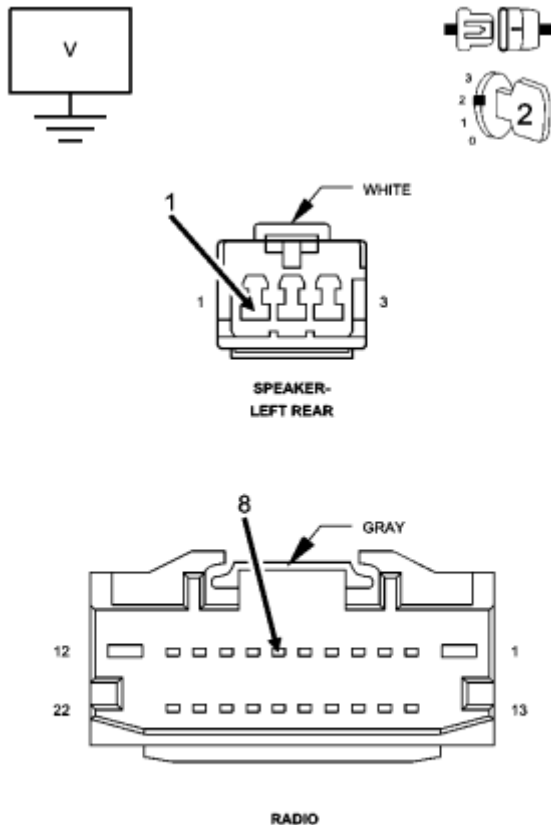
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE



819c0960

Fig. 23: Measuring For Voltage On Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Left Rear Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X205) Left Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

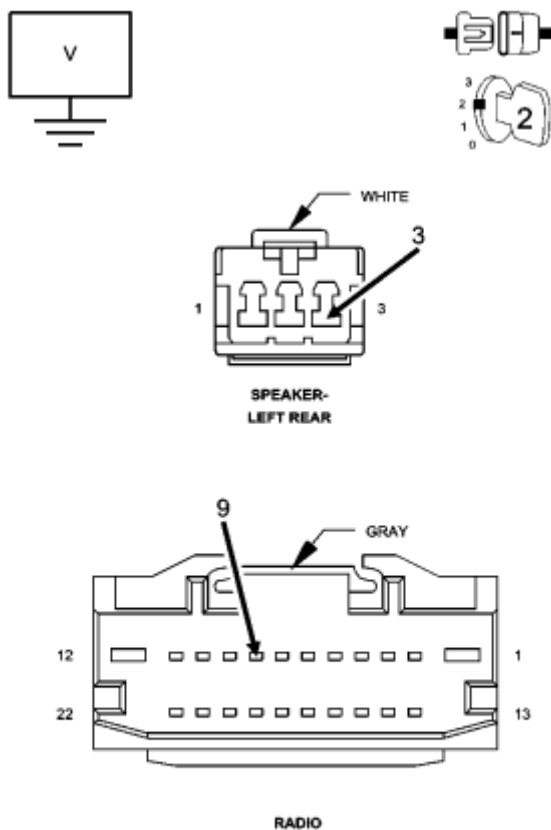
Repair the (X205) Left Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE



819c0971

Fig. 24: Measuring For Voltage On Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X295) Left Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X295) Left Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

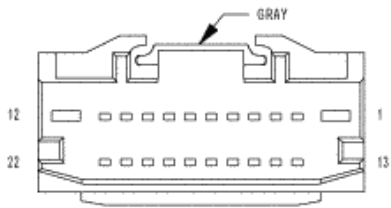
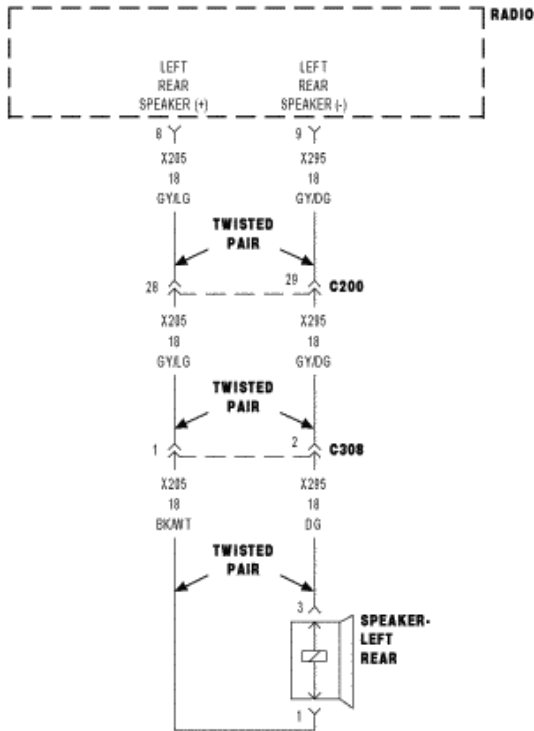
No

Replace the Radio in accordance with the service information.

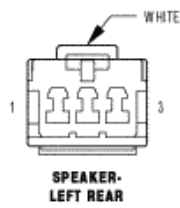
Perform **BODY VERIFICATION TEST - VER 1** .

B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



RADIO



SPEAKER-LEFT REAR

Fig. 25: Rear Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT OPEN (X295) LEFT REAR SPEAKER (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

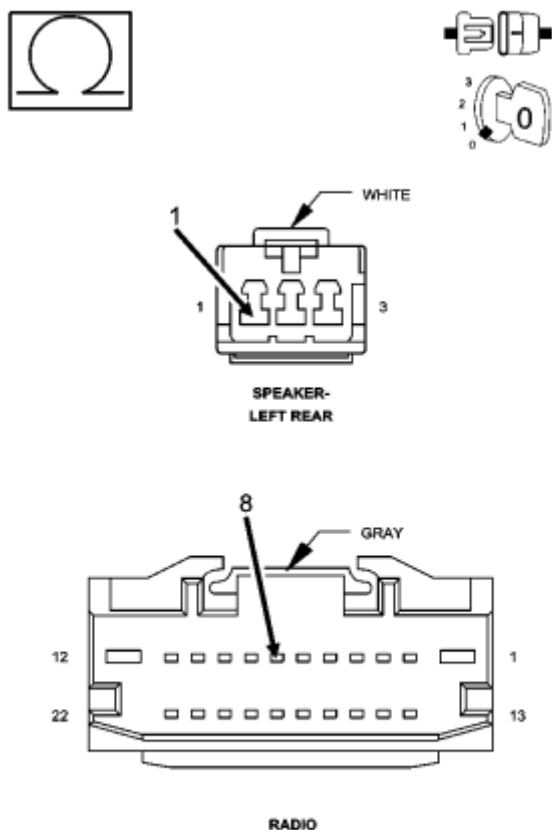
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X205) LEFT REAR SPEAKER (+) CIRCUIT OPEN



819c0975

Fig. 26: Measuring Resistance Of Left Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Left Audio Speaker harness connector.

Measure the resistance of the (X205) Left Rear Speaker (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

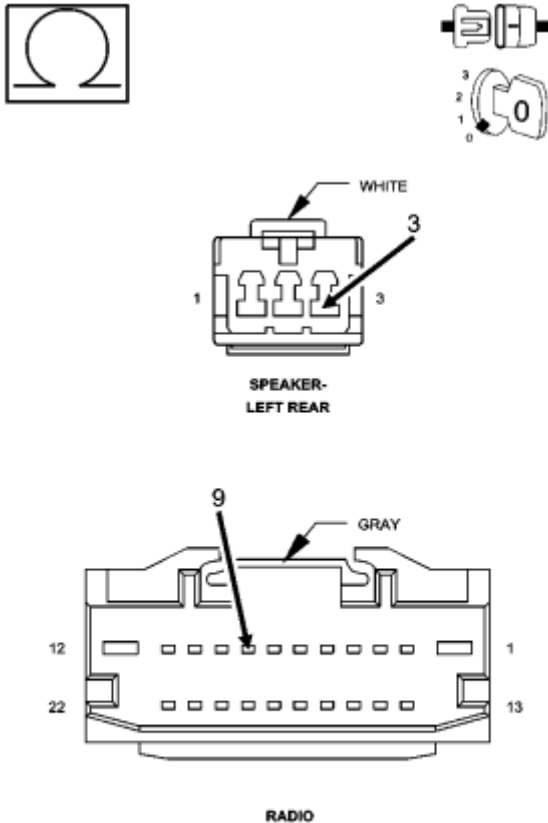
Go To 3.

No

Repair the (X205) Left Rear Speaker (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(X295) LEFT REAR SPEAKER (-) CIRCUIT OPEN**



819c097c

Fig. 27: Measuring Resistance Of Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X295) Left Rear Speaker (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X295) Left Rear Speaker (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Rear Left Audio Speaker in accordance with the service information.

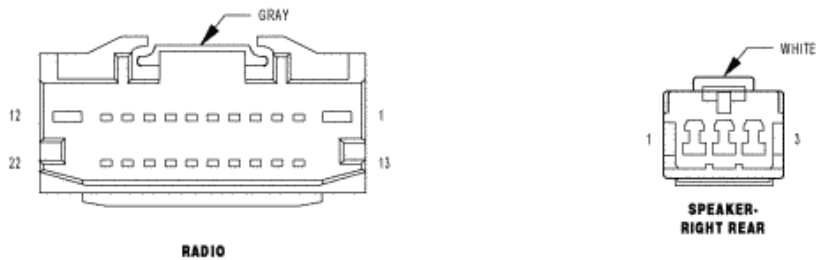
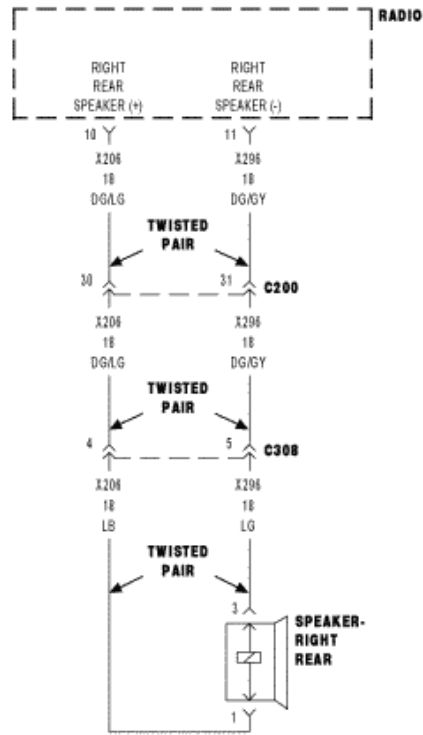
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



019c0936

Fig. 28: Rear Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

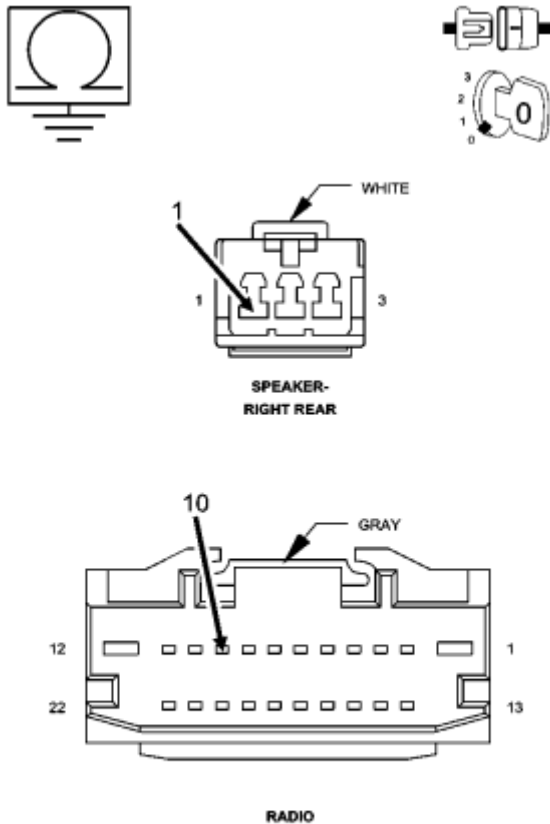
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND**



819c0b58

Fig. 29: Measuring Resistance Between Ground And Right Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Right Audio Speaker harness connector.

Measure the resistance between ground and the (X206) Right Rear Speaker (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

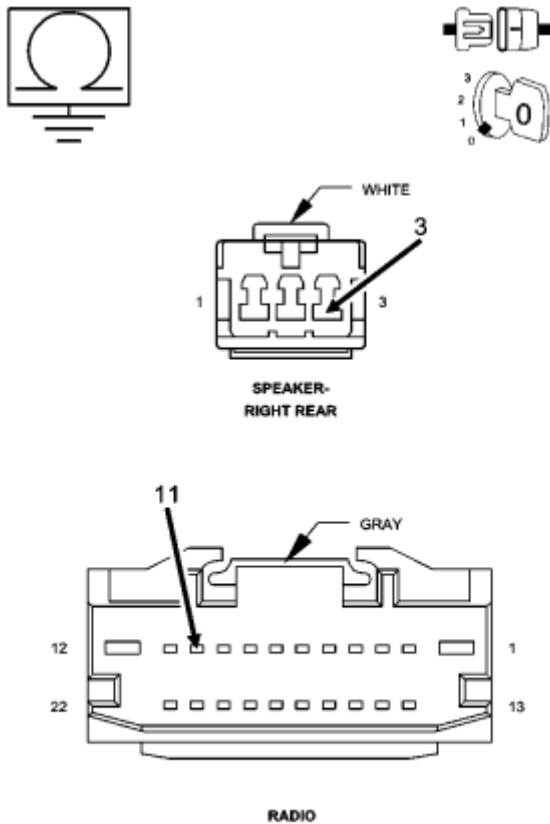
Repair the (X206) Right Rear Speaker (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. (X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND



819c0b60

Fig. 30: Measuring Resistance Between Ground And Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X296) Right Rear Speaker (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X296) Right Rear Speaker (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Rear Right Audio Speaker in accordance with the service information.

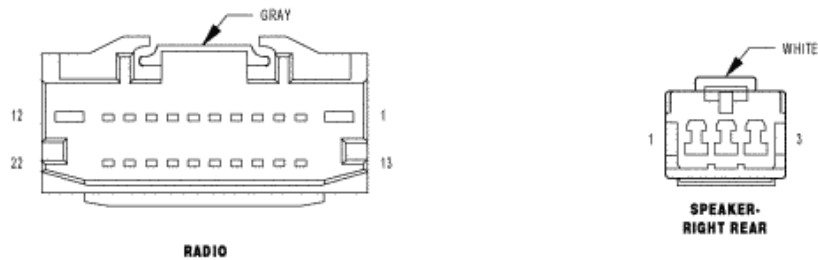
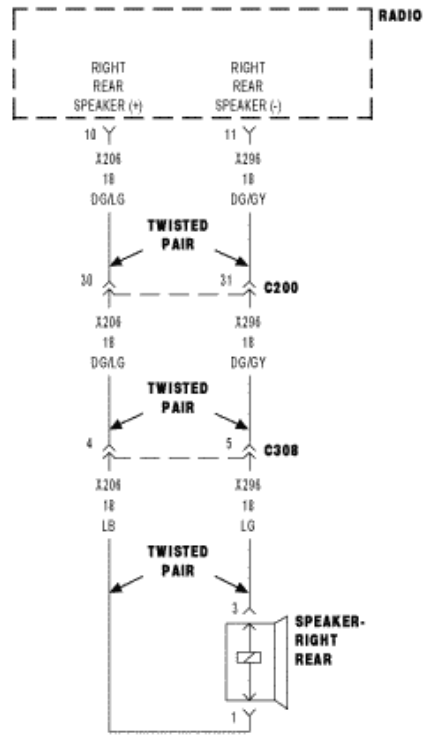
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B140E-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c0936

Fig. 31: Rear Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE
(X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B140E-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

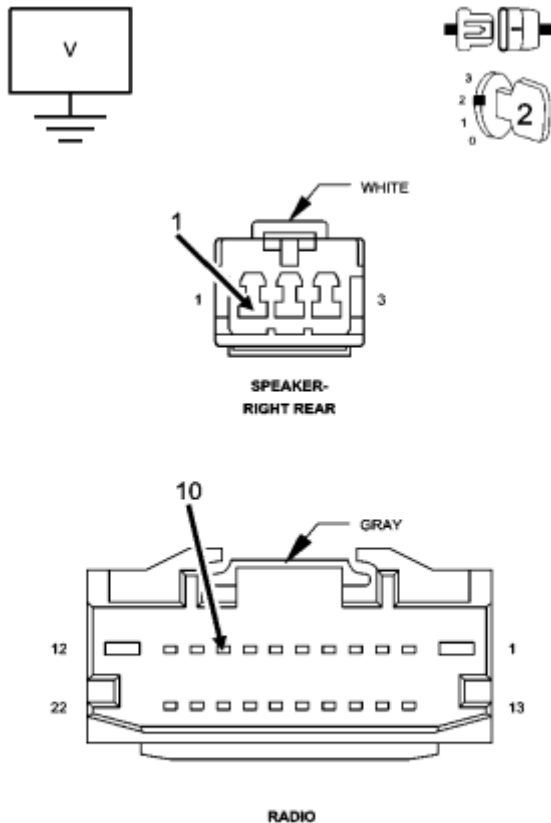
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE



819c0b9a

Fig. 32: Measuring Voltage On Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Right Rear Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X206) Right Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

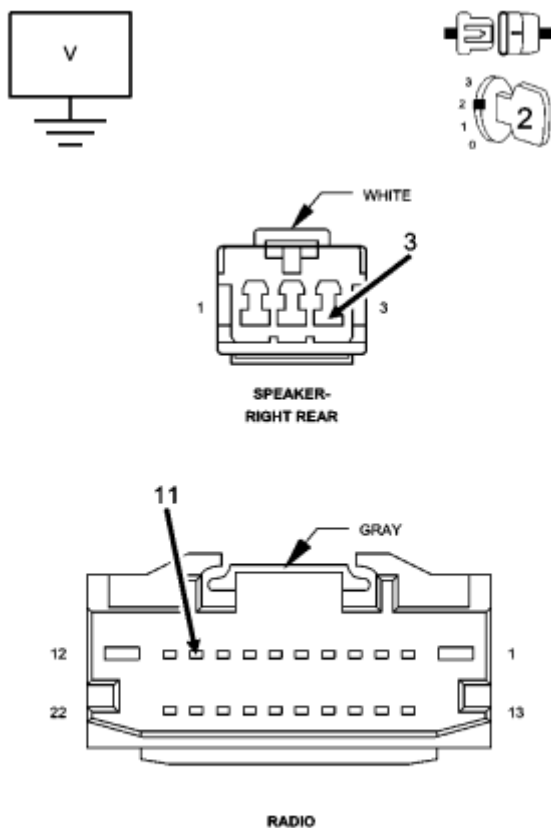
Repair the (X206) Right Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE



819c0ba8

Fig. 33: Measuring Voltage On Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X296) Right Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X296) Right Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

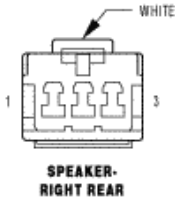
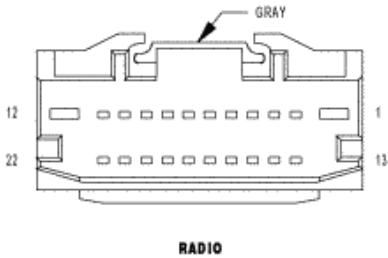
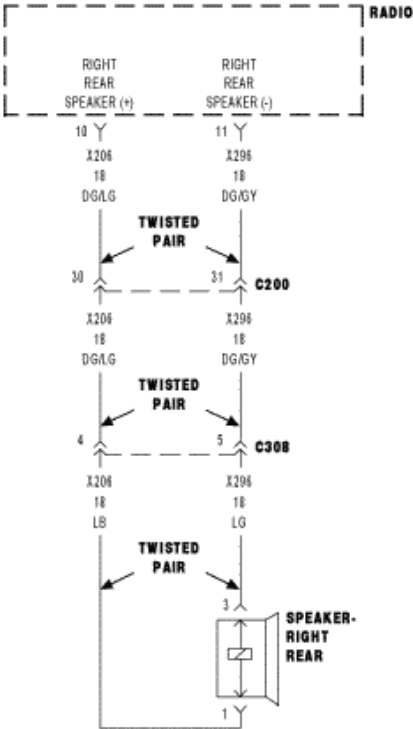


Fig. 34: Rear Right Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT OPEN (X296) RIGHT REAR SPEAKER (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

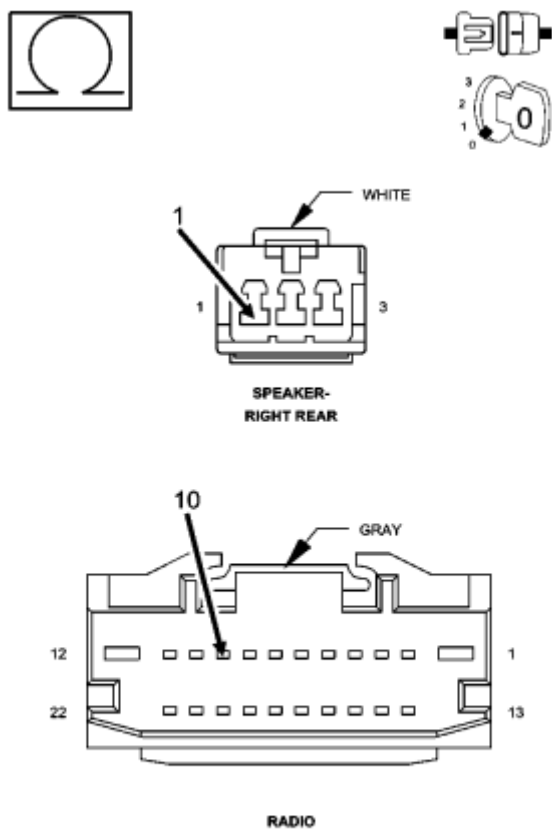
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X206) RIGHT REAR SPEAKER (+) CIRCUIT OPEN



819c0bb5

Fig. 35: Measuring Resistance Of Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Right Audio Speaker harness connector.

Measure the resistance of the (X206) Right Rear Speaker (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

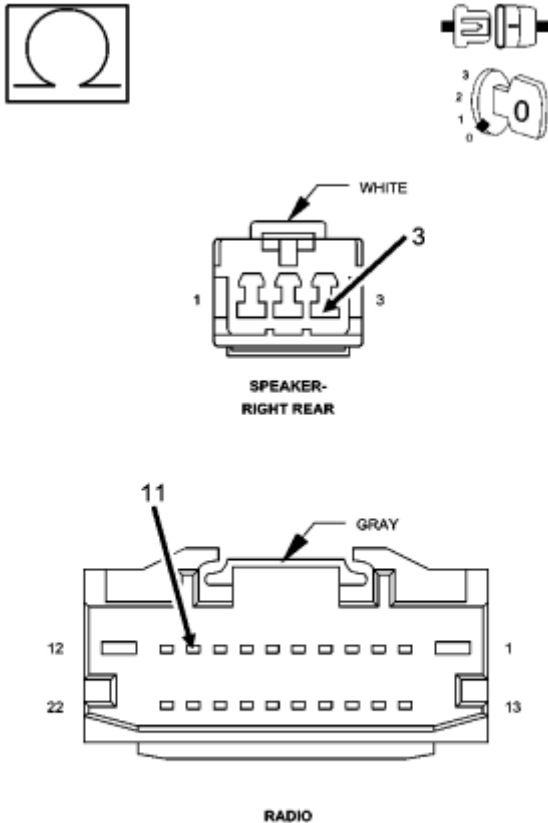
Go To 3.

No

Repair the (X206) Right Rear Speaker (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(X296) RIGHT REAR SPEAKER (-) CIRCUIT OPEN**



819c0bc3

Fig. 36: Measuring Resistance Of Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X296) Right Rear Speaker (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X296) Right Rear Speaker (-) circuit for an open condition.
Perform **BODY VERIFICATION TEST - VER 1** .

4. SPEAKER

Connect the Radio harness connector.

With the Rear Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Rear Right Audio Speaker in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1420-AUDIO CASSETTE ERROR/INOPERABLE CASSETTE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the Radio Cassette player turned on.

Set Conditions

- **Set Condition:**

The code will set when a damaged Cassette is placed in the Cassette Player.

Possible Causes

Possible Causes

CASSETTE READ FAILURE

Diagnostic Test

1. **RADIO**

Replace the problem Cassette with a good, clean, undamaged, cassette.

Turn the Radio cassette player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1420-AUDIO CASSETTE ERROR/INOPERABLE CASSETTE?

Yes

Eject the inoperative cassette and replace the Radio/Cassette Player in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1421-AUDIO CD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the radio CD player turned on.

Set Conditions

- **Set Condition:**
- The code will set if a CD that is not formatted as a music CD is installed in the radio CD player.

Possible Causes

Possible Causes
CD READ FAILURE

Diagnostic Test

1. RADIO

Replace the problem CD with a good, clean, unscratched, music CD.

Turn the radio CD player on.

With the scan tool, read DTC's.

Does the scan tool display: B1421 AUDIO CD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative CD and replace the CD in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1422-AUDIO DVD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. DVD PLAYER

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1422-AUDIO DVD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1423-VES DVD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. **DVD PLAYER**

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1423-VES DVD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1424-IMPROPER DVD-WRONG REGION

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. DVD PLAYER

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1424-IMPROPER DVD-WRONG REGION?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1429-RADIO DISPLAY HIGH TEMPERATURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition and Radio on.

Set Conditions

- Set Condition:**

The code will set if the temperature inside the Radio is above +65°C (+145°F)

Possible Causes

Possible Causes
HIGH TEMPERATURE FAILURE

Diagnostic Test

1. VERIFY THAT DTC B1429-RADIO DISPLAY HIGH TEMPERATURE IS ACTIVE.

With the scan tool, clear all DTC's.

Start the engine and allow the engine to reach normal operating temperature.

If the vehicle has been in the hot sunlight or extreme cold, move the vehicle indoors and open the doors to allow the inside temperature to stabilize.

The Radio should operate between -23°C and +65°C (-10°F and +145°F).

With the scan tool, read DTC's.

Does the scan tool display active: B1429-RADIO DISPLAY HIGH TEMPERATURE?

Yes

Replace the Radio in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142A-RADIO UNIT HIGH TEMPERATURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition and Radio on.

Set Conditions

- **Set Condition:**

The code will set if the temperature inside the Radio is above +65°C (+145°F)

Possible Causes

Possible Causes
HIGH TEMPERATURE FAILURE

Diagnostic Test

1. VERIFY THAT DTC B142A-RADIO UNIT HIGH TEMPERATURE IS ACTIVE.

With the scan tool, erase the DTC's.

Start the engine and allow the engine to reach normal operating temperature.

If the vehicle has been in the hot sunlight or extreme cold, move the vehicle indoors and open the doors to allow the inside temperature to stabilize.

The Radio should operate between -23°C and +65°C (-10°F and +145°F).

With the scan tool, read DTC's.

Does the scan tool display active: B142A-RADIO UNIT HIGH TEMPERATURE?

Yes

Replace the Radio in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142C-VES VIDEO SCREEN DISCONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in Video mode.

Set Conditions

• **Set Condition:**

With the Radio in Video mode, the Radio does not detect a VES Video Screen.

Possible Causes

Possible Causes
BAD VES VIDEO SCREEN CONNECTION RADIO

Diagnostic Test

1. TEST VES VIDEO SCREEN CONNECTION

Turn the ignition off.

Disconnect the VES Video Screen connector.

Inspect the VES Video Screen connection.

Was the VES Video Screen connection clean and secure?

Yes

Go To 2.

No

Repair the VES Video Screen connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **VES VIDEO SCREEN**

Refer to the Audio System in the Service Information and test the VES Video Screen in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the VES Video Screen in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **RADIO**

NOTE: **Reconnect all previously disconnected components.**

NOTE: **Move vehicle outside approximately 30ft (9.14m) from any structure.**

Turn the ignition on.

Turn the Radio on.

With the scan tool, clear all DTC's, put the Radio in mode.

With the scan tool, read DTC's.

Does the scan tool display active: B142C-VES VIDEO SCREEN DISCONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142D-AUDIO ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in seek mode.

Set Conditions

- **Set Condition:**

With the Radio in seek mode for two loops around the band. The Radio does not detect an Antenna connection or does not receive a Radio station signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION RADIO

Diagnostic Test

1. **TEST ANTENNA**

Turn the ignition off.

Disconnect the Radio Antenna connector.

Inspect the Radio Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. ANTENNA

Refer to the Audio System in the Service Information and test the antenna in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. RADIO

NOTE: **Reconnect all previously disconnected components.**

NOTE: **Move vehicle outside approximately 30ft (9.14m) from any structure.**

Turn the ignition on.

Turn the Radio on.

With the scan tool, clear all DTC's, put the Radio in seek up and down mode for 2 loops around the band cycle before proceeding.

With the scan tool, read DTC's.

Does the scan tool display active: B142D-AUDIO ANTENNA NOT CONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142E-GPS ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in Navigation mode.

Set Conditions

- **Set Condition:**

With the Radio in Navigation mode. The Radio does not detect an Antenna connection or does not receive a Navigation (GPS) signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION RADIO ANTENNA

Diagnostic Test

1. **TEST ANTENNA**

Turn the ignition off.

Disconnect the GPS Antenna connector.

Inspect the GPS Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.
Perform **BODY VERIFICATION TEST - VER 1** .

2. **ANTENNA**

Refer to the Audio System in the Service Information and test the antenna in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **RADIO**

NOTE: Reconnect all previously disconnected components.

NOTE: Move vehicle outside approximately 30ft (9.14m) from any structure.

Turn the ignition and Radio on.

With the scan tool, clear all DTC's and operate the Navigation system.

With the scan tool, read DTC's.

Does the scan tool display active: B142E-GPS ANTENNA NOT CONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142F-SATELLITE RADIO ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Satellite Radio in seek mode.

Set Conditions

- **Set Condition:**
- With the radio in seek mode for two loops around the band. The radio does not detect an antenna

connection or does not receive a radio satellite signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION SATELLITE RADIO RECEIVER

Diagnostic Test

1. TEST ANTENNA

Turn the ignition off.

Disconnect the Satellite Radio Antenna connector.

Inspect the Satellite Radio Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. SATELLITE RADIO ANTENNA

Refer to the Audio System in the service information and test the antenna in accordance with the service procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

3. SATELLITE RADIO RECEIVER

NOTE: Reconnect all previously disconnected components.

NOTE: **Move vehicle outside approximately 30ft (9.144m) from any structure.**

Turn the ignition and radio on.

With the scan tool, erase the audio DTC's, put the satellite radio in seek up and down mode for 2 loops around the band cycle before proceeding.

With the scan tool, read the audio DTC's.

Did this DTC reset?

Yes

Replace the Satellite Radio Receiver in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1430 SATELLITE RADIO ANTENNA INTERNAL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The Satellite Radio Antenna detects a software checksum test failure.

Possible Causes

Possible Causes
SATELLITE RADIO ANTENNA

Diagnostic Test

1. **REPLACE THE SATELLITE RADIO ANTENNA**

When this code is set, the Satellite Radio Antenna must be replaced.

Repair

Replace the Satellite Radio Antenna in accordance with the Service Information. Refer to **STANDARD PROCEDURE** . Refer to **STANDARD PROCEDURE** .

B1460-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ± 1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1460-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B1461-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic

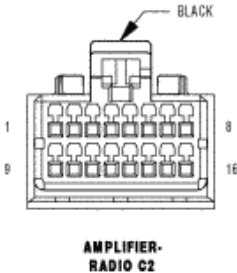
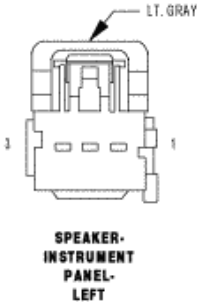
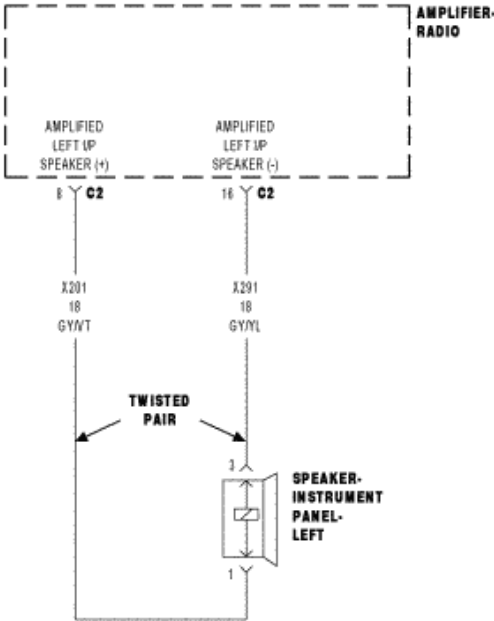


Fig. 37: Channel 1 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X291) AMPLIFIED LEFT FRONT I/P SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT FRONT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1461-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

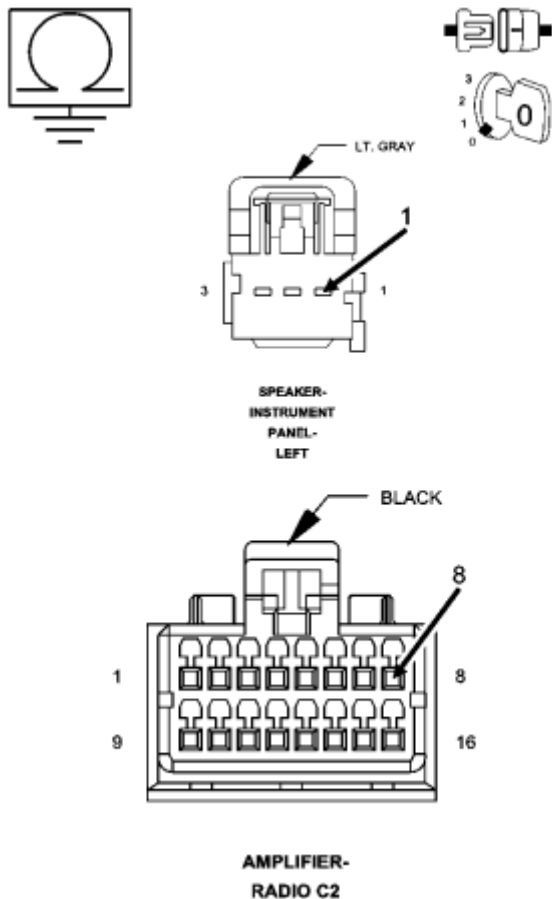
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c0f14

Fig. 38: Measuring Resistance Between Ground And (X201) Amplified Left Front I/P Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Left I/P Speaker harness connector.

Measure the resistance between ground and the (X201) Amplified Left Front I/P Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X201) Amplified Left Front I/P Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X291) AMPLIFIED LEFT FRONT I/P SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**

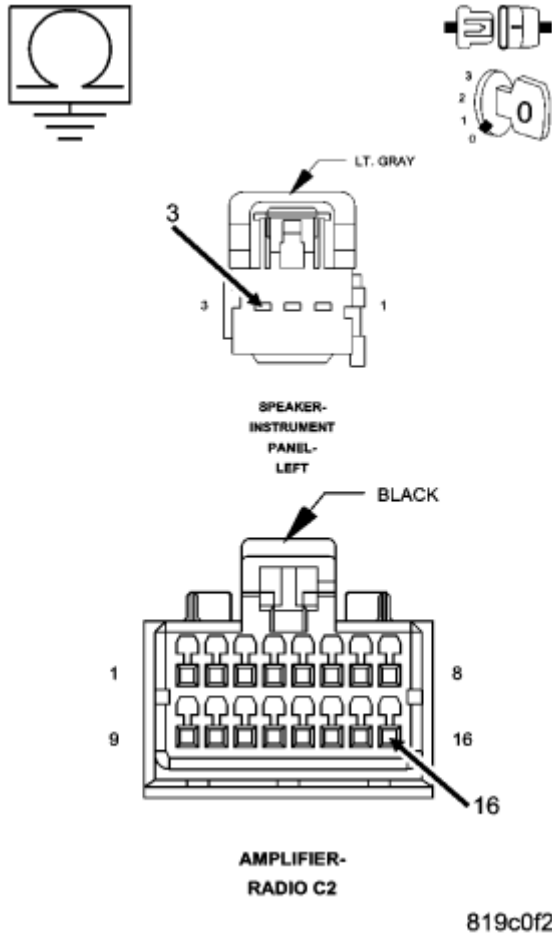


Fig. 39: Measuring Resistance Between Ground And Amplified Left Front I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X291) Amplified Left Front I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X291) Amplified Left Front I/P Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK OPERATION OF THE AMPLIFIED LEFT FRONT I/P SPEAKER**

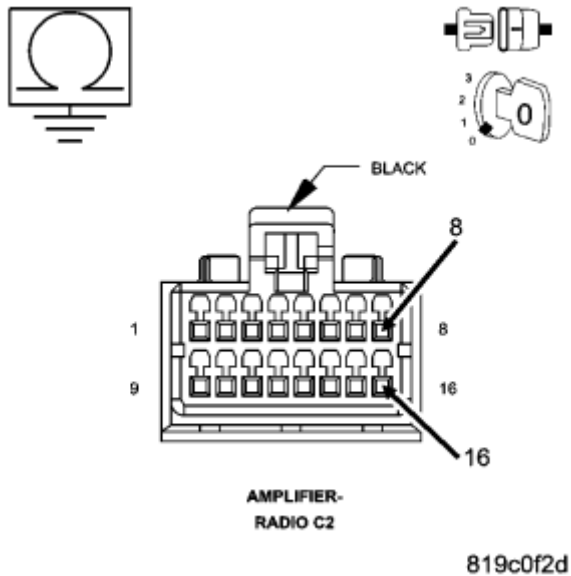


Fig. 40: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground
Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Front I/P Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Front I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

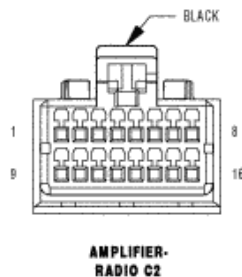
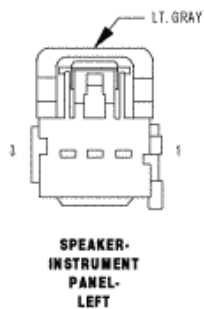
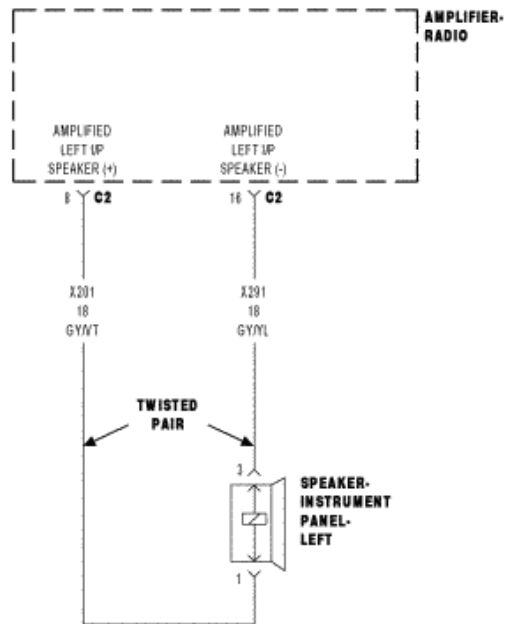
No

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1462-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



81N09477

Fig. 41: Channel 1 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1462-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT**

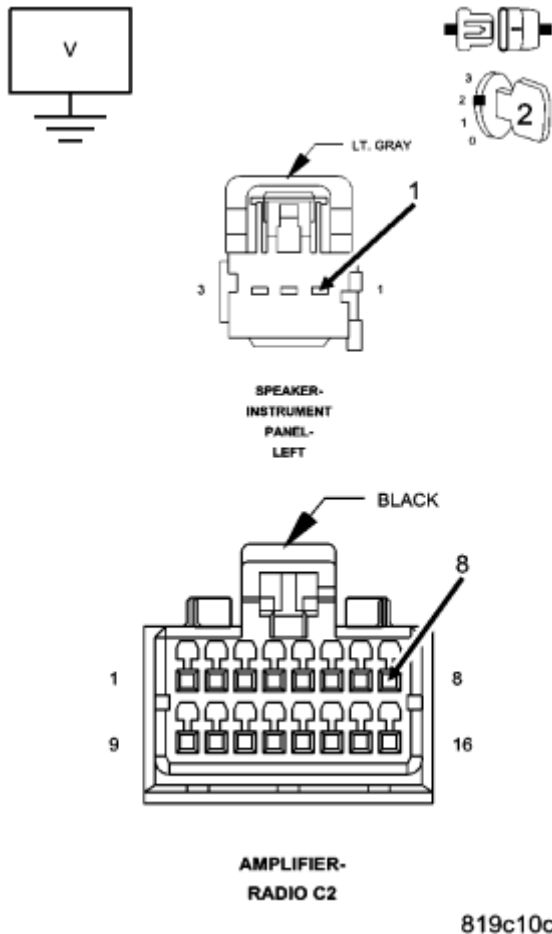


Fig. 42: Measuring For Voltage On (X201) Amplified Left I/P Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Left I/P Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X201) Amplified Left I/P Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X201) Amplified Left I/P Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT**

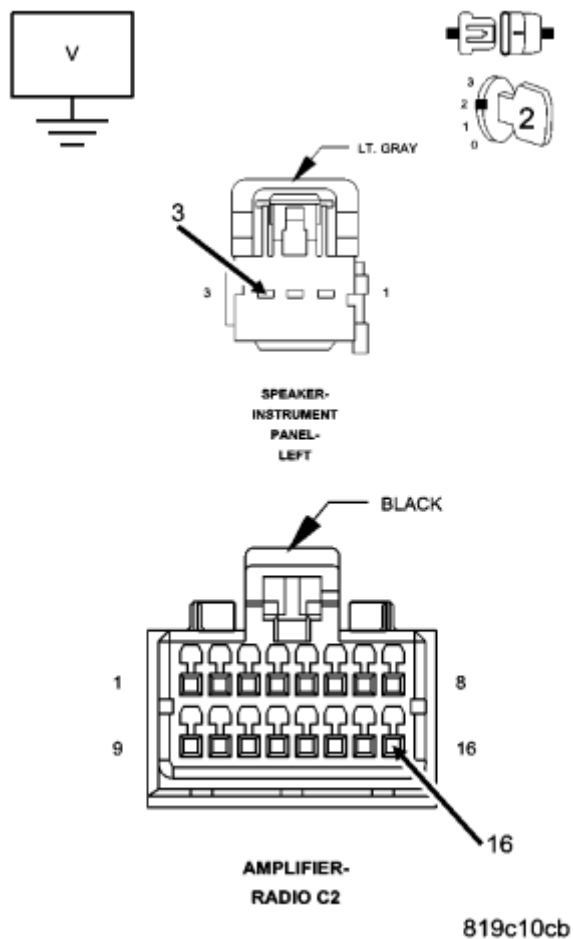


Fig. 43: Measuring For Voltage On (X291) Amplified Left I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X291) Amplified Left I/P Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X291) Amplified Left I/P Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1463-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT OPEN (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT OPEN LEFT FRONT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1463-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE LEFT FRONT I/P SPEAKER

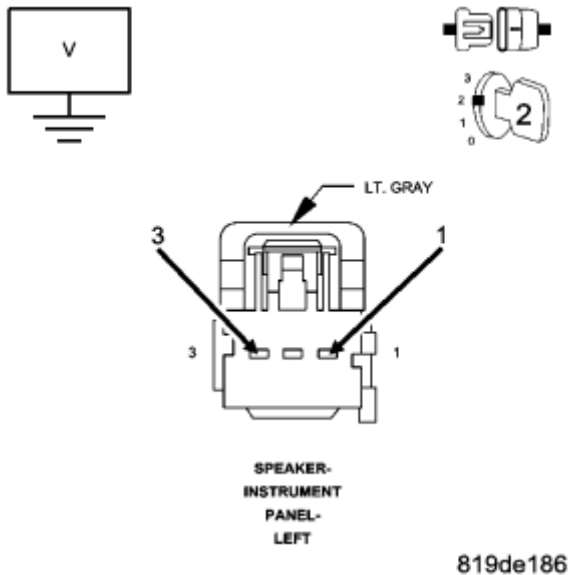


Fig. 44: Measuring Voltage Of Amplified Left I/P Speaker Circuits In Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left I/P Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left I/P Speaker circuits in the Amplified Left I/P Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Left I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT FOR AN OPEN**

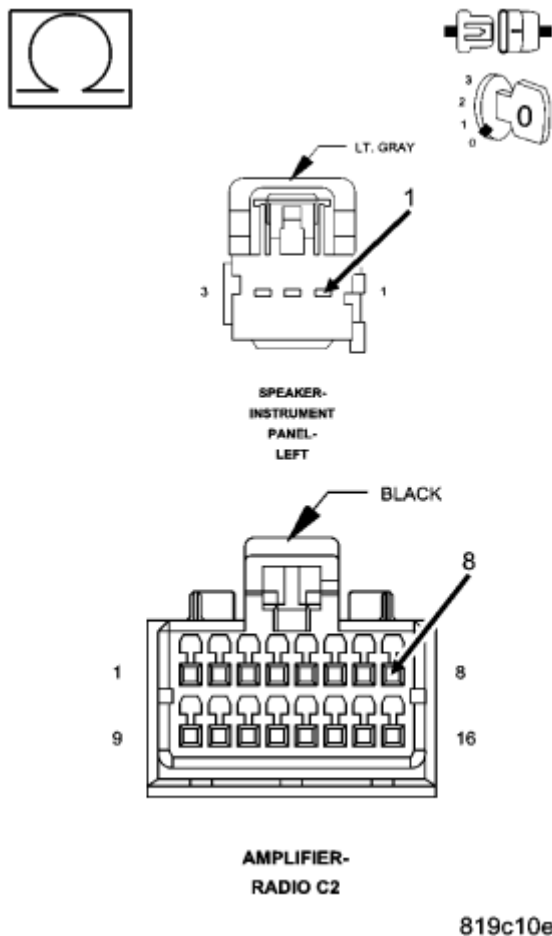


Fig. 45: Measuring Resistance Of (X201) Amplified Left I/P Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X201) Amplified Left I/P Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Left I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X201) Amplified Left I/P Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **CHECK THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT FOR AN OPEN**

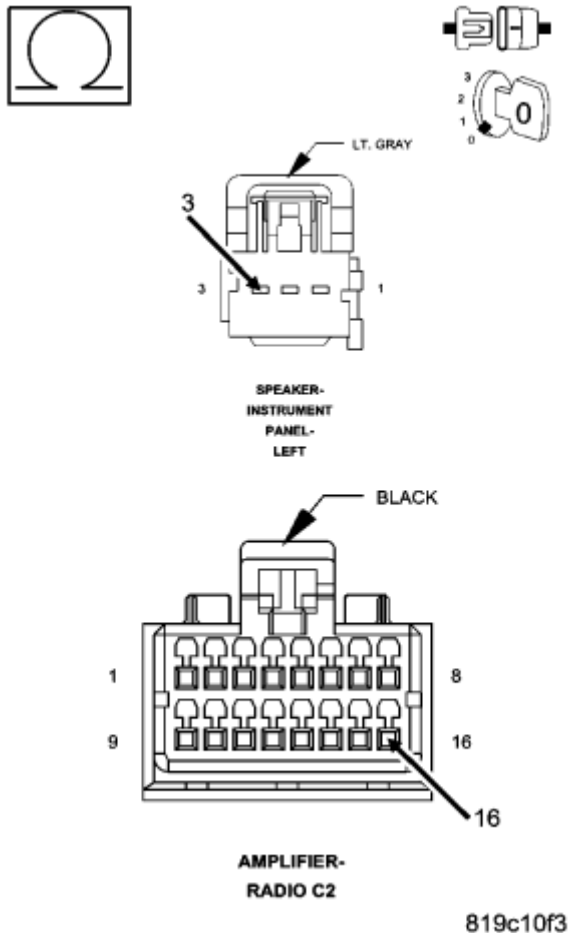


Fig. 46: Measuring Resistance Of (X291) Amplified Left I/P Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X291) amplified Left I/P Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Left I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

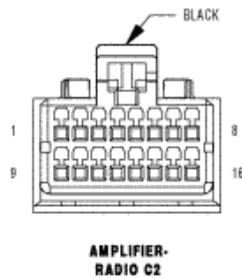
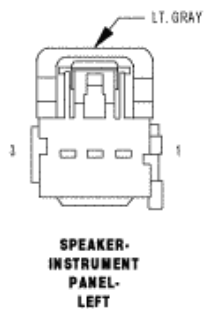
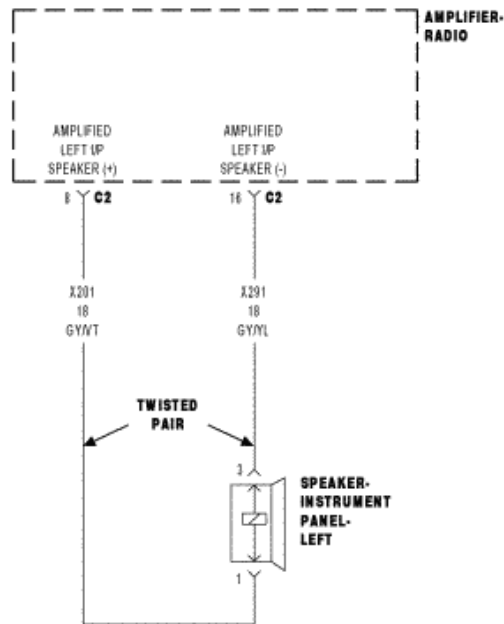
No

Repair the (X291) Amplified Left I/P Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1464-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



81N09477

Fig. 47: Channel 1 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT SHORTED TO THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT AMPLIFIED LEFT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1464-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT I/P SPEAKER

Turn the ignition off.

Disconnect the Amplified Left I/P Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

Replace the Amplified Left I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT, AND THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER

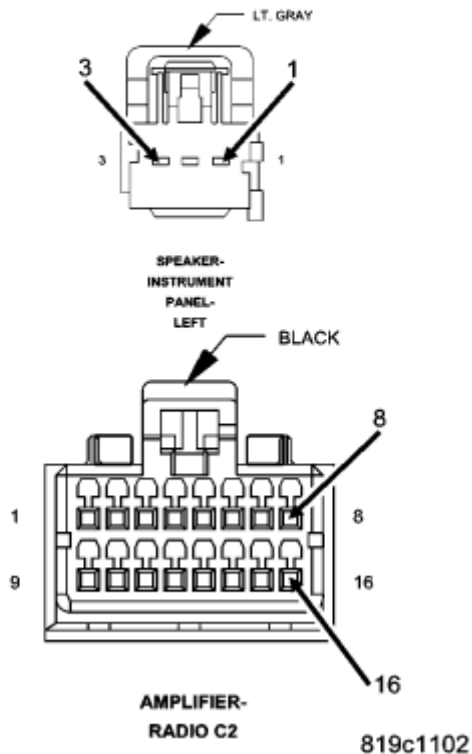


Fig. 48: Measuring Resistance Between (X201) Amplified Left I/P Speaker (+) Circuit And (X291) Amplified Left I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X201) Amplified Left I/P Speaker (+) circuit, and the (X291) Amplified Left I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X201) Amplified Left I/P Speaker (+) circuit, and the (X291) Amplified Left I/P Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1465-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read amplifier DTCs.

Does the scan tool display active: B1465-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

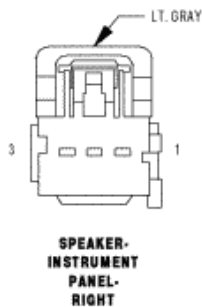
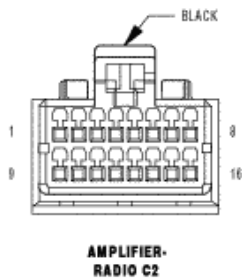
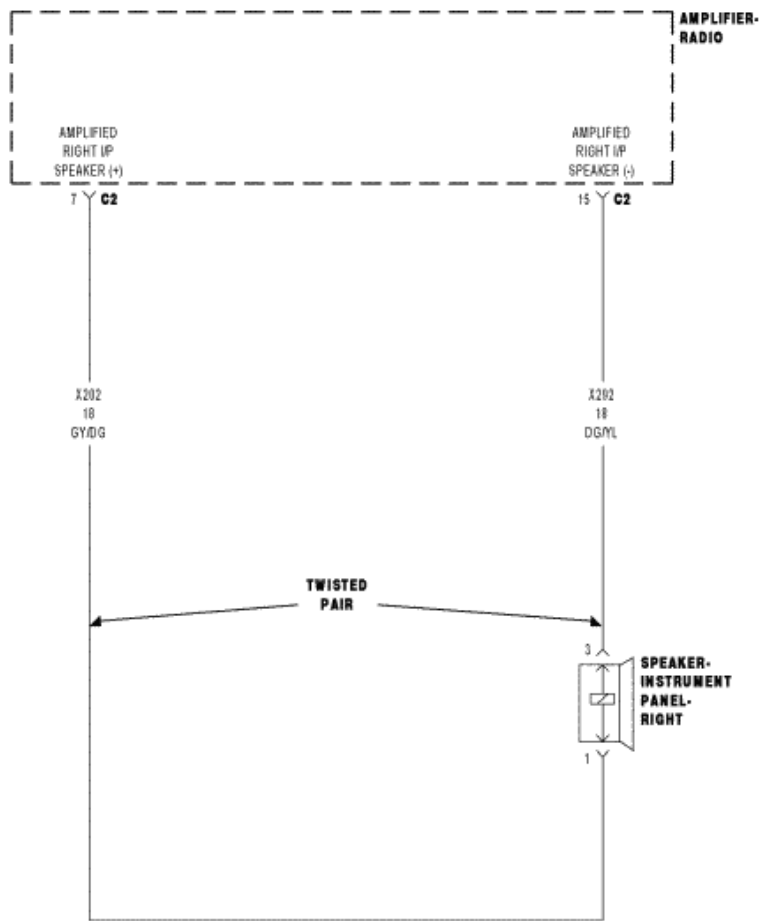
No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B1466-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c13a5

Fig. 49: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT FRONT I/P SPEAKER (+) CIRCUIT SHORTED TO GROUND (X292) AMPLIFIED RIGHT FRONT I/P SPEAKER (-) CIRCUIT SHORTED TO GROUND RIGHT FRONT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1466-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

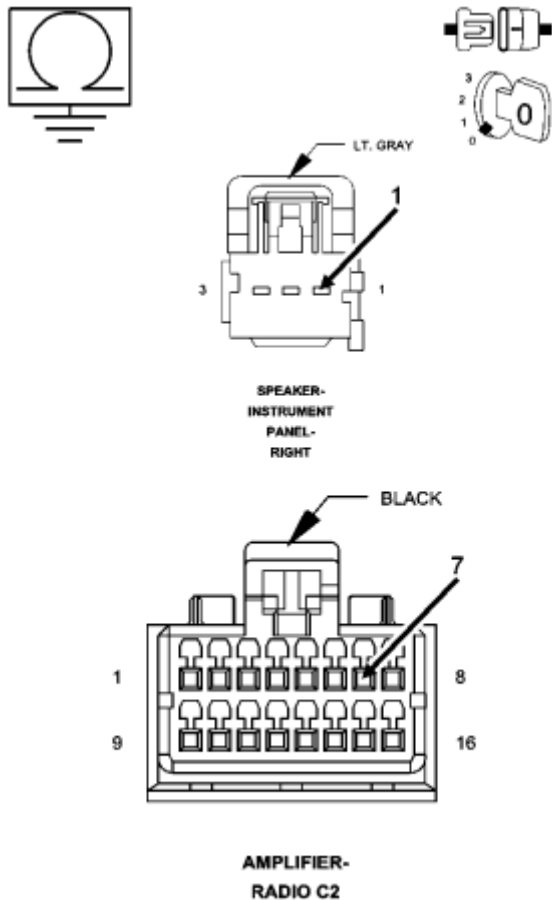
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X202) AMPLIFIED RIGHT FRONT I/P SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c142f

Fig. 50: Measuring Resistance Between Ground And (X202) Amplified Right Front I/P Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Right Front I/P Speaker harness connector.

Measure the resistance between ground and the (X202) Amplified Right Front I/P Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X202) Amplified Right Front I/P Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X292) AMPLIFIED RIGHT FRONT I/P SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**

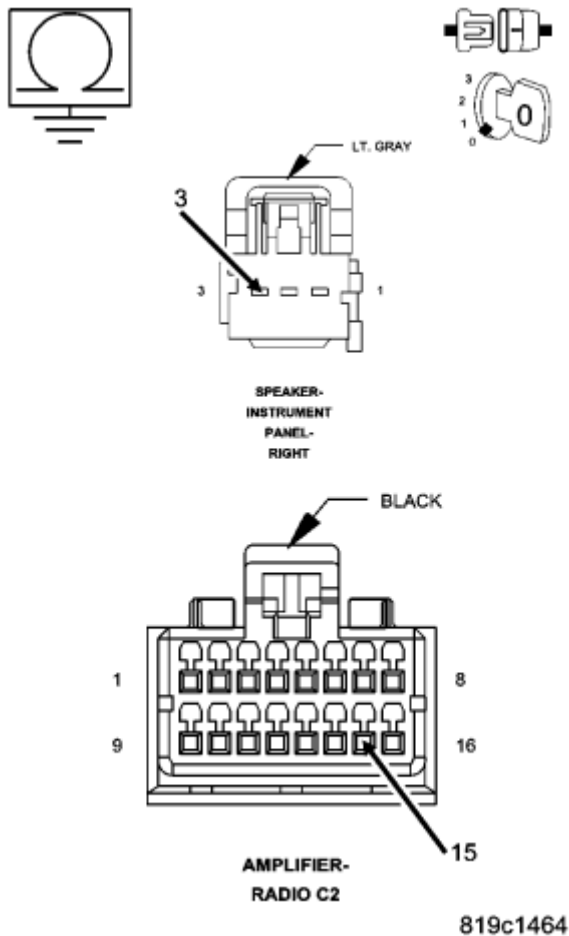


Fig. 51: Measuring Resistance Between Ground And (X292) Amplified Right Front I/P Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X292) Amplified Right Front I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X292) Amplified Right Front I/P Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT FRONT I/P SPEAKER

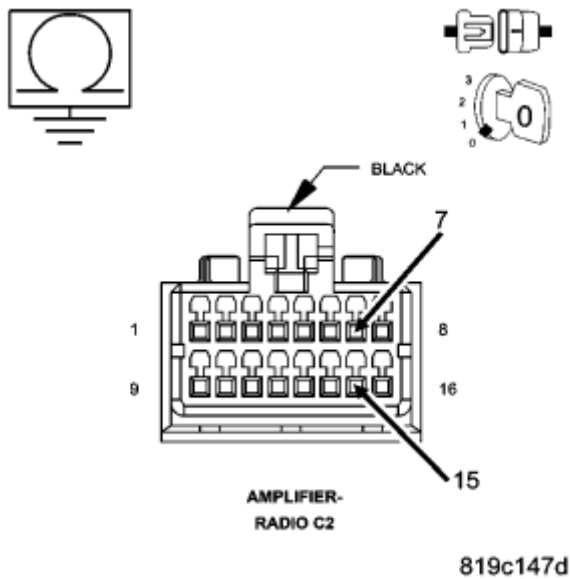


Fig. 52: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Front I/P Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Front I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

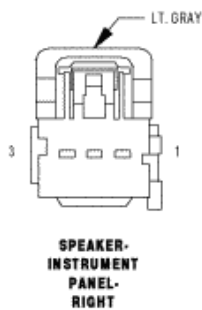
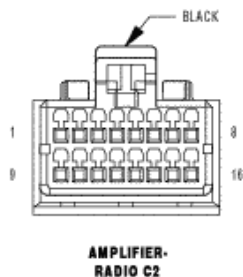
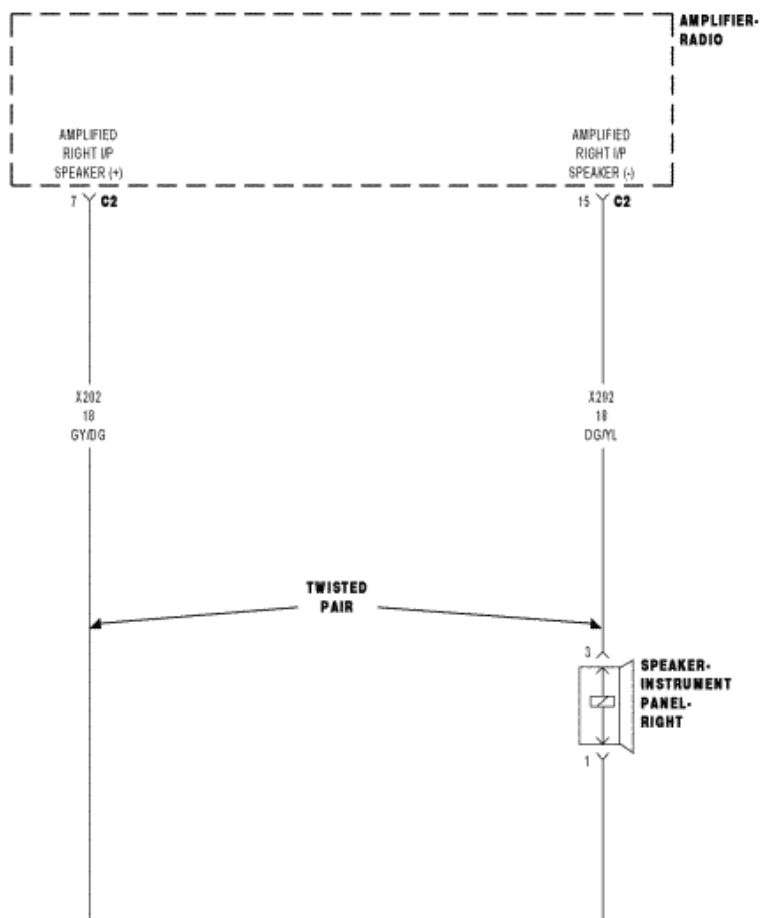
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1467-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c13a5

Fig. 53: Channel 2 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1467-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

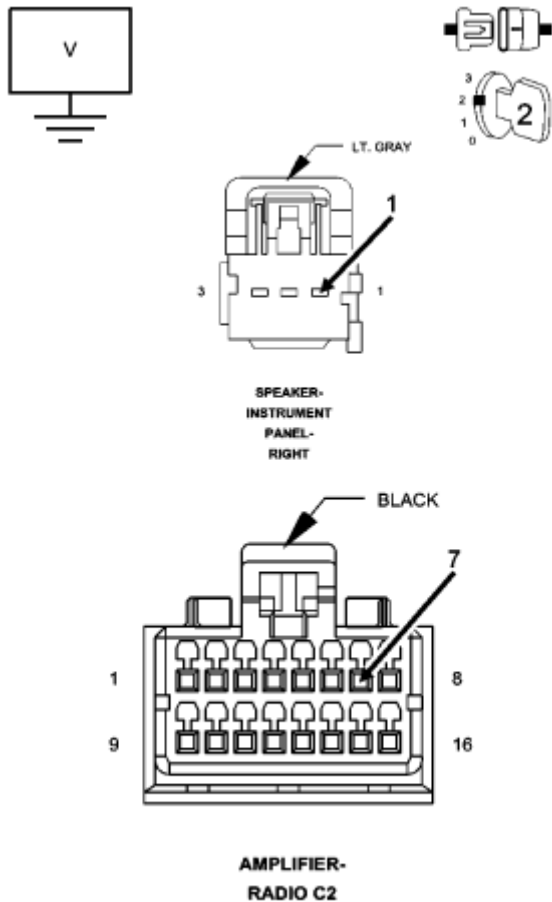
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT**



819c16c6

Fig. 54: Measuring For Voltage On (X202) Amplified Right I/P Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Right I/P Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X202) Amplified Right I/P Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X202) Amplified Right I/P Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK FOR VOLTAGE ON THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT

Measure for voltage on the (X292) Amplified Right I/P Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X292) Amplified Right I/P Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

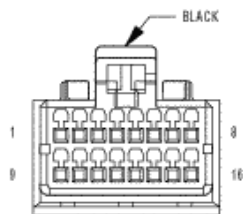
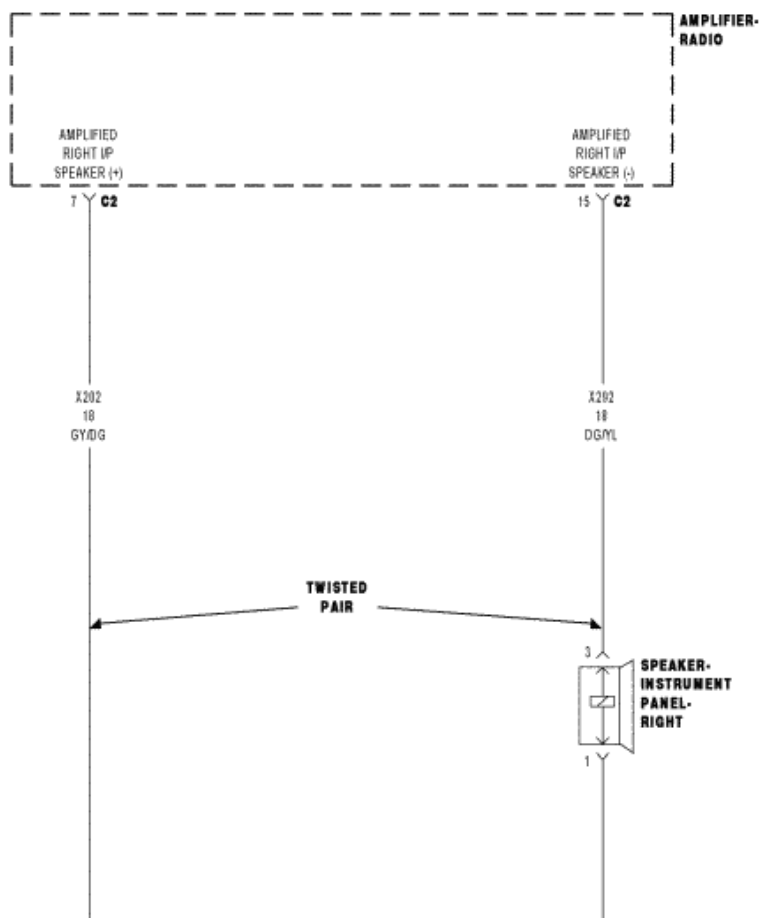
No

Replace the amplifier in accordance with the service information.

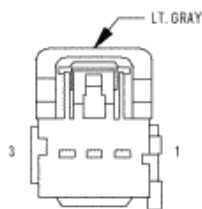
Perform **BODY VERIFICATION TEST - VER 1** .

B1468-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



AMPLIFIER-RADIO C2



SPEAKER-INSTRUMENT PANEL-RIGHT

019c13a5

Fig. 55: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT OPEN
(X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT OPEN
RIGHT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1468-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE RIGHT FRONT I/P SPEAKER

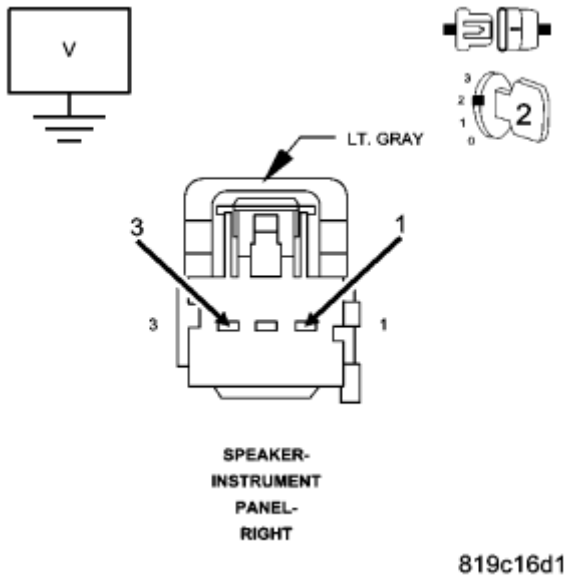


Fig. 56: Measuring Voltage Of Amplified Right I/P Speaker Circuits In Amplified Right I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right I/P Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right I/P Speaker circuits in the Amplified Right I/P Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

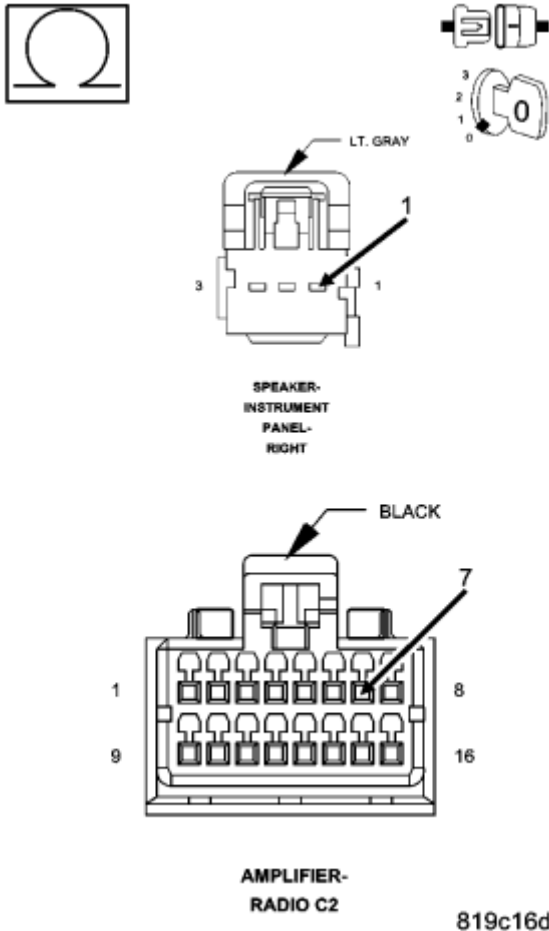
Replace the Amplified Right I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. CHECK THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT FOR AN OPEN



819c16de

Fig. 57: Measuring Resistance Of (X202) Amplified Right I/P Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Right I/P Speaker Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X202) Amplified Right I/P Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Right I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X202) Amplified Right I/P Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT FOR AN OPEN**

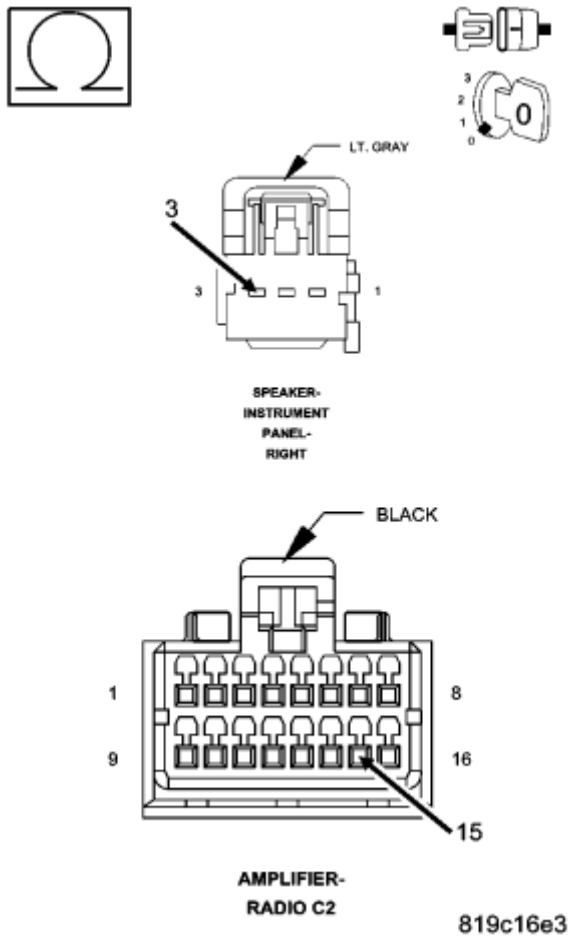


Fig. 58: Measuring Resistance Of (X292) Amplified Right I/P Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Right I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X292) Amplified Right I/P Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Right I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

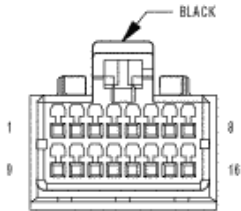
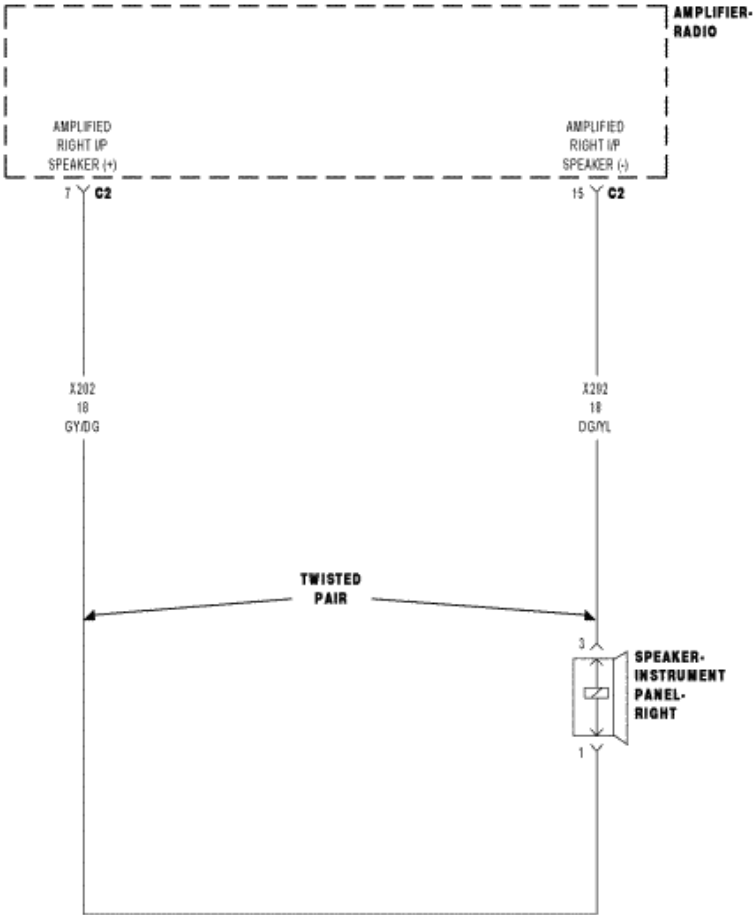
No

Repair the (X292) Amplified Right I/P Speaker (-) circuit for an open.

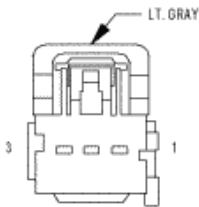
Perform **BODY VERIFICATION TEST - VER 1 .**

B1469-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



**AMPLIFIER-
RADIO C2**



**SPEAKER-
INSTRUMENT
PANEL-
RIGHT**

Fig. 59: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT SHORTED TO THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT AMPLIFIED RIGHT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1469-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT I/P SPEAKER

Turn the ignition off.

Disconnect the Amplified Right I/P Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

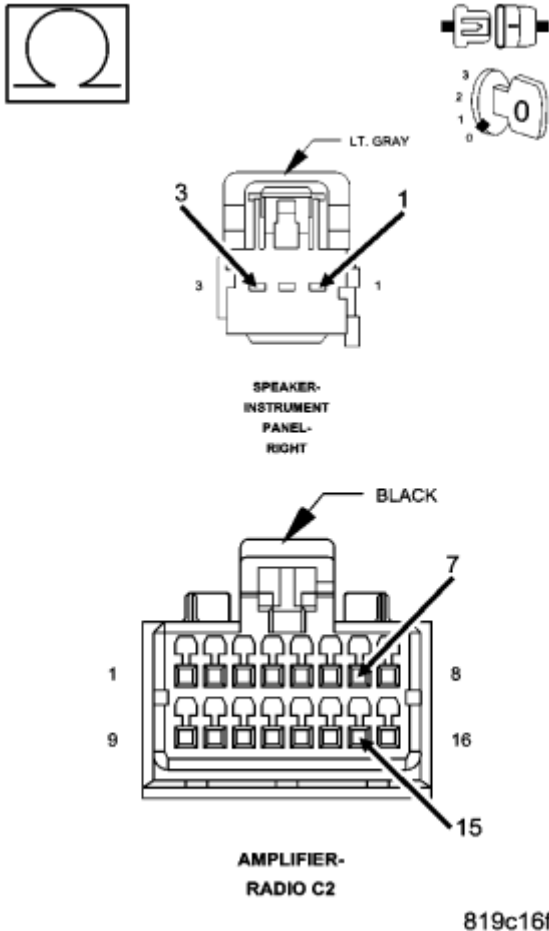
Replace the Amplified Right I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT, AND THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c16fd

Fig. 60: Measuring Resistance Between (X202) Amplified Right I/P Speaker (+) Circuit And (X292) Amplified Right I/P Speaker (-) Circuit
 Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X202) Amplified Right I/P Speaker (+) circuit, and the (X292) Amplified Right I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X202) Amplified Right I/P Speaker (+) circuit, and the (X292) Amplified Right I/P Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146A-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146A-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

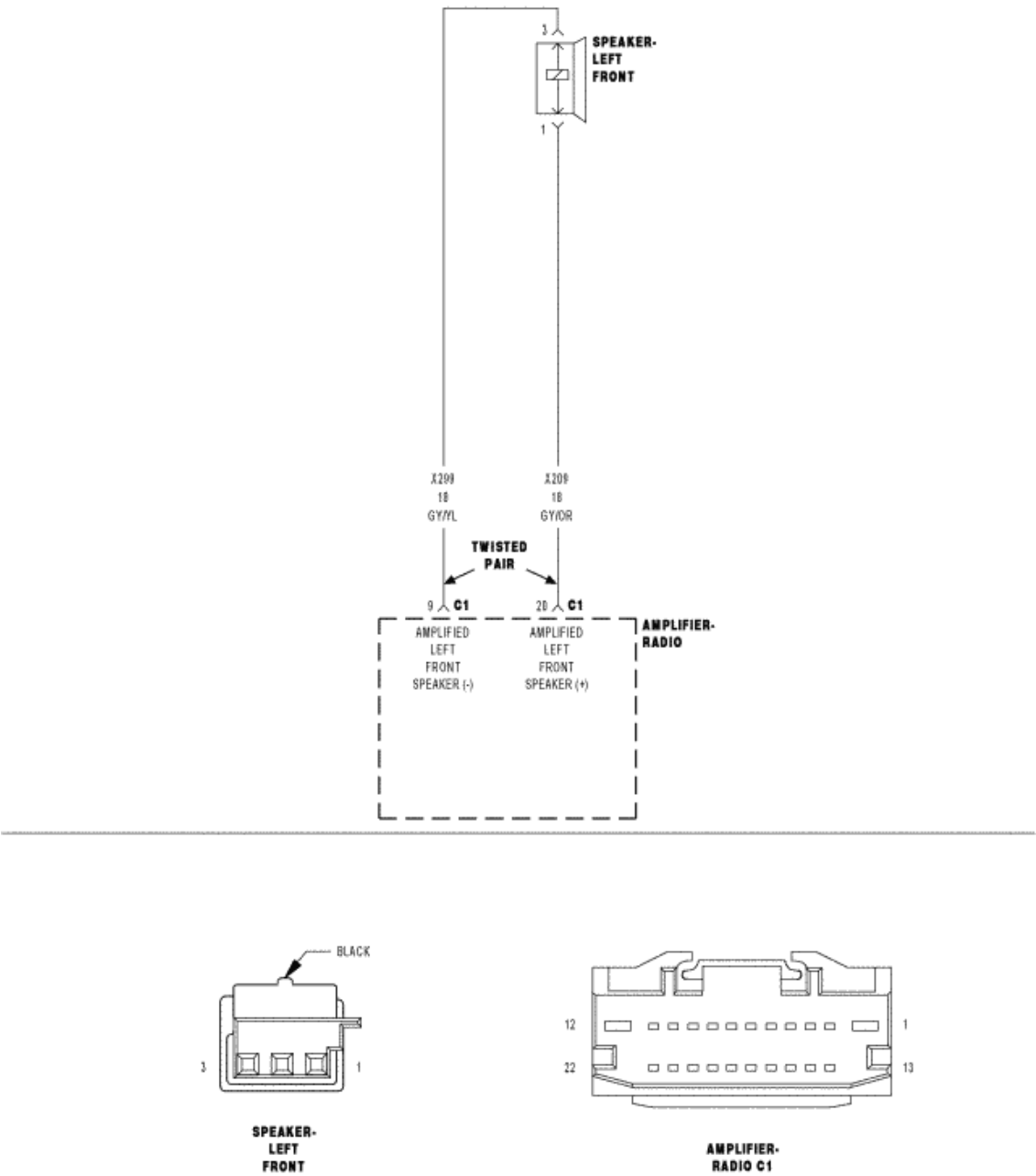
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B146B-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c10af

Fig. 61: Channel 3 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146B-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

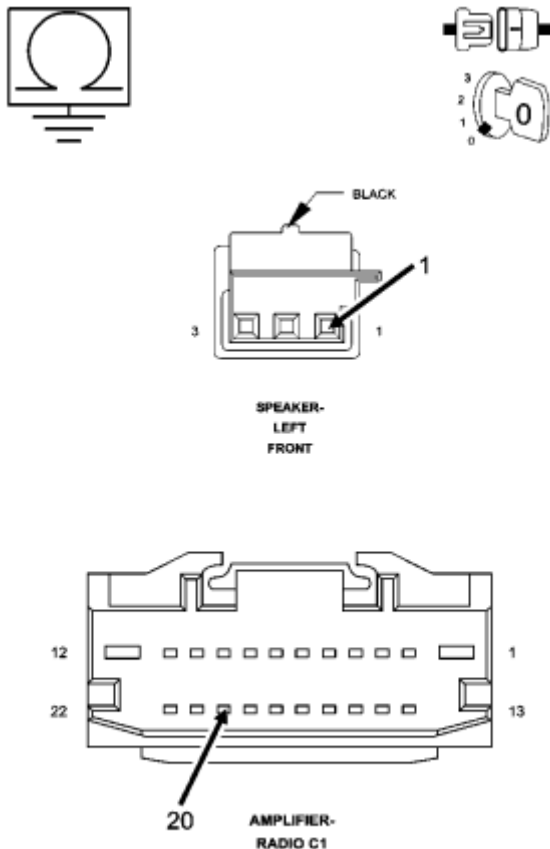
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c1937

Fig. 62: Measuring Resistance Between Ground And (X209) Amplified Left Front Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Left Front Speaker harness connector.

Measure the resistance between ground and the (X209) Amplified Left Front Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

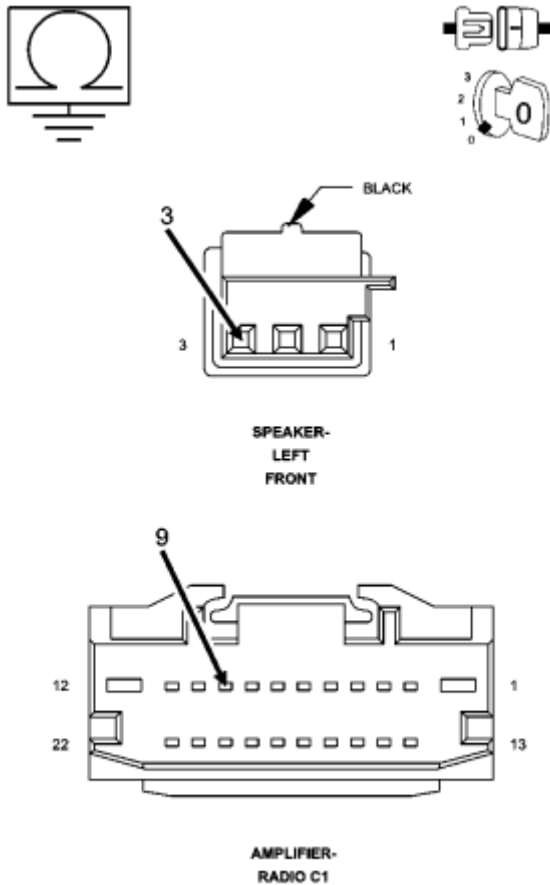
Repair the (X209) Amplified Left Front Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c1977

Fig. 63: Measuring Resistance Between Ground And (X299) Amplified Left Front Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X299) Amplified Left Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

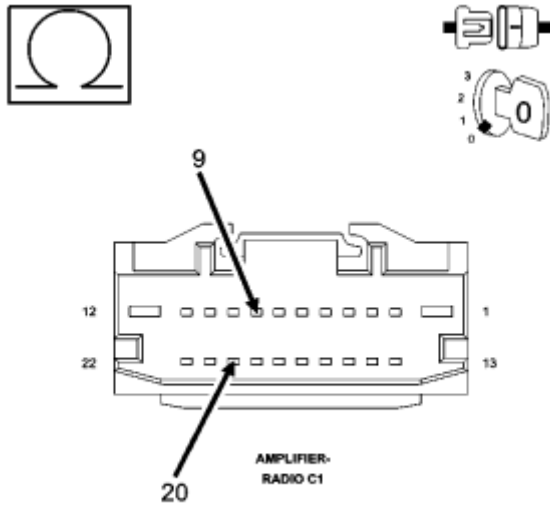
Repair the (X299) Amplified Left Front Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER



819c19ba

Fig. 64: Measuring Resistance Of Speaker Circuit Between Amplifier C1 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Front Speaker.

Measure the resistance of the speaker circuit between the Amplifier C1 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

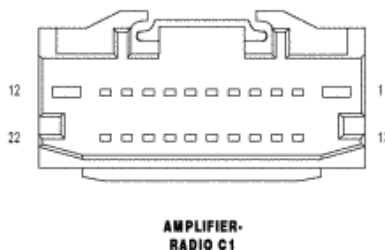
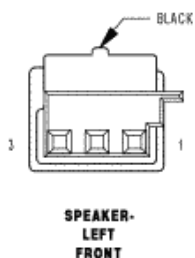
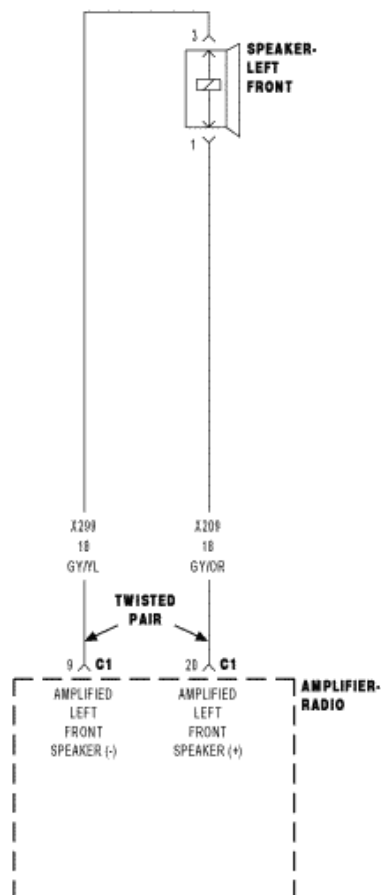
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146C-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



010c10a1

Fig. 65: Channel 3 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146C-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

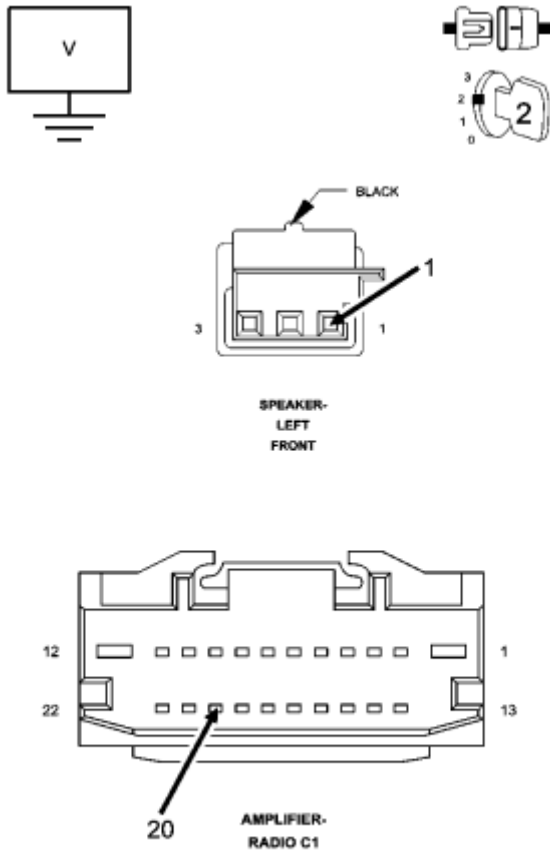
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR VOLTAGE ON THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT



819c1a0a

Fig. 66: Measuring For Voltage On (X209) Amplified Left Front Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Amplified Left Front Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X209) Amplified Left Front Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

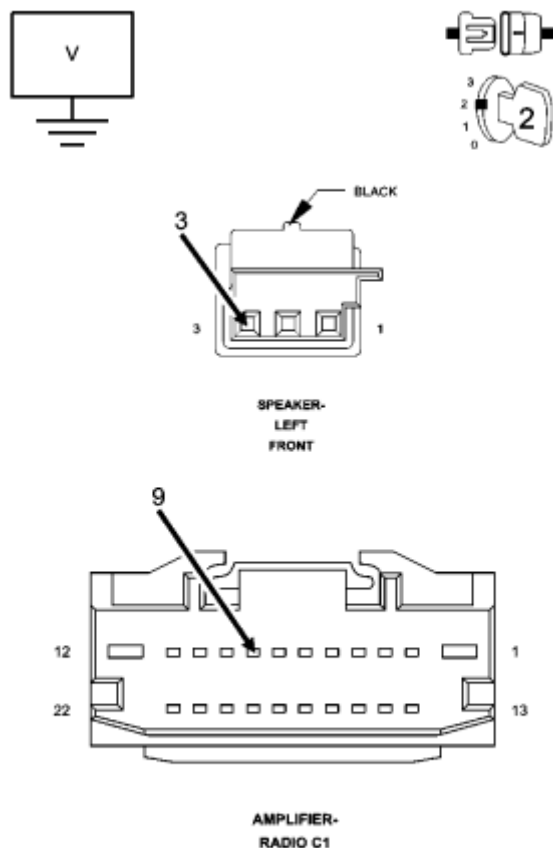
Repair the (X209) Amplified Left Front Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT**



819c1a4a

Fig. 67: Measuring For Voltage On (X299) Amplified Left Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X299) Amplified Left Front Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X299) Amplified Left Front Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

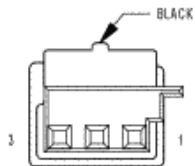
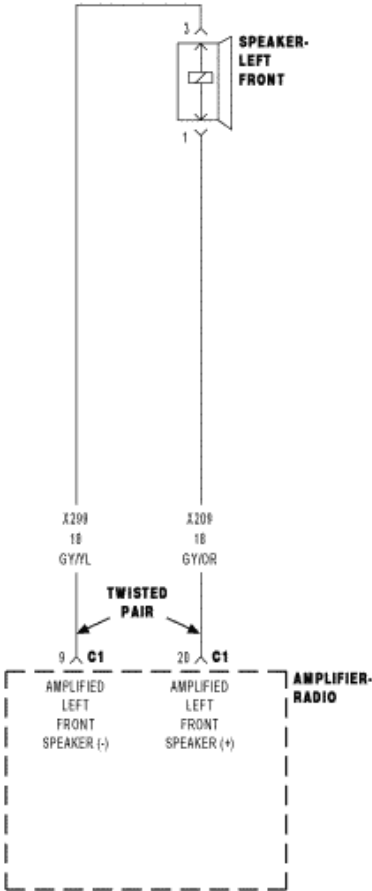
No

Replace the amplifier in accordance with the service information.

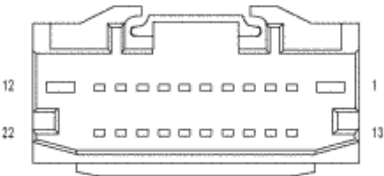
Perform **BODY VERIFICATION TEST - VER 1 .**

B146D-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



**SPEAKER-
LEFT
FRONT**



**AMPLIFIER-
RADIO C1**

Fig. 68: Channel 3 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT OPEN (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT OPEN AMPLIFIED LEFT FRONT SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146D-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

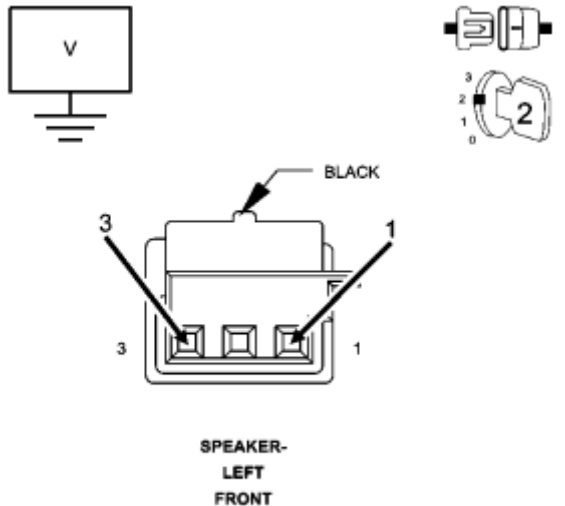
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER



819c1aa2

Fig. 69: Measuring Voltage Of Amplified Left Front Speaker Circuits In Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplified Left Front Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left Front Speaker circuits in the Amplified Left Front Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

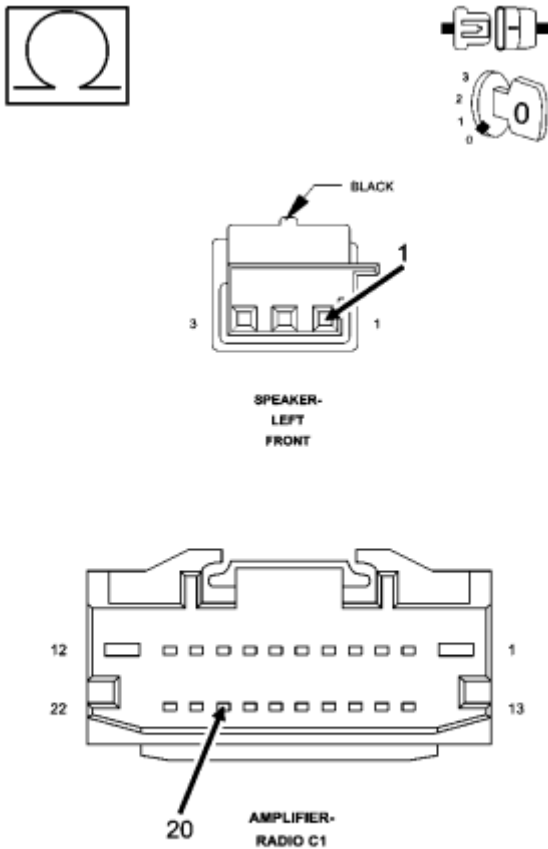
Replace the Amplified Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT FOR AN OPEN**



819c1aad

Fig. 70: Measuring Resistance Of (X209) Amplified Left Front Speaker (+) Circuit Between Amplifier C1 Harness Connector And Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Measure the resistance of the (X209) Amplified Left Front Speaker (+) circuit between the Amplifier C1 harness connector and the Amplified Left Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

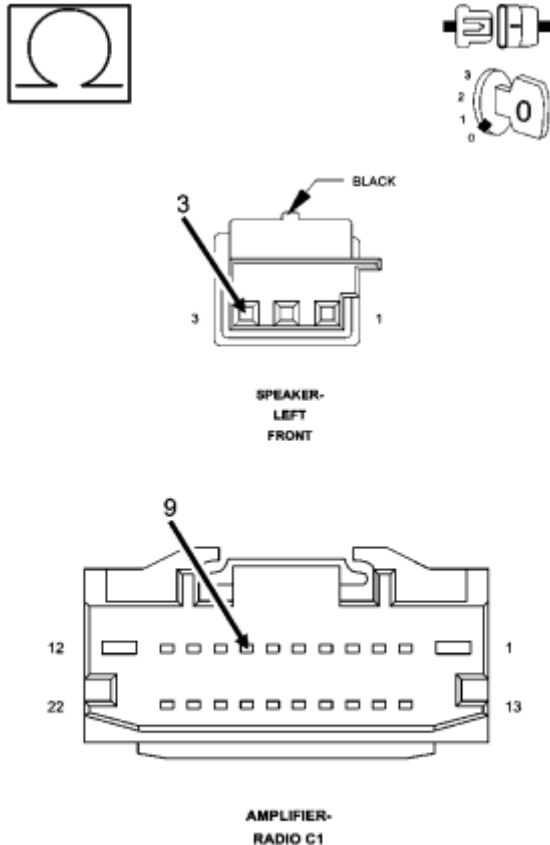
Go To 4.

No

Repair the (X209) Amplified Left Front Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT FOR AN OPEN



819c1ab4

Fig. 71: Measuring Resistance Of (X299) Amplified Left Front Speaker (-) Circuit Between Amplifier C1 Harness Connector And Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X299) Amplified Left Front Speaker (-) circuit between the Amplifier C1 harness connector and the Amplified Left Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

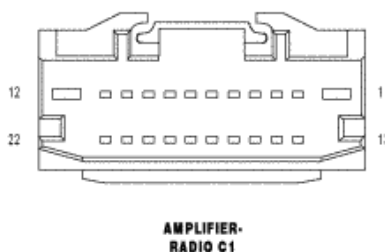
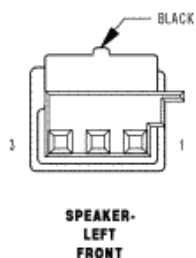
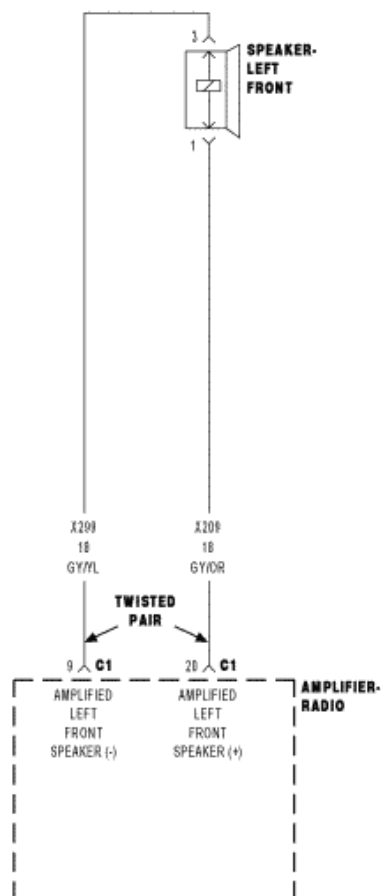
No

Repair the (X299) Amplified Left Front Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B146E-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



010c10a1

Fig. 72: Channel 3 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORTED TO THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT
AMPLIFIED LEFT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146E-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER

Turn the ignition off.

Disconnect the Amplified Left Front Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

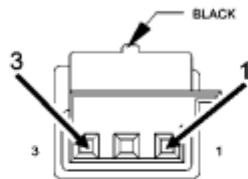
Replace the Amplified Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

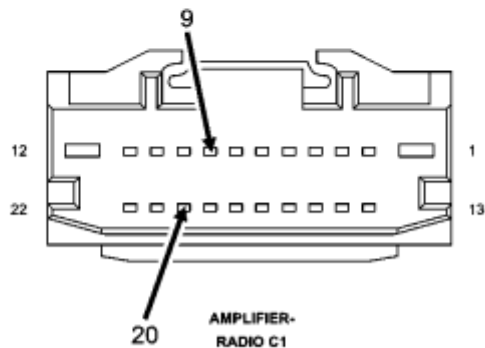
No

Go To 3.

3. CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT, AND THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



SPEAKER-
LEFT
FRONT



819c1ac0

Fig. 73: Measuring Resistance Between (X209) Amplified Left Front Speaker (+) Circuit And (X299) Amplified Left Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C1 harness connector.

Measure the resistance between the (X209) Amplified Left Front Speaker (+) circuit, and the (X299) Amplified Left Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X209) Amplified Left Front Speaker (+) circuit, and the (X299) Amplified Left Front Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146F-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read amplifier DTCs.

Does the scan tool display active: B146F-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

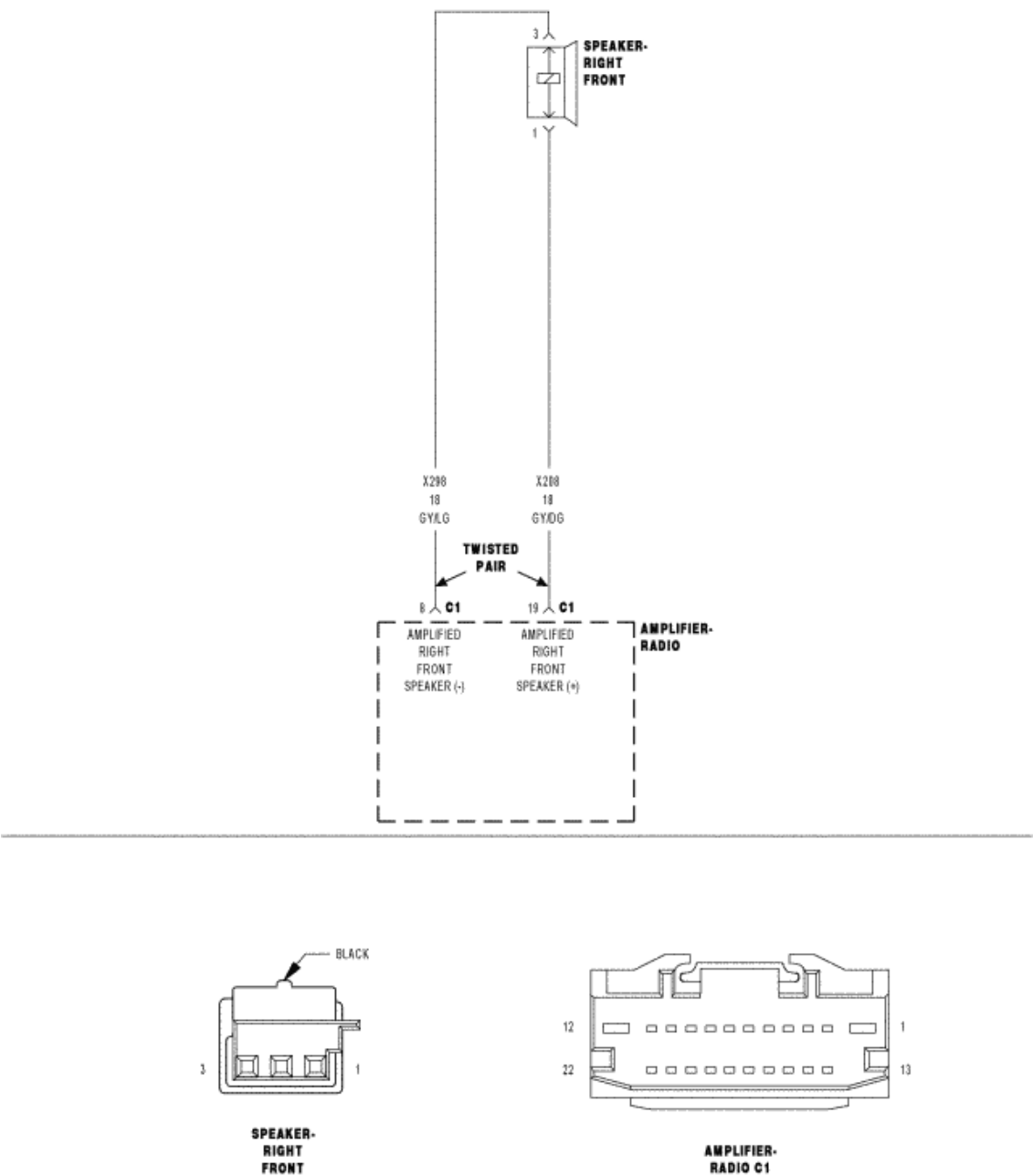
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B1470-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



01042000

Fig. 74: Channel 4 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT SHORTED TO GROUND
RIGHT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1470-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

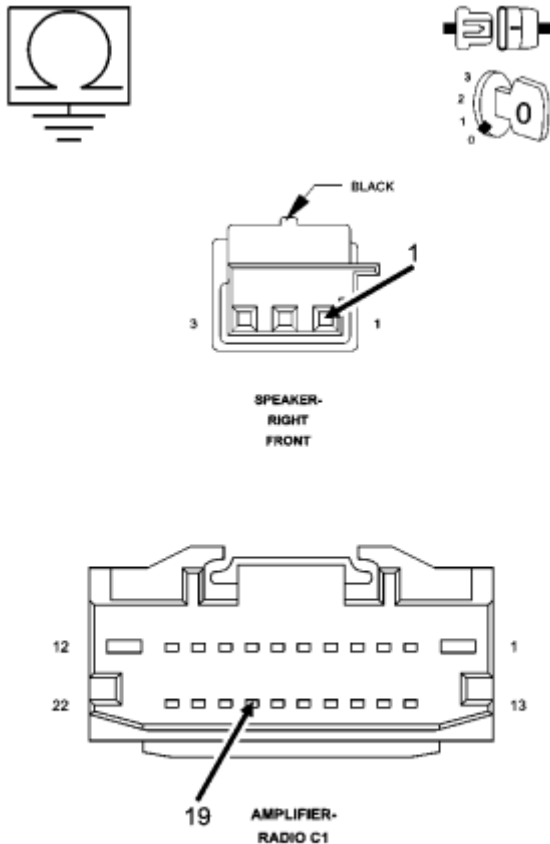
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c26a3

Fig. 75: Measuring Resistance Between Ground And (X208) Amplified Right Front Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Right Front Speaker harness connector.

Measure the resistance between ground and the (X208) Amplified Right Front Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

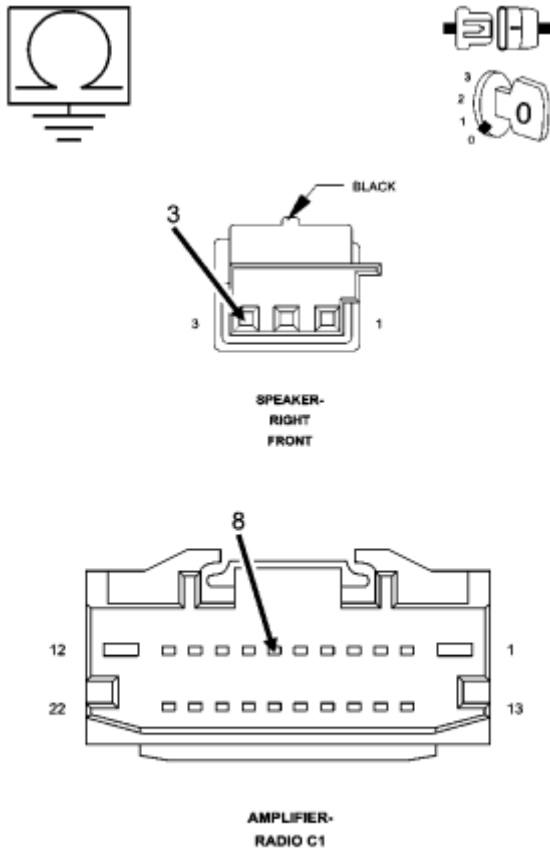
Repair the (X208) Amplified Right Front Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c26c6

Fig. 76: Measuring Resistance Between Ground And (X298) Amplified Right Front Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X298) Amplified Right Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X298) Amplified Right Front Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER

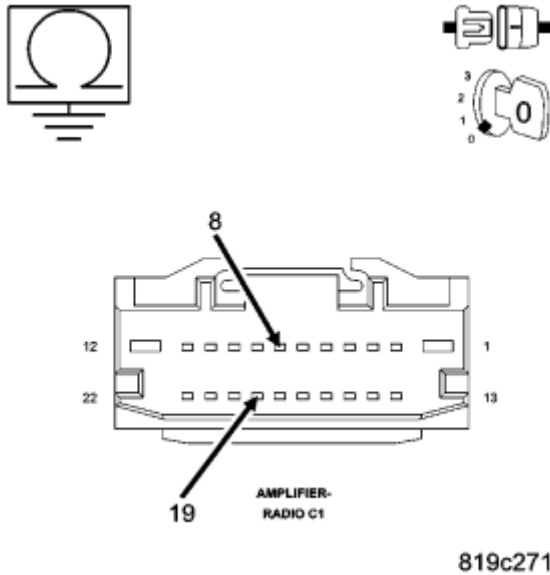


Fig. 77: Measuring Resistance Of Speaker Circuit Between Amplifier C1 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Front Speaker.

Measure the resistance of the speaker circuit between the Amplifier C1 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

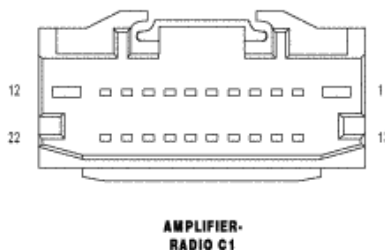
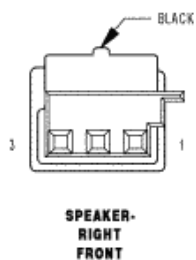
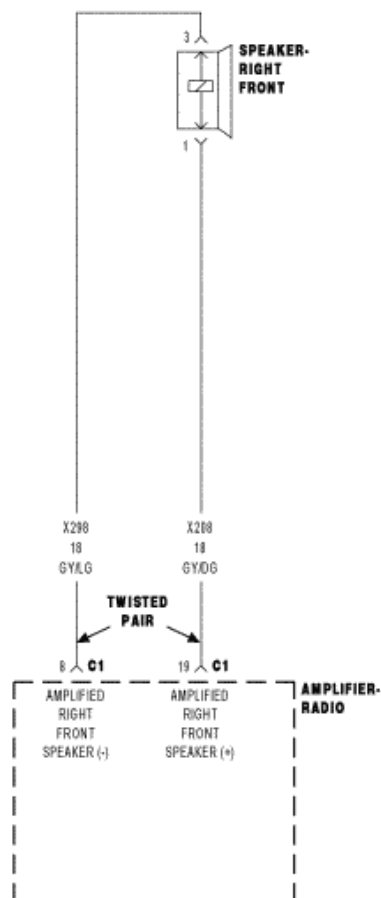
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1471-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c3000

Fig. 78: Channel 4 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1471-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

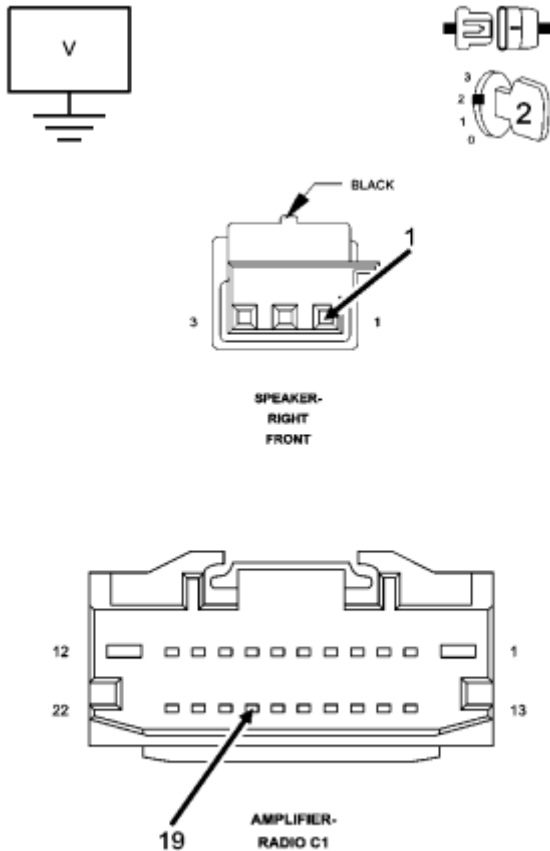
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT**



819c293e

Fig. 79: Measuring For Voltage On (X208) Amplified Right Front Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Amplified Right Front Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X208) Amplified Right Front Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

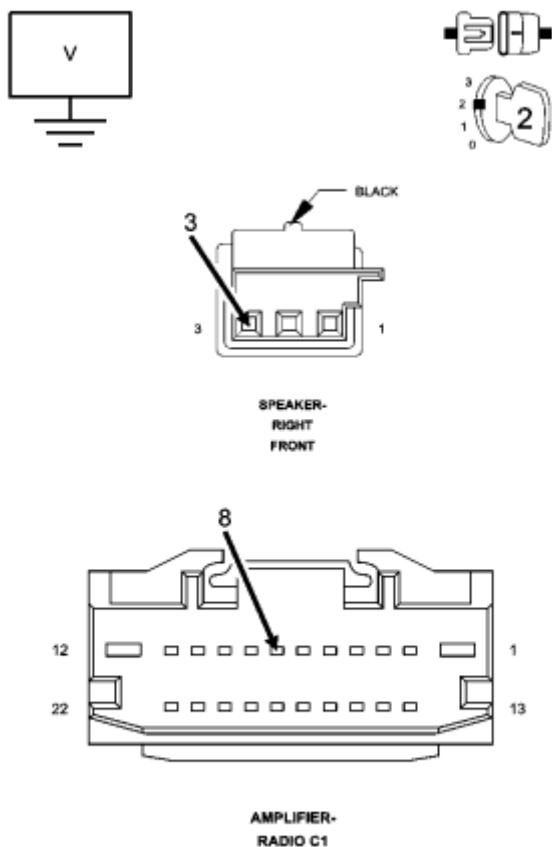
Repair the (X208) Amplified Right Front Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT**



819c2947

Fig. 80: Measuring For Voltage On (X298) Amplified Right Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X298) Amplified Right Front Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X298) Amplified Right Front Speaker (-) circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

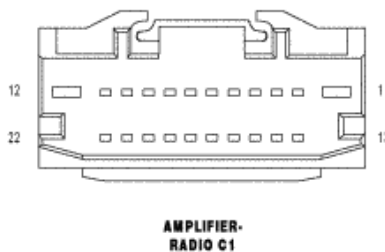
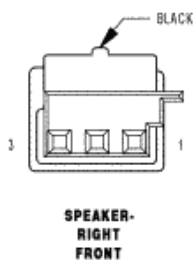
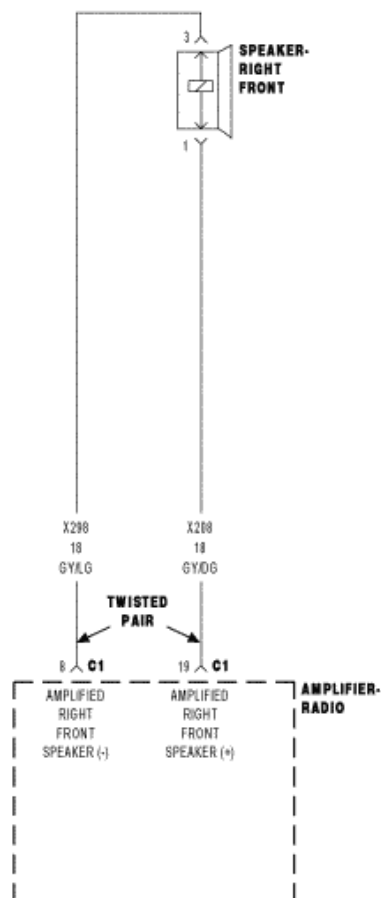
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1472-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



019c3000

Fig. 81: Channel 4 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT OPEN
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT OPEN
AMPLIFIED RIGHT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1472-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER

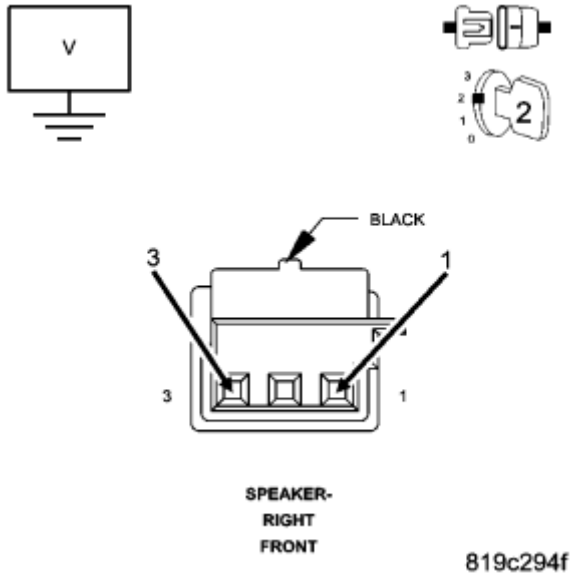


Fig. 82: Measuring Voltage Of Amplified Right Front Speaker Circuits In Amplified Right Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplified Right Front Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right Front Speaker circuits in the Amplified Right Front Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

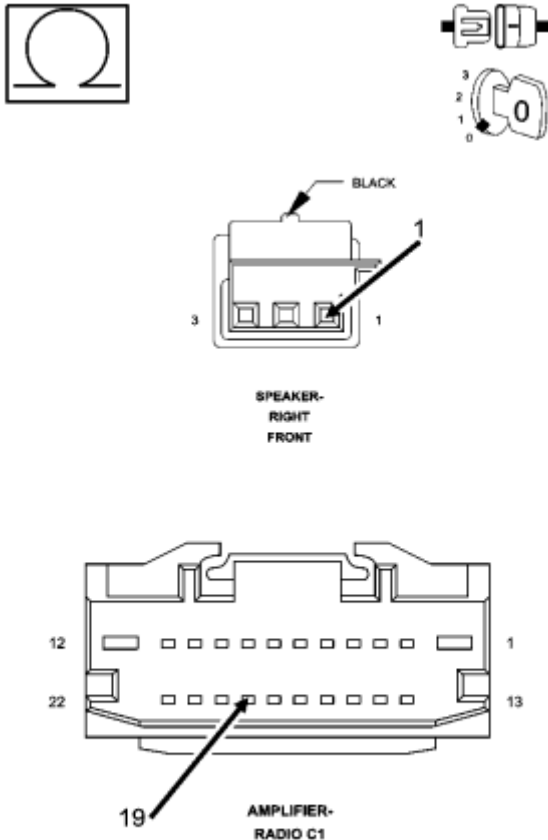
Replace the Amplified Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT FOR AN OPEN



819c295c

Fig. 83: Measuring Resistance Of (X208) Amplified Right Front Speaker (+) Circuit Between Amplifier C1 Harness Connector And Amplified Right Front Speaker Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Measure the resistance of the (X208) Amplified Right Front Speaker (+) circuit between the Amplifier C1 harness connector and the Amplified Right Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

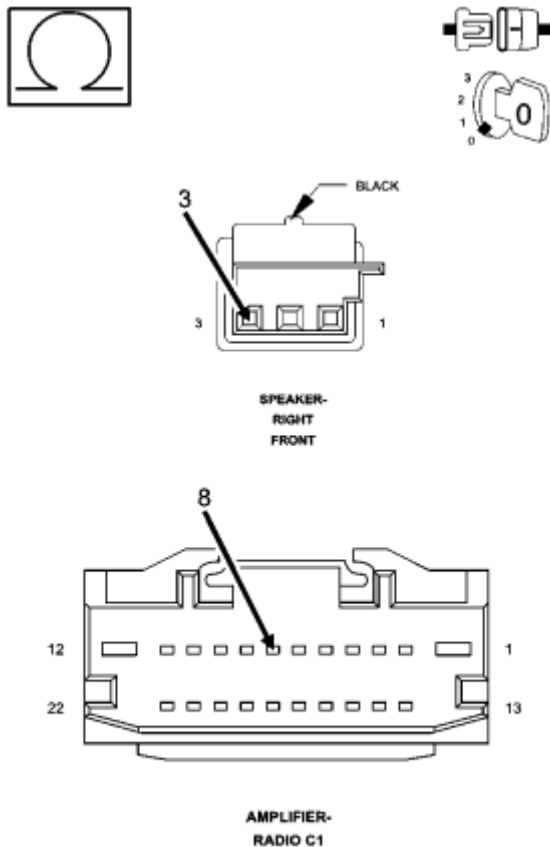
Go To 4.

No

Repair the (X208) Amplified Right Front Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **CHECK THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT FOR AN OPEN**



819c2962

Fig. 84: Measuring Resistance Of (X298) Amplified Right Front Speaker (-) Circuit Between Amplifier C1 Harness Connector And Amplified Right Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X298) Amplified Right Front Speaker (-) circuit between the Amplifier C1 harness connector and the Amplified Right Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Repair the (X298) Amplified Right Front Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1473-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic

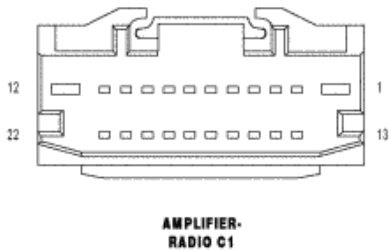
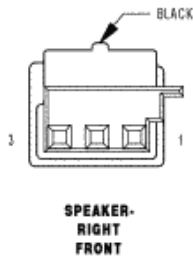
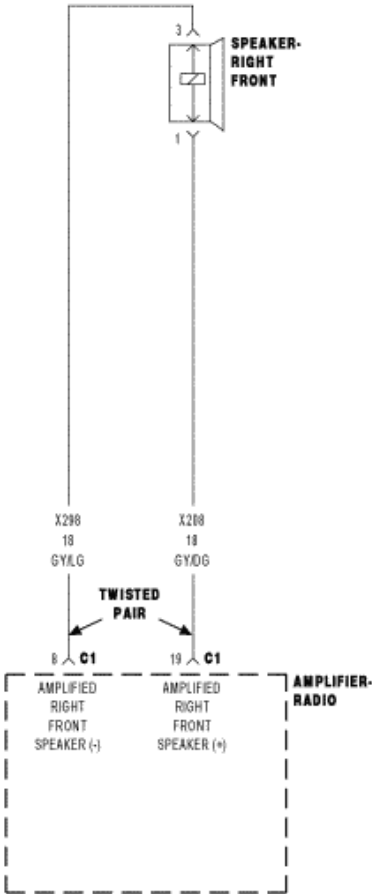


Fig. 85: Channel 4 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORTED TO THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT AMPLIFIED RIGHT FRONT SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1473-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER

Turn the ignition off.

Disconnect the Amplified Right Front Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

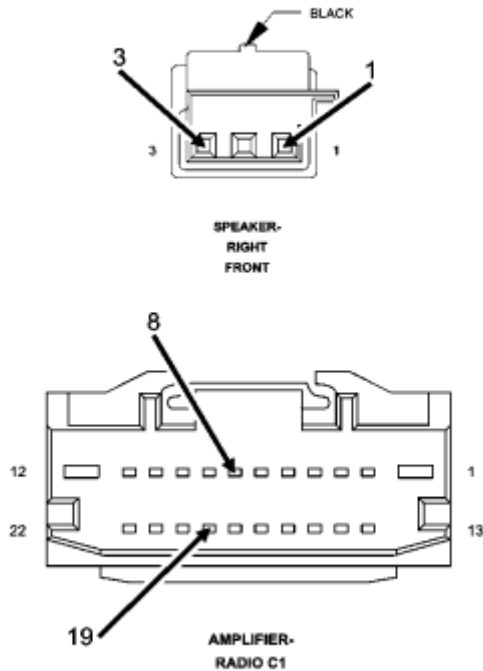
Replace the Amplified Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT, AND THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c29c2

Fig. 86: Measuring Resistance Between (X208) Amplified Right Front Speaker (+) Circuit And (X298) Amplified Right Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C1 harness connector.

Measure the resistance between the (X208) Amplified Right Front Speaker (+) circuit, and the (X298) Amplified Right Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X208) Amplified Right Front Speaker (+) circuit, and the (X298) Amplified Right Front Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1474-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1474-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

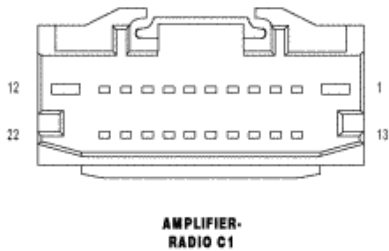
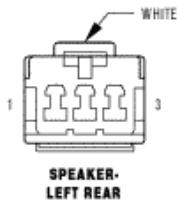
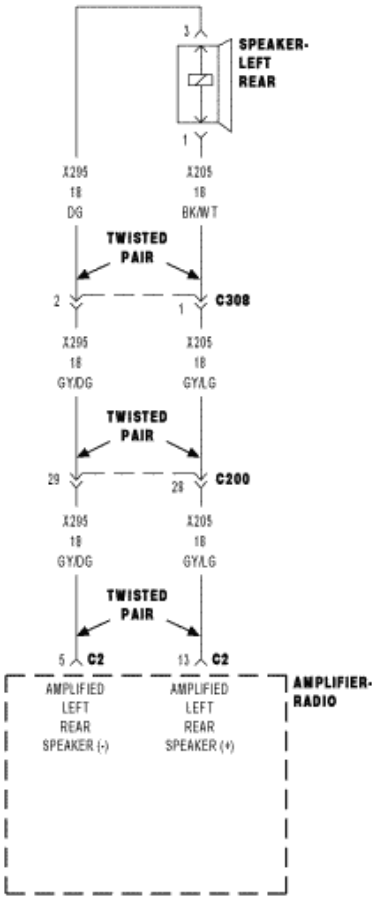
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B1475-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c0070

Fig. 87: Channel 5 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT REAR SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1475-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

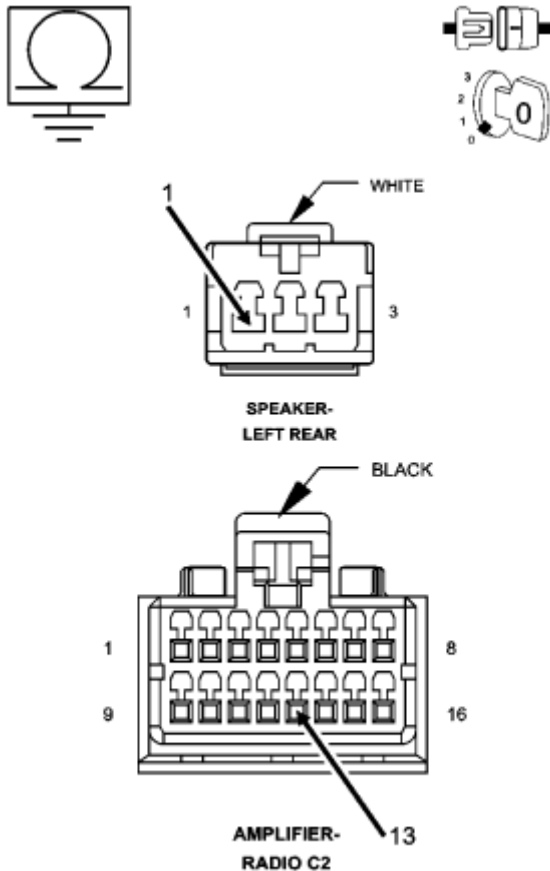
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c2bb5

Fig. 88: Measuring Resistance Between Ground And Amplified Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Left Rear Speaker harness connector.

Measure the resistance between ground and the (X205) Amplified Left Rear Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

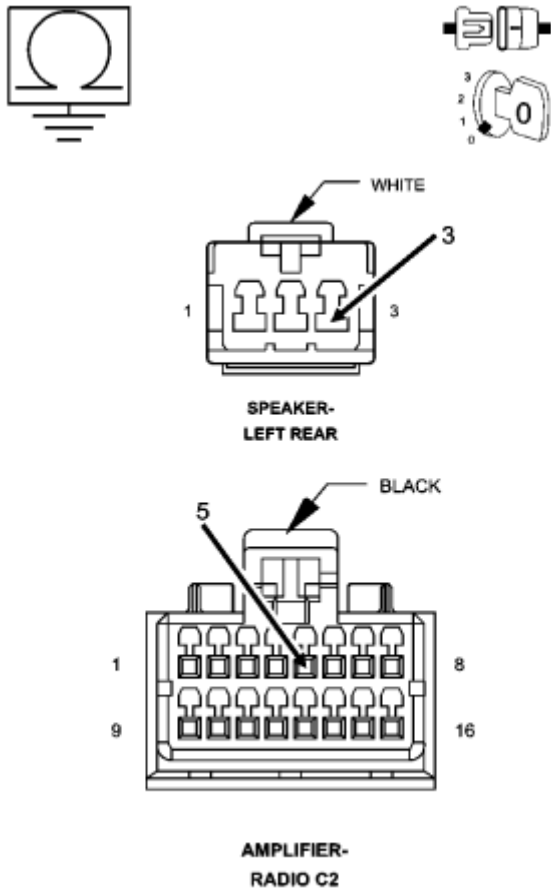
Repair the (X205) Amplified Left Rear Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c2bf0

Fig. 89: Measuring Resistance Between Ground And Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X295) Amplified Left Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

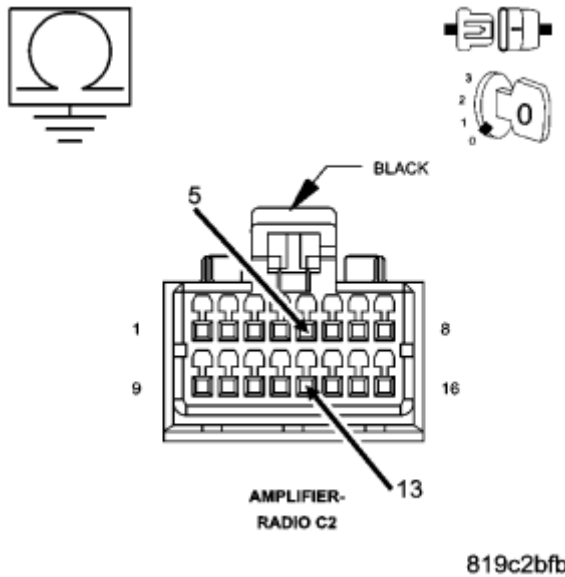
Repair the (X295) Amplified Left Rear Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER



819c2bfb

Fig. 90: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Rear Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

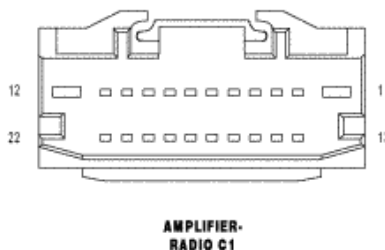
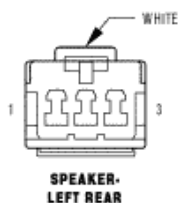
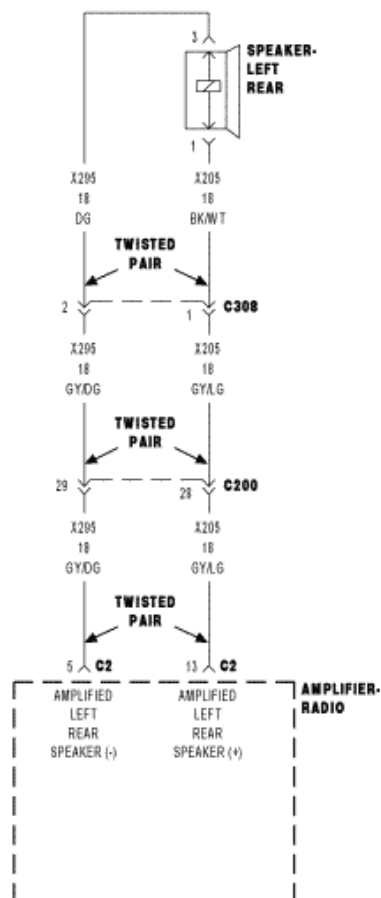
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1476-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c2073

Fig. 91: Channel 5 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1476-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT**

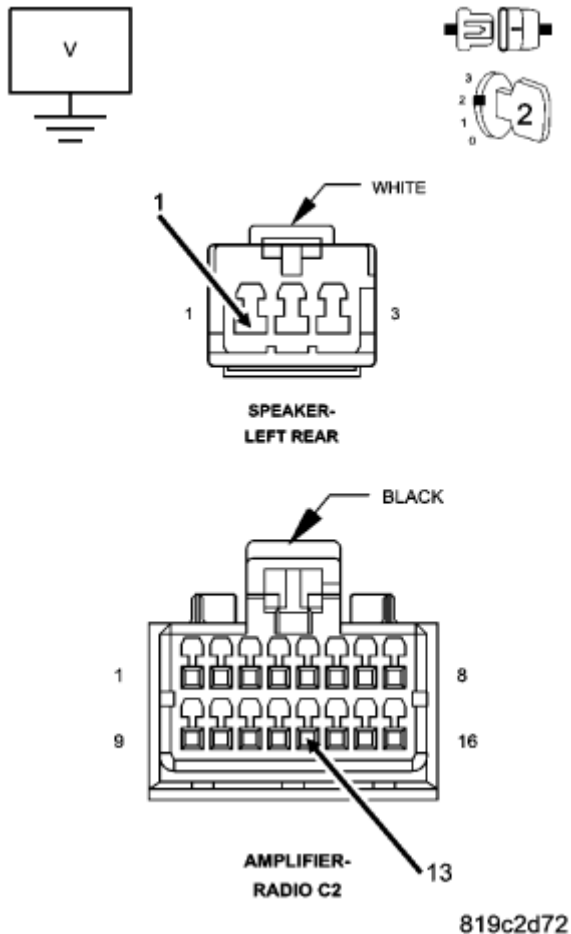


Fig. 92: Measuring For Voltage On (X205) Amplified Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Left Rear Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X205) Amplified Left Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X205) Amplified Left Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT**

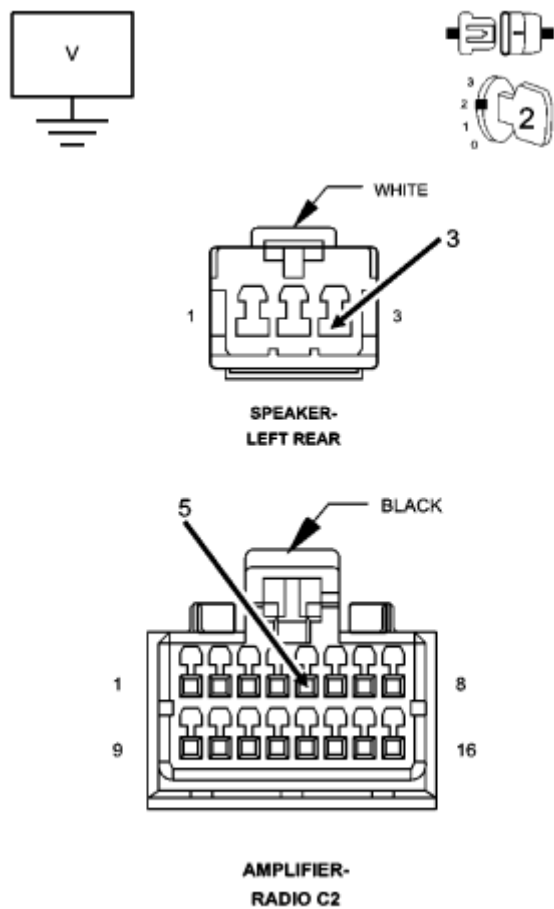


Fig. 93: Measuring For Voltage On (X295) Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X295) Amplified Left Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X295) Amplified Left Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1477-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

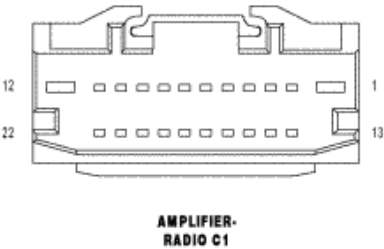
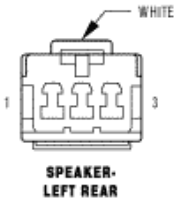
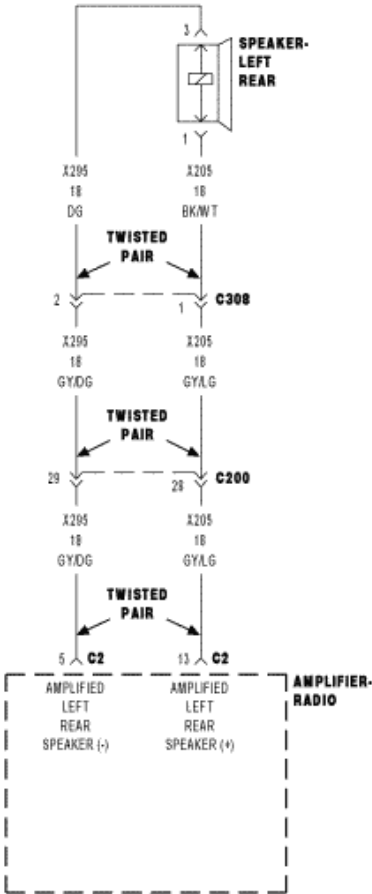


Fig. 94: Channel 5 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT OPEN (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT OPEN LEFT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1477-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

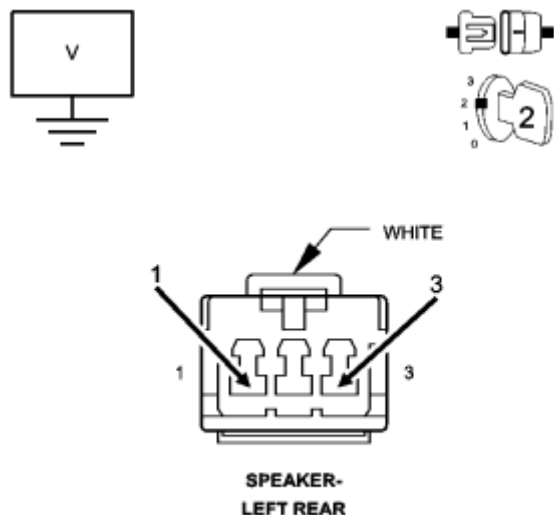
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER



819c2d99

Fig. 95: Measuring Voltage Of Amplified Left Rear Speaker Circuits In Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left Rear Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left Rear Speaker circuits in the Amplified Left Rear Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT FOR AN OPEN**

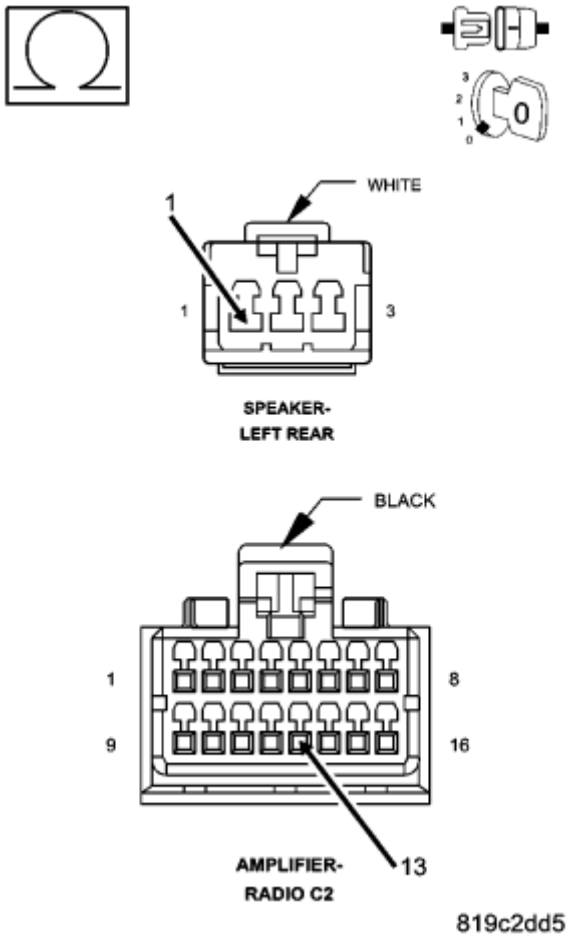


Fig. 96: Measuring Resistance Of (X205) Amplified Left Rear Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X205) Amplified Left Rear Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Left Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

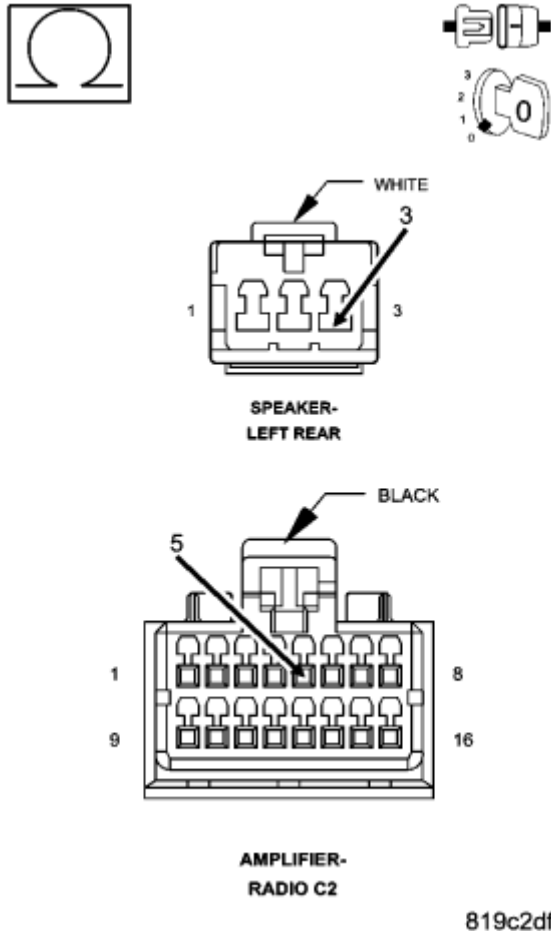
Go To 4.

No

Repair the (X205) Amplified Left Rear Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **CHECK THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT FOR AN OPEN**



819c2df0

Fig. 97: Measuring Resistance Of (X295) Amplified Left Rear Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X295) Amplified Left Rear Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Left Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

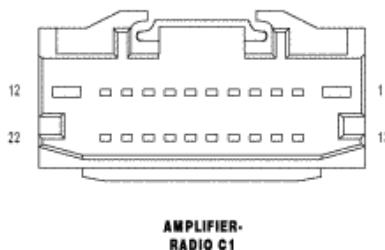
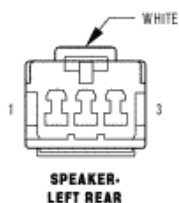
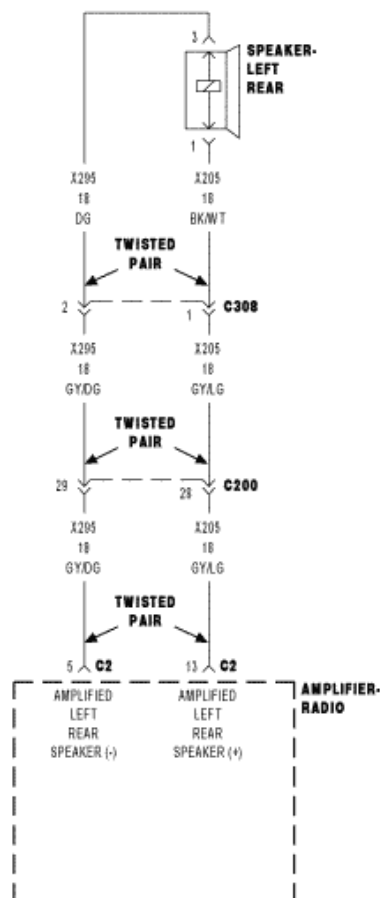
No

Repair the (X295) Amplified Left Rear Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1478-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



019c2073

Fig. 98: Channel 5 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT AMPLIFIED LEFT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1478-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER

Turn the ignition off.

Disconnect the Amplified Left Rear Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

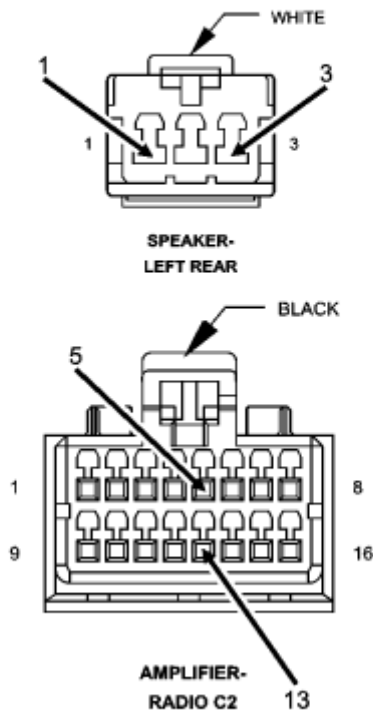
Replace the Amplified Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT, AND THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c2e06

Fig. 99: Measuring Resistance Between (X205) Amplified Left Rear Speaker (+) Circuit And (X295) Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X205) Amplified Left Rear Speaker (+) circuit, and the (X295) Amplified Left Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X205) Amplified Left Rear Speaker (+) circuit, and the (X295) Amplified Left Rear Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1479-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1479-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B147A-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic

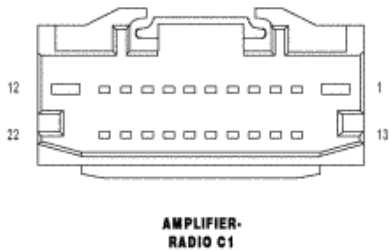
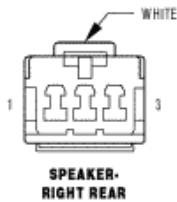
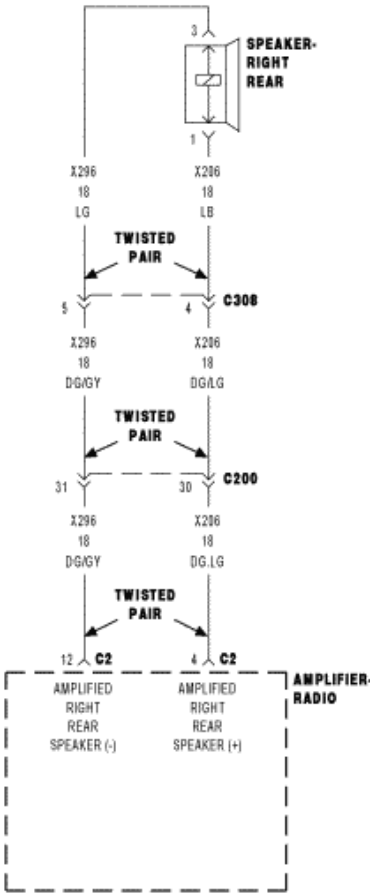


Fig. 100: Channel 6 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
RIGHT REAR SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147A-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

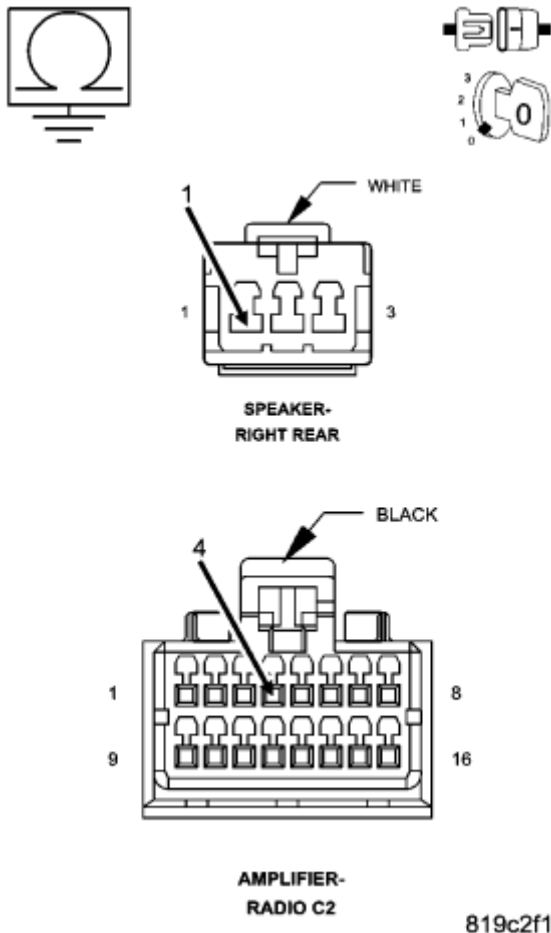
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c2f1a

Fig. 101: Measuring Resistance Between Ground And (X206) Amplified Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Right Rear Speaker harness connector.

Measure the resistance between ground and the (X206) Amplified Right Rear Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**

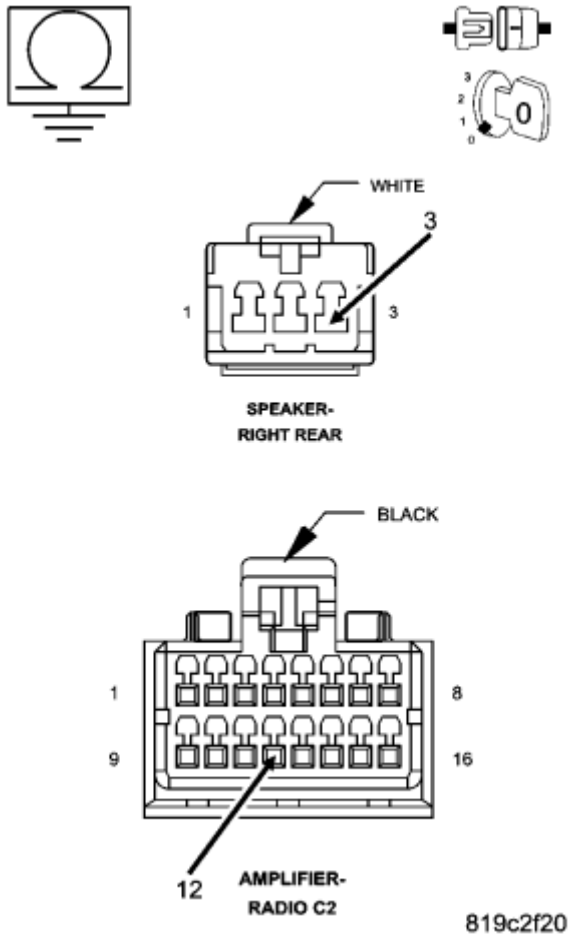


Fig. 102: Measuring Resistance Between Ground And (X296) Amplified Right Rear Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X296) Amplified Right Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

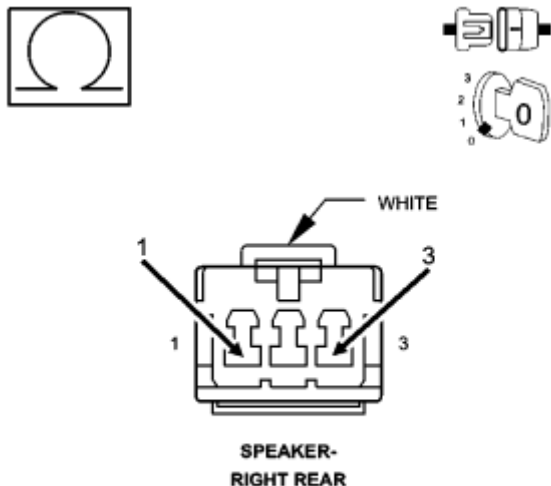
Repair the (X296) Amplified Right Rear Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT REAR SPEAKER



819c2f24

Fig. 103: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Rear Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

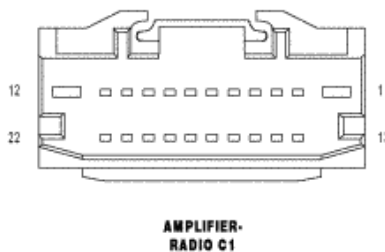
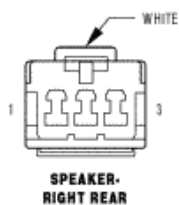
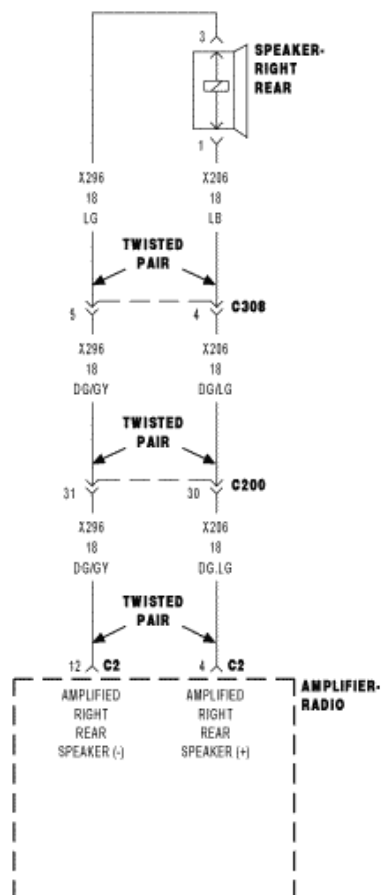
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B147B-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



810c306

Fig. 104: Channel 6 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147B-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT**

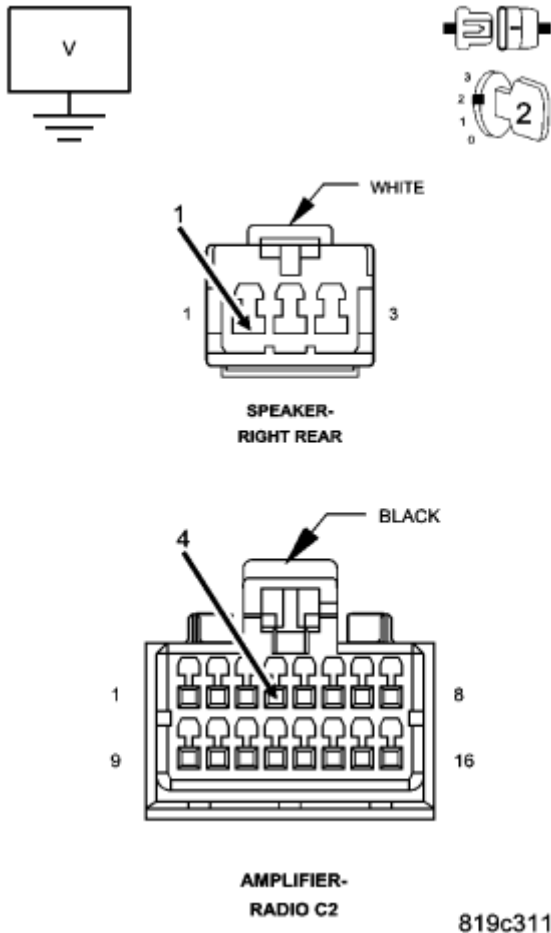


Fig. 105: Measuring Voltage On Amplified Right Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Right Rear Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X206) Amplified Right Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT**

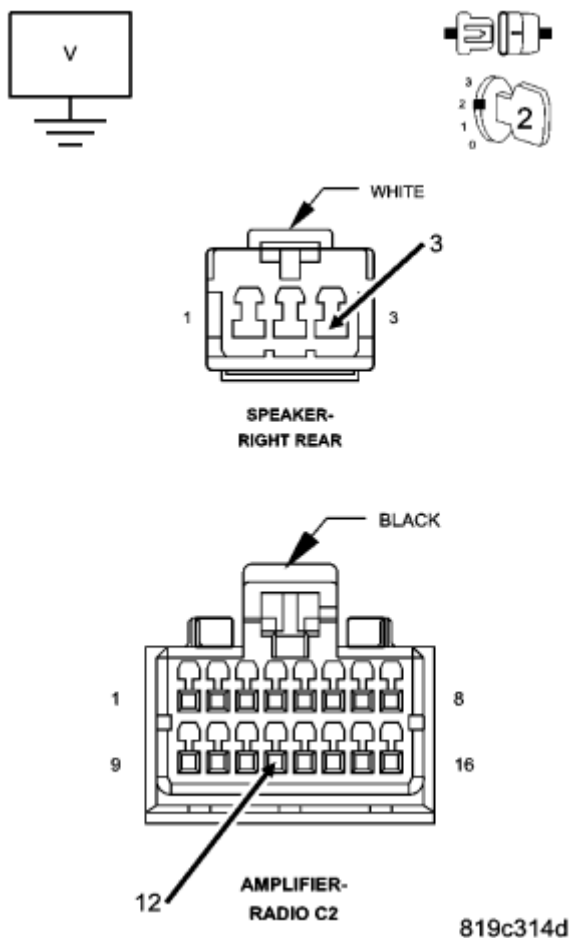


Fig. 106: Measuring For Voltage On (X296) Amplified Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X296) Amplified Right Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X296) Amplified Right Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B147C-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

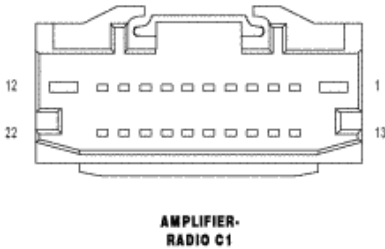
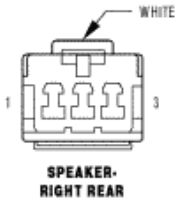
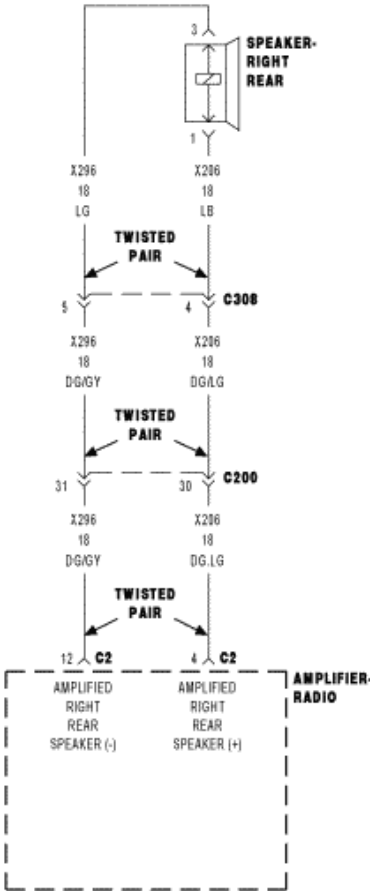


Fig. 107: Channel 6 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT OPEN (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT OPEN RIGHT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147C-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

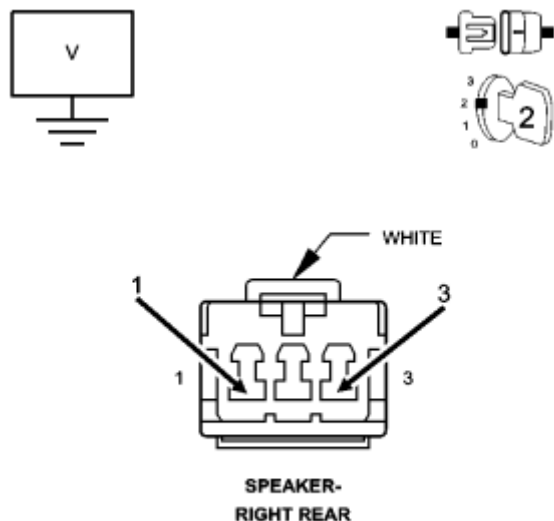
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE RIGHT REAR SPEAKER



819c315a

Fig. 108: Measuring Voltage Of Amplified Right Rear Speaker Circuits In Amplified Right Rear Speaker Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right Rear Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right Rear Speaker circuits in the Amplified Right Rear Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT FOR AN OPEN**

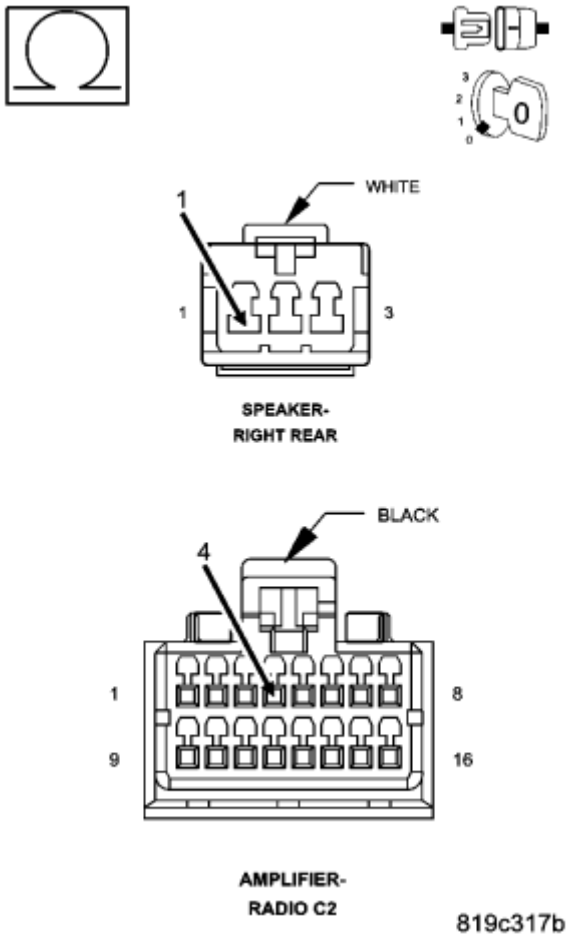


Fig. 109: Measuring Resistance Of (X206) Amplified Right Rear Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Right Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X206) Amplified Right Rear Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Right Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X206) Amplified Right Rear Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT FOR AN OPEN

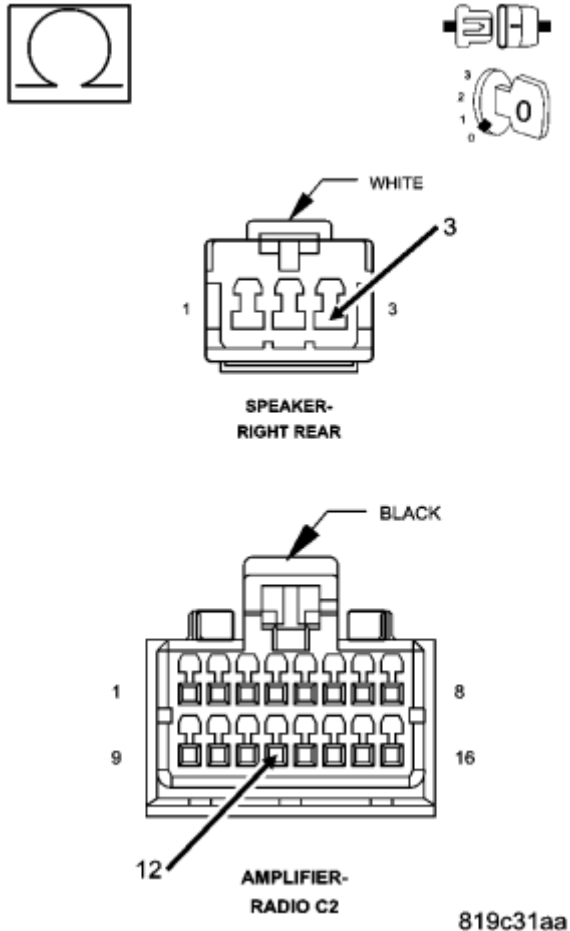


Fig. 110: Measuring Resistance Of (X296) Amplified Right Rear Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Right Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X296) Amplified Right Rear Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Right Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

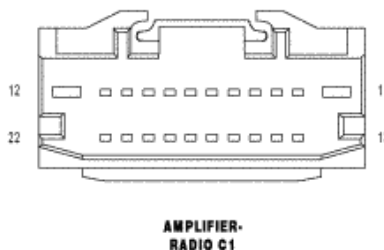
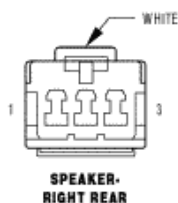
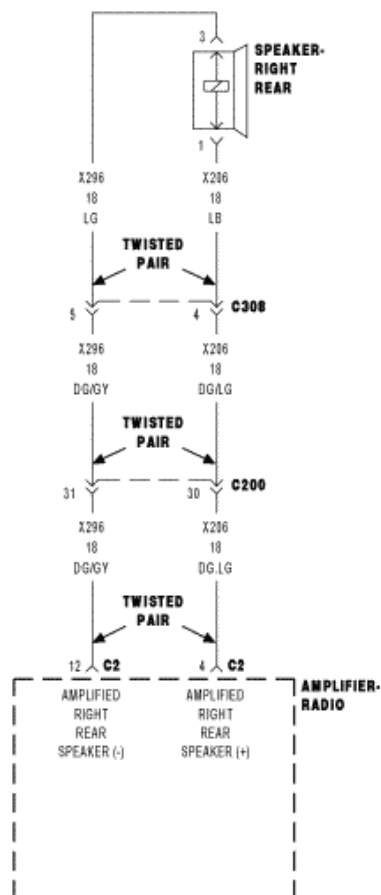
No

Repair the (X296) Amplified Right Rear Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B147D-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



810c306

Fig. 111: Channel 6 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT AMPLIFIED RIGHT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, clear Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147D-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT REAR SPEAKER

Turn the ignition off.

Disconnect the Amplified Right Rear Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

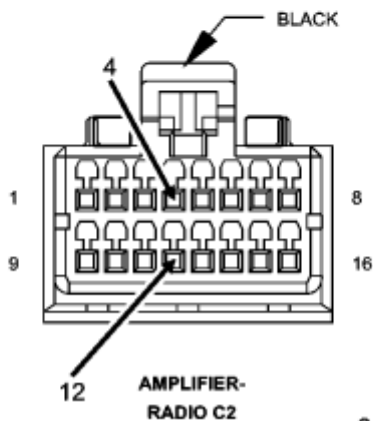
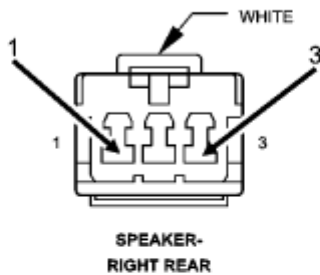
Replace the Amplified Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT, AND THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c320d

Fig. 112: Measuring Resistance Between (X206) Amplified Right Rear Speaker (+) Circuit And (X296) Amplified Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X206) Amplified Right Rear Speaker (+) circuit, and the (X296) Amplified Right Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit, and the (X296) Amplified Right Rear Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2222-SATELLITE RADIO RECEIVER INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The Satellite Radio Receiver detects a software checksum test failure.

Possible Causes

Possible Causes
SATELLITE RADIO RECEIVER

Diagnostic Test

1. **REPLACE THE SATELLITE RADIO RECEIVER**

When this code is set, the Satellite Radio must be replaced.

Repair

Replace the Satellite Radio Receiver in accordance with the Service Information. Refer to **STANDARD PROCEDURE** (ELECTRICAL DIAGNOSTICS). Refer to **STANDARD PROCEDURE** (SERVICE INFORMATION).

U0019-CAN INTERIOR BUS(+)/(-) CIRCUIT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**
- Whenever the CAN INTERIOR BUS (+) or INTERIOR BUS (-) circuit is open, shorted to voltage or shorted to ground, this code will set.

Possible Causes

Possible Causes
CAN INTERIOR BUS DTCs IN THE TOTALLY INTEGRATED POWER MODULE (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN AMPLIFIER

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display: U0019-CAN INTERIOR BUS CIRCUIT?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK TOTALLY INTEGRATED POWER MODULE DTCs

With the scan tool, read Totally Integrated Power Module DTCs

Does the scan tool display any CAN INTERIOR BUS DTCs - ACTIVE?

Yes

Refer to the symptom list for problems related to Communication in **ELECTRONIC CONTROL**

MODULES - ELECTRICAL DIAGNOSTICS .

No

Go to 3.

3. CAN INTERIOR BUS (+) CIRCUIT OPEN

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Totally Integrated Power Module C7 harness connector.

Measure the resistance of the (D265) CAN INTERIOR BUS (+) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

Perform **BODY VERIFICATION TEST - VER 1 .**

No

Repair the CAN INTERIOR BUS (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1 .**

4. CAN INTERIOR BUS (-) CIRCUIT OPEN

Measure the resistance of the (D264) CAN INTERIOR BUS (-) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1 .**

No

Repair the CAN INTERIOR BUS (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1 .**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**
- Whenever the CAN INTERIOR BUS (+) or INTERIOR BUS (-) circuit is open, shorted to voltage or shorted to ground, this code will set.

Possible Causes

Possible Causes
CAN INTERIOR BUS DTCs IN THE TOTALLY INTEGRATED POWER MODULE (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN AMPLIFIER

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display: U0020-CAN INTERIOR BUS OFF PERFORMANCE?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FRONT CONTROL MODULE DTCs**

With the scan tool, read Totally Integrated Power Module DTCs.

Does the scan tool display any CAN INTERIOR BUS DTCs - ACTIVE?

Yes

Refer to the symptom list for problems related to Communication in **ELECTRONIC CONTROL MODULES - ELECTRICAL DIAGNOSTICS** .

No

Go to 3.

3. **CAN INTERIOR BUS (+) CIRCUIT OPEN**

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Totally Integrated Power Module C7 harness connector.

Measure the resistance of the (D265) CAN INTERIOR BUS (+) circuit between the Totally Integrated Power module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the CAN INTERIOR BUS (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CAN INTERIOR BUS (-) CIRCUIT OPEN**

Measure the resistance of the (D264) CAN INTERIOR BUS (-) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the CAN INTERIOR BUS (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0195-LOST COMMUNICATION WITH SDAR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0197-LOST COMMUNICATION WITH HANDS FREE MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0199-LOST COMMUNICATION WITH DRIVERS DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0200-LOST COMMUNICATION WITH PASSENGER DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

2008 ACCESSORIES AND EQUIPMENT

Audio/Video Systems - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1401</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1402</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1403</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1405</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1406</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1407</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1409</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140A</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140B</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B140D</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140E</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140F</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1420</u>	AUDIO CASSETTE ERROR/INOPERABLE CASSETTE
<u>B1421</u>	AUDIO CD READ ERROR/INOPERABLE DISC
<u>B1422</u>	AUDIO DVD READ ERROR/INOPERABLE DISC
<u>B1423</u>	VES DVD READ ERROR/INOPERABLE DISC
<u>B1424</u>	IMPROPER DVD-WRONG REGION
<u>B1429</u>	RADIO DISPLAY HIGH TEMPERATURE
<u>B142A</u>	RADIO UNIT HIGH TEMPERATURE
<u>B142C</u>	VES VIDEO SCREEN DISCONNECTED
<u>B142D</u>	AUDIO ANTENNA NOT CONNECTED
<u>B142E</u>	GPS ANTENNA NOT CONNECTED
<u>B142F</u>	SATELLITE RADIO ANTENNA NOT CONNECTED
<u>B1460</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1461</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1462</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1463</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1464</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1465</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1466</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1467</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1468</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1469</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146A</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

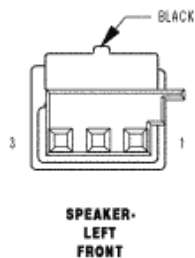
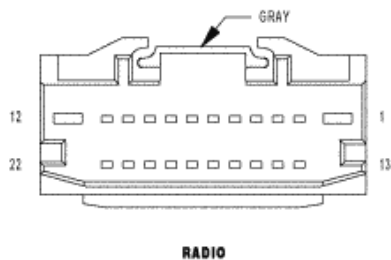
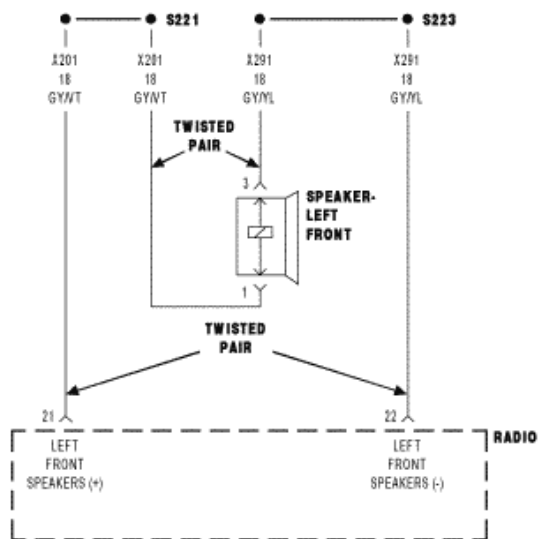
<u>B146B</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B146C</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B146D</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B146E</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146F</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1470</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1471</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1472</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1473</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1474</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1475</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1476</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1477</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1478</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1479</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B147A</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B147B</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B147C</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B147D</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B2222</u>	SATELLITE RADIO RECEIVER INTERNAL
<u>U0019</u>	CAN INTERIOR BUS(+)/(-) CIRCUIT
<u>U0020</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0195</u>	LOST COMMUNICATION WITH SDAR
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE MODULE
<u>U0199</u>	LOST COMMUNICATION WITH DRIVERS DOOR MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE

AUDIO/VIDEO SYSTEMS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



01940215

Fig. 1: Front Left Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND
(X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

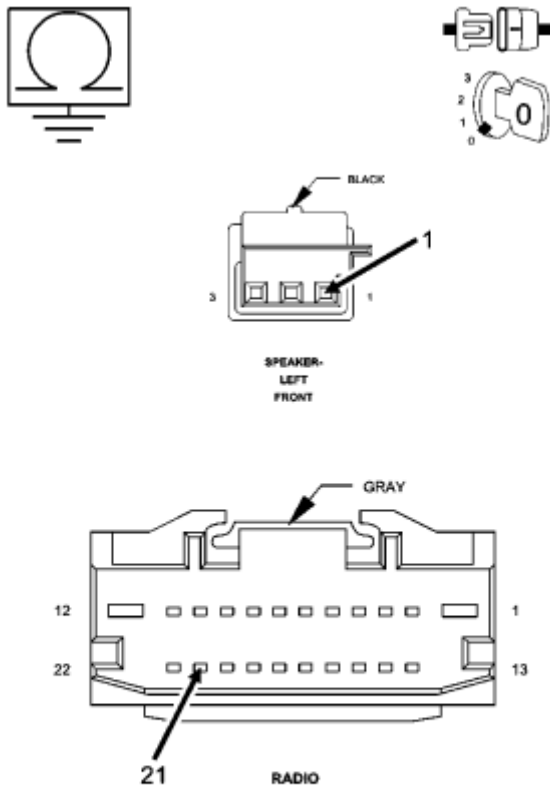
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND**



819c0219

Fig. 2: Measuring Resistance Between Ground And Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Left Audio Speaker harness connector.

Measure the resistance between ground and the (X201) Left Front Speakers (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

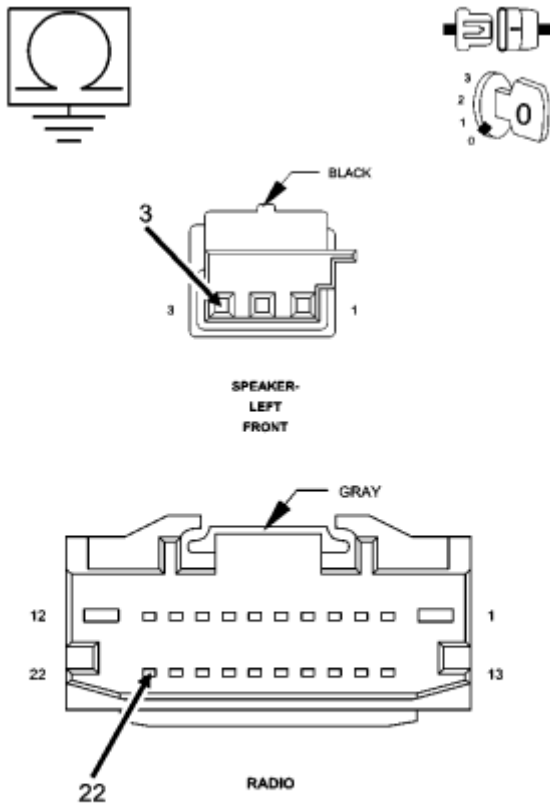
Repair the (X201) Left Front Speakers (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND



819c022c

Fig. 3: Measuring Resistance Between Ground And Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X291) Left Front Speakers (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X291) Left Front Speakers (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. SPEAKER

Connect the Radio harness connector.

With the Front Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1401-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Front Left Audio Speaker in accordance with the service information.

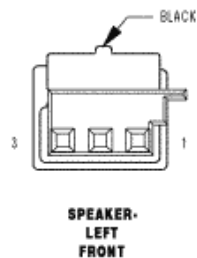
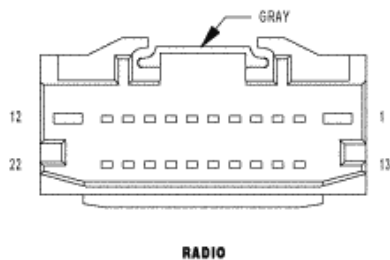
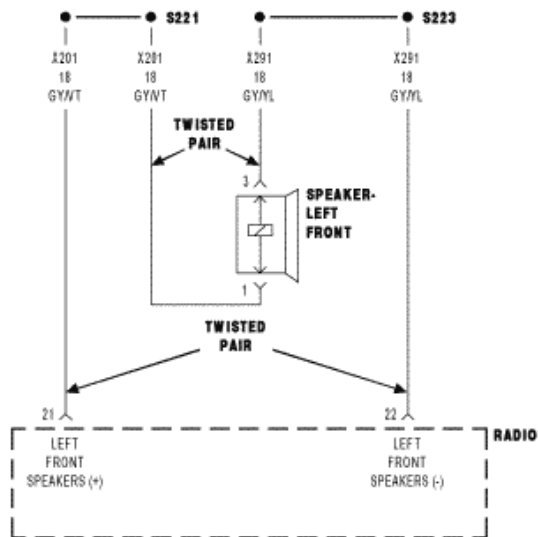
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1402-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



01940215

Fig. 4: Front Left Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE
(X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B1402-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

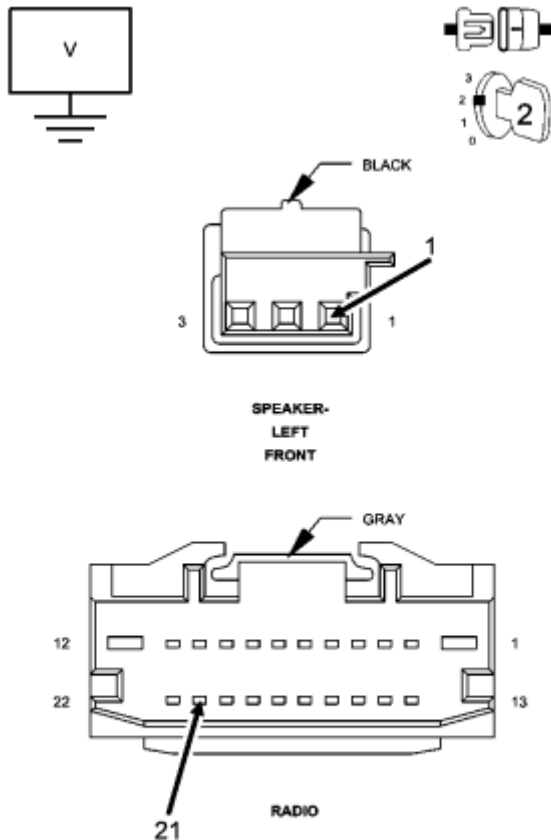
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X201) LEFT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE



819c027b

Fig. 5: Measuring Voltage Of Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Left Front Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X201) Left Front Speakers (+) circuit.

Is the voltage above 10.0 volts?

Yes

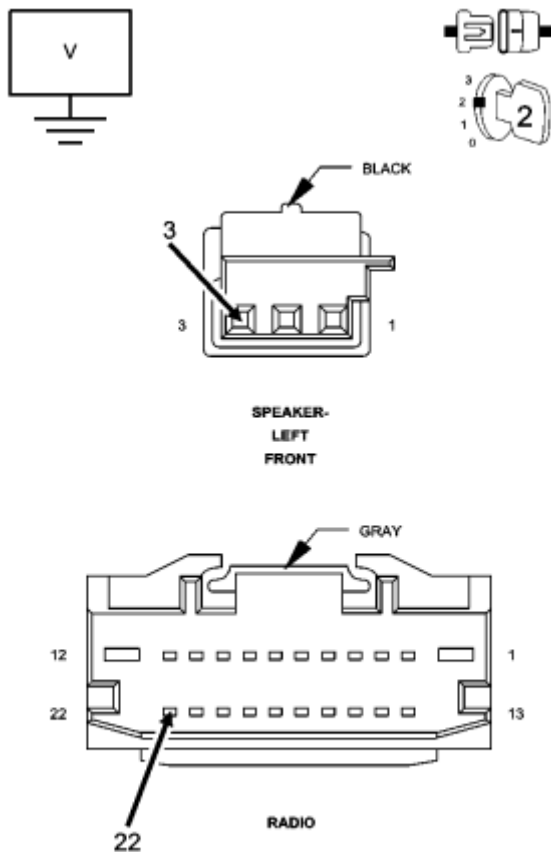
Repair the (X201) Left Front Speakers (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE



819c0283

Fig. 6: Measuring Voltage On Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X291) Left Front Speakers (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X291) Left Front Speakers (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

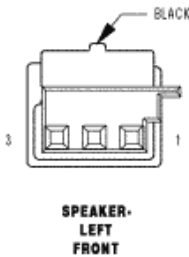
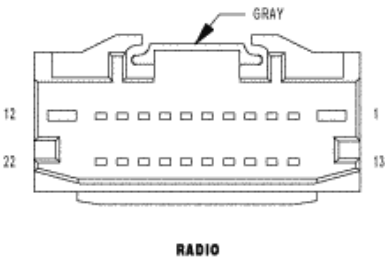
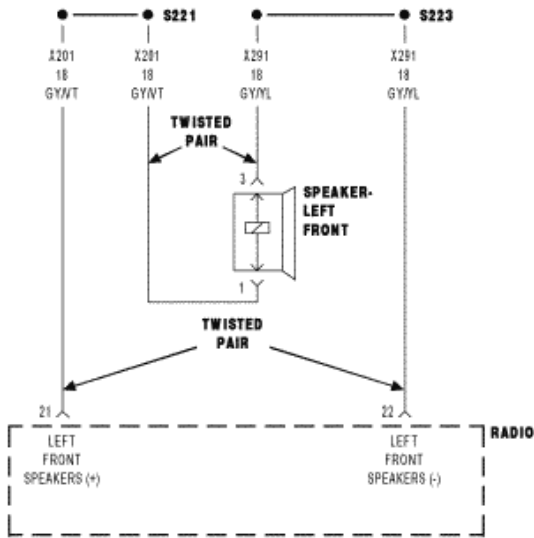


Fig. 7: Front Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X201) LEFT FRONT SPEAKERS (+) CIRCUIT OPEN (X291) LEFT FRONT SPEAKERS (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

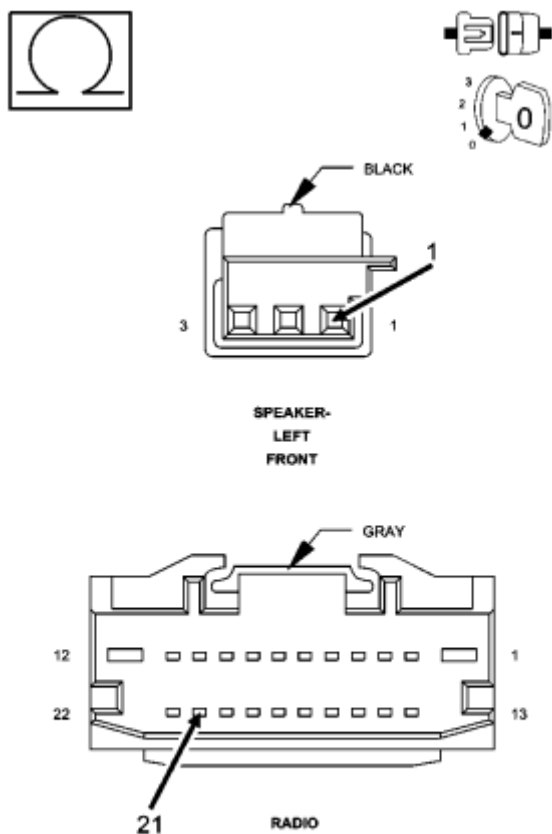
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X201) LEFT FRONT SPEAKERS (+) CIRCUIT OPEN



819c052f

Fig. 8: Measuring Resistance Of Left Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Left Audio Speaker harness connector.

Measure the resistance of the (X201) Left Front Speakers (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

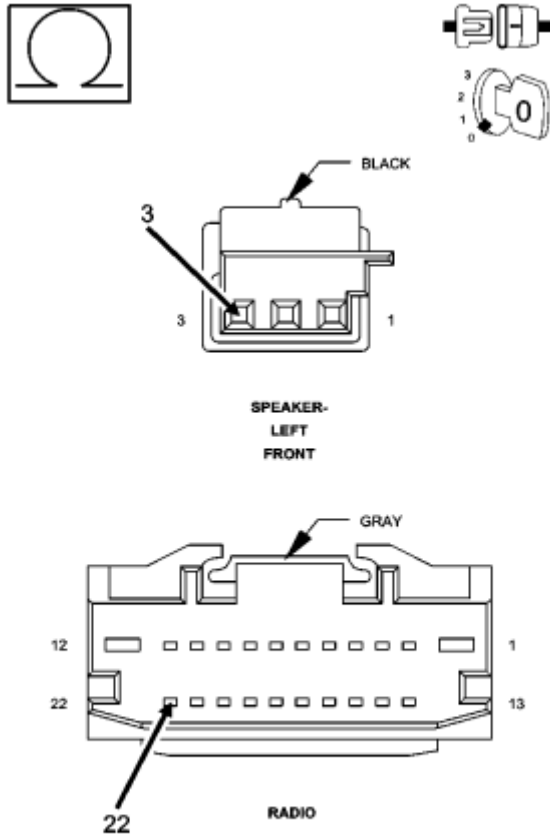
Go To 3.

No

Repair the (X201) Left Front Speakers (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X291) LEFT FRONT SPEAKERS (-) CIRCUIT OPEN



819c0552

Fig. 9: Measuring Resistance Of Left Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X291) Left Front Speakers (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X291) Left Front Speakers (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Front Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1403-FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Front Left Audio Speaker in accordance with the service information.

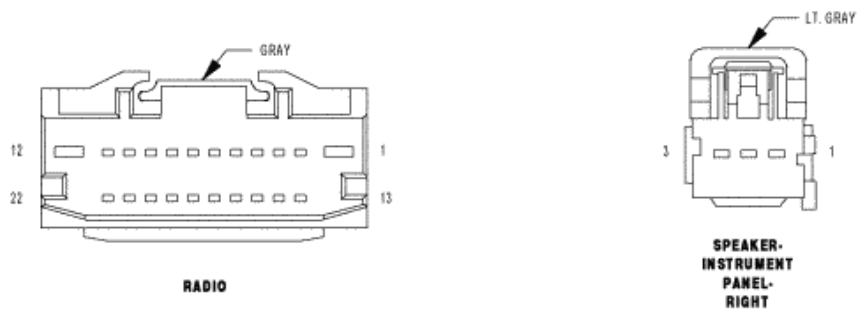
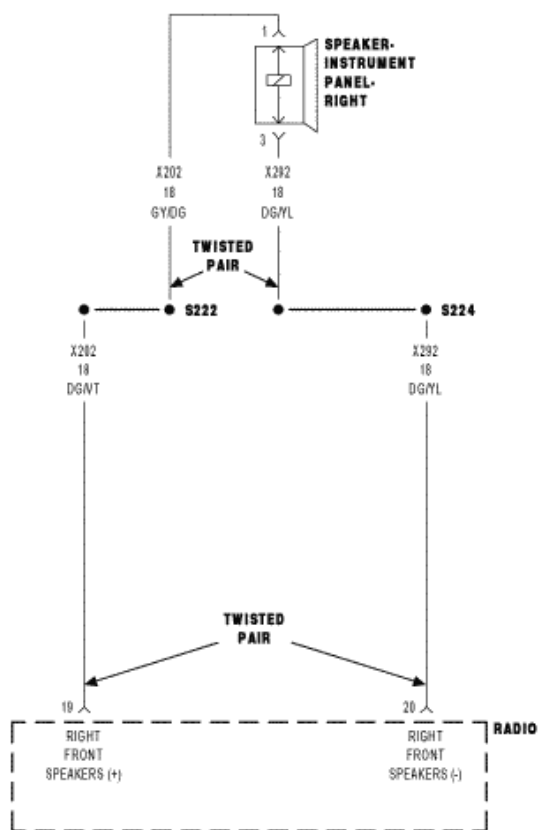
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



019c057c

Fig. 10: Front Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND
(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

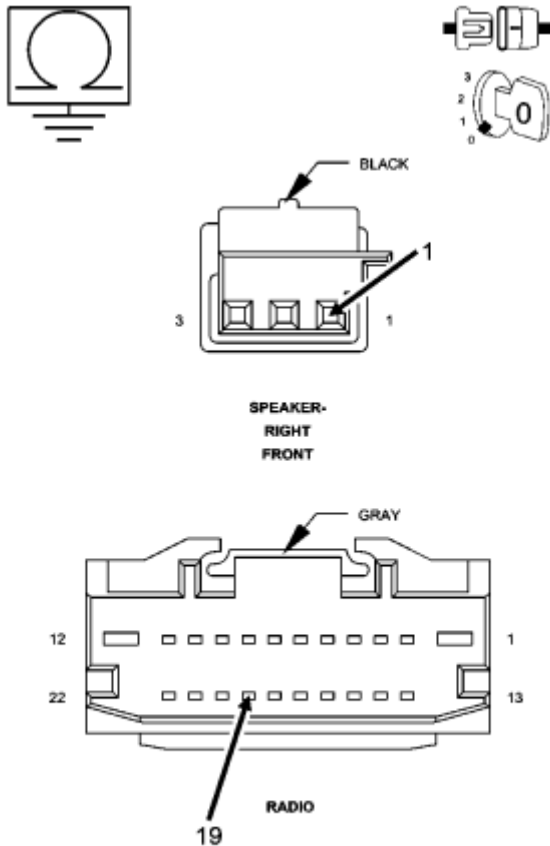
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO GROUND**



819c0581

Fig. 11: Measuring Resistance Between Ground And Right Front Speakers Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Right Audio Speaker harness connector.

Measure the resistance between ground and the (X202) Right Front Speakers (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

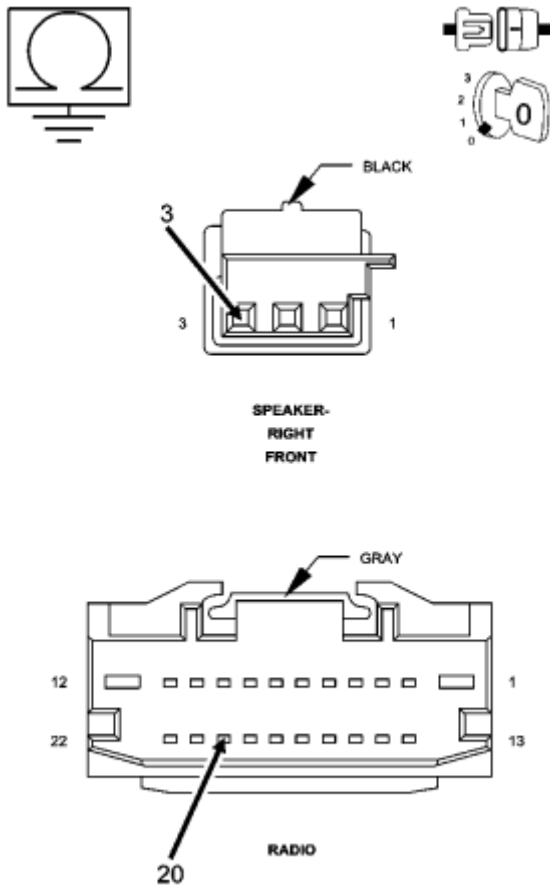
Repair the (X202) Right Front Speakers (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO GROUND



819c0593

Fig. 12: Measuring Resistance Between Ground And Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X292) Right Front Speakers (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X292) Right Front Speakers (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **SPEAKER**

Connect the Radio harness connector.

With the Front Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1405-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Front Right Audio Speaker in accordance with the service information.

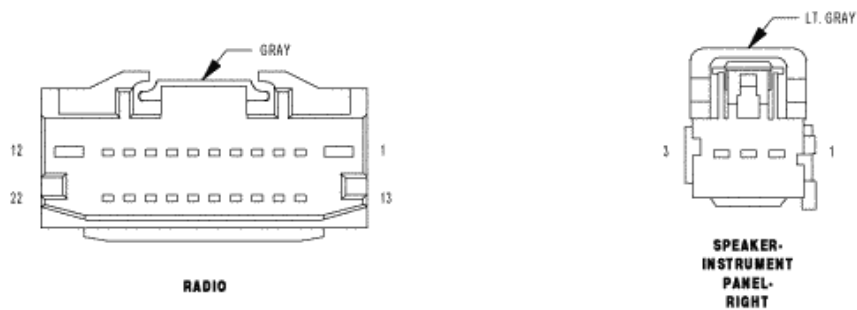
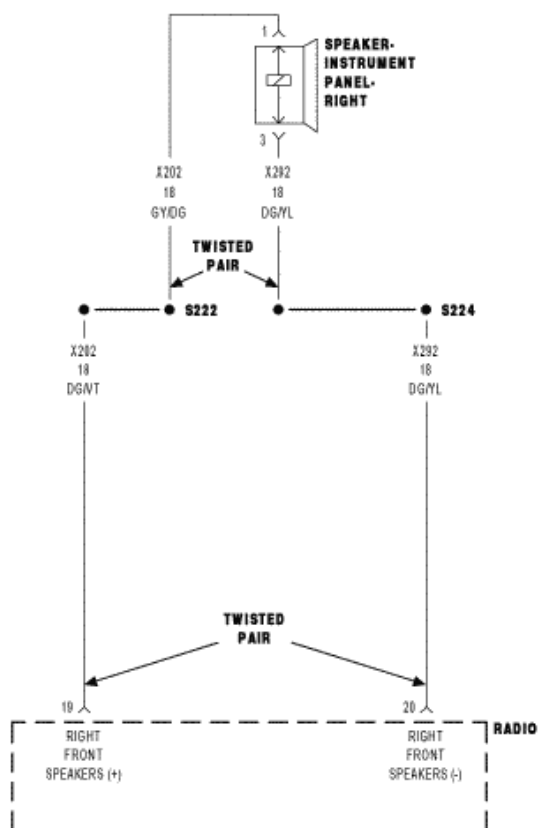
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1406-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c057c

Fig. 13: Front Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE
(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B1406-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

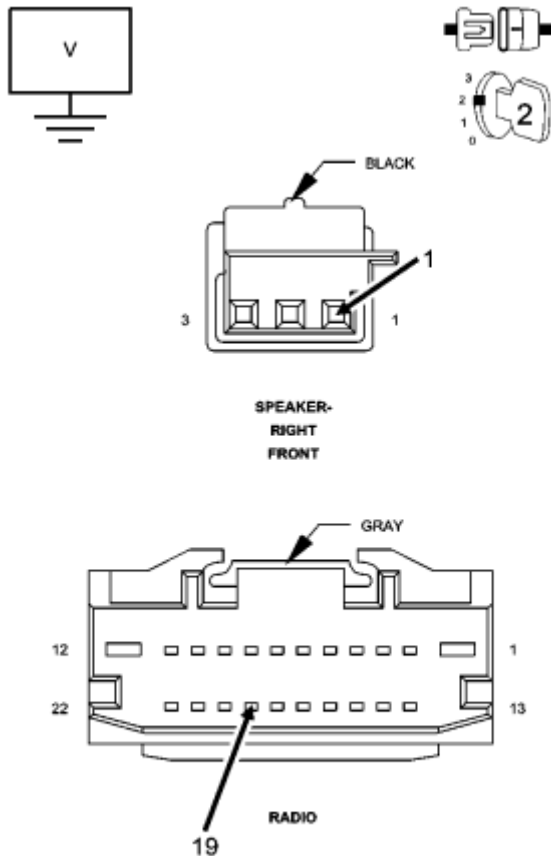
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X202) RIGHT FRONT SPEAKERS (+) CIRCUIT SHORTED TO VOLTAGE



819c073b

Fig. 14: Measuring Voltage On Right Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Right Front Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X202) Right Front Speakers (+) circuit.

Is the voltage above 10.0 volts?

Yes

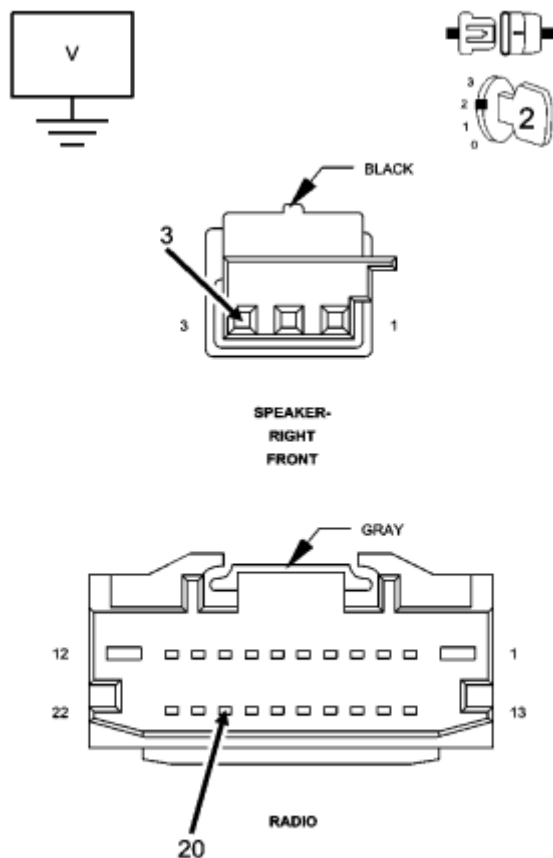
Repair the (X202) Right Front Speakers (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT SHORTED TO VOLTAGE



819c0746

Fig. 15: Measuring Voltage On Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X292) Right Front Speakers (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X292) Right Front Speakers (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

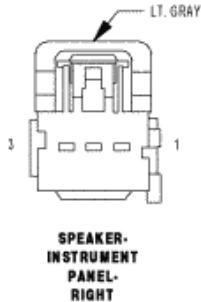
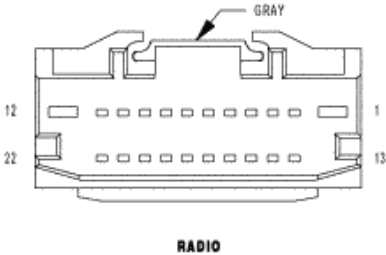
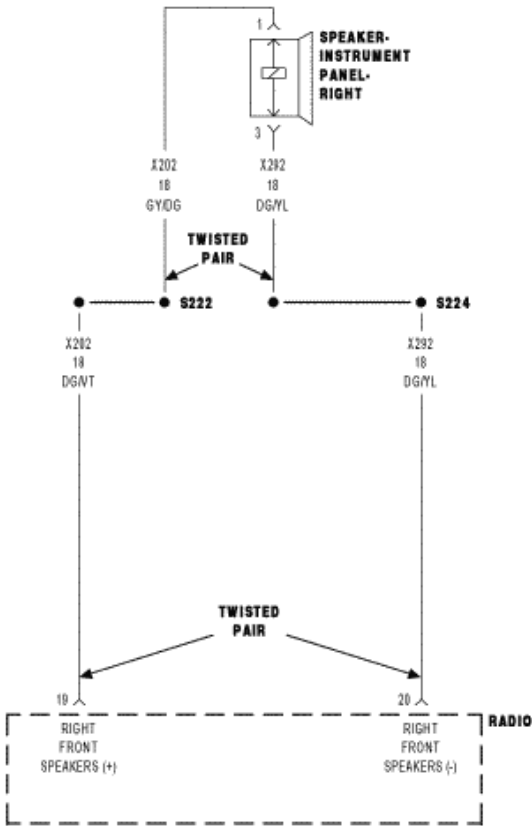


Fig. 16: Front Right Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X202) RIGHT FRONT SPEAKERS (+) CIRCUIT OPEN (X292) RIGHT FRONT SPEAKERS (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

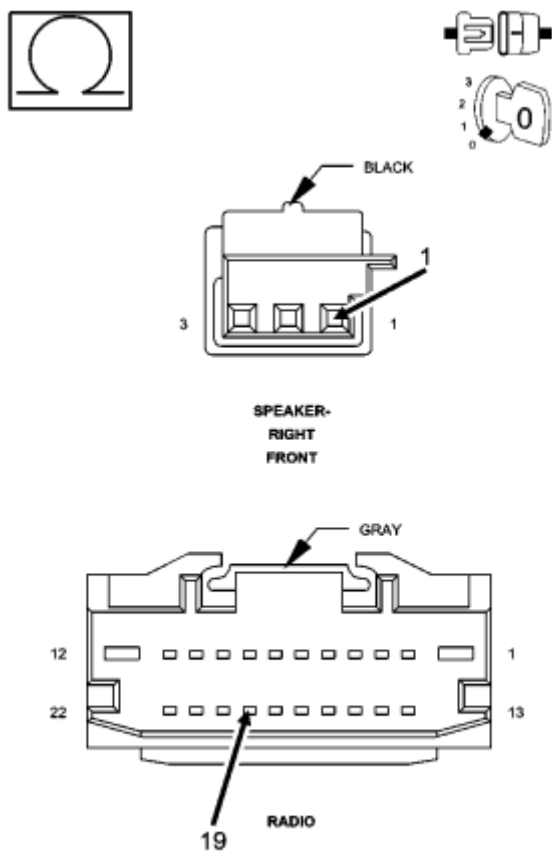
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X202) RIGHT FRONT SPEAKERS (+) CIRCUIT OPEN



819c074d

Fig. 17: Measuring Resistance Of Right Front Speakers (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Front Right Audio Speaker harness connector.

Measure the resistance of the (X202) Right Front Speakers (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

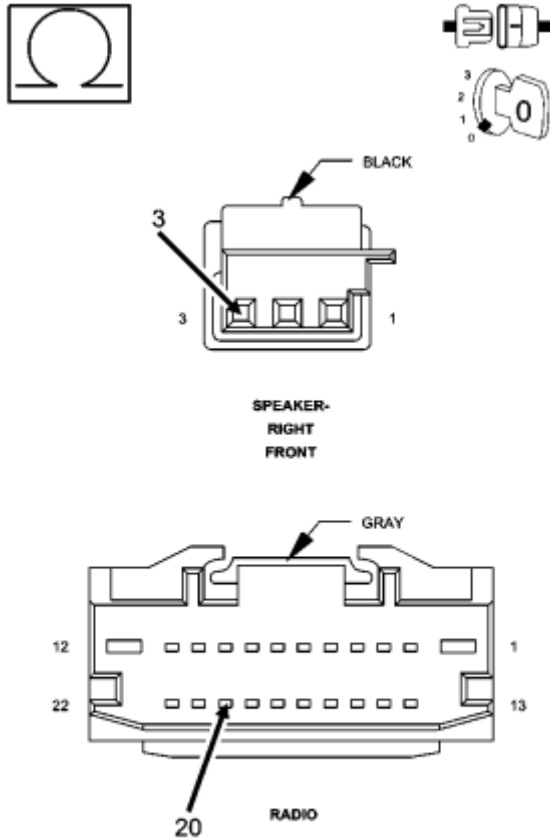
Go To 3.

No

Repair the (X202) Right Front Speakers (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(X292) RIGHT FRONT SPEAKERS (-) CIRCUIT OPEN**



819c0751

Fig. 18: Measuring Resistance Of Right Front Speakers (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X292) Right Front Speakers (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X292) Right Front Speakers (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Front Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1407-FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Front Right Audio Speaker in accordance with the service information.

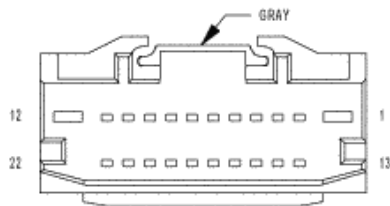
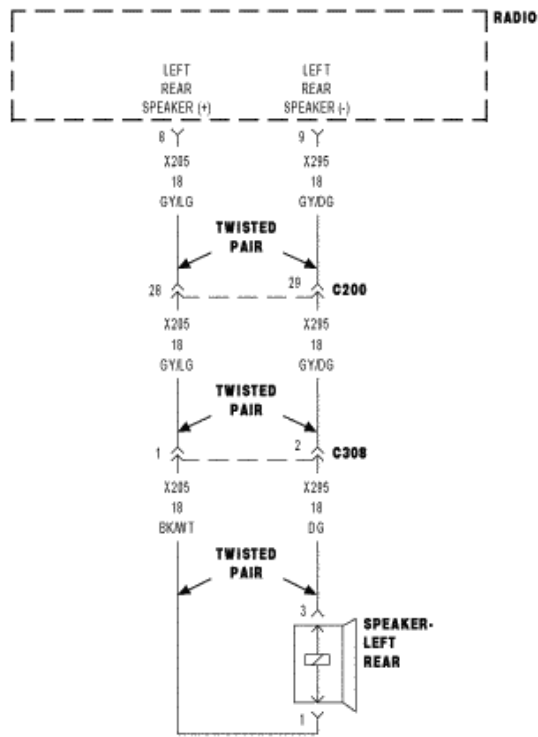
Perform **BODY VERIFICATION TEST - VER 1** .

No

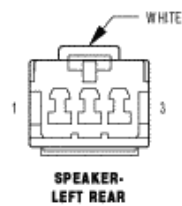
Test Complete.

B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



RADIO



SPEAKER-LEFT REAR

013c00a0

Fig. 19: Rear Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

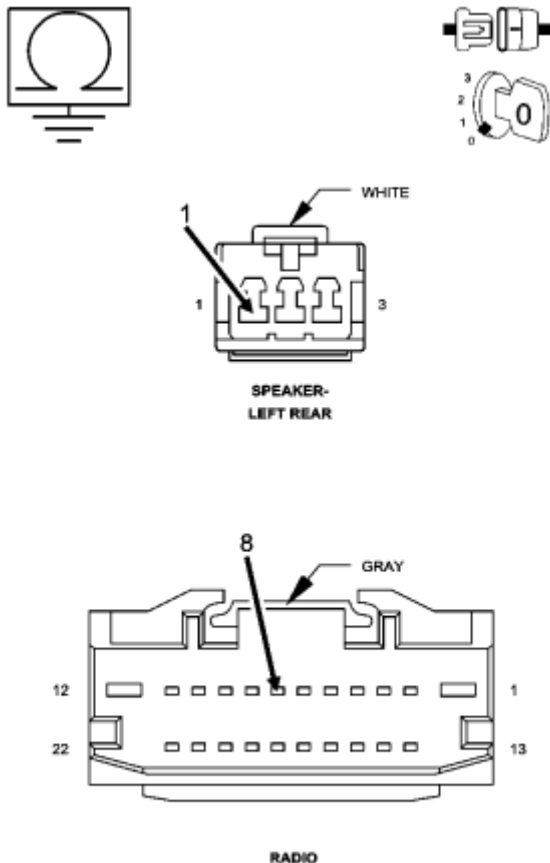
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND**



819c08f2

Fig. 20: Measuring Resistance Between Ground And Left Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Left Audio Speaker harness connector.

Measure the resistance between ground and the (X205) Left Rear Speaker (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

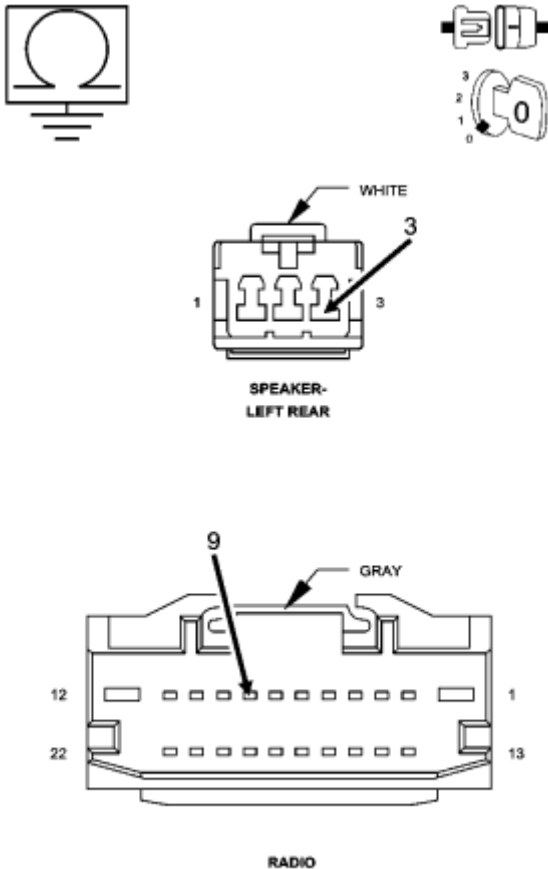
Repair the (X205) Left Rear Speaker (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND



819c0904

Fig. 21: Measuring Resistance Between Ground And Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X295) Left Rear Speaker (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X295) Left Rear Speaker (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B1409-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Rear Left Audio Speaker in accordance with the service information.

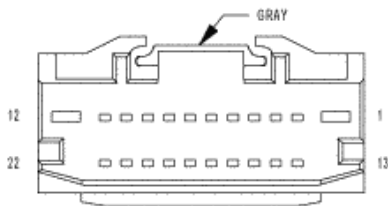
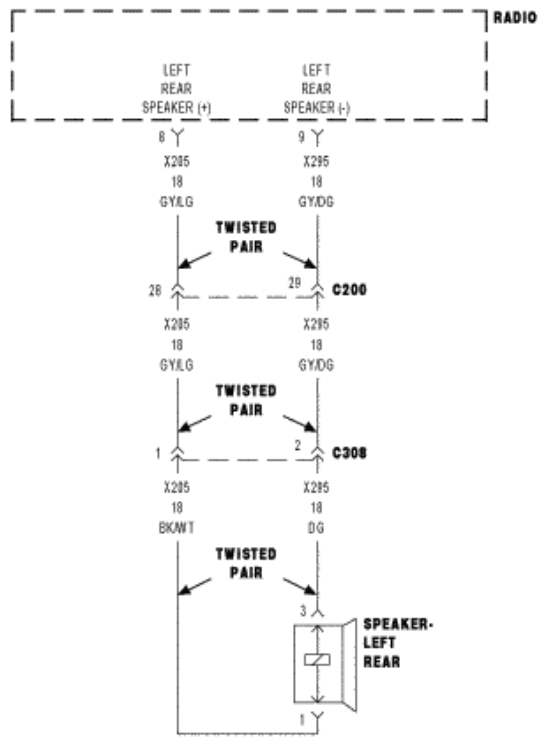
Perform **BODY VERIFICATION TEST - VER 1** .

No

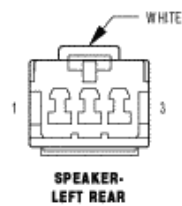
Test Complete.

B140A-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



RADIO



SPEAKER-LEFT REAR

013c0000

Fig. 22: Rear Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE
(X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B140A-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

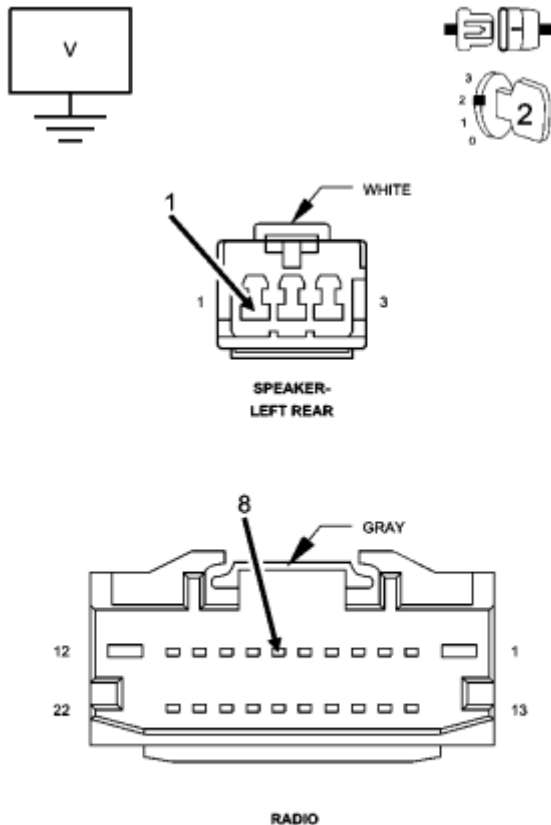
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X205) LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE



819c0960

Fig. 23: Measuring For Voltage On Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Left Rear Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X205) Left Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

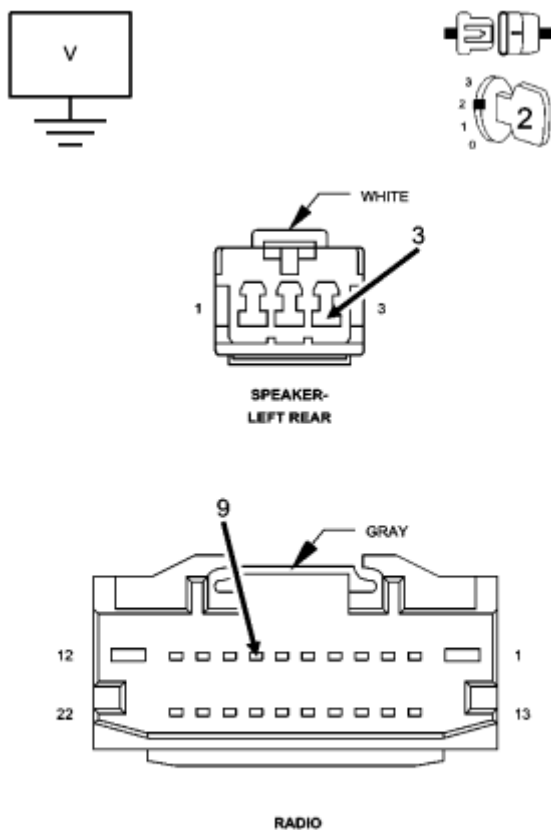
Repair the (X205) Left Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X295) LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE



819c0971

Fig. 24: Measuring For Voltage On Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X295) Left Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X295) Left Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

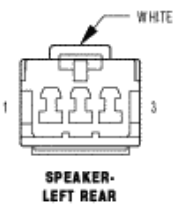
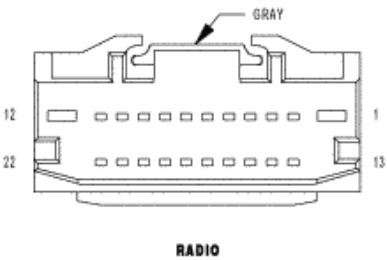
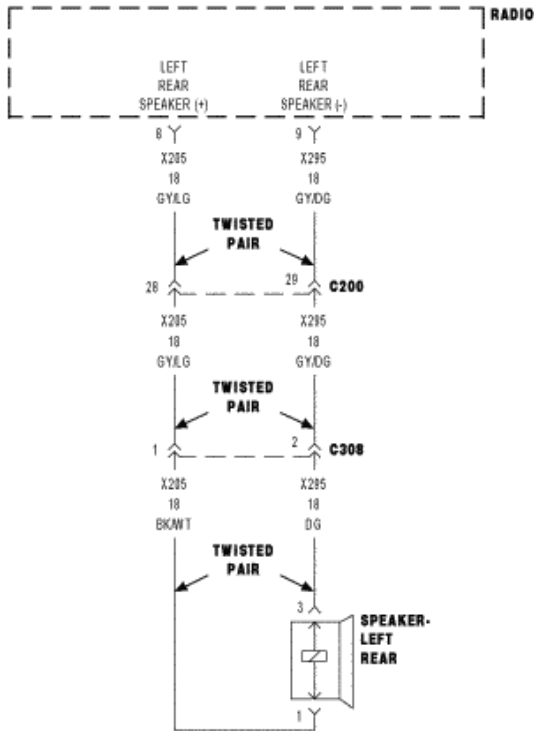


Fig. 25: Rear Left Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X205) LEFT REAR SPEAKER (+) CIRCUIT OPEN
(X295) LEFT REAR SPEAKER (-) CIRCUIT OPEN
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

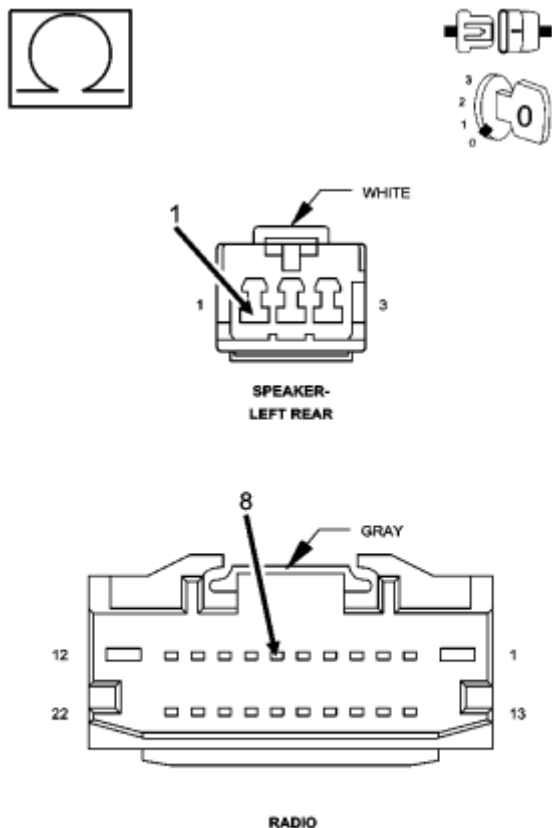
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X205) LEFT REAR SPEAKER (+) CIRCUIT OPEN



819c0975

Fig. 26: Measuring Resistance Of Left Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Left Audio Speaker harness connector.

Measure the resistance of the (X205) Left Rear Speaker (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

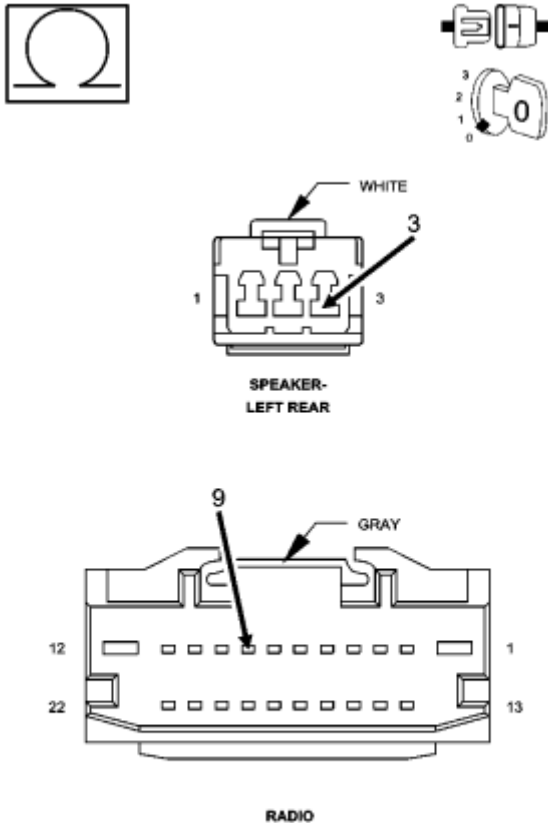
Go To 3.

No

Repair the (X205) Left Rear Speaker (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X295) LEFT REAR SPEAKER (-) CIRCUIT OPEN



819c097c

Fig. 27: Measuring Resistance Of Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X295) Left Rear Speaker (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X295) Left Rear Speaker (-) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Left Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140B-REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Rear Left Audio Speaker in accordance with the service information.

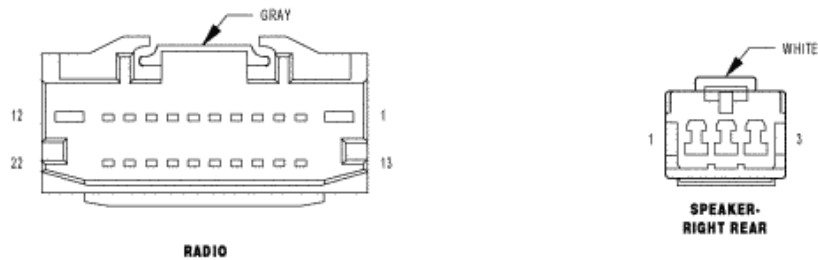
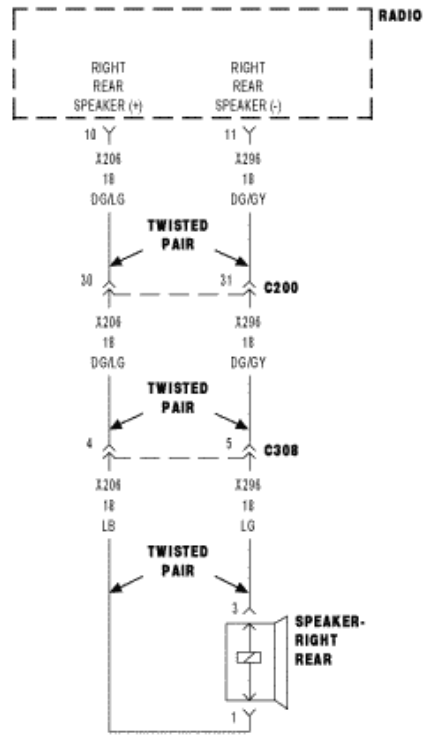
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



019c0930

Fig. 28: Rear Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is LOW for more than three seconds.

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
SPEAKER

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

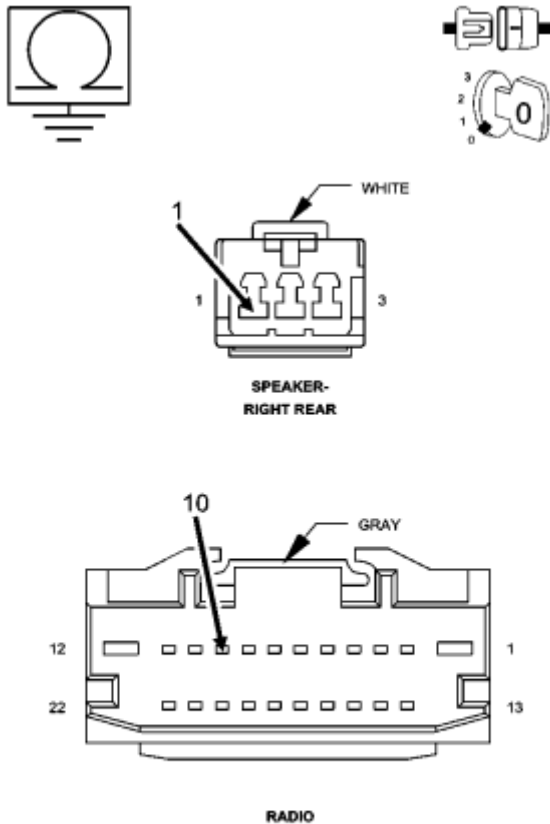
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND**



819c0b58

Fig. 29: Measuring Resistance Between Ground And Right Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Right Audio Speaker harness connector.

Measure the resistance between ground and the (X206) Right Rear Speaker (+) circuit.

Is the resistance below 1000.0 ohms?

Yes

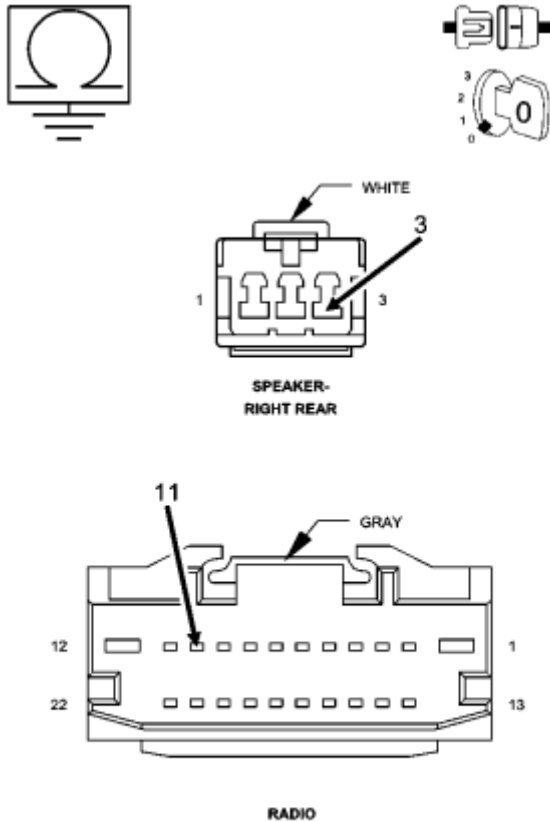
Repair the (X206) Right Rear Speaker (+) circuit for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. (X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND



819c0b60

Fig. 30: Measuring Resistance Between Ground And Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X296) Right Rear Speaker (-) circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X296) Right Rear Speaker (-) circuit for a short to ground condition.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140D-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Replace the Rear Right Audio Speaker in accordance with the service information.

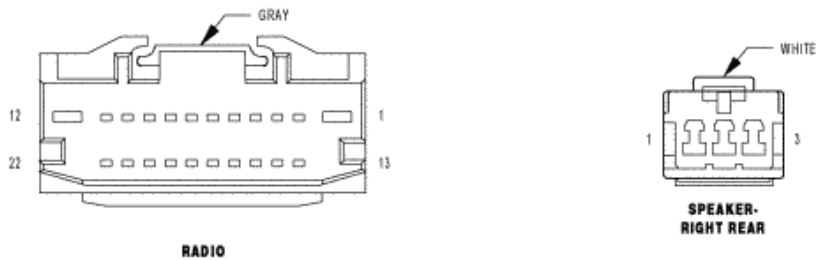
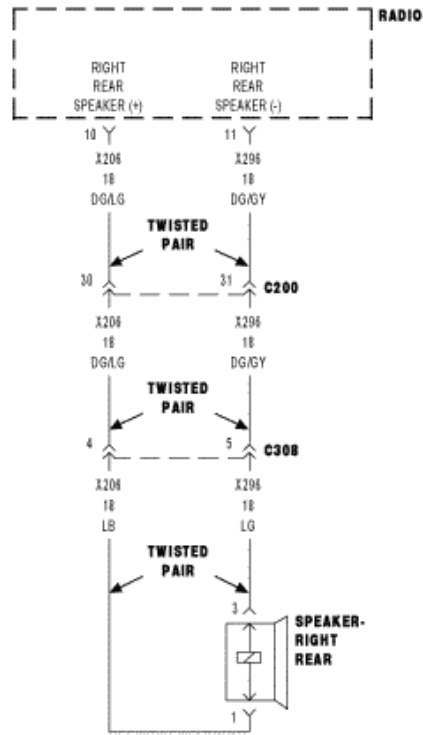
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B140E-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c0936

Fig. 31: Rear Right Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE
(X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE
SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Radio DTCs.

Does the scan tool display active: B140E-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

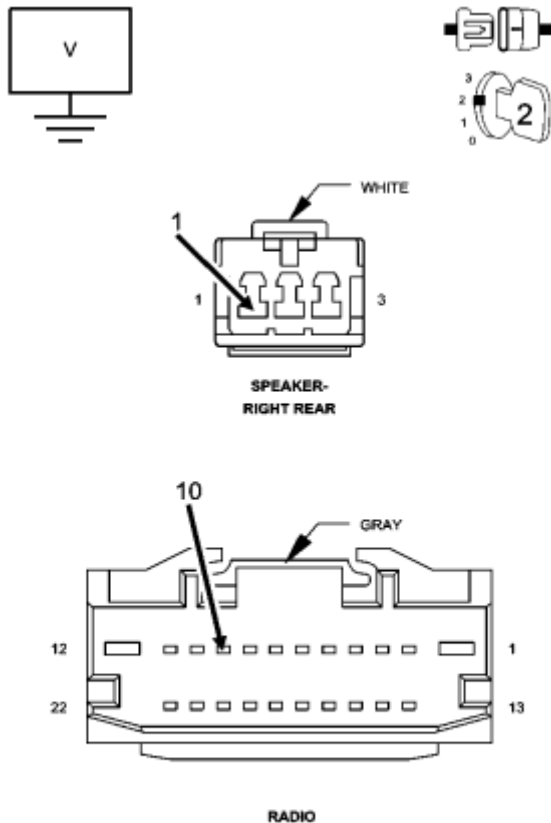
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (X206) RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO VOLTAGE



819c0b9a

Fig. 32: Measuring Voltage On Right Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Right Rear Audio Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X206) Right Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

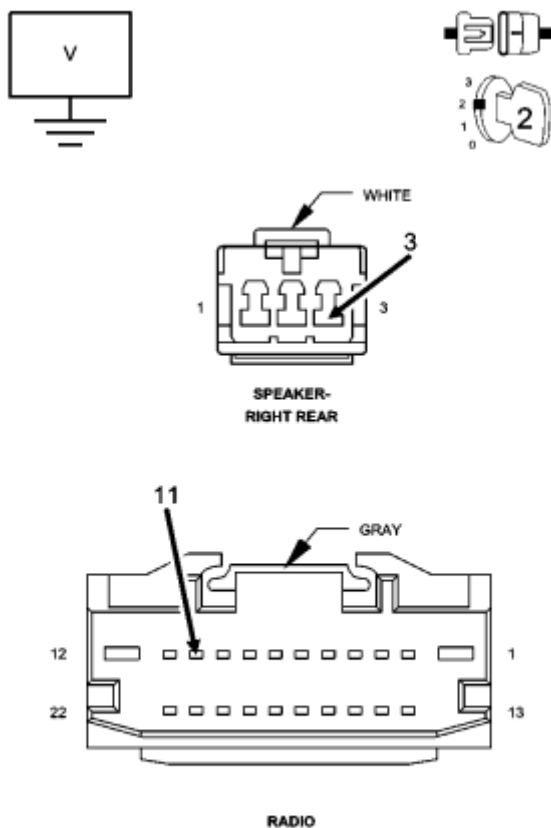
Repair the (X206) Right Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (X296) RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO VOLTAGE



819c0ba8

Fig. 33: Measuring Voltage On Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X296) Right Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X296) Right Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

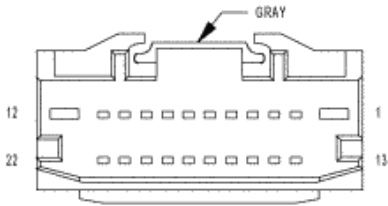
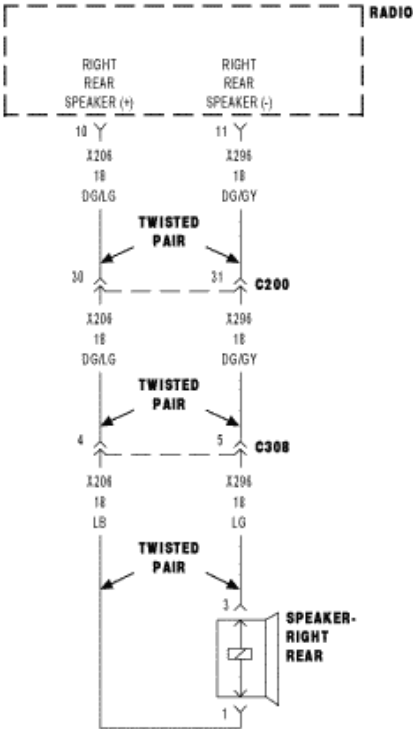
No

Replace the Radio in accordance with the service information.

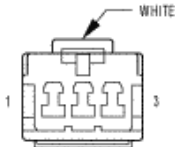
Perform **BODY VERIFICATION TEST - VER 1** .

B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



RADIO



**SPEAKER-
RIGHT REAR**

Fig. 34: Rear Right Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the radio on.

Set Conditions

- **Set Condition:**
- When the output circuit is open for more than three seconds. The radio will not set the fault if the radio confirms an amplifier is on the BUS.

Possible Causes

Possible Causes
(X206) RIGHT REAR SPEAKER (+) CIRCUIT OPEN (X296) RIGHT REAR SPEAKER (-) CIRCUIT OPEN SPEAKER

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all Radio DTC's.

Turn the Radio on.

With the scan tool, read the DTC information.

Does the scan tool read: B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

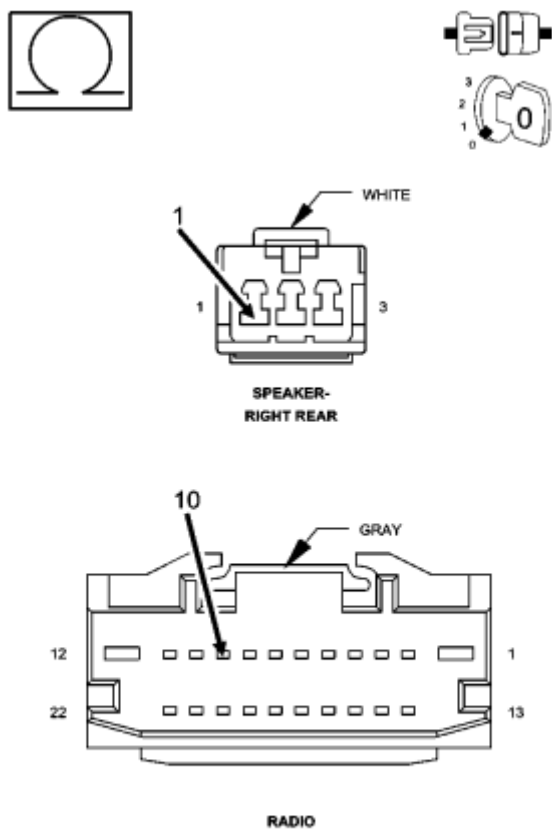
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (X206) RIGHT REAR SPEAKER (+) CIRCUIT OPEN



819c0bb5

Fig. 35: Measuring Resistance Of Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Disconnect the Rear Right Audio Speaker harness connector.

Measure the resistance of the (X206) Right Rear Speaker (+) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

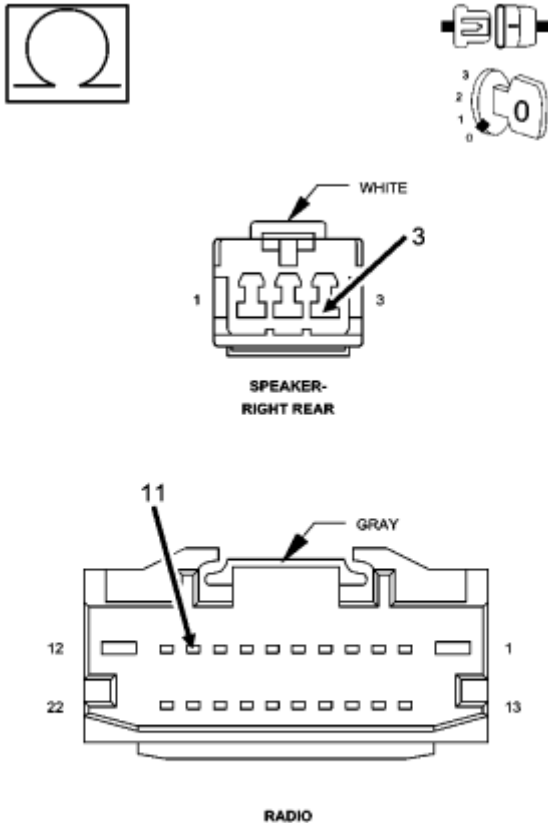
Go To 3.

No

Repair the (X206) Right Rear Speaker (+) circuit for an open condition.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(X296) RIGHT REAR SPEAKER (-) CIRCUIT OPEN**



819c0bc3

Fig. 36: Measuring Resistance Of Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X296) Right Rear Speaker (-) circuit between the Radio and the Speaker.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 4.

No

Repair the (X296) Right Rear Speaker (-) circuit for an open condition.
Perform **BODY VERIFICATION TEST - VER 1** .

4. **SPEAKER**

Connect the Radio harness connector.

With the Rear Right Audio Speaker still disconnected, turn the ignition on.

Turn the Radio on.

With the scan tool, clear all Radio DTC's.

With the scan tool, read the DTC information.

Does the scan tool read: B140F-REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Replace the Rear Right Audio Speaker in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1420-AUDIO CASSETTE ERROR/INOPERABLE CASSETTE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the Radio Cassette player turned on.

Set Conditions

- **Set Condition:**

The code will set when a damaged Cassette is placed in the Cassette Player.

Possible Causes

Possible Causes

CASSETTE READ FAILURE

Diagnostic Test

1. **RADIO**

Replace the problem Cassette with a good, clean, undamaged, cassette.

Turn the Radio cassette player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1420-AUDIO CASSETTE ERROR/INOPERABLE CASSETTE?

Yes

Eject the inoperative cassette and replace the Radio/Cassette Player in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1421-AUDIO CD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the radio CD player turned on.

Set Conditions

- **Set Condition:**
- The code will set if a CD that is not formatted as a music CD is installed in the radio CD player.

Possible Causes

Possible Causes
CD READ FAILURE

Diagnostic Test

1. RADIO

Replace the problem CD with a good, clean, unscratched, music CD.

Turn the radio CD player on.

With the scan tool, read DTC's.

Does the scan tool display: B1421 AUDIO CD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative CD and replace the CD in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1422-AUDIO DVD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. DVD PLAYER

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1422-AUDIO DVD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1423-VES DVD READ ERROR/INOPERABLE DISC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. **DVD PLAYER**

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1423-VES DVD READ ERROR/INOPERABLE DISC?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1424-IMPROPER DVD-WRONG REGION

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition on and the DVD player turned on.

Set Conditions

- **Set Condition:**

The code will set if a DVD that is not formatted as a DVD is installed in the DVD player.

Possible Causes

Possible Causes
DVD READ FAILURE

Diagnostic Test

1. DVD PLAYER

Replace the problem DVD with a good, clean, unscratched DVD.

Turn the DVD player on.

With the scan tool, read DTC's.

Does the scan tool display active: B1424-IMPROPER DVD-WRONG REGION?

Yes

Eject the inoperative DVD and replace the DVD in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1429-RADIO DISPLAY HIGH TEMPERATURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition and Radio on.

Set Conditions

- Set Condition:**

The code will set if the temperature inside the Radio is above +65°C (+145°F)

Possible Causes

Possible Causes
HIGH TEMPERATURE FAILURE

Diagnostic Test

1. VERIFY THAT DTC B1429-RADIO DISPLAY HIGH TEMPERATURE IS ACTIVE.

With the scan tool, clear all DTC's.

Start the engine and allow the engine to reach normal operating temperature.

If the vehicle has been in the hot sunlight or extreme cold, move the vehicle indoors and open the doors to allow the inside temperature to stabilize.

The Radio should operate between -23°C and +65°C (-10°F and +145°F).

With the scan tool, read DTC's.

Does the scan tool display active: B1429-RADIO DISPLAY HIGH TEMPERATURE?

Yes

Replace the Radio in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142A-RADIO UNIT HIGH TEMPERATURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the ignition and Radio on.

Set Conditions

- **Set Condition:**

The code will set if the temperature inside the Radio is above +65°C (+145°F)

Possible Causes

Possible Causes
HIGH TEMPERATURE FAILURE

Diagnostic Test

1. VERIFY THAT DTC B142A-RADIO UNIT HIGH TEMPERATURE IS ACTIVE.

With the scan tool, erase the DTC's.

Start the engine and allow the engine to reach normal operating temperature.

If the vehicle has been in the hot sunlight or extreme cold, move the vehicle indoors and open the doors to allow the inside temperature to stabilize.

The Radio should operate between -23°C and +65°C (-10°F and +145°F).

With the scan tool, read DTC's.

Does the scan tool display active: B142A-RADIO UNIT HIGH TEMPERATURE?

Yes

Replace the Radio in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142C-VES VIDEO SCREEN DISCONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in Video mode.

Set Conditions

- **Set Condition:**

With the Radio in Video mode, the Radio does not detect a VES Video Screen.

Possible Causes

Possible Causes
BAD VES VIDEO SCREEN CONNECTION RADIO

Diagnostic Test

1. TEST VES VIDEO SCREEN CONNECTION

Turn the ignition off.

Disconnect the VES Video Screen connector.

Inspect the VES Video Screen connection.

Was the VES Video Screen connection clean and secure?

Yes

Go To 2.

No

Repair the VES Video Screen connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **VES VIDEO SCREEN**

Refer to the Audio System in the Service Information and test the VES Video Screen in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the VES Video Screen in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **RADIO**

NOTE: **Reconnect all previously disconnected components.**

NOTE: **Move vehicle outside approximately 30ft (9.14m) from any structure.**

Turn the ignition on.

Turn the Radio on.

With the scan tool, clear all DTC's, put the Radio in mode.

With the scan tool, read DTC's.

Does the scan tool display active: B142C-VES VIDEO SCREEN DISCONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142D-AUDIO ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in seek mode.

Set Conditions

- **Set Condition:**

With the Radio in seek mode for two loops around the band. The Radio does not detect an Antenna connection or does not receive a Radio station signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION RADIO

Diagnostic Test

1. TEST ANTENNA

Turn the ignition off.

Disconnect the Radio Antenna connector.

Inspect the Radio Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. ANTENNA

Refer to the Audio System in the Service Information and test the antenna in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. RADIO

NOTE: **Reconnect all previously disconnected components.**

NOTE: **Move vehicle outside approximately 30ft (9.14m) from any structure.**

Turn the ignition on.

Turn the Radio on.

With the scan tool, clear all DTC's, put the Radio in seek up and down mode for 2 loops around the band cycle before proceeding.

With the scan tool, read DTC's.

Does the scan tool display active: B142D-AUDIO ANTENNA NOT CONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142E-GPS ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Radio in Navigation mode.

Set Conditions

- **Set Condition:**

With the Radio in Navigation mode. The Radio does not detect an Antenna connection or does not receive a Navigation (GPS) signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION RADIO ANTENNA

Diagnostic Test

1. **TEST ANTENNA**

Turn the ignition off.

Disconnect the GPS Antenna connector.

Inspect the GPS Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.
Perform **BODY VERIFICATION TEST - VER 1** .

2. **ANTENNA**

Refer to the Audio System in the Service Information and test the antenna in accordance with the Service Procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. RADIO

NOTE: Reconnect all previously disconnected components.

NOTE: Move vehicle outside approximately 30ft (9.14m) from any structure.

Turn the ignition and Radio on.

With the scan tool, clear all DTC's and operate the Navigation system.

With the scan tool, read DTC's.

Does the scan tool display active: B142E-GPS ANTENNA NOT CONNECTED?

Yes

Replace the Radio in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B142F-SATELLITE RADIO ANTENNA NOT CONNECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Satellite Radio in seek mode.

Set Conditions

- **Set Condition:**
- With the radio in seek mode for two loops around the band. The radio does not detect an antenna

connection or does not receive a radio satellite signal.

Possible Causes

Possible Causes
BAD ANTENNA CONNECTION SATELLITE RADIO RECEIVER

Diagnostic Test

1. TEST ANTENNA

Turn the ignition off.

Disconnect the Satellite Radio Antenna connector.

Inspect the Satellite Radio Antenna connection.

Was the Antenna connection clean and secure?

Yes

Go To 2.

No

Repair the Antenna connection as needed.

Perform **BODY VERIFICATION TEST - VER 1** .

2. SATELLITE RADIO ANTENNA

Refer to the Audio System in the service information and test the antenna in accordance with the service procedure.

Is the Antenna ok?

Yes

Go To 3.

No

Repair or replace the Antenna assembly as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

3. SATELLITE RADIO RECEIVER

NOTE: Reconnect all previously disconnected components.

NOTE: **Move vehicle outside approximately 30ft (9.144m) from any structure.**

Turn the ignition and radio on.

With the scan tool, erase the audio DTC's, put the satellite radio in seek up and down mode for 2 loops around the band cycle before proceeding.

With the scan tool, read the audio DTC's.

Did this DTC reset?

Yes

Replace the Satellite Radio Receiver in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

B1430 SATELLITE RADIO ANTENNA INTERNAL PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The Satellite Radio Antenna detects a software checksum test failure.

Possible Causes

Possible Causes
SATELLITE RADIO ANTENNA

Diagnostic Test

1. **REPLACE THE SATELLITE RADIO ANTENNA**

When this code is set, the Satellite Radio Antenna must be replaced.

Repair

Replace the Satellite Radio Antenna in accordance with the Service Information. Refer to **STANDARD PROCEDURE** . Refer to **STANDARD PROCEDURE** .

B1460-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ± 1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1460-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B1461-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic

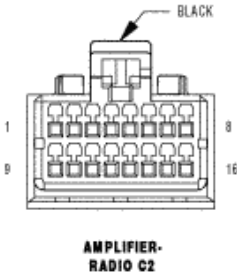
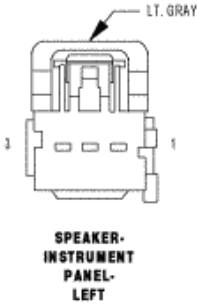
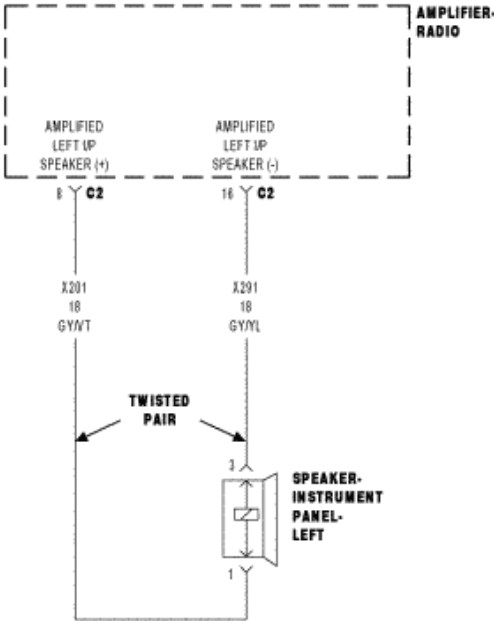


Fig. 37: Channel 1 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X291) AMPLIFIED LEFT FRONT I/P SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT FRONT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1461-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

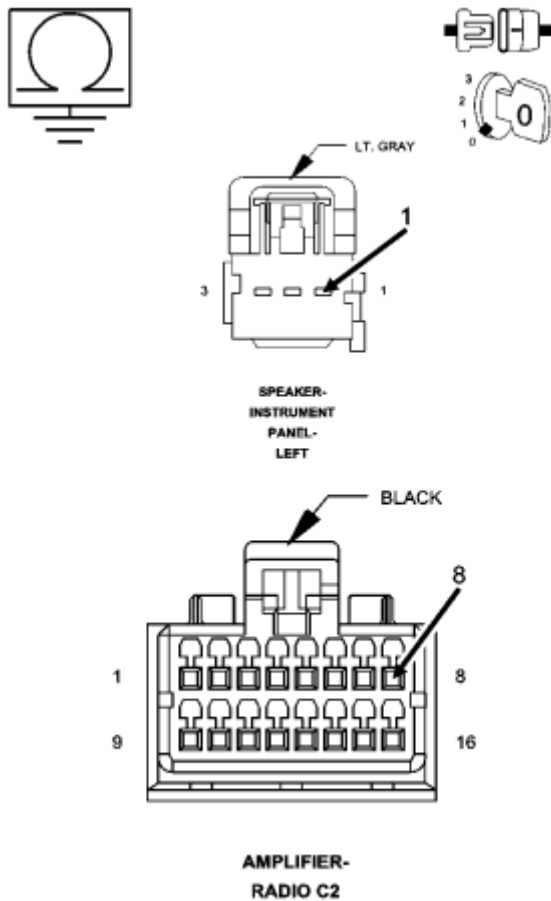
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X201) AMPLIFIED LEFT FRONT I/P SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c0f14

Fig. 38: Measuring Resistance Between Ground And (X201) Amplified Left Front I/P Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Left I/P Speaker harness connector.

Measure the resistance between ground and the (X201) Amplified Left Front I/P Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

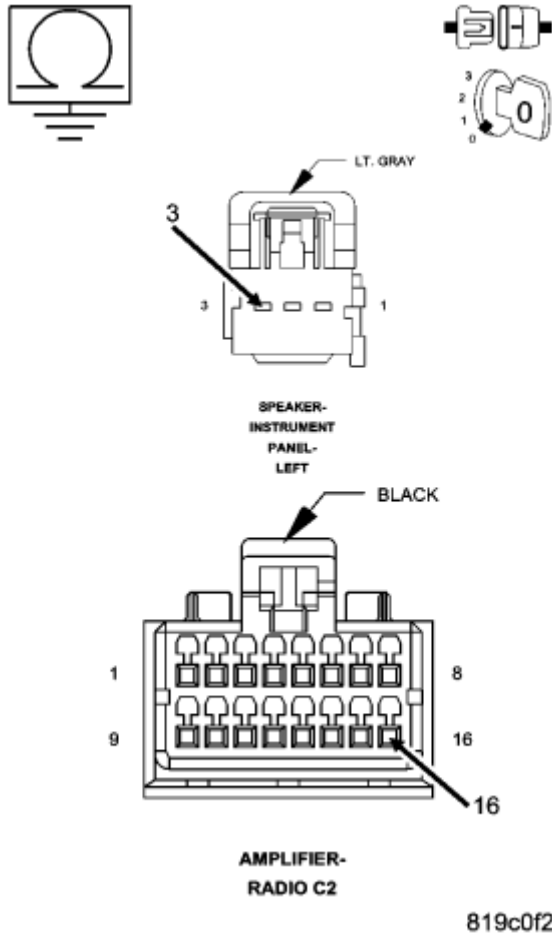
Repair the (X201) Amplified Left Front I/P Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X291) AMPLIFIED LEFT FRONT I/P SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c0f21

Fig. 39: Measuring Resistance Between Ground And Amplified Left Front I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X291) Amplified Left Front I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X291) Amplified Left Front I/P Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK OPERATION OF THE AMPLIFIED LEFT FRONT I/P SPEAKER**

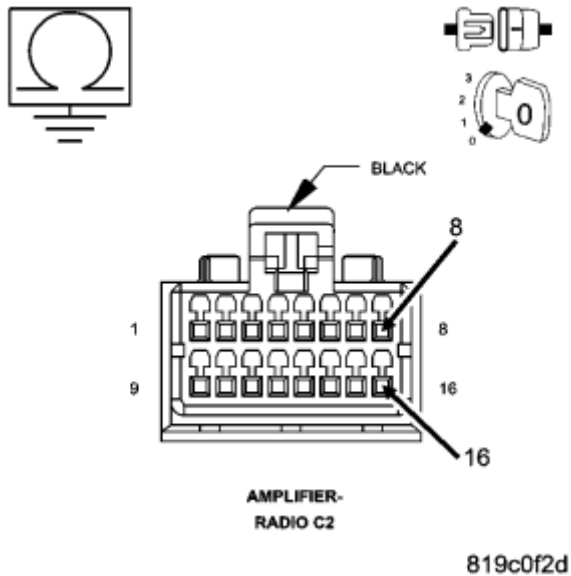


Fig. 40: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground
Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Front I/P Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Front I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

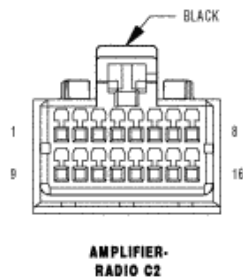
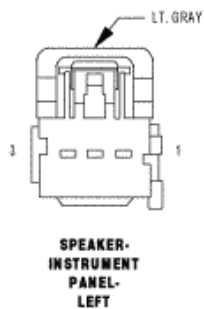
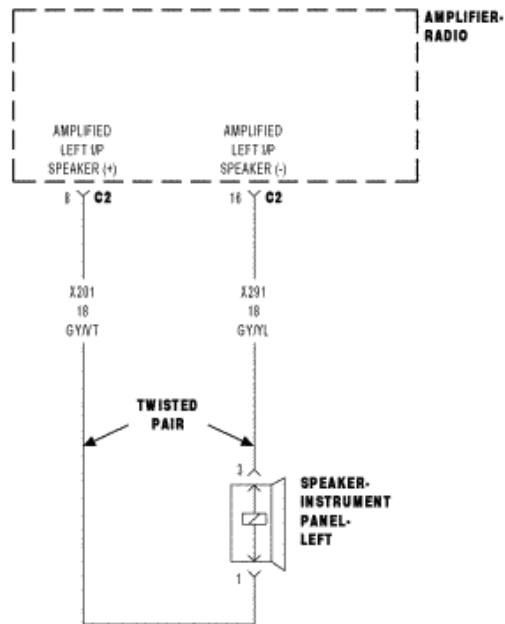
No

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1462-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



81N09477

Fig. 41: Channel 1 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1462-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT**

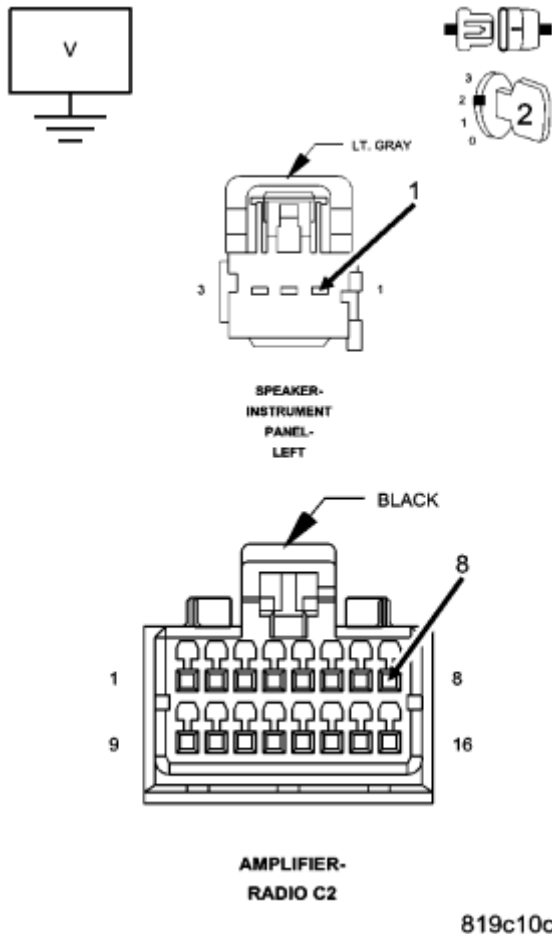


Fig. 42: Measuring For Voltage On (X201) Amplified Left I/P Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Left I/P Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X201) Amplified Left I/P Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X201) Amplified Left I/P Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT**

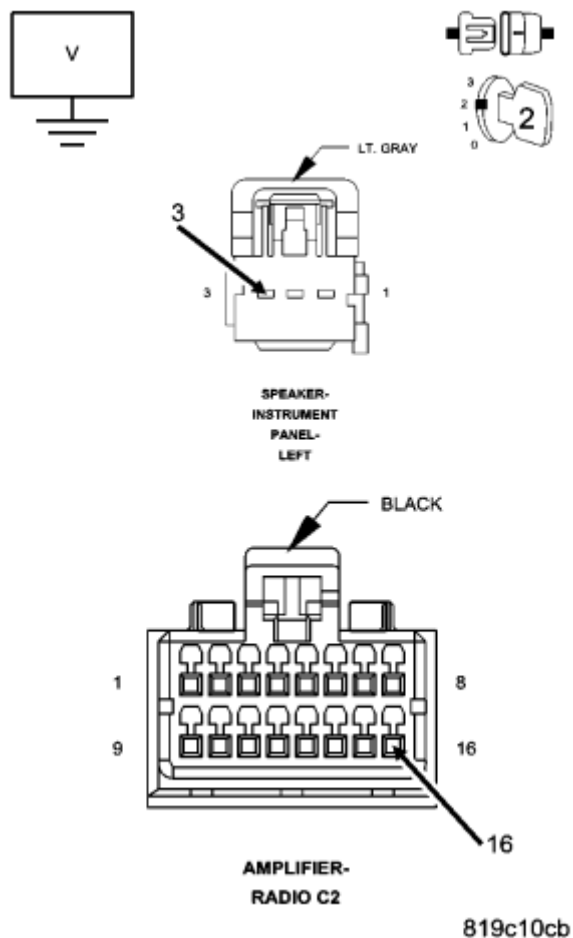


Fig. 43: Measuring For Voltage On (X291) Amplified Left I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X291) Amplified Left I/P Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X291) Amplified Left I/P Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1463-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT OPEN (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT OPEN LEFT FRONT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1463-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE LEFT FRONT I/P SPEAKER

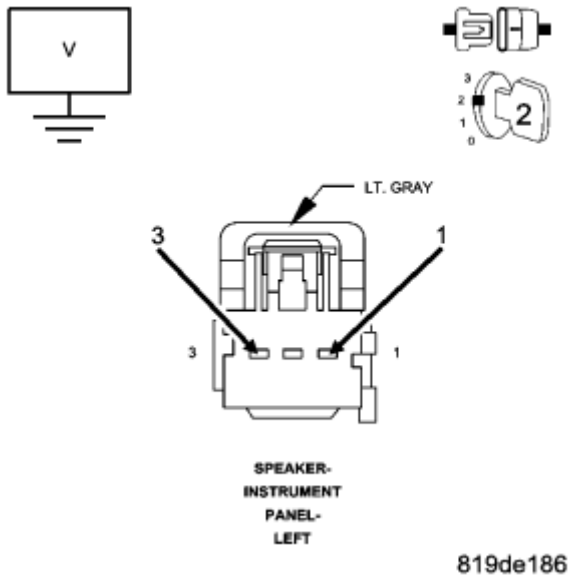


Fig. 44: Measuring Voltage Of Amplified Left I/P Speaker Circuits In Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left I/P Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left I/P Speaker circuits in the Amplified Left I/P Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Left I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT FOR AN OPEN**

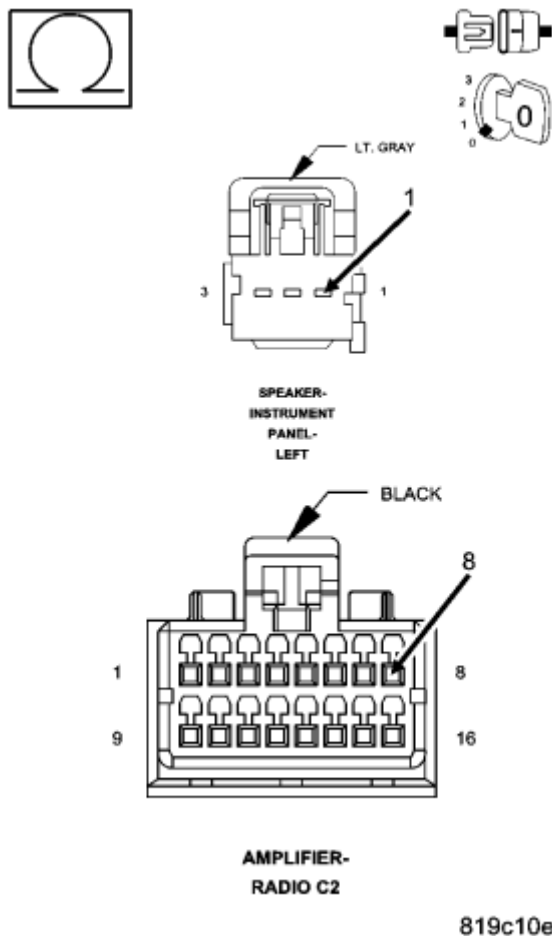


Fig. 45: Measuring Resistance Of (X201) Amplified Left I/P Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X201) Amplified Left I/P Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Left I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X201) Amplified Left I/P Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **CHECK THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT FOR AN OPEN**

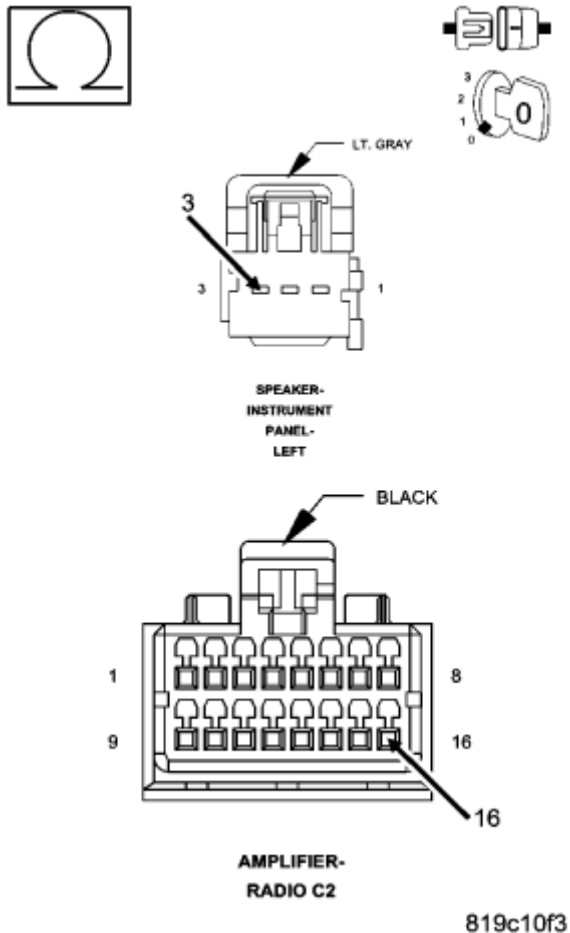


Fig. 46: Measuring Resistance Of (X291) Amplified Left I/P Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Left I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X291) amplified Left I/P Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Left I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

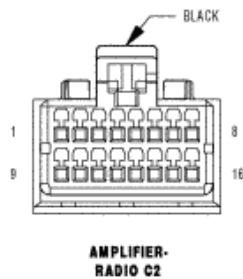
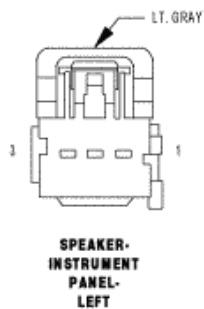
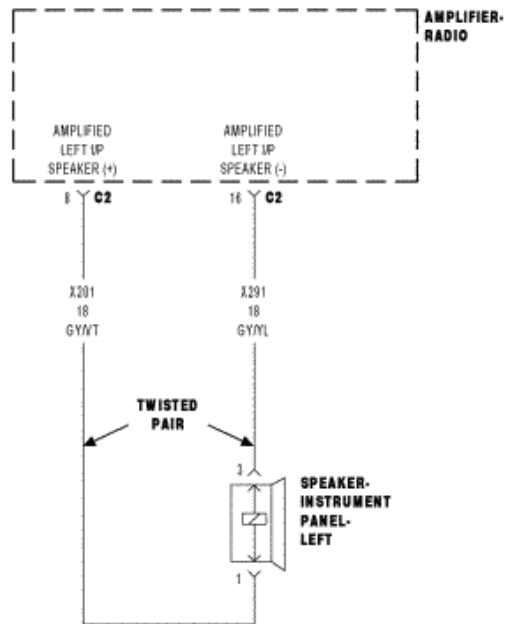
No

Repair the (X291) Amplified Left I/P Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1464-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



81N09477

Fig. 47: Channel 1 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT SHORTED TO THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUIT AMPLIFIED LEFT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1464-CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT I/P SPEAKER

Turn the ignition off.

Disconnect the Amplified Left I/P Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

Replace the Amplified Left I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X201) AMPLIFIED LEFT I/P SPEAKER (+) CIRCUIT, AND THE (X291) AMPLIFIED LEFT I/P SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER

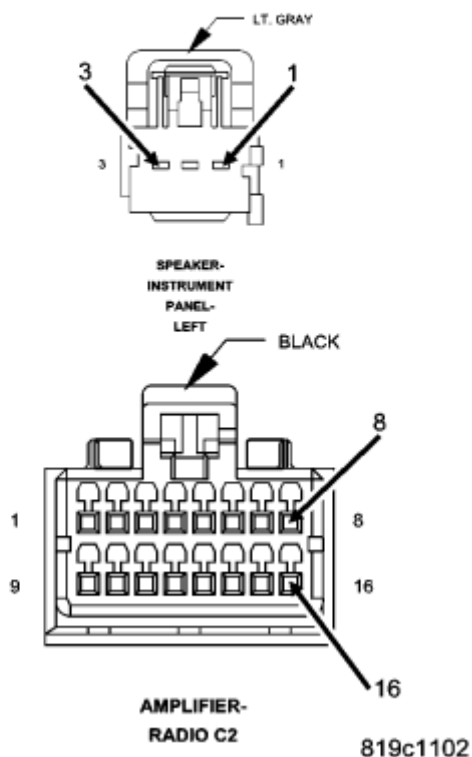


Fig. 48: Measuring Resistance Between (X201) Amplified Left I/P Speaker (+) Circuit And (X291) Amplified Left I/P Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X201) Amplified Left I/P Speaker (+) circuit, and the (X291) Amplified Left I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X201) Amplified Left I/P Speaker (+) circuit, and the (X291) Amplified Left I/P Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1465-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read amplifier DTCs.

Does the scan tool display active: B1465-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

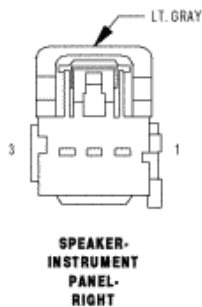
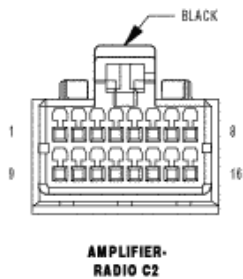
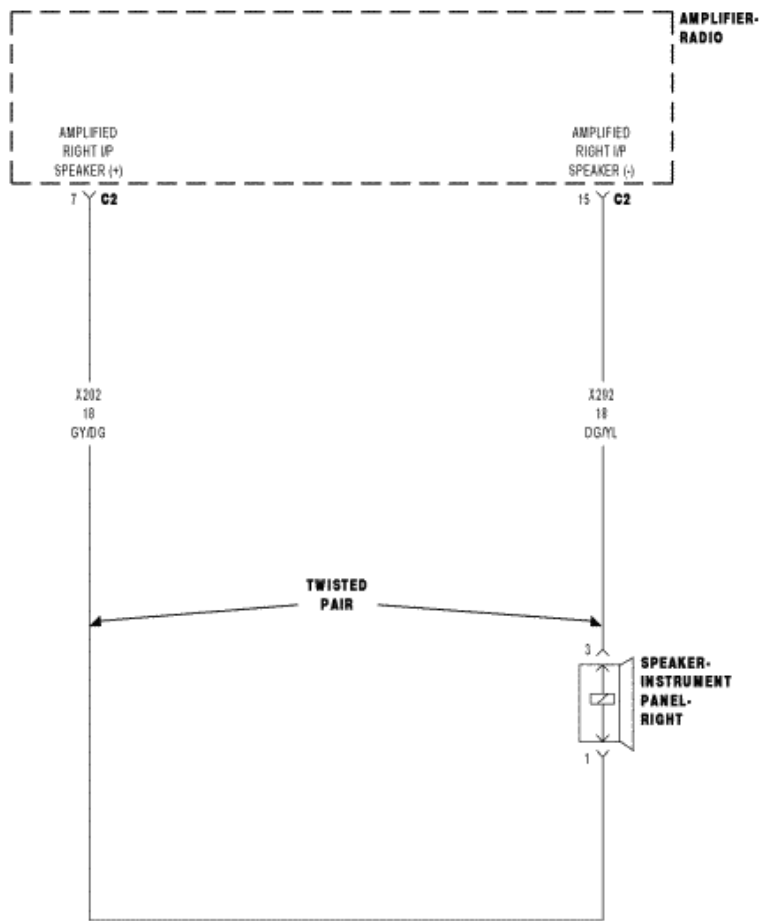
No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B1466-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c13a5

Fig. 49: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT FRONT I/P SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X292) AMPLIFIED RIGHT FRONT I/P SPEAKER (-) CIRCUIT SHORTED TO GROUND
RIGHT FRONT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1466-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

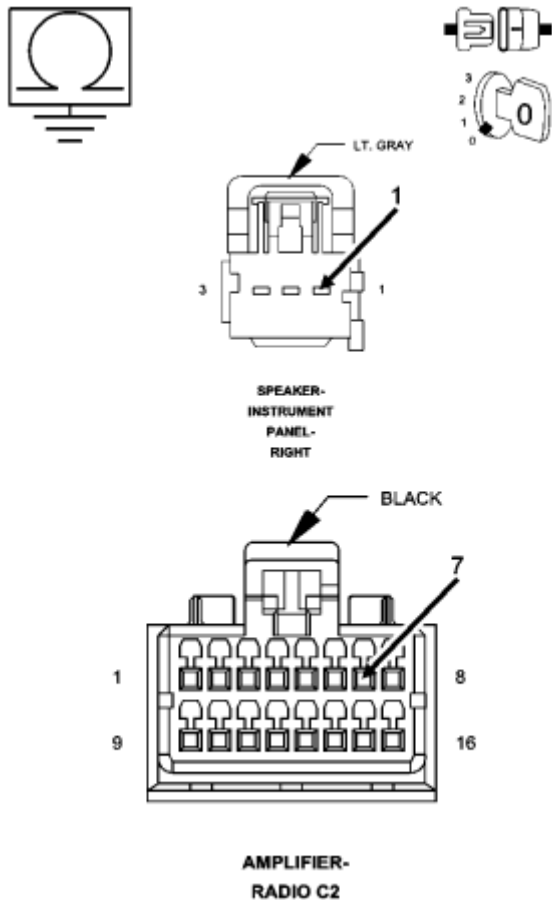
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X202) AMPLIFIED RIGHT FRONT I/P SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c142f

Fig. 50: Measuring Resistance Between Ground And (X202) Amplified Right Front I/P Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Right Front I/P Speaker harness connector.

Measure the resistance between ground and the (X202) Amplified Right Front I/P Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X202) Amplified Right Front I/P Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X292) AMPLIFIED RIGHT FRONT I/P SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**

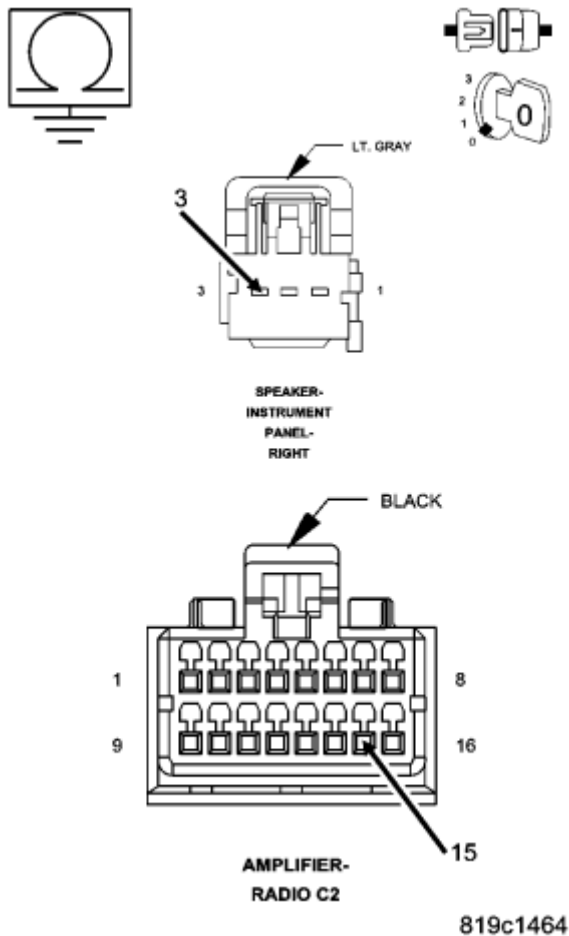


Fig. 51: Measuring Resistance Between Ground And (X292) Amplified Right Front I/P Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X292) Amplified Right Front I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X292) Amplified Right Front I/P Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT FRONT I/P SPEAKER

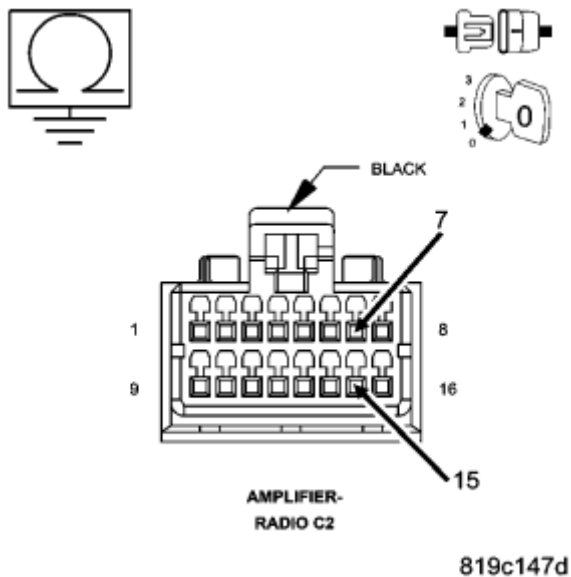


Fig. 52: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Front I/P Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Front I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

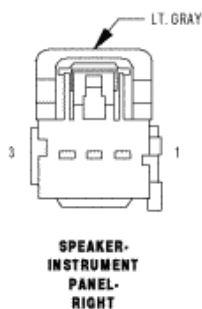
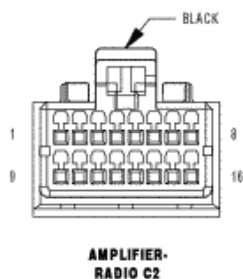
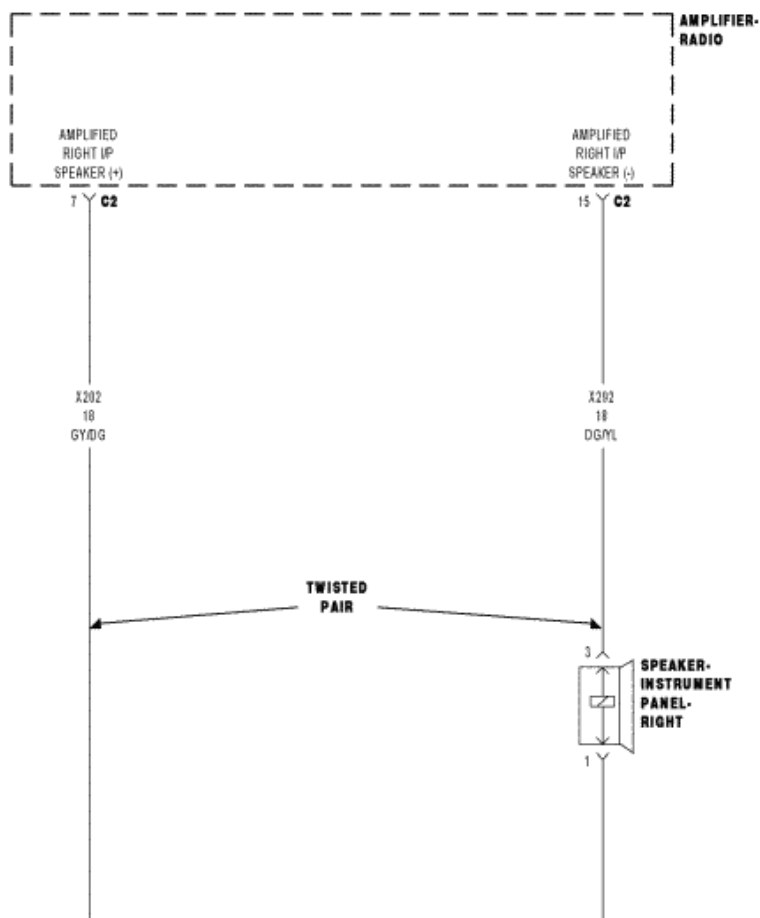
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1467-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c13a5

Fig. 53: Channel 2 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1467-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

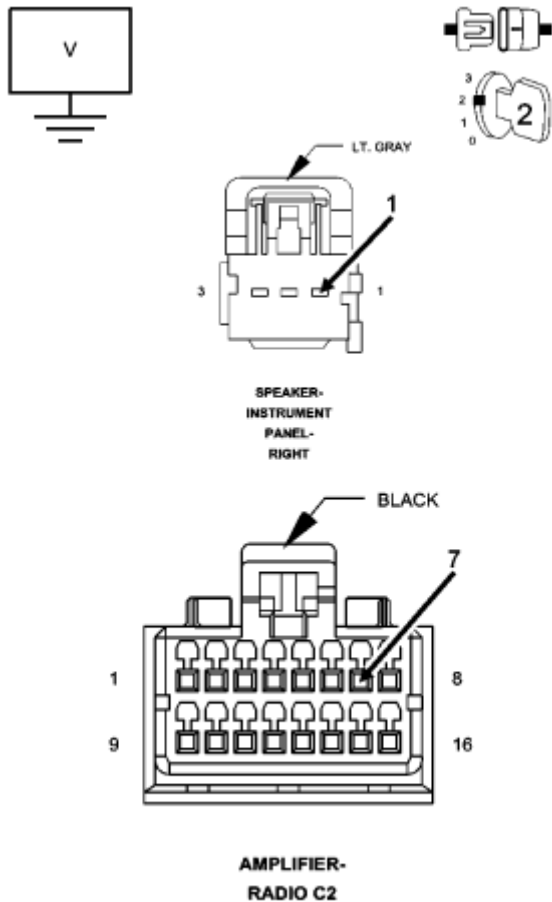
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT**



819c16c6

Fig. 54: Measuring For Voltage On (X202) Amplified Right I/P Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Right I/P Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X202) Amplified Right I/P Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X202) Amplified Right I/P Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK FOR VOLTAGE ON THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT

Measure for voltage on the (X292) Amplified Right I/P Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X292) Amplified Right I/P Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

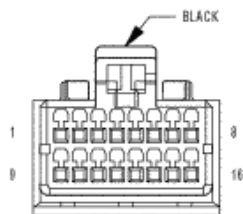
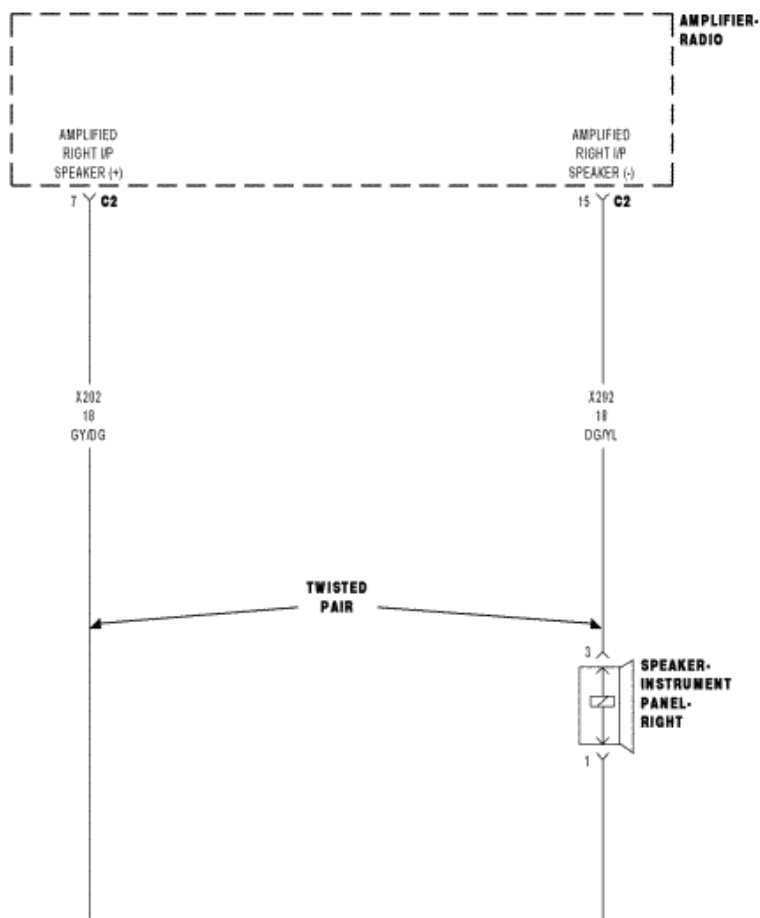
No

Replace the amplifier in accordance with the service information.

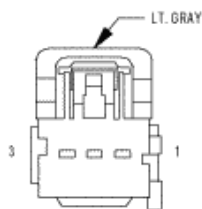
Perform **BODY VERIFICATION TEST - VER 1** .

B1468-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



AMPLIFIER-RADIO C2



SPEAKER-INSTRUMENT PANEL-RIGHT

019c13a5

Fig. 55: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT OPEN
(X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT OPEN
RIGHT I/P SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1468-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE RIGHT FRONT I/P SPEAKER

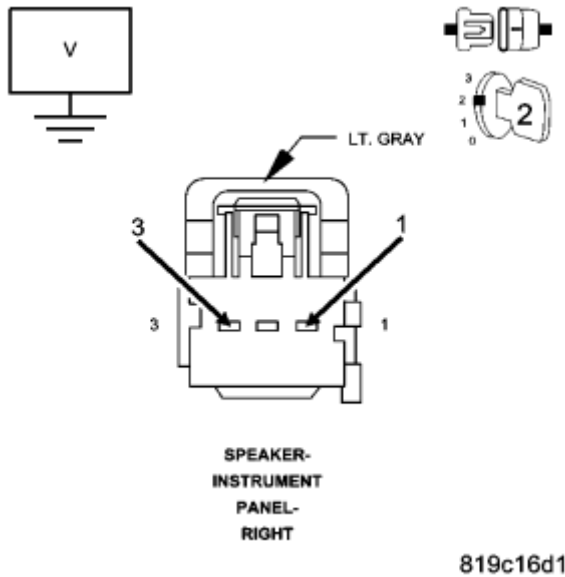


Fig. 56: Measuring Voltage Of Amplified Right I/P Speaker Circuits In Amplified Right I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right I/P Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right I/P Speaker circuits in the Amplified Right I/P Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Right I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. CHECK THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT FOR AN OPEN

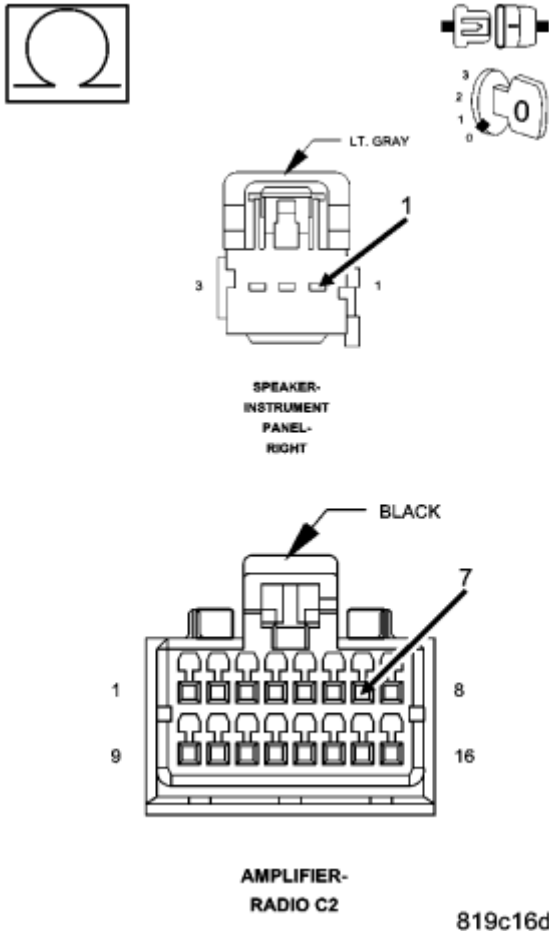


Fig. 57: Measuring Resistance Of (X202) Amplified Right I/P Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Right I/P Speaker Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X202) Amplified Right I/P Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Right I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X202) Amplified Right I/P Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT FOR AN OPEN**

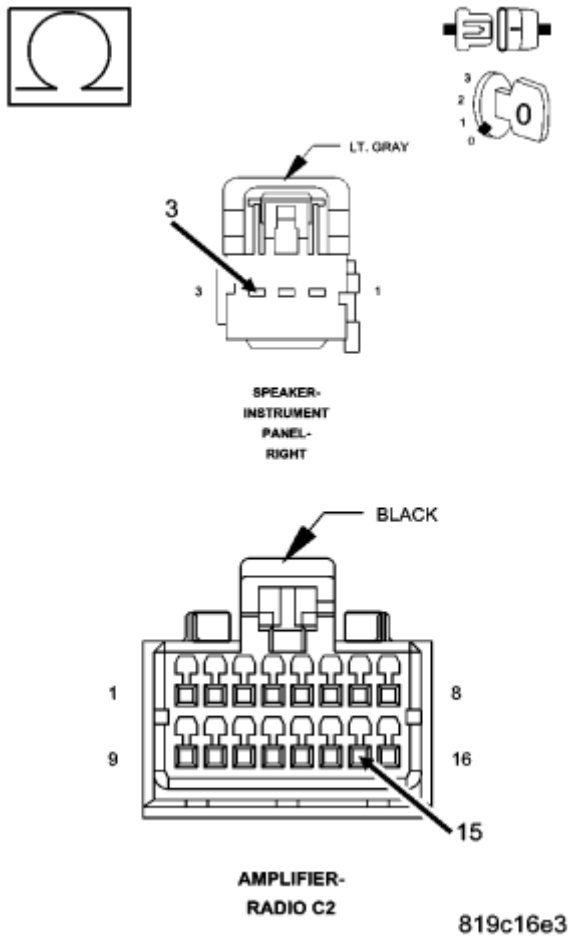


Fig. 58: Measuring Resistance Of (X292) Amplified Right I/P Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Right I/P Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X292) Amplified Right I/P Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Right I/P Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

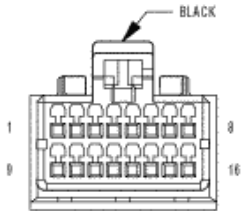
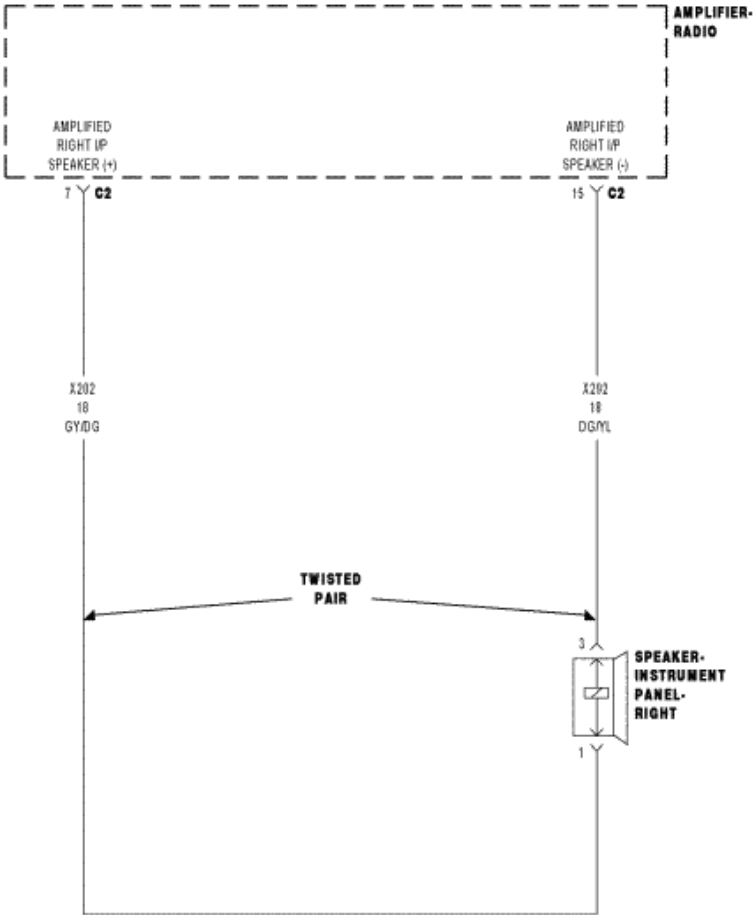
No

Repair the (X292) Amplified Right I/P Speaker (-) circuit for an open.

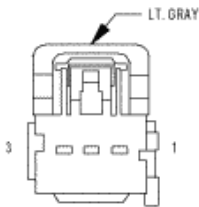
Perform **BODY VERIFICATION TEST - VER 1 .**

B1469-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



AMPLIFIER-RADIO C2



SPEAKER-INSTRUMENT PANEL-RIGHT

Fig. 59: Channel 2 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT SHORTED TO THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUIT AMPLIFIED RIGHT I/P SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1469-CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT I/P SPEAKER

Turn the ignition off.

Disconnect the Amplified Right I/P Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

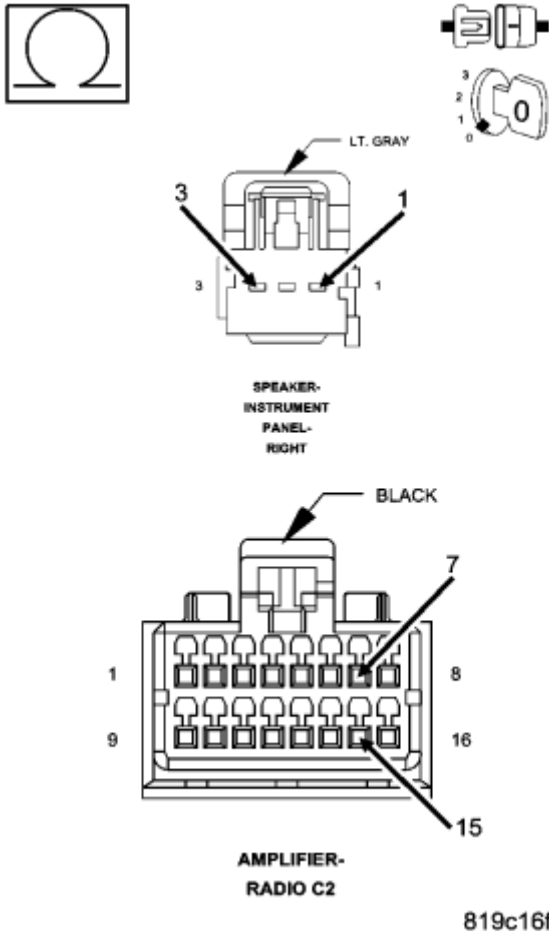
Replace the Amplified Right I/P Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X202) AMPLIFIED RIGHT I/P SPEAKER (+) CIRCUIT, AND THE (X292) AMPLIFIED RIGHT I/P SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c16fd

Fig. 60: Measuring Resistance Between (X202) Amplified Right I/P Speaker (+) Circuit And (X292) Amplified Right I/P Speaker (-) Circuit
 Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X202) Amplified Right I/P Speaker (+) circuit, and the (X292) Amplified Right I/P Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X202) Amplified Right I/P Speaker (+) circuit, and the (X292) Amplified Right I/P Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146A-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146A-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

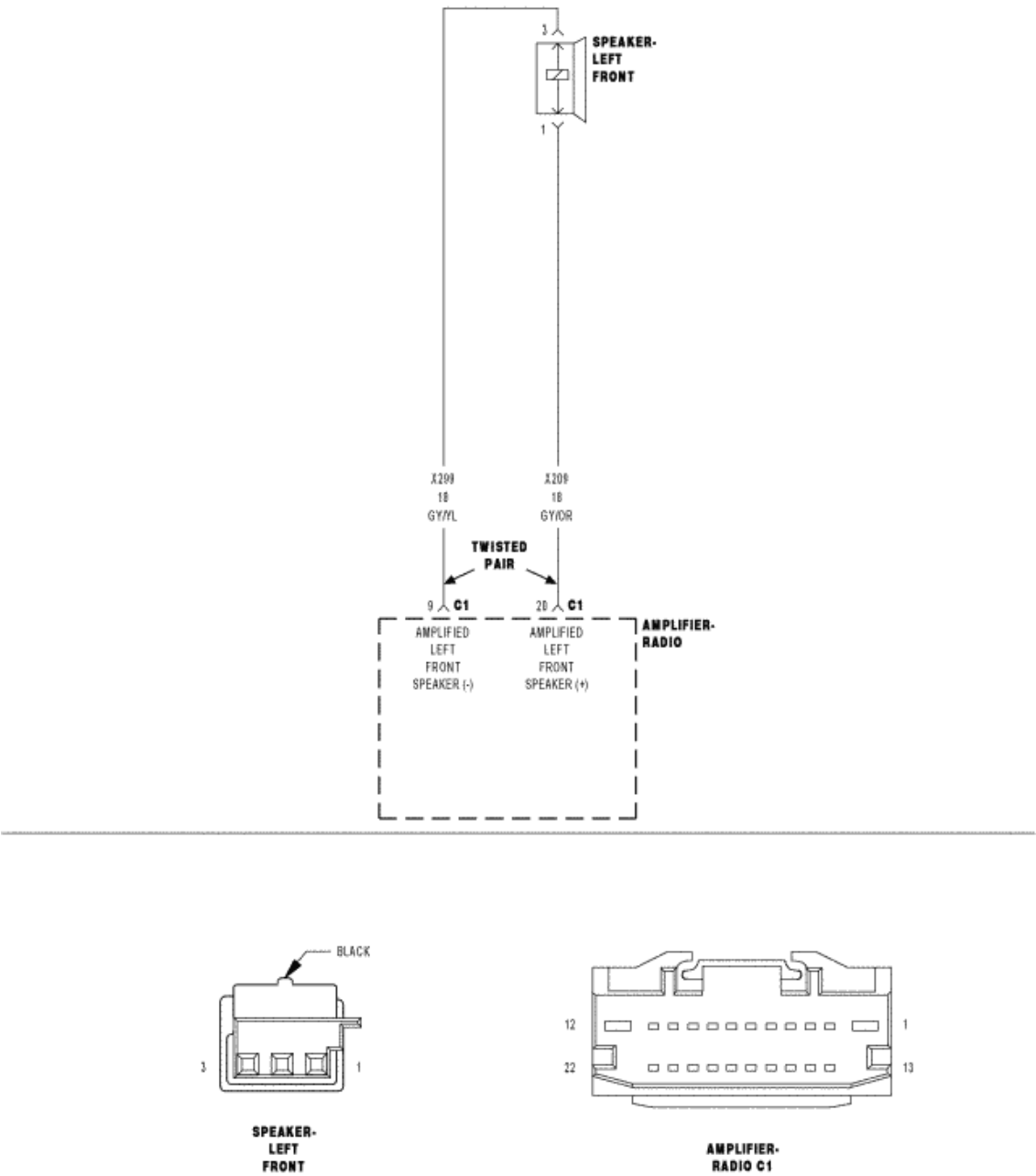
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B146B-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c10af

Fig. 61: Channel 3 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146B-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

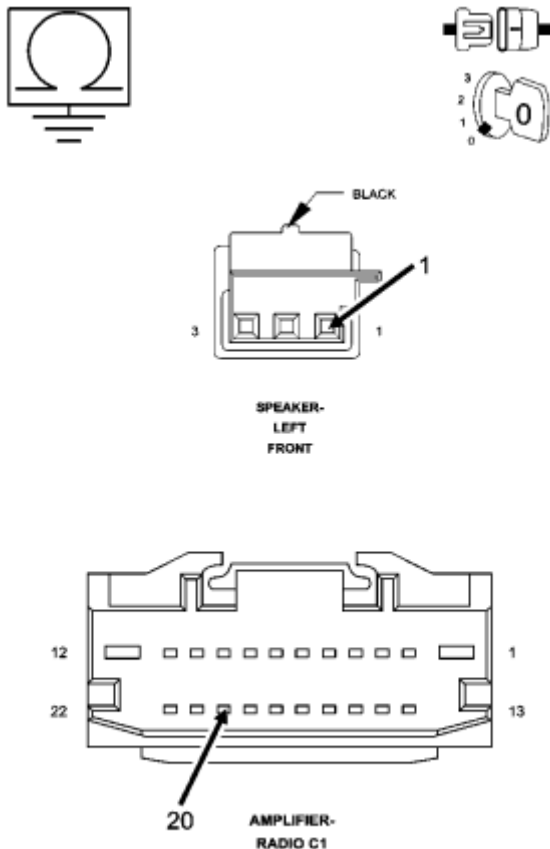
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c1937

Fig. 62: Measuring Resistance Between Ground And (X209) Amplified Left Front Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Left Front Speaker harness connector.

Measure the resistance between ground and the (X209) Amplified Left Front Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

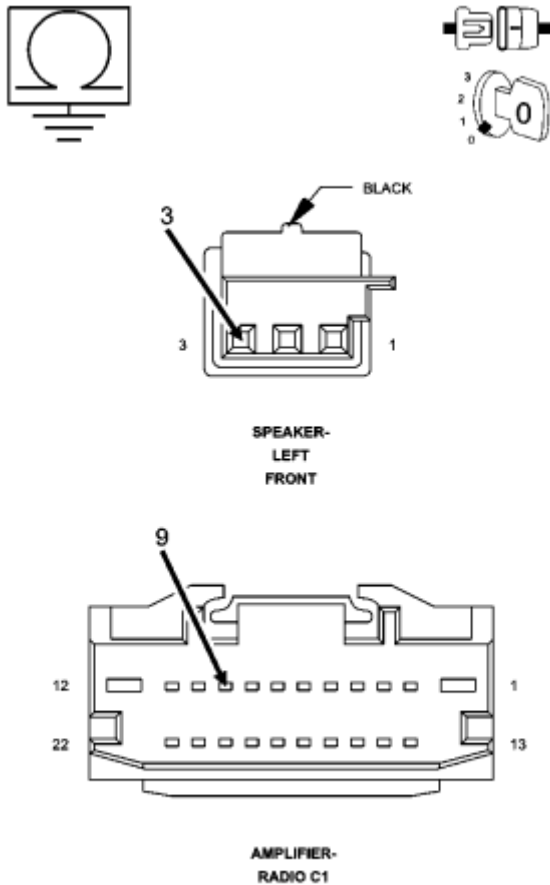
Repair the (X209) Amplified Left Front Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c1977

Fig. 63: Measuring Resistance Between Ground And (X299) Amplified Left Front Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X299) Amplified Left Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

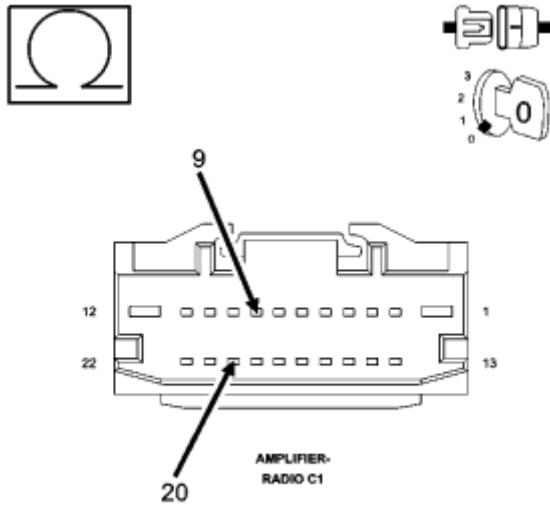
Repair the (X299) Amplified Left Front Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER



819c19ba

Fig. 64: Measuring Resistance Of Speaker Circuit Between Amplifier C1 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Front Speaker.

Measure the resistance of the speaker circuit between the Amplifier C1 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

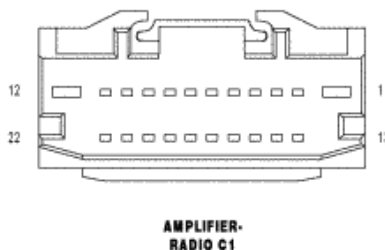
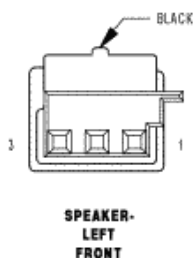
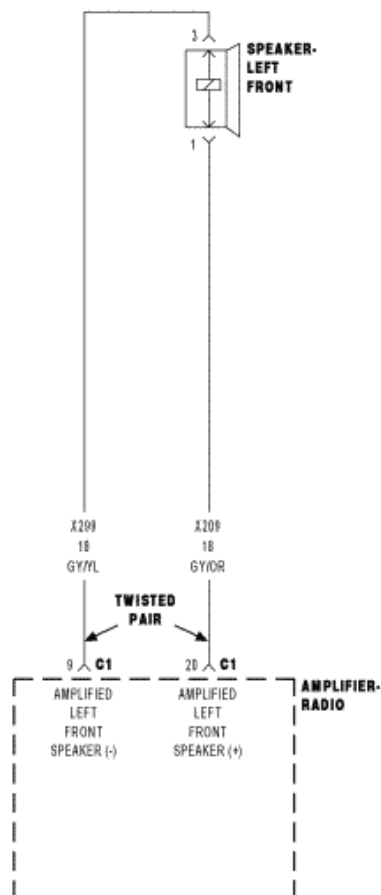
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146C-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



010c10a1

Fig. 65: Channel 3 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146C-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

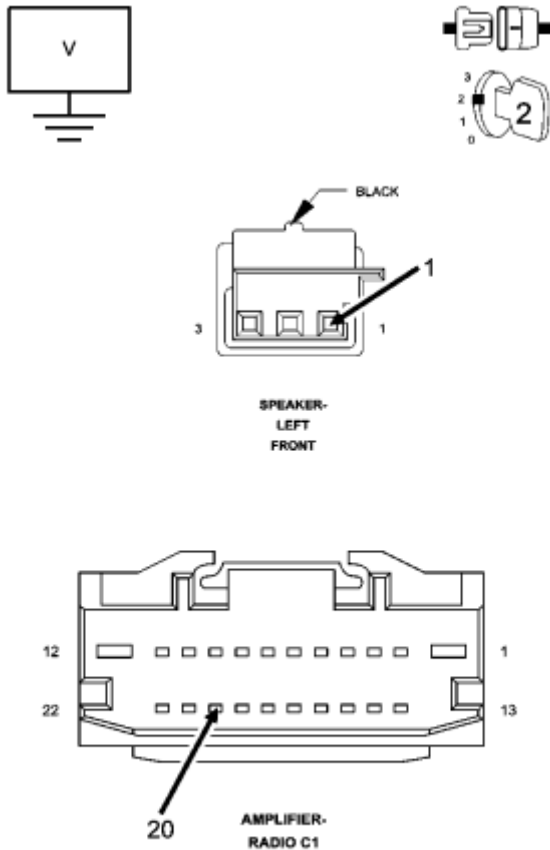
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT**



819c1a0a

Fig. 66: Measuring For Voltage On (X209) Amplified Left Front Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Amplified Left Front Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X209) Amplified Left Front Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

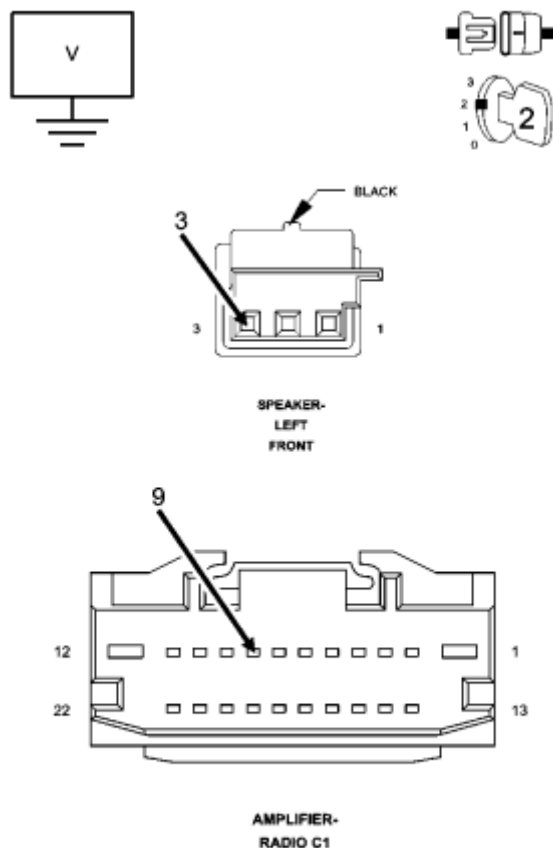
Repair the (X209) Amplified Left Front Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT**



819c1a4a

Fig. 67: Measuring For Voltage On (X299) Amplified Left Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X299) Amplified Left Front Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X299) Amplified Left Front Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

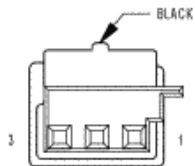
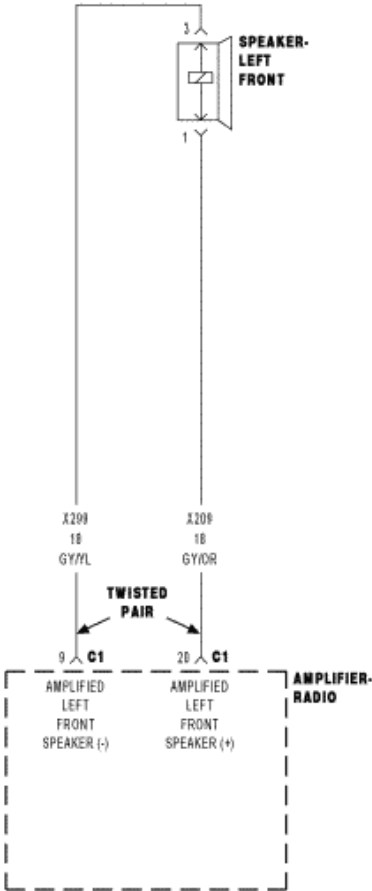
No

Replace the amplifier in accordance with the service information.

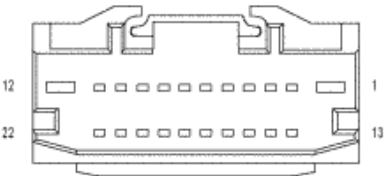
Perform **BODY VERIFICATION TEST - VER 1** .

B146D-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



**SPEAKER-
LEFT
FRONT**



**AMPLIFIER-
RADIO C1**

Fig. 68: Channel 3 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT OPEN
(X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT OPEN
AMPLIFIED LEFT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146D-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

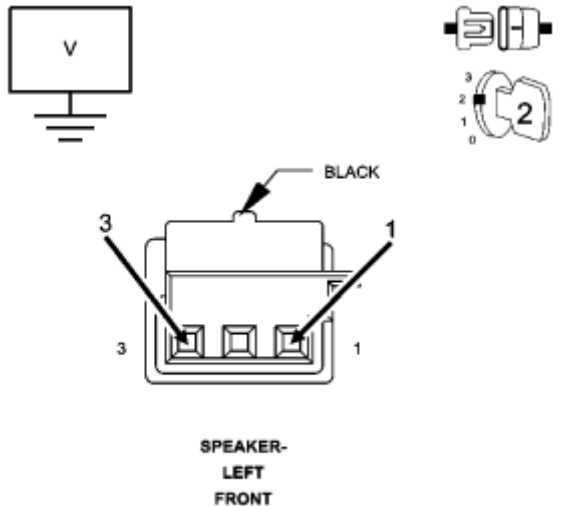
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER



819c1aa2

Fig. 69: Measuring Voltage Of Amplified Left Front Speaker Circuits In Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplified Left Front Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left Front Speaker circuits in the Amplified Left Front Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

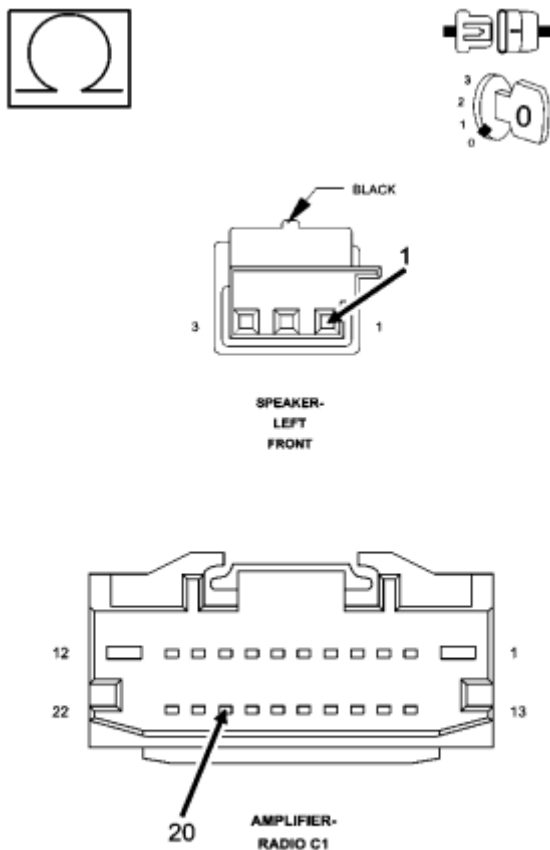
Replace the Amplified Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT FOR AN OPEN**



819c1aad

Fig. 70: Measuring Resistance Of (X209) Amplified Left Front Speaker (+) Circuit Between Amplifier C1 Harness Connector And Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Measure the resistance of the (X209) Amplified Left Front Speaker (+) circuit between the Amplifier C1 harness connector and the Amplified Left Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

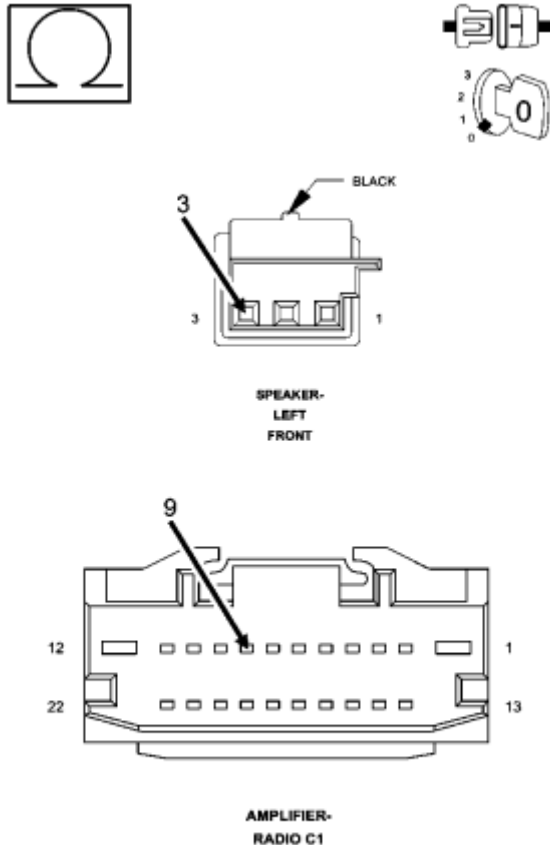
Go To 4.

No

Repair the (X209) Amplified Left Front Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT FOR AN OPEN



819c1ab4

Fig. 71: Measuring Resistance Of (X299) Amplified Left Front Speaker (-) Circuit Between Amplifier C1 Harness Connector And Amplified Left Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X299) Amplified Left Front Speaker (-) circuit between the Amplifier C1 harness connector and the Amplified Left Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

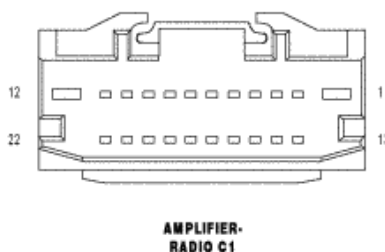
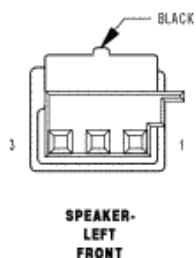
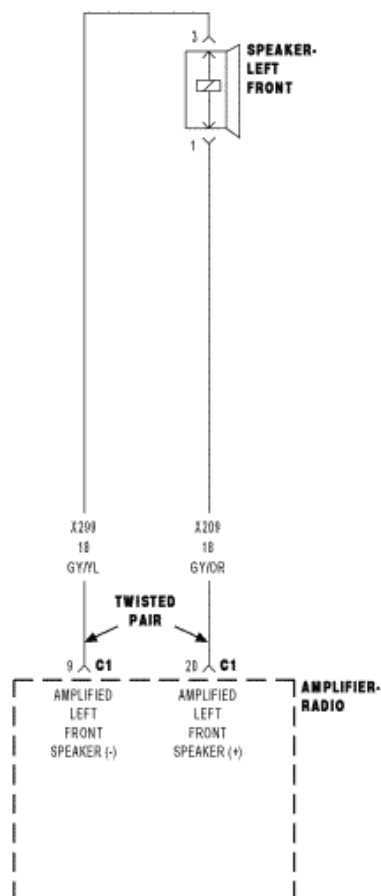
No

Repair the (X299) Amplified Left Front Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B146E-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



010c10a1

Fig. 72: Channel 3 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT SHORTED TO THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUIT AMPLIFIED LEFT FRONT SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B146E-CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT FRONT SPEAKER

Turn the ignition off.

Disconnect the Amplified Left Front Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

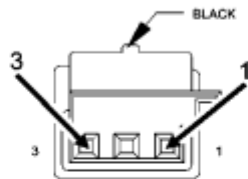
Replace the Amplified Left Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

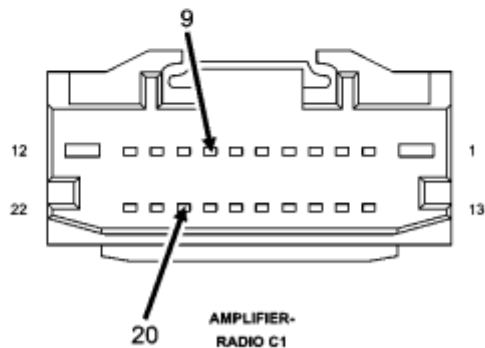
No

Go To 3.

3. CHECK THE (X209) AMPLIFIED LEFT FRONT SPEAKER (+) CIRCUIT, AND THE (X299) AMPLIFIED LEFT FRONT SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



SPEAKER-
LEFT
FRONT



819c1ac0

Fig. 73: Measuring Resistance Between (X209) Amplified Left Front Speaker (+) Circuit And (X299) Amplified Left Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C1 harness connector.

Measure the resistance between the (X209) Amplified Left Front Speaker (+) circuit, and the (X299) Amplified Left Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X209) Amplified Left Front Speaker (+) circuit, and the (X299) Amplified Left Front Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B146F-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read amplifier DTCs.

Does the scan tool display active: B146F-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

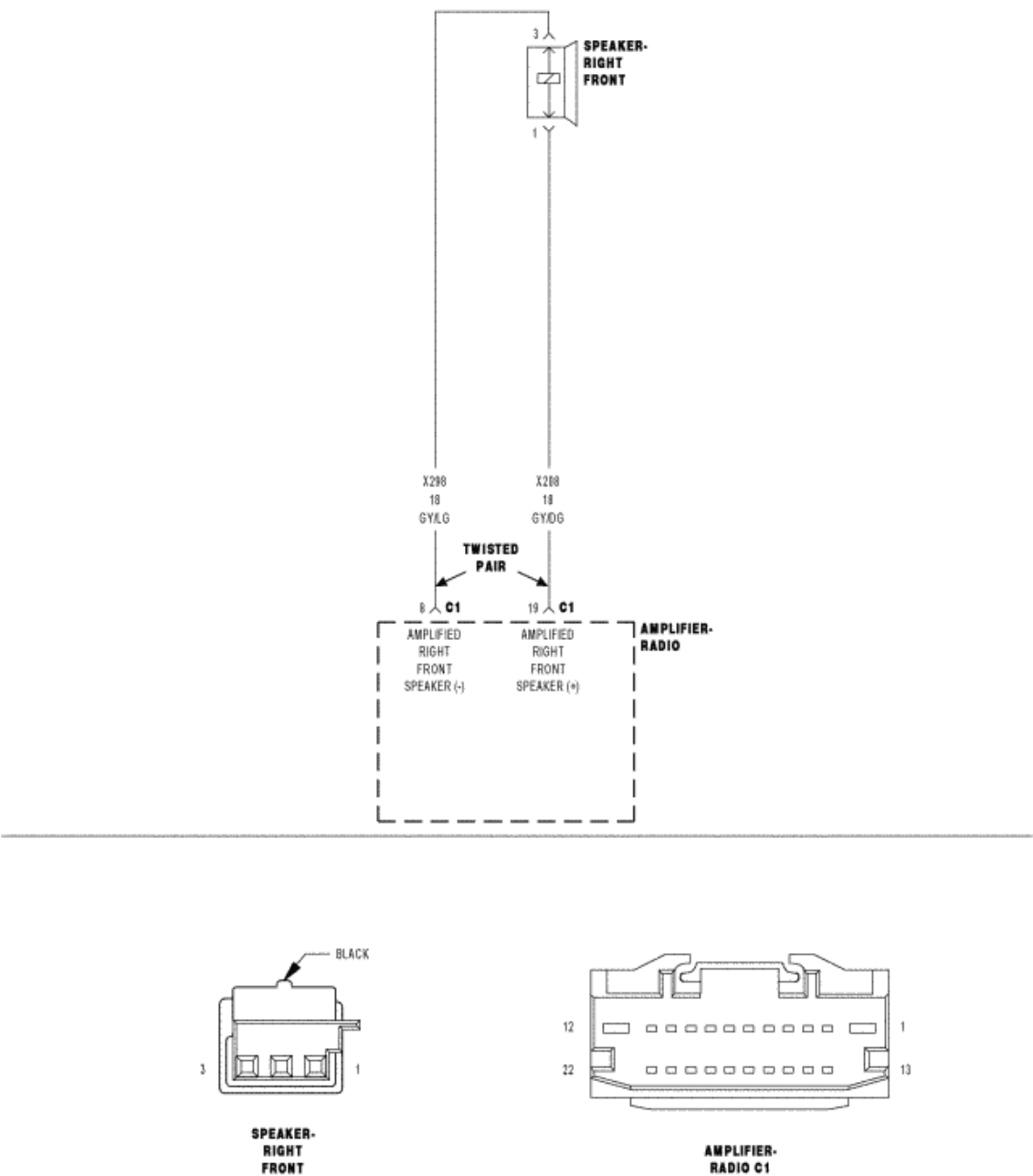
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B1470-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



01042000

Fig. 74: Channel 4 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT SHORTED TO GROUND
RIGHT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1470-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

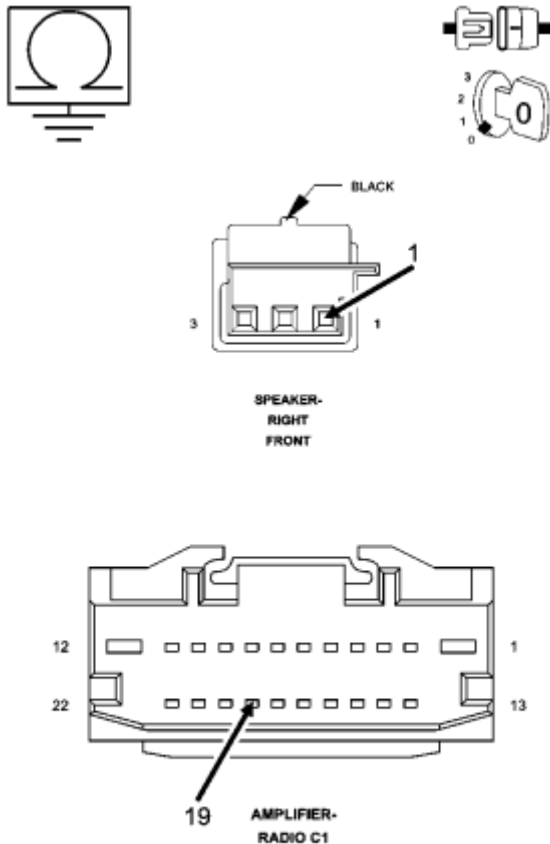
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c26a3

Fig. 75: Measuring Resistance Between Ground And (X208) Amplified Right Front Speaker (+) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Right Front Speaker harness connector.

Measure the resistance between ground and the (X208) Amplified Right Front Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

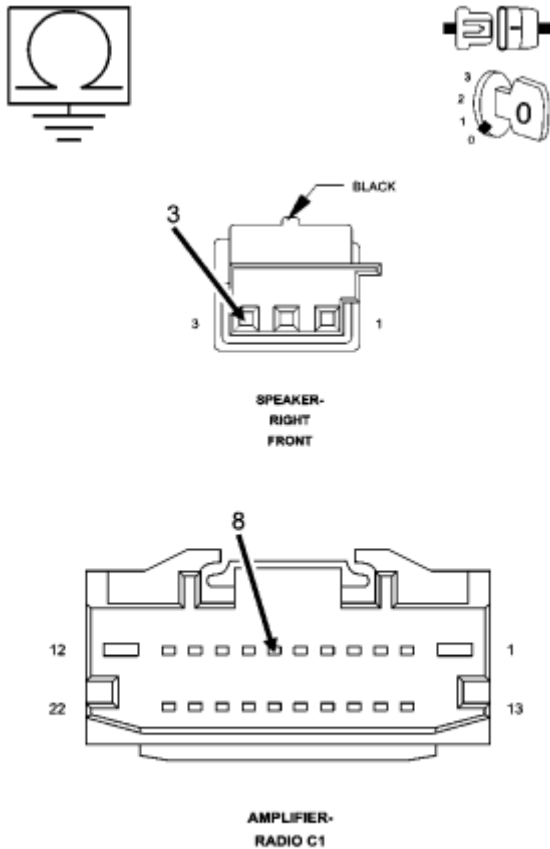
Repair the (X208) Amplified Right Front Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c26c6

Fig. 76: Measuring Resistance Between Ground And (X298) Amplified Right Front Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X298) Amplified Right Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

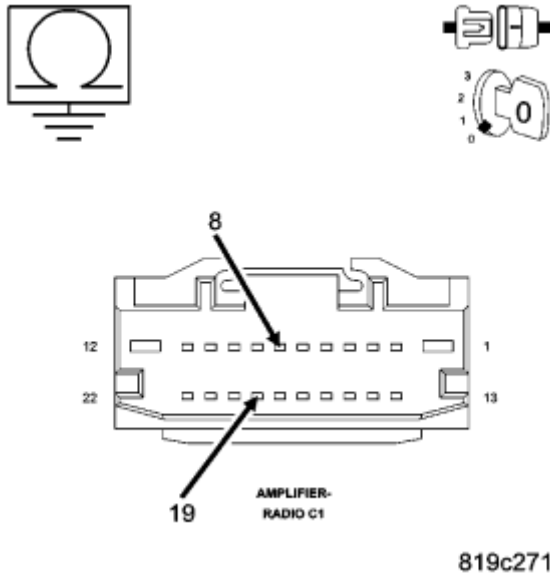
Repair the (X298) Amplified Right Front Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER



819c2716

Fig. 77: Measuring Resistance Of Speaker Circuit Between Amplifier C1 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Front Speaker.

Measure the resistance of the speaker circuit between the Amplifier C1 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

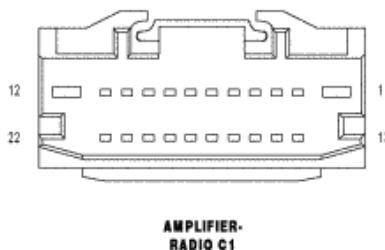
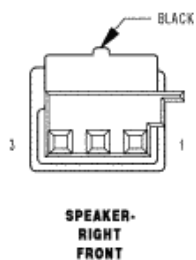
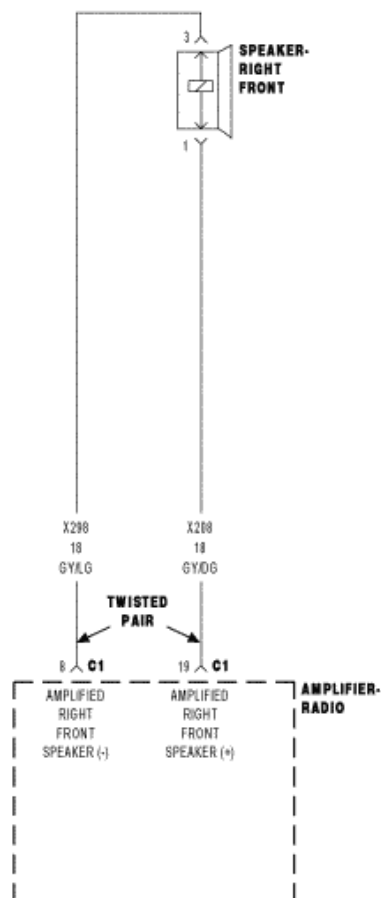
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1471-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c3000

Fig. 78: Channel 4 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1471-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

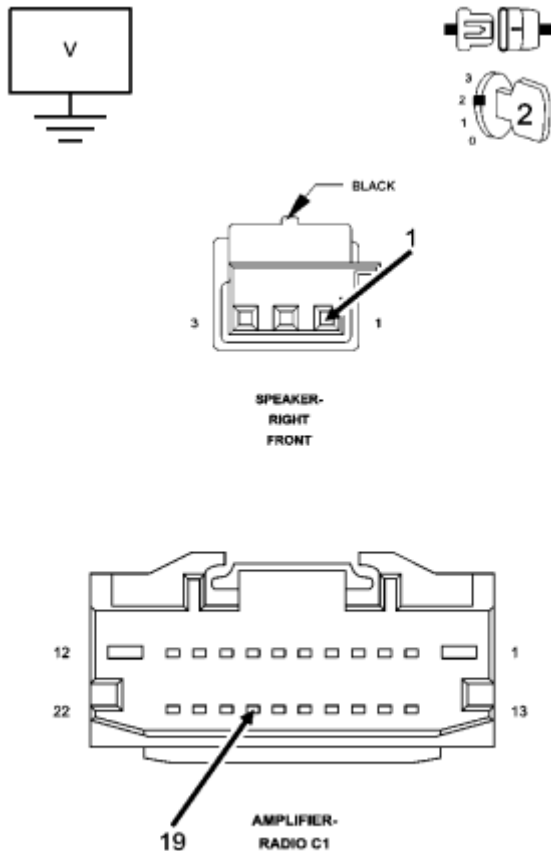
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT**



819c293e

Fig. 79: Measuring For Voltage On (X208) Amplified Right Front Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Amplified Right Front Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X208) Amplified Right Front Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

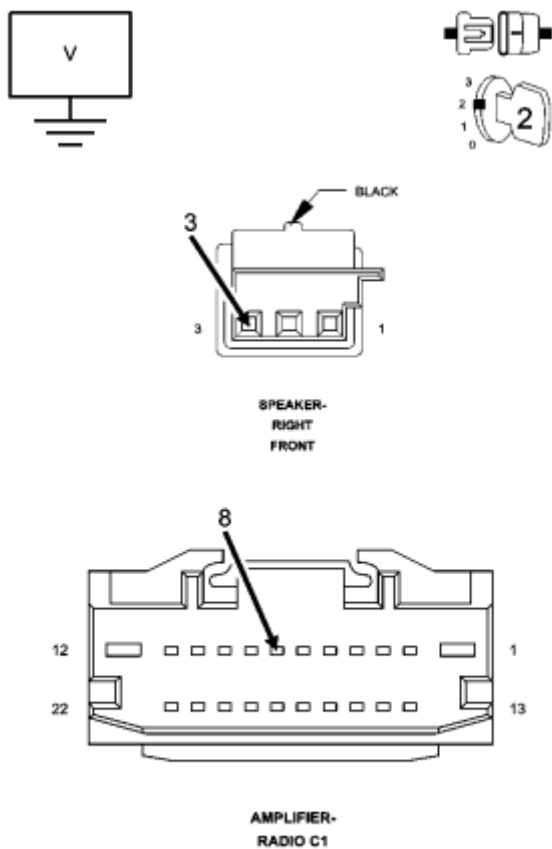
Repair the (X208) Amplified Right Front Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT**



819c2947

Fig. 80: Measuring For Voltage On (X298) Amplified Right Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X298) Amplified Right Front Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X298) Amplified Right Front Speaker (-) circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

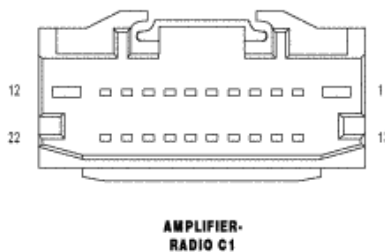
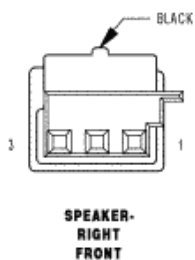
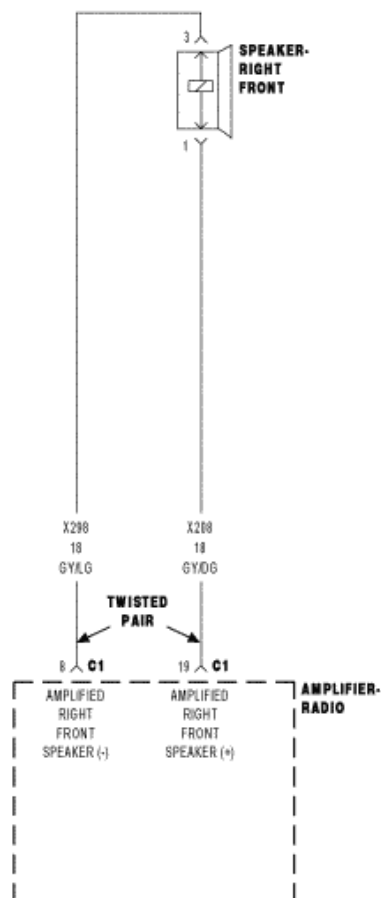
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1472-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic



019c3000

Fig. 81: Channel 4 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT OPEN
(X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT OPEN
AMPLIFIED RIGHT FRONT SPEAKER
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1472-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER

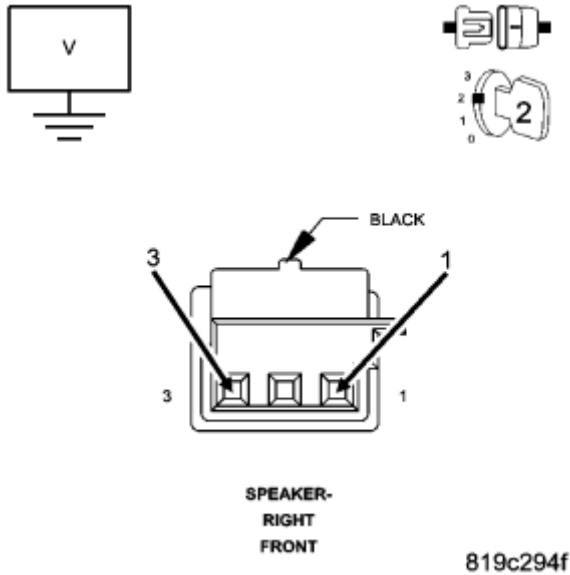


Fig. 82: Measuring Voltage Of Amplified Right Front Speaker Circuits In Amplified Right Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplified Right Front Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right Front Speaker circuits in the Amplified Right Front Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

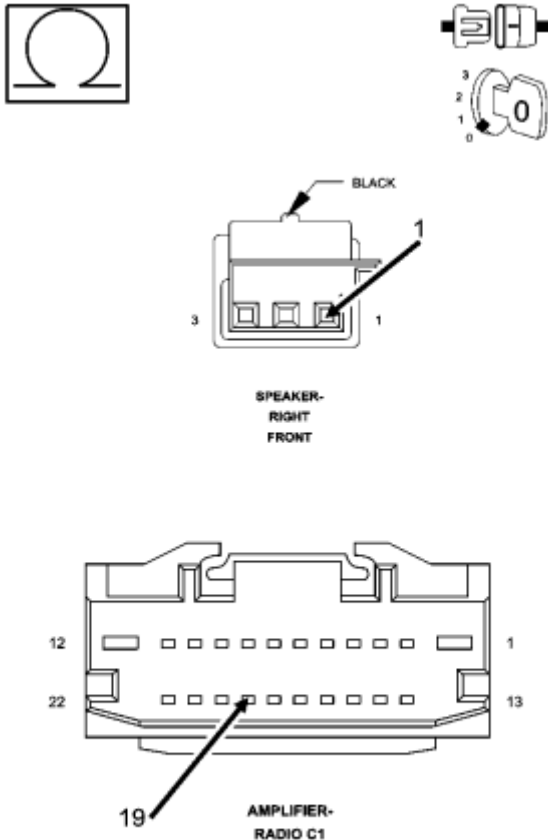
Replace the Amplified Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT FOR AN OPEN



819c295c

Fig. 83: Measuring Resistance Of (X208) Amplified Right Front Speaker (+) Circuit Between Amplifier C1 Harness Connector And Amplified Right Front Speaker Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Measure the resistance of the (X208) Amplified Right Front Speaker (+) circuit between the Amplifier C1 harness connector and the Amplified Right Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

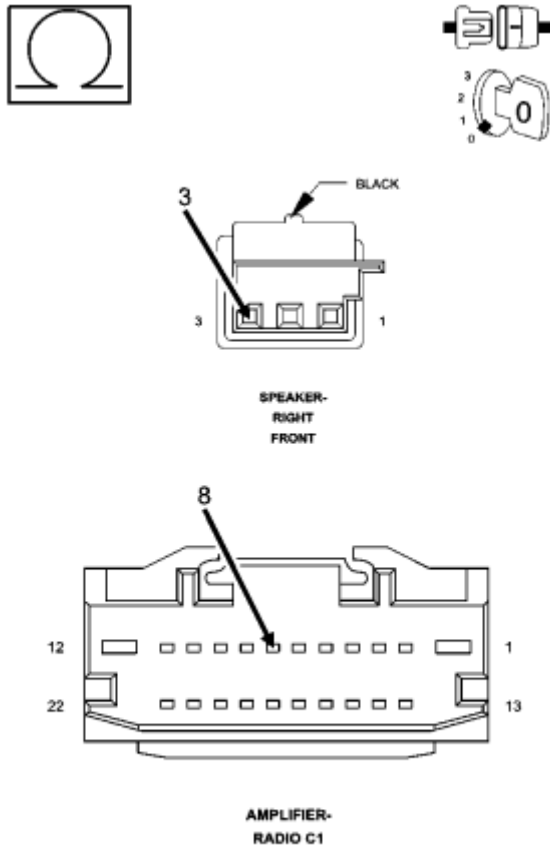
Go To 4.

No

Repair the (X208) Amplified Right Front Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT FOR AN OPEN**



819c2962

Fig. 84: Measuring Resistance Of (X298) Amplified Right Front Speaker (-) Circuit Between Amplifier C1 Harness Connector And Amplified Right Front Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X298) Amplified Right Front Speaker (-) circuit between the Amplifier C1 harness connector and the Amplified Right Front Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (X298) Amplified Right Front Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1473-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic

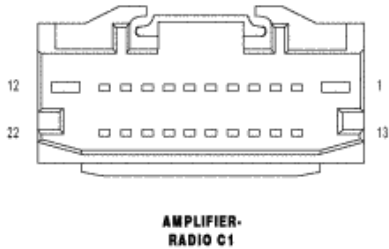
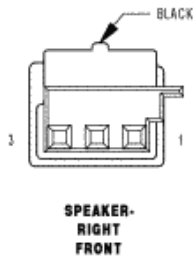
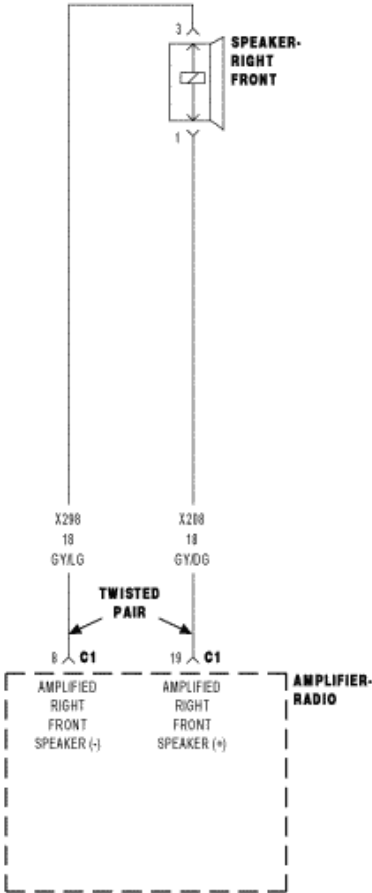


Fig. 85: Channel 4 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT SHORTED TO THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUIT AMPLIFIED RIGHT FRONT SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

**Does the scan tool display active: B1473-CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT
SHORTED TOGETHER?**

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT FRONT SPEAKER

Turn the ignition off.

Disconnect the Amplified Right Front Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

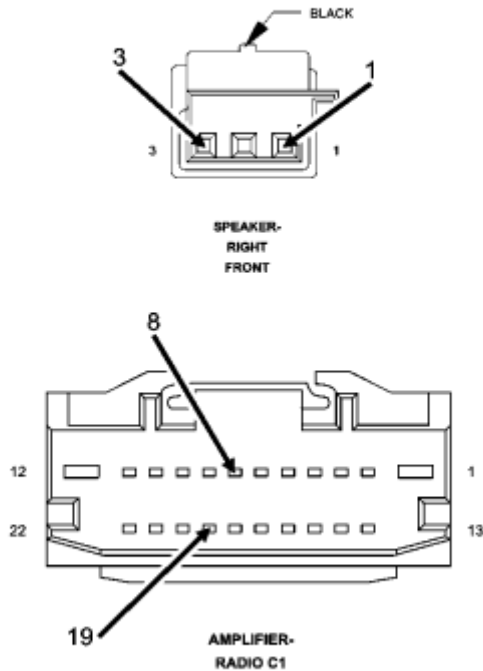
Replace the Amplified Right Front Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X208) AMPLIFIED RIGHT FRONT SPEAKER (+) CIRCUIT, AND THE (X298) AMPLIFIED RIGHT FRONT SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c29c2

Fig. 86: Measuring Resistance Between (X208) Amplified Right Front Speaker (+) Circuit And (X298) Amplified Right Front Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C1 harness connector.

Measure the resistance between the (X208) Amplified Right Front Speaker (+) circuit, and the (X298) Amplified Right Front Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X208) Amplified Right Front Speaker (+) circuit, and the (X298) Amplified Right Front Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1474-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1474-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

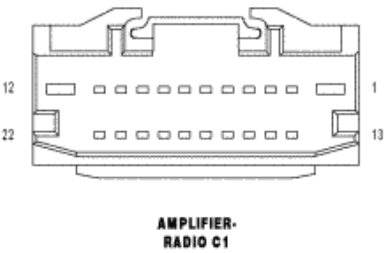
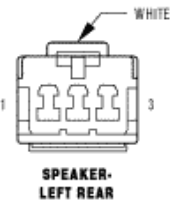
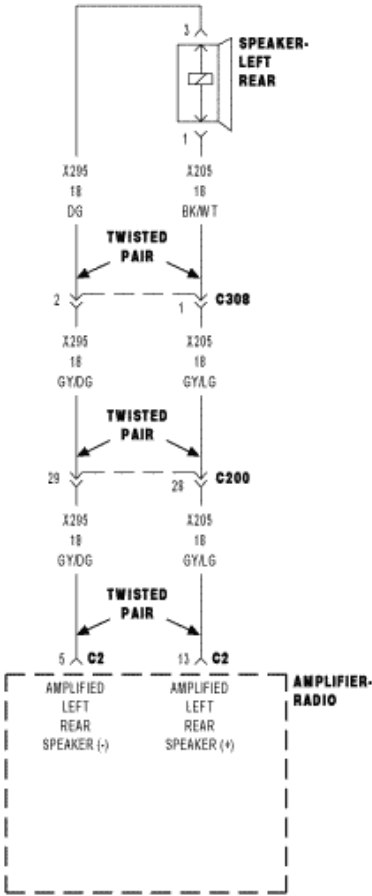
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B1475-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



010c0070

Fig. 87: Channel 5 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
LEFT REAR SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1475-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

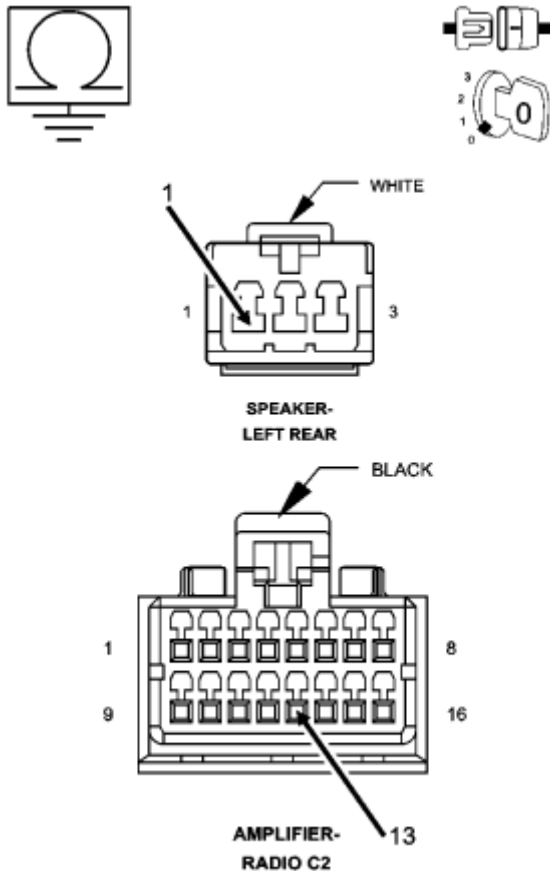
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**



819c2bb5

Fig. 88: Measuring Resistance Between Ground And Amplified Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Left Rear Speaker harness connector.

Measure the resistance between ground and the (X205) Amplified Left Rear Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

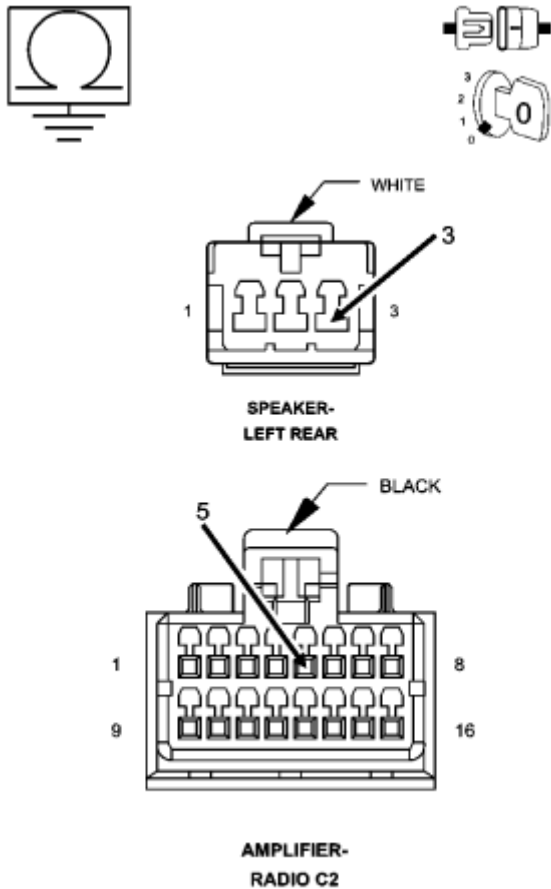
Repair the (X205) Amplified Left Rear Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**



819c2bf0

Fig. 89: Measuring Resistance Between Ground And Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X295) Amplified Left Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X295) Amplified Left Rear Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER

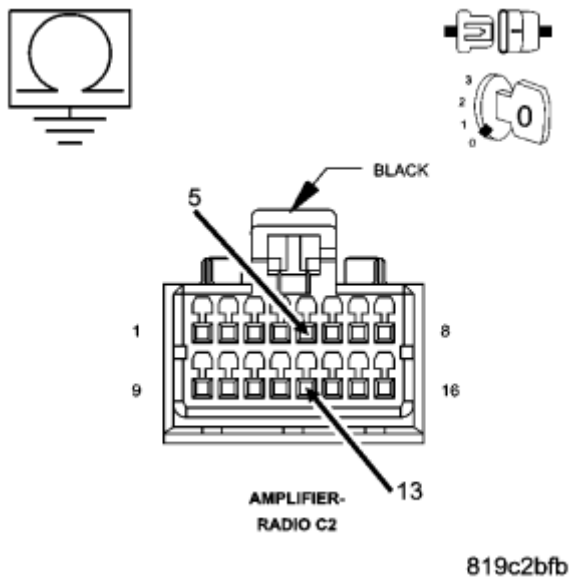


Fig. 90: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Left Rear Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

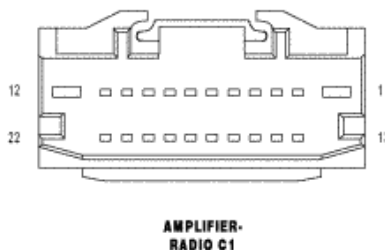
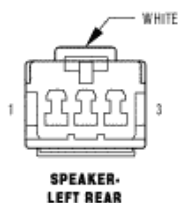
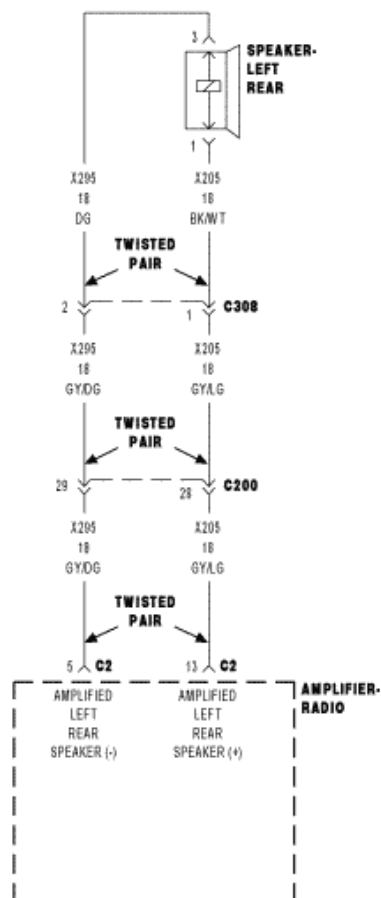
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1476-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



019c2073

Fig. 91: Channel 5 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1476-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT**

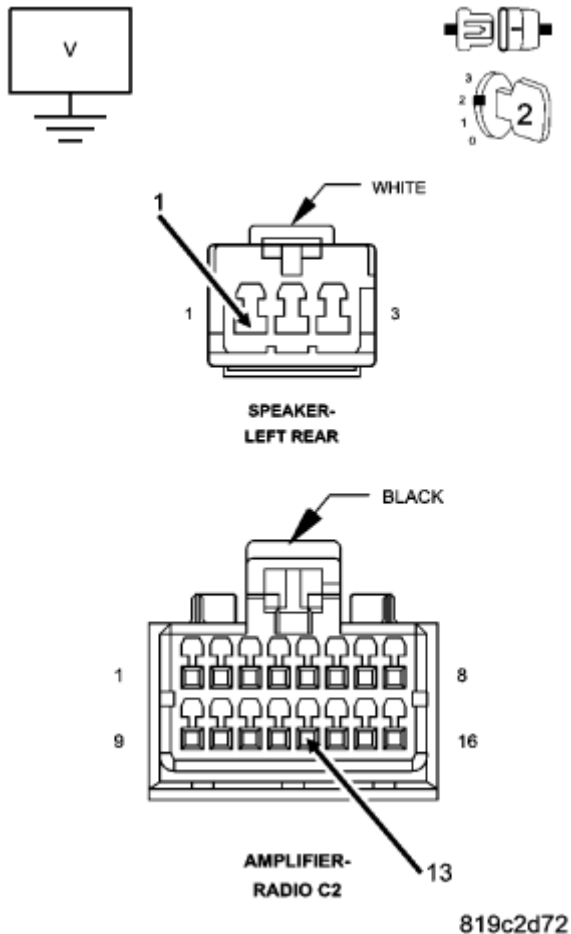


Fig. 92: Measuring For Voltage On (X205) Amplified Left Rear Speaker (+) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Left Rear Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X205) Amplified Left Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X205) Amplified Left Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT**

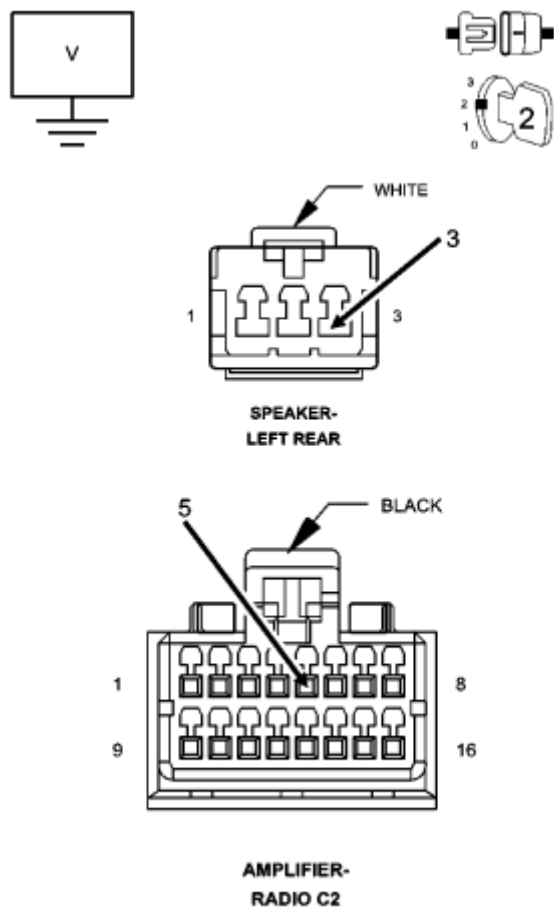


Fig. 93: Measuring For Voltage On (X295) Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X295) Amplified Left Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X295) Amplified Left Rear Speaker (-) circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1477-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

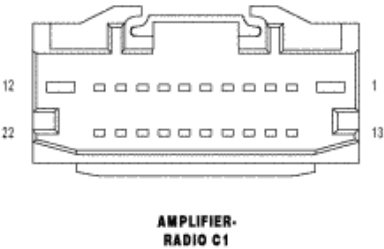
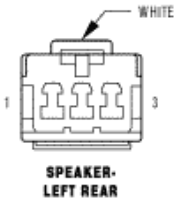
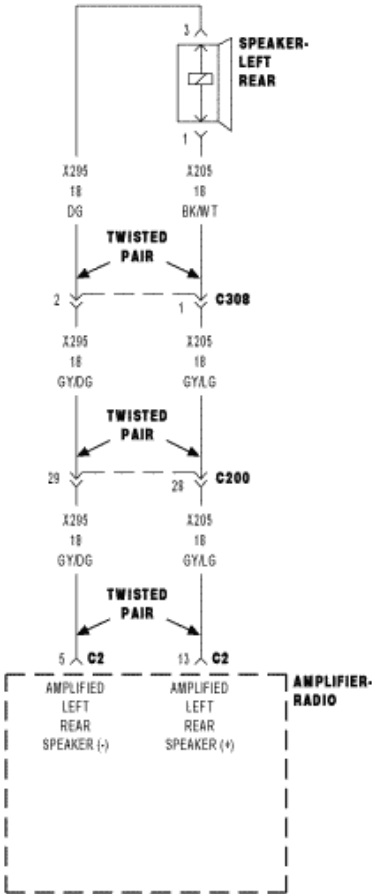


Fig. 94: Channel 5 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT OPEN (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT OPEN LEFT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1477-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

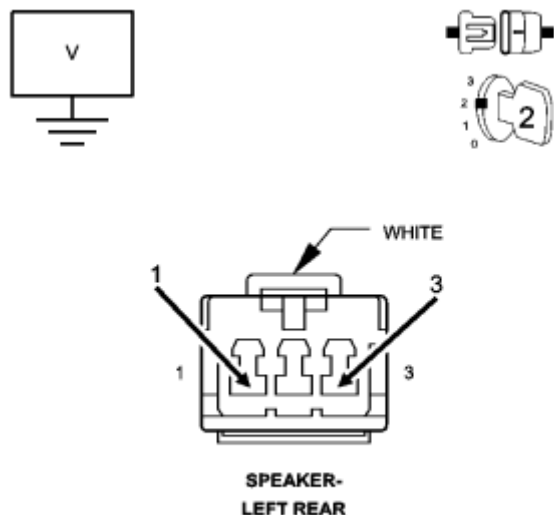
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER



819c2d99

Fig. 95: Measuring Voltage Of Amplified Left Rear Speaker Circuits In Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Left Rear Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Left Rear Speaker circuits in the Amplified Left Rear Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT FOR AN OPEN**

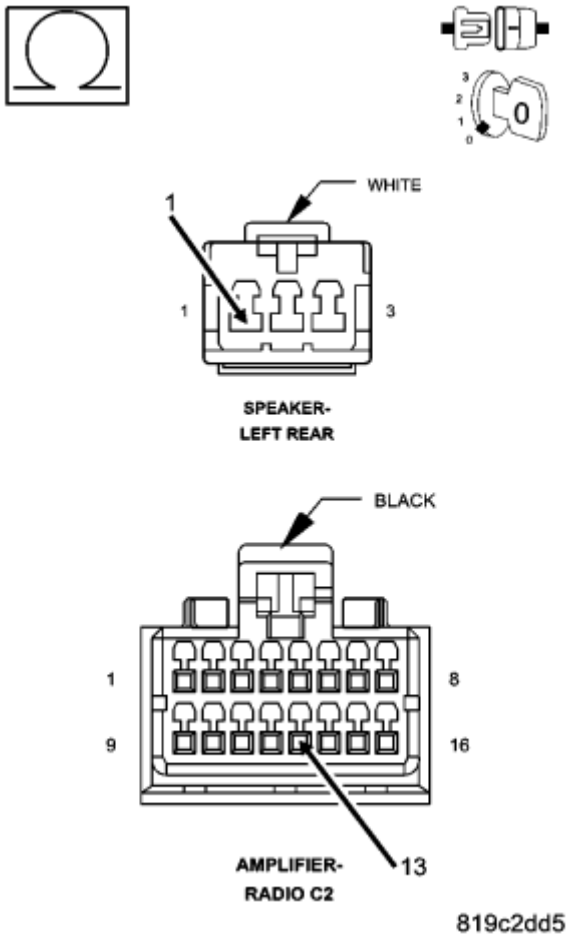


Fig. 96: Measuring Resistance Of (X205) Amplified Left Rear Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X205) Amplified Left Rear Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Left Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X205) Amplified Left Rear Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **CHECK THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT FOR AN OPEN**

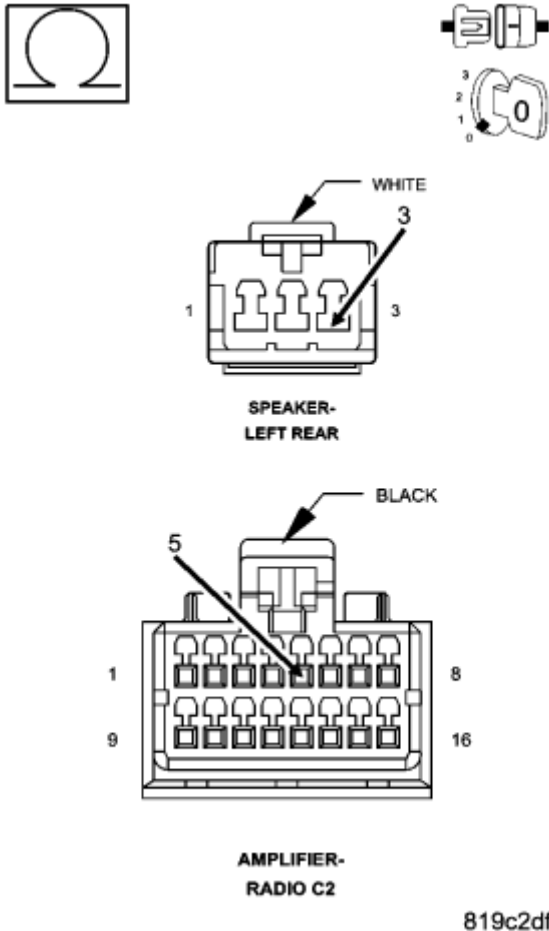


Fig. 97: Measuring Resistance Of (X295) Amplified Left Rear Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Left Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X295) Amplified Left Rear Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Left Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

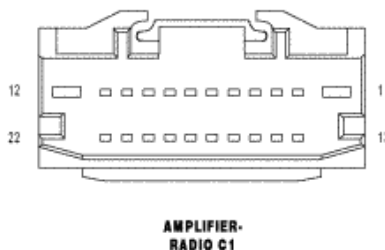
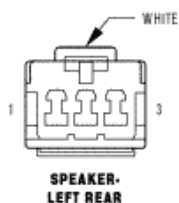
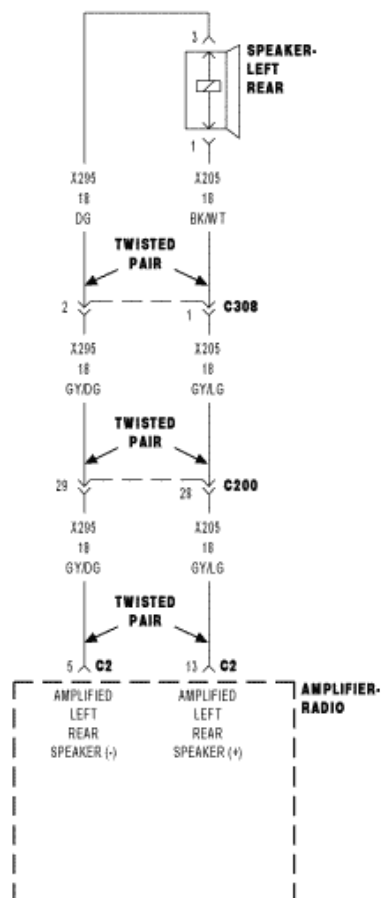
No

Repair the (X295) Amplified Left Rear Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1478-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



019c2073

Fig. 98: Channel 5 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT SHORTED TO THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUIT AMPLIFIED LEFT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, erase Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1478-CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED LEFT REAR SPEAKER

Turn the ignition off.

Disconnect the Amplified Left Rear Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

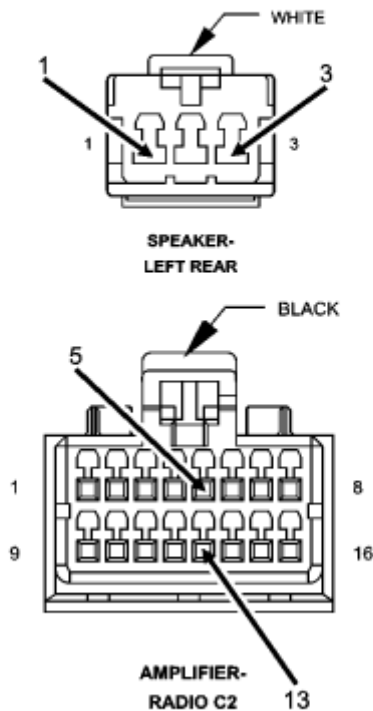
Replace the Amplified Left Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X205) AMPLIFIED LEFT REAR SPEAKER (+) CIRCUIT, AND THE (X295) AMPLIFIED LEFT REAR SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c2e06

Fig. 99: Measuring Resistance Between (X205) Amplified Left Rear Speaker (+) Circuit And (X295) Amplified Left Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X205) Amplified Left Rear Speaker (+) circuit, and the (X295) Amplified Left Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X205) Amplified Left Rear Speaker (+) circuit, and the (X295) Amplified Left Rear Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1479-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- This DTC will set if a DC offset occurs on the output channel, the amplifier shall set a DTC after a maturity rate of 5 ±1 sec.

Possible Causes

Possible Causes
AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B1479-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE?

Yes

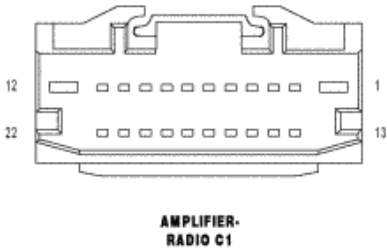
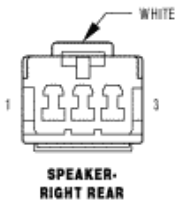
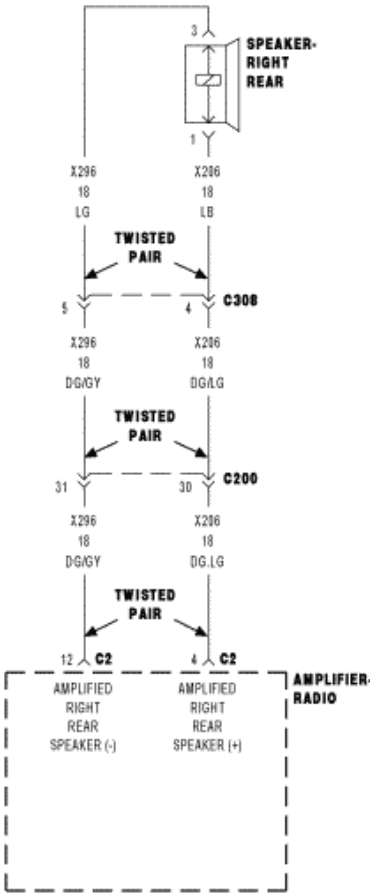
Replace the amplifier in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

B147A-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW

Circuit Schematic



810c2006

Fig. 100: Channel 6 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a shorted to ground condition on the speaker output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO GROUND
(X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT SHORTED TO GROUND
RIGHT REAR SPEAKER
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147A-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT FOR A SHORT TO GROUND**

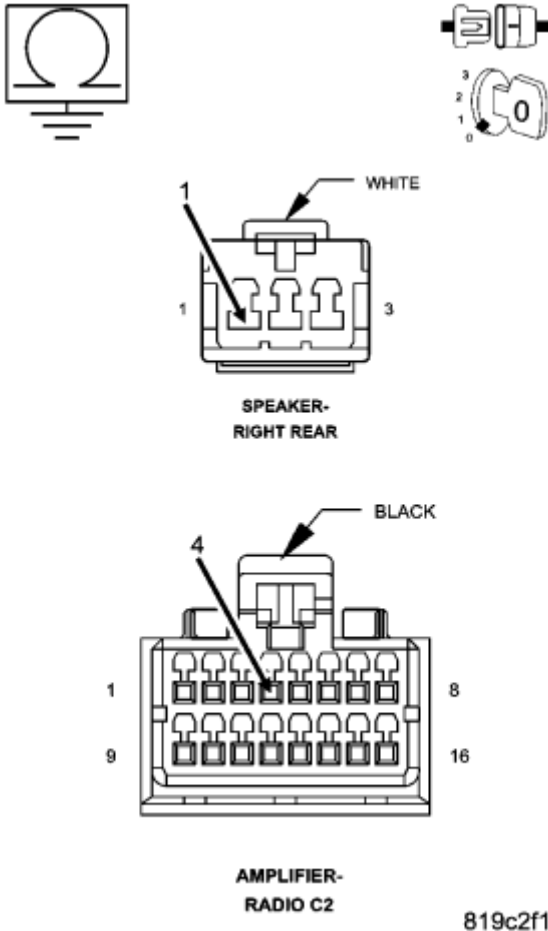


Fig. 101: Measuring Resistance Between Ground And (X206) Amplified Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Right Rear Speaker harness connector.

Measure the resistance between ground and the (X206) Amplified Right Rear Speaker (+) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT FOR A SHORT TO GROUND**

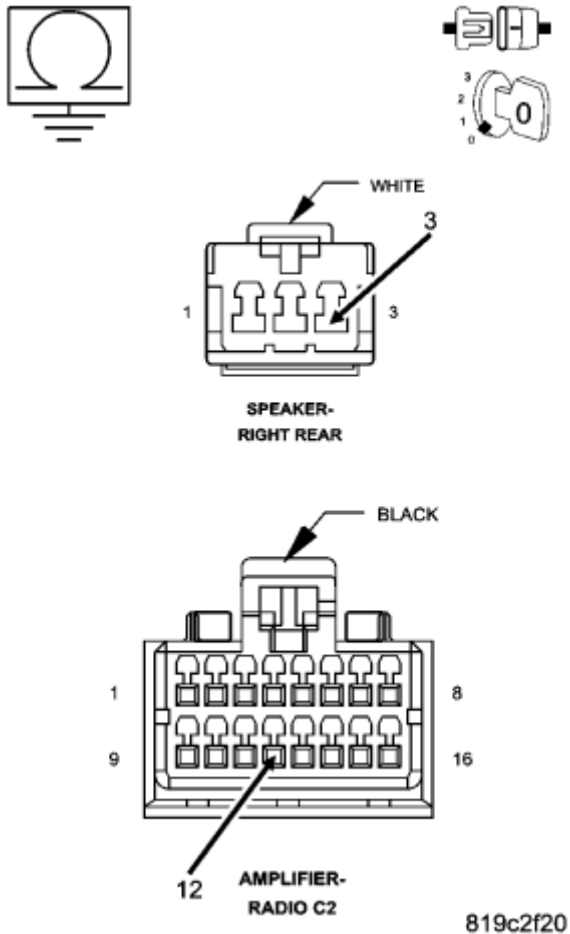


Fig. 102: Measuring Resistance Between Ground And (X296) Amplified Right Rear Speaker (-) Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X296) Amplified Right Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

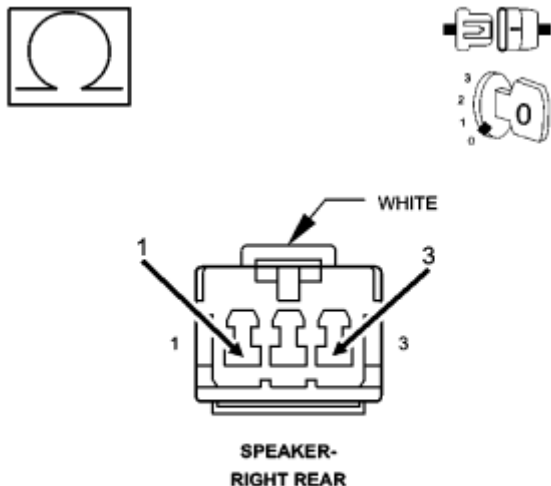
Repair the (X296) Amplified Right Rear Speaker (-) for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK OPERATION OF THE AMPLIFIED RIGHT REAR SPEAKER



819c2f24

Fig. 103: Measuring Resistance Of Speaker Circuit Between Amplifier C2 Harness Connector And Ground

Courtesy of CHRYSLER LLC

Reconnect and reinstall the Right Rear Speaker.

Measure the resistance of the speaker circuit between the Amplifier C2 harness connector and ground.

Is the resistance below 10K ohms?

Yes

Replace the Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

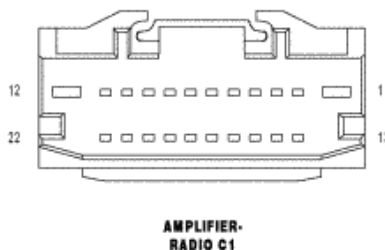
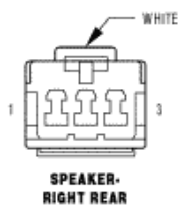
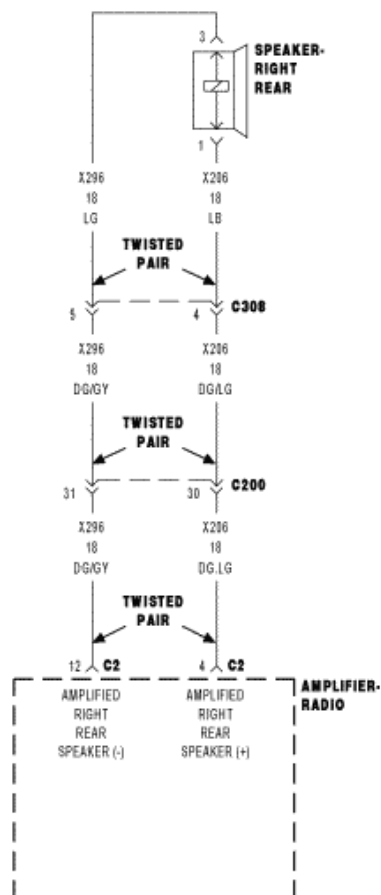
No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B147B-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH

Circuit Schematic



810c306

Fig. 104: Channel 6 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The amplifier detects a short to battery condition on the output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORT TO VOLTAGE
(X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT SHORT TO VOLTAGE
AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147B-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR VOLTAGE ON THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT**

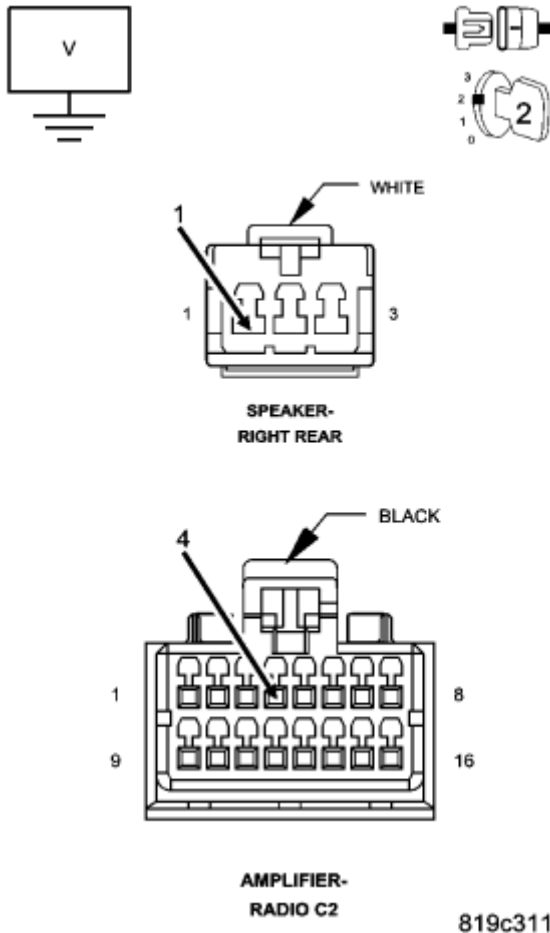


Fig. 105: Measuring Voltage On Amplified Right Rear Speaker (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Disconnect the Amplified Right Rear Speaker harness connector.

Turn the ignition on.

Measure for voltage on the (X206) Amplified Right Rear Speaker (+) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK FOR VOLTAGE ON THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT**

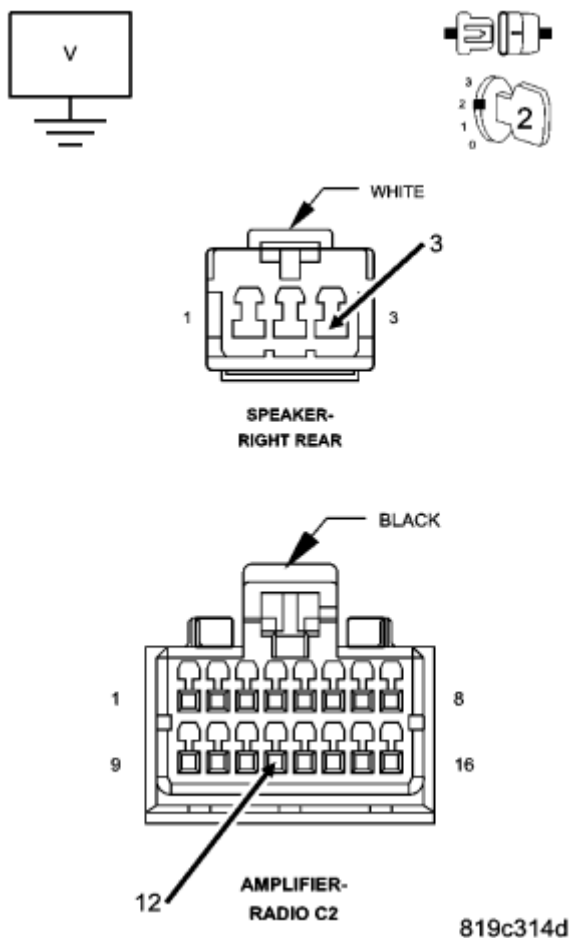


Fig. 106: Measuring For Voltage On (X296) Amplified Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Measure for voltage on the (X296) Amplified Right Rear Speaker (-) circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (X296) Amplified Right Rear Speaker (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1 .**

B147C-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN

Circuit Schematic

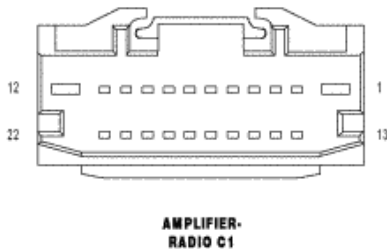
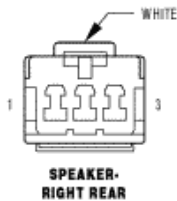
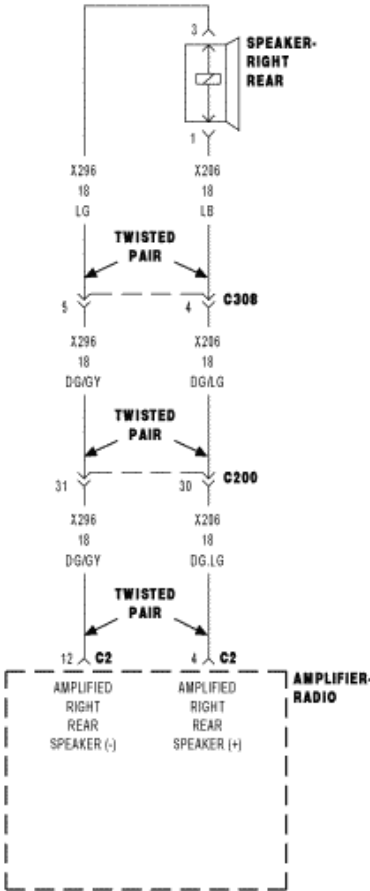


Fig. 107: Channel 6 Audio Speaker Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Amplifier BUS wake-up. Amplifier reset with scan tool.

Set Conditions

- **Set Condition:**
- The amplifier detects an open condition on the speaker output circuit.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT OPEN (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT OPEN RIGHT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. CHECK FOR AN INTERMITTENT CONDITION

Turn the ignition on.

Turn the radio on.

With the scan tool, erase Amplifier DTCs.

With the scan tool, reset the amplifier.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147C-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN?

Yes

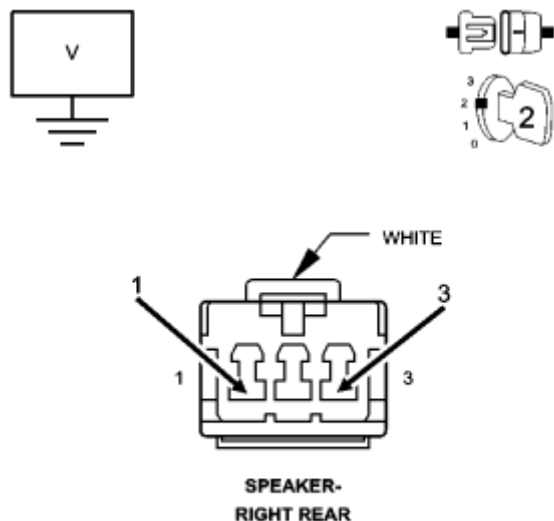
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE OPERATION OF THE RIGHT REAR SPEAKER



819c315a

Fig. 108: Measuring Voltage Of Amplified Right Rear Speaker Circuits In Amplified Right Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Right Rear Speaker harness connector.

Turn the ignition on.

Turn the radio on and turn the volume to mid level.

With a voltmeter set to read in A/C voltage, measure the voltage of the Amplified Right Rear Speaker circuits in the Amplified Right Rear Speaker harness connector.

Is the voltage present greater than 1 volt?

Yes

Replace the Amplified Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. **CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT FOR AN OPEN**

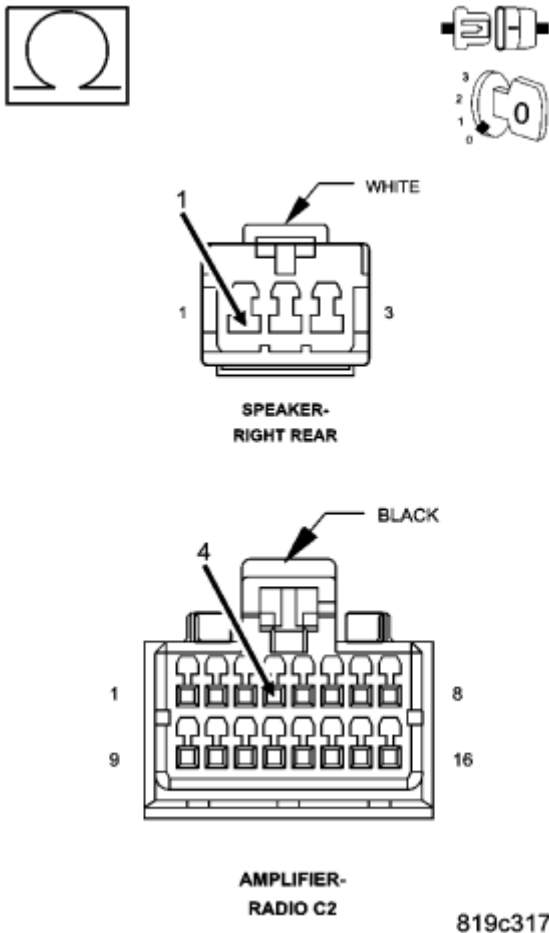


Fig. 109: Measuring Resistance Of (X206) Amplified Right Rear Speaker (+) Circuit Between Amplifier C2 Harness Connector And Amplified Right Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Amplifier C2 harness connector.

Measure the resistance of the (X206) Amplified Right Rear Speaker (+) circuit between the Amplifier C2 harness connector and the Amplified Right Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (X206) Amplified Right Rear Speaker (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT FOR AN OPEN

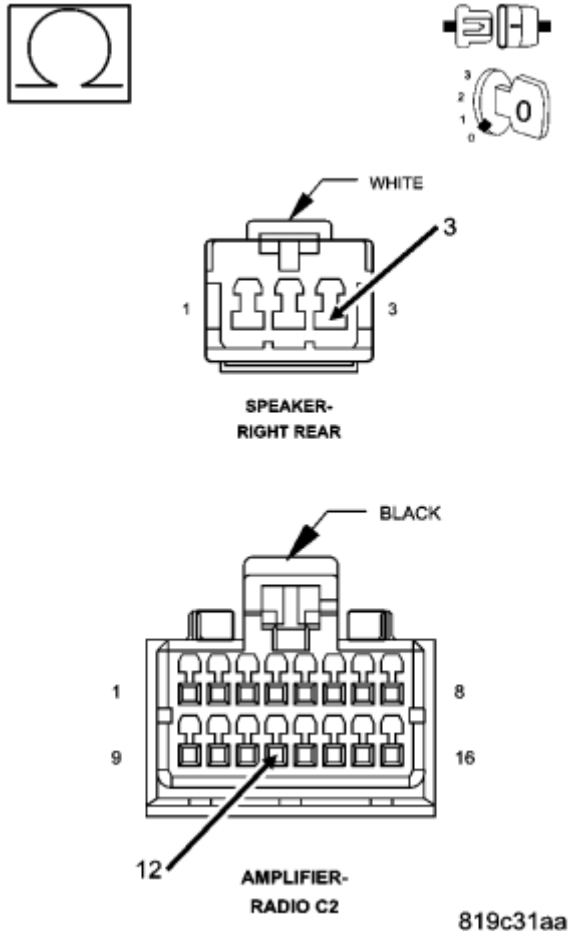


Fig. 110: Measuring Resistance Of (X296) Amplified Right Rear Speaker (-) Circuit Between Amplifier C2 Harness Connector And Amplified Right Rear Speaker Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (X296) Amplified Right Rear Speaker (-) circuit between the Amplifier C2 harness connector and the Amplified Right Rear Speaker harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

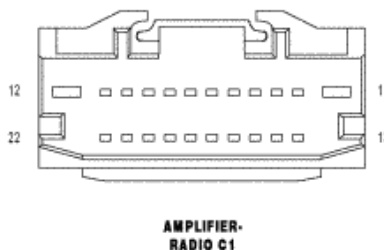
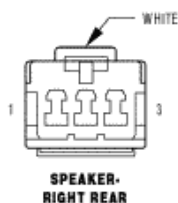
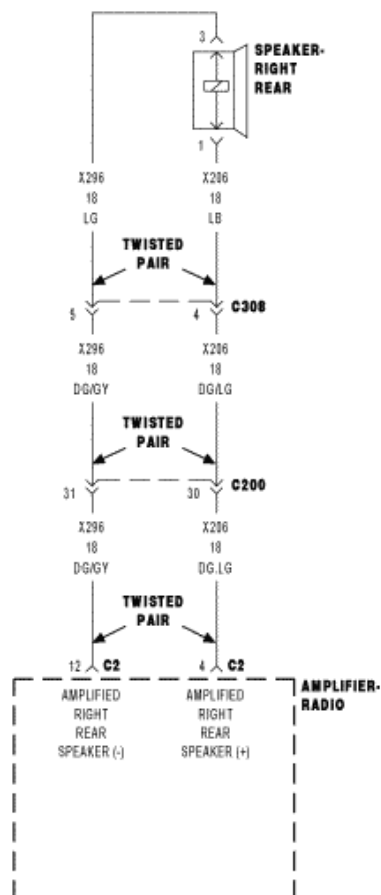
No

Repair the (X296) Amplified Right Rear Speaker (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B147D-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER

Circuit Schematic



810c306

Fig. 111: Channel 6 Audio Speaker Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Radio volume at 25 or higher.

Set Conditions

- **Set Condition:**
- The amplifier detects that the output circuits are shorted together.

Possible Causes

Possible Causes
(X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT SHORTED TO THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUIT AMPLIFIED RIGHT REAR SPEAKER AMPLIFIER

Diagnostic Test

1. **CHECK FOR AN INTERMITTENT CONDITION**

Turn the ignition on, then off, and then on again.

With the scan tool, clear Amplifier DTCs.

Turn the radio on.

Turn the volume level to 25.

With the scan tool, read Amplifier DTCs.

Does the scan tool display active: B147D-CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE OPERATION OF THE AMPLIFIED RIGHT REAR SPEAKER

Turn the ignition off.

Disconnect the Amplified Right Rear Speaker.

Measure the resistance of the speaker between the two terminals.

Is the resistance of the speaker less than 1 ohm?

Yes

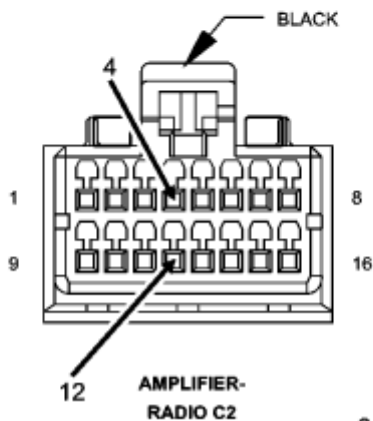
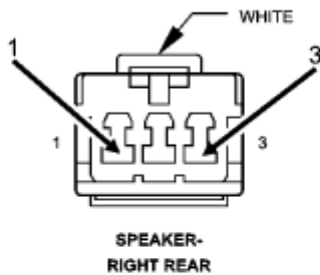
Replace the Amplified Right Rear Speaker in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (X206) AMPLIFIED RIGHT REAR SPEAKER (+) CIRCUIT, AND THE (X296) AMPLIFIED RIGHT REAR SPEAKER (-) CIRCUITS FOR A SHORT TOGETHER



819c320d

Fig. 112: Measuring Resistance Between (X206) Amplified Right Rear Speaker (+) Circuit And (X296) Amplified Right Rear Speaker (-) Circuit
Courtesy of CHRYSLER LLC

Disconnect the Amplifier C2 harness connector.

Measure the resistance between the (X206) Amplified Right Rear Speaker (+) circuit, and the (X296) Amplified Right Rear Speaker (-) circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X206) Amplified Right Rear Speaker (+) circuit, and the (X296) Amplified Right Rear Speaker (-) circuit for a short together.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2222-SATELLITE RADIO RECEIVER INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**
- The Satellite Radio Receiver detects a software checksum test failure.

Possible Causes

Possible Causes
SATELLITE RADIO RECEIVER

Diagnostic Test

1. **REPLACE THE SATELLITE RADIO RECEIVER**

When this code is set, the Satellite Radio must be replaced.

Repair

Replace the Satellite Radio Receiver in accordance with the Service Information. Refer to **STANDARD PROCEDURE** (ELECTRICAL DIAGNOSTICS). Refer to **STANDARD PROCEDURE** (SERVICE INFORMATION).

U0019-CAN INTERIOR BUS(+)/(-) CIRCUIT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**
- Whenever the CAN INTERIOR BUS (+) or INTERIOR BUS (-) circuit is open, shorted to voltage or shorted to ground, this code will set.

Possible Causes

Possible Causes
CAN INTERIOR BUS DTCs IN THE TOTALLY INTEGRATED POWER MODULE (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN AMPLIFIER

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display: U0019-CAN INTERIOR BUS CIRCUIT?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK TOTALLY INTEGRATED POWER MODULE DTCs

With the scan tool, read Totally Integrated Power Module DTCs

Does the scan tool display any CAN INTERIOR BUS DTCs - ACTIVE?

Yes

Refer to the symptom list for problems related to Communication in **ELECTRONIC CONTROL**

MODULES - ELECTRICAL DIAGNOSTICS .

No

Go to 3.

3. CAN INTERIOR BUS (+) CIRCUIT OPEN

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Totally Integrated Power Module C7 harness connector.

Measure the resistance of the (D265) CAN INTERIOR BUS (+) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

Perform **BODY VERIFICATION TEST - VER 1 .**

No

Repair the CAN INTERIOR BUS (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1 .**

4. CAN INTERIOR BUS (-) CIRCUIT OPEN

Measure the resistance of the (D264) CAN INTERIOR BUS (-) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1 .**

No

Repair the CAN INTERIOR BUS (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1 .**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**
- Whenever the CAN INTERIOR BUS (+) or INTERIOR BUS (-) circuit is open, shorted to voltage or shorted to ground, this code will set.

Possible Causes

Possible Causes
CAN INTERIOR BUS DTCs IN THE TOTALLY INTEGRATED POWER MODULE (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN AMPLIFIER

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTCs.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display: U0020-CAN INTERIOR BUS OFF PERFORMANCE?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FRONT CONTROL MODULE DTCs**

With the scan tool, read Totally Integrated Power Module DTCs.

Does the scan tool display any CAN INTERIOR BUS DTCs - ACTIVE?

Yes

Refer to the symptom list for problems related to Communication in **ELECTRONIC CONTROL MODULES - ELECTRICAL DIAGNOSTICS** .

No

Go to 3.

3. **CAN INTERIOR BUS (+) CIRCUIT OPEN**

Turn the ignition off.

Disconnect the Amplifier C1 harness connector.

Disconnect the Totally Integrated Power Module C7 harness connector.

Measure the resistance of the (D265) CAN INTERIOR BUS (+) circuit between the Totally Integrated Power module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the CAN INTERIOR BUS (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CAN INTERIOR BUS (-) CIRCUIT OPEN**

Measure the resistance of the (D264) CAN INTERIOR BUS (-) circuit between the Totally Integrated Power Module C7 harness connector and the Amplifier C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the CAN INTERIOR BUS (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0195-LOST COMMUNICATION WITH SDAR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0197-LOST COMMUNICATION WITH HANDS FREE MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0199-LOST COMMUNICATION WITH DRIVERS DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0200-LOST COMMUNICATION WITH PASSENGER DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

2008 ACCESSORIES AND EQUIPMENT

Audio/Video Systems - Service Information - Liberty

AUDIO/VIDEO - SERVICE INFORMATION

DESCRIPTION

AUDIO

Several combinations of radio receivers and speaker systems are offered on this model. The audio system uses an ignition switched source of battery current so that the system will only operate when the ignition switch is in the RUN or ACCESSORY positions.

The audio system includes the following components:

- Antenna
- Power amplifier
- Radio noise suppression components
- Radio receiver
- Remote radio switches (if equipped)
- Speakers
- Subwoofer

Certain functions and features of the audio system rely upon resources shared with other electronic modules in the vehicle over the Controlled Area Network (CAN). The data bus network allows the sharing of sensor information. For diagnosis of these electronic modules or of the data bus network, the use of a scan tool and the proper Diagnostic Procedures information is recommended.

OPERATION

OPERATION

The audio system components are designed to provide audio entertainment and information through the reception, tuning and amplification of locally broadcast radio signals in both the Amplitude Modulating (AM) and Frequency Modulating (FM) commercial frequency ranges.

The audio system components operate on battery current received through a fuse in the Totally Integrated Power Module (TIPM) on a fused ignition switch output (RUN-ACC) circuit so that the system will only operate when the ignition switch is in the Run or Accessory positions.

On vehicles that are equipped with the optional remote radio switches, the Cab Compartment Node (CCN) receives hard wired resistor multiplexed inputs from the remote radio switches. The programming in the CCN allows it to process those inputs and send the proper messages to the radio receiver over the Controlled Area Network (CAN) to control the radio volume up or down, station seek up or down, preset station advance, and mode advance functions.

Refer to the owner's manual for more information on the features, use and operation of each of the available audio systems.

DIAGNOSIS AND TESTING

AUDIO

AUDIO SYSTEM

Any diagnosis of the Audio system should begin with the use of scan tool. For information on the use of the scan tool, refer to the appropriate Diagnostic information.

Refer to the appropriate wiring information.

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

AUDIO SYSTEM DIAGNOSIS TABLE

CONDITION	POSSIBLE CAUSES	CORRECTION
NO AUDIO	1. Fuse faulty.	1. Check radio fuse and Ignition-Off Draw (IOD) fuse in Totally Integrated Power Module (TIPM). Replace fuses, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for shorted or open wires. Repair wiring, if required.
	4. Radio ground faulty.	4. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Speakers faulty.	5. Replace speaker as necessary.
	6. Radio faulty.	6. Refer to appropriate Diagnostic Service Information.
NO RADIO DISPLAY	1. Fuse faulty.	1. Check radio fuse and Ignition-Off Draw (IOD) fuse in Junction Block (JB). Replace fuses, if required.
	2. Radio connector faulty.	2. Check for loose or corroded radio connector. Repair, if required.
	3. Wiring faulty.	3. Check for battery voltage at radio connector. Repair wiring, if required.
	4. Radio ground faulty.	4. Check for continuity between radio

		chassis and a known good ground. There should be continuity. Repair ground, if required.
	5. Radio faulty.	5. Refer to appropriate Diagnostic Service Information.
POOR RADIO RECEPTION	1. Antenna faulty.	1. See DIAGNOSIS AND TESTING .
	2. Radio ground faulty.	2. Check for continuity between radio chassis and a known good ground. There should be continuity. Repair ground, if required.
	3. Radio noise suppression faulty.	3. Repair or replace ground strap as necessary.
	4. Radio faulty.	4. Refer to appropriate Diagnostic Service Information.
SOUND DISTORTION (VIBRATION FROM SPEAKER AREA, BUZZING - HUMMING)	1. Door trim panel loose or missing fasteners.	1. Inspect door trim panel and correct as necessary. Replace any missing fasteners.
	2. Water shield loose or misaligned.	2. Inspect water shield and adjust as required.
	3. Items placed in door trim panel map pockets vibrating or moving from side to side.	3. Remove items from door trim panel. Ensure that vibration is no longer present.
NO COMPACT DISC/DVD OPERATION	1. Faulty CD/DVD.	1. Insert known good CD/DVD and test operation.
	2. Foreign material on CD/DVD.	2. Clean CD/DVD and test operation.
	3. Condensation on CD/DVD or optics.	3. Allow temperature of vehicle interior to stabilize and test operation.
	4. Faulty CD/DVD player.	4. Refer to appropriate Diagnostic Service Information.

MANUAL DISC EJECT-NAVIGATION RADIO

1. Ensure all fuses are installed in the vehicle to operate accessories.
2. Turn ignition to ACC and power on radio.
3. Press OPEN/CLOSE button on radio and verify that disc will not eject automatically.
4. If disc will not eject automatically, use the following combination of buttons to manually eject disc:
 - With display open press and hold NAV button on right side.
 - Press SEEK UP and SEEK DOWN at the same time on left side.
5. Remove the disc from the radio.

AMPLIFIER

REMOVAL

REMOVAL

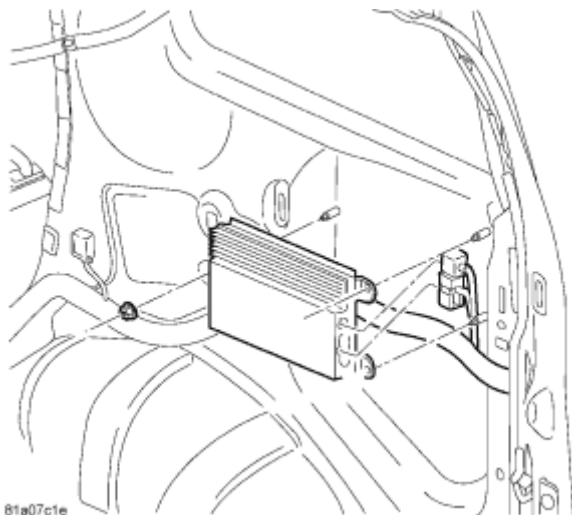


Fig. 1: Removing Amplifier
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the rear quarter trim panel. Refer to **REMOVAL** .
3. Remove the mounting fasteners.
4. Disconnect the electrical connectors and remove the amplifier.

INSTALLATION

INSTALLATION

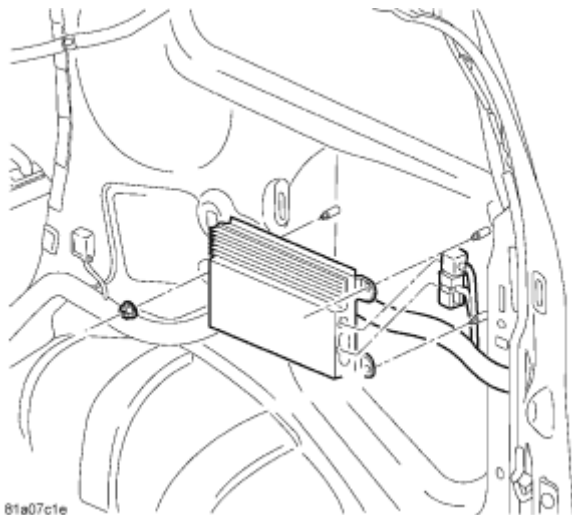


Fig. 2: Installing Amplifier
Courtesy of CHRYSLER LLC

1. Connect the electrical connectors and install the amplifier.
2. Install the amplifier mounting fasteners.
3. Install the rear quarter trim panel. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

ANTENNA BODY & CABLE

DESCRIPTION

ANTENNA BODY AND CABLE

DOMESTIC

All models feature a roof-mounted active mast antenna. This is a combination antenna that receives both AM/FM and satellite digital audio. The antenna cables are routed along the left side of the under the headliner, down the A-pillar to the instrument panel. For antenna removal, see **REMOVAL**. For antenna installation, see **INSTALLATION**.

OPERATION

ANTENNA BODY AND CABLE

The antenna body and cable connects the antenna mast to the radio. The radio antenna is an electromagnetic circuit component used to capture radio frequency signals that are broadcast by local commercial radio stations in both the Amplitude Modulating (AM) and Frequency Modulating (FM) frequency ranges. These electromagnetic radio frequency signals induce small electrical modulations into the antenna as they move past the mast. The antenna body transfers the weak electromagnetic radio waves induced into the antenna into the center conductor of the flexible primary antenna coaxial cable. The braided outer shield of the antenna coaxial cable is grounded through both the antenna body and the radio chassis, effectively shielding the radio waves as they are conducted to the radio. The radio then tunes and amplifies the weak radio signals into stronger electrical signals in order to operate the audio system speakers.

DIAGNOSIS AND TESTING

ANTENNA BODY AND CABLE

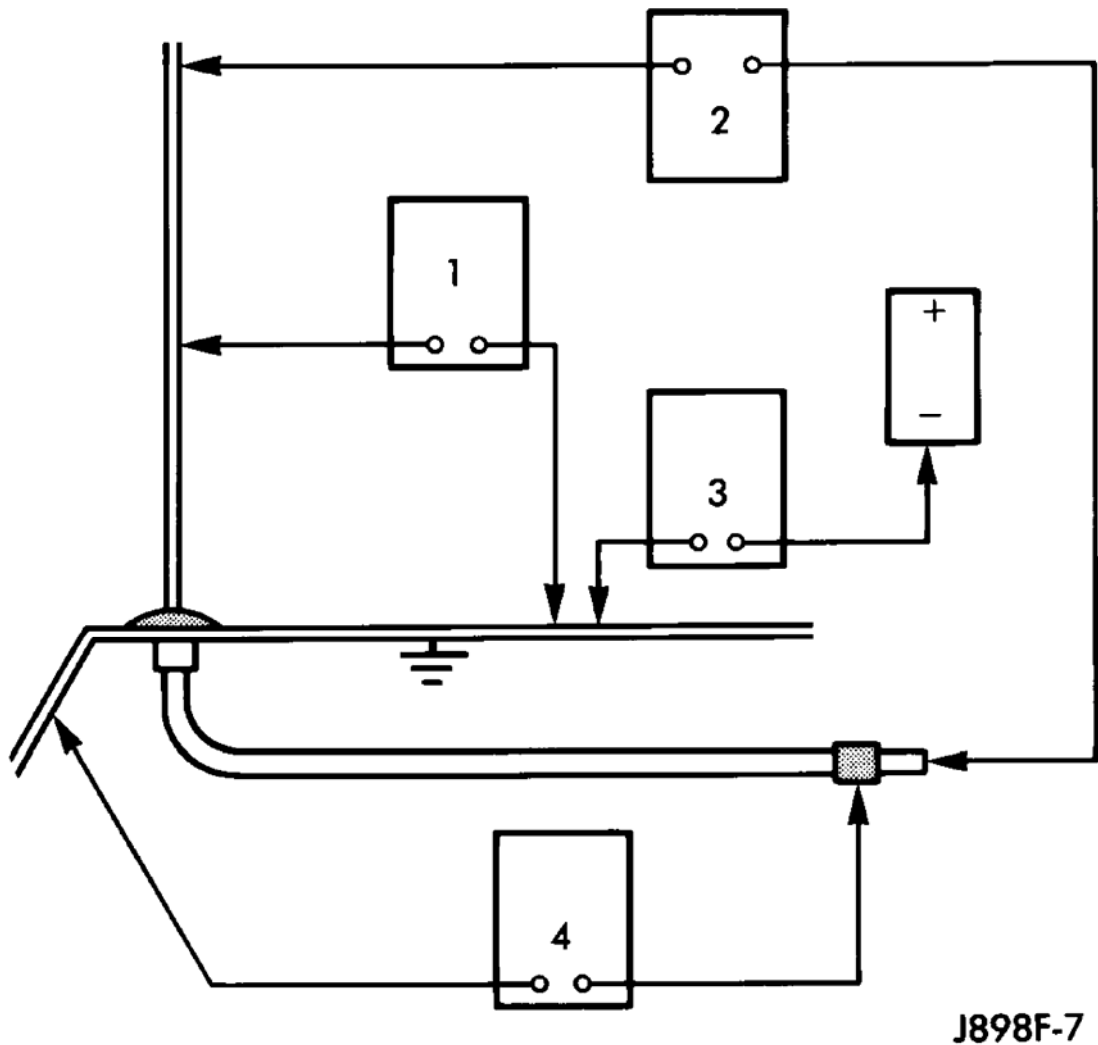


Fig. 3: Antenna Tests - Typical
 Courtesy of CHRYSLER LLC

The following four tests are used to diagnose the antenna with an ohmmeter:

- Test 1** - Mast to ground test
- Test 2** - Tip-of-mast to tip-of-conductor test
- Test 3** - Body ground to battery ground test
- Test 4** - Body ground to antenna coaxial cable shield test.

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way

to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

The ohmmeter test lead connections for each test are shown in the illustration.

NOTE: This model has a two-piece antenna coaxial cable. Tests 2 and 4 must be conducted in two steps to isolate an antenna cable problem. First, test the primary antenna cable (integral to the antenna body and cable) from the coaxial cable connector behind the right side kick panel to the antenna body. Then, test the secondary antenna cable (instrument panel antenna cable) from the coaxial cable connector behind the right side kick panel to the coaxial cable connector at the radio.

TEST 1

Test 1 determines if the antenna mast is insulated from ground. Proceed as follows:

1. Disconnect and isolate the antenna coaxial cable connector behind the right side kick panel.
2. Touch one ohmmeter test lead to the tip of the antenna mast. Touch the other test lead to known ground. Check the ohmmeter reading for continuity.
3. There should be no continuity. If OK, go to Test 2. If not OK, replace the faulty antenna body and cable.

TEST 2

Test 2 checks the antenna conductor components for an open circuit. This test should be performed first on the entire antenna circuit, from the antenna mast to the center conductor of the coaxial cable connector at the radio. If an open circuit is detected, each of the three antenna conductor components (antenna mast, antenna body and cable, instrument panel antenna cable) should be isolated and tested individually to locate the exact component that is the source of the open circuit. To begin this test, proceed as follows:

1. Disconnect the instrument panel antenna cable coaxial connector from the back of the radio.
2. Touch one ohmmeter test lead to the tip of the antenna mast. Touch the other test lead to the center conductor pin of the instrument panel antenna cable coaxial connector for the radio. Check the ohmmeter reading for continuity.
3. There should be continuity. The ohmmeter should register only a fraction of an ohm resistance. High or infinite resistance indicates a damaged or open antenna conductor. If OK, go to Test 3. If not OK, isolate and test each of the individual antenna conductor components. Replace only the faulty antenna conductor component.

TEST 3

Test 3 checks the condition of the vehicle body ground connection. To begin this test, proceed as follows:

1. This test must be performed with the battery positive cable disconnected from the battery. Disconnect and isolate both battery cables, negative cable first.
2. Reconnect the battery negative cable.

3. Touch one ohmmeter test lead to a good clean ground point on the vehicle fender. Touch the other test lead to the battery negative terminal post. Check the ohmmeter reading for continuity.
4. There should be continuity. The ohmmeter should register less than one ohm resistance. High or infinite resistance indicates a loose, corroded, or damaged connection between the battery negative terminal and the vehicle body. If OK, go to Test 4. If not OK, check the battery negative cable connection to the vehicle body and the radio noise suppression ground strap connections to the engine and the vehicle body for being loose or corroded. Clean or tighten these connections as required.

TEST 4

Test 4 checks the condition of the connection between the antenna coaxial cable shield and the vehicle body ground as follows:

1. Disconnect and isolate the antenna coaxial cable connector behind the right side kick panel.
2. Touch one ohmmeter test lead to a good clean ground point on the vehicle fender. Touch the other test lead to the outer crimp on the antenna coaxial cable connector. Check the ohmmeter reading for continuity.
3. There should be continuity. The ohmmeter should register less than one ohm resistance. High or infinite resistance indicates a loose, corroded, or damaged connection between the antenna body and the vehicle body or between the antenna body and the antenna coaxial cable shield. If not OK, clean the antenna body to fender mating surfaces and tighten the antenna cap nut to specifications.
4. Check the resistance again with an ohmmeter. If the resistance is still more than one ohm, replace the faulty antenna body and cable.

REMOVAL

ANTENNA BODY AND CABLE

1. Disconnect the battery negative cable.
2. Remove the headliner. Refer to **REMOVAL** .
3. Disconnect the electrical connectors.
4. Remove the routing clips and remove the cable.

INSTALLATION

ANTENNA BODY AND CABLE

1. Install the cable and routing clips.
2. Connect the electrical connectors.
3. Install the headliner. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

ANTENNA-SATELLITE

OPERATION

ANTENNA - SATELLITE RADIO

The satellite receiver is housed within the radio and is no longer a separate module. The satellite radio antenna receives signals from orbiting satellites and sends these signals to the radio. The satellite radio antenna must have open space in which to operate. Items carried on the roof, parking inside etc. can have an effect on the antenna's ability to receive signals.

REMOVAL

ANTENNA BODY AND CABLE

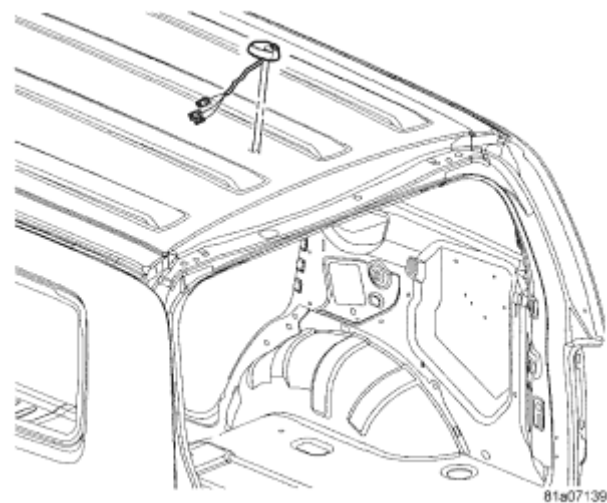


Fig. 4: Removing Antenna
Courtesy of CHRYSLER LLC

1. Disconnect the battery negative cable.
2. Lower the rear section of the headliner to gain access the antenna, ensuring that the headliner does not crease. Refer to **REMOVAL** .
3. Remove the mounting fastener.
4. Disconnect the electrical connectors and remove the antenna.

INSTALLATION

ANTENNA BODY AND CABLE

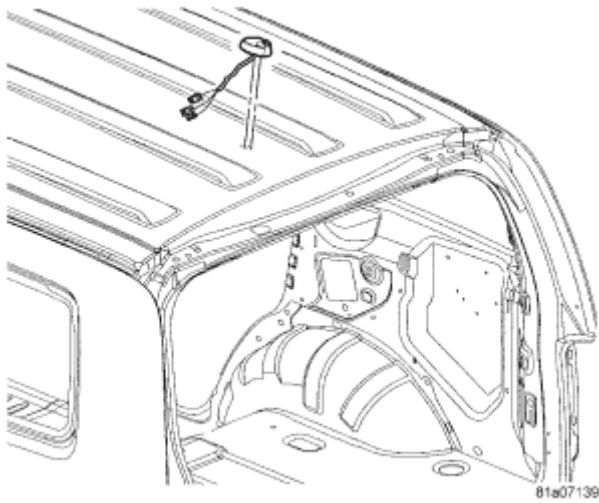


Fig. 5: Installing Antenna
Courtesy of CHRYSLER LLC

1. Connect the electrical connectors.
2. Install the antenna and mounting fastener.
3. Install the headliner. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

CABLE-INSTRUMENT PANEL ANTENNA

REMOVAL

INSTRUMENT PANEL ANTENNA CABLE

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Disconnect and isolate the battery negative cable.
2. Remove the instrument panel. Refer to **REMOVAL** .

CAUTION: Pulling the antenna cable straight out of the radio without pulling on the locking antenna connector could damage the cable or radio.

3. Disconnect the antenna cable from radio by pulling the locking antenna connector (2) away from radio.
4. Disengage each of the retainers that secure the cable to the instrument panel.
5. Remove the cable from the instrument panel.

INSTALLATION

INSTRUMENT PANEL ANTENNA CABLE

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Position the instrument panel antenna cable onto the instrument panel.
2. Engage each of the retainers that secure the cable to the back side of the instrument panel.
3. Connect cable to radio.
4. Install instrument panel. Refer to **INSTALLATION** .
5. Connect the battery negative cable.

RADIO

DESCRIPTION

RADIO

NOTE: The USB protective door can be serviced separately and does not require the replacement of the entire radio assembly.

RADIO

Available radios include:

- AM/FM Stereo Radio w/CD/MP3 Audio player and AUX jack with and without Satellite Radio (RES).
- AM/FM Stereo Radio w/6-CD/DVD player and AUX jack with and without Satellite Radio (REQ).
- 6.5" Integrated Touch Screen AM/FM Stereo Radio, Satellite Radio, Single Disc CD/DVD player. (CD/DVD/MP3/WMA Audio, DVD Video) w/ Full Map Navigation with GPS Antenna and Real Time Traffic (RER).

All radio receivers can communicate on the Controlled Area Network (CAN).

OPERATION

RADIO

The radio receiver operates only when the ignition switch is in the ON or ACCESSORY positions.

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article .

STANDARD PROCEDURE

RADIO BACKUP

The radio hard drive (HDD) can be backed up to save customer data in the event that a radio replacement is required. This procedure can only be done with all radios with a hard disk drive. All other radios do not have a HDD.

1. Turn the ignition to RUN, engine OFF.
2. Power on the external HDD.
3. Connect the external HDD to the radio using the USB (Universal Serial Bus) cable. The radio display will change to the "Manage My Files" screen.
4. Connect the scan tool and preform the following steps to place the radio into "Dealership Mode":
 - ECU View
 - Radio
 - Misc. Functions
 - Service Mode
 - Start
 - Next
5. Follow the on screen instructions on the radio to back up the radio HDD.

REMOVAL

RADIO

NOTE: The USB protective door can be serviced separately and does not require the replacement of the entire radio assembly.

NOTE: REQ and RET radios only must be put into "Transportation Mode" before removal. With Ignition in RUN or ACCESSORY, press SET and SCAN simultaneously until the radio displays "TRANSPORTATION" on the display or for 5 seconds.

1. Disconnect and isolate the battery negative cable.
2. Remove the instrument panel center trim panel.
3. Remove the radio mounting fasteners.

CAUTION: Pulling the antenna cable straight out of the radio without pulling on the locking antenna connector could damage the cable or radio.

4. Disconnect the antenna cable by pulling the locking antenna connector away from the radio.
5. Disconnect the electrical harness connector(s).
6. Remove radio from instrument panel.

INSTALLATION

RADIO

1. Connect the wire harness connector(s).
2. Connect the antenna cable.
3. Install the radio to the instrument panel.
4. Install and tighten the radio mounting fasteners.
5. Install the instrument panel center trim panel.
6. Connect the battery negative cable.

RADIO NOISE SUPPRESSION COMPONENTS

DESCRIPTION

RADIO NOISE SUPPRESSION COMPONENTS

Radio Frequency Interference (RFI) and ElectroMagnetic Interference (EMI) can be produced by any on-board or external source of electromagnetic energy. These electromagnetic energy sources can radiate electromagnetic signals through the air, or conduct them through the vehicle electrical system.

When the audio system converts RFI or EMI to an audible acoustic wave form, it is referred to as radio noise. This undesirable radio noise is generally manifested in the form of "buzzing," "hissing," "popping," "clicking," "crackling," and/or "whirring" sounds. In most cases, RFI and EMI radio noise can be suppressed using a combination of vehicle and component grounding, filtering and shielding techniques. This vehicle is equipped with factory-installed radio noise suppression devices that were designed to minimize exposure to typical sources of RFI and EMI; thereby, minimizing radio noise complaints.

Radio noise suppression is accomplished primarily through circuitry or devices that are integral to the factory-installed radios, audio power amplifiers and other on-board electrical components such as generators, wiper motors, blower motors, and fuel pumps that have been found to be potential sources of RFI or EMI. External radio noise suppression devices that are used on this vehicle to control RFI or EMI, and can be serviced, include the following:

- **Engine-to-body ground strap** - This length of braided ground strap has an eyelet terminal connector crimped to each end. One end is secured to the engine cylinder head(s). The other is secured to the plenum.
- **Resistor-type spark plugs** - This type of spark plug has an internal resistor connected in series between the spark plug terminal and the center electrode to help reduce the production of electromagnetic radiation that can result in radio noise.

OPERATION

RADIO NOISE SUPPRESSION COMPONENTS

There are two common strategies that can be used to suppress Radio Frequency Interference (RFI) and ElectroMagnetic Interference (EMI) radio noise. The first suppression strategy involves preventing the

production of RFI and EMI electromagnetic signals at their sources. The second suppression strategy involves preventing the reception of RFI and EMI electromagnetic signals by the audio system components.

The use of braided ground straps in key locations is part of the RFI and EMI prevention strategy. These ground straps ensure adequate ground paths, particularly for high current components such as many of those found in the starting, charging, ignition, engine control and transmission control systems. An insufficient ground path for any of these high current components may result in radio noise caused by induced voltages created as the high current seeks alternative ground paths through components or circuits intended for use by, or in close proximity to the audio system components or circuits.

Preventing the reception of RFI and EMI is accomplished by ensuring that the audio system components are correctly installed in the vehicle. Loose, corroded or improperly soldered wire harness connections, improperly routed wiring and inadequate audio system component grounding can all contribute to the reception of RFI and EMI. A properly grounded antenna body and radio chassis, as well as a shielded antenna coaxial cable with clean and tight connections will each help reduce the potential for reception of RFI and EMI.

REMOVAL

RADIO NOISE SUPPRESSION COMPONENTS

- 1. Disconnect and isolate the battery negative cable.
- 2. Remove the retaining bolt from the transmission bell housing.
- 3. Remove the retaining nut from the plenum.

INSTALLATION

RADIO NOISE SUPPRESSION COMPONENTS

- 1. Install the retaining nut and ground strap to the plenum.
- 2. Install retaining bolt to the transmission bell housing.
- 3. Connect the battery negative cable.

REMOTE SWITCHES

DESCRIPTION

REMOTE SWITCHES

Radio controls are mounted on the back of the steering wheel. The controls provide convenient no-look operation and operate the following functions:

Right side

A rocker switch that increases or decreases the volume

A push button that selects modes. Repeatedly pressing the button selects from among AM radio, FM radio and CD changer. If the vehicle is equipped with Satellite Digital Audio Radio (SDAR) or the Video Entertainment System™, these are also included in the selection.

Left side

A rocker switch with functions that vary depending on the mode: in a radio mode, the frequency increases or decreases; if a CD is playing, the player skips to the next or previous track; if SDAR is playing the tuner skips to the next or previous channel.

A push button that steps through preset selections: if the radio is playing, pressing the button selects the next preset frequency; if a CD is playing, the changer selects the next disc; if SDAR is playing the next preset channel is selected.

OPERATION

REMOTE SWITCHES

The six switches in the two remote radio switch units are normally open, resistor multiplexed momentary switches that are hard wired to the Cab Compartment Node (CCN) through the clockspring. The CCN sends a five volt reference signal to both switch units on one circuit, and senses the status of all of the switches by reading the voltage drop on a second circuit.

When the CCN senses an input (voltage drop) from any one of the remote radio switches, it sends the proper switch status messages on the Controlled Area Network (CAN) to the radio receiver. The electronic circuitry within the radio receiver is programmed to respond to these remote radio switch status messages by adjusting the radio settings as requested. For diagnosis of the CCN or the CAN data bus, the use of a scan tool and the proper Diagnostic article are recommended.

DIAGNOSIS AND TESTING

REMOTE SWITCHES

Any diagnosis of the Audio system should begin with the use of scan tool. For information on the use of the scan tool, refer to the appropriate Diagnostic information.

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article .

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Disconnect and isolate the battery negative cable. Remove the remote radio switch(es) from the steering wheel. See **REMOVAL**.
2. Use an ohmmeter to check the switch resistances as shown in the REMOTE RADIO SWITCH TEST chart. If the remote radio switch resistances check OK, go to step 3. If not OK, replace the faulty switch.

REMOTE RADIO SWITCH TEST TABLE

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Switch	Switch Position	Resistance
Right (White)	Volume Up	1.210 Kilohms $\pm$ 1%
Right (White)	Volume Down	3.010 Kilohms $\pm$ 1%
Right (White)	Mode Advance	0.0511 Kilohms $\pm$ 1%
Left (Black)	Seek Up	0.261 Kilohms $\pm$ 1%
Left (Black)	Seek Down	0.681 Kilohms $\pm$ 1%
Left (Black)	Pre-Set Station Advance	0.162 Kilohms $\pm$ 1%

3. Reconnect the battery negative cable. Turn the ignition switch to the On position. Check for 5 volts at the radio control mux circuit cavities of the steering wheel wire harness connectors for both remote radio switches. If OK, go to step 4. If not OK, repair the open or shorted radio control mux circuit as required.
4. Disconnect and isolate the battery negative cable. Disconnect the 22-way instrument panel wire harness connector from the CCN. Check for continuity between the remote radio switch ground circuit cavities of the steering wheel wire harness connectors for both remote radio switches and a good ground. There should be no continuity. If not OK, repair the shorted remote radio switch ground circuit as required.

REMOVAL

REMOTE SWITCHES

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Disconnect and isolate the battery negative cable.
2. Remove the driver side airbag from the vehicle. Refer to **REMOVAL** .
3. Remove the speed control switches.
4. Unplug the wire harness connector from the remote radio switch.
5. Depress the tabs on each side of each switch and push the switch through the rear steering wheel cover.

INSTALLATION

REMOTE SWITCHES

WARNING: Disable the airbag system before attempting any steering wheel, steering

column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Install remote radio switch to the steering wheel.
2. Connect the wire harness to the remote radio switch.
3. Install the speed control switches.
4. Install the driver side airbag. Refer to **INSTALLATION** .
5. Connect the battery negative cable.

SPEAKER

DESCRIPTION

SPEAKER

STANDARD

The standard equipment speaker system includes speakers in six locations. One 6.4 centimeter (2.50 inch) diameter speaker is installed on each end of the instrument panel top pad. One 16.5 centimeter (6.5 inch) full-range speaker is located in each front door. There is also one full-range 16.5 centimeter (6.5 inch) diameter full-range speaker located in each rear door.

PREMIUM

The optional premium speaker system features nine Premium model speakers. Each of the standard speakers are replaced with Premium model speakers. One 6.4 centimeter (2.50 inch) diameter speaker is installed on each end of the instrument panel top pad. One 16.5 centimeter (6.5 inch) Premium woofer is located in each front door. There is also one full-range 16.5 centimeter (6.5 inch) diameter Premium full-range speaker located in each rear door as well as one 1.9 centimeter (.75 inch) tweeter in each rear door. A 20.3 centimeter (8 inch) subwoofer is located in the rear cargo area. The premium speaker system also includes a power amplifier rated at 368 watts.

OPERATION

SPEAKER

Two wires connected to each speaker, one feed circuit (+) and one return circuit (-), allow the audio output signal electrical current to flow through the voice coil. For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article . The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

DIAGNOSIS AND TESTING

SPEAKER

Any diagnosis of the Audio system should begin with the use of scan tool. For information on the use of the scan tool, refer to the appropriate Diagnostic information.

Refer to the appropriate wiring information.

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

CAUTION: The speaker output of the radio is a "floating ground" system. Do not allow any speaker lead to short to ground, as damage to the radio may result.

NOTE: If poor sound quality is noted in the audio system, check the Cabin Equalization curve programmed in the TIPM. Make sure a base speaker system has the Base Cabin Equalization Curve programmed to the vehicle. If the vehicle has a premium speaker system, make sure the Premium Cabin Equalization Curve is programmed to the vehicle

1. If all speakers are inoperative, check the fuses in the Totally Integrated Power Module (TIPM). If OK, go to Step 2. If not OK, repair the shorted circuit or component as required and replace the faulty fuse.
2. Turn the ignition switch to the ON position. Turn the radio receiver ON. Adjust the balance and fader control controls to check the performance of each individual speaker. Note the speaker locations that are not performing correctly. Go to Step 3.
3. Turn the radio receiver OFF. Turn the ignition OFF. Disconnect and isolate the battery negative cable. If vehicle is **not** equipped with an amplifier, remove the radio receiver. If vehicle is equipped with an amplifier, disconnect wire harness connector at output side of amplifier. Go to Step 4.
4. Check both the speaker feed (+) circuit and return (-) circuit cavities for the inoperative speaker at the radio receiver wire harness connector for continuity to ground. There should be no continuity. If OK, go to Step 5. If not OK, repair the shorted speaker feed (+) and/or return (-) circuits(s) to the speaker as required.
5. Disconnect wire harness connector at the inoperative speaker. Check for continuity between the speaker feed (+) circuit cavities of the radio receiver wire harness connector and the speaker wire harness connector. Repeat the check between the speaker return (-) circuit cavities of the radio receiver wire harness connector and the speaker wire harness connector. In each case, there should be continuity. If OK, replace the faulty speaker. If not OK, repair the open speaker feed (+) and/or return (-) circuits(s) as required.

REMOVAL

SPEAKER

FRONT DOOR	Refer to <u>FRONT DOOR</u> removal procedure.
INSTRUMENT PANEL	Refer to <u>INSTRUMENT PANEL</u> removal procedure.
REAR DOOR	Refer to <u>REAR DOOR</u> removal procedure.
SUBWOOFER	Refer to <u>SUBWOOFER</u> removal procedure.

FRONT DOOR

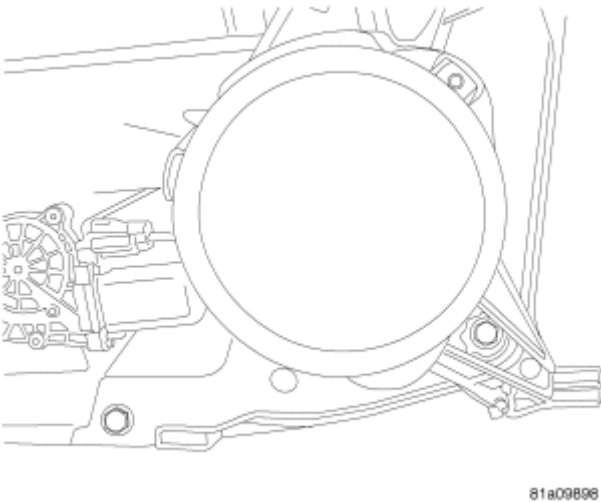


Fig. 6: Removing Speaker
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the front door trim panel. Refer to **REMOVAL** .
3. Remove the speaker mounting fasteners.
4. Remove the speaker from the door and disconnect the wire harness connector.

INSTRUMENT PANEL

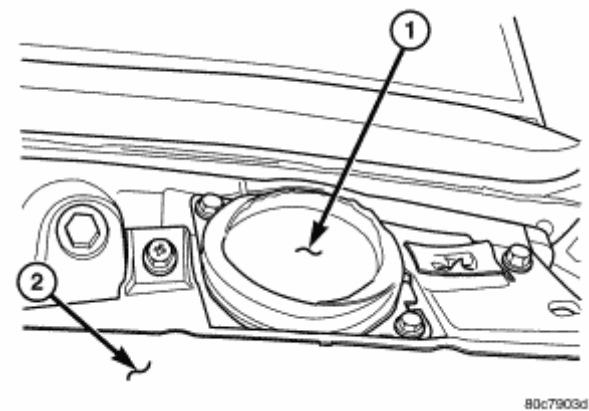


Fig. 7: Removing Speaker In Instrument Panel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the air outlet. Refer to **REMOVAL** .
3. Remove speaker mounting fasteners.
4. Remove speaker (1) and disconnect the wire harness connector.

REAR DOOR

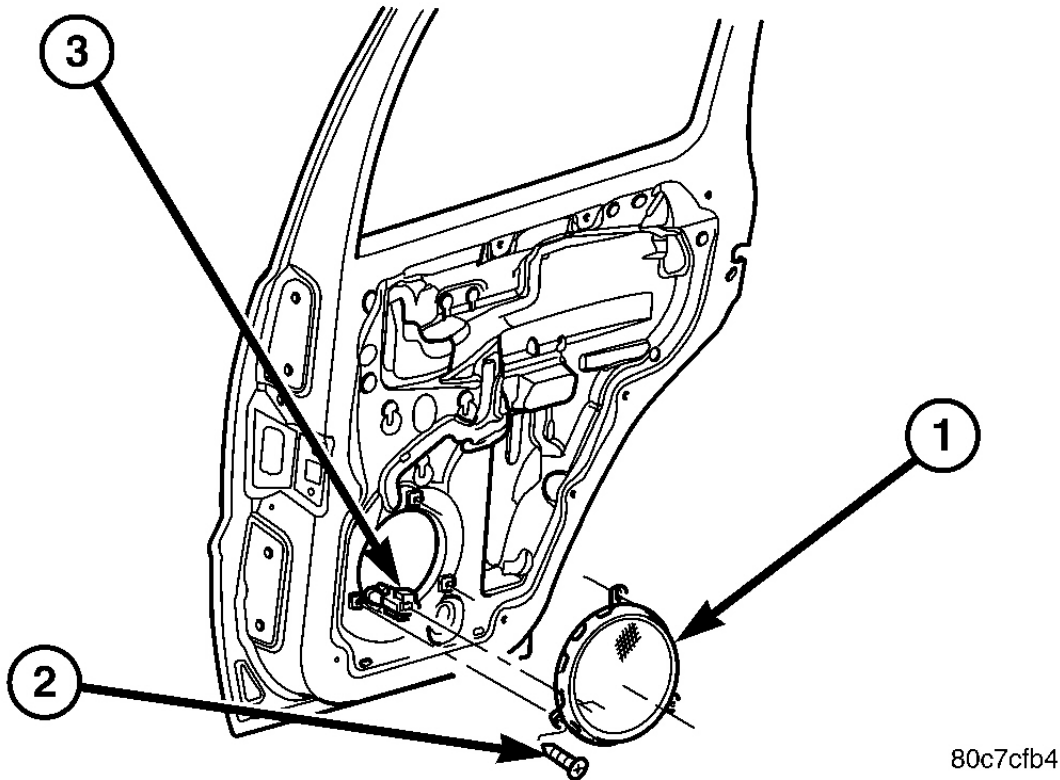


Fig. 8: Rear Door Speaker
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the rear door trim panel. Refer to **REMOVAL** .
3. Remove the speaker mounting fasteners.
4. Remove the speaker (1) from the door and disconnect the wire harness connector (3).

SUBWOOFER

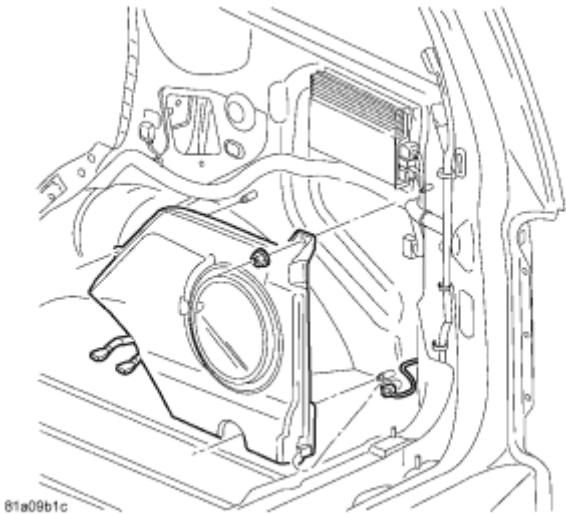


Fig. 9: Removing Subwoofer
Courtesy of CHRYSLER LLC

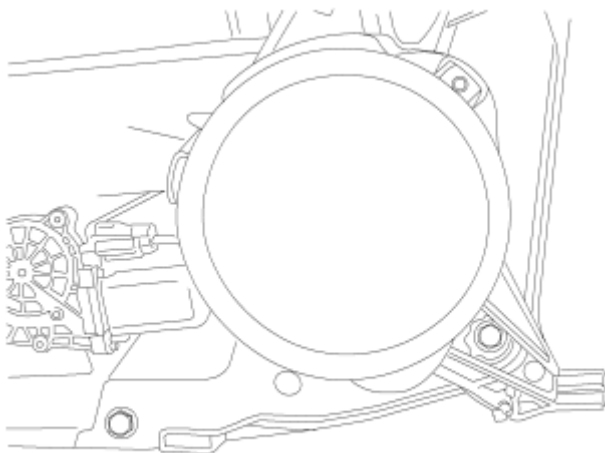
1. Disconnect and isolate the battery negative cable.
2. Remove the speaker grille fasteners and remove the speaker grille.
3. Remove the speaker mounting fasteners.
4. Remove the speaker and disconnect the electrical connector.

INSTALLATION

SPEAKER

FRONT DOOR	Refer to <u>FRONT DOOR</u> installation procedure.
INSTRUMENT PANEL	Refer to <u>INSTRUMENT PANEL</u> installation procedure.
REAR DOOR	Refer to <u>REAR DOOR</u> installation procedure.
SUBWOOFER	Refer to <u>SUBWOOFER</u> installation procedure.

FRONT DOOR

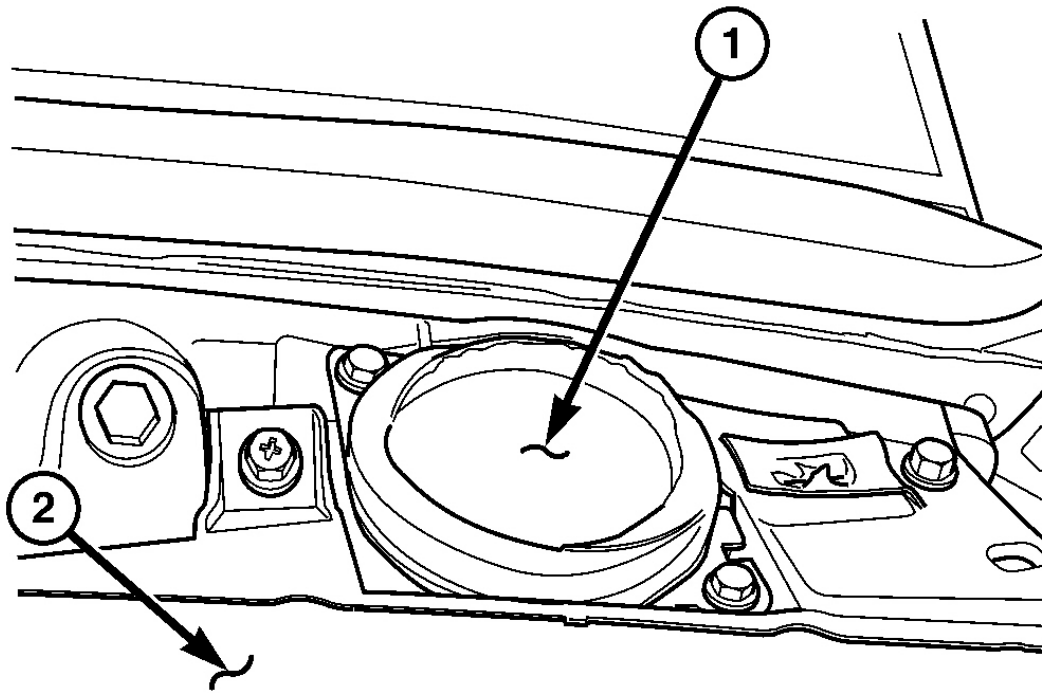


81a09896

Fig. 10: Installing Front Door Speaker
Courtesy of CHRYSLER LLC

1. Connect the wire harness connector and install the speaker to the door.
2. Install the speaker mounting screws. Tighten to 2 N.m (20 in. lbs.).
3. Install the front door trim panel. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

INSTRUMENT PANEL

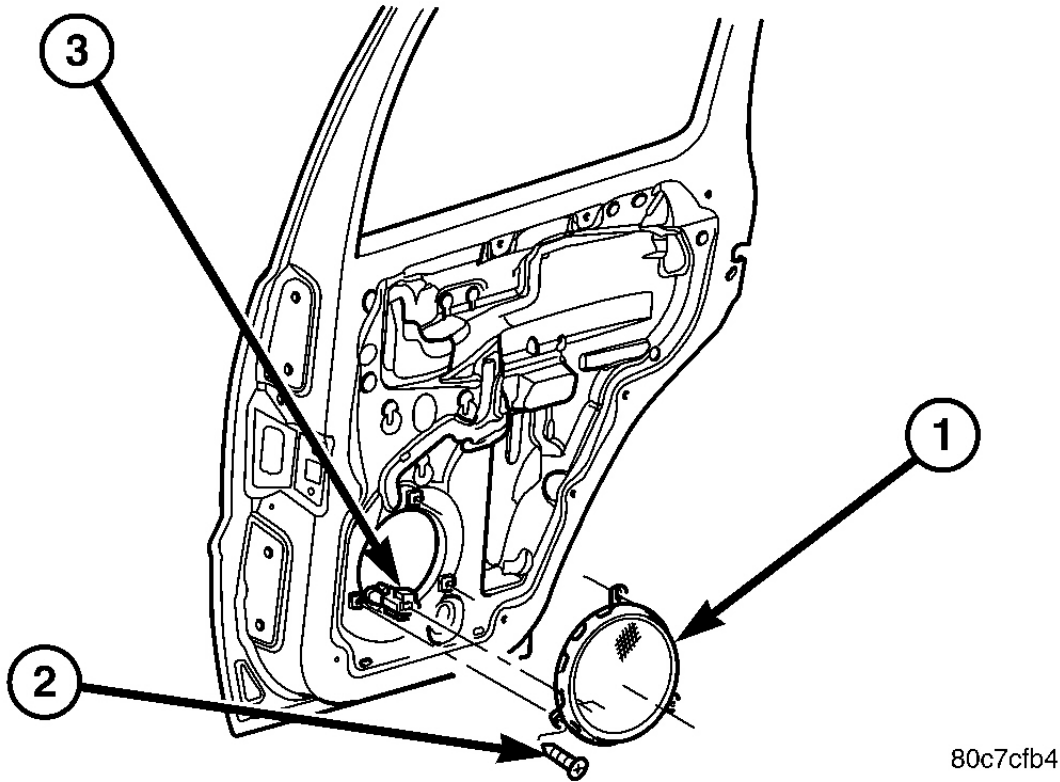


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Fig. 11: View Of Instrument Panel Speaker
Courtesy of CHRYSLER LLC

1. Connect wire harness connector and install speaker.
2. Install speaker mounting screws. Tighten to 2 N.m (20 in. lbs.).
3. Install the air outlet. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

REAR DOOR



80c7cfb4

Fig. 12: View Of Rear Door Speaker, Harness Connector & Mounting Screws
Courtesy of CHRYSLER LLC

1. Connect the wire harness connector and install the speaker to the door.
2. Install the speaker mounting screws. Tighten to 2 N.m (20 in. lbs.).
3. Install the rear door trim panel. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

SUBWOOFER

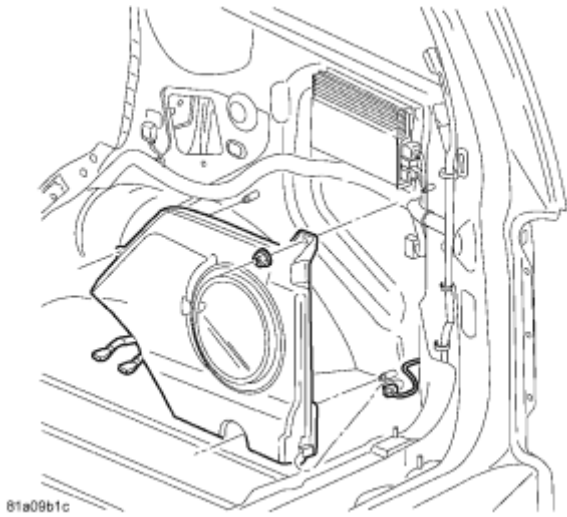


Fig. 13: Installing Subwoofer
Courtesy of CHRYSLER LLC

1. Connect the electrical connector and install the speaker.
2. Install the speaker mounting fasteners.
3. Install the speaker grille.
4. Connect the battery negative cable.

VIDEO SCREEN

REMOVAL

REMOVAL

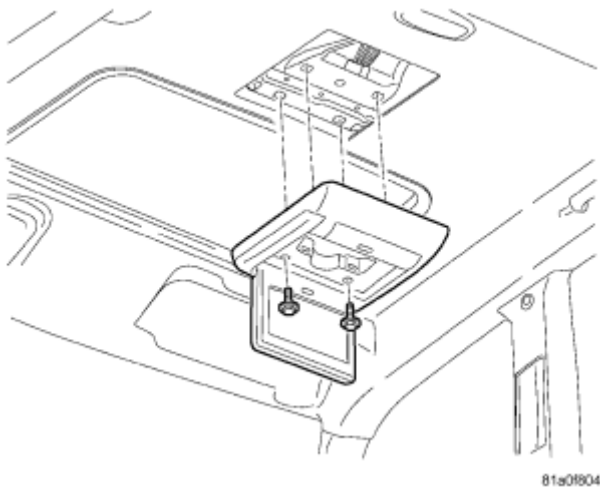


Fig. 14: Removing Video Screen
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.

2. Remove the video screen mounting fasteners.
3. Remove the video screen and disconnect the electrical connectors.

INSTALLATION

INSTALLATION

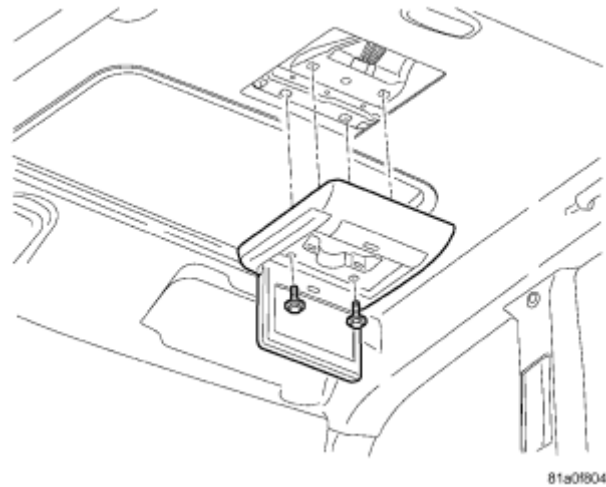


Fig. 15: Installing Video Screen
Courtesy of CHRYSLER LLC

1. Connect the electrical connectors and snap the video screen in position.
2. Install the video screen mounting fasteners.
3. Connect the battery negative cable.

2008 AUTOMATIC TRANSMISSION

42RLE - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>P0122</u>	TPS/APPS CIRCUIT LOW
<u>P0123</u>	TPS/APP CIRCUIT HIGH
<u>P0124</u>	TPS/APP INTERMITTENT
<u>P0218</u>	HIGH TEMPERATURE OPERATION ACTIVATED
<u>P0562</u>	BATTERY VOLTAGE LOW
<u>P0602</u>	CONTROL MODULE PROGRAMMING ERROR/NOT PROGRAMMED
<u>P0604</u>	INTERNAL CONTROL MODULE RAM
<u>P0605</u>	INTERNAL CONTROL MODULE ROM
<u>P0613</u>	INTERNAL TRANSMISSION PROCESSOR
<u>P0706</u>	TRANSMISSION RANGE SENSOR RATIONALITY
<u>P0711</u>	TRANSMISSION TEMPERATURE SENSOR PERFORMANCE
<u>P0712</u>	TRANSMISSION TEMPERATURE SENSOR LOW
<u>P0713</u>	TRANSMISSION TEMPERATURE SENSOR HIGH
<u>P0714</u>	TRANSMISSION TEMPERATURE SENSOR INTERMITTENT
<u>P0716</u>	INPUT SPEED SENSOR 1 CIRCUIT PERFORMANCE
<u>P0721</u>	OUTPUT SPEED SENSOR CIRCUIT PERFORMANCE
<u>P0726</u>	ENGINE SPEED INPUT CIRCUIT RANGE/PERFORMANCE
<u>P0731</u>	GEAR RATIO ERROR IN 1ST
<u>P0732</u>	GEAR RATIO ERROR IN 2ND
<u>P0733</u>	GEAR RATIO ERROR IN 3RD
<u>P0734</u>	GEAR RATIO ERROR IN 4TH
<u>P0736</u>	GEAR RATIO ERROR IN REVERSE
<u>P0740</u>	TCC OUT OF RANGE
<u>P0750</u>	LR SOLENOID CIRCUIT
<u>P0755</u>	2/4 SOLENOID CIRCUIT
<u>P0760</u>	OD SOLENOID CIRCUIT
<u>P0765</u>	UD SOLENOID CIRCUIT
<u>P0841</u>	LR PRESSURE SWITCH RATIONALITY
<u>P0845</u>	2/4 HYDRAULIC PRESSURE TEST
<u>P0846</u>	2/4 PRESSURE SWITCH RATIONALITY
<u>P0868</u>	LINE PRESSURE LOW
<u>P0869</u>	LINE PRESSURE HIGH
<u>P0870</u>	OD HYDRAULIC PRESSURE TEST
<u>P0871</u>	OD PRESSURE SWITCH RATIONALITY

<u>P0882</u>	TCM POWER INPUT LOW
<u>P0883</u>	TCM POWER INPUT HIGH
<u>P0884</u>	POWER UP AT SPEED
<u>P0888</u>	TRANSMISSION RELAY ALWAYS OFF
<u>P0890</u>	SWITCHED BATTERY
<u>P0891</u>	TRANSMISSION RELAY ALWAYS ON
<u>P0897</u>	TRANSMISSION FLUID DETERIORATED
<u>P0933</u>	LINE PRESSURE SENSOR CIRCUIT PERFORMANCE
<u>P0934</u>	LINE PRESSURE SENSOR CIRCUIT LOW
<u>P0935</u>	LINE PRESSURE SENSOR CIRCUIT HIGH
<u>P0944</u>	LOSS OF HYDRAULIC PUMP PRIME
<u>P0992</u>	2/4/OD HYDRAULIC PRESSURE TEST
<u>P128B</u>	TCM POWER CONTROL CIRCUIT 2 LOW - TIPM
<u>P128C</u>	TCM POWER CONTROL CIRCUIT 2 HIGH - TIPM
<u>P128D</u>	TCM POWER CONTROL CIRCUIT 2 OPEN - TIPM
<u>P128E</u>	TCM POWER CONTROL CIRCUIT 2 OVERCURRENT - TIPM
<u>P1684</u>	BATTERY WAS DISCONNECTED
<u>P1713</u>	RESTRICTED MANUAL VALVE IN T2 RANGE
<u>P1745</u>	TRANSMISSION LINE PRESSURE TOO HIGH FOR TOO LONG
<u>P1775</u>	SOLENOID SWITCH VALVE LATCHED IN TCC POSITION
<u>P1776</u>	SOLENOID SWITCH VALVE LATCHED IN LR POSITION
<u>P1790</u>	FAULT IMMEDIATELY AFTER SHIFT
<u>P1794</u>	SPEED SENSOR GROUND ERROR
<u>P1797</u>	MANUAL SHIFT OVERHEAT
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0141</u>	LOST COMMUNICATION WITH FCM

AUTOMATIC TRANSMISSION 42RLE - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

P0122-TPS/APPS CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Theory Of Operation

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of

range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

This DTC will set if the monitored TPS voltage drops below.078 volts for the period of 0.48 seconds.

Possible Causes

Possible Causes
RELATED TPS ENGINE DTCS PRESENT POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **DETERMINING IF RELATED ENGINE TPS DTCS ARE PRESENT**

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

Are there any Engine TPS DTCs present?

Yes

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article and perform the appropriate diagnostic procedure.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, record the Event Data to help identify the conditions in which the DTC was set.

With the scan tool, erase Transmission DTCs.

NOTE: Clearing DTCs does NOT erase the Event Data. To erase the Event Data you must either perform a Quick Learn procedure or battery disconnect (if available) with the scan tool, or manually disconnect the battery. Whatever method used might reset certain learned transmission values to controller defaults and may cause poor shift quality until those values are relearned.

Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the Event Data.

With the scan tool, read Transmission DTCs.

Does this DTC reset?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

Pay particular attention to the TPS signal and sensor ground circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0123-TPS/APP CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- Set Condition:**

This DTC will set if the monitored TPS voltage rises above 4.94 volts for the period of 0.48 seconds.

Possible Causes

Possible Causes
RELATED TPS ENGINE DTCS PRESENT POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

- 1. DETERMINING IF RELATED ENGINE TPS DTCS ARE PRESENT**

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

Are there any Engine TPS DTCs present?

Yes

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article and perform the appropriate diagnostic procedure.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 2.

2. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, record the Event Data to help identify the conditions in which the DTC was set.

With the scan tool, erase Transmission DTCs.

NOTE: **Clearing DTCs does NOT erase the Event Data. To erase the Event Data you must either perform a Quick Learn procedure or battery disconnect (if available) with the scan tool, or manually disconnect the battery. Whatever method used might reset certain learned transmission values to controller defaults and may cause poor shift quality until those values are relearned.**

Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the Event Data.

With the scan tool, read Transmission DTCs.

Does this DTC reset?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

Pay particular attention to the TPS signal and sensor ground circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0124-TPS/APP INTERMITTENT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The powertrain controller receives the throttle position signal from the Throttle Position Sensor (TPS). The controller provides the TPS with a 5 volt pull up and a sensor ground. The signal is checked for being out of range as well as for intermittent operation (excessive signal changes). The engine controller transmits the throttle value onto the Bus. Most engine controllers will calculate the throttle value if the throttle signal is lost. If an error is detected by the transmission controller and the throttle value is available on the Bus, the Bus value will be used, normal operation will continue, and a TPS code will be set. If an error is detected and the throttle value is not available on the Bus, normal operation will be discontinued, a TPS DTC will be set, and the MIL will be turned on after 5 minutes of calculated operation.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

This DTC will set if the monitored TPS throttle angle between the angles of 6° and 120° and the degree change is greater than 5° within a period of less than 7.0 ms.

Possible Causes

Possible Causes
RELATED TPS ENGINE DTCS PRESENT THROTTLE POSITION SENSOR POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF RELATED ENGINE TPS DTCS ARE PRESENT**

With the scan tool, check Engine DTCs, including pending DTCs and one trip failures.

Are there any Engine TPS DTCs present?

Yes

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article and perform the appropriate diagnostic procedure.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, record the Event Data to help identify the conditions in which the DTC was set.

With the scan tool, erase Transmission DTCs.

NOTE: **Clearing DTCs does NOT erase the Event Data. To erase the Event Data you must either perform a Quick Learn procedure or battery disconnect (if available) with the scan tool, or manually disconnect the battery. Whatever method used might reset certain learned transmission values to controller defaults and may cause poor shift quality until those values are relearned.**

Drive the vehicle and try to duplicate the conditions in which the DTC was reported by the Event Data.

With the scan tool, read Transmission DTCs.

Does this DTC reset?

Yes

Go to 3.

No

Go to 4.

3. CHECK THE THROTTLE POSITION SENSOR OPERATION

Ignition on, engine not running.

With the scan tool, under Transmission Sensors, monitor the TPS voltage in the following step.

Slowly open and close the throttle while checking for erratic voltage changes.

Did the TPS voltage change smooth and consistent?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Replace the Throttle Position Sensor per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

4. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

Pay particular attention to the TPS signal and sensor ground circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Test Complete.

P0218-HIGH TEMPERATURE OPERATION ACTIVATED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The DTC is an informational code only and is being set to aid the technician in determining root cause of a customer driveability issue. The code is also intended to alert the technician to determine if a cooling system malfunction has occurred or if an additional transmission air to oil cooler should be added to the vehicle if the customer regularly drives in a manner that overheats the transmission.

Monitor Conditions

When Monitored:

Whenever the engine is running.

Set Conditions

- **Set Condition:**

Immediately when an Overheat shift schedule is activated when the Transmission Oil Temperature reaches 115° C (240° F).

Possible Causes

Possible Causes
ENGINE COOLING SYSTEM OPERATION TRANSMISSION OIL COOLER PLUGGED HIGH TEMPERATURE OPERATIONS ACTIVATED

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK ENGINE COOLING SYSTEM

Perform Engine Cooling System diagnostics per the Service Information.

Is the Engine Cooling System functioning properly?

Yes

Go to 2.

No

Repair the cause of the engine overheating. Refer to **42RLE - SERVICE INFORMATION** article for the related diagnostic or repair procedures.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

2. TRANSMISSION OIL COOLER RESTRICTED

Check the Transmission Oil Cooler Flow in accordance with the Service Information.

Is the transmission oil cooler restricted or plugged?

Yes

Repair the cause of the plugged Transmission Oil Cooler as necessary and repair or replace the Transmission Oil Cooler per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. HIGH TEMPERATURE OPERATION

This DTC is an informational DTC designed to aid the Technician in diagnosing shift quality complaints.

This DTC indicates that the transmission has been operating in the "Overheat" shift schedule which may generate a customer complaint.

The customer driving patterns may indicate the need for an additional transmission oil cooler.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

If there are no possible causes remaining, view repair.

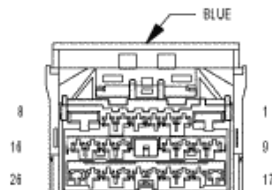
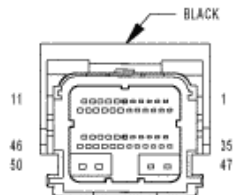
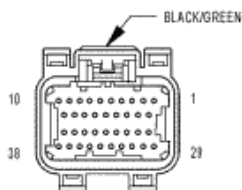
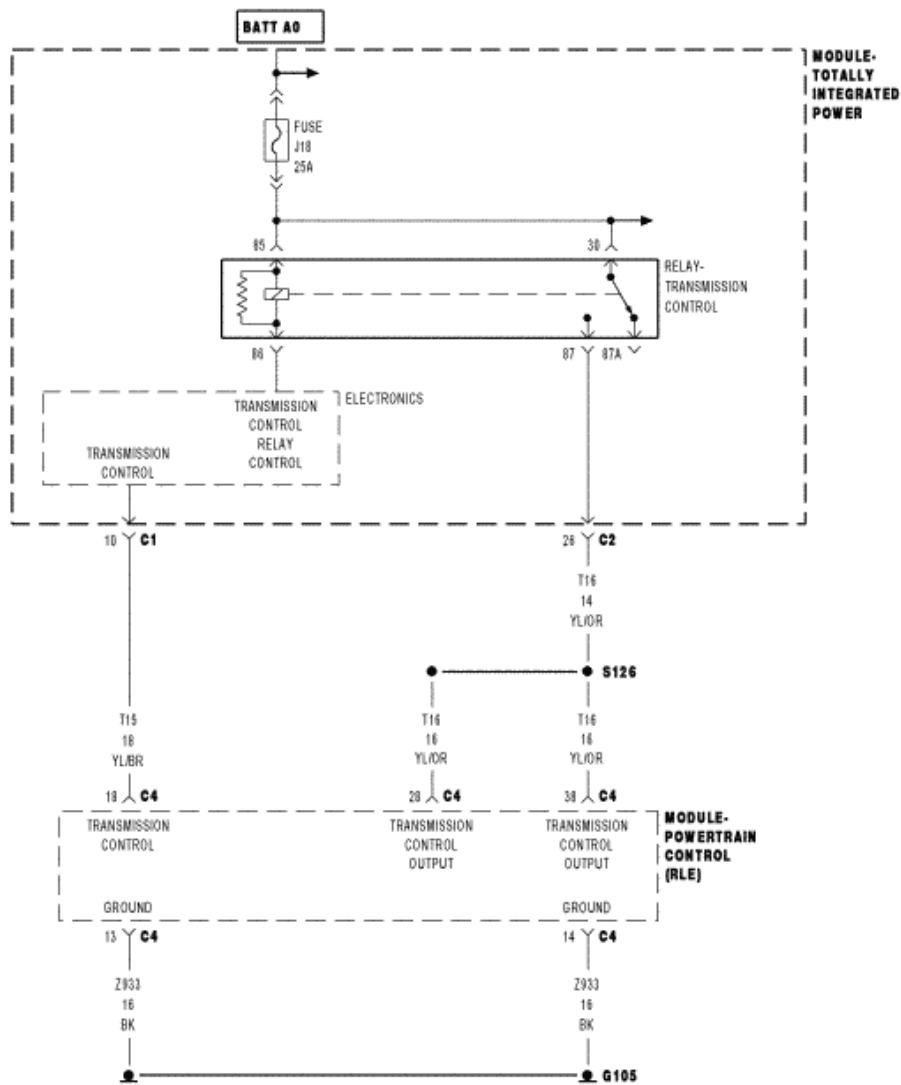
Repair

Repair the cause of transmission overheating per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0562-BATTERY VOLTAGE LOW

Circuit Schematic



0100001

Fig. 1: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Transmission damage may occur if there is insufficient supply voltage to properly control the solenoids. To prevent this possibility, the battery voltage is monitored and the system is placed in logical limp-in if the battery voltage drops below the limit.

Monitor Conditions

When Monitored:

With the engine running and the PCM has closed the Transmission Control Relay.

Set Conditions

- **Set Condition:**

If the battery voltage of the Transmission Control Relay Output Sense circuit(s) to the PCM is less- than 10.0 volts for the period of 15 seconds. Note: P0562 generally indicates a gradually falling battery voltage or a resistive connection(s) to the PCM. The DTC will also set if the battery voltage sensed at the PCM is less than 6.5 volts for 200ms or when Transmission Control Relay Output circuits are less than 7.2 volts for 200ms.

Possible Causes

Possible Causes
RELATED CHARGING SYSTEM DTC'S TRANSMISSION CONTROL RELAY (Z933) GROUND CIRCUIT OPEN OR HIGH RESISTANCE (T16) TRANSMISSION CONTROL OUTPUT TO TCM OPEN OR HIGH RESISTANCE TOTALLY INTEGRATED POWER MODULE (TIPM) POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Transmission damage may occur if there is insufficient supply voltage to properly control the solenoids. To prevent this possibility, the battery voltage is monitored and the system is placed in logical limp-in if the battery voltage drops below the limit.

Diagnostic Test

1. **CHECK FOR RELATED CHARGING SYSTEM DTC'S**

With the scan tool, read the Engine DTC's.

Are there any Charging System related DTCs present?

Yes

Refer to **CHARGING SYSTEM** and repair any Charging System DTCs before proceeding. After repairing the Charging System DTCs, perform the Transmission Verification test to verify the transmission and or controller was not damaged.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 2.

2. CHECK FOR TIPM DTCS

NOTE: **Generator, battery, and charging system must be fully functional before performing this test.**

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 3.

3. CONDITION P0562 PRESENT

With the scan tool, read Transmission DTCs.

With the scan tool, check the STARTS SINCE SET counter for P0562.

NOTE: **This counter only applies to the last DTC set.**

Is the STARTS SINCE SET counter set at 0?

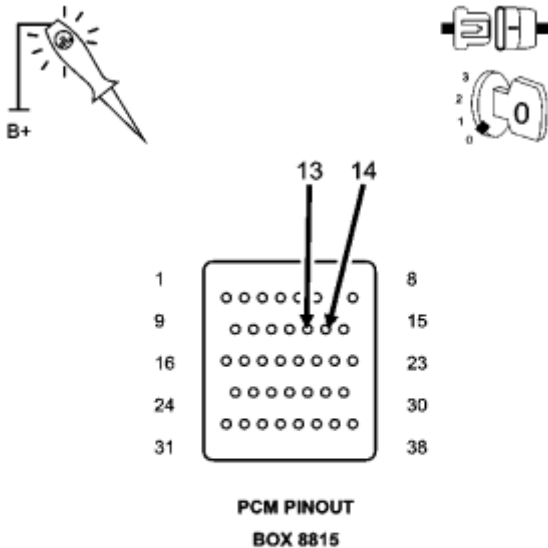
Yes

Go To 4.

No

Go To 6.

4. CHECK THE (Z933) GROUND CIRCUITS FOR AN OPEN



8199cef7

Fig. 2: Checking (Z933) Ground Circuits In Appropriate Terminals Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

NOTE: Check connectors - Clean/repair as necessary.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Using a 12-volt test light connected to 12-volts, check the (Z933) Ground circuits in the appropriate terminals of Miller tool #8815.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly for all the Ground circuits?

Yes

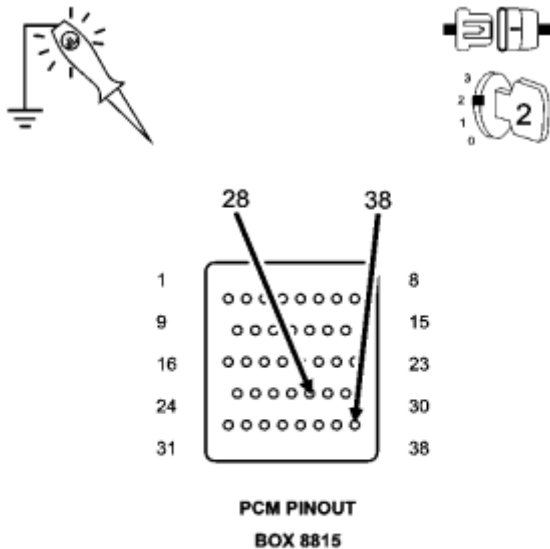
Go To 5.

No

Repair the (Z933) Ground circuit for an open circuit or high resistance.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

5. **CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN**



8199cf1e

Fig. 3: Checking All (T16) Transmission Control Output Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector (if equipped).

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check all (T16) Transmission Control Output circuits.

NOTE: The (T16) Transmission Control Output circuit branches off to both Transmission Solenoid/Pressure Switch Assembly, PCM and (if equipped) the Line Pressure Sensor/Variable Force Solenoid Assembly.

Does the test light illuminate brightly while cycling on and off on all (T16) Transmission Control Output circuits?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair the (T16) Transmission Control Relay Output circuit(s) for an open or high resistance.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorts and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0602-CONTROL MODULE PROGRAMMING ERROR/NOT PROGRAMMED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The controller is programmed during manufacturing with generic software to facilitate testing. This software does not have the proper calibrations to control a transmission in a vehicle. The check for generic software is made at power-up. If generic software is found, the MIL will light immediately and the MIL will stay on even if the fault is cleared, until the proper software is installed. Note: Transmission will be placed in limp-in mode.

Monitor Conditions

When Monitored:

Check for generic software is made at power-up.

Set Conditions

- **Set Condition:**

If generic software is found, the MIL will light immediately. This DTC is designed to signal the technician that the controller still has generic software installed.

Possible Causes

Possible Causes
PCM - PROGRAMMING ERROR

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CONTROL MODULE PROGRAMMING ERROR

NOTE: **Controller is programmed with generic software and will not allow the correct vehicle Powertrain management.**

Record the controller part number.

Update the controller with the correct software in accordance with the Service Information.

Verify that the controller updated successfully.

Test Complete

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0604-INTERNAL CONTROL MODULE RAM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

After the controller is reset, the microprocessor checks the integrity of each RAM location by writing to it and reading back from it. The read value should be the same as the written value. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

Monitor Conditions

When Monitored:

One time after the ignition key is turned to the run position.

Set Conditions

- **Set Condition:**

The read value does not match the written value in any RAM location.

Possible Causes

Possible Causes
PCM - INTERNAL ERROR

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **PCM - INTERNAL ERROR**

If there are no possible causes remaining, view repair.

Repair

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0605-INTERNAL CONTROL MODULE ROM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

After the controller is reset, the microprocessor checks the integrity of the program memory (ROM). A checksum is calculated by adding all used bytes in the program memory. The sum should be the same as a known constant stored in memory. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

Monitor Conditions

When Monitored:

One time after the ignition key is turned to the run position.

Set Conditions

- **Set Condition:**

If the ROM checksum does not match a known constant.

Possible Causes

Possible Causes
PCM - INTERNAL ERROR

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. PCM - INTERNAL ERROR

Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits.

If there are no possible causes remaining, view repair.

Repair

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0613-INTERNAL TRANSMISSION PROCESSOR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The internal watchdog is a separate hardware circuit which continuously monitors the microprocessor. To make sure the transmission is operating properly, the watchdog must receive a signal from the microprocessor within a specific time window. MIL on after 10 seconds of vehicle operation and transmission will be placed in limp-in.

Monitor Conditions

When Monitored:

After the ignition key is turned to the run position and 60 seconds thereafter.

Set Conditions

- **Set Condition:**

Either of the following conditions occur 3 times in less than 590 milliseconds: The watchdog line remains high after the watchdog test or the transmission relay coil is energized and remains on after the watchdog delay expires.

Possible Causes

Possible Causes
PCM - INTERNAL ERROR

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **PCM - INTERNAL ERROR**

Using the schematics as a guide, inspect the wiring and connectors. Repair as necessary. Pay particular attention to all power and ground circuits.

If there are no possible causes remaining, view repair.

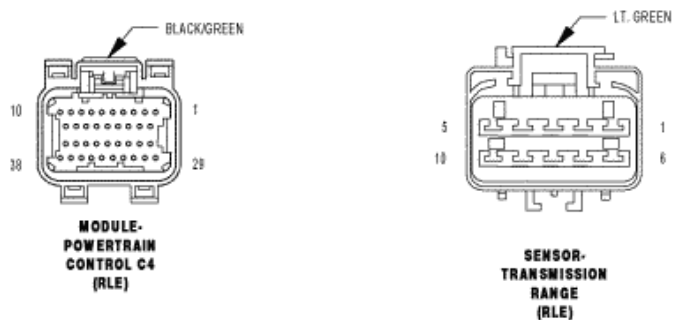
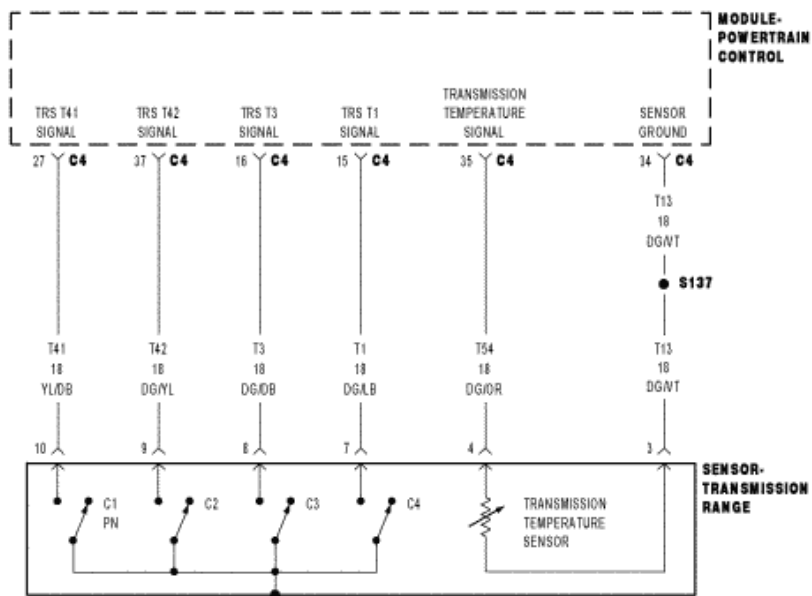
Repair

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0706-TRANSMISSION RANGE SENSOR RATIONALITY

Circuit Schematic



0199616a

Fig. 4: Transmission Range Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The C1 through C4 (T41, T42, T3, and T1) Signal circuits communicate the shift lever position to the PCM. Each circuit is terminated at the transmission with a switch. Each switch can be either open or closed, depending on the shift lever position. The PCM can decode this information and determine the shift lever position. Each shift lever position has a certain combination of switches, which will be open and closed, this is called a PRNDL code. There are 4 switches, therefore: there are many possible combinations of open and closed switches (codes). However, there are only 9 valid codes (8 for AutoStick), one for each gear position and three recognized between gear codes. The remainder of the codes should never occur, these are called invalid codes. The following chart shows the normal switch states for each shift lever position.

Monitor Conditions

When Monitored:

Continuously with the ignition on.

Set Conditions

- Set Condition:**

The DTC will set if the controller detects an invalid PRNDL code which lasts for more than 0.042 seconds.

Possible Causes

Possible Causes
SHIFTER OUT OF ADJUSTMENT
TRS SIGNAL CIRCUIT OPEN
TRS SIGNAL CIRCUIT SHORT TO GROUND
TRS SIGNAL CIRCUIT SHORT TO VOLTAGE
METAL DEBRIS IN OIL PAN
TRANSMISSION RANGE SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

TRS SWITCH STATES

SLP	T41 (C1)	T42 (C2)	T3 (C3)	T1 (C4)
P	CLOSED	CLOSED	CLOSED	OPEN
R	OPEN	CLOSED	OPEN	OPEN
N	CLOSED	CLOSED	OPEN	CLOSED
OD	OPEN	OPEN	OPEN	CLOSED
3 or AutoStick if equipped	OPEN	OPEN	CLOSED	OPEN
L	OPEN	CLOSED	CLOSED	CLOSED

SHIFT LEVER ERROR CODES REPORTED BY SCAN TOOL

ERROR CODE	SWITCH CIRCUIT STUCK	SWITCH POSITION
1	T1 (C4)	OPEN
2	T1 (C4)	CLOSED
3	T3 (C3)	OPEN
4	T3 (C3)	CLOSED
5	T42 (C2)	OPEN
6	T42 (C2)	CLOSED
7	T41 (C1)	OPEN
8	T41 (C1)	CLOSED

Diagnostic Test

1. CHECK IF THE DTC IS CURRENT

With the scan tool, perform the Shift Lever Position Test.

Select the test outcome from the following:

Test passes:

Go to step 6.

Test fails with Error Code:

Go to step 2.

Test fails without Error Code:

Perform the Gearshift Adjustment Procedure per the Service Information.

Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

2. CHECK THE TRANSMISSION SOLENOID/TRS ASSEMBLY

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, perform the Shift Lever Position Test.

When the scan tool instructs you to put the Gear Selector in a particular position, you must do so using the selector switch on the Transmission Simulator.

The LED for the gear position in question must be illuminated on the Transmission Simulator prior to pressing "ENTER" on the scan tool.

NOTE: When the scan tool requests the O/D off button be depressed, you must use the O/D OFF button in the vehicle or you will fail the Shift Lever Position Test with an error code 11 or OD-TOW/HALL STUCK OPEN.

NOTE: If the Shift Lever Position test fails, make sure to note the identification of the TRS Signal circuit for future reference.

Did the Shift Lever Position test pass?

Yes

Remove the Oil Pan and Main Valve Body Assembly per the Service Information. Check for metal debris on top of the TRS Assembly. If debris is present, determine the cause of the debris and repair the transmission as necessary. If no problems are found, replace the Transmission TRS Assembly per the Service Information.

Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

No

Go to step 3.

3. TRS SIGNAL CIRCUIT OPEN

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333.

Disconnect the PCM harness connectors and install Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the identified (T41, T42, T3, and T1) TRS Signal circuit, from the Transmission Solenoid/TRS Assembly harness connector to the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

Repair the identified (T41, T42, T3, and T1) TRS Signal circuit for an open.
Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

No

Go to step 4.

4. TRS SIGNAL CIRCUIT SHORT TO GROUND

Measure the resistance between ground and the identified (T41, T42, T3, and T1) TRS Signal circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the identified (T41, T42, T3, and T1) TRS Signal circuit for a short to ground.
Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

No

Go to step 5.

5. TRS SIGNAL CIRCUIT SHORT TO OTHER CIRCUITS

Measure the resistance between the identified (T41, T42, T3, and T1) TRS Signal circuit and all other circuits in the Transmission Solenoid/TRS Assembly harness connector.

Is the resistance below 100k ohms between the identified (T41, T42, T3, and T1) TRS Signal circuit and any other circuit(s) in the Transmission Solenoid/TRS Assembly harness connector?

Yes

Repair the identified (T41, T42, T3, and T1) TRS Signal circuit for a short to other circuit(s).
Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

6. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

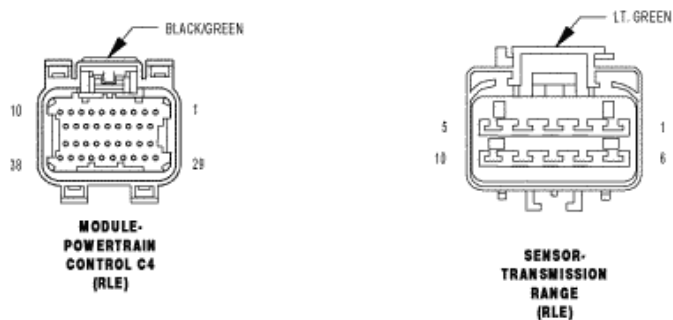
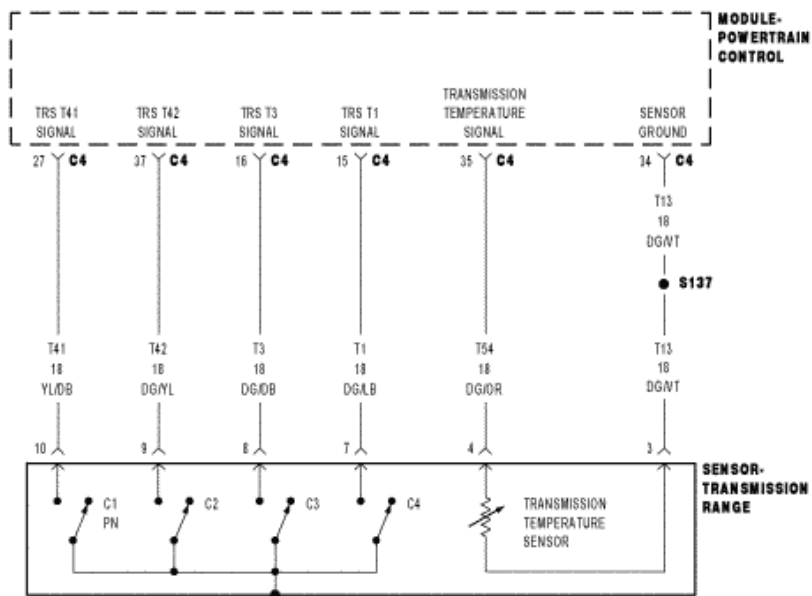
Perform the PRNDL Fault Clearing Procedure. See **STANDARD PROCEDURE**.

No

Test Complete.

P0711-TRANSMISSION TEMPERATURE SENSOR PERFORMANCE

Circuit Schematic



0199616a

Fig. 5: Transmission Range Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

DTC will set when the transmission temperature does not reach a normal operating temperature within a given time frame. Time is variable due to ambient temperature. Approximate DTC set time is 10 to 35 minutes. The following are starting temperature to warm up times to set this DTC: starting temperature - 40° C (-40° F) warm up time 35 minutes, starting temperature -28° C (-20° F) 25 minutes, starting temperature -6.6° C (20° F) 20 minutes, starting temperature 15.5 ° C (60° F) 10 minutes. When the fault is set, calculated temperature is substituted for measured temperature, however the DTC is stored only after three consecutive occurrences.

Possible Causes

Possible Causes
RELATED TRANSMISSION TEMPERATURE DTCS PRESENT
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR RELATED TRANSMISSION TEMPERATURE DTCS**

With the scan tool, read DTCS.

Are there any other Transmission Temperature Sensor DTCS present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 3.

No

Go to 4.

3. **PCM AND WIRING**

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the Transmission Temperature voltage while turning the Thermistor Voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

Do the readings on the Transmission Simulator match the scan tool readings (± 0.2 volts)?

Yes

Replace Transmission Range Sensor (TRS) Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for any Service Bulletins and for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

4. **CHECK THE WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

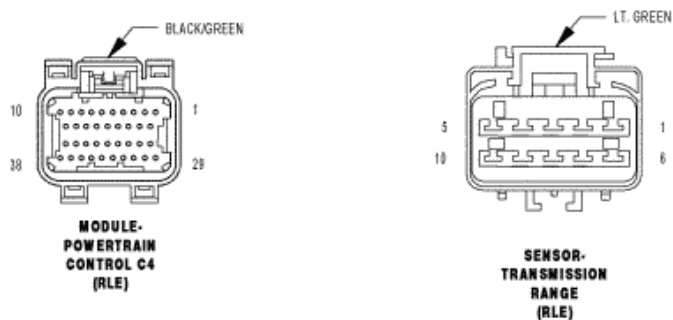
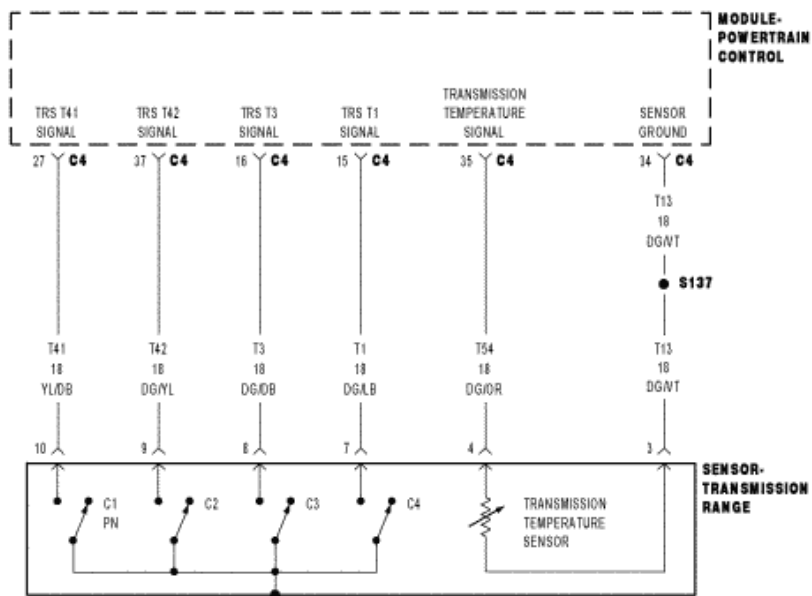
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0712-TRANSMISSION TEMPERATURE SENSOR LOW

Circuit Schematic



0199616a

Fig. 6: Transmission Range Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

The DTC will set when the monitored Temperature Sensor voltage drops below 0.078 volts for the period of 1.45 seconds. When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.

Possible Causes

Possible Causes
RELATED DTCS PRESENT (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT SHORT TO GROUND TRANSMISSION TEMPERATURE SENSOR POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF RELATED DTCS ARE PRESENT**

With the scan tool, read DTCs.

Are there any Speed Sensor DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 3.

No

Go to 5.

3. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the Transmission Temperature voltage while turning the Thermistor voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

Do the readings on the Transmission Simulator match the scan tool readings ± 0.2 volts?

Yes

Replace Transmission Range Sensor (TRS) Assembly per the Service Information.

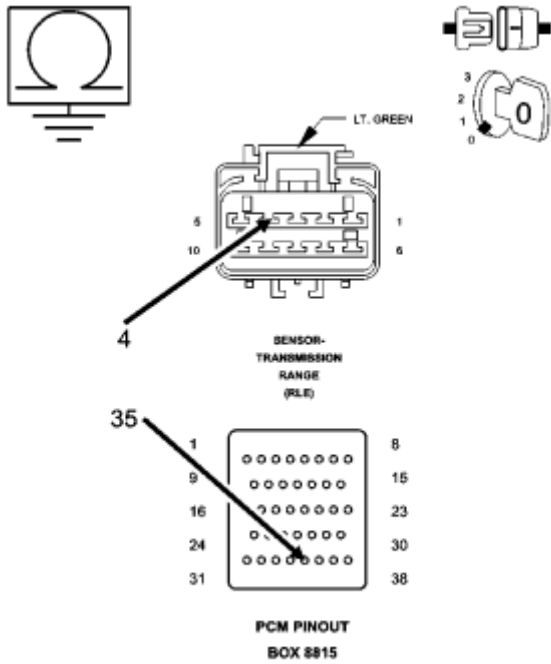
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 4.

4. CHECK THE (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT FOR A SHORT TO

GROUND



8199d30f

Fig. 7: Measuring Resistance Between Ground And Transmission Temperature Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the TRS Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance between ground and the (T54) Transmission Temperature Signal circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T54) Transmission Temperature Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. **CHECK THE WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

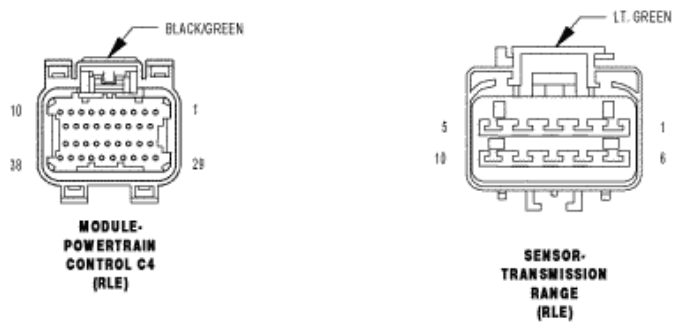
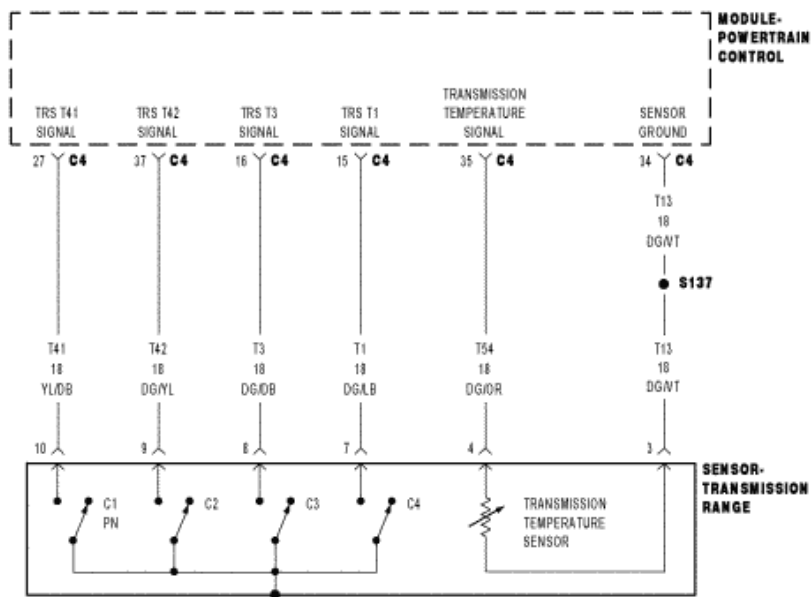
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0713-TRANSMISSION TEMPERATURE SENSOR HIGH

Circuit Schematic



0199616a

Fig. 8: Transmission Range Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

The DTC will set when the monitored Temperature Sensor voltage rises above 4.94 volts for the period of 1.45 seconds. When the fault is set, calculated temperature is substituted for measured temperature, however the fault code is stored only after three consecutive occurrences of the fault.

Possible Causes

Possible Causes
(K900) SENSOR GROUND OPEN (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT OPEN (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT SHORT TO VOLTAGE TRANSMISSION TEMPERATURE SENSOR POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 2.

No

Go to 6.

2. **CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR**

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the Transmission Temperature voltage while turning the Thermistor voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

Do the readings on the Transmission Simulator match the scan tool readings (± 0.2 volts)?

Yes

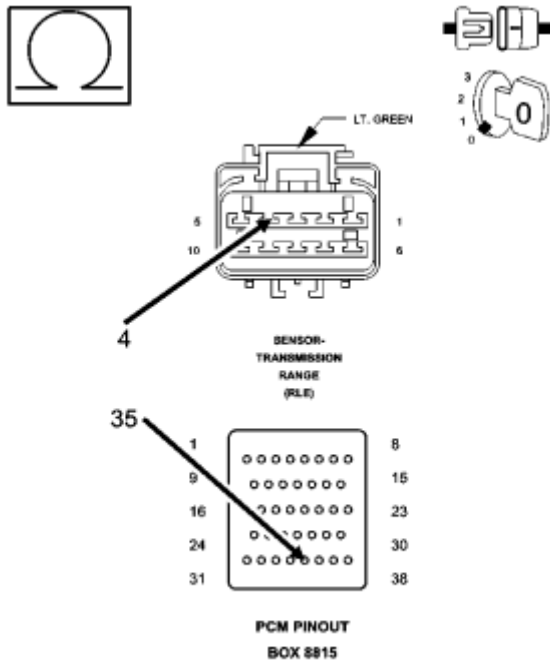
Replace Transmission Range Sensor (TRS) Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK THE (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT FOR AN OPEN



8199d341

Fig. 9: Measuring Resistance Of Transmission Temperature Signal Circuit Between TRS Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the TRS harness connector

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the Transmission Temperature Signal circuit between the TRS harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

Repair the Transmission Temperature Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 4.

4. CHECK THE (K900) SENSOR GROUND CIRCUIT FOR AN OPEN

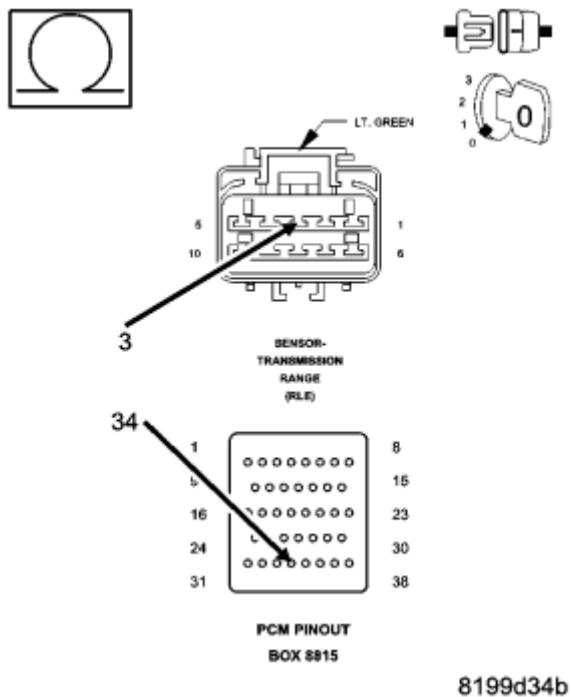


Fig. 10: Measuring Resistance Of (K900) Sensor Ground Circuit Between TRS Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Disconnect the PCM C2 harness connector.

Measure the resistance of the (K900) Sensor Ground circuit between the TRS harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

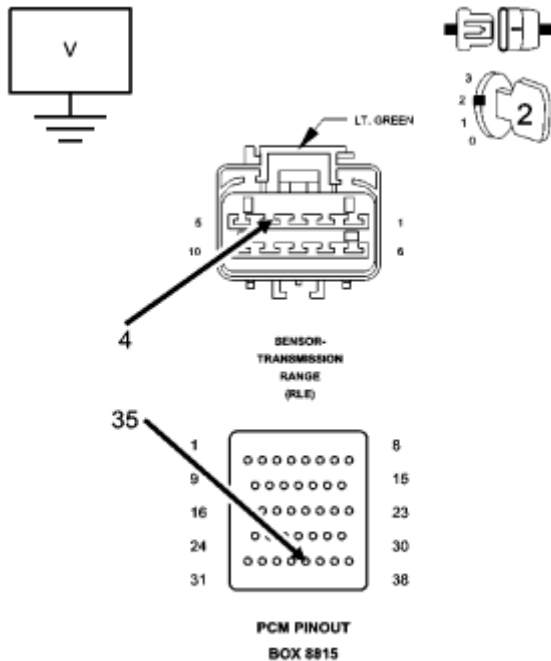
Repair the (K900) Sensor Ground circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 5.

5. CHECK THE (T54) TRANSMISSION TEMPERATURE SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



8199d357

Fig. 11: Measuring Voltage Of (T54) Transmission Temperature Sensor Signal Circuit In Appropriate Terminal Of Miller Tool #8815
 Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T54) Transmission Temperature Sensor Signal circuit in the appropriate terminal of Miller tool #8815.

Is the voltage above 0.5 volts?

Yes

Repair the (T54) Transmission Temperature Sensor Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

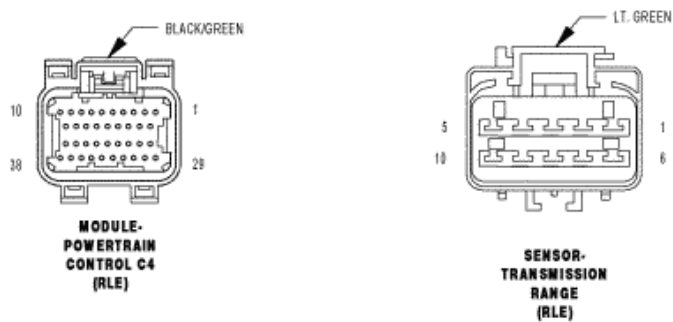
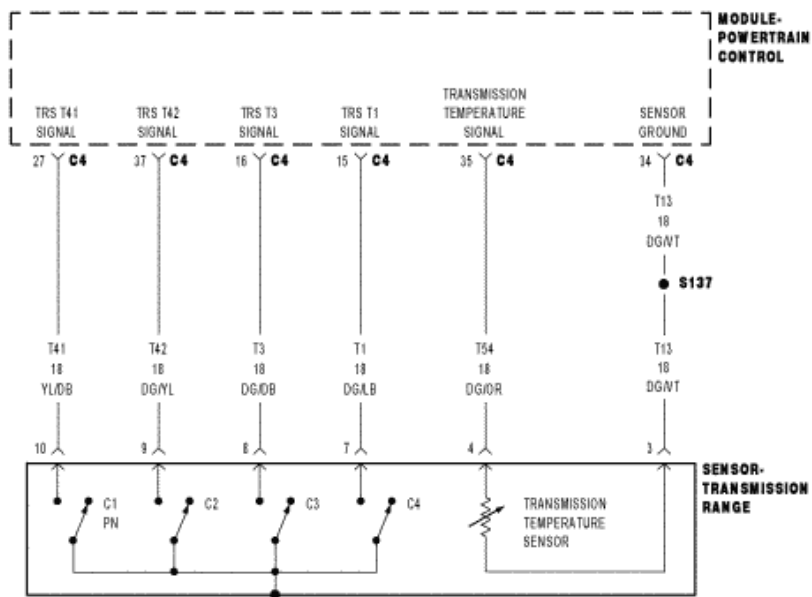
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0714-TRANSMISSION TEMPERATURE SENSOR INTERMITTENT

Circuit Schematic



0199616a

Fig. 12: Transmission Range Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The temperature sensor is used to sense the temperature of the transmission fluid. Transmission fluid temperature can affect shift quality, torque converter operation and when or if some diagnostics are run. A failed temperature sensor could affect the OBD diagnostics. If a problem occurs in the transmission temperature sensor circuit, transmission temperature will be based on a calculated value.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- **Set Condition:**

The DTC will set when the monitored Temperature Sensor voltage fluctuates or changes abruptly within a predetermined period of time.

Possible Causes

Possible Causes
TRANSMISSION TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 2.

No

Go to 3.

2. **CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR**

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Input/Output switch to OFF.

With the scan tool, monitor the Transmission Temperature voltage while turning the Thermistor voltage switch to all three positions on the Transmission Simulator.

Compare the scan tool readings with the numbers listed on the Transmission Simulator.

Do the readings on the Transmission Simulator match a non-fluctuating scan tool reading (± 0.2 volts)?

Yes

Replace Transmission Range Sensor (TRS) Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

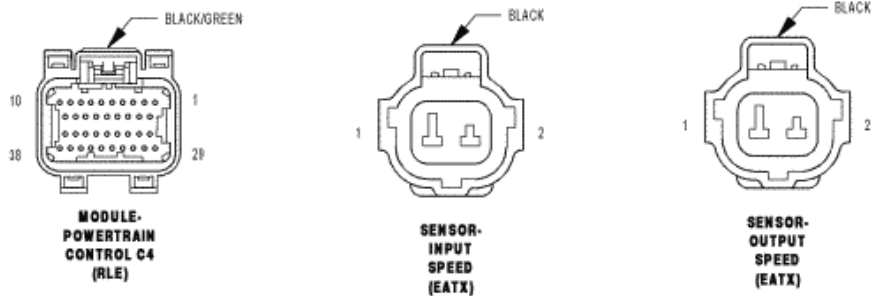
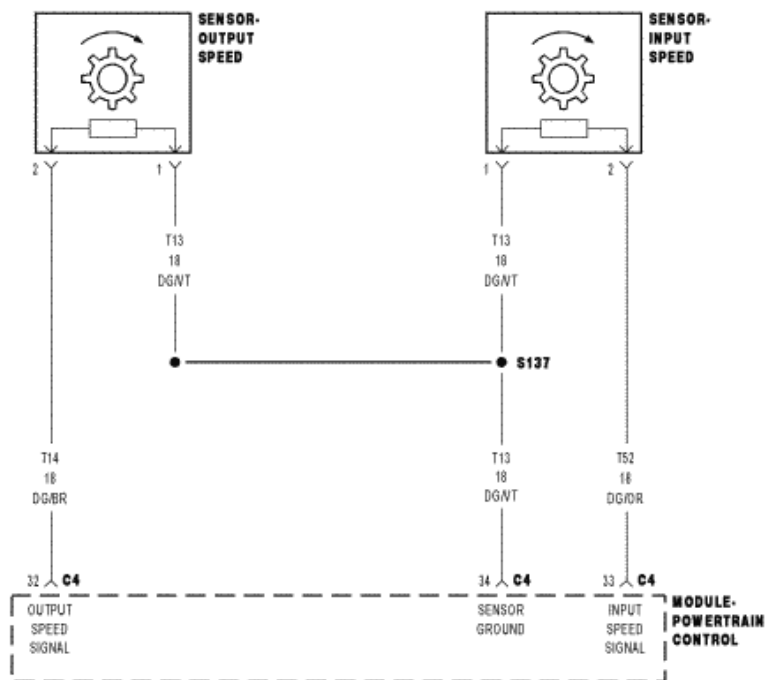
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0716-INPUT SPEED SENSOR 1 CIRCUIT PERFORMANCE

Circuit Schematic



019946509

Fig. 13: Speed Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission control system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through system checks.

Monitor Conditions

When Monitored:

The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- **Set Condition:**

If there is an excessive change in the Input rpm in any valid gear (R, 1st, 2nd, 3rd, or 4th).

Possible Causes

Possible Causes
(T52) INPUT SPEED SIGNAL CIRCUIT OPEN
(T13) SENSOR GROUND CIRCUIT OPEN
(T52) INPUT SPEED SIGNAL CIRCUIT SHORT TO GROUND
(T52) INPUT SPEED SIGNAL CIRCUIT SHORT TO VOLTAGE
(T13) SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
INPUT SPEED SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

Start the engine.

Place the shifter in Park.

With the scan tool, read the Input Speed Sensor rpm.

Is the Input Speed Sensor reading below 400 rpm?

Yes

Go to 2.

No

Go to 8.

2. CHECK THE PCM AND WIRING WITH THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, set the "Input/Output Speed" switch to "ON" and the rotary switch to the "3000/1250" position.

With the scan tool, read the Input and Output rpm.

Does the Input speed read 3000 rpm and the Output speed read 1250 rpm ($\pm$ 50 rpm)?

Yes

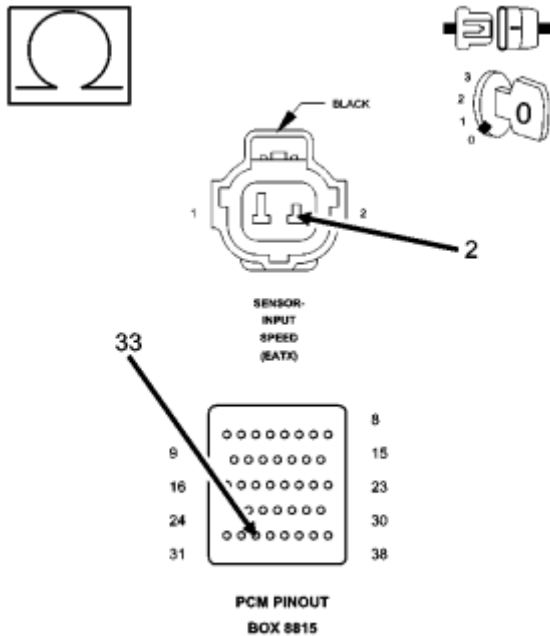
Replace the Input Speed Sensor per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK THE (T52) INPUT SPEED SIGNAL CIRCUIT FOR AN OPEN



8199d524

Fig. 14: Measuring Resistance Of (T52) Input Speed Signal Circuit Between Input Speed Sensor Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Input Speed Sensor harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T52) Input Speed Signal circuit between the Input Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

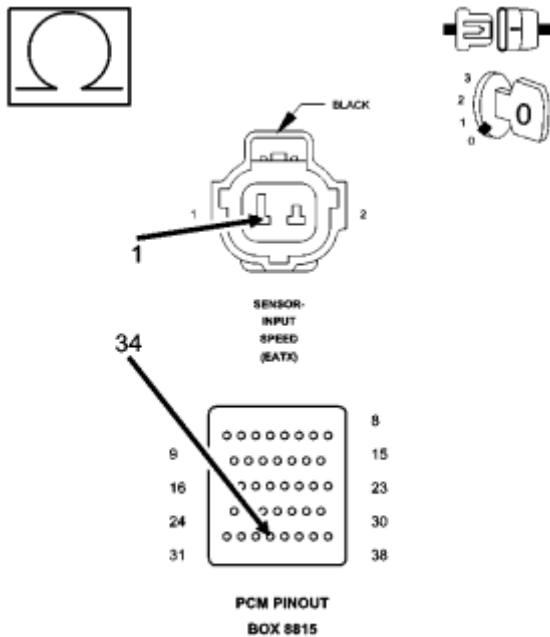
Repair the (T52) Input Speed Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 4.

4. CHECK THE (T13) SENSOR GROUND CIRCUIT FOR AN OPEN



8199d528

Fig. 15: Measuring Resistance Of (T13) Sensor Ground Circuit Between Input Speed Sensor Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (T13) Sensor Ground circuit between the Input Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

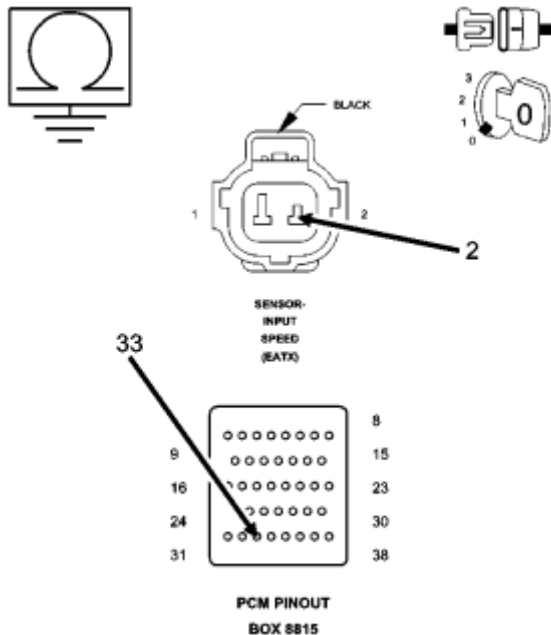
Repair the (T13) Sensor Ground circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 5.

5. CHECK THE (T52) INPUT SPEED SIGNAL CIRCUIT FOR A SHORT TO GROUND



8199d52c

Fig. 16: Measuring Resistance Between Ground And (T52) Input Speed Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T52) Input Speed Signal circuit.

Is the resistance Below 5.0 ohms?

Yes

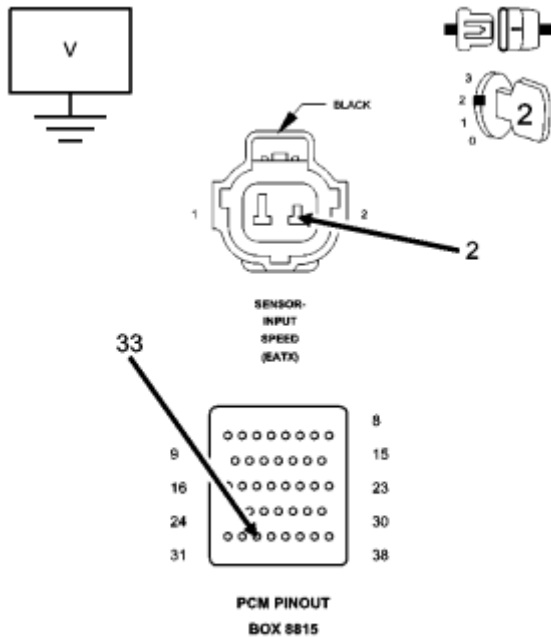
Repair the (T52) Input Speed Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 6.

6. CHECK THE (T52) INPUT SPEED SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



8199d534

Fig. 17: Measuring Voltage Of (T52) Input Speed Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the Output Speed Sensor harness connector.

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T52) Input Speed Signal circuit.

Is the voltage above 0.5 volt?

Yes

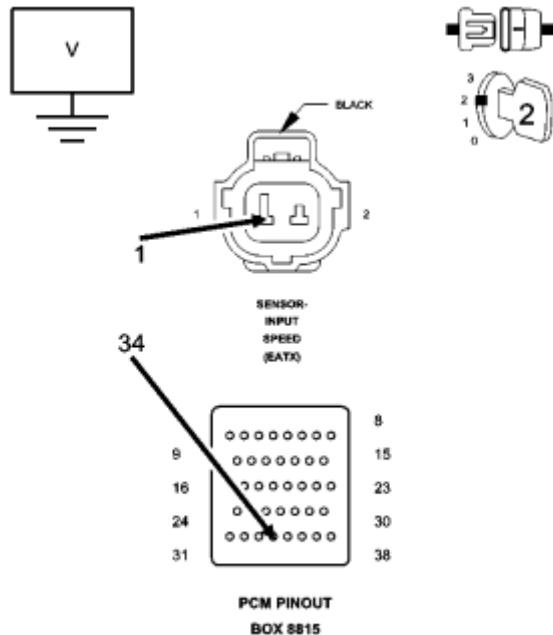
Repair the (T52) Input Speed Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T13) SENSOR GROUND CIRCUIT FOR A SHORT TO VOLTAGE



8199d530

Fig. 18: Measure Voltage Of Sensor Ground Circuit
Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T13) Sensor Ground circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T13) Speed Sensor Ground circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

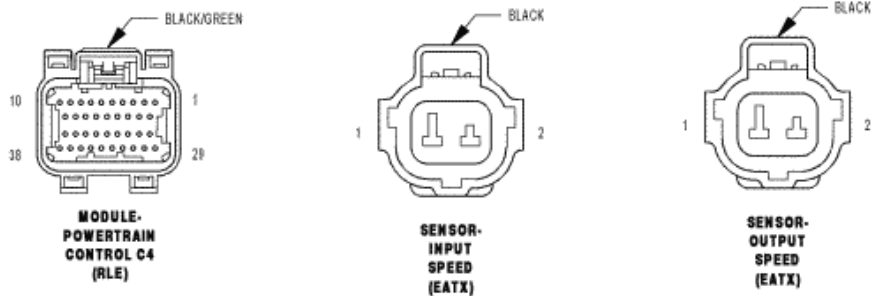
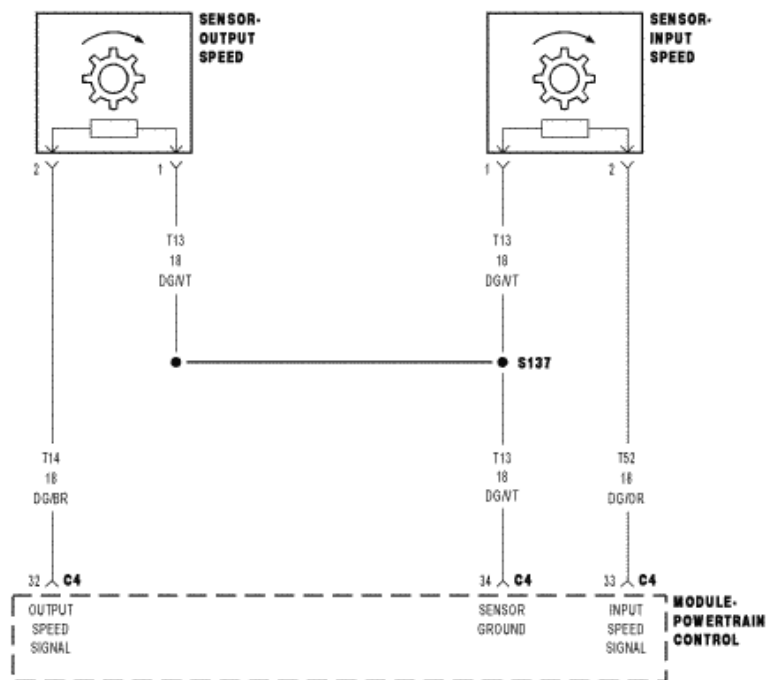
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0721-OUTPUT SPEED SENSOR CIRCUIT PERFORMANCE

Circuit Schematic



019946500

Fig. 19: Speed Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through system checks.

Monitor Conditions

When Monitored:

The transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- **Set Condition:**

If there is an excessive change in the Output rpm in any gear.

Possible Causes

Possible Causes
(T14) OUTPUT SPEED SIGNAL CIRCUIT OPEN
(T13) SENSOR GROUND CIRCUIT OPEN
(T14) OUTPUT SPEED SIGNAL CIRCUIT SHORT TO GROUND
(T14) OUTPUT SPEED SIGNAL CIRCUIT SHORT TO VOLTAGE
(T13) SENSOR GROUND CIRCUIT SHORT TO VOLTAGE
OUTPUT SPEED SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

Start the engine in Park.

Raise the drive wheels off of the ground.

WARNING: Properly support the vehicle.

Firmly apply the brakes and place the transmission selector in Drive.

WARNING: Be sure to keep hands and feet clear of rotating wheels.

Release the brakes and allow the drive wheels to spin freely.

NOTE: **The drive wheels must be turning at this point.**

With the scan tool, read the Output rpm

Is the Output rpm below 100?

Yes

Go to 2.

No

Go to 8.

2. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, set the "Input/Output Speed" switch to "ON" and the rotary switch to the "3000/1250" position.

With the scan tool, read the Input and Output rpm.

Does the Input rpm read 3000 and the Output rpm read 1250 (within 50 rpm)?

Yes

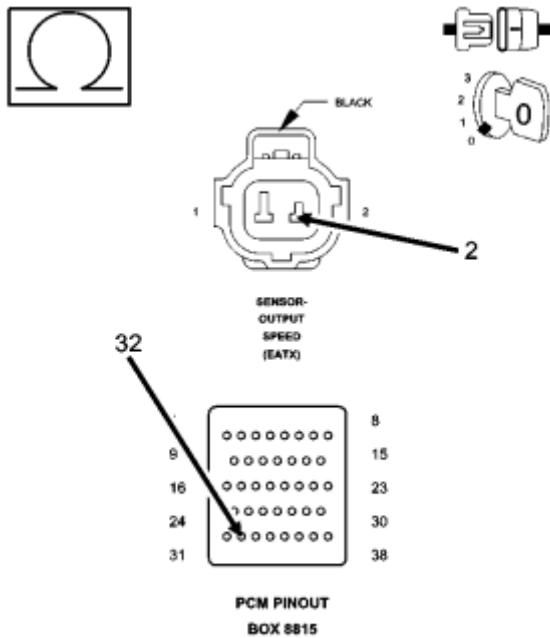
Replace the Output Speed per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. **CHECK THE (T14) OUTPUT SPEED SIGNAL CIRCUIT FOR AN OPEN**



8199eac2

Fig. 20: Measuring Resistance Of (T14) Output Speed Signal Circuit Between Output Speed Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Output Speed harness connector.

NOTE: Check connectors - Clean/repair as necessary.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T14) Output Speed Signal circuit between the Output Speed harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

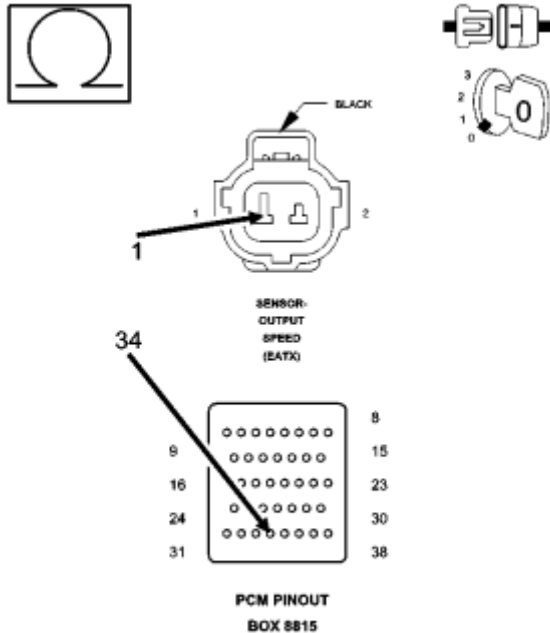
Yes

Repair the (T14) Output Speed Signal circuit for an open.
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go to 4.

4. CHECK THE (T13) SENSOR GROUND CIRCUIT FOR AN OPEN



8199f7f4

Fig. 21: Measuring Resistance Of Sensor Ground Circuit Between Output Speed Sensor Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the Sensor Ground circuit between the Output Speed Sensor harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

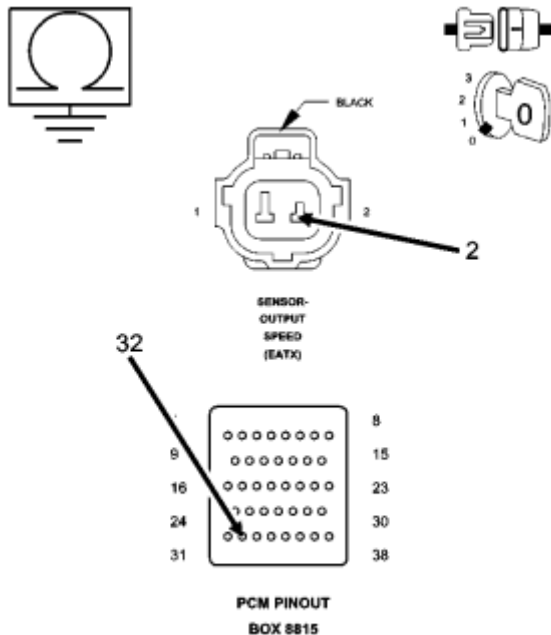
Yes

Repair the (T13) Sensor Ground circuit for an open.
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go to 5.

5. CHECK THE (T14) OUTPUT SPEED SIGNAL CIRCUIT FOR A SHORT TO GROUND



8199f785

Fig. 22: Measuring Resistance Between Ground And (T14) Output Speed Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T14) Output Speed Signal circuit.

Is the resistance below 5.0 ohms?

Yes

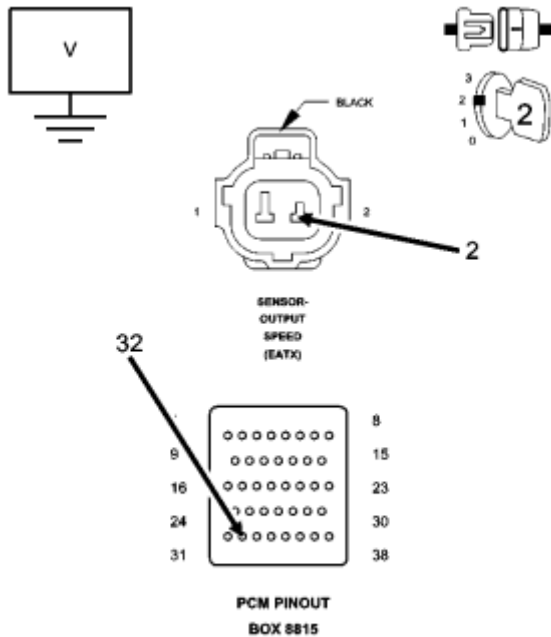
Repair the (T14) Output Speed Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 6.

6. CHECK THE (T14) OUTPUT SPEED SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



8199f7e1

Fig. 23: Measuring Voltage Of (T14) Output Speed Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T14) Output Speed Signal circuit.

Is the voltage above 0.5 volt?

Yes

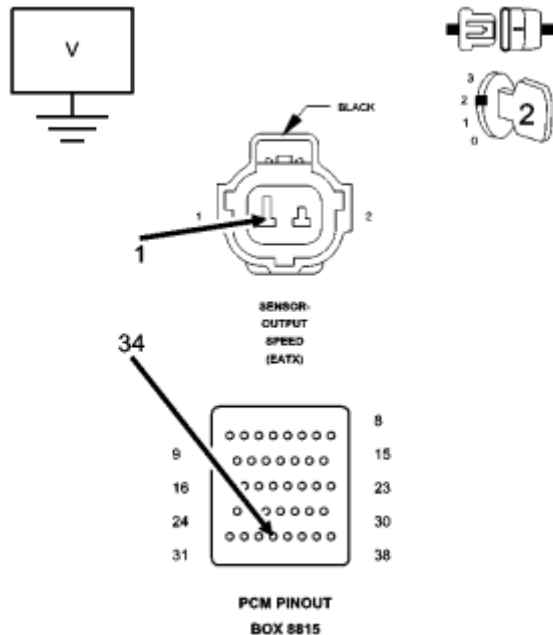
Repair the (T14) Output Speed Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T13) SENSOR GROUND CIRCUIT FOR A SHORT TO VOLTAGE



8199f843

Fig. 24: Measuring Voltage Of (T13) Speed Sensor Ground Circuit
Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T13) Speed Sensor Ground circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T13) Sensor Ground circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0726-ENGINE SPEED INPUT CIRCUIT RANGE/PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The PCM uses a dual port RAM internal to the controller to send the engine speed signal to the Transmission Control System. The calculated engine RPM is compared to a minimum and maximum value. If the PCM interprets this signal to be out of range when the engine is running the code is set. The MIL illuminates after 10 seconds of vehicle operation and the transmission system defaults to limp-in mode.

Monitor Conditions

When Monitored:

Whenever the engine is running.

Set Conditions

• **Set Condition:**

The Engine rpm is less than 390 or greater than 8000 for more than 2 seconds while the engine is running.

Possible Causes

Possible Causes
ENGINE DTCS PRESENT POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK IF THE DTC IS CURRENT

Start the engine.

NOTE: This DTC is not a Transmission Input Speed Sensor DTC.

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter set at 0 for this DTC ?

Yes

Go to 2.

No

Go to 3.

2. CHECK IF ENGINE DTCS ARE PRESENT

With the scan tool, read engine DTCs.

Are there any engine DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0731-GEAR RATIO ERROR IN 1ST

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into limp-in mode after four gear ratio error events occur in a given driving cycle.

Monitor Conditions

When Monitored:

The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- Set Condition:**

If the ratio of the Input rpm to the Output rpm does not match the current gear ratio when compared to the known gear ratio.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT
INTERMITTENT GEAR RATIO ERRORS

INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK FOR RELATED TRANSMISSION DTCS

With the scan tool, read Transmission DTCS.

If any of these DTCS are present, perform their respective tests first.

Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCS present?

Yes

Refer to appropriate diagnostic procedure, see **DIAGNOSTIC CODE INDEX** . If any of these DTCS are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

No

Go to 2.

2. CHECK TO SEE IF P0731 IS CURRENT

With the scan tool, perform the 1st gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

CAUTION: Do not overheat the transmission.

Did the Clutch Test pass, Input Speed remain at zero?

Yes

Go to 3.

No

Repair internal Transmission as necessary. Check all of the components related to the UD and LR clutches. Inspect the Oil Pump and repair or replace as necessary. Refer to **42RLE - SERVICE INFORMATION** for the proper repair procedures.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0732-GEAR RATIO ERROR IN 2ND

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified

through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into limp-in mode after four gear ratio error events occur in a given driving cycle.

Monitor Conditions

When Monitored:

The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- **Set Condition:**

If the ratio of the Input rpm to the Output rpm does not match the current gear ratio when compared to the known gear ratio.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERMITTENT GEAR RATIO ERRORS
INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT**

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?

Yes

Refer to appropriate diagnostic procedure, see **DIAGNOSTIC CODE INDEX**. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, perform the 2nd gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

CAUTION: Do not overheat the transmission.

Did the Clutch Test pass, Input Speed remain at zero?

Yes

Go to 3.

No

Go to 4.

3. **CHECK FOR INTERMITTENT OPERATION**

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors to the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

4. CHECK FOR RELATED PRESSURE SWITCH DTCS

With the scan tool, read Transmission DTCS.

Are the DTCS P0845 and/or P0846 present also?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair internal Transmission per the Service Information. Check all of the components related to the UD and 2/4 clutches. Inspect the Oil Pump and repair or replace as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0733-GEAR RATIO ERROR IN 3RD

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into limp-in mode after four gear ratio error events occur in a given driving cycle.

Monitor Conditions

When Monitored:

The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- **Set Condition:**

If the ratio of the Input rpm to the Output rpm does not match the current gear ratio when compared to the known gear ratio.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT
INTERMITTENT GEAR RATIO ERRORS
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT**

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?

Yes

Refer to appropriate diagnostic procedure, see **DIAGNOSTIC CODE INDEX**. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 2.

2. **CHECK IF THE DTC IS CURRENT**

With the scan tool, perform the 3rd gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

CAUTION: Do not overheat the transmission.

Did the Clutch Test pass, Input Speed remain at zero?

Yes

Go To 3.

No

Go To 4.

3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Test Complete.

4. **CHECK FOR RELATED PRESSURE SWITCH DTCS**

With the scan tool, read Transmission DTCS.

Are the DTCS P0870 and/or P0871 present also?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair internal Transmission per the Service Information. Check all of the components related to the UD and O/D clutches. Inspect the Oil Pump and repair or replace as necessary.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0734-GEAR RATIO ERROR IN 4TH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into limp-in mode after four gear ratio error events occur in a given driving cycle.

Monitor Conditions

When Monitored:

The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

- **Set Condition:**

If the ratio of the Input rpm to the Output rpm does not match the current gear ratio when compared to the known gear ratio.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT

INTERMITTENT GEAR RATIO ERRORS TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?

Yes

Refer to appropriate diagnostic procedure, see **DIAGNOSTIC CODE INDEX**. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, perform the 4th gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

CAUTION: Do not overheat the transmission.

Did the Clutch Test pass, Input Speed remain at zero?

Yes

Go to 3.

No

Go to 4.

3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets a Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors for the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

4. CHECK FOR RELATED PRESSURE SWITCH DTCS

With the scan tool, read Transmission DTCs.

Are the DTCs P0870 and/or P0871 present also?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair internal Transmission per the Service Information. Check all of the components related to the O/D and 2/4 clutches. Inspect the Oil Pump and repair or replace as necessary.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0736-GEAR RATIO ERROR IN REVERSE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The transmission system uses two speed sensors, one to measure input rpm and one to measure output rpm. These inputs are essential for proper transmission operation. Therefore, the integrity of this data is verified through data checks. When in gear, if the gear ratio does not compare to a known gear ratio, the corresponding gear ratio error trouble code is set. The transmission will go into limp-in mode after four gear ratio error events occur in a given driving cycle.

Monitor Conditions

When Monitored:

The Transmission gear ratio is monitored continuously while the transmission is in gear.

Set Conditions

• **Set Condition:**

If the ratio of the Input rpm to the Output rpm does not match the current gear ratio when compared to the known gear ratio.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT
INTERMITTENT GEAR RATIO ERRORS
INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. DETERMINING IF RELATED TRANSMISSION DTCS ARE PRESENT

With the scan tool, read Transmission DTCs.

If any of these DTCs are present, perform their respective tests first.

Are there any Loss of Prime, Line Pressure Sensor and/or Speed Sensor DTCs present?

Yes

Refer to appropriate diagnostic procedure, see **DIAGNOSTIC CODE INDEX**. If any of these DTCs are present, they will cause a gear ratio error. Perform the test for Loss of Prime first if it is present.

No

Go to 2.

2. CHECK TO SEE IF P0731 IS CURRENT

With the scan tool, perform the Reverse gear clutch test. Follow the instructions on the scan tool.

Increase the throttle angle or TPS Degree to 30° for no more than a few seconds.

CAUTION: Do not overheat the transmission.

Did the Clutch Test pass, Input Speed remain at zero?

Yes

Go to 3.

No

Repair internal Transmission per the Service Information. Check all of the components related to the Reverse and L/R clutches. Inspect the Oil Pump and repair or replace as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK FOR INTERMITTENT OPERATION

The conditions to set this DTC are not current at this time.

Check the gearshift linkage adjustment.

Gear ratio DTCs can be set by problems in the Input and Output Speed Sensor circuits. If the vehicle passes the Clutch Test and still sets Gear Ratio DTC, check the Speed Sensors for proper operation.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Check the wiring and connectors related to the Speed Sensors for a good connection, then perform a wiggle test using the Transmission Simulator.

This DTC can also be set under extreme temperature conditions, this is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0740-TCC OUT OF RANGE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

When in 2nd, 3rd, or 4th gear, the Torque Converter Clutch (TCC) can be locked or partially locked when certain conditions are met. The TCC piston is electronically modulated by increasing the duty cycle of the LR/TCC solenoid until the torque converter slip difference (difference between engine and turbine speed) is within 60 rpm. Then the LR/TCC solenoid is fully energized (FEMCC / 100% duty cycle). Torque converter slip is monitored in FEMCC to ensure adequate clutch capacity. The transmission will attempt normal EMCC operation (not in limp-in) even after the MIL is illuminated. MIL will illuminate after 5 minutes of accumulated slip in FEMCC.

Monitor Conditions

When Monitored:

The Torque Converter Clutch (TCC) is in FEMCC or PEMCC, Transmission temperature is hot, Engine temperature is greater than 38° C or 100° F, Transmission Input Speed greater than engine speed, TPS less than 30°, and brake not applied.

Set Conditions

- **Set Condition:**

The TCC is modulated by controlling the duty cycle of the L/R Solenoid until the difference between the Engine rpm and the Transmission Input Speed rpm or duty cycle is within a desired range. The DTC is set after the period of 10 seconds and 3 occurrences of either: FEMCC - with slip greater than 100 rpm or PEMCC - duty cycle greater than 85%.

Possible Causes

Possible Causes
RELATED L/R SOLENOID OR PRESSURE SWITCH DTCS PRESENT INTERNAL TRANSMISSION

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR RELATED DTCS**

With the scan tool, read DTCS.

Are the DTCS P0750 and/or P0841 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. **CHECK IF THE DTC IS CURRENT**

Ignition on, engine not running.

With the scan tool, record and erase DTCS.

Drive the vehicle until it is fully warmed up to at least 43° C (110° F).

Perform the following step 3 times.

Drive the vehicle at 80 km/h (50 mph) and allow 4th gear to engage for at least 10 seconds. Close the throttle, then tip back in until the throttle angle is between 25 and 29 degrees. Note that if you go over 30 degrees, you must back off of the throttle and retry.

Did the TCC engage during any of the attempts?

Yes

Go to 3.

No

Perform the Hydraulic Pressure test per **42RLE - SERVICE INFORMATION** and repair the internal transmission components and Torque convertor as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

This DTC can also be set under extreme temperature conditions. This is usually caused by an internal problem. Verify if the problem is only experienced under extreme hot or cold conditions.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

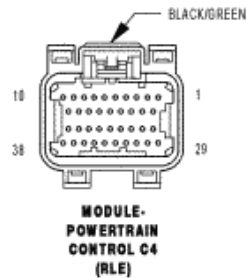
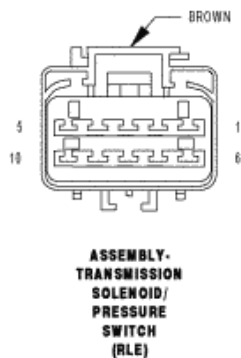
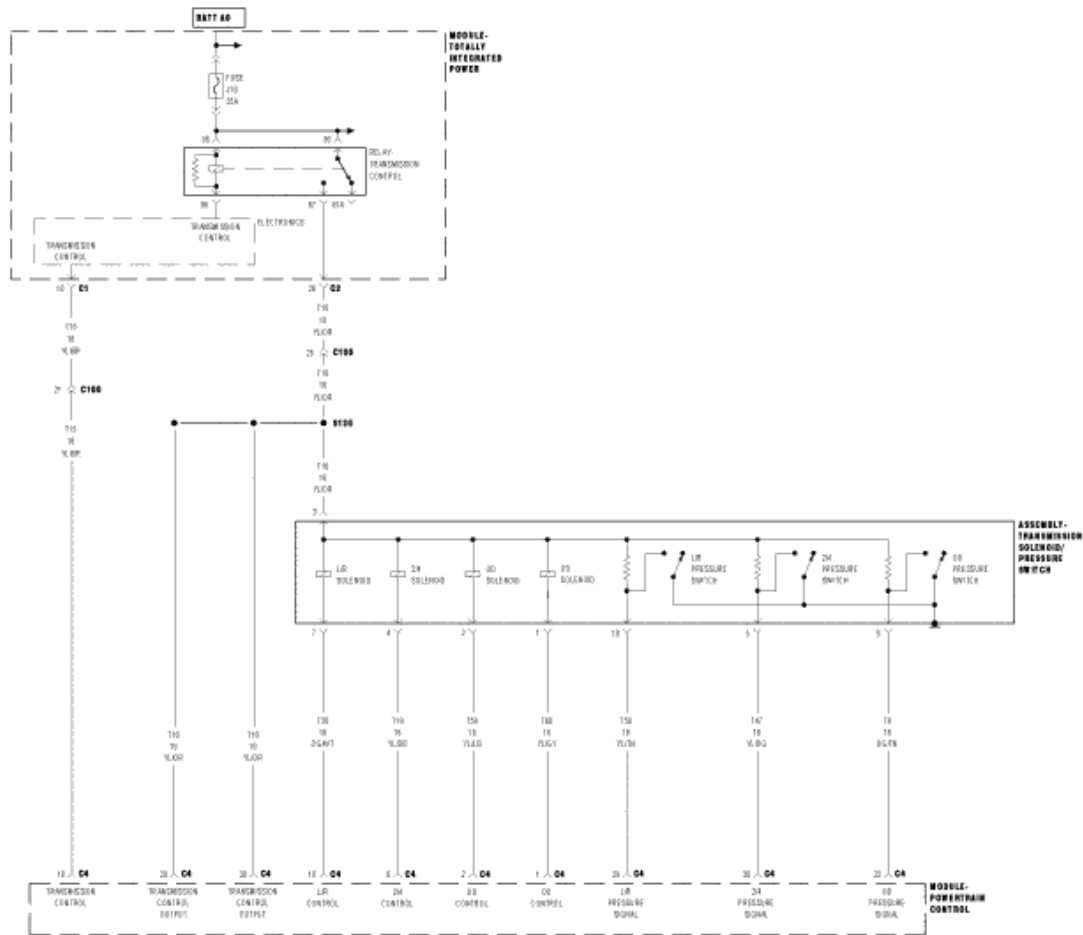
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0750-LR SOLENOID CIRCUIT

Circuit Schematic



019a117a

Fig. 25: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into Neutral, if the DTC is set above 35 Km/h (22 mph), limp-in mode when vehicle speed is below 35 Km/h (22 mph).

Monitor Conditions

When Monitored:

Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.

Set Conditions

- Set Condition:**

Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT (T20) L/R CONTROL CIRCUIT OPEN (T20) L/R CONTROL CIRCUIT SHORT TO GROUND (T20) L/R CONTROL CIRCUIT SHORT TO VOLTAGE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT**

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 0 for this DTC?

Yes

Go to 3.

No

Go to 8.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the L/R Solenoid.

Monitor the L/R Solenoid LED on the Transmission Simulator.

Did the L/R Solenoid LED on the Transmission Simulator blink on and off during actuation?

Yes

Go to 4.

No

Go to 5.

4. CHECK WIRING USING THE TRANSMISSION SIMULATOR

With the scan tool, continue to actuate the L/R Solenoid.

While monitoring the L/R Solenoid LED on the Transmission Simulator, wiggle the related wiring harness and connectors.

Did the L/R Solenoid LED on the Transmission Simulator continue to blink on and off during the wiggle test?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

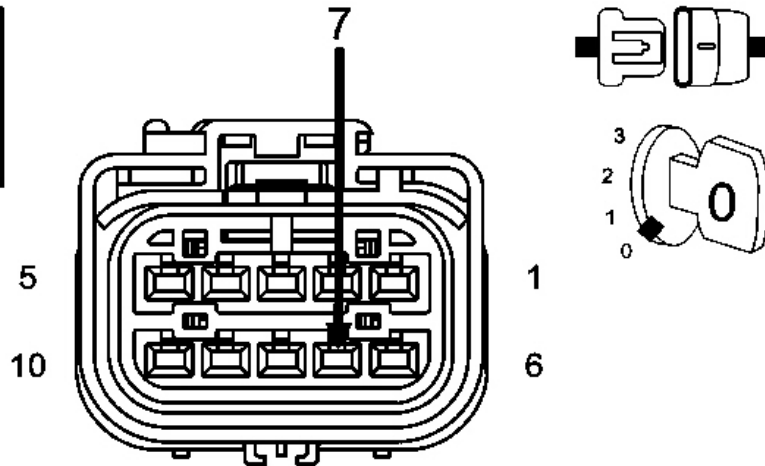
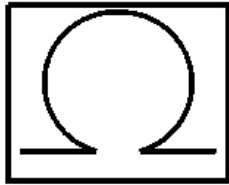
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

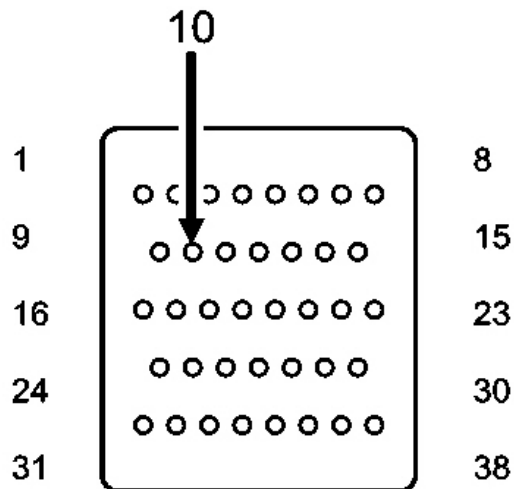
Repair wiring or connectors as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK THE (T20) L/R CONTROL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a591d

Fig. 26: Checking LR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T20) L/R Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

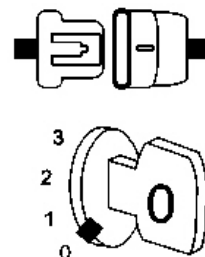
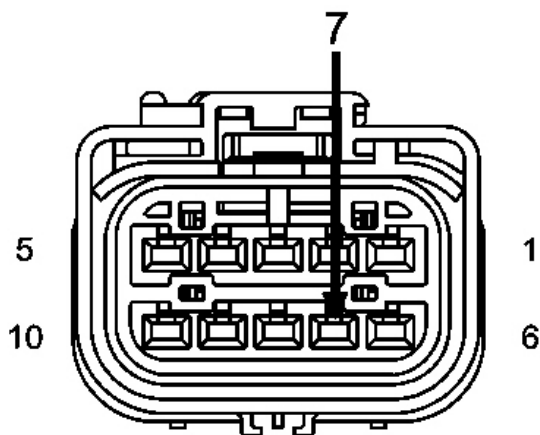
Repair the (T20) L/R Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

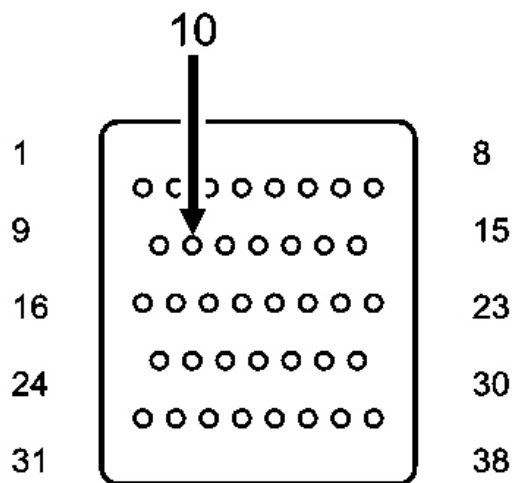
No

Go to 6.

6. CHECK THE (T20) L/R CONTROL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5a95

Fig. 27: Checking LR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T20) L/R Control circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T20) L/R Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T20) L/R CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

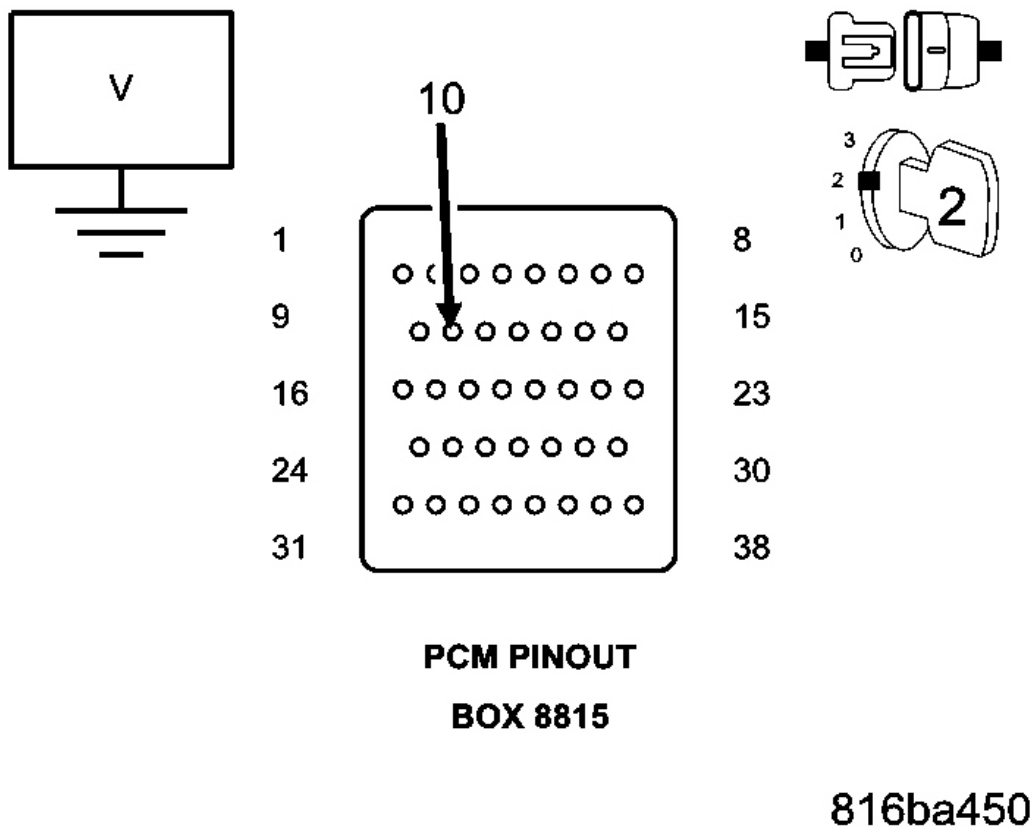


Fig. 28: Measuring Voltage Of L/R Control Circuit

Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T20) L/R Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T20) L/R Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

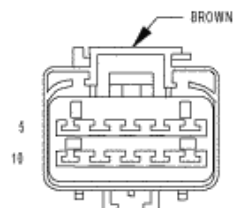
Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

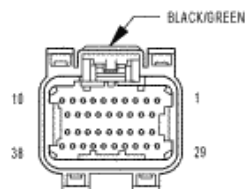
No

Test Complete.

Circuit Schematic



**ASSEMBLY-
TRANSMISSION
SOLENOID/
PRESSURE
SWITCH
(RLE)**



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoids circuits are periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into Neutral, if the DTC is set above 35 Km/h (22 mph), limp-in mode when vehicle speed is below 35 Km/h (22 mph).

Monitor Conditions

When Monitored:

Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.

Set Conditions

- Set Condition:**

Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT
(T19) 2/4 CONTROL CIRCUIT OPEN
(T19) 2/4 CONTROL CIRCUIT SHORT TO GROUND
(T19) 2/4 CONTROL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK FOR RELATED DTCS

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 0 for this DTC?

Yes

Go to 3.

No

Go to 8.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the 2/4 Solenoid.

Monitor the 2/4 Solenoid LED on the Transmission Simulator.

Did the 2/4 Solenoid LED on the Transmission Simulator blink on and off during actuation?

Yes

Go to 4.

No

Go to 5.

4. CHECK WIRING USING THE TRANSMISSION SIMULATOR

With the scan tool, continue to actuate the 2/4 Solenoid.

While monitoring the 2/4 Solenoid LED on the Transmission Simulator, wiggle the related wiring harness and connectors.

Did the 2/4 Solenoid LED on the Transmission Simulator continue to blink on and off during the wiggle test?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

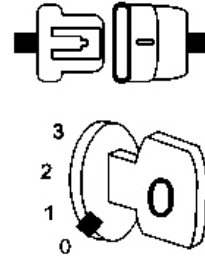
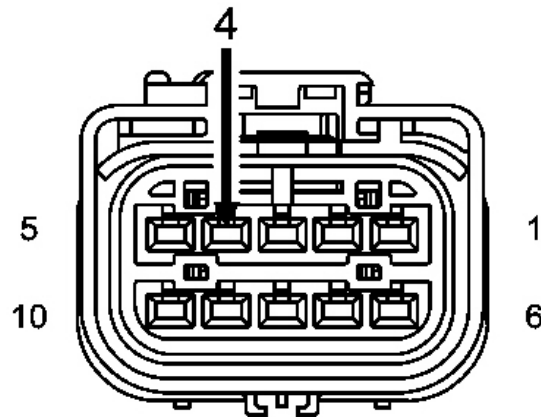
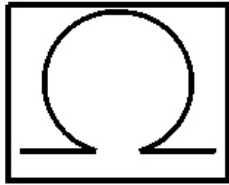
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

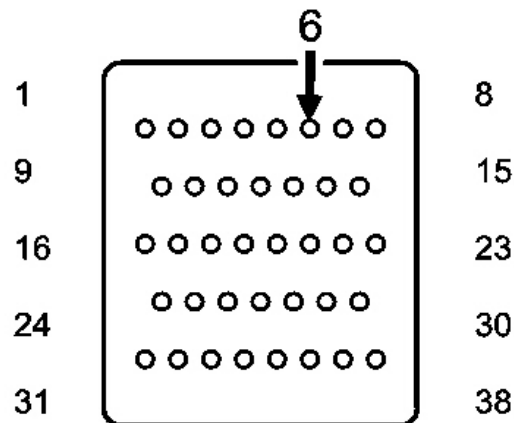
Repair wiring or connectors as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK THE (T19) 2/4 CONTROL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5aa5

Fig. 30: Checking 2/4 Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T19) 2/4 Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

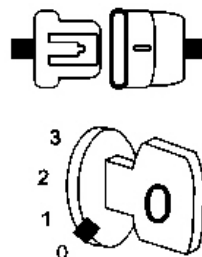
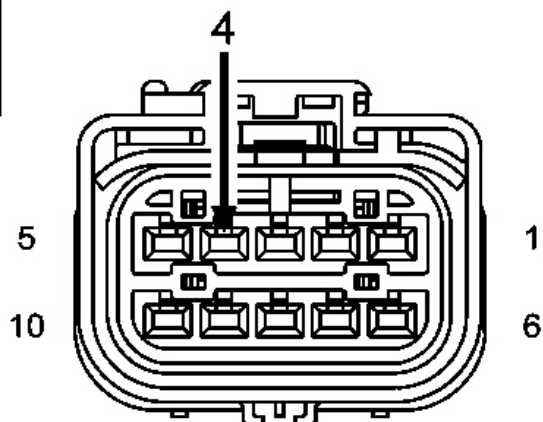
Repair the (T19) 2/4 Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

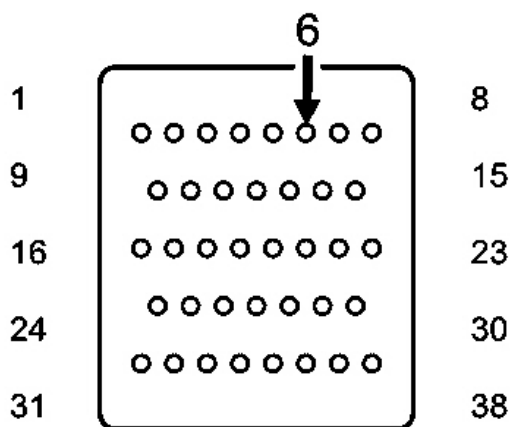
No

Go to 6.

6. CHECK THE (T19) 2/4 CONTROL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5aa9

Fig. 31: Checking 2/4 Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T19) 2/4 Control circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T19) 2/4 Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T19) 2/4 CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

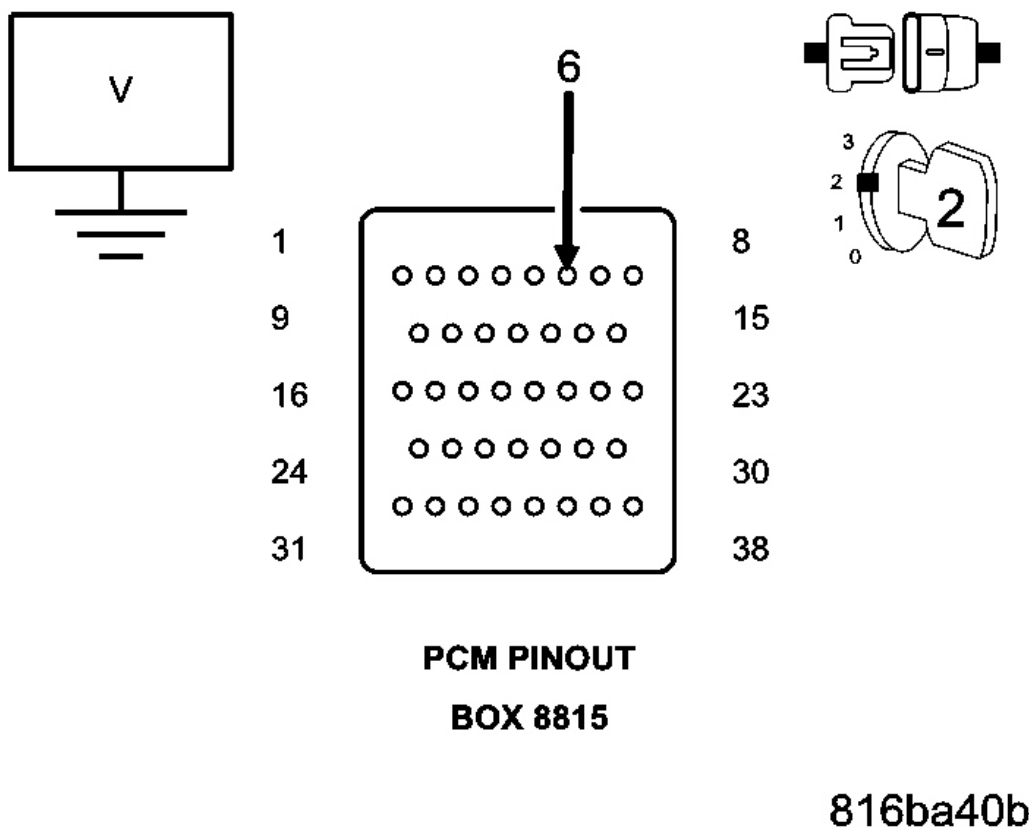


Fig. 32: Measuring Voltage Of 2/4 Control Circuit

Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T19) 2/4 Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T19) 2/4 Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Were there any problems found?

Yes

Repair as necessary.

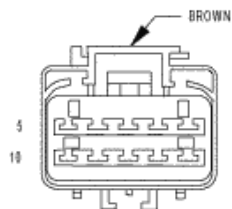
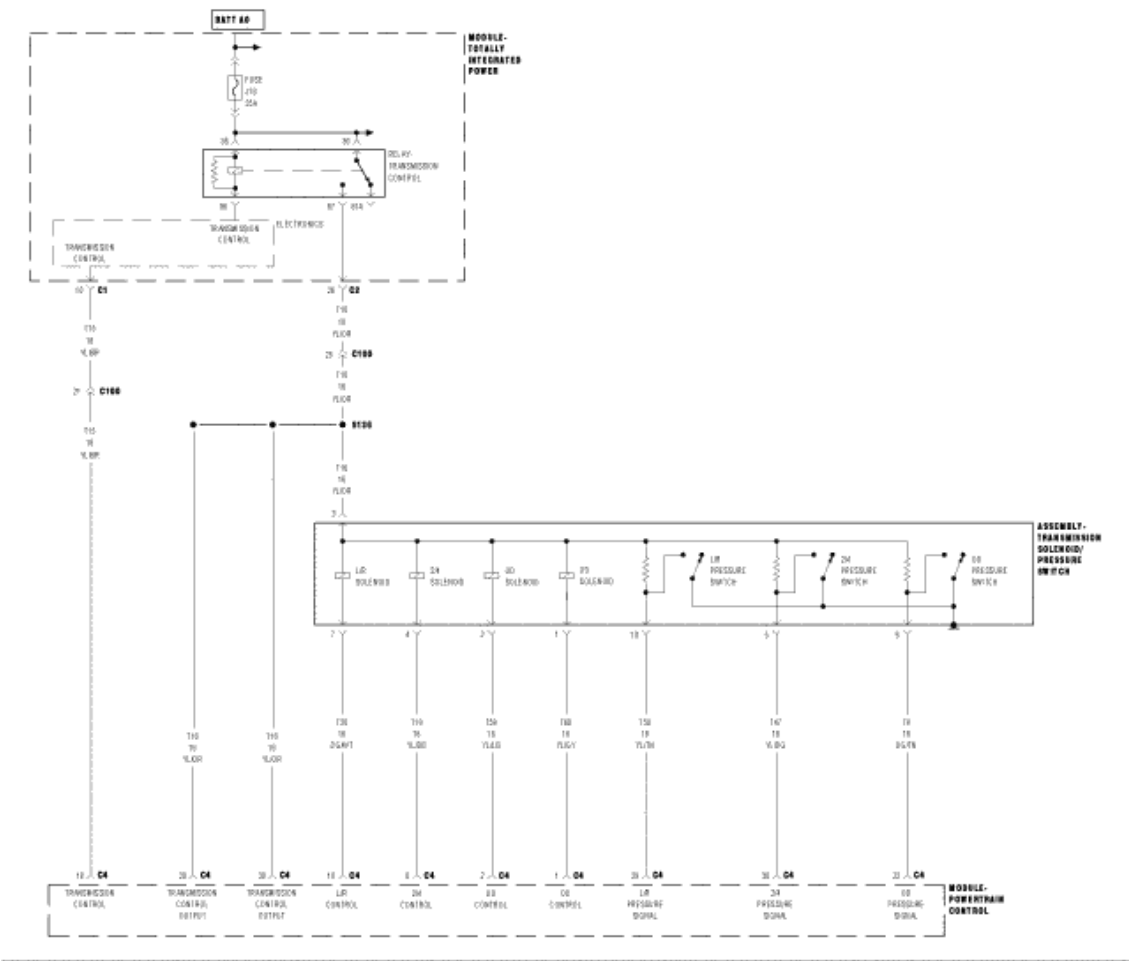
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

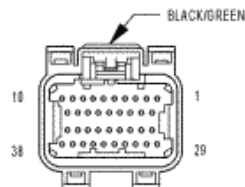
Test Complete.

P0760-OD SOLENOID CIRCUIT

Circuit Schematic



ASSEMBLY-
TRANSMISSION
SOLENOID/
PRESSURE
SWITCH
(RLE)



MODULE-
POWERTRAIN
CONTROL C4
(RLE)

W19a117a

Fig. 33: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoid circuits is periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into Neutral, if the DTC is set above 35 Km/h (22 mph), limp-in mode when vehicle speed is below 35 Km/h (22 mph).

Monitor Conditions

When Monitored:

Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.

Set Conditions

- Set Condition:**

Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT
(T60) OD CONTROL CIRCUIT OPEN
(T60) OD CONTROL CIRCUIT SHORT TO GROUND
(T60) OD CONTROL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK FOR RELATED DTCS

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 0 for this DTC?

Yes

Go to 3.

No

Go to 8.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the OD Solenoid.

Monitor the OD Solenoid LED on the Transmission Simulator.

Did the OD Solenoid LED on the Transmission Simulator blink on and off during actuation?

Yes

Go to 4.

No

Go to 5.

4. CHECK WIRING USING THE TRANSMISSION SIMULATOR

With the scan tool, continue to actuate the OD Solenoid.

While monitoring the OD Solenoid LED on the Transmission Simulator, wiggle the related wiring harness and connectors.

Did the OD Solenoid LED on the Transmission Simulator continue to blink on and off during the wiggle test?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

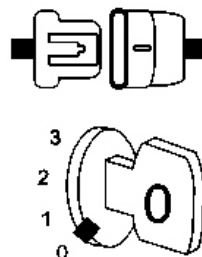
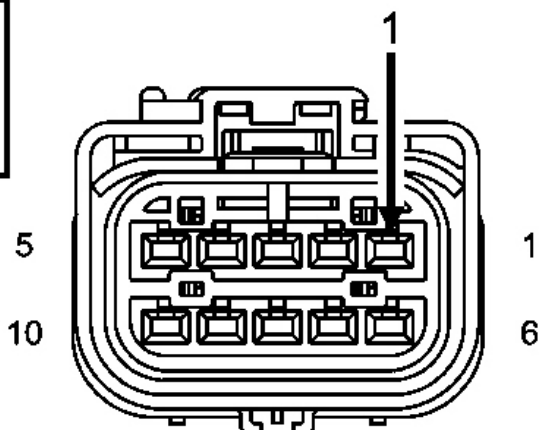
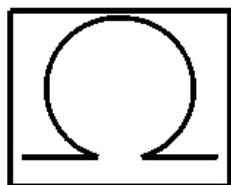
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

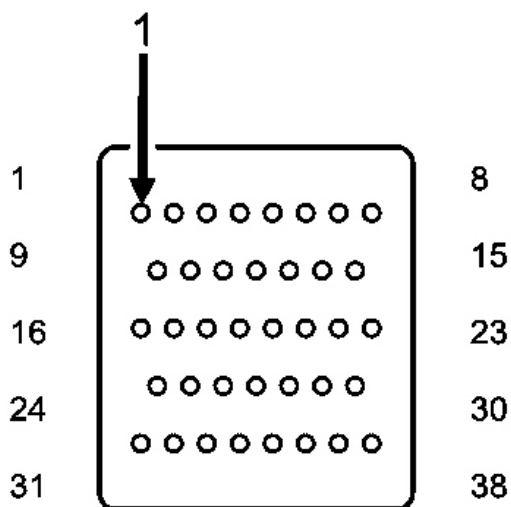
Repair wiring or connectors as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK THE (T60) OD CONTROL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5ab7

Fig. 34: Checking OD Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T60) OD Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

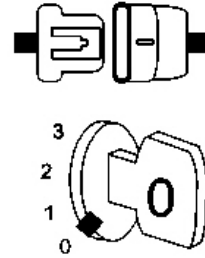
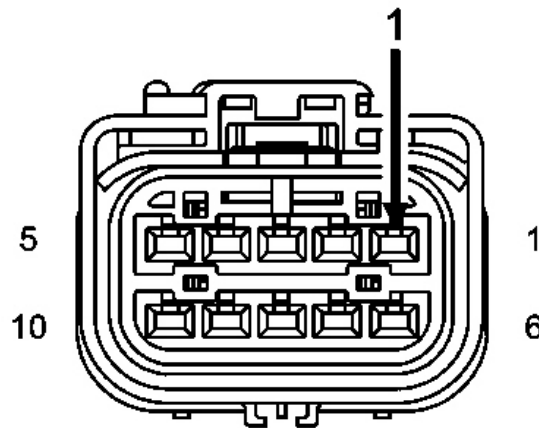
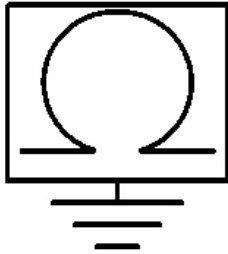
Repair the (T60) OD Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

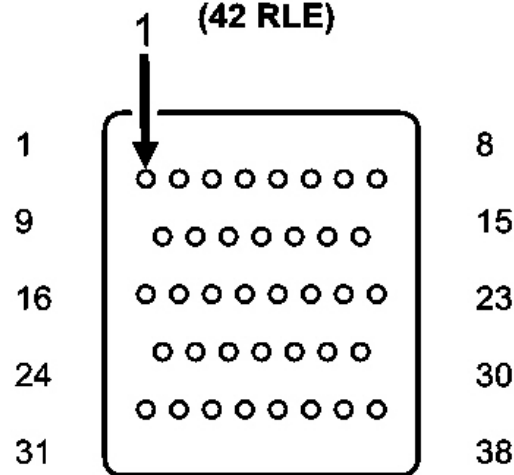
No

Go to 6.

6. CHECK THE (T60) OD CONTROL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5abb

Fig. 35: Checking OD Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T60) OD Control circuit.

Is the resistance below 5.0 ohms?

Yes

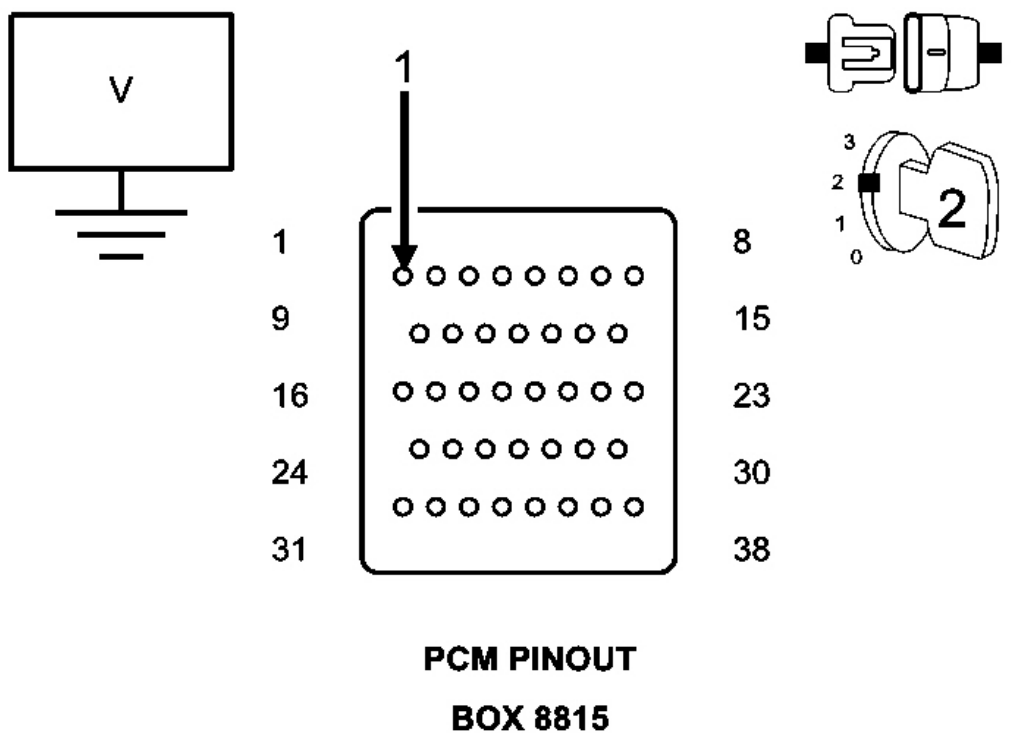
Repair the (T60) OD Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T60) OD CONTROL CIRCUIT FOR A SHORT TO VOLTAGE



816b924d

Fig. 36: Measuring Voltage Of (T60) OD Control Circuit

Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T60) OD Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T60) OD Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

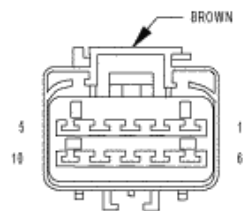
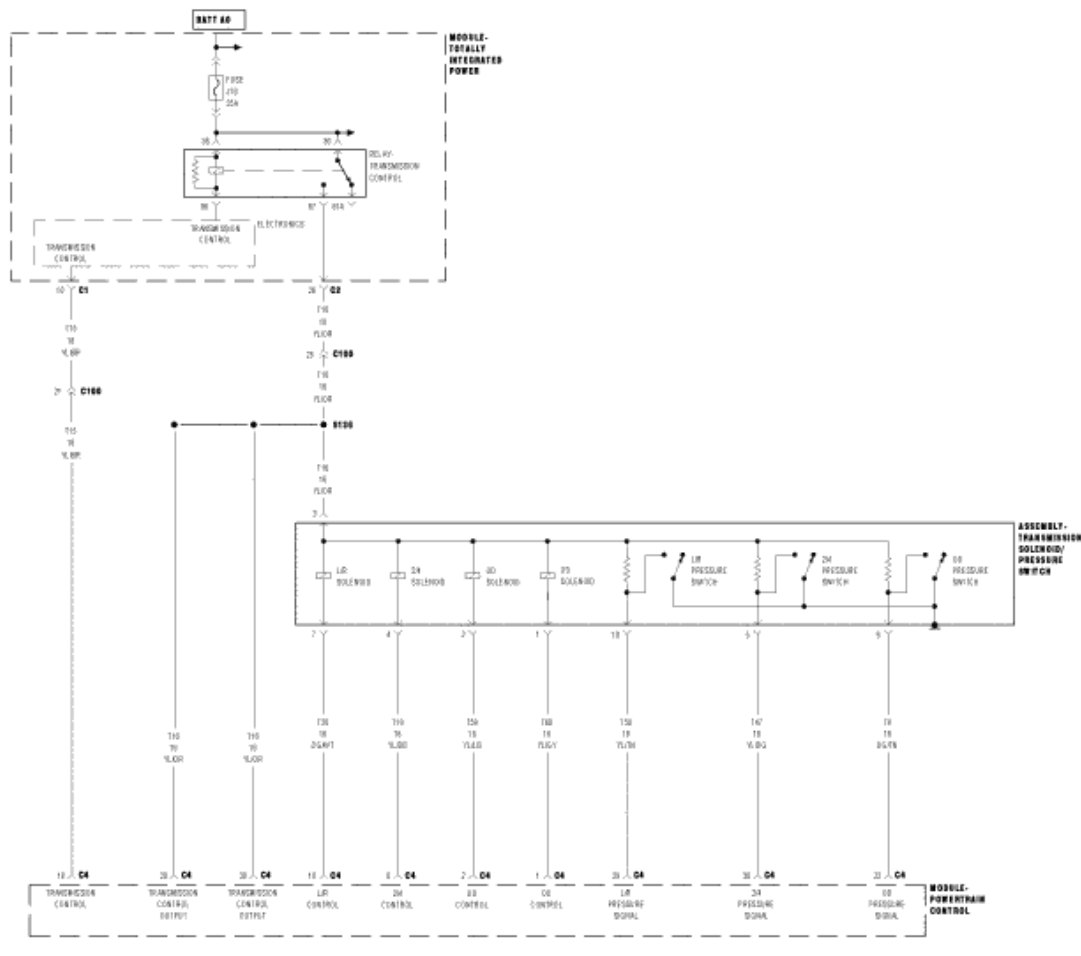
Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

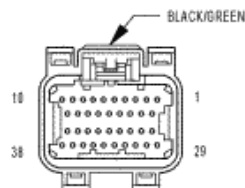
No

Test Complete.

Circuit Schematic



**ASSEMBLY-
TRANSMISSION
SOLENOID/
PRESSURE
SWITCH
(RLE)**



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**

Fig. 37: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

019e117e

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Four solenoids are used to control the friction elements (clutches). The continuity of the solenoid circuits is periodically tested. Each solenoid is turned on or off depending on its current state. An inductive spike should be detected by the PCM during this test. If no spike is detected, the circuit is tested again to verify the failure. In addition to the periodic testing, the solenoid circuits are tested if a gear ratio or pressure switch error occurs. In this case, one failure will result in the appropriate DTC being set. The MIL will illuminate and the transmission goes into Neutral, if the DTC is set above 35 Km/h (22 mph), limp-in mode when vehicle speed is below 35 Km/h (22 mph).

Monitor Conditions

When Monitored:

Initially at ignition on, then every 10 seconds thereafter. The solenoids will also be tested immediately after a gear ratio error or pressure switch error is detected.

Set Conditions

- **Set Condition:**

Three consecutive solenoid continuity test failures, or one failure if test is run in response to a gear ratio or pressure switch error.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT (T59) UD CONTROL CIRCUIT OPEN (T59) UD CONTROL CIRCUIT SHORT TO GROUND (T59) UD CONTROL CIRCUIT SHORT TO VOLTAGE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **DETERMINING IF RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT**

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 0 for this DTC?

Yes

Go to 3.

No

Go to 8.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, actuate the UD Solenoid.

Monitor the UD Solenoid LED on the Transmission Simulator.

Did the UD Solenoid LED on the Transmission Simulator blink on and off during actuation?

Yes

Go to 4.

No

Go to 5.

4. **CHECK WIRING USING THE TRANSMISSION SIMULATOR**

With the scan tool, continue to actuate the UD Solenoid.

While monitoring the UD Solenoid LED on the Transmission Simulator, wiggle the related wiring harness and connectors.

Did the UD Solenoid LED on the Transmission Simulator continue to blink on and off during the wiggle test?

Yes

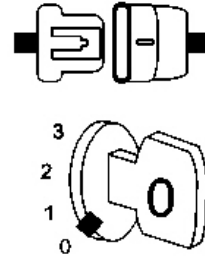
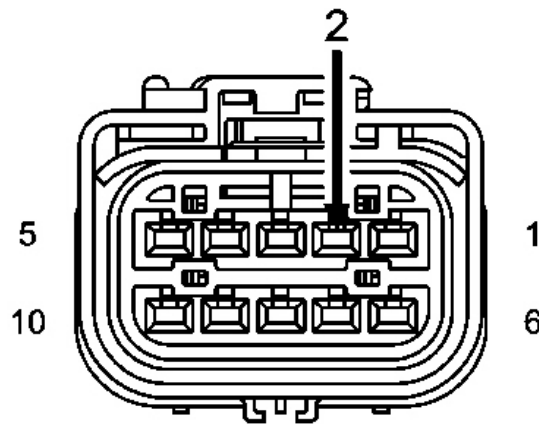
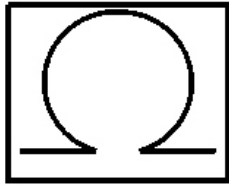
Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

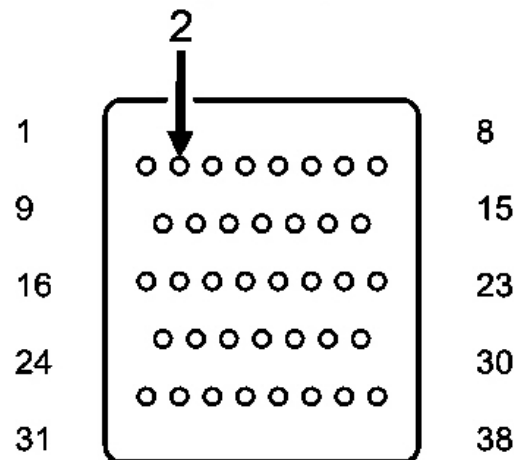
Repair wiring or connectors as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. **CHECK THE (T59) UD CONTROL CIRCUIT FOR AN OPEN**



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5ac7

Fig. 38: Checking UD Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T59) UD Control circuit between the Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

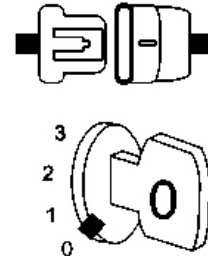
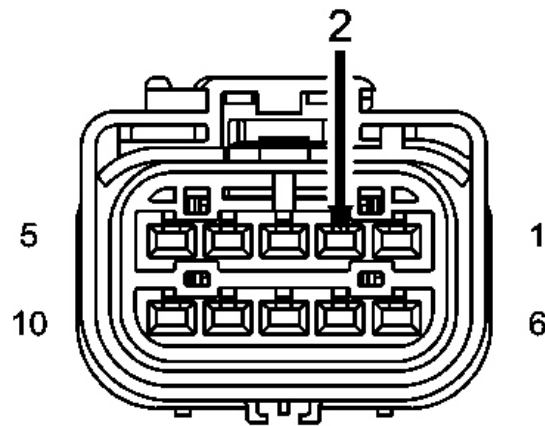
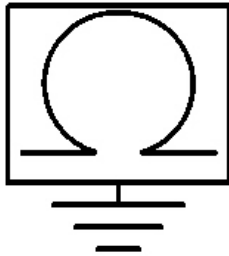
Repair the (T59) UD Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

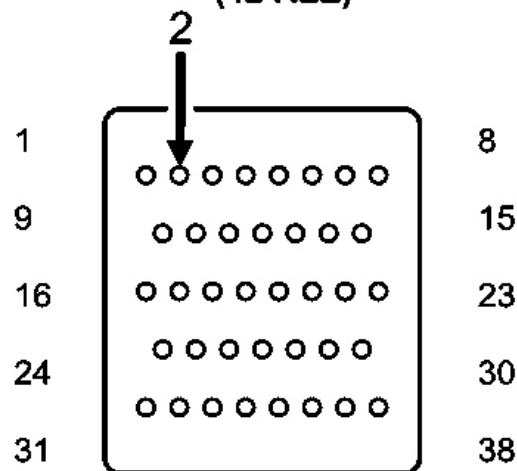
No

Go to 6.

6. CHECK THE (T59) UD CONTROL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a5ad1

Fig. 39: Checking UD Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T59) UD Control circuit.

Is the resistance below 5.0 ohms?

Yes

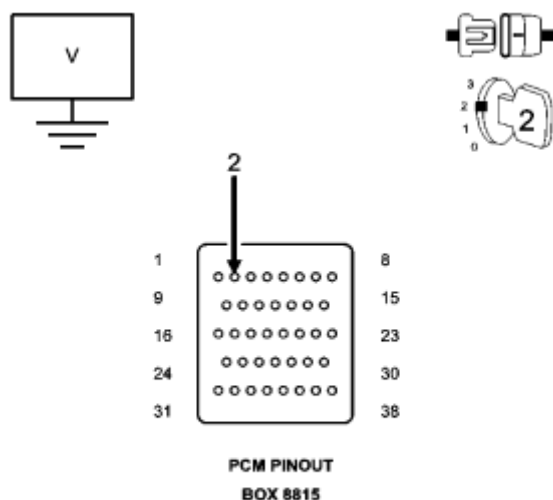
Repair the (T59) UD Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (T59) UD CONTROL CIRCUIT FOR A SHORT TO VOLTAGE



819b45f6

Fig. 40: Measuring Voltage Of (T59) UD Control Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T59) UD Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T59) UD Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0841-LR PRESSURE SWITCH RATIONALITY

Circuit Schematic

The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. If a set condition is identified, 1st gear and torque converter lock-up (EMCC) will be inhibited. The vehicle will launch in 2nd gear and shift normally through the gears without allowing EMCC. If during the same key start, the set condition is no longer valid, the transmission will return to normal operation (1st and EMCC available). Limp-in will not occur unless DTC P0841 is accompanied by a code P0706 and the MIL will illuminate after 5 minutes of substituted operation.

Monitor Conditions

When Monitored:

Whenever the engine is running.

Set Conditions

- Set Condition:

The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT
LOSS OF PRIME DTC PRESENT
(T50) L/R PRESSURE SIGNAL CIRCUIT OPEN
(T50) L/R PRESSURE SIGNAL CIRCUIT SHORT TO GROUND
(T50) L/R PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OPEN	OPEN	OPEN
P/N	CLOSED	OPEN	OPEN
1st	CLOSED	OPEN	OPEN
2nd	OPEN	CLOSED	OPEN
D	OPEN	OPEN	CLOSED
OD	OPEN	CLOSED	CLOSED

Diagnostic Test

1. CHECK FOR RELATED DTCS

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to step 2.

2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, check for other Transmission DTCs.

Is the DTC P0944 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to step 3.

3. CHECK TO SEE IF P0841 IS CURRENT

With the scan tool, view DTCs.

Is the status active for this DTC or is the Starts Since Set counter 2 or less?

Yes

Go to step 4.

No

Go to step 8.

4. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the

vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to L/R.

With the scan tool, monitor the L/R Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Did the L/R Pressure Switch state change?

Yes

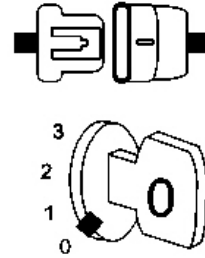
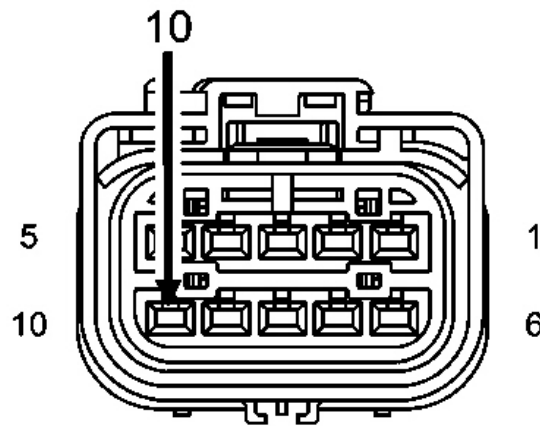
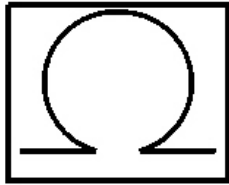
Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

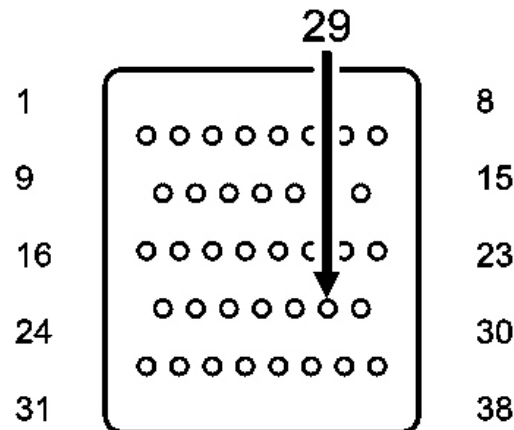
No

Go to step 5.

5. (T50) L/R PRESSURE SIGNAL CIRCUIT OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a606b

Fig. 42: Checking L/R Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T50) L/R Pressure Signal circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

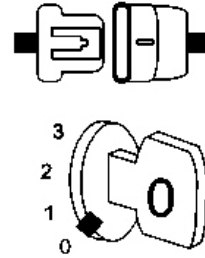
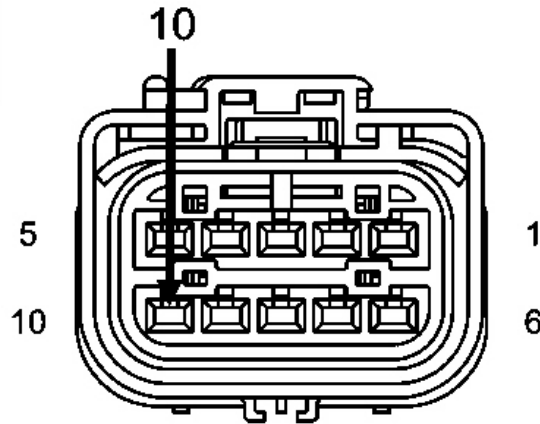
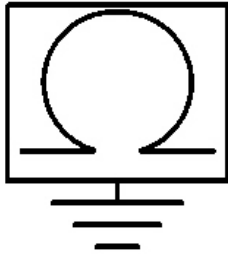
Repair the (T50) L/R Pressure Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

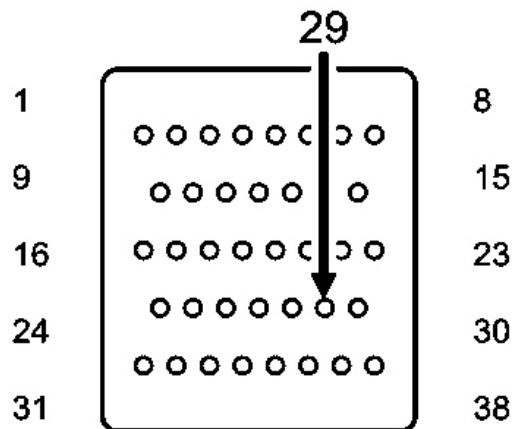
No

Go to step 6.

6. (T50) L/R PRESSURE SIGNAL CIRCUIT SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a6075

Fig. 43: Checking L/R Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T50) L/R Pressure Signal circuit.

Is the resistance below 5.0 ohms?

Yes

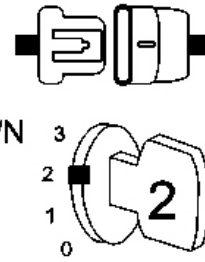
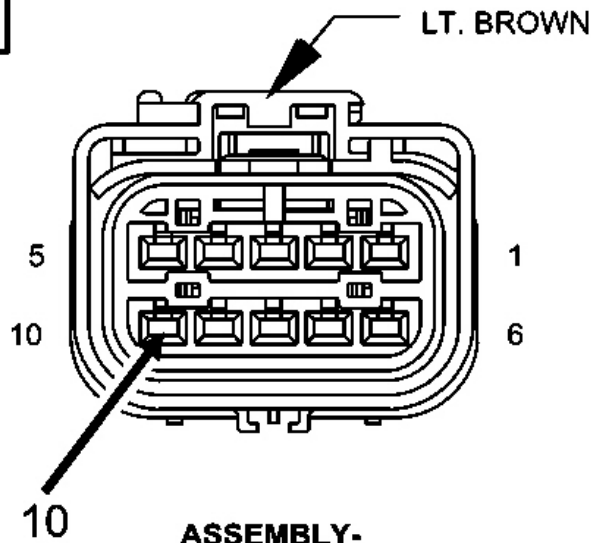
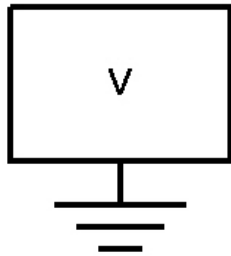
Repair the (T50) L/R Pressure Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

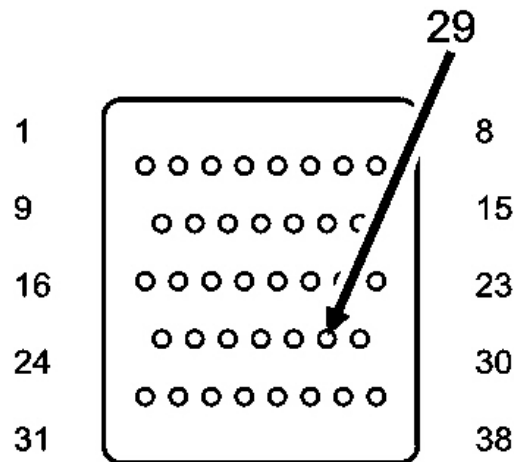
No

Go to step 7.

7. (T50) L/R PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ac523

Fig. 44: Measuring Voltage Of (T50) L/R Pressure Switch Sense Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Signal circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T50) L/R Pressure Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

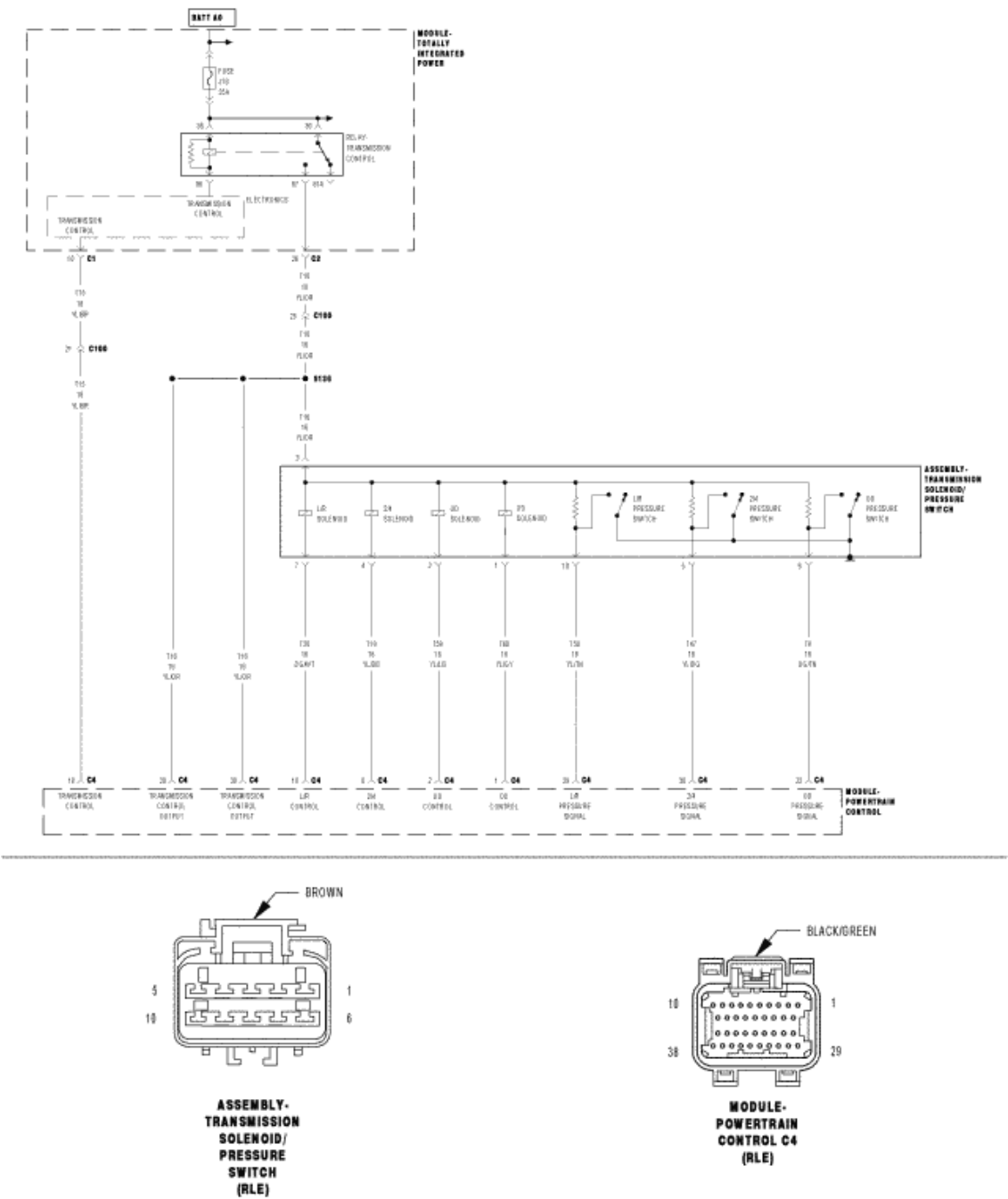
Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

Circuit Schematic



019a117a

Fig. 45: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 2/4 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 2/4 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to limp-in mode.

Monitor Conditions

When Monitored:

In any forward gear with engine speed above 1000 RPM, shortly after a shift and every minute thereafter.

Set Conditions

- **Set Condition:**

After a shift into a forward gear, with engine speed greater than 1000 rpm the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to verify that the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets

Possible Causes

Possible Causes
LOSS OF PRIME P0944 PRESENT (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN (T47) 2/4 PRESSURE SIGNAL CIRCUIT OPEN (T47) 2/4 PRESSURE SWITCH CIRCUIT SHORT TO GROUND (T47) 2/4 PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY INTERNAL TRANSMISSION POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECKING FOR LOSS OF PRIME DTC**

With the scan tool, read DTCs.

Is the DTC P0944 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. CHECK FOR RELATED TRANSMISSION DTCS

With the scan tool, read DTCs.

Are any of the DTCs P0732, P0734 and/or P0846 present also?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 4.

No

Go to 9.

4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to 2/4.

With the scan tool, monitor the UD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Wiggle the wires leading to the PCM while pressing and holding the Pressure Switch Test button.

Did the 2/4 Pressure Switch state change to closed and remain closed while wiggling the wires?

Yes

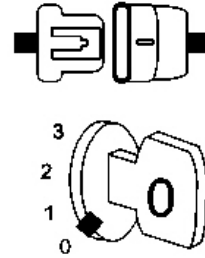
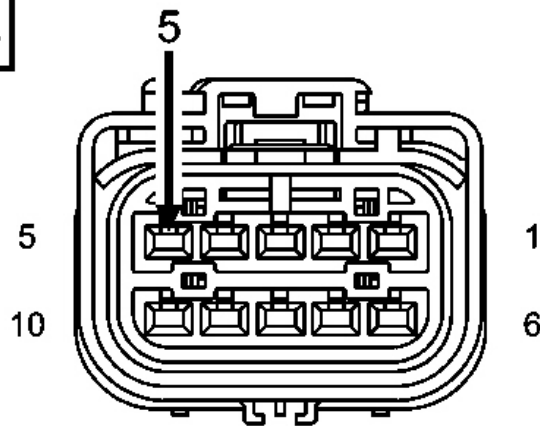
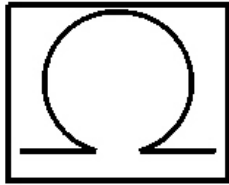
Disassemble and inspect the Valve Body per **42RLE - SERVICE INFORMATION** and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

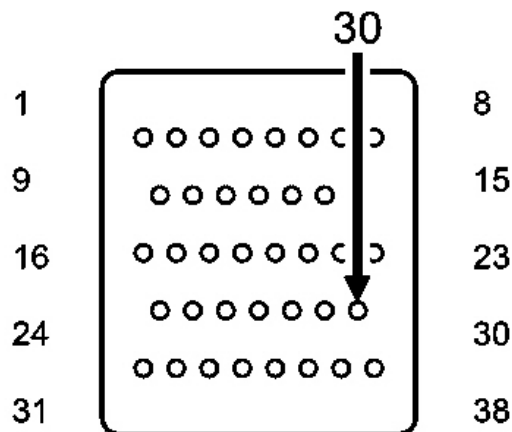
No

Go to 5.

5. (T47) 2/4 PRESSURE SIGNAL CIRCUIT OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a63b7

Fig. 46: Checking 2/4 Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T47) 2/4 Pressure Signal circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

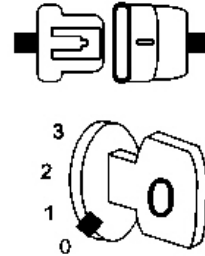
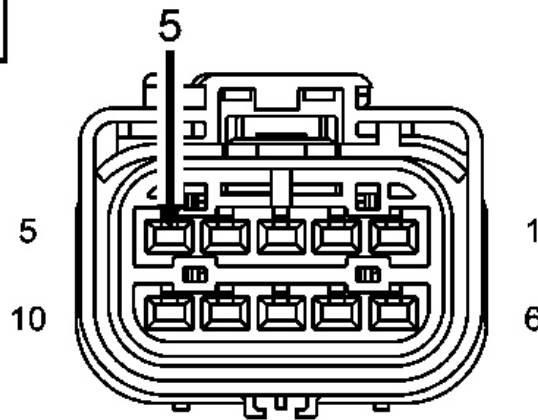
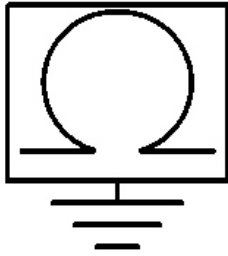
Repair the (T47) 2/4 Pressure Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

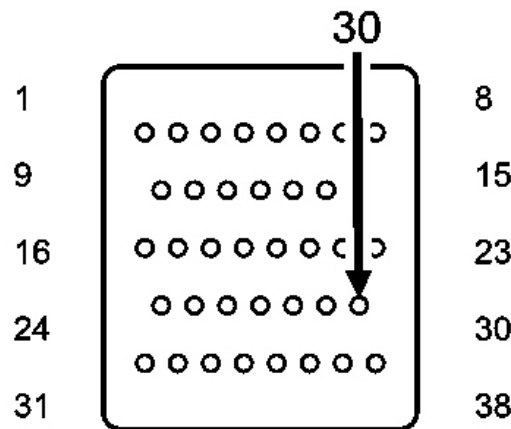
No

Go to 6.

6. (T47) 2/4 PRESSURE SIGNAL CIRCUIT SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a63c9

Fig. 47: Checking 2/4 Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T47) 2/4 Pressure Signal circuit.

Is the resistance below 5.0 ohms?

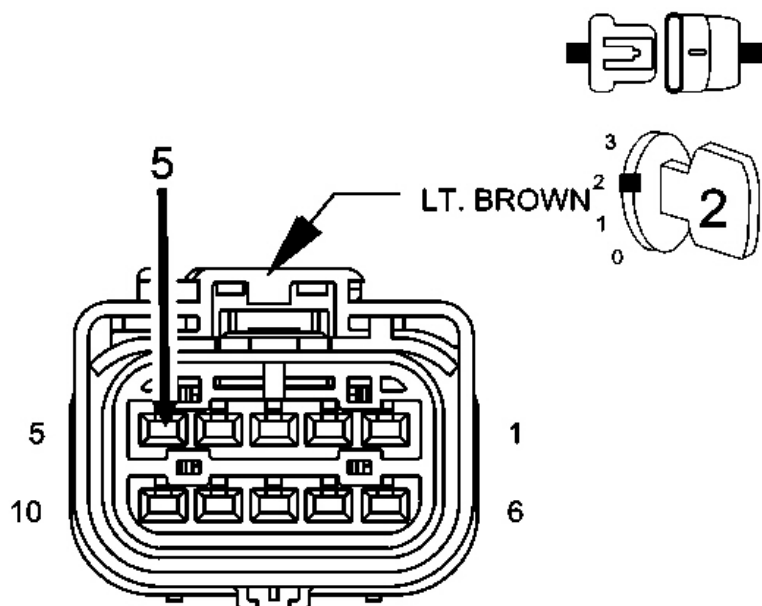
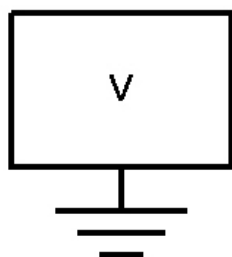
Yes

Repair the (T47) 2/4 Pressure Signal circuit for a short to ground.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

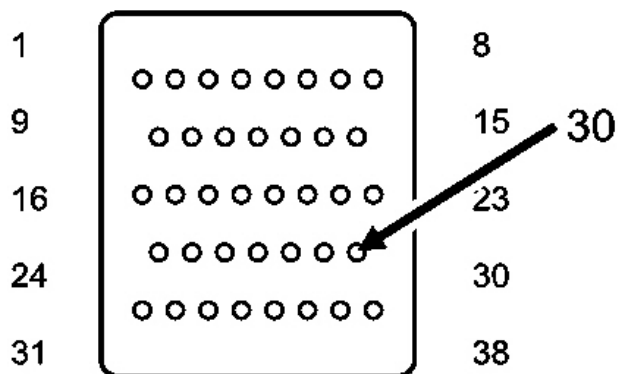
No

Go to 7.

7. (T47) 2/4 PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad436

Fig. 48: Measuring Voltage Of (T47) 2/4 Pressure Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T47) 2/4 Pressure Signal circuit.

Is the voltage above 0.5 volts?

Yes

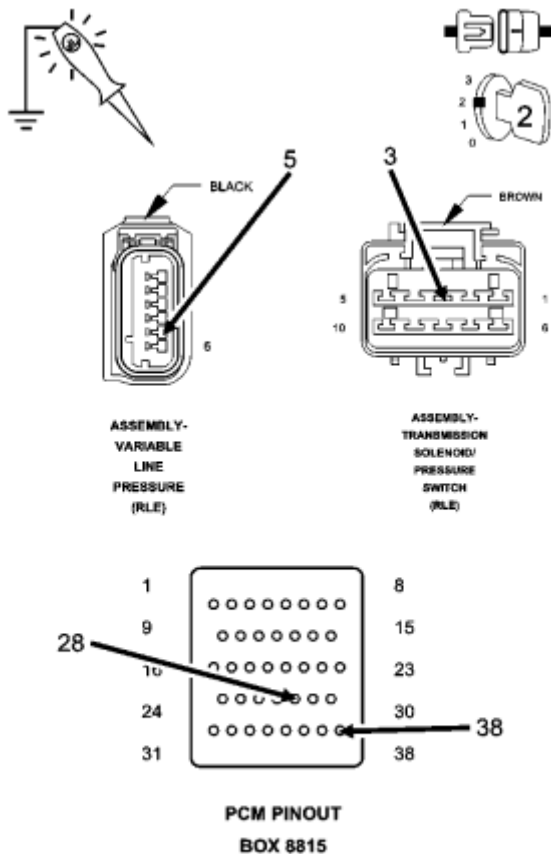
Repair the (T47) 2/4 Pressure Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 8.

8. TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN



819b5f73

Fig. 49: Checking (T16) Transmission Control Output Circuits
 Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check (T16) Transmission Control Relay Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Repair the Transmission Control Relay Output circuit for an open or high resistance. If the fuse is open make sure to check for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

9. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0846-2/4 PRESSURE SWITCH RATIONALITY

Circuit Schematic

The Transmission system uses three pressure switches to monitor the fluid pressure in the LR, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. The 2/4 pressure switch monitors the fluid pressure to the 2/4 clutch to confirm proper operation of the 2/4 solenoid. If the 2/4 pressure switch is identified as closed in P or N, the code will immediately be set and normal operation will be allowed for that given key start. If the problem is identified for 3 successive ignition cycles, the transmission will go into limp-in mode.

Monitor Conditions

When Monitored:

Whenever the engine is running.

Set Conditions

- Set Condition:**

The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

Possible Causes

Possible Causes
RELATED TIPM TCM POWER CONTROL CIRCUIT DTCS PRESENT
LOSS OF PRIME DTC PRESENT
(T47) 2/4 PRESSURE SIGNAL CIRCUIT OPEN
(T47) 2/4 PRESSURE SIGNAL CIRCUIT SHORT TO GROUND
(T47) 2/4 PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OPEN	OPEN	OPEN
P/N	CLOSED	OPEN	OPEN
1st	CLOSED	OPEN	OPEN
2nd	OPEN	CLOSED	OPEN
D	OPEN	OPEN	CLOSED
OD	OPEN	CLOSED	CLOSED

Diagnostic Test

1. CHECK FOR RELATED DTCS

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to step 2.

2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, read DTCs.

Is the DTC P0944 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to step 3.

3. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to step 4.

No

Go to step 8.

4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the

vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to 2/4.

With the scan tool, monitor the 2/4 Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Did the 2/4 Pressure Switch state change?

Yes

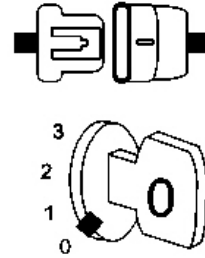
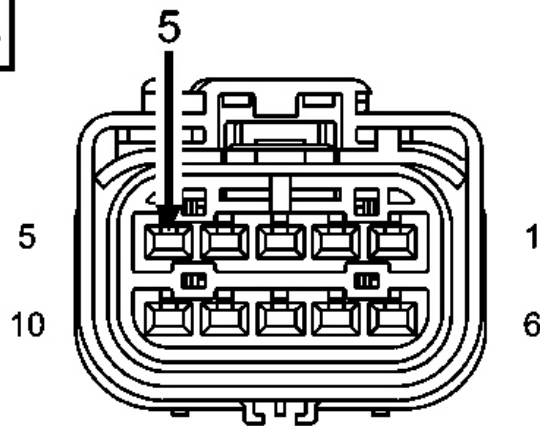
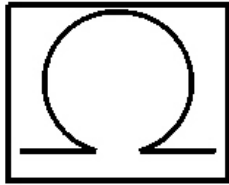
Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

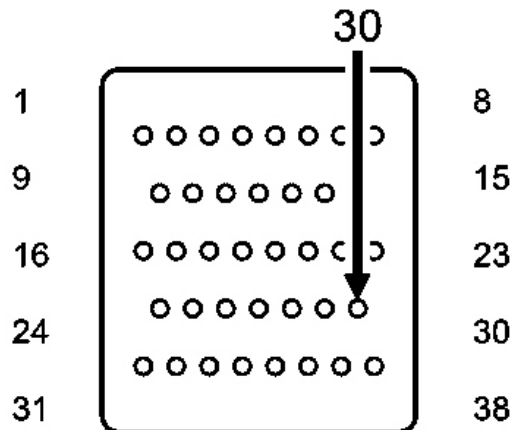
No

Go to step 5.

5. CHECK THE (T47) 2/4 PRESSURE SIGNAL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a63b7

Fig. 51: Checking 2/4 Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

NOTE: **Check connectors - Clean/repair as necessary.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T47) 2/4 Pressure Signal circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

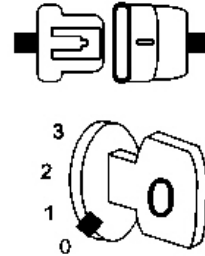
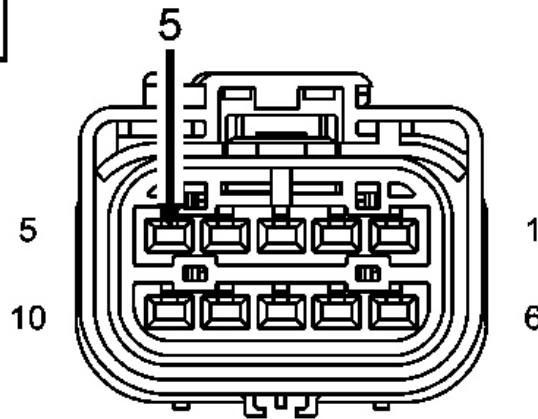
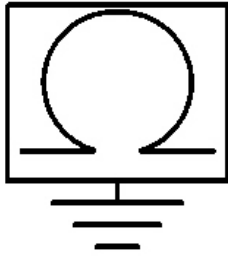
Repair the (T47) 2/4 Pressure Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

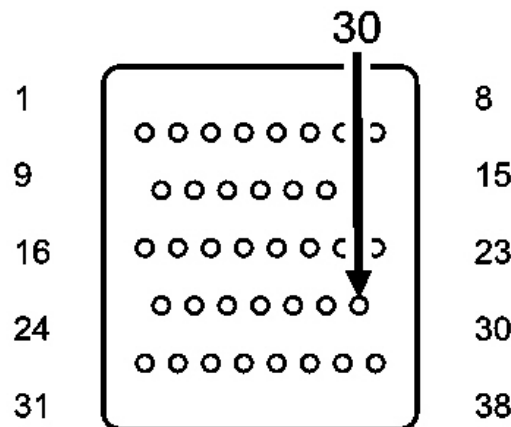
No

Go to step 6.

6. CHECK THE (T47) 2/4 PRESSURE SIGNAL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a63c9

Fig. 52: Checking 2/4 Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T47) 2/4 Pressure Signal circuit.

Is the resistance below 5.0 ohms?

Yes

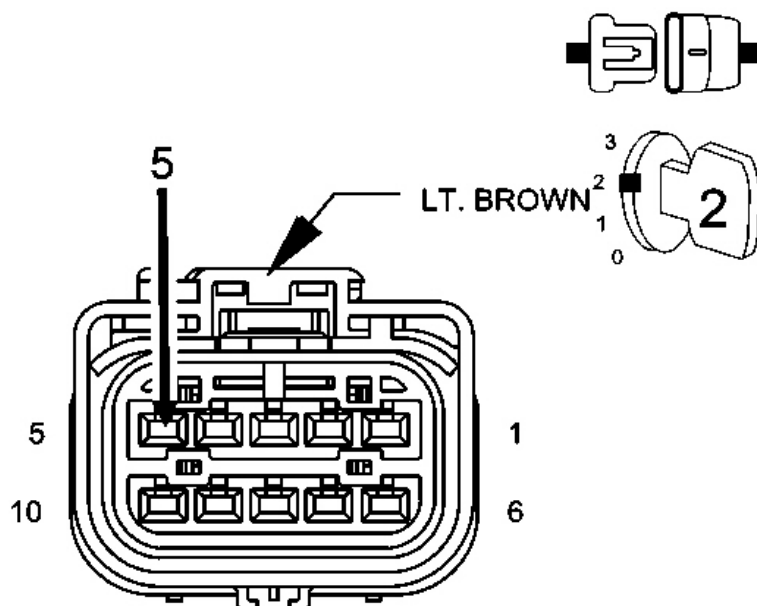
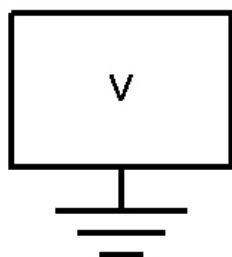
Repair the (T47) 2/4 Pressure Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

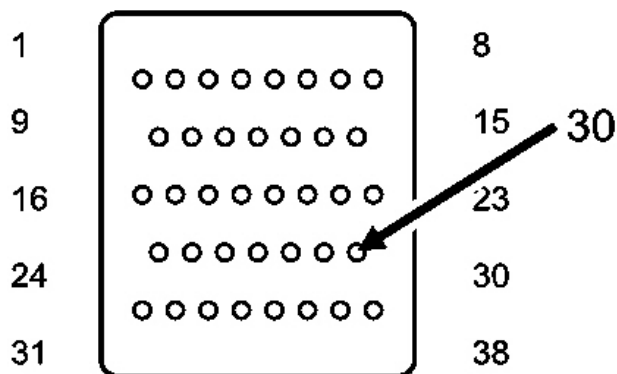
No

Go to step 7.

7. CHECK THE (T47) 2/4 PRESSURE SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad436

Fig. 53: Measuring Voltage Of (T47) 2/4 Pressure Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T47) 2/4 Pressure Signal circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T47) 2/4 Pressure Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

Circuit Schematic

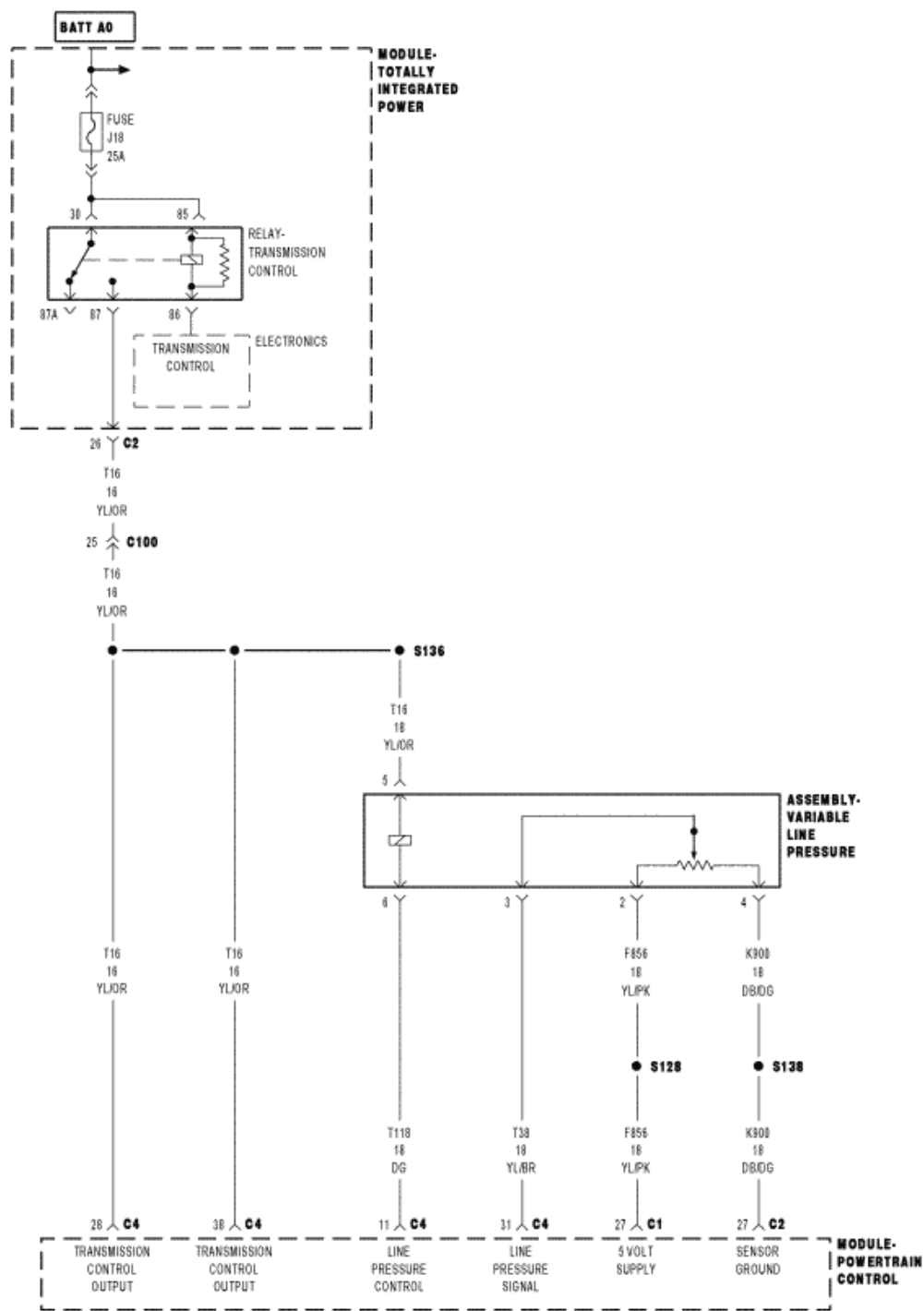


Fig. 54: Line Pressure Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Line pressure is measured by the Line Pressure Sensor (LPS) and regulation is achieved by changing the duty cycle of the Pressure Control Solenoid (PCS) controlled by the Transmission Control System. (5% duty cycle = solenoid off = Max line pressure, 62% duty cycle = solenoid on = Min line pressure). The Transmission Control System calculates the desired line pressure based on inputs from both the engine and transmission.

The Transmission Control System calculates torque input to the transmission and uses it as the primary input to the desired line pressure calculation. This is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 or 931 kPa (120 or 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality. The desired line pressure is continuously being compared to the actual line pressure. If the actual line pressure is consistently lower than the target while driving, the line pressure low DTC P0868 will set.

Monitor Conditions

When Monitored:

Continuously while driving in a forward gear.

Set Conditions

- Set Condition:**

The PCM continuously monitors Actual Line Pressure and compares it to Desired Line Pressure. If the Actual Line Pressure is more than 10 psi below Desired Line Pressure, this DTC will set.

Possible Causes

Possible Causes
CHECK FOR RELATED DTCS
LOW FLUID LEVEL
(F856) 5-VOLT SUPPLY CIRCUIT OPEN
(F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND
(F856) 5-VOLT SUPPLY CIRCUIT SHORT TO VOLTAGE
(T118) LP VFS CONTROL CIRCUIT SHORT TO ANOTHER CIRCUIT
INTERNAL TRANSMISSION
LINE PRESSURE SENSOR
CRACKED, PLUGGED, OR MIS-INSTALLED OIL FILTER
STUCK OR STICKING MAIN REGULATOR VALVE
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR RELATED DTCS**

With the scan tool, read DTCs

Is the DTC P0932 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 3.

No

Go to 10.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the from the TIPM.

CAUTION: Removal of the from the TIPM will prevent the vehicle from being started in gear.

WARNING: The must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

On the Transmission Simulator select the "OFF" position of the "Input/Output Speed" switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following steps.

Using the Transmission Simulator, set the rotary knob to each of the 3 line pressure positions.

NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.

Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?

Yes

Go to 4.

No

Go to 6.

4. CHECK THE LINE PRESSURE SENSOR

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and reconnect all previously disconnected connectors.

Install a Pressure Gauge, 0 to 2000 kPa or 0 to 300 psi to the L/R test port.

Start the engine in Park.

Monitor the line pressure readings of both the scan tool and the pressure gauge and compare the two readings.

Is the line pressure gauge reading within 34 kPa or 5 psi of the scan tool reading?

Yes

Go to 5.

No

Replace the Line Pressure Sensor per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK FOR A PLUGGED TRANSMISSION OIL FILTER

Turn the ignition off to the lock position.

Remove and inspect the Transmission Oil Pan for excessive debris per the Service Information.

Remove and inspect the Transmission Oil Filter per the Service Information.

Does the Oil Pan contain excessive debris and/or is the Transmission Oil Filter plugged?

Yes

Repair as necessary. If the Transmission Oil Filter is plugged or there is excessive debris, refer to **42RLE - SERVICE INFORMATION** for the proper Hydraulic repair procedure.

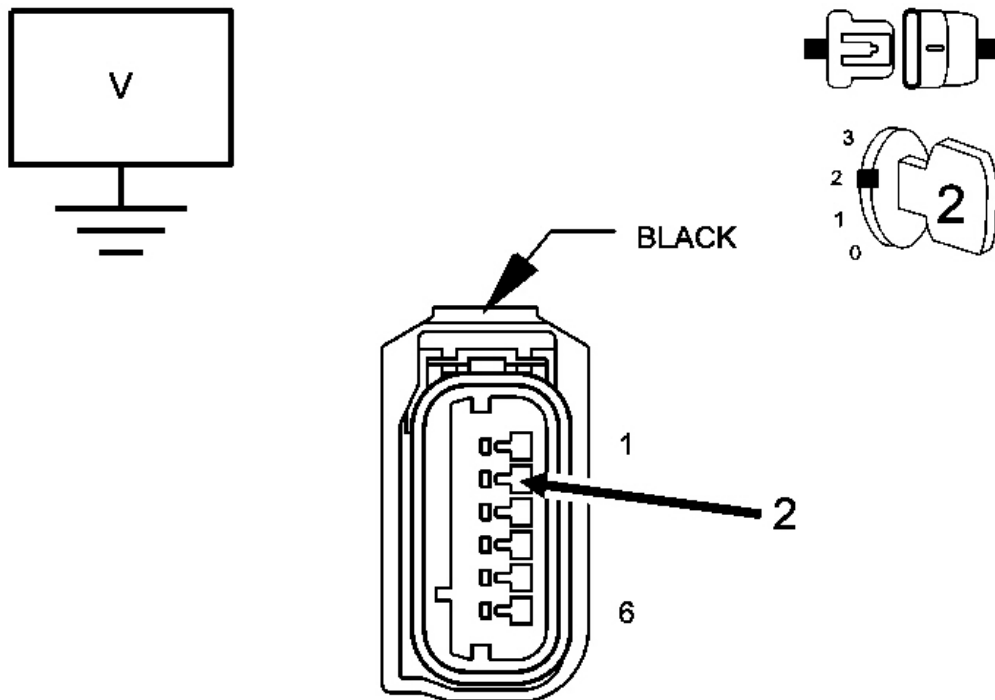
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair internal transmission and inspect the Transmission Oil Pump per **42RLE - SERVICE INFORMATION** and replace if necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE



**ASSEMBLY-
LINE PRESSURE
SENSOR/VARIABLE
FORCE SOLENOID
(RLE)**

816b7d58

Fig. 55: Checking 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Reconnect all previously disconnected connectors except the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

Ignition on, engine not running.

Measure the voltage of the (F856) 5-volt Supply circuit.

Is the voltage above 5.5 volts?

Yes

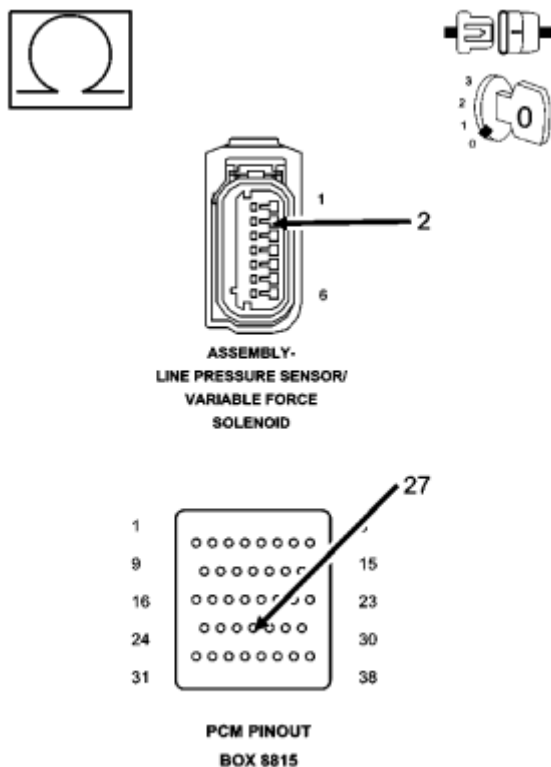
Repair the (F856) 5-volt Supply circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN



8168994b

Fig. 56: Checking 5-Volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C1 harness connector and connect Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (F856) 5-volt Supply circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

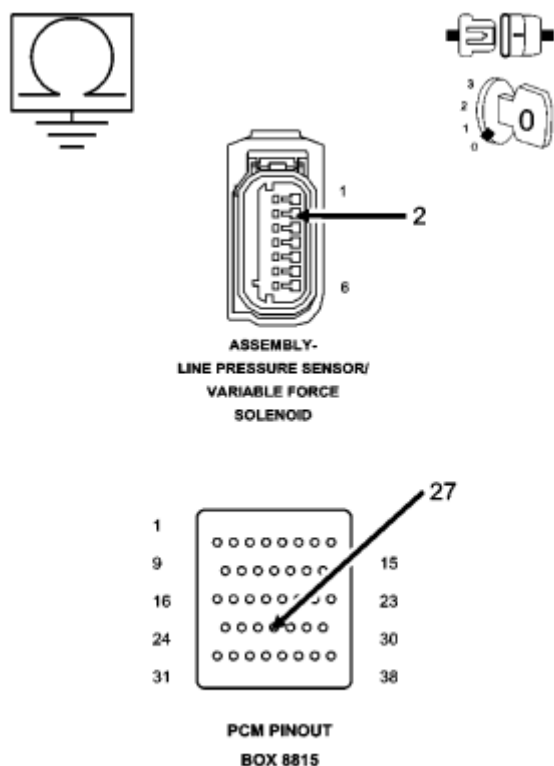
Repair the (F856) 5-volt Supply circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go to 8.

8. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND



81689ac2

Fig. 57: Checking 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

Is the resistance below 5.0 ohms?

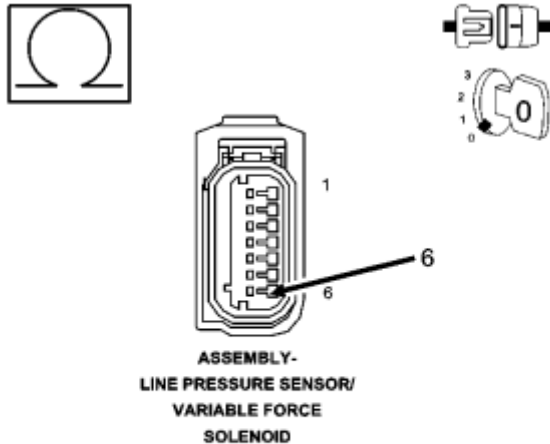
Yes

Repair the (F856) 5-volt Supply circuit for a short to ground.
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go to 9.

9. CHECK THE (T118) LP VFS CONTROL CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT



8168c257

Fig. 58: Checking Pressure Control Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

Disconnect all PCM harness connectors.

Measure the resistance between the (T118) LP VFS Control circuit and all other circuits in the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector.

Is the resistance below 5.0 ohms between the (T118) LP VFS Control circuit and any other circuit (s) in the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector?

Yes

Repair the (T118) LP VFS Control circuit for a short to another circuit(s).
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

10. **CHECK THE WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

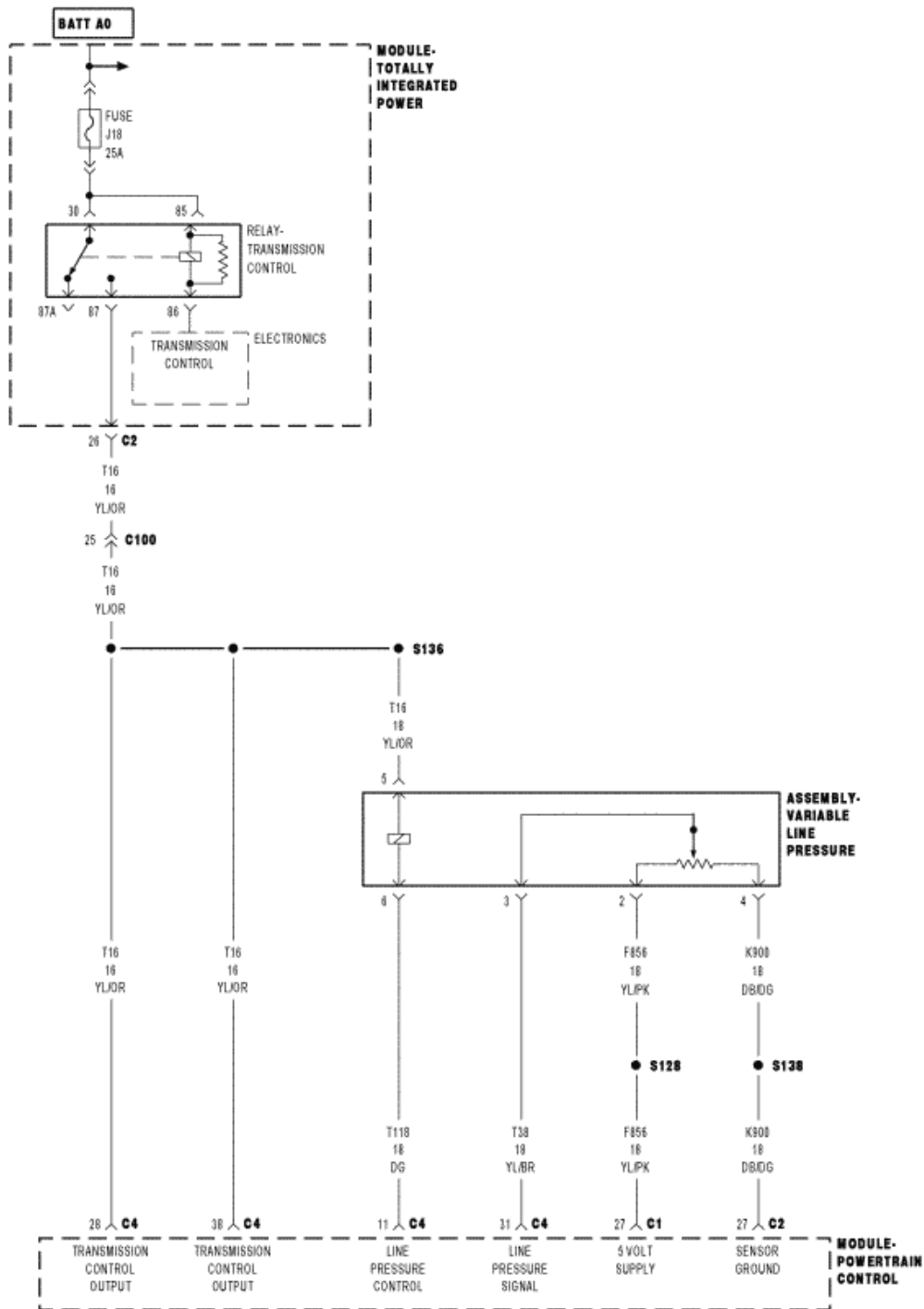
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0869-LINE PRESSURE HIGH

Circuit Schematic



01942600

Fig. 59: Line Pressure Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Line pressure is measured by the Line Pressure Sensor (LPS) and regulation is achieved by changing the duty cycle of the Pressure Control Solenoid (PCS) controlled by the Transmission Control System. (5% duty cycle = solenoid off = Max line pressure, 62% duty cycle = solenoid on = Min line pressure). The Transmission Control System calculates the desired line pressure based on inputs from both the engine and transmission.

The Transmission Control System calculates torque input to the transmission and uses it as the primary input to the desired line pressure calculation. This is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 or 931 kPa (120 or 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality. The desired line pressure is continuously being compared to the actual line pressure. If the actual line pressure is consistently higher than the highest desired line pressure ever used in the current gear, the line pressure high DTC P0869 will set.

Monitor Conditions

When Monitored:

Continuously while driving in a forward gear.

Set Conditions

- Set Condition:**

The PCM continuously monitors Actual Line Pressure. If the Actual Line Pressure reading is greater than the highest Desired Line Pressure ever used in the current gear, while the Pressure Control Solenoid duty cycle is at or near its maximum value (which should result in minimum line pressure), the DTC will set.

Possible Causes

Possible Causes
(F856) 5-VOLT SUPPLY CIRCUIT OPEN LINE PRESSURE SENSOR CONNECTION (T118) LP VFS CONTROL CIRCUIT OPEN (F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND (T118) LP VFS CONTROL CIRCUIT SHORT TO GROUND TRANSMISSION CONTROL OUTPUT CIRCUIT LINE PRESSURE SENSOR STUCK OR STICKING MAIN REGULATOR VALVE POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR RELATED DTCS**

With the scan tool, read DTCs.

Are there any line pressure sensor or transmission relay output DTCs present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 3.

No

Go to 9.

3. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

With the Transmission Simulator select the "OFF" position on the "Input/Output Speed" switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following step.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa

or 2.0 psi (0.2 volts) of the reading specified on the Transmission Simulator.

Did the Line Pressure read within ± 14 kPa or 2.0 psi (0.2 volts) in all three positions?

Yes

Go to 4.

No

Go to 5.

4. CHECK THE LINE PRESSURE SENSOR CALIBRATION

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit and reconnect all previously disconnected connectors.

Install the Line Pressure Gauge, Miller tool #C-3293, 0 to 2000 kPa or 0 to 300 psi in the L/R pressure port.

Start the engine in Park.

Monitor the Line Pressure readings on the scan tool and the pressure gauge.

Compare the Line Pressure readings between the scan tool and the pressure gauge.

Is the pressure gauge reading within 34 kPa or 5 psi of the scan tool reading?

Yes

Repair the internal transmission and inspect the Transmission Oil Pump per **42RLE - SERVICE INFORMATION** and replace if necessary. If no problem is found, replace the Pressure Control Solenoid.

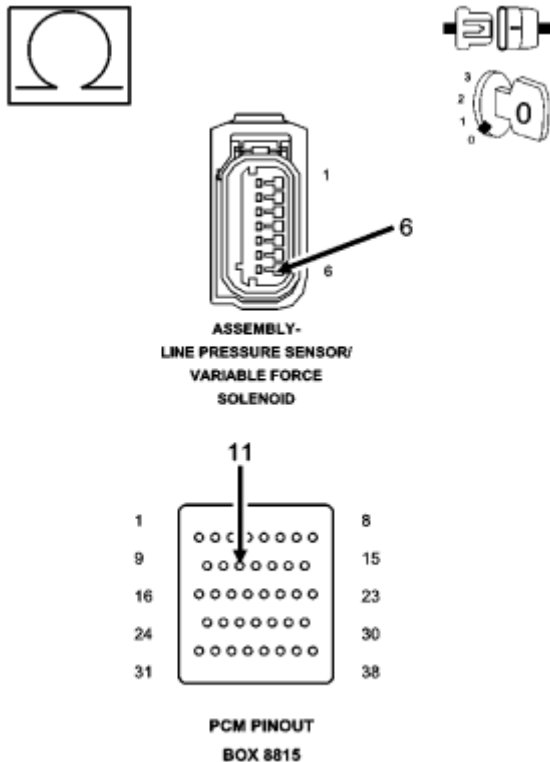
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Line Pressure Sensor per the Service information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK THE (T118) LP VFS CONTROL CIRCUIT FOR AN OPEN



816896d2

Fig. 60: Checking Pressure Control Solenoid Control Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333.

Disconnect the Powertrain Control Module C4 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T118) LP VFS Control circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

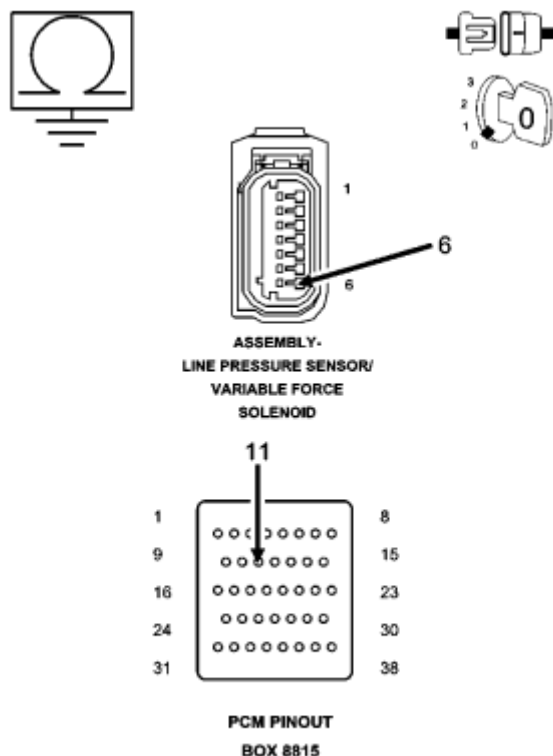
Repair the (T118) LP VFS Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 6.

6. **CHECK THE (T118) LP VFS CONTROL CIRCUIT FOR A SHORT TO GROUND**



816897c7

Fig. 61: Checking Pressure Control Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T118) LP VFS Control circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T118) LP VFS Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 7.

7. **CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN**

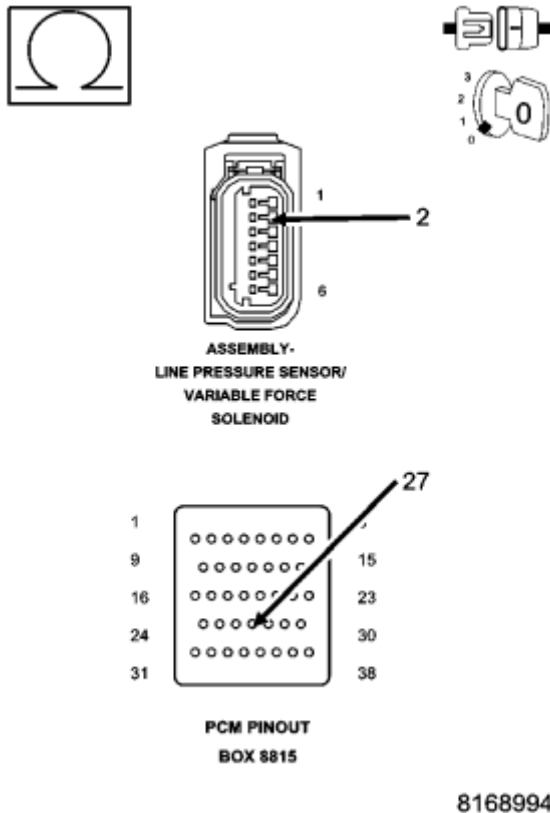


Fig. 62: Checking 5-Volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Disconnect the PCM C1 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (F856) 5-volt Supply circuit between the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

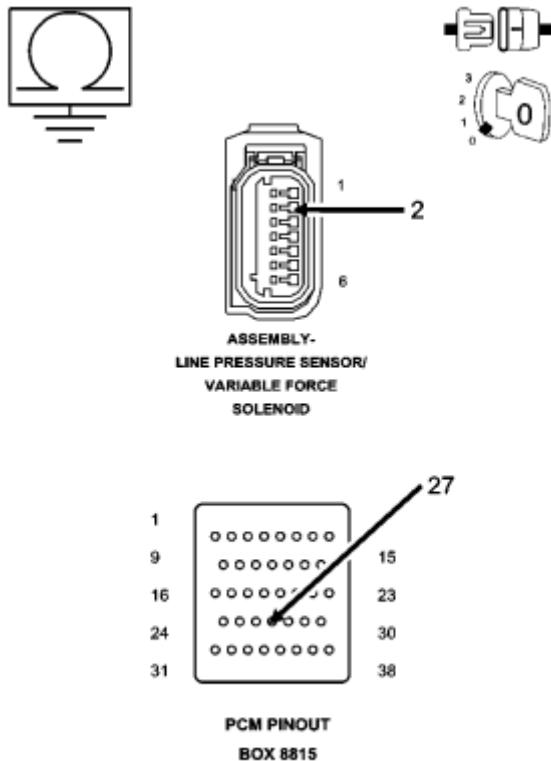
Repair the (F856) 5-volt Supply circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go to 8.

8. CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND



81689ac2

Fig. 63: Checking 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (F856) 5-volt Supply circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

9. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

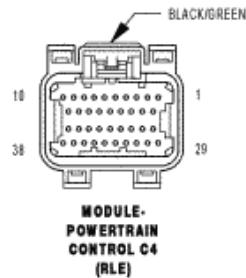
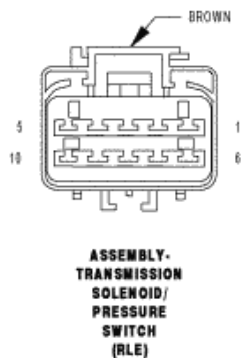
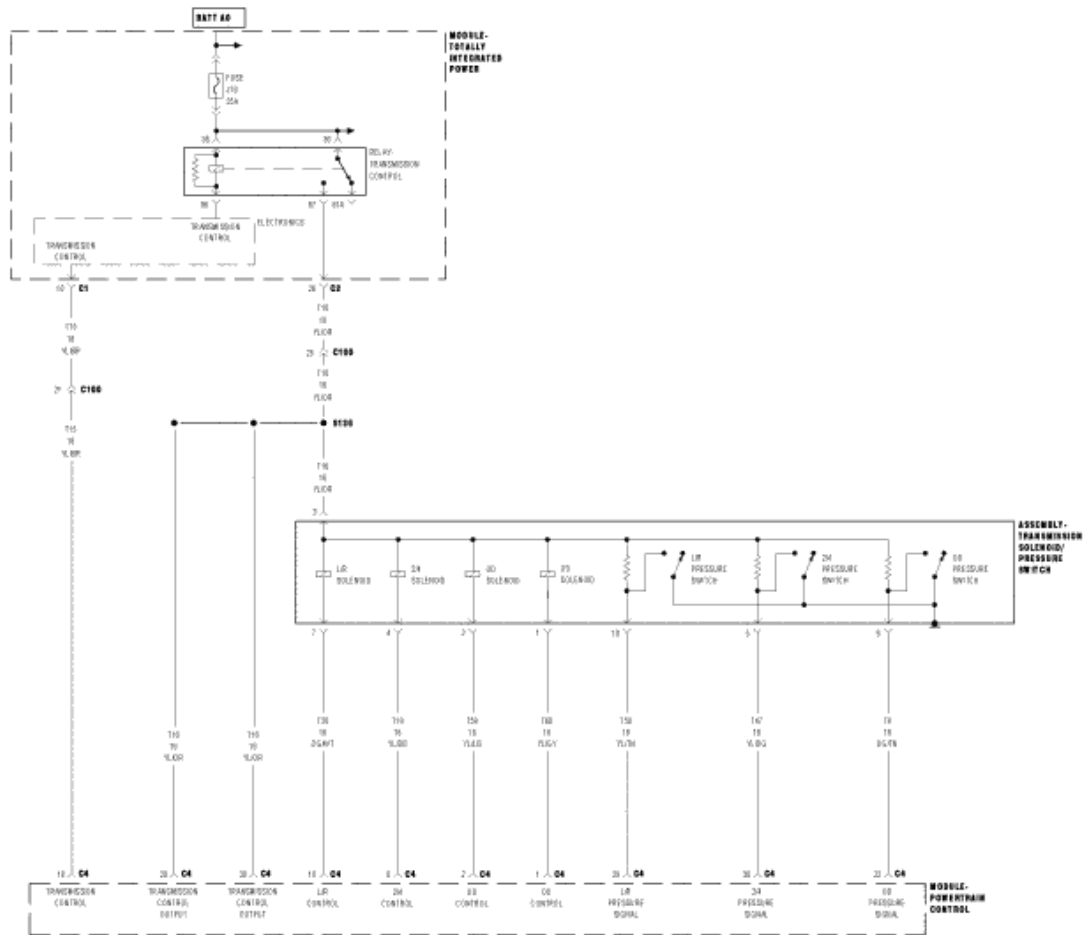
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Test Complete.

P0870-OD HYDRAULIC PRESSURE TEST

Circuit Schematic



019a117a

Fig. 64: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 2/4 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 2/4 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to limp-in mode.

Monitor Conditions

When Monitored:

In any forward gear with engine speed above 1000 rpm, shortly after a shift and every minute thereafter.

Set Conditions

- **Set Condition:**

After a shift into a forward gear, with engine speed greater than 1000 rpm, the PCM momentarily turns on element pressure to the clutch circuits that don't have pressure to identify the correct pressure switch closes. If the pressure switch does not close 2 times, the DTC sets.

Possible Causes

Possible Causes
LOSS OF PRIME P0944 PRESENT (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN (T9) OD PRESSURE SIGNAL CIRCUIT OPEN (T9) OD PRESSURE SIGNAL CIRCUIT SHORT TO GROUND (T9) OD PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY INTERNAL TRANSMISSION POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECKING FOR LOSS OF PRIME DTC**

With the scan tool, read DTCs.

Is the DTC P0944 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to 2.

2. CHECK FOR RELATED DTCS

With the scan tool, read DTCS.

Are any of the DTCS P0732, P0734 and/or P0846 present also?

Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCS.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to 4.

No

Go to 9.

4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to OD.

With the scan tool, monitor the UD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Wiggle the wires leading to the PCM while pressing and holding the Pressure Switch Test button.

Did the OD Pressure Switch state change to closed and remain closed while wiggling the wires?

Yes

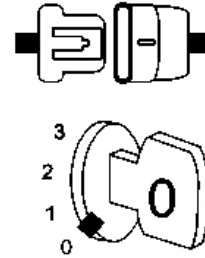
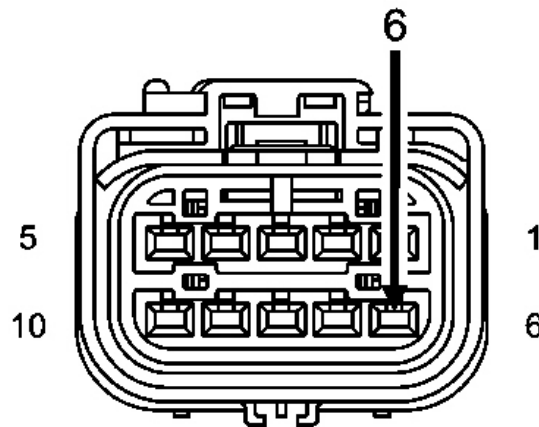
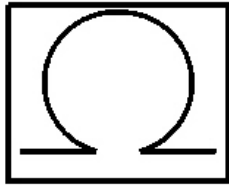
Disassemble and inspect the Valve Body per **42RLE - SERVICE INFORMATION** and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

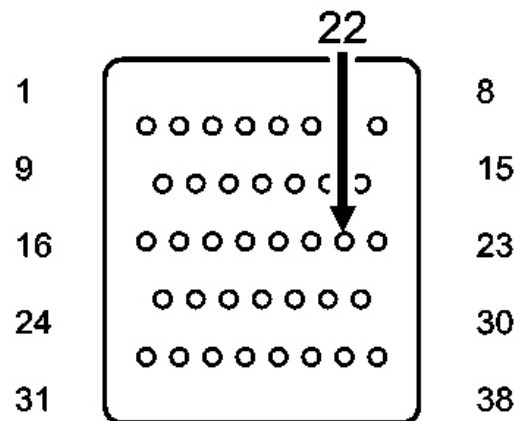
No

Go to 5.

5. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a64dd

Fig. 65: Checking OD Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

NOTE: **Check connectors - Clean/repair as necessary.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T9) OD Pressure Signal circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

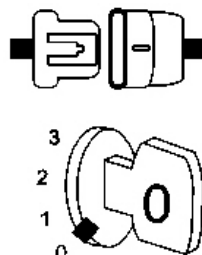
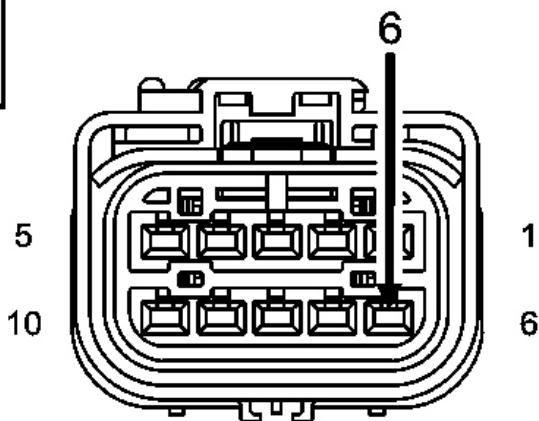
Repair the (T9) OD Pressure Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

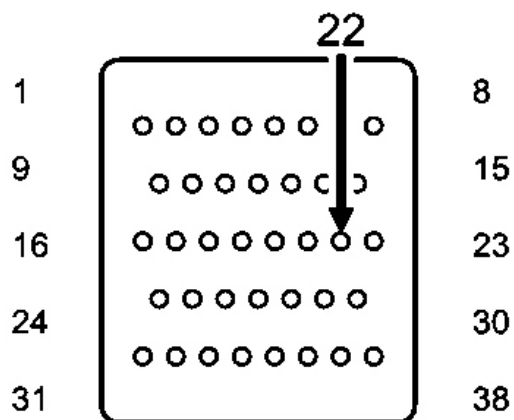
No

Go to 6.

6. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a64eb

Fig. 66: Checking OD Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T9) OD Pressure Signal circuit.

Is the resistance below 5.0 ohms?

Yes

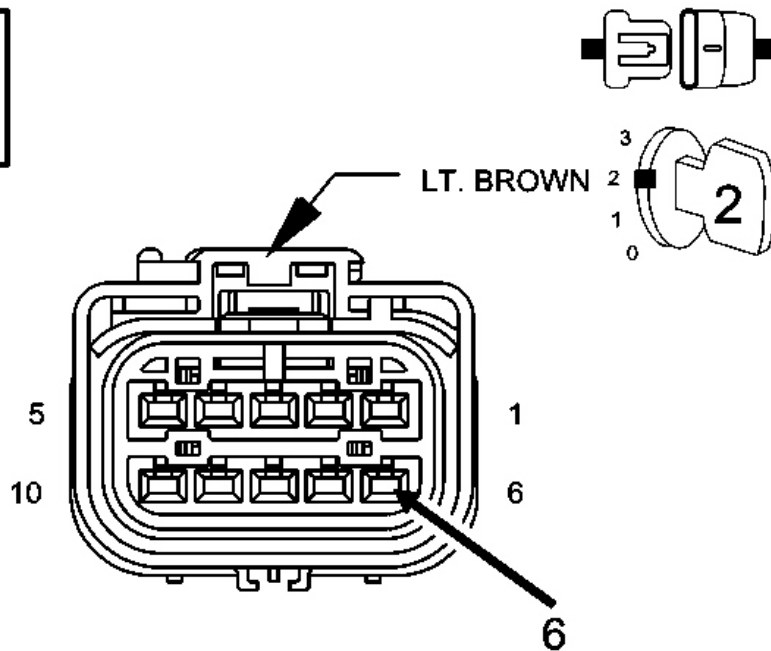
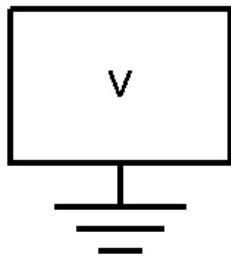
Repair the (T9) OD Pressure Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

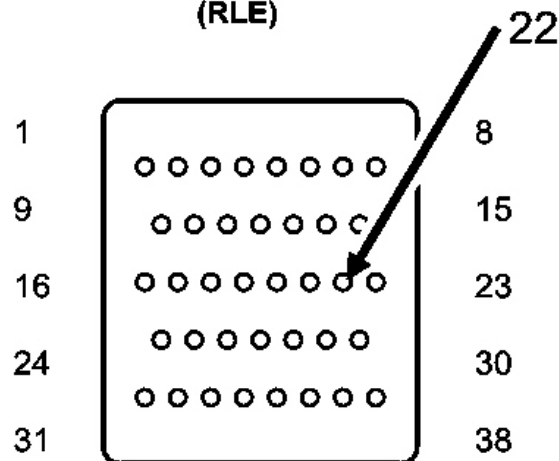
No

Go to 7.

7. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad432

Fig. 67: Measuring Voltage Of (T9) OD Pressure Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T9) OD Pressure Signal circuit.

Is the voltage above 0.5 volts?

Yes

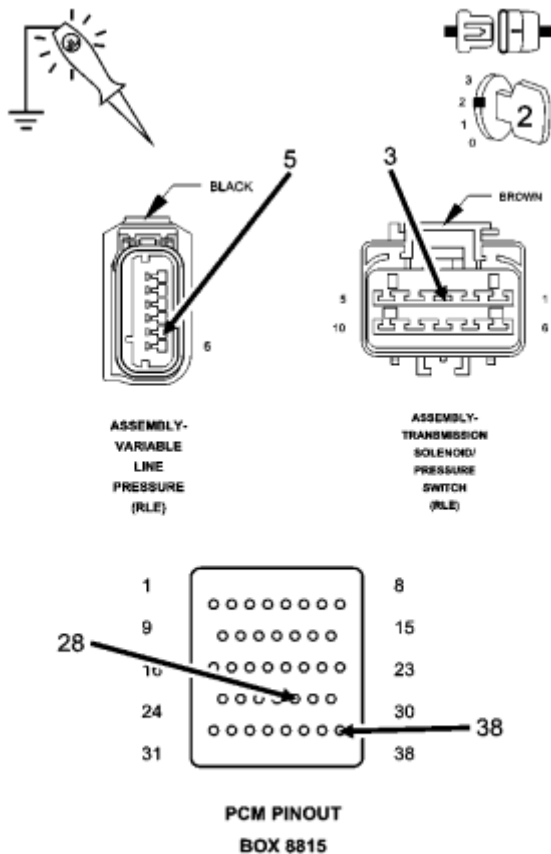
Repair the (T9) OD Pressure Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 8.

8. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN



819b5f73

Fig. 68: Checking (T16) Transmission Control Output Circuits
 Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Using a 12-volt test light connected to ground, check (T16) Transmission Control Output circuit in the Transmission Solenoid/Pressure Switch Assembly harness connector.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Repair the (T16) Transmission Control Relay Output circuit for an open. If the fuse is open make sure to check for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

9. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0871-OD PRESSURE SWITCH RATIONALITY

Circuit Schematic

The Transmission system uses three pressure switches to monitor the fluid pressure in the L/R, 2/4, and OD elements. The pressure switches are continuously monitored for the correct states in each gear. Normal operation will be experienced if no other codes are present. Transmission Control System will ignore the code. Limp-in condition will only occur if DTC P0871 is present with a DTC P0706.

Monitor Conditions

When Monitored:

Whenever the engine is running.

Set Conditions

- Set Condition:

The DTC is set if one of the pressure switches are open or closed at the wrong time in a given gear. If the problem is identified for 3 successive key starts, the transmission will go into limp-in mode and the MIL will turn on after 10 seconds of vehicle operation.

Possible Causes

Possible Causes
RELATED TIPM DTCS PRESENT
LOSS OF PRIME DTC PRESENT
(T9) OD PRESSURE SIGNAL CIRCUIT OPEN
(T9) OD PRESSURE SIGNAL CIRCUIT SHORT TO GROUND
(T9) OD PRESSURE SIGNAL CIRCUIT SHORT TO VOLTAGE
TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OPEN	OPEN	OPEN
P/N	CLOSED	OPEN	OPEN
1st	CLOSED	OPEN	OPEN
2nd	OPEN	CLOSED	OPEN
D	OPEN	OPEN	CLOSED
OD	OPEN	CLOSED	CLOSED

Diagnostic Test

- CHECK FOR TIPM TCM POWER INPUT DTCS

With the scan tool, read TIPM DTCs.

Are there any TIPM TCM Power Control Circuit DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to step 2.

2. CHECK FOR LOSS OF PRIME DTC

With the scan tool, read DTCs.

Is the DTC P0944 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure.

No

Go to step 3.

3. CHECK IF THE DTC IS CURRENT

With the scan tool, read DTCs.

Is the status Active or is the Starts Since Set counter 2 or less for this DTC?

Yes

Go to step 4.

No

Go to step 8.

4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector to OD.

With the scan tool, monitor the OD Pressure Switch state while pressing the Pressure Switch Test button on the Transmission Simulator.

Did the OD Pressure Switch state change?

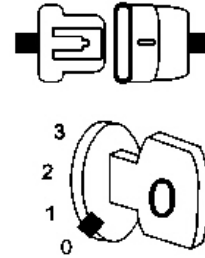
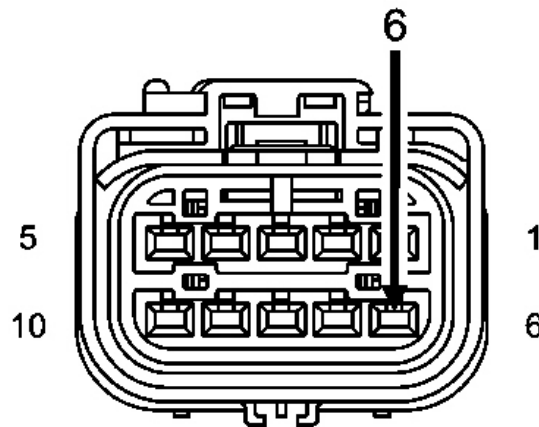
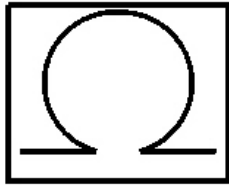
Yes

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

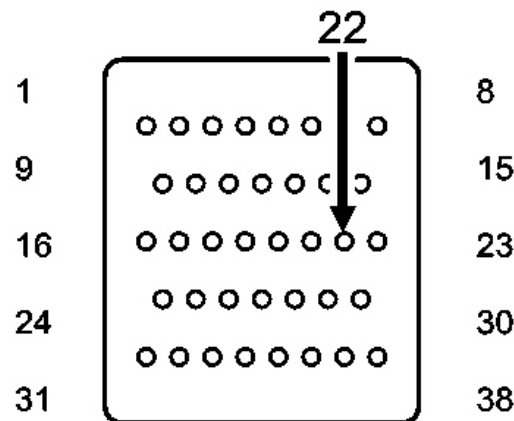
No

Go to step 5.

5. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a64dd

Fig. 70: Checking OD Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

NOTE: **Check connectors - Clean/repair as necessary.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Tool #8815 to perform diagnosis.

Measure the resistance of the (T9) OD Pressure Signal circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

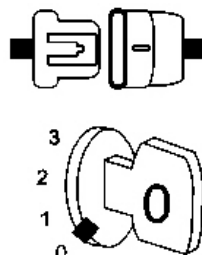
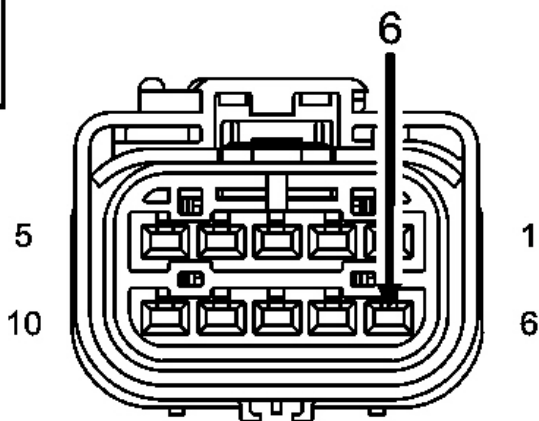
Repair the (T9) OD Pressure Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

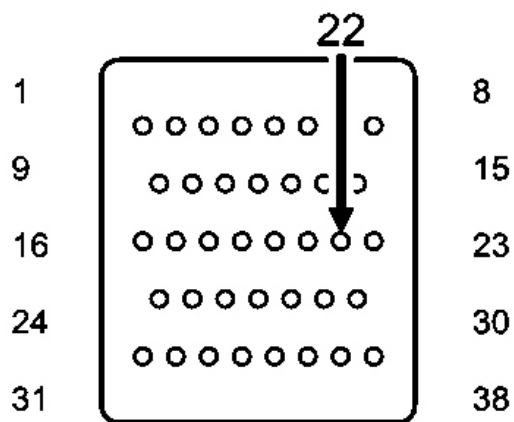
No

Go to step 6.

6. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a64eb

Fig. 71: Checking OD Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T9) OD Pressure Signal circuit.

Is the resistance below 5.0 ohms?

Yes

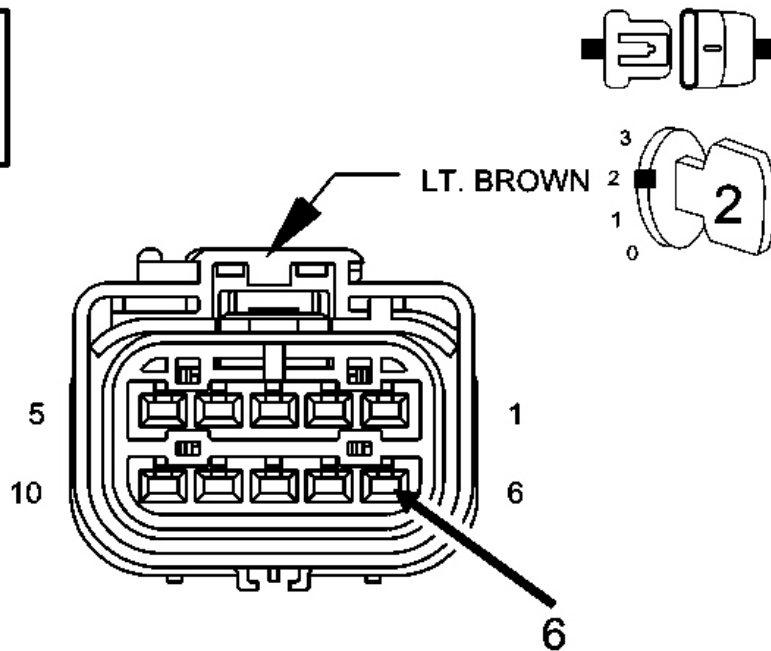
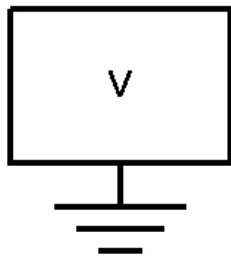
Repair the (T9) OD Pressure Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

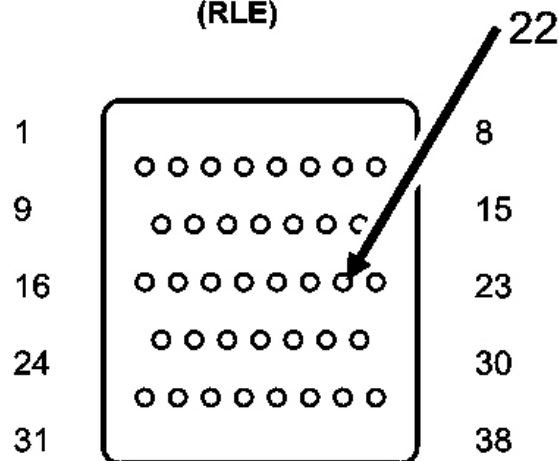
No

Go to step 7.

7. CHECK THE (T9) OD PRESSURE SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad432

Fig. 72: Measuring Voltage Of (T9) OD Pressure Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T9) OD Pressure Signal circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T9) OD Pressure Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform Quick Learn.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

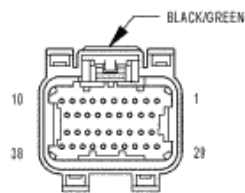
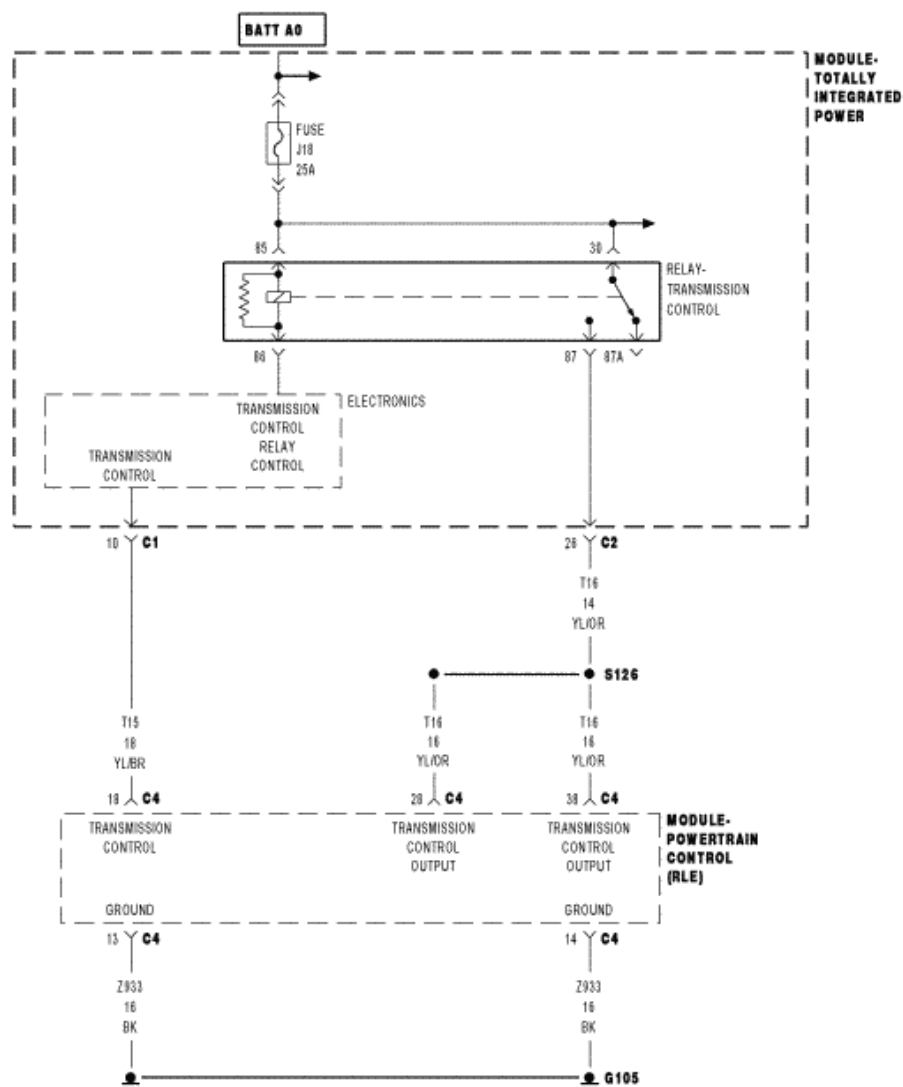
Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

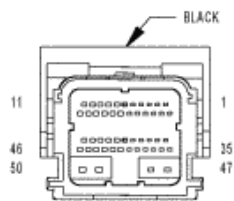
No

Test Complete.

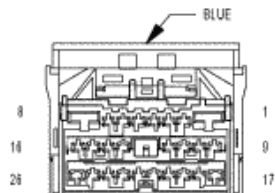
Circuit Schematic



MODULE-
POWERTRAIN
CONTROL C4
(RLE)



MODULE-
TOTALLY
INTEGRATED
POWER C1



MODULE-
TOTALLY
INTEGRATED
POWER C2

0100001

Fig. 73: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/TRS Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in event that the transmission should need to be placed into limp-in mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System requests for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If the Transmission Control System detects less that 3.0 volts when the output is commanded on, the DTC will set. **Note: Inadequate Transmission Control Output voltage can also cause DTCs P0846, P0869, or P0871 to set. Repairing the P0882 fault should also eliminate the related DTCs.**

Monitor Conditions

When Monitored:

When the ignition is turned from "OFF" position to "RUN" position and/or the ignition is turned from "START" position to "RUN" position.

Set Conditions

- Set Condition:**

This DTC is set when there is less than 3.0 volts present at the transmission control output circuits located in the Powertrain Control Module (PCM) when the Transmission Control System request the power up of those circuits.

Possible Causes

Possible Causes
RELATED TIPM DTCS TRANSMISSION CONTROL RELAY (T15) TRANSMISSION CONTROL CIRCUIT SHORT TO GROUND (T15) TRANSMISSION CONTROL CIRCUIT OPEN POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK IF THE DTC P0882 IS CURRENT

With the scan tool, Check the STARTS SINCE SET counter for P0882.

NOTE: This counter only applies to the last DTC set.

Is the STARTS SINCE SET counter equal to 0?

Yes

Go To 2.

No

Go To 6.

2. CHECK FOR TIPM RELATED DTCS

With the scan tool, check TIPM DTCs.

Are there any TIPM TCM Power Control circuit DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 3.

3. TRANSMISSION CONTROL RELAY

Turn the ignition off to the lock position.

NOTE: Due to different power control configurations, the Transmission Control Relay may be referred to as a PCM relay.

Remove the Transmission Control Relay.

NOTE: Check connectors - Clean/repair as necessary.

Install a substitute Relay in place of the Transmission Control Relay.

Ignition on, engine not running.

With the scan tool, monitor the Switched Battery voltage in the next step.

NOTE: The switched battery voltage should remain steady and around 12-volts

Does the Switched Battery voltage remain a steady voltage (12-volts) and the DTC not reset?

Yes

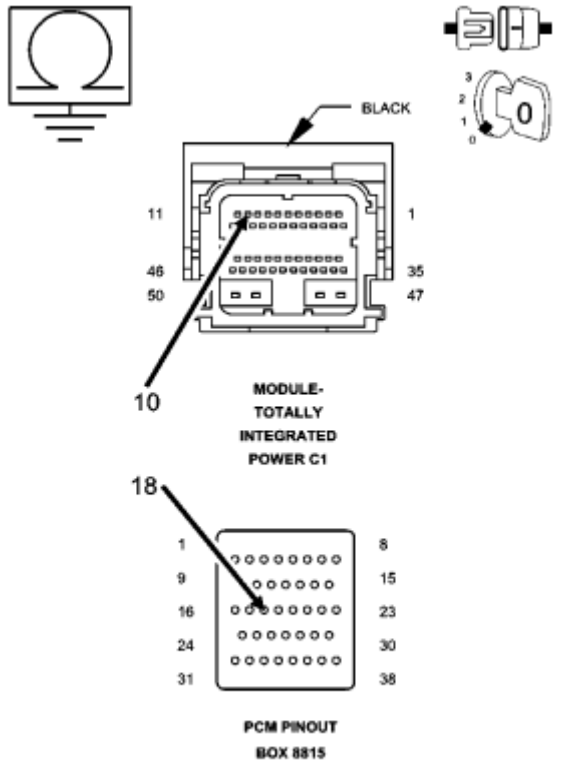
Replace the Transmission Control Relay.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

No

Go To 4.

4. CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO GROUND



819ba527

Fig. 74: Measuring Resistance Between Ground And (T15) Transmission Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Disconnect the TIPM C1 harness connector.

Measure the resistance between ground and the (T15) Transmission Control circuit.

Is the resistance below 5.0 ohms?

Yes

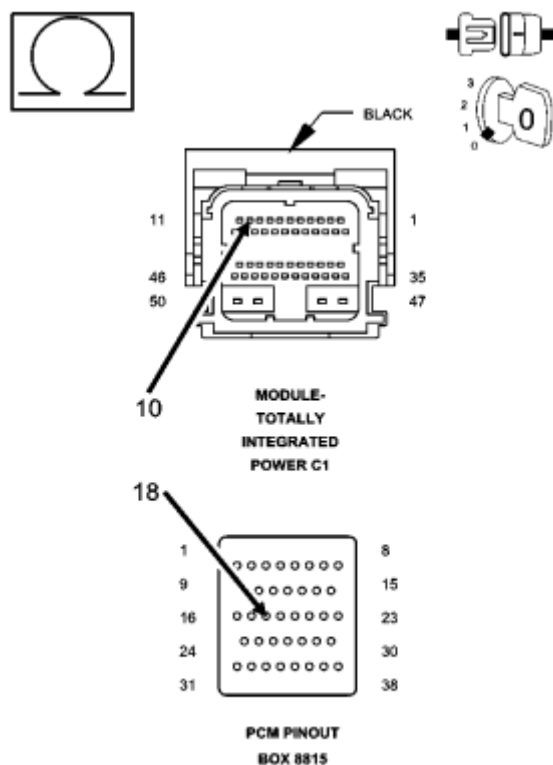
Repair the (T15) Transmission Control circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go To 5.

5. CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR AN OPEN



819ba510

Fig. 75: Measuring Resistance Of (T15) Transmission Control Circuit Between TIPM C1 Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (T15) Transmission Control circuit between the TIPM C1 harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

Repair the (T15) Transmission Control circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

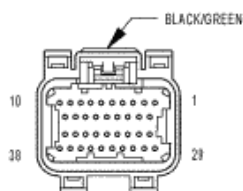
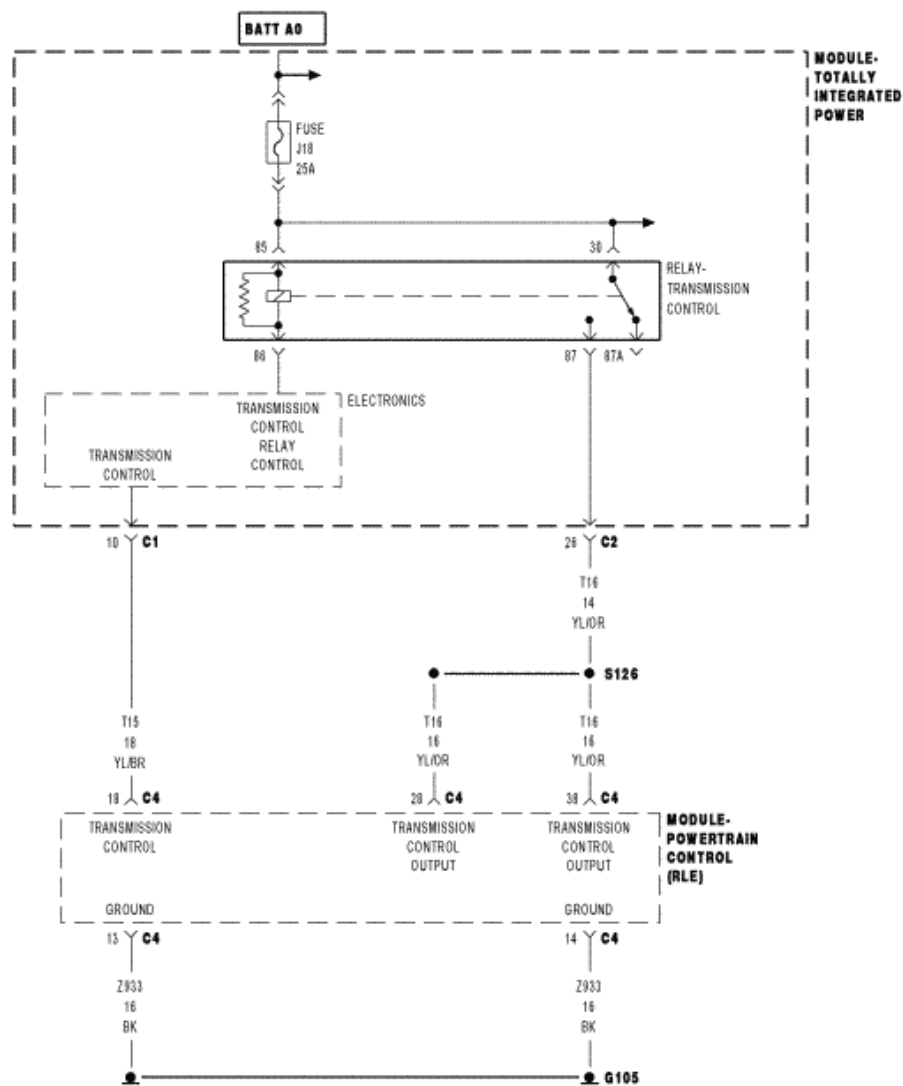
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

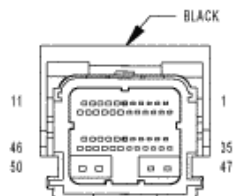
Test Complete.

P0883-TCM POWER INPUT HIGH

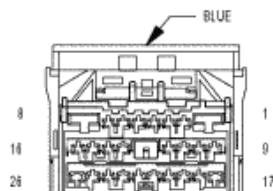
Circuit Schematic



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**



**MODULE-
TOTALLY
INTEGRATED
POWER C1**



**MODULE-
TOTALLY
INTEGRATED
POWER C2**

0100001

Fig. 76: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/Pressure Switch Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in the event that the transmission should need to be placed into limp-in mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System request for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If voltage is detected on the Transmission Output circuits before the request is sent, the DTC will set.

Monitor Conditions

When Monitored:

When the ignition is turned from "OFF" position to "RUN" position and/or the ignition is turned from "START" position to "RUN" position.

Set Conditions

- Set Condition:**

This DTC is set if the Powertrain Control Module senses greater than 3.0 volts on the Transmission Control Relay Output circuits prior to a request from the PCM to TIPM to energize the Transmission Output circuits.

Possible Causes

Possible Causes
TIPM DTCS PRESENT
TRANSMISSION CONTROL RELAY
(T15) TRANSMISSION CONTROL CIRCUIT SHORT TO VOLTAGE
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT VOLTAGE
TRANSMISSION SOLENOID/TRS ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR TCM TIPM DTCS**

With the scan tool under TIPM, check for TCM Power Control circuit DTCs.

Are there any TIPM TCM Power Control circuit DTCS present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 2.

2. CHECK TO SEE IF DTC P0883 IS CURRENT

With the scan tool, check the STARTS SINCE SET counter.

NOTE: This counter only applies to the last DTC set.

Is the STARTS SINCE SET counter set to 0?

Yes

Go To 3.

No

Go To 7.

3. TRANSMISSION CONTROL RELAY

Turn the ignition off to the lock position.

Remove the Transmission Control Relay.

NOTE: Due to different power control configurations, the Transmission Control Relay may be referred to as a PCM relay.

NOTE: Check connectors - Clean/repair as necessary.

Install a substitute Relay in place of the Transmission Control Relay.

Ignition on, engine not running.

Does the DTC reset?

Yes

Go To 4.

No

Replace the Transmission Control Relay.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

4. (T16) TRANSMISSION OUTPUT CIRCUIT SHORT TO VOLTAGE

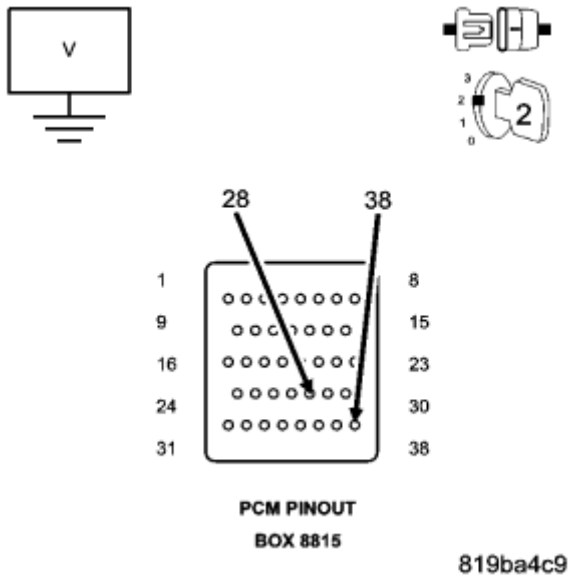


Fig. 77: Measuring Voltage Of (T16) Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

Disconnect the TIPM C2 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

Is the voltage above 0.5 volts on any (T16) Transmission Control Output circuit?

Yes

Go To 5.

No

Go To 6.

5. CHECK THE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY

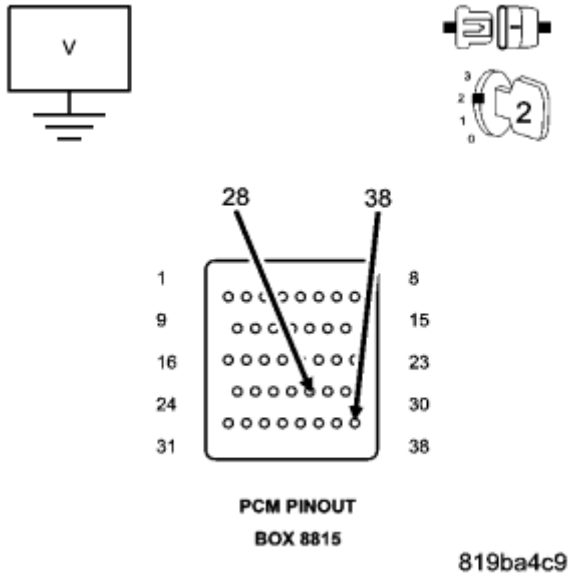


Fig. 78: Measuring Voltage Of (T16) Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

Is the voltage above 0.5 volts?

Yes

Repair the (T16) Transmission Control Output circuit for a short to voltage.

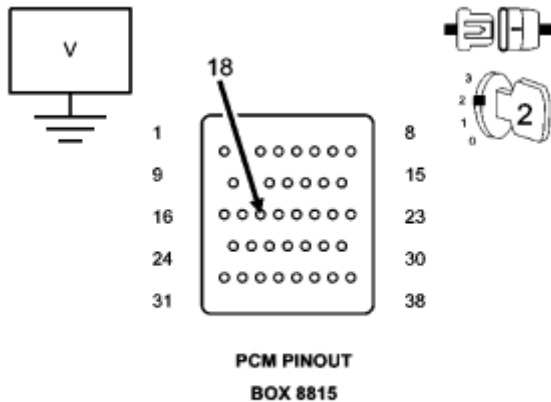
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO VOLTAGE



8165fde7

Fig. 79: Checking Transmission Control Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Measure the voltage of the (T15) Transmission Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T15) Transmission Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

7. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0884-POWER UP AT SPEED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

If a vehicle loses power to the PCM, the vehicle will go to the 2nd gear mode since there is no power available to control the transmission solenoids. However if power is restored, the PCM will power-up and normal operation will be restored. This DTC identifies that power to the PCM was restored when the gear selector was in a "Drive" position while the vehicle was moving at speeds above 32 km/h (20 mph). If a customer shifts to Neutral and cycles the ignition key and quickly shifts to "Drive" while moving before the PCM comes out of its START ROUTINE, the DTC can be set. Therefore it is critical that this DTC diagnosis repair procedure should only be used if the vehicle is experiencing intermittent 2nd gear operation and subsequently a return to normal operation during normal driving. The transmission will not be placed in limp-in. This is an informational DTC to be used when attempting to diagnose an intermittent 2nd gear operation and subsequent return to normal transmission operation.

Monitor Conditions

When Monitored:

One time after each controller reset. Note: the Transmission Control Module is integrated with Powertrain Control Module. The Transmission Control Module has separate powers and grounds specifically to its portion of the PCM.

Set Conditions

- **Set Condition:**

This DTC will set if the PCM powers up and senses the vehicle in a valid forward gear (no PRNDL DTCs) with an output speed above 800 rpm, approximately 32 km/h or 20 mph.

Possible Causes

Possible Causes
INTERMITTENT POWER AND GROUND CIRCUITS

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK THE POWER AND GROUND CIRCUITS

This DTC is set when the PCM is initialized while the vehicle is moving in a valid forward gear. This is usually caused by a momentary loss of power to the Transmission portion of the PCM.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Check all of the Fused B(+), Fused Ignition Switch Output, and Ground circuits related to the PCM for an intermittent open or short to ground.

Perform a wiggle test on all wiring and connectors pertaining to the PCM while looking for shorted or open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

If there are no possible causes remaining, view repair.

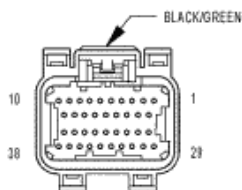
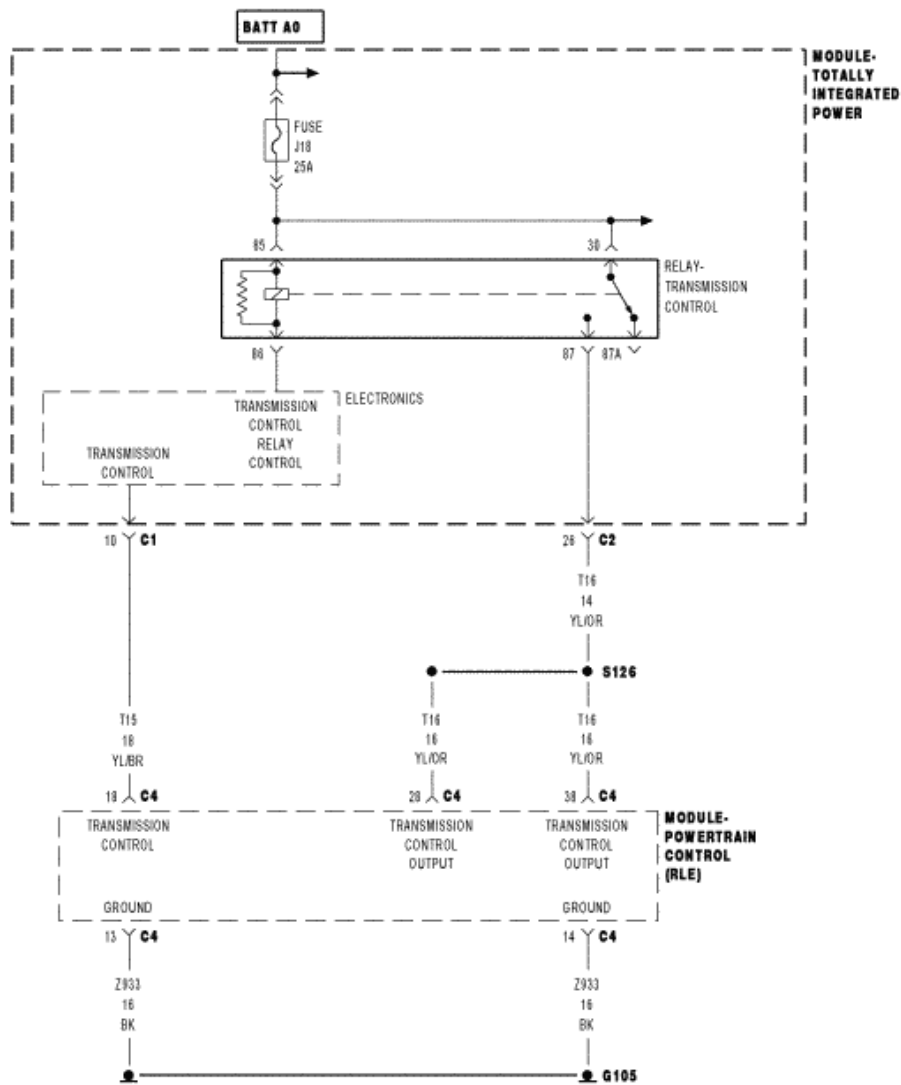
Repair

Repair as necessary.

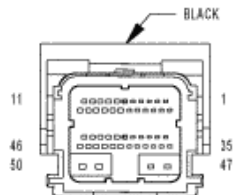
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0888-TRANSMISSION RELAY ALWAYS OFF

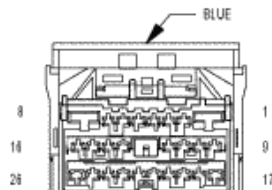
Circuit Schematic



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**



**MODULE-
TOTALLY
INTEGRATED
POWER C1**



**MODULE-
TOTALLY
INTEGRATED
POWER C2**

01a0051

Fig. 80: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/TRS Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in the event that the transmission should need to be placed into limp-in mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System requests for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If the Transmission Control System detects less than 3.0 volts when the output is commanded on, the DTC will set. **Note: Inadequate Transmission Control Output voltage can also cause DTCs P0846, P0869, or P0871 to set. Repairing the P0888 fault should also eliminate the related DTCs.**

Monitor Conditions

When Monitored:

When the ignition is turned from "OFF" position to "RUN" position and/or the ignition is turned from "START" position to "RUN" position.

Set Conditions

- Set Condition:**

This DTC is set when there is less than 3.0 volts present at the transmission control output circuits located in the Powertrain Control Module (PCM) when the Transmission Control System request the power up of those circuits.

Possible Causes

Possible Causes
RELATED TIPM DTCS
TRANSMISSION CONTROL RELAY
(T15) TRANSMISSION CONTROL CIRCUIT SHORT TO GROUND
(T15) TRANSMISSION CONTROL CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK IF THE DTC P0888 IS CURRENT

With the scan tool, Check the STARTS SINCE SET counter for P0888.

NOTE: **This counter only applies to the last DTC set.**

Is the STARTS SINCE SET counter equal to 0?

Yes

Go To 2.

No

Go To 6.

2. CHECK FOR TIPM RELATED DTCS

With the scan tool, check TIPM DTCS.

Are there any TIPM TCM Power Control circuit DTCS present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 3.

3. TRANSMISSION CONTROL RELAY

Turn the ignition off to the lock position.

NOTE: Due to different power control configurations, the Transmission Control Relay may be referred to as a PCM relay.

Remove the Transmission Control Relay.

NOTE: Check connectors - Clean/repair as necessary.

Install a substitute Relay in place of the Transmission Control Relay.

Ignition on, engine not running.

With the scan tool, monitor the Switched Battery voltage in the next step.

NOTE: The switched battery voltage should remain steady and around 12-volts.

Does the Switched Battery voltage remain a steady voltage (12-volts) and the DTC not reset?

Yes

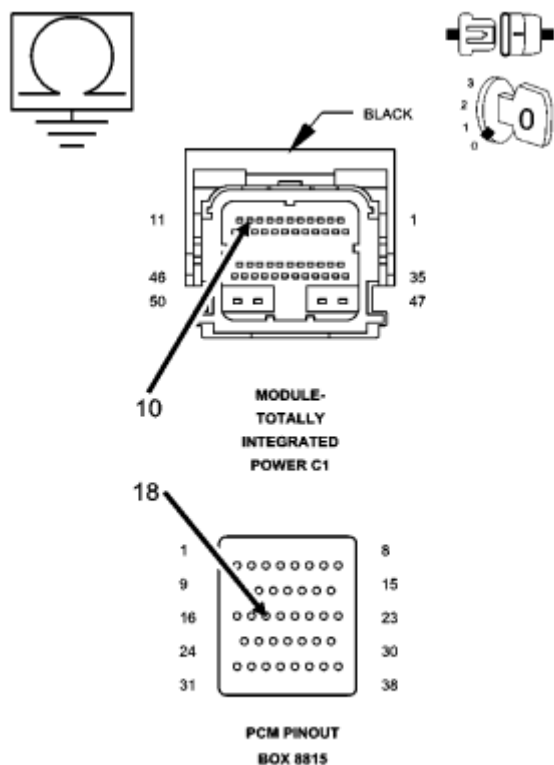
Replace the Transmission Control Relay.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

No

Go To 4.

4. **CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO GROUND**



819ba527

Fig. 81: Measuring Resistance Between Ground And (T15) Transmission Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Disconnect the TIPM C1 harness connector.

Measure the resistance between ground and the (T15) Transmission Control circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T15) Transmission Control circuit for a short to ground.
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go To 5.

5. CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR AN OPEN

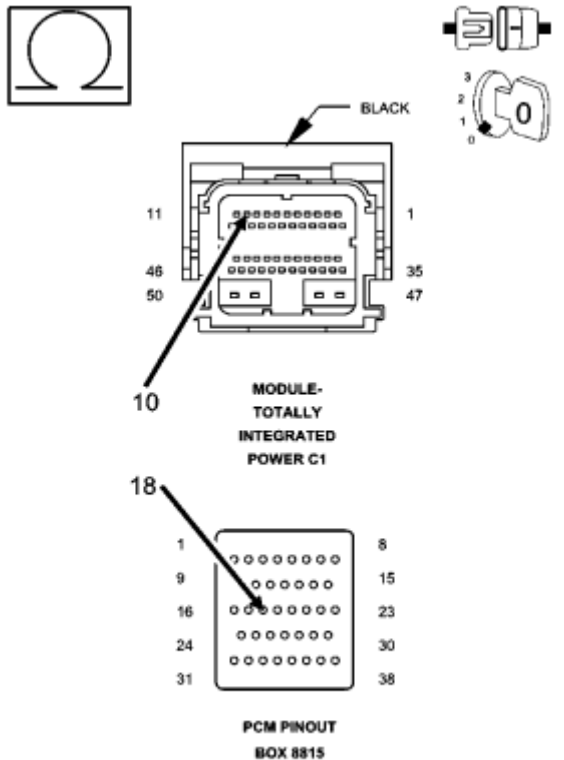


Fig. 82: Measuring Resistance Of (T15) Transmission Control Circuit Between TIPM C1 Harness Connector And Appropriate Terminal Of Miller Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (T15) Transmission Control circuit between the TIPM C1 harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

Repair the (T15) Transmission Control circuit for an open.
Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

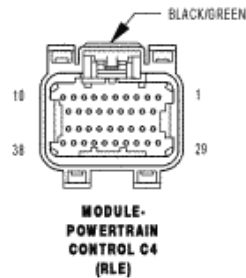
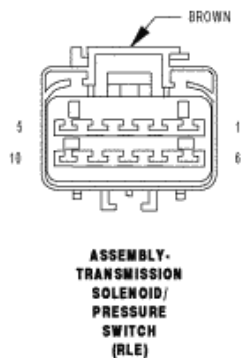
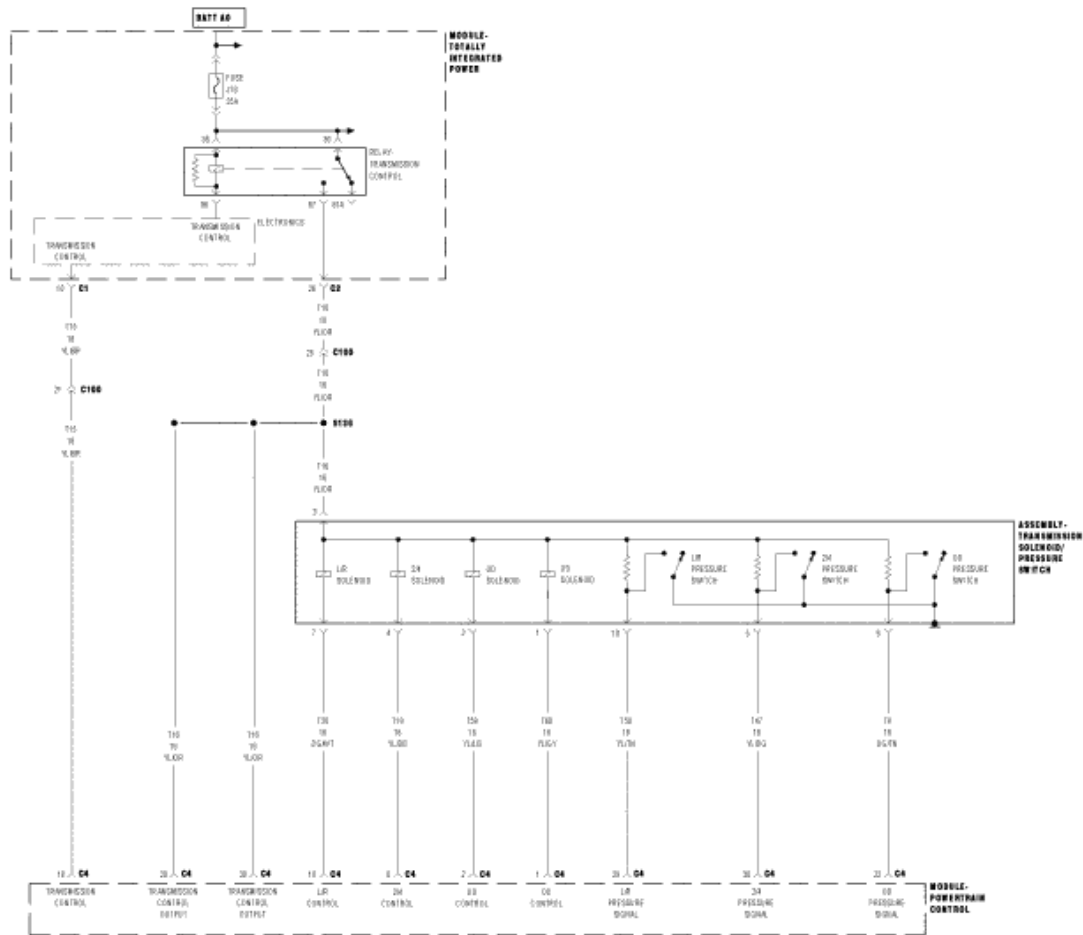
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0890-SWITCHED BATTERY

Circuit Schematic



819a117a

Fig. 83: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The transmission relay is used to supply power to the solenoid pack when in normal operating mode and to turn off power to produce transmission limp-in mode. The relay output (which supplies power to the solenoid pack) is fed back to the controller. It is referred to as SWITCHED BATTERY. After a controller reset (ignition key turned to the RUN position or after cranking engine), the controller verifies that the relay contacts are open by checking for no voltage on Switched battery line (transmission control relay output) before the relay is energized. After switched battery is verified for no voltage, the voltage of each of the solenoid pack pressure switches is also checked. Since the solenoid pack is not powered up, there should be no voltage on any of the pressure switches.

Monitor Conditions

When Monitored:

One time after a reset (ignition key turned to the RUN position or after cranking engine).

Set Conditions

- **Set Condition:**

A fault is set if voltage greater than 4.5 volts is detected for 7 ms on any of the pressure switch circuits before the relay is energized. The transmission is placed in limp-In. The MIL is on after 10 seconds. of vehicle operation.

Possible Causes

Possible Causes
(T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
(T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
(T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK TO SEE IF DTC P0890 IS PRESENT**

With the scan tool, view DTCs.

Is the status Active for this DTC or is the STARTS SINCE SET counter set at 0?

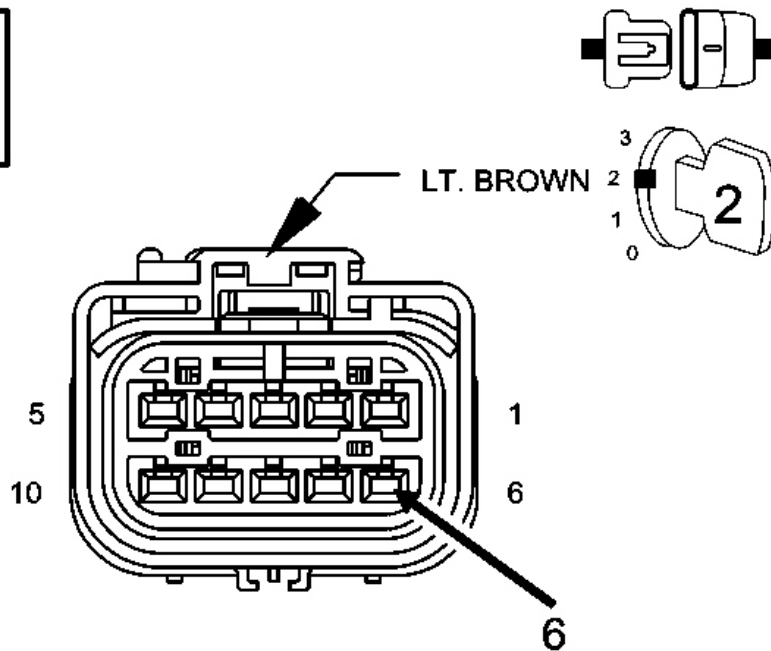
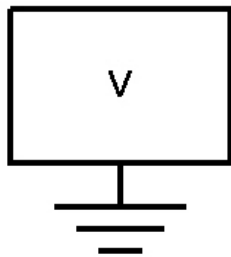
Yes

Go To 2.

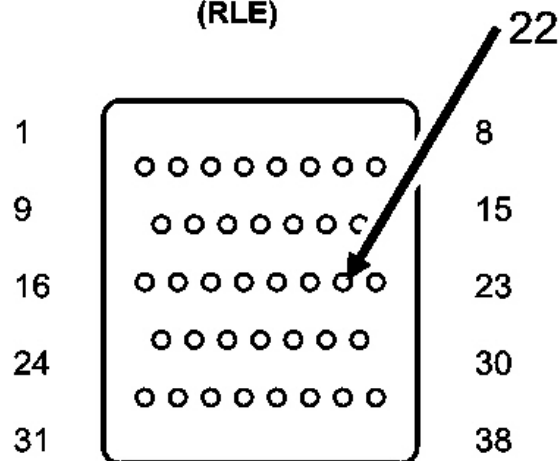
No

Go To 5.

2. **(T9) OD PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE**



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad432

Fig. 84: Measuring Voltage Of (T9) OD Pressure Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the voltage of the (T9) OD Pressure Switch Sense circuit.

Is the voltage above 0.5 volt?

Yes

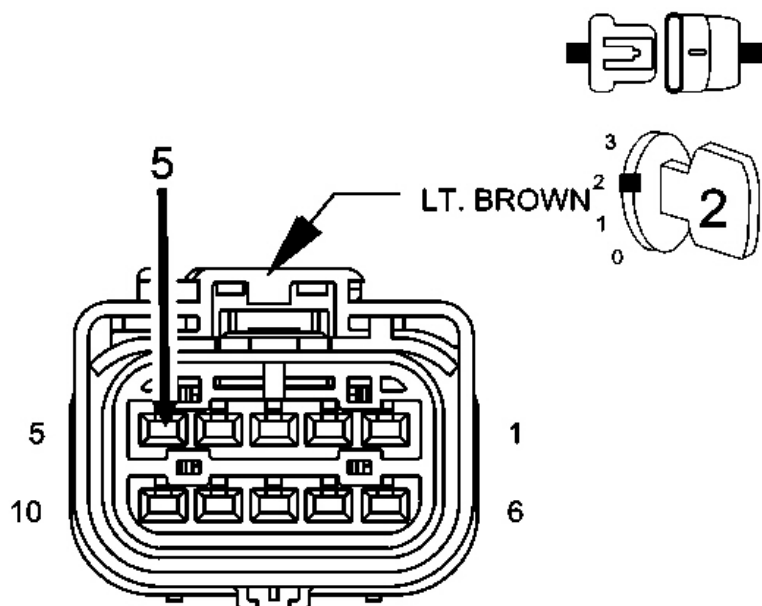
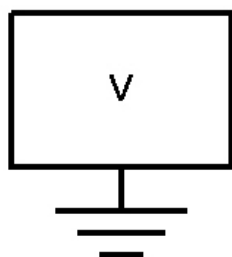
Repair the (T9) OD Pressure Switch Sense circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

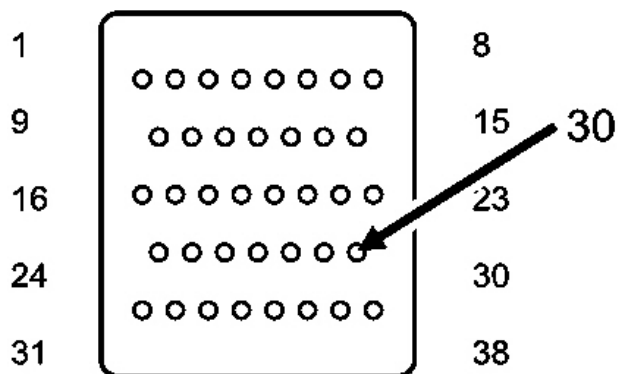
No

Go To 3.

3. (T47) 2/4 PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ad436

Fig. 85: Measuring Voltage Of (T47) 2/4 Pressure Signal Circuit
Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T47) 2/4 Pressure Switch Sense circuit.

Is the voltage above 0.5 volt?

Yes

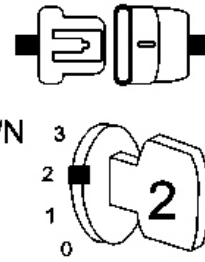
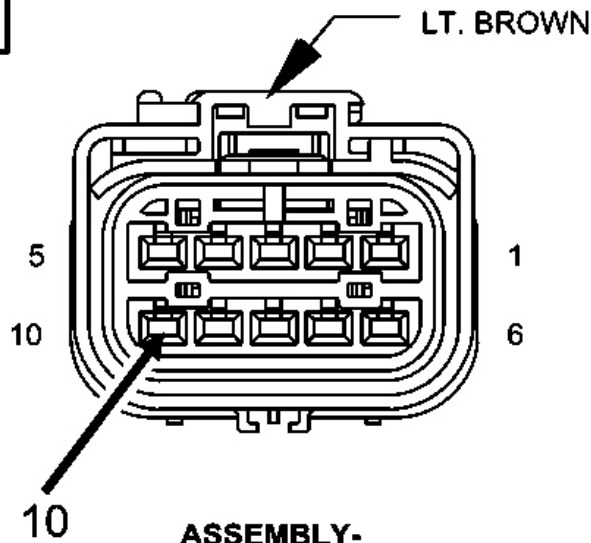
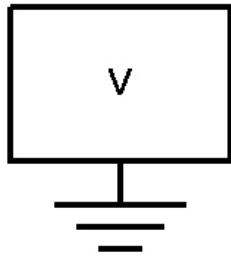
Repair the (T47) 2/4 Pressure Switch Sense circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

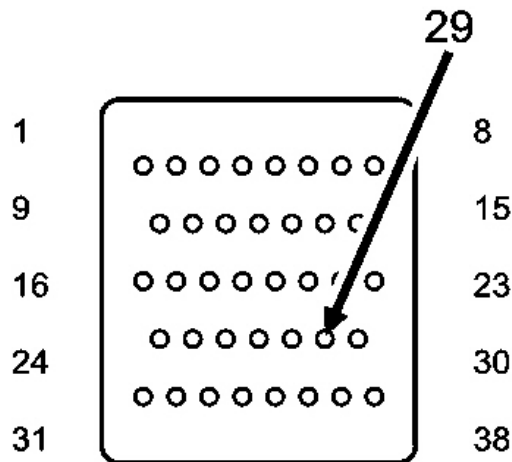
No

Go To 4.

4. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ac523

Fig. 86: Measuring Voltage Of (T50) L/R Pressure Switch Sense Circuit
Courtesy of CHRYSLER LLC

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring and connectors while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

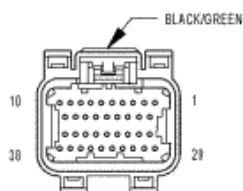
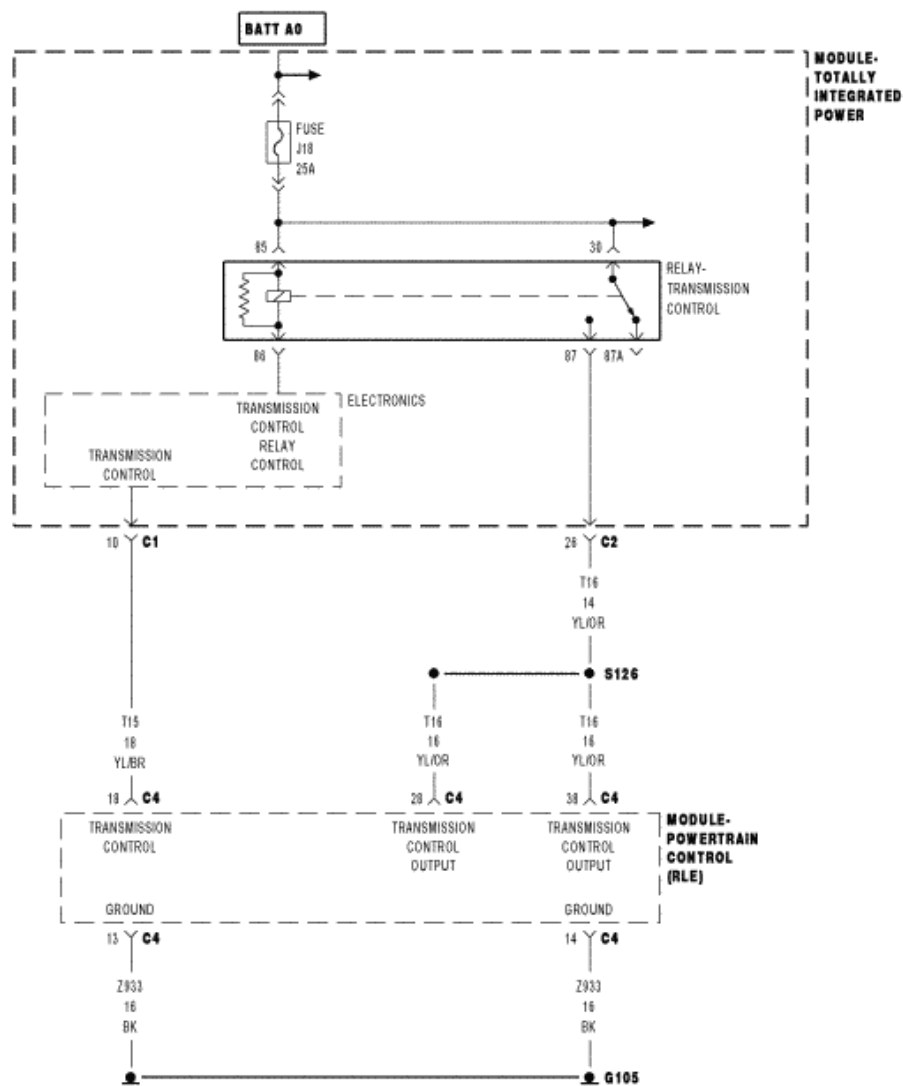
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

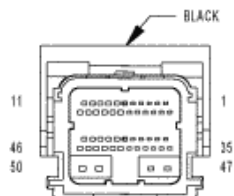
Test Complete.

P0891-TRANSMISSION RELAY ALWAYS ON

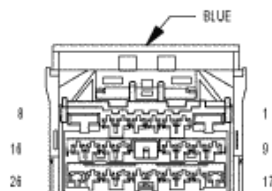
Circuit Schematic



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**



**MODULE-
TOTALLY
INTEGRATED
POWER C1**



**MODULE-
TOTALLY
INTEGRATED
POWER C2**

01a04051

Fig. 87: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Transmission Control Output circuit is used to supply power to the Transmission Solenoid/Pressure Switch Assembly and to the PCM when in normal operating mode. The purpose of the Transmission Output circuit is to allow the Transmission Control System to turn off the power to the Transmission Solenoid/TRS Assembly in the event that the transmission should need to be placed into limp-in mode due to a DTC.

After a PCM reset, (ignition switch turned to the run position, or after cranking the engine) the Transmission Control System verifies that the Transmission Output circuit is open by checking for voltage on the Transmission Output circuits before the Transmission Control System request for the circuit to be powered up. The request is sent by a direct circuit control from the PCM to the TIPM. If voltage is detected on the Transmission Output circuits before the request is sent, the DTC will set.

Monitor Conditions

When Monitored:

When the ignition is turned from "OFF" position to "RUN" position and/or the ignition is turned from "START" position to "RUN" position.

Set Conditions

- Set Condition:**

This DTC is set if the Powertrain Control Module senses greater than 3.0 volts on the Transmission Control Relay Output circuits prior to a request from the PCM to TIPM to energize the Transmission Output circuits.

Possible Causes

Possible Causes
TIPM DTCS PRESENT
TRANSMISSION CONTROL RELAY
(T15) TRANSMISSION CONTROL CIRCUIT SHORT TO VOLTAGE
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT VOLTAGE
TRANSMISSION SOLENOID/TRS ASSEMBLY
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR TCM TIPM DTCS**

With the scan tool under TIPM, check for TCM Power Control circuit DTCs.

Are there any TIPM TCM Power Control circuit DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 2.

2. CHECK TO SEE IF DTC P0891 IS CURRENT

With the scan tool, check the STARTS SINCE SET counter.

NOTE: **This counter only applies to the last DTC set.**

Is the STARTS SINCE SET counter set to 0?

Yes

Go To 3.

No

Go To 7.

3. TRANSMISSION CONTROL RELAY

Turn the ignition off to the lock position.

NOTE: **Due to different power control configurations, the Transmission Control Relay may be referred to as a PCM relay.**

Remove the Transmission Control Relay.

NOTE: **Check connectors - Clean/repair as necessary.**

Install a substitute relay in place of the Transmission Control Relay.

Ignition on, engine not running.

Does the DTC reset?

Yes

Go To 4.

No

Replace the Transmission Control Relay.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

4. (T16) TRANSMISSION OUTPUT CIRCUIT SHORT TO VOLTAGE

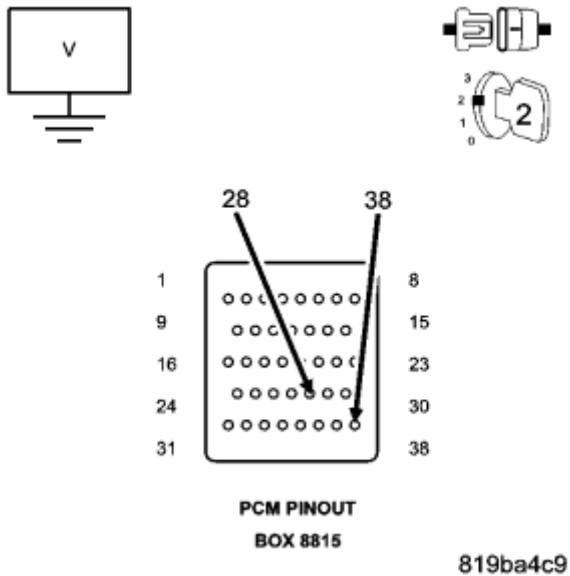


Fig. 88: Measuring Voltage Of (T16) Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

Disconnect the TIPM C2 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

Is the voltage above 0.5 volts on any (T16) Transmission Control Output circuit?

Yes

Go To 5.

No

Go To 6.

5. CHECK THE TRANSMISSION SOLENOID/PRESSURE SWITCH ASSEMBLY

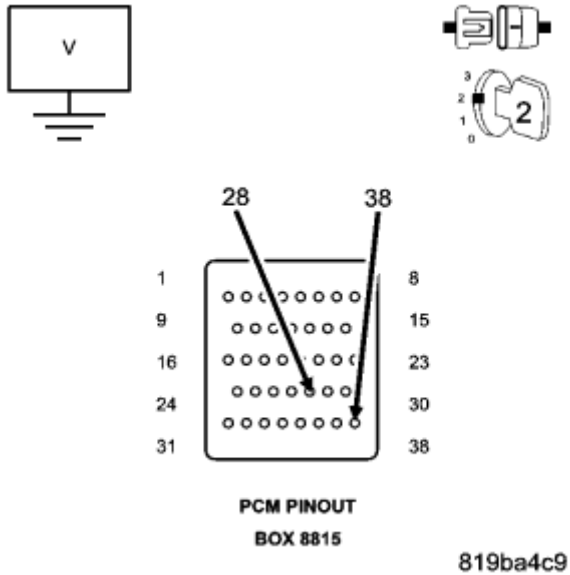


Fig. 89: Measuring Voltage Of (T16) Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Ignition on, engine not running.

Measure the voltage of the (T16) Transmission Control Output circuits in the Miller tool #8815.

Is the voltage above 0.5 volts?

Yes

Repair the (T16) Transmission Control Output circuit for a short to voltage.

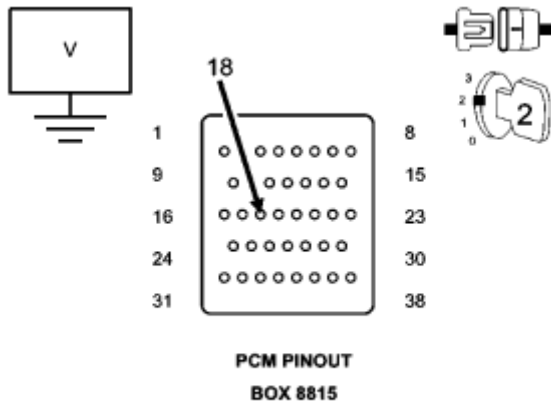
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Transmission Solenoid/Pressure Switch Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK THE (T15) TRANSMISSION CONTROL CIRCUIT FOR A SHORT TO VOLTAGE



8165fde7

Fig. 90: Checking Transmission Control Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Measure the voltage of the (T15) Transmission Control circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T15) Transmission Control circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

7. **CHECK WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0897-TRANSMISSION FLUID DETERIORATED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

To prevent a bump due to A/C clutch engagement, a temporary torque converter partial EMCC condition is established prior to A/C clutch engagement. A message is received over the bus indicating that A/C clutch engagement is imminent. Partial EMCC is then established and a reply message, "OK to engage A/C clutch" is sent via the bus. Partial EMCC will be held for 450 ms before returning to full EMCC. During the transition from full to partial EMCC, a turbine acceleration sum is calculated, if this value exceeds a threshold value for several transitions, degraded transmission fluid is indicated.

Monitor Conditions

When Monitored:

Each transition from full EMCC to partial EMCC for A/C bump prevention.

Set Conditions

- Set Condition:**

DTC set if 20 occurrences of a turbine acceleration sum. Fault Set Time: 20 transitions from full EMCC to partial EMCC. Transmission will not use partial EMCC. Established for A/C bump prevention.

Possible Causes

Possible Causes
WORN OUT/ BURNT TRANSAXLE FLUID

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. WORN OUT/ BURNT TRANSMISSION FLUID

Turn the ignition off to the lock position.

Flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information.

NOTE: The Transmission Cooler must be flushed before proceeding.

Allow the engine to idle for 10 minutes, in Park.

Turn the ignition off to the lock position.

Again, flush the Transmission Oil Cooler and lines, replace the Transmission Oil Filter, refill with new Transmission Fluid, start the engine, and adjust the fluid per the Service Information.

With the scan tool, perform a Battery Disconnect.

NOTE: The Battery Disconnect must be done to re-enable EMCC during an A/C Clutch engagement.

NOTE: The vehicle may exhibit intermittent shudder during the first few hundred miles. The new Transmission Fluid will gradually penetrate the Torque Converter Clutch friction material and the shudder should disappear.

Erase the DTC and return the vehicle to the customer.

Did the DTC reset and/or does the vehicle still shudder after a few thousand miles?

Yes

Replace the Torque Converter per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0933-LINE PRESSURE SENSOR CIRCUIT PERFORMANCE

Circuit Schematic

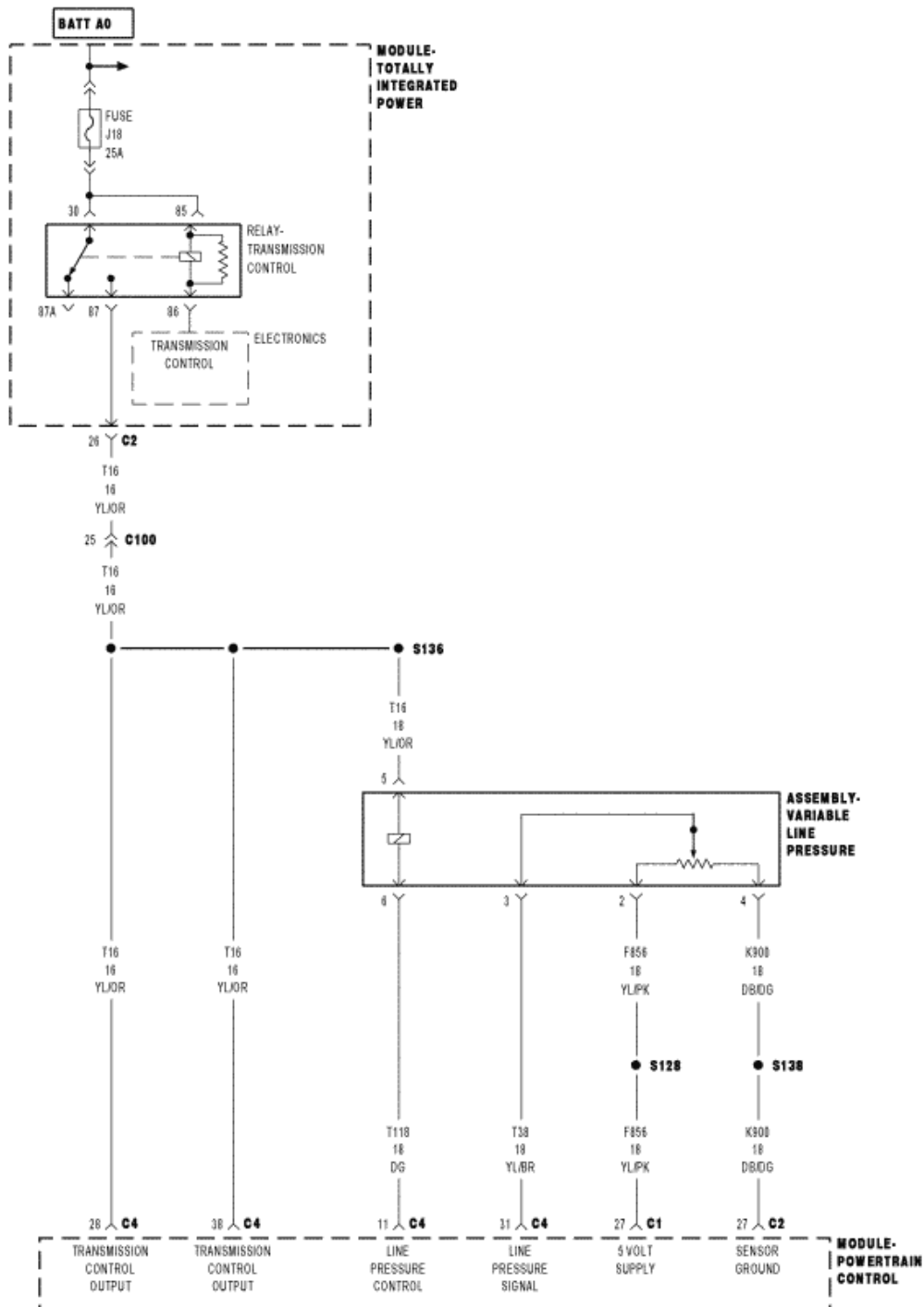


Fig. 91: Line Pressure Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 psi) during shifts and in Park and Neutral to ensure consistent shift quality.

Monitor Conditions

When Monitored:

Continuously with the ignition on, engine running, with the transmission in gear.

Set Conditions

- Set Condition:**

The PCM continuously monitors Actual Line Pressure and compares it to Desired Line Pressure. If the Actual Line Pressure reading is more than 172.4 kPa (25 psi) higher than the Desired Line Pressure, but is less than the highest Line Pressure ever used in the current gear, the DTC sets.

Possible Causes

Possible Causes
RELATED DTC'S PRESENT LINE PRESSURE CONNECTOR AND WIRING INTERNAL TRANSMISSION POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. DETERMINING IF RELATED DTCS ARE PRESENT

With the scan tool, check for other transmission DTCs.

Are there any other line pressure related DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom. Perform the test for P0934 and/or P0935 first if present.

No

Go To 2.

2. COMPARE ACTUAL LINE PRESSURE TO DESIRED LINE PRESSURE

CAUTION: Apply Parking Brake

Start the engine.

CAUTION: Firmly apply the brakes.

With the scan tool, monitor the Line Pressure, Desired Line Pressure and the TPS degrees.

While firmly applying the brakes, place the shifter in Reverse, then slowly press the accelerator pedal to a TPS degree of 15°.

Compare the Line Pressure reading to the Desired Line Pressure reading on the scan tool.

Does the Line Pressure stay within ± 34 kPa or 5 psi of the Desired Line Pressure?

No

Go To 3.

Yes

Go To 5.

3. CHECK LINE PRESSURE CONNECTOR AND WIRING

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure Sensor voltage while wiggling the wiring harness and connectors pertaining to the Line Pressure Sensor/Variable Force Solenoid Assembly.

Did the voltage remain steady while wiggling the wiring harness and connectors?

Yes

Go To 4.

No

Disconnect and properly reconnect the Line Pressure Sensor/Variable Force Solenoid Assembly

connector. Inspect terminals and repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

4. CHECK PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

With the Transmission Simulator select the "OFF" position on the "Input/Output Speed" switch.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure during the following step.

With the Transmission Simulator, turn the selector switch to each of the 3 Line Pressure positions.

NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.

Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Repair internal transmission and inspect the oil pump per **42RLE - SERVICE INFORMATION** and replace if necessary. If no problems are found, replace the Line Pressure Sensor/Variable Force Solenoid Assembly - possible cause is the Pressure Control Solenoid is stuck.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

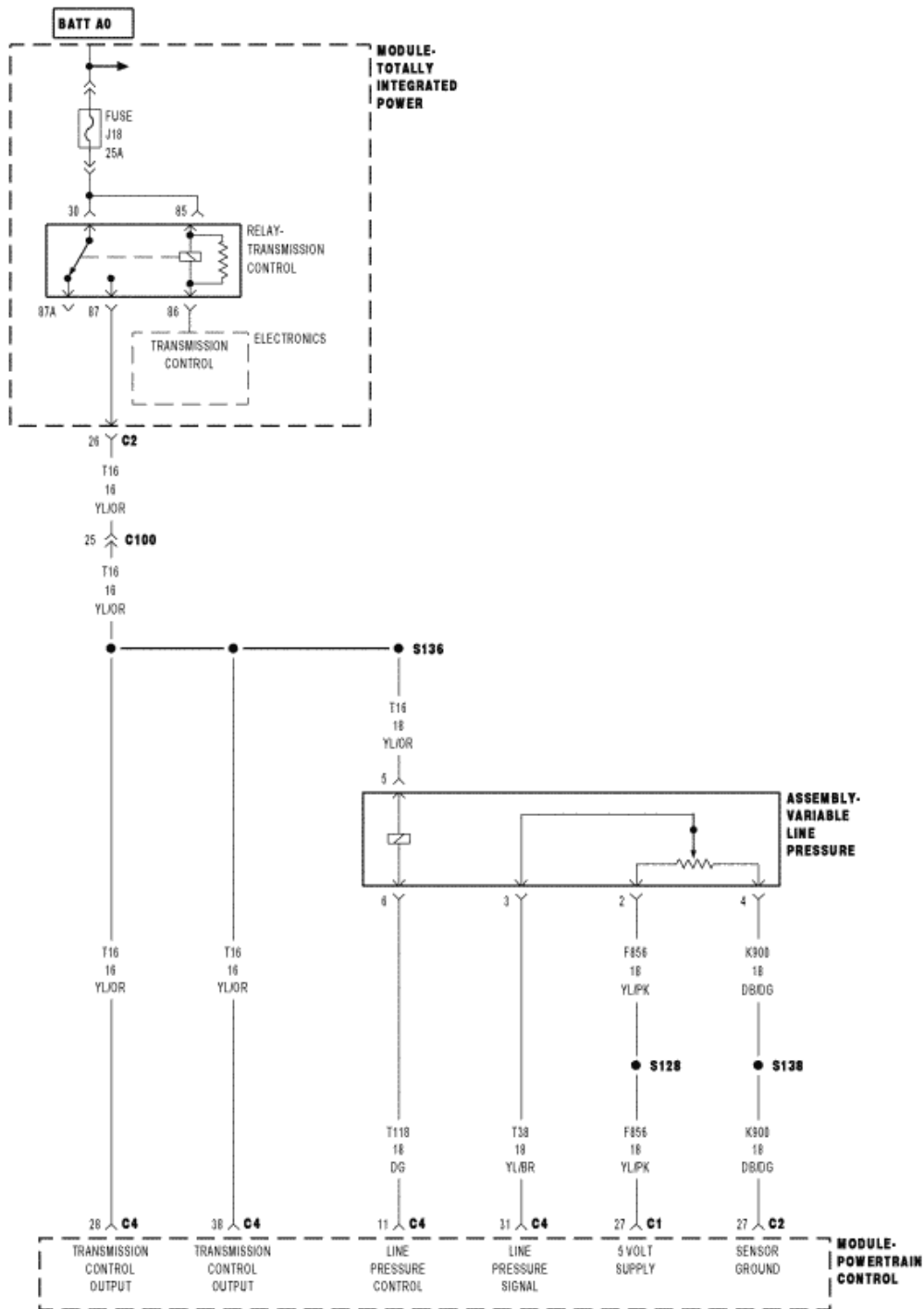
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0934-LINE PRESSURE SENSOR CIRCUIT LOW

Circuit Schematic



01942600

Fig. 92: Line Pressure Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 PSI) during shifts and in Park and Neutral to ensure consistent shift quality.

The monitored Line Pressure Sensor voltage should always be between 0.35 and 4.75 volts. Any monitored voltages outside these parameters indicate a Line Pressure Sensor or wiring problem and will cause either DTC P0934 or P0935 to set.

Monitor Conditions

When Monitored:

Continuously with the ignition on and engine running.

Set Conditions

- Set Condition:**

This DTC will set when the monitored Line Pressure Sensor voltage is less than or equal to 0.35 volts for 0.18 seconds.

Possible Causes

Possible Causes
(F856) 5-VOLT SUPPLY CIRCUIT OPEN
(F856) 5-VOLT SUPPLY CIRCUIT SHORT TO GROUND
(T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
LINE PRESSURE SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK IF DTC IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P0934.

NOTE: **This counter only applies to the last DTC set.**

Is the STARTS SINCE SET counter 2 or less?

Yes

Go To 2.

No

Go To 6.

2. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the from the TIPM.

CAUTION: Removal of the from the TIPM will prevent the vehicle from being started in gear.

WARNING: The must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, under Transmission Sensors, monitor the Line Pressure.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.

Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?

Yes

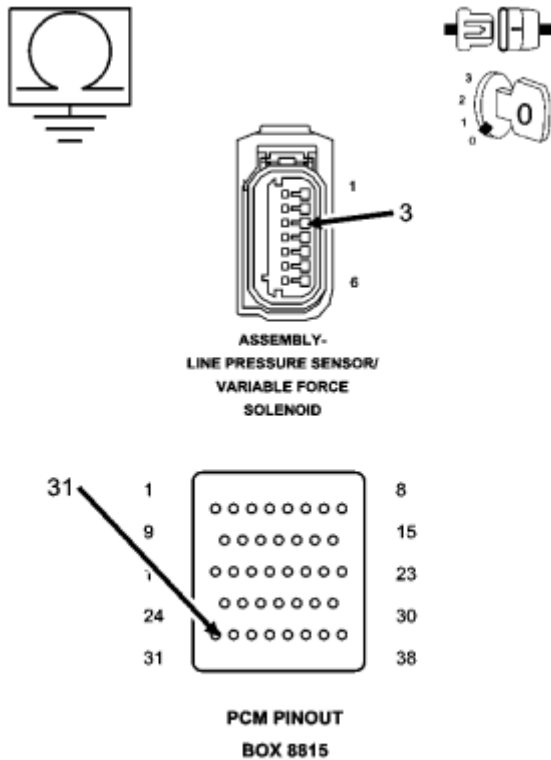
Replace the Line Pressure Sensor per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Go To 3.

3. CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND



8168ce0a

Fig. 93: Checking Line Pressure Sensor Signal Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance between ground and the (T38) Line Pressure Sensor Signal circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (T38) Line Pressure Sensor Signal circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 4.

4. **CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR AN OPEN**

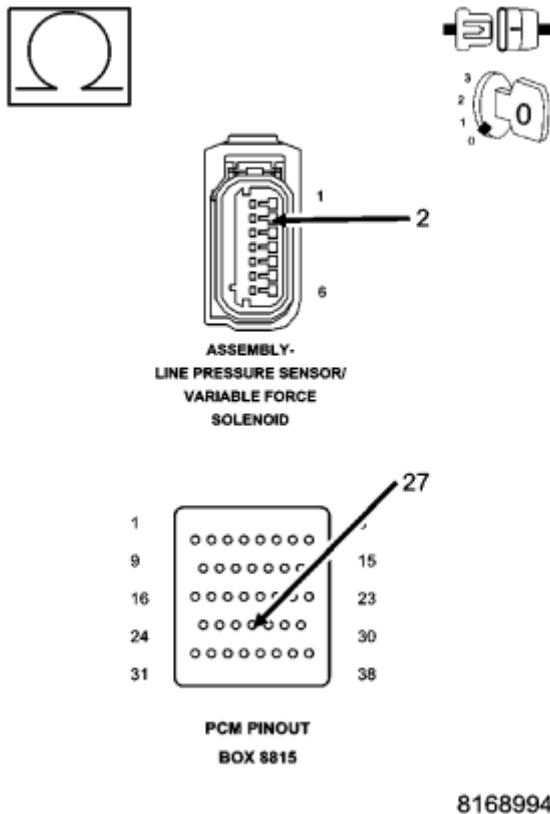


Fig. 94: Checking 5-Volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Disconnect the PCM C1 harness connector and connect Miller tool #8815.

Measure the resistance of the (F856) 5-volt Supply circuit between Line Pressure Sensor/Variable Force Solenoid Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance below 5.0 ohms?

Yes

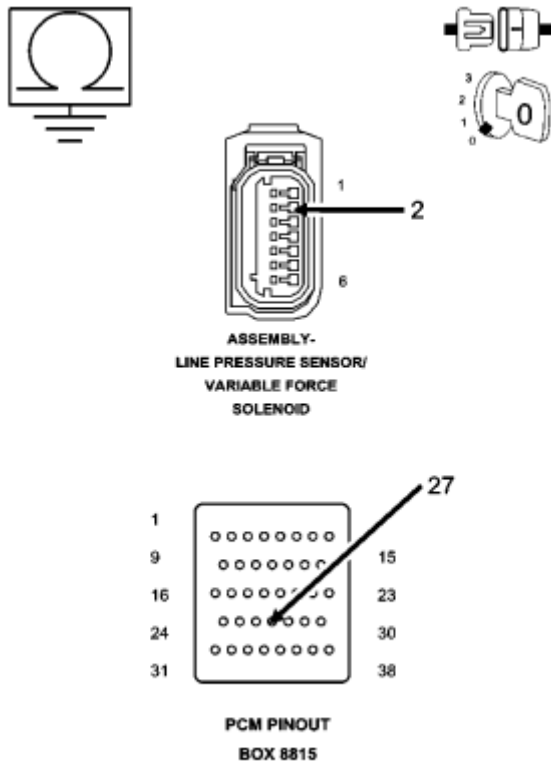
Go To 5.

No

Repair the (F856) 5-volt Supply circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. **CHECK THE (F856) 5-VOLT SUPPLY CIRCUIT FOR A SHORT TO GROUND**



81689ac2

Fig. 95: Checking 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the PCM C1 harness connector and connect Miller tool #8815.

Measure the resistance between ground and the (F856) 5-volt Supply circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (F856) 5-volt Supply circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

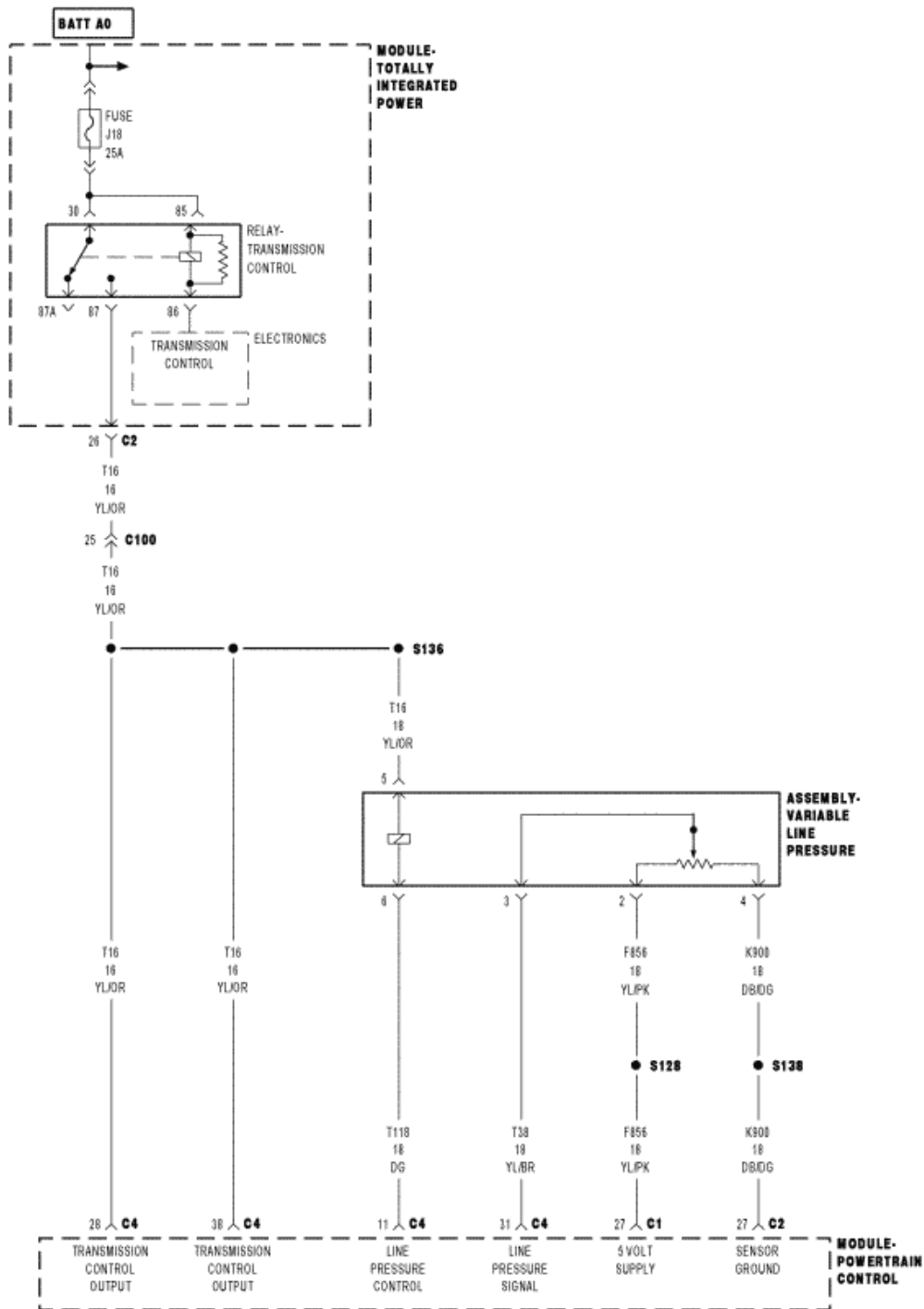
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P0935-LINE PRESSURE SENSOR CIRCUIT HIGH

Circuit Schematic



01942600

Fig. 96: Line Pressure Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Line pressure is electronically controlled by the Transmission Control System and is measured by the Line Pressure Sensor (LPS). The desired line pressure is continuously being compared to the actual line pressure and is regulated by electronically changing the duty cycle of the Pressure Control Solenoid (PCS). (5% duty cycle = solenoid off = max line pressure, 62% duty cycle = solenoid on = min line pressure).

The Transmission Control System calculates the desired line pressure based on inputs from the transmission and engine. A calculated torque input to the transmission is used as the primary input of the desired line pressure calculation and is called Torque Based Line Pressure. In addition, the line pressure is set to a preset level 827 to 931 kPa (120 to 135 PSI) during shifts and in Park and Neutral to ensure consistent shift quality.

The monitored Line Pressure Sensor voltage should always be between 0.35 and 4.75 volts. Any monitored voltages outside these parameters indicate a Line Pressure Sensor or wiring problem and will cause either DTC P0934 or P0935 to set.

Monitor Conditions

When Monitored:

Continuously with ignition on and engine running.

Set Conditions

- Set Condition:**

This DTC will set if the monitored Line Pressure Sensor voltage is greater than or equal to 4.75 volts for the period of 0.18 seconds

Possible Causes

Possible Causes
(T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT OPEN
(K900) SENSOR GROUND CIRCUIT OPEN
(T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
LINE PRESSURE SENSOR
POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. CHECK TO SEE IF DTC IS CURRENT

With the scan tool, Check the STARTS SINCE SET counter for P0935.

NOTE: **This counter only applies to the last DTC set.**

Is the STARTS SINCE SET counter 2 or less?

Yes

Go To 2.

No

Go To 6.

2. CHECK THE PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Relay.

Remove the from the TIPM.

CAUTION: Removal of the from the TIPM will prevent the vehicle from being started in gear.

WARNING: The must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the scan tool, monitor the Line Pressure.

Using the Transmission Simulator, set the rotary switch to each of the 3 line pressure positions.

NOTE: All three scan tool Line Pressure readings should be steady and ± 14 kPa or 2.0 psi of the reading specified on the Transmission Simulator.

Did the Line Pressure read within ± 14 kPa or 2.0 psi in all three positions?

Yes

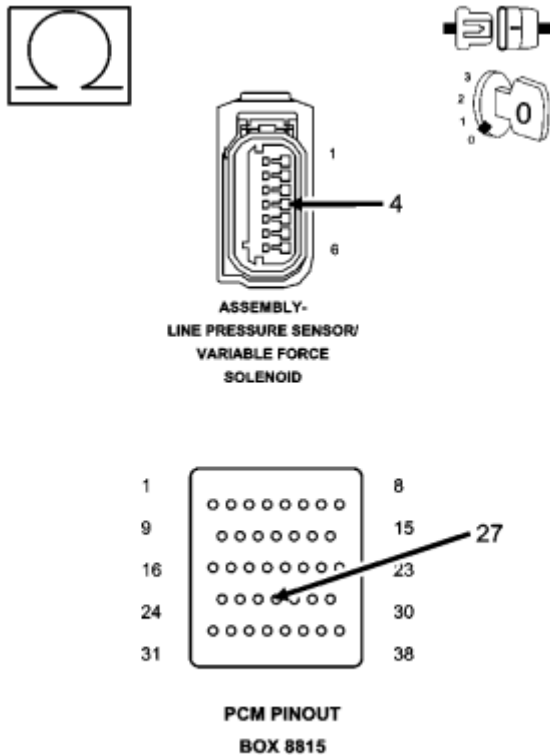
Replace the Line Pressure Sensor per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 3.

3. CHECK THE (K900) SENSOR GROUND CIRCUIT FOR AN OPEN



8168caac

Fig. 97: Checking Sensor Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Disconnect the PCM C2 harness connector and connect Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (K900) Sensor Ground circuit from the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector to the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

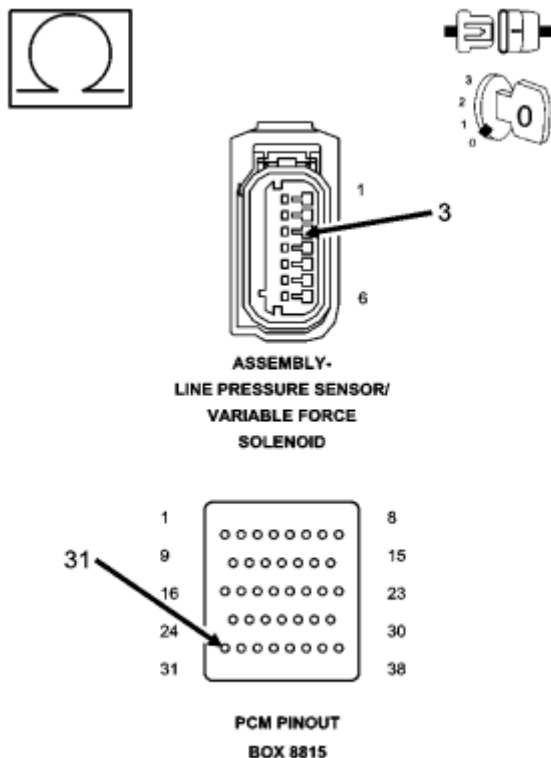
Repair the (K900) Sensor Ground circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 4.

4. **CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR AN OPEN**



8168ca63

Fig. 98: Checking Line Pressure Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the PCM C4 harness connector and connect Miller tool #8815.

Measure the resistance of the (T38) Line Pressure Sensor Signal circuit from the Line Pressure Sensor/Variable Force Solenoid Assembly harness connector to the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

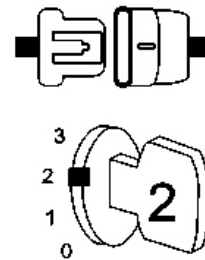
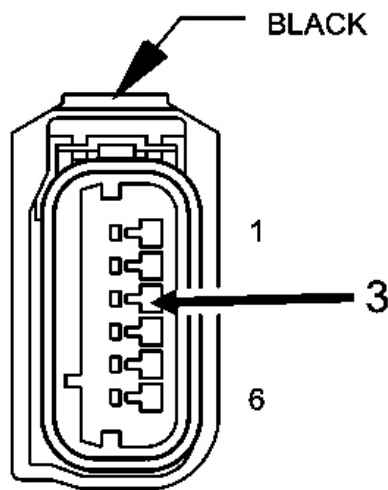
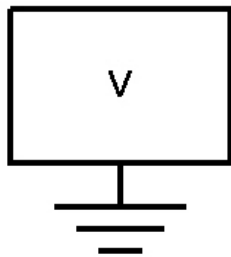
Repair the (T38) Line Pressure Sensor Signal circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

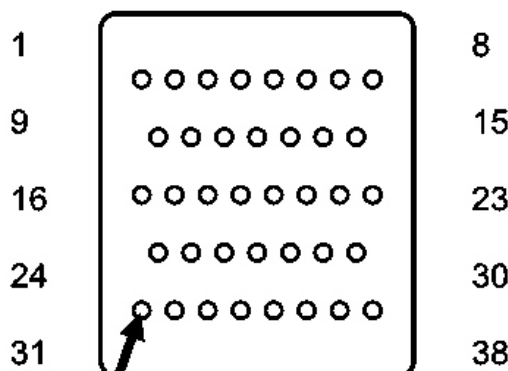
No

Go To 5.

5. **CHECK THE (T38) LINE PRESSURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**



**ASSEMBLY-
LINE PRESSURE
SENSOR/VARIABLE
FORCE SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ac7bd

Fig. 99: Measuring Voltage Of (T38) Line Pressure Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T38) Line Pressure Sensor Signal circuit.

Is the voltage above 5.5 volts?

Yes

Repair the (T38) Line Pressure Sensor Signal circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. CHECK WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Where there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Loss of Prime Test is used to prevent transmission defaults and erroneous fault codes during temporary loss of pump prime that may occur with low transmission fluid under severe braking conditions, start-up, etc. and to point towards more subtle problems such as a plugged or ruptured oil filter. The Loss of Prime fault is set by a loss of hydraulic pressure in the transmission system. This condition, if sustained, will result in the vehicle being unable to move.

Monitor Conditions

When Monitored:

Every 350 ms

Set Conditions

- Set Condition:**

If the transmission begins to slip in any forward gear, and the pressure switch or switches that should be closed for a given gear are open, a loss of prime test begins. All available elements (in 1st gear LR, 2/4 and OD, in 2nd, 3rd, and 4th gear 2/4 and OD) are turned on by the PCM to see if pump prime exists. The code is set if none of the pressure switches respond. The PCM will continue to run the loss of prime test until pump pressure returns. The vehicle will not move or the transmission will slip. Normal operation will continue if pump prime returns.

Possible Causes

Possible Causes
LOW TRANSMISSION FLUID LEVEL SHIFT LEVER POSITION PLUGGED TRANSMISSION FILTER TRANSMISSION OIL PUMP

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

Place the gear selector in Park.

Start the engine.

NOTE: **The Transmission Temperature must be at least 43° C (110° F) before**

performing the following steps.

The Transmission must be at operating temperature prior to checking pressure. Cold transmission fluid will result in higher pressure readings.

Place the Transmission in Reverse.

With the scan tool, observe the Transmission Pressure Switch states.

Are any of the Pressure Switches closed?

Yes

Go to 2.

No

Go to 4.

2. INTERMITTENT OPERATION

The conditions necessary to set this DTC are not present at this time.

Test drive the vehicle. Allow the Transmission to shift through all gears and ranges.

Was a delayed engagement and/or a no drive condition present during the test drive?

Yes

Go to 4.

No

Go to 3.

3. CHECK THE WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wiring while checking for shorted and open circuits.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

4. **SHIFT LEVER POSITION TEST**

With the scan tool, perform a Shift Lever Position test. Follow the instructions on the screen.

Did the Shift Lever Position Test pass?

Yes

Go to 5.

No

Perform the diagnostic procedure for P0706-TRANSMISSION RANGE SENSOR RATIONALITY.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. **CHECK FOR PLUGGED TRANSMISSION FILTER**

Remove the Transmission Pan and inspect the Transmission Fluid and Transmission Filter per the Service Information.

Does the Transmission Oil Pan contain excessive debris and/or is the Oil Filter plugged?

Yes

Repair the cause of the plugged Transmission Filter. Refer to **42RLE - SERVICE INFORMATION** for the proper repair procedure.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Transmission Oil Pump per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P0992-2/4/OD HYDRAULIC PRESSURE TEST

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Pressure switches are normally off or open (no pressure applied) and read high (+12 volts). When an element is

applied, the corresponding pressure switch closes to ground (0 volts) or turns on. The controller tests the OD and 2/4 pressure switches when they are off (when the corresponding friction element is not applied) by briefly applying the OD and 2/4 elements which will cause the corresponding pressure switch to close. The test verifies that the switches are operational and that the switch will close when the corresponding element is applied. If a switch fails to respond, it is re-tested. The MIL illuminates and the transmission system defaults to limp-in mode.

Monitor Conditions

When Monitored:

In any forward gear with engine speed above 1000 rpm, shortly after a shift and every minute thereafter.

Set Conditions

- **Set Condition:**

After a shift into a forward gear, with engine speed greater than 1000 rpm, the PCM momentarily turns on element pressure to the clutch circuits that do not have pressure to identify that the correct pressure switch closes. If the pressure switch does not close 2 times the DTC sets.

Possible Causes

Possible Causes
CONDITION P0992 PRESENT

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK IF THE DTC IS CURRENT**

NOTE: **The vehicle must be driven to set this DTC. The transmission must be at operating temperature with the Engine rpm above 1000 rpm.**

This DTC is an indication of both the 2/4 and the O/D Hydraulic Pressure Switch DTCs being present.

Perform the diagnostic procedures for both P0845 and P0870.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

If there are no possible causes remaining, view repair.

Repair

Refer to **DIAGNOSTIC CODE INDEX** and perform the diagnostic procedures for P0845 and

P128B-TCM POWER CONTROL CIRCUIT 2 LOW - TIPM

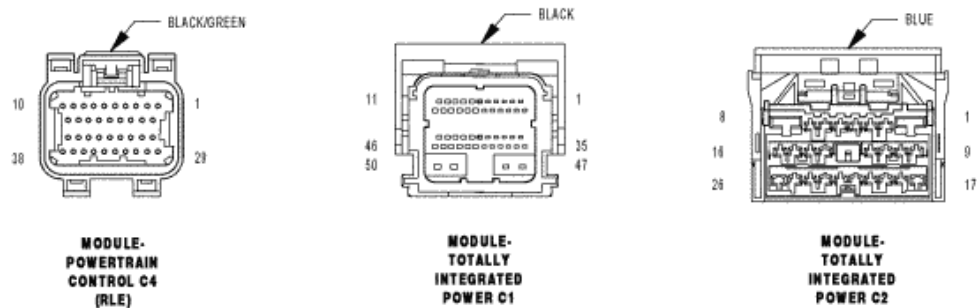
[illegible]

Fig. 100: Transmission Control Output Circuit Schematic

01-08-051

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

Set Conditions

- **Set Condition:**

A shorted condition is detected in the Transmission Control Output circuit.

Possible Causes

Possible Causes
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO GROUND
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **CHECK IF THE DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, check TIPM DTCs.

Is the status Active for this DTC?

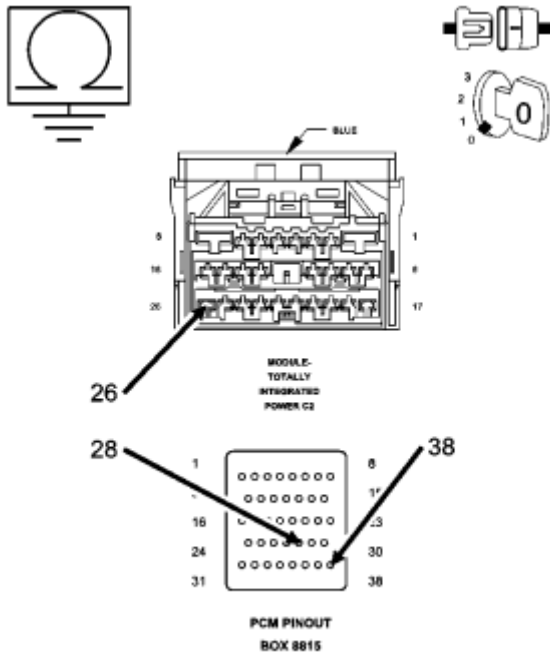
Yes

Go To 2.

No

Go To 5.

2. **CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO GROUND**



819bb5a7

Fig. 101: Measure Resistance Between Ground And Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C2 harness connector.

Disconnect the PCM C4 harness connector and install Miller tool #8815.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance between ground and the (T16) Transmission Control Output circuit.

Is the resistance below 5.0 ohms?

Yes

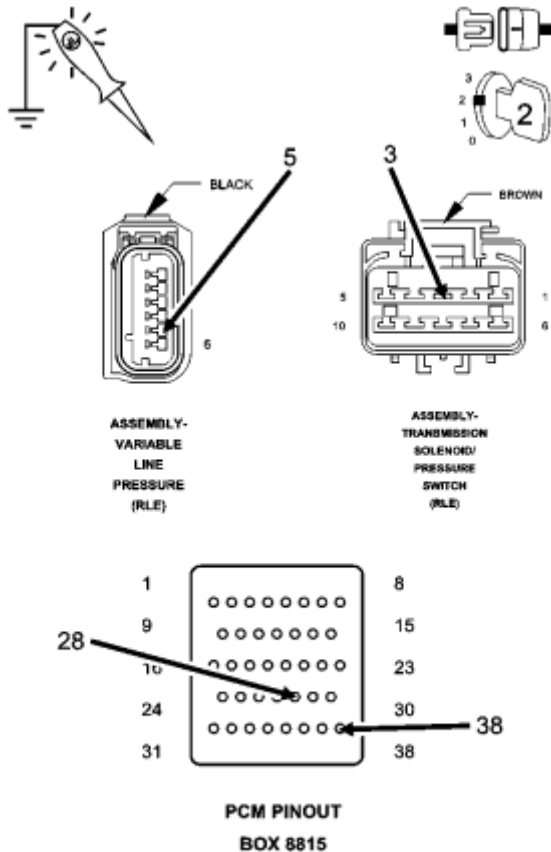
Repair the (T16) Transmission Control Output circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go to 3.

3. CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN



819b5f73

Fig. 102: Checking (T16) Transmission Control Output Circuits
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Reconnect the TIPM C2 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid harness connector (if equipped).

Ignition on, engine not running.

Using the scan tool under the TIPM Actuators, actuate the Transmission.

Using a 12-volt test light connected to ground, check the (T16) Transmission Control Output circuits.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly at all the (T16) Transmission Control Output circuits?

Yes

Go To 4.

No

Repair the (T16) Transmission Control Output circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

4. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.

Check the TIPM harness connector terminals for corrosion, damage, or terminal push out.

Pay particular attention to all power and ground circuits.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Totally Integrated Power Module per Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test complete.

P128C-TCM POWER CONTROL CIRCUIT 2 HIGH - TIPM

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

Set Conditions

- **Set Condition:**

A shorted condition is detected in the TIPM TCM Power control circuit.

Possible Causes

Possible Causes
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO VOLTAGE TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **CHECK IF THE DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, read TIPM DTCs.

Is the status Active for this DTC?

Yes

Go To 2.

No

Go To 4.

2. **(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT SHORT TO VOLTAGE**

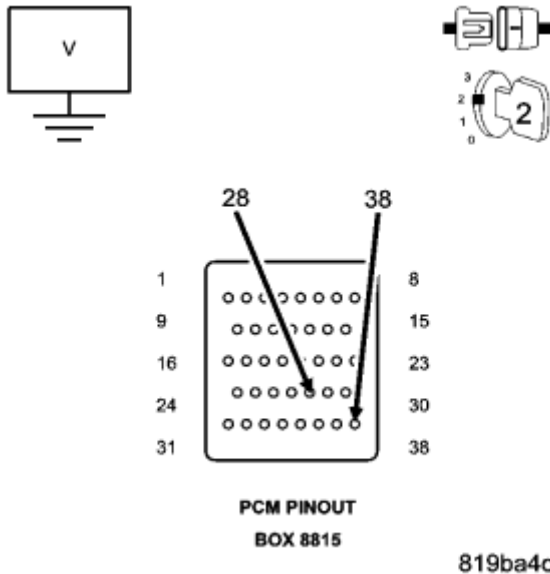


Fig. 104: Measuring Voltage Of (T16) Transmission Control Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C10 harness connector.

Disconnect the PCM C4 harness connector.

Measure the voltage of the (T16) Transmission Control Output circuit.

Is the voltage above 10.0 v?

Yes

Repair the (T16) Transmission Control Output circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 3.

3. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.

Check the TIPM harness connector terminals for corrosion, damage, or terminal push out.

Pay particular attention to all power and ground circuits.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Totally Integrated Power Module per Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test complete.

P128D-TCM POWER CONTROL CIRCUIT 2 OPEN - TIPM

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

Set Conditions

- **Set Condition:**

An open condition of the Transmission Control Output circuit is detected by the Totally Integrated Power Module (TIPM).

Possible Causes

Possible Causes
(T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **CHECK IF THE DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, select View DTCs.

Is the status Active for this DTC?

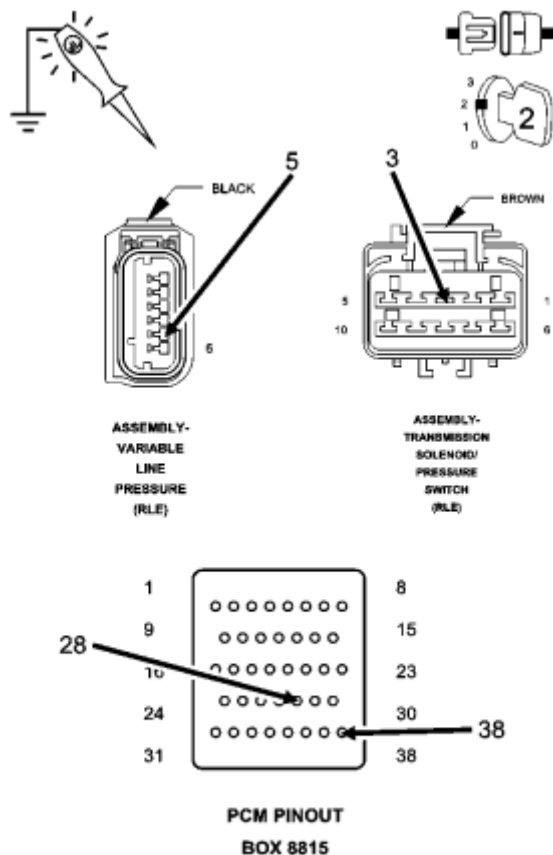
Yes

Go To 2.

No

Go To 4.

2. **CHECK THE (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT FOR AN OPEN**



819b5f73

Fig. 106: Checking (T16) Transmission Control Output Circuits
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector and install Miller tool #8815.

Disconnect the Transmission Solenoid harness connector.

Disconnect the Line Pressure Sensor/Variable Force Solenoid harness connector (if equipped).

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Ignition on, engine not running.

Using the scan tool under the TIPM Actuators, actuate the Transmission.

Using a 12-volt test light connected to ground, check the (T16) Transmission Control Output circuits.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Go To 3.

No

Repair the (T16) Transmission Control Output circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. TOTALLY INTEGRATED POWER MODULE

Using the schematics as a guide, inspect the wire harness and connectors.

Check the TIPM harness connector terminals for corrosion, damage, or terminal push out.

Pay particular attention to all power and ground circuits.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Replace the Totally Integrated Power Module per Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

No

Test complete.

P128E-TCM POWER CONTROL CIRCUIT 2 OVERCURRENT - TIPM

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

Set Conditions

- **Set Condition:**

An overcurrent condition is detected in the TCM Power Control circuit. One Trip Fault. Three good trips to turn off the MIL.

Possible Causes

Possible Causes
LINE PRESSURE SENSOR VARIABLE FORCE SOLENOID SOLENOID/PRESSURE SWITCH ASSEMBLY POWERTRAIN CONTROL MODULE (PCM) TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **CHECK IF THE DTC IS ACTIVE**

Ignition on, engine not running.

With a scan tool, read TIPM DTCs.

Is the DTC active at this time?

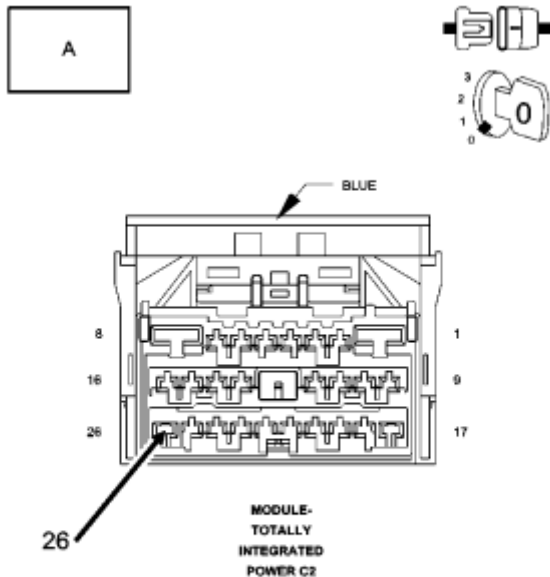
Yes

Go To 2.

No

Go To 5.

2. **CHECK THE (T16) TRANSMISSION CONTROL OUTPUT**



819bb7af

Fig. 108: Checking Transmission Control Output
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C2 harness connector.

Connect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C2 harness connector.

Read the amperage on the ammeter.

Does the amperage read below 2.0 amps?

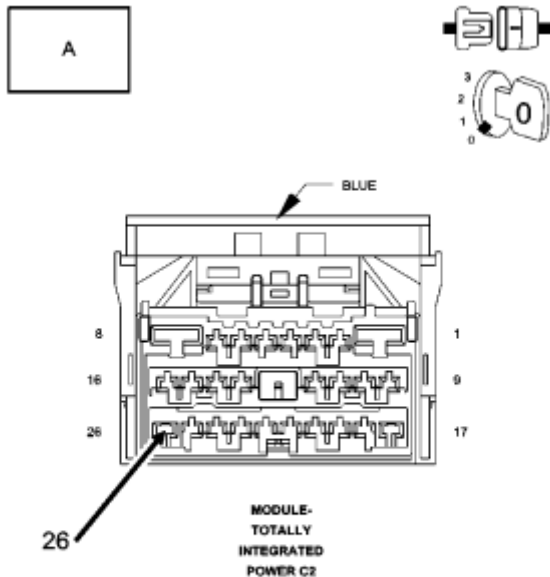
Yes

Go To 4.

No

Go To 3.

3. CHECK THE PCM



819bb7af

Fig. 109: Checking Transmission Control Output
Courtesy of CHRYSLER LLC

Disconnect the ammeter from the TIPM C2 harness connector and battery positive.

Disconnect the PCM C4 harness connector.

Reconnect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C2 harness connector.

Read the amperage on the ammeter.

Does the amperage read below 2.0 amps?

Yes

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 4.

4. CHECK THE TRANSMISSION SOLENOIDS

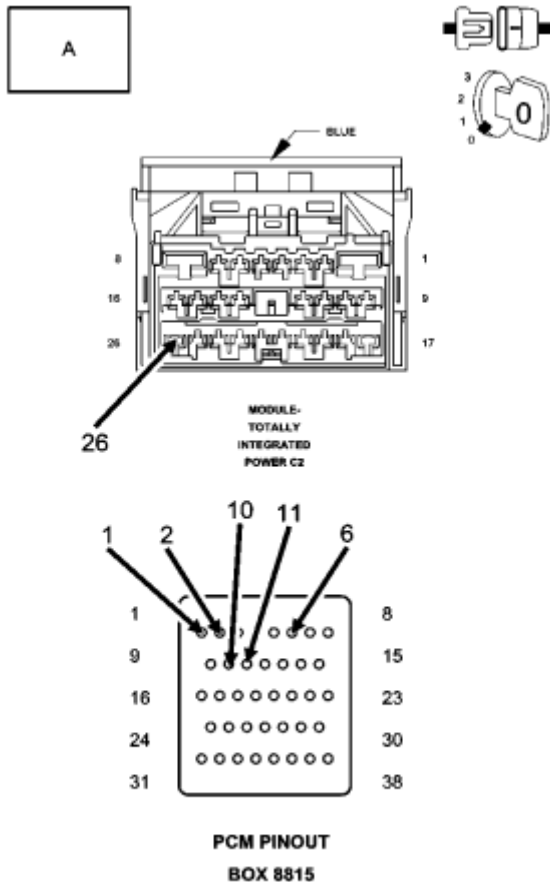


Fig. 110: Checking Transmission Solenoids
Courtesy of CHRYSLER LLC

Disconnect the ammeter from the TIPM C2 harness connector.

Disconnect the PCM C4 harness connector and install Miller tool #8815.

Connect the positive probe of an ammeter to battery positive and connect the negative probe to the (T16) Transmission Control Output circuit in the TIPM C2 harness connector.

While monitoring the amperage reading of the ammeter and using a jumper wire, jump each solenoid control circuit to ground one at a time in the appropriate terminals of Miller tool #8815.

NOTE: The amperage draw should be approximately .02 milliampere on each solenoid circuit with the PCM C4 harness connector disconnected.

Does the amperage read between .05 and .015 milliampere $\pm$.005 milliampere on each solenoid tested?

Yes

Replace the Totally Integrated Control Module per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Depending on the identified circuit in the test, replace either Transmission Solenoid/Pressure Switch Assembly or the Line Pressure Solenoid (if equipped) per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

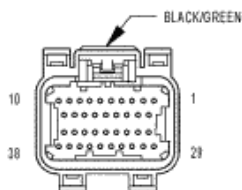
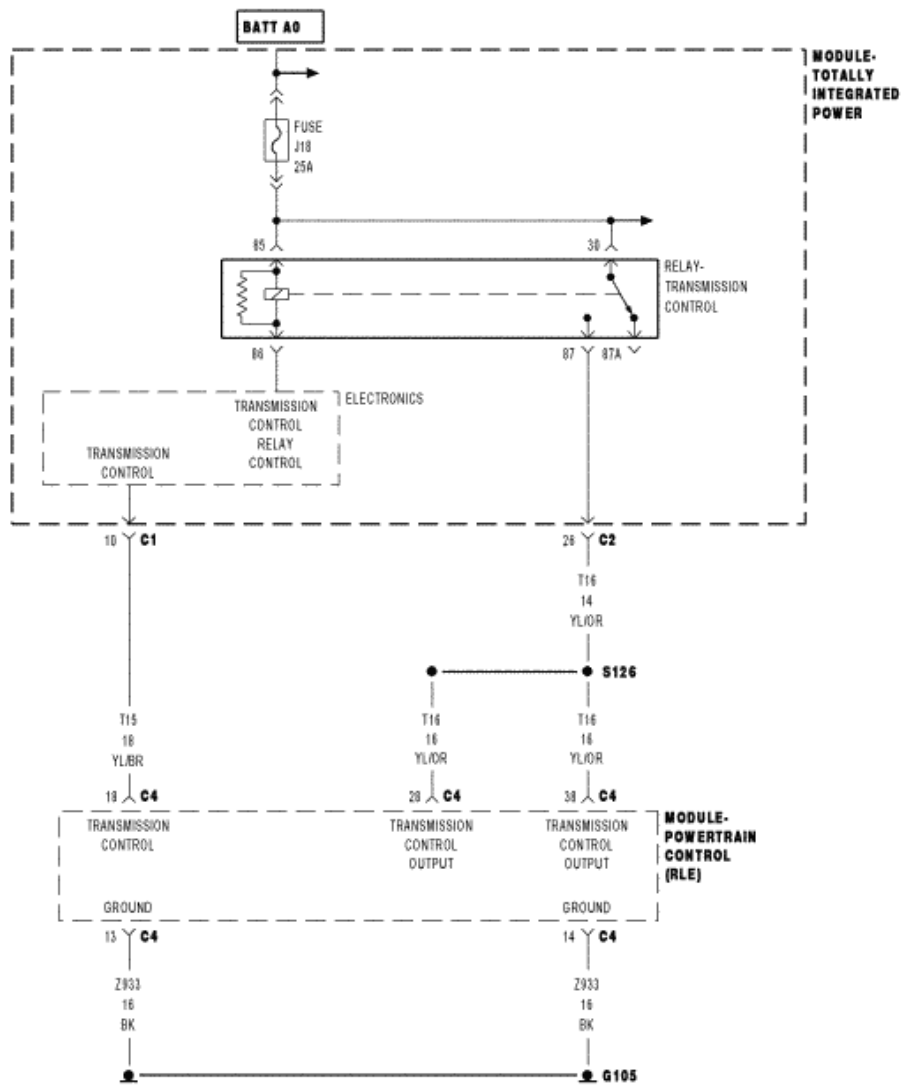
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

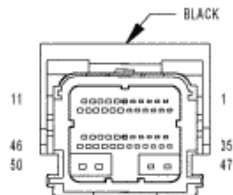
Test Complete.

P1684-BATTERY WAS DISCONNECTED

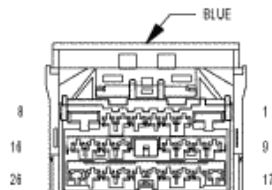
Circuit Schematic



**MODULE-
POWERTRAIN
CONTROL C4
(RLE)**



**MODULE-
TOTALLY
INTEGRATED
POWER C1**



**MODULE-
TOTALLY
INTEGRATED
POWER C2**

0100051

Fig. 111: Transmission Control Output Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Note: This is not a fault code. It exists to provide reference information only. A battery backed RAM is used to maintain some learned values. When the battery is disconnected, this memory is lost. When the battery is reconnected, the loss of learned values will be detected by the controller. The code will be set and the learned values will be initialized to known constants and the learning process will continue. Setting the code has no effect except for re-initialization of learned values.

Monitor Conditions

When Monitored:

After a reset (ignition key turned to the RUN position).

Set Conditions

- **Set Condition:**

The checksum of the battery backed RAM does not match the stored checksum. Set Time: Less than 7 ms.

Possible Causes

Possible Causes
BATTERY WAS DISCONNECTED PCM WAS REPLACED OR DISCONNECTED QUICK LEARN WAS PERFORMED (A209) FUSED B+ CIRCUIT TO PCM OPEN (Z933) GROUND CIRCUIT(S) OPEN

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **BATTERY WAS DISCONNECTED**

Has the battery been disconnected, lost its charge, or been replaced recently?

Yes

Disconnecting or replacing the battery will set this DTC. Erase the DTC.
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 2.

2. **CHECK IF THE QUICK LEARN WAS PERFORMED**

Has a Quick Learn procedure been performed?

Yes

Performing Quick Learn will set this DTC. Erase the DTC.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 3.

3. PCM REPLACED OR DISCONNECTED

Has the PCM been replaced or disconnected?

Yes

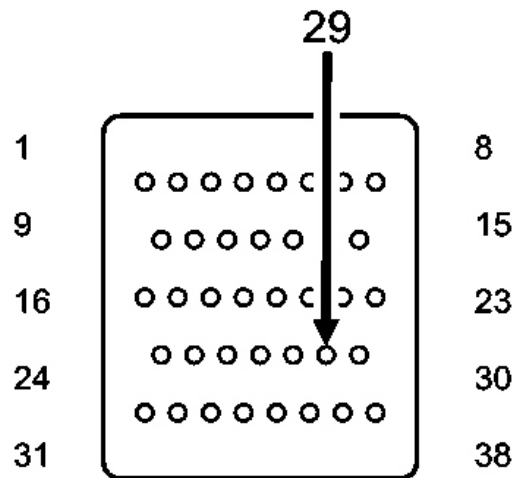
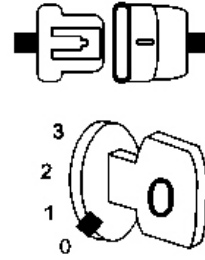
Replacing or disconnecting the PCM will set this DTC. Erase the DTC.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 4.

4. (A209) FUSED B(+) CIRCUIT



**PCM PINOUT
BOX 8815**

812ac99e

Fig. 112: Checking Fused B+ Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C1 harness connector.

NOTE: Check connectors - Clean/repair as necessary.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground, check the (A209) Fused B(+) circuit.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

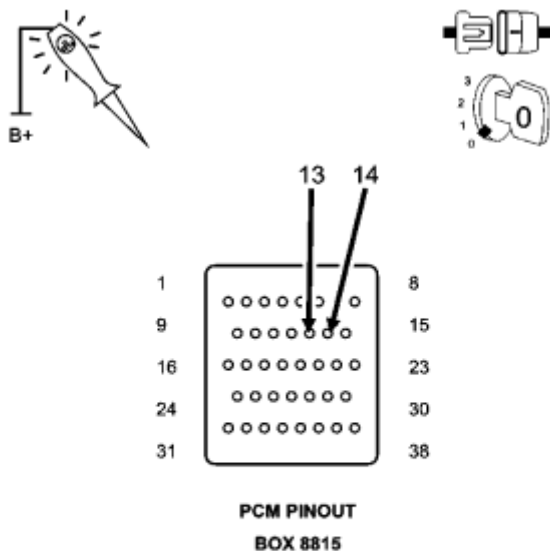
Go To 5.

No

Repair the Fused B+ circuit for an open. If the fuse is open make sure to check for a short to ground.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

5. (Z933) GROUND CIRCUITS



8199cef7

Fig. 113: Checking (Z933) Ground Circuits In Appropriate Terminals Of Miller Tool #8815

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

NOTE: Check connectors - Clean/repair as necessary.

Using a 12-volt test light connected to 12-volts, check the (Z933) Ground circuits in the appropriate terminal of Miller tool #8815.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly for all of the ground circuits?

Yes

Go To 6.

No

Repair the Ground circuits for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P1713-RESTRICTED MANUAL VALVE IN T2 RANGE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on, engine running with the gear shift selector in a valid forward gear.

Set Conditions

- **Set Condition:**

This DTC sets whenever Transmission control system detects the manual valve is in the T2 range when it should be in OD. This is mainly an informational DTC.

Possible Causes

Possible Causes
RELATED TRANSMISSION DTCS PRESENT CUSTOMER DRIVING HABITS MIS-ADJUSTED SHIFTER CABLE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **DETERMINING IF RELATED DTCS ARE PRESENT**

With the scan tool, check for other transmission DTCS.

Are there any speed sensor or gear ratio DTCS present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go to 2.

2. **CHECK THE GEAR SHIFT CABLE FOR PROPER ADJUSTMENT**

Check the Gear shift cable adjustment per the Service Information.

Also check the cable for possible binding or improperly routed.

Is the Gear shift cable properly adjusted and not binding or improperly routed?

Yes

Go to 3.

No

Adjust the Shifter Assembly per the Service Information.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. CHECK CUSTOMER DRIVING HABIT

This DTC can be set if the customer does not move the shift lever completely into the OD position (in between gears) causing the manual valve to be in the T2 position.

When this occurs, the feed port to the clutch is restricted, the transmission will declare Neutral, and this DTC will set.

This DTC can also be set by simply bumping the shift lever toward Neutral while accelerating.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

If there are no possible causes remaining, view repair.

Repair

This DTC can be set by the shift lever in the wrong position or not completely in the OD position. Make sure the customer is properly informed.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P1745-TRANSMISSION LINE PRESSURE TOO HIGH FOR TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This DTC is an informational DTC to inform the technician that transmission has been operating in an open-loop line pressure control for 3220 kilometers (2000 miles) or 1000 2-3 upshifts resulting from a Line Pressure DTC. The 42RLE Transmission is not designed to operate in open-loop line pressure control for an extended period time. This DTC is intended to protect the transmission. If the DTC sets, the transmission controller will place the transmission into limp-in mode.

Monitor Conditions

When Monitored:

Continuously with ignition on.

Set Conditions

- **Set Condition:**

If the transmission has been operating in an open-loop line pressure control for 3220 kilometers (2000 miles) or 1000 2-3 upshifts.

Possible Causes

Possible Causes
LINE PRESSURE DTCS PRESENT

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK FOR RELATED DTCS**

With the scan tool, check for Transmission Line Pressure DTCS.

NOTE: In order to erase this DTC you must reset (erase) the VLP Shift Counter and the Output tooth counter which is a single procedure under Miscellaneous functions in the scan tool called "Clear Variable Line Pressure (VLP) counters".

View repair

Repair

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom. See **DIAGNOSIS AND TESTING**.

P1775-SOLENOID SWITCH VALVE LATCHED IN TCC POSITION

Circuit Schematic

The Solenoid Switch Valve, an internal, hydraulically operated valve, controls the direction of the transmission fluid when the LR solenoid is energized. When the solenoid switch valve is in the downshifted position and the LR solenoid is energized, fluid is directed to the LR element for 1st gear. When the solenoid switch valve is In the up-shifted position (2nd, 3rd, and 4th gear) and the LR solenoid is energized, fluid is directed into the Lockup Switch Valve which controls the Torque Converter Clutch. When shifting into 1st gear, a special sequence is followed to insure solenoid switch valve movement into the downshifted position. The LR pressure switch is monitored to confirm switch valve movement. If the solenoid switch valve movement is not confirmed (i.e. no LR pressure when the LR solenoid is energized), 2nd gear is substituted for 1st. No 1st gear (2nd gear is substituted). The transmission Torque converter FEMCC operation is inhibited. MIL on after 5 min. of substituted operation.

Monitor Conditions

When Monitored:

Prior to a shift into 1st gear.

Set Conditions

- Set Condition:**

Transmission temperature must be hot. DTC is set after six unsuccessful attempts to shift into 1st gear.

Possible Causes

Possible Causes
RELATED DTC P0841 PRESENT (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE INTERNAL TRANSMISSION POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. DETERMINING IF RELATED DTCS ARE PRESENT

With the scan tool, check for other Transmission DTCs.

Is the DTC P0841 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 2.

2. CHECK TO SEE IF DTC P1775 IS CURRENT

With the scan tool, view DTCs.

Is the status Active for this DTC or is the STARTS SINCE SET counter 2 or less?

Yes

Go To 3.

No

Go To 8.

3. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to L/R.

With the scan tool, monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button.

Did the Pressure Switch state change from open to closed when the test button was pressed?

Yes

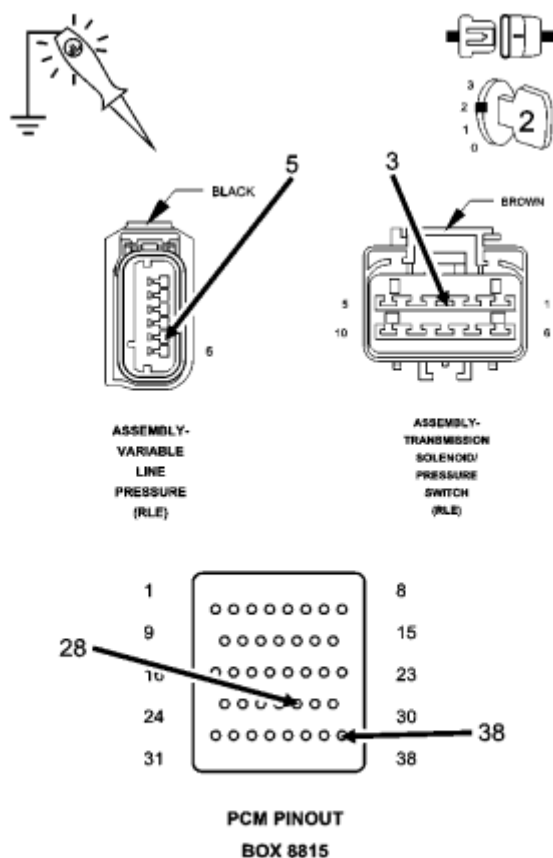
Repair internal transmission as necessary per the Service Information. Inspect the Solenoid Switch Valve per **42RLE - SERVICE INFORMATION** and repair or replace as necessary. If no problems are found, replace the Transmission Solenoid/Pressure Switch Assembly.

Perform 42RLE TRANSMISSION VERIFICATION TEST.

No

Go To 4.

4. (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN



819b5f73

Fig. 115: Checking (T16) Transmission Control Output Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

Disconnect the PCM C4 harness connector.

With the scan tool under TIPM, actuate the Transmission.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal

to pin connection. Install Miller tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground, check all (T16) Transmission Control Relay Output circuits in the appropriate terminals of Miller tool #8815.

NOTE: **The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly on all (T16) Transmission Control Output circuits?

Yes

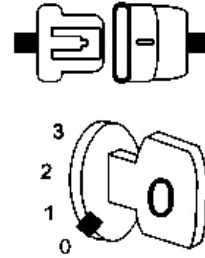
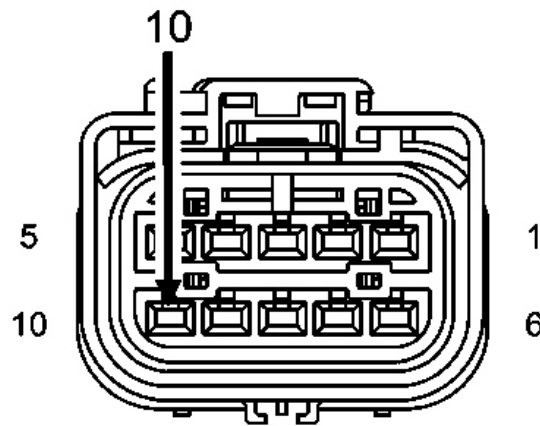
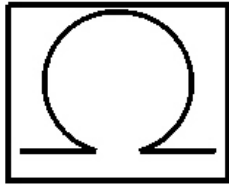
Go To 5.

No

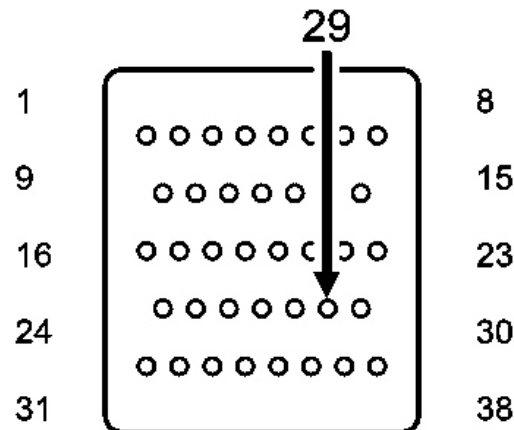
Repair the (T16) Transmission Control Relay Output circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

5. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a606b

Fig. 116: Checking L/R Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

With the scan tool under TIPM, stop the Transmission actuation.

Turn the ignition off to the lock position.

Measure the resistance of the (T50) L/R Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

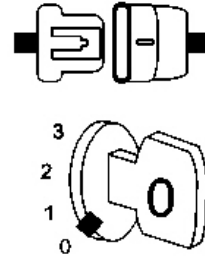
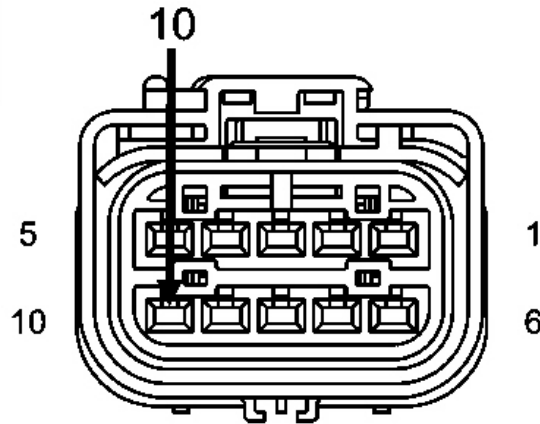
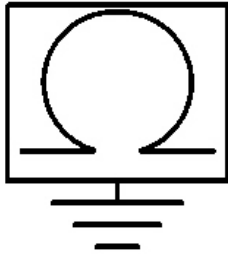
Repair the (T50) L/R Pressure Switch Sense circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

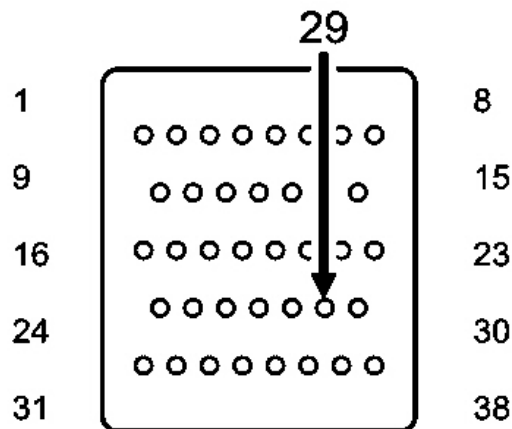
No

Go To 6.

6. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a6075

Fig. 117: Checking L/R Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T50) L/R Pressure Switch Sense circuit.

Is the resistance below 5.0 ohms?

Yes

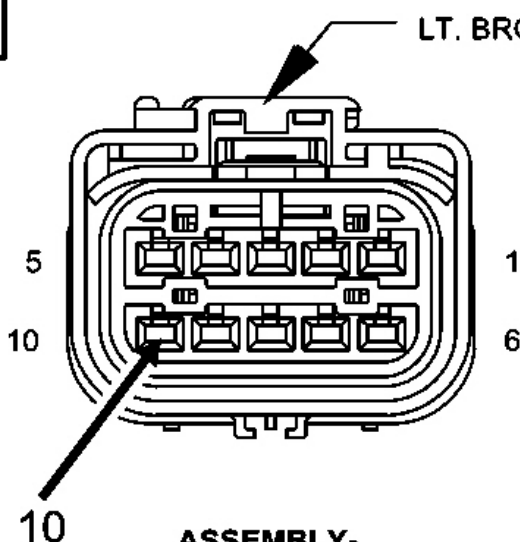
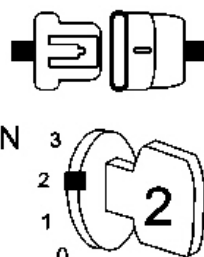
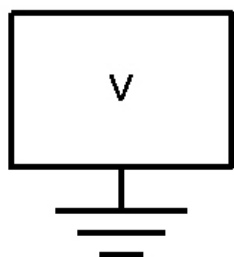
Repair the (T50) L/R Pressure Switch Sense circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

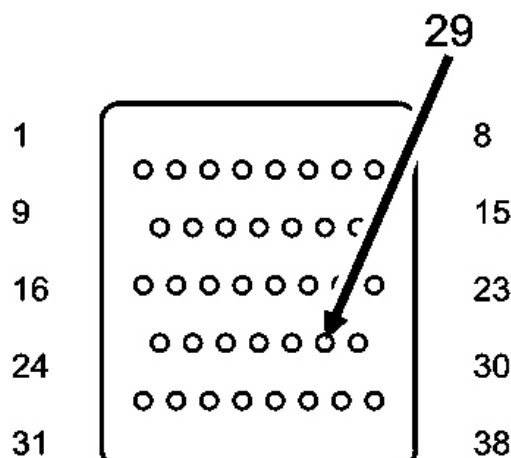
No

Go To 7.

7. (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ac523

Fig. 118: Measuring Voltage Of (T50) L/R Pressure Switch Sense Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

8. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Test drive and verify if the transmission is launching in 2nd gear and/or no TCC engagement.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Are there 2nd gear launches and/or no TCC engagement?

Yes

Disassemble and inspect the Valve Body per **42RLE - SERVICE INFORMATION** and repair or replace as necessary. If no problems are found in the Valve Body, replace the Transmission Solenoid Pressure Switch Assembly.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

Circuit Schematic

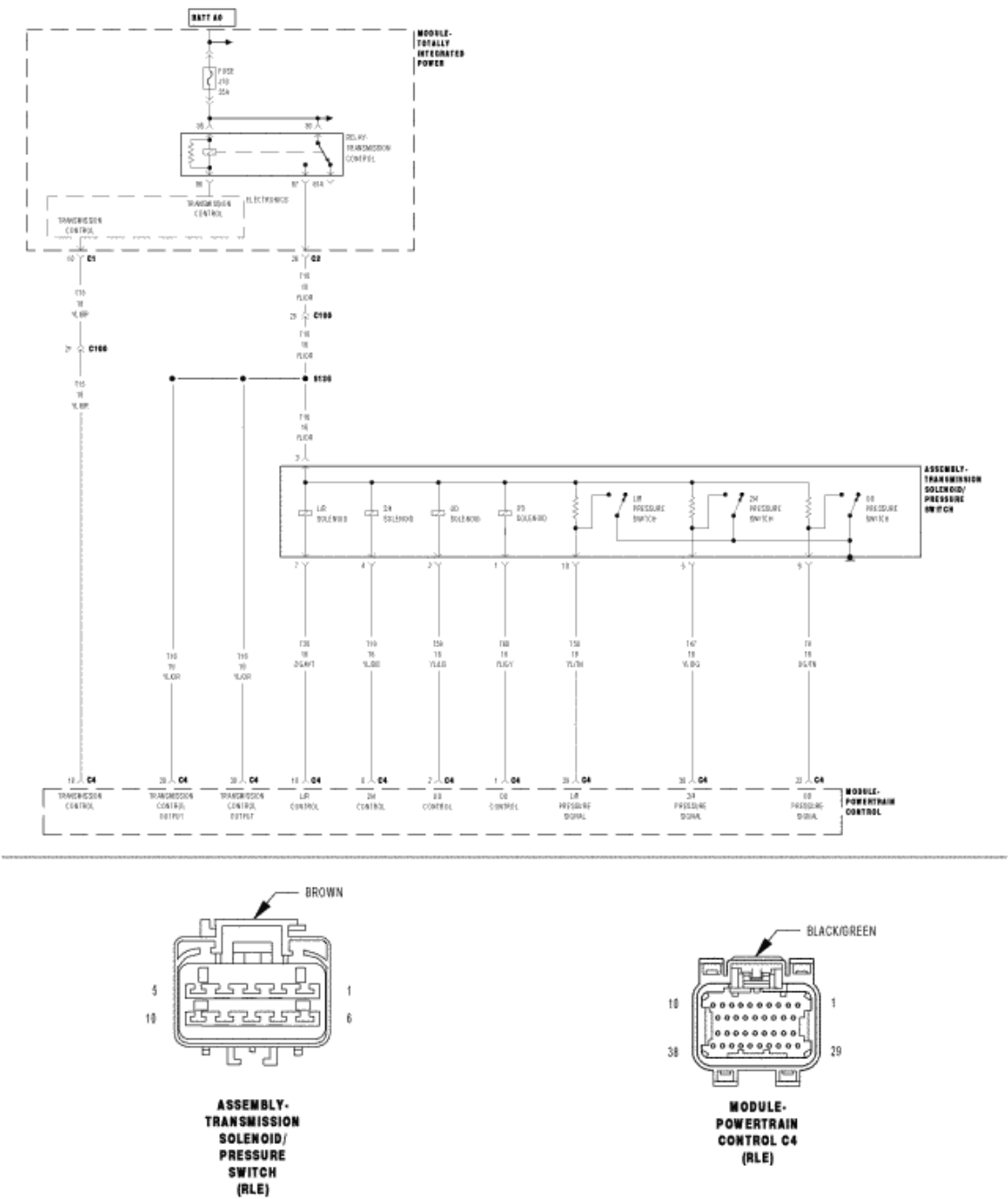


Fig. 119: Transmission Solenoid/Pressure Switch Assembly Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Solenoid Switch Valve, an internal, hydraulically operated valve, controls the direction of the transmission fluid when the L/R solenoid is energized. When the solenoid switch valve is in the downshifted position and the L/R solenoid is energized, fluid is directed to the L/R element for 1st gear. When the solenoid switch valve is In the up-shifted position (2nd, 3rd, and 4th gear) and the L/R solenoid is energized, fluid is directed into the Lockup Switch Valve which controls the Torque Converter Clutch. When doing PEMCC or FEMCC, the L/R pressure switch should indicate no pressure if the solenoid switch valve is in the L/R position. If the L/R pressure switch indicates pressure for some time while in partial or full EMCC, the EMCC operation is aborted and momentarily inhibited to avoid accidental application of the L/R clutch. EMCC is attempted again when there is no L/R pressure. The fourth detection of L/R pressure while in PEMCC or FEMCC will result in setting the DTC. Torque converter EMCC operation inhibited. MIL on after 5 min. of substituted operation.

Monitor Conditions

When Monitored:

Every 7 ms when doing PEMCC or FEMCC.

Set Conditions

- **Set Condition:**

Must be in partial or full EMCC. The DTC is set if L/R pressure is detected high for the fourth time.

Possible Causes

Possible Causes
RELATED DTC P0841 PRESENT DTC EVENT DATA SHOWS TRS CODE TR2 - SHIFT LEVER OR MANUAL CONTROL VALVE IN A INVALID POSITION SHIFTER CABLE OUT OF ADJUSTMENT SOLENOID SWITCH VALVE STICKING IN ITS BORE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT OPEN (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO GROUND (T50) L/R PRESSURE SWITCH SENSE CIRCUIT SHORT TO VOLTAGE VALVE BODY POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **DETERMINING IF RELATED DTC'S ARE PRESENT**

With the scan tool, check for other Transmission DTCs.

Is the DTC P0841 present also?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

No

Go To 2.

2. CHECK THE DTC EVENT DATA FOR TRS CODE TR2

With the scan tool, check the DTC EVENT DATA for P1776.

Does the DTC EVENT DATA show a TRS Code of TR2?

Yes

This indicates the shift lever and the manual control valve were in an invalid position between Neutral and OD. Check the shifter cable for: proper adjustment, binding, friction, improper routing, or the shifter was moved in transit. Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Go To 3.

3. CHECK TO SEE IF DTC P1776 IS CURRENT

With the scan tool, check the STARTS SINCE SET counter for P1776.

NOTE: **This counter only applies to the last DTC set.**

Is the status Active or is the STARTS SINCE SET counter 2 or less for this DTC?

Yes

Go To 4.

No

Go To 9.

4. CHECK THE PCM AND WIRING USING THE TRANSMISSION SIMULATOR

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit.

Ignition on, engine not running.

With the Transmission Simulator, turn the Pressure Switch selector switch to L/R.

With the scan tool, monitor the L/R Pressure Switch State while pressing the Pressure Switch Test button.

Did the Pressure Switch state change from open to closed when the test button was pressed?

Yes

Go To 5.

No

Go To 6.

5. CHECK THE SOLENOID SWITCH VALVE FOR STICKING

Remove the transmission oil pan and Valve body and inspect the Solenoid Switch Valve for sticking in its bore, repair or replace as necessary.

NOTE: This DTC may be caused by debris lodged in the Transmission Solenoid Switch Valve bore. If debris is found, clean the valve body and reassemble the transmission per the Service Information.

With the scan tool, record the DTC EVENT DATA for P1776 and erase DTCs.

Reassemble the transmission and test drive the vehicle. Try to duplicate the original set conditions using the DTC EVENT DATA recorded earlier.

With the scan tool, check Transmission DTCs.

Did the DTC P1776 reset?

Yes

Replace the Transmission Solenoid Assembly per the Service Information.

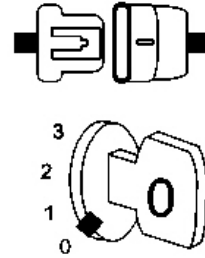
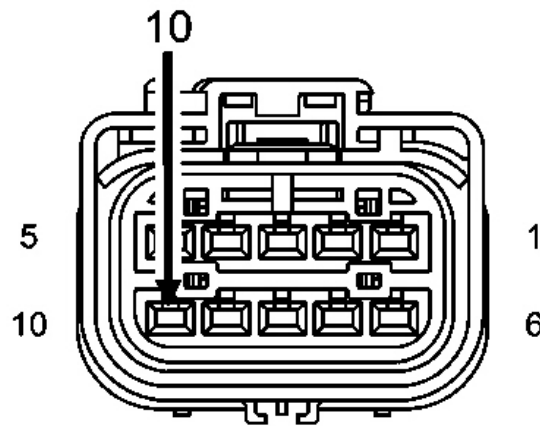
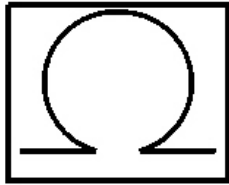
Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

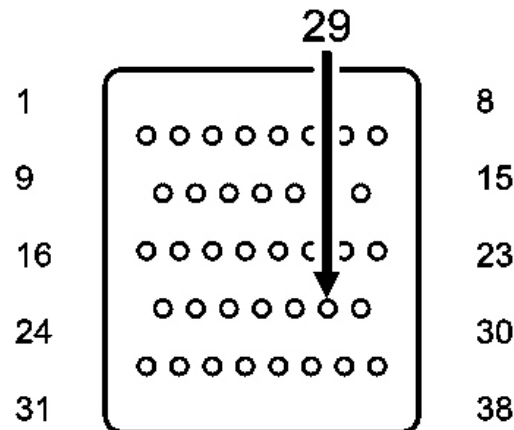
Test Complete

Perform **42RLE TRANSMISSION VERIFICATION TEST.**

6. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR AN OPEN



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a606b

Fig. 120: Checking L/R Pressure Switch Sense Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Transmission Solenoid/Pressure Switch Assembly harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of the (T50) L/R Pressure Switch Sense circuit between the Transmission Solenoid/Pressure Switch Assembly harness connector and the appropriate terminal of Miller tool #8815.

Is the resistance above 5.0 ohms?

Yes

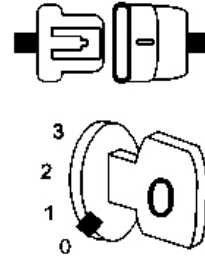
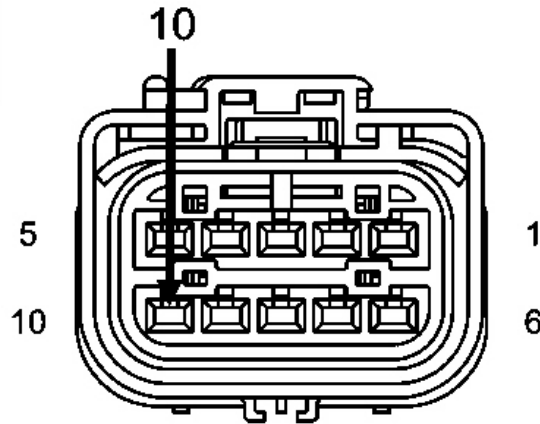
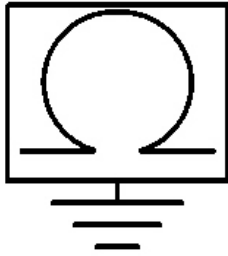
Repair the (T50) L/R Pressure Switch Sense circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

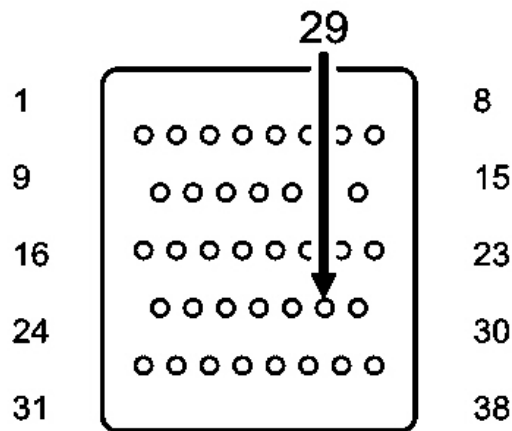
No

Go To 7.

7. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR A SHORT TO GROUND



**ASSEMBLY-
TRANSMISSION
SOLENOID/PRESSURE
SWITCH
(42 RLE)**



**PCM PINOUT
BOX 8815**

812a6075

Fig. 121: Checking L/R Pressure Switch Sense Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T50) L/R Pressure Switch Sense circuit.

Is the resistance below 5.0 ohms?

Yes

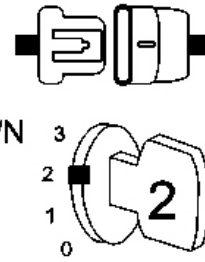
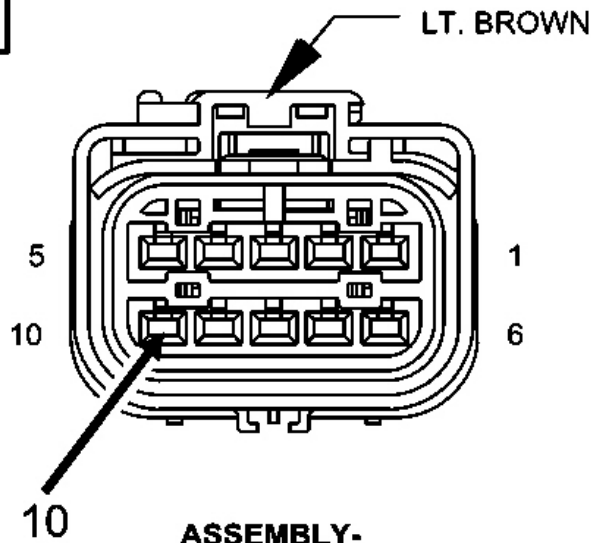
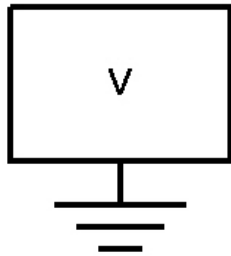
Repair the (T50) L/R Pressure Switch Sense circuit for a short to ground.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

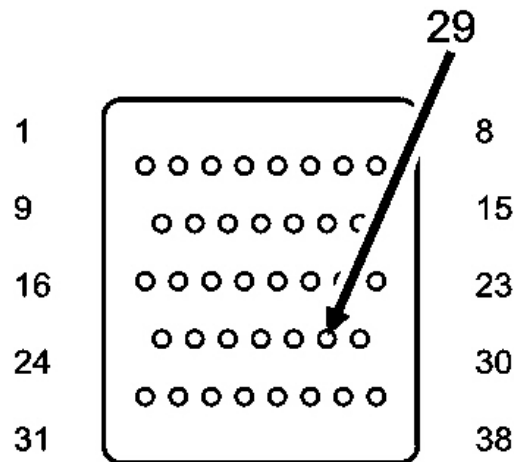
No

Go To 8.

8. CHECK THE (T50) L/R PRESSURE SWITCH SENSE CIRCUIT FOR A SHORT TO VOLTAGE



**ASSEMBLY-
TRANSMISSION
SOLENOID
(RLE)**



**PCM PINOUT
BOX 8815**

816ac523

Fig. 122: Measuring Voltage Of (T50) L/R Pressure Switch Sense Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

With the scan tool under TIPM, actuate the Transmission.

Measure the voltage of the (T50) L/R Pressure Switch Sense circuit.

Is the voltage above 0.5 volts?

Yes

Repair the (T50) L/R Pressure Switch Sense circuit for a short to voltage.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. Check for Service Information Tune-ups or Service Bulletins for any possible causes that may apply. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Test drive the vehicle and verify if the transmission is launching in 2nd gear and/or there is no TCC engagement.

With the scan tool, check the EVENT DATA to help identify the conditions in which the DTC was set.

Check for any Service Information Tune-ups or Service Bulletins for possible causes that may apply.

Are there 2nd gear launches and/or no TCC engagement?

Yes

Disassemble and inspect the Valve Body per **42RLE - SERVICE INFORMATION** Inspect the Solenoid Switch Valve for sticking in its bore and repair or replace as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P1790-FAULT IMMEDIATELY AFTER SHIFT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This DTC is not stored alone. It is stored if a Gear Ratio DTC is detected immediately after shift. The existence of DTC P1790 indicates a mechanical or hydraulic (not electrical) related problems. It should be noted, however, that all mechanical problems don't necessarily result in DTC P1790. When this DTC exists, diagnosing the system should be based on the associated DTC and only mechanical causes should be considered.

Monitor Conditions

When Monitored:

After a Gear Ratio Error code is stored.

Set Conditions

- **Set Condition:**

After a Gear Ratio Error DTC has already been set. The DTC is set if the fault happened within 1.3 seconds of a shift. The DTC set time will vary from 1.214 seconds to 15 seconds.

Possible Causes

Possible Causes
FAULT AFTER SHIFT

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **FAULT AFTER SHIFT**

This DTC is set along with a Gear Ratio DTC. Perform the appropriate test for the Gear Ratio DTC stored.

NOTE: **Check Pending DTCs or 1 trip failures if there are no Active or Stored Gear Ratio DTCs.**

If there are no possible causes remaining, view repair.

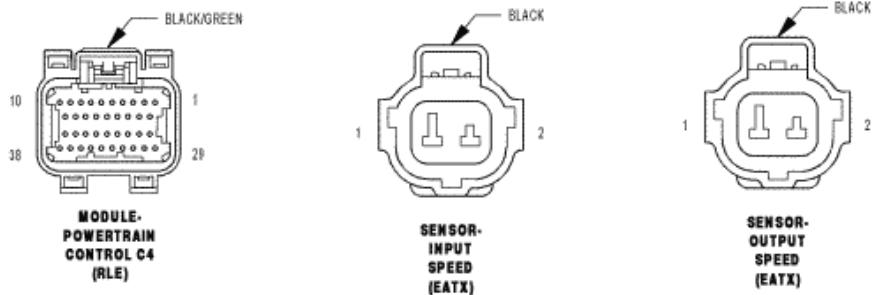
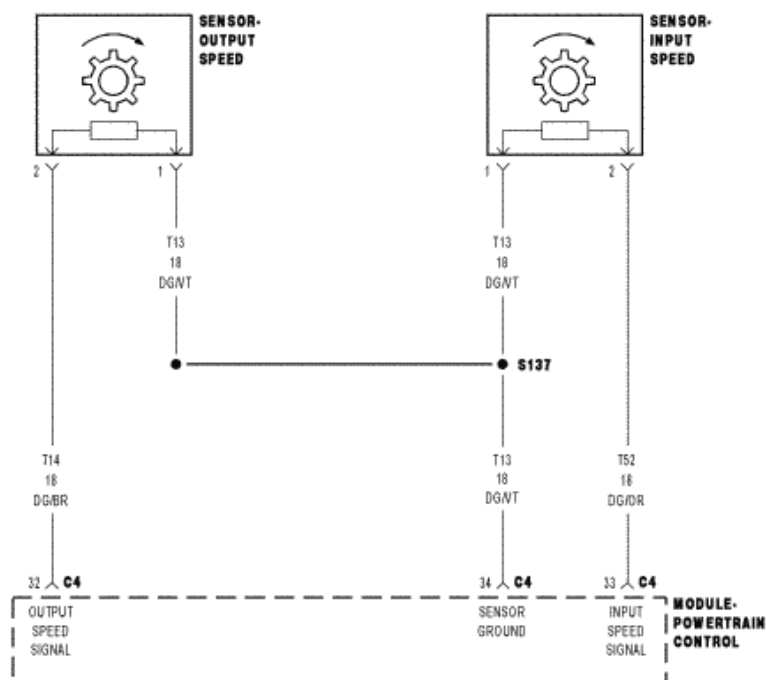
Repair

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

P1794-SPEED SENSOR GROUND ERROR

Circuit Schematic



019946500

Fig. 123: Speed Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The input and output speed sensors use a common ground circuit. The loss of this common ground results in the input signal being sensed for both. After a reset in Neutral, and after observing a specific ratio, the Speed Check Fault Counter will increment. Because the speed sensors and the thermistor share the same ground circuit, this DTC may indicate a loss of the common speed sensor ground. In some cases this fault will cause a Gear Ratio Error DTC to be set.

Monitor Conditions

When Monitored:

Every 7 ms after a controller reset with transmission in Neutral.

Set Conditions

- **Set Condition:**

After a PCM reset in Neutral and Input and Output sensor ratio equals 2.50 to 1.0 ± 50.0 RPM.

Possible Causes

Possible Causes
SPEED SENSOR GROUND CIRCUIT OPEN POWERTRAIN CONTROL MODULE

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. PCM AND WIRING

Turn the ignition off to the lock position.

Remove the Starter Solenoid Relay from the TIPM.

CAUTION: Removal of the Starter Solenoid Relay from the TIPM will prevent the vehicle from being started in gear.

WARNING: The Starter Solenoid Relay must be removed from the TIPM. Failure to do so can result in personal injury or death.

Install the Transmission Simulator, Miller tool #8333 and the Electronic Transmission Adapter kit 8333-1A.

Ignition on, engine not running.

With the Transmission Simulator, set the "Input/Output Speed" switch to "ON" and the rotary switch to the "3000/1250" position.

With the scan tool, monitor the Input and Output Speed Sensor readings.

Does the Input Speed read 3000 RPM and the Output Speed read 1250 RPM, $\pm$ 50 RPM?

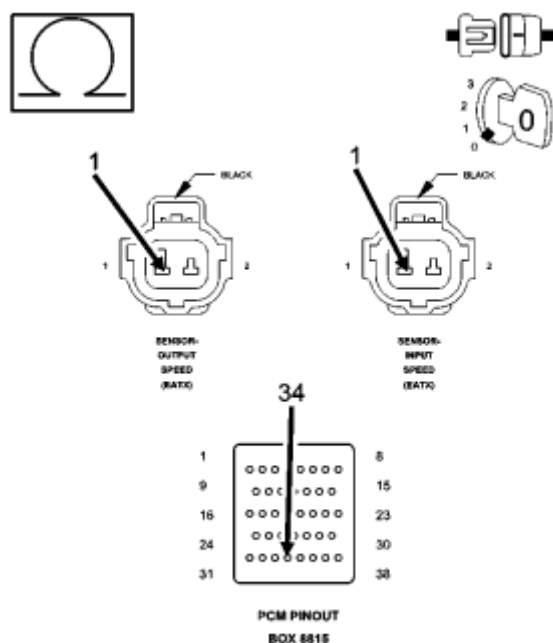
Yes

Go To 2.

No

Go To 3.

2. (T13) SPEED SENSOR GROUND CIRCUIT OPEN



819b6b85

Fig. 124: Measuring Resistance Of Speed Sensor Ground Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position.

Disconnect the PCM C4 harness connector.

Disconnect the Input and Output Speed Sensor harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller tool #8815 to perform diagnosis.

Measure the resistance of both of the (T13) Speed Sensor Ground circuits from the appropriate terminal of special tool #8815 to the Input and Output Speed Sensor harness connectors.

Is the resistance above 5.0 ohms on either circuit?

Yes

Repair the (T13) Speed Sensor Ground circuit for an open.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Using the schematics as a guide, check the Powertrain Control Module (PCM) terminals for corrosion, damage, or terminal push out. Pay particular attention to all power and ground circuits. If no problems are found, replace and program the PCM per the Service Information. With the scan tool, perform QUICK LEARN.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set the DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle the wires while checking for shorted and open circuits.

With the scan tool, check the DTC EVENT DATA to help identify the conditions in which the DTC was set.

Were there any problems found?

Yes

Repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Test Complete.

P1797-MANUAL SHIFT OVERHEAT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The major cause of heat build up in the transmission is torque converter slip. With the transmission in the AutoStick® mode, the torque converter can slip during aggressive driving or heavy loading conditions such as trailer towing or driving up steep grades. In the non AutoStick® mode, internal controller logic prevents the transmission from overheating by managing the shift and EMCC schedule. In the AutoStick® mode, when the transmission or engine temperature approaches an overheat condition, the manual shift overheat DTC sets and the AutoStick® mode is temporarily suspended until the temperature returns to normal.

Monitor Conditions

When Monitored:

Continuously with engine running.

Set Conditions

- Set Condition:**

If the Engine Temperature exceeds 123° C (255° F) or the Transmission Temperature exceeds 135° C (275° F) while in AutoStick® mode. Note: Aggressive driving or driving in Low for extended periods of time will set this DTC.

Possible Causes

Possible Causes
MANUAL SHIFT OVERHEAT

Always perform the **42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **MANUAL SHIFT OVERHEAT**

This is an informational DTC only.

With the scan tool, check the Event Data to help identify the conditions in which the DTC was set.

Check the engine and transmission cooling system for proper operation.

Check the Radiator Cooling Fan operation.

Check the Transmission Cooling operation.

Check the Transmission Fluid Level per **42RLE - SERVICE INFORMATION** to verify that it is not overfilled.

NOTE: **Aggressive driving or driving in Low for extended periods of time will set this DTC.**

If there are no possible causes remaining, view repair.

Repair

If the Transmission Fluid is low, repair any Transmission Fluid leak as necessary and adjust the Transmission Fluid Level per the Service Information. Refer to **42RLE - SERVICE INFORMATION** for the related symptoms and repair as necessary.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

U0002-CAN C BUS OFF PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

Monitor Conditions

When Monitored:

Every 7 ms with:

- 1) Engine speed greater than 500 RPM.
- 2) Battery voltage between 10 and 16 volts.

Set Conditions

- **Set Condition:**

CAN C BUS messages are not received for 10 seconds.

Diagnose the U0002 CAN C BUS OFF PERFORMANCE as the U0001 CAN C BUS CIRCUIT test in appropriate Engine ELECTRICAL DIAGNOSTICS article for diagnostic procedures and for further possible causes.

U0100-LOST COMMUNICATION WITH ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

Monitor Conditions

When Monitored:

Every 7 ms with:

- 1) Engine speed greater than 500 RPM.
- 2) Battery voltage between 10 and 16 volts.

Set Conditions

- **Set Condition:**

CAN C BUS messages are not received for 10 seconds.

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for diagnostic procedures and for further possible causes.

U0121-LOST COMMUNICATION WITH ABS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

Monitor Conditions

When Monitored:

Every 7 ms with:

- 1) Engine speed greater than 500 RPM.
- 2) Battery voltage between 10 and 16 volts.

Set Conditions

- **Set Condition:**

CAN C BUS messages are not received for 10 seconds.

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for diagnostic procedures and for further possible causes.

U0141-LOST COMMUNICATION WITH FCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The NGC controller communicates over the CAN C BUS. The transmission controller continuously monitors BUS activity. The CAN C BUS is also used to communicate transmission MIL status to the Engine Controller. If the Engine Controller is unable to communicate with the Transmission Controller, a DTC will set and the Engine Controller will illuminate the MIL.

Monitor Conditions

When Monitored:

Every 7 ms with:

- 1) Engine speed greater than 500 RPM.
- 2) Battery voltage between 10 and 16 volts.

Set Conditions

- **Set Condition:**

CAN C BUS messages are not received for 10 seconds.

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for diagnostic procedures and for further possible causes.

STANDARD PROCEDURE

42RLE PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Perform the following steps prior to any diagnostic procedure(s).

NOTE: Due to different power control configurations, the Transmission Control Relay (if equipped) may be referred to as a PCM relay.

1. Many transmission symptoms can be caused by a low fluid level. If the fluid level is low, locate and repair any leaks and fill the transmission to the proper fluid level. Refer to **42RLE - SERVICE INFORMATION** for the proper repair and fluid fill procedures.
2. Testing should only be performed with the battery fully charged to avoid false diagnosis.
3. With the scan tool check pinion factor (if equipped) for proper tire identification and program or reprogram if necessary.
4. With the scan tool, read Engine (PCM) DTCs. If Engine DTCs are present, refer to appropriate Engine ELECTRICAL DIAGNOSTICS article and perform to the appropriate diagnostic procedure(s) before proceeding.
5. With the scan tool, read Transmission (TCM) DTCs. Record all Stored, Active, and Pending DTC information. Diagnose any Pending DTC as a matured DTC.
6. With the scan tool, read and record any Event Data. Use this data to help identify the conditions in which the DTC was set.

NOTE: Event Data may exist even if no DTCs are stored. Clearing DTCs does NOT erase the Event Data. To erase Event Data information you must either with the scan tool perform a Quick Learn procedure, battery disconnect (if available), or manually disconnect the battery. Whatever method used can reset some learned transmission values to controller defaults. This may cause poor shift quality until those values are relearned. Most DTCs require two "bad trips" before they are stored and the MIL illuminates. The transmission may enter "limp-in" mode during the first bad trip. However, if the fault condition is not present in the next ignition cycle and a "good trip" has been completed, the one trip or "pending" DTC may be cleared. The pending DTC information will be stored in the Event Data even though the scan tool shows no DTCs present. If the customer reports a limp-in event and no DTCs are present, check the Event Data.

7. With the scan tool, perform the Shift Lever Position Test. If the test does not pass, refer to **P0706-TRANSMISSION RANGE SENSOR RATIONALITY**.
8. For Gear Ratio Error DTCs, use the scan tool to read and record the Clutch Volume Index (CVI) information.
9. Use the wiring diagram as a guide, inspect the wiring and connectors related to this circuit and repair as necessary.
10. Refer to the **When Monitored** and **Set Conditions** for this DTC. DTCs can set at ignition on, at start up, driving under specific conditions, and after controller diagnostic monitors have run.
11. Refer to applicable Technical Service Bulletins (TSBs) for controller software update information. Some conditions can be corrected by upgrading the Engine (PCM) or Transmission (TCM) controller software.
12. Check for any Service Information Tune-ups or Service Bulletins for any possible causes that may apply.

Did any of the above procedures repair the vehicle?

Yes

Testing is complete.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

No

Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate diagnostic procedure(s).

See **DIAGNOSIS AND TESTING**.

42RLE TRANSMISSION VERIFICATION TEST

Perform the following after completion of a diagnostic repair:

NOTE: **After completion of the Transmission Verification Test, the Powertrain Verification Test must be performed. Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article.**

1. Reconnect any disconnected components.
2. With the scan tool, erase all Transmission and Engine DTCs.
3. With the scan tool check pinion factor (if equipped) for proper tire identification and program or reprogram if necessary.
4. Erase DTC P0700 under engine to turn the MIL off after completion of transmission repairs.
5. Perform a PRNDL FAULT CLEARING PROCEDURE after completion of repairs for P0706-TRANSMISSION RANGE SENSOR RATIONALITY. See **STANDARD PROCEDURE**.
6. If the Powertrain Control Module or the Transmission has been repaired or replaced, it is necessary to perform the scan tool Quick Learn Procedure.
7. If the Torque converter has been replaced, with the scan tool perform TCC BREAK-IN.
8. If the Powertrain Control Module or Front Control Module has been replaced you must reset the Pinion Factor in the Front Control Module.
9. With the scan tool, display Transmission Temperature. Start and run the engine until the Transmission Temperature is HOT, above 43° C or 110° F.
10. Check the transmission fluid and adjust if necessary. Refer to **42RLE - SERVICE INFORMATION** for the Fluid Fill procedure.
11. Road test the vehicle. With the scan tool, monitor the engine rpm. Make 15 to 20 1-2, 2-3, 3-4 upshifts. Perform these shifts from a standing start to 72 km/h (45 mph) with a constant throttle opening of 20 to 25 degrees.
12. With speeds below 40 km/h (25 mph), make 5 to 8 wide open throttle kickdowns to 1st gear. Allow at least 5 seconds each in 2nd and 3rd gear between each kickdown.
13. For a specific DTC, drive the vehicle to the Symptom's When Monitored/When Set conditions to verify the DTC is repaired.
14. If equipped with AutoStick®, upshift and downshift several times using the AutoStick® feature during the road test.

NOTE: **Use the OBDII task manager to run a Good Trip in each gear, this will**

confirm the repair and to ensure that the DTC has not re-matured.

15. Check for any Diagnostic Trouble Codes (DTCs) during and after the road test.

Did any Diagnostic Trouble Codes set during the road test?

Yes

Repair is not complete. Refer to **DIAGNOSTIC CODE INDEX** and perform the appropriate symptom (s).

No

Repair is complete.

PRNDL FAULT CLEARING PROCEDURE

1. With the scan tool, erase Transmission DTCs.
2. Cycle the ignition off, then start the vehicle.
3. Firmly apply the brakes and shift into Overdrive.

NOTE: Vehicle must remain in Overdrive for at least 3.0 seconds.

4. With the brakes firmly applied, shift slowly through all gears (PRNDL) as least three times, pausing momentarily in each gear.

NOTE: If all the PRNDL lights box individually then the error was cleared.

5. Shift into park and turn the ignition off to the lock position.
6. With the ignition on, engine not running, using the scan tool, read DTCs.

Does the DTC P0706 reset, or do all the PRNDL indicators remain boxed in park or neutral?

Yes

Return to the symptom list and perform diagnostics for P0706-TRANSMISSION RANGE SENSOR RATIONALITY.

No

Test Complete.

Perform **42RLE TRANSMISSION VERIFICATION TEST**.

ALL PRESSURE SPECIFICATIONS ARE PSI (ON HOIST, WITH WHEELS FREE TO TURN)

Gear Selector Position	Actual Gear	PRESSURE TAPS						
		Underdrive Clutch	Overdrive Clutch	Reverse Clutch	Torque Converter Clutch Off	Torque Converter Clutch On	2/4 Clutch	Low/Reverse Clutch
PARK - 0 mph *	PARK	0-2	0-5	0-2	60-110	45-100	0-2	115-145
REVERSE - 0 mph *	REVERSE	0-2	0-7	165-235	50-100	35-85	0-2	165-235
NEUTRAL - 0 mph *	NEUTRAL	0-2	0-5	0-2	60-110	45-100	0-2	115-145
Low - 20 mph #	FIRST	110-145	0-5	0-2	60-110	45-100	0-2	115-145
Third - 30 mph #	SECOND	110-145	0-5	0-2	60-110	45-100	115-145	0-2
Third - 45 mph #	DIRECT	75-95	75-95	0-2	60-90	45-80	0-2	0-2
OD - 30 mph #	OVERDRIVE	0-2	75-95	0-2	60-90	45-80	75-95	0-2
OD - 50 mph #	OVERDRIVE WITH TCC	0-2	75-95	0-2	0-5	60-95	75-95	0-2
* Engine Speed at 1500 RPM								
# CAUTION: Both wheels must be turning at same speed.								

ELEMENTS IN USE AT EACH POSITION OF SELECTOR LEVER

Shift Lever Position	INPUT CLUTCHES			HOLDING CLUTCHES	
	Underdrive	Overdrive	Reverse	2/4	Low/Reverse
P - PARK	-	-	-	-	X
R - REVERSE	-	-	X	-	X
N - NEUTRAL	-	-	-	-	X
OD - OVERDRIVE	-	-	-	-	-
First	X	-	-	-	X
Second	X	-	-	X	-
Direct	X	X	-	-	-
Overdrive	-	X	-	X	-
D - DRIVE*	-	-	-	-	-
First	X	-	-	-	X
Second	X	-	-	X	-
Direct	X	X	-	-	-
L - LOW*	-	-	-	-	-
First	X	-	-	-	X
Second	X	-	-	X	-

Direct	X	X	-	-	-
* Vehicle upshift and downshift speeds are increased when in these selector positions.					

GENERAL SPECIFICATIONS

Transmission Type	Four-Speed Automatic, Electronically Controlled, Fully Adaptive, Electronically Modulated Torque Converter
Lubrication Method	Pump (internal - external gear-type)
Cooling Method	Water Heat Exchanger and/or Air-to-Oil Heat Exchanger

GEAR RATIOS

1st Gear	2.84:1
2nd Gear	1.57:1
3rd Gear (Direct)	1.00:1
4th Gear (Overdrive)	0.69:1
Reverse Gear	2.21:1

BEARING PRELOAD (DRAG TORQUE)

Description	Metric	Standard
Output Shaft	0.22-0.903 N.m	1-8 in. lbs.

CLUTCH PACK

Description	Metric	Standard
Low/Reverse Clutch (Select Reaction Plate)	0.84-1.60 mm	0.033-0.063 in.
Two/Four Clutch (No Select)	0.76-2.64 mm	0.030-0.104 in.
Reverse Clutch (Select Snap Ring)	0.89-1.37 mm	0.035-0.054 in.
Overdrive Clutch (No Select)	1.07-3.25 mm	0.042-0.128 in.
Underdrive Clutch (Select Reaction Plate)	0.94-1.50 mm	0.037-0.059 in.

INPUT SHAFT

Description	Metric	Standard
End Play	0.127-0.635 mm	0.005-0.025 in.

OIL PUMP CLEARANCES

DESCRIPTION	METRIC	STANDARD
Outer Gear-to-Crescent	0.060-0.298 mm	0.0023-0.0117 in.
Inner Gear-to-Crescent	0.093-0.385 mm	0.0036-0.0151 in.
Outer Gear-to-Pocket	0.089-0.202 mm	0.0035-0.0079 in.
Outer Gear Side Clearance	0.020-0.046 mm	0.0008-0.0018 in.

Inner Gear Side Clearance	0.020-0.046 mm	0.0008-0.0018 in.
Reaction Shaft Support Bearing Sleeve	45.22 - 45.23 mm	1.780 - 1.781 in.

GEAR TRAIN MEASUREMENTS

Description	Metric	Standard
Front Sun Gear Bushings	29.55 - 29.60 mm	1.163 - 1.165 in.
Rear Carrier Bushing	29.75 - 30.00 mm	1.171 - 1.181 in.
Overdrive Hub/Shaft Bushing	21.52 - 21.58 mm	0.847 - 0.850 in.
Oil Pump Reaction Support Sleeve	45.27 - 45.31 mm	1.782 - 1.784 in.
Front/Rear Carrier Pinion end Play	0.15 - 0.61 mm	0.006 - 0.024 in.
Torque Converter Hub Bushing	38.019 - 38.11	1.499 - 1.501 in.

TORQUE SPECIFICATIONS

Description	N.m	Ft. Lbs.	In. Lbs.
Bolt, Torque Converter Housing to Engine	68	50	-
Bolt, Converter-to-Driveplate	88	65	-
Bolt, Fluid Filter-to-Valve Body	5	-	45
Bolt, L/R Piston Retainer-to-Case	5	-	45
Bolt, Adapter/Extension Housing	54	40	-
Bolt, Manual Valve Lever-to-Manual Valve	5	-	45
Bolt, Oil Pan-to-Case	20	14.5	-
Bolt, Oil Pump-to-Case	30	-	265
Bolt, Park Sprag Retainer	4.5	-	40
Bolt, Reaction Shaft Support Halves	28	-	250
Screw, Solenoid/Pressure Switch Assembly-to-Valve Body	5.5	-	50
Bolt, Valve Body-to-Case	12	-	105
Bolt, Valve Body-to-Transfer Plate	5	-	45
Fitting, Cooler Line	47.5	35	-
Nut, Output Shaft	271	200	-
Plug, Pressure Tap	5	-	45
Bolt, Input Speed-to-Case Sensor	9	-	80
Bolt, Output Speed-to-Case Sensor	9	-	80
Bolt, Crossmember to Frame	68	50	-
Bolt, Rear Support to Transmission	47	35	-
Bolt, Clevis Bracket to Crossmember	47	35	-
Bolt, Clevis Bracket to Transmission	68	50	-
Screw, TRS/Manual Shaft Retaining	5	-	45
Screw, 2/4 Accumulator Retainer Plate	5	-	45

DIAGNOSTIC CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
"Key in LOCK (1), or ACC (2) positions The shifter can move out of PARK without depressing the brake pedal"	The park interlock cable is misadjusted or not installed and shifter solenoid failure.	Replace the shifter assy and readjust the park interlock cable. Refer to <u>SHIFT MECHANISM</u> and <u>PARK INTERLOCK CABLE</u> .
"Key in ON (3) position. The shifter can move out of PARK without depressing the brake pedal"	The shifter will not move out of PARK with the override activated "	Replace the shifter assy. Refer to <u>SHIFT MECHANISM</u> .
"Key in ON (3) position. The shifter cannot be moved out of PARK with the brake pedal depressed."	1. Misadjusted Park Lock cable.	1.Readjust the park interlock cable "
	2. The shifter will move out of PARK with the override activated.	2. If the shifter solenoid get powered with brake pedal depressed than change the shifter assy. - If the shifter solenoid does not get powered when brake pedal is depressed, verify the electrical system."

PRESSURE SWITCH STATES

GEAR	L/R	2/4	OD
R	OP	OP	OP
P/N	CL	OP	OP
1st	CL	OP	OP
2nd	OP	CL	OP
D	OP	OP	CL
OD	OP	CL	CL
OP = OPEN			
CL = CLOSED			

TRS SWITCH STATES

SLP	T42	T41	T3	T1
P	CL	CL	CL	OP
R	CL	OP	OP	OP
N	CL	CL	OP	CL
D	OP	OP	OP	CL
2	OP	OP	CL	OP
1	CL	OP	CL	CL

2008 ELECTRICAL

Battery System - Service Information - Liberty

BATTERY SYSTEM - SERVICE INFORMATION

DESCRIPTION

BATTERY SYSTEM

This vehicle is equipped with a single 12-volt battery. All of the components of the battery system are located within the engine compartment of the vehicle. The battery system for this vehicle contains the following components:

- **Battery** - The storage battery provides a reliable means of storing a renewable source of electrical energy within the vehicle.
- **Battery Cables** - The battery cables connect the positive and negative charged battery terminal posts to the vehicle electrical system.
- **Battery Hold down** - The battery hold down hardware secures the battery in the battery tray.
- **Battery Thermal Guard** - The battery thermal guard insulates the battery to protect it from engine compartment temperature extremes.
- **Battery Tray** - The battery tray provides a secure mounting location in the vehicle for the battery and an anchor point for the battery hold down hardware.

For battery system maintenance schedules, refer to **DESCRIPTION** . For the proper jump starting procedures, refer to **STANDARD PROCEDURE** .

OPERATION

BATTERY SYSTEM

The battery system is designed to provide a safe, efficient, reliable and mobile means of delivering and storing electrical energy. This electrical energy is required to operate the engine starting system, as well as to operate many of the other vehicle accessory systems for limited durations while the engine and/or the charging system are not operating. The battery system is also designed to provide a reserve of electrical energy to supplement the charging system for short durations while the engine is running and the electrical current demands of the vehicle exceed the output of the charging system. In addition to delivering, and storing electrical energy for the vehicle, the battery system serves as a capacitor and voltage stabilizer for the vehicle electrical system. It absorbs most abnormal or transient voltages caused by the switching of any of the electrical components or circuits in the vehicle.

DIAGNOSIS AND TESTING

BATTERY SYSTEM

The battery, starting, and charging systems in the vehicle operate with one another and must be tested as a complete system. In order for the engine to start and the battery to maintain its charge properly, all of the

components that are used in these systems must perform within specifications. It is important that the battery, starting, and charging systems be thoroughly tested and inspected any time a battery needs to be charged or replaced. The cause of abnormal battery discharge, overcharging or early battery failure must be diagnosed and corrected before a battery is replaced and before a vehicle is returned to service. The service information for these systems has been separated within this service information to make it easier to locate the specific information you are seeking. However, when attempting to diagnose any of these systems, it is important that you keep their interdependency in mind.

The diagnostic procedures used for the battery, starting, and charging systems include the most basic conventional diagnostic methods, to the more sophisticated On-Board Diagnostics (OBD) built into the Powertrain Control Module (PCM). Use of an induction-type milliampere ammeter, a volt/ohmmeter, a battery charger, a carbon pile rheostat (load tester) and a 12-volt test lamp may be required. All OBD-sensed systems are monitored by the PCM. Each monitored circuit is assigned a Diagnostic Trouble Code (DTC). The PCM will store a DTC in electronic memory for any failure it detects. Refer to **DIAGNOSIS AND TESTING** for the proper charging system on-board diagnostic test procedures.

MICRO 420 ELECTRICAL SYSTEM TESTER

The Micro 420 automotive battery system tester is designed to help diagnose the cause of a defective battery. See **STANDARD PROCEDURE** for directions on using the Micro 420 battery tester.

BATTERY SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
THE BATTERY SEEMS WEAK OR DEAD WHEN ATTEMPTING TO START THE ENGINE.	1. The electrical system ignition-off draw is excessive.	1. See <u>STANDARD PROCEDURE</u> for the proper test procedures. Repair the excessive ignition-off draw, as required.
	2. The charging system is inoperative.	2. Determine if the charging system is performing to specifications, refer to <u>DIAGNOSIS AND TESTING</u> . Repair the inoperative charging system, as required.
	3. The battery is discharged.	3. Determine the battery state-of-charge using the Micro 420 battery tester, see <u>STANDARD PROCEDURE</u> . Charge the battery as required.
	4. The battery terminal connections are loose or corroded.	4. See <u>DIAGNOSIS AND TESTING</u> . Clean and tighten the battery terminal connections, as required.
	5. The battery has an incorrect size or rating for this vehicle.	5. See <u>SPECIFICATIONS</u> for the proper size and rating. Replace an incorrect battery, as required.
	6. The battery is inoperative.	6. Determine the battery cranking capacity using the Micro 420 battery tester, see <u>STANDARD PROCEDURE</u> . Replace the inoperative battery, as required.
	7. The starting system is inoperative.	7. Determine if the starting system is performing to specifications. Refer to <u>DIAGNOSIS AND TESTING</u> . Repair the

	8. The battery is physically damaged.	inoperative starting system, as required. 8. Inspect the battery for loose terminal posts or a cracked and leaking case. Replace the damaged battery, as required.
THE BATTERY STATE OF CHARGE CANNOT BE MAINTAINED.	1. The battery has an incorrect size or rating for this vehicle. 2. The battery terminal connections are loose or corroded. 3. The electrical system ignition-off draw is excessive. 4. The battery is inoperative. 5. The starting system is inoperative. 6. The charging system is inoperative. 7. Electrical loads exceed the output of the charging system. 8. Slow driving or prolonged idling with high-amperage draw systems in use.	1. See <u>SPECIFICATIONS</u> for the proper size and rating. Replace an incorrect battery, as required. 2. See <u>DIAGNOSIS AND TESTING</u>. Clean and tighten the battery terminal connections, as required. 3. See <u>STANDARD PROCEDURE</u> for the proper test procedures. Repair the inoperative electrical system, as required. 4. Test the battery using the Micro 420 battery tester, see <u>STANDARD PROCEDURE</u>. Replace the inoperative battery, as required. 5. Determine if the starting system is performing to specifications. Refer to <u>DIAGNOSIS AND TESTING</u> . Repair the inoperative starting system, as required. 6. Determine if the charging system is performing to specifications, refer to <u>DIAGNOSIS AND TESTING</u> . Repair the inoperative charging system, as required. 7. Inspect the vehicle for aftermarket electrical equipment which might cause excessive electrical loads. 8. Advise the vehicle operator, as required.
THE BATTERY WILL NOT ACCEPT A CHARGE.	1. The battery is inoperative.	1. Test the battery using the Micro 420 battery tester, see <u>STANDARD PROCEDURE</u> . Replace the inoperative battery, as required.

STANDARD PROCEDURE

BATTERY CONNECTION PROCEDURE

NOTE: This reconnection procedure is to be performed anytime the battery has been disconnected.

1. Connect the battery negative cable to the battery post and tighten the clamp nut.
2. Install the rear compartment floor trim panel.

CAUTION: Once the battery has been connected, review and perform the following information as applicable.

ELECTRONIC STABILITY PROGRAM (ESP)

If the vehicle is equipped with ESP, once the battery is reconnected, the Steering Angle Sensor (SAS) in the clockspring needs to be calibrated. The SAS requires calibration anytime the battery or an ABS (ESP) component has been disconnected for any length of time. **If the SAS is not calibrated following battery reconnection, the ESP/BAS indicator lamp is illuminated following five ignition cycles indicating the need for calibration.**

To calibrate, perform the following:

1. Start the engine.
2. Center the steering wheel.
3. Turn the steering wheel all the way to the left until the internal stop in the steering gear is met, then turn the wheel all the way to the right until the opposite internal stop in the steering gear is met.
4. Center the steering wheel.
5. Stop the engine.

CLEANING

BATTERY SYSTEM

The following information details the recommended cleaning procedures for the battery and related components. In addition to the maintenance schedules found in this service information and the Owner's Manual, it is recommended that these procedures be performed any time the battery or related components must be removed for vehicle service.

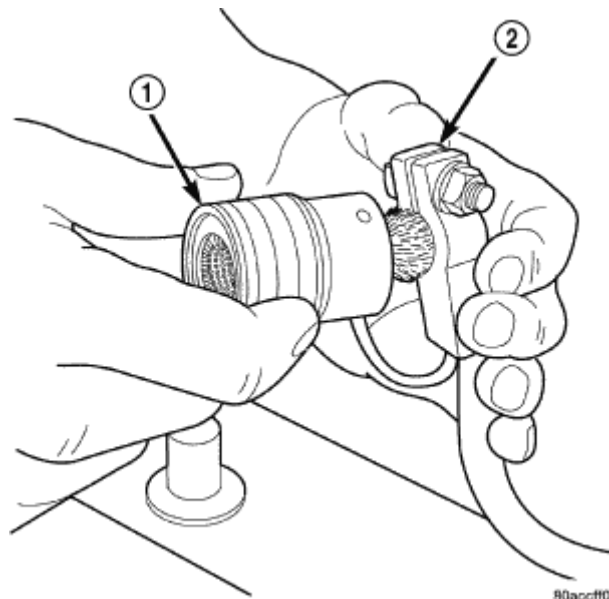


Fig. 1: Cleaning Battery Cable Terminal Clamps Of All Corrosion And Removing Any Corrosion Using Wire Brush

Courtesy of CHRYSLER LLC

1. Clean the battery cable terminal clamps (2) of all corrosion. Remove any corrosion using a wire brush (1) or a post and terminal cleaning tool, and a sodium bicarbonate (baking soda) and warm water cleaning solution.
2. Clean the battery tray and battery hold down hardware of all corrosion. Remove any corrosion using a wire brush and a sodium bicarbonate (baking soda) and warm water cleaning solution. Paint any exposed bare metal.

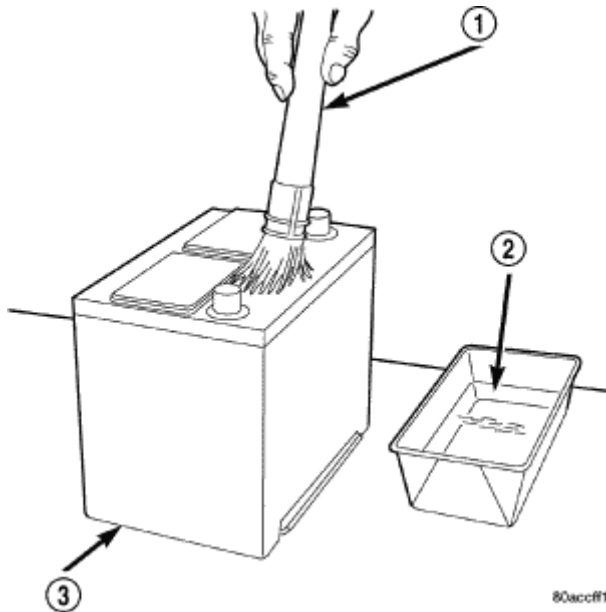
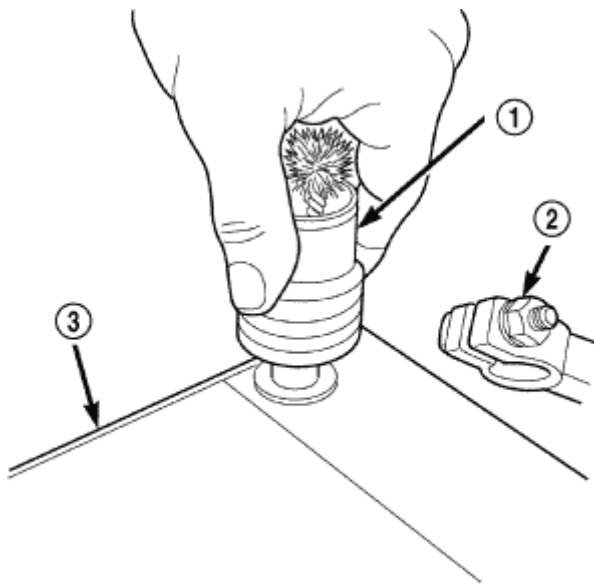


Fig. 2: Removing Acid Film

Courtesy of CHRYSLER LLC

3. If the removed battery is to be reinstalled, clean the outside of the battery case (3) and the top cover with a sodium bicarbonate (baking soda) and warm water cleaning solution using a stiff bristle parts cleaning brush (1) to remove any acid film. Rinse the battery with clean water. Ensure that the cleaning solution does not enter the battery cells through the vent holes. If the battery is being replaced. See **SPECIFICATIONS** for the factory-installed battery specifications. Confirm that the replacement battery is the correct size and has the correct ratings for the vehicle.
4. Clean the battery thermal guard with a sodium bicarbonate (baking soda) and warm water cleaning solution using a stiff bristle parts cleaning brush to remove any acid film.



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Fig. 3: Cleaning Any Corrosion From Battery Terminal Posts With Wire Brush Or Post And Terminal Cleaner
Courtesy of CHRYSLER LLC

5. Clean any corrosion from the battery terminal posts with a wire brush or a post and terminal cleaner, and a sodium bicarbonate (baking soda) and warm water cleaning solution.

INSPECTION

BATTERY SYSTEM

The following information details the recommended inspection procedures for the battery and related components. In addition to the maintenance schedules found in this service information and the owner's manual, it is recommended that these procedures be performed any time the battery or related components must be removed for vehicle service.

1. Inspect the battery cable terminal clamps for damage. Replace any battery cable that has a damaged or deformed terminal clamp.
2. Inspect the battery tray and battery hold down hardware for damage. Replace any damaged parts.
3. Slide the thermal guard off of the battery case (if equipped). Inspect the battery case for cracks or other damage that could result in electrolyte leaks. Also, check the battery terminal posts for looseness. Batteries with damaged cases or loose terminal posts must be replaced.
4. Inspect the battery thermal guard for tears, cracks, deformation or other damage (if equipped). Replace any battery thermal guard that has been damaged.
5. Inspect the battery built-in test indicator sight glass (if equipped) for an indication of the battery condition. If the battery is discharged, charge as required.

SPECIFICATIONS

BATTERY SYSTEM

The battery Group Size number, the Cold Cranking Amperage (CCA) rating, and the Reserve Capacity (RC) rating or Ampere-Hours (AH) rating can be found on the original equipment battery label. Be certain that a replacement battery has the correct Group Size number, as well as CCA, and RC or AH ratings that equal or exceed the original equipment specification for the vehicle being serviced. Battery sizes and ratings are discussed in more detail below.

- **Group Size** - The outside dimensions and terminal placement of the battery conform to standards established by the Battery Council International (BCI). Each battery is assigned a BCI Group Size number to help identify a correctly-sized replacement.
- **Cold Cranking Amperage** - The Cold Cranking Amperage (CCA) rating specifies how much current (in amperes) the battery can deliver for thirty seconds at -18° C (0° F). Terminal voltage must not fall below 7.2 volts during or after the thirty second discharge period. The CCA required is generally higher as engine displacement increases, depending also upon the starter current draw requirements.
- **Reserve Capacity** - The Reserve Capacity (RC) rating specifies the time (in minutes) it takes for battery terminal voltage to fall below 10.5 volts, at a discharge rate of 25 amperes. RC is determined with the battery fully-charged at 26.7° C (80° F). This rating estimates how long the battery might last after a charging system failure, under minimum electrical load.
- **Ampere-Hours** - The Ampere-Hours (AH) rating specifies the current (in amperes) that a battery can deliver steadily for twenty hours, with the voltage in the battery not falling below 10.5 volts. This rating is also sometimes identified as the twenty-hour discharge rating.
- **Load Test Amperage** - The Load Test Amperage rating specifies the current (in amperes) that a battery should be tested at with the battery load test equipment. This value should always be 50 percent of the CCA. For example: if the CCA for this battery is 700 amps, the Load Test Amperage is 50 percent of that or 350 amps.

BATTERY CLASSIFICATIONS & RATINGS					
Part Number	BCI Group Size Classification	Cold Cranking Amperage	Reserve Capacity	Ampere - Hours	Load Test Amperage
04609365AE	34	600	120 Minutes	66	300
05148004AA	27	800	150 Minutes	75	400

SPECIFICATIONS-TORQUE BATTERY

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Battery Terminal Clamp Pinch-Bolt Hex Nut	5	-	45
Battery Hold Down Bolt	7	-	62
Starter Solenoid B(+) Terminal Stud Nut	13	-	115
Battery Negative Cable Ground Eyelet Terminal To Engine Block Bolt	16.5	-	145
Generator Output	14	-	125

Terminal Stud Nut			
Totally Integrated Power Module B(+) Terminal Stud Nut	10	-	90
Battery Negative Cable Eyelet Terminal To The Inner Fender Bolt	12	9	-
Battery Tray Nut	10.5	-	93

SPECIAL TOOLS

SPECIAL TOOLS

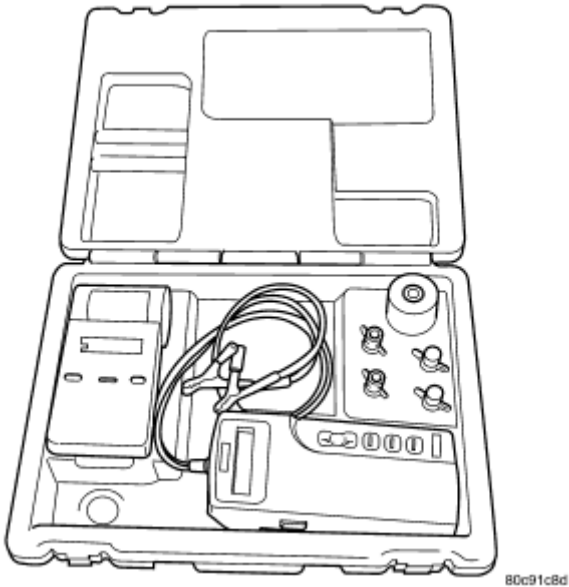


Fig. 4: Battery System Special Tools
Courtesy of CHRYSLER LLC

BATTERY

DESCRIPTION

BATTERY

Low-maintenance conventional batteries are used on vehicles equipped with a gasoline engine, these batteries have non-removable battery cell caps. Under normal service, the composition of this battery reduces gassing and water loss at normal charge rates.

Conventional batteries are made up of six individual cells that are connected in series. Each cell contains positive charged cell groups made of lead oxide, and negatively charged cell groups made of sponge lead. The cells are submerged in a sulfuric acid and water solution called electrolyte.

The battery is used to store electrical energy potential in a chemical form. When an electrical load is applied to the battery terminals, an electrochemical reaction occurs within the battery. This reaction causes the battery to discharge electrical current.

OPERATION

BATTERY

The battery is designed to store electrical energy in a chemical form. When an electrical load is applied to the terminals of the battery, an electrochemical reaction occurs. This reaction causes the battery to discharge electrical current from its terminals. As the battery discharges, a gradual chemical change takes place within each cell. The sulfuric acid in the electrolyte combines with the plate materials, causing both plates to slowly change to lead sulfate. At the same time, oxygen from the positive plate material combines with hydrogen from the sulfuric acid, causing the electrolyte to become mainly water. The chemical changes within the battery are caused by the movement of excess or free electrons between the positive and negative plate groups. This movement of electrons produces a flow of electrical current through the load device attached to the battery terminals.

As the plate materials become more similar chemically, and the electrolyte becomes less acid, the voltage potential of each cell is reduced. However, by charging the battery with a voltage higher than that of the battery itself, the battery discharging process is reversed. Charging the battery gradually changes the sulfated lead plates back into sponge lead and lead dioxide, and the water back into sulfuric acid. This action restores the difference in the electron charges deposited on the plates, and the voltage potential of the battery cells. For a battery to remain useful, it must be able to produce high-amperage current over an extended period. A battery must also be able to accept a charge, so that its voltage potential may be restored.

The battery is vented to release excess hydrogen gas that is created when the battery is being charged or discharged. However, even with these vents, hydrogen gas can collect in or around the battery. If hydrogen gas is exposed to flame or sparks, it may ignite. If the electrolyte level is low, the battery may arc internally and explode. If the battery is equipped with removable cell caps, add distilled water whenever the electrolyte level is below the top of the plates. If the battery cell caps cannot be removed, the battery must be replaced if the electrolyte level becomes low.

DIAGNOSIS AND TESTING

BATTERY

The battery must be completely charged and the terminals should be properly cleaned and inspected before diagnostic procedures are performed. See **CLEANING**, and **INSPECTION** for the proper battery cleaning and inspection procedures. See **STANDARD PROCEDURE** for the proper battery charging procedures.

MICRO 420 BATTERY TESTER

The Micro 420 automotive battery tester is designed to help diagnose the cause of an inoperative battery. See **STANDARD PROCEDURE** for instructions on the use of the Micro 420 battery tester.

WARNING: IF THE BATTERY SHOWS SIGNS OF FREEZING, LEAKING OR LOOSE POSTS, DO NOT TEST, ASSIST-BOOST, OR CHARGE. THE BATTERY

MAY ARC INTERNALLY AND EXPLODE. PERSONAL INJURY AND/OR VEHICLE DAMAGE MAY RESULT.

WARNING: EXPLOSIVE HYDROGEN GAS FORMS IN AND AROUND THE BATTERY. DO NOT SMOKE, USE FLAME, OR CREATE SPARKS NEAR THE BATTERY. PERSONAL INJURY AND/OR VEHICLE DAMAGE MAY RESULT.

WARNING: THE BATTERY CONTAINS SULFURIC ACID, WHICH IS POISONOUS AND CAUSTIC. AVOID CONTACT WITH THE SKIN, EYES, OR CLOTHING. IN THE EVENT OF CONTACT, FLUSH WITH WATER AND CALL A PHYSICIAN IMMEDIATELY. KEEP OUT OF THE REACH OF CHILDREN.

A battery that will not accept a charge is inoperative, and must be replaced. Further testing is not required. A fully-charged battery must be load tested to determine its cranking capacity. A battery that is fully-charged, but does not pass the load test, is inoperative and must be replaced.

NOTE: Completely discharged batteries may take several hours to accept a charge.

STANDARD PROCEDURE

CONVENTIONAL BATTERY CHARGING

CAUTION: Vehicles equipped with a diesel engine utilize a unique spiral cell battery. This battery has a maximum charging voltage that must be used in order to restore the battery to its full potential, failure to use the spiral cell battery charging procedure could result in damage to the battery or personal injury. See STANDARD PROCEDURE for the appropriate procedure.

Battery charging is the means by which the battery can be restored to its full voltage potential. A battery is fully-charged when:

Micro 420 battery tester indicates battery is OK.

Open-circuit voltage of the battery is 12.65 volts or above.

Battery passes Load Test multiple times.

WARNING: If the battery shows signs of freezing, leaking, loose posts, do not test, assist-boost, or charge. The battery may arc internally and explode. Personal injury and/or vehicle damage may result.

WARNING: Explosive hydrogen gas forms in and around the battery. Do not smoke, use flame, or create sparks near the battery. Personal injury and/or vehicle damage may result.

WARNING: The battery contains sulfuric acid, which is poisonous and caustic. Avoid contact with the skin, eyes, or clothing. In the event of contact, flush with water and call a physician immediately. Keep out of the reach of children.

WARNING: If the battery is equipped with removable cell caps, be certain that each of the cell caps is in place and tight before the battery is returned to service. Personal injury and/or vehicle damage may result from loose or missing cell caps.

CAUTION: Always disconnect and isolate the battery negative cable before charging a battery. Do not exceed sixteen volts while charging a battery. Damage to the vehicle electrical system components may result.

CAUTION: Battery electrolyte will bubble inside the battery case during normal battery charging. Electrolyte boiling or being discharged from the battery vents indicates a battery overcharging condition. Immediately reduce the charging rate or turn off the charger to evaluate the battery condition. Damage to the battery may result from overcharging.

CAUTION: The battery should not be hot to the touch. If the battery feels hot to the touch, turn off the charger and let the battery cool before continuing the charging operation. Damage to the battery may result.

After the battery has been charged to an open-circuit voltage reading of 12.4 volts or greater, retest the battery with the Micro 420 tester or perform a load test to determine the battery cranking capacity. See **STANDARD PROCEDURE** for the proper battery test procedures. If the battery passes a load test, return the battery to service. If the battery fails a load test, it is faulty and must be replaced.

Clean and inspect the battery hold downs, tray, terminals, posts, and top before completing battery service. See **CLEANING** for the proper battery system cleaning procedures. See **INSPECTION** for the proper battery system inspection procedures.

CHARGING A COMPLETELY DISCHARGED CONVENTIONAL BATTERY

The following procedure should be used to recharge a completely discharged battery. Unless this procedure is properly followed, a good battery may be needlessly replaced.

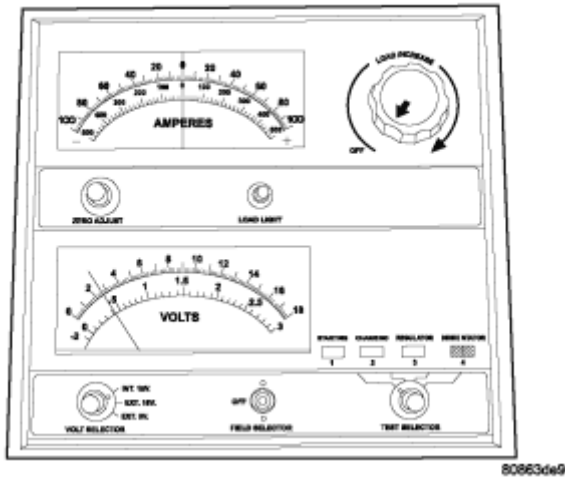


Fig. 5: Conventional Battery Charger
 Courtesy of CHRYSLER LLC

1. Measure the voltage at the battery posts with a voltmeter, accurate to 1/10 (0.10) volt. If the reading is below ten volts, the battery charging current will be low. It could take some time before the battery accepts a current greater than a few milliamperes. Such low current may not be detectable on the ammeters built into many battery chargers.
2. Disconnect and isolate the battery negative cable. Connect the battery charger leads. Some battery chargers are equipped with polarity-sensing circuitry. This circuitry protects the battery charger and the battery from being damaged if they are improperly connected. If the battery state-of-charge is too low for the polarity-sensing circuitry to detect, the battery charger will not operate. This makes it appear that the battery will not accept charging current. See the instructions provided by the manufacturer of the battery charger for details on how to bypass the polarity-sensing circuitry.
3. Battery chargers vary in the amount of voltage and current they provide. The amount of time required for a battery to accept measurable charging current at various voltages is shown in the CHARGE RATE TABLE. If the charging current is still not measurable at the end of the charging time, the battery is faulty and must be replaced. If the charging current is measurable during the charging time, the battery may be good and the charging should be completed in the normal manner.

CONVENTIONAL BATTERY CHARGE RATE TABLE

Voltage	Minutes
16.0 volts maximum	up to 10 min.
14.0 to 15.9 volts	up to 20 min.
13.9 volts or less	up to 30 min.

CHARGING TIME REQUIRED

The time required to charge a battery will vary, depending upon the following factors:

- Battery Capacity** - A completely discharged heavy-duty battery requires twice the charging time of a small capacity battery.
- Temperature** - A longer time will be needed to charge a battery at -18° C (0° F) than at 27° C (80° F).

When a fast battery charger is connected to a cold battery, the current accepted by the battery will be very low at first. As the battery warms, it will accept a higher charging current rate (amperage).

Charger Capacity - A battery charger that supplies only five amperes will require a longer charging time. A battery charger that supplies twenty amperes or more will require a shorter charging time.

State-Of-Charge - A completely discharged battery requires more charging time than a partially discharged battery. Electrolyte is nearly pure water in a completely discharged battery. At first, the charging current (amperage) will be low. As the battery charges, the specific gravity of the electrolyte will gradually rise.

The CONVENTIONAL BATTERY CHARGING TIME TABLE gives an indication of the time required to charge a typical battery at room temperature based upon the battery state-of-charge and the charger capacity.

CONVENTIONAL BATTERY CHARGING TIME TABLE

Charging Amperage	5 Amps	10 Amps	20 Amps
Open Circuit Voltage	Hours Charging @ 21° C (70° F)		
12.25 to 12.49	6 hours	3 hours	1.5 hours
12.00 to 12.24	10 hours	5 hours	2.5 hours
10.00 to 11.99	14 hours	7 hours	3.5 hours
Below 10.00	18 hours	9 hours	4.5 hours

IGNITION-OFF DRAW TEST

NOTE: Verify all vehicle electronic modules are in "sleep mode" prior to performing this test. Failure to do so could result in inaccurate digital multi-meter readings.

The term Ignition-Off Draw (IOD) identifies a normal condition where power is being drained from the battery with the ignition switch in the Off position. A normal vehicle electrical system will draw from five to thirty-five milliamperes (0.005 to 0.035 ampere) with the ignition switch in the Off position, and all non-ignition controlled circuits in proper working order. Up to thirty-five milliamperes are needed to enable the memory functions for the Powertrain Control Module (PCM), digital clock, electronically tuned radio, and other modules which may vary with the vehicle equipment.

A vehicle that has not been operated for approximately twenty days, may discharge the battery to an inadequate level. When a vehicle will not be used for twenty days or more (stored), remove the IOD fuse from the Totally Integrated Power Module (TIPM). This will reduce battery discharging.

Excessive IOD can be caused by:

- Electrical items left on.
- Faulty or improperly adjusted switches.

Faulty or shorted electronic modules and components.

An internally shorted generator.

Intermittent shorts in the wiring.

If the IOD is over thirty-five milliamperes, the problem must be found and corrected before replacing a battery. In most cases, the battery can be charged and returned to service after the excessive IOD condition has been corrected.

1. Verify that all electrical accessories are off. Turn off all lamps, remove the ignition key, and close all doors. If the vehicle is equipped with an illuminated entry system or an electronically tuned radio, allow the electronic timer function of these systems to automatically shut off (time out). This may take up to three minutes.
2. Determine that the underhood lamp is operating properly, then disconnect the lamp wire harness connector or remove the lamp bulb.
3. Disconnect the battery negative cable.
4. Set an electronic digital multi-meter to its highest amperage scale. Connect the multi-meter between the disconnected battery negative cable terminal clamp and the battery negative terminal post. Make sure that the doors remain closed so that the illuminated entry system is not activated. The multi-meter amperage reading may remain high for up to three minutes, or may not give any reading at all while set in the highest amperage scale, depending upon the electrical equipment in the vehicle. The multi-meter leads must be securely clamped to the battery negative cable terminal clamp and the battery negative terminal post. If continuity between the battery negative terminal post and the negative cable terminal clamp is lost during any part of the IOD test, the electronic timer function will be activated and all of the tests will have to be repeated.
5. After about three minutes, the high-amperage IOD reading on the multi-meter should become very low or nonexistent, depending upon the electrical equipment in the vehicle. If the amperage reading remains high, remove and replace each fuse or circuit breaker in the Totally Integrated Power Module (TIPM), one at a time until the amperage reading becomes very low, or nonexistent. **Refer to the appropriate wiring information for complete TIPM fuse, circuit breaker, and circuit identification.** This will isolate each circuit and identify the circuit that is the source of the high-amperage IOD. If the amperage reading remains high after removing and replacing each fuse and circuit breaker, disconnect the wire harness from the generator. If the amperage reading now becomes very low or nonexistent, refer to **DIAGNOSIS AND TESTING** for the proper charging system diagnosis and testing procedures. After the high-amperage IOD has been corrected, switch the multi-meter to progressively lower amperage scales and, if necessary, repeat the fuse and circuit breaker remove-and-replace process to identify and correct all sources of excessive IOD. It is now safe to select the lowest milliamperage scale of the multi-meter to check the low-amperage IOD.

CAUTION: Do not open any doors, or turn on any electrical accessories with the lowest milliamperage scale selected, or the multi-meter may be damaged.

6. Observe the multi-meter reading. The low-amperage IOD should not exceed thirty-five milliamperes (0.035 ampere). If the current draw exceeds thirty-five milliamperes, isolate each circuit using the fuse and circuit breaker remove-and-replace process in step 5. The multi-meter reading will drop to within the acceptable limit when the source of the excessive current draw is disconnected. Repair this circuit as

required; whether a wiring short, incorrect switch adjustment, or a component failure is at fault.

OPEN-CIRCUIT VOLTAGE TEST

A battery open-circuit voltage (no load) test will show the approximate state-of-charge of a battery.

Before proceeding with this test, completely charge the battery. Refer to the appropriate battery charging procedure.

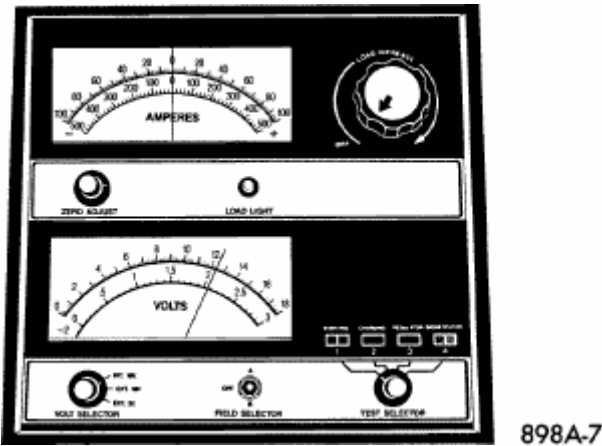


Fig. 6: Circuit Voltage Tester
Courtesy of CHRYSLER LLC

1. Before measuring the open-circuit voltage, the surface charge must be removed from the battery. Turn on the headlamps for fifteen seconds, then allow up to five minutes for the battery voltage to stabilize.
2. Disconnect and isolate both battery cables, negative cable first.
3. Using a voltmeter connected to the battery posts (see the instructions provided by the manufacturer of the voltmeter), measure the open-circuit voltage.

See the OPEN-CIRCUIT VOLTAGE TABLE. This voltage reading will indicate the battery state-of-charge, but will not reveal its cranking capacity. If a battery has an open-circuit voltage reading of 12.4 volts or greater, it may be load tested to reveal its cranking capacity.

OPEN CIRCUIT VOLTAGE TABLE	
Open Circuit Voltage	Charge Percentage
11.7 volts or less	0%
12.0 volts	25%
12.2 volts	50%
12.4 volts	75%
12.6 volts or more	100%

USING MICRO 420 BATTERY TESTER

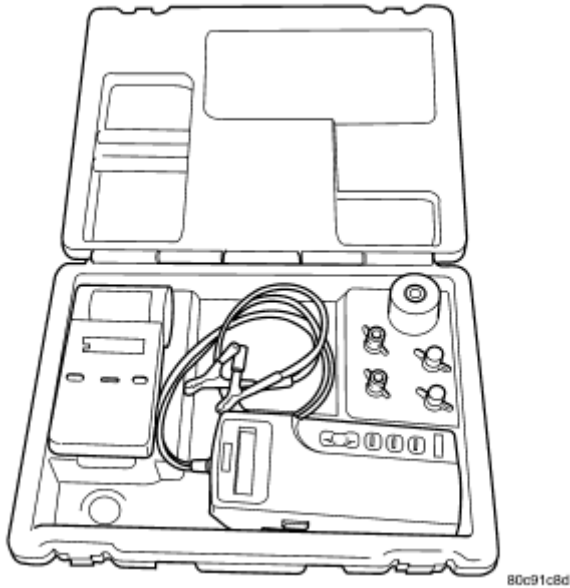


Fig. 7: Micro 420 Battery Tester
Courtesy of CHRYSLER LLC

Always use the Micro 420 Instruction Manual that was supplied with the tester as a reference. If the Instruction Manual is not available the following procedure can be used:

WARNING: Always wear appropriate eye protection and use extreme caution when working with batteries.

BATTERY TESTING

1. If testing the battery OUT-OF-VEHICLE, clean the battery terminals with a wire brush before testing. If the battery is equipped with side post terminals, install and tighten the supplied lead terminal stud adapters. Do not use steel bolts. Failure to properly install the stud adapters, or using stud adapters that are dirty or worn-out may result in false test readings.
2. If testing the battery IN-THE-VEHICLE, make certain all of the vehicle accessory loads are OFF, including the ignition.
3. Connect the tester to the battery, the red clamp to the positive (+) terminal and the black clamp to the negative (-) terminal.

NOTE: Multiple batteries connected in parallel must have the ground cable disconnected to perform a battery test. Failure to disconnect may result in false battery test readings.

4. Using the ARROW key select **in** or **out** of vehicle testing and press ENTER to make a selection.
5. If not selected, choose the Cold Cranking Amp (CCA) battery rating. Or select the appropriate battery rating for your area (see menu). The tester will then run its self programmed test of the battery and display the results. Refer to the BATTERY TEST RESULTS TABLE.

CAUTION: If **REPLACE BATTERY** is the result of the test, this may mean a poor connection between the vehicle's cables and battery exists. After disconnecting the vehicle's battery cables from the battery, retest the battery using the **OUT-OF-VEHICLE** test before replacing.

6. While viewing the battery test result, press the **CODE** button and the tester will prompt you for the last 4 digits of the VIN. Use the **UP/DOWN** arrow buttons to scroll to the correct character; then press **ENTER** to select and move to the next digit. Then press the **ENTER** button to view the **SERVICE CODE**. Pressing the **CODE** button a second time will return you to the test results.

BATTERY TEST RESULTS	
GOOD BATTERY	Return to service
GOOD - RECHARGE	Fully charge battery and return to service
CHARGE & RETEST	Fully charge battery and retest battery
REPLACE BATTERY	Replace the battery and retest complete system
BAD-CELL REPLACE	Replace the battery and retest complete system

NOTE: The **SERVICE CODE** is required on every warranty claim submitted for battery replacement.

REMOVAL

BATTERY

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

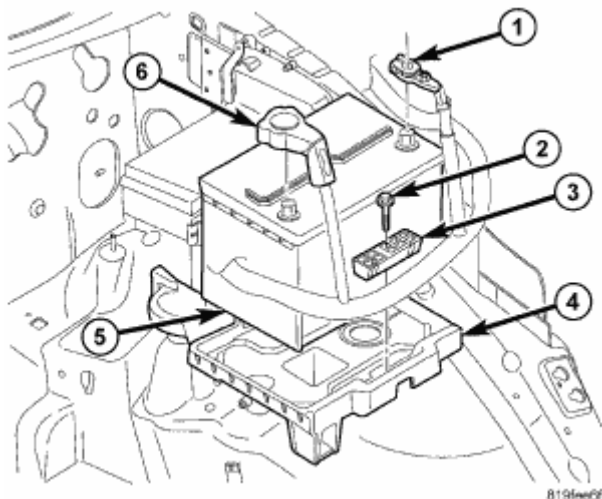


Fig. 8: Battery Negative Cable, Bolt, Retainer, Battery Tray, Battery & Battery Positive Cable
Courtesy of CHRYSLER LLC

NOTE: Left hand drive shown in illustration, right hand drive similar.

1. Loosen the pinch clamp bolt and disconnect and isolate the battery negative cable (1).
2. Loosen the pinch clamp bolt and disconnect the battery positive cable (6).
3. Loosen bolt (2) and remove the retainer (3) that holds the battery (5) to the battery tray (4).

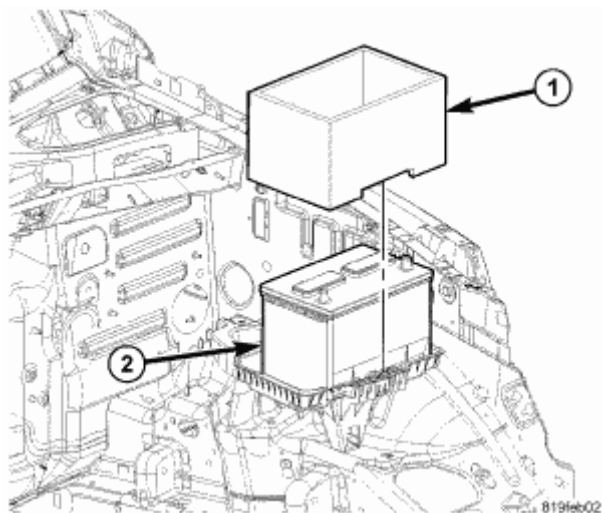


Fig. 9: Thermal Guard & Battery
Courtesy of CHRYSLER LLC

4. Remove the battery from the vehicle.
5. Remove thermal guard (1) from battery (2).

INSTALLATION

BATTERY

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves should be worn when removing or servicing a battery. Safety glasses also should be worn.

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

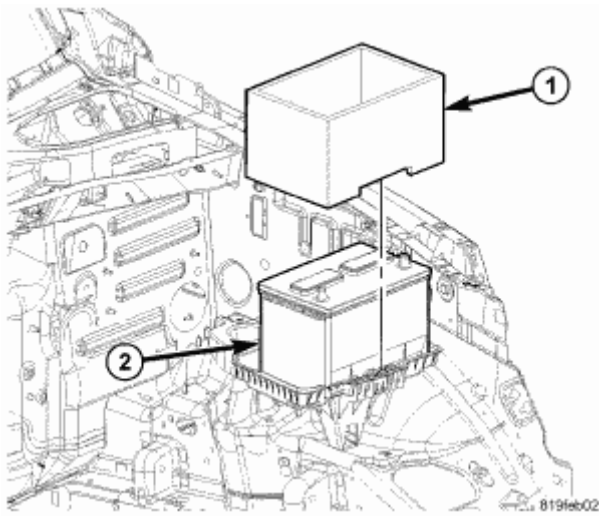


Fig. 10: Thermal Guard & Battery
 Courtesy of CHRYSLER LLC

NOTE: Left hand drive shown in illustration, right hand drive similar.

NOTE: When replacing battery, the thermal guard **MUST** be transferred to the new battery.

1. Carefully install the thermal guard (1) onto the battery (2).

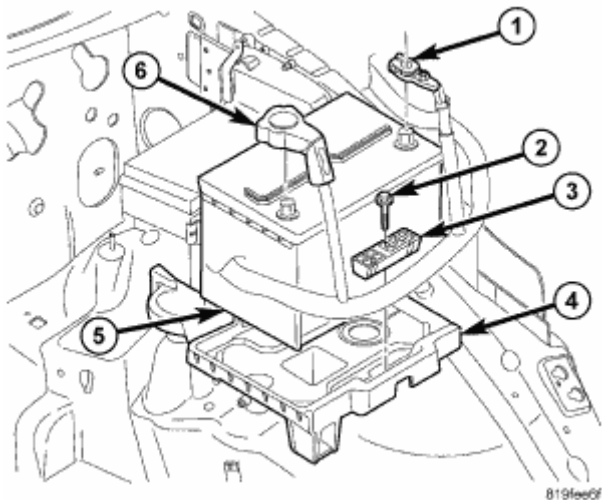


Fig. 11: Battery Negative Cable, Bolt, Retainer, Battery Tray, Battery & Battery Positive Cable
 Courtesy of CHRYSLER LLC

2. Install battery (5) into the vehicle making sure that the thermal guard is present and battery is properly positioned on battery tray (4).
3. Install the battery hold down retainer (3) and bolt (2) making sure that it is properly positioned on battery (5). Tighten the hold down bolt to 7 N.m (62 in. lbs.)

4. Connect the battery positive cable (6) and tighten the pinch clamp nut to 5 N.m (45 in. lbs.)
5. Connect the battery negative cable (1) and tighten the pinch clamp nut to 5 N.m (45 in. lbs.)
6. Verify proper vehicle operation.

BATTERY CABLES

DESCRIPTION

BATTERY CABLE

The battery cables are large gauge, stranded copper wires sheathed within a heavy plastic or synthetic rubber insulating jacket. The wire used in the battery cables combines excellent flexibility and reliability with high electrical current carrying capacity. The battery cables feature a clamping type female battery terminal made of stamped sheet metal that is die cast onto one end of the battery cable wire. A pinch-bolt and nut are installed at the open end of the female battery terminal clamp. Large eyelet type terminals are crimped onto the opposite end of the battery cable wire and then soldered. The battery positive cable wires feature a larger female battery terminal clamp to allow connection to the larger battery positive terminal post. The battery negative cable wires have a smaller female battery terminal clamp.

Both the battery positive and negative cables are available for service replacement only as a unit with the battery wire harness, which may include portions of the wiring circuits for the generator and other components on some vehicles.

OPERATION

BATTERY CABLE

The battery cables connect the battery terminal posts to the vehicle electrical system. These cables also provide a path back to the battery for electrical current generated by the charging system for restoring the voltage potential of the battery. The female battery terminal clamps on the ends of the battery cable wires provide a strong and reliable connection of the battery cable to the battery terminal posts. The terminal pinch bolts allow the female terminal clamps to be tightened around the male terminal posts on the top of the battery. The eyelet terminals secured to the opposite ends of the battery cable wires from the female battery terminal clamps provide secure and reliable connection of the battery cables to the vehicle electrical system.

One wire has an eyelet terminal that connects the battery positive cable to the B(+) terminal stud of the Totally Integrated Power Module (TIPM), and the other wire has an eyelet terminal that connects the battery positive cable to the B(+) terminal stud of the engine starter motor solenoid. The battery negative cable terminal clamp has one wire as an eyelet terminal that connects the battery negative cable to the vehicle powertrain through a ground connection, typically on the engine cylinder block.

DIAGNOSIS AND TESTING

BATTERY CABLES

A voltage drop test will determine if there is excessive resistance in the battery cable terminal connections or the battery cable. If excessive resistance is found in the battery cable connections, the connection point should be disassembled, cleaned of all corrosion or foreign material, then reassembled. Following reassembly, check

the voltage drop for the battery cable connection and the battery cable again to confirm repair.

When performing the voltage drop test, it is important to remember that the voltage drop is giving an indication of the resistance between the two points at which the voltmeter probes are attached. **EXAMPLE:** When testing the resistance of the battery positive cable, touch the voltmeter leads to the battery positive cable terminal clamp and to the battery positive cable eyelet terminal at the starter solenoid B(+) terminal stud. If you probe the battery positive terminal post and the battery positive cable eyelet terminal at the starter solenoid B(+) terminal stud, you are reading the combined voltage drop in the battery positive cable terminal clamp-to-terminal post connection and the battery positive cable.

VOLTAGE DROP TEST

The following operation will require a voltmeter accurate to 1/10 (0.10) volt. Before performing this test, be certain that the following procedures are accomplished:

The battery is fully-charged and load tested.

Fully engage the parking brake.

If the vehicle is equipped with an automatic transmission, place the gearshift selector lever in the Park position. If the vehicle is equipped with a manual transmission, place the gearshift selector lever in the Neutral position and block the clutch pedal in the fully depressed position.

Verify that all lamps and accessories are turned off.

To prevent the engine from starting, remove the Automatic Shut Down (ASD) relay. The ASD relay can be found in the Fuse Block located in the left front bumper fascia. See the fuse and relay layout label affixed to the underside of the Fuse Block cover for ASD relay identification and location.

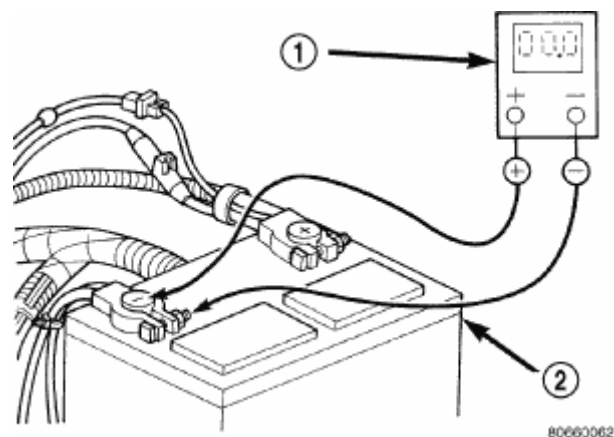


Fig. 12: Connecting Positive Lead Of Voltmeter To Battery Negative Terminal Post
Courtesy of CHRYSLER LLC

1. Connect the positive lead of the voltmeter (1) to the battery (2) negative terminal post. Connect the negative lead of the voltmeter (1) to the battery (2) negative cable terminal clamp. Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If voltage is detected, correct the poor connection between the battery negative cable terminal clamp and the battery negative terminal post.

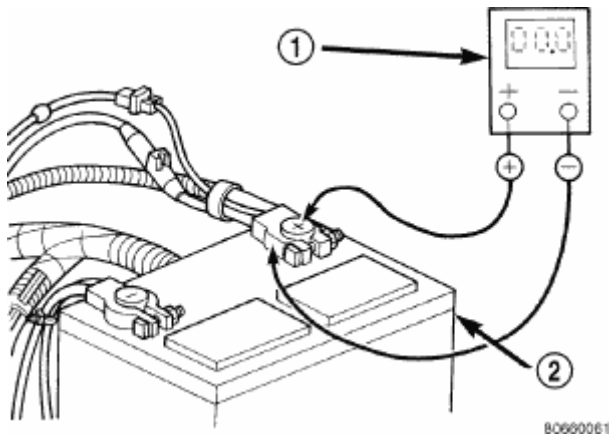


Fig. 13: Connecting Positive Lead Of Voltmeter To Battery Positive Terminal Post
 Courtesy of CHRYSLER LLC

2. Connect the positive lead of the voltmeter (1) to the battery (2) positive terminal post. Connect the negative lead of the voltmeter (1) to the battery (2) positive cable terminal clamp. Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If voltage is detected, correct the poor connection between the battery positive cable terminal clamp and the battery positive terminal post.

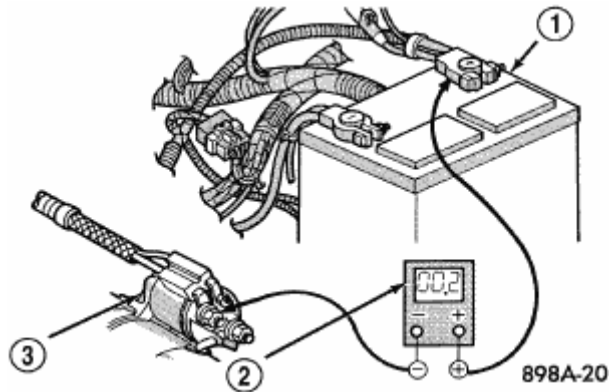


Fig. 14: Connecting Voltmeter To Measure Between Battery Positive Cable Terminal Clamp And Starter Solenoid B(+) Terminal Stud
 Courtesy of CHRYSLER LLC

3. Connect the voltmeter (2) to measure between the battery positive cable terminal clamp (1) and the starter solenoid B(+) terminal stud (3). Rotate and hold the ignition switch in the Start position. Observe the voltmeter. If the reading is above 0.2 volt, clean and tighten the battery positive cable eyelet terminal connection at the starter solenoid B(+) terminal stud. Repeat the test. If the reading is still above 0.2 volt, replace the faulty battery positive cable.

NOTE: Left hand drive gasoline engine shown in illustration, right hand drive and diesel similar.

1. Loosen the pinch clamp bolt and disconnect and isolate the battery negative cable (2).
2. Loosen the pinch clamp bolt and disconnect the battery positive cable (1).
3. Remove the negative cable retaining stud (7) from the mounting surface on the inner fender. Remove the cable (6) from the stud.
4. Disconnect the cable assembly routing clips from the inner fender.

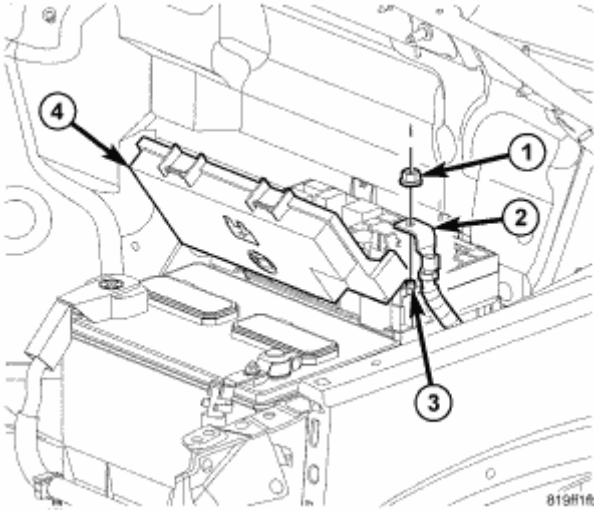


Fig. 17: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover

Courtesy of CHRYSLER LLC

5. Remove the positive cable retaining nut (1) from the mounting stud on the Totally Integrated Power Module (3). Remove the cable (2) from the stud.

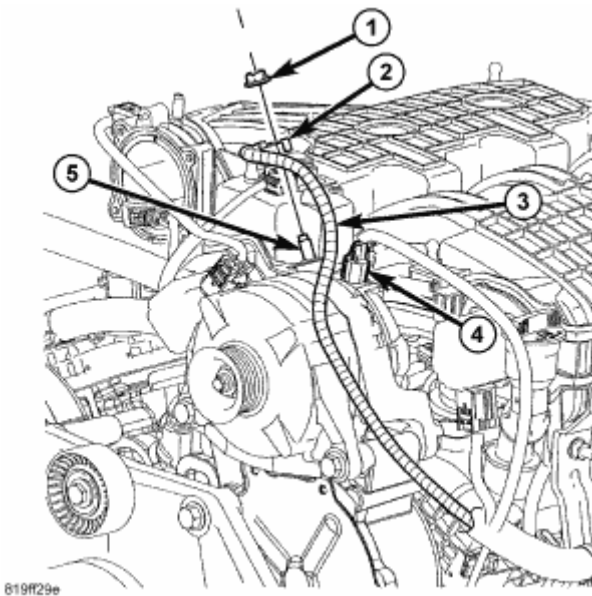


Fig. 18: Removing/Installing Positive Battery Cable Nut From/To B+ Terminal Of Generator & Cable From/To Generator
 Courtesy of CHRYSLER LLC

6. Remove the positive battery cable nut (1) from the B+ terminal of the generator (5). Remove the cable (2) from the generator.

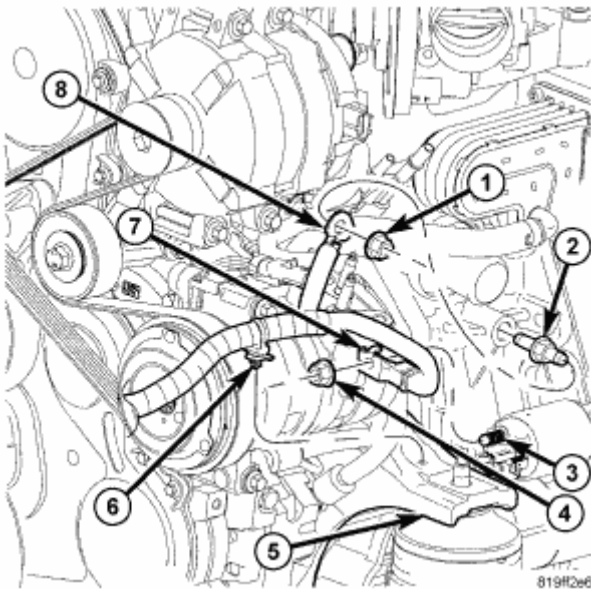


Fig. 19: Negative Battery Cable Nut, Mounting Stud, Starter Motor, Positive Battery Cable Nut, Battery Cable Retaining Pushpins & Cables
 Courtesy of CHRYSLER LLC

7. Remove the positive battery cable nut (4) from the B+ terminal of the starter motor (3). Remove the cable (7) from the starter.
8. Remove the negative battery cable nut (1) from the mounting stud (2) on the engine block. Remove the

cable (8) from the stud.

9. One at a time, trace any remaining battery cable retaining pushpins (6), fasteners and routing clips until the cables are free from the vehicle.
10. Remove the battery cables from the engine compartment.

INSTALLATION

BATTERY CABLE

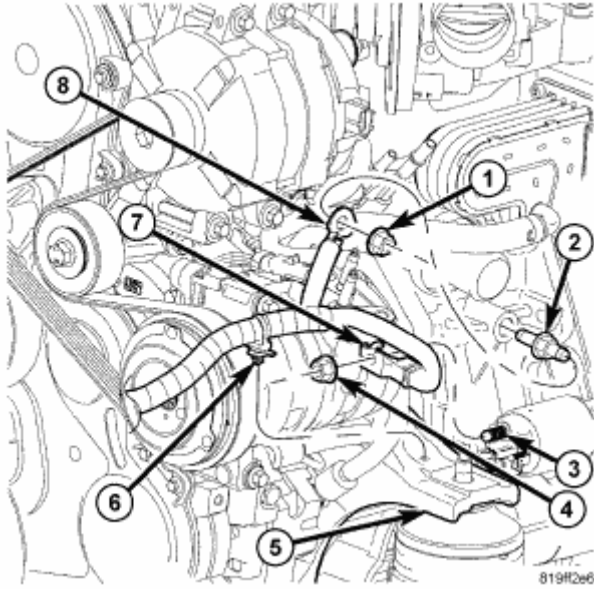


Fig. 20: Negative Battery Cable Nut, Mounting Stud, Starter Motor, Positive Battery Cable Nut, Battery Cable Retaining Pushpins & Cables

Courtesy of CHRYSLER LLC

WARNING: Remove metallic jewelry to avoid injury by accidental arcing of battery current.

NOTE: Left hand drive gasoline engine shown in illustration, right hand drive and diesel similar.

1. Position the battery cables in the engine compartment.
2. One at a time, install the battery cable retaining pushpins (6), fasteners and routing clips until the cables are installed exactly where they were in the vehicle.
3. Install the negative battery cable (8) to the mounting stud (2) on the engine block. Install the negative battery cable retaining nut (1).
4. Connect the positive battery cable (7) to the B+ terminal of the starter motor (3). Install the retaining nut (4) and tighten it to 13 N.m (115 in. lbs.).

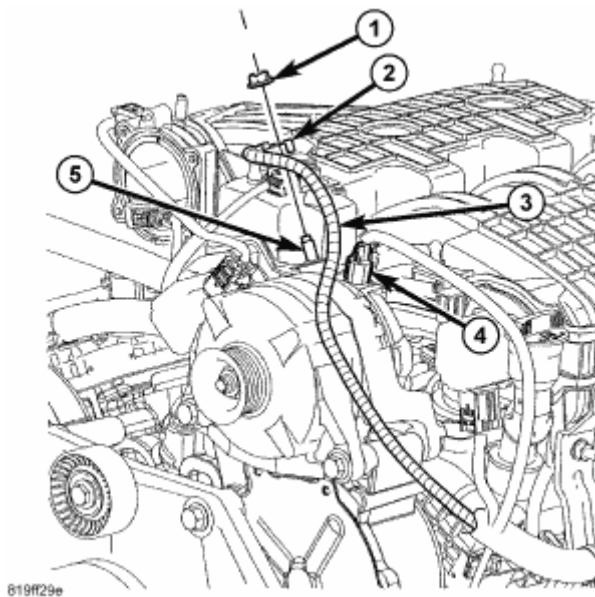


Fig. 21: Removing/Installing Positive Battery Cable Nut From/To B+ Terminal Of Generator & Cable From/To Generator
 Courtesy of CHRYSLER LLC

5. Connect the positive battery cable (2) to the B+ terminal of the generator (5). Install the retaining nut (1) and tighten it to 14 N.m (125 in. lbs.).

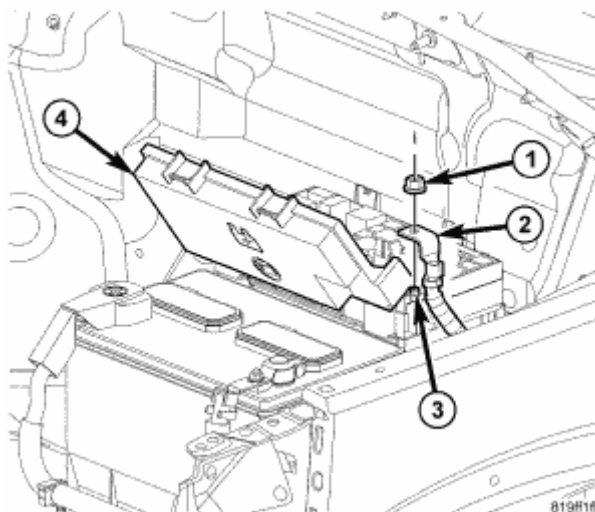


Fig. 22: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover
 Courtesy of CHRYSLER LLC

6. Position the Totally Integrated Power Module (TIPM) positive cable (2) onto the mounting stud (3) and install the retaining nut (1). Tighten the nut to 9 - 11 N.m (80 - 100 in. lbs.). Close the TIPM cover (4).

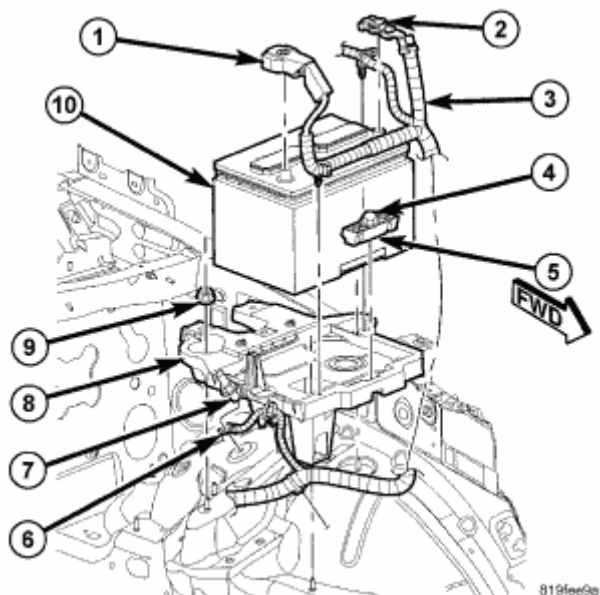


Fig. 23: Battery Cable Assembly
 Courtesy of CHRYSLER LLC

7. Connect the battery cable assembly routing clips to the inner fender.
8. Position the negative battery cable (6) onto the mounting stud (7). Install the mounting stud onto the inner fender and tighten to 12 N.m (9 ft. lbs.)
9. Connect the battery positive cable (1). Tighten the cable clamp nut to 5 N.m (45 in. lbs.)
10. Connect the battery negative cable (2). Tighten the cable clamp nut to 5 N.m (45 in. lbs.)

BATTERY TRAY

DESCRIPTION

BATTERY TRAY

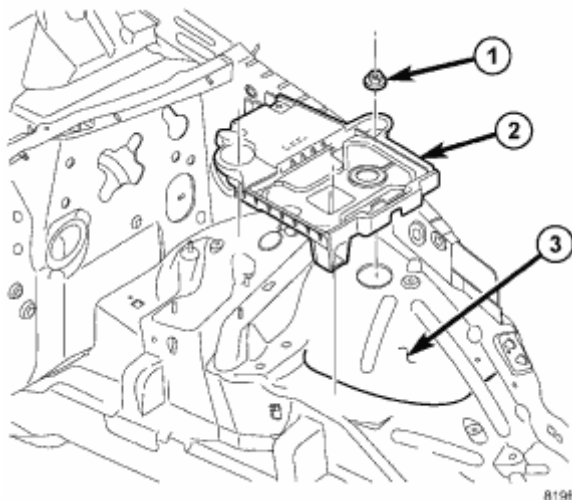


Fig. 24: Nuts, Plastic Battery Tray & Inner Fender

Courtesy of CHRYSLER LLC

NOTE: Left hand drive gasoline engine shown in illustration, right hand drive and diesel similar.

The battery is placed and secured in a plastic battery tray (2). The battery tray is located in the left front side of the vehicle and is secured to the inner fender (3) with three nuts (1).

REMOVAL

BATTERY TRAY

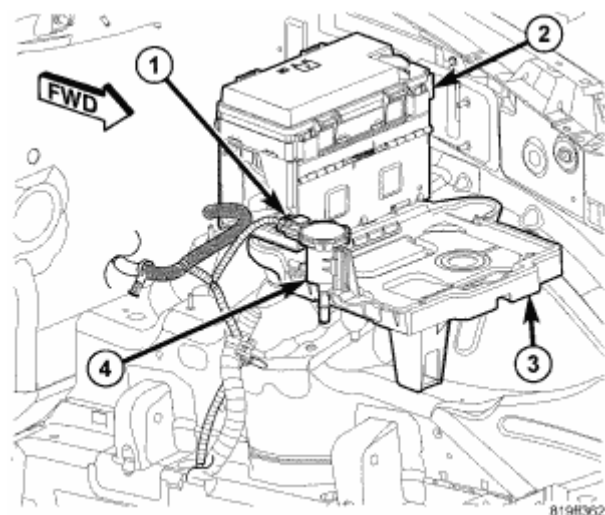


Fig. 25: Electrical Connector, Battery, Battery Tray & Solenoid

Courtesy of CHRYSLER LLC

NOTE: Left hand drive gasoline engine shown in illustration, right hand drive and diesel similar.

1. Disconnect and isolate the battery negative cable.
2. Remove the battery. See **REMOVAL**.
3. On gasoline engine equipped vehicles, disconnect the purge solenoid vacuum hose and electrical connector (1). Using an appropriate flat bladed tool, remove the solenoid (4) from the battery tray (3) by disengaging the solenoid mounting clip and lifting it up off the battery tray mounting tab.

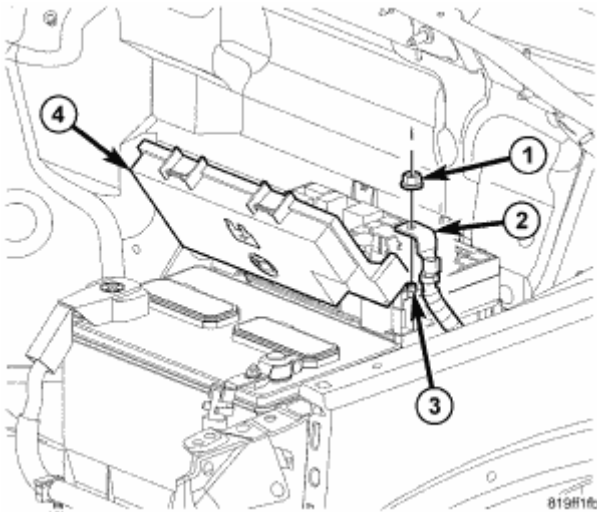


Fig. 26: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover
 Courtesy of CHRYSLER LLC

4. Open the Totally Integrated Power Module (TIPM) cover (4).
5. Remove the TIPM positive cable retaining nut (1) and remove the cable (2) from the mounting stud (3).

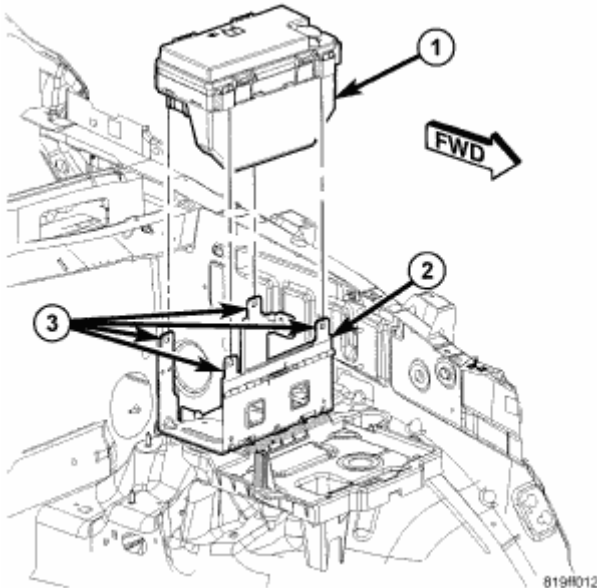


Fig. 27: Identifying Integrated Power Module (TIPM), TIPM Mounting Bracket & Mounting Tabs
 Courtesy of CHRYSLER LLC

6. Using an appropriate flat bladed tool, depress the four mounting clips to disengage and remove the TIPM housing (1) from the TIPM bracket mounting tabs (3).

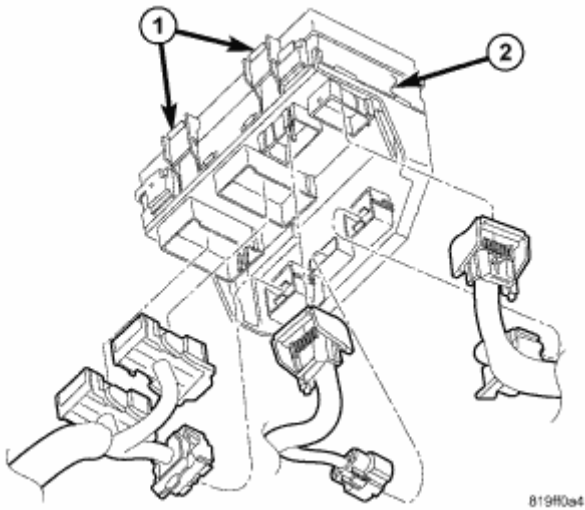


Fig. 28: Disconnecting/Connecting TIPM Wire Harness Connectors
 Courtesy of CHRYSLER LLC

7. Disconnect each of the seven TIPM wire harness connectors from the TIPM housing (2).
8. Remove the TIPM from the vehicle.

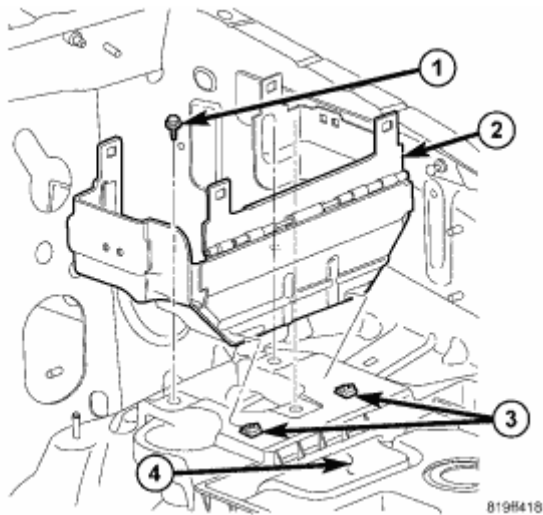


Fig. 29: TIPM Bracket Retaining Screws, Bracket, Mounting Tabs & Battery Tray
 Courtesy of CHRYSLER LLC

9. Remove the TIPM bracket retaining screws (1) and slide the bracket (2) rearward to disengage the mounting tabs (3). Remove the TIPM bracket from the battery tray (4).

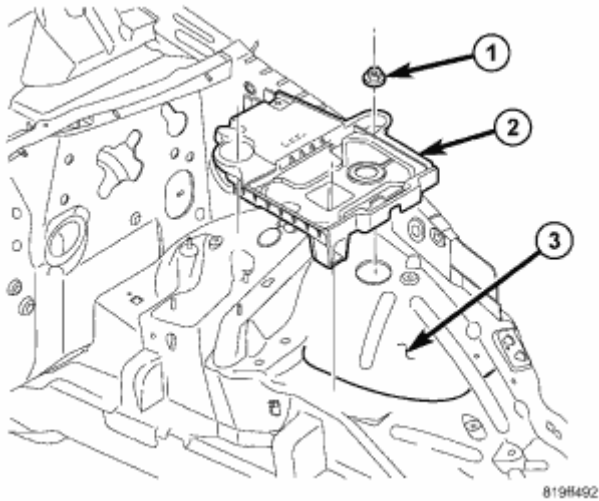


Fig. 30: Nuts, Plastic Battery Tray & Inner Fender
Courtesy of CHRYSLER LLC

10. Remove the three nuts (1) securing the battery tray (2) to the left inner fender (3).
11. Lift the battery tray out of the engine compartment and remove from the vehicle.

INSTALLATION

INSTALLATION

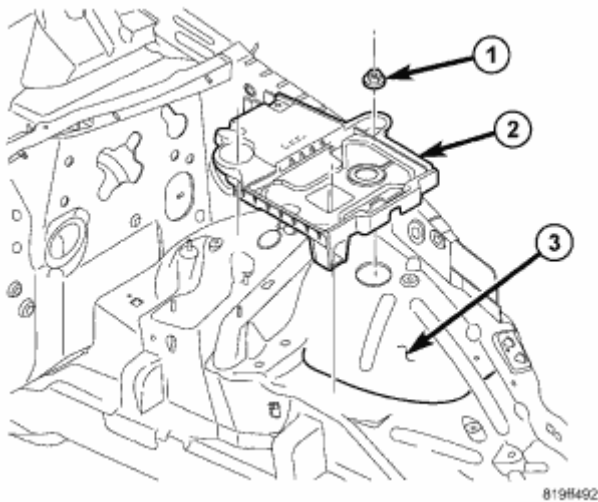


Fig. 31: Nuts, Plastic Battery Tray & Inner Fender
Courtesy of CHRYSLER LLC

1. Position the battery tray (2) into the engine compartment and onto the mounting studs on the left inner fender (3).
2. Install the nuts (1) securing the battery tray (2) to the left inner fender (3).
3. Tighten the nuts to 10.5 N.m (93 in. lbs.)

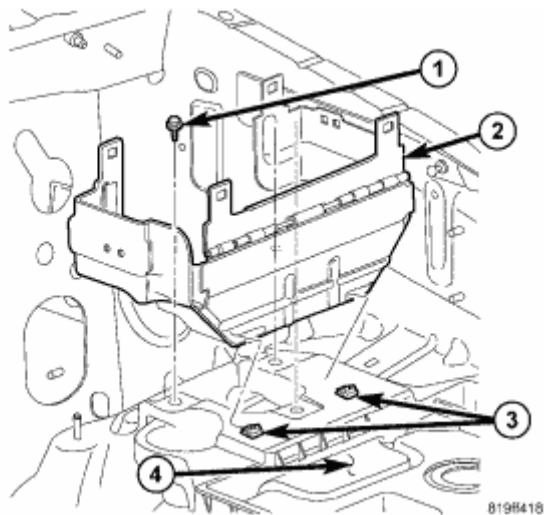


Fig. 32: TIPM Bracket Retaining Screws, Bracket, Mounting Tabs & Battery Tray
 Courtesy of CHRYSLER LLC

4. Position the TIPM bracket (2) onto the battery tray (4). Slide the bracket (2) forward to engage the slots in the bracket with the mounting tabs of the battery tray (3). Install the TIPM bracket retaining screws (1) into the battery tray (4).

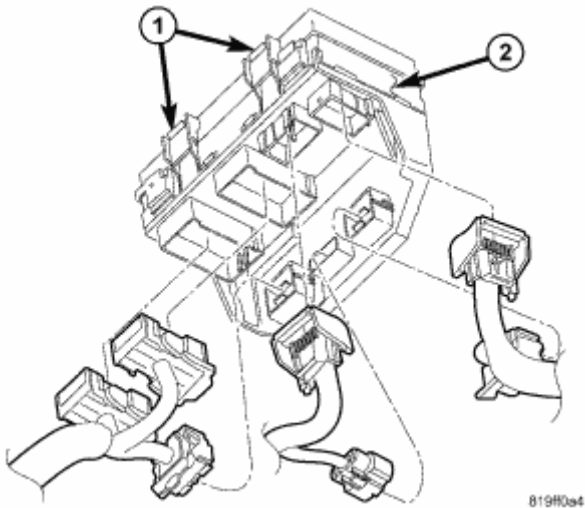


Fig. 33: Disconnecting/Connecting TIPM Wire Harness Connectors
 Courtesy of CHRYSLER LLC

5. Position the TIPM (2) into the engine compartment.
6. Connect each of the seven TIPM wire harness connectors as shown in illustration.

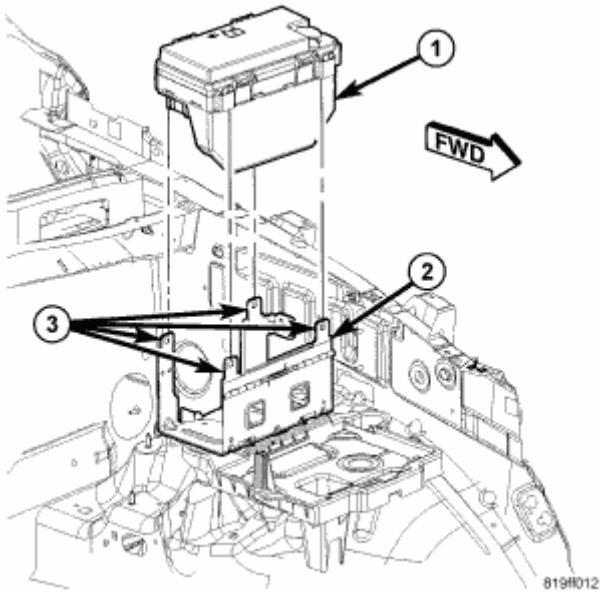


Fig. 34: Identifying Integrated Power Module (TIPM), TIPM Mounting Bracket & Mounting Tabs
 Courtesy of CHRYSLER LLC

7. Position the TIPM (1) onto the mounting bracket (2) and push down until the mounting clips are fully seated onto the mounting tabs (3).

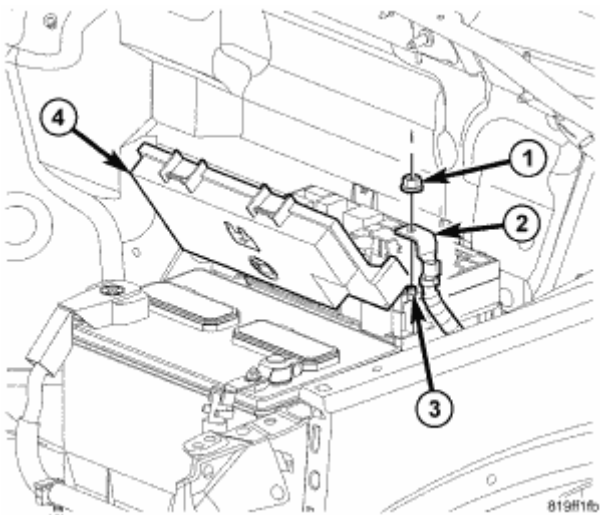


Fig. 35: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover
 Courtesy of CHRYSLER LLC

8. Position the TIPM positive cable (2) onto the mounting stud (3) and install the retaining nut (1). Tighten the nut to 9 - 11 N.m (80 - 100 in. lbs.).

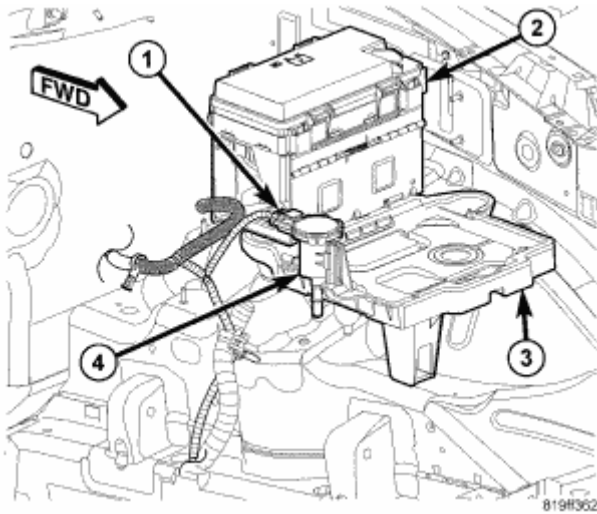


Fig. 36: Electrical Connector, Battery, Battery Tray & Solenoid
Courtesy of CHRYSLER LLC

9. On gasoline engine equipped vehicles, position the purge solenoid (4) onto the mounting tab of the battery tray (3) and push downward until the solenoid locks into place. Connect the purge solenoid vacuum hose and electrical connector (1).
10. Install the battery. See **INSTALLATION**.
11. Connect the battery negative cable.
12. Close the hood.
13. Insert the ignition key and turn it to the "RUN" position and wait twelve seconds. The TIPM will collect the necessary vehicle configuration and VIN data from the CCN and PCM at this time. After twelve seconds turn the ignition key to the "OFF" position and then back to the "ON" position and verify proper vehicle systems operation.

THERMAL GUARD

DESCRIPTION

THERMAL GUARD

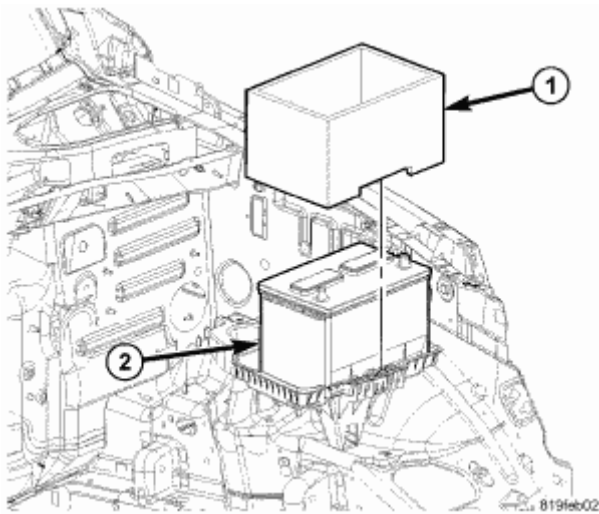


Fig. 37: Thermal Guard & Battery
Courtesy of CHRYSLER LLC

On gasoline engine equipped vehicles, a flexible thermal guard (1) wraps around the battery case (2) to enclose the sides of the battery. The thermal guard (1) consists of a plastic cloth outer skin with a polyester based insulator fiber.

REMOVAL

REMOVAL

WARNING: To protect the hands from battery acid, a suitable pair of heavy duty rubber gloves, not the household type, should be worn when removing or servicing a battery. Safety glasses also should be worn.

1. Disconnect and isolate the battery negative cable.
2. Remove the battery. See **REMOVAL**.
3. Carefully lift the thermal guard off over the battery taking care not to tear it.
4. Remove the thermal guard from battery.

INSTALLATION

INSTALLATION

NOTE: When replacing battery, the thermal guard **MUST** be transferred to the new battery.

1. Slip the battery thermal guard over the battery being careful not to tear it.
2. Install the battery into the vehicle. See **INSTALLATION**.
3. Connect the battery negative cable.

2008 ACCESSORIES AND EQUIPMENT

Body - Liberty

WARNING

WARNING - CAUTIONS AND WARNINGS

WARNING: Use an OSHA approved breathing filter when spraying paint or solvents in a confined area. Personal injury can result.

Avoid prolonged skin contact with petroleum or alcohol - based cleaning solvents. Personal injury can result.

Do not stand under a hoisted vehicle that is not properly supported on safety stands. Personal injury can result.

CAUTION: When holes must be drilled or punched in an inner body panel, verify depth of space to the outer body panel, electrical wiring, or other components. Damage to vehicle can result.

Do not weld exterior panels unless combustible material on the interior of vehicle is removed from the repair area. Fire or hazardous conditions, can result.

Always have a fire extinguisher ready for use when welding.

Disconnect the negative (-) cable clamp from the battery when servicing electrical components that are live when the ignition is OFF. Damage to electrical system can result.

Do not use abrasive chemicals or compounds on painted surfaces. Damage to finish can result.

Do not use harsh alkaline based cleaning solvents on painted or upholstered surfaces. Damage to finish or color can result.

Do not hammer or pound on plastic trim panel when servicing interior trim. Plastic panels can break.

WARNING - USE OF HEAT DURING REPAIR

WARNING: Chrysler Group engineering's position on the use of heat during collision repair is as follows:

Any body panel or frame component damaged which is to be repaired and reused, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.

During rough straightening prior to panel replacement, damaged panels or frame components may be heated to assist in body/frame

realignment. The application of heat must be constrained to the parts which will be replaced and not allowed to affect any other components.

This "no heat" recommendation is due to the extensive use of high strength and advanced high strength steels in Chrysler Group products. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer.

Ignoring these recommendations may lead to serious compromises in the ability to protect occupants in a future collision event, reduce the engineered qualities and attributes, or decrease the durability and reliability of the vehicle.

Failure to follow these instructions may result in serious or fatal injury.

This statement supersedes any previously released information by the Chrysler Group.

DIAGNOSIS AND TESTING

WATER LEAKS

Water leaks can be caused by poor sealing, improper body component alignment, body seam porosity, missing plugs, or blocked drain holes. Centrifugal and gravitational force can cause water to drip from a location away from the actual leak point, making leak detection difficult. All body sealing points should be water tight in normal wet-driving conditions. Water flowing downward from the front of the vehicle should not enter the passenger or luggage compartment. Moving sealing surfaces will not always seal water tight under all conditions. At times, side glass or door seals will allow water to enter the passenger compartment during high pressure washing or hard driving rain (severe) conditions. Overcompensating on door or glass adjustments to stop a water leak that occurs under severe conditions can cause premature seal wear and excessive closing or latching effort. After completing a repair, water test vehicle to verify leak has stopped before returning vehicle to use.

VISUAL INSPECTION BEFORE WATER LEAK TESTS

Verify that floor and body plugs are in place, body drains are clear, and body components are properly aligned and sealed. If component alignment or sealing is necessary, refer to the appropriate information in this article for proper procedures.

WATER LEAK TESTS

WARNING: Do not use electric shop lights or tools in water test area. Personal injury can result.

When the conditions causing a water leak have been determined, simulate the conditions as closely as possible.

If a leak occurs with the vehicle parked in a steady light rain, flood the leak area with an open-ended garden hose.

If a leak occurs while driving at highway speeds in a steady rain, test the leak area with a reasonable velocity stream or fan spray of water. Direct the spray in a direction comparable to actual conditions.

If a leak occurs when the vehicle is parked on an incline, hoist the end or side of the vehicle to simulate this condition. This method can be used when the leak occurs when the vehicle accelerates, stops or turns. If the leak occurs on acceleration, hoist the front of the vehicle. If the leak occurs when braking, hoist the back of the vehicle. If the leak occurs on left turns, hoist the left side of the vehicle. If the leak occurs on right turns, hoist the right side of the vehicle. For hoisting recommendations. Refer to **STANDARD PROCEDURE** .

WATER LEAK DETECTION

To detect a water leak point-of-entry, do a water test and watch for water tracks or droplets forming on the inside of the vehicle. If necessary, remove interior trim covers or panels to gain visual access to the leak area. If the hose cannot be positioned without being held, have someone help do the water test.

Some water leaks must be tested for a considerable length of time to become apparent. When a leak appears, find the highest point of the water track or drop. The highest point usually will show the point of entry. After leak point has been found, repair the leak and water test to verify that the leak has stopped.

Locating the entry point of water that is leaking into a cavity between panels can be difficult. The trapped water may splash or run from the cavity, often at a distance from the entry point. Most water leaks of this type become apparent after accelerating, stopping, turning, or when on an incline.

MIRROR INSPECTION METHOD

When a leak point area is visually obstructed, use a suitable mirror to gain visual access. A mirror can also be used to deflect light to a limited-access area to assist in locating a leak point.

BRIGHT LIGHT LEAK TEST METHOD

Some water leaks in the luggage compartment can be detected without water testing. Position the vehicle in a brightly lit area. From inside the darkened luggage compartment inspect around seals and body seams. If necessary, have a helper direct a drop light over the suspected leak areas around the luggage compartment. If light is visible through a normally sealed location, water could enter through the opening.

PRESSURIZED LEAK TEST METHOD

When a water leak into the passenger compartment cannot be detected by water testing, pressurize the passenger compartment and soap test exterior of the vehicle. To pressurize the passenger compartment, close all doors and windows, start engine, and set heater control to high blower in HEAT position. If engine can not be started, connect a charger to the battery to ensure adequate voltage to the blower. With interior pressurized, apply dish detergent solution to suspected leak area on the exterior of the vehicle. Apply detergent solution with spray device or soft bristle brush. If soap bubbles occur at a body seam, joint, seal or gasket, the leak entry point could be at that location.

WIND NOISE

Wind noise is the result of most air leaks. Air leaks can be caused by poor sealing, improper body component alignment, body seam porosity, or missing plugs in the engine compartment or door hinge pillar areas. All body sealing points should be airtight in normal driving conditions. Moving sealing surfaces will not always seal airtight under all conditions. At times, side glass or door seals will allow wind noise to be noticed in the passenger compartment during high cross winds. Over compensating on door or glass adjustments to stop wind noise that occurs under severe conditions can cause premature seal wear and excessive closing or latching effort. After a repair procedure has been performed, test vehicle to verify noise has stopped before returning vehicle to use.

VISUAL INSPECTION BEFORE TESTS

Verify that floor and body plugs are in place and body components are aligned and sealed. If component alignment or sealing is necessary, refer to the appropriate procedure of this article for proper procedures.

ROAD TESTING WIND NOISE

1. Drive the vehicle to verify the general location of the wind noise.
2. Apply 50 mm (2 in.) masking tape in 150 mm (6 in.) lengths along weatherstrips, weld seams or moldings. After each length is applied, drive the vehicle. If noise goes away after a piece of tape is applied, remove tape, locate, and repair defect.

POSSIBLE CAUSE OF WIND NOISE

Moldings standing away from body surface can catch wind and whistle.

Gaps in sealed areas behind overhanging body flanges can cause wind-rushing sounds.

Misaligned movable components.

Missing or improperly installed plugs in pillars.

Weld burn through holes.

STANDARD PROCEDURE

BODY LUBRICATION

All mechanisms and linkages should be lubricated when necessary. This will maintain ease of operation and provide protection against rust and excessive wear. The weatherstrip seals should be lubricated to prolong their life as well as to improve door sealing.

All applicable exterior and interior vehicle operating mechanisms should be inspected and cleaned. Pivot/sliding contact areas on the mechanisms should then be lubricated.

1. When necessary, lubricate the operating mechanisms with the specified lubricants.
2. Apply silicone lubricant to a cloth and wipe it on door seals to avoid over-spray that can soil passenger's clothing.
3. Before applying lubricant, the component should be wiped clean. After lubrication, any excess lubricant

should be removed.

- 4. The hood latch, latch release mechanism, latch striker, and safety latch should be lubricated periodically.
- 5. The door lock cylinders should be lubricated twice each year (preferably autumn and spring).

Spray a small amount of lock cylinder lubricant directly into the lock cylinder.

Apply a small amount to the key and insert it into the lock cylinder.

Rotate it to the locked position and then back to the unlocked position several times.

Remove the key. Wipe the lubricant from it with a clean cloth to avoid soiling of clothing.

Component	Fluid, Lubricant, and Genuine Part
Hinges:	
Door & Hood	Mopar® Engine Oil
Lift Gate	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Latches: Hood/Safety Catch	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Seat Regulator & Track	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Lock Cylinders	Mopar® Lock Cylinder Lube

BUZZ, SQUEAK & RATTLE

Buzz, Squeak & Rattles (BSR) may be caused by any one or more of the following and may be corrected as indicated:

- Loose fasteners should be tightened to specifications.
- Damaged or missing clips should be replaced.
- Damaged trim panels should be replaced.
- Incorrectly installed trim panels should be reinstalled properly.

Many BSR complaints such as loose trim, can be serviced using the Mopar® Parts BSR Noise Reduction Kit. This kit contains various tapes including foam, flock and anti-squeak used to eliminate noises caused by metal, plastic and vinyl components. Long life lubricants and greases can also be used on a variety of components. Refer to **Buzz, Squeak & Rattle Kit** table for material contents and usage.

Buzz, Squeak & Rattle Kit

ITEM	FEATURES	APPLICATIONS	SERVICE TEMP
Itch And Squeak Tape	An abrasion resistant material thin enough to conform to most irregular surfaces. Stops most itches and squeaks.	Between metal and metal, metal and plastic, metal and vinyl, vinyl and plastic. Interior. Examples: Trim panels and bezels.	-40° to 225° Fahrenheit (-40° to 107° Celsius)
Black Nylon Flock	Nylon Flock with an aggressive acrylic adhesive. Provides for cushioning and compression fit, also isolates	Between metal and metal, metal and plastic, vinyl and plastic. Examples: Pull cups, bezels,	-40° to 180° Fahrenheit (-40° to 82° Celsius)

	components. Water-resistant.	clips, ducts, top cover to glass, cowl panel.	
High Density Urethane Foam	Tear resistant, highly resilient and durable.	Between metal and metal, metal and plastic. Water-resistant. Examples: I/P, heavy metal rattles, isolating brackets.	-40° to 180° Fahrenheit (-40° to 82° Celsius)
Open Cell Foam Tape	Soft foam conforms to irregular surfaces.	Wire harness and connector wrap. Examples: Seals, gasket, wiring, heat ducts.	-40° to 180° Fahrenheit (-40° to 82° Celsius)
Closed Cell Low Density Foam Tape	Soft, conformable. Water-resistant.	Wherever bulk is needed. Prevents closing flutters and rattles when applied to door watershield. Examples: Door, I/P.	-40° to 180° Fahrenheit (-40° to 82° Celsius)
NYE® Grease 880	Long life.	Suspensions. Examples: Strut busings, sway bars.	-40° to 390° Fahrenheit (-40° to 200° Celsius)
Krytox® Oil	Long life. Will not dry out or harm plastics or rubber.	When access is not possible, oil will migrate to condition. Vinyl, rubber, plastic, metal. Examples: Convertible top bushings, pull cups trim panel inserts.	-30° to 400° Fahrenheit (-34° to 205° Celsius)
Krytox® Grease	Long life. Will not dry out or harm plastics or rubber.	Vinyl, rubber, plastic, metal, glass. Examples: Weather-strips, backlite and windshield moldings.	-30° to 400° Fahrenheit (-34° to 205° Celsius)

HEAT STAKING

1. Remove trim panel.
2. Bend or move the trim panel components at the heat staked joints. Observe the heat staked locations and/or component seams for looseness.
3. Heat stake the components.
 - If the heat staked or component seam location is loose, hold the two components tightly together and using a soldering gun with a flat tip, melt the material securing the components together. Do not over heat the affected area, damage to the exterior of the trim panel may occur.
 - If the heat staked material is broken or missing, use a hot glue gun to apply new material to the area to be repaired. The panels that are being heat staked must be held together while the applying the glue. Once the new material is in place, it may be necessary to use a soldering gun to melt the newly applied material. Do not over heat the affected area, damage to the exterior of the trim panel may occur.

4. Allow the repaired area to cool and verify the repair.
5. Install trim panel.

PLASTIC BODY PANEL REPAIR

There are many different types of plastics used in today's automotive environment. Chrysler groups plastics in three different categories: Rigid, Semi-Rigid, and Flexible. Any of these plastics may require the use of an adhesion promoter for repair. These types of plastic are used extensively on DaimlerChrysler Motors vehicles. Always follow repair material manufacturer's plastic identification and repair procedures.

Rigid Plastics:

Examples of rigid plastic use: Fascias, Hoods, Doors, and other Body Panels, which include SMC, ABS, and Polycarbonates.

Semi-Rigid Plastics:

Examples of semi-rigid plastic use: Interior Panels, Under Hood Panels, and other Body Trim Panels.

Flexible Plastics:

Examples of flexible plastic use: Fascias, Body Moldings, and upper and lower Fascia Covers.

Repair Procedure:

The repair procedure for all three categories of plastics is basically the same. The one difference is the material used for the repair. The materials must be specific for each substrate, rigid repair material for rigid plastic repair, semi-rigid repair material for semi-rigid plastic repair and flexible repair material for flexible plastic repair.

Adhesion Promoter/Surface Modifier:

Adhesion Promoters/Surface Modifiers are required for certain plastics. All three categories may have plastics that require the use of adhesion promoter/surface modifiers. Always follow repair material manufacturer's plastic identification and repair procedures.

SAFETY PRECAUTION AND WARNINGS

WARNING:

Eye protection should be used when servicing components. Personal injury can result.

Use an OSHA approved breathing mask when mixing epoxy, grinding, and spraying paint or solvents in a confined area. Personal injury can result.

Avoid prolonged skin contact with resin, petroleum, or alcohol based solvents. Personal injury can result.

Do not venture under a hoisted vehicle that is not properly

supported on safety stands. Personal injury can result.

NOTE: When holes must be drilled or cut in body panels, verify locations of internal body components and electrical wiring. Damage to vehicle can result.

Do not use abrasive chemicals or compounds on undamaged painted surfaces around repair areas. Damage to finish can result.

RIGID, SEMI-RIGID, AND FLEXIBLE PLASTIC PARTS TYPES

CODE	FAMILY NAME	COMMON TRADE NAME	TYPICAL APPLICATION
ASA	ACRYLONITRILE STYRENE ACRYLITE	LURAN S	CONSOLES, GRILLES
ABS	ACRYLONITRILE BUTADIENE STYRENE	TERLURAN	"A" PILLARS, CONSOLES, GRILLES
ABS/PC	ABS/PC ALLOY	PULSE, PROLOY, BAYBLEND	DOORS, INSTRUMENT PANELS
ABS/PVC	ABS/PV ALLOY	PROLOY, PULSE, LUSTRAN, CYCLOVIN	DOOR PANELS, GRILLES, TRIM
BMC	BULK MOLDING COMPOUND	BMC	FENDER EXTENSIONS
EMA	EHTYLENE METHYL ACRYLATE/IONOMER	SURLYN, EMA, IONOMER	BUMPER GUARDS, PADS
METTON	METTON	METTON	GRILLES, KICK PANELS, RUNNING BOARDS
MPPO	MODIFIED POLYPHENYLENE OXIDE	MPPO	SPOILER ASSEMBLY
PA	POLYAMID	ZYTEL, VYDYNE, PA, MINLON	FENDERS, QUARTER PANELS
PET	THERMOPLASTIC POLYESTER	RYNITE	TRIM
PBT/PPO	PBT/PPO ALLOY	GERMAX	CLADDINGS
PBTP	POLYBUTYLENE THEREPHTHALATE	PBT, PBTP, POCAN, VALOX	WHEEL COVERS, FENDERS, GRILLES
PBTP/EEBC	POLYBUTYLENE THEREPHTHALATE/EEBC ALLOY	BEXLOY, "M", PBTP/EEBC	FASCIAS, ROCKER PANEL, MOLDINGS
PC	POLYCARBONATE	LEXAN, MERLON, CALIBRE, MAKROLON PC	TAIL LIGHT LENSES, IP TRIM, VALANCE PANELS
PC/ABS	PC/ABS ALLOY	GERMAX, BAY BLENDS, PULSE	DOORS, INSTRUMENT PANELS
PPO	POLYPHENYLENE OXIDE	AZDEL, HOSTALEN,	INTERIOR TRIM, DOOR

		MARLEX, PRFAX, NORYL, GTX, PPO	PANELS, SPLASH SHIELDS, STEERING COLUMN SHROUD
PPO/PA	POLYPHENYLENE/POLYAMID	PPO/PA, GTX 910	FENDERS, QUARTER PANELS
PR/FV	FIBERGLASS REINFORCED PLASTIC	FIBERGLASS, FV, PR/FV	BODY PANELS
PS	POLYSTYRENE	LUSTREX, STYRON, PS	DOOR PANELS, DASH PANELS
RTM	RESIN TRANSFER MOLDING COMPOUND	RTM	BODY PANELS
SMC	SHEET MOLDED COMPOUND	SMC	BODY PANELS
TMC	TRANSFER MOLDING COMPOUND	TMC	GRILLES
UP	UNSATURATED POLYESTER (THERMOSETTING)	SMC, BMC, TMC, ZMC, IMC, XSMC, UP	GRILLE OPENING PANEL, LIFTGATES, FLARESIDE FENDERS, FENDER EXTENSIONS
EEBC	ETHER/ESTER BLOCKED CO- POLYMER	EEBC	BUMPERS
EEBC/PBTP	EEBC/POLYBUTYLENE TEREPHTHALATE	EEBC, PBTP, BEXLOY	BUMPER, ROCKER PANELS
EMPP	ETHYLENE MODIFIED POLYPROPYLENE	EMPP	BUMPER COVERS
EPDM	ETHYLENE/PROPPYLENE DIENE MONOMER	EPDM, NORDEL, VISTALON	BUMPERS
EPM	ETHYLENE/PROPPYLENE CO-POLYMER	EPM	FENDERS
MPU	FOAM POLYURETHANE	MPU	SPOILERS
PE	POLYETHYLENE	ALATHON, DYLAN, LUPOLEN, MARLEX	-
PP	POLYPROPYLENE (BLENDS)	NORYL, AZDEL, MARLOX, DYLOX, PRAVEX	INNER FENDER, SPOILERS, KICK PANELS
PP/EPDM	PP/EPDM ALLOY	PP/EPDM	SPOILERS, GRILLES
PUR	POLYURETHANE	COLONELS, PUR, PU	FASCIAS, BUMPERS
PUR/PC	PUR/PC ALLOY	TEXIN	BUMPERS
PVC	POLYVINYL CHLORIDE	APEX, GEON, VINYLITE	BODY MOLDINGS, WIRE INSULATION, STEERING WHEELS
RIM	REACTION INJECTED MOLDED POLYURETHANE	RIM, BAYFLEX	FRONT FASCIAS, MODULAR WINDOWS
RRIM	REINFORCED REACTION INJECTED MOLDED	PUR, RRIM	FASCIAS, BODY PANELS, BODY TRIMS

TPE	THERMO POLYETHYLENE	TPE, HYTREL, BEXLOY-V	FASCIAS, BUMBERS, CLADDINGS
TPO	THERMOPOLYOLEFIN	POLYTROPE, RENFLEX, SANTOPRENE, VISAFLEX, ETA, APEX, TPO, SHIELDS, CLADDINGS	BUMPERS, END CAPS, TELCAR, RUBBER, STRIPS, SIGHT, INTERIOR B POST
TPP	THERMO-POLYPROPYLENE	TPP	BUMPERS
TPU	THERMOPOLYURETHANE, POLYESTER	TPU, HYTREL, TEXIN, ESTANE	BUMPERS, BODY SIDE, MOLDINGS, FENDERS, FASCIAS

PANEL SECTIONING

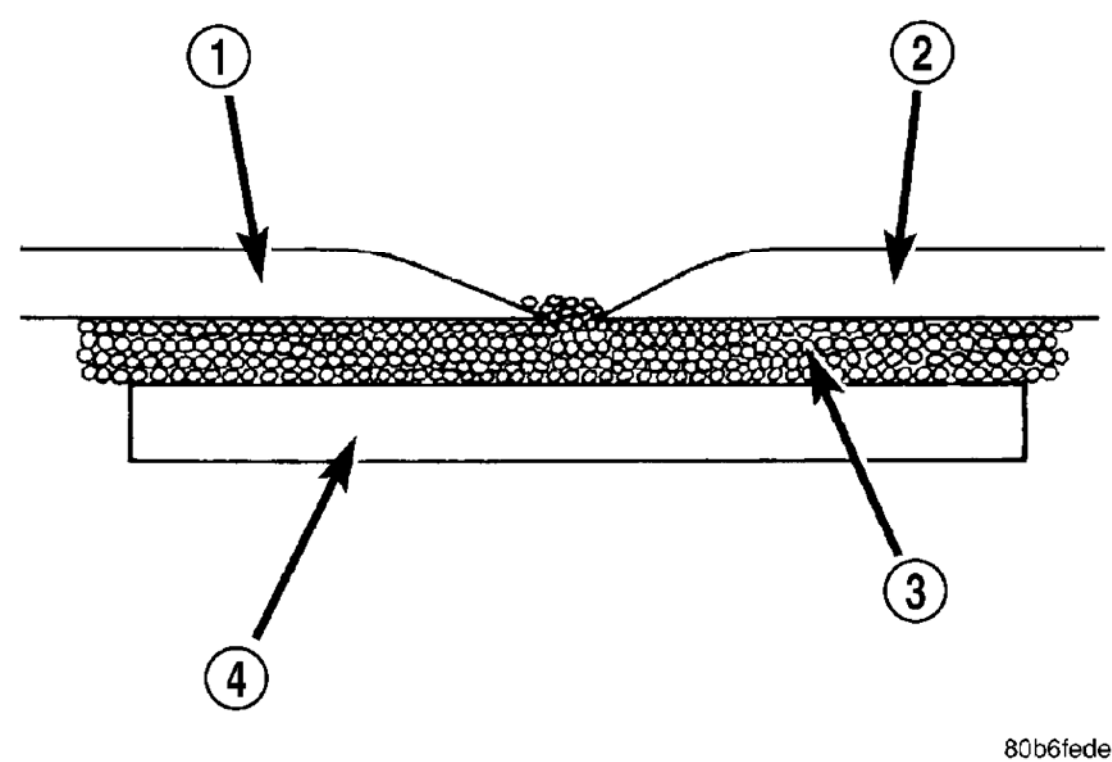


Fig. 1: View Of Panel Sectioning
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - EXISTING PANEL
2 - NEW PANEL
3 - PANEL ADHESIVE
4 - BONDING STRIP |
|--|

If it is required to section a large panel for a plastic repair, it will be necessary to reinforce the panel. To bond

two plastic panels together, a reinforcement must overlap both panels. The panels must be "V'd" at a 20 degree angle. The area to be reinforced should be washed, then sanded. Be sure to wipe off any excess soap and water when finished. Lightly sand or abrade the plastic with an abrasive pad or sandpaper. Blow off any dust with compressed air or wipe with a clean dry rag.

When bonding plastic panels, follow repair material manufacturers recommendations. Be sure that enough adhesive has been applied to allow squeeze out and to fill the full bond line. Once the pieces have been brought together, do not move them until the adhesive is cured. The assembly can be held together with clamps, rivets, etc. A faster cure can be obtained by heating with a heat lamp or heat gun. After the parts have been bonded and have had time to cure, rough sand the seam and apply the final adhesive filler to the area being repaired. Smooth the filler with a spreader, wooden tongue depressor, or squeegee. For fine texturing, a small amount of water can be applied to the filler surface while smoothing. The cured filler can be sanded as necessary and, as a final step, cleanup can be done with soapy water. Wipe the surface clean with a dry cloth allowing time for the panel to dry before moving on with the repair.

PANEL REINFORCEMENT

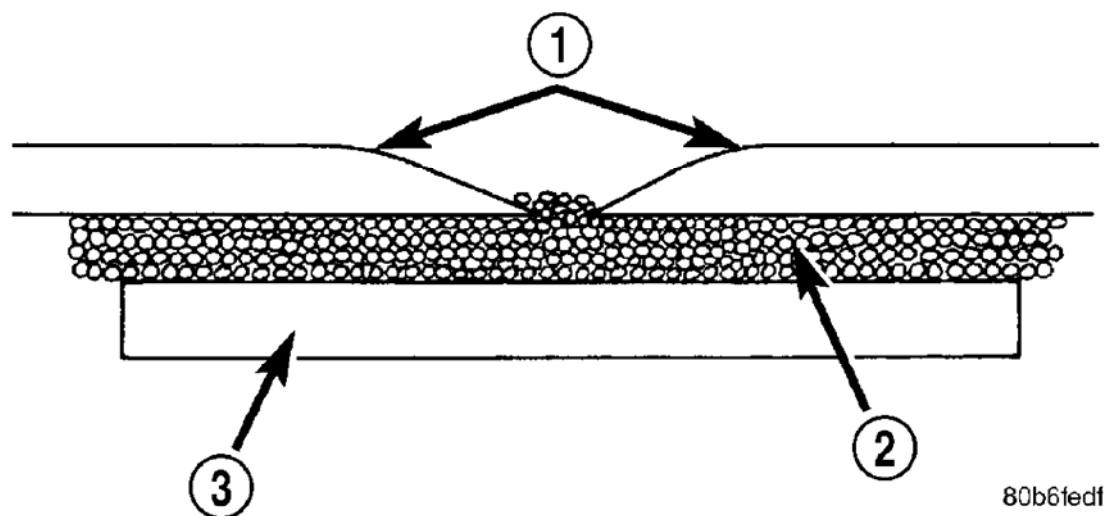
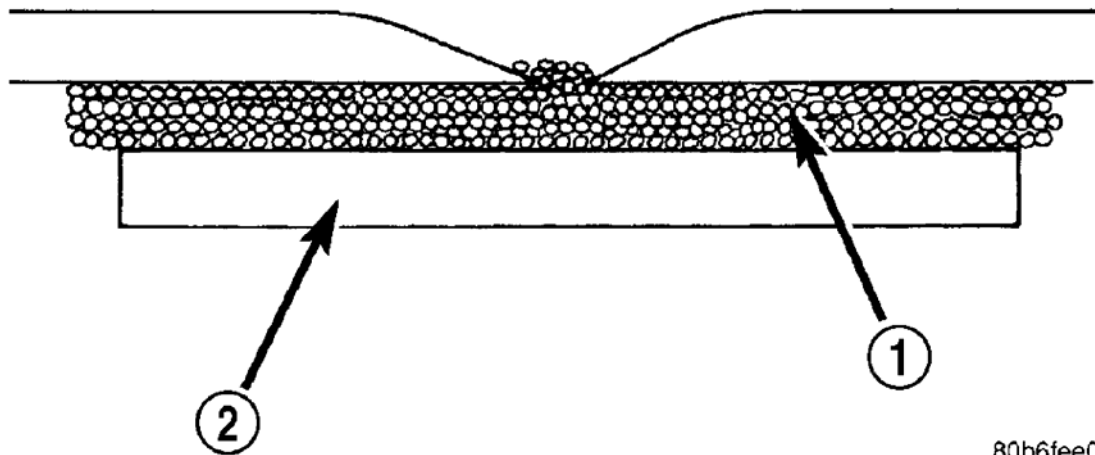


Fig. 2: Identifying Softened Edges
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SOFTENED EDGES
2 - PANEL ADHESIVE
3 - BONDING STRIP |
|---|

Structural repair procedures for rigid panels with large cracks and holes will require a reinforcement backing. Reinforcements can be made with several applications of glass cloth saturated with structural adhesive. Semi-rigid or flexible repair materials should be used for semi-rigid or flexible backing reinforcement and open meshed fiberglass dry wall tape can be used to form a reinforcement. The dry wall tape allows the resin to penetrate through and make a good bond between the panel and the adhesive. Structurally, the more dry wall tape used, the stronger the repair.

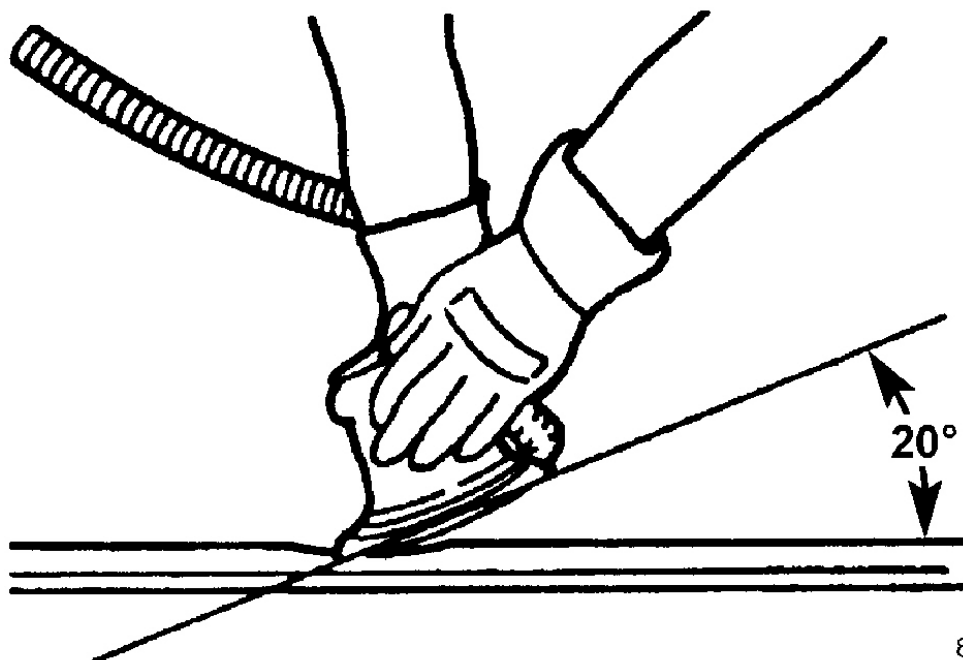


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Fig. 3: Identifying Panel Reinforcement
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - PANEL ADHESIVE
2 - REINFORCEMENT |
|---|

Another kind of repair that can be done to repair large cracks and holes is to use a scrap piece of similar plastic and bond with structural adhesive. The reinforcement should cover the entire break and should have a generous amount of overlap on either side of the cracked or broken area.



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Fig. 4: Identifying Beveling 20 Degree Angle
Courtesy of CHRYSLER LLC

When repairing plastic, the damaged area is first "V'd" out, or beveled. Large bonding areas are desirable when repairing plastic because small repairs are less likely to hold permanently. Beveling the area around a crack at a 20° angle will increase the bonding surface for a repair. It is recommended that sharp edges be avoided because the joint may show through after the panel is refinished.

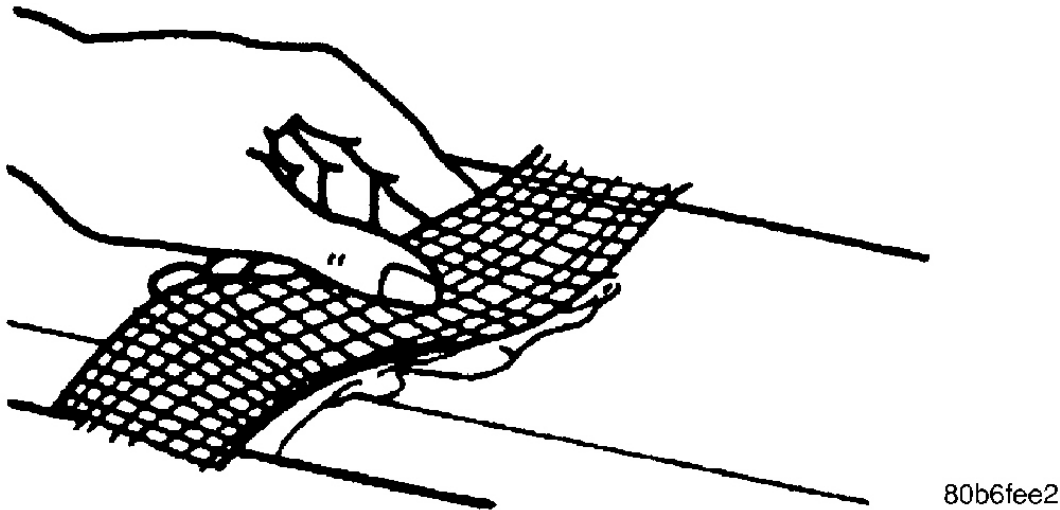


Fig. 5: Applying Fiberglass Tape
Courtesy of CHRYSLER LLC

Panel repair for both flexible and rigid panels are basically the same. The primary difference between flexible panel repair and rigid panel repair is in the adhesive materials used.

The technician should first decide what needs to be done when working on any type of body panel. One should determine if it is possible to return the damage part to its original strength and appearance without exceeding the value of the replacement part.

When plastic repairs are required, it is recommended that the part be left on the vehicle when ever possible. That will save time, and the panel will remain stationary during the repair. Misalignment can cause stress in the repair areas and can result in future failure.

VISUAL INSPECTION

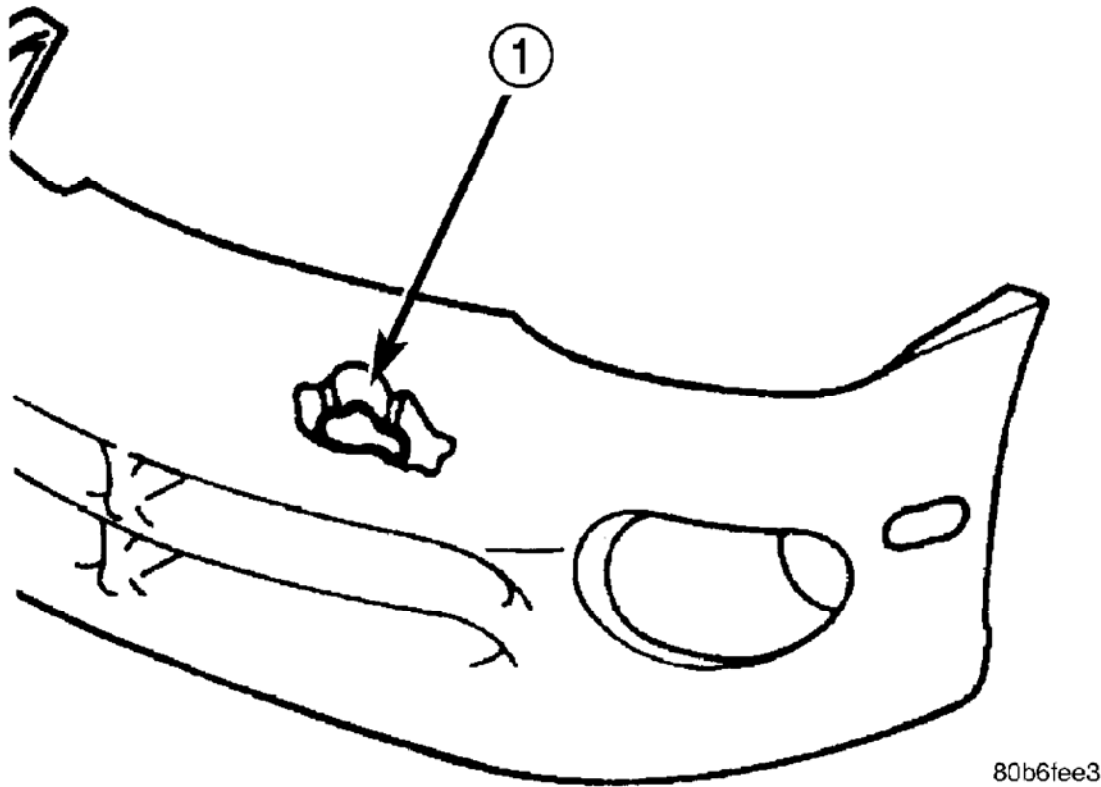


Fig. 6: Identifying Damaged Component
Courtesy of CHRYSLER LLC

1 - PUNCTURE

Composite materials can mask the severity of an accident. Adhesive bond lines, interior structure of the doors, and steel structures need to be inspected carefully to get a true damage assessment. Close inspection may require partial removal of interior trim or inner panels.

Identify the type of repair: Puncture or Crack - Damage that has penetrated completely through the panel. Damage is confined to one general area; a panel section is not required. However, a backer panel, open fiberglass tape, or matted material must be bonded from behind.

PANEL SURFACE PREPARATION

If a body panel has been punctured, cracked, or crushed, the damaged area must be removed from the panel to achieve a successful repair. All spider web cracks leading away from a damaged area must be stopped or removed. To stop a running crack in a panel, drill a 6 mm (0.250 in.) hole at the end of the crack farthest away from the damage. If spider web cracks can not be stopped, the panel would require replacement. The surfaces around the damaged area should be stripped of paint and freed from wax and oil. Scuff surfaces around repair area with 360 grit wet/dry sandpaper, or equivalent, to assure adhesion of repair materials.

PATCHING PANELS

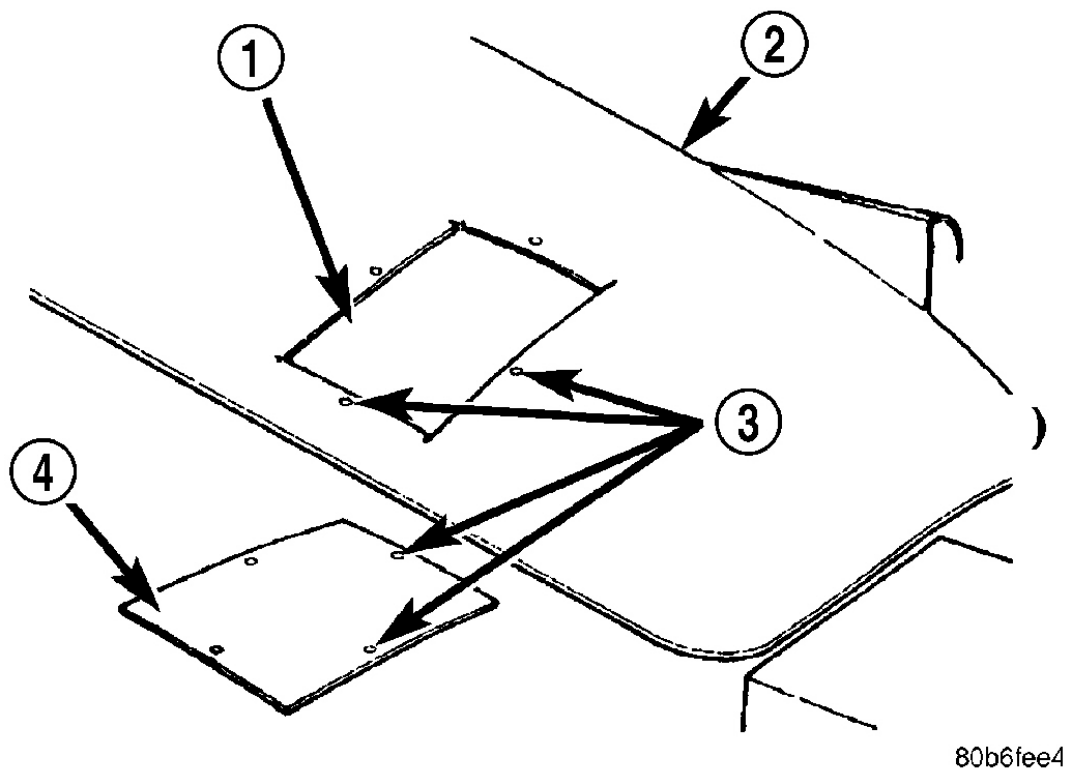


Fig. 7: Identifying Damaged Panel Cutout and Patch
Courtesy of CHRYSLER LLC

- 1 - CUTOUT
- 2 - DAMAGED BODY PANEL
- 3 - 4 MM (0.160 IN.) HOLES
- 4 - PATCH CUT TO SIZE

A panel that has extensive puncture type damage can be repaired by cutting out the damaged material. Use a suitable reciprocating saw or cut off wheel to remove the section of the panel that is damaged. The piece cut out can be used as a template to shape the new patch. It is not necessary to have access to the back of the panel to install a patch. Bevel edges of cutout at 20° to expose a larger bonding area on the outer side. This will allow for an increased reinforcement areas.

PANEL PATCH FABRICATIONS

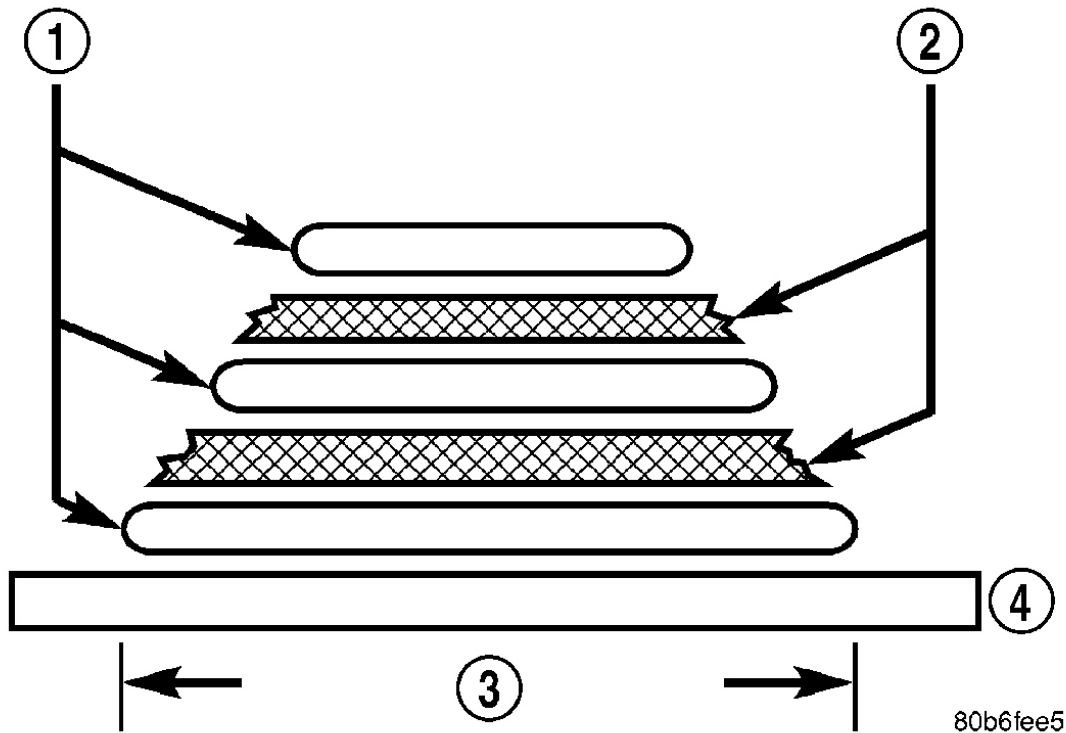


Fig. 8: Fabricating Panel
 Courtesy of CHRYSLER LLC

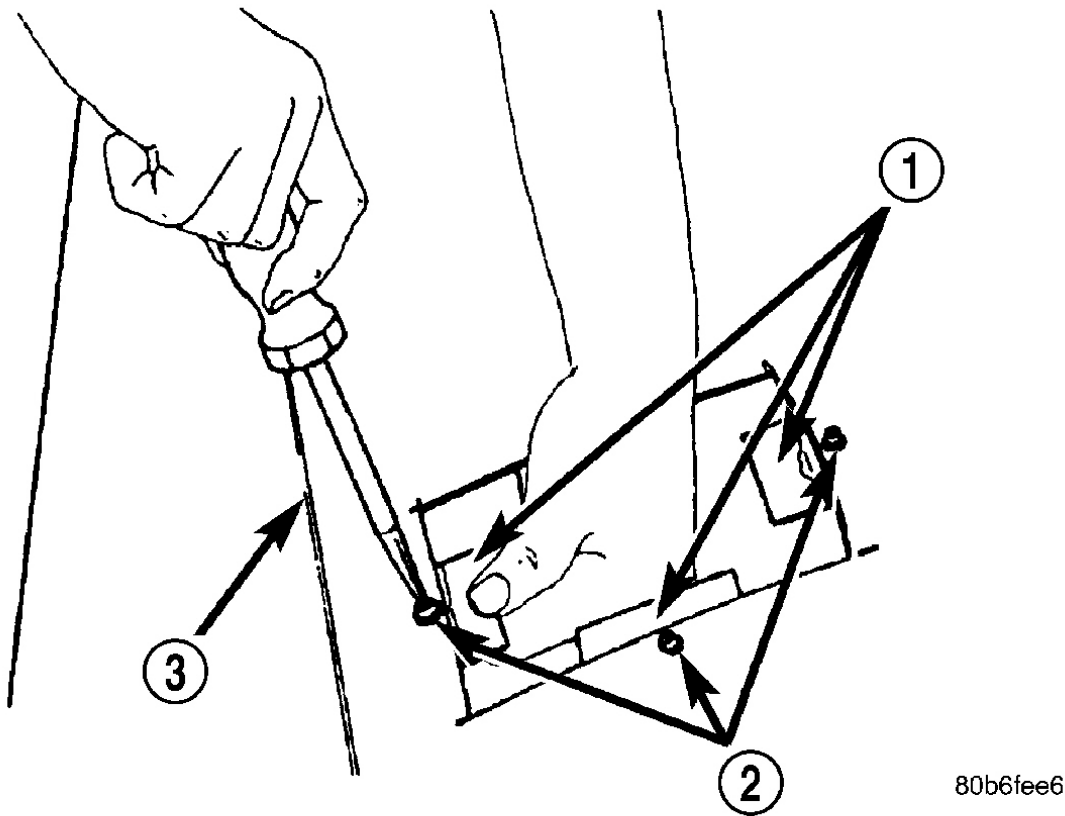
- | |
|---|
| 1 - STRUCTURAL ADHESIVE
2 - FIBERGLASS CLOTH OR FIBERGLASS MESH TAPE
3 - WIDTH OF V-GROOVE
4 - WAXED PAPER |
|---|

A patch can be fabricated from any rigid fiberglass panel that has comparable contour with the repair area. Lift gates and fenders can be used to supply patch material. If existing material is not available or compatible, a patch can be constructed with adhesive and reinforcement mesh (dry wall tape). Perform the following operation if required:

1. Cover waxed paper or plastic with adhesive backed nylon mesh (dry wall tape) larger than the patch required.
2. Tape waxed paper or plastic sheet with mesh to a surface that has a compatible contour to the repair area.
3. Apply a liberal coat of adhesive over the reinforcement mesh. If necessary apply a second or third coat of adhesive and mesh after first coat has cured. The thickness of the patch should be the same as the repair area.
4. After patch has cured, peel waxed paper or plastic from the back of the patch.
5. If desired, a thin film coat of adhesive can be applied to the back of the patch to cover mesh for added

strength.

PANEL PATCH INSTALLATION



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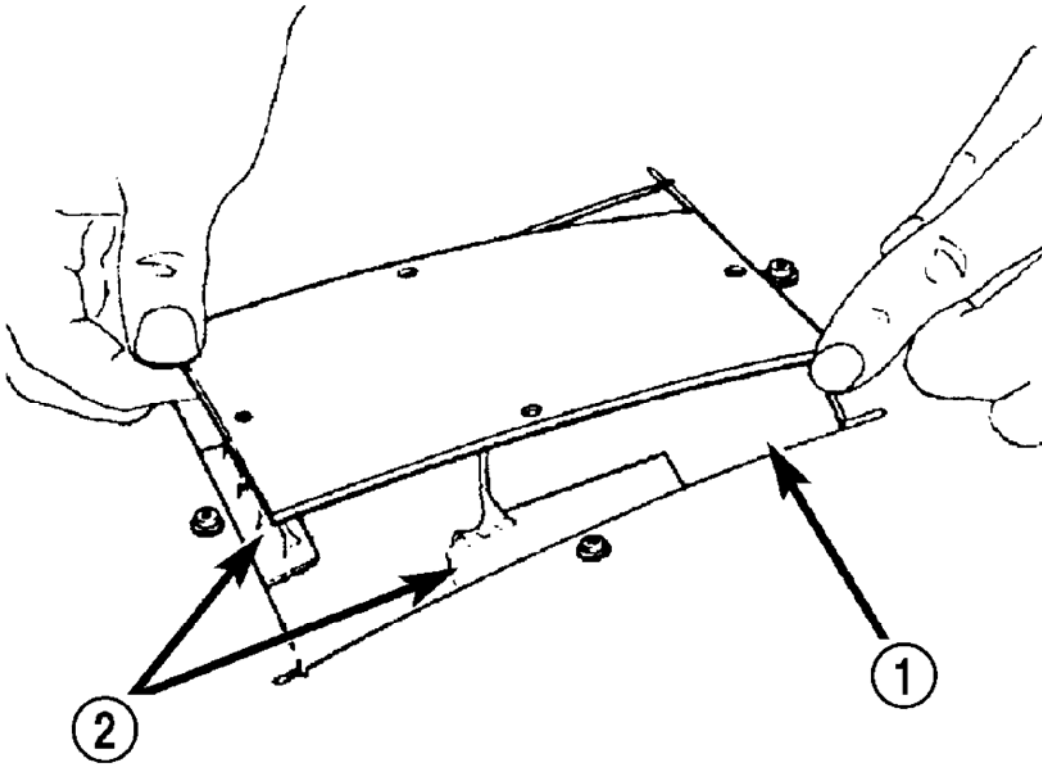
Fig. 9: Securing Support Squares to Body Panel

Courtesy of CHRYSLER LLC

- 1 - SUPPORT SQUARES
- 2 - SCREWS
- 3 - DAMAGED BODY PANEL

1. Make a paper or cardboard pattern the size and shape of the cutout hole in the panel.
2. Trim 3 mm (0.125 in.) from edges of pattern so patch will have a gap between connecting surfaces.
3. Using the pattern as a guide, cut the patch to size.
4. Cut scrap pieces of patch material into 50 mm (2 in.) squares to use as patch supports to sustain the patch in the cutout.
5. Drill 4 mm (0.160 in.) holes 13 mm (0.5 in.) in from edge of cutout hole.
6. Drill 4 mm (0.160 in.) holes 13 mm (0.5 in.) away from edge of patch across from holes drilled around cutout.

7. Drill 3 mm (0.125 in.) holes in the support squares 13 mm (0.5 in.) from the edge in the center of one side.
8. Scuff the backside of the body panel around the cutout hole with a scuff pad or sandpaper.
9. Mix enough adhesive to cover one side of all support squares.
10. Apply adhesive to cover one side of all support squares.
11. Using number 8 sheet metal screws, secure support squares to back side of body panel with adhesive sandwiched between the panel and squares.

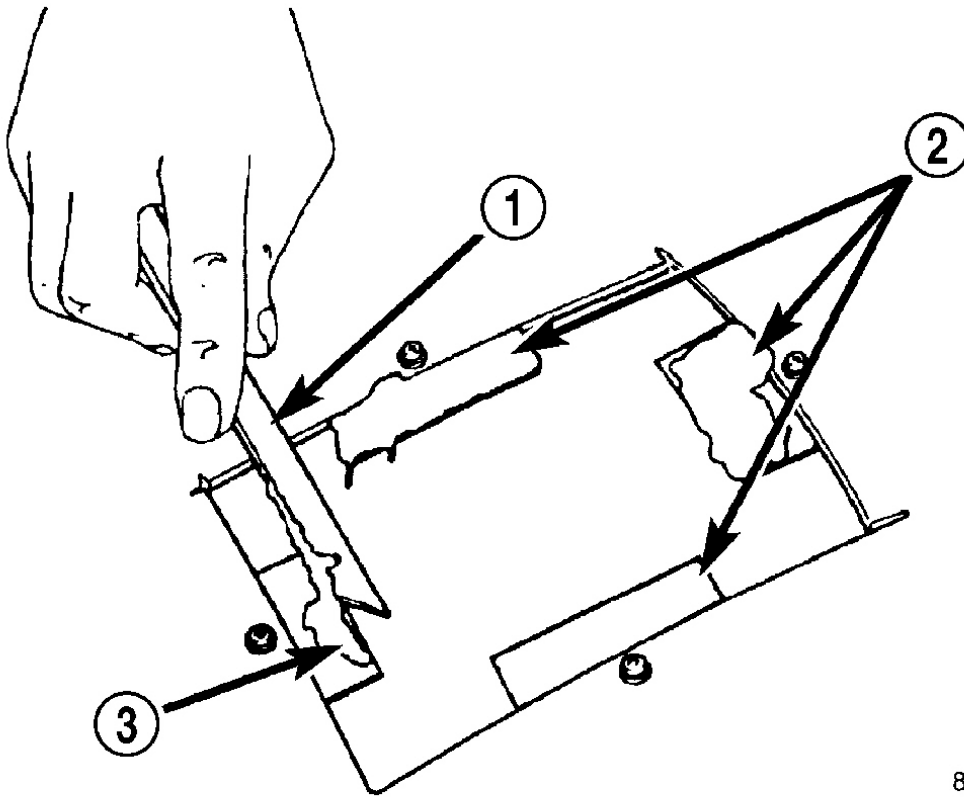


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Fig. 10: Positioning Patch In Cutout and Aligning
Courtesy of CHRYSLER LLC

1 - CUTOUT 2 - SUPPORT SQUARES

12. Position patch in cutout against support squares and adjust patch until the gap is equal along all sides.
13. Drill 3 mm (0.125 in.) holes in the support squares through the pre-drilled holes in the patch.



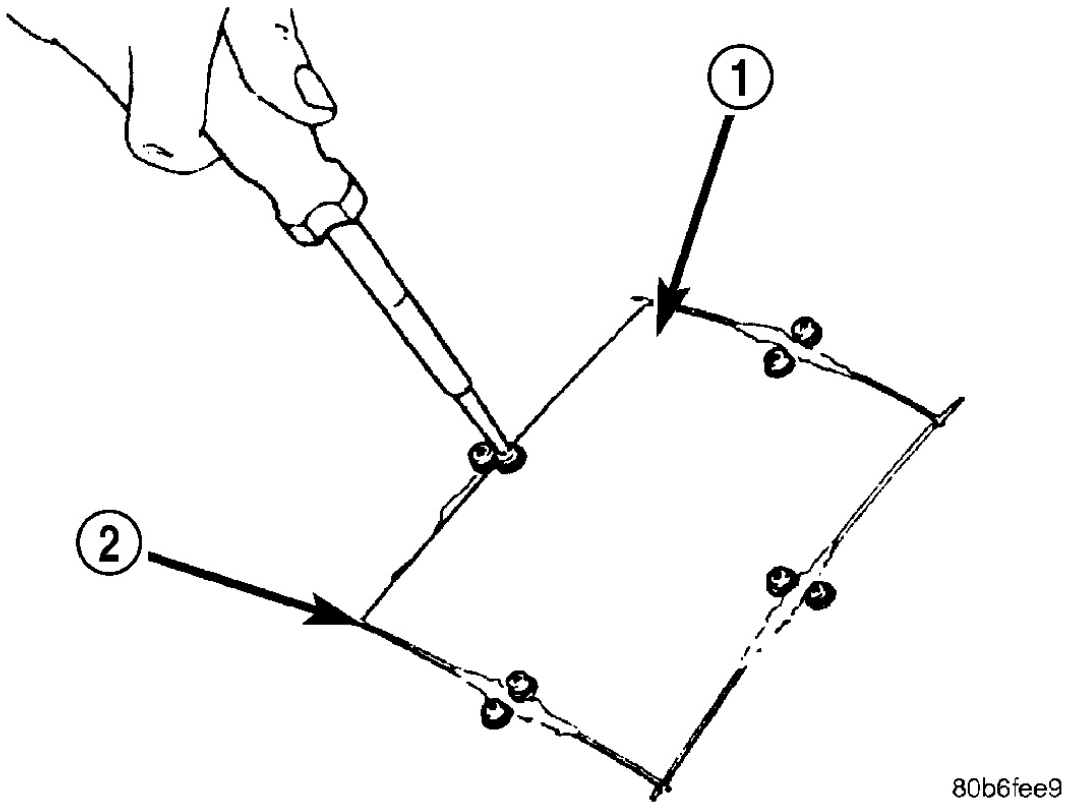
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Fig. 11: Applying Adhesive to Support Squares

Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - APPLICATOR
2 - SUPPORT SQUARES
3 - ADHESIVE |
|---|

14. Apply a coat of adhesive to the exposed ends of the support squares.



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Fig. 12: Installing Screws
Courtesy of CHRYSLER LLC

1 - PATCH 2 - GAP

15. Install screws to hold the patch to support squares. Tighten screws until patch surface is flush with panel surface.
16. Allow adhesive to cure, and remove all screws.

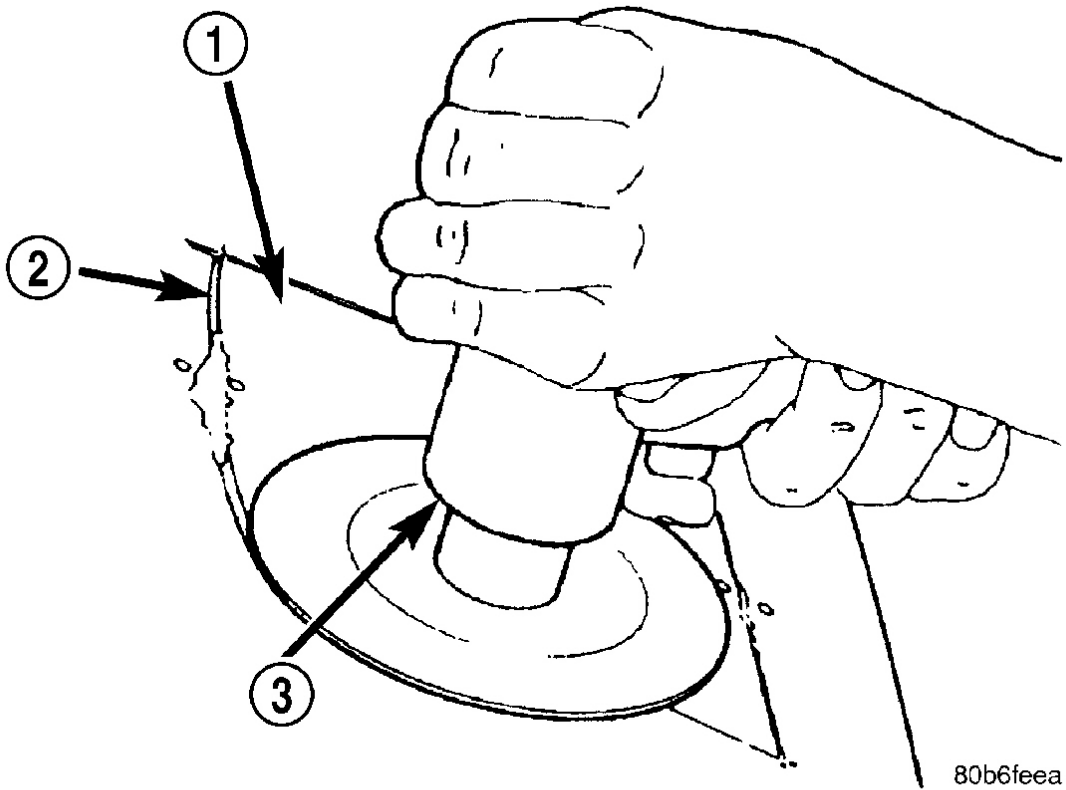


Fig. 13: Grinding Surface
Courtesy of CHRYSLER LLC

1 - PATCH
2 - GAP
3 - DISC GRINDER

17. Using a 125 mm (5 in.) 24 grit disc grinder, grind a 50 mm (2 in.) to 75 mm (3 in.) wide and 2 mm (0.080 in.) deep path across the gaps around the patch. With compressed air, blow dust from around patch.

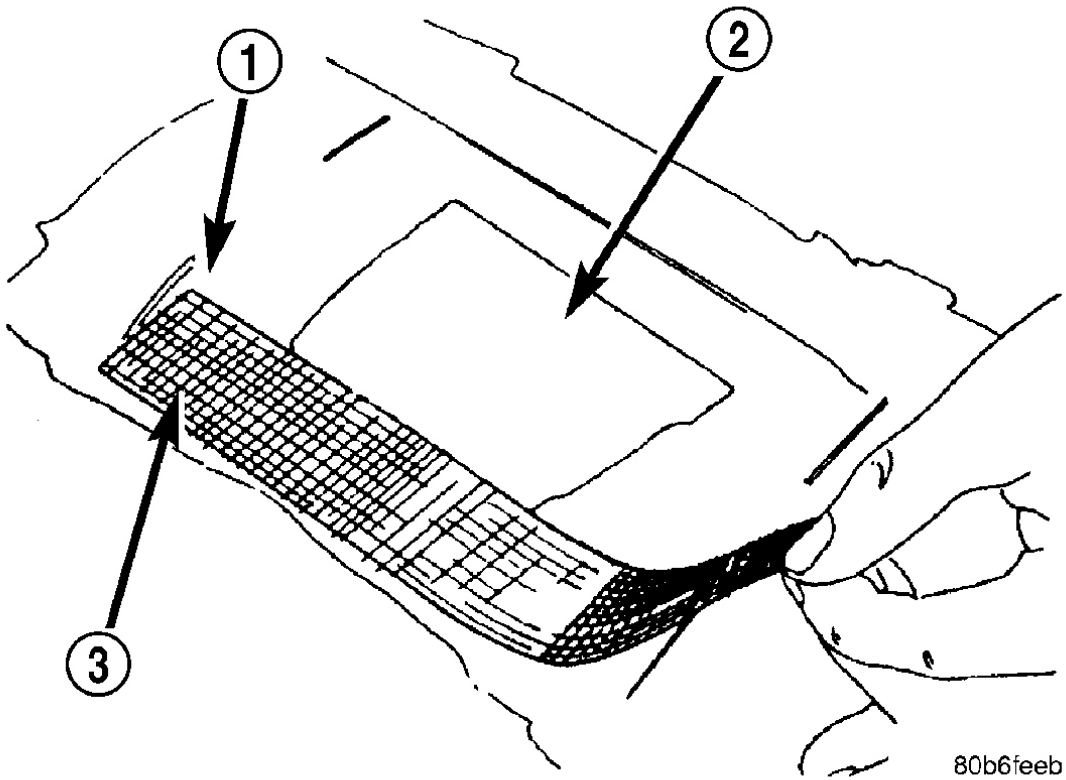


Fig. 14: Covering Gaps With Mesh
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - GROUND DOWN AREA
2 - PATCH
3 - MESH |
|---|

18. Apply adhesive backed nylon mesh (dry wall tape) over gaps around patch.
19. Mix enough adhesive to cover the entire patch area.

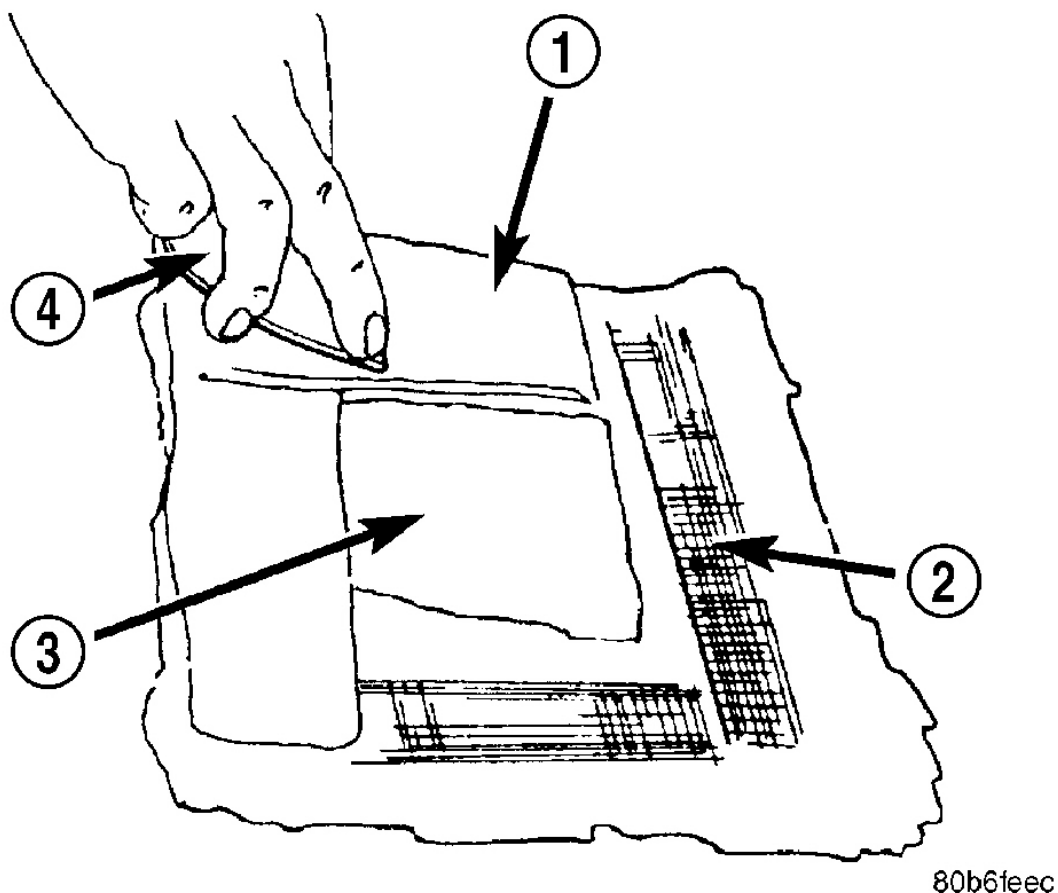


Fig. 15: Covering Mesh With Adhesive
Courtesy of CHRYSLER LLC

- | |
|--------------|
| 1 - ADHESIVE |
| 2 - MESH |
| 3 - PATCH |
| 4 - SPREADER |

20. Apply adhesive over the mesh around patch, and smooth epoxy with a wide spreader to reduce finish grinding. Use two to three layers of mesh and adhesive to create a stronger repair.

PATCHED PANEL SURFACING

After patch panel is installed, the patch area can be finished using the same methods as finishing other types of body panels. If mesh material is exposed in the patched area, grind surface down, and apply a coat of high quality rigid plastic body filler. Prime, block sand, and paint as required.

SPECIFICATIONS

SPECIFICATIONS - TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Close out panel bolts	2.5	-	22
Fender bolts	9	-	80
Front door carrier plate bolts	5.5	-	50
Front door exterior handle nuts	4.5	-	40
Front door hinge to A-pillar bolts	26	19	-
Front door hinge to door nuts	36.5	27	-
Front door latch adjustment screw	4.5	-	40
Front door latch bracket screw to door shut face	7	-	60
Front door latch screw to door shut face	7	-	60
Front door latch striker bolts	26	19	-
Front door module screws	1.5	-	13
Front door speaker screws	1.5	-	13
Front door window motor screws	3.5	-	31
Front seat back recliner bolts	47.5	35	-
Front seat belt bolt	47.5	35	-
Front seat bolts/nuts riser to floor	62	46	-
Front seat nuts riser to frame	27.5	20	-
Front seat riser nuts to seat frame (Domestic)	47.5	35	-
Front seat riser nuts to seat frame (Export)	28	21	-
Grille opening reinforcement	10	-	85
Hood hinge to body bolts	20	15	-
Hood hinge to hood nuts	20	15	-
Hood latch bolts	13.5	10	-
Hood latch support bolts	8.5	-	75
Hood release handle bolts	4	3	-
Instrument panel center support bracket bolts	28	20.5	-
Instrument panel HVAC nuts/bolts	6	-	55
Instrument panel lower bolts	30.5	22.5	-
Instrument panel lower nuts	6	-	55
Instrument panel upper bolts	28	20.5	-
Lift gate exterior handle	8	6	-
Lift gate hinge to body bolts	28.5	21	-
Lift gate hinge to body nuts	28.5	21	-
Lift gate hinge to lift gate bolts	28.5	21	-
Lift gate striker screws	28	20.5	-
Load floor nuts	28	20.5	-

Outside mirror nuts	7	-	65
Radiator crossmember bolts	10	-	85
Rear door carrier plate bolts	5.5	-	50
Rear door hinge to B-pillar bolts	26	19	-
Rear door hinge to door nuts	36.5	27	-
Rear door latch adjustment screw	4.5	-	40
Rear door latch bracket screw to door shut face	7	-	60
Rear door latch screw to door shut face	7	-	60
Rear door latch striker bolts	26	19	-
Rear door exterior handle nuts	4.5	-	40
Rear door speaker screws	1.5	-	13
Rear door window motor screws	3.5	-	31
Rear fascia support bolts	7	5	-
Rear seat belt anchor nut	62	46	-
Rear seat belt bolt	44.5	33	-
Rear seat 40 pivot bolt	27.5	20	-
Rear seat 40 power inverter screw	3	-	26.5
Rear seat 40 release lever	7	-	62
Rear seat 40 seat bolt	27.5	20	-
Rear seat 40 seat screw	10	-	88.5
Rear seat 40 shield screw	3	-	26.5
Rear seat 40 bracket bolts	47.5	35	-
Rear seat 60 bracket bolts	47.5	35	-
Rear seat hinge bolts	47.5	35	-
Rear seat recliner bolt	7	-	62
Rear seat riser bolts	10	-	88.5
Rear seat trim screws	3	-	26.5
Rear seat 60 belt attachment to seat back	47.5	35	-
Rear seat mounting bolts	54	40	-
Rear seat mounting nuts	62	46	-
Rear seat 60 release lever	7	-	62
Rear seat 60 seat bolt restraint	55	40.5	-
Rear seat 60 seat screw	8	-	71
Rear seat 60 seat screw	10	-	88.5
Rear seat 60 shield screw	3	-	26.5
Rear seat riser to seat frame bolts	10	7	-
Rear view mirror setscrew	1	-	15
Roof luggage rack bolts	6.2	-	55
Running boards bolts	-	-	-
Running boards nuts	25	18.5	-
Side step nuts/bolts	23	17	-
Side view mirror nuts			

	7	-	65
Sunroof mounting bolts	9	-	80
Washer bottle bolt	10	-	85

SPECIAL TOOLS

SPECIAL TOOLS

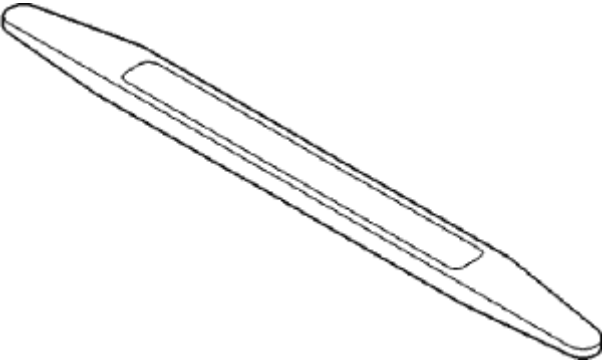
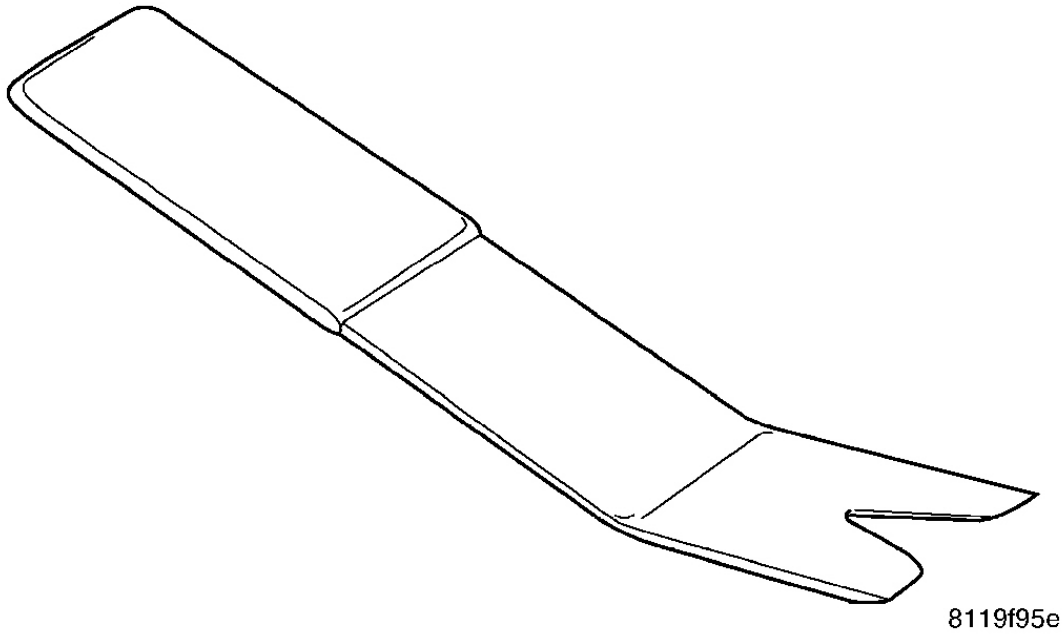


Fig. 16: Trim Stick C-4755
Courtesy of CHRYSLER LLC



Fig. 17: Torx Bit Set C-4794-B
Courtesy of CHRYSLER LLC



8119f95e

Fig. 18: Moldings Remover C-4829-A
Courtesy of CHRYSLER LLC

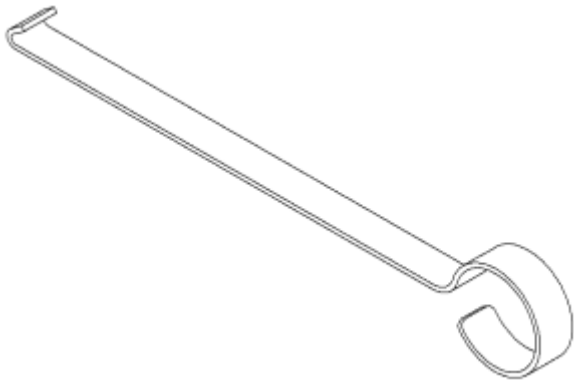


Fig. 19: Outer Belt Molding Remover - 9093
Courtesy of CHRYSLER LLC

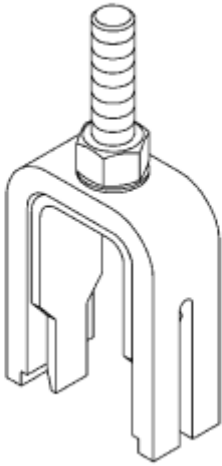


Fig. 20: Strain Gauge Alignment Tool No. 9689
 Courtesy of CHRYSLER LLC

DOOR - FRONT

CARRIER PLATE

REMOVAL

CARRIER PLATE - FRONT DOOR

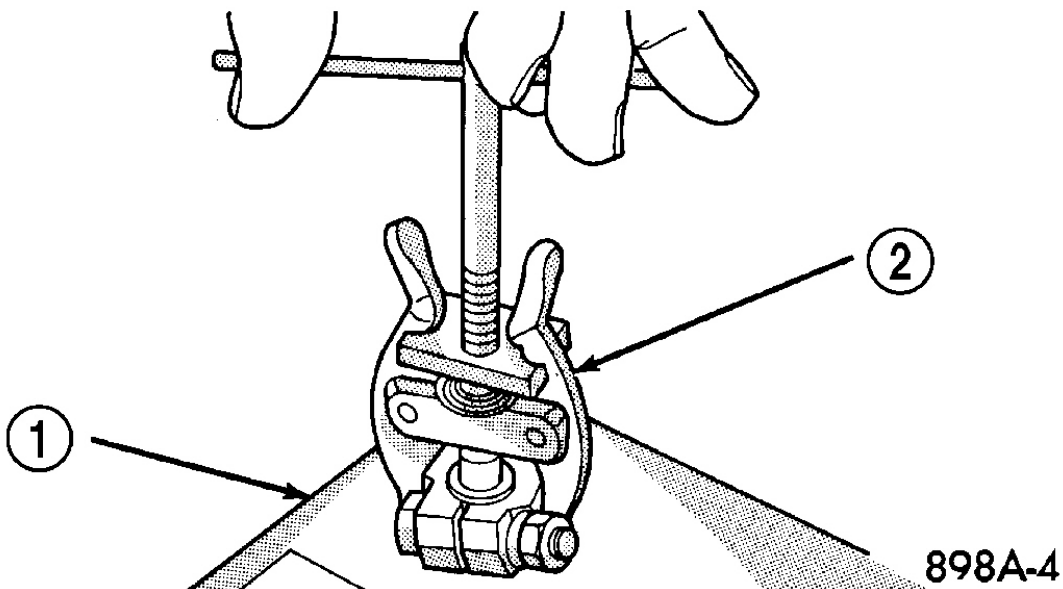


Fig. 21: Removing Battery Cable Terminal Clamp - Typical

CAUTION: Do not attempt to remove the trim panel the conventional way. This door panel has hooks holding it to the door rather than push pins. The door module must be removed as an assembly. Carefully follow these instructions in order to prevent unnecessary damage to the trim panel.

1. Loosen the battery terminal nut and use a battery terminal removal tool (2) to disconnect the negative battery cable from the battery (1).
2. Remove the trim panel from the door. See REMOVAL.

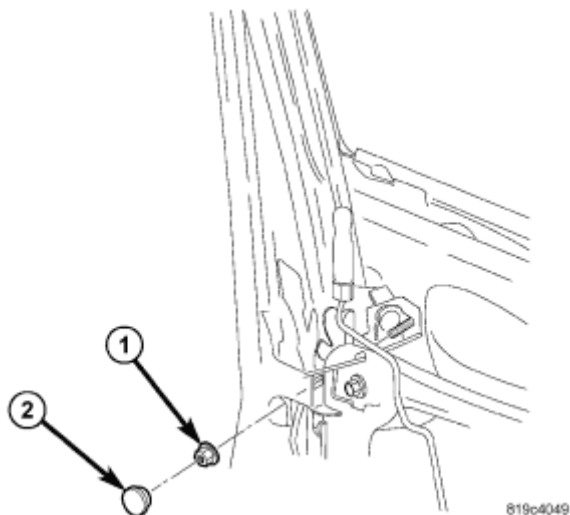


Fig. 22: Door Plug & Rear Exterior Handle Nut
Courtesy of CHRYSLER LLC

3. Remove the door plug (2).
4. Remove rear exterior handle nut (1).

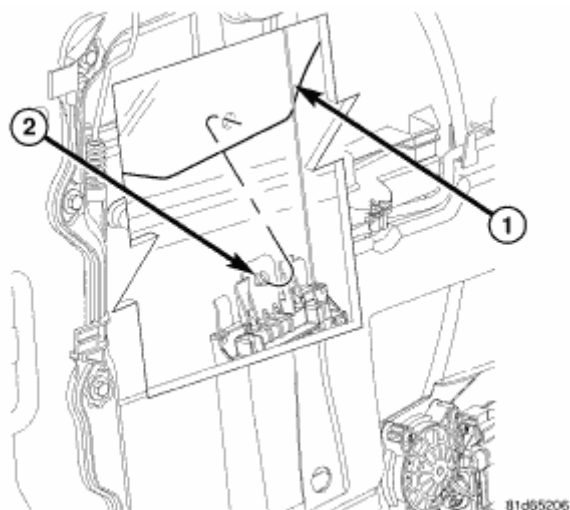
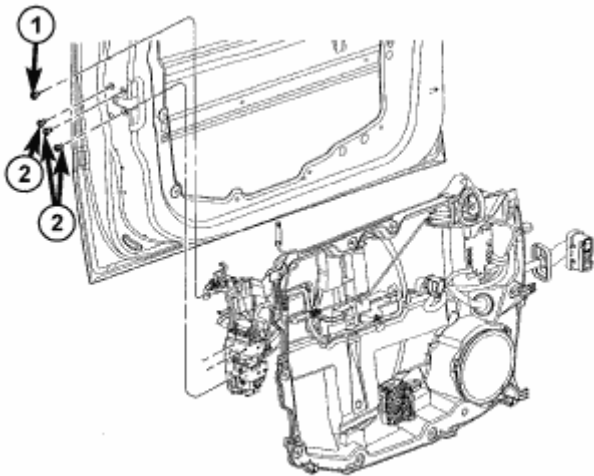


Fig. 23: Door Glass And Window Regulator Liftplate

Courtesy of CHRYSLER LLC

NOTE: The window must be in proper position to disengage glass. Release tab on liftplate must be aligned with access hole in door module. Use a slotted screwdriver in the slot on the window regulator liftplate, press gently outboard while pressing down on the glass to release the glass from the liftplate.

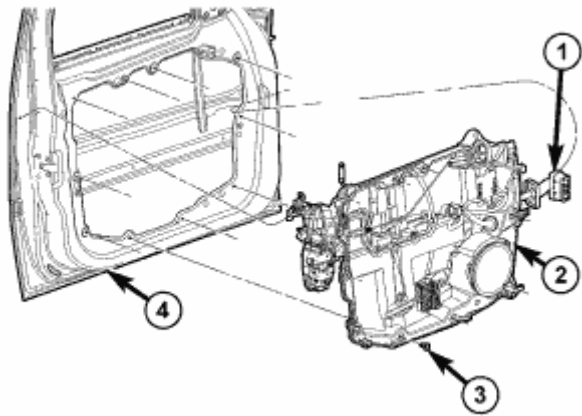
5. Remove the tape covering the access hole on the carrier plate and discard. Access the window regulator liftplate through the hole in the carrier plate.
6. Push down the door glass (1) and use a slotted screwdriver to release the tab on the window regulator liftplate (2). Lift the glass up and secure to the header.



81965a81

Fig. 24: Removing/Installing Door Latch & Latch Bracket Securing Screws
Courtesy of CHRYSLER LLC

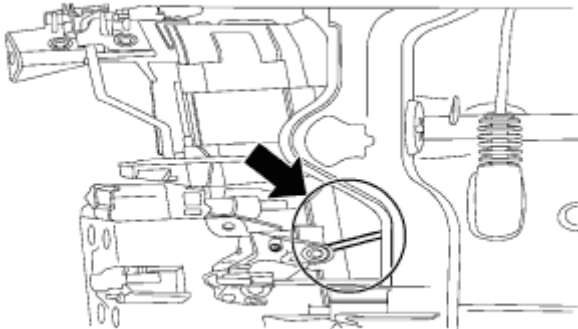
7. Remove the three screws (2) securing the door latch to the door shut face.
8. Remove the one screw (1) attaching the latch bracket to the door shut face.



819856ca

Fig. 25: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

9. Disconnect and remove the electrical connector (1) from the door (4).
10. Remove the 10 screws (3) from the carrier plate (2).
11. Disconnect the outside mirror electrical connector.
12. Remove the carrier plate (2) from the door (4).



8198c5db

Fig. 26: Disconnecting/Connecting Inside Lock Rod
 Courtesy of CHRYSLER LLC

NOTE: The window regulator is not serviceable. The new carrier plate will come equipped with the regulator assembly installed.

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

13. Disconnect the inside lock rod from the latch.

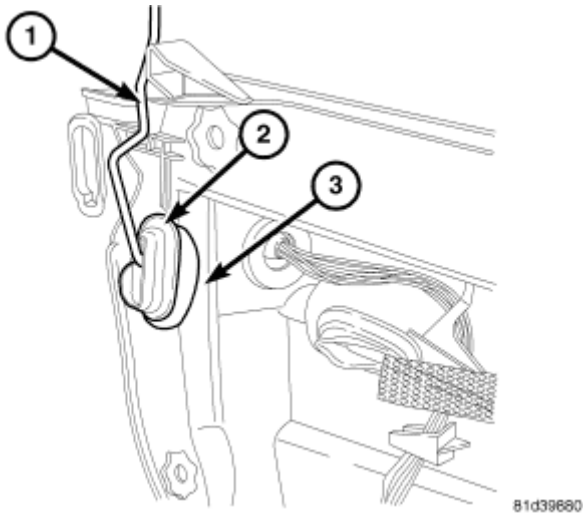


Fig. 27: Inside Lock Rod, Grommet & Carrier Plate
Courtesy of CHRYSLER LLC

14. Disengage the grommet (2) and remove the inside lock rod (1) from carrier plate (3).

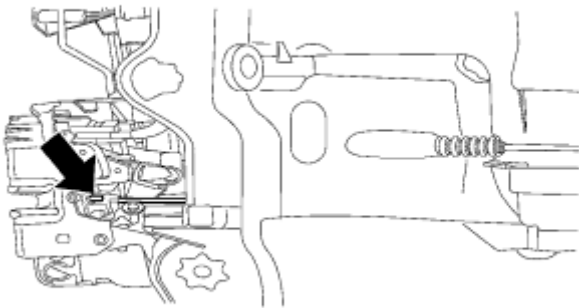


Fig. 28: Disconnecting/Installing Interior Handle Lock Rod
Courtesy of CHRYSLER LLC

15. Disconnect the interior handle lock rod from the latch.

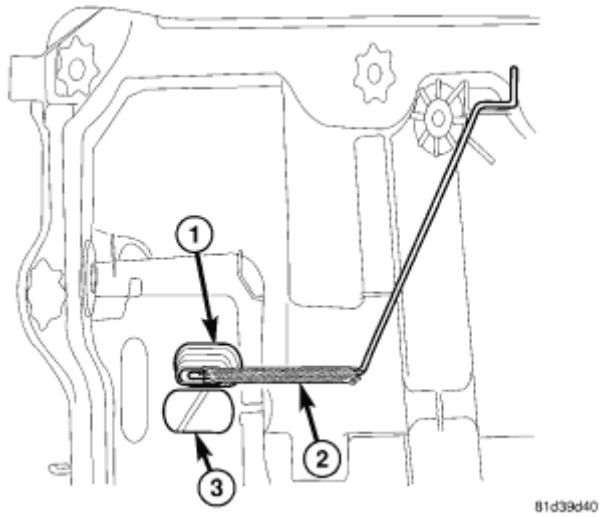


Fig. 29: Grommet, Interior Handle Lock Rod & Carrier
 Courtesy of CHRYSLER LLC

16. Remove interior handle lock rod (2) and grommet (1) from carrier (3).

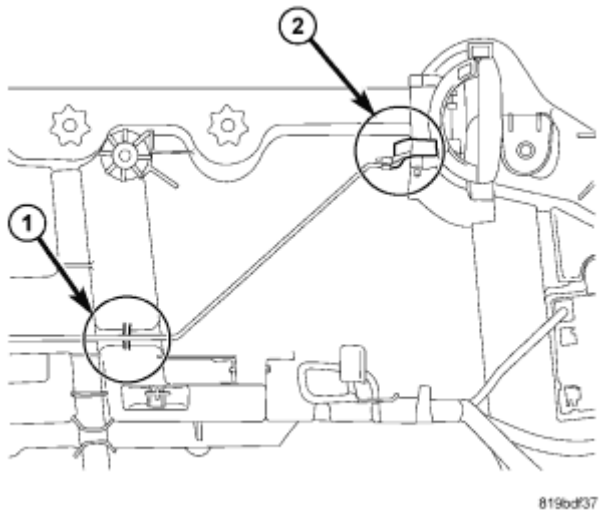
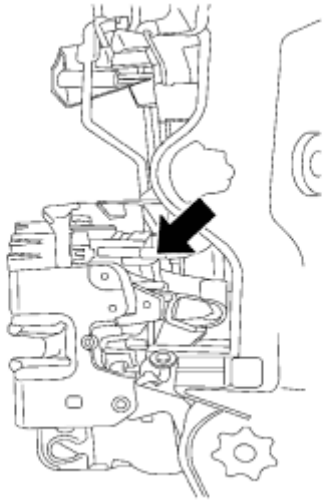


Fig. 30: Carrier & Interior Handle
 Courtesy of CHRYSLER LLC

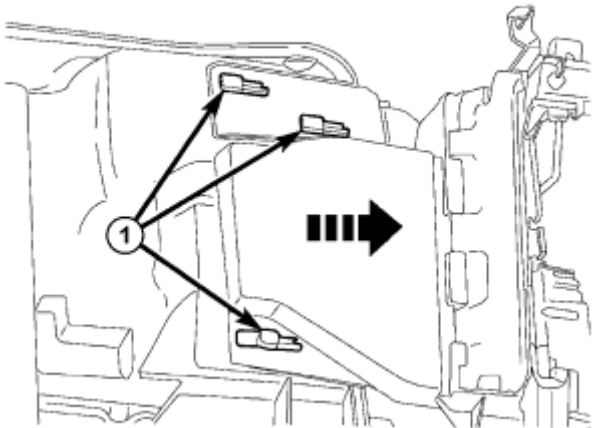
17. Remove the interior lock rod from the interior handle.



819be020

Fig. 31: Disconnecting/Connecting Latch Electrical Connector
 Courtesy of CHRYSLER LLC

18. Disconnect the latch electrical connector.



819be028

Fig. 32: Carrier Plate Slots
 Courtesy of CHRYSLER LLC

19. Turn the carrier plate over and slide the latch bracket assembly to remove from the carrier plate slots (1).

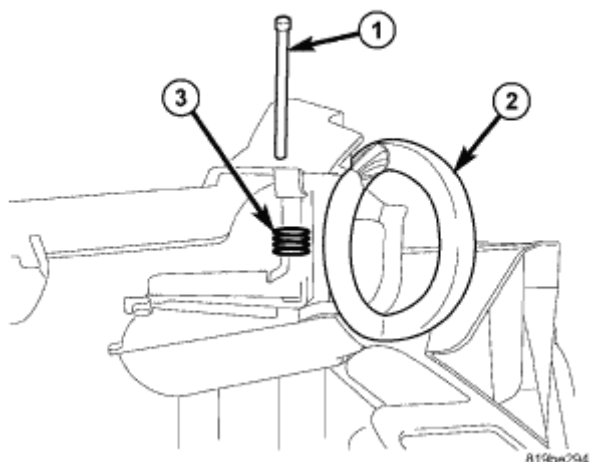


Fig. 33: Push Pin, Handle & Spring
 Courtesy of CHRYSLER LLC

20. Remove the push pin (1) from the handle.
21. Remove the spring (3) and handle (2) from the carrier.

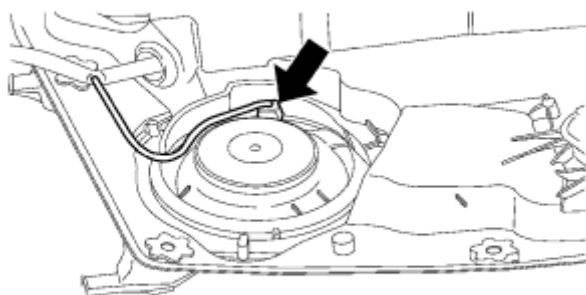
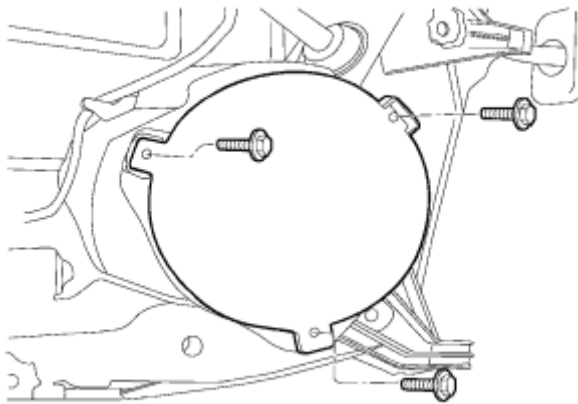


Fig. 34: Disconnecting/Connecting Speaker Electrical Connector
 Courtesy of CHRYSLER LLC

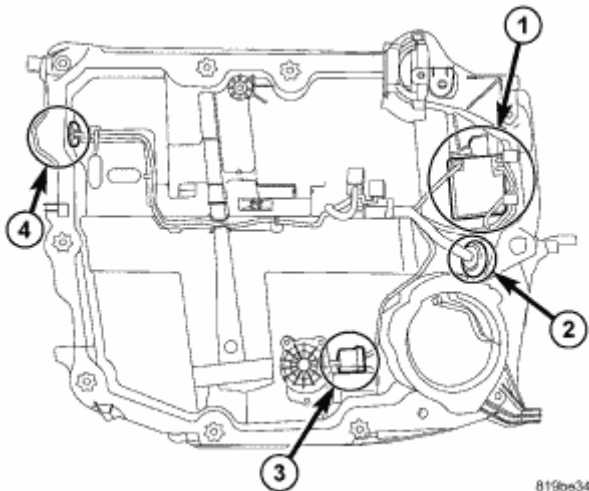
22. Disconnect the speaker electrical connector.
23. Remove speaker wire from wire clip.



819bs2d8

Fig. 35: Removing/Installing Speaker Bolts & Speaker
Courtesy of CHRYSLER LLC

24. Remove the speaker bolts and speaker from the carrier.



819bs343

Fig. 36: Identifying Connectors & Electrical Harness
Courtesy of CHRYSLER LLC

25. Remove the electrical harness (4) from the carrier plate.
26. Release harness from all the hooks in the carrier plate.
27. Disconnect the connectors (1) from the module.
28. Disconnect the connector (3) from the window motor.
29. Remove the electrical harness (2) from the carrier plate.
30. Remove the harness from the carrier plate.

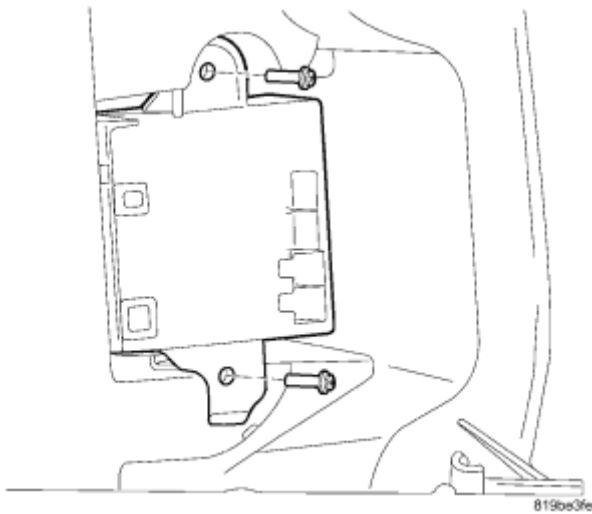


Fig. 37: Removing/Installing Screws And Module
 Courtesy of CHRYSLER LLC

31. Remove the screws and module from the carrier plate.

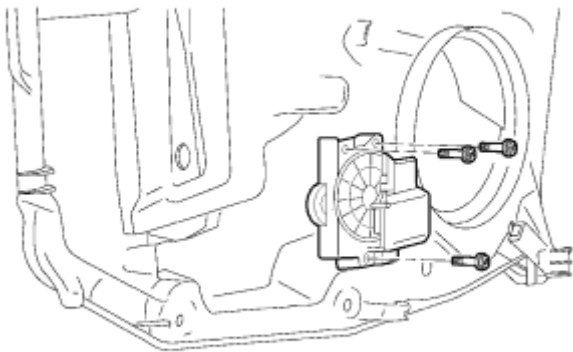
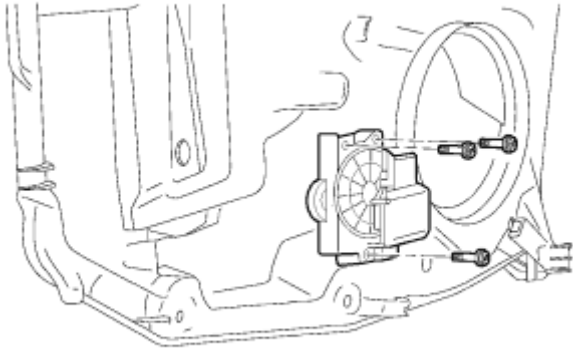


Fig. 38: Removing/Installing Screws And Window Motor
 Courtesy of CHRYSLER LLC

32. Remove the screws and window motor from the carrier plate.

INSTALLATION

CARRIER PLATE - FRONT DOOR

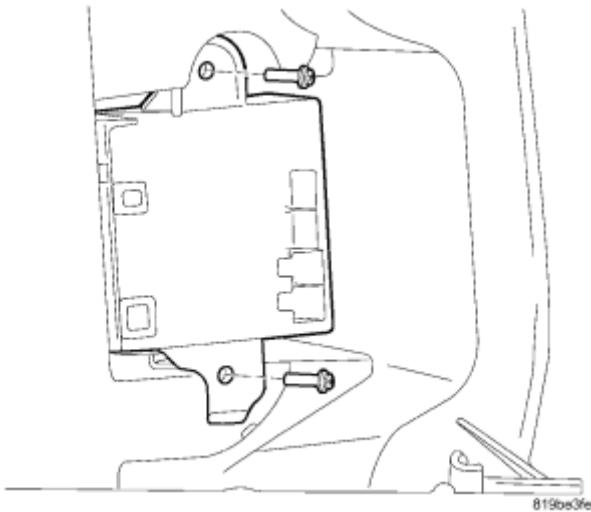


819be48a

Fig. 39: Removing/Installing Screws And Window Motor
Courtesy of CHRYSLER LLC

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

1. Install the window motor and screws to the carrier plate and tighten to 3.5 N.m (31 in. lbs.).



819be3fe

Fig. 40: Removing/Installing Screws And Module
Courtesy of CHRYSLER LLC

2. Install the module and screws to the carrier plate and tighten to 1.5 N.m (13 in. lbs.).

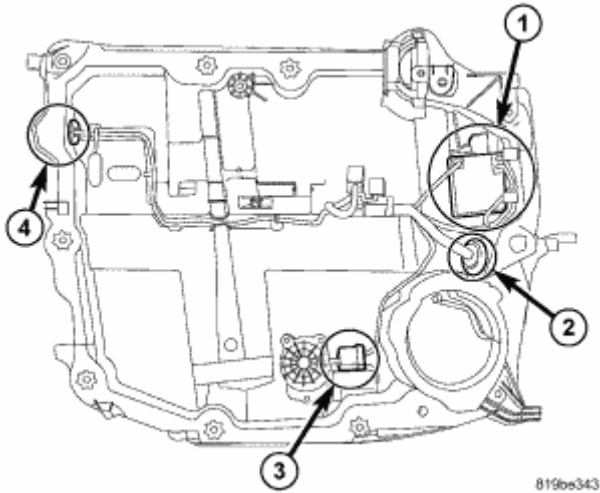


Fig. 41: Identifying Connectors & Electrical Harness
Courtesy of CHRYSLER LLC

3. Install the harness to the carrier plate.
4. Install the electrical harness (2) and seat the rubber grommet into the carrier plate.
5. Connect the electrical connector (3) to the motor.
6. Connect the electrical connectors (1) to the module.
7. Route the harness through all of the hooks in the carrier plate.
8. Install the electrical harness (4) and seat the rubber grommet into the carrier plate.

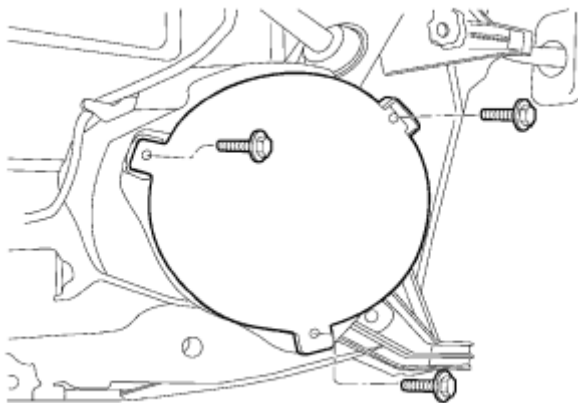
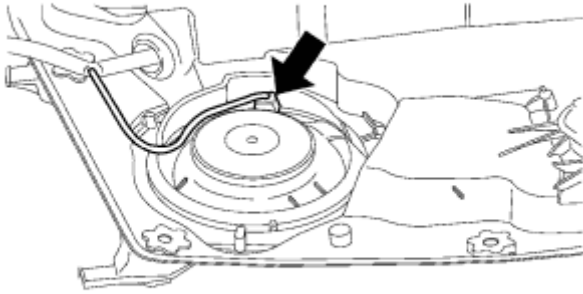


Fig. 42: Removing/Installing Speaker Bolts & Speaker
Courtesy of CHRYSLER LLC

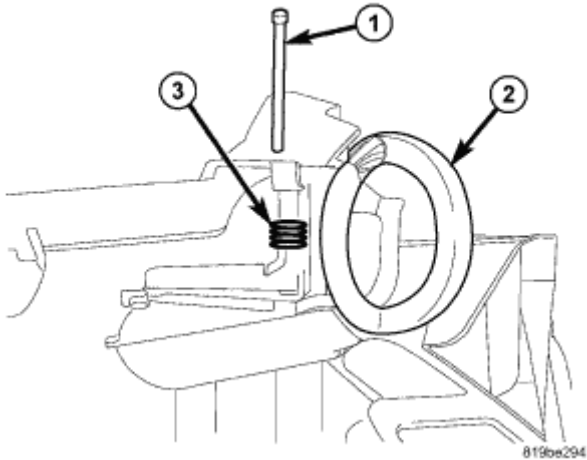
9. Install the speaker and bolts to the carrier and tighten to 1.5 N.m (13 in. lbs.).



819be2c2

Fig. 43: Disconnecting/Connecting Speaker Electrical Connector
Courtesy of CHRYSLER LLC

10. Connect the speaker electrical connector.
11. Install speaker wire to wire clip.

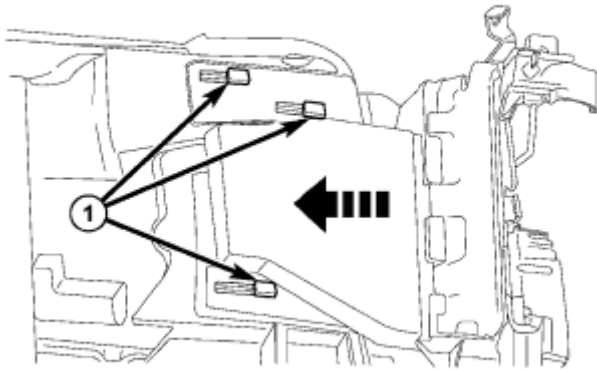


819be294

Fig. 44: Push Pin, Handle & Spring
Courtesy of CHRYSLER LLC

12. Install the handle (2) and spring (3) to the carrier.
13. Install the push pin (1) into the carrier, spring and the handle.

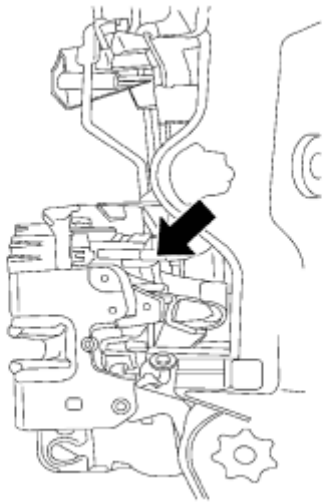
NOTE: **Make sure that the push pin is seated flush with the carrier.**



819be0ef

Fig. 45: Identifying Carrier Plate Slots
Courtesy of CHRYSLER LLC

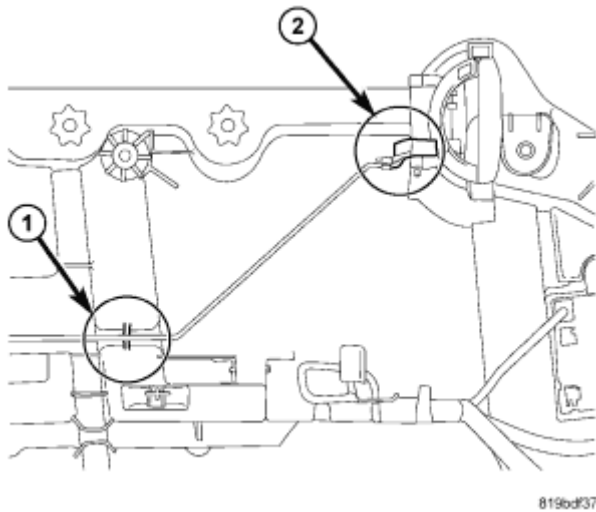
14. Install the latch bracket assembly to the carrier plate slots (1) then slide the latch bracket until fully seated.



819be020

Fig. 46: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

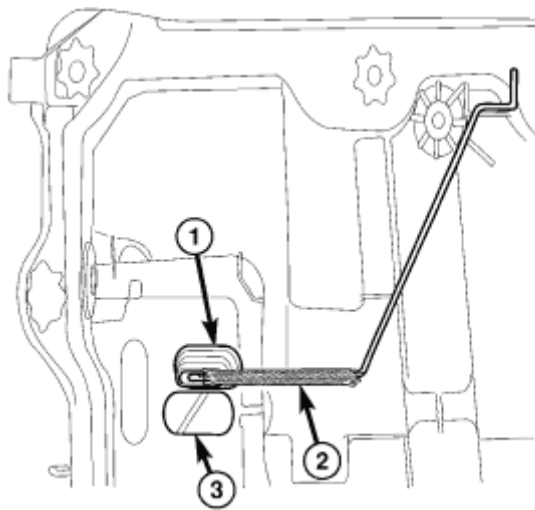
15. Connect the latch electrical connector.



8196d37

Fig. 47: Carrier & Interior Handle
 Courtesy of CHRYSLER LLC

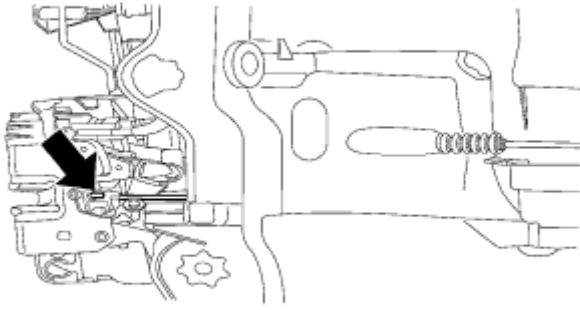
16. Install the interior lock rod to the interior handle (2). Make sure the lock rod is positioned properly to the carrier (1).



81d39d40

Fig. 48: Grommet, Interior Handle Lock Rod & Carrier
 Courtesy of CHRYSLER LLC

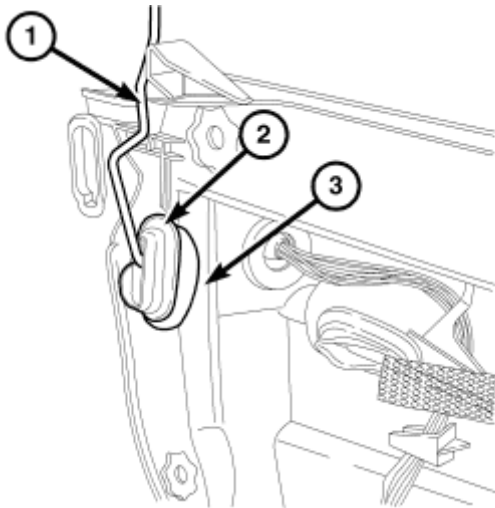
17. Install the interior lock rod (2) into the carrier plate (3) and seat the grommet (1).



819bdcdb4

Fig. 49: Disconnecting/Installing Interior Handle Lock Rod
Courtesy of CHRYSLER LLC

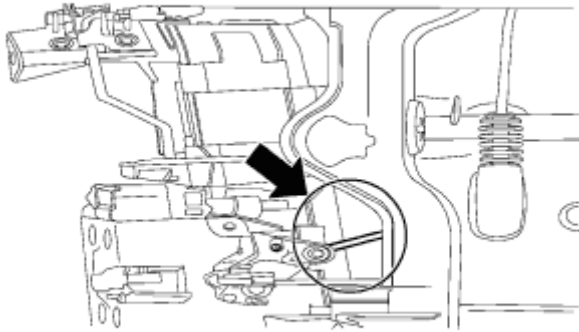
18. Connect the interior handle lock rod to the latch.



81d39680

Fig. 50: Inside Lock Rod, Grommet & Carrier Plate
Courtesy of CHRYSLER LLC

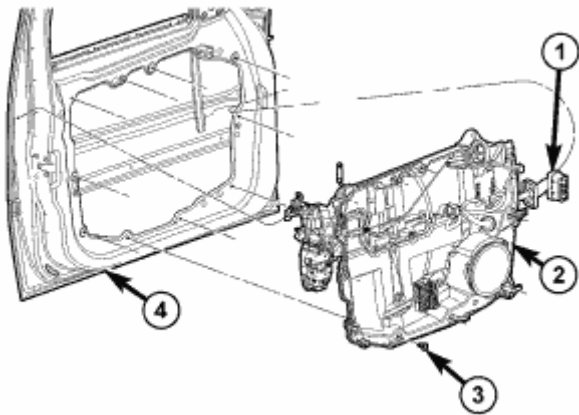
19. Install the inside lock rod (1) to the carrier plate (3) and seat the grommet (2).



8198c5db

Fig. 51: Disconnecting/Connecting Inside Lock Rod
Courtesy of CHRYSLER LLC

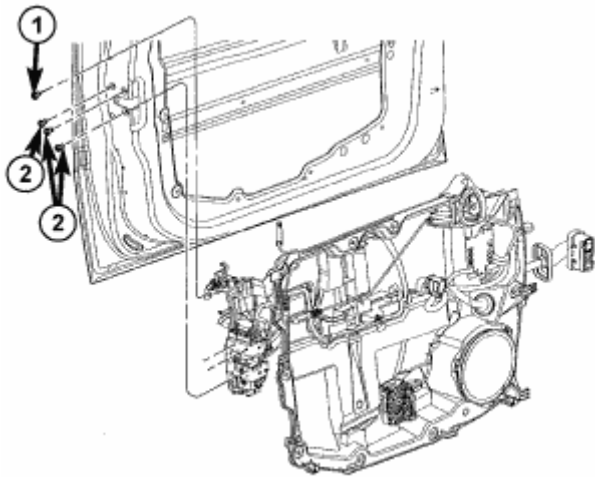
20. Connect the inside lock rod to the latch.



819856ca

Fig. 52: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

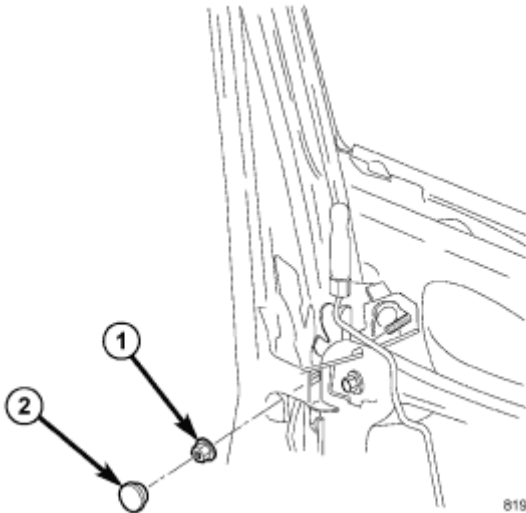
21. Connect the outside mirror electrical connector.
22. Install the electrical connector (1) to the door (4) and connect the electrical connector.
23. Align the carrier plate (2) to the door (4).



81985a81

Fig. 53: Removing/Installing Door Latch & Latch Bracket Securing Screws
Courtesy of CHRYSLER LLC

24. Install the three screws (2) securing the door latch to the door shut face and tighten screws to 7 N.m (60 in. lbs.).
25. Install the one screw (1) attaching the latch bracket to the door shut face and tighten screw to 7 N.m (60 in. lbs.).



819c4049

Fig. 54: Door Plug & Rear Exterior Handle Nut
Courtesy of CHRYSLER LLC

NOTE: The door glass must be in the full up position in order to access the rear exterior handle nut. Use a light and a magnetic socket on the rear nut to prevent dropping the nut into the door assembly.

26. Install the rear nut (1) to the exterior handle and tighten to 4.5 N.m (40 in. lbs.).
27. Install the door plug (2) to the door.

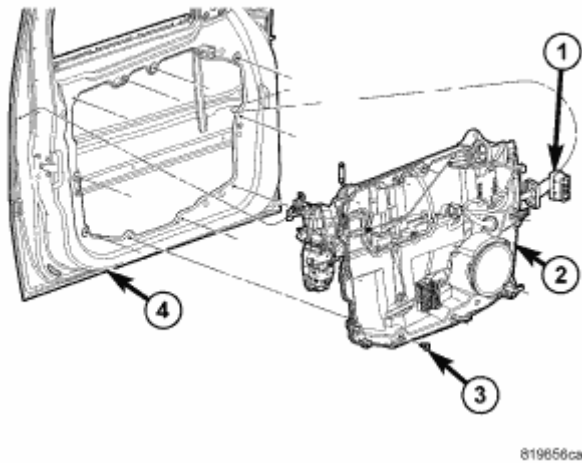


Fig. 55: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

28. Install the 10 screws (3) to the carrier plate (2) and tighten screws to 5.5 N.m (50 in. lbs.).

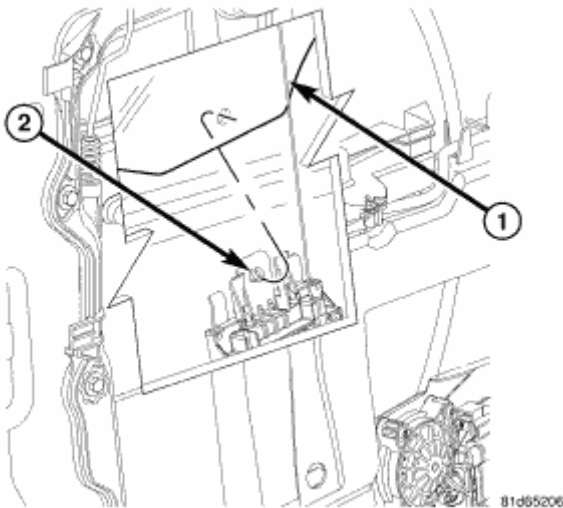


Fig. 56: Door Glass And Window Regulator Liftplate
 Courtesy of CHRYSLER LLC

NOTE: The glass should snap into place. Make sure the glass is secure to the liftplate by pulling up on the glass to verify.

29. Connect the door glass (1) to the window regulator (2) by sliding the glass down into the liftplate.
30. Apply the adhesive tape to the inspection hole of the carrier plate.

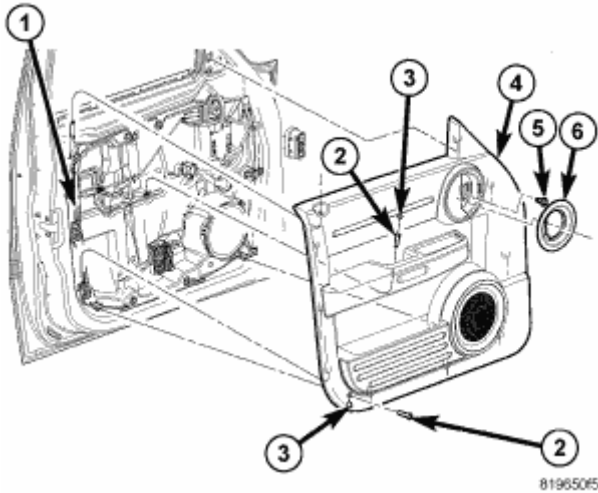


Fig. 57: Removing/Installing Trim Panel
Courtesy of CHRYSLER LLC

31. Install the trim panel to the door. See INSTALLATION.
32. Adjust the latch assembly, see ADJUSTMENTS.
33. Connect the negative battery cable to the battery.

NOTE: Cycle the door lock, open with interior and exterior door handles and operate the power window to make sure everything is working properly and no binding exists.

DOOR - FRONT

REMOVAL

DOOR - FRONT

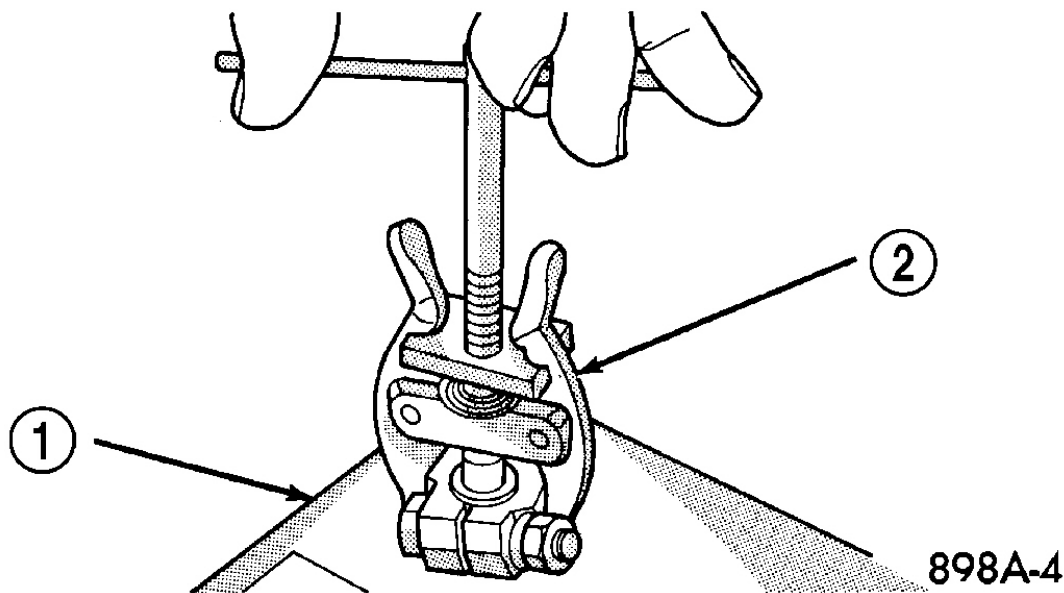


Fig. 58: Removing Battery Cable Terminal Clamp - Typical
 Courtesy of CHRYSLER LLC

1. Loosen the battery terminal nut and use a battery terminal removal tool (2) to disconnect the negative battery cable from the battery (1).

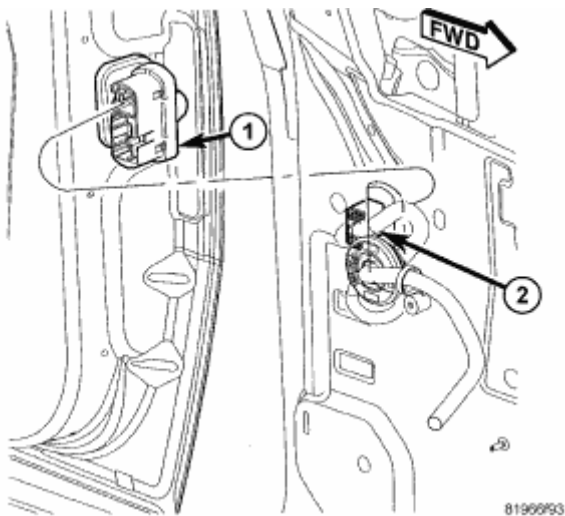


Fig. 59: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
 Courtesy of CHRYSLER LLC

2. Disconnect the door harness electrical connector (1) from the body connector (2) at the A-pillar.

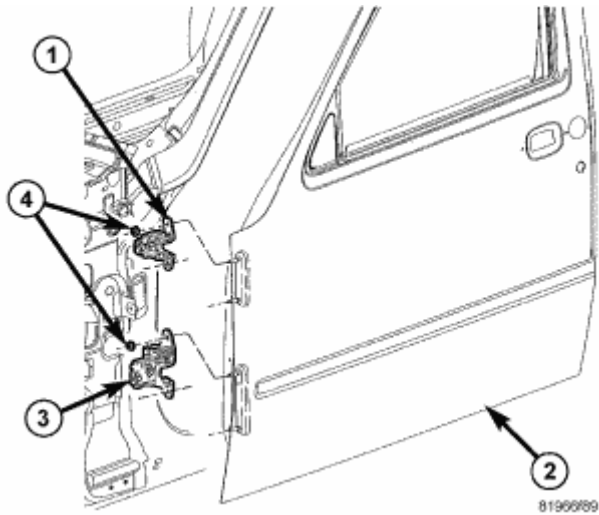


Fig. 60: Upper/Lower Hinges, Door & Nuts
Courtesy of CHRYSLER LLC

NOTE: Use a grease pencil or equivalent, mark the location of the upper (1) and lower (3) hinges on the door (2) for alignment during Reinstallation.

3. Support the door with a suitable lifting device.
4. Remove the nuts (4) attaching the door (2) to the upper (1) and lower (3) hinges.
5. Carefully remove the door (2) from the vehicle.

INSTALLATION

DOOR - FRONT

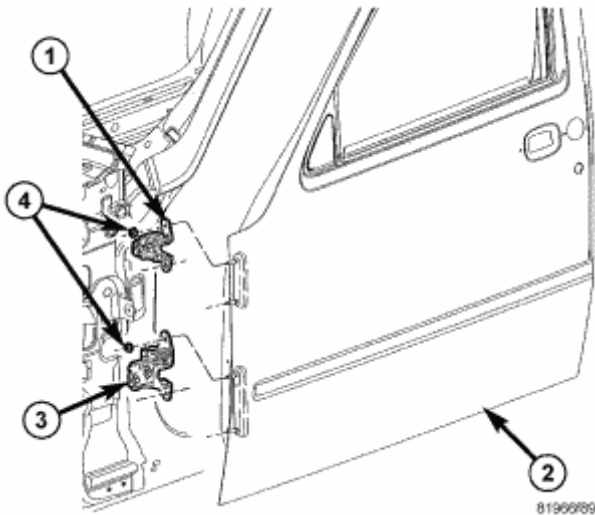


Fig. 61: Upper/Lower Hinges, Door & Nuts
Courtesy of CHRYSLER LLC

1. Carefully position the door (2) to the upper (1) and lower (3) hinges using a suitable lifting device.

2. Loosely install the nuts (4) to the door studs and hinges at the lower A-pillar.
3. Align the door to the body using the reference marks made during the removal procedure.
4. Tighten the hinge to door nuts to 36.5 N.m (27 ft. lbs.).

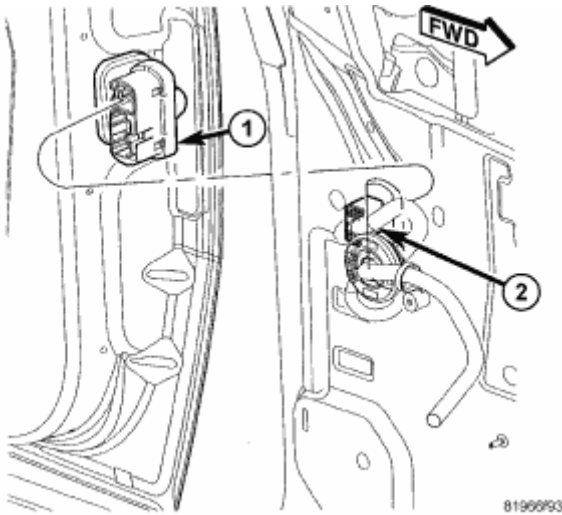


Fig. 62: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
Courtesy of CHRYSLER LLC

5. Connect the door harness electrical connector (1) to the body connector (2) at the lower A-pillar.
6. Connect the negative battery cable to the battery.
7. If necessary, adjust the front door. See **ADJUSTMENTS**.

ADJUSTMENTS

DOOR - FRONT

NOTE: For vehicles with four doors, it is recommended that you adjust the rear door before adjusting the front door. See **ADJUSTMENTS**.

Door adjustment measurements should be taken from stationary or welded body panels like the roof, rocker or quarter panels.

During adjustment procedures, it is recommended that all the hinge fasteners be loosened except for the upper most fasteners. Adjustments can be made using the upper bolts to hold the door with final torque of the fasteners occurring after correct door positioning is achieved.

A suitable body sealant should be used when removing or moving the hinges.

FORE/AFT

NOTE: Fore/aft (lateral) door adjustment is done by loosening the hinge to the hinge pillar fasteners one hinge at a time and moving the door to the correct position.

1. Support the door with a suitable lifting device.
2. Loosen the hinge to hinge pillar fasteners. See **REMOVAL**.
3. Adjust the door to the correct position. See **SPECIFICATIONS**.
4. Tighten the hinge pillar fasteners to 26 N.m (19 ft. lbs.).

UP/DOWN

NOTE: Up/down door adjustment is done by loosening either the hinge to the hinge pillar fasteners or the hinge to door fasteners and moving the door to the correct position.

NOTE: When the up/down adjustments are done correctly, the top of the door is positioned over flush to the roof. See **SPECIFICATIONS**.

1. Support the door with a suitable lifting device.
2. Loosen the latch striker bolts. See **REMOVAL**.
3. Loosen the hinge to door fasteners (see **REMOVAL**) or loosen the hinge to hinge pillar fasteners (see **REMOVAL**).
4. Adjust the door to the correct position. See **SPECIFICATIONS**.
5. Tighten the hinge pillar fasteners to 26 N.m (19 ft. lbs.) or the door to hinges fasteners to 36.5 N.m (27 ft. lbs.).
6. Tighten the latch striker bolts. See **INSTALLATION**.

IN/OUT

NOTE: In/out door adjustment is done by loosening the hinge to door fasteners one hinge at a time and moving the door to the correct position.

1. Support the door with a suitable lifting device.
2. Loosen the latch striker bolts. See **REMOVAL**.
3. Loosen the hinge to door fasteners. See **REMOVAL**.
4. Adjust the door to the correct position. See **SPECIFICATIONS**.
5. Tighten the door to hinges fasteners to 36.5 N.m (27 ft. lbs.).
6. Tighten the latch striker bolts. See **INSTALLATION**.

GLASS - FRONT DOOR

REMOVAL

GLASS - FRONT DOOR

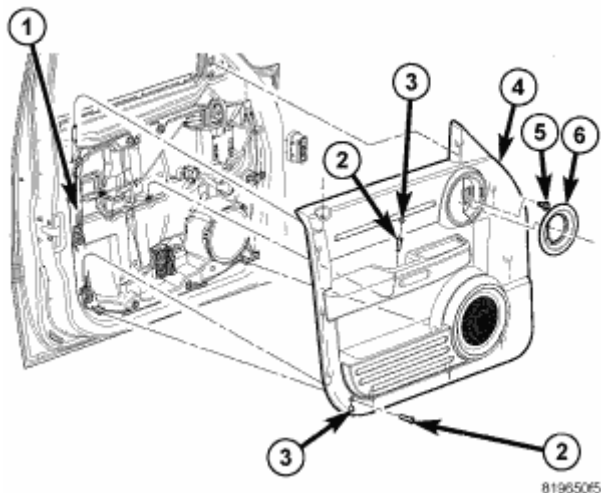


Fig. 63: Removing/Installing Trim Panel
 Courtesy of CHRYSLER LLC

CAUTION: Do not attempt to remove the trim panel the conventional way. This door panel has hooks holding it to the door rather than push pins. The door module must be removed as an assembly. Carefully follow these instructions in order to prevent unnecessary damage to the trim panel.

1. Remove the trim panel. See **REMOVAL**.

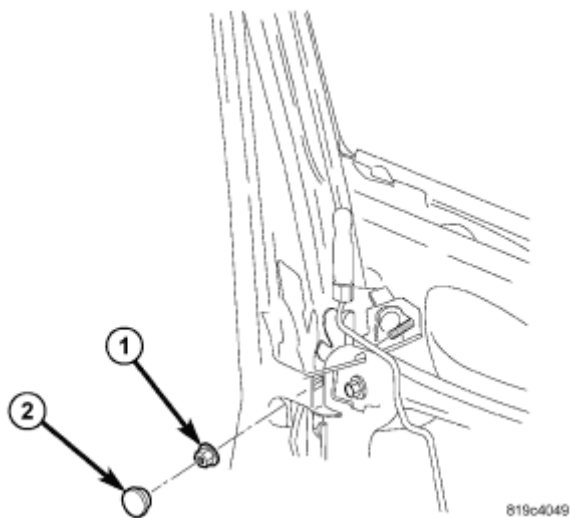
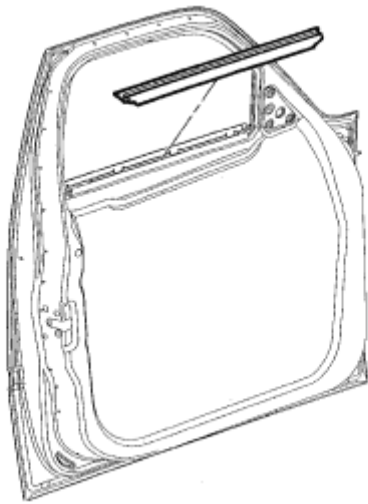


Fig. 64: Door Plug & Rear Exterior Handle Nut
 Courtesy of CHRYSLER LLC

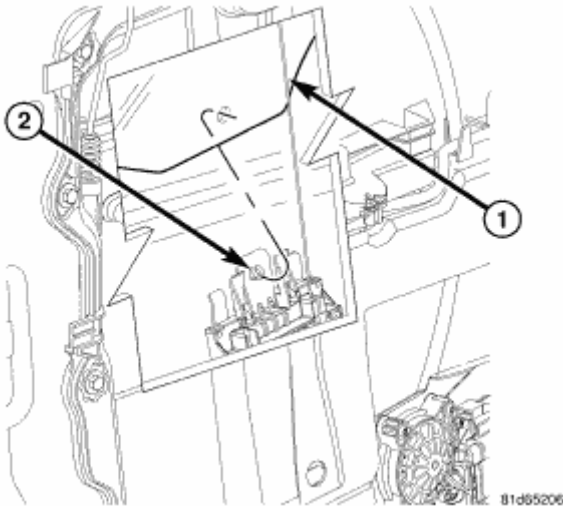
2. Remove the door plug (2).
3. Remove rear exterior handle nut (1).



8196a4f2

Fig. 65: Removing/Installing Inner Door Weatherstrip
Courtesy of CHRYSLER LLC

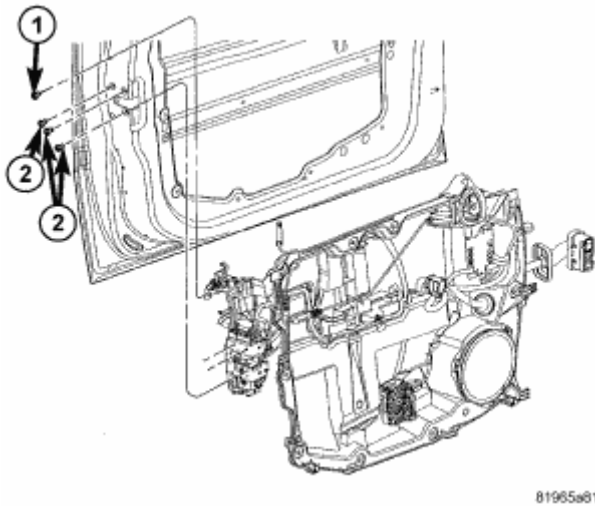
4. Remove the inner door weatherstrip. See **REMOVAL**.



81d65206

Fig. 66: Door Glass And Window Regulator Liftplate
Courtesy of CHRYSLER LLC

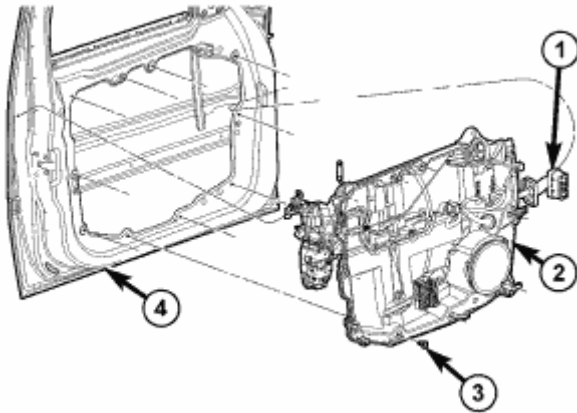
5. Remove the tape covering the access hole on the carrier plate and discard. Access the window regulator liftplate through the hole in the carrier plate.
6. Push down the door glass (1) and use a screw driver to release the tap on the window regulator liftplate (2). Lift the glass up and secure the to the header.



81985a81

Fig. 67: Removing/Installing Door Latch & Latch Bracket Securing Screws
Courtesy of CHRYSLER LLC

7. Remove the three screws (2) securing the door latch to the door shut face.
8. Remove the one screw (1) attaching the latch presenter to the door shut face.



819856ca

Fig. 68: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

9. Disconnect and remove the electrical connector (1) from the door (5).
10. Remove the rear exterior handle nut attaching the door handle to the latch presenter.
11. Remove the 10 screws (4) from the carrier plate (2).
12. Remove the carrier plate (2) from the door (5).

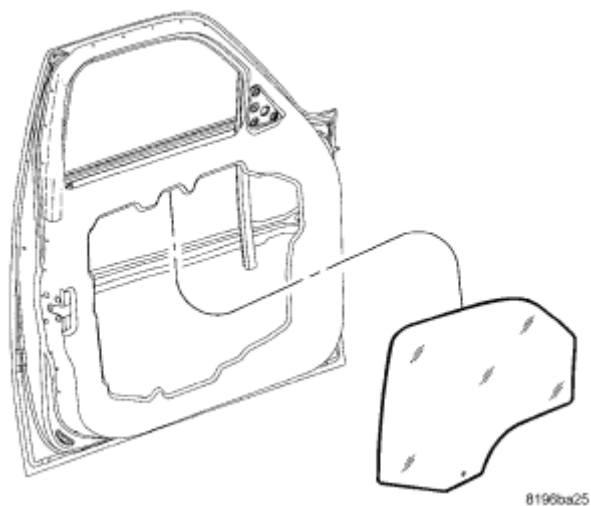


Fig. 69: Removing/Installing Front Door Glass
 Courtesy of CHRYSLER LLC

13. Remove the door glass from the module opening in the door.

INSTALLATION

GLASS - FRONT DOOR

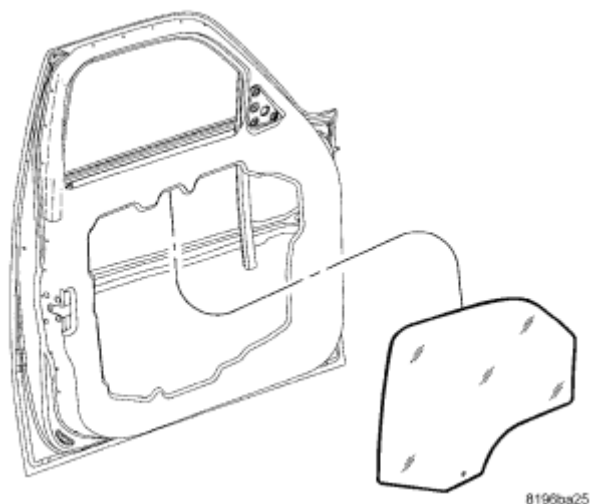


Fig. 70: Removing/Installing Front Door Glass
 Courtesy of CHRYSLER LLC

1. Install the door glass to the module opening in the door.

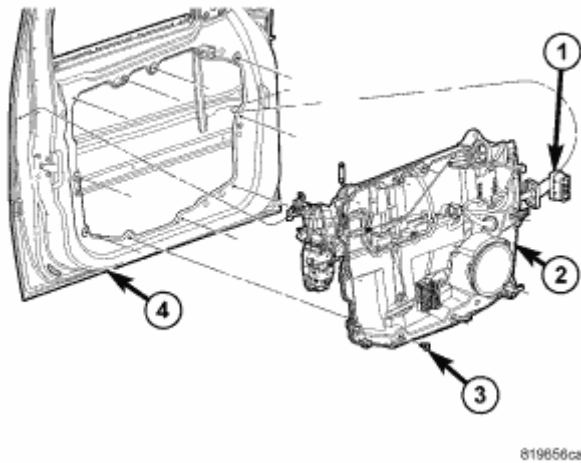


Fig. 71: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

2. Align the latch presenter to the rear exterior handle stud.
3. Align the carrier plate (2) to the door (4).
4. Install the electrical connector (1) to the door (4) and connect the electrical connector.

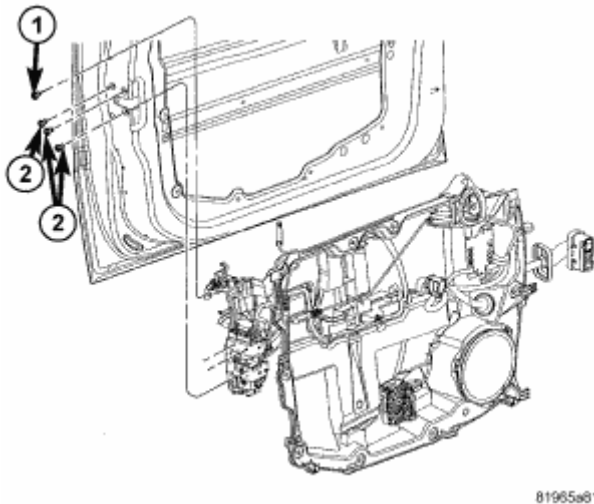


Fig. 72: Removing/Installing Door Latch & Latch Bracket Securing Screws
 Courtesy of CHRYSLER LLC

5. Install the three screws (2) securing the door latch to the door shut face and tighten screws to 7 N.m (60 in. lbs.).
6. Install the one screw (1) attaching the latch present to the door shut face and tighten screw to 7 N.m (60 in. lbs.).

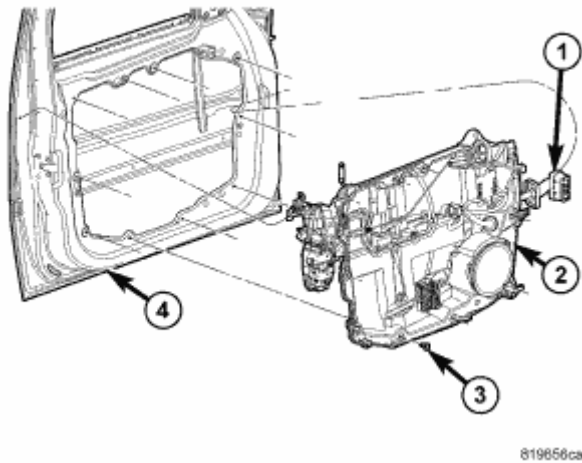


Fig. 73: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

7. Install the 10 screws (3) to the carrier plate (2) and tighten screws to 5.5 N.m (50 in. lbs.).

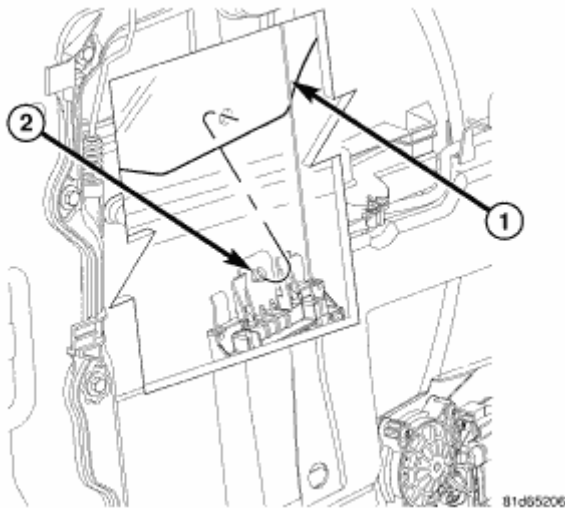
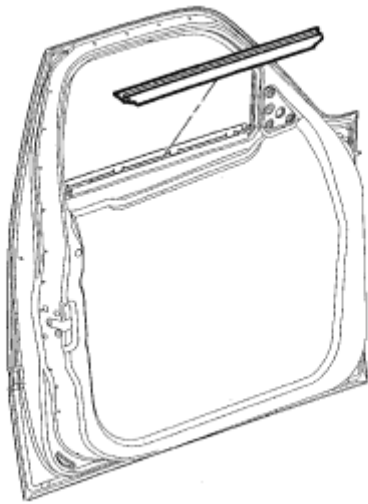


Fig. 74: Door Glass And Window Regulator Liftplate
 Courtesy of CHRYSLER LLC

NOTE: The glass should snap into place. Make sure the glass is secure to the liftplate by pulling up on the glass to verify.

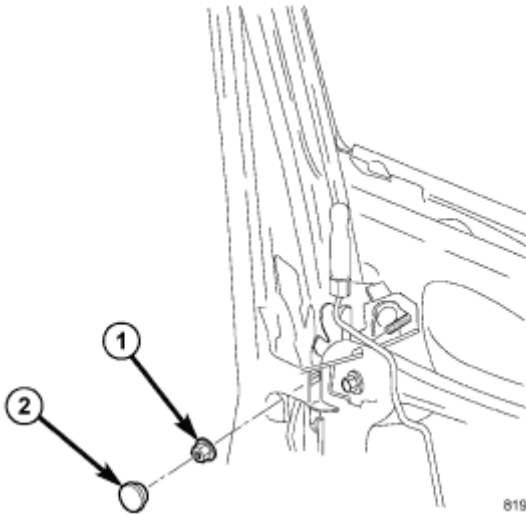
8. Connect the door glass (1) to the window regulator (2) by sliding the glass down into the liftplate.
9. Apply the adhesive tape to the inspection cover in the door module.



8196a4f2

Fig. 75: Removing/Installing Inner Door Weatherstrip
Courtesy of CHRYSLER LLC

10. Install the inner door weatherstrip. See **INSTALLATION**.



819c4049

Fig. 76: Door Plug & Rear Exterior Handle Nut
Courtesy of CHRYSLER LLC

NOTE: The door glass must be in the full up position in order to access the rear exterior handle nut. Use light and a magnetic socket on the rear nut to prevent from dropping the nut into the door assembly.

11. Install the rear nut (1) to the exterior handle and tighten to 4.5 N.m (40 in. lbs.).
12. Install the door plug (2) to the door.
13. Install the trim panel to the door. See **INSTALLATION**.

HANDLE - EXTERIOR DOOR

REMOVAL

HANDLE - EXTERIOR DOOR

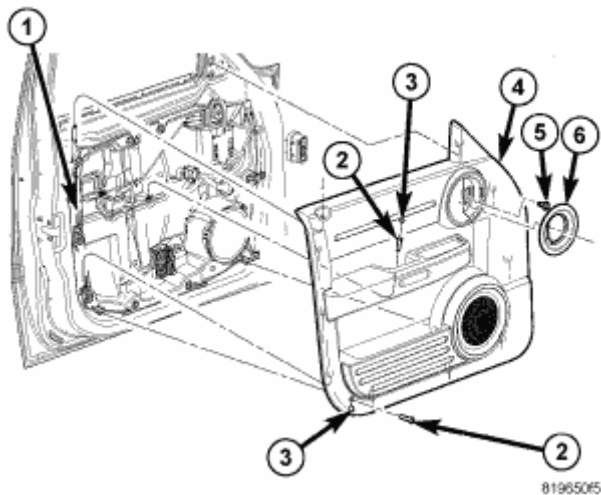


Fig. 77: Removing/Installing Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the trim panel from the door. See **REMOVAL**.

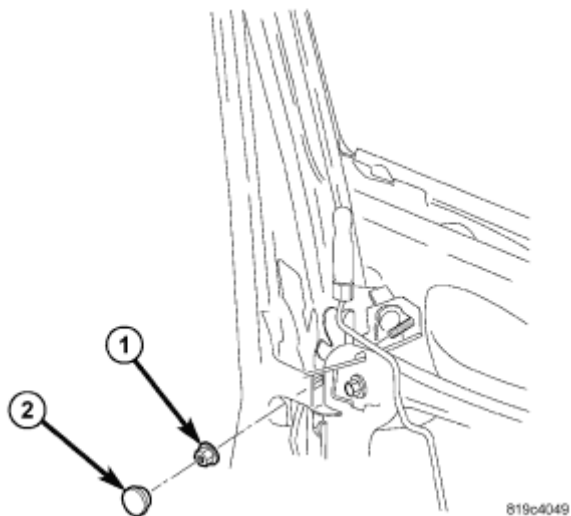
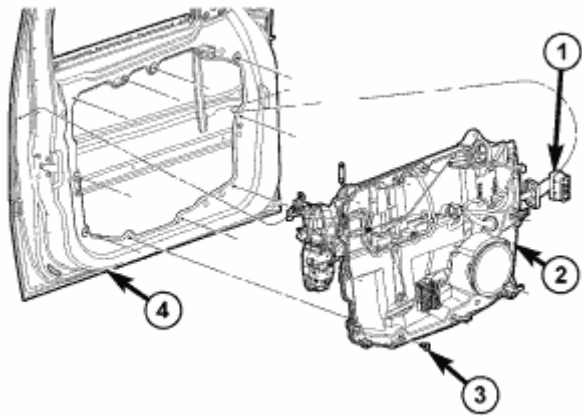


Fig. 78: Door Plug & Rear Exterior Handle Nut
Courtesy of CHRYSLER LLC

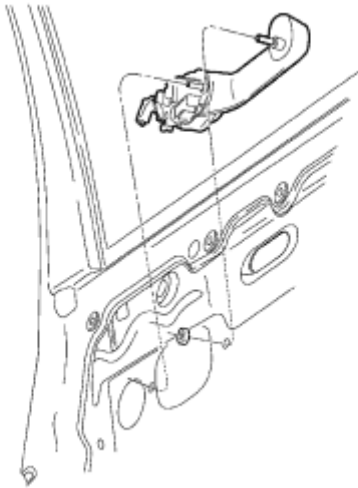
2. Remove the door plug (2).
3. Remove rear exterior handle nut (1).



819858ca

Fig. 79: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

4. Remove the carrier plate. See **REMOVAL**.



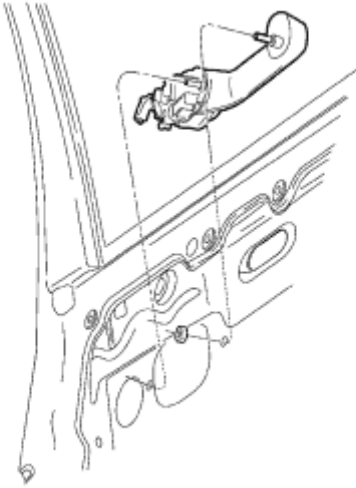
819c4044

Fig. 80: Removing/Installing Front Exterior Handle
 Courtesy of CHRYSLER LLC

5. Remove the front exterior handle nut and remove the handle from the door.

INSTALLATION

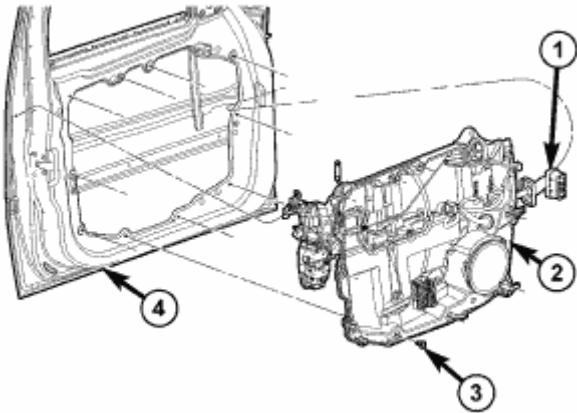
HANDLE - EXTERIOR DOOR



819c4044

Fig. 81: Removing/Installing Front Exterior Handle
Courtesy of CHRYSLER LLC

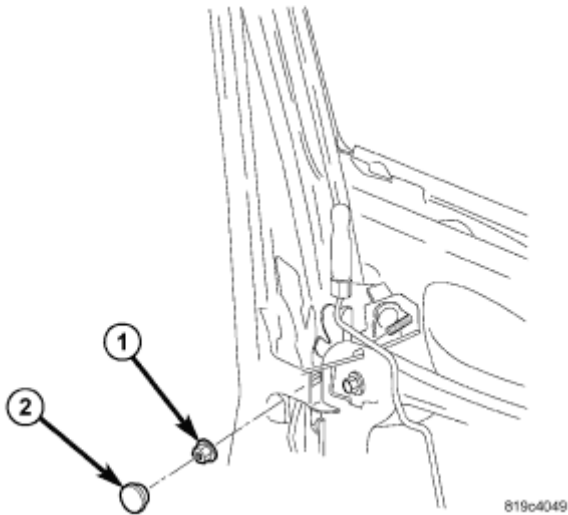
1. Position the handle on the door and install the front nut and tighten to 4.5 N.m (40 in. lbs.).



819856ca

Fig. 82: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

2. Install the carrier plate to the door. See INSTALLATION.

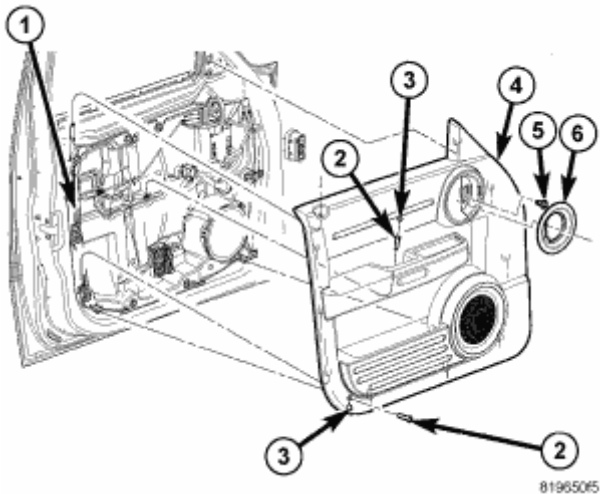


819c4049

Fig. 83: Door Plug & Rear Exterior Handle Nut
 Courtesy of CHRYSLER LLC

NOTE: The door glass must be in the full up position in order to access the rear exterior handle nut. Use light and a magnetic socket on the rear nut to prevent from dropping the nut into the door assembly.

3. Install the rear nut (1) to the exterior handle and tighten to 4.5 N.m (40 in. lbs.).
4. Install the door plug (2) to the door.



81965015

Fig. 84: Removing/Installing Trim Panel
 Courtesy of CHRYSLER LLC

5. Install the trim panel to the door. See **INSTALLATION**.
6. Adjust the latch. Refer to. See **ADJUSTMENTS**.

HANDLE - INTERIOR DOOR

REMOVAL

HANDLE - INTERIOR DOOR

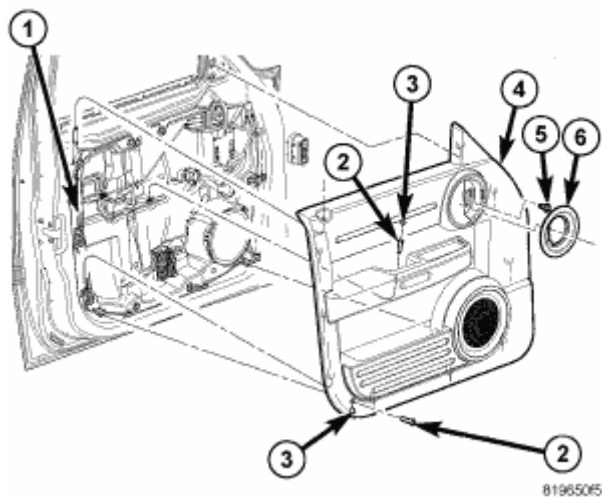


Fig. 85: Removing/Installing Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the trim panel. See **REMOVAL**.

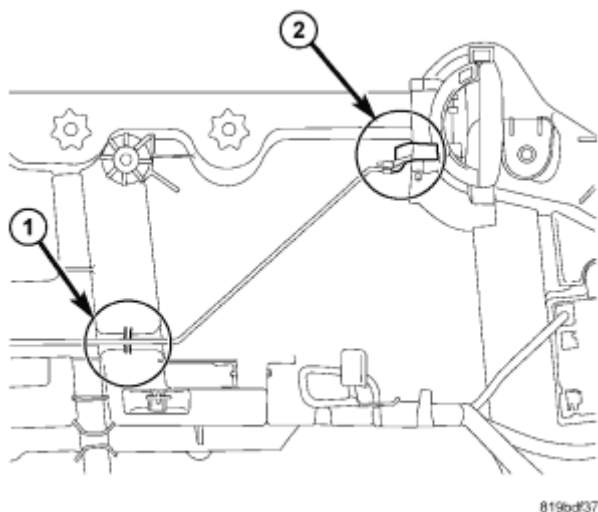


Fig. 86: Carrier & Interior Handle
Courtesy of CHRYSLER LLC

2. Remove the interior lock rod from the interior handle.

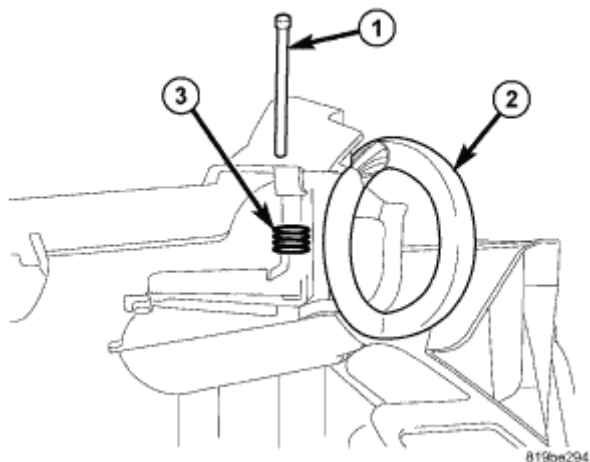


Fig. 87: Push Pin, Handle & Spring
Courtesy of CHRYSLER LLC

3. Remove the push pin (1) from the handle.
4. Remove the spring (3) and handle (2) from the carrier.

INSTALLATION

HANDLE - INTERIOR DOOR

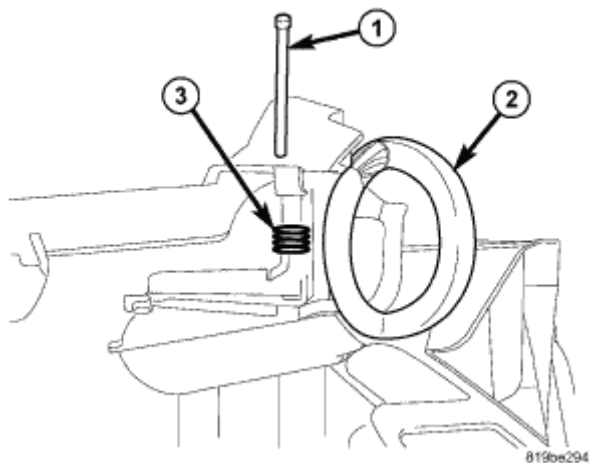


Fig. 88: Push Pin, Handle & Spring
Courtesy of CHRYSLER LLC

1. Install the handle (2) and spring (3) to the carrier.
2. Install the push pin (1) into the carrier, spring and the handle.

NOTE: **Make sure that the push pin is seated flush with the carrier.**

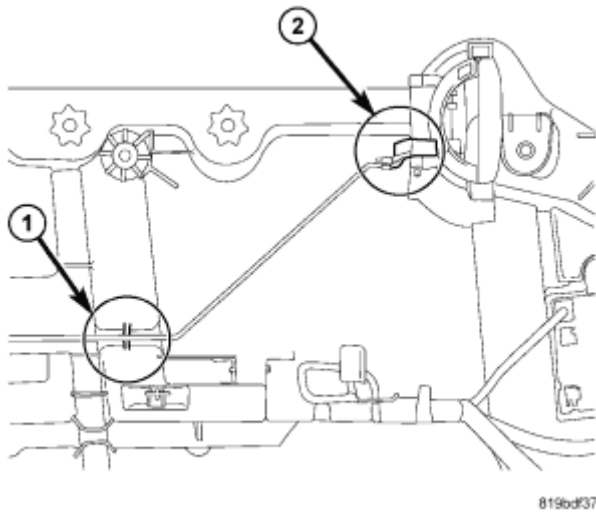


Fig. 89: Carrier & Interior Handle
 Courtesy of CHRYSLER LLC

3. Install the interior lock rod to the interior handle (2). Make sure the lock rod is positioned properly to the carrier (1).

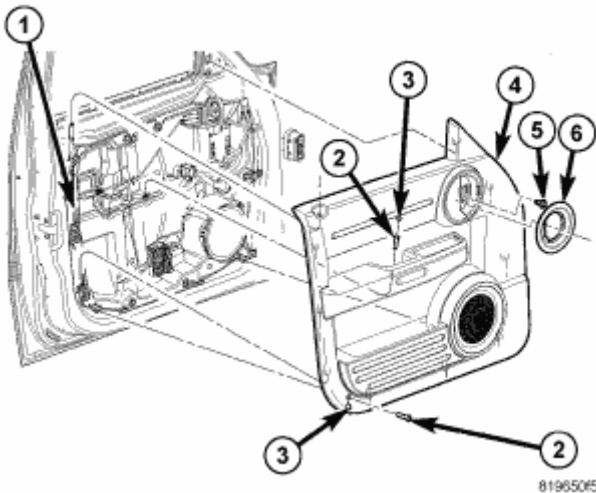


Fig. 90: Removing/Installing Trim Panel
 Courtesy of CHRYSLER LLC

4. Install the trim panel. See INSTALLATION.

HINGE - FRONT DOOR

REMOVAL

HINGE - FRONT DOOR

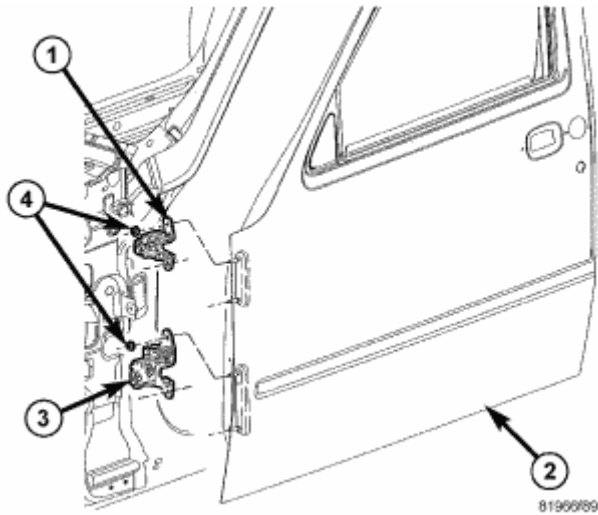


Fig. 91: Upper/Lower Hinges, Door & Nuts
 Courtesy of CHRYSLER LLC

1. Remove the front door. See **REMOVAL**.

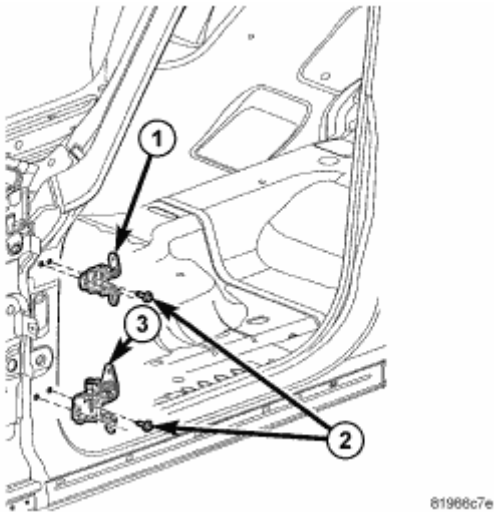


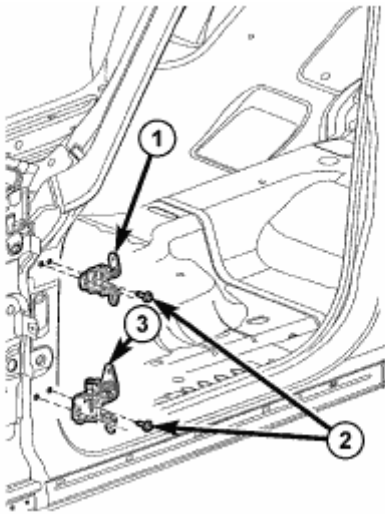
Fig. 92: Removing/Installing Front Door Hinge
 Courtesy of CHRYSLER LLC

NOTE: Use a grease pencil or equivalent, mark the location of the upper (1) and lower (3) hinge on the body of the lower A-pillar for alignment during installation.

2. Remove the four bolts (2) that secure the upper door hinge (1) and lower door hinge (3) to the body of the lower A-pillar and remove the hinges.

INSTALLATION

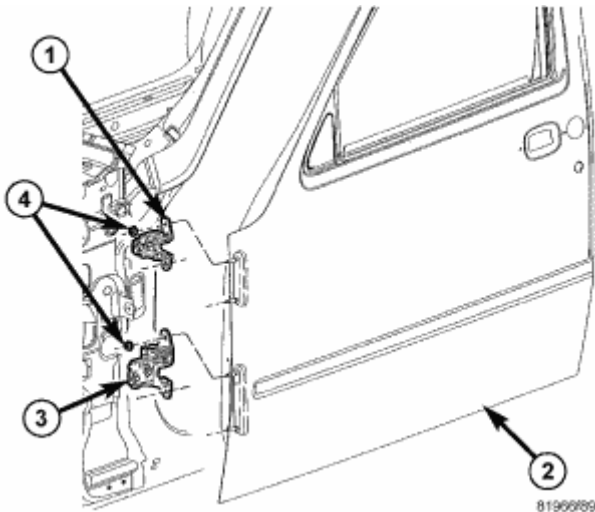
HINGE - FRONT DOOR



81988c7e

Fig. 93: Removing/Installing Front Door Hinge
 Courtesy of CHRYSLER LLC

1. Install the upper (1) and lower (3) hinges to the B-pillar and loosely install the bolts.
2. Align the hinges on the A-pillar using the reference marks made during the removal procedure and tighten the bolts to 26 N.m (19 ft. lbs.).



81988c7e

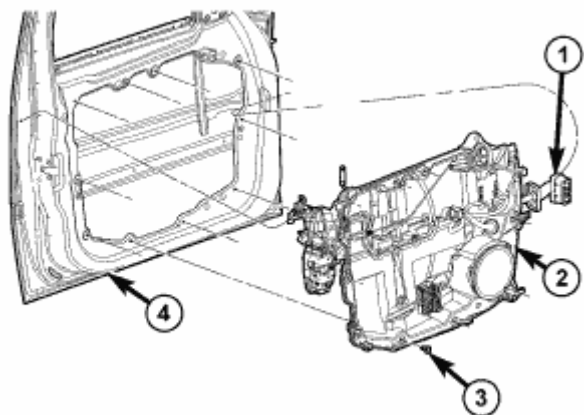
Fig. 94: Upper/Lower Hinges, Door & Nuts
 Courtesy of CHRYSLER LLC

3. Install the front door. See **INSTALLATION**.

LATCH - FRONT DOOR

REMOVAL

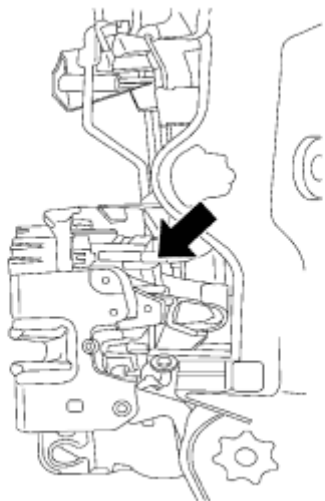
LATCH - FRONT DOOR



819856ca

Fig. 95: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

1. Remove the carrier plate. See **REMOVAL**.



819856020

Fig. 96: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

2. Disconnect the latch electrical connector.

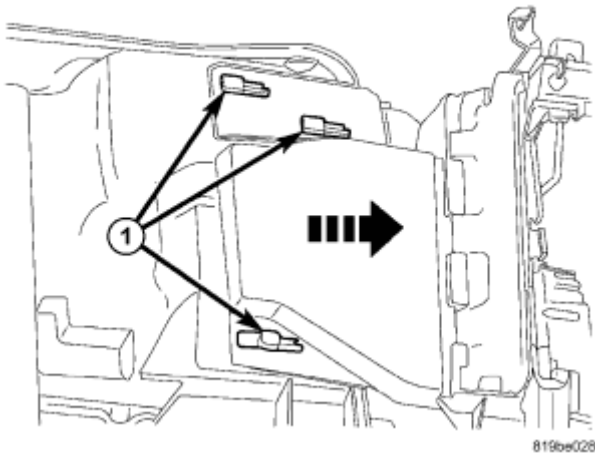


Fig. 97: Carrier Plate Slots
 Courtesy of CHRYSLER LLC

3. Turn the carrier plate over and slide the latch bracket assembly to remove from carrier.

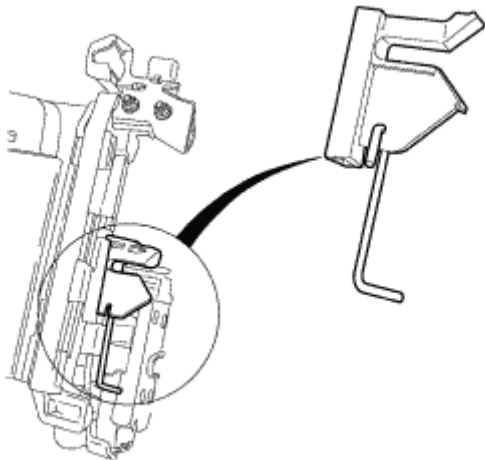
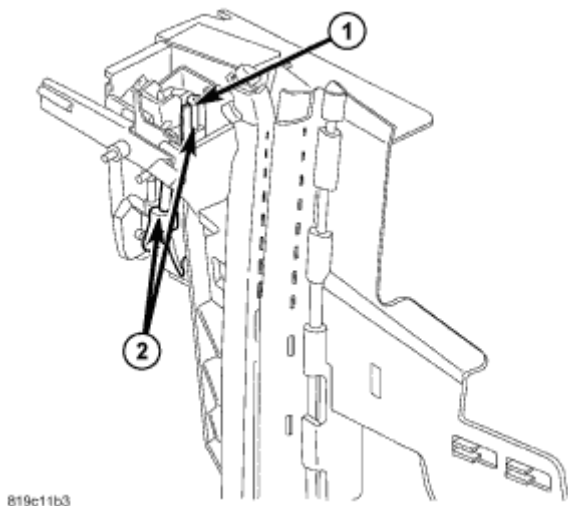


Fig. 98: Removing/Installing Slide Fork
 Courtesy of CHRYSLER LLC

4. Remove the slide fork from the latch bracket.

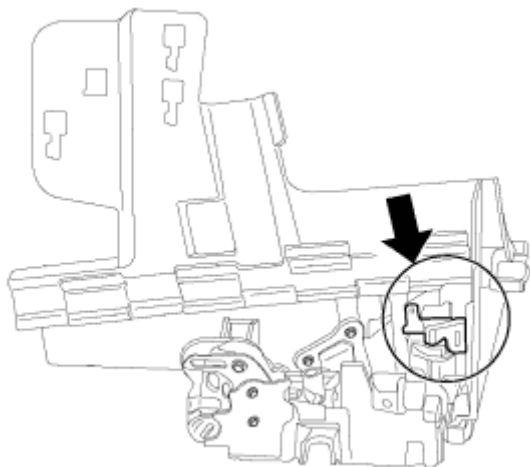


819c11b3

Fig. 99: Release Rod & Swing Clips
 Courtesy of CHRYSLER LLC

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

5. Remove the release rod (1) by disengaging the two swing clips (2).

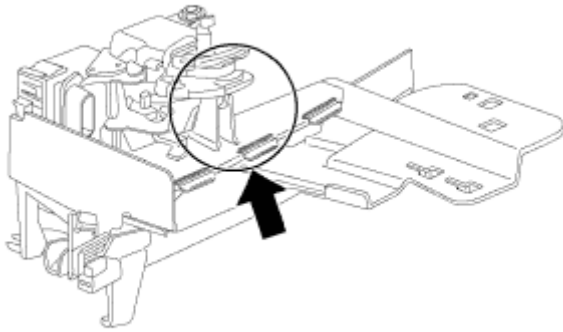


819c1137

Fig. 100: Removing/Installing First Latch Attachment Point
 Courtesy of CHRYSLER LLC

NOTE: The latch has three attachment points to the latch bracket.

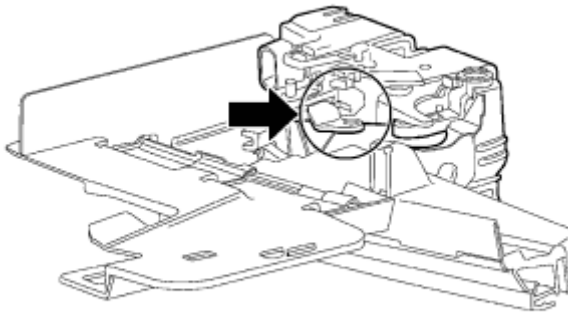
6. Remove the first latch attachment point from the latch bracket.



819c114b

Fig. 101: Removing/Installing Second Latch Attachment Point
 Courtesy of CHRYSLER LLC

7. Remove the second latch attachment point from the latch bracket.



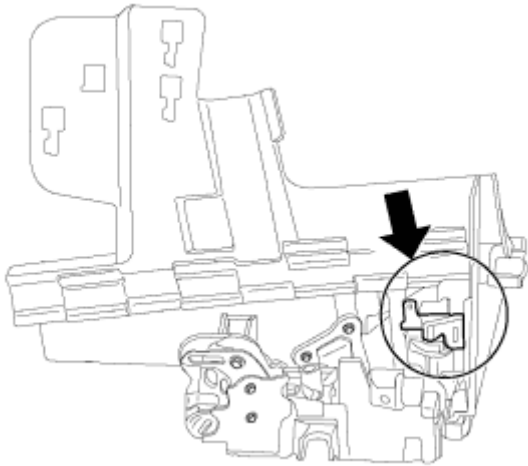
819c118e

Fig. 102: Removing/Installing Third Latch Attachment Point
 Courtesy of CHRYSLER LLC

8. Remove the third latch attachment point from the latch bracket and remove the latch from the latch bracket.

INSTALLATION

LATCH - FRONT DOOR

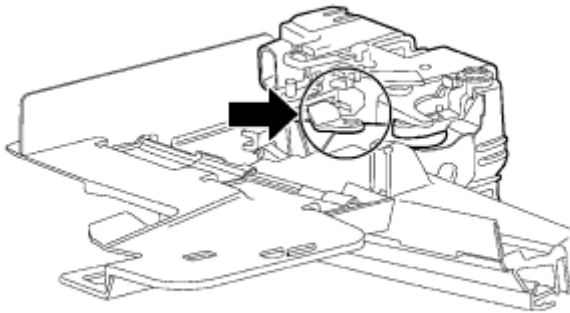


819c1137

Fig. 103: Removing/Installing First Latch Attachment Point
 Courtesy of CHRYSLER LLC

NOTE: The latch has three attachment points to the latch bracket and need to be attached in the following order:

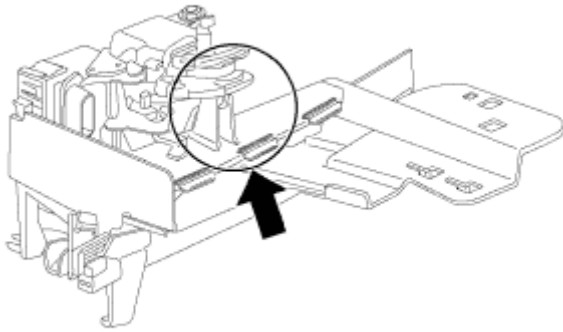
1. Install the first latch attachment point to the latch bracket.



819c118e

Fig. 104: Removing/Installing Third Latch Attachment Point
 Courtesy of CHRYSLER LLC

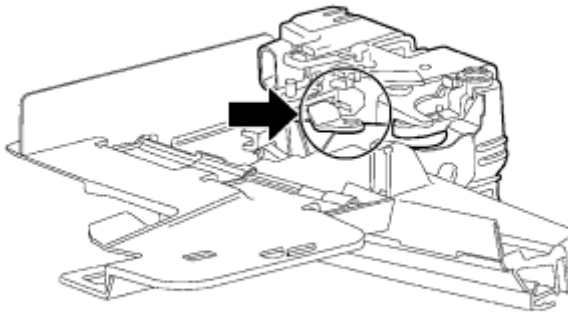
2. It is necessary to align the third attachment point prior to attaching the second point, but do not attach at this time.



819c1148

Fig. 105: Removing/Installing Second Latch Attachment Point
Courtesy of CHRYSLER LLC

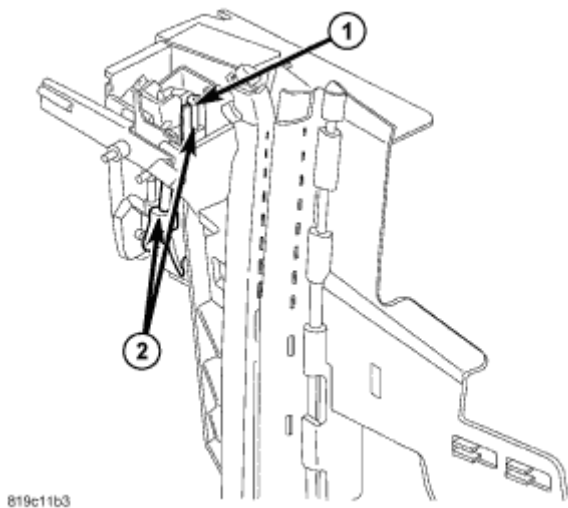
3. Install the second latch attachment point to the latch bracket.



819c118e

Fig. 106: Removing/Installing Third Latch Attachment Point
Courtesy of CHRYSLER LLC

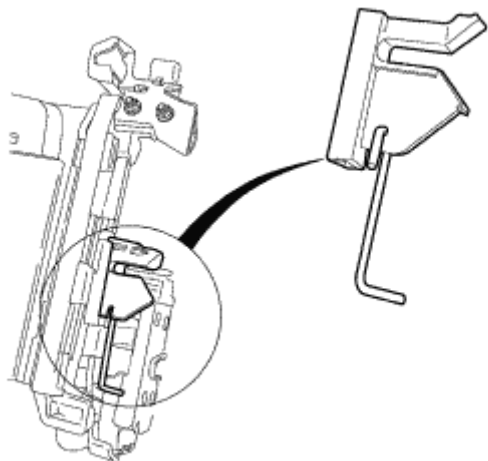
4. Install the third latch attachment point to the latch bracket.



819c11b3

Fig. 107: Release Rod & Swing Clips
 Courtesy of CHRYSLER LLC

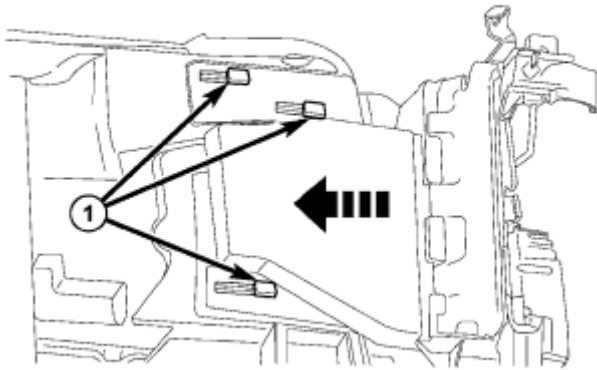
5. Install the release rod (1) then engage the two swing clips (2).



819c11c4

Fig. 108: Removing/Installing Slide Fork
 Courtesy of CHRYSLER LLC

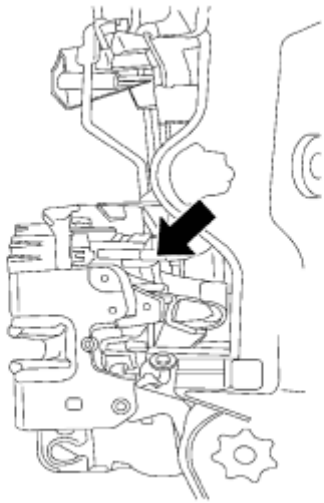
6. Install the slide fork to the latch bracket.



819be0ef

Fig. 109: Identifying Carrier Plate Slots
Courtesy of CHRYSLER LLC

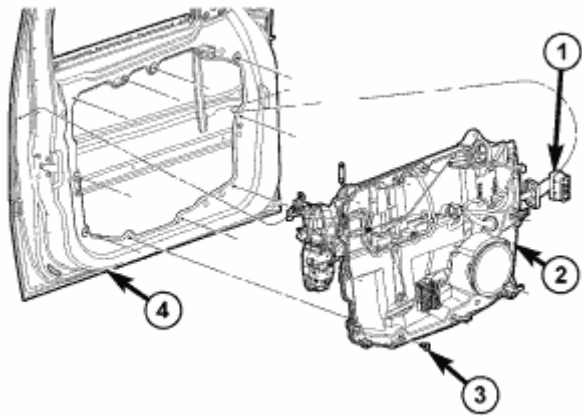
7. Install the latch bracket assembly to the carrier plate slots (1) then slide the latch bracket until fully seated.



819be020

Fig. 110: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

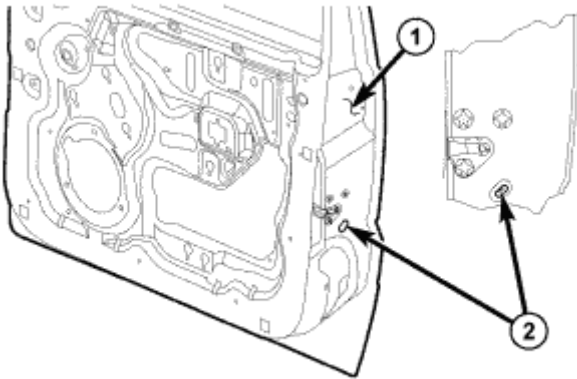
8. Connect the latch electrical connector.



819856ca

Fig. 111: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

9. Install the carrier plate. See **INSTALLATION**.



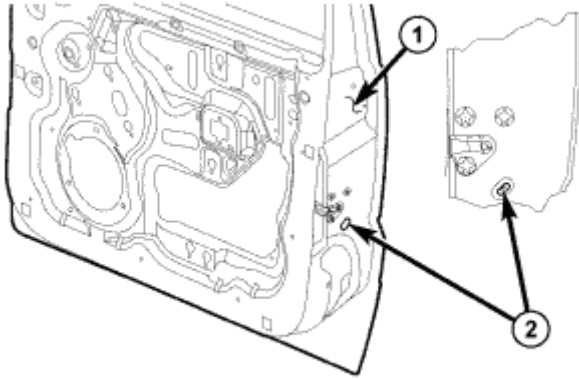
819c4912

Fig. 112: Adjusting Latch
Courtesy of CHRYSLER LLC

10. Adjust the latch as needed. See **ADJUSTMENTS**.

ADJUSTMENTS

LATCH - FRONT DOOR



819c4912

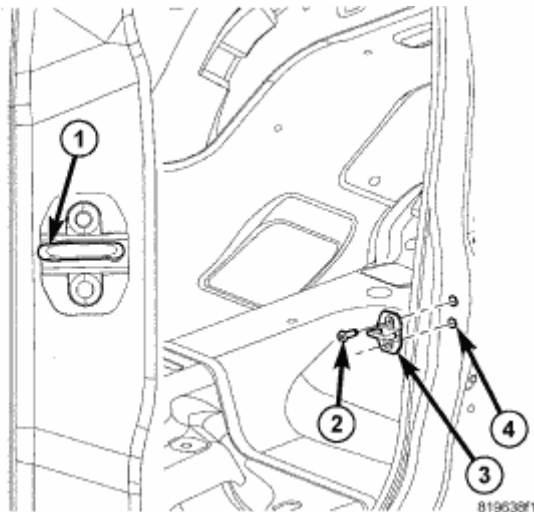
Fig. 113: Adjusting Latch
Courtesy of CHRYSLER LLC

1. Locate the access hole and remove tape covering adjustment hole.
2. Insert a 5/32" hex-wrench through hole and into adjustment screw (2). Loosen screw.
3. Operate outside handle several times to release any restriction because of mis-alignment.
4. Tighten adjustment screw to 4 N.m (35 in. lbs.).
5. Test handle for proper operation.

STRIKER - FRONT DOOR LATCH

REMOVAL

STRIKER - FRONT DOOR LATCH



819639f1

Fig. 114: Striker Loop, Bolts, Striker & B-Pillar
Courtesy of CHRYSLER LLC

1. Remove the bolts (2) from the striker latch (3).
2. Remove the latch striker (3) from the B-pillar (4).

INSTALLATION

STRIKER - FRONT DOOR LATCH

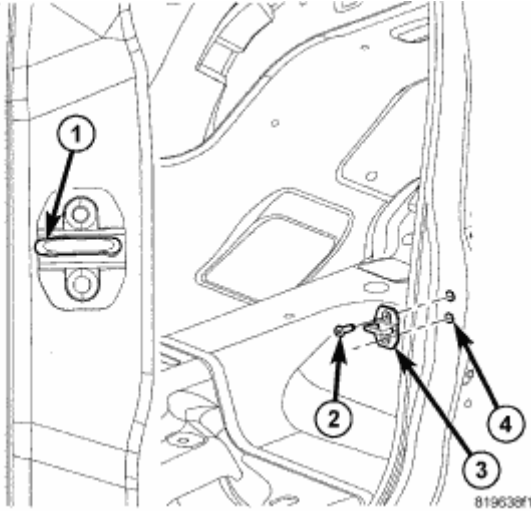


Fig. 115: Striker Loop, Bolts, Striker & B-Pillar
Courtesy of CHRYSLER LLC

NOTE: The striker needs to be properly orientated to the B-pillar. The striker loop (1) must be installed to the inboard side of the B-pillar.

1. Install the striker (3) to the B-pillar (4).
2. Install the bolts (2) and tighten to 26 N.m (19 ft. lbs.).
3. Adjust the door as necessary. See ADJUSTMENTS, and for fit SPECIFICATIONS.

CYLINDER - FRONT DOOR LOCK

REMOVAL

CYLINDER - FRONT DOOR LOCK

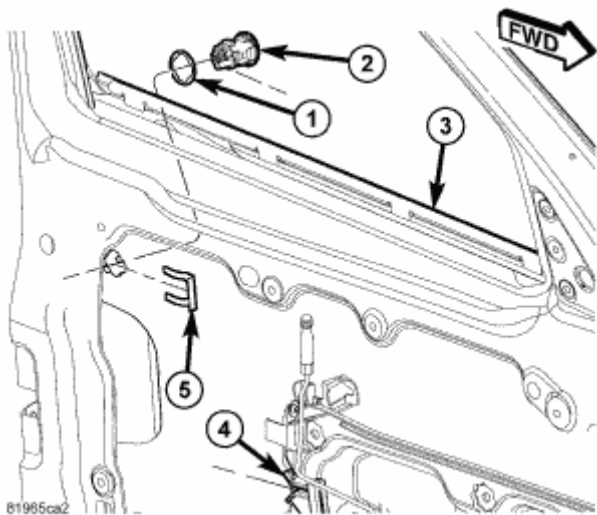


Fig. 116: Gasket, Door Lock Cylinder, Door, Carrier Plate & Door Lock Cylinder Retainer
 Courtesy of CHRYSLER LLC

1. Remove carrier plate from door, see **REMOVAL**.
2. Remove door lock cylinder retainer (5) from door lock cylinder (2).
3. Remove door lock cylinder (2) and gasket (1) from door (3).

INSTALLATION

CYLINDER - FRONT DOOR LOCK

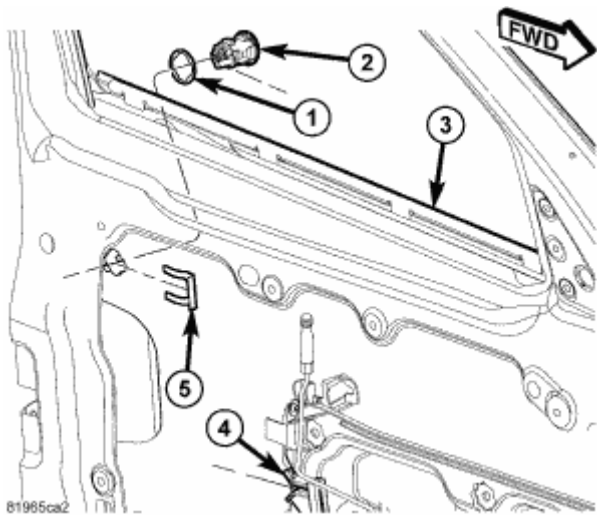


Fig. 117: Gasket, Door Lock Cylinder, Door, Carrier Plate & Door Lock Cylinder Retainer
 Courtesy of CHRYSLER LLC

NOTE: The lever on the key cylinder needs to point forward.

1. Install lock cylinder (2) and gasket (1) to door (3).
2. Install lock cylinder retainer (5) to door lock cylinder (2).

NOTE: Make sure the door lock cylinder (2) is engaged to the carrier plate (4).

3. Install the carrier plate to the door, see INSTALLATION.

RUN CHANNEL - FRONT DOOR GLASS

REMOVAL

RUN CHANNEL - FRONT DOOR GLASS

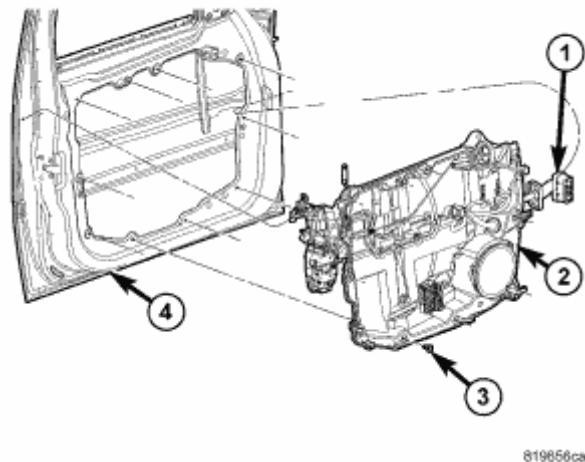


Fig. 118: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

1. Remove the door carrier plate from the door, see REMOVAL.

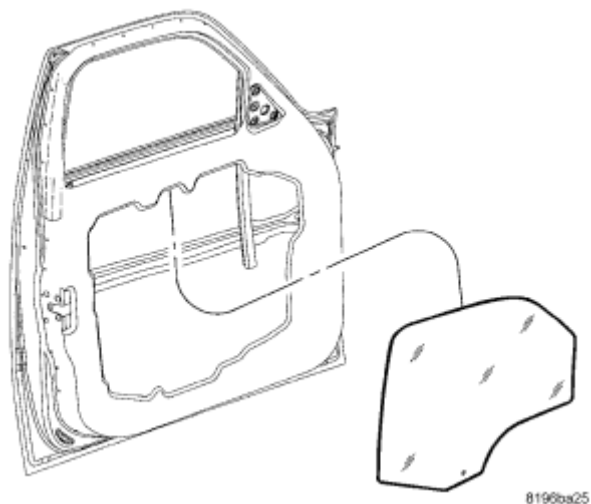
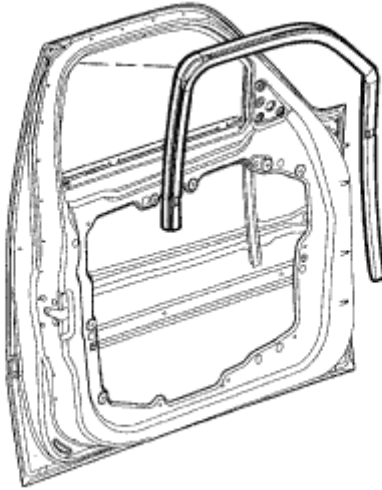


Fig. 119: Removing/Installing Front Door Glass
Courtesy of CHRYSLER LLC

2. Remove the front door glass from the window opening in the door. See **REMOVAL**.



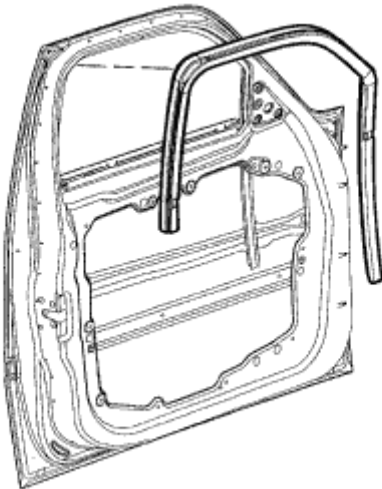
81966572

Fig. 120: Removing/Installing Run Channel
Courtesy of CHRYSLER LLC

3. Remove the run channel from the window opening in the door.

INSTALLATION

RUN CHANNEL - FRONT DOOR GLASS



81966572

Fig. 121: Removing/Installing Run Channel
Courtesy of CHRYSLER LLC

1. Install the run channel to the window opening in the door.

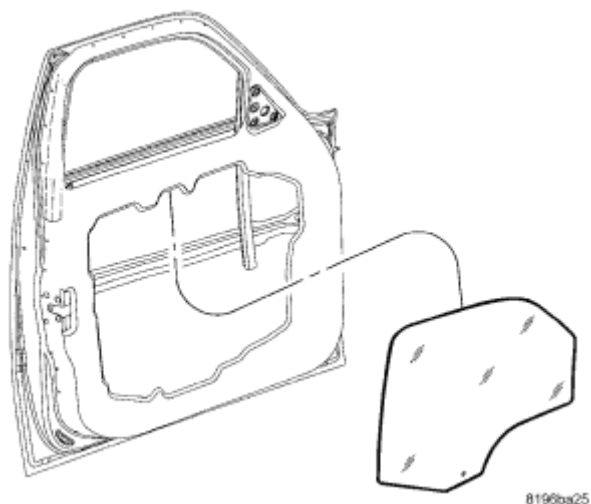


Fig. 122: Removing/Installing Front Door Glass
Courtesy of CHRYSLER LLC

2. Install the front door glass to the window opening in the door, see **INSTALLATION**.

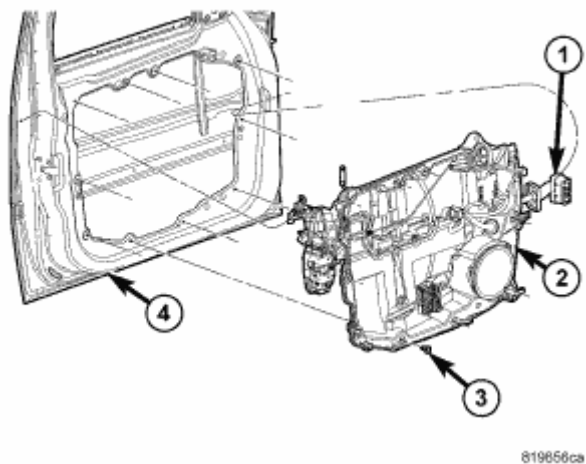


Fig. 123: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

3. Install the carrier plate to the door, see **INSTALLATION**.
4. Cycle the window several times to make sure the window doesn't bind on the outer weather-strip or run channel.

PANEL - DOOR TRIM FRONT

REMOVAL

PANEL - DOOR TRIM FRONT

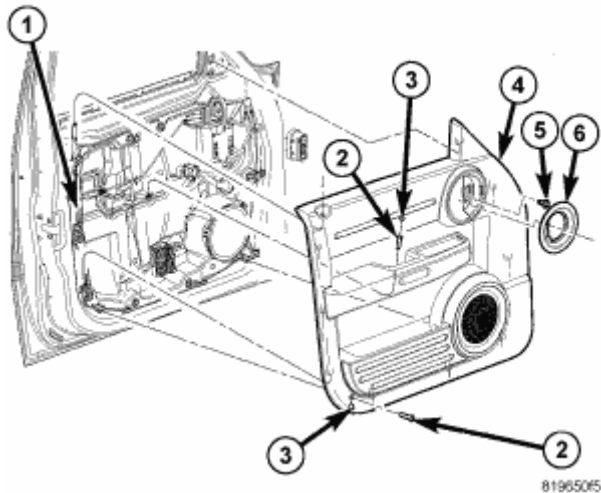


Fig. 124: Removing/Installing Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the door handle trim bezel (6).
2. Remove the fastener (5) from the handle area of the front door trim (4).
3. Use a very thin pry tool to remove the cap screw covers (3) from the front door trim (4).
4. Remove the screws (2) from the front door trim (4).
5. Remove the power window switch and disconnect the electrical connector.
6. Disengage the trim panel from the four way locator at the handle area of the trim panel, then carefully remove the door trim panel (4) from the door (1) by lifting upward until removed from the door lock and the mounting attachments on the carrier plate.

INSTALLATION

PANEL - DOOR TRIM FRONT

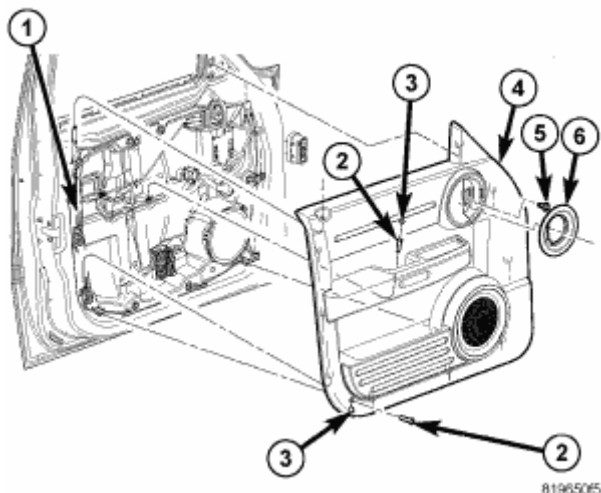


Fig. 125: Removing/Installing Trim Panel
Courtesy of CHRYSLER LLC

CAUTION: Pay close attention to the plastic hook attachment points on the inside of the door trim panel. Make sure that every hook is correctly positioned to the door when installing the trim panel. Damage to the trim panel will occur if the hooks in the door panel are not properly positioned to the door during installation.

1. Connect the electrical connectors and install the power window switch.
2. Carefully install the door trim panel (4) to the door (1) by lifting upward and over the door lock into the trim panel then attach the trim panel to the carrier plate attachment points.
3. Install the screws (2) and the cap screw covers (3) to the front door trim (4).
4. Install the fastener (5) at the handle area of the front door trim (4) and tighten screw to 5.5 N.m (50 in. lbs.).
5. Install the door handle trim bezel (6).

REGULATOR - POWER WINDOW

REMOVAL

REGULATOR - POWER WINDOW

NOTE: The window regulator is part of the carrier plate and is not serviceable. Replace the carrier plate if the regulator fails.

1. Replace the carrier plate, see **REMOVAL**.

INSTALLATION

REGULATOR - POWER WINDOW

NOTE: The window regulator is part of the carrier plate and is not serviceable. Replace the carrier plate if the regulator fails.

1. Install the carrier plate, see **INSTALLATION**.

DOORS - REAR

CARRIER PLATE

REMOVAL

CARRIER PLATE - REAR DOOR

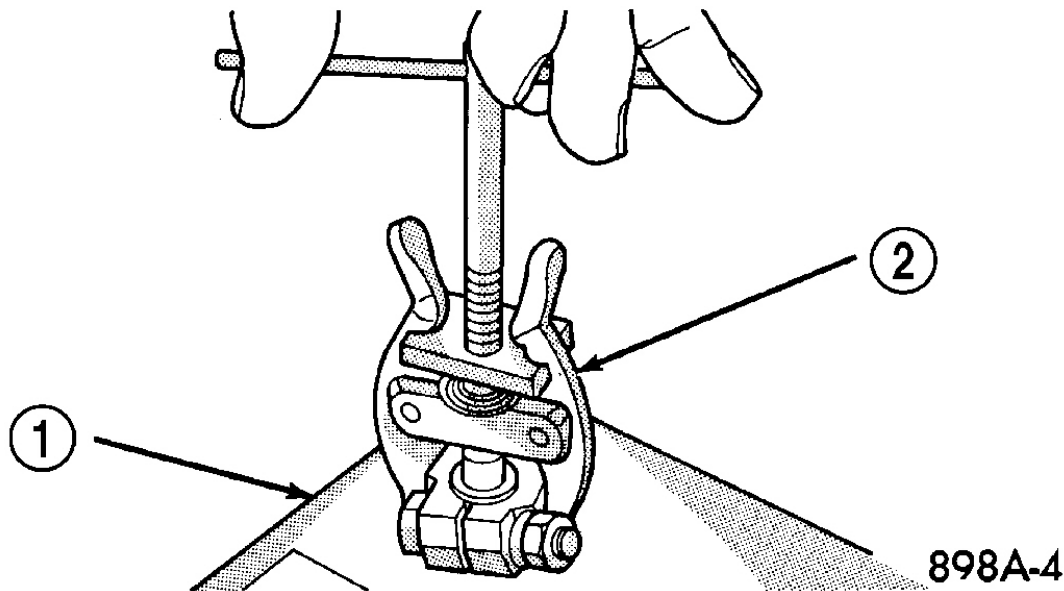


Fig. 126: Removing Battery Cable Terminal Clamp - Typical
 Courtesy of CHRYSLER LLC

CAUTION: Do not attempt to remove the trim panel the conventional way. This door panel has hooks holding it to the door rather than push pins. The door module must be removed as an assembly. Carefully follow these instructions in order to prevent unnecessary damage to the trim panel.

1. Loosen the battery terminal nut and use a battery terminal removal tool (2) to disconnect the negative battery cable from the battery (1).

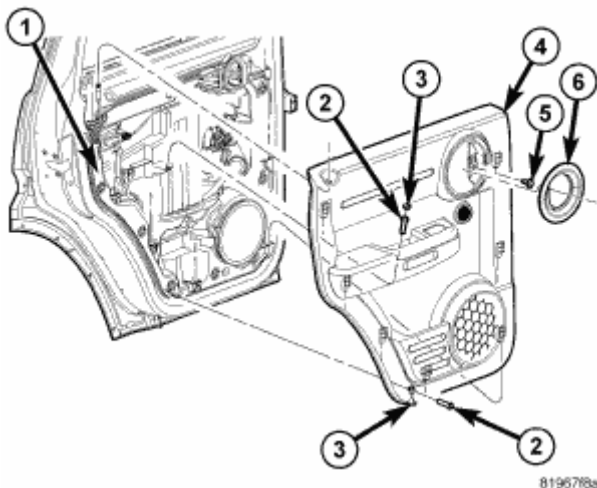


Fig. 127: Removing/Installing Rear Door Trim Panel

Courtesy of CHRYSLER LLC

2. Remove the trim panel from the door, see **REMOVAL**.

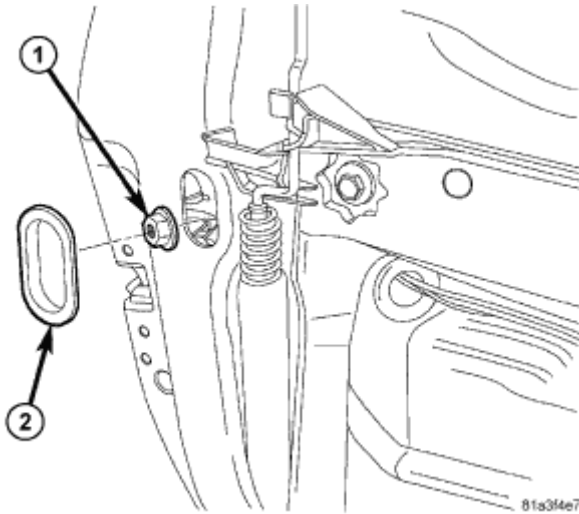


Fig. 128: Removing/Installing Door Plug & Rear Exterior Handle Nut
Courtesy of CHRYSLER LLC

3. Remove the door plug (2).
4. Remove rear exterior handle nut (1).

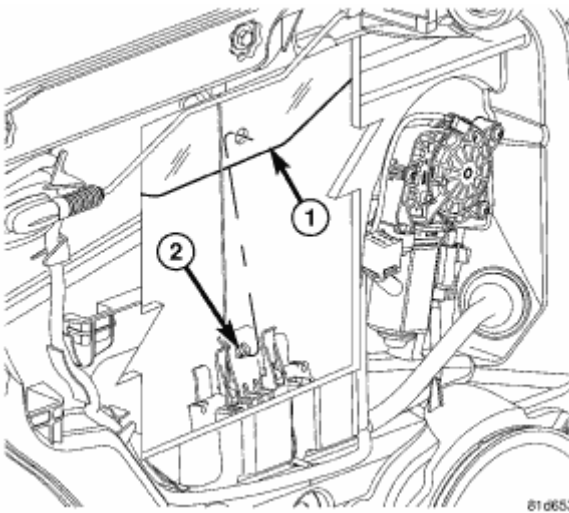
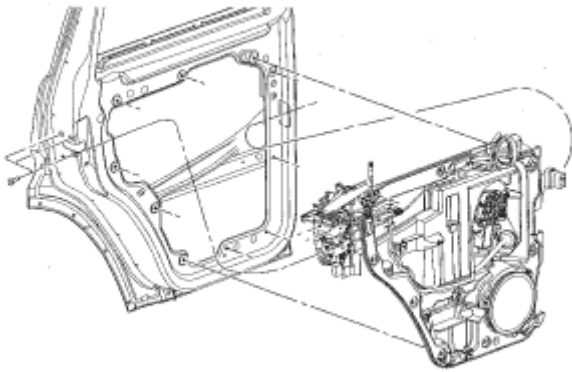


Fig. 129: Window Regulator And Door Glass
Courtesy of CHRYSLER LLC

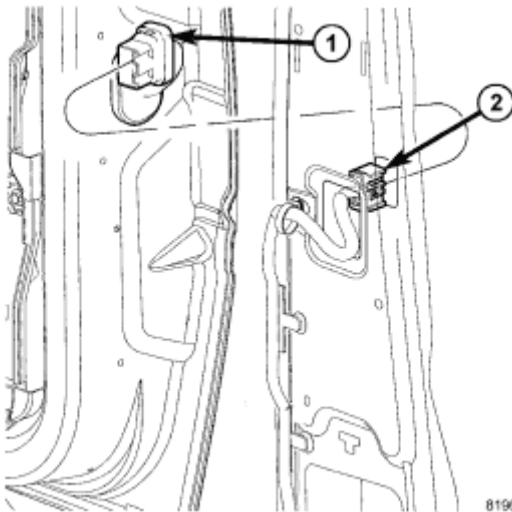
5. Access the window regulator through the hole in the carrier plate. Disconnect the window regulator (2) from the door glass (1) and support the glass.



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Fig. 130: Removing/Installing Rear Door Latch Screws
 Courtesy of CHRYSLER LLC

6. Remove the three screws securing the door latch to the door shut face.



81967443

Fig. 131: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
 Courtesy of CHRYSLER LLC

7. Disconnect the door harness electrical connector (1) from the body connector (2) at the B-pillar.

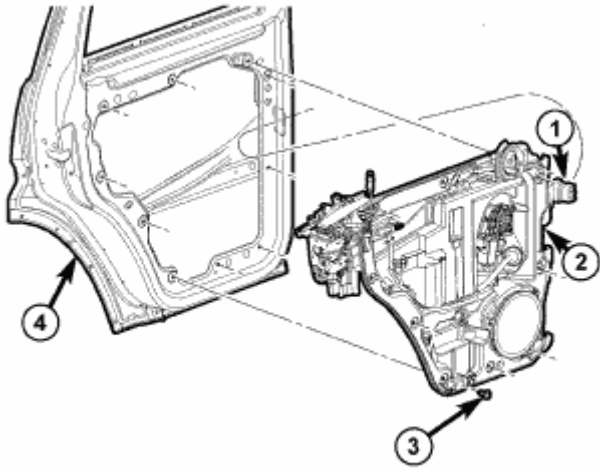


Fig. 132: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

8. Remove the 9 screws (3) from the carrier plate (2).
9. Remove the electrical connector (1) from the door (4).
10. Remove the carrier plate (2) from the door (4).

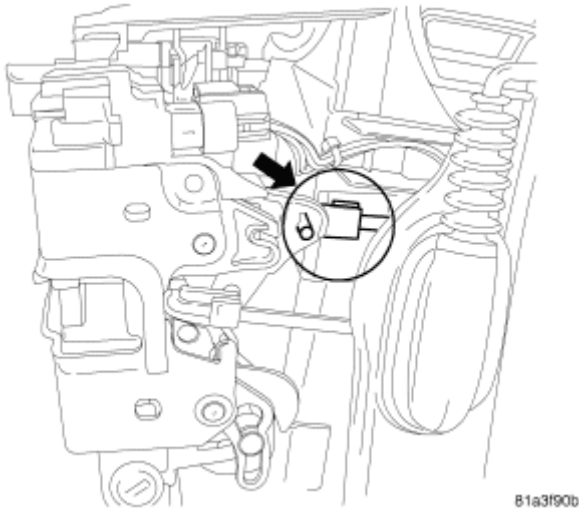


Fig. 133: Disconnecting/Installing Inside Lock Rod
 Courtesy of CHRYSLER LLC

NOTE: The window regulator is not serviceable. The new carrier plate will come equipped with the regulator assembly installed.

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

11. Disconnect the inside lock rod from the latch.

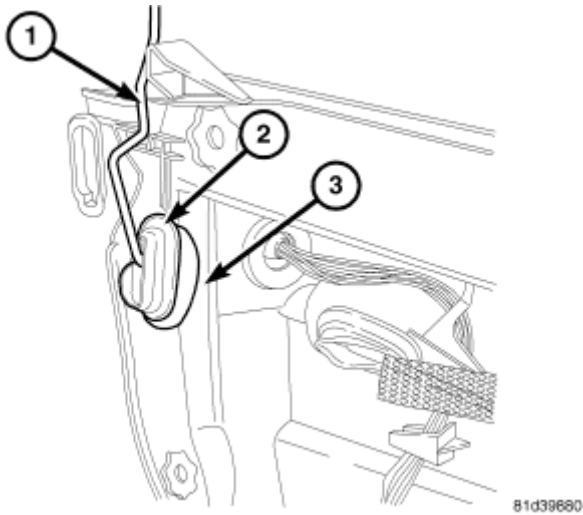


Fig. 134: Inside Lock Rod, Grommet & Carrier Plate
 Courtesy of CHRYSLER LLC

12. Disengage the grommet (2) and remove the inside lock rod (1) from carrier plate (3).

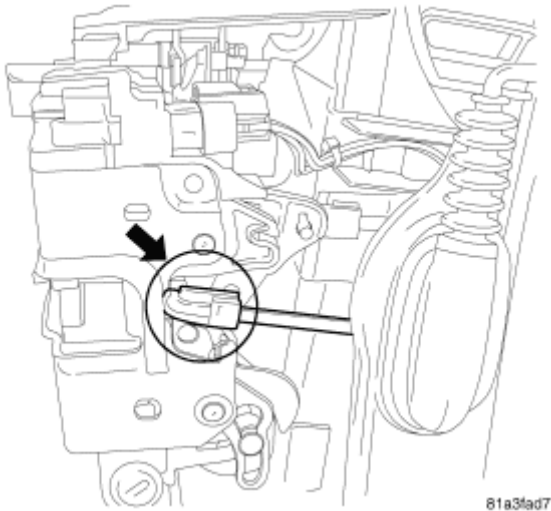


Fig. 135: Disconnecting/Connecting Interior Handle Lock Rod
 Courtesy of CHRYSLER LLC

13. Disconnect the interior handle lock rod from the latch.

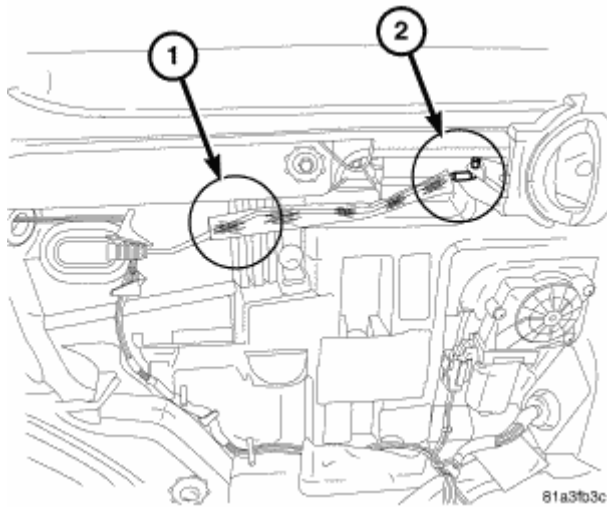


Fig. 136: Carrier & Interior Handle
 Courtesy of CHRYSLER LLC

14. Remove the interior lock rod from the interior handle.

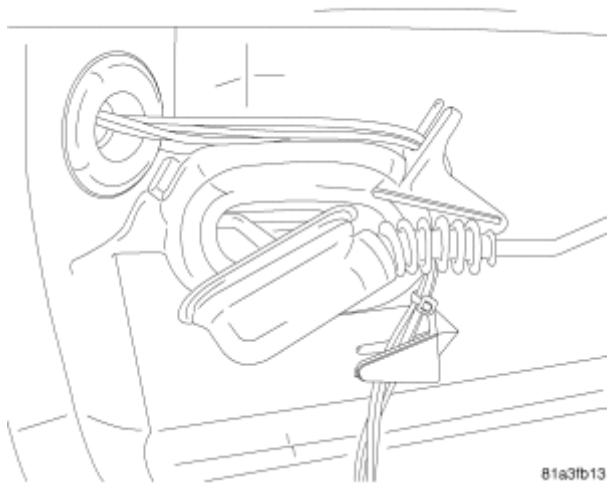


Fig. 137: Removing/Installing Interior Handle Lock Rod And Grommet
 Courtesy of CHRYSLER LLC

15. Remove the interior handle lock rod and grommet from the carrier.

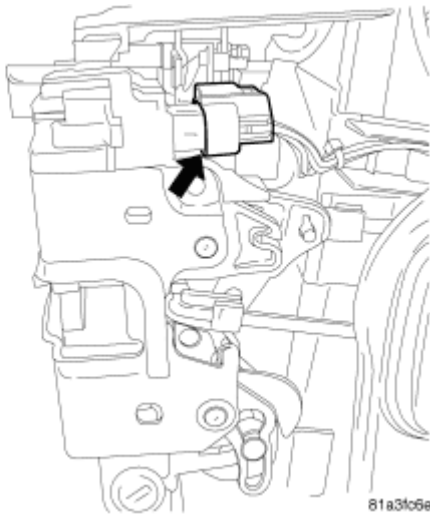


Fig. 138: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

16. Disconnect the latch electrical connector.

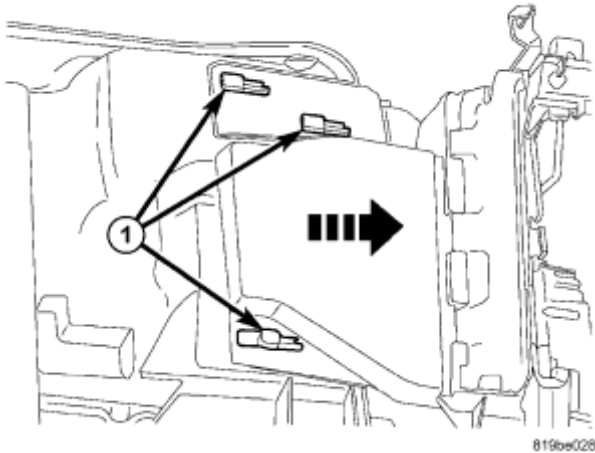


Fig. 139: Carrier Plate Slots
Courtesy of CHRYSLER LLC

17. Turn the carrier plate over and slide the latch bracket assembly to remove from the carrier plate slots (1).

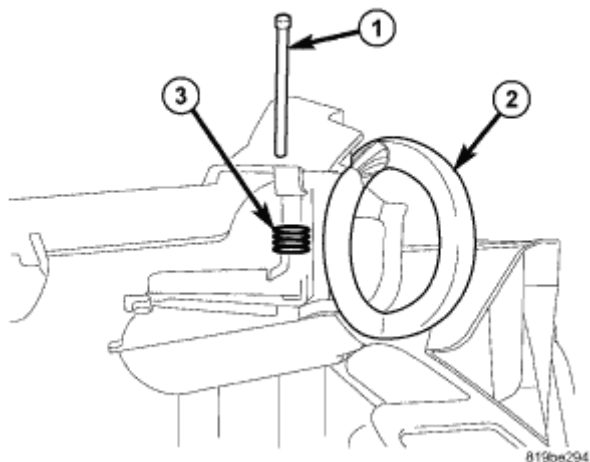


Fig. 140: Push Pin, Handle & Spring
 Courtesy of CHRYSLER LLC

18. Remove the push pin (1) from the handle.
19. Remove the spring (3) and handle (2) from the carrier.

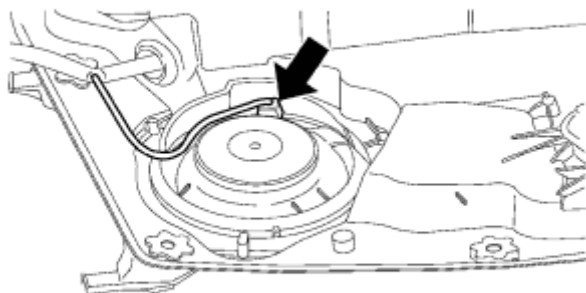
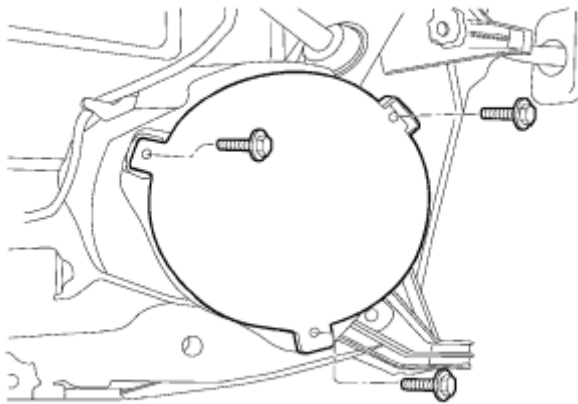


Fig. 141: Disconnecting/Connecting Speaker Electrical Connector
 Courtesy of CHRYSLER LLC

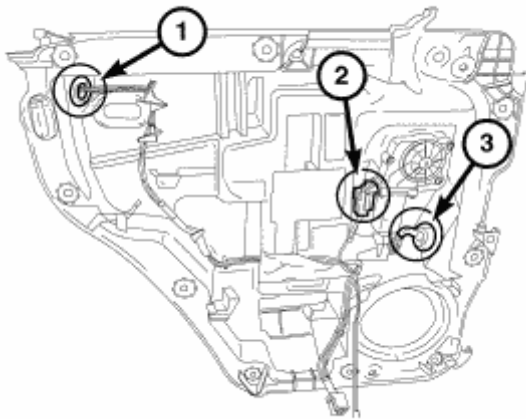
20. Disconnect the speaker electrical connector.



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Fig. 142: Removing/Installing Speaker Bolts & Speaker
Courtesy of CHRYSLER LLC

21. Remove the speaker bolts and speaker from the carrier.



81a31c16

Fig. 143: Carrier Plate Electrical Harnesses & Motor Connectors
Courtesy of CHRYSLER LLC

22. Remove the electrical harness (1) from the carrier plate.
23. Release harness from all the hooks in the carrier plate.
24. Disconnect the connector (2) from the motor.
25. Remove the electrical harness (3) from the carrier plate.
26. Remove the harness from the carrier plate.

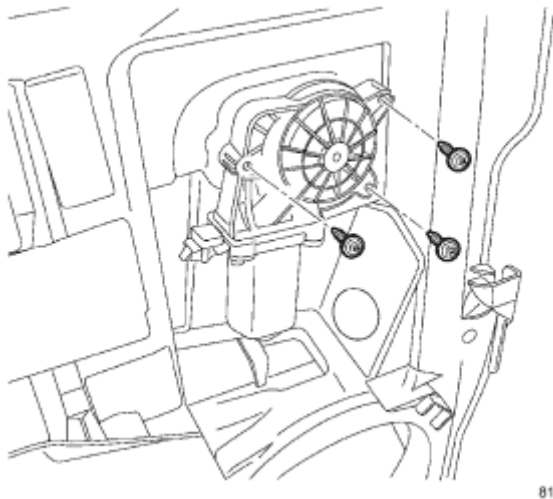


Fig. 144: Removing/Installing Screws And Window Motor
Courtesy of CHRYSLER LLC

27. Remove the screws and window motor from the carrier plate.

INSTALLATION

CARRIER PLATE - REAR DOOR

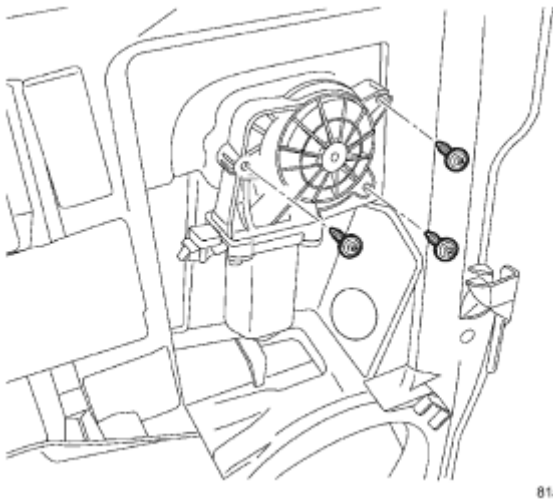
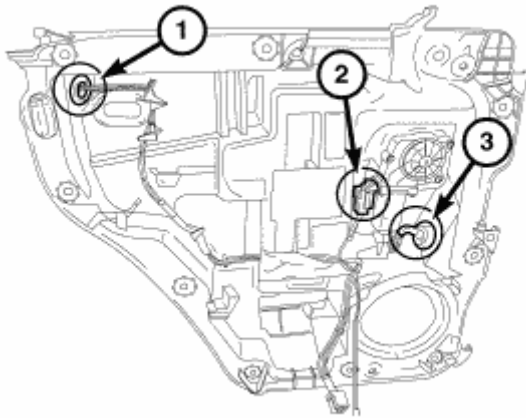


Fig. 145: Removing/Installing Screws And Window Motor
Courtesy of CHRYSLER LLC

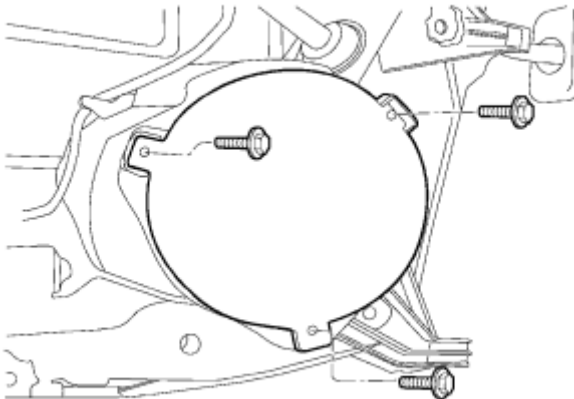
1. Install the motor and screws to the carrier plate and tighten to 3.5 N.m (31 in. lbs.).



81a31c16

Fig. 146: Carrier Plate Electrical Harnesses & Motor Connectors
 Courtesy of CHRYSLER LLC

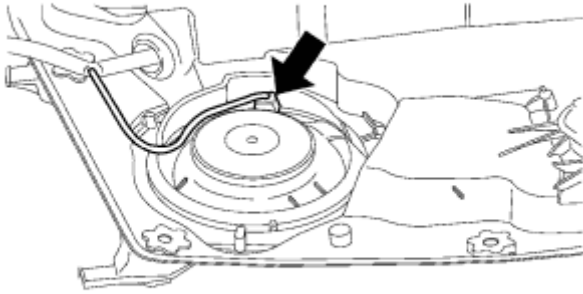
2. Install the harness to the carrier plate.
3. Install the electrical harness (3) and seat the rubber grommet into the carrier plate.
4. Connect the electrical connector (2) to the motor.
5. Route the harness through all of the hooks in the carrier plate.
6. Install the electrical harness (1) and seat the rubber grommet into the carrier plate.



819bs2d8

Fig. 147: Removing/Installing Speaker Bolts & Speaker
 Courtesy of CHRYSLER LLC

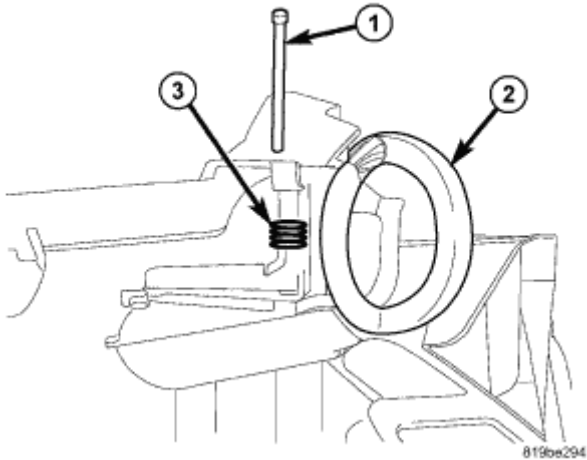
7. Install the speaker and bolts to the carrier and tighten to 1.5 N.m (13 in. lbs.).



819be2c2

Fig. 148: Disconnecting/Connecting Speaker Electrical Connector
 Courtesy of CHRYSLER LLC

8. Connect the speaker electrical connector.
9. Install speaker wire to wire clip.

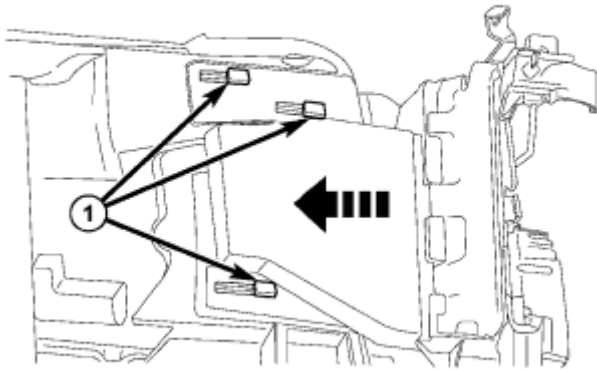


819be294

Fig. 149: Push Pin, Handle & Spring
 Courtesy of CHRYSLER LLC

NOTE: Make sure that the push pin is seated flush with the carrier.

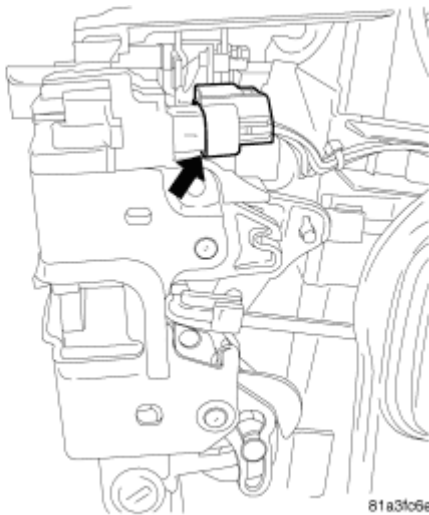
10. Install the handle (2) and spring (3) to the carrier.
11. Install the push pin (1) into the carrier, spring and the handle.



8190a0ef

Fig. 150: Identifying Carrier Plate Slots
Courtesy of CHRYSLER LLC

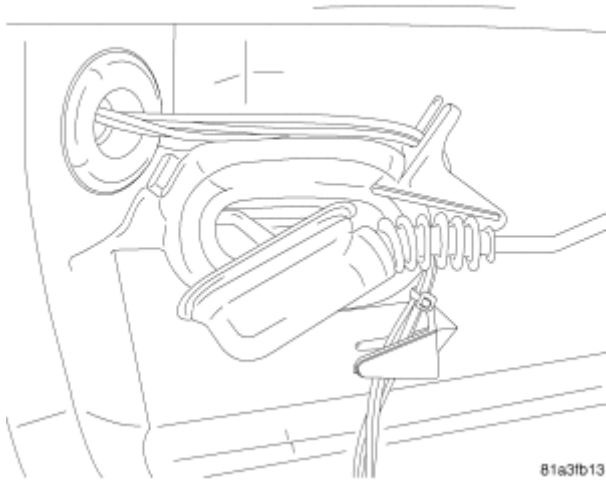
12. Install the latch bracket assembly to the carrier plate slots (1) then slide the latch bracket until fully seated.



81a3fc6e

Fig. 151: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

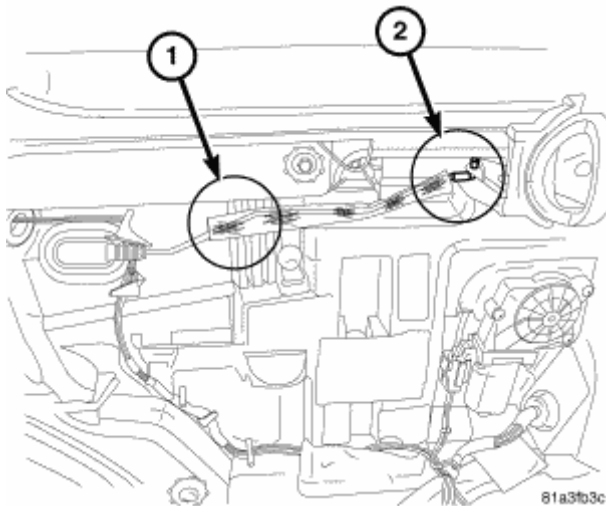
13. Connect the latch electrical connector.



81a3fb13

Fig. 152: Removing/Installing Interior Handle Lock Rod And Grommet
Courtesy of CHRYSLER LLC

14. Install the interior handle lock rod into the carrier and seat the grommet.

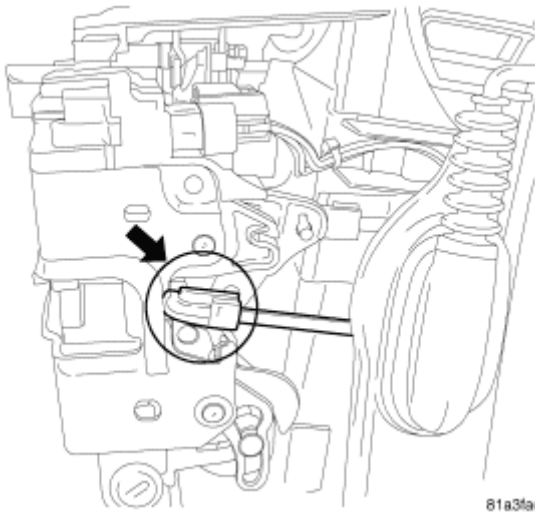


81a3fb3c

Fig. 153: Carrier & Interior Handle
Courtesy of CHRYSLER LLC

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

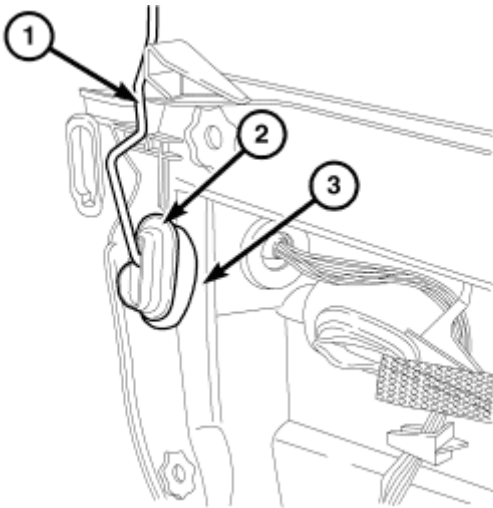
15. Install the interior lock rod to the interior handle (2). Make sure the lock rod is positioned properly to the carrier (1).



81a3fad7

Fig. 154: Disconnecting/Connecting Interior Handle Lock Rod
Courtesy of CHRYSLER LLC

16. Connect the interior handle lock rod to the latch.



81d39680

Fig. 155: Inside Lock Rod, Grommet & Carrier Plate
Courtesy of CHRYSLER LLC

17. Install the inside lock rod (1) to the carrier plate (3) and seat the grommet (2).

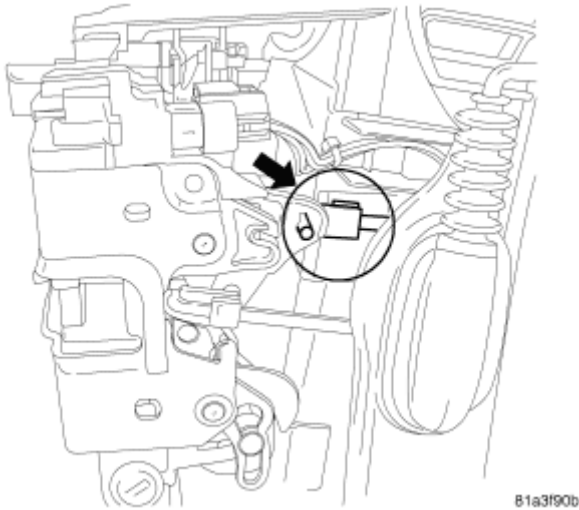


Fig. 156: Disconnecting/Installing Inside Lock Rod
 Courtesy of CHRYSLER LLC

18. Connect the inside lock rod to the latch.

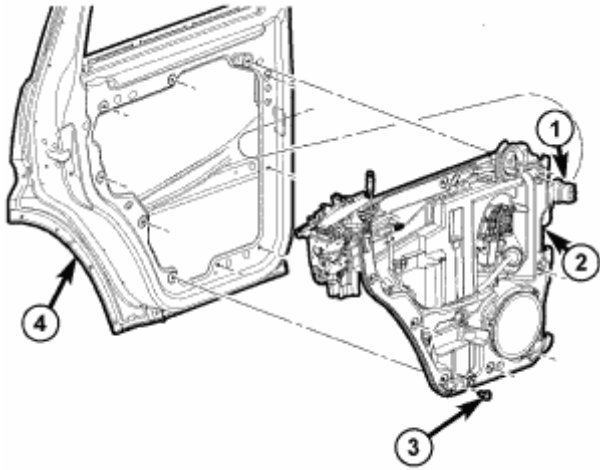
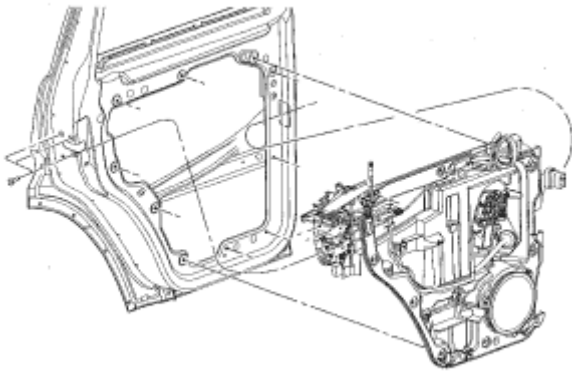


Fig. 157: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

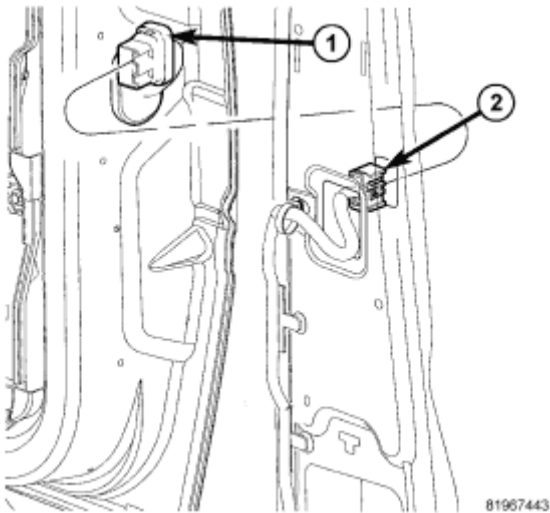
19. Install the carrier plate (2) to the door (4).
20. Install the electrical connector (1) to the door (4) and connect the electrical connector.



81968a6a

Fig. 158: Removing/Installing Rear Door Latch Screws
Courtesy of CHRYSLER LLC

21. Install the screws securing the door latch to the door shut face and tighten screws to 7 N.m (60 in. lbs.).
22. Install the 9 screws to the carrier plate and tighten screws to 5.5 N.m (50 in. lbs.).



81967443

Fig. 159: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
Courtesy of CHRYSLER LLC

23. Connect the door harness electrical connector (1) to the body connector (2) at the B-pillar.

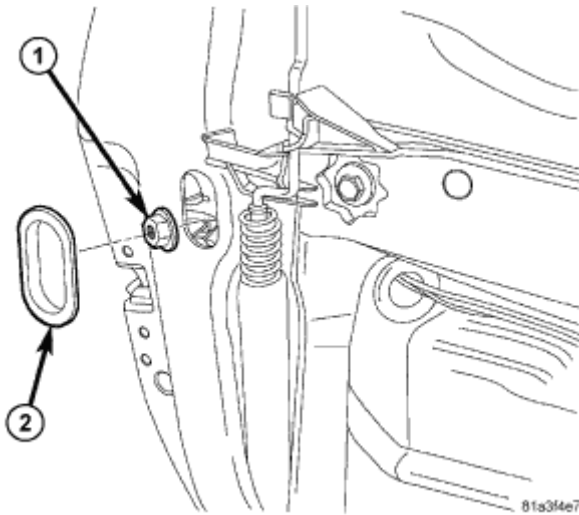


Fig. 160: Removing/Installing Door Plug & Rear Exterior Handle Nut
 Courtesy of CHRYSLER LLC

24. Install the rear nut (1) to the exterior handle and tighten to 4.5 N.m (40 in. lbs.).
25. Install the door plug (2) to the door.

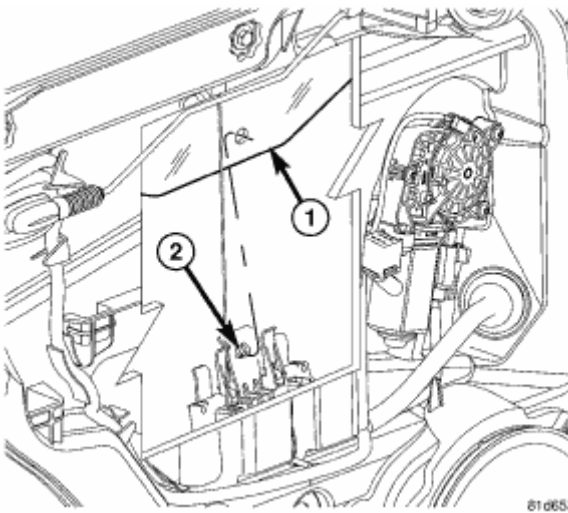


Fig. 161: Window Regulator And Door Glass
 Courtesy of CHRYSLER LLC

NOTE: Place the glass in the full down position in order to access the window regulator.

26. Access the window regulator through the hole in the carrier plate. Connect the door glass (1) to the window regulator (2).
27. Apply the adhesive tape to the inspection hole of the carrier plate.

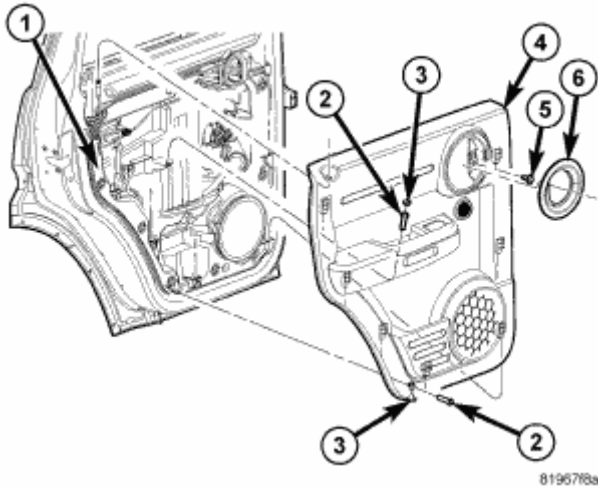


Fig. 162: Removing/Installing Rear Door Trim Panel
Courtesy of CHRYSLER LLC

28. Install the trim panel to the door, see **INSTALLATION**.
29. Connect the negative battery cable to the battery.

NOTE: Cycle the door lock, open with interior and exterior door handles and operate the power window to make sure everything is working properly and binding exists.

DOOR - REAR

REMOVAL

DOOR - REAR

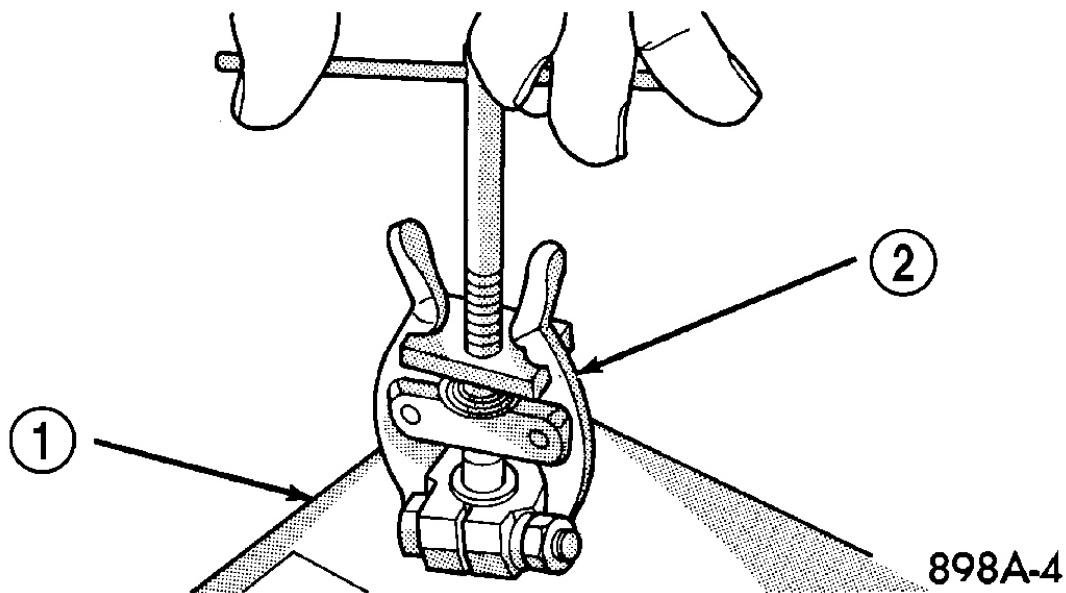


Fig. 163: Removing Battery Cable Terminal Clamp - Typical
 Courtesy of CHRYSLER LLC

1. Loosen the battery terminal nut and use a battery terminal removal tool (2) to disconnect the negative battery cable from the battery (1).

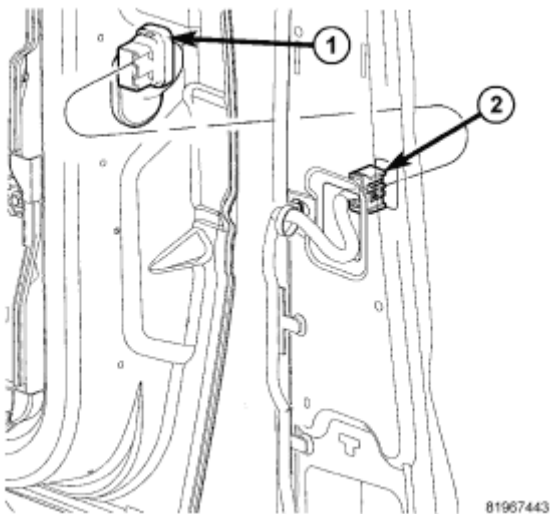
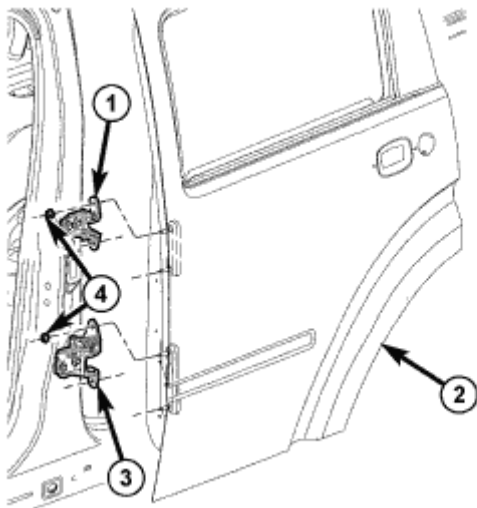


Fig. 164: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
 Courtesy of CHRYSLER LLC

2. Disconnect the door harness electrical connector (1) from the body connector (2) at the B-pillar.



81967432

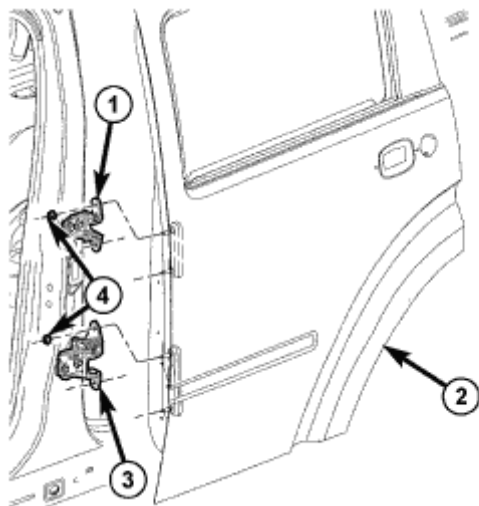
Fig. 165: Removing/Installing Upper/Lower Hinges, Door & Nuts
 Courtesy of CHRYSLER LLC

NOTE: Use a grease pencil or equivalent, mark the location of the upper (1) and lower (3) hinges on the door (2) for alignment during installation.

3. Support the rear door with a suitable lifting device.
4. Remove the nuts (4) attaching the door (2) to the upper (1) and lower (3) hinges.
5. Carefully remove the door (2) from the vehicle.

INSTALLATION

DOOR - REAR



81967432

Fig. 166: Removing/Installing Upper/Lower Hinges, Door & Nuts
 Courtesy of CHRYSLER LLC

1. Carefully position the door (2) to the upper (1) and lower (3) hinges using a suitable lifting device.

2. Loosely install the nuts (4) to the door studs and hinges at the B-pillar.
3. Align the door to the body using the reference marks made during the removal procedure.
4. Tighten the hinge to door nuts to 36.5 N.m (27 ft. lbs.).

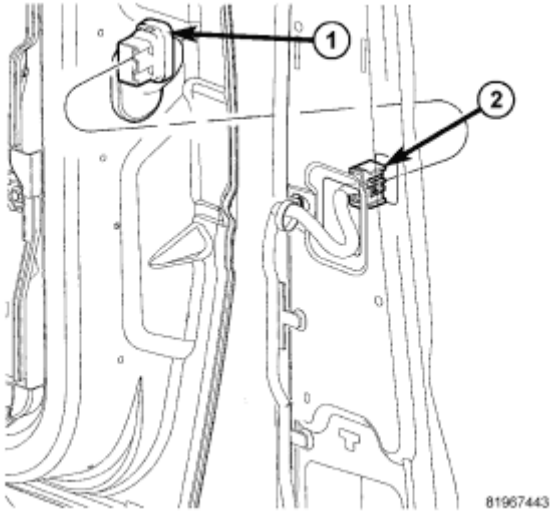


Fig. 167: Disconnecting/Connecting Door Harness Electrical Connector From/To Body Connector
Courtesy of CHRYSLER LLC

5. Connect the door harness electrical connector (1) to the body connector (2) at the B-pillar.
6. Connect the negative battery cable.
7. Adjust the door as necessary. See **SPECIFICATIONS**.

ADJUSTMENTS

DOOR - REAR

NOTE: It is recommended that you adjust the rear door before adjusting the front door.

Door adjustment measurements should be taken from stationary or welded body panels like the roof, rocker or quarter panels.

During adjustment procedures, it is recommended that all the hinge fasteners be loosened except for the upper most fasteners. Adjustments can be made using the upper fasteners to hold the door with final torque of the fasteners occurring after correct door positioning is achieved.

FORE/AFT

NOTE: Fore/aft (lateral) door adjustment is done by loosening the hinge to the hinge pillar fasteners one hinge at a time and moving the door to the correct position.

1. Support the door with a suitable lifting device.
2. Loosen the hinge to hinge pillar fasteners. See **REMOVAL**.

3. Adjust the door to the correct position. See **SPECIFICATIONS**.
4. Tighten the hinge pillar fasteners to 26 N.m (19 ft. lbs.). See **INSTALLATION**.

NOTE: Use a suitable body sealer on the hinge to body mating surfaces.

UP/DOWN

NOTE: Up/down door adjustment is done by loosening either the hinge to the hinge pillar fasteners or the hinge to door fasteners and moving the door to the correct position.

NOTE: When the up/down adjustments are done correctly, the top of the door is positioned over flush to the roof. See **SPECIFICATIONS**.

1. Support the door with a suitable lifting device.
2. Remove the latch striker. See **REMOVAL**.
3. Loosen the hinge to hinge pillar fasteners (see **REMOVAL**) or loosen the hinge to door fasteners (see **REMOVAL**).
4. Adjust the door to the correct position. See **SPECIFICATIONS**.
5. Tighten the hinge pillar fasteners to 26 N.m (19 ft. lbs.) or the door to hinges fasteners to 36.5 N.m (27 ft. lbs.). See **INSTALLATION**.
6. Install the latch striker. See **INSTALLATION**.

IN/OUT

NOTE: In/out door adjustment is done by loosening the hinge to door fasteners one hinge at a time and moving the door to the correct position.

1. Support the door with a suitable lifting device.
2. Remove the latch striker. See **REMOVAL**.
3. Loosen the hinge to door fasteners. See **REMOVAL**.
4. Adjust the front of the door to the correct position. See **SPECIFICATIONS**.
5. Tighten the door to hinges fasteners to 36.5 N.m (27 ft. lbs.).
6. Install the latch striker. See **INSTALLATION**.

APPLIQUE - REAR DOOR

REMOVAL

APPLIQUE - REAR DOOR

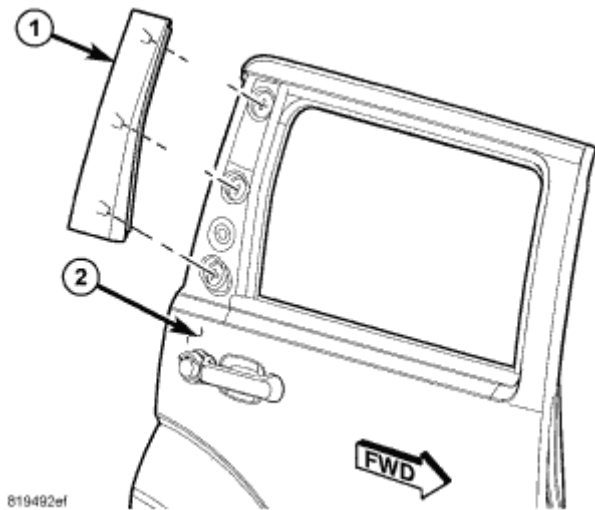


Fig. 168: Removing/Installing Rear Door Applique
 Courtesy of CHRYSLER LLC

1. Use a trim stick C-4755 or equivalent, remove the door applique (1) from the rear door (2).

INSTALLATION

APPLIQUE - REAR DOOR

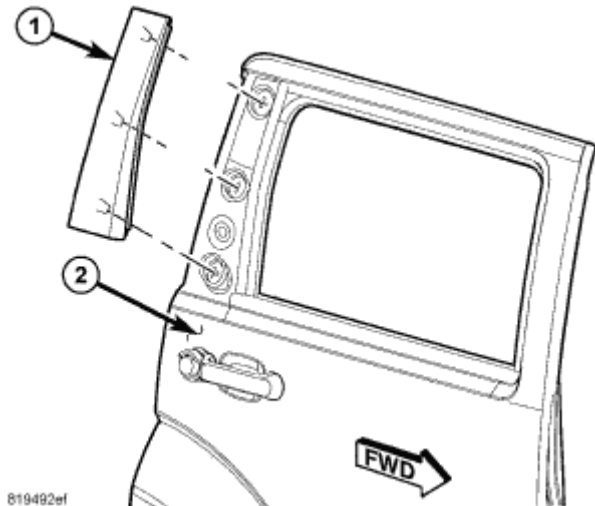


Fig. 169: Removing/Installing Rear Door Applique
 Courtesy of CHRYSLER LLC

1. Align the door applique (1) to the rear door (2) and apply enough hand pressure in order to make sure the clips are fully seated.

GLASS - REAR DOOR

REMOVAL

GLASS - REAR DOOR

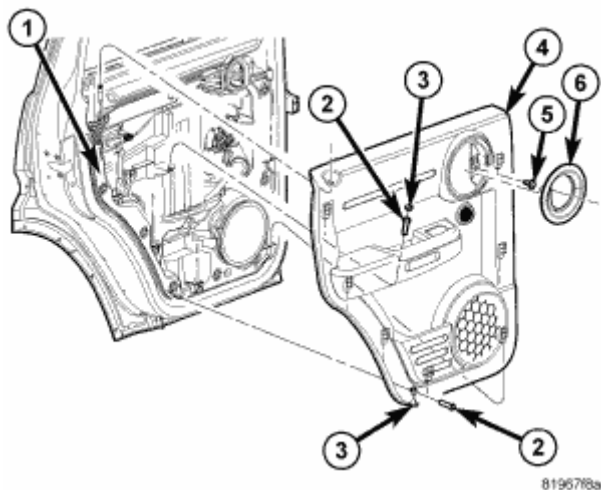


Fig. 170: Removing/Installing Rear Door Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the trim panel. See **REMOVAL**.

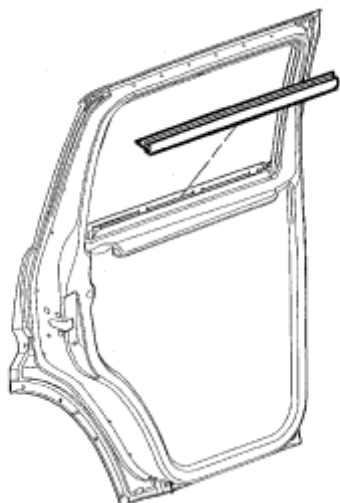


Fig. 171: Removing/Installing Inner Belt Molding Outboard
Courtesy of CHRYSLER LLC

2. Rotate the inner belt molding outboard while pulling up to disengage the retention tabs.

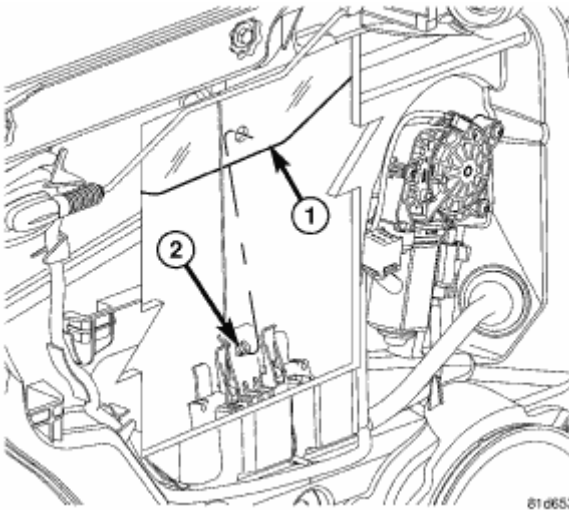


Fig. 172: Window Regulator And Door Glass
 Courtesy of CHRYSLER LLC

NOTE: Place the glass in the full down position in order to access the window regulator.

3. Access the window regulator through the hole in the carrier plate. Disconnect the window regulator (2) from the door glass (1).

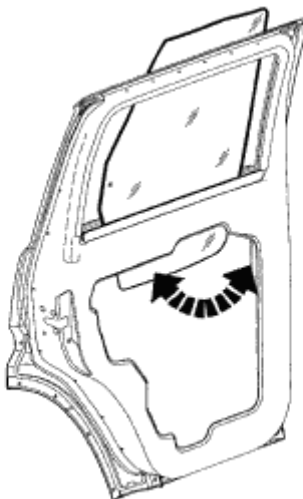
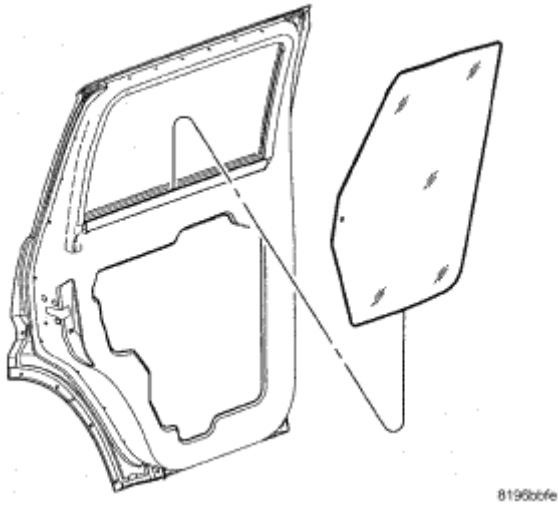


Fig. 173: Rotating Glass Upward/Downward Inside Run Channel
 Courtesy of CHRYSLER LLC

NOTE: The following two graphics are shown with the carrier removed for clarity.

4. Rotate the glass upward inside the run channel.



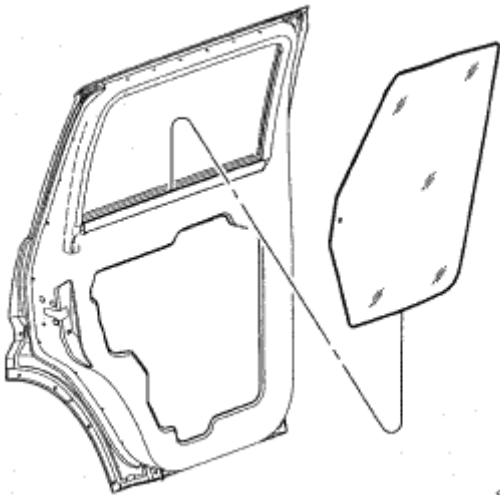
8196b6fe

Fig. 174: Removing/Installing Rear Door Glass
Courtesy of CHRYSLER LLC

5. Remove the door glass from the window opening in the door.

INSTALLATION

GLASS - REAR DOOR

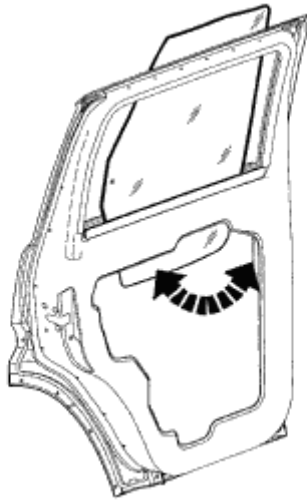


8196b6fe

Fig. 175: Removing/Installing Rear Door Glass
Courtesy of CHRYSLER LLC

NOTE: The following two graphics are shown with the carrier removed for clarity.

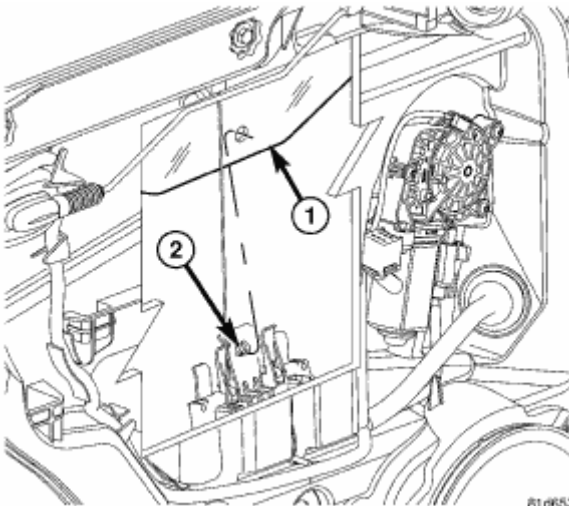
1. Install the door glass to the window opening in the door.



8198bc25

Fig. 176: Rotating Glass Upward/Downward Inside Run Channel
 Courtesy of CHRYSLER LLC

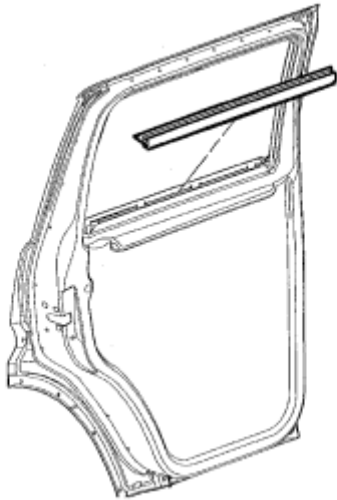
2. Rotate the glass downward into the run channel.



81d6535c

Fig. 177: Window Regulator And Door Glass
 Courtesy of CHRYSLER LLC

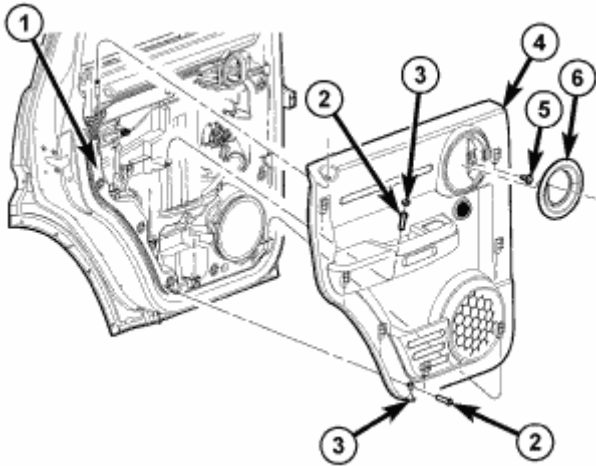
3. Access the window regulator through the hole in the carrier plate. Connect the door glass (1) to the window regulator (2).



8196aa73

Fig. 178: Removing/Installing Inner Belt Molding Outboard
Courtesy of CHRYSLER LLC

4. Press the belt molding onto the trim panel flange starting at the rear and working forward.



819678a

Fig. 179: Removing/Installing Rear Door Trim Panel
Courtesy of CHRYSLER LLC

5. Install the trim panel. See **INSTALLATION**.
6. Cycle the window several times to make sure the window doesn't bind on the outer weatherstrip or run channel.

HANDLE - EXTERIOR DOOR

REMOVAL

HANDLE - EXTERIOR DOOR

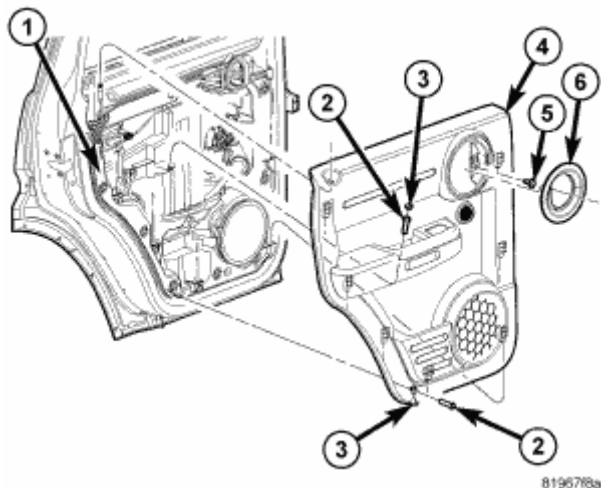


Fig. 180: Removing/Installing Rear Door Trim Panel
 Courtesy of CHRYSLER LLC

1. Remove the trim panel from the door, see **REMOVAL**.

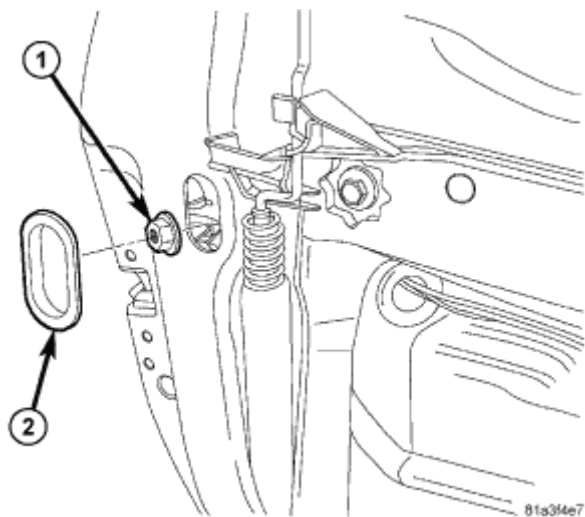
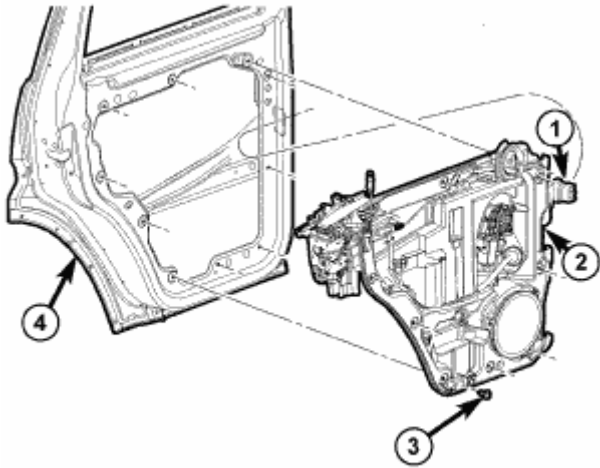


Fig. 181: Removing/Installing Door Plug & Rear Exterior Handle Nut
 Courtesy of CHRYSLER LLC

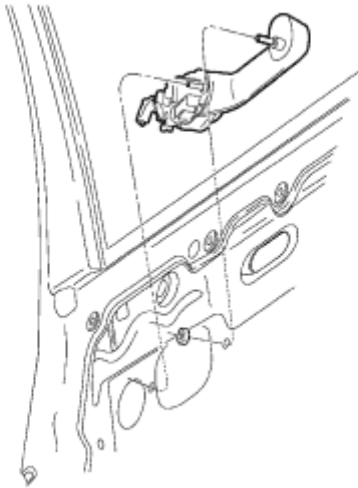
2. Remove the door plug (2).
3. Remove rear exterior handle nut (1).



81968a22

Fig. 182: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

4. Remove the carrier plate, see **REMOVAL**.



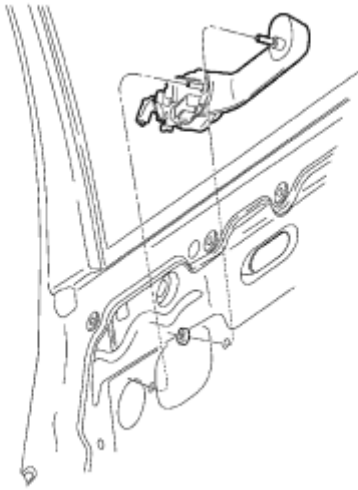
819c4044

Fig. 183: Removing/Installing Front Exterior Handle
 Courtesy of CHRYSLER LLC

5. Remove the front exterior handle nut and remove the handle from the door.

INSTALLATION

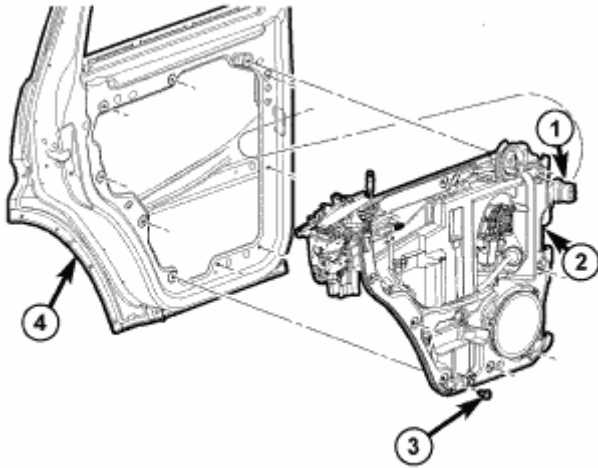
HANDLE - EXTERIOR DOOR



819c4044

Fig. 184: Removing/Installing Front Exterior Handle
 Courtesy of CHRYSLER LLC

1. Install the handle and front exterior handle nut to the door and tighten to 4.5 N.m (40 in. lbs.).



81968a22

Fig. 185: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

2. Install the carrier plate to the door, see **INSTALLATION**.

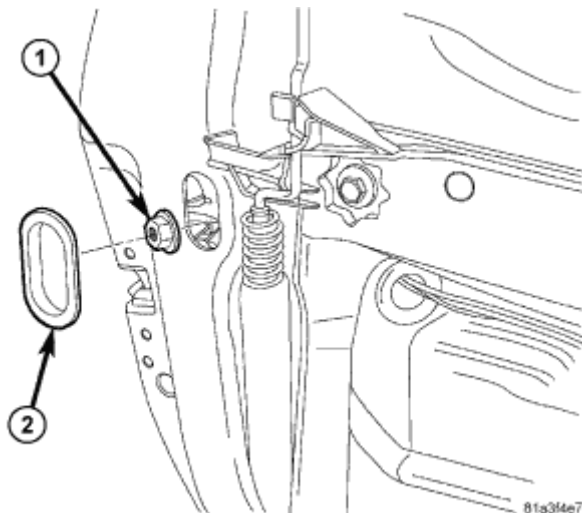


Fig. 186: Removing/Installing Door Plug & Rear Exterior Handle Nut
 Courtesy of CHRYSLER LLC

NOTE: The door glass must be in the full up position in order to access the rear exterior handle nut. Use light and a magnetic socket on the rear nut to prevent from dropping the nut into the door assembly.

3. Install the rear nut (1) to the exterior handle and tighten to 4.5 N.m (40 in. lbs.).
4. Install the door plug (2) to the door.

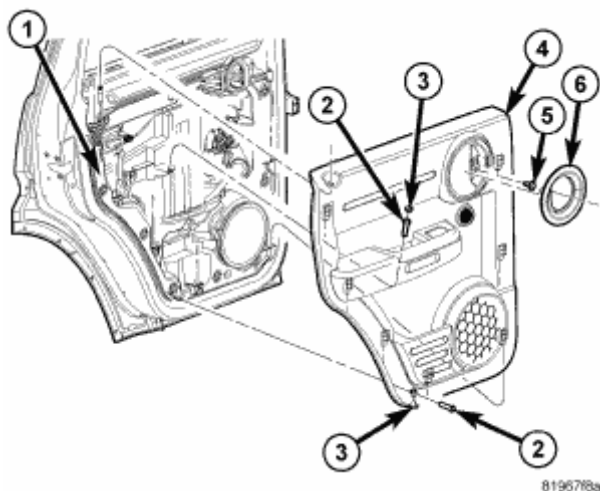


Fig. 187: Removing/Installing Rear Door Trim Panel
 Courtesy of CHRYSLER LLC

5. Install the trim panel to the door, see **INSTALLATION**.

HANDLE - INTERIOR DOOR

REMOVAL

HANDLE - INTERIOR DOOR

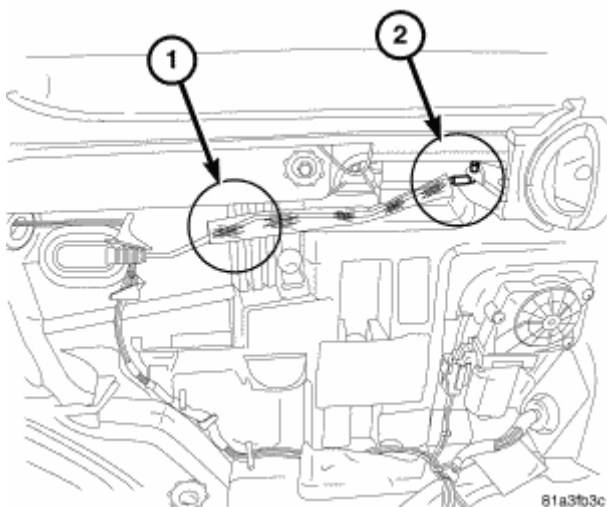


Fig. 188: Carrier & Interior Handle

Courtesy of CHRYSLER LLC

1. Remove the door trim panel, see **REMOVAL**.
2. Remove the interior lock rod from the interior handle (2).

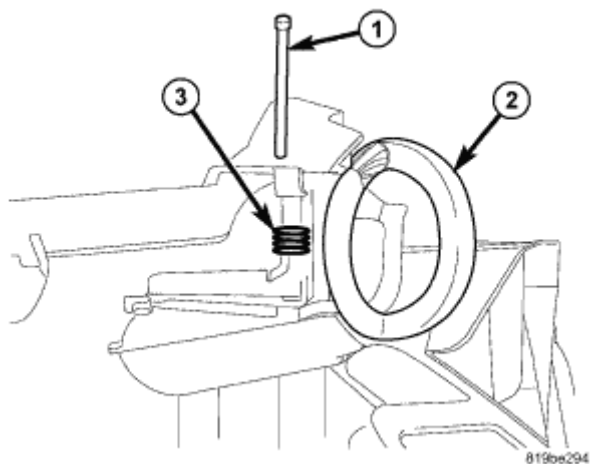


Fig. 189: Push Pin, Handle & Spring

Courtesy of CHRYSLER LLC

3. Remove the push pin (1) from the handle.
4. Remove the spring (3) and handle (2) from the carrier.

INSTALLATION

HANDLE - INTERIOR DOOR

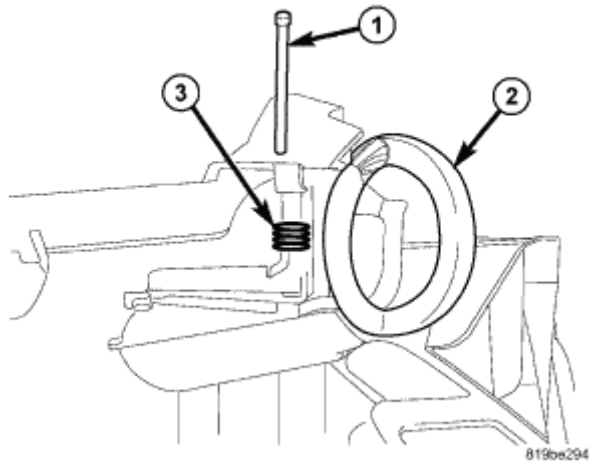


Fig. 190: Push Pin, Handle & Spring
 Courtesy of CHRYSLER LLC

1. Install the handle (2) and spring (3) to the carrier.
2. Install the push pin (1) into the carrier, spring and the handle.

NOTE: Make sure that the push pin is seated flush with the carrier.

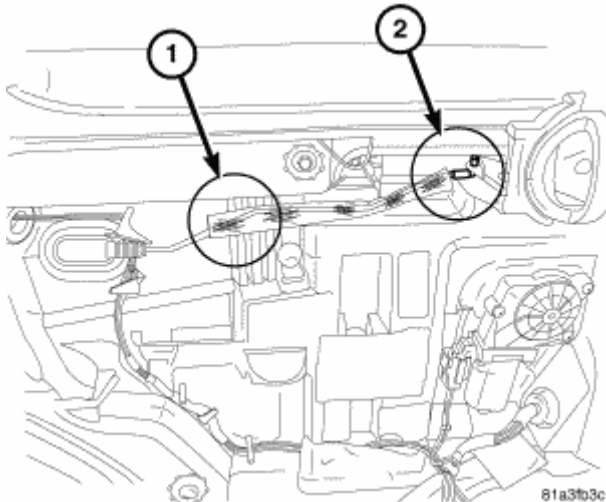


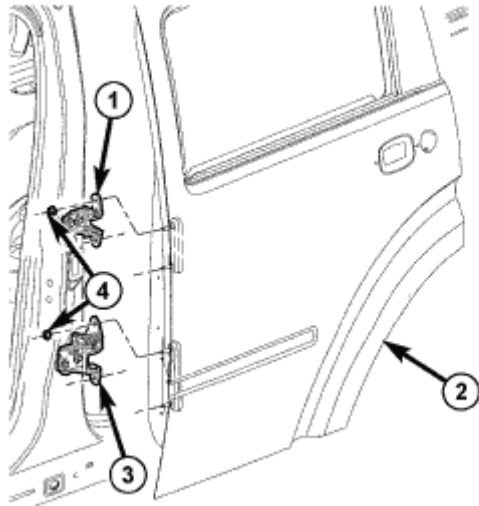
Fig. 191: Carrier & Interior Handle
 Courtesy of CHRYSLER LLC

3. Install the interior lock rod to the interior handle (2). Make sure the lock rod is positioned properly to the carrier (1).
4. Install the door trim panel, see **INSTALLATION**.

HINGE - REAR DOOR

REMOVAL

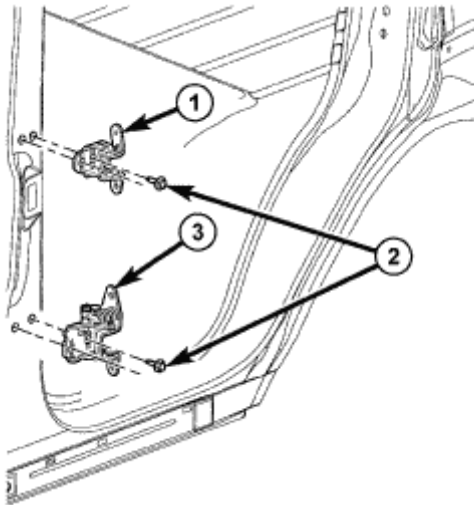
HINGE - REAR DOOR



81967432

Fig. 192: Removing/Installing Upper/Lower Hinges, Door & Nuts
Courtesy of CHRYSLER LLC

1. Remove the rear door, see **REMOVAL**.



819673ad

Fig. 193: Upper/Lower Door Hinge & Bolts
Courtesy of CHRYSLER LLC

NOTE: Use a grease pencil or equivalent, mark the location of the upper (1) and lower (3) hinge on the body of the lower B-pillar for alignment during installation.

2. Remove the bolts (2) that secure the upper door hinge (1) and lower door hinge (3) to the body of the B-pillar and remove the hinges.

INSTALLATION

HINGE - REAR DOOR

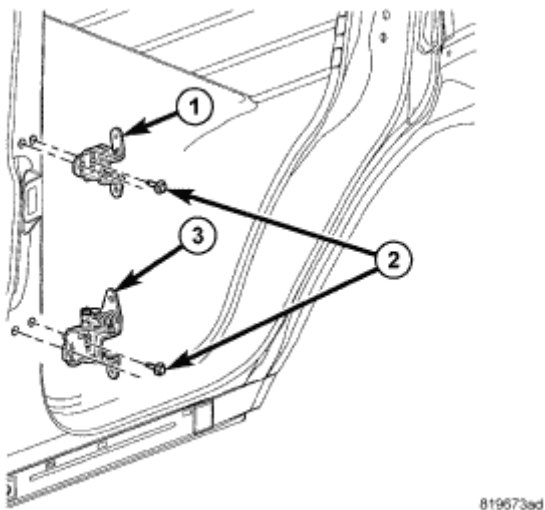


Fig. 194: Upper/Lower Door Hinge & Bolts
Courtesy of CHRYSLER LLC

1. Install the upper (1) and lower (3) hinges onto B-pillar and loosely install the bolts (2).
2. Align the hinges to the B-pillar using the reference marks made during the removal procedure and tighten the bolts to 26 N.m (19 ft. lbs.).

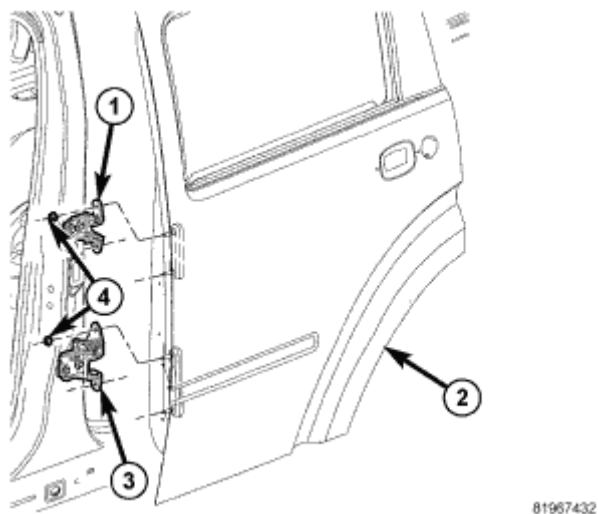


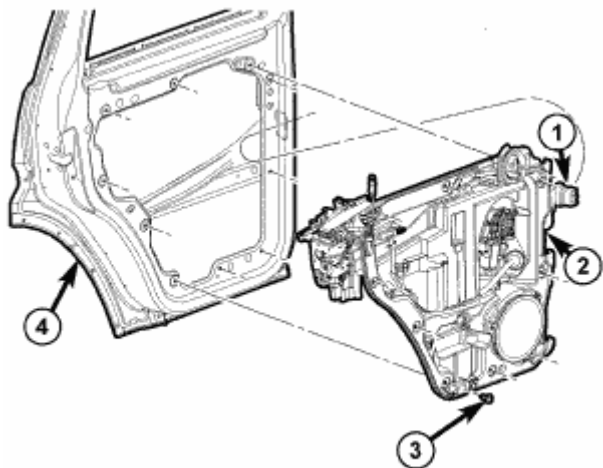
Fig. 195: Removing/Installing Upper/Lower Hinges, Door & Nuts
Courtesy of CHRYSLER LLC

3. Install the rear door, see INSTALLATION.

LATCH - REAR DOOR

REMOVAL

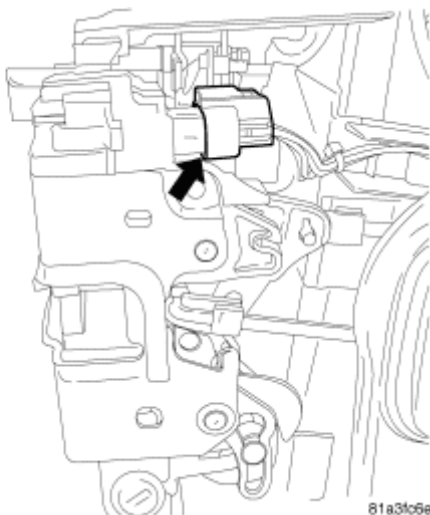
LATCH - REAR DOOR



81968a22

Fig. 196: Electrical Connector, Carrier Plate, Screws & Door
Courtesy of CHRYSLER LLC

1. Remove the carrier plate, see **REMOVAL**.



81a3fc6e

Fig. 197: Disconnecting/Connecting Latch Electrical Connector
Courtesy of CHRYSLER LLC

2. Disconnect the latch electrical connector.

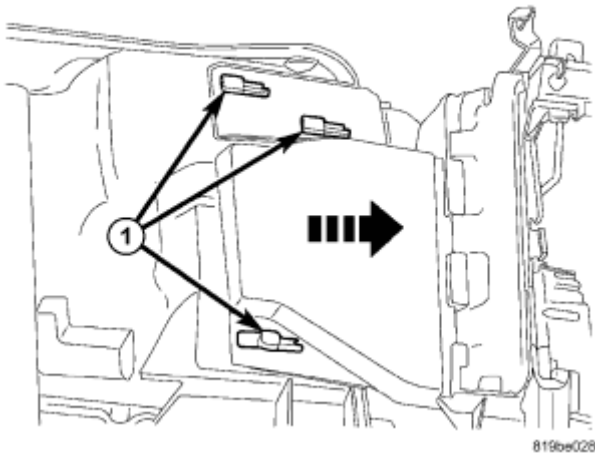


Fig. 198: Carrier Plate Slots
 Courtesy of CHRYSLER LLC

3. Turn the carrier plate over and slide the latch bracket assembly to remove from carrier.

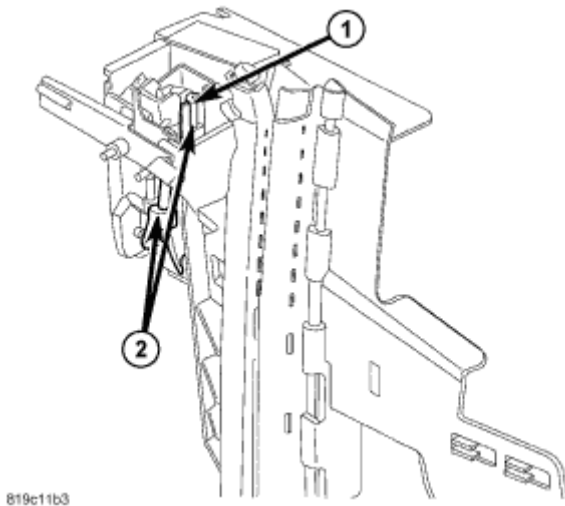
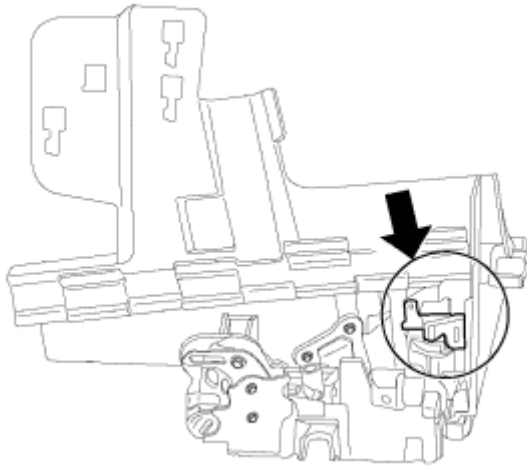


Fig. 199: Release Rod & Swing Clips
 Courtesy of CHRYSLER LLC

NOTE: All the lock rods are color coded to help identify the location for the particular lock rod.

4. Remove the release rod (1) by disengaging the two swing clips (2).

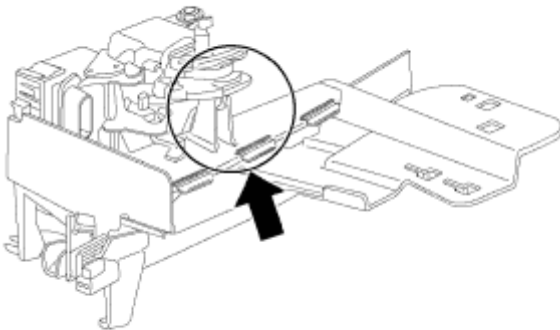


819c1137

Fig. 200: Removing/Installing First Latch Attachment Point
 Courtesy of CHRYSLER LLC

NOTE: The latch has three attachment points to the latch bracket.

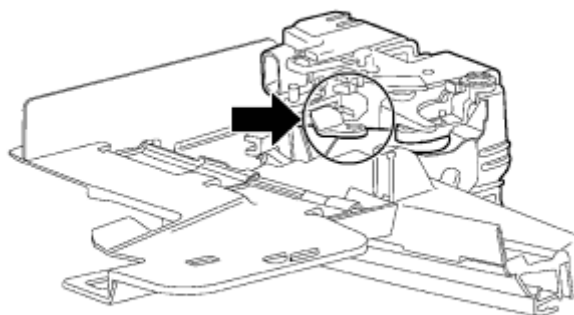
5. Remove the first latch attachment point from the latch bracket.



819c1148

Fig. 201: Removing/Installing Second Latch Attachment Point
 Courtesy of CHRYSLER LLC

6. Remove the second latch attachment point from the latch bracket.



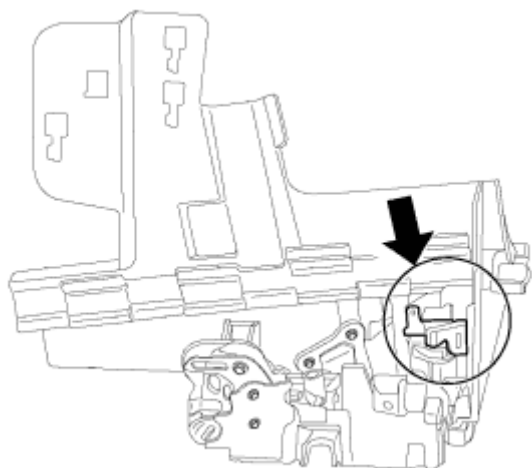
819c118e

Fig. 202: Removing/Installing Third Latch Attachment Point
 Courtesy of CHRYSLER LLC

7. Remove the third latch attachment point from the latch bracket and remove the latch from the latch bracket.

INSTALLATION

LATCH - REAR DOOR

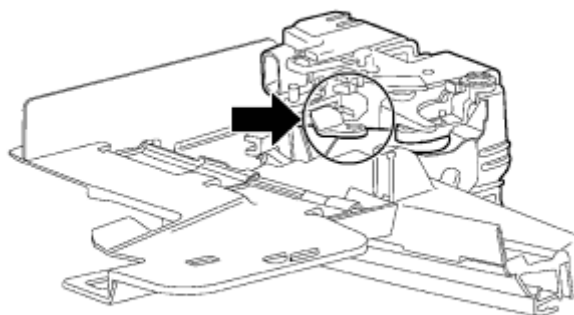


819c1137

Fig. 203: Removing/Installing First Latch Attachment Point
 Courtesy of CHRYSLER LLC

NOTE: The latch has three attachment points to the latch bracket and need to be attached in the following order:

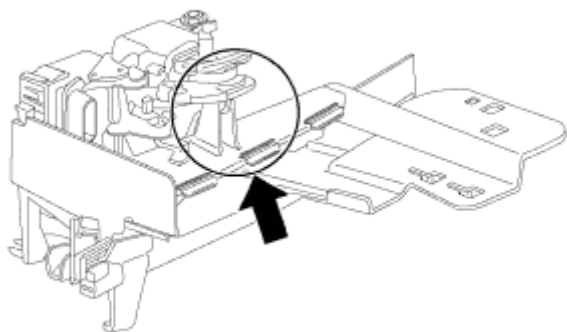
1. Install the first latch attachment point to the latch bracket.



819c118e

Fig. 204: Removing/Installing Third Latch Attachment Point
 Courtesy of CHRYSLER LLC

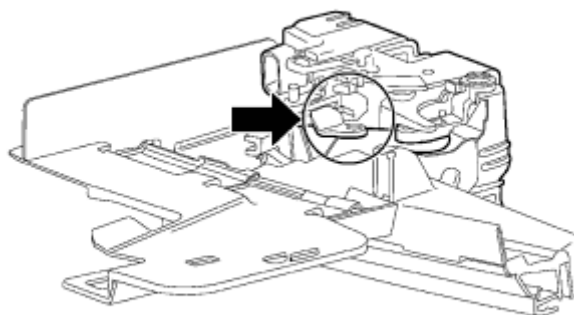
2. It is necessary to align the third attachment point prior to attaching the second point, but do not attach at this time.



819c1148

Fig. 205: Removing/Installing Second Latch Attachment Point
 Courtesy of CHRYSLER LLC

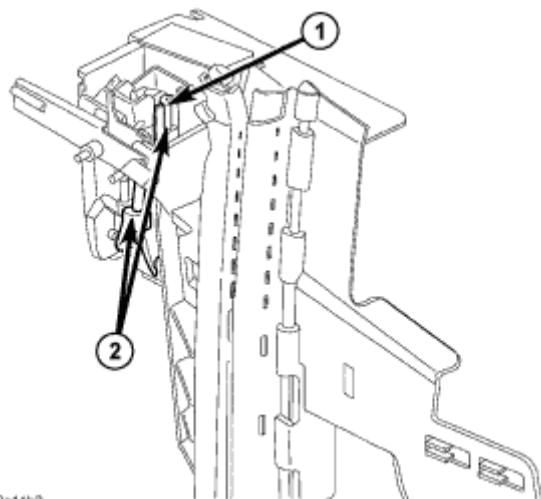
3. Install the second latch attachment point to the latch bracket.



819c118e

Fig. 206: Removing/Installing Third Latch Attachment Point
 Courtesy of CHRYSLER LLC

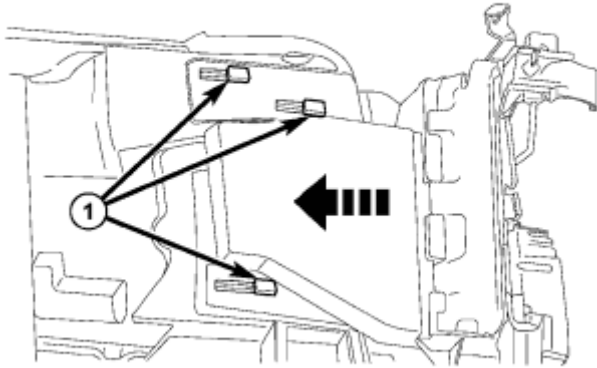
4. Install the third latch attachment point to the latch bracket.



819c11b3

Fig. 207: Release Rod & Swing Clips
 Courtesy of CHRYSLER LLC

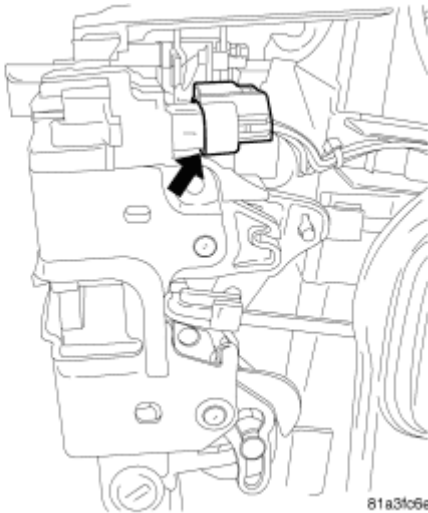
5. Install the release rod (1) then engage the two swing clips (2).



8190a0ef

Fig. 208: Identifying Carrier Plate Slots
 Courtesy of CHRYSLER LLC

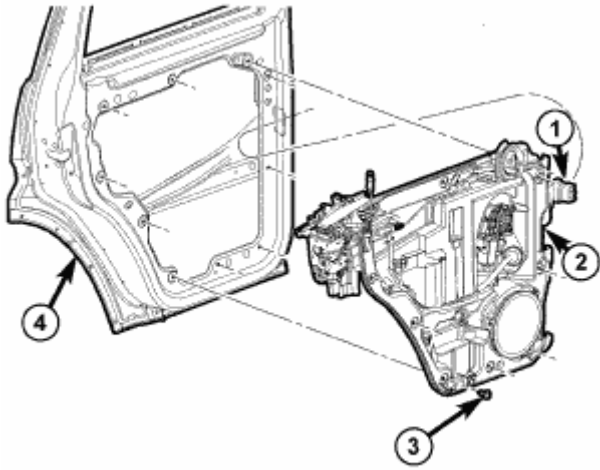
6. Install the latch bracket assembly to the carrier plate slots (1) then slide the latch bracket until fully seated.



81a31c6e

Fig. 209: Disconnecting/Connecting Latch Electrical Connector
 Courtesy of CHRYSLER LLC

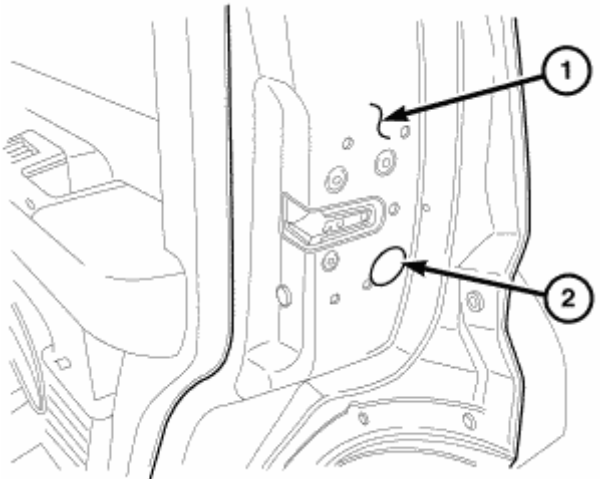
7. Connect the latch electrical connector.



81968a22

Fig. 210: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

8. Install the carrier plate, see INSTALLATION.



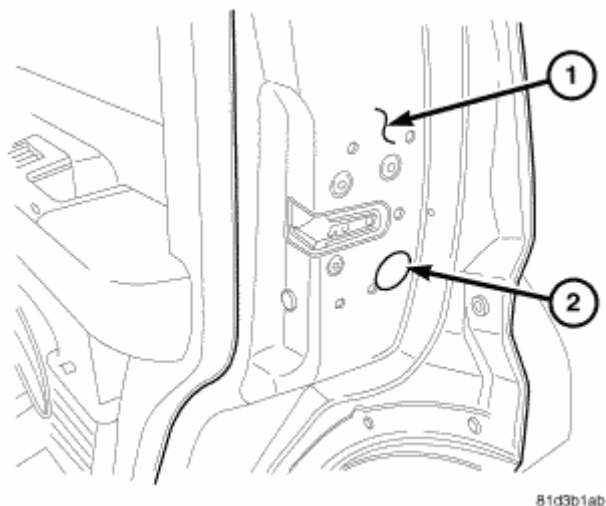
81d3b1ab

Fig. 211: Adjusting Rear Door Latch
 Courtesy of CHRYSLER LLC

9. Adjust the latch as needed, see ADJUSTMENTS.

ADJUSTMENTS

LATCH - REAR DOOR



81d3b1ab

Fig. 212: Adjusting Rear Door Latch

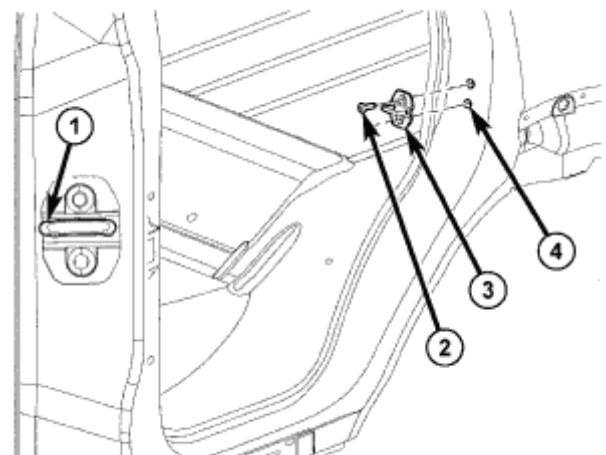
Courtesy of CHRYSLER LLC

1. Locate the access hole on door (1) and remove tape (2) covering it.
2. Insert a 5/32" hex-wrench through hole and into adjustment screw. Loosen screw.
3. Operate outside handle several times to release any restriction because of mis-alignment.
4. Tighten adjustment screw to 4.5 N.m (40 in. lbs.).
5. Test handle for proper operation.

STRIKER - REAR DOOR LATCH

REMOVAL

STRIKER - REAR DOOR LATCH



81963895

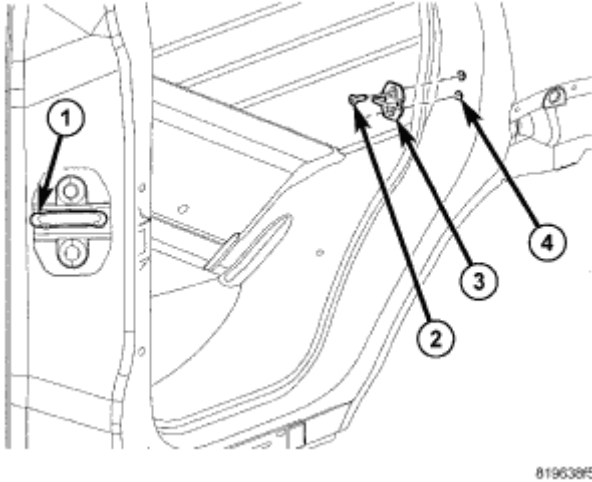
Fig. 213: Striker Loop, Bolts, Striker & B-Pillar

Courtesy of CHRYSLER LLC

1. Remove the bolts (2) from the striker latch (3).
2. Remove the latch striker (3) from the B-pillar (4).

INSTALLATION

STRIKER - REAR DOOR LATCH



819638F5

Fig. 214: Striker Loop, Bolts, Striker & B-Pillar
Courtesy of CHRYSLER LLC

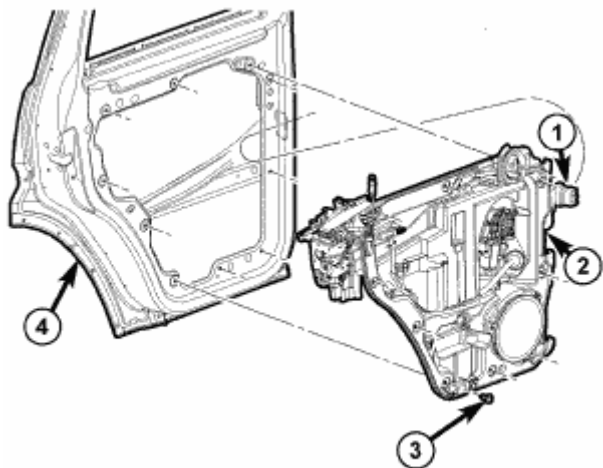
NOTE: The striker needs to be properly orientated to the B-pillar. The striker loop (1) must be installed to the inboard side of the B-pillar.

1. Install the striker (3) to the B-pillar (4).
2. Install the bolts (2) and tighten to 26 N.m (19 ft. lbs.).
3. Adjust the door as necessary, see **SPECIFICATIONS**.

RUN - REAR DOOR GLASS

REMOVAL

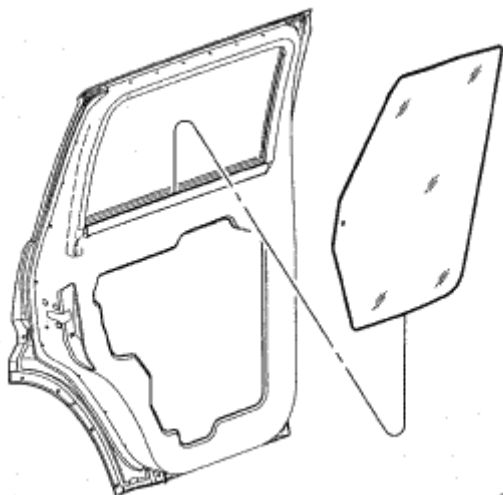
RUN - REAR DOOR GLASS



81968a22

Fig. 215: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

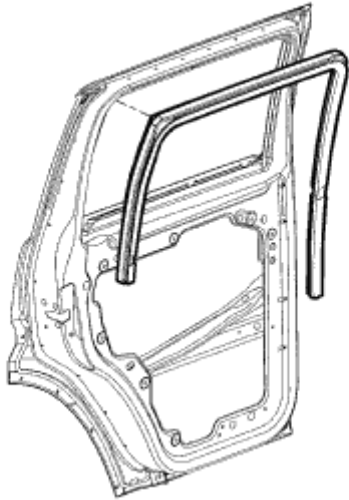
1. Remove the carrier plate from the door, see **REMOVAL**.



81968bfe

Fig. 216: Removing/Installing Rear Door Glass
 Courtesy of CHRYSLER LLC

2. Remove the rear door glass from the window opening in the door, see **REMOVAL**.



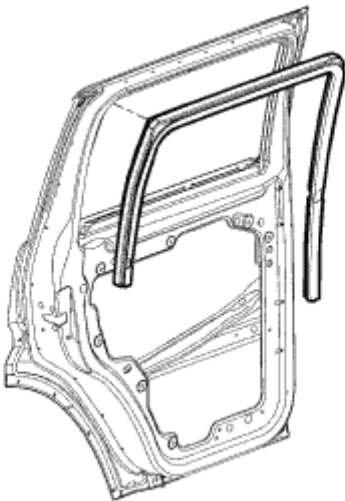
8198b5bc

Fig. 217: Removing/Installing Run Channel
Courtesy of CHRYSLER LLC

3. Remove the run channel from the window opening in the door.

INSTALLATION

RUN - REAR DOOR GLASS



8198b5bc

Fig. 218: Removing/Installing Run Channel
Courtesy of CHRYSLER LLC

1. Install the run channel to the window opening in the door.

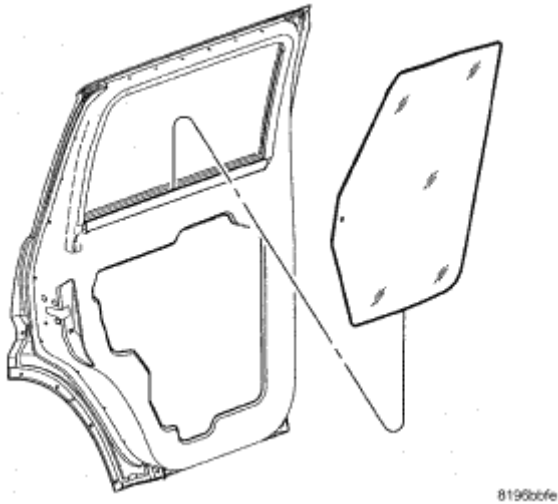


Fig. 219: Removing/Installing Rear Door Glass
 Courtesy of CHRYSLER LLC

2. Install the rear door glass to the window opening in the door, see **INSTALLATION**.

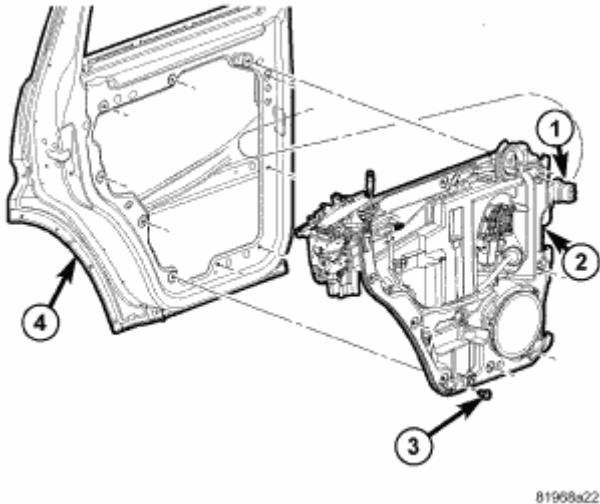


Fig. 220: Electrical Connector, Carrier Plate, Screws & Door
 Courtesy of CHRYSLER LLC

3. Install the carrier plate to the door, see **INSTALLATION**.
4. Cycle the window several times to make sure the window doesn't bind on the outer weatherstrip or run channel.

PANEL - DOOR TRIM REAR

REMOVAL

PANEL - DOOR TRIM REAR

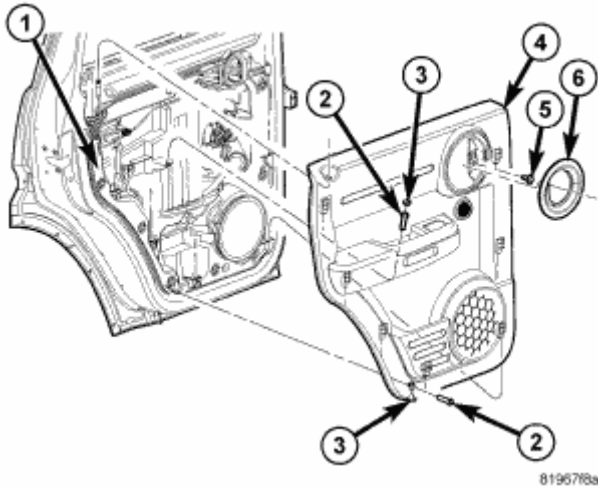


Fig. 221: Removing/Installing Rear Door Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the door handle trim bezel (6).
2. Remove the fastener (5) from the handle area of the front door trim (4).
3. Use a very thin pry tool to remove the cap screw covers (3) from the door trim (4).
4. Remove the screws (2) from the front door trim (4).
5. Remove the power window switch and disconnect the electrical connector.
6. Disengage the trim panel from the four way locator at the handle area of the trim panel, then carefully remove the door trim panel (4) from the door (1) by lifting upward until removed from the door lock and the mounting attachments on the carrier plate.

INSTALLATION

PANEL - DOOR TRIM REAR

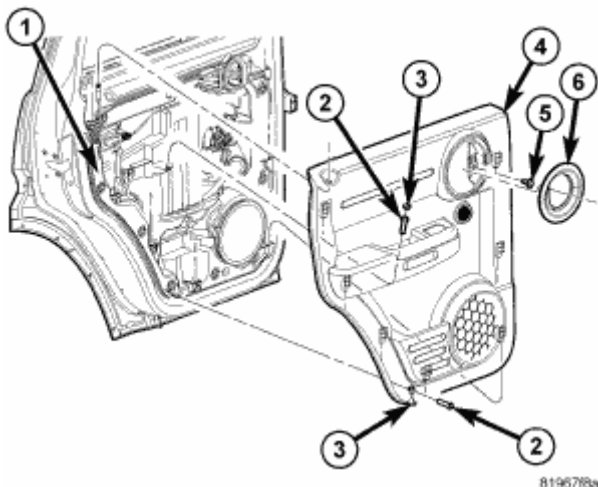


Fig. 222: Removing/Installing Rear Door Trim Panel
Courtesy of CHRYSLER LLC

1. Carefully install the door trim panel (4) to the door (1) by lifting upward and over the door lock into the trim panel then attach the trim panel to the carrier plate attachment points.
2. Connect the electrical connector and install the power window switch.
3. Install the screws (2) to the front door trim (4).
4. Install the cap screw covers (3) to the front door trim (4).
5. Install the fastener (5) at the handle area of the front door trim (4) and tighten screw to 5.5 N.m (50 in. lbs.).
6. Install the door handle trim bezel (6).

REGULATOR - POWER WINDOW

REMOVAL

REGULATOR - POWER WINDOW

NOTE: The window regulator is part of the carrier plate and is not serviceable. Replace the carrier plate if the regulator fails.

1. Replace the carrier plate, see **REMOVAL**.

INSTALLATION

REGULATOR - POWER WINDOW

NOTE: The window regulator is part of the carrier plate and is not serviceable. Replace the carrier plate if the regulator fails.

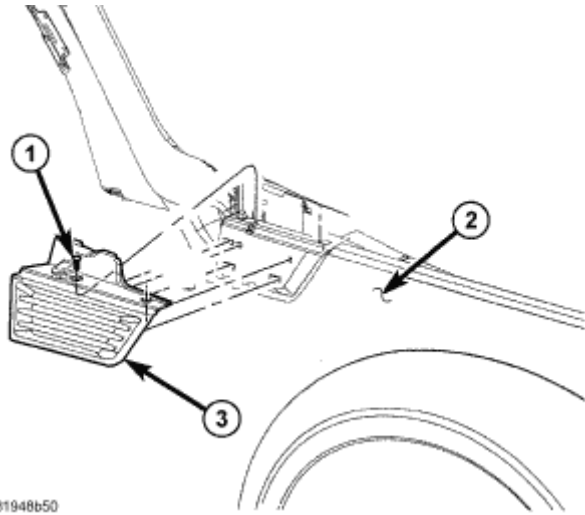
1. Install the carrier plate, see **INSTALLATION**.

EXTERIOR

APPLIQUE - FRONT FENDER

REMOVAL

APPLIQUE - FRONT FENDER



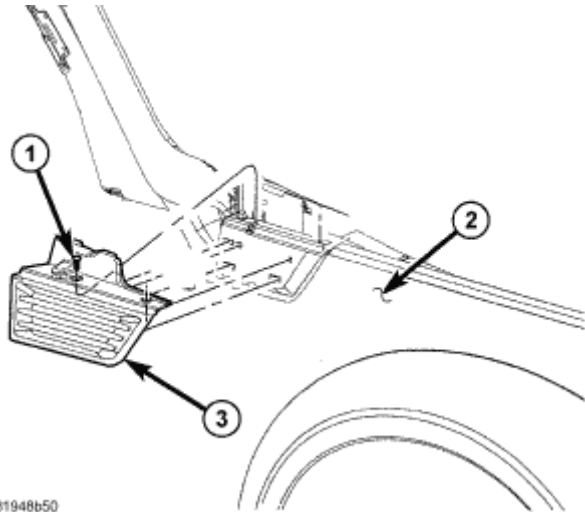
81948b50

Fig. 223: Screws, Fender & Applique
Courtesy of CHRYSLER LLC

1. Remove the two screws (1) from the fender applique (3).
2. Use a trim stick C-4755 or equivalent, separate the fender applique (3) from the fender (2).

INSTALLATION

APPLIQUE - FRONT FENDER



81948b50

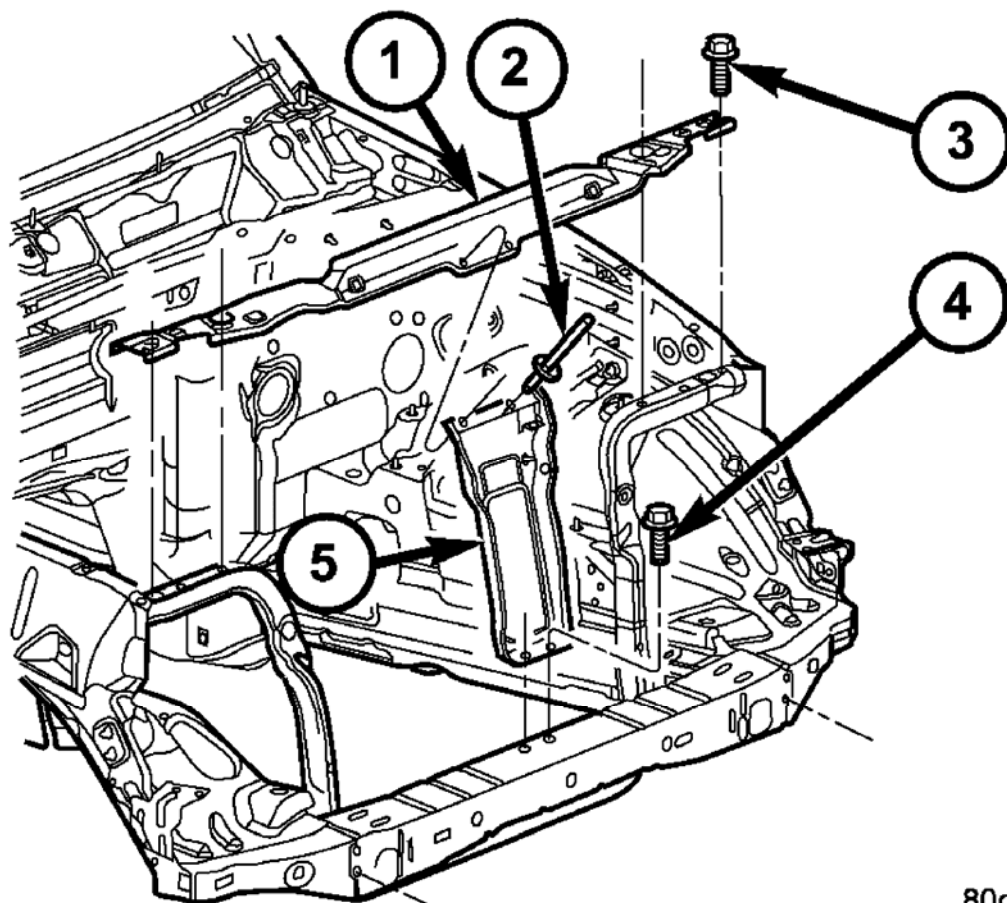
Fig. 224: Screws, Fender & Applique
Courtesy of CHRYSLER LLC

1. Align the fender applique (3) to the fender assembly (2) and apply enough hand pressure in order to make sure the clips are fully seated.
2. Install the two screws (1) to the fender applique (3).

RADIATOR CROSSMEMBER

REMOVAL

CROSSMEMBER - RADIATOR CLOSURE P



80cb3944

Fig. 225: Radiator Crossmember
Courtesy of CHRYSLER LLC

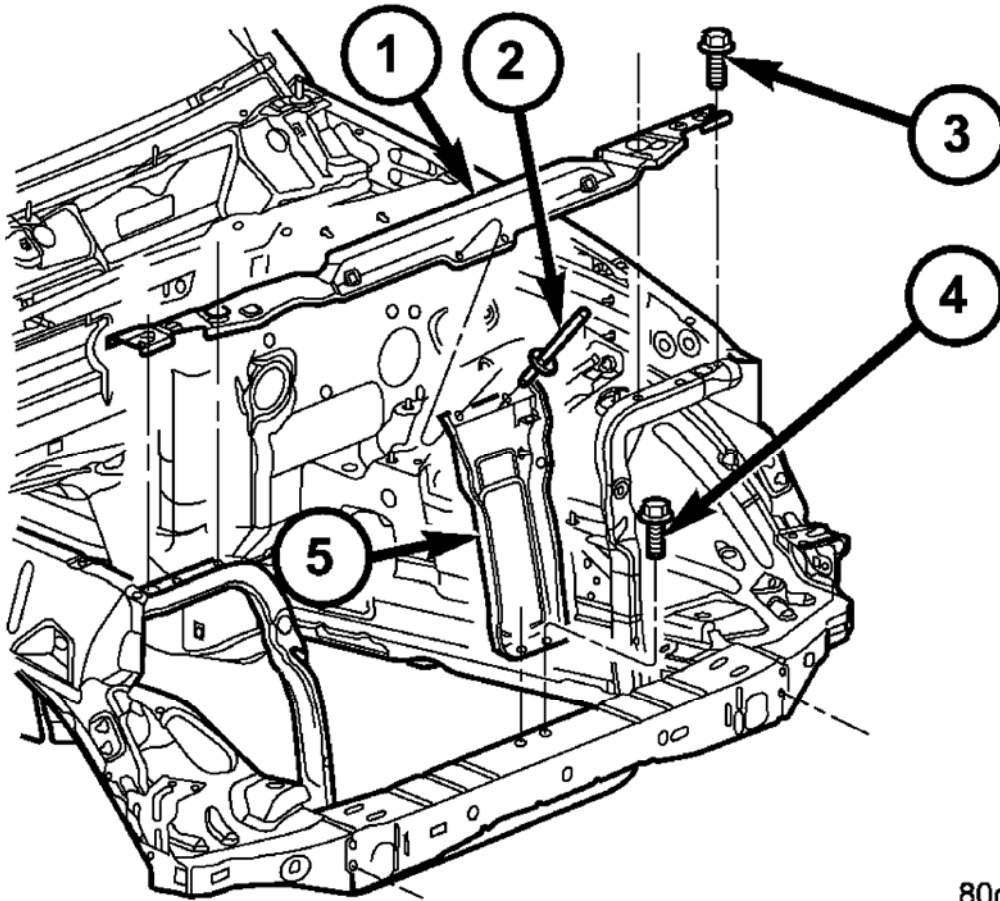
- 1 - CROSSMEMBER
- 2 - RIVETS
- 3 - BOLTS (4)
- 4 - BOLTS (2)
- 5 - HOOD LATCH SUPPORT

1. Remove the grille, see **REMOVAL**.
2. Remove the hood latch, see **REMOVAL**.
3. Remove the rivet securing the washer bottle to the crossmember.
4. Remove the rivets attaching the hood latch support to the crossmember.
5. Remove the bolts (4) and remove the hood latch support (5).

6. Remove the bolts (3) and remove the crossmember (1).

INSTALLATION

CROSSMEMBER - RADIATOR CLOSURE P



80cb3944

Fig. 226: Radiator Crossmember
Courtesy of CHRYSLER LLC

- 1 - CROSSMEMBER
- 2 - RIVETS
- 3 - BOLTS (4)
- 4 - BOLTS (2)
- 5 - HOOD LATCH SUPPORT

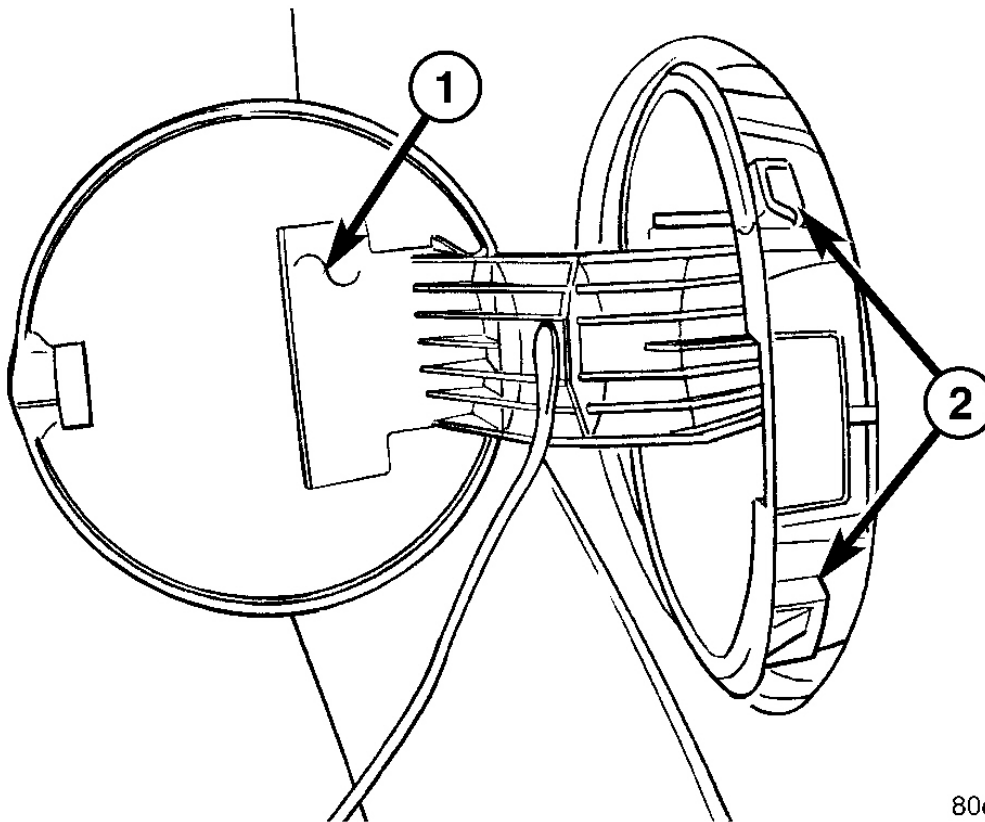
1. Install the crossmember (1) and install the bolts (3).
2. Tighten the bolts to 10 N.m (85 in. lbs.).
3. Install the hood latch support (5) and install the bolts (4).

4. Tighten the bolts to 10 N.m (85 in. lbs.).
5. Install new rivets (2) attaching the hood latch support to the crossmember.
6. Install the hood latch, see **INSTALLATION**.
7. Install the grille, see **INSTALLATION**.
8. Install a new rivet securing the washer bottle to the crossmember.

DOOR - FUEL FILL

REMOVAL

DOOR - FUEL FILL



80ce9fd1

Fig. 227: Fuel Fill Door/Housing
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - FUEL FILL DOOR
2 - HOUSING TABS |
|--|

1. Remove the fuel cap.

2. Remove the three screws connecting the fuel door/housing to the filler neck.
3. Reach in through the opening and depress the tabs (2) at the upper and bottom right of the door/housing.
4. Remove the fuel door/housing from the vehicle.

INSTALLATION

DOOR - FUEL FILL

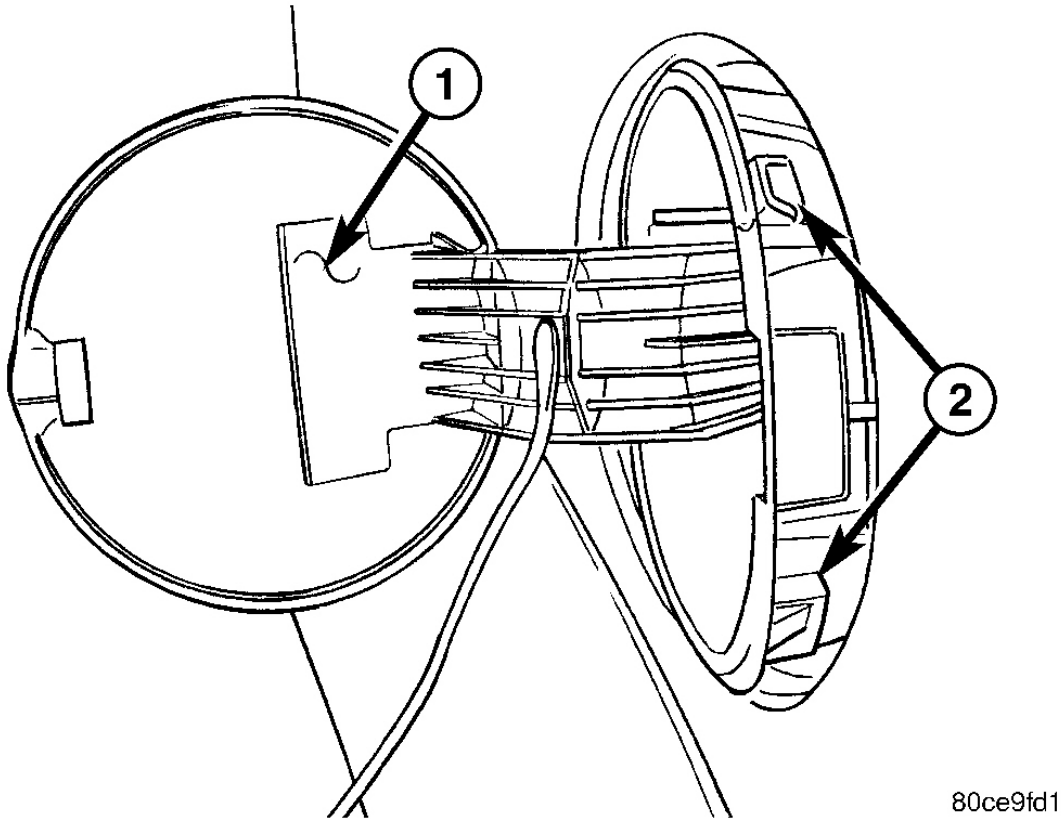


Fig. 228: Fuel Fill Door/Housing
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - FUEL FILL DOOR
2 - HOUSING TABS |
|--|

1. Position the fuel filler door/housing into the vehicle and fully seat the tabs (2).
2. Install the three screws.
3. Install the fuel cap.

FENDER - FRONT

REMOVAL

FENDER - FRONT

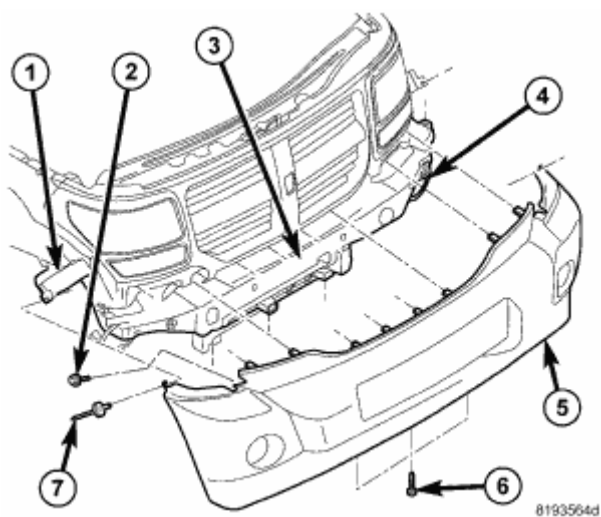
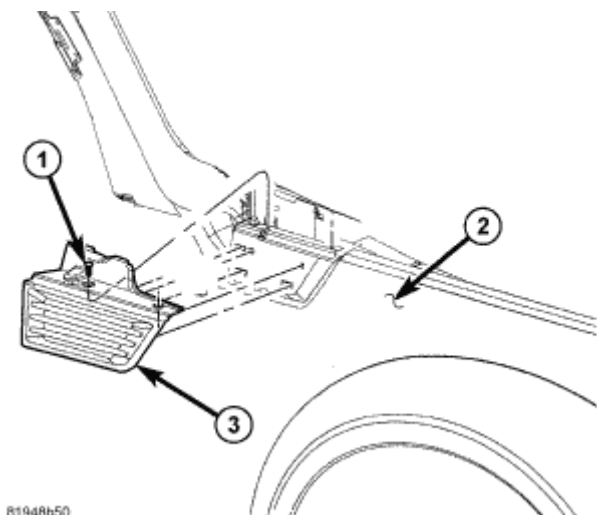


Fig. 229: Removing/Installing Fascia Assembly
Courtesy of CHRYSLER LLC

1 - Fascia Support Bracket
2 - Fastener
3 - Carrier
4 - Fog Lamp Connectors
5 - Fascia
6 - Push Pins
7 - Rivet

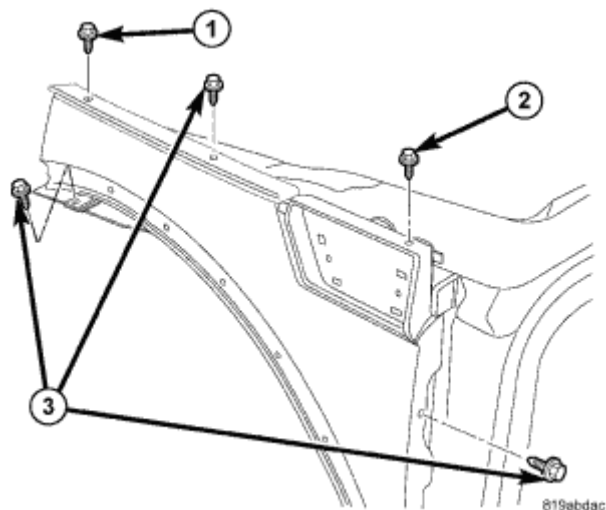
1. Remove the front fascia, refer to **REMOVAL** .
2. Remove the front fascia support bracket (1).
3. Remove the grille, see **REMOVAL**.



81948b50

Fig. 230: Screws, Fender & Applique
 Courtesy of CHRYSLER LLC

4. Remove the two screws (1) from the fender applique (3).
5. Use a trim stick C-4755 or equivalent, separate the fender applique (3) from the fender (2).
6. Remove the front wheel opening flare molding, see **REMOVAL**.



819abdac

Fig. 231: Removing/Installing Fender
 Courtesy of CHRYSLER LLC

7. Remove the bolts and remove the fender.

INSTALLATION

FENDER - FRONT

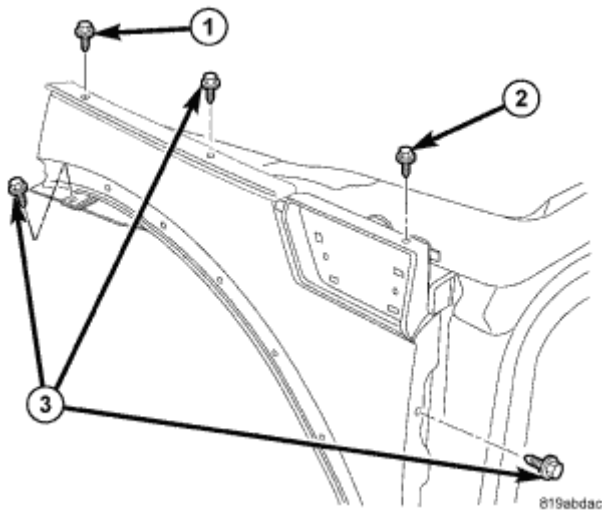


Fig. 232: Removing/Installing Fender
Courtesy of CHRYSLER LLC

NOTE: Follow the mandatory torque sequence when tightening the fender bolts.

1. Align the fender with adjacent body parts, install and tighten bolt (2) first then tighten bolt (1) then all remaining bolts (3). Tighten all bolts to 9 N.m (80 in. lbs.). Make sure there are no excessive gaps between the fender and the door assemblies, see **SPECIFICATIONS**.
2. Install the front wheel opening flare molding, see **INSTALLATION**.

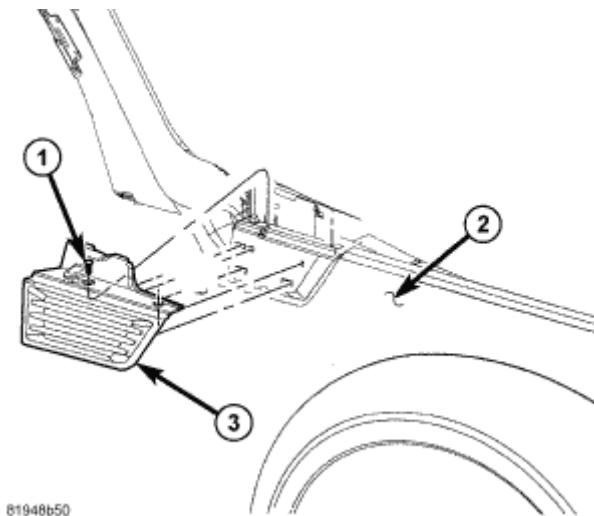


Fig. 233: Screws, Fender & Applique
Courtesy of CHRYSLER LLC

3. Align the fender applique (3) to the fender assembly (2) and apply enough hand pressure in order to make sure the clips are fully seated.
4. Install the two screws (1) to the fender applique (3).
5. Install the grille, see **INSTALLATION**.

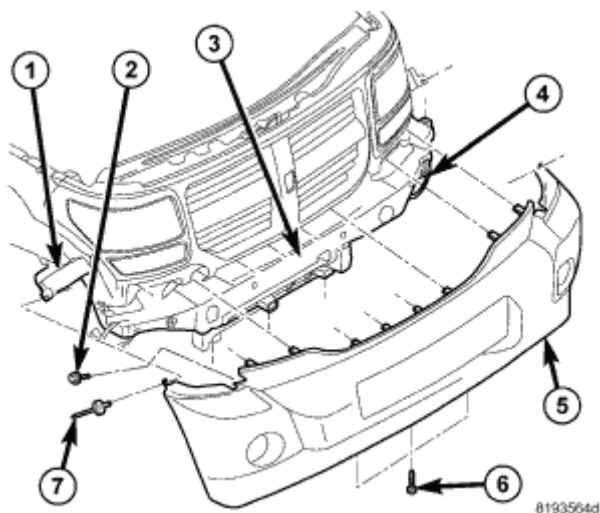


Fig. 234: Removing/Installing Fascia Assembly
Courtesy of CHRYSLER LLC

1 - Fascia Support Bracket
2 - Fastener
3 - Carrier
4 - Fog Lamp Connectors
5 - Fascia
6 - Push Pins
7 - Rivet

6. Install the fender support bracket (1).
7. Install the fascia assembly, refer to **INSTALLATION** .

GLASS - OUTSIDE REARVIEW MIRROR

REMOVAL

GLASS - OUTSIDE REARVIEW MIRROR

WARNING: Always wear eye and hand protection when servicing the mirror assembly. Failure to observe these warnings may result in personal injury from broken glass.

1. Carefully pull/pry the broken glass holder from the mirror assembly.
2. Disconnect the heated mirror electrical connectors from the terminals on the mirror glass holder, if equipped.

INSTALLATION

GLASS - OUTSIDE REARVIEW MIRROR

CAUTION: It is important to make sure the motor is square to the glass holder (attaching fingers) prior to glass holder attachment, otherwise the glass holder could be installed incorrectly causing poor retention and possible repeat failure.

1. Position the new mirror glass holder to the mirror assembly.

NOTE: Position the mirror glass holder so that the moisture drain hole on the mirror glass holder assembly is facing downward.

2. Align the mirror glass holder's attaching fingers to the mirror motor housing.

NOTE: Ensure that the protective rubber cover of the mirror motor housing is positioned correctly around the bottom of the fingers area.

3. Using one hand, firmly press the mirror glass holder assembly into place while at the same time supporting the housing assembly from the backside with the other hand.

NOTE: Pressure must be applied equally over the center portion of the mirror to engage the mirror glass holder's attaching fingers to the corresponding fingers on the housing assembly. One or more clicks may be heard when finger engagement takes place.

4. Verify retention of the mirror glass holder assembly by gently pulling outward on the mirror glass holder.

GRILLE - RADIATOR

REMOVAL

GRILLE - RADIATOR

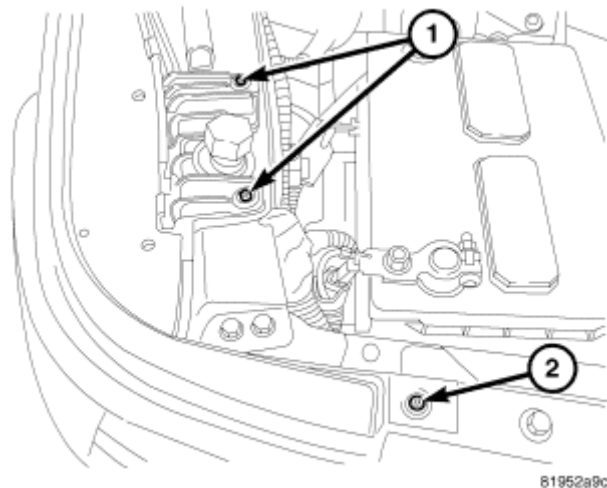


Fig. 235: Grille Torx Screws

Courtesy of CHRYSLER LLC

1. Remove the torx screws (1) from the grille to radiator support.
2. Remove the torx screw (2) from the grille to fender.

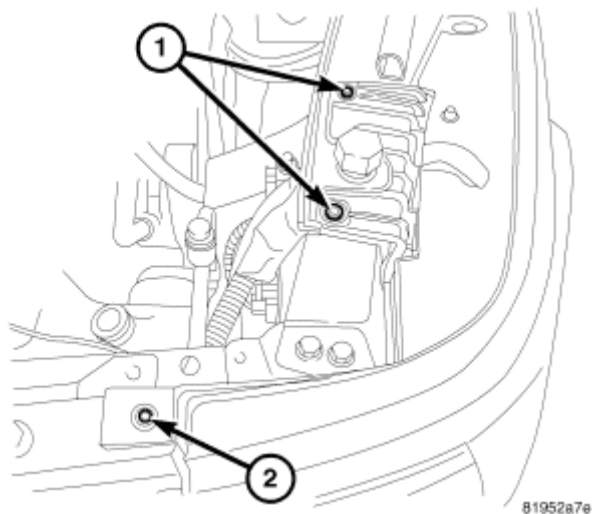


Fig. 236: Grille Torx Screws RT
Courtesy of CHRYSLER LLC

3. Raise and support the hood.
4. Remove the torx screws (1) from the grille to radiator support.
5. Remove the torx screw (2) from the grille to fender.

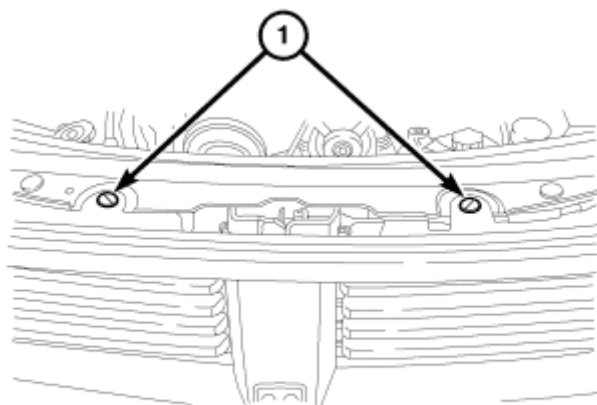
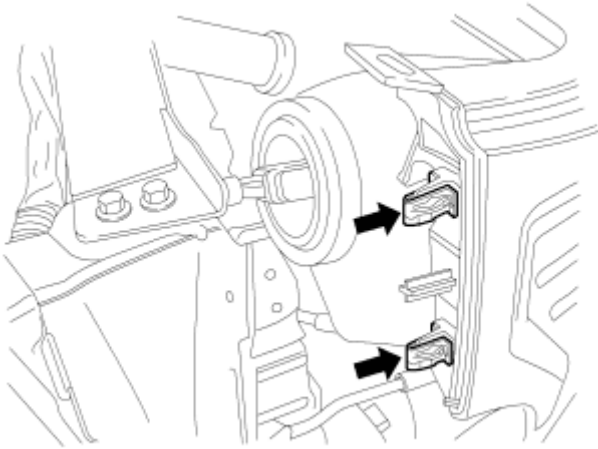


Fig. 237: Removing/Installing Grille Push Pins
Courtesy of CHRYSLER LLC

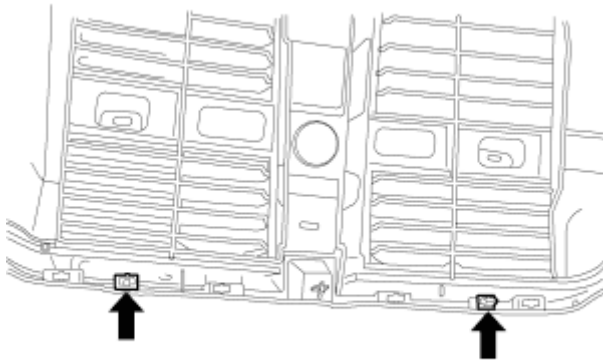
6. Remove the push pins (1) from the grille.



81953530

Fig. 238: Grille Side Fastener
 Courtesy of CHRYSLER LLC

7. Carefully pull on the grille assembly to release the fasteners on both sides of the grille.
8. Remove the front lamp, side marker lamp and the turn signal lamp connectors.



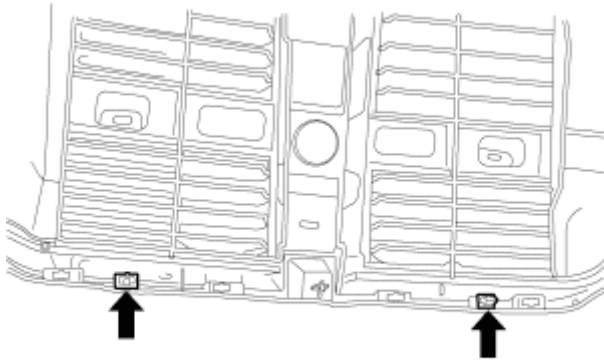
81953550

Fig. 239: Grille Lower Fastener
 Courtesy of CHRYSLER LLC

9. Carefully pull on the grille assembly to release the fasteners located on the lower part of the grille.
10. Remove the front lamp units from both sides of the grille, refer to **REMOVAL** .

INSTALLATION

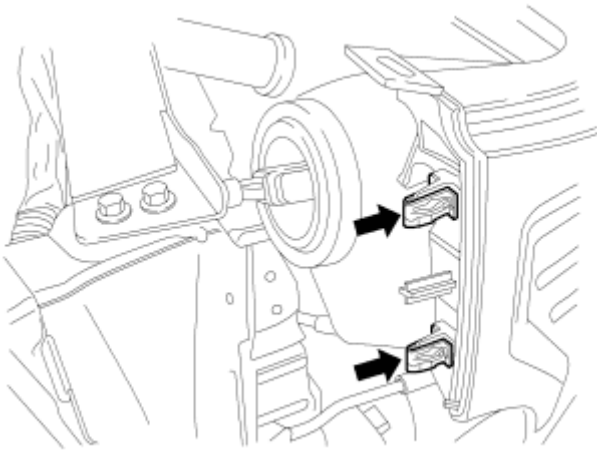
GRILLE - RADIATOR



81953550

Fig. 240: Grille Lower Fastener
Courtesy of CHRYSLER LLC

1. Install the front lamp units to both sides of the grille, refer to **INSTALLATION** .
2. Install the grille to the vehicle and connect the front lamp, side marker lamp and the turn signal lamp connectors.
3. Carefully push the lower part of the grille until the lower grille fasteners lock properly into position.

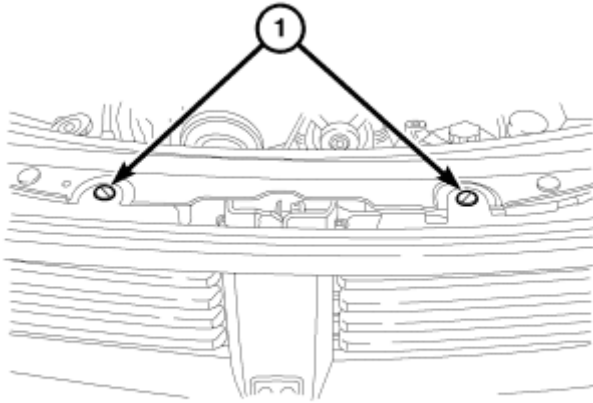


81953530

Fig. 241: Grille Side Fastener
Courtesy of CHRYSLER LLC

NOTE: This step requires proper positioning of the grille so as both side of the grille are installed at the same time.

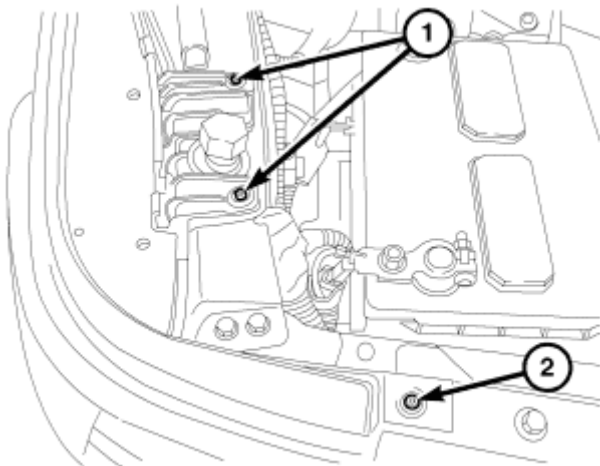
4. Position properly then carefully push the sides of the grille until the fasteners lock properly into position.



81952ab8

Fig. 242: Removing/Installing Grille Push Pins
 Courtesy of CHRYSLER LLC

5. Install the push pins (1) to the grille.



81952a9c

Fig. 243: Grille Torx Screws
 Courtesy of CHRYSLER LLC

6. Install the torx screw (2) to the left side of the grille and fender.
7. Install the torx screws (1) to the left side of the grille and the radiator support.

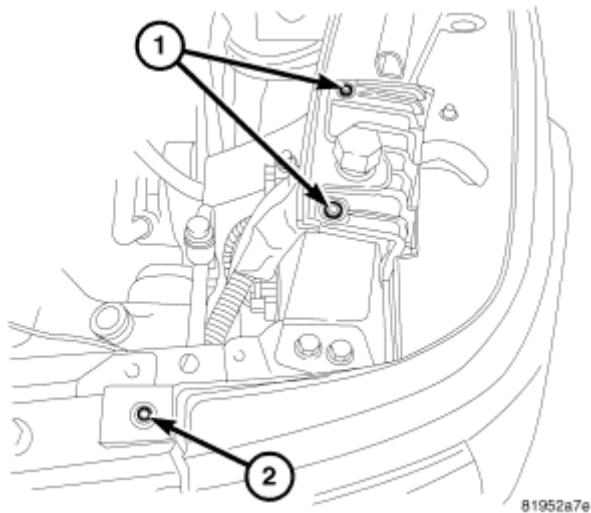


Fig. 244: Grille Torx Screws RT
Courtesy of CHRYSLER LLC

8. Install the torx screw (2) to the right side of the grille and fender.
9. Install the torx screws (1) to the right side of the grille and the radiator support.
10. Lower the hood.

MIRROR - OUTSIDE REARVIEW

REMOVAL

MIRROR - OUTSIDE REARVIEW

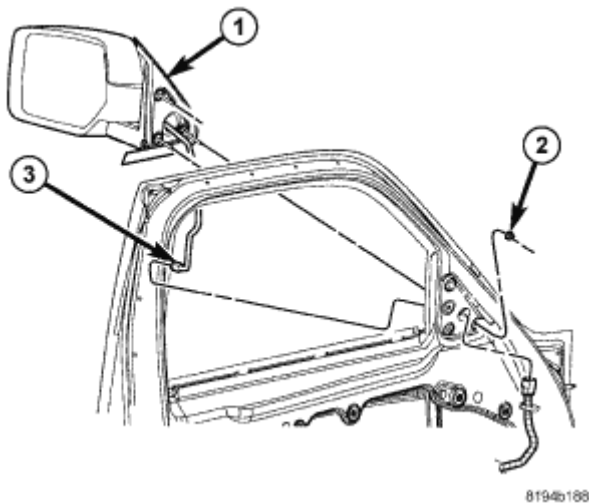


Fig. 245: Mirror Assembly, Nuts & Electrical Connector
Courtesy of CHRYSLER LLC

- | |
|-------------------------------------|
| 1 - MIRROR ASSEMBLY
2 - NUTS (3) |
|-------------------------------------|

3 - ELECTRICAL CONNECTOR

1. Partially remove the door trim panel as necessary to gain access to the mirror. See **REMOVAL**.
2. Disconnect the electrical connector (3).
3. Remove the three nuts (2) and remove the mirror assembly (1).

INSTALLATION

MIRROR - OUTSIDE REARVIEW

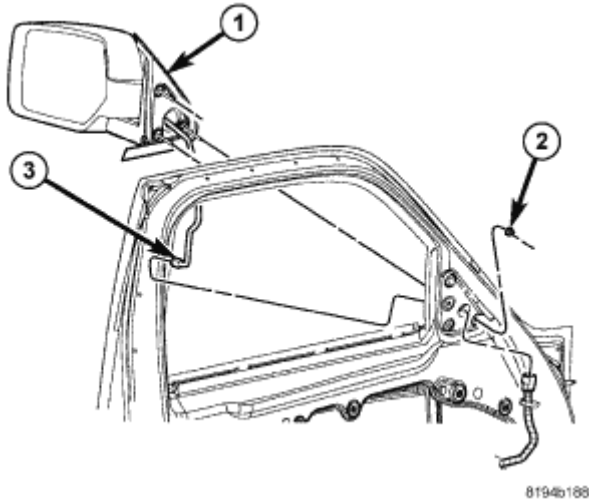


Fig. 246: Mirror Assembly, Nuts & Electrical Connector
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - MIRROR ASSEMBLY2 - NUTS (3)3 - ELECTRICAL CONNECTOR |
|---|

1. Install the mirror assembly (1).
2. Install the three nuts (2) and tighten to 7 N.m (65 in. lbs.).
3. Connect the electrical connector (3).
4. Install the trim panel, see **INSTALLATION**.

MOLDING - FRONT AND REAR DOOR

REMOVAL

MOLDING - FRONT AND REAR DOOR

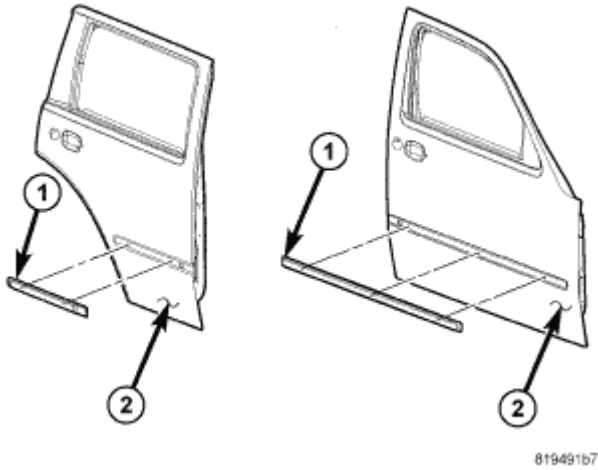


Fig. 247: Removing/Installing Front/Rear Door Molding
 Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, remove and discard the molding (1) from the outside of the door (2).

INSTALLATION

MOLDING - FRONT AND REAR DOOR

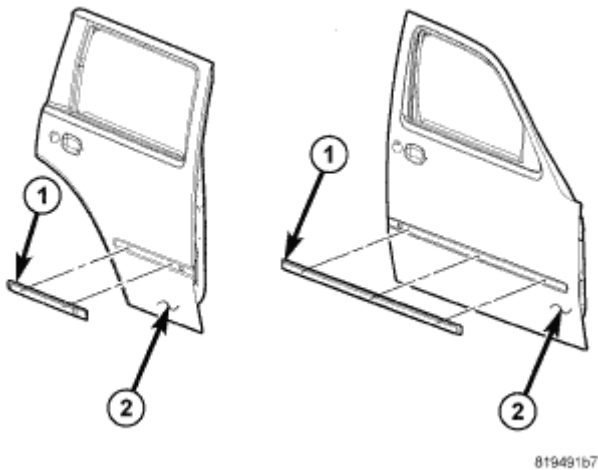


Fig. 248: Removing/Installing Front/Rear Door Molding
 Courtesy of CHRYSLER LLC

1. Thoroughly clean all residue from the body side molding attachment area of the door.
2. Wipe area clean with a 50% solution of water and alcohol and wipe dry.
3. Apply new body side molding (1) using the locators in the door (2) and apply pressure of approximately 40 p.s.i. over the entire surface of the molding.

MOLDING - FRONT WHEEL OPENING FLARE

REMOVAL

MOLDING - FRONT WHEEL OPENING FLARE

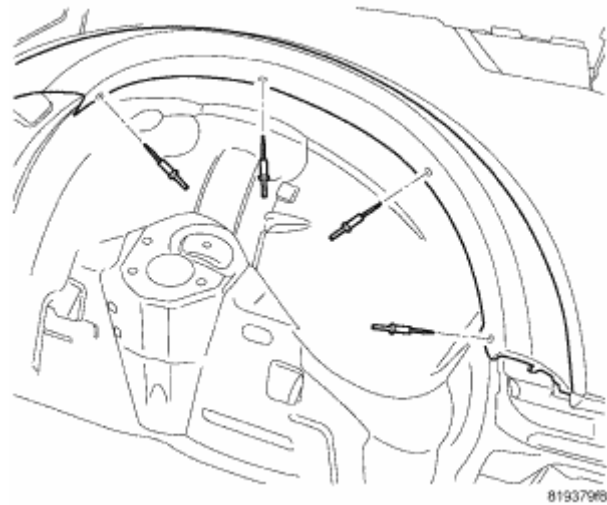


Fig. 249: Removing/Installing Rivets Connecting Fender Flare To Wheel House Liner
Courtesy of CHRYSLER LLC

1. Remove four rivets connecting the fender flare to the wheel house liner.

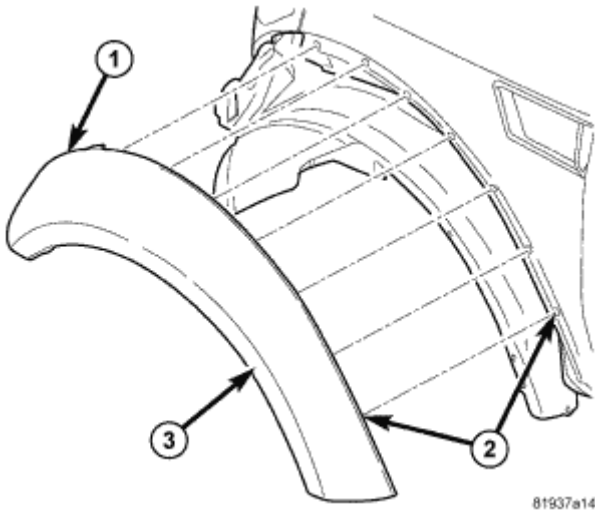


Fig. 250: Removing/Installing Fender Flare Molding
Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - Front Flare Clip |
| 2 - Rear Flare Clip |
| 3 - Front Flare Molding |

2. Using a trim stick C-4755 or equivalent, separate the front flare clips from the front of the molding (1), and rear flare clips from the rear of the molding (2).
3. Remove the fender flare molding (3) from the fender.

INSTALLATION

MOLDING - FRONT WHEEL OPENING FLARE

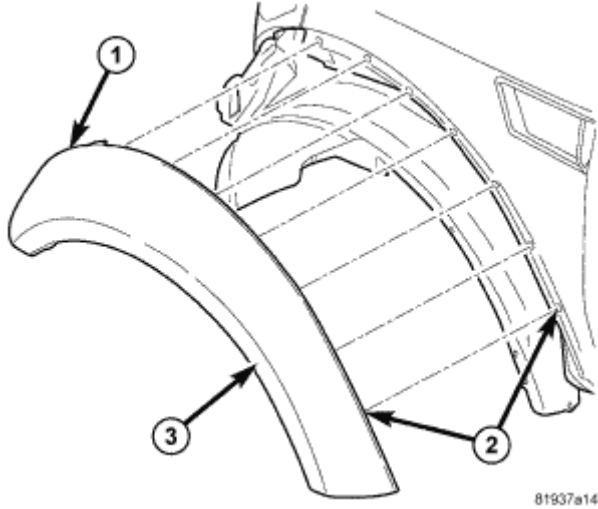


Fig. 251: Removing/Installing Fender Flare Molding
Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - Front Flare Clip |
| 2 - Rear Flare Clip |
| 3 - Front Flare Molding |

1. Position and install the front of the molding (1) and the rear of the molding (2) to the fender.
2. Align the front fender molding (3) to the fender assembly and apply enough hand pressure in order to make sure the clips are fully seated.

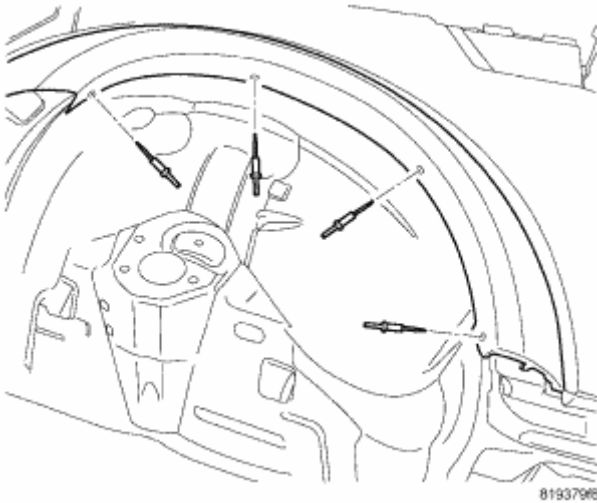


Fig. 252: Removing/Installing Rivets Connecting Fender Flare To Wheel House Liner
 Courtesy of CHRYSLER LLC

3. Install four rivets connecting the front fender flare molding to the wheel house liner.

MOLDING - REAR WHEEL OPENING FLARE

REMOVAL

MOLDING - REAR WHEEL OPENING FLARE

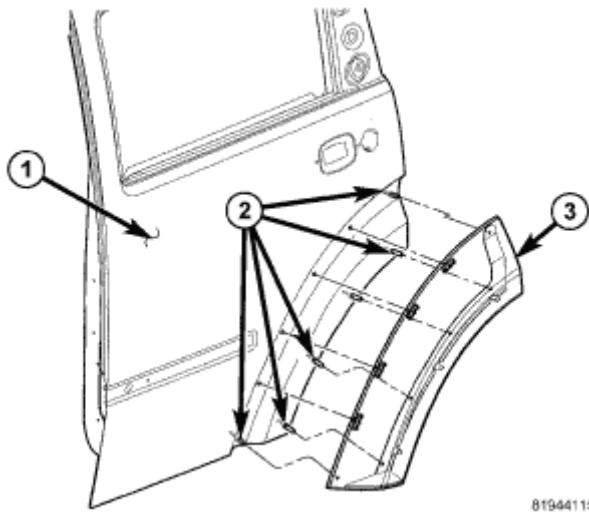


Fig. 253: Rear Wheel Flare Molding - Front
 Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - Door |
| 2 - Rivets |
| 3 - Front Flare Molding |

1. Raise and support the vehicle.
2. Open the rear door and remove the rivets (2) from the inside surface of the door (1).
3. Using a trim stick C-4755 or equivalent, separate the clips attaching the molding (3) to the door (1) and remove the molding.

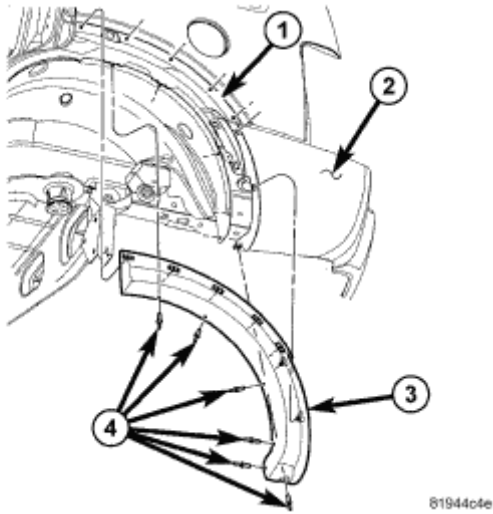


Fig. 254: Rear Wheel Flare Molding - Rear
Courtesy of CHRYSLER LLC

1 - Body
2 - Rear Fascia
3 - Rear Flare Molding
4 - Rivets

4. Remove the tire and wheel in order to gain access to the rear wheel flare molding.
5. Remove the rivets (4) attaching the rear flare molding (3) to the body (1) and rear fascia (2).
6. Using a trim stick C-4755 or equivalent, separate the clips attaching the molding (3) to the body (1) and the rear fascia (2) and remove the molding.

INSTALLATION

MOLDING - REAR WHEEL OPENING FLARE

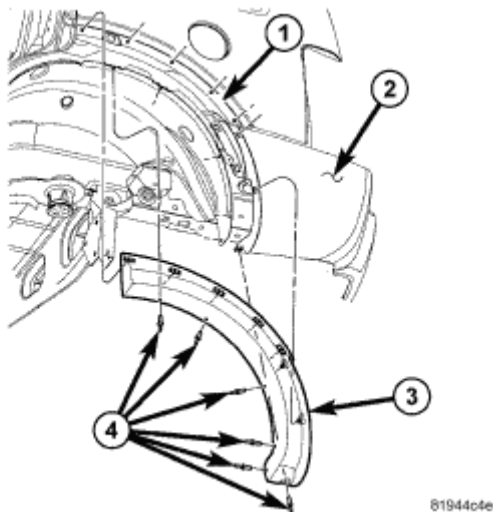


Fig. 255: Rear Wheel Flare Molding - Rear
 Courtesy of CHRYSLER LLC

1 - Body
2 - Rear Fascia
3 - Rear Flare Molding
4 - Rivets

1. Position and install the molding (3) to the body (1) and the rear fascia (2), then apply enough hand pressure in order to make sure the clips are fully seated.
2. Install rivets (4) attaching the rear flare molding (3) to the wheel house liner, the body (1) and the rear fascia (2).

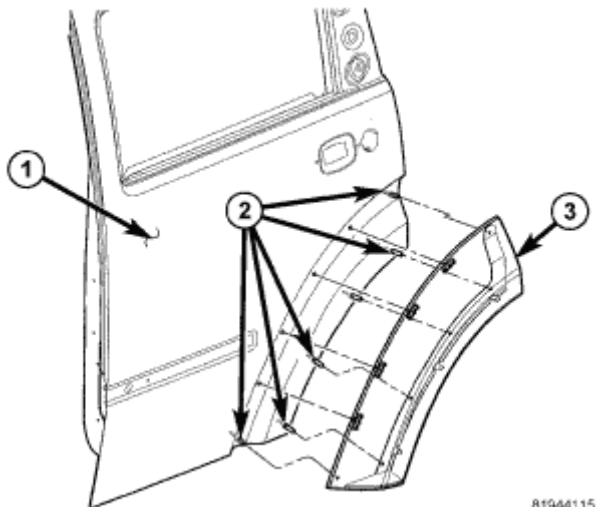


Fig. 256: Rear Wheel Flare Molding - Front
 Courtesy of CHRYSLER LLC

1 - Door

2 - Rivets
3 - Front Flare Molding

3. Position and install the molding (3) to the door (1), then apply enough hand pressure in order to make sure the clips are fully seated.
4. Open the rear door and install rivets (2) to the inside surface of the door (1) and into the molding (3).
5. Install wheel and tire and torque the wheel nuts to 136 N.m (100 ft. lbs.).

MOLDING - SILL

REMOVAL

MOLDING - SILL

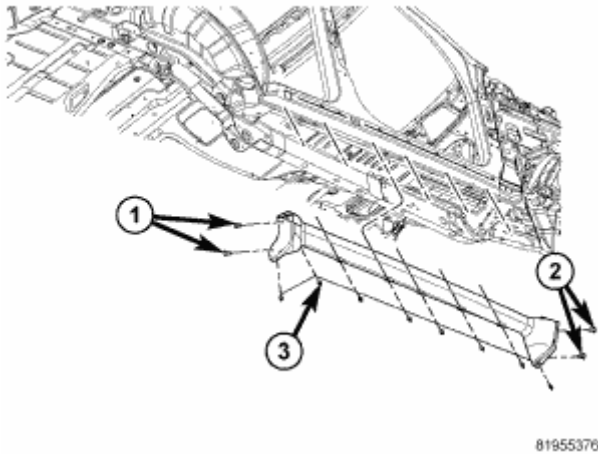
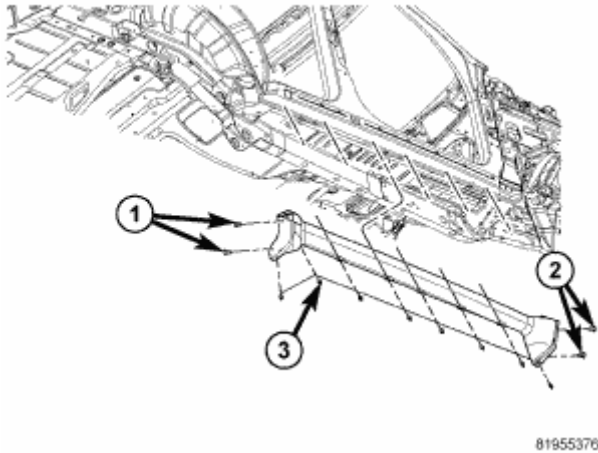


Fig. 257: Removing/Installing Sill Molding
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Use a trim tool C-4755 or equivalent, remove the push pins located at the rear wheel opening (1).
3. Remove the push pins located at the front wheel opening (2).
4. Remove the eight rivets (3) from the sill molding and remove the sill molding from the vehicle.

INSTALLATION

MOLDING - SILL



81955376

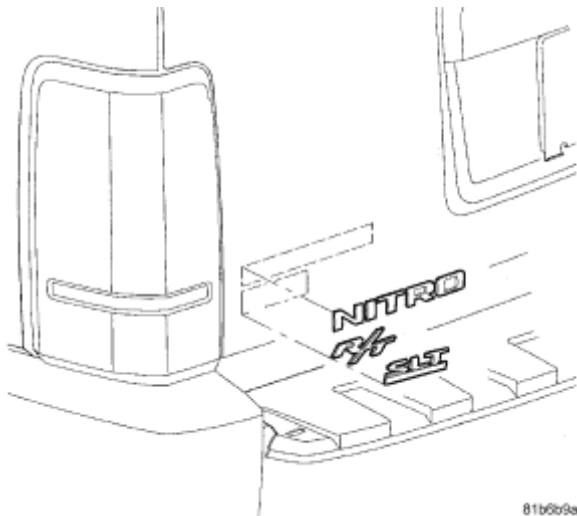
Fig. 258: Removing/Installing Sill Molding
Courtesy of CHRYSLER LLC

1. Install the sill molding to the vehicle and install the eight rivets (3) to the sill molding.
2. Install the push pins located at the front wheel opening (2).
3. Install the push pins located at the rear wheel opening (1).

NAME PLATES - EXTERIOR

REMOVAL

NAME PLATES - EXTERIOR



81b6b9a9

Fig. 259: Identifying Side Name Plate (NITRO, R/T And SLT)
Courtesy of CHRYSLER LLC

1. Apply a length of masking tape on the body, parallel to the top edge of the nameplate to use as a guide, if necessary.

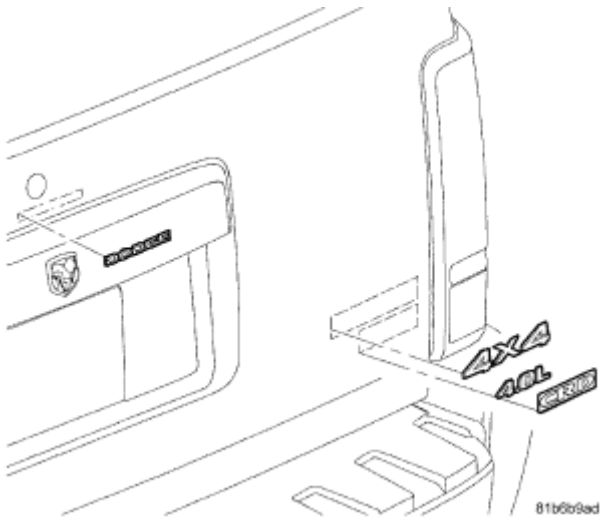


Fig. 260: Identifying Name Plate (Dodge, 4x4, 4.0L And CRD)
Courtesy of CHRYSLER LLC

2. Apply a length of masking tape on the body, parallel to the top edge of the nameplate to use as a guide, if necessary.

NOTE: **Exterior nameplates are attached to body panels with adhesive tape.**

3. If temperature is below 21°C (70°F) warm emblem with a heat lamp or gun. Do not exceed 52°C (120°F) when heating emblem.

CAUTION: Use care when separating the emblem from the body surface to avoid scratching the paint.

4. Using a trim stick C-4755 or equivalent, behind the emblem to separate the adhesive backing from the body.
5. Clean adhesive residue from body with MOPAR® Super Clean solvent or equivalent.

INSTALLATION

NAME PLATES - EXTERIOR

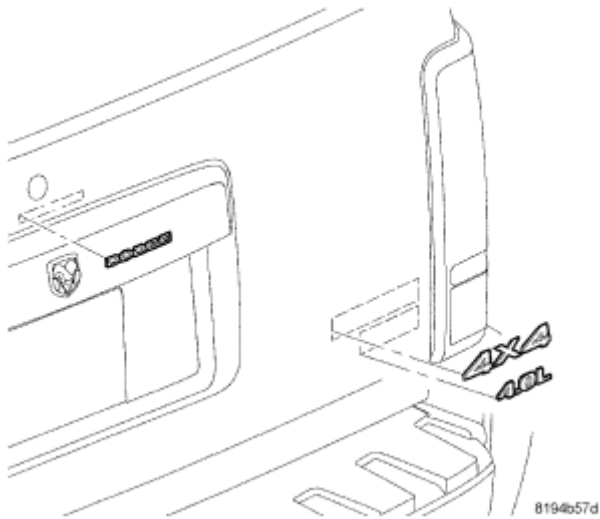


Fig. 261: Identifying Name Plate (Dodge, 4x4 And 4.0L)
 Courtesy of CHRYSLER LLC

NOTE: Before applying the emblem, clean the body surface with MOPAR® Super Kleen solvent or equivalent.

1. Remove protective cover from adhesive tape on back of emblem.
2. Position the correct emblem properly on the body.

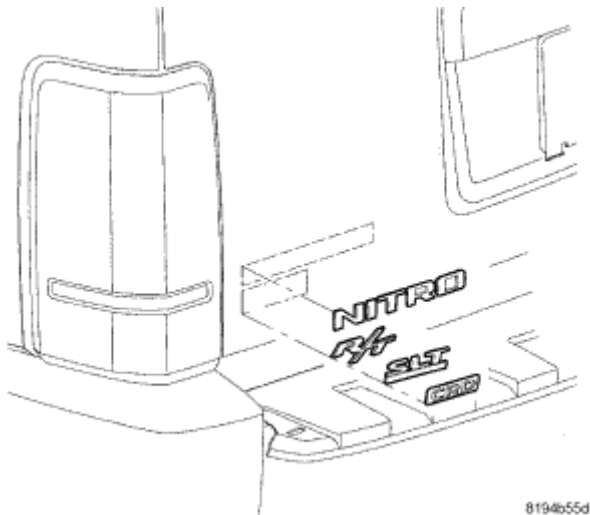


Fig. 262: Identifying Side Name Plate (NITRO, R/T, SLT And CRD)
 Courtesy of CHRYSLER LLC

3. Position the correct emblem properly on the body.
4. Press emblem firmly to the body with the palm of hand.
5. If temperature is below 21°C (70°F) warm emblem with a heat lamp or gun to assure adhesion. Do not exceed 52°C (120°F) when heating emblem.

PANEL - A-PILLAR

REMOVAL

PANEL - A-PILLAR

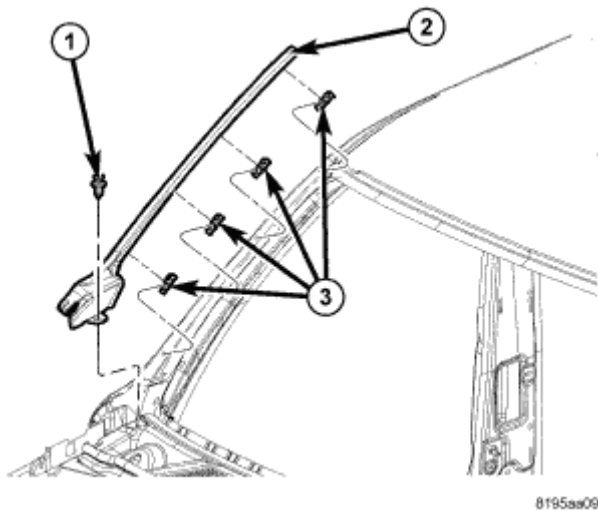


Fig. 263: Push Pin, Windshield A-Pillar Molding & Clips
Courtesy of CHRYSLER LLC

- 1. Using a trim stick C-4755 or equivalent, remove the push pin (1).
- 2. Remove the windshield A-pillar molding (2) and clips (3) from the windshield A-pillar.

INSTALLATION

PANEL - A-PILLAR

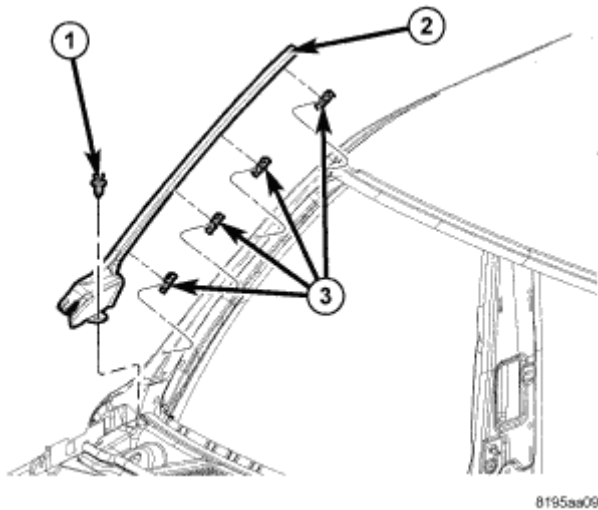


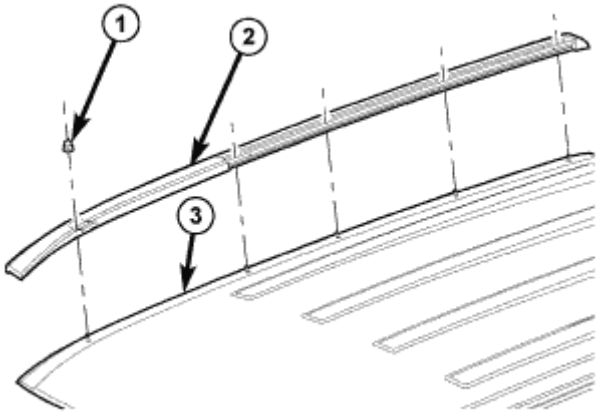
Fig. 264: Push Pin, Windshield A-Pillar Molding & Clips
Courtesy of CHRYSLER LLC

1. Install the windshield A-pillar molding (2) and clips (3) to the windshield A-pillar.
2. Install the push pin (1).

RACK - LUGGAGE

REMOVAL

RACK - LUGGAGE



81940091

Fig. 265: Roof Rack Assembly
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - Nuts
2 - Roof Rack
3 - Roof |
|---------------------------------------|

1. Remove the five nuts (1) from the roof rack (2).
2. Remove the roof rack (2) from the roof (3).

INSTALLATION

RACK - LUGGAGE

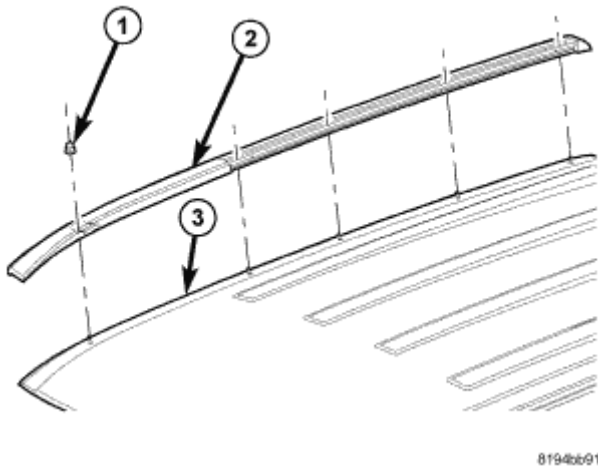


Fig. 266: Roof Rack Assembly
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - Nuts
2 - Roof Rack
3 - Roof |
|---------------------------------------|

1. Carefully install the roof rack (2) to the roof (3).
2. Install five nuts (1) and tighten the nuts to 6.2 N.m (55 in. lbs.).

RUNNING BOARD - FULL

REMOVAL

RUNNING BOARD - FULL

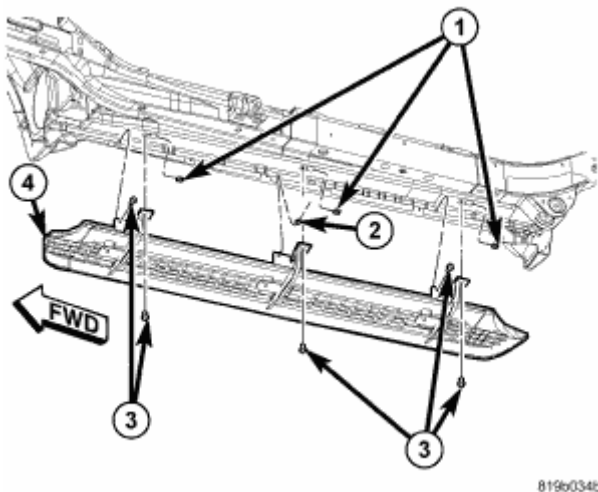


Fig. 267: Running Board
Courtesy of CHRYSLER LLC

1. Remove the running board bolts (3).
2. Remove the running board nut (2).
3. Remove the running board (4) from the vehicle.
4. Remove the u-clip fasteners (1) from the vehicle body.

INSTALLATION

RUNNING BOARD - FULL

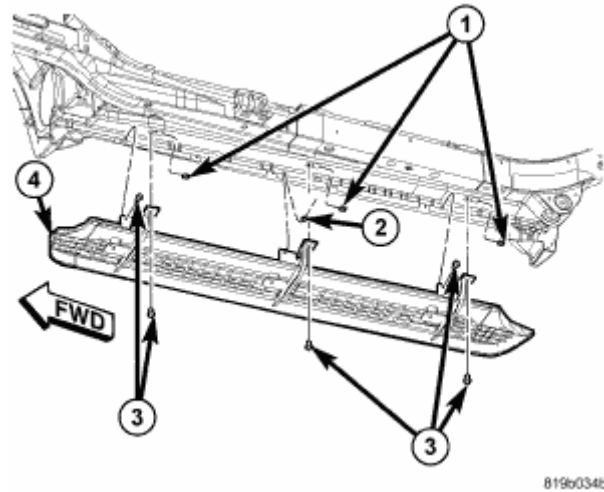


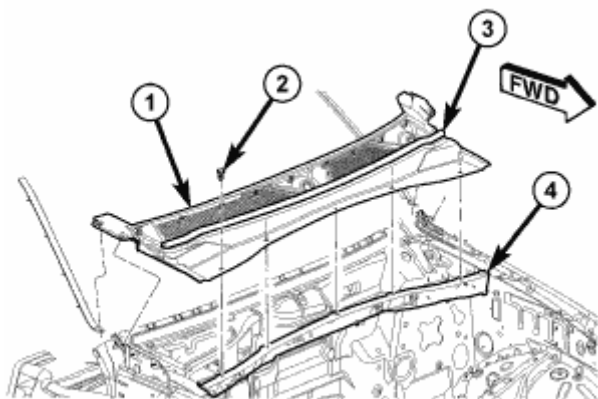
Fig. 268: Running Board
Courtesy of CHRYSLER LLC

1. Install the u-clip fasteners (1) to the vehicle body.
2. Install the running board (4) and the nut (2) to the vehicle.
3. Install the running board bolts (3). Tighten the running board bolts (3) and nut (2) to 25 N.m (18.5 ft. lbs.).

SCREEN - TOP COWL

REMOVAL

SCREEN - TOP COWL



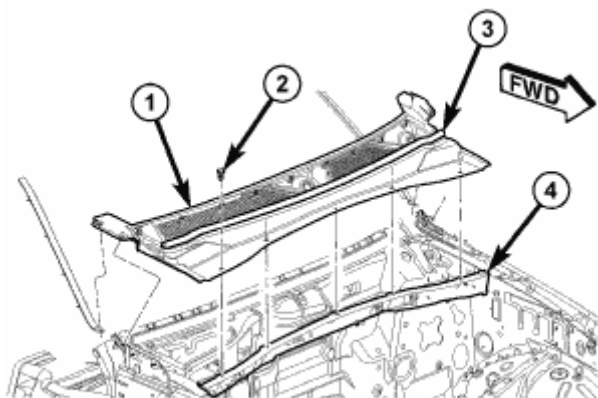
8194dc06

Fig. 269: Cowl Grille, Push Pins, Hood Seal & Body
Courtesy of CHRYSLER LLC

1. Remove the wiper arms, refer to **REMOVAL** .
2. Remove the hood seal (3).
3. Use a trim stick C-4755 or equivalent, separate the cover assembly from the A-pillar.
4. Remove the push pins (2) and remove the cowl grille (1) from the body (4).

INSTALLATION

SCREEN - TOP COWL



8194dc06

Fig. 270: Cowl Grille, Push Pins, Hood Seal & Body
Courtesy of CHRYSLER LLC

1. Position the cowl grille (1) and engage the clips to the bottom of the windshield.
2. Install the push pins (2) through the cowl grille (1) and into the body (4).
3. Install the hood seal (3).

4. Install the wiper arms, refer to **INSTALLATION** .

SHIELD - FRONT WHEELHOUSE SPLASH

REMOVAL

SHIELD - FRONT WHEELHOUSE SPLASH

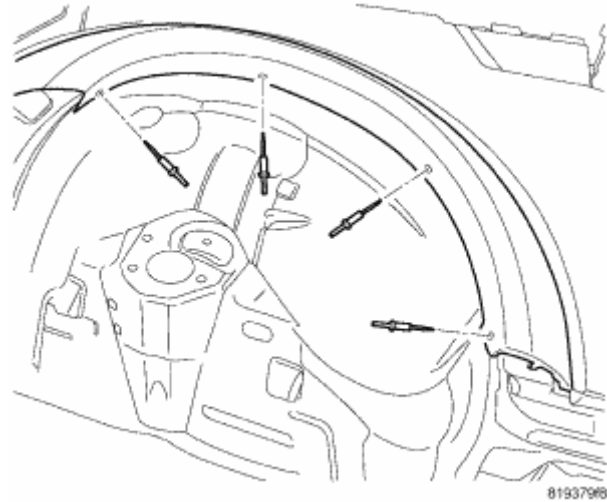


Fig. 271: Removing/Installing Rivets Connecting Fender Flare To Wheel House Liner
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle, refer to **STANDARD PROCEDURE** .
2. Remove the wheel and tire to gain access to the front wheel house liner.
3. Carefully remove four rivets from the front fender flare molding.

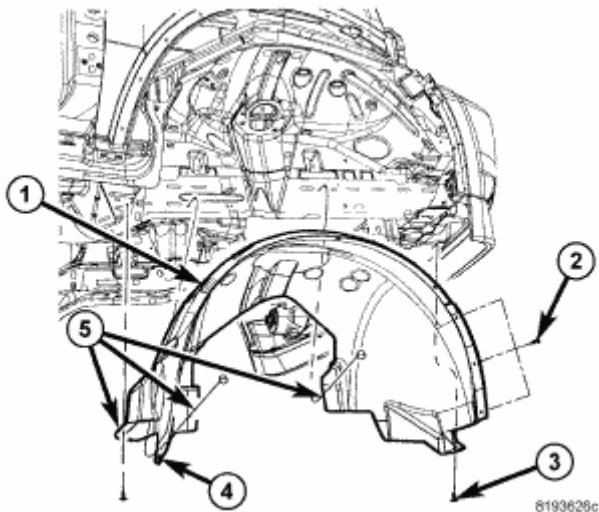


Fig. 272: Front Wheel House Splash Shield
Courtesy of CHRYSLER LLC

1 - FRONT WHEEL HOUSE LINER
2 - PUSH PINS
3 - RIVET
4 - PUSH PIN
5 - PUSH PINS

4. Remove the rivet (3) securing the wheel house liner to the lower front fascia.
5. Remove all push pins from wheel house liner.
6. Remove the wheel speed sensor harness from the wheel house liner.
7. Remove front wheel house liner from front wheel house opening.

INSTALLATION

SHIELD - FRONT WHEELHOUSE SPLASH

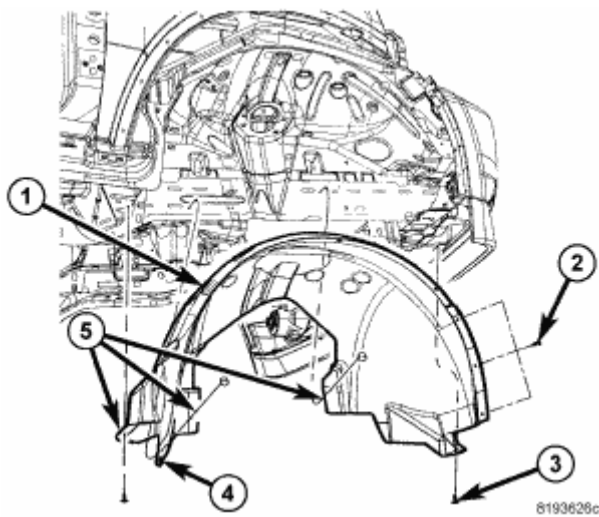


Fig. 273: Front Wheel House Splash Shield
Courtesy of CHRYSLER LLC

1 - FRONT WHEEL HOUSE LINER
2 - PUSH PINS
3 - RIVET
4 - PUSH PIN
5 - PUSH PINS

1. Install front wheel house liner (1) into front wheel house opening.
2. Install the wheel speed sensor harness to the wheel house liner.
3. Align and install three push pins (5) into holes in the wheel house liner and fender inner wheelhouse.
4. Align and install three push pins (2) into holes in the wheel house liner and front fascia.
5. Install the rivet (4) connecting the splash shield to the side sill molding.

6. Install all remaining push pins.
7. Install the rivet (3) into the hole in the wheel house liner and lower front fascia.

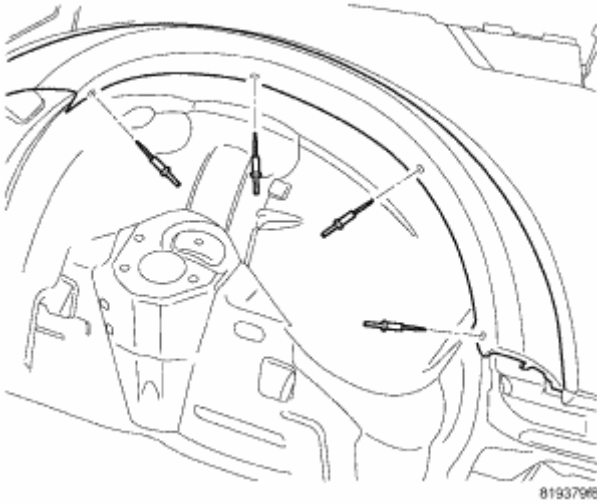


Fig. 274: Removing/Installing Rivets Connecting Fender Flare To Wheel House Liner
Courtesy of CHRYSLER LLC

8. Install four rivets to the front fender flare molding, wheel house liner and the fender.
9. Install wheel and tire and torque the wheel nuts to 136 N.m (100 ft. lbs.).

SHIELD - REAR WHEELHOUSE SPLASH

REMOVAL

SHIELD - REAR WHEELHOUSE SPLASH

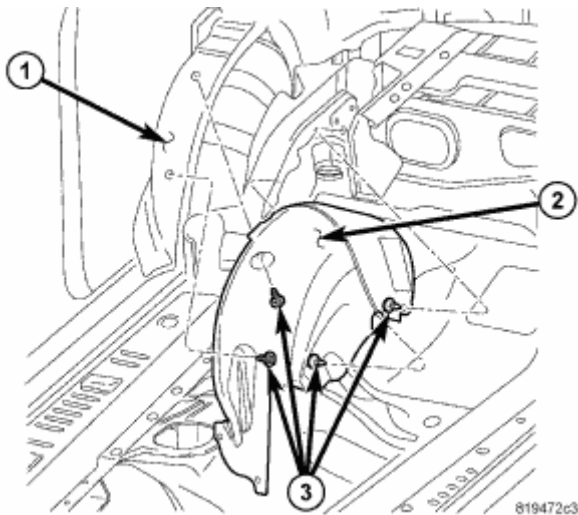


Fig. 275: Rear Wheelhouse Splash Shield
Courtesy of CHRYSLER LLC

1. Remove the rear wheel flare molding, see **REMOVAL**.
2. Remove the two push pins securing the sill plate molding to the wheel liner and body.
3. Remove the four push pins (3) at the wheelhouse opening (1).
4. Remove the wheel liner (2) from the wheelhouse opening (1).

INSTALLATION

SHIELD - REAR WHEELHOUSE SPLASH

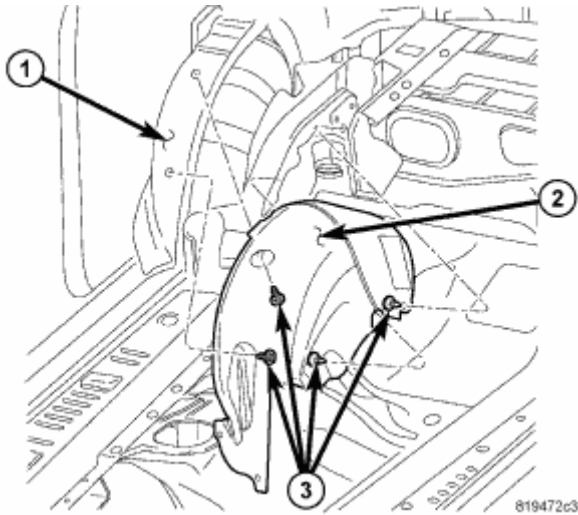


Fig. 276: Rear Wheelhouse Splash Shield
Courtesy of CHRYSLER LLC

1. Install the wheel house liner (2) to the wheel house opening (1).
2. Install the four push pins (3) to the wheel house liner (2).
3. Install the two push pins securing the sill plate molding and the wheel house liner to the body.
4. Install the rear wheel flare molding, see **INSTALLATION**.

FULL OPEN RETRACTABLE ROOF

DESCRIPTION

FULL OPEN RETRACTABLE ROOF

This vehicle is available with the Full Open Retractable Roof (FORR) option. Marketed as Sky Slider™, the unit is made of reinforced acrylic cloth, similar to a convertible top. The material can be collected to the rear of the vehicle or over the front occupant.

Features

Sky Slider™ offers a convenient express one-touch switch for opening and closing, allowing for operator interruption for infinite positioning

The fabric roof can be gathered fully forward, or fully rearward, or partially opened to any position in-between

The top panel nests into the weather-strip seal to minimize wind noise. Factory installation ensures optimum fit, finish and function

A color-keyed, decorative molding joins the FORR assembly to the headliner

The FORR assembly is equipped with a matching headliner

The full-length open roof assembly is attached to the vehicle through a unique roof structure to facilitate similar performance in noise, wind and crash safety as the standard vehicle. This structure is then bonded to the body side reinforcement system.

OPERATION

FULL OPEN RETRACTABLE ROOF

Automatic Roof Operation (Auto Mode)

Automatic Operation is movement of the roof to either the full open or full closed position without the vehicle operator continually pressing one of the three roof switch buttons. Anti-pinch detection is active in auto mode.

Pressing one of the three roof switch buttons for less than 500 milliseconds will result in the roof moving automatically. The roof will continue movement until either the full open or full closed position is reached or the vehicle operator interrupts movement by pressing any roof switch button.

Manual Roof Operation (Manual Mode)

Manual Operation is movement of the roof while the vehicle operator is continually pressing one of the three roof switch buttons. Roof movement is stopped as soon as the button is released. Anti-pinch detection is not active in manual mode.

Pressing one of the three roof switch buttons for more than 500 milliseconds will result in the roof moving manually. While in manual mode, the roof will move in the desired direction until either the full open or full closed position is reached or the roof switch button is released.

Front Open

To open the Front of the roof from the closed position press the vehicle **most rearward** roof switch button. Once the roof is in the **front open mode**, only the front of the roof can be controlled by the vehicle operator. Use the vehicle **most rearward** roof switch button to further open the roof, or the vehicle **most forward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **front open mode**.

Rear Open

To open the Rear of the roof from the closed position press the vehicle **most forward** roof switch button. Once the roof is in the **rear open mode**, only the rear of the roof can be controlled by the vehicle operator. Use the vehicle **most forward** roof switch button to further open the roof, or the vehicle **most rearward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **rear open mode**.

Global Close

Pressing the roof switch center button with the roof in any position other than closed position, will result in the roof closing. A short press for less than 500 milliseconds will result in automatic mode closing, and a long press for more than 500 milliseconds will result in manual mode closing.

Power Modes Of Operation

The Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module) will function as follows in respect to Country Code Configuration:

Key out door open - (No Function all Markets)

Remote Start active - (No Function all Markets)

Accessory Delay, Front Doors closed, key out - (Manual & Automatic Function for North American Markets) (Manual Function Only for Non-North American Markets)

Key in Accessory Mode - (Manual & Automatic Function for North American Markets) (Manual Function Only for Non-North American Markets)

Ignition On (Engine Off) - (Manual & Automatic Function all Markets)

Ignition On (Engine Running) - (Manual & Automatic Function all Markets)

DIAGNOSIS AND TESTING

FULL OPEN RETRACTABLE ROOF

Any diagnosis of the FULL OPEN RETRACTABLE ROOF (FORR) system should begin with a scan tool and proper Diagnostic Procedures. The scan tool can provide confirmation that the FORR Electronic Control Unit (ECU), (sometimes referred to as the Power Top Control Module) is functional, that all of the electronic modules are sending and receiving the proper messages on the Controller Area Network (CAN) Data Bus, and that the power to the FORR is being sent the proper hard wired output by the FORR switch.

Check the condition of the circuit protection and inspect all wiring connector pins for proper engagement and continuity. For complete circuit diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views wire harness connectors, splices and grounds.

NOTE: Roof limits:

Motor Thermal Protection: The ECU Calculates the internal motor temperature. When the calculated temperature exceeds 365F(185C), the ECU allows the roof to only close. At 392F(200C) The ECU prevents motor movement.

System Low Temperature Operation: (Via the Vehicle Ambient Temp Sensor) At 14F (-10C) the ECU does not allow the system to vent without stopping the other motor. At -4F (-20C) the motors are allowed to close only.

Speed Thresholds: At 86 m.p.h. (138 km/h) we stop operation and at 81

m.p.h. (129 km/h) we resume operation.

NOTE: For the FORR initialization procedure, refer to **STANDARD PROCEDURE** .

SYMPTOM	POSSIBLE CAUSES	CORRECTION
Roof Completely Inoperative	Inoperative control switch	Perform sunroof switch diagnostics
	Inoperative circuit between FORR motor/ECU, control switch, and body harness.	Check the condition of the circuit protection and inspect all wiring. Repair as necessary.
	Inoperative FORR motor/ECU	Replace as necessary Motor/ECU
Audible Whine When Switch Is Depressed, Roof Does Not Operate	Inoperative drive motor gear	Replace drive motor Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Audible Clicking Or Ratcheting When Switch Is Pressed, FORR Does Not Operate.	Cables out of calibration	Left & right hand cables need to be timed See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Cable retainer clip worn or broken	Replace cable retainer clip See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Inoperative drive motor gear	Replace drive motor Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Front Header Bow Misaligned To Frame	Debris in drive track	Remove debris from track, check cables for wear replace if necessary and reset timing. See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace Drive Cables See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
		Left & right hand cables need to be timed

	Cables out of time	See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken cap extension	Replace the front drive assembly. See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Rear Header Bow Misaligned To Frame	Debris in drive track	Remove Debris from Track, check cables for wear replace if necessary and reset Timing. See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Cables out of time	Left & right hand cables need to be timed See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken cap extension	Replace the rear drive assembly. See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Front Lift Arm Not Lifting	Spring disengaged from lift arm	Repair or replace spring if necessary See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Pin disengaged or broken	Repair or replace nylon pin if necessary See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Lift arm disengaged from cap extension or broken	Repair or replace front lift arm assembly if necessary See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Floating Bows Not Lifting	Spring disengaged	Repair or replace spring if necessary See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Broken lift arm assembly	Replace lift arm assembly if necessary See <u>REMOVAL</u> . Re-initialize ECU:

		Refer to <u>STANDARD PROCEDURE</u> .
Top Cover Loose In Side View To Seal	Tension cable not attach at front header	Attach tension cable to front header See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Tension cable not attach at rear header	Attach tension cable to rear header See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	Tension cable broken	Replace tension cable See <u>REMOVAL</u> . Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Top Stops Moving Prior To Full Close, Or Full Open	Debris in track	Clean track Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
	ECU lost normed "home" position	Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .
Slider Chatter	Debris in track	Clean track Re-initialize ECU: Refer to <u>STANDARD PROCEDURE</u> .

STANDARD PROCEDURE

FULL OPEN RETRACTABLE ROOF INITIALIZATION

Limits

Temperature

The temperature must be between 5°C (41°F) to 45°C (113°F) for initialization to be performed, Outside of this temperature range an initialization will not start and if requested by a diagnostics scan tool, the Electronic Control Unit (ECU), (sometimes referred to as the Power Top Control Module) will send the proper reject code.

Voltage

Vehicle voltage must be maintained between 11V - 15V.

Roof Initialization Procedure

1. Ensure the Vehicle is in the RUN power mode with the engine running.
2. If roof is in a position other than fully closed; press roof switch center button for less than 1 second and wait for the roof to close.
3. With roof fully closed: Push and hold the roof switch center button for more than 20 seconds and do not release until the following roof cycle is complete:

Front of Roof will Close (Then Stall)

Rear of Roof will Close (Then Stall)

Rear of Roof will Open

Rear of Roof will Close

Rear of Roof Vents (approx two inches)

Front of Roof will Open

Front of Roof will Close

Rear of Roof Closes from Vent

4. Once all movement has stopped, release the roof switch center button. Roof system initialization is now complete.

MANUAL OPERATION

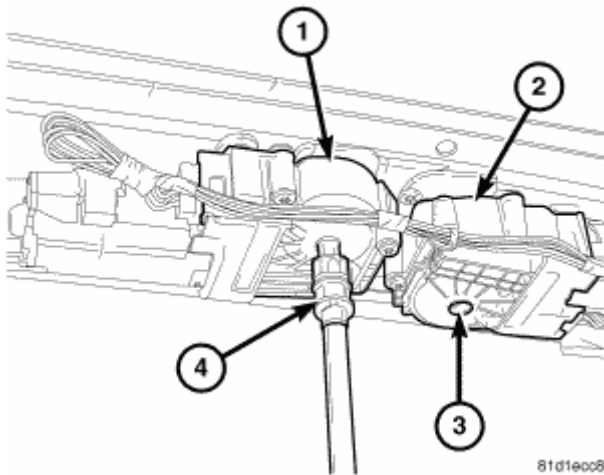
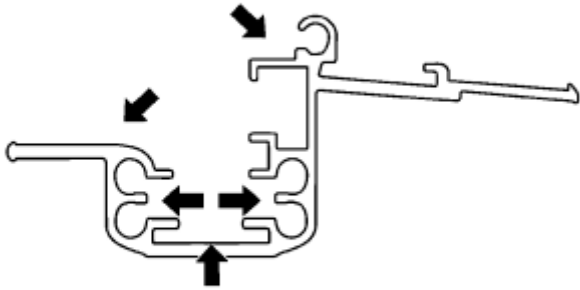


Fig. 277: Rear Drive Motor, Front Drive Motor, Drive Axle And Hex Socket
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - REAR DRIVE MOTOR
2 - FRONT DRIVE MOTOR
3 - DRIVE AXLE LOCATION
4 - 6 mm HEX SOCKET |
|---|

1. Remove the rear dome light, refer to **REMOVAL** .
2. Disconnect the green module electrical connector.
3. Locate the motor drive axle hole (3) and using a 6 mm hex socket or equivalent (4), open or close the desired drive assembly as required.

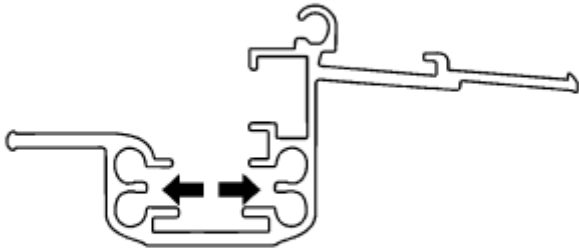
TRACK CLEANING



81dc951b

Fig. 278: Track Cleaning Areas (1 Of 2)
 Courtesy of CHRYSLER LLC

1. Open the roof fully from front to rear.
2. Using a vacuum remove all loose debris.
3. Apply alcohol to a clean rag and wipe the tracks clean in the areas shown.



81dc9520

Fig. 279: Track Cleaning Areas (2 Of 2)
 Courtesy of CHRYSLER LLC

4. Using a cotton swab apply alcohol to the head of the swab and clean the notch on both sides as indicated.
5. Close the roof and open the rear portion fully and repeat the cleaning process.
6. When cleaning is complete re-initialize the system, see **STANDARD PROCEDURE**.

CABLE

REMOVAL

CABLE

FRONT DRIVE CABLES

1. Remove the front drive assembly, see REMOVAL.
2. Slide the cables out and remove.

REAR DRIVE CABLES

1. Remove the rear drive assembly, see REMOVAL.
2. Slide the cables out and remove.

INSTALLATION

CABLE

FRONT DRIVE CABLES

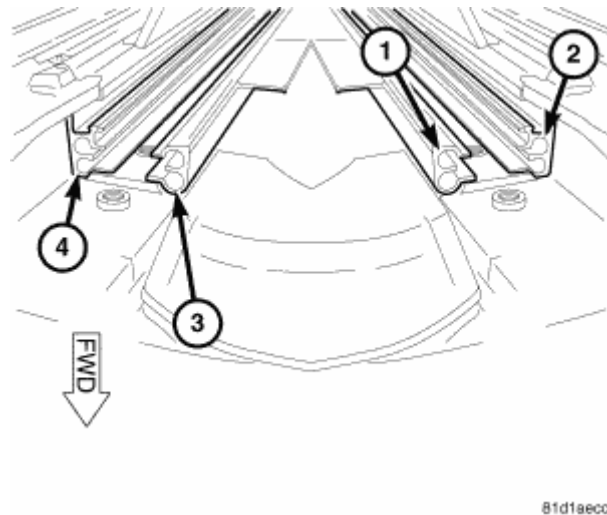


Fig. 280: Drive Cables
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - FRONT DRIVE CABLE - BLUE END2 - REAR DRIVE CABLE - RED END3 - FRONT DRIVE CABLE - ORANGE END4 - REAR DRIVE CABLE - GREEN END |
|---|

1. Install the front drive cables into their correct positions, see Fig. 280.

NOTE: It may be necessary to twist the cables while pushing to fully install the

cables.

2. Install the front drive assembly, see INSTALLATION.
3. Re-initialize ECU, see STANDARD PROCEDURE.

REAR DRIVE CABLES

1. Install the rear drive cables into their correct positions, see Fig. 280.

NOTE: It may be necessary to twist the cables while pushing to fully install the cables.

2. Install the rear drive assembly, see INSTALLATION.
3. Re-initialize ECU, see STANDARD PROCEDURE.

CABLE

REMOVAL

CABLE - RETAINER

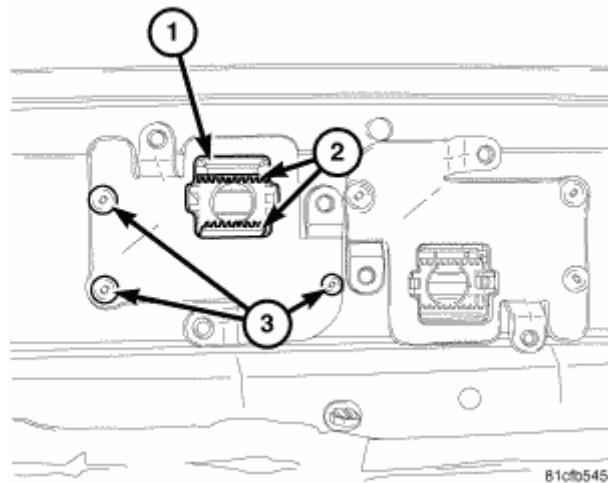


Fig. 281: Cable Retainer And Rivets
Courtesy of CHRYSLER LLC

1. Remove the drive cables, see REMOVAL.
2. Remove the rivets (3) and remove the motor mounting plate.
3. Remove the cable retainer (1).

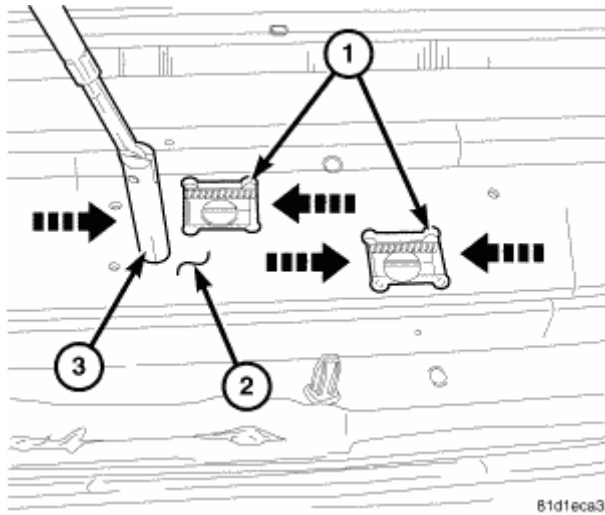


Fig. 282: Cable Guide Openings, Rail And Magnet
Courtesy of CHRYSLER LLC

4. Using a magnet (3) draw out the remaining rivet pieces through the cable guide openings (1) in the rail (2).

INSTALLATION

CABLE - RETAINER

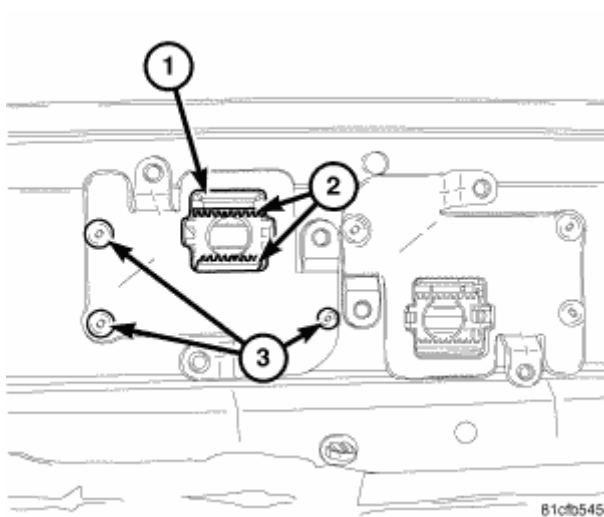


Fig. 283: Cable Retainer And Rivets
Courtesy of CHRYSLER LLC

1. Install the cable retainer (1) into the rail.
2. Install the motor mounting plate and install new rivets (3).
3. Install the drive cables (2), see **INSTALLATION**.

CABLE

REMOVAL

CABLE - TENSION

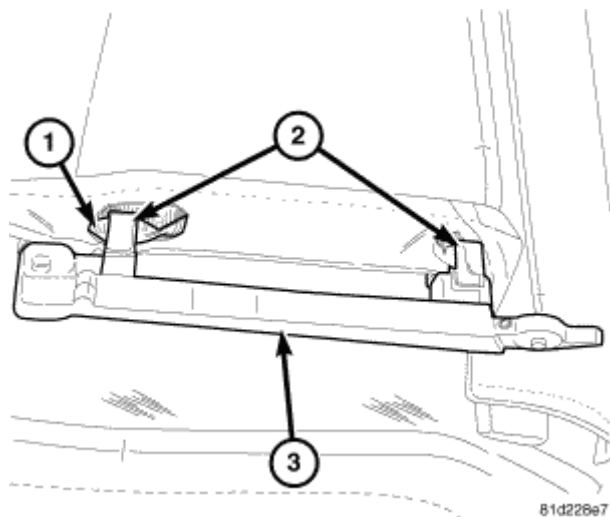


Fig. 284: Tension Cable, Hooks And Lift Arm
Courtesy of CHRYSLER LLC

1. Remove the cover assembly, see **REMOVAL**.
2. Disconnect the tension cable (1) from the hooks (2) of the lift arm (3).

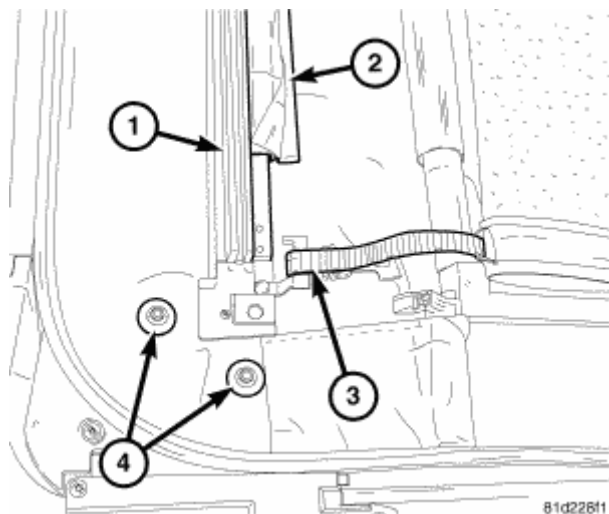


Fig. 285: Tension Cable And Header Bow
Courtesy of CHRYSLER LLC

3. Disconnect the tension cable (3) from the header bows (1) and remove the tension cable from the headliner.

INSTALLATION

CABLE - TENSION

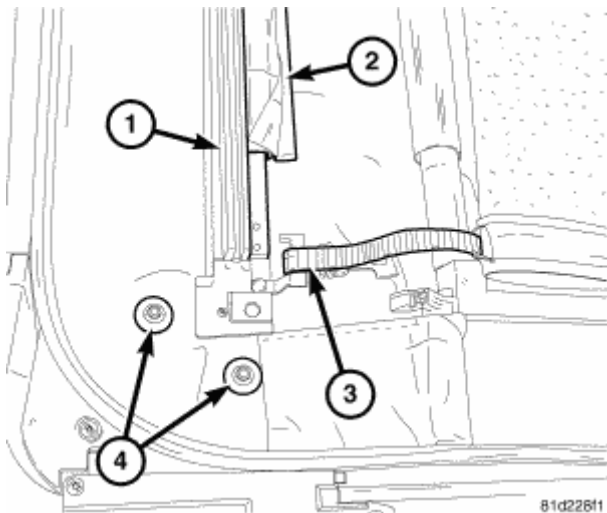


Fig. 286: Tension Cable And Header Bow
 Courtesy of CHRYSLER LLC

1. Install the tension cable (3) into the pocket along the sides of the headliner and attach the cable (3) to the header bows (1).

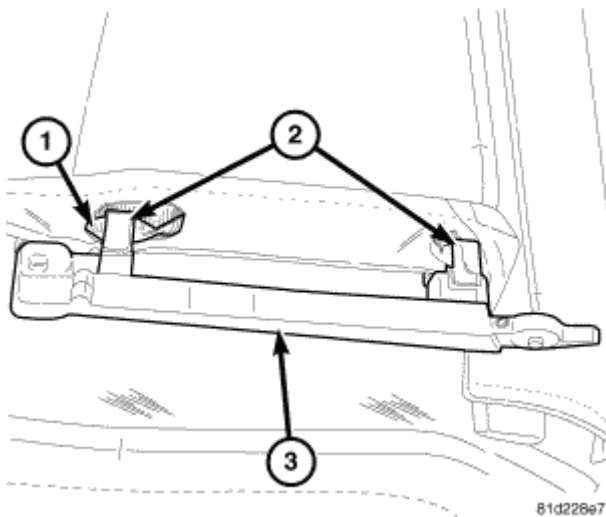


Fig. 287: Tension Cable, Hooks And Lift Arm
 Courtesy of CHRYSLER LLC

2. Attach the tension cable (1) to the hooks (2) of the lift arms (3).
3. Install the cover assembly, see **INSTALLATION**.

COUPLER

REMOVAL

COUPLER

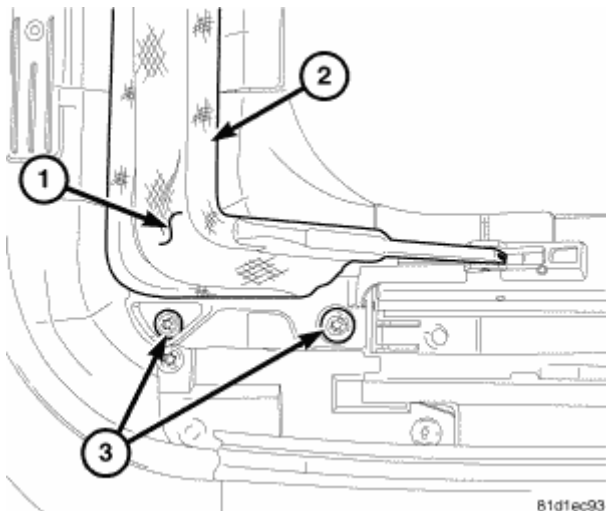


Fig. 288: Wind Deflector And Screws
Courtesy of CHRYSLER LLC

1. Remove the wind deflector (1), see **REMOVAL**.

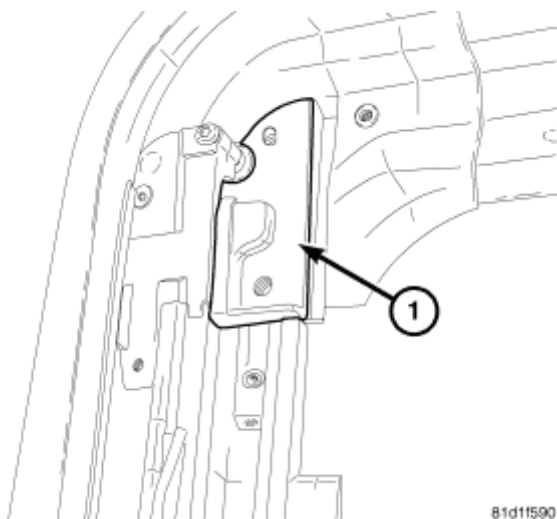
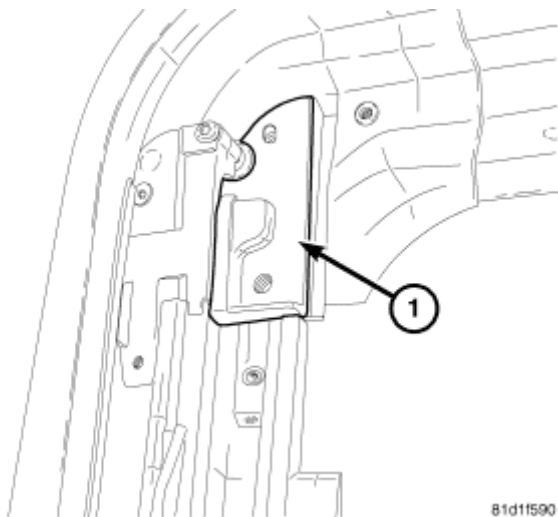


Fig. 289: Coupler
Courtesy of CHRYSLER LLC

2. Remove the coupler (1).

INSTALLATION

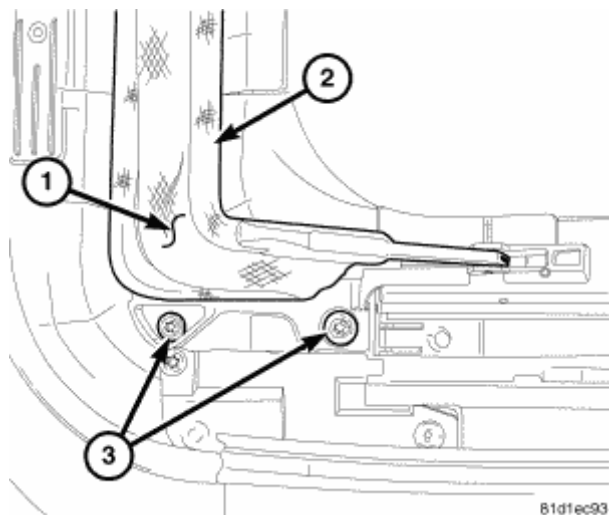
COUPLER



81d1f590

Fig. 290: Coupler
 Courtesy of CHRYSLER LLC

1. Install the coupler (1).



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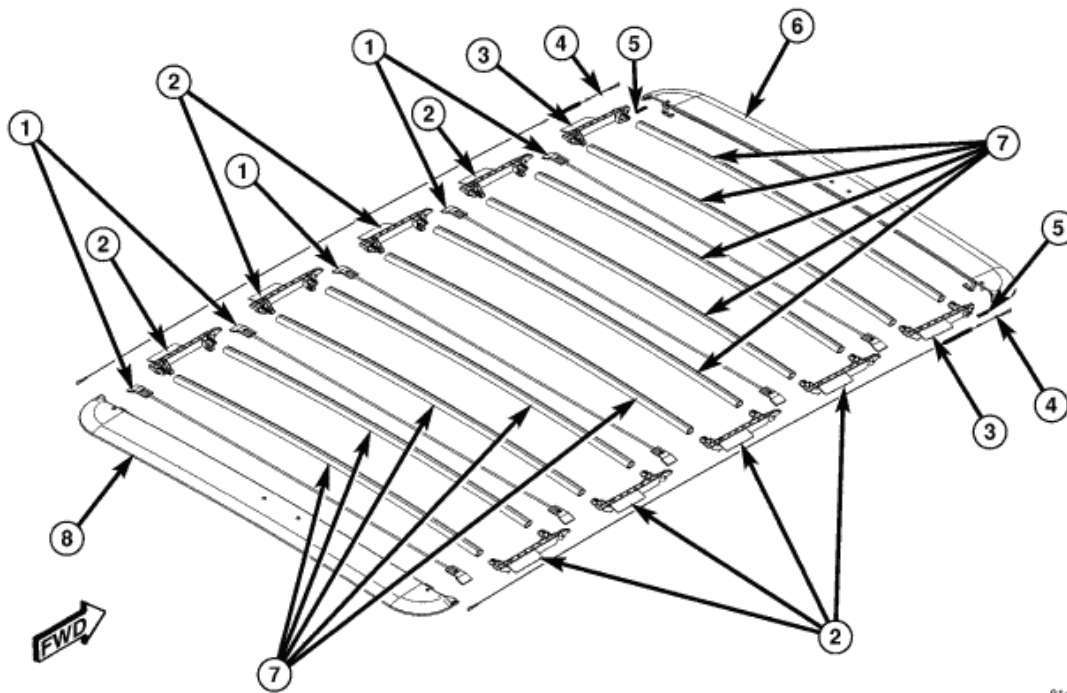
Fig. 291: Wind Deflector And Screws
 Courtesy of CHRYSLER LLC

2. Install the wind deflector (1), see **INSTALLATION**.

COVER

REMOVAL

COVER



81cfa8d9

Fig. 292: Cover Assembly
 Courtesy of CHRYSLER LLC

- 1 - HEADLINER BOWS (5)
- 2 - REAR LIFT ARMS (8)
- 3 - FRONT LIFT ARMS (2)
- 4 - TENSION CABLES (2)
- 5 - FRONT LIFT ARM COMPRESSION SPRINGS (2)
- 6 - FRONT HEADER BOW
- 7 - ROOF BOWS (10)
- 8 - REAR HEADER BOW

1. Remove the cover assembly, see **REMOVAL**.

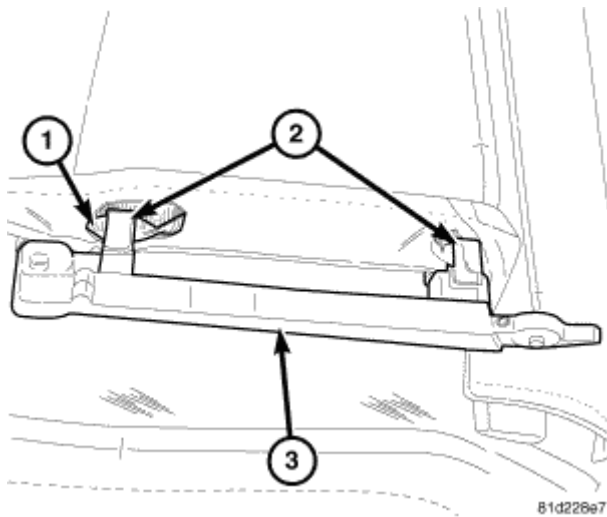


Fig. 293: Tension Cable, Hooks And Lift Arm
 Courtesy of CHRYSLER LLC

2. Disconnect the tension cables (1) from the lift arm hooks (2) along both sides.

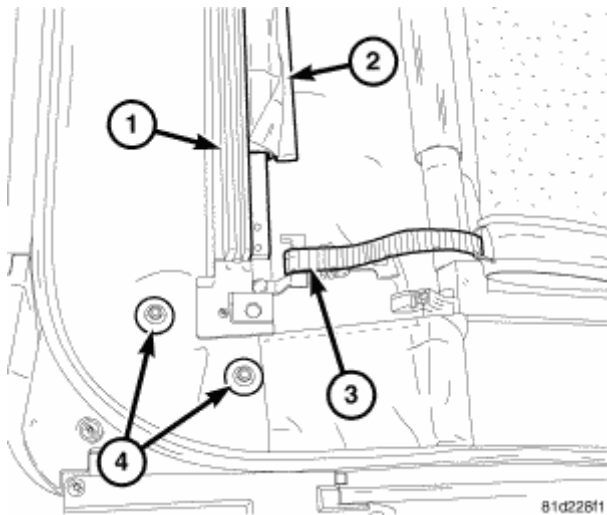
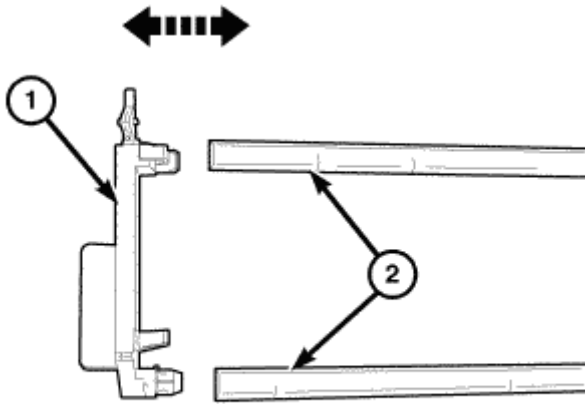


Fig. 294: Tension Cable And Header Bow
 Courtesy of CHRYSLER LLC

3. Disconnect the tension cable (3) from the header bows (1).



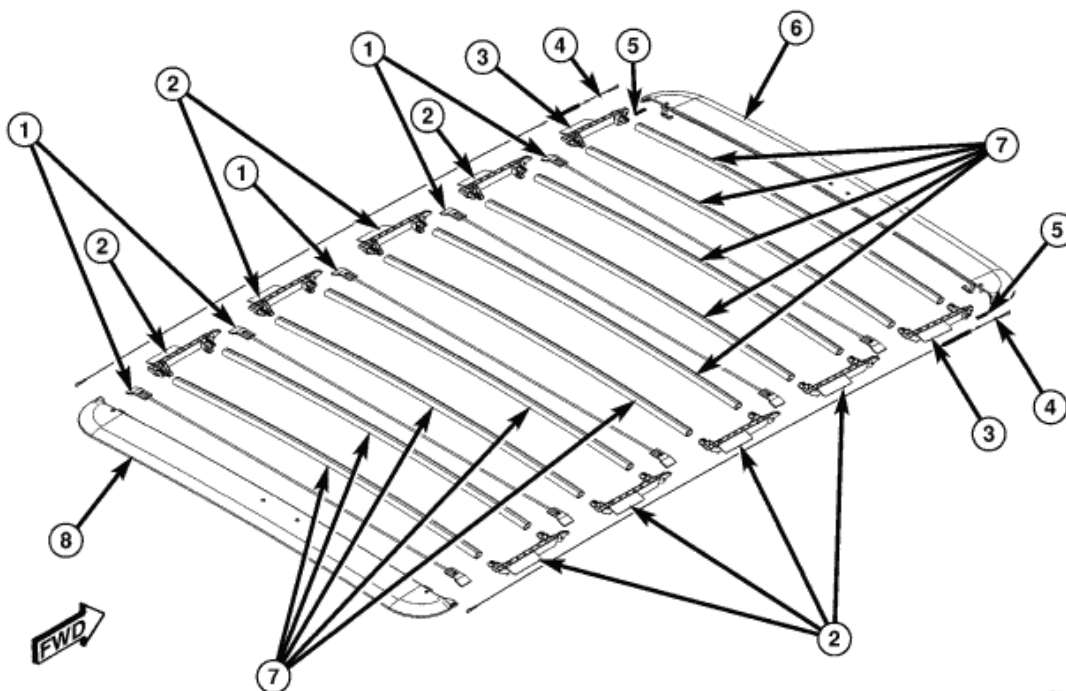
81d22934

Fig. 295: Lift Arm And Bows
Courtesy of CHRYSLER LLC

4. Grasp the bows and pull the lift arms (1) from the bows (2) along one side of the cover assembly and discard the lift arms.
5. Remove the remaining lift arms and bows and separate the cover assembly from the headliner.
6. If necessary, remove the header bows from the cover, see **REMOVAL**.

INSTALLATION

COVER

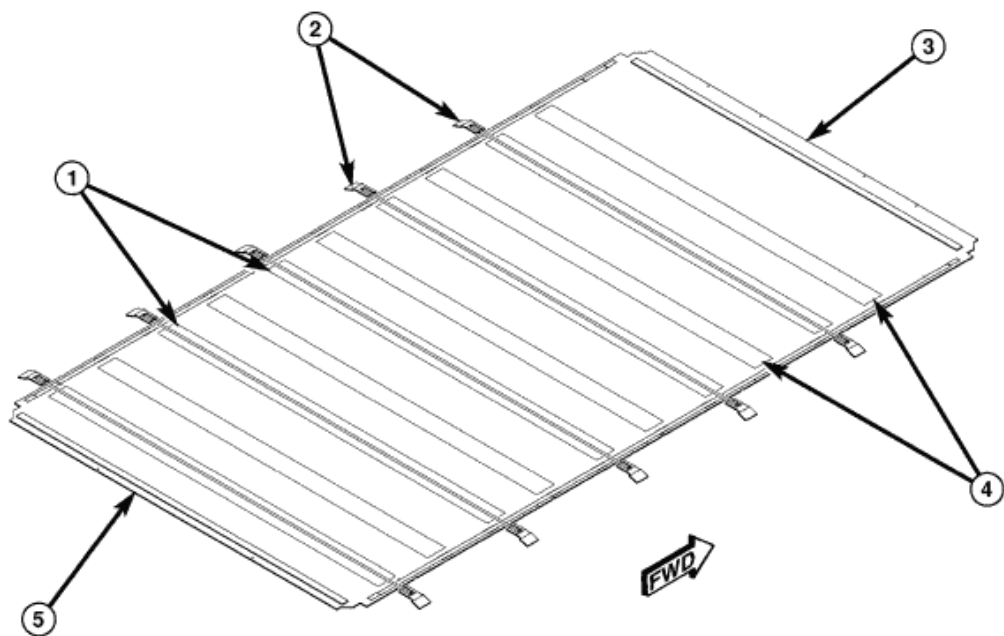


81cfa8d9

Fig. 296: Cover Assembly

- 1 - HEADLINER BOWS (5)
 - 2 - REAR LIFT ARMS (8)
 - 3 - FRONT LIFT ARMS (2)
 - 4 - TENSION CABLES (2)
 - 5 - FRONT LIFT ARM COMPRESSION SPRINGS (2)
 - 6 - FRONT HEADER BOW
 - 7 - ROOF BOWS (10)
 - 8 - REAR HEADER BOW

1. If necessary, install the header bows (6, 7), see INSTALLATION.

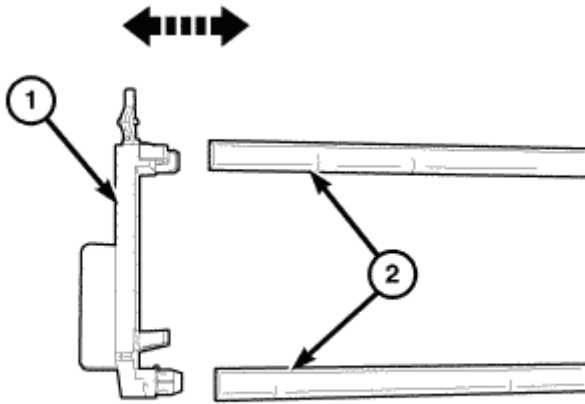


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Fig. 297: Headliner Bows And Sleeves
Courtesy of CHRYSLER LLC

- 1 - HEADLINER BOW SLEEVES
 - 2 - HEADLINER BOWS
 - 3 - FRONT OF HEADLINER
 - 4 - COVER BOW SLEEVES
 - 5 - REAR OF HEADLINER

- 2. Install the headliner bows (2) in the correct sleeves (1).
- 3. Position the cover assembly top down on a bench and position the headliner onto the cover.



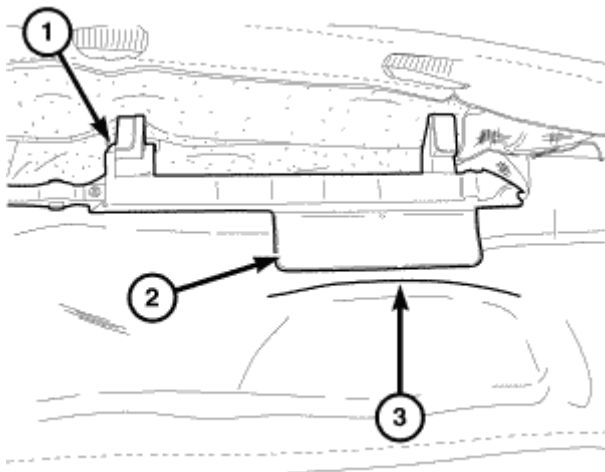
81d22934

Fig. 298: Lift Arm And Bows
Courtesy of CHRYSLER LLC

4. Place the lift arms and bows into the bow sleeves.

NOTE: Always install new lift arms (1) when they have been separated from the bows (2).

5. Using a bar clamp or plastic hammer, install new lift arms (1) onto the bows (2) and seat fully.



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Fig. 299: Lift Arm Support Tabs And The Cover Pockets
Courtesy of CHRYSLER LLC

6. Insert the lift arm support tabs (2) into the cover pockets (3).

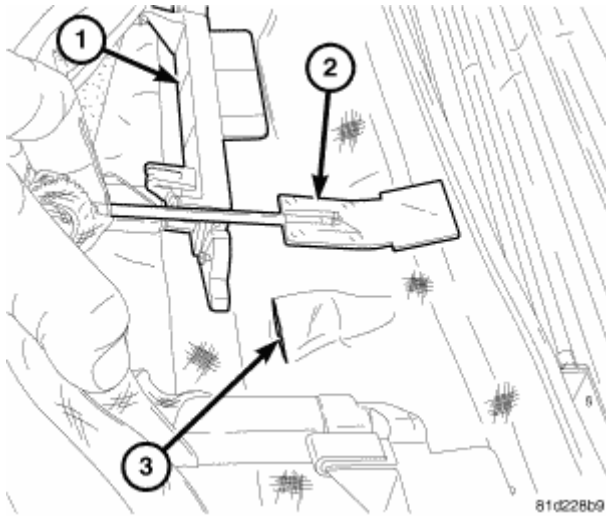


Fig. 300: Headliner Bow And Cover Pocket
 Courtesy of CHRYSLER LLC

7. Insert the headliner bows (2) into the cover pockets (3).

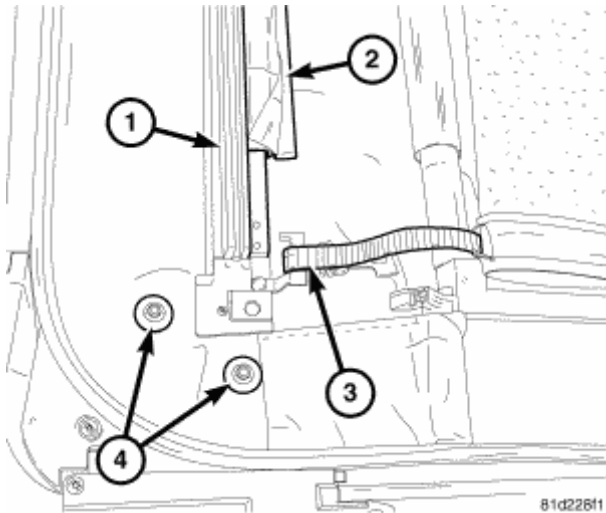


Fig. 301: Tension Cable And Header Bow
 Courtesy of CHRYSLER LLC

8. Connect the tension straps (3) to the hooks on the header bows (1).

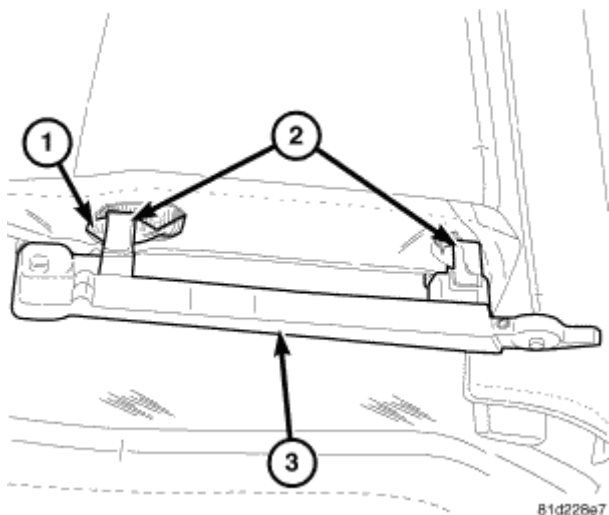


Fig. 302: Tension Cable, Hooks And Lift Arm
 Courtesy of CHRYSLER LLC

9. Connect the tension cables (1) to the lift arm hooks (2) along both sides.
10. Install the cover assembly, see **INSTALLATION**.

COVER ASSEMBLY

REMOVAL

COVER ASSEMBLY

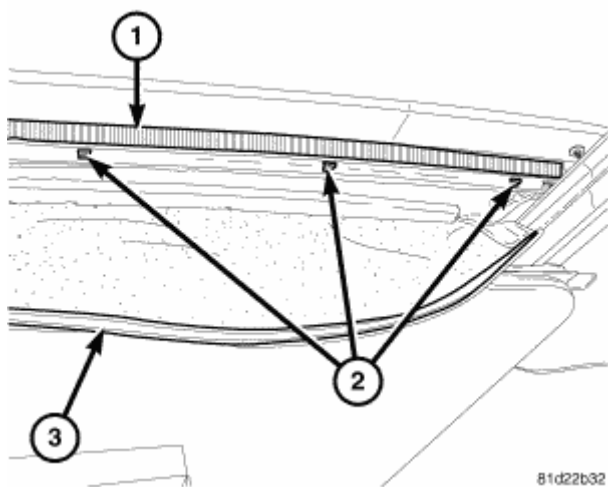


Fig. 303: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

1. Open the front drive assembly about 300 mm (12 inches).
2. Separate the headliner hook and loop strip (3) and expose the drive mechanism (1).
3. Remove the five screws (2) and separate the cover assembly from the front drive (1).

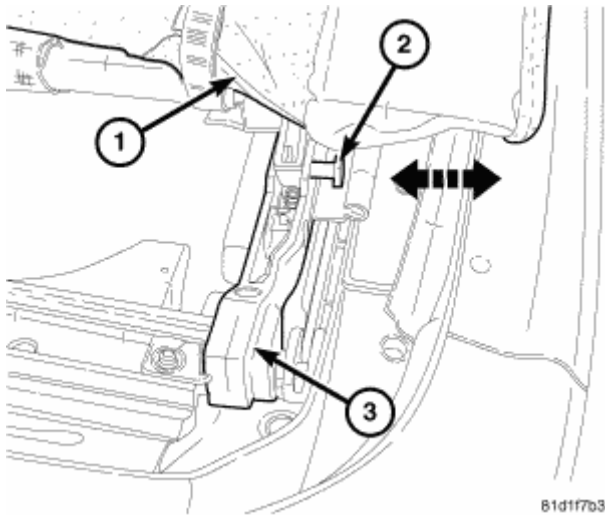


Fig. 304: Nylon Pins, Cover Assembly And Drive Assembly Cap
 Courtesy of CHRYSLER LLC

4. Move the front drive forward to gain access to the nylon pin (2).
5. Carefully remove the two nylon pins (2) and separate the cover assembly (1) from the drive assembly cap (3).

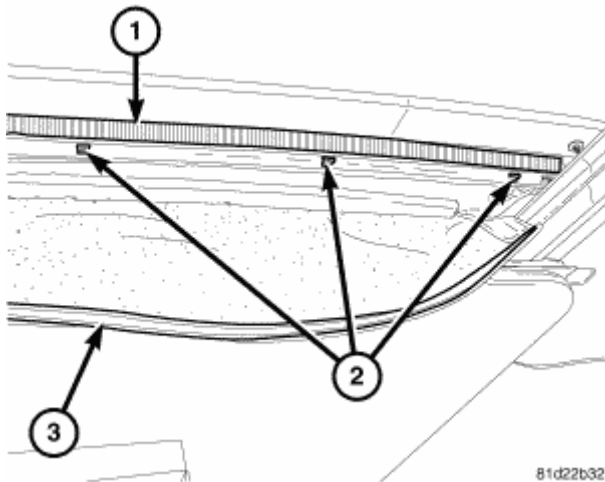


Fig. 305: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

6. Manually open the rear drive assembly about 300 mm (12 inches), see **STANDARD PROCEDURE**.
7. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
8. Remove the five screws (2) and separate the cover assembly from the drives (1).

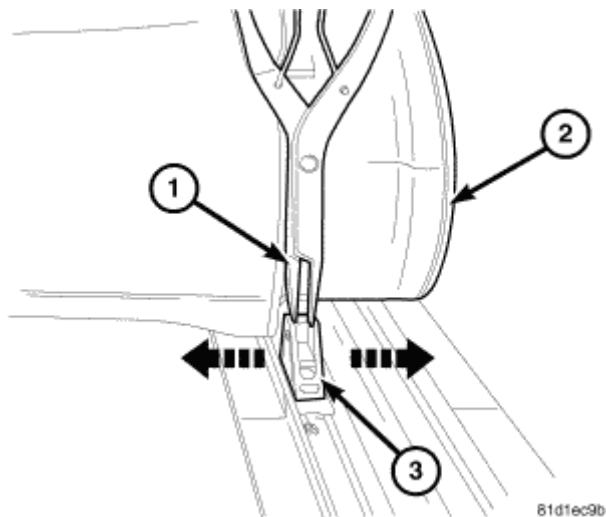


Fig. 306: Lift Arms And Sliders
 Courtesy of CHRYSLER LLC

9. Starting at the front, separate the lift arms from the sliders and remove the top assembly.

INSTALLATION

COVER ASSEMBLY

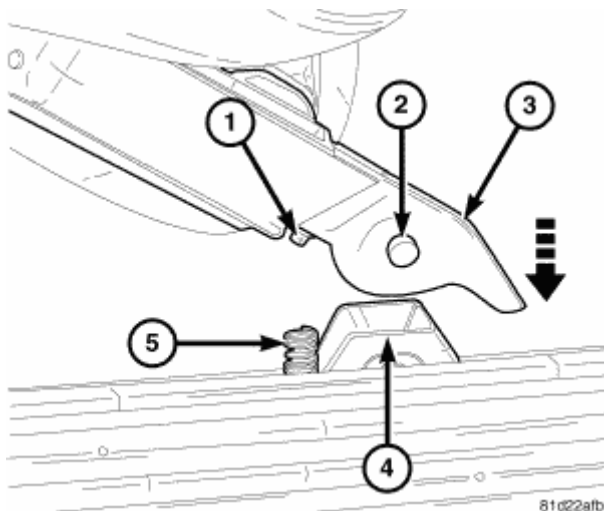


Fig. 307: Lift Arm, Locators, Rear Sliders And Pins
 Courtesy of CHRYSLER LLC

1. Place the top assembly onto a clean surface top up and roll up from front to back to aid installation.
2. Position the cover assembly onto the roof.
3. Starting at the rear position the cover assembly over the rear sliders (4).
4. Position the springs so that they engage with the locators (1) on the lift arms (3).
5. Fully seat the lift arm pins (2) into the sliders (4).
6. Repeat steps 3 through 5 for the remaining lift arms.

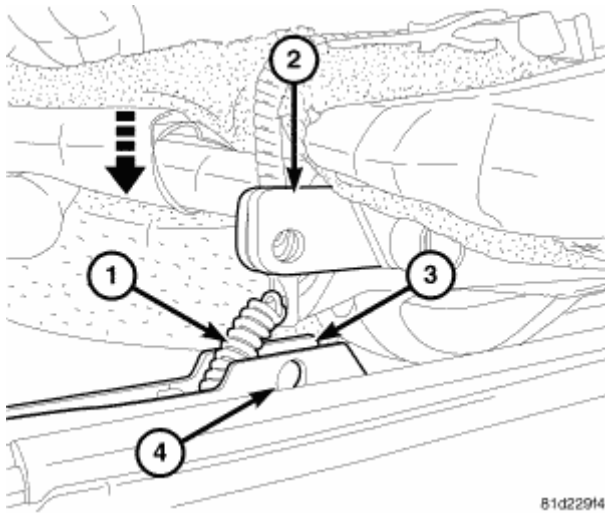


Fig. 308: Lift Arm, Drive Assembly, Compression Spring And Hole
 Courtesy of CHRYSLER LLC

7. Position the forward lift arm (2) over the front drive assembly (3) and install the compression spring (1).
8. Lower the lift arm (2) and line up the hole in the lift arm with the hole (4) in the front drive assembly (3).

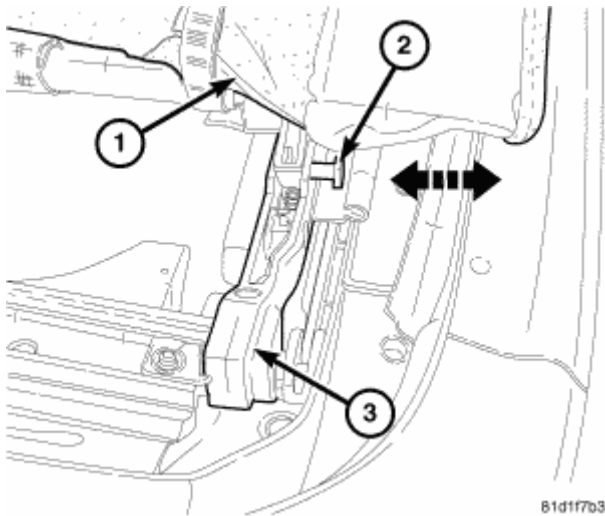


Fig. 309: Nylon Pins, Cover Assembly And Drive Assembly Cap
 Courtesy of CHRYSLER LLC

9. Insert the nylon pin (2) with the slot in the end in the horizontal position.
10. Seat the pin (2) fully.
11. Manually position the front and rear drive assemblies about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.

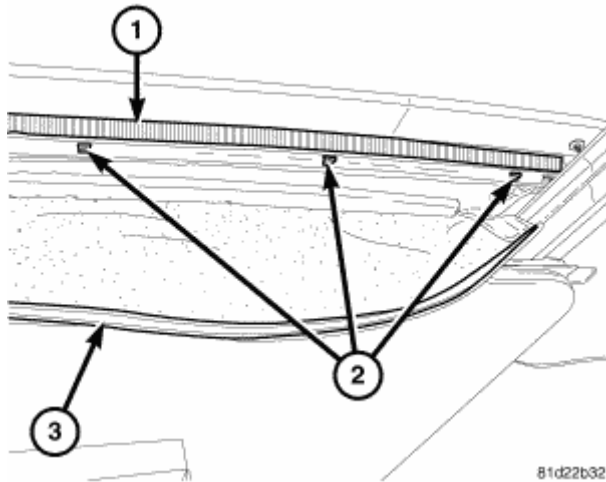


Fig. 310: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

12. Position the rear of the cover down over the rear drive (1) and seat fully.
13. Install the five screws (2).
14. Line up the headliner (3) center notch with the center screw (2) and seat the headliner hook and loop strip (3) fully.
15. Position the front of the cover down over the front drive assembly and seat fully.
16. Install the five screws (2), and seat the headliner hook and loop strip (3) fully.
17. Re-initialize ECU, see **STANDARD PROCEDURE**.

DRIVE ASSEMBLY

REMOVAL

DRIVE ASSEMBLY - FRONT

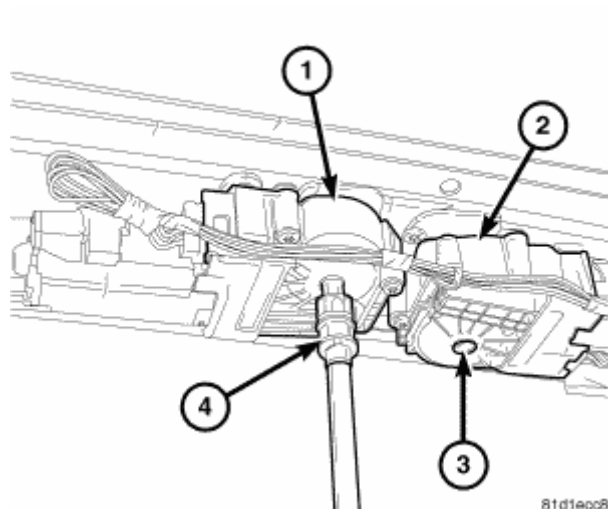
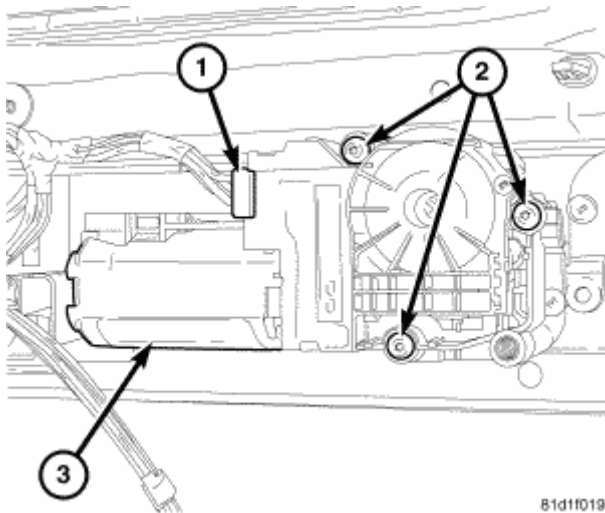


Fig. 311: Rear Drive Motor, Front Drive Motor, Drive Axle And Hex Socket

- 1 - REAR DRIVE MOTOR
- 2 - FRONT DRIVE MOTOR
- 3 - DRIVE AXLE LOCATION
- 4 - 6 mm HEX SOCKET

1. Drop headliner down as needed to gain access to the motors, see **REMOVAL**.
2. Disconnect the module electrical connector.
3. Manually position the front drive assembly about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.



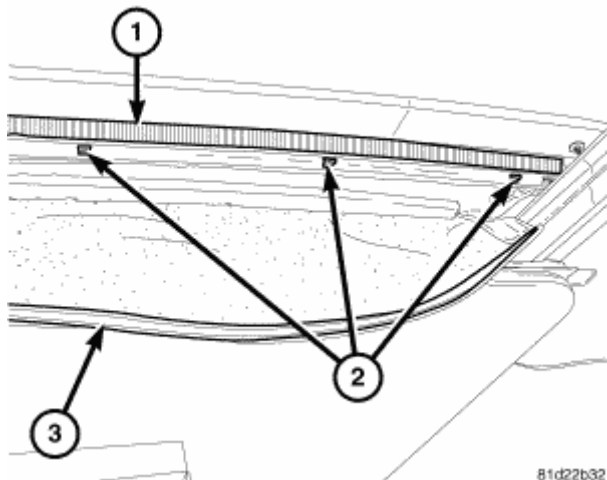
81d1f019

Fig. 312: Front Motor, Screws And Electrical Connector
Courtesy of CHRYSLER LLC

4. Remove the three screws (2) and separate the front motor (3) from the roof system.

NOTE: Discard the screws (2) and replace with service screws and washers.

5. Disconnect the electrical connector (1) and remove the motor.



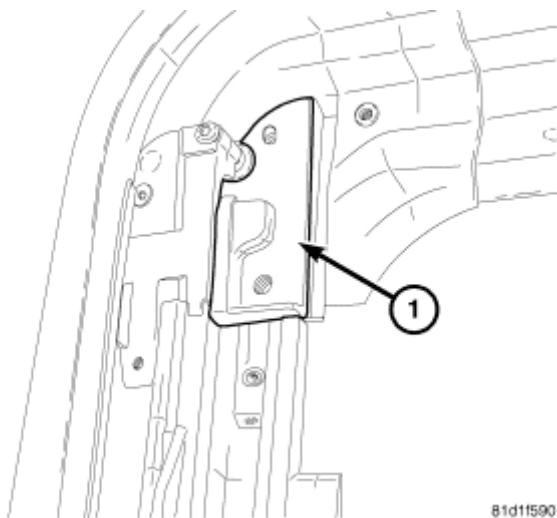
81d22b32

Fig. 313: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

6. Manually position the front bow and drive assembly (1) back about 300 mm (12 inches).

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

7. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
8. Remove the five screws (2) and separate the cover assembly from the drive (1).



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Fig. 314: Coupler
 Courtesy of CHRYSLER LLC

9. Remove the wind deflector, see **REMOVAL**.
10. Remove the couplers (1).

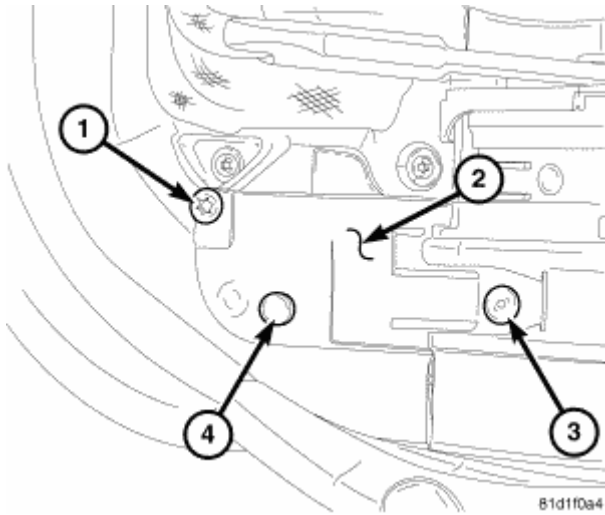


Fig. 315: Front Cam Plate
Courtesy of CHRYSLER LLC

11. Remove the front cam plates (2), see **REMOVAL**.

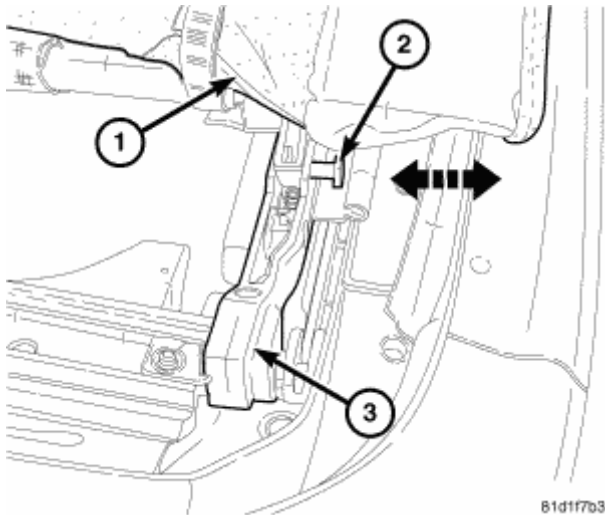


Fig. 316: Nylon Pins, Cover Assembly And Drive Assembly Cap
Courtesy of CHRYSLER LLC

12. Move the front drive forward to gain access to the nylon pin (2).
13. Carefully remove the two nylon pins (2) and separate the cover assembly (1) from the drive assembly cap (3).
14. Remove the nylon push pins (2).

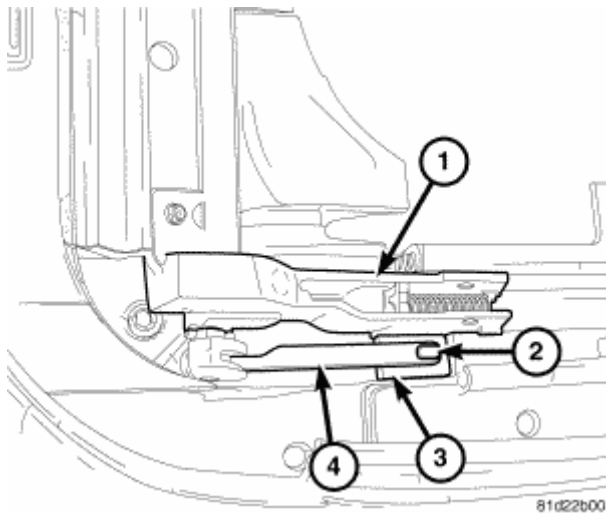


Fig. 317: Drive Link And Drive Assembly
Courtesy of CHRYSLER LLC

15. Disconnect the drive link (4) and remove the drive assembly (1).
16. Pull cables out slightly.

INSTALLATION

DRIVE ASSEMBLY - FRONT

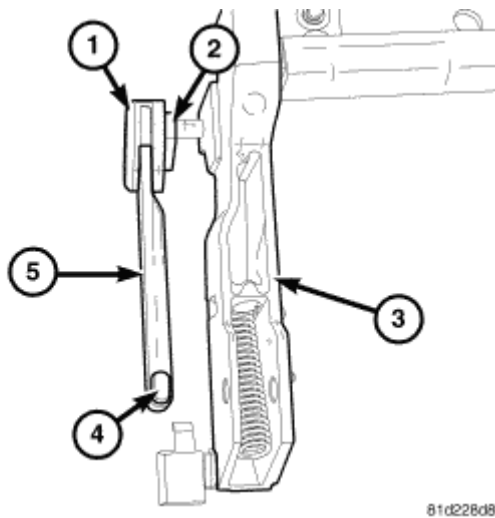


Fig. 318: Bevel, Tear Drop, Front Drive End Cap, Nylon Button And Drive Link
Courtesy of CHRYSLER LLC

- 1 - BEVEL
- 2 - TEAR DROP
- 3 - FRONT DRIVE END CAP
- 4 - NYLON BUTTON
- 5 - DRIVE LINK

1. Install the drive links (5) onto the drive assembly end caps (4) with the tear drops (2) toward the caps (3), the bevels (1) out and the nylon buttons (4) up.

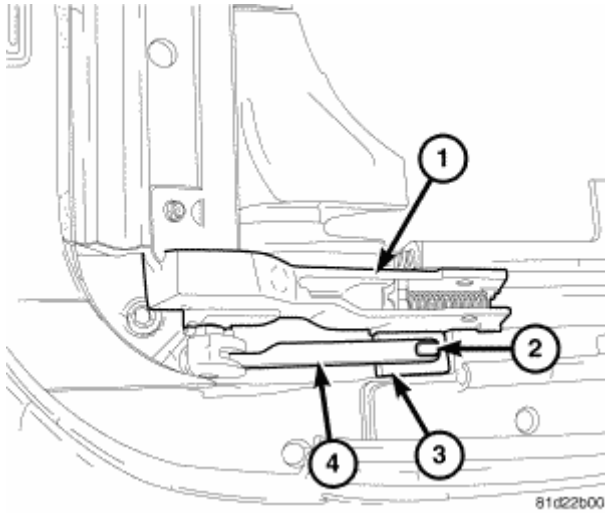


Fig. 319: Drive Link And Drive Assembly
Courtesy of CHRYSLER LLC

2. Push the drive cables into the tracks leaving the hole in the cable end (3) exposed.

NOTE: It may be necessary to twist the cables while pushing to fully install the cables.

3. Insert the rear of the drive assembly (1) into the drive channel.
4. Connect the drive links (4) to the drive cable ends (3) and make sure that the nylon buttons (2) are facing up.

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

5. Push the drive assembly back into the tracks.

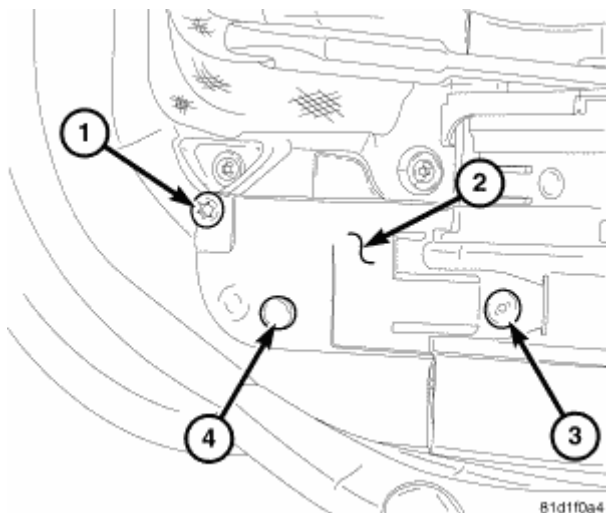


Fig. 320: Front Cam Plate
 Courtesy of CHRYSLER LLC

6. Install the cam plates (2), see INSTALLATION.

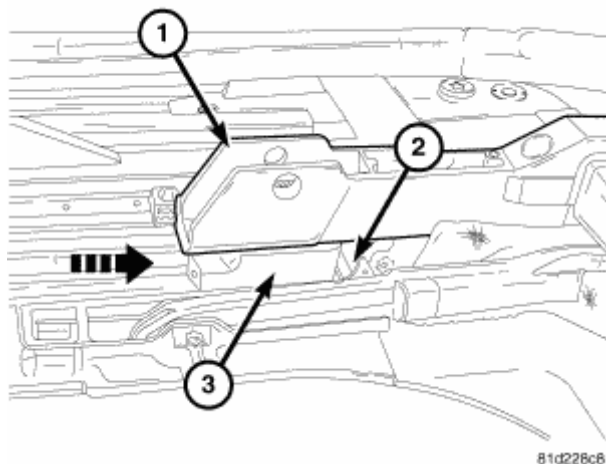


Fig. 321: Front Drive Assembly, Cable Ends And Frame
 Courtesy of CHRYSLER LLC

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

7. Manually push the front drive assembly (1) fully forward.
8. Using a small screwdriver or equivalent, make sure the cable ends (3) are in contact with the frame (2).

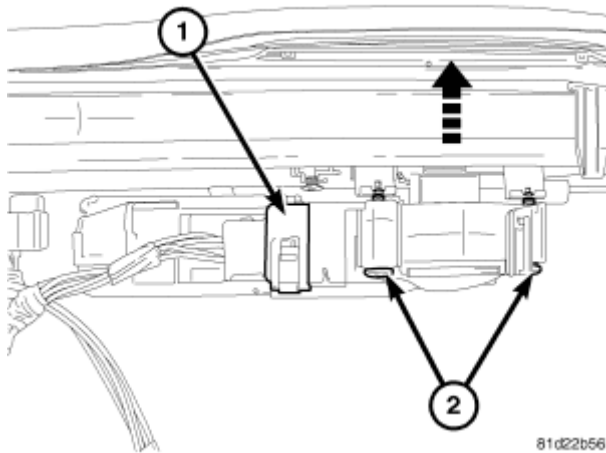


Fig. 322: Front Drive Motor And Screws
Courtesy of CHRYSLER LLC

9. Position the front drive motor (1) up onto the motor mounting plate.

CAUTION: Do not install the motor using any twisting motion. Always install the motor straight and use the screws to draw the drive gear into the drive cables.

NOTE: When ever the motors are removed, the screws (2) need to be discarded and replaced with new service screws and washers.

10. Install new motor screws (2) and draw the motor evenly using the motor screws.
11. Connect the electrical connector.

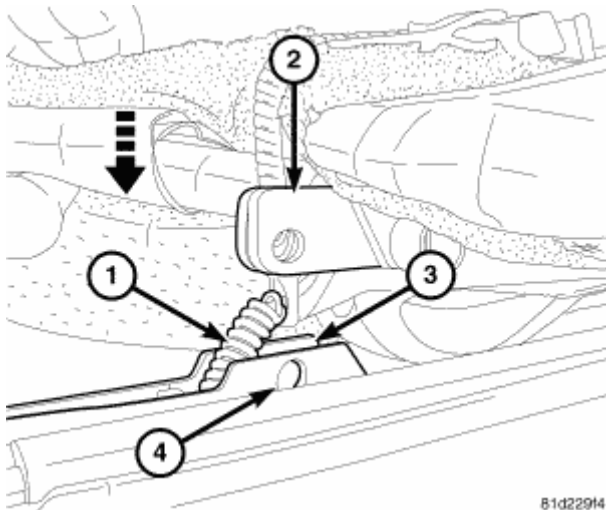


Fig. 323: Lift Arm, Drive Assembly, Compression Spring And Hole
Courtesy of CHRYSLER LLC

12. Position the forward lift arm (2) over the front drive assembly (3) and install the compression spring (1).
13. Lower the lift arm (2) and line up the hole in the lift arm with the hole (4) in the front drive assembly (3).

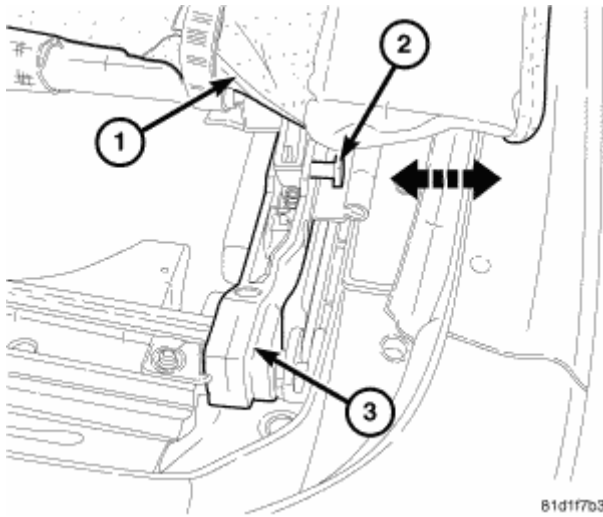


Fig. 324: Nylon Pins, Cover Assembly And Drive Assembly Cap
Courtesy of CHRYSLER LLC

14. Insert the nylon pin (2) with the slot in the end in the horizontal position.
15. Seat the pin (2) fully.
16. Manually position the front and rear drive assemblies about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.

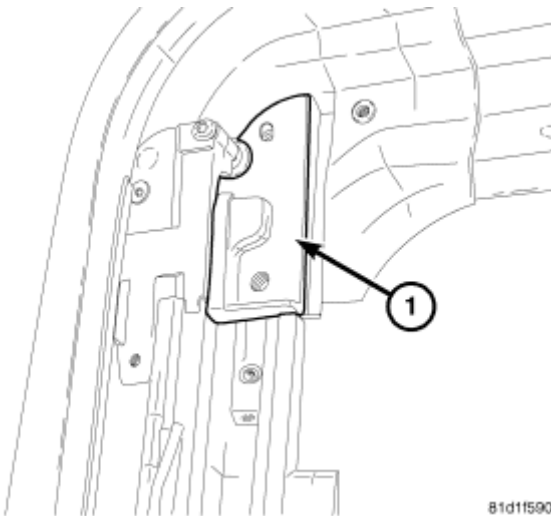


Fig. 325: Coupler
Courtesy of CHRYSLER LLC

17. Install the couplers (1).
18. Install the wind deflector, see **INSTALLATION**.

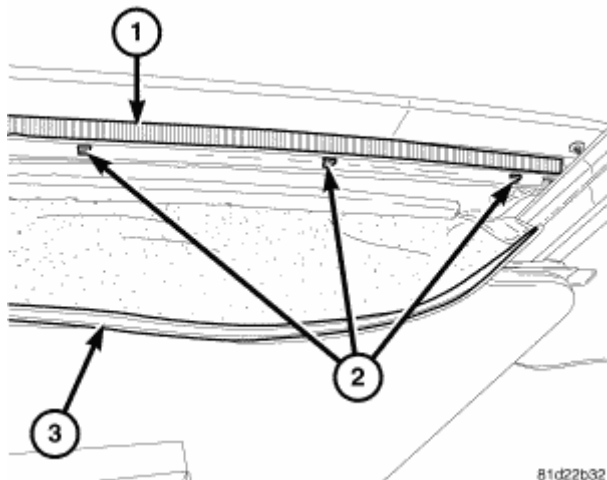


Fig. 326: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

19. Position the front of the cover down over the front drive assembly and seat fully.
20. Install the five screws (2), and seat the headliner hook and loop strip (3) fully.
21. Connect the large ECU electrical connector.
22. Install the headliner, see **INSTALLATION**.
23. Re-initialize ECU, see **STANDARD PROCEDURE**.

DRIVE ASSEMBLY

REMOVAL

DRIVE ASSEMBLY - REAR

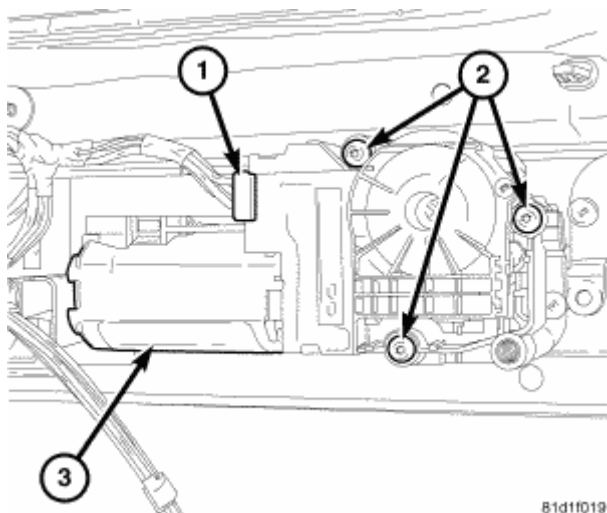


Fig. 327: Front Motor, Screws And Electrical Connector
 Courtesy of CHRYSLER LLC

1. Remove the front drive assembly, see **REMOVAL**.
2. Remove the three screws (2) and separate the rear motor (3) from the roof system.

NOTE: Discard the screws (2) and replace with service screws and washers.

3. Disconnect the electrical connector (1) and remove the motor.

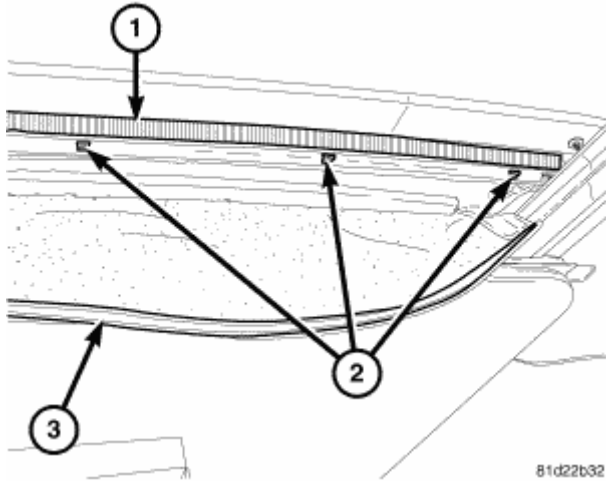


Fig. 328: Drive Mechanism, Loop Strip And Screws
Courtesy of CHRYSLER LLC

4. Manually position the rear bow and drive assembly (1) forward about 300 mm (12 inches).

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

5. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
6. Remove the five screws (2) and separate the cover assembly from the drive (1).

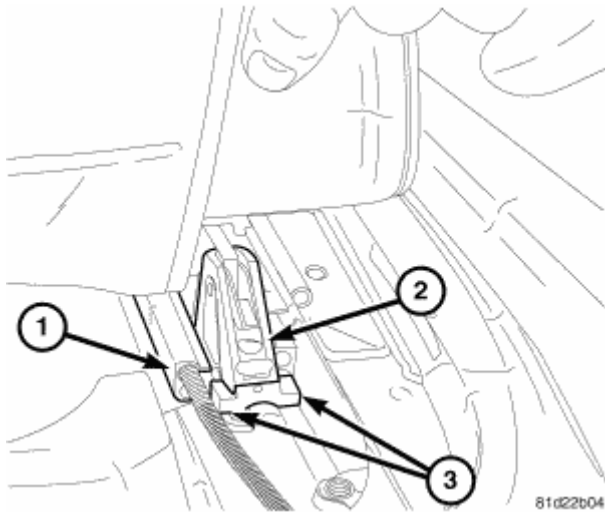


Fig. 329: Slider Assembly
 Courtesy of CHRYSLER LLC

7. Slide the cover and slider assembly (2) out of the front of the tracks and roll up backwards as you go.
8. Remove the cover assembly from the vehicle.
9. Slide drive assembly forward and remove.
10. Pull cables out slightly.

INSTALLATION

DRIVE ASSEMBLY - REAR

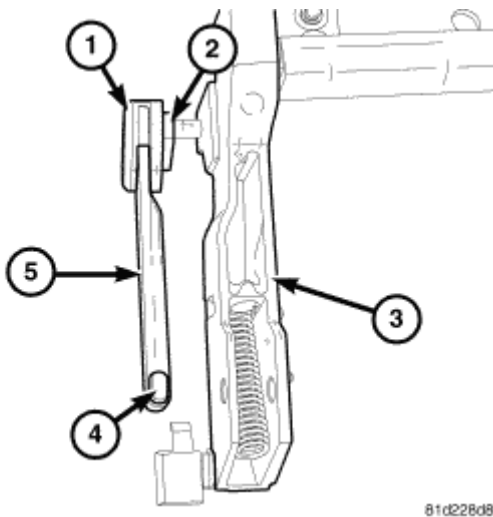


Fig. 330: Bevel, Tear Drop, Front Drive End Cap, Nylon Button And Drive Link
 Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - BEVEL |
| 2 - TEAR DROP |
| 3 - FRONT DRIVE END CAP |

4 - NYLON BUTTON

5 - DRIVE LINK

NOTE: Front drive assembly shown, rear drive assembly similar.

1. Install the drive links (5) onto the drive assembly end caps (4) with the tear drops (2) toward the caps (3), the bevels (1) out and the nylon buttons (4) up.

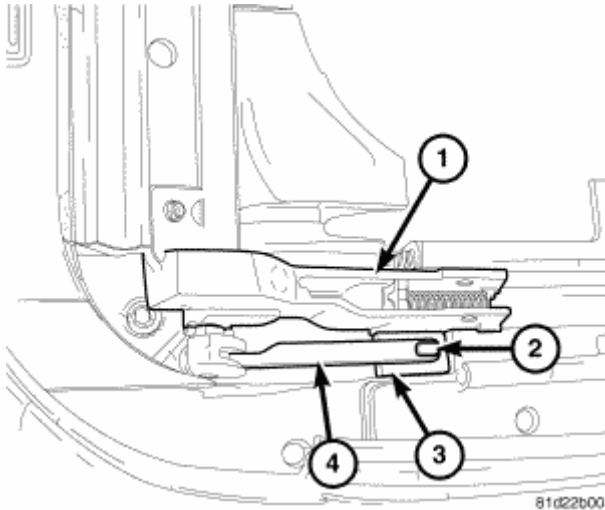


Fig. 331: Drive Link And Drive Assembly
Courtesy of CHRYSLER LLC

NOTE: Front drive assembly shown, rear drive assembly similar.

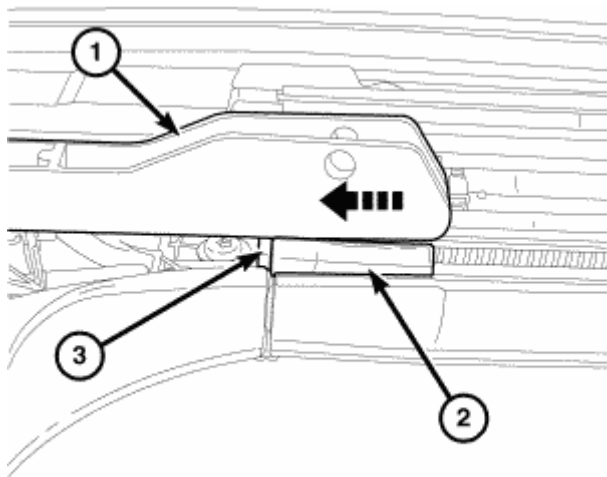
2. Push the drive cables into the tracks leaving the hole in the cable end (3) exposed.

NOTE: It may be necessary to twist the cables while pushing to fully install the cables.

3. Insert the rear of the drive assembly (1) into the drive channel.
4. Connect the drive links (4) to the drive cable ends (3) and make sure that the nylon buttons (2) are facing up.

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

5. Push the drive assembly back into the tracks.

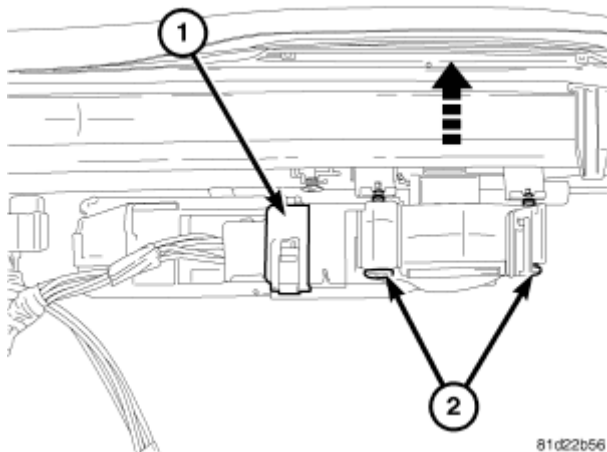


81d228dc

Fig. 332: Rear Drive Assembly, Cable Ends And Frame
Courtesy of CHRYSLER LLC

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

6. Manually push the rear drive assembly (1) rearward fully.
7. Using a small screwdriver or equivalent, make sure the cable ends (2) are in contact with the frame (3).



81d22b56

Fig. 333: Front Drive Motor And Screws
Courtesy of CHRYSLER LLC

8. Position the rear drive motor (1) up onto the motor mounting plate.

CAUTION: Do not install the motor using any twisting motion. Always install the motor straight and use the screws to draw the drive gear into the drive cables.

NOTE: When ever the motors are removed, the screws (2) need to be discarded and replaced with new service screws and washers.

9. Install the motor screws (2) and draw the motor up evenly using the motor screws.
10. Connect the electrical connector.

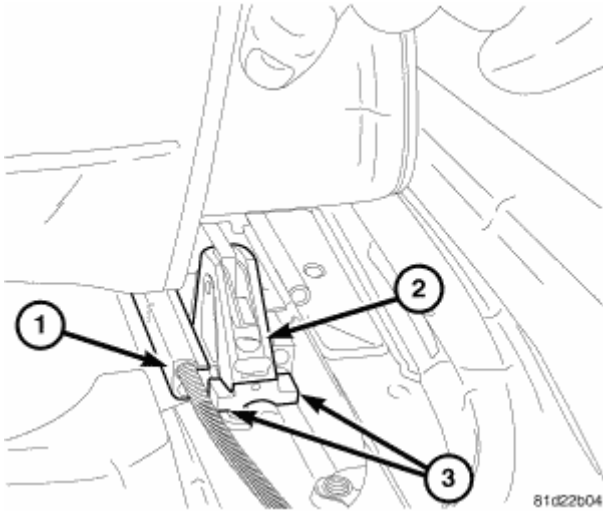


Fig. 334: Slider Assembly
Courtesy of CHRYSLER LLC

11. Clean the tracks (1), see **STANDARD PROCEDURE**.

NOTE: Apply 5 grams of Nyogel 729F Grease to the drive track only (3).

12. Install the top assembly and sliders (2) back to front into the tracks (1) and slide back unrolling the top as you proceed.

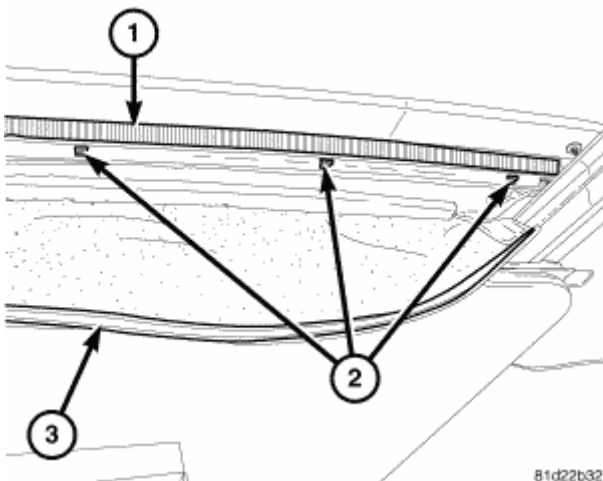


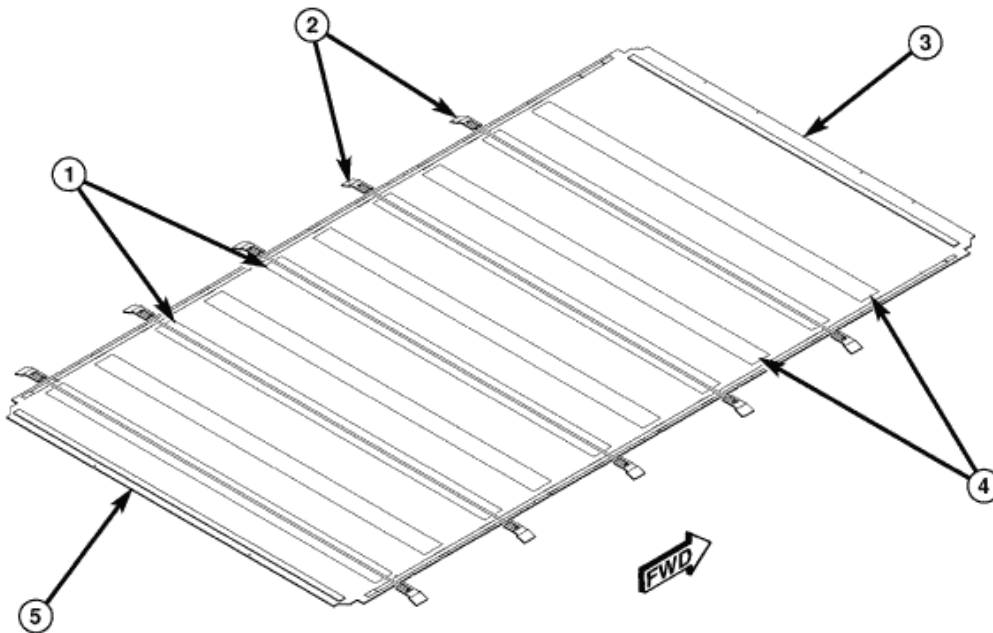
Fig. 335: Drive Mechanism, Loop Strip And Screws
Courtesy of CHRYSLER LLC

13. Manually position the rear drive assembly about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.
14. Position the rear of the cover down over the rear drive (1) and seat fully.
15. Install the five screws (2).
16. Line up the headliner (3) center notch with the center screw (2) and seat the headliner hook and loop strip (3) fully.
17. Install the front drive assembly, see **INSTALLATION**.

HEADLINER

REMOVAL

HEADLINER



81ctb01e

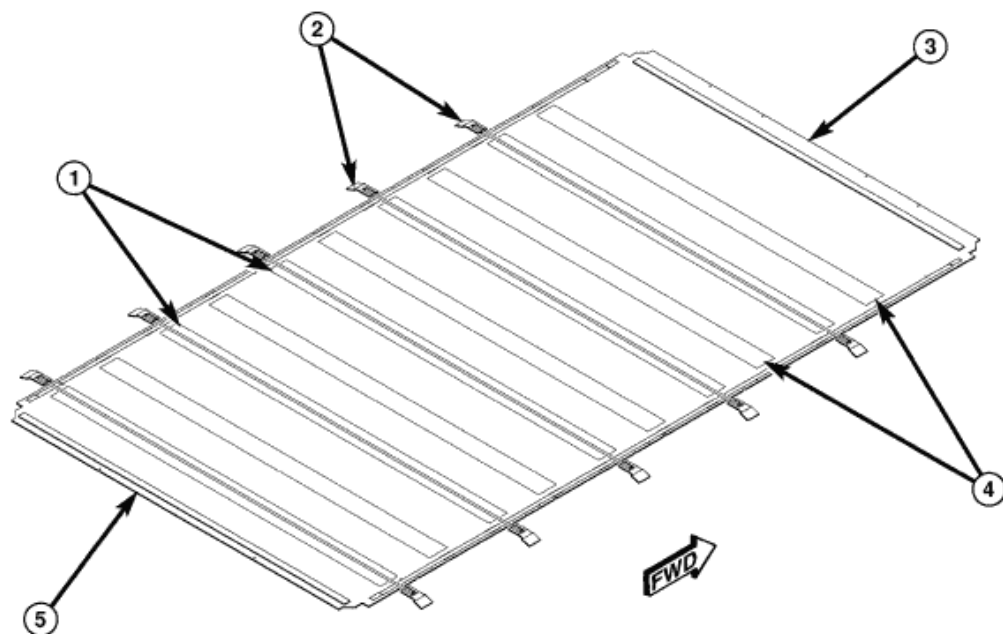
Fig. 336: Headliner Bows And Sleeves
Courtesy of CHRYSLER LLC

- | |
|---------------------------|
| 1 - HEADLINER BOW SLEEVES |
| 2 - HEADLINER BOWS |
| 3 - FRONT OF HEADLINER |
| 4 - COVER BOW SLEEVES |
| 5 - REAR OF HEADLINER |

1. Remove the cover, see **REMOVAL**.
2. Remove the headliner bows (2) and the tension cables from the headliner.

INSTALLATION

HEADLINER



81cfb01e

Fig. 337: Headliner Bows And Sleeves
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - HEADLINER BOW SLEEVES
2 - HEADLINER BOWS
3 - FRONT OF HEADLINER
4 - COVER BOW SLEEVES
5 - REAR OF HEADLINER |
|---|

1. Install the headliner bows (2) in the correct sleeves (1).
2. Install the tension cables.
3. Install the cover, see **INSTALLATION**.

LIFT ARM AND BOW ASSEMBLY

REMOVAL

LIFT ARM AND BOW ASSEMBLY

Description

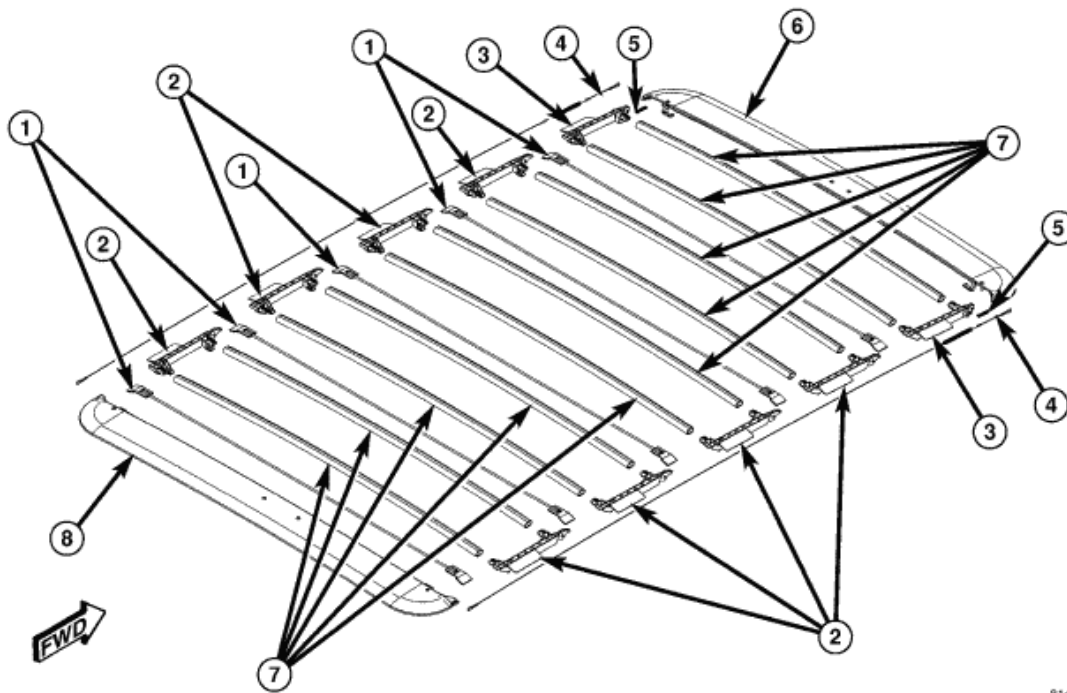
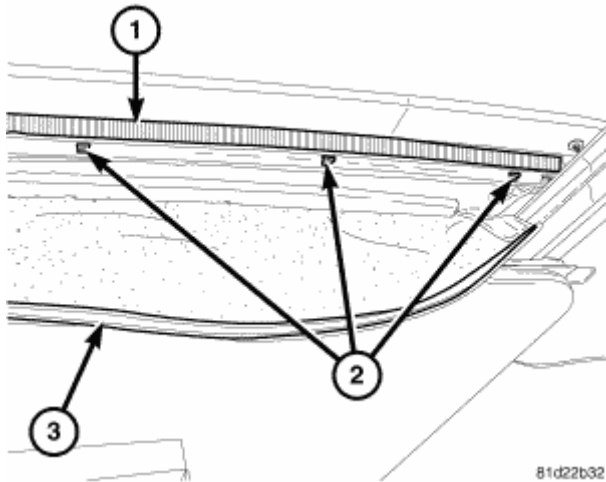


Fig. 338: Cover Assembly
Courtesy of CHRYSLER LLC

- 1 - HEADLINER BOWS (5)
- 2 - REAR LIFT ARMS (8)
- 3 - FRONT LIFT ARMS (2)
- 4 - TENSION CABLES (2)
- 5 - FRONT LIFT ARM COMPRESSION SPRINGS (2)
- 6 - FRONT HEADER BOW
- 7 - ROOF BOWS (10)
- 8 - REAR HEADER BOW

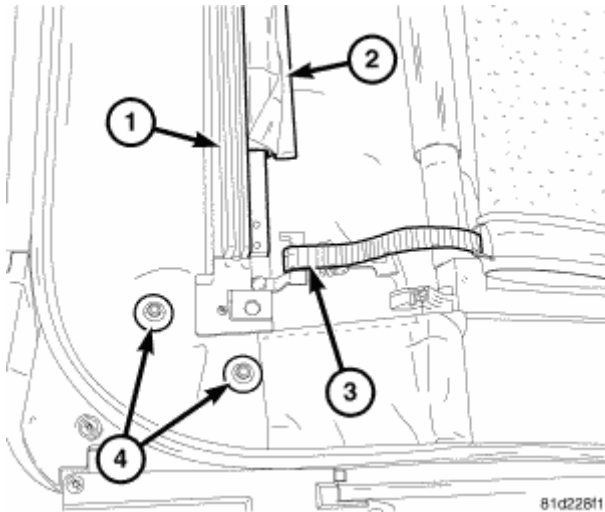
Header Bows



81d22b32

Fig. 339: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

1. Open the front drive assembly about 300 mm (12 inches).
2. Separate the headliner hook and loop strip (3) and expose the drive mechanism (1).
3. Remove the five screws (2) and separate the cover assembly from the front drive (1).



81d22b11

Fig. 340: Tension Cable And Header Bow
 Courtesy of CHRYSLER LLC

4. Disconnect the tension cable (3) from the header bows (1).
5. Remove and discard the push nuts (4).
6. Carefully release the mesh strap (2) from the header bow (1) two sided tape and remove the header bow from the cover assembly.

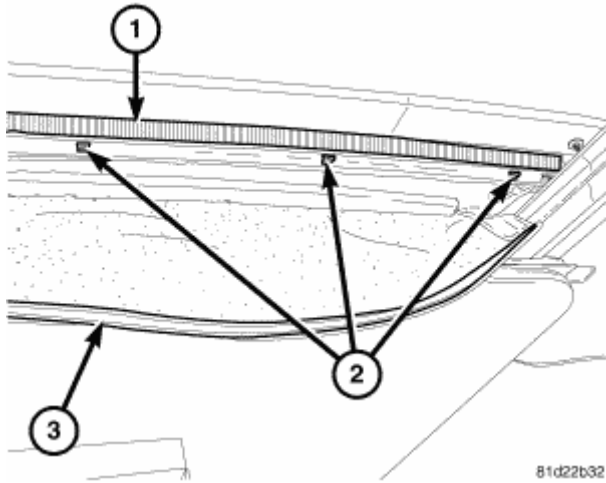


Fig. 341: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

1. Open the front drive assembly about 300 mm (12 inches).
2. Separate the headliner hook and loop strip (3) and expose the drive mechanism (1).
3. Remove the five screws (2) and separate the cover assembly from the front drive (1).

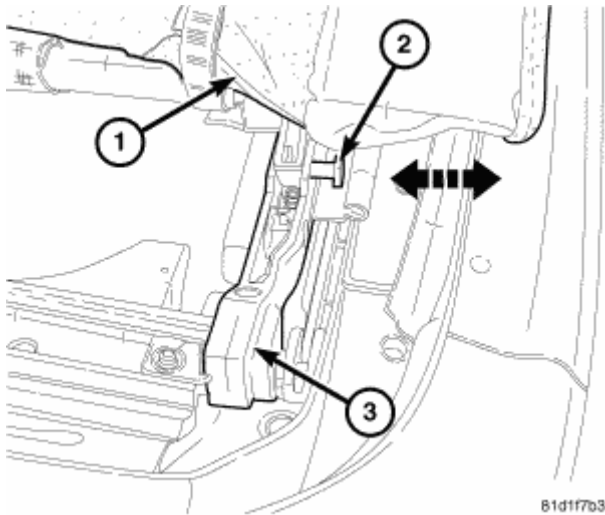


Fig. 342: Nylon Pins, Cover Assembly And Drive Assembly Cap
 Courtesy of CHRYSLER LLC

4. Move the front drive forward to gain access to the nylon pin (2).
5. Carefully remove the two nylon pins (2) and separate the cover assembly (1) from the drive assembly cap (3).

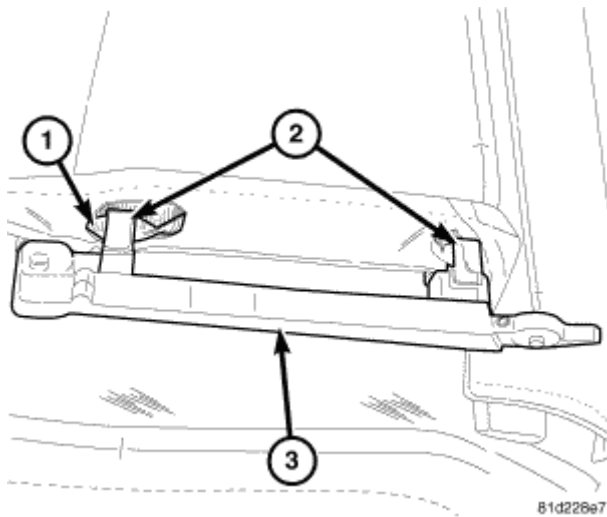


Fig. 343: Tension Cable, Hooks And Lift Arm
 Courtesy of CHRYSLER LLC

6. Disconnect the tension cables (1) from the lift arm hooks (2) along both sides.

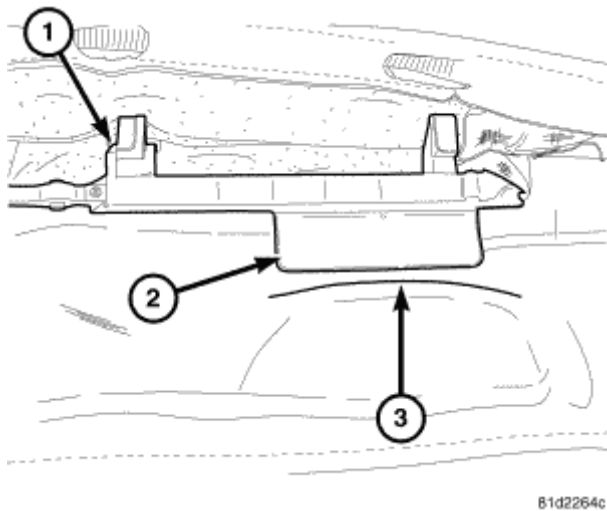
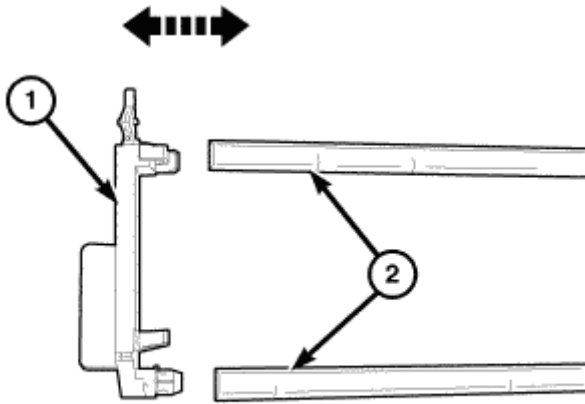


Fig. 344: Lift Arm Support Tabs And The Cover Pockets
 Courtesy of CHRYSLER LLC

7. Release the lift arm support tabs from the pocket (3) in the cover.

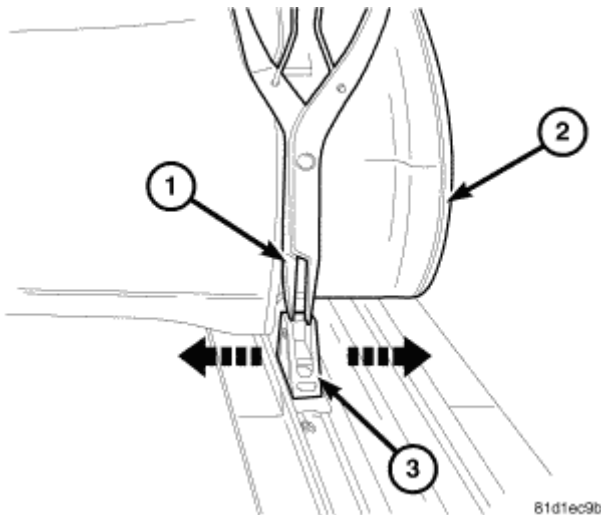


81d22934

Fig. 345: Lift Arm And Bows
 Courtesy of CHRYSLER LLC

8. Grasp the bows and pull the lift arms (1) from the bows (2) along one side of the cover assembly and discard the lift arms.

Rear Lift Arm and Bow Assemblies



81d1ec9b

Fig. 346: Lift Arms And Sliders
 Courtesy of CHRYSLER LLC

1. Open the rear drive assembly about 300 mm (12 inches).
2. Using a spreading tool (1) or equivalent, spread the slider assembly (3) apart and separate the lift arms from the slider.

CAUTION: Use care when separating the lift arms from the sliders to avoid losing the springs.

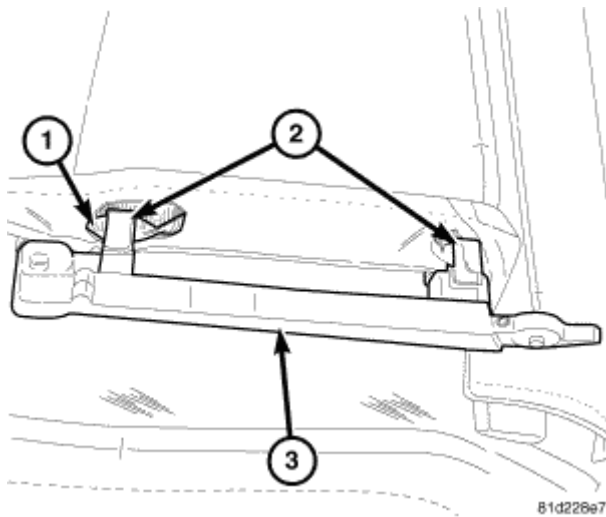


Fig. 347: Tension Cable, Hooks And Lift Arm
 Courtesy of CHRYSLER LLC

3. Disconnect the tension cables (1) from the lift arm hooks (2) along both sides.

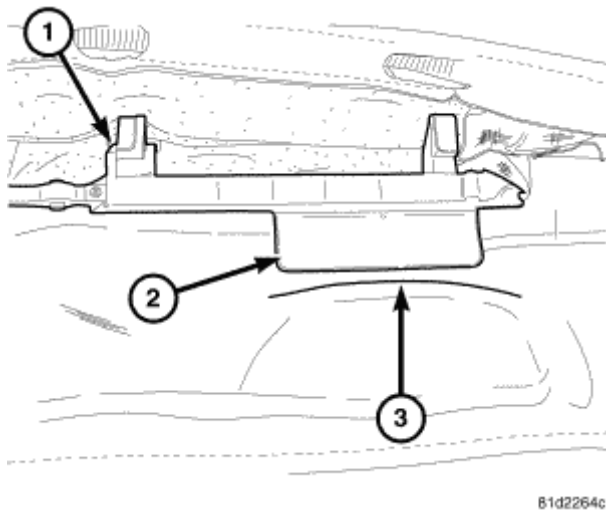
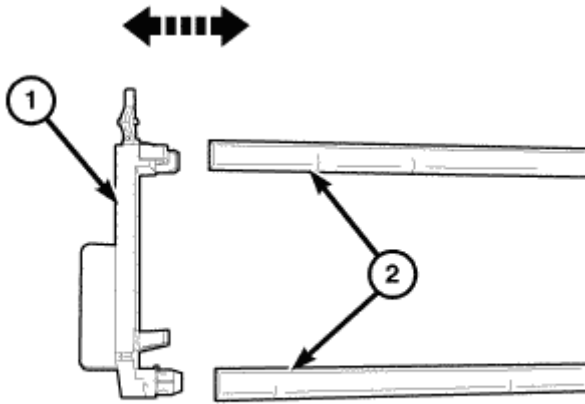


Fig. 348: Lift Arm Support Tabs And The Cover Pockets
 Courtesy of CHRYSLER LLC

4. Release the lift arm support tabs from the pocket (3) in the cover.



81d22934

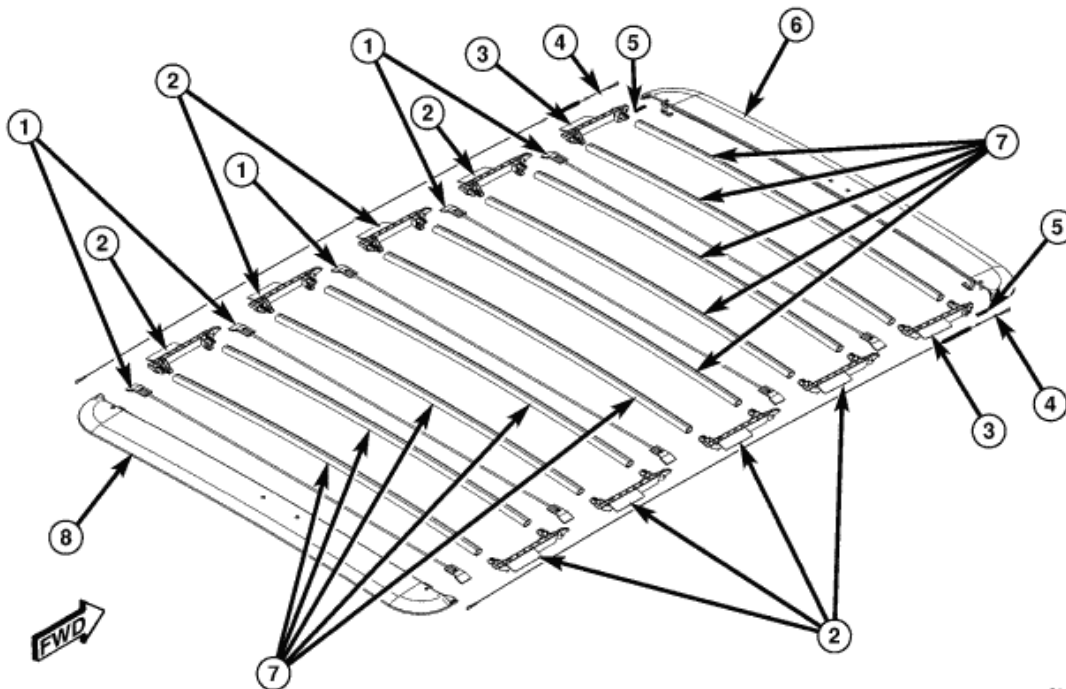
Fig. 349: Lift Arm And Bows
Courtesy of CHRYSLER LLC

5. Grasp the bows and pull the lift arms (1) from the bows (2) along one side of the cover assembly and discard the lift arms.

INSTALLATION

LIFT ARM AND BOW ASSEMBLY

Description



81cfa8d9

Fig. 350: Cover Assembly
Courtesy of CHRYSLER LLC

- 1 - HEADLINER BOWS (5)
- 2 - REAR LIFT ARMS (8)
- 3 - FRONT LIFT ARMS (2)
- 4 - TENSION CABLES (2)
- 5 - FRONT LIFT ARM COMPRESSION SPRINGS (2)
- 6 - FRONT HEADER BOW
- 7 - ROOF BOWS (10)
- 8 - REAR HEADER BOW

Header Bows

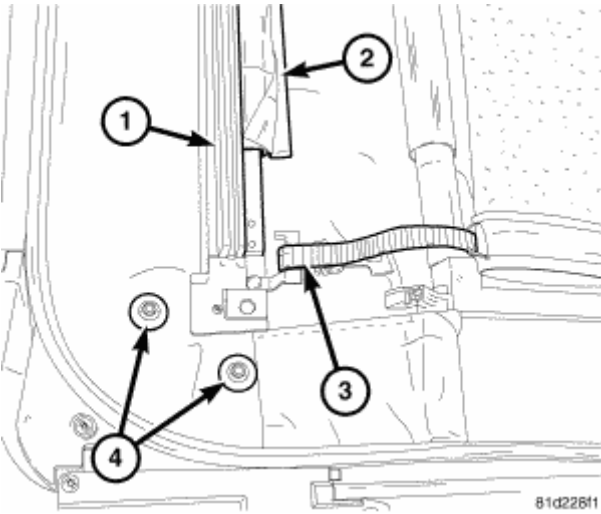
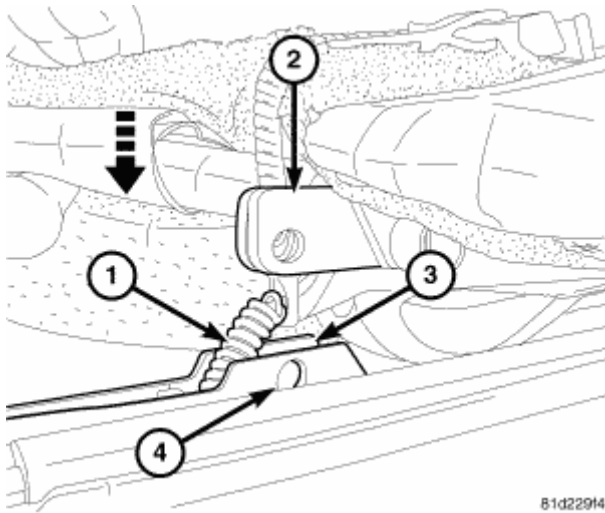


Fig. 351: Tension Cable And Header Bow
Courtesy of CHRYSLER LLC

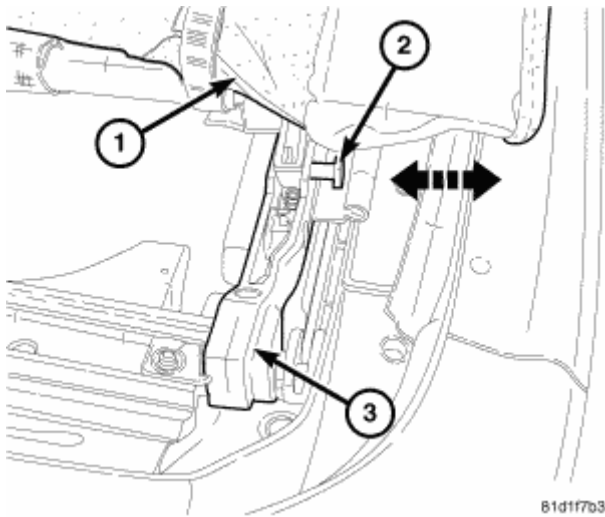
1. Position the header bow (1) into the cover assembly.
2. Install new push nuts (4).
3. Secure the mesh strap (2) to the header bow using new two sided tape.
4. Connect the tension straps (3) to the hooks on the header bows (1).



81d22914

Fig. 352: Lift Arm, Drive Assembly, Compression Spring And Hole
 Courtesy of CHRYSLER LLC

5. Position the forward lift arm (2) over the front drive assembly (3) and install the compression spring (1).
6. Lower the lift arm (2) and line up the hole in the lift arm with the hole (4) in the front drive assembly (3).



81d1f7b3

Fig. 353: Nylon Pins, Cover Assembly And Drive Assembly Cap
 Courtesy of CHRYSLER LLC

7. Insert the nylon pin (2) with the slot in the end in the horizontal position.
8. Seat the pin (2) fully.

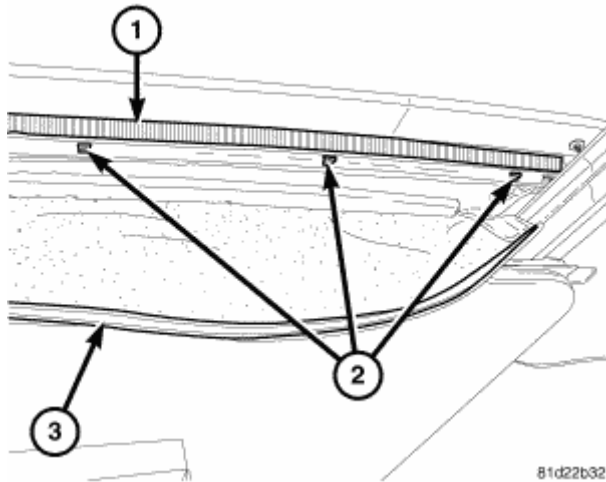


Fig. 354: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

9. Position the front drive assembly about 300 mm (12 inches) open.
10. Position the front of the cover down over the front drive assembly and seat fully.
11. Install the five screws (2), and seat the headliner hook and loop strip (3) fully.
12. Re-initialize ECU, see **STANDARD PROCEDURE**.

Front Lift Arm and Bow Assembly

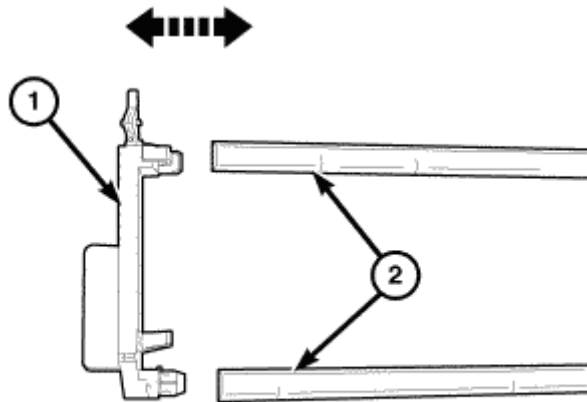
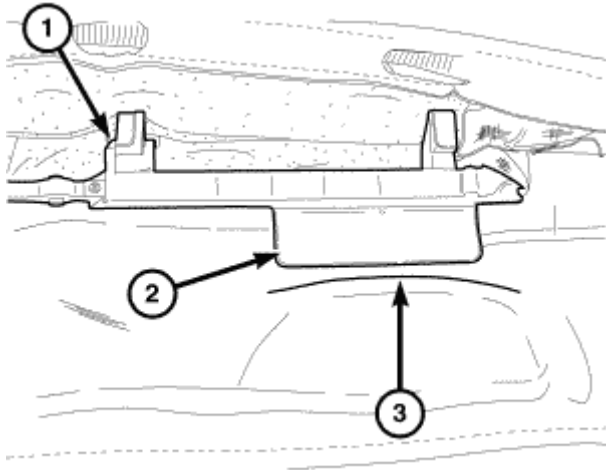


Fig. 355: Lift Arm And Bows
 Courtesy of CHRYSLER LLC

1. Place the lift arms and bows into the bow sleeves.

NOTE: Always install new lift arms (1) when they have been separated from the bows (2).

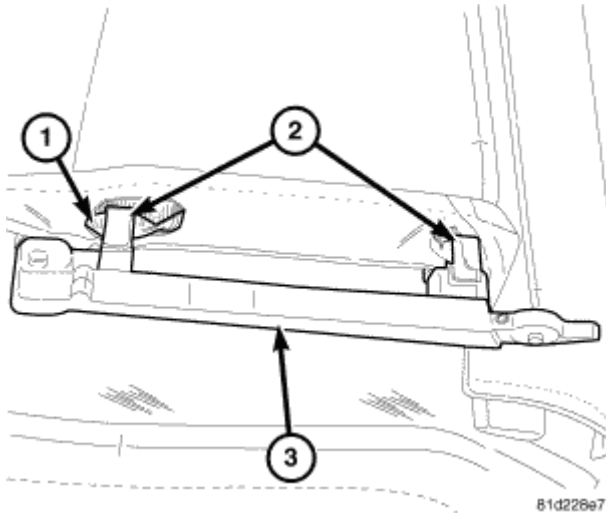
2. Using a bar clamp or plastic hammer, install new lift arms (1) onto the bows (2) and seat fully.



81d2264c

Fig. 356: Lift Arm Support Tabs And The Cover Pockets
Courtesy of CHRYSLER LLC

3. Insert the lift arm support tabs (2) into the cover pockets (3).



81d226e7

Fig. 357: Tension Cable, Hooks And Lift Arm
Courtesy of CHRYSLER LLC

4. Connect the tension cables (1) to the lift arm hooks (2) along both sides.

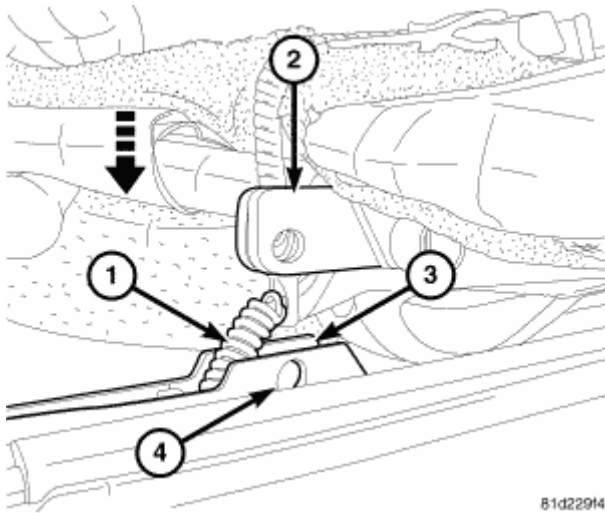


Fig. 358: Lift Arm, Drive Assembly, Compression Spring And Hole
 Courtesy of CHRYSLER LLC

5. Position the forward lift arm (2) over the front drive assembly (3) and install the compression spring (1).
6. Lower the lift arm (2) and line up the hole in the lift arm with the hole (4) in the front drive assembly (3).

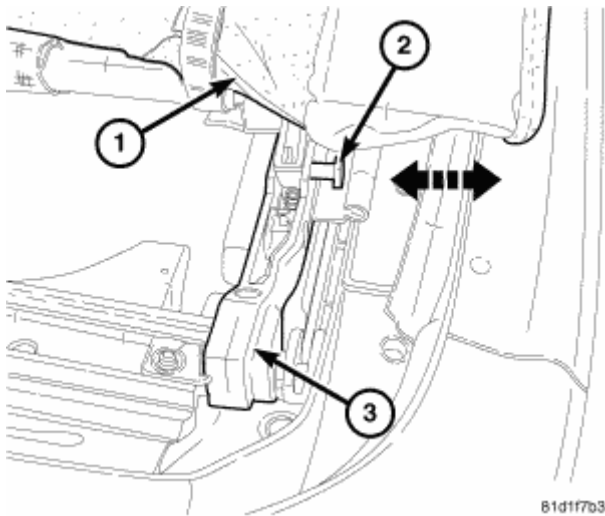


Fig. 359: Nylon Pins, Cover Assembly And Drive Assembly Cap
 Courtesy of CHRYSLER LLC

7. Insert the nylon pin (2) with the slot in the end in the horizontal position.
8. Seat the pin (2) fully.

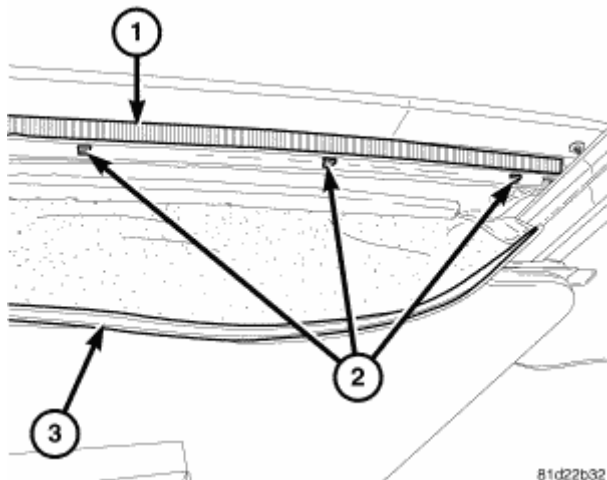


Fig. 360: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

9. Position the front drive assembly about 300 mm (12 inches) open.
10. Position the front of the cover down over the front drive assembly and seat fully.
11. Install the five screws (2), and seat the headliner hook and loop strip (3) fully.
12. Re-initialize ECU, see **STANDARD PROCEDURE**.

Rear Lift Arm and Bow Assembly

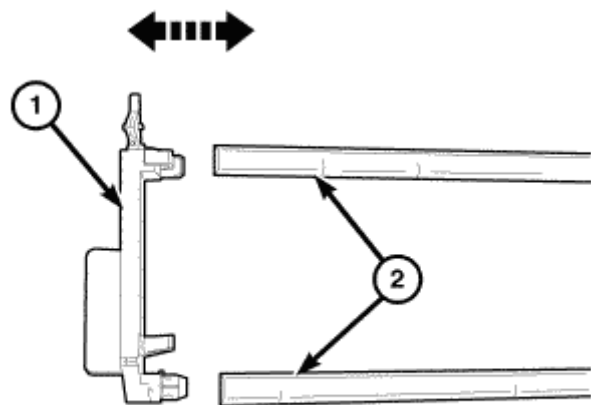
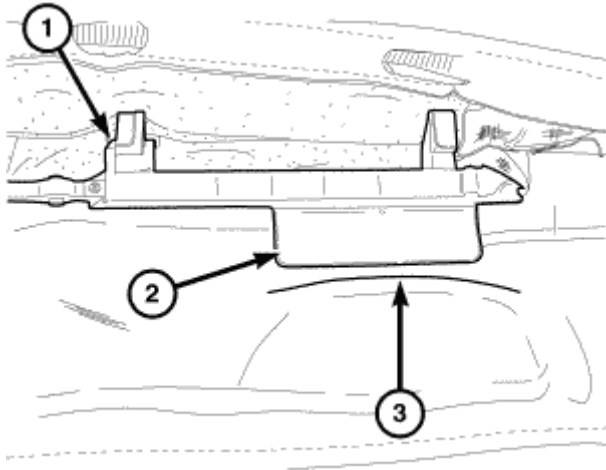


Fig. 361: Lift Arm And Bows
 Courtesy of CHRYSLER LLC

1. Place the lift arms and bows into the bow sleeves.

NOTE: Always install new lift arms (1) when they have been separated from the bows (2).

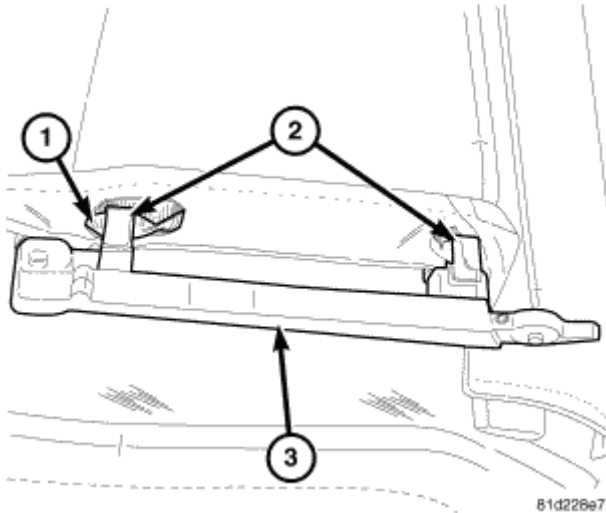
2. Using a bar clamp or plastic hammer, install new lift arms (1) onto the bows (2) and seat fully.



81d2264c

Fig. 362: Lift Arm Support Tabs And The Cover Pockets
Courtesy of CHRYSLER LLC

3. Insert the lift arm support tabs (2) into the cover pockets (3).



81d226e7

Fig. 363: Tension Cable, Hooks And Lift Arm
Courtesy of CHRYSLER LLC

4. Connect the tension cables (1) to the lift arm hooks (2) along both sides.

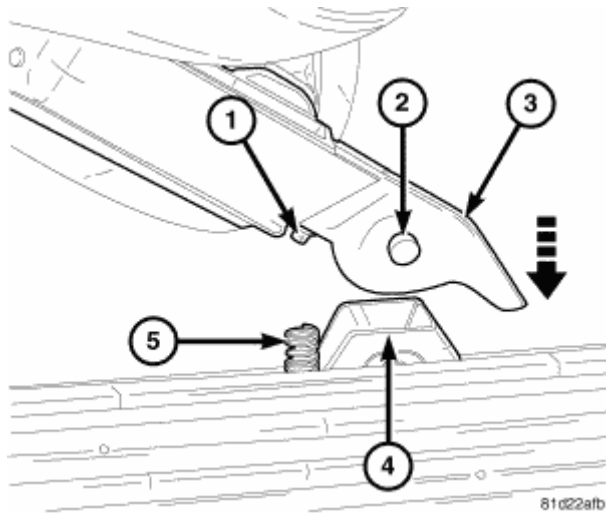


Fig. 364: Lift Arm, Locators, Rear Sliders And Pins
 Courtesy of CHRYSLER LLC

5. Position the cover assembly over the slider (4).
6. Position the spring so that it engages with the locator (1) on the lift arm (3).
7. Seat the lift arm pins (2) into the slider (4) fully.
8. Re-initialize ECU, see **STANDARD PROCEDURE**.

PLATE

REMOVAL

PLATE - CAM

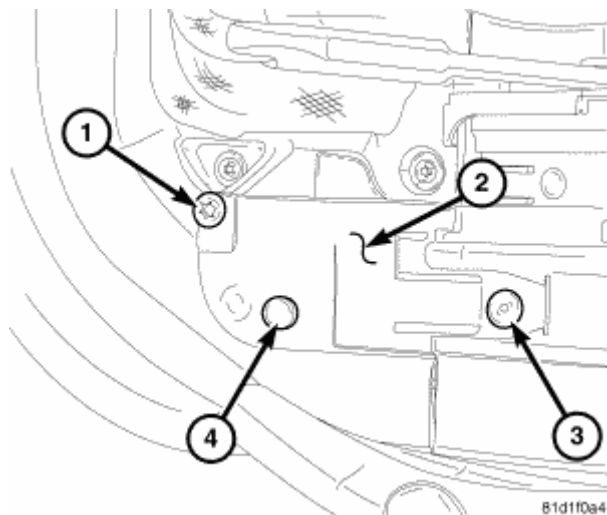


Fig. 365: Front Cam Plate
 Courtesy of CHRYSLER LLC

1. Lower the headliner in vehicle as necessary to gain access to the cam plate stud (4) being serviced, see

REMOVAL.

2. Remove the stud nut (4) from inside the vehicle.
3. Remove the screw (1).
4. Remove the rivet (3) and remove the cam plate (2).

INSTALLATION

PLATE - CAM

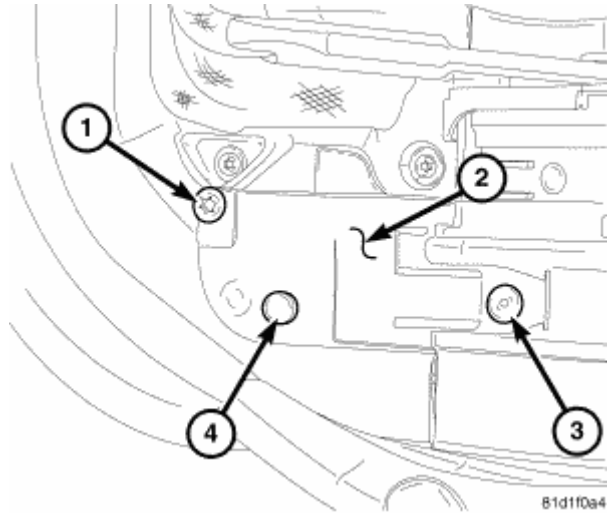


Fig. 366: Front Cam Plate
Courtesy of CHRYSLER LLC

1. Install the cam plate (2) and install the rivet (3).
2. Install the screw (1).
3. Install the stud nut (4) from inside the vehicle and tighten to 5 N.m (44 in. lbs.).
4. Install the headliner, see **INSTALLATION**.
5. Re-initialize ECU, see **STANDARD PROCEDURE**.

PLATE

REMOVAL

PLATE - MOTOR MOUNTING

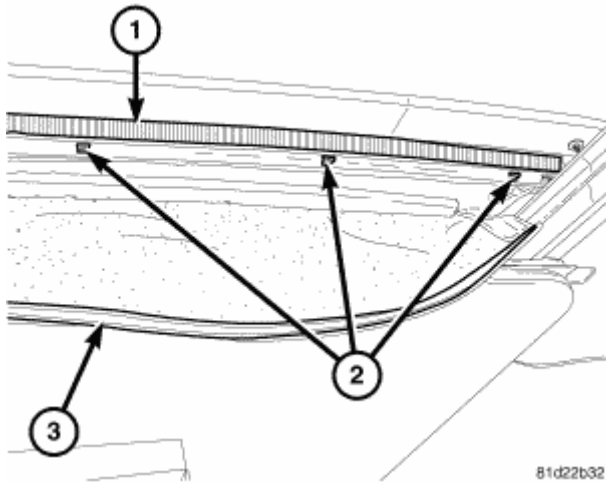


Fig. 367: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

NOTE: Both motor mounting plates must be removed when servicing one or the other. It is necessary to remove both plates in order to remove the rivet pieces from the roof rail.

1. Drop headliner down as needed to gain access to the motors, see **REMOVAL**.
2. Disconnect the large module electrical connector.
3. Manually position the front drive assembly about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.
4. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
5. Remove the five screws (2) and separate the cover assembly from the drive (1).

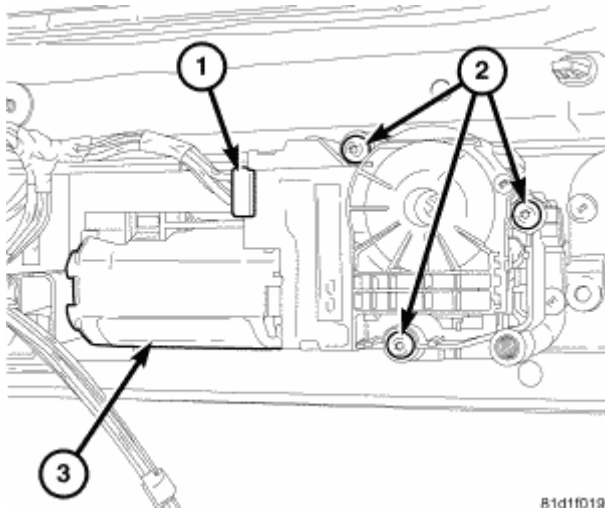


Fig. 368: Front Motor, Screws And Electrical Connector
 Courtesy of CHRYSLER LLC

6. Remove the three screws (2) and separate the front motor (3) from the roof system.

NOTE: Discard the screws (2) and replace with service screws and washers.

7. Disconnect the electrical connector (1) and remove the motor.
8. Manually position the front bow and drive assembly (1) forward fully.

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

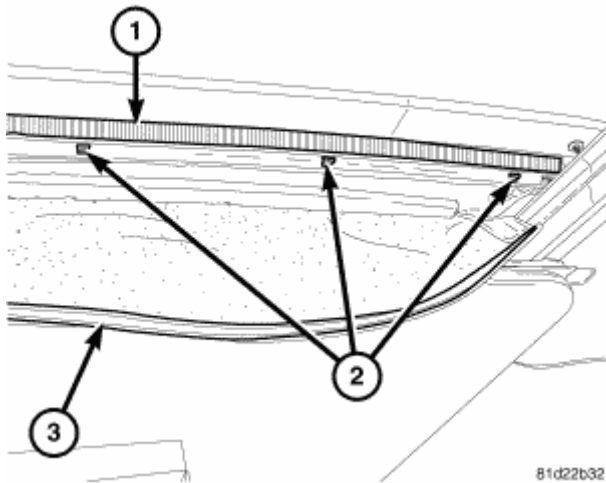


Fig. 369: Drive Mechanism, Loop Strip And Screws
Courtesy of CHRYSLER LLC

9. Manually position the rear drive assembly about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.
10. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
11. Remove the five screws (2) and separate the cover assembly from the drive (1).

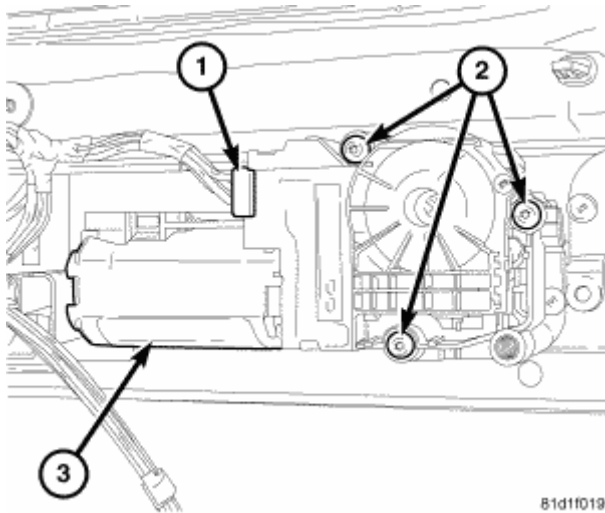


Fig. 370: Front Motor, Screws And Electrical Connector
 Courtesy of CHRYSLER LLC

12. Remove the three screws (2) and separate the rear motor (3) from the roof system.

NOTE: Discard the screws (2) and replace with service screws and washers.

13. Disconnect the electrical connector (1) and remove the motor.
14. Manually position the rear bow and drive assembly (1) rearward fully.

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

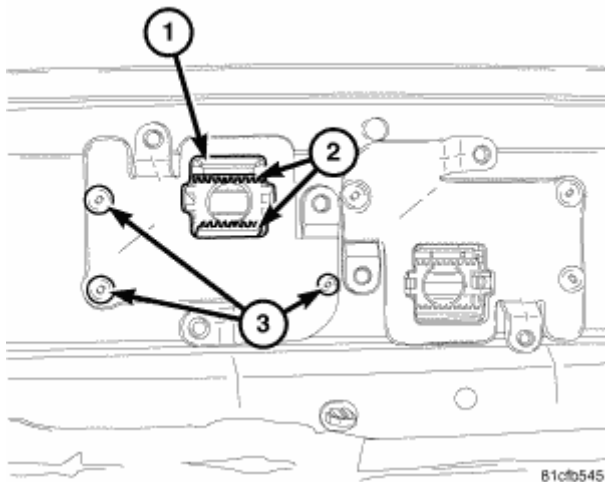


Fig. 371: Cable Retainer And Rivets
 Courtesy of CHRYSLER LLC

15. Remove the rivets (3) and remove the motor mounting plates.

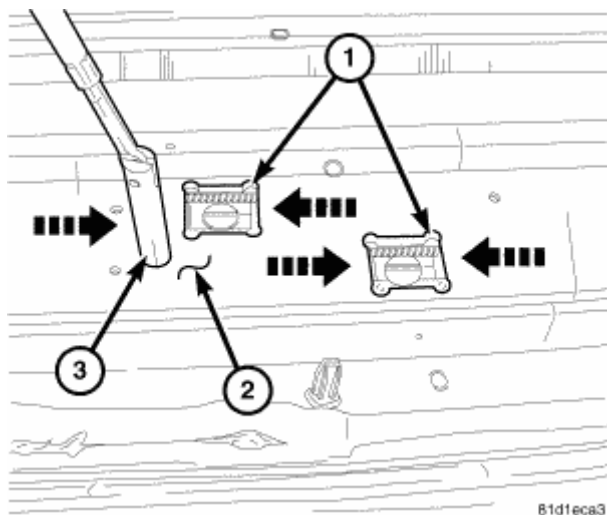


Fig. 372: Cable Guide Openings, Rail And Magnet
 Courtesy of CHRYSLER LLC

16. Using a magnet (3) draw out the remaining rivet pieces through the cable guide openings (1) in the rail (2).

INSTALLATION

PLATE - MOTOR MOUNTING

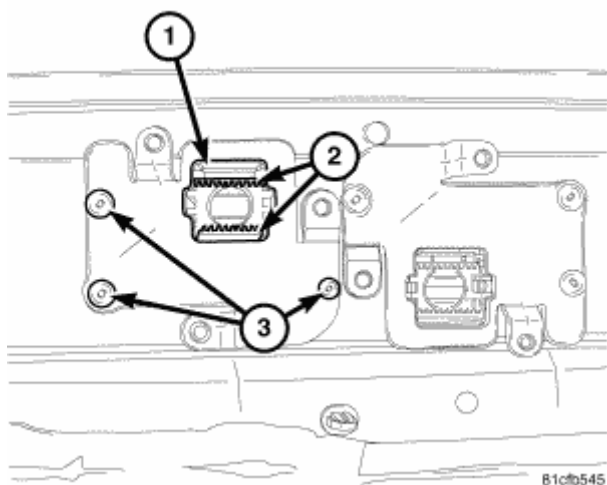


Fig. 373: Cable Retainer And Rivets
 Courtesy of CHRYSLER LLC

NOTE: Both motor mounting plates must be removed when servicing one or the other. It is necessary to remove both plates in order to remove the rivet pieces from the roof rail.

1. Install the motor mounting plates and install new rivets (3).

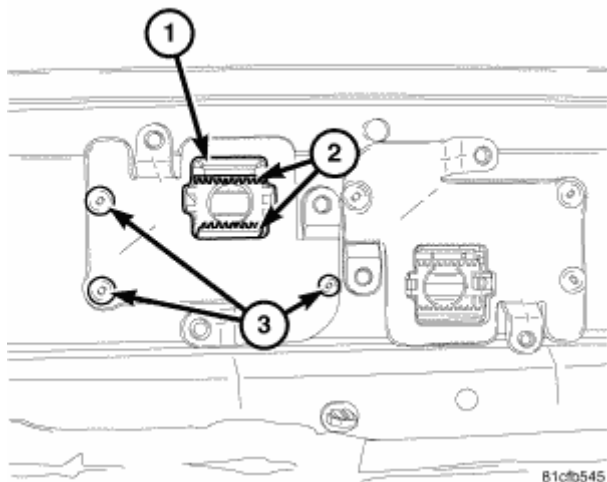


Fig. 374: Cable Retainer And Rivets
 Courtesy of CHRYSLER LLC

2. Install the motor mounting plates and install new rivets (3).

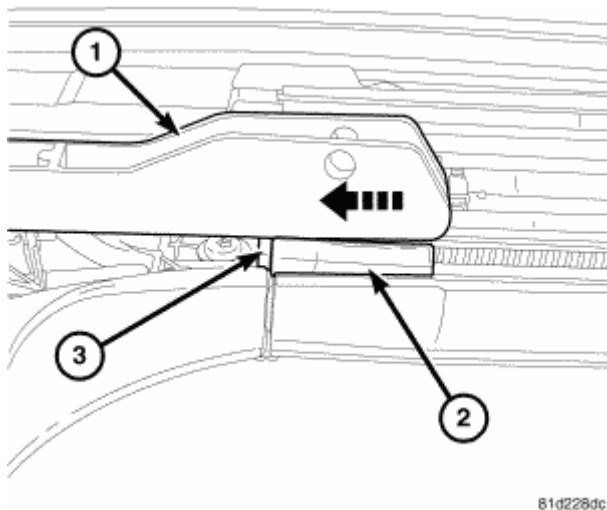


Fig. 375: Rear Drive Assembly, Cable Ends And Frame
 Courtesy of CHRYSLER LLC

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

3. Manually push the rear drive assembly (1) rearward fully.
4. Using a small screwdriver or equivalent, make sure the cable ends (2) are in contact with the frame (3).

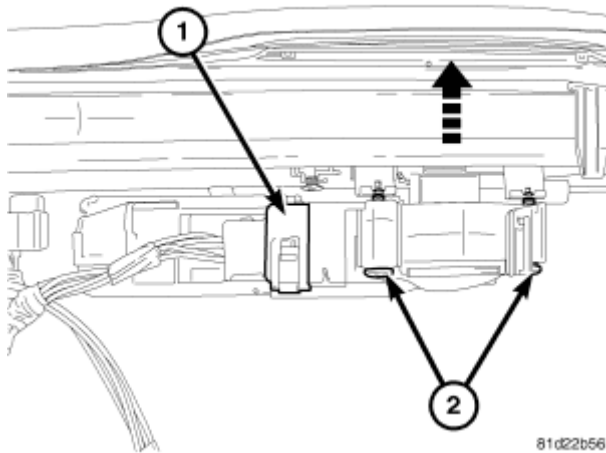


Fig. 376: Front Drive Motor And Screws
Courtesy of CHRYSLER LLC

5. Position the rear drive motor (1) up onto the motor mounting plate.

CAUTION: Do not install the motor using any twisting motion. Always install the motor straight and use the screws to draw the drive gear into the drive cables.

NOTE: When ever the motors are removed, the screws (2) need to be discarded and replaced with new service screws and washers.

6. Install the motor screws (2) and draw the motor up evenly using the motor screws.
7. Connect the electrical connector.

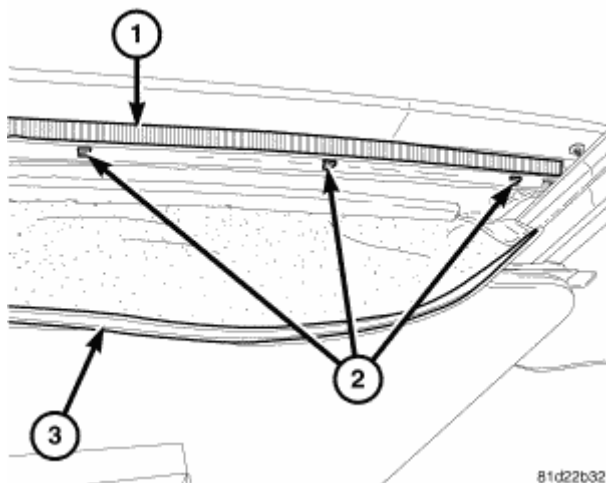


Fig. 377: Drive Mechanism, Loop Strip And Screws
Courtesy of CHRYSLER LLC

8. Manually position the rear drive assembly about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.
9. Position the rear of the cover down over the rear drive (1) and seat fully.
10. Install the five screws (2).
11. Line up the headliner (3) center notch with the center screw (2) and seat the headliner hook and loop strip (3) fully.

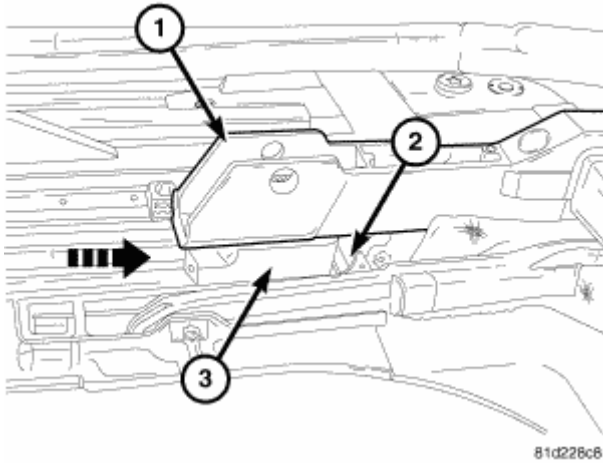


Fig. 378: Front Drive Assembly, Cable Ends And Frame
Courtesy of CHRYSLER LLC

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight back.

12. Manually push the front drive assembly (1) fully forward.
13. Using a small screwdriver or equivalent, make sure the cable ends (3) are in contact with the frame (2).

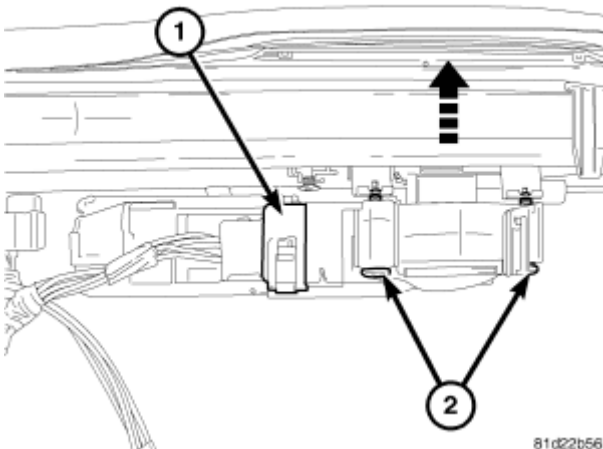


Fig. 379: Front Drive Motor And Screws

Courtesy of CHRYSLER LLC

14. Position the front drive motor (1) up onto the motor mounting plate.

CAUTION: Do not install the motor using any twisting motion. Always install the motor straight and use the screws to draw the drive gear into the drive cables.

NOTE: When ever the motors are removed, the screws (2) need to be discarded and replaced with new service screws and washers.

15. Install the motor screws (2) and draw the motor evenly using the motor screws.
16. Connect the electrical connector.

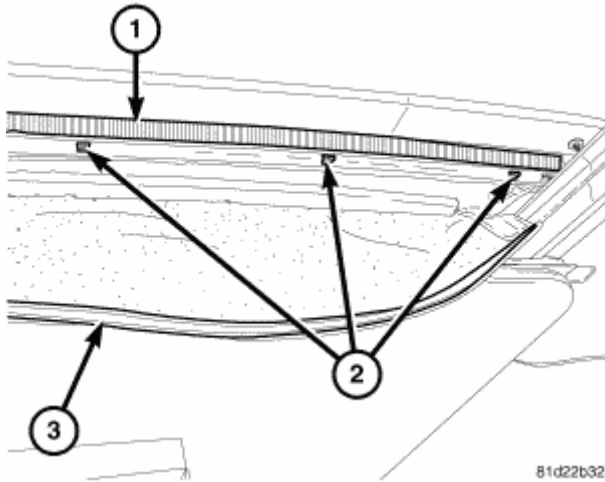


Fig. 380: Drive Mechanism, Loop Strip And Screws
Courtesy of CHRYSLER LLC

17. Manually position the front and rear drive assemblies about 300 mm (12 inches) open, see **STANDARD PROCEDURE**.
18. Position the front of the cover down over the front drive assembly and seat fully.
19. Install the five screws (2), and seat the headliner hook and loop strip (3) fully.
20. Connect the large ECU electrical connector.
21. Install the headliner, see **INSTALLATION**.
22. Re-initialize ECU, see **STANDARD PROCEDURE**.

SLIDER ASSEMBLY

REMOVAL

SLIDER ASSEMBLY

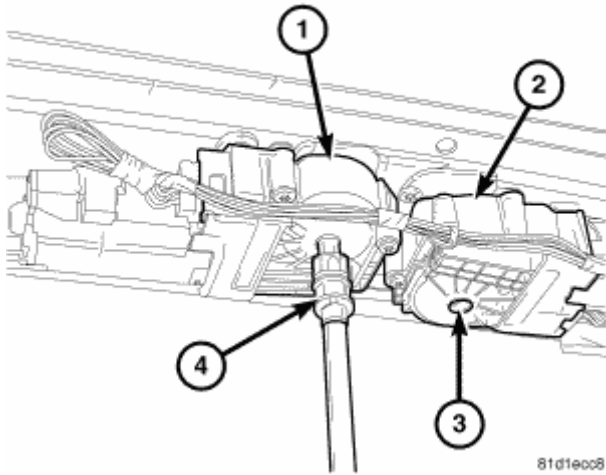


Fig. 381: Rear Drive Motor, Front Drive Motor, Drive Axle And Hex Socket
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - REAR DRIVE MOTOR
2 - FRONT DRIVE MOTOR
3 - DRIVE AXLE LOCATION
4 - 6 mm HEX SOCKET |
|---|

1. Remove the front drive assembly, see **REMOVAL**.
2. Manually move the rear drive assembly to open about 10 inches.

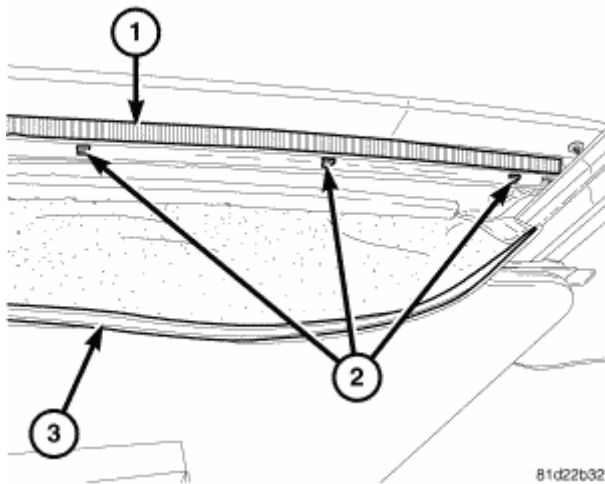


Fig. 382: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

3. Separate the headliner hook and loop strip (3) and expose the drive mechanism.
4. Remove the five screws (2) and separate the cover assembly from the rear drive (1).

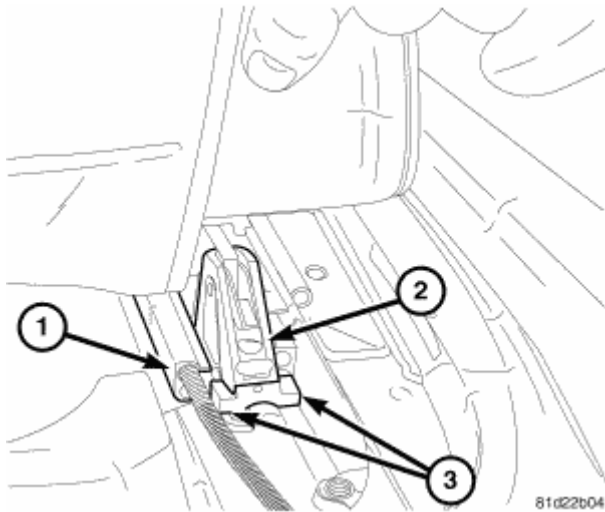


Fig. 383: Slider Assembly
 Courtesy of CHRYSLER LLC

5. Pull the cover assembly forward and disengage the sliders (2) from the rails (1).

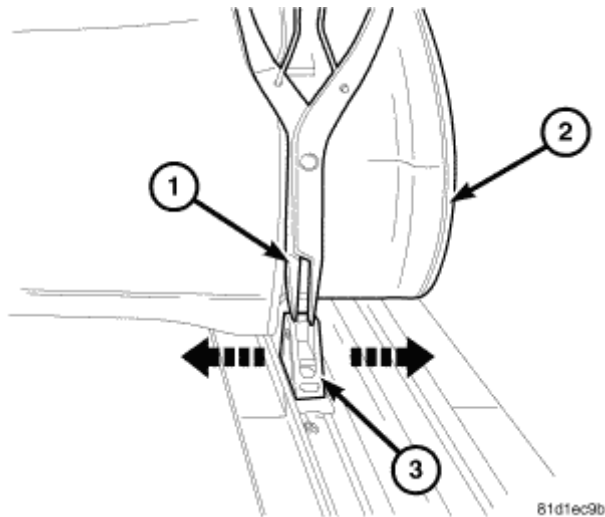


Fig. 384: Lift Arms And Sliders
 Courtesy of CHRYSLER LLC

6. Roll the cover assembly (2) back until you get to the slider (3) being serviced.
7. Using a spreading tool (1) or equivalent, spread the slider assembly (3) apart and separate the lift arms from the slider.

CAUTION: Use care when separating the lift arms from the sliders to avoid losing the springs.

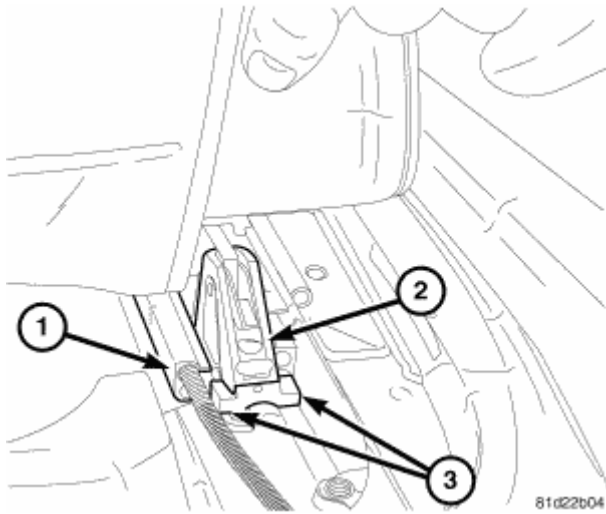


Fig. 385: Slider Assembly
 Courtesy of CHRYSLER LLC

8. Remove the slider (2) being serviced from the track (1).

INSTALLATION

SLIDER ASSEMBLY

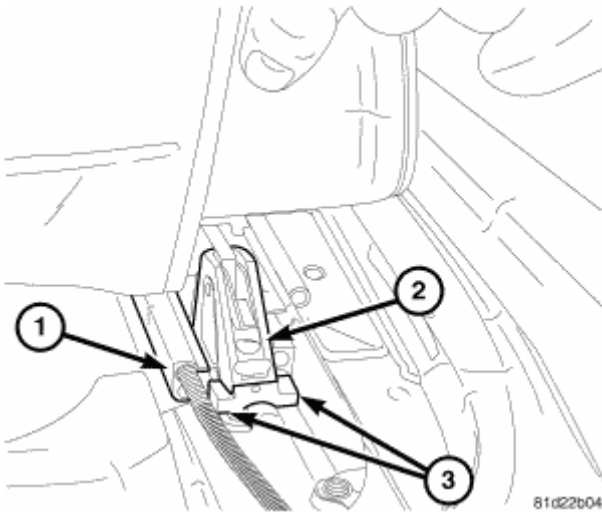


Fig. 386: Slider Assembly
 Courtesy of CHRYSLER LLC

1. Clean the track as necessary, see **STANDARD PROCEDURE**.

NOTE: Apply 5 grams of Nyogel 729F Grease to the drive track only (3).

2. Install the slider (2) being serviced into the track (1) and slide back.

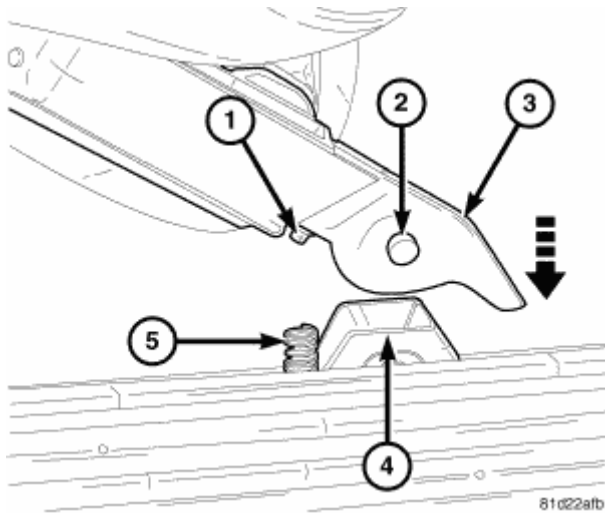


Fig. 387: Lift Arm, Locators, Rear Sliders And Pins
 Courtesy of CHRYSLER LLC

3. Position the cover assembly over the slider (4).
4. Position the spring so that it engages with the locator (1) on the lift arm (3).
5. Seat the lift arm pins (2) into the slider (4) fully.

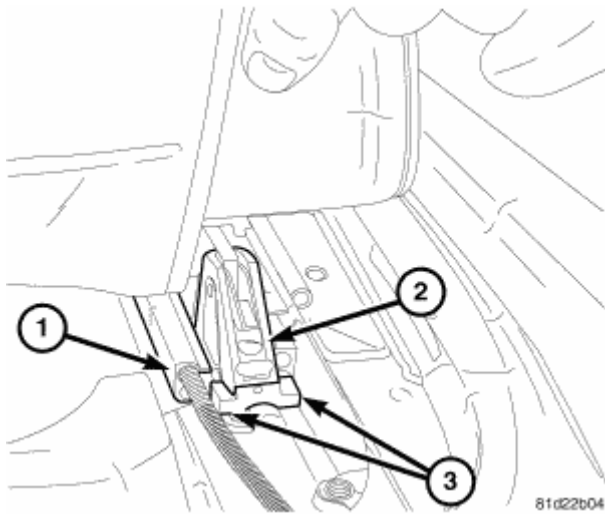


Fig. 388: Slider Assembly
 Courtesy of CHRYSLER LLC

6. Unroll the top assembly and engage the sliders (2) into the tracks (1).

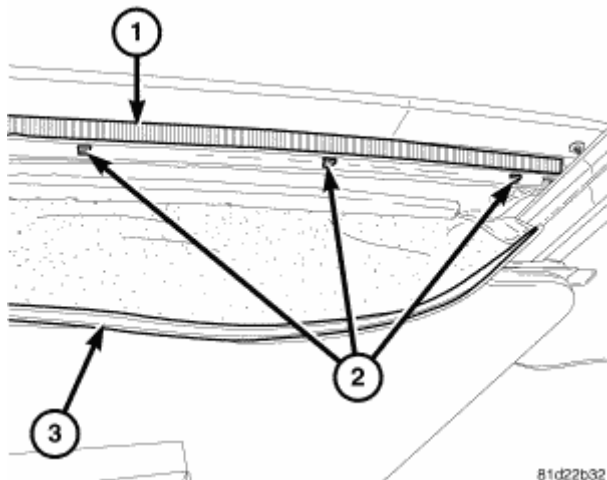


Fig. 389: Drive Mechanism, Loop Strip And Screws
 Courtesy of CHRYSLER LLC

7. Position the rear of the cover down over the rear drive and seat fully.
8. Install the five screws (2).
9. Line up the headliner (3) center notch with the center screw (2) and seat the headliner hook and loop strip fully.
10. Install the front drive assembly, see **INSTALLATION**.

WIND DEFLECTOR

REMOVAL

WIND DEFLECTOR

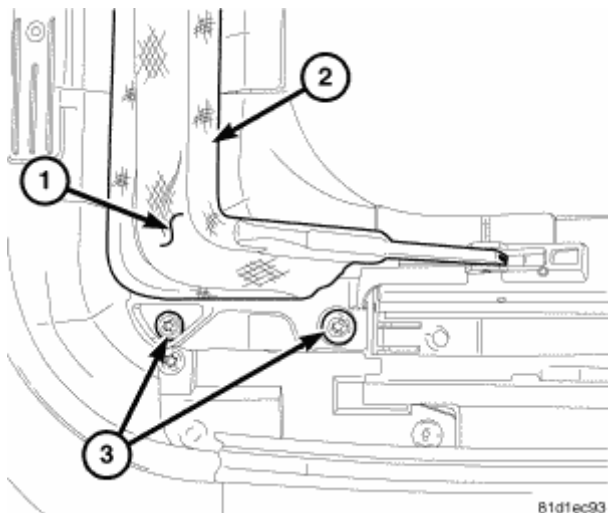


Fig. 390: Wind Deflector And Screws
 Courtesy of CHRYSLER LLC

1. Open the front of the roof enough to clear the wind deflector assembly (2).
2. Remove the center support screw.
3. Using an offset screwdriver, remove the two inner screws (1).
4. Remove the outer screws (3).

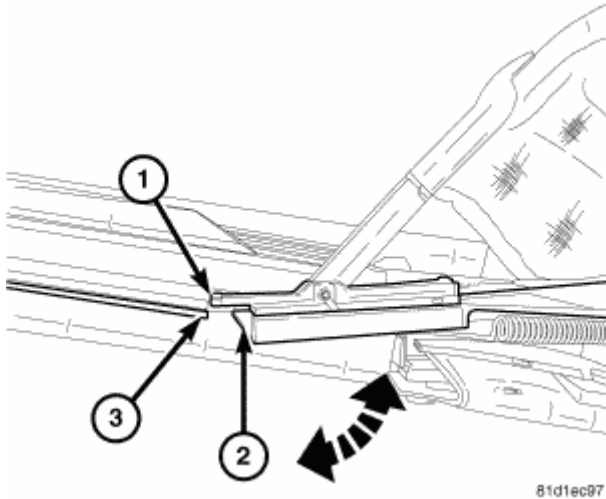


Fig. 391: Wind Deflector, Tab And The Rail
Courtesy of CHRYSLER LLC

5. Lift the front of the wind deflector assembly up and separate from the rail (3).

INSTALLATION

WIND DEFLECTOR

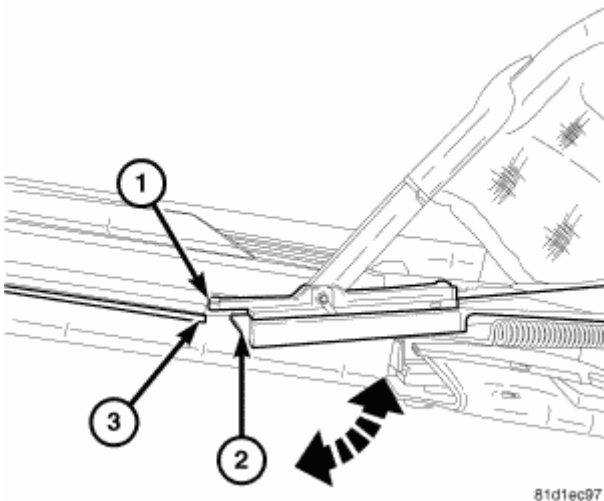


Fig. 392: Wind Deflector, Tab And The Rail
Courtesy of CHRYSLER LLC

1. Install the wind deflector onto the rail (3) with the tab (1) above the rail (3) and the tab (2) below the rail

(3).

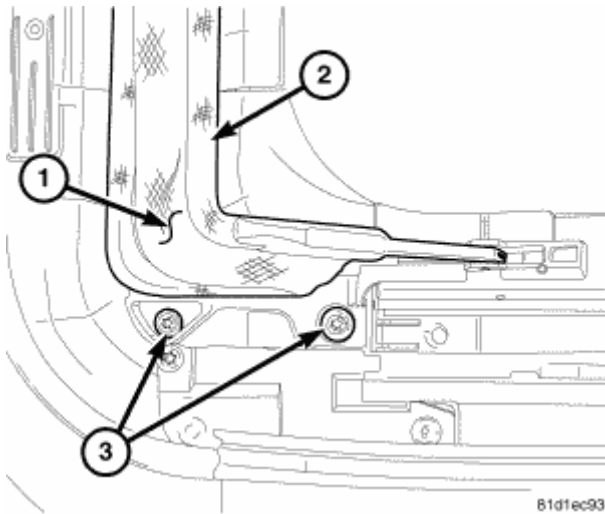


Fig. 393: Wind Deflector And Screws
Courtesy of CHRYSLER LLC

2. Install the four screws (3).
3. Using an offset screwdriver, install the two inner screws (1).
4. Install the center support screw.

HOOD

BUMPER - HOOD

REMOVAL

BUMPER - HOOD

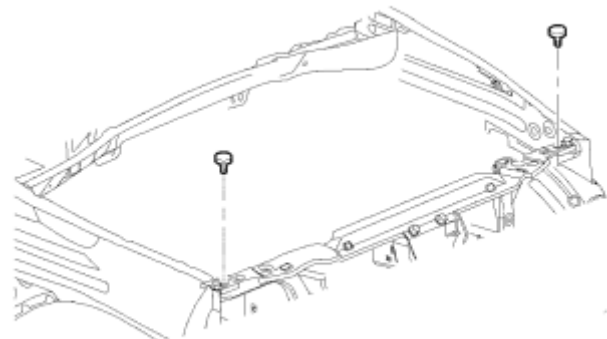


Fig. 394: Hood Adjustment Bumper

Courtesy of CHRYSLER LLC

1. Remove the hood adjustment bumpers.

INSTALLATION

BUMPER - HOOD

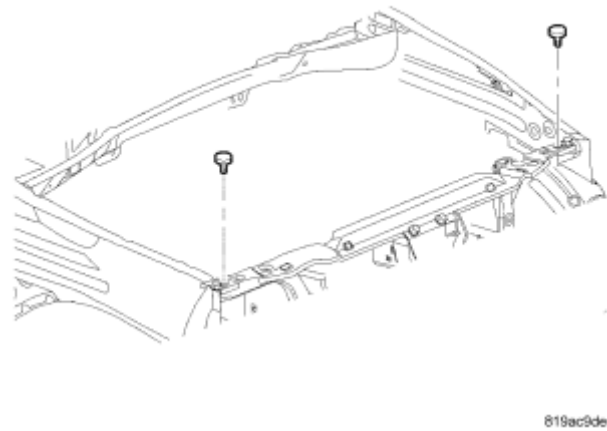


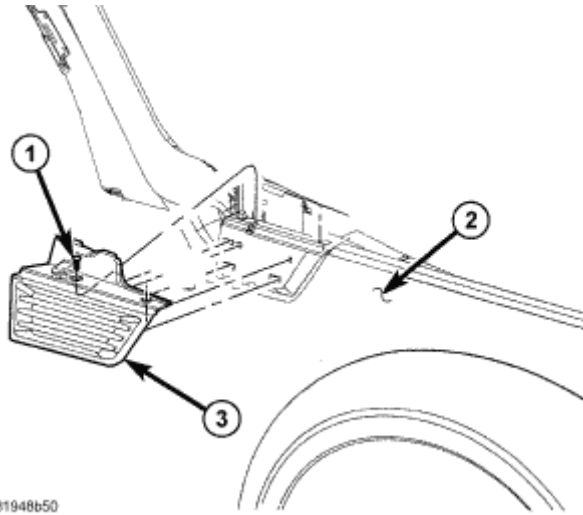
Fig. 395: Hood Adjustment Bumper
Courtesy of CHRYSLER LLC

1. Install the hood adjustment bumpers. Make sure there are no excessive gaps between the areas around the hood, adjust as necessary, see **SPECIFICATIONS**.

HINGE - HOOD

REMOVAL

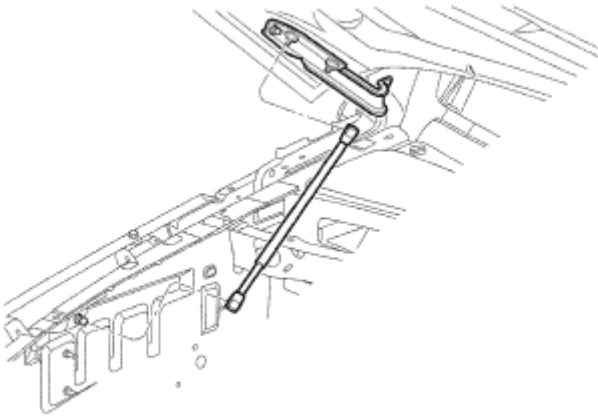
HINGE - HOOD



81948b50

Fig. 396: Screws, Fender & Applique
 Courtesy of CHRYSLER LLC

1. Raise and support the hood.
2. Remove the two screws (1) from the fender applique.
3. Use a trim stick C-4755 or equivalent, separate the fender applique (3) from the fender (2).

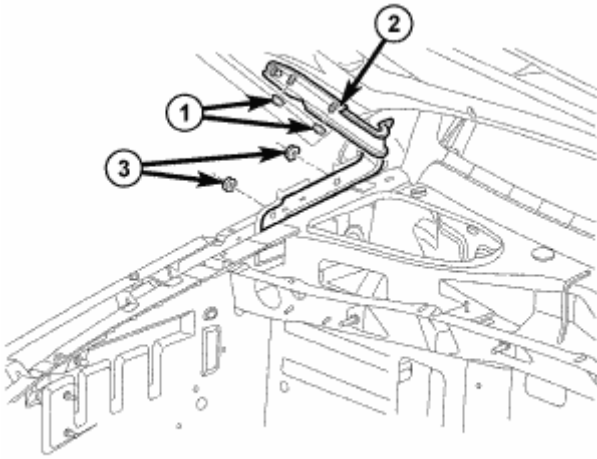


8194f9d7

Fig. 397: Support Cylinder
 Courtesy of CHRYSLER LLC

NOTE: It is not necessary to remove the hood to replace one or both hinges. The hinges can be replaced one at a time.

4. Remove hood support cylinder, see **REMOVAL**.



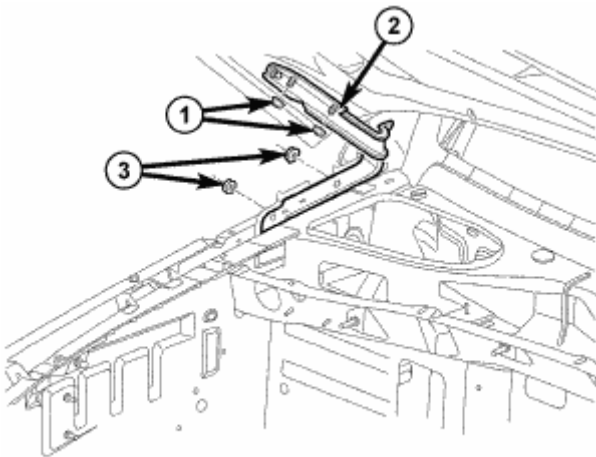
819489e1

Fig. 398: Hood Hinge
Courtesy of CHRYSLER LLC

5. Using a grease pencil or equivalent, mark position of hinge (2).
6. Remove nuts (3) attaching hinge (2) to the body.
7. Remove nuts (1) attaching hinge (2) to hood.
8. Remove hinge (2) from the vehicle.

INSTALLATION

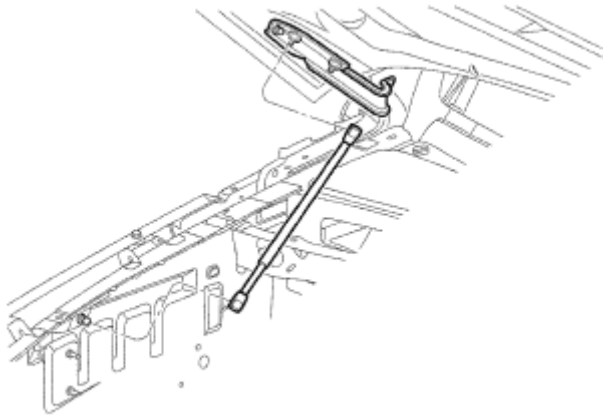
HINGE - HOOD



819489e1

Fig. 399: Hood Hinge
Courtesy of CHRYSLER LLC

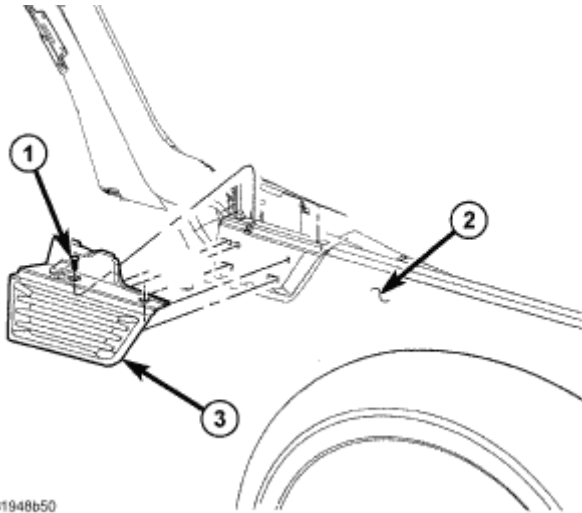
1. Install the hinge (2) to the vehicle use the reference position made during removal.
2. Install nuts (3) attaching hinge (2) to the body and tighten to 20 N.m (15 ft. lbs.).
3. Install nuts (1) attaching hinge (2) to hood and tighten to 20 N.m (15 ft. lbs.).



8194f9d7

Fig. 400: Support Cylinder
 Courtesy of CHRYSLER LLC

4. Install hood support cylinder, see INSTALLATION.



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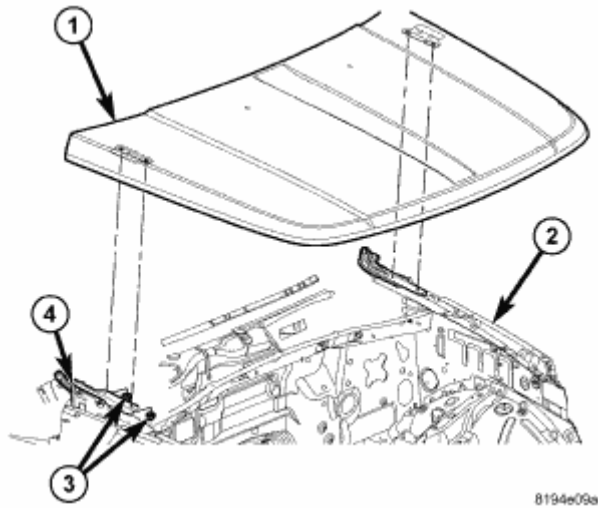
Fig. 401: Screws, Fender & Applique
 Courtesy of CHRYSLER LLC

5. Install the two screws (1) to the fender applique.

HOOD

REMOVAL

HOOD



8194e09a

Fig. 402: Removing/Installing Hood
 Courtesy of CHRYSLER LLC

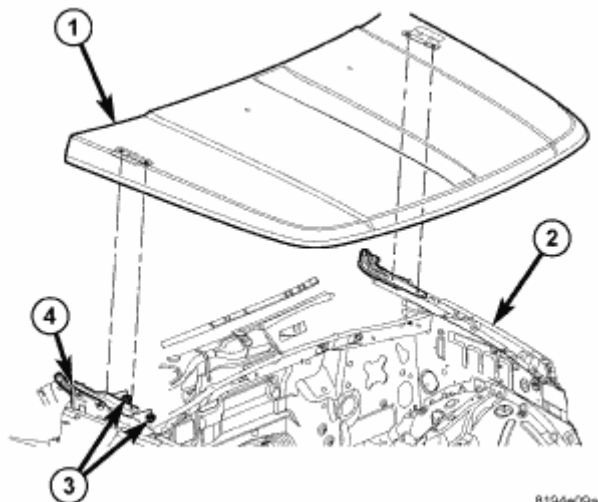
WARNING: Before removal of the nuts on the hood hinges get a helper to hold the hood in position to keep from the hood falling from the vehicle causing personal injury and/or damage to the vehicle.

NOTE: Use a grease pencil or equivalent, mark location of hood hinges on the hood for installation and alignment purposes.

1. Remove nuts (3) attaching hinges (4) to hood (1).
2. With the aid of a helper, remove hood from vehicle.

INSTALLATION

HOOD



8194e09a

Fig. 403: Removing/Installing Hood

Courtesy of CHRYSLER LLC

1. With the aid of a helper, the position hood (1) onto the hinges (4).
2. Install nuts (3) finger-tight.
3. Align hinges with installation reference marks made previously and tighten bolts to 20 N.m (15 ft. lbs.).
4. Inspect hood for proper alignment and adjust as necessary, see **ADJUSTMENTS**.

ADJUSTMENTS

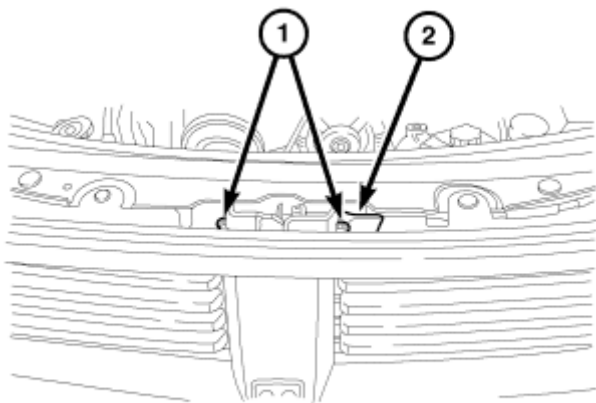
HOOD

1. If hood is low in relation to cowl panel, insert shims between hinge and hood.
2. Adjust hood bumper in or out to adjust hood-to-fender height alignment.
3. Adjust the hood latch as necessary. Tighten the bolts to 13.5 N.m (10 ft. lbs.).
4. Align the latch striker so that striker enters the latch squarely and without binding.

LATCH - HOOD

REMOVAL

LATCH - HOOD



81951996

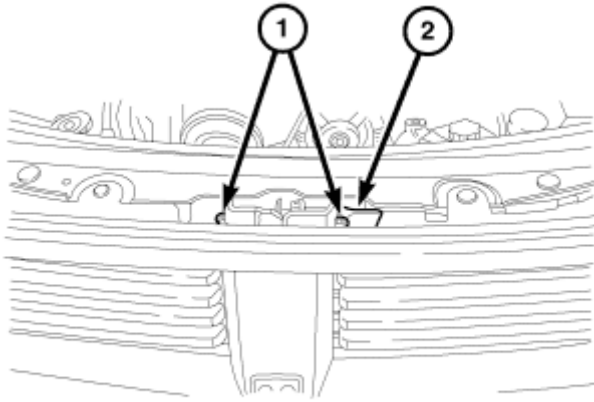
Fig. 404: Release Cable & Bolts
Courtesy of CHRYSLER LLC

NOTE: Mark the location of the latch with a grease marker prior to removal from the vehicle.

1. Remove the bolts (1) from the latch.
2. Disconnect the release cable (2) and remove the latch from the vehicle.

INSTALLATION

LATCH - HOOD



81951996

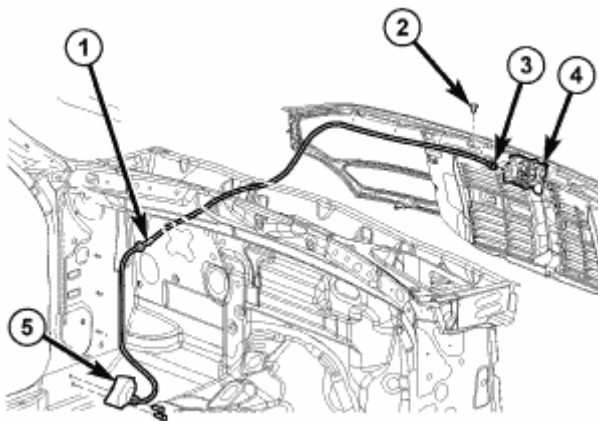
Fig. 405: Release Cable & Bolts
Courtesy of CHRYSLER LLC

1. Install the latch to the vehicle in the same position noted during removal.
2. Install the bolts (1) and tighten to 13.5 N.m (10 ft. lbs.).
3. Attach the latch release cable (2) to the latch.

RELEASE - HOOD LATCH

REMOVAL

RELEASE - HOOD LATCH



8195167c

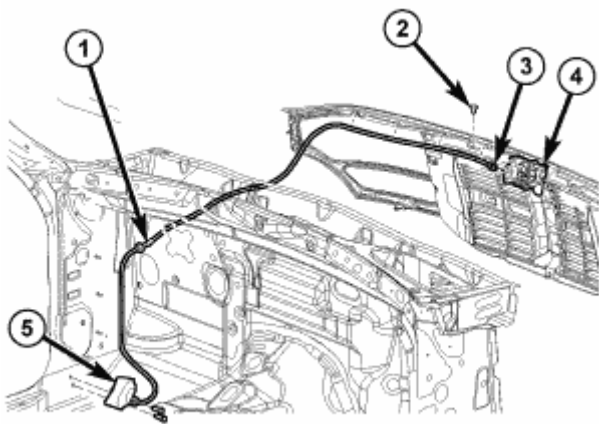
Fig. 406: Latch Release Cable
Courtesy of CHRYSLER LLC

- 1 - Grommet
- 2 - Push Pin
- 3 - Latch Release Cable
- 4 - Hood Latch
- 5 - Latch Release Handle

1. Remove the latch release cable (3) from the latch (4).
2. Remove the push pin (2) from the grille, carefully remove the latch release cable from under the grille and from the retaining tabs on the grille.
3. Remove the cowl trim cover.
4. Remove the bolts from the hood latch handle (5).
5. Pull from the inside of the vehicle to remove the cable. Disconnect any remaining attaching clips and pull the cable grommet (1) and cable from the body.

INSTALLATION

RELEASE - HOOD LATCH



8195167c

Fig. 407: Latch Release Cable
Courtesy of CHRYSLER LLC

- 1 - Grommet
- 2 - Push Pin
- 3 - Latch Release Cable
- 4 - Hood Latch
- 5 - Latch Release Handle

NOTE: Lubricate the grommet with soapy water to ease with installation of the latch release cable to the body.

1. Install the latch release cable (1) through the opening in the body from the inside of the vehicle. Pull from the engine compartment until the grommet is seated properly in the body.

NOTE: **Route the latch release cable in the same position as noted during removal.**

2. Install the latch release cable to the grille retaining tabs, carefully route under the push pin (2) connection on the grille.
3. Install the push pin (2) to the grille.
4. Install the latch release cable (3) to the latch (4).
5. Install the bolts to the hood latch handle (5) and tighten to 4 N.m (33 in. lbs.).
6. Install the cowl trim cover.

RELEASE - HOOD LATCH HANDLE

REMOVAL

RELEASE - HOOD LATCH HANDLE

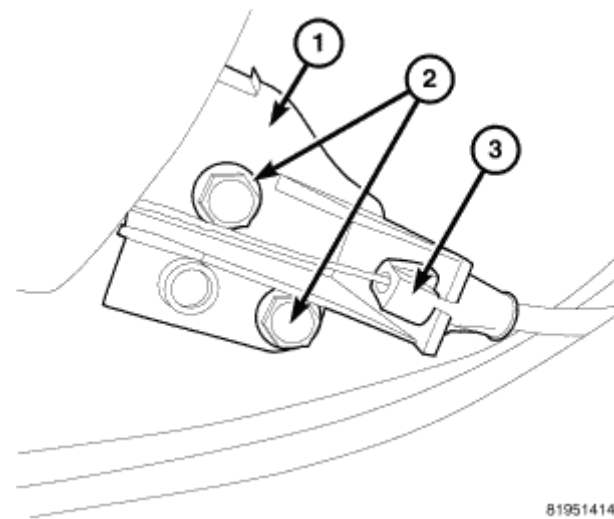
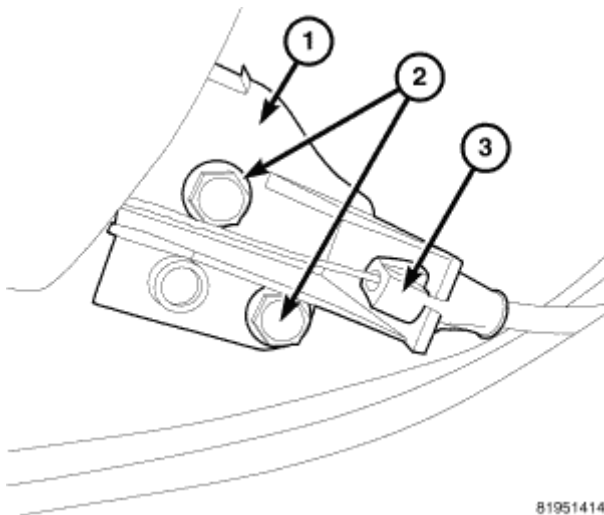


Fig. 408: Latch Release Handle
Courtesy of CHRYSLER LLC

1. Remove the cowl trim panel, see **REMOVAL**.
2. Remove the two bolts (2) from the handle (1).
3. Disconnect the hood release cable (3) from the handle (1).
4. Remove the handle (1) from the vehicle.

INSTALLATION

RELEASE - HOOD LATCH HANDLE



81951414

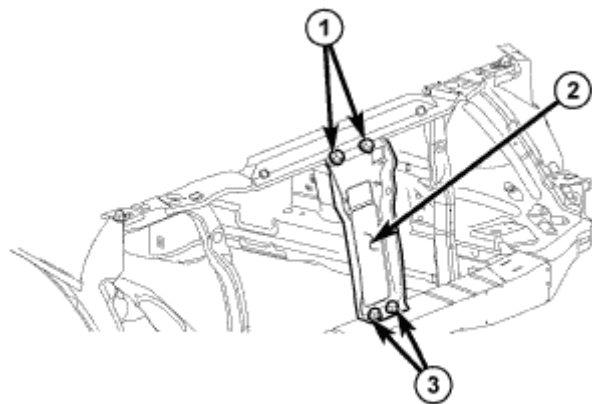
Fig. 409: Latch Release Handle
Courtesy of CHRYSLER LLC

1. Install the hood release cable (3) to the handle (1).
2. Install the two bolts (2) to the handle (1) and tighten to 4 N.m (33 in. lbs.)
3. Install the cowl trim cover, see **INSTALLATION**.

BRACKET - LATCH SUPPORT

REMOVAL

BRACKET - LATCH SUPPORT



819983fe

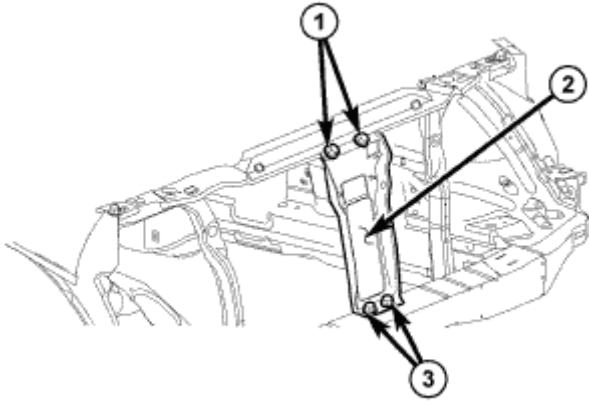
Fig. 410: Latch Support
Courtesy of CHRYSLER LLC

1. Remove the grille, see **REMOVAL**.
2. Remove the latch from the latch support, see **REMOVAL**.

3. Remove the upper bolts (1) and the lower bolts (3) from the latch support (2).
4. Remove the latch support (2) from the vehicle.

INSTALLATION

BRACKET - LATCH SUPPORT



819983fe

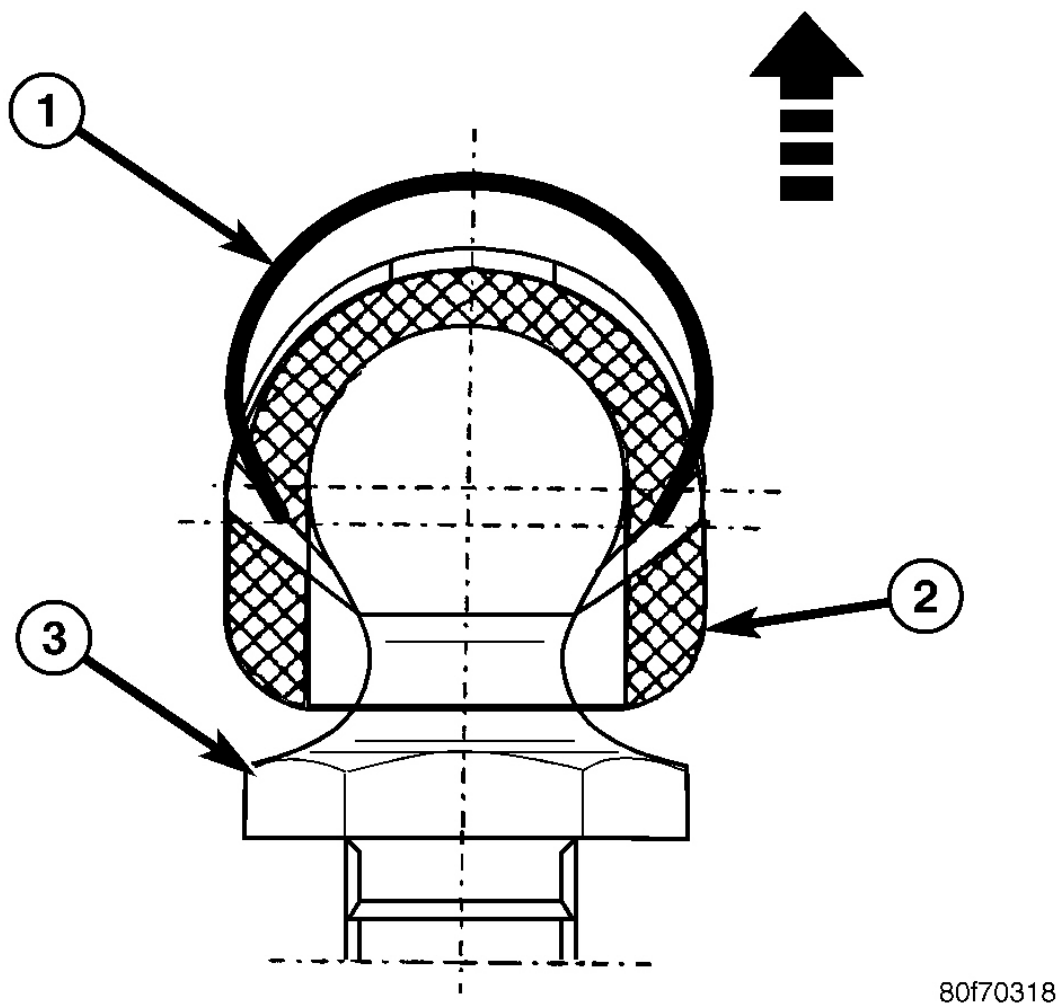
Fig. 411: Latch Support
Courtesy of CHRYSLER LLC

1. Install the latch support (2) to the vehicle.
2. Install the upper bolts (1) and the lower bolts (3) to the latch support (2) and tighten to 8.5 N.m (75 in. lbs.).
3. Install the latch to the latch support, see **INSTALLATION**.
4. Install the grille, see **INSTALLATION**.

SUPPORT - HOOD LATCH

REMOVAL

SUPPORT - HOOD LATCH



80f70318

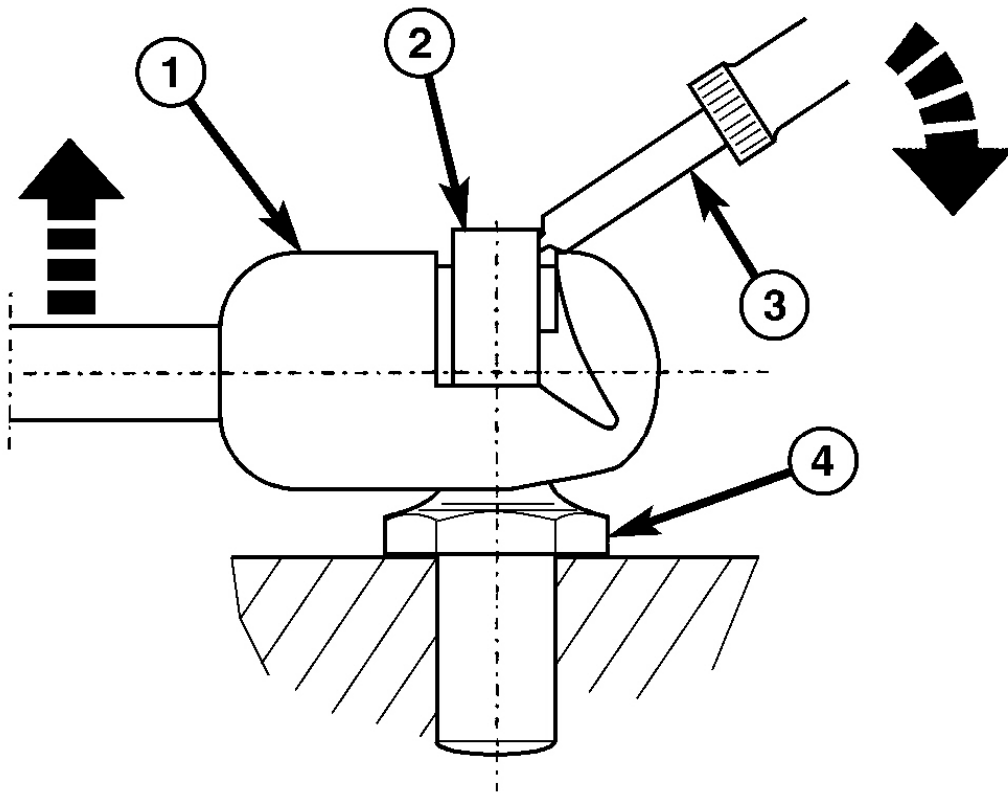
Fig. 412: Removing/Installing Upper Support Cylinder Retaining Clip
Courtesy of CHRYSLER LLC

- | |
|---|
| <p>1 - RETAINING CLIP
2 - BALL SOCKET
3 - BALL STUD</p> |
|---|

NOTE: The support cylinders can be replaced one at a time.

1. Open and support the hood.

NOTE: Lift the clips only enough to release the ball studs.

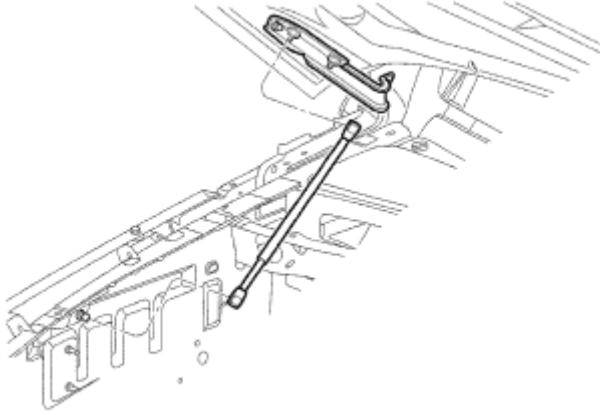


80f70308

Fig. 413: Removing/Installing Support Cylinder - Ball Socket - Typical
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - BALL SOCKET
2 - RETAINING CLIP
3 - FLAT BLADED TOOL
4 - BALL STUD |
|--|

2. Using a small flat bladed tool, or equivalent, release the upper retaining clips while pulling the ball socket away from the ball stud.



8194f9d7

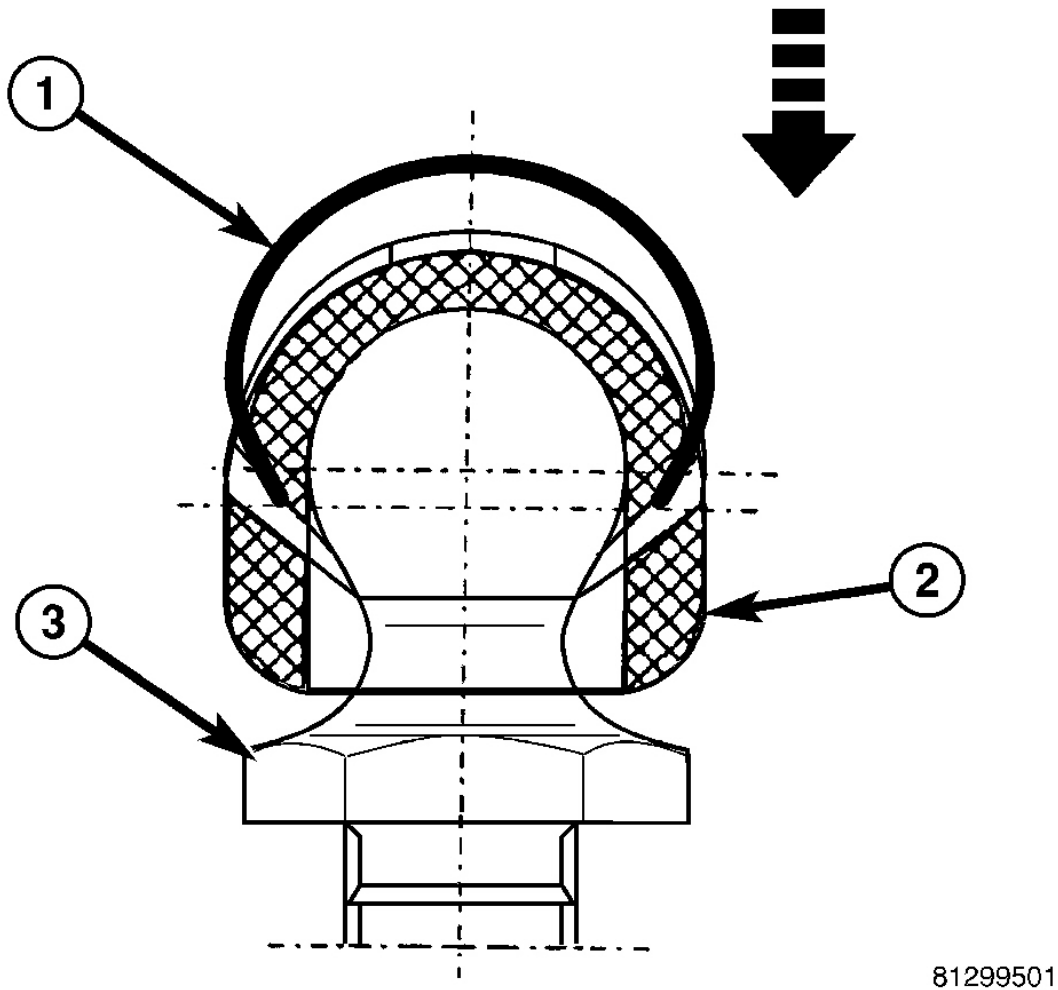
Fig. 414: Support Cylinder
Courtesy of CHRYSLER LLC

CAUTION: Do not pull the supports from the middle while removing.

3. Pulling at the ends only, remove the support cylinder.

INSTALLATION

SUPPORT - HOOD LATCH

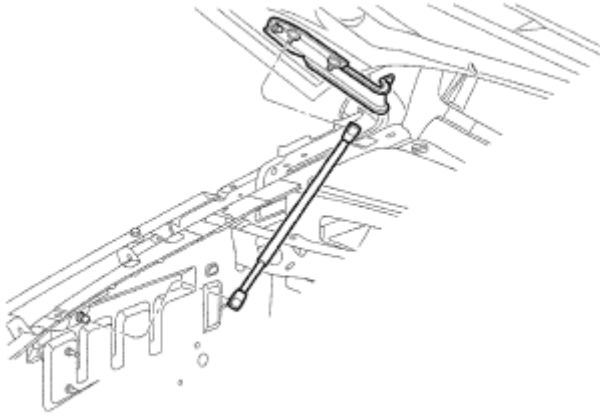


81299501

Fig. 415: Removing/Installing Support Cylinder Retaining Clip
Courtesy of CHRYSLER LLC

- 1 - RETAINING CLIP
- 2 - BALL SOCKET
- 3 - BALL STUD

1. Make sure the retaining clips (1) are seated into the ball socket (2) fully.



8194f9d7

Fig. 416: Support Cylinder
Courtesy of CHRYSLER LLC

CAUTION: Do not install the support cylinders by pressing at the center of the cylinder. Press the ends only.

2. Install the support cylinder over the ball studs with the thin end connected to the body side of the hinge and the retaining clips snapping into place.

INSTRUMENT PANEL

WARNING

RESTRAINT SYSTEM

WARNING: To avoid personal injury or death, during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or inoperative buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or faulty seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® parts catalog.

WARNING: To avoid personal injury or death, on vehicles equipped with airbags, disable the supplemental restraint system before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the supplemental restraint system. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid personal injury or death on vehicles equipped with airbags, before performing any welding operations disconnect and isolate the battery negative (ground) cable and disconnect all wire harness connectors from the airbag control module (ACM). Failure to take the proper precautions could result in accidental airbag deployment and other possible damage to the supplemental restraint system circuits and components.

WARNING: To avoid personal injury or death, do not attempt to dismantle an airbag unit or tamper with its inflator. Do not puncture, incinerate, or bring into contact with electricity. Do not store at temperatures exceeding 93° C (200° F). An airbag inflator unit may contain sodium azide and potassium nitrate. These materials are poisonous and extremely flammable. Contact with acid, water, or heavy metals may produce harmful and irritating gases (sodium hydroxide is formed in the presence of moisture) or combustible compounds. An airbag inflator unit may also contain a gas canister pressurized to over 2500 psi.

WARNING: To avoid personal injury or death, when handling a seat belt tensioner retractor, proper care should be exercised to keep fingers out from under the retractor cover and away from the seat belt webbing where it exits from the retractor cover.

WARNING: To avoid personal injury or death, replace all restraint system components only with parts specified in the DaimlerChrysler Mopar® parts catalog. Substitute parts may appear interchangeable, but internal differences may result in inferior occupant protection.

WARNING: To avoid personal injury or death, the fasteners, screws, and bolts originally used for the restraint system components must never be replaced with any substitutes. These fasteners have special coatings and are specifically designed for the restraint system. Any time a new fastener is needed, replace it with the correct fasteners provided in the service package or specified in the DaimlerChrysler Mopar® parts catalog.

WARNING: To avoid personal injury or death, when a steering column has an airbag unit attached, never place the column on the floor or any other surface with the steering wheel or airbag unit face down.

BEZEL - CLUSTER

REMOVAL

BEZEL - CLUSTER

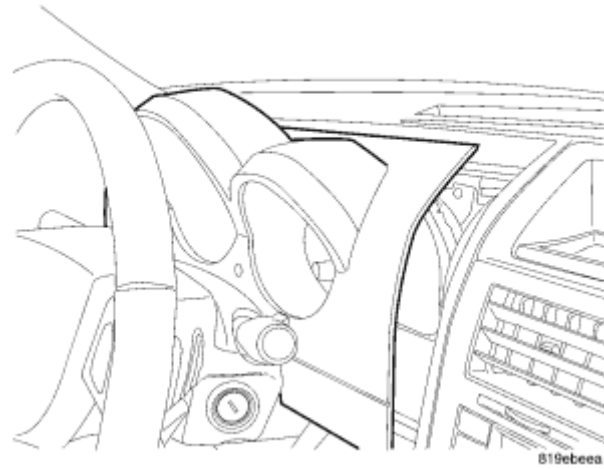


Fig. 417: Cluster Bezel
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.

NOTE: **Position the steering column to the lowest position to ease in the removal of the cluster bezel.**

2. Using a trim stick C-4755 or equivalent, remove the cluster bezel from the instrument panel assembly.

INSTALLATION

BEZEL - CLUSTER

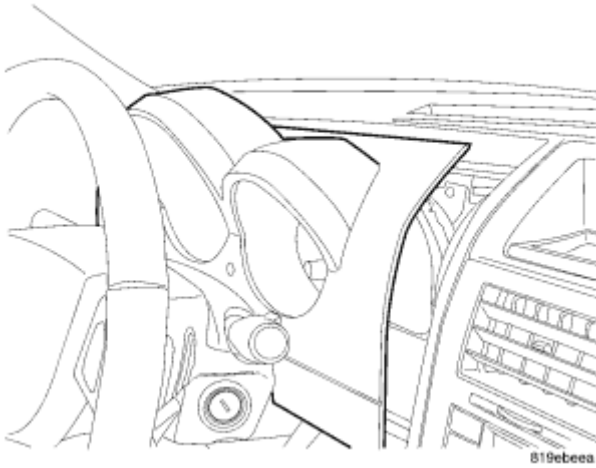


Fig. 418: Cluster Bezel
 Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**
2. Position and install the cluster bezel to the instrument panel, use hand pressure to seat the bezel clips.

BEZEL - INSTRUMENT PANEL CENTER

REMOVAL

BEZEL - INSTRUMENT PANEL CENTER

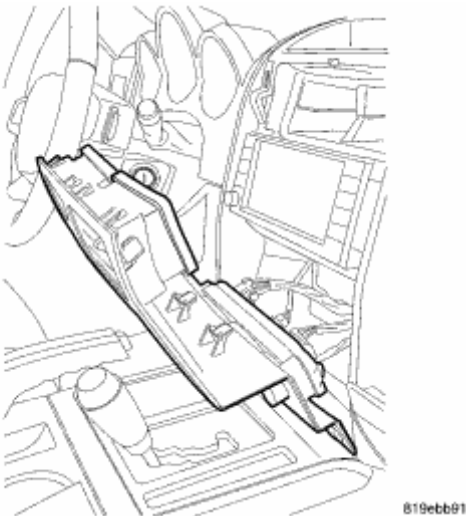


Fig. 419: Instrument Panel Center Bezel
 Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**

2. Set the park brake and move the transmission gear selector into the most rearward position.
3. Using a trim stick C-4755 or equivalent and starting at the top of the center bezel, pry the bezel away from the instrument panel far enough to disengage the snap clip retainers that secure it to the instrument panel.
4. Reach behind the bezel to access and disconnect all electrical connections.
5. Remove the center bezel from the instrument panel.
6. Remove all heating and air conditioning vents, control units and power outlets from the center bezel.

INSTALLATION

BEZEL - INSTRUMENT PANEL CENTER

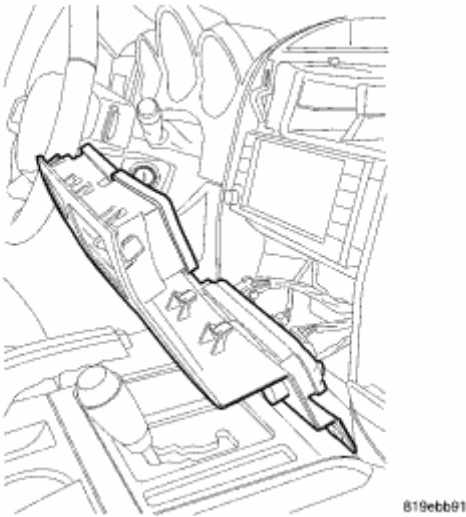


Fig. 420: Instrument Panel Center Bezel
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Install all heating and air conditioning vents, control units, power outlets to the center bezel.
3. Connect the electrical connectors.
4. Position the center bezel and seat the retaining clips starting with the lower clips first using hand pressure.
5. Place the transmission into park.

BEZEL - HVAC

REMOVAL

BEZEL - HVAC

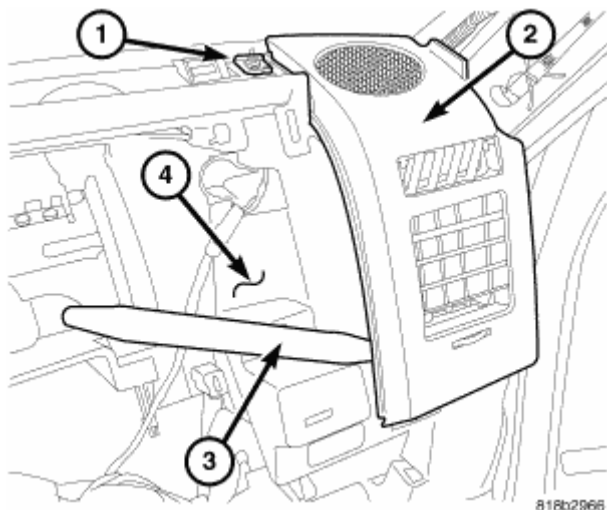


Fig. 421: Instrument Panel Air Outlet R and I
 Courtesy of CHRYSLER LLC

1. Remove the defroster grille, see **REMOVAL**.
2. Remove the A-pillar trim molding from the side of the vehicle being serviced, see **REMOVAL**.
3. Remove the screw (1) that secures the top of the air outlet (2) to the instrument panel (4).
4. Using a trim stick C-4755 or equivalent (3), gently pry the lower portion of the air outlet rearward to disengage the two metal retaining clips from the instrument panel and remove the outlet.
5. If required, carefully disengage the plastic retaining tabs that secure the air outlet grille to the back of air outlet and remove the grille from the outlet.

INSTALLATION

BEZEL - HVAC

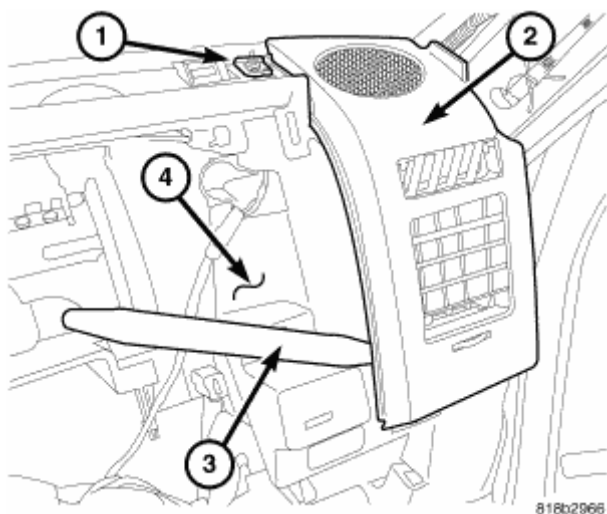


Fig. 422: Instrument Panel Air Outlet R and I
 Courtesy of CHRYSLER LLC

1. Carefully install the air outlet grille onto the back of air outlet and engage the plastic retaining tabs that secure grille to the outlet. Make sure the retaining tabs are fully engaged.
2. Position the instrument panel air outlet(s) to the instrument panel and engage the two metal retaining clips to the instrument panel. Make sure the retainers are fully engaged.
3. Install the screw (1) that secures the top of the air outlet (2) to the instrument panel (4). Tighten the screw to 1.2 N.m (10 in. lbs.).
4. Install the A-pillar trim molding(s), see **INSTALLATION**.
5. Install the defroster grille, see **INSTALLATION**.

BIN - INSTRUMENT PANEL

REMOVAL

BIN - INSTRUMENT PANEL

CAUTION: Carefully disengage the retaining clips on the instrument panel bin, make sure the tool does not scratch the instrument panel assembly while removing.

1. Remove the screws underneath the bin mat and remove bin.
2. Using a trim stick C-4755 or equivalent, release the clips attaching the instrument panel bin to the instrument panel.

INSTALLATION

BIN - INSTRUMENT PANEL

CAUTION: Carefully align the upper center tray clips to the instrument panel slots. Make sure the panel is properly positioned to avoid breaking the clip tabs on the bin.

1. Align and install the instrument panel bin to the instrument panel.
2. Use hand pressure to engage the instrument panel bin clips to the instrument panel slots.
3. Install screws underneath the bin mat and tighten.

BIN - STEERING COLUMN COVER

REMOVAL

BIN - STEERING COLUMN COVER

1. Remove the steering column cover panel, see **REMOVAL**.
2. Use a trim stick C-4755 or equivalent, disengage the lower hinges of the steering column cover bin from the steering column cover panel.

INSTALLATION

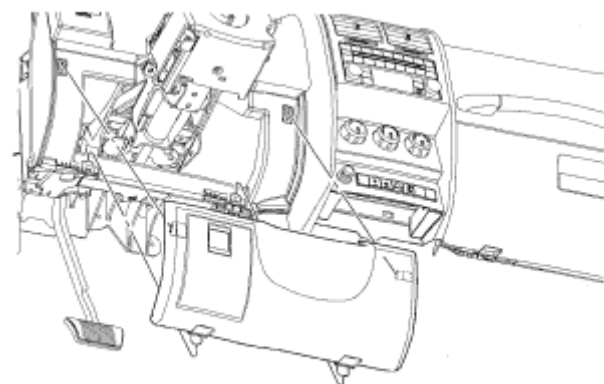
BIN - STEERING COLUMN COVER

1. Install the steering column cover bin lower hinges to the steering column cover panel.
2. Install the steering column cover panel, see **INSTALLATION**.

COVER - STEERING COLUMN

REMOVAL

COVER - STEERING COLUMN



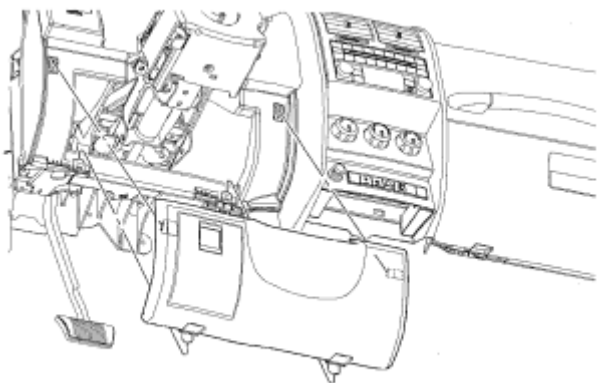
8196d206

Fig. 423: Knee Blocker
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Position the steering column into the highest position to ease in the removal of the steering column cover. Reach into the steering column opening at the top of the steering column cover and pull the top rearward to disengage cover blocker clips.
3. Gently swing the cover open.
4. While the cover is in a full down position, slide the cover to the left or outboard of the driver side, this will allow the claws of the cover to disengage from the trim panel hinges, and then pull the cover rearward to remove the steering column cover.

INSTALLATION

COVER - STEERING COLUMN



8196d206

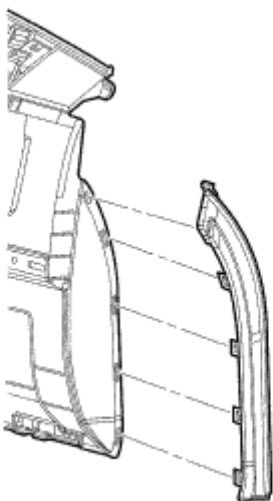
Fig. 424: Knee Blocker
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**
2. Align steering column cover's claws to instrument panel tabs. When claws are aligned with tabs, slide the cover to the right or inboard of the driver side to engage the claws over the instrument panels hinges.
3. Gently swing the steering column cover upward until the clips touch the corresponding slots in the instrument panel and use hand pressure to engage the clips.

END CAP - INSTRUMENT PANEL

REMOVAL

END CAP - INSTRUMENT PANEL



819ec577

Fig. 425: Instrument Panel End Cap
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Using a trim stick C-4755 or equivalent, remove the end cap bezel from the instrument panel assembly.

INSTALLATION

END CAP - INSTRUMENT PANEL

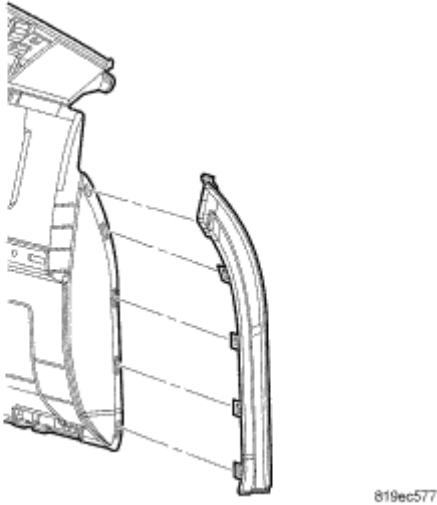


Fig. 426: Instrument Panel End Cap
Courtesy of CHRYSLER LLC

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Position the end cap and seat the retaining clips using hand pressure.

GLOVE BOX - INSTRUMENT PANEL

REMOVAL

GLOVE BOX - INSTRUMENT PANEL

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Open the glove box.
3. Squeeze the stop tabs located on the sides of the box while and swing the glove box door open.
4. With box in the full down position slide the box to the right off of the hinges and remove.

INSTALLATION

GLOVE BOX - INSTRUMENT PANEL

1. Before proceeding with the following repair procedure, review all warnings and cautions. See

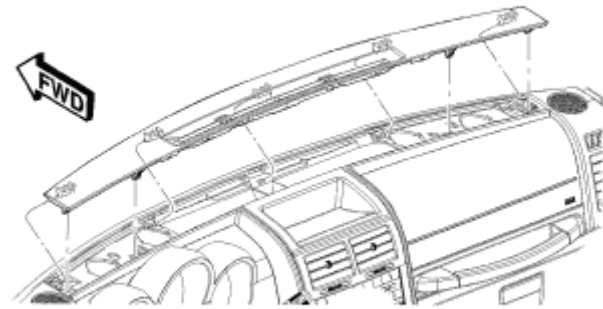
WARNING.

2. Position the box on and slide the box to the left to engage the hinges.
3. Close the glove box.

GRILLE-DEFROSTER

REMOVAL

GRILLE-DEFROSTER



8196d433

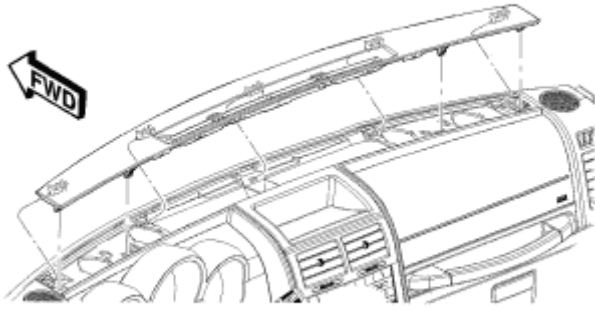
Fig. 427: Defroster Grille
Courtesy of CHRYSLER LLC

CAUTION: Carefully disengage the retaining clips on the defroster grille, make sure the tool does not scratch the instrument panel assembly while removing.

1. Using a trim stick C-4755 or equivalent, release the rearward edge clips, and secondly once the rearward edge clips are released. Move in an upward and rearward direction to release the front edge clips of the instrument panel top cover.
2. Remove the defroster grille from instrument panel.

INSTALLATION

GRILLE-DEFROSTER



8196d433

Fig. 428: Defroster Grille
Courtesy of CHRYSLER LLC

CAUTION: Carefully align the defroster grille clips to the instrument panel slots. Make sure the panel is properly positioned to avoid breaking the clip tabs on the defroster grille.

1. Position the defroster grille at a 45° angle and engage the forward clips first then engage the rear clips of the defroster grille to the instrument panel.
2. Use hand pressure to engage the defroster grille clips to the instrument panel slots.

LATCH - GLOVE BOX DOOR

REMOVAL

LATCH - GLOVE BOX DOOR

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Remove the glove box, see **REMOVAL**.
3. Remove the three screws and remove the glove box latch.

INSTALLATION

LATCH - GLOVE BOX DOOR

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Position the latch to the glove box.
3. Install the three screws.
4. Install the glove box, see **INSTALLATION**.

PANEL - INSTRUMENT

REMOVAL

PANEL - INSTRUMENT

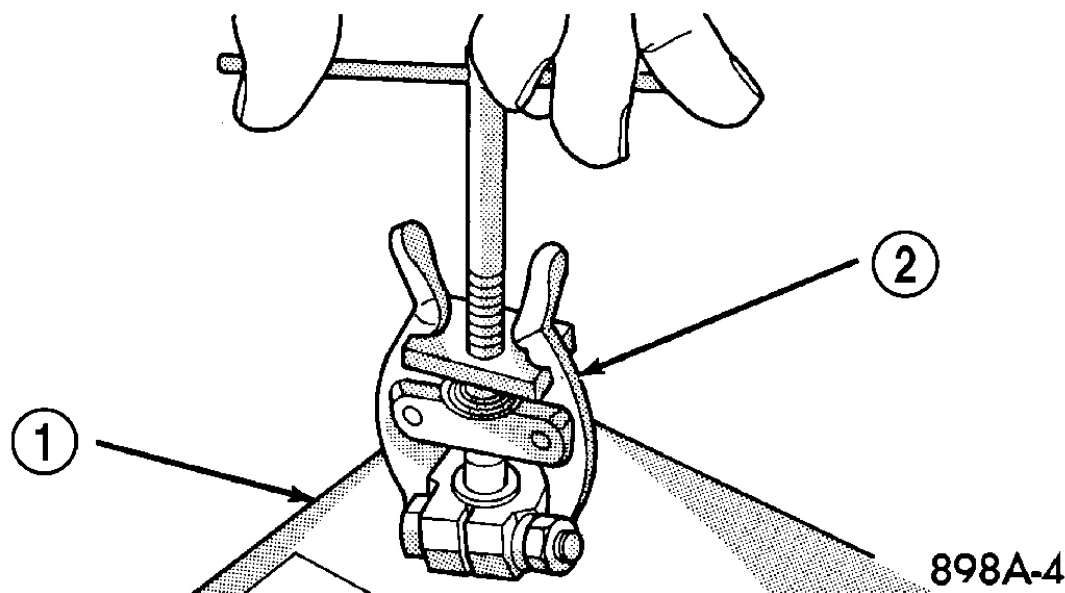
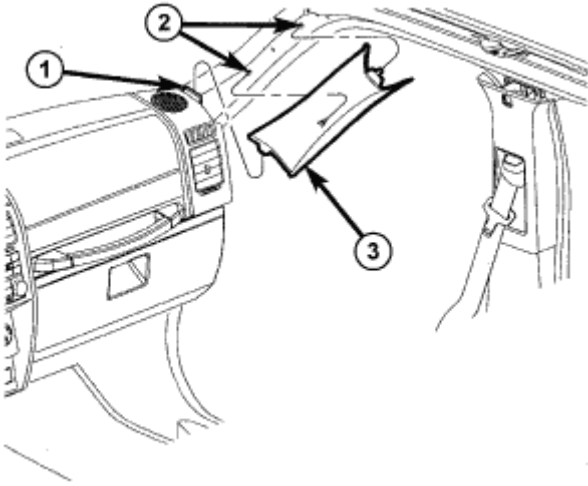


Fig. 429: Removing Battery Cable Terminal Clamp - Typical
Courtesy of CHRYSLER LLC

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

NOTE: Before starting this procedure, be certain to turn the steering wheel until the front wheels are in the straight-ahead position.

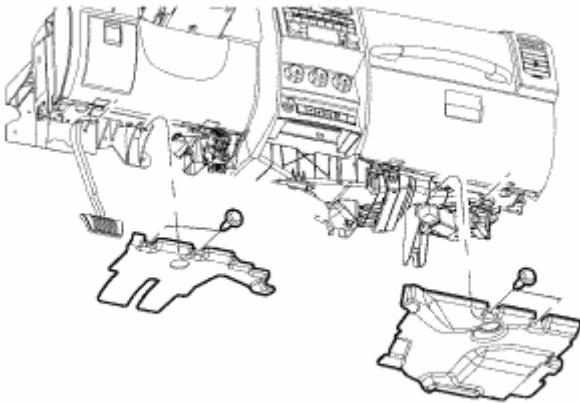
1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Loosen the battery terminal nut and use a battery terminal removal tool (2) to disconnect the negative battery cable from the battery (1).



819543f7

Fig. 430: Instrument Panel, Slots & Moldings
 Courtesy of CHRYSLER LLC

3. Remove the right and left A-pillar trim moldings using a small pry tool or equivalent, lift the A-pillar trim molding (3) from the A-pillar slots (2) releasing the clips on the molding.



819d2bec

Fig. 431: Removing/Installing Fasteners And Close Out Panels
 Courtesy of CHRYSLER LLC

4. Remove the fasteners and close out panels from the lower I/P.

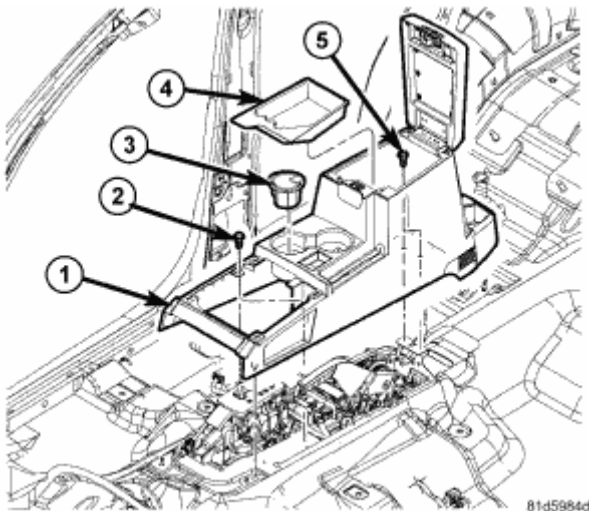


Fig. 432: Removing/Installing Floor Console
 Courtesy of CHRYSLER LLC

5. Remove the floor console, see **REMOVAL**.

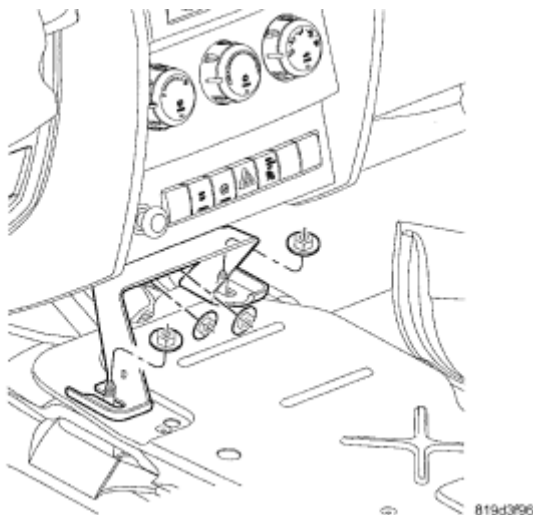
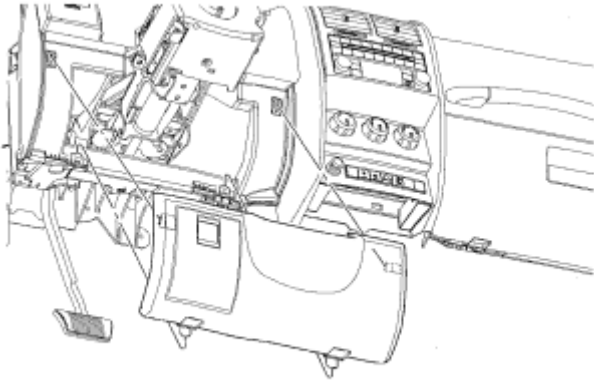


Fig. 433: Removing/Installing Nuts And Instrument Panel Support Bracket
 Courtesy of CHRYSLER LLC

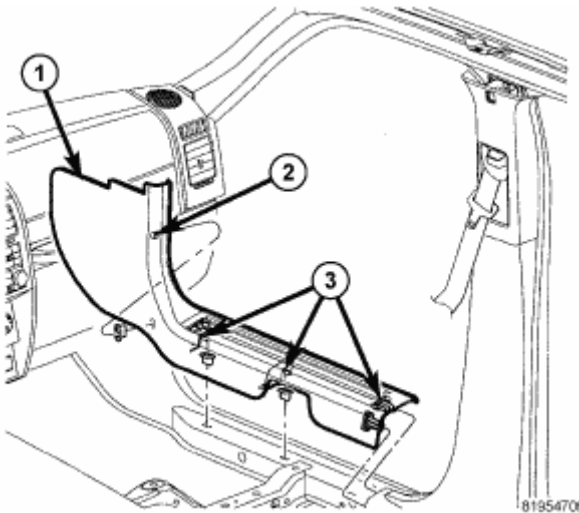
6. Remove the nuts and the instrument panel support bracket.



8196d206

Fig. 434: Knee Blocker
Courtesy of CHRYSLER LLC

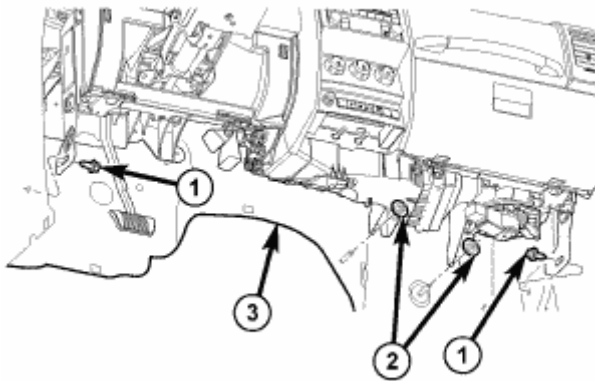
7. Reach into the steering column opening at the top of the knee blocker and pull the top rearward to disengage upper knee blocker clips.
8. Gently swing the knee blocker open.
9. While the cover is in a full down position, slide the cover to the left or outboard of the driver side, this will allow the claws of the cover to disengage from the trim panel hinges, and then pull the cover rearward to remove the steering column cover.



8195d70f

Fig. 435: Cowl Trim Panel
Courtesy of CHRYSLER LLC

10. Remove the right and left cowl side panels, see **REMOVAL**.



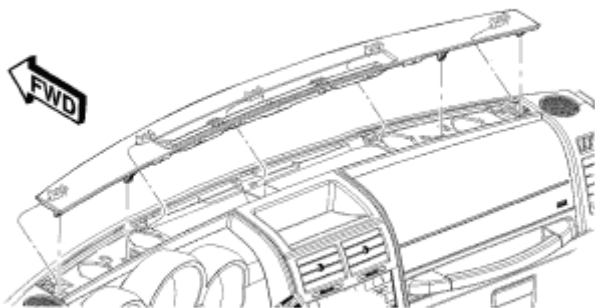
819d4076

Fig. 436: Lower Instrument Panel
 Courtesy of CHRYSLER LLC

11. Remove bolts (1) and the nuts (2) from the lower instrument panel mounts.

NOTE: Using a grease pencil or equivalent, mark the position of the steering wheel.

12. Remove the steering column from the vehicle, refer to **REMOVAL** .



8196d433

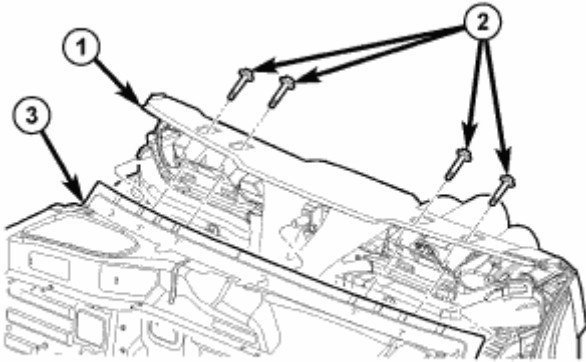
Fig. 437: Defroster Grille
 Courtesy of CHRYSLER LLC

CAUTION: Carefully disengage the retaining clips on the defroster grille. Make sure the tool does not scratch the instrument panel assembly while removing.

13. Using a trim stick C-4755 or equivalent, release the rearward edge clips, and secondly once the rearward

edge clips are released. Move in an upward and rearward direction to release the front edge clips of the instrument panel top cover.

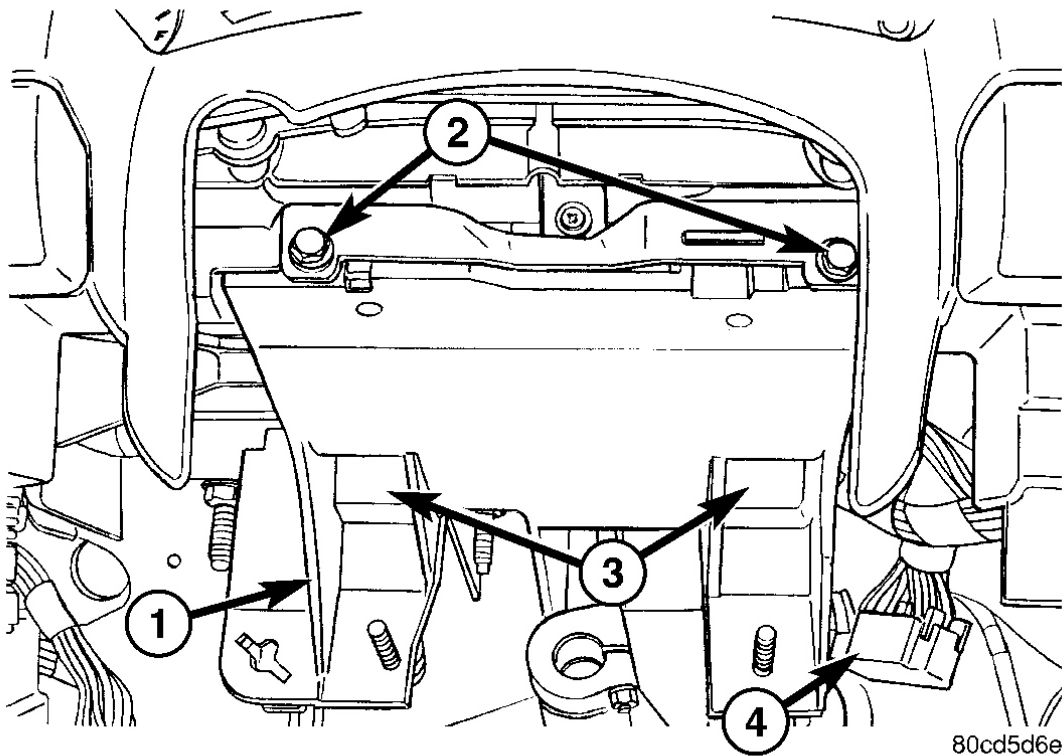
14. Remove the defroster grille from the instrument panel.



819d4224

Fig. 438: Upper Instrument Panel
Courtesy of CHRYSLER LLC

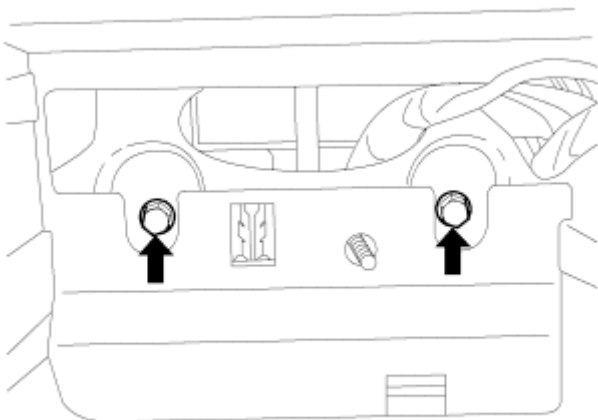
15. Remove the bolts (2) attaching the instrument panel (1) to the body (3).



80cd5d6e

Fig. 439: Pedal Support Bracket
 Courtesy of CHRYSLER LLC

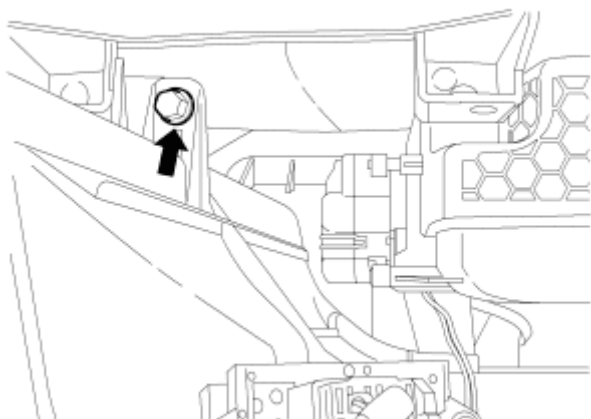
16. Disconnect the electrical connector at the inner side of the pedal support bracket.
17. Remove the two bolts at the front of the pedal support bracket.
18. Remove the two bolts from the bottom side of the pedal support bracket.



81a957b6

Fig. 440: Center Instrument Panel Attachment
Courtesy of CHRYSLER LLC

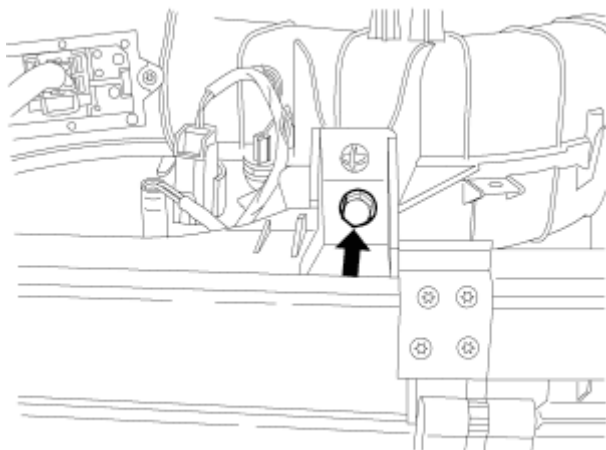
19. Remove the instrument panel center bezel.
20. Disconnect the following electrical connections:
 - Control Head
 - Lighter
 - Switch Bank
21. Remove the fasteners from the center instrument panel attachment.



81a957b2

Fig. 441: Upper Instrument Panel Attachment
Courtesy of CHRYSLER LLC

22. Remove the glove box, see **REMOVAL**.
23. Remove the fastener from the upper instrument panel attachment.



81a957c3

Fig. 442: Lower Instrument Panel Attachment

Courtesy of CHRYSLER LLC

24. Remove the fastener from the lower instrument panel attachment.

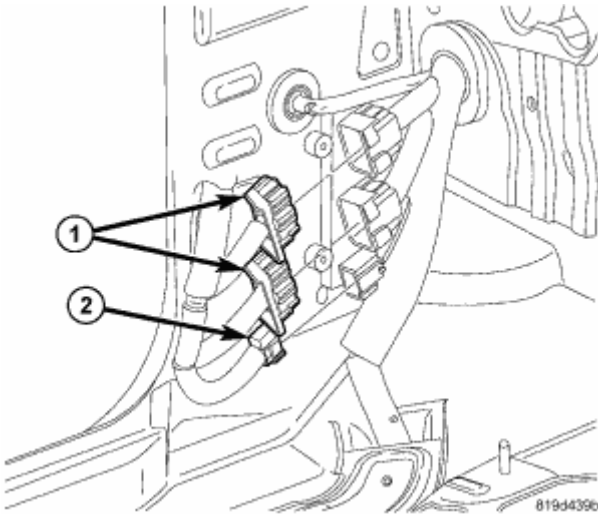


Fig. 443: 40 Way Electrical Connectors And NAG1 Connector
Courtesy of CHRYSLER LLC

25. Disconnect the two 40 way electrical connectors (1) and the Nag1 connector for the transmission if equipped.
26. Remove the electrical connections on the instrument panel harness.
27. Remove the instrument panel from the vehicle compartment.

INSTALLATION

PANEL - INSTRUMENT

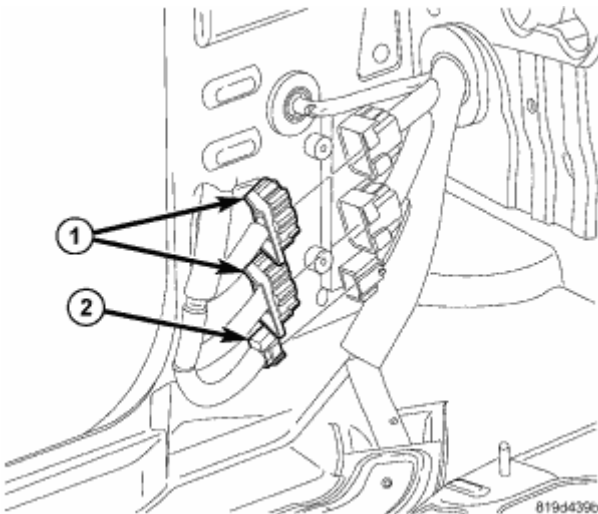


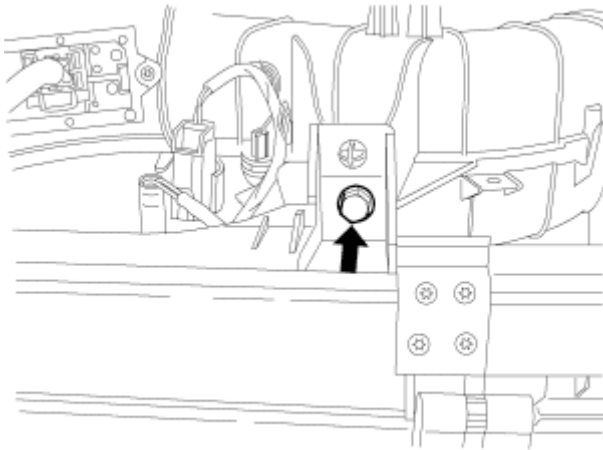
Fig. 444: 40 Way Electrical Connectors And NAG1 Connector
Courtesy of CHRYSLER LLC

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

NOTE: Before starting this procedure, be certain to turn the steering wheel until the front wheels are in the straight-ahead position.

NOTE: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**

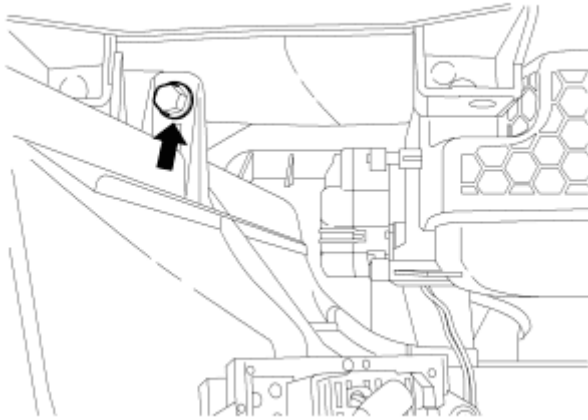
1. Install the instrument panel to the vehicle.
2. Connect the two 40 way electrical connectors (1) and the Nag1 connector for the transmission, if equipped.



81a957c3

Fig. 445: Lower Instrument Panel Attachment
Courtesy of CHRYSLER LLC

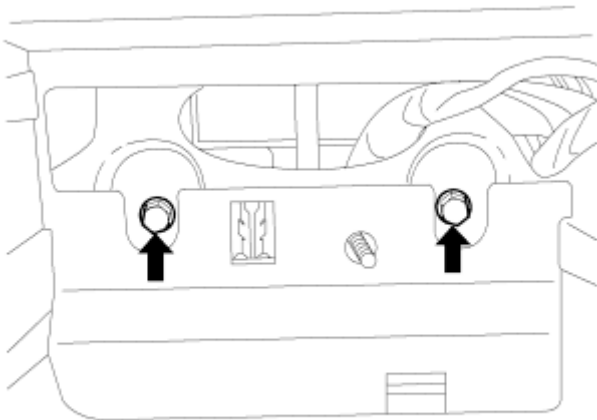
3. Install the fastener to the lower instrument panel attachment.



81a957b2

Fig. 446: Upper Instrument Panel Attachment
Courtesy of CHRYSLER LLC

4. Install the fastener to the upper instrument panel attachment.
5. Install the glove box, see **INSTALLATION**.



81a957b6

Fig. 447: Center Instrument Panel Attachment
Courtesy of CHRYSLER LLC

6. Install the fasteners to the center instrument panel attachment.
7. Connect the following electrical connections:
 - Control Head
 - Lighter
 - Switch Bank
8. Install the instrument panel center bezel.

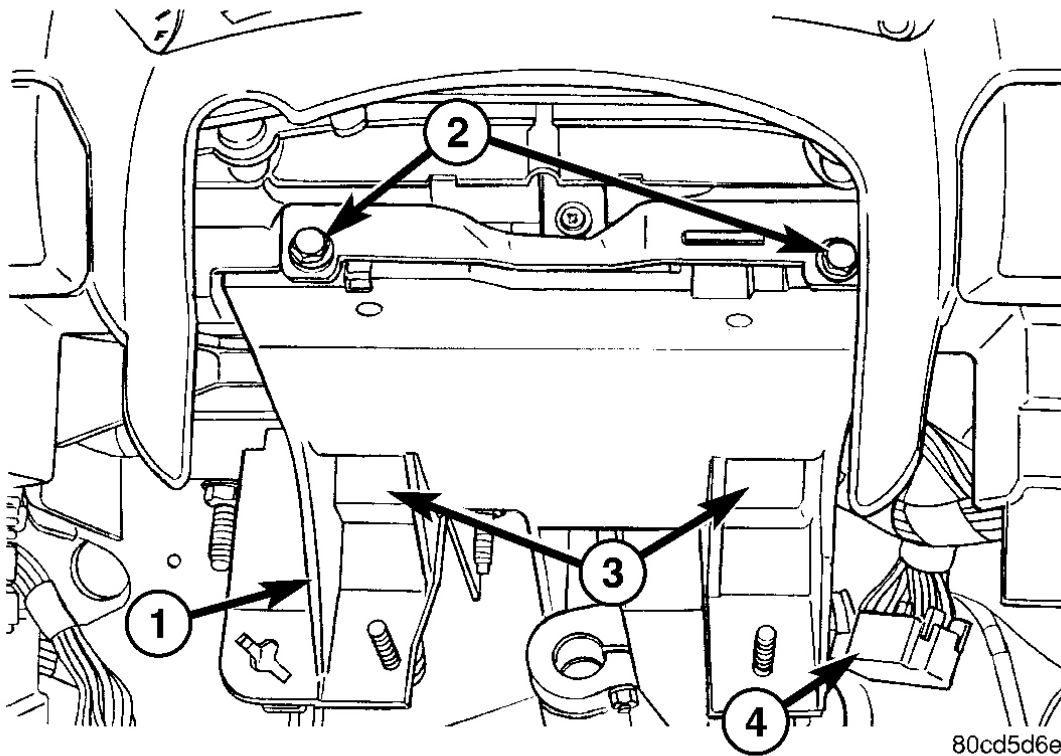


Fig. 448: Pedal Support Bracket
 Courtesy of CHRYSLER LLC

9. Install the two bolts to the bottom side of the pedal support bracket.
10. Install the two bolts at the front of the pedal support bracket.
11. Connect the electrical connector at the inner side of the pedal support bracket.

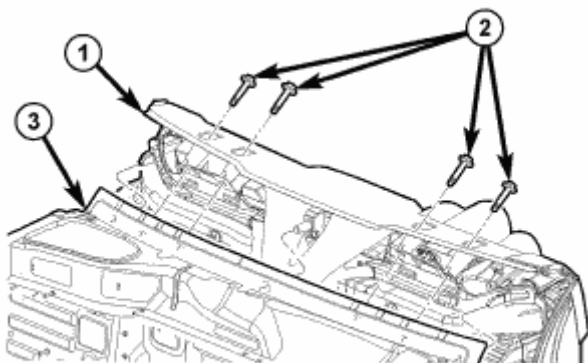
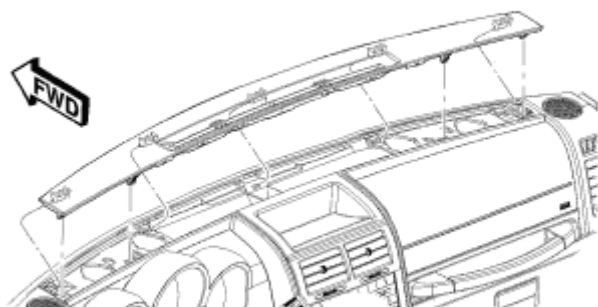


Fig. 449: Upper Instrument Panel
Courtesy of CHRYSLER LLC

CAUTION: Make sure the clips located at the center stack and between the HVAC duct and instrument panel are engaged before tightening the upper instrument panel bolts.

12. Install the bolts (2) attaching the instrument panel (1) to the body (3) and tighten to 28 N.m (20.5 ft. lbs.).

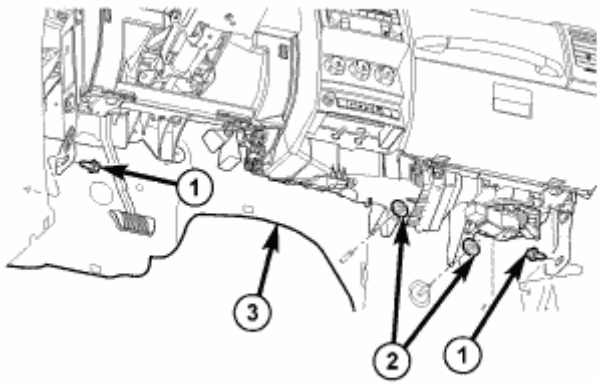


8196d433

Fig. 450: Defroster Grille
Courtesy of CHRYSLER LLC

CAUTION: Carefully align the defroster grille clips to the instrument panel slots. Make sure the panel is properly positioned to avoid breaking the clip tabs from the defroster grille.

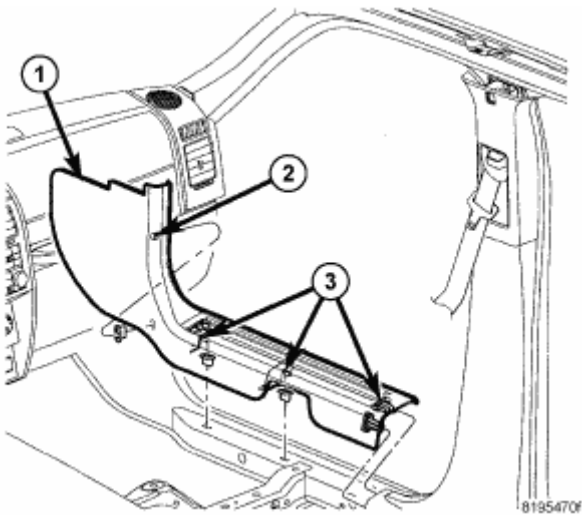
13. Align and install the defroster grille to the instrument panel.
14. Use hand pressure to engage the defroster grille clips to the instrument panel slots.
15. Install the steering column to the vehicle, refer to **INSTALLATION** .



819d4076

Fig. 451: Lower Instrument Panel
Courtesy of CHRYSLER LLC

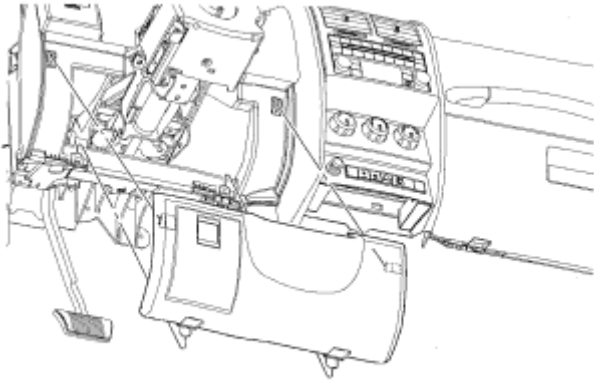
16. Install the bolts (1) and tighten to 6 N.m (55 in. lbs.).
17. Install the nuts (2) to the lower instrument panel mounts and tighten to 30.5 N.m (22.5 ft. lbs.).



8195470F

Fig. 452: Cowl Trim Panel
Courtesy of CHRYSLER LLC

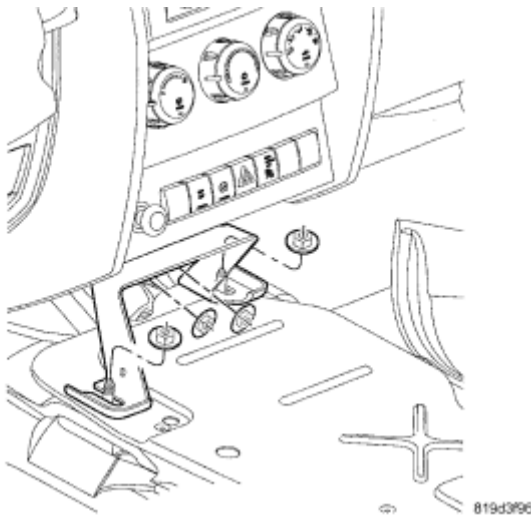
18. Install the right and left cowl side panels, see **INSTALLATION**.



8196d206

Fig. 453: Knee Blocker
Courtesy of CHRYSLER LLC

19. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**
20. Align steering column cover's claws to instrument panel tabs. When claws are aligned with tabs, slide the cover to the right or inboard of the driver side to engage the claws over the instrument panels hinges.
21. Gently swing the steering column cover upward until the clips touch the corresponding slots in the instrument panel and use hand pressure to engage the clips.



819d3f96

Fig. 454: Removing/Installing Nuts And Instrument Panel Support Bracket
Courtesy of CHRYSLER LLC

22. Install the instrument panel support bracket and nuts and tighten to 28 N.m (20.5 ft. lbs.).

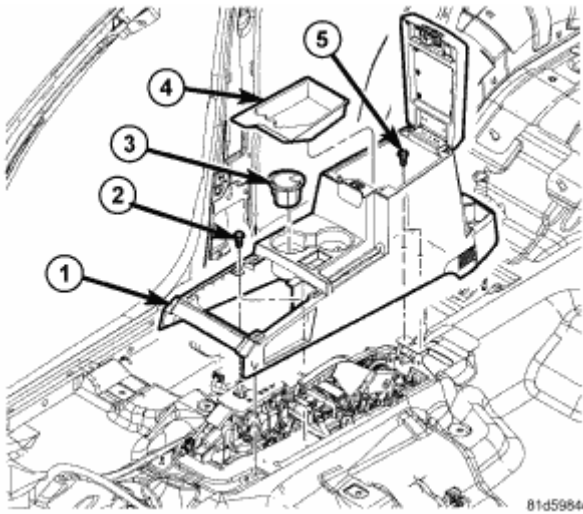


Fig. 455: Removing/Installing Floor Console
Courtesy of CHRYSLER LLC

23. Install the floor console, see **INSTALLATION**.

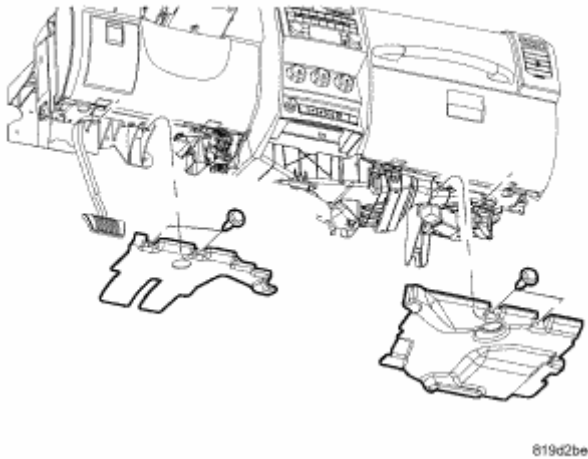


Fig. 456: Removing/Installing Fasteners And Close Out Panels
Courtesy of CHRYSLER LLC

24. Install the close out panels and the bolts to the lower I/P and tighten to 2.5 N.m (22 in. lbs.).

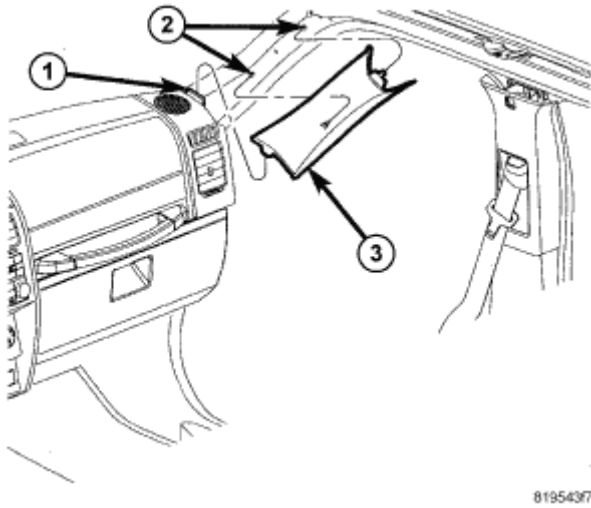


Fig. 457: Instrument Panel, Slots & Moldings
Courtesy of CHRYSLER LLC

25. Align the right and left A-pillar trim tabs on the moldings (3) to the top cover slot of the instrument panel (1).
26. Align the two clips on the molding to the slots (2) on the A-pillar. Snap the A-pillar trim molding (3) into place using hand pressure.
27. Connect the negative battery cable to the battery.

STRIKER - GLOVE BOX DOOR LATCH

REMOVAL

STRIKER - GLOVE BOX DOOR LATCH

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Open the glove box.
3. Remove the two striker screws and remove the latch striker.

INSTALLATION

STRIKER - GLOVE BOX DOOR LATCH

1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Install the striker and install the two screws.
3. Loosen the screws to adjust if necessary.

INTERIOR

BASE - FLOOR CONSOLE

REMOVAL

BASE - FLOOR CONSOLE

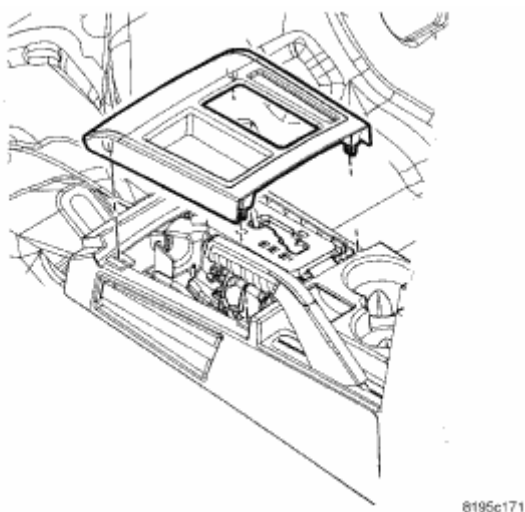


Fig. 458: Floor Console Shift Bezel
Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, pry the shift bezel out of the floor console.
2. If equipped, remove electrical connectors attached to shift bezel.

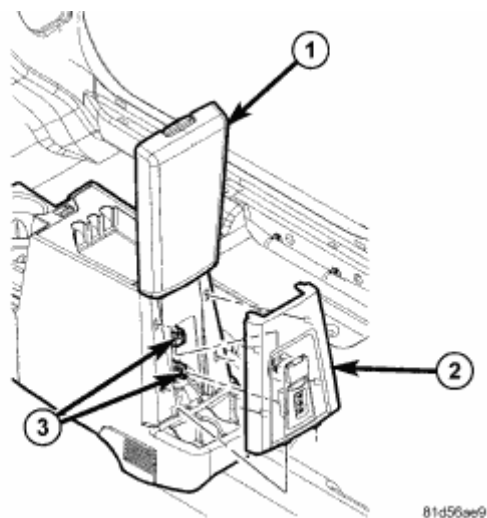


Fig. 459: Console Lid, End Cap & Electrical Connectors
Courtesy of CHRYSLER LLC

3. Open console lid (1).
4. Using a trim stick C-4755 or equivalent, release the fasteners at the four locations around the floor console end cap (2).
5. Disconnect electrical connectors (3) from end cap (2).
6. Remove end cap (2).

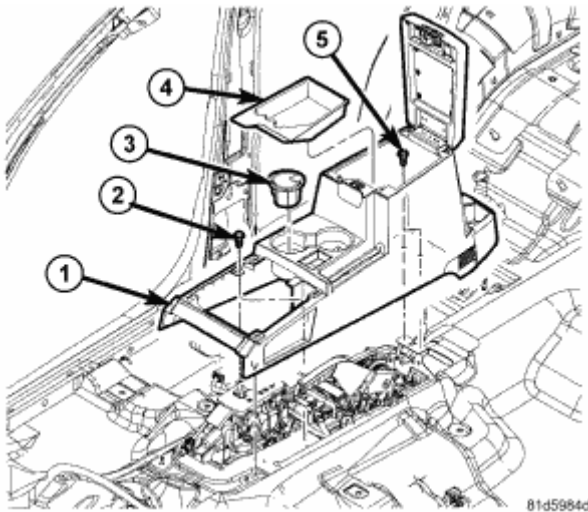


Fig. 460: Removing/Installing Floor Console
 Courtesy of CHRYSLER LLC

7. Remove ash cup (3) from console (1).
8. Remove bin (4) from console (1).
9. Remove two screws (2) from front of console (1).
10. Remove two screws (5) from rear of console (1) located inside the console bin.
11. Lift console (1) at back and remove.

INSTALLATION

BASE - FLOOR CONSOLE

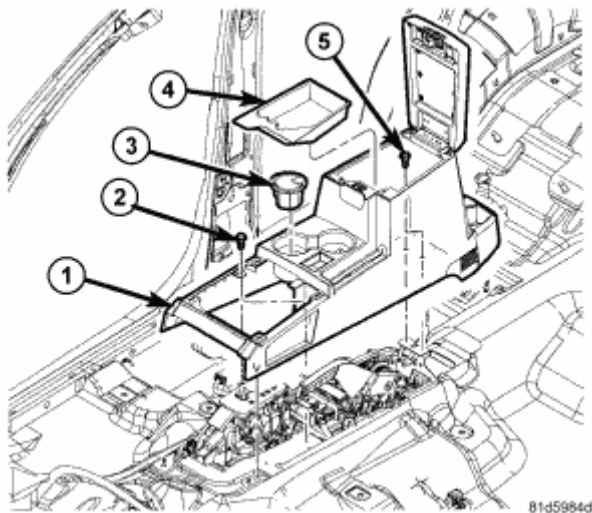


Fig. 461: Removing/Installing Floor Console
 Courtesy of CHRYSLER LLC

1. Install the console (1) into the vehicle.
2. Install the two screws (5) to the rear of the console (1), located inside the console bin.

3. Install the two screws (2) in the front of console (1).
4. Install the bin (4) to the console (1).
5. Install the ash cup (3) to the console (1).

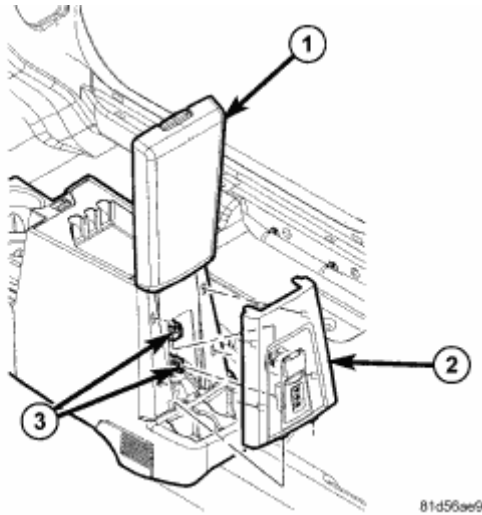


Fig. 462: Console Lid, End Cap & Electrical Connectors
Courtesy of CHRYSLER LLC

6. Connect the electrical connectors (3) to the end cap (2).
7. Align the end cap (2) to the console, use hand pressure to seat the clips.

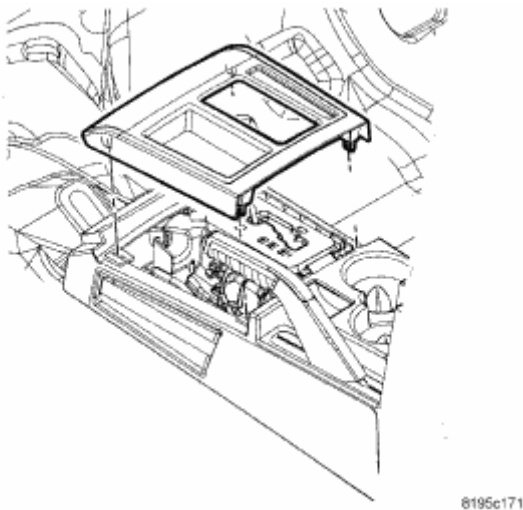


Fig. 463: Floor Console Shift Bezel
Courtesy of CHRYSLER LLC

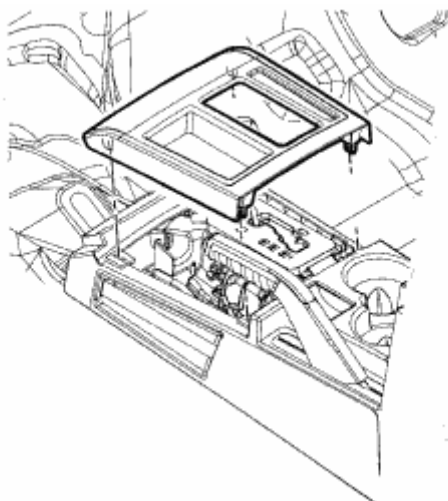
8. If equipped, connect electrical connectors attached to shift bezel.
9. Align and use hand pressure to install the shift bezel into the floor console.

BEZEL - CONSOLE SHIFT

REMOVAL

BEZEL - CONSOLE SHIFT

1. If equipped with a manual transmission and built before February 11, 2008, using a slide-hammer, snap out the shift knob from the lever.



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Fig. 464: Floor Console Shift Bezel
Courtesy of CHRYSLER LLC

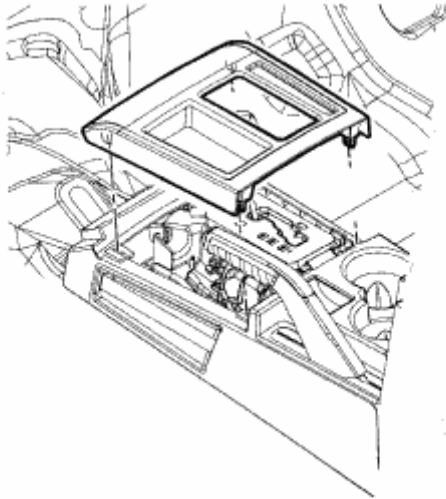
2. Using a trim stick C-4755 or equivalent, pry the shift bezel out of the floor console. If equipped with a manual transmission, the lever boot will come off with the bezel.
3. If equipped, remove electrical connectors attached to shift bezel.
4. If equipped with a manual transmission and built on or after February 11, 2008, using a slide-hammer, snap out the shift knob from the lever.

NOTE: If equipped with a manual transmission and built on or after February 11, 2008, to remove the boot from the console bezel, operate the retaining clips to release the boot frame. Do not attempt using a trim stick on the top surface, that will damage the part.

INSTALLATION

BEZEL - CONSOLE SHIFT

1. If equipped with a manual transmission and built on or after February 11, 2008, snap in the shift knob on the shift lever.



8195c171

Fig. 465: Floor Console Shift Bezel
 Courtesy of CHRYSLER LLC

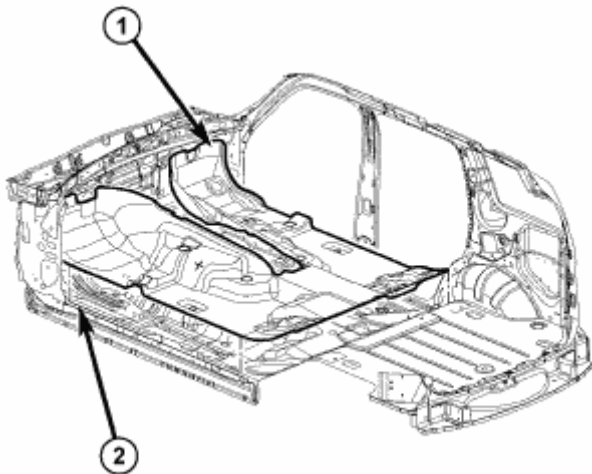
2. If equipped, connect electrical connectors attached to shift bezel.
3. Align and use hand pressure to install the shift bezel into the floor console.
4. If equipped with a manual transmission and built before February 11, 2008, snap in the shift knob on the shift lever.

CARPET - FLOOR

REMOVAL

CARPET - FLOOR

Front Carpet



8195eb8b

Fig. 466: Front Carpet
 Courtesy of CHRYSLER LLC

1. Remove front seats, see **REMOVAL**.
2. Remove the floor console, see **REMOVAL**.
3. Remove the rear seats, see **REMOVAL**.
4. Remove the cowl trim panels, see **REMOVAL**.
5. Remove the B-pillar lower trim, see **REMOVAL**.
6. Remove all electrical harnesses from the carpet.
7. Remove the carpet from the vehicle.

INSTALLATION

CARPET - FLOOR

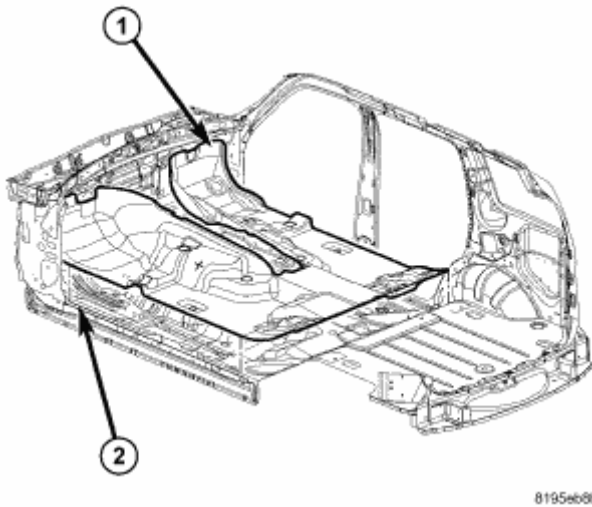


Fig. 467: Front Carpet
Courtesy of CHRYSLER LLC

1. Install the carpet to the vehicle.
2. Route all the electrical harness pigtails into the carpet at the varies locations.
3. Install the B-pillar lower trim, see **INSTALLATION**.
4. Install the cowl trim panels, see **INSTALLATION**.
5. Install the rear seats, see **INSTALLATION**.
6. Install the floor console, see **INSTALLATION**.
7. Install the front seats, see **INSTALLATION**.

COVER - B PILLAR LOWER

REMOVAL

COVER - B PILLAR LOWER

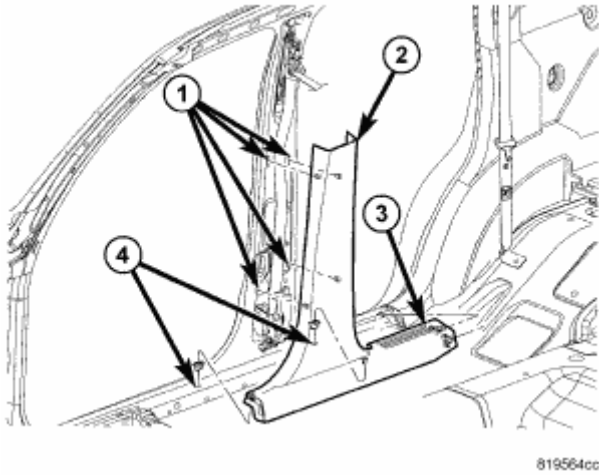


Fig. 468: Lower B Pillar Cover
 Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, pry up on the trim panel (2), releasing the retaining clips from the body (4).
2. Remove the trim panel (2) from the B-pillar (1).
3. Remove the trim panel (2) by sliding the panel forward releasing the panel from the scuff clips in the body (3).

INSTALLATION

COVER - B PILLAR LOWER

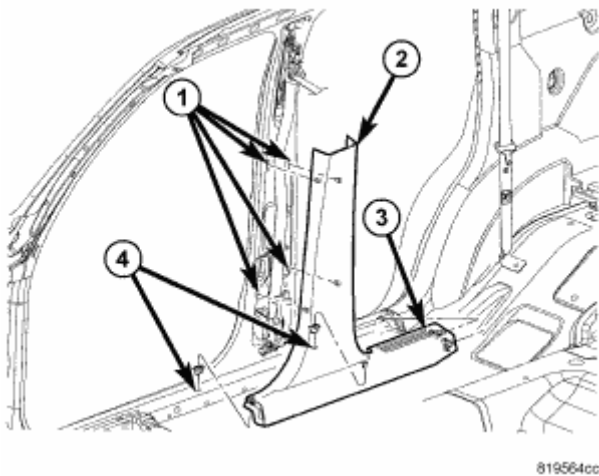


Fig. 469: Lower B Pillar Cover
 Courtesy of CHRYSLER LLC

1. Align and install the trim panel clips (3) rearward and into quarter trim panel.
2. Push the trim panel (2) down into the body (4) using hand pressure until all clips are seated.

3. Align and install the trim panel (2) to the body slots (1) on the B-pillar. Snap into place using hand pressure.

COVER - B PILLAR UPPER

REMOVAL

COVER - B PILLAR UPPER

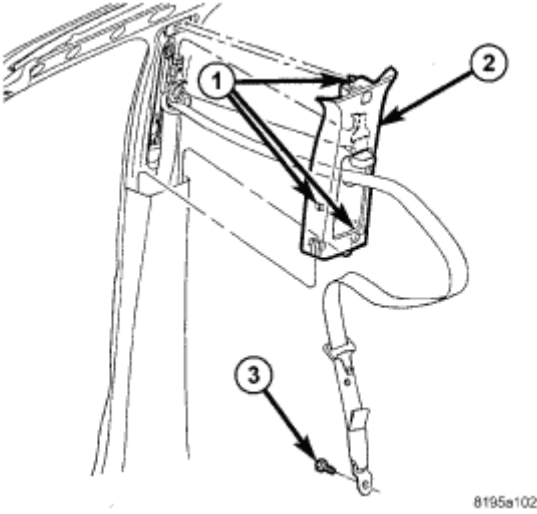
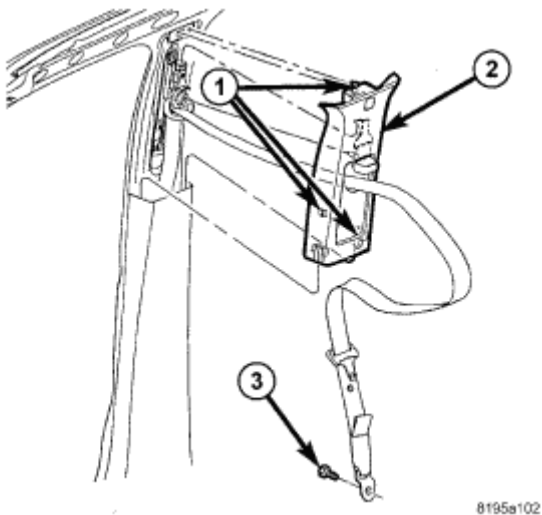


Fig. 470: Upper B-Pillar Trim
Courtesy of CHRYSLER LLC

1. Remove the seat belt bolt (3).
2. Using a trim stick C-4755 or equivalent, pry out the screw cover from the top of the trim panel (2), remove the screw.
3. Remove the trim (2) by sliding up and out of the B-pillar lower trim.
4. Remove the seatbelt webbing from the B-pillar upper trim (2).

INSTALLATION

COVER - B PILLAR UPPER



8195a102

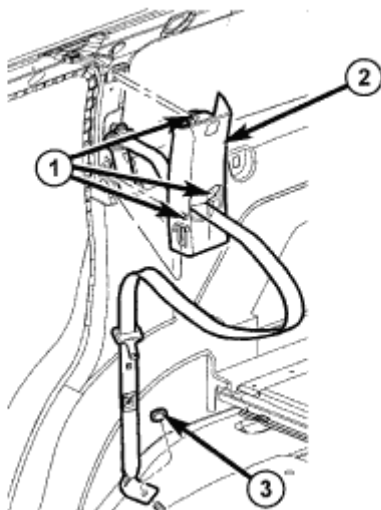
Fig. 471: Upper B-Pillar Trim
Courtesy of CHRYSLER LLC

1. Feed the seatbelt webbing through the B-pillar trim (2). Slide the belt adjuster to top position.
2. Install the trim (2) by sliding down and into the B-pillar lower trim.
3. Align the 4-way locator and seat the B-pillar trim (2) to the body.
4. Install the screw and screw cover.
5. Install the seat belt bolt (3) and tighten to 44.5 N.m (33 ft. lbs.).

COVER - C PILLAR

REMOVAL

COVER - C PILLAR



819590fe

Fig. 472: C-Pillar Cover
Courtesy of CHRYSLER LLC

1. Remove the seat belt bolt (3).
2. Using a trim stick C-4755 or equivalent, pry out the screw cover from the top of the trim panel (2), remove the screw.
3. Remove the trim (2) by sliding up and out of the quarter trim molding.
4. Remove the seatbelt webbing from the C-pillar trim (2).

INSTALLATION

COVER - C PILLAR

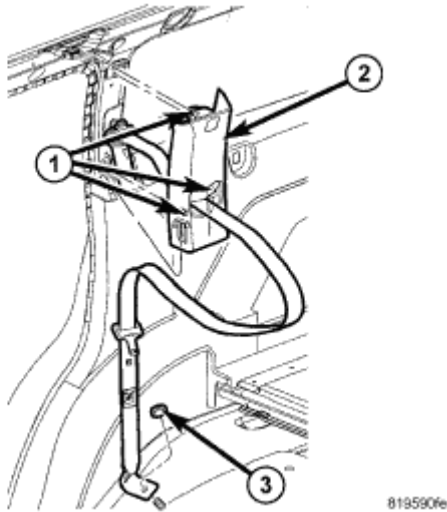


Fig. 473: C-Pillar Cover
Courtesy of CHRYSLER LLC

1. Feed the seatbelt webbing through the C-pillar trim (2).
2. Install the trim (2) by sliding down and into the quarter trim molding.
3. Align the 4-way locator and seat the C-pillar trim (2) to the body.
4. Install the screw and screw cover.
5. Install the seat belt bolt (3) and tighten to 62 N.m (46 ft. lbs.).

CAP - FLOOR CONSOLE END

REMOVAL

CAP - FLOOR CONSOLE END

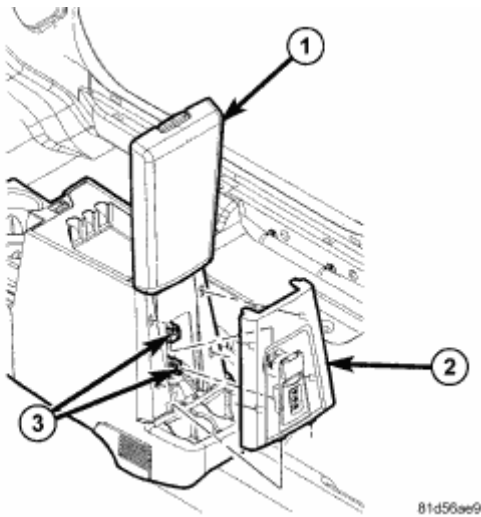


Fig. 474: Console Lid, End Cap & Electrical Connectors
 Courtesy of CHRYSLER LLC

1. Open console lid (1).
2. Using a trim stick C-4755 or equivalent, release the fasteners at the four locations around the floor console end cap (2).
3. Disconnect electrical connectors (3) from end cap (2).
4. Remove end cap (2).

INSTALLATION

CAP - FLOOR CONSOLE END

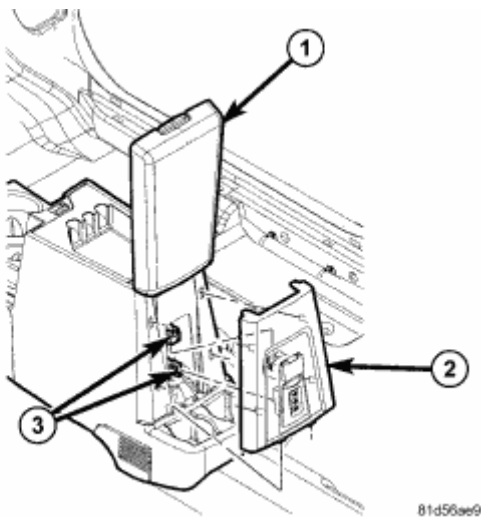


Fig. 475: Console Lid, End Cap & Electrical Connectors
 Courtesy of CHRYSLER LLC

1. Connect the electrical connectors (3) to the end cap (2).
2. Align the end cap (2) to the console, use hand pressure to seat the clips.

FLOOR - LOAD

REMOVAL

FLOOR - LOAD

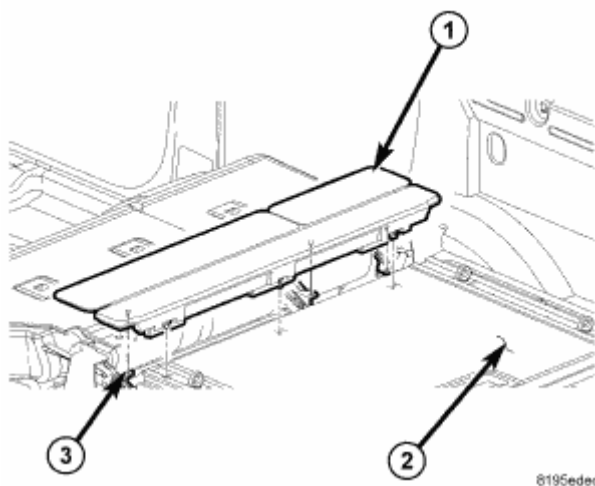


Fig. 476: Load Floor Panel, Load Floor & Rear Seat Bracket
Courtesy of CHRYSLER LLC

1. Position the rear seats in the forward position.
2. Remove the load floor panel (1) from the load floor (2) and the rear seat bracket (3).

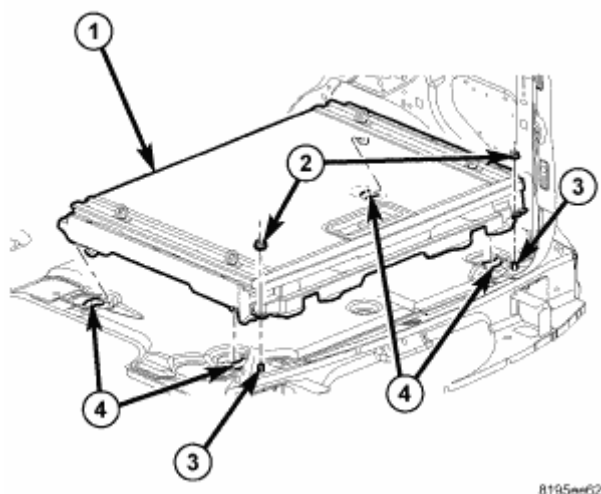


Fig. 477: Load Floor
Courtesy of CHRYSLER LLC

3. Remove the nuts (2) from the load floor (1).
4. Lift the rear of the floor panel (1) up and rearward to release from the body hooks (4).
5. Remove the load floor (1) from the vehicle.

INSTALLATION

FLOOR - LOAD

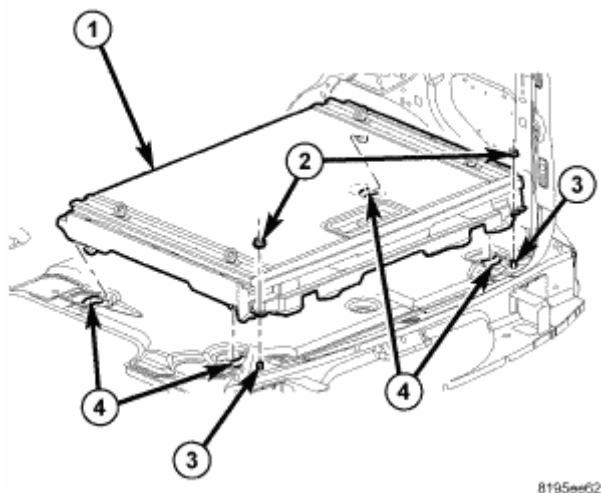


Fig. 478: Load Floor
Courtesy of CHRYSLER LLC

1. Install the load floor (1) to the vehicle.
2. Lift the rear of the floor panel (1) up and forward to catch the hooks (4).
3. Lower the load floor (1) onto the studs (3).
4. Install the nuts (2) to the load floor (1) and tighten the nuts to 28 N.m (20.5 ft. lbs.).

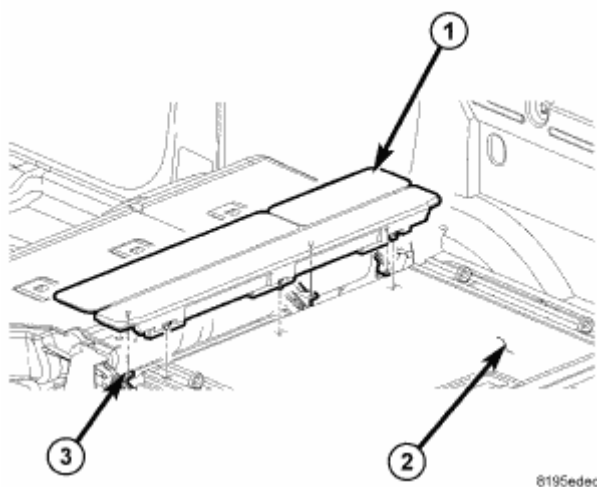


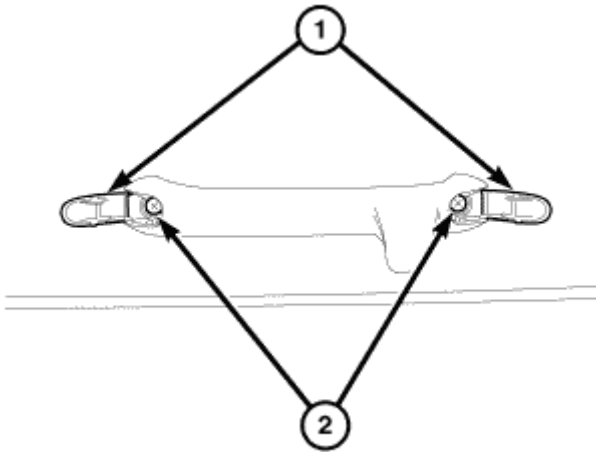
Fig. 479: Load Floor Panel, Load Floor & Rear Seat Bracket
Courtesy of CHRYSLER LLC

5. Install the load floor panel (1) to the load floor (2) and the rear seat bracket (3). Use hand pressure to seat the clips.
6. Return the rear seats in the upright position.

HANDLE - ASSIST

REMOVAL

HANDLE - ASSIST



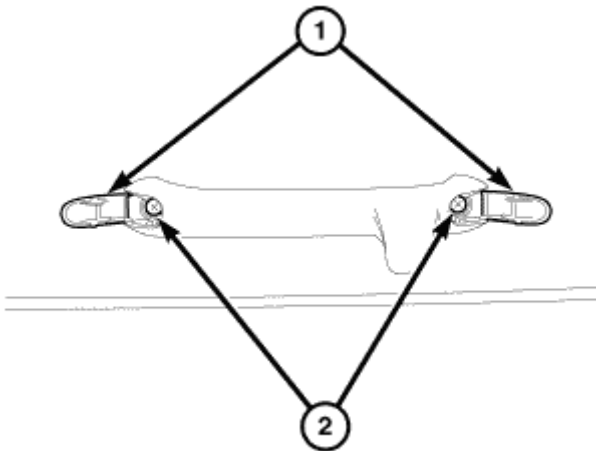
81a6a93c

Fig. 480: Handle Assist
Courtesy of CHRYSLER LLC

1. Using a small pry tool or equivalent, release the assist handle by prying open the covers (1) at either end.
2. Remove the screws (2) from the assist handle.

INSTALLATION

HANDLE - ASSIST



81a6a93c

Fig. 481: Handle Assist
Courtesy of CHRYSLER LLC

NOTE: **Inspect and replace the screw retaining clips if damaged.**

1. Position the assist handle to the headliner and install the screws (2).
2. Close the covers (1) on either end of the assist handle.

HEADLINER

REMOVAL

HEADLINER

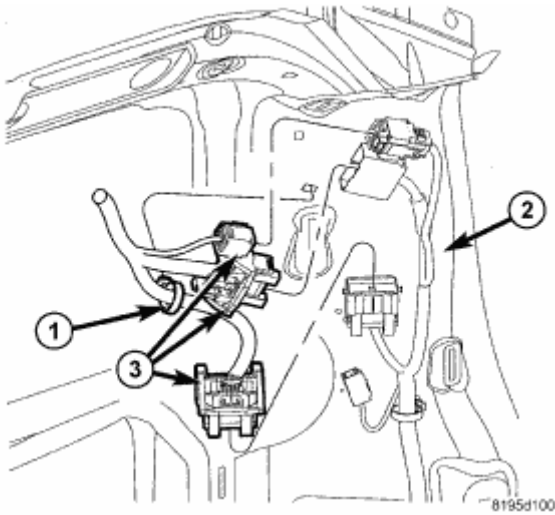


Fig. 482: Harness Clip, D-Pillar Body & Body Harness Connectors
Courtesy of CHRYSLER LLC

1. Disconnect the negative battery cable.
2. If equipped, remove the sunroof opening trim ring.
3. Remove the quarter trim, see **REMOVAL**.
4. Remove the upper B-pillar trim, see **REMOVAL**.
5. Remove the A-pillar trim, see **REMOVAL**.
6. If equipped, remove the overhead console, refer to **REMOVAL**.
7. Remove the sun visor support, see **REMOVAL**.
8. Remove the visors, see **REMOVAL**.
9. Remove the assist handles, see **REMOVAL**.
10. Disconnect the body harness connectors (3).
11. Remove the harness clip (1) from the D-pillar body (2).

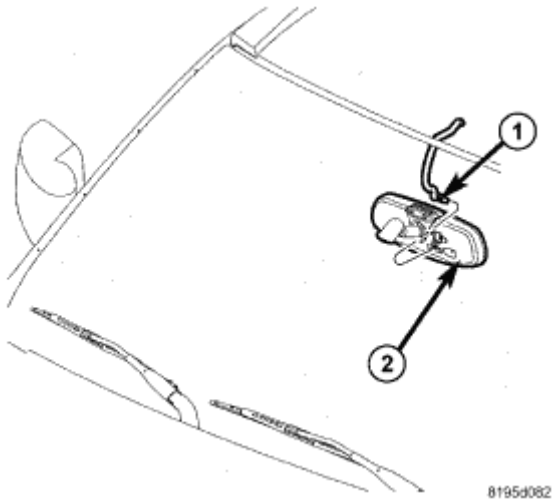


Fig. 483: Mirror Electrical Connector
 Courtesy of CHRYSLER LLC

12. If equipped, disconnect the electrical connector (1) from the mirror (2).

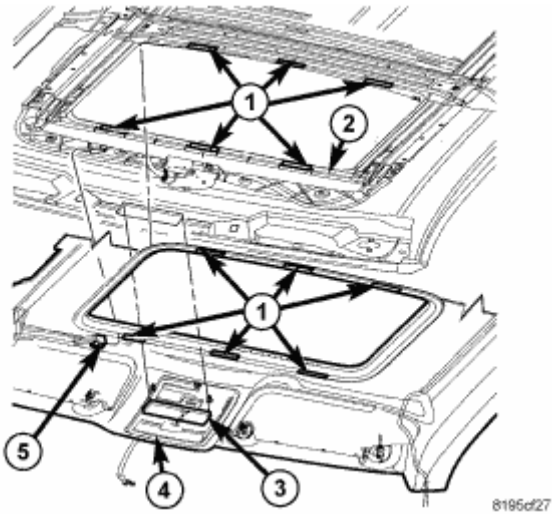
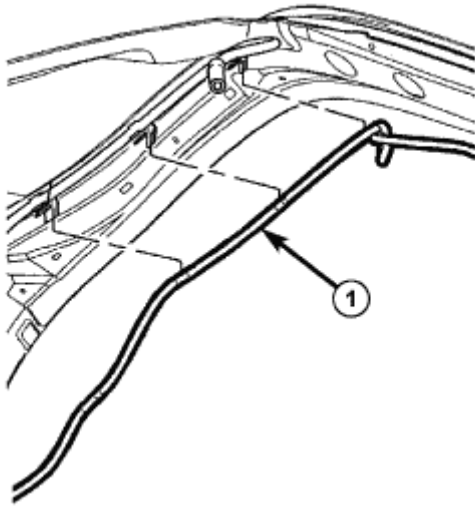


Fig. 484: Dual Lock Areas, Sunroof, Spacer Foam Blocker, Headliner & Sunroof Motor Jumper
 Courtesy of CHRYSLER LLC

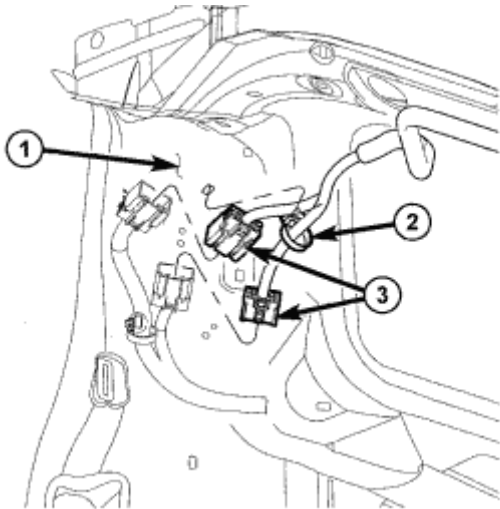
13. Disconnect the sunroof motor jumper (5).
14. Using a trim stick C-4755 or equivalent, separate the dual lock fasteners (1) of the headliner (4) to remove the headliner from the sunroof (2).



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Fig. 485: Lift Gate Washer Hose
Courtesy of CHRYSLER LLC

15. Cut the lift gate washer hose (1) at the A-pillar.



8195ce10

Fig. 486: DVD Electrical Connector
Courtesy of CHRYSLER LLC

16. Remove the harness clip (2) from the D-pillar body (1).
17. Disconnect the DVD electrical connectors (3).

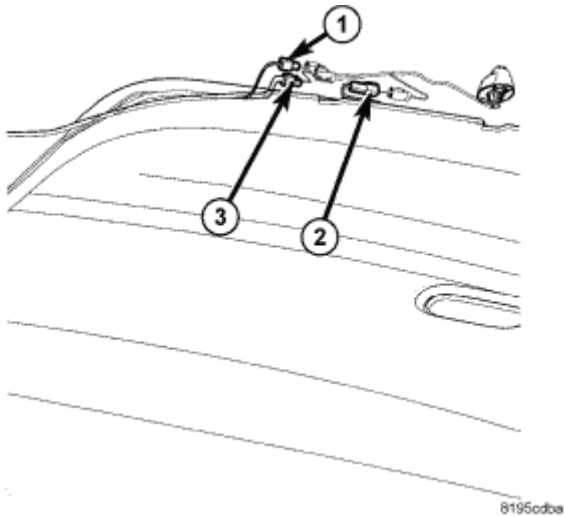


Fig. 487: Satellite Radio Body Antenna Connector, Power Connector & Radio Body Antenna Connector
 Courtesy of CHRYSLER LLC

18. If equipped, disconnect the satellite radio body antenna connector (1).
19. Disconnect the power connector (2).
20. Disconnect the radio body antenna connector (3).

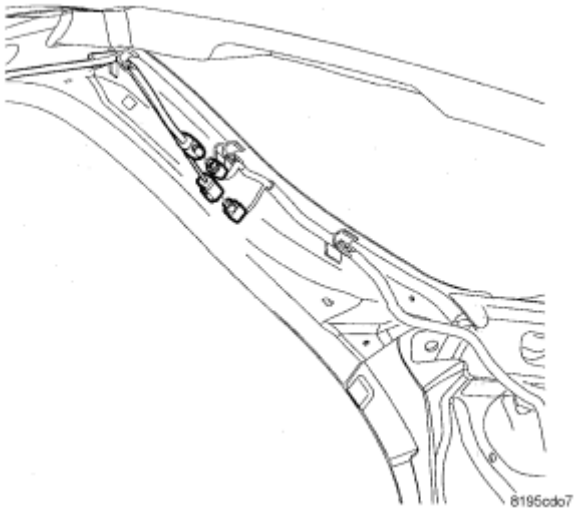


Fig. 488: Radio/Satellite Connections L/F
 Courtesy of CHRYSLER LLC

21. Disconnect the radio and/or satellite electrical connectors along the left A-pillar.

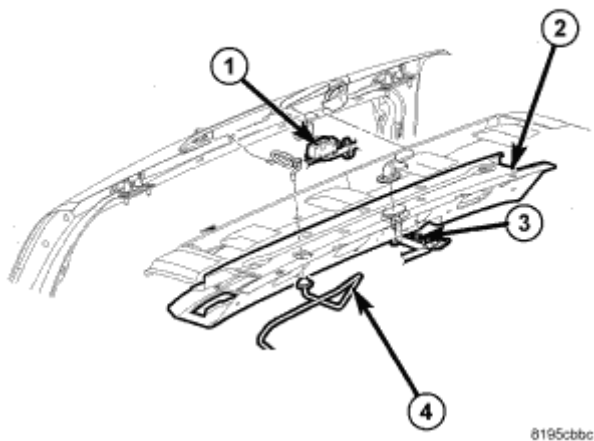


Fig. 489: Headliner Rear Connections
 Courtesy of CHRYSLER LLC

22. Remove the Center High Mount Stop Lamp (CHMSL) and disconnect the lift gate washer hose (4), refer to **REMOVAL** .
23. Disconnect the electrical connector for the lift gate harness (1).
24. Remove the clip (3) from the header roof (2).

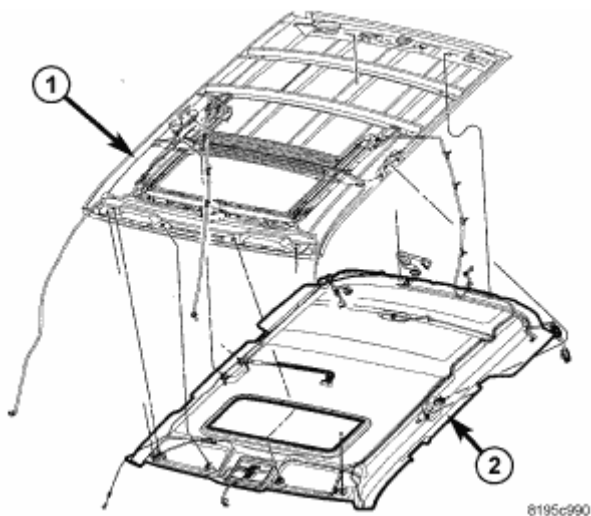


Fig. 490: Headliner & Roof
 Courtesy of CHRYSLER LLC

CAUTION: It is necessary to fold the corner and the side up between the C and D pillar area of the headliner to remove from the vehicle. The corner must be folded up and not down to avoid damaging the headliner.

25. Fold the rear seat in the down position and remove the headliner (2) from the roof (1).

INSTALLATION

HEADLINER

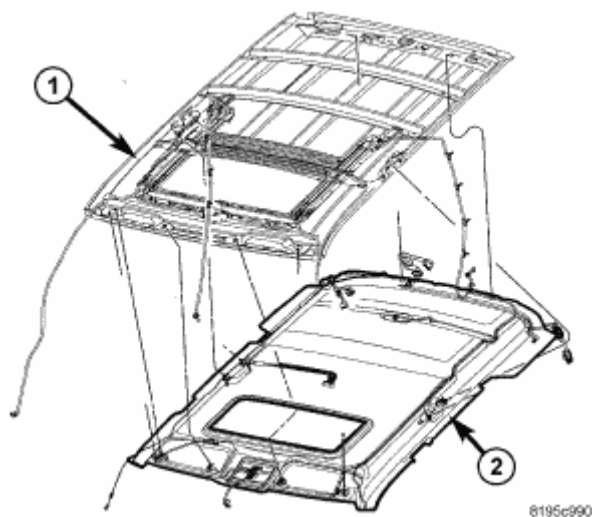


Fig. 491: Headliner & Roof
Courtesy of CHRYSLER LLC

CAUTION: It is necessary to fold the corner and the side up between the C and D pillar area of the headliner to remove from the vehicle. The corner must be folded up and not down to avoid damaging the headliner.

1. Install the headliner (2) to the roof (1).

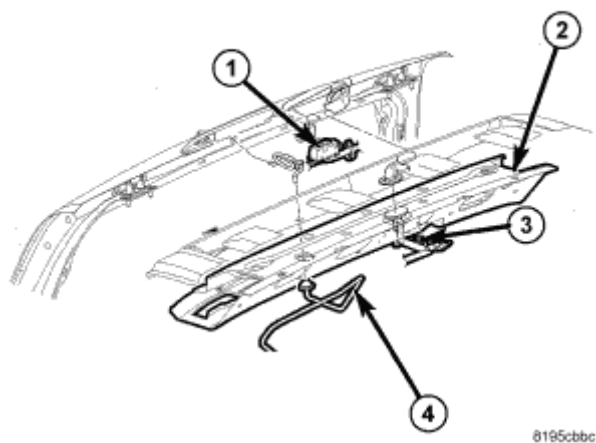


Fig. 492: Headliner Rear Connections
Courtesy of CHRYSLER LLC

2. Connect the lift gate washer drain hose (4) to the Center High Mounted Stop Lamp (CHMSL) and install to the lift gate, refer to **INSTALLATION**.
3. Connect the electrical connector for the lift gate harness (1).
4. Install the clip (3) to the header roof (2).

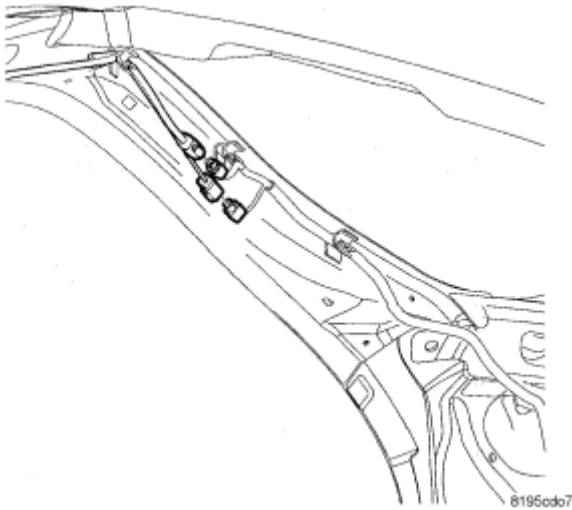


Fig. 493: Radio/Satellite Connections L/F
Courtesy of CHRYSLER LLC

5. Connect the radio and/or satellite electrical connectors along the left A-pillar.

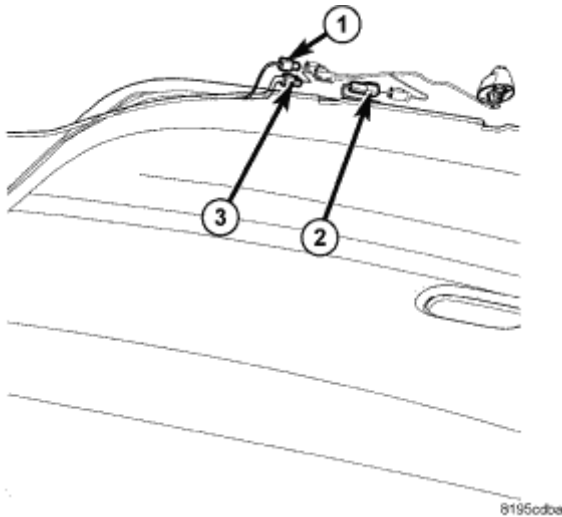


Fig. 494: Satellite Radio Body Antenna Connector, Power Connector & Radio Body Antenna Connector
Courtesy of CHRYSLER LLC

6. Connect the satellite radio body antenna connector (1).
7. Connect the power connector (2).
8. Connect the radio body antenna connector (3).

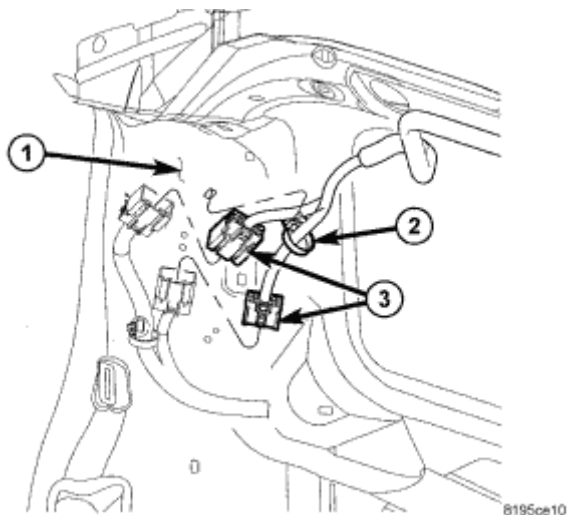


Fig. 495: DVD Electrical Connector
 Courtesy of CHRYSLER LLC

9. Attach the harness clip (2) to the D-pillar body (1).
10. Connect the DVD electrical connectors (3).

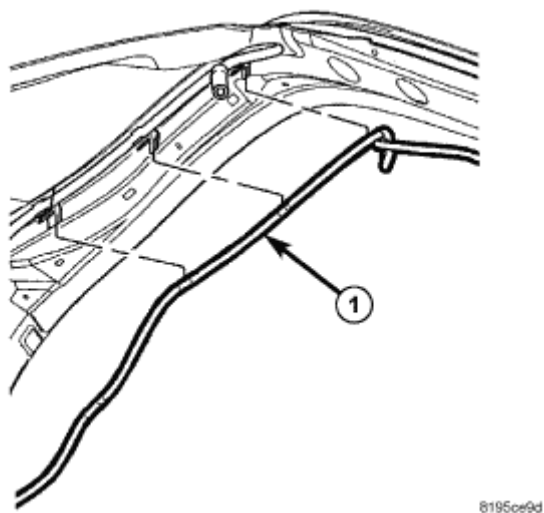


Fig. 496: Lift Gate Washer Hose
 Courtesy of CHRYSLER LLC

NOTE: Install a union where the lift gate washer hose was cut during removal.

11. Connect the lift gate washer hoses (1) with a union at the A-pillar.

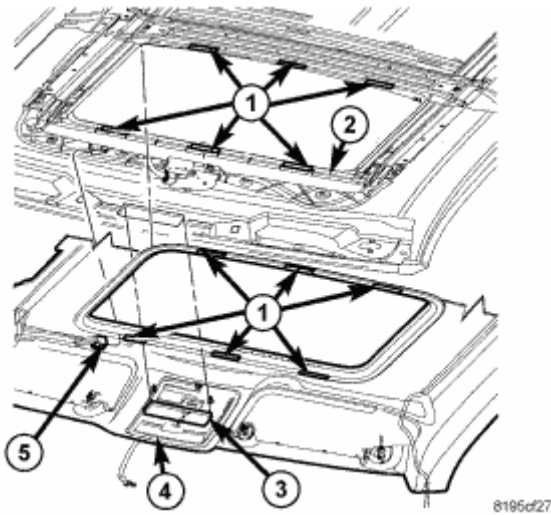


Fig. 497: Dual Lock Areas, Sunroof, Spacer Foam Blocker, Headliner & Sunroof Motor Jumper
 Courtesy of CHRYSLER LLC

12. Connect the sunroof motor jumper (5).
13. Remove the tape backing from the spacer foam blocker (3), use hand pressure on the foam blocker to stick the headliner and the sunroof together.
14. Use hand pressure at the dual lock areas (1) of the headliner (4) to make sure the headliner sticks to the sunroof (2).

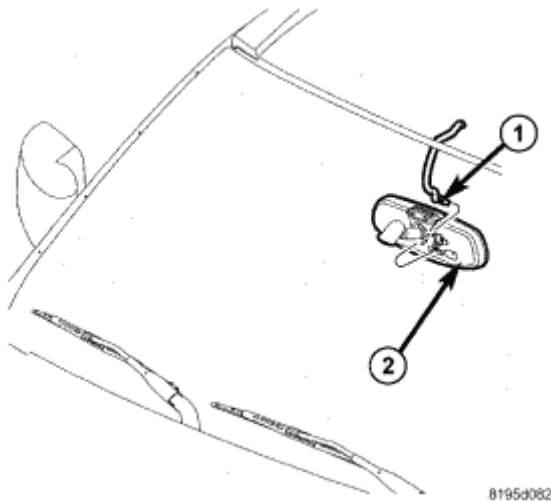


Fig. 498: Mirror Electrical Connector
 Courtesy of CHRYSLER LLC

15. Connect the electrical connector (1) for the mirror (2).

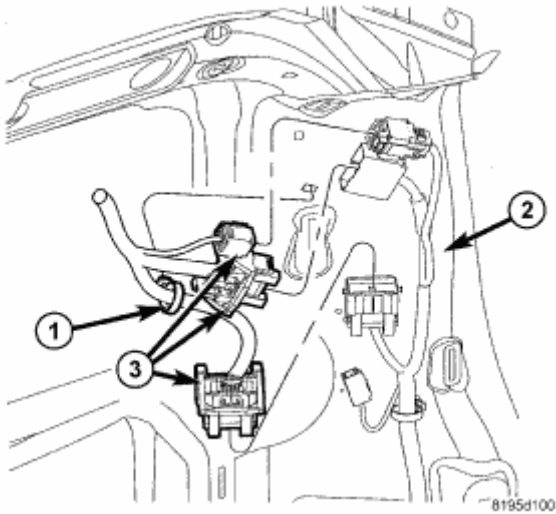


Fig. 499: Harness Clip, D-Pillar Body & Body Harness Connectors
Courtesy of CHRYSLER LLC

16. Connect the body harness connectors (3).
17. Attach the harness clip (1) to the D-pillar body (2).
18. Install the assist handles, see **INSTALLATION**.
19. Install the visors, see **INSTALLATION**.
20. Install the visor supports, see **INSTALLATION**.
21. Install the overhead console, refer to **INSTALLATION** .
22. Install the A-pillar trim and grab handles, see **INSTALLATION**.
23. Install the upper B-pillar trim, see **INSTALLATION**.
24. Install the quarter trim panels, see **INSTALLATION**.
25. Install the sunroof opening trim ring, if equipped.
26. Connect the negative battery cable.

LATCH - ARMREST LID

REMOVAL

LATCH - ARMREST LID

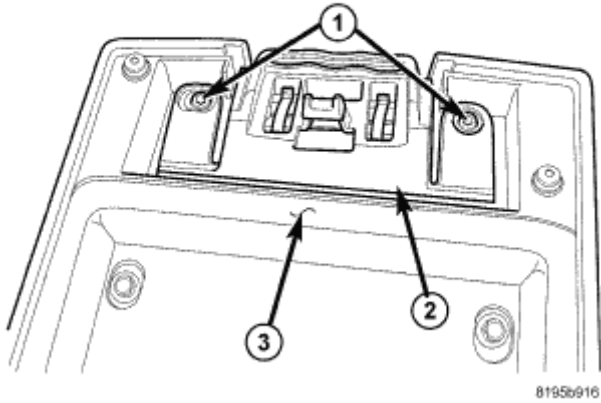


Fig. 500: Armrest Lid Latch
 Courtesy of CHRYSLER LLC

NOTE: Using a grease pencil or equivalent, mark location of lid latch (2) on the console lid (3) for installation alignment.

1. Remove the two screws (1) attaching the console lid latch (2) to the console lid (3).
2. Remove the lid latch (2) from the console lid (3).

INSTALLATION

LATCH - ARMREST LID

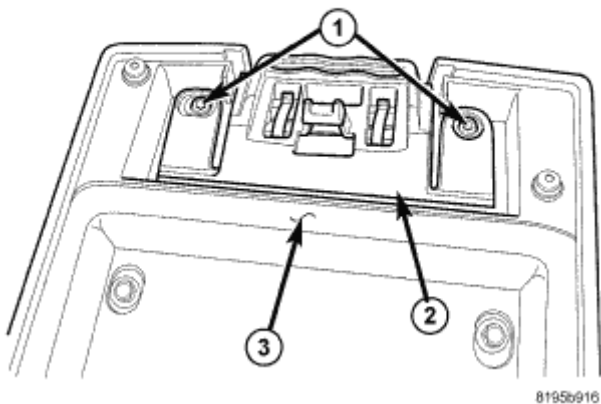


Fig. 501: Armrest Lid Latch
 Courtesy of CHRYSLER LLC

NOTE: Align the lid latch (2) with the reference marks made during removal.

1. Install the two screws (1) attaching the console lid latch (2) to the console lid (3).
2. Check the adjustment of the lid latch (2) and adjust as necessary by loosening the two screws (1) and moving the lid latch (2) right or left as needed until the console lid (3) closes properly.

LID - FLOOR CONSOLE

REMOVAL

LID - FLOOR CONSOLE

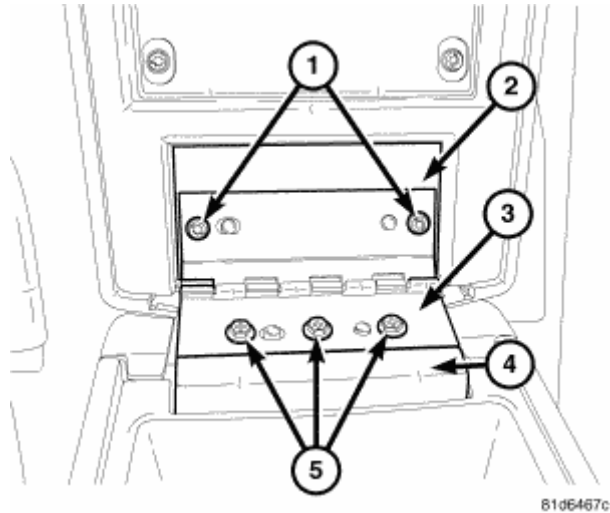


Fig. 502: Floor Console Lid
Courtesy of CHRYSLER LLC

1. Remove the two screws (1) attaching the console lid (2) to the hinge (3).
2. Remove the console lid (2) from the hinge (3).
3. Remove the three screws (5) attaching the hinge (3) to the console (4).
4. Remove the hinge (3) from the console (4).

INSTALLATION

LID - FLOOR CONSOLE

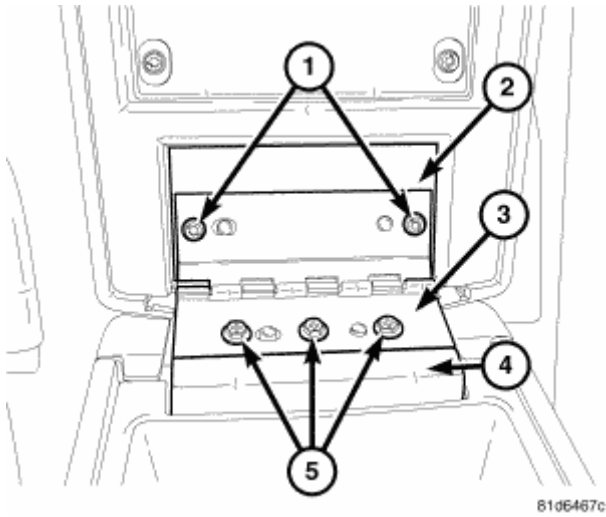


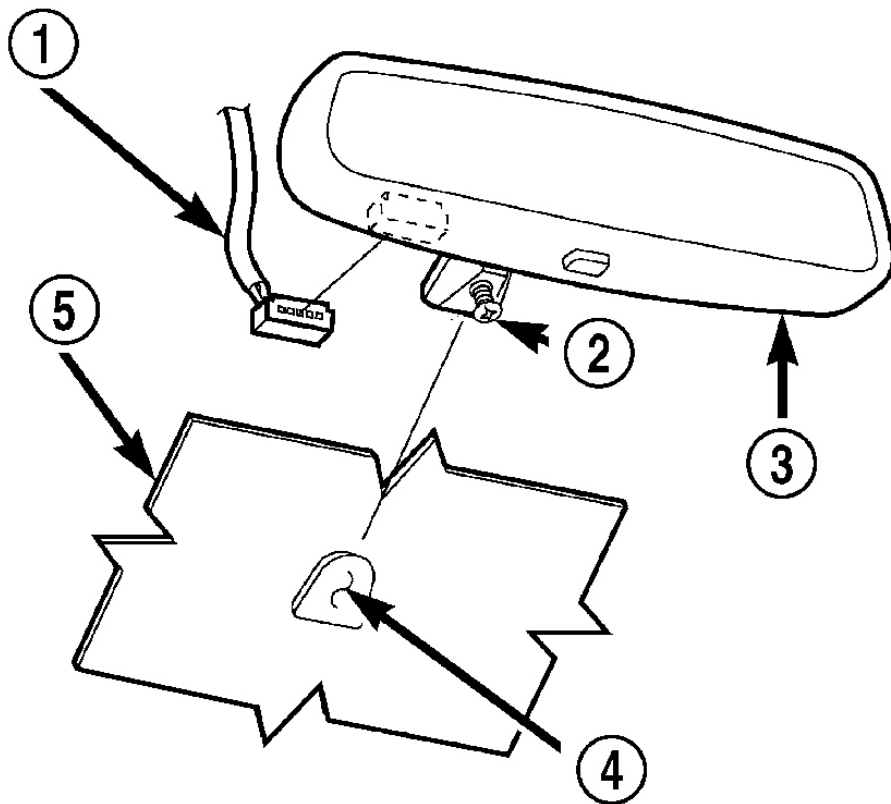
Fig. 503: Floor Console Lid
Courtesy of CHRYSLER LLC

1. Install the hinge (3) to the console (4).
2. Install the three screws (5) attaching hinge (3) to the console (4).
3. Install the console lid (2) to the hinge (3).
4. Install the two screws (1) attaching the console lid (2) to the hinge (3).

MIRROR - REAR VIEW

REMOVAL

MIRROR - REAR VIEW



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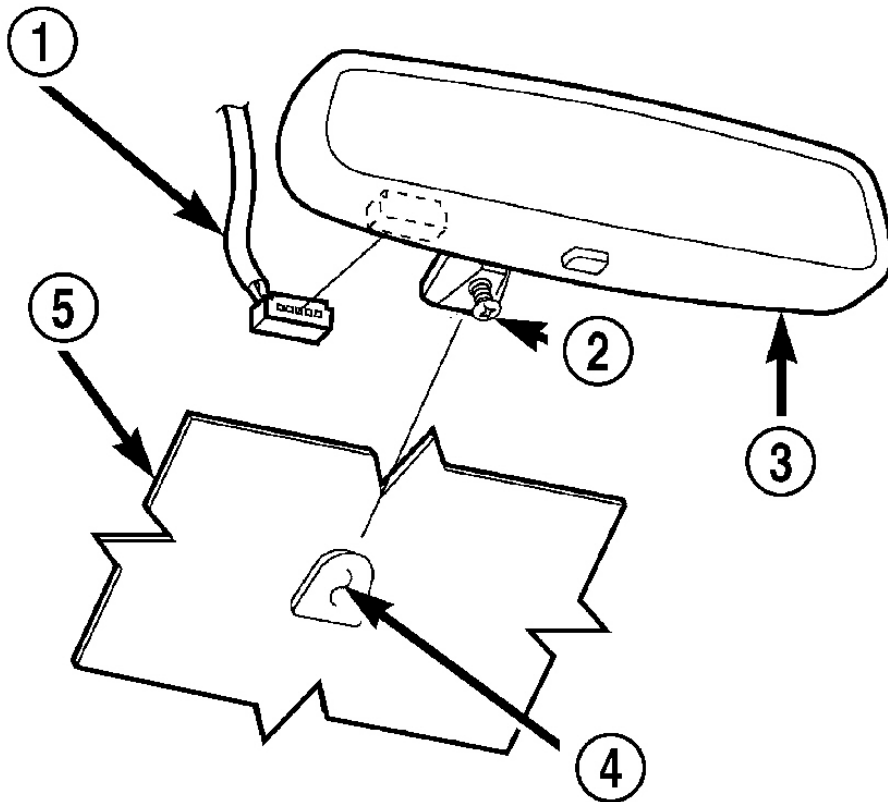
Fig. 504: Removing/Installing Rear View Mirror
Courtesy of CHRYSLER LLC

- 1 - CONNECTOR
- 2 - SCREW
- 3 - REAR VIEW MIRROR
- 4 - SUPPORT BUTTON
- 5 - WINDSHIELD

1. If equipped, disconnect mirror harness connector.
2. Loosen the mirror base setscrew.
3. Slide the mirror base upward and off the bracket.

INSTALLATION

MIRROR - REAR VIEW



80b3c6eb

Fig. 505: Removing/Installing Rear View Mirror
 Courtesy of CHRYSLER LLC

- 1 - CONNECTOR
- 2 - SCREW
- 3 - REAR VIEW MIRROR
- 4 - SUPPORT BUTTON
- 5 - WINDSHIELD

1. Position the mirror base at the bracket and slide it downward onto the support bracket.
2. Tighten the setscrew 1 N.m (15 in. lbs.) torque.
3. If equipped, connect mirror harness connector.

REAR VIEW MIRROR - SUPPORT BRACKET

1. Mark the position for the mirror bracket on the outside of the windshield glass with a wax pencil.
2. Clean the bracket contact area on the glass. Use a mild powdered cleanser on a cloth saturated with isopropyl (rubbing) alcohol. Finally, clean the glass with a paper towel dampened with alcohol.
3. Sand the surface on the support bracket with fine grit-sandpaper. Wipe the bracket surface clean with a

paper towel.

4. Apply accelerator to the surface on the bracket according to the following instructions:
 - Crush the vial to saturate the felt applicator.
 - Remove the paper sleeve.
 - Apply accelerator to the contact surface on the bracket.
 - Allow the accelerator to dry for five minutes.
 - Do not touch the bracket contact surface after the accelerator has been applied.
5. Apply adhesive accelerator to the bracket contact surface on the windshield glass. Allow the accelerator to dry for one minute. Do not touch the glass contact surface after the accelerator has been applied.
6. Install the bracket according to the following instructions:
 - Apply one drop of adhesive at the center of the bracket contact-surface on the windshield glass.
 - Apply an even coat of adhesive to the contact surface on the bracket.
 - Align the bracket with the marked position on the windshield glass.
 - Press and hold the bracket in place for at least one minute.

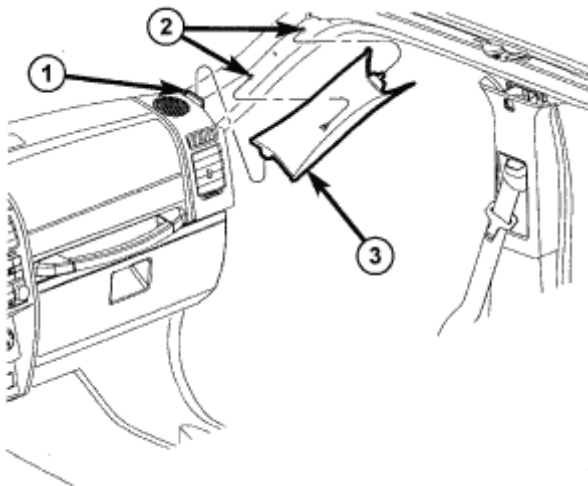
NOTE: **Verify that the mirror support bracket is correctly aligned, because the adhesive will cure rapidly.**

7. Allow the adhesive to cure for 8-10 minutes. Remove any excess adhesive with an alcohol-dampened cloth.
8. Allow the adhesive to cure for an additional 8-10 minutes before installing the mirror.

MOLDING - A PILLAR

REMOVAL

MOLDING - A PILLAR



81954367

Fig. 506: Instrument Panel, Slots & Moldings
Courtesy of CHRYSLER LLC

1. Using a small pry tool or equivalent, lift the A-pillar trim molding (3) from the A-pillar slots (2) releasing the clips on the molding.

NOTE: The top tethered clip has a locking tab that needs to be lifted in order for clip to slide out of the trim attachment point.

2. Remove the top clip from the trim molding.

INSTALLATION

MOLDING - A PILLAR

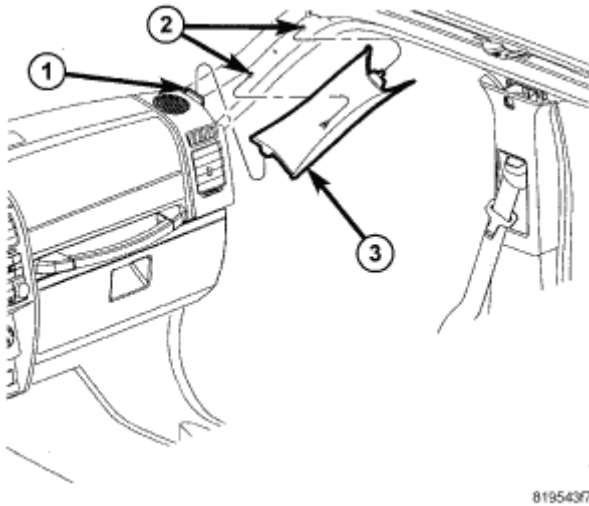


Fig. 507: Instrument Panel, Slots & Moldings
Courtesy of CHRYSLER LLC

1. Align the A-pillar trim tab on the molding (3) to the top cover slot of the instrument panel (1).
2. Install the top clip on the trim molding.
3. Align the two clips on the molding to the slots (2) on the A-pillar. Snap the A-pillar trim molding (3) into place using hand pressure.

MOLDING - HEADLINER

REMOVAL

MOLDING - HEADLINER

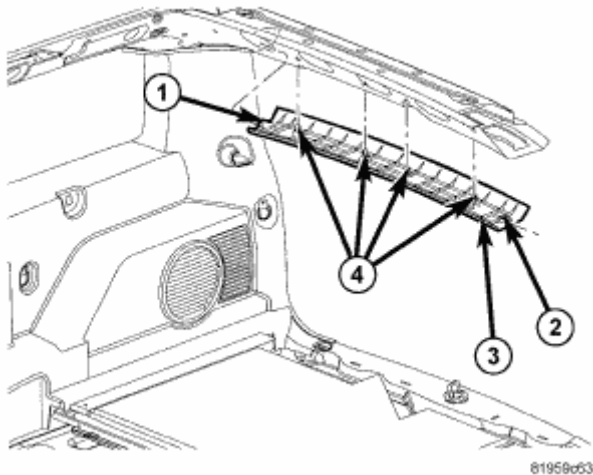


Fig. 508: Headliner Molding
 Courtesy of CHRYSLER LLC

1. Open the lift gate.

NOTE: **Align second clip from Right (Cross Car Locator) to its slot first. This helps line up the rest of clips.**

2. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be released from the quarter trim molding.
3. Carefully pull down to remove the remaining clips (4) attaching the molding to the body then move the molding to the left to released the tab from the quarter trim molding.

INSTALLATION

MOLDING - HEADLINER

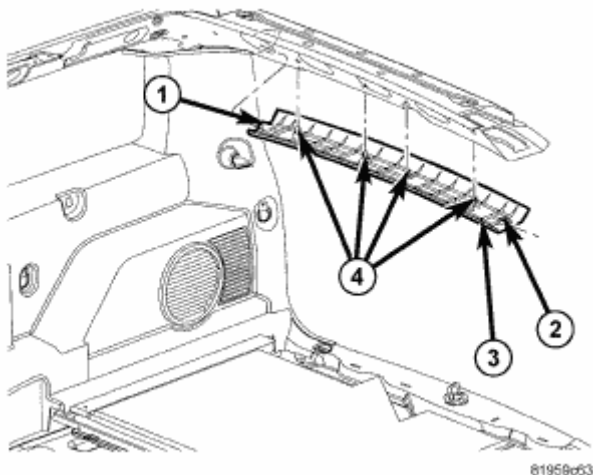


Fig. 509: Headliner Molding

Courtesy of CHRYSLER LLC

1. Install the headliner molding (3) to the body by sliding the tab (1) on the right side into the quarter trim molding.
2. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be slide into the other side of the quarter trim molding.
3. Using hand pressure snap the remaining clips (4) into place.
4. Close the lift gate.

PANEL - COWL SIDE

REMOVAL

PANEL - COWL SIDE

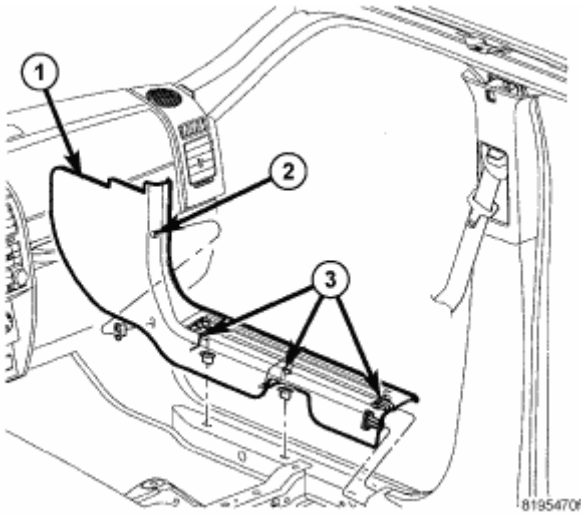


Fig. 510: Cowl Trim Panel
Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, remove the cowl trim cover (1) by pulling it away from the A-pillar and releasing the clip (2), continue lifting up the cowl trim panel (1) to release the clips (3) from the body.

INSTALLATION

PANEL - COWL SIDE

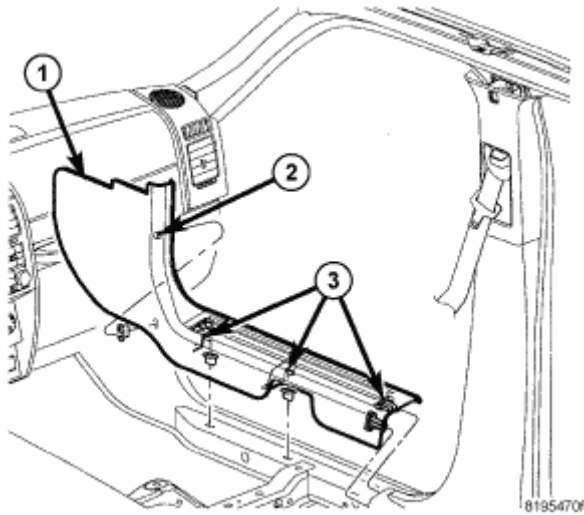


Fig. 511: Cowl Trim Panel
 Courtesy of CHRYSLER LLC

1. Align and install the cowl trim cover (1) by sliding the rear tabs of the cowl trim cover under the B-pillar trim.

CAUTION: When installing the cowl trim cover make sure not to damage the body plugs around the sill area. If damage occurs to the body plugs replace with new plugs. Failure to replace a damaged body plug will result in a water leak to the floor area of the vehicle.

2. Using hand pressure install the clips (3) into the body and the A-pillar (2).

PANEL - LOAD FLOOR

REMOVAL

PANEL - LOAD FLOOR

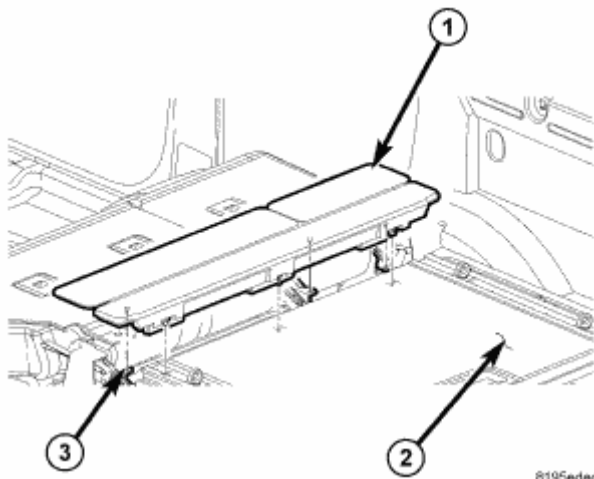


Fig. 512: Load Floor Panel, Load Floor & Rear Seat Bracket
Courtesy of CHRYSLER LLC

1. Position the rear seats in the forward position.
2. Remove the load floor panel (1) from the load floor (2) and the rear seat bracket (3).

INSTALLATION

PANEL - LOAD FLOOR

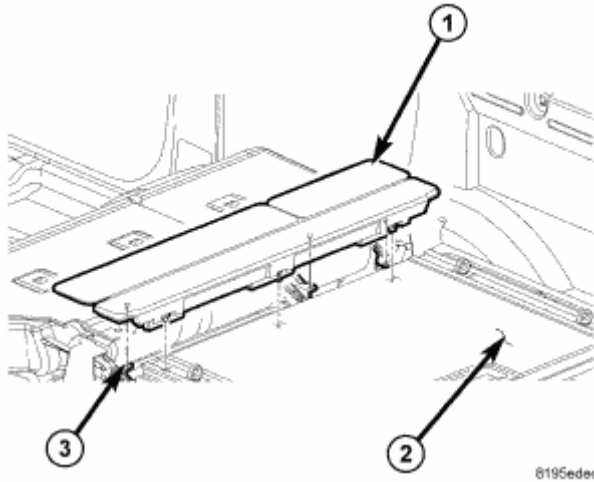


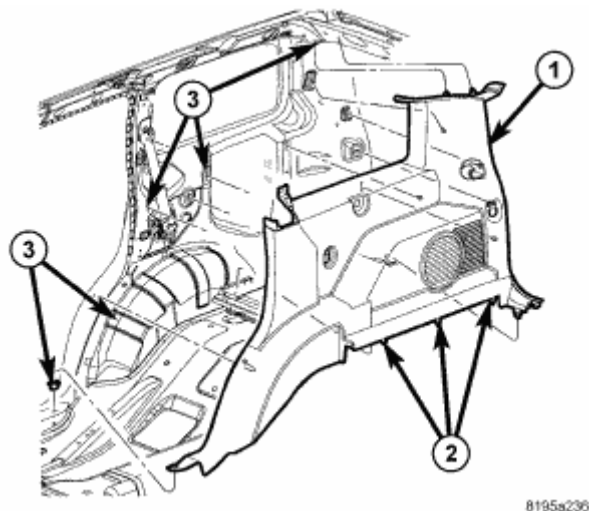
Fig. 513: Load Floor Panel, Load Floor & Rear Seat Bracket
Courtesy of CHRYSLER LLC

1. Install the load floor panel (1) to the load floor (2) and the rear seat bracket (3). Use hand pressure to seat the clips.
2. Return the rear seats in the upright position.

PANEL - QUARTER TRIM

REMOVAL

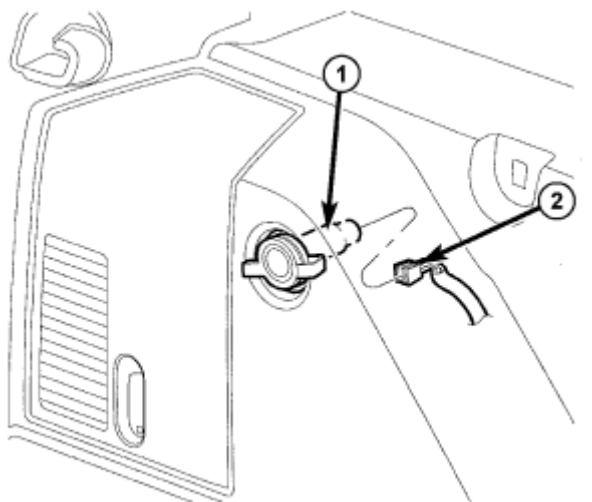
PANEL - QUARTER TRIM



8195a236

Fig. 514: Quarter Trim Panel
 Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, remove the rear door scuff plate, see **REMOVAL**.
2. Fold down the rear seat.
3. Remove the C-pillar cover, see **REMOVAL**.
4. Remove the screws and the cargo tie downs.
5. Remove the quarter trim panel (1) by carefully pulling at the clip locations (3).



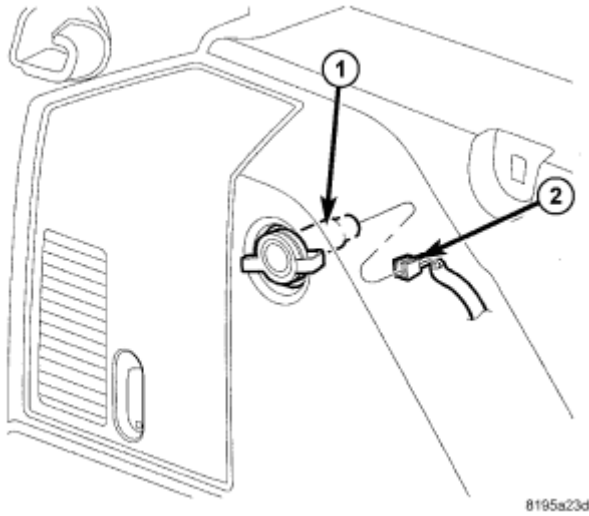
8195a23d

Fig. 515: Quarter Trim Panel Electrical Connector
 Courtesy of CHRYSLER LLC

6. If replacing the left side quarter trim panel disconnect the 12v power supply electrical connector (2) from the socket (1).

INSTALLATION

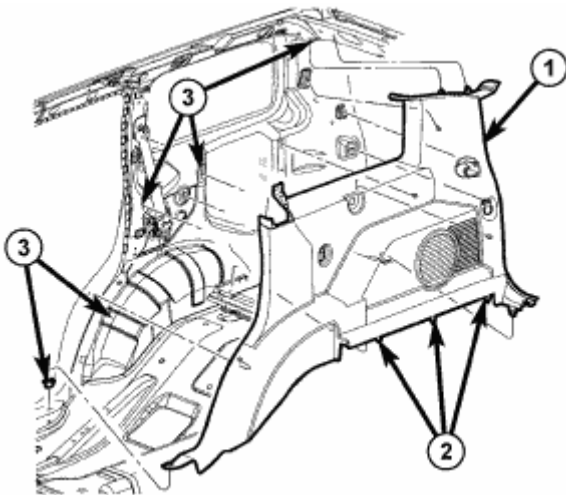
PANEL - QUARTER TRIM



8195a23d

Fig. 516: Quarter Trim Panel Electrical Connector
 Courtesy of CHRYSLER LLC

1. If installing the left side quarter trim panel connect the 12v power supply electrical connector (2) from the socket (1).



8195a23e

Fig. 517: Quarter Trim Panel
 Courtesy of CHRYSLER LLC

2. Install the quarter trim panel (1) to the inside of the vehicle, carefully align and install the bottom of the quarter trim panel slots into the load floor first. Then continue to seat the remaining clips on the panel, working from the bottom up. Use hand pressure to seat the clips (3).
3. Install the cargo tie downs and tighten the screw.
4. Install the rear door scuff plate, see **INSTALLATION**.
5. Install the C-pillar cover, see **INSTALLATION**.
6. Return the rear seat to the up position.

REMOVAL

PLATE - SCUFF

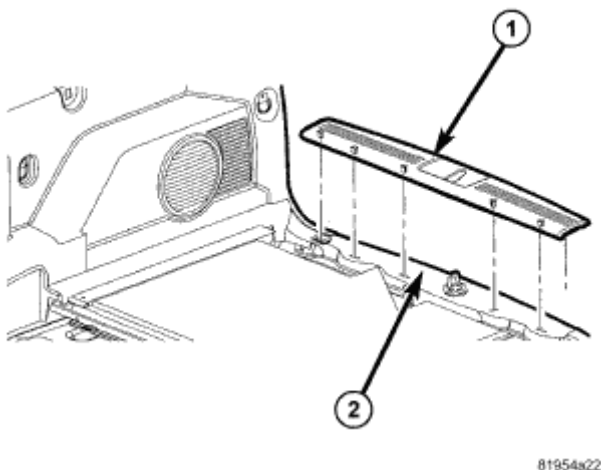


Fig. 518: Rear Door Scuff Plate
Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Using a trim stick C-4755 or equivalent, release the retaining clips and remove the scuff plate (1) from the body (2).

INSTALLATION

PLATE - SCUFF

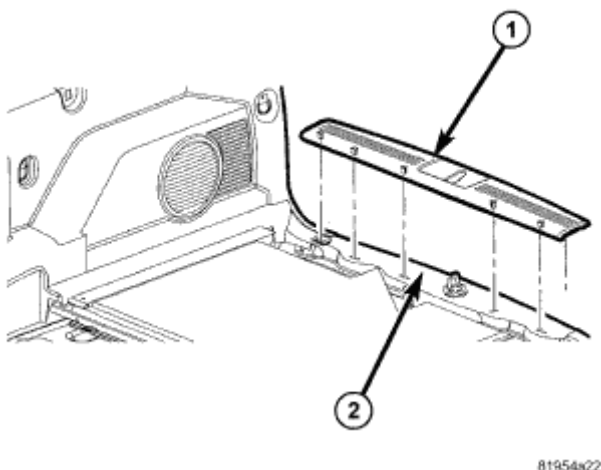


Fig. 519: Rear Door Scuff Plate
Courtesy of CHRYSLER LLC

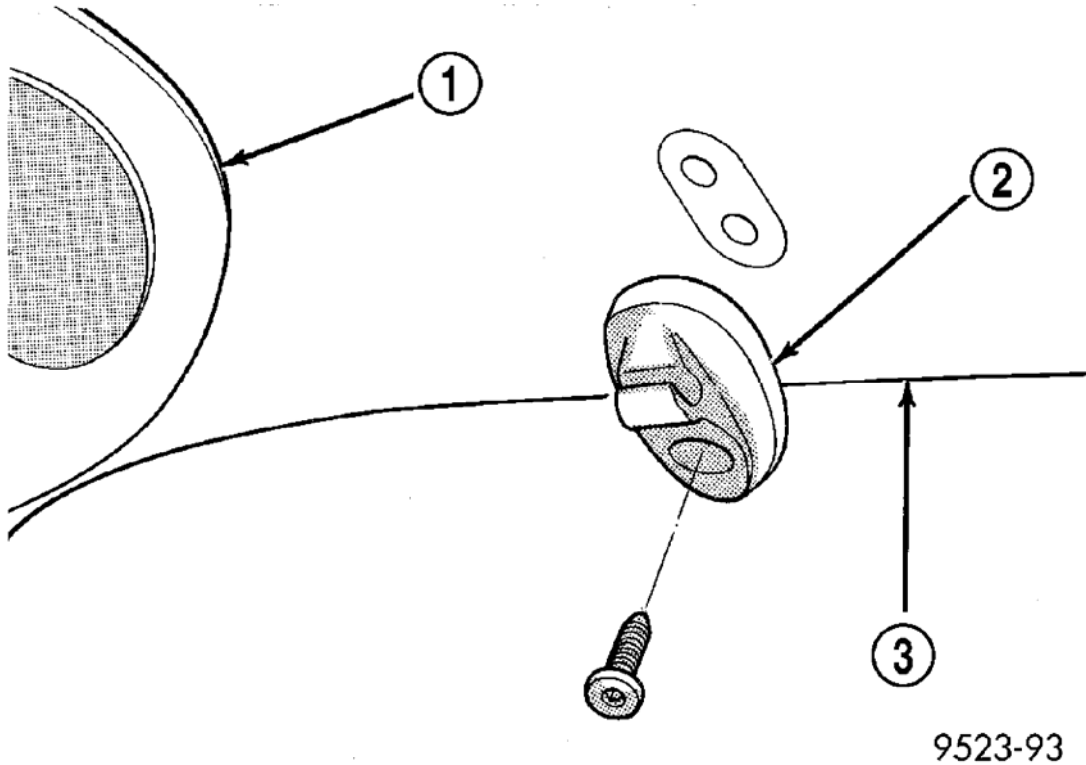
1. Align the trim clips and use hand pressure to install the scuff plate (1) to the body (2).

2. Close the lift gate.

SUPPORT - SUN VISOR

REMOVAL

SUPPORT - SUN VISOR



9523-93

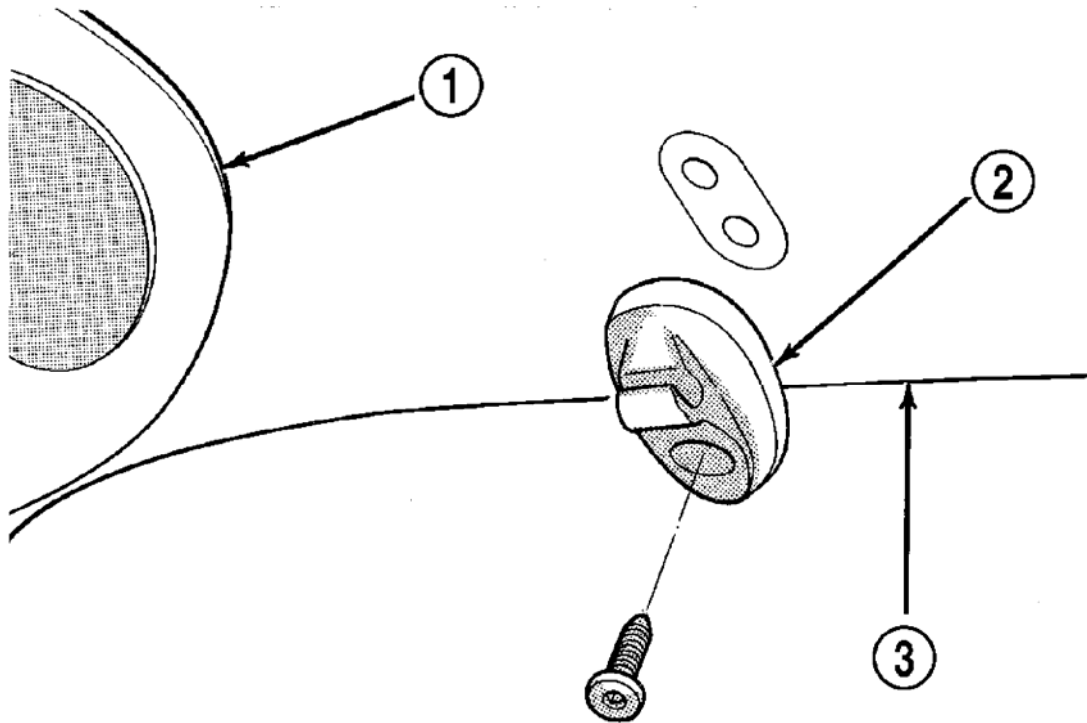
Fig. 520: Removing/Installing Sun Visor Support

Courtesy of CHRYSLER LLC

1. Disengage the sun visor (1) from the sun visor support (2).
2. Remove the screw that secures the support to the roof panel and remove the support from the headliner (3).

INSTALLATION

SUPPORT - SUN VISOR



9523-93

Fig. 521: Removing/Installing Sun Visor Support
Courtesy of CHRYSLER LLC

1. Position the sun visor support (2) on the headliner (3) and install the screw that secures the support to the roof panel.
2. Engage the sun visor (1) and sun visor support.

VISOR - SUN

REMOVAL

VISOR - SUN

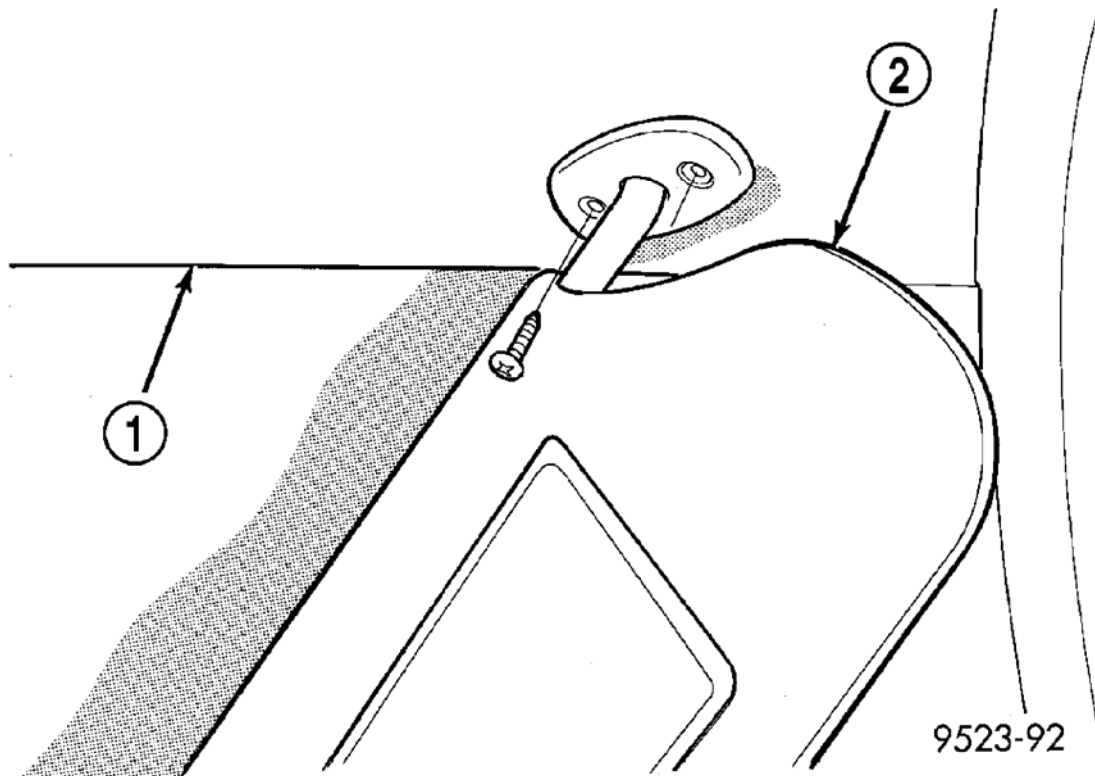


Fig. 522: Removing/Installing Sun Visor
Courtesy of CHRYSLER LLC

1. Remove the two screws and remove the sun visor (2) from the headliner/roof assembly (1).
2. If equipped, disconnect the illuminated vanity mirror wire harness connector.

INSTALLATION

VISOR - SUN

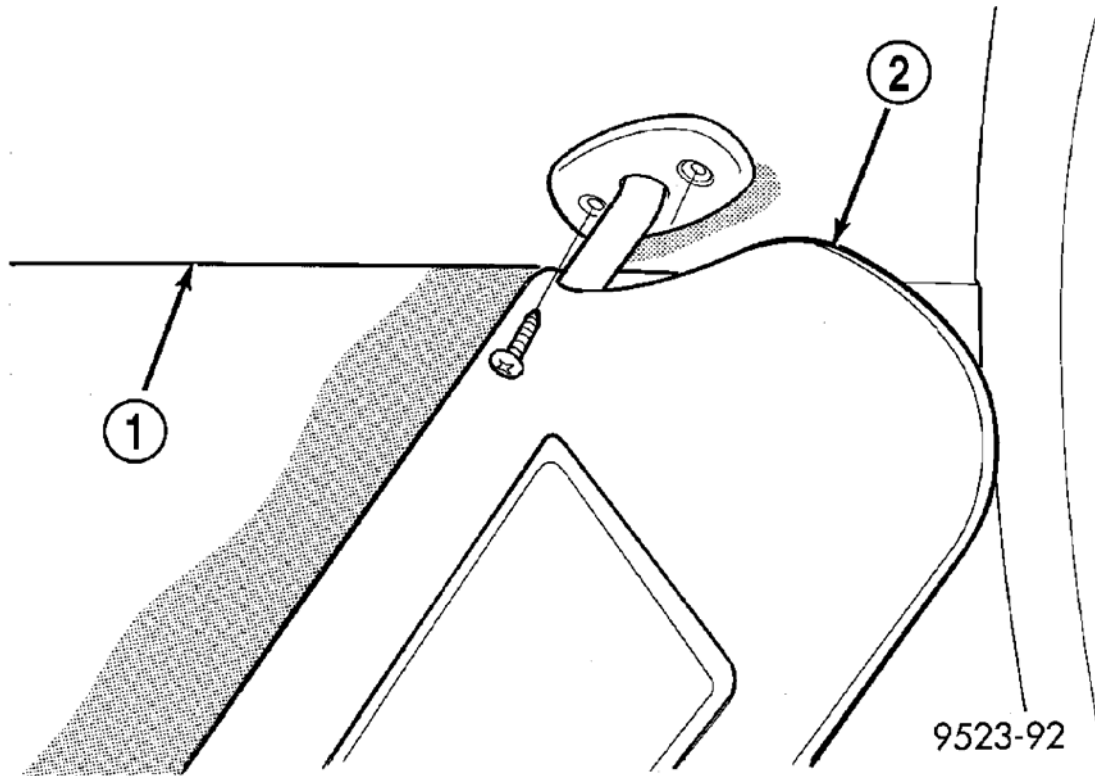


Fig. 523: Removing/Installing Sun Visor
Courtesy of CHRYSLER LLC

1. If equipped, connect the illuminated vanity mirror wire harness connector.
2. Position the sun visor (2) to the headliner/roof (1) and install the screws. Tighten the screws to 2 N.m (20 in. lbs.).

LIFTGATE

BUMPER - LIFTGATE

REMOVAL

BUMPER - LIFTGATE

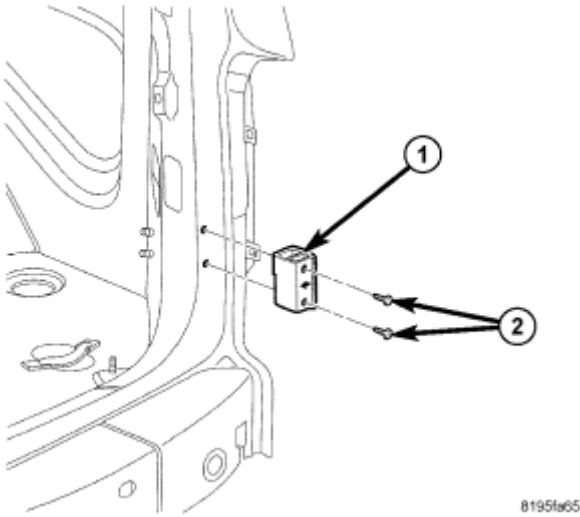


Fig. 524: Lift Gate Bumper
Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Remove the screws (2) and bumper (1) from the body.

INSTALLATION

BUMPER - LIFTGATE

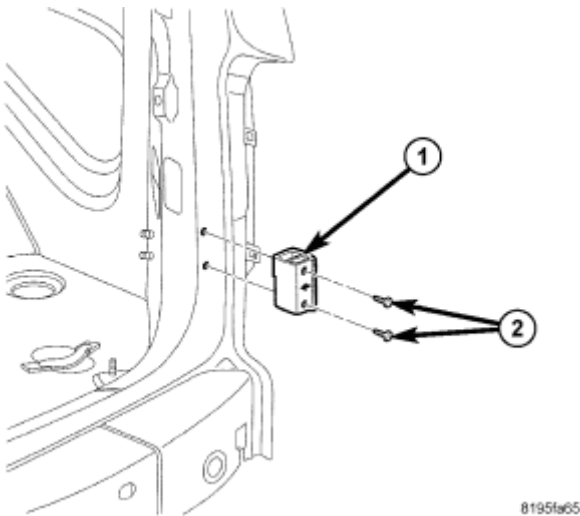


Fig. 525: Lift Gate Bumper
Courtesy of CHRYSLER LLC

NOTE: Make sure the bumper is properly oriented with printed arrows pointing inboard.

1. Install the bumper (1) and screws (2) to the body and tighten to 12 N.m (106 in. lbs.).
2. Close the lift gate.

HANDLE - EXTERIOR

REMOVAL

HANDLE - EXTERIOR

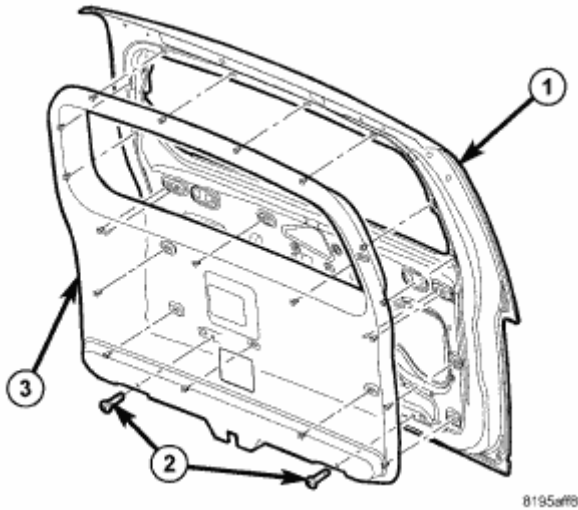


Fig. 526: Liftgate Trim Panel
Courtesy of CHRYSLER LLC

1. Remove two bolts (2) from the lower trim panel (3).
2. Using a trim stick C-4755 or equivalent, release the fasteners at all of the locations around the trim panel (3).
3. Lift the trim panel (3) from the lift gate (1).

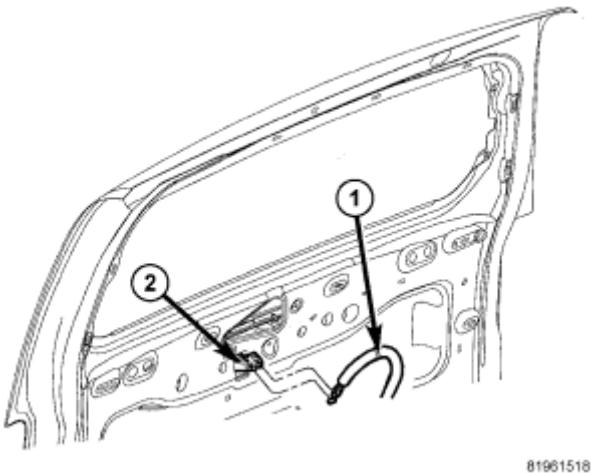


Fig. 527: Latch Cable
Courtesy of CHRYSLER LLC

4. Disconnect the latch cable (1) from the lift gate handle (2).

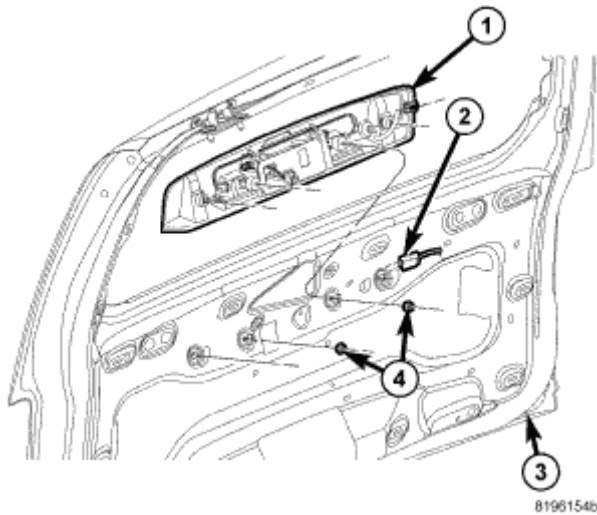


Fig. 528: Exterior Lift Gate Handle
Courtesy of CHRYSLER LLC

5. Remove the two nuts (4).
6. Disconnect the electrical connector (2).
7. Using a trim stick C-4755 or equivalent, remove the exterior lift gate handle (1) from the lift gate (3).

INSTALLATION

HANDLE - EXTERIOR

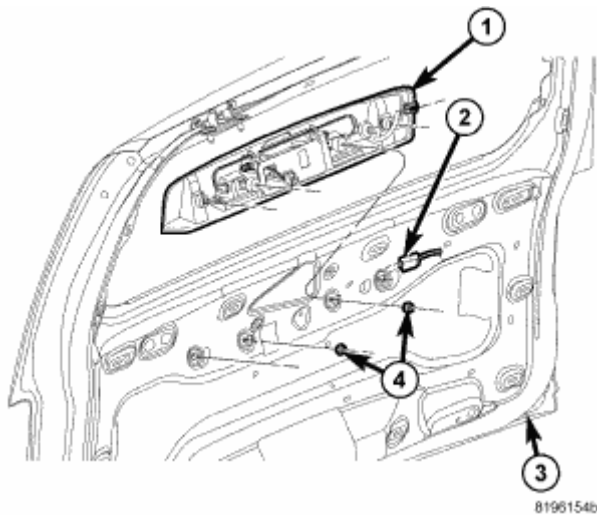
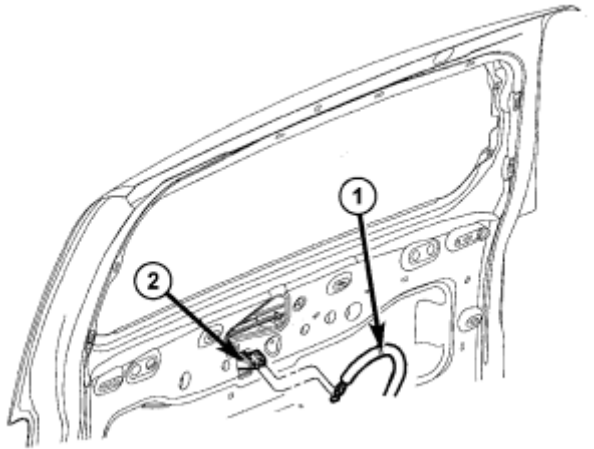


Fig. 529: Exterior Lift Gate Handle
Courtesy of CHRYSLER LLC

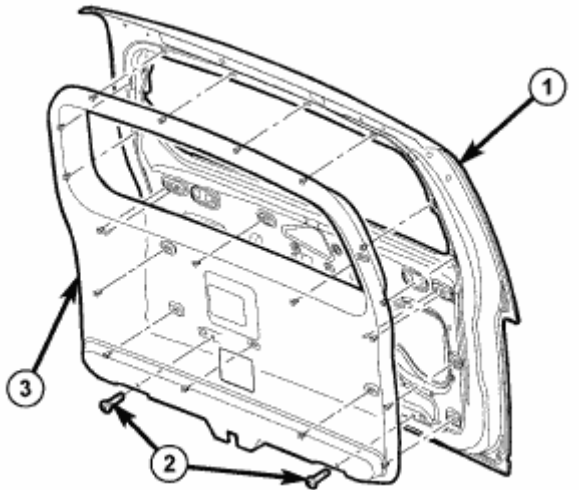
1. Install the exterior lift gate handle (1) to the lift gate (3).
2. Install the two nuts (4) and tighten to 8 N.m (6 ft. lbs.).
3. Connect the electrical connector (2).



81961518

Fig. 530: Latch Cable
 Courtesy of CHRYSLER LLC

4. Connect the latch cable (1) to the lift gate handle (2).



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Fig. 531: Liftgate Trim Panel
 Courtesy of CHRYSLER LLC

5. Align and install the trim panel (3) to the left gate (1), use hand pressure to seat all of the fasteners around the trim panel (3).
6. Install the two bolts (2) to the lower trim panel (3) and tighten to and tighten to 7 N.m (65 in. lbs.).

HINGE - LIFTGATE

REMOVAL

HINGE - LIFTGATE

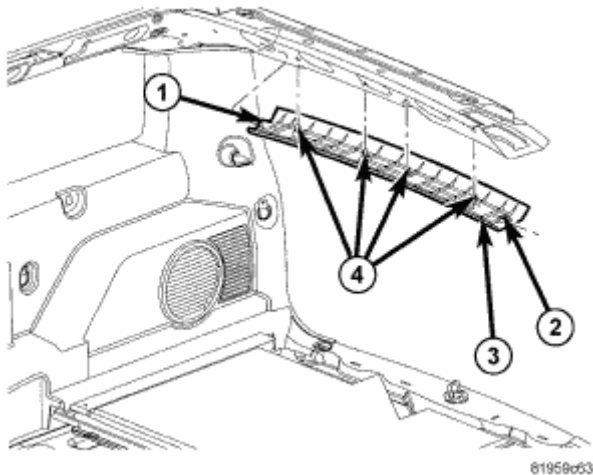


Fig. 532: Headliner Molding
 Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be released from the quarter trim molding.
3. Carefully pull down to remove the remaining clips (4) attaching the molding to the body then move the molding to the left to released the tab from the quarter trim molding.

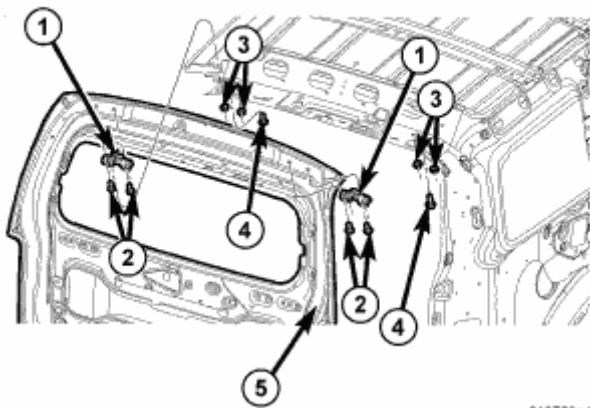


Fig. 533: Lift Gate Hinge
 Courtesy of CHRYSLER LLC

4. Using a grease pencil or equivalent, mark the position of the hinges (1) to aid with installation.

CAUTION: Support the lift gate while the hinge is removed.

5. Place a block under the lift gate and remove the nuts (3) from the hinge (1) located on the body.
6. Remove the bolts (4) from the hinge (1) located on the body.
7. Remove the bolts (2) from the hinge (1) at the lift gate.
8. Remove the hinge (1) from the vehicle.

INSTALLATION

HINGE - LIFTGATE

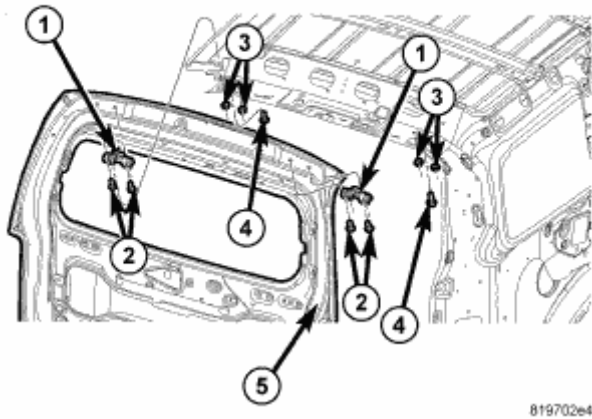


Fig. 534: Lift Gate Hinge
Courtesy of CHRYSLER LLC

1. Apply body sealer on the hinge to body mating surface. Align hinges with the installation reference marks made previously.
2. Remove the block under the lift gate and install the hinge (1) to the vehicle.
3. Install the bolts (4) to the hinge (1) at the body location and tighten bolts to 28.5 N.m (21 ft. lbs.).
4. Install the nuts (3) to the hinge (1) at the body location and tighten nuts to 28.5 N.m (21 ft. lbs.).
5. Install the bolts (2) to the hinge (1) at the lift gate location and tighten bolts to 28.5 N.m (21 ft. lbs.).
6. Adjust as necessary, see **ADJUSTMENTS**.

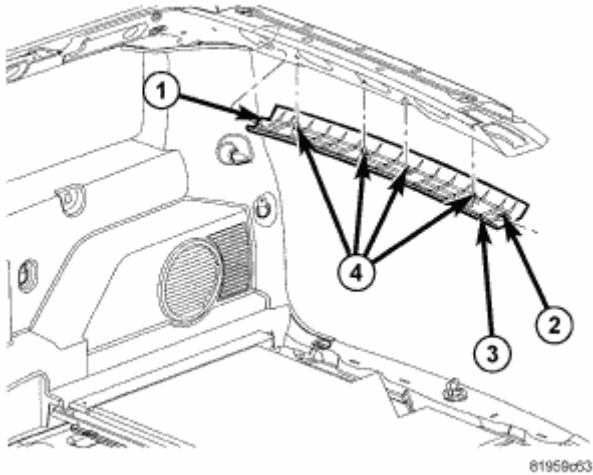


Fig. 535: Headliner Molding
 Courtesy of CHRYSLER LLC

7. Install the headliner molding (3) to the body by sliding the tab (1) on the right side into the quarter trim molding.
8. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be slide into the other side of the quarter trim molding.
9. Using hand pressure snap the remaining clips (4) into place.
10. Close the lift gate.

LATCH - LIFTGATE

REMOVAL

LATCH - LIFTGATE

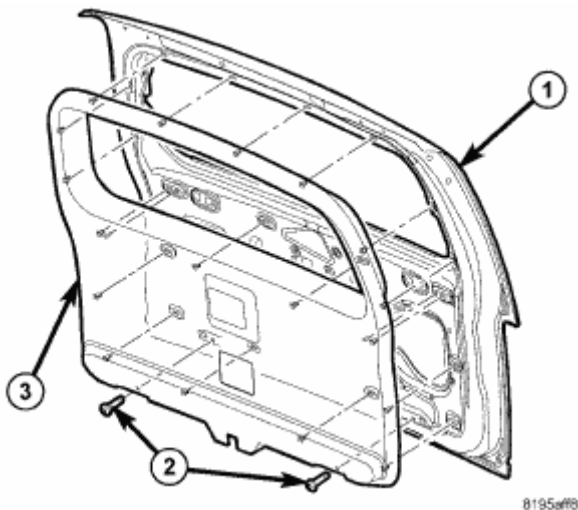
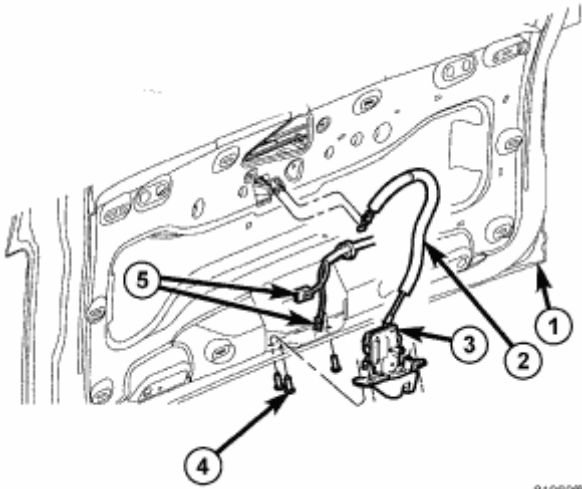


Fig. 536: Liftgate Trim Panel
 Courtesy of CHRYSLER LLC

1. Remove two bolts (2) from the lower trim panel (3).
2. Using a trim stick C-4755 or equivalent, release the fasteners at all of the locations around the trim panel (3).
3. Lift the trim panel (3) from the lift gate (1).



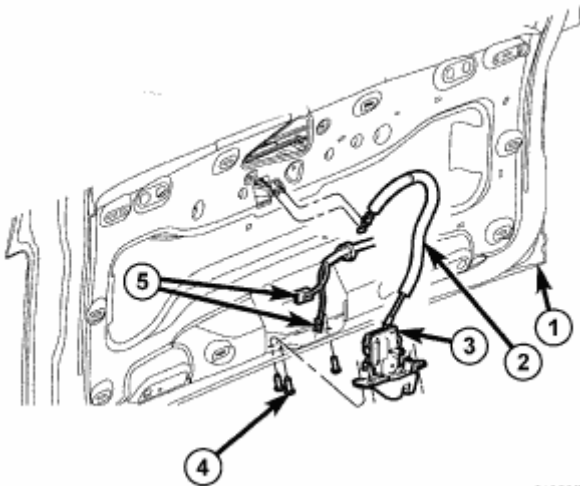
81960765

Fig. 537: Lift Gate Latch
Courtesy of CHRYSLER LLC

4. Remove the three bolts (4) from the lift gate latch (3).
5. Disconnect the electrical connectors (5).
6. Disconnect the cable (2) from the latch (3).
7. Remove the lift gate latch (3) from the lift gate (1).

INSTALLATION

LATCH - LIFTGATE



81960765

Fig. 538: Lift Gate Latch
Courtesy of CHRYSLER LLC

1. Install the latch (3) to the lift gate (1).
2. Install the three bolts (4) to the lift gate latch (3) and tighten the bolts to 11 N.m (95 in. lbs.).
3. Connect the cable (2) to the latch (3).
4. Connect the electrical connectors (5).

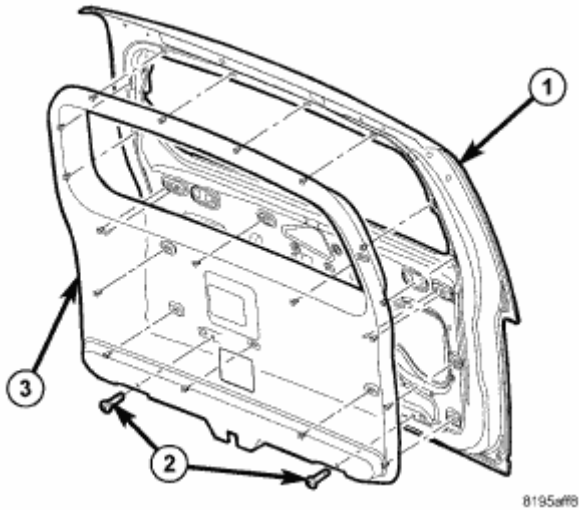


Fig. 539: Liftgate Trim Panel
Courtesy of CHRYSLER LLC

5. Align and install the trim panel (3) to the lift gate (1), use hand pressure to seat all of the fasteners around the trim panel (3).
6. Install the two bolts (2) to the lower trim panel (3) and tighten to 7 N.m (65 in. lbs.).

LATCH - ACCESS PANEL

DESCRIPTION

LATCH - ACCESS PANEL

This panel provides access to the lift gate latch. If power is interrupted to the latch, then the lift gate can be opened manually by removing the access panel and pushing the latch release lever down.

REMOVAL

LATCH - ACCESS PANEL

NOTE: The latch access panel is located on the lift gate trim panel near the latch mechanism.

1. Using a trim stick C-4755 or equivalent, remove the access panel.

INSTALLATION

LATCH - ACCESS PANEL

1. Position and install the latch access panel to the lift gate trim panel.

LIFTGATE

REMOVAL

LIFTGATE

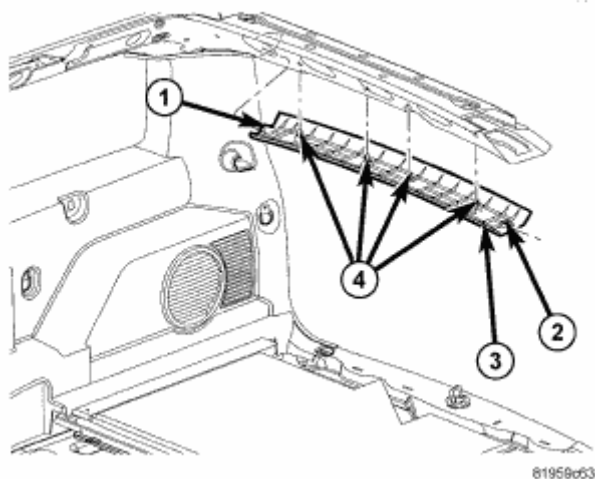


Fig. 540: Headliner Molding
Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be released from the quarter trim molding.
3. Carefully pull down to remove the remaining clips (4) attaching the molding to the body then move the molding to the left to released the tab from the quarter trim molding.

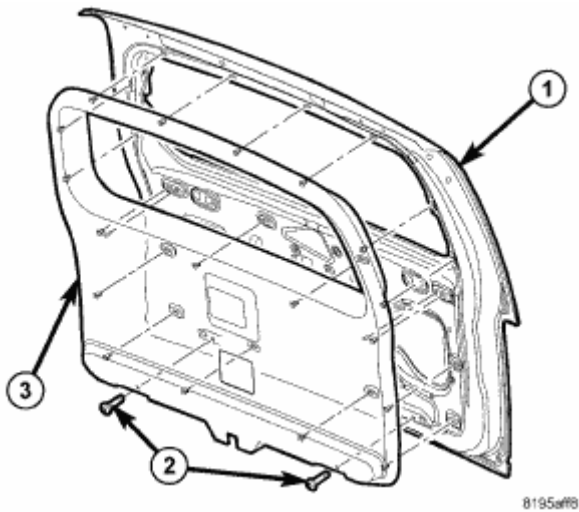


Fig. 541: Liftgate Trim Panel
 Courtesy of CHRYSLER LLC

4. Remove two bolts (2) from the lower trim panel (3).
5. Using a trim stick C-4755 or equivalent, release the fasteners at all of the locations around the trim panel (3).
6. Lift the trim panel (2) from the lift gate (1).
7. Disconnect the lift gate harness connector, remove the grommet and electrical harness.

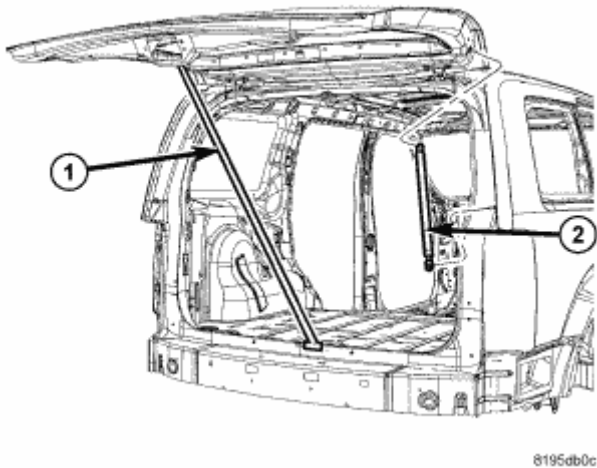
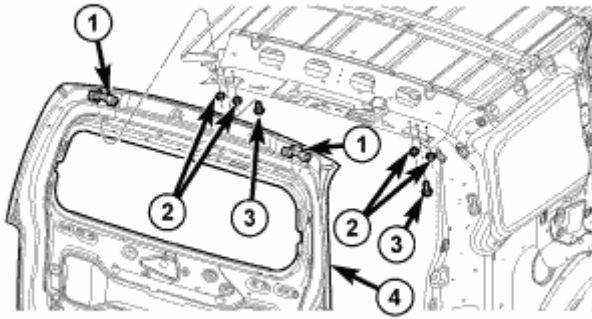


Fig. 542: Lift Gate Support Cylinder & Lift Gate Support Tool
 Courtesy of CHRYSLER LLC

8. Support the lift gate with a lift gate support tool (1).
9. Remove the support cylinders (2) from the lift gate and body.



81961d3c

Fig. 543: Lift Gate/Hinge
Courtesy of CHRYSLER LLC

10. Remove the center high mounted stop lamp, refer to **REMOVAL** .
11. Disconnect all electrical connectors and remove electrical harness from the lift gate.

CAUTION: With assistance support the lift gate while the hinges are being removed.

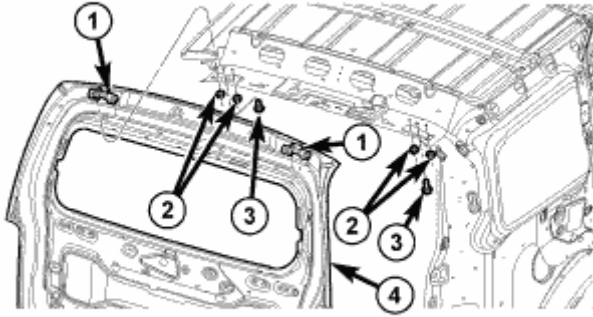
12. Using a grease pencil or equivalent, mark the position of the hinges (1) to aid with installation.
13. Remove nuts (2) from the hinges (1) located on the body.

WARNING: Make sure assistants are prepared when removing the bolts from the hinges. When the bolts are removed the lift gate is no longer attached to the vehicle and can fall.

14. Remove the bolts (3) from the hinges (1) located on the body.
15. Remove the lift gate (4) from the vehicle.

INSTALLATION

LIFTGATE



81961d3c

Fig. 544: Lift Gate/Hinge
Courtesy of CHRYSLER LLC

NOTE: With assistance, support the lift gate while the hinges are being installed.

1. With assistance, install the lift gate (4) to the vehicle.
2. Apply body sealer on the hinge to body mating surface. Align hinges with installation reference marks made previously.
3. Install the bolts (3) to the hinges (1) at the body location and tighten bolts to 28.5 N.m (21 ft. lbs.).
4. Install the nuts (2) to the hinges (1) at the body location and tighten nuts to 28.5 N.m (21 ft. lbs.).

CAUTION: With assistance, support the lift gate while the hinges are being removed.

5. Install electrical harness to the lift gate and connect all electrical connections.

NOTE: Use a soapy water solution or equivalent to lubricate the grommet.

6. Install the electrical harness, grommet and connector to the vehicle.
7. Install the center high mounted stop lamp, refer to **INSTALLATION**.
8. Check and adjust lift gate as necessary, see **ADJUSTMENTS**.

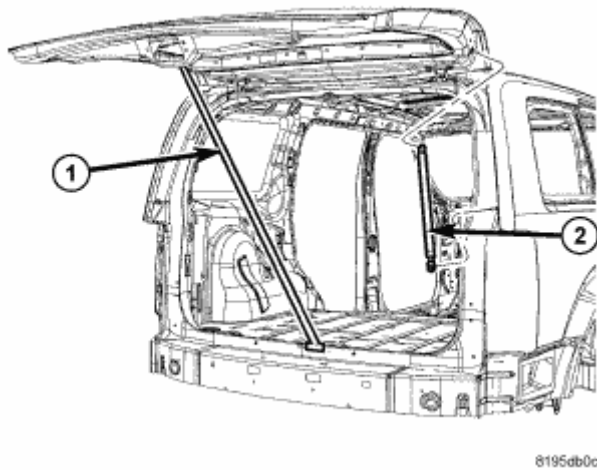


Fig. 545: Lift Gate Support Cylinder & Lift Gate Support Tool
 Courtesy of CHRYSLER LLC

9. Install the support cylinders (2) to the lift gate and body.

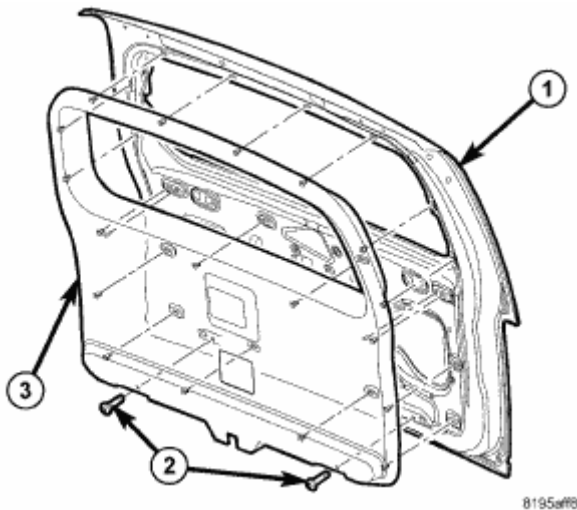


Fig. 546: Liftgate Trim Panel
 Courtesy of CHRYSLER LLC

10. Align and install the trim panel (3) to the left gate (1), use hand pressure to seat all of the fasteners around the trim panel (3).
11. Install the two bolts (2) to the lower trim panel (3) and tighten to 7 N.m (65 in. lbs.).

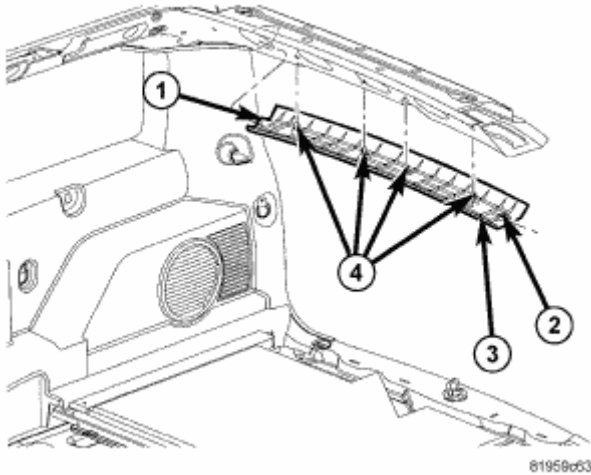


Fig. 547: Headliner Molding
 Courtesy of CHRYSLER LLC

12. Install the headliner molding (3) to the body by sliding the tab (1) on the right side into the quarter trim molding.
13. Pull down at the center of the headliner molding (3) only enough to allow the tab (2) to be slide into the other side of the quarter trim molding.
14. Using hand pressure snap the remaining clips (4) into place.
15. Close the lift gate.

ADJUSTMENTS

LIFTGATE

In/out

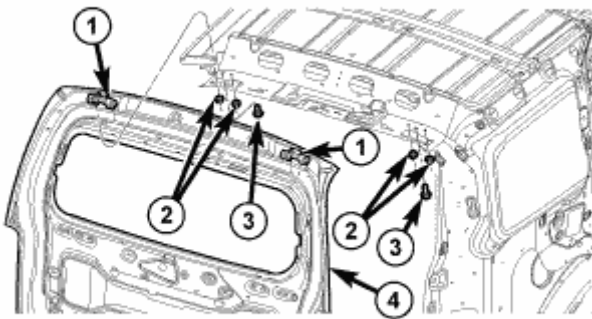


Fig. 548: Lift Gate/Hinge
 Courtesy of CHRYSLER LLC

NOTE: The position of the lift gate can be adjusted upward or downward by the use of slots in the hinge. An inward or outward adjustment is achieved by use of slots in the body. If an inward or outward adjustment is needed, use a body sealer on the hinge to body mating surface.

1. Using a trim stick C-4755 or equivalent, remove the headliner molding.
2. For the upper lift gate adjustments, loosen the hinge nuts (2) and bolts (3) but do not remove. Adjust to specifications, see **SPECIFICATIONS**.
3. Apply body sealer on the hinge to body mating surface.
4. Tighten the hinge bolts to 28.5 N.m (21 ft. lbs.).
5. Tighten the hinge nuts to 28.5 N.m (21 ft. lbs.).

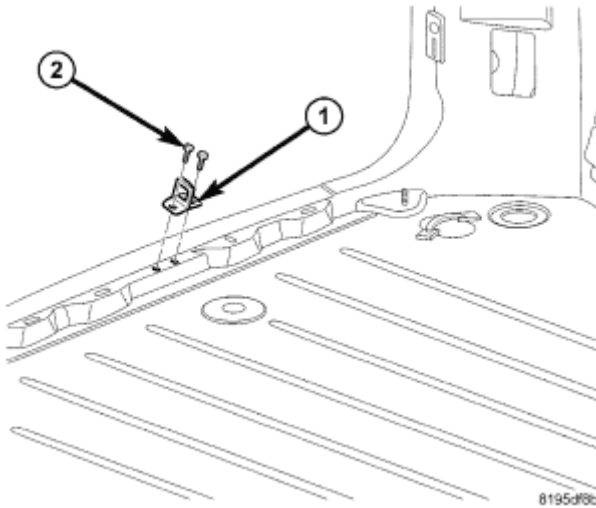
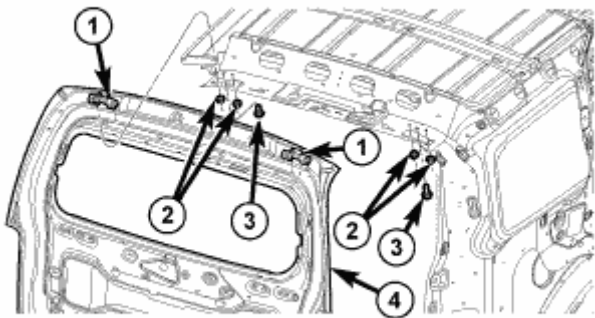


Fig. 549: Lift Gate Latch Striker
Courtesy of CHRYSLER LLC

6. Remove the rear door scuff plate.
7. For the lower lift gate adjustments, loosen the striker screws (2) and adjust to specifications, see **SPECIFICATIONS**.
8. Tighten the striker screws to 28 N.m (20.5 ft. lbs.).
9. Install the rear door scuff plate.
10. Position the headliner molding and seat fully.

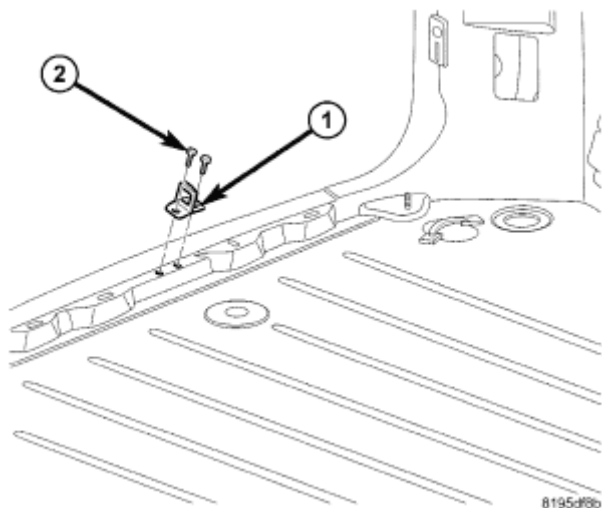
Up/Down and Left/Right



81961d3c

Fig. 550: Lift Gate/Hinge
 Courtesy of CHRYSLER LLC

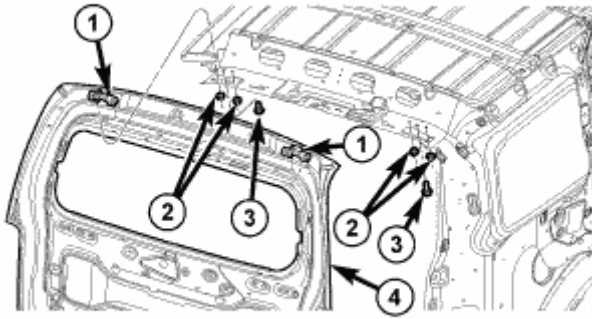
1. Loosen the hinge to lift gate bolts (2) but do not remove.



8195d78b

Fig. 551: Lift Gate Latch Striker
 Courtesy of CHRYSLER LLC

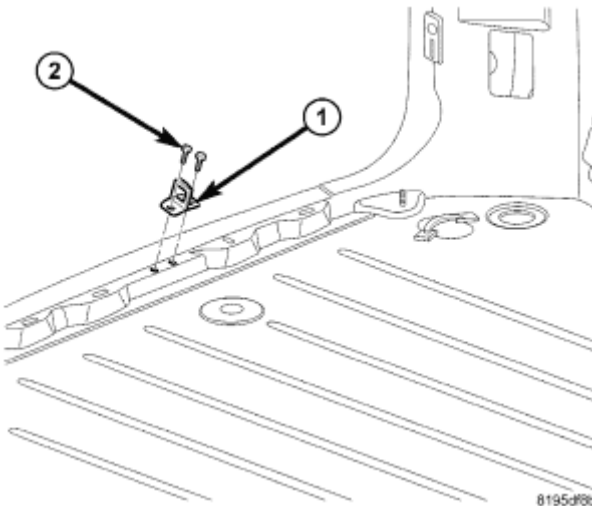
2. Remove the rear door scuff plate.
3. Loosen the striker screws (2).
4. Adjust the lift gate up/down position to specifications, see **SPECIFICATIONS**.



81961d3c

Fig. 552: Lift Gate/Hinge
Courtesy of CHRYSLER LLC

5. Apply body sealer on the hinge to lift gate mating surface.
6. Tighten the hinge to lift gate bolts to 28.5 N.m (21 ft. lbs.).



8195d98b

Fig. 553: Lift Gate Latch Striker
Courtesy of CHRYSLER LLC

7. Confirm the lower lift gate in/out position and tighten the striker screws to 28 N.m (20.5 ft. lbs.).
8. Install the lift gate trim scuff plate and install the screws.

PANEL - LIFTGATE TRIM

REMOVAL

PANEL - LIFTGATE TRIM

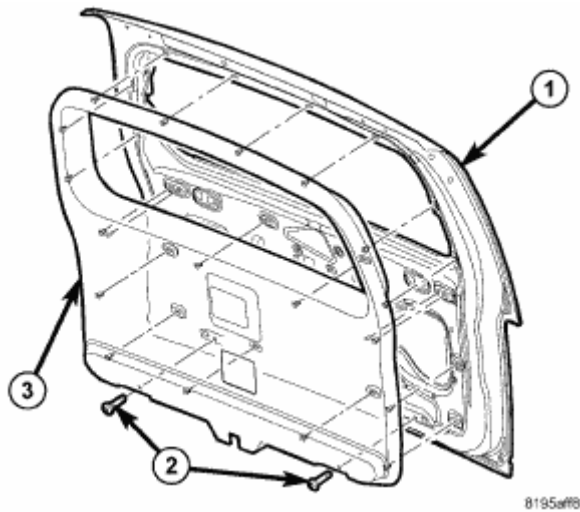


Fig. 554: Liftgate Trim Panel
Courtesy of CHRYSLER LLC

1. Remove two bolts (2) from the lower trim panel (3).
2. Using a trim stick C-4755 or equivalent, release the fasteners at all of the locations around the trim panel (3).
3. Lift the trim panel (3) from the lift gate (1).

INSTALLATION

PANEL - LIFTGATE TRIM

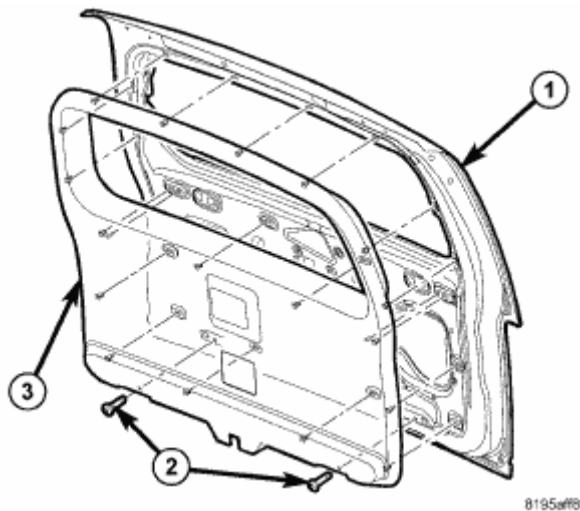


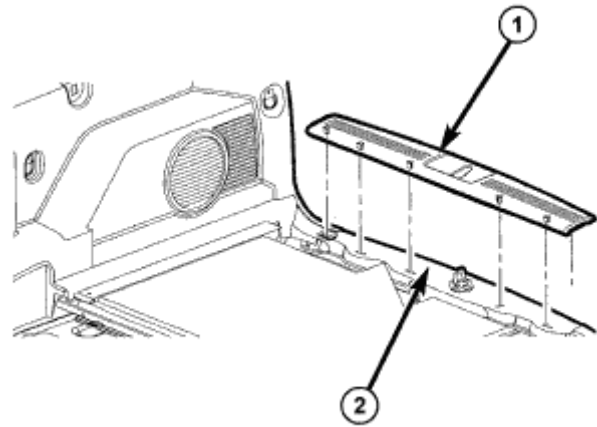
Fig. 555: Liftgate Trim Panel
Courtesy of CHRYSLER LLC

1. Align and install the trim panel (3) to the lift gate (1), use hand pressure to seat all of the fasteners around the trim panel (3).
2. Install the two bolts (2) to the lower trim panel (3) and tighten to 7 N.m (65 in. lbs.).

STRIKER - LIFTGATE

REMOVAL

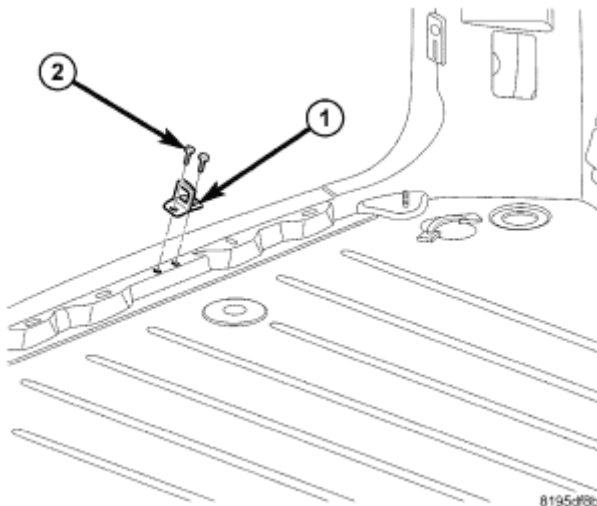
STRIKER - LIFTGATE



81954x22

Fig. 556: Rear Door Scuff Plate
Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Using a trim stick C-4755 or equivalent, release the retaining clips and remove the scuff plate (1) from the body (2).



8195d78b

Fig. 557: Lift Gate Latch Striker
Courtesy of CHRYSLER LLC

3. Using a grease pencil or equivalent, mark location of latch striker (1).
4. Remove the two screws (2) from the latch striker (1).

INSTALLATION

STRIKER - LIFTGATE

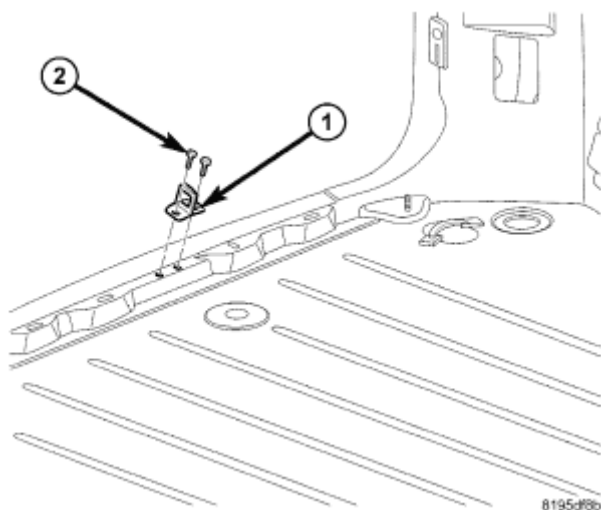


Fig. 558: Lift Gate Latch Striker
Courtesy of CHRYSLER LLC

1. Install the latch striker (1) to the body. Align latch striker (1) with the reference marks made previously.
2. Install the two screws (2) to the latch striker (1) and tighten the screws to 28 N.m (20.5 ft. lbs.).

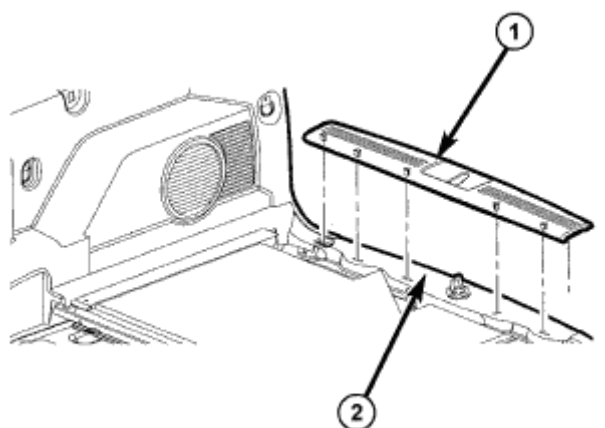


Fig. 559: Rear Door Scuff Plate
Courtesy of CHRYSLER LLC

3. Align the trim clips and use hand pressure to install the scuff plate (1) to the body (2).
4. Close the lift gate.
5. Adjust the lift gate as necessary, see **ADJUSTMENTS**.

ADJUSTMENTS

STRIKER - LIFTGATE

1. Loosen the striker bolts.
2. Adjust the striker up/down so that it is centered within the latch opening.
3. Adjust the striker fore/aft so the swing gate is under flush to the body -0.5 mm (+/- 1.0 mm).
4. Adjust the striker cross-car engagement to the latch by adding 2.0 mm shims as necessary.

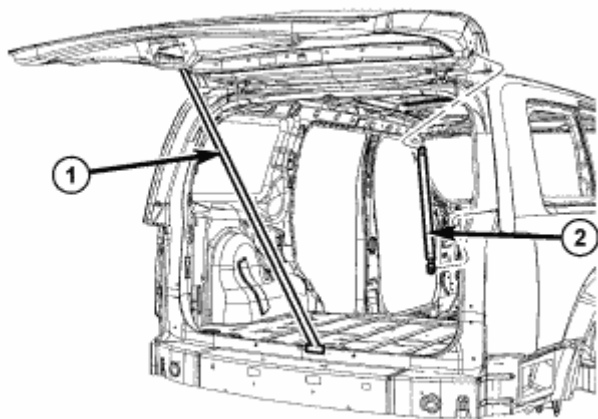
NOTE: Make sure the striker is not twisted within the latch opening. Striker should be parallel to the opening.

5. Tighten the striker bolts to 28 N.m (21 ft. lbs.).

SUPPORT - LIFTGATE

REMOVAL

SUPPORT - LIFTGATE



8195db0c

Fig. 560: Lift Gate Support Cylinder & Lift Gate Support Tool
Courtesy of CHRYSLER LLC

1. Raise and support the lift gate with a lift gate support tool (1).
2. Remove the support cylinder (2) from the lift gate and body.

INSTALLATION

SUPPORT - LIFTGATE

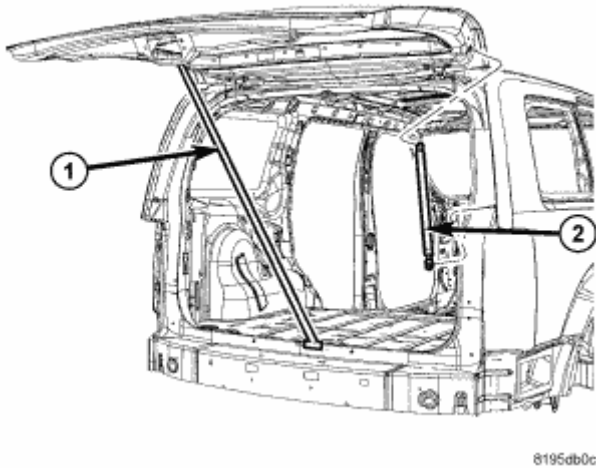


Fig. 561: Lift Gate Support Cylinder & Lift Gate Support Tool
 Courtesy of CHRYSLER LLC

1. Install the support cylinder (2) to the lift gate and body.
2. Remove lift gate support tool (1) and close the lift gate.

SUPPORT - BRACKET/ BALL STUD

REMOVAL

SUPPORT - BRACKET/ BALL STUD

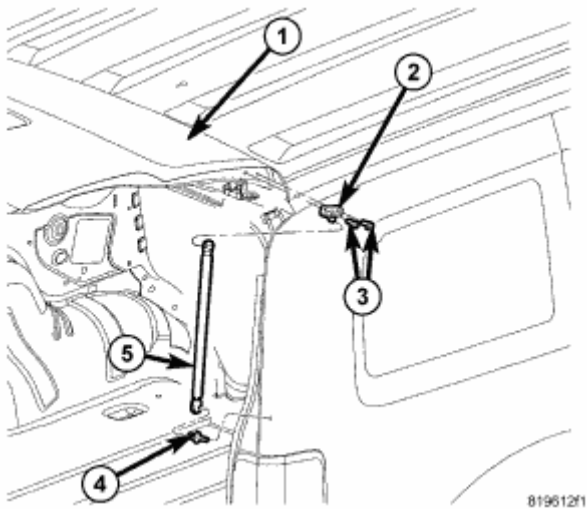


Fig. 562: Bracket/Ball Stud Support
 Courtesy of CHRYSLER LLC

1. Raise and support the lift gate with a lift gate support tool.
2. Remove the support cylinder (5) from the support cylinder bracket (2) and body.
3. Remove the bolts (3) from the support cylinder bracket (2).

4. Remove the bracket (2) from the lift gate (1).
5. Remove the ball stud (4) from the body.

INSTALLATION

SUPPORT - BRACKET/ BALL STUD

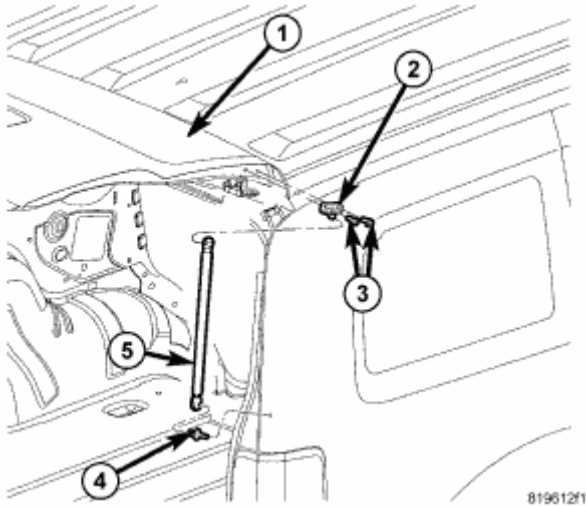


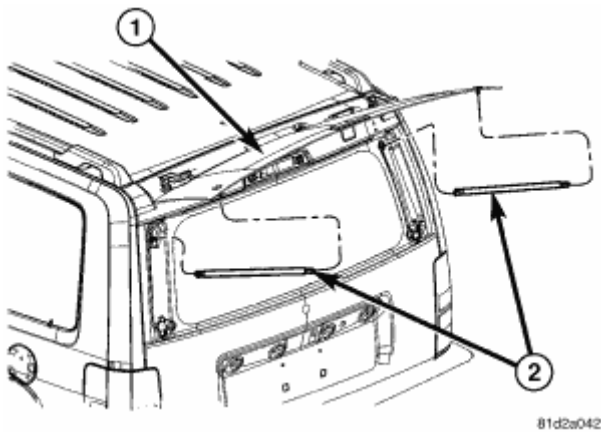
Fig. 563: Bracket/Ball Stud Support
Courtesy of CHRYSLER LLC

1. Install the ball stud (4) to the body and tighten securely.
2. Install the bracket (2) to the lift gate (1).
3. Install the bolts (3) to the support cylinder bracket (2) and tighten the bolts.
4. Install the support cylinder (5) to the support cylinder bracket (2) and body.
5. Remove the lift gate support tool.

GLASS - FLIPPER

REMOVAL

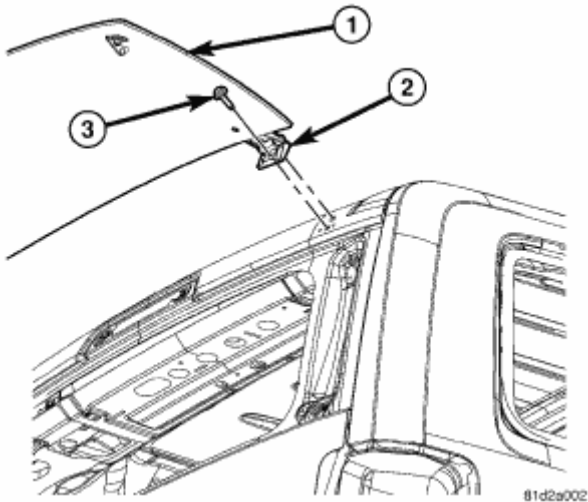
GLASS - FLIPPER



81d2a042

Fig. 564: Support Cylinder And Flipper Glass
 Courtesy of CHRYSLER LLC

1. Open the flipper glass (1).
2. Using a grease pencil or equivalent, mark the position of the hinge on the body to aid installation.
3. Remove the support cylinders (2), see **INSTALLATION**.



81d2a002

Fig. 565: Flipper Glass And Screws
 Courtesy of CHRYSLER LLC

4. Disconnect the electrical connectors, if equipped.
5. Open the glass to the full travel with the support cylinders off.
6. Remove the screws (3) and remove the glass (1).

INSTALLATION

GLASS - FLIPPER

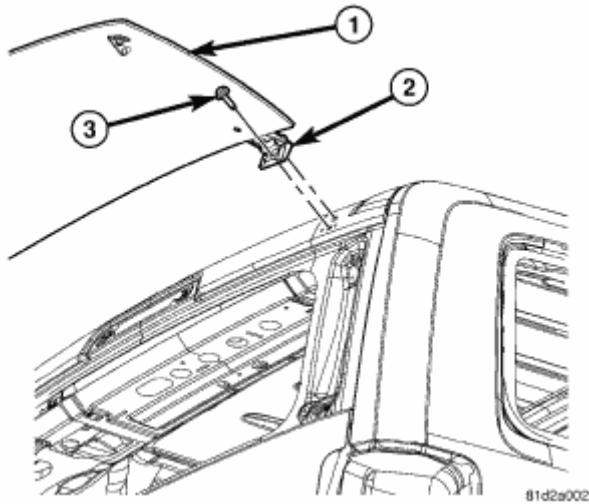


Fig. 566: Flipper Glass And Screws
Courtesy of CHRYSLER LLC

1. Install the flipper glass (1) and install the screws (3).

NOTE: Flipper glass hinges must follow the contour of the roof line before the screws are tightened.

2. Tighten the screws to 9.5 N.m (84 in. lbs.)
3. Connect the electrical connector, if equipped.

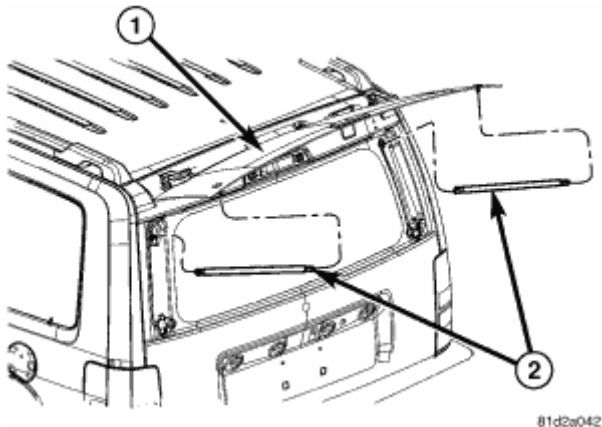


Fig. 567: Support Cylinder And Flipper Glass
Courtesy of CHRYSLER LLC

4. Install the support cylinders (2), see **INSTALLATION**.
5. Adjust the glass (1), see **SPECIFICATIONS**.

LATCH - FLIPPER GLASS

REMOVAL

LATCH - FLIPPER GLASS

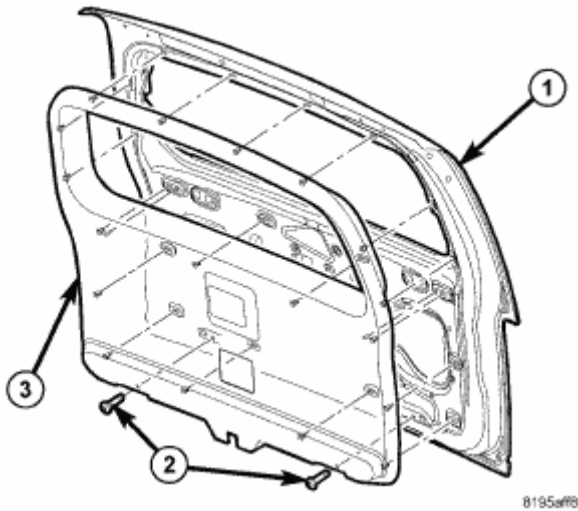


Fig. 568: Liftgate Trim Panel
Courtesy of CHRYSLER LLC

1. Remove the trim panel (3), see **REMOVAL**.

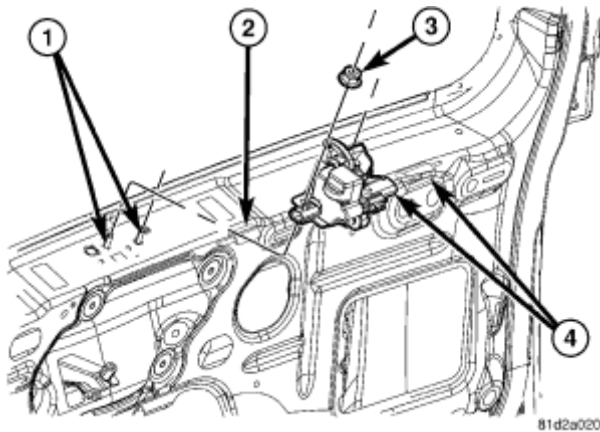


Fig. 569: Flipper Glass Latch And Electrical Connectors
Courtesy of CHRYSLER LLC

2. Disconnect the electrical connectors (2, 4).
3. Remove the nuts (3) and remove the latch.

INSTALLATION

LATCH - FLIPPER GLASS

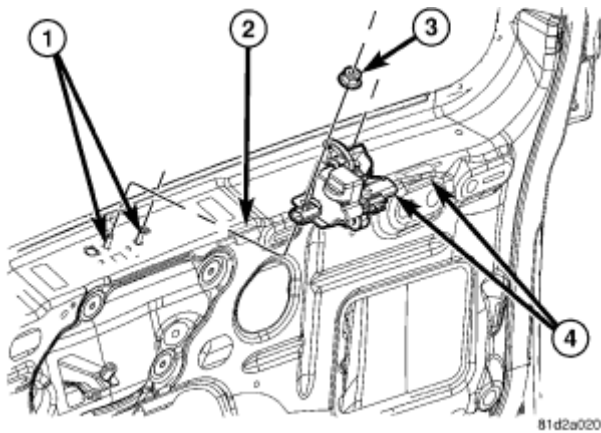


Fig. 570: Flipper Glass Latch And Electrical Connectors
 Courtesy of CHRYSLER LLC

1. Install the latch onto the liftgate studs (1) and install the nuts (3).
2. Tighten the nuts (3) to 13 N.m (115 in. lbs.)
3. Connect the electrical connectors (2, 4).
4. Adjust the glass (1), see **SPECIFICATIONS**.

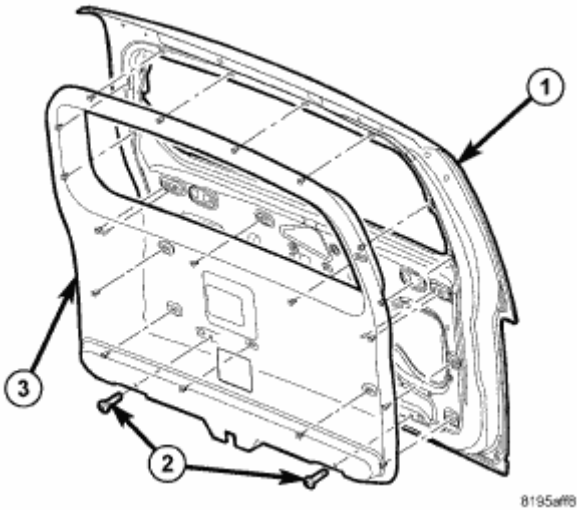


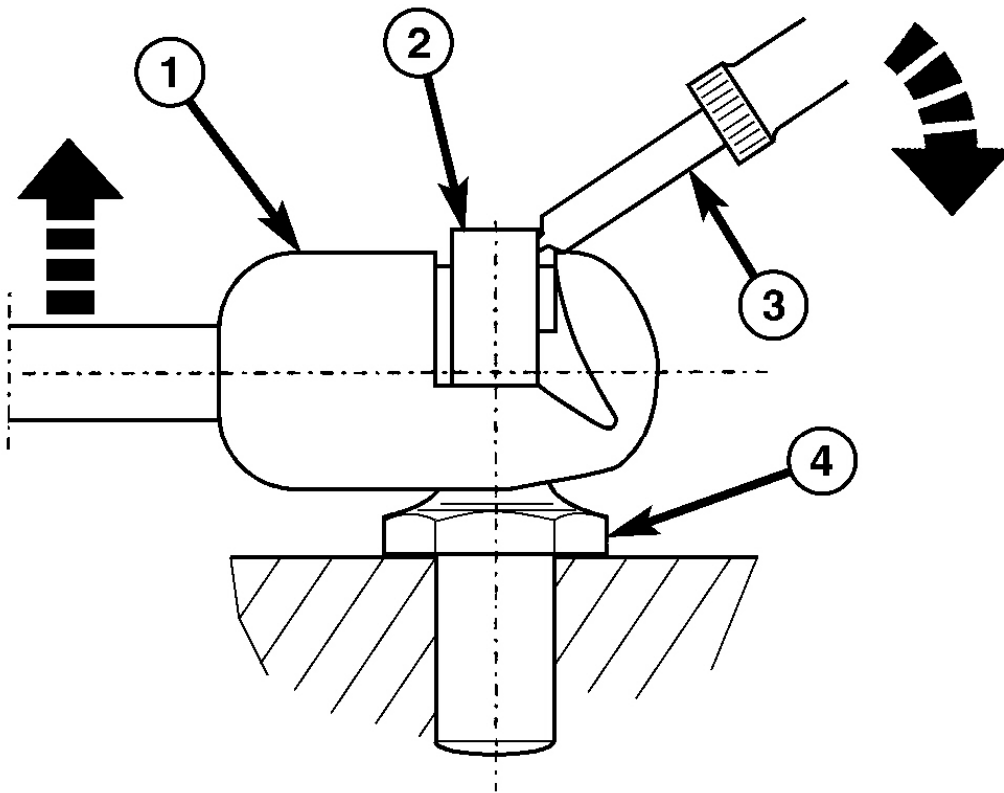
Fig. 571: Liftgate Trim Panel
 Courtesy of CHRYSLER LLC

5. Install the liftgate trim (3), see **INSTALLATION**.

SUPPORT CYLINDER - FLIPPER GLASS

REMOVAL

SUPPORT CYLINDER - FLIPPER GLASS



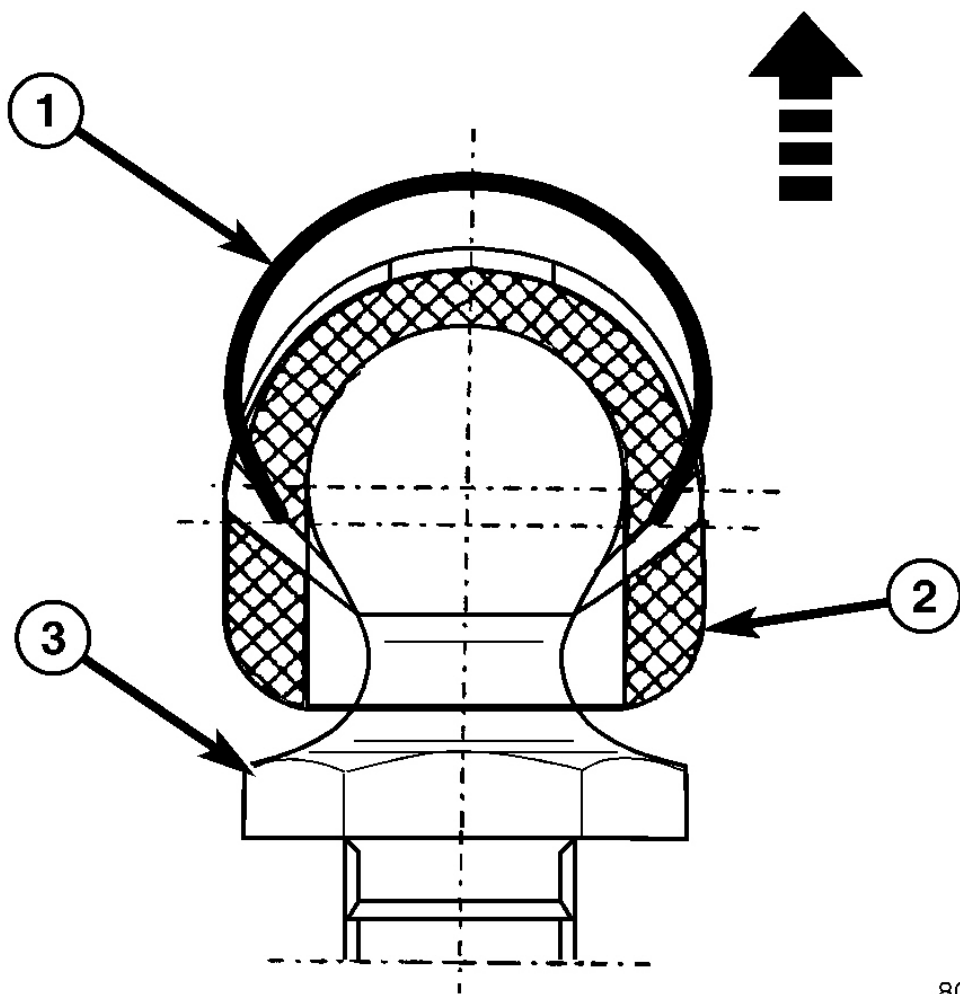
80f70308

Fig. 572: Removing Support Cylinder
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - BALL SOCKET2 - RETAINING CLIP3 - FLAT BLADED TOOL4 - BALL STUD |
|---|

WARNING: Do not remove the flip-up glass support rods with the glass closed. The support rod pistons are operated by high pressure gas and could cause personal injury and/or vehicle damage if they are removed with the pistons compressed (glass closed). Once removed, do not attempt to disassemble or repair the support rods.

1. Open the flip-up glass and support.
2. Using a small flat bladed tool (3), or equivalent, release the retaining clips (2) while pulling the ball socket (1) away from the ball stud (4).



80f70318

Fig. 573: Support Cylinder Retaining Clip
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - RETAINING CLIP
2 - BALL SOCKET
3 - BALL STUD |
|--|

NOTE: Lift the clips (1) only enough to release the ball studs (3).

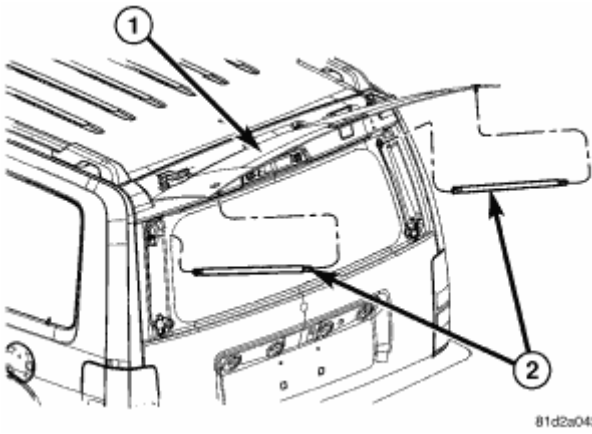
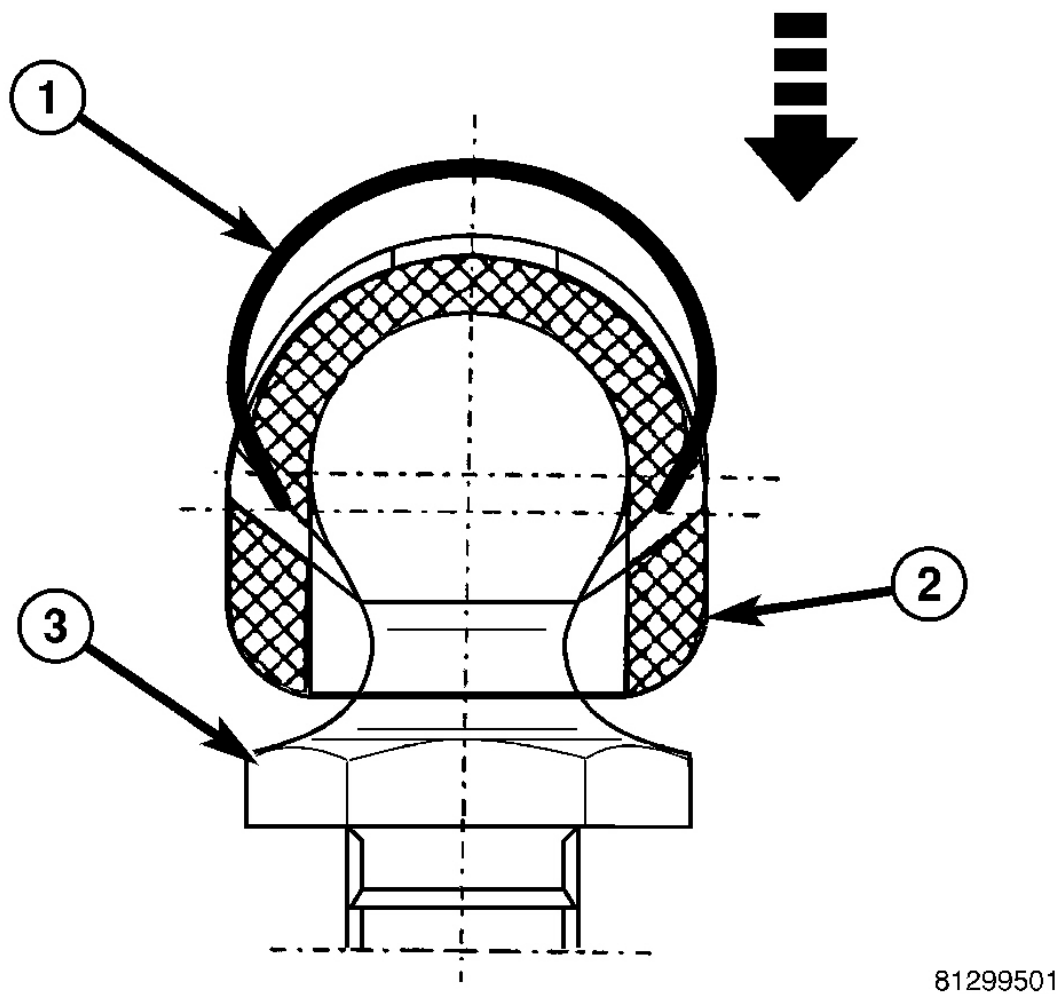


Fig. 574: Support Cylinder And Flipper Glass
Courtesy of CHRYSLER LLC

3. Remove the support cylinder (2) from the upper and lower ball studs.

INSTALLATION

SUPPORT CYLINDER - FLIPPER GLASS



81299501

Fig. 575: Removing/Installing Support Cylinder Retaining Clip
Courtesy of CHRYSLER LLC

- 1 - RETAINING CLIP
- 2 - BALL SOCKET
- 3 - BALL STUD

WARNING: Do not remove the flip-up glass support rods with the glass closed. The support rod pistons are operated by high pressure gas and could cause personal injury and/or vehicle damage if they are removed with the pistons compressed (glass closed). Once removed, do not attempt to disassemble or repair the support rods.

1. Make sure the retaining clips (1) are seated into the ball socket (2) fully.

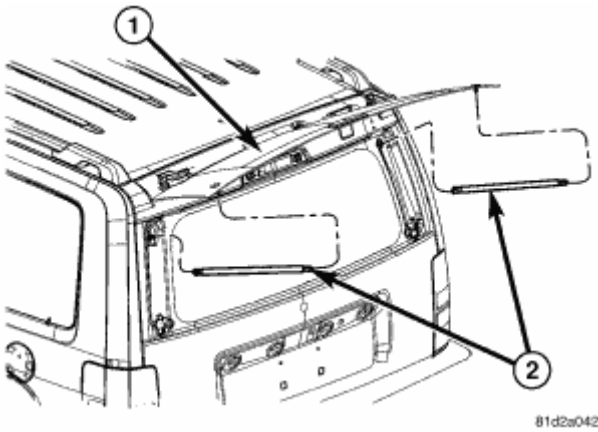


Fig. 576: Support Cylinder And Flipper Glass
 Courtesy of CHRYSLER LLC

2. Install the support cylinder (2) over the ball studs with the thin end connected to the glass and the retaining clips snapping into place.

HINGE - FLIPPER GLASS

REMOVAL

HINGE - FLIPPER GLASS

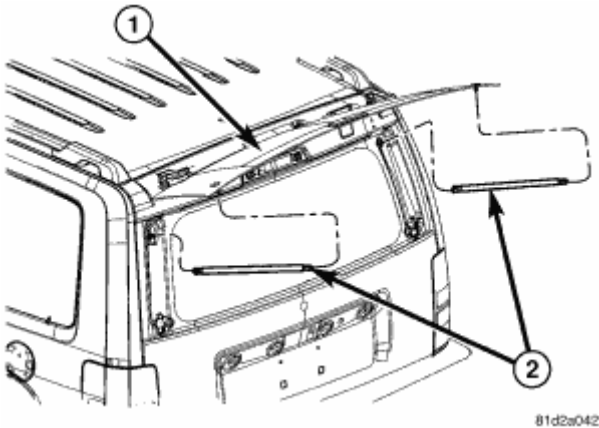


Fig. 577: Support Cylinder And Flipper Glass
 Courtesy of CHRYSLER LLC

1. Remove the support cylinders and support glass, see **REMOVAL**.

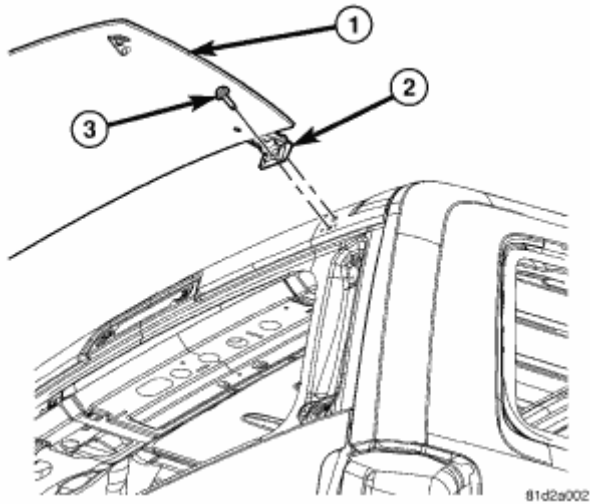
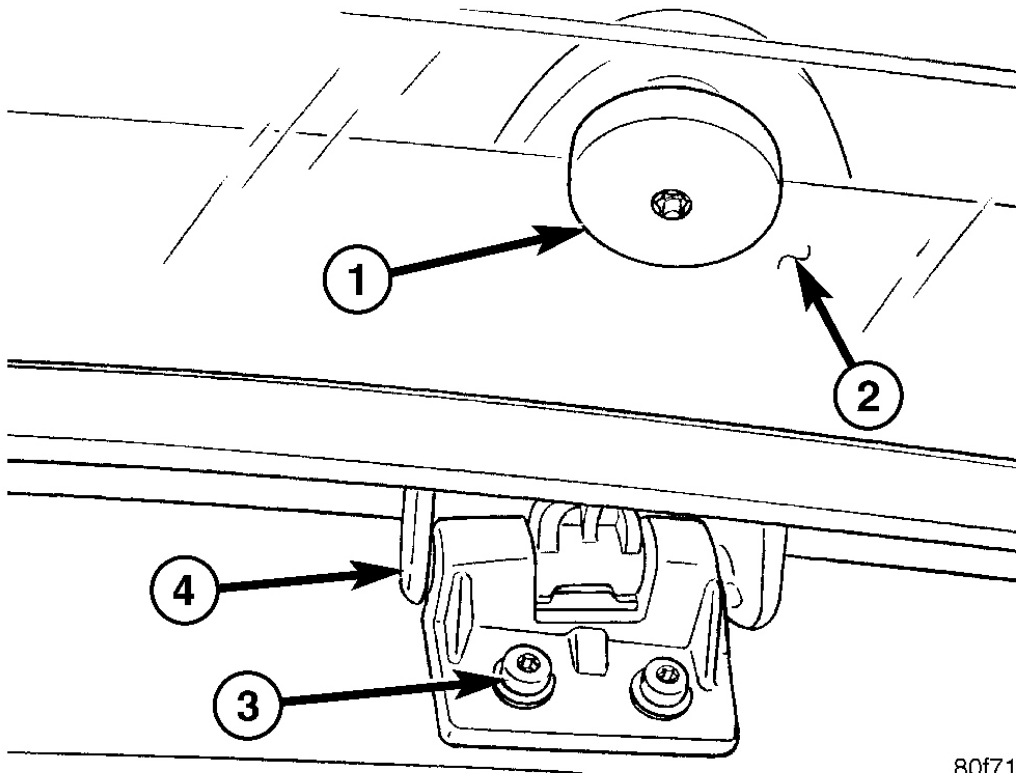


Fig. 578: Flipper Glass And Screws
Courtesy of CHRYSLER LLC

NOTE: It is not necessary to remove the glass to replace one or both hinges. The hinges can be replaced one at a time.

2. Open the flipper glass (1).
3. Using a grease pencil or equivalent, mark the position of the hinge (2) on the body to aid installation.
4. Remove the hinge to body bolts (3).



80f7101a

Fig. 579: Flip-Up Glass - Hinge
Courtesy of CHRYSLER LLC

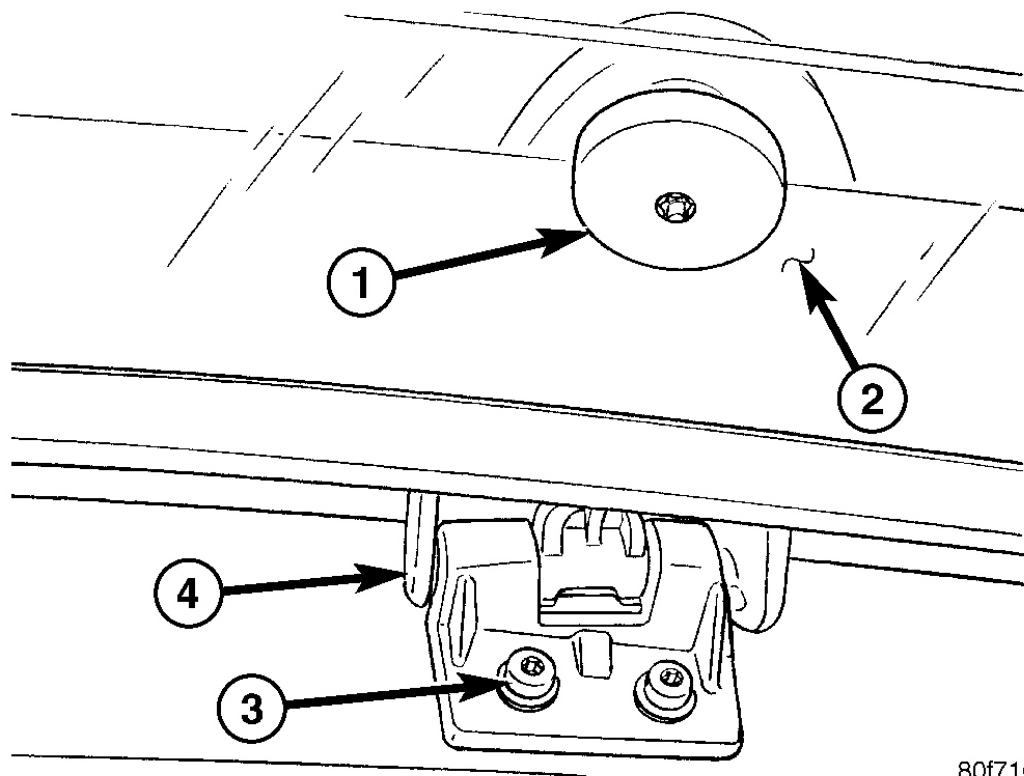
- | |
|--|
| 1 - GLASS BOLT
2 - FLIP-UP GLASS
3 - BODY BOLTS
4 - HINGE |
|--|

CAUTION: Do not allow glass to twist on remaining hinge when the other hinge is being serviced. Damage to the hinge that is not being serviced may result.

5. Remove the bolt (1) and remove the hinge (4).

INSTALLATION

HINGE - FLIPPER GLASS



80f7101a

Fig. 580: Flip-Up Glass - Hinge
Courtesy of CHRYSLER LLC

- 1 - GLASS BOLT
- 2 - FLIP-UP GLASS
- 3 - BODY BOLTS
- 4 - HINGE

1. Install the hinge (4) onto the vehicle and align with marks made previously.
2. Install the hinge to glass bolt (1) and tighten to 10 N.m (90 in. lbs.).

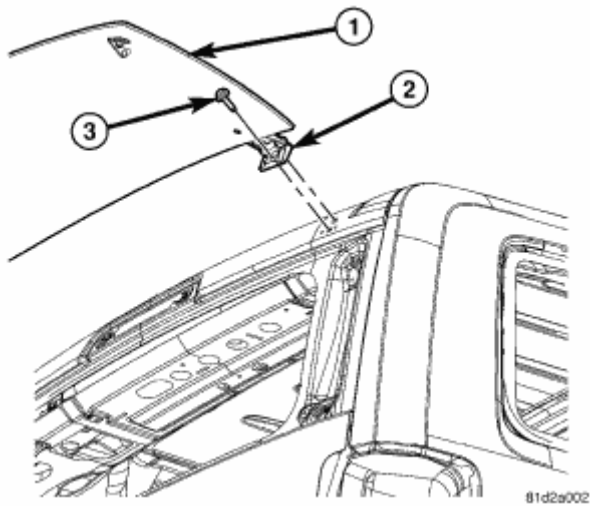


Fig. 581: Flipper Glass And Screws
Courtesy of CHRYSLER LLC

3. Install the bolt (3) and tighten to 9.5 N.m (84 in. lbs.).
4. Adjust the flip-up glass as necessary, see **SPECIFICATIONS**.

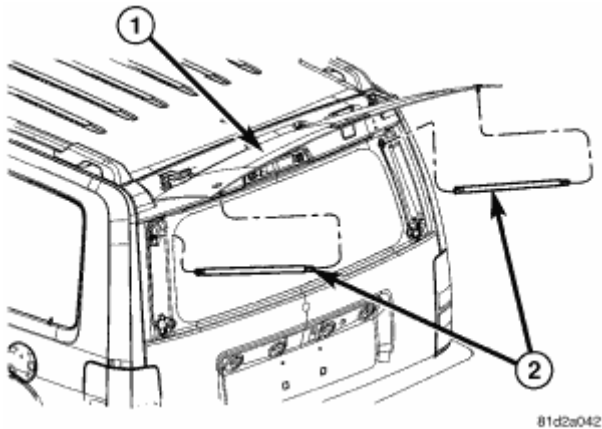


Fig. 582: Support Cylinder And Flipper Glass
Courtesy of CHRYSLER LLC

5. Install the support cylinders (2), see **INSTALLATION**.

PAINT

SPECIFICATIONS

SPECIFICATIONS - COLOR CODES

NOTE: Because of late model changes to the available paint colors. Refer to **DESCRIPTION** , or **DESCRIPTION**.

EXTERIOR COLORS

EXTERIOR COLOR	DAIMLERCHRYSLER CODE
Inferno Red Crystal Pearlcoat	ARH
Light Graystone Pearlcoat	EDA
Modern Blue Pearlcoat	EBL
Bright Silver Metallic Clearcoat	WS2
Brilliant Black Crystal Pearlcoat	AXR
Stone White Clearcoat	SW1
Red Rock Crystal Pearlcoat	EEM
Jeep Green Metallic Clearcoat	EGJ

INTERIOR COLORS

INTERIOR COLOR	DAIMLERCHRYSLER CODE
Slate Gray/Pastel Slate Gray	DA
Dark Pebble Beige/Pastel Pebble Beige	KA

PAINT CODE

DESCRIPTION

PAINT CODE

Exterior vehicle body colors are identified on the Vehicle Certification Label. Refer to **DESCRIPTION** . The first digit of the paint code listed on the vehicle indicates the sequence of application, i.e.: P = primary coat, Q = secondary coat. The color names provided in the Paint and Trim Code Description chart are the color names used on most repair product containers. . See **SPECIFICATIONS**.

BASE COAT/CLEAR COAT FINISH

DESCRIPTION

BASECOAT/CLEARCOAT FINISH

The original equipment finish is a multi step process that involves cleaning, applying electro de-position (E-coat), anti-chip primer, basecoat, and clearcoat steps.

On most vehicles a two-part paint application (basecoat/clearcoat) is used. Color paint that is applied to primer is called basecoat. The clear coat protects the basecoat from ultraviolet light and provides a durable high-gloss finish.

**CAUTION: Do not use abrasive chemicals or compounds on painted surfaces.
Damage to finish can result.**

**Do not use harsh alkaline based cleaning solvents on painted surfaces.
Damage to finish or color can result.**

PAINT TOUCH-UP

DESCRIPTION

PAINTED SURFACE TOUCH-UP

When a painted metal surface has been scratched or chipped, it should be touched-up as soon as possible to avoid corrosion. For best results, use Mopar® Scratch Filler/Primer, Touch-Up Paints and Clear Topcoat.

WARNING: Use an OSHA approved respirator and safety glasses when spraying paint or solvents in a confined area. Personal injury can result.

OPERATION

1. Scrape loose paint and corrosion from inside scratch or chip.
2. Clean affected area with Mopar® Tar/Road Oil Remover, and allow to dry.
3. Fill the inside of the scratch or chip with a coat of filler/primer. Do not overlap primer onto good surface finish. The applicator brush should be wet enough to puddle-fill the scratch or chip without running. Do not stroke brush applicator on body surface. Allow the filler/primer to dry hard.
4. Cover the filler/primer with color touch-up paint. Do not overlap touch-up color onto the original color coat around the scratch or chip. Butt the new color to the original color, if possible. Do not stroke applicator brush on body surface. Allow touch-up paint to dry hard.
5. On vehicles without clearcoat, the touch-up color can be lightly finesse sanded (1500 grit) and polished with rubbing compound.
6. On vehicles with clearcoat, apply clear top coat to touch-up paint with the same technique as described in step 4. Allow clear topcoat to dry hard. If desired, step 5 can be performed on clear topcoat.

WARNING: Avoid prolonged skin contact with petroleum or alcohol-based cleaning solvents. Personal injury can result.

FINESSE SANDING/BUFFING & POLISHING

DESCRIPTION

FINESSE SANDING/BUFFING & POLISHING

CAUTION: Do not remove more than .5 mils of clearcoat finish, if equipped. Basecoat paint must retain clearcoat for durability.

Use a Paint Thickness Gauge #PR-ETG-2X or equivalent to determine film thickness before and after the repair.

Minor acid etching, orange peel, or smudging in clearcoat or single-stage finishes can be reduced with light finesse sanding, hand buffing, and polishing. **If the finish has been finesse sanded in the past, it cannot be repeated. Finesse sanding operation should be performed by a trained automotive paint technician.**

SEATS

WARNING

RESTRAINT SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with the Supplemental Restraint System (SRS), never attempt to repair the electrically conductive circuits or wiring components related to the SRS. Such repairs can compromise the conductivity and current carrying capacity of those critical electrical circuits, which may cause SRS components not to deploy when required, or to deploy when not required. Any wire harness containing broken, cut, burned or otherwise damaged electrically conductive SRS wiring, terminals or connector components must be removed and replaced with an entire new wire harness. Only minor cuts or abrasions of wire and terminal insulation where the conductive material has not been damaged, or connector insulators where the integrity of the latching and locking mechanisms have not been compromised may be repaired using appropriate methods.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service. The ORC contains a rollover sensor, which enables the system to deploy the side curtain airbags in the event of a vehicle rollover event. If an ORC is accidentally rolled during service while still connected to battery power, the side curtain airbags will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, before performing any welding operations disconnect and isolate the battery negative (ground) cable and disconnect all wire harness connectors from the Occupant Restraint Controller (ORC). Failure to take the proper precautions could result in accidental airbag deployment and other possible damage to the Supplemental Restraint System (SRS) circuits and components.

WARNING: To avoid serious or fatal injury, do not attempt to dismantle an airbag unit or tamper with its inflator. Do not puncture, incinerate, or bring into contact with electricity. Do not store at temperatures exceeding 93° C (200° F). An airbag inflator unit may contain sodium azide and potassium nitrate. These materials are poisonous and extremely flammable. Contact with acid, water, or heavy metals may produce harmful and irritating gases (sodium hydroxide is formed in the presence of moisture) or combustible compounds. An airbag inflator unit may also contain a gas canister pressurized to over 17.24 kPa (2500 psi).

WARNING: To avoid serious or fatal injury when handling a seat belt tensioner retractor, proper care should be exercised to keep fingers out from under the retractor cover and away from the seat belt webbing where it exits from the retractor cover.

WARNING: To avoid serious or fatal injury, replace all Supplemental Restraint System (SRS) components only with parts specified in the DaimlerChrysler Mopar® Parts Catalog. Substitute parts may appear interchangeable, but internal differences may result in inferior occupant protection.

WARNING: To avoid serious or fatal injury, the fasteners, screws, and bolts originally used for the Supplemental Restraint System (SRS) components must never be replaced with any substitutes. These fasteners have special coatings and are specifically designed for the SRS. Any time a new fastener is needed, replace it with the correct fasteners provided in the service package or specified in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury when a steering column has an airbag unit attached, never place the column on the floor or any other surface with the steering wheel or airbag unit face down.

SEAT - FRONT

DESCRIPTION

DESCRIPTION

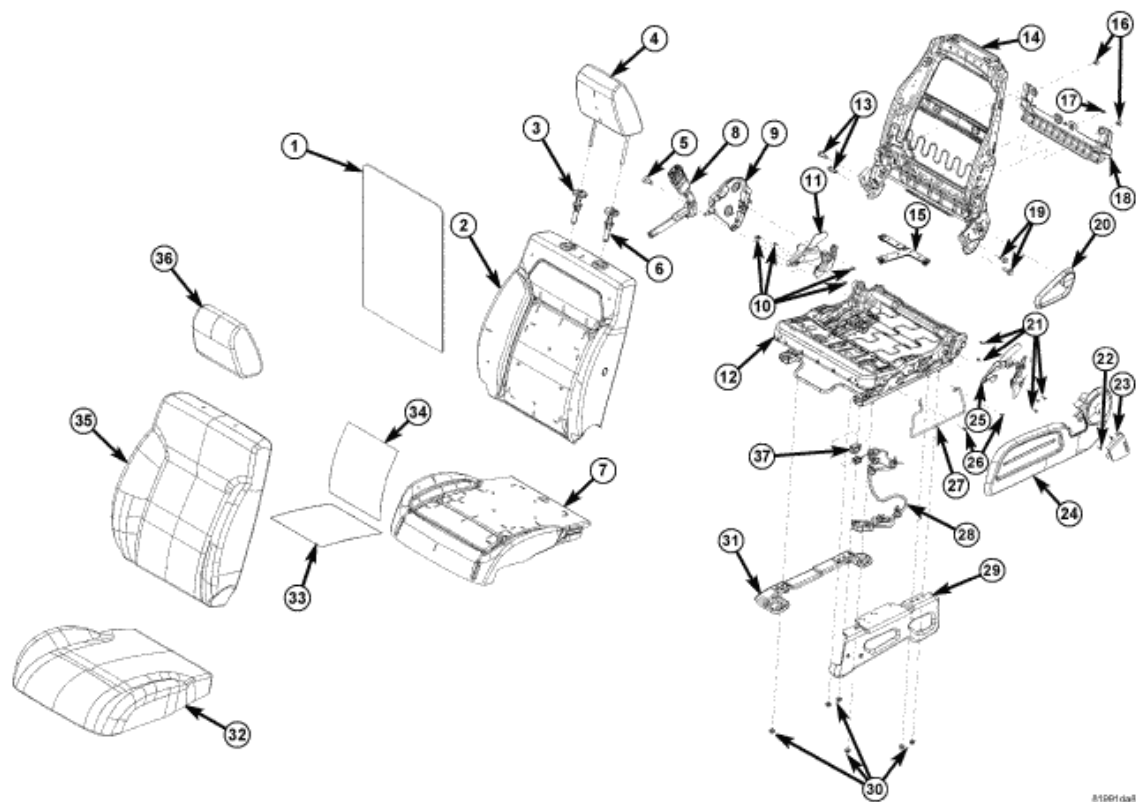
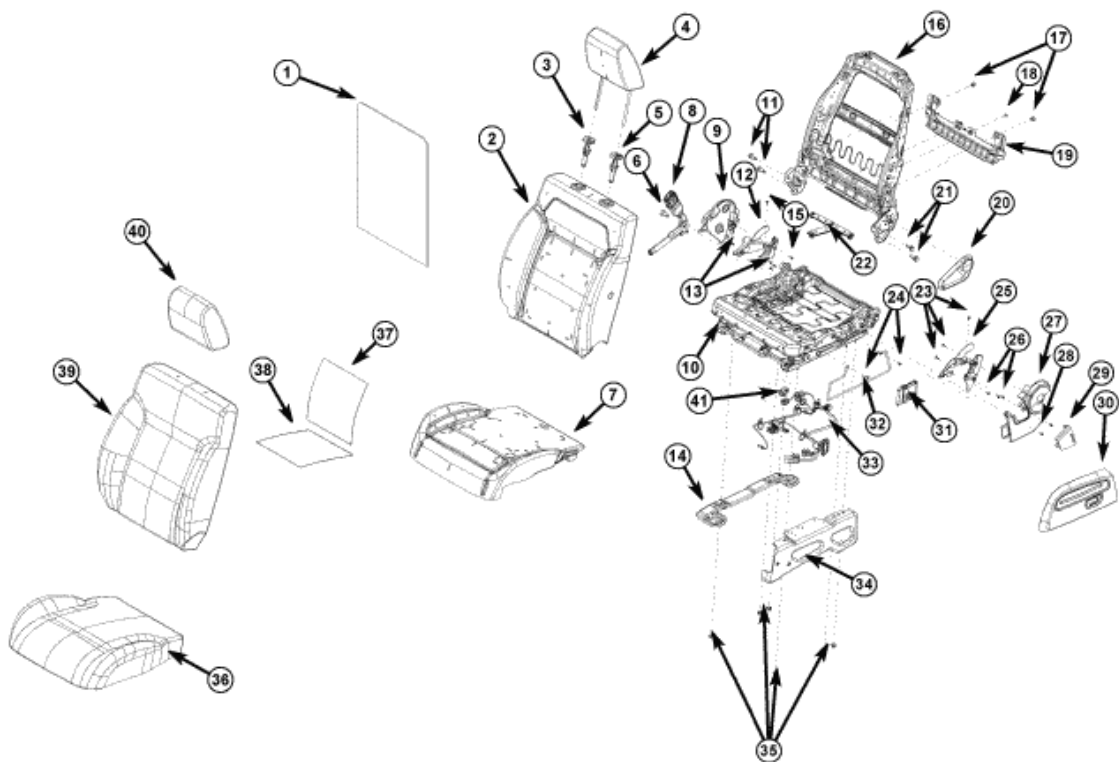


Fig. 583: Drivers Seat 2 Way Assembly
Courtesy of CHRYSLER LLC

1 - BAG, BSR	20 - RECLINER, HANDLE ASSEMBLY
2 - CUSHION, BACK	21 - SCREW
3 - HEADREST, GUIDE WITHOUT BUTTON	22 - SCREW
4 - HEADREST, ASSEMBLY	23 - SHIELD
5 - BOLT, SEAT BELT 47.5 N.m (35 ft. lbs.)	24 - SHIELD
6 - HEADREST, GUIDE WITH LOCK AND BUTTON	25 - SHIELD
7 - CUSHION, SEAT	26 - RIVET
8 - PRETENSIONER, ASSEMBLY	27 - WIRE, SHIELD ATTACHMENT
9 - SHIELD, ASSEMBLY	28 - HARNESS, ASSEMBLY
10 - SCREW	29 - RISER, LH OUTBOARD

- | | |
|--|----------------------------------|
| 11 - SHIELD | 30 - NUT 27.5 N.m (20 ft. lbs.) |
| 12 - FRAME, SEAT | 31 - RISER, LH INBOARD |
| 13 - SCREW, M10 47.5 N.m (35 ft. lbs.) | 32 - COVER, SEAT |
| 14 - FRAME, SEAT BACK | 33 - ELEMENT, HEATED SEAT |
| 15 - PLATE, ROUTING | 34 - ELEMENT, HEATED SEAT BACK |
| 16 - PIN, PUSH | 35 - COVER, SEAT BACK |
| 17 - SCREW | 36 - COVER, HEAD REST |
| 18 - SHIELD | 37 - SENSOR, SEAT TRACK POSITION |
| 19 - SCREW, M10 47.5 N.m (35 ft. lbs.) | - |



81591458

Fig. 584: Drivers Seat 6 Way Assembly
Courtesy of CHRYSLER LLC

- | | |
|--|---------------------------|
| 1 - BAG, BSR | 22 - PLATE, ROUTING |
| 2 - CUSHION, BACK | 23 - SCREW |
| 3 - HEADREST, GUIDE WITHOUT BUTTON | 24 - RIVET |
| 4 - HEADREST, ASSEMBLY | 25 - SHIELD |
| 5 - HEADREST, GUIDE WITH LOCK | 26 - SCREW |
| 6 - BOLT, SEAT BELT 47.5 N.m (35 ft. lbs.) | 27 - SHIELD |
| 7 - CUSHION, SEAT | 28 - SCREW |
| 8 - PRETENSIONER, ASSEMBLY | 29 - SHIELD, CLOSEOUT |
| 9 - SHIELD, ASSEMBLY | 30 - SHIELD, POWER SWITCH |
| 10 - FRAME, SEAT | 31 - SHIELD, POWER SEAT |

- | | |
|--|----------------------------------|
| 11 - SCREW, M10 47.5 N.m (35 ft. lbs.) | 32 - WIRE, SHIELD ATTACHMENT |
| 12 - SHIELD | 33 - HARNESS, 6 WAY POWER |
| 13 - SCREW | 34- RISER, LH OUTBOARD |
| 14 - RISER, LH INBOARD | 35 - NUT 27.5 N.m (20 ft. lbs.) |
| 15 - SCREW | 36 - COVER, SEAT |
| 16 - FRAME, SEAT BACK | 37 - ELEMENT, HEATED SEAT BACK |
| 17 - PIN, PUSH | 38 - ELEMENT, HEATED SEAT |
| 18 - SHIELD | 39 - COVER, SEAT BACK |
| 19 - SHIELD | 40 - COVER, HEAD REST |
| 20 - RECLINER, HANDLE ASSEMBLY | 41 - SENSOR, SEAT TRACK POSITION |
| 21 - SCREW, M10 47.5 N.m (35 ft. lbs.) | - |

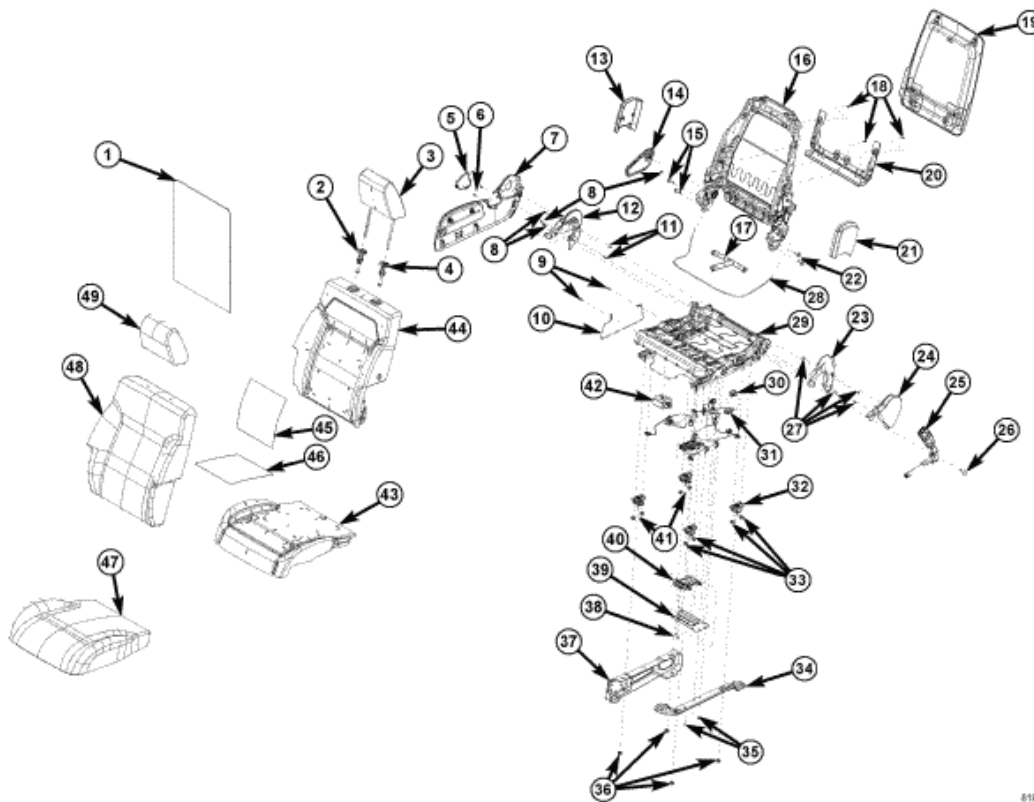
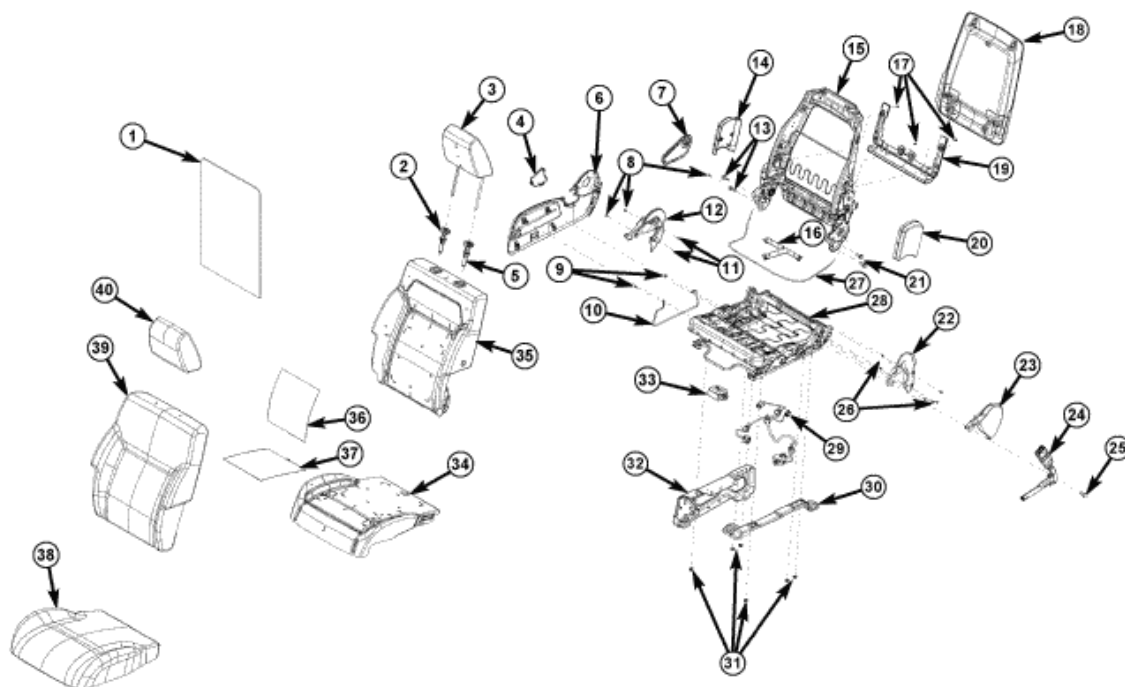


Fig. 585: Passenger Seat Domestic Assembly
Courtesy of CHRYSLER LLC

- | | |
|------------------------------------|----------------------------------|
| 1 - BAG, BSR | 26 - BOLT, SEAT BELT |
| 2 - HEADREST, GUIDE WITHOUT BUTTON | 27 - SCREW |
| 3 - HEADREST, ASSEMBLY | 28 - CABLE, RELEASE |
| 4 - HEADREST, GUIDE WITH LOCK | 29 - FRAME, SEAT |
| 5 - SHIELD, CLOSEOUT | 30 - SENSOR, SEAT TRACK POSITION |
| 6 - SCREW | 31 - HARNESS, ASSEMBLY |
| 7 - SHIELD, ASSEMBLY | 32 - GAGE, STRAIN TI |
| 8 - SCREW | 33 - NUT 27.5 N.m (20 ft. lbs.) |

9 - RIVET	34 - RISER
10 - WIRE, SHIELD ATTACHMENT	35 - RIVET
11 - SCREW	36 - NUT 47.5 N.m (35 ft. lbs.)
12 - SHIELD	37 - RISER
13 - SHIELD	38 - SCREW
14 - RECLINER, HANDLE ASSEMBLY	39 - BRACKET, METAL MODULE
15 - SCREW, M10 47.5 N.m (35 ft. lbs.)	40 - MODULE, OCS
16 - FRAME, SEAT BACK	41 - NUT 27.5 N.m (20 ft. lbs.)
17 - PLATE, ROUTING	42 - MODULE, ASSEMBLY HEATED
18 - SCREW	43 - CUSHION, SEAT
19 - PANEL, BACK ASSEMBLY	44 - CUSHION, BACK
20 - SHIELD	45 - ELEMENT, HEATED BACK
21 - SHIELD	46 - ELEMENT, HEATED SEAT
22 - SCREW, M10 47.5 N.m (35 ft. lbs.)	47 - COVER, SEAT
23 - SHIELD, ASSEMBLY	48 - COVER, SEAT BACK
24 - SHIELD, SIDE	49 - COVER, HEAD REST
25 - PRETENSIONER, ASSEMBLY	-



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Fig. 586: Passenger Seat Export Assembly
Courtesy of CHRYSLER LLC

1 - BAG, BSR	21 - SCREW, M10 47.5 N.m (35 ft. lbs.)
2 - HEADREST, GUIDE WITHOUT BUTTON	22 - SHIELD, ASSEMBLY

3 - HEADREST, ASSEMBLY	23 - SHIELD, ASSEMBLY
4 - SHIELD, CLOSEOUT	24 - PRETENSIONER, ASSEMBLY
5 - HEADREST, GUIDE WITH LOCK	25 - BOLT, SEAT BELT 47.5 N.m (35 ft. lbs.)
6 - SHIELD, ASSEMBLY	26 - SCREW
7 - RECLINER, HANDLE ASSEMBLY	27 - CABLE, RELEASE
8 - SCREW	28 - FRAME, SEAT
9 - RIVET	29 - HARNESS, ASSEMBLY
10 - WIRE, SHIELD ATTACHMENT	30 - RISER
11 - SCREW	31 - NUT 27.5 N.m (20 ft. lbs.)
12 - SHIELD	32 - RISER
13 - SCREW, M10 47.5 N.m (35 ft. lbs.)	33 - MODULE, ASSEMBLY HEATED
14 - SHIELD	34 - CUSHION, SEAT
15 - FRAME, SEAT BACK	35 - CUSHION, BACK
16 - PLATE, ROUTING	36 - ELEMENT, HEATED BACK
17 - SCREW	37 - ELEMENT, HEATED SEAT
18 - PANEL, BACK ASSEMBLY	38 - COVER, SEAT
19 - SHIELD	39 - COVER, SEAT BACK
20 - SHIELD	40 - COVER, HEAD REST

REMOVAL

SEAT - FRONT

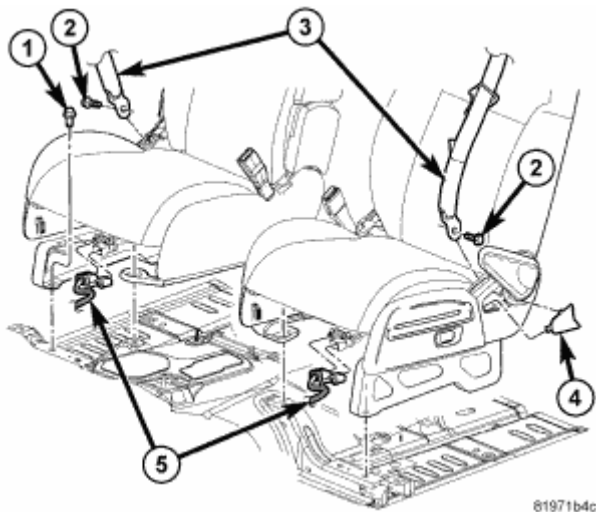
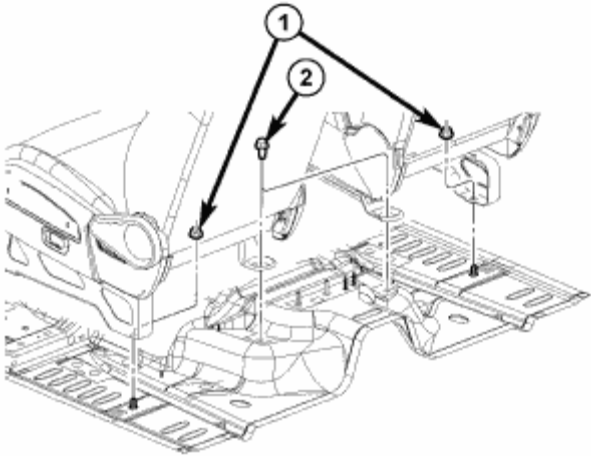


Fig. 587: Front Bolts, Seat Belt Bolts, Seat Belts, Side Shield & Electrical Connectors
 Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the head rests to ease with seat removal.

2. Remove the side shield (4) to expose the seat belt bolts.
3. Position the recliner lever up and remove the seat belt bolts (2) and seat belts (3), refer to **REMOVAL** .
4. Slide the seats back and remove the front bolts (1).
5. Disconnect the electrical connectors (5).



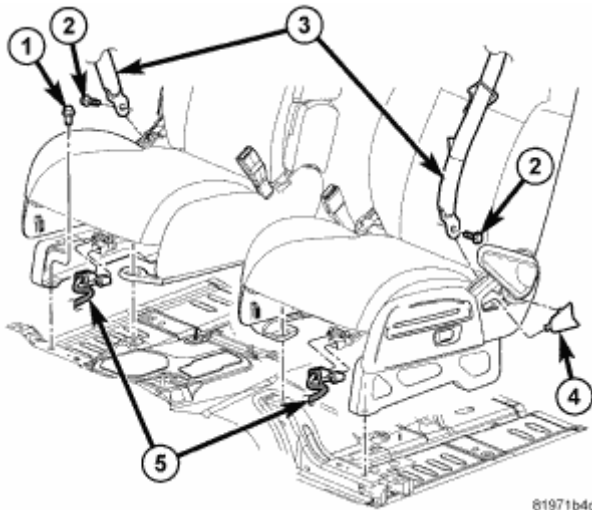
81971b50

Fig. 588: Rear Nuts And Bolts
 Courtesy of CHRYSLER LLC

6. Slide the seats to forward position and remove the rear nuts (1) and bolts (2).
7. Remove the seats from the vehicle.

INSTALLATION

SEAT - FRONT



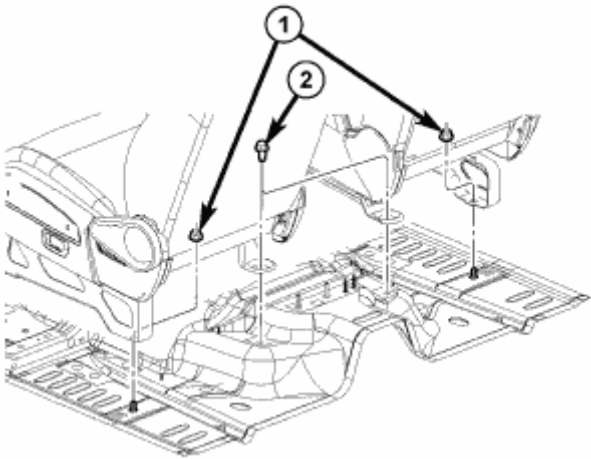
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Fig. 589: Front Bolts, Seat Belt Bolts, Seat Belts, Side Shield & Electrical Connectors
 Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

NOTE: Start all seat fasteners first before tightening to specifications.

1. Install the seats to the vehicle.
2. Slide the seats to the rearward position, connect the electrical connectors (5) and install the bolts (1).
3. Tighten the inboard bolts first then tighten the outboard bolts (1) to 62 N.m (46 ft. lbs.).
4. Install the seat belts (3) and bolts (2), refer to INSTALLATION .



81971b50

Fig. 590: Rear Nuts And Bolts

Courtesy of CHRYSLER LLC

5. Tighten the rear nuts (1) to 62 N.m (46 ft. lbs.).
6. Tighten the rear bolts (2) to 62 N.m (46 ft. lbs.).
7. Install the side shield (4) to the seats.
8. Install the head rest to the seats.
9. Do not reconnect the battery negative cable at this time. The supplemental restraint system verification test procedure should be performed following service of any supplemental restraint system component, refer to STANDARD PROCEDURE .
10. Following successful completion of the supplemental restraint system verification test procedure, perform the Occupant Classification System Verification Test using a scan tool. Refer to the appropriate diagnostic procedures.

SEAT BACK - FRONT

REMOVAL

SEAT BACK - FRONT

Driver Seat 6 Way

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the front seat, see REMOVAL.
2. For the drivers seat illustration, see DESCRIPTION.
3. Remove the power seat switch cover (30).
4. Remove the screws (28) and remove the side shield (27).
5. Remove the screws (26) and remove the outer shield (25).
6. Remove the inner shield (25).
7. Remove the outer shield (9).
8. Remove the screws (13) and remove the inner shield (12).
9. Remove the left side bolts (21) and the right side bolts (11).
10. Separate the seat back from the seat frame assembly.

Driver Seat 2 Way

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the front seat, see REMOVAL.
2. For the drivers seat illustration, see DESCRIPTION.
3. Remove the screws (22) and remove the side shield (24).
4. Remove the screws (21) and remove the outer shield (25).
5. Remove the inner shield (25).
6. Remove the outer shield (9).
7. Remove the screws (10) and remove the inner shield (11).
8. Remove the left side bolts (19) and the right side bolts (13).
9. Separate the seat back from the seat frame assembly.

Passenger Seat

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the front seat, see REMOVAL.
2. For the passenger seat illustration, see DESCRIPTION.
3. Remove side shield (24).
4. Remove the screws (27) and remove the shield (23).

5. Remove upper shield (21).
6. Remove the shield from the lower seat cushion frame.
7. Remove the screws (8) and remove the shield (12).
8. Remove the shield (13).
9. Remove the recliner handle (14).
10. Remove the left side bolts (22) and the right side bolts (15).
11. Separate the seat back from the seat frame assembly.

DISASSEMBLY

DISASSEMBLY

Driver Seat

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**

1. Remove the front seat back, see **REMOVAL.**
2. For the drivers seat illustration, see **DESCRIPTION.**
3. Remove the headrest (4).
4. Remove the seat back shield (19).
5. Remove the seat back cover (39).
6. Remove the left guide (5) and right guide (3) from the seat back cushion (2).
7. Remove the seat back cushion (2) from the seat back frame (16).

Passenger Seat

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING.**

1. Remove the front seat back, see **REMOVAL.**
2. For the passenger seat illustration, see **DESCRIPTION.**
3. Remove the headrest (3).
4. Remove the seat back shield (18).
5. Remove the seat back cover (48).
6. Remove the left guide (4) and right guide (2) from the seat back cushion (44).
7. Remove the seat back cushion (44) from the seat back frame (29).

ASSEMBLY

ASSEMBLY

Driver Seat

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. For the drivers seat illustration, see DESCRIPTION.
2. Install the seat back cushion (2) to the seat back frame (16).
3. Install the left guide (5) and right guide (3) to the seat back cushion (2).
4. Install the seat back cover (39).
5. Install the seat back shield (19).
6. Install the headrest (4).
7. Install the front seat back, see INSTALLATION.

Passenger Seat

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. For the passenger seat illustration, see DESCRIPTION.
2. Install the seat back cushion (44) to the seat back frame (29).
3. Install the left guide (4) and right guide (2) to the seat back cushion (44).
4. Install the seat back cover (48).
5. Install the seat back shield (18).
6. Install the headrest (3).
7. Install the front seat back, see INSTALLATION.

INSTALLATION

SEAT BACK - FRONT

Driver Seat 6 Way

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. For the drivers seat illustration, see DESCRIPTION.
2. Install the left side bolts (21) and the right side bolts (11) and tighten to 47.5 N.m (35 ft. lbs.).
3. Install the inner shield (12) and screws (13).
4. Install the outer shield (9).
5. Install the inner shield (25).
6. Install the outer shield (25) and screws (26).

7. Install the side shield (27) and screws (28).
8. Install the power seat switch cover (30).
9. Install the front seat to the vehicle, see **INSTALLATION**.

Driver Seat 2 Way

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.

1. For the drivers seat illustration, see **DESCRIPTION**.
2. Install the left side bolts (19) and the right side bolts (13) and tighten to 47.5 N.m (35 ft. lbs.).
3. Install the inner shield (11) and screws (10).
4. Install the outer shield (9).
5. Install the inner shield (25).
6. Install the outer shield (25) and screws (21).
7. Install the side shield (24) and screws (22).
8. Install the front seat to the vehicle, see **INSTALLATION**.

Passenger Seat

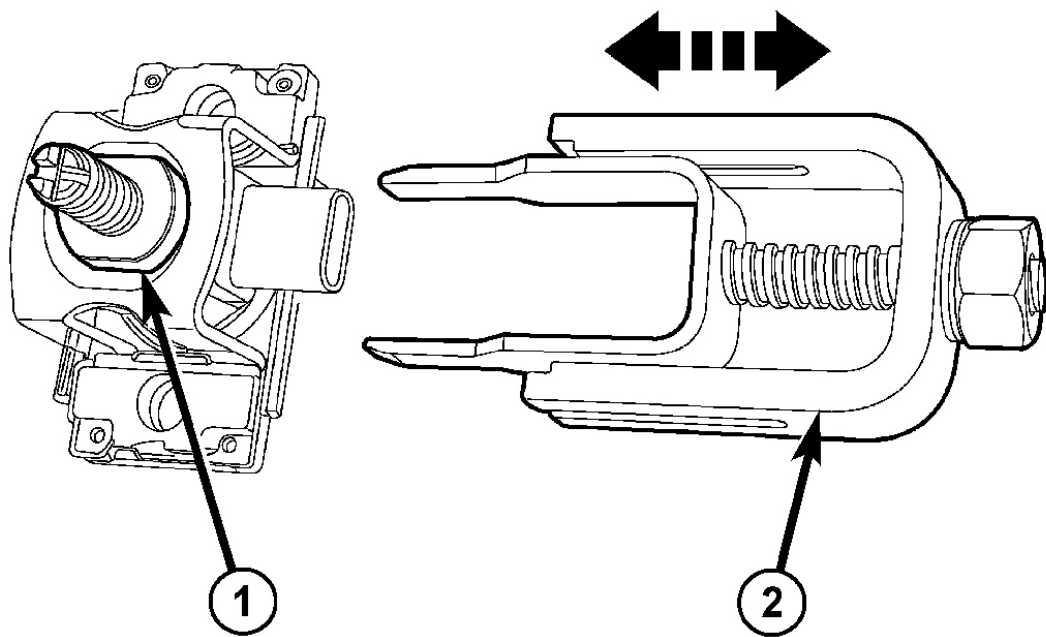
WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.

1. For the passenger seat illustration, see **DESCRIPTION**.
2. Install the left side bolts (22) and the right side bolts (15) and tighten to 47.5 N.m (35 ft. lbs.).
3. Install the recliner handle (14).
4. Install the shield (13).
5. Install the shield (12) and screws (8).
6. Install the shield to the lower seat cushion frame.
7. Install upper shield (21).
8. Install the shield (23) and screws (27).
9. Install side shield (24).
10. Install the front seat to the vehicle, see **INSTALLATION**.

SEAT CUSHION - FRONT

REMOVAL

SEAT CUSHION - FRONT

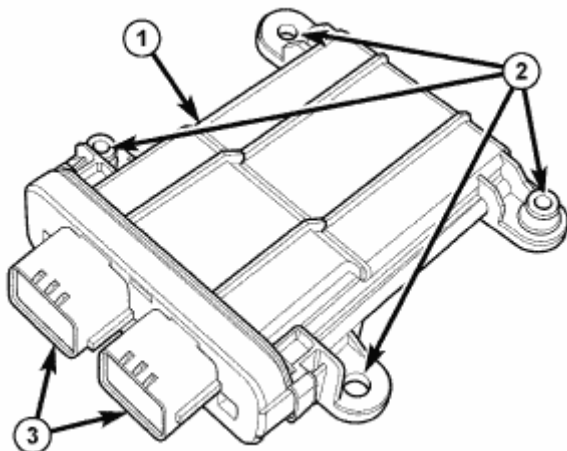


816a7796

Fig. 591: Removing/Installing Seat Weight Sensor
 Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the passenger or drivers front seat, see REMOVAL.
2. Remove the seat weight sensors if equipped, passenger seat only, refer to REMOVAL .



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Fig. 592: Occupant Classification Module
Courtesy of CHRYSLER LLC

3. Disconnect the electrical connectors and remove the occupant classification module, refer to **REMOVAL** .

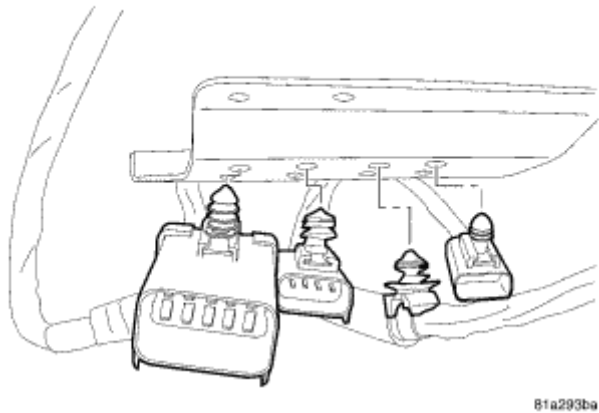


Fig. 593: OCS Electrical Connectors
Courtesy of CHRYSLER LLC

4. Remove the electrical harness connectors from the OCS mounting plate.

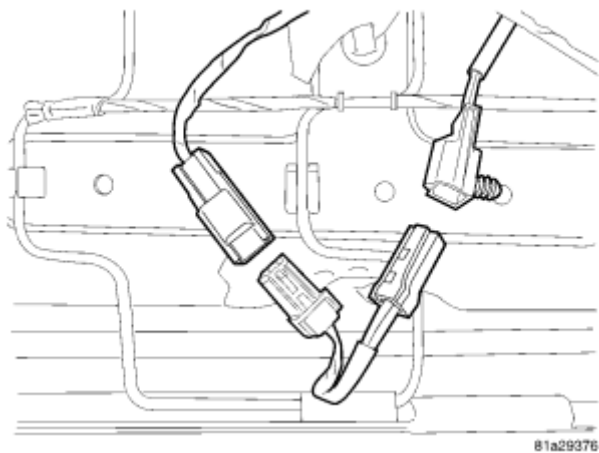


Fig. 594: Heated Seat Element Electrical Connectors
Courtesy of CHRYSLER LLC

5. Remove the electrical connectors for both the heated seat back and seat elements.

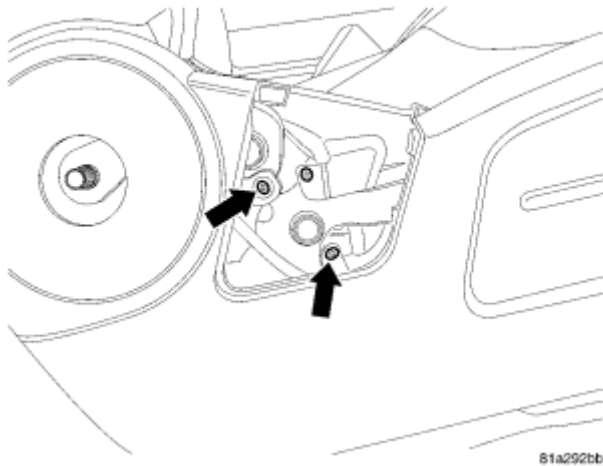


Fig. 595: Passenger Outer Trim Screws
Courtesy of CHRYSLER LLC

6. Remove the recliner handle.
7. Remove the two screws from the side of the outer seat trim.

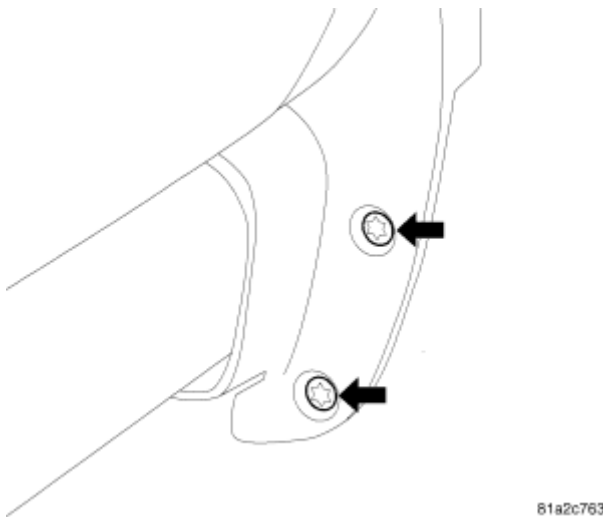


Fig. 596: Rear Seat Screws
Courtesy of CHRYSLER LLC

8. Remove the two screws from the rear of the outer seat trim and remove the trim panel.
9. Remove the seat position sensor.

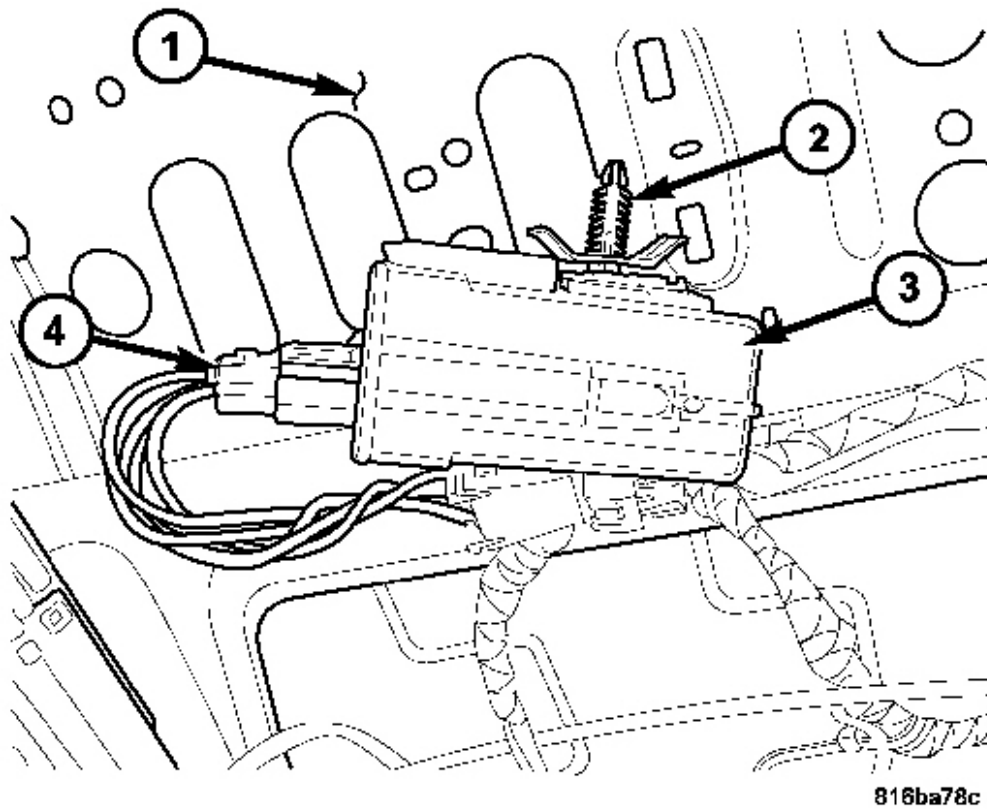


Fig. 597: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

10. Position the right front seat to the full rearward position.
11. Disconnect and isolate the battery negative cable.
12. Disconnect the wire harness connector (4) from the heated seat module (3).
13. Unsnap the heated seat module retaining tab (2) from the seat pan (1).
14. Remove the heated seat module (3) from the vehicle.
15. Remove the three nuts and remove the left seat track.
16. Remove the three nuts and remove the right seat track.
17. Remove the electrical harness from the seat bottom.

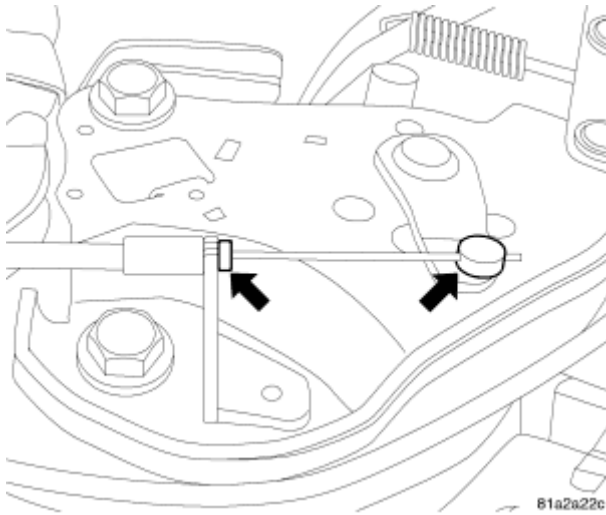


Fig. 598: Recliner Cable
 Courtesy of CHRYSLER LLC

18. Remove the recliner cable from the left and right side of the seat.

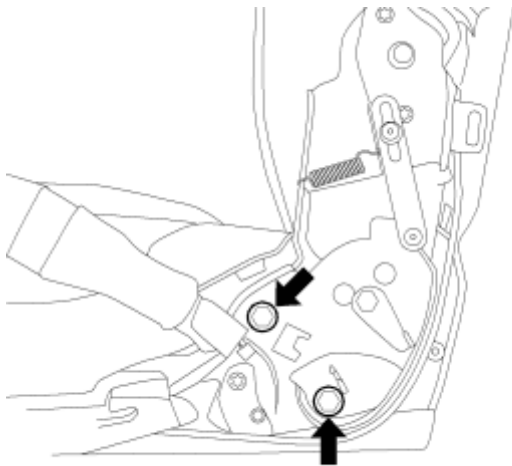


Fig. 599: Seat Frame Bolts
 Courtesy of CHRYSLER LLC

19. Remove the two seat frame bolts from the left and right side of the seat.
20. Separate the seat bottom and the seat back.

DISASSEMBLY

DISASSEMBLY

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See WARNING.

1. Remove the seat cushion section from the front seat assembly, see **REMOVAL**.
2. Remove the seat cover plastic retaining clips from the seat frame.
3. Remove the cover and cushion together from the seat frame.
4. Fold the seat cover back to expose the hog rings, cut and remove all hog rings.
5. Remove the seat cover from the seat cushion.

ASSEMBLY

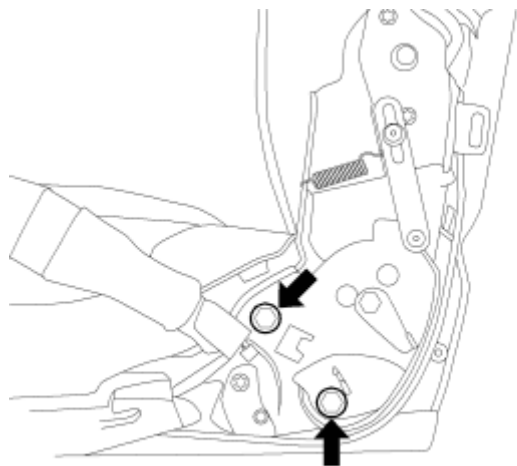
ASSEMBLY

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.

1. Install the seat cover to the seat cushion.
2. Fold the seat cover back to access the hog ring locations and install new hog rings to the seat cushion and cover.
3. Install the cover and cushion together to the seat frame.
4. Install the seat cover plastic retaining clips to the seat frame.
5. Install the seat cushion section to the front seat assembly, see **INSTALLATION**.

INSTALLATION

SEAT CUSHION - FRONT



61a2a30c

Fig. 600: Seat Frame Bolts
Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.

1. Install the seat bottom to the seat back frame.
2. Install the two seat frame bolts to the left and right side of the seat and tighten to 47.5 N.m (35 ft. lbs.)

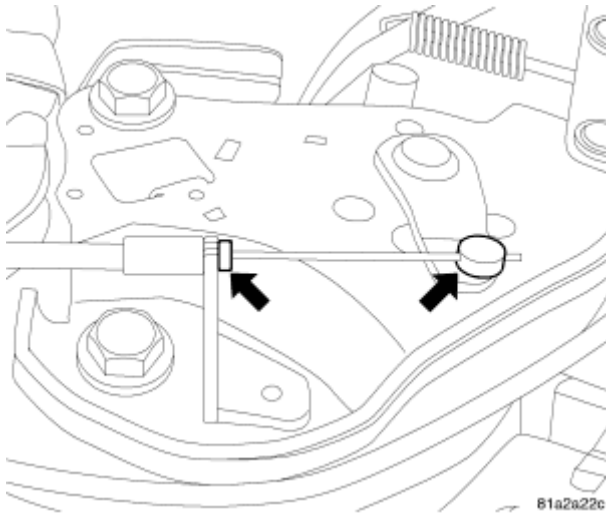


Fig. 601: Recliner Cable
Courtesy of CHRYSLER LLC

3. Install the recliner cable to the left and right side of the seat if equipped, passenger side only.
4. Install the electrical harness to the seat bottom.
5. Install the right and left seat tracks to the seat frame and tighten the nuts to 27.5 N.m (20 ft. lbs.).

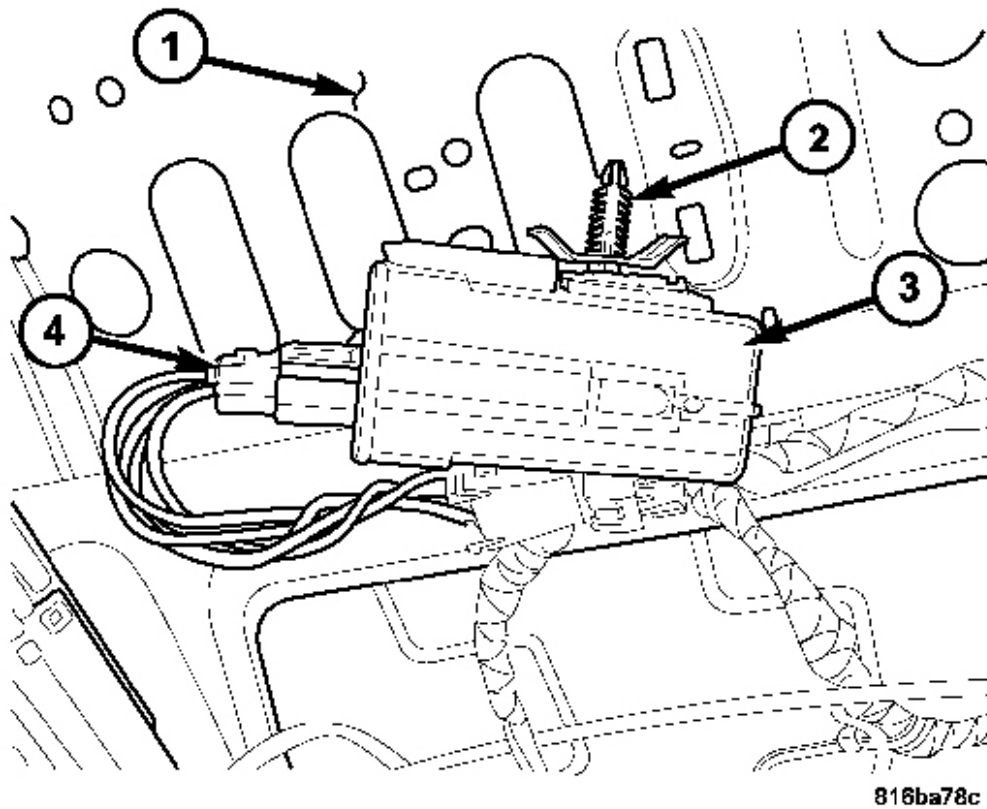


Fig. 602: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

6. Install the heated seat module (3) into the vehicle.
7. Position the retaining tab (2) with the mounting hole in the seat pan (1). Firmly apply even pressure to the module (3) until the mounting tab is fully seated.
8. Connect the wire harness connector (4) to the heated seat module (3).

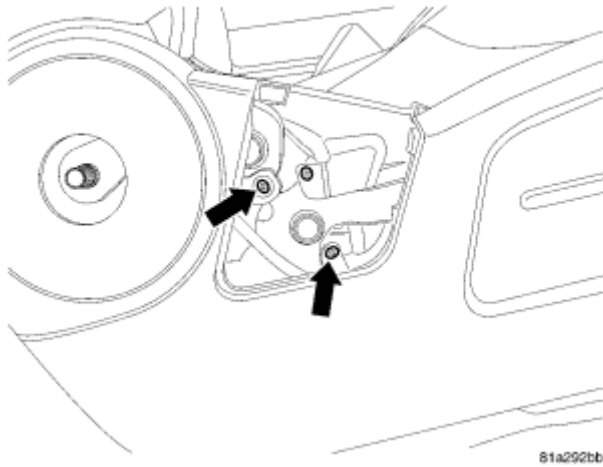


Fig. 603: Passenger Outer Trim Screws
Courtesy of CHRYSLER LLC

9. Install the seat position sensor.
10. Install the two screws to the side of the outer seat trim.

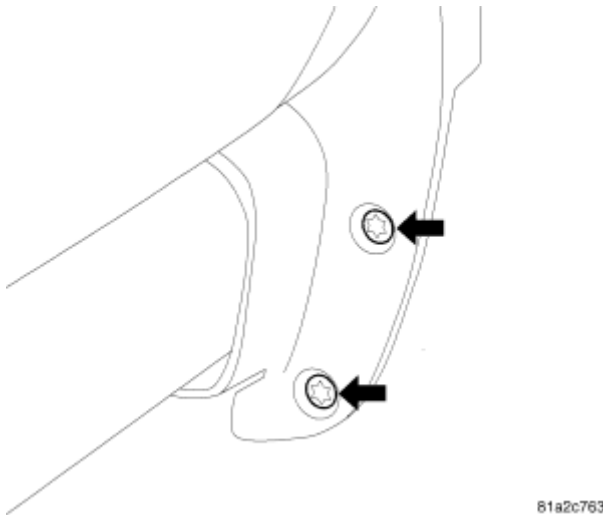
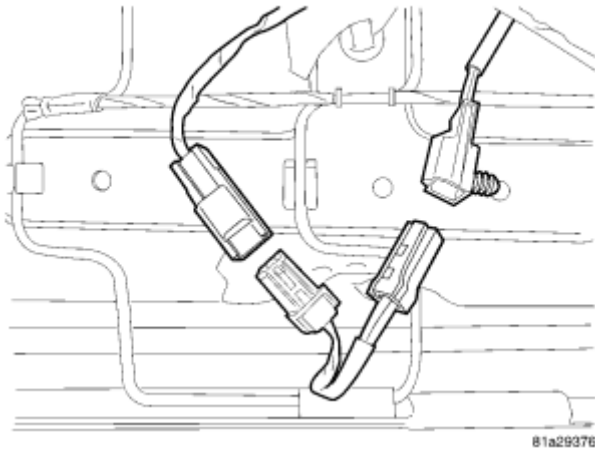


Fig. 604: Rear Seat Screws
Courtesy of CHRYSLER LLC

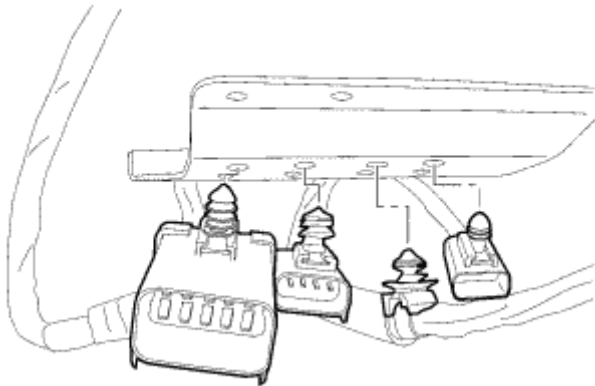
11. Install the two screws to the rear of the outer seat trim.
12. Install the recliner handle.



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Fig. 605: Heated Seat Element Electrical Connectors
 Courtesy of CHRYSLER LLC

13. Install the electrical connectors for both the heated seat back and seat elements.



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Fig. 606: OCS Electrical Connectors
 Courtesy of CHRYSLER LLC

14. Install the electrical harness connectors to the OCS mounting plate.

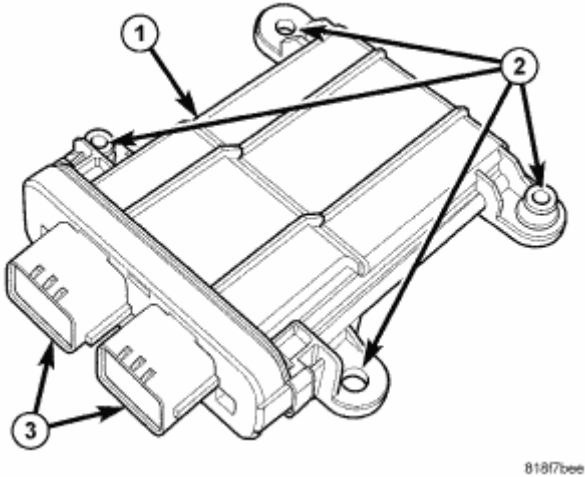


Fig. 607: Occupant Classification Module
 Courtesy of CHRYSLER LLC

15. Install the occupant classification module and connect the electrical connectors if equipped, passenger side only, refer to **INSTALLATION** .

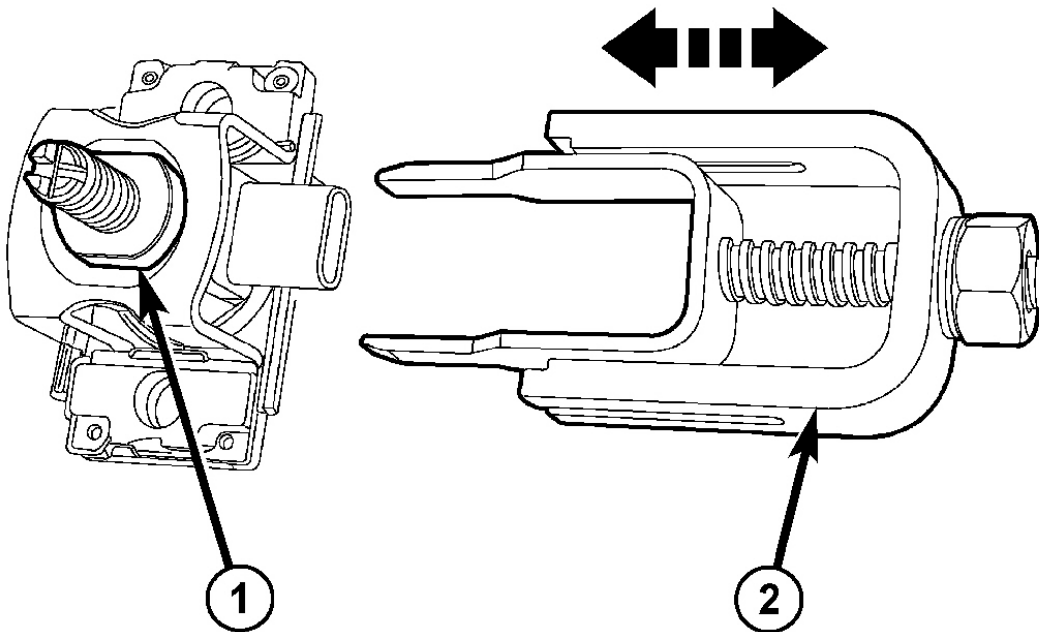


Fig. 608: Removing/Installing Seat Weight Sensor
 Courtesy of CHRYSLER LLC

16. Install the seat weight sensors if equipped, passenger seat only, refer to **INSTALLATION** .

17. Install the passenger or drivers front seat, see INSTALLATION.

SEAT - REAR

DESCRIPTION

DESCRIPTION

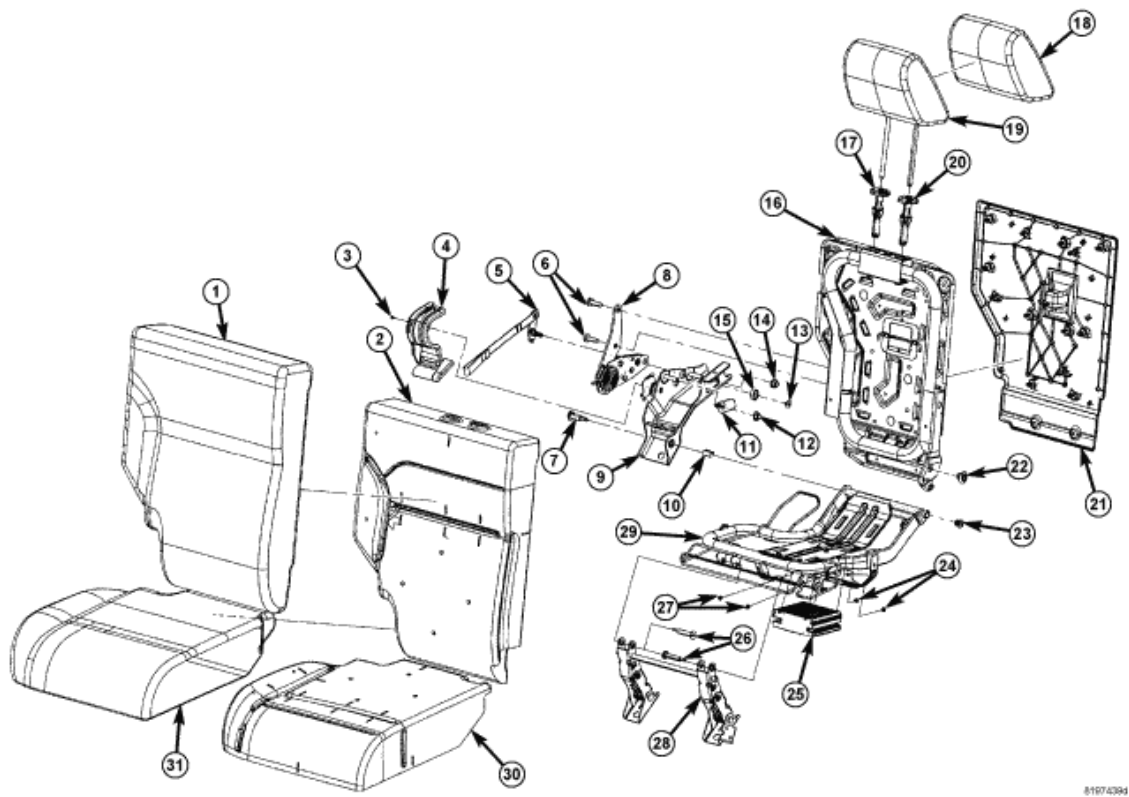


Fig. 609: Rear Seat Assembly
Courtesy of CHRYSLER LLC

- | | |
|--|---|
| 1 - COVER, BACK 40 | 17 - SLEEVE, ASSEMBLY SLAVE |
| 2 - CUSHION, BACK 40 | 18 - COVER, HEADREST |
| 3 - SCREW, SHIELD 3 N.m (26.5 in. lbs.) | 19 - HEADREST, ASSEMBLY |
| 4 - SHIELD, ASSEMBLY | 20 - SLEEVE, ASSEMBLY MASTER |
| 5 - LEVER, RELEASE ASSEMBLY | 21 - PANEL, BACK, ASSEMBLY |
| 6 - SCREWS, M10 X 30MM 47.5 N.m (35 ft. lbs.) | 22 - CLIP, PLASTIC |
| 7 - SCREW, M8 X 1.25 X 19 27.5 N.m (20 ft. lbs.) | 23 - BUSHING, PRESS FIT |
| 8 - RECLINER, ASSEMBLY | 24 - SCREWS, POWER INVERTER 3 N.m (26.5 in. lbs.) |
| 9 - BRACKET, FLOOR ASSEMBLY | 25 - POWER INVERTER |
| 10 - BUSHING, SPACER | 26 - SCREWS 10 N.m (88.5 in. lbs.) |
| 11 - BRACKET, ATTACHMENT | 27 - SCREWS, POWER INVERTER 3 N.m (26.5 in. lbs.) |

12 - NUT, LOCK M10 X 1.5 47.5 N.m (35 ft. lbs.)
13 - SCREW, RELEASE LEVER 7 N.m (62 in. lbs.)
14 - NUT, LOCK M10 X 1.5 47.5 N.m (35 ft. lbs.)
15 - BUSHING, SPACER
16 - FRAME, BACK CUSHION

28 - LINK, ASSEMBLY
29 - FRAME, SEAT CUSHION
30 - CUSHION, SEAT
31 - COVER, SEAT
-

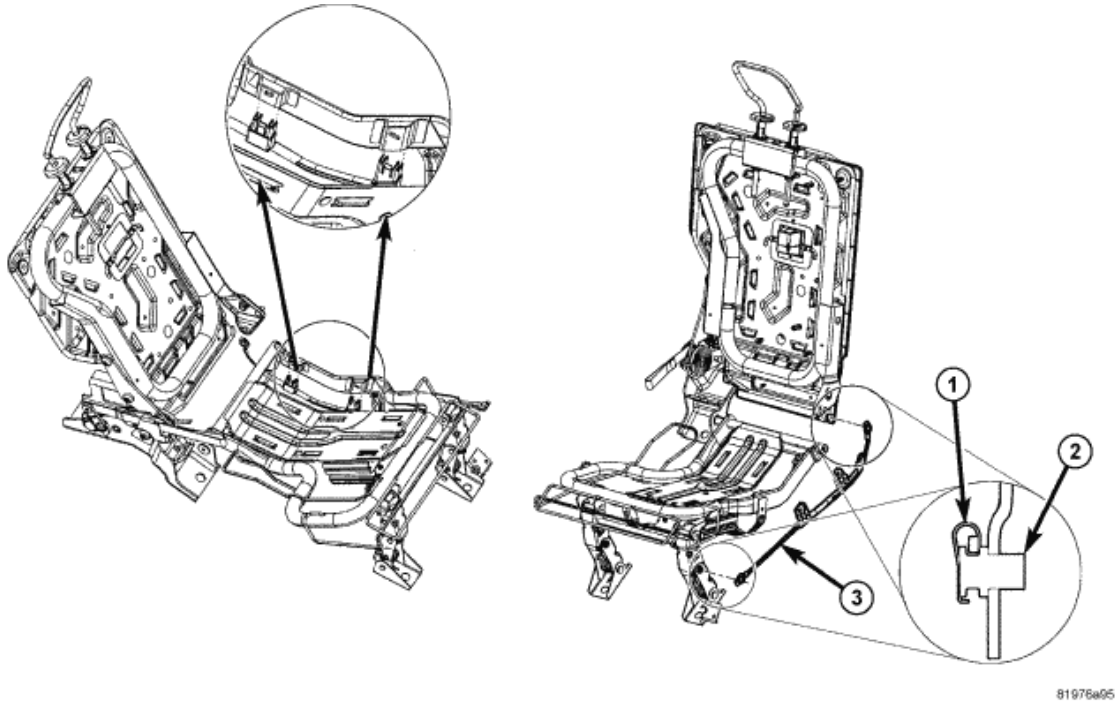
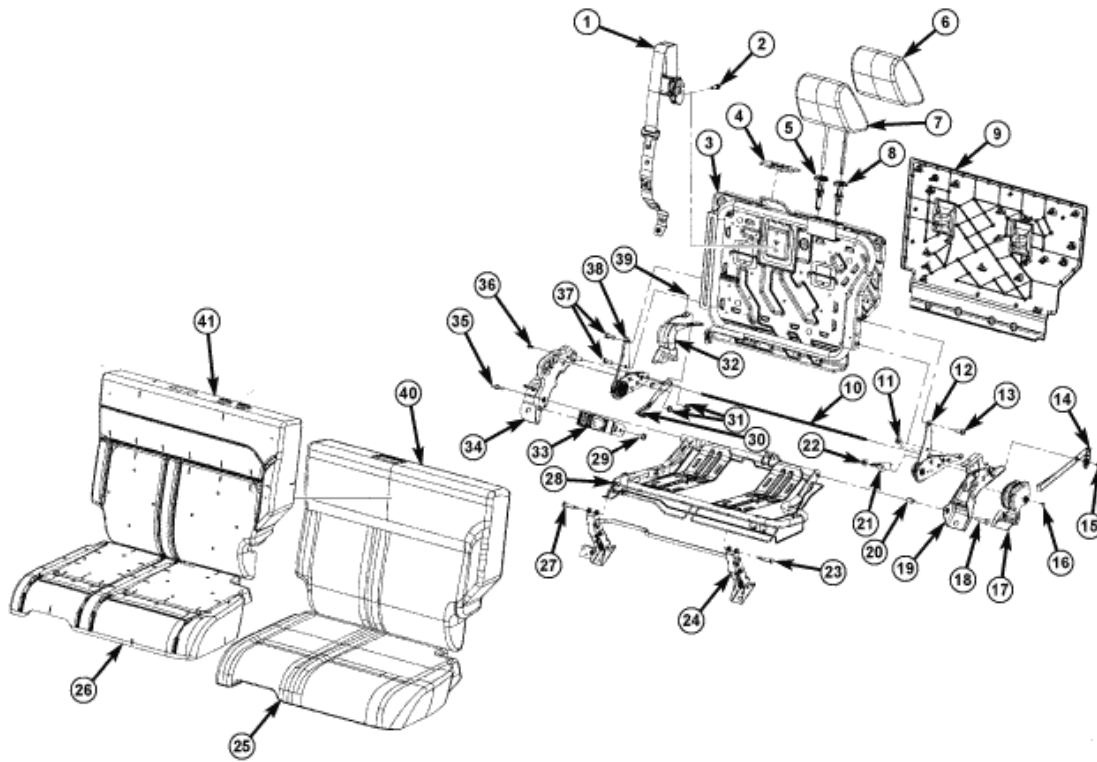


Fig. 610: Rear Seat Cable
Courtesy of CHRYSLER LLC

1 - CLIP CABLE END
2 - STUD
3 - CABLE



81674391

Fig. 611: Rear Seat Assembly
Courtesy of CHRYSLER LLC

1 - RETRACTOR, ASSEMBLY	22 - NUT, LOCK M10 X 1.5 47.5 N.m (35 ft. lbs.)
2 - BOLT, RETRACTOR 47.5 N.m (35 ft. lbs.)	23 - SCREW 10 N.m (88.5 in. lbs.)
3 - FRAME, BACK CUSHION	24 - LINK, ASSEMBLY
4 - BEZEL, RETRACTOR	25 - CUSHION, SEAT
5 - SLEEVE, ASSEMBLY SLAVE	26 - COVER, SEAT
6 - COVER, HEADREST	27 - SCREW 10 N.m (88.5 in. lbs.)
7 - HEADREST, ASSEMBLY	28 - FRAME, SEAT CUSHION
8 - SLEEVE, ASSEMBLY MASTER	29 - BOLT, RESTRAINT 55 N.m (40.5 ft. lbs.)
9 - PANEL, ASSEMBLY BACK	30 - BRACKET, ATTACHMENT
10 - ROD, RECLINER	31 - NUTS, LOCK M10 X 1.5 47.5 N.m (35 ft. lbs.)
11 - NUT, LOCK M10 X 1.5 47.5 N.m (35 ft. lbs.)	32 - SHIELD, ASSEMBLY
12 - RECLINER, ASSEMBLY	33 - BUCKLE, SEAT BELT
13 - SCREW, M10 X 30MM 47.5 N.m (35 ft. lbs.)	34 - BRACKET, FLOOR ASSEMBLY
14 - LEVER, RELEASE ASSEMBLY	35 - PIVOT, STUD 27.5 N.m (20 ft. lbs.)
15 - SCREW, RELEASE LEVER 8 N.m (71 in. lbs.)	36 - SCREW 8 N.m (71 in. lbs.)
16 - SCREW, SHIELD 3 N.m (26.5 in. lbs.)	37 - SCREWS, M10 X 30MM 47.5 N.m (35 ft. lbs.)
17 - SHIELD, ASSEMBLY	38 - RECLINER, ASSEMBLY

18 - SCREW, M8 X 1.25 X 19 27.5 N.m (20 ft. lbs.)

19 - BRACKET, FLOOR ASSEMBLY

20 - BUSHING, SPACER

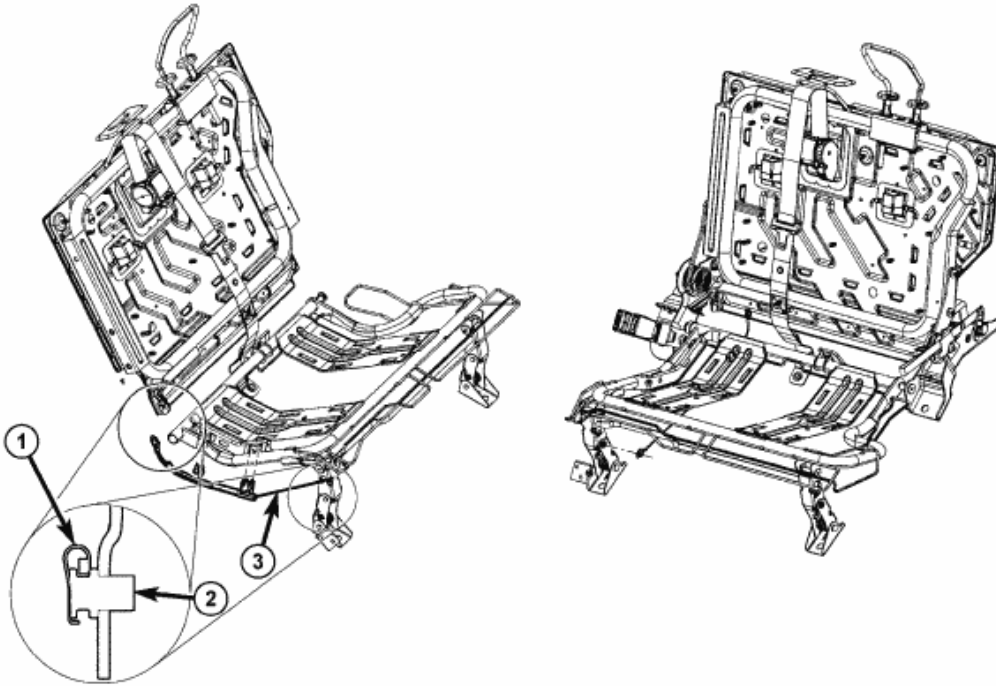
21 - BRACKET, PLASTIC

39 - SCREW, SHIELD 3 N.m (26.5 in. lbs.)

40 - CUSHION, SEAT BACK

41 - COVER, SEAT BACK

-



81975aa0

Fig. 612: Rear Seat Cable
Courtesy of CHRYSLER LLC

1 - CLIP CABLE END

2 - STUD

3 - CABLE

REMOVAL

SEAT - REAR

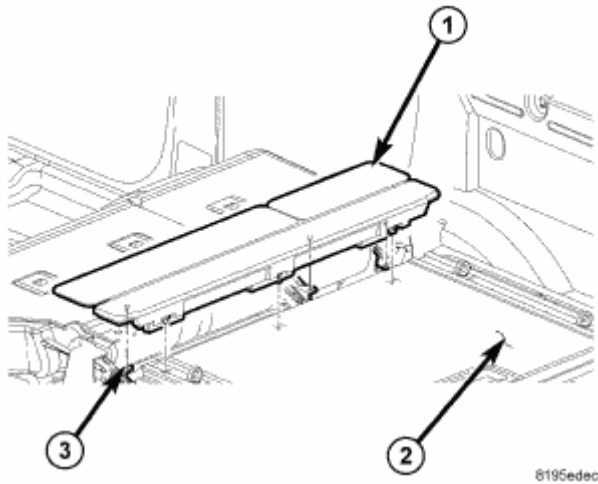


Fig. 613: Load Floor Panel, Load Floor & Rear Seat Bracket
 Courtesy of CHRYSLER LLC

1. Disconnect the negative battery cable.
2. Position the rear seats so that the seats are in a flat position.
3. Remove the load floor panel (1) from the load floor (2) and the rear seat bracket (3).

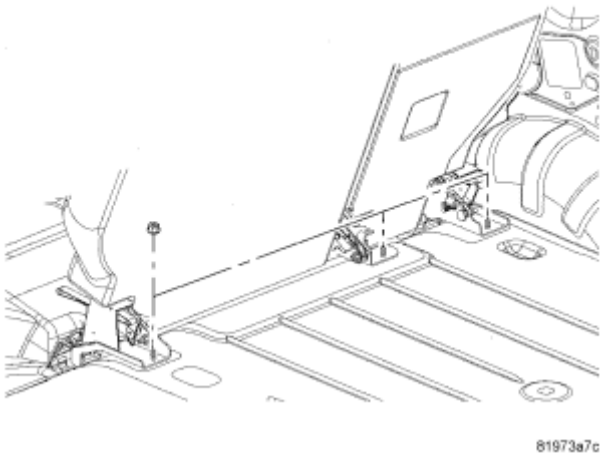
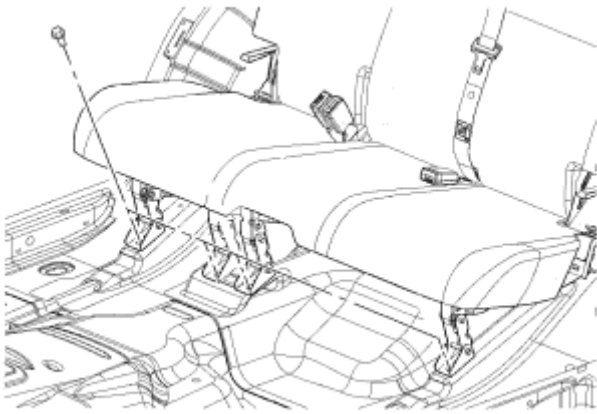


Fig. 614: Removing/Installing Seat Bracket Nuts
 Courtesy of CHRYSLER LLC

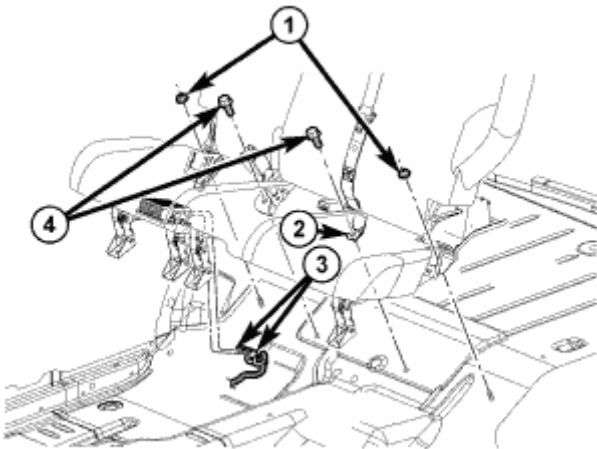
4. Remove the three seat bracket nuts.



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Fig. 615: Removing/Installing Bolts From Cushion Legs
 Courtesy of CHRYSLER LLC

5. Remove the four bolts from the cushion legs.



81973a81

Fig. 616: Seat Bracket Nuts, Center Seat Belt, Seat Module Electrical Connector & Center Bracket Bolts
 Courtesy of CHRYSLER LLC

NOTE: Lift the bottom cushion and prop up to access the fasteners.

6. Remove the two seat bracket nuts (1) from the seat brackets.
7. Remove the center bracket bolts (4) and the center seat belt (2).
8. Remove the electrical connector (3) from the seat module.
9. Fold down the seat backs and remove from the vehicle.

INSTALLATION

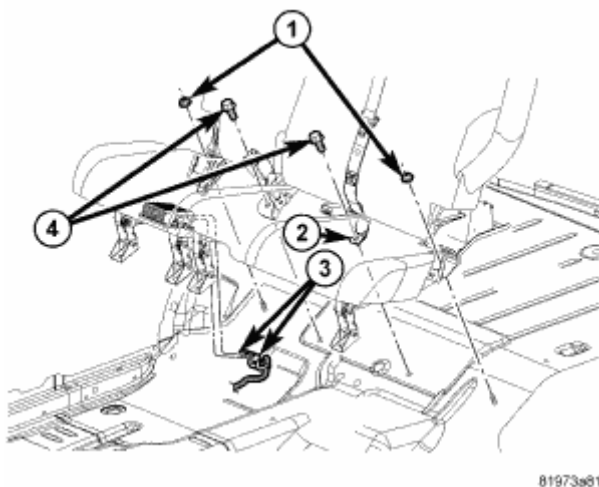


Fig. 617: Seat Bracket Nuts, Center Seat Belt, Seat Module Electrical Connector & Center Bracket Bolts
Courtesy of CHRYSLER LLC

1. Fold the seat in a flat position and install the seat assembly to the rear studs.
2. Connect the electrical connector (3) to the seat module.
3. Install the anchor bolt to the seat belt (2), and tighten to 62 N.m (46 ft. lbs.), refer to **INSTALLATION** .
4. Install the two seat bracket nuts (1) to the seat brackets and tighten to 62 N.m (46 ft. lbs.)
5. Install the seat bracket bolt (4) to the seat bracket and tighten to 62 N.m (46 ft. lbs.)

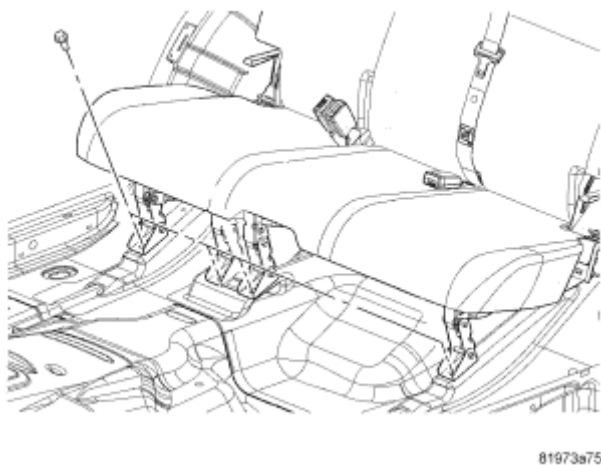


Fig. 618: Removing/Installing Bolts From Cushion Legs
Courtesy of CHRYSLER LLC

6. Install the four seat bracket bolts to the seat brackets and tighten to 54 N.m (40 ft. lbs.).

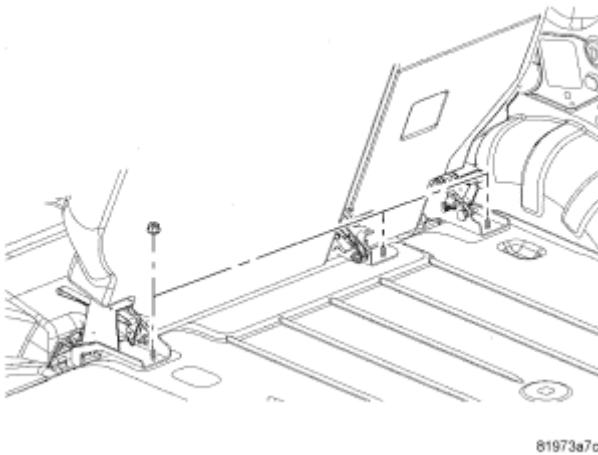


Fig. 619: Removing/Installing Seat Bracket Nuts
 Courtesy of CHRYSLER LLC

7. Install the three seat bracket nuts the seat brackets and tighten to 54 N.m (40 ft. lbs.).

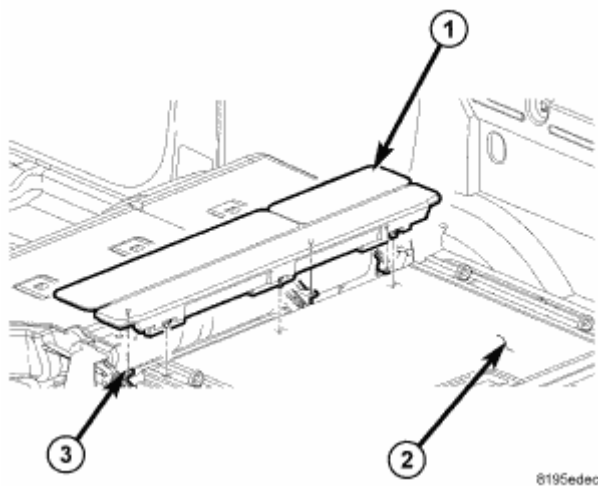


Fig. 620: Load Floor Panel, Load Floor & Rear Seat Bracket
 Courtesy of CHRYSLER LLC

8. Install the load floor panel (1) to the load floor (2) and the rear seat bracket (3). Use hand pressure to seat the clips.
9. Return the rear seats in the upright position.
10. Connect the negative battery cable to the battery.

SEAT BACK - REAR

REMOVAL

SEAT BACK - REAR

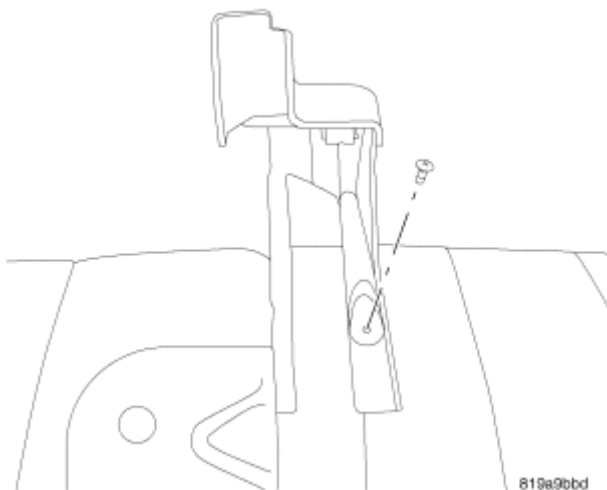


Fig. 621: Removing/Installing 40/60 Seat
Courtesy of CHRYSLER LLC

1. Remove the 40 and 60 seat, see **REMOVAL**.
2. Remove the screw and trim covering.

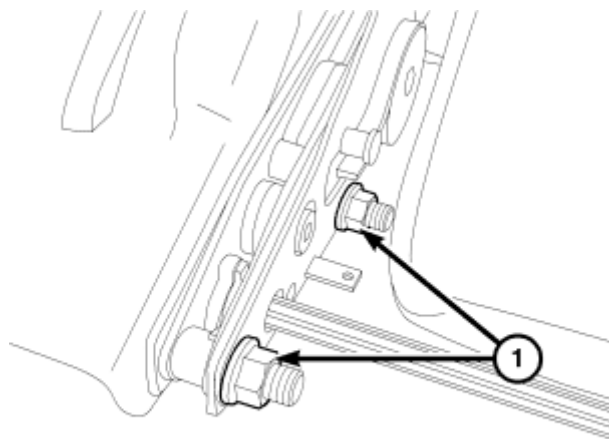
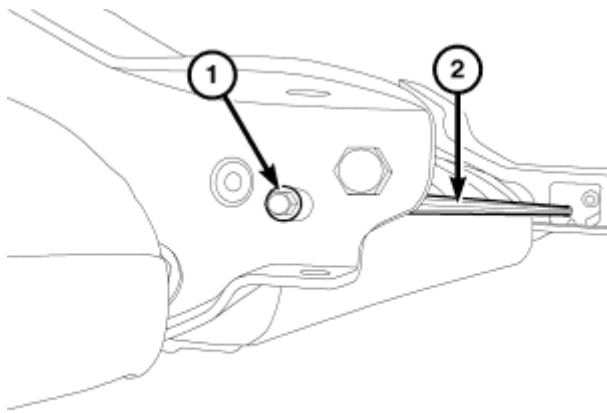


Fig. 622: Removing/Installing Nuts Attaching 40 60 Seat Back Frames
Courtesy of CHRYSLER LLC

3. Remove the nuts (1) attaching the 40 and 60 seat back frames.

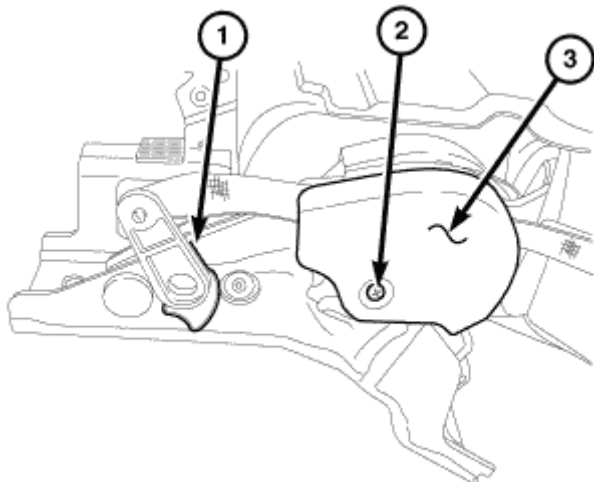


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Fig. 623: Removing/Installing Recliner Rod Nut And Recliner Rod
 Courtesy of CHRYSLER LLC

4. Remove the recliner rod nut (1) and recliner rod (2).
5. Remove the 40 seat back frame from the 60 seat back frame.

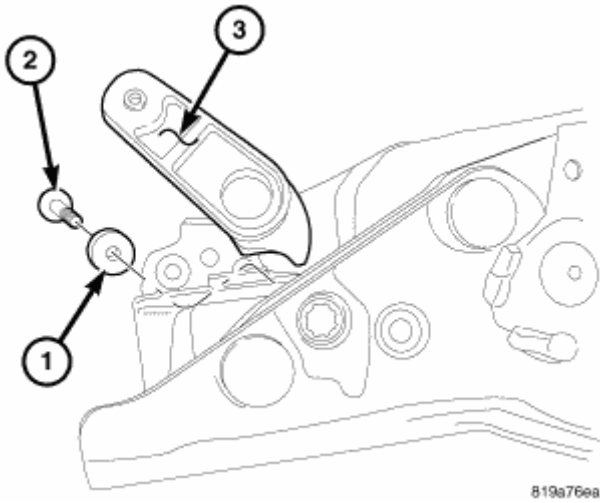
NOTE: Mark the position of the recliner lever prior to removal. This will make sure that the recliner lever is in the proper position after installation.



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Fig. 624: 40 Seat Floor Bracket Trim
 Courtesy of CHRYSLER LLC

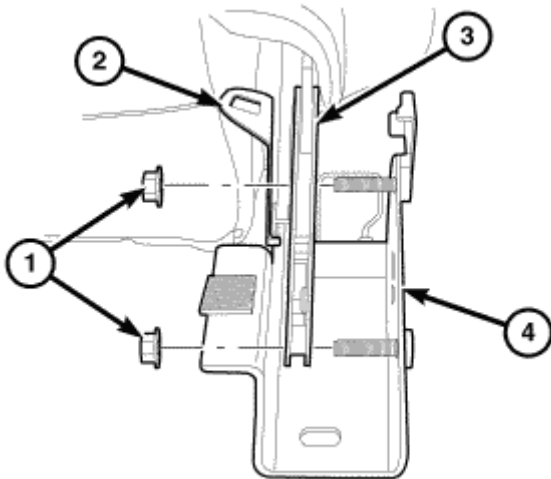
6. Trace (1) an outline of the recliner handle. Remove screw (2) and the floor bracket trim (3) from the hinge.



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Fig. 625: 40 Seat Recliner Handle
 Courtesy of CHRYSLER LLC

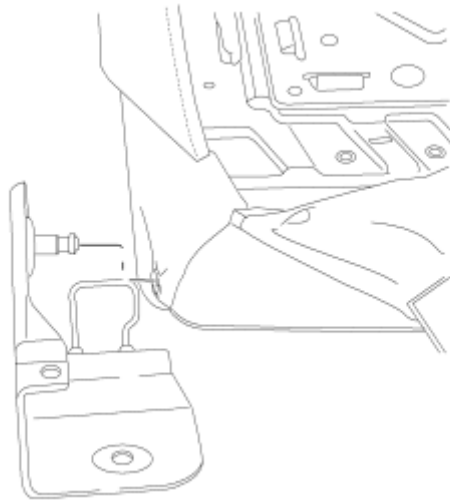
7. Remove the screw (2), washer (1) and recliner handle (3) from the floor bracket.



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Fig. 626: 40 Seat Right Floor Bracket
 Courtesy of CHRYSLER LLC

8. Remove the bracket nuts (1), trim attachment bracket (2) and bracket (4) from the hinge (3).

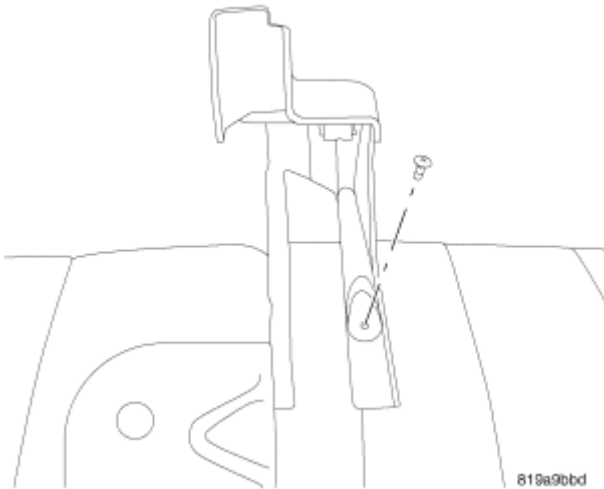


819a7790

Fig. 627: 40 Seat Left Floor Bracket
 Courtesy of CHRYSLER LLC

9. Remove the left floor bracket from the seat frame.

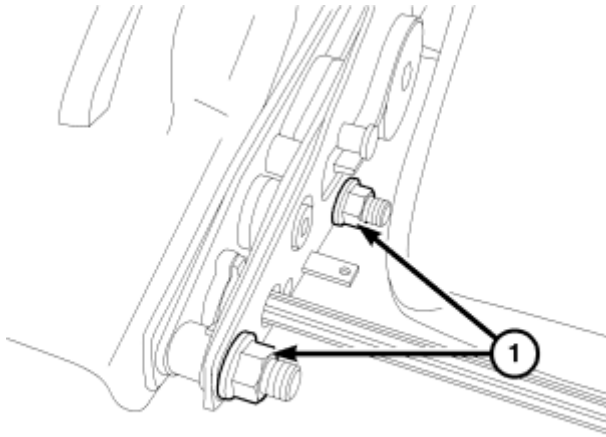
60/40 Seat Back - 60



819a9bbd

Fig. 628: Removing/Installing 40/60 Seat
 Courtesy of CHRYSLER LLC

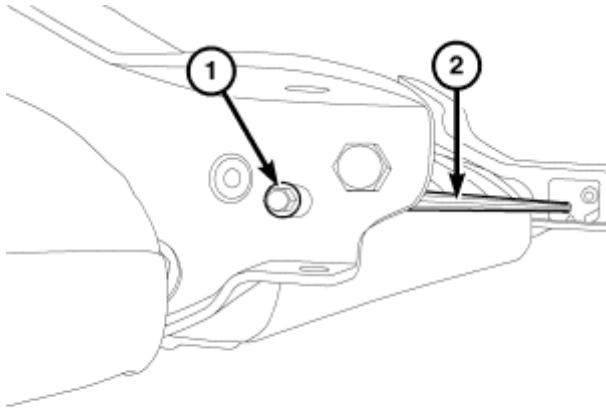
1. Remove the 40 and 60 seat, see **REMOVAL**.
2. Remove the screw and trim covering.



819a8f13

Fig. 629: Removing/Installing Nuts Attaching 40 60 Seat Back Frames
 Courtesy of CHRYSLER LLC

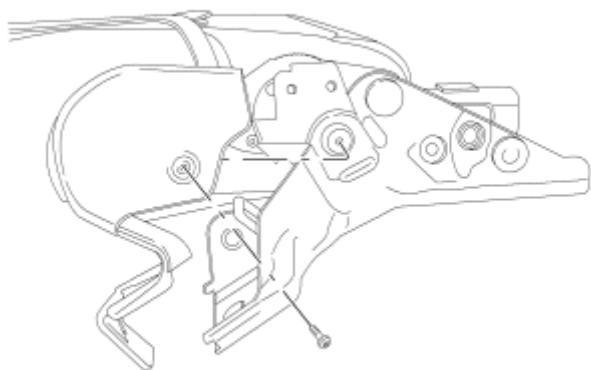
3. Remove the nuts (1) attaching the 40 and 60 seat back frames.



819a8f0b

Fig. 630: Removing/Installing Recliner Rod Nut And Recliner Rod
 Courtesy of CHRYSLER LLC

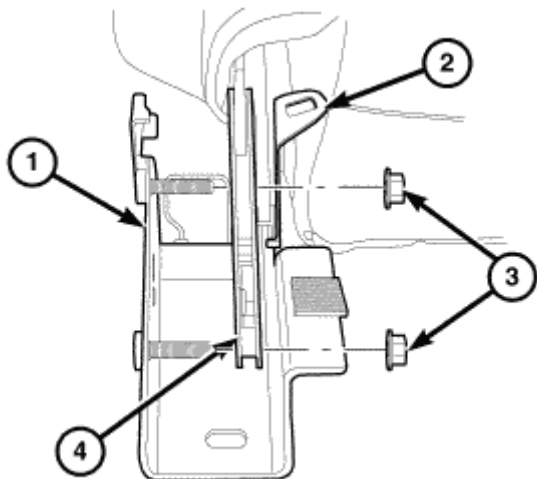
4. Remove the recliner rod nut (1) and recliner rod (2) and the spacer.
5. Remove the 40 seat back frame from the 60 seat back frame.



819a5a9e

Fig. 631: Removing/Installing Screw And Trim Covering From Hinge
 Courtesy of CHRYSLER LLC

6. Remove screw and trim covering from the hinge.



819a5ad9

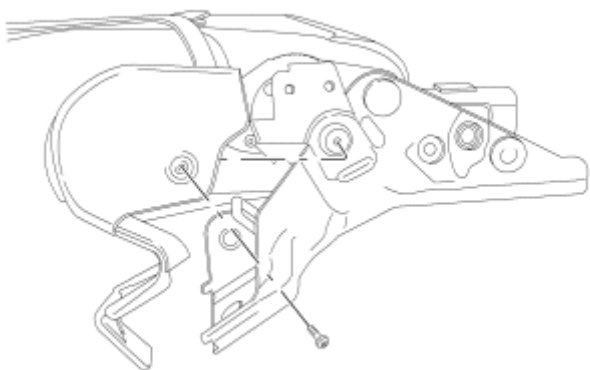
Fig. 632: Bracket, Trim Attachment Bracket, Bracket Nuts & Hinge
 Courtesy of CHRYSLER LLC

7. Remove the bracket nuts (3), trim attachment bracket (2) and bracket (1) from the hinge (4).

DISASSEMBLY

DISASSEMBLY

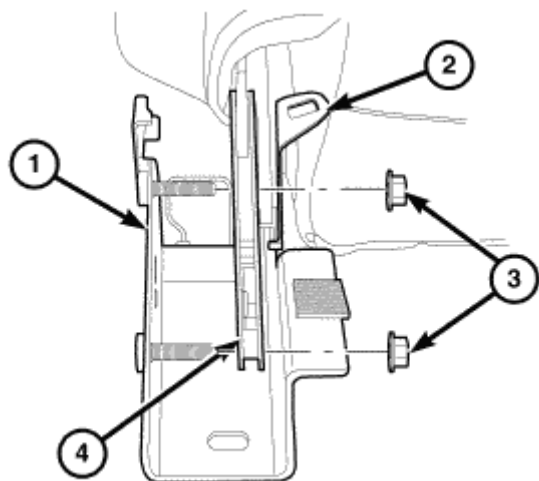
60/40 Seat Back- 60



819a5a9e

Fig. 633: Removing/Installing Screw And Trim Covering From Hinge
 Courtesy of CHRYSLER LLC

1. Remove screw and trim covering from the hinge.



819a5ad9

Fig. 634: Bracket, Trim Attachment Bracket, Bracket Nuts & Hinge
 Courtesy of CHRYSLER LLC

2. Remove the bracket nuts (3), trim attachment bracket (2) and bracket (1) from the hinge (4).

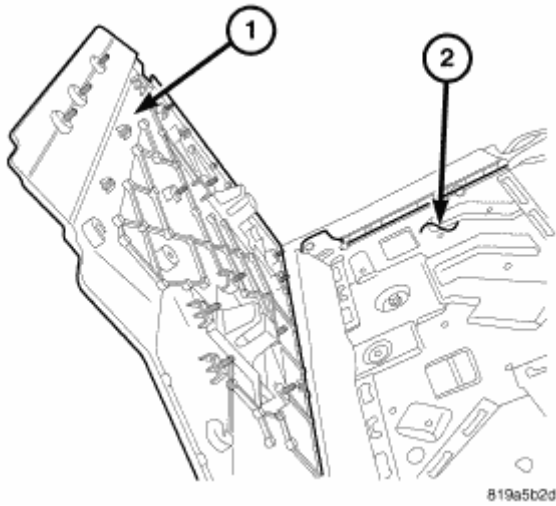


Fig. 635: Seat Back Trim Panel & Seat Back Frame
Courtesy of CHRYSLER LLC

3. Remove the seat back trim panel (1) from the seat back frame (2).

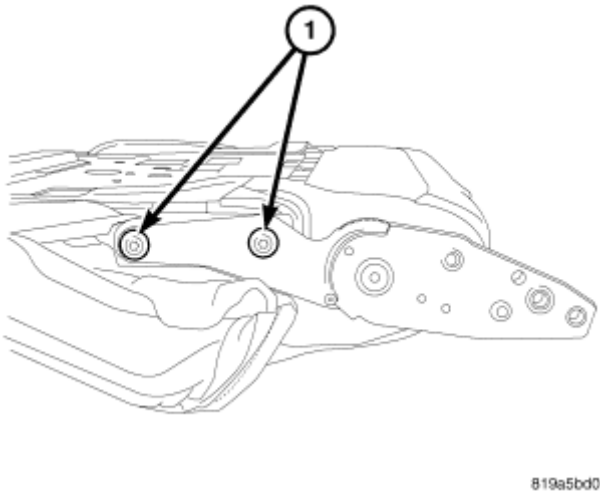
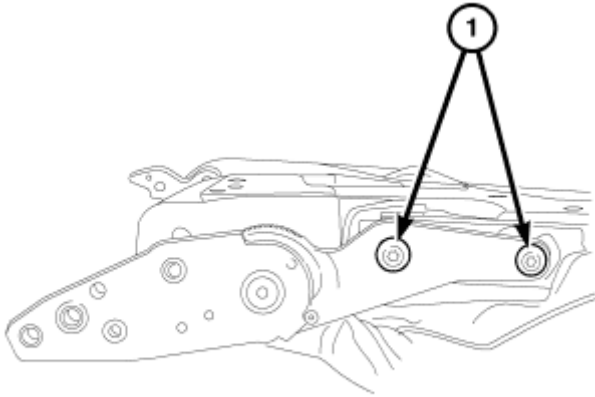


Fig. 636: Left Hinge Bolts
Courtesy of CHRYSLER LLC

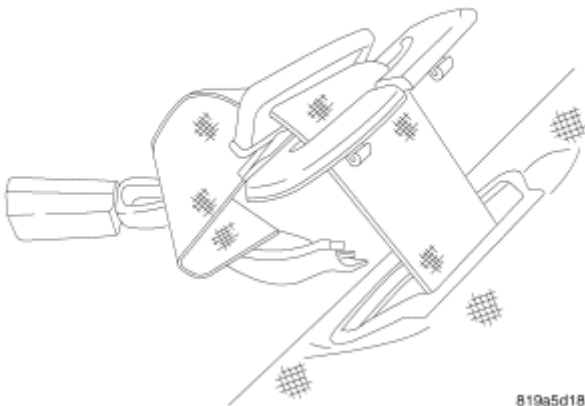
4. Remove the bolts (1) from the left hinge.



819a5c08

Fig. 637: Right Hinge Bolts
Courtesy of CHRYSLER LLC

5. Remove the bolts (1) from the right hinge.



819a5d18

Fig. 638: 60 Seat Back Seat Belt Trim
Courtesy of CHRYSLER LLC

6. Remove the seat belt trim from the top of the seat cushion.

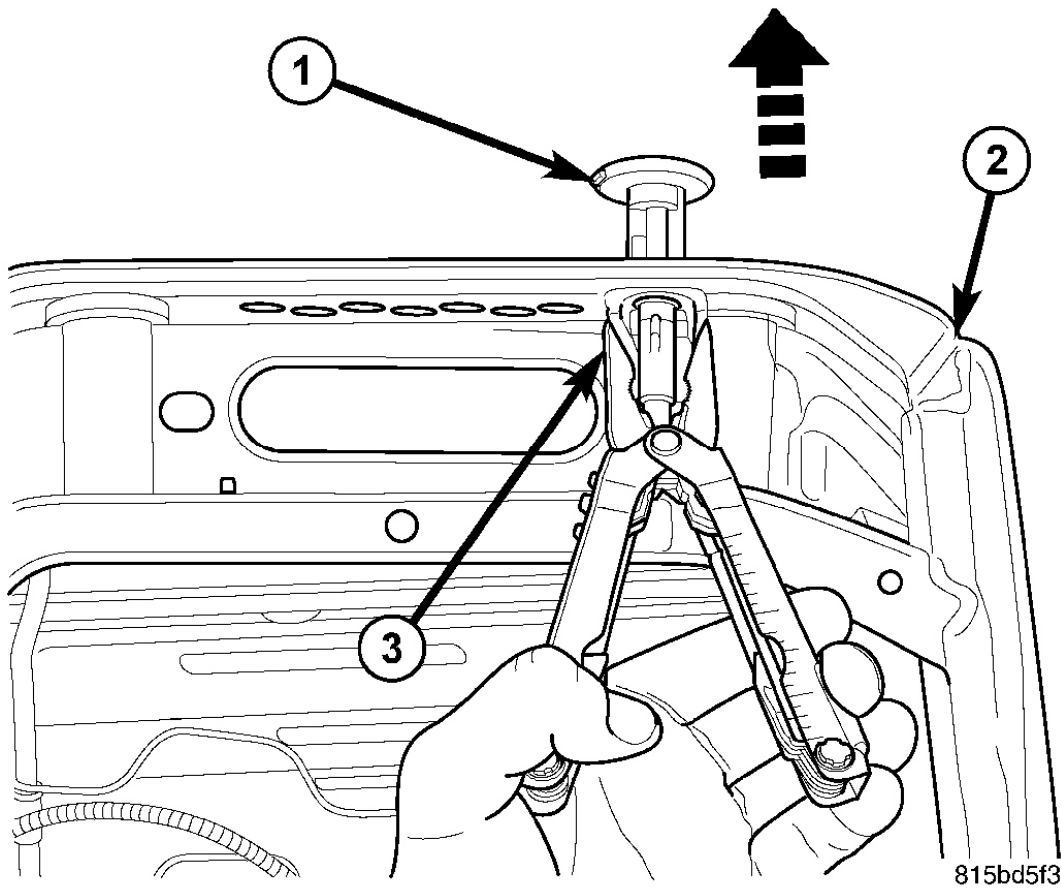


Fig. 639: Headrest Sleeve Removal
Courtesy of CHRYSLER LLC

7. Depress the tabs (3) on the head rest guide (1) and remove from the top of the seat cushion (2).
8. Remove the seat belt through the cover and cushion.
9. Remove the cover and cushion from the seat back frame.
10. Position the seat cover to expose the hog rings and cut off all hog rings to separate the cover from the cushion.

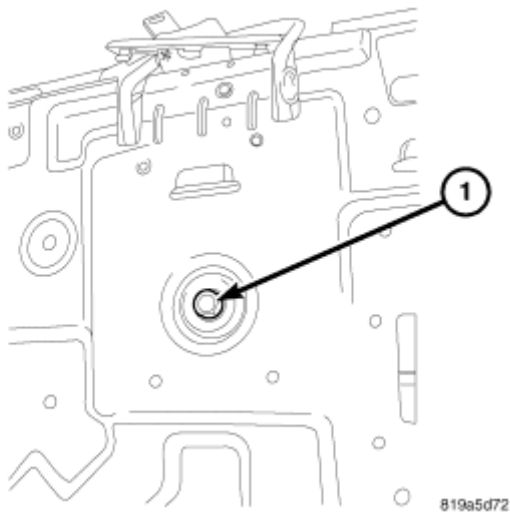


Fig. 640: 60 Seat Back Seat Belt Bolt
Courtesy of CHRYSLER LLC

11. Remove the bolt retaining the seat belt assembly from the seat back frame.

60/40 Seat Back- 40

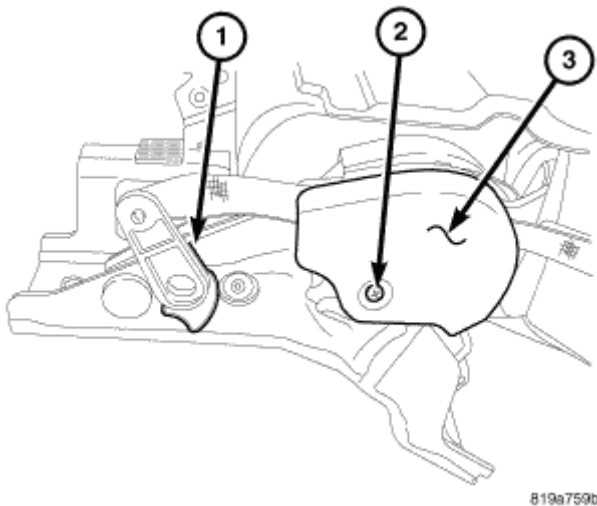


Fig. 641: 40 Seat Floor Bracket Trim
Courtesy of CHRYSLER LLC

NOTE: Mark the position of the recliner handle prior to removal. This will make sure that the recliner handle is in the proper position after installation.

1. Trace (1) an outline of the recliner handle. Remove screw (2) and the floor bracket trim (3) from the hinge.

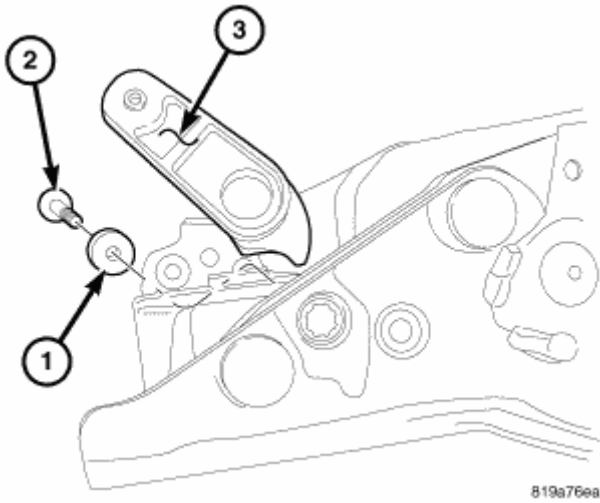


Fig. 642: 40 Seat Recliner Handle
 Courtesy of CHRYSLER LLC

2. Remove the screw (2), washer (1) and recliner handle (3) from the floor bracket.

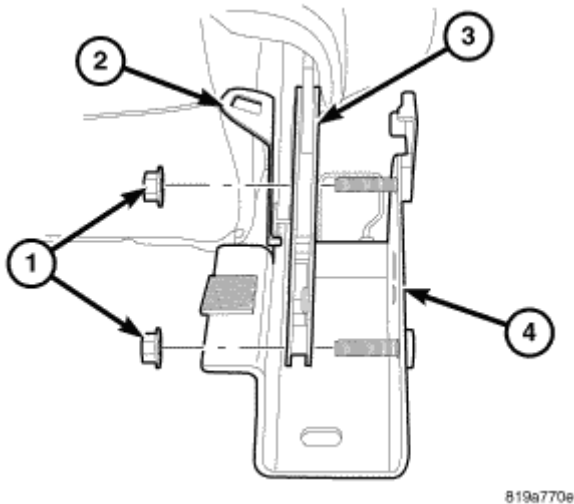
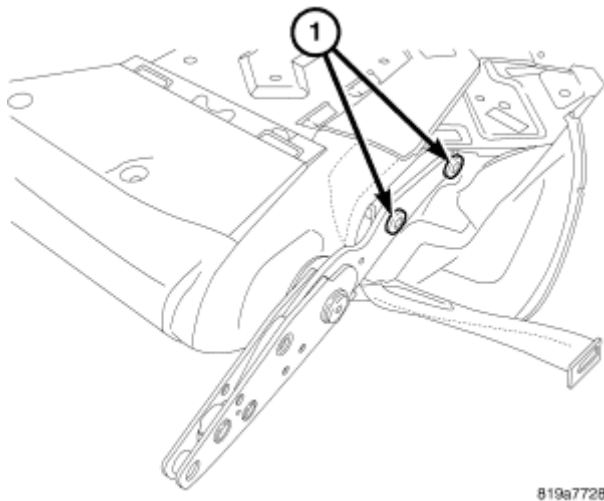


Fig. 643: 40 Seat Right Floor Bracket
 Courtesy of CHRYSLER LLC

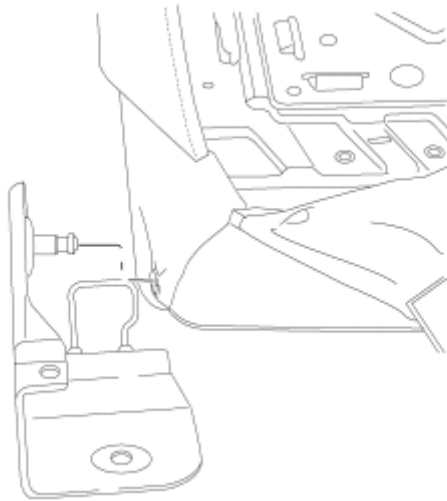
3. Remove the bracket nuts (1), trim attachment bracket (2) and bracket (4) from the hinge (3).



819a7728

Fig. 644: Right Hinge Bolts
Courtesy of CHRYSLER LLC

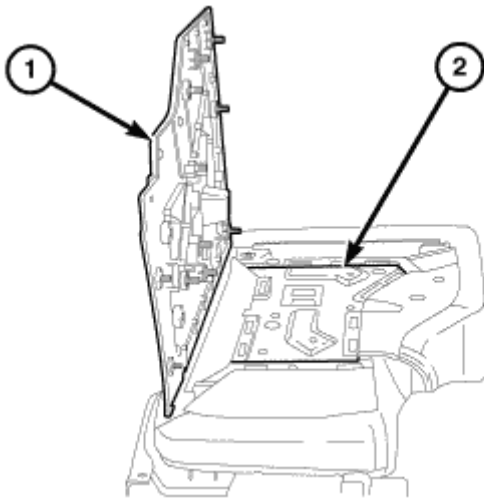
4. Remove the bolts (1) from the right hinge.



819a7790

Fig. 645: 40 Seat Left Floor Bracket
Courtesy of CHRYSLER LLC

5. Remove the left floor bracket from the seat frame.



819a77d3

Fig. 646: Seat Back Trim Panel & Seat Back Frame
Courtesy of CHRYSLER LLC

6. Remove the seat back trim panel (1) from the seat back frame (2).
7. Remove the hog ring attaching the seat back cushion to the seat frame.
8. Remove the seat cover clips from the seat back frame.

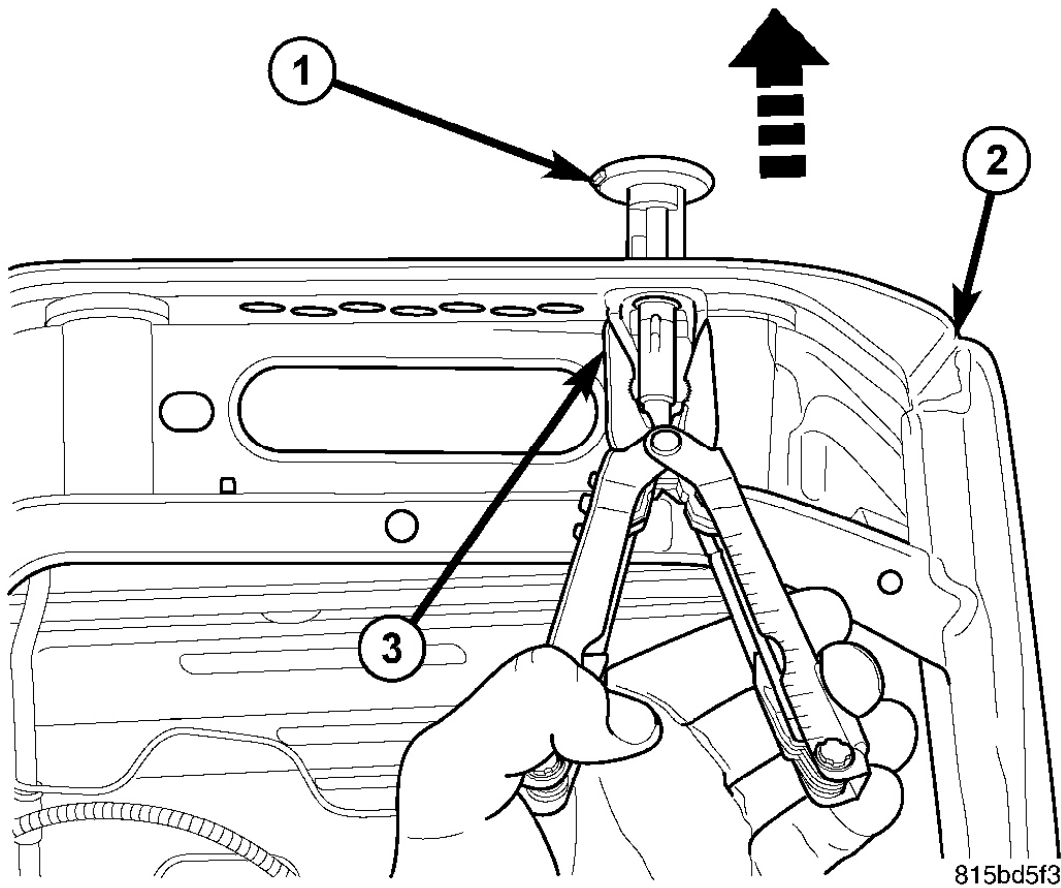
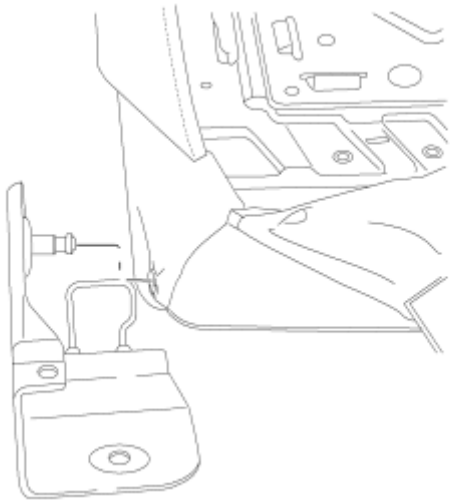


Fig. 647: Headrest Sleeve Removal
Courtesy of CHRYSLER LLC

9. Depress the tabs (3) on the head rest guide (1) and remove from the top of the seat cushion (2).
10. Remove the cover and cushion from the seat back frame.
11. Position the seat cover to expose the hog rings and cut off all hog rings to separate the cover from the cushion.

ASSEMBLY

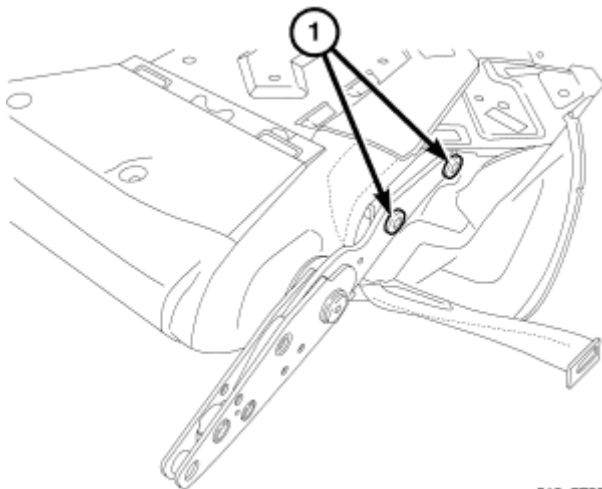
ASSEMBLY



819a7790

Fig. 648: 40 Seat Left Floor Bracket
 Courtesy of CHRYSLER LLC

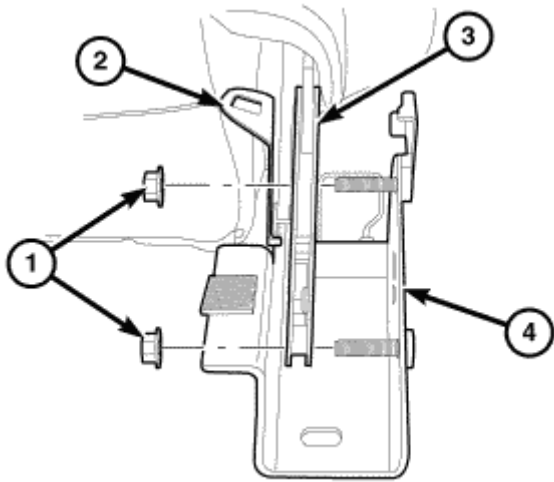
1. Install the seat back cover to the seat back cushion and install new hog rings.
2. Install the cover and cushion to the seat back frame, pull the seat cover tight around the cushion and seat frame.
3. Install the head rest guides to the top of the seat cushion.
4. Install the left floor bracket to the seat frame.



819a7728

Fig. 649: Right Hinge Bolts
 Courtesy of CHRYSLER LLC

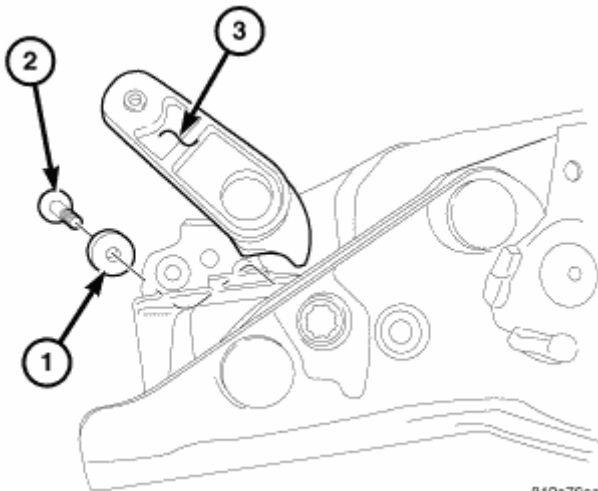
5. Install the right hinge and bolts (1) to the seat back frame and tighten to 47.5 N.m (35 ft. lbs.).



819a770e

Fig. 650: 40 Seat Right Floor Bracket
 Courtesy of CHRYSLER LLC

6. Install the bracket (4), trim attachment bracket (2) and bracket nuts (1) to the hinge (3) and tighten to 47.5 N.m (35 ft. lbs.).



819a76ea

Fig. 651: 40 Seat Recliner Handle
 Courtesy of CHRYSLER LLC

7. Install the recliner handle (3), washer (1) and screw to the floor bracket in the position noted during removal and tighten to 7 N.m (62 in. lbs.).

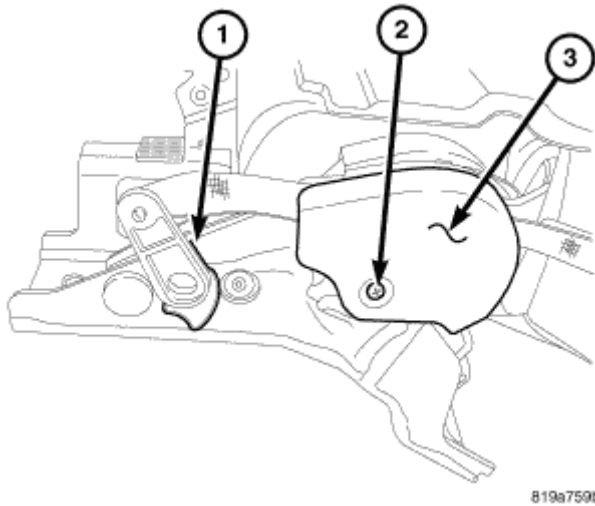


Fig. 652: 40 Seat Floor Bracket Trim
 Courtesy of CHRYSLER LLC

8. Install the trim covering and screw to the floor bracket and tighten to 3 N.m (26.5 in. lbs.).
9. Install the plastic seat cover clips to the seat back frame.
10. Install the hog ring attaching the seat back cushion to the seat frame.

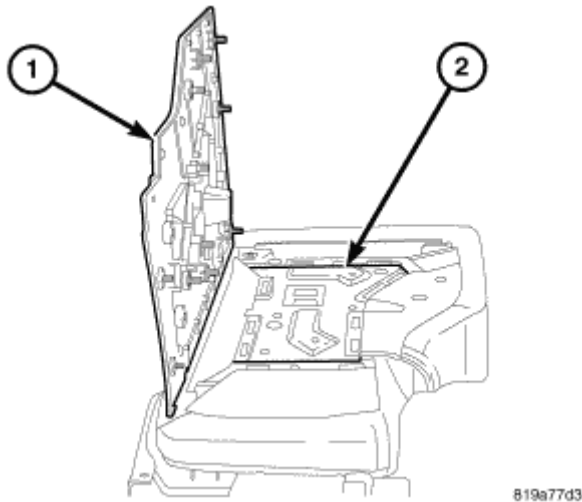


Fig. 653: Seat Back Trim Panel & Seat Back Frame
 Courtesy of CHRYSLER LLC

NOTE: Replace any damaged clips as necessary. Failure to replace any missing or damaged clips could result in a noise complaint.

11. Install the seat back trim panel (1) to the seat back frame (2).

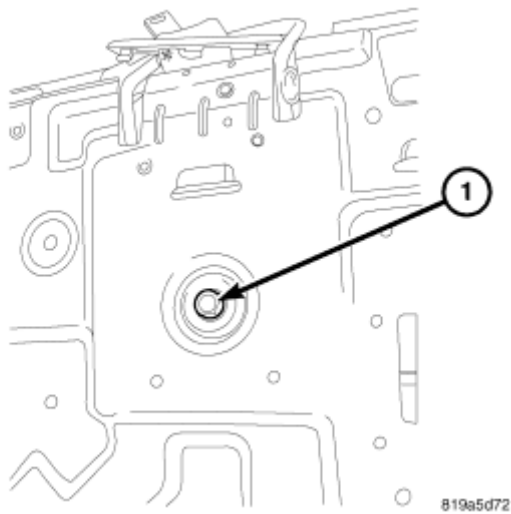


Fig. 654: 60 Seat Back Seat Belt Bolt
Courtesy of CHRYSLER LLC

1. Install the seat belt assembly and bolt to the seat back frame and tighten to 47.5 N.m (35 ft. lbs.).
2. Install the seat back cover to the seat back cushion and install new hog rings.
3. Feed the seat belt through the cushion and cover.
4. Install the cover and cushion to the seat back frame, pull the seat cover tight around the cushion and seat frame.

NOTE: **Replace any head rest guide's damaged during removal.**

5. Install the head rest guides to the top of the seat cushion.

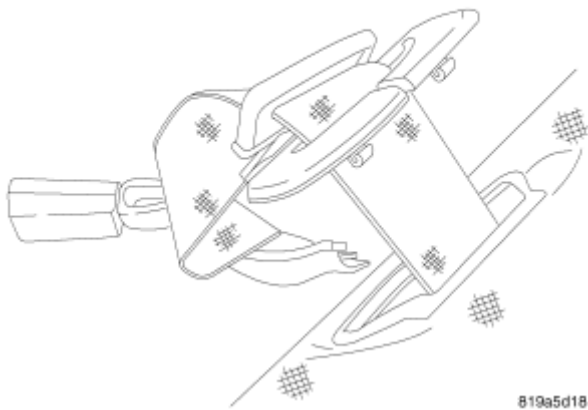
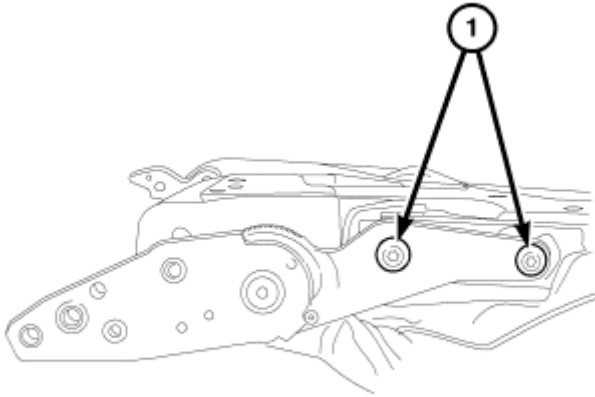


Fig. 655: 60 Seat Back Seat Belt Trim
Courtesy of CHRYSLER LLC

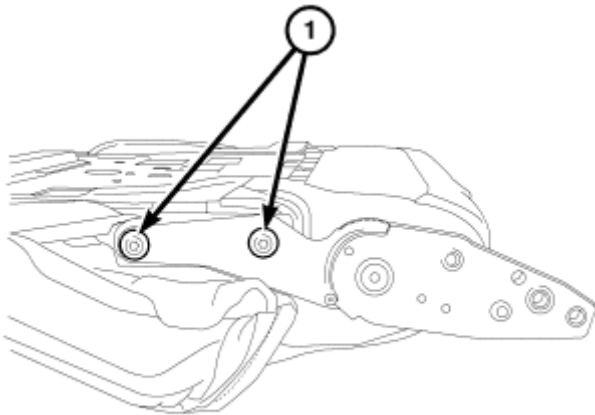
6. Install the seat belt trim to the top of the seat back cushion.



819a5c08

Fig. 656: Right Hinge Bolts
Courtesy of CHRYSLER LLC

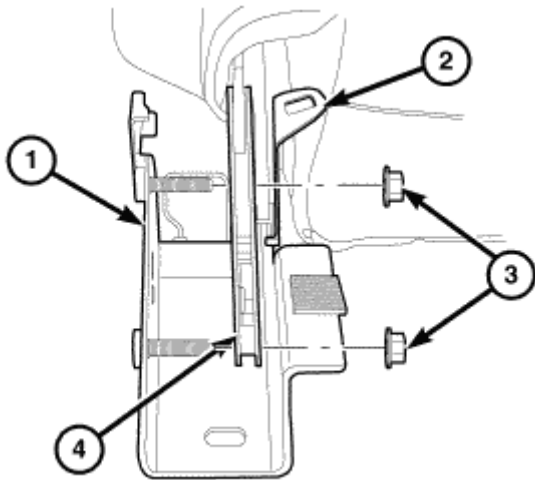
7. Install the right hinge and bolts (1) to the seat back frame and tighten to 47.5 N.m (35 ft. lbs.).



819a5bd0

Fig. 657: Left Hinge Bolts
Courtesy of CHRYSLER LLC

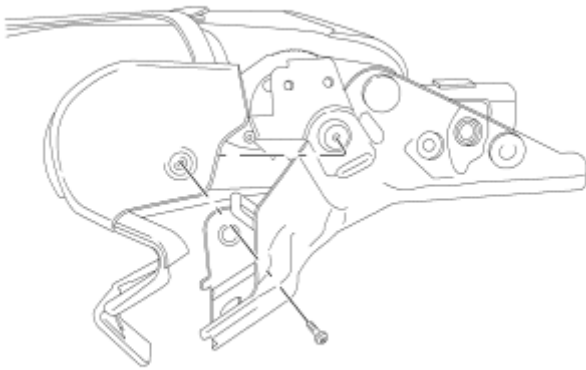
8. Install the left hinge and bolts (1) to the seat back frame and tighten to 47.5 N.m (35 ft. lbs.).



819a5ad9

Fig. 658: Bracket, Trim Attachment Bracket, Bracket Nuts & Hinge
 Courtesy of CHRYSLER LLC

9. Install the bracket (1), trim attachment bracket (2) and bracket nuts (3) to the hinge (4) and tighten to 47.5 N.m (35 ft. lbs.).



819a5a9e

Fig. 659: Removing/Installing Screw And Trim Covering From Hinge
 Courtesy of CHRYSLER LLC

10. Install the trim covering and screw to the floor bracket and tighten to 3 N.m (26.5 in. lbs.).
11. Install the plastic seat cover clips to the seat back frame.

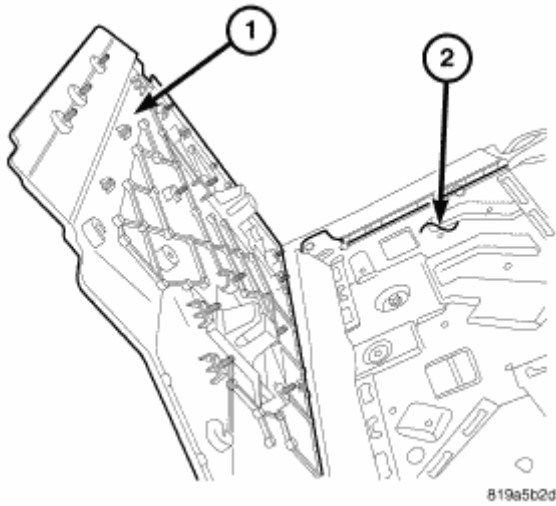


Fig. 660: Seat Back Trim Panel & Seat Back Frame
 Courtesy of CHRYSLER LLC

12. Install the seat back trim panel (1) to the seat back frame (2).

INSTALLATION

SEAT BACK - REAR

60/40 Seat Back - 40

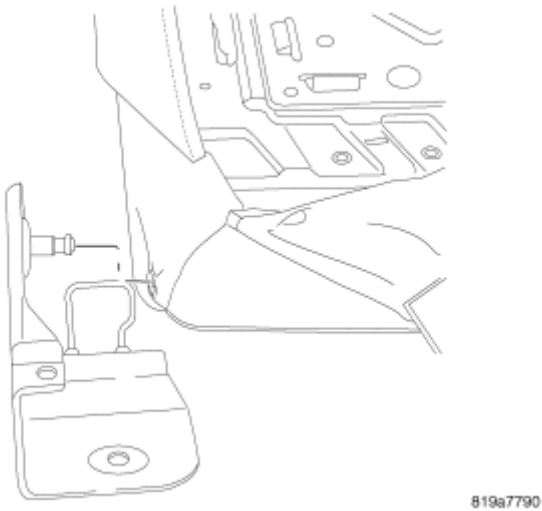
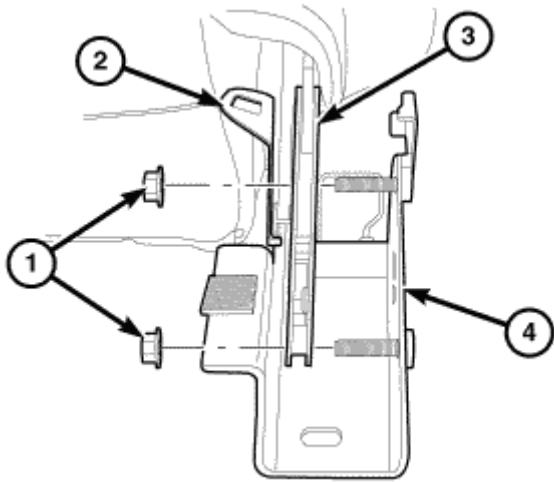


Fig. 661: 40 Seat Left Floor Bracket
 Courtesy of CHRYSLER LLC

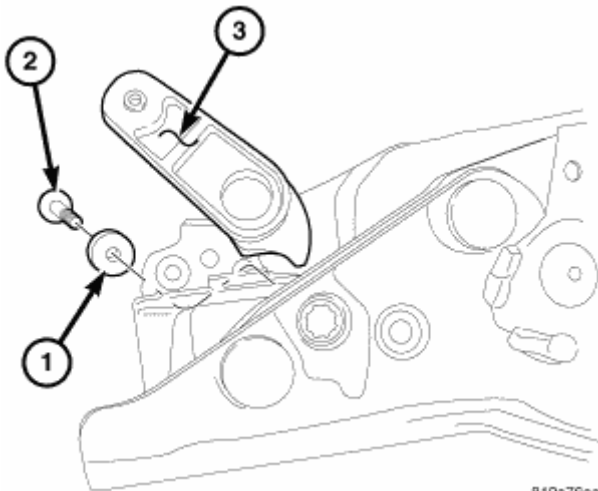
1. Install the left floor bracket to the seat frame.



819a770e

Fig. 662: 40 Seat Right Floor Bracket
 Courtesy of CHRYSLER LLC

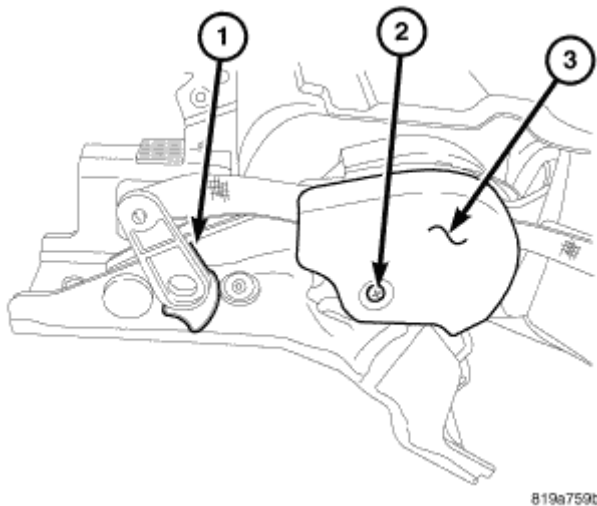
2. Install the bracket (4), trim attachment bracket (2) and bracket nuts (1) to the hinge (3) and tighten to 47.5 N.m (35 ft. lbs.).



819a76ea

Fig. 663: 40 Seat Recliner Handle
 Courtesy of CHRYSLER LLC

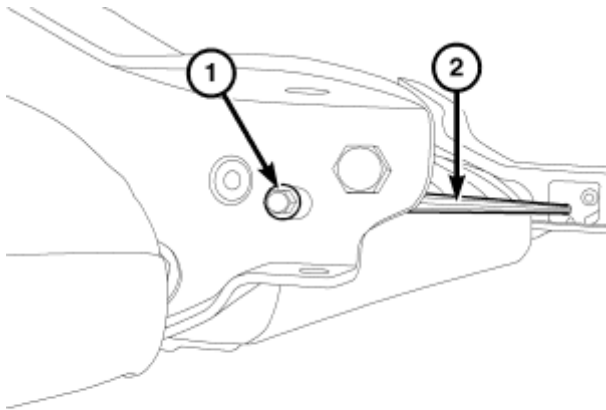
3. Install the recliner handle (3), washer (1) and screw to the floor bracket in the position noted during removal and tighten to 7 N.m (62 in. lbs.).



819a759b

Fig. 664: 40 Seat Floor Bracket Trim
 Courtesy of CHRYSLER LLC

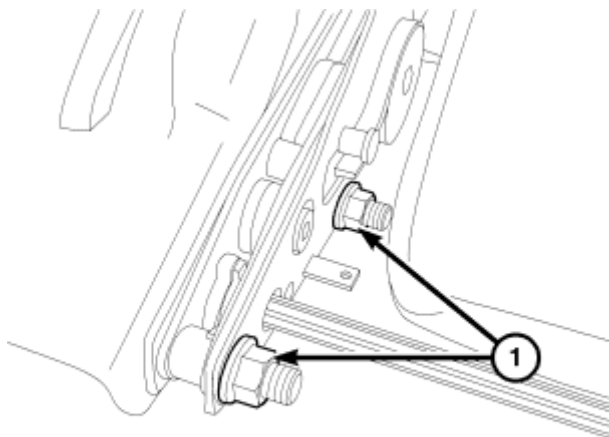
4. Install the trim covering (3) and screw (2) to the floor bracket and tighten to 3 N.m (26.5 in. lbs.).



819a8f0b

Fig. 665: Removing/Installing Recliner Rod Nut And Recliner Rod
 Courtesy of CHRYSLER LLC

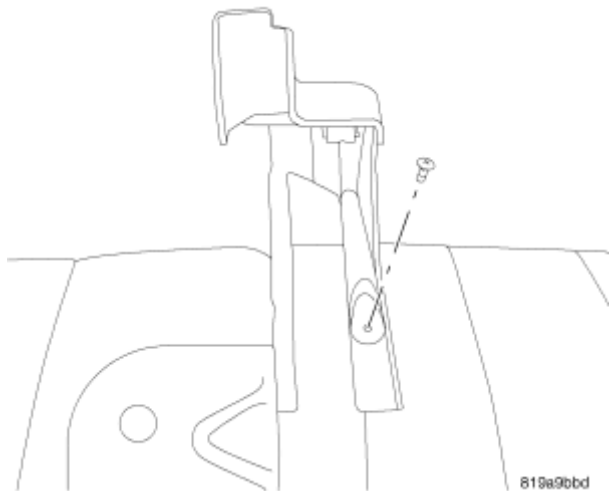
5. Install the spacer, recliner rod (2) and recliner rod nut (1) to the position noted during removal and tighten to 7 N.m (62 in. lbs.).
6. Remove the 40 seat back frame from the 60 seat back frame.



819a8f13

Fig. 666: Removing/Installing Nuts Attaching 40 60 Seat Back Frames
Courtesy of CHRYSLER LLC

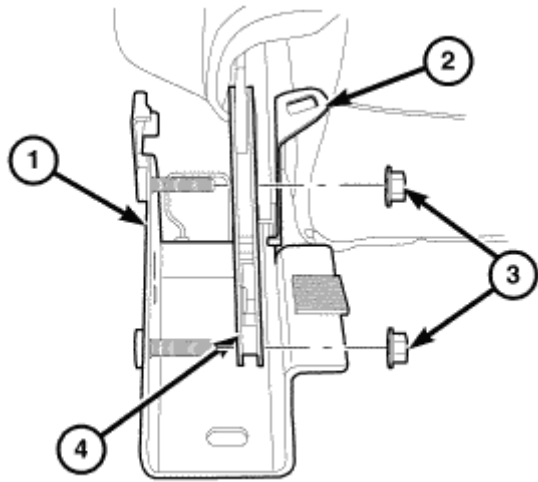
7. Install the 40 seat back frame to the 60 seat back frames and tighten to 47.5 N.m (35 ft. lbs.).



819a9bbd

Fig. 667: Removing/Installing 40/60 Seat
Courtesy of CHRYSLER LLC

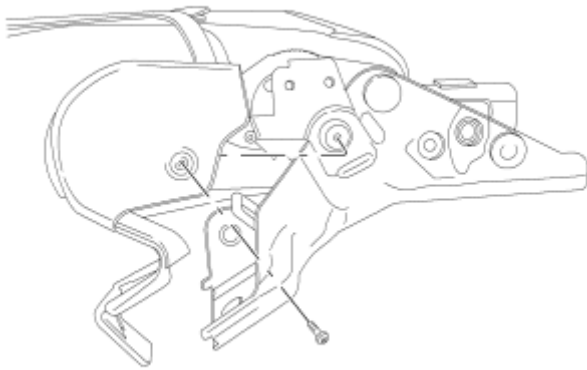
8. Install the trim covering and screw and tighten to 3 N.m (26.5 in. lbs.).
9. Install the 40 and 60 seat, see **INSTALLATION**.



819a5ad9

Fig. 668: Bracket, Trim Attachment Bracket, Bracket Nuts & Hinge
 Courtesy of CHRYSLER LLC

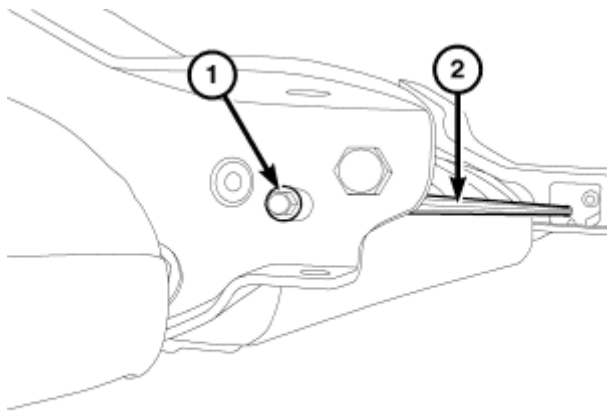
1. Install the bracket (1), trim attachment bracket (2) and bracket nuts (3) to the hinge (4) and tighten to 47.5 N.m (35 ft. lbs.).



819a5a9e

Fig. 669: Removing/Installing Screw And Trim Covering From Hinge
 Courtesy of CHRYSLER LLC

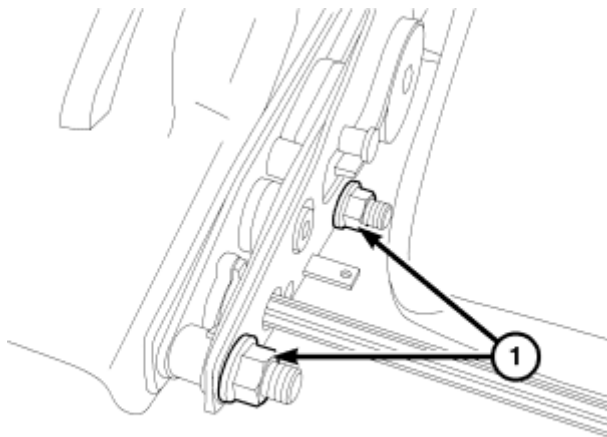
2. Install screw and trim covering to the hinge and tighten to 3 N.m (26.5 in. lbs.).



819a8f0b

Fig. 670: Removing/Installing Recliner Rod Nut And Recliner Rod
 Courtesy of CHRYSLER LLC

3. Install the recliner rod (2), recliner rod nut (1) to the position noted during removal and tighten to 7 N.m (62 in. lbs.).



819a8f13

Fig. 671: Removing/Installing Nuts Attaching 40 60 Seat Back Frames
 Courtesy of CHRYSLER LLC

4. Install the 40 seat back frame to the 60 seat back frames and tighten to 47.5 N.m (35 ft. lbs.).

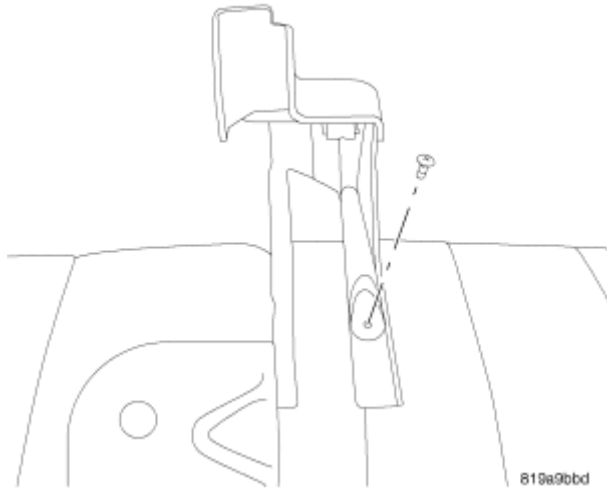


Fig. 672: Removing/Installing 40/60 Seat
Courtesy of CHRYSLER LLC

5. Install the trim covering and screw and tighten to 3 N.m (26.5 in. lbs.).
6. Install the 40 and 60 seat, see **INSTALLATION**.

SEAT CUSHION - REAR

REMOVAL

SEAT CUSHION - REAR

60/40 Split Seat - 40

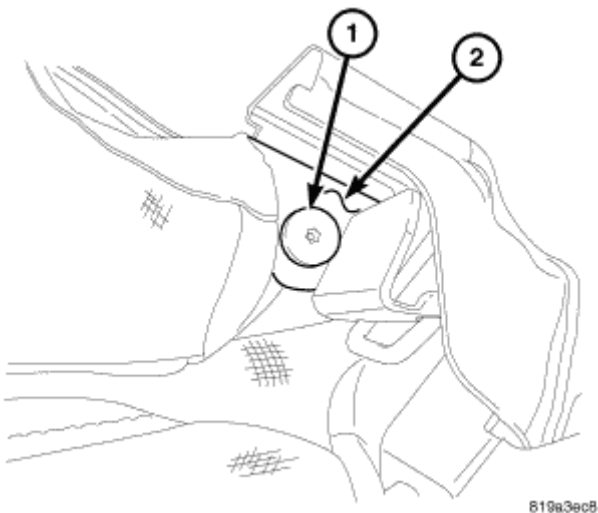


Fig. 673: Removing/Installing Seat Bolt From Floor Bracket
Courtesy of CHRYSLER LLC

CAUTION: Relieve the tension on the cable by positioning the seat correctly. Failure to relieve tension will result in damage to the cable.

1. Remove the 60/40 rear seat from the vehicle and place on a clean work bench, see **REMOVAL**.
2. Remove the seat bolt (1) from the floor bracket (2).
3. Disconnect the cable.
4. Remove the front bracket to the cushion bolts to separate the forward legs to the cushion.
5. Disconnect the cable housing.

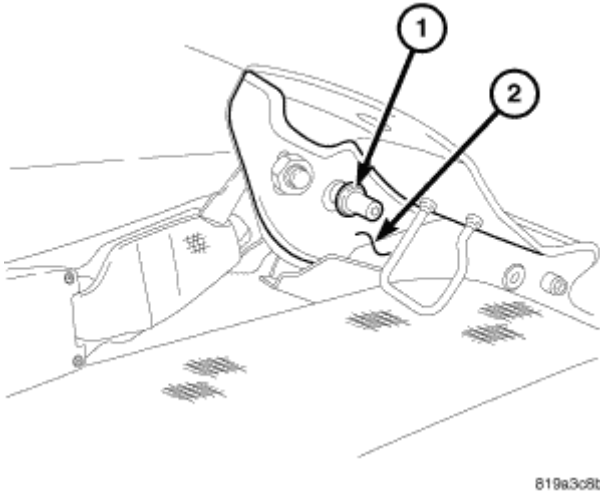


Fig. 674: 40 Seat Pivot Bolt
Courtesy of CHRYSLER LLC

6. Remove the seat assembly from the pivot bolt (1) on the floor bracket (2).

60/40 Split Seat - 60

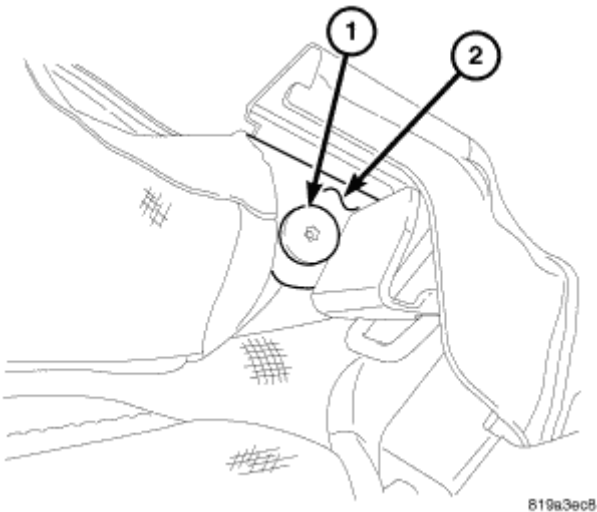
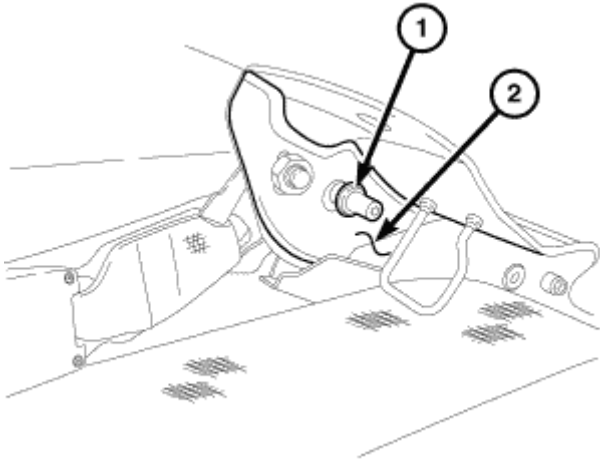


Fig. 675: Removing/Installing Seat Bolt From Floor Bracket
Courtesy of CHRYSLER LLC

CAUTION: Relieve the tension on the cable by positioning the seat correctly. Failure to relieve tension will result in damage to the cable.

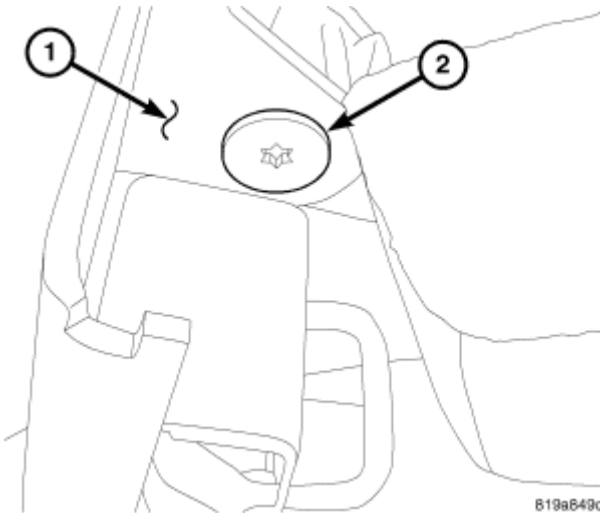
1. Remove the seat bolt (1) from the floor bracket (2) on the right side of the 40 seat.
2. Disconnect the cable.
3. Remove the 40 seat from the pivot bolt.



619a3c8b

Fig. 676: 40 Seat Pivot Bolt
Courtesy of CHRYSLER LLC

4. Remove the pivot bolt (1) from the floor bracket (2).
5. Disconnect the cable.



619a649c

Fig. 677: 60 Seat Bolt
Courtesy of CHRYSLER LLC

6. Remove the seat bolt (2) from the floor bracket (1) on the left side of the 60 seat.

7. Remove the 60 seat from the seat back frame.

DISASSEMBLY

DISASSEMBLY

60/40 Split Seat - 40

1. Remove the 40 seat cushion section from the rear seat assembly, see **REMOVAL**.
2. Remove the seat cover plastic retaining clips from the seat frame.
3. Remove the cover and cushion together from the seat frame.
4. Fold the seat cover back to expose the hog rings, cut and remove all hog rings.
5. Remove the seat cover from the seat cushion.

60/40 Split Seat - 60

1. Remove the 60 seat cushion section from the rear seat assembly, see **REMOVAL**.
2. Remove the seat cover plastic retaining clips from the seat frame.
3. Remove the cover and cushion together from the seat frame.
4. Fold the seat cover back to expose the hog rings, cut and remove all hog rings.
5. Remove the seat cover from the seat cushion.

ASSEMBLY

ASSEMBLY

60/40 Seat - 60

1. Install the seat cover to the seat cushion.
2. Fold the seat cover back to access the hog ring locations and install new hog rings to the seat cushion and cover.
3. Install the cover and cushion together to the seat frame.
4. Install the seat cover plastic retaining clips to the seat frame.
5. Install the 60 seat cushion section to the rear seat assembly, see **INSTALLATION**.

60/40 Seat - 40

1. Install the seat cover to the seat cushion.
2. Fold the seat cover back to access the hog ring locations and install new hog rings to the seat cushion and cover.
3. Install the cover and cushion together to the seat frame.
4. Install the seat cover plastic retaining clips to the seat frame.
5. Install the 40 seat cushion section to the rear seat assembly, see **INSTALLATION**.

INSTALLATION

SEAT CUSHION - REAR

60/40 Split Seat - 60

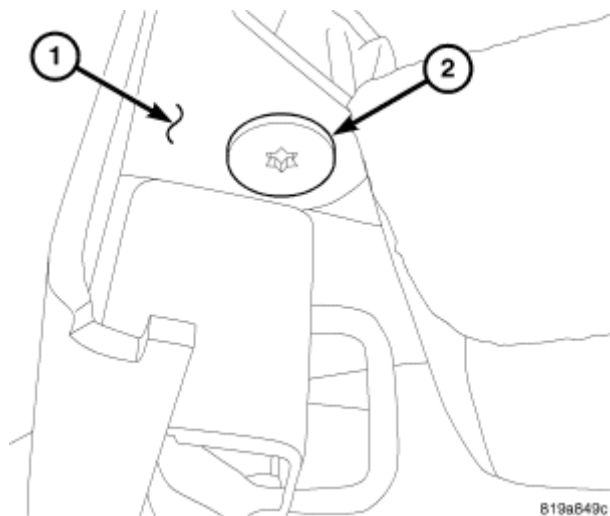


Fig. 678: 60 Seat Bolt
Courtesy of CHRYSLER LLC

1. Position the 60 seat to the seat back frame.
2. Install the seat bolt (2) to the floor bracket (1) and seat frame on the left side of the 60 seat and tighten to 27.5 N.m (20 ft. lbs.).

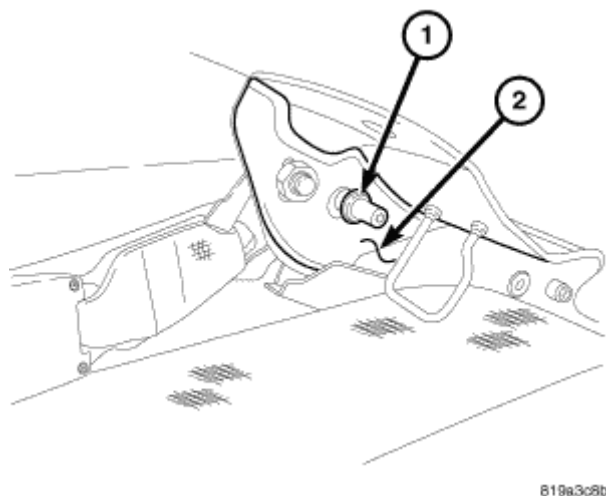


Fig. 679: 40 Seat Pivot Bolt
Courtesy of CHRYSLER LLC

3. Install the 60 seat pivot bolt (1) to the floor bracket (2) and seat frame and tighten to 27.5 N.m (20 ft. lbs.).
4. Attach the cable to the seat back frame and to the seat riser.

5. Install the 40 seat onto the pivot bolt.

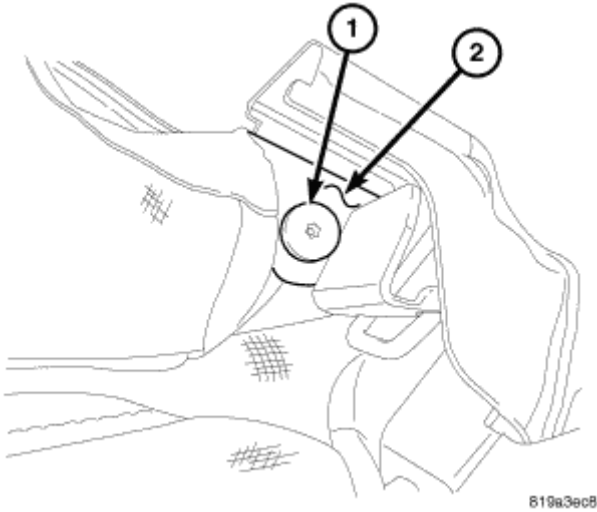


Fig. 680: Removing/Installing Seat Bolt From Floor Bracket
Courtesy of CHRYSLER LLC

6. Install the seat bolt (1) to the floor bracket (2) on the right side of the 40 seat and tighten to 27.5 N.m (20 ft. lbs.).
7. Attach the cable to the seat back frame and to the seat riser.

60/40 Split Seat - 40

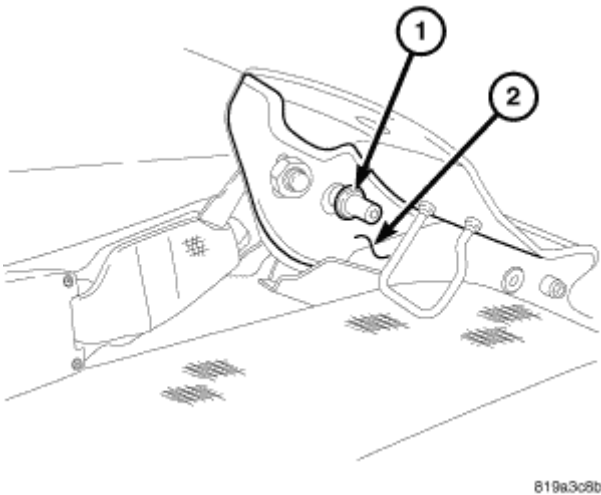


Fig. 681: 40 Seat Pivot Bolt
Courtesy of CHRYSLER LLC

1. Install the seat pivot bolt (1) to the floor bracket (2) and tighten to 27.5 N.m (20 ft. lbs.).
2. Install the seat onto the pivot bolt.

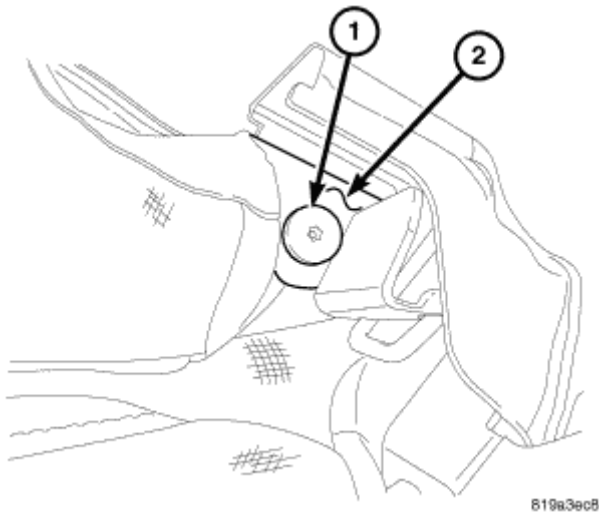


Fig. 682: Removing/Installing Seat Bolt From Floor Bracket
 Courtesy of CHRYSLER LLC

3. Install the seat bolt (1) to the floor bracket (2) on the right side of the 40 seat and tighten to 27.5 N.m (20 ft. lbs.).
4. Attach the cable to the seat back frame and to the seat riser.

STATIONARY GLASS

GLASS - QUARTER WINDOW

REMOVAL

GLASS - QUARTER WINDOW

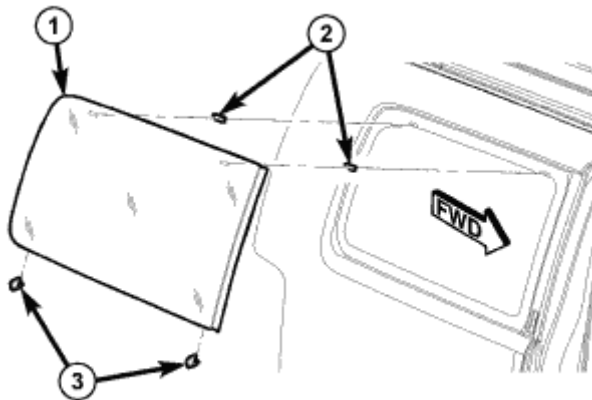


Fig. 683: Quarter Glass, Adhesive Backed Spacers & Spacers
 Courtesy of CHRYSLER LLC

1. Remove the quarter trim panel as necessary to gain access to the glass seal from the inside, see **REMOVAL**.
2. Cut urethane bonding from around quarter glass (1) using a suitable sharp cold knife. A pneumatic cutting device can be used if available.
3. Remove glass from vehicle.

INSTALLATION

GLASS - QUARTER WINDOW

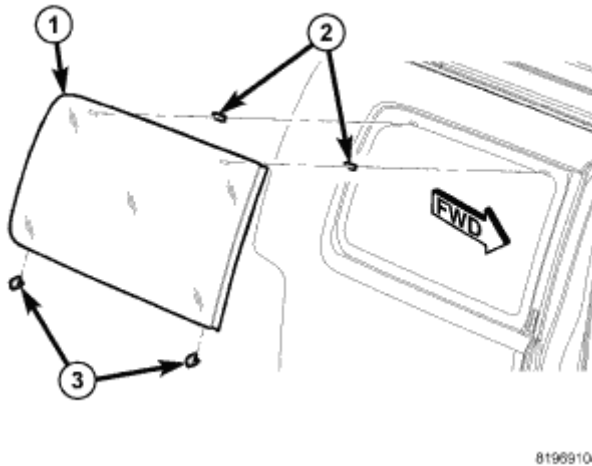


Fig. 684: Quarter Glass, Adhesive Backed Spacers & Spacers
Courtesy of CHRYSLER LLC

CAUTION: Open a window before installing glass. This will avoid pressurizing the passenger compartment. If a door or swing gate flip-up glass is slammed before urethane is cured, water leaks can result.

The quarter glass fence should be cleaned of old urethane bonding material. Support spacers should be cleaned and properly installed onto the quarter glass.

1. Clean inside of glass with Mopar® Glass Cleaner and lint-free cloth.
2. Apply PVC (vinyl) primer 25 mm (1 in.) wide around edge of glass. Wipe with clean/dry lint-free cloth.
3. Apply fence primer around edge of fence. Allow at least eighteen minutes drying time.
4. Apply a 10 mm (0.4 in.) bead of urethane around window vinyl border location.
5. Install the adhesive backed spacers (2) to the upper part of the quarter glass (1).
6. Install the spacers (3) to the lower part of the quarter glass (1).
7. Position quarter glass (1) into window opening and lock clips into place.
8. Install the quarter trim panel if removed, see **REMOVAL**.
9. After urethane has cured, water test quarter glass to verify repair.

GLASS - WINDSHIELD

WARNING

WINDSHIELD SAFETY PRECAUTIONS

WARNING: Do not operate the vehicle within 24 hours of windshield installation. It takes at least 24 hours for urethane adhesive to cure. If it is not cured, the windshield may not perform properly in an accident.

Urethane adhesives are applied as a system. Use glass cleaner, glass prep solvent, glass primer, PVC (vinyl) primer and pinch weld (fence) primer provided by the adhesive manufacturer. If not, structural integrity could be compromised.

DaimlerChrysler does not recommend glass adhesive by brand. Technicians should review product labels and technical data sheets, and use only adhesives that their manufacturers warrant will restore a vehicle to the requirements of FMVSS 212. Technicians should also insure that primers and cleaners are compatible with the particular adhesive used.

Be sure to refer to the urethane manufacturer's directions for curing time specifications, and do not use adhesive after its expiration date.

Vapors that are emitted from the urethane adhesive or primer could cause personal injury. Use them in a well-ventilated area.

Skin contact with urethane adhesive should be avoided. Personal injury may result.

Always wear eye and hand protection when working with glass.

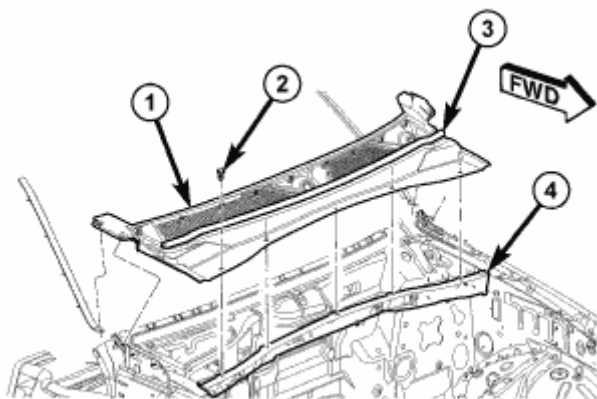
CAUTION: Protect all painted and trimmed surfaces from coming in contact with urethane or primers.

Be careful not to damage painted surfaces when removing moldings or cutting urethane around windshield.

REMOVAL

GLASS - WINDSHIELD

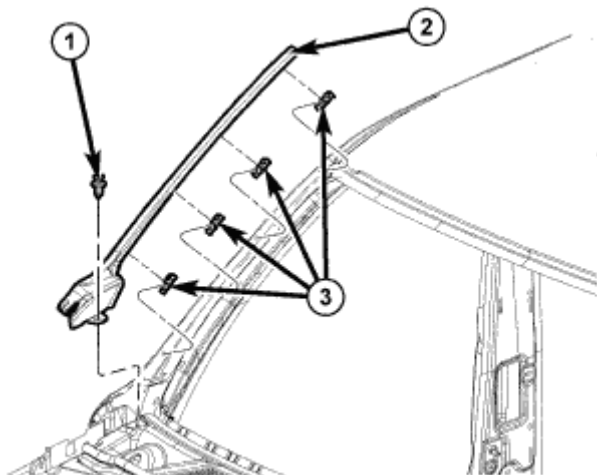
1. Before proceeding with the following repair procedure, review all warnings and cautions. See **WARNING**.
2. Remove inside rear view mirror, see **REMOVAL**.
3. Remove the wiper arms, refer to **REMOVAL**.



8194dc06

Fig. 685: Cowl Grille, Push Pins, Hood Seal & Body
Courtesy of CHRYSLER LLC

4. Remove the hood seal (3).
5. Use a trim stick C-4755 or equivalent, separate the cover assembly from the a-pillar.
6. Remove the four push pins (2) and remove the cowl grille (1) from the body (4).



8195aa09

Fig. 686: Push Pin, Windshield A-Pillar Molding & Clips
Courtesy of CHRYSLER LLC

7. Using a trim stick C-4755 or equivalent, remove the push pin (1).
8. Remove the windshield A-pillar molding (2) and clips (3) from the windshield A-pillar.

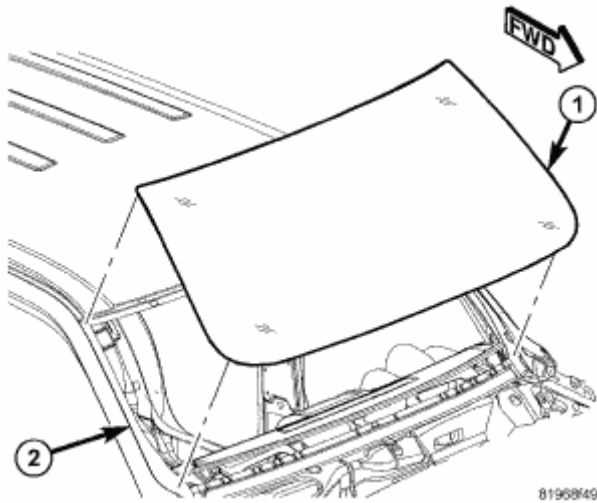


Fig. 687: Removing/Installing Windshield
Courtesy of CHRYSLER LLC

9. Cut urethane bonding from around windshield using a suitable sharp cold knife. A pneumatic cutting device can be used if available.
10. Remove windshield from vehicle.

INSTALLATION

GLASS - WINDSHIELD

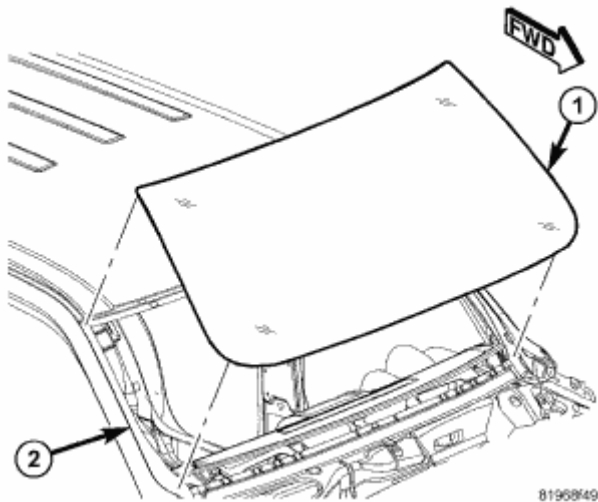


Fig. 688: Removing/Installing Windshield
Courtesy of CHRYSLER LLC

WARNING: Review all warnings and cautions in this procedure before preceding with installation.

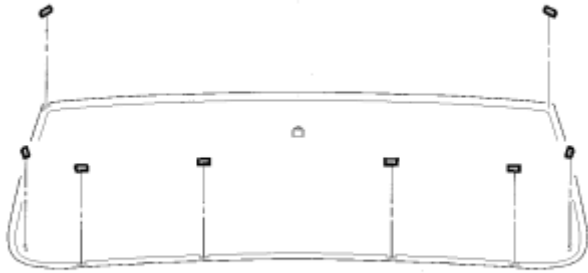
CAUTION: Open a window before installing windshield. This will avoid pressurizing

the passenger compartment. If a door or swing gate flip-up glass is slammed before urethane is cured, water leaks can result.

CAUTION: Protect all painted and trimmed surfaces from coming in contact with urethane or primers.

The windshield fence should be cleaned of old urethane bonding material. Support spacers should be cleaned and properly installed on weld studs or repair screws at bottom of windshield opening.

1. Place replacement windshield into windshield opening. Position glass in the center of the opening against the support spacers. Mark the glass at the support spacers with a grease pencil or masking tape and ink pen to use as a reference for installation. Remove replacement windshield from windshield opening.



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Fig. 689: Windshield Spacers
Courtesy of CHRYSLER LLC

2. Position the windshield inside up on a suitable work surface with two padded, wood 10 cm by 10 cm by 50 cm (4 in. by 4 in. by 20 in.) blocks, placed parallel 75 cm (2.5 ft.) apart.
3. Clean inside of windshield with Mopar® Glass Cleaner and lint-free cloth.
4. Apply clear glass primer 25 mm (1 in.) wide around edge of windshield. Wipe with clean/dry lint-free cloth.
5. Apply black-out primer 15 mm (.75 in.) wide on top and sides of windshield and 25 mm (1 in.) on bottom of windshield. Allow at least three minutes drying time.
6. Position adhesive backed spacers at the edge of the windshield opening.
7. Align the dot on the upper molding to the tick mark in the center of the glass and install upper molding onto windshield.
8. Apply a 10 mm (0.4 in.) bead of urethane around perimeter of windshield along the inside of the moldings. Apply two beads along the bottom edge.
9. Apply fence primer around the perimeter of the windshield opening fence. Allow at least 18 minutes drying time.

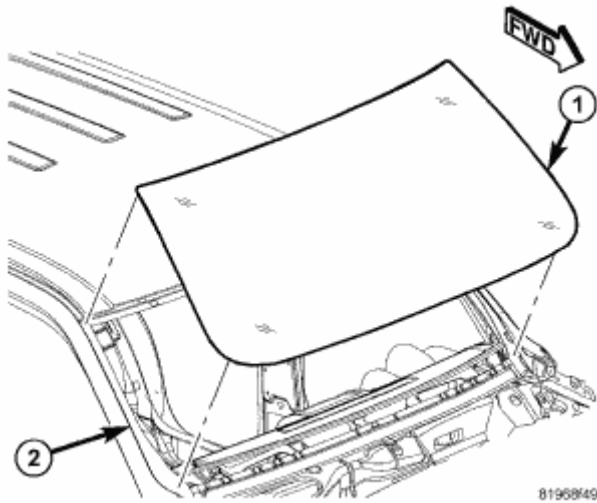


Fig. 690: Removing/Installing Windshield
Courtesy of CHRYSLER LLC

10. With aid of a helper, position windshield over windshield opening. Align reference marks at bottom of windshield to support spacers.
11. Slowly lower windshield glass to windshield opening fence. Guide top molding into proper position if necessary. Push windshield inward to fence spacers at bottom and until top molding is flush to roof line.
12. Clean excess urethane from exterior with Mopar® Super Clean or equivalent.

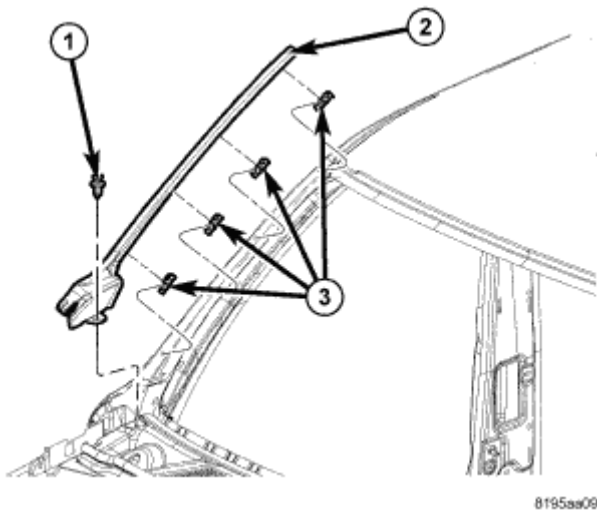
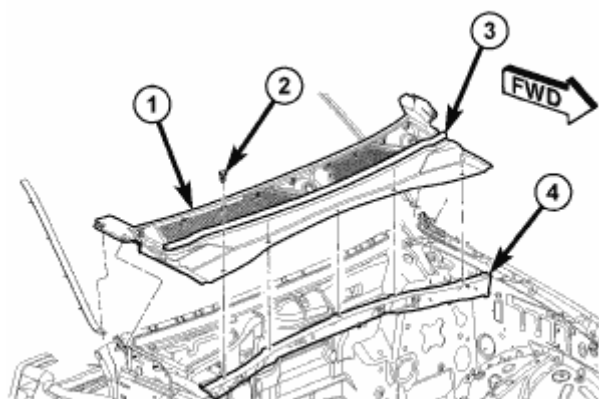


Fig. 691: Push Pin, Windshield A-Pillar Molding & Clips
Courtesy of CHRYSLER LLC

13. Install the windshield A-pillar molding (2) and clips (3) to the windshield A-pillar.
14. Install the push pin (1).



8194dc06

Fig. 692: Cowl Grille, Push Pins, Hood Seal & Body
Courtesy of CHRYSLER LLC

15. Position the cowl grille (1) and engage the clips to the bottom of the windshield.
16. Install the four push pins (2) through the cowl grille (1) and into the body (4).
17. Install the hood seal (3).
18. Install the wiper arms, refer to **INSTALLATION** .
19. Install inside rear view mirror, see **INSTALLATION**.
20. After urethane has cured, water test windshield to verify repair.

SUNROOF

DESCRIPTION

SUNROOF

WARNING: Keep fingers and other body parts out of sunroof opening at all times.

The sunroof features a power sliding glass panel and a sunshade which can be manually positioned anywhere along its travel, rearward of glass panel front edge.

The sunroof is electrically operated from two switches located on the windshield header, rearward of the map lamp. To operate the sunroof the ignition switch must be in either the Accessory or On/Run position. One switch (vent) is a push button type and opens the sunroof to the vent position only. The other switch (open/close) is a rocker type for opening and closing the sunroof. Pressing and releasing the open button once the sunroof will express open and the wind deflector will raise. If the button is pressed a second time the sunroof will stop in that position. Pressing and releasing the button while the sunroof is in the open position will cause the sunroof to express close and the wind deflector will lower. If the button is pressed a second time the sunroof will stop in that position.

SUNROOF OPERATION INSTRUCTIONS

SWITCH INPUTS			
-	OPEN	CLOSE	VENT
FULL VENT	Push and hold switch until glass stops in flush closed position, the glass will then express open Press the switch for less than 0.65 seconds for express to full open	Push and hold switch until glass stops in flush closed position. Press the switch for less than 0.65 seconds for express to full closed	No action
VENT RANGE	Push and hold switch until glass passes through flush closed position. Glass will then open	Push and hold switch until glass stops in flush closed position.	Push and hold switch until glass stops in full vent position.
FLUSH	Press switch for less than 0.65 seconds for express to full open. Press switch for more than 0.65 seconds and glass will stop when switch is released	No action	Press and hold switch. Glass will travel through flush closed to full vent. Glass will stop when switch is released or when fully vented. Press switch for less than 0.65 seconds for express to full vent
FULL OPEN	No action	Press and hold switch until glass stops in flush closed position or anywhere in between. Press switch for less than 0.65 seconds for express to flush closed	Press and hold switch. Glass will travel through flush closed to full vent. Glass will stop when switch is released. Press switch for less than 0.65 seconds for express to full vent

DIAGNOSIS AND TESTING

SUNROOF

Before beginning sunroof diagnostics verify that all other power accessories are in proper operating condition. For electrical diagnostic information follow the chart "Sunroof Diagnosis Chart". Refer to **DIAGNOSIS AND TESTING** (POWER TOP-FULL OPEN RETRACTABLE DIAGNOSTICS). Refer to **DIAGNOSIS AND TESTING** (POWER FULL OPEN RETRACTABLE ROOF - SERVICE INFORMATION). Refer to **DIAGNOSIS AND TESTING** (POWER TOP - SUNROOF - SERVICE INFORMATION). Also refer to **SYSTEM WIRING DIAGRAMS** for circuit, splice and component descriptions.

Before beginning diagnosis for wind noise or water leaks, verify that the sunroof is in a fully closed position. A common problem is the sunroof is left in an open position, this can be caused by releasing the control switch before the sunroof was fully closed. The sunroof module is equipped with a water-management system. If however, the sunroof glass is in a partial closed position, high pressure water may be forced beyond the water management system boundaries and onto the headlining.

MECHANICAL SUNROOF DIAGNOSIS

SYMPTOM	POSSIBLE CAUSE
Sunroof water leak.	Drain tubes clogged or kinked or disconnected from the sunroof. Glass panel improperly adjusted. Faulty glass panel seal.
Gurgling sound from sunroof.	Low spot in drain hose routing, allowing water to stand.
Wind noise from sunroof.	Front of glass panel too high or rear too low. Wind deflector not deploying. Glass not centered in opening. Faulty glass panel seal.
Rattles from open sunroof while driving.	Loose or broken attaching hardware. Worn or broken mechanism.
Sunroof does not stop in the fully closed position.	Drive motor has lost position of glass, teach procedure required to reprogram drive motor. Refer to <u>DRIVE MOTOR TEACH PROCEDURE</u> .

WATER DRAINAGE AND WIND NOISE DIAGNOSIS

Adequate drainage is provided by a drain trough in the sunroof housing which encircles the sliding glass panel and leads to drain hoses. If a wet headliner or other water leak complaints are encountered, before performing any adjustments, first ensure that the drainage system is not plugged or disconnected. Use a pint container to pour water into the sunroof housing drain trough. If water flow is restricted, use compressed air to blow out any material plugging the drain system. Retest system again.

To further check for a disconnected drain hose:

1. Lower headliner as necessary to gain access to sunroof housing drain tubes. See **REMOVAL**.
2. Repair as necessary.
3. Install headliner. See **INSTALLATION**.

The sliding glass panel is designed to seal water entry with a snug fit between the roof and the seal. The fit can be checked by inserting a piece of paper between the roof and the seal. The piece of paper should have some resistance when pulled out when the glass panel is in the closed position. The sunroof housing will drain off a minimum amount of water. Excessive wind noise could result if the gap clearances are exceeded. The sunroof glass panel may need to be adjusted. See **ADJUSTMENTS** for proper procedures.

DEFLECTOR - SUNROOF WIND

REMOVAL

DEFLECTOR - SUNROOF WIND

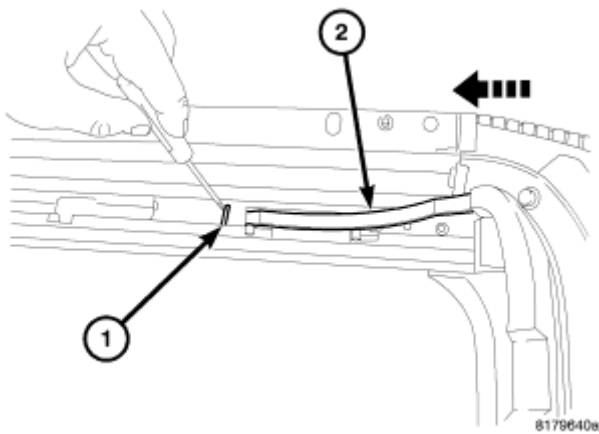


Fig. 693: Pressing Spring Lock With Small Flat Bladed Tool And Pushing Wind Deflector Reward To Release From Car Top Opening
Courtesy of CHRYSLER LLC

1. Open the sunroof glass to the full open position.
2. Press the spring lock (1) with a small flat bladed tool and push the wind deflector (2) reward to release from the car top opening.
3. Repeat the previous step on the opposite side.

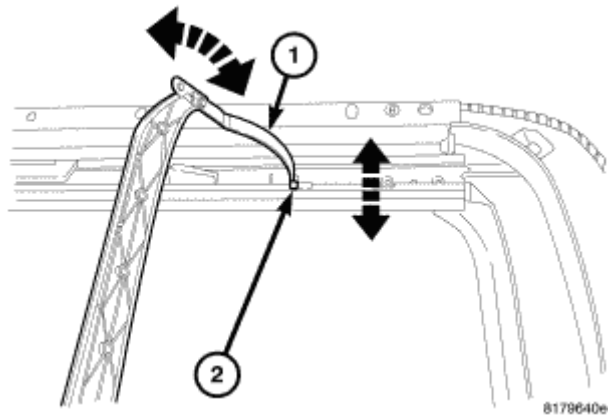


Fig. 694: Rotating Wind Deflector Up And Release From Mounting Hole In Sunroof Frame
Courtesy of CHRYSLER LLC

4. Rotate the wind deflector (1) up and release from the mounting hole (2) in the sunroof frame.

INSTALLATION

DEFLECTOR - SUNROOF WIND

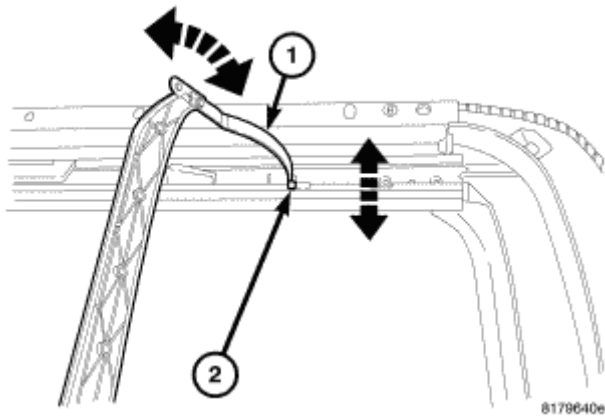


Fig. 695: Rotating Wind Deflector Up And Release From Mounting Hole In Sunroof Frame
 Courtesy of CHRYSLER LLC

1. Position the wind deflector springs (1) into the mounting holes (2) in the sunroof frame.
2. Rotate forward and down into position.

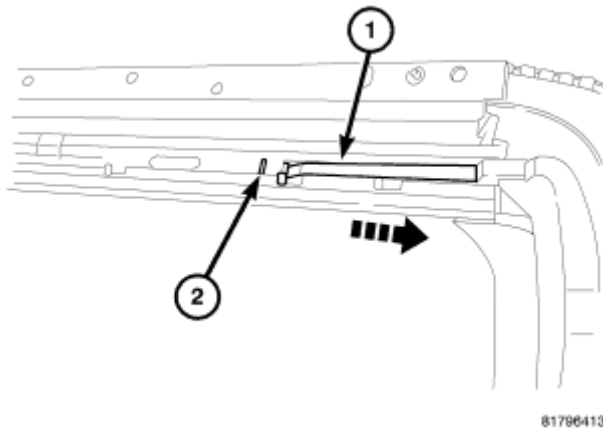


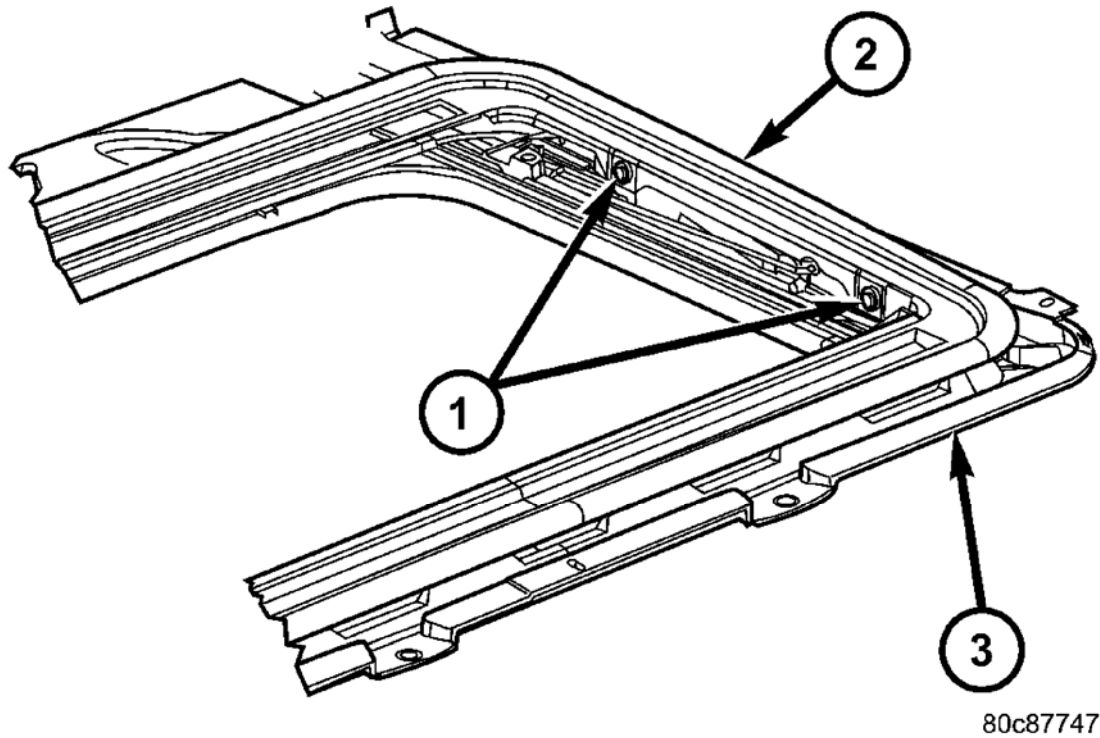
Fig. 696: Sliding Wind Deflector And Spring Forward Under Car Top Lip And Making Sure Spring Lock Snaps Into Place
 Courtesy of CHRYSLER LLC

3. Slide the wind deflector and spring (1) forward under the car top lip and make sure the spring lock snaps into place (2) fully.

GLASS - SUNROOF

REMOVAL

GLASS - SUNROOF



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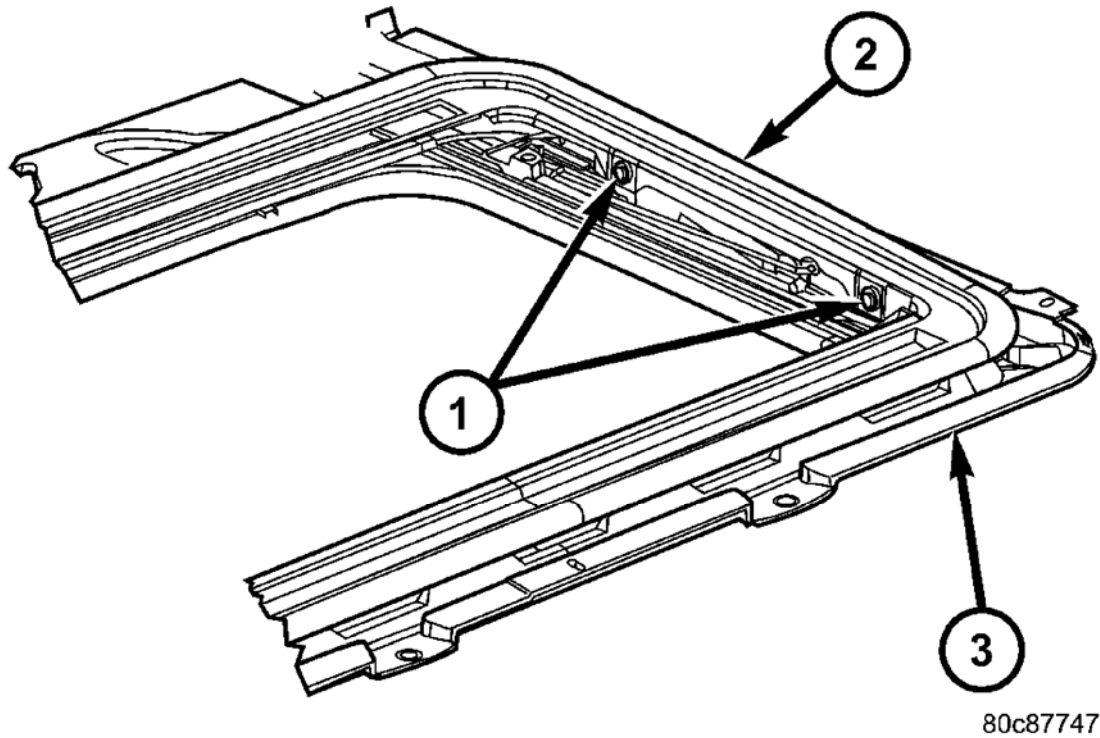
Fig. 697: Removing/Installing Sunroof Glass Panel
Courtesy of CHRYSLER LLC

- | |
|---|
| <p>1 - SCREWS
2 - GLASS PANEL
3 - MODULE ASSEMBLY</p> |
|---|

1. Slide sunshade rearward to the open position.
2. Move the glass panel (2) to the closed position.
3. Remove the four glass panel screws (1).
4. Lift off glass panel and remove from vehicle.

INSTALLATION

GLASS - SUNROOF



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Fig. 698: Removing/Installing Sunroof Glass Panel
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - SCREWS
2 - GLASS PANEL
3 - MODULE ASSEMBLY |
|--|

1. Position glass panel (2) on to mechanism lift arm.
2. Start the four attaching screws (1).
3. Center glass in opening by running a business card around the glass.
4. Adjust glass panel. See **ADJUSTMENTS**.

ADJUSTMENTS

GLASS - SUNROOF

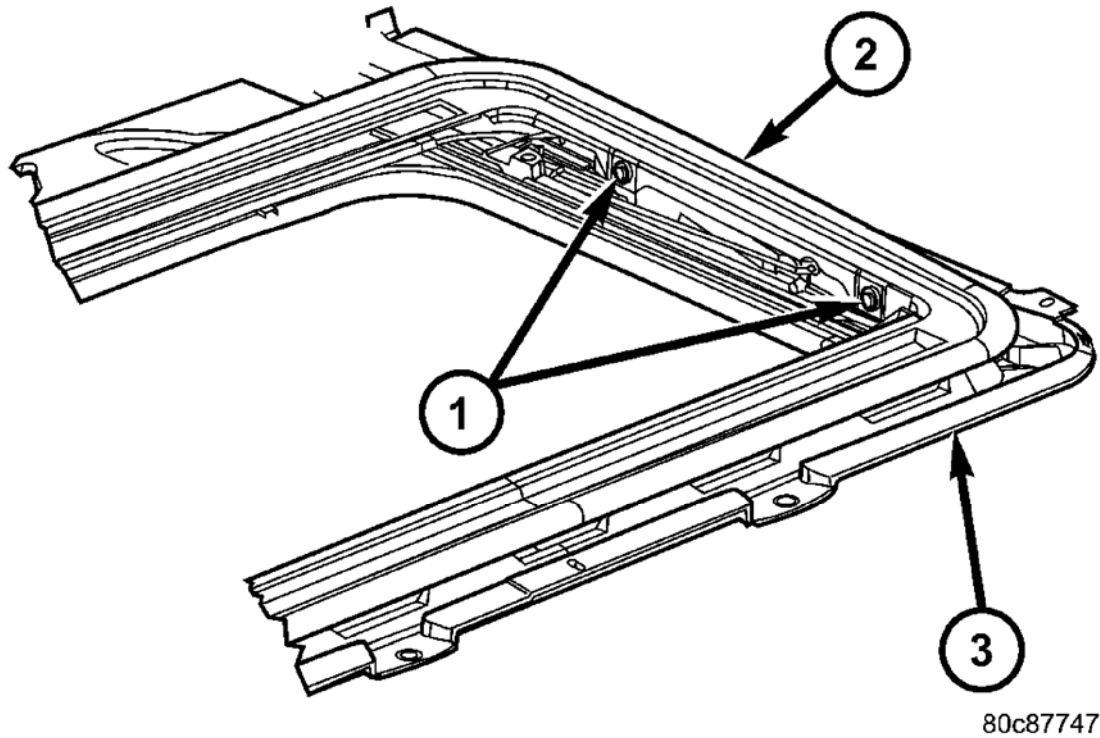
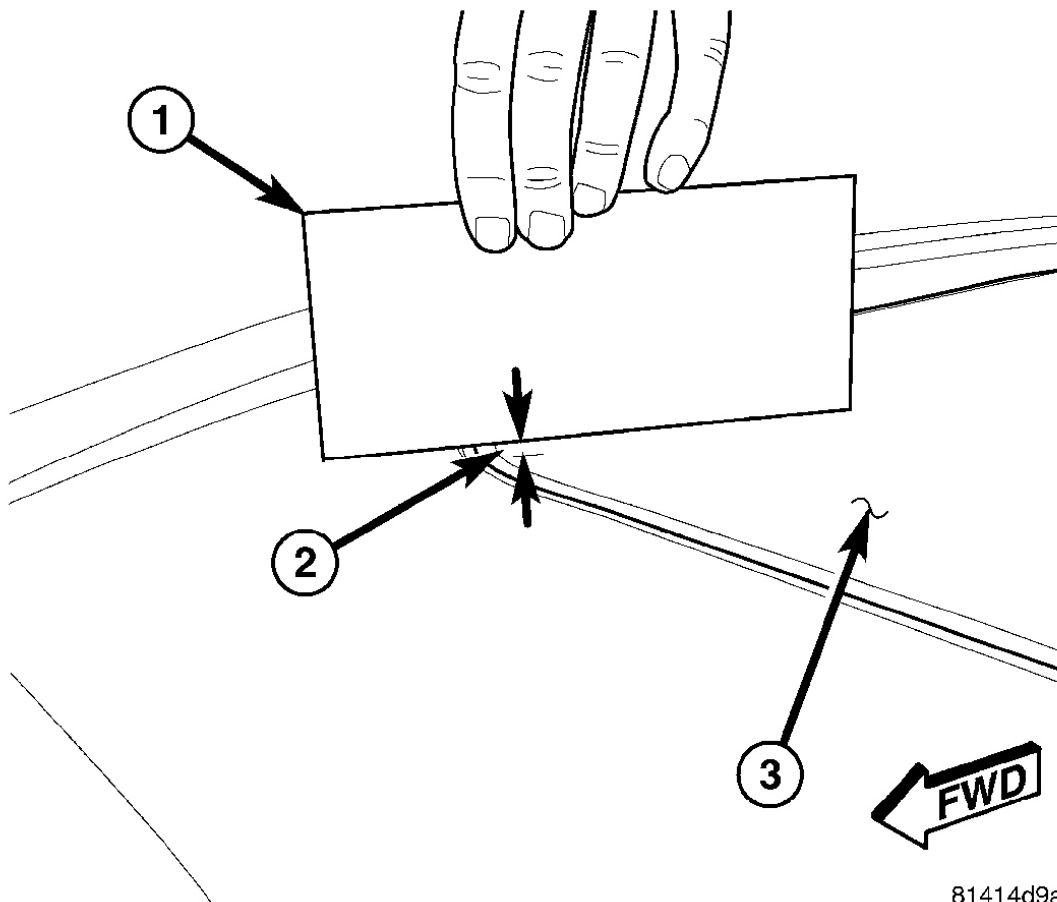


Fig. 699: Removing/Installing Sunroof Glass Panel
Courtesy of CHRYSLER LLC

1 - SCREWS 2 - GLASS PANEL 3 - MODULE ASSEMBLY
--

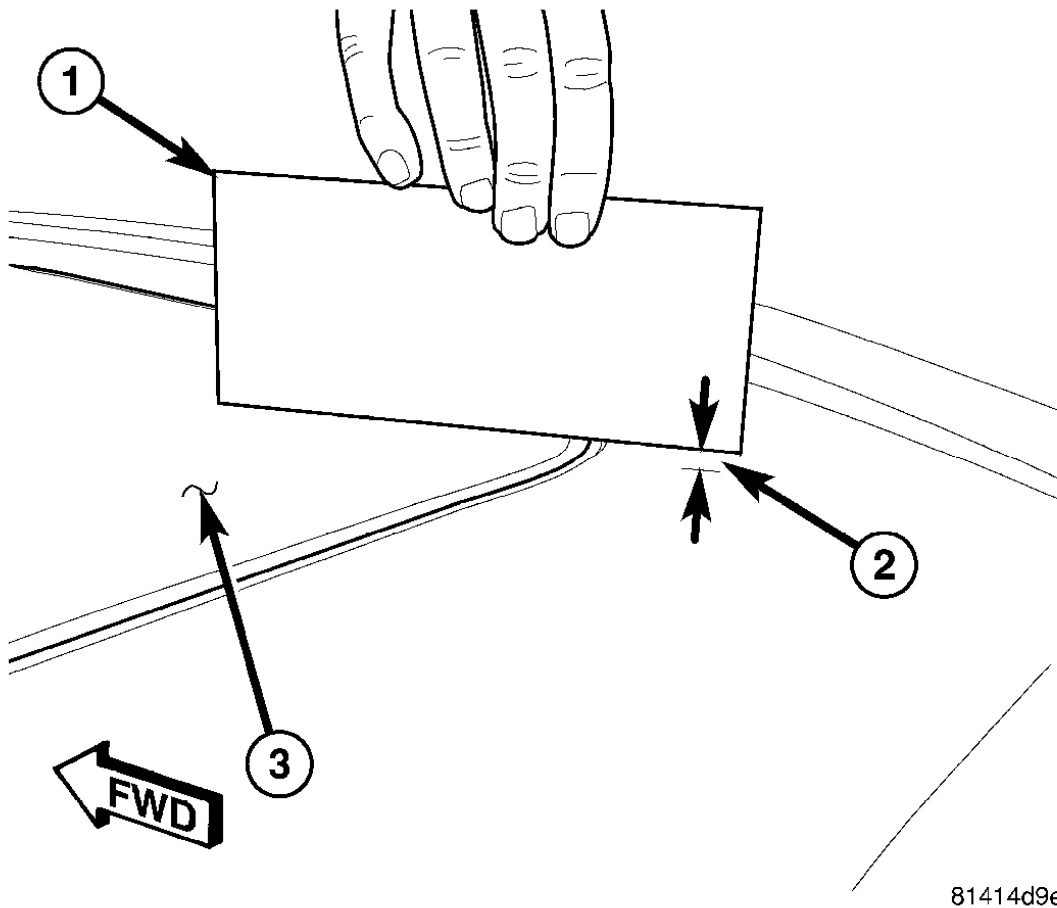
1. Move the sunshade rearward to the open position.
2. Move the sunroof glass panel to the fully closed position.
3. Adjust the glass one corner at a time.
 - a. Loosen four glass screws (1).
 - b. Lift glass assembly and align the top of the glass panel to the top of the roof panel.
 - c. Tighten screw to 3.5 N.m (31 in. lbs.).
 - d. Repeat steps a and b for each corner of the glass panel.
 - e. When properly adjusted, the front of the glass panel is flush to 2 mm (0.78 in.) lower than the roof surface and the rear edge of the glass panel is flush to 2 mm (0.78 in.) higher than the roof surface.



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Fig. 700: Checking Sunroof Front Height
Courtesy of CHRYSLER LLC

NOTE: When properly adjusted, the front of the glass panel (3) is flush to 2 mm (0.78 in.) lower than the roof surface (2).



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Fig. 701: Checking Sunroof Rear Height
Courtesy of CHRYSLER LLC

NOTE: When properly adjusted, the rear edge of the glass panel (3) is flush to 2 mm (0.78 in.) higher than the roof surface (2).

4. Verify sunroof operation and alignment. Check fit and re-adjust as necessary.

HOSE - SUNROOF DRAIN

REMOVAL

HOSE - SUNROOF DRAIN

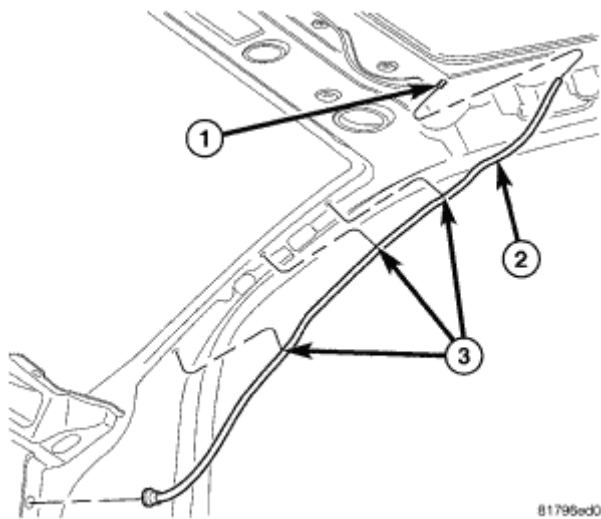


Fig. 702: Sunroof Assembly, Front Hose & Support Clips
 Courtesy of CHRYSLER LLC

1. Drop down the headliner as necessary to gain access to the drain hoses, see **REMOVAL**.
2. Disconnect the front hose (2) from the sunroof assembly (1).
3. Release the support clips (3) and disconnect the lower grommet and remove the hose.

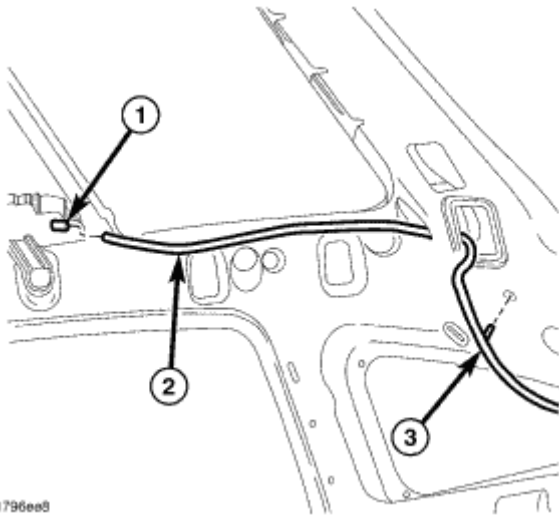


Fig. 703: Sunroof Assembly, Rear Hose & Support Clips
 Courtesy of CHRYSLER LLC

4. Disconnect the rear hose (2) from the sunroof assembly (1) and release the support clips (3).

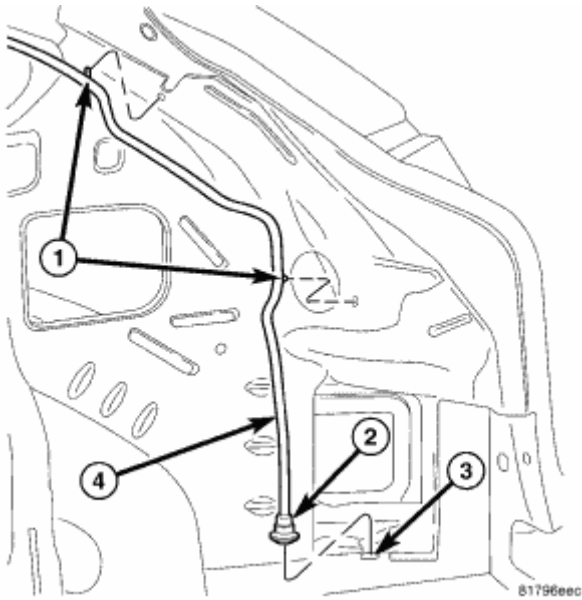


Fig. 704: Support Clips, Grommet, Body & Rear Hose
 Courtesy of CHRYSLER LLC

5. Separate the remaining support clips (1).
6. Disconnect the grommet (2) from the body (3) and remove the rear hose as necessary.

INSTALLATION

HOSE - SUNROOF DRAIN

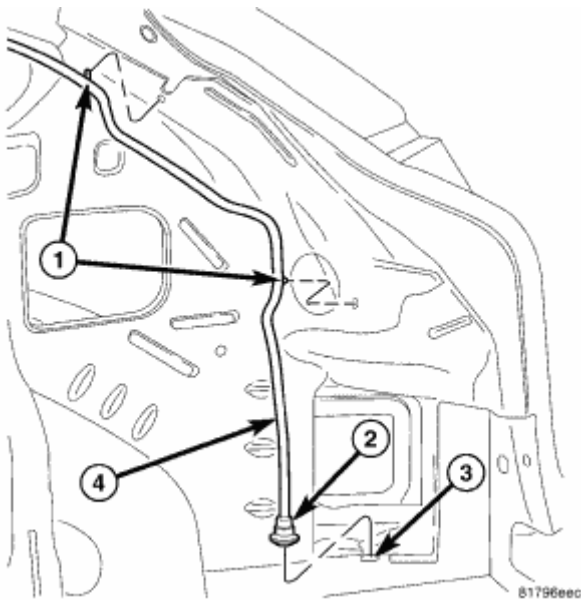


Fig. 705: Support Clips, Grommet, Body & Rear Hose
 Courtesy of CHRYSLER LLC

1. Install the rear hose (4) and connect the grommet (2) to the body (3).

2. Connect the support clips (1).

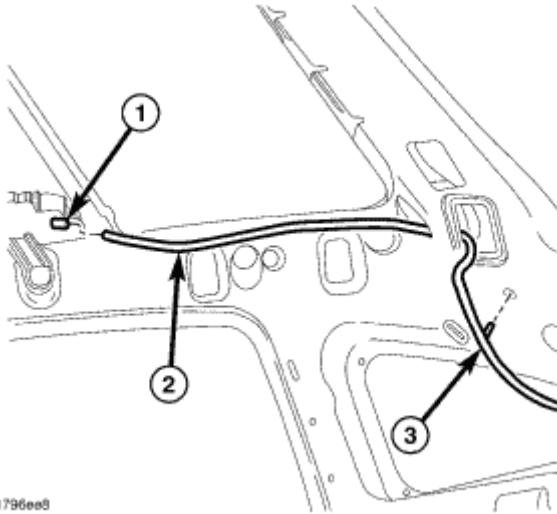


Fig. 706: Sunroof Assembly, Rear Hose & Support Clips
Courtesy of CHRYSLER LLC

3. Route the hose as required and connect the remaining support clips (3).
4. Connect the hose (2) to the sunroof assembly (1).

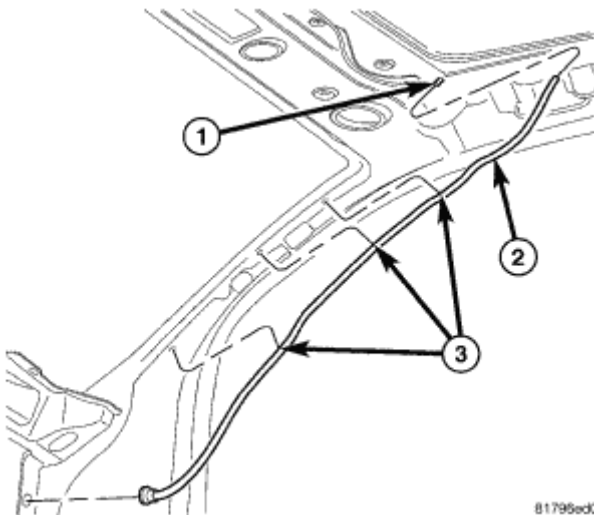


Fig. 707: Sunroof Assembly, Front Hose & Support Clips
Courtesy of CHRYSLER LLC

5. Connect the front hose lower grommet to the body.
6. Connect the front hose (2) to the sunroof assembly (1) and connect the support clips (3).

MOTOR - SUNROOF WITH CONTROL UNT

DESCRIPTION

MOTOR - SUNROOF WITH CONTROL UNT

For motor and control unit service. Refer to **REMOVAL** (POWER FULL OPEN RETRACTABLE ROOF - SERVICE INFORMATION). Refer to **REMOVAL** (POWER TOP - SUNROOF - SERVICE INFORMATION).

SEAL- SUNROOF GLASS

REMOVAL

SEAL- SUNROOF GLASS

1. Remove sunroof glass panel, see **REMOVAL**.
2. Place glass panel on clean work area with the top side up. Support the glass assembly from underside to avoid bending or otherwise damaging the mounting tabs.
3. Grasp the seal and pull seal away from the glass panel. The seal is a one piece seal.

INSTALLATION

SEAL- SUNROOF GLASS

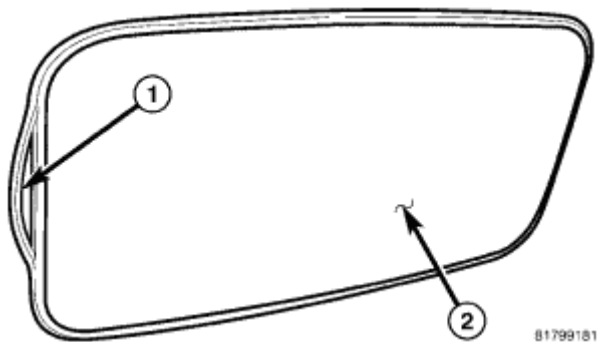


Fig. 708: Sunroof Glass Seal
Courtesy of CHRYSLER LLC

NOTE: Always position seal seam on center of the passenger side of glass panel.

1. Place seal (1) into position.
2. Seat the seal (1) into the glass channel fully. Using care working the seal around the glass (2), being careful not to over stretch the seal while installing.
3. Install the glass panel, see **INSTALLATION**.

SUNROOF - MODULE/FRAME ASSEMBLY

REMOVAL

SUNROOF - MODULE/FRAME ASSEMBLY

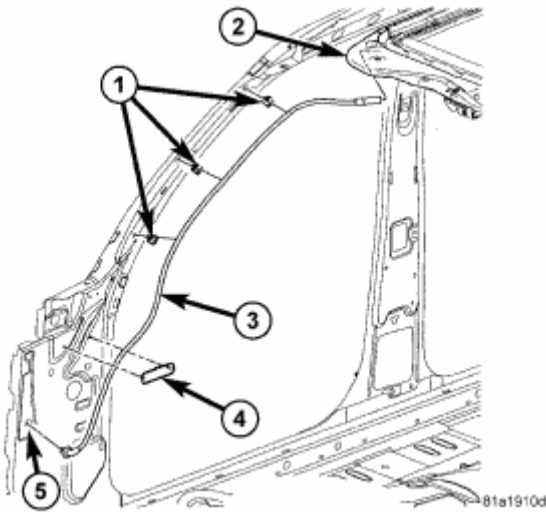


Fig. 709: Disconnecting/Connecting Front Drain Tube At Sunroof
 Courtesy of CHRYSLER LLC

1. Move glass panel to fully closed position.
2. Disconnect and isolate negative battery cable.
3. If equipped, remove the overhead console, refer to **REMOVAL** .
4. Remove headliner, see **REMOVAL**.
5. Disconnect wire harness.
6. Disconnect the front drain tube (3) at the sunroof (2).

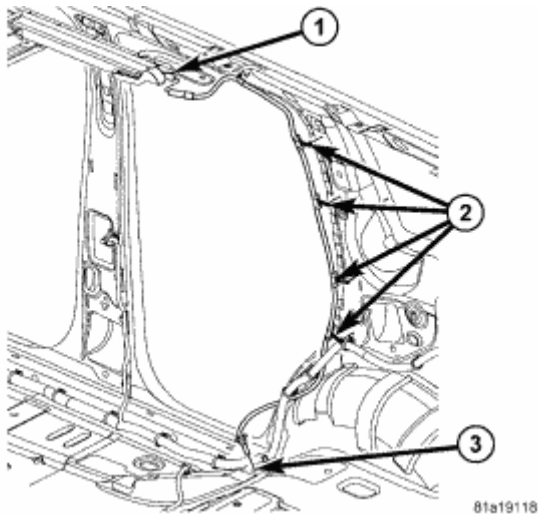
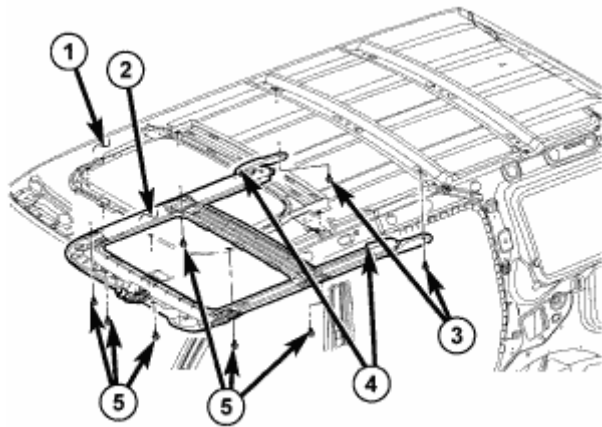


Fig. 710: Disconnecting/Connecting Rear Drain Tube At Sunroof
 Courtesy of CHRYSLER LLC

7. Disconnect the rear drain tube at the sunroof (1).



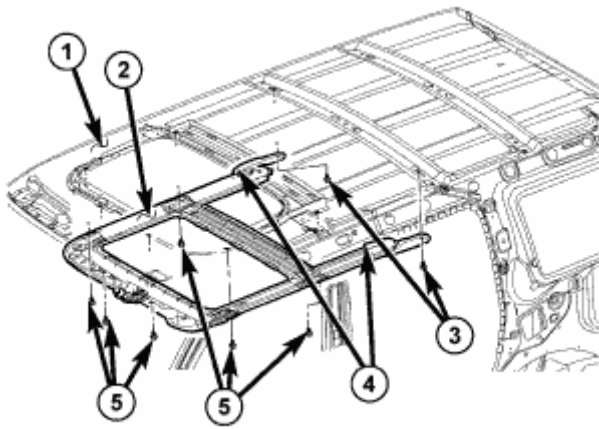
81a189b5

Fig. 711: Roof Panel, Sunroof Module Assembly, Module Bracket Bolts & Fasteners
Courtesy of CHRYSLER LLC

8. Remove two module bracket bolts (3) and loosen the remaining six fasteners (5).
9. With the aid of a helper, remove fasteners (5) attaching sunroof module assembly (2) to roof panel (1).
10. Remove the glass panel.
11. Remove the sunshade, see **REMOVAL**.
12. Remove the drive motor. Refer to **REMOVAL** (POWER FULL OPEN RETRACTABLE ROOF - SERVICE INFORMATION). Refer to **REMOVAL** (POWER TOP - SUNROOF - SERVICE INFORMATION).
13. Remove the wire harness.
14. Remove the trough.
15. Remove the module side brackets.
16. Remove the deflector.

INSTALLATION

SUNROOF - MODULE/FRAME ASSEMBLY



81a18965

Fig. 712: Roof Panel, Sunroof Module Assembly, Module Bracket Bolts & Fasteners
Courtesy of CHRYSLER LLC

1. Install the module brackets.
2. Install the drive motor. Refer to **INSTALLATION** (POWER FULL OPEN RETRACTABLE ROOF - SERVICE INFORMATION). Refer to **INSTALLATION** (POWER TOP - SUNROOF - SERVICE INFORMATION).
3. Install the sunshade, see **INSTALLATION**.
4. Install the trough.
5. Install the glass panel.
6. Raise rear end of sunroof module assembly (2) to the roof (1) and guide into position and start the rear fasteners (3).
7. Raise front end of sunroof module assembly (2) to the roof (1) and guide into position, start the remaining fasteners (3).
8. Visually line up the alignment guide holes with the guide holes in the roof of the vehicle.
9. Tighten the fasteners to 9 N.m (80 in. lbs.).
10. Tighten the nuts (4).

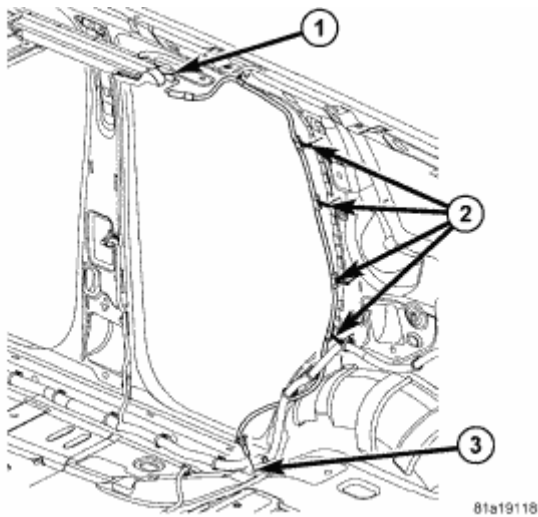


Fig. 713: Disconnecting/Connecting Rear Drain Tube At Sunroof
 Courtesy of CHRYSLER LLC

11. Connect the rear drain tube at the sunroof (1).

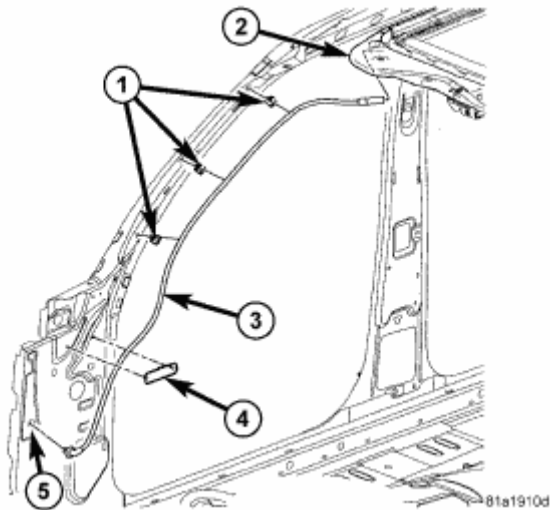
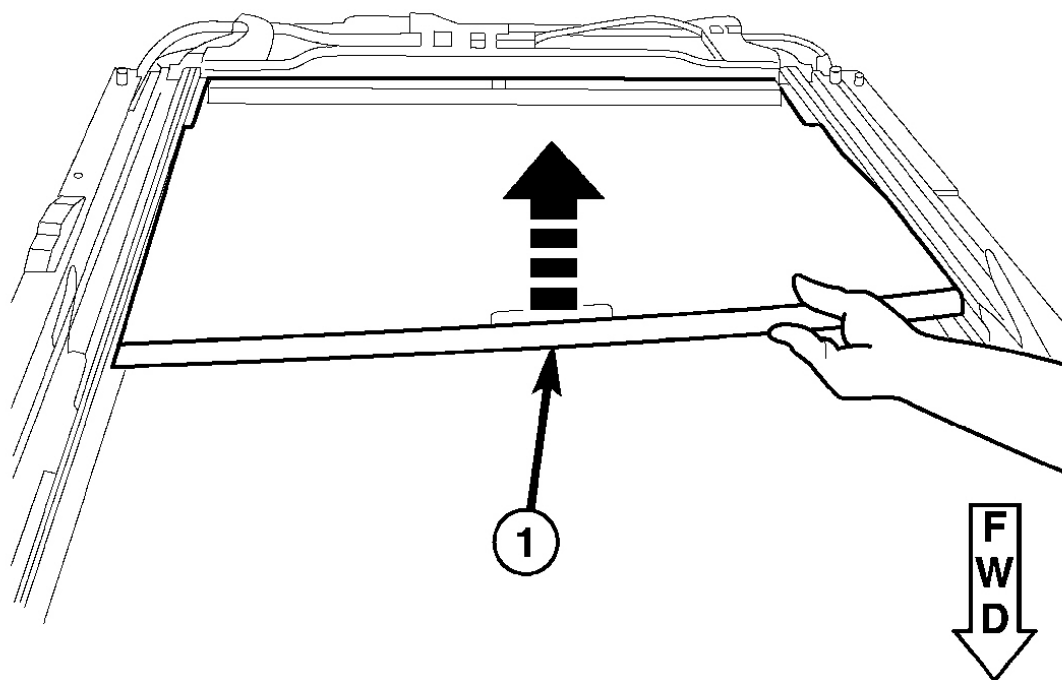


Fig. 714: Disconnecting/Connecting Front Drain Tube At Sunroof
 Courtesy of CHRYSLER LLC

12. Connect the front drain tube (3) at the sunroof (2).
13. Install the wire harness.
14. Connect battery negative cable.
15. If equipped, install the overhead console, refer to **INSTALLATION** .
16. Perform the sunroof motor teach procedure, refer to **STANDARD PROCEDURE** .
17. Test sunroof operation, adjust glass as necessary, see **ADJUSTMENTS**.
18. Install the headliner, see **INSTALLATION**.

REMOVAL

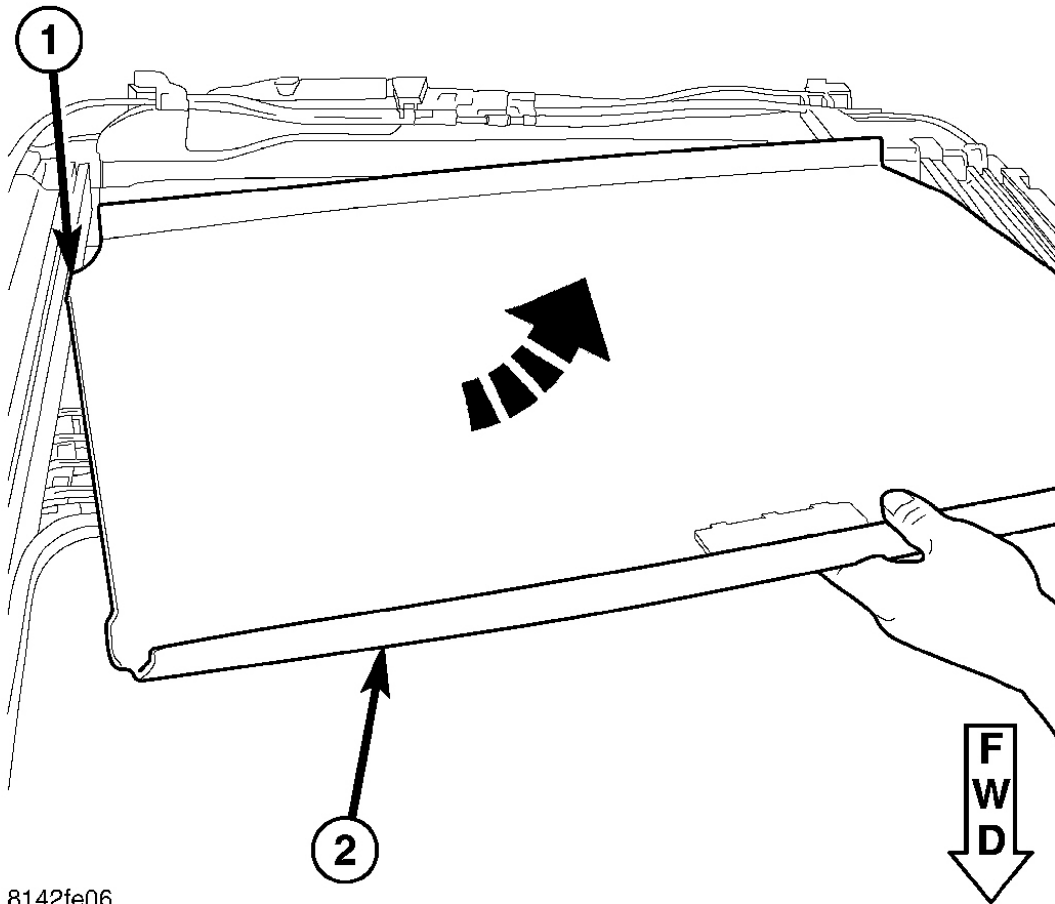
SUNSHADE - SUNROOF



8142fe05

Fig. 715: Removing/Installing Drain Channel
Courtesy of CHRYSLER LLC

1. Remove the drain trough, see **REMOVAL**.
2. Push up the front center of the sunshade (1) to pop out the front two feet.



8142fe06

Fig. 716: Removing/Installing Sunshade
Courtesy of CHRYSLER LLC

3. Rotate the sunshade (2) so that the other feet (1) are removed from the guide track.

INSTALLATION

SUNSHADE - SUNROOF

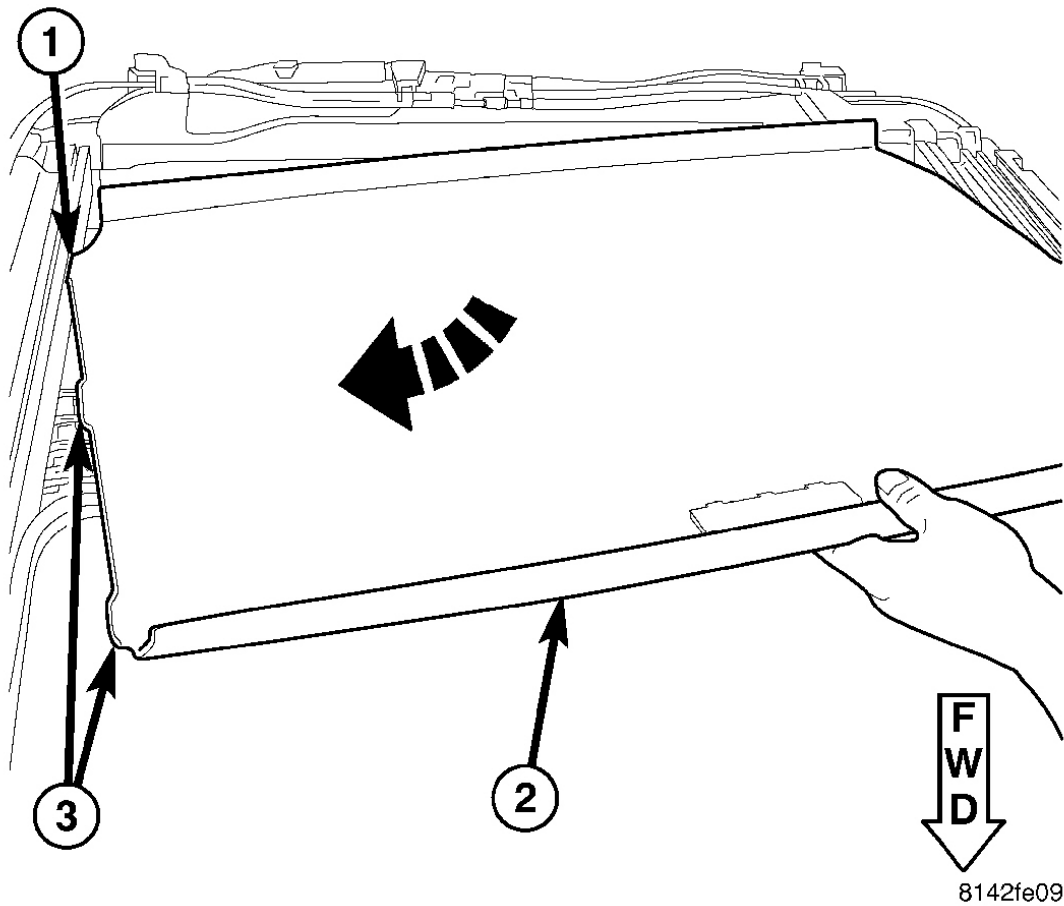
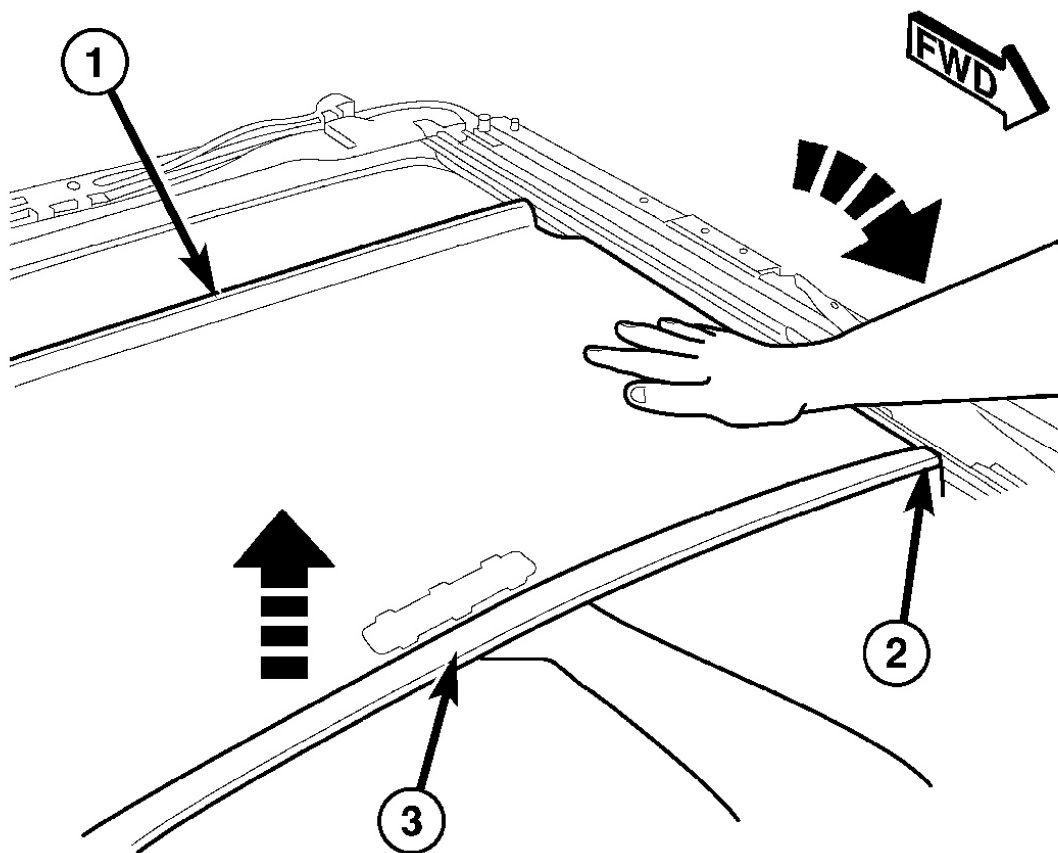


Fig. 717: Removing/Installing Sunshade
Courtesy of CHRYSLER LLC

1. Verify the sunshade track is free of obstructions like the trim lace/ring.
2. Start with sunshade (2) at an angle with one foot (1) in the track.
3. Rotate the sunshade so the other rear foot is in the track as well as the 2 other feet (3) on the same side as the first foot.



8142fe08

Fig. 718: Removing/Installing Drain Channel
Courtesy of CHRYSLER LLC

4. To insert the remaining two feet (2) apply force to the middle front of sunshade (3) and guide them into the track.
5. Check that all the feet are in the right track and verify sunshade operation.
6. Install the drain trough, see **INSTALLATION**.

SWITCH - SUNROOF CONTROL

DESCRIPTION

SWITCH - SUNROOF CONTROL

Vehicles equipped with a power sunroof utilize a sunroof control switch. On this model, the sunroof control switch is located in the overhead console, in between the two reading lamps. The switch is mounted in the overhead console with four plastic retaining tabs, molded into the switch housing.

This switch incorporates four selections of operation open, auto open, close and vent. The individual switches in

the sunroof control switch unit cannot be repaired. If one switch is damaged or faulty, the entire sunroof control switch unit must be replaced.

OPERATION

SWITCH - SUNROOF CONTROL

With the operation of the sunroof control switch, voltage is directed to the sunroof motor, through the switch contacts or control module. If the control switch is depressed and held depressed the voltage signal is controlled manually through the switch contacts, so when the switch is released the sunroof stops.

Refer to the Owner's Manual for more information on the operation of the sunroof switch and system.

DIAGNOSIS AND TESTING

SWITCH - SUNROOF CONTROL

The following test will determine if the sunroof control switch is operating properly.

- 1. Remove the overhead console from the headliner, refer to **REMOVAL** .
- 2. Remove the sunroof control switch from the overhead console, see **REMOVAL**.
- 3. Using an ohmmeter, test the switch terminals for proper continuity using the table below. If any of the terminals do not show proper continuity, replace the sunroof control switch.

SWITCH POSITION (DEPRESSED)	CONTINUITY BETWEEN TERMINALS
VENT (V)	3, 4
OPEN (AUTO)	1, 4
CLOSE	2, 4

REMOVAL

SWITCH - SUNROOF CONTROL

- 1. Disconnect and isolate the negative battery cable.
- 2. Remove the overhead console from the headliner, refer to **REMOVAL** .
- 3. Disconnect the sunroof control switch electrical connector. Depress the connector retaining tab and pull the connector straight out.
- 4. To remove the switch from the overhead console, push on the back of the switch until it comes free from the overhead console.

INSTALLATION

SWITCH - SUNROOF CONTROL

- 1. Install the switch in the overhead console assembly. Be certain the switch is securely snapped in place.
- 2. Connect the sunroof control switch electrical connector. Be certain the switch connector is securely

snapped in place.

3. Install the overhead console, refer to **INSTALLATION** .
4. Connect the negative battery cable.

TROUGH - SUNROOF

REMOVAL

TROUGH - SUNROOF

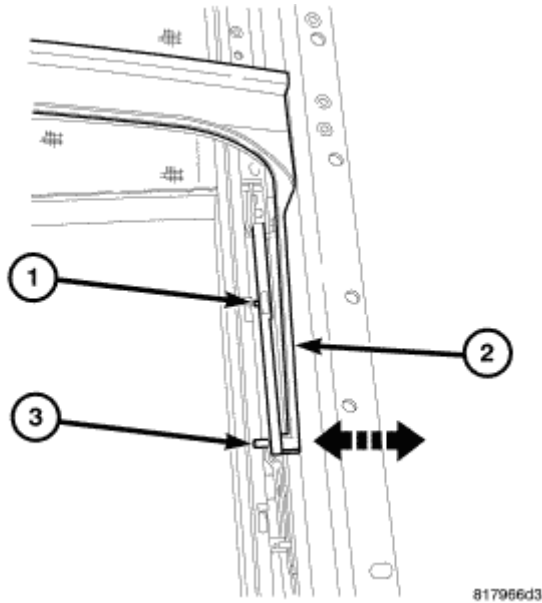


Fig. 719: Separating/Installing Trough Pins From Glass Lift Mechanisms
Courtesy of CHRYSLER LLC

1. Remove the glass, see **REMOVAL**.
2. Separate the trough pins (3) from the glass lift mechanisms (1).

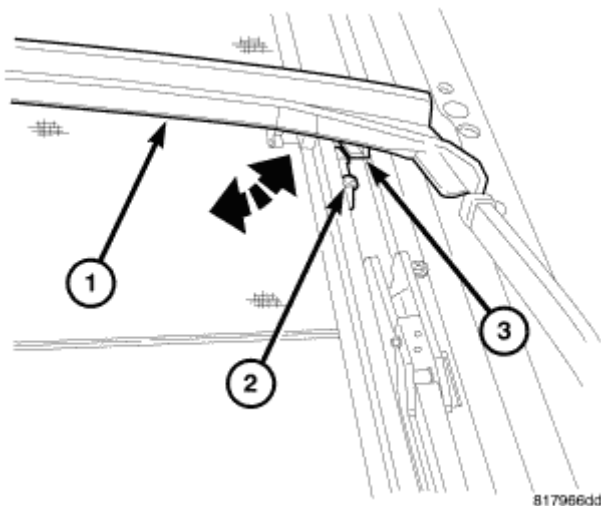


Fig. 720: Pushing Down On Center Of Trough To Flatten It Out And Installing Remaining Trough Guide And Guide Shoe Into Track

Courtesy of CHRYSLER LLC

3. Slide trough (1) to one side and push down on the center of the trough until the guide shoe tab (3) releases from the track (2).
4. Slide the trough in the opposite direction to release the other shoe and lift the trough out of the sunroof opening.

INSTALLATION

TROUGH - SUNROOF

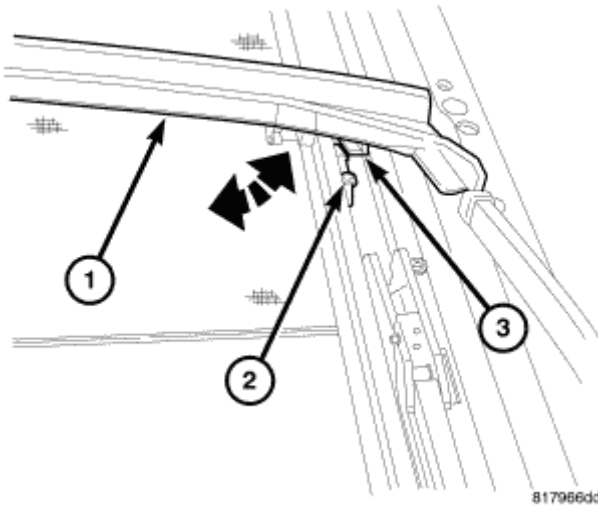


Fig. 721: Pushing Down On Center Of Trough To Flatten It Out And Installing Remaining Trough Guide And Guide Shoe Into Track

Courtesy of CHRYSLER LLC

1. Insert one of the trough guides (3) and guide shoe (2) into the track.
2. Push down on the center of the trough (1) to flatten it out and install the remaining trough guide (3) and guide shoe (2) into the track.

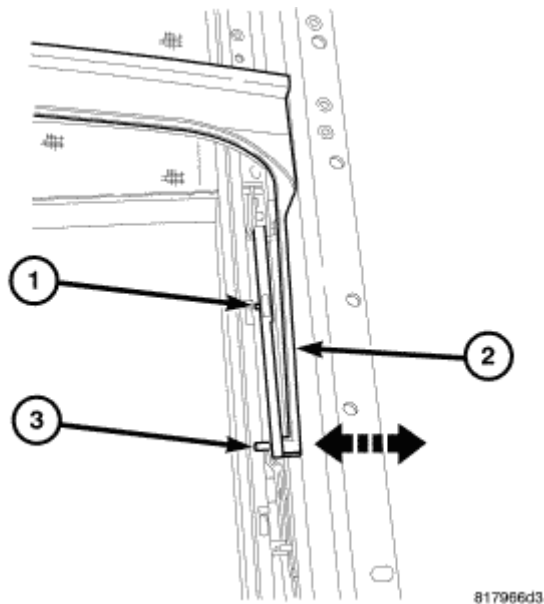


Fig. 722: Separating/Installing Trough Pins From Glass Lift Mechanisms
 Courtesy of CHRYSLER LLC

3. Install the trough guide pins into the glass lift mechanism (3) and seat fully.
4. Install the glass, see INSTALLATION.

WEATHERSTRIP/SEALS

WEATHERSTRIP - A-PILLAR

REMOVAL

WEATHERSTRIP - A-PILLAR

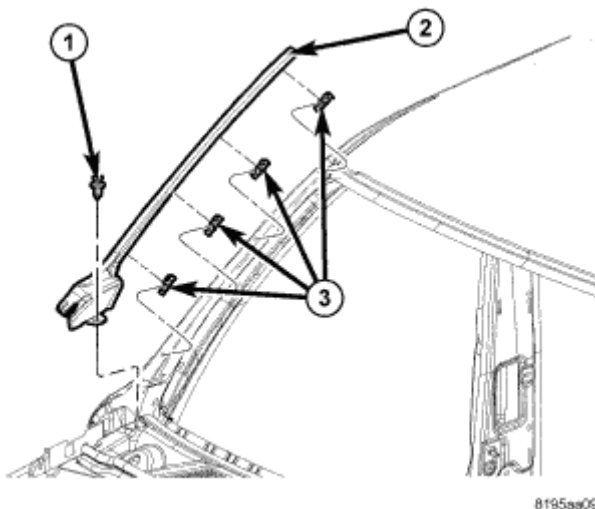


Fig. 723: Push Pin, Windshield A-Pillar Molding & Clips
 Courtesy of CHRYSLER LLC

1. Using a trim stick C-4755 or equivalent, remove the push pin (1).
2. Remove the windshield A-pillar molding (2) and clips (3) from the windshield A-pillar.

INSTALLATION

WEATHERSTRIP - A-PILLAR

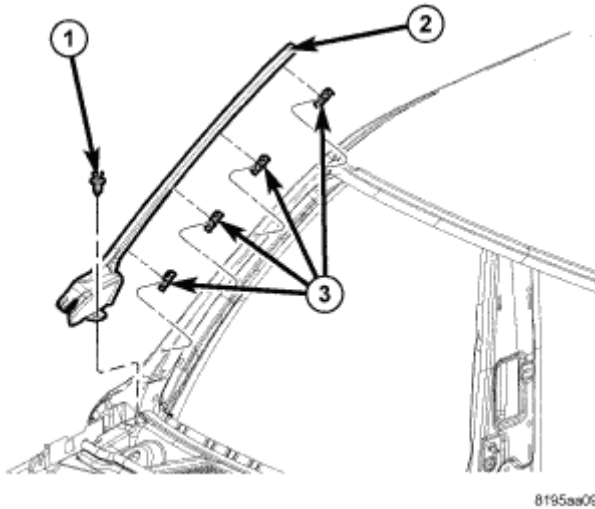


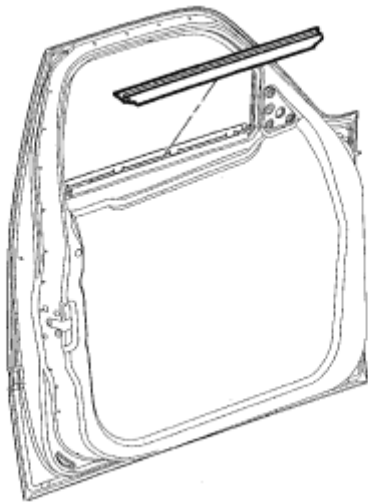
Fig. 724: Push Pin, Windshield A-Pillar Molding & Clips
Courtesy of CHRYSLER LLC

1. Install the windshield A-pillar molding (2) and clips (3) to the windshield A-pillar.
2. Install the push pin (1).

WEATHERSTRIP - FDB - INNER

REMOVAL

WEATHERSTRIP - FDB - INNER



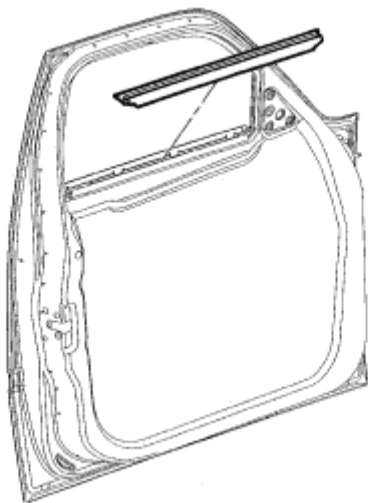
8196a4f2

Fig. 725: Removing/Installing Inner Door Weatherstrip
 Courtesy of CHRYSLER LLC

1. Remove the door trim panel, see **REMOVAL**.
2. Rotate the outer belt molding outboard while pulling up to disengage the retention tabs.

INSTALLATION

WEATHERSTRIP - FDB - INNER



8196a4f2

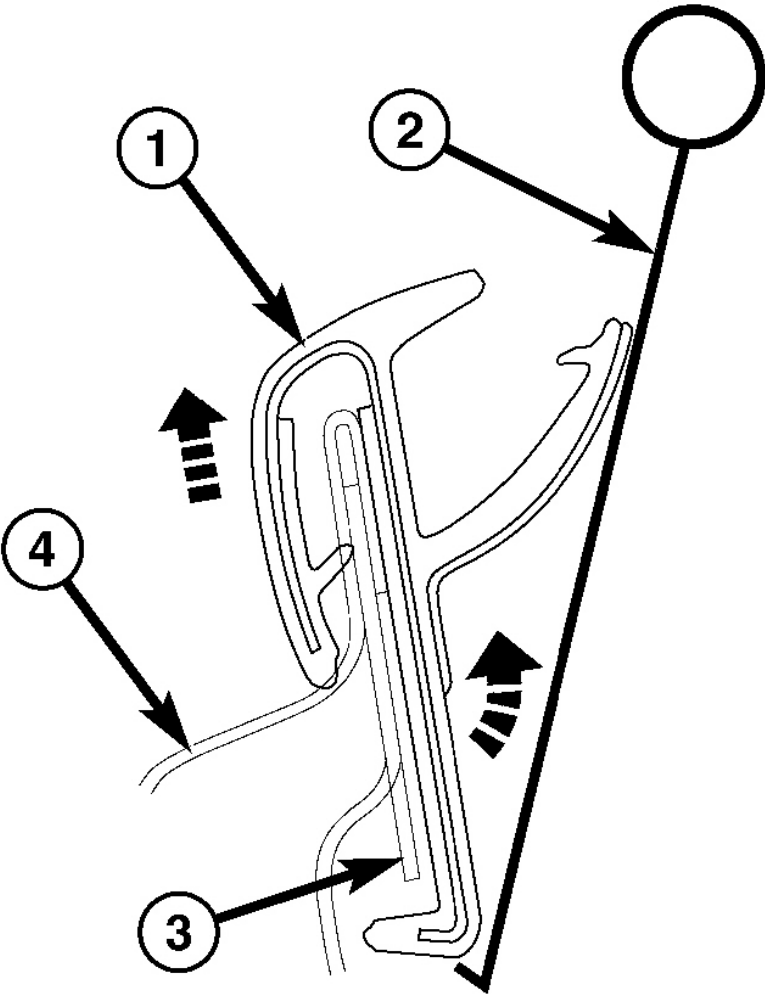
Fig. 726: Removing/Installing Inner Door Weatherstrip
 Courtesy of CHRYSLER LLC

1. Press the belt molding onto the trim panel flange starting at the rear and working forward.
2. Install the door trim panel, see **INSTALLATION**.

WEATHERSTRIP - FDB - OUTER

REMOVAL

WEATHERSTRIP - FDB - OUTER



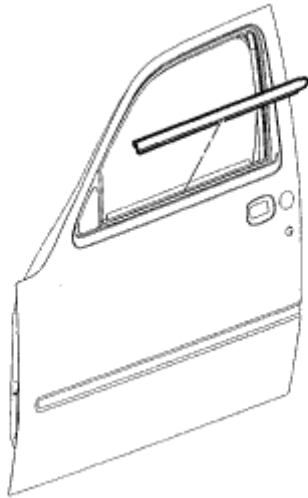
80bfd7d

Fig. 727: Identifying Outer Belt Molding
Courtesy of CHRYSLER LLC

- 1 - OUTER BELT MOLDING
- 2 - SPECIAL TOOL #9093
- 3 - RETAINING TAB
- 4 - DOOR OUTER PANEL

1. Lower window completely.

2. Insert the outer door belt molding removal tool - 9093 between belt molding and glass at rear and then slide tool forward approximately 14 cm (5.5 in.).
3. Push down on outer belt molding and rotate upper part of tool outward from vehicle approximately 6 - 8 cm (2.5 - 3 in.) then lift up on molding to disengage from locking tab.
4. Repeat step 2 and 3 at 28 cm (11 in.), 43 cm (17 in.), and 57 cm (22.5 in.) from rear of door.



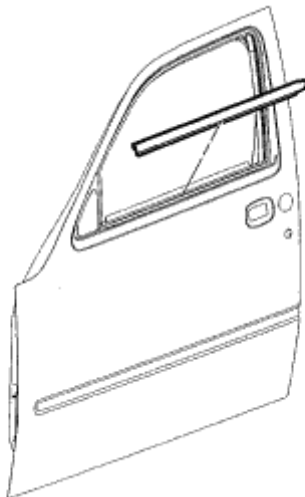
8196a374

Fig. 728: Removing/Installing Outer Belt Molding
Courtesy of CHRYSLER LLC

5. Remove outer belt molding.

INSTALLATION

WEATHERSTRIP - FDB - OUTER



8196a374

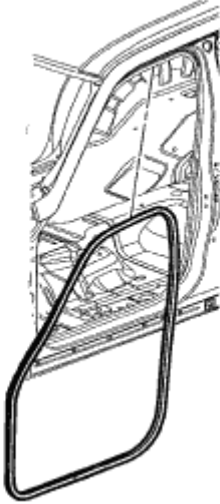
Fig. 729: Removing/Installing Outer Belt Molding
Courtesy of CHRYSLER LLC

1. Press the outer belt molding onto the outer door window flange starting at the rear and working forward.
2. Cycle the window to make sure the window doesn't bind on the outer belt molding.

WEATHERSTRIP - FRONT DOOR

REMOVAL

WEATHERSTRIP - FRONT DOOR



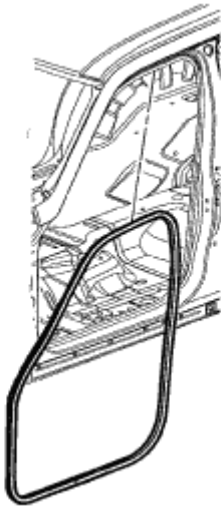
8196a061

Fig. 730: Front Door Weatherstrip
Courtesy of CHRYSLER LLC

1. Open the front door.
2. Remove weatherstrip from the body mount flange.

INSTALLATION

WEATHERSTRIP - FRONT DOOR



8196a061

Fig. 731: Front Door Weatherstrip
Courtesy of CHRYSLER LLC

NOTE: Position the seal to the bottom of the door opening, with bulb facing outboard, starting the installation at the center of the lower flange. Press the seal onto the sill flange and work around the perimeter of the door opening until fully seated. Work 1/2 the way around and then start at the other end of the seal working back, making sure the splice joint has no gap and smoothing the seal to avoid puckers or wrinkles. If in extreme cold temperatures preheating the weatherstrip to 23.8° C (75° F) may be required to fully seat the weatherstrip.

1. Install the weatherstrip to the body mount flange.
2. Trim the weatherstrip if necessary, and connect the ends together along the flange.

WEATHERSTRIP - FD - MOUNTED

REMOVAL

WEATHERSTRIP - FD - MOUNTED

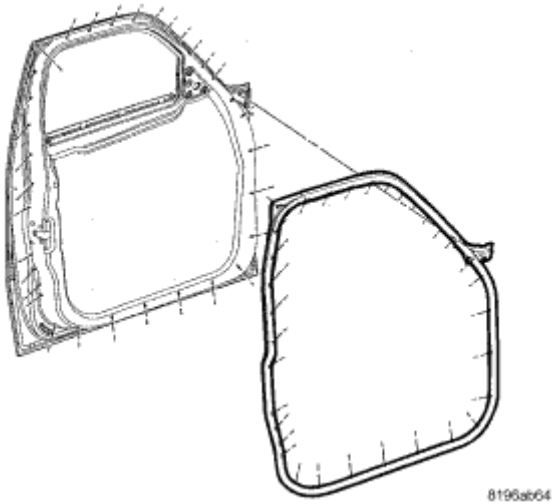


Fig. 732: Front Door Mounted Weatherstrip
Courtesy of CHRYSLER LLC

1. Carefully remove the plastic hook style clips on the weatherstrip from the door and remove the seal from the door.

INSTALLATION

WEATHERSTRIP - FD - MOUNTED

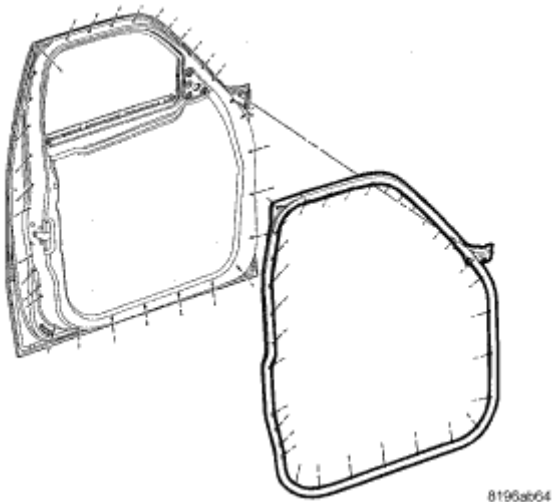


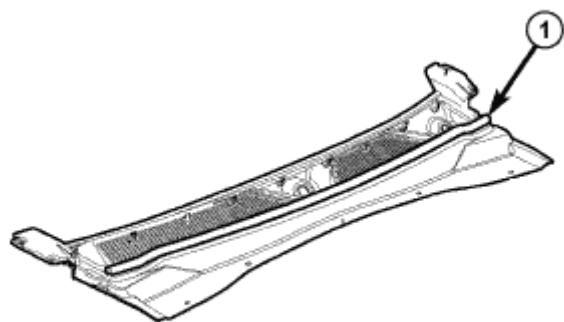
Fig. 733: Front Door Mounted Weatherstrip
Courtesy of CHRYSLER LLC

1. Position the seal correctly and install the plastic hook style clips on the weatherstrip to the door.

WEATHERSTRIP - HOOD TO COWL

REMOVAL

WEATHERSTRIP - HOOD TO COWL



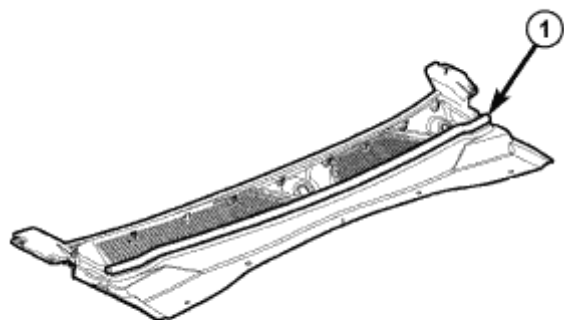
81950af1

Fig. 734: Cowl Weather-Strip
Courtesy of CHRYSLER LLC

1. Raise and support the hood.
2. Remove the cowl weather-strip (1) by peeling the cowl seal from the cowl grille.

INSTALLATION

WEATHERSTRIP - HOOD TO COWL



81950af1

Fig. 735: Cowl Weather-Strip
Courtesy of CHRYSLER LLC

1. Install the cowl weather-strip (1) to the cowl grille.
2. Remove the hood support rod and lower the hood.

WEATHERSTRIP - LIFT GATE OPENING

REMOVAL

WEATHERSTRIP - LIFT GATE OPENING

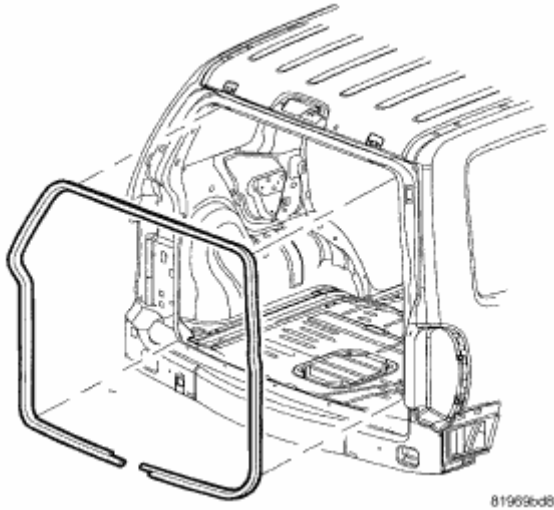


Fig. 736: Lift Gate Opening Weatherstrip
Courtesy of CHRYSLER LLC

1. Open the lift gate.
2. Remove the weatherstrip seal from the lift gate opening.

INSTALLATION

WEATHERSTRIP - LIFT GATE OPENING

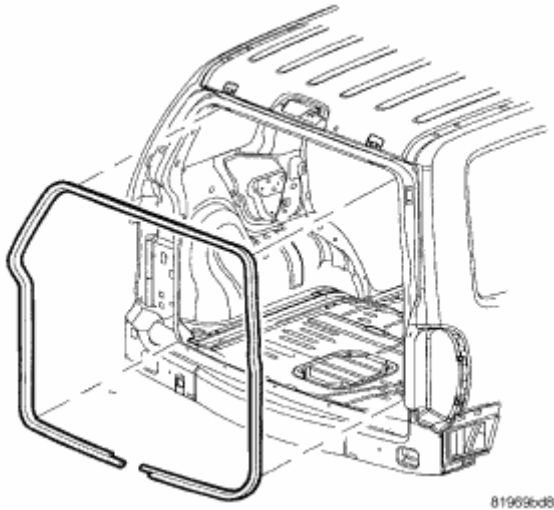


Fig. 737: Lift Gate Opening Weatherstrip
Courtesy of CHRYSLER LLC

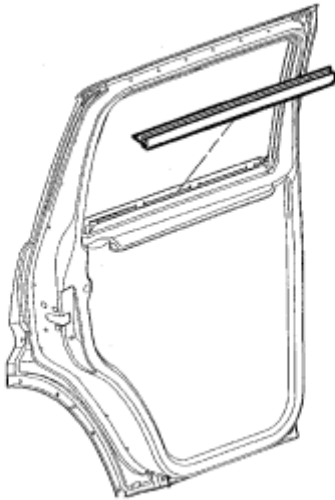
NOTE: **Seat the lift gate weatherstrip fully into all corners without stretching. If in extreme cold temperatures preheating the weatherstrip to 23.8° C (75° F) may be required to fully seat the weatherstrip.**

1. Install the weatherstrip to the upper right and left hand corners of the lift gate opening.
2. Using hand pressure seat the seal into the upper corners then seat across the header.
3. Seat the seal down the D-pillar to the lower flange on both sides.
4. Seat the seal along the lower flange to the slice joint.
5. Trim the weatherstrip if necessary, and connect the ends together along the flange.

WEATHERSTRIP - RDB - INNER

REMOVAL

WEATHERSTRIP - RDB - INNER



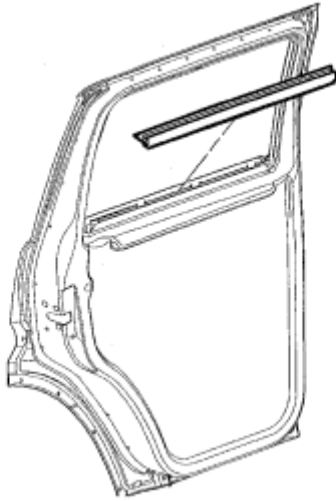
8196ss73

Fig. 738: Removing/Installing Inner Belt Molding Outboard
Courtesy of CHRYSLER LLC

1. Remove the door trim panel, see **REMOVAL**.
2. Rotate the inner belt molding outboard while pulling up to disengage the retention tabs.

INSTALLATION

WEATHERSTRIP - RDB - INNER



8196as73

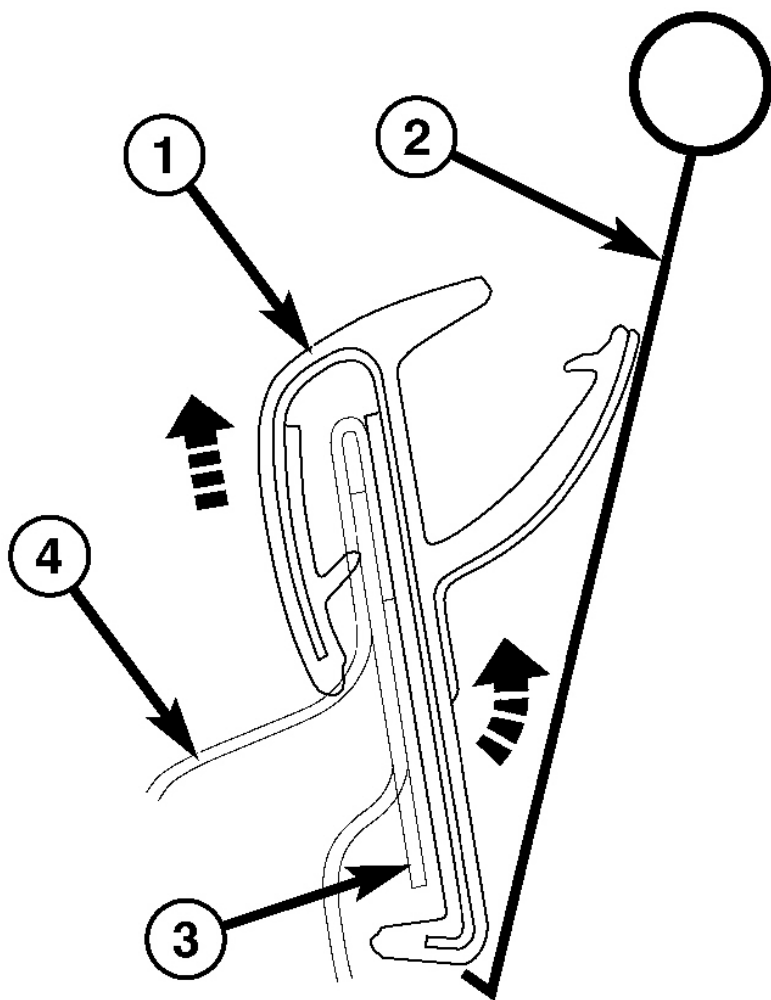
Fig. 739: Removing/Installing Inner Belt Molding Outboard
Courtesy of CHRYSLER LLC

1. Press the belt molding onto the trim panel flange starting at the rear and working forward.
2. Install the door trim panel, see **INSTALLATION**.

WEATHERSTRIP - RDB - OUTER

REMOVAL

WEATHERSTRIP - RDB - OUTER



80bfd7d

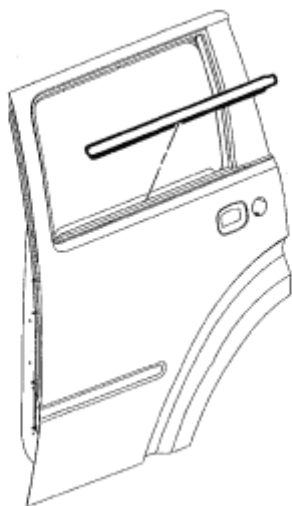
Fig. 740: Identifying Outer Belt Molding
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - OUTER BELT MOLDING
2 - SPECIAL TOOL #9093
3 - RETAINING TAB
4 - DOOR OUTER PANEL |
|---|

1. Lower window completely.
2. Insert the outer door belt molding removal tool - 9093 between belt molding and glass at rear and then slide tool forward approximately 14 cm (5.5 in.).
3. Push down on outer belt molding and rotate upper part of tool outward from vehicle approximately 6 - 8

cm (2.5 - 3 in.) then lift up on molding to disengage from locking tab.

4. Repeat step 2 and 3 at 28 cm (11 in.), 43 cm (17 in.), and 57 cm (22.5 in.) from rear of door.



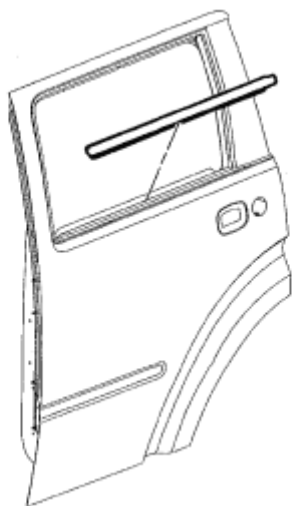
8196a414

Fig. 741: Removing/Installing Outer Belt Molding
Courtesy of CHRYSLER LLC

5. Remove outer belt molding.

INSTALLATION

WEATHERSTRIP - RDB - OUTER



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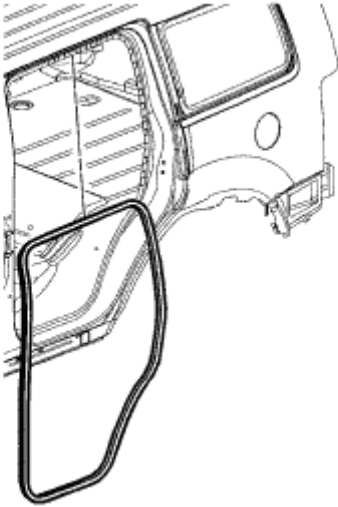
Fig. 742: Removing/Installing Outer Belt Molding
Courtesy of CHRYSLER LLC

1. Press the outer belt molding onto the outer door window flange starting at the rear and working forward.
2. Cycle the window to make sure the window doesn't bind on the outer belt molding.

WEATHERSTRIP - REAR DOOR

REMOVAL

WEATHERSTRIP - REAR DOOR



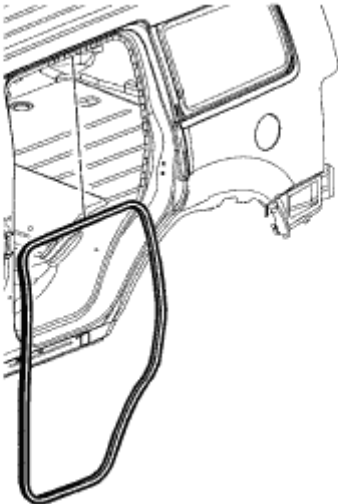
8196a006

Fig. 743: Rear Door Weatherstrip
Courtesy of CHRYSLER LLC

1. Open the rear door.
2. Remove weatherstrip from the body mount flange.

INSTALLATION

WEATHERSTRIP - REAR DOOR



8196a006

Fig. 744: Rear Door Weatherstrip
Courtesy of CHRYSLER LLC

NOTE: Position the seal to the bottom of the door opening, with bulb facing outboard, starting the installation at the center of the lower flange. Press the seal onto the sill flange and work around the perimeter of the door opening until fully seated. Work 1/2 the way around and then start at the other end of the seal working back, making sure the splice joint has no gap and smoothing the seal to avoid puckers or wrinkles. If in extreme cold temperatures preheating the weatherstrip to 23.8° C (75° F) may be required to fully seat the weatherstrip.

1. Install the weatherstrip to the body mount flange.
2. Trim the weatherstrip if necessary, and connect the ends together along the flange.

WEATHERSTRIP - RD - MOUNTED

REMOVAL

WEATHERSTRIP - RD - MOUNTED

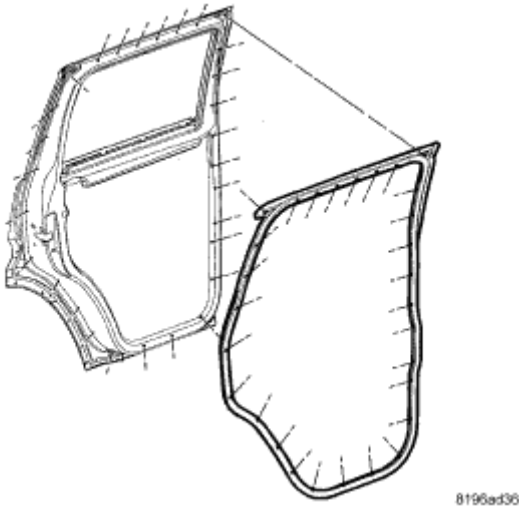


Fig. 745: Rear Door Mounted Weatherstrip
Courtesy of CHRYSLER LLC

1. Carefully remove the plastic hook style clips on the weatherstrip from the door and remove the seal from the door.

INSTALLATION

WEATHERSTRIP - RD - MOUNTED

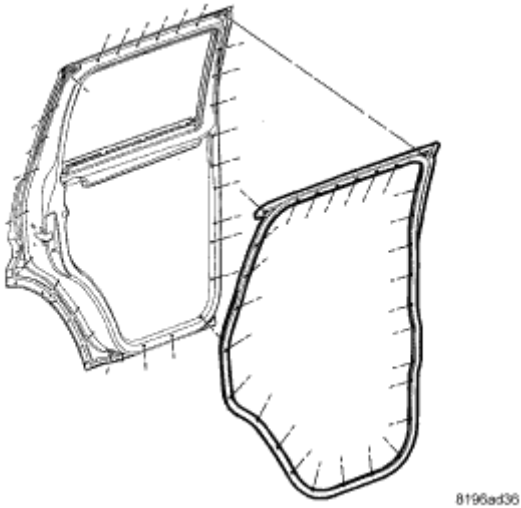


Fig. 746: Rear Door Mounted Weatherstrip
Courtesy of CHRYSLER LLC

1. Position the seal correctly and install the plastic hook style clips on the weatherstrip to the door.

BODY STRUCTURE

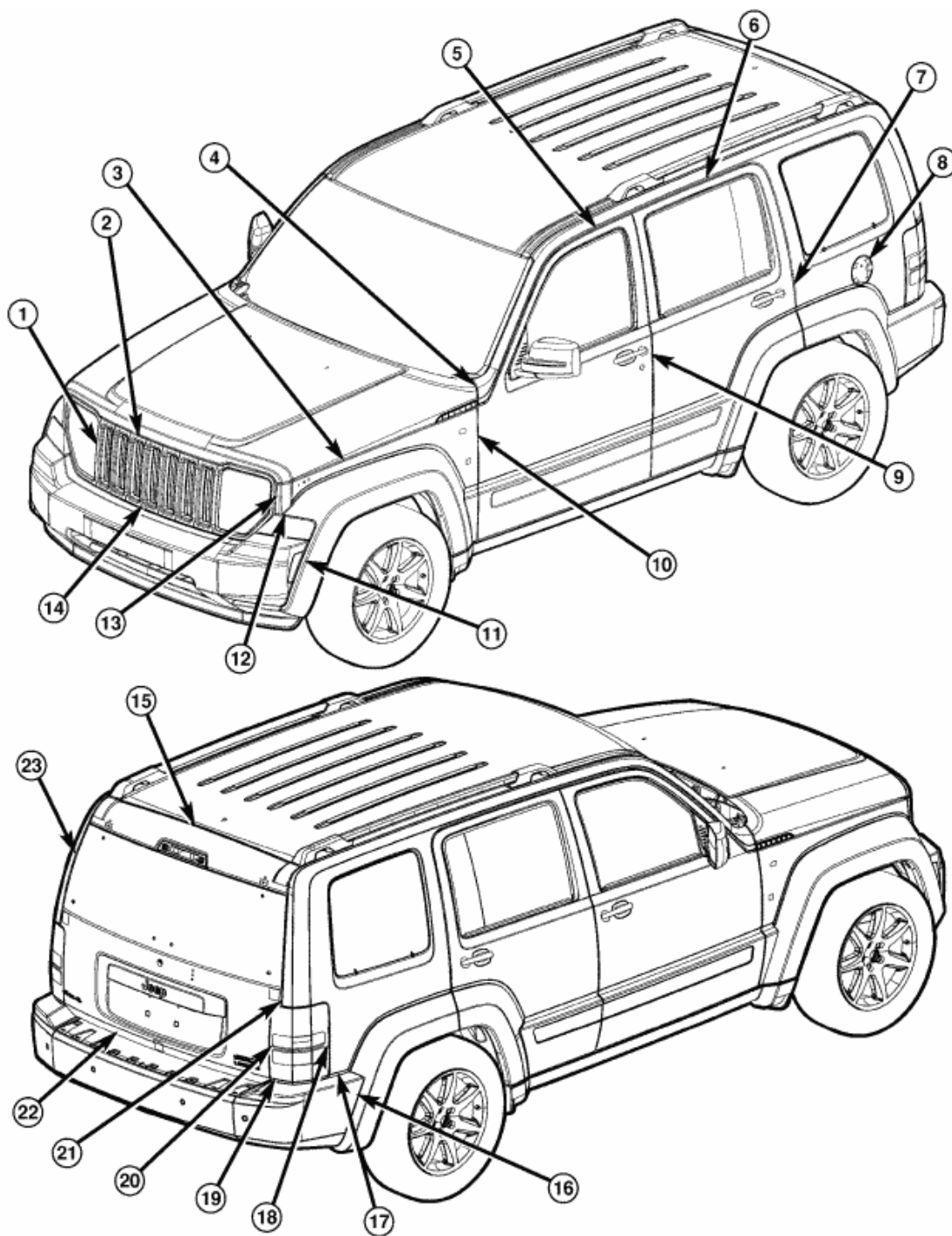
GAP AND FLUSH

SPECIFICATIONS

GAP AND FLUSH

INDEX

DESCRIPTION	FIGURE
BODY GAP AND FLUSH	<u>Fig. 747.</u>



81d982fa

Fig. 747: Gap And Flush Measurements
 Courtesy of CHRYSLER LLC

NOTE: All dimensions are in millimeters.

O/F = Over Flush

U/F = Under Flush

U/D = Up/Down

F/A = Fore/Aft

DIMENSION	DESCRIPTION	GAP	FLUSH
1	Headlamp to Grille	3.0 +/- 2.0 Parallel within 2.0	-
2	Hood to Grille	8.0 +/- 2.0 Parallel within 2.0	O/F -2.0 +/- 2.0 Parallel within 2.0
3	Hood to Fender	7.0 +/- 1.5 Parallel within 1.5	O/F 1.0 +/- 1.5 Parallel within 1.5
4	Hood to Body Side Aperture	4.5 +/- 1.5 Parallel within 1.5	O/F 0.5 +/- 1.5 Parallel within 1.5
5	Front Door to Body Side Aperture	4.5 +/- 1.5 Parallel within 1.0 Except 7.25 +/- 1.25 @ A-pillar U/D	U/F -1.5 +/- 1.5 Parallel within 1.5
6	Rear Door to Body Side Aperture (above belt)	4.5 +/- 1.5 Parallel within 1.5	U/F 1.5 +/- 1.5 Parallel within 1.5
7	Rear Door to Body Side Aperture (below belt)	4.5 +/- 1.5 Parallel within 1.5	0.0 +/- 1.5 Parallel within 1.5
8	Fuel Door to Body Side Aperture	3.25 +/- 1.0 Parallel within 1.0	U/F 0.75 +/-1.0 Parallel within 1.0
9	Front Door to Rear Door	4.5 +/- 1.5 Parallel within 1.5	0.0 +/- 1.5 Parallel within 1.5
10	Fender to Door	4.5 +/- 1.5 Parallel within 1.5	O/F 1.0 +/- 1.5 Parallel within 1.5
11	Fascia to Fender Flare	3.0 +/- 2.0 Parallel within 2.0 Centered within 2.0	-
12	Side Marker to Fender	3.0 +/- 2.0	-
13	Grille to Fender	5.5 +/- 2.0 Parallel within 2.0 Centered within 2.0	U/F -1.0 +/- 2.0 Parallel within 2.0
14	Fascia to Grille	4.0 +/- 2.0 Parallel within 2.0	-
15	Lift Gate to Roof	9.0 +/- 1.5 Parallel within 1.5	U/F -1.5 +/- 1.5 Parallel within 1.5
16	Fascia to Rear Wheel Flare	3.0 +/- 2.0 Centered within 2.0	-
17	Fascia to Body Side Aperture	0.0 +/- 1.0 -0.0	-
		2.0 +/- 1.5	U/F 0.75 +/-2.0

18	Tail Lamp to Body Side Aperture	Parallel within 1.5 F/A 4.0 +/- 1.5 Centered within 2.0 U/D	Parallel within 2.0 Centered within 2.0
19	Tail Lamp to Fascia	3.0 +/- 2.0 Parallel within 2.0 Centered within 2.0	-
20	Tail Lamp to Lift Gate	4.0 +/- 2.0 Parallel within 2.0 Centered within 2.0	O/F 1.0 +/- 2.0 Parallel within 2.0
21	Lift Gate to Body Side Aperture	4.0 +/- 1.0 Parallel within 1.0	U/F 1.75 +/- 1.5 Parallel within 1.5
22	Fascia to Lift Gate	Cross/Car: 4.0 +/- 2.0 Centered within 2.0 U/D: 8.0 +/- 2.0 Parallel within 2.0	-
23	Lift Gate Glass to Body Side Aperture	4.0 +/- 2.0 Parallel within 2.0 Centered within 2.0	U/F -2.5 +/- 2.0 Parallel within 2.0

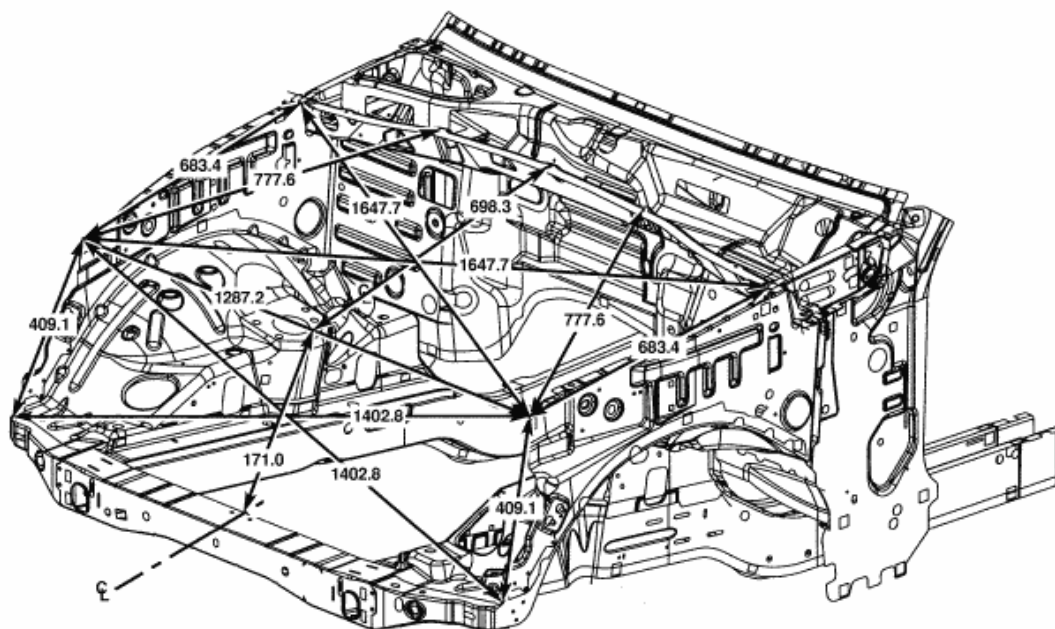
OPENING DIMENSIONS

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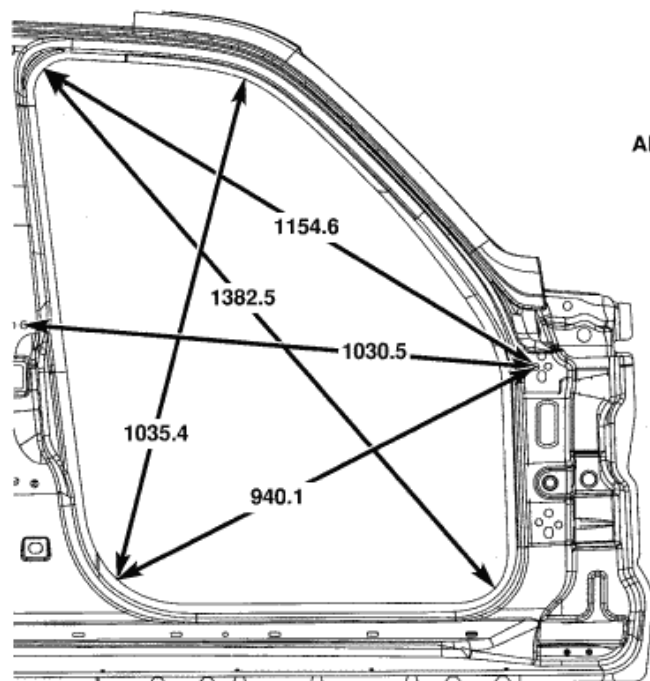
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WINDSHIELD	<u>Fig. 754.</u>



ALL DIMENSIONS ARE IN MILLIMETERS

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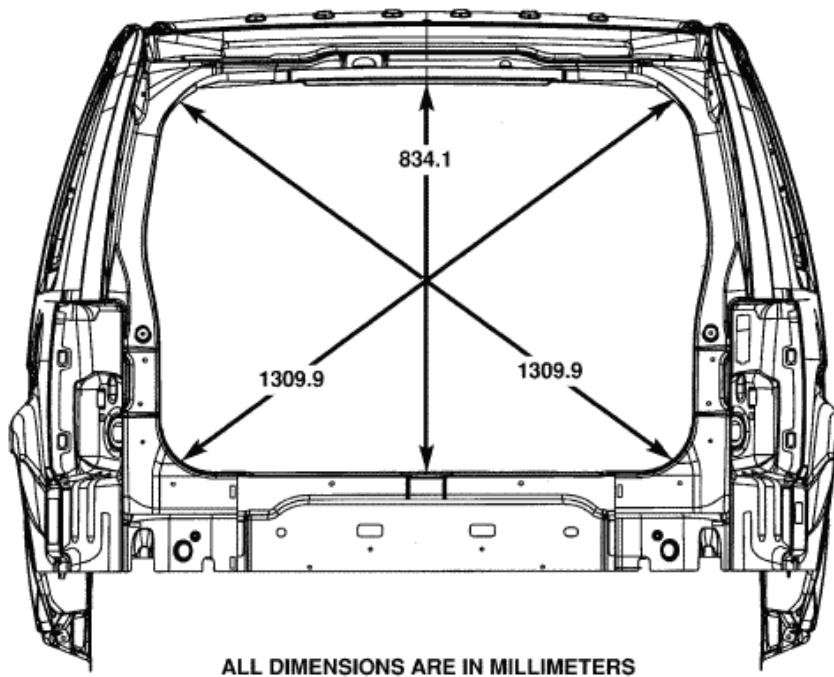
Fig. 748: Engine Box Dimensions
 Courtesy of CHRYSLER LLC



ALL DIMENSIONS ARE IN MILLIMETERS

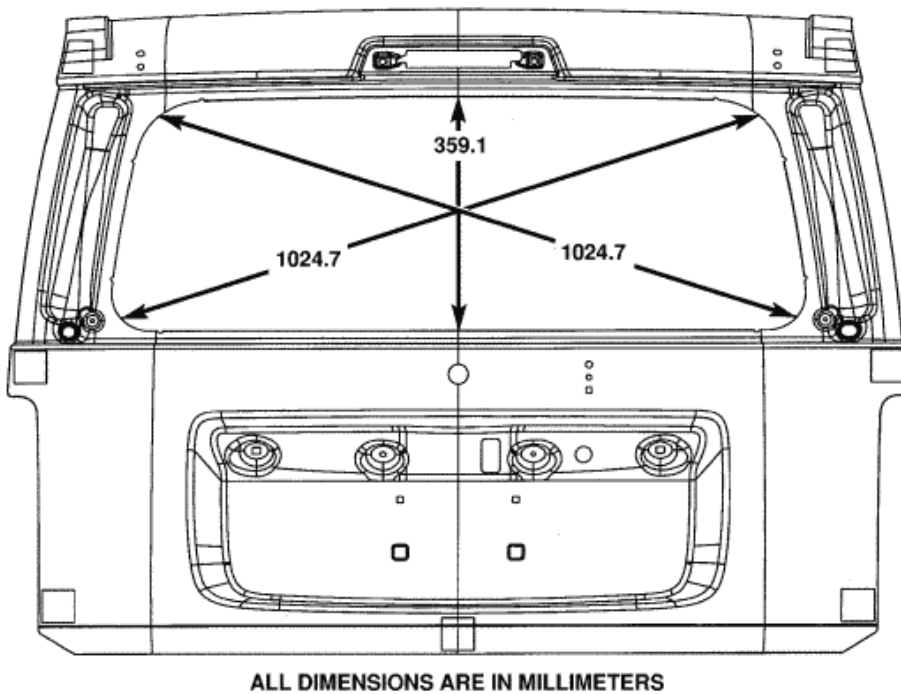
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Fig. 749: Front Door Dimensions
 Courtesy of CHRYSLER LLC



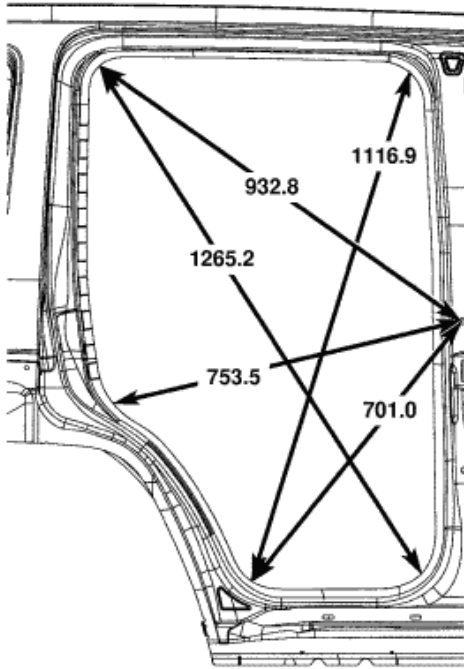
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Fig. 750: Liftgate Dimensions
 Courtesy of CHRYSLER LLC



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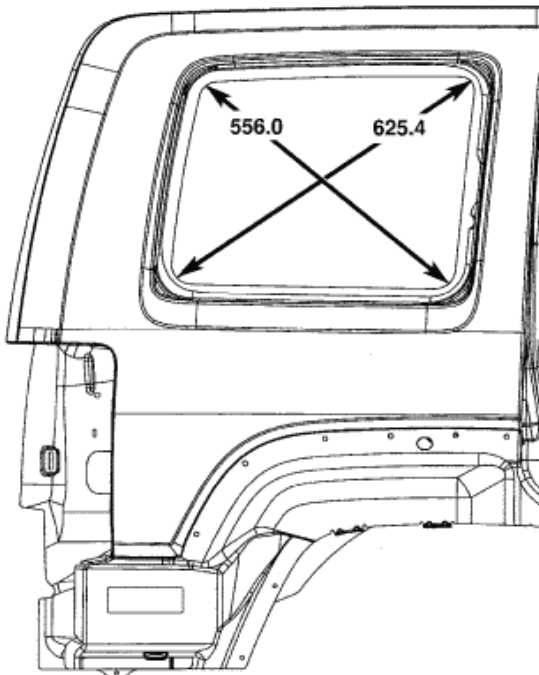
Fig. 751: Liftgate Window Dimensions
 Courtesy of CHRYSLER LLC



ALL DIMENSIONS ARE IN MILLIMETERS

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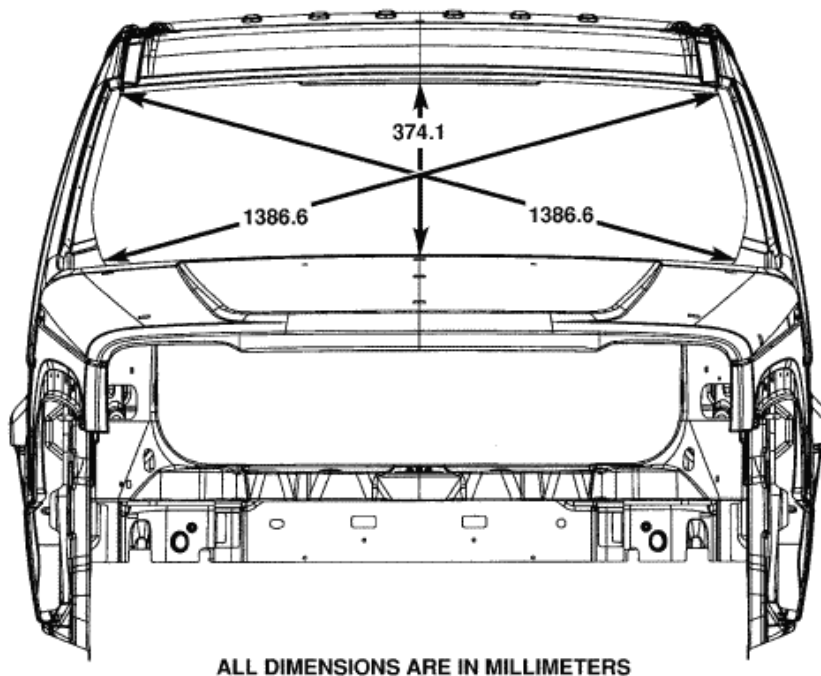
Fig. 752: Rear Door Dimensions
Courtesy of CHRYSLER LLC



ALL DIMENSIONS ARE IN MILLIMETERS

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Fig. 753: Rear Quarter Window Dimensions
Courtesy of CHRYSLER LLC



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Fig. 754: Windshield Dimensions
 Courtesy of CHRYSLER LLC

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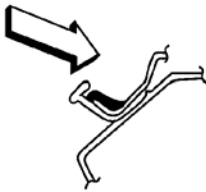
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HOLD GUN NOZZLE IN DIRECTION OF ARROW IN ORDER TO EFFECTIVELY SEAL METAL JOINTS.



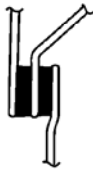
DO NOT HOLD GUN NOZZLE IN DIRECTION OF ARROW. SEALER APPLIED AS SHOWN IN INEFFECTIVE.



3 METAL THICKNESS



2 METAL THICKNESS



3 METAL THICKNESS



2 METAL THICKNESS

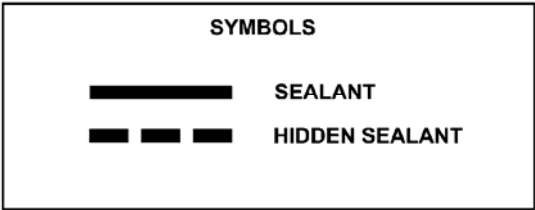
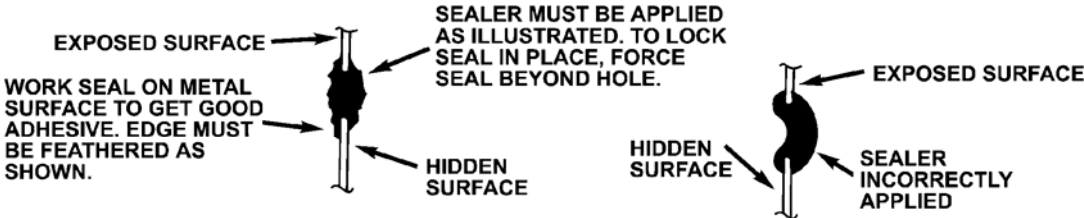
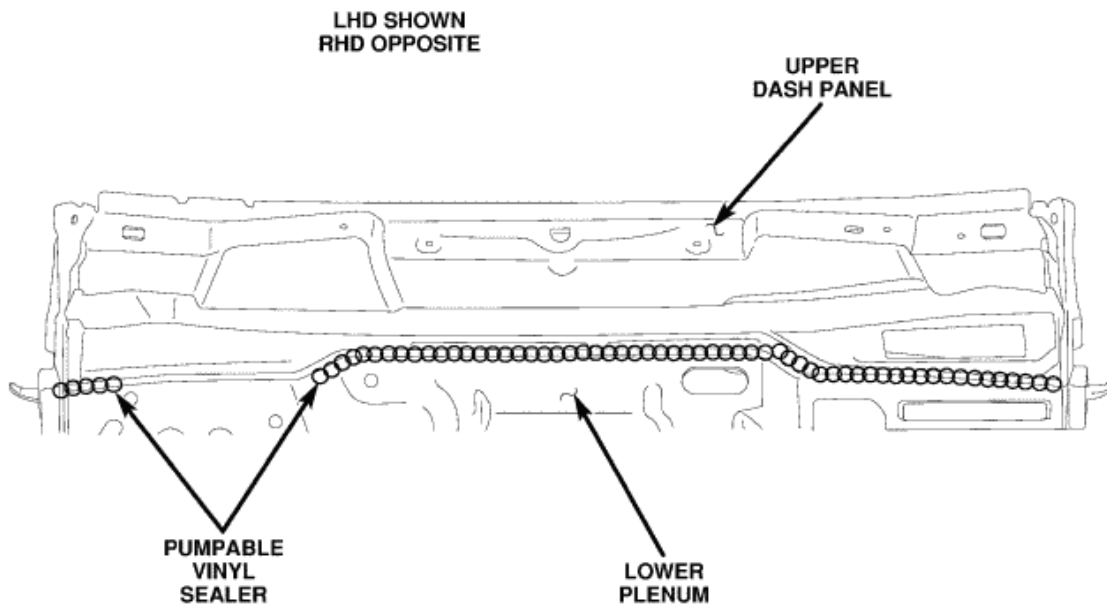
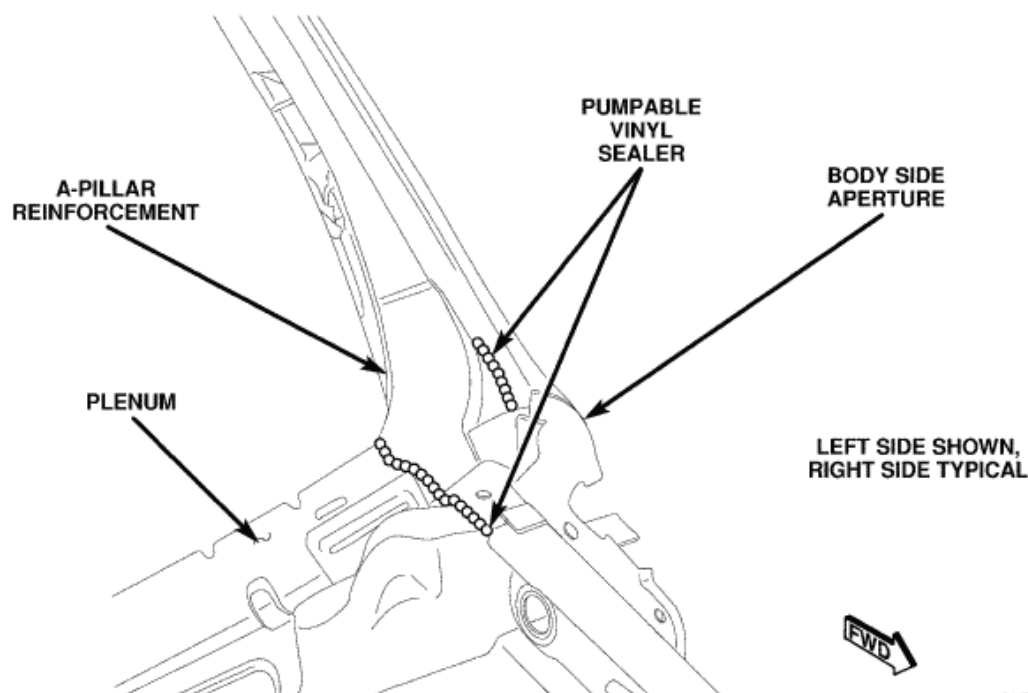


Fig. 755: Application Methods
 Courtesy of CHRYSLER LLC



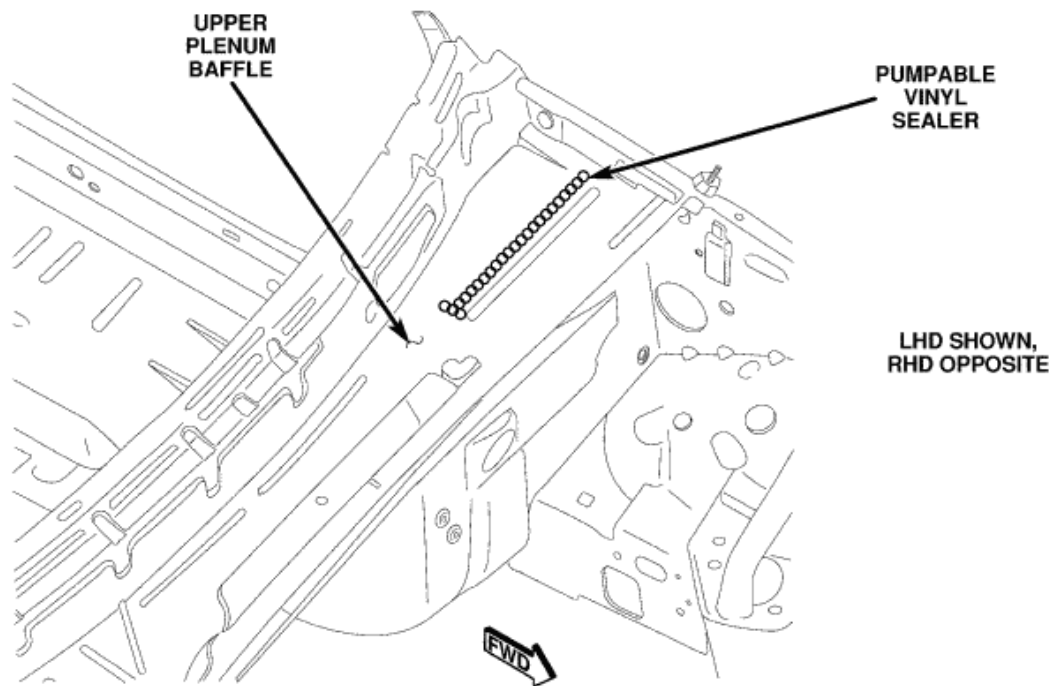
81d92914

Fig. 756: Upper Dash/Lower Plenum Sealer Locations
Courtesy of CHRYSLER LLC



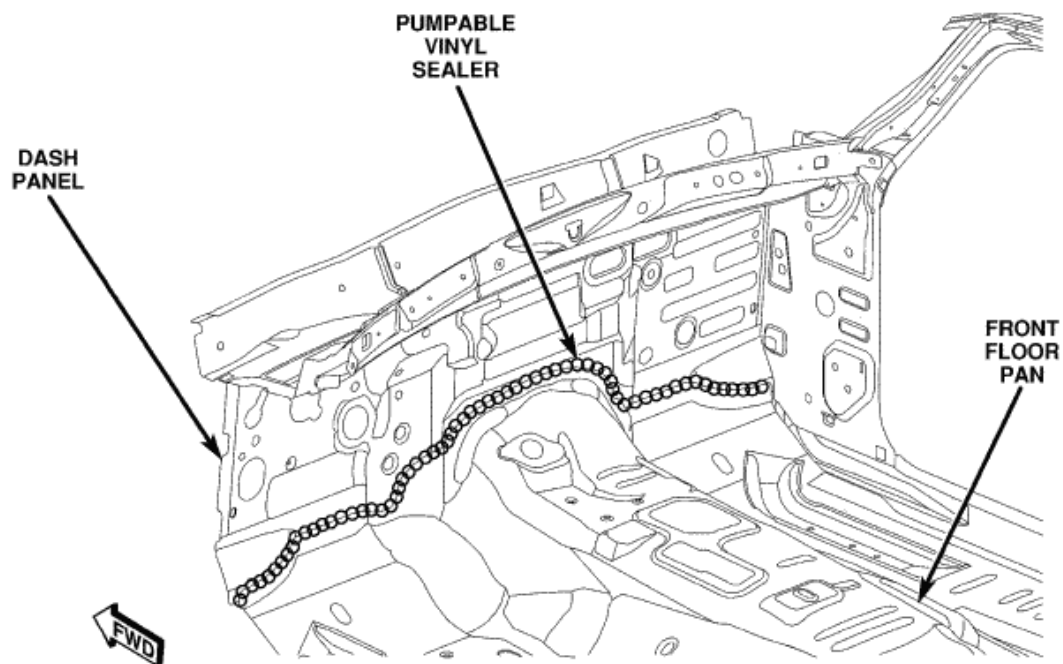
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Fig. 757: A-Pillar Reinforcement/Inner Body Side Aperture/Plenum Sealer Locations
Courtesy of CHRYSLER LLC



81d92a05

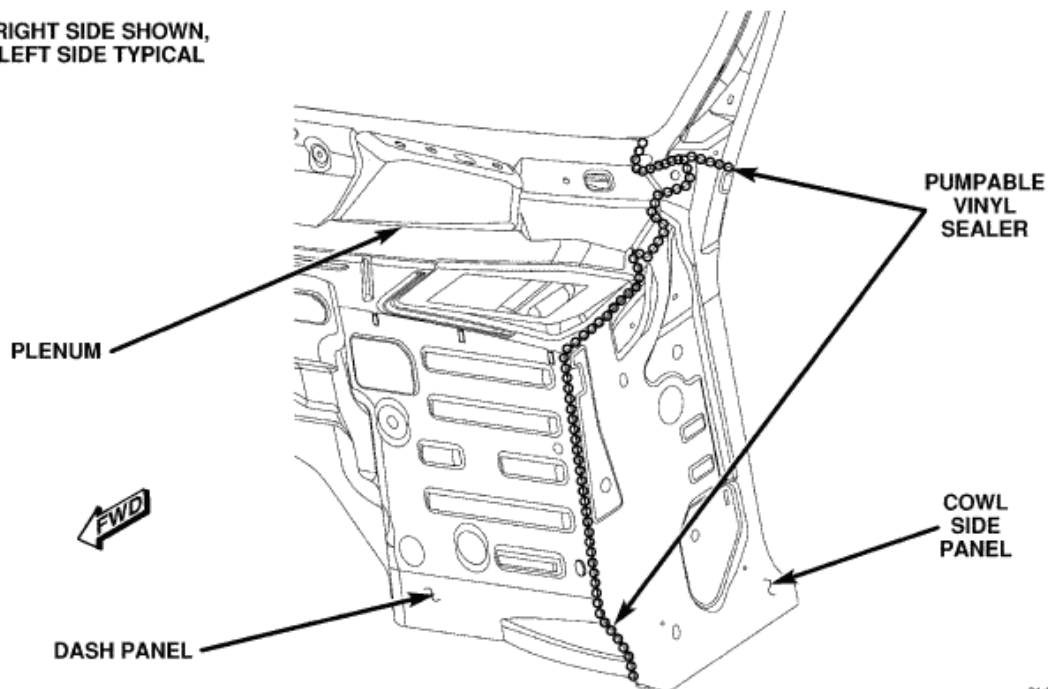
Fig. 758: Upper Plenum Baffle Sealer Locations
 Courtesy of CHRYSLER LLC



81d92a3a

Fig. 759: Dash/Front Floor Pan Sealer Locations
 Courtesy of CHRYSLER LLC

RIGHT SIDE SHOWN,
LEFT SIDE TYPICAL



81d931a0

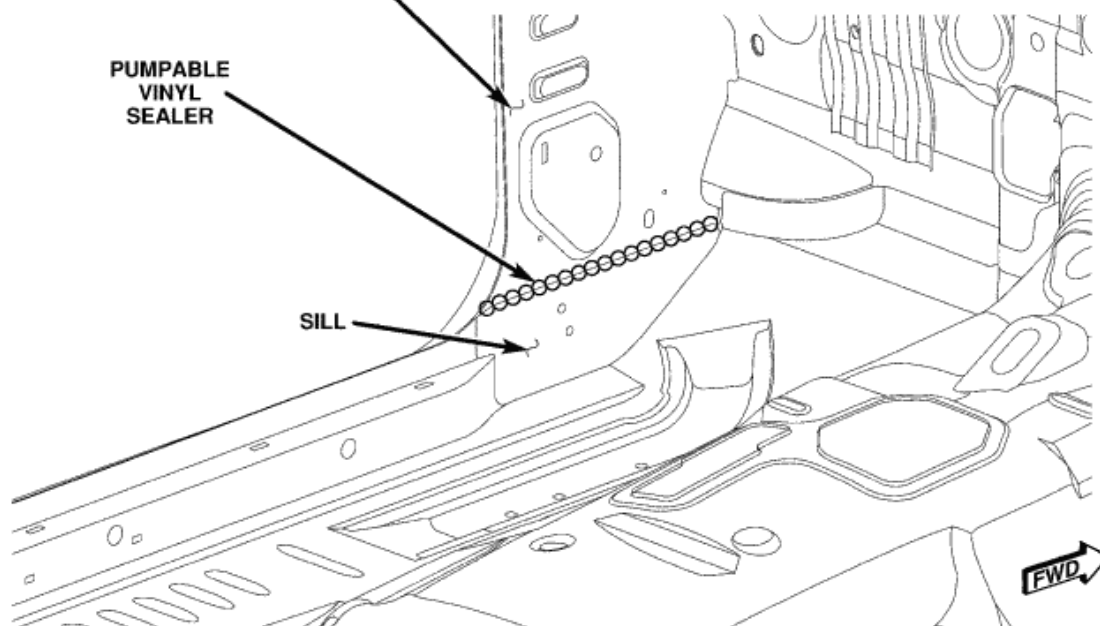
Fig. 760: Dash And Plenum/Cowl Side Sealer Locations
Courtesy of CHRYSLER LLC

COWL SIDE PANEL

LEFT SIDE SHOWN,
RIGHT SIDE TYPICAL

PUMPABLE
VINYL
SEALER

SILL



81d931a7

Fig. 761: Cowl Side/Body Side Sill Sealer Locations
Courtesy of CHRYSLER LLC

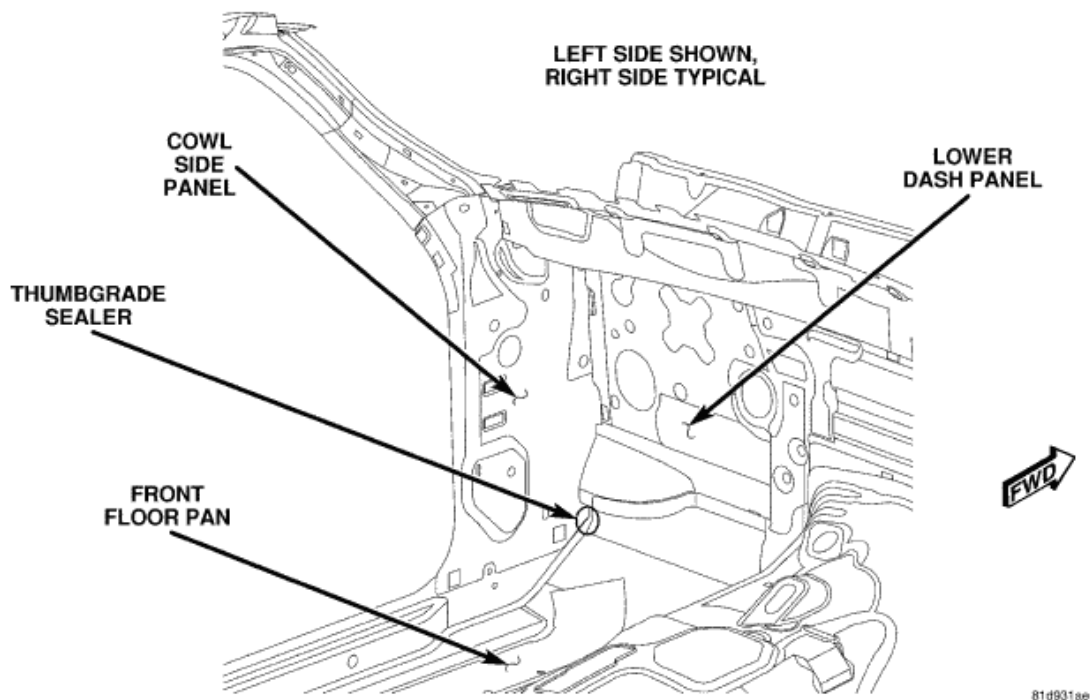


Fig. 762: Lower Dash/Front Floor Pan And Cowl Sealer Locations
 Courtesy of CHRYSLER LLC

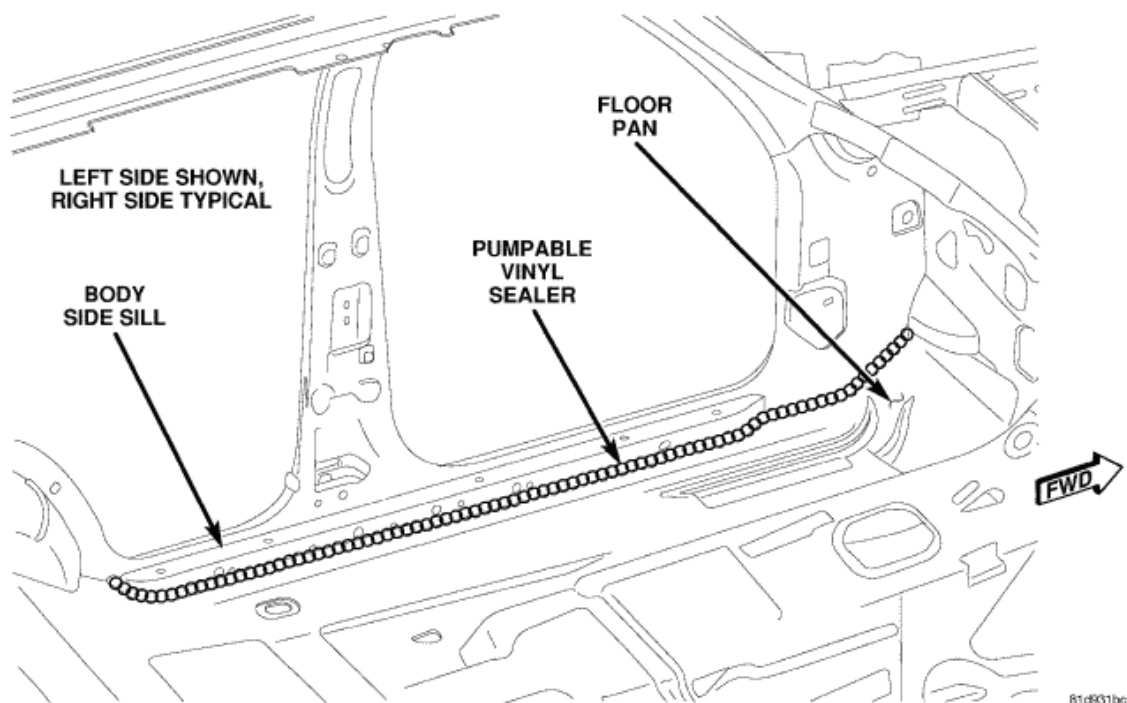
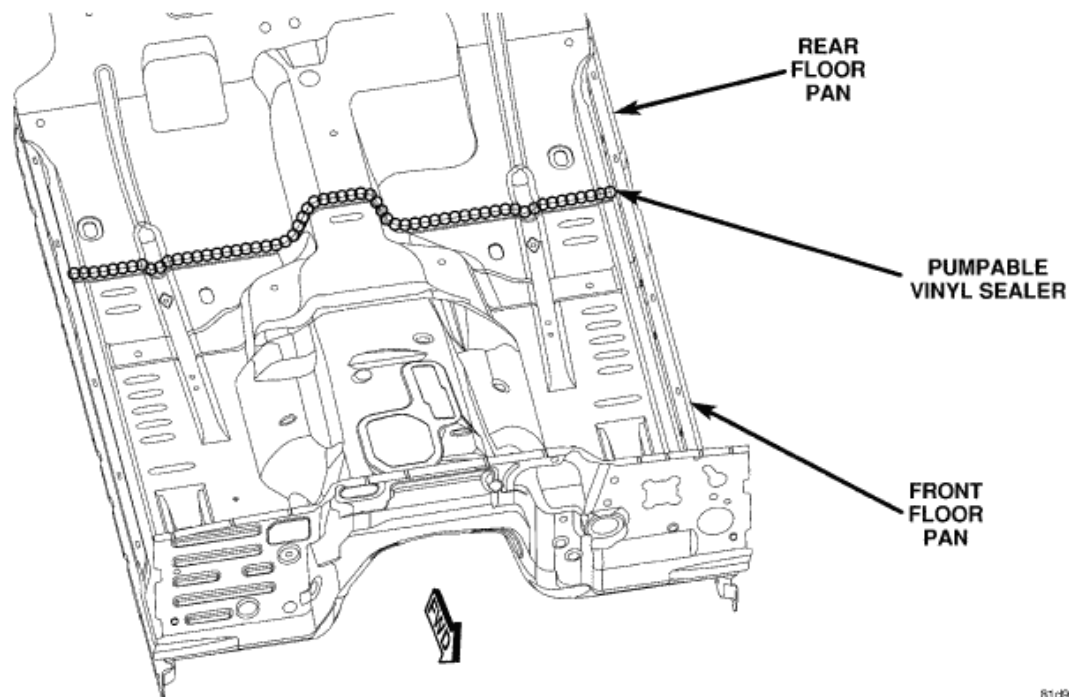
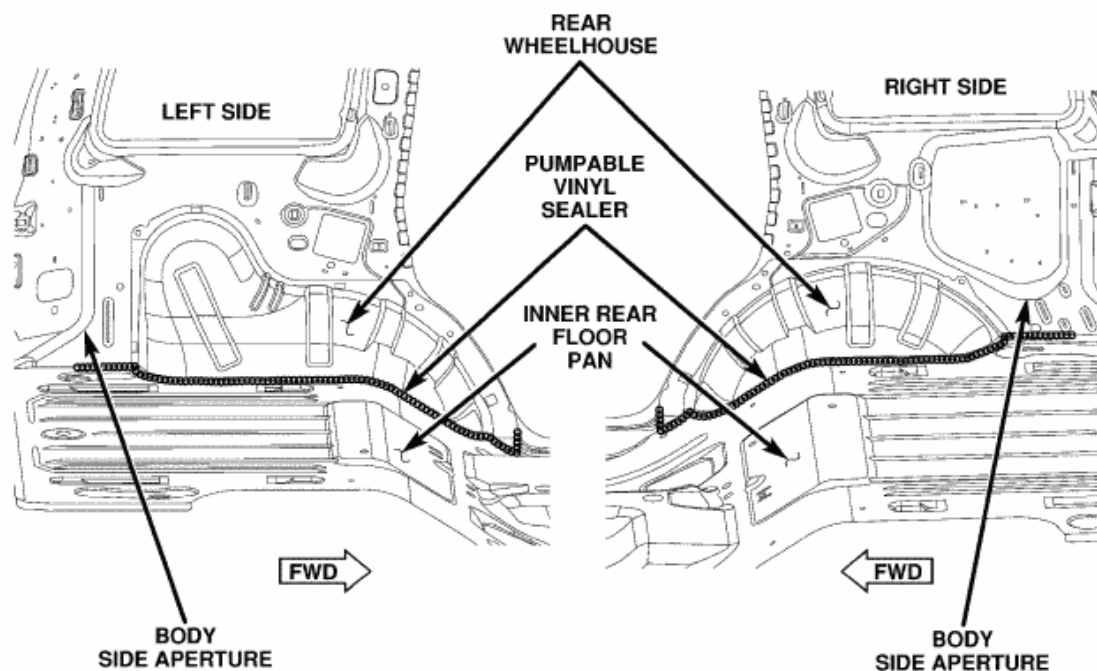


Fig. 763: Floor Pan/Body Side Sill Sealer Locations
 Courtesy of CHRYSLER LLC



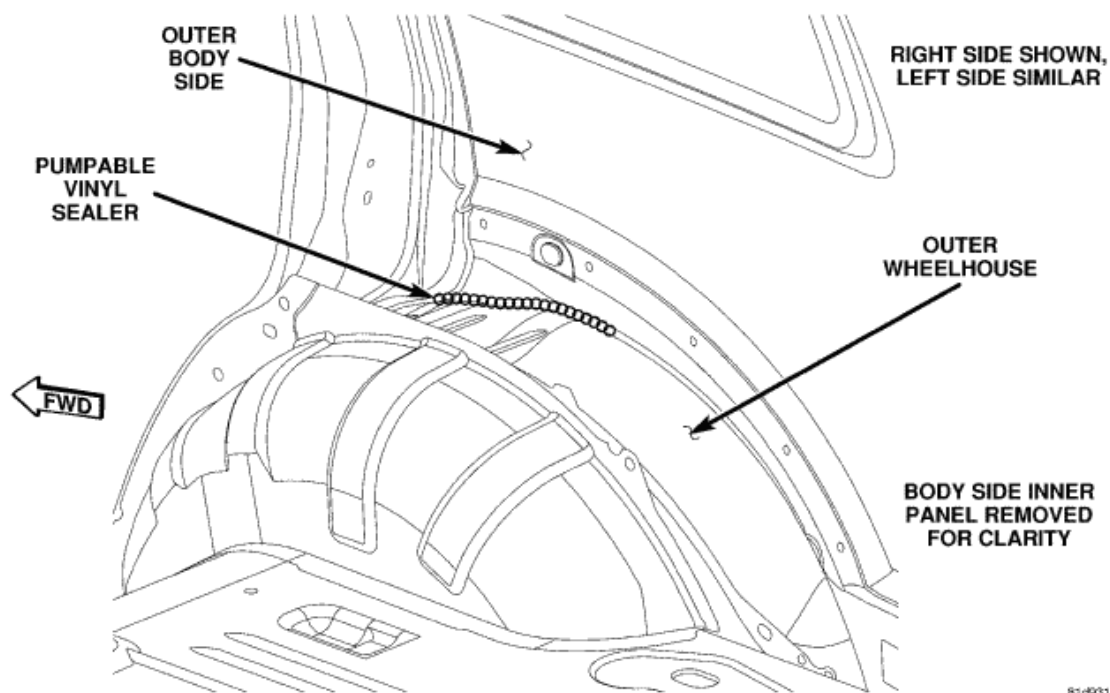
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Fig. 764: Front Floor Pan/Rear Floor Pan Sealer Locations
 Courtesy of CHRYSLER LLC



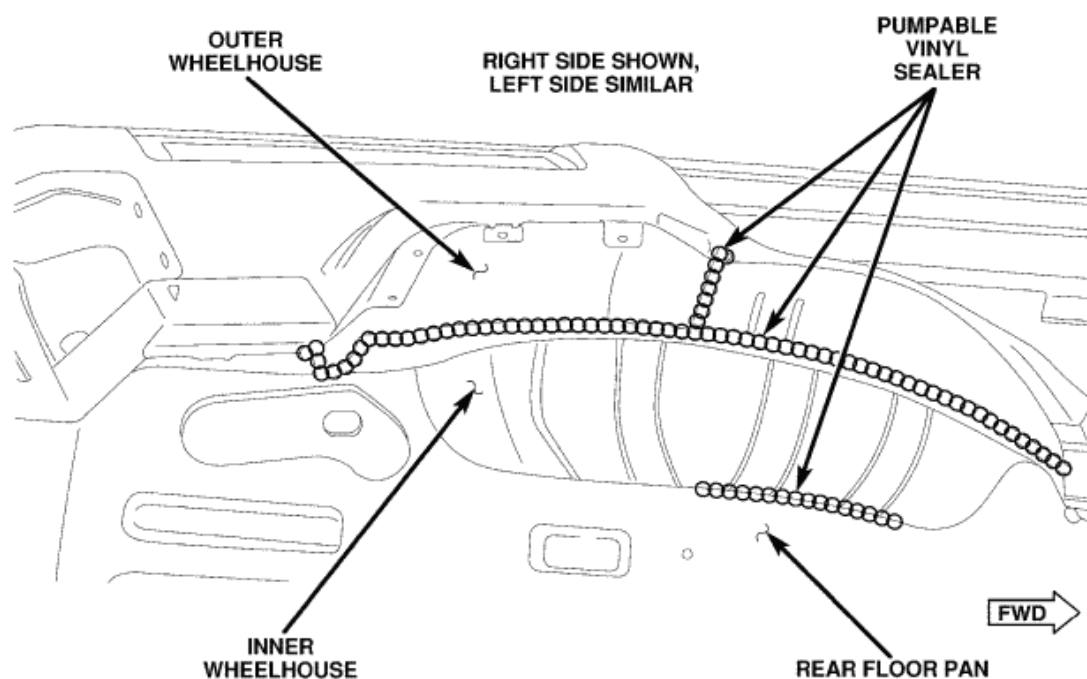
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Fig. 765: Rear Floor Pan/Rear Wheelhouses Sealer Locations
 Courtesy of CHRYSLER LLC



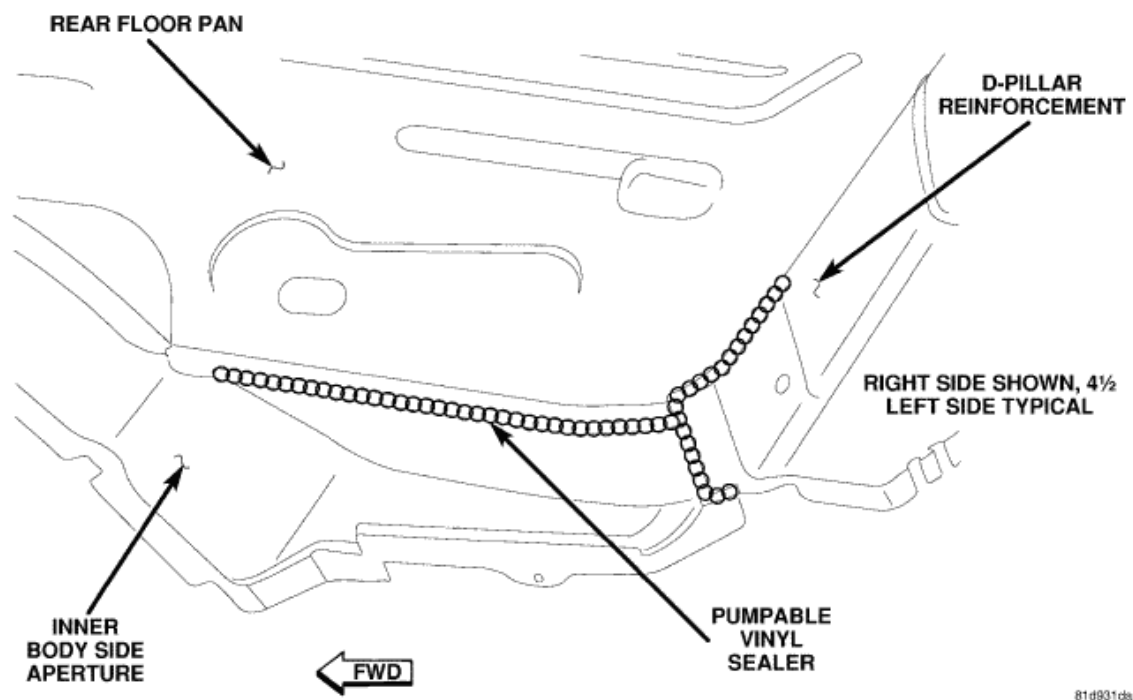
81d931cd

Fig. 766: Outer Wheelhouse/Outer Body Side Sealer Locations
 Courtesy of CHRYSLER LLC



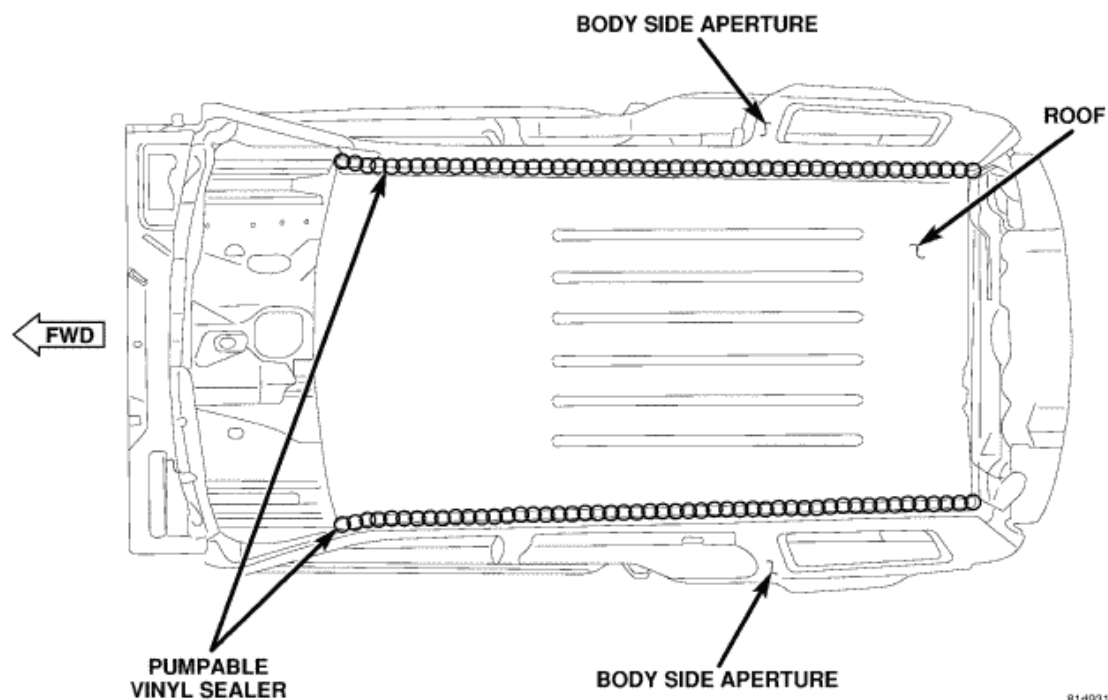
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Fig. 767: Inner/Outer Wheelhouse/Inner Body Side Inner And Outer Panel Sealer Locations
 Courtesy of CHRYSLER LLC



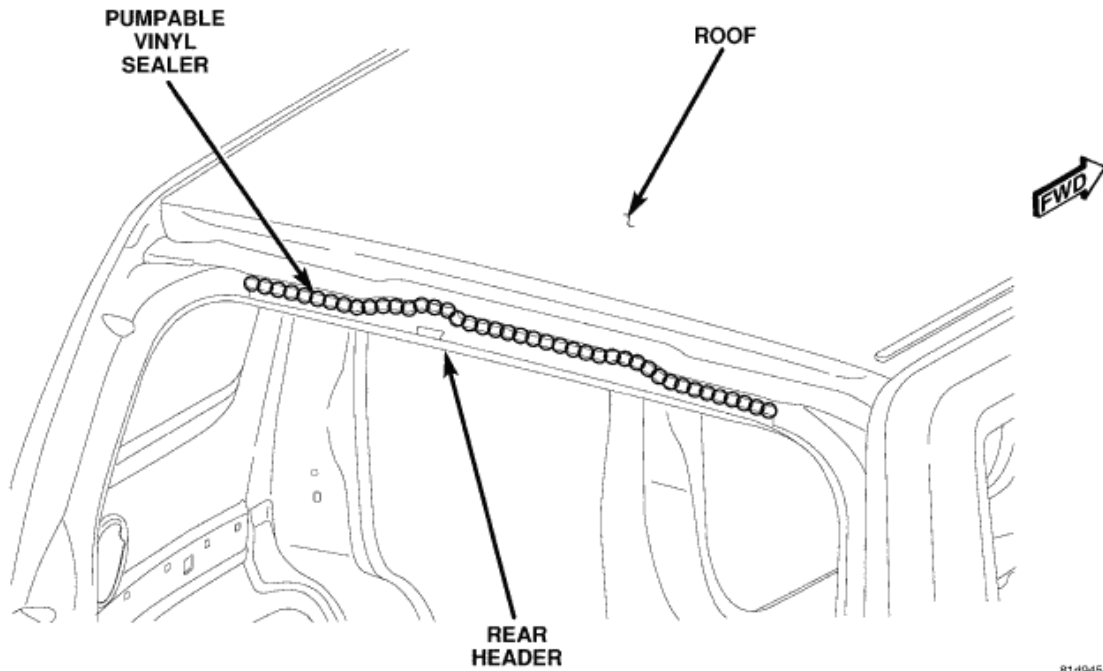
81d931da

Fig. 768: Rear Floor Pan/Inner Bodyside/D-Pillar Reinforcement Sealer Locations
 Courtesy of CHRYSLER LLC



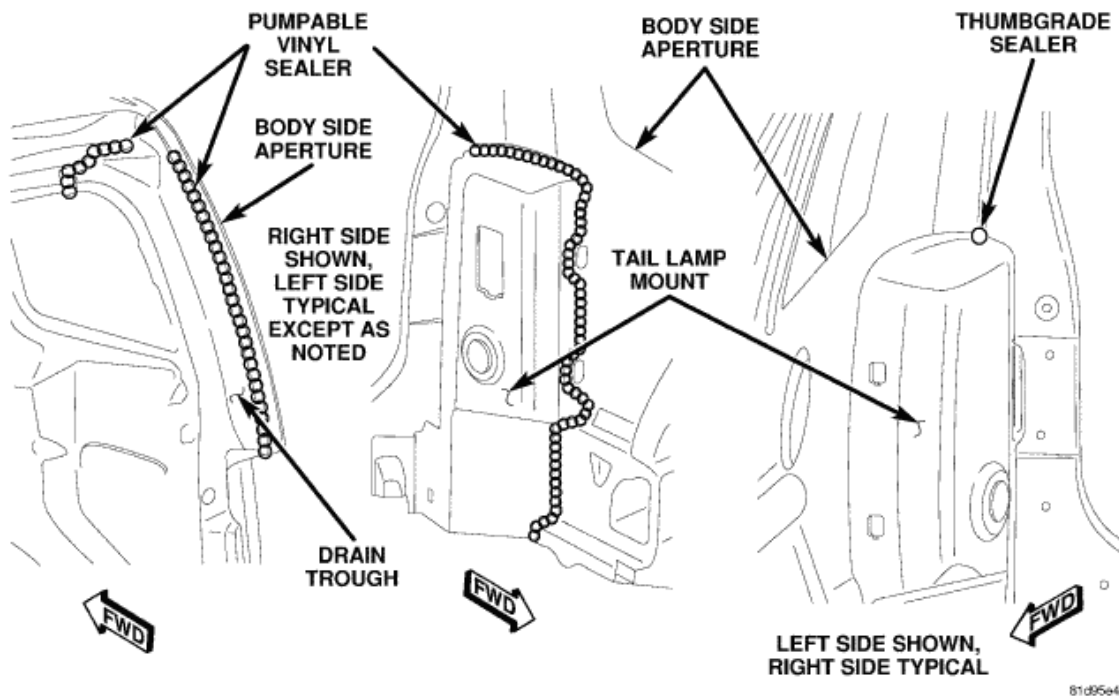
81d931e6

Fig. 769: Roof/Body Side Apertures Sealer Locations
 Courtesy of CHRYSLER LLC



81d9459d

Fig. 770: Roof/Rear Header Sealer Locations
 Courtesy of CHRYSLER LLC



81d95e4c

Fig. 771: Drain Trough/Body Side Aperture/Tail Lamp Sealer Locations
 Courtesy of CHRYSLER LLC

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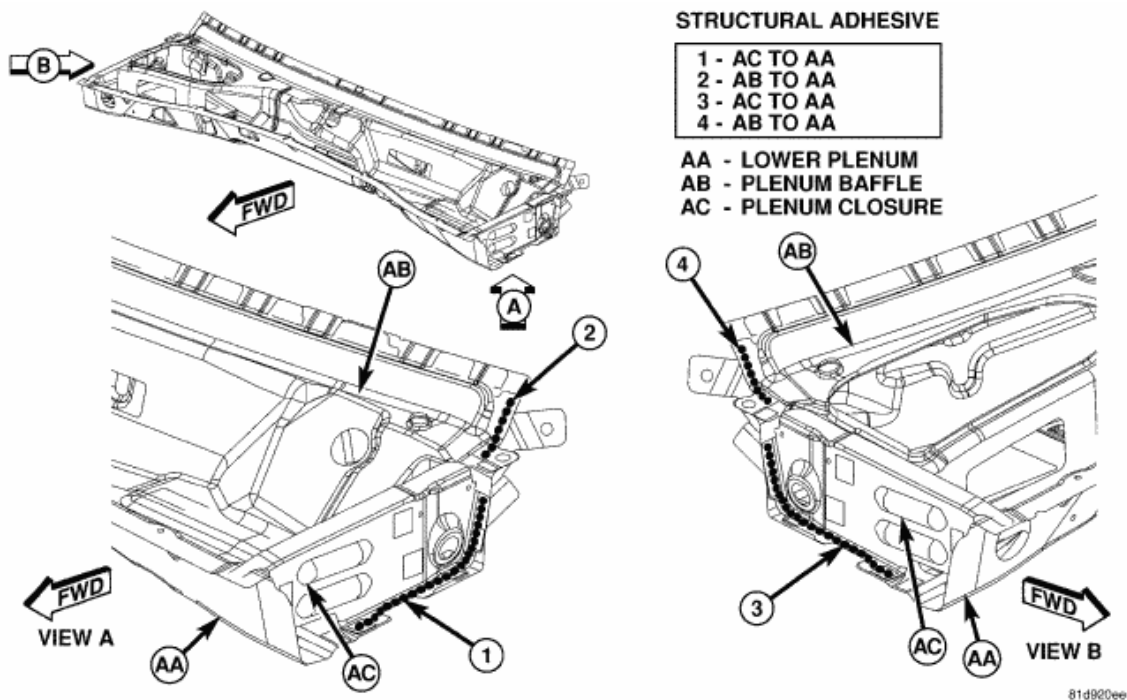


Fig. 772: Plenum Lower Structural Adhesive Locations
Courtesy of CHRYSLER LLC

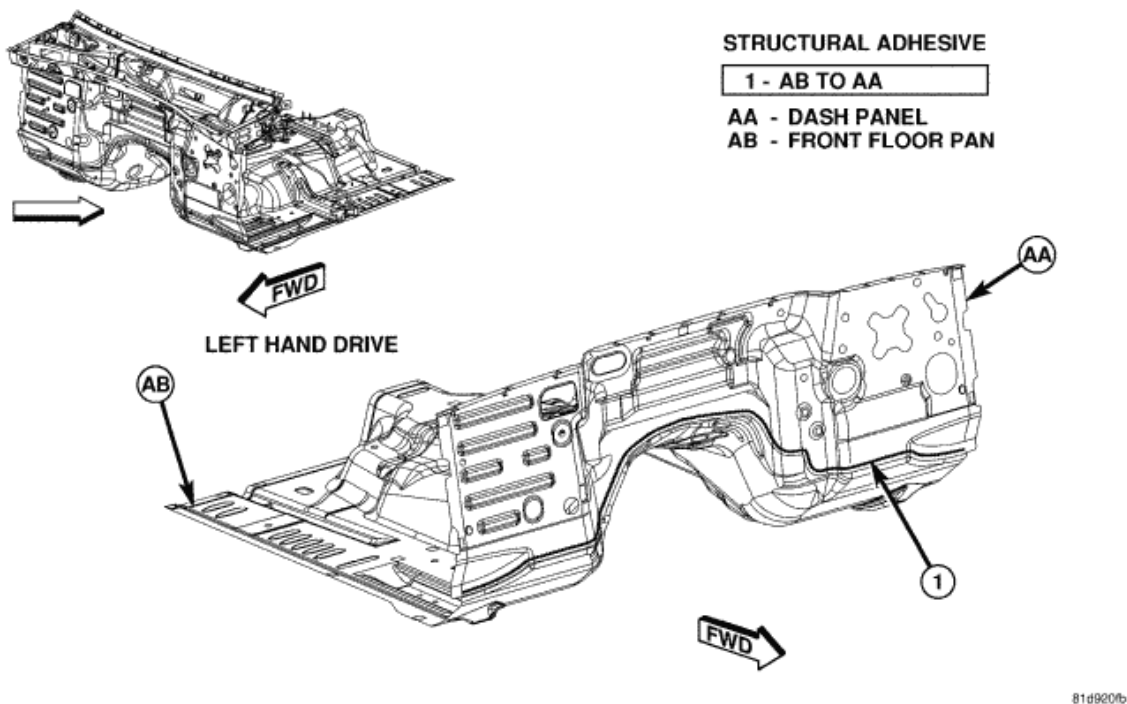
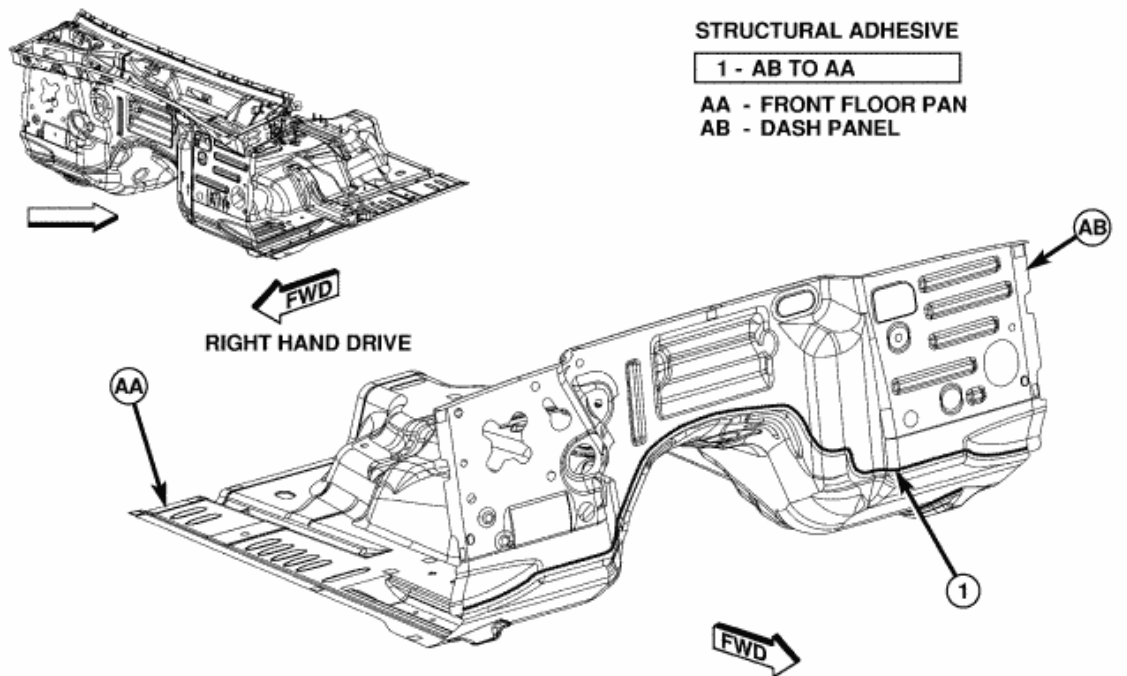


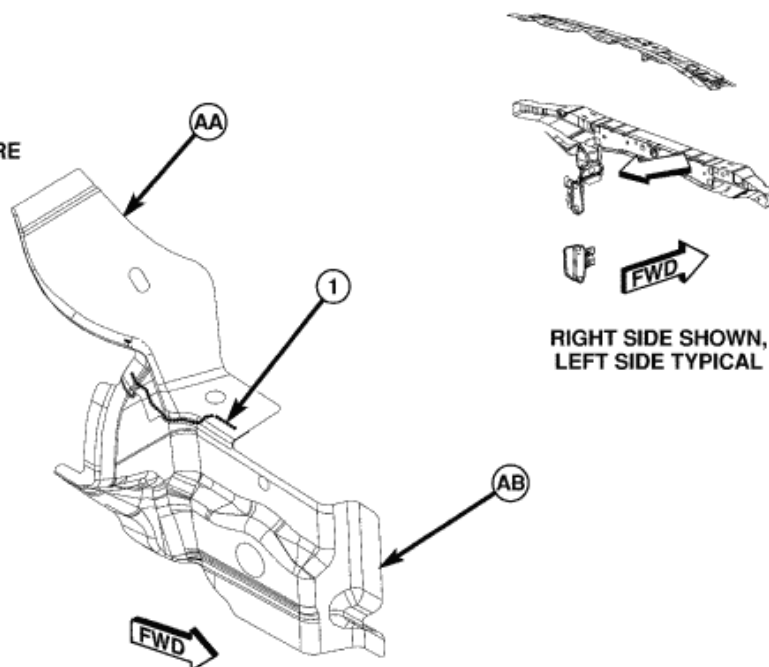
Fig. 773: Front Floor, Dash And Plenum - Left Hand Drive Structural Adhesive Locations
Courtesy of CHRYSLER LLC



81d92120

Fig. 774: Front Floor, Dash And Plenum - Right Hand Drive Structural Adhesive Locations
 Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE
1 - AA TO AB
 AA - CLOSE-OUT PANEL
 AB - REINFORCEMENT
 (BODY SIDE APERTURE
 EXTENSION)



81d9221d

Fig. 775: Miscellaneous Body Structural Adhesive Locations (1 Of 2)
 Courtesy of CHRYSLER LLC

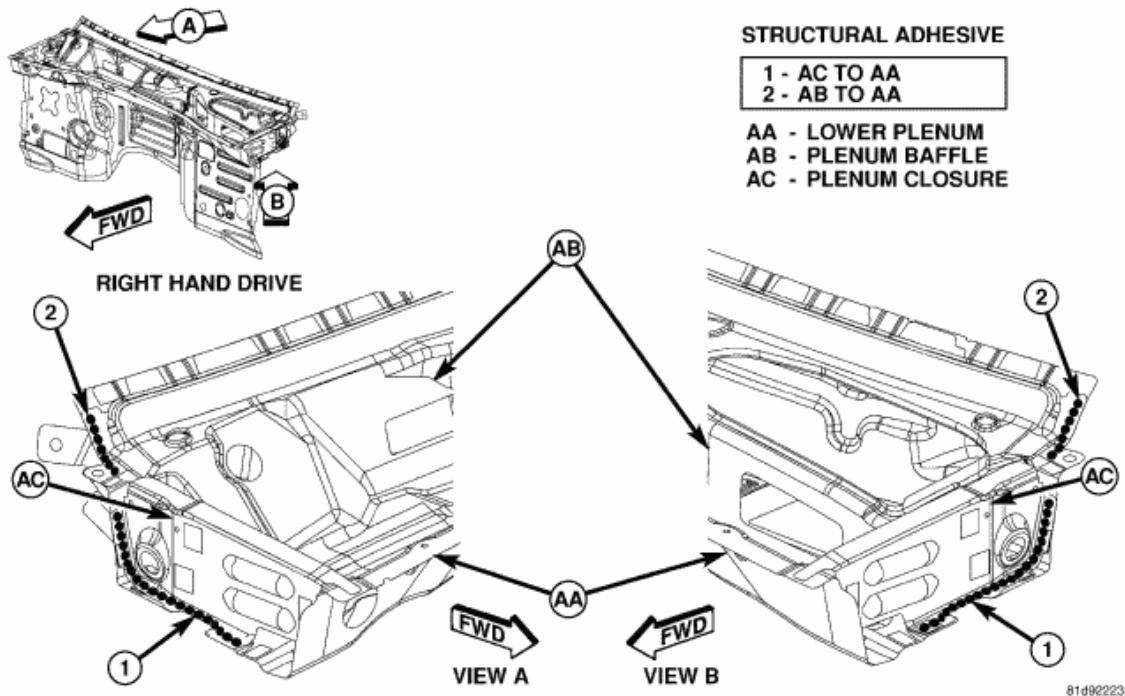


Fig. 776: Miscellaneous Body Structural Adhesive Locations (2 Of 2)
Courtesy of CHRYSLER LLC

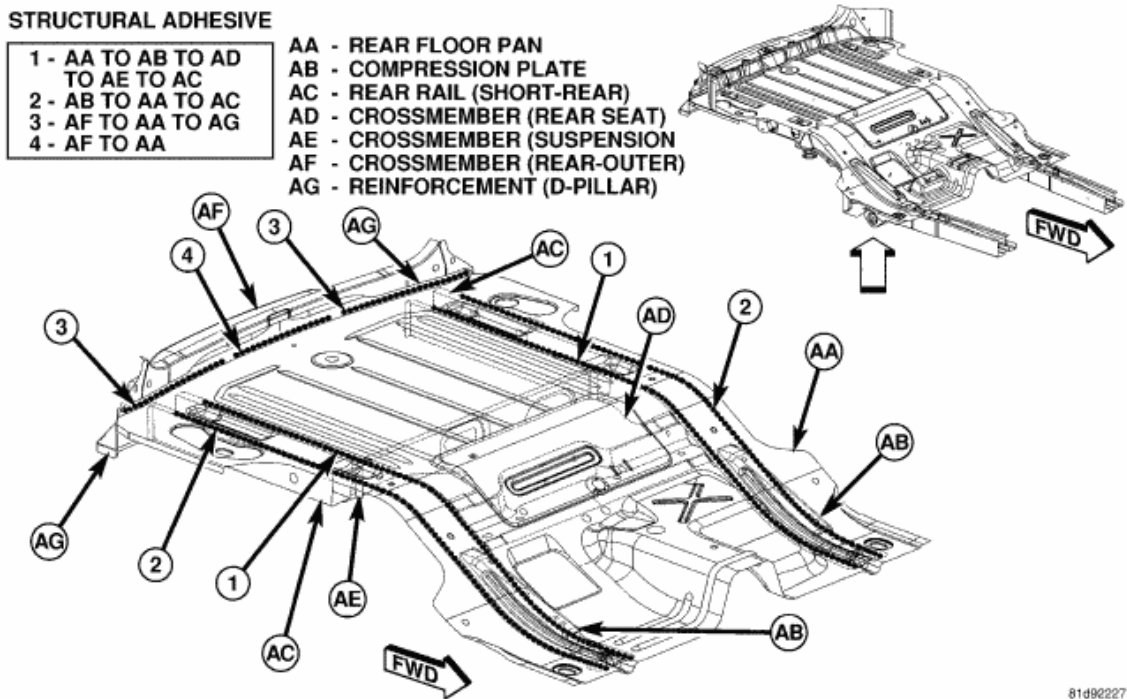
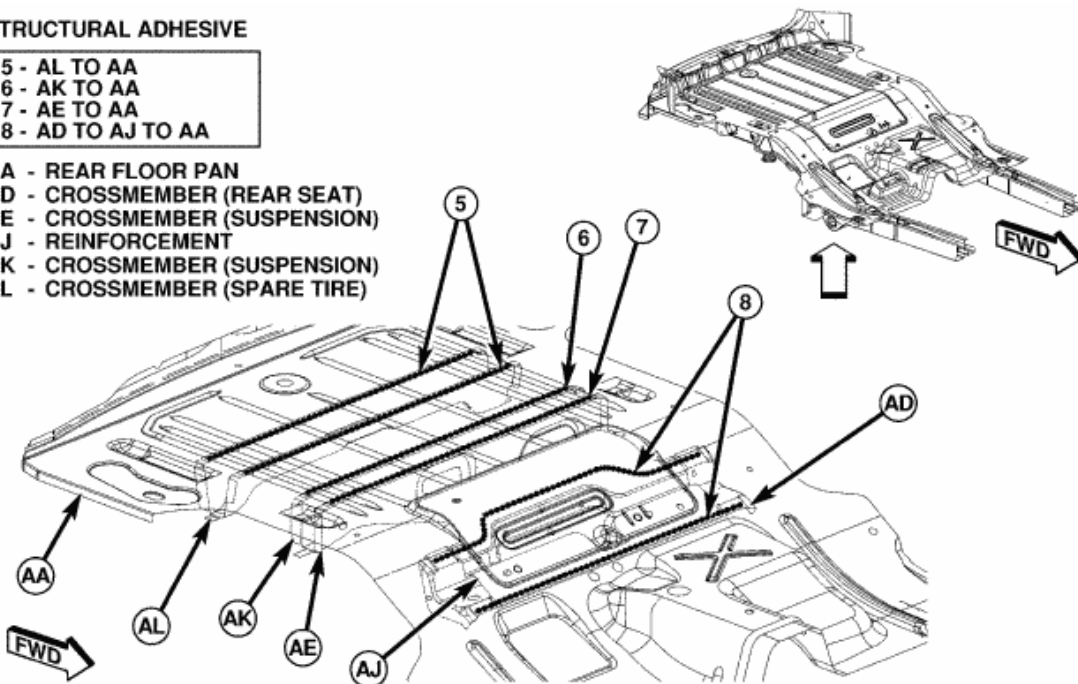


Fig. 777: Rear Floor Complete Structural Adhesive Locations (1 Of 2)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

- 5 - AL TO AA
- 6 - AK TO AA
- 7 - AE TO AA
- 8 - AD TO AJ TO AA

- AA - REAR FLOOR PAN
- AD - CROSSMEMBER (REAR SEAT)
- AE - CROSSMEMBER (SUSPENSION)
- AJ - REINFORCEMENT
- AK - CROSSMEMBER (SUSPENSION)
- AL - CROSSMEMBER (SPARE TIRE)



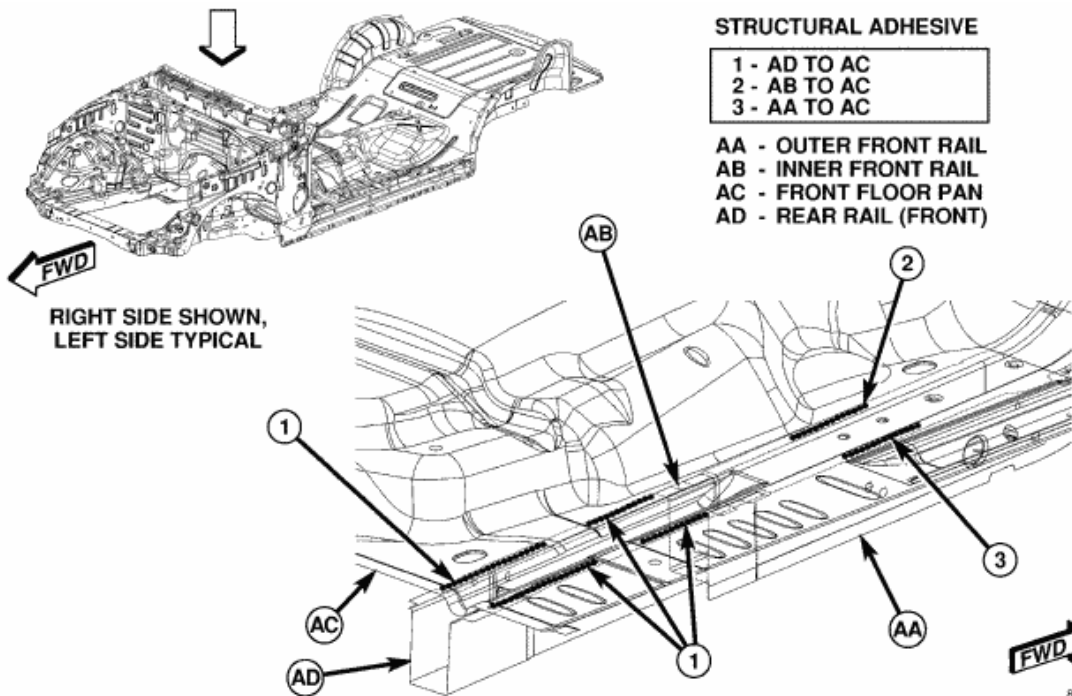
81d9222b

Fig. 778: Rear Floor Complete Structural Adhesive Locations (2 Of 2)
 Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

- 1 - AD TO AC
- 2 - AB TO AC
- 3 - AA TO AC

- AA - OUTER FRONT RAIL
- AB - INNER FRONT RAIL
- AC - FRONT FLOOR PAN
- AD - REAR RAIL (FRONT)



81d92231

Fig. 779: Underbody And Dash Structural Adhesive Locations (1 Of 3)
 Courtesy of CHRYSLER LLC

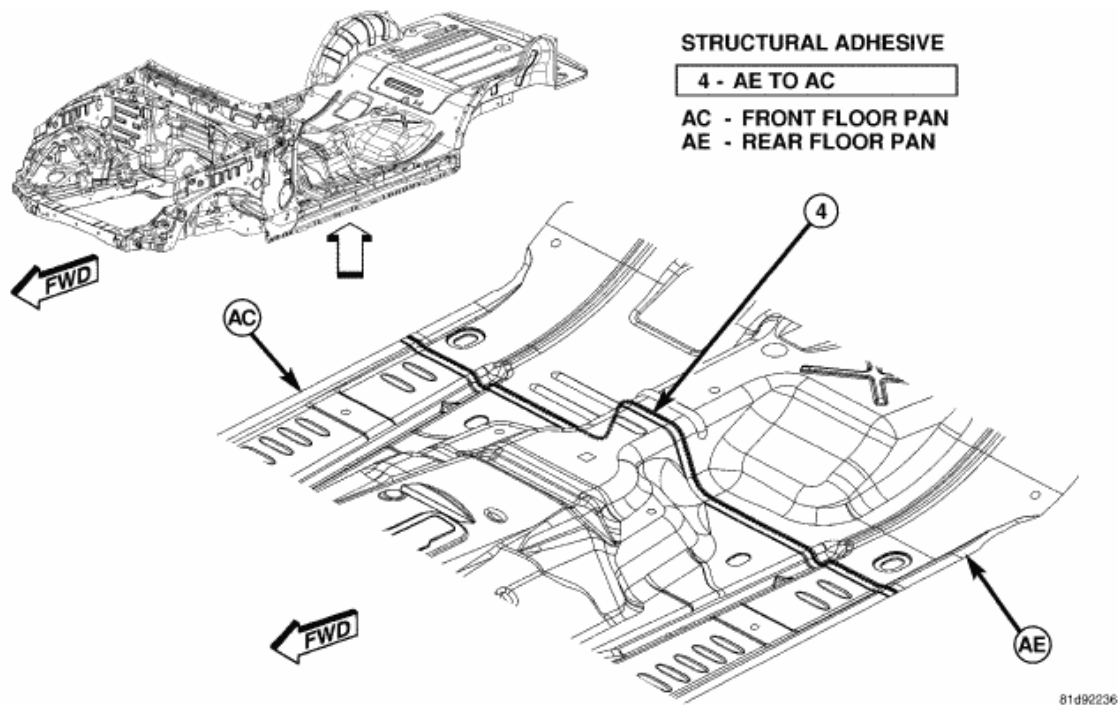


Fig. 780: Underbody And Dash Structural Adhesive Locations (2 Of 3)
Courtesy of CHRYSLER LLC

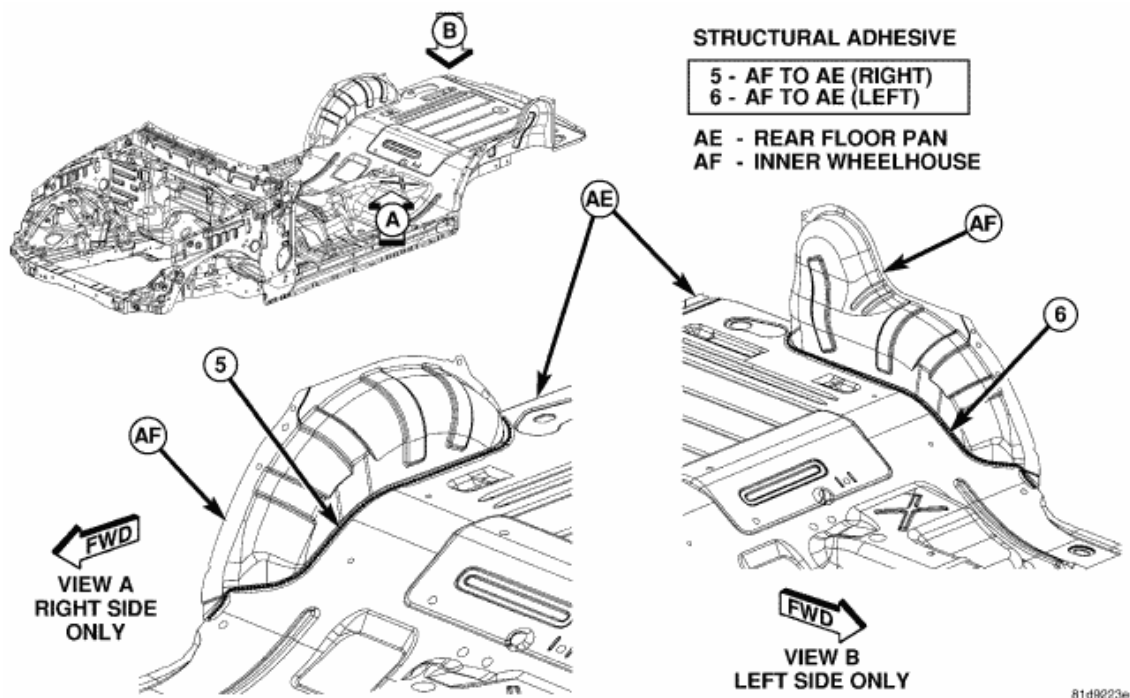
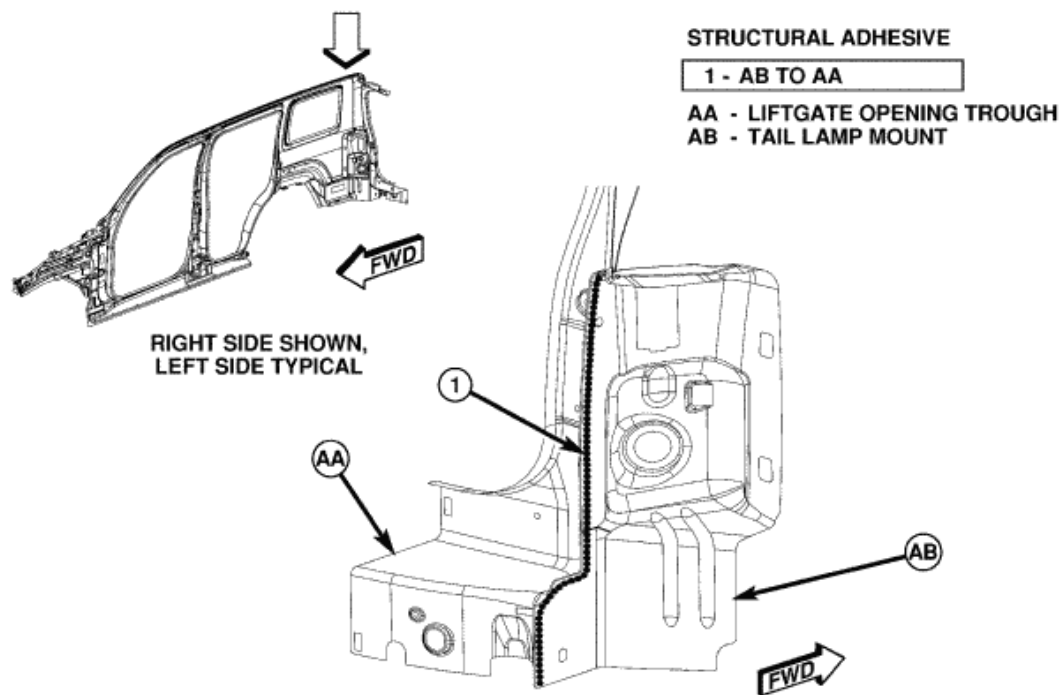
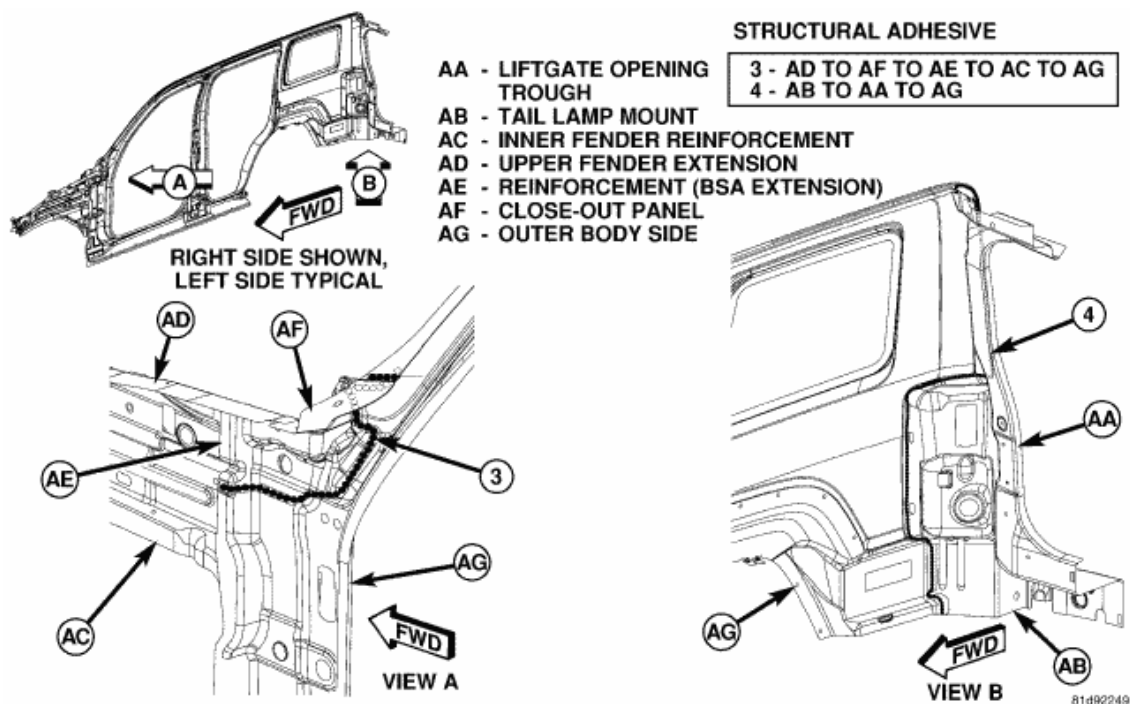


Fig. 781: Underbody And Dash Structural Adhesive Locations (3 Of 3)
Courtesy of CHRYSLER LLC



81d92243

Fig. 782: Body Side Aperture Outer Structural Adhesive Locations (1 Of 2)
Courtesy of CHRYSLER LLC



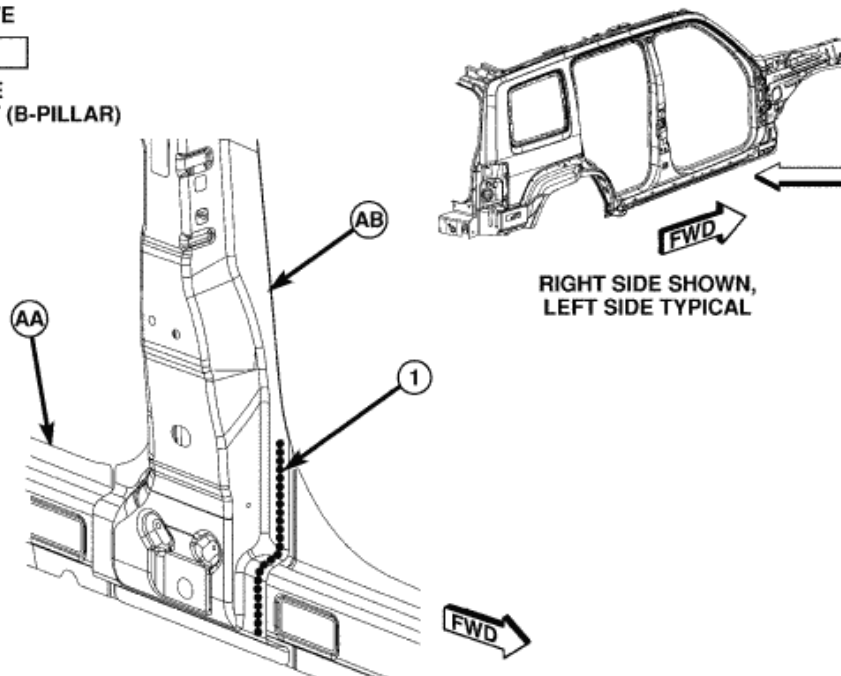
81d92249

Fig. 783: Body Side Aperture Outer Structural Adhesive Locations (2 Of 2)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

1 - AB TO AA

AA - INNER BODY SIDE
AB - REINFORCEMENT (B-PILLAR)



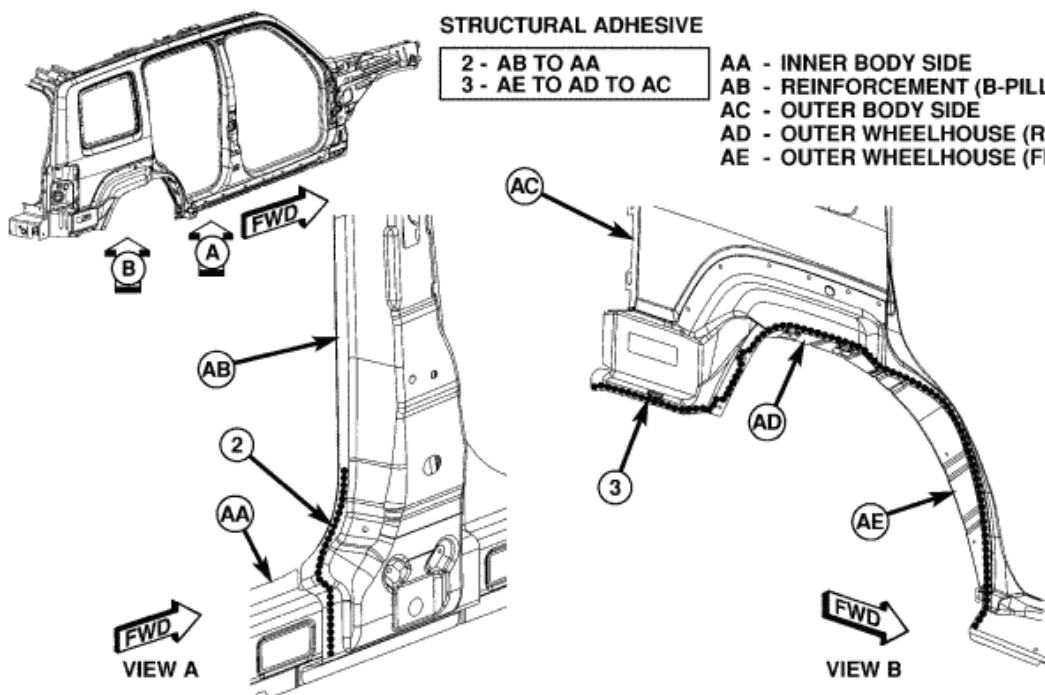
81d92254

Fig. 784: Body Side Aperture Complete Structural Adhesive Locations (1 Of 2)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

2 - AB TO AA
3 - AE TO AD TO AC

AA - INNER BODY SIDE
AB - REINFORCEMENT (B-PILLAR)
AC - OUTER BODY SIDE
AD - OUTER WHEELHOUSE (REAR)
AE - OUTER WHEELHOUSE (FRONT)



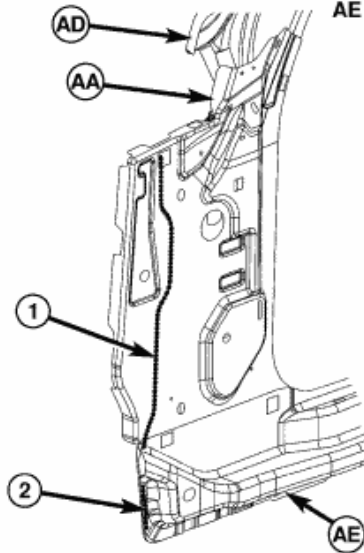
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Fig. 785: Body Side Aperture Complete Structural Adhesive Locations (2 Of 2)
Courtesy of CHRYSLER LLC

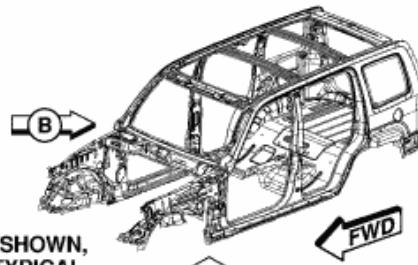
STRUCTURAL ADHESIVE

- 1 - AD TO AA
- 2 - AE TO AD TO AA
- 3 - AC TO AB

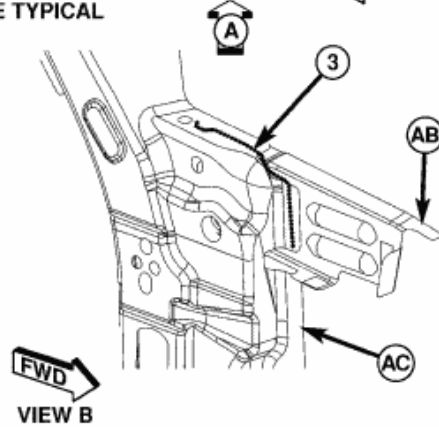
- AA - COWL SIDE
- AB - PLENUM CLOSURE
- AC - INNER BODY SIDE
- AD - OUTER BODY SIDE
- AE - BODY SIDE SILL



FWD
VIEW A



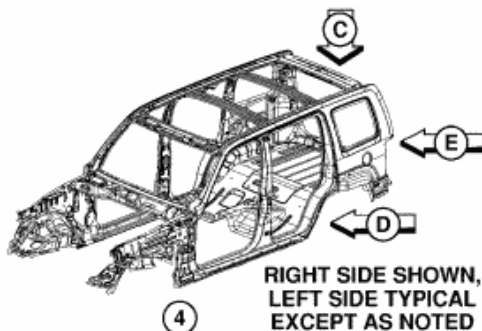
RIGHT SIDE SHOWN,
LEFT SIDE TYPICAL



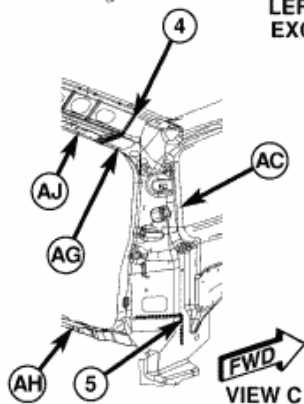
FWD
VIEW B

81d924b1

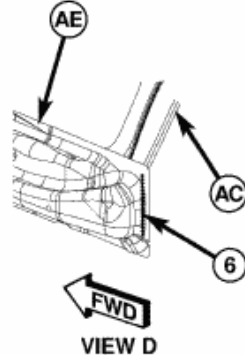
Fig. 786: Body In White Without Roof Structural Adhesive Locations (1 Of 3)
Courtesy of CHRYSLER LLC



RIGHT SIDE SHOWN,
LEFT SIDE TYPICAL
EXCEPT AS NOTED



FWD
VIEW C

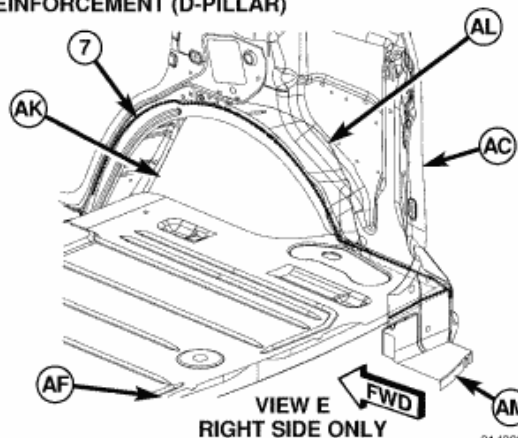


FWD
VIEW D

- AC - INNER BODY SIDE
- AE - BODY SIDE SILL
- AF - GUSSET
- AG - REINFORCEMENT
(INNER ROOF SIDE RAIL)
- AH - CROSSMEMBER
(GATE OPENING)
- AJ - ROOF HEADER
- AK - OUTER WHEELHOUSE (FRONT)
- AL - OUTER WHEELHOUSE (REAR)
- AM - REINFORCEMENT (D-PILLAR)

STRUCTURAL ADHESIVE

- 4 - AJ TO AG
- 5 - AH TO AC
- 6 - AE TO AC
- 7 - AL TO AK TO AM
TO AF TO AC



VIEW E
RIGHT SIDE ONLY

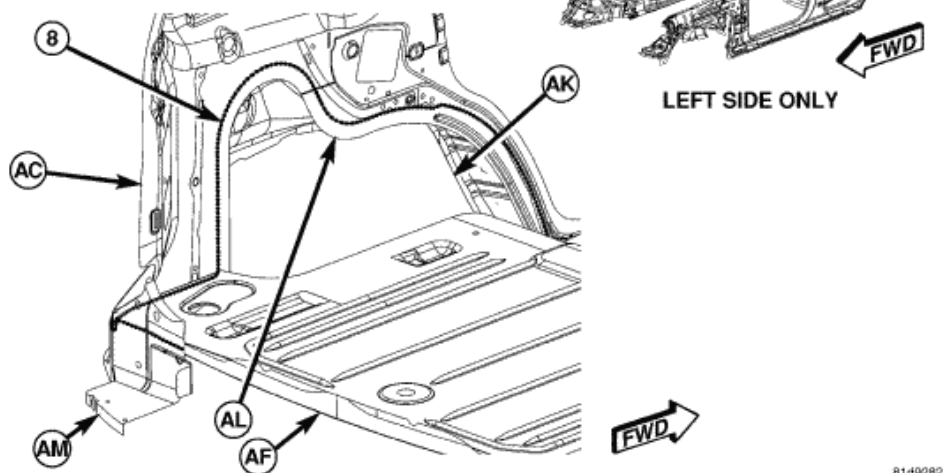
81d92814

Fig. 787: Body In White Without Roof Structural Adhesive Locations (2 Of 3)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

8 - AL TO AK TO AM TO AC

AC - INNER BODY SIDE
AF - GUSSET
AK - OUTER WHEELHOUSE (FRONT)
AL - OUTER WHEELHOUSE (REAR)
AM - REINFORCEMENT (D-PILLAR)



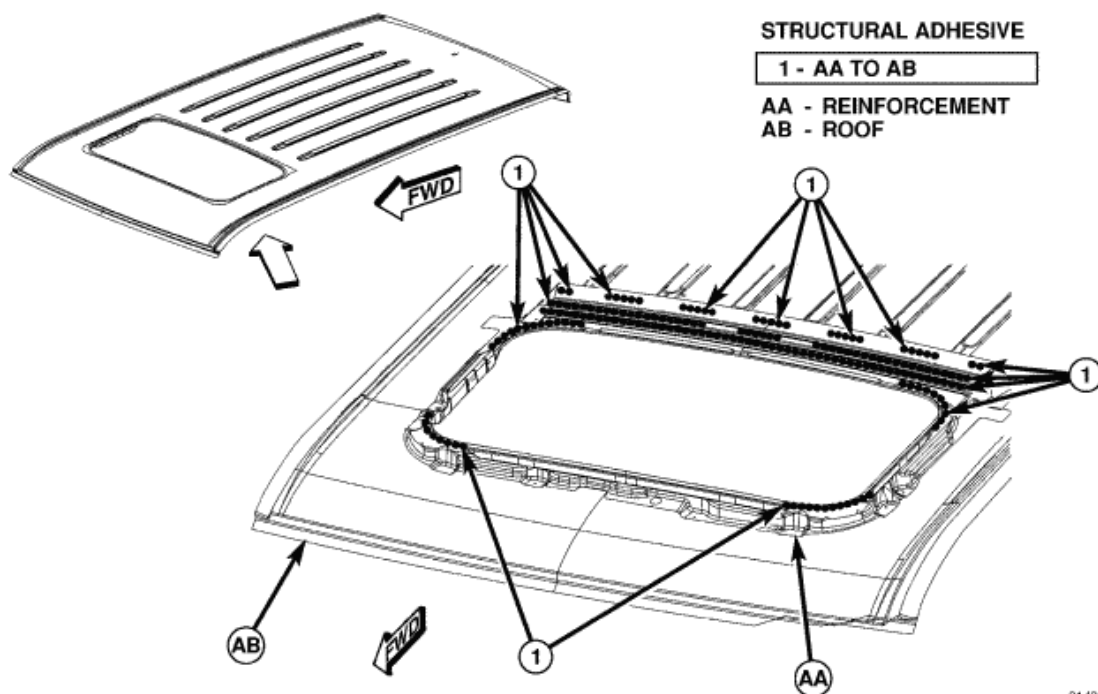
81d92825

Fig. 788: Body In White Without Roof Structural Adhesive Locations (3 Of 3)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

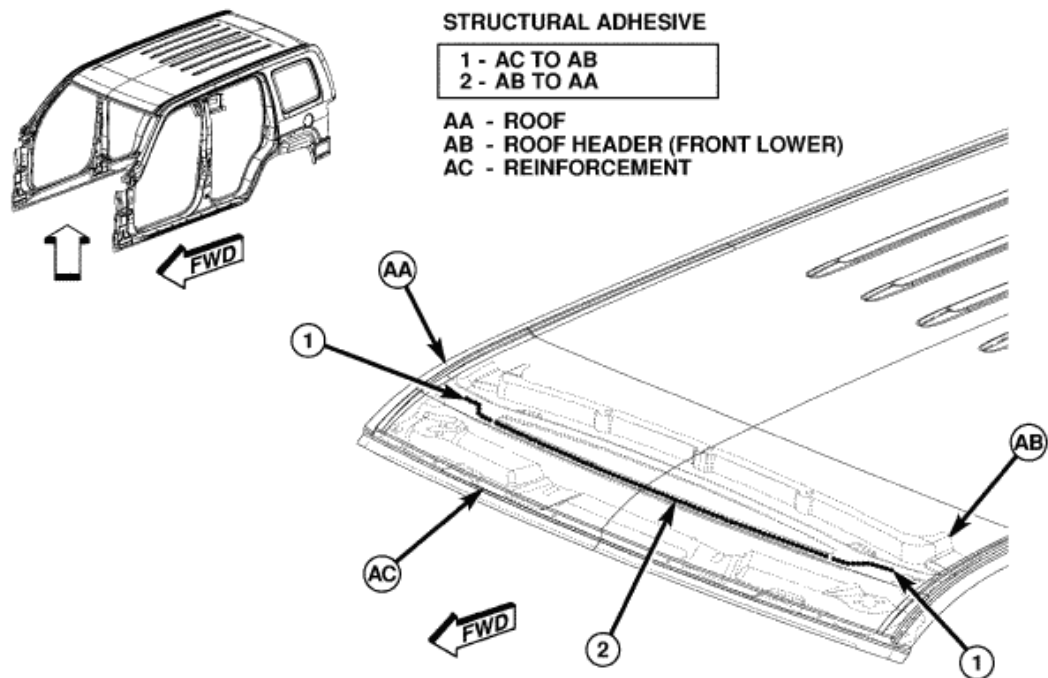
1 - AA TO AB

AA - REINFORCEMENT
AB - ROOF



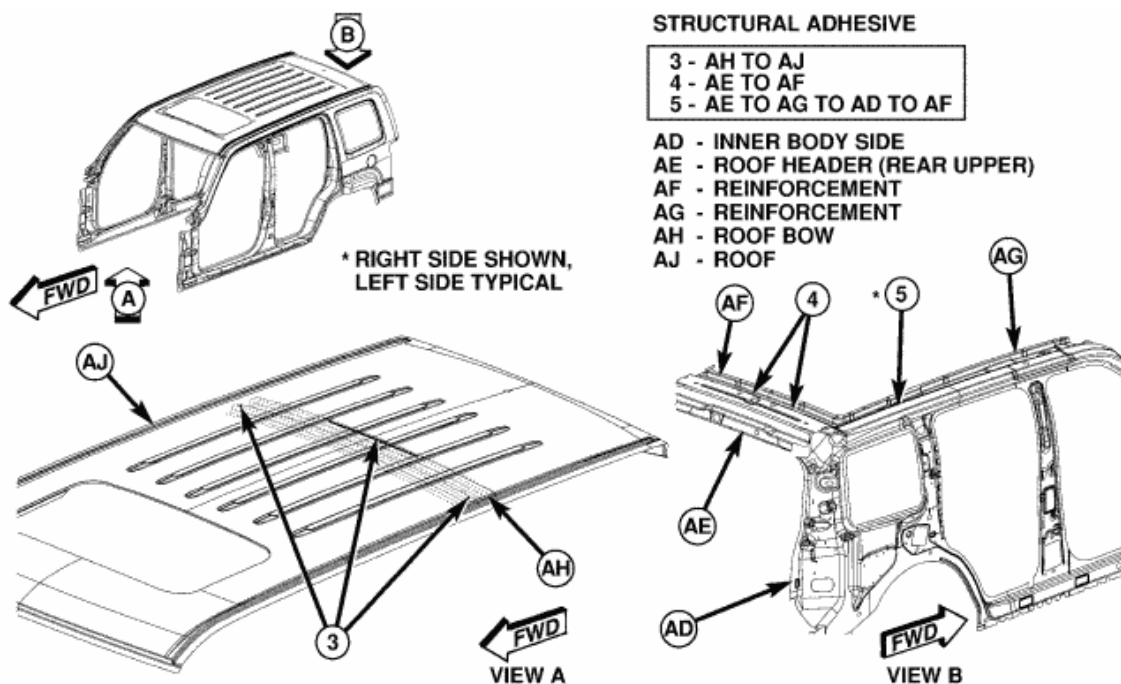
81d9287a

Fig. 789: Roof With Sunroof Structural Adhesive Locations
Courtesy of CHRYSLER LLC



81d92882

Fig. 790: Body In White Complete Structural Adhesive Locations (1 Of 4)
Courtesy of CHRYSLER LLC



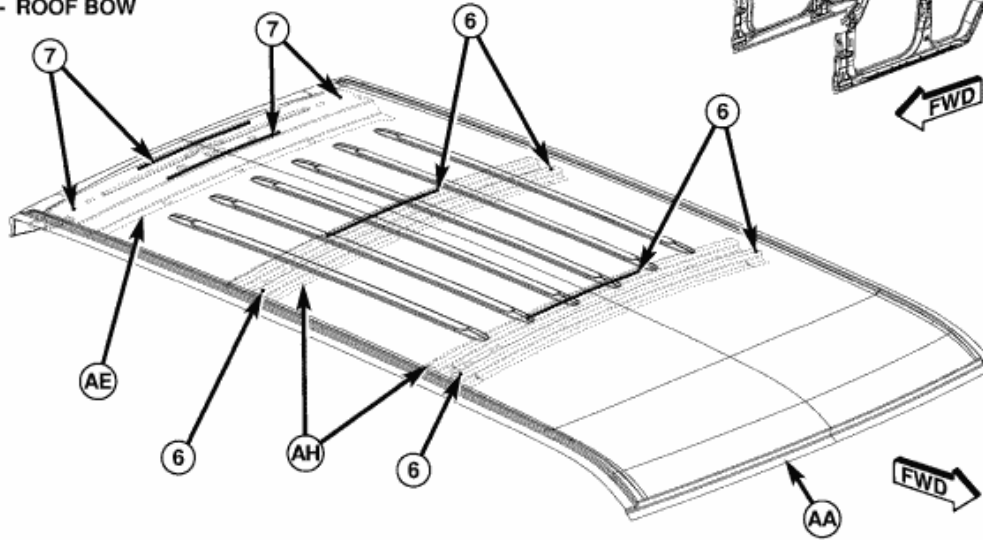
81d92881

Fig. 791: Body In White Complete Structural Adhesive Locations (2 Of 4)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

6 - AH TO AA
7 - AE TO AA

AA - ROOF
AE - ROOF HEADER (REAR UPPER)
AH - ROOF BOW



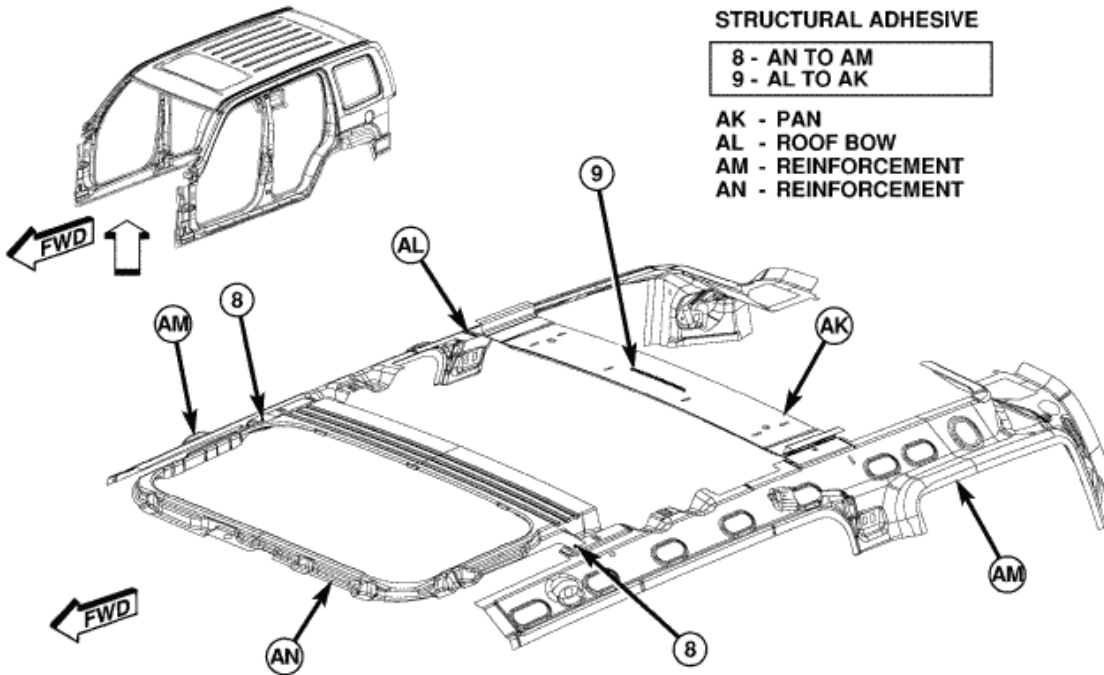
81d9283c

Fig. 792: Body In White Complete Structural Adhesive Locations (3 Of 4)
Courtesy of CHRYSLER LLC

STRUCTURAL ADHESIVE

8 - AN TO AM
9 - AL TO AK

AK - PAN
AL - ROOF BOW
AM - REINFORCEMENT
AN - REINFORCEMENT



81d928a4

Fig. 793: Body In White Complete Structural Adhesive Locations (4 Of 4)
Courtesy of CHRYSLER LLC

WELD LOCATIONS

SPECIFICATIONS

WELD LOCATIONS

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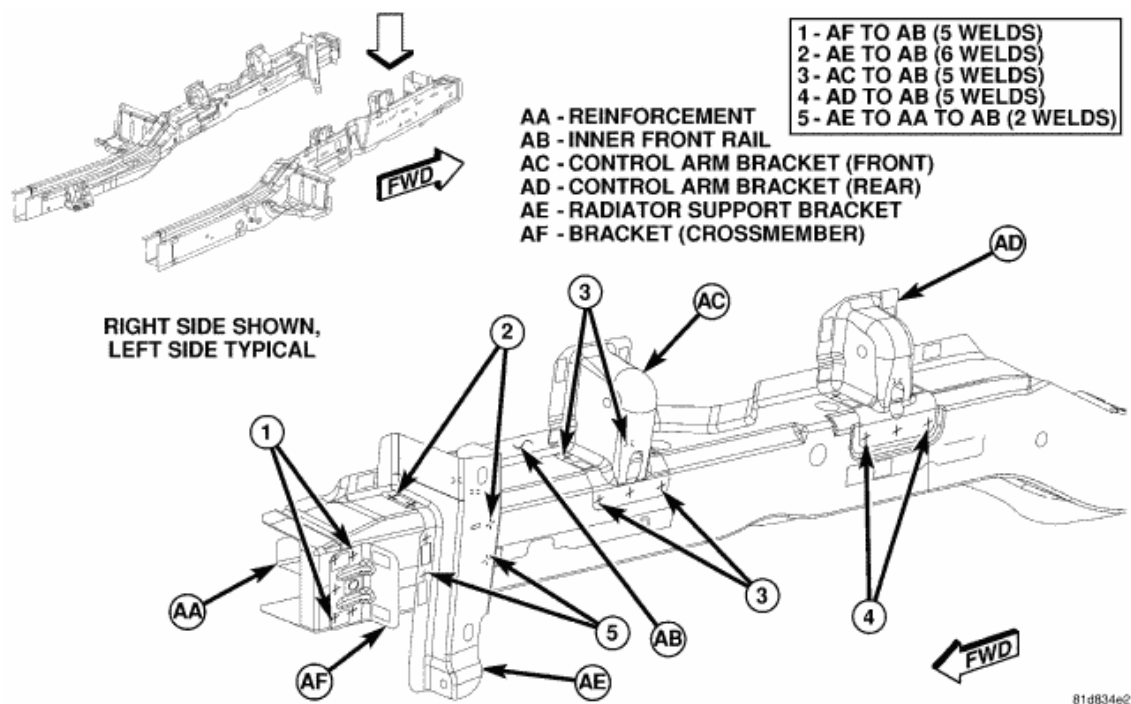


Fig. 794: Front Rails Weld Locations (1 Of 12)

Courtesy of CHRYSLER LLC

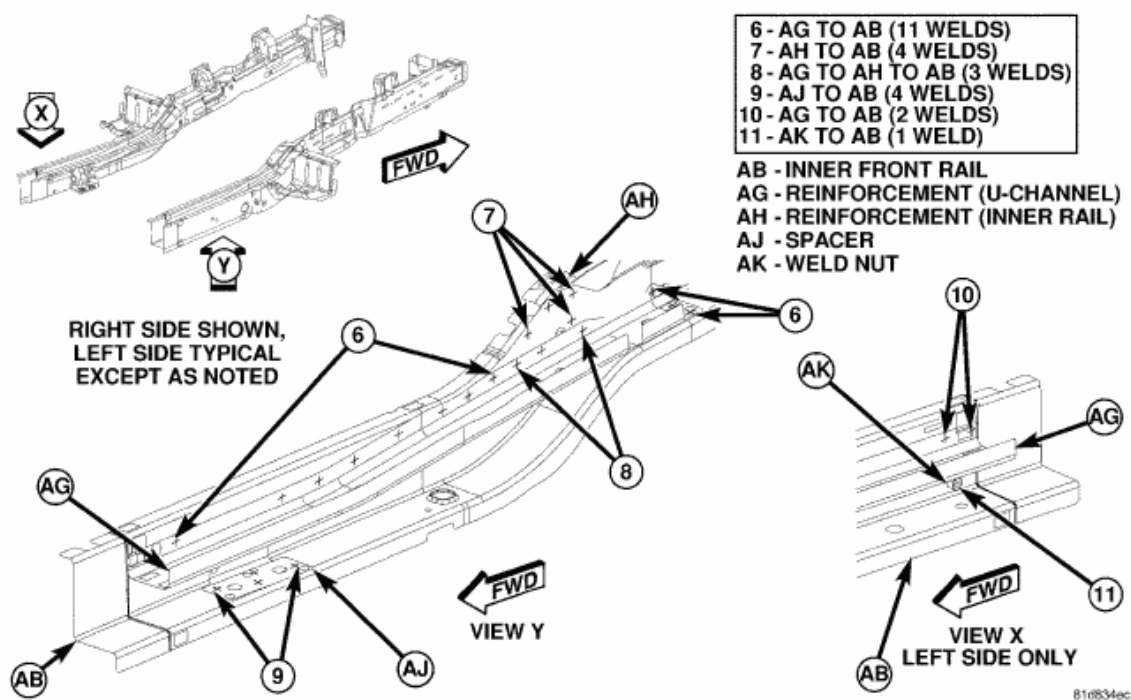


Fig. 795: Front Rails Weld Locations (2 Of 12)

Courtesy of CHRYSLER LLC

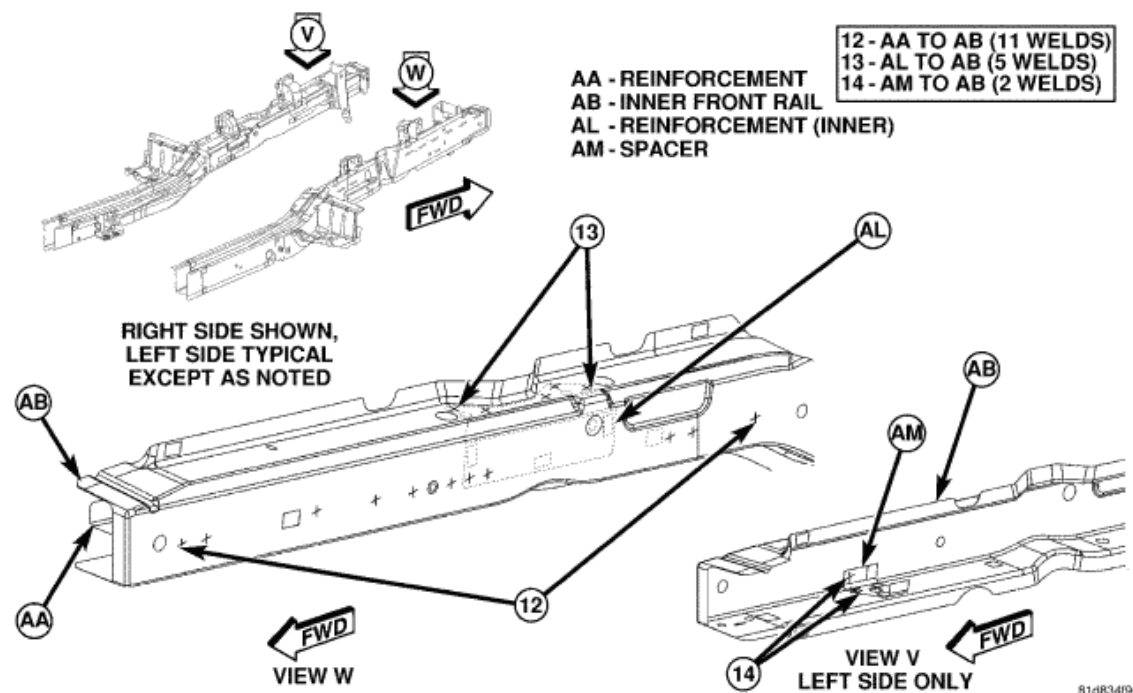


Fig. 796: Front Rails Weld Locations (3 Of 12)

Courtesy of CHRYSLER LLC

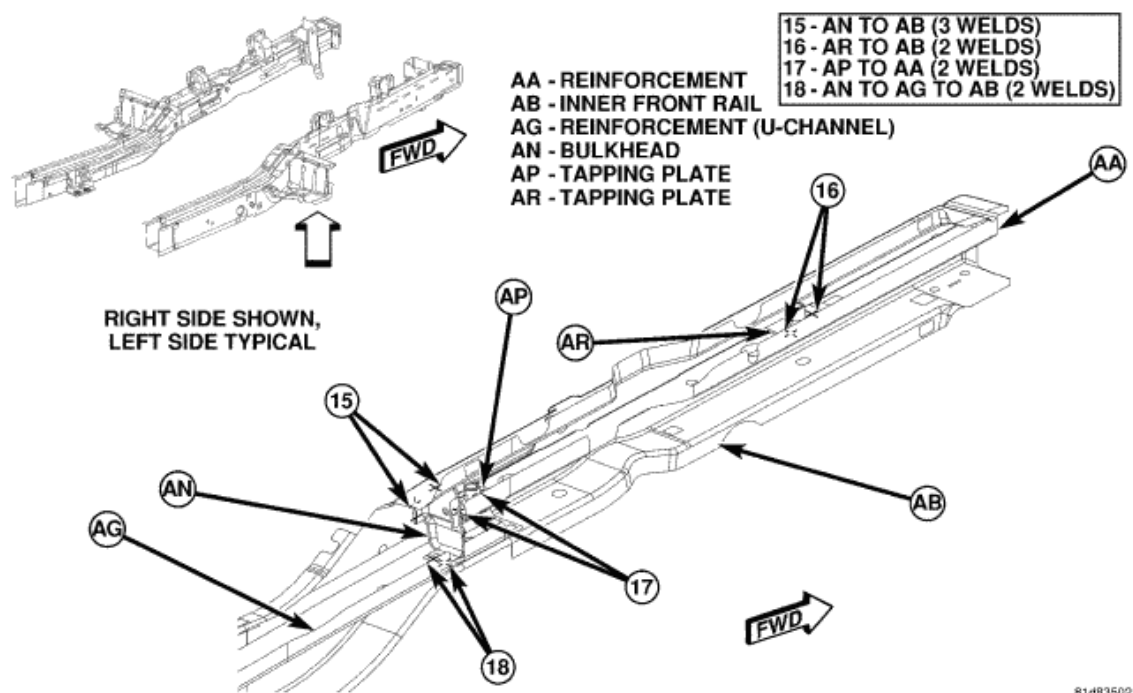
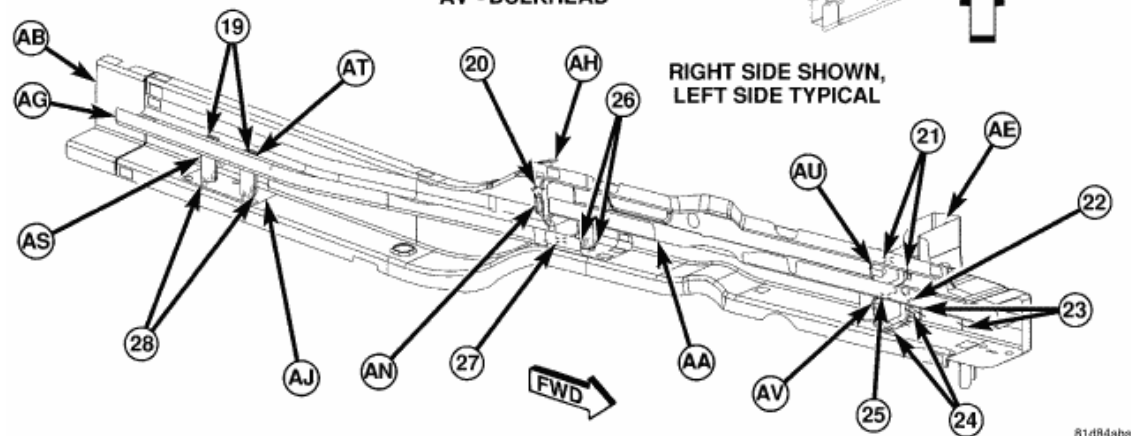


Fig. 797: Front Rails Weld Locations (4 Of 12)

Courtesy of CHRYSLER LLC

- 19 - AT TO AG (2 WELDS)
- 20 - AB TO AH (1 WELD)
- 21 - AU TO AB (2 WELDS)
- 22 - AV TO AA (1 WELD)
- 23 - AE TO AB (2 WELDS)
- 24 - AV TO AB (3 WELDS)
- 25 - AV TO AV TO AA TO AA (2 WELDS)
- 26 - AS TO AG (2 WELDS)
- 27 - AN TO AG (1 WELD)
- 28 - AJ TO AS TO AS (4 WELDS)

- AA - REINFORCEMENT
- AB - INNER FRONT RAIL
- AE - BRACKET
- AG - REINFORCEMENT (U-CHANNEL)
- AH - REINFORCEMENT
- AJ - SPACER
- AN - BULKHEAD
- AS - SPACER
- AT - WELD NUT
- AU - BULKHEAD
- AV - BULKHEAD



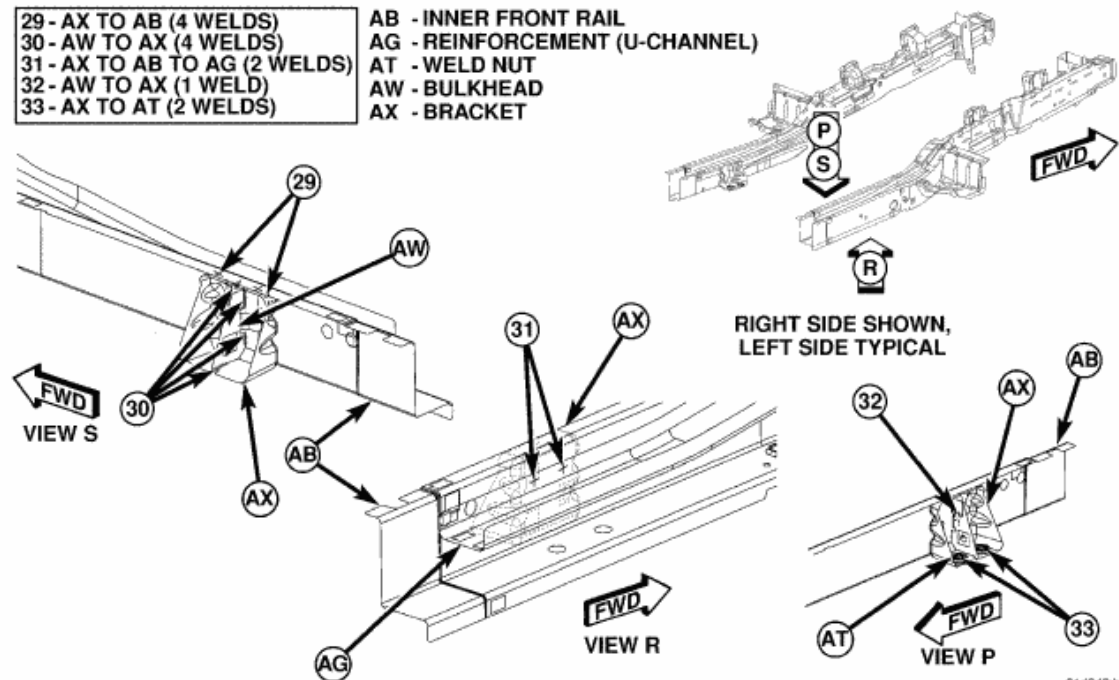
81d84abb

Fig. 798: Front Rails Weld Locations (5 Of 12)

Courtesy of CHRYSLER LLC

- 29 - AX TO AB (4 WELDS)
- 30 - AW TO AX (4 WELDS)
- 31 - AX TO AB TO AG (2 WELDS)
- 32 - AW TO AX (1 WELD)
- 33 - AX TO AT (2 WELDS)

- AB - INNER FRONT RAIL
- AG - REINFORCEMENT (U-CHANNEL)
- AT - WELD NUT
- AW - BULKHEAD
- AX - BRACKET



81d84fbb

Fig. 799: Front Rails Weld Locations (6 Of 12)

Courtesy of CHRYSLER LLC

AE - BRACKET
AN - BULKHEAD
AU - BULKHEAD
AV - BULKHEAD
AZ - WELD NUT
BA - OUTER FRONT RAIL

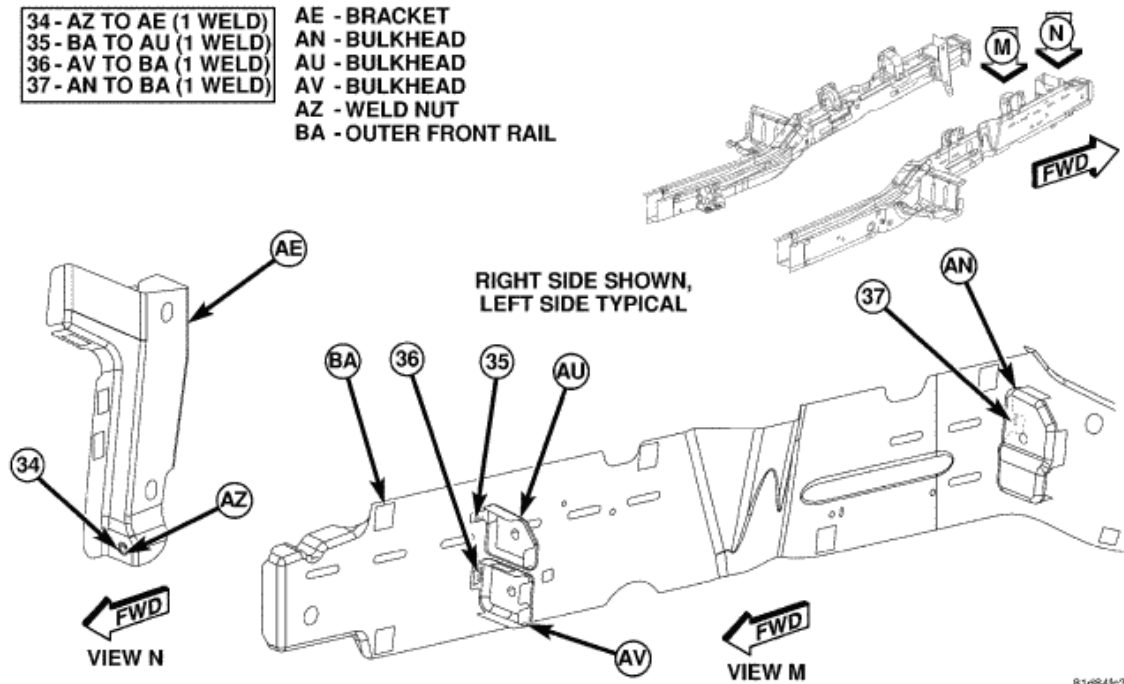


Fig. 800: Front Rails Weld Locations (7 Of 12)

Courtesy of CHRYSLER LLC

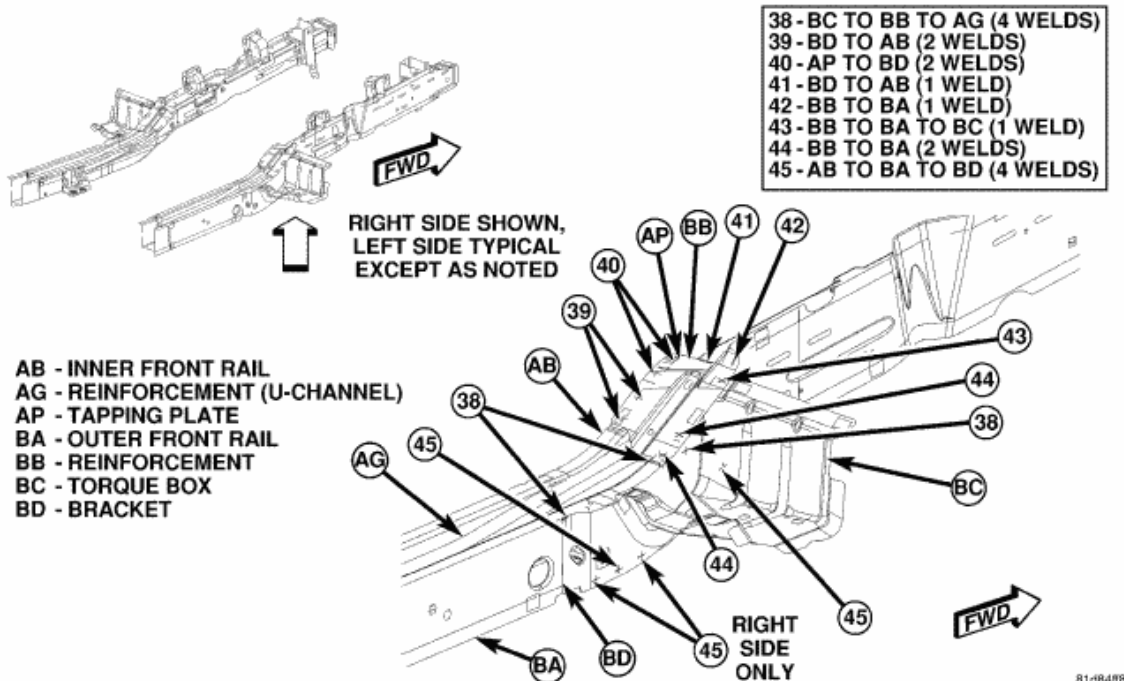


Fig. 801: Front Rails Weld Locations (8 Of 12)

Courtesy of CHRYSLER LLC

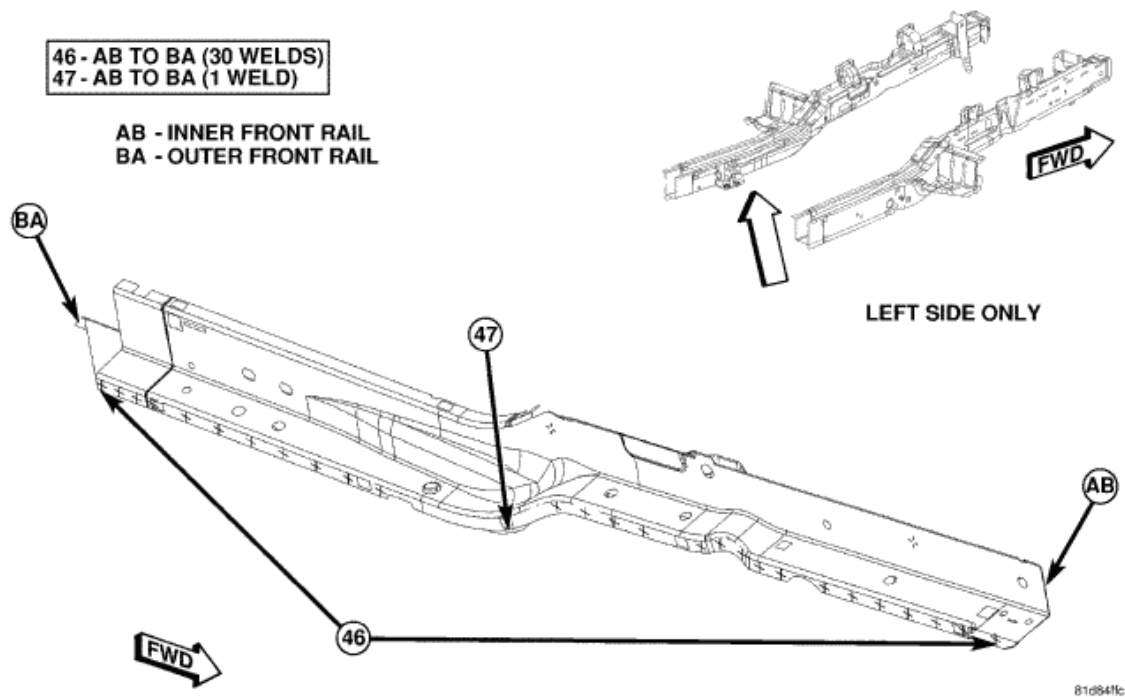


Fig. 802: Front Rails Weld Locations (9 Of 12)
Courtesy of CHRYSLER LLC

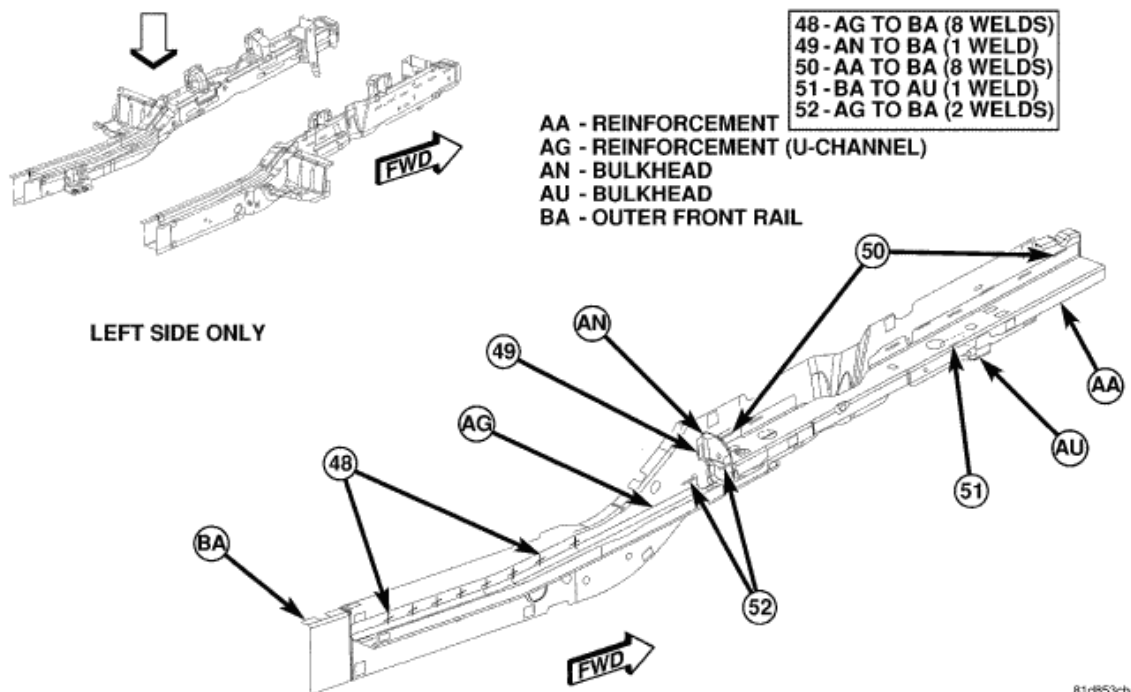


Fig. 803: Front Rails Weld Locations (10 Of 12)
Courtesy of CHRYSLER LLC

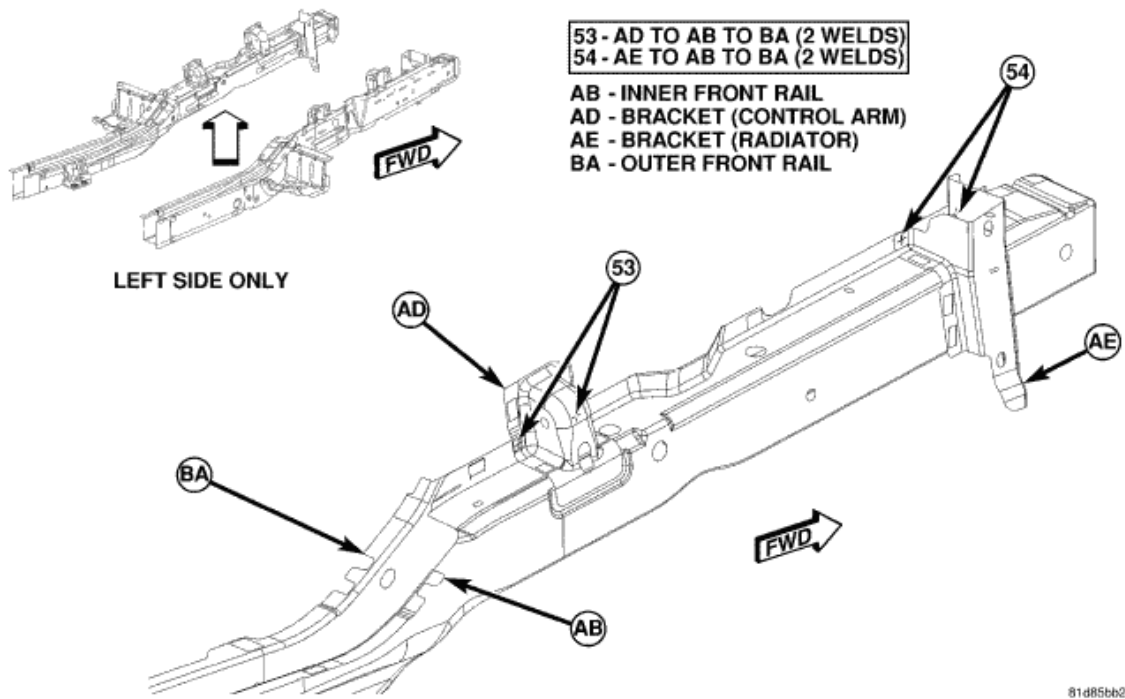


Fig. 804: Front Rails Weld Locations (11 Of 12)
 Courtesy of CHRYSLER LLC

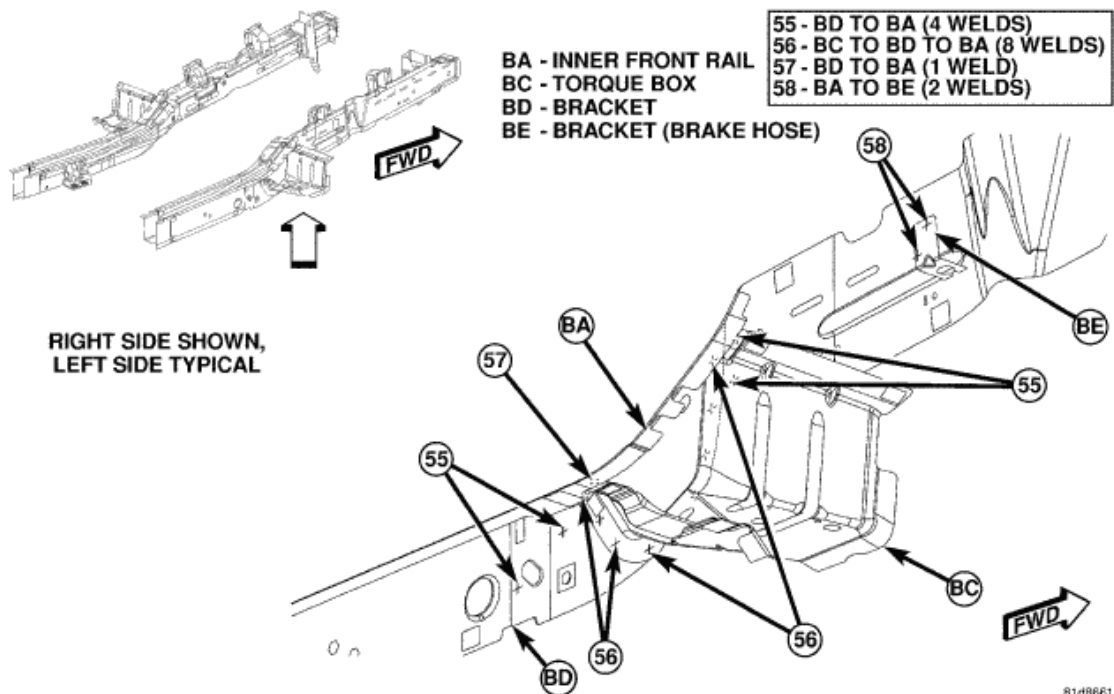


Fig. 805: Front Rails Weld Locations (12 Of 12)
 Courtesy of CHRYSLER LLC

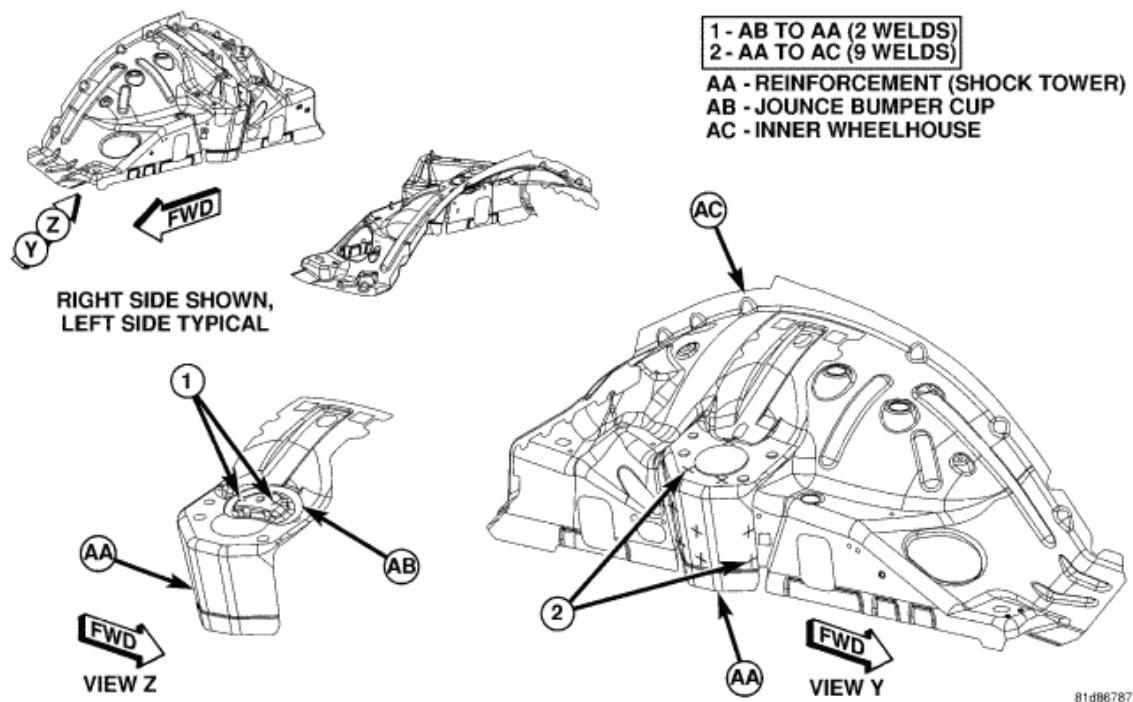


Fig. 806: Front Wheelhouse Weld Locations (1 Of 3)
Courtesy of CHRYSLER LLC

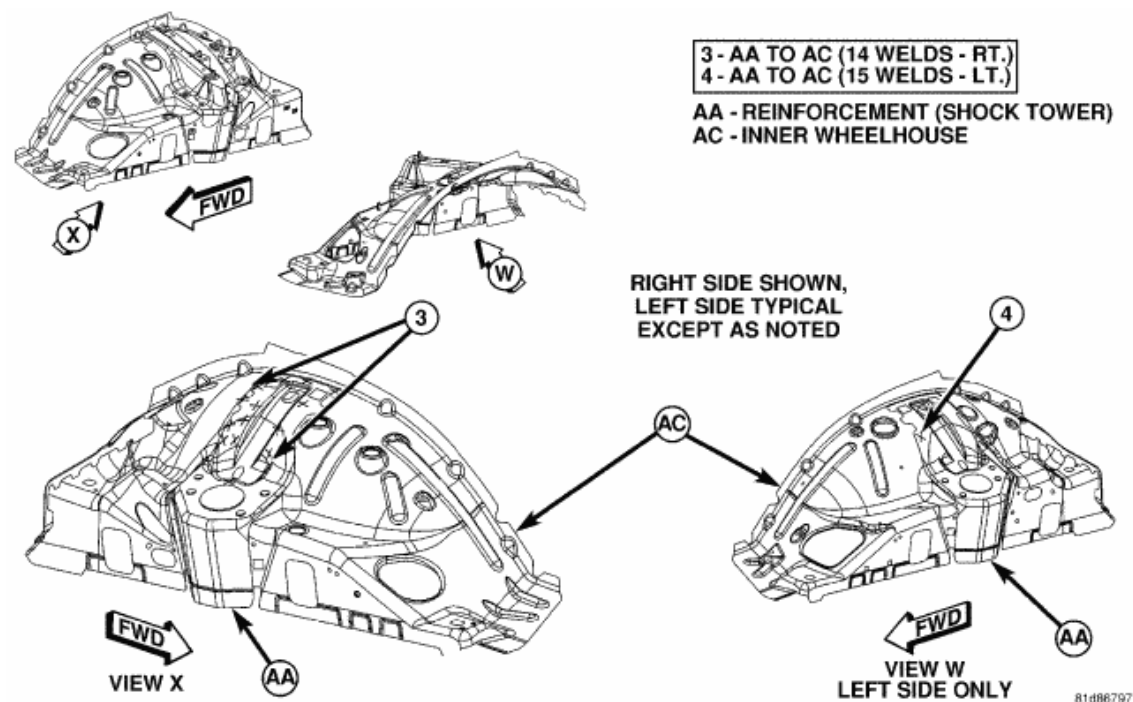
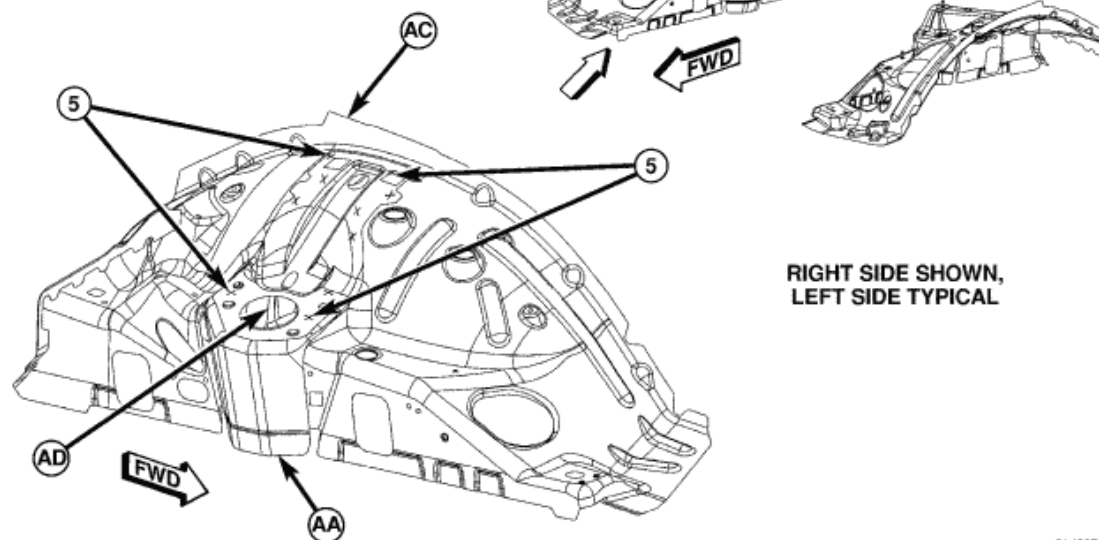


Fig. 807: Front Wheelhouse Weld Locations (2 Of 3)
Courtesy of CHRYSLER LLC

5 - AD TO AC TO AA (10 WELDS)

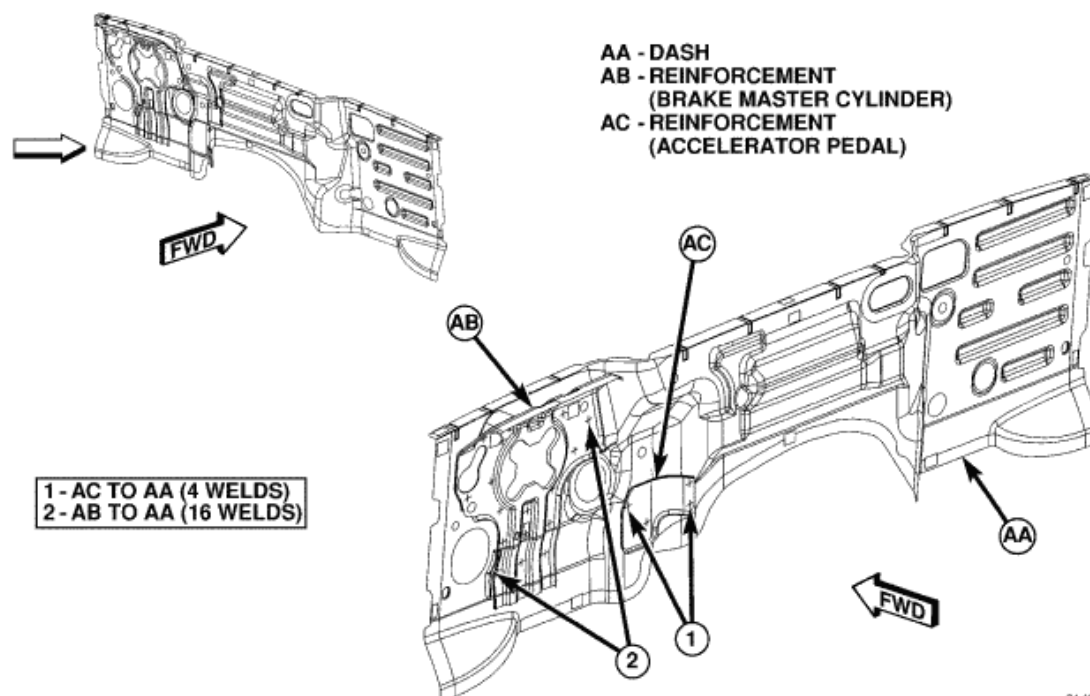
AA - REINFORCEMENT (SHOCK TOWER - LOWER)
AC - INNER WHEELHOUSE
AD - REINFORCEMENT (SHOCK TOWER - UPPER)



81d867a2

Fig. 808: Front Wheelhouse Weld Locations (3 Of 3)

Courtesy of CHRYSLER LLC



81d8683a

Fig. 809: Dash Weld Locations

Courtesy of CHRYSLER LLC

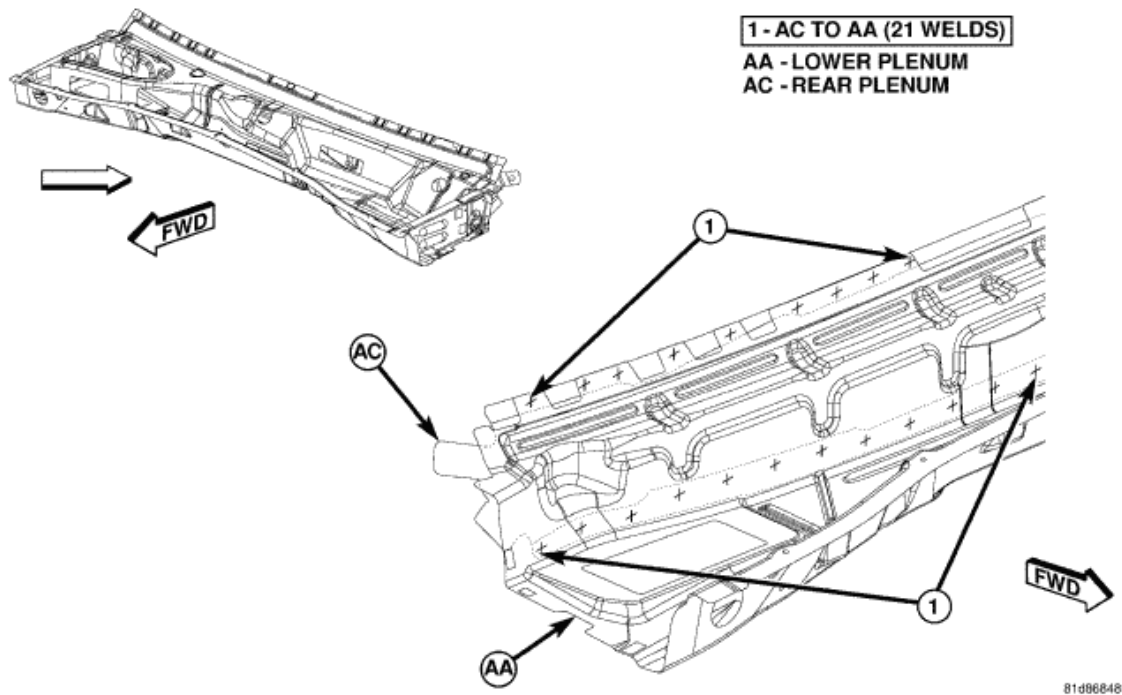


Fig. 810: Lower Plenum Weld Locations (1 Of 4)
Courtesy of CHRYSLER LLC

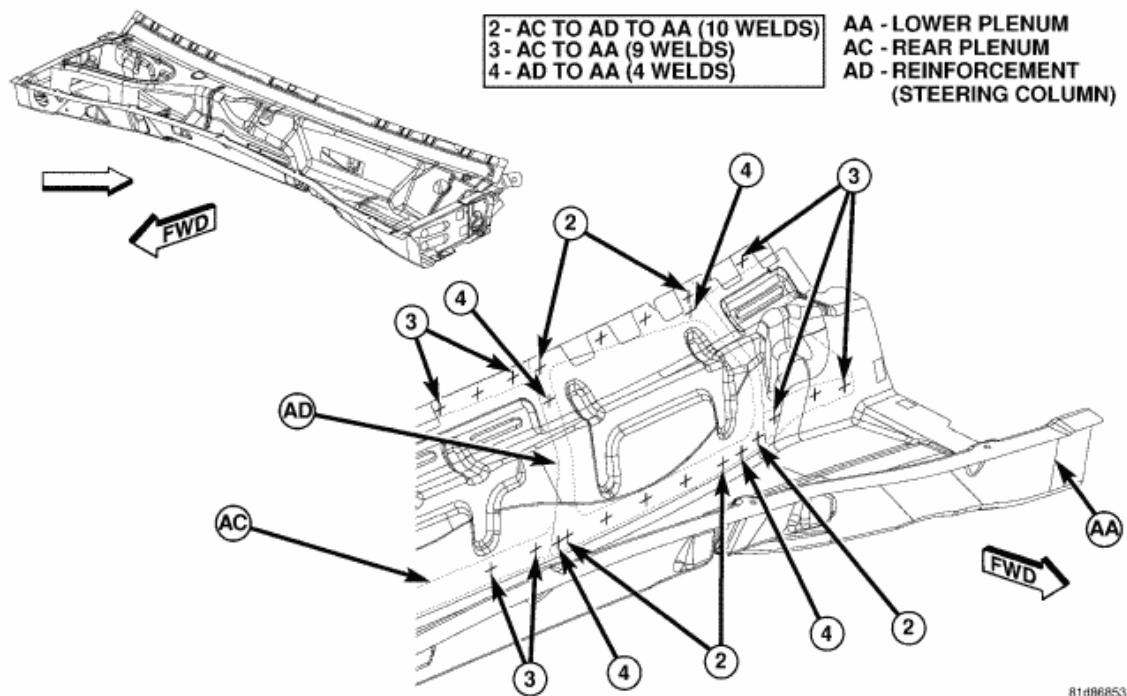


Fig. 811: Lower Plenum Weld Locations (2 Of 4)
Courtesy of CHRYSLER LLC

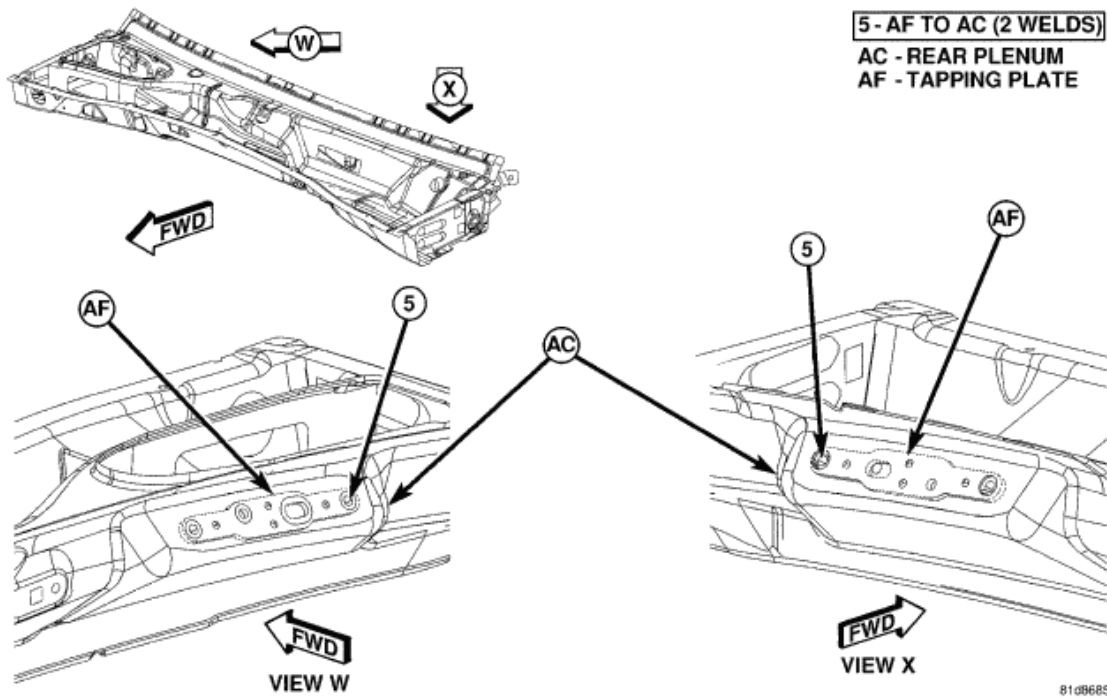


Fig. 812: Lower Plenum Weld Locations (3 Of 4)
Courtesy of CHRYSLER LLC

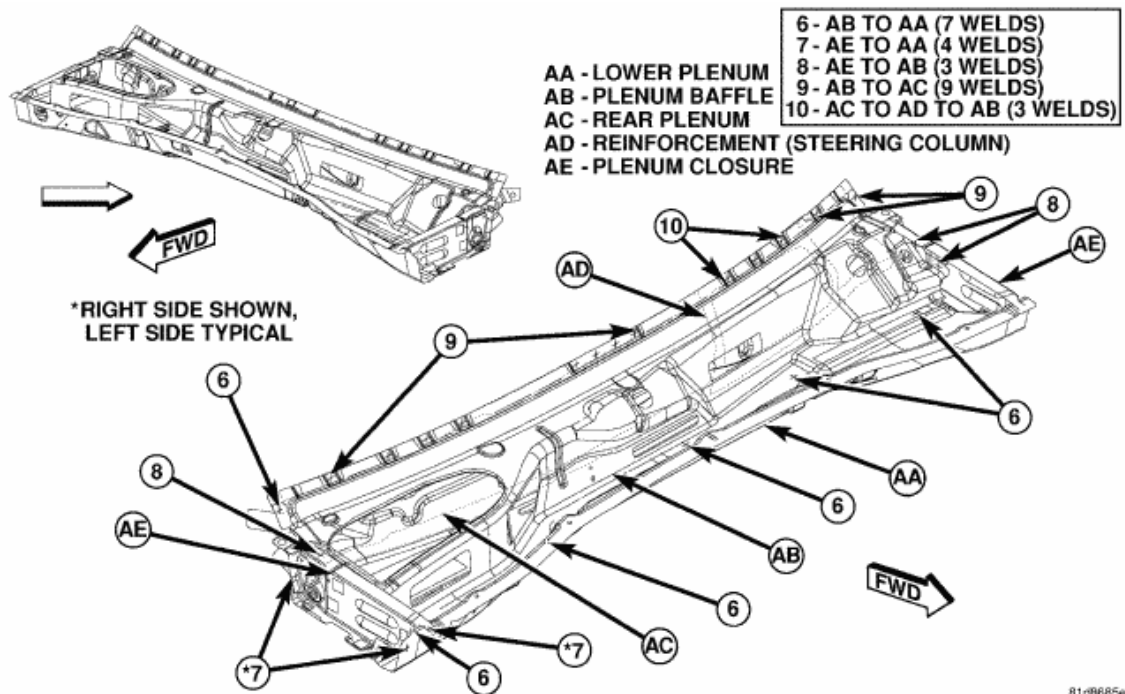


Fig. 813: Lower Plenum Weld Locations (4 Of 4)
Courtesy of CHRYSLER LLC

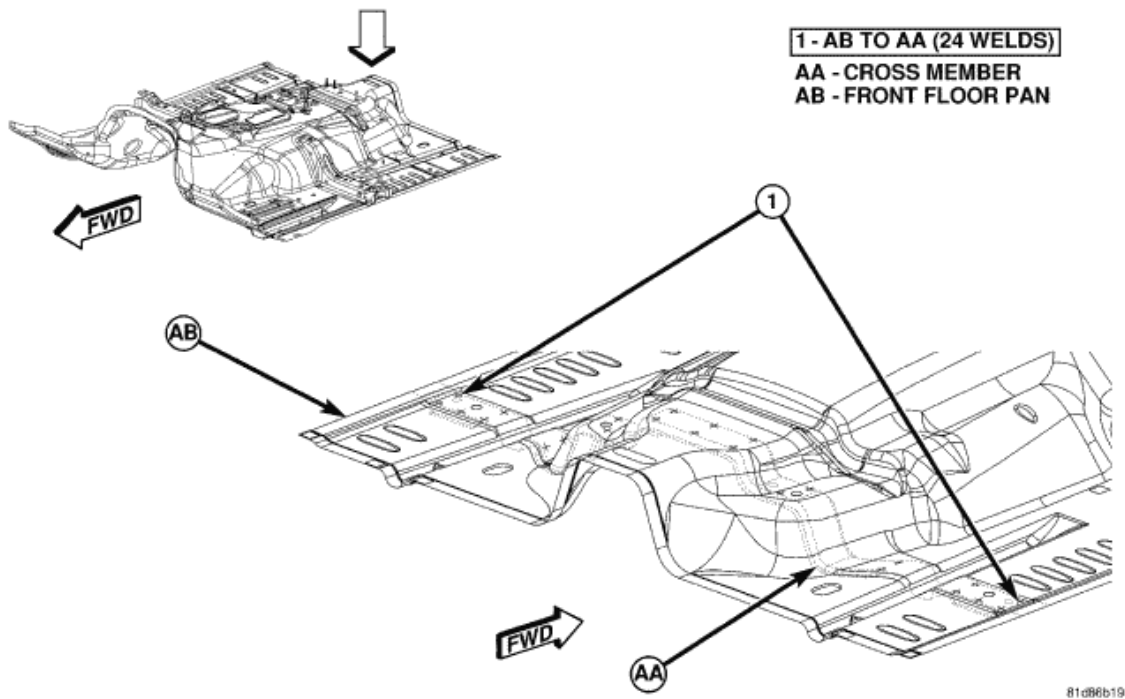


Fig. 814: Front Floor Weld Locations (1 Of 6)
Courtesy of CHRYSLER LLC

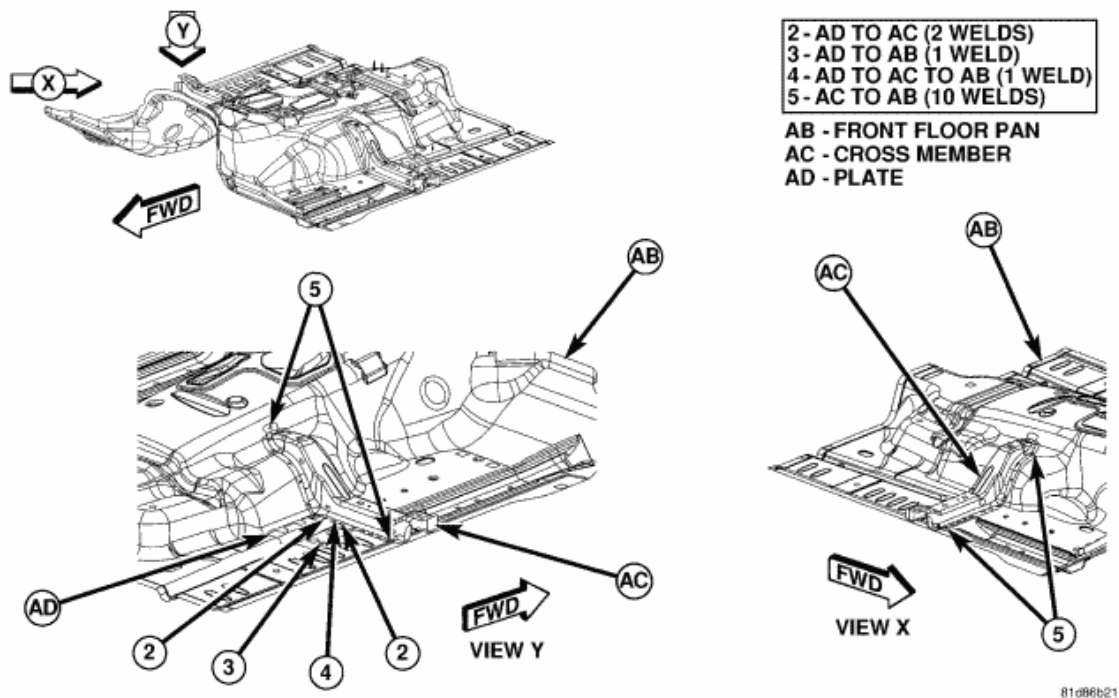


Fig. 815: Front Floor Weld Locations (2 Of 6)
Courtesy of CHRYSLER LLC

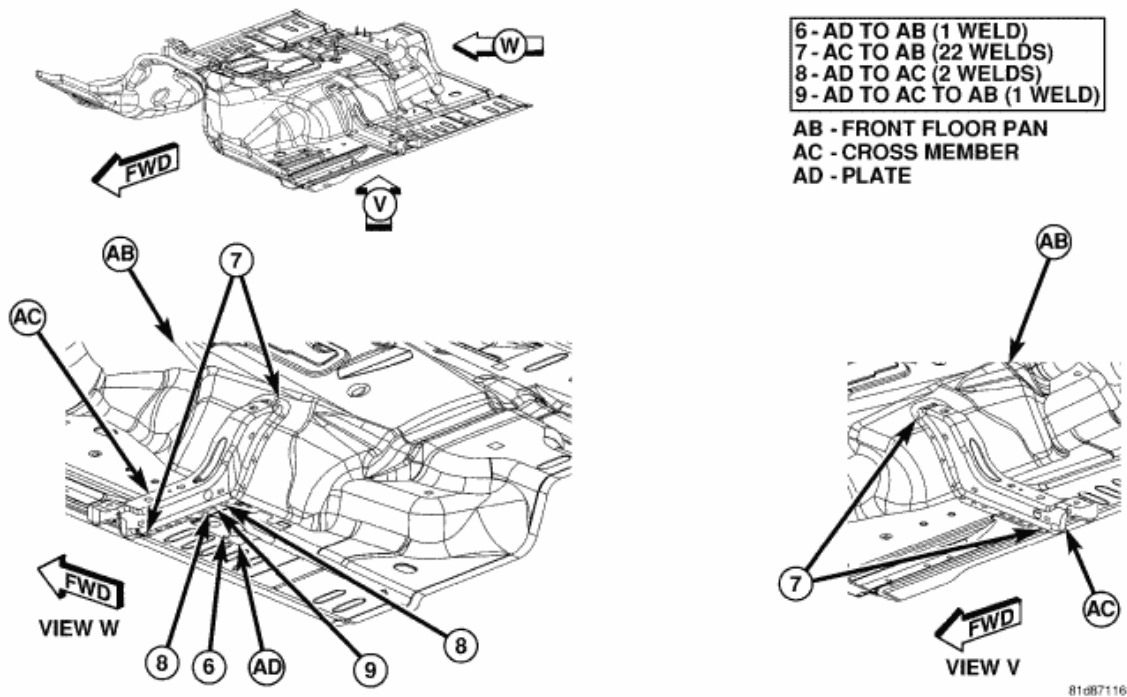


Fig. 816: Front Floor Weld Locations (3 Of 6)
 Courtesy of CHRYSLER LLC

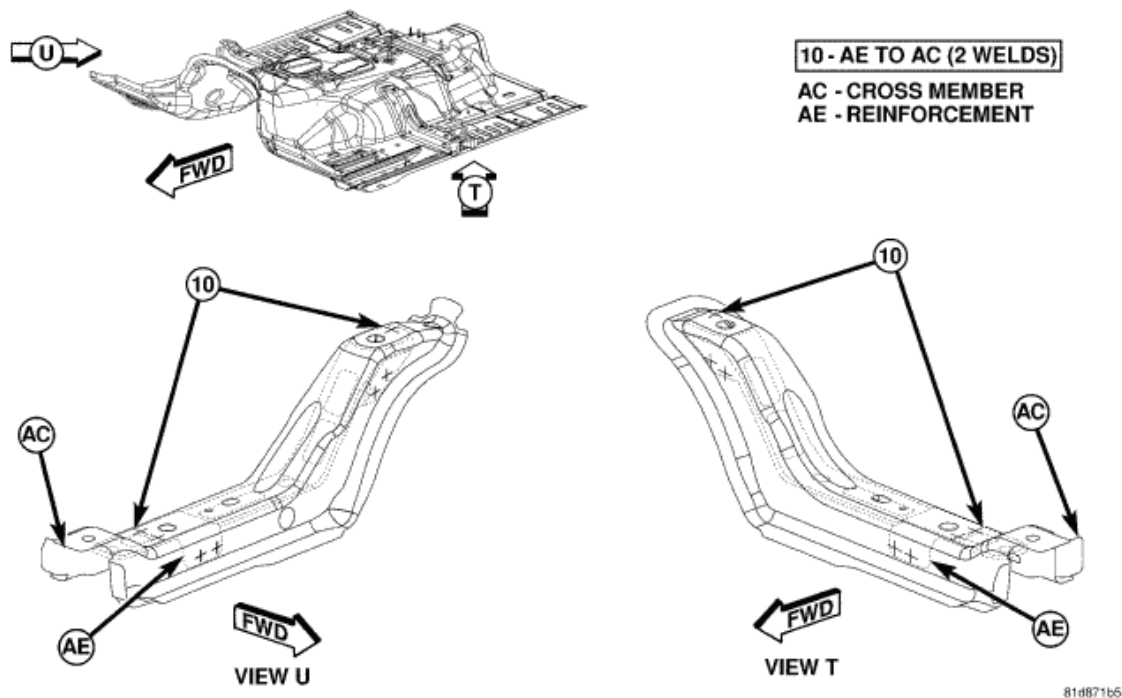
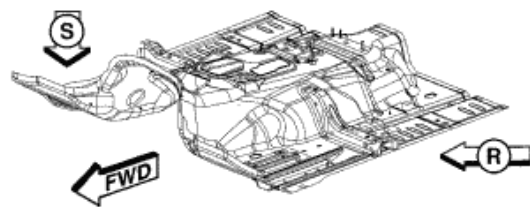
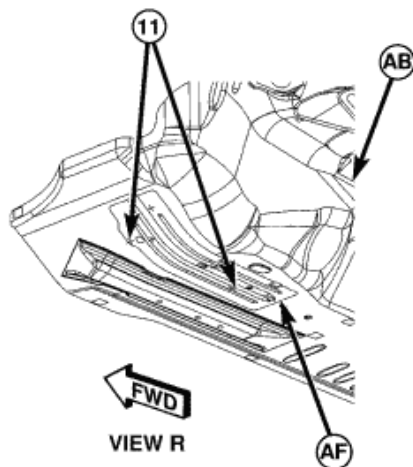
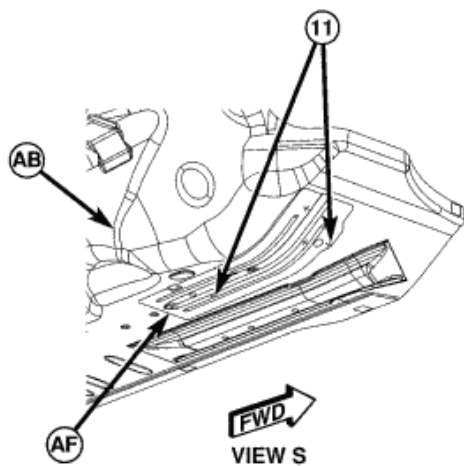


Fig. 817: Front Floor Weld Locations (4 Of 6)
 Courtesy of CHRYSLER LLC



11 - AF TO AB (10 WELDS)

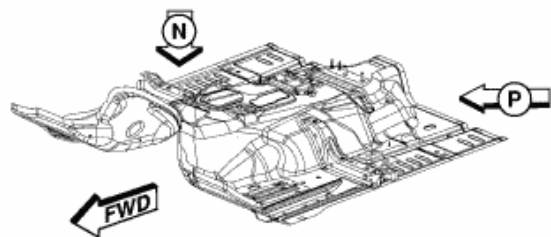
AB - FRONT FLOOR PAN
AF - PLATE



81d871f1

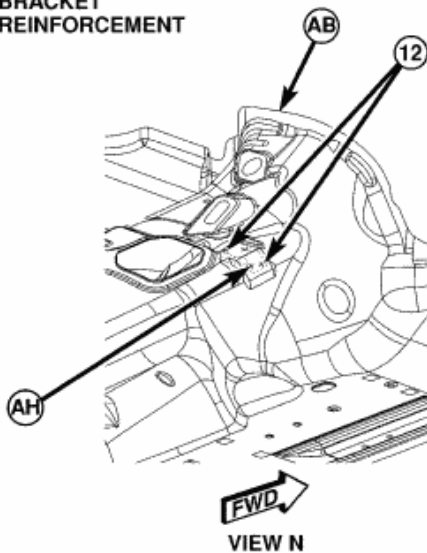
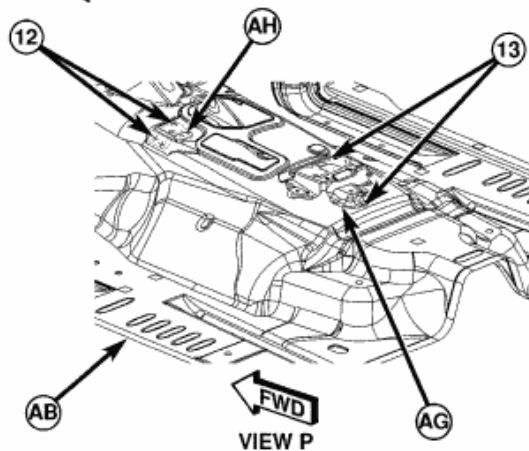
Fig. 818: Front Floor Weld Locations (5 Of 6)

Courtesy of CHRYSLER LLC



12 - AH TO AB (8 WELDS)
13 - AG TO AB (11 WELDS)

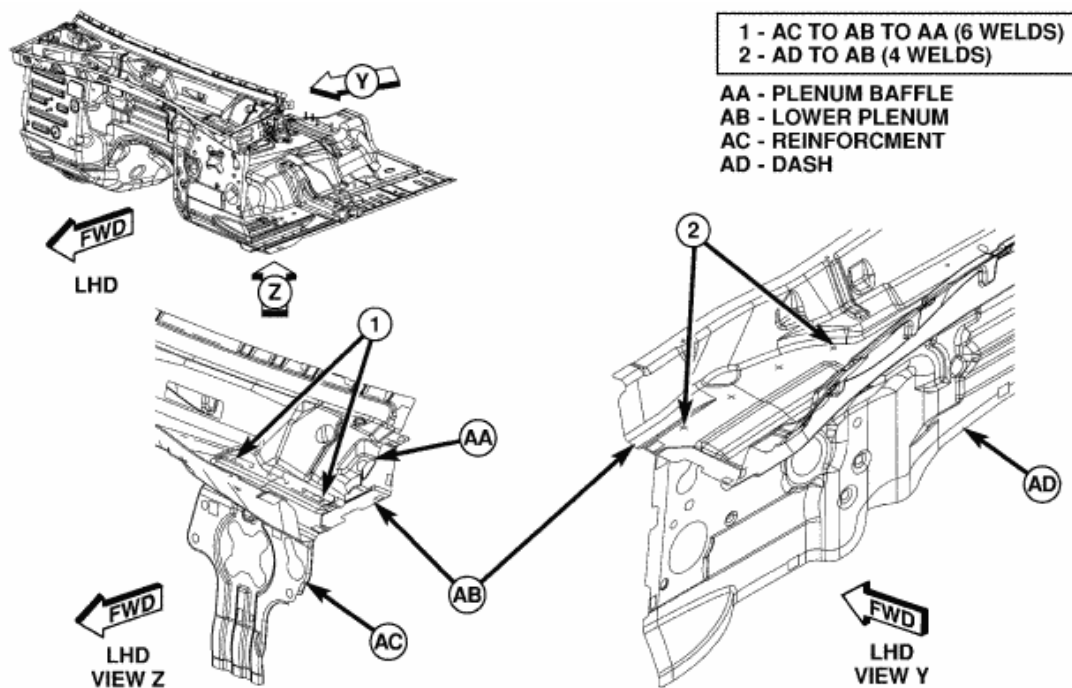
AB - FRONT FLOOR PAN
AG - BRACKET
AH - REINFORCEMENT



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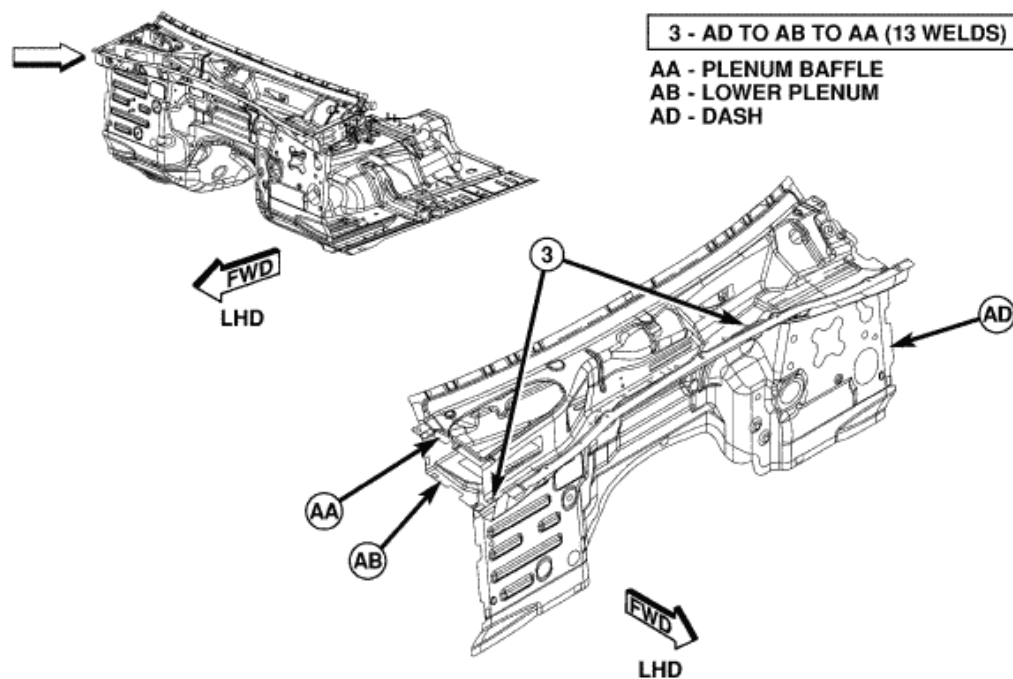
Fig. 819: Front Floor Weld Locations (6 Of 6)

Courtesy of CHRYSLER LLC



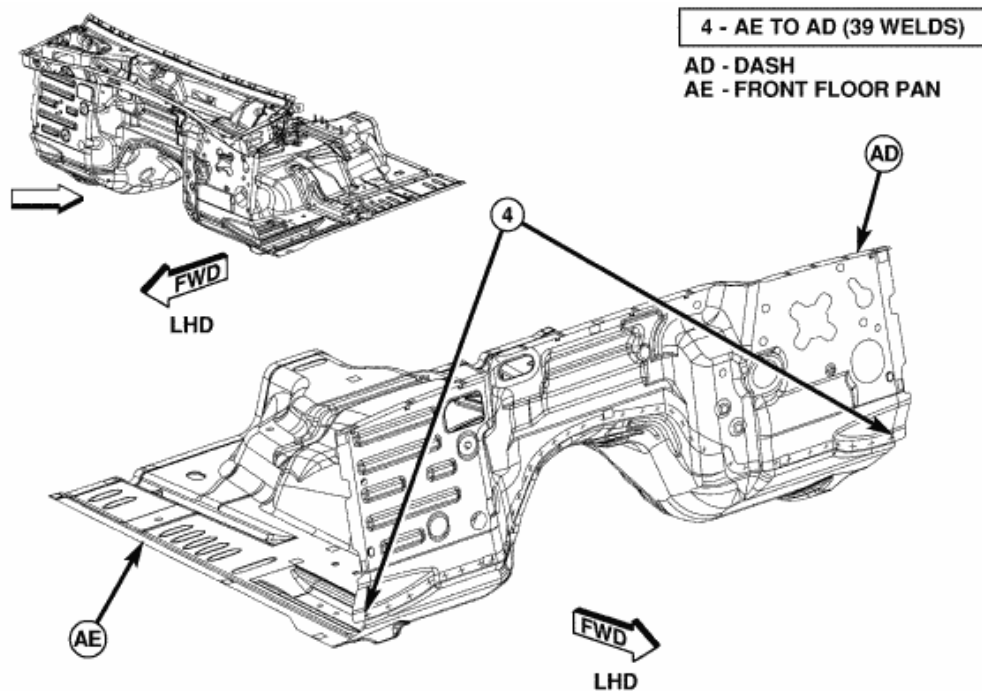
81d8778f

Fig. 820: Front Floor/Dash/Plenum Weld Locations (1 Of 6)
Courtesy of CHRYSLER LLC



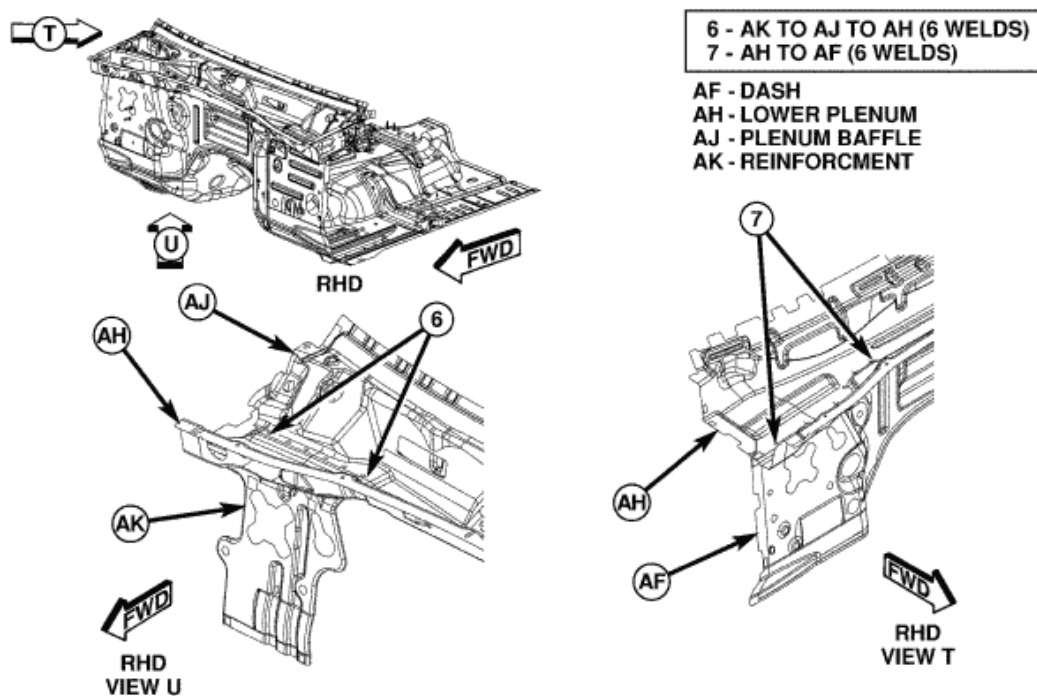
81d87796

Fig. 821: Front Floor/Dash/Plenum Weld Locations (2 Of 6)
Courtesy of CHRYSLER LLC



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Fig. 822: Front Floor/Dash/Plenum Weld Locations (3 Of 6)
 Courtesy of CHRYSLER LLC



81d8779a

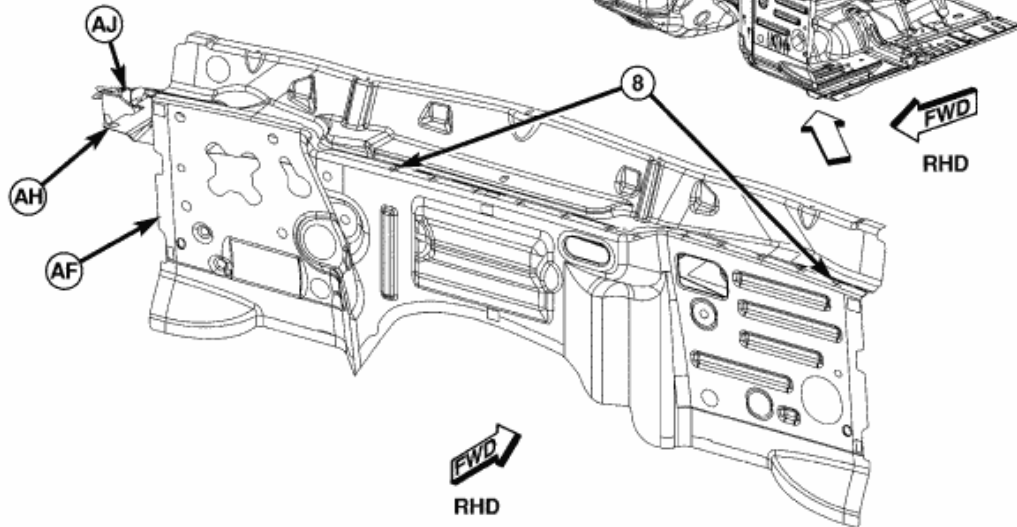
Fig. 823: Front Floor/Dash/Plenum Weld Locations (4 Of 6)
 Courtesy of CHRYSLER LLC

8 - AJ TO AH TO AF (12 WELDS)

AF - DASH

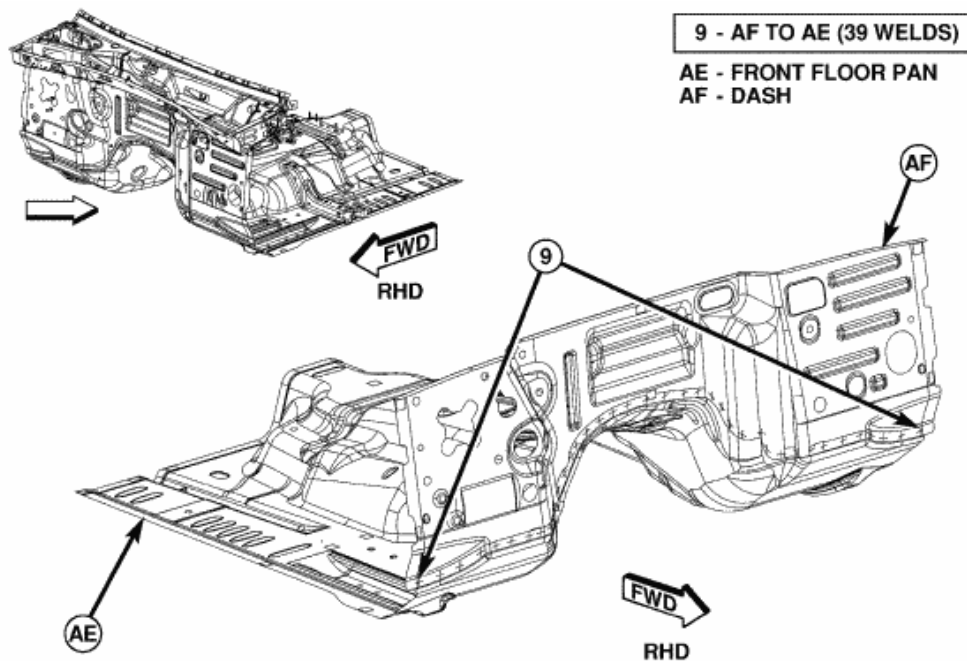
AH - LOWER PLENUM

AJ - PLENUM BAFFLE



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Fig. 824: Front Floor/Dash/Plenum Weld Locations (5 Of 6)
Courtesy of CHRYSLER LLC



81d89867

Fig. 825: Front Floor/Dash/Plenum Weld Locations (6 Of 6)
Courtesy of CHRYSLER LLC

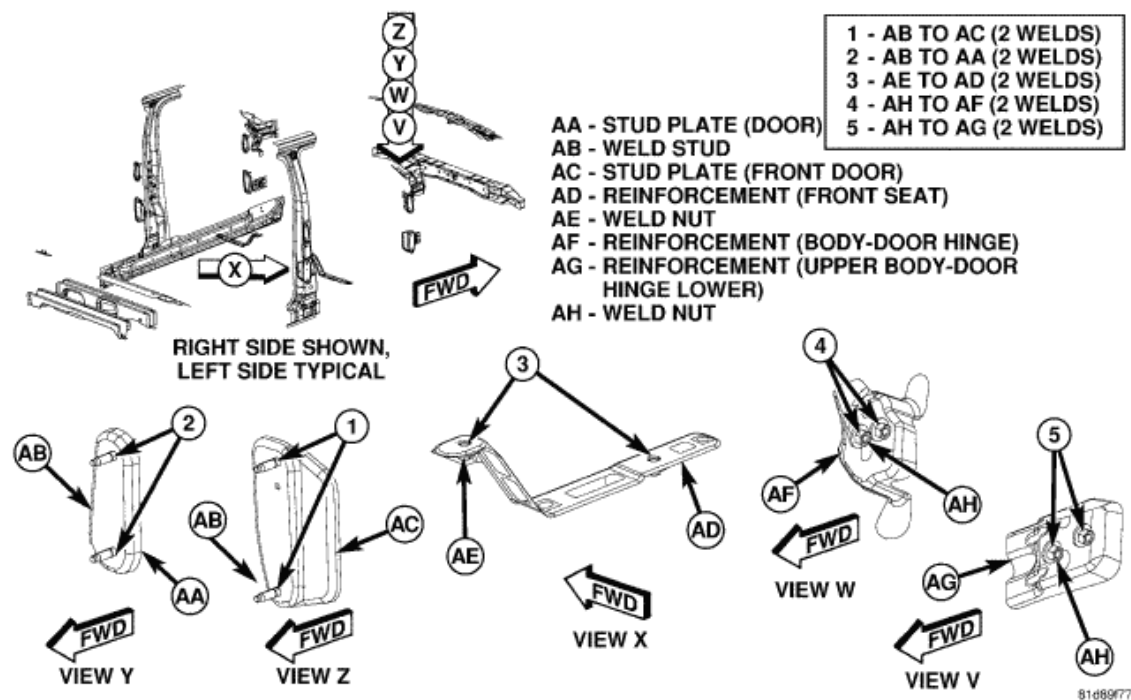


Fig. 826: Miscellaneous Weld Locations (1 Of 11)
Courtesy of CHRYSLER LLC

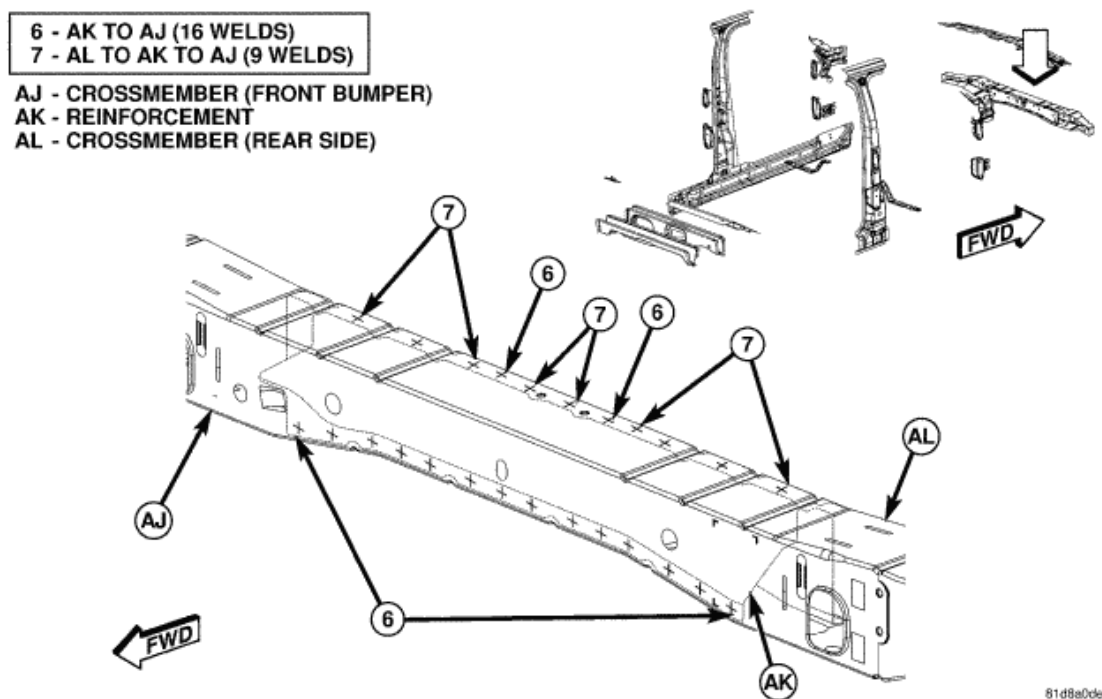
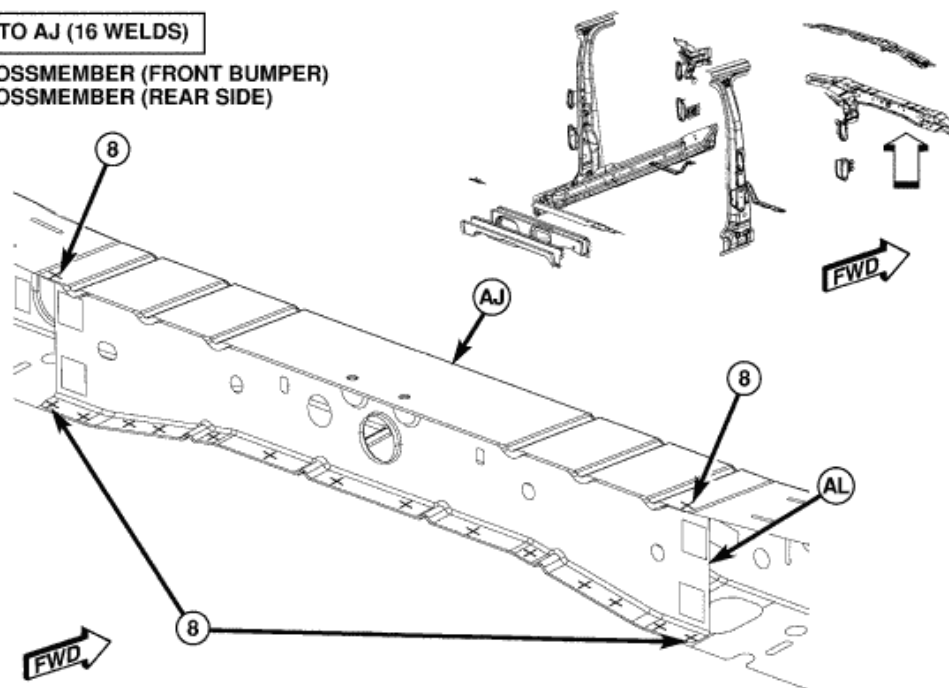


Fig. 827: Miscellaneous Weld Locations (2 Of 11)
Courtesy of CHRYSLER LLC

8 - AL TO AJ (16 WELDS)

AJ - CROSSMEMBER (FRONT BUMPER)

AL - CROSSMEMBER (REAR SIDE)



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Fig. 828: Miscellaneous Weld Locations (3 Of 11)

Courtesy of CHRYSLER LLC

9 - AH TO AM (4 WELDS)

11 - AN TO AP (3 WELDS)

12 - AR TO AN (1 WELD)

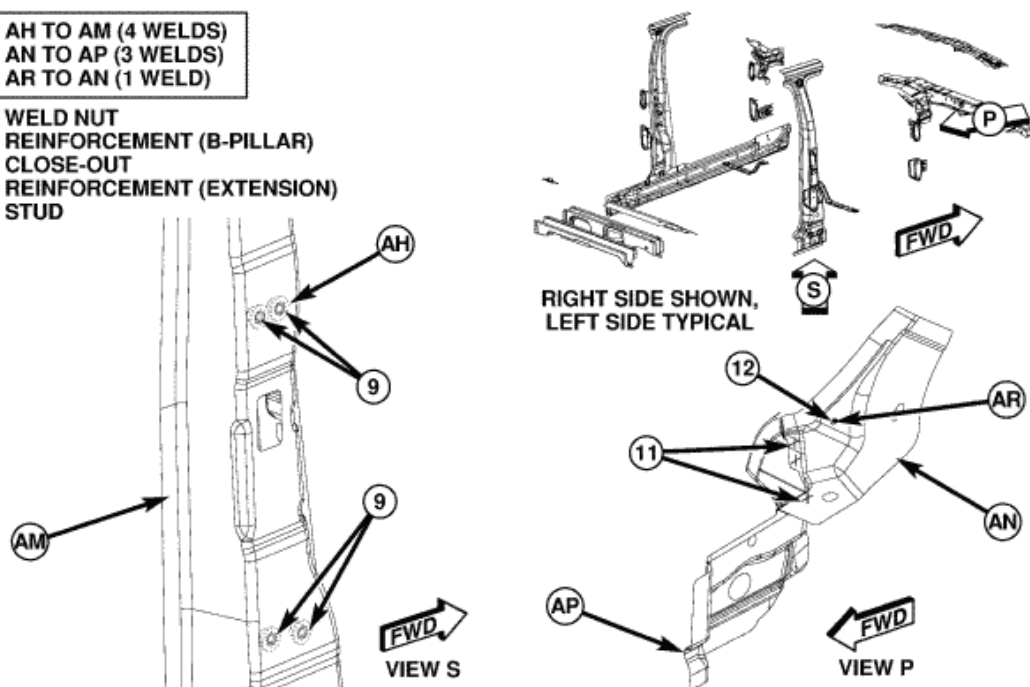
AH - WELD NUT

AM - REINFORCEMENT (B-PILLAR)

AN - CLOSE-OUT

AP - REINFORCEMENT (EXTENSION)

AR - STUD



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Fig. 829: Miscellaneous Weld Locations (4 Of 11)

Courtesy of CHRYSLER LLC

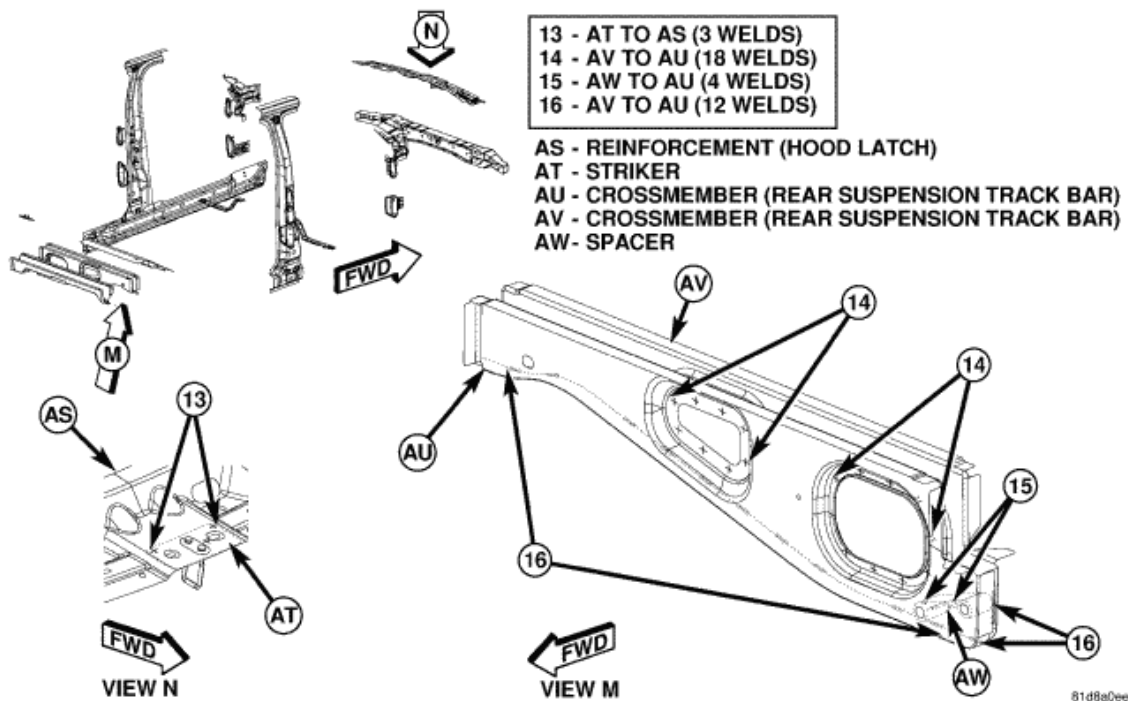


Fig. 830: Miscellaneous Weld Locations (5 Of 11)
 Courtesy of CHRYSLER LLC

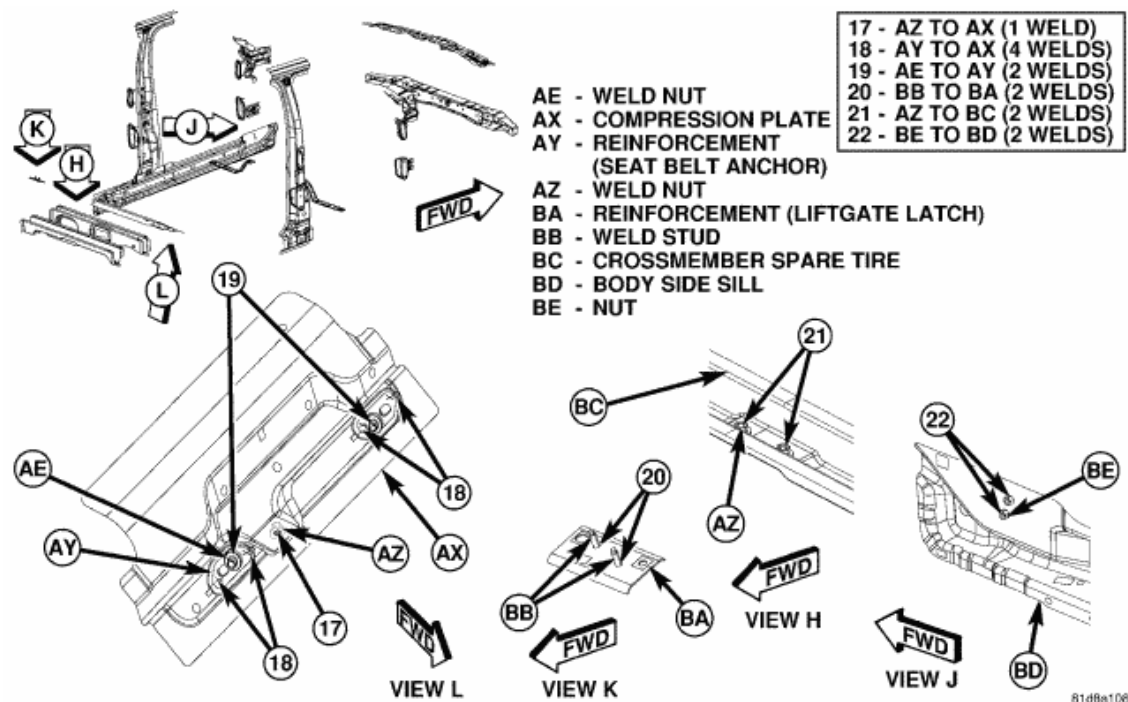
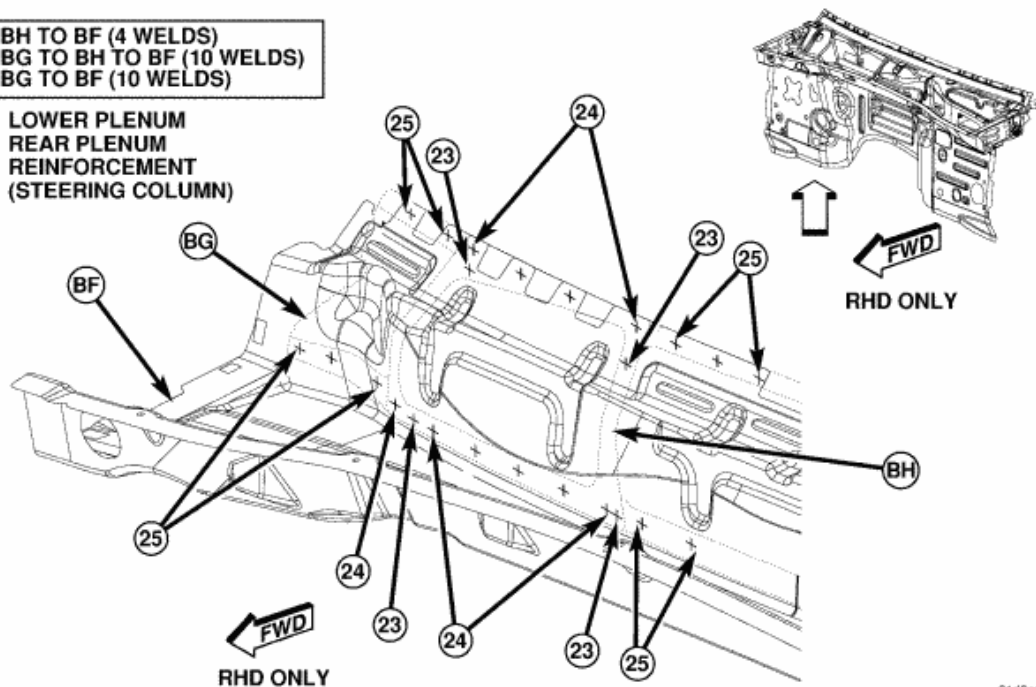


Fig. 831: Miscellaneous Weld Locations (6 Of 11)
 Courtesy of CHRYSLER LLC

23 - BH TO BF (4 WELDS)
 24 - BG TO BH TO BF (10 WELDS)
 25 - BG TO BF (10 WELDS)

BF - LOWER PLENUM
 BG - REAR PLENUM
 BH - REINFORCEMENT
 (STEERING COLUMN)



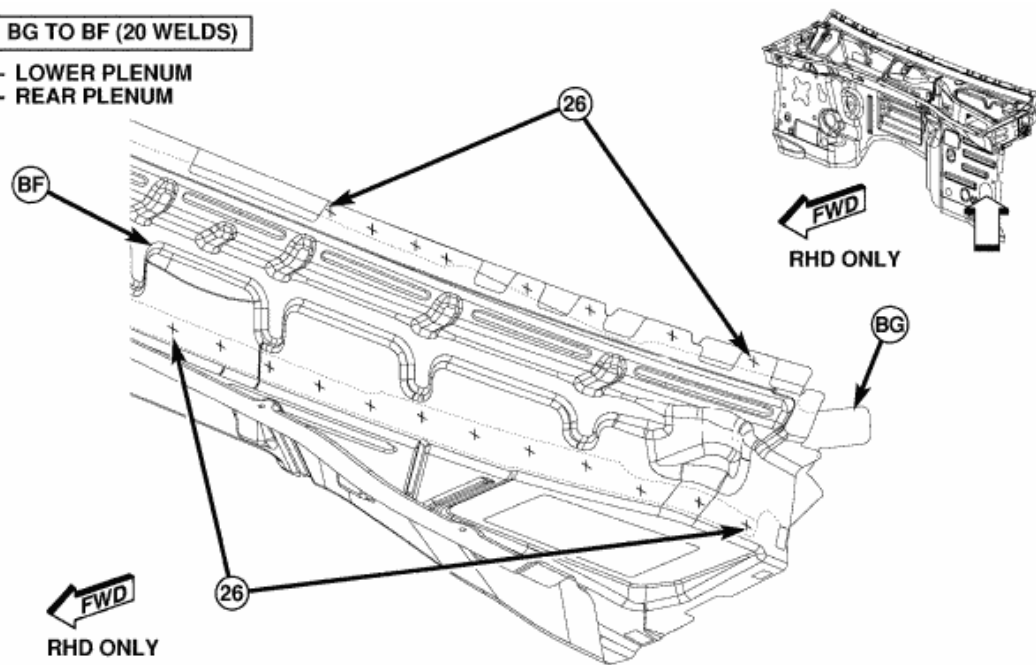
81d8a110

Fig. 832: Miscellaneous Weld Locations (7 Of 11)

Courtesy of CHRYSLER LLC

26 - BG TO BF (20 WELDS)

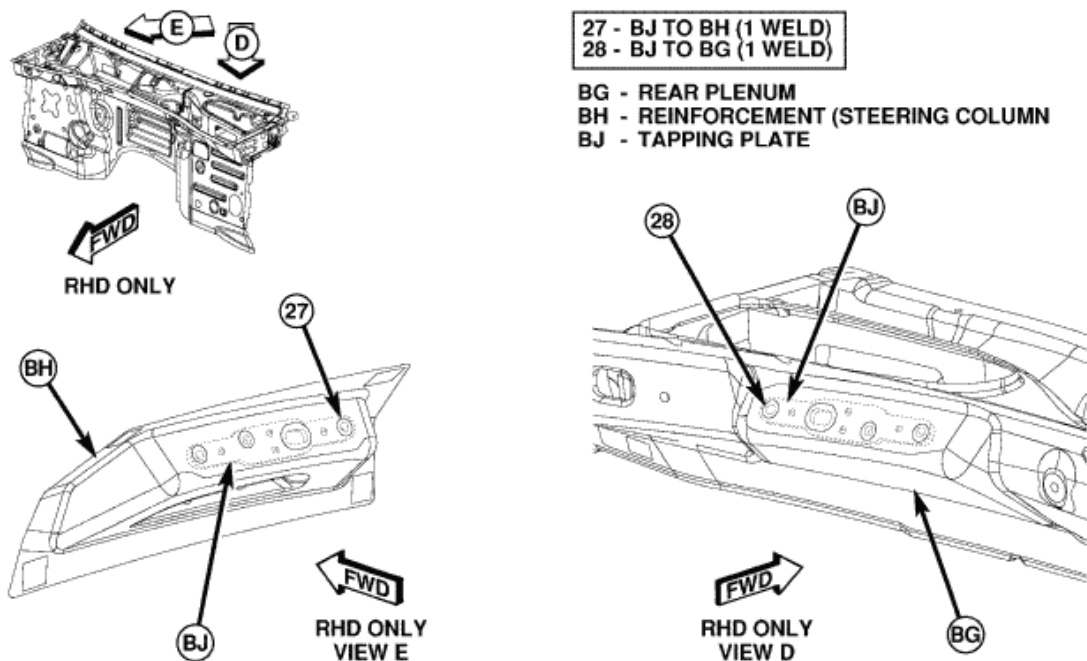
BF - LOWER PLENUM
 BG - REAR PLENUM



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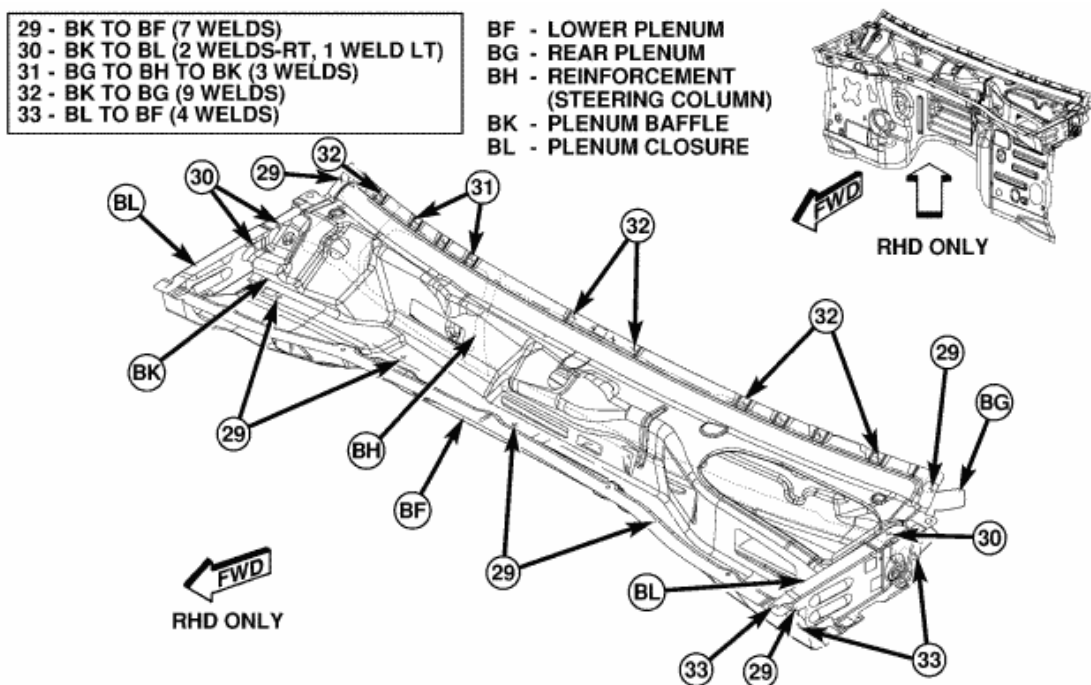
Fig. 833: Miscellaneous Weld Locations (8 Of 11)

Courtesy of CHRYSLER LLC



81d8a145

Fig. 834: Miscellaneous Weld Locations (9 Of 11)
Courtesy of CHRYSLER LLC

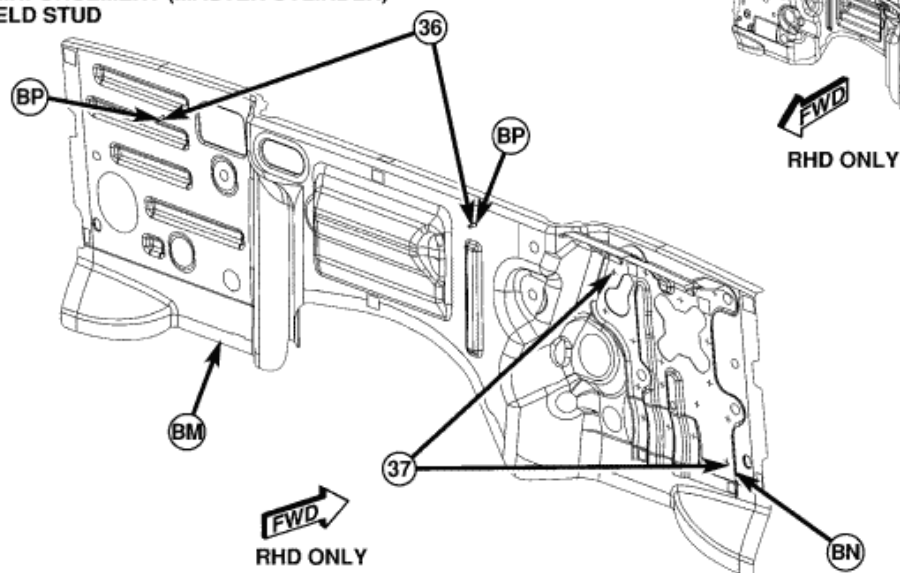


81d8a162

Fig. 835: Miscellaneous Weld Locations (10 Of 11)
Courtesy of CHRYSLER LLC

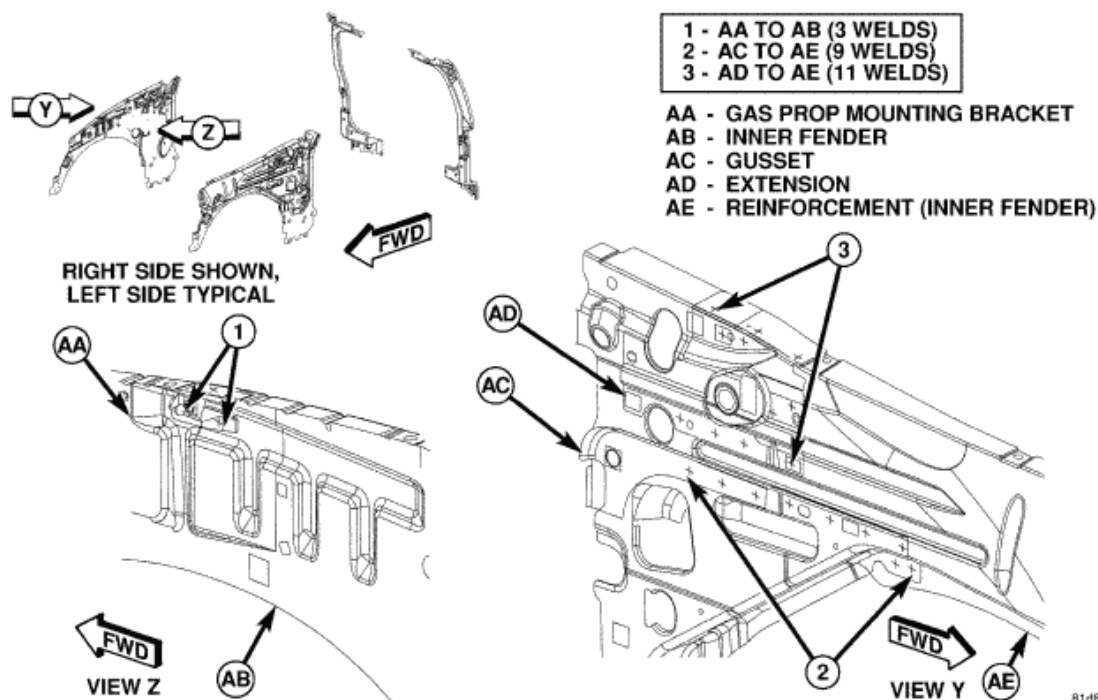
36 - BP TO BM (2 WELDS)
37 - BN TO BM (17 WELDS)

BM - DASH
BN - REINFORCEMENT (MASTER CYLINDER)
BP - WELD STUD



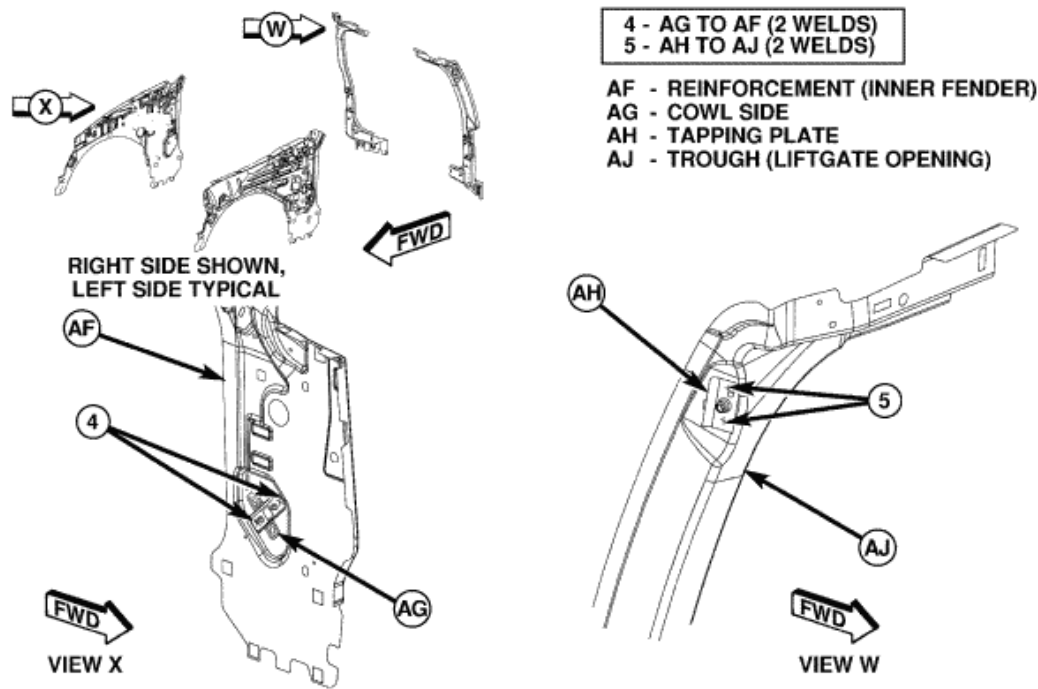
81d8a169

Fig. 836: Miscellaneous Weld Locations (11 Of 11)
Courtesy of CHRYSLER LLC



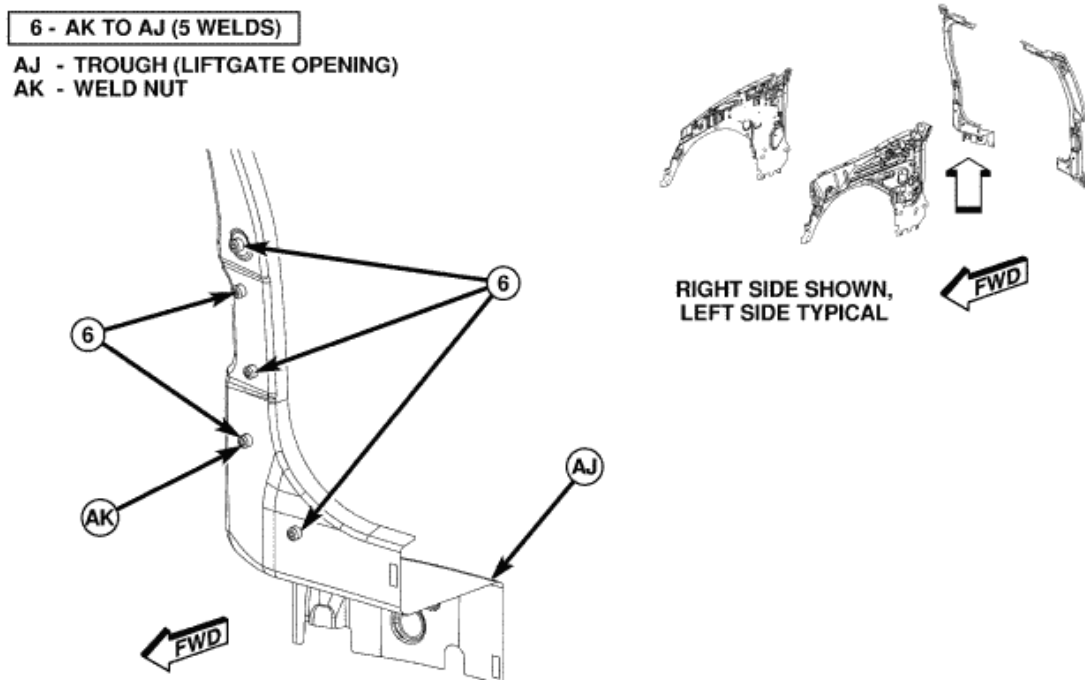
81d8a292

Fig. 837: Miscellaneous Body Weld Locations (1 Of 3)
Courtesy of CHRYSLER LLC



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Fig. 838: Miscellaneous Body Weld Locations (2 Of 3)
Courtesy of CHRYSLER LLC



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Fig. 839: Miscellaneous Body Weld Locations (3 Of 3)
Courtesy of CHRYSLER LLC

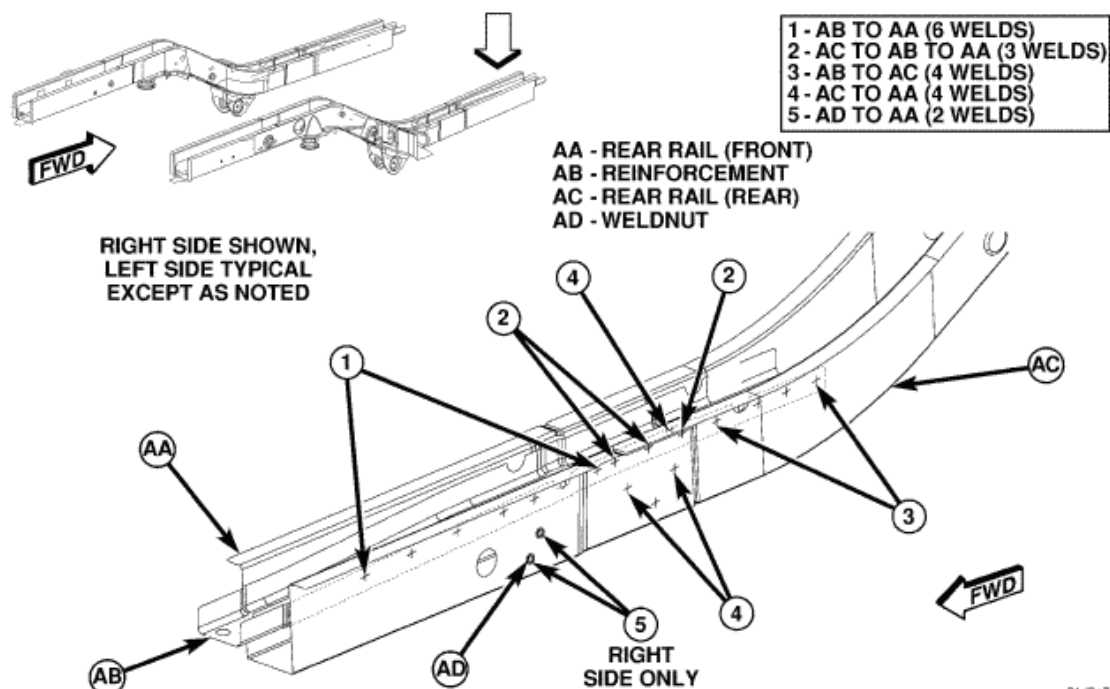


Fig. 840: Rear Rails Weld Locations (1 Of 19)

Courtesy of CHRYSLER LLC

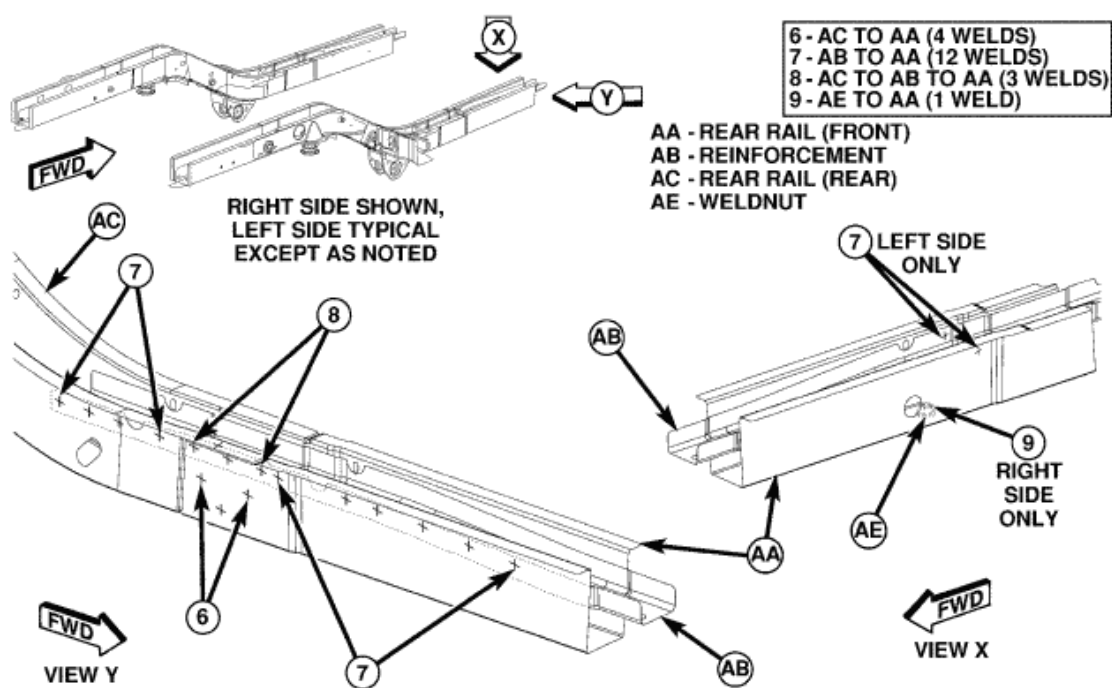


Fig. 841: Rear Rails Weld Locations (2 Of 19)

Courtesy of CHRYSLER LLC

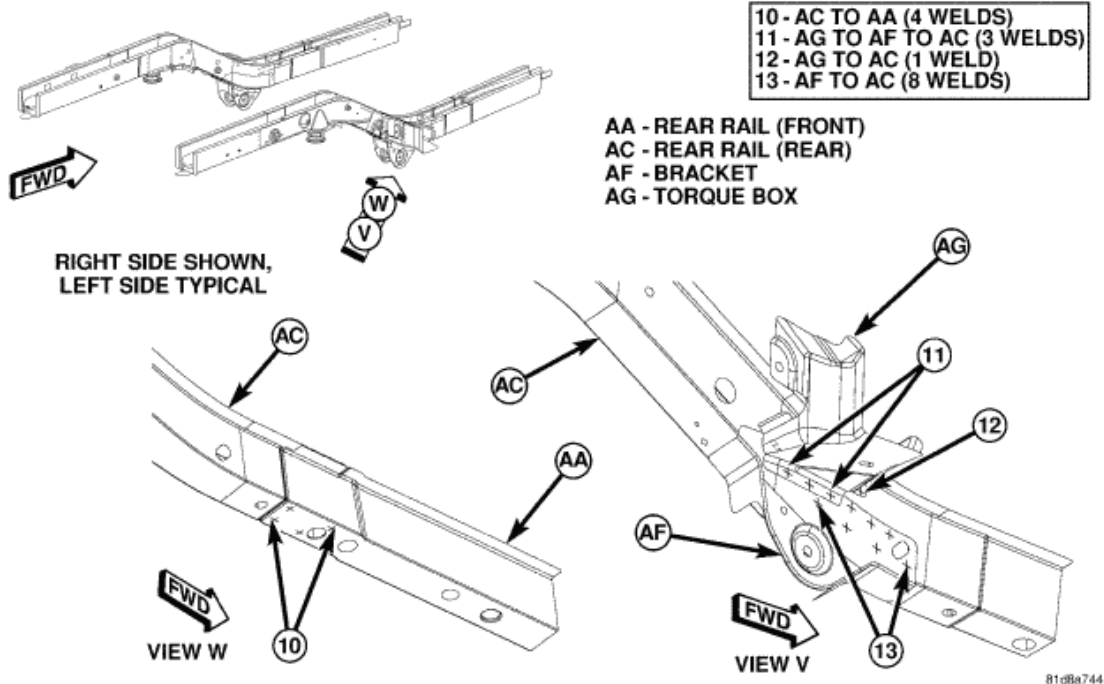


Fig. 842: Rear Rails Weld Locations (3 Of 19)
 Courtesy of CHRYSLER LLC

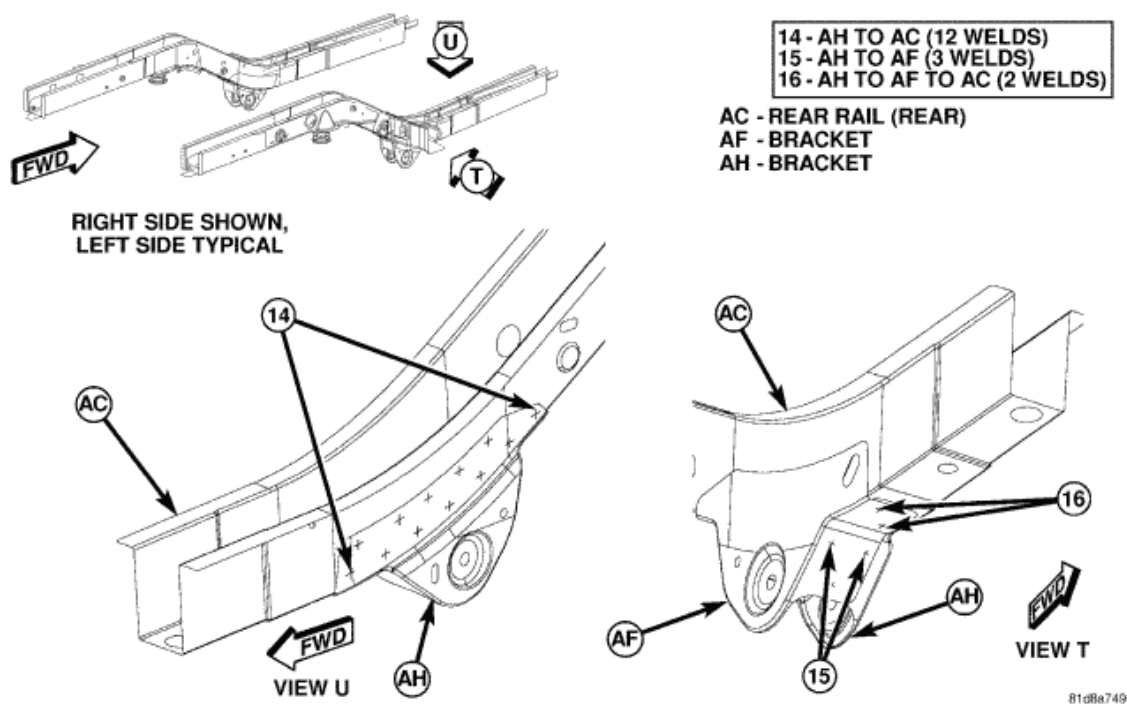
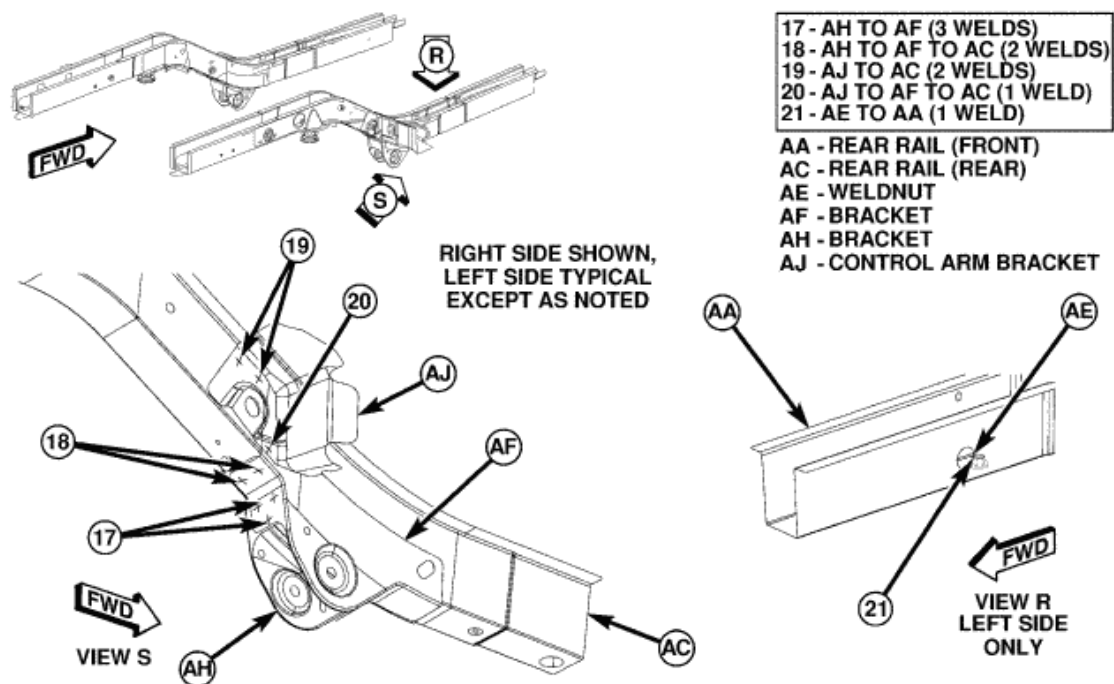


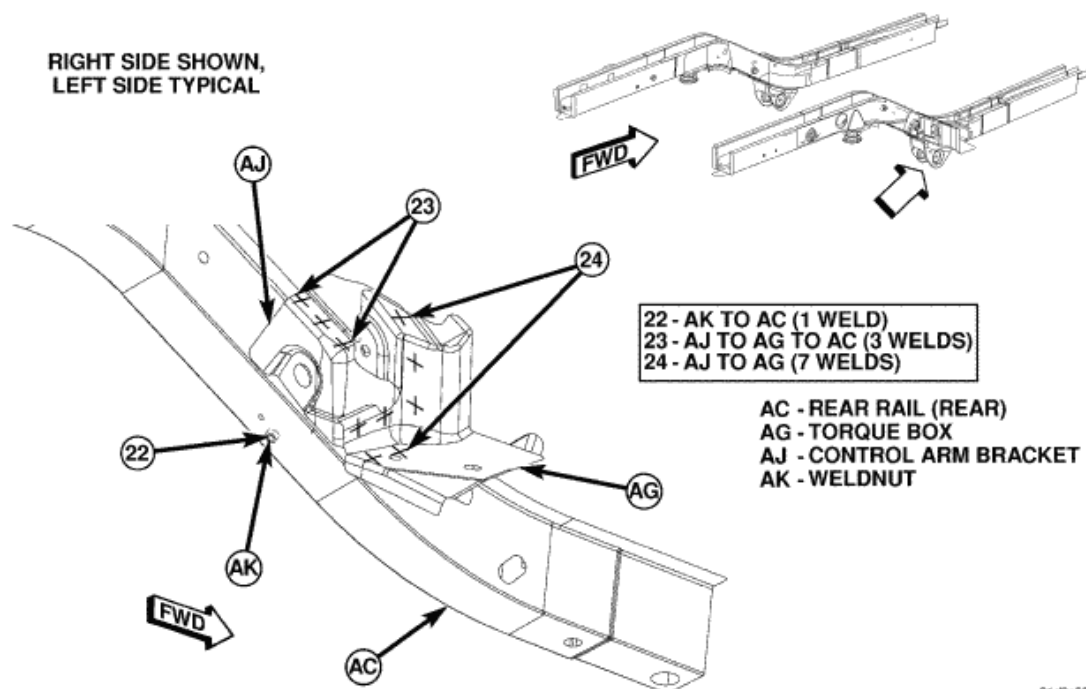
Fig. 843: Rear Rails Weld Locations (4 Of 19)
 Courtesy of CHRYSLER LLC



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Fig. 844: Rear Rails Weld Locations (5 Of 19)

Courtesy of CHRYSLER LLC



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Fig. 845: Rear Rails Weld Locations (6 Of 19)

Courtesy of CHRYSLER LLC

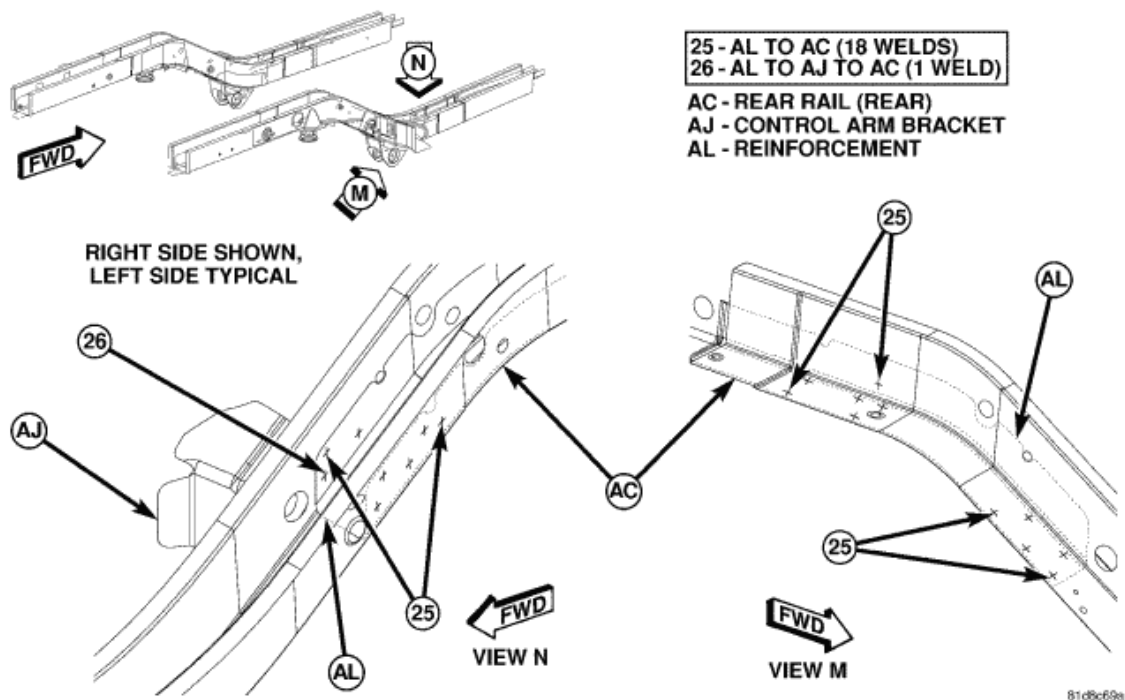


Fig. 846: Rear Rails Weld Locations (7 Of 19)
Courtesy of CHRYSLER LLC

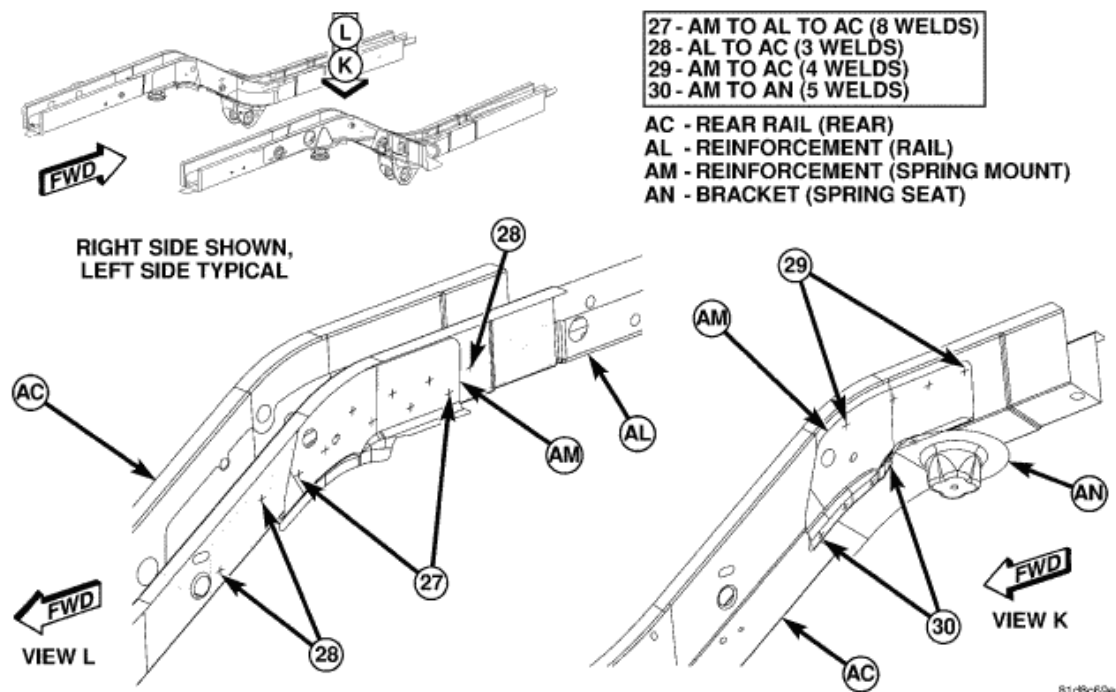


Fig. 847: Rear Rails Weld Locations (8 Of 19)
Courtesy of CHRYSLER LLC

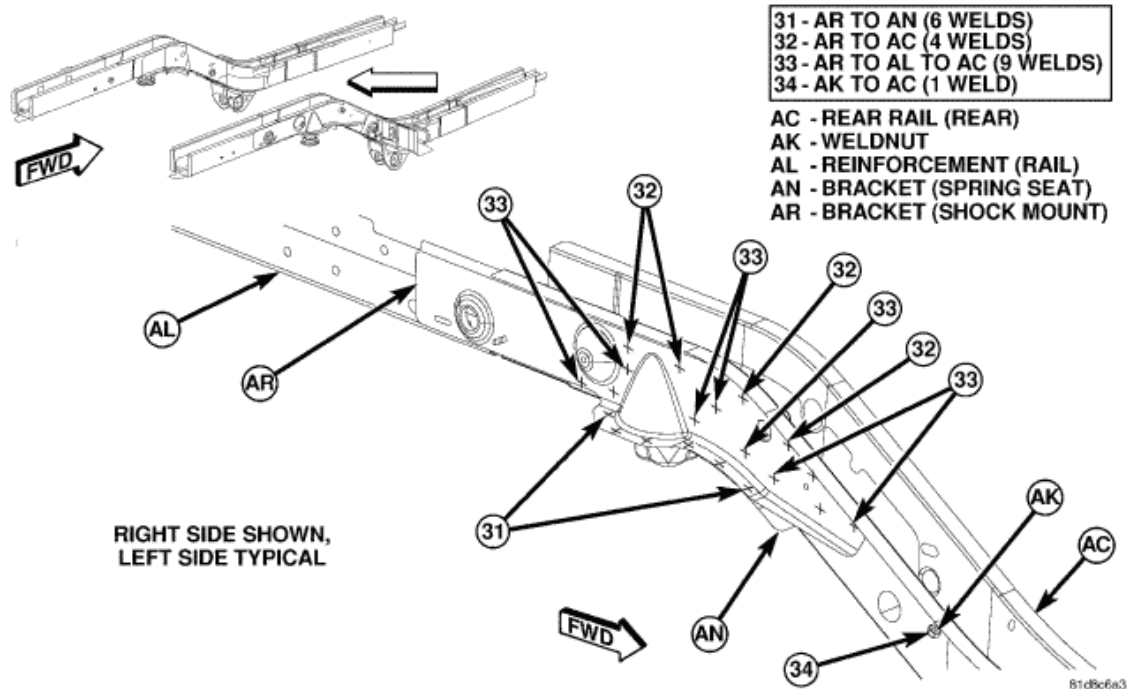


Fig. 848: Rear Rails Weld Locations (9 Of 19)
 Courtesy of CHRYSLER LLC

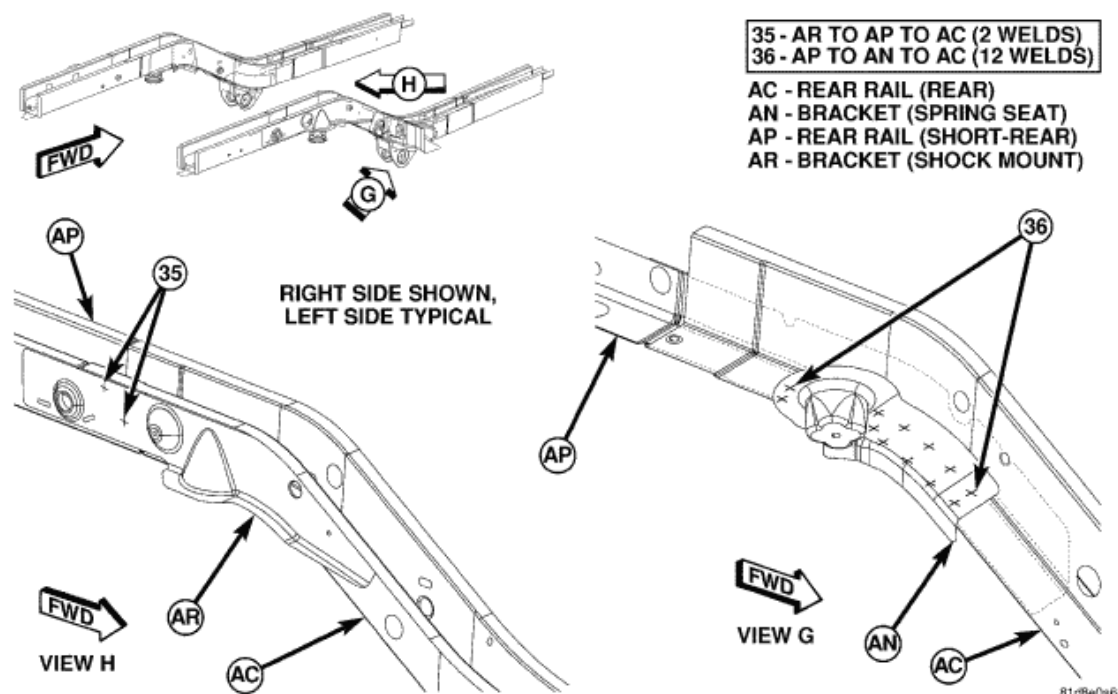


Fig. 849: Rear Rails Weld Locations (10 Of 19)
 Courtesy of CHRYSLER LLC

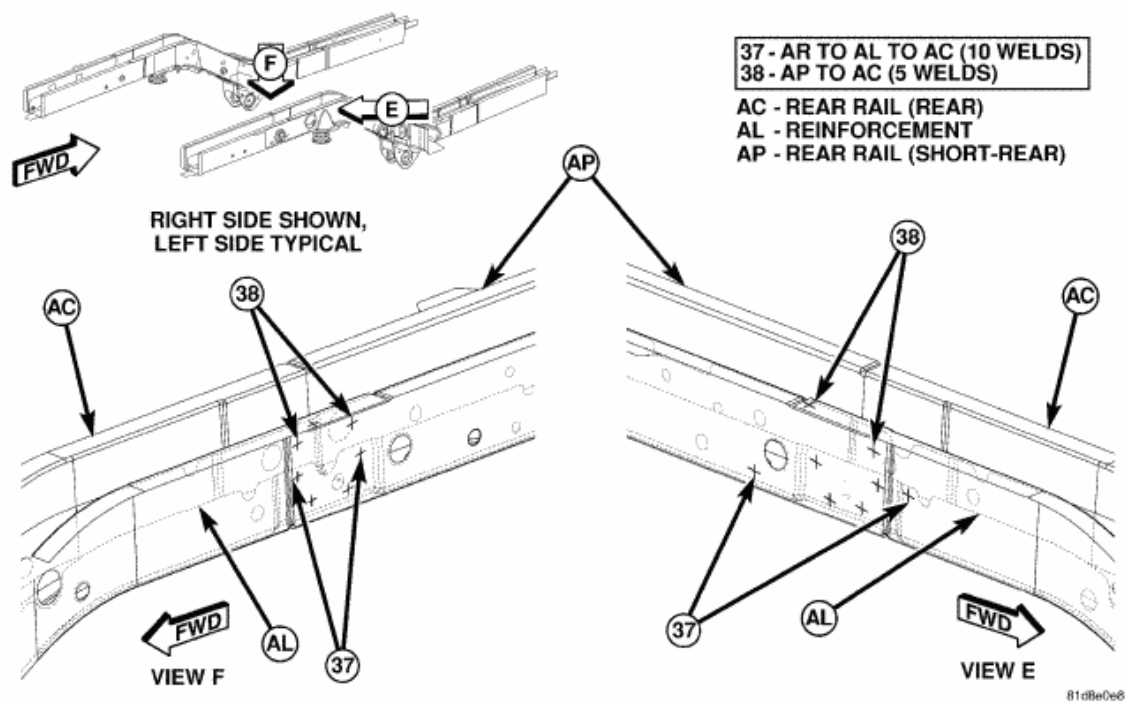


Fig. 850: Rear Rails Weld Locations (11 Of 19)
Courtesy of CHRYSLER LLC

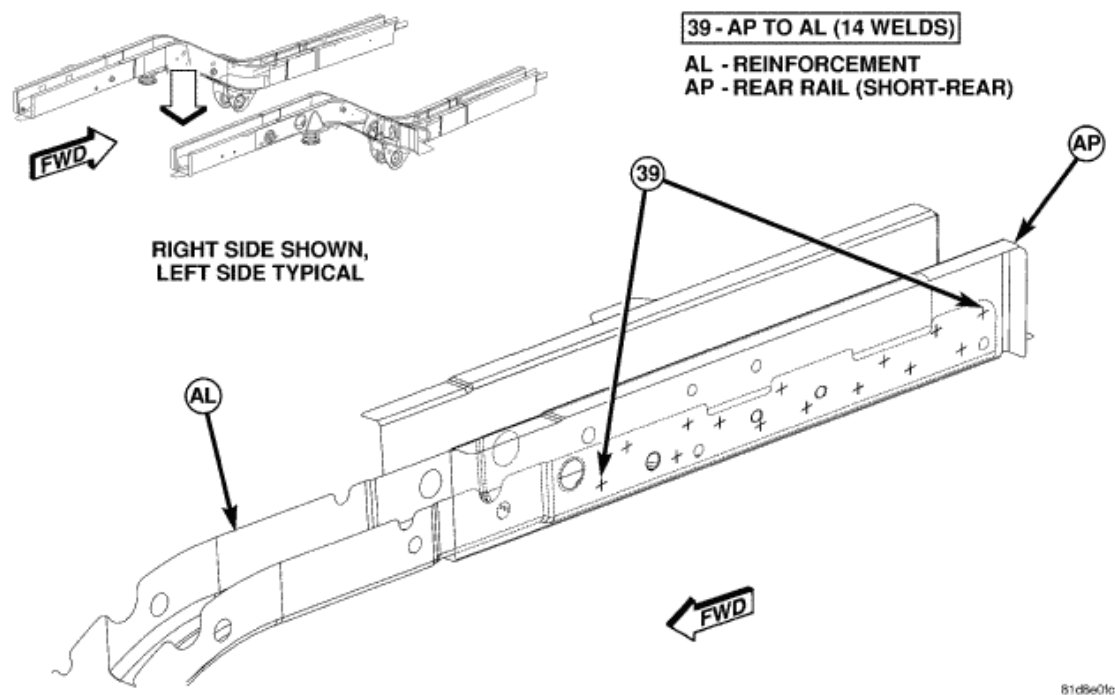


Fig. 851: Rear Rails Weld Locations (12 Of 19)
Courtesy of CHRYSLER LLC

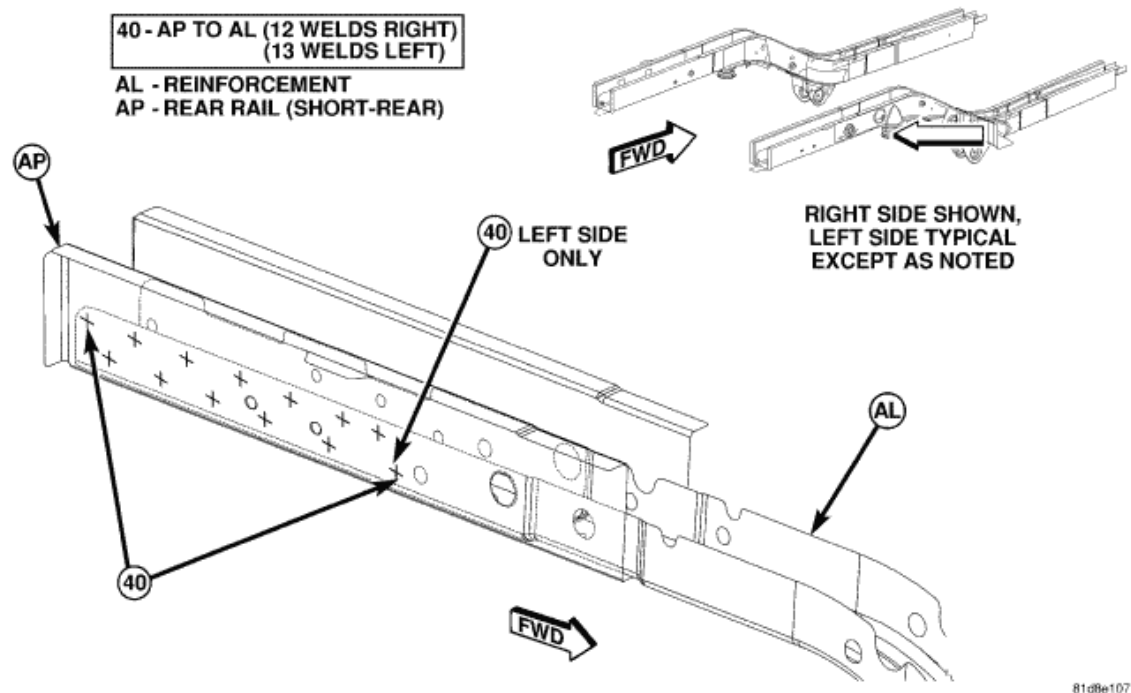


Fig. 852: Rear Rails Weld Locations (13 Of 19)
Courtesy of CHRYSLER LLC

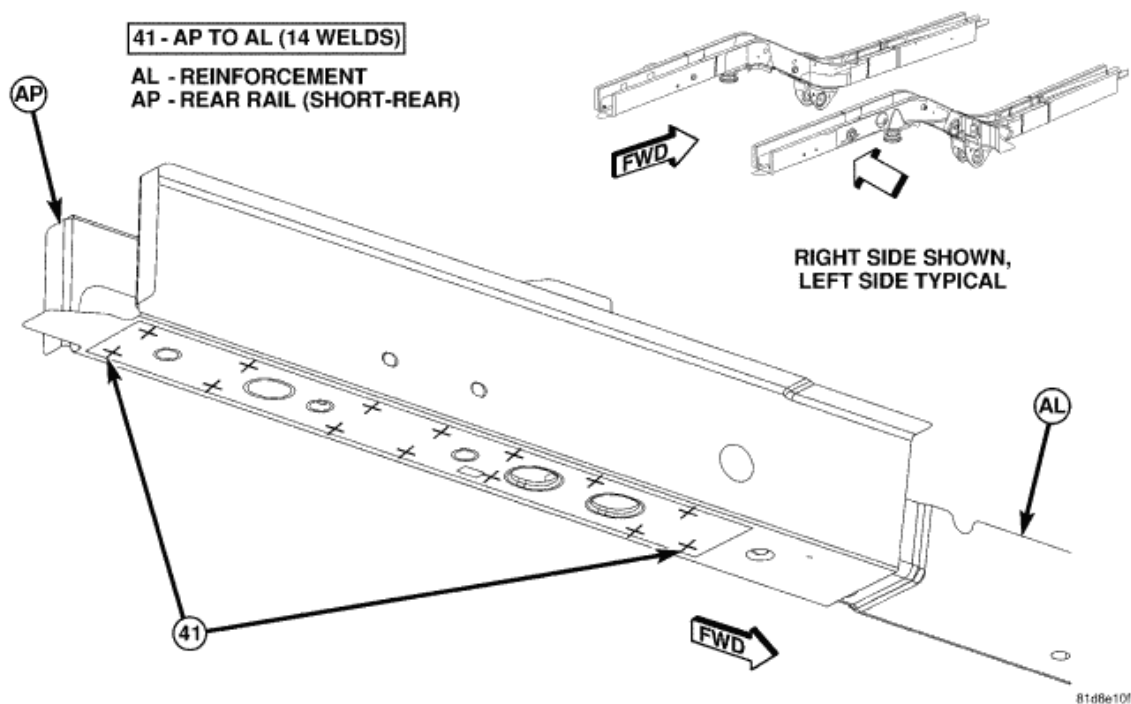


Fig. 853: Rear Rails Weld Locations (14 Of 19)
Courtesy of CHRYSLER LLC

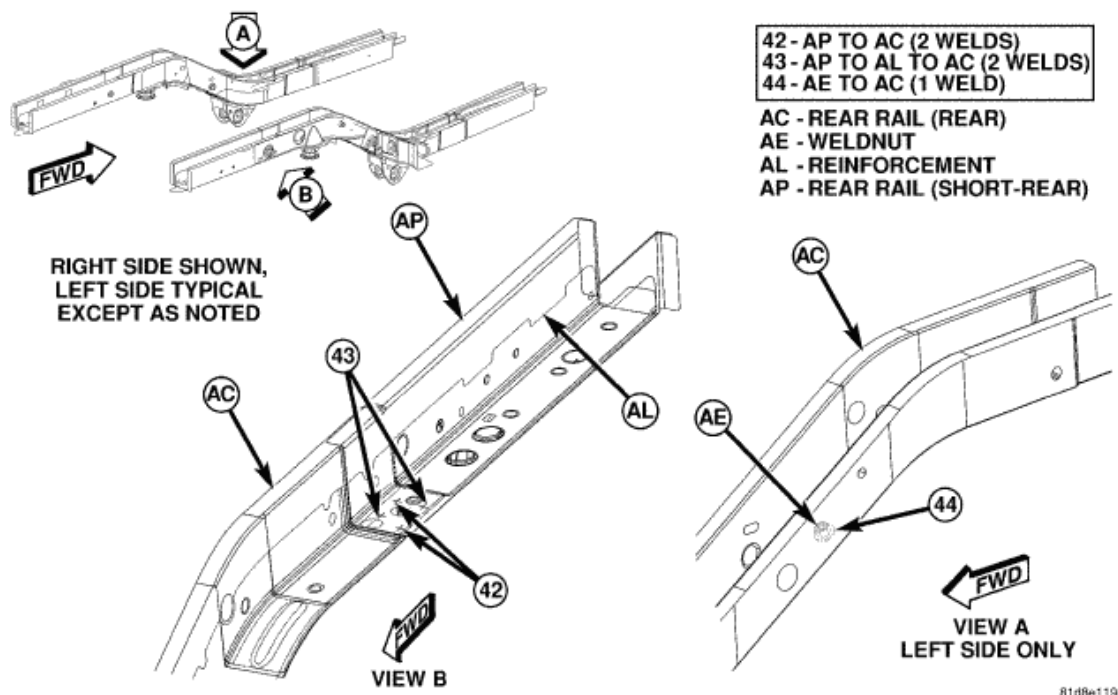


Fig. 854: Rear Rails Weld Locations (15 Of 19)
 Courtesy of CHRYSLER LLC

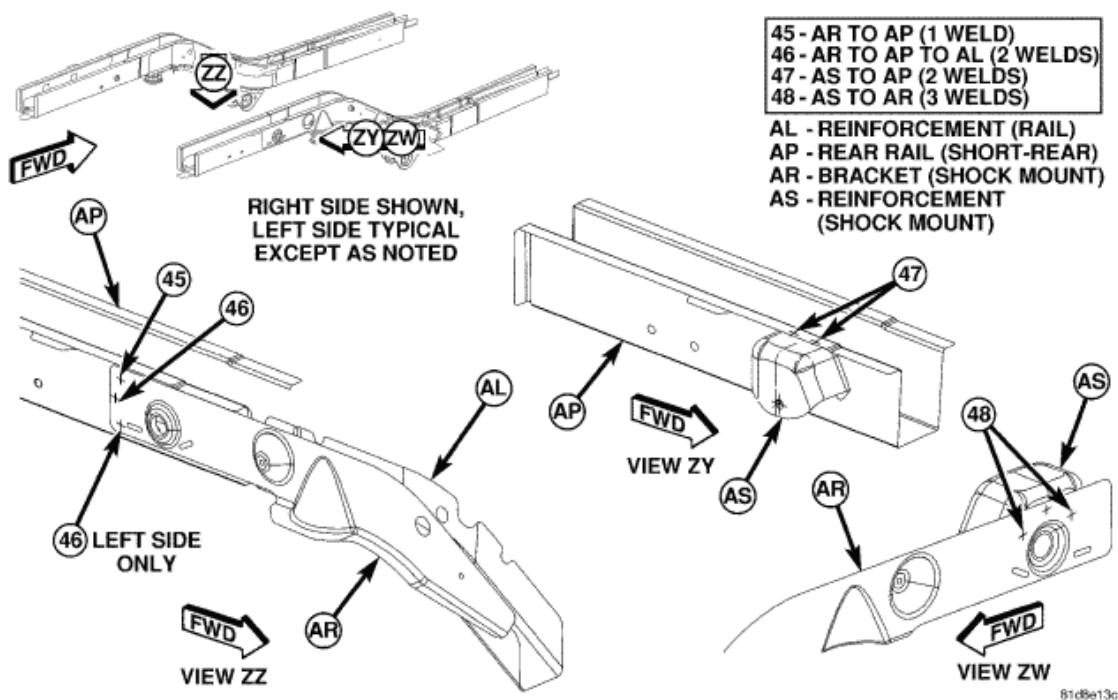
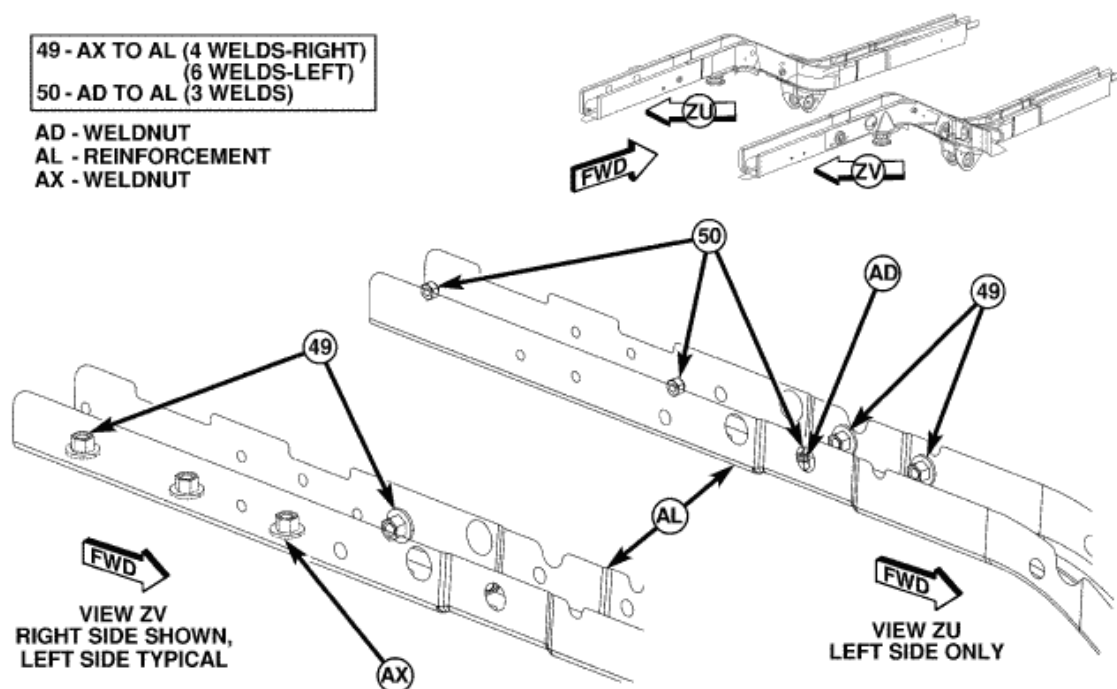


Fig. 855: Rear Rails Weld Locations (16 Of 19)
 Courtesy of CHRYSLER LLC

49 - AX TO AL (4 WELDS-RIGHT)
(6 WELDS-LEFT)
50 - AD TO AL (3 WELDS)

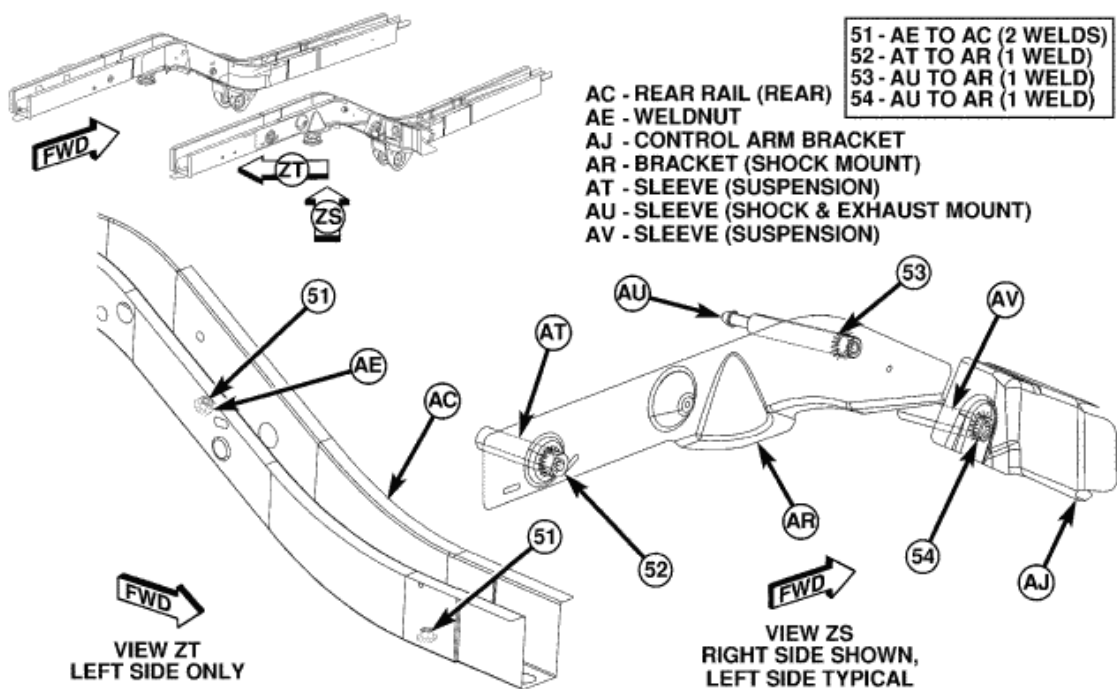
AD - WELDNUT
AL - REINFORCEMENT
AX - WELDNUT



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Fig. 856: Rear Rails Weld Locations (17 Of 19)

Courtesy of CHRYSLER LLC



81dBe190

Fig. 857: Rear Rails Weld Locations (18 Of 19)

Courtesy of CHRYSLER LLC

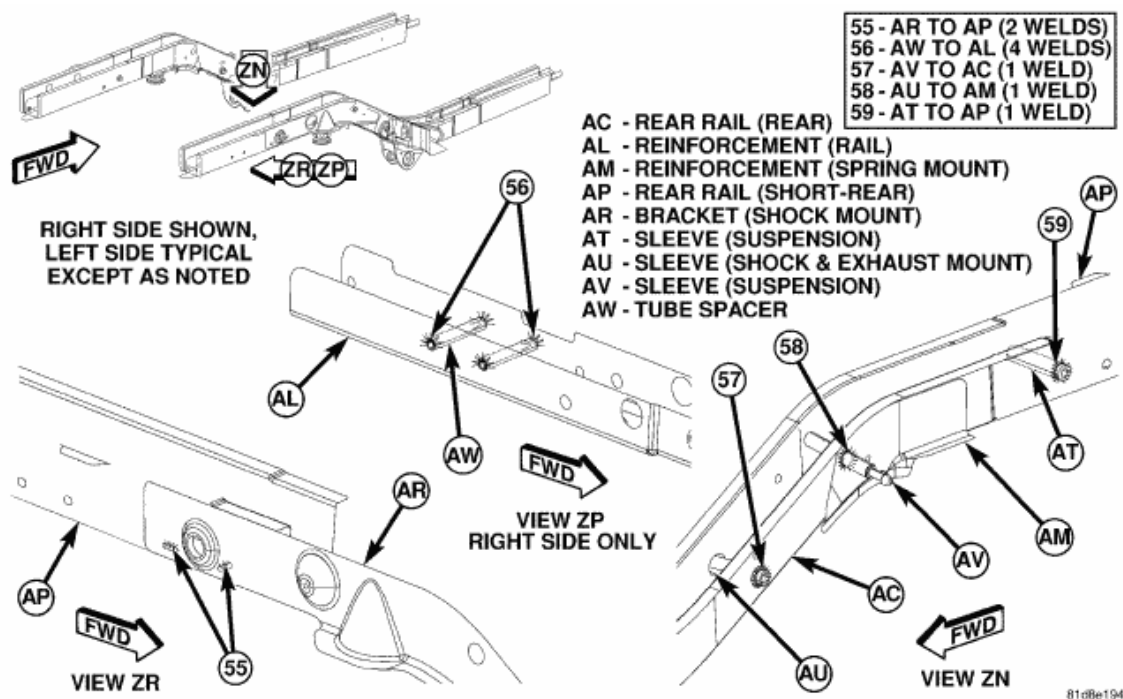


Fig. 858: Rear Rails Weld Locations (19 Of 19)
Courtesy of CHRYSLER LLC

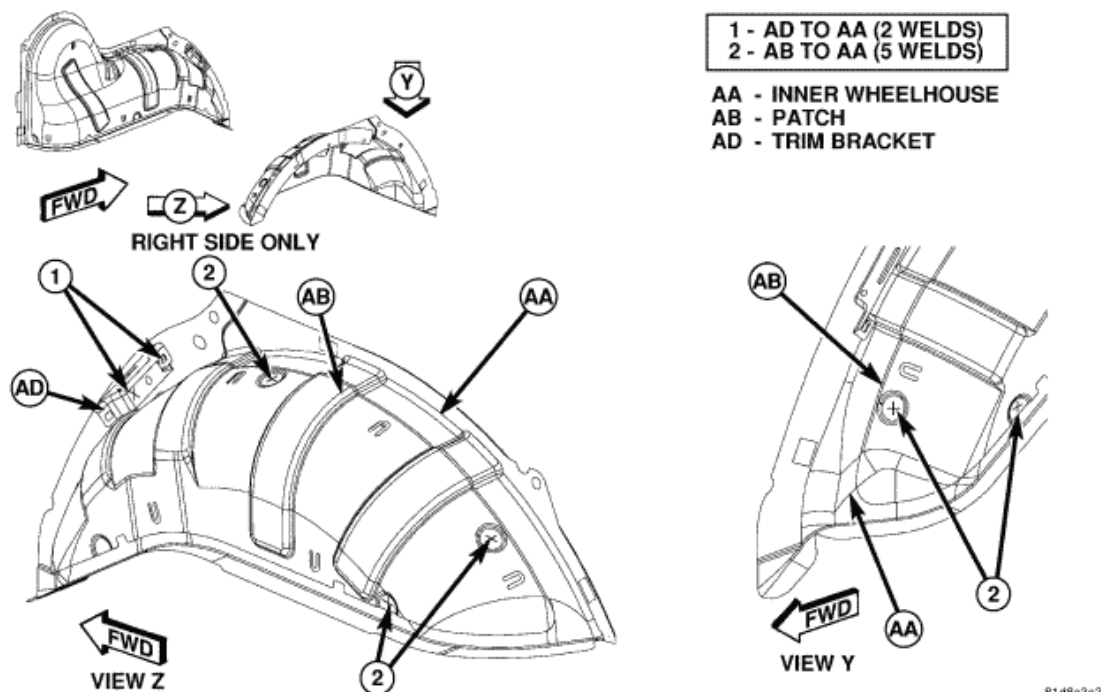


Fig. 859: Rear Wheelhouse Weld Locations (1 Of 4)
Courtesy of CHRYSLER LLC

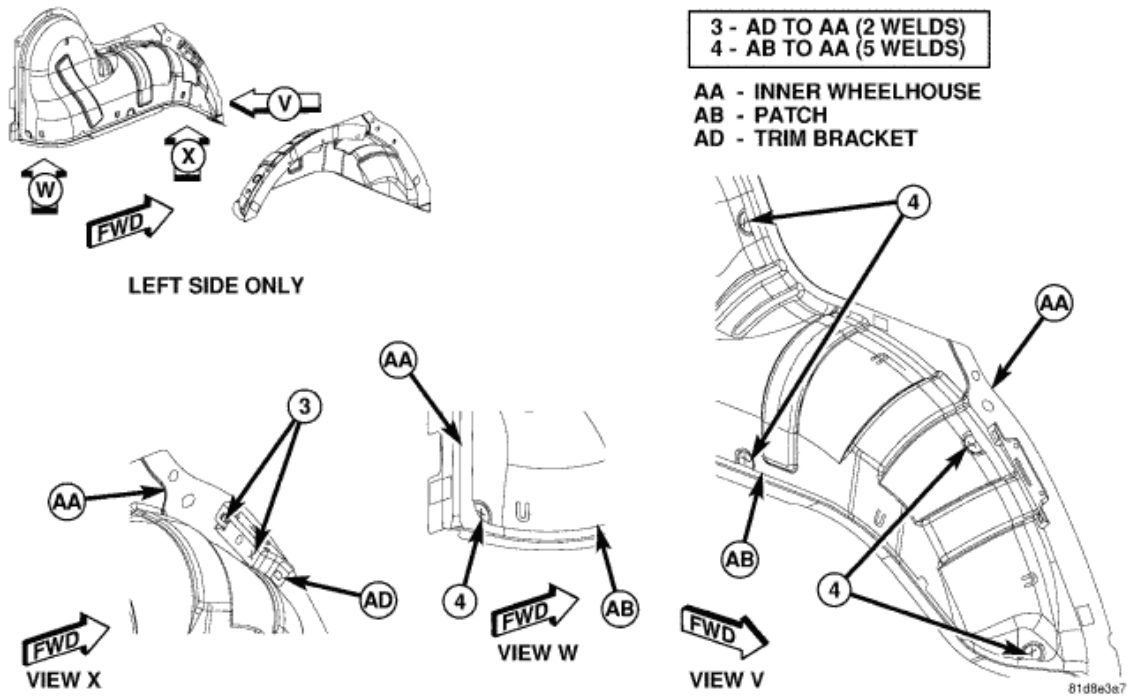


Fig. 860: Rear Wheelhouse Weld Locations (2 Of 4)
Courtesy of CHRYSLER LLC

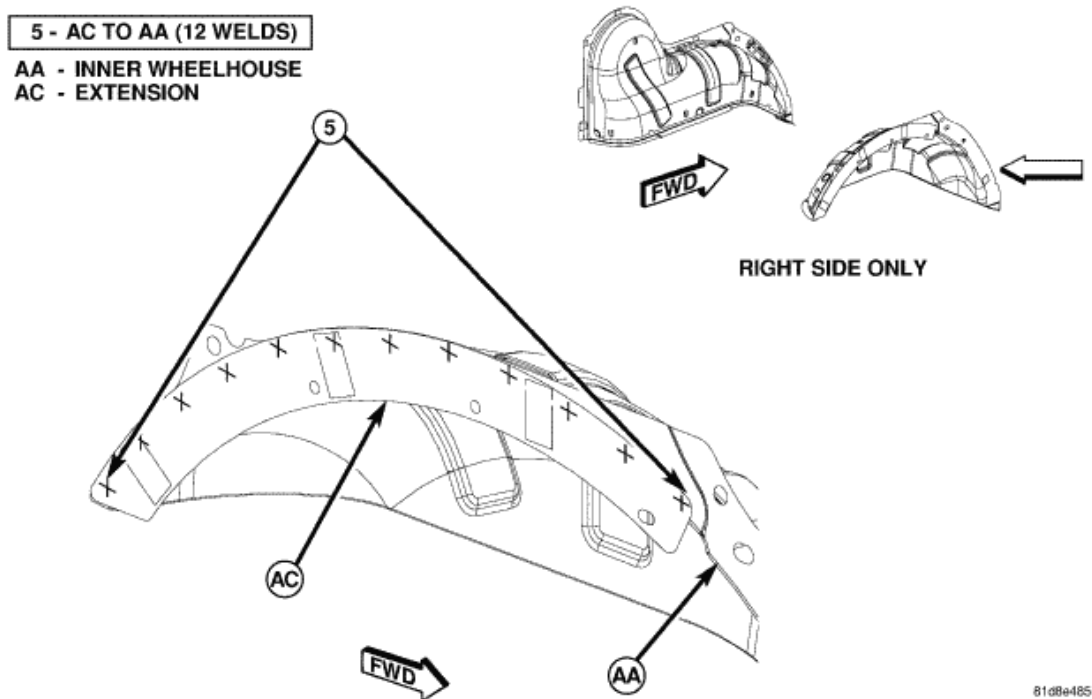
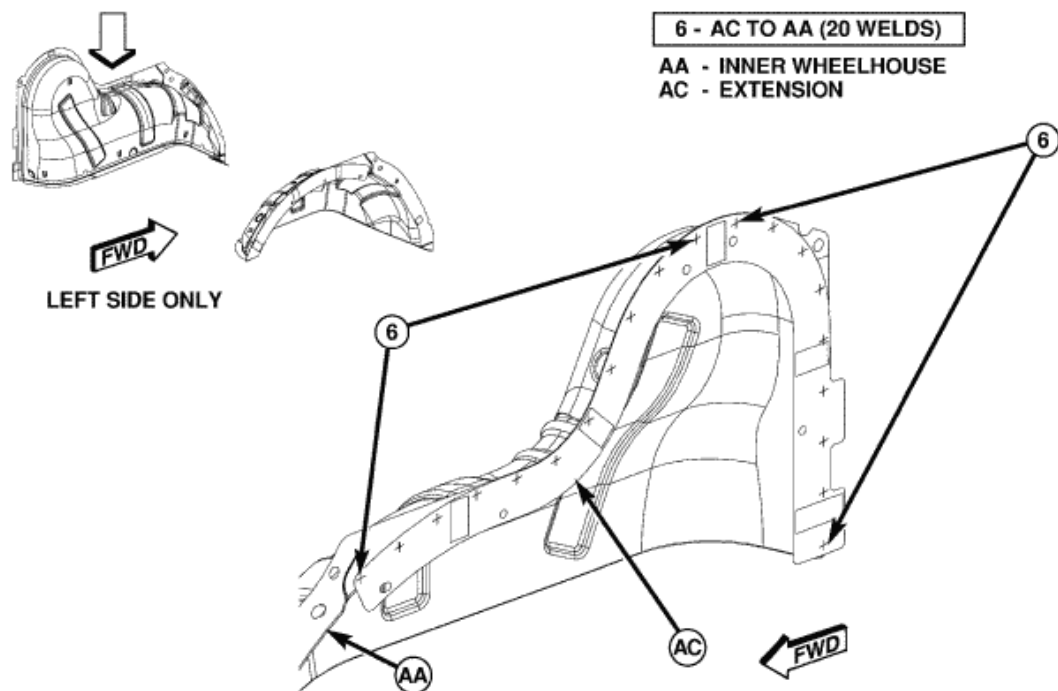
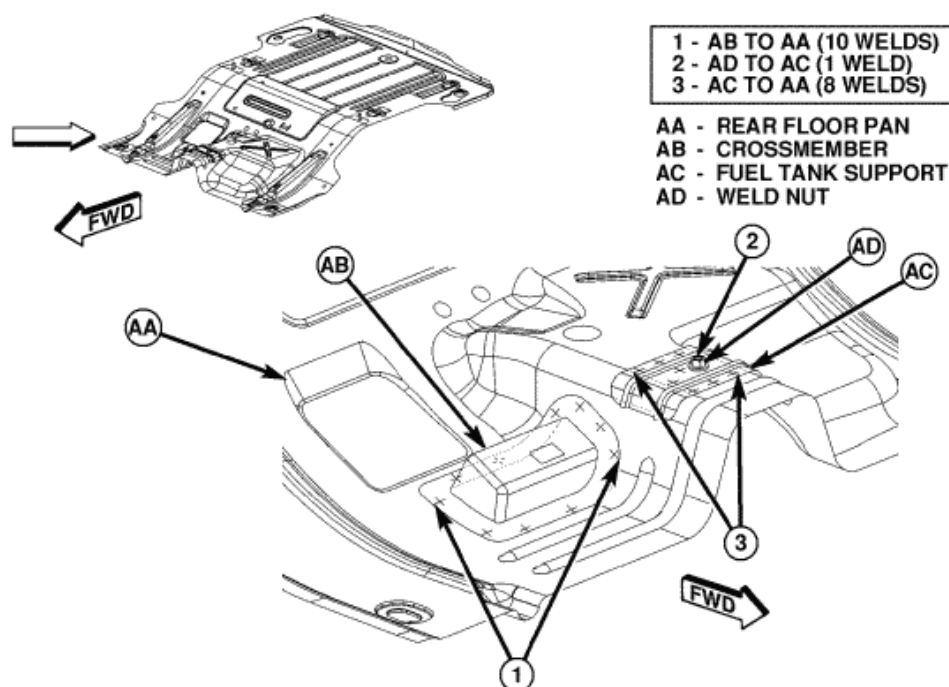


Fig. 861: Rear Wheelhouse Weld Locations (3 Of 4)
Courtesy of CHRYSLER LLC



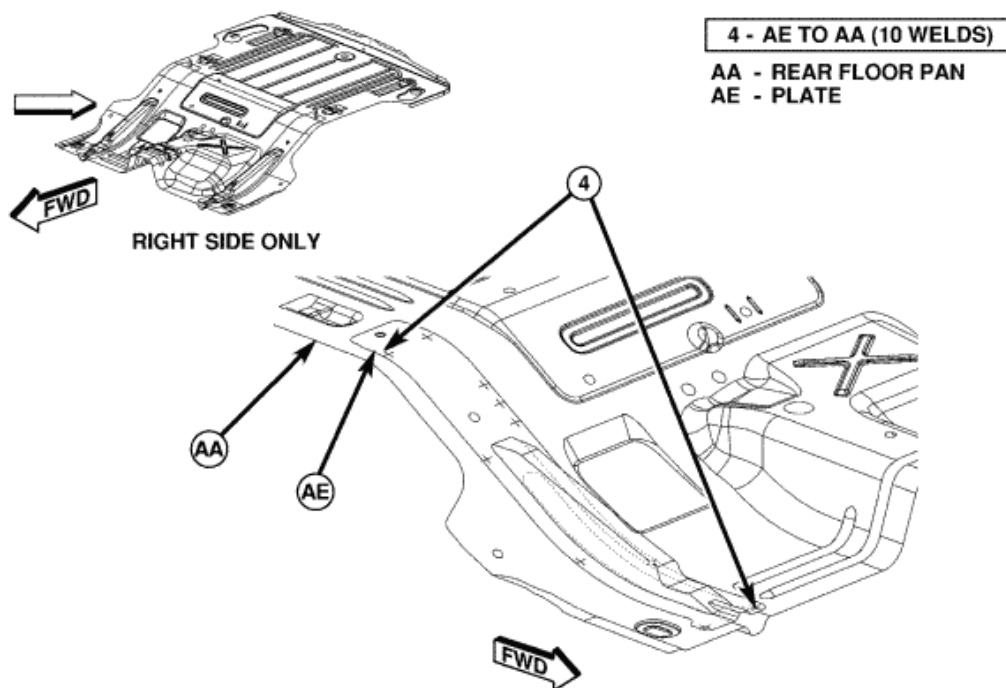
81d8e53b

Fig. 862: Rear Wheelhouse Weld Locations (4 Of 4)
 Courtesy of CHRYSLER LLC



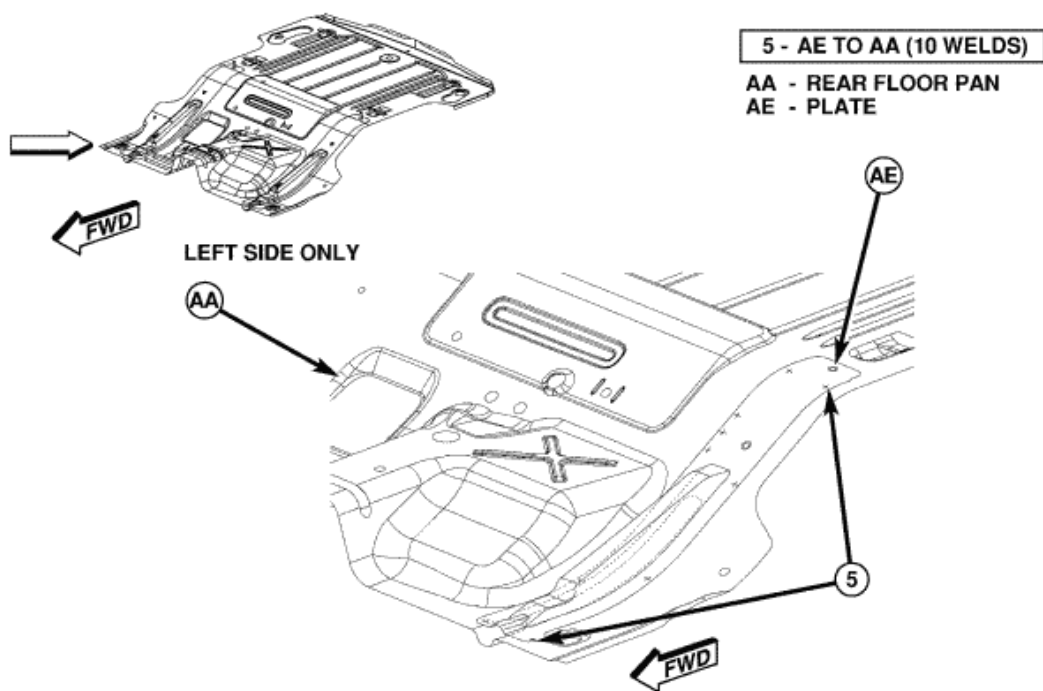
81d8e618

Fig. 863: Rear Floor Weld Locations (1 Of 4)
 Courtesy of CHRYSLER LLC



81d8e61c

Fig. 864: Rear Floor Weld Locations (2 Of 4)
Courtesy of CHRYSLER LLC



81d8e7de

Fig. 865: Rear Floor Weld Locations (3 Of 4)
Courtesy of CHRYSLER LLC

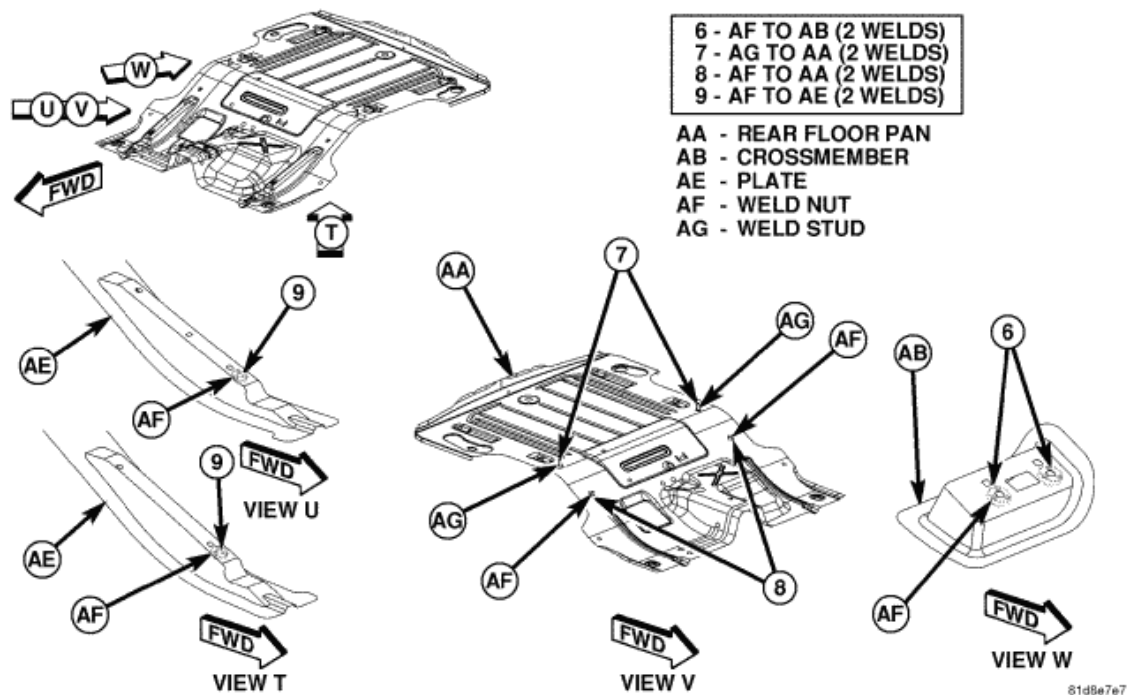


Fig. 866: Rear Floor Weld Locations (4 Of 4)
 Courtesy of CHRYSLER LLC

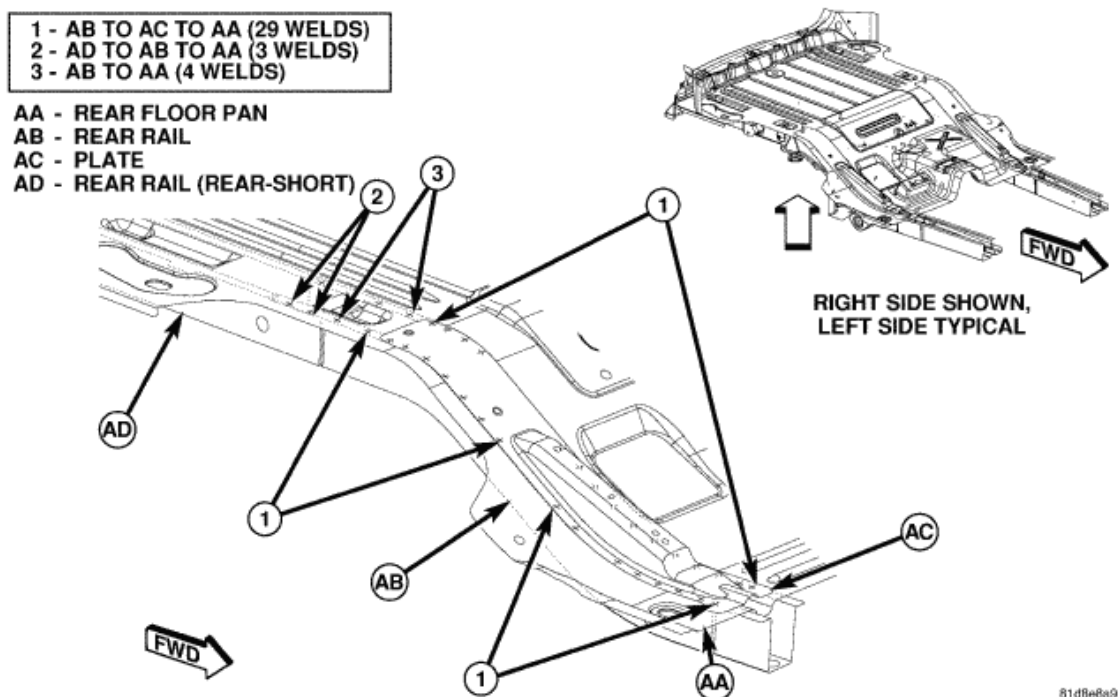


Fig. 867: Rear Floor Complete Weld Locations (1 Of 13)
 Courtesy of CHRYSLER LLC

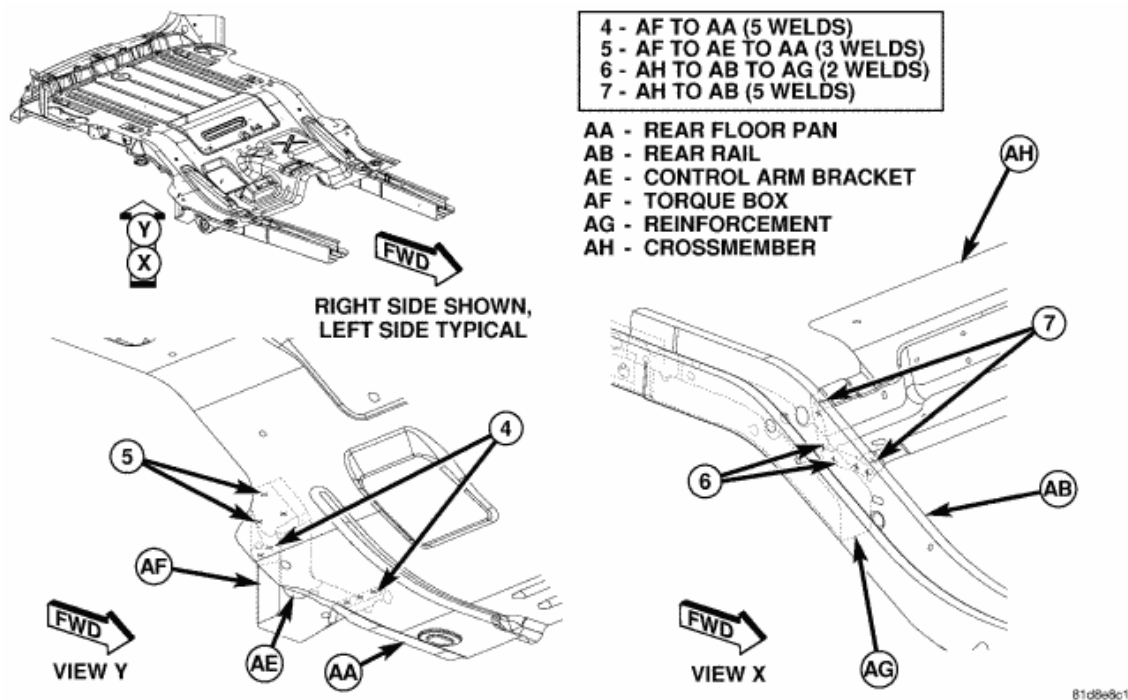


Fig. 868: Rear Floor Complete Weld Locations (2 Of 13)
 Courtesy of CHRYSLER LLC

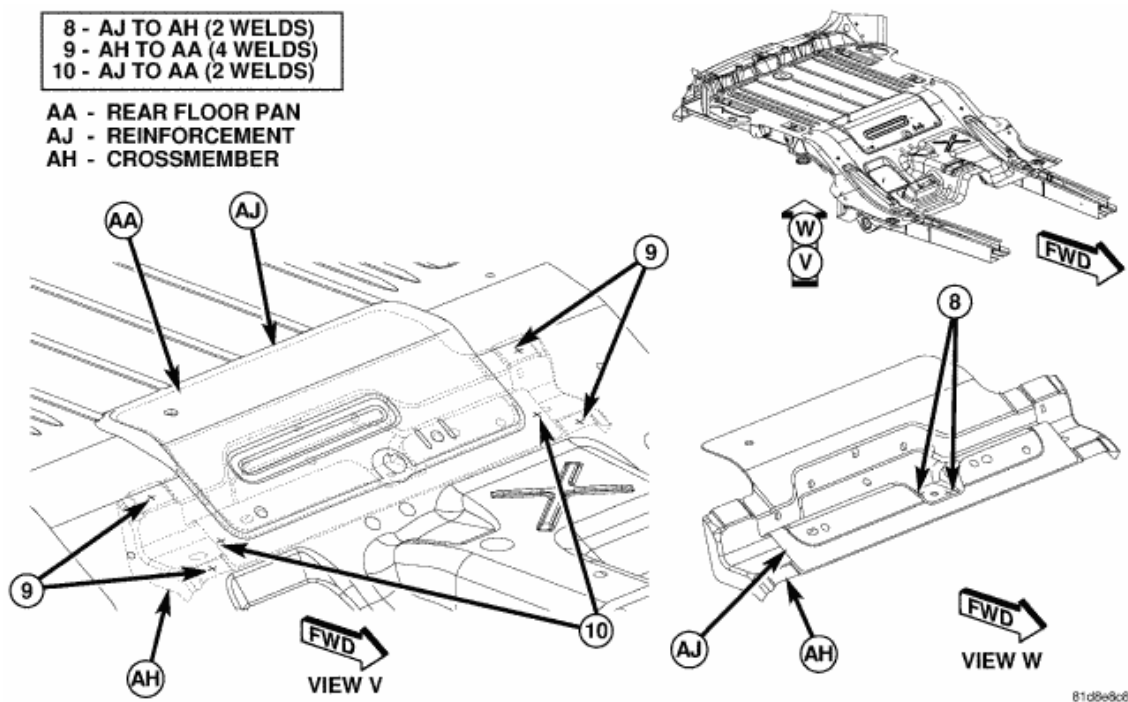
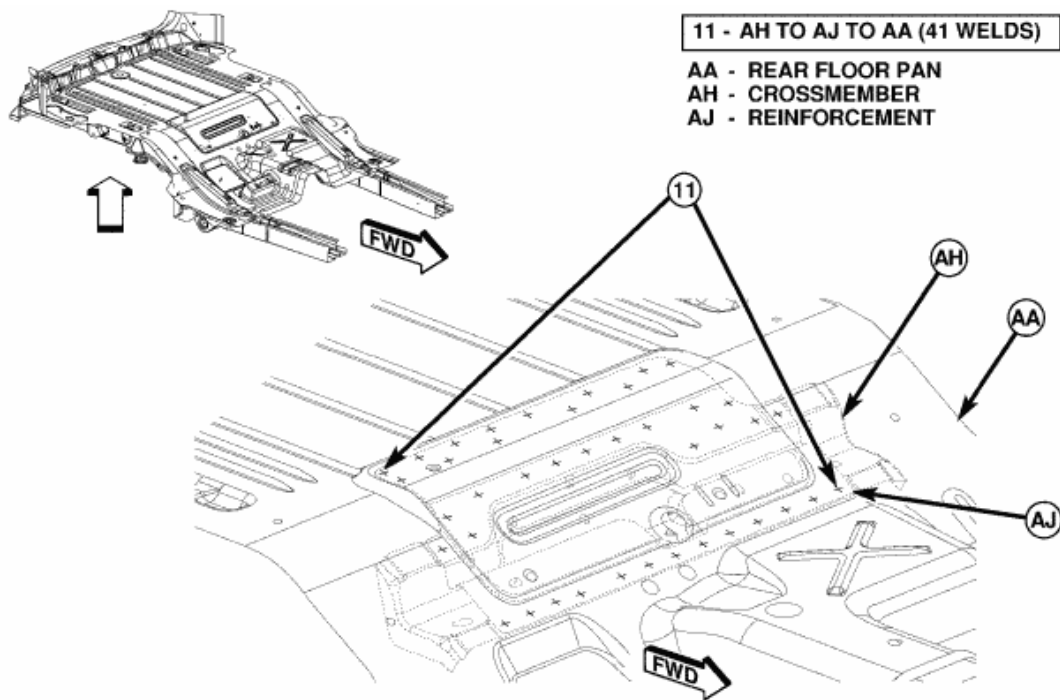
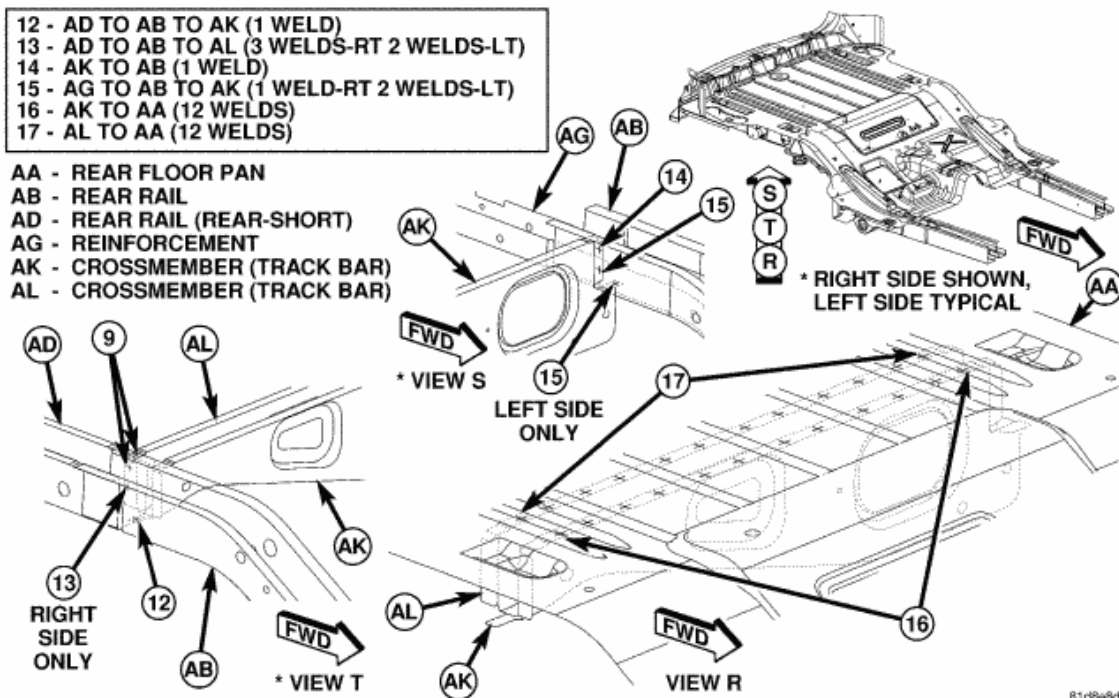


Fig. 869: Rear Floor Complete Weld Locations (3 Of 13)
 Courtesy of CHRYSLER LLC



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Fig. 870: Rear Floor Complete Weld Locations (4 Of 13)
Courtesy of CHRYSLER LLC



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Fig. 871: Rear Floor Complete Weld Locations (5 Of 13)
Courtesy of CHRYSLER LLC

18 - AM TO AD TO AG (3 WELDS)
 19 - AM TO AD (3 WELDS)
 20 - AM TO AA (24 WELDS)

AA - REAR FLOOR PAN
 AD - REAR RAIL (REAR-SHORT)
 AG - REINFORCEMENT
 AM - CROSSMEMBER (SPARE TIRE)

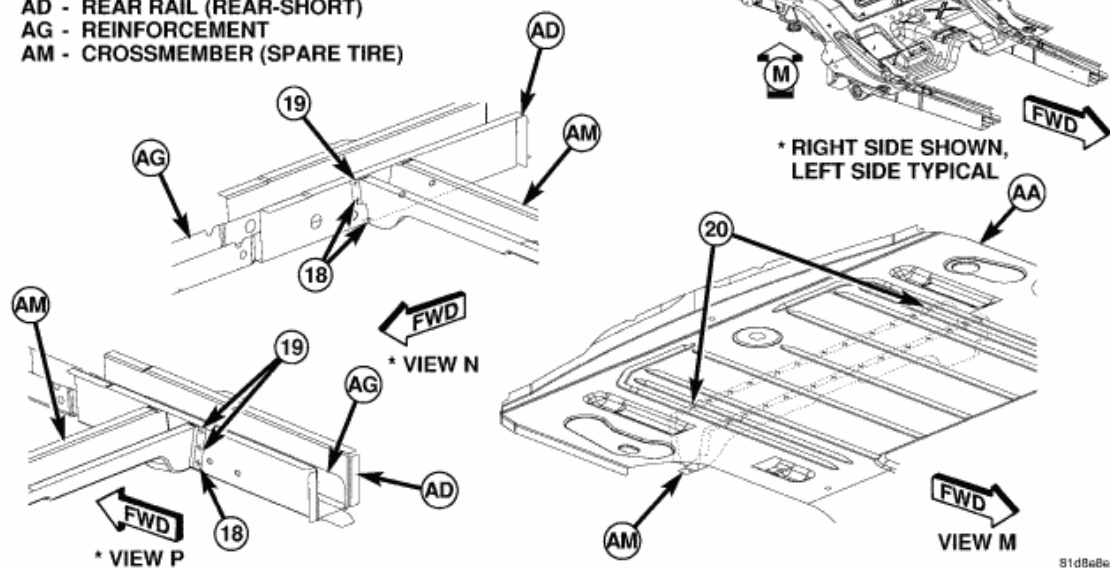


Fig. 872: Rear Floor Complete Weld Locations (6 Of 13)
 Courtesy of CHRYSLER LLC

21 - AD TO AA (12 WELDS)
 22 - AM TO AD TO AA (2 WELDS)
 23 - AN TO AA TO AD (2 WELDS)

AA - REAR FLOOR PAN
 AD - REAR FAIL (REAR-SHORT)
 AM - CROSSMEMBER (SPARE TIRE)
 AN - CROSSMEMBER (GATE OPENING)

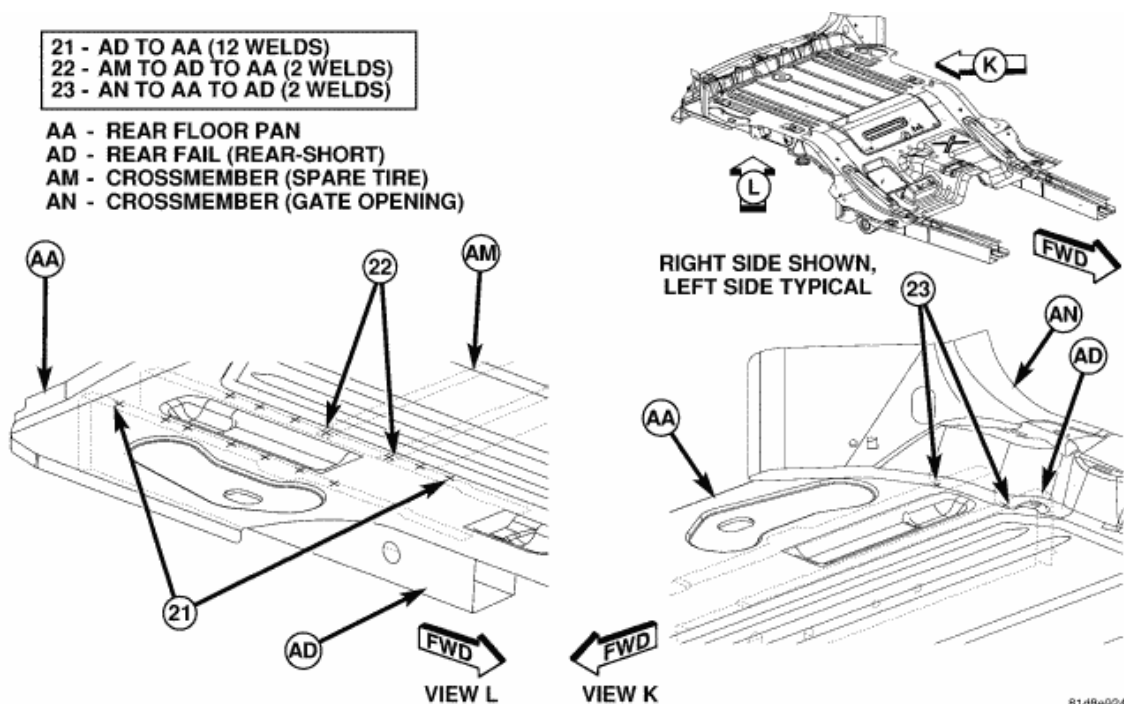


Fig. 873: Rear Floor Complete Weld Locations (7 Of 13)
 Courtesy of CHRYSLER LLC

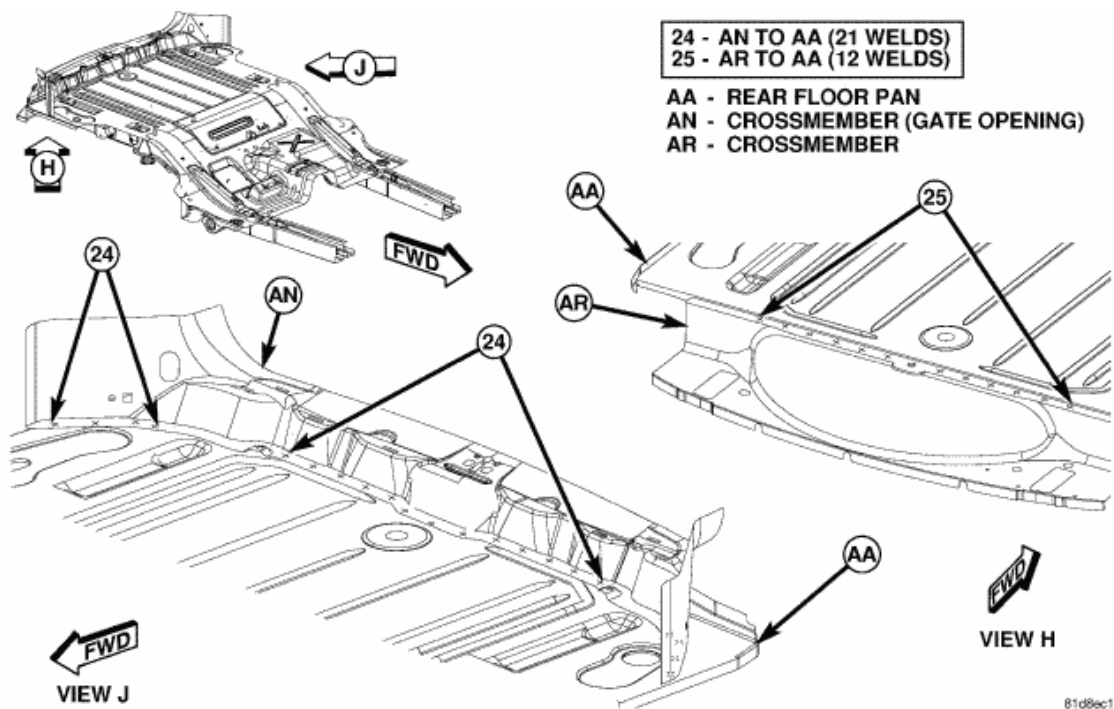


Fig. 874: Rear Floor Complete Weld Locations (8 Of 13)
Courtesy of CHRYSLER LLC

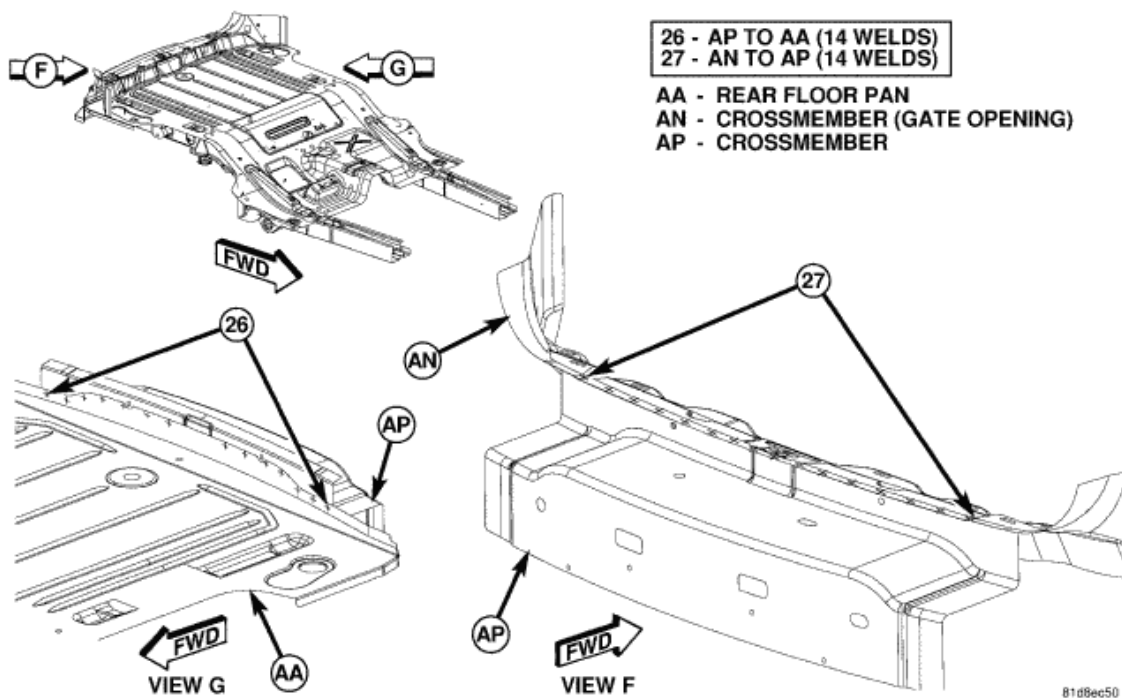


Fig. 875: Rear Floor Complete Weld Locations (9 Of 13)
Courtesy of CHRYSLER LLC

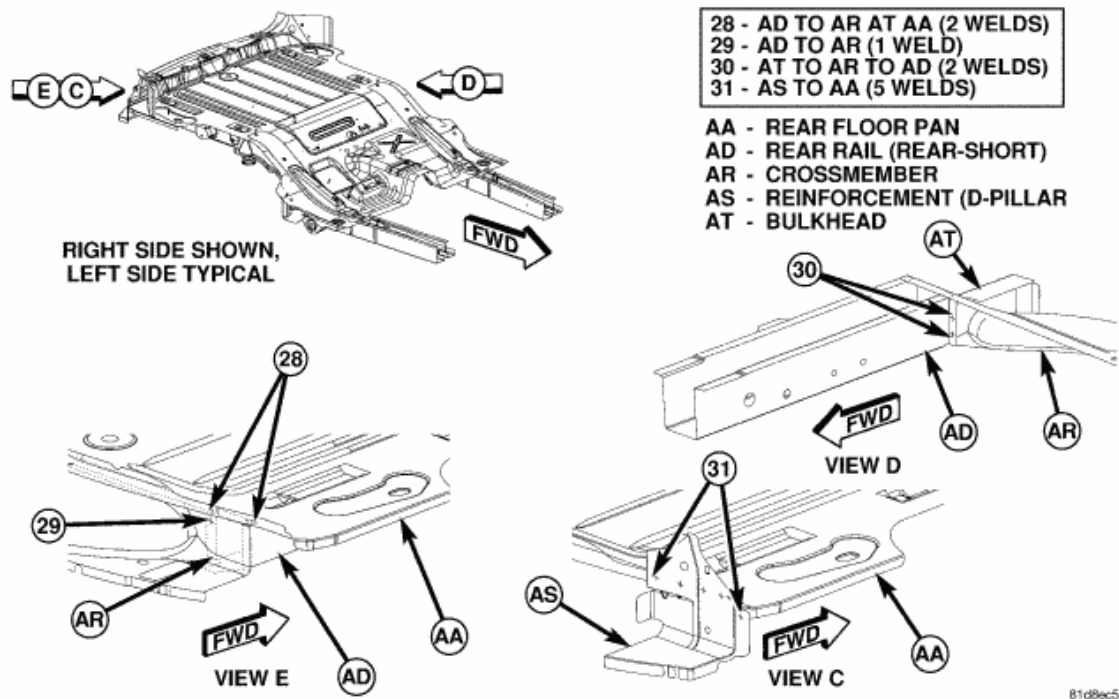


Fig. 876: Rear Floor Complete Weld Locations (10 Of 13)
Courtesy of CHRYSLER LLC

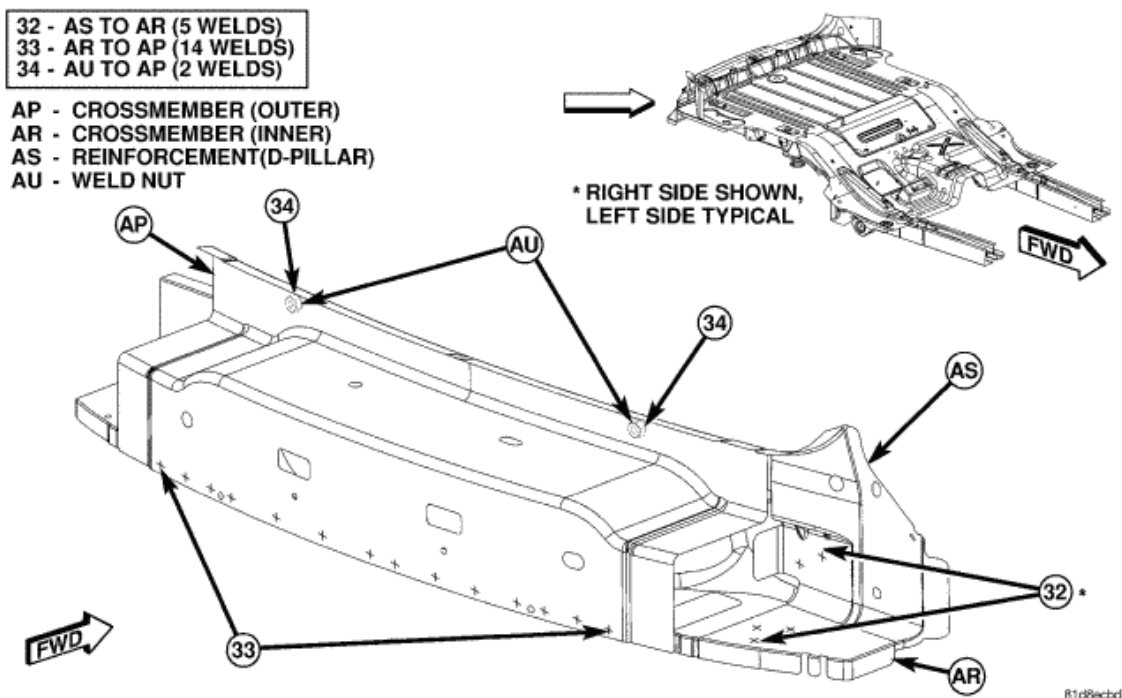


Fig. 877: Rear Floor Complete Weld Locations (11 Of 13)
Courtesy of CHRYSLER LLC

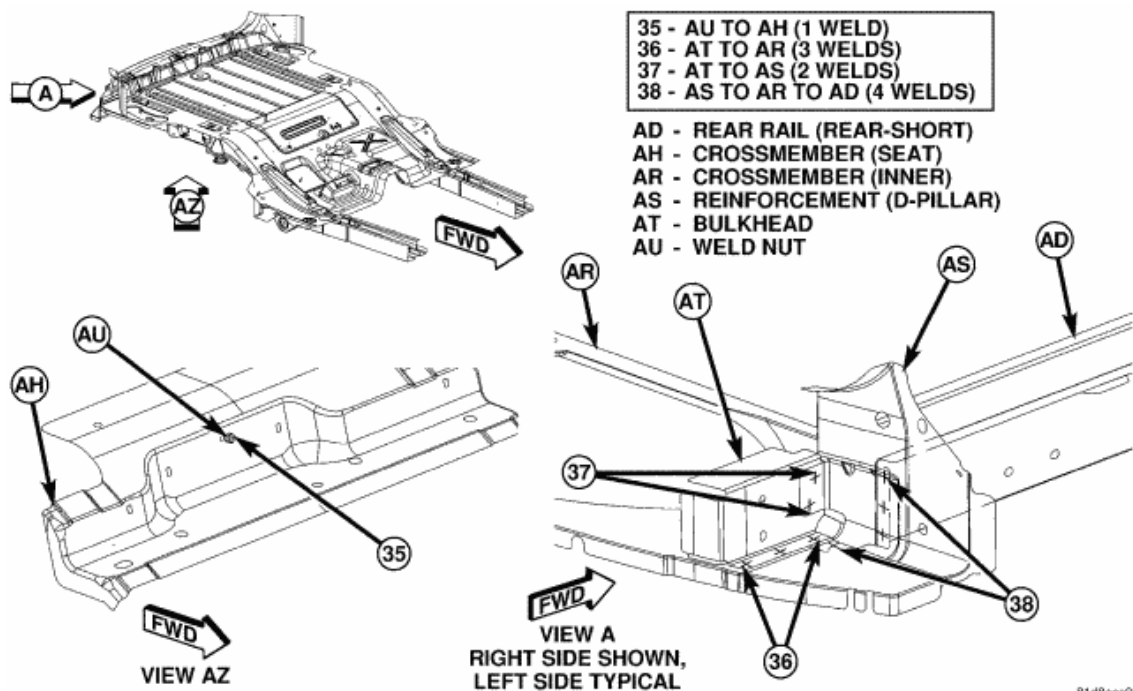


Fig. 878: Rear Floor Complete Weld Locations (12 Of 13)

Courtesy of CHRYSLER LLC

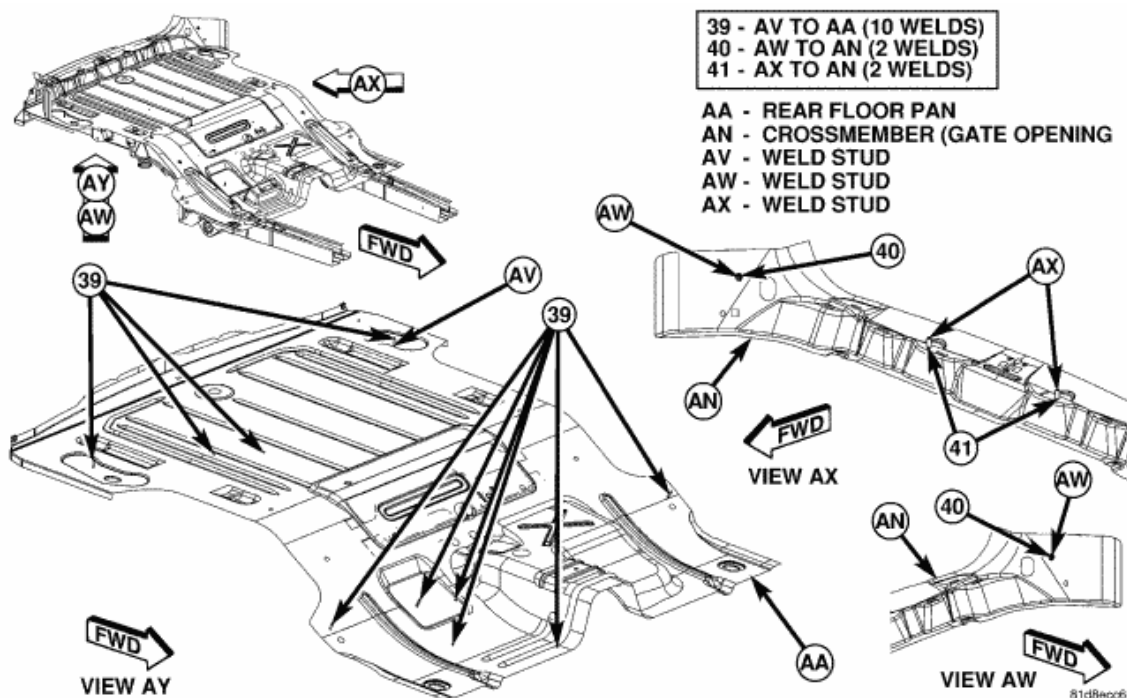


Fig. 879: Rear Floor Complete Weld Locations (13 Of 13)

Courtesy of CHRYSLER LLC

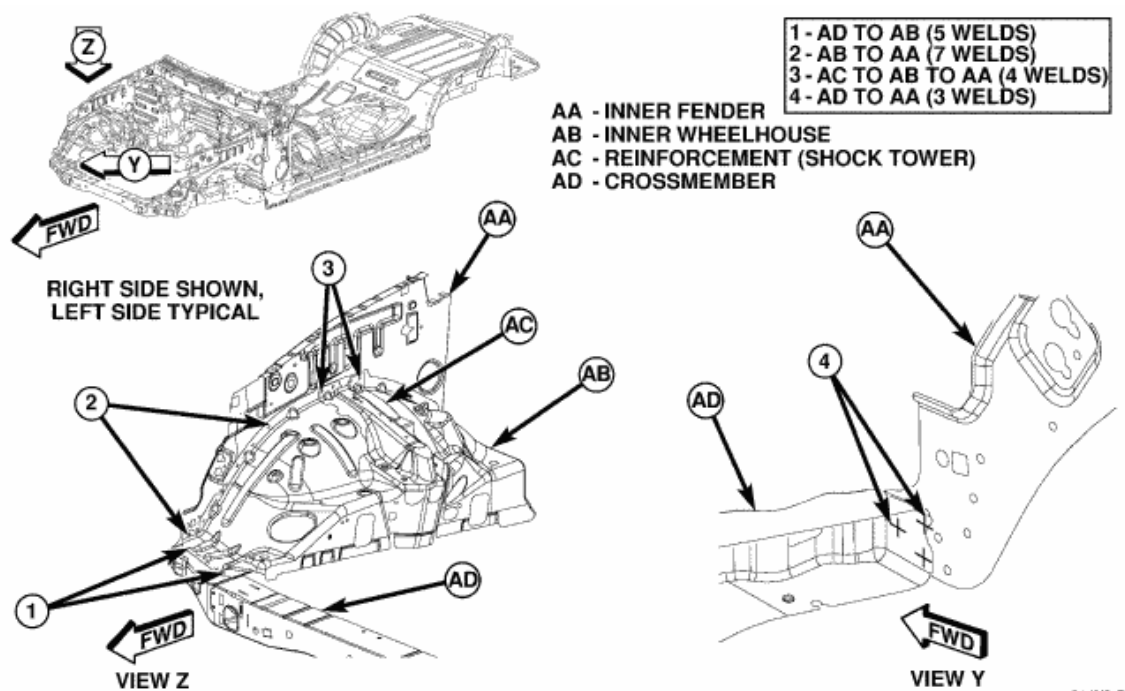


Fig. 880: Underbody And Dash Weld Locations (1 Of 14)
 Courtesy of CHRYSLER LLC

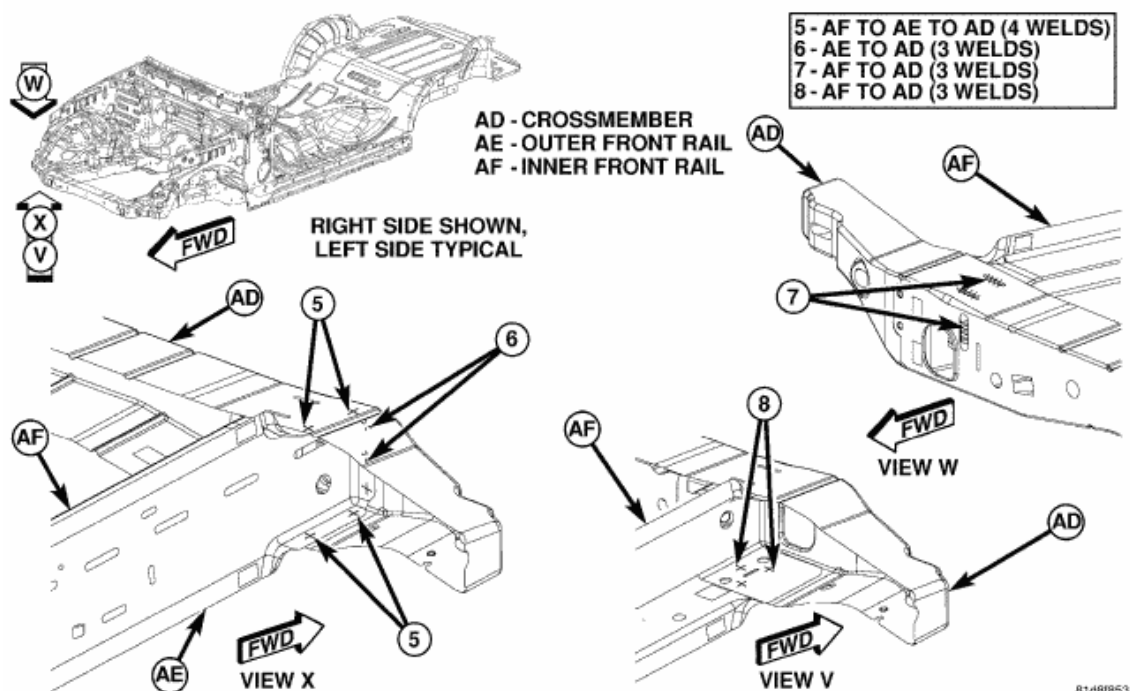


Fig. 881: Underbody And Dash Weld Locations (2 Of 14)
 Courtesy of CHRYSLER LLC

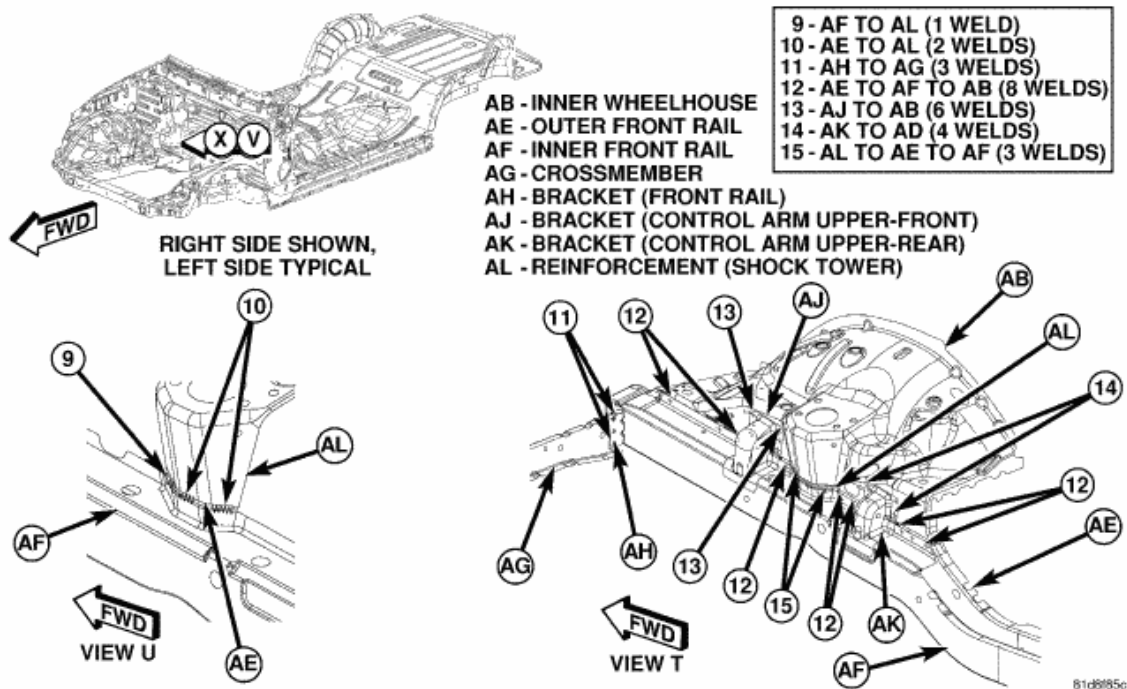


Fig. 882: Underbody And Dash Weld Locations (3 Of 14)

Courtesy of CHRYSLER LLC

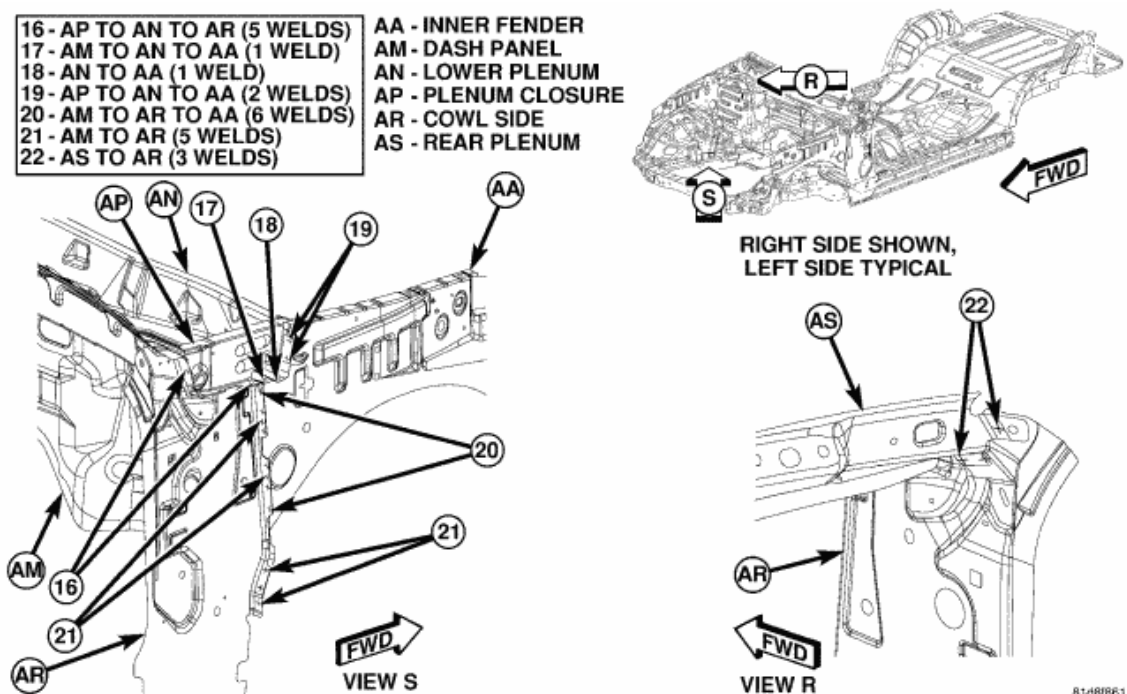
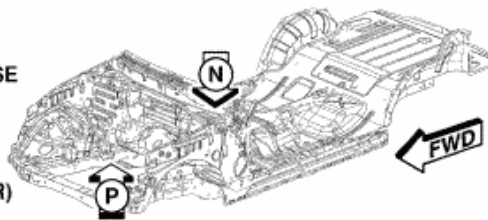


Fig. 883: Underbody And Dash Weld Locations (4 Of 14)

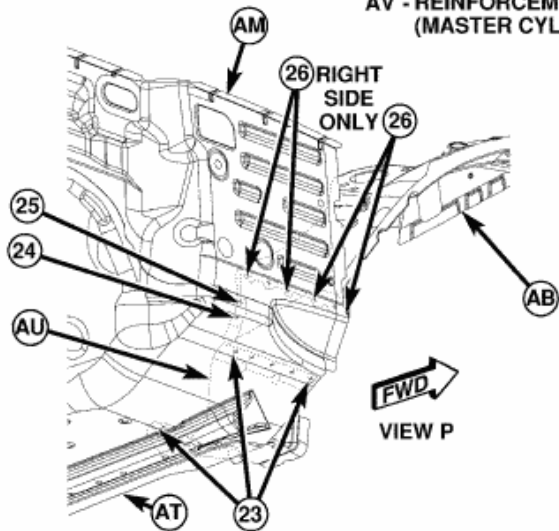
Courtesy of CHRYSLER LLC

23 - AU TO AT (8 WELDS)
 24 - AT TO AB (1 WELD)
 25 - AT TO AB TO AM (1 WELD)
 26 - AB TO AM (6 WELDS-RT)
 (3 WELDS-LT)
 27 - AV TO AB TO AM (3 WELDS)

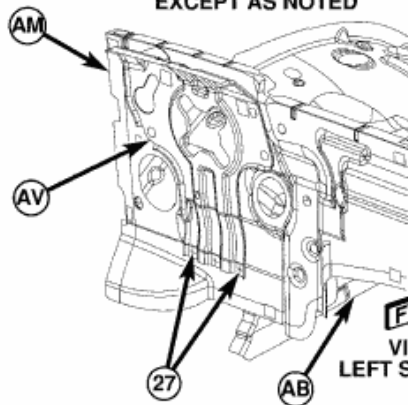
AB - INNER WHEELHOUSE
 AM - DASH PANEL
 AT - FRONT FLOOR PAN
 AU - TORQUE BOX
 AV - REINFORCEMENT
 (MASTER CYLINDER)



RIGHT SIDE SHOWN,
 LEFT SIDE TYPICAL
 EXCEPT AS NOTED



VIEW P



VIEW N
 LEFT SIDE ONLY

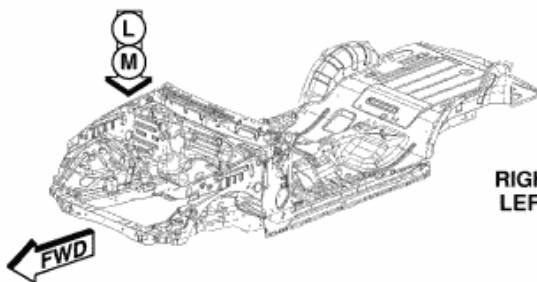
81d8f866

Fig. 884: Underbody And Dash Weld Locations (5 Of 14)

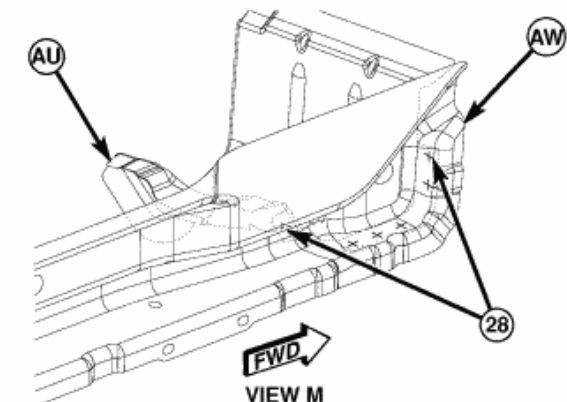
Courtesy of CHRYSLER LLC

28 - AU TO AW (6 WELDS)
 29 - AR TO AW (18 WELDS)

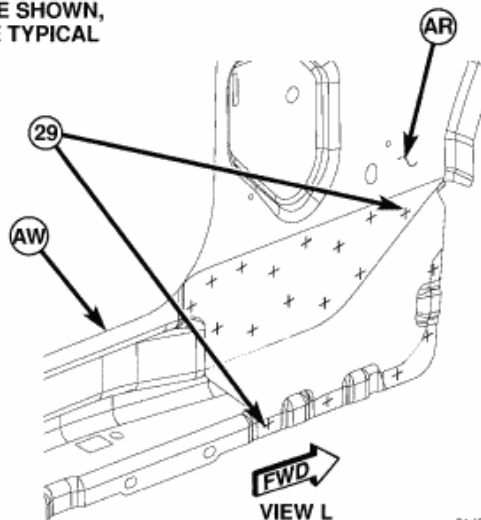
AR - COWL SIDE
 AU - TORQUE BOX
 AW - BODY SIDE SILL



RIGHT SIDE SHOWN,
 LEFT SIDE TYPICAL



VIEW M



VIEW L

81d8f86a

Fig. 885: Underbody And Dash Weld Locations (6 Of 14)

Courtesy of CHRYSLER LLC

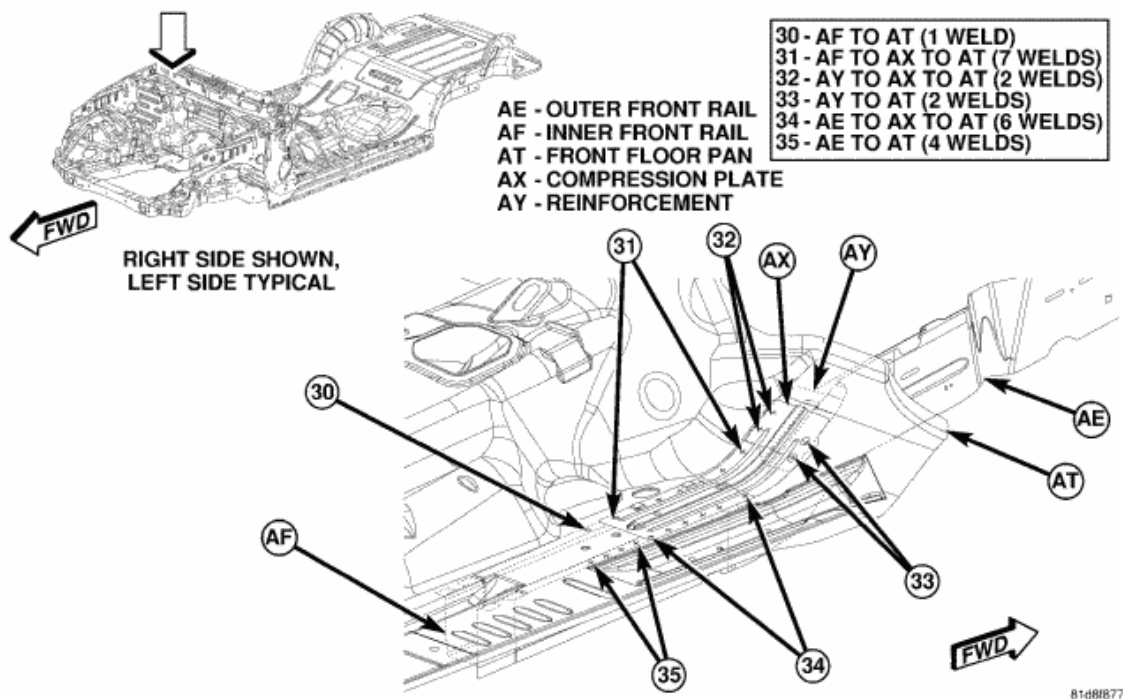


Fig. 886: Underbody And Dash Weld Locations (7 Of 14)

Courtesy of CHRYSLER LLC

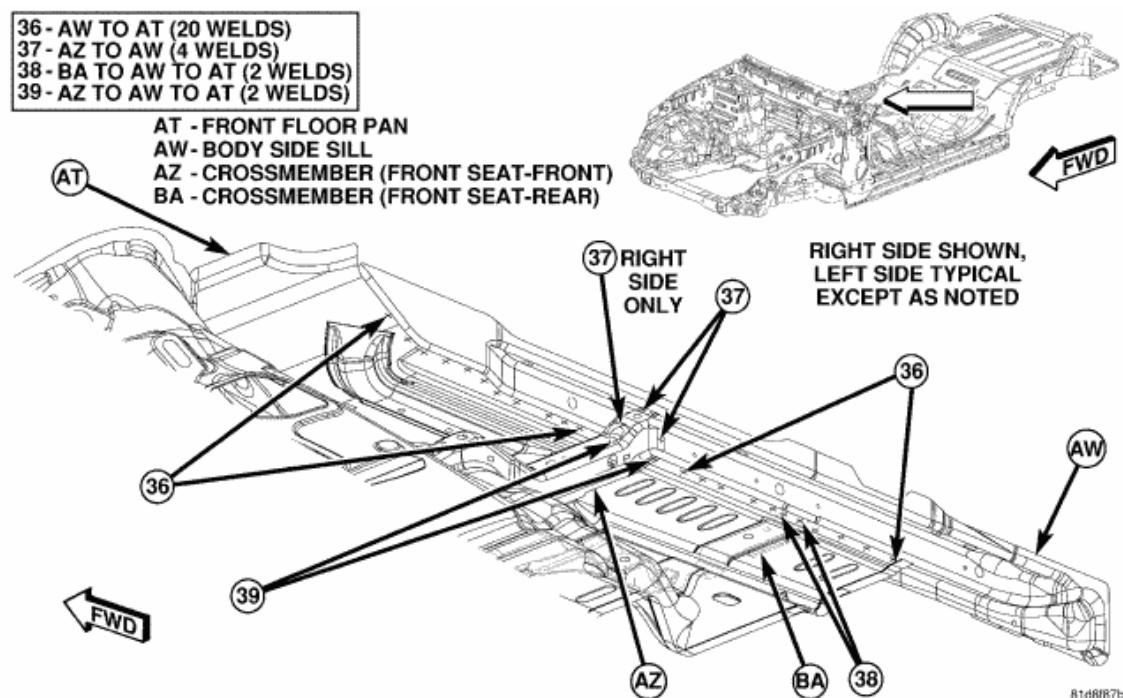
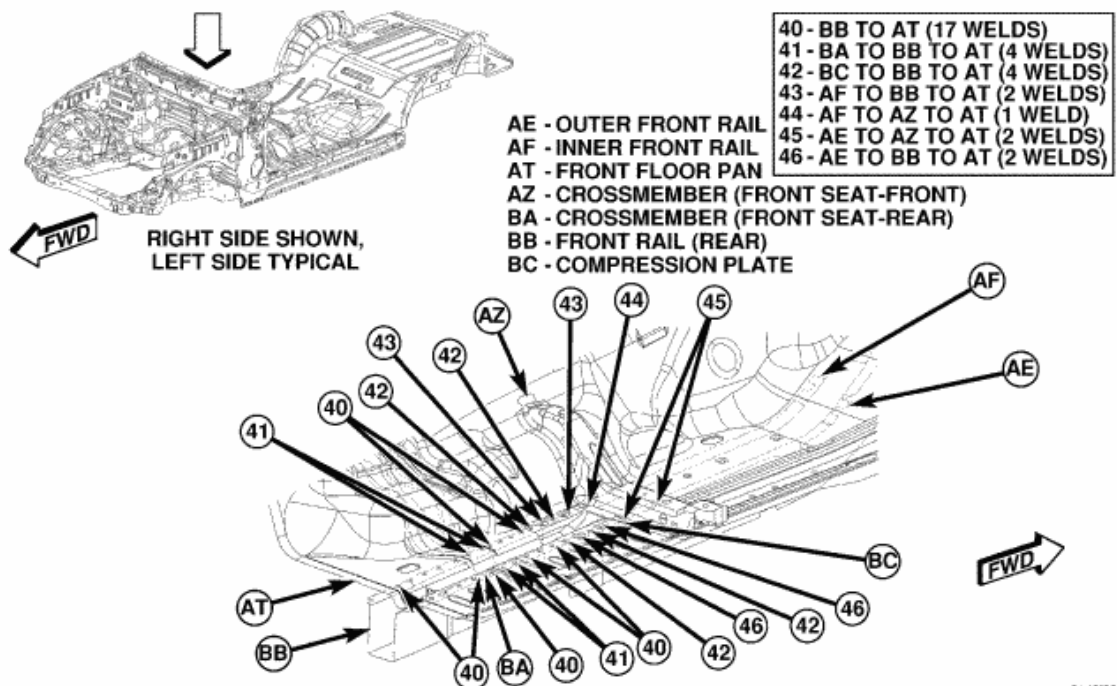


Fig. 887: Underbody And Dash Weld Locations (8 Of 14)

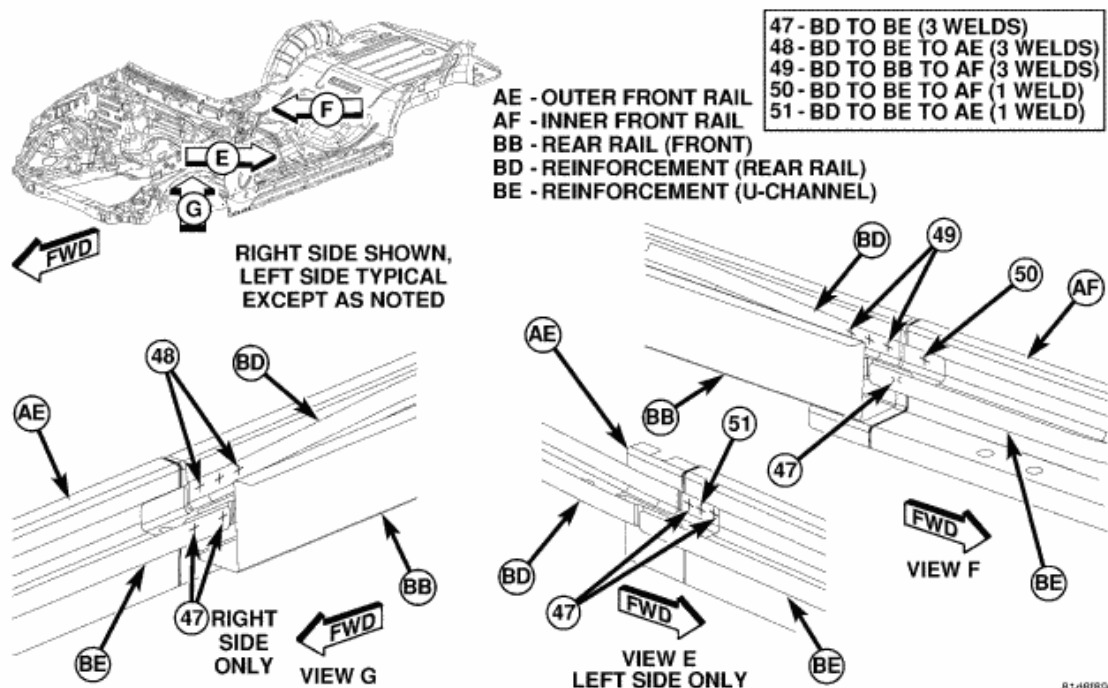
Courtesy of CHRYSLER LLC



81d8f884

Fig. 888: Underbody And Dash Weld Locations (9 Of 14)

Courtesy of CHRYSLER LLC



81d8f891

Fig. 889: Underbody And Dash Weld Locations (10 Of 14)

Courtesy of CHRYSLER LLC

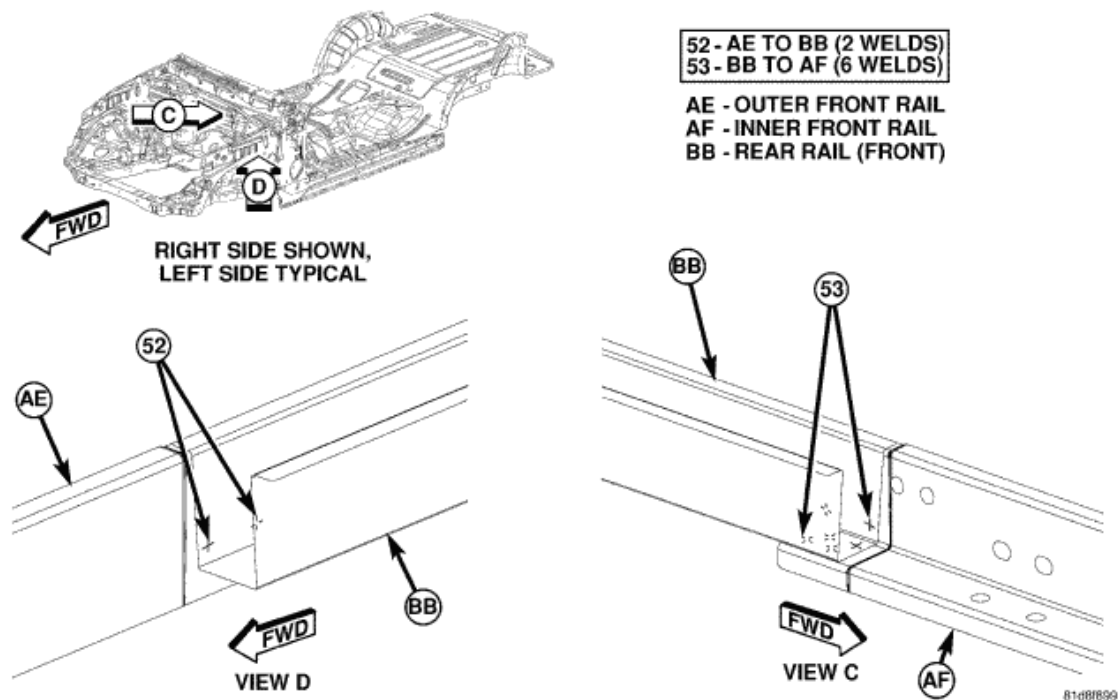


Fig. 890: Underbody And Dash Weld Locations (11 Of 14)
Courtesy of CHRYSLER LLC

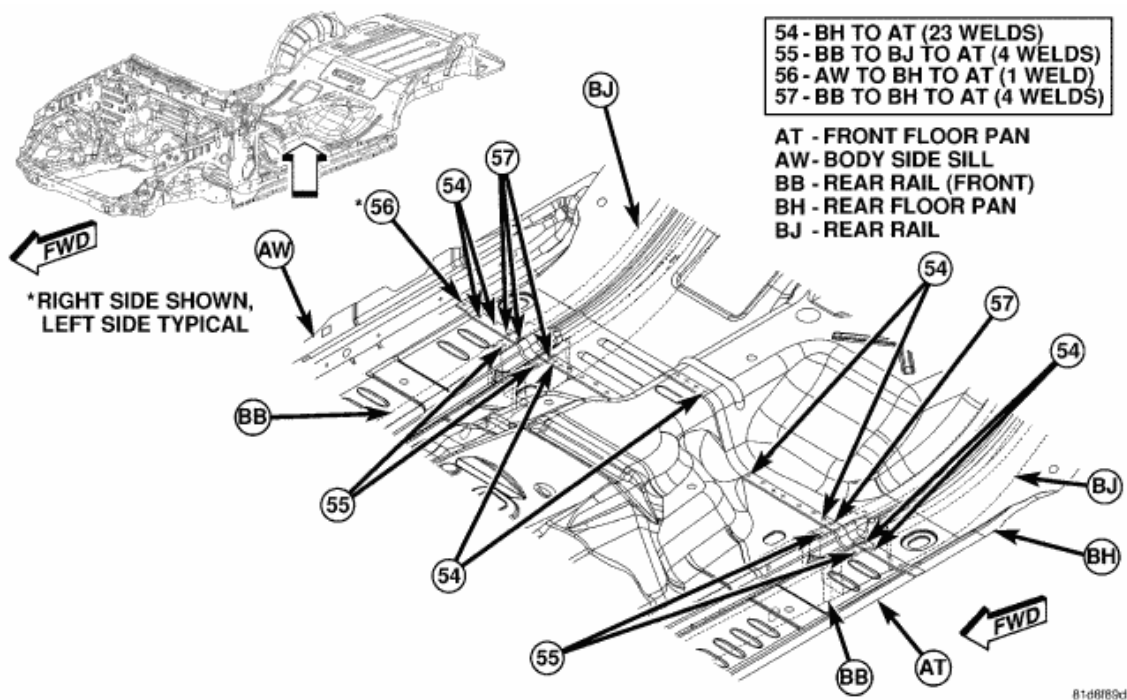


Fig. 891: Underbody And Dash Weld Locations (12 Of 14)
Courtesy of CHRYSLER LLC

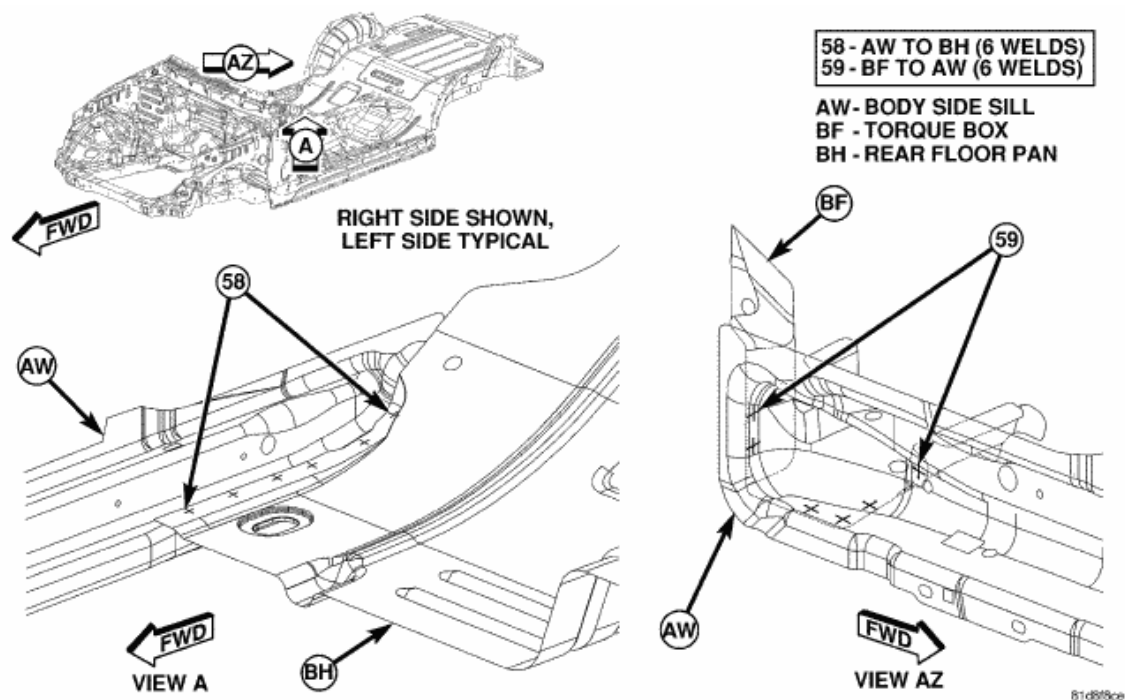


Fig. 892: Underbody And Dash Weld Locations (13 Of 14)

Courtesy of CHRYSLER LLC

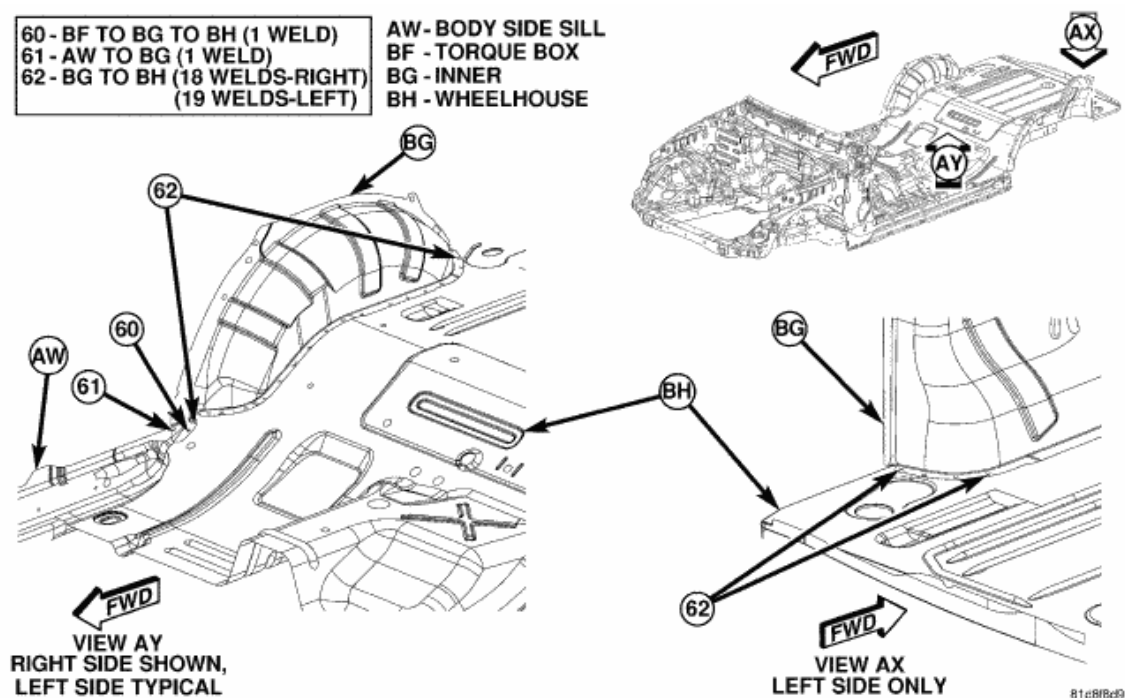
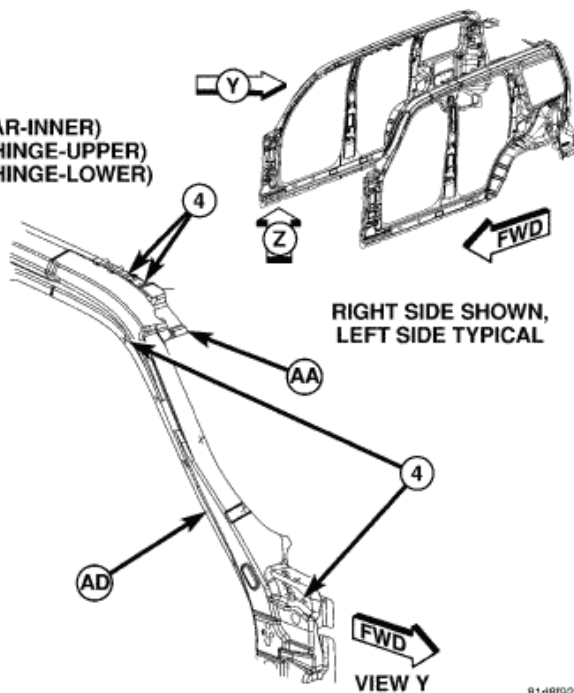
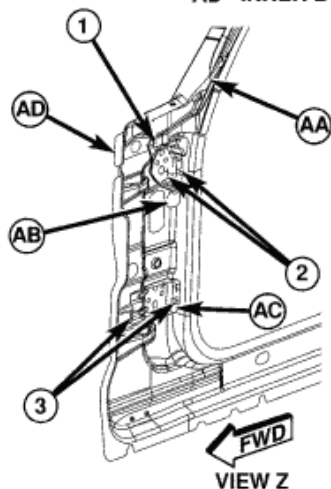


Fig. 893: Underbody And Dash Weld Locations (14 Of 14)

Courtesy of CHRYSLER LLC

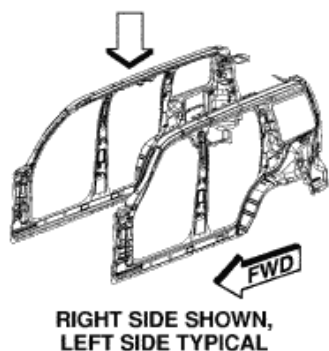
- 1 - AA TO AB TO AD (1 WELD)
- 2 - AB TO AD (2 WELDS)
- 3 - AC TO AD (4 WELDS)
- 4 - AA TO AD (16 WELDS)

AA - REINFORCEMENT (A-PILLAR-INNER)
 AB - REINFORCEMENT (DOOR HINGE-UPPER)
 AC - REINFORCEMENT (DOOR HINGE-LOWER)
 AD - INNER BODY SIDE



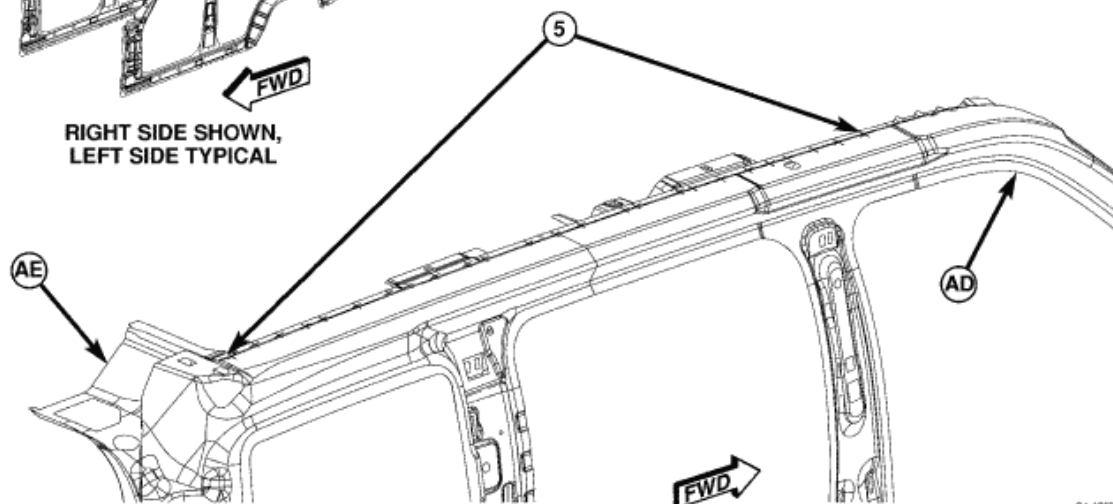
81d8f926

Fig. 894: Body Side Aperture - Inner Weld Locations (1 Of 5)
 Courtesy of CHRYSLER LLC



AD - INNER BODY SIDE
 AE - REINFORCEMENT (INNER ROOF SIDE RAIL)

- 5 - AE TO AD (25 WELDS)



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Fig. 895: Body Side Aperture - Inner Weld Locations (2 Of 5)
 Courtesy of CHRYSLER LLC

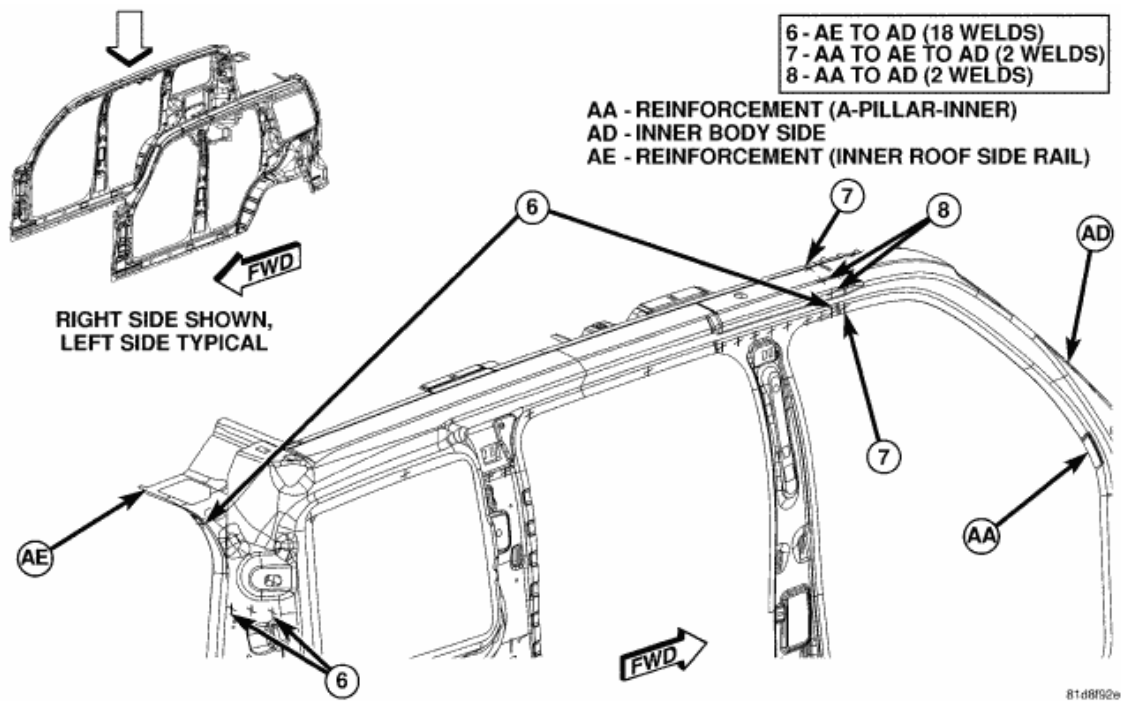


Fig. 896: Body Side Aperture - Inner Weld Locations (3 Of 5)
Courtesy of CHRYSLER LLC

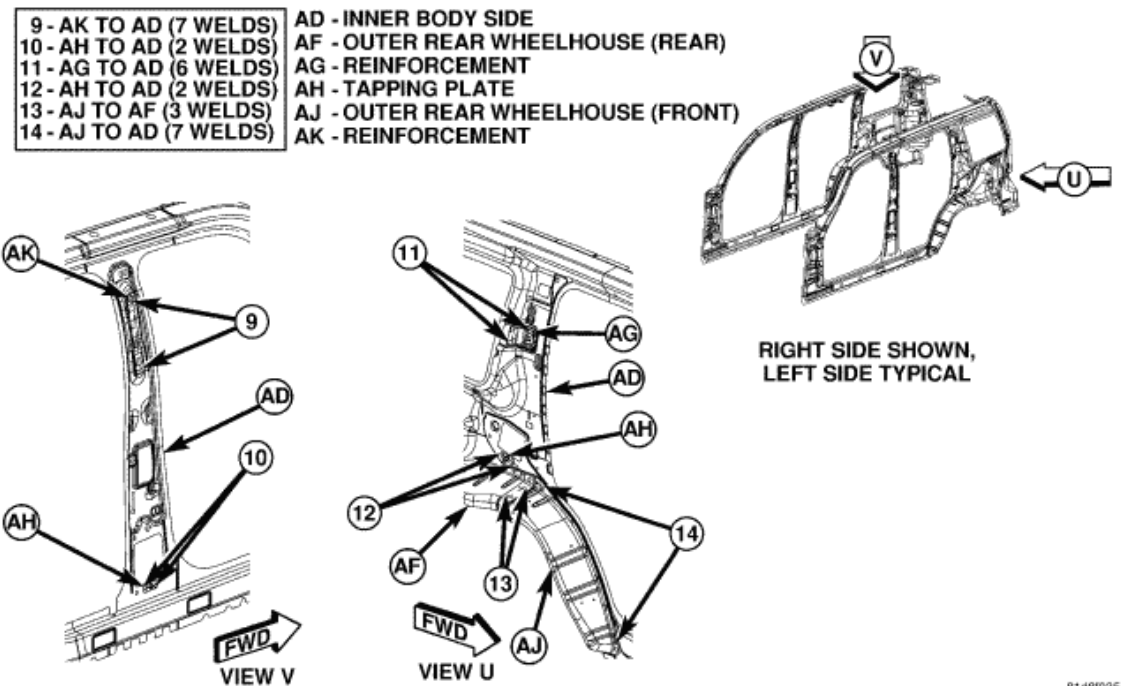


Fig. 897: Body Side Aperture - Inner Weld Locations (4 Of 5)
Courtesy of CHRYSLER LLC

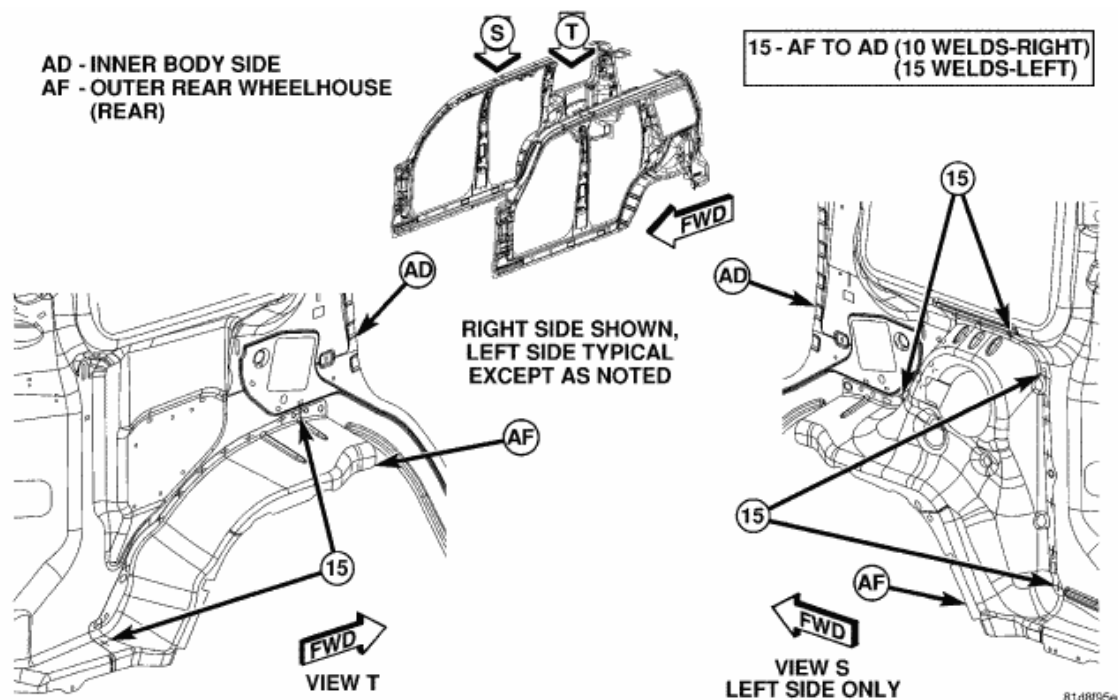


Fig. 898: Body Side Aperture - Inner Weld Locations (5 Of 5)

Courtesy of CHRYSLER LLC

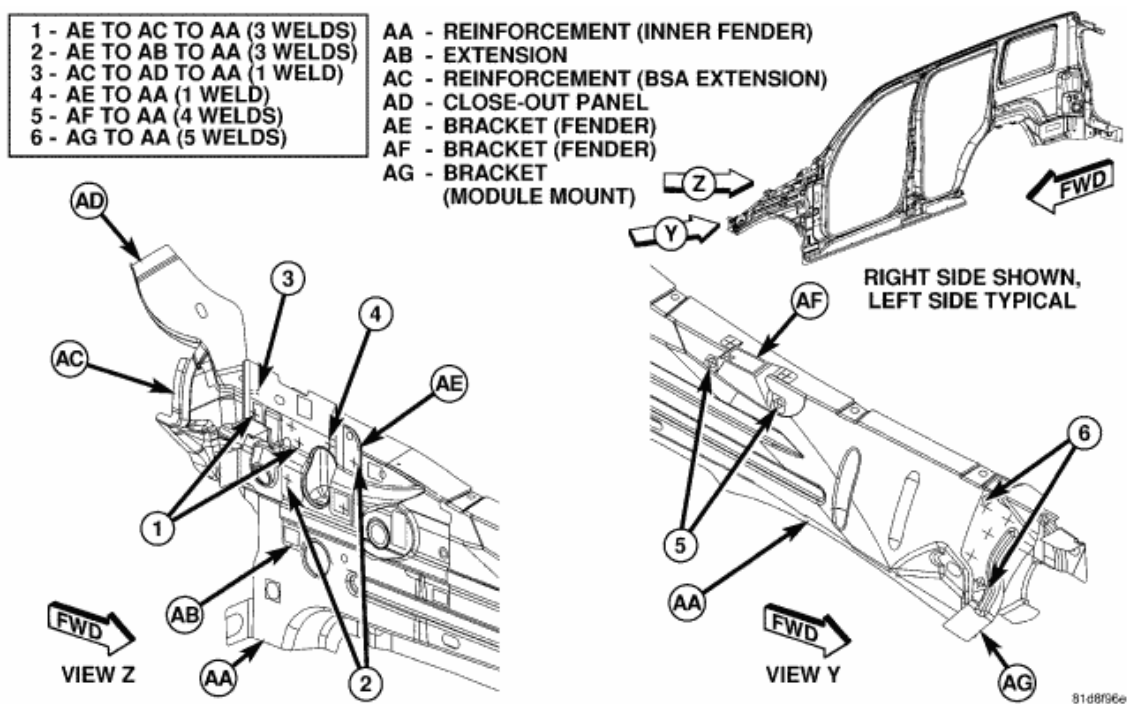


Fig. 899: Body Side Aperture - Outer Weld Locations (1 Of 6)

Courtesy of CHRYSLER LLC

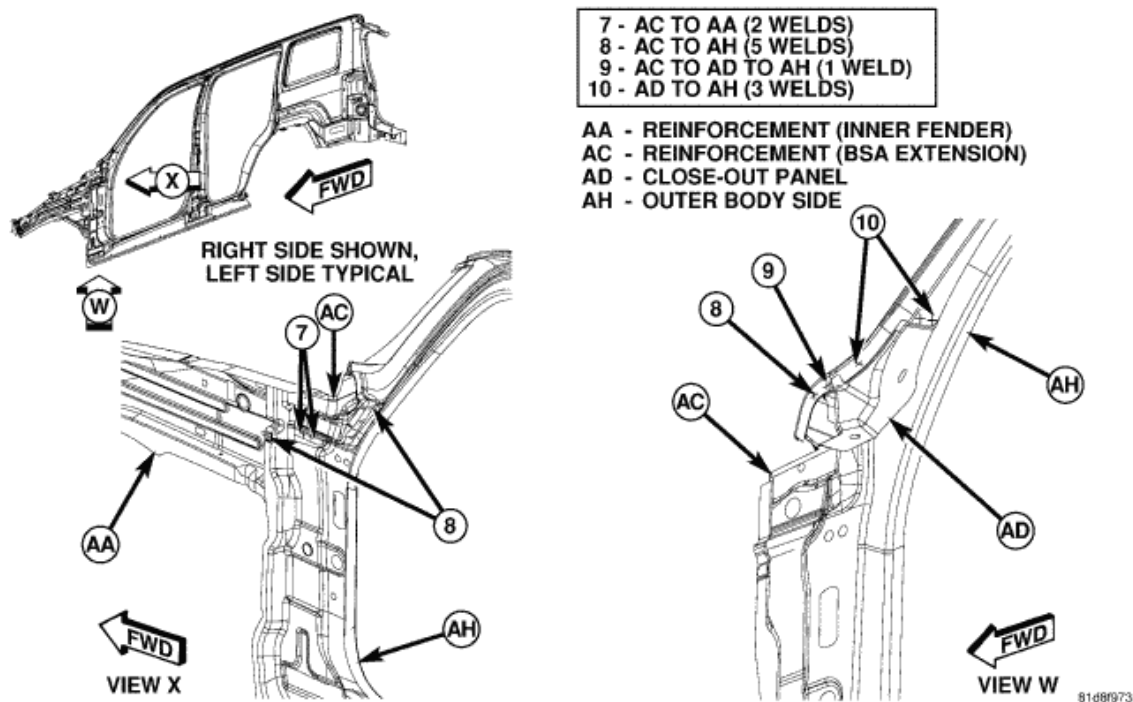


Fig. 900: Body Side Aperture - Outer Weld Locations (2 Of 6)
 Courtesy of CHRYSLER LLC

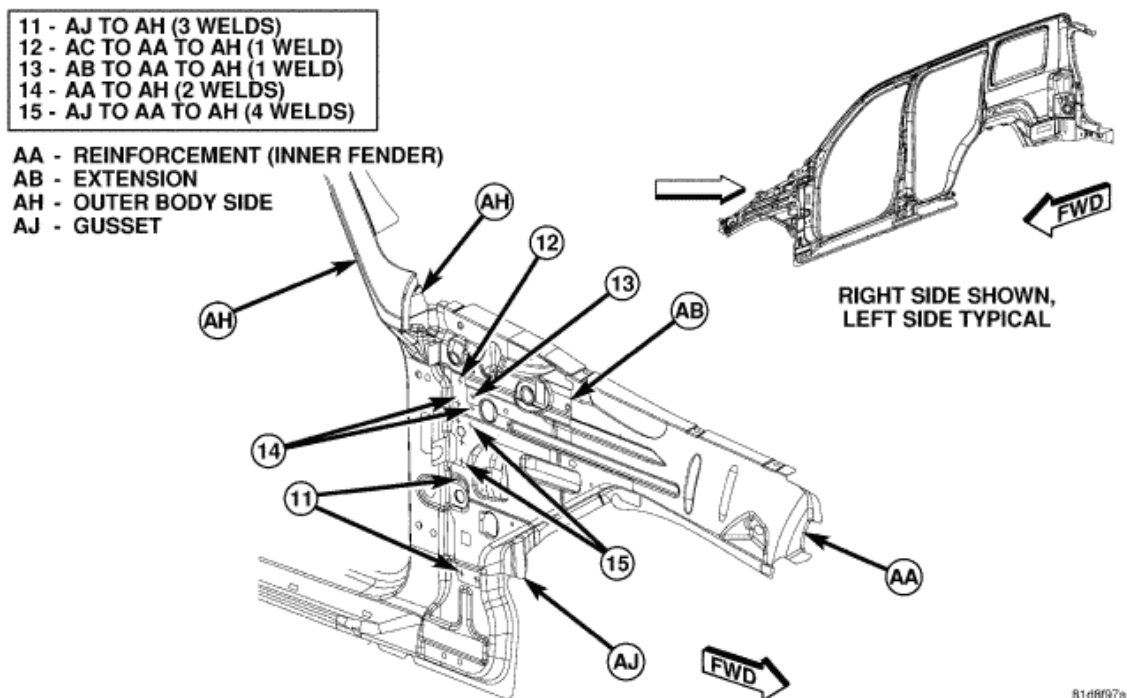


Fig. 901: Body Side Aperture - Outer Weld Locations (3 Of 6)
 Courtesy of CHRYSLER LLC

16 - AK TO AH (11 WELDS)
17 - AL TO AH (1 WELD)
18 - AM TO AH (5 WELDS)

AH - OUTER BODY SIDE
AK - REINFORCEMENT (B-PILLAR)
AL - BRACKET
AM - REINFORCEMENT (C-PILLAR STRIKER)

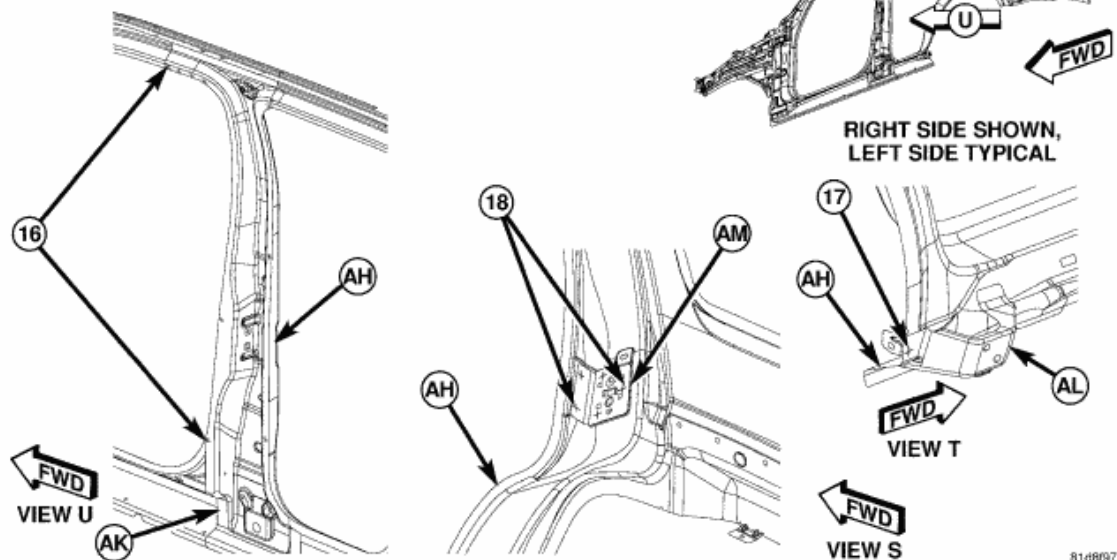


Fig. 902: Body Side Aperture - Outer Weld Locations (4 Of 6)
Courtesy of CHRYSLER LLC

19 - AN TO AH (10 WELDS)
20 - AP TO AH (8 WELDS)

AH - OUTER BODY SIDE
AN - LIFTGATE OPENING TROUGH
AP - TAIL LAMP MOUNT

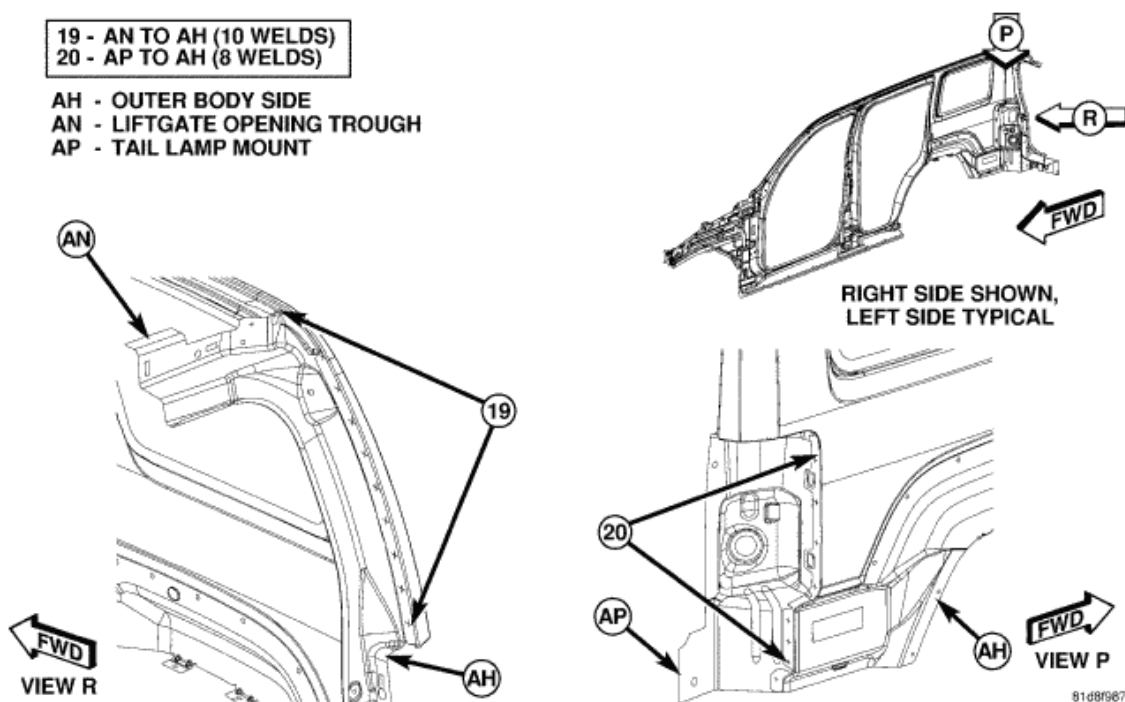
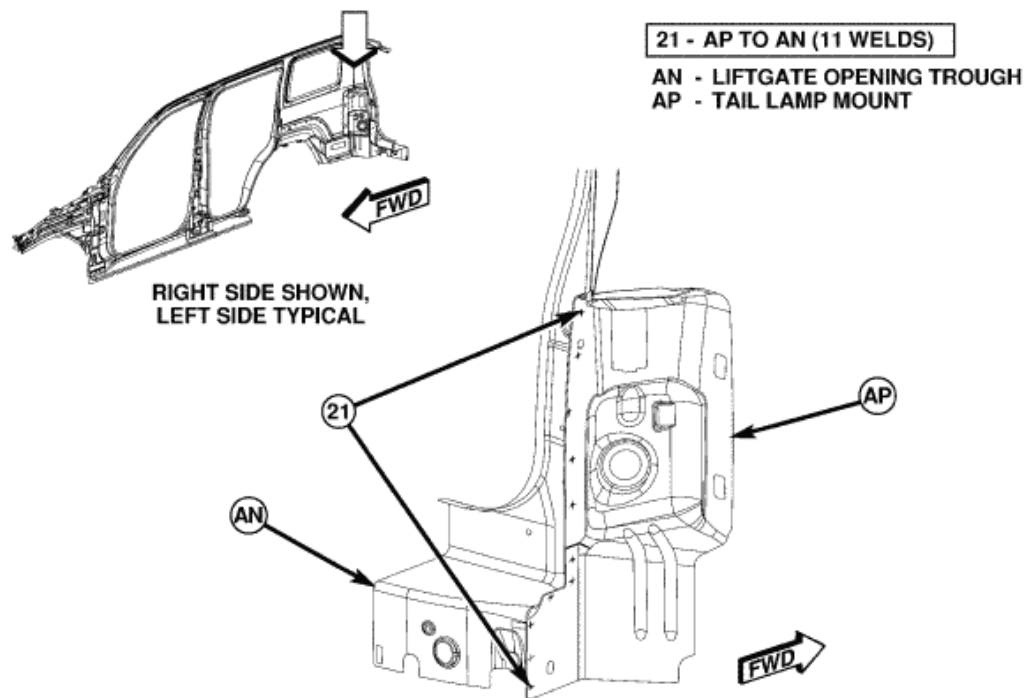
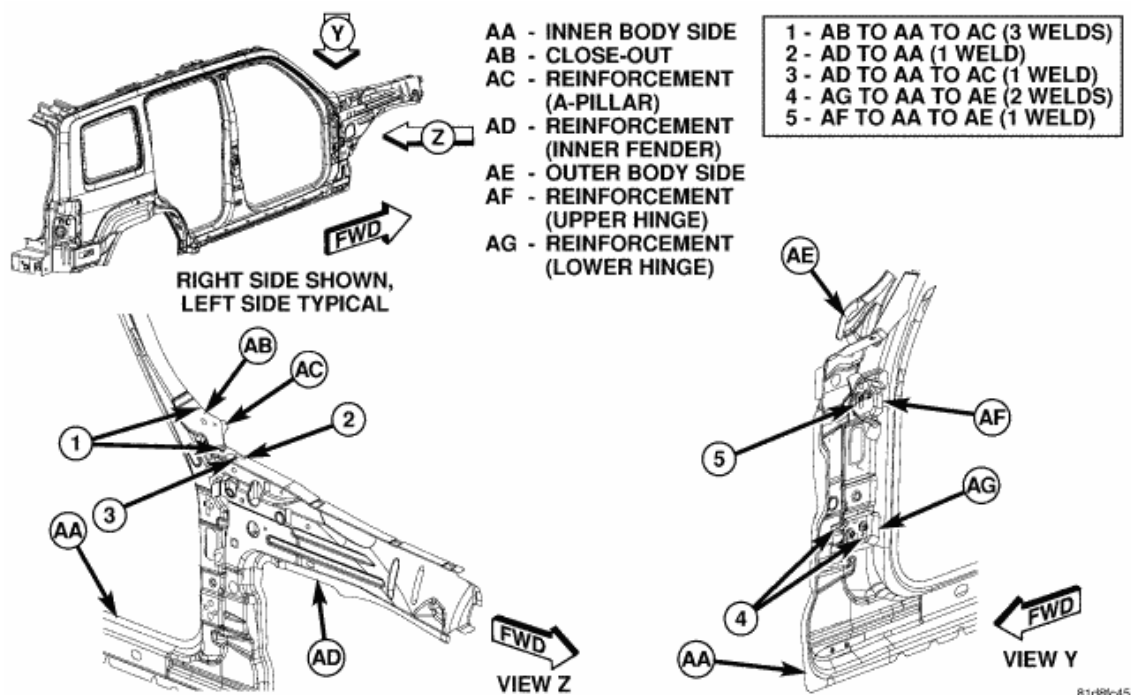


Fig. 903: Body Side Aperture - Outer Weld Locations (5 Of 6)
Courtesy of CHRYSLER LLC



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Fig. 904: Body Side Aperture - Outer Weld Locations (6 Of 6)
Courtesy of CHRYSLER LLC

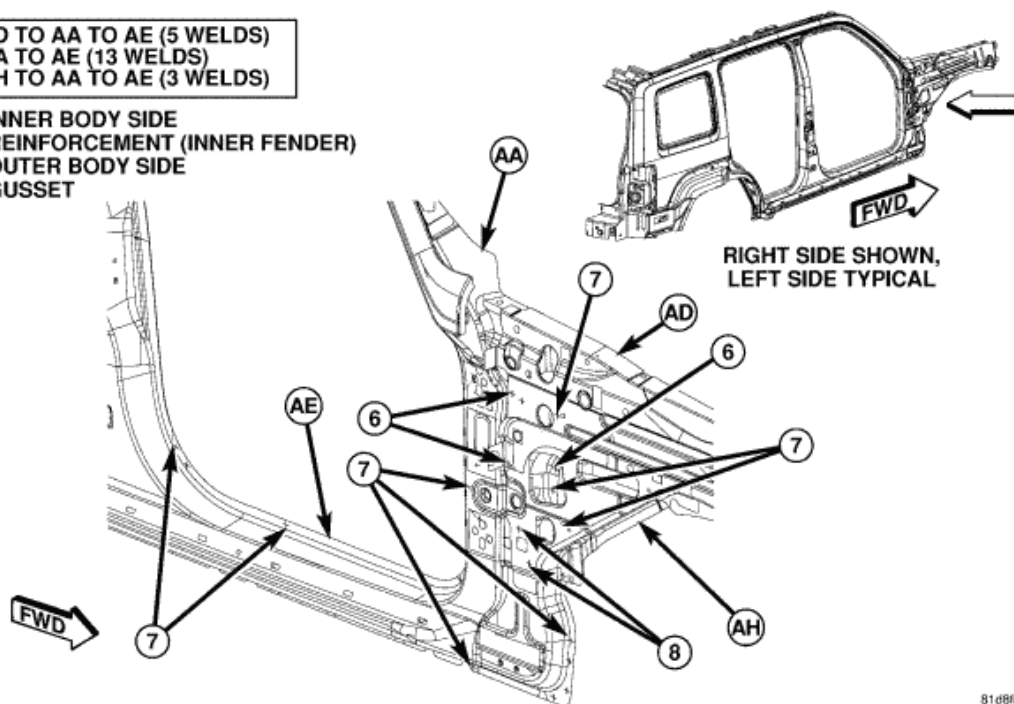


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Fig. 905: Body Side Aperture - Complete Weld Locations (1 Of 8)
Courtesy of CHRYSLER LLC

- 6 - AD TO AA TO AE (5 WELDS)
- 7 - AA TO AE (13 WELDS)
- 8 - AH TO AA TO AE (3 WELDS)

AA - INNER BODY SIDE
AD - REINFORCEMENT (INNER FENDER)
AE - OUTER BODY SIDE
AH - GUSSET

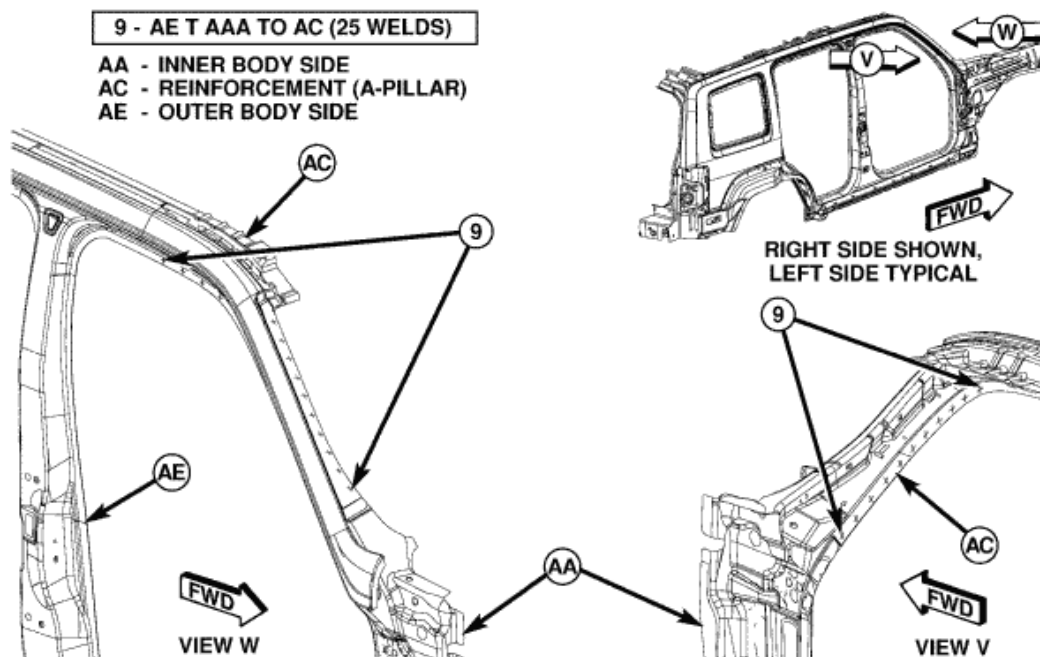


81d8fcf7

Fig. 906: Body Side Aperture - Complete Weld Locations (2 Of 8)
Courtesy of CHRYSLER LLC

- 9 - AE T AAA TO AC (25 WELDS)

AA - INNER BODY SIDE
AC - REINFORCEMENT (A-PILLAR)
AE - OUTER BODY SIDE



81d8fc23

Fig. 907: Body Side Aperture - Complete Weld Locations (3 Of 8)
Courtesy of CHRYSLER LLC

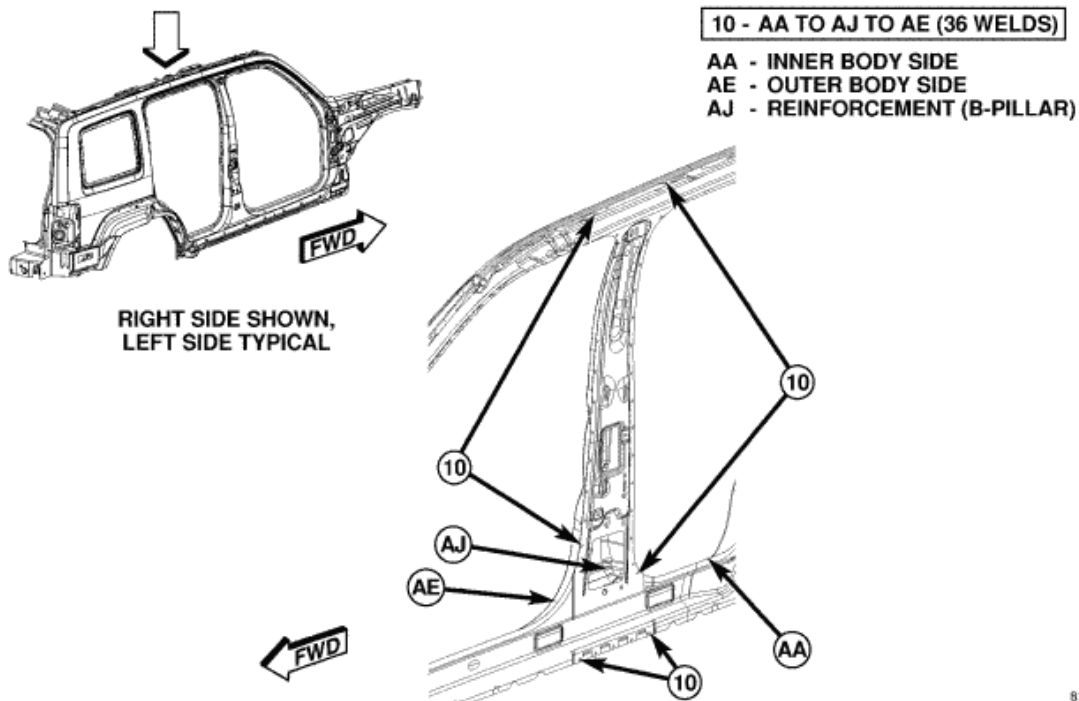


Fig. 908: Body Side Aperture - Complete Weld Locations (4 Of 8)
Courtesy of CHRYSLER LLC

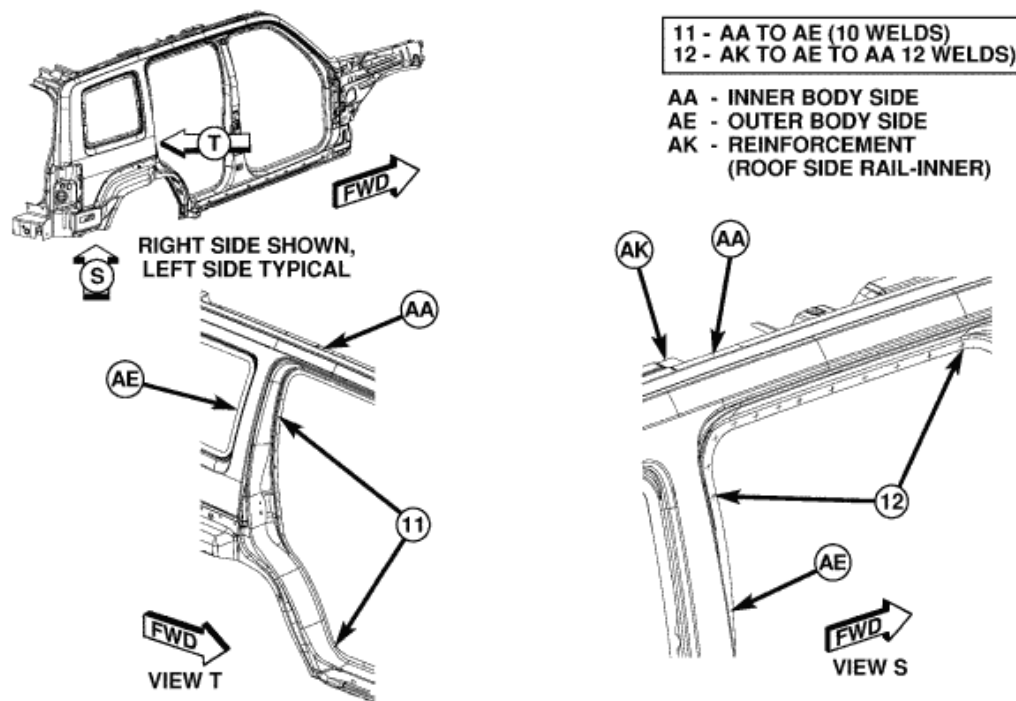


Fig. 909: Body Side Aperture - Complete Weld Locations (5 Of 8)
Courtesy of CHRYSLER LLC

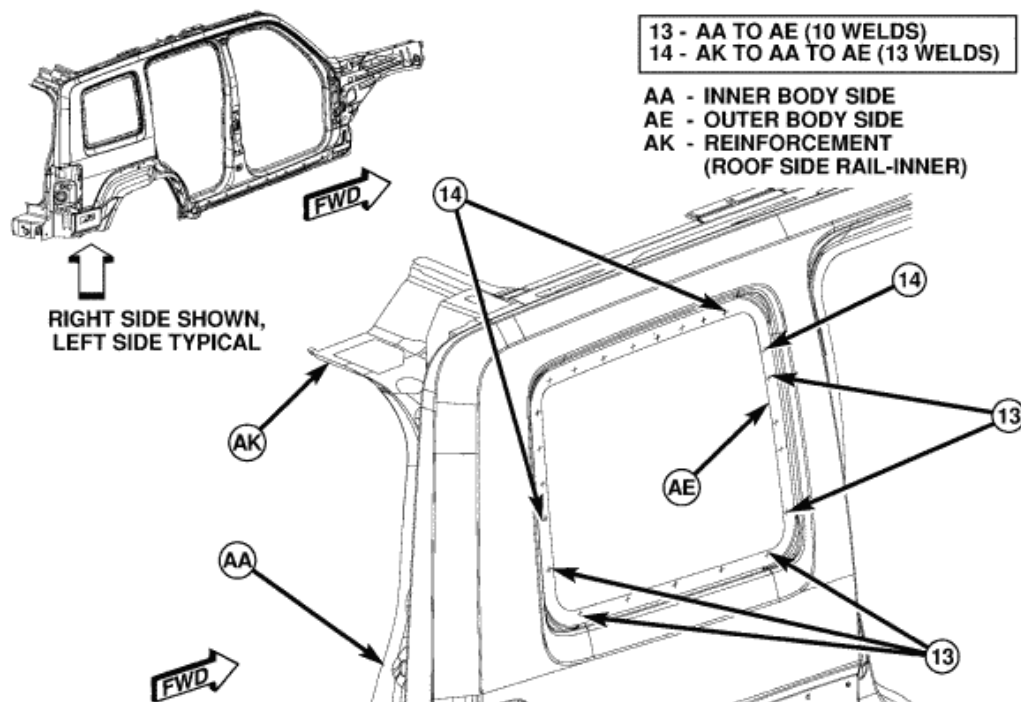


Fig. 910: Body Side Aperture - Complete Weld Locations (6 Of 8)
Courtesy of CHRYSLER LLC

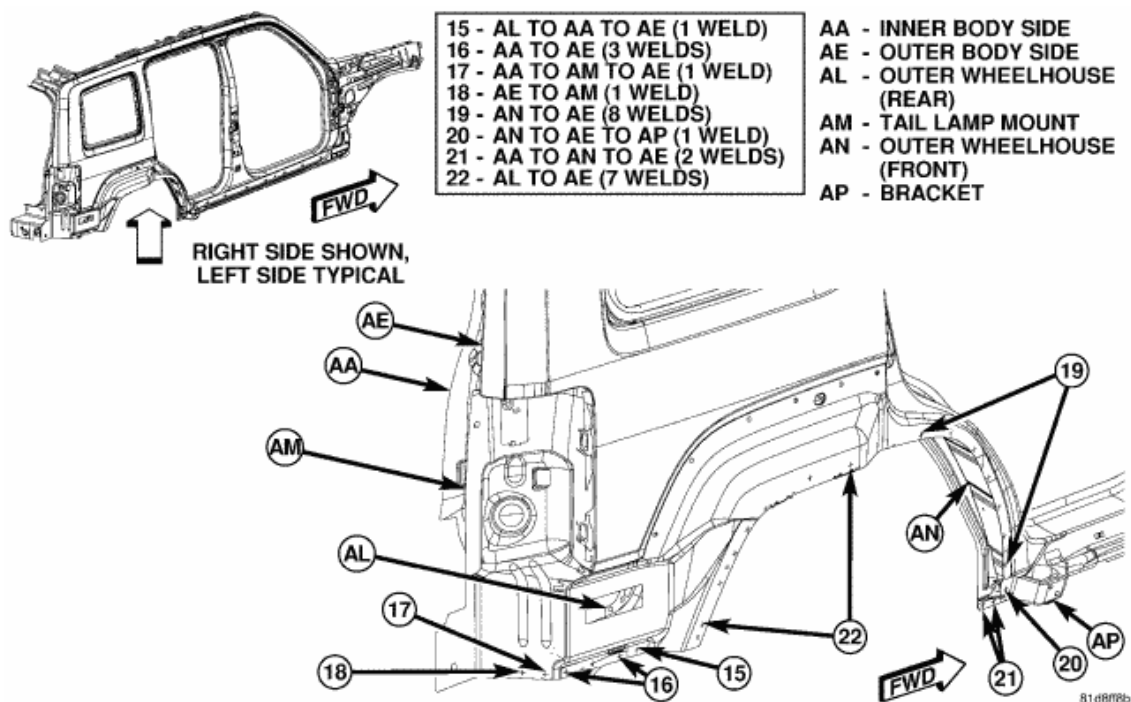


Fig. 911: Body Side Aperture - Complete Weld Locations (7 Of 8)
Courtesy of CHRYSLER LLC

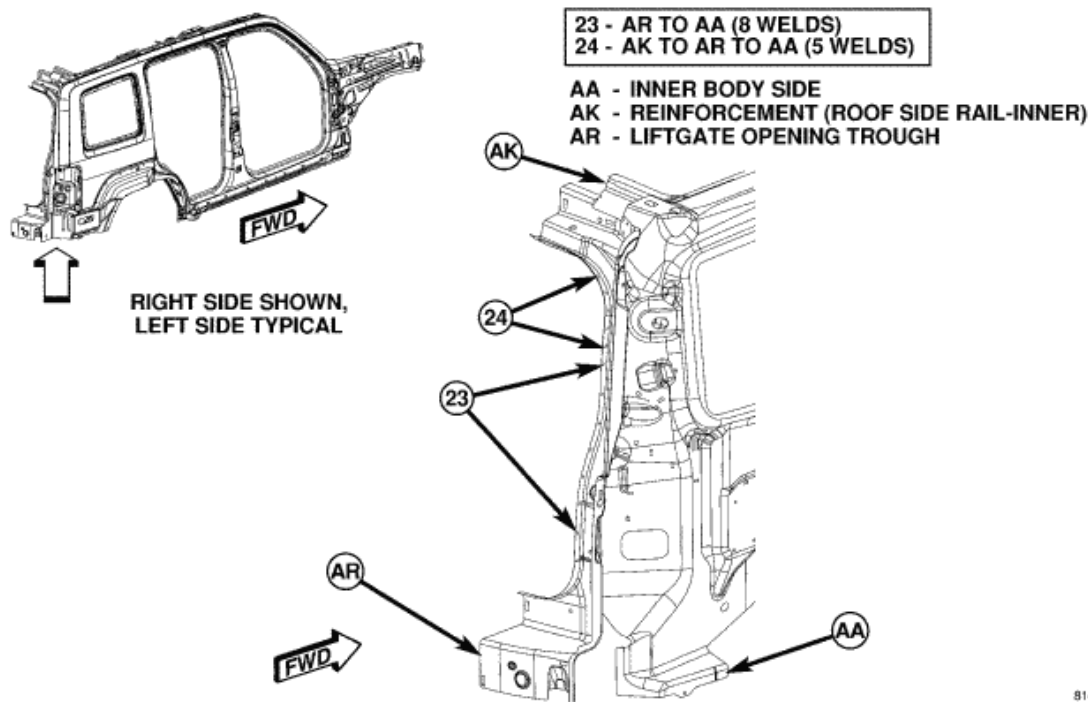


Fig. 912: Body Side Aperture - Complete Weld Locations (8 Of 8)
Courtesy of CHRYSLER LLC

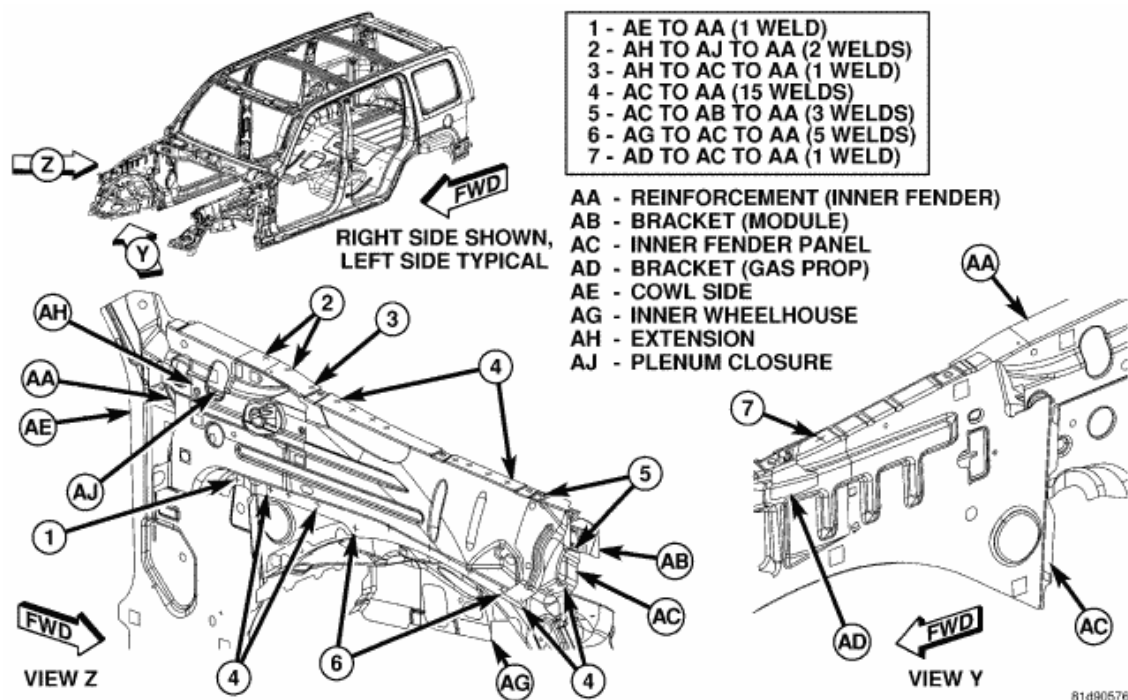


Fig. 913: Body In White Without Roof Weld Locations (1 Of 14)
Courtesy of CHRYSLER LLC

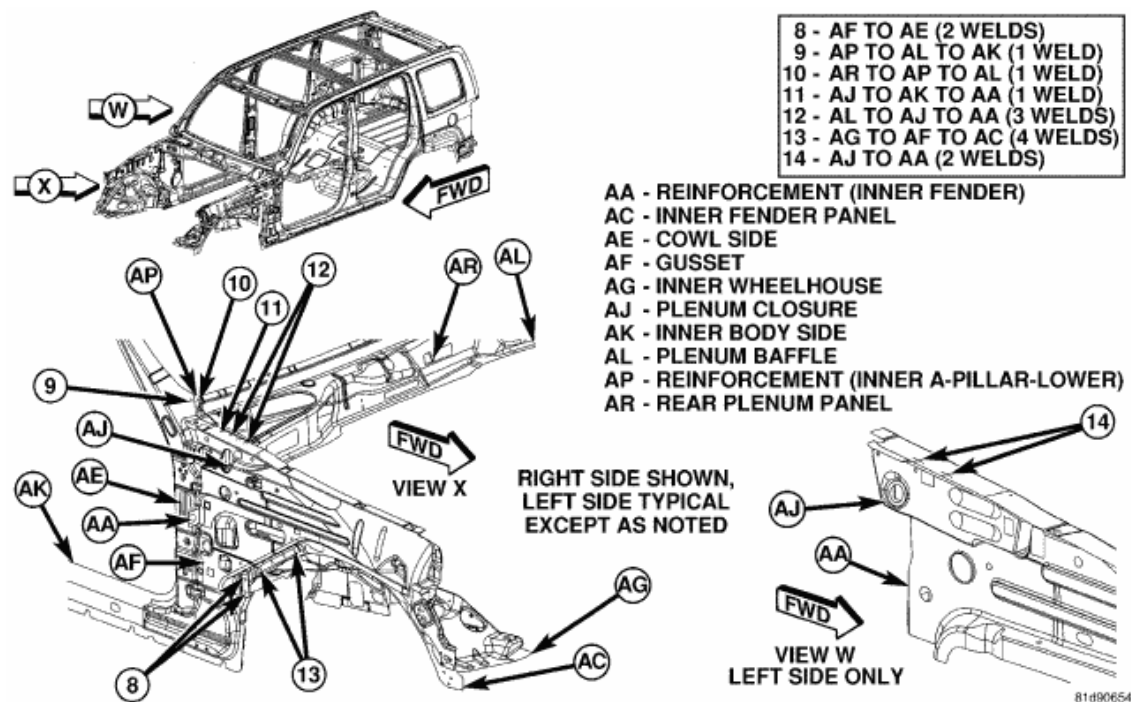


Fig. 914: Body In White Without Roof Weld Locations (2 Of 14)

Courtesy of CHRYSLER LLC

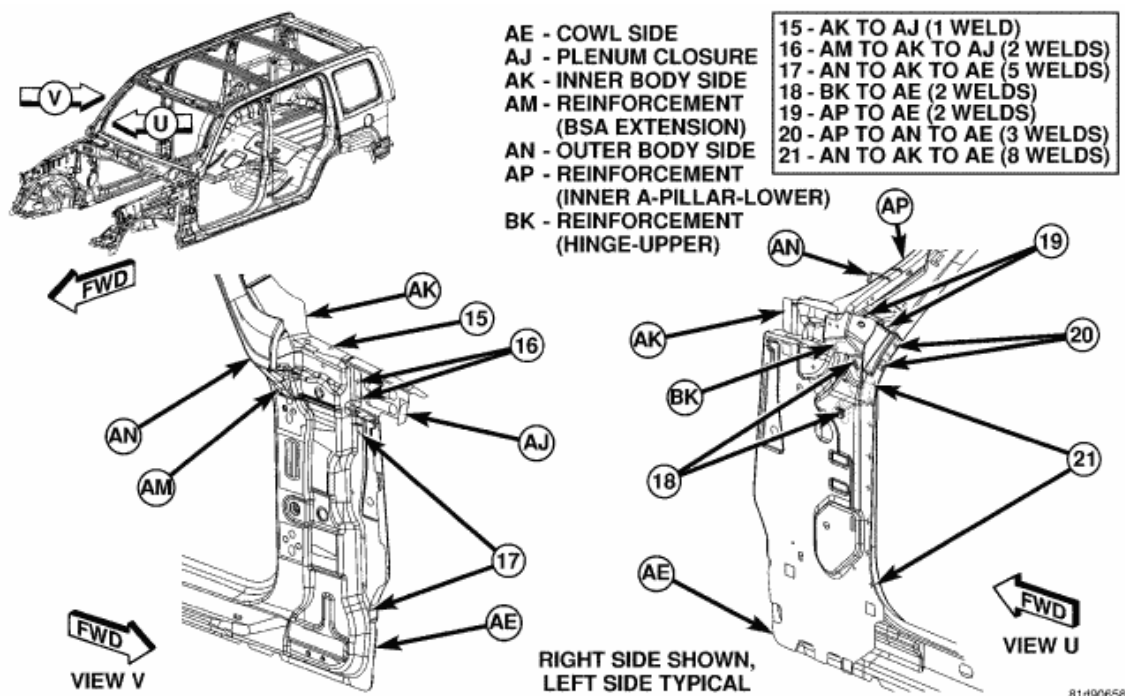
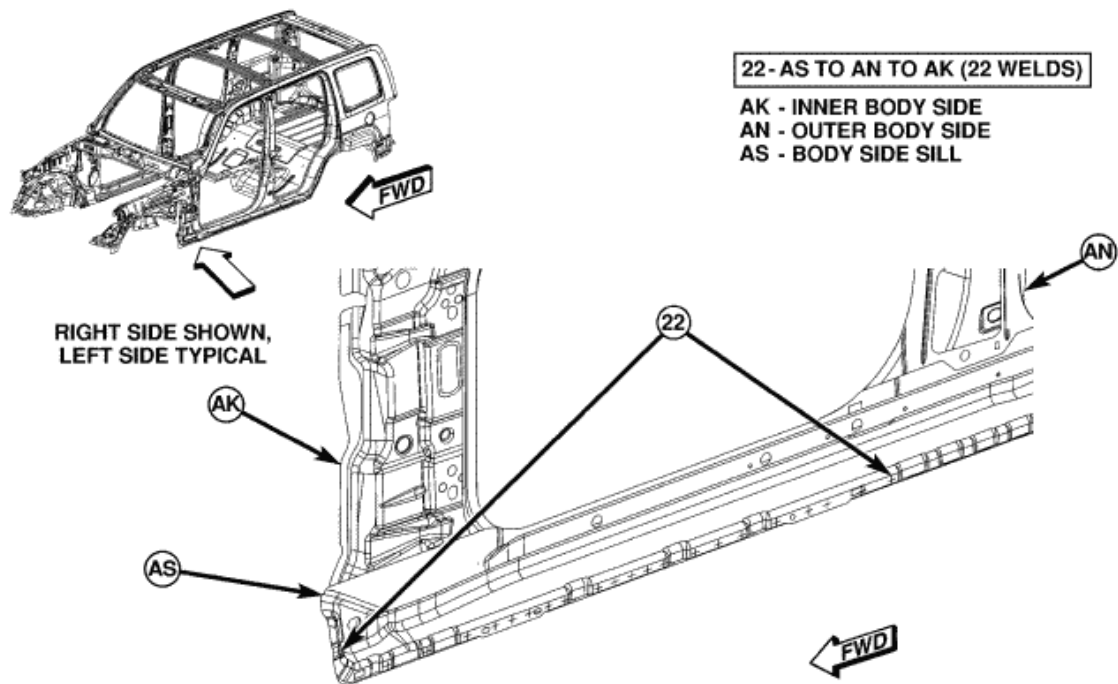


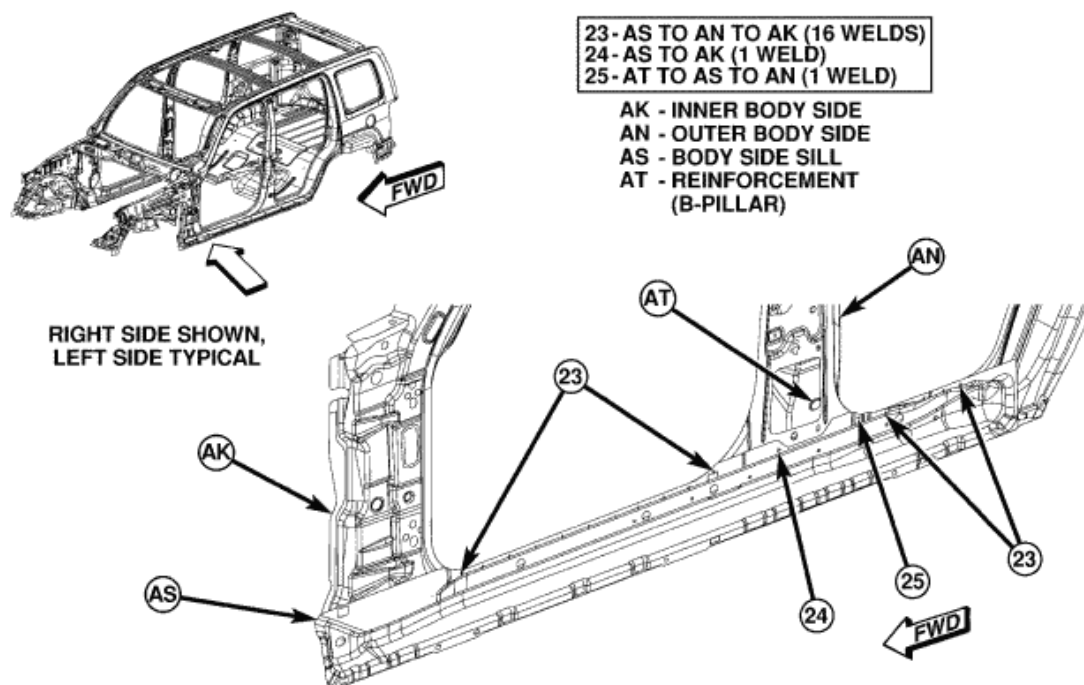
Fig. 915: Body In White Without Roof Weld Locations (3 Of 14)

Courtesy of CHRYSLER LLC



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Fig. 916: Body In White Without Roof Weld Locations (4 Of 14)
Courtesy of CHRYSLER LLC



81d906c8

Fig. 917: Body In White Without Roof Weld Locations (5 Of 14)
Courtesy of CHRYSLER LLC

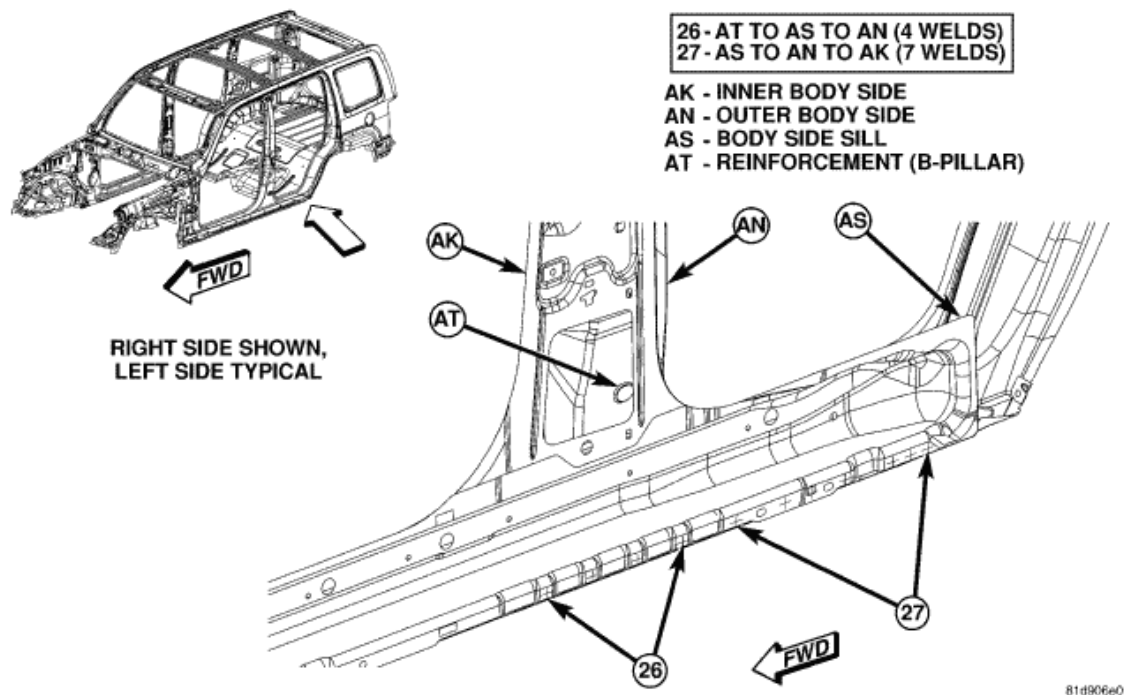


Fig. 918: Body In White Without Roof Weld Locations (6 Of 14)
Courtesy of CHRYSLER LLC

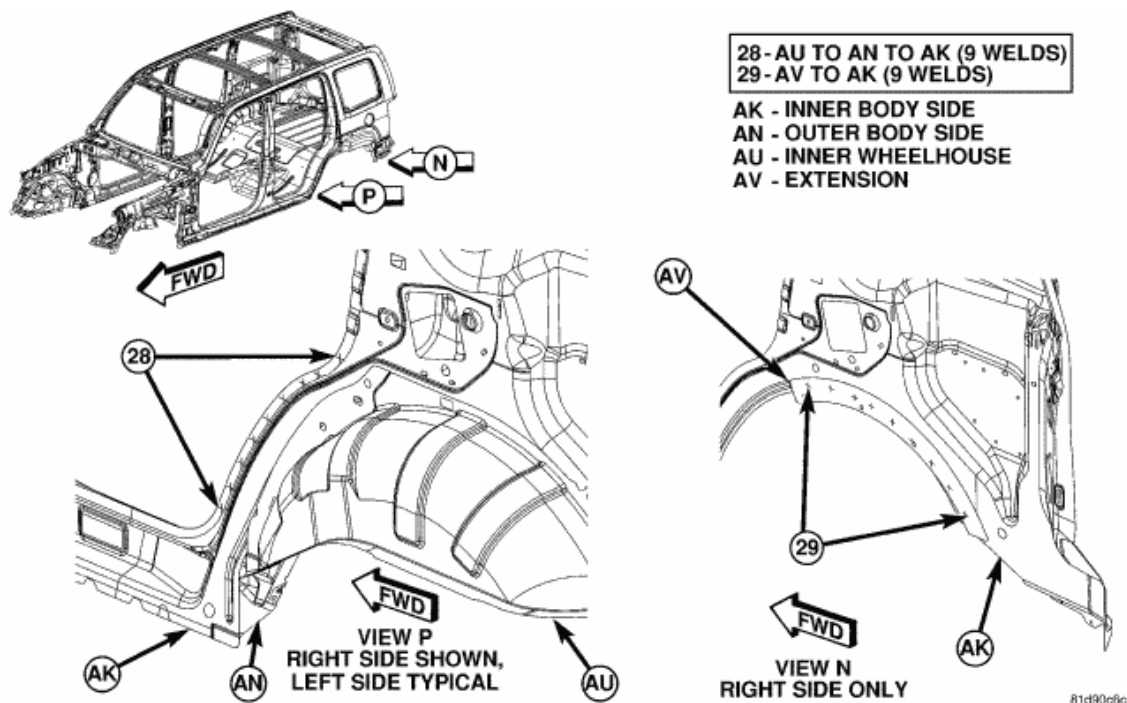


Fig. 919: Body In White Without Roof Weld Locations (7 Of 14)
Courtesy of CHRYSLER LLC

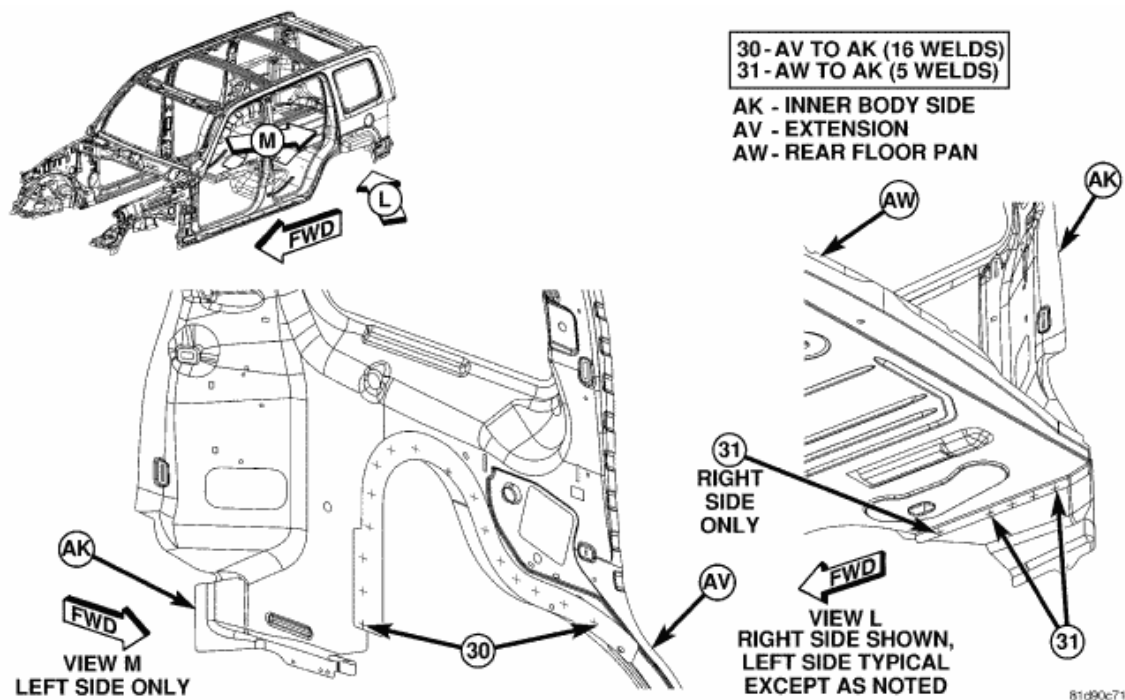


Fig. 920: Body In White Without Roof Weld Locations (8 Of 14)

Courtesy of CHRYSLER LLC

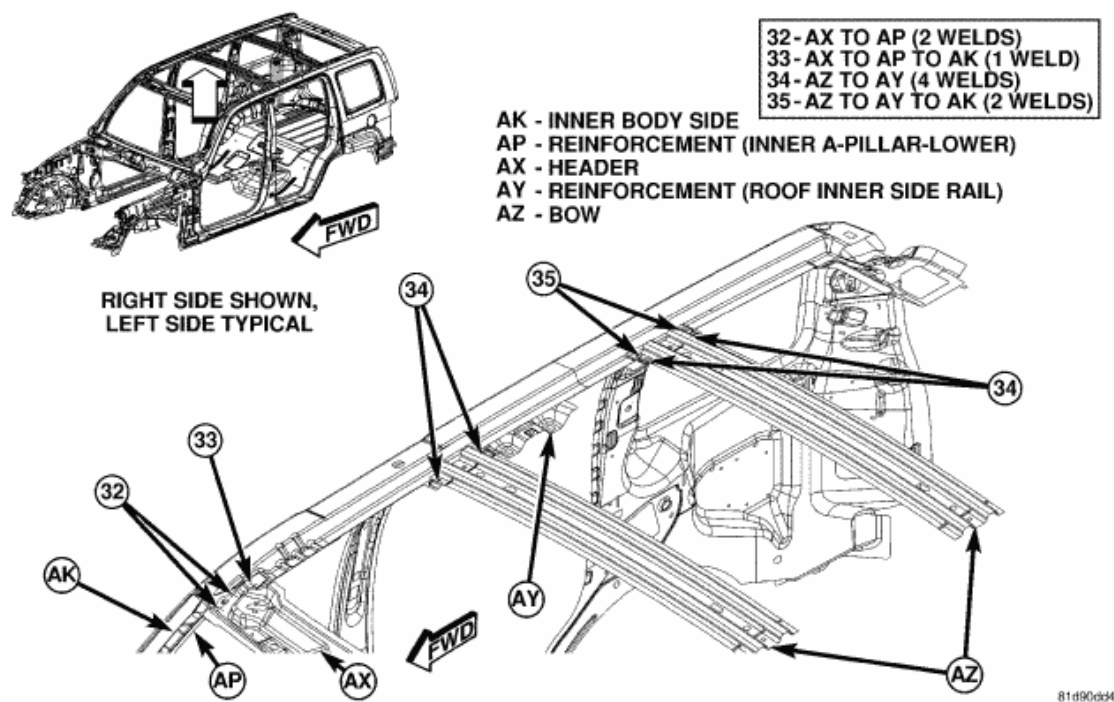


Fig. 921: Body In White Without Roof Weld Locations (9 Of 14)

Courtesy of CHRYSLER LLC

36- BA TO AK (4 WELDS)
 37- BB TO BA TO AK (1 WELD)
 38- BB TO BA (1 WELD)
 39- BC TO BB TO AK (3 WELDS)
 40- BD TO BB TO BA (1 WELD)
 41- BF TO BC TO AK (2 WELDS)

AK - INNER BODY SIDE
 BA - CROSSMEMBER
 BB - LIFTGATE OPENING TROUGH
 BC - REINFORCEMENT (D-PILLAR)
 BD - CROSSMEMBER (OUTER)
 BF - TAIL LAMP MOUNT

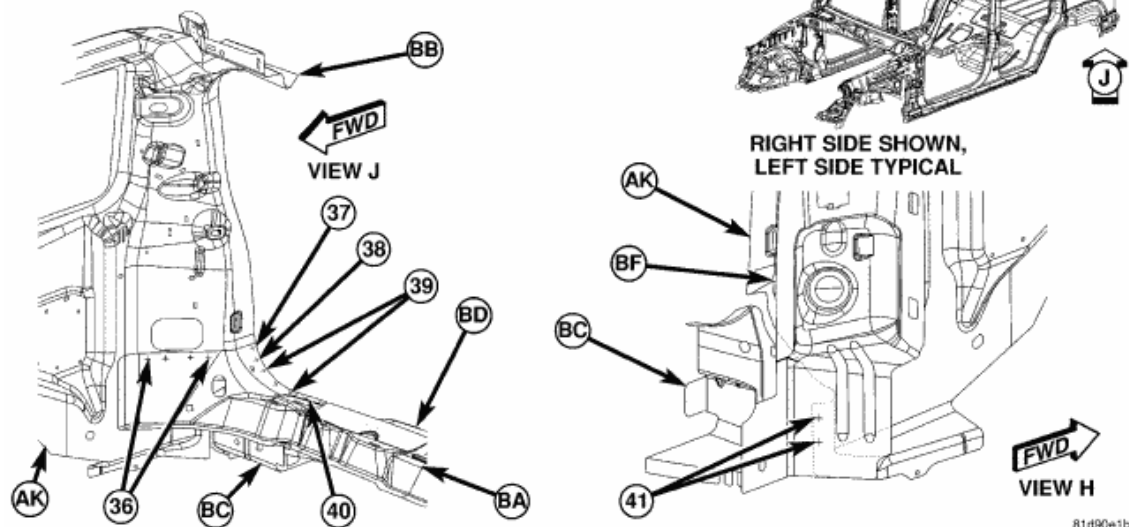
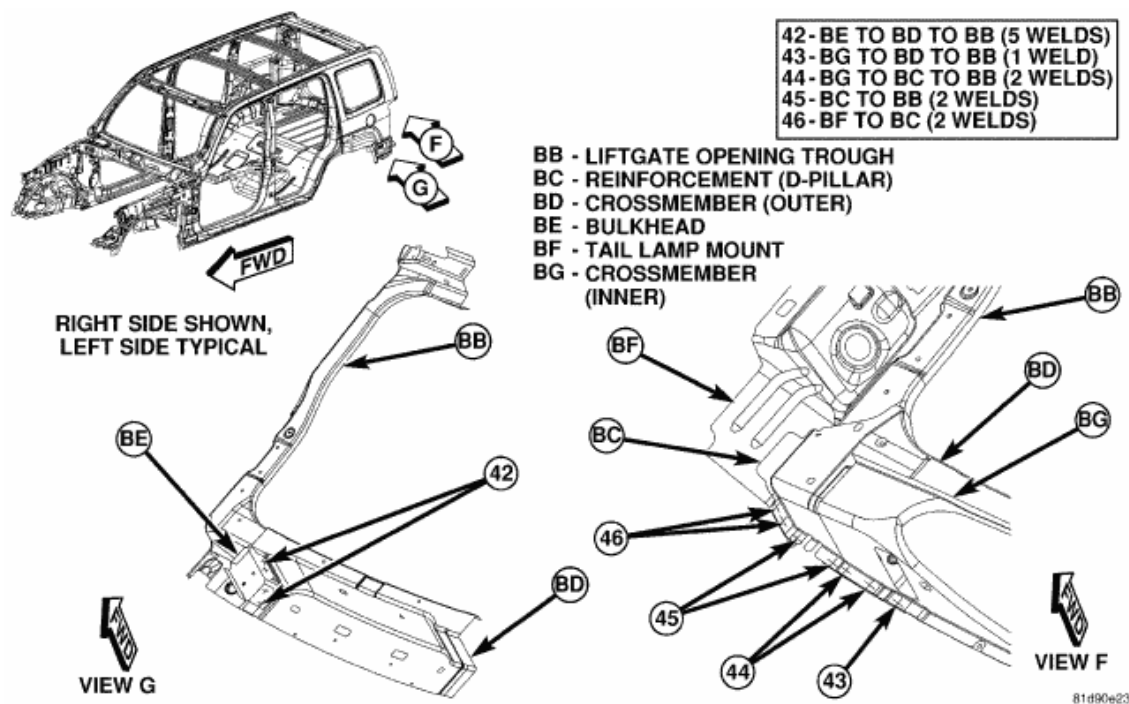


Fig. 922: Body In White Without Roof Weld Locations (10 Of 14)

Courtesy of CHRYSLER LLC



42- BE TO BD TO BB (5 WELDS)
 43- BG TO BD TO BB (1 WELD)
 44- BG TO BC TO BB (2 WELDS)
 45- BC TO BB (2 WELDS)
 46- BF TO BC (2 WELDS)

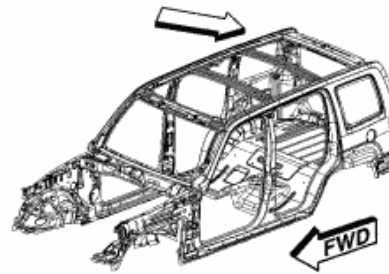
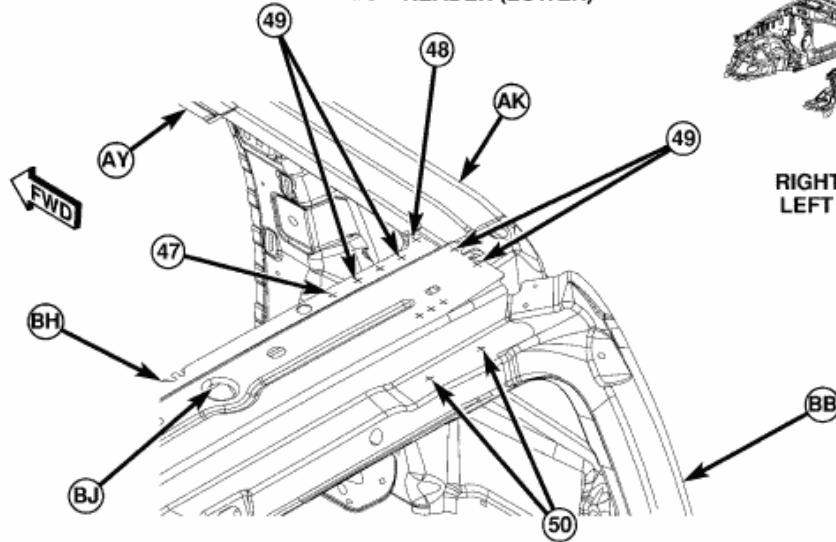
BB - LIFTGATE OPENING TROUGH
 BC - REINFORCEMENT (D-PILLAR)
 BD - CROSSMEMBER (OUTER)
 BE - BULKHEAD
 BF - TAIL LAMP MOUNT
 BG - CROSSMEMBER (INNER)

Fig. 923: Body In White Without Roof Weld Locations (11 Of 14)

Courtesy of CHRYSLER LLC

47-BJ TO BH TO AY (1 WELD)
48-BH TO AY TO AK (1 WELD)
49-BH TO AK (5 WELDS)
50-BH TO BB (5 WELDS)

AK - INNER BODY SIDE
AY - REINFORCEMENT
(ROOF INNER SIDE RAIL)
BH - LIFTGATE OPENING TROUGH
BH - HEADER (UPPER)
BJ - HEADER (LOWER)



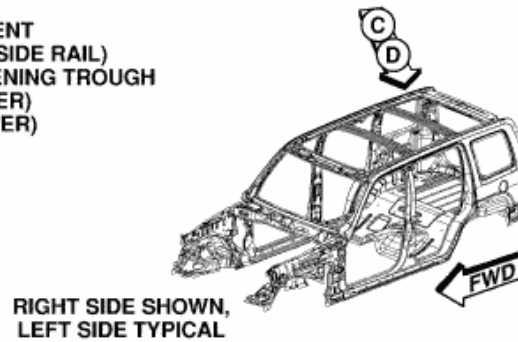
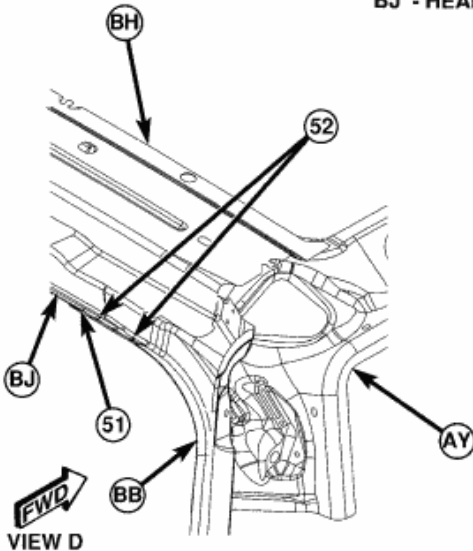
RIGHT SIDE SHOWN,
LEFT SIDE TYPICAL

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Fig. 924: Body In White Without Roof Weld Locations (12 Of 14)
Courtesy of CHRYSLER LLC

51-BJ TO BH TO BB (1 WELD)
52-BH TO BB TO AY (3 WELDS)
53-BJ TO AY (3 WELDS)

AY - REINFORCEMENT
(INNER ROOF SIDE RAIL)
BB - LIFTGATE OPENING TROUGH
BH - HEADER (UPPER)
BJ - HEADER (LOWER)



RIGHT SIDE SHOWN,
LEFT SIDE TYPICAL

81d90e98

Fig. 925: Body In White Without Roof Weld Locations (13 Of 14)
Courtesy of CHRYSLER LLC

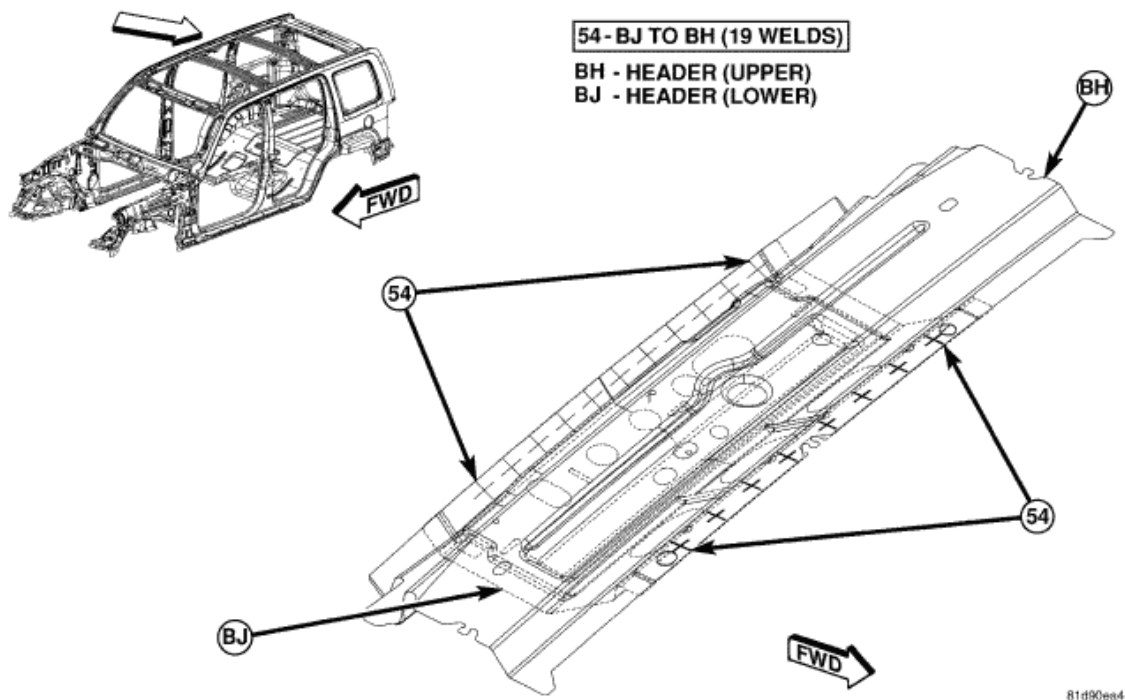


Fig. 926: Body In White Without Roof Weld Locations (14 Of 14)
 Courtesy of CHRYSLER LLC

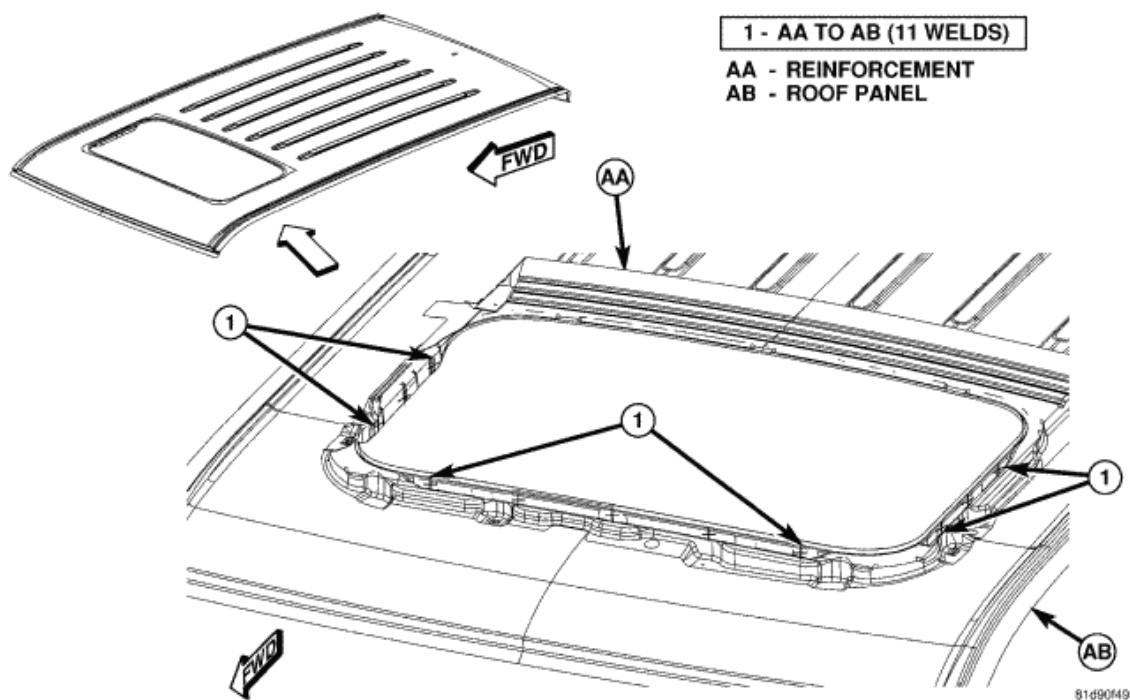


Fig. 927: Roof With Sunroof And Without Sunroof Weld Locations
 Courtesy of CHRYSLER LLC

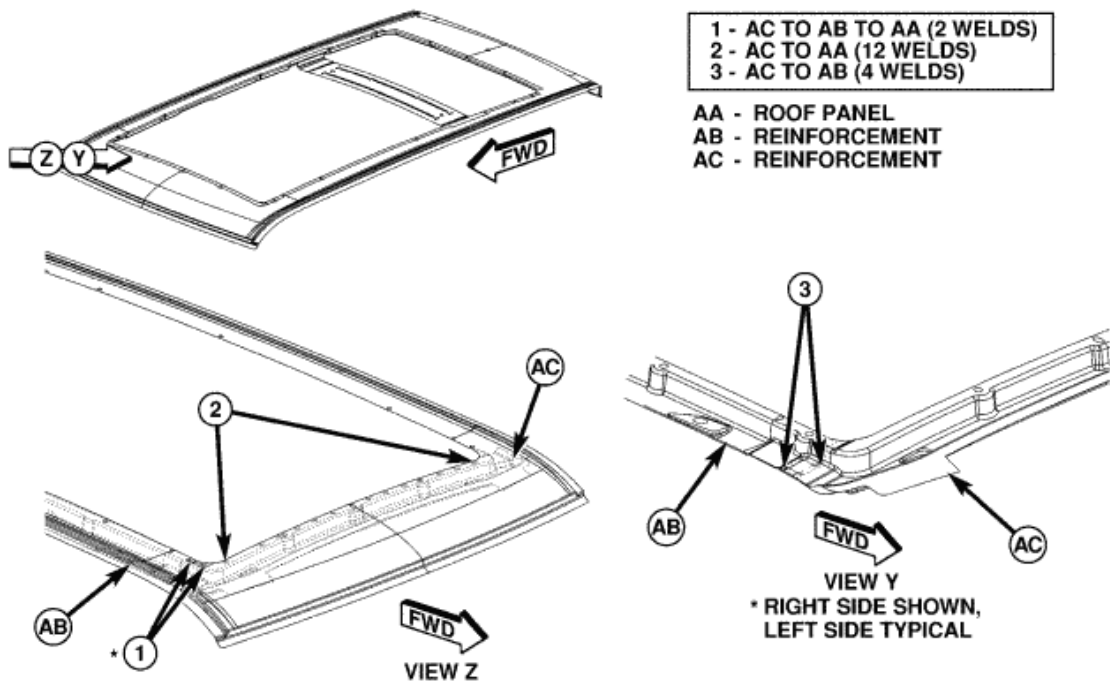


Fig. 928: Retractable Roof Weld Locations (1 Of 3)
Courtesy of CHRYSLER LLC

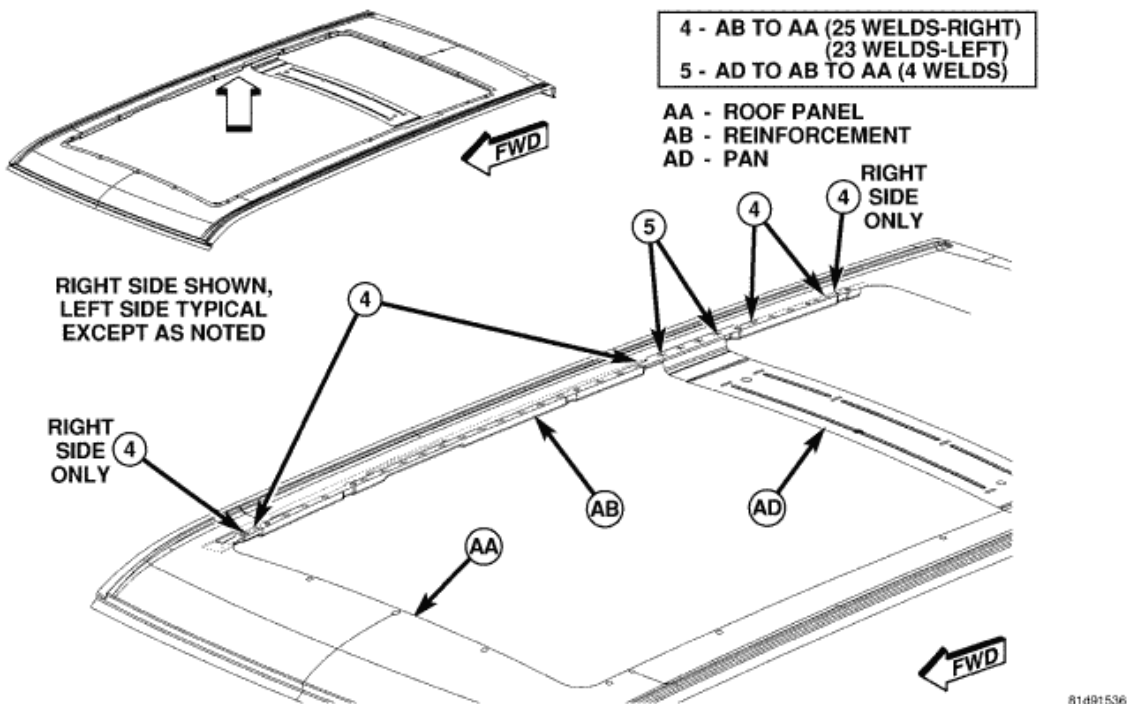


Fig. 929: Retractable Roof Weld Locations (2 Of 3)
Courtesy of CHRYSLER LLC

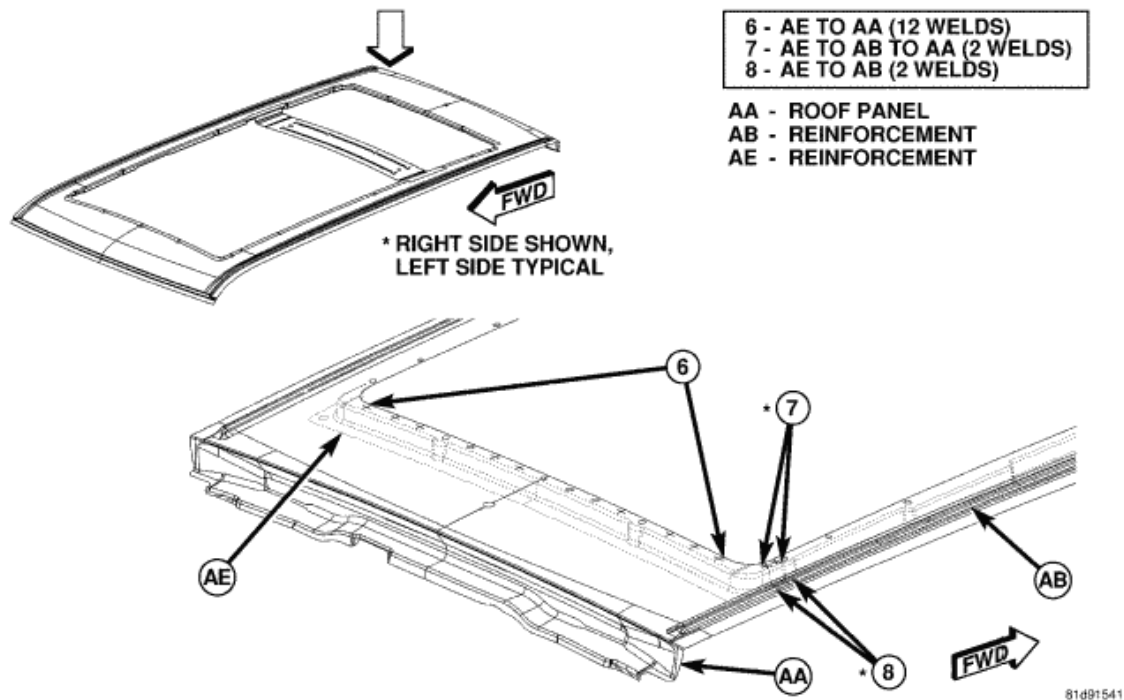


Fig. 930: Retractable Roof Weld Locations (3 Of 3)
 Courtesy of CHRYSLER LLC

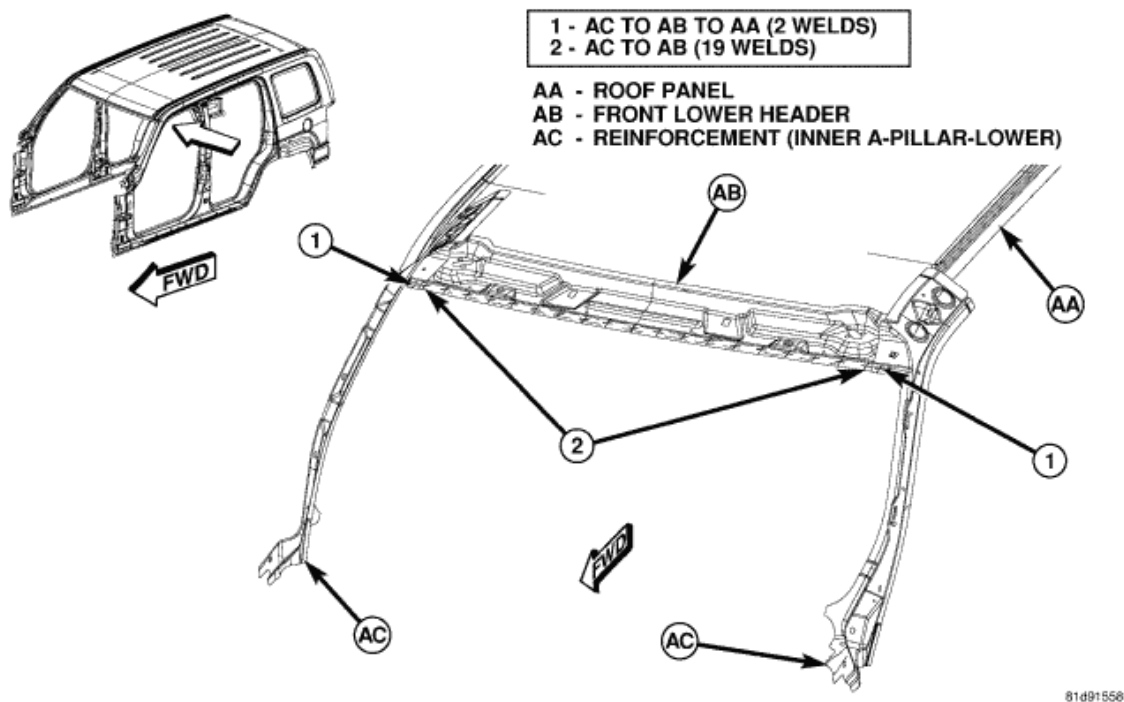


Fig. 931: Body In White Complete Weld Locations (1 Of 4)
 Courtesy of CHRYSLER LLC

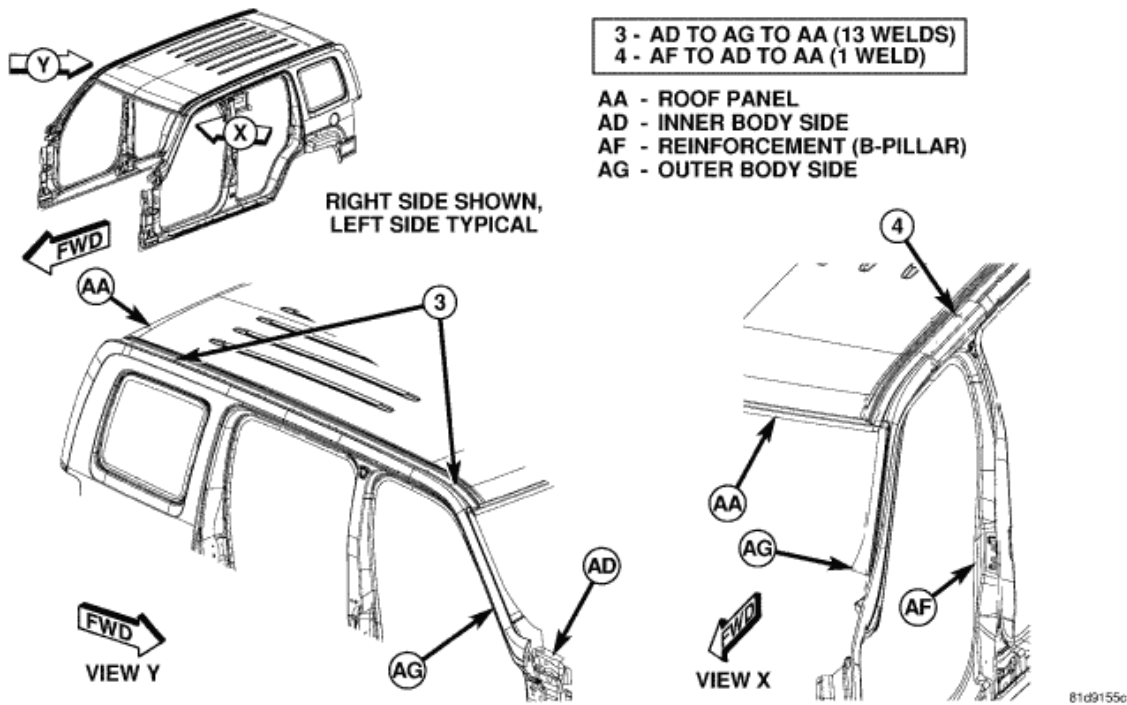


Fig. 932: Body In White Complete Weld Locations (2 Of 4)
Courtesy of CHRYSLER LLC

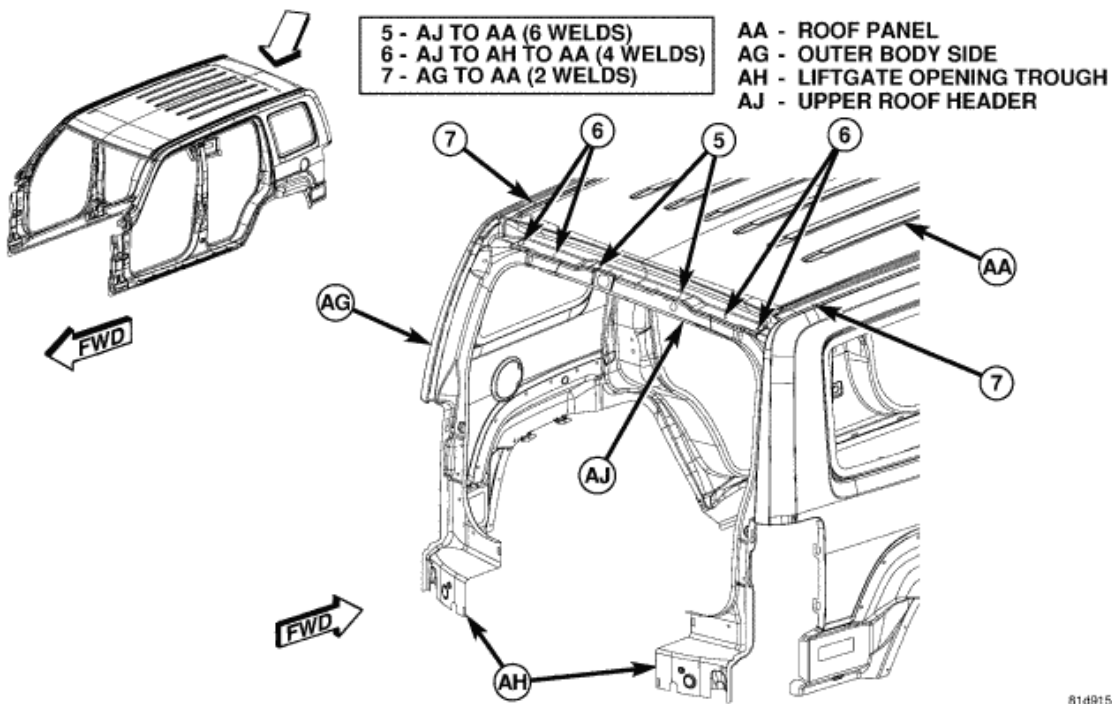


Fig. 933: Body In White Complete Weld Locations (3 Of 4)
Courtesy of CHRYSLER LLC

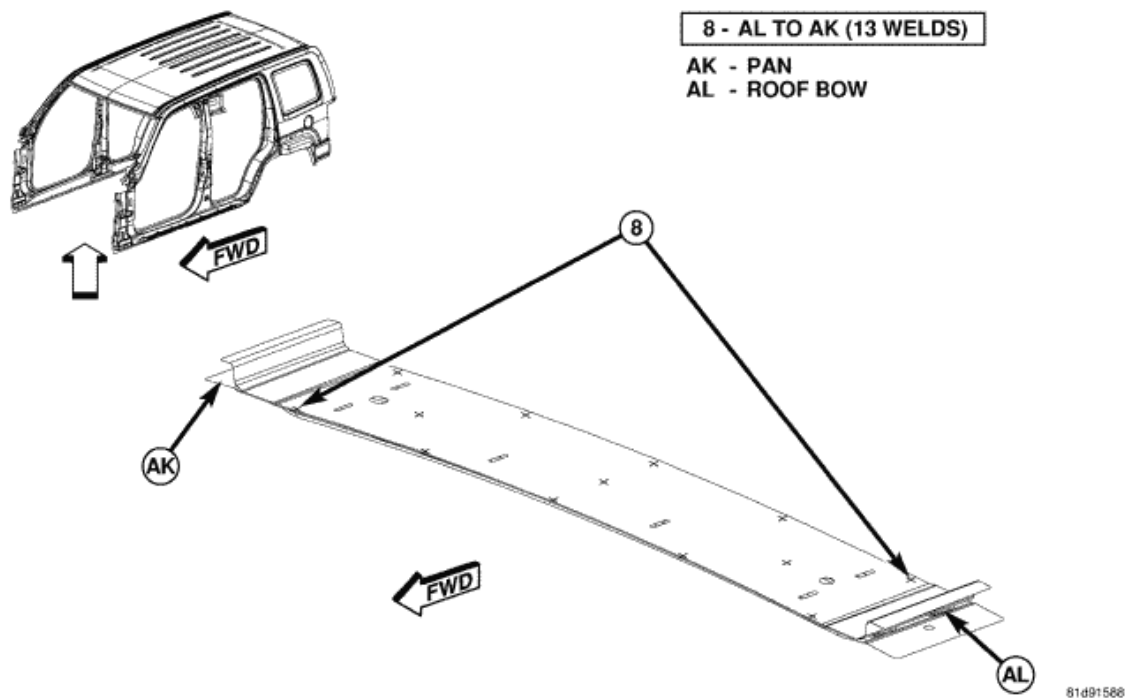


Fig. 934: Body In White Complete Weld Locations (4 Of 4)
Courtesy of CHRYSLER LLC

2008 BRAKES

Base - Service Information - Liberty

BASE - SERVICE INFORMATION

DESCRIPTION

BRAKE SYSTEM

ESP and Power assist four wheel disc brakes are standard equipment. Front disc brake components consist of single piston calipers and ventilated rotors. Rear disc brakes use a drum in hat design for the parking brake which is activated by brake shoes pressing against the inside of the drum in hat rotor.

The parking brake mechanism is lever and cable operated. The cables are attached on a equalizer on the lever cable. The parking brakes are operated by a hand lever.

The vehicle is equipped with ESP (Electronic Stability Program). There are four wheel speed sensors, one sensor at each wheel to monitor input.

A dual diaphragm vacuum power brake booster is used for all applications. All models have an aluminum master cylinder with plastic reservoir.

Factory brake lining on all models consists of an organic base material combined with metallic particles. The original equipment linings do not contain asbestos.

WARNING

WARNING

WARNING: DaimlerChrysler does not manufacture any vehicles or replacement parts that contain asbestos. Aftermarket products may or may not contain asbestos. Refer to aftermarket product packaging for product information. Whether the product contains asbestos or not, dust and dirt can accumulate on brake parts during normal use. Follow practices prescribed by appropriate regulations for the handling, processing and disposing of dust and debris.

CAUTION: Never use gasoline, kerosene, alcohol, motor oil, transmission fluid, or any fluid containing mineral oil to clean the system components. These fluids damage rubber cups and seals. Use only fresh brake fluid or Mopar brake cleaner to clean or flush brake system components. These are the only cleaning materials recommended. If system contamination is suspected, check the fluid for dirt, discoloration, or separation into distinct layers. Also check the reservoir cap seal for distortion. Drain and flush the system with new brake fluid if contamination is suspected.

CAUTION: Use Mopar brake fluid, or an equivalent quality fluid meeting SAE/DOT standards J1703 and DOT 3. Brake fluid must be clean and free of contaminants. Use fresh fluid from sealed containers only to ensure proper antilock component operation.

CAUTION: Use Mopar multi-mileage or high temperature grease to lubricate caliper slide surfaces, drum brake pivot pins, and shoe contact points on the backing plates. Use multi-mileage grease or GE 661 or Dow 111 silicone grease on caliper slide pins to ensure proper operation.

DIAGNOSIS AND TESTING

BASE BRAKE SYSTEM

Base brake components consist of the brake shoes, calipers, rotors, brake lines, master cylinder, booster, and parking brake components.

Brake diagnosis involves determining if the problem is related to a mechanical, hydraulic, or vacuum operated component.

The first diagnosis step is the preliminary check.

PRELIMINARY BRAKE CHECK

1. Check condition of tires and wheels. Damaged wheels and worn, damaged, or underinflated tires can cause pull, shudder, vibration, and a condition similar to grab.
2. If complaint was based on noise when braking, check suspension components. Jounce front and rear of vehicle and listen for noise that might be caused by loose, worn or damaged suspension or steering components.
3. Inspect brake fluid level and condition. Note that the brake reservoir fluid level will decrease in proportion to normal lining wear. **Also note that brake fluid tends to darken over time. This is normal and should not be mistaken for contamination.**
 - If fluid level is abnormally low, look for evidence of leaks at calipers, brake lines, and master cylinder.
 - If fluid appears contaminated, drain out a sample to examine. System will have to be flushed if fluid is separated into layers, or contains a substance other than brake fluid. The system seals and cups will also have to be replaced after flushing. Use clean brake fluid to flush the system.
4. Check parking brake operation. Verify free movement and full release of cables and hand lever. Also note if vehicle was being operated with parking brake partially applied.
5. Check brake pedal operation. Verify that pedal does not bind and has adequate free play. If pedal lacks free play, check pedal and power booster for being loose or for bind condition. Do not road test until condition is corrected.
6. Check booster vacuum check valve and hose.
7. If components checked appear OK, road test the vehicle.

ROAD TESTING

1. If complaint involved low brake pedal, pump pedal and note if it comes back up to normal height.
2. Check brake pedal response with transmission in Neutral and engine running. Pedal should remain firm under constant foot pressure.
3. During road test, make normal and firm brake stops in 40-64 km/h (25-40 mph) range. Note faulty brake operation such as low pedal, hard pedal, fade, pedal pulsation, pull, grab, drag, noise, etc.
4. Attempt to stop the vehicle with the parking brake only and note grab, drag, noise, etc.

PEDAL FALLS AWAY

A brake pedal that falls away under steady foot pressure is generally the result of a system leak. The leak point could be at a brake line, fitting, hose, or caliper. If leakage is severe, fluid will be evident at or around the leaking component.

Internal leakage (seal by-pass) in the master cylinder caused by worn or damaged piston cups, may also be the problem cause.

An internal leak in the ABS or junction block may also be the problem with no physical evidence.

Pedal fall-away can also be caused by the vacuum level building in the booster. This is common, especially in vehicles equipped with a vacuum pump, and is not an indication of malfunction. To differentiate between a leak and vacuum build, turn off the engine, and pump the pedal 4-5 times (until the vacuum is depleted), then press and hold the pedal with constant force. If the pedal still falls away, pursue root causing leaks. If the pedal remains firm under this condition, leaks are not the issue.

LOW PEDAL

If a low pedal is experienced, pump the pedal several times. If the pedal comes back up worn linings or rotors are the most likely causes. The proper course of action is to inspect and replace all worn components.

SPONGY PEDAL

A spongy pedal is most often caused by air in the system. However, substandard brake lines and hoses can also cause a spongy pedal. The proper course of action is to bleed the system, and replace substandard quality brake hoses if suspected.

HARD PEDAL OR HIGH PEDAL EFFORT

A hard pedal or high pedal effort may be due to lining that is water soaked, contaminated, glazed, or badly worn. The power booster or check valve could also be faulty.

Hard pedal is also a symptom of a vacuum leak - check hoses and connections.

PEDAL PULSATION

Pedal pulsation is caused by components that are loose, or beyond tolerance limits.

The primary cause of pulsation are disc brake rotors with excessive lateral runout or thickness variation. Other causes are loose wheel bearings or calipers and worn, damaged tires.

NOTE: Some pedal pulsation may be felt during ABS activation.

BRAKE DRAG

Brake drag occurs when the lining is in constant contact with the rotor or drum. Drag can occur at one wheel, all wheels, fronts only, or rears only.

Drag is a product of incomplete brake shoe release. Drag can be minor or severe enough to overheat the linings, rotors and drums.

Minor drag will usually cause slight surface charring of the lining. It can also generate hard spots in rotors and drums from the overheat-cool down process. In most cases, the rotors, drums, wheels and tires are quite warm to the touch after the vehicle is stopped.

Severe drag can char the brake lining all the way through. It can also distort and score rotors and drums to the point of replacement. The wheels, tires and brake components will be extremely hot. In severe cases, the lining may generate smoke as it chars from overheating.

Common causes of brake drag are:

- Seized or improperly adjusted parking brake cables.
- Loose/worn wheel bearing.
- Seized caliper piston.
- Caliper binding on corroded bushings or rusted slide surfaces.
- Loose caliper mounting.
- Drum parking brake shoes binding on worn/damaged support plates.
- Mis-assembled components.
- Long booster output rod.

If brake drag occurs at all wheels, the problem may be related to a blocked master cylinder return port, or faulty power booster (binds-does not release).

BRAKE FADE

Brake fade is usually a product of overheating caused by brake drag. However, brake overheating and resulting fade can also be caused by riding the brake pedal, making repeated high deceleration stops in a short time span, or constant braking on steep mountain roads. Refer to **BRAKE DRAG** for causes.

BRAKE PULL

Front brake pull condition could result from:

- Contaminated lining in one caliper

- Seized caliper piston
- Binding caliper
- Loose caliper
- Rusty caliper slide surfaces
- Improper brake shoes
- Damaged rotor

A worn, damaged wheel bearing or suspension component are further causes of pull. A damaged front tire (bruised, ply separation) can also cause pull.

A common and frequently misdiagnosed pull condition is where direction of pull changes after a few stops. The cause is a combination of brake drag followed by fade at one of the brake units.

As the dragging brake overheats, efficiency is so reduced that fade occurs. Since the opposite brake unit is still functioning normally, its braking effect is magnified. This causes pull to switch direction in favor of the normally functioning brake unit.

An additional point when diagnosing a change in pull condition concerns brake cool down. Remember that pull will return to the original direction, if the dragging brake unit is allowed to cool down (and is not seriously damaged).

REAR BRAKE GRAB OR PULL

Rear grab or pull is usually caused by improperly adjusted or seized parking brake cables, contaminated lining, bent or binding shoes and support plates, or improperly assembled components. This is particularly true when only one rear wheel is involved. However, when both rear wheels are affected, the master cylinder or proportioning valve could be at fault.

BRAKES DO NOT HOLD AFTER DRIVING THROUGH DEEP WATER PUDDLES

This condition is generally caused by water soaked lining. If the lining is only wet, it can be dried by driving with the brakes very lightly applied for a mile or two. However, if the lining is both soaked and dirt contaminated, cleaning and/or replacement will be necessary.

BRAKE LINING CONTAMINATION

Brake lining contamination is mostly a product of leaking calipers, worn seals, driving through deep water puddles, or lining that has become covered with grease and grit during repair. Contaminated lining should be replaced to avoid further brake problems.

WHEEL AND TIRE PROBLEMS

Some conditions attributed to brake components may actually be caused by a wheel or tire problem.

A damaged wheel can cause shudder, vibration and pull. A worn or damaged tire can also cause pull.

Severely worn tires with very little tread left can produce a grab-like condition as the tire loses and recovers

traction. Flat-spotted tires can cause vibration and generate shudder during brake operation. A tire with internal damage such as a severe bruise, cut, or ply separation can cause pull and vibration.

BRAKE NOISES

Some brake noise is common with some disc brakes during the first few stops after a vehicle has been parked overnight or stored. This is primarily due to the formation of trace corrosion (light rust) on metal surfaces. This light corrosion is typically cleared from the metal surfaces after a few brake applications causing the noise to subside.

BRAKE SQUEAK/SQUEAL

Brake squeak or squeal may be due to linings that are wet or contaminated with brake fluid, grease, or oil. Glazed linings and rotors with hard spots can also contribute to squeak. Dirt and foreign material embedded in the brake lining will also cause squeak/squeal.

A very loud squeak or squeal is frequently a sign of severely worn brake lining. If the lining has worn through to the brake shoes in spots, metal-to-metal contact occurs. If the condition is allowed to continue, rotors and drums can become so scored that replacement is necessary.

BRAKE CHATTER

Brake chatter is usually caused by loose or worn components, or glazed/burnt lining. Rotors with hard spots can also contribute to chatter. Additional causes of chatter are out-of-tolerance rotors, brake lining not securely attached to the shoes, loose wheel bearings and contaminated brake lining.

THUMP/CLUNK NOISE

Thumping or clunk noises during braking are frequently **not** caused by brake components. In many cases, such noises are caused by loose or damaged steering, suspension, or engine components. However, calipers that bind on the slide surfaces can generate a thump or clunk noise.

STANDARD PROCEDURE

MANUAL BLEEDING

Use Mopar brake fluid, or an equivalent quality fluid meeting SAE J1703-F and DOT 3 standards only. Use fresh, clean fluid from a sealed container at all times.

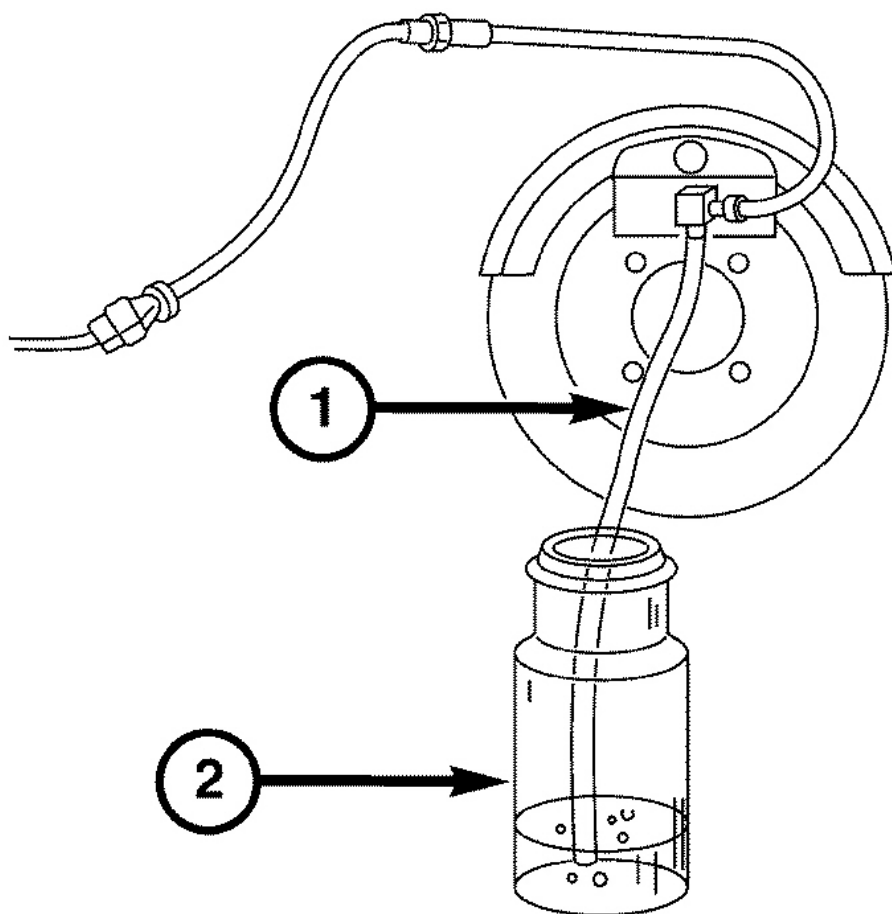
Do not pump the brake pedal at any time while bleeding. Air in the system will be compressed into small bubbles that are distributed throughout the hydraulic system. This will make additional bleeding operations necessary.

Do not allow the master cylinder to run out of fluid during bleed operations. An empty cylinder will allow additional air to be drawn into the system. Check the cylinder fluid level frequently and add fluid as needed.

Bleed only one brake component at a time in the following sequence:

Master Cylinder
Junction Block
Right Rear Wheel
Left Rear Wheel
Right Front Wheel
Left Front Wheel

1. Remove reservoir filler caps and fill reservoir.
2. If calipers were overhauled, open all caliper bleed screws. Then close each bleed screw as fluid starts to drip from it. Top off master cylinder reservoir once more before proceeding.



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Fig. 1: Bleed Hose Setup
Courtesy of CHRYSLER LLC

- 3. Attach one end of bleed hose to bleed screw and insert opposite end in glass container partially filled with brake fluid. Be sure end of bleed hose is immersed in fluid.
- 4. Open up bleeder, then have a helper press down the brake pedal. Once the pedal is down close the bleeder. Repeat bleeding until fluid stream is clear and free of bubbles. Then move to the next wheel.

PRESSURE BLEEDING - BASE BRAKES

Use Mopar brake fluid, or an equivalent quality fluid meeting SAE J1703-F and DOT 3 standards only. Use fresh, clean fluid from a sealed container at all times.

Do not pump the brake pedal at any time while bleeding. Air in the system will be compressed into small bubbles that are distributed throughout the hydraulic system. This will make additional bleeding operations necessary.

Do not allow the master cylinder to run out of fluid during bleed operations. An empty cylinder will allow additional air to be drawn into the system. Check the cylinder fluid level frequently and add fluid as needed.

Bleed only one brake component at a time in the following sequence:

- Master Cylinder
- Right Rear Wheel
- Left Rear Wheel
- Right Front Wheel
- Left Front Wheel

Follow the manufacturers instructions carefully when using pressure equipment. Do not exceed the tank manufacturers pressure recommendations. Generally, a tank pressure of 103-139 kPa (15-20 psi) is sufficient for bleeding.

Fill the bleeder tank with recommended fluid and purge air from the tank lines before bleeding.

Do not pressure bleed without a proper master cylinder adapter. The wrong adapter can lead to leakage, or drawing air back into the system. Use adapter provided with the equipment or Adapter 6921.

SPECIFICATIONS

BASE BRAKES

DESCRIPTION	SPECIFICATION
Front Disc Brake Rotor Diameter	302 x 28 mm (11.9 x 1.1 in)
Rear Disc Brake Rotor Diameter	316 x 12 mm (12.04 x 0.472 in)
Front Ventilated Disc Brake Rotor	Max. Runout 0.020 mm (0.001 in.)

Rear Solid Disc Brake Rotor	Max. Runout 0.020 mm (0.001 in.)
Front Ventilated Disc Brake Rotor	Max. Thickness Variation 0.009 mm (0.0004 in.)
Rear Solid Disc Brake Rotor	Max. Thickness Variation 0.009 mm (0.0004 in.)
Front Ventilated Disc Brake Rotor	Min. Thickness 26.4 mm (1.039 in.)
Rear Solid Disc Brake Rotor	Min. Thickness 10.4 mm (0.409 in.)
Disc Brake Calipers	Single piston floating
Brake Booster	Dual Diaphragm

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Brake Booster Mounting Nuts	25	-	220
Brake Pedal Shaft to Steering Column Support Bracket Nut & Washer Assembly	22.6	-	200
Master Cylinder Mounting Nuts	25	-	220
Master Cylinder Brake Lines	20	15	180
ESP Module Bolt	10	-	85
ESP Module Nut	10	-	85
Front Caliper Adapter Mounting Bolts	136	100	-
Front Caliper to Adapter Mounting Bolts	37	28	-
Rear Caliper Adapter Mounting Bolts	102	75	-
Rear Caliper to Adapter Mounting Bolts	37	28	-
Front Caliper Brake Hose Banjo Bolt	31	23	-
Rear Caliper Brake Hose Banjo Bolt	31	23	-
Parking Brake Lever Nuts	16	-	140
Parking Brake Lever Bracket Screws	10-14	7-10	-

SPECIAL TOOLS

BASE BRAKES

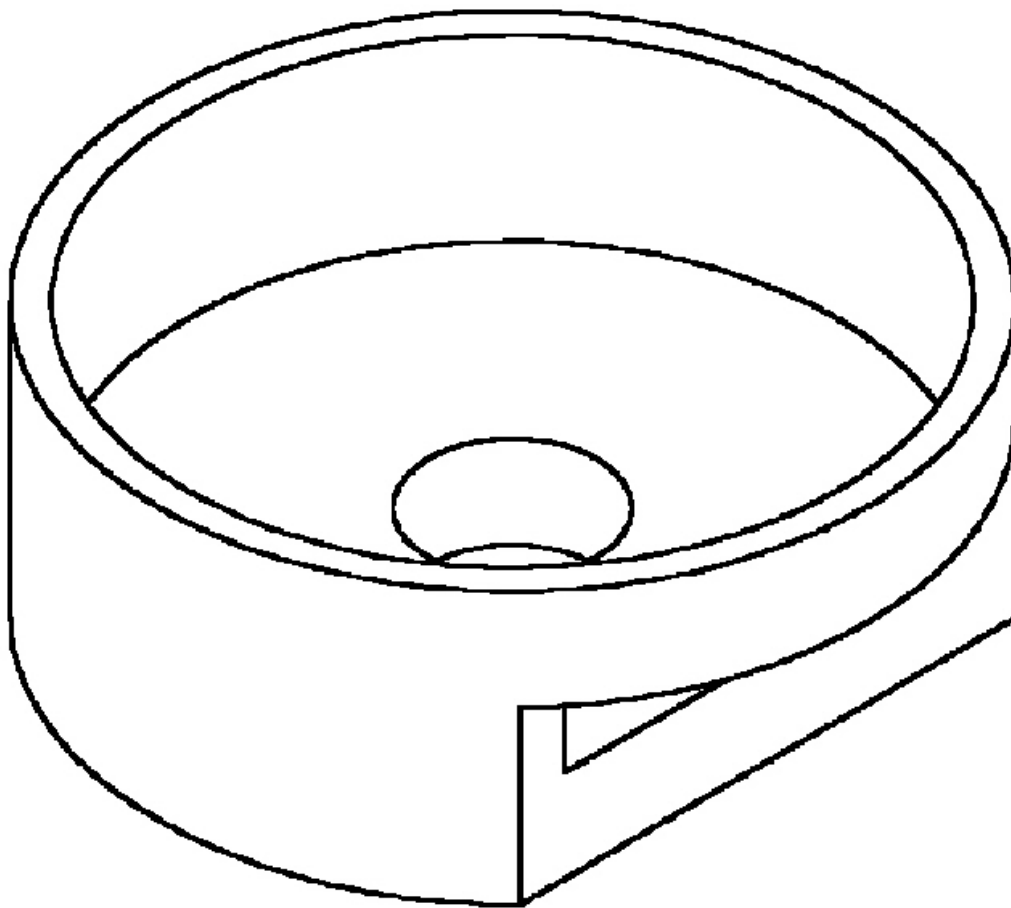


Fig. 2: Installer Caliper Dust Boot 8280
Courtesy of CHRYSLER LLC

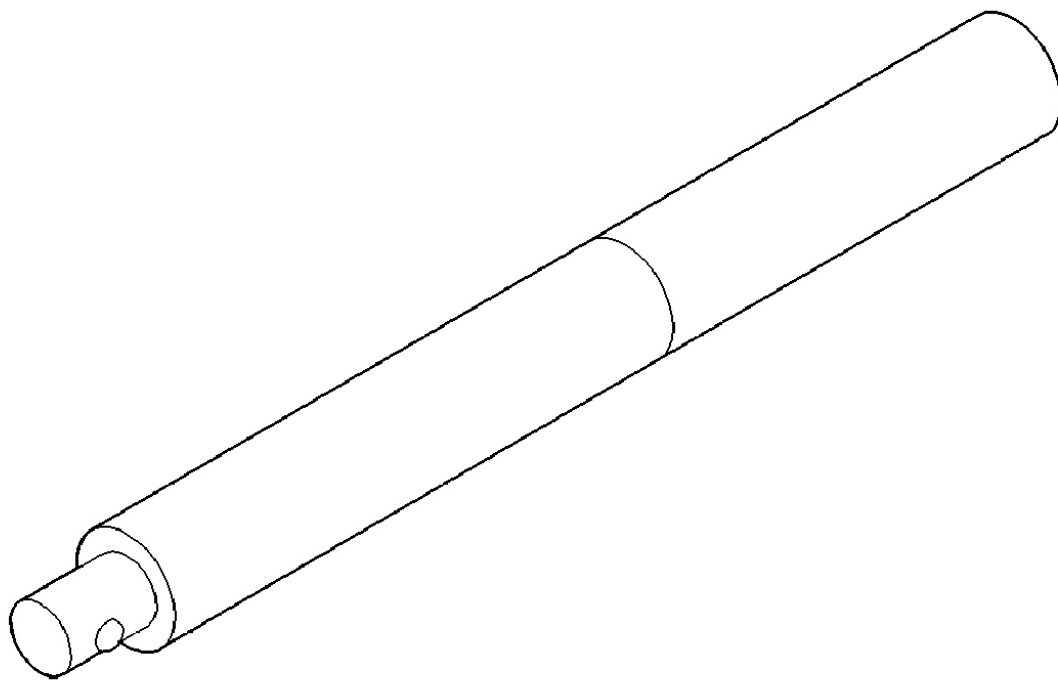


Fig. 3: Handle C-4171
Courtesy of CHRYSLER LLC

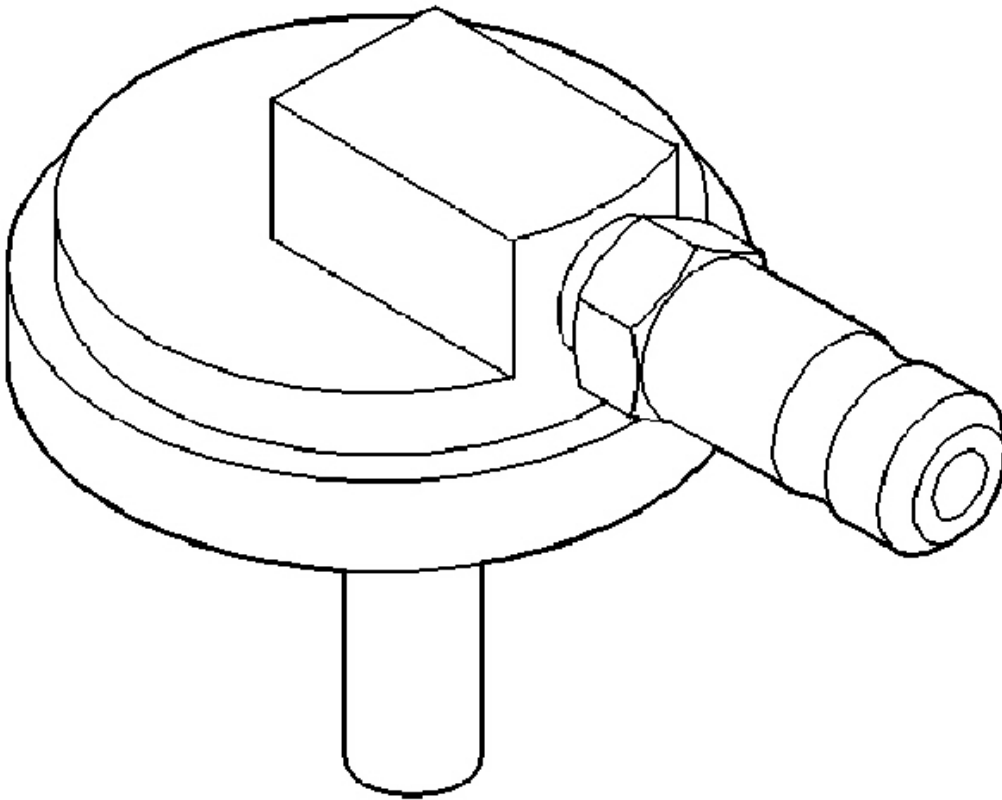


Fig. 4: Adapter Pressure Bleeder 6921
Courtesy of CHRYSLER LLC

HYDRAULIC/MECHANICAL

BRAKE LINES

DESCRIPTION

BRAKE HOSES AND LINES

Flexible rubber hose is used at both front and rear brake. Solid crimp one piece double walled ISO style flare steel tubing is also part of the rubber hoses. They are serviced as one piece to the major hydraulic braking components.

DIAGNOSIS AND TESTING

BRAKE LINE AND HOSES

Flexible rubber hose is used at both front and rear brakes. Inspect the hoses whenever the brake system is serviced, at every engine oil change, or whenever the vehicle is in for service.

Inspect the hoses for surface cracking, scuffing, or worn spots. Replace any brake hose/line immediately if the fabric casing of the hose is exposed due to cracks or abrasions.

Also check brake hose installation. Faulty installation can result in kinked, twisted hoses, or contact with the wheels and tires or other chassis components. All of these conditions can lead to scuffing, cracking and eventual failure.

The steel brake lines should be inspected periodically for evidence of corrosion, twists, kinks, leaks, or other damage. Heavily corroded lines will eventually rust through causing leaks. In any case, corroded or damaged brake lines/hoses should be replaced.

Factory replacement brake lines/hoses are recommended to ensure quality, correct length and superior fatigue life. Care should be taken to make sure that brake line/hose mating surfaces are clean and free from nicks and burrs. Also remember that the brake lines are serviced as a whole assembly with the rubber hoses in a solid crimp design.

Use new copper seal washers at all caliper connections. Be sure brake line connections are properly made (not cross threaded) and tightened to recommended torque.

REMOVAL

LEFT FRONT BRAKE HOSE/LINE

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Remove the left front brake tube at the HCU.
3. Raise and support vehicle.
4. Disconnect the wheel speed sensor from the hose.
5. Remove the brake hose banjo bolt at the caliper.
6. Disconnect the brake hose/line from the body.
7. Remove the brake hose/line from the vehicle.

LEFT REAR BRAKE LINE/HOSE

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Remove the brake tube at the HCU.
3. Raise and support vehicle.
4. Remove the exhaust from the engine manifolds and the hanger bracket at the transmission.

5. Remove the fuel tank. Refer to **REMOVAL** .

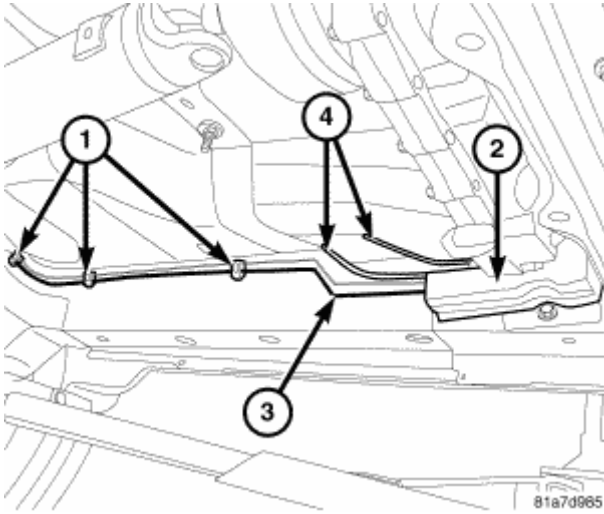


Fig. 5: Identifying Bracket, Brake Hose/Line, Fuel Line Bundle & Retainers
Courtesy of CHRYSLER LLC

6. Remove the brake hose banjo bolt at the caliper.
7. Remove the bracket (2) on the body securing the brake/fuel line bundle then remove the brake line (3) from the fuel line bundle (4).
8. Disconnect the brake hose/line from the retainers (1) on the body.
9. Remove the brake hose/line (3) from the vehicle.

RIGHT FRONT BRAKE HOSE/LINE

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Remove the air box assembly.

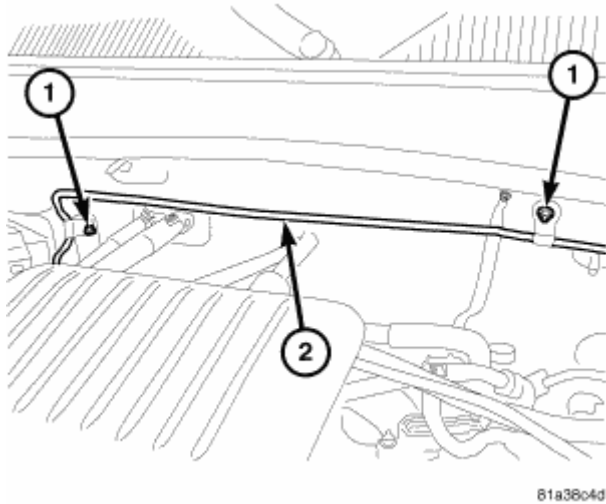


Fig. 6: Identifying Brake Line & Mounting Clip Studs
 Courtesy of CHRYSLER LLC

3. Remove the right front brake tube at the HCU.
4. Remove the brake line (2) from the mounting clip studs (1).
5. Disconnect the electrical connectors to the body control module on the inner fender.
6. Raise and support vehicle.
7. Remove the tire and wheel assembly.
8. Disconnect the wheel speed sensor routing clips (1) from the hose (4).
9. Remove the brake hose banjo bolt (3) at the caliper.
10. Disconnect the brake hose/line from the body.
11. Remove the brake hose/line from the vehicle.

RIGHT REAR BRAKE LINE/HOSE

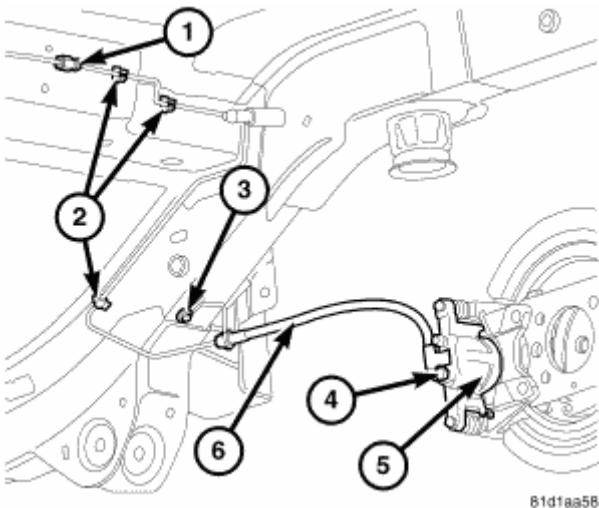


Fig. 7: Mounting Bracket
 Courtesy of CHRYSLER LLC

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Raise and support the vehicle.
3. Remove the caliper banjo bolt (4).
4. Disconnect the brake hose/line union fitting (1).
5. Remove the brake line from the mounting clips (2) at the body.
6. Remove the brake hose/line mounting bolt (3) from the body.
7. Remove the line/hose (6).

INSTALLATION

LEFT FRONT BRAKE HOSE/LINE

1. Install the line/hose.
2. Install the brake hose banjo bolt at the caliper.
3. Reconnect the wheel speed sensor routing clips to the hose.
4. Install the tire and wheel assembly.
5. Lower the vehicle.
6. Install the line to the mounting clips on the body.
7. Install the brake line to the HCU.
8. Remove the prop rod from the brake pedal.
9. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed. . See STANDARD PROCEDURE.**

LEFT REAR BRAKE HOSE/LINE

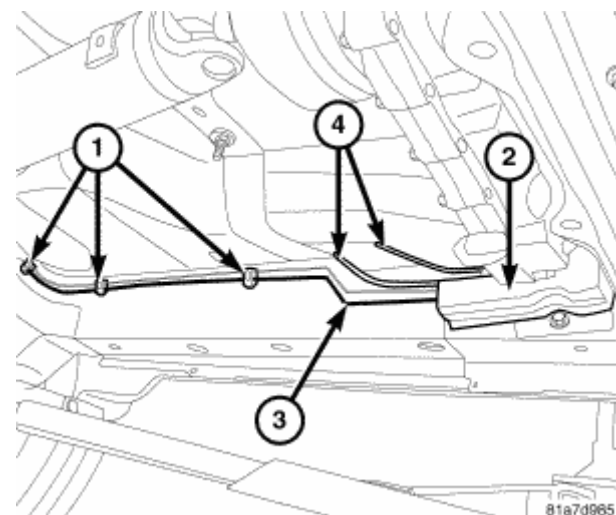


Fig. 8: Identifying Bracket, Brake Hose/Line, Fuel Line Bundle & Retainers
 Courtesy of CHRYSLER LLC

1. Install the brake hose/line (3) to the vehicle.
2. Reconnect the brake hose/line in the retainers (1) to the body.
3. Reinstall the brake line (3) to the fuel line bundle (4) and install the bracket (2).
4. Install the exhaust to the manifolds and reinstall the exhaust hanger at the transmission.
5. Install the fuel tank. Refer to **INSTALLATION** .
6. Install the brake hose banjo bolt at the caliper.
7. Lower the vehicle.
8. Install the brake tube at the HCU.
9. Remove the prop rod.
10. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed.** . See **STANDARD PROCEDURE**.

RIGHT FRONT BRAKE HOSE/LINE

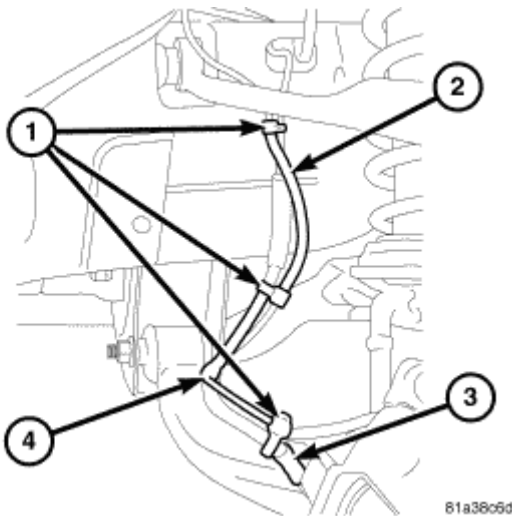
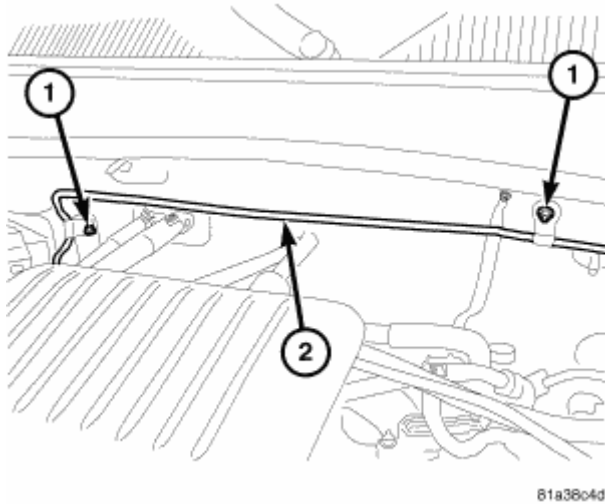


Fig. 9: Identifying Line/Hose, Brake Hose Banjo Bolt, Wheel Speed Sensor Routing Clips & Hose
Courtesy of CHRYSLER LLC

1. Install the line/hose (4).
2. Install the brake hose banjo bolt (3) at the caliper.
3. Reconnect the wheel speed sensor routing clips (1) to the hose (4).
4. Install the tire and wheel assembly.
5. Lower the vehicle.

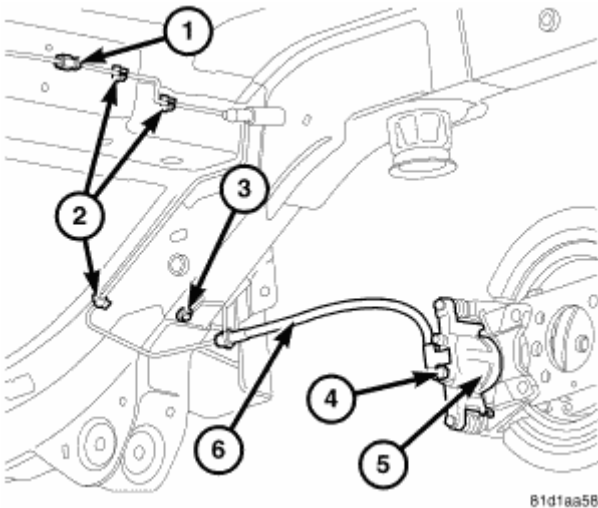


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Fig. 10: Identifying Brake Line & Mounting Clip Studs
Courtesy of CHRYSLER LLC

6. Install the mounting clips on the studs (1).
7. Install the brake line to the HCU.
8. Install the air box assembly.
9. Reconnect the electrical connectors to the body control module on the inner fender.
10. Remove the prop rod from the brake pedal.
11. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed.** . See STANDARD PROCEDURE.

RIGHT REAR BRAKE LINE/HOSE



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Fig. 11: 08 MOUNTING BRACKET
Courtesy of CHRYSLER LLC

1. Install the line/hose (6).

2. Install the brake hose/line mounting bolt (3) to the body.
3. Install the caliper banjo bolt (4).
4. Install the brake line to the mounting clips (2) at the body.
5. Reconnect the brake hose/line union fitting (1).
6. Remove the prop rod from the brake pedal.
7. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed.** . See STANDARD PROCEDURE.

BRAKE PADS/SHOES

REMOVAL

PADS-DISC BRAKE-FRONT

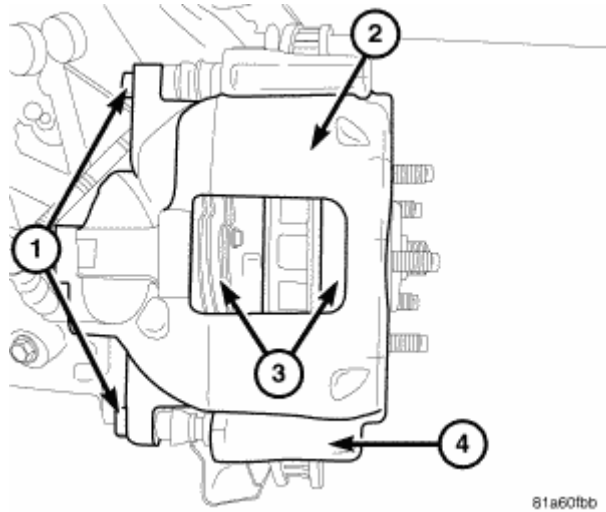


Fig. 12: Identifying Caliper Mounting Bolts, Disc Brake Caliper, Inboard/Outboard Pads & Adapter
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the front wheel and tire assembly.
3. Drain a small amount of fluid from the master cylinder brake reservoir with a **clean** suction gun.
4. Bottom the caliper pistons into the caliper by prying the caliper over.
5. Remove the caliper mounting bolts (1).
6. Remove the disc brake caliper (2) from the adapter (4).

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

7. Remove the inboard and outboard pads (3).

PADS-DISC BRAKE-REAR

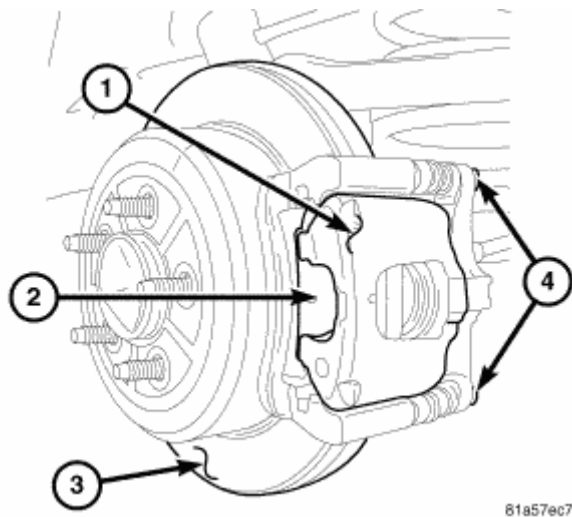


Fig. 13: Caliper Assembly
Courtesy of CHRYSLER LLC

1. Raise and support vehicle.
2. Remove the wheel and tire assemblies.
3. Compress the caliper (1).
4. Remove the rear caliper mounting bolts (4). See **REMOVAL**.

NOTE: **Do not allow brake hose to support caliper assembly.**

5. Remove the caliper by tilting the top up and off the caliper adapter.
6. Support and hang the caliper.
7. Remove the brake pads (2) from the caliper (1).

INSTALLATION

PADS-DISC BRAKE-FRONT

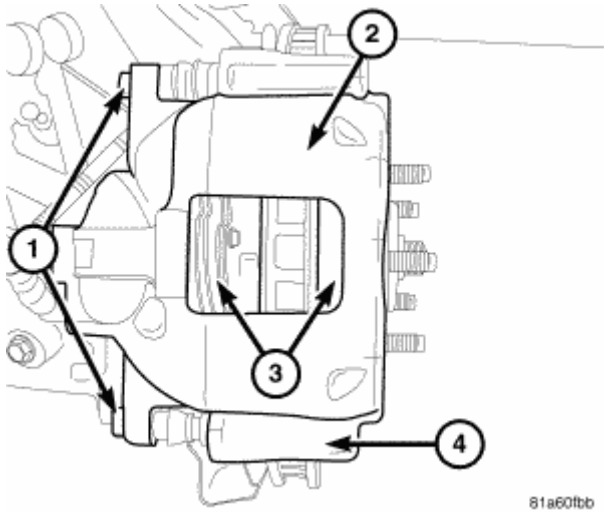


Fig. 14: Identifying Caliper Mounting Bolts, Disc Brake Caliper, Inboard/Outboard Pads & Adapter
 Courtesy of CHRYSLER LLC

1. Install the inboard and outboard pads (3).
2. Install the caliper (2). See **INSTALLATION**.
3. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .

PADS-DISC BRAKE-REAR

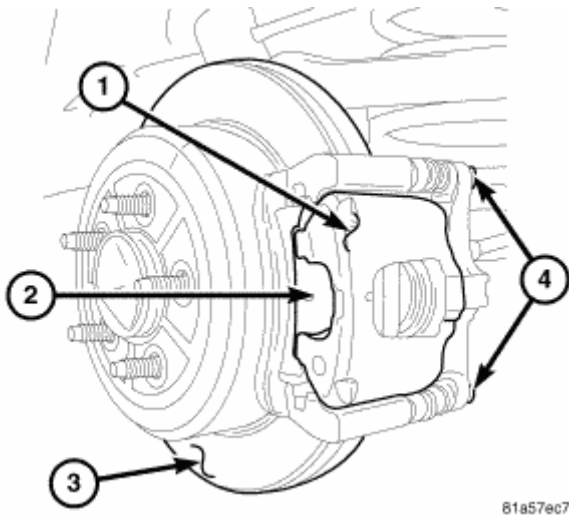


Fig. 15: Caliper Assembly
 Courtesy of CHRYSLER LLC

1. Install the brake pads (2) to the caliper adapter.
2. Install caliper (1) to the rotor and then install the caliper mounting bolts (4). See **INSTALLATION**.
3. Install wheel and tire assemblies and lower vehicle. Refer to **STANDARD PROCEDURE** .
4. Apply brakes several times to seat caliper pistons and brake shoes and obtain firm pedal.
5. Top off master cylinder fluid level.

DISC BRAKE CALIPERS

DESCRIPTION

DISC BRAKE CALIPER

The calipers are a single piston type. The calipers are free to slide laterally, this allows continuous compensation for lining wear.

OPERATION

DISC BRAKE CALIPER

When the brakes are applied fluid pressure is exerted against the caliper piston. The fluid pressure is exerted equally and in all directions. This means pressure exerted against the caliper piston and within the caliper bore will be equal. See **Fig. 16**.

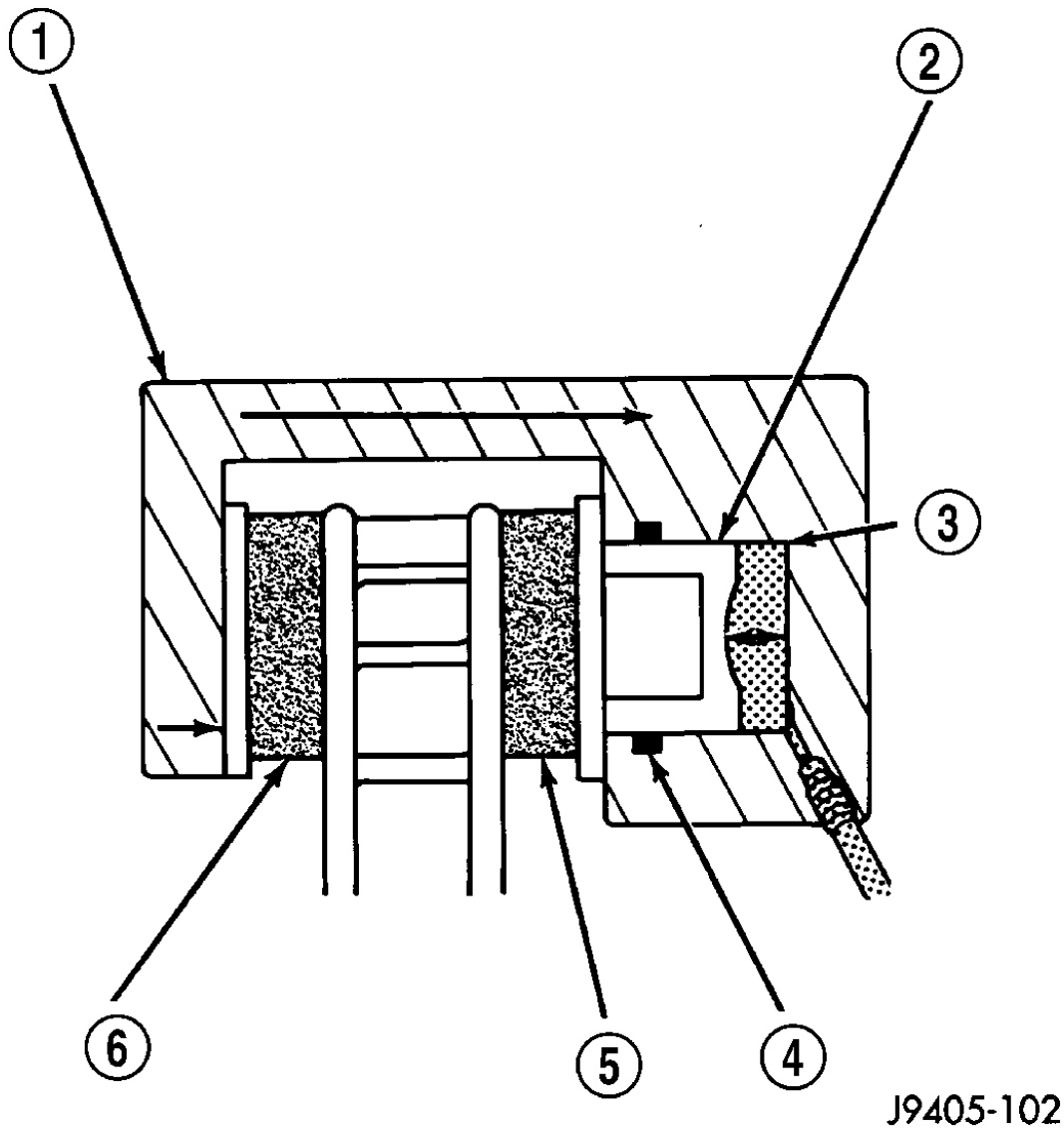


Fig. 16: Brake Caliper Operation
 Courtesy of CHRYSLER LLC

1 - CALIPER
2 - PISTON
3 - PISTON BORE
4 - SEAL
5 - INBOARD SHOE
6 - OUTBOARD SHOE

Fluid pressure applied to the piston is transmitted directly to the inboard brake shoe. This forces the shoe lining

against the inner surface of the disc brake rotor. At the same time, fluid pressure within the piston bore forces the caliper to slide inward on the mounting bolts. This action brings the outboard brake shoe lining into contact with the outer surface of the disc brake rotor.

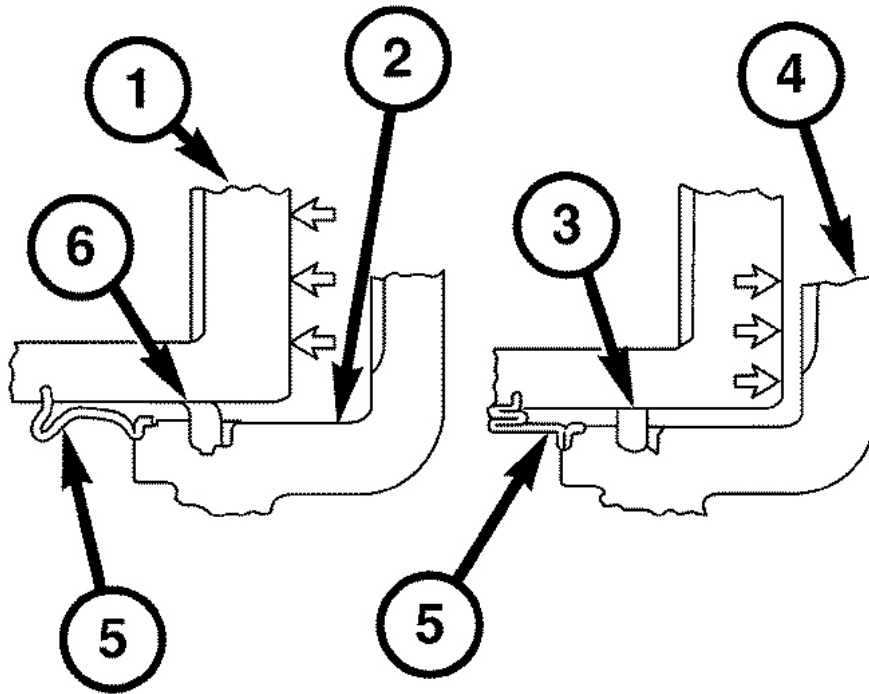
In summary, fluid pressure acting simultaneously on both piston and caliper, produces a strong clamping action. When sufficient force is applied, friction will attempt to stop the rotors from turning and bring the vehicle to a stop.

Application and release of the brake pedal generates only a very slight movement of the caliper and piston. Upon release of the pedal, the caliper and piston return to a rest position. The brake shoes do not retract an appreciable distance from the rotor. In fact, clearance is usually at, or close to zero. The reasons for this are to keep road debris from getting between the rotor and lining and in wiping the rotor surface clear each revolution.

The caliper piston seal controls the amount of piston extension needed to compensate for normal lining wear.

During brake application, the seal is deflected outward by fluid pressure and piston movement. See **Fig. 17**. When the brakes (and fluid pressure) are released, the seal relaxes and retracts the piston.

The amount of piston retraction is determined by the amount of seal deflection. Generally the amount is just enough to maintain contact between the piston and inboard brake shoe.



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Fig. 17: Caliper Piston Seal Function For Automatic Adjustment
Courtesy of CHRYSLER LLC

1 - PISTON
2 - CYLINDER BORE
3 - PISTON SEAL BRAKE PRESSURE OFF
4 - CALIPER HOUSING
5 - DUST BOOT
6 - PISTON SEAL BRAKE PRESSURE ON

REMOVAL

CALIPER- DISC BRAKE-FRONT

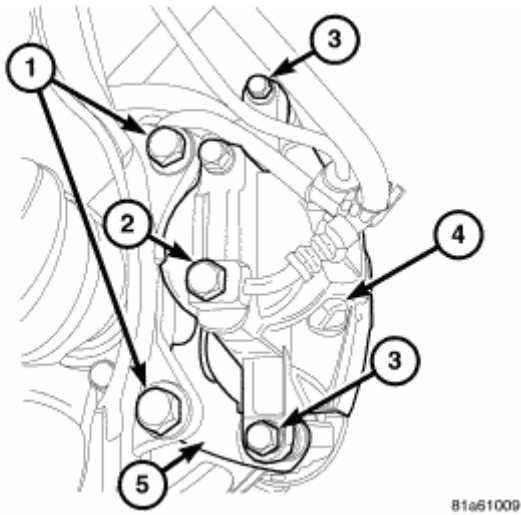


Fig. 18: Disc Brake Caliper Components
 Courtesy of CHRYSLER LLC

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Raise and support vehicle.
3. Remove front wheel and tire assembly.
4. Remove the brake hose banjo bolt (2) if replacing caliper.
5. Remove the caliper mounting bolts (3).
6. Remove the caliper (4) from vehicle.

CALIPER-DISC BRAKE-REAR

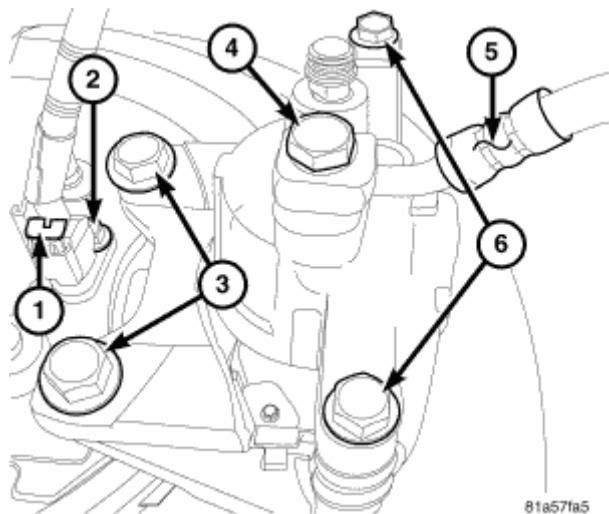
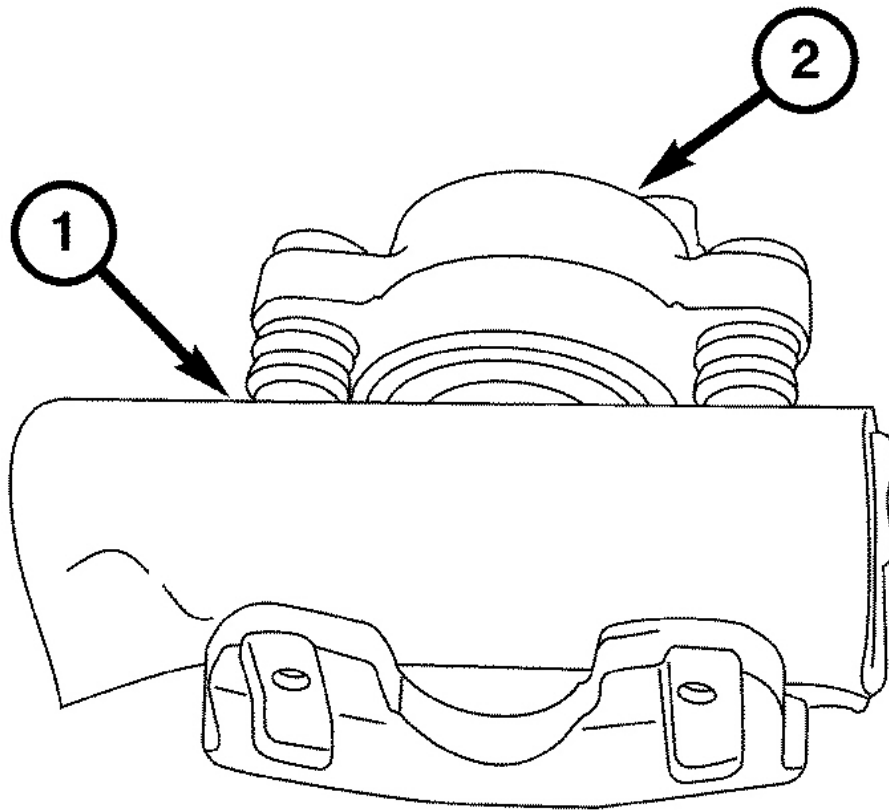


Fig. 19: Identifying Bolts, Brake Hose & Brake Hose Banjo Bolt
 Courtesy of CHRYSLER LLC

1. Install prop rod on the brake pedal to keep pressure on the brake system, Holding pedal in this position will isolate master cylinder from hydraulic brake system and will not allow brake fluid to drain out of brake fluid reservoir while brake lines are open. This will allow you to bleed out the area of repair instead of the entire system.
2. Raise and support vehicle.
3. Remove the wheel and tire assembly.
4. Remove the brake hose banjo bolt (4) if replacing caliper.
5. Remove the caliper mounting bolts (6).
6. Remove the caliper from vehicle.

DISASSEMBLY

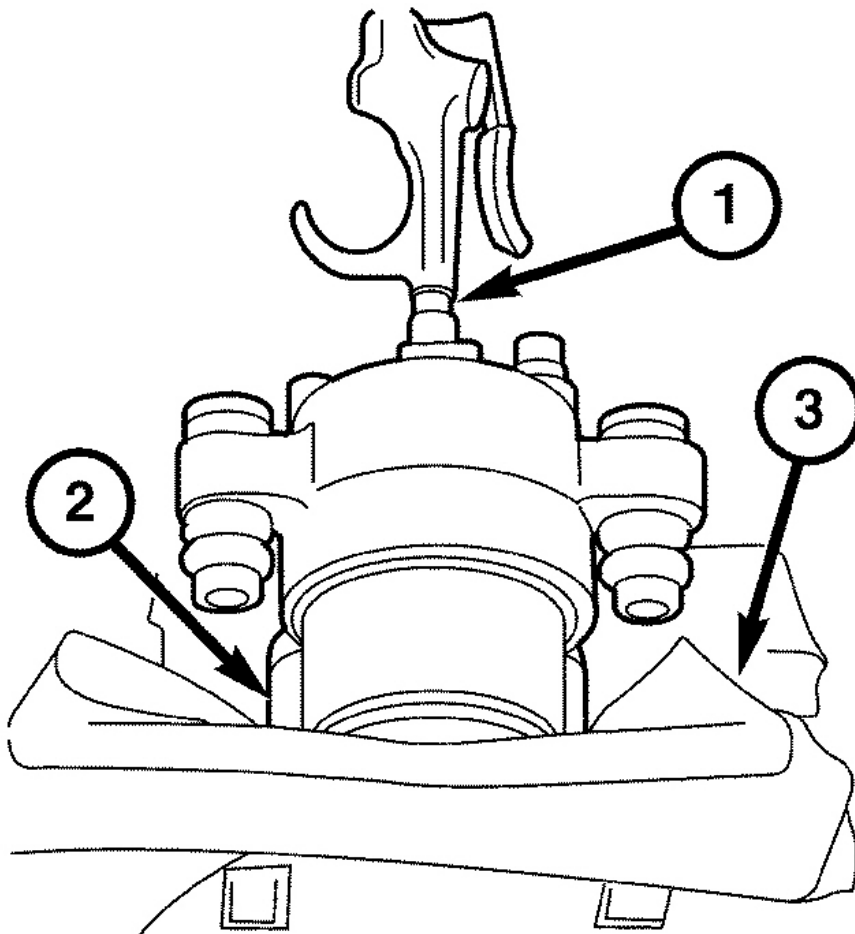
DISC BRAKE CALIPER



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Fig. 20: Padding Caliper Interior - Typical
Courtesy of CHRYSLER LLC

1. Remove brake shoes from caliper.
2. Drain brake fluid out of caliper.
3. Take a piece of wood and pad it with one-inch thickness of shop towels (1). Place this piece in the outboard shoe side of the caliper in front of the piston. This will cushion and protect caliper piston during removal.



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Fig. 21: Removing Caliper Piston - Typical
Courtesy of CHRYSLER LLC

4. Remove caliper piston (2) with **short bursts** of low pressure compressed air. Direct air through fluid inlet port and ease piston out of bore.

CAUTION: Do not blow the piston out of the bore with sustained air pressure. This could result in a cracked piston. Use only enough air pressure to ease the piston out.

WARNING: Never attempt to catch the piston as it leaves the bore. This may

result in personal injury.

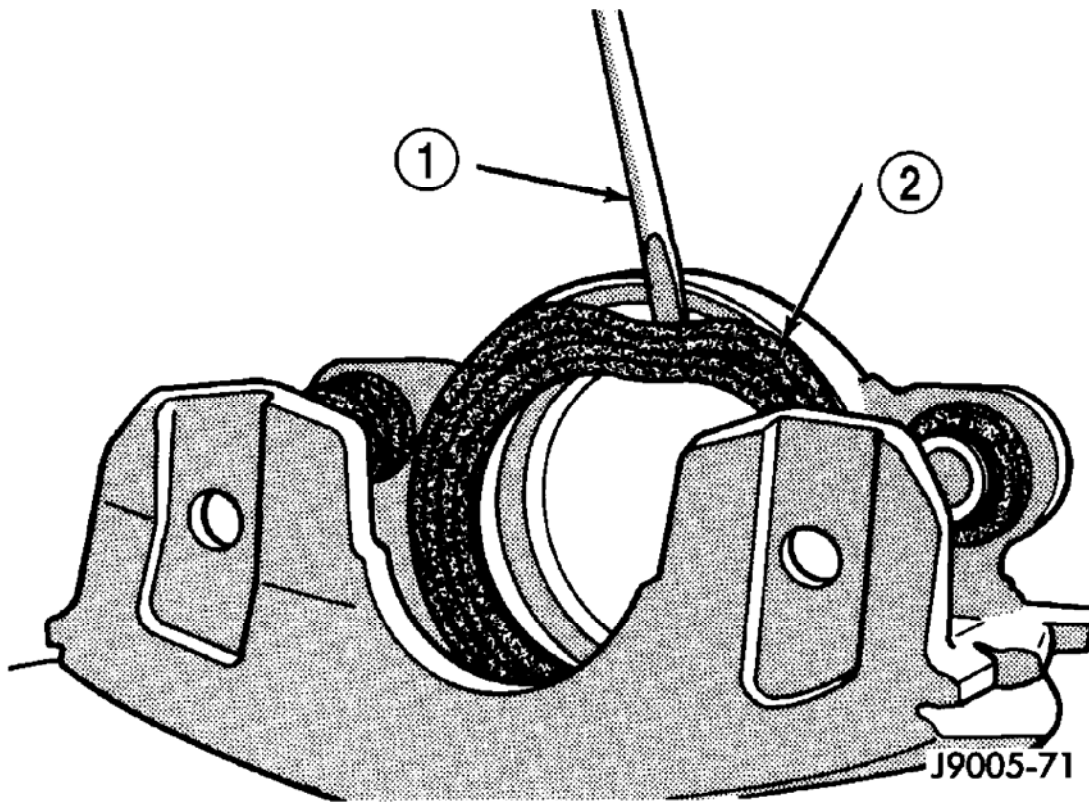
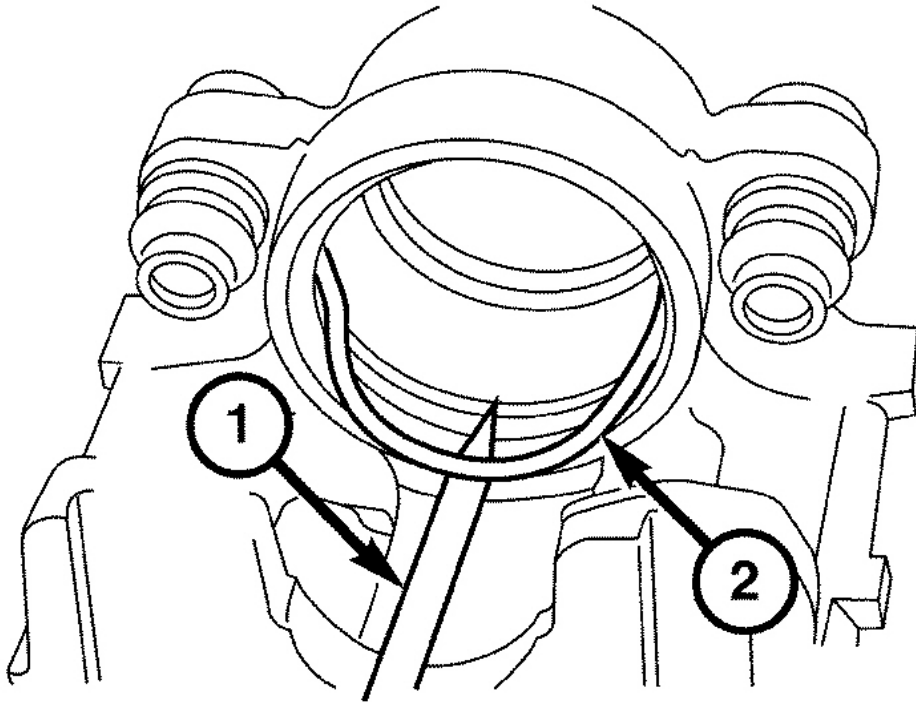


Fig. 22: Removing Caliper Piston Dust Boot - Typical
Courtesy of CHRYSLER LLC

5. Remove caliper piston dust boot with suitable pry tool (1).



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Fig. 23: Removing Piston Seal - Typical
Courtesy of CHRYSLER LLC

6. Remove caliper piston seal with wood or plastic tool (1). Do not use metal tools as they will scratch piston bore.

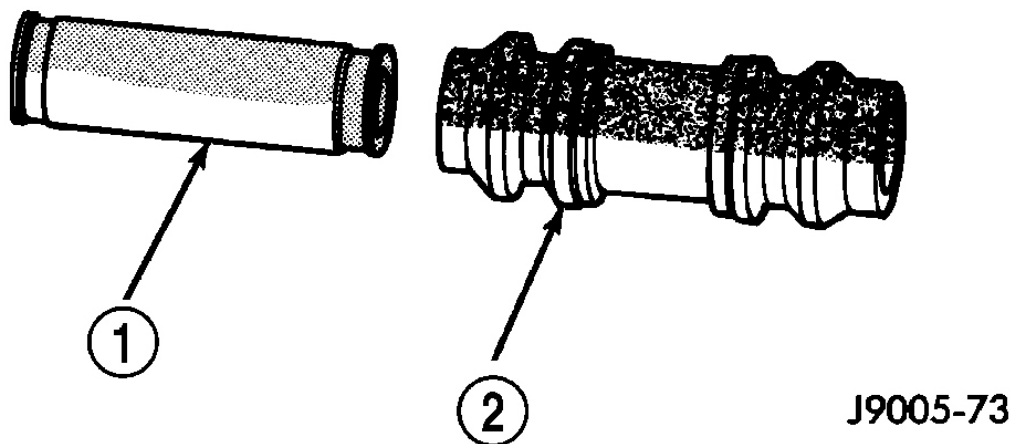


Fig. 24: Mounting Bolt Bushing & Boot - Typical
Courtesy of CHRYSLER LLC

7. Remove caliper mounting bolt bushings (1) and boots (2).

CLEANING

DISC BRAKE CALIPER

Clean the caliper components with clean brake fluid or brake clean only. Wipe the caliper and piston dry with lint free towels or use low pressure compressed air.

CAUTION: Do not use gasoline, kerosene, thinner, or similar solvents. These products may leave a residue that could damage the piston and seal.

INSPECTION

DISC BRAKE CALIPER

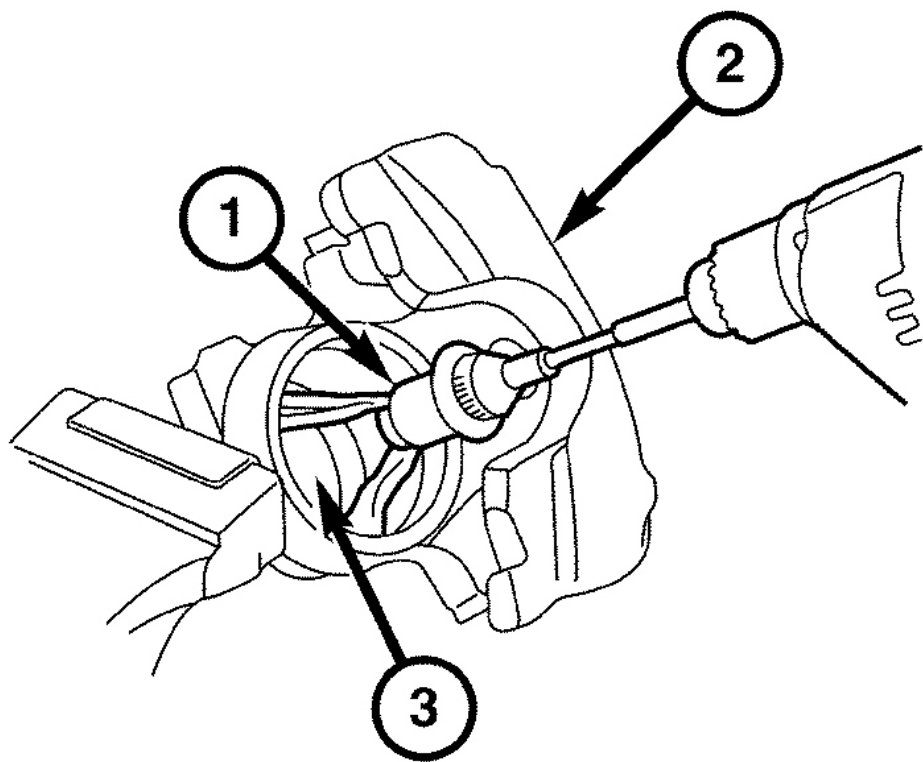
The piston is made from a phenolic resin (plastic material) and should be smooth and clean.

The piston must be replaced if cracked or scored. Do not attempt to restore a scored piston surface by sanding or polishing.

CAUTION: If the caliper piston is replaced, install the same type of piston in the caliper. Never interchange phenolic resin and steel caliper pistons. The pistons, seals, seal grooves, caliper bore and piston tolerances are different.

The bore can be **lightly** polished with a brake hone to remove very minor surface imperfections. See **Fig. 25**.

The caliper should be replaced if the bore is severely corroded, rusted, scored, or if polishing would increase bore diameter more than 0.025 mm (0.001 inch).



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Fig. 25: Polishing Piston Bore - Typical
Courtesy of CHRYSLER LLC

1 - SPECIAL HONE
2 - CALIPER
3 - PISTON BORE

ASSEMBLY

DISC BRAKE CALIPER

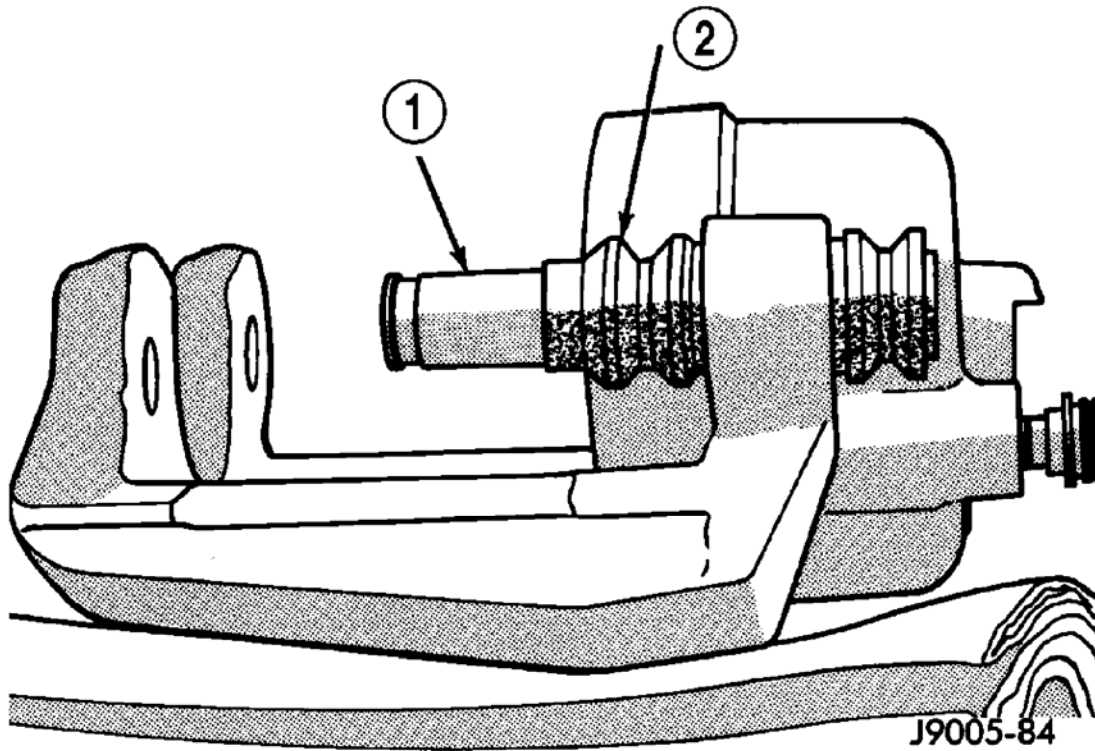


Fig. 26: Installing Bushings & Boots - Typical
Courtesy of CHRYSLER LLC

1 - BUSHING
2 - BOOT

CAUTION: Dirt, oil, and solvents can damage caliper seals. Insure assembly area is clean and dry.

1. Lubricate caliper piston bore, new piston seal and piston with clean brake fluid.
2. Lubricate caliper bushings and interior of bushing boots with silicone grease.
3. Install bushing boots (2) in caliper, then insert bushing into boot and push bushing (1) into place.

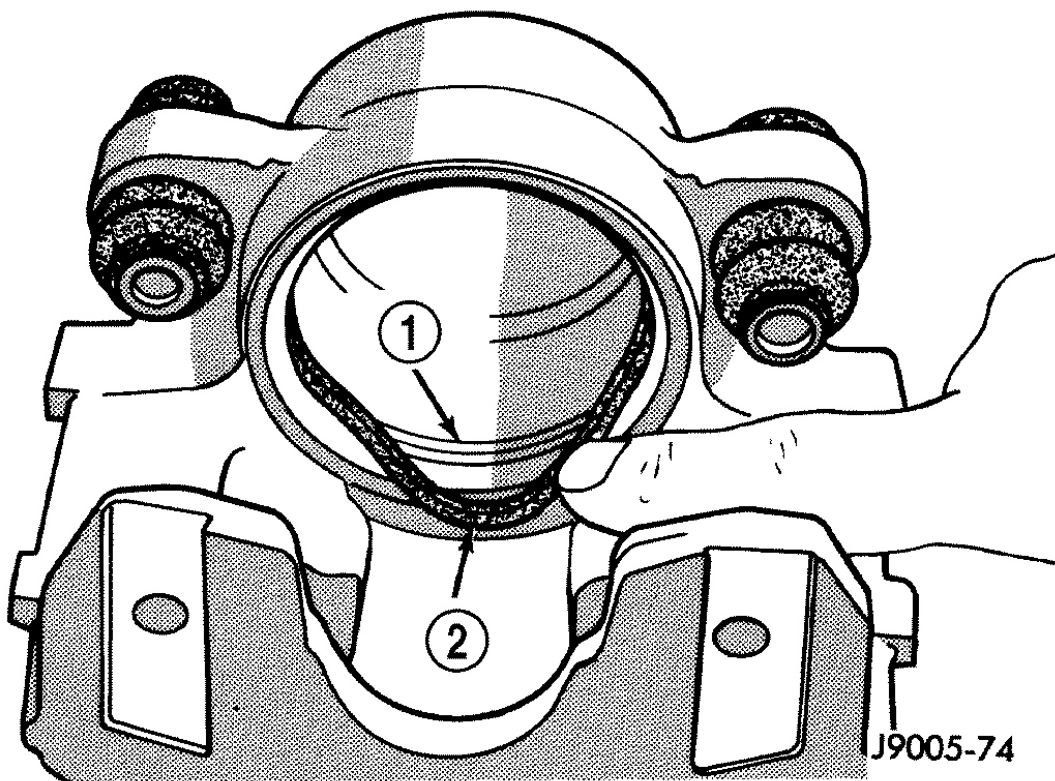
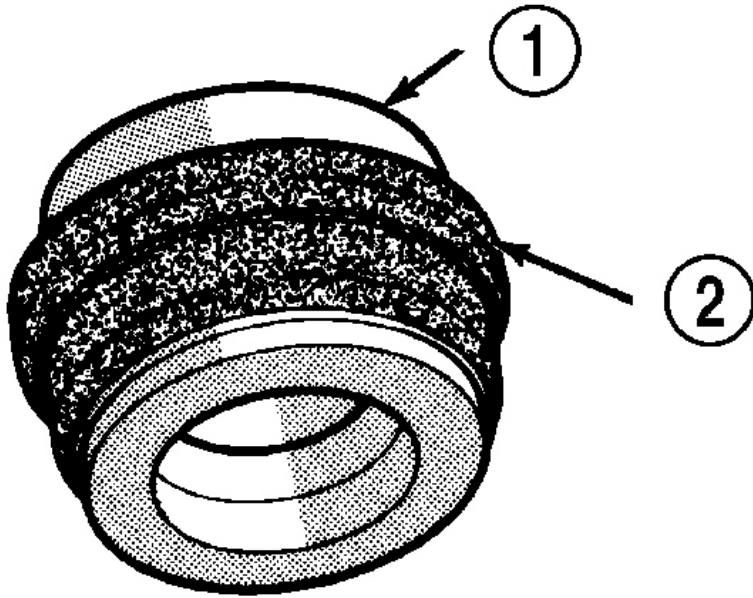


Fig. 27: Installing Piston Seal - Typical
Courtesy of CHRYSLER LLC

1 - SEAL GROOVE
2 - PISTON SEAL

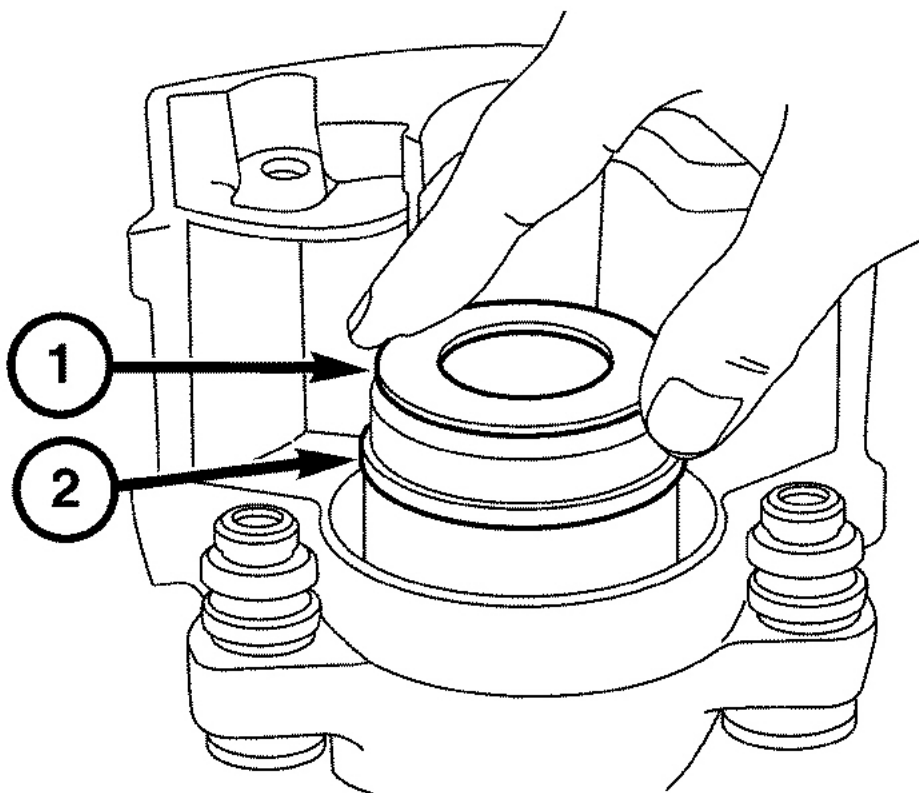
4. Install new piston seal into seal groove (1) with finger.



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Fig. 28: Dust Boot On Piston - Typical
Courtesy of CHRYSLER LLC

5. Install new dust boot on caliper piston and seat boot in piston groove (1).

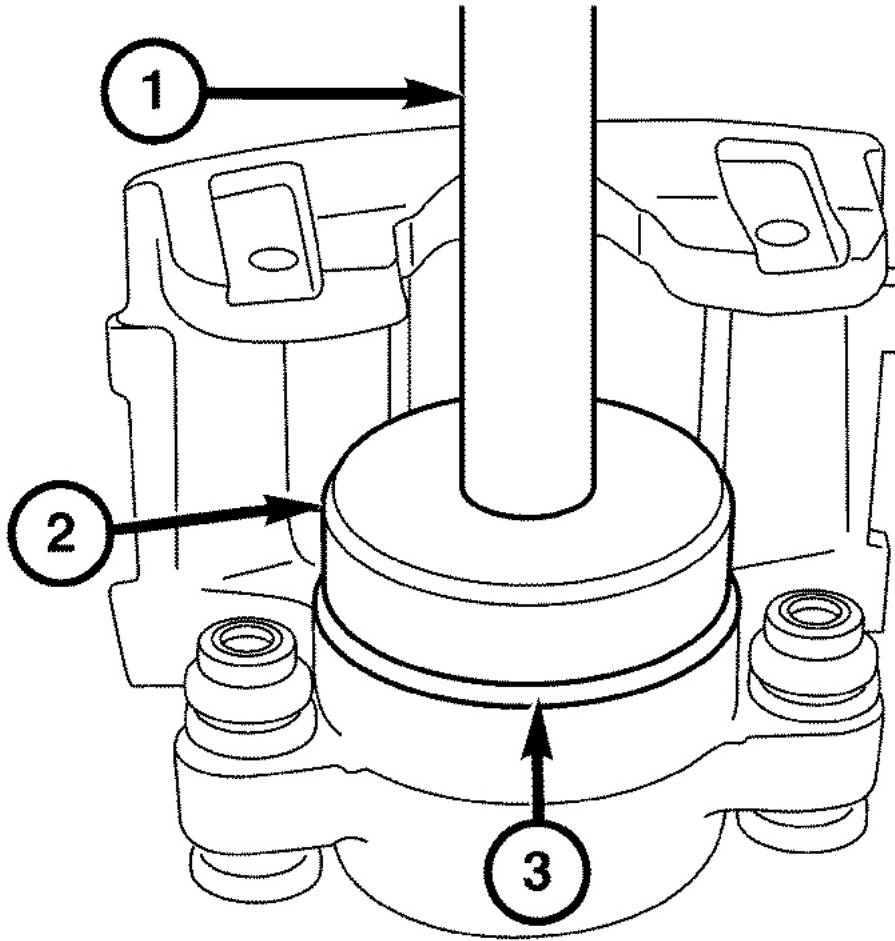


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Fig. 29: Installing Caliper Piston - Typical
Courtesy of CHRYSLER LLC

1 - PISTON
2 - BOOT

6. Press piston (1) into caliper bore by hand, use a turn and push motion to work piston into seal.
7. Press caliper piston to bottom of bore.



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Fig. 30: Installing Piston Dust Boot - Typical
Courtesy of CHRYSLER LLC

1 - HANDLE C-4171
2 - INSTALLER C-4842
3 - DUST BOOT

8. Seat dust boot (3) in caliper with Installer Tool C-4842 (2) and Tool Handle C-4171 (1).

9. Replace caliper bleed screw if removed.

INSTALLATION

CALIPER-DISC BRAKE-FRONT

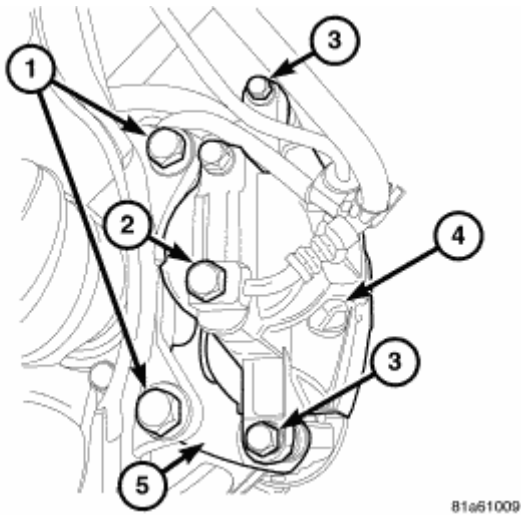


Fig. 31: Disc Brake Caliper Components
Courtesy of CHRYSLER LLC

1. Install caliper (4) to the caliper adapter (5).
2. Coat the caliper mounting bolts (3) with silicone grease. Begin with the bolt closet to the bleeder screws (top), Then install and tighten the bolts to 37 N.m (28 ft. lbs.).

CAUTION: Verify brake hose is not twisted or kinked before tightening fitting bolt.

3. Install the brake hose banjo bolt (2) and brake hose to the caliper (4) with **new seal washers** and tighten fitting bolt to 31 N.m (23 ft. lbs.) if removed.
4. Remove the prop rod from the vehicle.
5. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed.** . See STANDARD PROCEDURE.
6. Install the wheel and tire assemblies. Refer to STANDARD PROCEDURE .
7. Remove the supports and lower the vehicle.
8. Verify a firm pedal before moving the vehicle.

CALIPER-DISC BRAKE-REAR

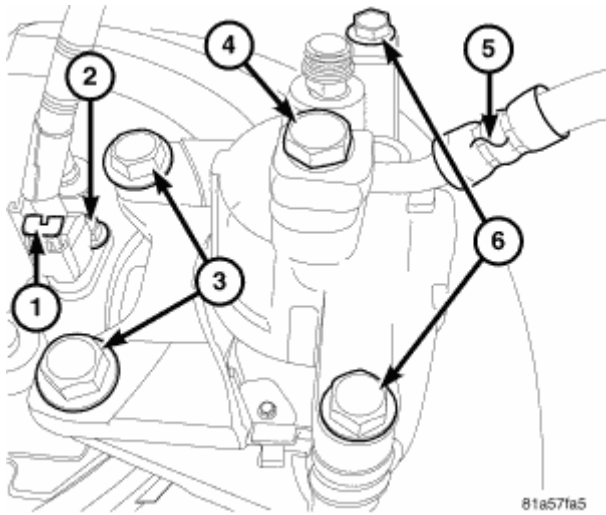


Fig. 32: Identifying Bolts, Brake Hose & Brake Hose Banjo Bolt
 Courtesy of CHRYSLER LLC

1. Install the brake pads if removed.
2. Install caliper. Tighten the bolts (6) to 37 N.m (28 ft. lbs.)

CAUTION: Verify brake hose (5) is not twisted or kinked before tightening fitting bolt.

3. Install the brake hose (5) to the caliper with **new seal washers** and install the brake hose banjo bolt (4) tighten fitting bolt to 31 N.m (23 ft. lbs.).
4. Remove the prop rod from the vehicle.
5. Bleed the area of repair for the brake system. **If a proper pedal is not felt during bleeding an area of repair then a base bleed system must be performed.** . See STANDARD PROCEDURE.
6. Install the wheel and tire assemblies. Refer to STANDARD PROCEDURE .
7. Remove the supports and lower the vehicle.
8. Verify a firm pedal before moving the vehicle.

DISC BRAKE CALIPER ADAPTER

REMOVAL

DISC BRAKE CALIPER ADAPTER

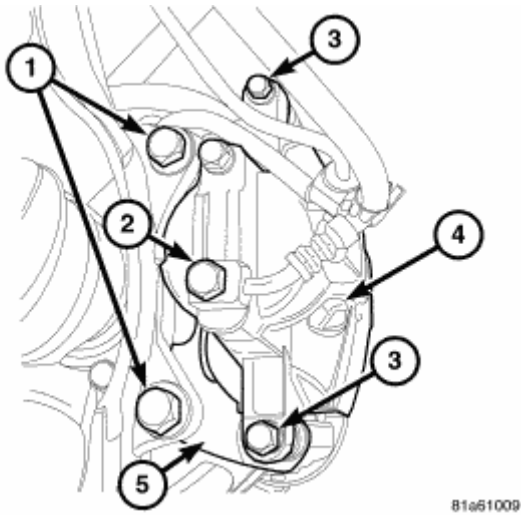


Fig. 33: Disc Brake Caliper Components
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the front wheel and tire assembly.
3. Drain a small amount of fluid from master cylinder brake reservoir with a **clean** suction gun.
4. Bottom the caliper pistons into the caliper by prying the caliper over.
5. Remove the caliper mounting bolts (3).
6. Remove the disc brake caliper (4) from the adapter (5).

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

7. Remove the inboard and outboard brake pads. See **REMOVAL**.
8. Remove the caliper adapter mounting bolts (1).

INSTALLATION

DISC BRAKE CALIPER ADAPTER

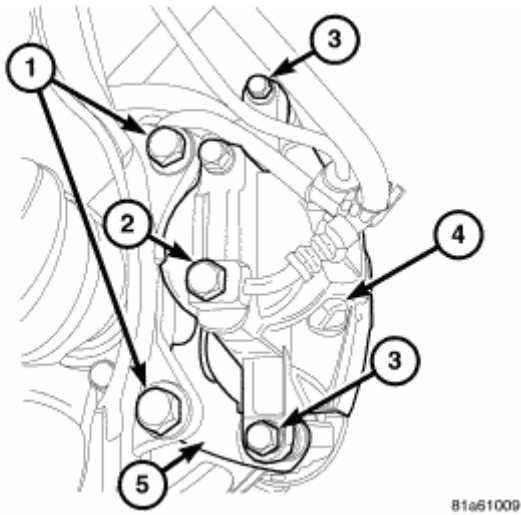


Fig. 34: Disc Brake Caliper Components
Courtesy of CHRYSLER LLC

1. Install the caliper adapter mounting bolts (1). Tighten the mounting bolts to 135 N.m (100 ft. lbs).
2. Install the inboard and outboard pads. See **INSTALLATION**.
3. Install the caliper mounting bolts (3). See **INSTALLATION**.
4. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .

ROTORS

DIAGNOSIS AND TESTING

BRAKE DRUM IN HAT ROTOR

The maximum allowable diameter of the drum braking surface is indicated on the drum outer edge. Always replace the drum if machining would cause drum diameter to exceed the size limit indicated on the drum in hat.

BRAKE DRUM RUNOUT

Measure drum diameter and runout with an accurate gauge. The most accurate method of measurement involves mounting the drum in a brake lathe and checking variation and runout with a dial indicator.

Machine the drum if runout or variation exceed values. Replace the drum in hat rotor if machining causes the drum in hat rotor to exceed the maximum allowable diameter.

DISC BRAKE ROTOR

The rotor braking surfaces should not be refinished unless necessary.

Light surface rust and scale can be removed with a lathe equipped with dual sanding discs. The rotor surfaces can be restored by machining in a disc brake lathe if surface scoring and wear are light.

Replace the rotor under the following conditions:

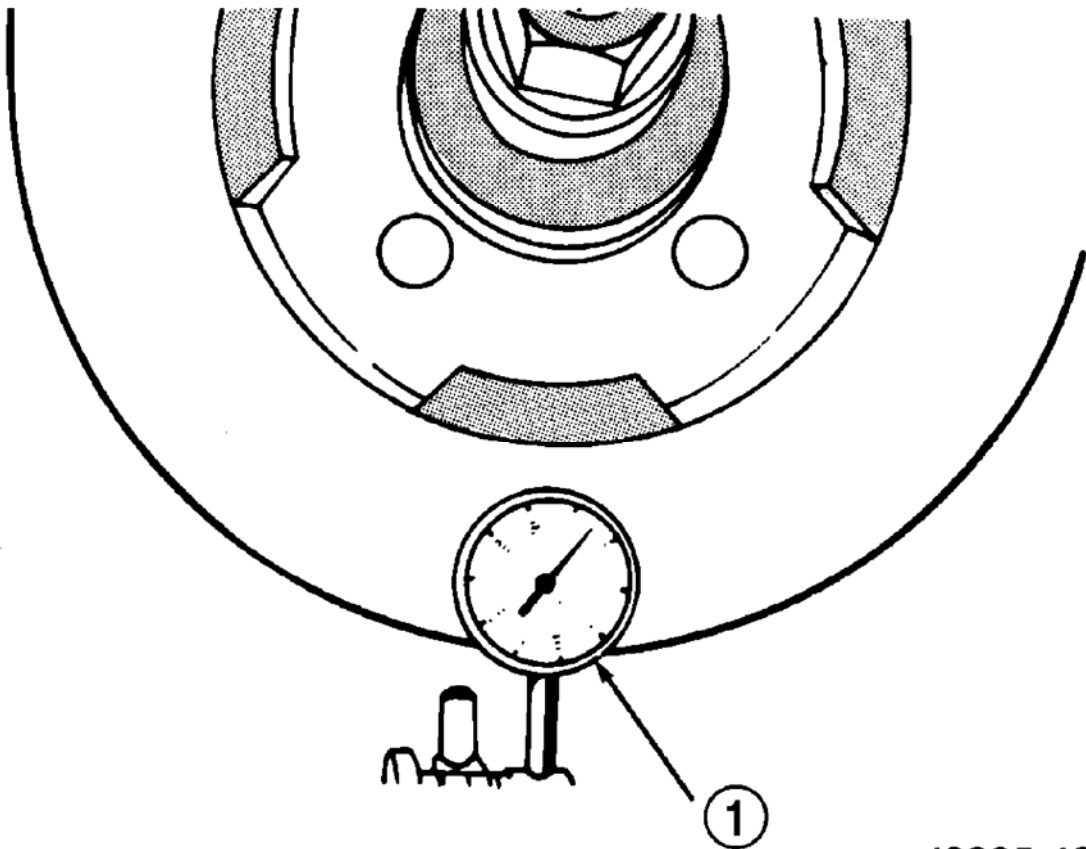
severely scored
tapered
hard spots
cracked
below minimum thickness

ROTOR MINIMUM THICKNESS

Measure rotor thickness at the center of the brake shoe contact surface. Replace the rotor if worn below minimum thickness, or if machining would reduce thickness below the allowable minimum.

Rotor minimum thickness is usually specified on the rotor hub. The specification is either stamped or cast into the hub surface.

ROTOR RUNOUT



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Fig. 35: Checking Rotor Runout & Thickness Variation
Courtesy of CHRYSLER LLC

1 - DIAL INDICATOR

Check rotor lateral runout with dial indicator C-3339 (1). See **Fig. 35**. Excessive lateral runout will cause brake pedal pulsation and rapid, uneven wear of the brake shoes. Position the dial indicator plunger approximately 25.4 mm (1 in.) inward from the rotor edge. The dial indicator should be positioned in the center of the rotor surface. Maximum allowable rotor runout is 0.102 mm (0.004 in.).

ROTOR THICKNESS VARIATION

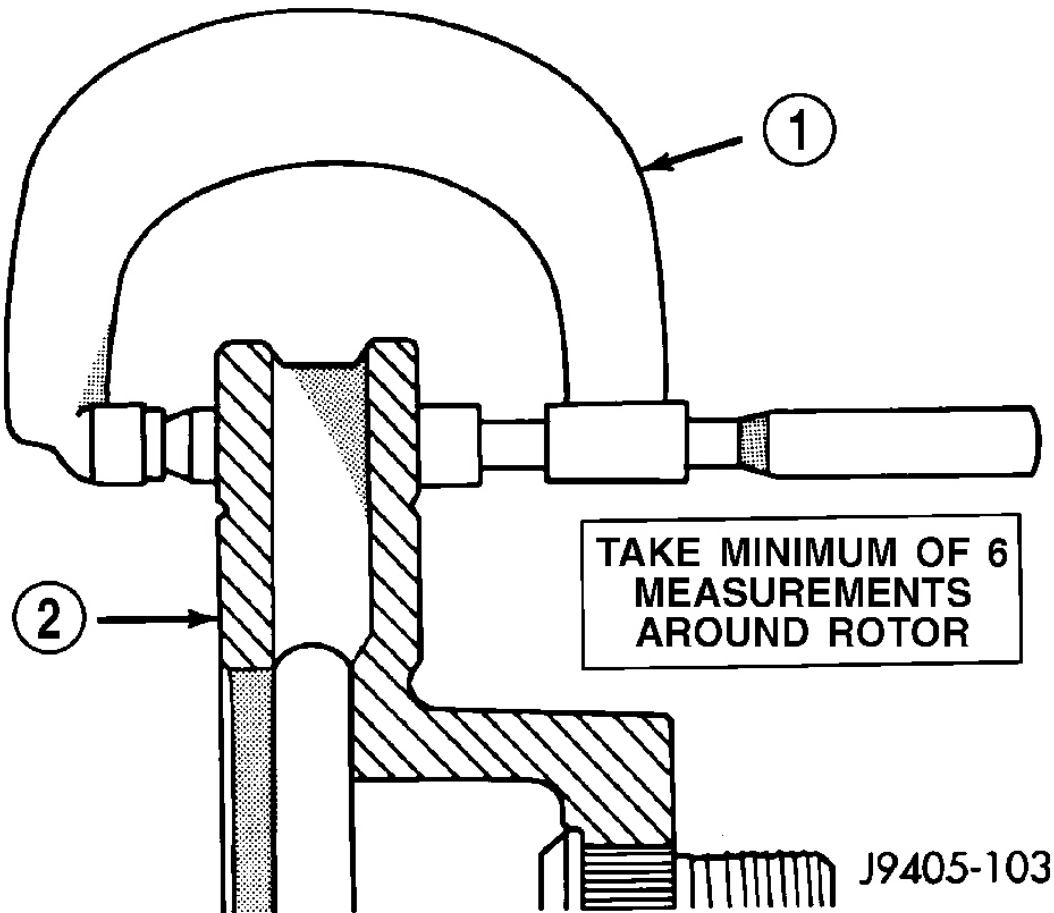


Fig. 36: Measuring Rotor Thickness
Courtesy of CHRYSLER LLC

1 - MICROMETER

2 - ROTOR

Variations in rotor thickness will cause pedal pulsation, noise and shudder.

Measure rotor thickness at 6 to 12 points around the rotor face. See **Fig. 36**.

Position the micrometer (1) approximately 25.4 mm (1 in.) from the rotor (2) outer circumference for each measurement.

Thickness should not **vary** by more than 0.013 mm (0.0005 in.) from point-to-point on the rotor. Machine or replace the rotor if necessary.

STANDARD PROCEDURE

BRAKE DRUM IN HAT ROTOR MACHINING

The brake drum in hat rotor can be machined on a drum lathe when necessary. Initial machining cuts should be limited to 0.12 - 0.20 mm (0.005 - 0.008 in.) at a time as heavier feed rates can produce taper and surface variation. Final finish cuts of 0.025 to 0.038 mm (0.001 to 0.0015 in.) are recommended and will generally provide the best surface finish.

Be sure the drum in hat rotor is securely mounted in the lathe before machining operations. A damper strap should always be used around the drum to reduce vibration and avoid chatter marks.

The maximum allowable diameter of the drum braking surface is stamped or cast into the drum in hat rotor.

CAUTION: Replace the drum in hat rotor if machining will cause the drum to exceed the maximum allowable diameter.

DISC BRAKE ROTOR MACHINING

NOTE: A hub mounted on-vehicle lathe is highly recommended. This type of lathe trues the rotor to the vehicles hub/bearing.

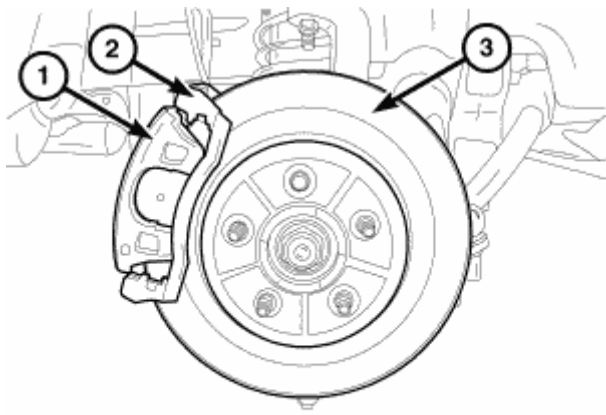
The disc brake rotor can be machined if scored or worn. The on-vehicle lathe must machine both sides of the rotor simultaneously with dual cutter heads. The rotor mounting surface must be clean before placing on the on-vehicle lathe. Equipment capable of machining only one side at a time may produce a tapered rotor. **This type of rotor machining is not recommended .**

NOTE: Proper wheel torque is also critical to help prevent any warping of the disc brake rotor.

CAUTION: Brake rotors that do not meet minimum thickness specifications before or after machining must be replaced.

REMOVAL

DISC BRAKE ROTOR-FRONT



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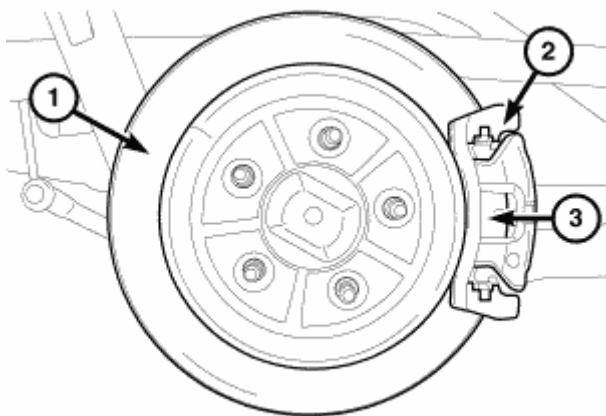
Fig. 37: Front Disc Brake Rotor
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

3. Remove the caliper adapter (2). See **REMOVAL**.
4. Remove the disc brake rotor (3).

DISC BRAKE ROTOR-REAR



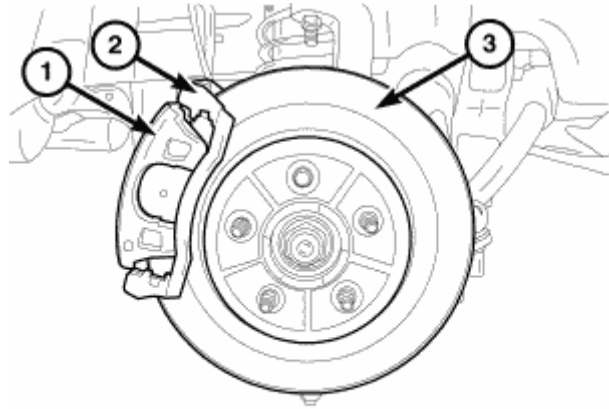
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Fig. 38: Rear Disc Brake Rotor
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle
2. Remove the tire and wheel assembly.
3. Remove the disc brake caliper adapter (2) and pads (3). See **REMOVAL**.
4. Remove the retaining clips and rotor assembly (1).

INSTALLATION

DISC BRAKE ROTOR-FRONT

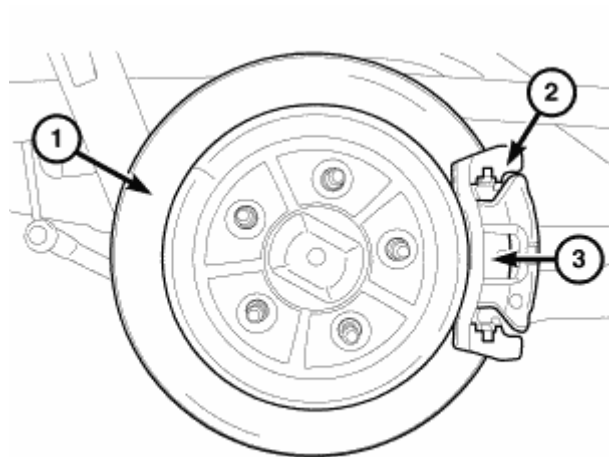


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Fig. 39: Front Disc Brake Rotor
Courtesy of CHRYSLER LLC

1. Install the disc brake rotor (3) to the hub.
2. Install the caliper mounting adapter (2). See **INSTALLATION**.
3. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .

DISC BRAKE ROTOR-REAR



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Fig. 40: Rear Disc Brake Rotor
Courtesy of CHRYSLER LLC

1. Install the rotor (1) to the axle shaft.
2. Install the disc brake caliper adapter (2) and pads (3). See **INSTALLATION**.
3. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
4. Lower the vehicle.

PEDAL

DESCRIPTION

BRAKE PEDAL



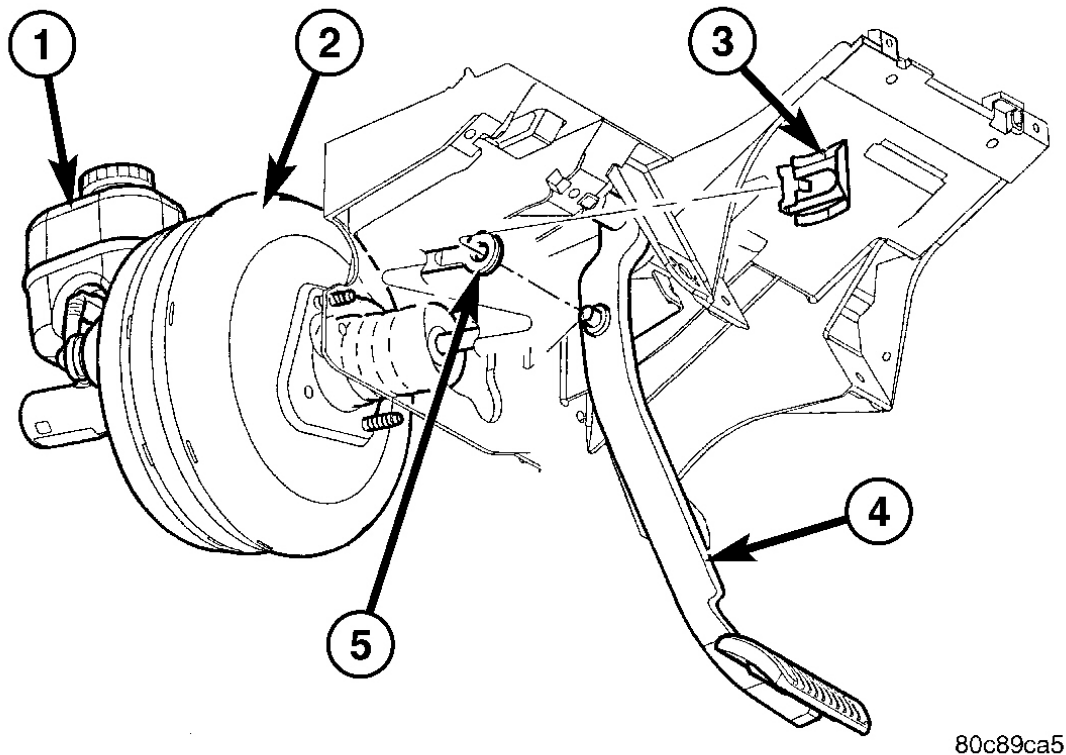
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Fig. 41: Brake Pedal
Courtesy of CHRYSLER LLC

A suspended-type brake pedal is used, the pedal pivots on a shaft mounted in the steering column support bracket. The bracket is attached to the dash panel.

OPERATION

BRAKE PEDAL



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Fig. 42: Booster Push Rod
Courtesy of CHRYSLER LLC

- 1 - MASTER CYLINDER ASSEMBLY
- 2 - BRAKE BOOSTER
- 3 - CLIP
- 4 - BRAKE PEDAL
- 5 - BOOSTER ROD

The brake pedal (4) is attached to the booster push rod (5). When the pedal is depressed, the primary booster push rod (5) is depressed which moves the booster secondary rod. The booster secondary rod depresses the master cylinder piston (1). See **Fig. 42**.

REMOVAL

BRAKE PEDAL

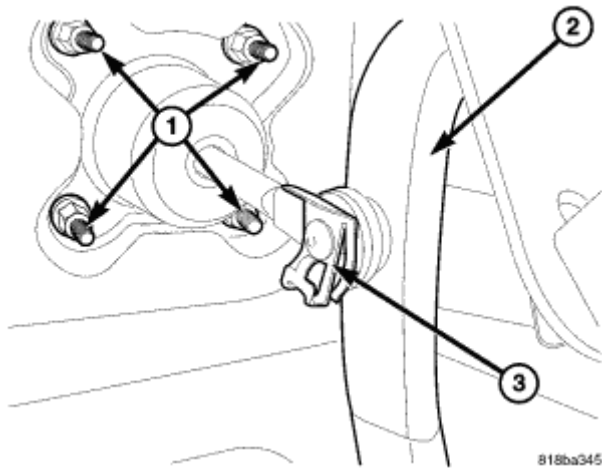


Fig. 43: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
 Courtesy of CHRYSLER LLC

1. Remove the knee blocker under the steering column. Refer to **REMOVAL** .
2. Remove the retainer clip (3) securing the booster push rod to pedal (2).
3. Remove the brake lamp switch. Refer to **REMOVAL** .
4. Remove the two nuts securing the pedal to the column bracket.
5. Remove the pedal from the vehicle.

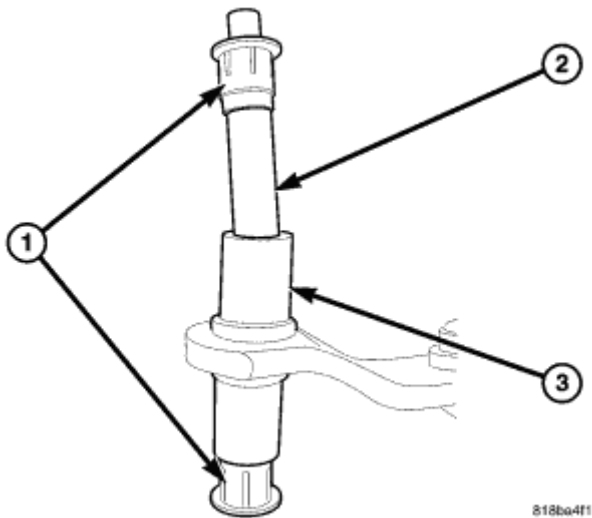


Fig. 44: Pedal Bushing
 Courtesy of CHRYSLER LLC

6. Remove the pedal bushing if necessary.

INSTALLATION

BRAKE PEDAL

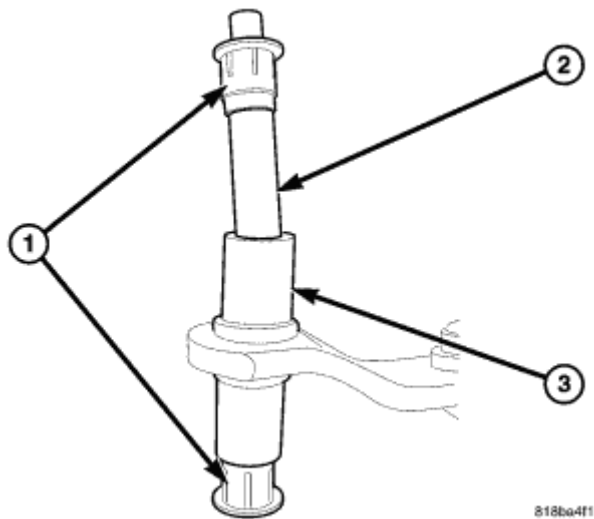


Fig. 45: Pedal Bushing
 Courtesy of CHRYSLER LLC

1. Lubricate the brake pedal pin and bushings with Mopar multi-mileage grease.
2. Install the pedal bushings if removed.

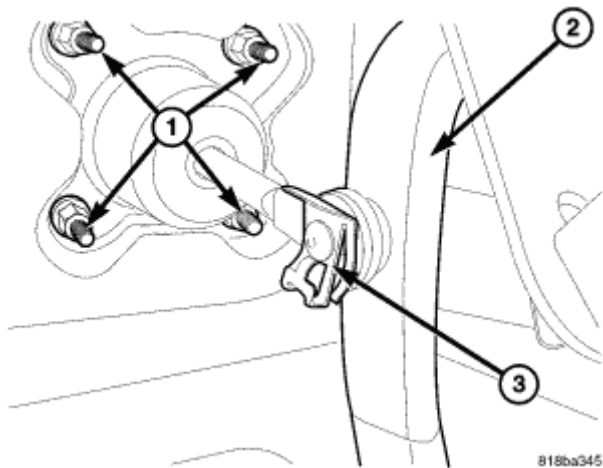


Fig. 46: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
 Courtesy of CHRYSLER LLC

3. Install the pedal into the vehicle.
4. Install the nuts securing the pedal to the column bracket.
5. Tighten the nuts to 22.6 N.m (200 in. lbs.).
6. Install the booster push rod on the pedal pin and install a new retainer clip (3).
7. Install the brake lamp switch. Refer to **INSTALLATION** .
8. Install the knee blocker. Refer to **INSTALLATION** .

DESCRIPTION

POWER BRAKE BOOSTER

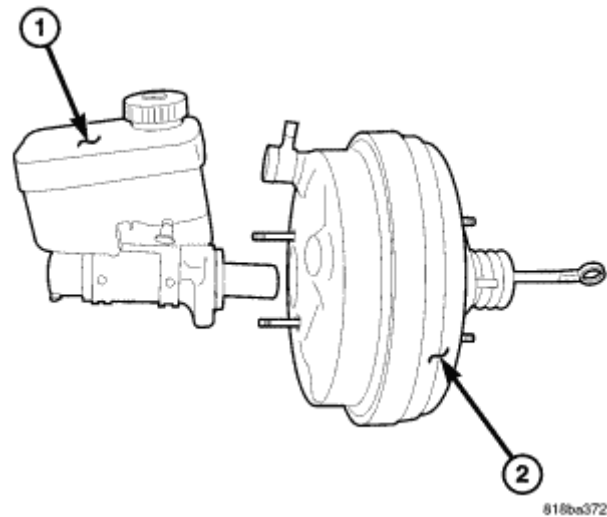


Fig. 47: Brake Master/Booster Assembly
Courtesy of CHRYSLER LLC

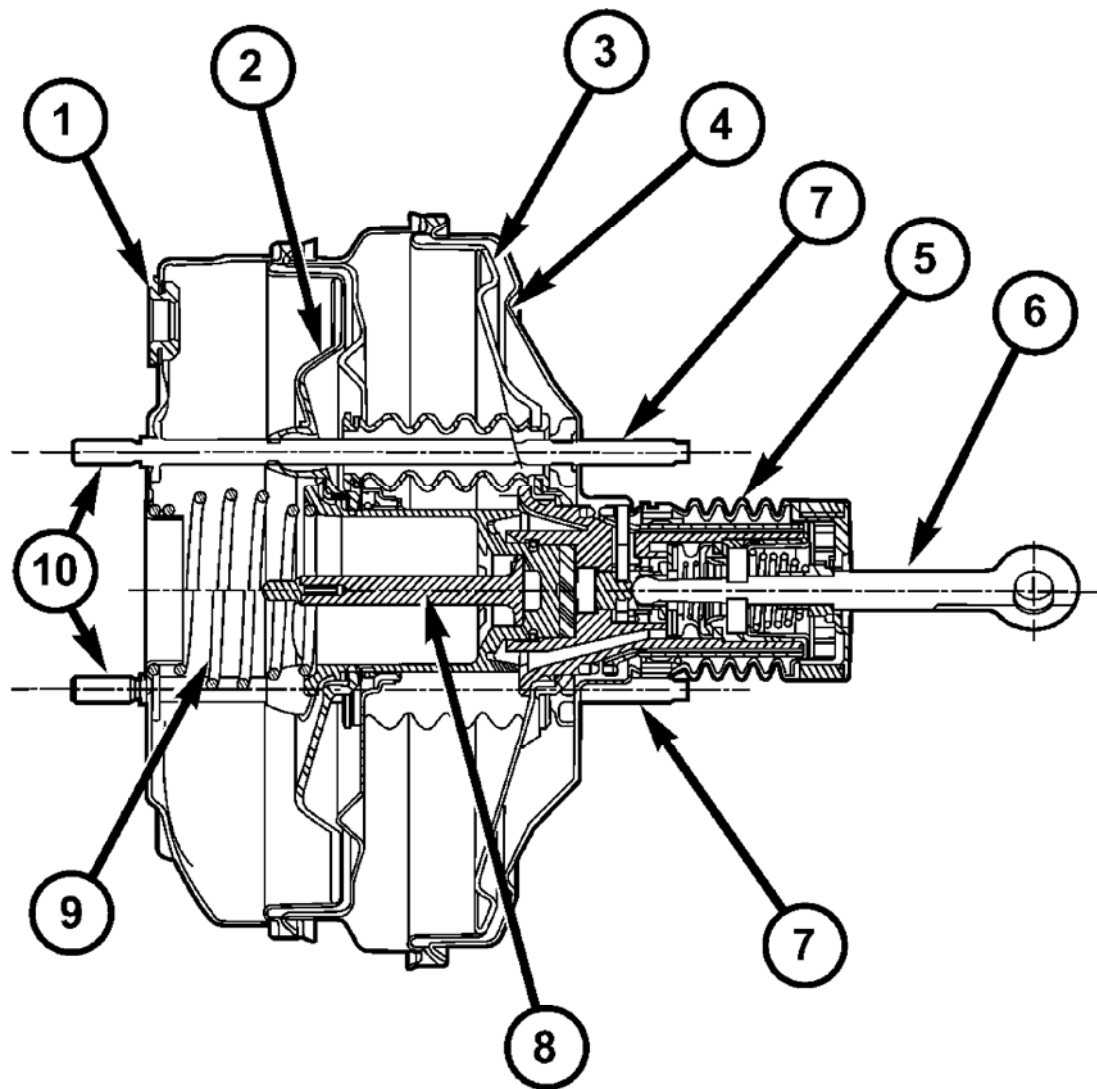
The booster assembly consists of a housing divided into separate chambers by two internal diaphragms. The outer edge of each diaphragm is attached to the booster housing. The diaphragms are connected to the booster primary push rod.

Two push rods are used in the booster. The primary push rod connects the booster to the brake pedal. The secondary push rod connects the booster (2) to the master cylinder (1) to stroke the cylinder pistons.

The booster assembly is of the tie-bar design. This means the structural support of the assembly is through the tie-bars, whose ends protrude through the booster shell. One end is the master cylinder mounting stud and the other end is the booster mounting stud. The booster assembly (with properly functioning check valve installed) may not have a good vacuum seal unless the booster is installed on the dash panel mounting bracket with master cylinder and booster mounting nuts properly torqued.

OPERATION

POWER BRAKE BOOSTER



80f2ad83

Fig. 48: Power Brake Booster Cut Away
Courtesy of CHRYSLER LLC

- 1 - VACUUM CHECK VALVE
- 2 - FRONT DIAPHRAGM
- 3 - REAR DIAPHRAGM
- 4 - HOUSING
- 5 - SEAL
- 6 - PRIMARY PUSH ROD (TO BRAKE PEDAL)
- 7 - BOOSTER MOUNTING STUDS

- | |
|--|
| 8 - SECONDARY PUSH ROD (TO MASTER CYLINDER)
9 - SPRING
10 - MASTER CYLINDER MOUNTING STUDS |
|--|

The atmospheric inlet valve is opened and closed by the primary push rod (6). Booster vacuum supply is through a hose attached to an intake manifold fitting at one end and to the booster check valve (1) at the other. The vacuum check valve (1) in the booster housing (4) is a one-way device that prevents vacuum leak back.

Power assist is generated by utilizing the pressure differential between normal atmospheric pressure and a vacuum. The vacuum needed for booster operation is taken directly from the engine intake manifold. The entry point for atmospheric pressure is through a filter and inlet valve at the rear of the housing. See **Fig. 48**.

The chamber areas forward of the booster diaphragms are exposed to vacuum from the intake manifold. The chamber areas to the rear of the diaphragms, are exposed to normal atmospheric pressure of 101.3 Kilopascals (14.7 pounds/square in.).

Brake pedal application causes the primary push rod to open the atmospheric inlet valve. This exposes the area behind the diaphragms to atmospheric pressure. The resulting pressure differential provides the extra apply force for power assist.

The booster check valve, check valve grommet and booster seals are serviceable.

DIAGNOSIS AND TESTING

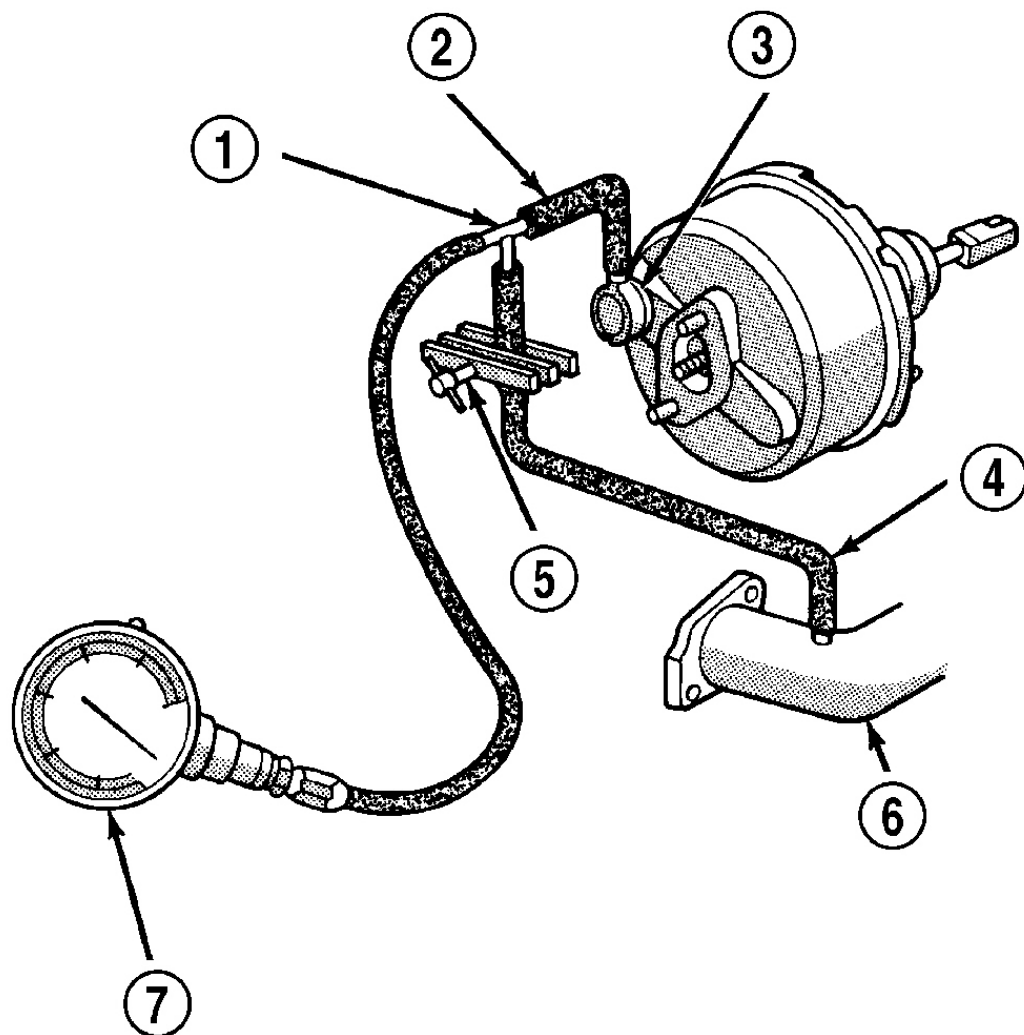
MASTER CYLINDER/POWER BOOSTER

1. Start engine and check booster vacuum hose connections. A hissing noise indicates vacuum leak. Correct any vacuum leak before proceeding, also ensure booster mounting nuts are torqued correctly.
2. Stop engine and shift transmission into Neutral.
3. Pump brake pedal until all vacuum reserve in booster is depleted.
4. Press and hold brake pedal under light foot pressure. The pedal should hold firm, if the pedal falls away master cylinder is faulty (internal leakage). This could also indicate an external leak, such as at fittings, hoses, HCU, etc, or a symptom of an internal leak in the HCU
5. Start engine and note pedal action. It should fall away slightly under light foot pressure then hold firm. If no pedal action is discernible, power booster, vacuum supply, or vacuum check valve is faulty. Proceed to the POWER BOOSTER VACUUM TEST.
6. If the POWER BOOSTER VACUUM TEST passes, rebuild booster vacuum reserve as follows: Release brake pedal. Increase engine speed to 1500 RPM, close the throttle and immediately turn off ignition to stop engine.
7. Wait a minimum of 90 seconds and try brake action again. Booster should provide two or more vacuum assisted pedal applications. If vacuum assist is not provided, booster is faulty.

POWER BOOSTER VACUUM TEST

1. Connect vacuum gauge to booster check valve with short length of hose and T-fitting. See **Fig. 49**.
2. Start and run engine at curb idle speed for one minute.

3. Observe the vacuum supply. If vacuum supply is not adequate, repair vacuum supply.
4. Clamp hose shut between vacuum source and check valve.
5. Stop engine and observe vacuum gauge.
6. If vacuum drops more than one inch Hg (33 millibars) within 15 seconds, booster diaphragm or check valve is faulty.



J9005-81

Fig. 49: Typical Booster Vacuum Test Connections
Courtesy of CHRYSLER LLC

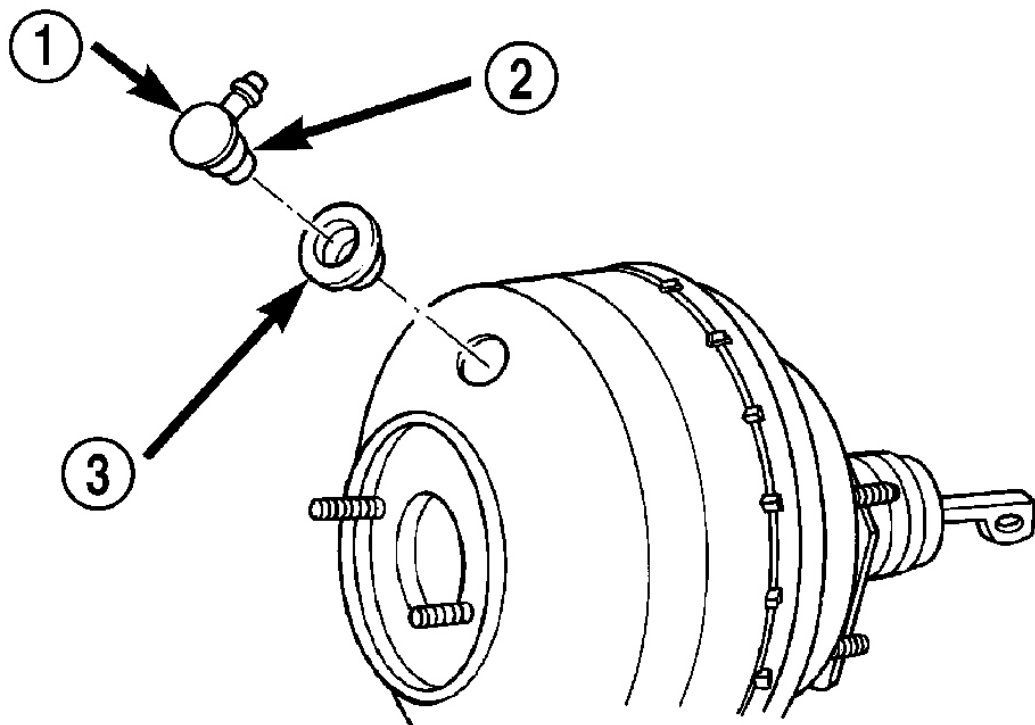
1 - TEE FITTING

2 - SHORT CONNECTING HOSE

3 - CHECK VALVE
4 - CHECK VALVE HOSE
5 - CLAMP TOOL
6 - INTAKE MANIFOLD
7 - VACUUM GAUGE

POWER BOOSTER CHECK VALVE TEST

1. Disconnect vacuum hose from check valve.
2. Remove check valve and valve seal from booster.
3. Use a hand operated vacuum pump for test.
4. Apply 15-20 inches vacuum at large end of check valve. See **Fig. 50**.
5. Vacuum should hold steady. If gauge on pump indicates vacuum loss, check valve is faulty and should be replaced.



8031e866

Fig. 50: Typical - Vacuum Check Valve & Seal
 Courtesy of CHRYSLER LLC

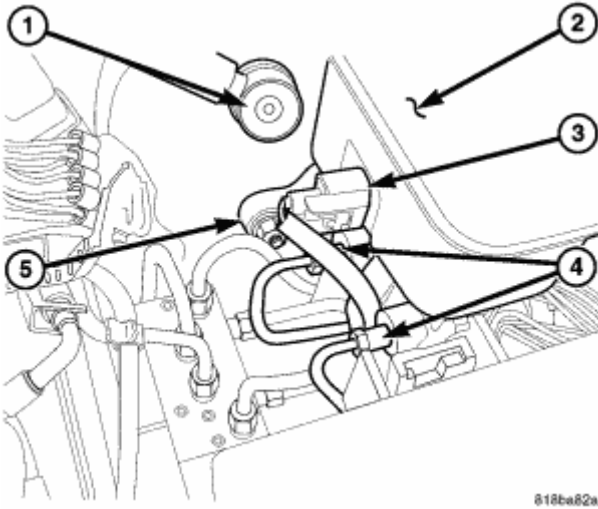
1 - BOOSTER CHECK VALVE

2 - APPLY TEST VACUUM HERE

3 - VALVE SEAL

REMOVAL

POWER BRAKE BOOSTER - LHD

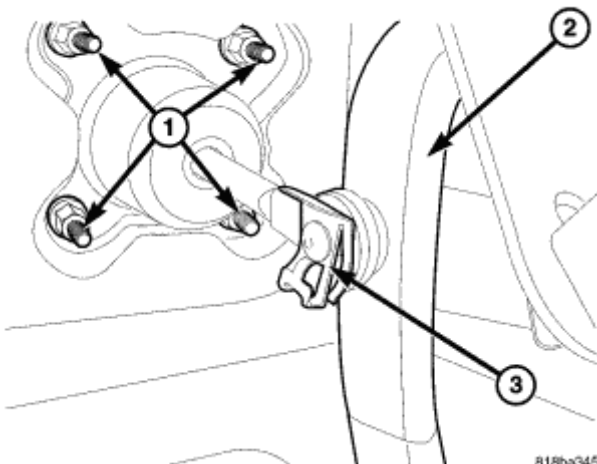


818ba82a

Fig. 51: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve

Courtesy of CHRYSLER LLC

1. Disconnect the wire (3) to the fluid level switch at the bottom of the reservoir (2).
2. Remove the master cylinder (2). See **REMOVAL**.
3. Disconnect vacuum hoses from booster check valve (1).
4. Remove the brake lines (4) from the master cylinder and the HCU (ABS vehicles only) or the junction block for clearance.
5. Disconnect the HCU from the mounts and move to the side for clearance of the booster.



818ba345

Fig. 52: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
Courtesy of CHRYSLER LLC

6. Remove knee blocker under the steering column. Refer to **REMOVAL** .
7. Remove the brake light switch and discard. Refer to **REMOVAL** .
8. Remove retaining clip (3) that secures booster push rod to brake pedal (2).
9. Remove nuts attaching booster (1) to the dash panel.
10. In engine compartment, slide booster studs out of dash panel, tilt booster upward, and remove booster from engine compartment.

POWER BRAKE BOOSTER - RHD

1. Remove the air box. Refer to **REMOVAL** .
2. Siphon the fluid out of the master cylinder.

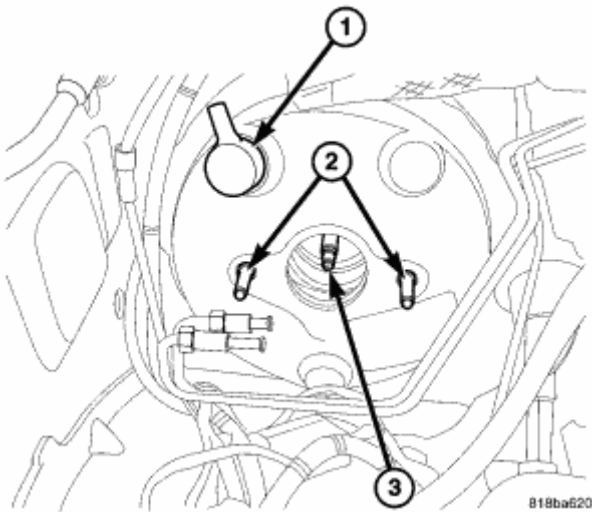


Fig. 53: Brake Booster
Courtesy of CHRYSLER LLC

3. Remove the brake lines from the master cylinder.
4. Remove the master cylinder. See **REMOVAL**.
5. Disconnect vacuum hose from booster check valve (1).

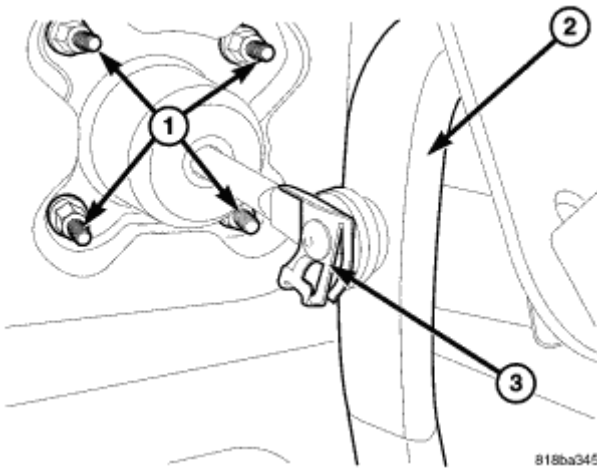


Fig. 54: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
 Courtesy of CHRYSLER LLC

6. Remove knee blocker under the steering column. Refer to **REMOVAL** .
7. Remove the brake light switch and discard. Refer to **REMOVAL** .
8. Remove retaining clip (3) that secures booster push rod to brake pedal (2).
9. Remove nuts (1) attaching booster to the dash panel.
10. In engine compartment, slide booster studs out of dash panel, tilt booster upward, and remove booster from engine compartment.

INSTALLATION

POWER BRAKE BOOSTER - LHD

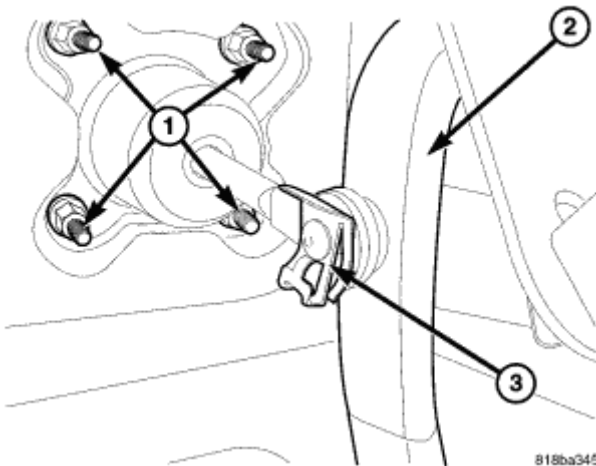


Fig. 55: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
 Courtesy of CHRYSLER LLC

1. Align and position booster on the dash panel.

2. Install booster mounting nuts (1). Tighten nuts just enough to hold booster in place.

NOTE: Lubricate the pedal pin with Mopar multi-mileage grease before installation.

3. Slide booster push rod onto the brake pedal (2). Then secure push rod to pedal pin with retaining clip (3).
4. Tighten booster mounting nuts (1) to 25 N.m (220 in. lbs.).
5. Install a new brake lamp switch and reconnect the electrical connector.
6. Install the knee blocker. Refer to **INSTALLATION**.

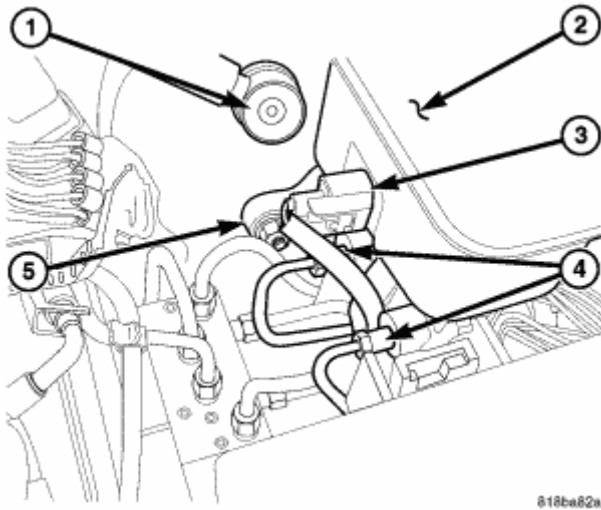


Fig. 56: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve

Courtesy of CHRYSLER LLC

7. If original master cylinder is being installed, check condition of seal at rear of master cylinder. Replace seal if cut, or torn.
8. Clean cylinder mounting surface of brake booster. Use shop towel wetted with brake cleaner for this purpose. Dirt, grease, or similar materials will prevent proper cylinder seating and could result in vacuum leak.
9. Align and install master cylinder on the booster studs. Install mounting nuts and tighten to 25 N.m (220 in. lbs.).
10. Connect vacuum hose to booster check valve (1).
11. Remount the HCU. Tighten bracket mounting nuts to 14 N.m (125 in. lbs.).
12. Connect and secure the brake lines (4) to HCU or junction block and master cylinder. Start all brake line fittings by hand to avoid cross threading.
13. Connect the wire to fluid level switch (3) at the bottom of the reservoir (2).
14. Fill and bleed base brake system. See **STANDARD PROCEDURE**.
15. Verify proper brake operation before moving vehicle.

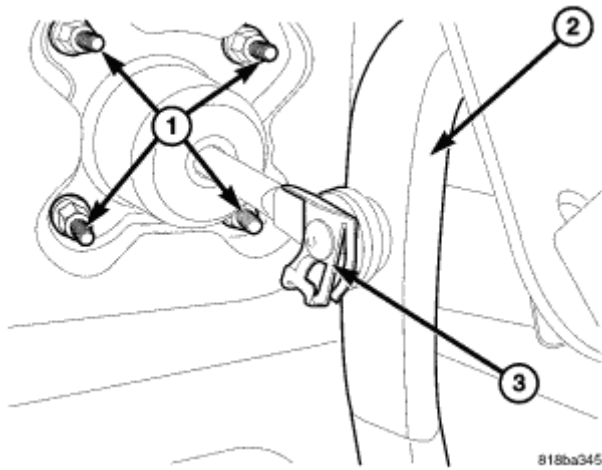


Fig. 57: Identifying Retainer Clip, Pedal & Booster Mounting Nuts
 Courtesy of CHRYSLER LLC

1. Align and position booster on the dash panel.
2. Install booster mounting nuts (1). Tighten nuts just enough to hold booster in place.

NOTE: **Lubricate the pedal pin with Mopar multi-mileage grease before installation.**

3. Slide booster push rod onto the brake pedal (2). Then secure push rod to pedal pin with retaining clip (3).
4. Tighten booster mounting nuts (1) to 39 N.m (29 ft. lbs.).
5. Install a new brake lamp switch and reconnect the electrical connector.
6. Install the knee blocker. Refer to **INSTALLATION** .

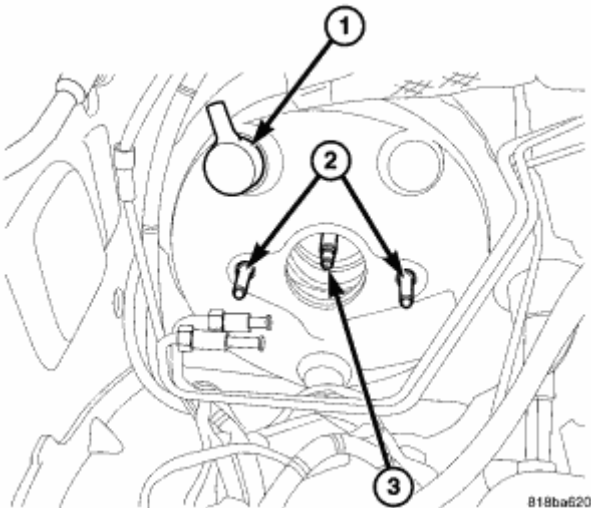


Fig. 58: Brake Booster
 Courtesy of CHRYSLER LLC

7. If original master cylinder is being installed, check condition of seal at rear of master cylinder. Replace seal if cut, or torn.
8. Clean cylinder mounting surface of brake booster. Use shop towel wetted with brake cleaner for this purpose. Dirt, grease, or similar materials will prevent proper cylinder seating and could result in vacuum leak.
9. Align and install master cylinder on the booster studs (2). Install mounting nuts and tighten to 17.5 N.m (155 in. lbs.). See **INSTALLATION**.
10. Connect vacuum hose to booster check valve (1).
11. Connect and secure the brake lines to master cylinder. Start all brake line fittings by hand to avoid cross threading.
12. Connect the wire to fluid reservoir.
13. Install the air box.
14. Fill and bleed base brake system. See **STANDARD PROCEDURE**.
15. Verify proper brake operation before moving vehicle.

MASTER CYLINDER

DESCRIPTION

MASTER CYLINDER

The master cylinder has a removable plastic reservoir. The cylinder body is made of aluminum and contains a primary and secondary piston assembly. The cylinder body including the piston assemblies are not serviceable. If diagnosis indicates an internal problem with the cylinder body, it must be replaced as an assembly. The reservoir and grommets are the only replaceable parts on the master cylinder.

OPERATION

MASTER CYLINDER

The master cylinder bore contains a primary and secondary piston. The primary piston supplies hydraulic pressure to the front brakes. The secondary piston supplies hydraulic pressure to the rear brakes. The master cylinder reservoir stores reserve brake fluid for the hydraulic brake circuits.

DIAGNOSIS AND TESTING

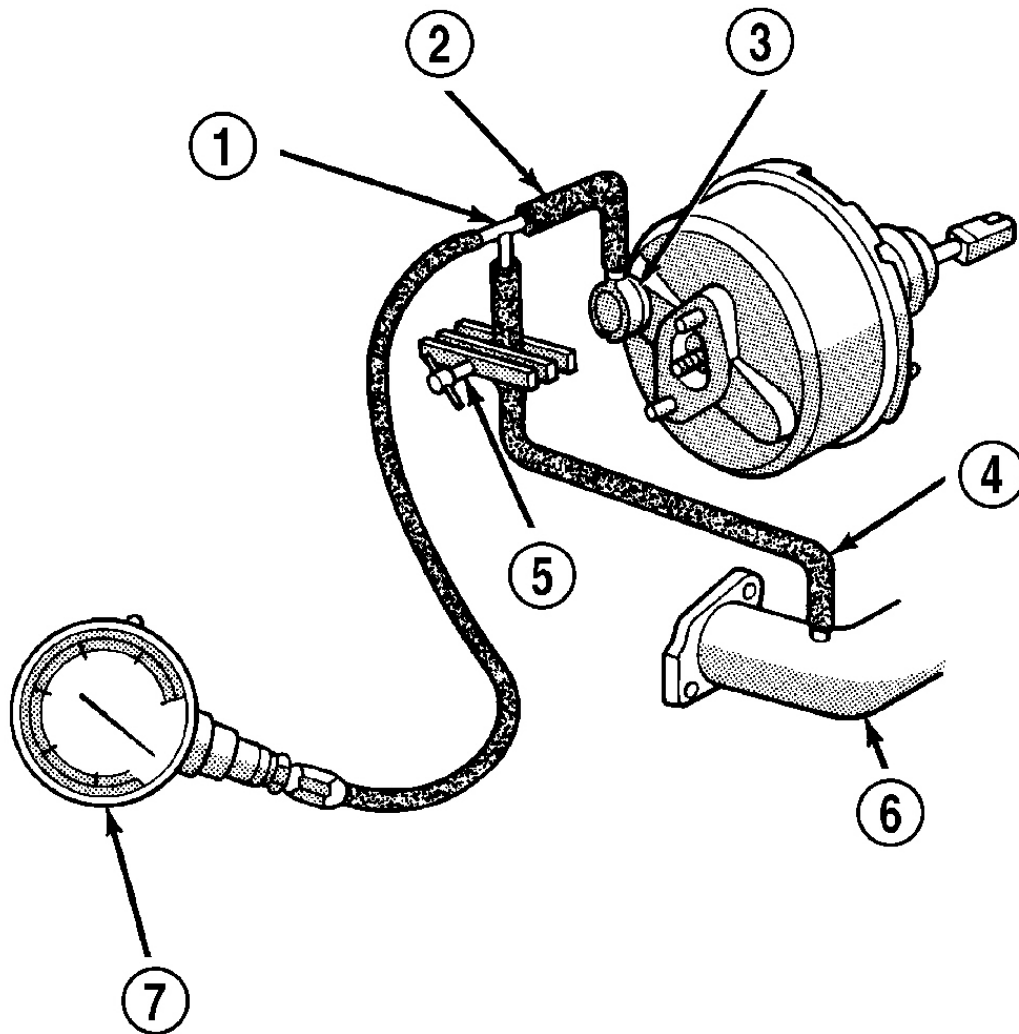
MASTER CYLINDER/POWER BOOSTER

1. Start engine and check booster vacuum hose connections. A hissing noise indicates vacuum leak. Correct any vacuum leak before proceeding, also ensure booster mounting nuts are torqued correctly.
2. Stop engine and shift transmission into Neutral.
3. Pump brake pedal until all vacuum reserve in booster is depleted.
4. Press and hold brake pedal under light foot pressure. The pedal should hold firm, if the pedal falls away master cylinder is faulty (internal leakage). This could also indicate an external leak, such as at fittings, hoses, HCU, etc, or a symptom of an internal leak in the HCU

5. Start engine and note pedal action. It should fall away slightly under light foot pressure then hold firm. If no pedal action is discernible, power booster, vacuum supply, or vacuum check valve is faulty. Proceed to the POWER BOOSTER VACUUM TEST.
6. If the POWER BOOSTER VACUUM TEST passes, rebuild booster vacuum reserve as follows: Release brake pedal. Increase engine speed to 1500 RPM, close the throttle and immediately turn off ignition to stop engine.
7. Wait a minimum of 90 seconds and try brake action again. Booster should provide two or more vacuum assisted pedal applications. If vacuum assist is not provided, booster is faulty.

POWER BOOSTER VACUUM TEST

1. Connect vacuum gauge to booster check valve with short length of hose and T-fitting. See **Fig. 49**.
2. Start and run engine at curb idle speed for one minute.
3. Observe the vacuum supply. If vacuum supply is not adequate, repair vacuum supply.
4. Clamp hose shut between vacuum source and check valve.
5. Stop engine and observe vacuum gauge.
6. If vacuum drops more than one inch Hg (33 millibars) within 15 seconds, booster diaphragm or check valve is faulty.

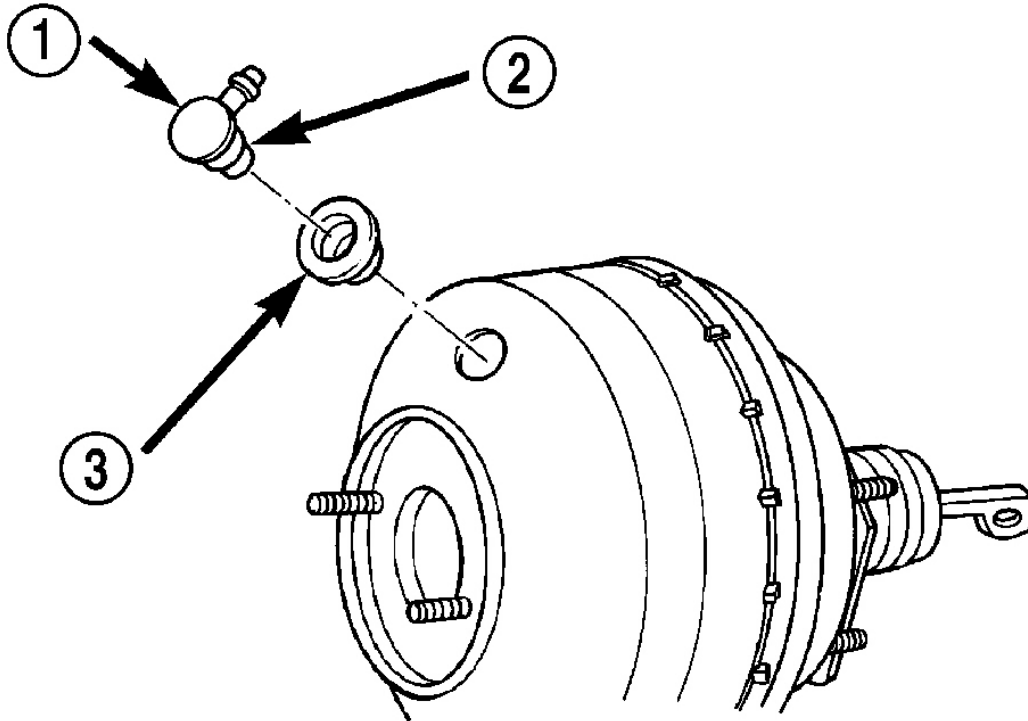


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Fig. 59: Typical Booster Vacuum Test Connections
 Courtesy of CHRYSLER LLC

1 - TEE FITTING
2 - SHORT CONNECTING HOSE
3 - CHECK VALVE
4 - CHECK VALVE HOSE
5 - CLAMP TOOL
6 - INTAKE MANIFOLD
7 - VACUUM GAUGE

1. Disconnect vacuum hose from check valve.
2. Remove check valve and valve seal from booster.
3. Use a hand operated vacuum pump for test.
4. Apply 15-20 inches vacuum at large end of check valve. See **Fig. 50**.
5. Vacuum should hold steady. If gauge on pump indicates vacuum loss, check valve is faulty and should be replaced.



8031e866

Fig. 60: Typical - Vacuum Check Valve & Seal
Courtesy of CHRYSLER LLC

1 - BOOSTER CHECK VALVE
2 - APPLY TEST VACUUM HERE
3 - VALVE SEAL

STANDARD PROCEDURE

MASTER CYLINDER BLEEDING

A new master cylinder should be bled before installation on the vehicle. Required bleeding tools include bleed

tubes and a wood dowel to stroke the pistons. Bleed tubes can be fabricated from brake line.

1. Mount master cylinder in vise.
2. Attach bleed tubes to cylinder outlet ports. Then position each tube end into reservoir. See **Fig. 61**.
3. Fill reservoir with fresh brake fluid.
4. Press cylinder pistons inward with wood dowel. Then release pistons and allow them to return under spring pressure. Continue bleeding operations until air bubbles are no longer visible in fluid.

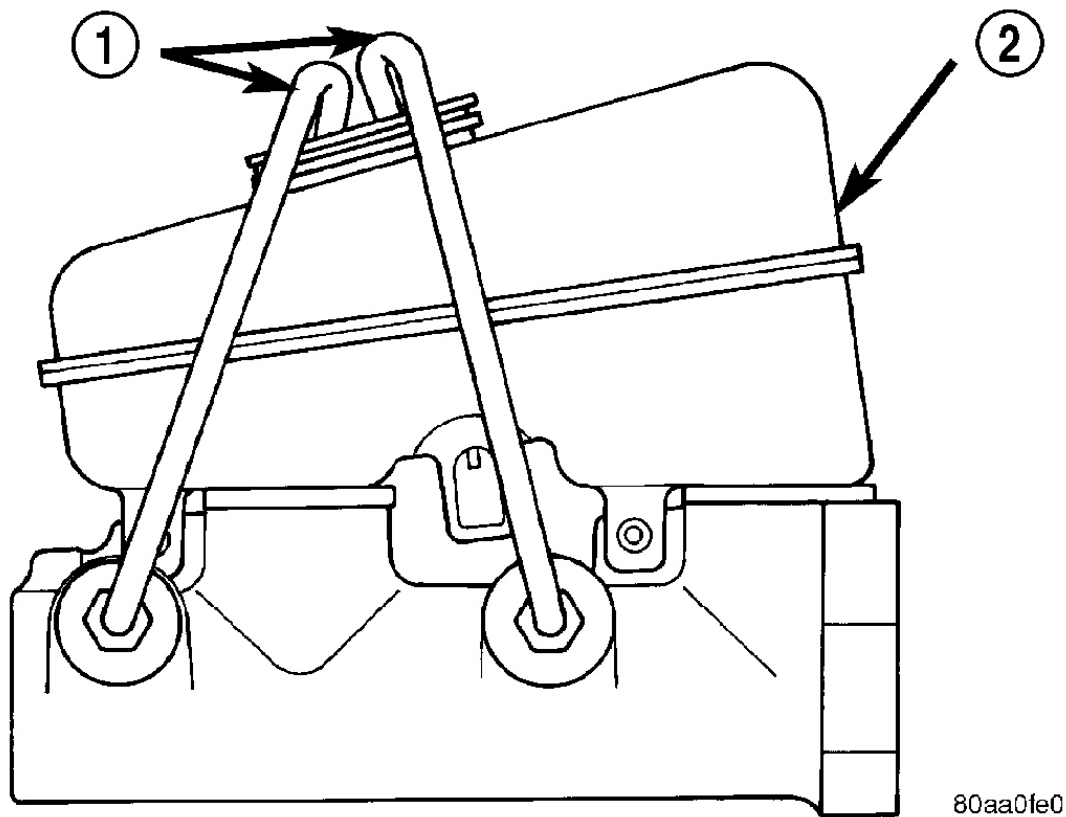


Fig. 61: Master Cylinder - Typical
Courtesy of CHRYSLER LLC

1 - BLEEDING TUBES
2 - RESERVOIR

REMOVAL

MASTER CYLINDER

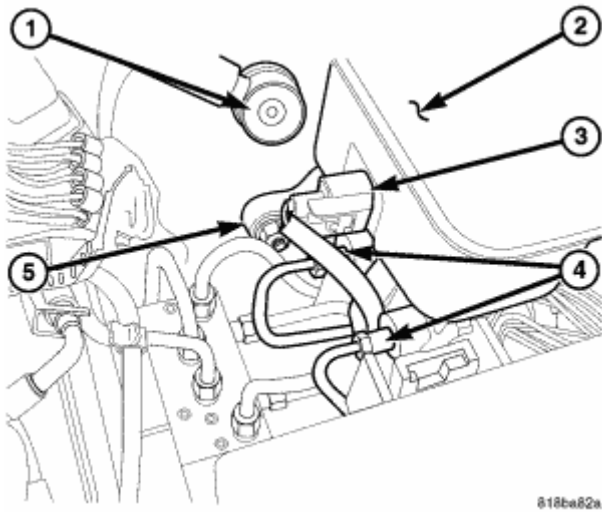


Fig. 62: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve

Courtesy of CHRYSLER LLC

1. Siphon and drain the fluid from the reservoir (2).
2. Disconnect the fluid level electrical connector (3) from the reservoir (2).
3. Remove the brake lines (4) at the master cylinder.
4. Remove mounting nuts (5) from the master cylinder.

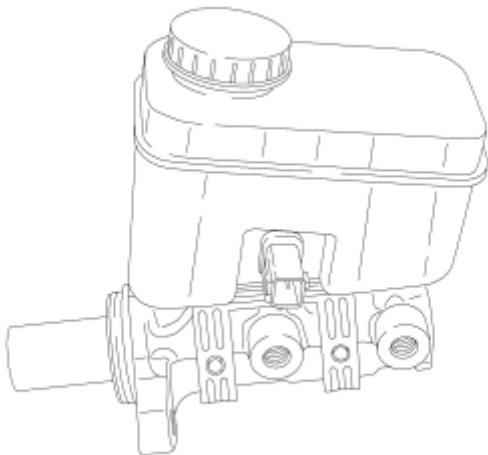
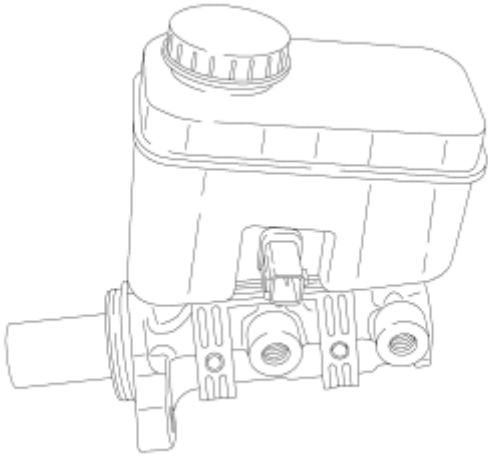


Fig. 63: Master Cylinder
Courtesy of CHRYSLER LLC

5. Remove master cylinder.
6. Remove cylinder cover and drain the rest of the fluid.
7. If master cylinder reservoir requires service, see **REMOVAL**.

INSTALLATION

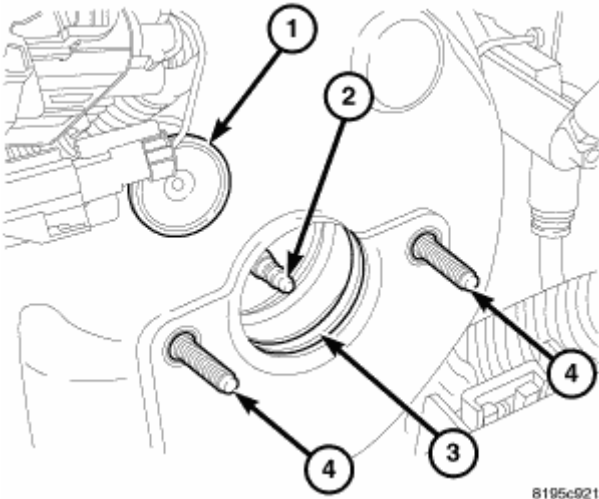
MASTER CYLINDER



8195c916

Fig. 64: Master Cylinder
Courtesy of CHRYSLER LLC

NOTE: If master cylinder is replaced, bleed cylinder before installation.



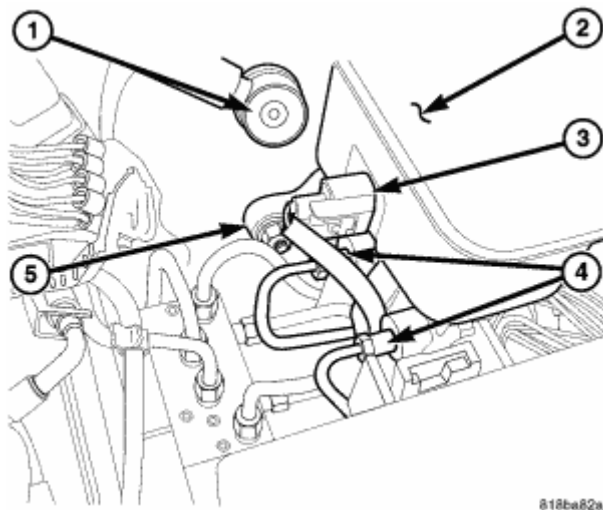
8195c921

Fig. 65: Identifying Brake Booster & Brake Booster Studs
Courtesy of CHRYSLER LLC

1. Clean cylinder mounting surface of brake booster (3).

NOTE: Insure the O-ring is on the master cylinder at the booster interface.

2. Install master cylinder onto brake booster studs (4).



818ba82a

Fig. 66: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve

Courtesy of CHRYSLER LLC

3. Install mounting nuts (5) and tighten to 17 N.m (151 in. lbs.).
4. Connect the brake lines (4) to the master cylinder and tighten to 19 N.m (168 in. lbs.).
5. Connect fluid level electrical connector (3) to the reservoir (2).
6. Fill and bleed base brake system. See **STANDARD PROCEDURE**.

FLUID

DESCRIPTION

BRAKE FLUID

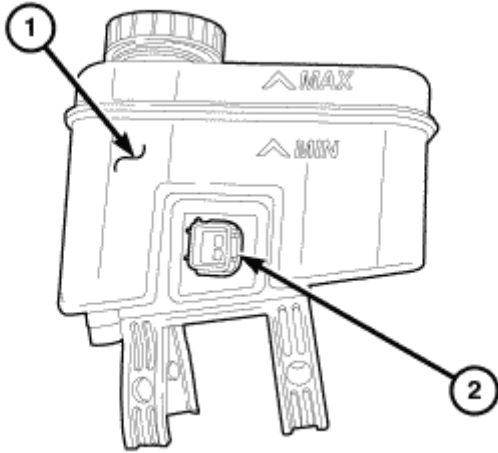
The brake fluid used in this vehicle must conform to DOT 3 specifications and SAE J1703 standards. No other type of brake fluid is recommended or approved for usage in the vehicle brake system. Use only Mopar brake fluid or an equivalent from a tightly sealed container.

CAUTION: Never use reclaimed brake fluid or fluid from a container which has been left open. An open container of brake fluid will absorb moisture from the air and contaminate the fluid.

CAUTION: Never use any type of a petroleum-based fluid in the brake hydraulic system. Use of such type fluids will result in seal damage of the vehicle brake hydraulic system causing a failure of the vehicle brake system. Petroleum based fluids would be items such as engine oil, transmission fluid, power steering fluid, etc.

STANDARD PROCEDURE

BRAKE FLUID LEVEL



8195c90c

Fig. 67: Identifying Master Cylinder Reservoir
 Courtesy of CHRYSLER LLC

Always clean the master cylinder reservoir and caps before checking fluid level. If not cleaned, dirt could enter the fluid.

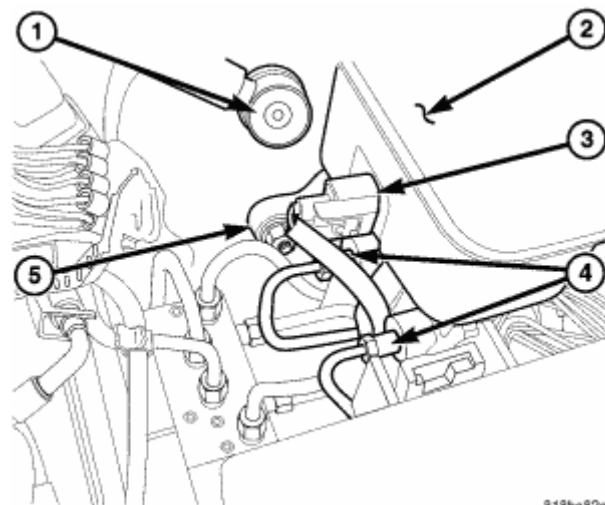
The fluid fill level is indicated on the side of the master cylinder reservoir (1).

The correct fluid level is to the MAX indicator on the side of the reservoir. If necessary, add fluid to the proper level.

FLUID RESERVOIR

REMOVAL

RESERVOIR



818ba82a

Fig. 68: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve

Courtesy of CHRYSLER LLC

1. Install prop rod on brake pedal to keep pressure on the brake system.
2. Remove reservoir cap and siphon fluid into drain container.
3. Remove the electrical connector (3) from the fluid level switch in the reservoir (2).

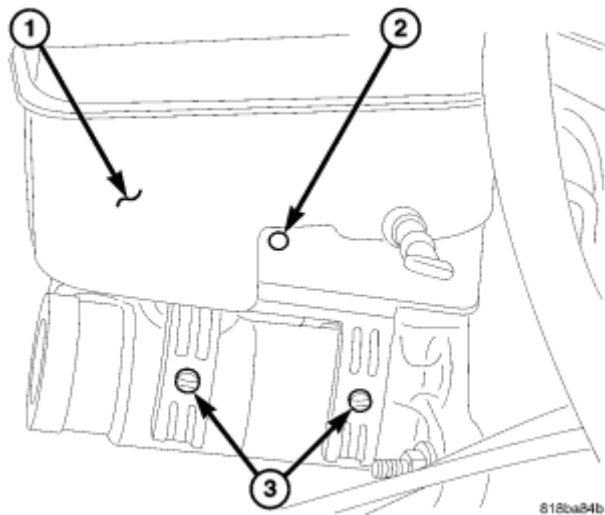


Fig. 69: Identifying Reservoir & Tabs
Courtesy of CHRYSLER LLC

4. Remove the reservoir (1) from the master cylinder by pulling the four tabs (3) outward to release.

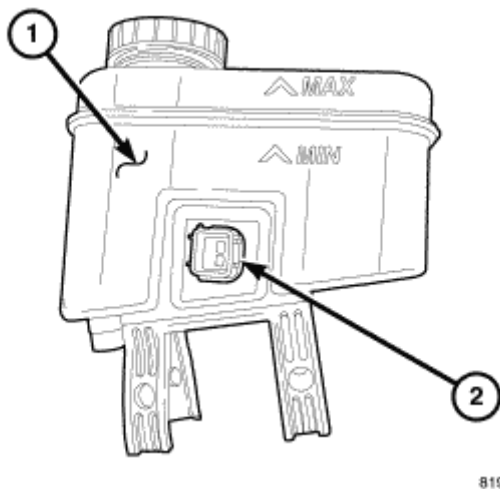


Fig. 70: Identifying Master Cylinder Reservoir
Courtesy of CHRYSLER LLC

5. Remove the reservoir (1) from the master cylinder by pulling upwards.
6. If replacing the reservoir (1) remove the fluid level sensor (2) by squeezing the tabs together while pulling on the sensor (2).

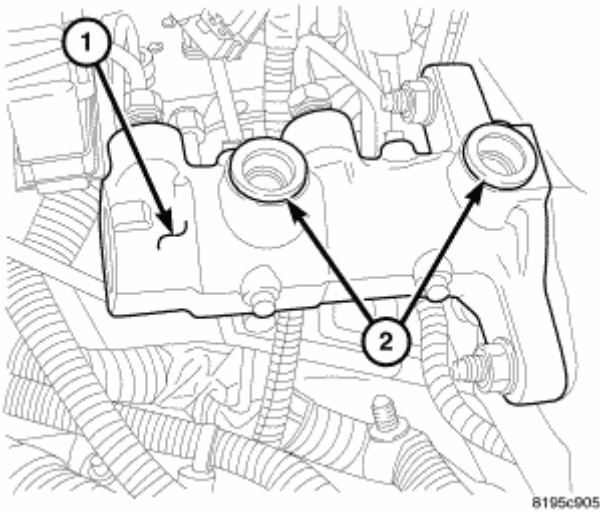


Fig. 71: Master W/O Reservoir
 Courtesy of CHRYSLER LLC

7. Remove old grommets (2) from cylinder body (1).

INSTALLATION

RESERVOIR

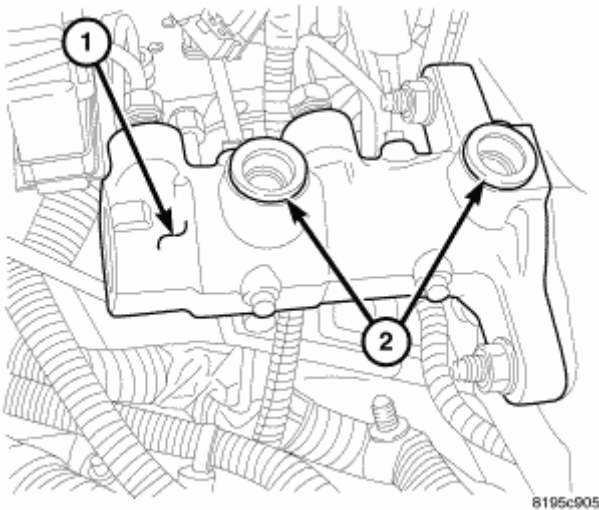
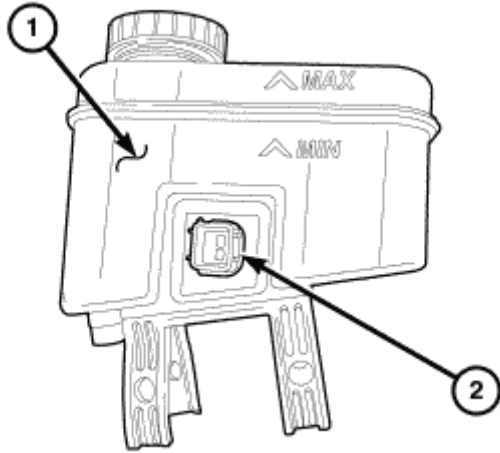


Fig. 72: Master W/O Reservoir
 Courtesy of CHRYSLER LLC

CAUTION: Do not use any type of tool to install the grommets (2). Tools may cut, or tear the grommets creating a leak problem after installation. Install the grommets using finger pressure only and insure that the grommets are properly seated and checked for leaks after installation.

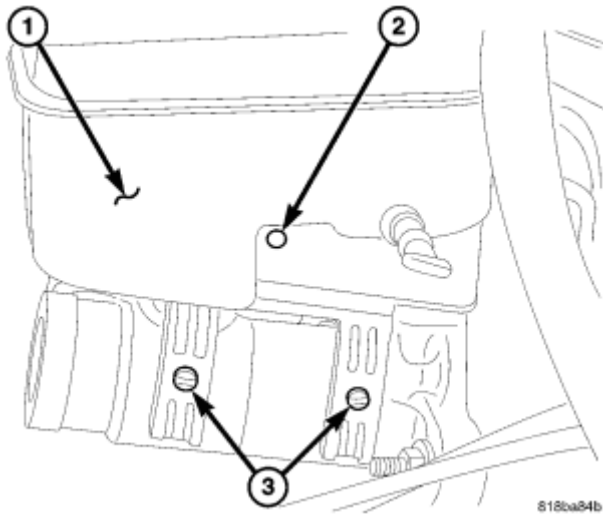
1. Lubricate new grommets (2) with clean brake fluid and Install new grommets (2) onto reservoir outlets (1). Use finger pressure to install and seat grommets.



8195c90c

Fig. 73: Identifying Master Cylinder Reservoir
Courtesy of CHRYSLER LLC

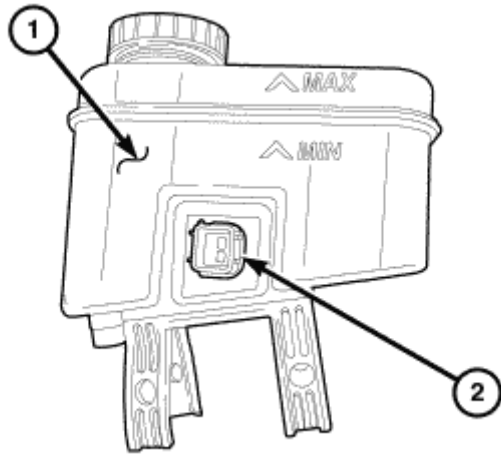
2. Start reservoir (1) and grommets into holes on master cylinder.



818ba84b

Fig. 74: Identifying Reservoir & Tabs
Courtesy of CHRYSLER LLC

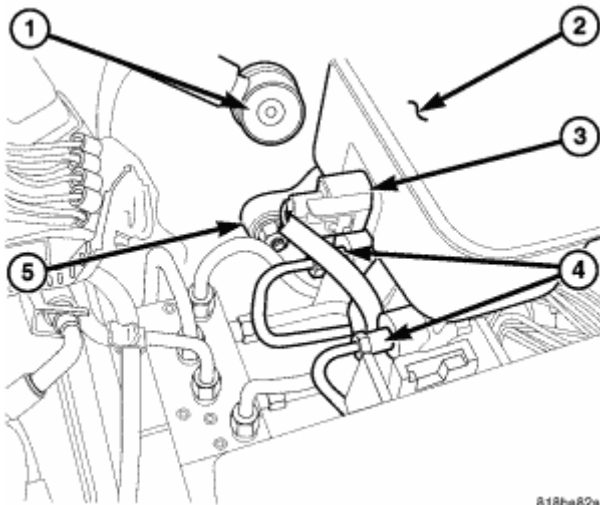
3. Then rock reservoir (1) back and forth while pressing downward to seat it in the holes on the master cylinder. **Make sure the four tabs are securely seated over the nubs (3).**



8195c90c

Fig. 75: Identifying Master Cylinder Reservoir
 Courtesy of CHRYSLER LLC

4. Install the fluid level sensor (2) if removed by just inserting the sensor in the reservoir until the tabs click.



818ba82a

Fig. 76: Identifying Reservoir, Fluid Level Electrical Connector, Brake Lines, Mounting Nuts & Booster Check Valve
 Courtesy of CHRYSLER LLC

5. Reconnect the electrical connector (3) to the fluid reservoir level switch.
6. Remove the prop rod from the vehicle.
7. Fill and bleed base brake system. See **STANDARD PROCEDURE**.

SUPPORT PLATE

REMOVAL

SUPPORT PLATE

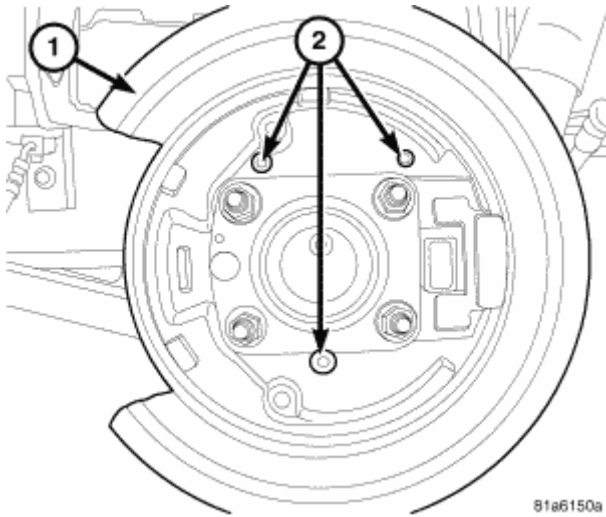


Fig. 77: Identifying Support Plate & Attaching Bolts
 Courtesy of CHRYSLER LLC

1. Remove wheel and tire assembly.
2. Remove the disc brake caliper. See **REMOVAL**.
3. Remove the rotor. See **REMOVAL**.
4. Remove the axle shaft. Refer to **REMOVAL** .
5. Remove the park brake shoes. See **REMOVAL**.
6. Remove the bolts (2) attaching the support plate (1) to the axle and remove the support plate (1).

INSTALLATION

SUPPORT PLATE

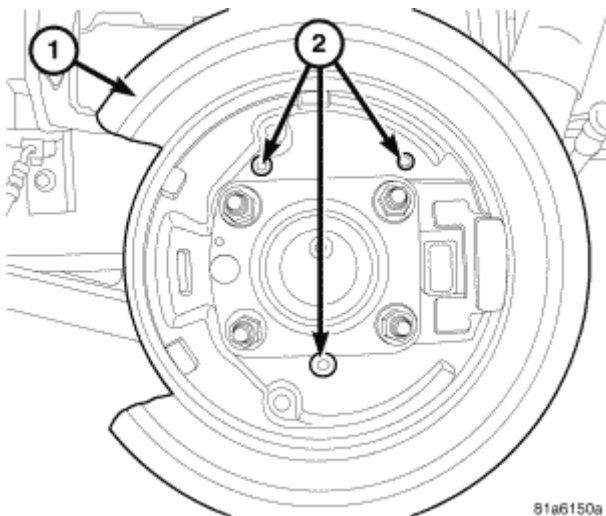


Fig. 78: Identifying Support Plate & Attaching Bolts
 Courtesy of CHRYSLER LLC

1. Install support plate (1) on axle flange. Tighten attaching bolts (2) to 115 N.m (85 ft. lbs.).

2. Install the park brake shoes. See **INSTALLATION**.
3. Install axle shaft. Refer to **INSTALLATION** .
4. Adjust brake shoes to drum with brake gauge. See **ADJUSTMENTS**.
5. Install the rotor. See **INSTALLATION**.
6. Install the caliper. See **INSTALLATION**.
7. Install the wheel and tire assembly. Refer to **STANDARD PROCEDURE** .

PARKING BRAKE

DESCRIPTION

PARKING BRAKE

The parking brake is a hand lever and cable operated system used to apply the rear brakes.

OPERATION

PARKING BRAKE

A hand operated lever in the passenger compartment is the main application device. The front cable is connected between the hand lever and the rear cables with an equalizer.

The rear cables are connected to the actuating lever on each primary brake shoe. The levers are attached to the brake shoes by a pin either pressed into, or welded to the lever. A clip is used to secure the pin in the brake shoe. The pin allows each lever to pivot independently of the brake shoe.

To apply the parking brakes, the hand lever is pulled upward. This pulls the rear brake shoe actuating levers forward, by means of a tensioner and cables. As the actuating lever is pulled forward, the parking brake strut (which is connected to both shoes), exerts a linear force against the secondary brake shoe. This action presses the secondary shoe into contact with the drum. Once the secondary shoe contacts the drum, force is exerted through the strut. This force is transferred through the strut to the primary brake shoe causing it to pivot into the drum as well.

A gear type ratcheting mechanism is used to hold the lever in an applied position. Parking brake release is accomplished by the hand lever release button.

A parking brake switch is mounted on the parking brake lever and is actuated by movement of the lever. The switch, which is in circuit with the red warning light in the dash, will illuminate the warning light whenever the parking brakes are applied.

Parking brake is self-adjusting when the lever is pulled. The cable tensioner, once adjusted at the factory, should not need further adjustment under normal circumstances.

ADJUSTMENTS

PARKING BRAKE LOCK OUT

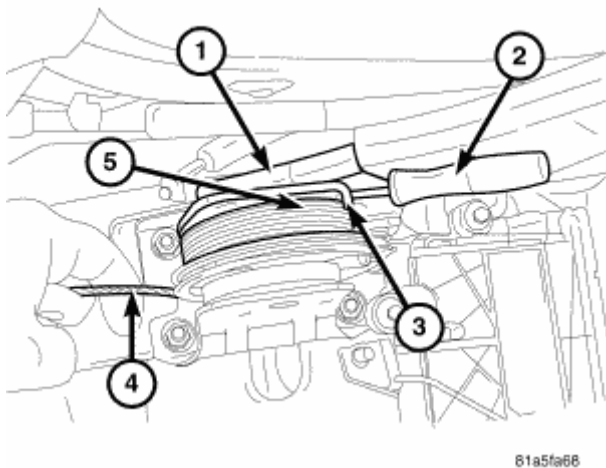


Fig. 79: Parking Brake Lock Out
 Courtesy of CHRYSLER LLC

NOTE: **The parking brake is self-adjusting, it can not be adjusted.**

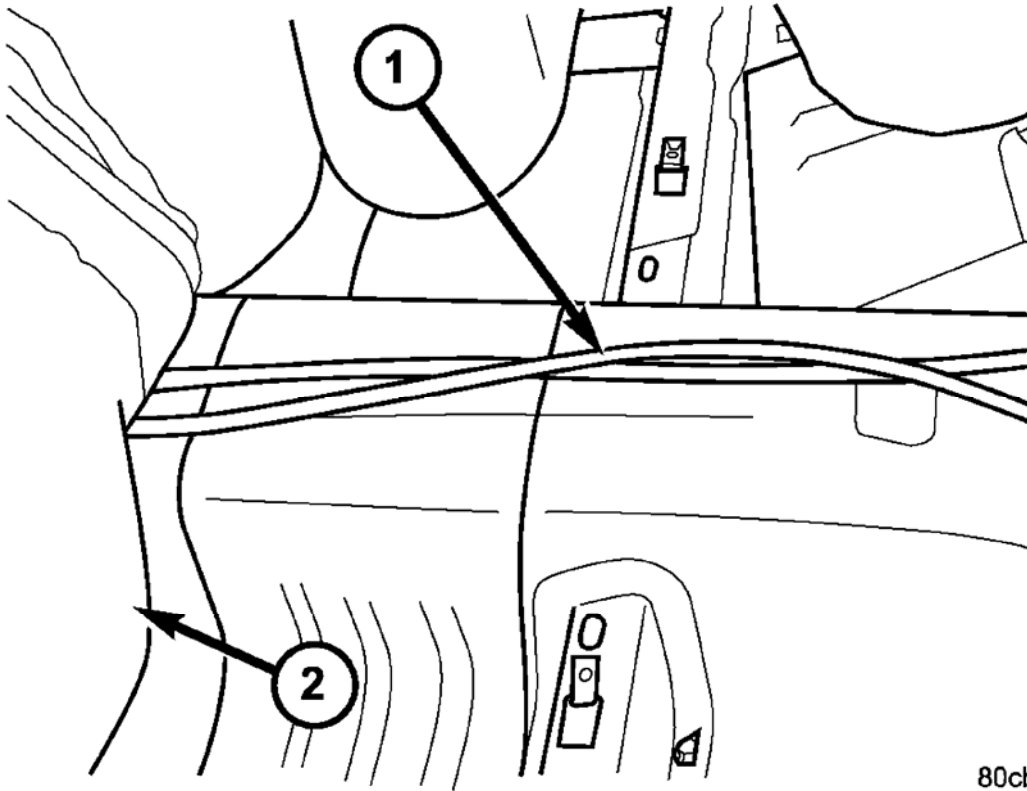
1. Remove the center floor console. Refer to **REMOVAL** .
2. With lever in DOWN position, pull up on the core cable (4) rotating the drum (5) until the drum cut-out aligns with hole on lever tab (3), then install a punch (2) in this hole and drum cut-out. Release grasp on core cable.
3. The park brake system is now locked out to perform necessary repairs.

CABLES

REMOVAL

REAR PARKING BRAKE CABLES

1. Lock out the parking brake cables. See **ADJUSTMENTS**.



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Fig. 80: Mounting Brackets
Courtesy of CHRYSLER LLC

1 - PARK BRAKE CABLES 2 - CARPET

2. Remove the rear seat. Refer to **REMOVAL** .
3. Pull the carpet forward far enough in the rear to gain access to the two parking brake cables through the floor.

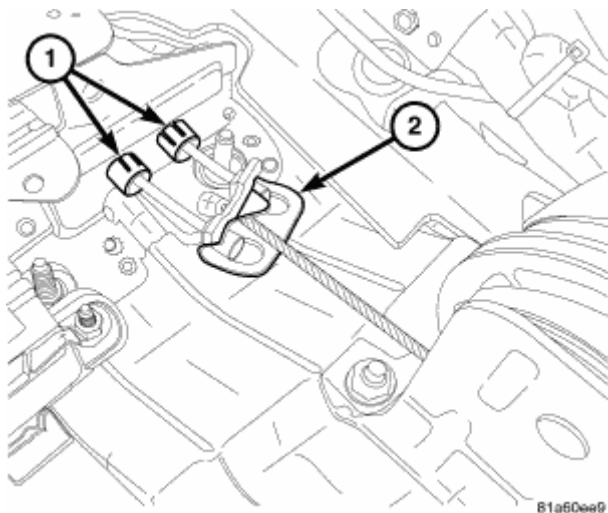


Fig. 81: Identifying Cables & Equalizer
 Courtesy of CHRYSLER LLC

4. Disconnect the two cables (1) from the equalizer (2) and then remove the cables from the mount using a proper sized box end wrench over the tangs.

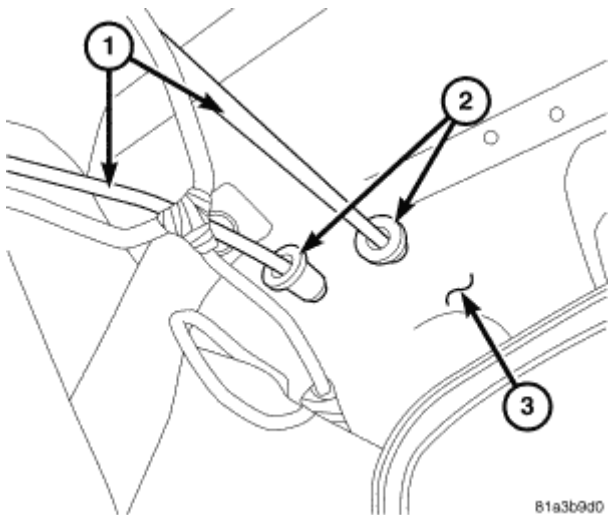


Fig. 82: Identifying Cables, Floor & Grommets
 Courtesy of CHRYSLER LLC

5. Push the cables (1) through the floor (3) with the grommets (2).

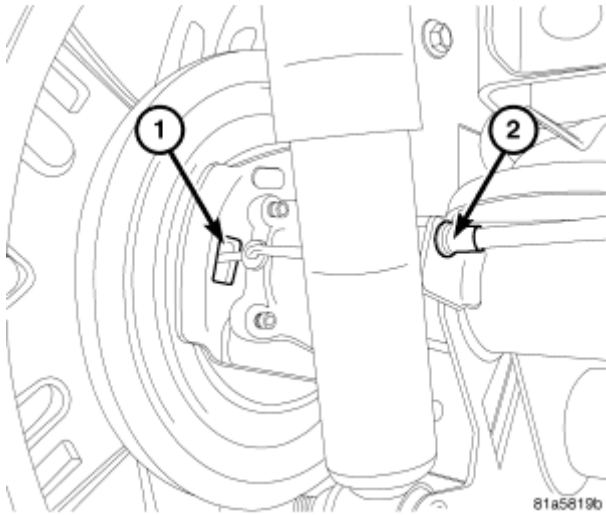


Fig. 83: Identifying Brake Lever & Brake Cable
Courtesy of CHRYSLER LLC

6. Remove the stabilizer bar bracket retainer.
7. Remove the park brake cable from the stabilizer bar retainer and mount.
8. Remove the cable from the axle bracket with a proper sized box end wrench over the tangs.
9. Remove the brake cable (2) from the brake lever (3).

INSTALLATION

REAR PARKING BRAKE CABLES

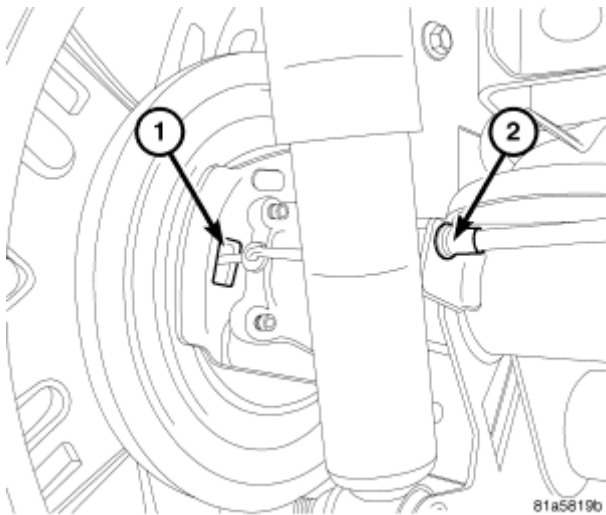


Fig. 84: Identifying Brake Lever & Brake Cable
Courtesy of CHRYSLER LLC

1. Install the cables (2) into the axle bracket.
2. Reconnect the cable to the park brake lever (1).
3. Install the park brake cable between the stabilizer bar retainer bracket and the mount. Tighten the bolts to

47 N.m (35 ft. lbs.).

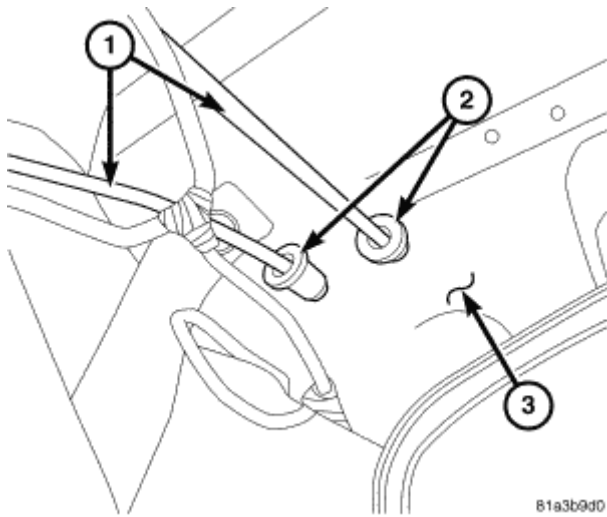


Fig. 85: Identifying Cables, Floor & Grommets
Courtesy of CHRYSLER LLC

4. Push the cables (1) through the floor (3) and seat the grommets (2).

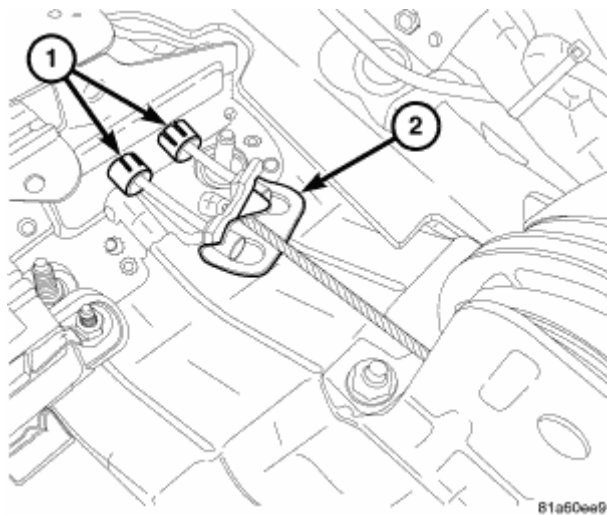
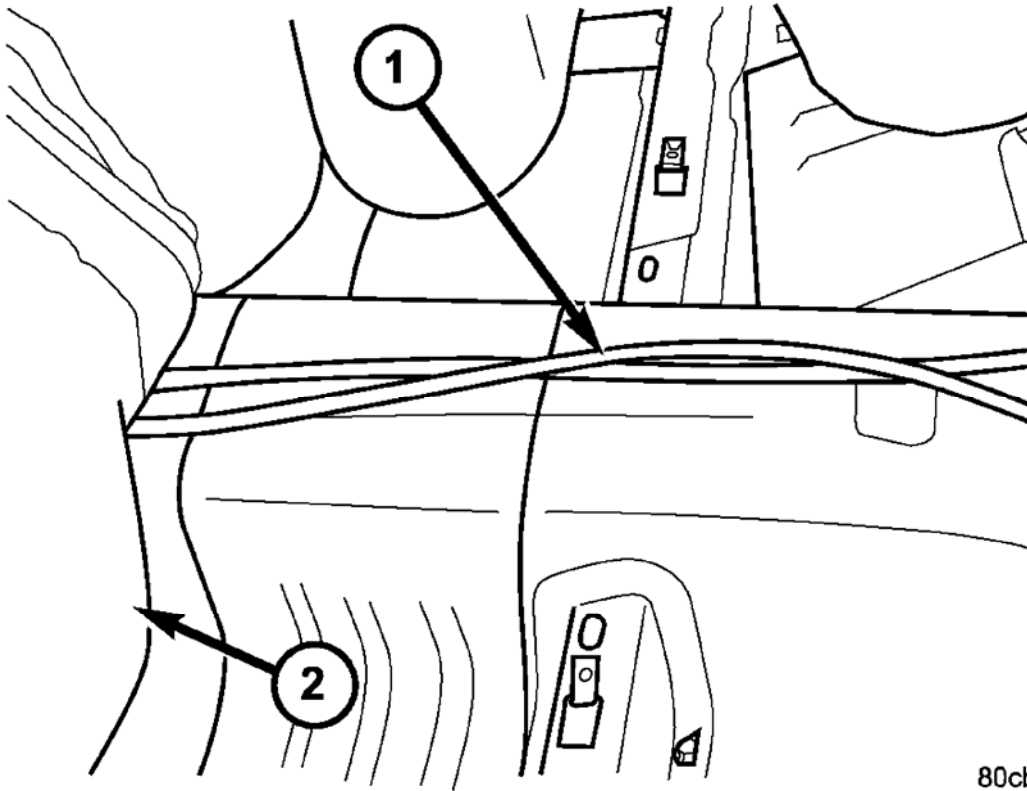


Fig. 86: Identifying Cables & Equalizer
Courtesy of CHRYSLER LLC

5. Reconnect the two cables (1) to the front mount and then to the equalizer (2).



80cb48d2

Fig. 87: Mounting Brackets
Courtesy of CHRYSLER LLC

- | |
|-------------------------------------|
| 1 - PARK BRAKE CABLES
2 - CARPET |
|-------------------------------------|

6. Lay the carpet (2) back down in the rear.
7. Install the rear seat. Refer to **INSTALLATION** .
8. Remove the lock out device on the lever.
9. Adjust the park brake shoes. See **ADJUSTMENTS**.
10. Test the parking brake.

LEVER

REMOVAL

PARKING BRAKE LEVER

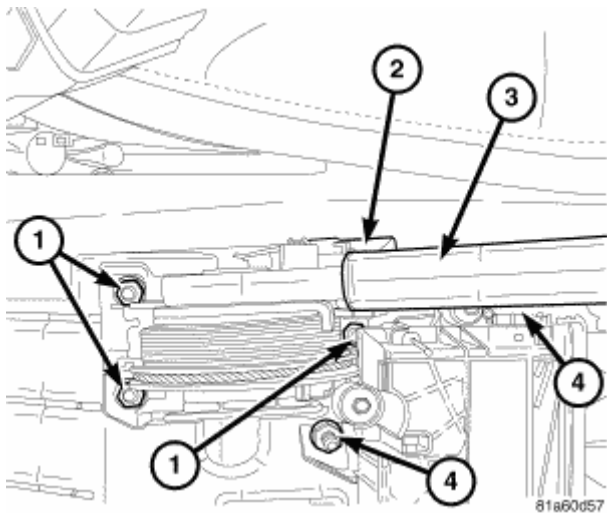


Fig. 88: Identifying Parking Brake Lever Assembly Mounting Nuts, Parking Brake Lamp Switch Wire, Lever Assembly & Occupant Restraint Controller Mounting Nuts
 Courtesy of CHRYSLER LLC

1. Remove the center floor console. Refer to **REMOVAL** .
2. Lock out the parking brakes. See **ADJUSTMENTS**.
3. Disengage the front cables from the equalizer.
4. Disconnect the parking brake lamp switch wire (2).
5. Remove the occupant restraint controller mounting nuts (4). Refer to **REMOVAL** .
6. Remove the parking brake lever assembly mounting nuts (1).
7. Remove the lever assembly (3).

INSTALLATION

PARKING BRAKE LEVER

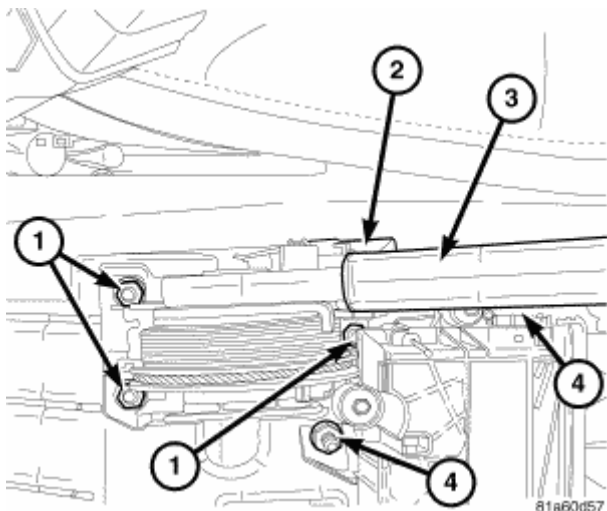


Fig. 89: Identifying Parking Brake Lever Assembly Mounting Nuts, Parking Brake Lamp Switch Wire, Lever Assembly & Occupant Restraint Controller Mounting Nuts

Courtesy of CHRYSLER LLC

1. Install the parking brake lever assembly (3).
2. Install the parking brake lever assembly (3) to the mounting bolts and tighten the nuts (1) to 16 N.m (140 in. lbs.).
3. Engage the front cables to the equalizer.
4. Reconnect the parking brake lamp switch wire (2).
5. If installing a new parking brake lever remove the pin that comes on the lever when shipped.
6. If you are reinstalling the original park brake lever remove the lock out device at this time.
7. Install the occupant restraint controller. Refer to **INSTALLATION** .
8. Test the parking brake lever.
9. Install the center floor console. Refer to **INSTALLATION** .

SHOES

DESCRIPTION

DRUM IN HAT PARK BRAKES

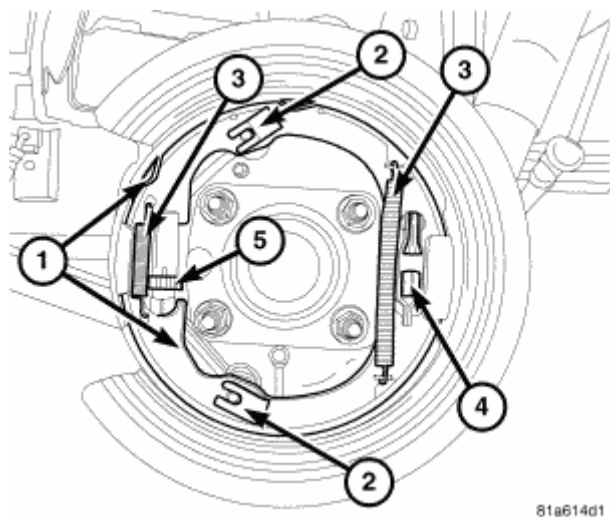


Fig. 90: Identifying Brake Shoes

Courtesy of CHRYSLER LLC

Drum in hat park brakes are dual shoe, internal expanding units with an automatic self adjusting mechanism.

OPERATION

DRUM IN HAT PARK BRAKE

When the parking brake lever is pulled the brake cable pulls the brake shoes outward against the brake drum. When the brake lever is released the return springs attached to the brake shoes pull the shoes back to their original position.

REMOVAL

PARK BRAKE SHOES - DRUM IN HAT

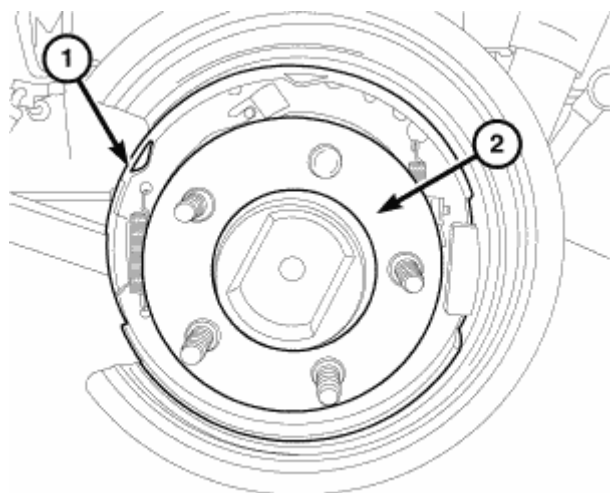


Fig. 91: Identifying Rear Park Brake Shoes & Axle Shaft
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the disc brake caliper. See **REMOVAL**.
4. Remove the disc brake rotor. See **REMOVAL**.
5. Remove the axle shaft (2). Refer to **REMOVAL**.

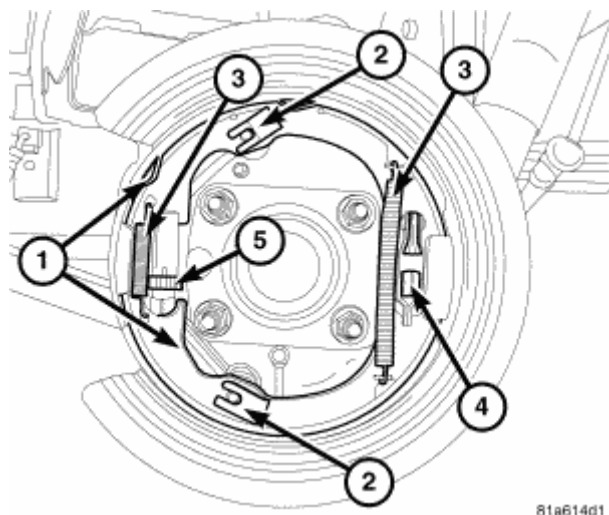


Fig. 92: Identifying Brake Shoes
Courtesy of CHRYSLER LLC

6. Disassemble the rear park brake shoes (1).

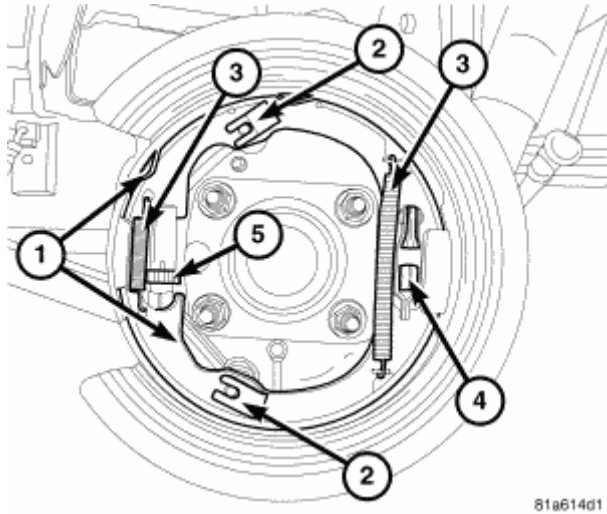
CLEANING

REAR DRUM IN HAT BRAKE

Clean the individual brake components, including the support plate exterior, with a water dampened cloth or with brake cleaner. Do not use any other cleaning agents. Remove light rust and scale from the brake shoe contact pads on the support plate with fine sandpaper.

INSPECTION

REAR DRUM IN HAT BRAKE



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Fig. 93: Identifying Brake Shoes
Courtesy of CHRYSLER LLC

As a general rule, riveted brake shoes (1) should be replaced when worn to within 0.78 mm (1/32 in.) of the rivet heads. Bonded lining should be replaced when worn to a thickness of 1.6 mm (1/16 in.).

Examine the lining contact pattern to determine if the shoes are bent or the drum is tapered. The lining should exhibit contact across its entire width. Shoes exhibiting contact only on one side should be replaced and the drum checked for runout or taper.

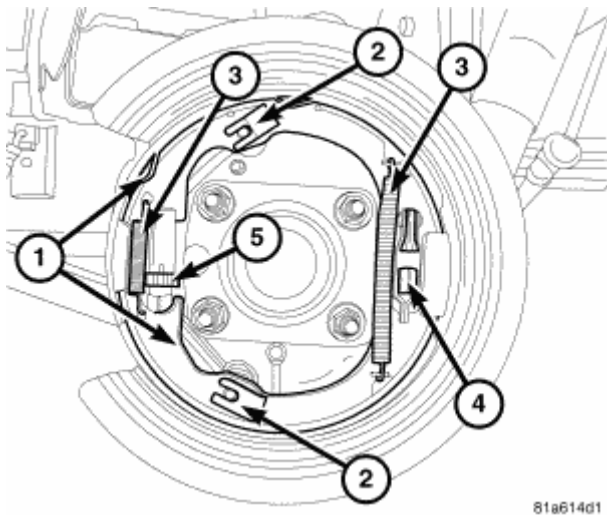
Inspect the adjuster screw assembly. Replace the assembly if the star wheel or threads are damaged, or the components are severely rusted or corroded.

Discard the brake springs and retainer components if worn, distorted or collapsed. Also replace the springs if a brake drag condition had occurred. Overheating will distort and weaken the springs.

Inspect the brake shoe contact pads on the support plate, replace the support plate if any of the pads are worn or rusted through. Also replace the plate if it is bent or distorted.

INSTALLATION

PARK BRAKE SHOES - DRUM IN HAT

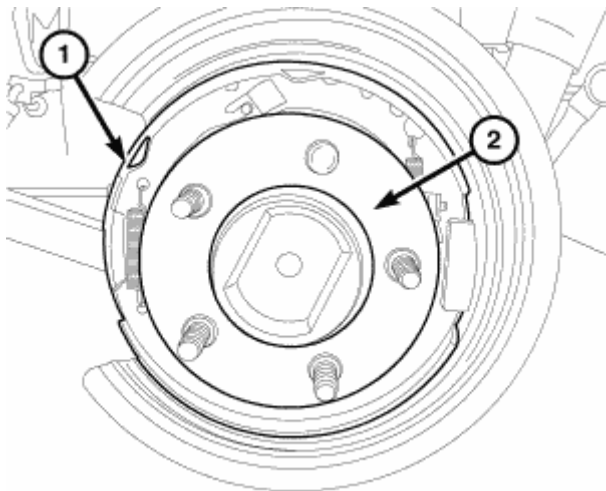


81a614d1

Fig. 94: Identifying Brake Shoes
Courtesy of CHRYSLER LLC

NOTE: On a new vehicle or after parking brake lining replacement, it is recommended that the parking brake system be conditioned prior to use. This is done by making one stop from 25 mph on dry pavement or concrete using light to moderate force on the parking brake lever.

1. Reassemble the rear park brake shoes (1).
2. Adjust the rear brake shoes (5). See **ADJUSTMENTS**.



81a614c1

Fig. 95: Identifying Rear Park Brake Shoes & Axle Shaft
Courtesy of CHRYSLER LLC

3. Install the axle shaft (2). Refer to **INSTALLATION**.
4. Install the disc brake rotor. See **INSTALLATION**.
5. Install the disc brake caliper. See **INSTALLATION**.

6. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
7. Lower the vehicle.

ADJUSTMENTS

REAR DRUM IN HAT PARK BRAKE (ROTOR INSTALLED) USING ADJUSTMENT TOOL

Adjustment can be made with a standard brake gauge or with adjusting tool. Adjustment is performed with the complete brake assembly installed on the backing plate.

1. Be sure parking brake lever is fully released.
2. Raise vehicle so rear wheels can be rotated freely.
3. Remove plug from each access hole in brake support plates.
4. Insert adjusting tool through support plate access hole and engage tool in teeth of adjusting screw star wheel. See **Fig. 96**.

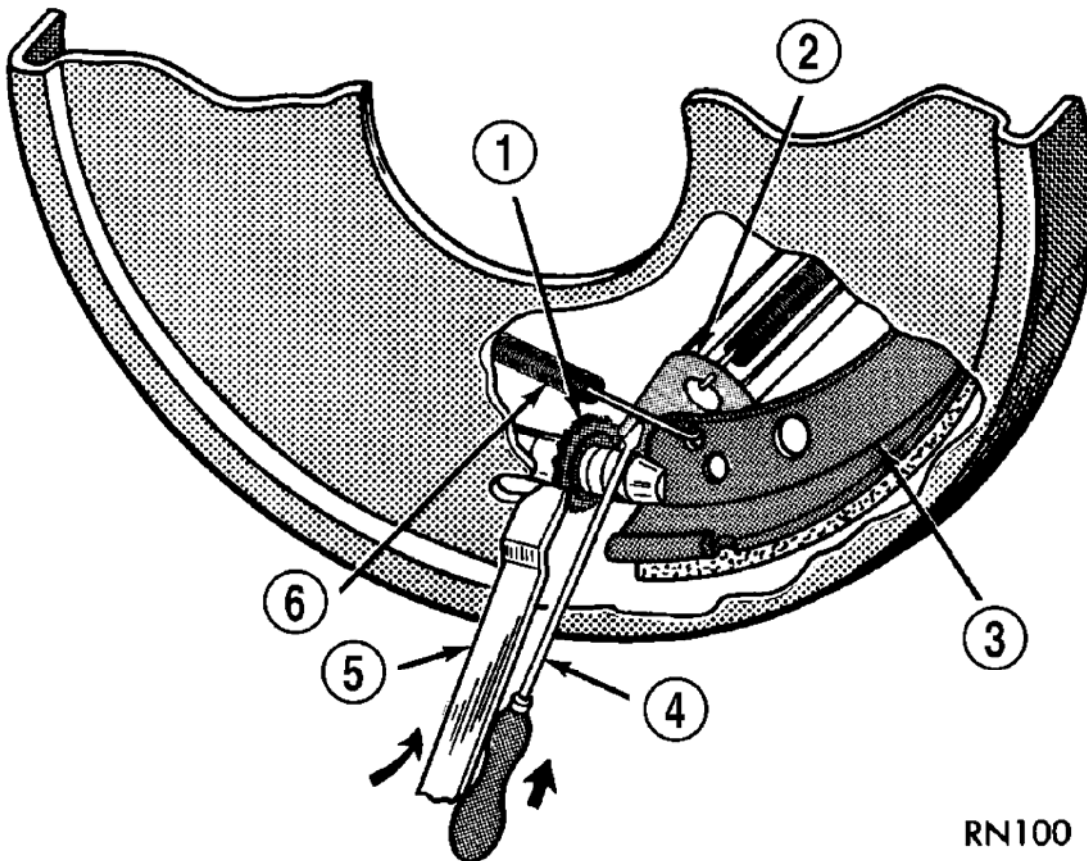


Fig. 96: Brake Adjustment
Courtesy of CHRYSLER LLC

2 - LEVER
3 - BRAKE SHOE WEB
4 - SCREWDRIVER
5 - ADJUSTING TOOL
6 - ADJUSTER SPRING

5. Rotate adjuster screw star wheel (move tool handle upward) until slight drag can be felt when wheel is rotated.
6. Push and hold adjuster lever away from star wheel with thin screwdriver.
7. Back off adjuster screw star wheel until brake drag is eliminated.
8. Repeat adjustment at opposite wheel. Be sure adjustment is equal at both wheels.
9. Install support plate access hole plugs.
10. Lower vehicle.
11. Apply park brake hand lever and make sure park brakes hold the vehicle stationary.
12. Release park brake hand lever.

REAR DRUM IN HAT PARK BRAKE (ROTOR REMOVED)

Under normal circumstances, the only time adjustment is required is when the shoes are replaced, removed for access to other parts, or when one or both rotors are replaced.

Adjustment can be made with a standard brake gauge or with adjusting tool. Adjustment is performed with the complete brake assembly installed on the backing plate.

CAUTION: Before adjusting the park brake shoes be sure that the park brake lever is in the fully released position. If park brake lever is not in the fully released position, the park brake shoes can not be accurately adjusted.

1. Raise vehicle.
2. Remove tire and wheel.
3. Remove disc brake caliper from caliper adapter. See **REMOVAL**.
4. Remove rotor from the axle shaft. See **REMOVAL**.

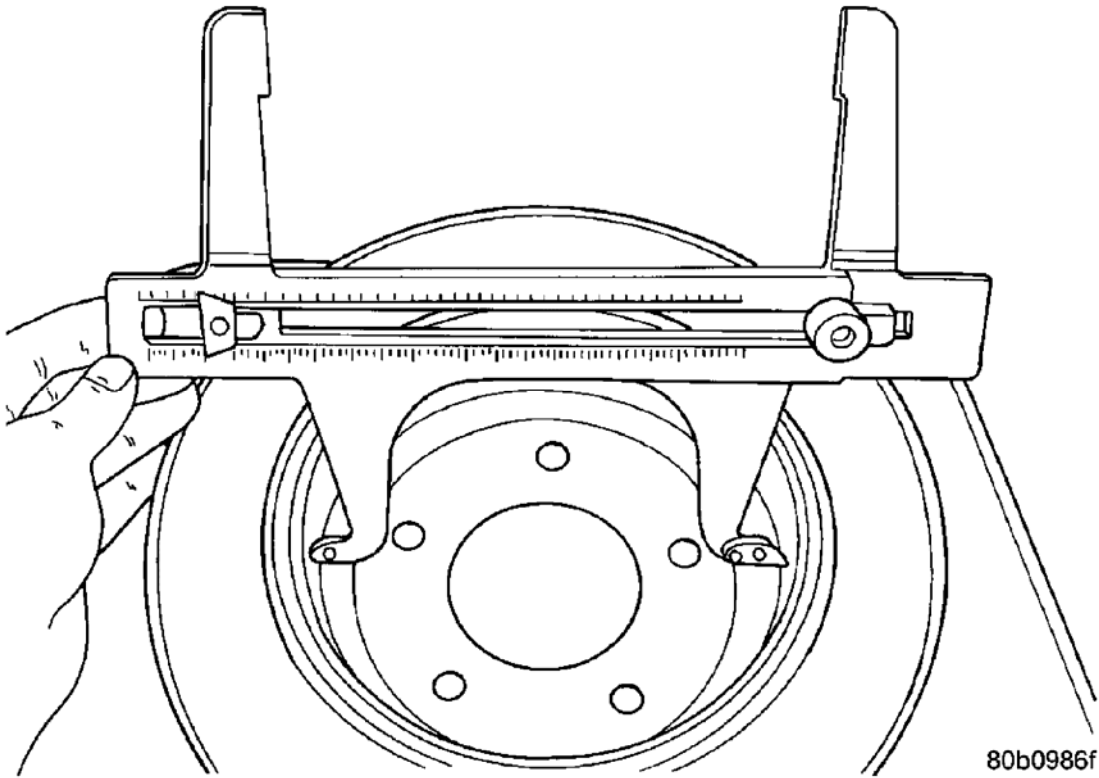


Fig. 97: Measuring Park Brake Drum Diameter
Courtesy of CHRYSLER LLC

NOTE: When measuring the brake drum diameter, the diameter should be measured in the center of the area in which the park brake shoes contact the surface of the brake drum.

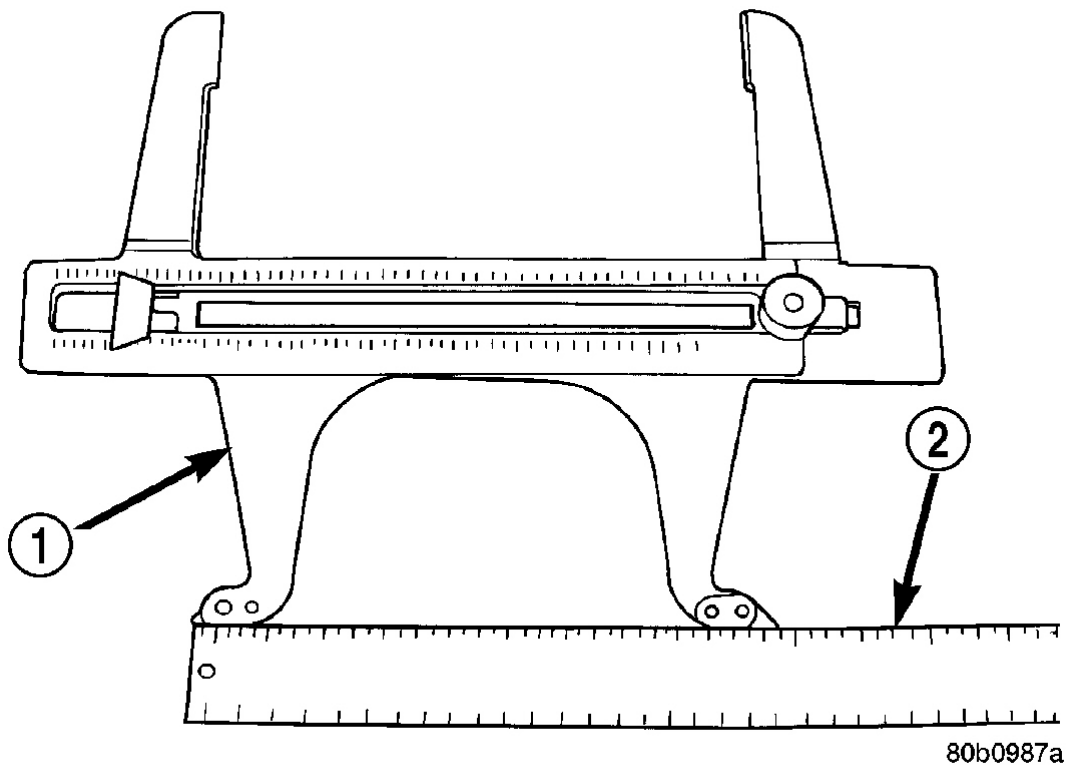
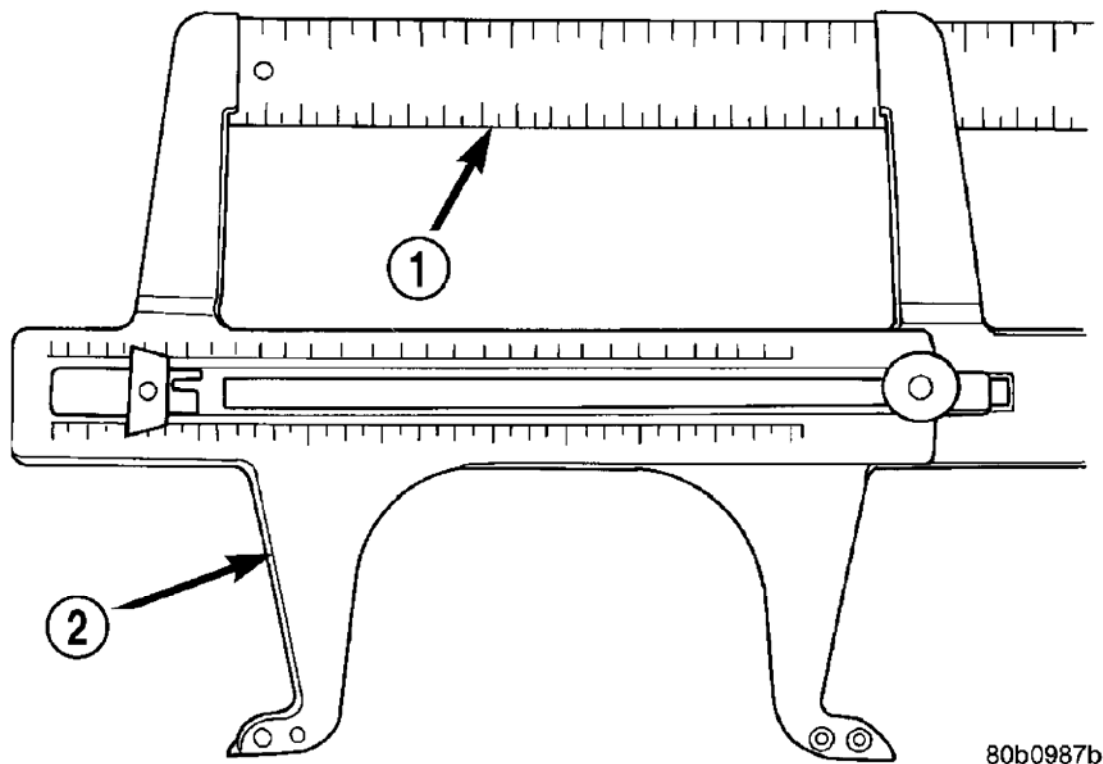


Fig. 98: Reading Park Brake Drum Diameter
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL C-3919
2 - RULER

5. Using Brake Shoe Gauge, Special Tool C-3919 (1), or equivalent, **accurately** measure the inside diameter of the park brake drum portion of the rotor. See **Fig. 97**.
6. Using a ruler (2) that reads in 64th of an inch, accurately read the measurement of the inside diameter of the park brake drum from the special tool. See **Fig. 98**.



80b0987b

Fig. 99: Setting Gauge To Park Brake Shoe Measurement
Courtesy of CHRYSLER LLC

- | |
|--------------------------------------|
| 1 - RULER
2 - SPECIAL TOOL C-3919 |
|--------------------------------------|

7. Reduce the inside diameter measurement of the brake drum that was taken using Special Tool C-3919 (2) by 1/64 of an inch. Reset Gauge, Brake Shoe, Special Tool C-3919 (2) or the equivalent used, so that the outside measurement jaws are set to the reduced measurement. See **Fig. 99**.
8. Place Gauge, Brake Shoe, Special Tool C-3919 (2), or equivalent over the park brake shoes. The special tool must be located diagonally across at the top of one shoe and bottom of opposite shoe (widest point) of the park brake shoes.
9. Using the star wheel adjuster, adjust the park brake shoes until the lining on the park brake shoes just touches the jaws on the special tool.
10. Repeat step 8 above and measure shoes in both directions.
11. Install brake rotor on the axle shaft. See **INSTALLATION**.
12. Rotate rotor to verify that the park brake shoes are not dragging on the brake drum. If park brake shoes are dragging, remove rotor and back off star wheel adjuster one notch and recheck for brake shoe drag against drum. Continue with the previous step until brake shoes are not dragging on brake drum.
13. Install disc brake caliper on caliper adapter. See **INSTALLATION**.
14. Install wheel and tire.
15. Tighten the wheel mounting nuts in the proper sequence until all nuts are torqued to half the specified

torque. Then repeat the tightening sequence to the full specified torque of 129 N.m (95 ft. lbs.).

16. Lower vehicle.

CAUTION: Before moving vehicle, pump brake pedal several times to ensure the vehicle has a firm enough pedal to stop the vehicle.

NOTE: After parking brake lining replacement, it is recommended that the parking brake system be conditioned prior to use. This is done by making one stop from 25 mph on dry pavement or concrete using light to moderate force on the parking brake hand lever.

17. Road test the vehicle to ensure proper function of the vehicle's brake system.

Charging System - Liberty

CHARGING SYSTEM

DESCRIPTION

CHARGING SYSTEM

The charging system consists of:

Generator

Electronic Voltage Regulator (EVR) circuitry within the Powertrain Control Module (PCM)

Ignition switch

Battery (refer to **BATTERY SYSTEM - SERVICE INFORMATION** article for information)

Battery temperature sensor

Generator Lamp (if equipped)

Check Gauges Lamp (if equipped)

Wiring harness and connections (refer to **SYSTEM WIRING DIAGRAMS** article for information)

OPERATION

CHARGING SYSTEM

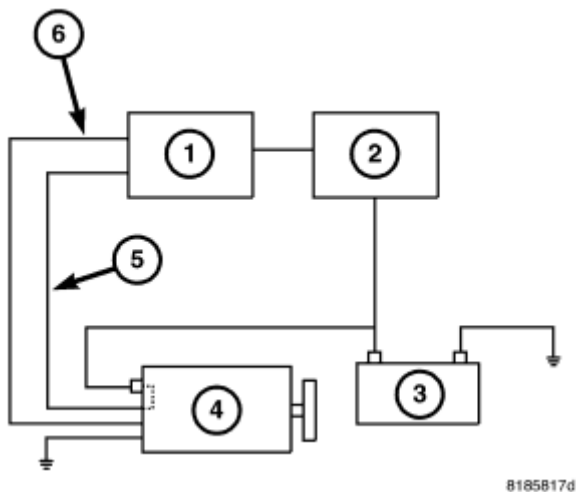


Fig. 1: CHARGING SYSTEM
Courtesy of CHRYSLER LLC

- 1 - PCM
- 2 - TIPM
- 3 - Battery

- 4 - Generator
- 5 - Feed Back Circuit B+
- 6 - Control Circuit
- 7 - Battery Sense

On gasoline powered engines, the charging system is turned on and off with the PCM (Powertrain Control Module) and ignition switch with engine running. On diesel powered engines, the charging system is turned on and off with the ECM (Engine Control Module) and ignition switch with engine running. The field circuit will not be energized until engine is running and ignition switch on. This voltage is connected through the PCM and supplied to one of the generator field terminals (Gen. Source B+) at the back of the generator. The generator is internally grounded. The generator regulates the field using pin-1 of the field connector (high side driver).

The generator is driven by the engine through a serpentine belt and pulley, or a decoupler pulley arrangement.

The PCM, or ECM receives a voltage input from the generator (5) and also a battery voltage input (7) from the TIPM (Totally Integrated Power Module), it then compares the voltages to the desired voltage programmed in the EVR (Electronic Voltage Regulator) software, and, if there is a difference it sends a signal to the generator EVR circuit to increase or decrease output. It uses a Pulse Width Modulation (PWM) to send signals to the generator circuitry to control the amount of output from the generator. The amount of DC current produced by the generator is controlled by the EVR circuitry contained within the generator.

All vehicles are equipped with On-Board Diagnostics (OBD). All OBD-sensed systems, including EVR circuitry, are monitored by the PCM. Each monitored circuit is assigned a Diagnostic Trouble Code (DTC). The PCM will store a DTC in electronic memory for certain failures it detects.

The Check Gauges Lamp (if equipped) monitors: **charging system voltage**, engine coolant temperature and engine oil pressure. If an extreme condition is indicated, the lamp will be illuminated. This is done as reminder to check the three gauges. The lamp is located on the instrument panel.

Voltage is monitored at the B+ terminal stud to insure it is connected. If the B+ cable is loose, the PCM will shut down generator field. Because of this new feature, pin-2 of the field connector is internally connected to the B+ terminal.

The generator used with diesel engines is internally regulated. The generator and ECM communicate for diagnostics, etc. If the generator regulator becomes disconnected from the ECM, it will still operate, but in a default mode.

DIAGNOSIS AND TESTING

CHARGING SYSTEM

The following procedures may be used to diagnose the charging system if:

- the check gauges lamp (if equipped) is illuminated with the engine running
- the voltmeter (if equipped) does not register properly
- an undercharged or overcharged battery condition occurs.

Remember that an undercharged battery is often caused by:

- accessories being left on with the engine not running
- a faulty or improperly adjusted switch that allows a lamp to stay on.

INSPECTION

The Powertrain Control Module (PCM) monitors critical input and output circuits of the charging system, making sure they are operational. A Diagnostic Trouble Code (DTC) is assigned to each input and output circuit monitored by the On-Board Diagnostic (OBD) system. Some charging system circuits are checked continuously, and some are checked only under certain conditions.

To perform a complete test of the charging system, use a diagnostic scan tool. Perform the following inspections before attaching the scan tool.

1. Inspect the battery condition. Refer to **BATTERY SYSTEM - SERVICE INFORMATION** article for procedures.
2. Inspect condition of battery cable terminals, battery posts, connections at engine block, starter solenoid and relay. They should be clean and tight. Repair as required.
3. Inspect all fuses in both the fuse block and Power Distribution Center (PDC) for tightness in receptacles. They should be properly installed and tight. Repair or replace as required.
4. Inspect generator mounting bolts for tightness. Replace or tighten bolts if required. Refer to **GENERATOR** for torque specifications.
5. Inspect generator drive belt condition and tension. Tighten or replace belt as required. Refer to Belt Tension Specifications in **SPECIFICATIONS** .
6. Inspect automatic belt tensioner (if equipped). Refer to **COOLING** article for information.
7. Inspect generator electrical connections at generator field, battery output, and ground terminal (if equipped). Also check generator ground wire connection at engine (if equipped). They should all be clean and tight. Repair as required.

SPECIFICATIONS

GENERATOR RATINGS

TYPE	RATED SAE AMPS	ENGINES
DENSO	136	3.7L
DENSO	160	3.7L
DENSO	180	2.8L Diesel

GENERATOR TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Generator Horizontal Mounting Bolts - 3.7L	57	42	-
Generator Vertical	40	29	-

Mounting Bolt - 3.7L			
Generator Mounting Bolts - 2.8L Diesel	54	40	-
Rear Generator Support Bracket Bolts (to engine) - 2.8L Diesel	28	-	250
B+ Cable Terminal Nut	13	10	115
Generator Decoupler	110	81	-

SPECIAL TOOLS

SPECIAL TOOLS

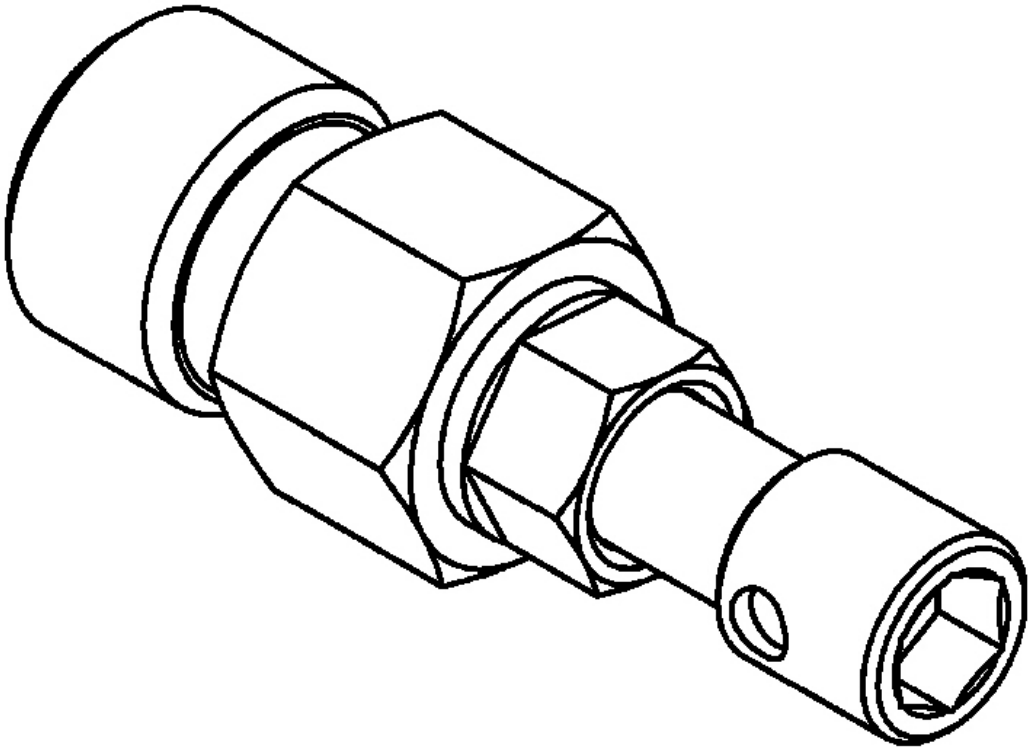
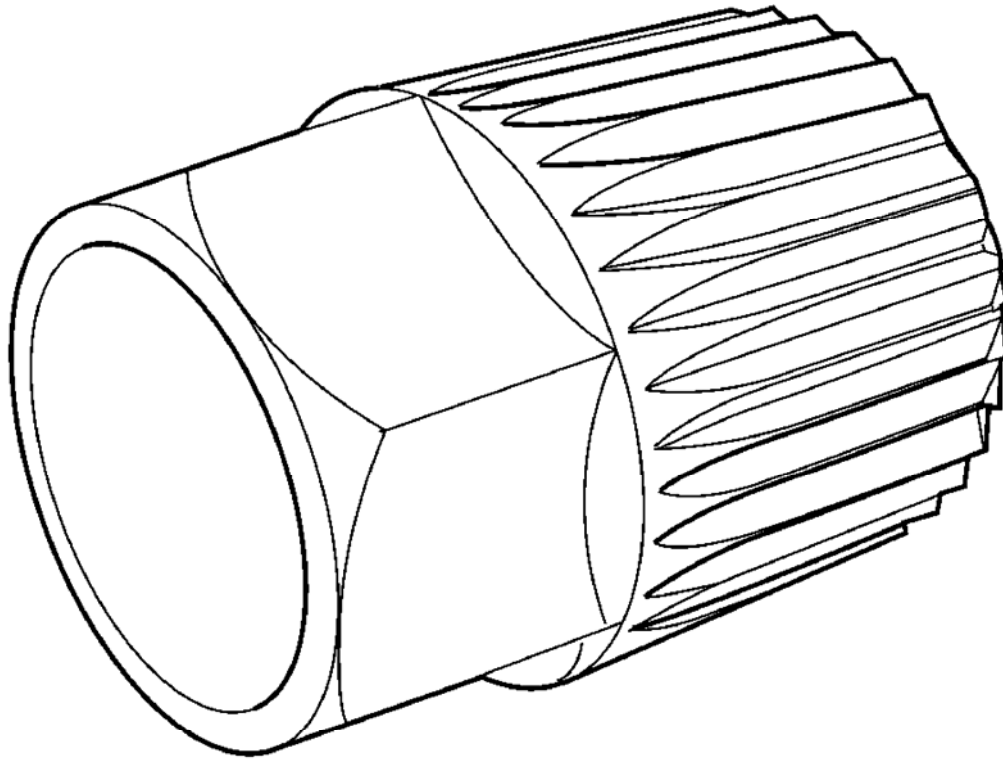


Fig. 2: Generator Decoupler Tool #8433
Courtesy of CHRYSLER LLC



80cb8152

Fig. 3: Generator Decoupler Tool #8823
Courtesy of CHRYSLER LLC

GENERATOR

DESCRIPTION

GENERATOR

The generator is belt-driven by the engine using a serpentine type drive belt. It is serviced only as a complete assembly. If the generator fails for any reason, the entire assembly must be replaced.

OPERATION

GENERATOR

As the energized rotor begins to rotate within the generator, the spinning magnetic field induces a current into the windings of the stator coil. Once the generator begins producing sufficient current, it also provides the current needed to energize the rotor.

The stator winding connections deliver the induced AC current to 3 positive and 3 negative diodes for rectification. From the diodes, rectified DC current is delivered to the vehicle electrical system through the generator battery terminal.

Although the generators appear the same externally, different generators with different output ratings are used on this vehicle. Be certain that the replacement generator has the same output rating and part number as the original unit. Refer to **SPECIFICATIONS** and see Generator Ratings for amperage ratings and part numbers.

Noise emitting from the generator may be caused by: worn, loose or defective bearings; a loose or defective drive pulley; incorrect, worn, damaged or misadjusted fan drive belt; loose mounting bolts; a misaligned drive pulley or a defective stator or diode.

REMOVAL

REMOVAL - 2.8L DIESEL

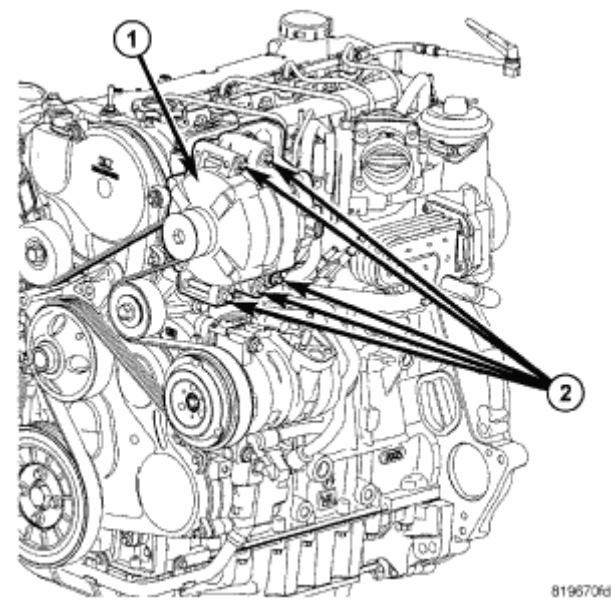


Fig. 4: Identifying Generator & Mounting Bolts
Courtesy of CHRYSLER LLC

CAUTION: Disconnect negative cable from battery before removing battery output wire from generator. Failure to do so can result in injury.

1. Disconnect and isolate negative battery cable at battery.

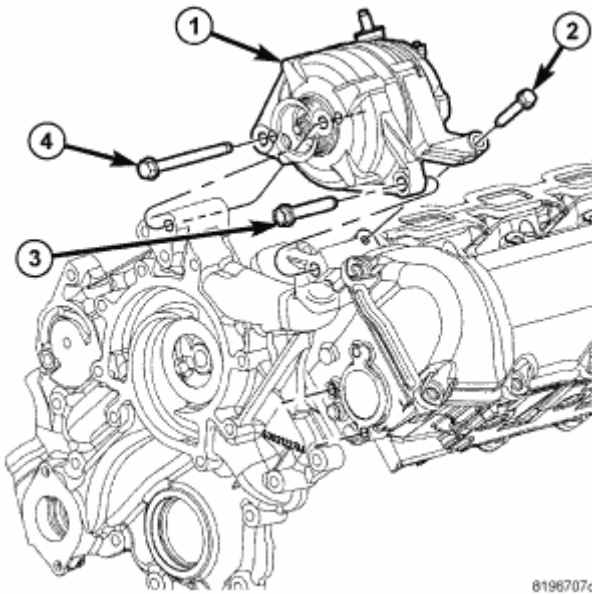
CAUTION: Never force a belt over a pulley rim using a screwdriver. The synthetic fiber of the belt can be damaged.

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump will be rotating in the wrong

direction if the belt is installed incorrectly, causing the engine to overheat. Refer to belt routing label in engine compartment, or refer to Belt Schematics in COOLING article .

2. Remove generator drive belt. Refer to COOLING article for procedures.
3. Unsnap plastic protective cover from B+ mounting stud.
4. Remove B+ terminal mounting nut at top of generator.
5. Disconnect field wire electrical connector at rear of generator by pushing on connector tab.
6. Remove four generator mounting bolts (2).
7. Remove generator (1) from vehicle.

REMOVAL - 3.7L



8198707c

Fig. 5: Identifying Generator & Mounting Bolts
Courtesy of CHRYSLER LLC

CAUTION: Disconnect negative cable from battery before removing battery output wire from generator. Failure to do so can result in injury.

1. Disconnect and isolate negative battery cable at battery.

CAUTION: Never force a belt over a pulley rim using a screwdriver. The synthetic fiber of the belt can be damaged.

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump will be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to

overheat. Refer to belt routing label in engine compartment, or refer to Belt Schematics in COOLING article .

2. Remove generator drive belt. Refer to COOLING article for procedures.
3. Unsnap plastic protective cover from B+ mounting stud.
4. Remove B+ terminal mounting nut at top of generator.
5. Disconnect field wire electrical connector at rear of generator by pushing on connector tab.
6. Remove one vertical generator mounting bolt (2) and two horizontal mounting bolts (3) and (4).
7. Remove generator (1) from vehicle.

INSTALLATION

INSTALLATION - 2.8L DIESEL

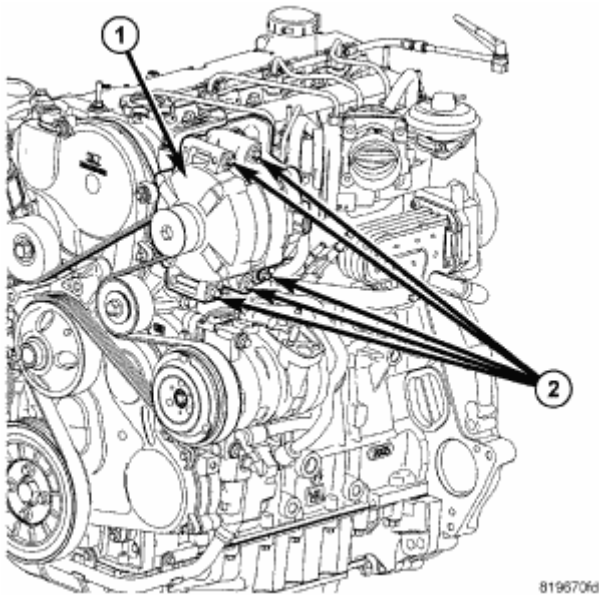


Fig. 6: Identifying Generator & Mounting Bolts
Courtesy of CHRYSLER LLC

1. Position generator (1) to engine and install four mounting bolts (2). Tighten all four bolts to 54 N.m (40 ft. lbs.).
2. Snap field wire connector into rear of generator.
3. Install B+ terminal and nut to generator mounting stud. Tighten nut to 13 N.m (115 in. lbs.)
4. Snap plastic protective cover to B+ terminal.

CAUTION: Never force a belt over a pulley rim using a screwdriver. The synthetic fiber of the belt can be damaged.

CAUTION: When installing a serpentine accessory drive belt, the belt MUST be

routed correctly. The water pump will be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to overheat. Refer to belt routing label in engine compartment, or refer to Belt Schematics in COOLING article .

5. Install drive belt. Refer to COOLING article for belt routing, belt adjustment and bolt tightening procedures.
6. Install negative battery cable to battery.

INSTALLATION - 3.7L

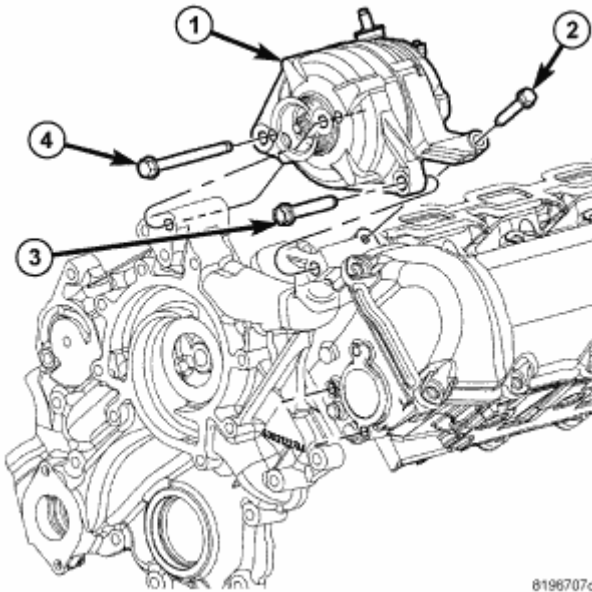


Fig. 7: Identifying Generator & Mounting Bolts
Courtesy of CHRYSLER LLC

1. Position generator (1) to engine and install three mounting bolts (2), (3) and (4). Tighten two horizontal mounting bolts (3) and (4) to 57 N.m (42 ft. lbs.). Tighten vertical mounting bolt (2) to 40 N.m (29 ft. lbs.)
2. Snap field wire connector into rear of generator.
3. Install B+ terminal and nut to generator mounting stud. Tighten nut to 13 N.m (115 in. lbs.)
4. Snap plastic protective cover to B+ terminal.

CAUTION: Never force a belt over a pulley rim using a screwdriver. The synthetic fiber of the belt can be damaged.

CAUTION: When installing a serpentine accessory drive belt, the belt **MUST** be routed correctly. The water pump will be rotating in the wrong direction if the belt is installed incorrectly, causing the engine to overheat. Refer to belt routing label in engine compartment, or refer

to Belt Schematics in COOLING article .

5. Install drive belt. Refer to COOLING article for belt routing, belt adjustment and bolt tightening procedures.
6. Install negative battery cable to battery.

PULLEY - GENERATOR DECOUPLER

DESCRIPTION

GENERATOR DECOUPLER

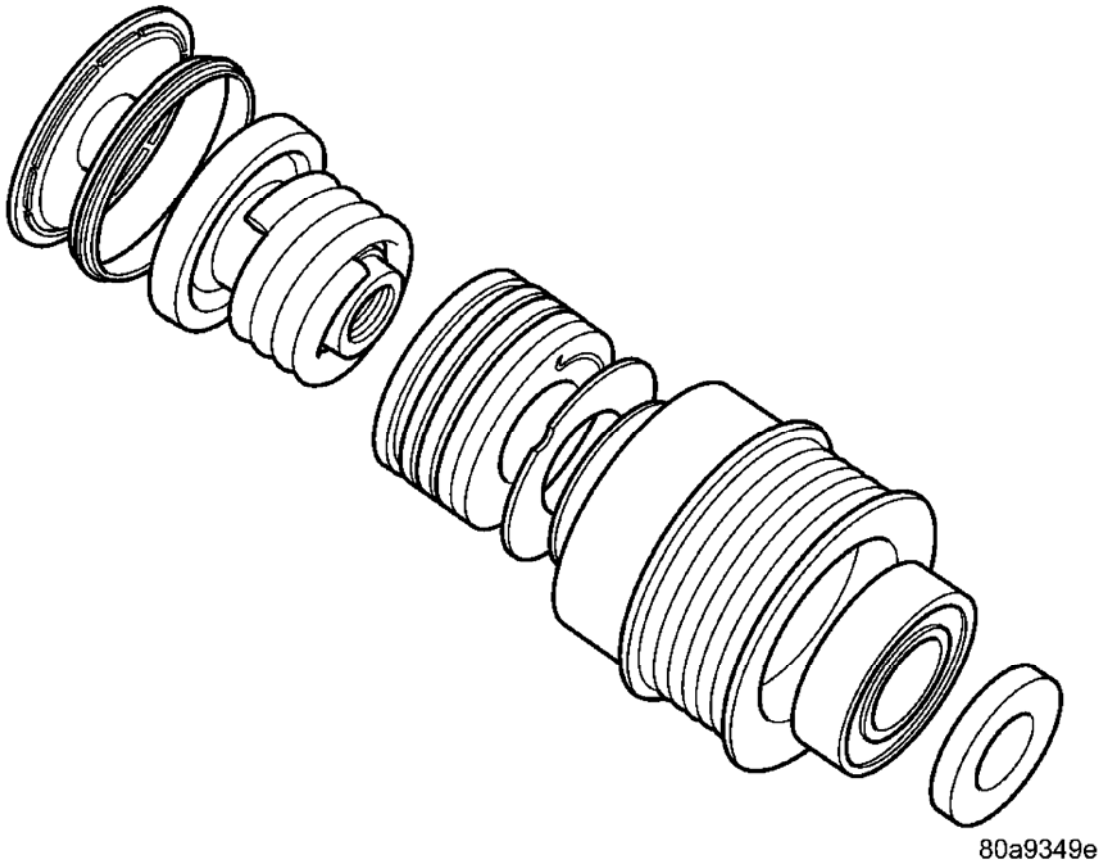


Fig. 8: Generator Decoupler Pulley
Courtesy of CHRYSLER LLC

The generator decoupler is used only with certain engines. The decoupler is used in place of the standard generator drive pulley.

OPERATION

GENERATOR DECOUPLER

The generator decoupler is used only with certain engines. The decoupler is a one-way clutch designed to help reduce belt tension fluctuation, vibration, reduce fatigue loads, improve belt life, reduce hubloads on components, and reduce noise. Dry operation is used (no grease or lubricants). The decoupler is not temperature sensitive and also has a low sensitivity to electrical load. The decoupler is a non-serviceable item and is to be replaced as an assembly. See **Fig. 8**.

DIAGNOSIS AND TESTING

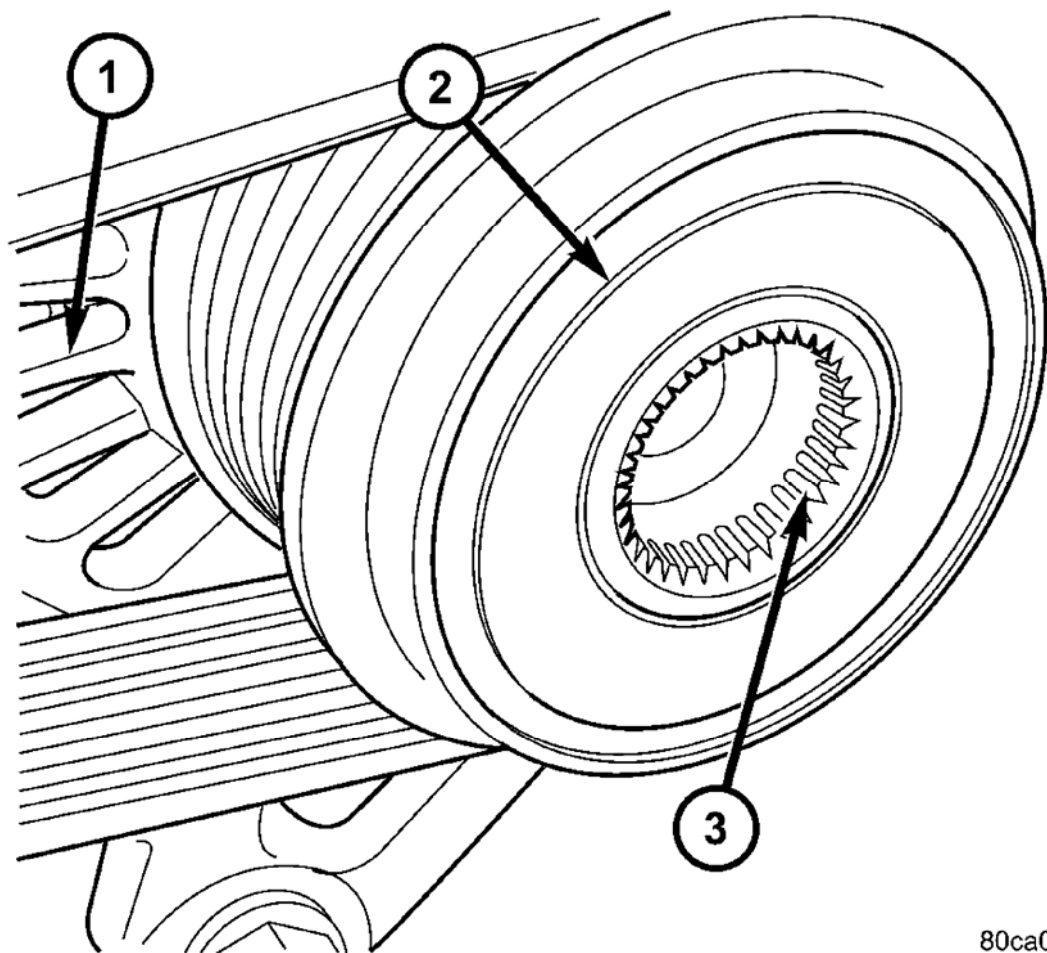
GENERATOR DECOUPLER

CONDITION	POSSIBLE CAUSES	CORRECTION
Does not drive generator (generator not charging)	Internal failure -	Replace decoupler -
Noise coming from decoupler	Internal failure	Replace decoupler

REMOVAL

GENERATOR DECOUPLER

The generator decoupler is used only with certain engines.

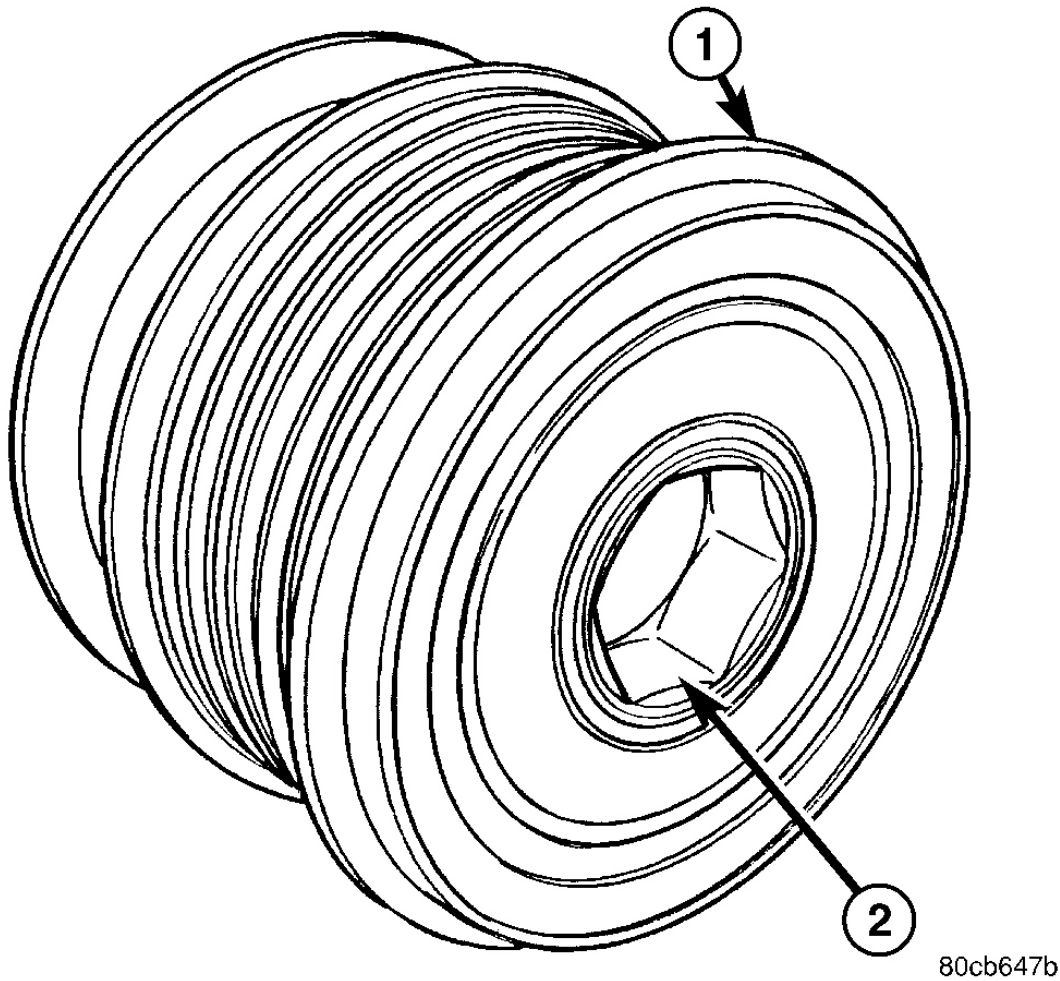


80ca0870

Fig. 9: Generator Decoupler Pulley (INA)
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - GENERATOR
2 - DECOUPLER (INA)
3 - MACHINED SPLINES |
|--|

Two different type generator decoupler pulleys are used. One can be identified by the use of machined splines (3). See **Fig. 9**.



80cb647b

Fig. 10: Generator Decoupler Pulley (Litens)
Courtesy of CHRYSLER LLC

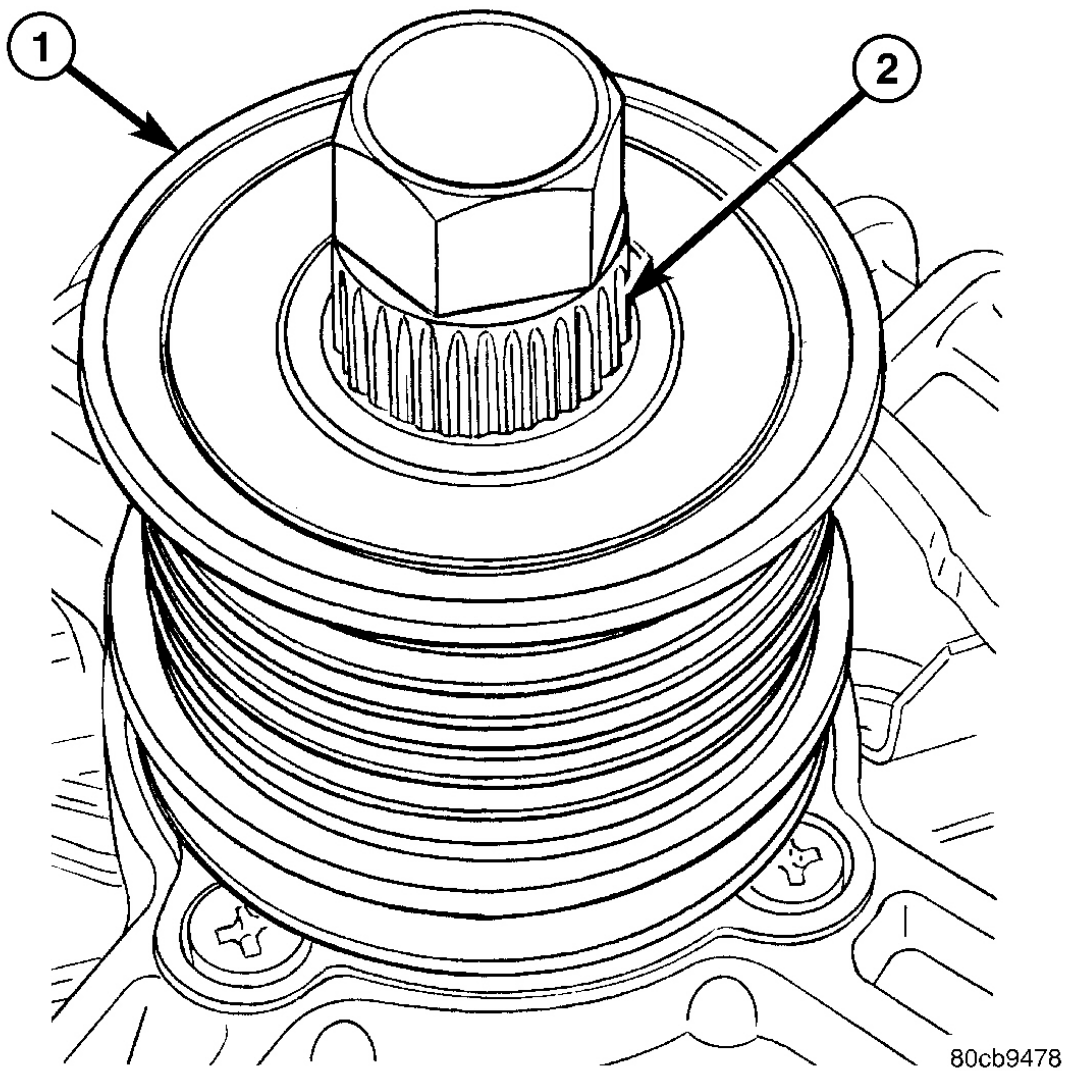
- | |
|---|
| 1 - DECOUPLER (LITENS)
2 - HEX OPENING |
|---|

The other decoupler is equipped with a hex opening (2) and will not use splines. See **Fig. 10**.

Different special tools are required to service each different decoupler. Refer to following procedure.

INA Decoupler

1. Disconnect negative battery cable.
2. Remove generator and accessory drive belt. Refer to **REMOVAL** .

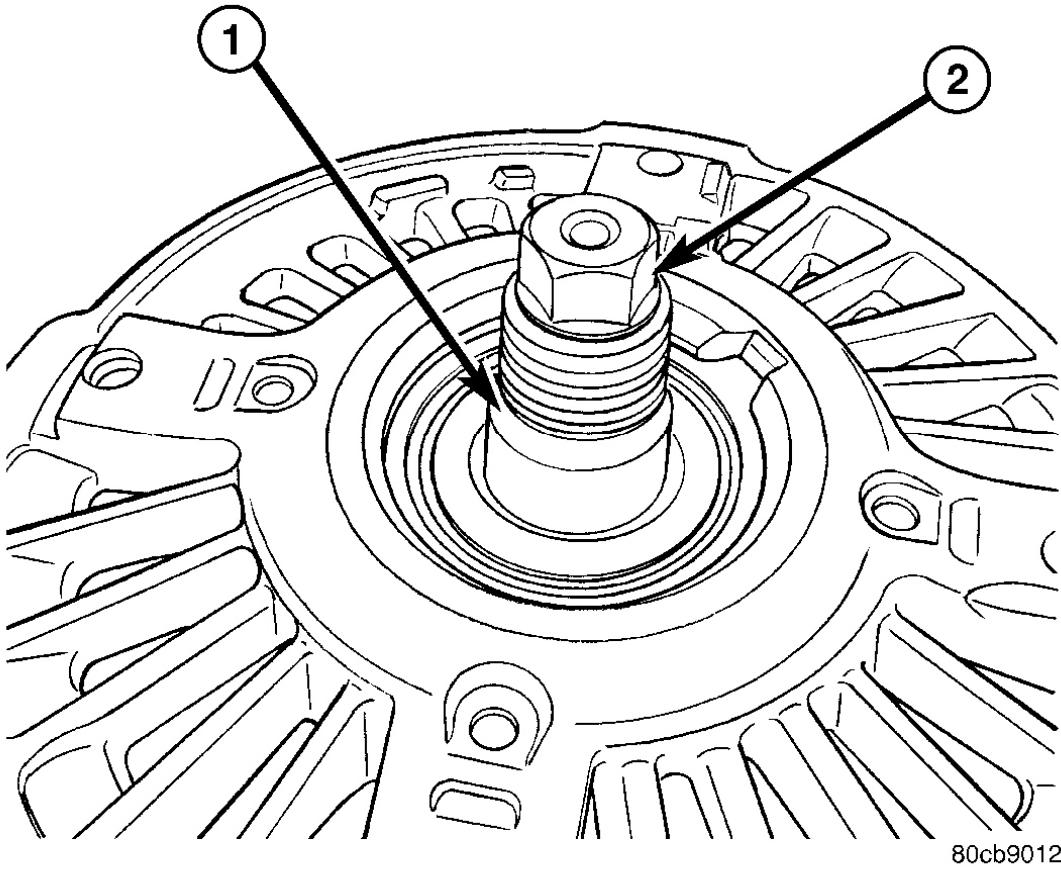


80cb9478

Fig. 11: #8823 Tool & INA Decoupler
Courtesy of CHRYSLER LLC

1 - INA DECOUPLER 2 - TOOL #8823 (VM.1048)

3. Position Special Tool #8823 (VM.1048) (2) into decoupler (1). See **Fig. 11**.

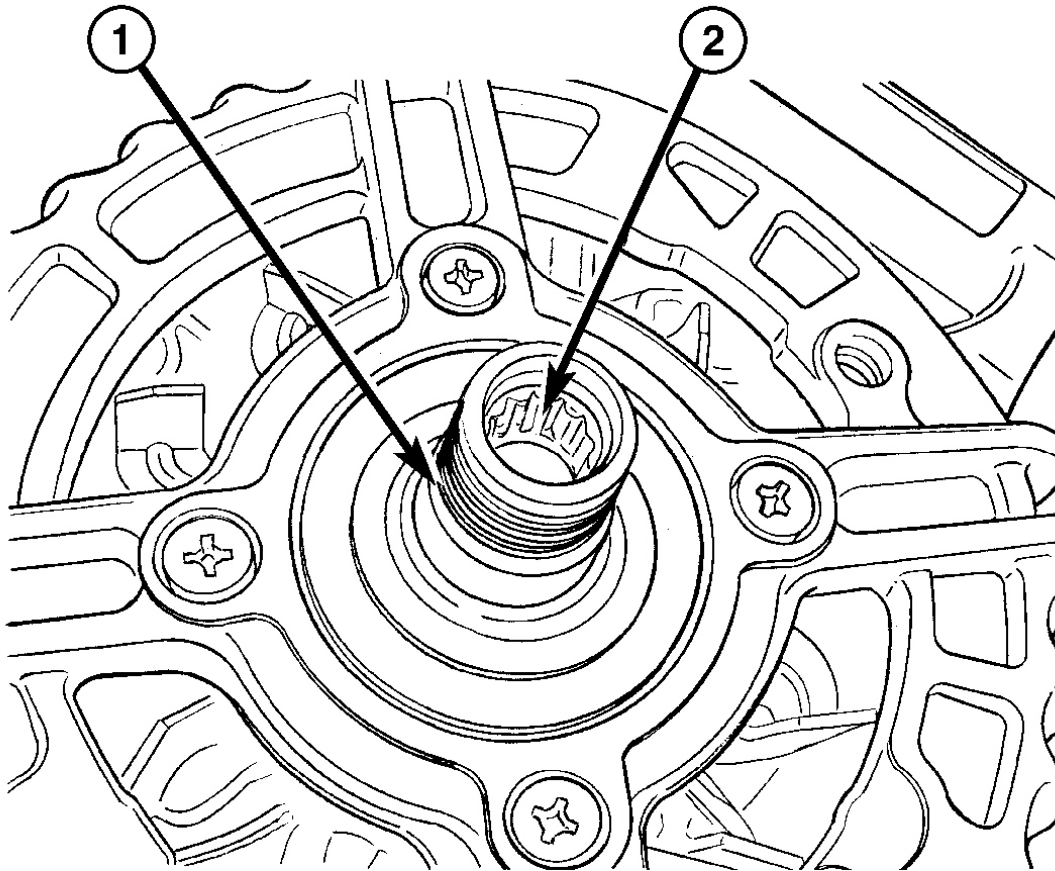


80cb9012

Fig. 12: End Of Generator Shaft (Hex)
Courtesy of CHRYSLER LLC

1 - GENERATOR SHAFT 2 - HEX

4. Determine if end of generator shaft is hex shaped (2). See **Fig. 12**.



80cb9020

Fig. 13: End Of Generator Shaft (Splined)
Courtesy of CHRYSLER LLC

1 - GENERATOR SHAFT 2 - SPLINES

5. Determine if end of generator shaft is splined (2). See **Fig. 13**.

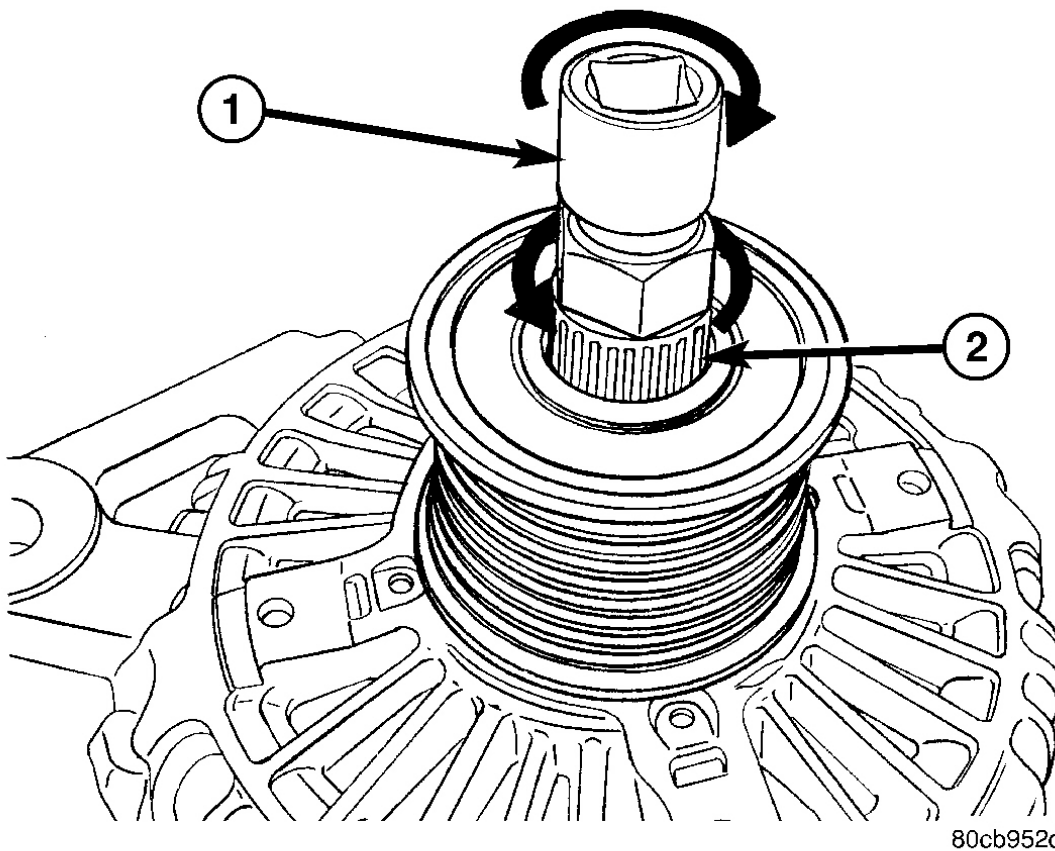


Fig. 14: Decoupler Removal (INA-Hex)
Courtesy of CHRYSLER LLC

1 - DEEP 10 MM SOCKET 2 - TOOL #8823 (VM.1048)

6. If hex is used, insert a 10-MM deep socket (1) into tool #8823 (VM.1048). See **Fig. 14**.

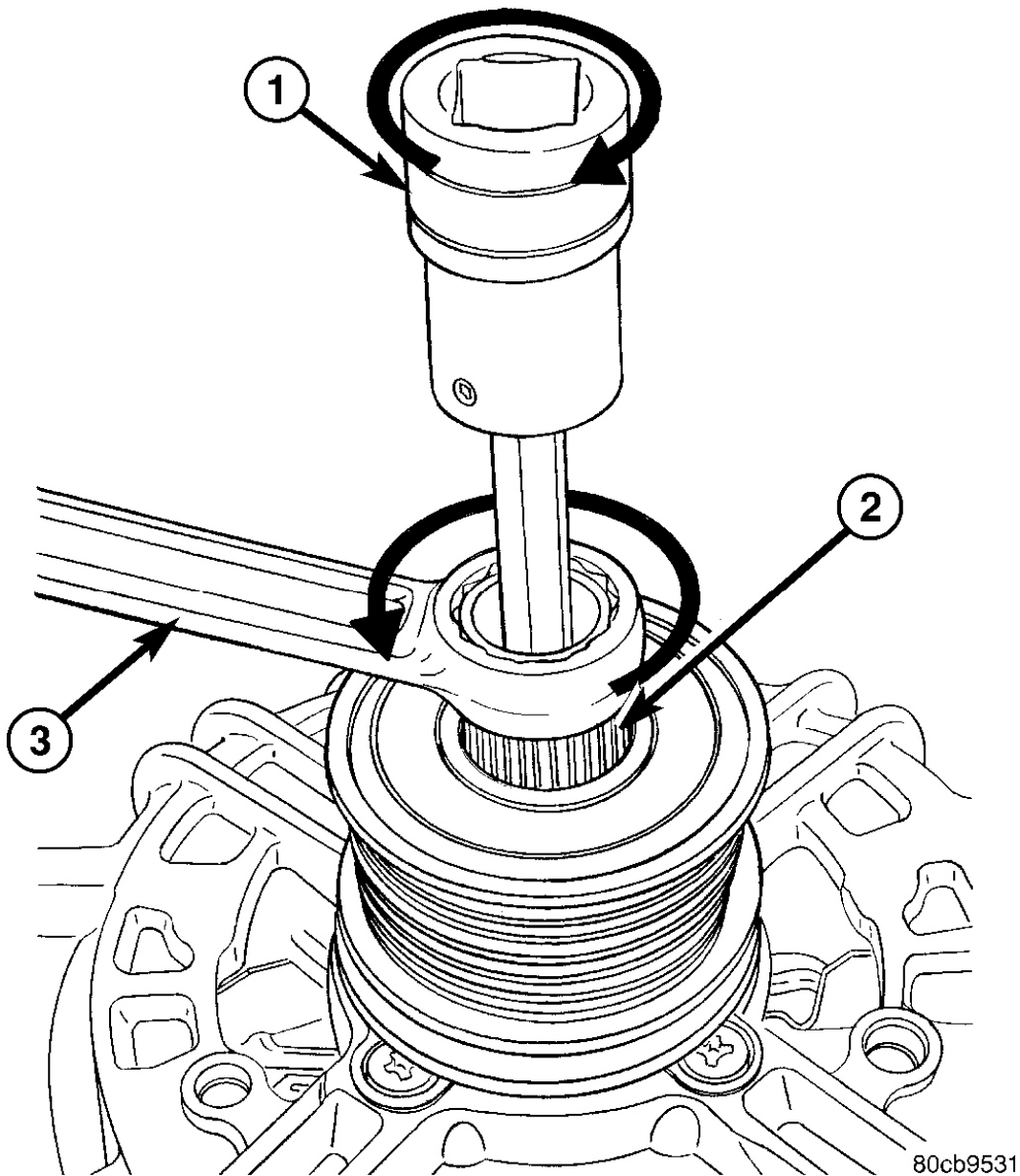


Fig. 15: Decoupler Removal (INA-Splined)
Courtesy of CHRYSLER LLC

- | |
|--------------------------|
| 1 - DRIVER |
| 2 - TOOL #8823 (VM.1048) |
| 3 - 17 MM WRENCH |

7. If splined, insert a 5/16" 6-point hex driver (1), or a 10-MM 12-point triple square driver into tool #8823 (VM.1048). See **Fig. 15**.

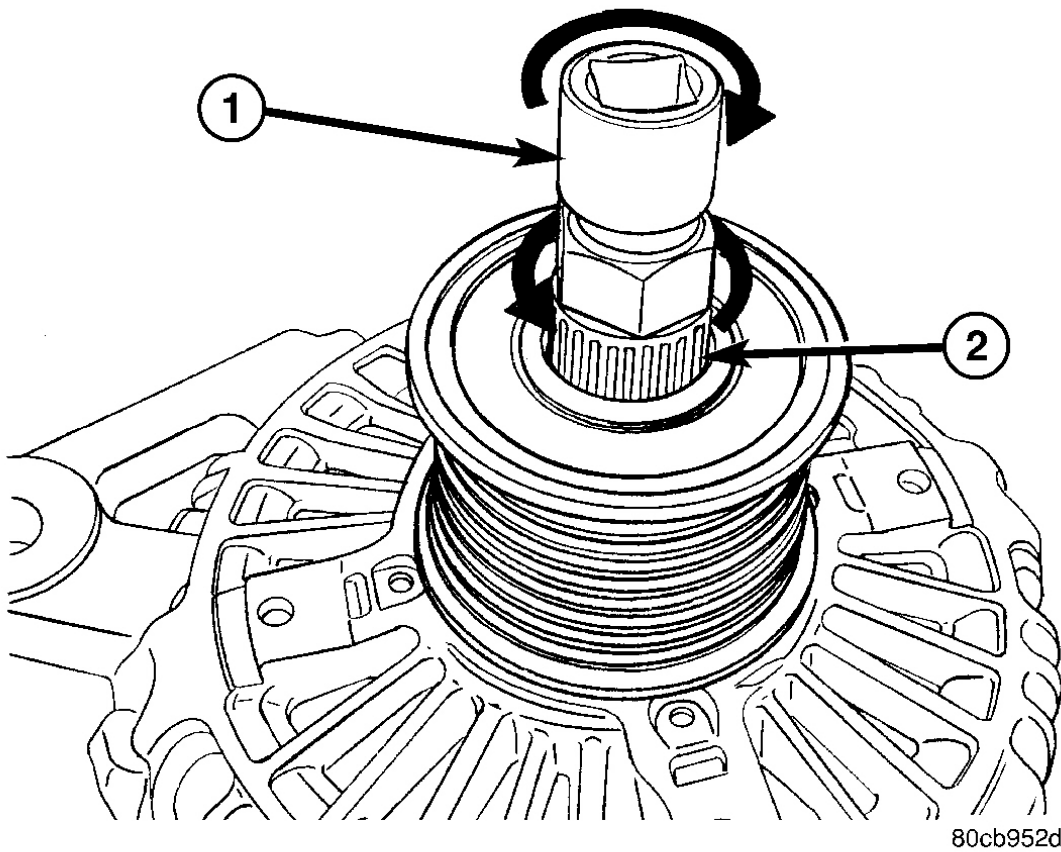
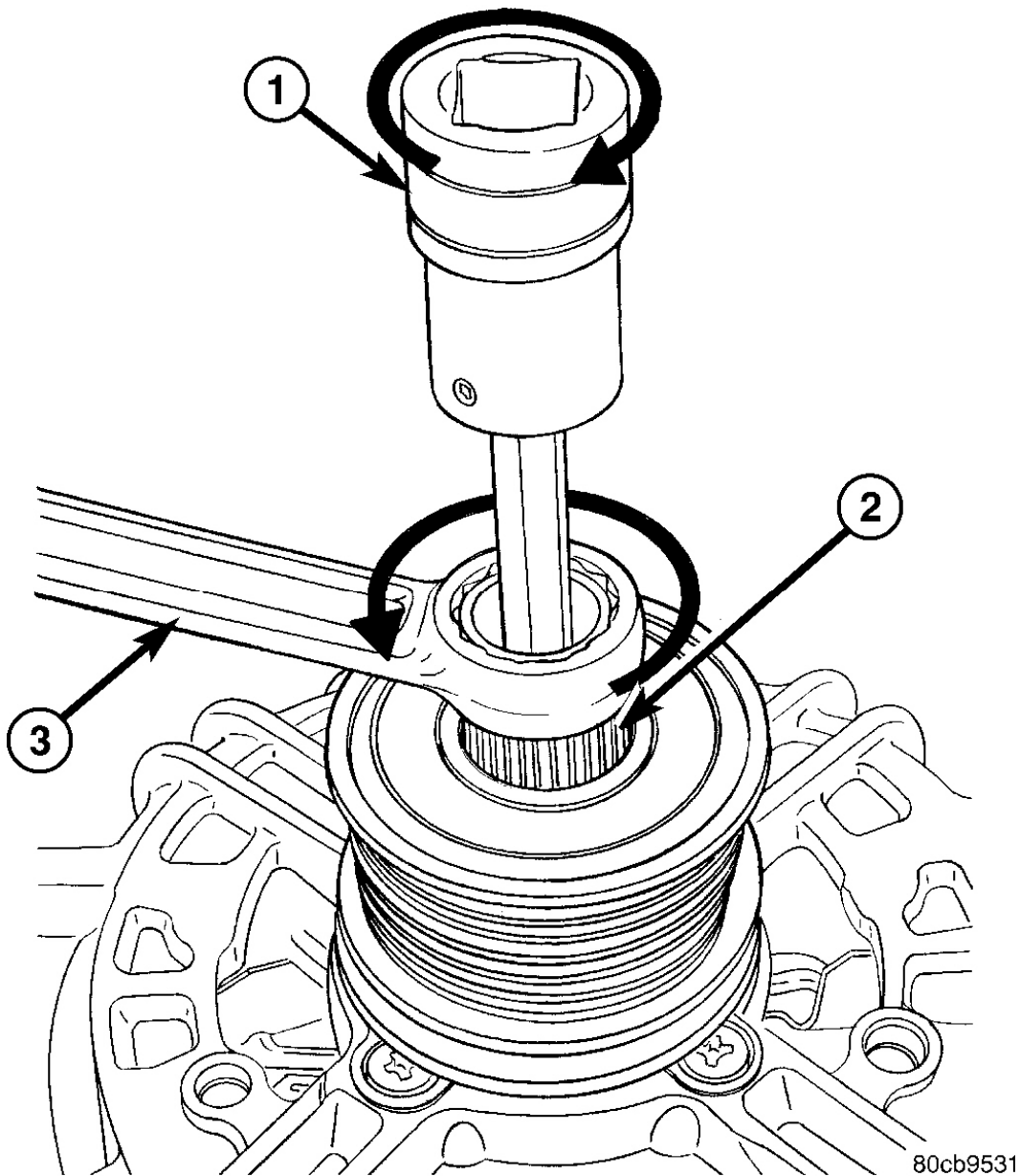


Fig. 16: Decoupler Removal (INA-Hex)
Courtesy of CHRYSLER LLC

1 - DEEP 10 MM SOCKET 2 - TOOL #8823 (VM.1048)

8. The generator shaft uses conventional right-hand threads to attach decoupler. To break decoupler loose from generator threads rotate end of tool (1) clockwise. See **Fig. 14**.



80cb9531

Fig. 17: Decoupler Removal (INA-Splined)
Courtesy of CHRYSLER LLC

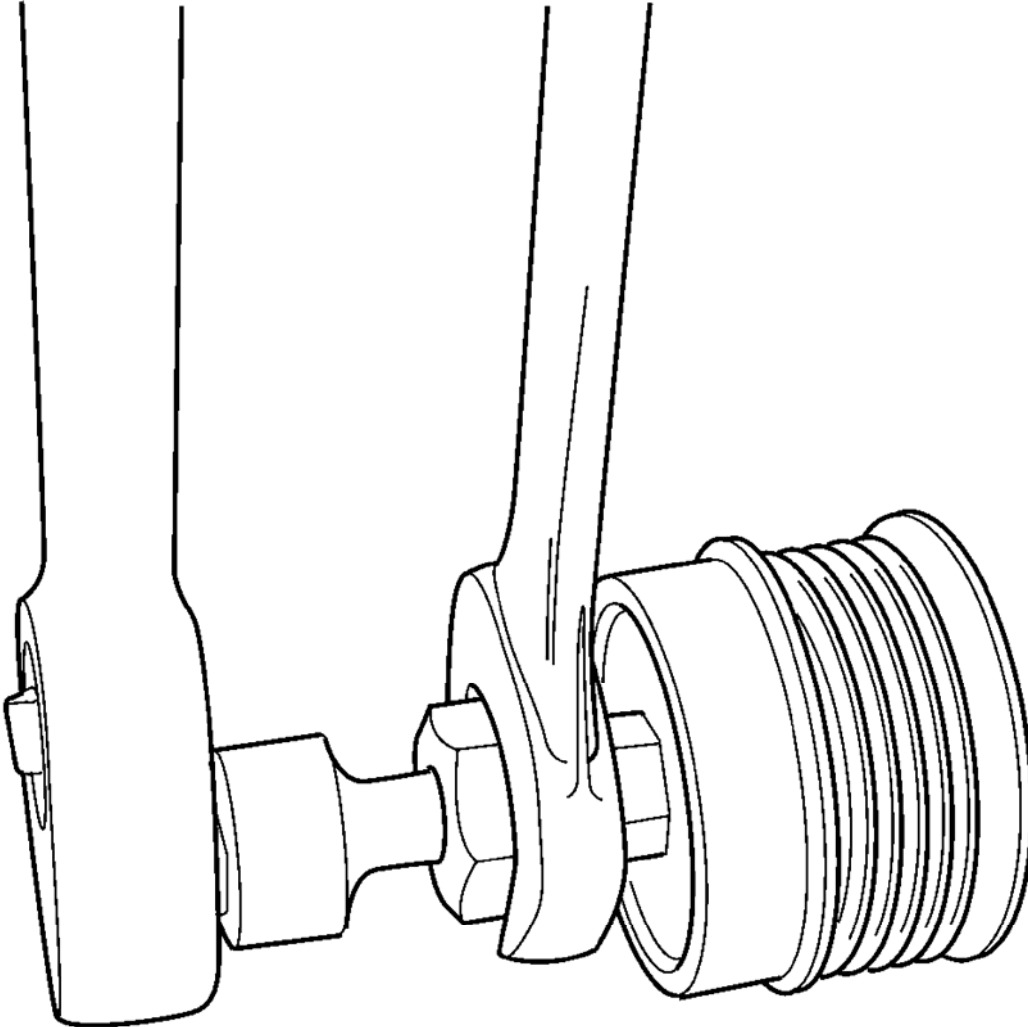
- | |
|--------------------------|
| 1 - DRIVER |
| 2 - TOOL #8823 (VM.1048) |
| 3 - 17 MM WRENCH |

9. Rotate end of tool (1) clockwise. See **Fig. 14**.

10. After breaking loose with tool, unthread decoupler by hand from generator.

Litens Decoupler

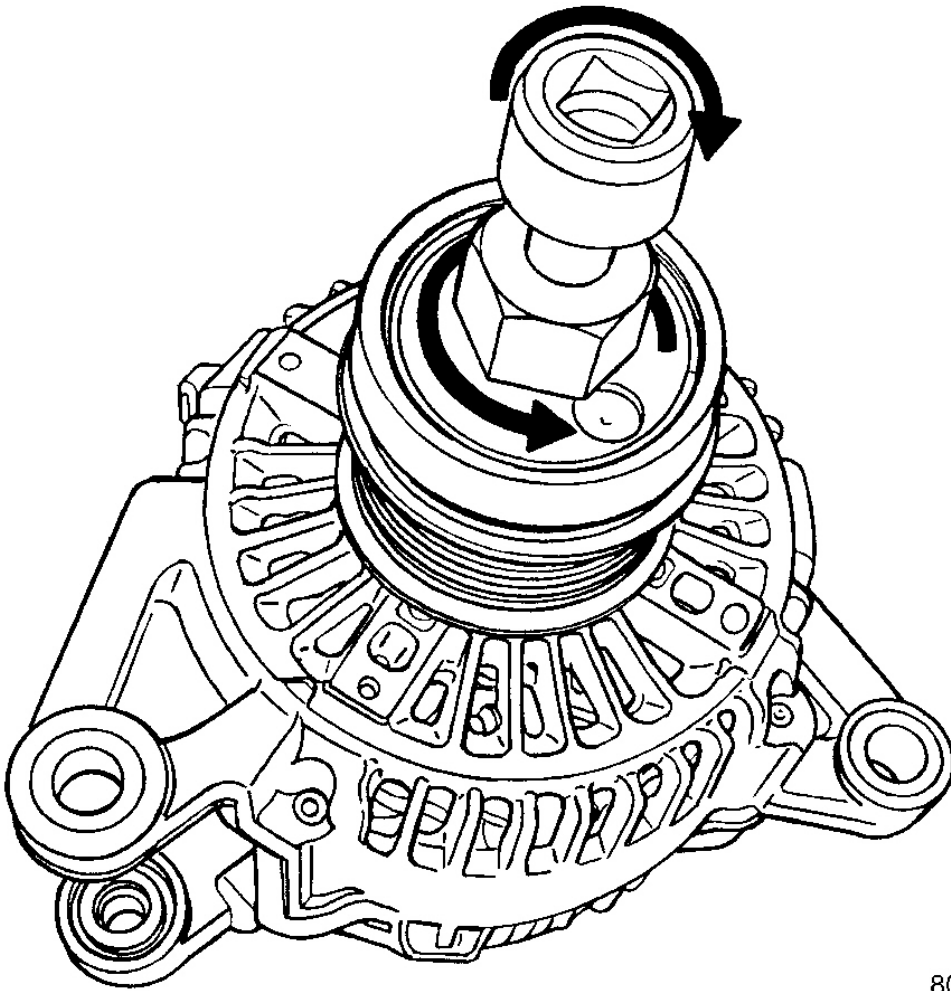
1. Disconnect negative battery cable.
2. Remove generator and accessory drive belt. Refer to **REMOVAL** .



80a9c046

Fig. 18: # 8433 Tool & Litens Decoupler
Courtesy of CHRYSLER LLC

3. Position Special Tool #8433 into decoupler. Align to hex end of generator shaft. See **Fig. 18**.



80cabb87

Fig. 19: Decoupler Removal (Litens)
Courtesy of CHRYSLER LLC

4. The generator shaft uses conventional right-hand threads to attach decoupler. To break decoupler loose from generator threads, rotate end of tool clockwise. See **Fig. 19**.
5. After breaking loose with tool, unthread decoupler by hand from generator.

INSTALLATION

GENERATOR DECOUPLER

INA Decoupler

1. Thread decoupler pulley onto generator shaft by hand (right-hand threads).
2. Position Special Tool #8823 (VM.1048) into decoupler.

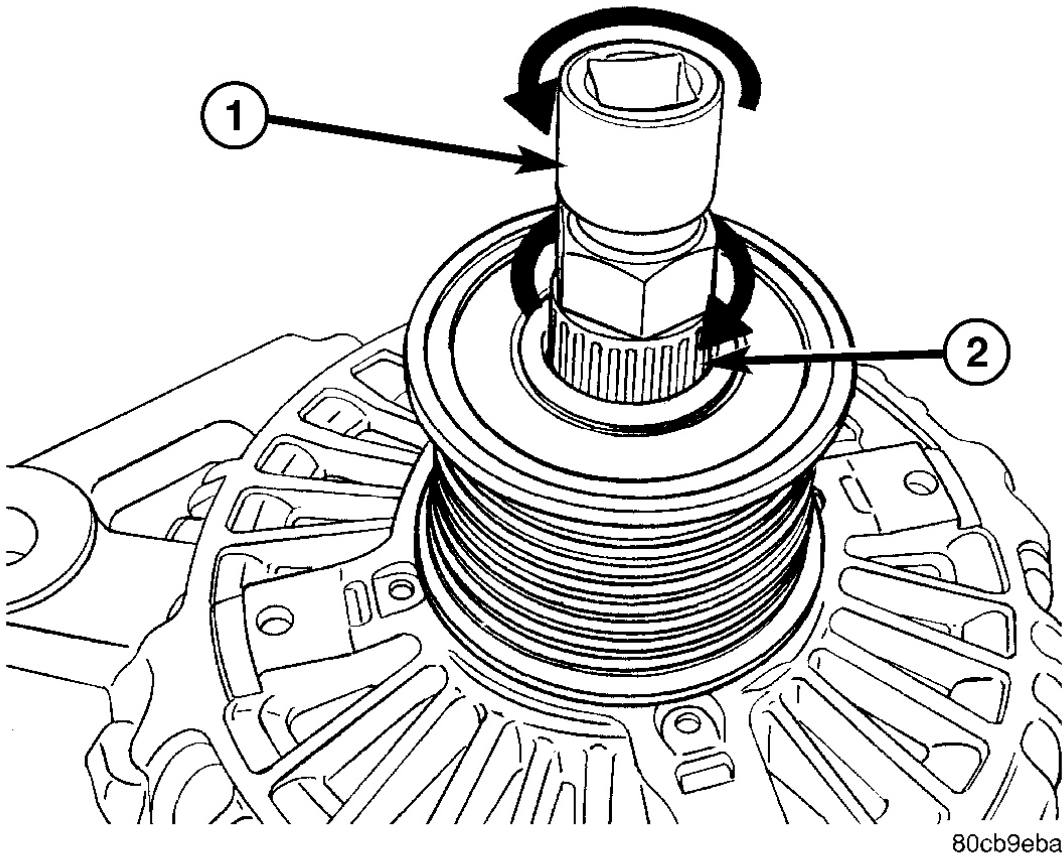


Fig. 20: Decoupler Installation (INA-Hex)
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - 10-MM DEEP SOCKET
2 - TOOL # 8823 (VM.1048) |
|--|

3. Determine if end of generator shaft is hex shaped or is splined. If hex is used, insert a 10-MM deep socket (1) into tool #8823 (VM.1048). See **Fig. 20**.

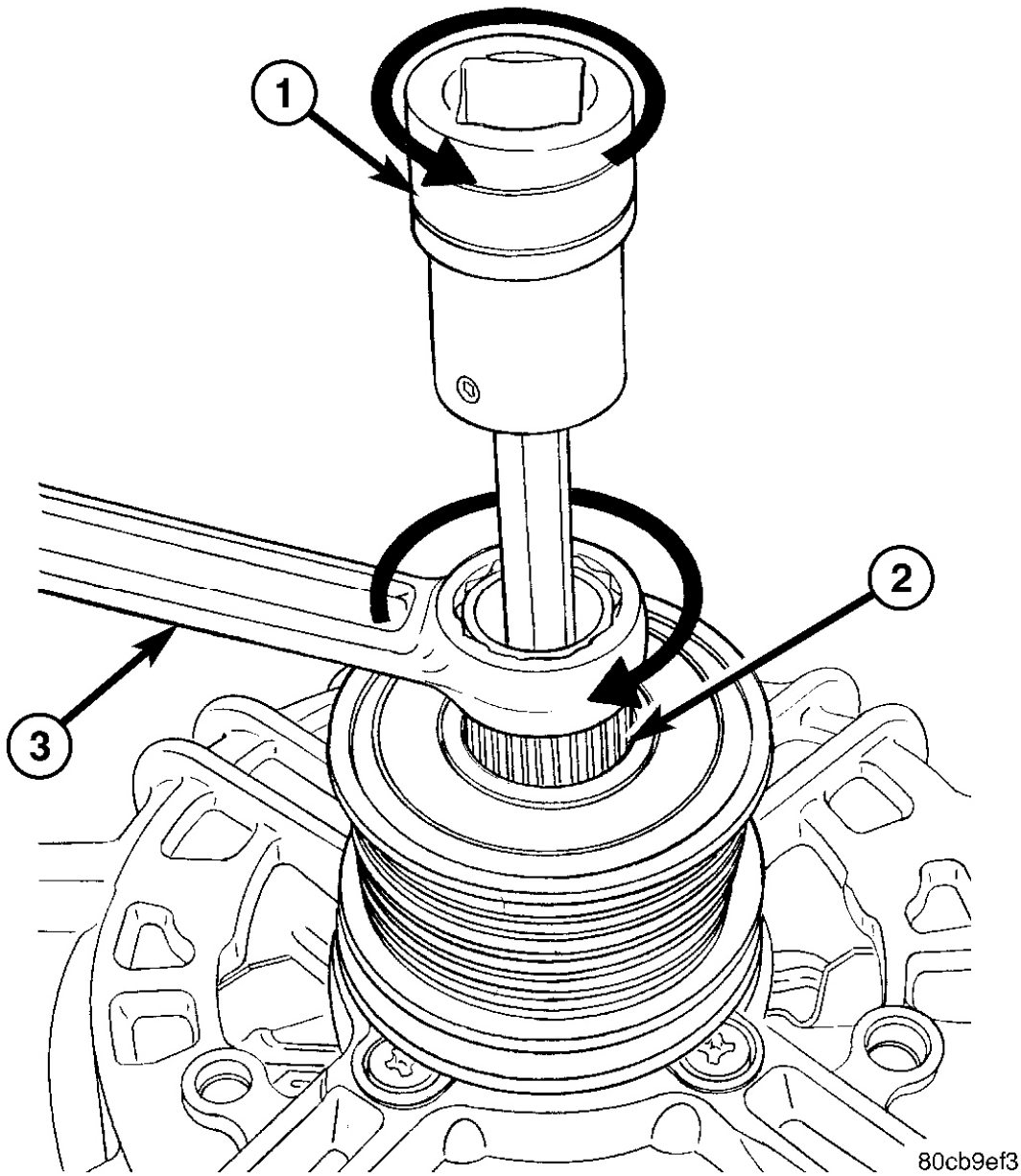


Fig. 21: Decoupler Installation (INA Splined)
Courtesy of CHRYSLER LLC

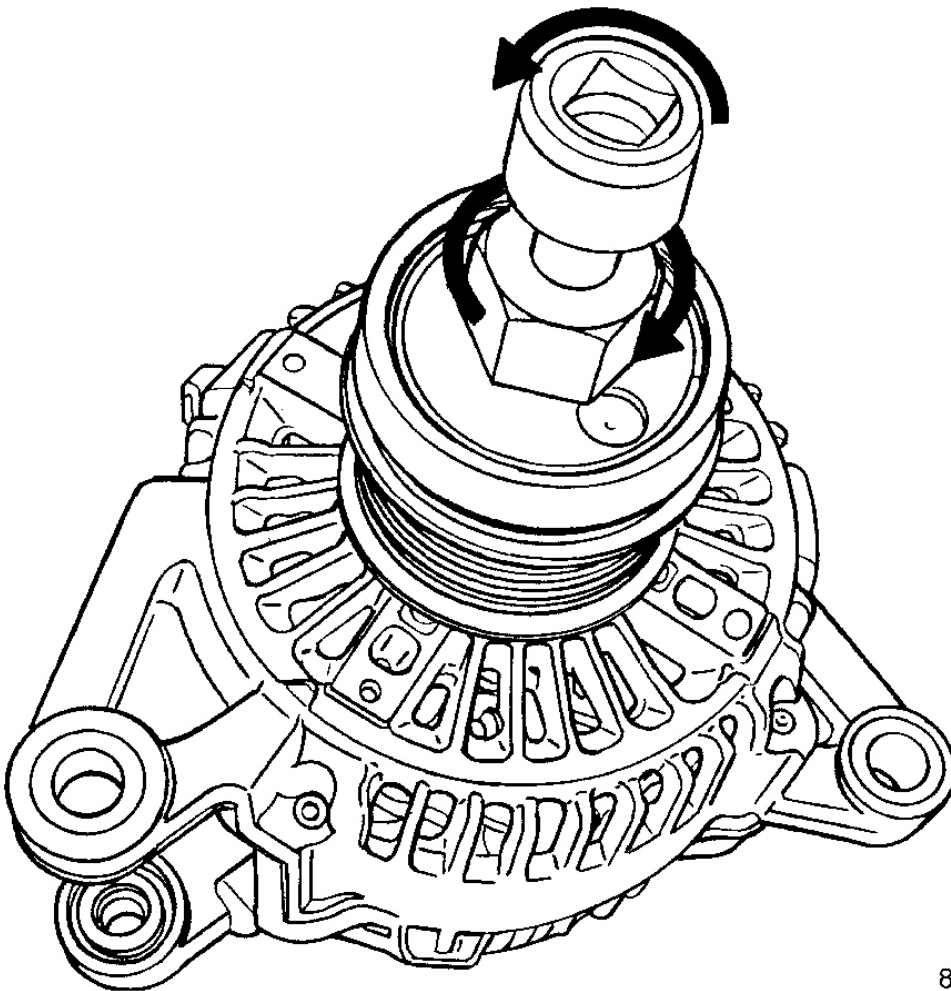
- | |
|---------------------------|
| 1 - DRIVER |
| 2 - TOOL # 8823 (VM.1048) |
| 3 - BACKUP WRENCH |

4. If splined, insert a 5/16" 6-point hex driver (1), or a 10-MM 12-point triple square driver into tool #8823 (VM.1048). See **Fig. 21**.

5. **Do not use an adjustable, ratcheting "click type" torque wrench. Most "click type" wrenches will only allow torque to be applied in a clockwise rotation. Use a dial-type or beam-type wrench.** Tighten in counterclockwise rotation and tighten to 110 N.m (81 ft. lbs.).
6. Install accessory drive belt, and generator. Refer to **INSTALLATION** .
7. Connect negative battery cable.

Litens Decoupler

1. Thread decoupler pulley onto generator shaft by hand (right-hand threads).
2. Position Special Tool 8433 into decoupler. Align tool to hex end of generator shaft.



80cabf58

Fig. 22: Decoupler Installation (Litens)
Courtesy of CHRYSLER LLC

3. **Do not use an adjustable, ratcheting "click type" torque wrench. Most "click type" wrenches will only allow torque to be applied in a clockwise rotation. Use a dial-type or beam-type wrench.** Tighten in counterclockwise rotation and tighten to 110 N.m (81 ft. lbs.).
4. Install accessory drive belt, and generator. Refer to **INSTALLATION** .
5. Connect negative battery cable.

REGULATOR - VOLTAGE

DESCRIPTION

ELECTRONIC VOLTAGE REGULATOR

The Electronic Voltage Regulator (EVR) is not a separate component. It is actually a voltage regulating circuit located within the Powertrain Control Module (PCM). The EVR is not serviced separately. If replacement is necessary, the PCM must be replaced.

OPERATION

ELECTRONIC VOLTAGE REGULATOR

The amount of DC current produced by the generator is controlled by EVR circuitry contained within the Powertrain Control Module (PCM). This circuitry is connected in series with the generators second rotor field terminal and its ground.

Voltage is regulated by cycling the ground path to control the strength of the rotor magnetic field. The EVR circuitry monitors system line voltage (B+) and battery temperature. It then determines a target charging voltage. If sensed battery voltage is 0.5 volts or lower than the target voltage, the PCM grounds the field winding until sensed battery voltage is 0.5 volts above target voltage. A circuit in the PCM cycles the ground side of the generator field up to 100 times per second (100Hz), but has the capability to ground the field control wire 100% of the time (full field) to achieve the target voltage. If the charging rate cannot be monitored (limp-in), a duty cycle of 25% is used by the PCM in order to have some generator output. Also refer to **OPERATION** for additional information.

2008 ACCESSORIES AND EQUIPMENT

Chime/Buzzer - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

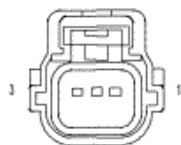
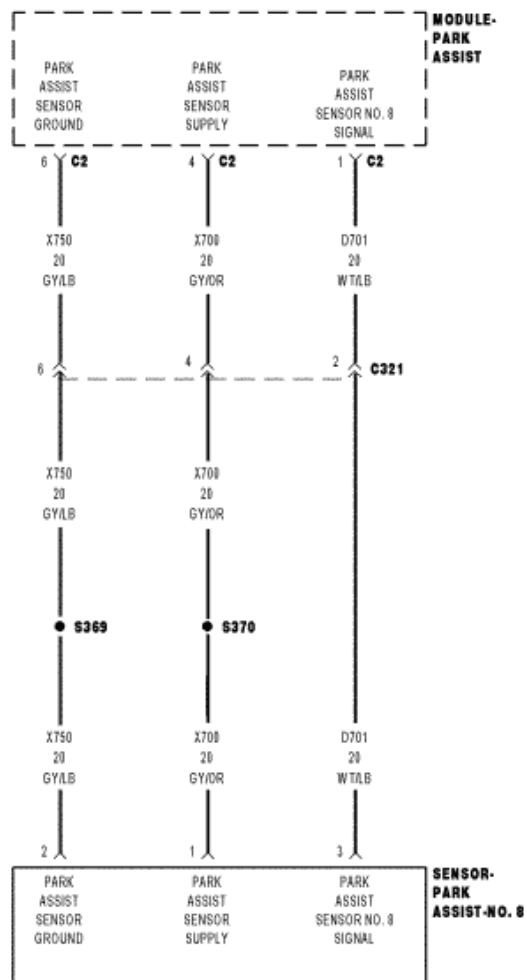
DTC	Description
<u>B1230</u>	PTS SENSOR 8 CIRCUIT PERFORMANCE
<u>B1231</u>	PTS SENSOR 8 CIRCUIT LOW
<u>B1233</u>	PTS SENSOR 8 RING TIME TOO SHORT
<u>B1234</u>	PTS SENSOR 8 RING TIME TOO LONG
<u>B1236</u>	PTS SENSOR 9 CIRCUIT LOW
<u>B1238</u>	PTS SENSOR 9 RING TIME TOO SHORT
<u>B1239</u>	PTS SENSOR 9 RING TIME TOO LONG
<u>B123B</u>	PTS SENSOR 10 CIRCUIT LOW
<u>B123D</u>	PTS SENSOR 10 RING TIME TOO SHORT
<u>B123E</u>	PTS SENSOR 10 RING TIME TOO LONG
<u>B127C</u>	PTS SENSOR 11 CIRCUIT LOW
<u>B127E</u>	PTS SENSOR 11 RING TIME TOO SHORT
<u>B127F</u>	PTS SENSOR 11 RING TIME TOO LONG
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B2126</u>	SENSOR SUPPLY VOLTAGE LOW
<u>B2127</u>	SENSOR SUPPLY VOLTAGE HIGH
<u>B212A</u>	PTS DISPLAY SUPPLY VOLTAGE LOW
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B2232</u>	(PTS) PARKTRONICS INTERNAL
<u>B2234</u>	(PTS) PARKTRONICS REAR DISPLAY INTERNAL
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0423</u>	IMPLAUSIBLE DATA RECEIVED FROM CLUSTER/CCN
<u>U1101</u>	LOST COMMUNICATION WITH PTS DISPLAY

CHIME/BUZZER - ELECTRICAL DIAGNOSTICS

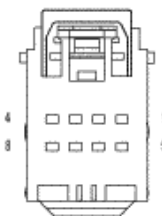
DIAGNOSIS AND TESTING

B1230-PTS SENSOR 8 CIRCUIT PERFORMANCE

Circuit Schematic



SENSOR-PARK ASSIST NO. 8 (PARKTRONICS)



MODULE-PARK ASSIST C2 (PARKTRONICS)

01616500

Fig. 1: PTS Sensor 8 Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

During Reverse and during self test in Forward between 18 km/h (11 mph) and 40 km/h (25 mph).

Set Conditions

- **Set Condition:**

If the system detects data corruption in the transmission in the internal communication line between the module and sensors, this code will set.

Possible Causes

Possible Causes
(D701) PTS SENSOR NO. 8 SIGNAL CIRCUIT SHORT TO GROUND
(D701) PTS SENSOR NO. 8 SIGNAL CIRCUIT SHORT TO BATTERY
(D701) PTS SENSOR NO. 8 SIGNAL CIRCUIT OPEN
PTS SENSOR NO. 8
PARK ASSIST MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

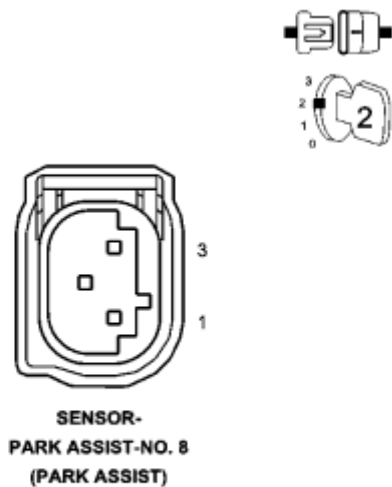
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK PARK ASSIST SENSOR NO. 8 FOR INTERNAL SHORT



819d4552

Fig. 2: Checking Park Assist Sensor No. 8
Courtesy of CHRYSLER LLC

Disconnect Park Assist Sensor No. 8.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace Park Assist Sensor No. 8.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO

GROUND

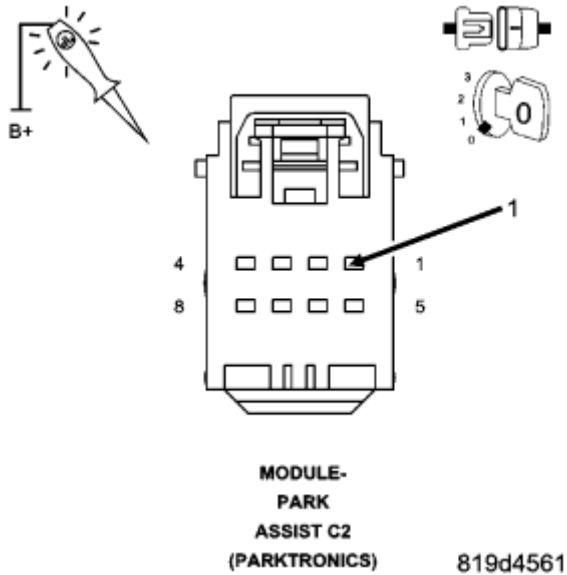


Fig. 3: Checking Park Assist Sensor No. 8 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist module harness connectors C1 and C2.

Using a 12-volt test light connected to 12-volts check the (D701) Park Assist Sensor No. 8 Signal circuit at the Park Assist module C2 harness connector.

Does the test light illuminate brightly?

Yes

Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO BATTERY**

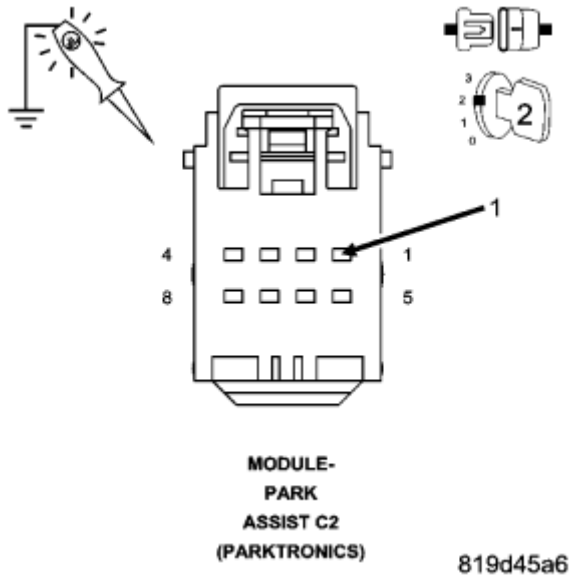


Fig. 4: Checking Park Assist Sensor No. 8 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground check the (D701) Park Assist Sensor No. 8 Signal circuit at the Park Assist module C2 harness connector for a short to battery.

Does the test light illuminate brightly?

Yes

Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to battery.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 5.

5. CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR AN OPEN

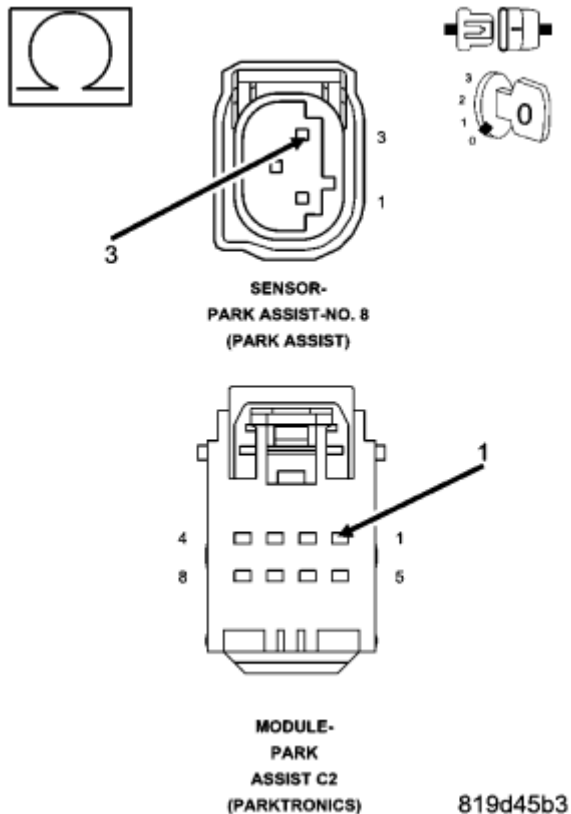


Fig. 5: Measuring Resistance Of Park Assist Sensor No. 8 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (D701) Park Assist Sensor No. 8 Signal circuit between the Park Assist Module C2 harness connector and the Park Assist Sensor No. 8 harness connector.

Is the resistance below 5.0 ohms?

No

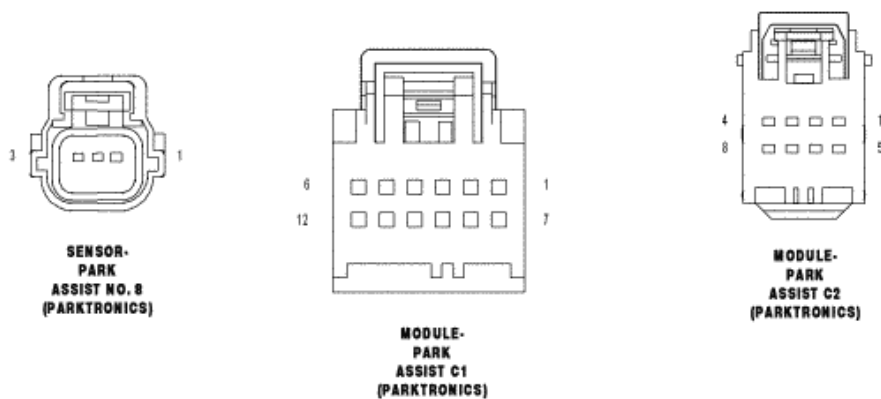
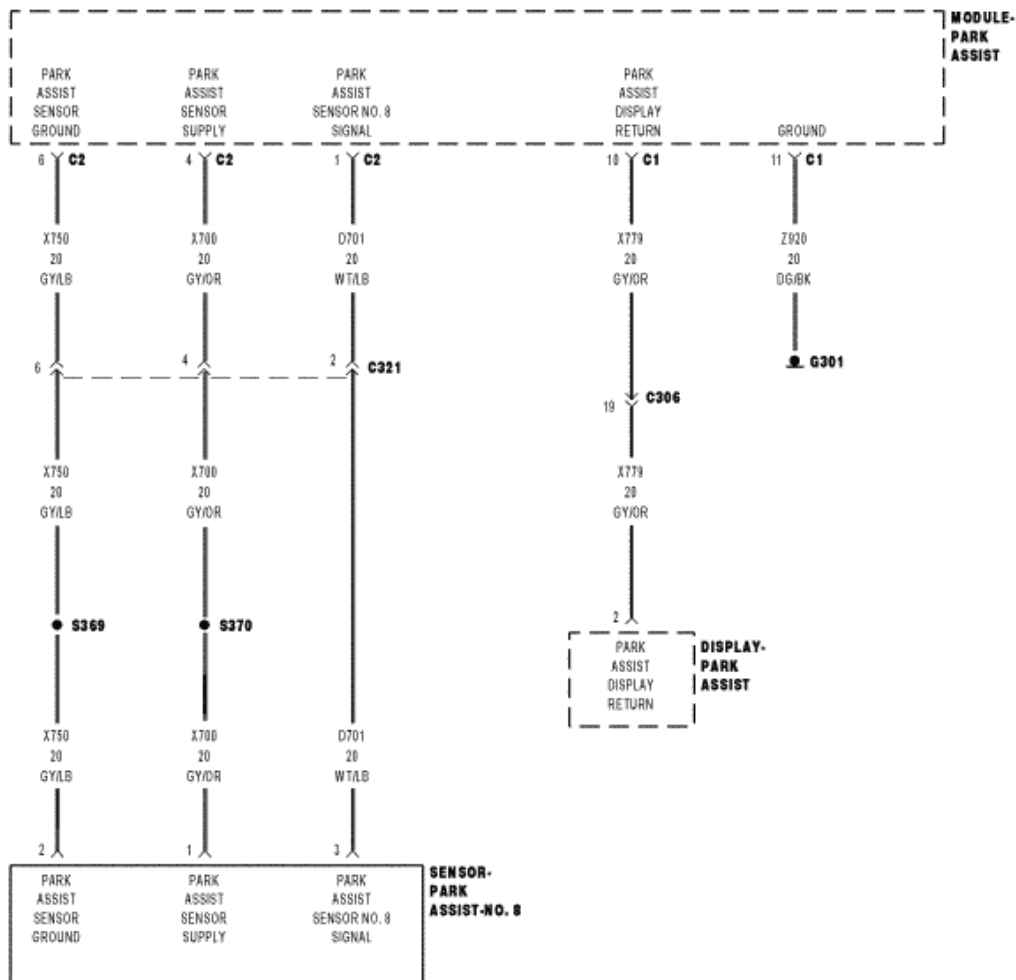
Repair the (D701) Park Assist Sensor No. 8 Signal circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Park Assist Module in accordance with service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B1231-PTS SENSOR 8 CIRCUIT LOW

Circuit Schematic



0161a705

Fig. 6: PTS Sensor 8 Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse at speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time is too short (700 [micro]secs).

Possible Causes

Possible Causes
(D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT SHORTED TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT
(D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT SHORTED TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT
(D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT SHORTED TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT
(D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT SHORTED TO GROUND
PARK ASSIST SENSOR NO. 8
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

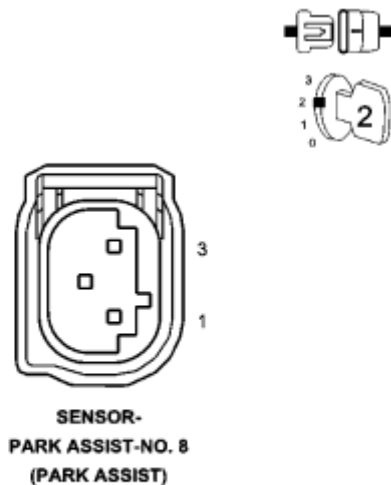
Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK PARK ASSIST SENSOR NO. 8 FOR A SHORT TO GROUND



819d4552

Fig. 7: Checking Park Assist Sensor No. 8
Courtesy of CHRYSLER LLC

Shift the transmission into park.

With the scan tool, erase DTCs.

Turn the ignition off.

Disconnect Park Assist Sensor No. 8.

Turn the ignition on.

Shift the transmission into reverse.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace Park Assist Sensor No. 8 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

3. **CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT**

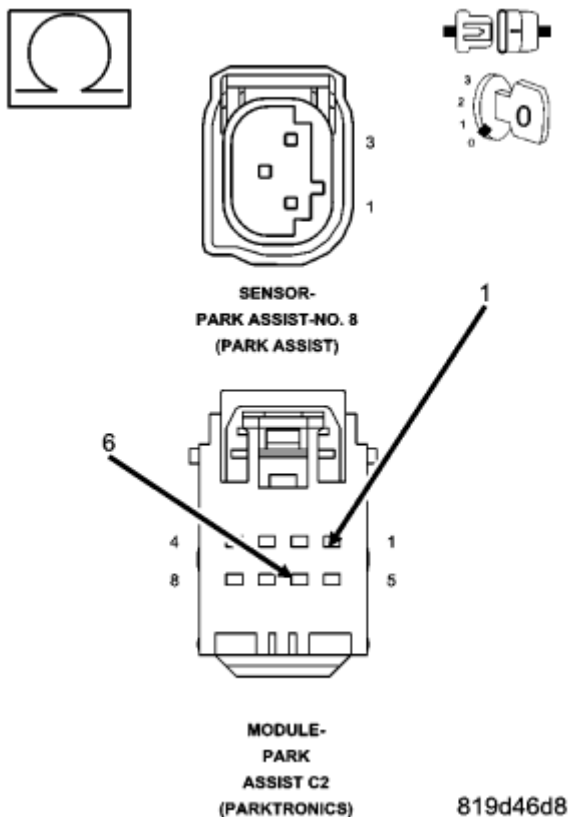


Fig. 8: Measuring Resistance Between Park Assist Sensor No. 8 Signal Circuit And Park Assist Sensor Ground Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Measure the resistance between the (D701) Park Assist Sensor No. 8 Signal circuit and the (X750) Park Assist Sensor Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to the (X750) Park Assist Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT**

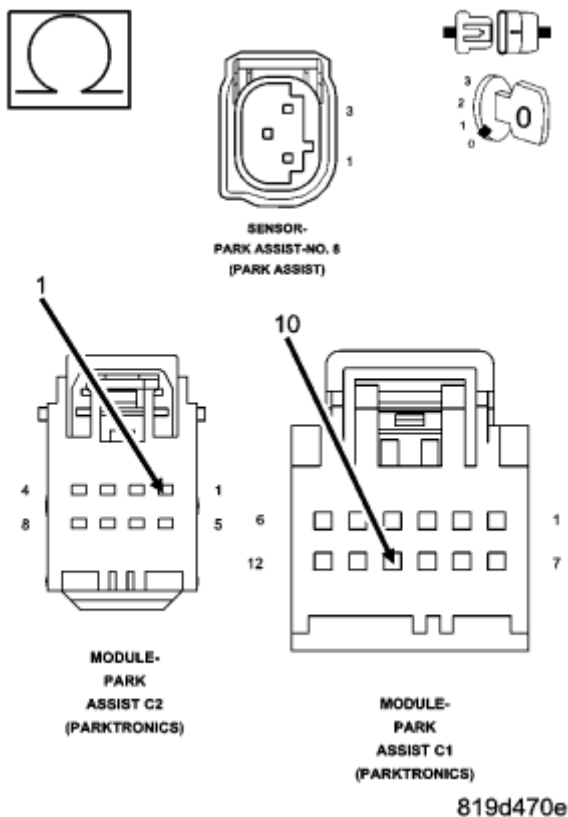


Fig. 9: Measuring Resistance Between Park Assist Sensor No. 8 Signal Circuit And Park Assist Display Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D701) Park Assist Sensor No. 8 Signal circuit and the (X779) Park Assist Display Ground circuit.

Is the resistance below 10K ohms?

Yes

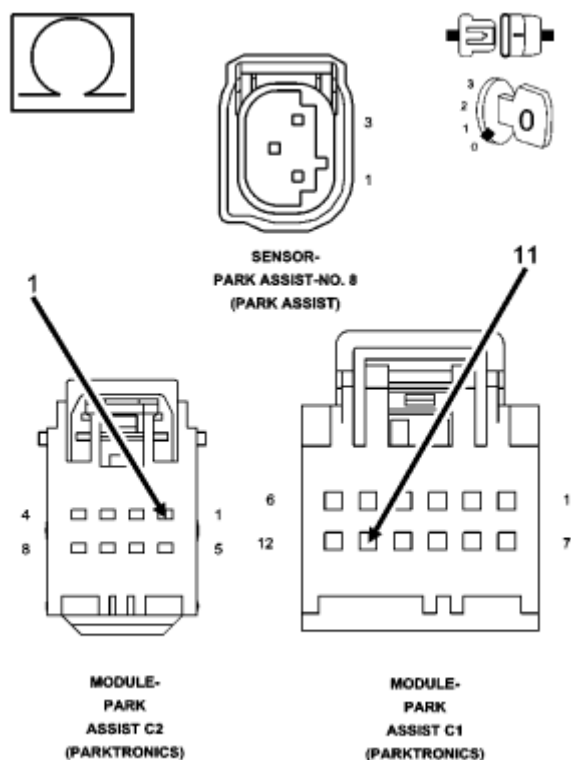
Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to the (X779) Park Assist Display Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT**



819d4715

Fig. 10: Measuring Resistance Between Park Assist Sensor No. 8 Signal Circuit And Park Assist Module Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D701) Park Assist Sensor No. 8 Signal circuit and the (Z920) Park Assist Module Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to the (Z920) Park Assist Module Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK THE (D701) PARK ASSIST SENSOR NO. 8 SIGNAL CIRCUIT FOR A SHORT TO GROUND

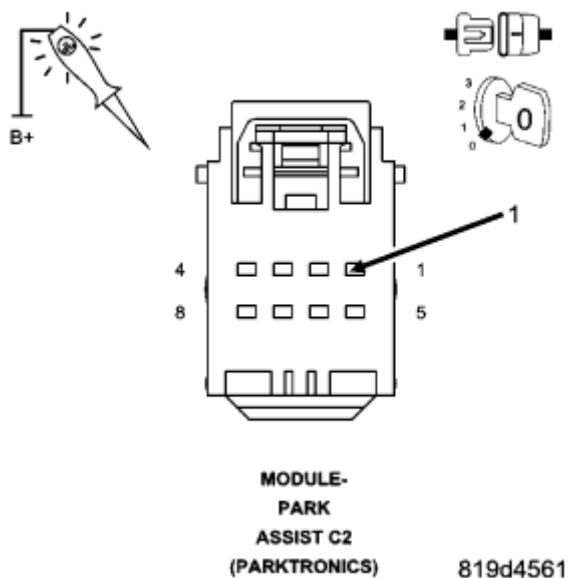


Fig. 11: Checking Park Assist Sensor No. 8 Signal Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D701) Park Assist Sensor No. 8 Signal circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D701) Park Assist Sensor No. 8 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1233-PTS SENSOR 8 RING TIME TOO SHORT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time exceeds limit (greater than 1450 [micro]secs).

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 8

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE PARK ASSIST SENSOR NO. 8

View Repair

Repair

Replace Park Assist Sensor No. 8 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1234-PTS SENSOR 8 RING TIME TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Data line stuck at 0.

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 8

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE PARK ASSIST SENSOR NO. 8

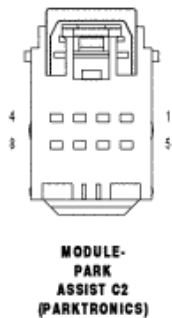
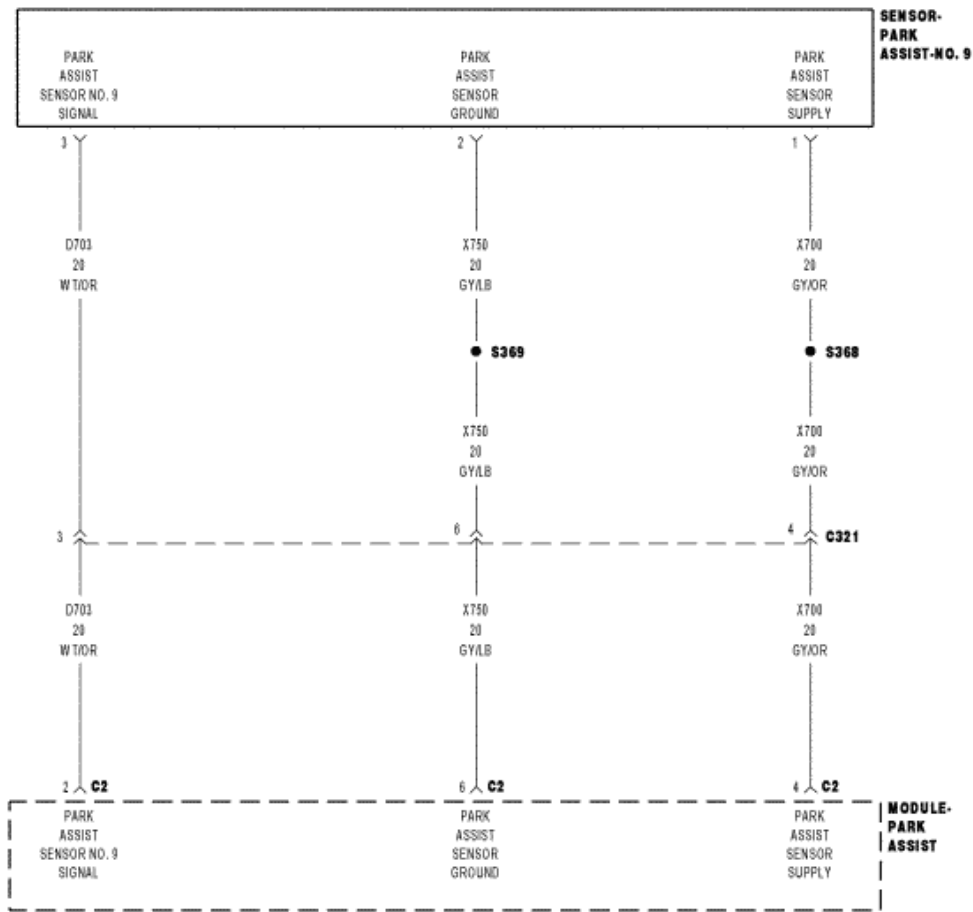
View Repair

Repair

Replace Park Assist Sensor No. 8 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

Circuit Schematic



01 a32509

Fig. 12: PTS Sensor 9 Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

During Reverse and during self test in Forward between 18 km/h (11 mph) and 40 km/h (25 mph).

Set Conditions

- **Set Condition:**

If the system detects data corruption in the transmission in the internal communication line between the module and sensors, this code will set.

Possible Causes

Possible Causes
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT SHORT TO GROUND
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT SHORT TO BATTERY
(D703) PTS SENSOR NO. 9 SIGNAL CIRCUIT OPEN
PTS SENSOR NO. 9
PARK ASSIST MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

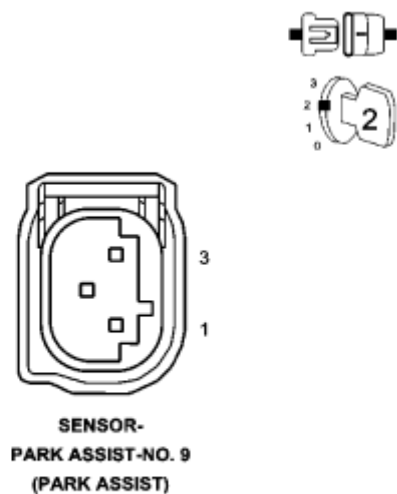
Go To step 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK PARK ASSIST SENSOR NO. 9 FOR INTERNAL SHORT



819d4a58

Fig. 13: Checking Park Assist Sensor No. 9
Courtesy of CHRYSLER LLC

Disconnect Park Assist Sensor No. 9.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

Go To step 3.

No

Replace Park Assist Sensor No. 9.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO GROUND**

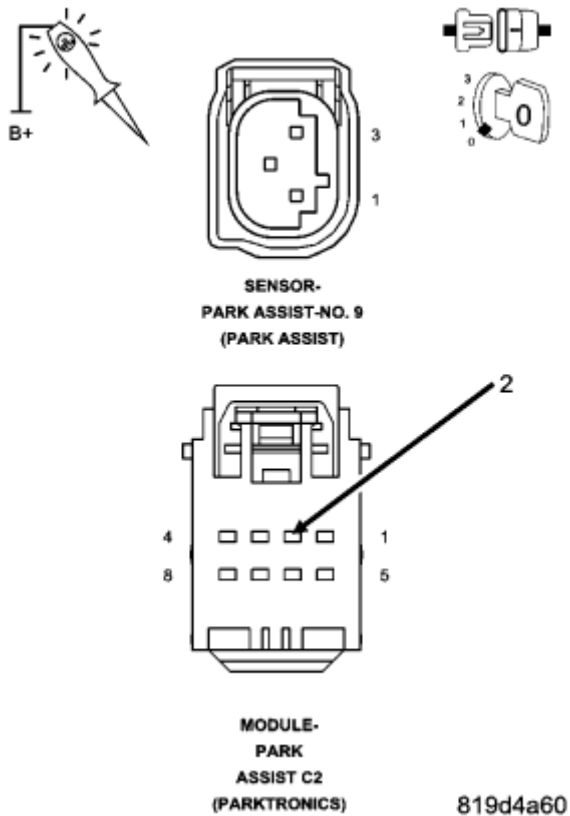


Fig. 14: Checking Park Assist Sensor No. 9 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist module harness connectors C1 and C2.

Using a 12-volt test light connected to 12-volts check the (D703) Park Assist Sensor No. 9 Signal circuit at the Park Assist module C2 harness connector.

Does the test light illuminate brightly?

Yes

Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 4.

4. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO BATTERY**

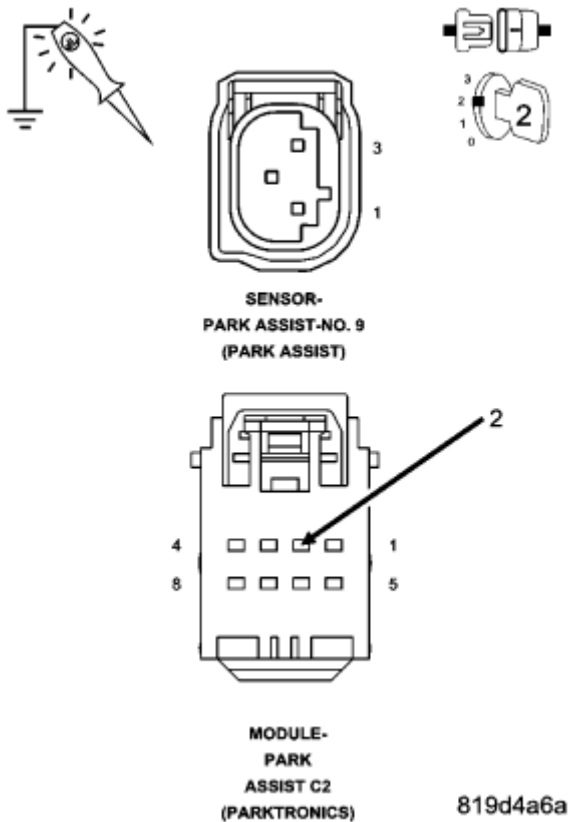


Fig. 15: Checking Park Assist Sensor No. 9 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground check the (D703) Park Assist Sensor No. 9 Signal circuit at the Park Assist module C2 harness connector for a short to battery.

Does the test light illuminate brightly?

Yes

Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to battery.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 5.

5. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR AN OPEN**

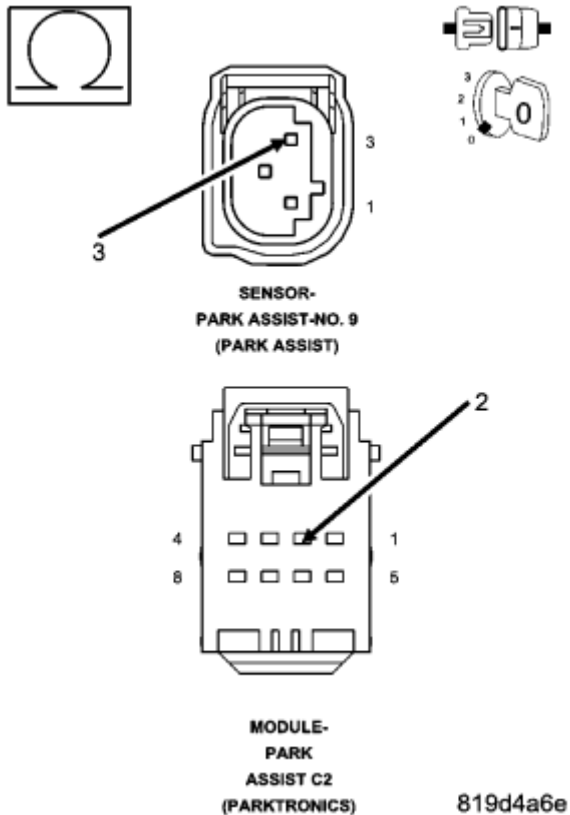


Fig. 16: Measuring Resistance Of Park Assist Sensor No. 9 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (D703) Park Assist Sensor No. 9 Signal circuit between the Park Assist Module C2 harness connector and the Park Assist Sensor No. 9 harness connector.

Is the resistance below 5.0 ohms?

No

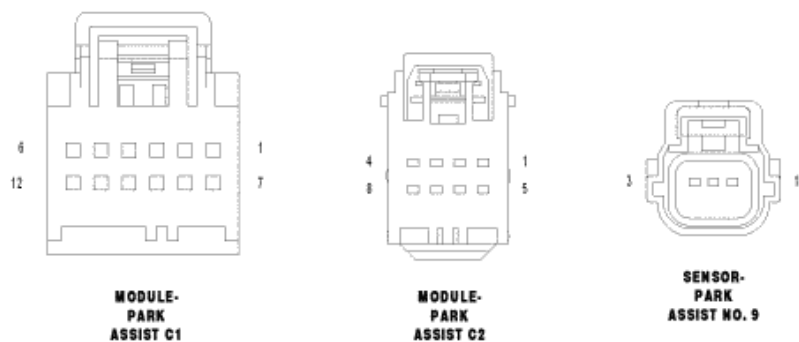
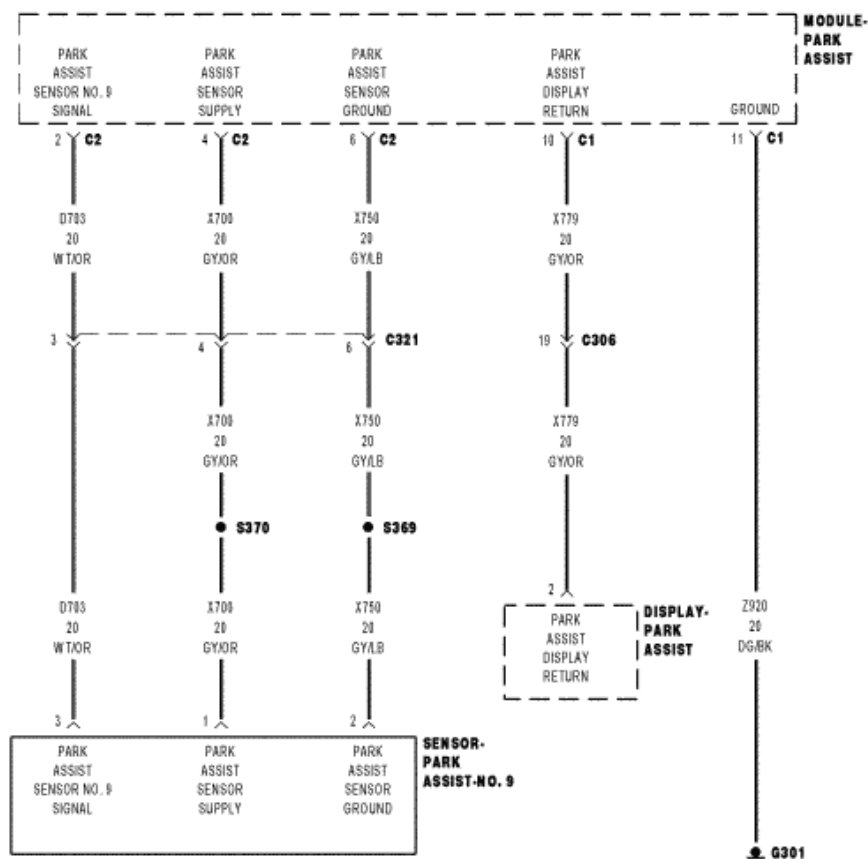
Repair the (D703) Park Assist Sensor No. 9 Signal circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Park Assist Module in accordance with service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B1236-PTS SENSOR 9 CIRCUIT LOW

Circuit Schematic



81d1a7d0

Fig. 17: PTS Sensor 9 Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time is too short (700 [micro]secs).

Possible Causes

Possible Causes
(D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT
(D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT
(D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO (X920) PARK ASSIST MODULE GROUND CIRCUIT
(D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT SHORTED TO GROUND
PARK ASSIST SENSOR NO. 9
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

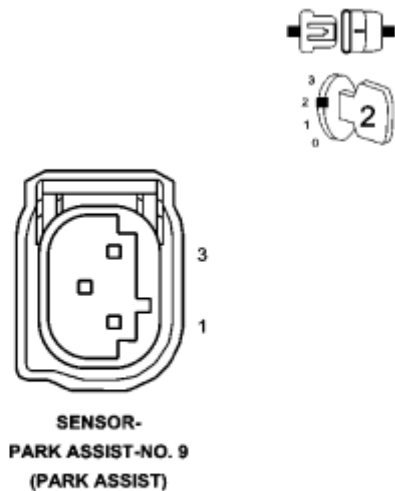
Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK PARK ASSIST SENSOR NO. 9 FOR A SHORT TO GROUND



819d4a58

Fig. 18: Checking Park Assist Sensor No. 9
Courtesy of CHRYSLER LLC

Shift the transmission into park.

With the scan tool, erase DTCs.

Turn the ignition off.

Disconnect Park Assist Sensor No. 9.

Turn the ignition on.

Shift the transmission into reverse.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 3.

No

Replace Park Assist Sensor No. 9 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

3. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT**

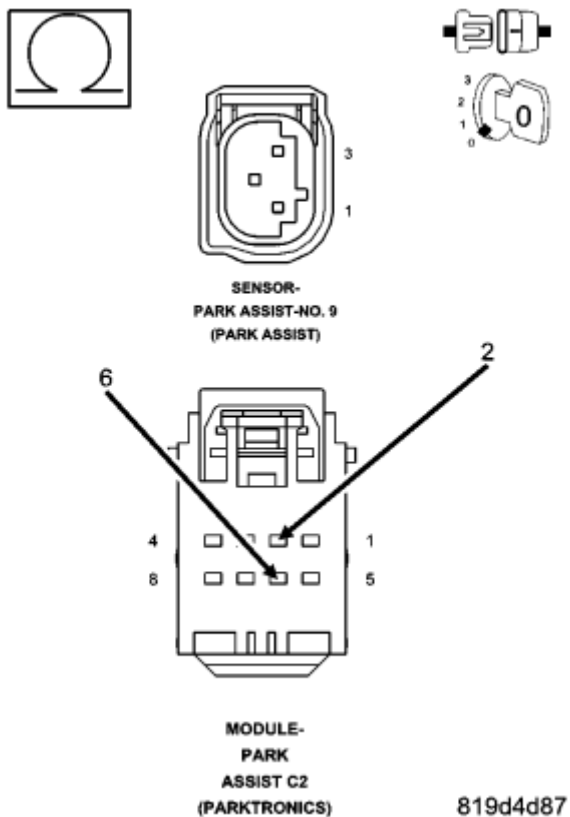


Fig. 19: Measuring Resistance Between Park Assist Sensor No. 9 Signal Circuit And Park Assist Sensor Ground Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Measure the resistance between the (D703) Park Assist Sensor No. 9 Signal circuit and the (X750) Park Assist Sensor Ground circuit.

Is the resistance below 10K ohms?

Yes

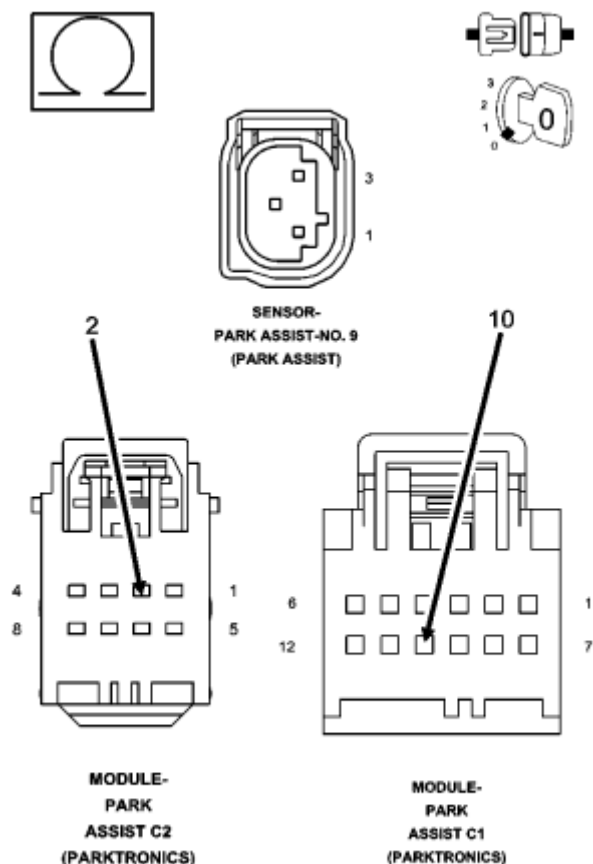
Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to the (X750) Park Assist Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT**



819d4e10

Fig. 20: Measuring Resistance Between Park Assist Sensor No. 9 Signal Circuit And Park Assist

Display Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D703) Park Assist Sensor No. 9 Signal circuit and the (X779) Park Assist Display Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to the (X779) Park Assist Display Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO (X920) PARK ASSIST MODULE GROUND CIRCUIT**

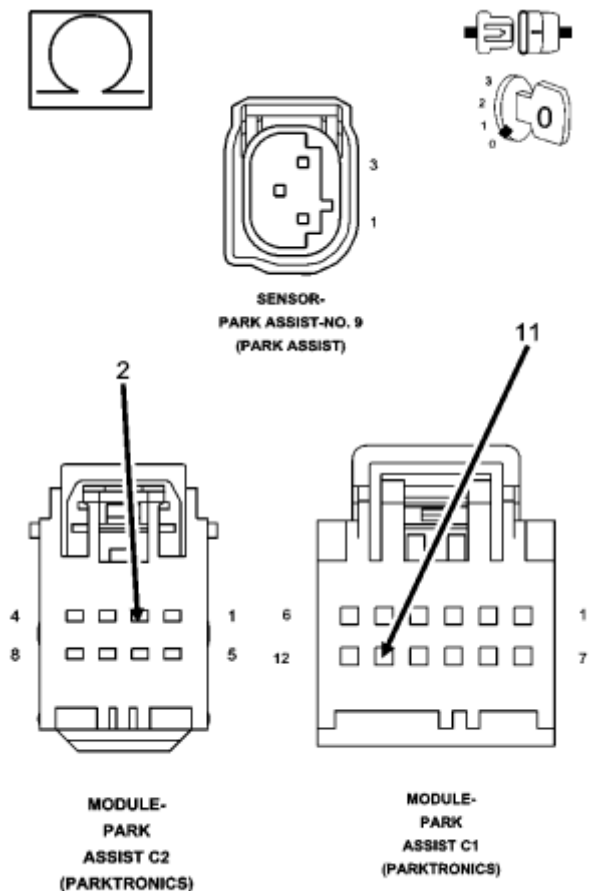


Fig. 21: Measuring Resistance Between Park Assist Sensor No. 9 Signal Circuit And Park Assist Module Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D703) Park Assist Sensor No. 9 Signal circuit and the (X920) Park Assist Module Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to the (X920) Park Assist Module Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK THE (D703) PARK ASSIST SENSOR NO. 9 SIGNAL CIRCUIT FOR A SHORT TO GROUND

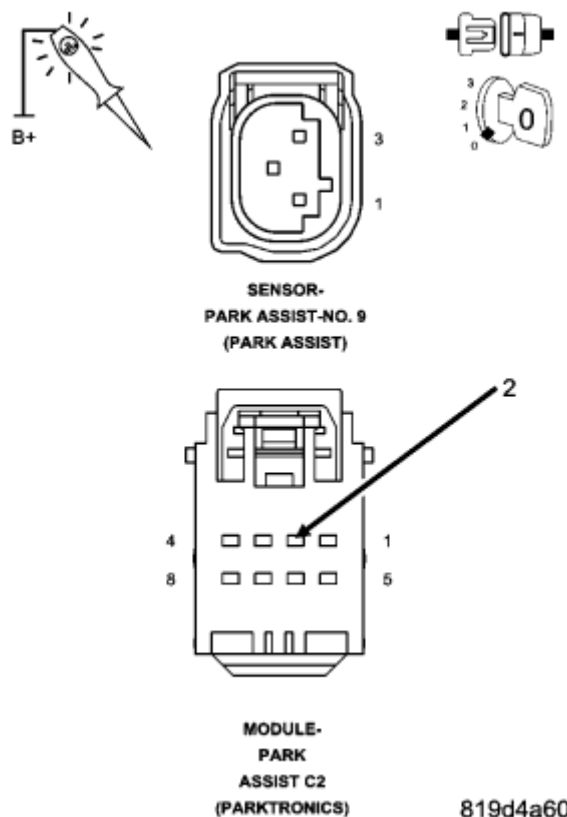


Fig. 22: Checking Park Assist Sensor No. 9 Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D703) Park Assist Sensor No. 9 Signal circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D703) Park Assist Sensor No. 9 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1238-PTS SENSOR 9 RING TIME TOO SHORT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time exceeds limit (greater than 1450 [micro]secs).

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 9

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE PARK ASSIST SENSOR NO. 9

View Repair

Repair

Replace Park Assist Sensor No. 9 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1239-PTS SENSOR 9 RING TIME TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering

continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Data line stuck at 0.

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 9

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REPLACE PARK ASSIST SENSOR NO. 9**

View Repair

Repair

Replace Park Assist Sensor No. 9 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B123A PTS SENSOR 10 CIRCUIT PERFORMANCE

Circuit Schematic

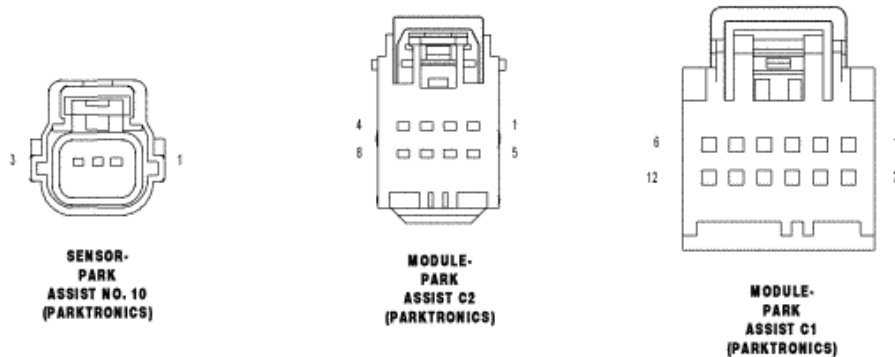
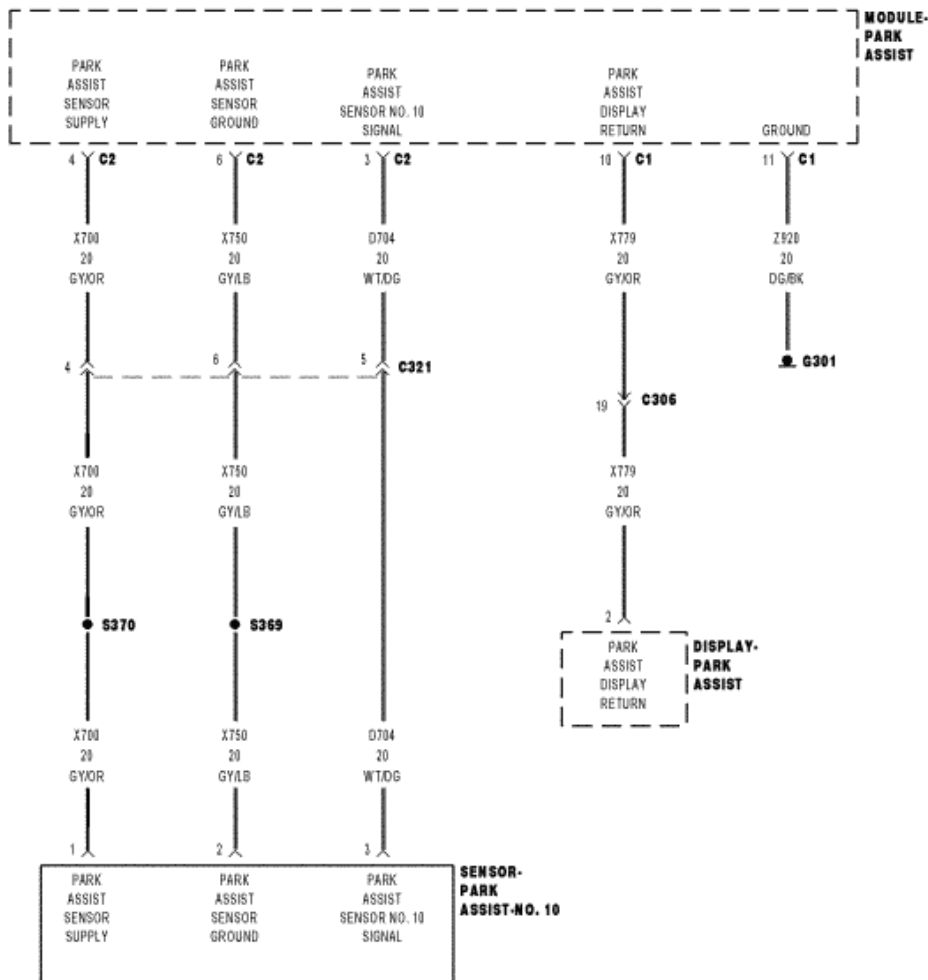


Fig. 23: PTS Sensor 10 Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

During Reverse and during self test in Forward between 18 km/h (11 mph) and 40 km/h (25 mph).

Set Conditions

- **Set Condition:**

If the system detects data corruption in the transmission in the internal communication line between the module and sensors, this code will set.

Possible Causes

Possible Causes
(D704) PTS SENSOR NO. 10 SIGNAL CIRCUIT SHORT TO GROUND
(D704) PTS SENSOR NO. 10 SIGNAL CIRCUIT SHORT TO BATTERY
(D704) PTS SENSOR NO. 10 SIGNAL CIRCUIT OPEN
PTS SENSOR NO. 10
PARK ASSIST MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

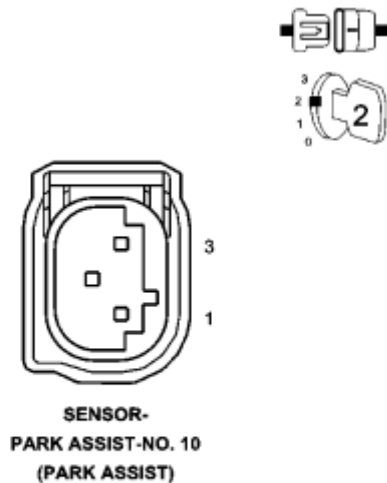
Go To step 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK PARK ASSIST SENSOR NO. 10 FOR INTERNAL SHORT



819d4ed3

Fig. 24: Checking Park Assist Sensor No. 10
Courtesy of CHRYSLER LLC

Disconnect Park Assist Sensor No. 10.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

Go To step 3.

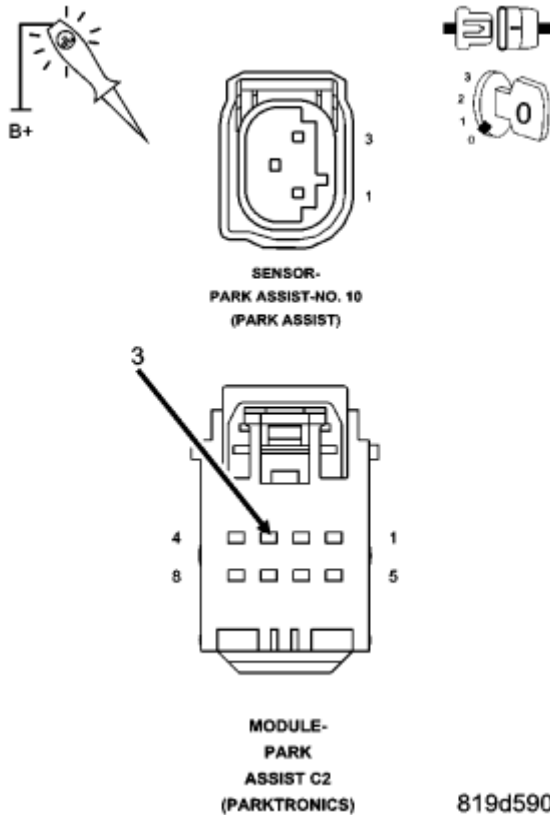
No

Replace Park Assist Sensor No. 10.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO

GROUND



819d590b

Fig. 25: Checking Park Assist Sensor No. 10 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist module harness connectors C1 and C2.

Using a 12-volt test light connected to 12-volts check the (D704) Park Assist Sensor No. 10 Signal circuit at the Park Assist module C2 harness connector.

Does the test light illuminate brightly?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To step 4.

4. CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO

BATTERY

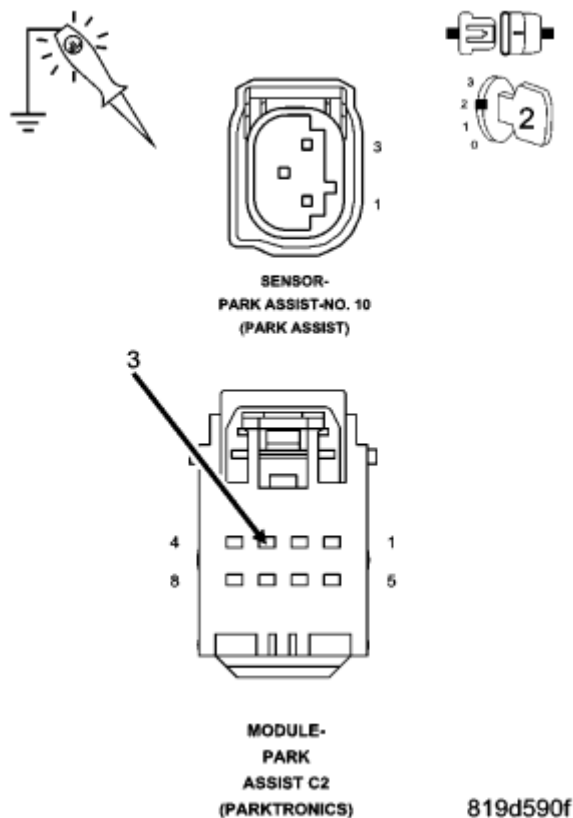


Fig. 26: Checking Park Assist Sensor No. 10 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground check the (D704) Park Assist Sensor No. 10 Signal circuit at the Park Assist module C2 harness connector for a short to battery.

Does the test light illuminate brightly?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to battery.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 5.

5. **CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR AN OPEN**

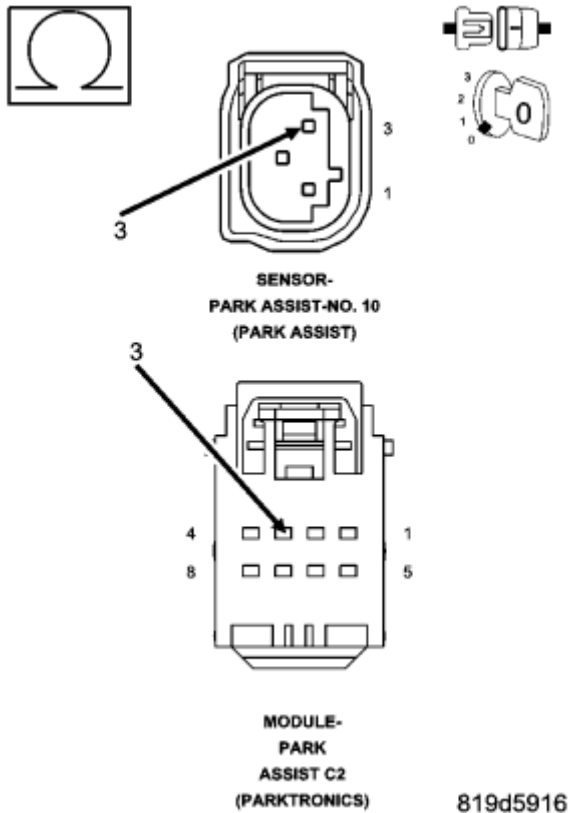


Fig. 27: Measuring Resistance Of Park Assist Sensor No. 10 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (D704) Park Assist Sensor No. 10 Signal circuit between the Park Assist Module C2 harness connector and the Park Assist Sensor No. 10 harness connector.

Is the resistance below 5.0 ohms?

No

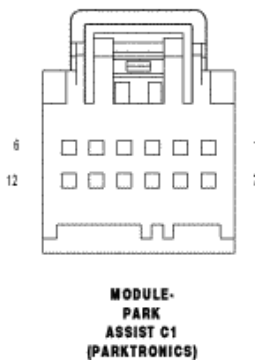
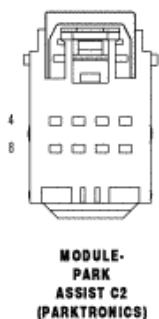
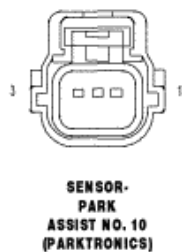
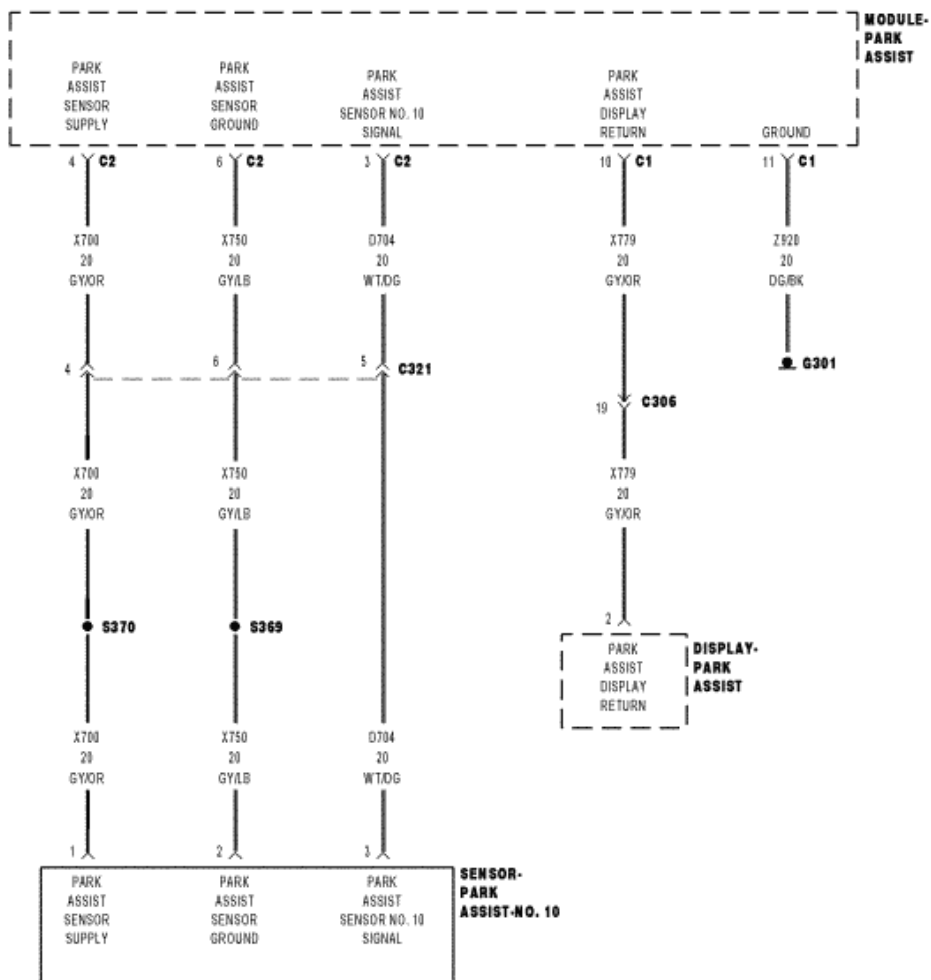
Repair the (D704) Park Assist Sensor No. 10 Signal circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Park Assist Module in accordance with service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B123B-PTS SENSOR 10 CIRCUIT LOW

Circuit Schematic



01010401

Fig. 28: PTS Sensor 10 Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time is too short (700 [micro]secs).

Possible Causes

Possible Causes
(D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT SHORTED TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT
(D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT SHORTED TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT
(D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT SHORTED TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT
(D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT SHORTED TO GROUND
PARK ASSIST SENSOR NO. 10
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

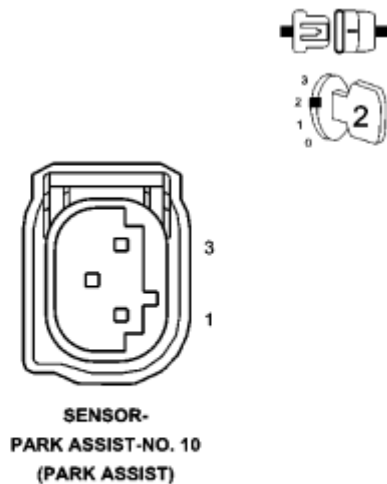
Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK PARK ASSIST SENSOR NO. 10 FOR A SHORT TO GROUND



819d4ed3

Fig. 29: Checking Park Assist Sensor No. 10
Courtesy of CHRYSLER LLC

Shift the transmission into park.

With the scan tool, erase DTCs.

Turn the ignition off.

Disconnect Park Assist Sensor No. 10.

Turn the ignition on.

Shift the transmission into reverse.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 3.

No

Replace Park Assist Sensor No. 10 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

3. **CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT**

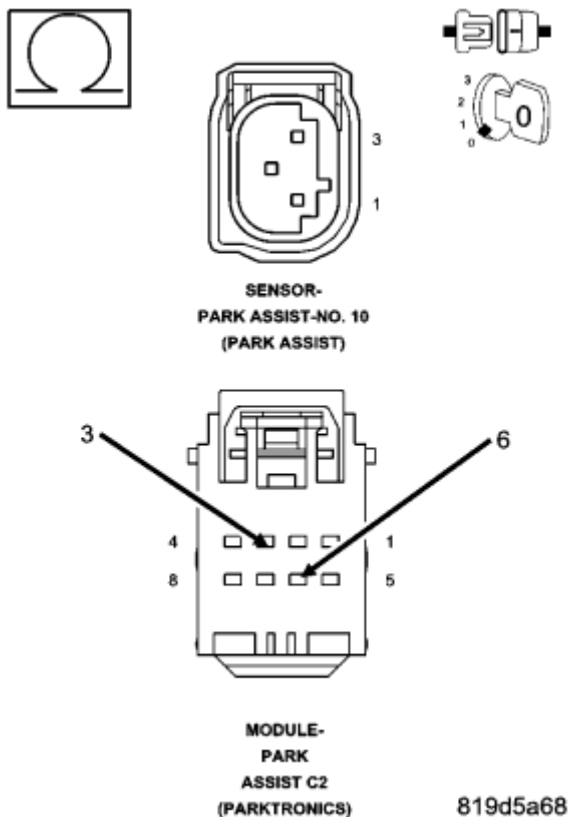


Fig. 30: Measuring Resistance Between Park Assist Sensor No. 10 Signal Circuit And Park Assist Sensor Ground Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Measure the resistance between the (D704) Park Assist Sensor No. 10 Signal circuit and the (X750) Park Assist Sensor Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to the (X750) Park Assist Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT**

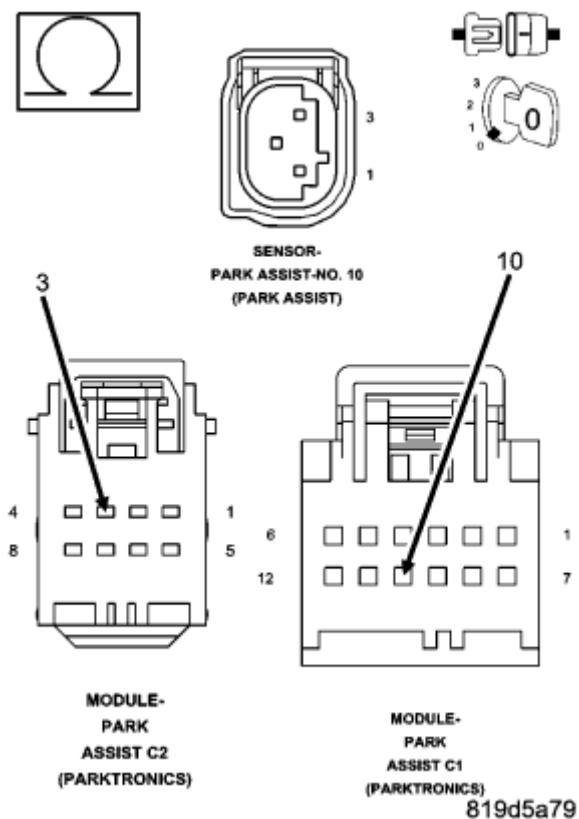


Fig. 31: Measuring Resistance Between Park Assist Sensor No. 10 Signal Circuit And Park Assist Display Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D704) Park Assist Sensor No. 10 Signal circuit and the (X779) Park Assist Display Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to the (X779) Park Assist Display Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT**

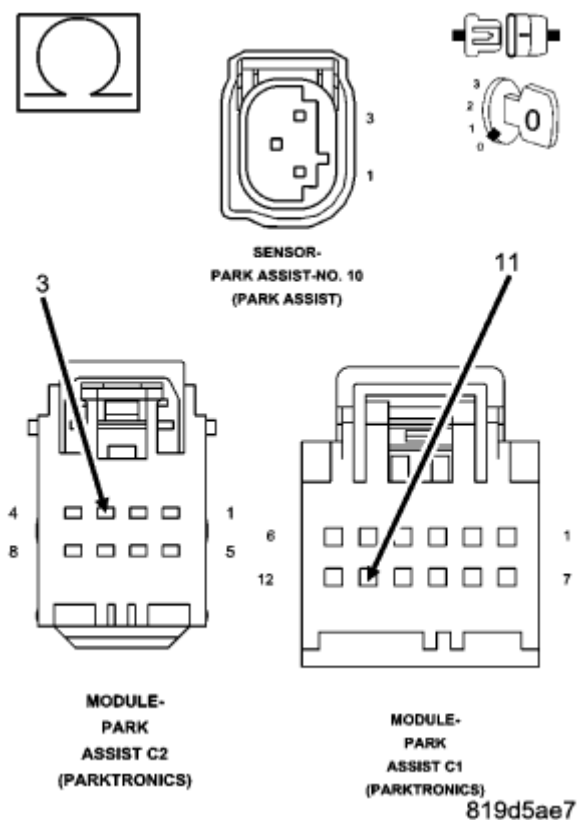


Fig. 32: Measuring Resistance Between Park Assist Sensor No. 10 Signal Circuit And Park Assist Module Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D704) Park Assist Sensor No. 10 Signal circuit and the (Z920) Park Assist Module Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to the (Z920) Park Assist Module Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. **CHECK THE (D704) PARK ASSIST SENSOR NO. 10 SIGNAL CIRCUIT FOR A SHORT TO GROUND**

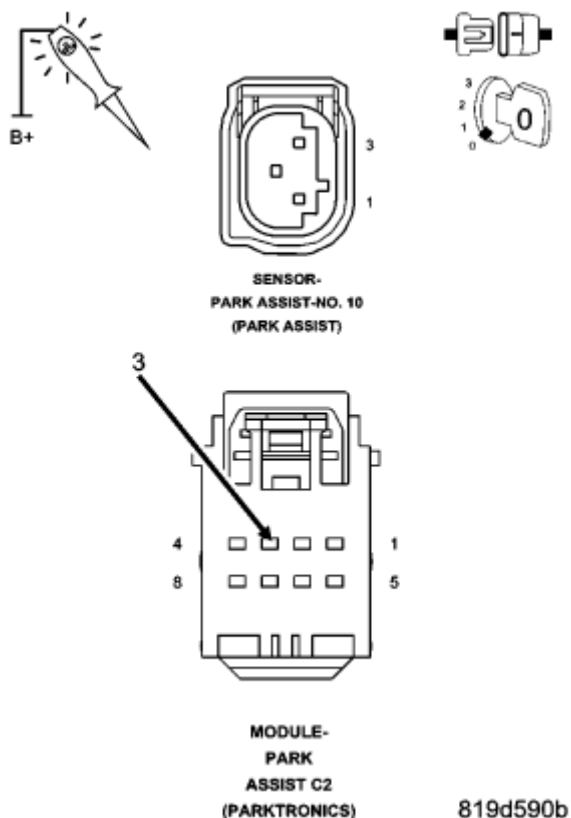


Fig. 33: Checking Park Assist Sensor No. 10 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D704) Park Assist Sensor No. 10 Signal circuit and ground.

Is the resistance below 10K ohms?

Yes

Repair the (D704) Park Assist Sensor No. 10 Signal circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Park Assist Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B123D-PTS SENSOR 10 RING TIME TOO SHORT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time exceeds limit (greater than 1450 [micro]secs).

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 10

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE THE PARK ASSIST SENSOR N0. 10

View Repair

Repair

Replace Park Assist Sensor No. 10 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B123E-PTS SENSOR 10 RING TIME TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Data line stuck at 0.

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 10

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE PARK ASSIST SENSOR NO. 10

View Repair

Repair

Replace Park Assist Sensor No. 10 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B127B PTS SENSOR 11 CIRCUIT PERFORMANCE

Circuit Schematic

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

During Reverse and during self test in Forward between 18 km/h (11 mph) and 40 km/h (25 mph).

Set Conditions

- Set Condition:**

If the system detects data corruption in the transmission in the internal communication line between the module and sensors, this code will set.

Possible Causes

Possible Causes
(D710) PTS SENSOR NO. 11 SIGNAL CIRCUIT SHORT TO GROUND
(D710) PTS SENSOR NO. 11 SIGNAL CIRCUIT SHORT TO BATTERY
(D710) PTS SENSOR NO. 11 SIGNAL CIRCUIT OPEN
PTS SENSOR NO. 11
PARK ASSIST MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

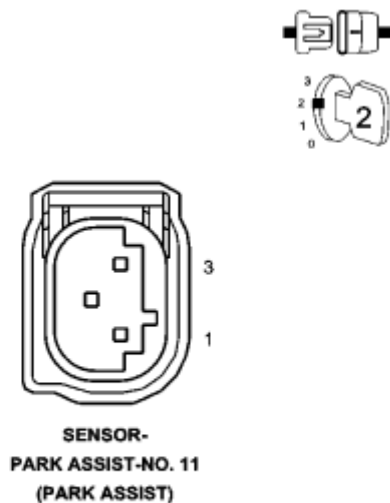
Go To step 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK PARK ASSIST SENSOR NO. 11 FOR INTERNAL SHORT



819d5c21

Fig. 35: Checking Park Assist Sensor No. 11
Courtesy of CHRYSLER LLC

Disconnect Park Assist Sensor No. 11.

With the scan tool, read Park Assist Module DTCs.

Does the scan tool display this DTC as active?

Yes

Go To step 3.

No

Replace Park Assist Sensor No. 11.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR A SHORT TO

GROUND

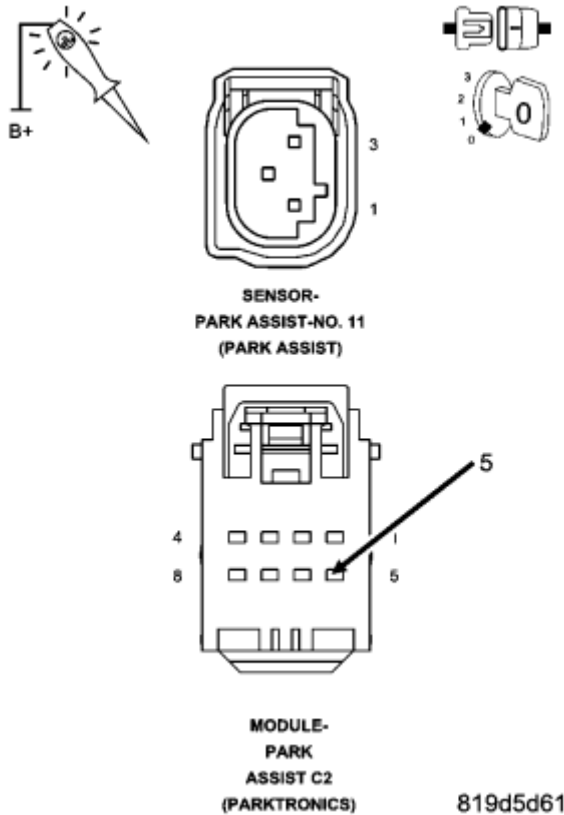


Fig. 36: Checking Park Assist Sensor No. 11 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist module harness connectors C1 and C2.

Using a 12-volt test light connected to 12-volts check the (D710) Park Assist Sensor No. 11 Signal circuit at the Park Assist module C2 harness connector.

Does the test light illuminate brightly?

Yes

Repair the (D710) Park Assist Sensor No. 11 Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 4.

4. CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR A SHORT TO

BATTERY

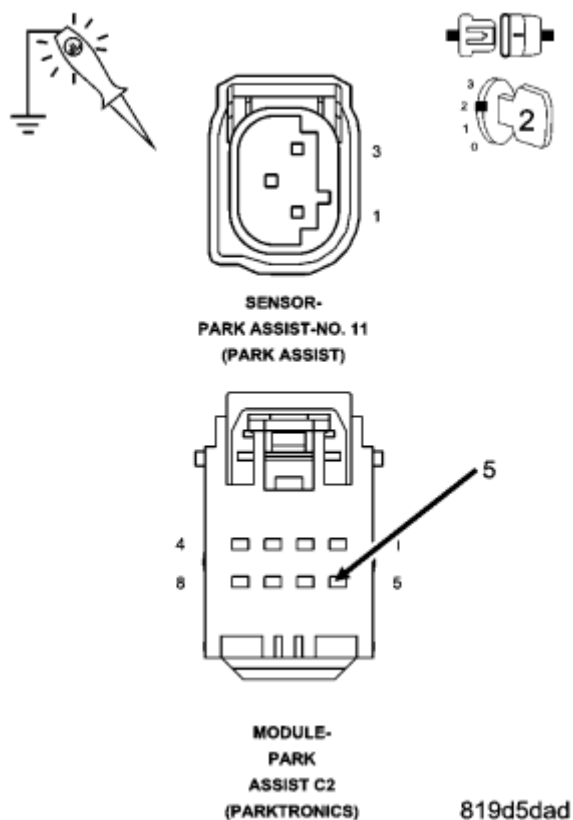


Fig. 37: Checking Park Assist Sensor No. 11 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground check the (D710) Park Assist Sensor No. 11 Signal circuit at the Park Assist module C2 harness connector for a short to battery.

Does the test light illuminate brightly?

Yes

Repair the (D710) Park Assist Sensor No. 11 Signal circuit for a short to battery.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 5.

5. **CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR AN OPEN**

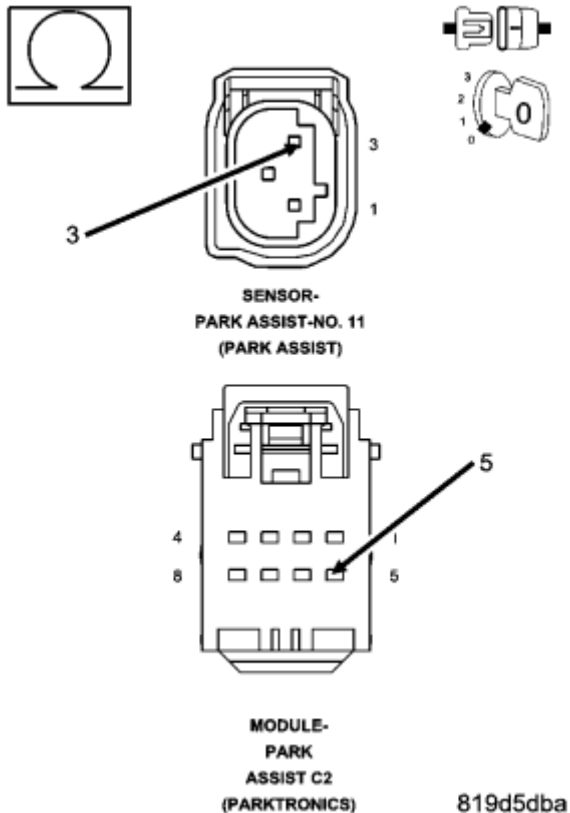


Fig. 38: Measuring Resistance Of Park Assist Sensor No. 11 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (D710) Park Assist Sensor No. 11 Signal circuit between the Park Assist Module C2 harness connector and the Park Assist Sensor No. 11 harness connector.

Is the resistance below 5.0 ohms?

No

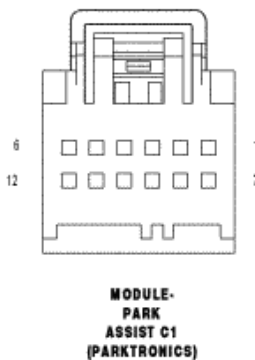
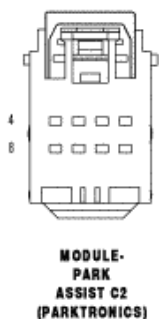
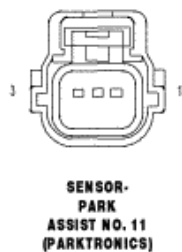
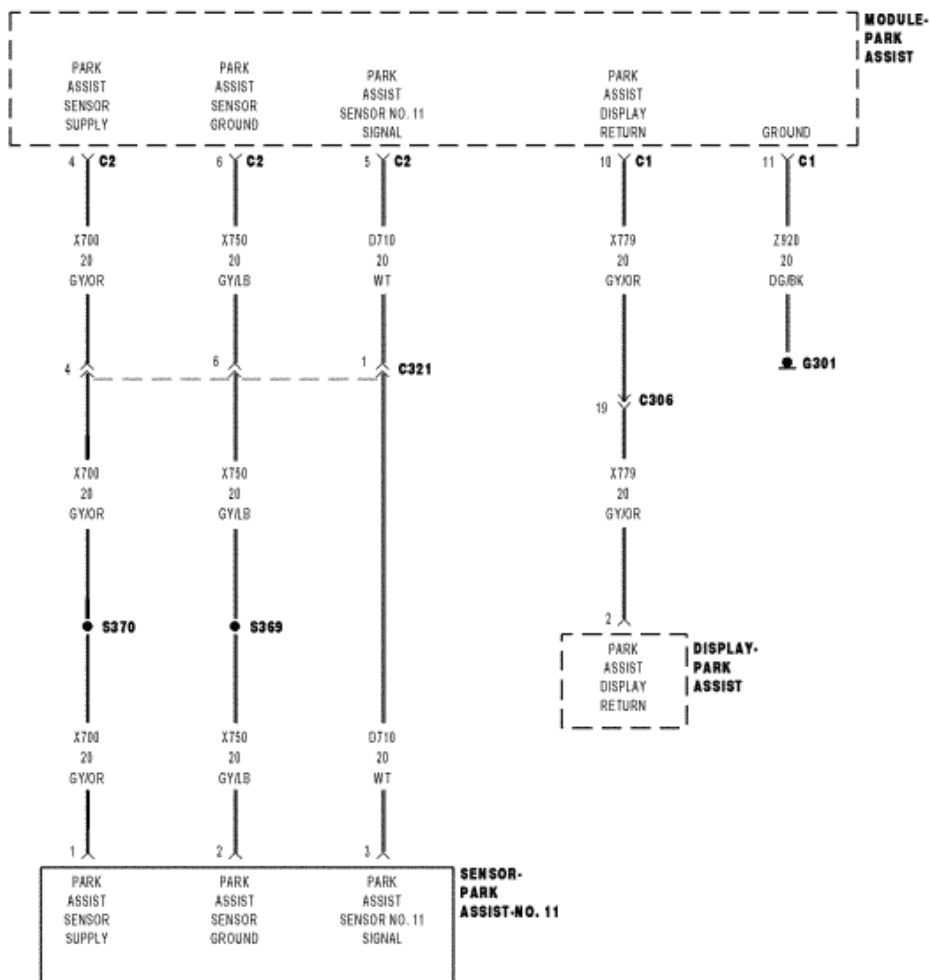
Repair the (D710) Park Assist Sensor No. 11 Signal circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Park Assist Module in accordance with service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B127C-PTS SENSOR 11 CIRCUIT LOW

Circuit Schematic



01010609

Fig. 39: PTS Sensor 11 Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time is too short (700 [micro]secs).

Possible Causes

Possible Causes
(D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT SHORTED TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT
(D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT SHORTED TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT
(D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT SHORTED TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT
(D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT SHORTED TO GROUND
PARK ASSIST SENSOR NO. 11
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

Turn the ignition off.

Disconnect Park Assist Sensor No. 11.

Turn the ignition on.

Shift the transmission into reverse.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

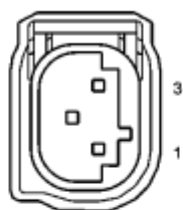
Go To 3.

No

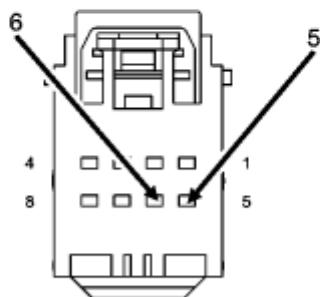
Replace Park Assist Sensor No. 11 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR A SHORT TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT**



SENSOR-
PARK ASSIST-NO. 11
(PARK ASSIST)



MODULE-
PARK
ASSIST C2
(PARKTRONICS)

819d5f0a

Fig. 41: Measuring Resistance Between Park Assist Sensor No. 11 Signal Circuit And Park Assist Sensor Ground Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Measure the resistance between the (D710) Park Assist Sensor No. 11 Signal circuit and the (X750) Park Assist Sensor Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D710) Park Assist Sensor No. 11 Signal circuit for a short to the (X750) Park Assist Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR A SHORT TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT**

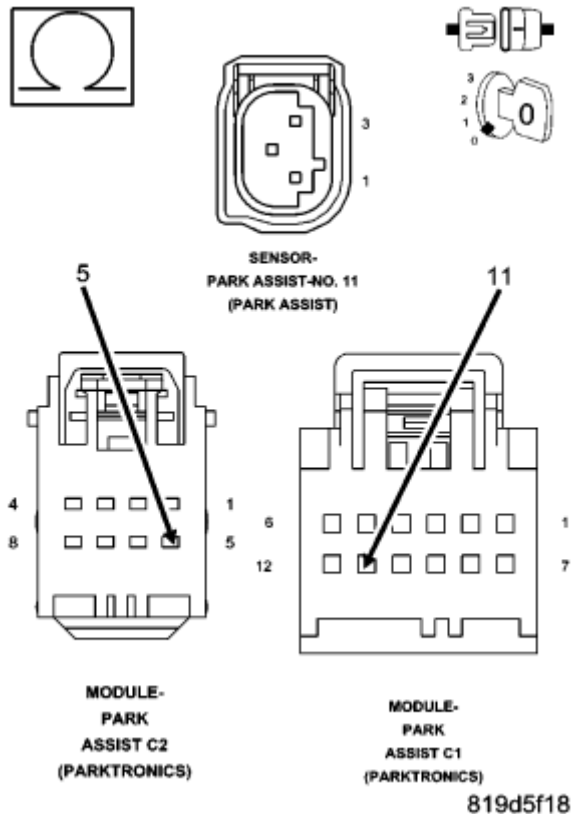


Fig. 43: Measuring Resistance Between Park Assist Sensor No. 11 Signal Circuit And Park Assist Module Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (D710) Park Assist Sensor No. 11 Signal circuit and the (Z920) Park Assist Module Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D710) Park Assist Sensor No. 11 Signal circuit for a short to the (Z920) Park Assist Module Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

- 6. CHECK THE (D710) PARK ASSIST SENSOR NO. 11 SIGNAL CIRCUIT FOR A SHORT TO GROUND**

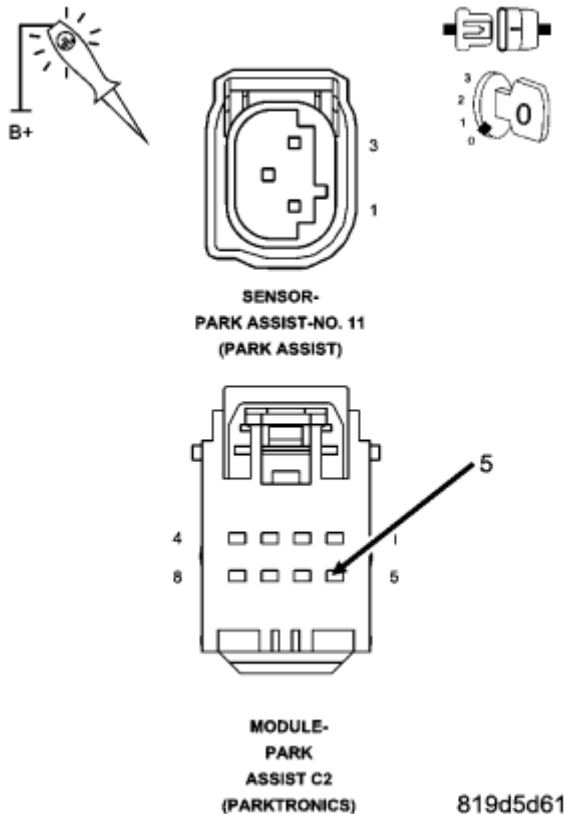


Fig. 44: Checking Park Assist Sensor No. 11 Signal Circuit
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D710) Park Assist Sensor No. 11 Signal circuit and ground.

Is the resistance below 10K ohms?

Yes

Repair the (D710) Park Assist Sensor No. 11 Signal circuit for a short to ground.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Park Assist Module in accordance with the service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B127E-PTS SENSOR 11 RING TIME TOO SHORT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16 km/h (10 mph).

Set Conditions

- **Set Condition:**

Sensor ring down time exceeds limit (greater than 1450 [micro]secs).

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 11

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REPLACE THE PARK ASSIST SENSOR N0. 11**

View Repair

Repair

Replace Park Assist Sensor No. 11 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B127F-PTS SENSOR 11 RING TIME TOO LONG

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Data line stuck at 0.

Possible Causes

Possible Causes
PARK ASSIST SENSOR NO. 11

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REPLACE PARK ASSIST SENSOR NO. 11

View Repair

Repair

Replace Park Assist Sensor No. 11 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B210D-BATTERY VOLTAGE LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Battery voltage less than 9 volts for approximately 5 to 6 seconds.

Possible Causes

Possible Causes
RESISTANCE IN THE BATTERY POSITIVE CIRCUIT RESISTANCE IN THE GENERATOR CASE GROUND GENERATOR OPERATION (K20) GENERATOR FIELD CONTROL CIRCUIT OPEN (K20) GENERATOR FIELD CONTROL CIRCUIT SHORTED TO GROUND GROUND CIRCUIT OPEN PCM

Diagnostic Test

1. CHECK FOR ANY POWERTRAIN CONTROL MODULES DTCS

NOTE: Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.

NOTE: Inspect the vehicle for after market accessories that may exceed the Generator System output.

NOTE: Make sure the generator drive belt is in good operating condition.

NOTE: Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Turn the ignition on.

With the scan tool, read active PCM DTC's.

Does the scan tool display any active PCM DTC's?

Yes

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

No

Check the above conditions that can cause a low voltage condition. Repair as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

B210E-BATTERY VOLTAGE HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Park Assist Module supply voltage greater than 16.0 volts.

Possible Causes

Possible Causes
VEHICLE CHARGING SYSTEM
PARK ASSIST MODULE

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. VERIFY OPERATION OF THE VEHICLE CHARGING SYSTEM

NOTE: Troubleshoot any PCM charging/cranking DTCs before proceeding.

NOTE: Make sure the battery is fully charged.

Are any charging system DTCs present?

Yes

Refer to **DIAGNOSIS AND TESTING** .

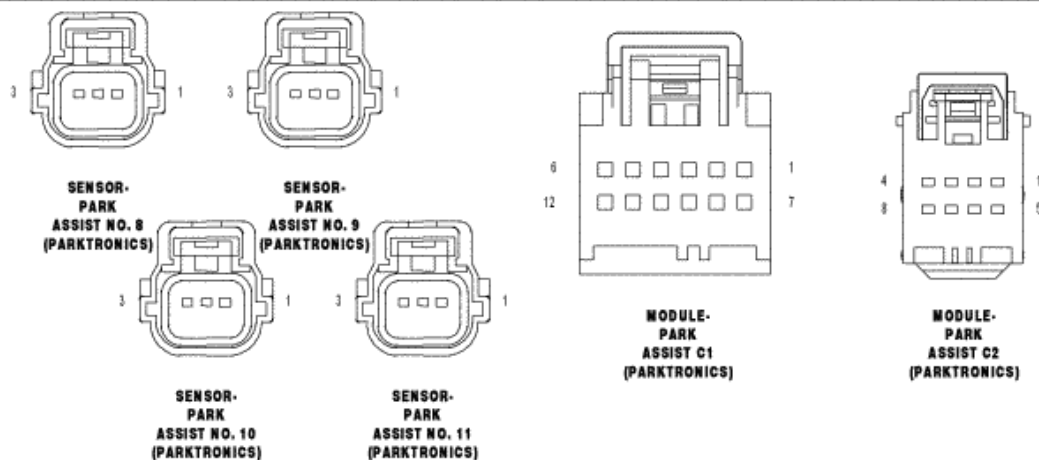
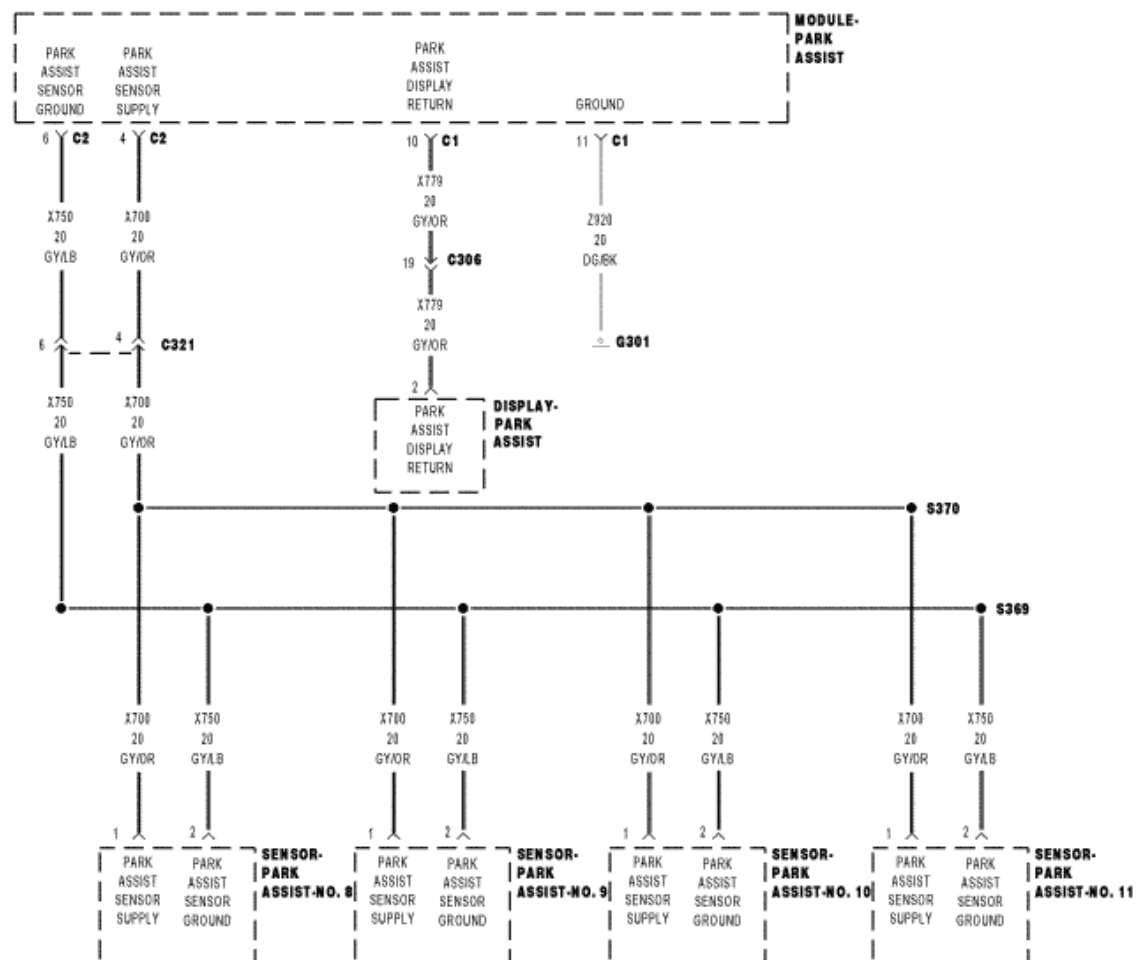
No

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2126-SENSOR SUPPLY VOLTAGE LOW

Circuit Schematic



81610306

Fig. 45: Park Assist Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Park Assist Sensor supply voltage less than 7.2 volts.

Possible Causes

Possible Causes
(X700) PARK ASSIST SENSOR SUPPLY CIRCUIT SHORTED TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT
(X700) PARK ASSIST SENSOR SUPPLY CIRCUIT SHORTED TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT
(X700) PARK ASSIST SENSOR SUPPLY CIRCUIT SHORTED TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT
(X700) PARK ASSIST SENSOR SUPPLY CIRCUIT SHORTED TO GROUND
PARK ASSIST SENSOR
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

Apply the park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK EACH PARK ASSIST SENSOR FOR A SHORT TO GROUND

Turn the ignition off.

Disconnect one Park Assist Sensor.

Turn the ignition on.

With the scan tool, read Park Assist Module DTCs. If this DTC is still active, repeat this procedure by disconnecting another park assist sensor. However, if this DTC changes from active to stored, or if all four sensors have been disconnected, proceed as follows:

Is this DTC still active?

Yes

Go To 3.

No

Replace the Park Assist Sensor that caused this DTC to change from active to stored after disconnecting it in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

3. CHECK THE (X700) PARK ASSIST SENSOR SUPPLY CIRCUIT FOR A SHORT TO (X750) PARK ASSIST SENSOR GROUND CIRCUIT

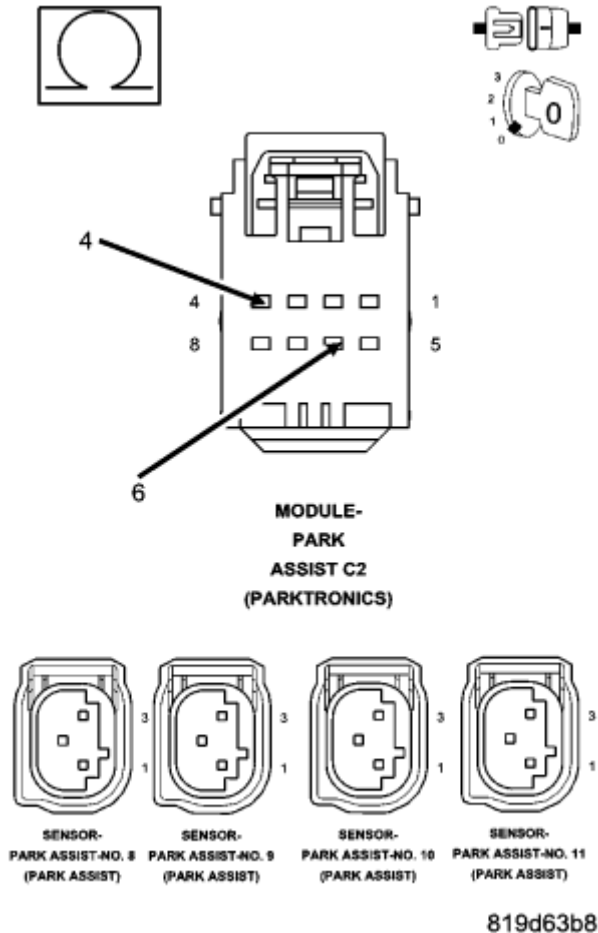


Fig. 46: Measuring Resistance Between Park Assist Sensor Supply Circuit And Park Assist Sensor Ground Circuit
 Courtesy of CHRYSLER LLC

NOTE: Perform this test with all Park Assist Sensors disconnected.

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Measure the resistance between the (X700) Park Assist Sensor Supply circuit and the (X750) Park Assist Sensor Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X700) Park Assist Sensor Supply circuit for a short to the (X750) Park Assist Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (X700) PARK ASSIST SENSOR SUPPLY CIRCUIT FOR A SHORT TO (X779) PARK ASSIST DISPLAY GROUND CIRCUIT**

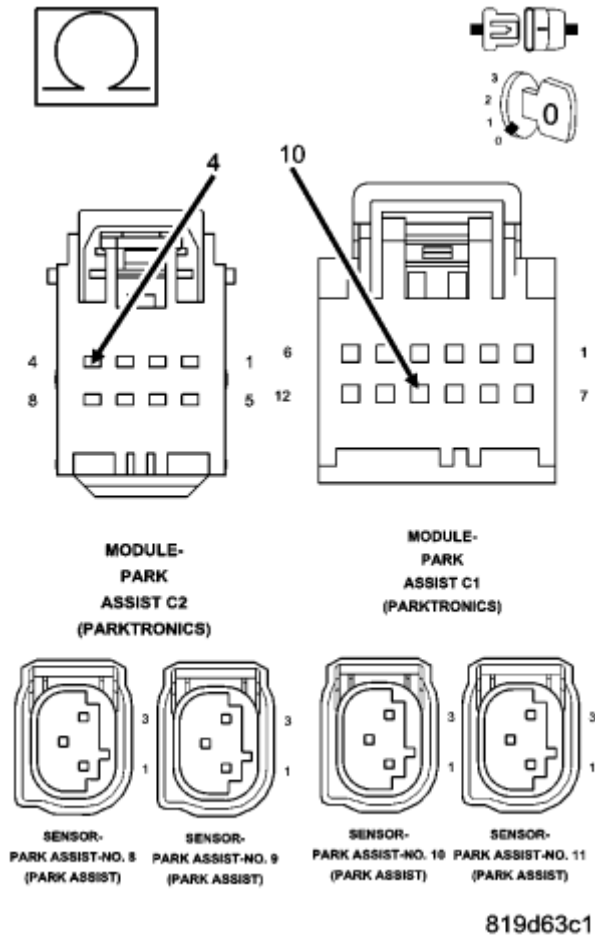


Fig. 47: Measuring Resistance Between Park Assist Sensor Supply Circuit And Park Assist Display Ground Circuit

Courtesy of CHRYSLER LLC

NOTE: Perform this test with all Park Assist Sensors disconnected.

Measure the resistance between the (X700) Park Assist Sensor Supply circuit and the (X779) Park Assist Display Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X700) Park Assist Sensor Supply circuit for a short to the (X779) Park Assist Display

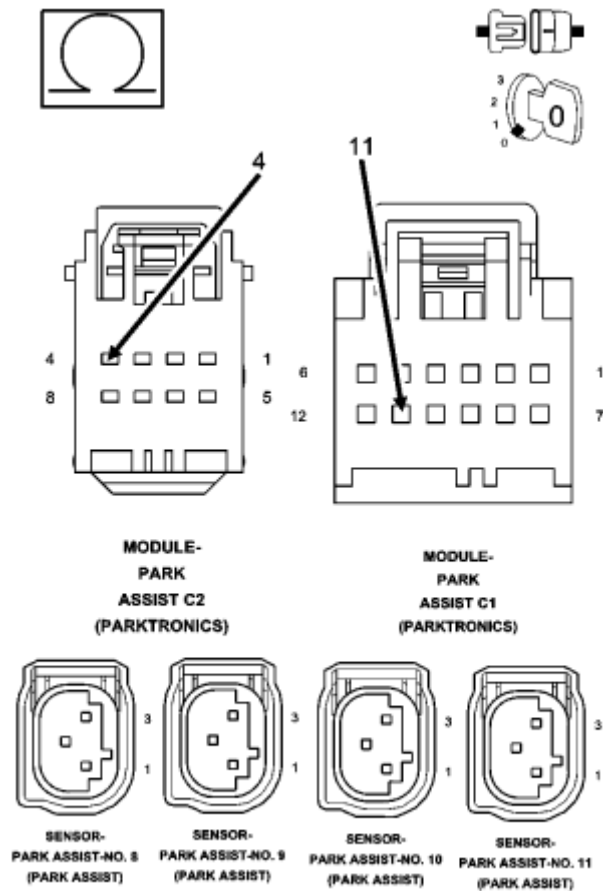
Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (X700) PARK ASSIST SENSOR SUPPLY CIRCUIT FOR A SHORT TO (Z920) PARK ASSIST MODULE GROUND CIRCUIT**



819d63ec

Fig. 48: Measuring Resistance Between Park Assist Sensor Supply Circuit And Park Assist Module Ground Circuit

Courtesy of CHRYSLER LLC

NOTE: Perform this test with all Park Assist Sensors disconnected.

Measure the resistance between the (X700) Park Assist Sensor Supply circuit and the (Z920) Park Assist Module Ground circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X700) Park Assist Sensor Supply circuit for a short to the (Z920) Park Assist Module Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK THE (X700) PARK ASSIST SENSOR SUPPLY CIRCUIT FOR A SHORT TO GROUND

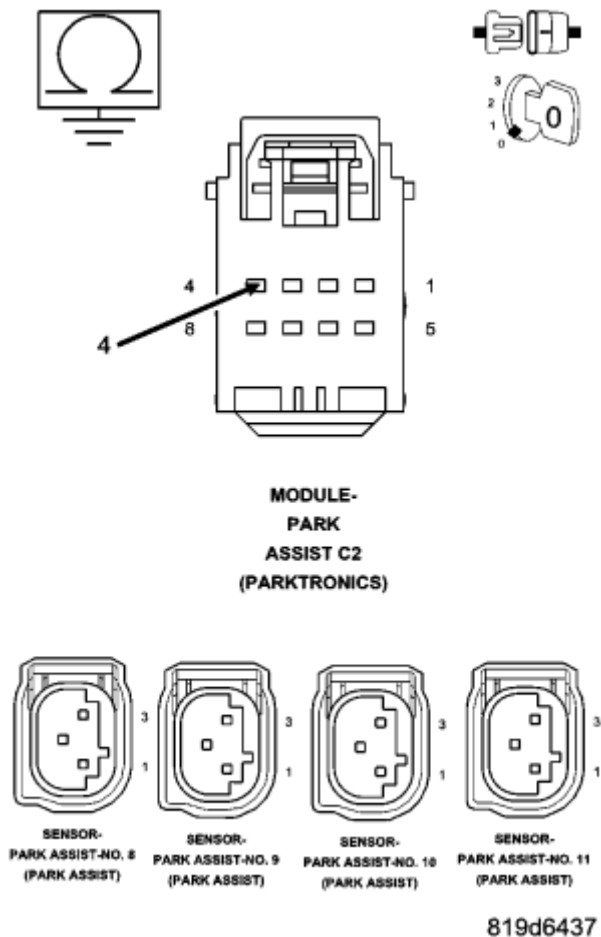


Fig. 49: Measuring Resistance Between Ground And Park Assist Sensor Supply Circuit
Courtesy of CHRYSLER LLC

NOTE: Perform this test with all Park Assist Sensors disconnected.

Measure the resistance between ground and the (X700) Park Assist Sensor Supply circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X700) Park Assist Sensor Supply circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

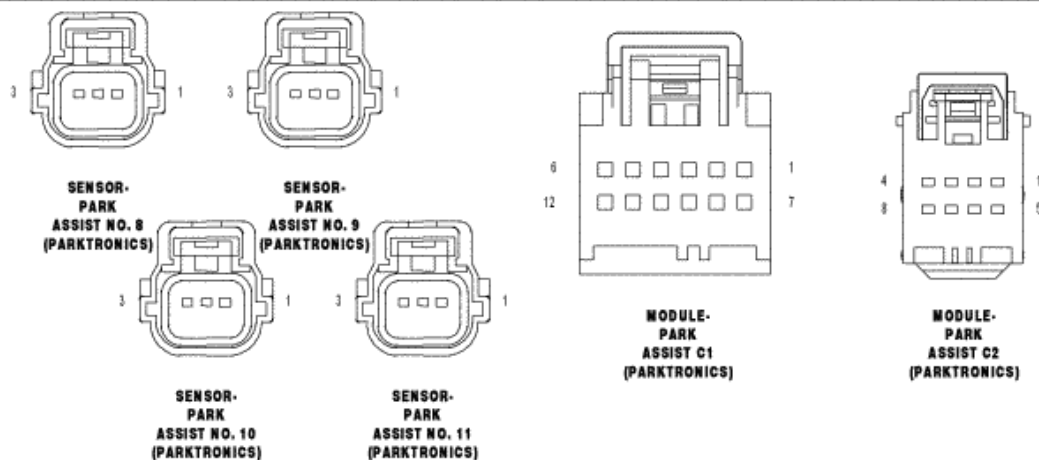
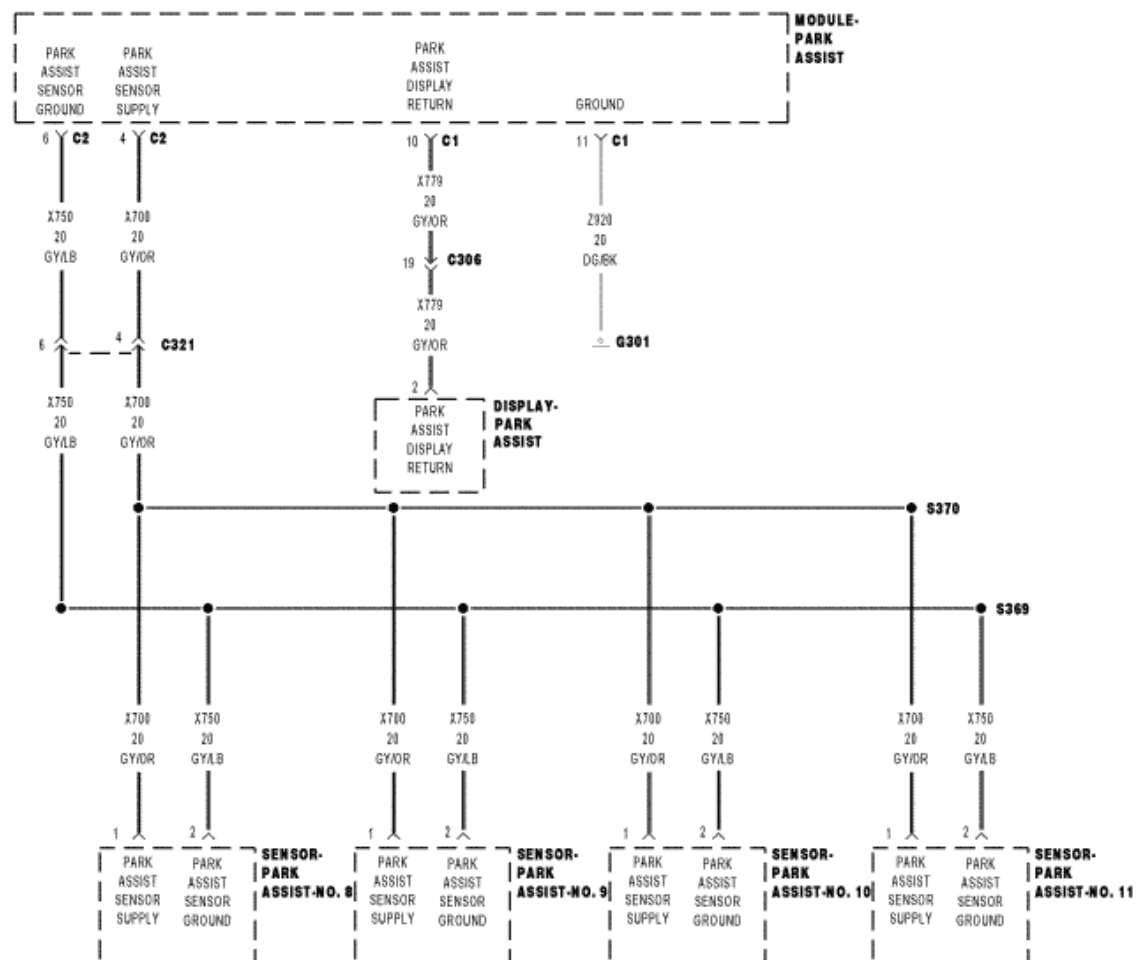
No

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2127-SENSOR SUPPLY VOLTAGE HIGH

Circuit Schematic



81610306

Fig. 50: Park Assist Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

NOTE: The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since Chrysler Group vehicles use only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Park Assist Sensor supply voltage greater than 9.2 volts.

Possible Causes

Possible Causes
(X700) PARK ASSIST SENSOR SUPPLY CIRCUIT SHORT TO VOLTAGE PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (X700) PARK ASSIST SENSOR SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE**

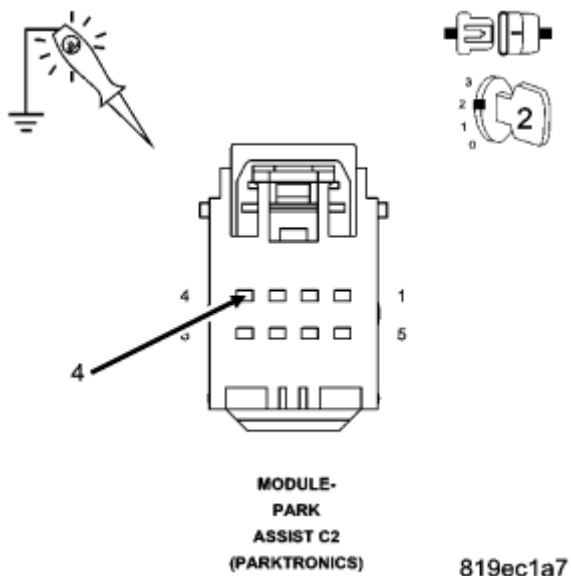


Fig. 51: Measuring Voltage On Park Assist Sensor Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Turn the ignition on.

Measure the voltage on the (X700) Park Assist Sensor Supply circuit.

Is the voltage above 9.2 volts?

Yes

Repair the (X700) Park Assist Sensor Supply circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

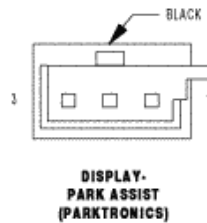
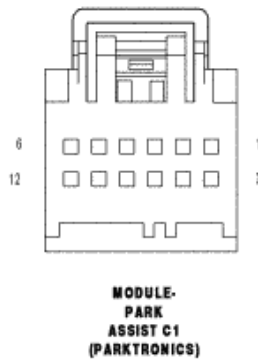
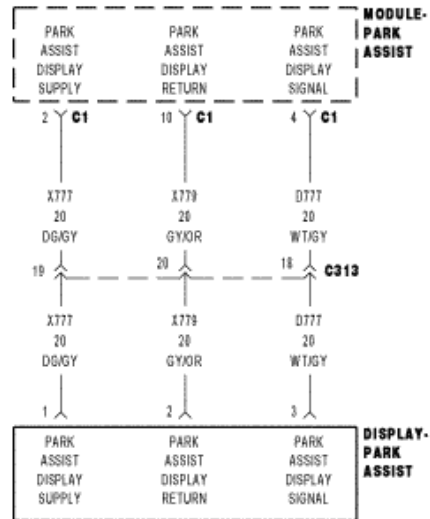
No

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B212A-PTS DISPLAY SUPPLY VOLTAGE LOW

Circuit Schematic



01a537a0

Fig. 52: Park Assist Sensor Display Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph)

Set Conditions

- **Set Condition:**

Park Assist Sensor Display voltage less than 8.0 volts.

Possible Causes

Possible Causes
(X777) PARK ASSIST DISPLAY SUPPLY CIRCUIT SHORT TO GROUND PARK ASSIST DISPLAY PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK PARK ASSIST DISPLAY FOR AN INTERNAL SHORT TO GROUND**

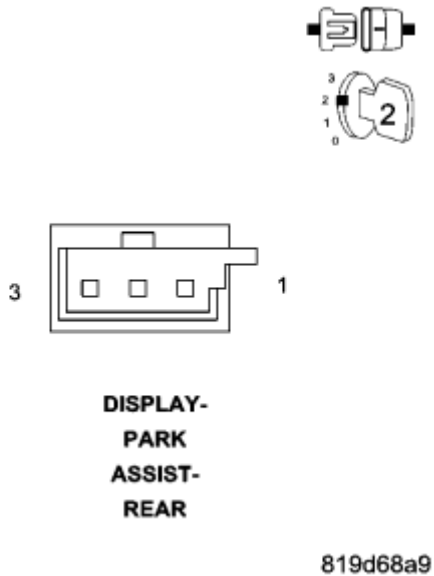


Fig. 53: Checking Park Assist Display
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Display Module harness connector.

Turn the ignition on.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC still active?

Yes

Go To 3.

No

Replace the Park Assist Display Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK THE (X777) PARK ASSIST DISPLAY SUPPLY CIRCUIT FOR A SHORT GROUND**

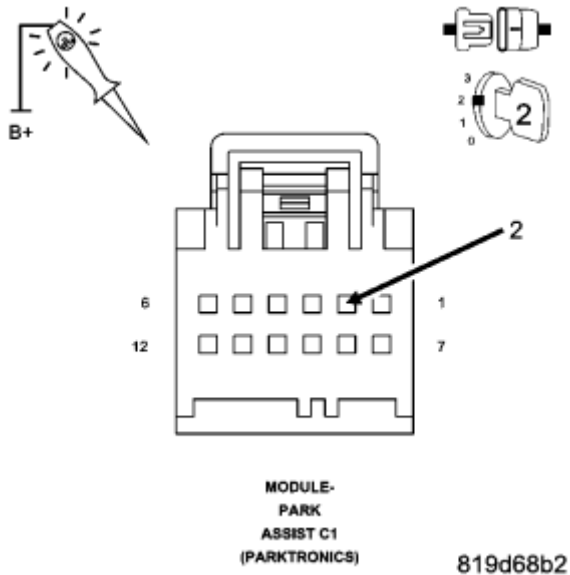


Fig. 54: Checking Park Assist Display Supply Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts check the (X777) Park Assist Display Supply circuit.

Does the test light illuminate brightly?

Yes

Repair the (X777) Park Assist Display Supply circuit for a short to ground.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Park Assist Module in accordance with the service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

B222A-VEHICLE LINE MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Vehicle Line data transmitted on the CAN C Interior bus doesn't correspond with the data stored in the Park Assist Module.

Possible Causes

Possible Causes
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK VEHICLE LINE IN THE PCM**

With the scan tool, compare the vehicle line that is programmed in to the PCM to the vehicle line of the vehicle.

Does the vehicle line programmed into the PCM match the vehicle?

Yes

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **POWERTRAIN VERIFICATION TEST** .

B2232-(PTS) PARKTRONICS INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Park Assist Module detects an internal failure.

Possible Causes

Possible Causes
PARK ASSIST MODULE

Diagnostic Test

1. **REPLACE THE PARK ASSIST MODULE**

View Repair

Repair

Replace the Park Assist Module in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

B2234-(PTS) PARKTRONICS REAR DISPLAY INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

The Park Assist Module detects an internal Park Assist Display failure.

Possible Causes

Possible Causes
PARK ASSIST DISPLAY

Diagnostic Test

1. **REPLACE THE PARK ASSIST DISPLAY**

View Repair

Repair

Replace the Park Assist Display in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0423-IMPLAUSIBLE DATA RECEIVED FROM CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Park Assist Module supply voltage between 9-16 volts. Ignition in Run/Start.

Set Conditions

- **Set Condition:**

Ignition status = 7h

Possible Causes

Possible Causes
NO COMMUNICATION WITH INSTRUMENT CLUSTER DTCS STORED OR ACTIVE IN THE INSTRUMENT CLUSTER ACTIVE DTCS IN THE TIPM PARK ASSIST MODULE

Diagnostic Test

1. CHECK FOR ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. INSTRUMENT CLUSTER IS ACTIVE ON THE CAN C INTERIOR BUS

With the scan tool, select ECU View.

Verify that the Instrument Cluster is active on the bus.

Is the Instrument Cluster active on the bus?

Yes

Go To 3.

No

(Refer to **DIAGNOSIS AND TESTING**) for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1**.

3. DTCS STORED OR ACTIVE IN THE INSTRUMENT CLUSTER

Check for Ignition Switch DTCs in the Instrument Cluster.

Are any DTCs active or stored in the Instrument Cluster?

Yes

Refer to the appropriate article and perform the diagnostics for the DTCs.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go to 4.

4. **ACTIVE DTCS IN THE TIPM**

With the scan tool, select ECU View and select TIPM.

With the scan tool, read active DTCs.

Are any Communication DTCs active in the TIPM Park Assist System?

Yes

Refer to the appropriate article and perform the diagnostics for the DTCs.

Perform **BODY VERIFICATION TEST - VER 1** .

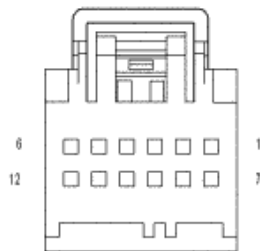
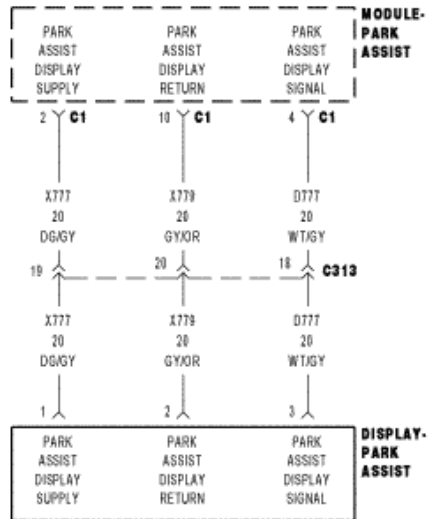
No

Replace and program the Park Assist Module in accordance with the Service Information.

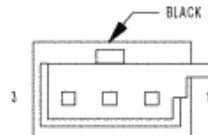
Perform **BODY VERIFICATION TEST - VER 1** .

U1101-LOST COMMUNICATION WITH PTS DISPLAY

Circuit Schematic



MODULE-PARK ASSIST C1 (PARKTRONICS)



DISPLAY-PARK ASSIST (PARKTRONICS)

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Fig. 55: Park Assist Sensor Display Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

While the vehicle is in reverse for speeds less than 16km/h (10 mph).

Set Conditions

- **Set Condition:**

Data display line open.

Possible Causes

Possible Causes
(D777) PARK ASSIST DISPLAY SIGNAL CIRCUIT OPEN
(X777) PARK ASSIST DISPLAY SUPPLY CIRCUIT OPEN
(X779) PARK ASSIST DISPLAY GROUND CIRCUIT OPEN
PARK ASSIST DISPLAY
PARK ASSIST MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

Turn the ignition on.

Apply the vehicle park brake.

Shift the transmission into Reverse.

With the scan tool, record and erase Park Assist Module DTCs.

Wait 30 seconds.

With the scan tool, read Park Assist Module DTCs.

Is this DTC active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK THE (D777) PARK ASSIST DISPLAY SIGNAL CIRCUIT FOR AN OPEN

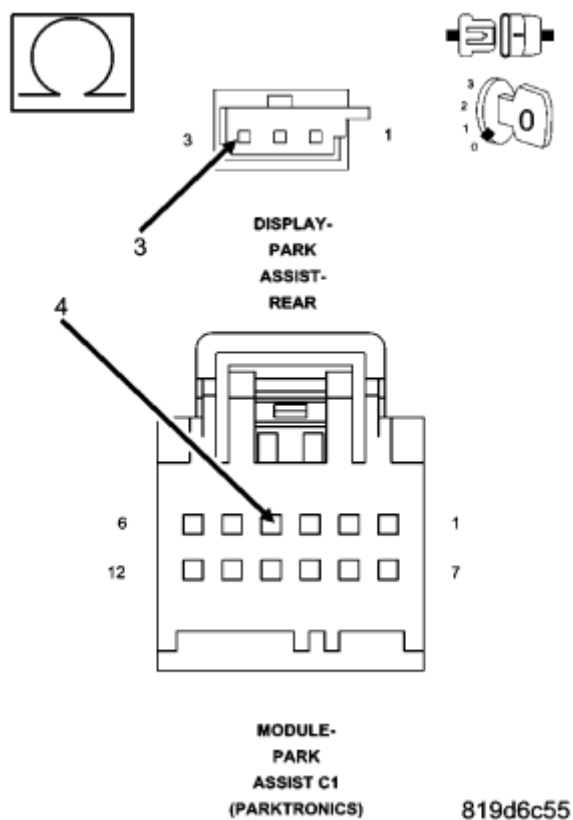


Fig. 56: Measuring Resistance Of Park Assist Display Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Park Assist Module harness connector.

Disconnect the Park Assist Display Module harness connector.

Measure the resistance of the (D777) Park Assist Display Signal circuit between the Park Assist Module harness connector and the Park Assist Display harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 3.

No

Repair the (D777) Park Assist Display Signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

3. CHECK THE (X777) PARK ASSIST DISPLAY SUPPLY CIRCUIT FOR AN OPEN

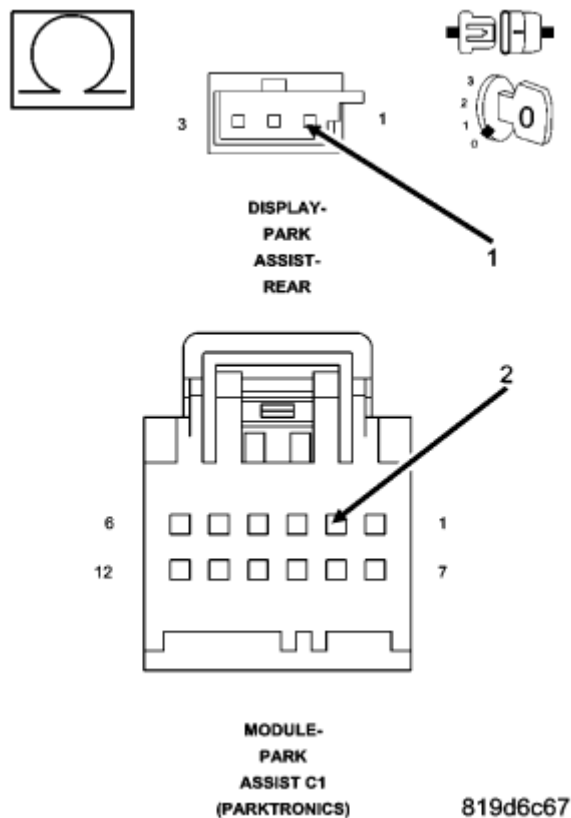


Fig. 57: Measuring Resistance Of Park Assist Display Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (X777) Park Assist Display Supply circuit between the Park Assist Module harness connector and the Park Assist Display harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 4.

No

Repair the (X777) Park Assist Display Supply circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. CHECK THE (X779) PARK ASSIST DISPLAY GROUND CIRCUIT FOR AN OPEN

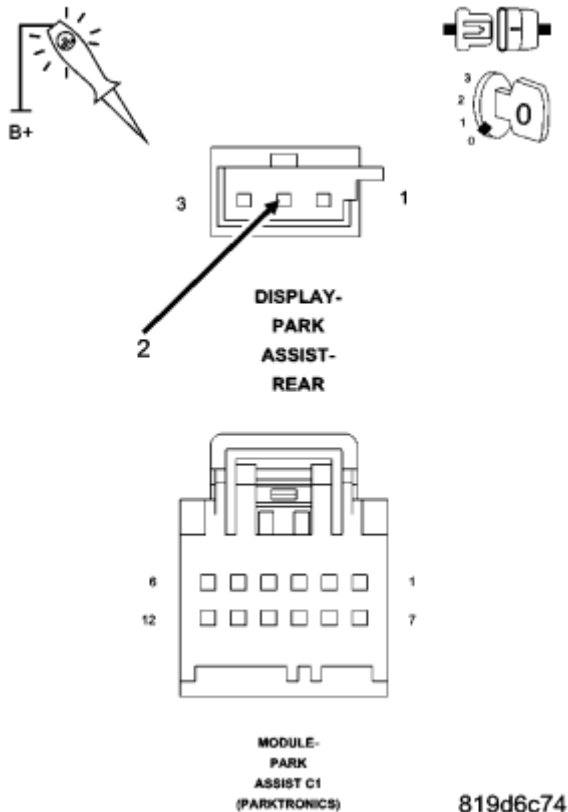


Fig. 58: Checking Park Assist Display Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts check the (X779) Park Assist Display Ground circuit at the Park Assist Display harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (X779) Park Assist Display Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

5. **CHECK THE OPERATION OF THE PARK ASSIST DISPLAY**

Replace the Park Assist Display in accordance with the service information.

Reconnect the Park Assist Module harness connector.

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display U1101-LOST COMMUNICATION WITH PTS DISPLAY?

Yes

Replace the Park Assist Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test Complete.

Perform **BODY VERIFICATION TEST - VER 1** .

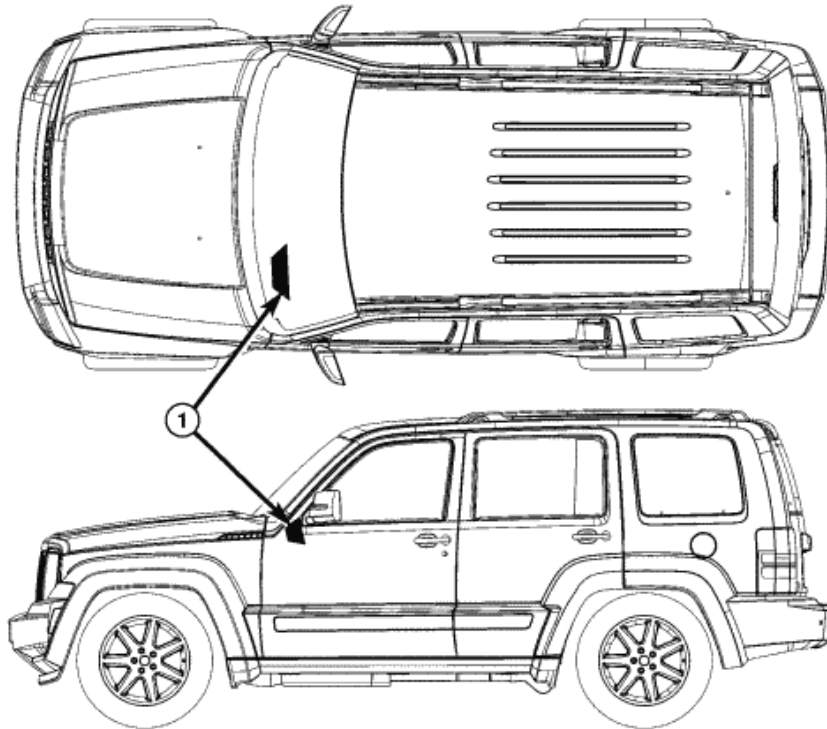
2008 ACCESSORIES AND EQUIPMENT

Chime/Buzzer - Service Information - Liberty

CHIME/BUZZER - SERVICE INFORMATION

DESCRIPTION

CHIME WARNING SYSTEM



81d35ce3

Fig. 1: Chime Warning System
Courtesy of CHRYSLER LLC

A chime warning system is standard factory-installed equipment. The chime warning system uses an electromechanical transducer and an electromechanical relay that are soldered onto the electronic circuit board inside of the ElectroMechanical Instrument Cluster (EMIC) (1) to provide audible indications of various vehicle conditions that may require the attention of the vehicle operator or occupants. The EMIC also includes the hardware and software necessary to serve as the electronic body control module and is sometimes referred to as the Cab Compartment Node or CCN.

The electromechanical transducer generates beep tones and chime tones, while the electromechanical relay generates click tones to emulate the sounds associated with conventional turn signal and hazard warning flasher operation. The microprocessor-based EMIC utilizes electronic **chime request** messages received from other modules in the vehicle over the Controller Area Network (CAN) data bus and the Local Interface Network (LIN) data bus along with hard wired inputs to monitor many sensors and switches throughout the vehicle. In response to those inputs, the circuitry and programming of the EMIC allow it to control the audible outputs that

are produced through its on-board transducer and relay.

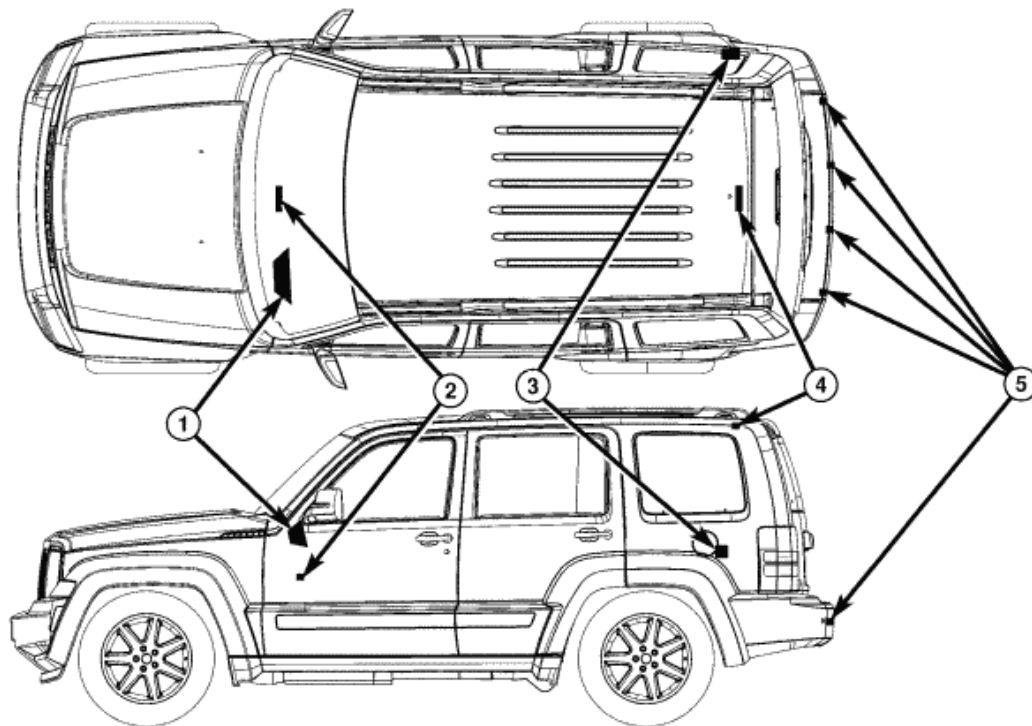
The EMIC is capable of producing the following audible outputs:

- **Slow Rate Repetitive Click** - Repeated **click** tones that are issued at a slow rate of about 90 clicks per minute.
- **Fast Rate Repetitive Click** - Repeated **click** tones that are issued at a fast rate of more than about 180 clicks per minute.
- **Single Chime Tone** - A single **chime** tone.
- **Slow Rate Repetitive Chime** - Repeated **chime** tones that are issued at a slow rate of about 50 chimes per minute.
- **Fast Rate Repetitive Chime** - Repeated **chime** tones that are issued at a fast rate of about 180 chimes per minute.

Hard wired circuitry connects the EMIC and the various chime warning system switch and sensor inputs to their modules and to each other through the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the EMIC through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

The EMIC chime warning system circuits and components cannot be adjusted or repaired. If the EMIC circuitry, the on-board transducer or the relay are damaged or ineffective, the EMIC unit must be replaced.

PARK ASSIST SYSTEM



81d35d29

Fig. 2: Park Assist System
Courtesy of CHRYSLER LLC

A park assist system is an optional factory-installed electronic parking aid. During parking and other similar vehicle maneuvers this system alerts the vehicle operator to obstacles located in the path immediately behind the vehicle which, due to the surrounding rear vehicle structure, might be otherwise difficult to perceive. When an object is detected, the system uses an electromechanical transducer and Light Emitting Diode (LED) indicators within the park assist display unit to provide the vehicle operator with visual and audible indications of the presence and proximity of such objects.

The park assist system includes the following major components, which are described in further detail elsewhere in this service information:

Instrument Cluster (1) - In vehicles equipped with the optional park assist system, the Electronic Vehicle Information Center (EVIC) within the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) displays textual warnings and error messages and emits audible warnings related to the current operating status of the park assist system and provides an interface that allows the vehicle operator to manually disable or enable the system using the customer programmable features option.

Park Assist Display (4) - Vehicles equipped with the park assist system have a park assist display unit mounted in the rear of the headliner just forward of the liftgate opening. The body of the display is concealed above the headliner where it is secured by a retainer on the back of the headliner substrate. Only the narrow, oval-shaped smoked clear lens of the display is visible on the outer surface of the headliner.

Park Assist Module (3) - Vehicles equipped with the park assist system include a park assist module

which is secured through integral mounting tabs by push-in type fasteners to the quarter inner panel above and behind the right rear wheel house where it is concealed beneath the quarter inner trim panel.

Park Assist Sensors (5) - Vehicles equipped with the park assist system have four ultrasonic park assist sensors that are concealed behind the rear bumper fascia. Each sensor is snapped into an individual molded plastic mounting bracket located at horizontal intervals along the back side of the rear bumper fascia.

Park Assist Switch (2) - The optional park assist system can be manually disabled or enabled using either a park assist switch that is integral to the instrument panel switch pod in the instrument panel center stack below the heater and air conditioner controls, or using the settings function found in the menu for the Electronic Vehicle Information Center (EVIC) of vehicles without a park assist switch in the instrument panel switch pod.

Hard wired circuitry connects the various park assist system components to each other through the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other and to the vehicle electrical system through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

The park assist system components cannot be adjusted or repaired. If any of the park assist system components is damaged or ineffective, that component must be replaced.

OPERATION

CHIME WARNING SYSTEM

The chime warning system operates on battery voltage received through a fuse in the Totally Integrated Power Module (TIPM) on a non-switched fused B(+) circuit so that the system may operate regardless of the ignition switch position. The chime warning system also monitors the ignition switch position so that some chime features are functional only with the ignition switch in the ON position, while others are functional regardless of the ignition switch position.

The chime warning system provides an audible indication to the vehicle operator or occupants under the following conditions:

Airbag Indicator Warning - The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) transducer will generate one short chime when the ignition switch is in the ON position, and the airbag indicator is illuminated. This warning indicates that a failure condition has been monitored affecting the operation of the Supplemental Restraint System (SRS) related components or circuits. This warning will only occur following completion of the airbag indicator bulb test, and will only occur once during any ignition cycle.

Door Ajar Warning - The EMIC/CCN will generate one short chime when the ignition switch is in the ON position, when the door ajar indicator is illuminated, or when a **DOOR(S) OPEN** textual message is displayed in the odometer Vacuum Fluorescent Display (VFD) unit of the instrument cluster. This warning indicates that a door is, or multiple doors are not closed or completely latched while the vehicle

is moving.

Fasten Seat Belt Indicator Warning - The EMIC/CCN transducer will generate repetitive chimes at a slow rate to announce that the seat belt switches and the ignition switch indicate that a front seat belt is not fastened with the ignition switch in the ON position. Vehicles with the optional Occupant Classification System (OCS) monitor both outboard front seat belts, while vehicles without OCS monitor only the driver side front seat belt. The chime warning system also supports the enhanced seat belt reminder (beltminder) when this feature is enabled. Refer to **OPERATION** .

Gate Ajar Indicator Warning - The EMIC/CCN transducer will generate one short chime when the liftgate ajar indicator is illuminated, or when a **LIFTGATE OPEN** textual message is displayed in the odometer VFD unit of the instrument cluster. This warning indicates that the liftgate is not closed or completely latched while the vehicle is moving.

Head/Park Lamps-On Warning - The EMIC/CCN transducer will generate repetitive chimes at a fast rate to indicate that inputs from the headlamp switch and the ignition switch indicate that the exterior lamps are turned ON with the ignition switch in the OFF position, and a hard wired input is received indicating that the driver side front door is open. The chimes will continue to sound until the exterior lamps are turned OFF, the driver side front door is closed, or the ignition switch is turned to the ON position, whichever occurs first.

Key-In-Ignition Warning - The EMIC/CCN transducer will generate repetitive chimes at a fast rate to indicate that inputs from the key-in ignition switch, the ignition switch, and the driver side front door ajar switch indicate that the key is in the ignition lock cylinder with the ignition switch in the OFF position with the driver side front door open. The chimes will continue to sound until the key is removed from the ignition lock cylinder, the driver side front door is closed, or the ignition switch is turned to the ON position, whichever occurs first.

Low Fuel Indicator Warning - The EMIC/CCN transducer will generate one short chime when the low fuel indicator is illuminated in the instrument cluster. This warning indicates that the monitored fuel level in the fuel tank is low. This chime will only occur once during any ignition cycle.

Park Brake Reminder - The EMIC/CCN transducer will generate one short chime when the brake/park brake indicator is illuminated to announce that the park brake is applied or not fully released and the vehicle is moving. This chime will repeat each time the input conditions are met.

Overspeed Warning - The EMIC transducer will generate one short chime when the vehicle speed is over a pre-programmed speed value. This feature is only enabled on vehicles that have been configured for sale in a Middle East Gulf Coast Country (GCC).

Park Brake Reminder - The instrument cluster chime tone generator will generate ten repetitive chimes at a slow rate to announce that the hard wired input from the park brake switch and an electronic **vehicle speed** message input received from the PCM over the CAN data bus indicates that the park brake is applied and the vehicle is moving. This chime feature will repeat each time the input conditions are met.

Sentry Key Customer Learn Mode Announcement - The EMIC/CCN transducer will generate one short chime to confirm that the Sentry Key electronic **Customer Learn** mode is active, which indicates that the Sentry Key Remote Entry Module/Wireless Control Module (SKREEM/WCM) is prepared for programming additional Sentry Key transponders. This chime feature is only active on vehicles equipped with the optional Sentry Key system, and sold in a market where Customer Learn programming is an allowed feature.

Turn Signal On Warning - The EMIC/CCN transducer will generate repetitive chimes at a slow rate to indicate that a turn signal has been active continuously for 1.6 kilometers (1 mile) with the vehicle speed greater than 22 kilometers-per-hour (15 miles-per hour). Vehicles built for markets other than the United

States and Canada have a revised distance threshold of 4 kilometers (2.49 miles) for this feature. The chime will continue until the turn signal input becomes inactive or until the electronic **vehicle speed** message indicates that the speed is less than 22 kilometers-per-hour (15 miles-per-hour), whichever occurs first. The hazard warning flashers will not activate this chime feature.

Warning Indicator Announcement - The EMIC/CCN transducer will generate one short chime each time the Malfunction Indicator Lamp (MIL) lamp or certain other indicators are illuminated by the instrument cluster circuitry. The MIL and certain other indicators may be illuminated when any critical engine or transmission systems are operating outside of their normal parameters. The instrument cluster monitors electronic messages received over the CAN data bus to determine when to illuminate these indicators.

The EMIC/CCN provides chime service for all available features in the chime warning system, except for the audible warning function provided by each of the optional park assist system display modules. The EMIC/CCN relies upon its internal programming, numerous hard wired inputs, and electronic message inputs received from other modules over the Controller Area Network (CAN) and the Local Interface Network (LIN) data buses to provide the chime warning system features. The internal programming of the EMIC/CCN determines the priority of each chime request input that is received, as well as the rate and duration of each chime that is to be generated.

The hard wired circuits between components related to the chime warning system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the chime warning system or the electronic controls or communication between modules and other devices that provide some features of the chime warning system. The most reliable, efficient, and accurate means to diagnose the chime warning system or the electronic controls and communication related to chime warning system operation requires the use of a diagnostic scan tool.

PARK ASSIST SYSTEM

The park assist system is active only when the ignition switch is in the ON or START positions, the parking brake is released, the transmission gear selector lever is in the REVERSE position and the vehicle speed is less than 16 kilometers-per-hour (10 miles-per-hour). In vehicles equipped with this option, the system is enabled from the factory as a default. The system can be manually disabled and enabled by the vehicle operator using either the park assist switch integral to the instrument panel switch pod, or by using the settings menu of the Electronic Vehicle Information Center (EVIC) of vehicles not equipped with a park assist switch in the instrument panel switch pod. If the vehicle operator does not want the system active, momentarily depressing the park assist switch OFF button, or selecting the park assist disable setting of the EVIC will disable the system until the switch button is depressed again or the EVIC park assist setting is changed to enabled.

Reasons for disabling the system include trailer towing and off road use. With a trailer attached to the vehicle the audible and visible park assist alerts would be incessant whenever the gear selector lever was in the REVERSE position due to the proximity of the trailer to the rear of the vehicle. Similarly, operating the vehicle off road may cause the park assist alerts to become distracting due to the proximity of large trees or boulders and the extreme rear approach angles that may be encountered while maneuvering on off road trails or terrain.

When the system is disabled, a **PARK ASSIST OFF** icon and textual message will appear in the EVIC display of the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) whenever the gear selector lever is in the REVERSE position.

The microprocessor based park assist module is the central component of the park assist system. It supplies voltage to the park assist sensors and the park assist display, receives and analyzes data from the sensors, calculates and communicates the proper display information to the park assist display, performs system diagnostics, and communicates with other electronic modules in the vehicle or with a diagnostic scan tool over the Controller Area Network (CAN) data bus. The module operates on battery voltage received through a fuse in the Totally Integrated Power Module (TIPM), and is grounded through a take out of the body wire harness.

Four ultrasonic park assist sensors in the rear bumper fascia allow the park assist system to locate and identify the proximity of nearby obstacles. These sensors each generate ultrasonic sound pulses when triggered by the park assist module, then signal the module when an echo of the reflected sound pulses is received. The detection distance range from the rear of the vehicle is about 0.3 meters (11.8 inches) to about 2 meters (80 inches), and the detection height range from the ground is about 0.2 meters (7.8 inches) to about 0.8 meters (31 inches). The detection area extends somewhat around both rear sides (corners) of the vehicle.

The park assist display unit provides the vehicle operator with both visible and audible warnings indicating the relative range of a detected object. The display is visible to the vehicle operator over an inboard shoulder when looking rearward while backing the vehicle up, but is not visible in a properly adjusted inside rear view mirror when looking forward. The display contains two sets of eight Light Emitting Diode (LED) indicator units, one set dedicated to each side of the vehicle, and an audible chime tone transducer. The LED units are concealed beneath a smoked oval lens and are not clearly visible when they are not illuminated. When the park assist system is active and no obstacles are detected, the two outermost, amber LED units in the display are illuminated at a reduced intensity to provide visual confirmation that the system is operating.

The display provides a visual indication of a detected object by illuminating one or more LED indicators, amber first followed by red, moving toward the center of the display as the vehicle gets closer to the object. As the vehicle comes to within about 40 centimeters (31 inches) of the object, 1 red LED is illuminated and the display emits a series of short, intermittent, audible beeps. If the audio system is turned ON, the audio output will be muted automatically while the park assist audible warning is being generated. The audible warning changes from intermittent beeps to a continuous tone as the final red indicators are illuminated on 1 or both sides of the display and the vehicle comes to within 30.5 centimeters (12 inches) of a detected object.

When the park assist module monitors a problem in any of the park assist system circuits or components, it stores a fault code or Diagnostic Trouble Code (DTC) in its memory circuit, illuminates all four red LED units in the park assist display, sends an electronic message to the EVIC, and a **SERVICE PARK ASSIST SYSTEM** textual message is displayed in the EVIC display.

The hard wired circuits between components related to the park assist system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the park assist system or the electronic controls or communication between modules and other devices that provide some features of

the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist system or the electronic controls and communication related to park assist system operation requires the use of a diagnostic scan tool.

DIAGNOSIS AND TESTING

CHIME WARNING SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between components related to the chime warning system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the chime warning system or the electronic controls or communication between modules and other devices that provide some features of the chime warning system. The most reliable, efficient, and accurate means to diagnose the chime warning system or the electronic controls and communication related to chime warning system operation requires the use of a diagnostic scan tool.

PARK ASSIST SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

If a **SERVICE PARK ASSIST SYSTEM** textual message appears in the Electronic Vehicle Information Center (EVIC) display, be certain to confirm the following:

- Be certain that the rear bumper is free of dirt and debris to keep the system operating properly.
- Be certain that the parking brake is not applied.

- The presence of jackhammers, large trucks, and other vibrations in the vicinity of the vehicle could impact the performance of the system.

The hard wired circuits between components related to the park assist system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the park assist system or the electronic controls or communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist system or the electronic controls and communication related to park assist system operation requires the use of a diagnostic scan tool.

DISPLAY-PARK ASSIST

DESCRIPTION

PARK ASSIST DISPLAY

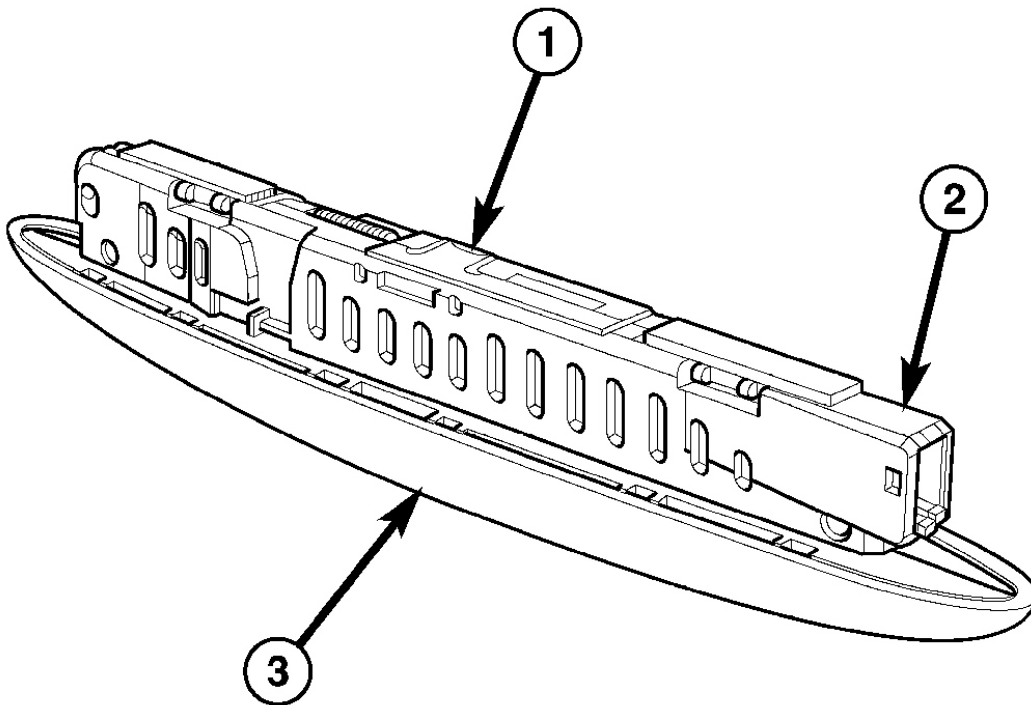


Fig. 3: Identifying Rear Park Assist Display
Courtesy of CHRYSLER LLC

The park assist display (1) is located in the headliner at the rear of the vehicle, just forward of the upper liftgate opening header. Only the smoked clear plastic display lens (3) is visible on the headliner. The lens prevents the 4 red Light Emitting Diode (LED) units and 12 amber LED units from being clearly visible unless they are illuminated by the electronic circuitry of the display.

The remainder of the display including the mounting provisions and the electrical connection are concealed above the headliner. A molded plastic housing with an integral connector receptacle (2) at one end contains and protects the electronic circuitry of the display, including an audible tone transducer and an electronic communication chip.

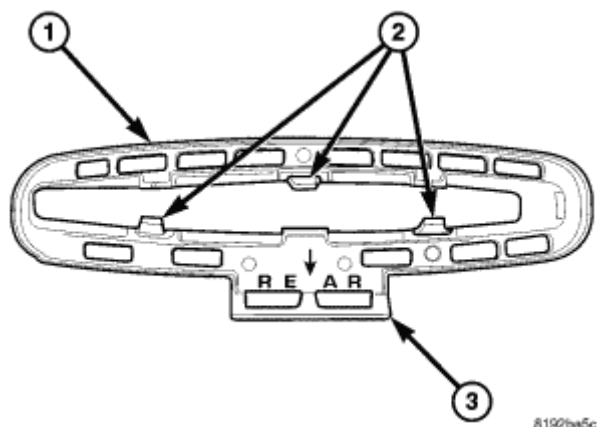


Fig. 4: Identifying Rear Park Assist Display Housing
Courtesy of CHRYSLER LLC

A molded plastic retainer (1) with three integral tabs (2) engages three slots integral to the display housing above the lens. The retainer is installed over the display housing above the headliner substrate to engage and securely lock the display into the opening in the headliner. An arrow and the text **REAR** are molded into an integral installation tab (3) to ensure correct retainer orientation.

The park assist display is serviced only as a complete unit. It cannot be adjusted or repaired. If ineffective or damaged, the entire display unit must be replaced.

OPERATION

PARK ASSIST DISPLAY

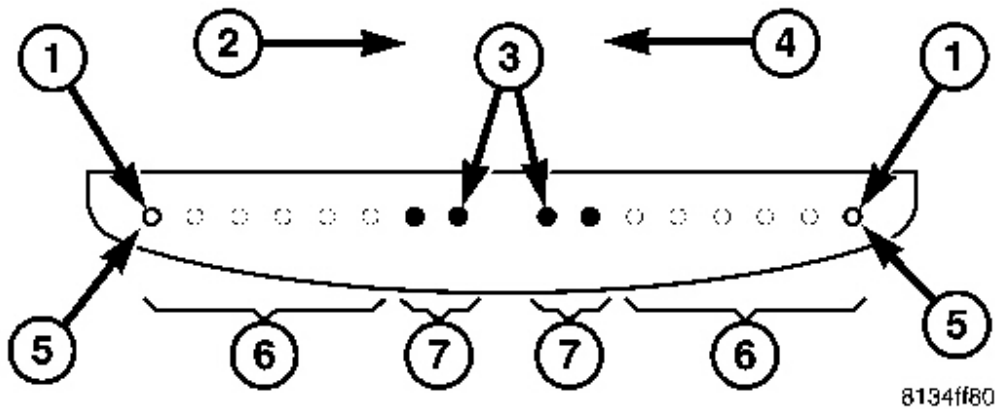


Fig. 5: Identifying LEDs
Courtesy of CHRYSLER LLC

The park assist display provides the vehicle operator with visual feedback by illuminating amber or red Light Emitting Diode (LED) units individually or in unison, and audible feedback by energizing an audible tone transducer on the display electronic circuit board to emit either an intermittent or a continuous tone. While the park assist system is active, the number, position and color of the illuminated LED units as well as the audible signal frequency indicate the relative position and distance of obstacles detected at the rear of the vehicle.

The park assist display receives battery current and ground from and is completely controlled by the park assist module. The display also contains an electronic communication chip that allows bi-directional communication to occur with the park assist module over a dedicated serial bus line. The microprocessor in the park assist module completely controls the display outputs, continually monitors the display status, and will store a Diagnostic Trouble Code (DTC) in memory for any monitored fault it detects in the park assist display. The illumination intensity of the LED units is also controlled by the park assist module based upon internal programming and electronic **panel lamps dimming** messages received over the Controller Area Network (CAN) data bus.

When the ignition switch is turned to the ON position, all 16 of the LED units in the display will illuminate in unison for approximately 1 second as a bulb test. This output will be interrupted if the system is active and senses an obstacle. Following the conclusion of the bulb test, when the system is active but no obstacle is detected, the display will indicate system readiness by illuminating the two outermost amber LED units (1) at a reduced intensity. As an obstacle is detected, the outermost amber LED unit (5) on the side of the vehicle where the obstacle was detected will be illuminated at normal intensity and a single short audible tone (one-half second duration) is sounded. Then additional amber LED units (6) will begin illuminating inward (2 or 4) as the obstacle gets closer until, finally, the two red LED units (7) are illuminated.

When the final red LED unit (3) is illuminated, the obstacle is approximately 40 centimeters (16 inches) from

the rear corner of the vehicle or approximately 50 centimeters (19.7 inches) from the rear bumper face and an intermittent audible tone will be generated. The frequency of the audible tone will increase as the obstacle continues to become closer until the tone is continuous when the obstacle is about 15 centimeters (6 inches) from the rear corner of the vehicle or about 30 centimeters (11.8 inches) from the rear bumper face. Whenever a park assist audible tone is being generated, the park assist module sends electronic messages to the radio over the CAN data bus to mute the audio system. The audible tone will be cancelled after about two seconds if the detected distance to the obstacle remains constant. See the PARK ASSIST DISPLAY OUTPUTS table for additional details.

The hard wired circuits between components related to the park assist display may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the park assist display or the electronic controls or communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist display or the electronic controls and communication related to park assist display operation requires the use of a diagnostic scan tool.

PARK ASSIST DISPLAY OUTPUTS				
DISPLAY LED	DETECTION DISTANCE		LED COLOR	AUDIBLE SIGNAL
	REAR CORNERS	REAR CENTER		
1st LED	-	200 cm (78.7 in.)	Amber	Single Tone (One-Half Second Duration)
2nd LED		130 cm (51.2 in.)	Amber	None
3rd LED		115 cm (45.3 in.)	Amber	None
4th LED	80 cm (31.5 in.)	100 cm (39.3 in.)	Amber	None
5th LED	65 cm (25.5 in.)	85 cm (33.5 in.)	Amber	None
6th LED	50 cm (20 in.)	70 cm (27.6 in.)	Amber	None
7th LED	40 cm (16 in.)	50 cm (19.7 in.)	Red	40 cm (16 in.) Intermittent
8th LED	15 cm (6 in.)	30 cm (11.8 in.)	Red	30 cm (11.8 in.) Continuous

REMOVAL

PARK ASSIST DISPLAY

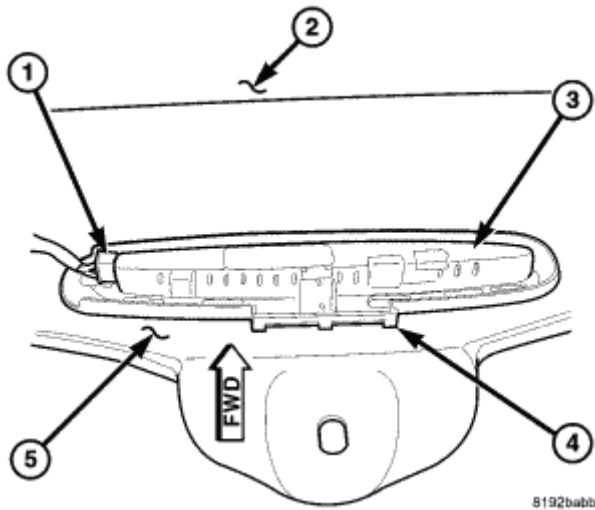


Fig. 6: Park Assist Display
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the trim from the upper liftgate opening. Refer to **REMOVAL** .
3. Partially remove the quarter trim panel from both upper D-pillars. Refer to **REMOVAL** .
4. Carefully pull down the rear edge of the headliner (5) from the upper liftgate opening header (2) far enough to access the rear park assist display housing (3) and the display retainer (4).
5. Disconnect the wire harness connector (1) from the connector receptacle on the left end of the display housing.
6. Carefully spread the front and rear edges of the molded plastic retainer far enough to disengage the three retainer tabs from the slots in the display housing, then lift the retainer off of the display housing.
7. Push the right end of the display out through the lower surface of the headliner, then slide the display toward the right side of the vehicle far enough to disengage the connector receptacle from the headliner opening.

INSTALLATION

PARK ASSIST DISPLAY

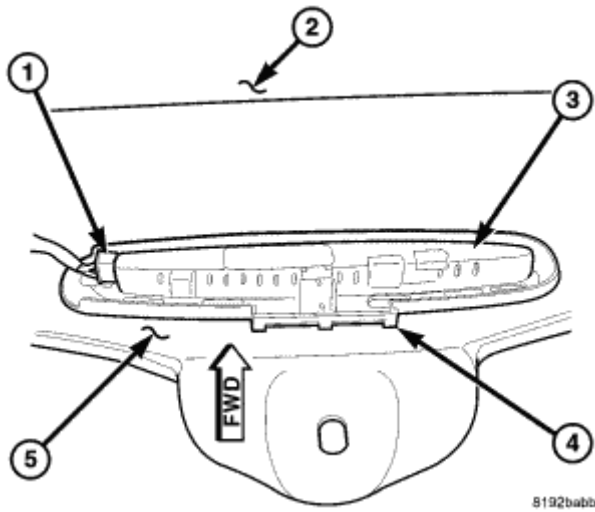


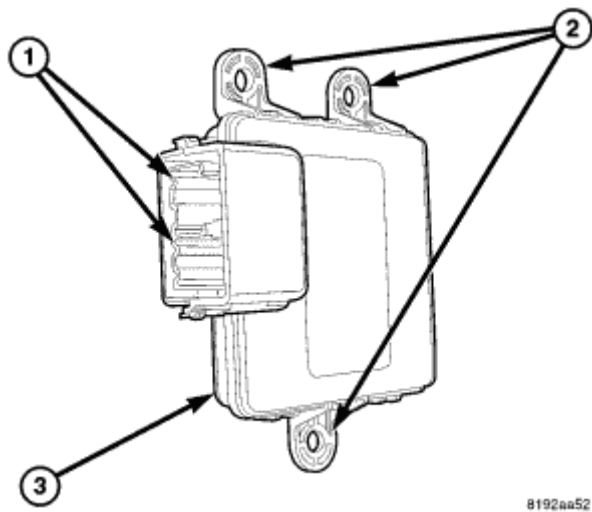
Fig. 7: Park Assist Display
Courtesy of CHRYSLER LLC

1. Carefully position the connector receptacle on the left end of the park assist display housing (3) through the left end of the display opening in the lower surface of the headliner (5).
2. Slide the display toward the left side of the vehicle far enough to engage the right end of the display housing into the right end of the display opening in the headliner.
3. Carefully pull down the rear edge of the headliner from the upper liftgate opening header (2) far enough to access the rear park assist display housing.
4. With the display lens held flush against the lower surface of the headliner, position the molded plastic retainer (4) over the display housing with the installation tab oriented towards the rear of the vehicle.
5. Slide the retainer down over the display housing until it is flush with the headliner substrate and the three tabs of the retainer are engaged in the three slots of the display housing.
6. Reconnect the wire harness connector (1) to the connector receptacle on the left end of the display housing.
7. Reinstall the quarter trim panel onto both upper D-pillars. Refer to **INSTALLATION** .
8. Reinstall the trim onto the upper liftgate opening. Refer to **INSTALLATION** .
9. Reconnect the battery negative cable.

MODULE-PARK ASSIST

DESCRIPTION

PARK ASSIST MODULE



8192aa52

Fig. 8: Park Assist Module
Courtesy of CHRYSLER LLC

The Park Assist Module (3) is secured with three push-in plastic fasteners through three mounting tabs (2) integral to the module housing to the right inner quarter panel above the right rear wheel housing. The module is concealed beneath the quarter inner trim panel. Concealed within the molded plastic park assist module housing is a microprocessor and the other electronic circuitry of the module. The module housing is sealed to enclose and protect the internal electronic circuitry. The module software is flash programmable.

Two connector receptacles (1) containing terminal pins are integral to the forward-facing side of the housing. The module is connected to the vehicle electrical system through two dedicated take outs and connectors of the body wire harness.

The park assist module cannot be adjusted or repaired and, if damaged or ineffective, it must be replaced.

OPERATION

PARK ASSIST MODULE

The microprocessor in the park assist module contains the park assist system logic circuits. The module uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is also used for park assist system diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel.

The module provides voltage to the four park assist sensors located behind the rear bumper fascia and to the park assist display located in the headliner just forward of the liftgate opening header. The module then monitors return inputs from each of the sensors and the display on dedicated hard wired data communication circuits. The sensor inputs allow the module to determine when an obstacle is in the rear path of the vehicle and enables the module to calculate the relative location of the obstacle, and whether the distance to that obstacle is increasing or decreasing.

Pre-programmed decision algorithms and calibrations allow the module microprocessor to determine the

appropriate park assist system outputs based upon the inputs received from the park assist sensors and electronic messages received from other modules in the vehicle over the CAN data bus. When the programmed conditions are met the module sends electronic messages to the park assist displays over a dedicated serial bus to obtain the proper park assist system visual and audible outputs. The module also broadcasts electronic messages over the CAN data bus to enable the other electronic features of the park assist system.

The park assist module microprocessor continuously monitors all of the park assist system electrical circuits and components to determine the system readiness. If the module detects a monitored system fault, it sets a Diagnostic Trouble Code (DTC) and sends the appropriate electronic messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the CAN data bus to control operation of certain park assist system audible warnings and textual messages displayed in the Electronic Vehicle Information Center (EVIC) display of the cluster.

The park assist module receives battery current on a fused ignition switch output (run-start) circuit through a fuse in the Junction Block (JB). The module receives ground through a ground circuit and take out of the body wire harness. These connections allow the module to be operational whenever the ignition switch is in the START or ON positions.

The hard wired circuits between components related to the park assist module may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the park assist module or the electronic controls or communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist module or the electronic controls and communication related to park assist module operation requires the use of a diagnostic scan tool.

REMOVAL

PARK ASSIST MODULE

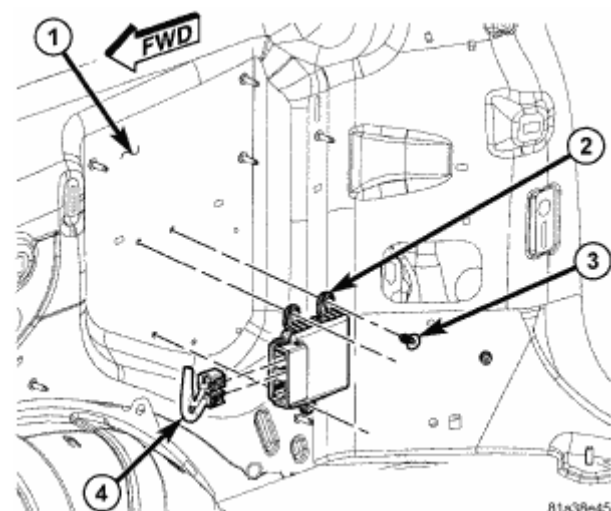


Fig. 9: Identifying Right Quarter Inner Panel, Park Assist Module, Plastic Push-In Fasteners & Body Wire Harness Connectors

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the trim from the right quarter inner panel to access the park assist module (2), which is located above and behind the right rear wheel house, forward of the D-pillar. Refer to **REMOVAL** .
3. Disconnect the two body wire harness connectors (4) from the park assist module connector receptacles.
4. Remove the three plastic push-in fasteners (3) that secure the module to the right quarter inner panel (1).
5. Remove the module from the right quarter inner panel.

INSTALLATION

PARK ASSIST MODULE

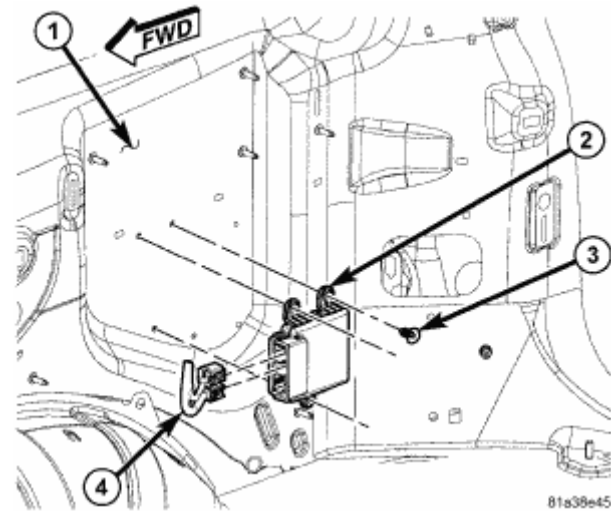


Fig. 10: Identifying Right Quarter Inner Panel, Park Assist Module, Plastic Push-In Fasteners & Body Wire Harness Connectors

Courtesy of CHRYSLER LLC

1. Position the park assist module (2) to the right quarter inner panel (1) behind and above the right rear wheel house, forward of the D-pillar.
2. Secure the module to the right quarter inner panel using three plastic push-in fasteners (3).
3. Reconnect the two body wire harness connectors (4) to the module connector receptacles.
4. Reinstall the trim onto the right quarter inner panel. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

SENSOR-PARK ASSIST

DESCRIPTION

PARK ASSIST SENSOR

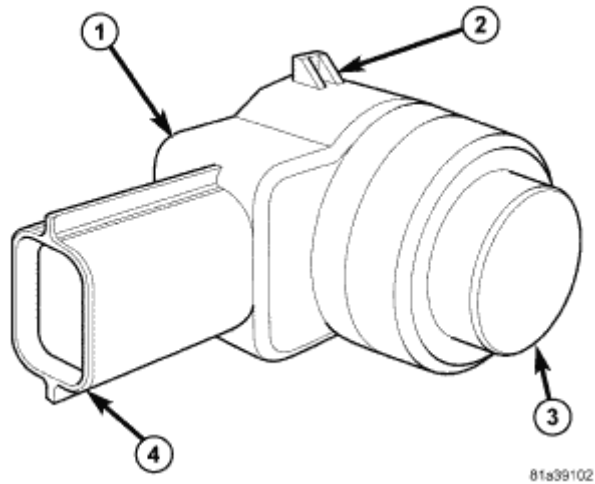


Fig. 11: Park Assist Sensor
Courtesy of CHRYSLER LLC

Vehicles equipped with the park assist system have four park assist sensors (1) installed on the rear bumper fascia. Only the membrane (3) of each sensor is visible through a hole in the outer vertical surface of the fascia. The remainder of each sensor including the sensor mounting bracket, the sensor spacer and the sensor wiring connection is concealed behind the fascia. A sensor wire harness behind the fascia connects the sensors to the vehicle electrical system.

Each of the four sensors is identical in construction and is interchangeable. The electronic circuitry and a communication chip for each sensor is enclosed and protected within the molded black plastic sensor housing. The housing includes an integral connector receptacle (4) and two integral latch tabs (2). The sensor membrane extends from the surface of the sensor housing, and is finished to match or contrast with the outer surface of the fascia.

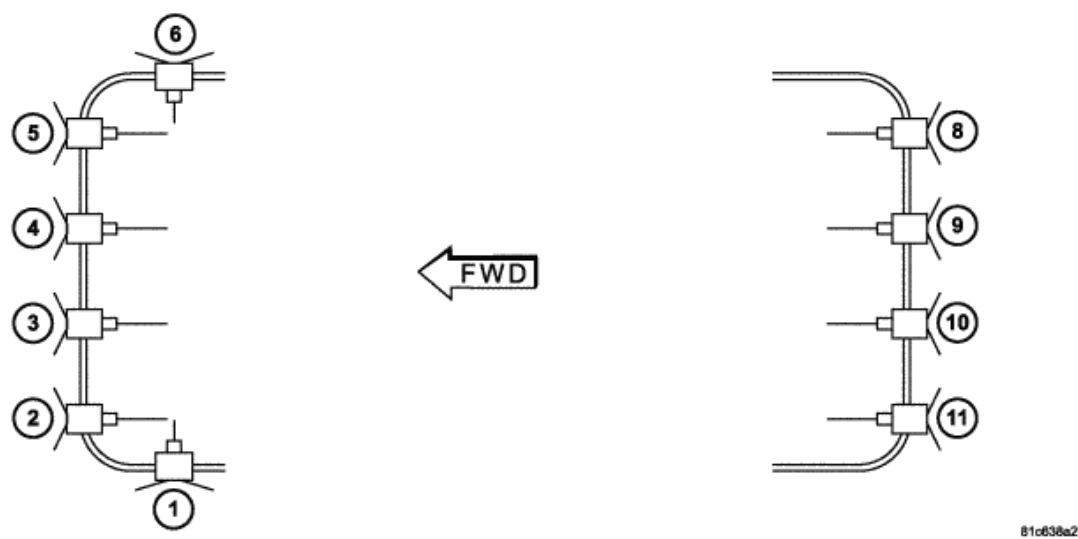


Fig. 12: Locating Park Assist Sensors
Courtesy of CHRYSLER LLC

The numbering system for the park assist sensors allows for up to twelve sensors on the vehicle, six front and six rear. The sensors are numbered in a clockwise manner starting at the left front bumper. The left front sensor (if equipped with front park assist) is the number 1 sensor. The numbering continues in a clockwise direction around the vehicle. Since this vehicle uses only four rear sensors, sensor numbers 7 and 12 are omitted, so the left rear sensor is the number 11 sensor.

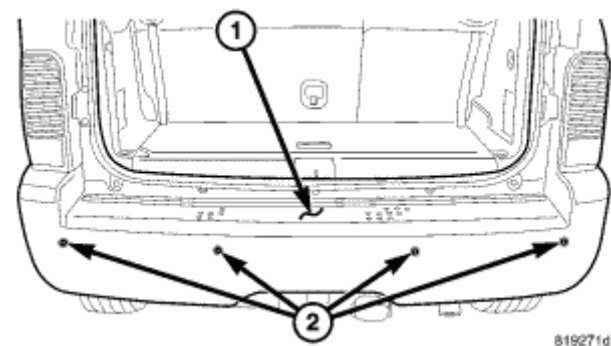


Fig. 13: Locating Park Assist Sensor Membranes
Courtesy of CHRYSLER LLC

A resilient O-ring spacer around the circumference of each of the four sensor membranes (2) isolates the membrane from the openings in the fascia (1). Each sensor is snapped into its own dedicated molded plastic mounting bracket. Each mounting bracket is heat-staked to the back side of the rear fascia.

The park assist sensors cannot be adjusted or repaired. If ineffective or damaged they must be replaced. The sensors and the spacers are each available for individual service replacement.

OPERATION

PARK ASSIST SENSOR

The park assist sensors are ultrasonic transceivers that are completely controlled by the park assist module. The sensors transmit and receive ultrasonic signals. The sensors each receive battery current and ground in parallel from the module, but are each connected to individual dedicated serial bus communication circuits to the module.

Each sensor membrane is oscillated, then quieted by the module in a pulsing fashion. While the sensor membrane oscillates, it emits an ultrasonic signal. This signal will bounce or echo off of objects in the path of the vehicle. While quieted, each membrane receives the echoes of the ultrasonic signals it and the other sensors have transmitted. The sensors then communicate this echo data over the serial bus lines back to the module. The microprocessor in the module uses the intervals between the ultrasonic transmission and reception data from the sensors to calculate the distance to any obstacles identified by the ultrasonic echoes.

The hard wired circuits between components related to the park assist sensors may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the park assist sensors or the electronic controls or communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist sensors or the electronic controls and communication related to park assist sensor operation requires the use of a diagnostic scan tool.

REMOVAL

PARK ASSIST SENSOR

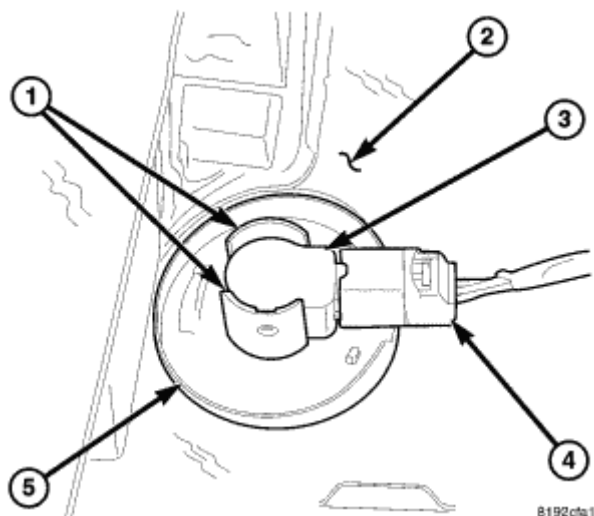


Fig. 14: Identifying Park Assist Sensor Components
Courtesy of CHRYSLER LLC

NOTE: The park assist sensors (3) and the sensor spacers (O-rings) are each available for separate service replacement. The sensor brackets (5) are bonded to and integral to the back side of the rear bumper fascia (2).

1. Disconnect and isolate the battery negative cable.
2. Remove the rear wheel flare and loosen the bumper fascia on the same side of the vehicle as the park assist sensor requiring service. Refer to **REMOVAL**.
3. From the back of the fascia (2), disconnect the wire harness connector (4) from the park assist sensor (3) connector receptacle.
4. Carefully pry the sensor bracket (5) latch features (1) away from the top and bottom latch tabs of the sensor far enough to disengage the sensor from the bracket.
5. Disengage the O-ring spacer from around the circumference of the sensor membrane protrusion.

INSTALLATION

PARK ASSIST SENSOR

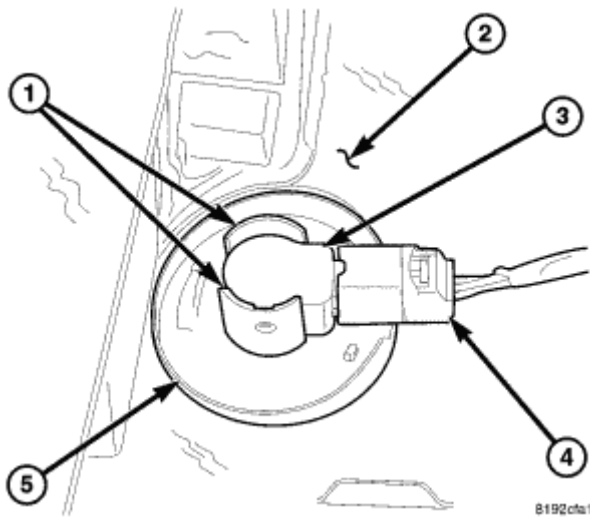


Fig. 15: Identifying Park Assist Sensor Components
 Courtesy of CHRYSLER LLC

NOTE: The park assist sensors (3) and the sensor spacers (O-rings) are each available for separate service replacement. The sensor brackets (5) are bonded to and integral to the back side of the rear bumper fascia (2).

1. Engage the O-ring spacer around the circumference of the sensor membrane protrusion.

NOTE: Production and all service replacement O-ring spacers are tapered. The wide side (base) of the O-ring should be seated against the sensor housing and the narrow side should be oriented toward the outer surface of the sensor membrane and the rear fascia.

2. Align and insert the sensor (3) into the sensor bracket (5) on the back of the rear bumper fascia (2) until the bracket latch features (1) are fully engaged over the top and bottom latch tabs of the sensor. Be certain that the sensor membrane is flush with the outer surface of the fascia.

NOTE: Be certain that each sensor membrane is properly centered in the openings of the rear fascia and that the O-ring spacers are not pinched. Improper centering or pinched O-rings can be detrimental to proper park assist sensor operation.

3. From the back of the fascia, reconnect the wire harness connector (4) to the sensor connector receptacle.
4. Reinstall the rear wheel flare and the bumper fascia on the same side of the vehicle as the park assist sensor that was serviced. Refer to **INSTALLATION**.
5. Reconnect the battery negative cable.

SWITCH-PARK ASSIST

DESCRIPTION

PARK ASSIST SWITCH

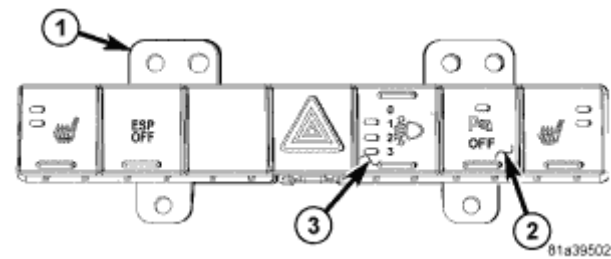


Fig. 16: Identifying Park Assist Switch
Courtesy of CHRYSLER LLC

The park assist switch (2) is integral to the instrument panel switch pod (1), which is secured to the instrument panel center bezel just below the heater and air conditioner controls. The park assist switch push button is clearly identified with a white International Control and Display Symbol graphic for **Parking Aid** and the text **OFF**. An amber Light Emitting Diode (LED) unit is illuminated behind a small clear plastic jewel-like lens in the push button to give a visual indication whenever the park assist system has been manually disabled with the ignition switch in the ON or START positions. The switch button also has panel lamps dimmer controlled illumination for night visibility.

All of the circuitry and components of the park assist switch are contained within a molded black plastic instrument panel switch pod housing. A single connector receptacle is integral to the back of the switch pod housing. The switch is connected to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

The park assist switch cannot be adjusted or repaired and, if the switch is ineffective or damaged, the entire instrument panel switch pod unit must be replaced. Refer to **REMOVAL**.

OPERATION

PARK ASSIST SWITCH

The status of the park assist switch is continually monitored by the circuitry within the instrument panel switch pod. The switch pod receives battery voltage at all times on a fused battery feed circuit, and a path to ground at all times through the instrument panel wire harness. The only other inputs to and outputs from the switch pod consist of electronic communication with the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the single wire Local Interface Network (LIN) data bus.

Each time the park assist switch push button is depressed the switch pod circuitry sends an electronic **park assist switch status** message input to the EMIC over the LIN data bus. The EMIC then sends an electronic **park assist switch request** message to the park assist module over the Controller Area Network (CAN) data bus. The park assist module responds to each **park assist switch request** message by toggling the status of the park assist system from enabled to disabled, or from disabled to enabled, then sends an electronic **park assist system status** message back to the EMIC over the CAN data bus as confirmation.

The EMIC responds to the system status message by sending a message to the switch pod over the LIN data bus to control the park assist switch Light Emitting Diode (LED) unit so that the LED is illuminated with the system disabled and the ignition switch in the ON or START positions, and is extinguished with the system enabled or

with the ignition switch in any position except ON or START.

The hard wired circuits between components related to the park assist switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the electronic controls or communication between modules and other devices that provide some features of the park assist system. The most reliable, efficient, and accurate means to diagnose the park assist switch or the electronic controls and communication related to park assist switch operation requires the use of a diagnostic scan tool.

2008 TRANSMISSION

Clutch - Liberty

WARNING

CLUTCH

WARNING: DaimlerChrysler does not manufacture any vehicles or replacement parts that contain asbestos. Aftermarket products may or may not contain asbestos. Refer to aftermarket product packaging for product information. Whether the product contains asbestos or not, dust and dirt can accumulate on manual clutch parts during normal use. Follow practices prescribed by appropriate regulations for the handling, processing and disposing of dust and debris.

DIAGNOSIS AND TESTING

CLUTCH

Drive the vehicle at normal speeds. Shift the transmission through all gear ranges and observe clutch action. If the clutch chatters, grabs, slips or does not release properly, remove and inspect the clutch components. If the problem is noise or hard shifting, further diagnosis may be needed as the transmission or another driveline component may be at fault.

NOTE: Vehicles equipped with a Dual Mass Flywheel may produce a rattle when the engine is shut off. This noise is considered normal.

CLUTCH CONTAMINATION

Fluid contamination is a frequent cause of clutch malfunctions. Oil, water or clutch fluid on the clutch disc and pressure plate surfaces will cause chatter, slip and grab. Inspect components for oil, hydraulic fluid or water/road splash contamination.

Oil contamination indicates a leak at either the rear main seal or transmission input shaft. Clutch fluid leaks are usually from damaged slave cylinder push rod seals. Heat buildup caused by slippage between the pressure plate, disc and flywheel can bake the oil residue onto the components. The glaze-like residue ranges in color from amber to black.

Road splash contamination is dirt/water entering the clutch housing due to loose bolts, housing cracks. Driving through deep water puddles can force water/road splash into the housing through such openings.

IMPROPER RELEASE OR CLUTCH ENGAGEMENT

Clutch release or engagement problems are caused by wear or damage clutch components. A visual inspection of the release components will usually reveal the problem part.

Release problems can result in hard shifting and noise. Look for leaks at the clutch cylinders and interconnecting line and loose slave cylinder bolts. Also worn/loose release fork, pivot stud, clutch disc, pressure plate or release bearing.

Engagement problems can result in slip, chatter/shudder and noisy operation. The causes may be clutch disc contamination, wear, distortion or flywheel damage. Visually inspect to determine the actual cause of the problem.

CLUTCH MISALIGNMENT

Clutch components must be in proper alignment with the crankshaft and transmission input shaft. Misalignment caused by excessive runout or warpage of any clutch component will cause grab, chatter and improper clutch release.

PRESSURE PLATE AND DISC RUNOUT

Check the clutch disc before installation. Axial (face) runout of a **new** disc should not exceed 0.50 mm (0.020 in.). Measure runout about 6 mm (1/4 in.) from the outer edge of the disc facing. Obtain another disc if runout is excessive.

Check condition of the clutch before installation. A warped cover or diaphragm spring will cause grab and incomplete release or engagement. Be careful when handling the cover and disc. Impact can distort the cover, diaphragm spring, release fingers and the hub of the clutch disc.

Use an alignment tool when positioning the disc on the flywheel. The tool prevents accidental misalignment which could result in cover distortion and disc damage.

A frequent cause of clutch cover distortion (and consequent misalignment) is improper bolt tightening.

FLYWHEEL RUNOUT

Check flywheel runout whenever misalignment is suspected. Flywheel runout should not exceed 0.08 mm (0.003 in.). Measure runout at the outer edge of the flywheel face with a dial indicator. Mount the indicator on a stud installed in place of one of the flywheel bolts.

Common causes of runout are:

- heat warpage
- improper machining
- incorrect bolt tightening
- improper seating on crankshaft flange shoulder
- foreign material on crankshaft flange

Flywheel machining is not recommended. The flywheel clutch surface is machined to a unique contour and machining will negate this feature. Minor flywheel scoring can be cleaned up by hand with 180 grit emery or with surface grinding equipment. Remove only enough material to reduce scoring (approximately 0.001 - 0.003 in.). Heavy stock removal is **not recommended**. Replace the flywheel if scoring is severe and deeper than

0.076 mm (0.003 in.). Excessive stock removal can result in flywheel cracking or warpage after installation; it can also weaken the flywheel and interfere with proper clutch release.

Clean the crankshaft flange before mounting the flywheel. Dirt and grease on the flange surface may cock the flywheel causing excessive runout. Use new bolts when remounting a flywheel and secure the bolts with Mopar® Lock And Seal or equivalent. Tighten flywheel bolts to specified torque only. Overtightening can distort the flywheel hub causing runout.

DIAGNOSIS CHART

The **Diagnosis Chart** describes common clutch problems, causes and correction. Conditions, causes and corrective action are outlined in the indicated columns.

Diagnosis Chart

CONDITION	POSSIBLE CAUSES	CORRECTION
Disc facing worn out	1. Normal wear. 2. Driver frequently rides (slips) the clutch. Results in rapid overheating and wear. 3. Insufficient clutch cover diaphragm spring tension.	1. Replace cover and disc. 2. Replace cover and disc. 3. Replace cover and disc.
Clutch disc facing contaminated with oil, grease, or clutch fluid.	1. Leak at rear main engine seal or transmission input shaft seal. 2. Excessive amount of grease applied to the input shaft splines. 3. Road splash, water entering housing. 4. Slave cylinder leaking.	1. Replace appropriate seal. 2. Remove grease and apply the correct amount of grease. 3. Replace clutch disc. Clean clutch cover and reuse if in good condition. 4. Replace hydraulic clutch linkage.
Clutch is running partially disengaged.	1. Release bearing sticking or binding and does not return to the normal running position.	1. Verify failure. Replace the release bearing and transmission front bearing retainer as necessary.
Flywheel below minimum thickness specification.	1. Improper flywheel machining. Flywheel has excessive taper or excessive material removal.	1. Replace flywheel.
Clutch disc, cover and/or diaphragm spring warped or distorted.	1. Rough handling. Impact bent cover, spring, or disc. 2. Improper bolt tightening procedure.	1. Replace disc or cover as necessary. 2. Tighten clutch cover using proper procedure.
Facing on flywheel side of disc torn, gouged, or worn.	1. Flywheel surface scored or nicked. 2. Clutch disc sticking or binding on transmission input shaft.	1. Correct surface condition if possible. Replace flywheel and disc as necessary. 2. Lubricate splines with high temperature grease.
Clutch disc facing burnt. Flywheel	1. Frequent operation under high	1. Correct condition of flywheel

and cover pressure plate surfaces heavily glazed.	loads or hard acceleration conditions. 2. Driver frequently rides (slips) clutch. Results in rapid wear and overheating of disc and cover.	and pressure plate surface. Replace clutch cover and disc. Alert driver to problem cause. 2. Correct condition of flywheel and pressure plate surface. Replace clutch cover and disc. Alert driver to problem cause.
Clutch disc binds on input shaft splines.	1. Clutch disc hub splines damaged during installation. 2. Input shaft splines rough, damaged, or corroded.	1. Clean, smooth, and lubricate hub splines if possible. Replace disc if necessary. 2. Clean, smooth, and lubricate shaft splines if possible. Replace input shaft if necessary.
Clutch disc rusted to flywheel and/or pressure plate.	1. Clutch not used for an extended period of time (e.g. long term vehicle storage).	1. Sand rusted surfaces with 180 grit sanding paper. Replace clutch cover and flywheel if necessary.
Pilot bearing seized, loose, or rollers are worn.	1. Bearing cocked during installation. 2. Bearing defective. 3. Bearing not lubricated. 4. Clutch misalignment.	1. Install and lubricate a new bearing. 2. Install and lubricate a new bearing. 3. Install and lubricate a new bearing. 4. Inspect clutch and correct as necessary. Install and lubricate a new bearing.
Clutch will not disengage properly.	1. Low clutch fluid level. 2. Clutch cover loose. 3. Clutch disc bent or distorted. 4. Clutch cover diaphragm spring bent or warped. 5. Clutch disc installed backwards. 6. Release fork bent or fork pivot loose or damaged. 7. Clutch master or slave cylinder failure.	1. Replace hydraulic linkage assembly. 2. Follow proper bolt tightening procedure. 3. Replace clutch disc. 4. Replace clutch cover. 5. Remove and install clutch disc correctly. 6. Replace fork or pivot as necessary. 7. Replace hydraulic linkage assembly.
Clutch pedal squeak.	1. Pivot pin loose. 2. Master cylinder bushing not lubricated. 3. Pedal bushings worn out or cracked.	1. Tighten pivot pin if possible. Replace clutch pedal if necessary. 2. Lubricate master cylinder bushing. 3. Replace and lubricate bushings.
Clutch master or slave cylinder	1. Master or slave cylinder	1. Replace clutch hydraulic

plunger dragging or binding	components worn or corroded.	linkage assembly.
Release bearing is noisy.	1. Release bearing defective or damaged.	1. Replace release bearing.
Contact surface of release bearing damaged.	1. Clutch cover incorrect or release fingers bent or distorted. 2. Release bearing defective or damaged. 3. Release bearing misaligned.	1. Replace clutch cover and release bearing. 2. Replace the release bearing. 3. Check and correct runout of clutch components. Check front bearing sleeve for damage/alignment. Repair as necessary.
Partial engagement of clutch disc. One side of disc is worn and the other side is glazed and lightly worn.	1. Clutch pressure plate position incorrect. 2. Clutch cover, spring, or release fingers bent or distorted. 3. Clutch disc damaged or distorted. 4. Clutch misalignment.	1. Replace clutch disc and cover. 2. Replace clutch disc and cover. 3. Replace clutch disc. 4. Check alignment and runout of flywheel, disc, pressure plate, and clutch housing. Correct as necessary.

STANDARD PROCEDURE

CLUTCH

Use Mopar® brake fluid, or an equivalent quality fluid meeting SAE J1703-F and DOT 3 standards only. Use fresh, clean fluid from a sealed container at all times.

Do not allow the master cylinder to run out of fluid during bleed operations. An empty cylinder will allow additional air to be drawn into the system. Check the cylinder fluid level frequently and add fluid as needed.

BLEED CLUTCH HYDRAULIC CIRCUIT

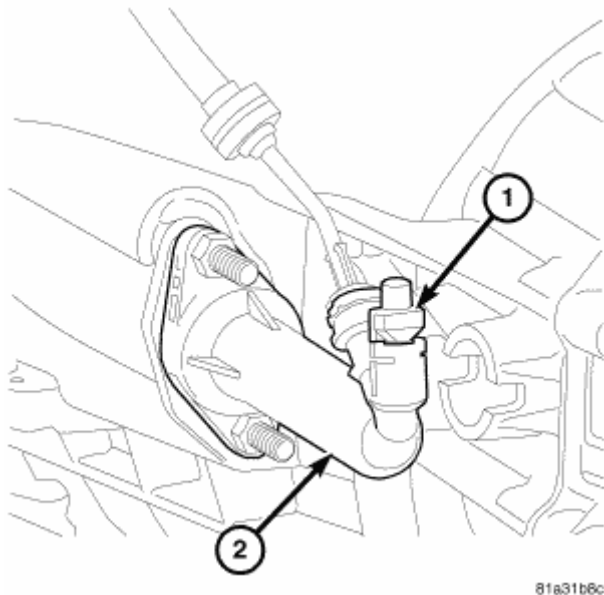


Fig. 1: Identifying Bleeder & Slave Cylinder
Courtesy of CHRYSLER LLC

1. Verify fluid level in brake master cylinder, top off brake fluid as necessary.
2. Open bleeder (1) on slave cylinder (2) and install a length of clear hose to divert fluid into suitable container. Push and hold clutch pedal down then close bleeder. Repeat this step several times.
3. Remove slave cylinder from transmission.
4. Hold slave cylinder with actuator rod pointing down and open bleeder. Push cylinder actuator rod in completely then close bleeder. Repeat this step several times.
5. Remove drain hose and replace dust cap on bleeder and install slave cylinder on transmission.
6. Actuate clutch pedal 25 times, then start engine and verify clutch operation and pedal feel.

If pedal feels spongy or clutch does not fully disengage, air is still trapped in the hydraulic circuit and must be bleed again.

PRESSURE BLEED CLUTCH HYDRAULIC CIRCUIT

Follow manufacturers instructions carefully when using pressure equipment. Do not exceed the tank manufacturers pressure recommendations. Generally, a tank pressure of 15-20 psi is sufficient for bleeding.

Fill bleeder tank with recommended DOT 3 fluid and purge air from the tank lines before bleeding.

Do not pressure bleed without a proper master cylinder adapter. The wrong adapter can lead to leakage, or drawing air back into the system. Use adapter provided with the equipment or Adapter 6921.

NOTE: When pressure bleeding system slave cylinder must be removed and actuator rod pointing downward to remove trapped air.

SPECIFICATIONS

CLUTCH

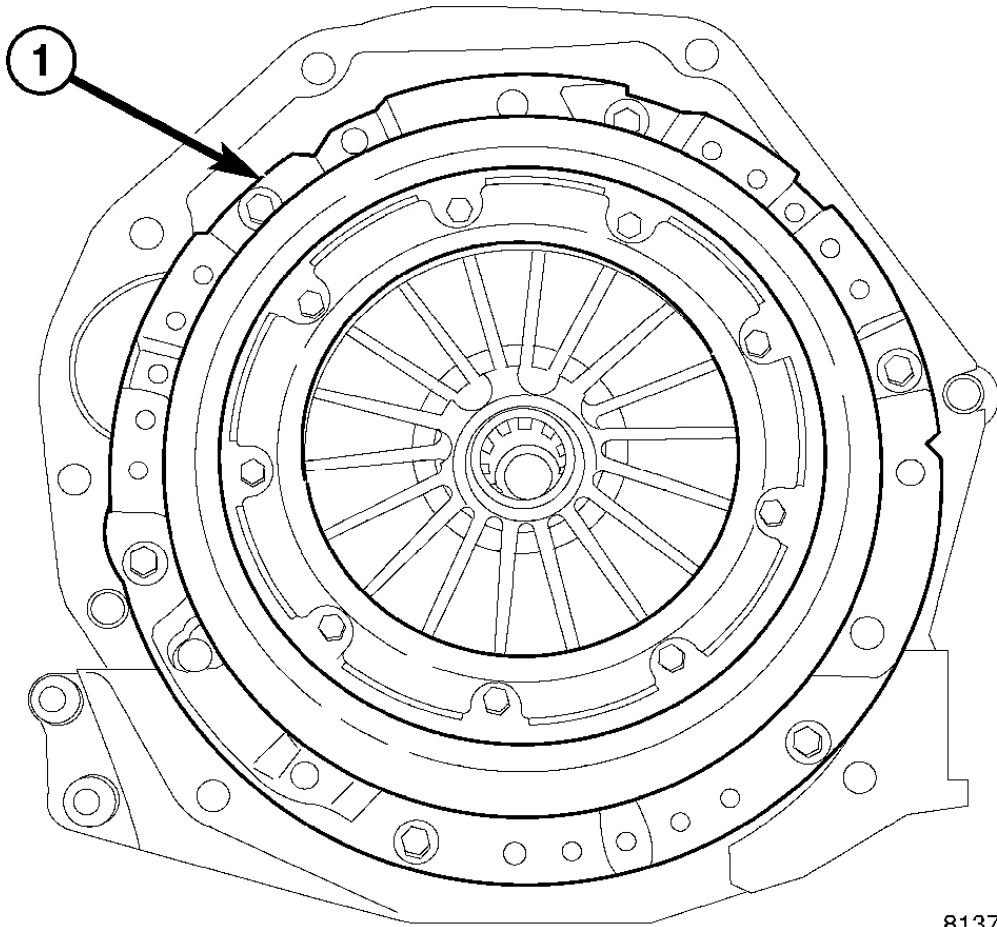
TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Pressure Plate Bolts - 4.0L	33	24	-
Pressure Plate Bolts - 3.7L	33	24	-
Pressure Plate Bolts - 2.8L Diesel	33	24	-
Flywheel Bolts - 4.0L	95	70	-
Flywheel Bolts - 3.7L	95	70	-
Flywheel Bolts - 2.8L Diesel	25 then rotate wrench 60°	18 then rotate wrench 60°	-
Slave Cylinder Nuts	23	17	-
Pedal Bracket Nuts	39	29	-

DISC-CLUTCH

REMOVAL

DISC CLUTCH/PRESSURE PLATE



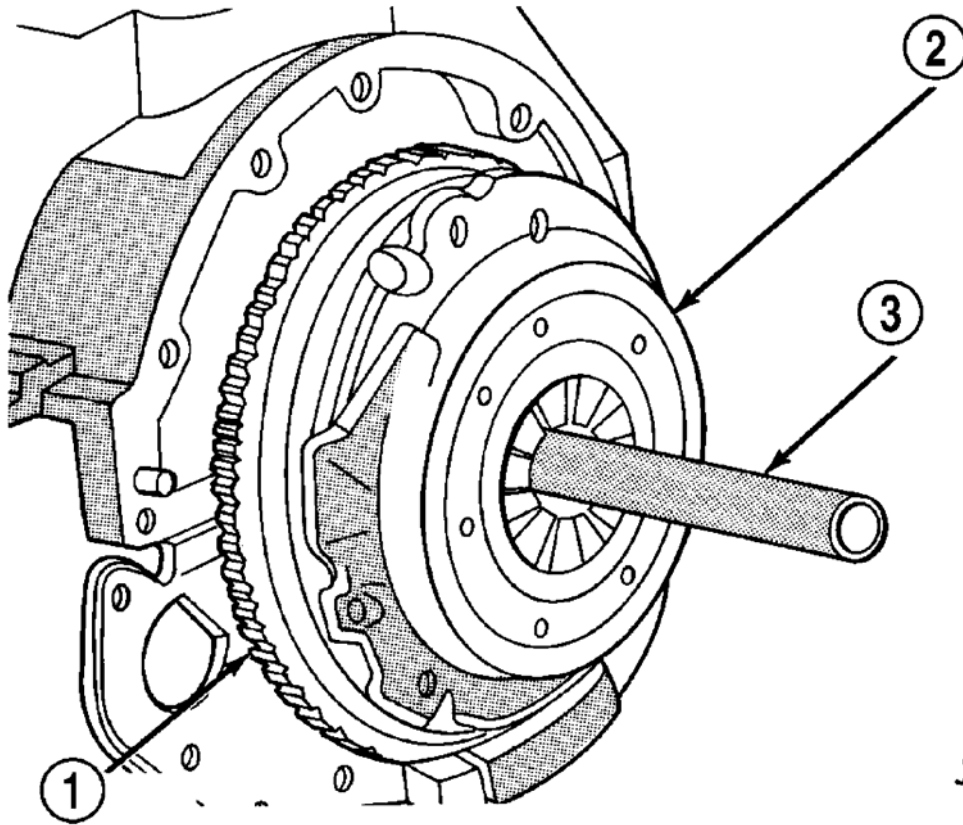
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Fig. 2: Pressure Plate
Courtesy of CHRYSLER LLC

1. Remove transmission.
2. Mark position of pressure plate (1) on flywheel with paint or a scribe for assembly reference, if clutch is not being replaced.
3. Loosen pressure plate bolts evenly and in rotation to relieve spring tension and avoid warping the plate.
4. Remove pressure plate bolts and pressure plate and disc.

INSTALLATION

DISC CLUTCH/PRESSURE PLATE



J9106-18

Fig. 3: Aligning Clutch Disc-Typical
 Courtesy of CHRYSLER LLC

1. Lightly scuff sand flywheel face with 180 grit emery cloth, then clean with a wax and grease remover.
2. Lubricate pilot bearing with Mopar® high temperature bearing grease or equivalent.
3. Check runout and operation of **new** clutch disc.

NOTE: **Disc must slide freely on transmission input shaft splines.**

4. With the disc on the input shaft, check face runout with dial indicator. Check runout at disc hub 6 mm (1/4 in.) from outer edge of facing. Obtain another clutch disc if runout exceed 0.5 mm (0.020 in.).
5. Position clutch disc on flywheel with side marked flywheel against the flywheel.

NOTE: **If not marked, the flat side of disc hub goes towards the flywheel.**

6. Insert clutch alignment tool (3) through the clutch disc and into the pilot bearing.
7. Position clutch pressure plate (2) over disc and on the flywheel (1).
8. Install pressure plate bolts finger tight.

CAUTION: Use only the factory bolts to mount the pressure plate. The bolts

must be the correct size. If bolts are too short, there isn't enough thread engagement, if too long bolts interfere with the Dual Mass Flywheel.

9. Tighten pressure plate bolts evenly and in rotation a few threads at a time.

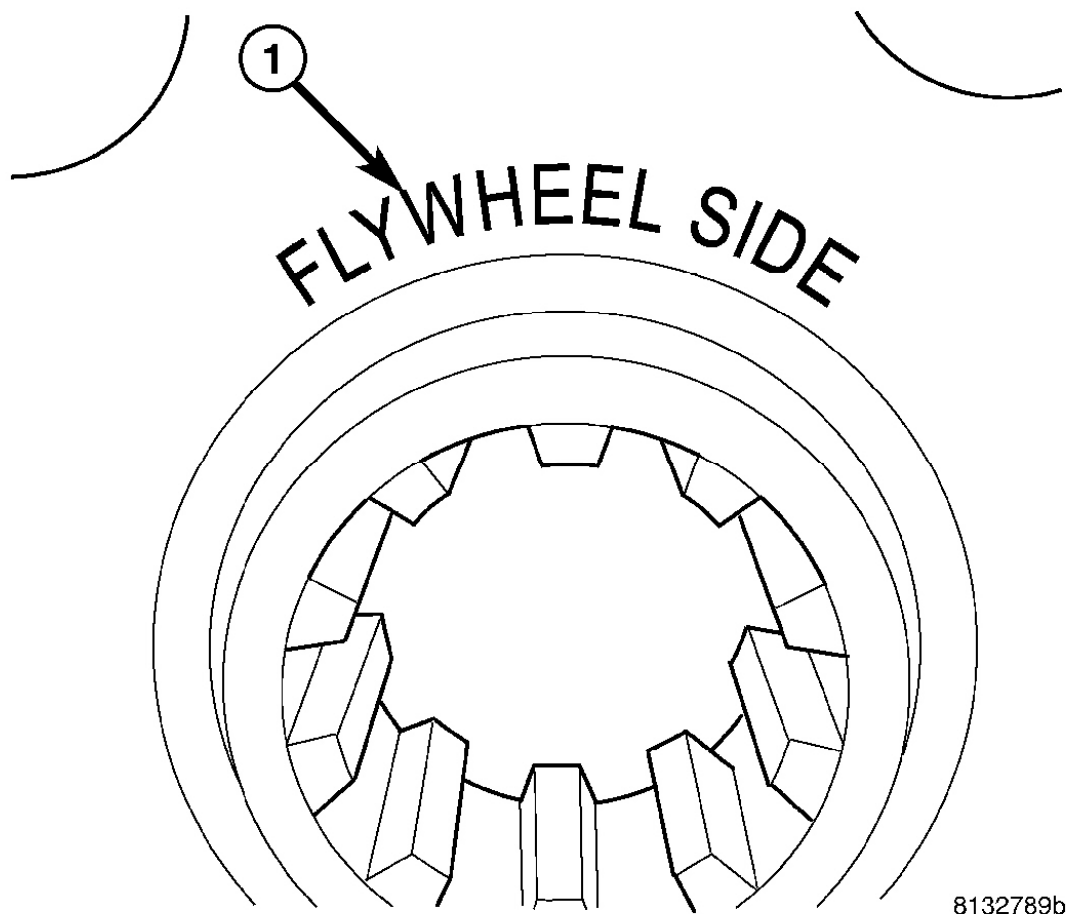
CAUTION: The bolts must be tightened evenly and to specified torque. Failure to follow these instructions will distort the pressure plate.

10. Tighten pressure plate bolts 33 N.m (24 ft. lbs.).
11. Apply light coat of Mopar® high temperature bearing grease or equivalent to clutch disc hub and splines of transmission input shaft.

CAUTION: Do not over lubricate shaft splines. This will result in grease contamination of disc.

12. Install transmission.

DISC CLUTCH/PRESSURE PLATE - 2.8L DIESEL



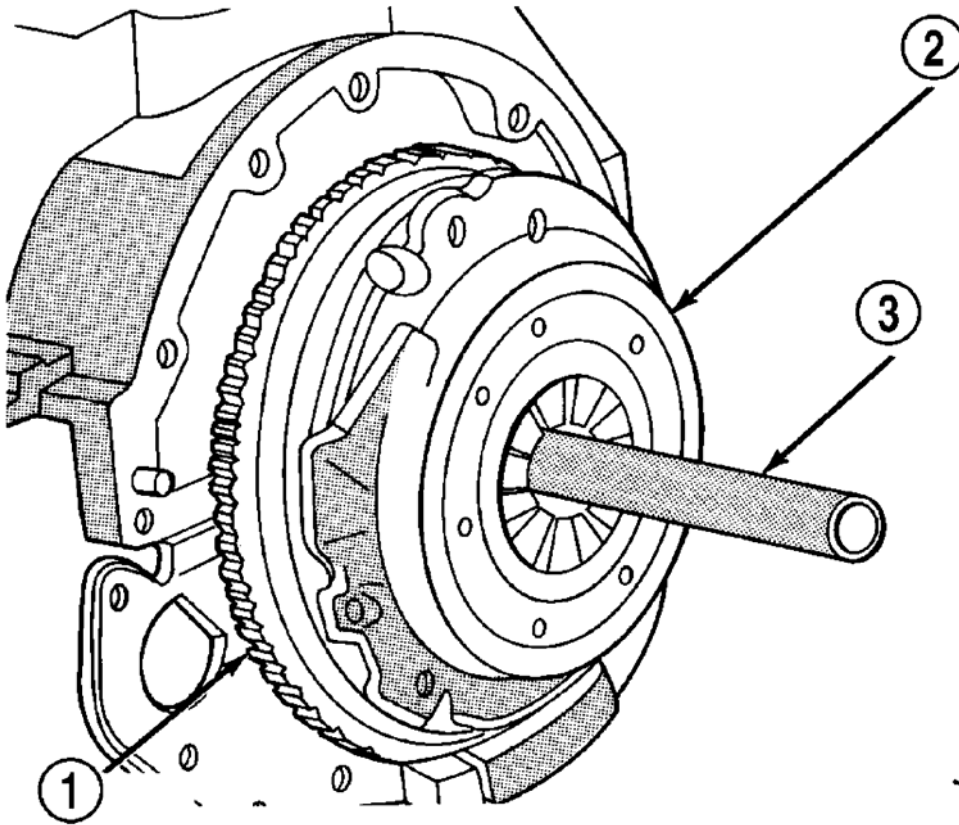
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Fig. 4: Clutch Disc
Courtesy of CHRYSLER LLC

1. Lightly scuff sand flywheel face with 180 grit emery cloth, then clean with a wax and grease remover.
2. Lubricate pilot bearing with Mopar® high temperature bearing grease or equivalent.
3. Check runout and operation of **new** clutch disc.

NOTE: **Disc must slide freely on transmission input shaft splines.**

4. With the disc on the input shaft, check face runout with dial indicator. Check runout at disc hub 6 mm (1/4 in.) from outer edge of facing. Obtain another clutch disc if runout exceed 0.5 mm (0.020 in.).
5. Position clutch disc on flywheel with side marked flywheel side (1) against the flywheel. If not marked, the flat side of disc hub goes towards the flywheel.



J9106-18

Fig. 5: Aligning Clutch Disc-Typical
Courtesy of CHRYSLER LLC

6. Insert clutch alignment tool (3) through the clutch disc and into the pilot bearing.
7. Position clutch pressure plate (2) over disc and on the flywheel (1).

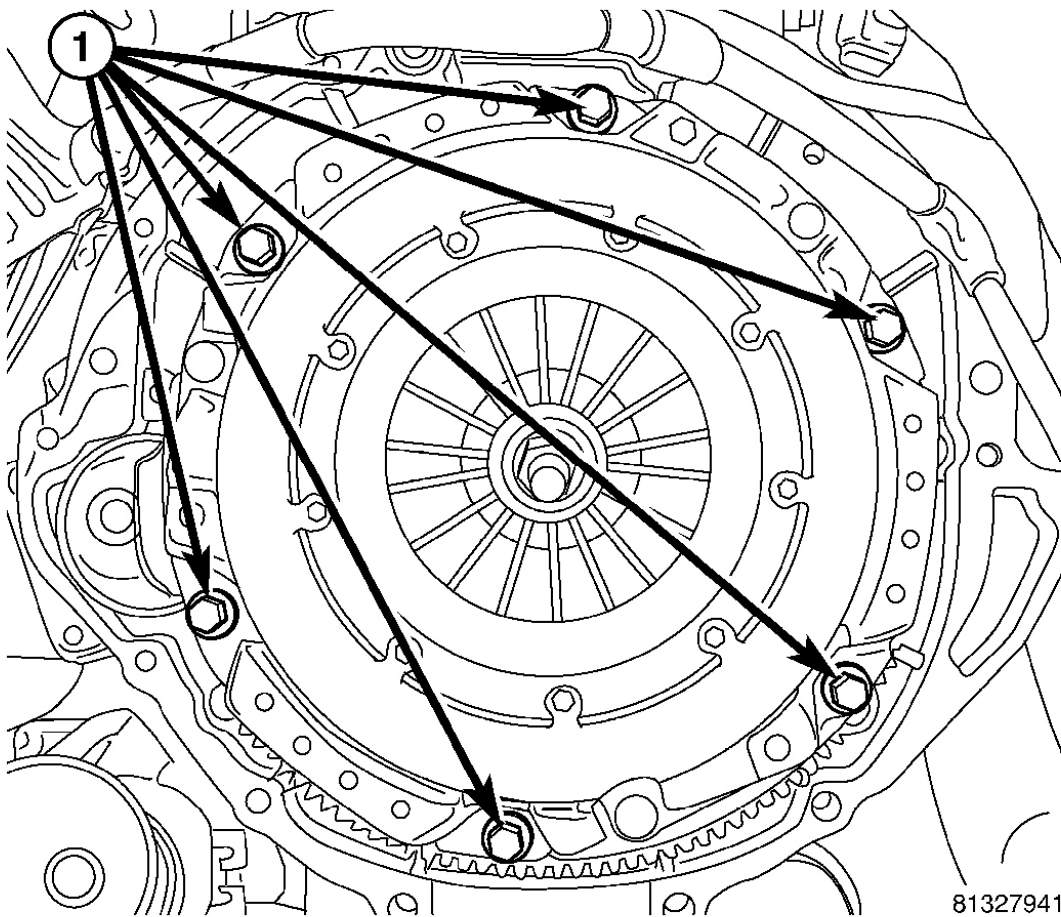


Fig. 6: Pressure Plate
Courtesy of CHRYSLER LLC

8. Install pressure plate bolts (1) finger tight.
9. Tighten pressure plate bolts evenly and in rotation a few threads at a time.

CAUTION: The bolts must be tightened evenly and to specified torque. Failure to follow these instruction will distort the pressure plate.

10. Tighten pressure plate bolts to 33 N.m (24 ft. lbs.).
11. Apply light coat of Mopar® high temperature bearing grease or equivalent to clutch disc hub and splines of transmission input shaft.

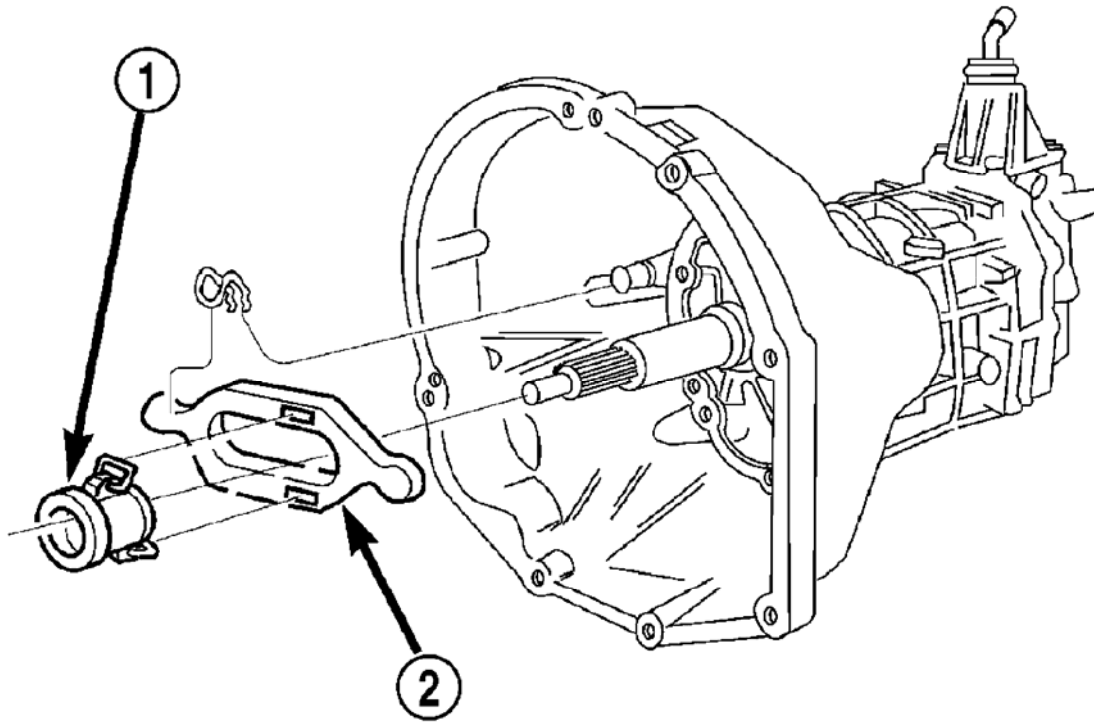
CAUTION: Do not over lubricate shaft splines. Failure to follow these instructions will contaminate the disc.

12. Install transmission.

BEARING-CLUTCH RELEASE

REMOVAL

BEARING-CLUTCH RELEASE



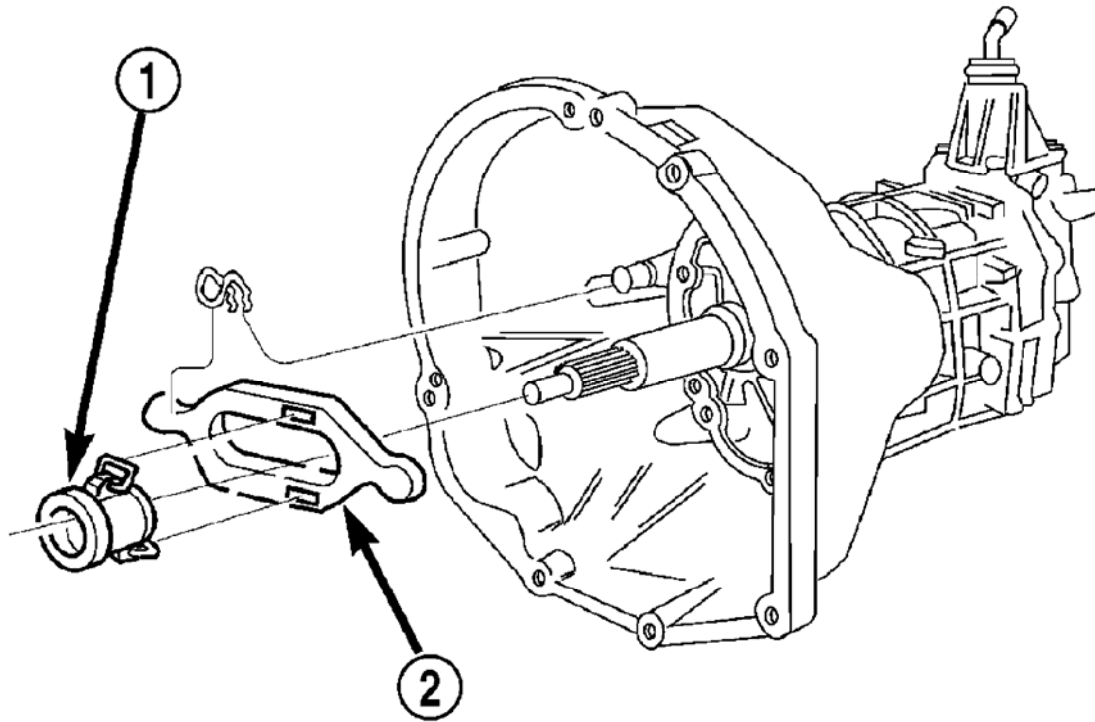
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Fig. 7: Clutch Release Bearing
Courtesy of CHRYSLER LLC

1. Remove transmission.
2. Disconnect release bearing (1) from release fork (2) and remove the bearing.
3. Inspect bearing slide surface of transmission front bearing retainer. Replace retainer if slide surface is scored, worn, or cracked.
4. Inspect release fork and fork pivot. Be sure pivot is secure and in good condition. Be sure fork is not distorted or worn. Replace release fork retainer spring if bent or damaged.

INSTALLATION

BEARING-CLUTCH RELEASE



80be45ed

Fig. 8: Clutch Release Bearing
Courtesy of CHRYSLER LLC

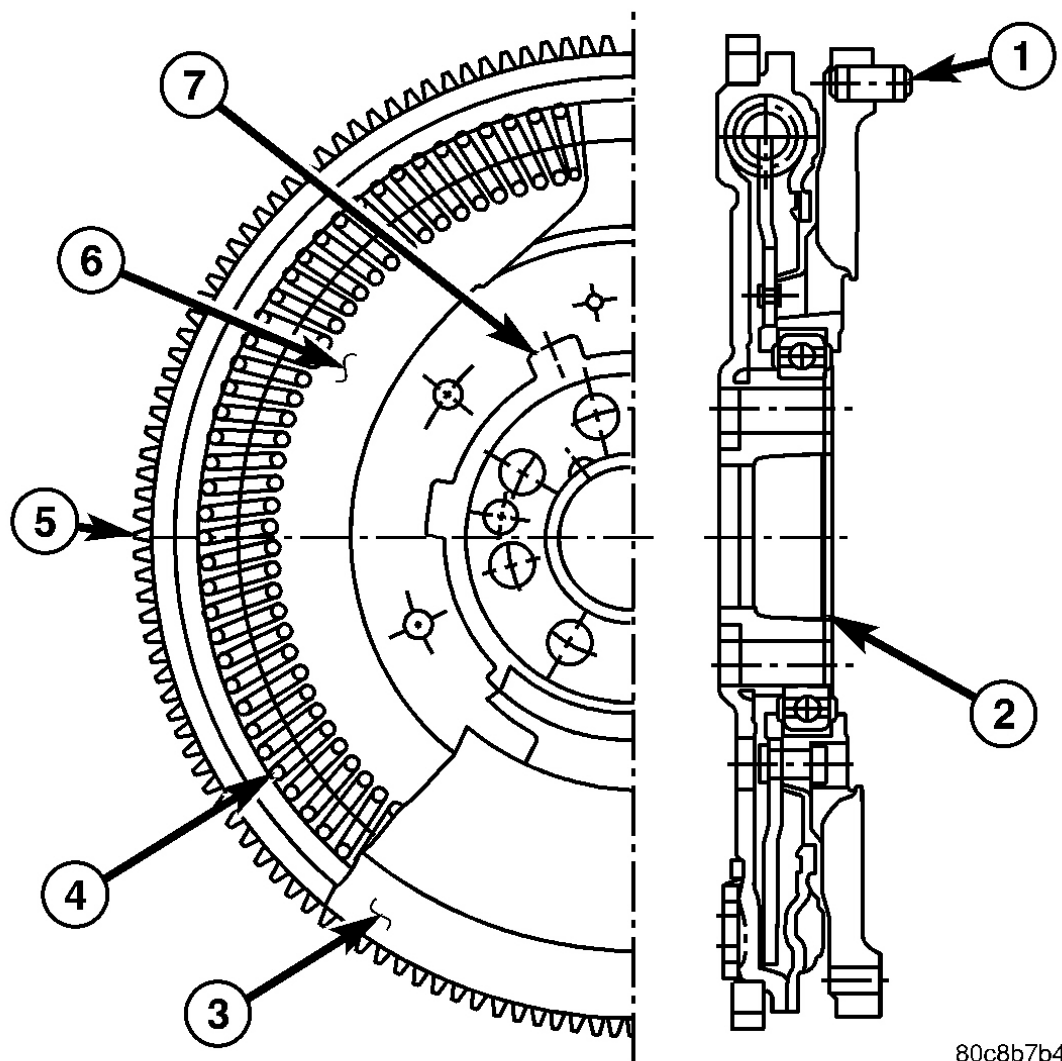
1. Lubricate crankshaft pilot bearing with Mopar® high temperature bearing grease or equivalent. Apply grease to end of long shank, small diameter flat blade screwdriver. Then insert tool through clutch disc hub to reach bearing.
2. Lubricate input shaft splines, bearing retainer slide surface, fork pivot and release fork pivot surface.
3. Install new release bearing (1) and secure to release fork (2).
4. Install transmission.

FLYWHEEL

DESCRIPTION

FLYWHEEL

DUAL MASS FLYWHEEL



80c8b7b4

Fig. 9: Dual Mass Flywheel
 Courtesy of CHRYSLER LLC

The Dual Mass Flywheel is used on all engines. The flywheel incorporates the ring gear (5) around the outer circumference to mesh with the starter to permit engine cranking. The primary flywheel (6) side is bolted to the crankshaft. The secondary flywheel (3) side serves as the driving member to the clutch disc. Internal springs (4) between the flywheels are used to dampen energy. The Dual Mass Flywheel is serviced as an assembly only and should never be taken apart.

DIAGNOSIS AND TESTING

FLYWHEEL

Check flywheel runout whenever misalignment is suspected. Flywheel runout should not exceed 0.08 mm

(0.003 in.). Measure runout at the outer edge of the flywheel face with a dial indicator. Mount the indicator on a stud installed in place of one of the flywheel bolts.

Common causes of runout are:

- heat warpage
- improper machining
- incorrect bolt tightening
- improper seating on crankshaft flange shoulder
- foreign material on crankshaft flange

Flywheel machining is not recommended. The flywheel clutch surface is machined to a unique contour and machining will negate this feature. Minor flywheel scoring can be cleaned up by hand with 180 grit emery or with surface grinding equipment. Remove only enough material to reduce scoring (approximately 0.001 - 0.003 in.). Heavy stock removal is **not recommended**. Replace the flywheel if scoring is severe and deeper than 0.076 mm (0.003 in.). Excessive stock removal can result in flywheel cracking or warpage after installation; it can also weaken the flywheel and interfere with proper clutch release.

Clean the crankshaft flange before mounting the flywheel. Dirt and grease on the flange surface may cock the flywheel causing excessive runout. Use new bolts when remounting a flywheel and secure the bolts with Mopar® Lock And Seal or equivalent. Tighten flywheel bolts to specified torque only. Overtightening can distort the flywheel hub causing runout.

REMOVAL

REMOVAL

1. Remove transmission.
2. Remove clutch pressure plate and disc.
3. Remove flywheel-to-crankshaft bolts and remove flywheel assembly.

INSTALLATION

INSTALLATION

1. Clean the surfaces of the flywheel and pressure plate.
2. Install flywheel with **new** bolts and tighten in a criss-cross pattern. Tighten bolts to 95 N.m (70 ft. lbs.). On 2.8L diesel engine tighten bolts to 25 N.m (180 ft. lbs.) then rotate wrench 60°.
3. Install clutch disc and pressure plate.
4. Install transmission.

BEARING-PILOT

REMOVAL

BEARING-PILOT

1. Remove transmission.
2. Remove pressure plate and clutch disc.
3. Remove pilot bearing with an internal (blind hole) puller.

INSTALLATION

BEARING-PILOT

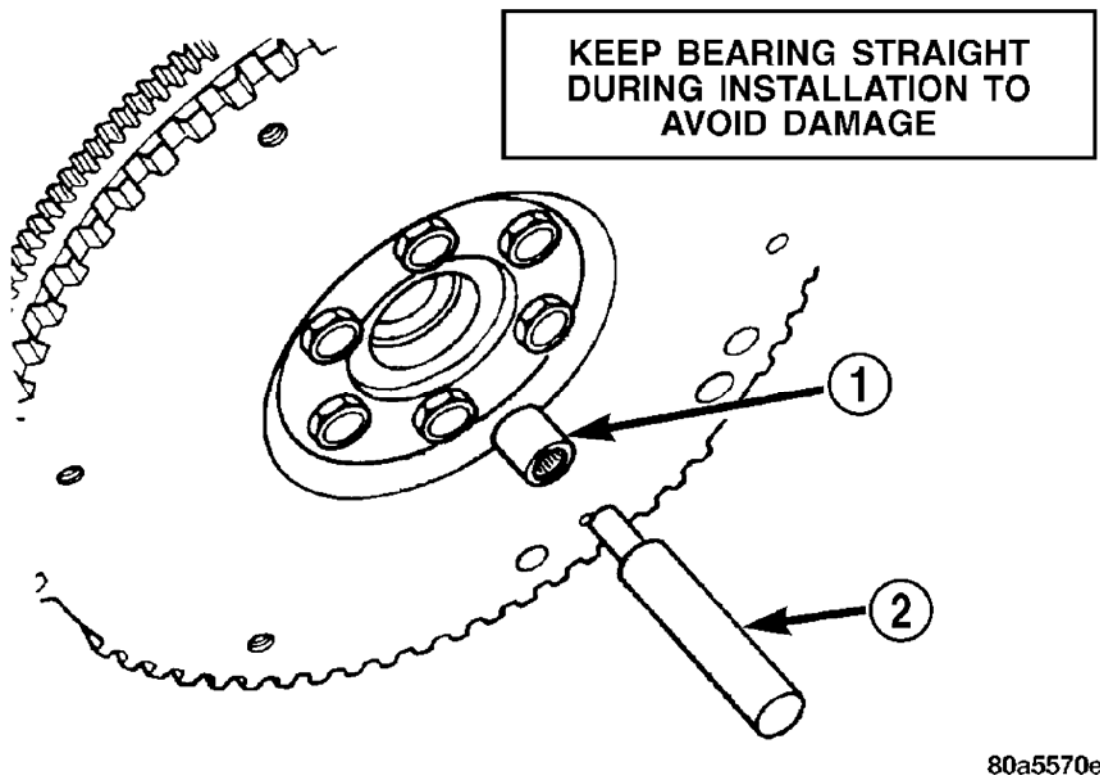


Fig. 10: Pilot Bearing Installer
Courtesy of CHRYSLER LLC

1. Lubricate new bearing with Mopar® high temperature bearing grease or equivalent.
2. Start new pilot bearing (1) into crankshaft by hand. Then seat bearing with clutch alignment tool (2).
3. Install clutch disc and pressure plate.
4. Install transmission.

CYLINDER-MASTER

REMOVAL

REMOVAL

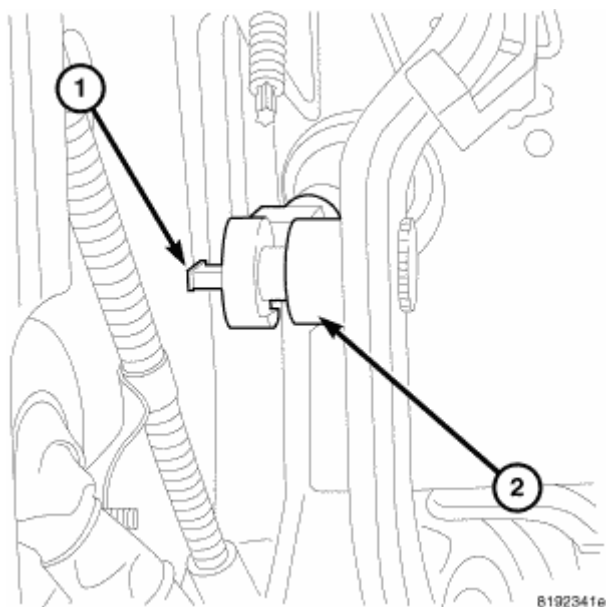


Fig. 11: Identifying Actuator Rod & Clutch Pedal Pin
Courtesy of CHRYSLER LLC

1. Pry actuator rod (1) off clutch pedal pin (2).

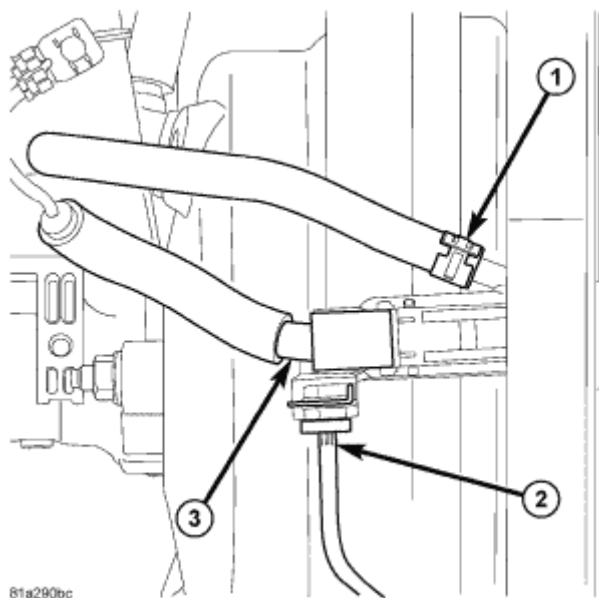


Fig. 12: Identifying Hose, Wiring Harness & Hydraulic Line
Courtesy of CHRYSLER LLC

2. Remove hose (1) from clutch master cylinder and plug hose to prevent fluid loss.
3. Disconnect wiring harness (3) from pedal position switch.
4. Pull the hydraulic line (2) clip and remove line from bottom of clutch master cylinder.

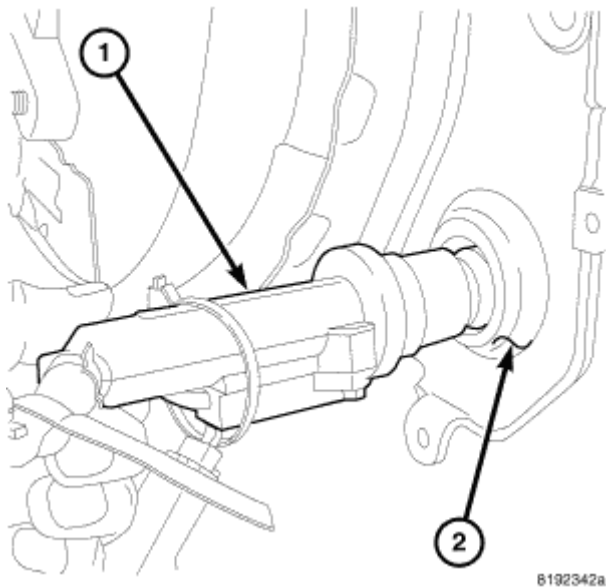


Fig. 13: Identifying Clutch Master Cylinder Assembly & Brake Booster Mounting Plate
 Courtesy of CHRYSLER LLC

5. Turn clutch master cylinder assembly (1) clockwise a quarter turn and remove from brake booster mounting plate (2).

INSTALLATION

INSTALLATION

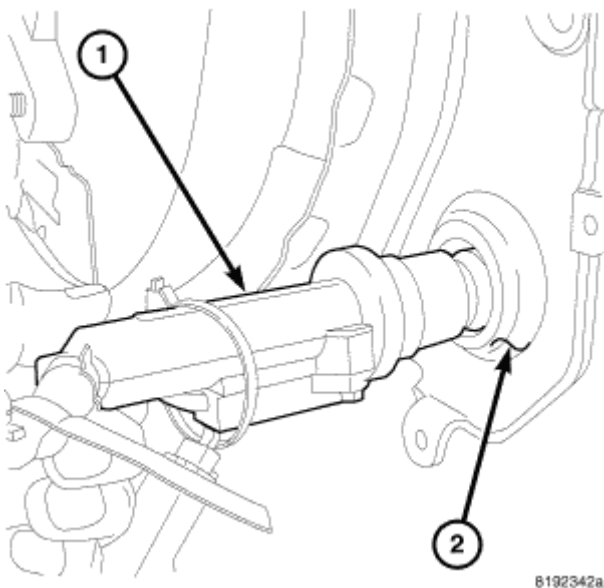


Fig. 14: Identifying Clutch Master Cylinder Assembly & Brake Booster Mounting Plate
 Courtesy of CHRYSLER LLC

1. Install clutch master cylinder (1) through brake booster mounting plate (2) and turn counter clockwise a

quarter turn.

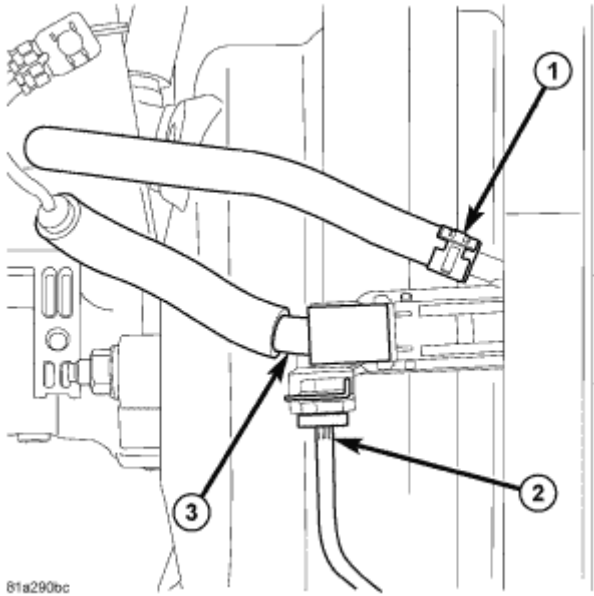


Fig. 15: Identifying Hose, Wiring Harness & Hydraulic Line
Courtesy of CHRYSLER LLC

2. Install actuator hose (1) to clutch master cylinder.
3. Install hydraulic line (2) to the bottom of clutch master cylinder.

NOTE: **Verify O-ring is on hydraulic line.**

4. Connect wiring harness (3) to pedal position switch.

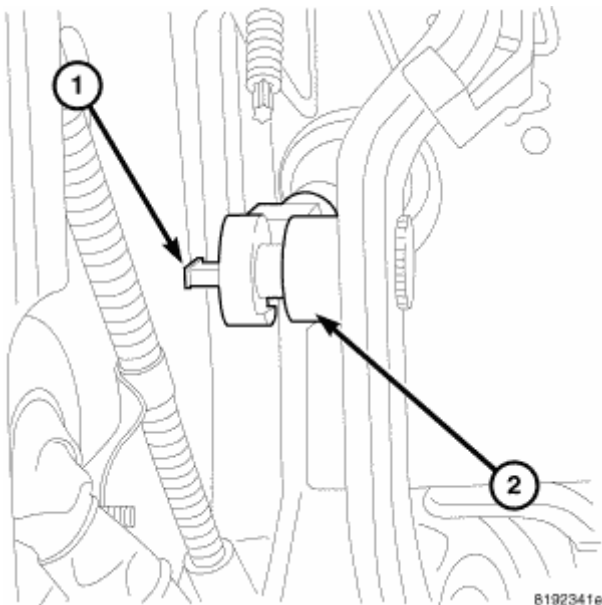


Fig. 16: Identifying Actuator Rod & Clutch Pedal Pin

Courtesy of CHRYSLER LLC

5. Install actuator rod (1) on clutch pedal pin (2).
6. Bleed clutch hydraulic circuit.

CYLINDER-SLAVE

REMOVAL

REMOVAL

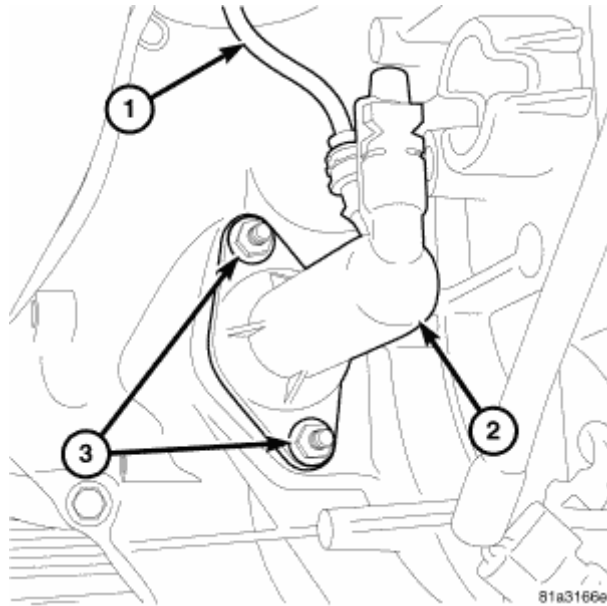


Fig. 17: Identifying Hydraulic Line, Slave Cylinder & Mounting Nuts
Courtesy of CHRYSLER LLC

1. With transmission in neutral, position vehicle on hoist.
2. Pull clip from hydraulic line (1) at the slave cylinder (2) and remove the line.
3. Remove mounting nuts (3) from slave cylinder (2).
4. Remove the slave cylinder.

INSTALLATION

INSTALLATION

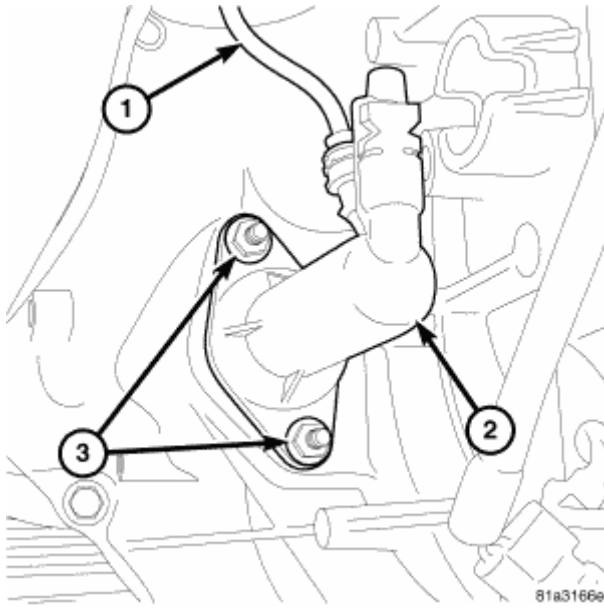


Fig. 18: Identifying Hydraulic Line, Slave Cylinder & Mounting Nuts
Courtesy of CHRYSLER LLC

1. Install slave cylinder (2) in transmission.
2. Install slave cylinder nuts (3) and tighten to 23 N.m (17 ft. lbs.).
3. Install hydraulic line (1) to slave cylinder (2).

NOTE: **Verify O-ring is on hydraulic line.**

4. Bleed hydraulic system.

PEDAL-CLUTCH

REMOVAL

PEDAL-CLUTCH

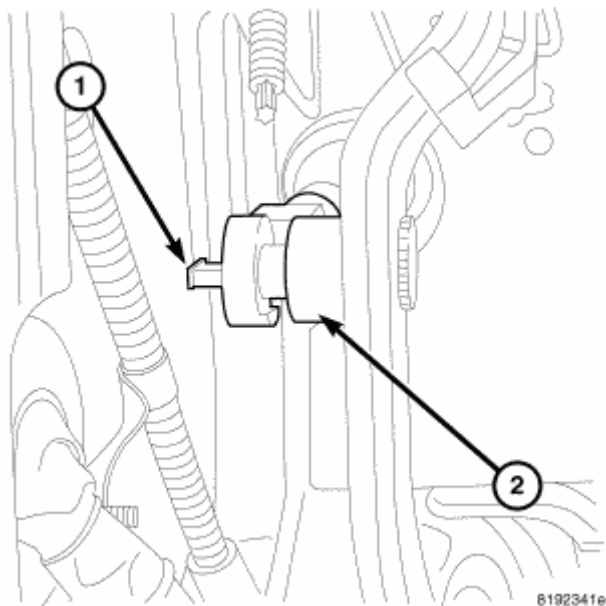


Fig. 19: Identifying Actuator Rod & Clutch Pedal Pin
 Courtesy of CHRYSLER LLC

1. Remove steering column lower cover and knee blocker for access.
2. Disengage bushing (1) attaching clutch master cylinder actuator to pedal pivot (2).
3. Remove nuts attaching pedal and bracket to dash panel and upper cowl support.
4. Separate pedal assembly from vehicle.

INSTALLATION

PEDAL-CLUTCH

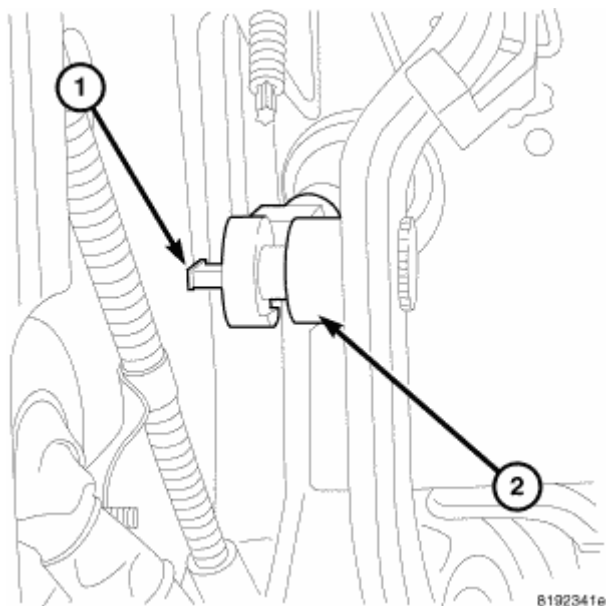


Fig. 20: Identifying Actuator Rod & Clutch Pedal Pin

Courtesy of CHRYSLER LLC

- 1. Place clutch pedal and bracket over studs on dash panel and cowl support.
- 2. Install pedal and bracket to dash panel nuts and tighten to 39 N.m (29 ft. lbs.).
- 3. Install actuator (1) on brake pedal pivot (2).

SWITCH-CLUTCH PEDAL POSITION

DESCRIPTION

SWITCH-CLUTCH PEDAL POSITION

The clutch pedal position switch is attached to the side of the clutch master cylinder.

The clutch pedal position switch override relay is located in the Power Distribution Center (PDC). Refer to PDC cover label for location within PDC.

OPERATION

SWITCH-CLUTCH PEDAL POSITION

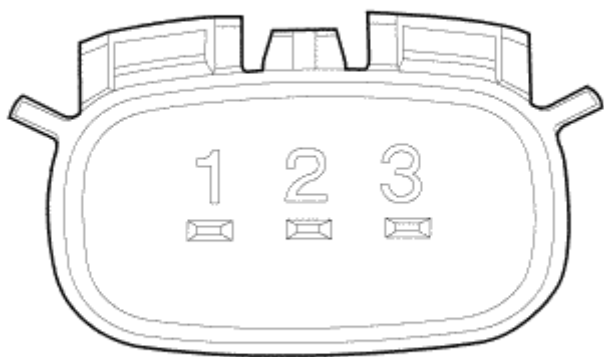
The clutch pedal position switch is used to prevent starter motor engagement unless the clutch pedal is depressed. An input from this switch is also used to either shut down/prevent operation of the speed control system when the clutch pedal is depressed.

Four Wheel Drive Feature: The clutch pedal position switch override relay, inhibits operation of the position switch when the vehicle transfer case is in the four wheel drive low-range position. This enables the starter motor to operate without depressing the clutch pedal, for off-road applications. If Diagnostic Trouble Codes (DTC's) for the override relay or transfer case switch are stored, override relay will be inhibited.

DIAGNOSIS AND TESTING

SWITCH-CLUTCH PEDAL POSITION

START INTERLOCK TEST - DIESEL AND GAS



81a1387a

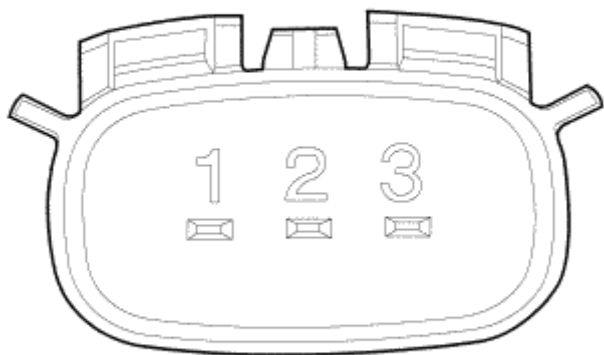
Fig. 21: Clutch Pedal Switch Connector
 Courtesy of CHRYSLER LLC

Ohm meter set on continuity: One lead on switch START INTERLOCK post 2 and second lead on COMMON post 3.

Pedal Released - No Continuity

Pedal Depressed End Of Stroke - Continuity

CRUISE TEST - DIESEL ONLY



81a1387a

Fig. 22: Clutch Pedal Switch Connector
 Courtesy of CHRYSLER LLC

Ohm meter set on continuity: One lead on switch CRUISE post 1 and second lead on COMMON post 3.

Pedal Released - Continuity

Pedal Depressed Beginning Of Stroke - No Continuity

REMOVAL

REMOVAL

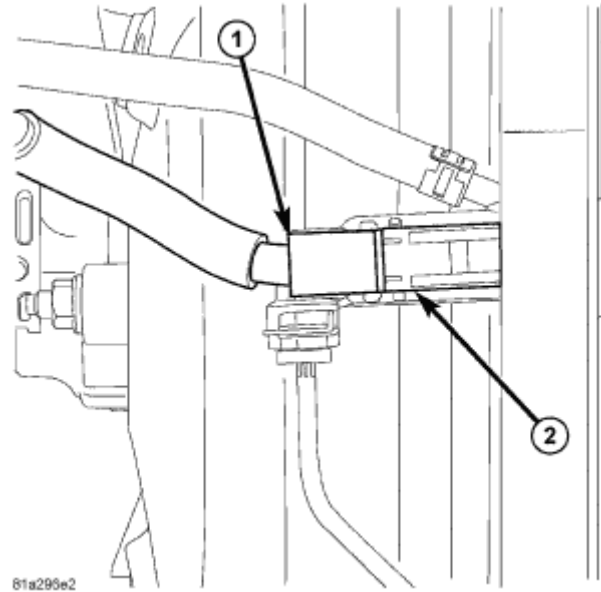


Fig. 23: Identifying Wiring Harness & Pedal Position Switch
Courtesy of CHRYSLER LLC

1. Disconnect wiring harness (1) from pedal position switch (2).

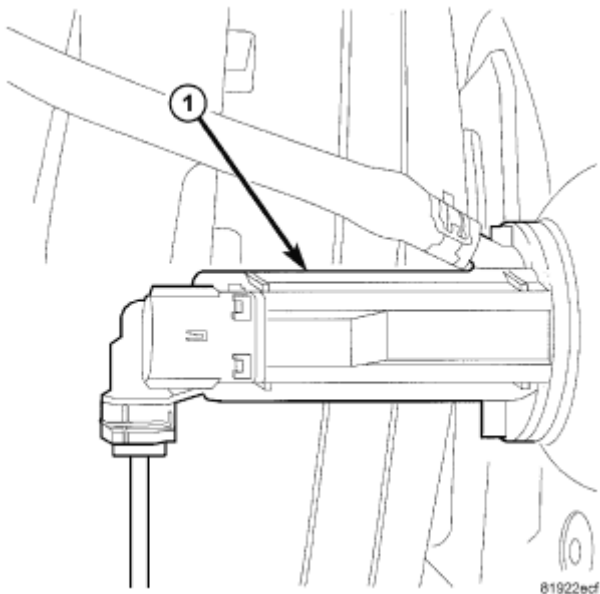


Fig. 24: Identifying Pedal Position Switch
Courtesy of CHRYSLER LLC

2. Pry pedal position switch (1) off clutch master cylinder.

INSTALLATION

INSTALLATION

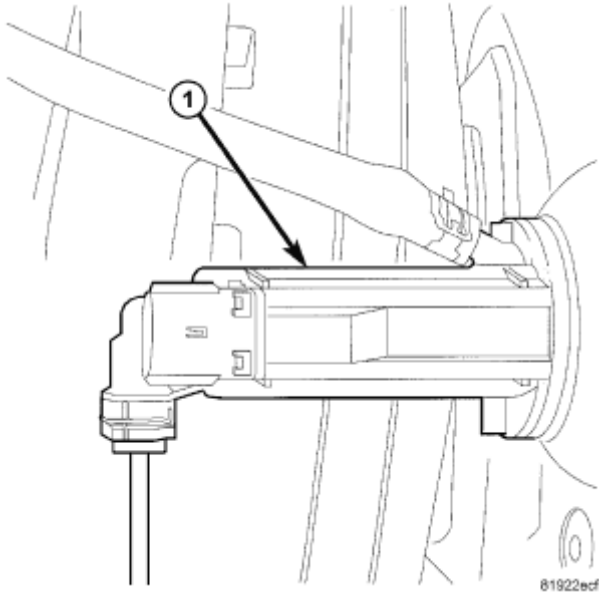


Fig. 25: Identifying Pedal Position Switch
Courtesy of CHRYSLER LLC

1. Snap pedal position switch (1) on clutch master cylinder.

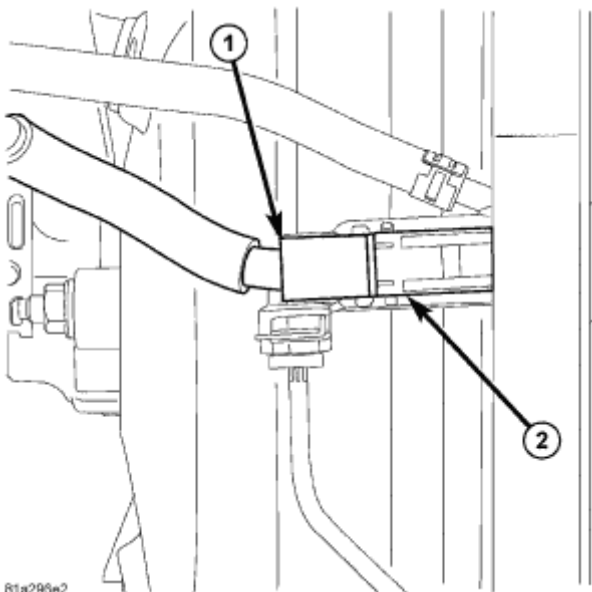


Fig. 26: Identifying Wiring Harness & Pedal Position Switch
Courtesy of CHRYSLER LLC

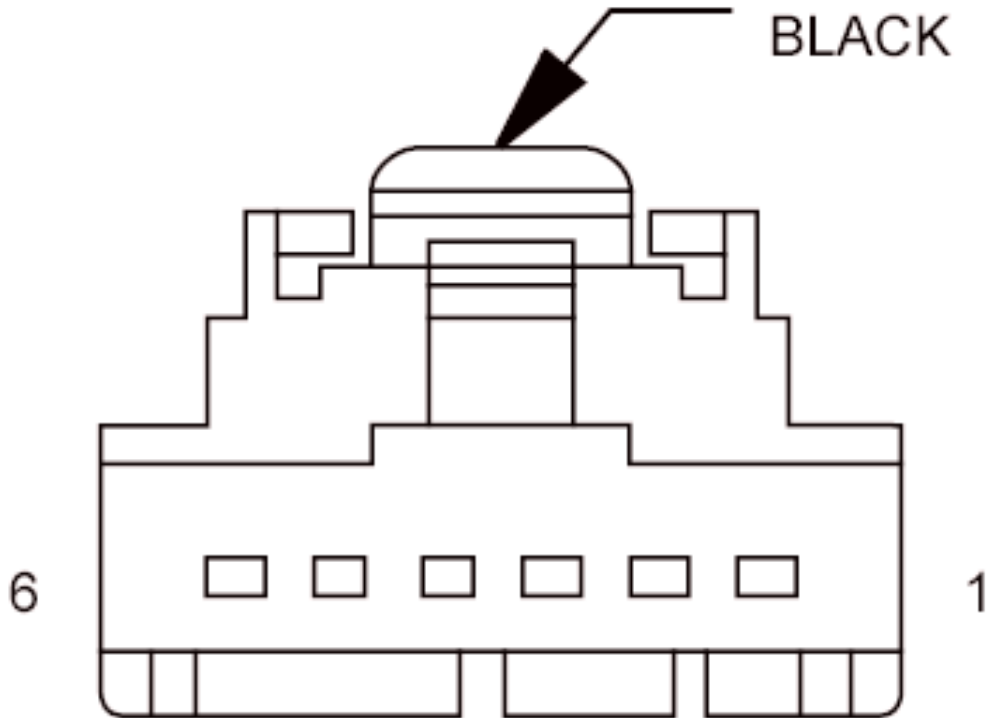
2. Connect harness (1) to clutch pedal position switch (2).

2008 ELECTRICAL

Connector Pin-Outs - Liberty

CONNECTOR PIN-OUTS

ACTUATOR-BLEND DOOR - BLACK 6 WAY FEMALE

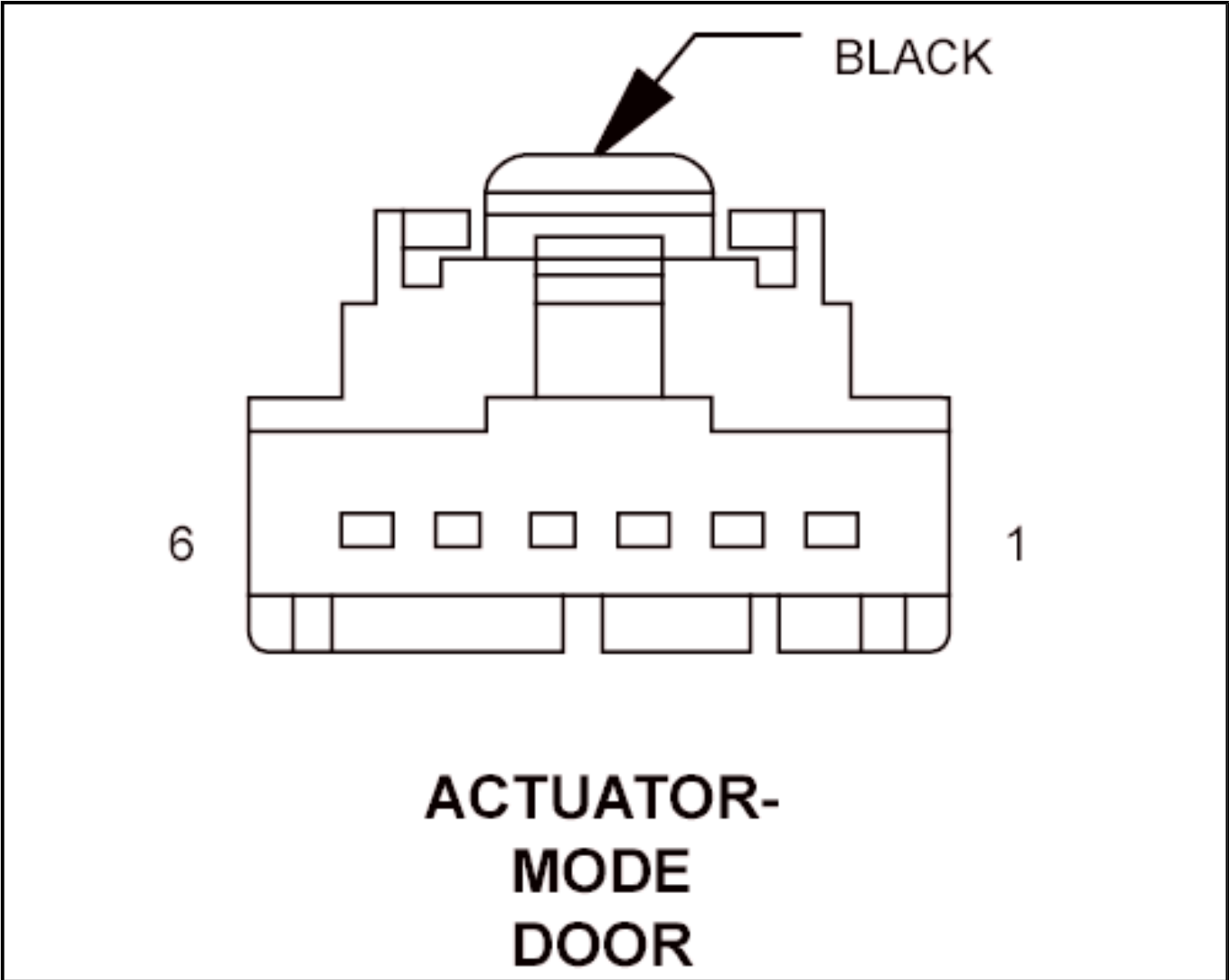


ACTUATOR- BLEND DOOR

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	C54 20LB/YL	BLEND DOOR DRIVER (LHD)
5	C154 20LB/OR	COMMON DOOR DRIVER (RHD)

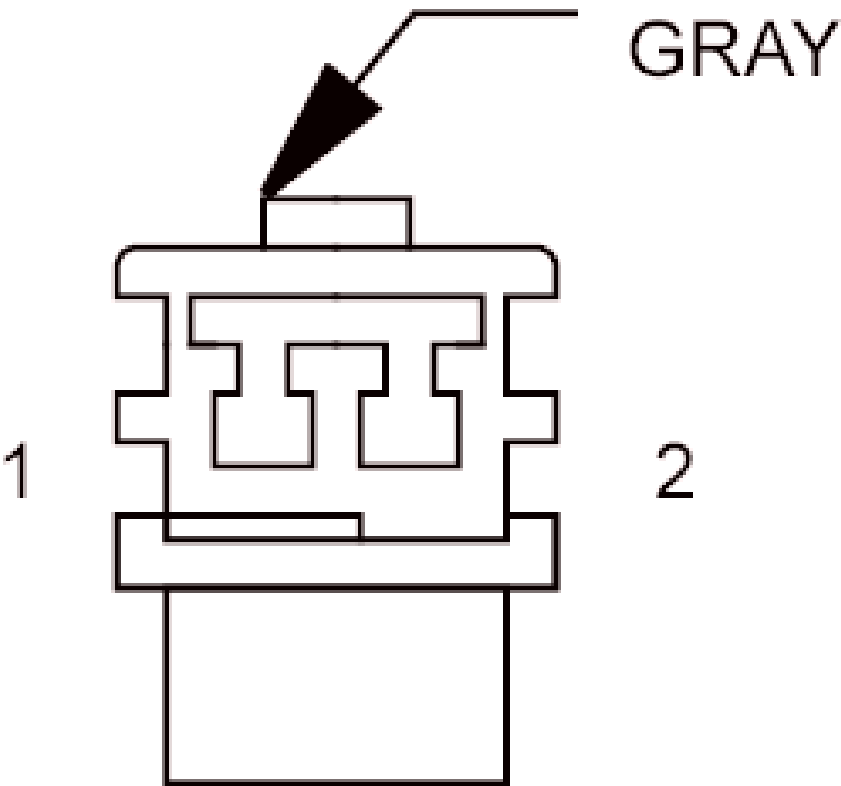
6	C154 20LB/OR	COMMON DOOR DRIVER (LHD)
6	C54 20LB/YL	BLEND DOOR DRIVER (RHD)

ACTUATOR-MODE DOOR - BLACK 6 WAY FEMALE



CAV	CIRCUIT	FUNCTION
2	-	-
3	-	-
4	-	-
5	C35 20LB/OR	MODE DOOR DRIVER (LHD)
5	C154 20LB/OR	COMMON DOOR DRIVER (RHD)
6	C154 20LB/OR	COMMON DOOR DRIVER (LHD)
6	C35 20LB/OR	MODE DOOR DRIVER (RHD)

ACTUATOR-RECIRCULATION DOOR - GRAY 2 WAY (LHD)

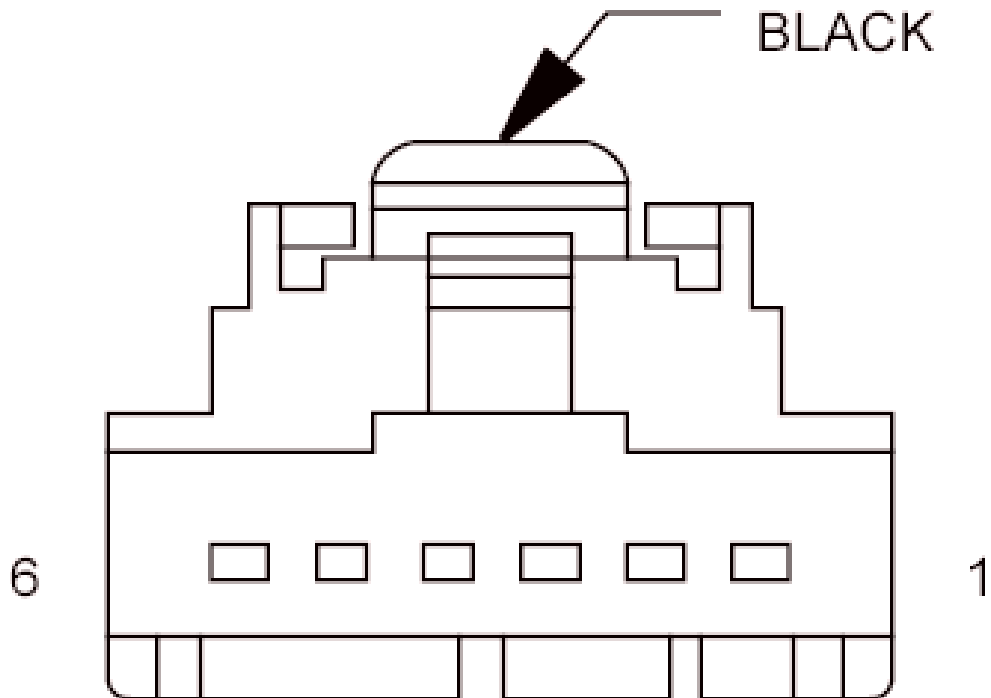


**ACTUATOR-
RECIRCULATION
DOOR
(LHD)**

CAV	CIRCUIT	FUNCTION
1	C32 20DB/TN	RECIRCULATION DOOR DRIVER
2	C154 20LB/OR	COMMON DOOR DRIVER

ACTUATOR-RECIRCULATION DOOR - BLACK 6 WAY (RHD) FEMALE

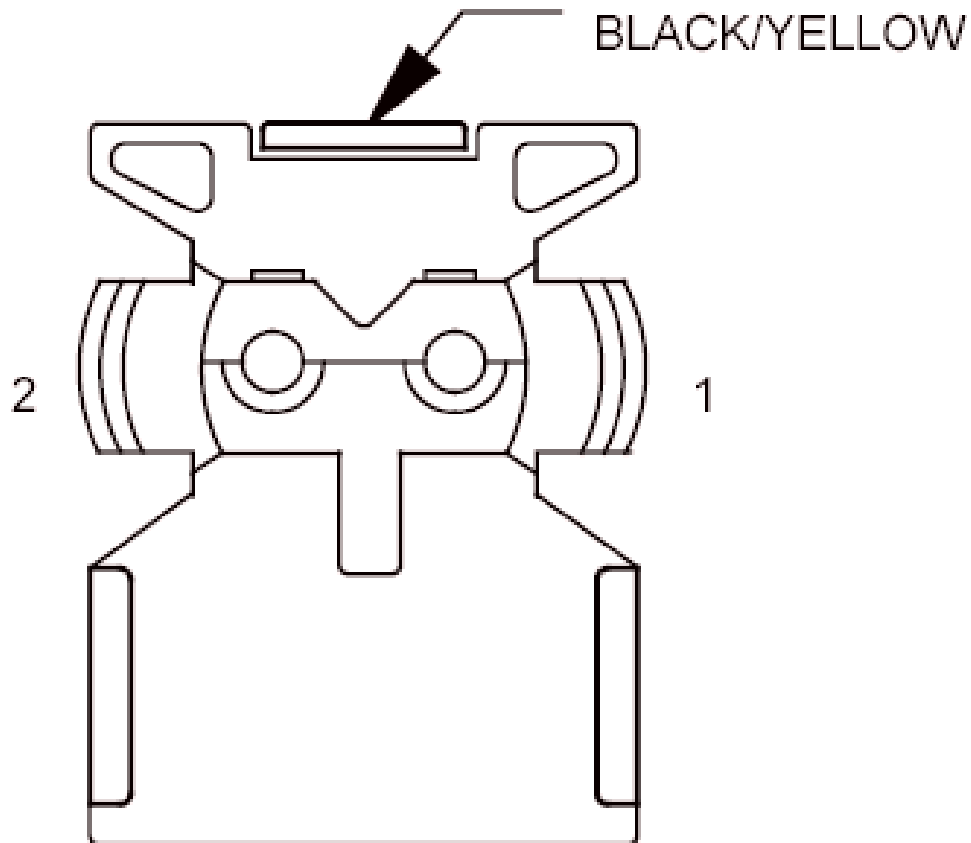
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**ACTUATOR-
RECIRCULATION
DOOR
(RHD)**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	C154 20LB/OR	COMMON DOOR DRIVER
6	C32 20DB/TN	RECIRCULATION DOOR DRIVER

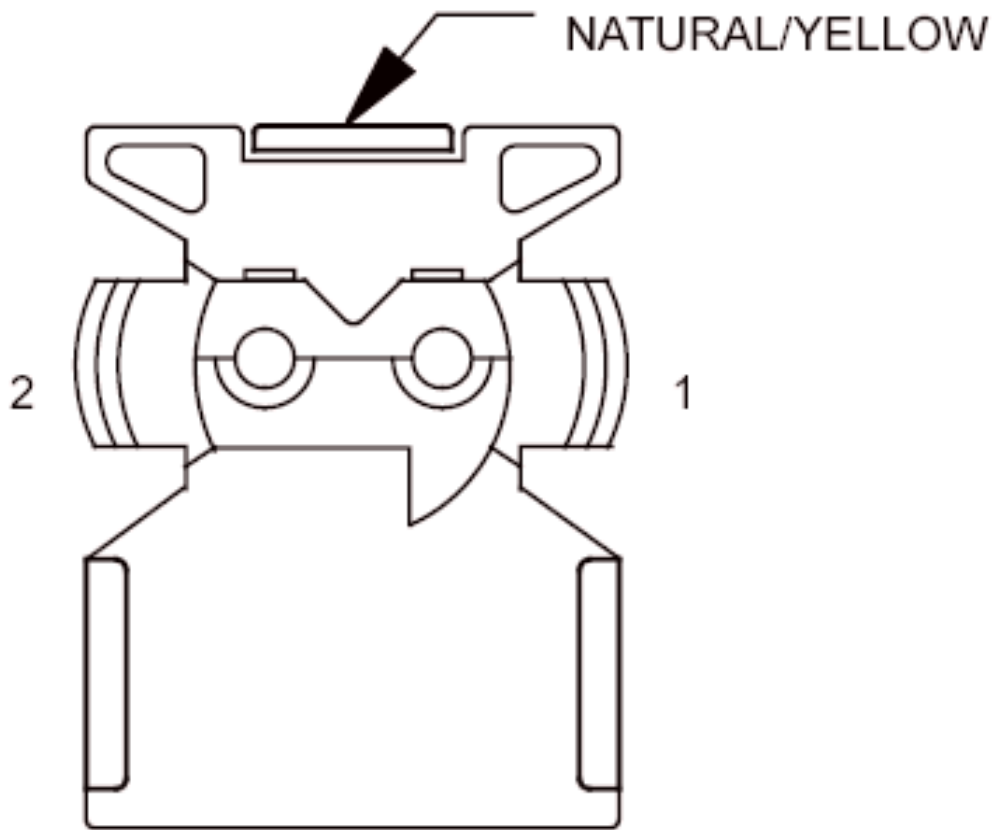
AIRBAG-DRIVER SQUIB 1 - BLACK/YELLOW 2 WAY



AIRBAG- DRIVER SQUIB 1

CAV	CIRCUIT	FUNCTION
1	R45 20LB	DRIVER SQUIB 1 LINE 1
2	R43 20BR	DRIVER SQUIB 1 LINE 2

AIRBAG-DRIVER SQUIB 2 - NATURAL/YELLOW 2 WAY

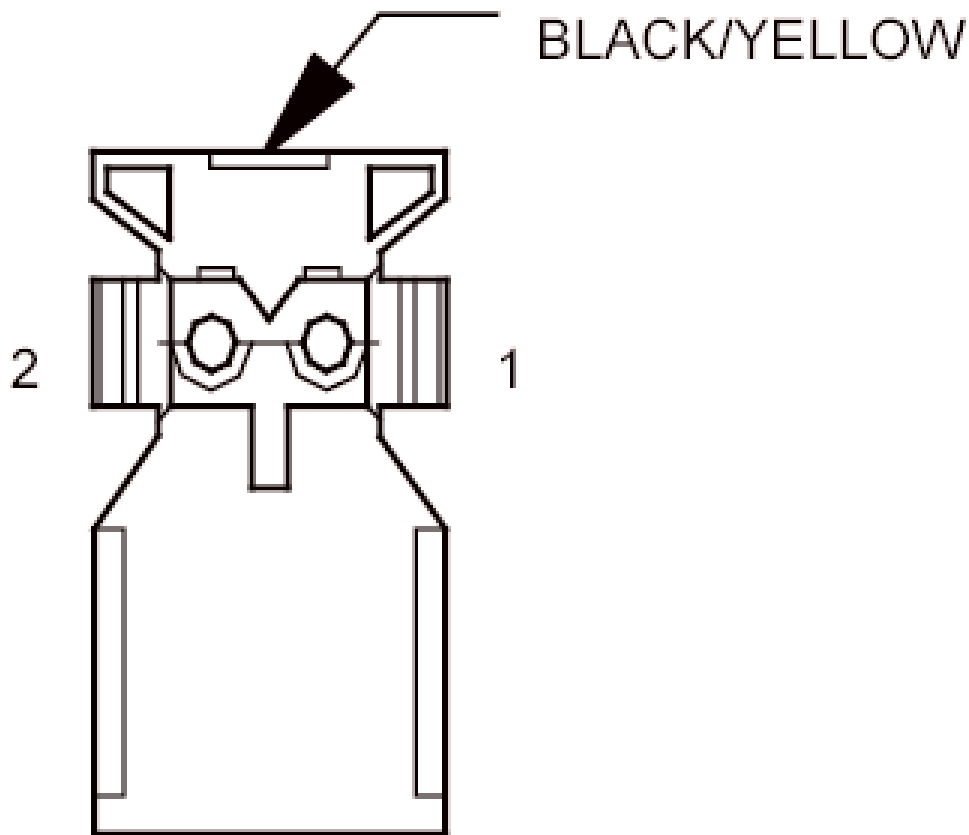


AIRBAG- DRIVER SQUIB 2

CAV	CIRCUIT	FUNCTION
1	R63 20RD	DRIVER SQUIB 2 LINE 1
2	R61 20YL	DRIVER SQUIB 2 LINE 2

AIRBAG-PASSENGER SQUIB 1 - BLACK/YELLOW 2 WAY

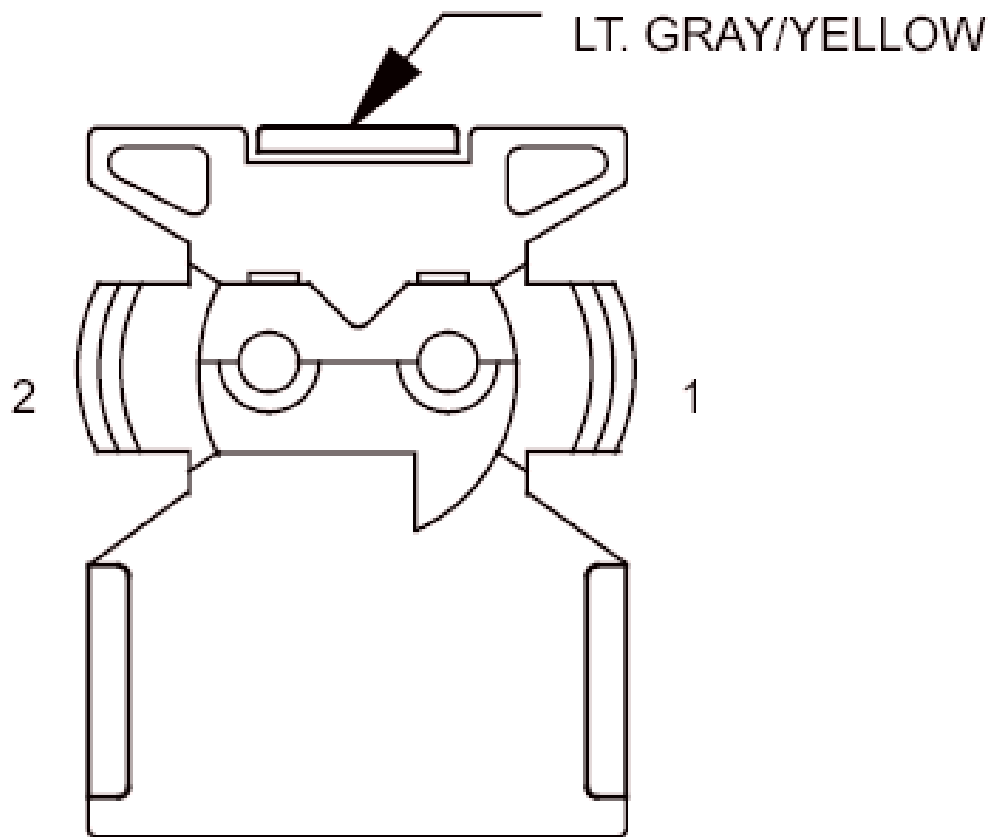




AIRBAG- PASSENGER SQUIB 1

CAV	CIRCUIT	FUNCTION
1	R42 20LB/BR	PASSENGER SQUIB 1 LINE 2
2	R44 20LB/OR	PASSENGER SQUIB 1 LINE 1

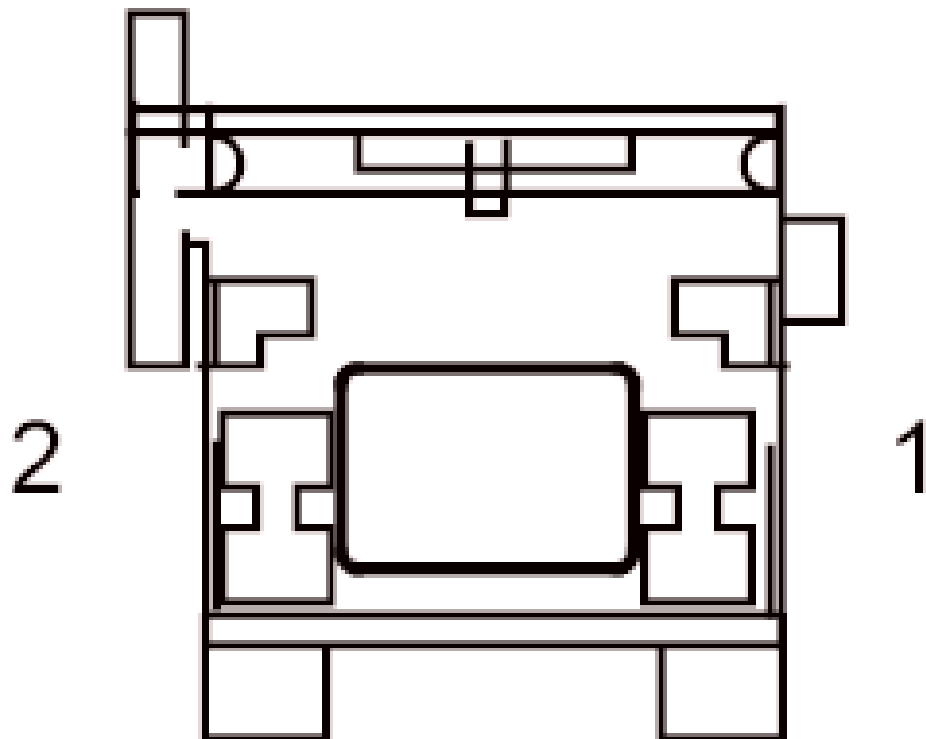
AIRBAG-PASSENGER SQUIB 2 - LT. GRAY/YELLOW 2 WAY



AIRBAG- PASSENGER SQUIB 2

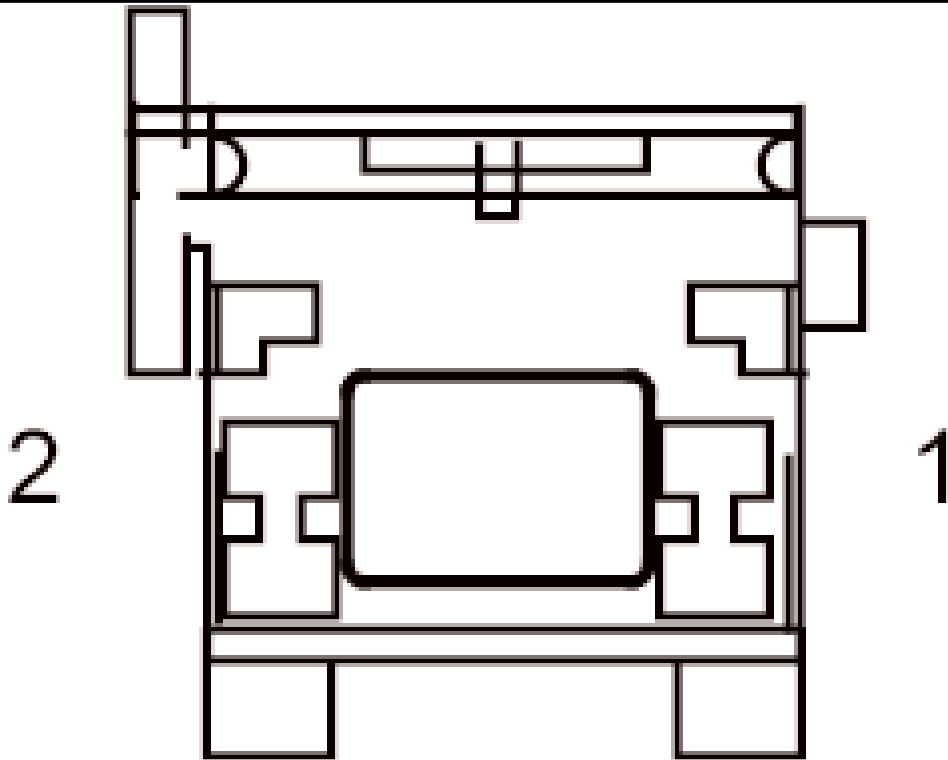
CAV	CIRCUIT	FUNCTION
1	R62 20LB/VT	PASSENGER SQUIB 2 LINE 2
2	R64 20LB/WT	PASSENGER SQUIB 2 LINE 1

AIRBAG-SIDE CURTAIN-LEFT - 2 WAY



AIRBAG- SIDE CURTAIN- LEFT

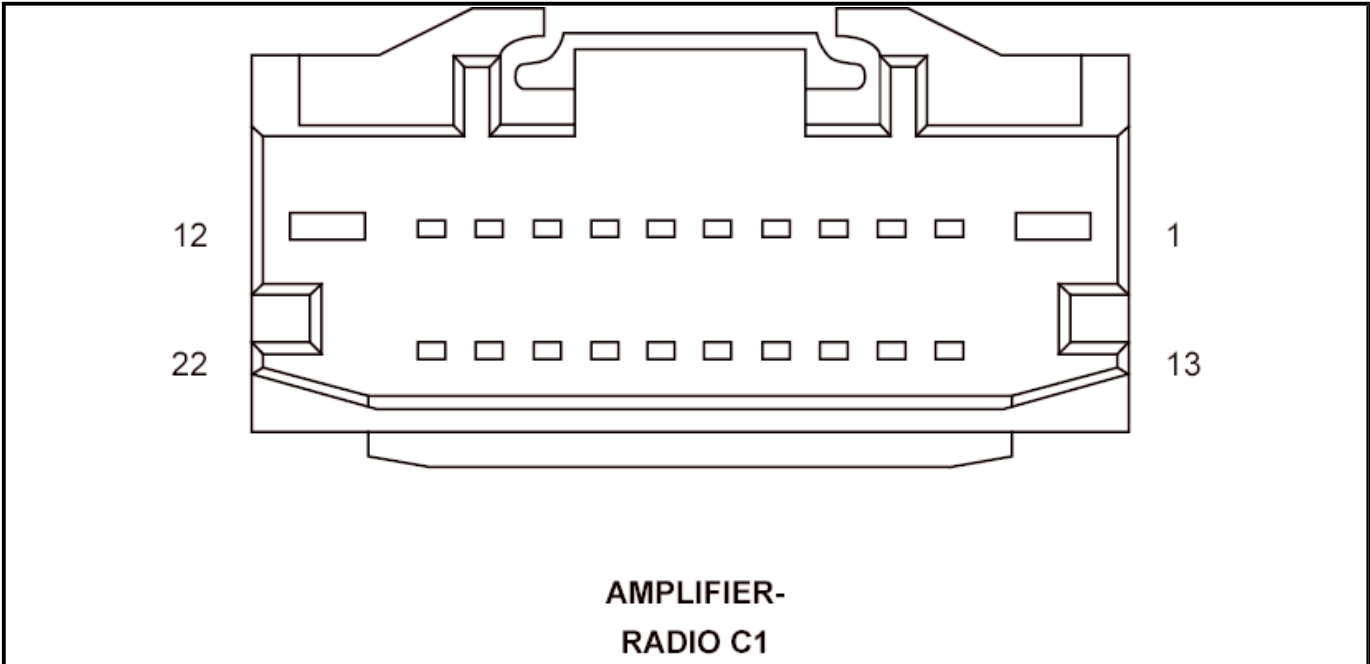
CAV	CIRCUIT	FUNCTION
1	R1 20LB/WT	LEFT CURTAIN SQUIB 1 LINE 2
2	R3 20LB/OR	LEFT CURTAIN SQUIB 1 LINE

AIRBAG-SIDE CURTAIN-RIGHT - 2 WAY

**AIRBAG-
SIDE
CURTAIN-
RIGHT**

CAV	CIRCUIT	FUNCTION
1	R2 20WT/LB	RIGHT CURTAIN SQUIB 1 LINE 2
2	R4 20OR/LB	RIGHT CURTAIN SQUIB 1 LINE 1

AMPLIFIER-RADIO C1 - 22 WAY



AMPLIFIER-RADIO C1		
CAV	CIRCUIT	FUNCTION
1	Z920 14BK/PK	GROUND
2	D265 20WT/GY	CAN INTERIOR BUS (+)
3	-	-
4	X51 18DG/DB	RADIO LEFT AUDIO (+)
5	X52 18GY/DB	RADIO RIGHT AUDIO (+)
6	-	-
7	-	-
8	X298 18GY/LG	AMPLIFIED RIGHT FRONT SPEAKER (-)
9	X299 18GY/YL	AMPLIFIED LEFT FRONT SPEAKER (-)
10	-	-
11	-	-
12	A116 14YL/RD	FUSED B(+) (I.O.D.)
13	D264 20WT/OR	CAN INTERIOR BUS (-)
14	-	-
15	X57 18DG/OR	RADIO LEFT AUDIO (-)
16	X58 18GY/OR	RADIO RIGHT AUDIO (-)

17	-	-
18	-	-
19	X208 18GY/DG	AMPLIFIED RIGHT FRONT SPEAKER (+)
20	X209 18GY/OR	AMPLIFIED LEFT FRONT SPEAKER (+)
21	-	-
22	-	-

AMPLIFIER-RADIO C2 - BLACK 16 WAY

AMPLIFIER-
RADIO C2

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	X301 18GY/WT	AMPLIFIED SUBWOOFER 2 (+)

4	X206 18DG/LG	AMPLIFIED RIGHT REAR SPEAKER (+)
5	X295 18GY/DG	AMPLIFIED LEFT REAR SPEAKER (-)
6	X390 18DG/BR	AMPLIFIED SUBWOOFER 1 (-)
7	X202 18DG/VT	AMPLIFIED RIGHT I/P SPEAKER (+)
8	X201 18GY/VT	AMPLIFIED LEFT I/P SPEAKER (+)
9	-	-
10	-	-
11	X391 18DG/WT	AMPLIFIED SUBWOOFER 2 (-)
12	X296 18DG/GY	AMPLIFIED RIGHT REAR SPEAKER (-)
13	X205 18GY/LG	AMPLIFIED LEFT REAR SPEAKER (+)
14	X300 18GY/BR	AMPLIFIED SUBWOOFER 1 (+)
15	X292 18DG/YL	AMPLIFIED RIGHT I/P SPEAKER (-)
16	X291 18GY/YL	AMPLIFIED LEFT I/P SPEAKER (-)

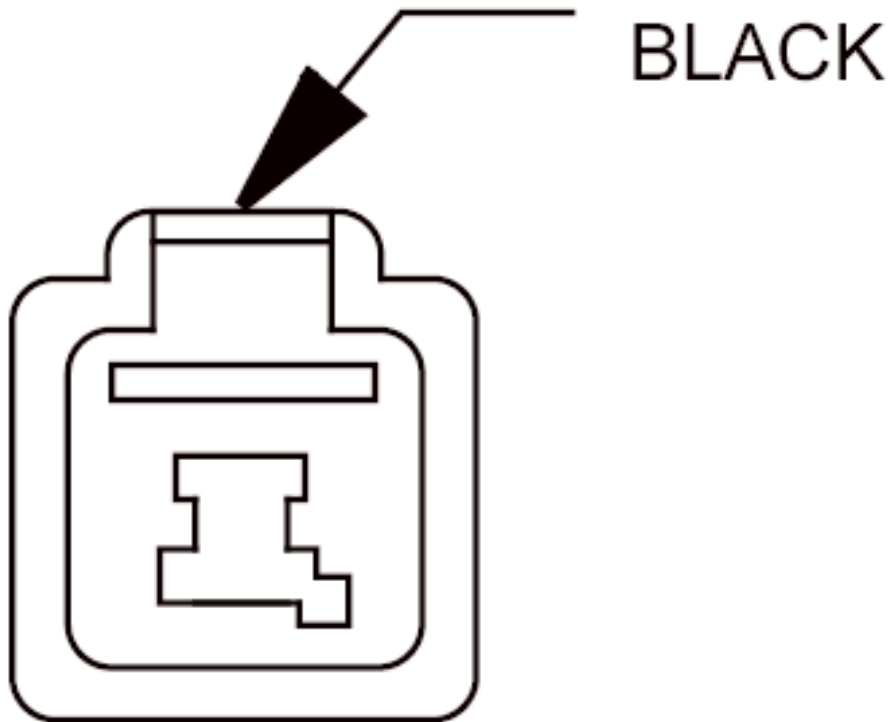
ANTENNA-GLOBAL POSITIONING SYSTEM - 2 WAY (NAVIGATION)

**CONNECTOR
NOT
AVAILABLE**

CAV	CIRCUIT	FUNCTION
1	D8 WT/LB	GPS ANTENNA SIGNAL
2	D108 LB/WT	GPS ANTENNA SHIELD

ANTENNA-RADIO C2 - BLACK 1 WAY

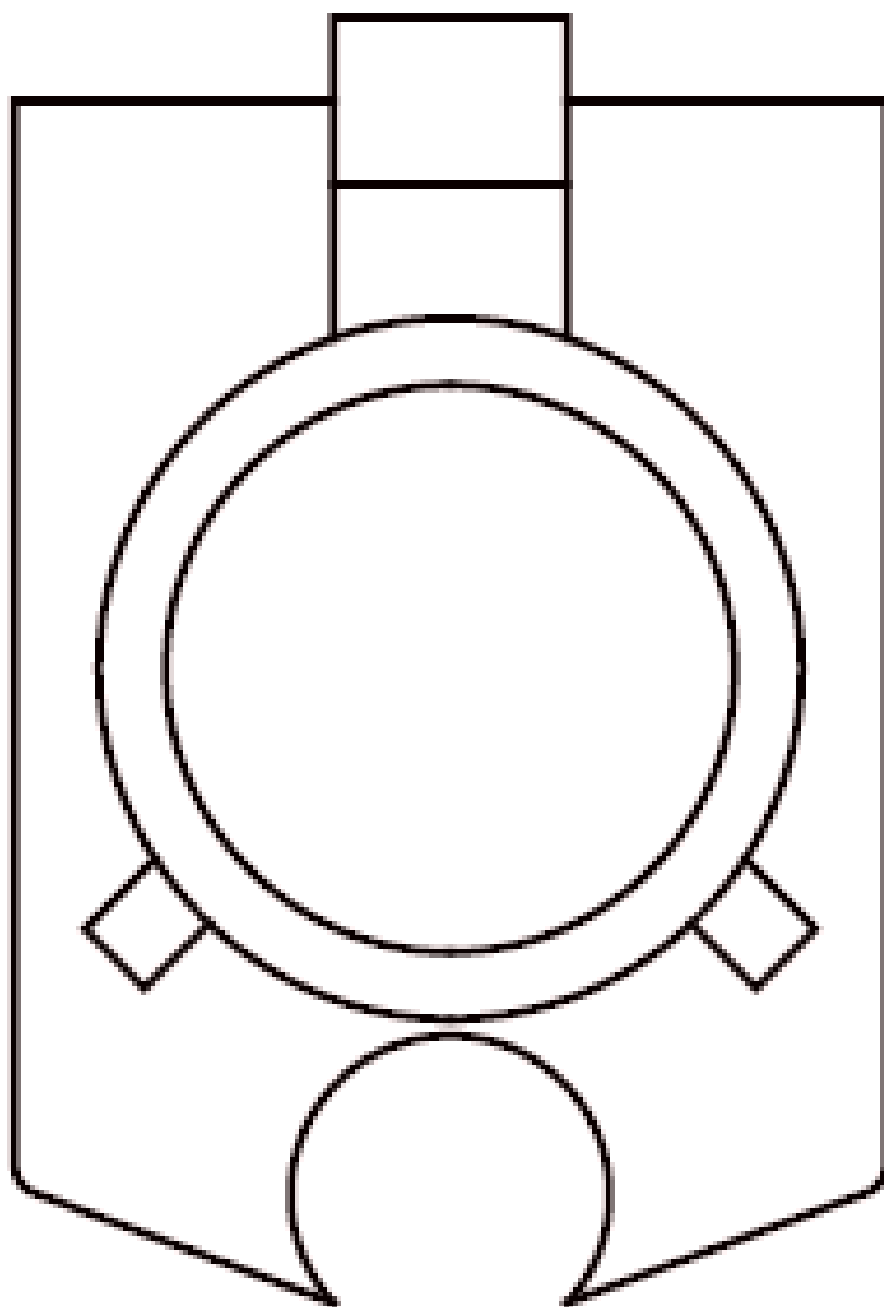




ANTENNA- RADIO C2

CAV	CIRCUIT	FUNCTION
1	X62 18GY/OR	AMPLIFIED ANTENNA FEED

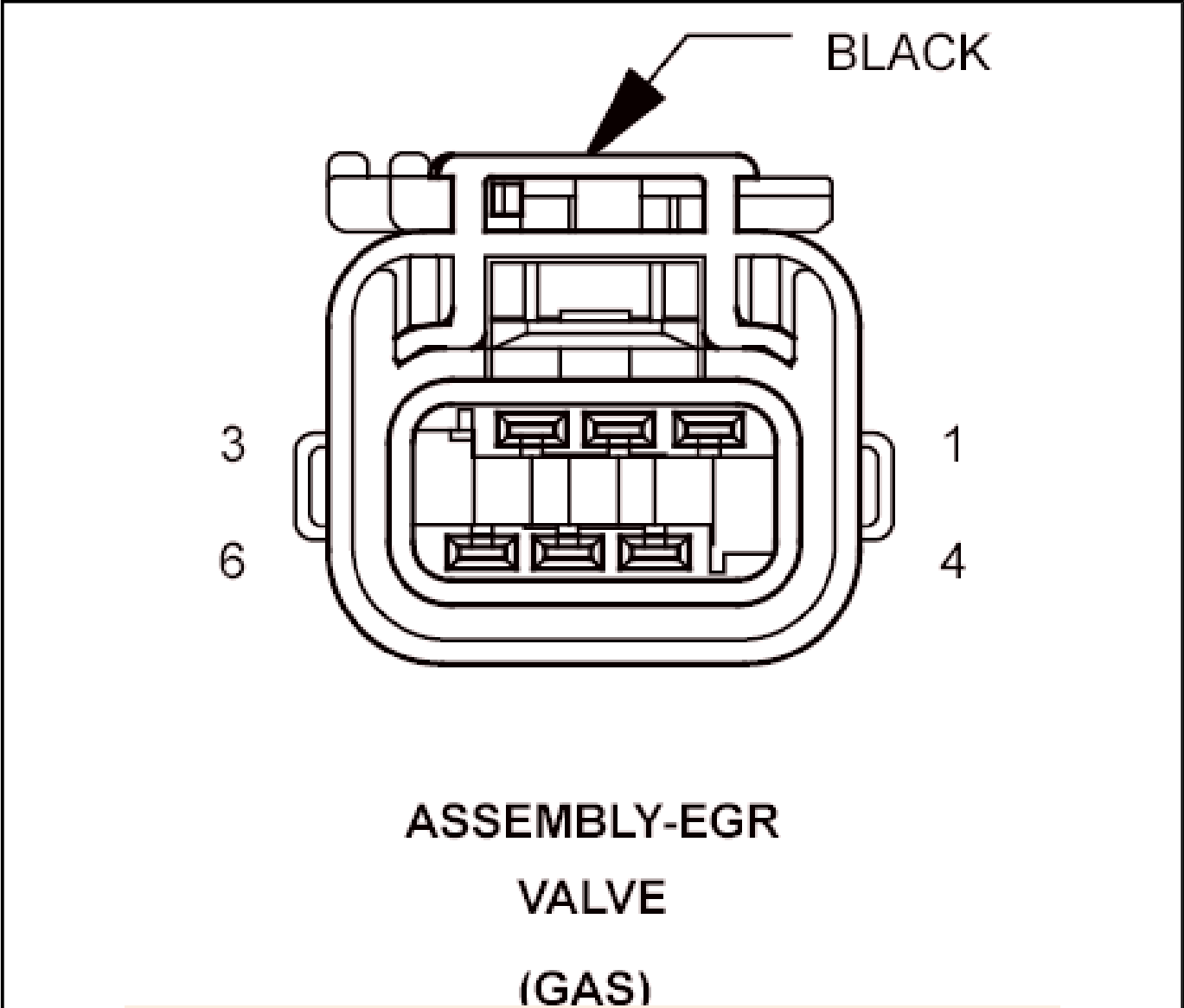
ANTENNA-SATELLITE RADIO - 2 WAY



ANTENNA-

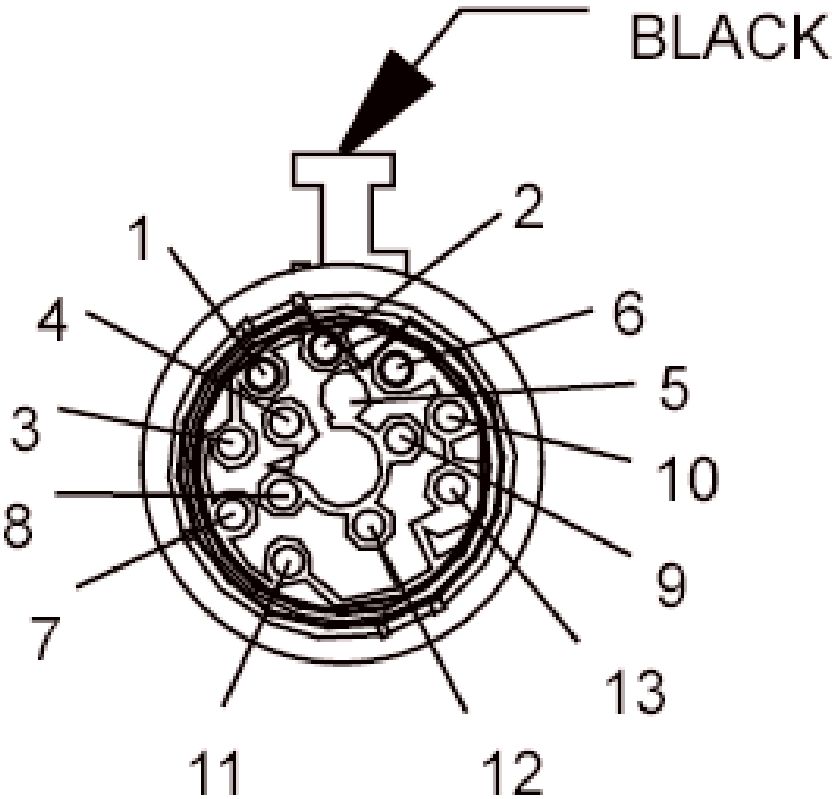
CAV	CIRCUIT	FUNCTION
1	D106 WT/LG	SATELLITE ANTENNA SIGNAL
2	D126 WT/TN	SATELLITE ANTENNA SHIELD

ASSEMBLY-EGR VALVE - BLACK 6 WAY (GAS)



CAV	CIRCUIT	FUNCTION
1	K34 18DB/LG	EGR SIGNAL
2	K857 18BR/LG	5 VOLT SUPPLY
3	K900 18DB/DG	SENSOR GROUND
4	Z904 18BK	GROUND
5	-	-

ASSEMBLY-ELECTROHYDRAULIC CONTROL UNIT - BLACK 13 WAY (NAG1)

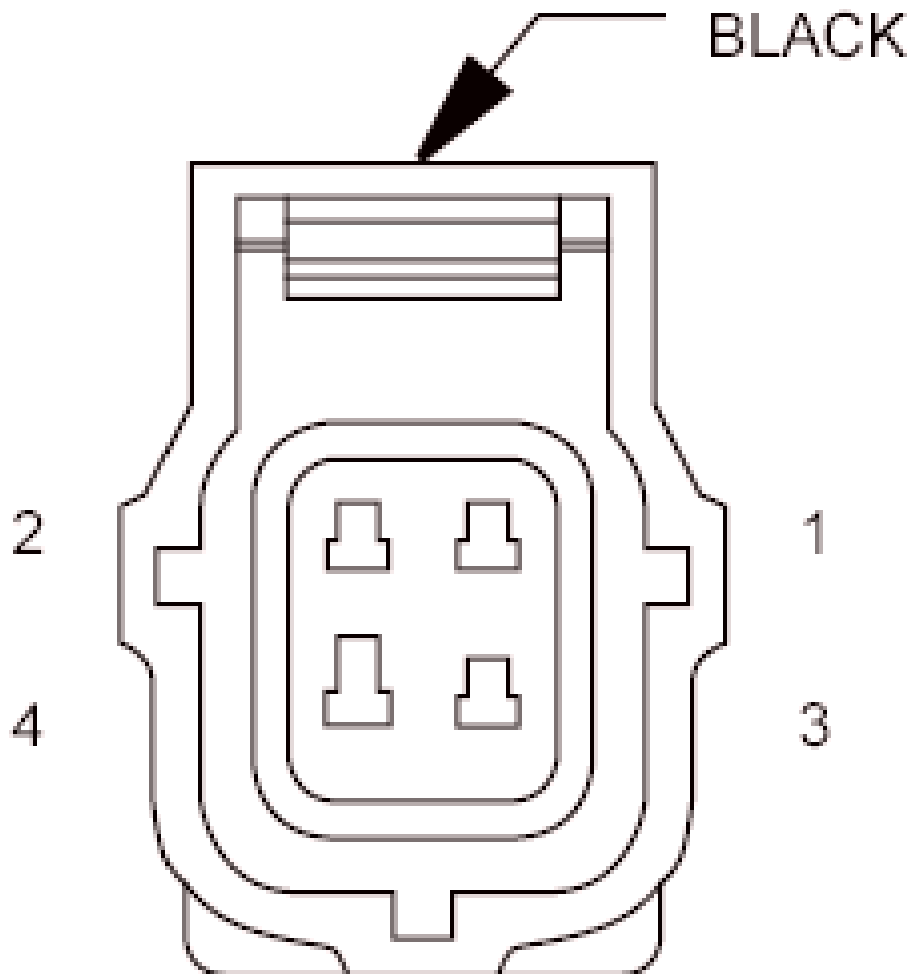


ASSEMBLY-
ELECTROHYDRAULIC
CONTROL UNIT
(NAG1)

CAV	CIRCUIT	FUNCTION
1	T71 18YL/PK	INPUT SPEED 2 (N3) SIGNAL (4x4)
1	T71 18YL/OR	INPUT SPEED 2 (N3) SIGNAL (EXCEPT 4x4)
2	T76 18YL/TN	MODULATION PRESSURE CONTROL
3	T70 18LB	INPUT SPEED 1 (N2) SIGNAL (4x4)

3	T70 18YL	INPUT SPEED 1 (N2) SIGNAL (EXCEPT 4x4)
4	T54 18VT	TRANSMISSION TEMPERATURE SIGNAL
5	-	-
6	T78 18LB	SOLENOID SUPPLY VOLTAGE (4x4)
6	T78 18YL	SOLENOID SUPPLY VOLTAGE (EXCEPT 4x4)
7	T72 18YL/DB	SENSOR SUPPLY VOLTAGE
8	T74 18YL/LG	2-3 CONTROL
9	T73 18YL/GY	3-4 CONTROL
10	T77 18YL/BR	SHIFT PRESSURE CONTROL
11	T75 18YL/LB	TCC CONTROL
12	T13 18DG/VT	SENSOR GROUND
13	T60 18YL/BK	1-2/4-5 CONTROL (4x4)
13	T60 18YL/GY	1-2/4-5 CONTROL (EXCEPT 4x4)

ASSEMBLY-GLOW PLUG - BLACK 4 WAY (DIESEL)

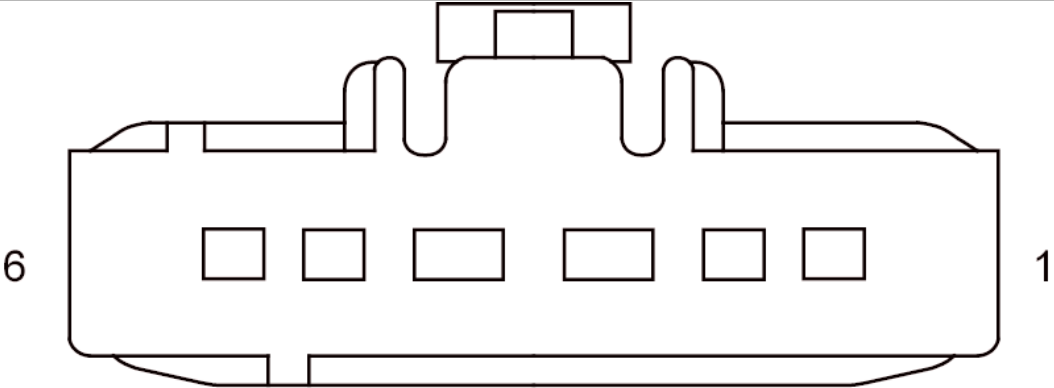


**ASSEMBLY-
GLOW
PLUG
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	A202 16RD/WT	GLOW PLUG 1 CONTROL
2	A203 16RD/BR	GLOW PLUG 2 CONTROL
3		

	A204 16RD/YL	GLOW PLUG 3 CONTROL
4	A208 16RD/OR	GLOW PLUG 4 CONTROL

ASSEMBLY-HVAC C1 - 6 WAY FEMALE

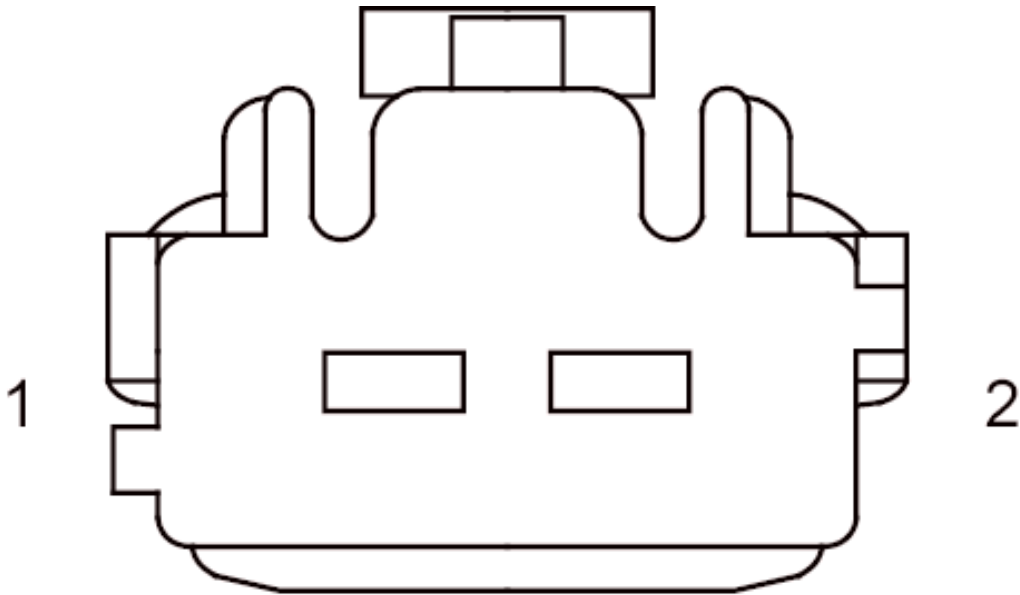


ASSEMBLY-HVAC

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	C806 10DB/BR	BLOWER MOTOR CONTROL OUTPUT
5	-	-
6	C56 18DB/LB	BLOWER MOTOR CONTROL

ASSEMBLY-HVAC C2 - 2 WAY (ATC) FEMALE



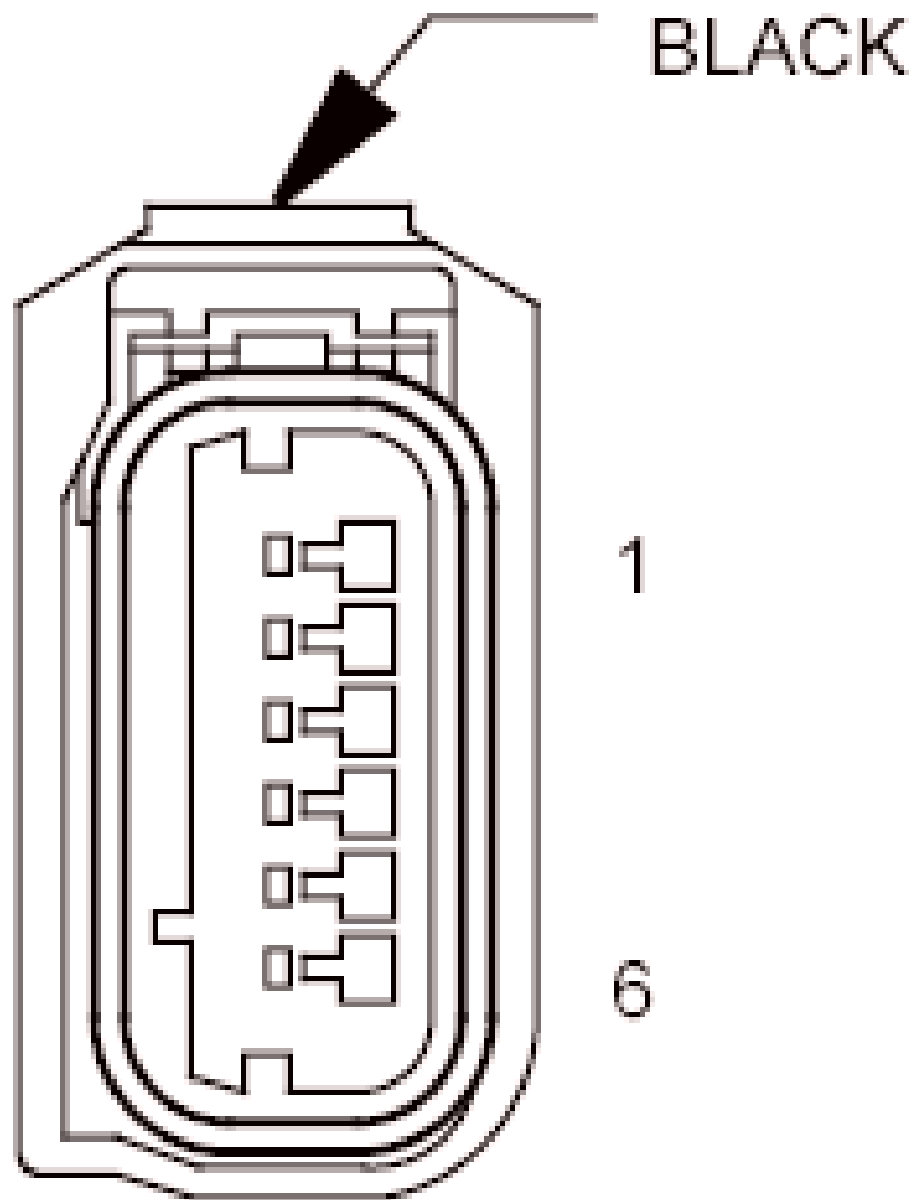


**ASSEMBLY-
HVAC C2
(ATC)**

CAV	CIRCUIT	FUNCTION
1	C7 10DB	BLOWER MOTOR SUPPLY
2	Z911 10BK	GROUND

ASSEMBLY-LINE PRESSURE SENSOR/VARIABLE FORCE SOLENOID - BLACK 6 WAY (RLE)

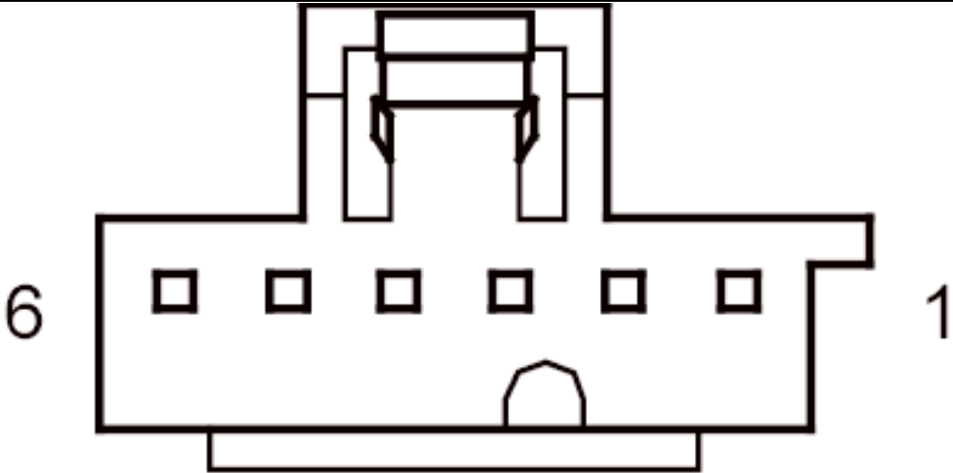




ASSEMBLY-
LINE PRESSURE
SENSOR/

CAV	CIRCUIT	FUNCTION
1	-	-
2	K857 18BR/LG	5 VOLT SUPPLY
3	T38 18YL/BR	LINE PRESSURE SIGNAL
4	K900 18DB/DG	SENSOR GROUND
5	T16 18YL/OR	TRANSMISSION CONTROL OUTPUT
6	T118 18DG	LP VFS CONTROL

ASSEMBLY-SHIFT LEVER - 6 WAY (NAG1) FEMALE



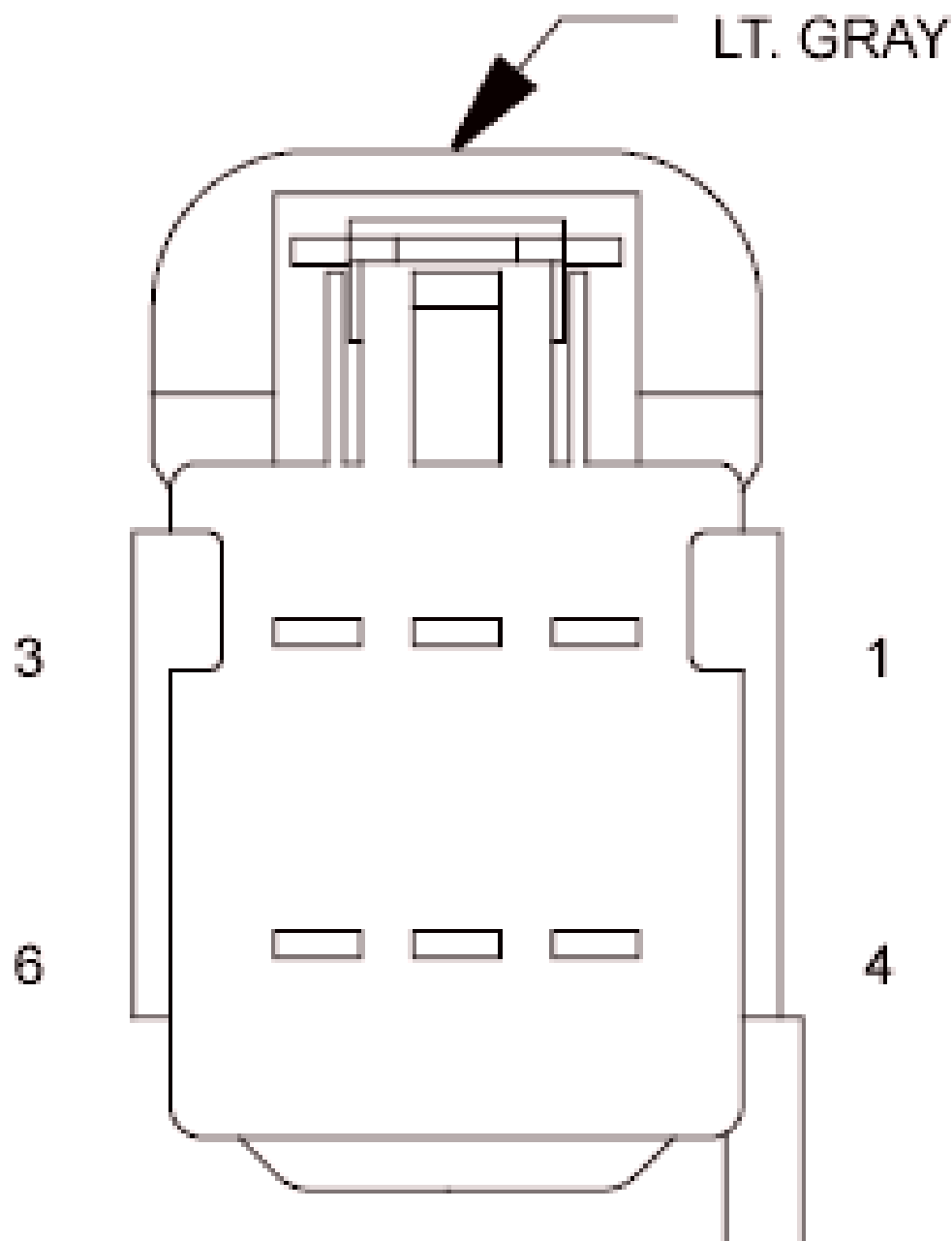
ASSEMBLY-
SHIFT
LEVER

(NAG1)

CAV	CIRCUIT	FUNCTION
1	F1 20PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START)
2	Z910 18BK/GY	GROUND
3	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT
4	-	-
5	D65 20WT/BK	CAN C BUS (+)

6	D64 20WT/LG	CAN C BUS (-) EXCEPT LHD
6	D64 20WT/LB	CAN C BUS (-) LHD

ASSEMBLY-SHIFT LEVER - 6 WAY (RLE) FEMALE

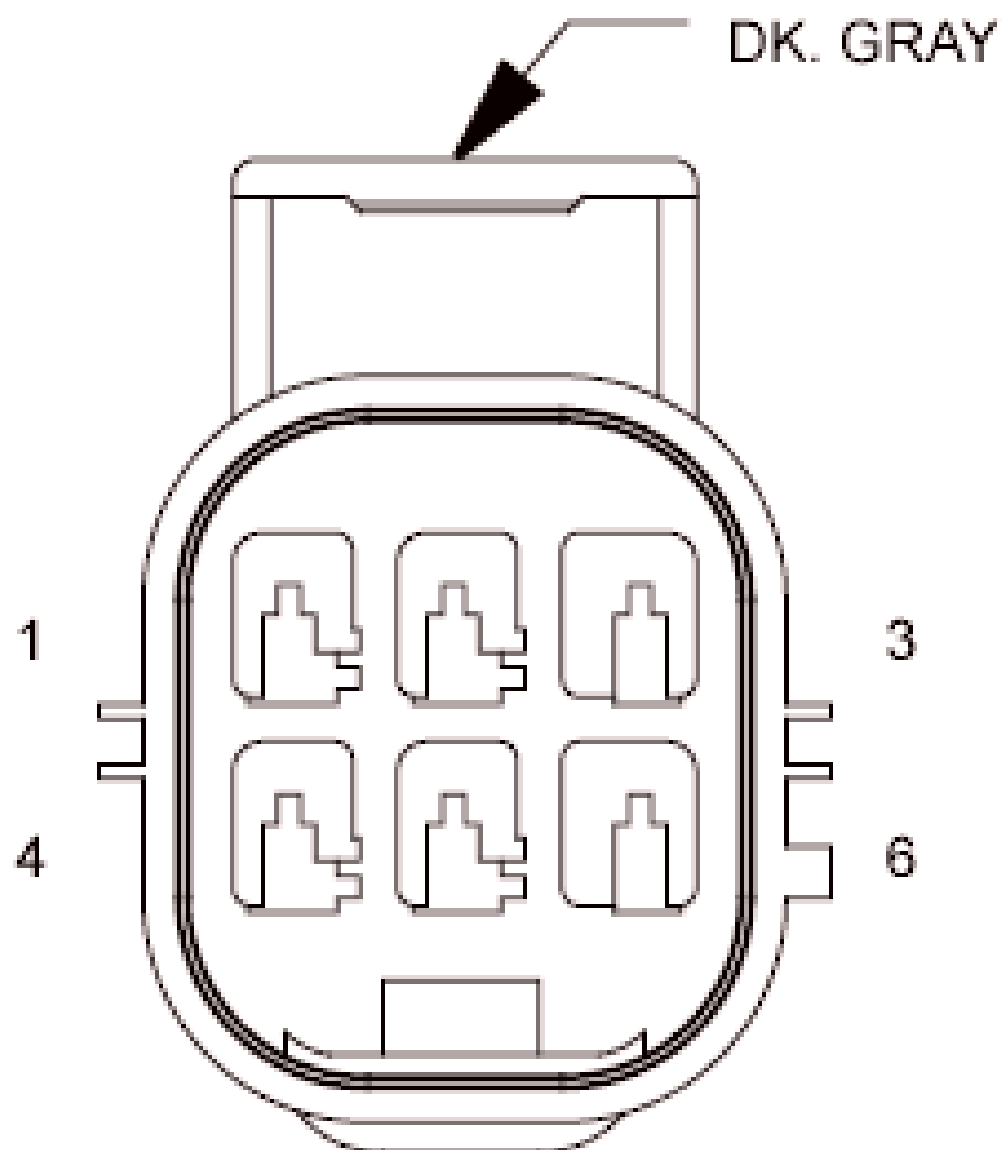


**ASSEMBLY-
SHIFT
LEVER**

(R I E)

CAV	CIRCUIT	FUNCTION
1	E12 20OR/GY	PANEL LAMPS DRIVER
2	Z910 18BK	GROUND
3	T6 20DG	TOW/HAUL OD OFF SIGNAL
4	Z910 18BK	GROUND
5	K321 20BR/YL	BTSI UNLOCK SIGNAL
6	Z910 18BK/WT	GROUND

ASSEMBLY-TAIL LAMP-LEFT - DK. GRAY 6 WAY (EXCEPT EXPORT)

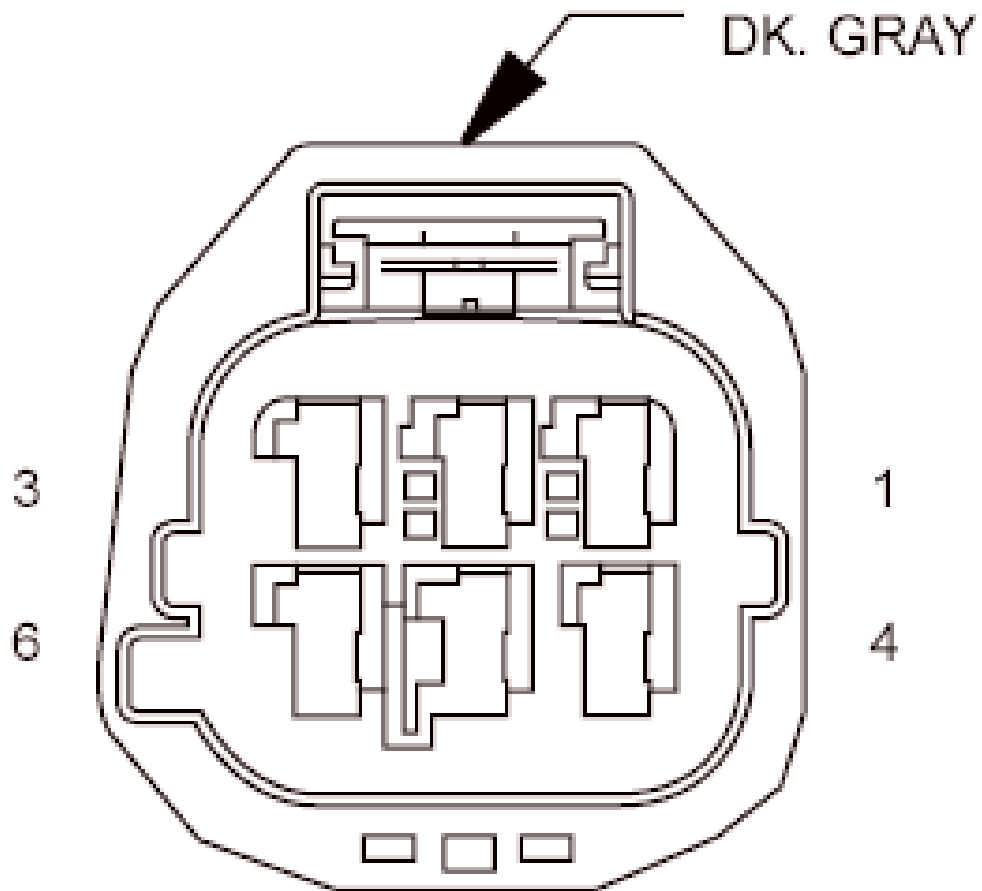


**ASSEMBLY-
TAIL
LAMP-
LEFT**

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	-	-
2	Z919 18BK/YL	GROUND
3	L63 18DG/WT	LEFT REAR STOP/TURN SIGNAL CONTROL
4	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
5	L53 18DG/WT	LEFT REAR STOP SIGNAL CONTROL
6	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT

ASSEMBLY-TAIL LAMP-LEFT - DK. GRAY 6 WAY (EXPORT)

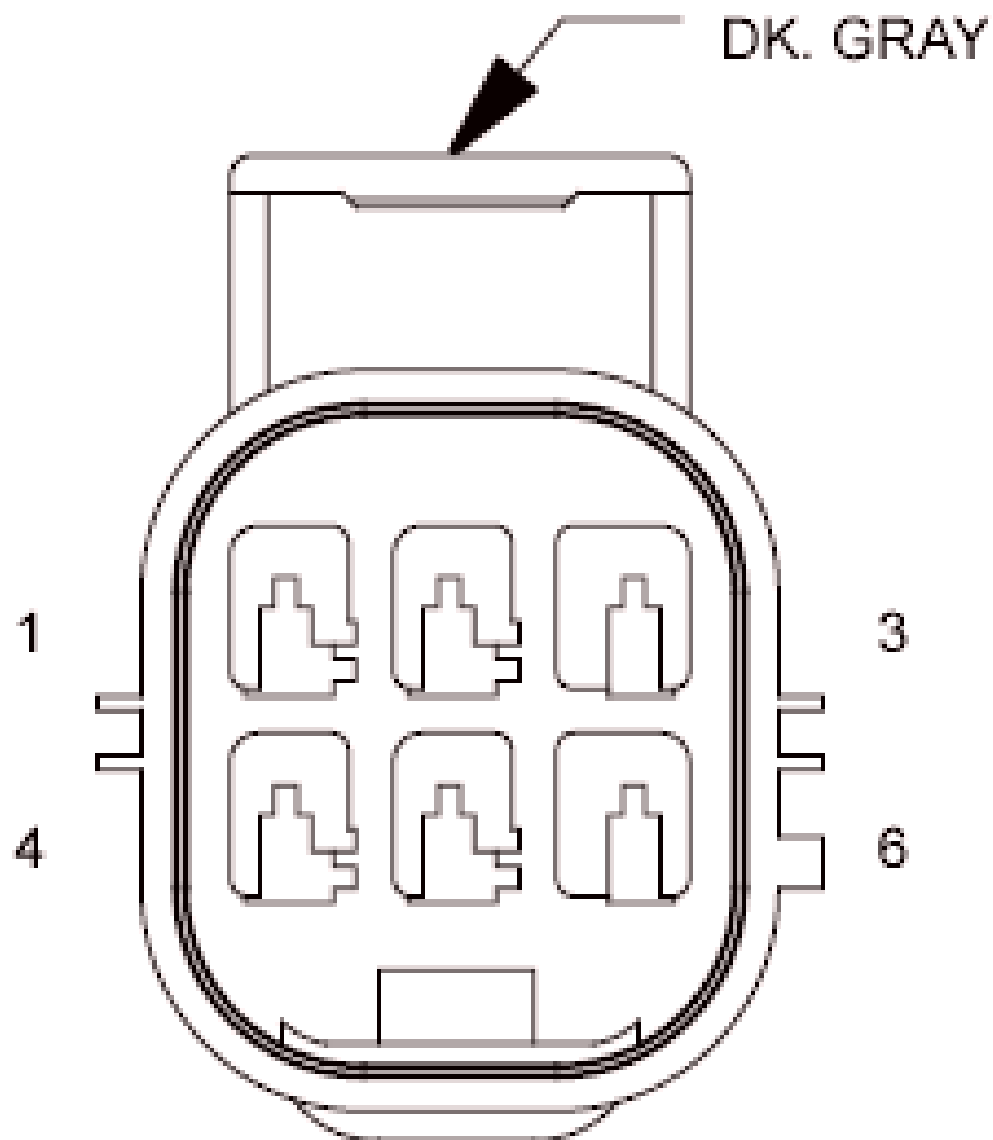


**ASSEMBLY-
TAIL
LAMP-
LEFT
(EXPORT)**

CAV	CIRCUIT	FUNCTION
1	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
2	Z919 18BK/YL	GROUND
3	L63 18DG/WT	LEFT REAR STOP/TURN

		SIGNAL CONTROL (BASE AUDIO)
3	L63 18WT/DG	LEFT REAR STOP/TURN SIGNAL CONTROL (EXCEPT BASE AUDIO)
4	L899 18WT/OR	REAR FOG LAMP SIGNAL CONTROL
5	L53 18DG/WT	LEFT REAR STOP SIGNAL CONTROL
6	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT

ASSEMBLY-TAIL LAMP-RIGHT - DK. GRAY 6 WAY (EXCEPT EXPORT)

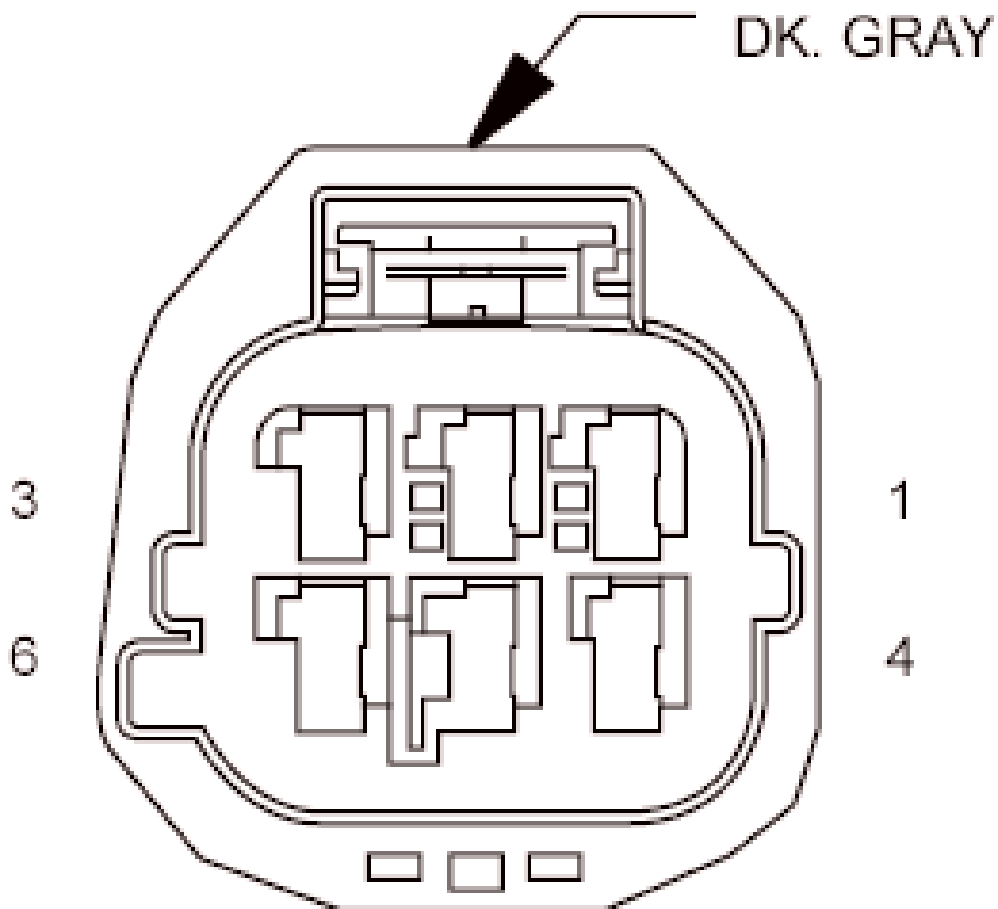


**ASSEMBLY-
TAIL
LAMP-
RIGHT**

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	-	-
2	Z920 18BK/WT	GROUND
3	L62 18WT/OR	RIGHT REAR STOP/TURN SIGNAL CONTROL
4	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
5	L54 18WT/LG	RIGHT REAR STOP SIGNAL CONTROL
6	L217 18WT/VT	RIGHT REAR PARK LAMP CONTROL OUTPUT

ASSEMBLY-TAIL LAMP-RIGHT - DK. GRAY 6 WAY (EXPORT)

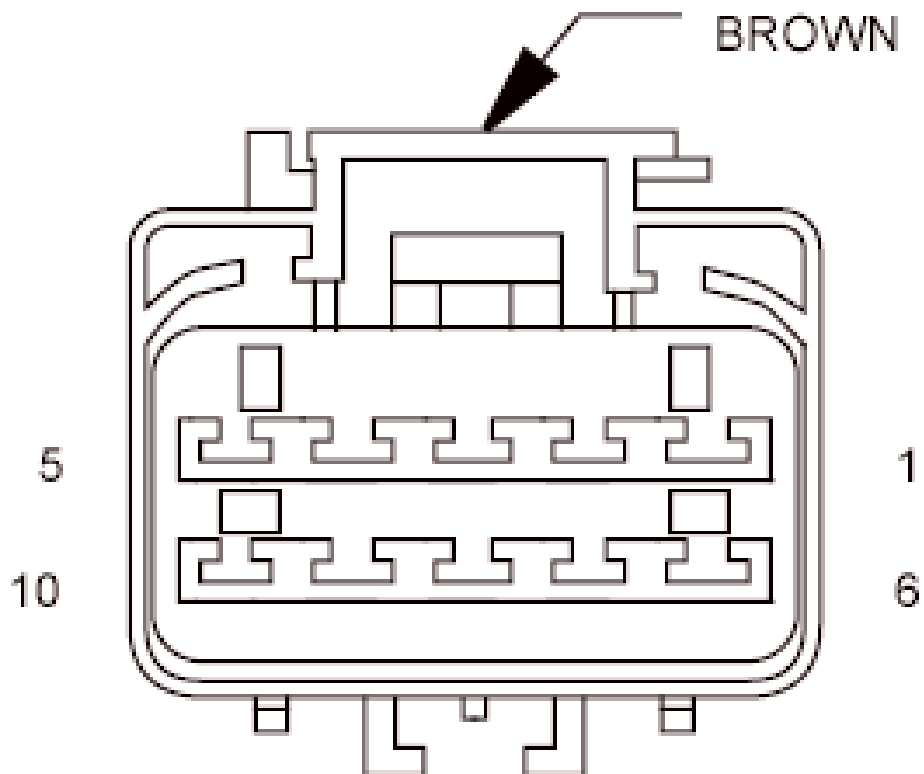


**ASSEMBLY-
TAIL
LAMP-
RIGHT
(EXPORT)**

CAV	CIRCUIT	FUNCTION
1	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
2	Z920 18BK/WT	GROUND
3	L62 18WT/OR	RIGHT REAR STOP/TURN

		SIGNAL CONTROL
4	L899 18WT/OR	REAR FOG LAMP SIGNAL CONTROL (RHD EXCEPT BASE)
5	L54 18WT/LG	RIGHT REAR STOP SIGNAL CONTROL
6	L217 18WT/VT	RIGHT REAR PARK LAMP CONTROL OUTPUT

ASSEMBLY-TRANSMISSION SOLENOID/PRESSURE SWITCH - BROWN 10 WAY (RLE)

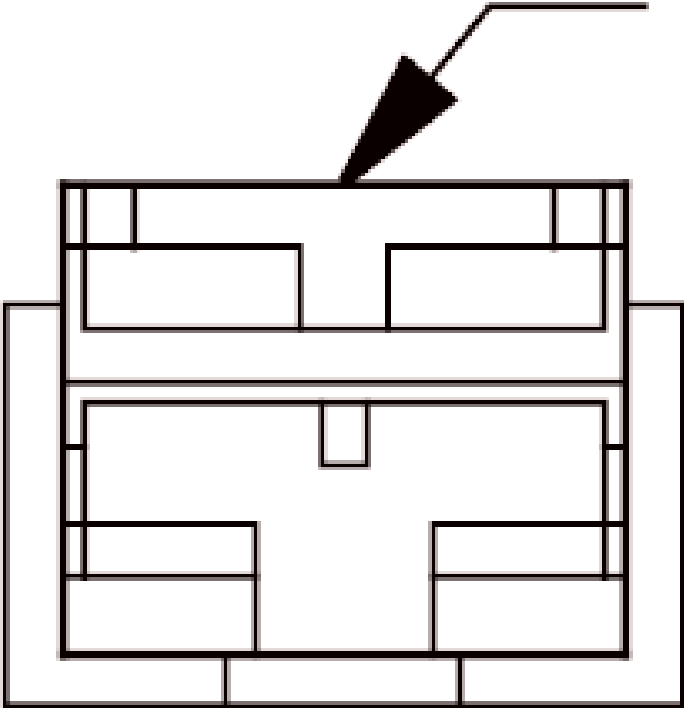


**ASSEMBLY-
TRANSMISSION
SOLENOID/
PRESSURE
SWITCH
(RLE)**

CAV	CIRCUIT	FUNCTION
1	T60 18YL/GY	OD CONTROL
2	T59 18YL/LB	UD CONTROL
3	T16 14YL/OR	TRANSMISSION CONTROL OUTPUT
4	T19 18YL/DB	2/4 CONTROL
5	T47 18YL/DG	2/4 PRESSURE SIGNAL
6	T9 18DG/TN	OD PRESSURE SIGNAL

7	T20 18DG/WT	L/R CONTROL
8	-	-
9	-	-
10	T50 18YL/TN	L/R PRESSURE SIGNAL

BACKLITE-ELECTRIC HEATED (GROUND) - BLACK 1 WAY

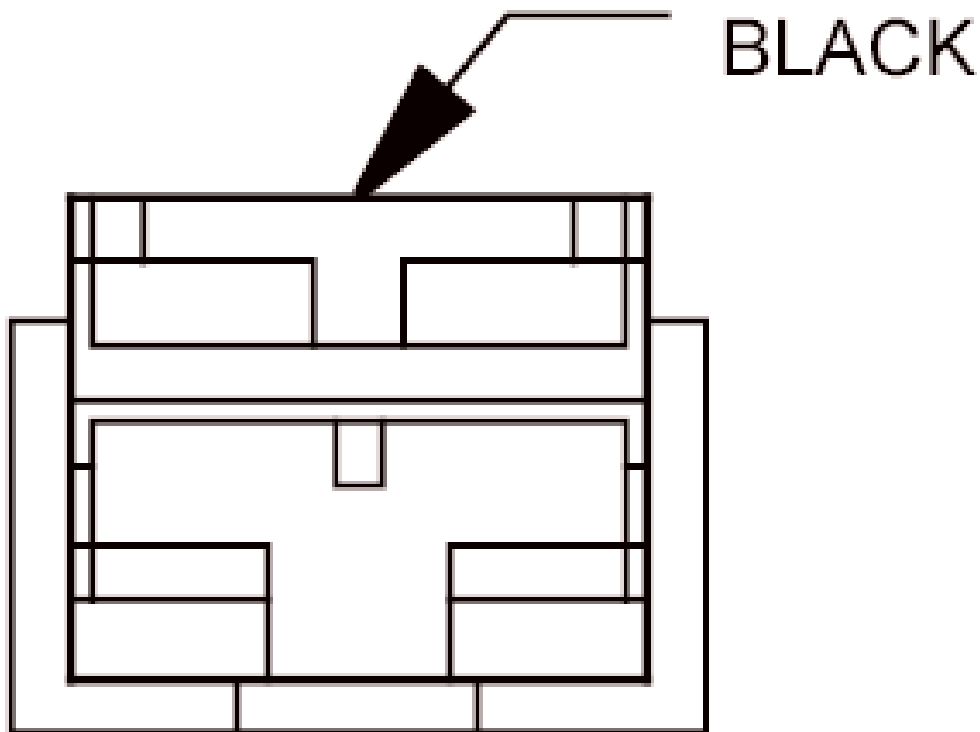


BLACK

**BACKLITE-
ELECTRIC
HEATED
(GROUND)**

CAV	CIRCUIT	FUNCTION
1	Z920 12BK/OR	GROUND

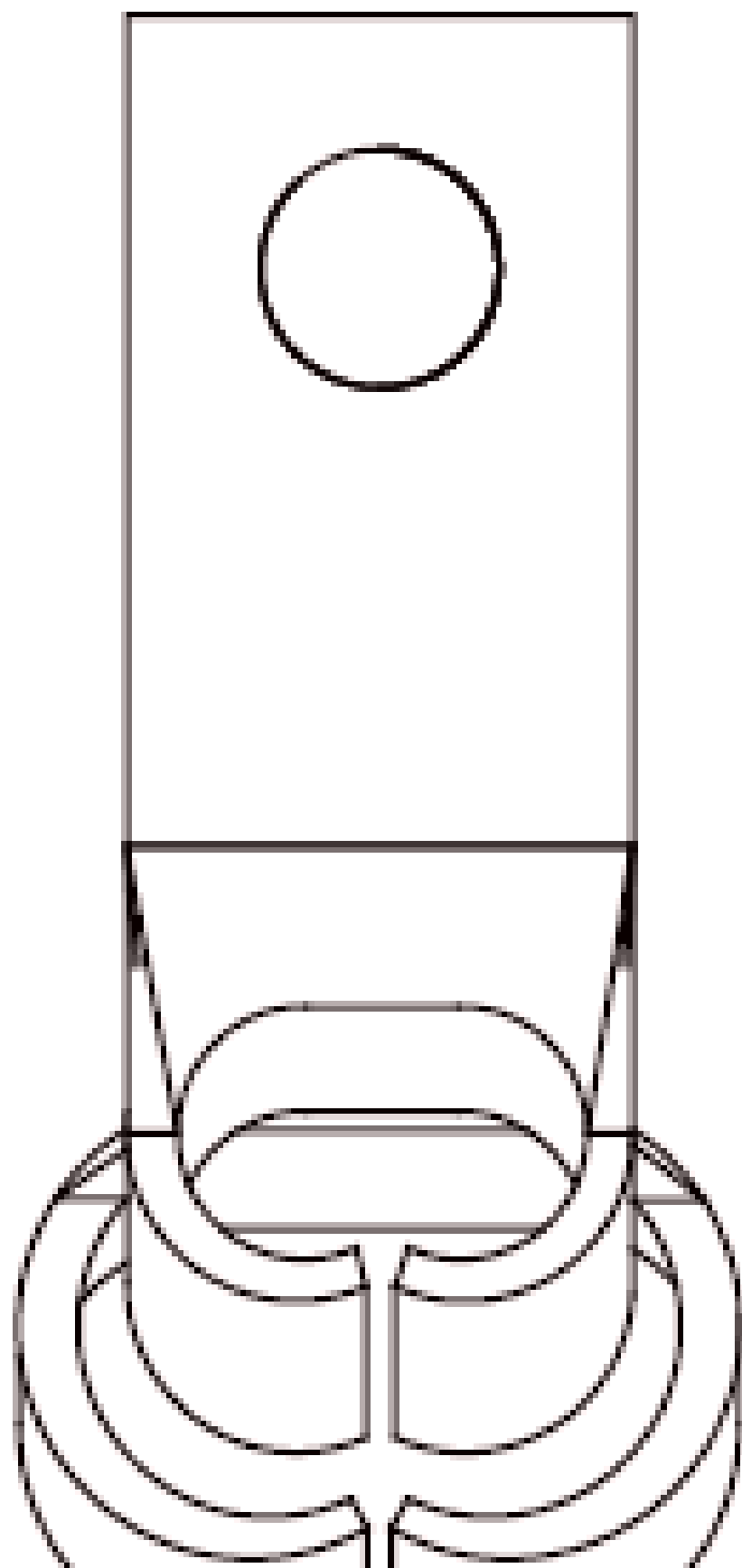
BACKLITE-ELECTRIC HEATED (POWER) - BLACK 1 WAY



BACKLITE- ELECTRIC HEATED (POWER)

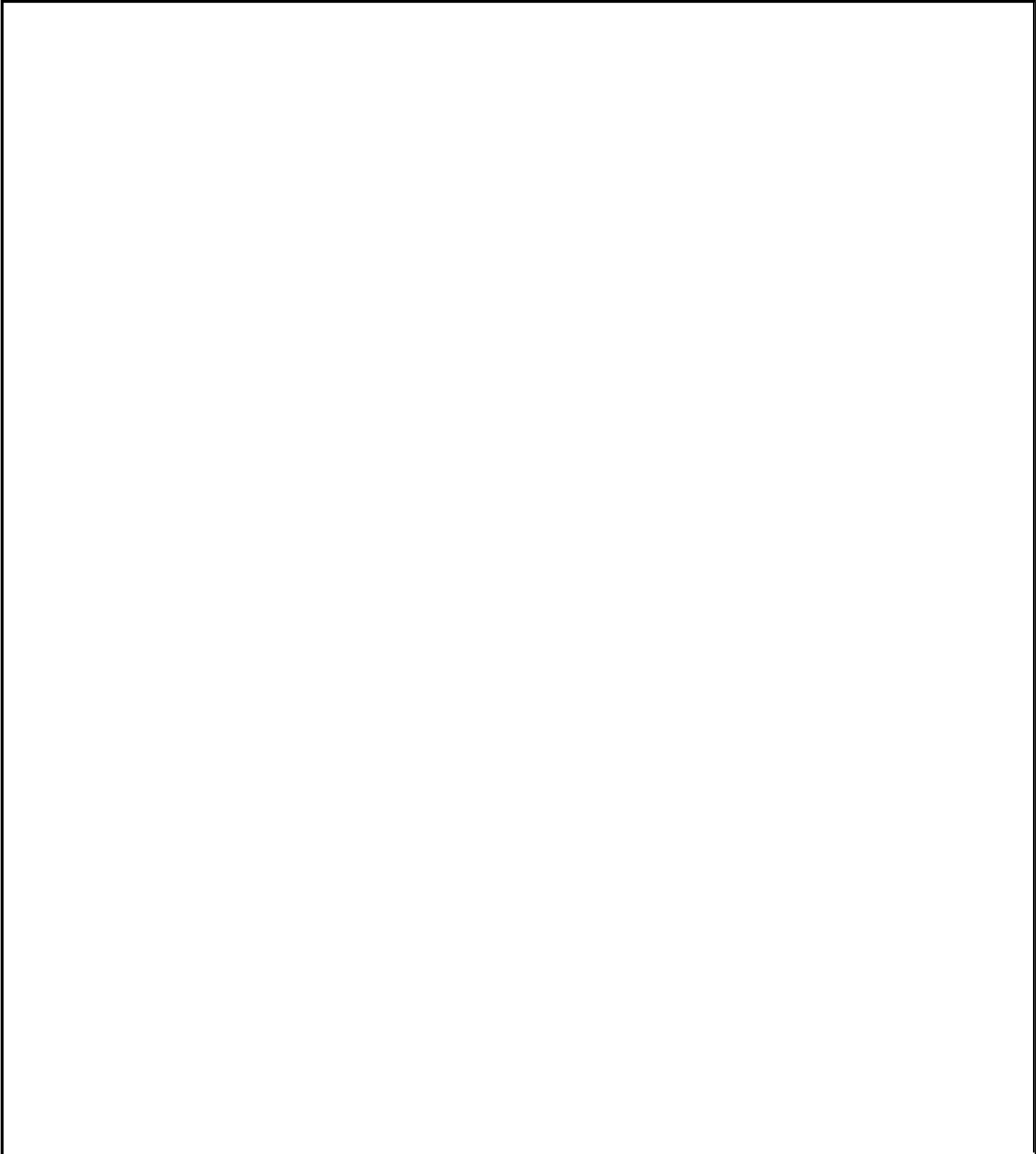
CAV	CIRCUIT	FUNCTION
1	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT

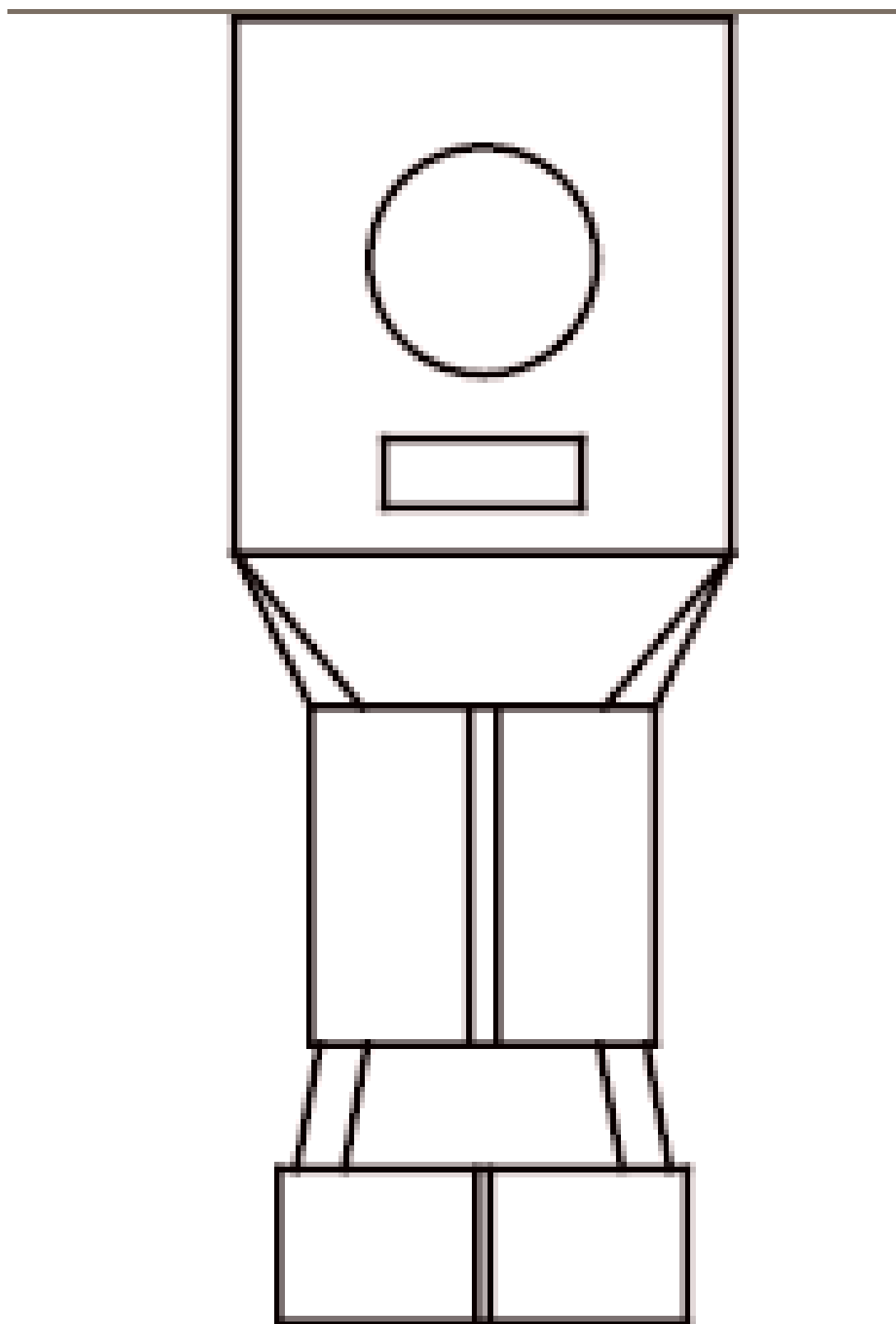
BATTERY-NEGATIVE - 1 WAY (DIESEL)



CAV	CIRCUIT	FUNCTION
1	Z901 6BK	GROUND
1	Z902 2BK	GROUND

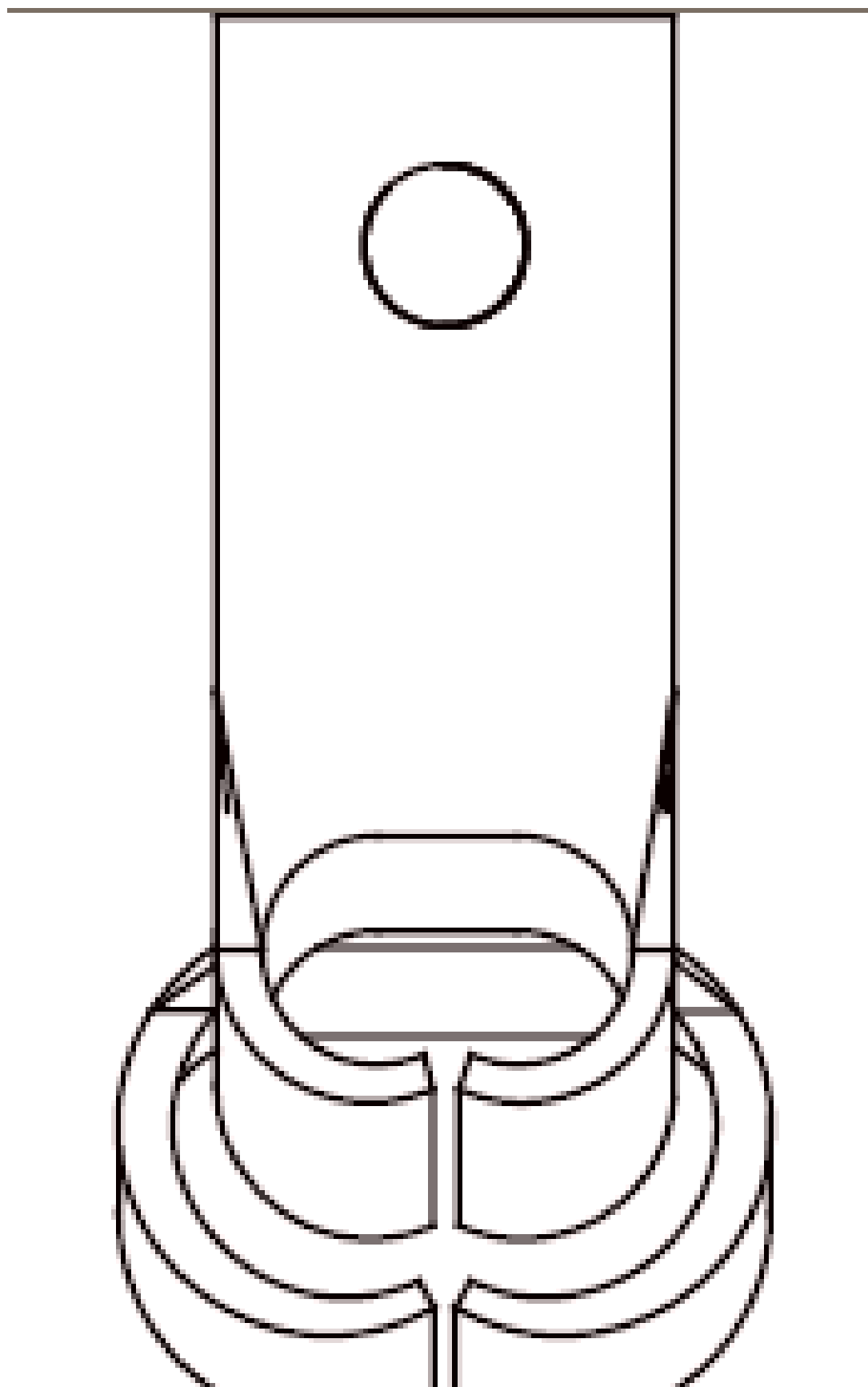
BATTERY-NEGATIVE - 1 WAY (GAS)





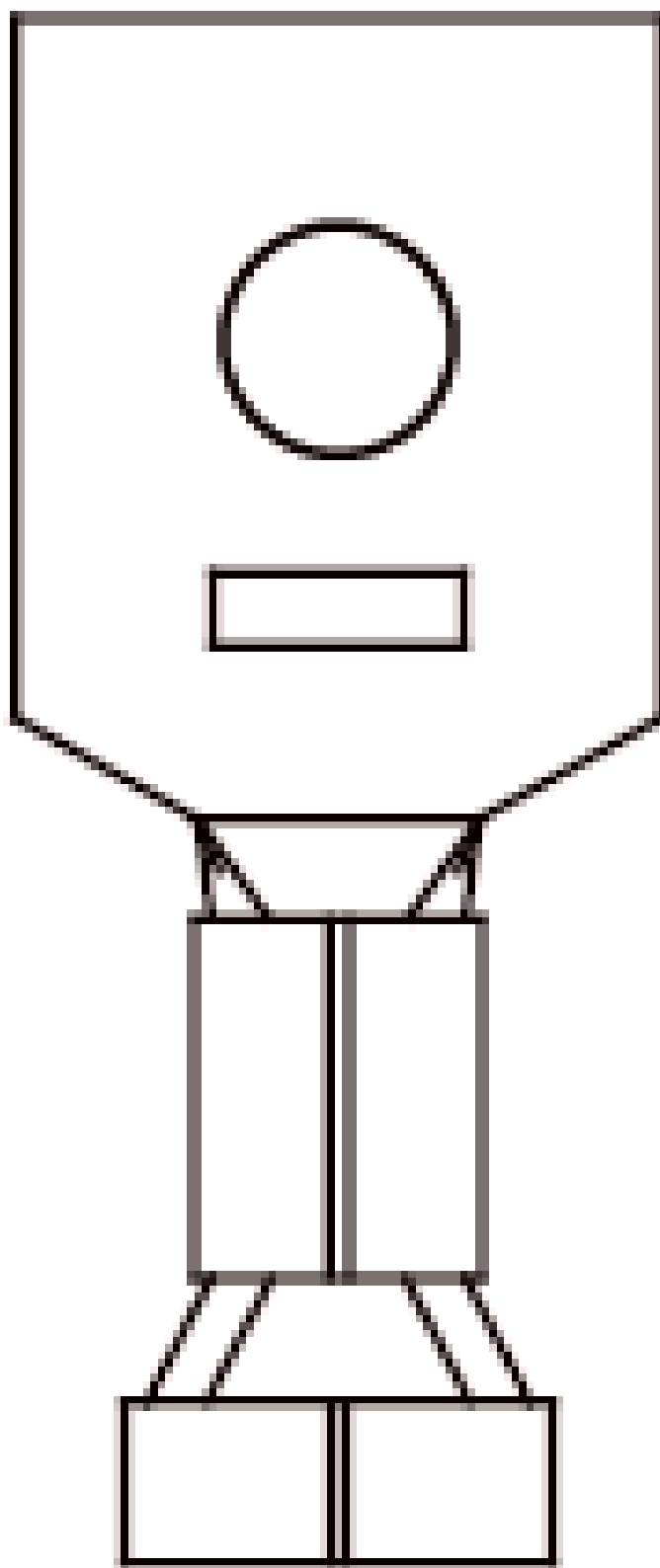
CAV	CIRCUIT	FUNCTION
1	Z901 6BK	GROUND
1	Z902 4BK	GROUND

BATTERY-POSITIVE - 1 WAY (DIESEL)



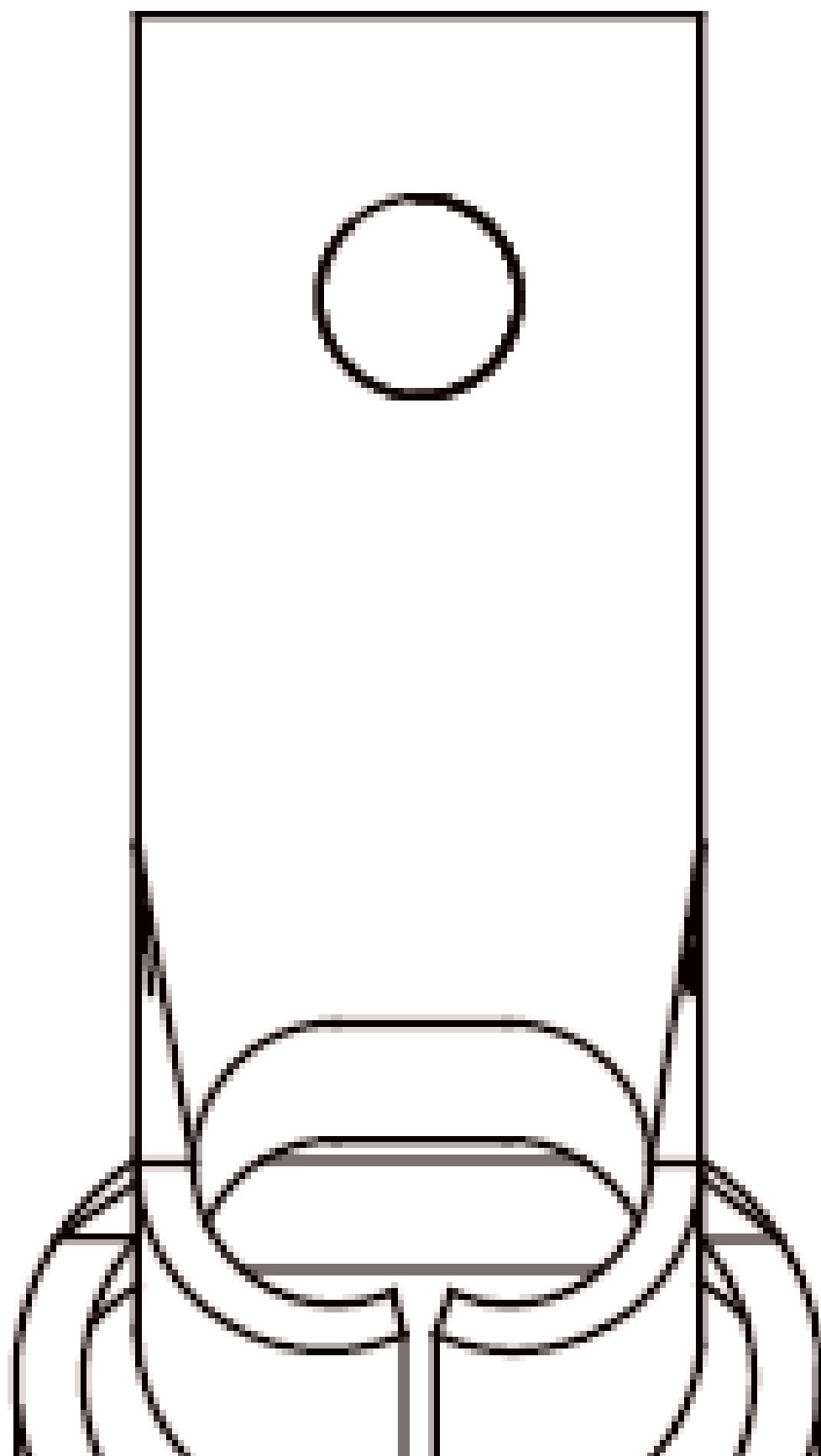
CAV	CIRCUIT	FUNCTION
1	A0 2RD	B(+)
1	A0 6RD	B(+)
1	A2 16DB	B(+)

BATTERY-POSITIVE - 1 WAY (DIESEL)



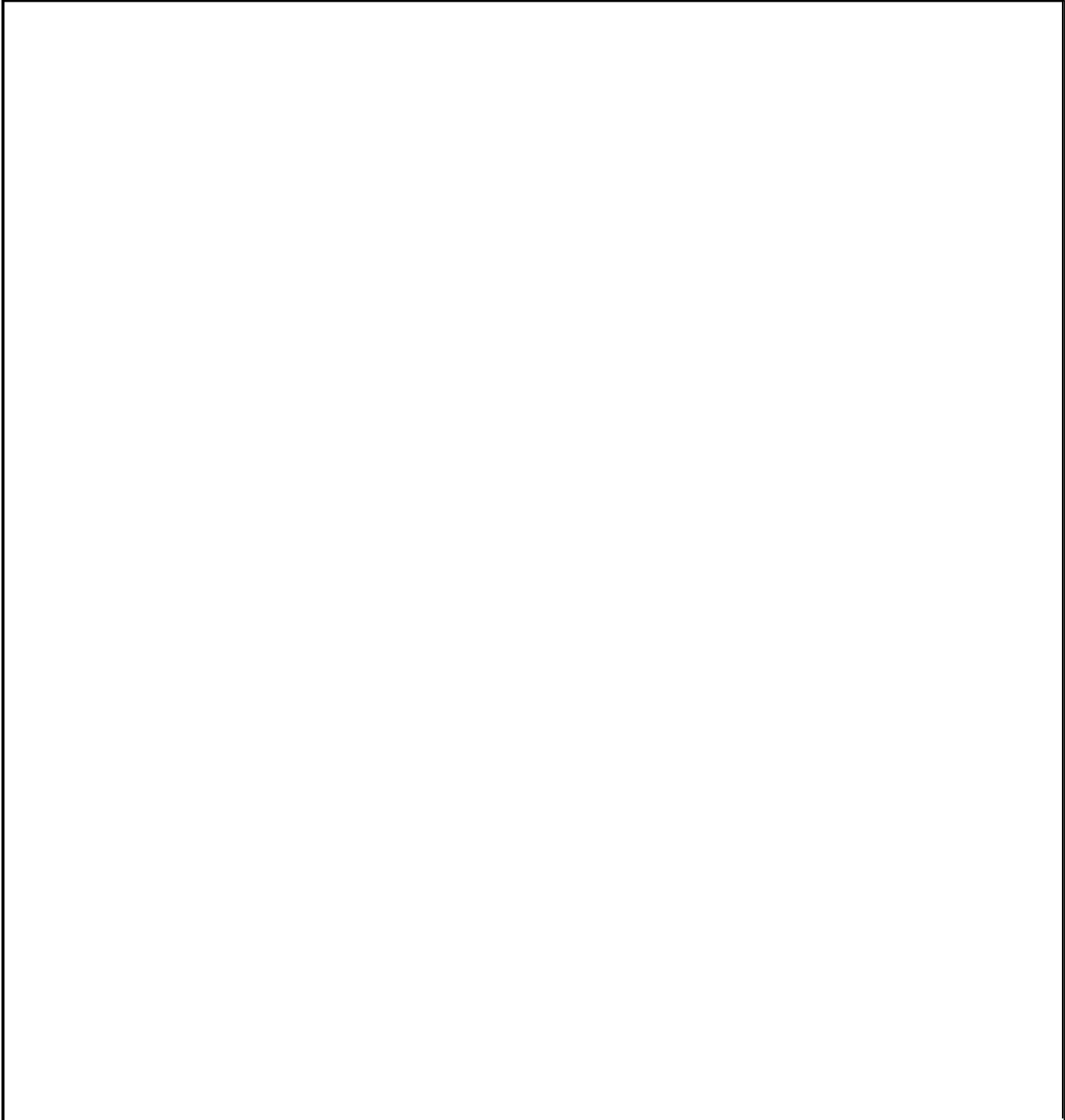
CAV	CIRCUIT	FUNCTION
1	A940 6RD	B(+)

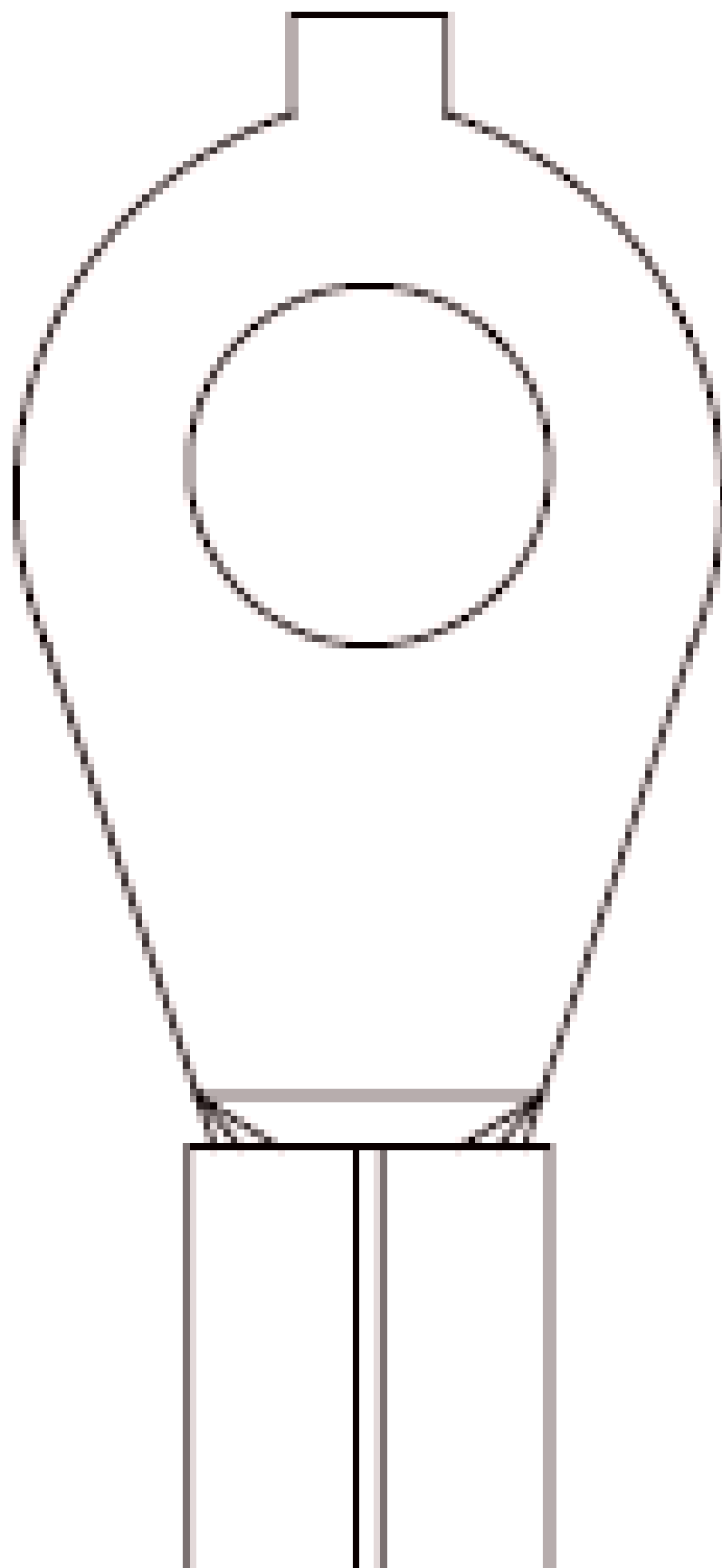
BATTERY-POSITIVE - 2 WAY (GAS)



CAV	CIRCUIT	FUNCTION
1	A0 6RD	B(+) (3.7L)
1	A0 4RD	B(+) (3.7L/4.0L)
1	A0 4RD	B(+) (4.0L)
1	A1 8LB	B(+) (4.0L)

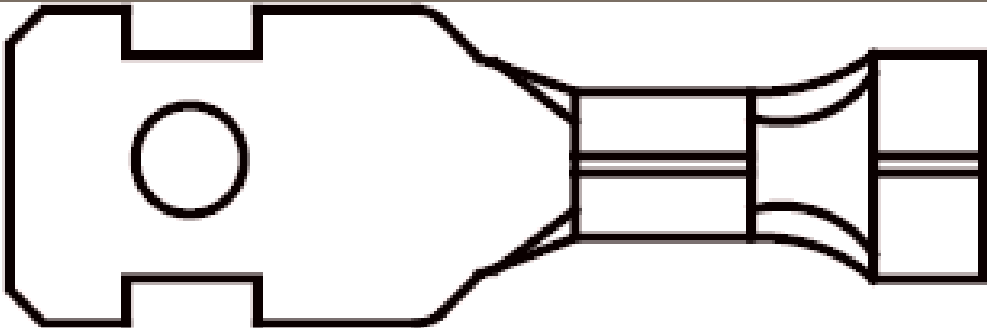
BATTERY-POSITIVE-GENERATOR - 1 WAY (3.7L)





CAV	CIRCUIT	FUNCTION
1	A1 8LB	B(+)

BATTERY-POSITIVE-GENERATOR - 1 WAY (DIESEL)



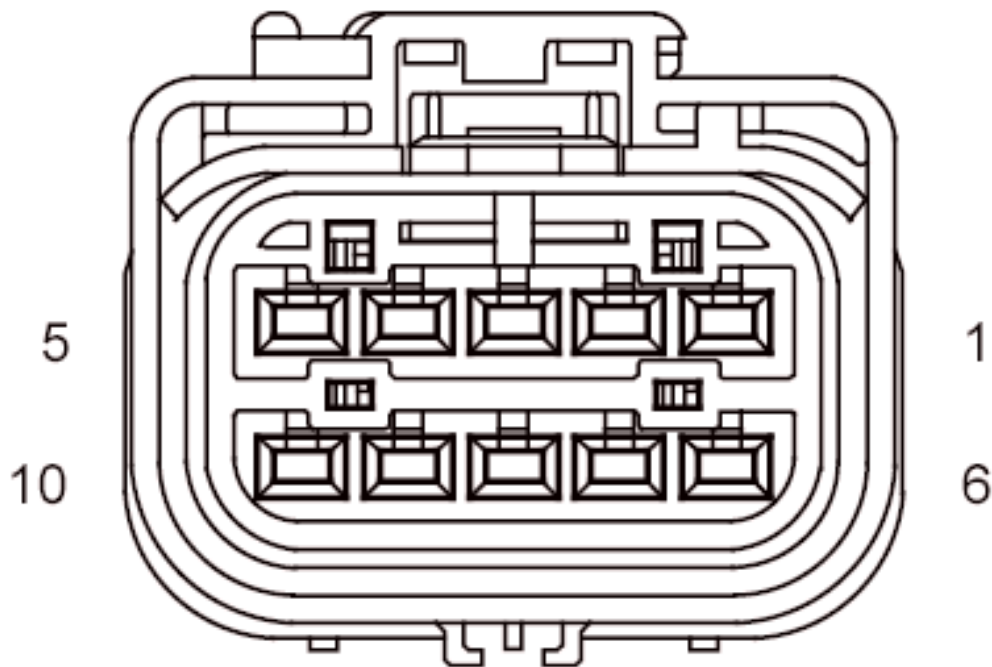
**BATTERY-
POSITIVE-
GENERATOR

(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	A1 08LB	B(+)

C101 - 10 WAY (EARLY BUILD 2.8L DIESEL) FEMALE

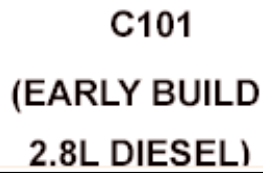
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C101
(EARLY BUILD
2.8L DIESEL)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	K202 18DB/BR	GLOW PLUG RELAY CONTROL
6	Z904 14BK	GROUND
7	-	-
8	D330 18VT/WT	GLOW PLUG MODULE SIGNAL
9	-	-
10	F344 16BR/GY	FUSED ASD RELAY OUTPUT

C101 - 10 WAY (EARLY BUILD 2.8L DIESEL) MALE



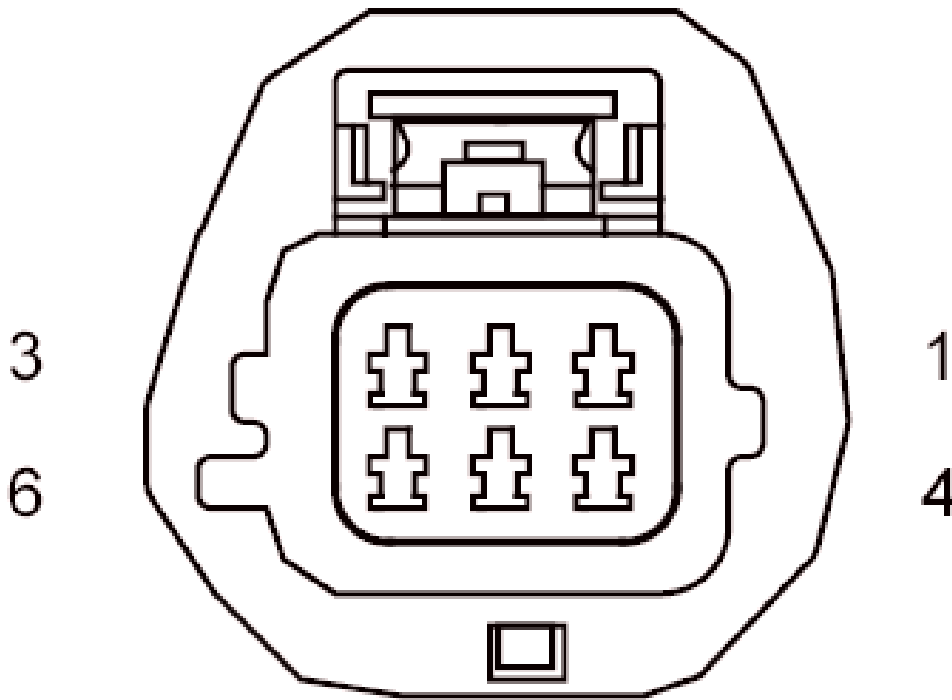
C101 - 6 WAY (LATE BUILD 2.8L DIESEL)

**CONNECTOR
NOT
AVAILABLE**

CAV	CIRCUIT	FUNCTION
1	F344K 16BR/GY	FUSED ASD RELAY OUTPUT
2	D330 20VT/WT	GLOW PLUG MODULE SIGNAL
3	-	-
4	K202 20DB/BR	GLOW PLUG RELAY CONTROL
5	-	-
6	Z904 16BK	GROUND

C101 - 6 WAY (LATE BUILD 2.8L DIESEL) FEMALE

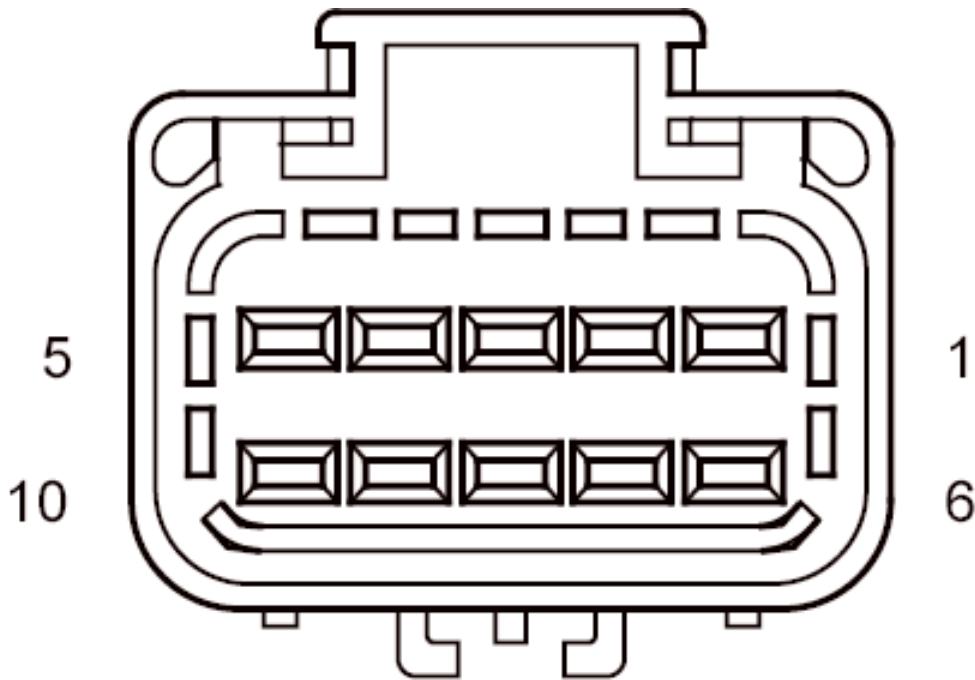




C101
(LATE BUILD
2.8L DIESEL)

CAV	CIRCUIT	FUNCTION
1	F344K 16BR/GY	FUSED ASD RELAY OUTPUT
2	D330 20VT/WT	GLOW PLUG MODULE SIGNAL
3	-	-
4	K202 20DB/BR	GLOW PLUG RELAY CONTROL
5	-	-
6	Z904 16BK	GROUND

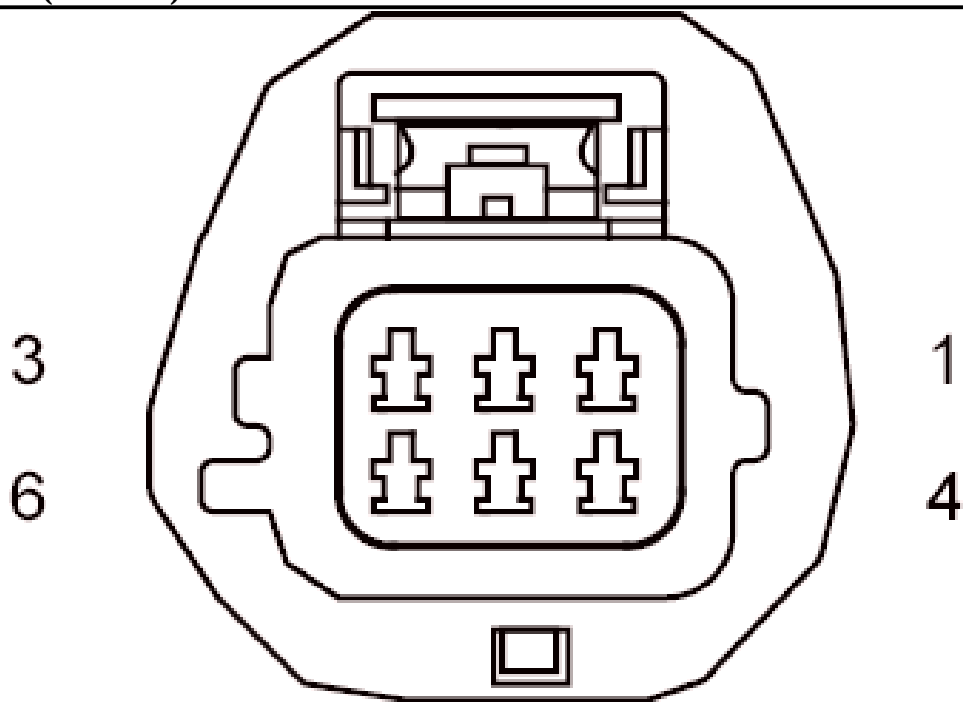
C104 - 10 WAY (DIESEL) FEMALE



C104
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	A993 16RD	FUEL HEATER RELAY OUTPUT
2	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
3	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
4	A288 10RD/LB	CABIN HEATER 3 RELAY OUTPUT
5	F921 20PK/YL	FUSED RUN RELAY OUTPUT
6	N1 18DB/OR	FUSED FUEL PUMP OUTPUT
7	K360 18GY/BR	CABIN HEATER 1 RELAY CONTROL
8	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL
9	K363 18OR/BR	CABIN HEATER 3 RELAY CONTROL
10	Z904 18BK	GROUND

C104 - 10 WAY (DIESEL) MALE

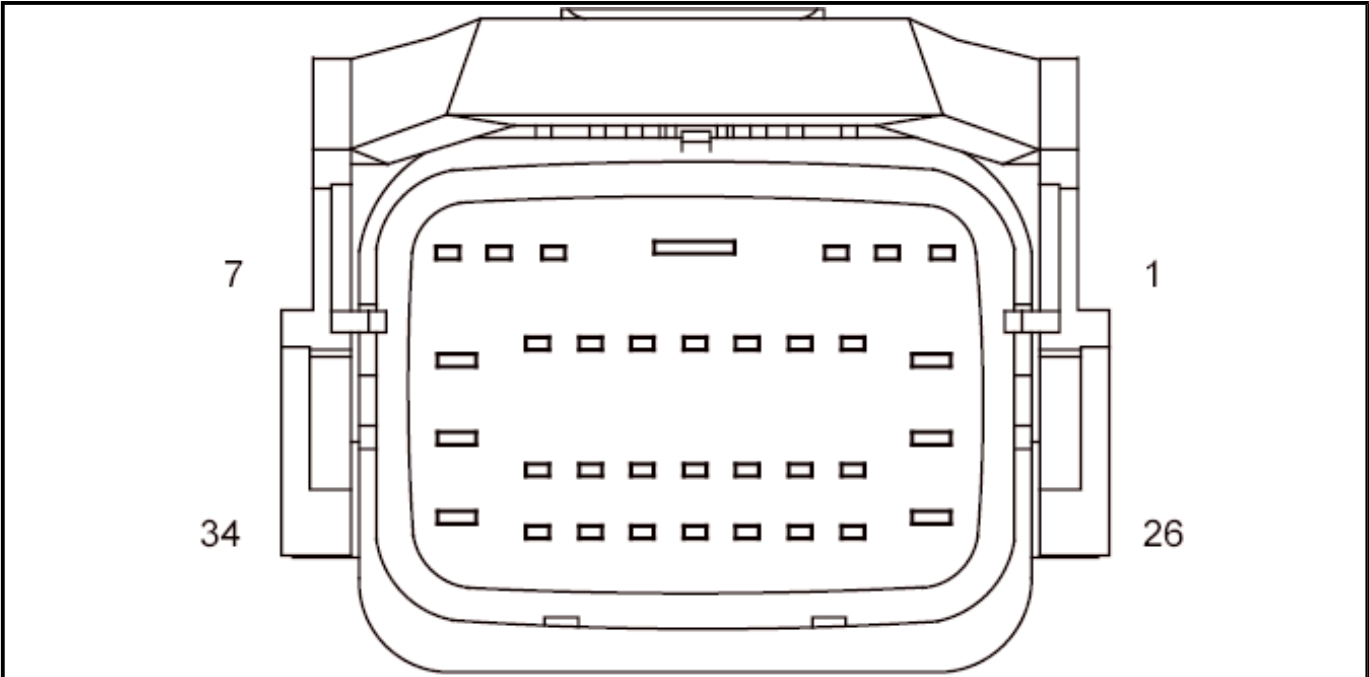


C101
(LATE BUILD
2.8L DIESEL)

CAV	CIRCUIT	FUNCTION
1	A993 14RD	FUEL HEATER RELAY OUTPUT (LHD)
1	A993 16RD	FUEL HEATER RELAY OUTPUT (RHD)
2	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
3	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
4	A288 10RD/LB	CABIN HEATER 3 RELAY OUTPUT
5	F921 20PK/YL	FUSED RUN RELAY OUTPUT
6	N1 18DB/OR	FUSED FUEL PUMP OUTPUT

7	K360 18GY/BR	CABIN HEATER 1 RELAY CONTROL
8	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL
9	K363 18OR/BR	CABIN HEATER 3 RELAY CONTROL
10	Z904 18BK/YL	GROUND (LHD)
10	Z904 18BK	GROUND (RHD)

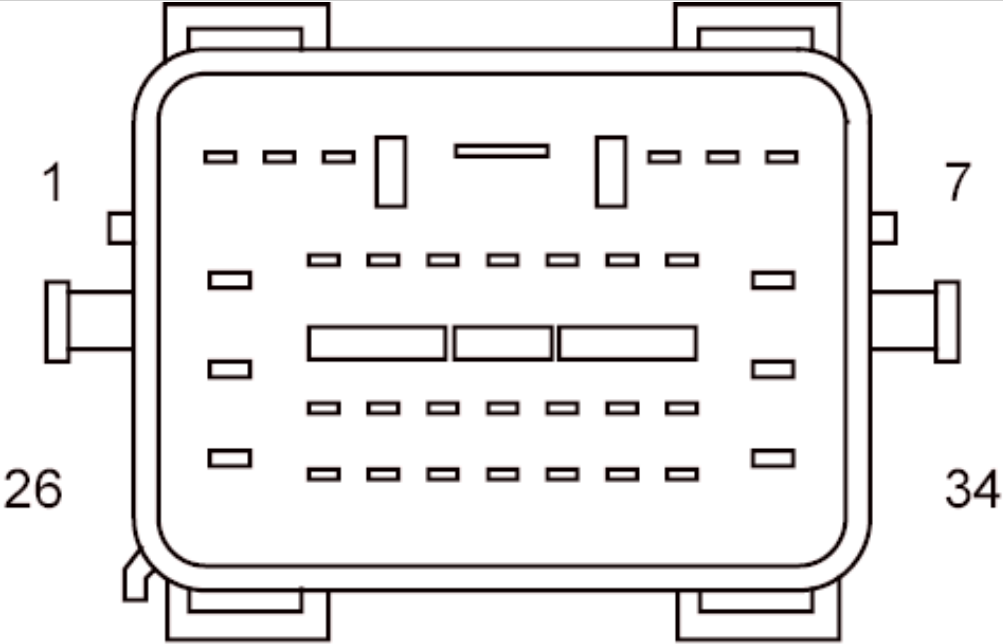
C105 - 34 WAY FEMALE



C105		
CAV	CIRCUIT	FUNCTION
1	-	-
2	A993 16RD	FUEL HEATER RELAY OUTPUT (DIESEL RHD)
2	A993 14RD	FUEL HEATER RELAY OUTPUT (DIESEL)
3	K594 20BR/LG	DRIVETRAIN SENSOR RETURN (4WD)
4	T315 12YL/BR	SHIFT MOTOR CONTROL A (4WD)
5	F342 14BR/WT	FUSED ASD RELAY OUTPUT
6	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY (4WD)

7	D21 20WT/BR	SCI TRANSMIT (DIESEL)
8	T316 12YL/GY	STEP MOTOR CONTROL B (4WD)
9	B15 20DG/WT	BRAKE SIGNAL 1
9	B15 18DG/WT	BRAKE SIGNAL 1 (GAS)
10	B16 20LB/DG	BRAKE SIGNAL 2
10	B16 18LB/DG	BRAKE SIGNAL 2 (GAS)
11	K107 18VT/WT	ESM SIGNAL
12	T301 20DG/YL	SWITCHED BATTERY SOLENOID SUPPLY (4WD)
13	D64 20WT/LB	CAN C BUS (-)
14	D65 20WT/LG	CAN C BUS (+)
14	D65 20WT/BK	CAN C BUS (+) (GAS)
15	K29 18WT/BR	APP SIGNAL 2
16	K400 18BR/VT	APP SENSOR GROUND 2
17	K23 18BR/WT	APP SIGNAL 1
18	K167 18BR/YL	APP SENSOR GROUND 1
19	-	-
20	T313 20YL/LG	MODE SENSOR SIGNAL
21	T317 20YL/TN	STEP MOTOR CONTROL D
22	Z904 18BK/YL	GROUND (DIESEL LHD)
22	Z904 18BK	GROUND (DIESEL RHD)
23	Z903 18BK	GROUND
24	-	-
25	B20 20DG/OR	BRAKE FLUID LEVEL SIGNAL (RHD)
25	B20 18DG/OR	BRAKE FLUID LEVEL SIGNAL (RHD) (EXCEPT TPM)
26	K360 18GY/BR	SWITCHED BATTERY SOLENOID SUPPLY (DIESEL)
27	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL (DIESEL)
28	K363 18OR/BR	CABIN HEATER 3 RELAY CONTROL (DIESEL)
29	V937 18VT/BR	S/C RETURN
30	V71 18VT/OR	S/C SIGNAL 1
31	V72 18OR/VT	S/C SIGNAL 2
32	F1 20PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START) (DIESEL)
33	K855 18BR/OR	5 VOLT SUPPLY
34	K857 18BR/LG	5 VOLT SUPPLY

C105 - 34 WAY MALE



C105

CAV	CIRCUIT	FUNCTION
1	B16 18LB/DG	BRAKE SIGNAL 2
2	B15 20DG/WT	FUEL HEATER RELAY OUTPUT
3	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
3	F1 18PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) (DIESEL)
4	T315 14YL/BR	SHIFT MOTOR CONTROL A
4	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT (DIESEL)
5	F342K 14BR/WT	FUSED ASD RELAY OUTPUT
5	K334 18BR/LG	- (RHD)
6	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
6	D64 20WT/LB	CAN C BUS (-) (DIESEL)
7	D65 20WT/LG	CAN C BUS (+) (DIESEL)
8	T316 14YL/GY	SHIFT MOTOR CONTROL B
8	T315 14YL/BR	SHIFT MOTOR CONTROL A (DIESEL)
9	B15 20DG/WT	BRAKE SIGNAL 1

9	V71 20VT/OR	S/C SIGNAL 1 (DIESEL)
10	B16 18LB/DG	BRAKE SIGNAL 2
10	V72 20OR/VT	S/C SIGNAL 2 (DIESEL)
11	V937 20VT/BR	S/C RETURN (DIESEL)
11	K107 18VT/WT	ESM SIGNAL (GAS)
12	T301 14DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
12	K91 18DB/YL	SENSOR GROUND (DIESEL)
13	D64 20WT/LB	CAN C BUS (-)
13	K51 18BR/WT	ASD RELAY CONTROL (DIESEL)
14	D65 20WT/LG	CAN C BUS (+)
14	K400 20BR/VT	APP SENSOR GROUND 2 (DIESEL)
15	K29 18WT/BR	APP SIGNAL 2
15	K29 20WT/BR	APP SIGNAL 2 (DIESEL)
16	K400 18BR/VT	APP SENSOR GROUND 2
16	K855 20BR/OR	5 VOLT SUPPLY (DIESEL)
17	K23 18BR/WT	APP SIGNAL 1
17	K857 20BR/LG	5 VOLT SUPPLY (DIESEL)
18	K167 18BR/YL	APP SENSOR GROUND 1
18	K23 20BR/WT	APP SIGNAL 1 (DIESEL)
19	-	-
20	T313 20YL/LG	MODE SENSOR SIGNAL
20	Z903 18BK	GROUND (DIESEL)
21	T317 20YL/TN	STEP MOTOR CONTROL D
21	F942 20PK/LG	- (DIESEL)
22	T313 20YL/LG	MODE SENSOR SIGNAL
23	Z903 18BK	GROUND
23	T317 20YL/TN	STEP MOTOR CONTROL D (DIESEL)
24	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
25	B20 18DG/OR	BRAKE FLUID LEVEL SIGNAL
25	T316 14YL/GY	SHIFT MOTOR CONTROL B (DIESEL)
26	T301 14DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
27	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
28	K360 18GY/BR	CABIN HEATER 1 RELAY CONTROL
29	V937 18VT/BR	S/C RETURN

29	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL (DIESEL)
30	V71 18VT/OR	S/C SIGNAL 1
31	V72 20OR/VT	S/C SIGNAL 2
31	D21 20WT/BR	SCI TRANSMIT (DIESEL)
32	Z904 18BK/YL	GROUND
33	K855 20BR/OR	5 VOLT SUPPLY
33	A993 16RD	FUEL HEATER RELAY OUTPUT (DIESEL)
34	K857 20BR/LG	5 VOLT SUPPLY
34	F342 14BR/WT	FUSED ASD RELAY OUTPUT (DIESEL)

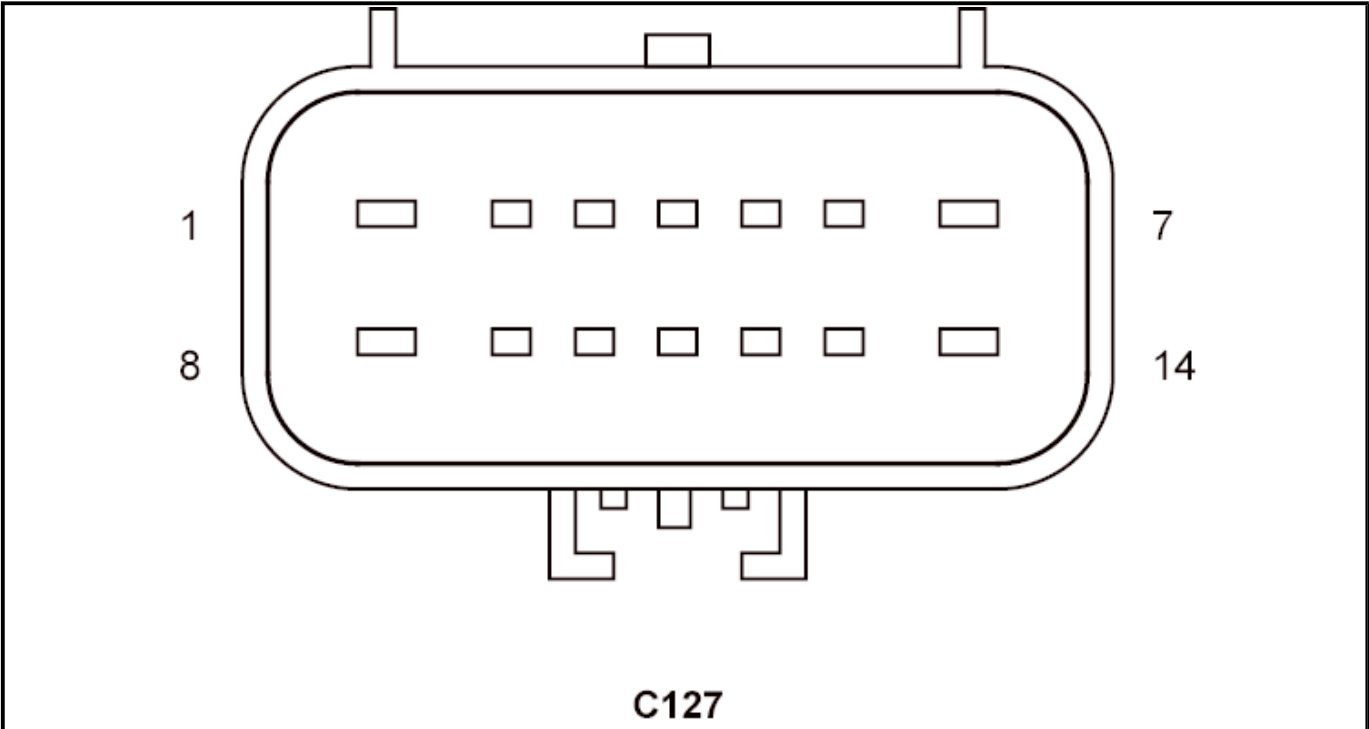
C127 - 14 WAY FEMALE

C127

CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SENSOR GROUND
2	T54 18VT	TRANSMISSION TEMPERATURE SIGNAL
3	T60 18YL/GY	OD CONTROL
4	T70 18YL	INPUT SPEED 1 (N2) SIGNAL
5	T71 18YL/PK	INPUT SPEED 2 (N3) SIGNAL
5	T71 18YL/OR	INPUT SPEED 2 (N3) SIGNAL (4x4)
6	T72 18YL/DB	5 VOLT SUPPLY
7	T73 18YL/GY	2-3 SOLENOID CONTROL

8	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT
9	T74 18YL/LG	2-3 CONTROL
10	T75 18YL/LB	TCC SOLENOID CONTROL
11	T76 18YL/TN	MODULATION PRESSURE SOLENOID CONTROL
12	T77 18YL/BR	SHIFT PRESSURE CONTROL
13	T78 18YL	SENSOR GROUND
13	T78 18LB	SENSOR GROUND (4x4)
14	F941 18PK/LG	IGNITION SWITCH OUTPUT (RUN-START)

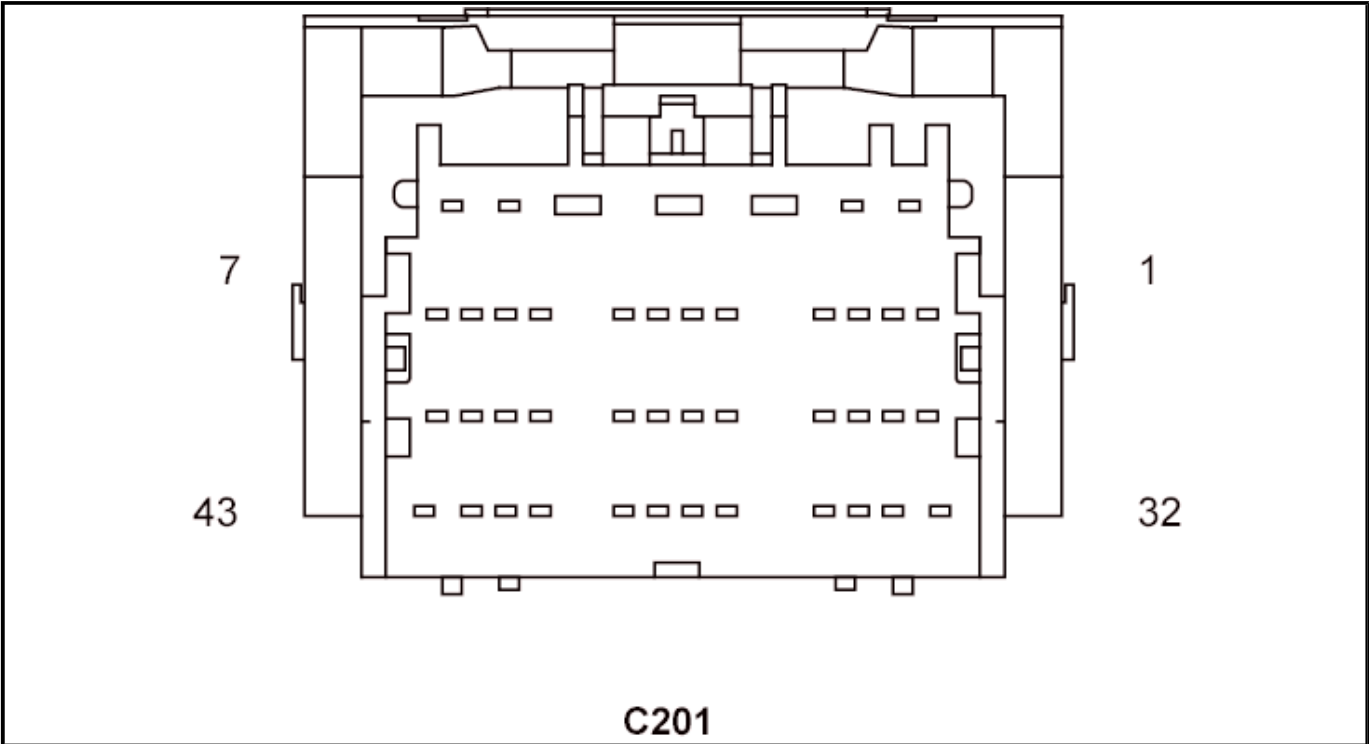
C127 - 14 WAY MALE



C127		
CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SENSOR GROUND
2	T54 18VT	TRANSMISSION TEMPERATURE SIGNAL
3	T60 18YL/GY	OD CONTROL
4	T70 18YL	INPUT SPEED 1 (N2) SIGNAL
5	T71 18YL/OR	INPUT SPEED 2 (N3) SIGNAL
6	T72 18YL/DB	5 VOLT SUPPLY
7	T73 18YL/GY	2-3 SOLENOID CONTROL
8	T16 14YL/OR	TRANSMISSION CONTROL OUTPUT

9	T74 18YL/LG	2-3 CONTROL
10	T75 18YL/LB	TCC SOLENOID CONTROL
11	T76 18YL/TN	MODULATION PRESSURE SOLENOID CONTROL
12	T77 18YL/BR	SHIFT PRESSURE CONTROL
13	T78 18YL	SENSOR GROUND
14	F941 18PK/LG	IGNITION SWITCH OUTPUT (RUN-START)

C201 - 43 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	X712 18DG/LB	MICROPHONE 1 IN (+) (EXCEPT EXPORT)
1	X712 22DG/LB	MICROPHONE 1 IN (+) (EXPORT)
2	X722 18LB/DG	MICROPHONE 2 IN (+) (EXCEPT EXPORT)
2	X722 22LB/DG	MICROPHONE 2 IN (+) (EXPORT)
3	A116 14YL/RD	FUSED B(+) (I.O.D.)
4	A115 12RD	FUSED B(+)
5	C7 10DB	BLOWER MOTOR SUPPLY
6	T315 12YL/BR	SHIFT MOTOR CONTROL A
7	L91 18WT/DB	HAZARD SWITCH SENSE

8	X792 18LB/DG	MICROPHONE IN (-) (EXCEPT EXPORT)
8	X792 22LB/DG	MICROPHONE IN (-) (EXPORT)
9	X795 18DG	COMMON AUDIO OUTPUT (EXCEPT EXPORT)
9	X795 22DG	COMMON AUDIO OUTPUT (EXPORT)
10	X835 18OR/GY	SENSOR GROUND (EXCEPT EXPORT)
10	X835 22OR/GY	SENSOR GROUND (EXPORT)
11	X793 18DG/YL	MICROPHONE FEED (EXCEPT EXPORT)
11	X793 22DG/YL	MICROPHONE FEED (EXPORT)
12	M27 20YL/LB	READING/RAIL LAMPS DRIVER
13	M24 20YL/WT	COURTESY LAMPS DRIVER
14	A901 18RD	FUSED B(+)
15	A417 18RD	FUSED B(+)
16	F921 18PK/YL	FUSED RUN RELAY OUTPUT
17	C830 22DB/YL	IR SENSOR RETURN
18	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
19	A909 18RD	FUSED B(+)
20	A106 20LB/RD	FUSED B(+)
21	V71 22VT/OR	S/C SIGNAL 1
22	V72 22OR/VT	S/C SIGNAL 2
23	V937 22VT/BR	S/C RETURN
24	R79 20LB/VT	LEFT FRONT IMPACT SENSOR SIGNAL
25	R81 20LB/WT	LEFT FRONT IMPACT SENSOR GROUND
26	G38 18GY	GARAGE DOOR OPENER ENABLE
27	F1 20PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) (EATX)
28	B15 18DG/WT	BRAKE SIGNAL 1
29	B16 18LB/DG	BRAKE SIGNAL 2
30	B25 20DG/WT	PARK BRAKE SWITCH SENSE
31	F921 20PK/YL	FUSED RUN RELAY OUTPUT
32	A108 18LG/RD	FUSED B(+)
33	P806 20LG/WT	INVERTER STATUS

		INDICATOR DRIVER (EXCEPT EXPORT)
33	D21 20WT/BR	SCI TRANSMIT (EXPORT)
34	B6 18DG/WT	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
35	B7 18DG/VT	RIGHT FRONT WHEEL SPEED SENSOR SUPPLY
36	D64 20WT/LB	CAN C BUS (-)
37	D65 20WT/BK	CAN C BUS (+)
38	D71 20WT/DB	DIAGNOSTIC CAN C (-)
39	D72 20WT/LB	DIAGNOSTIC CAN C (+)
40	D264 20WT	CAN INTERIOR BUS (-)
41	D265 20WT/OR	CAN INTERIOR BUS (+)
42	D506 20WT/DG	LIN BUS
43	T316 12YL/GY	SHIFT MOTOR CONTROL B

C201 - 43 WAY MALE

C201		
CAV	CIRCUIT	FUNCTION
1	X704 18DG/YL	RIGHT AUDIO OUTPUT (HANDS FREE)
1	X712 22DG/LB	MICROPHONE 1 IN (+) (HANDS FREE)
2	X703 18OR/GY	LEFT AUDIO OUTPUT (HANDS FREE)
2	X722 22LB/DG	MICROPHONE 2 IN (+)

		(HANDS FREE)
3	A116 14YL/RD	FUSED B(+) (I.O.D.) (LHD)
4	A115 14RD	FUSED B(+)
5	C7 10DB	BLOWER MOTOR SUPPLY
6	T315 12YL/BR	SHIFT MOTOR CONTROL A
7	L91 18WT/DB	HAZARD SWITCH SENSE
8	X792 22LB	MICROPHONE IN (-) (HANDS FREE)
9	X795 18DG	COMMON AUDIO OUTPUT (HANDS FREE)
10	X835 22OR/GY	SENSOR GROUND (HANDS FREE)
11	X793 22DG/YL	MICROPHONE FEED (HANDS FREE)
12	M27 18YL/LB	READING/RAIL LAMPS DRIVER
13	M24 18YL/WT	COURTESY LAMPS DRIVER
14	A901 18RD	FUSED B(+)
15	A417 18RD	FUSED B(+) (EXCEPT EXPORT)
15	A417 20RD	FUSED B(+) (EXPORT)
16	C83 22DB/LG	INFRARED SENSOR SIGNAL
17	C830 22DB/YL	IR SENSOR RETURN
18	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
19	A909 18RD	FUSED B(+)
20	A106 20LB/RD	FUSED B(+)
21	V71 20VT/OR	S/C SIGNAL 1
22	V72 20OR/VT	S/C SIGNAL 2
23	V937 20VT/BR	S/C RETURN
24	R79 20LB/VT	LEFT FRONT IMPACT SENSOR SIGNAL
25	R81 20LB/WT	LEFT FRONT IMPACT SENSOR GROUND
26	G38 18GY	GARAGE DOOR OPENER ENABLE
27	F1 20PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) (EATX)
28	B15 20DG/WT	BRAKE SIGNAL 1
29	B16 20LB/DG	BRAKE SIGNAL 2
30	B25 18DG/WT	PARK BRAKE SWITCH SENSE
31	F921 20PK/YL	FUSED RUN RELAY OUTPUT

32	A108 18LG/RD	FUSED B(+)
33	P806 18LG/WT	INVERTER STATUS INDICATOR DRIVER (EXCEPT EXPORT)
33	D21 20WT/BR	SCI TRANSMIT (EXPORT EXCEPT GAS)
34	B6 18DG/WT	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
35	B7 18DG/VT	RIGHT FRONT WHEEL SPEED SENSOR SUPPLY
36	D64 20WT/LB	CAN C BUS (-)
37	D65 20WT/BK	CAN C BUS (+)
38	D71 20WT/DB	DIAGNOSTIC CAN C (-)
39	D72 20WT/LB	DIAGNOSTIC CAN C (+)
40	D264 20WT/OR	CAN INTERIOR BUS (-)
41	D265 20WT/GY	CAN INTERIOR BUS (+)
42	D506 20WT/DG	LIN BUS
43	T316 12YL/GY	SHIFT MOTOR CONTROL B

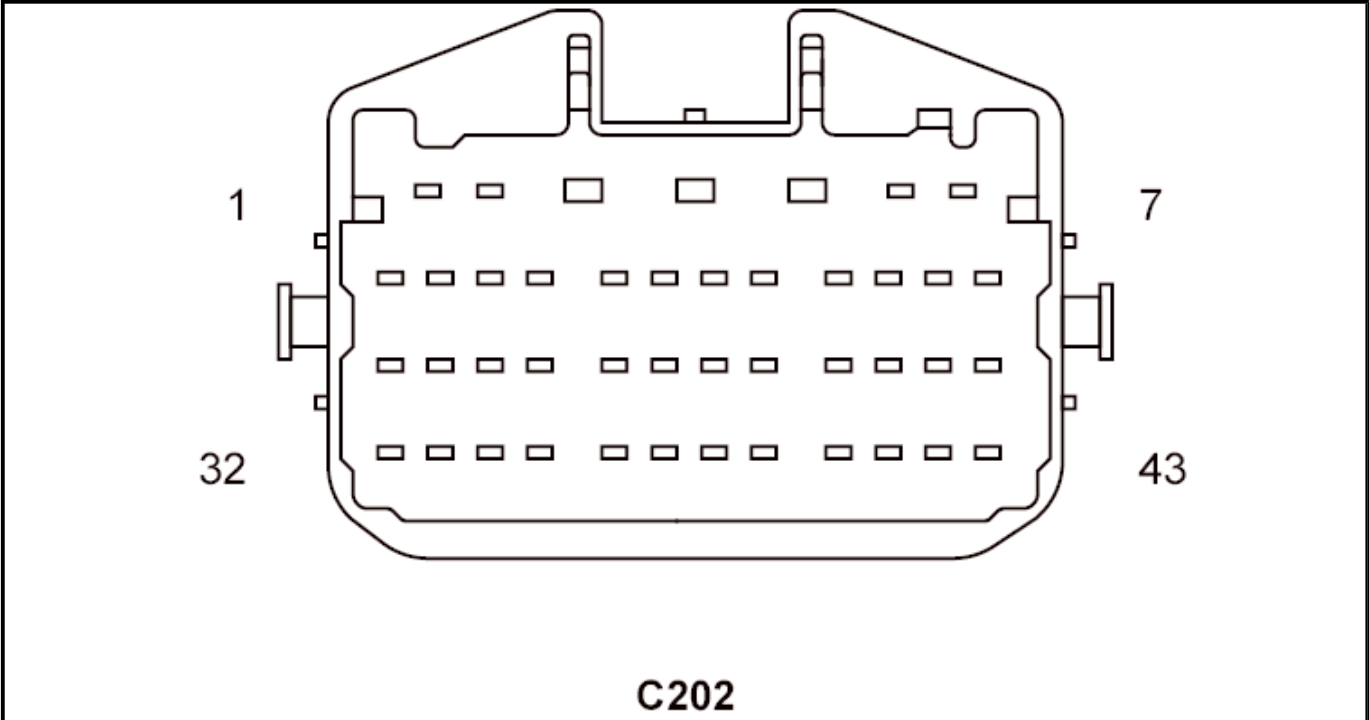
C202 - 43 WAY FEMALE

CAV	CIRCUIT	FUNCTION
1	X202 18DG/VT	RIGHT FRONT SPEAKERS (+)
2	X292 18DG/YL	RIGHT FRONT SPEAKERS (-)
3	A285 10RD/DB	CABIN HEATER 1 RELAY

		OUTPUT
4	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
5	A288 10RD/LB	CABIN HEATER 3 RELAY OUTPUT
6	X201 18GY/VT	LEFT FRONT SPEAKERS (+)
7	X291 18GY/YL	LEFT FRONT SPEAKERS (-)
8	X295 18GY/DG	LEFT REAR SPEAKER (-)
9	X205 18GY/LG	LEFT REAR SPEAKER (+)
10	X296 18DG/GY	RIGHT REAR SPEAKER (-)
11	X206 18DG/LG	RIGHT REAR SPEAKER (+)
12	X202 18DG/VT	RIGHT FRONT SPEAKERS (+)
13	X292 18DG/YL	RIGHT FRONT SPEAKERS (-)
14	X201 18GY/VT	LEFT FRONT SPEAKERS (+)
15	X291 18GY/YL	LEFT FRONT SPEAKERS (-)
16	X62 18GY/OR	AMPLIFIED ANTENNA FEED
17	D21 20WT/BR	SCI TRANSMIT
18	G920 20VT/YL	MEMORY SEAT SWITCH RETURN
19	G200 20VT/BR	MEMORY SEAT SET SWITCH MUX
20	T301 18DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
21	T313 20YL/LG	MODE SENSOR SIGNAL
22	T317 20YL/TN	STEP MOTOR CONTROL D
23	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
24	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	F941 18PK/LG	IGNITION SWITCH OUTPUT (RUN-START)
32	F307 18LB/PK	FUSED ACCESSORY RELAY OUTPUT
33	A412 18RD	FUSED B(+)
34	A413 18RD	FUSED B(+)
35	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN)

36	F20 20PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
37	K855 18BR/OR	5 VOLT SUPPLY
38	K23 18BR/WT	APP SIGNAL 1
39	K167 18BR/YL	APP SENSOR GROUND 1
40	K400 18BR/VT	APP SENSOR GROUND 2
41	K29 18WT/BR	APP SIGNAL 2
42	K857 18BR/LG	5 VOLT SUPPLY
43	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT

C202 - 43 WAY MALE

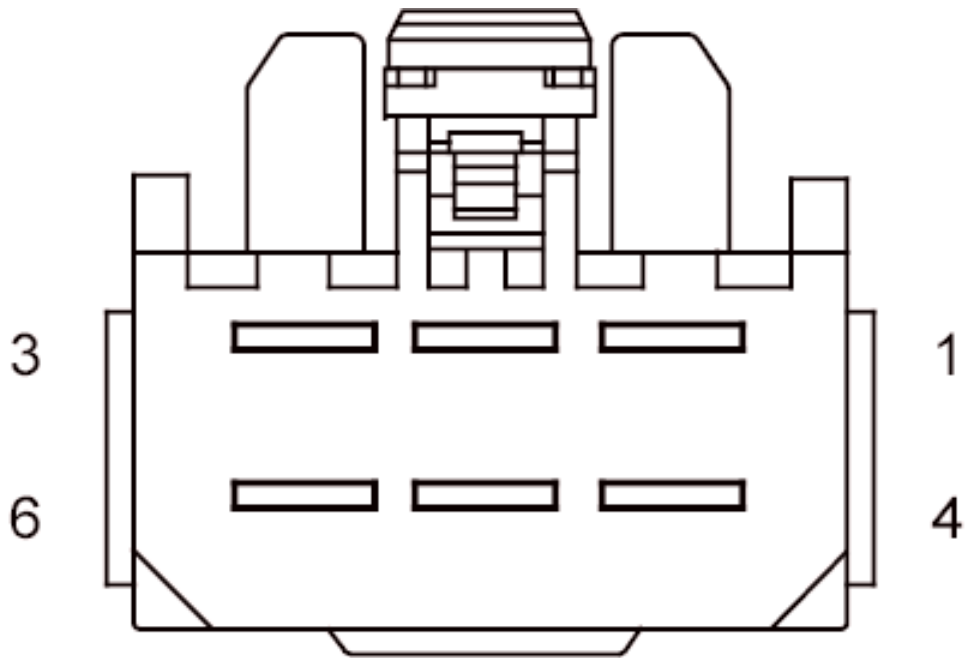


CAV	CIRCUIT	FUNCTION
1	X202 18DG/VT	RIGHT FRONT SPEAKERS (+)
2	X292 18DG/YL	RIGHT FRONT SPEAKERS (-)
3	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
4	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
5	A288 10RD/LB	CABIN HEATER 3 RELAY OUTPUT
6	X201 18GY/VT	LEFT FRONT SPEAKERS (+)
7	X291 18GY/YL	LEFT FRONT SPEAKERS (-)
8	X295 18GY/DG	LEFT REAR SPEAKER (-) (BASE AUDIO)

8	X57 18DG/OR	RADIO LEFT AUDIO (-) (PREMIUM AUDIO)
9	X205 18GY/LG	LEFT REAR SPEAKER (+) (BASE AUDIO)
9	X51 18DG/DB	RADIO LEFT AUDIO (+) (PREMIUM AUDIO)
10	X296 18DG/GY	RIGHT REAR SPEAKER (-) (BASE AUDIO)
10	X58 18GY/OR	RADIO RIGHT AUDIO (-) (PREMIUM AUDIO)
11	X206 18DG/LG	RIGHT REAR SPEAKER (+) (BASE AUDIO)
11	X52 18GY/DB	RADIO RIGHT AUDIO (+) (PREMIUM AUDIO)
12	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (BASE AUDIO)
12	X208 18GY/DG	AMPLIFIED RIGHT FRONT SPEAKER (+) (PREMIUM AUDIO)
13	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (BASE AUDIO)
13	X298 18GY/LG	AMPLIFIED RIGHT FRONT SPEAKER (-) (PREMIUM AUDIO)
14	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (BASE AUDIO)
14	X209 18GY/OR	AMPLIFIED LEFT FRONT SPEAKER (+) (PREMIUM AUDIO)
15	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (BASE AUDIO)
15	X299 18GY/YL	AMPLIFIED LEFT FRONT SPEAKER (-) (PREMIUM AUDIO)
16	X62 18GY/OR	AMPLIFIED ANTENNA FEED
17	-	-
18	G920 20VT/YL	MEMORY SEAT SWITCH RETURN
19	G200 20VT/BR	MEMORY SEAT SET SWITCH MUX
20	T301 20DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
21	T313 20YL/LG	MODE SENSOR SIGNAL
22	T317 20YL/TN	STEP MOTOR CONTROL D

23	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
24	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-
31	F941 20PK/LG	IGNITION SWITCH OUTPUT (RUN-START)
32	F307 18LB/PK	FUSED ACCESSORY RELAY OUTPUT
33	A412 18RD	FUSED B(+)
34	A413 18RD	FUSED B(+)
35	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN)
36	F20 20PK/WT	FUSED IGNITION SWITCH OUTPUT (RUN-START)
37	K855 20BR/OR	5 VOLT SUPPLY
38	K23 20BR/WT	APP SIGNAL 1
39	K167 20BR/YL	APP SENSOR GROUND 1
40	K400 20BR/VT	APP SENSOR GROUND 2
41	K29 20WT/BR	APP SIGNAL 2
42	K857 20BR/LG	5 VOLT SUPPLY
43	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT (EXCEPT LHD DIESEL REAR SEAT VIDEO)
43	L51 18WT/TN	BRAKE LAMP SWITCH OUTPUT (LHD DIESEL REAR SEAT VIDEO)

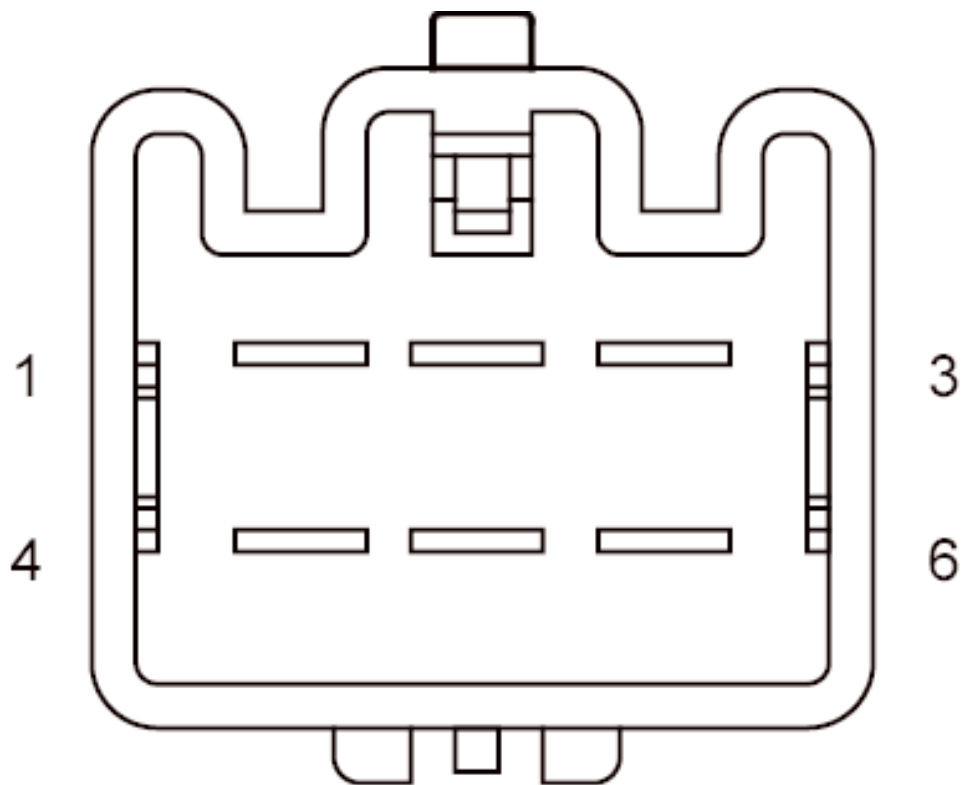
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C228
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
2	Z911 10BK/LG	GROUND
3	A286 10RD/WT	CABIN HEATER 1 RELAY OUTPUT
4	Z911 10BK/RD	GROUND
5	A288 10RD/LB	CABIN HEATER 2 RELAY OUTPUT
6	-	-

C228 - 6 WAY (DIESEL) MALE

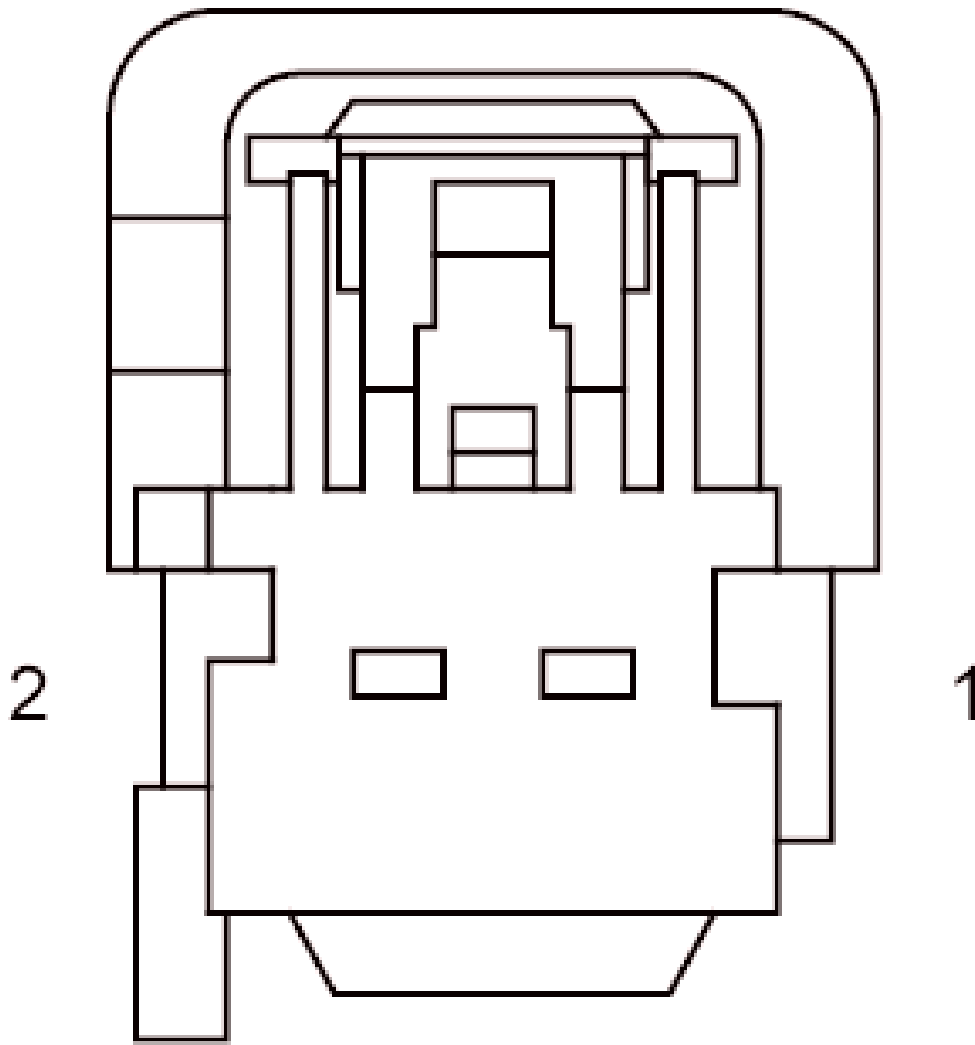


C228

(DIESEL)

CAV	CIRCUIT	FUNCTION
1	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
2	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
3	A288 10RD/LB	CABIN HEATER 3 RELAY OUTPUT
4	Z911 10BK/LG	GROUND
5	-	-
6	Z911 10BK/RD	GROUND

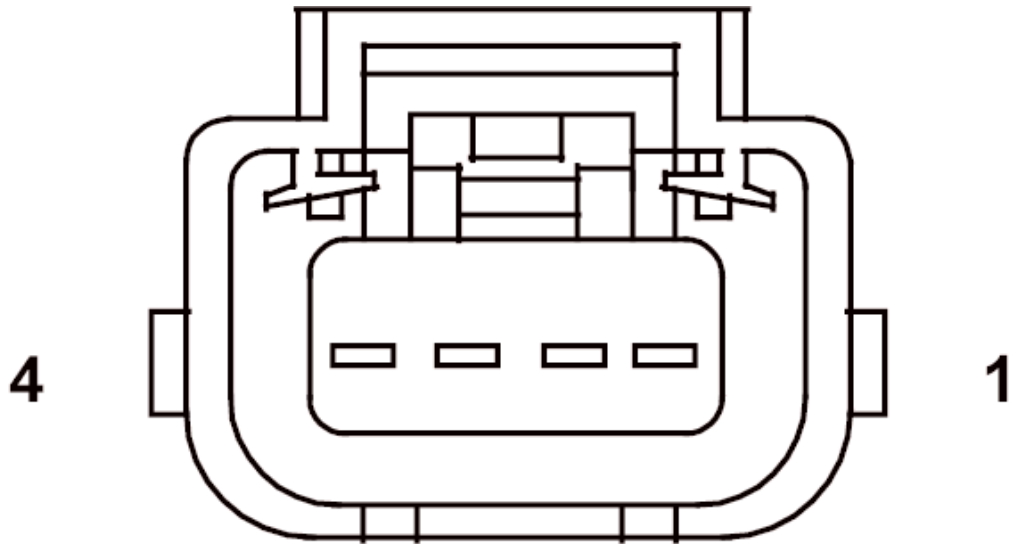
C231 - 2 WAY FEMALE



C231

CAV	CIRCUIT	FUNCTION
1	C32 20DB/TN	RECIRCULATION DOOR DRIVER (A)
2	C154 20LB/OR	RECIRCULATION DOOR DRIVER (B)

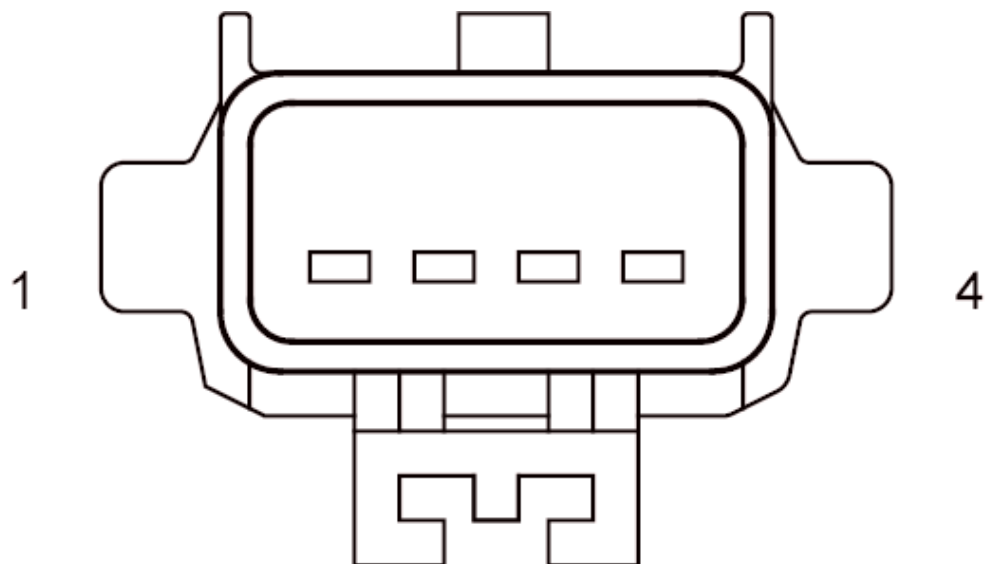
C232 - 4 WAY FEMALE



C232

CAV	CIRCUIT	FUNCTION
1	R82 20WT/LB	RIGHT FRONT IMPACT SENSOR GROUND
2	R80 20VT/LB	RIGHT FRONT IMPACT SENSOR SIGNAL
3	-	-
4	-	-

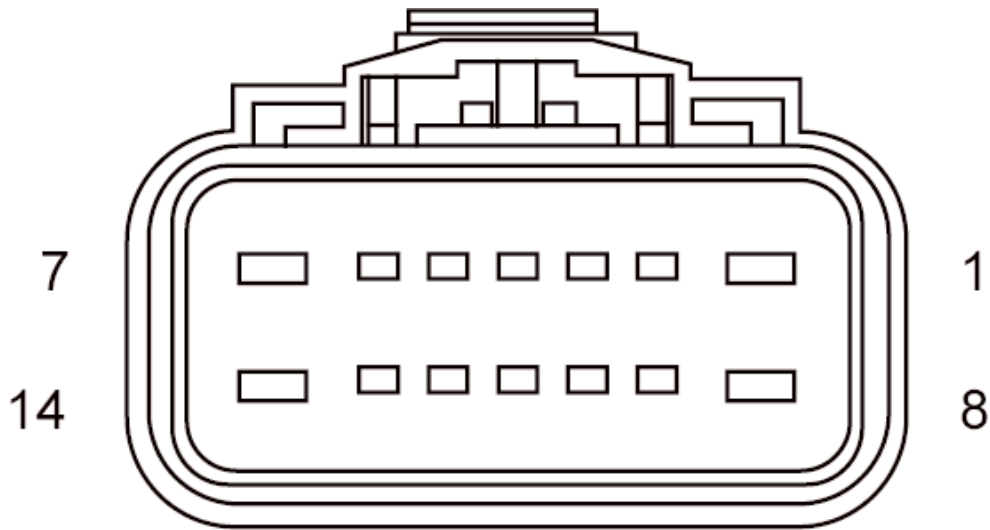
C232 - 4 WAY MALE



C232

CAV	CIRCUIT	FUNCTION
1	R82 20WT/LB	RIGHT FRONT IMPACT SENSOR GROUND
2	R80 20VT/LB	RIGHT FRONT IMPACT SENSOR SIGNAL
3	-	-
4	-	-

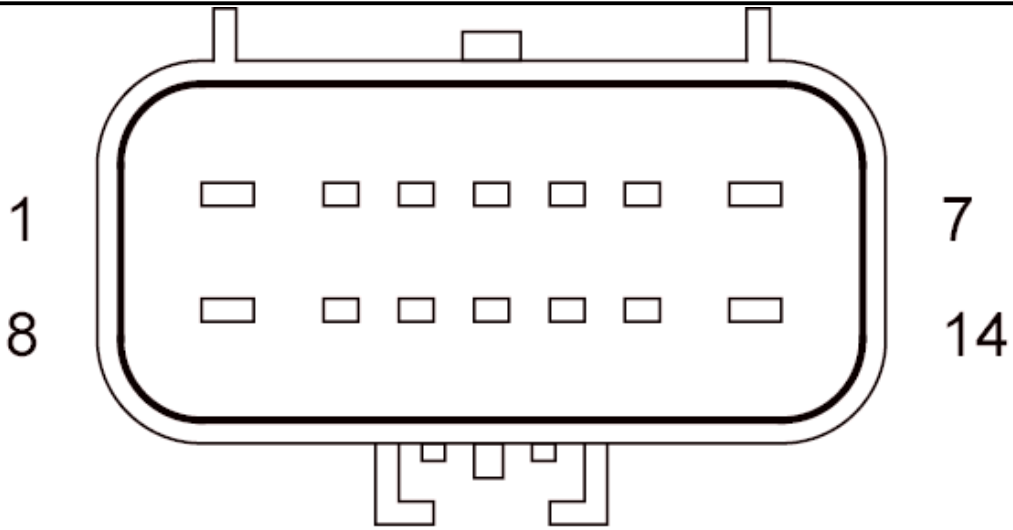
C304 - 14 WAY FEMALE



C304

CAV	CIRCUIT	FUNCTION
1	W3 14BR/WT	FRONT WIPER HIGH/LOW RELAY LOW SPEED OUTPUT
2	D96 18WT/LB	SIREN SIGNAL CONTROL (EXPORT)
3	Z907 18BK/GY	GROUND
4	Z907 18BK/LG	GROUND (LHD)
4	Z907 14BK	GROUND (RHD)
5	Z907 18BK/PK	GROUND
6	-	-
7	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
8	W4 14BR/OR	FRONT WIPER HIGH/LOW RELAY HIGH SPEED OUTPUT
9	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
10	Z907 18BK/YL	GROUND (LHD)
10	Z907 18BK/DG	GROUND (RHD)
11	Z907 18BK/PK	GROUND (LHD)
11	Z907 18BK/YL	GROUND (RHD)
12	W7 20BR/GY	FRONT WIPER PARK SWITCH SENSE
13	A412 18RD	FUSED B(+) (EXPORT)
14	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL

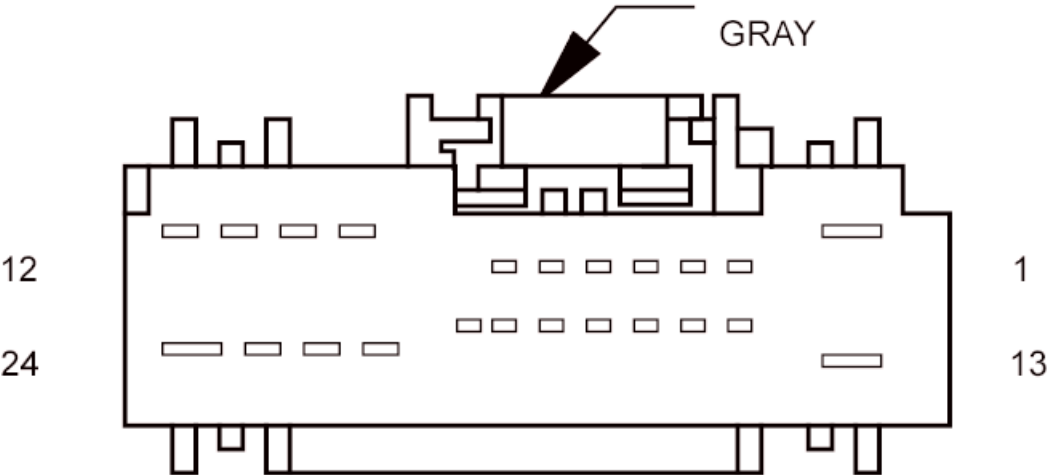
C304 - 14 WAY MALE



C304

CAV	CIRCUIT	FUNCTION
1	W3 14BR/WT	FRONT WIPER HIGH/LOW RELAY LOW SPEED OUTPUT
2	D96 18WT/LB	SIREN SIGNAL CONTROL (EXPORT)
3	Z907 18BK/WT	GROUND
4	Z907 18BK/LG	GROUND (LHD)
4	Z907 14BK	GROUND (RHD)
5	Z907 18BK/WT	GROUND
6	-	-
7	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
8	W4 14BR/OR	FRONT WIPER HIGH/LOW RELAY HIGH SPEED OUTPUT
9	D508 18WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
10	Z907 18BK/YL	GROUND
11	Z907 18BK/PK	GROUND
12	W7 20BR/GY	FRONT WIPER PARK SWITCH SENSE
13	A412 18RD	FUSED B(+) (EXPORT)
14	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL

C306 - 24 WAY FEMALE

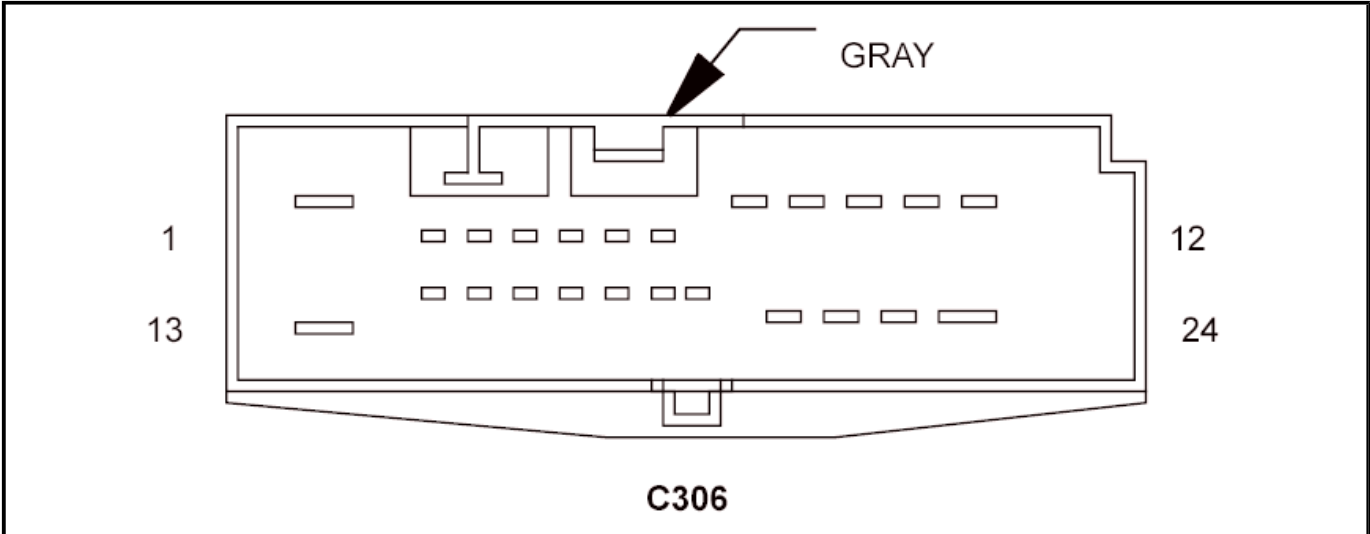


C306

CAV	CIRCUIT	FUNCTION
1	P304 16LG/DB	LIFTGATE LOCK DRIVER
2	-	-
3	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE
4	A645 20RD/VT	INTRUSION TRANSMITTER SENSOR SIGNAL
5	G460 20DG/VT	FRONT INTRUSION SENSOR SIGNAL
6	X777 20DG/GY	PARK ASSIST DISPLAY SUPPLY
7	D777 20WT/GY	PARK ASSIST DISPLAY SIGNAL
8	F921 20PK/YL	FUSED RUN RELAY OUTPUT
9	C83 22DB/LG	INFRARED SENSOR SIGNAL
10	A414 18RD	FUSED B(+) (I.O.D.)
11	M24 18YL/WT	COURTESY LAMPS DRIVER
12	M27 20YL/LB	READING/RAIL LAMPS DRIVER
13	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
14	C830 22DB/YL	IR SENSOR RETURN
15	D506 20WT/DG	LIN BUS
16	X62 18GY/OR	AMPLIFIED ANTENNA FEED
17	G945 20VT/DG	INTRUSION TRANSMITTER SENSOR GROUND
18	Z919 20BK/RD	GROUND

19	X779 20GY/OR	PARK ASSIST DISPLAY RETURN
20	G946 20LG/VT	INTRUSION RECEIVER SENSOR GROUND
21	G38 18GY	GARAGE DOOR OPENER ENABLE
22	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
23	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT
24	W13 16BR/LG	FUSED REAR WIPER MOTOR CONTROL OUTPUT

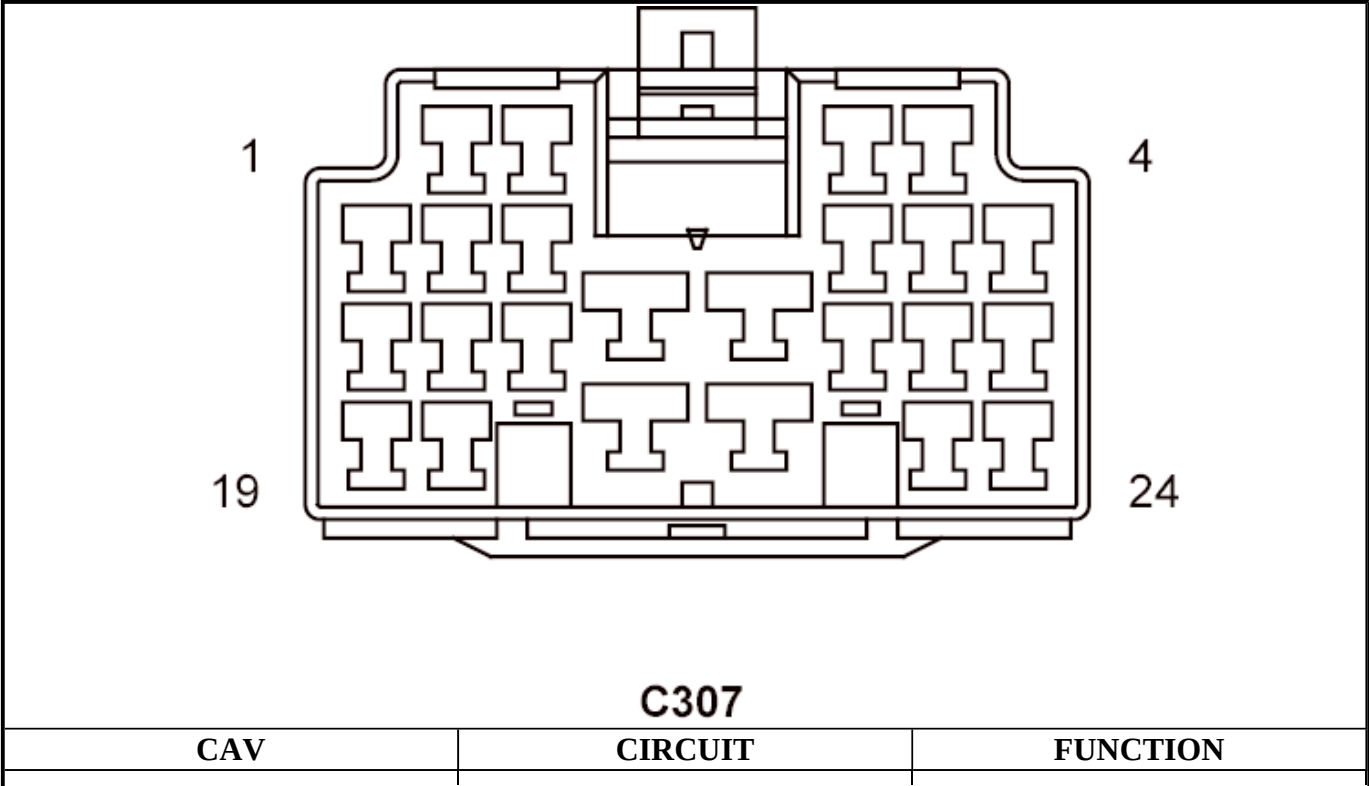
C306 - 24 WAY MALE



CAV	CIRCUIT	FUNCTION
1	P304 16LG/DB	LIFTGATE LOCK DRIVER
2	-	-
3	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE
4	A645 20RD/VT	INTRUSION TRANSMITTER SENSOR SIGNAL
5	G460 20DG/VT	FRONT INTRUSION SENSOR SIGNAL
6	X777 20DG/GY	PARK ASSIST DISPLAY SUPPLY
7	D777 20WT/GY	PARK ASSIST DISPLAY SIGNAL
8	F921 20PK/YL	FUSED RUN RELAY OUTPUT
9	C83 22DB/LG	INFRARED SENSOR SIGNAL
10	A414 18RD	FUSED B(+) (I.O.D.)

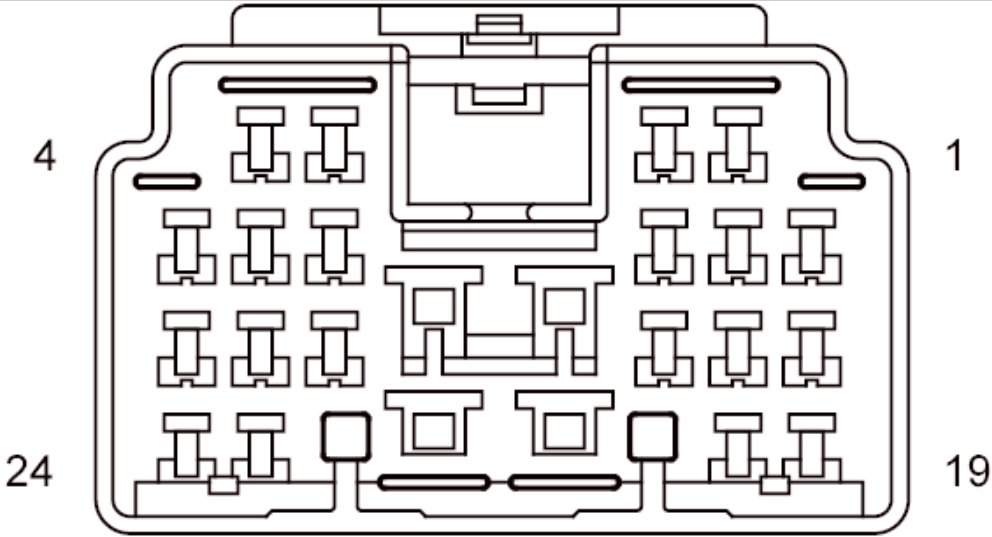
11	M24 18YL/WT	COURTESY LAMPS DRIVER
12	M27 18YL/LB	READING/RAIL LAMPS DRIVER
13	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
14	C830 22DB/YL	IR SENSOR RETURN
15	D506 20WT/DG	LIN BUS
16	X62 18GY/OR	AMPLIFIED ANTENNA FEED
17	G945 20VT/DG	INTRUSION TRANSMITTER SENSOR GROUND
18	Z919 20BK/RD	GROUND
19	X779 20GY/OR	PARK ASSIST DISPLAY RETURN
20	G946 20LG/VT	INTRUSION RECEIVER SENSOR GROUND
21	G38 18GY	GARAGE DOOR OPENER ENABLE
22	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
23	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT
24	W13 16BR/LG	FUSED REAR WIPER MOTOR CONTROL OUTPUT

C307 - 24 WAY FEMALE



1	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)
2	P930 18TN/WT	DRIVER FRONT DOOR LOCK DRIVER
3	Z913 18BK/PK	GROUND
4	Z913 14BK/RD	GROUND
5	-	-
6	Q411 14OR/WT	MASTER WINDOW SWITCH LEFT REAR (UP)
7	P235 14LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT (RHD)
8	X201 18GY/VT	LEFT FRONT SPEAKERS (+)
8	X202 18DG/VT	AMPLIFIED RIGHT DOOR SPEAKER (+) (RHD)
9	X291 18GY/YL	LEFT FRONT SPEAKERS (-)
9	X292 18DG/YL	AMPLIFIED RIGHT FRONT DOOR SPEAKER (-) (RHD)
10	-	-
11	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP)
12	P237 14DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
13	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN)
14	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT
15	A215 14RD/LG	FUSED B(+)
16	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN)
17	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP)
18	A855 20DG/RD	FUSED B(+)
19	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT (LHD)
20	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
21	Z913 14BK/WT	GROUND
22	Z913 14BK/TN	GROUND (LHD)
23	P910 18TN/LG	DRIVER FRONT DOOR UNLOCK DRIVER
24	Z913 20BK/OR	GROUND
24	A855 18DG/RD	FUSED B(+) (POWER WINDOWS)

C307 - 24 WAY MALE

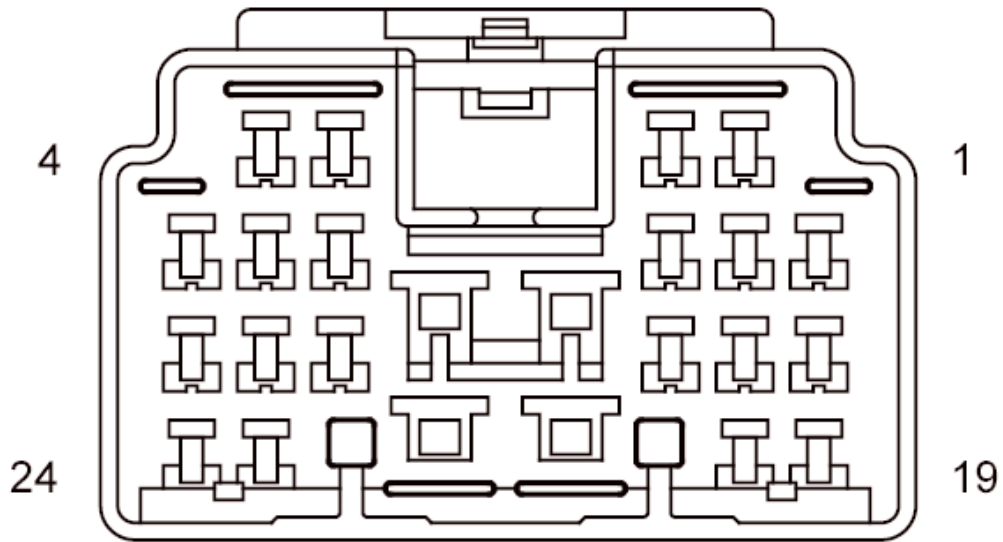


C307

CAV	CIRCUIT	FUNCTION
1	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)
2	P930 18TN/WT	LEFT FRONT DOOR LOCK DRIVER
3	Z913 18BK/PK	GROUND
4	Z913 14BK/RD	GROUND
5	-	-
6	Q411 14OR/WT	MASTER WINDOW SWITCH LEFT REAR (UP)
7	P235 16LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT (RHD)
8	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (LHD)
8	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (RHD)
9	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (LHD)
9	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (RHD)
10	-	-
11	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP)
12	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)

13	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN)
14	F30 14PK/YL	FUSED IGNITION SWITCH OUTPUT (RUN-ACC)
15	A215 14RD/LG	FUSED B(+) (POWER WINDOWS)
16	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN)
17	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP)
18	A855 20DG/RD	FUSED B(+) (EXCEPT POWER WINDOWS)
19	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT (EXCEPT POWER WINDOWS)
20	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
21	Z913 14BK/WT	GROUND (POWER WINDOWS)
22	Z913 14BK/TN	GROUND (LHD)
23	P910 18TN/LG	LEFT FRONT DOOR UNLOCK DRIVER
24	Z913 20BK/OR	GROUND (EXCEPT POWER WINDOWS)
24	A855 18DG/RD	FUSED B(+) (POWER WINDOWS)

C308 - 24 WAY FEMALE



C308

CAV	CIRCUIT	FUNCTION
1	-	-
2	P940 18TN/BR	RIGHT FRONT DOOR UNLOCK DRIVER
3	Z913 18BK/YL	GROUND
4	-	-
5	-	-
6	-	-
7	P235 14LG/TN	SECONDARY LOCK DRIVER (RHD)
8	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (LHD)
8	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (RHD)
9	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (LHD)
9	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (RHD)
10	-	-
11	-	-
12	P237 14DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
13	-	-
14	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT

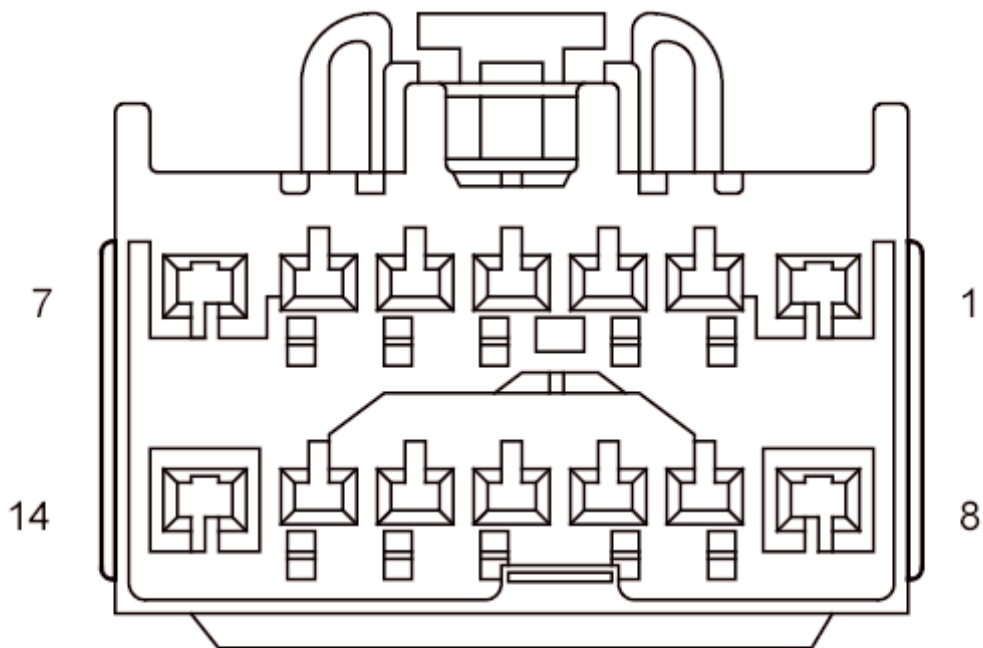
15	A214 14RD/LB	FUSED B(+)
16	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN)
17	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP)
18	-	-
19	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
20	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
21	Z913 14BK/WT	GROUND
22	-	-
23	P920 18LG/GY	RIGHT FRONT DOOR LOCK DRIVER
24	Z913 20BK/BR	GROUND (EXCEPT POWER WINDOWS)

C308 - 24 WAY MALE

C308		
CAV	CIRCUIT	FUNCTION
1	-	-
2	P940 18TN/BR	RIGHT FRONT DOOR UNLOCK DRIVER
3	Z913 18BK/YL	GROUND
4	-	-
5	-	-

6	-	-
7	P235 16LG/TN	SECONDARY LOCK DRIVER (RHD)
8	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (LHD)
8	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (RHD)
9	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (LHD)
9	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (RHD)
10	-	-
11	-	-
12	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
13	-	-
14	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT (LHD EXCEPT POWER WINDOWS)
15	A214 14RD/LB	FUSED B(+) (POWER WINDOWS)
16	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN) (LHD EXCEPT POWER WINDOWS)
17	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP) (LHD EXCEPT POWER WINDOWS)
18	-	-
19	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT (LHD EXCEPT POWER WINDOWS)
20	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT (LHD EXCEPT POWER WINDOWS)
21	Z913 14BK/WT	GROUND (POWER WINDOWS)
22	-	-
23	P920 18LG/GY	RIGHT FRONT DOOR LOCK DRIVER
24	Z913 20BK/BR	GROUND (LHD EXCEPT POWER WINDOWS)

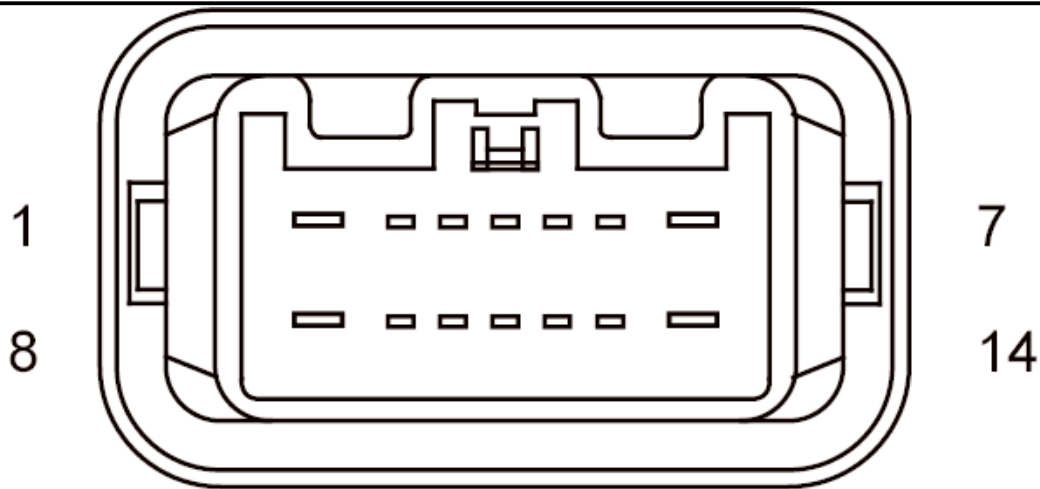
C309 - 14 WAY FEMALE



C309

CAV	CIRCUIT	FUNCTION
1	Z913 14BK/LB	GROUND
2	-	-
3	X295 18GY/DG	LEFT REAR SPEAKER (-)
4	X205 18GY/LG	LEFT REAR SPEAKER (+)
5	Z913 18BK/LG	GROUND
6	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
7	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
8	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)
9	P235 16LG/TN	SECONDARY LOCK DRIVER (RHD)
10	P5 18TN/OR	LEFT REAR DOOR UNLOCK DRIVER
11	P32 18TN/VT	LEFT REAR DOOR LOCK DRIVER
12	G77 20VT/GY	LEFT REAR DOOR AJAR SWITCH SENSE
13	-	-
14	Q411 14OR/WT	MASTER WINDOW SWITCH LEFT REAR (UP)

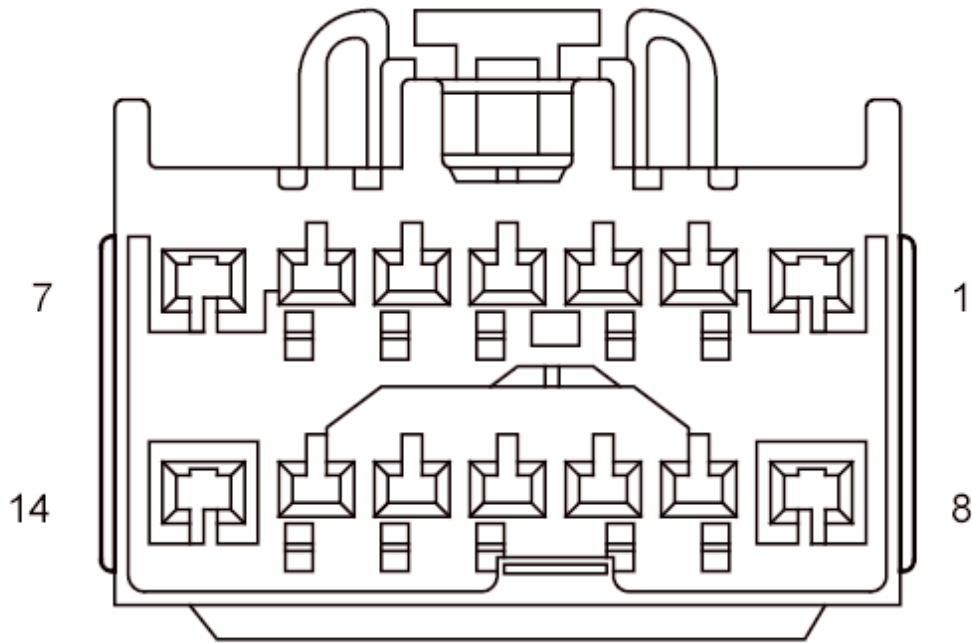
C309 - 14 WAY MALE



C309

CAV	CIRCUIT	FUNCTION
1	Z913 14BK/LB	GROUND
2	-	-
3	X295 18GY/DG	LEFT REAR SPEAKER (-)
4	X205 18GY/LG	LEFT REAR SPEAKER (+)
5	Z913 18BK/LG	GROUND
6	P237 14DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
7	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
8	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)
9	P235 14LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT (RHD)
10	P5 18TN/OR	LEFT REAR DOOR UNLOCK DRIVER
11	P32 18TN/VT	LEFT REAR DOOR LOCK DRIVER
12	G77 20VT/GY	LEFT REAR DOOR AJAR SWITCH SENSE
13	-	-
14	Q411 14OR/WT	MASTER WINDOW SWITCH LEFT REAR (UP)

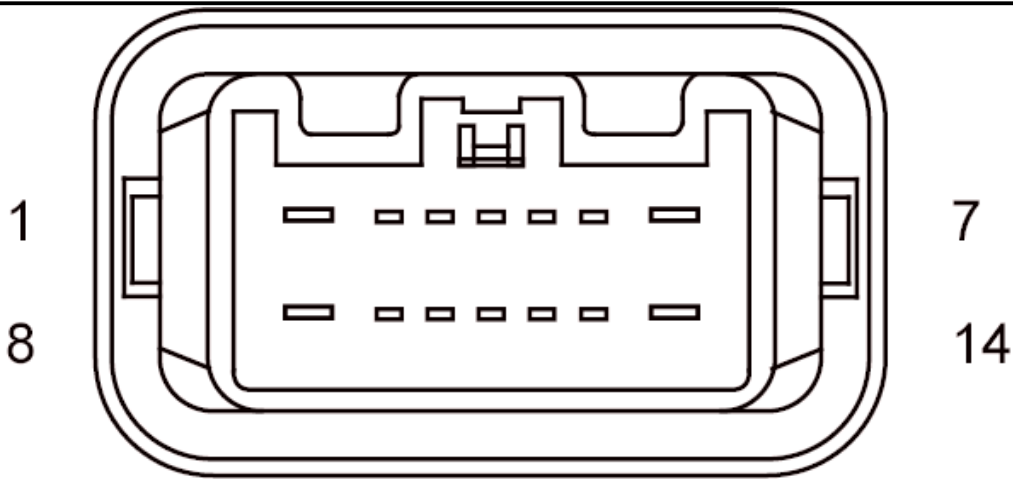
C310 - 14 WAY FEMALE



C310

CAV	CIRCUIT	FUNCTION
1	Z913 14BK/VT	GROUND
2	-	-
3	X296 18DG/GY	RIGHT REAR SPEAKER (-)
4	X206 18DG/LG	RIGHT REAR SPEAKER (+)
5	Z913 18BK/GY	GROUND
6	P237 14DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT (RHD)
7	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
8	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN)
9	P235 14LG/TN	SECONDARY LOCK DRIVER (RHD)
10	P34 18TN/LB	RIGHT REAR DOOR UNLOCK DRIVER
11	P38 18TN/DB	RIGHT REAR DOOR LOCK DRIVER
12	G76 20VT/YL	RIGHT REAR DOOR AJAR SWITCH SENSE
13	-	-
14	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP)

C310 - 14 WAY MALE

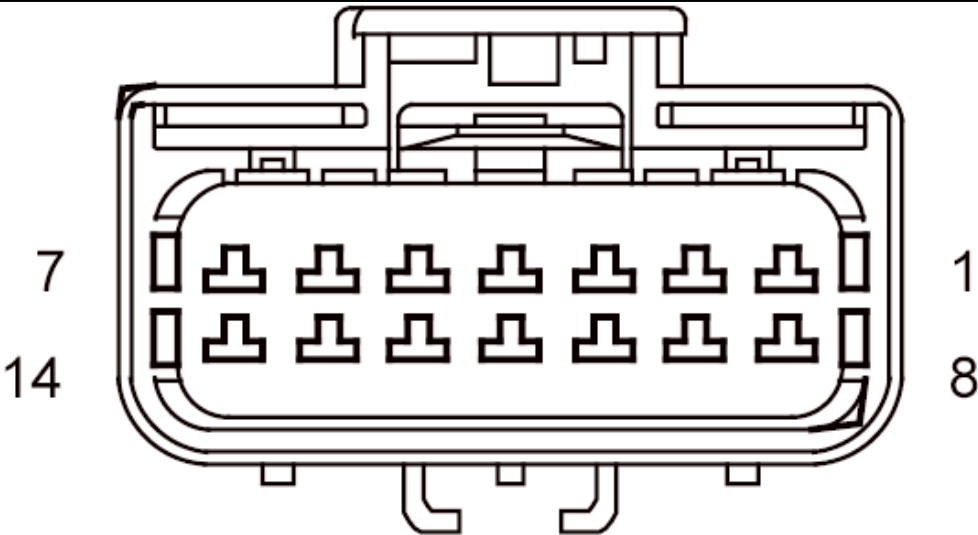


C310

CAV	CIRCUIT	FUNCTION
1	Z913 14BK/VT	GROUND (EXCEPT RHD BASE)
1	Z913 16BK/VT	GROUND (RHD BASE)
2	-	-
3	X296 18DG/GY	RIGHT REAR SPEAKER (-)
4	X206 18DG/LG	RIGHT REAR SPEAKER (+)
5	Z913 18BK/GY	GROUND
6	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
7	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT (EXCEPT RHD BASE)
7	Q15 16OR/LB	WINDOW LOCK OUT SWITCH OUTPUT (RHD BASE)
8	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN) (EXCEPT RHD BASE)
8	Q612 16OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN) (RHD BASE)
9	P235 16LG/TN	SECONDARY LOCK DRIVER
10	P34 16TN/LB	RIGHT REAR DOOR UNLOCK DRIVER
11	P38 16TN/DB	RIGHT REAR DOOR LOCK DRIVER

12	G76 20VT/YL	RIGHT REAR DOOR AJAR SWITCH SENSE
13	-	-
14	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP) (EXCEPT RHD BASE)
14	Q412 16OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP) (RHD BASE)

C311 - 14 WAY FEMALE

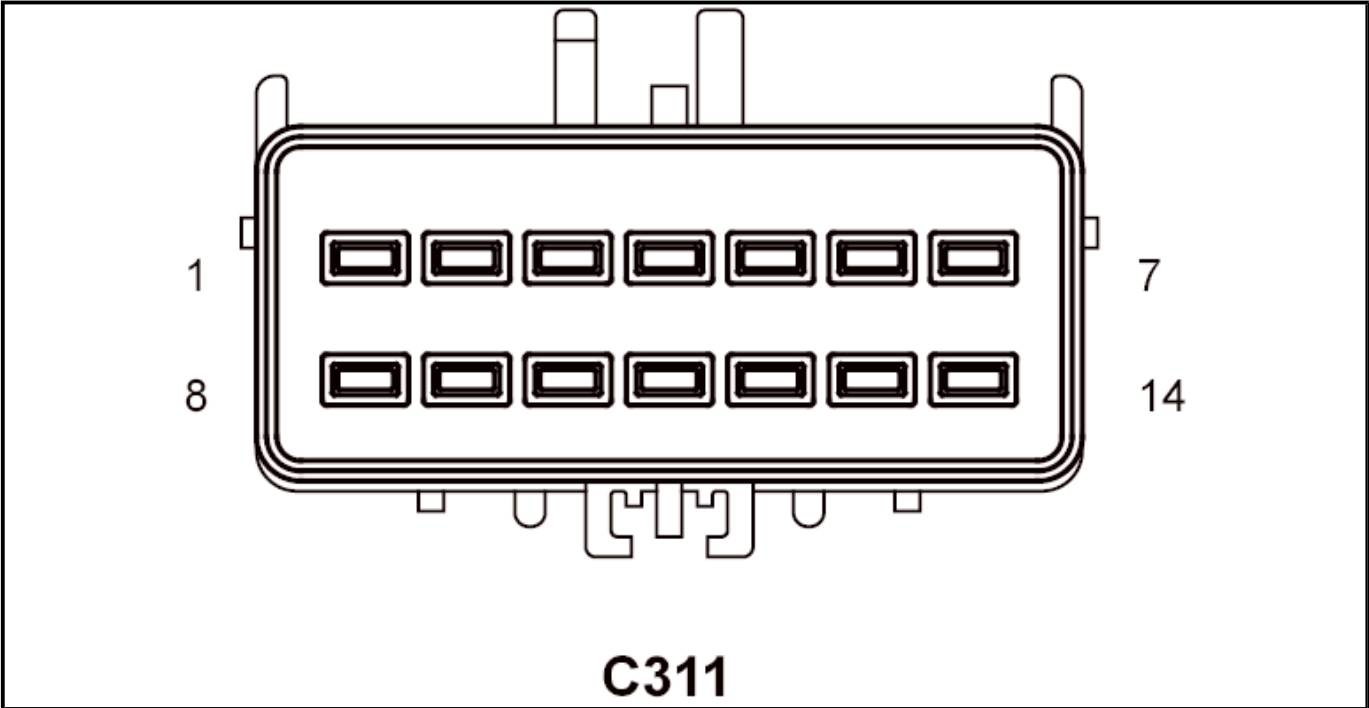


C311

CAV	CIRCUIT	FUNCTION
1	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER (LHD)
1	P188 16LG/VT	LEFT SEAT HEATER B(+) DRIVER (RHD)
2	D264 20WT/OR	CAN INTERIOR BUS (-)
3	D265G 20WT/GY	CAN INTERIOR BUS (+)
4	A210 14OR/RD	FUSED B(+)
5	Z913 14BK/OR	GROUND
6	A907 12RD	FUSED B(+)
7	-	-
8	R261 20LB/WT	DRIVER SEAT TRACK POSITION SENSOR SIGNAL (EXCEPT EXPORT)
9	R263 20LB/VT	DRIVER SEAT TRACK

		POSITION SENSOR SUPPLY (EXCEPT EXPORT)
10	Z914 16BK	GROUND
11	-	-
12	-	-
13	-	-
14	-	-

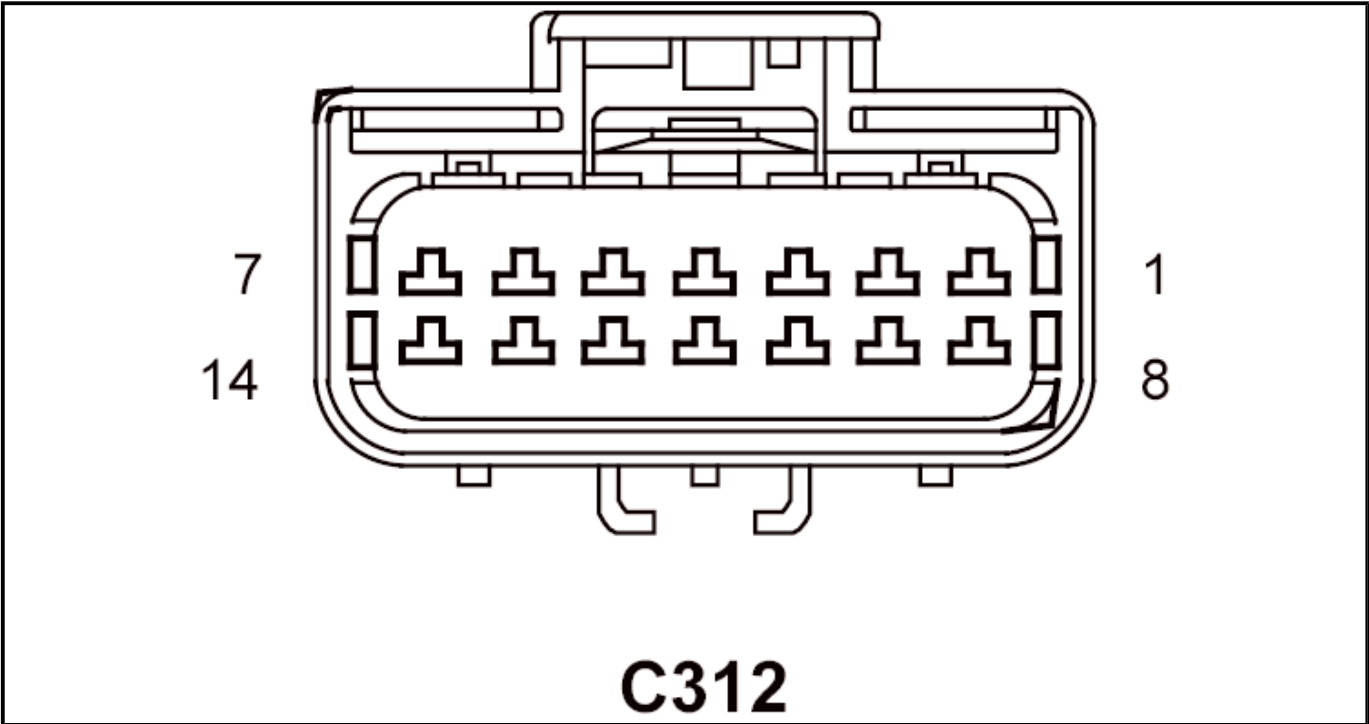
C311 - 14 WAY MALE



C311		
CAV	CIRCUIT	FUNCTION
1	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER (LHD)
1	P188 16LG/VT	RIGHT SEAT HEATER B(+) DRIVER (RHD)
2	D264 20WT/OR	CAN INTERIOR BUS (-)
3	D265 20WT/GY	CAN INTERIOR BUS (+)
4	A210 14OR/RD	FUSED B(+)
5	Z913 14BK/OR	GROUND
6	A907 12RD	FUSED B(+)
7	-	-
8	R261 20LB/WT	DRIVER SEAT TRACK POSITION SENSOR SIGNAL
9	R263 20LB/VT	DRIVER SEAT TRACK POSITION SENSOR SUPPLY
10	Z914 16BK	GROUND

11	-	-
12	-	-
13	-	-
14	-	-

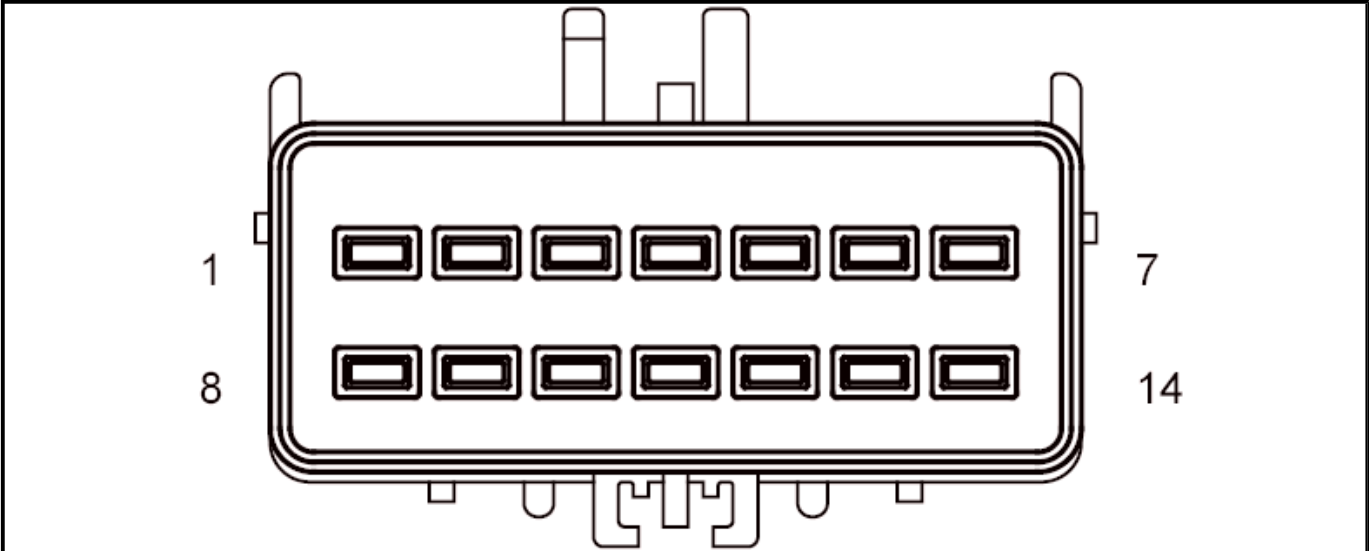
C312 - 14 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER (LHD)
1	P188 16LG/VT	RIGHT SEAT HEATER B(+) DRIVER (RHD)
2	A27 20RD/LB	FUSED B(+)
3	D64 20WT/LB	CAN C BUS (-)
4	D65 20WT/BK	CAN C BUS (+)
5	R262 20WT/LB	PASSENGER SEAT TRACK POSITION SENSOR SIGNAL
6	R264 20VT/LB	PASSENGER SEAT TRACK POSITION SENSOR SUPPLY
7	Z913 20BK/DG	GROUND (EXCEPT EXPORT)
7	Z913 20BK/LG	GROUND (EXPORT)
8	A210 14OR/RD	FUSED B(+)
9	P693 16LG/WT	HEATED SEAT MODULE SUPPLY
10	D65 20WT/BK	CAN C BUS (+)
11	D64 20WT/LB	CAN C BUS (-)

12	D506 20WT/DG	LIN BUS
13	Z914 16BK	GROUND
14	Z913 14BK	GROUND

C312 - 14 WAY MALE

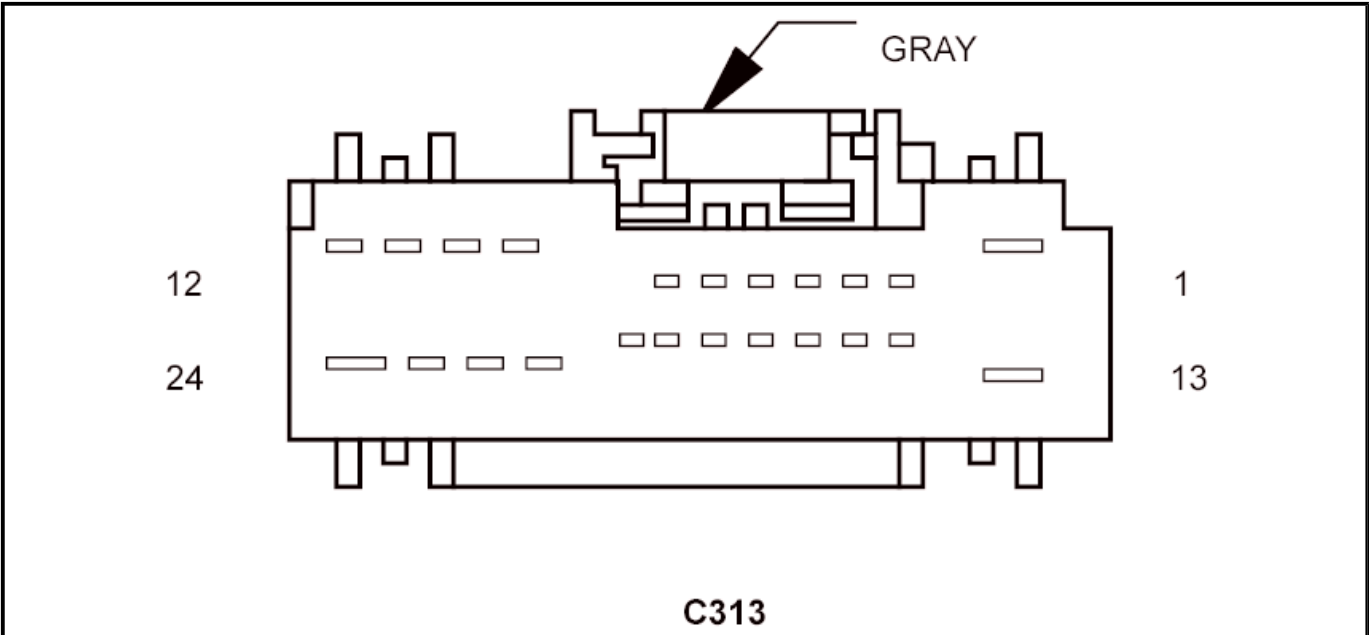


C312

CAV	CIRCUIT	FUNCTION
1	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER (LHD)
1	P188 16LG/VT	RIGHT SEAT HEATER B(+) DRIVER (RHD)
2	A27 20RD/LB	FUSED B(+)
3	D64 20WT/LB	CAN C BUS (-)
4	D65 20WT/BK	CAN C BUS (+)
5	R262 20WT/LB	PASSENGER SEAT TRACK POSITION SENSOR SIGNAL
6	R264 20VT/LB	PASSENGER SEAT POSITION SENSOR VOLTAGE (MEXICO)
7	Z913 20BK/DG	GROUND (BASE)
7	Z913 14BK	GROUND (EXCEPT BASE)
8	A210 14OR/RD	FUSED B(+)
9	P693 16LG/WT	HEATED SEAT MODULE SUPPLY (EXCEPT BASE)
10	D65 20WT/BK	CAN C BUS (+)
11	D64 20WT/LB	CAN C BUS (-)
12	D506 20WT/DG	LIN BUS (EXCEPT BASE)

13	Z914 16BK	GROUND (EXCEPT BASE)
14	Z913 20BK	GROUND (EXCEPT EXPORT)
14	Z913 14BK	GROUND (EXPORT)

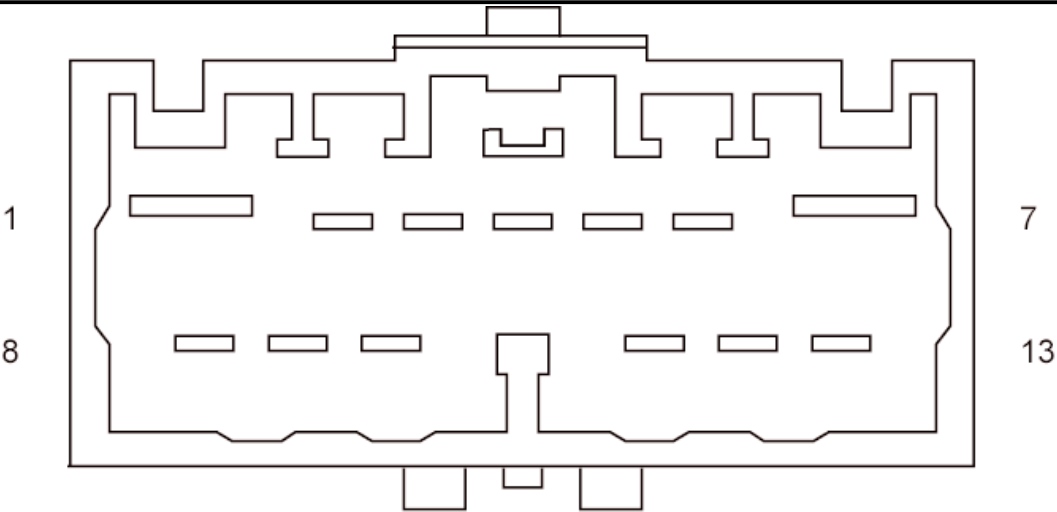
C313 - 24 WAY FEMALE



C313		
CAV	CIRCUIT	FUNCTION
1	P304 16LG/DB	LIFTGATE LOCK DRIVER
2	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE
3	-	-
4	D264 20WT/OR	CAN INTERIOR BUS (-)
5	D265 20VT/GY	CAN INTERIOR BUS (+)
6	-	-
7	-	-
8	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
9	G38 18GY	GARAGE DOOR OPENER ENABLE
10	W17 20BR/DB	REAR WIPER PARK SWITCH SENSE
11	X835 18OR/GY	SENSOR GROUND
12	X793 18DG/YL	MICROPHONE FEED
13	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
14	-	-
15	-	-
16	-	-
17	-	-

18	D777 20WT/GY	PARK ASSIST DISPLAY SIGNAL
19	X777 20DG/GY	PARK ASSIST DISPLAY SUPPLY
20	X779 20GY/OR	PARK ASSIST DISPLAY RETURN
21	X712 18DG/LB	MICROPHONE 1 IN (+)
22	X722 18LB/DG	MICROPHONE 2 IN (+)
23	X792 18LB/DG	MICROPHONE IN (-)
24	W13 16BR/LG	FUSED REAR WIPER MOTOR CONTROL OUTPUT

C313 - 13 WAY MALE

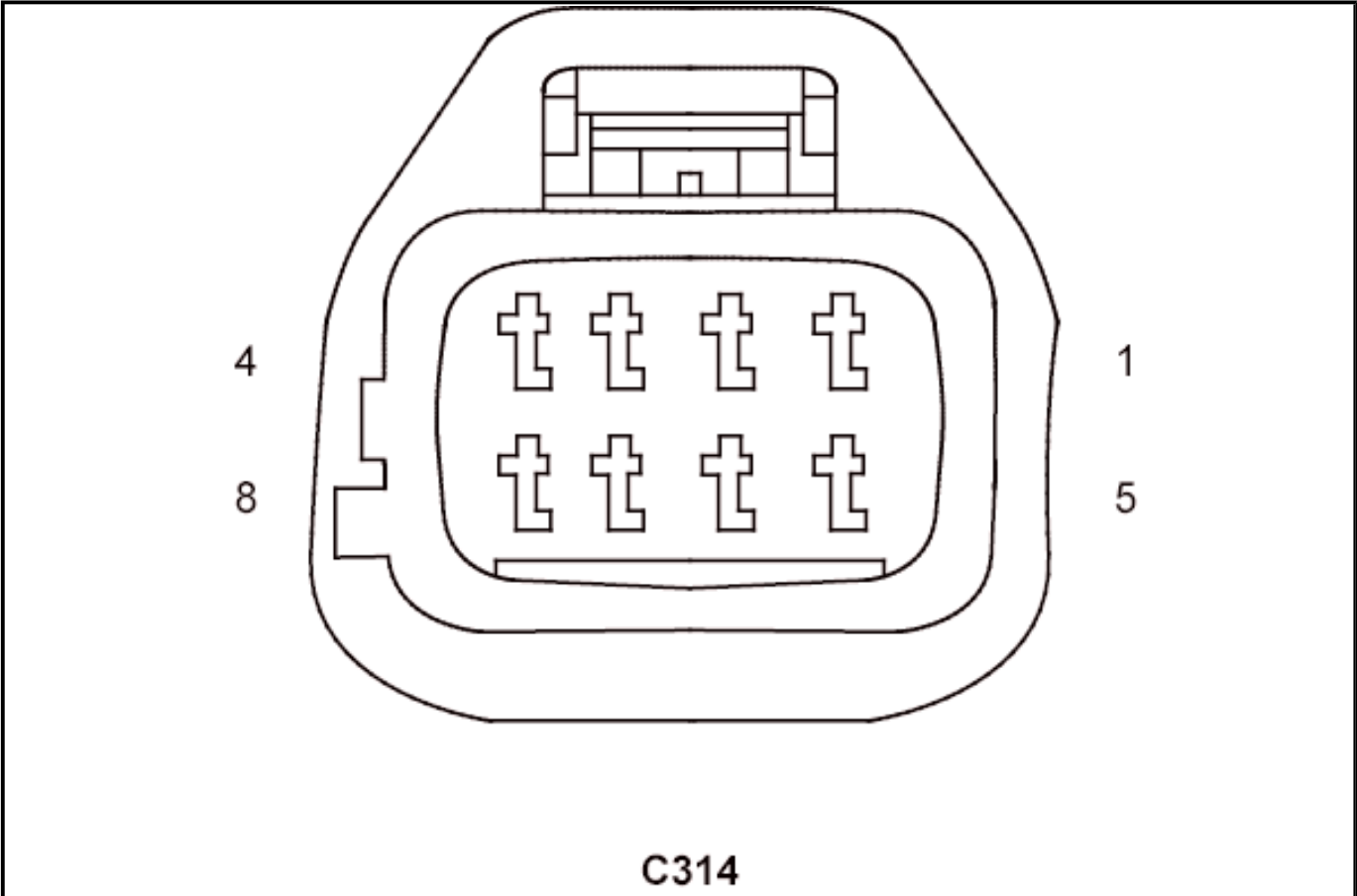


C313

CAV	CIRCUIT	FUNCTION
1	C15 12DB/WT	LIFTGATE LOCK DRIVER
2	F943 18PK/LG	LIFTGATE AJAR SWITCH SENSE
3	X712 22DG/LB	- (HANDS FREE)
4	X722 22LB/DG	CAN INTERIOR BUS (-) (HANDS FREE)
5	X792 22LB/DG	CAN INTERIOR BUS (+) (HANDS FREE)
6	L1 18WT/LG	-
7	Z920 12BK/OR	-
8	A906 12RD	LEFT REAR PARK LAMP CONTROL OUTPUT (LHD)
8	A906 16RD	REAR WIPER MOTOR

		CONTROL (RHD)
9	F306 16DB/PK	GARAGE DOOR OPENER ENABLE
10	X793 22DG/YL	REAR WIPER PARK SWITCH SENSE (HANDS FREE)
11	X835 22OR/GY	SENSOR GROUND (HANDS FREE)
12	Z919 20BK/DG	MICROPHONE FEED
13	Z919 12BK/TN	LIFTGATE UNLOCK DRIVER

C314 - 8 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	B4 18LG	LEFT REAR WHEEL SPEED SENSOR SUPPLY
2	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
3	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR SUPPLY
4	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL

5	-	-
6	P37 20LG/TN	DOOR LOCK SWITCH GROUND
7	N4 18DB/WT	FUEL LEVEL SIGNAL
8	N1 16DB/OR	FUSED FUEL PUMP OUTPUT

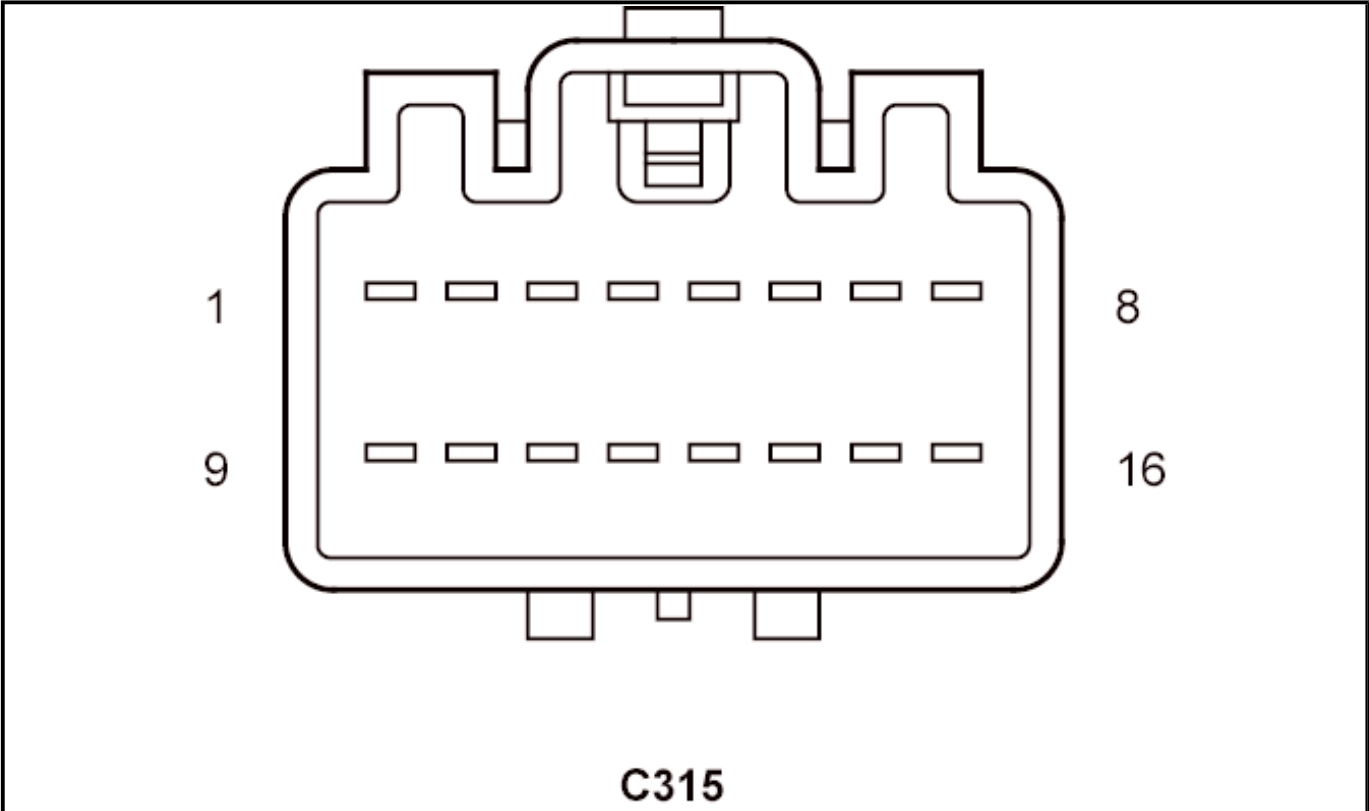
C314 - 8 WAY MALE

C314

CAV	CIRCUIT	FUNCTION
1	B4 18LG	LEFT REAR WHEEL SPEED SENSOR SUPPLY
2	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
3	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR SUPPLY
4	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL
5	-	-
6	K91 18DB/YL	SENSOR GROUND

7	N4 18DB/WT	FUEL LEVEL SIGNAL
8	N1 16DB/OR	FUSED FUEL PUMP OUTPUT

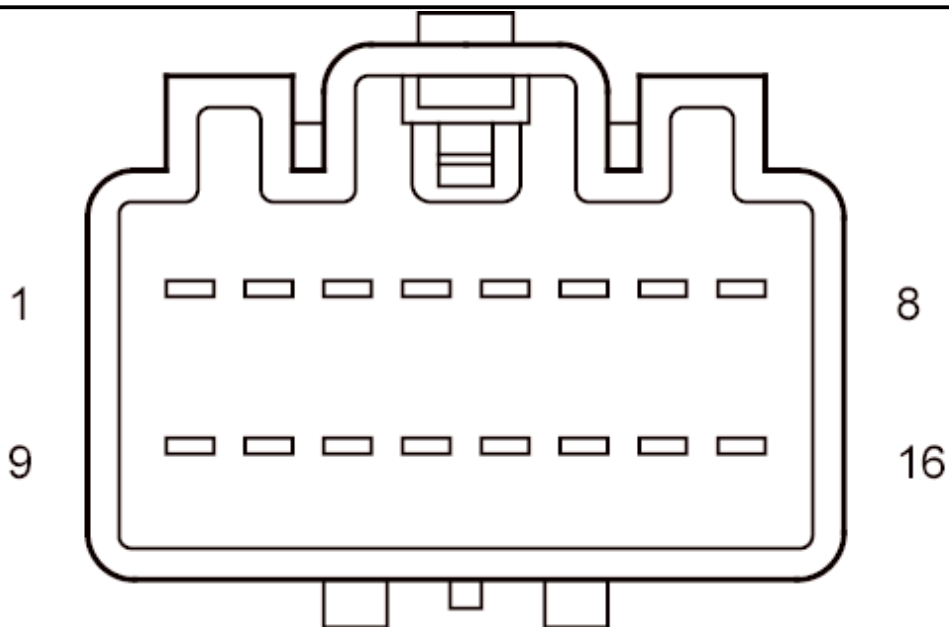
C315 - 16 WAY FEMALE



C315

CAV	CIRCUIT	FUNCTION
1	X534 18GY/BR	VIDEO SIGNAL 1
2	X535 18GY/YL	VIDEO COMMON 1
3	X536 18BK/BK	VIDEO SHIELD 1
4	X538 18DG/WT	AUDIO RIGHT 1
5	X539 18DG/TN	AUDIO LEFT 1
6	X540 18GY/VT	AUDIO RETURN 1
7	-	-
8	A116 16YL/RD	FUSED B(+) (I.O.D.)
9	Z919 18BK/DB	GROUND
10	X544 18DG/DB	AUDIO RIGHT 2
11	X545 18DG/LB	AUDIO LEFT 2
12	X546 18GY/OR	AUDIO RETURN 2
13	X550 18DG/YL	AUDIO RIGHT 3
14	X551 18DG/VT	AUDIO LEFT 3
15	X552 18GY/LB	AUDIO RETURN 3
16	-	-

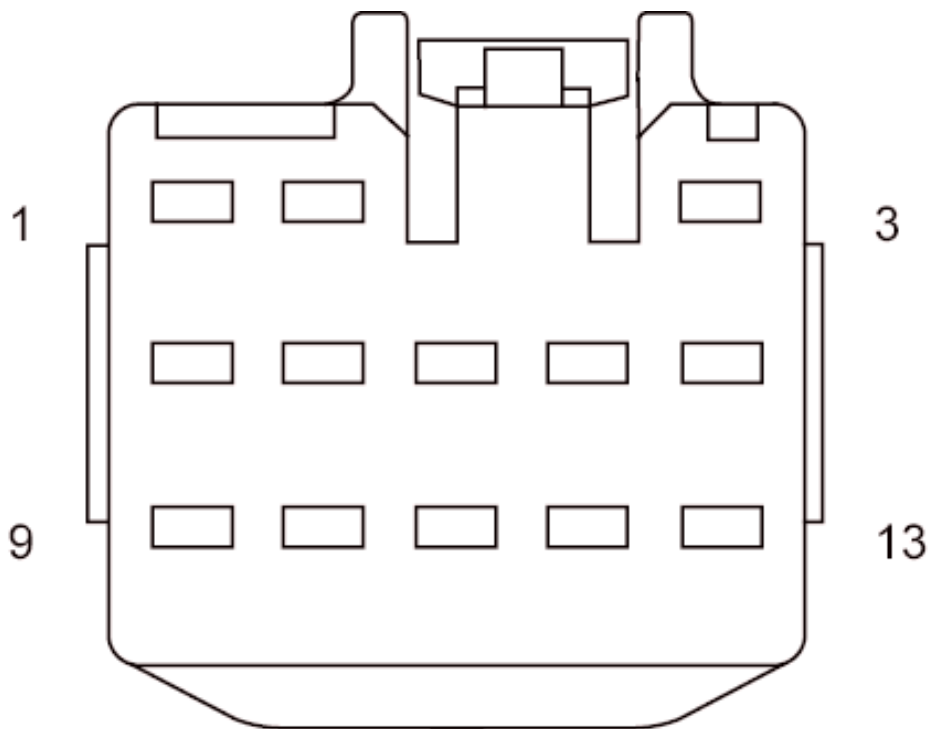
C315 - 16 WAY MALE



C315

CAV	CIRCUIT	FUNCTION
1	X534 18GY/BR	VIDEO SIGNAL 1
2	X535 18GY/YL	VIDEO COMMON 1
3	X536 18BK/BK	VIDEO SHIELD 1
4	X538 18DG/WT	AUDIO RIGHT 1
5	X539 18DG/TN	AUDIO LEFT 1
6	X540 18GY/VT	AUDIO RETURN 1
7	-	-
8	A116 16YL/RD	FUSED B(+) (I.O.D.)
9	Z919 18BK/DB	GROUND
10	X544 18DG/DB	AUDIO RIGHT 2
11	X545 18DG/LB	AUDIO LEFT 2
12	X546 18GY/OR	AUDIO RETURN 2
13	X550 18DG/YL	AUDIO RIGHT 3
14	X551 18DG/VT	AUDIO LEFT 3
15	X552 18GY/LB	AUDIO RETURN 3
16	-	-

C316 - 13 WAY FEMALE

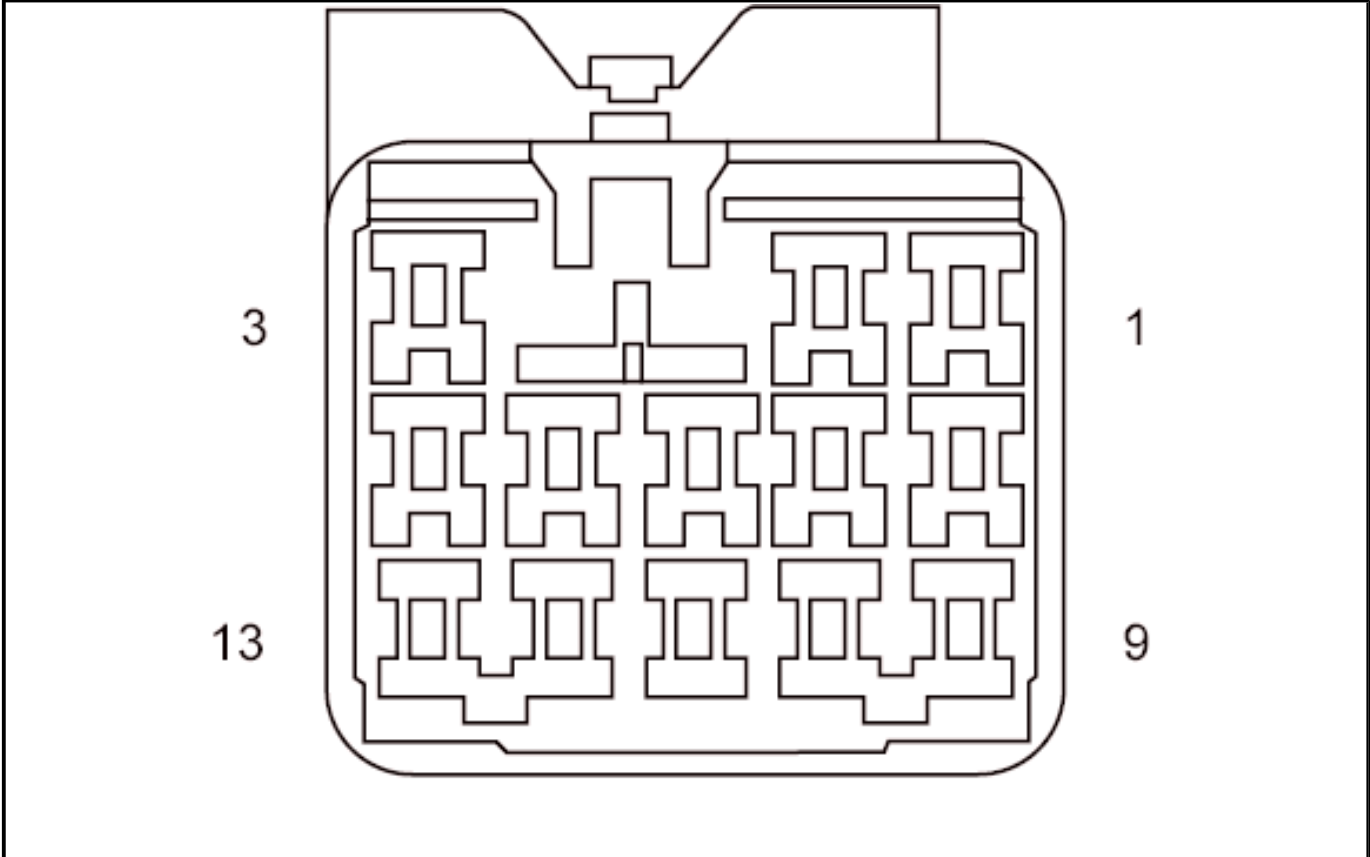


C316

CAV	CIRCUIT	FUNCTION
1	P76 20TN/LB	MIRROR COMMON DRIVER (BASE AUDIO)
1	D264 20WT/OR	CAN INTERIOR BUS (-) (PREMIUM AUDIO)
2	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER (BASE AUDIO)
2	D265 20WT/GY	CAN INTERIOR BUS (+) (PREMIUM AUDIO)
3	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER
4	G160 20VT/LG	PASSENGER DOOR LOCK SWITCH MUX
5	G74 20VT/WT	PASSENGER DOOR AJAR SWITCH SENSE (LHD)
5	G75 20VT	DRIVER DOOR AJAR SWITCH SENSE (RHD)
6	P37 20LG/TN	DOOR LOCK SWITCH RETURN
7	-	-

8	F306 16DB/PK	FUSED ACCESSORY RELAY OUTPUT
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-

C316 - 13 WAY MALE

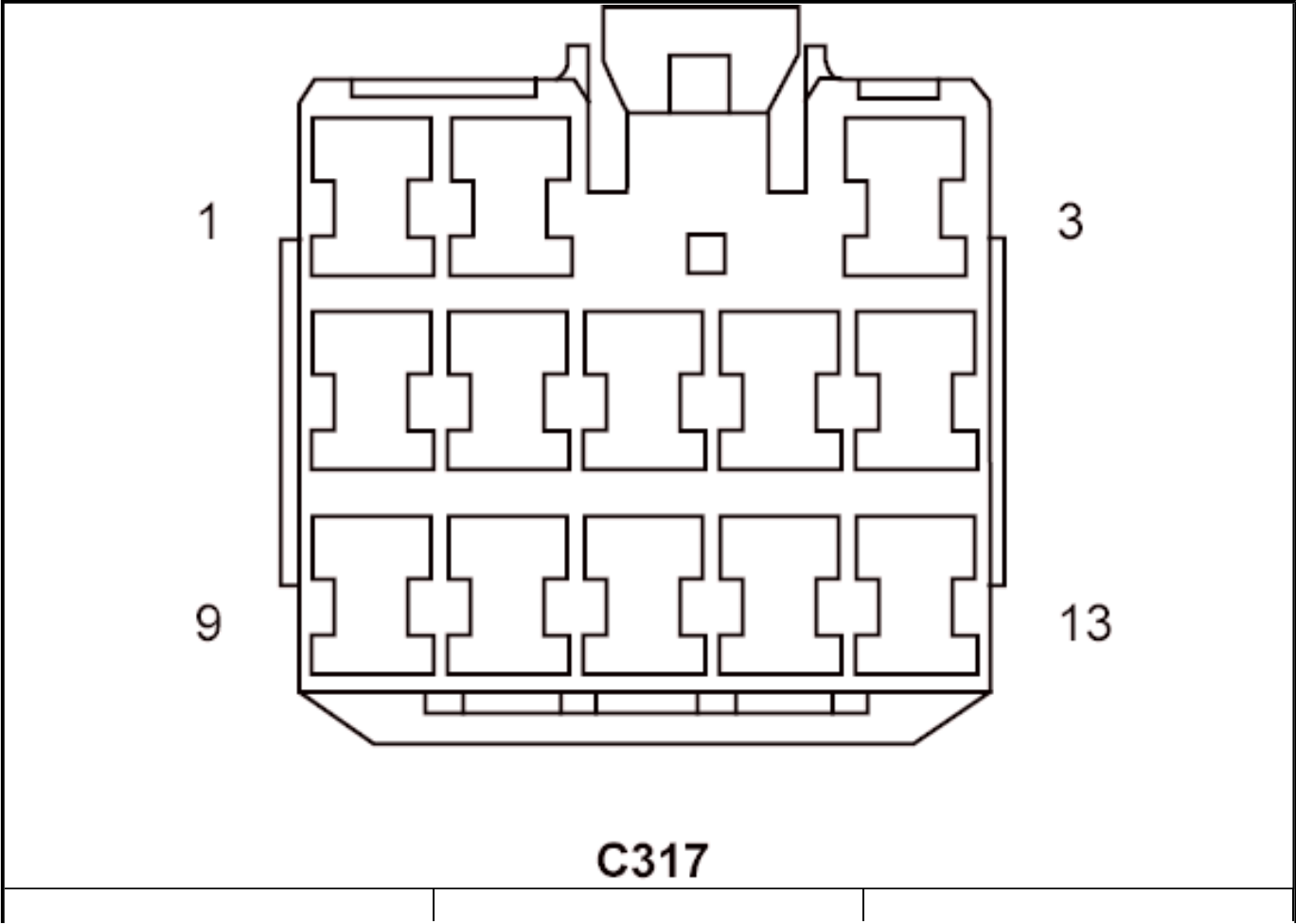


C316

CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-)
1	P76 20TN/LB	MIRROR COMMON DRIVER (MAN FOLDING OSRV MIRRORS)
2	D265 20WT/GY	CAN INTERIOR BUS (+)
2	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER (MAN FOLDING OSRV MIRRORS)
3	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER (MAN

		FOLDING OSRV MIRRORS)
4	G160 20VT/LG	RIGHT DOOR LOCK SWITCH MUX (LHD)
5	G74 20VT/WT	PASSENGER DOOR AJAR SWITCH SENSE (LHD)
5	G75 20VT	DOOR AJAR SWITCH SENSE (RHD)
6	P37 20LG/TN	DOOR LOCK SWITCH GROUND
7	-	-
8	F306 18DB/PK	FUSED ACCESSORY RELAY OUTPUT (UGDO)
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-

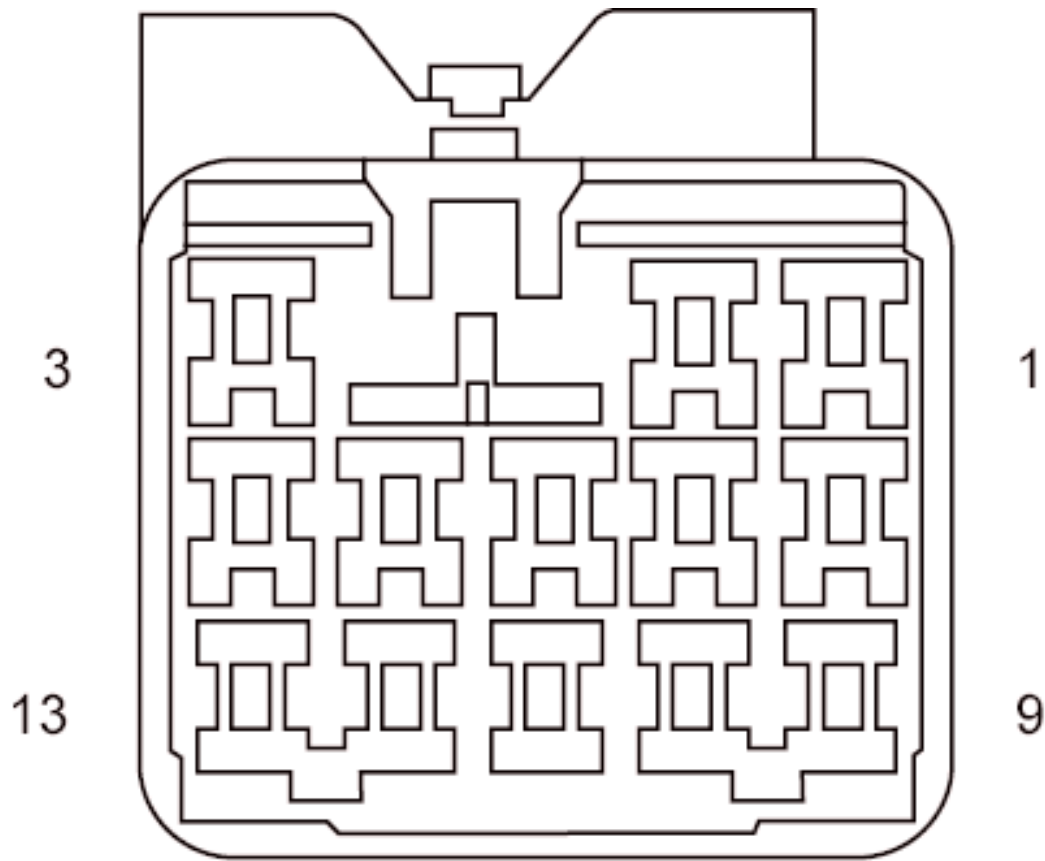
C317 - 16 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-) (EXCEPT LHD BASE)
1	P76 20TN/LB	MIRROR COMMON DRIVER (LHD BASE)
2	D265 20WT/GY	CAN INTERIOR BUS (+) (EXCEPT LHD BASE)
2	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER (LHD BASE)
3	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER (LHD BASE)
4	-	-
5	G75 20VT	DRIVER DOOR AJAR SWITCH SENSE
6	P37 20LG/TN	DOOR LOCK SWITCH RETURN (LHD BASE)
6	G200 20VT/BR	MEMORY SEAT SET SWITCH MUX (LHD EXCEPT BASE)
7	G161 20VT/DG	DRIVER DOOR LOCK SWITCH MUX (LHD BASE)
7	G920 20VT/YL	MEMORY SEAT SWITCH RETURN (LHD EXCEPT BASE)
8	G200 20VT/BR	MEMORY SEAT SET SWITCH MUX (RHD)
9	D264 20WT/OR	CAN INTERIOR BUS (-) (RHD GAS EXPORT)
10	-	-
11	G920 20VT/YL	MEMORY SEAT SWITCH RETURN (RHD)
12	-	-
13	Z913 14BK/TN	GROUND (RHD)

C317 - 13 WAY MALE

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C317

CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-) (EXCEPT LHD BASE)
1	P76 20TN/LB	MIRROR COMMON DRIVER (LHD BASE)
2	D265 20WT/GY	CAN INTERIOR BUS (+) (EXCEPT LHD BASE)
2	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER (LHD BASE)
3	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER (LHD BASE)
4	-	-
5	G75 20VT	DRIVER DOOR AJAR SWITCH SENSE
6	G200 20VT/BR	MEMORY SEAT SET SWITCH

		MUX (EXCEPT LHD BASE)
6	P37 20LG/TN	DOOR LOCK SWITCH RETURN (LHD BASE)
7	G920 20VT/YL	MEMORY SEAT SWITCH RETURN (EXCEPT LHD BASE)
7	G161 20VTDG	DRIVER DOOR LOCK SWITCH MUX (LHD BASE)
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-

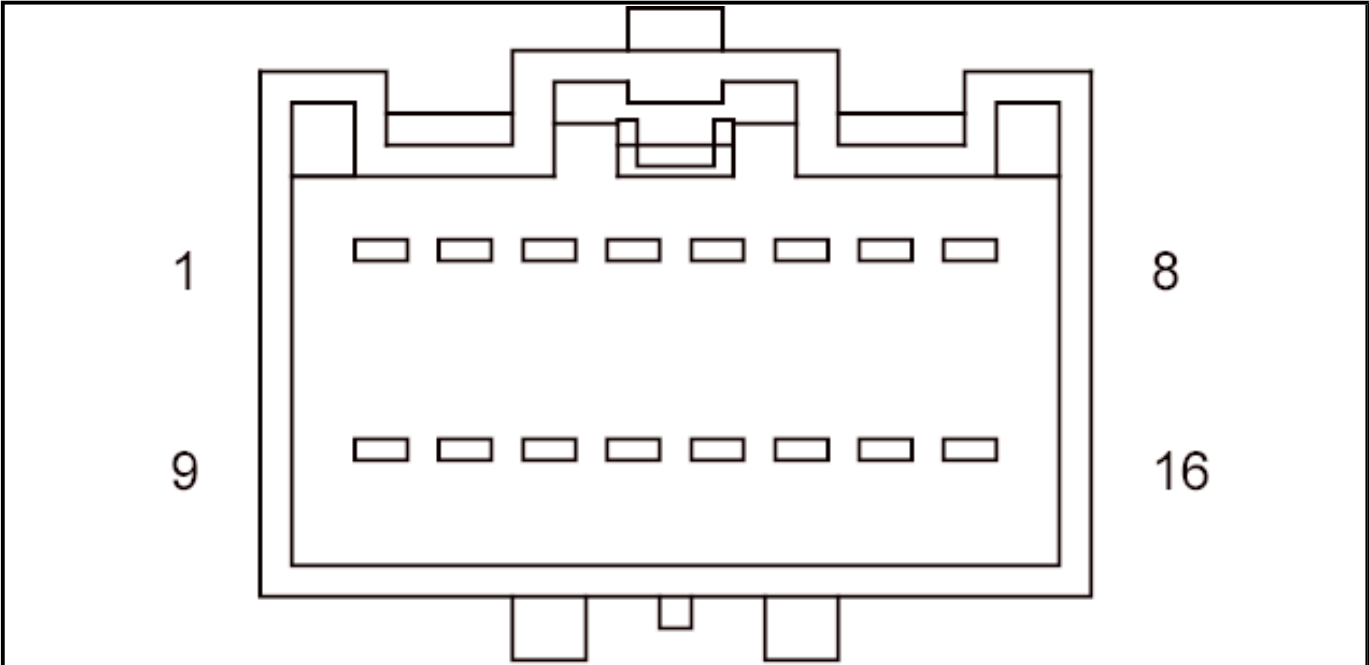
C318 - 16 WAY FEMALE

C318

CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-)
2	D265 20WT/GY	CAN INTERIOR BUS (+)
3	X541 18GY/LB	NVIDEO SIGNAL 2
4	X542 18GY/YL	VIDEO COMMON 2
5	X543 18BK/BK	VIDEO SHIELD 2
6	X519 20DG/VT	AUX AUDIO COMMON NO. 2

7	X521 20GY/LB	AUX AUDIO LEFT SIGNAL NO. 2
8	X522 20GY/DB	AUX AUDIO RIGHT SIGNAL NO. 2
9	X531 20GY/LB	AUX VIDEO SIGNAL NO. 2
10	X532 20BK	AUX VIDEO COMMON NO. 2
11	X533 20DG/OR	AUX VIDEO SHIELD NO. 2
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

C318 - 16 WAY MALE



C318

CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-)
2	D265 20WT/GY	CAN INTERIOR BUS (+)
3	X541 18GY/LB	VIDEO SIGNAL 2
4	X542 18GY/YL	VIDEO COMMON 2
5	X543 18BK/BK	VIDEO SHIELD 2
6	X519 20DG/VT	AUX AUDIO COMMON NO. 2

7	X521 20GY/LB	AUX AUDIO LEFT SIGNAL NO. 2
8	X522 20GY/DB	AUX AUDIO RIGHT SIGNAL NO. 2
9	X531 20GY/LB	AUX VIDEO SIGNAL NO. 2
10	X532 20BK	AUX VIDEO COMMON NO. 2
11	X533 20DG/OR	AUX VIDEO SHIELD NO. 2
12	-	-
13	-	-
14	-	-
15	D264 20WT/OR	CAN INTERIOR BUS (-)
16	D265 20WT/GY	CAN INTERIOR BUS (+)

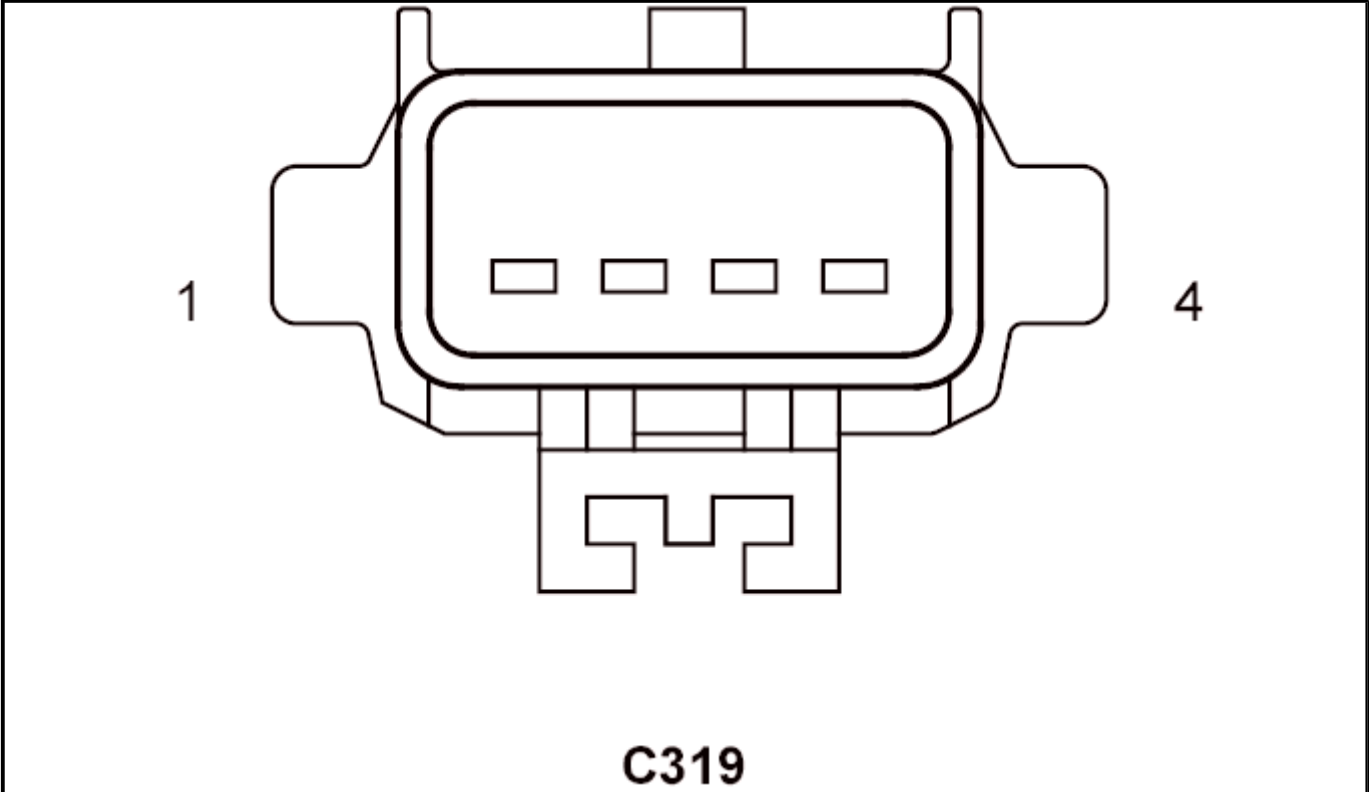
C319 - 4 WAY FEMALE

C319

CAV	CIRCUIT	FUNCTION
1	R57 20LG/GY	DRIVER SEAT BELT SWITCH SENSE
2	Z913 20BK/WT	GROUND
3	R55 20LG/DG	DRIVER SEAT BELT TENSIONER LINE 1 (EXCEPT LHD EXPORT PREMIUM AUDIO)
3	R55 20LB/VT	DRIVER SEAT BELT TENSIONER LINE 1 (LHD

		EXPORT PREMIUM AUDIO)
4	R53 20LG/YL	DRIVER SEAT BELT TENSIONER LINE 2

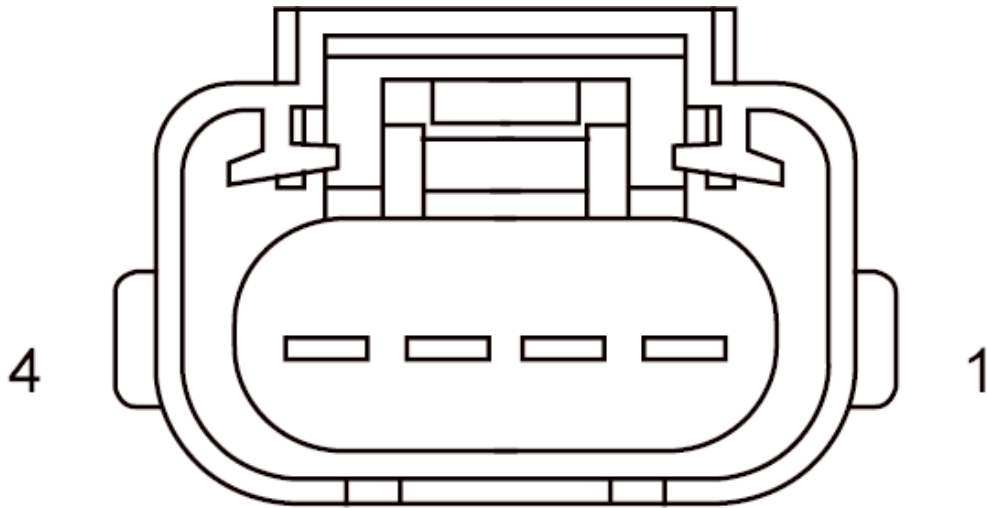
C319 - 4 WAY MALE



CAV	CIRCUIT	FUNCTION
1	R57 20LG/GY	DRIVER SEAT BELT SWITCH SENSE (EXCEPT LHD BASE)
1	R57 18LG/GY	DRIVER SEAT BELT SWITCH SENSE (LHD BASE)
2	Z913 20BK/WT	GROUND (EXCEPT LHD BASE)
2	Z913 18BK	GROUND (LHD BASE)
3	R55 20LG/DG	DRIVER SEAT BELT TENSIONER LINE 1
4	R53 20LG/YL	DRIVER SEAT BELT TENSIONER LINE 2

C320 - 4 WAY FEMALE





C320

CAV	CIRCUIT	FUNCTION
1	R58 20LB/GY	PASSENGER SEAT BELT SWITCH SIGNAL
2	R60 20LB/TN	PASSENGER SEAT BELT SWITCH GROUND
3	R56 20LB/DG	LEFT SEAT BELT TENSIONER LINE 1
4	R54 20LB/YL	LEFT SEAT BELT TENSIONER LINE 2

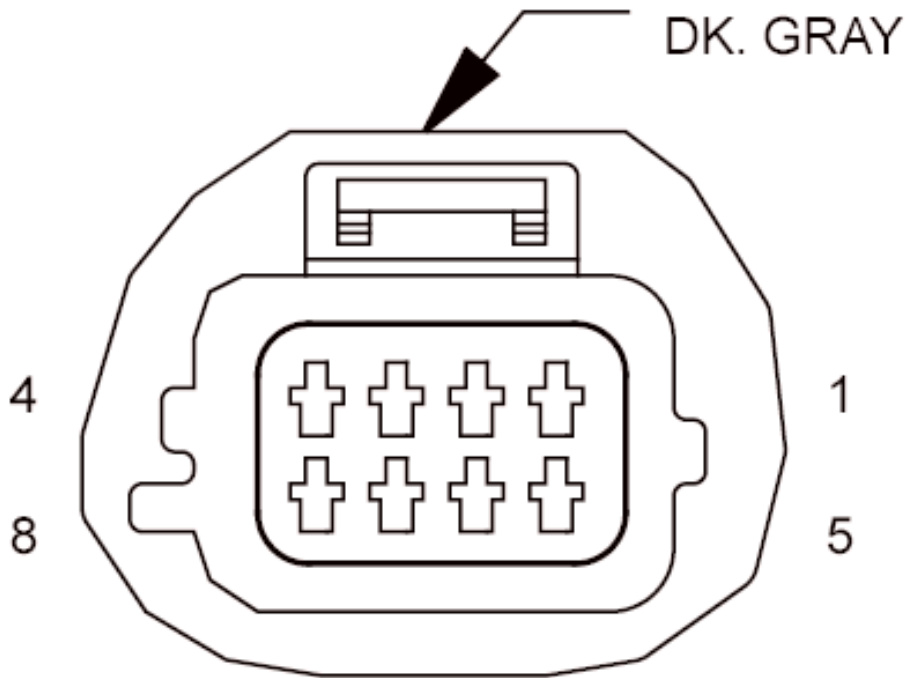
C320 - 4 WAY MALE



C320

CAV	CIRCUIT	FUNCTION
1	R58 20LB/GY	PASSENGER SEAT BELT SWITCH SIGNAL
2	R60 20LB/TN	PASSENGER SEAT BELT SWITCH GROUND
3	R56 20LB/DG	LEFT SEAT BELT TENSIONER LINE 1
4	R54 20LB/YL	LEFT SEAT BELT TENSIONER LINE 2

C321 - 8 WAY FEMALE

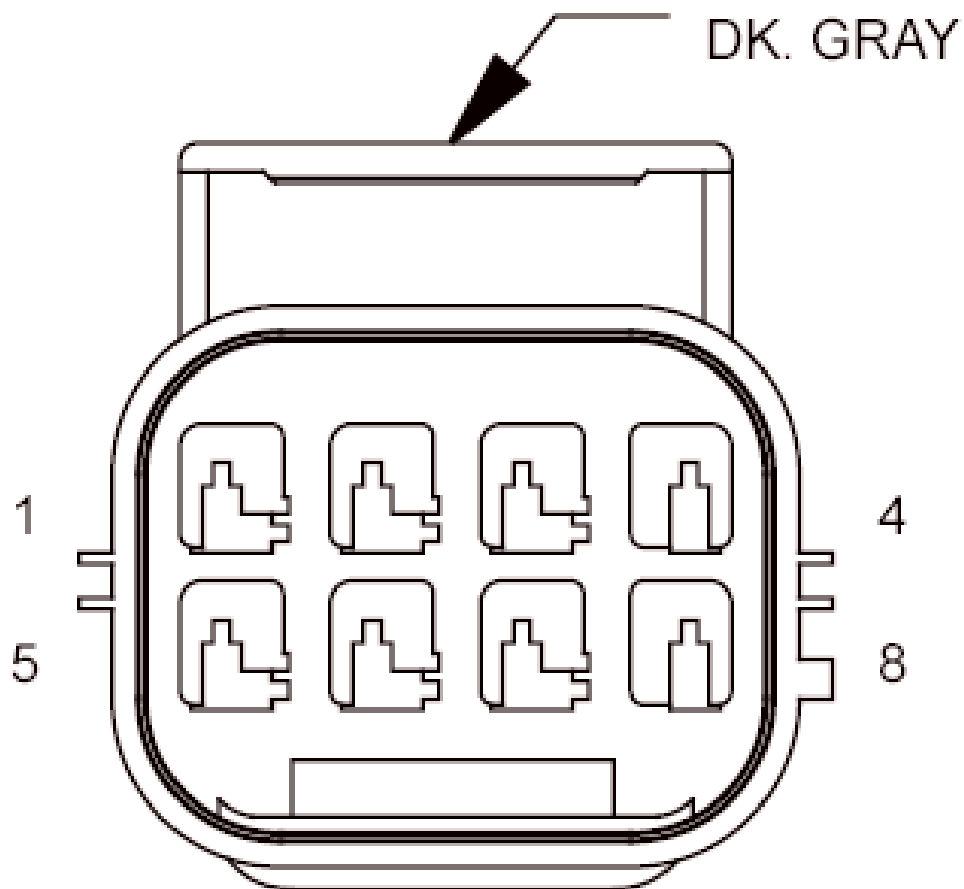


C321

(EXPORT)

CAV	CIRCUIT	FUNCTION
1	D710 20WT	PARK ASSIST SENSOR NO. 1 SIGNAL
2	D701 20WT/LB	PARK ASSIST SENSOR NO. 2 SIGNAL
3	D703 20WT/OR	PARK ASSIST SENSOR NO. 3 SIGNAL
4	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
5	D704 20WT/DG	PARK ASSIST SENSOR NO. 10 SIGNAL
6	X750 20GY/LB	PARK ASSIST SENSOR GROUND
7	-	-
8	-	-

C321 - DK. GRAY 8 WAY (EXPORT) MALE



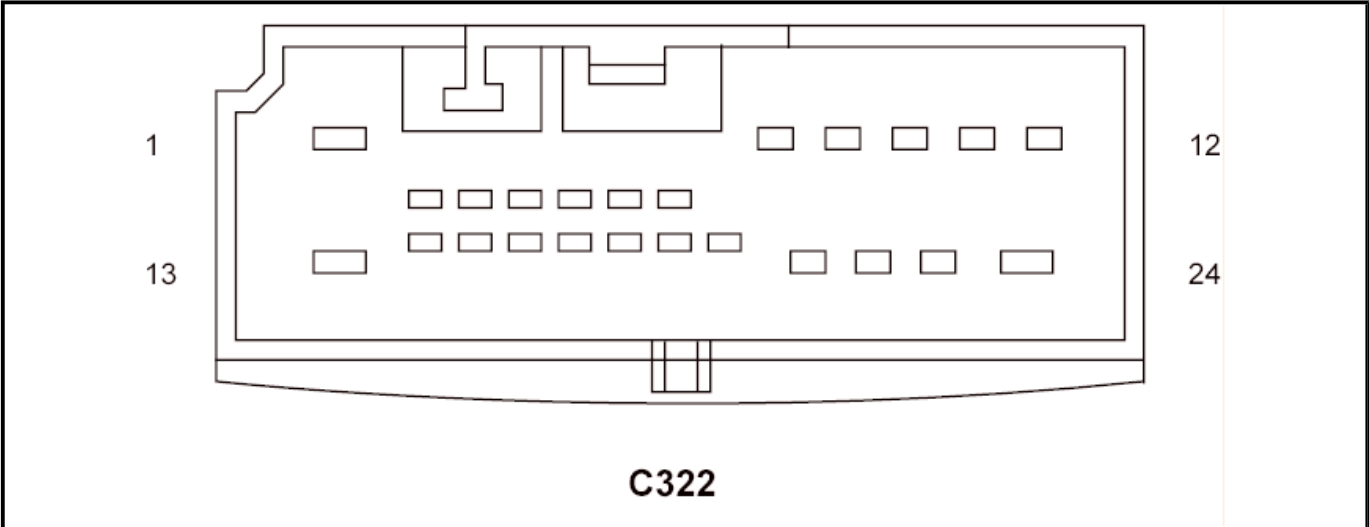
C321

(EXPORT)

CAV	CIRCUIT	FUNCTION
1	D710 20WT	PARK ASSIST SENSOR NO. 11 SIGNAL
2	D701 20WT/LB	PARK ASSIST SENSOR NO. 2 SIGNAL
3	D703 20WT/OR	PARK ASSIST SENSOR NO. 3 SIGNAL
4	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
5	D704 20WT/DG	PARK ASSIST SENSOR NO. 10 SIGNAL
6	X750 20GY/LB	PARK ASSIST SENSOR GROUND

7	-	-
8	-	-

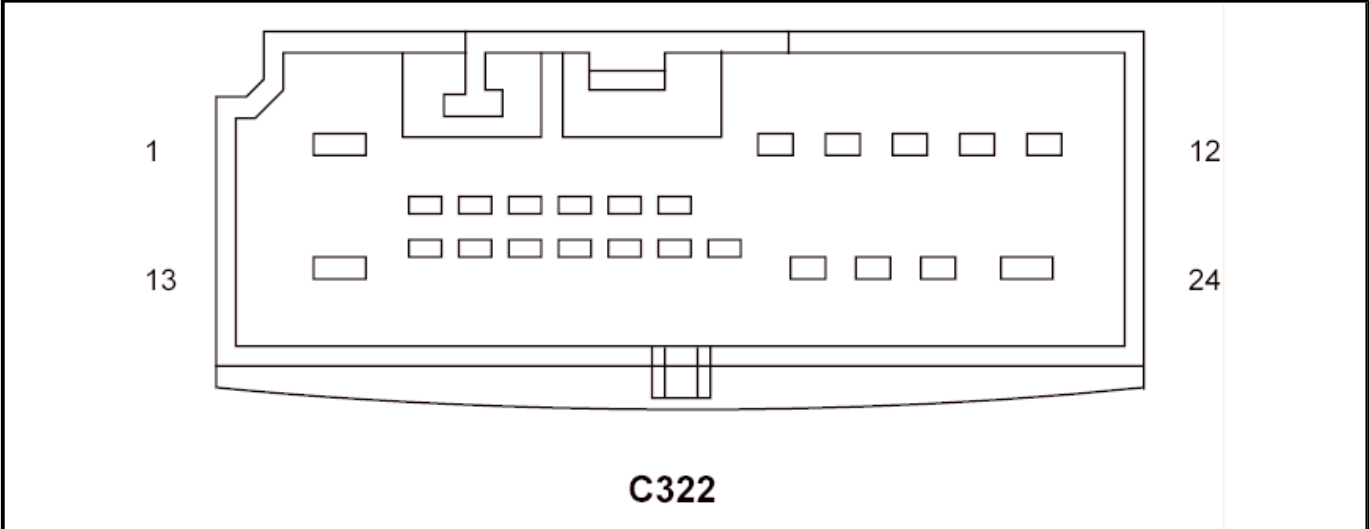
C322 - 24 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
2	-	-
3	-	-
4	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE
5	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
6	-	-
7	-	-
8	A408 18WT/RD	FUSED B(+)
9	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
10	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT
11	-	-
12	Z919 18BK/LG	GROUND
13	-	-
14	D264 20WT/OR	CAN INTERIOR BUS (124K) (-)
15	D265 20WT/GY	CAN INTERIOR BUS (124K) (+)
16	-	-
17	-	-
18	-	-
19	D264 20WT/OR	CAN INTERIOR BUS (124K) (-)

20	D265 20WT/GY	CAN INTERIOR BUS (124K) (+)
21	-	-
22	-	-
23	Z919 18BK/DB	GROUND
24	Z920 16BK/LG	GROUND

C322 - 24 WAY MALE



CAV	CIRCUIT	FUNCTION
1	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
2		-
3		-
4	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE
5	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
6		-
7		-
8	A408 18WT/RD	FUSED B(+)
9	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
10	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT
11		-
12	Z919 18BK/LG	-
13		-
14	D264 20WT/OR	CAN INTERIOR BUS (124K) (-)
15	D265 20WT/GY	CAN INTERIOR BUS (124K) (+)
16		-

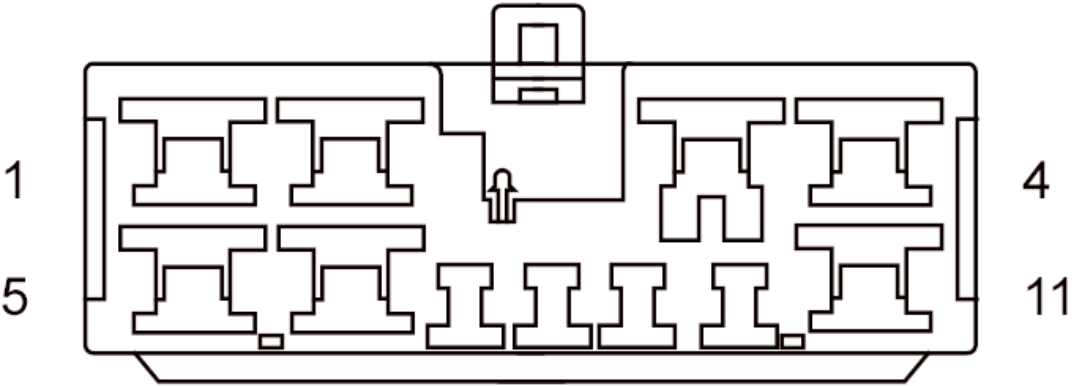
17		-
18		-
19	D264 20WT/OR	CAN INTERIOR BUS (124K) (-)
20	D265 20WT/GY	CAN INTERIOR BUS (124K) (+)
21		-
22		-
23	Z919 18BK/DB	GROUND
24	Z920 16BK/LG	GROUND

C323 - 11 WAY FEMALE

C323

CAV	CIRCUIT	FUNCTION
1	Z920 12BK/OR	GROUND
2	Z920 16BK/LG	GROUND
3	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
4	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT-
5	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
6	W13 16BR/LG	FUSED REAR WIPER MOTOR CONTROL OUTPUT
7	-	-
8	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT
9	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
10	A408 16WT/RD	FUSED B(+)
11	P304 16LG/DB	LIFTGATE LOCK DRIVER

C323 - 11 WAY MALE

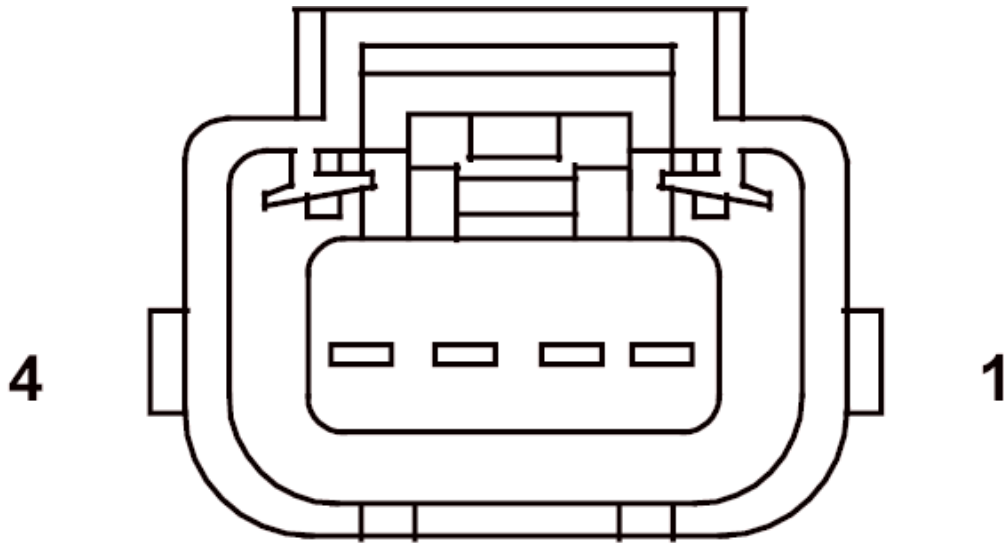


C323

CAV	CIRCUIT	FUNCTION
1	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
2	W13 16BR/LG	REAR WIPER MOTOR CONTROL
3	-	-
4	-	-
5	P304 16LG/DB	LIFTGATE LOCK DRIVER
6	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
7	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT
8	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
9	W17 20BR/DB	REAR WIPER PARK SWITCH SENSE
10	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE
11	Z920 12BK/OR	GROUND

C324 - 4 WAY FEMALE





C324

CAV	CIRCUIT	FUNCTION
1	R8120LB/WT	LEFT FRONT IMPACT SENSOR GROUND
2	R79 20LB/VT	LEFT FRONT IMPACT SENSOR SIGNAL
3	-	-
4	-	-

C324 - 4 WAY MALE



4

CAV

1

CIRCUIT

R81 20LB/WT

FUNCTION

LEFT FRONT IMPACT
SENSOR GROUND

2

R79 20LB/VT

LEFT FRONT IMPACT SENSOR SIGNAL

3

—

—

4

—

—

C326 - 8 WAY

CONNECTOR NOT AVAILABLE

CAV	CIRCUIT	FUNCTION
1	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
2	-	-
3	-	-
4	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE
5	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT
6	-	-
7	-	-
8	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE

C326 - 8 WAY

**CONNECTOR
NOT
AVAILABLE**

CAV	CIRCUIT	FUNCTION
1	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
2	-	-
3	-	-
4	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE
5	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT
6	-	-
7	-	-
8	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE

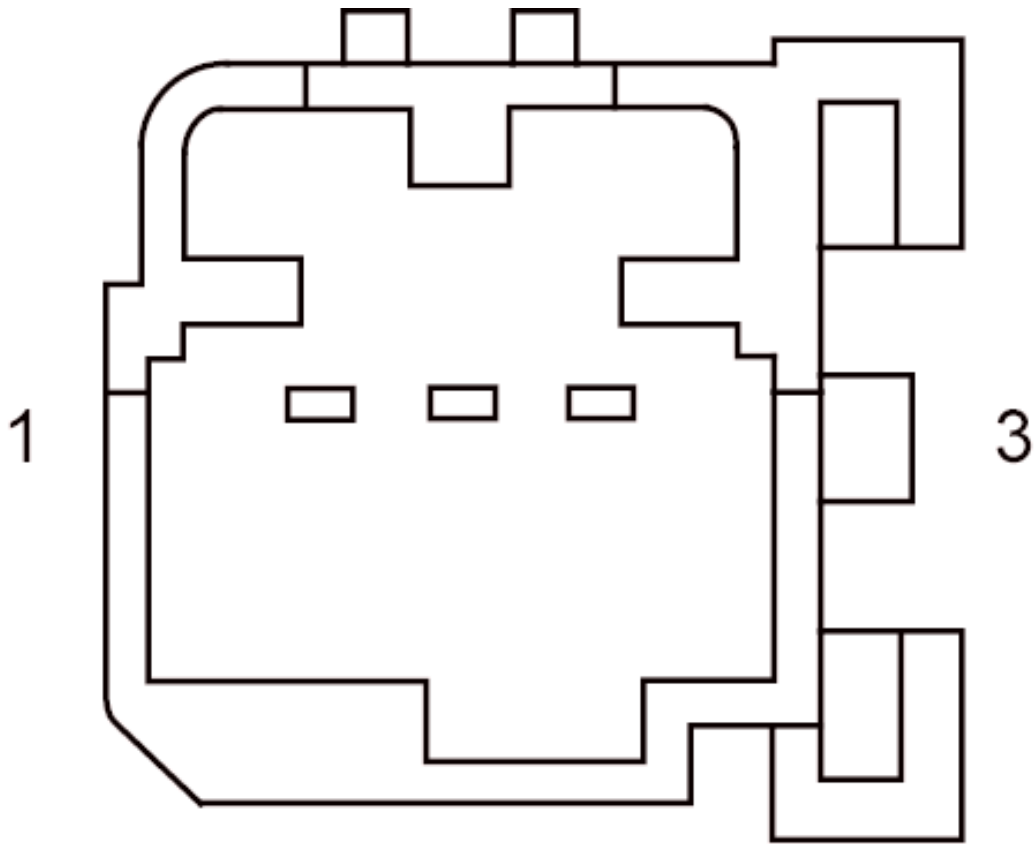
C329 - 3 WAY

**CONNECTOR
NOT
AVAILABLE**

CAV	CIRCUIT	FUNCTION
1	L24 20WT/VT	AUTO HEADLAMPS SIGNAL
2	-	-
3	G939 20VT/DB	SUN SENSOR RETURN

C329 - 3 WAY FEMALE

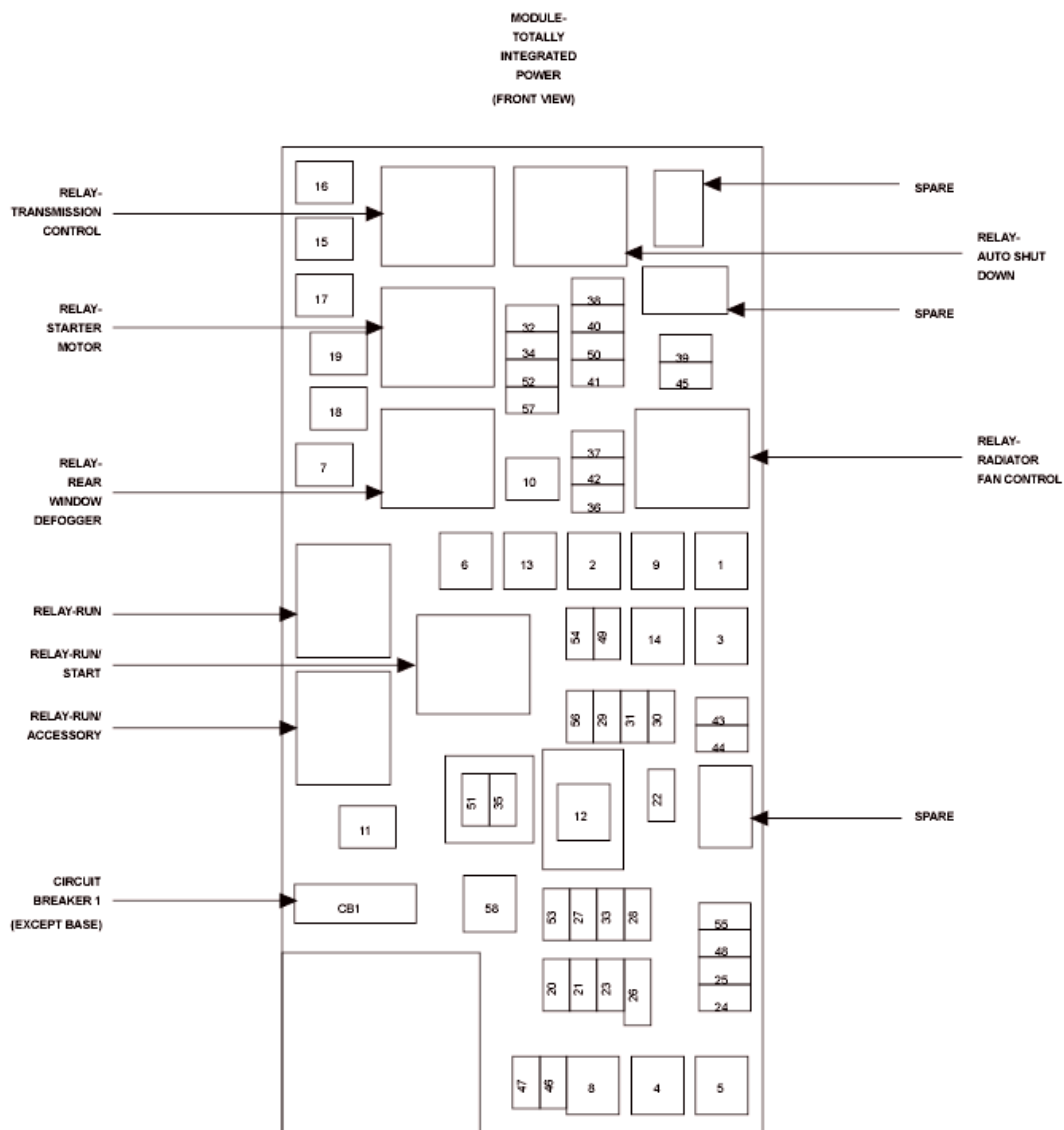




C329

CAV	CIRCUIT	FUNCTION
1	L24 20WT/VT	AUTO HEADLAMPS SIGNAL
2	-	-
3	G939 20VT/DB	SUN SENSOR RETURN

CIRCUIT BREAKER 1 - 0 WAY (EXCEPT BASE)



CAV

CIRCUIT

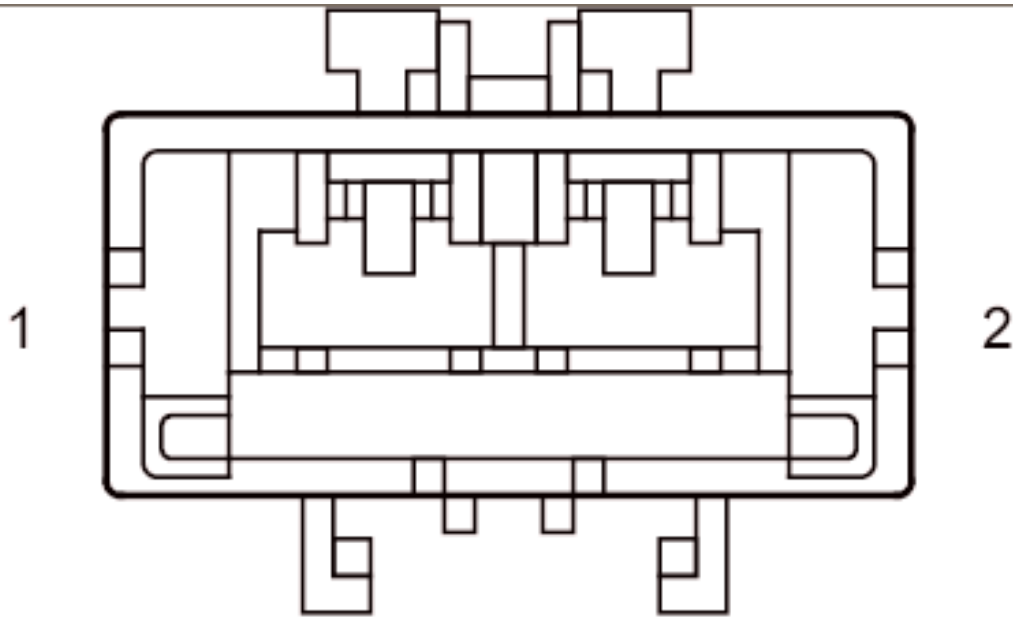
FUNCTION

1

F30 12PK/YL

FUSED RUN/ACCESSORY
RELAY OUTPUT

CIRCUIT BREAKER-POWER SEAT - 2 WAY MALE

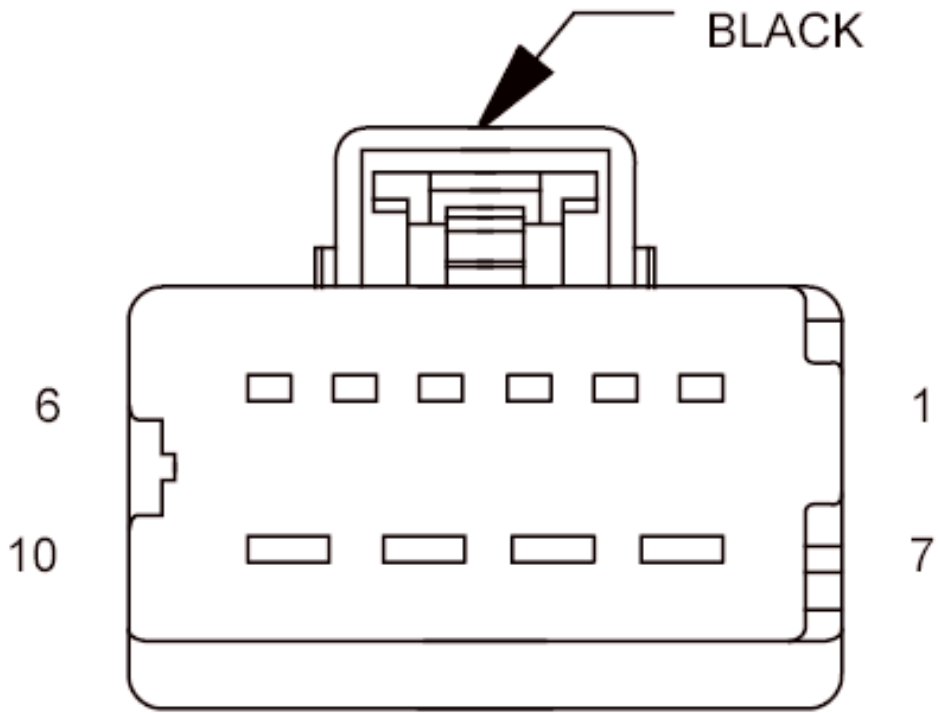


**CIRCUIT
BREAKER-
POWER
SEAT**

CAV	CIRCUIT	FUNCTION
1	A907 12RD	FUSED B(+)
2	A210 14OR/RD	FUSED B(+)

CLUSTER C1 - BLACK 10 WAY

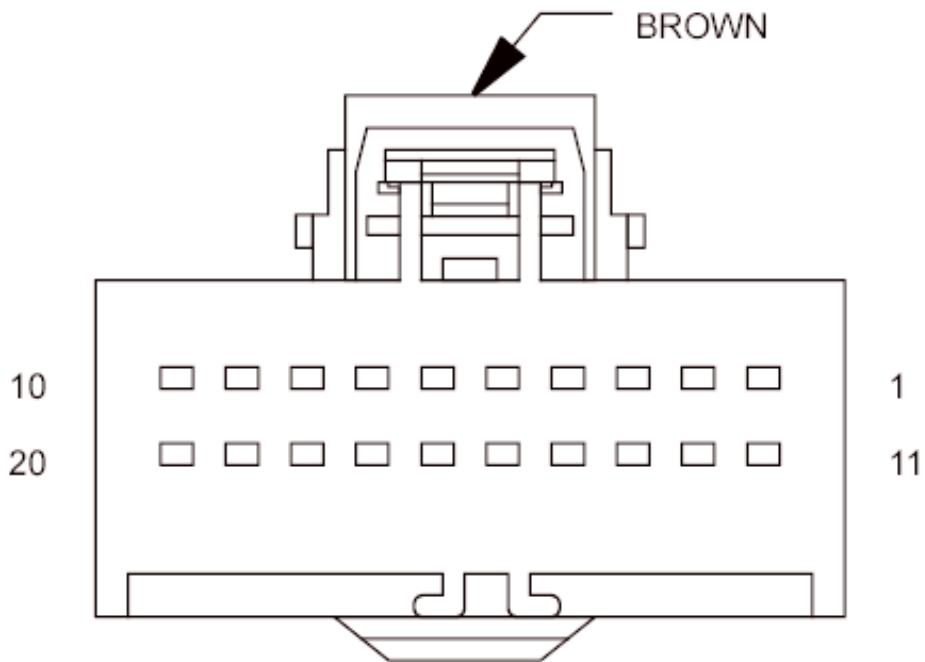




CLUSTER C1

CAV	CIRCUIT	FUNCTION
1	A909 18RD	FUSED B(+)
2	E12 20OR/GY	PANEL LAMPS DRIVER
3	G95 18VT/BR	NEUTRAL INDICATOR
4	-	-
5	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
6	A412 18RD	FUSED B(+)
8	Z910 18BK	GROUND
9	Z910 18BK	GROUND
10	Z910 18BK	GROUND

CLUSTER C2 - BROWN 20 WAY

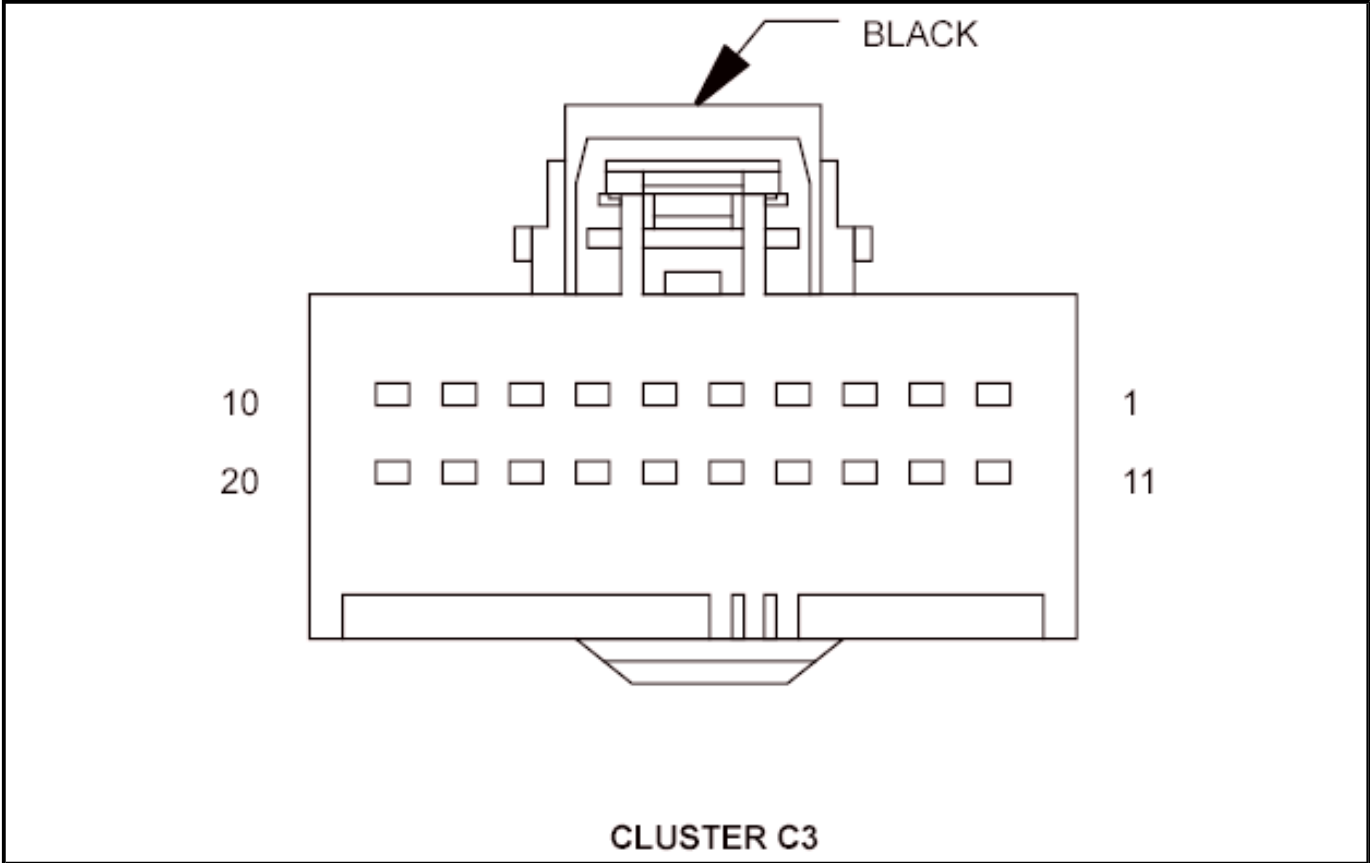


CLUSTER C2

CAV	CIRCUIT	FUNCTION
1	-	-
2	M27 20YL/LB	READING/RAIL LAMPS DRIVER
3	-	-
4	-	-
5	-	-
6	-	-
7	B25 20DG/WT	PARK BRAKE SWITCH SENSE
8	L51 20WT/DG	BRAKE LAMP SWITCH OUTPUT
9	-	-
10	-	-
11	-	-
12	-	-
13	Y13 20VT/YL	SIGNAL RETURN
14	-	-
15	D264 20WT	CAN INTERIOR BUS (-)
16	D265 20WT/OR	CAN INTERIOR BUS (+)
17	-	-
18	G38 18GY	UGDO ENABLE CONTROL

		CIRCUIT
19	D506 20WT/DG	LIN BUS
20	-	-

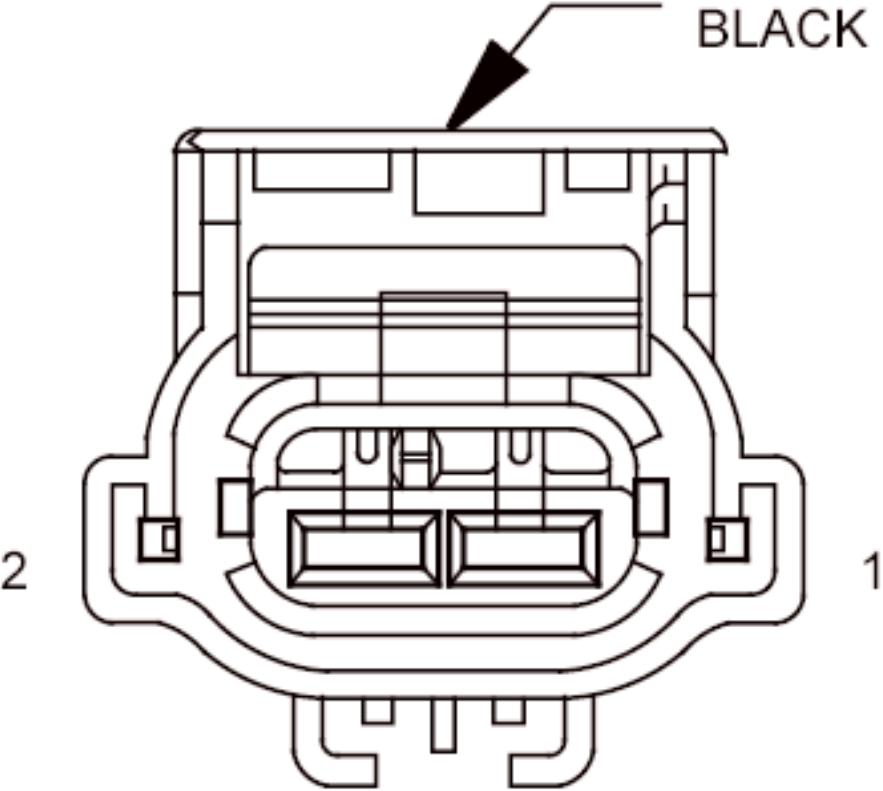
CLUSTER C3 - BLACK 20 WAY



CLUSTER C3		
CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	X20 22GY/WT	RADIO CONTROL MUX
10	X3 22DG/VT	HORN SWITCH SENSE
11	K321 20BR/YL	BTSI UNLOCK SIGNAL
12	K77 22BR/WT	TRANSFER CASE POSITION SENSOR INPUT
13	-	-
14	T6 20DG	TOW/HAUL OD OFF SIGNAL

15	-	-
16	-	-
17	-	-
18	P806 20LG/WT	INVERTER STATUS INDICATOR DRIVER
19	-	-
20	-	-

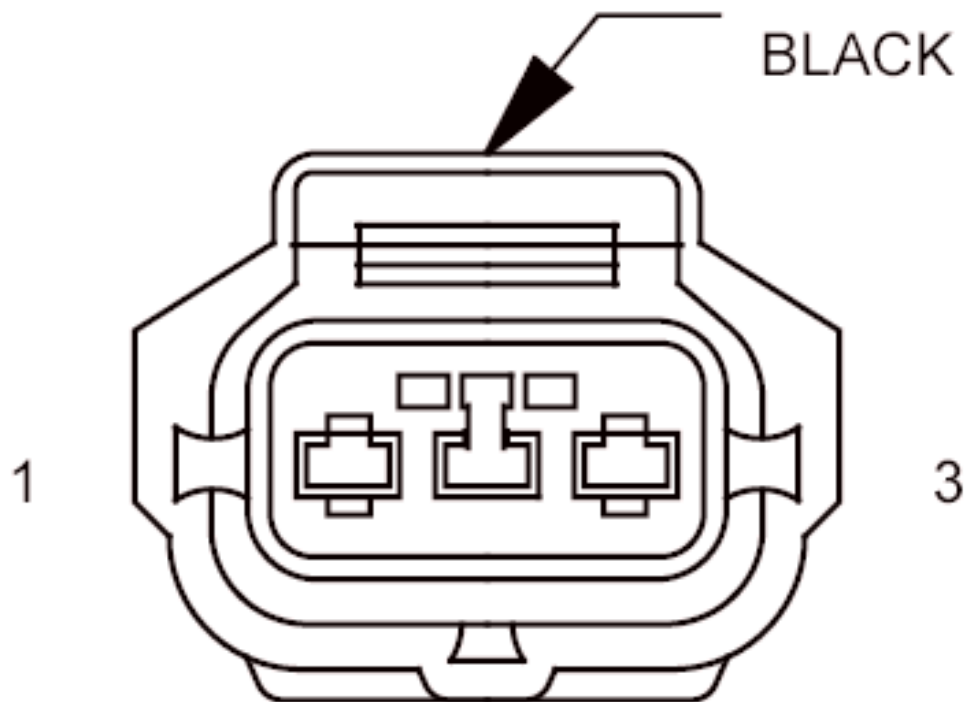
CLUTCH-A/C COMPRESSOR - BLACK 2 WAY



**CLUTCH-A/C
COMPRESSOR**

CAV	CIRCUIT	FUNCTION
1	C3 18DB/YL	A/C CLUTCH CONTROL OUTPUT
2	Z904 18BK	GROUND
2	Z904 18BK/VT	GROUND (Diesel)

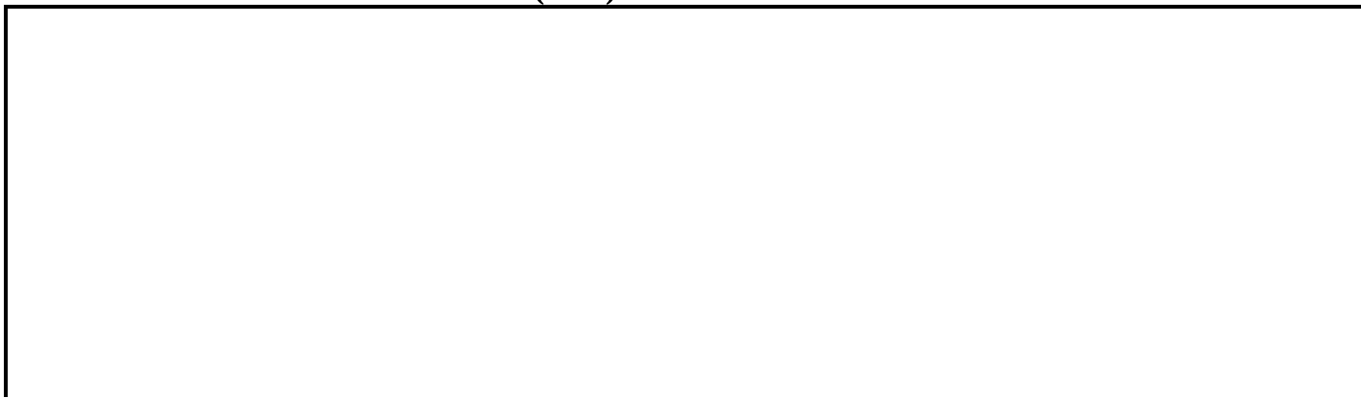
COIL-IGNITION 1 - BLACK 3 WAY (3.7L) MALE

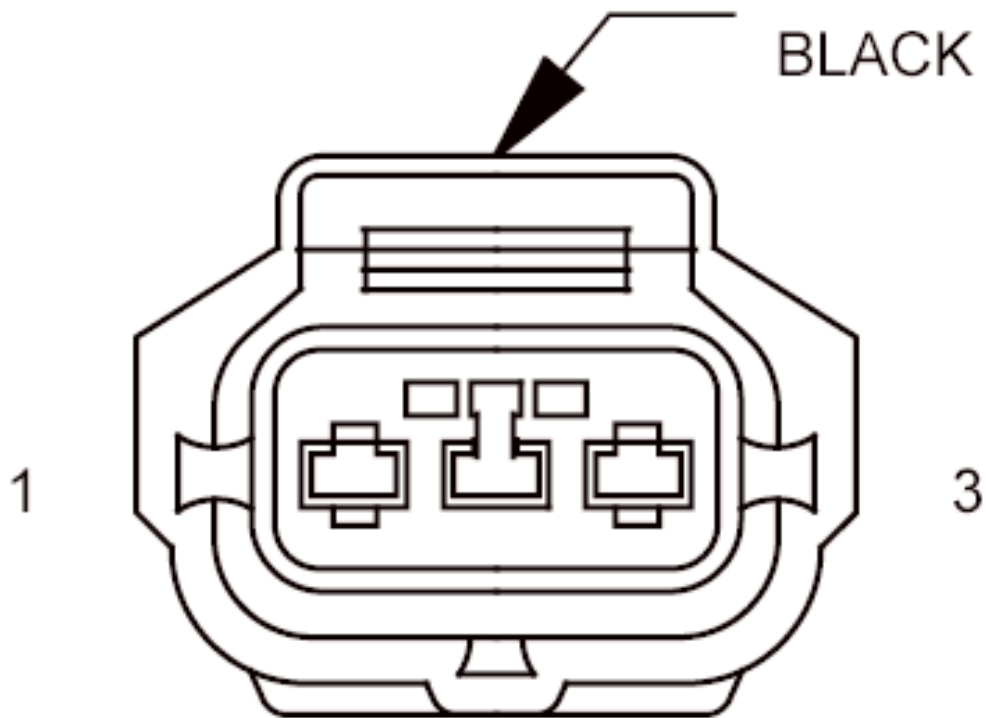


COIL- IGNITION-NO. 1 (3.7L)

CAV	CIRCUIT	FUNCTION
1	K86 16YL/DB	COIL CONTROL 1
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-

COIL-IGNITION 2 - BLACK 2 WAY (3.7L)

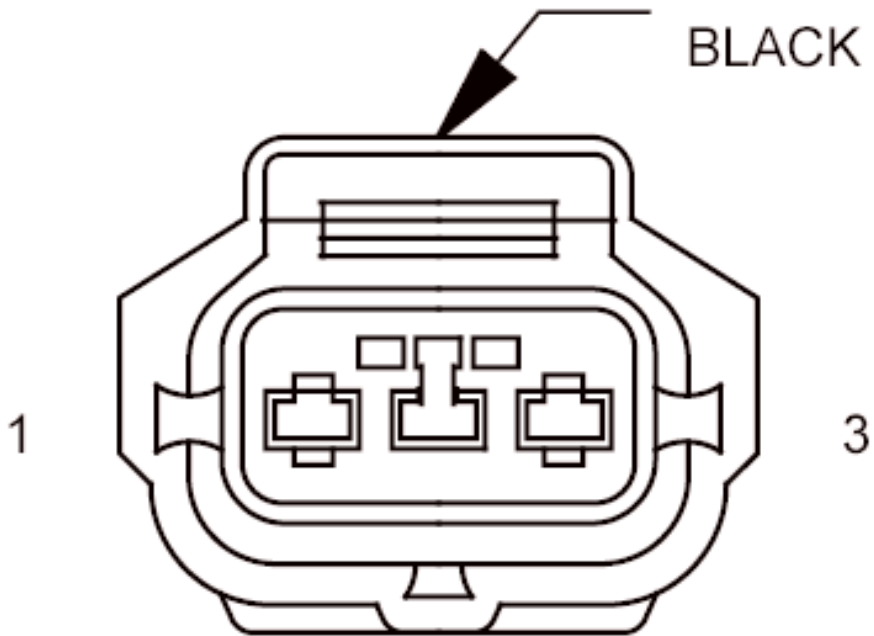




COIL- IGNITION-NO. 2 (3.7L)

CAV	CIRCUIT	FUNCTION
1	K85 16DB/YL	COIL CONTROL 2
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-

COIL-IGNITION 3 - BLACK 3 WAY (3.7L)

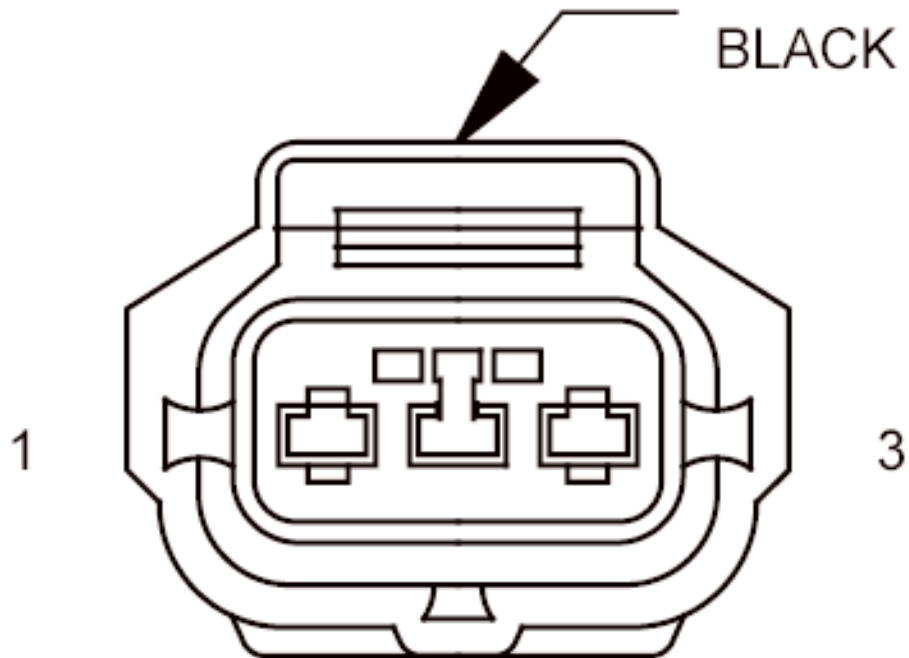


**COIL-
IGNITION-NO. 3
(3.7L)**

CAV	CIRCUIT	FUNCTION
1	K93 16DB	COIL CONTROL 3
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-

COIL-IGNITION 4 - BLACK 3 WAY (3.7L)





**COIL-
IGNITION-NO. 4
(3.7L)**

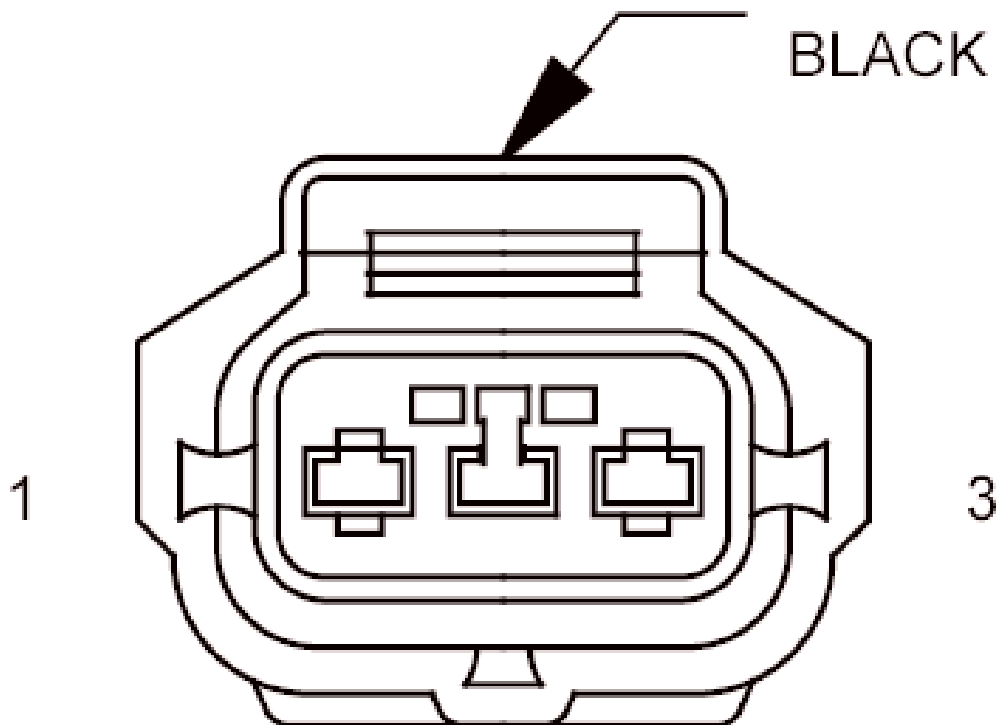
CAV	CIRCUIT	FUNCTION
1	K15 16DB/GY	COIL CONTROL 4
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-

COIL-IGNITION 5 - BLACK 3 WAY (3.7L)



3

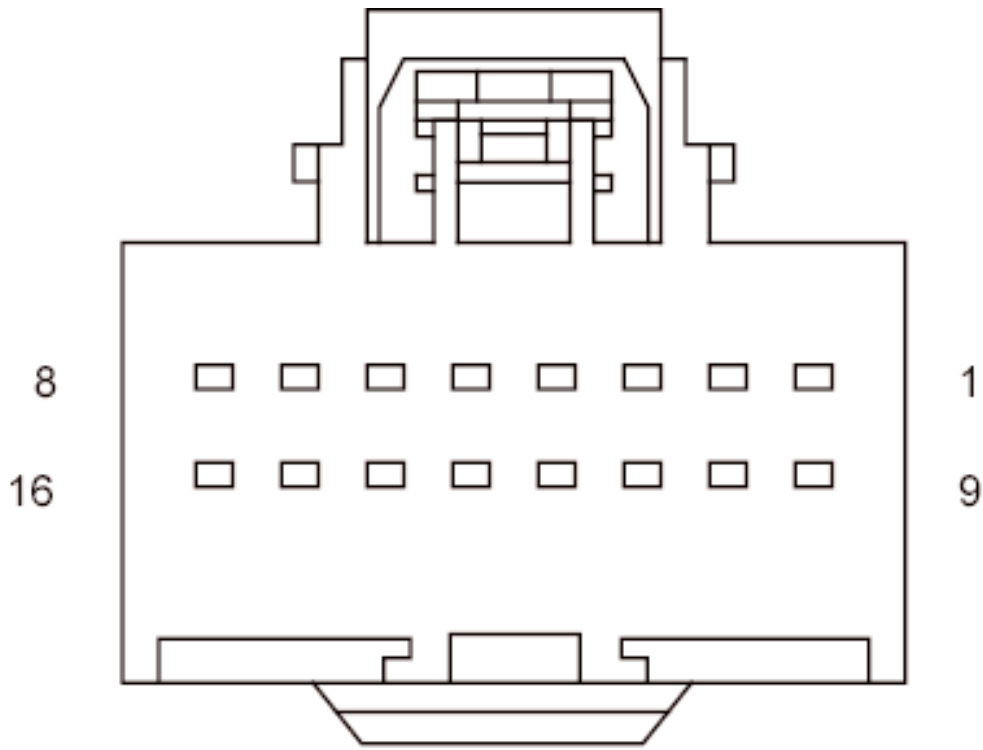
CAV	CIRCUIT	FUNCTION
1	K16 16DB/YL	COIL CONTROL 5
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-



COIL- IGNITION 6 (3.7L)

CAV	CIRCUIT	FUNCTION
1	K10 16DB/OR	COIL CONTROL 6
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	-	-

CONTROL-A/C-HEATER C1 - 16 WAY (MTC) FEMALE

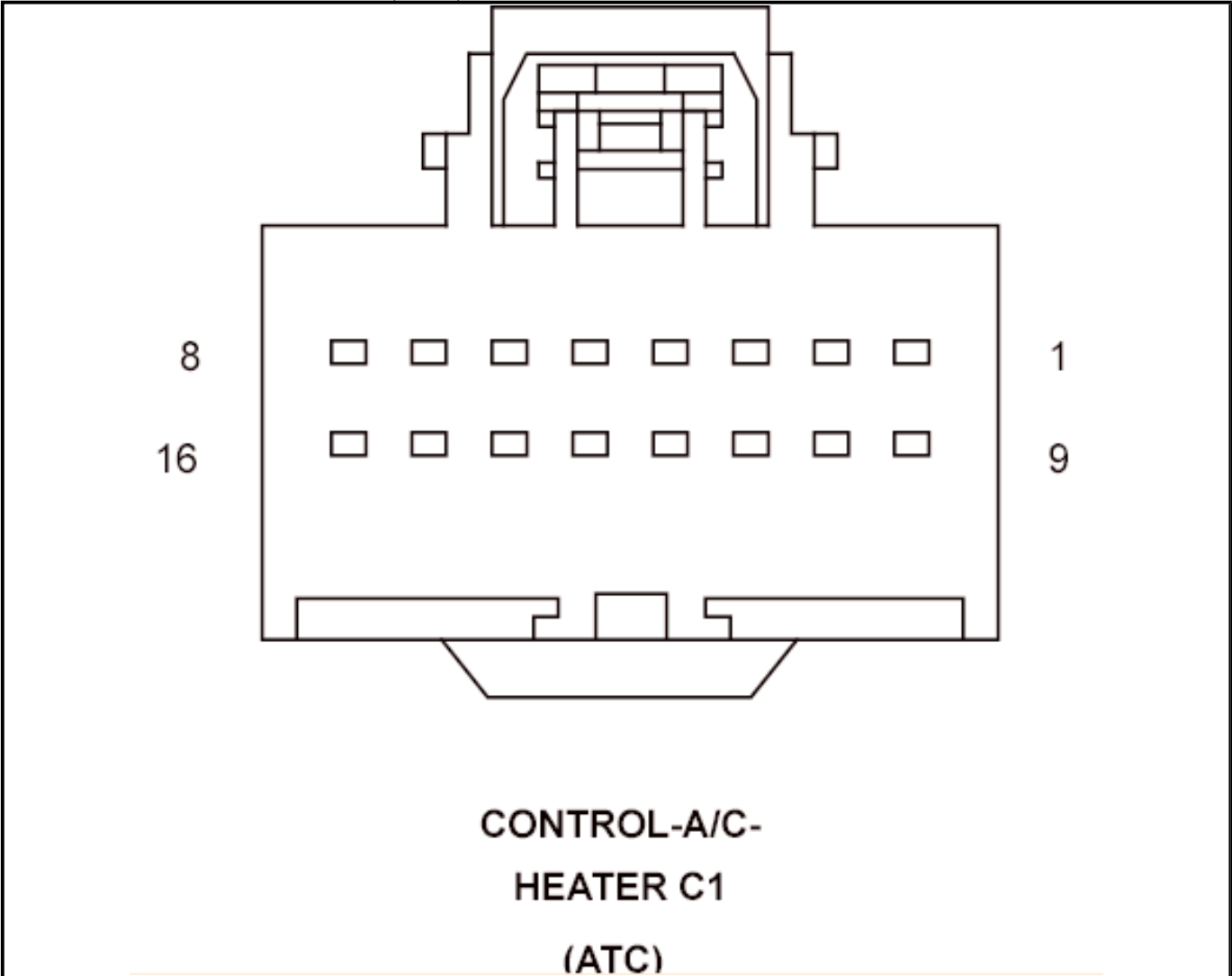


**CONTROL-A/C-
HEATER C1
(MTC)**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	F921 18PK/YL	FUSED RUN/START RELAY OUTPUT
4	Z910 18BK/PK	GROUND
5	D264 20WT	CAN INTERIOR BUS (-)
6	D265 20WT/OR	CAN INTERIOR BUS (+)
7	C121 20DB/DG	SENSOR GROUND
8	C21 20DB/LG	EVAPORATOR TEMPERATURE SENSOR SIGNAL
9	L24 20WT/VT	-
10	G939 20VT/DB	-
11	C32 20DB/TN	RECIRCULATION DOOR DRIVER
12	C35 20LB/OR	MODE DOOR DRIVER

13	C54 20LB/YL	DRIVER BLEND DOOR DRIVER
14	C154 20LB/OR	COMMON DOOR DRIVER
15	-	-
16	-	-

CONTROL-A/C-HEATER C1 (ATC) - 16 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	C56 18DB/LB	BLOWER MOTOR CONTROL
2	A417 18RD	FUSED B(+)
3	F921 20PK/YL	FUSED RUN RELAY OUTPUT
4	Z910 18BK/PK	GROUND
5	D264 20WT	CAN INTERIOR BUS (125K) (-)
6	D265 20WT/OR	CAN INTERIOR BUS (125K) (+)
7	C121 20DB/DG	REAR TEMPERATURE

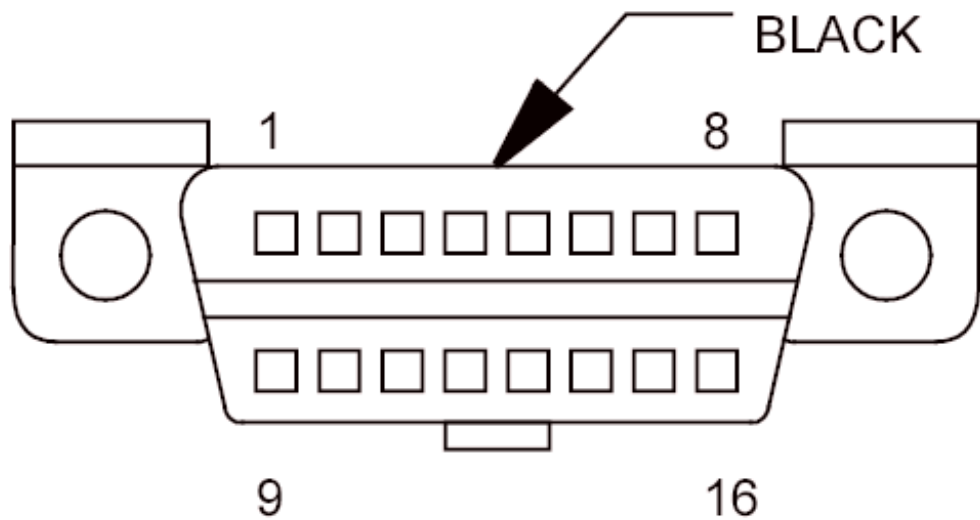
		RETURN
8	C21 20DB/LG	EVAPORATOR TEMPERATURE SENSOR SIGNAL
9	L24 20WT/VT	AUTO HEADLAMPS SIGNAL
10	G939 20VT/DB	SUN SENSOR RETURN
11	C32 20DB/TN	RECIRCULATION DOOR DRIVER
12	C35 20LB/OR	MODE DOOR DRIVER
13	C54 20LB/YL	BLEND DOOR DRIVER
14	C154 20LB/OR	COMMON DOOR DRIVER
15	C830 22DB/YL	IR SENSOR RETURN
16	C83 22DB/LG	INFRARED SENSOR SIGNAL

CONTROL-A/C-HEATER C2 - 5 WAY (MTC) FEMALE

**CONTROL-A/C-
HEATER C2
(MTC)**

CAV	CIRCUIT	FUNCTION
1	Z911 10BK	GROUND
2	C71 16DB/BR	FRONT BLOWER LOW SPEED
3	C72 16DB/OR	FRONT BLOWER M1 SPEED
4	C73 12DB/VT	FRONT BLOWER M2 SPEED
5	C75 12DB/GY	BLOWER MOTOR HIGH

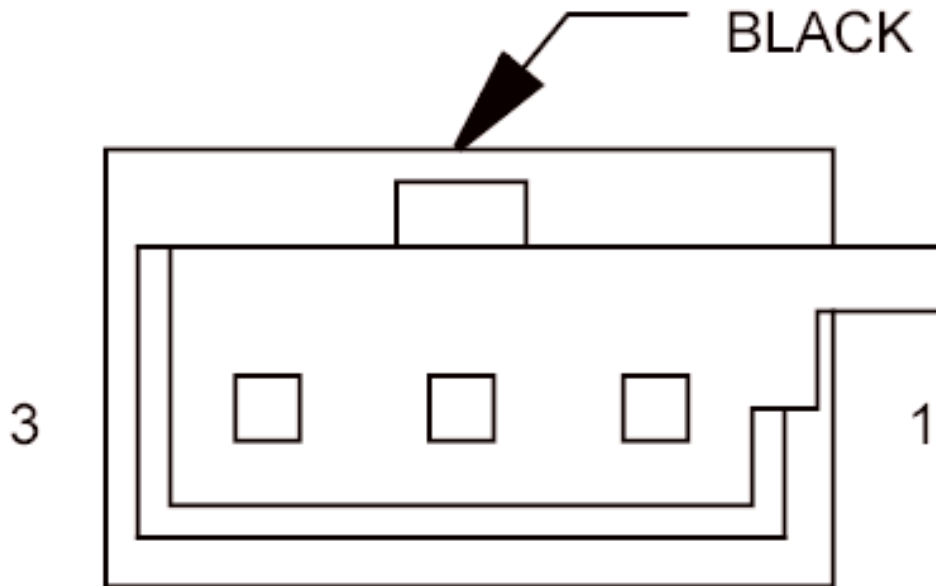
DATA LINK CONNECTOR - BLACK 16 WAY FEMALE



DATA
LINK
CONNECTOR

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	Z910 18BK/LG	GROUND
5	Z910 18BK/YL	GROUND
6	D72 20WT/LB	DIAGNOSTIC CAN C (+)
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	D71 20WT/DB	DIAGNOSTIC CAN C (-)
15	-	-
16	A901 18RD	FUSED B(+)

DISPLAY-PARK ASSIST - BLACK 3 WAY (PARKTRONICS)

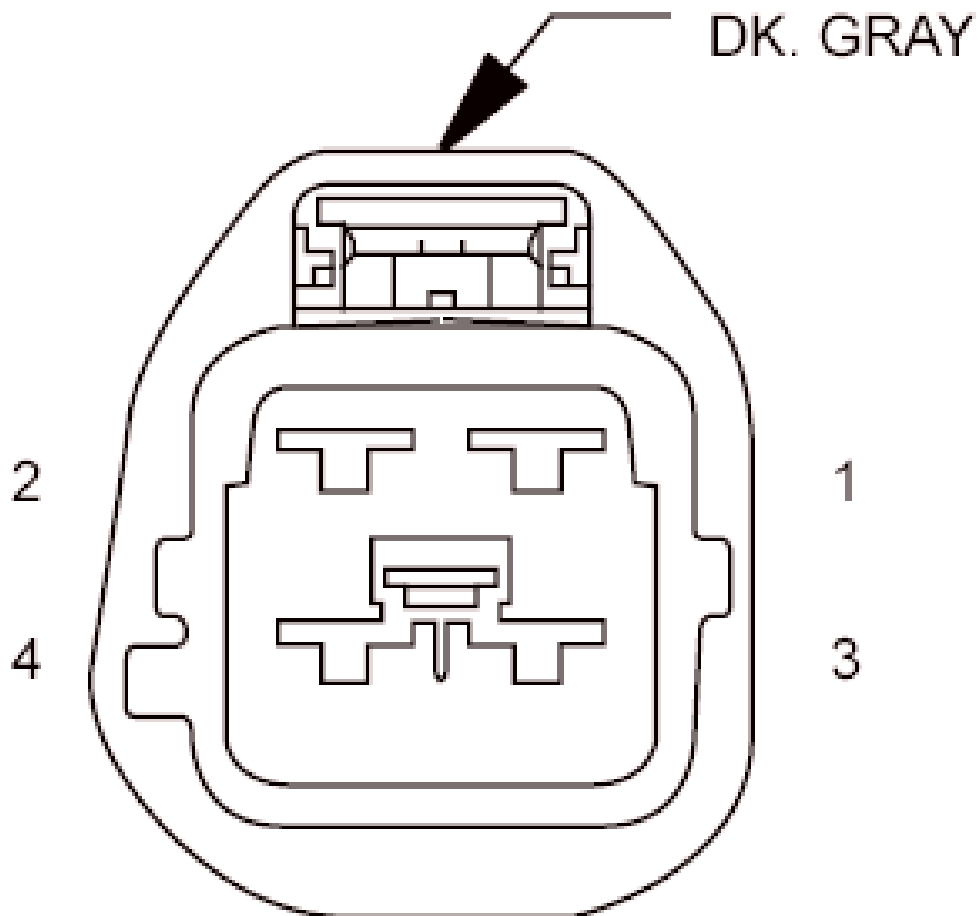


DISPLAY- PARK ASSIST (PARKTRONICS)

CAV	CIRCUIT	FUNCTION
1	X777 20DG/GY	PARK ASSIST DISPLAY SUPPLY
2	X779 20GY/OR	PARK ASSIST DISPLAY RETURN
3	D777 20WT/GY	PARK ASSIST DISPLAY SIGNAL

FAN MODULE-RADIATOR COOLING - DK. GRAY 4 WAY

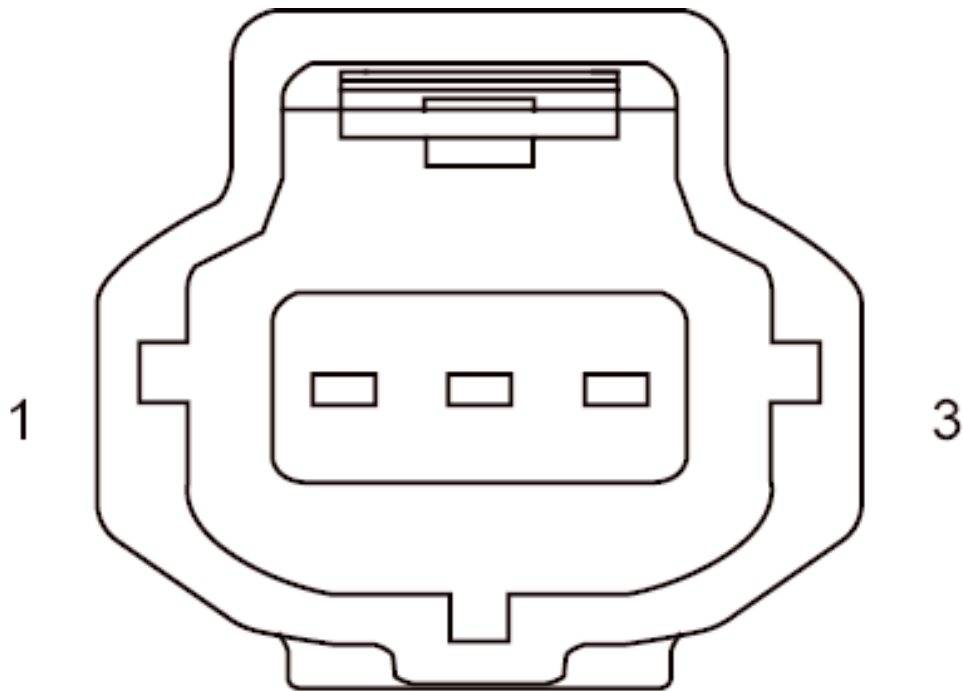




FAN MODULE- RADIATOR COOLING

CAV	CIRCUIT	FUNCTION
1	N173 10DB/VT	HIGH SPEED RAD FAN RELAY OUTPUT
2	Z908 10BK	GROUND
3	N23 10DB/DG	LOW SPEED RAD FAN CONTROL (PWM)
4	-	-

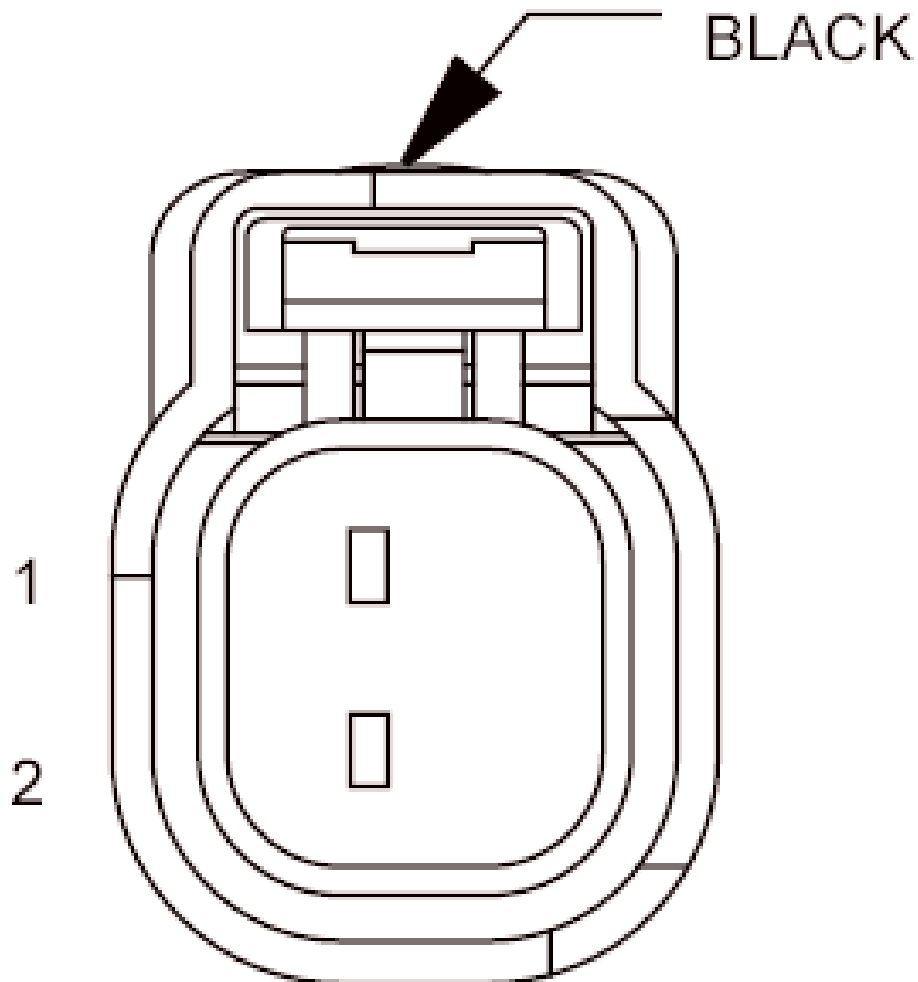
GENERATOR - 3 WAY (DIESEL)



GENERATOR (DIESEL)

CAV	CIRCUIT	FUNCTION
1	-	-
2	D509 20WT/OR	ECM LIN BUS
3	-	-

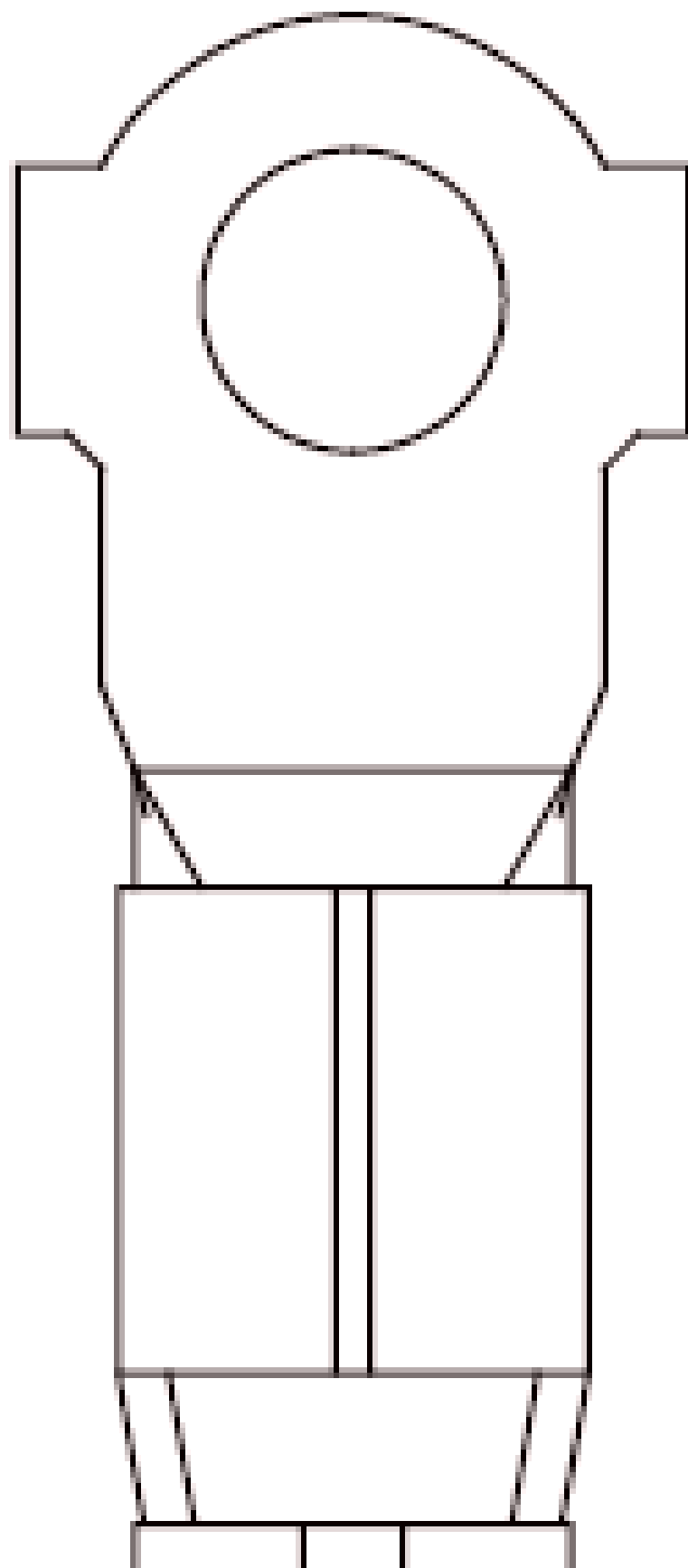
GENERATOR - BLACK 2 WAY (GAS)



GENERATOR (GAS)

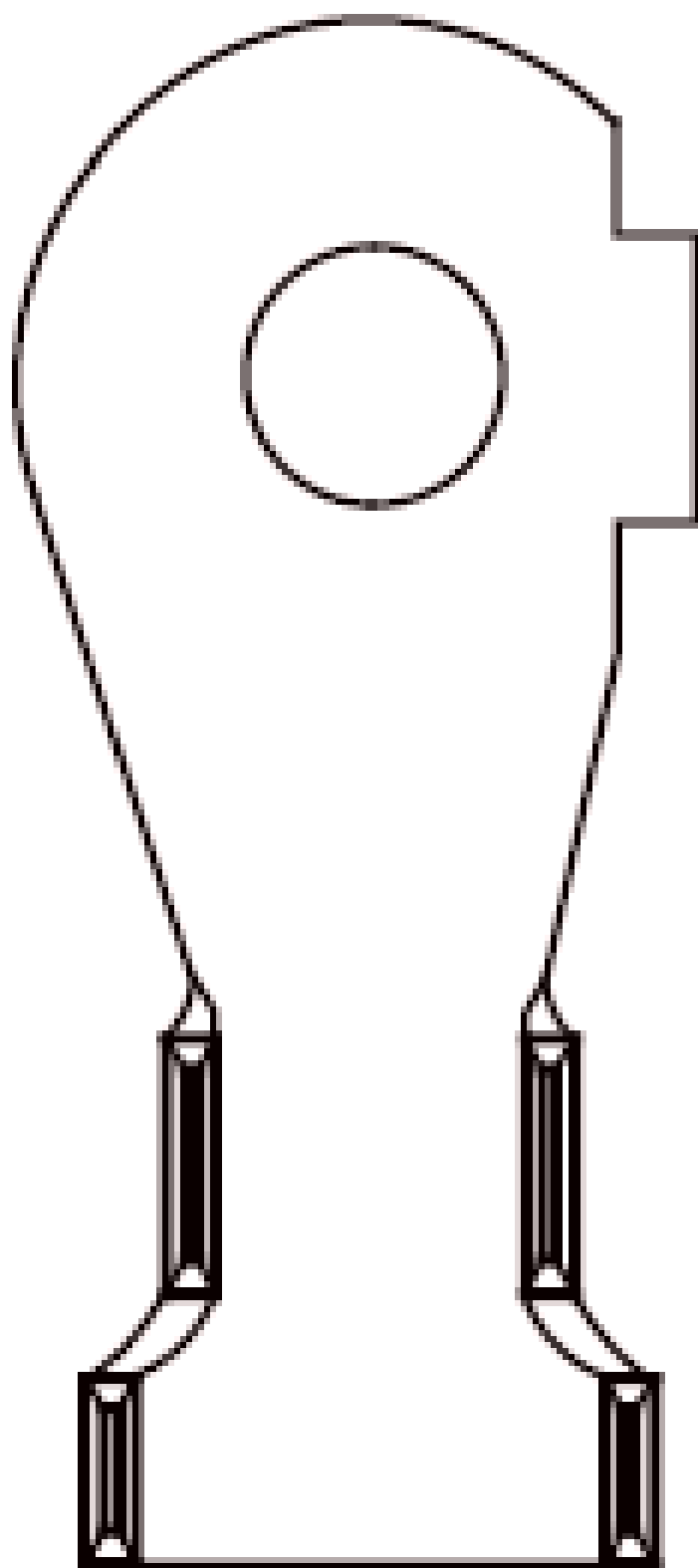
CAV	CIRCUIT	FUNCTION
1	K125 16BR/DG	GEN FIELD CONTROL (LHD)
1	K125 18BR/DG	GEN FIELD CONTROL (RHD)
2	A803 18GY/RD	GEN SENSE

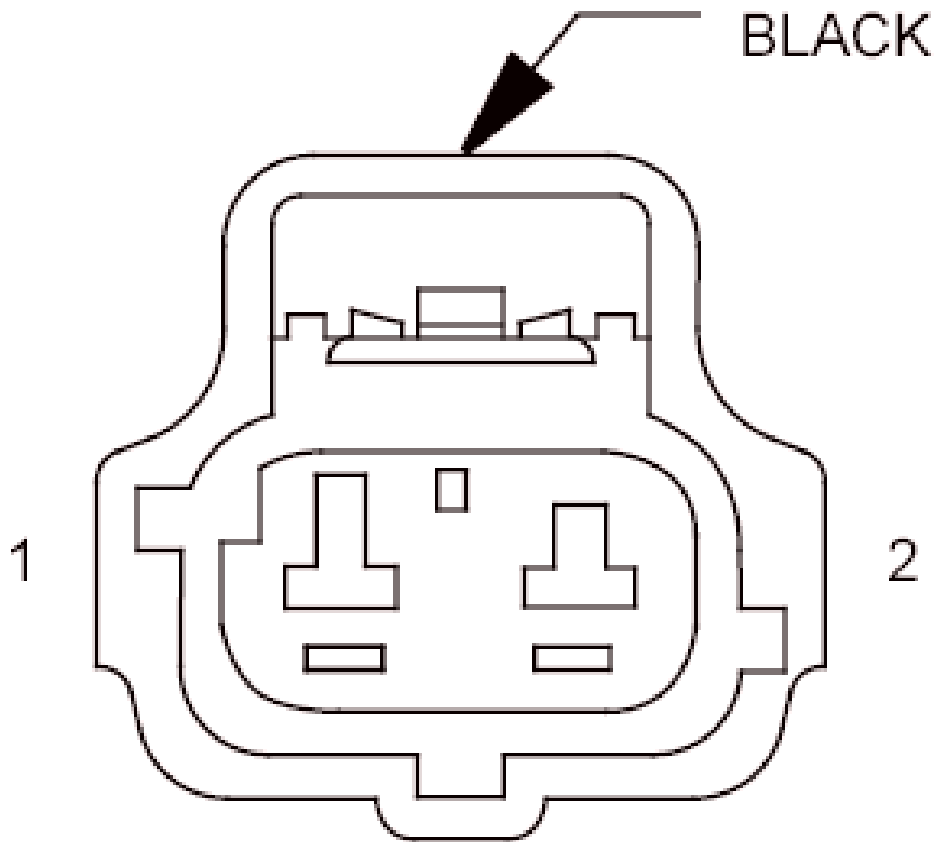
GENERATOR-EYELET - 1 WAY (DIESEL)



CAV	CIRCUIT	FUNCTION
1	A801 4RD/GY	FUSED B(+)

GENERATOR-EYELET - 1 WAY (GAS)



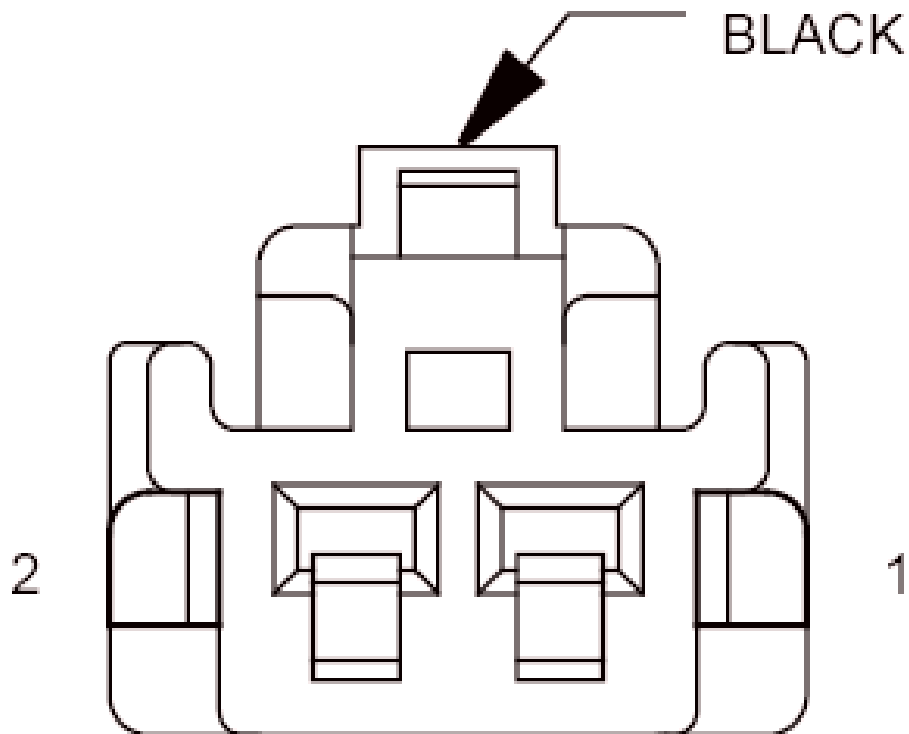


**HEATER-
FUEL
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	A993 16RD	FUEL HEATER RELAY OUTPUT
2	Z904 16BK	GROUND

HEATER-SEAT BACK-LEFT - BLACK 2 WAY

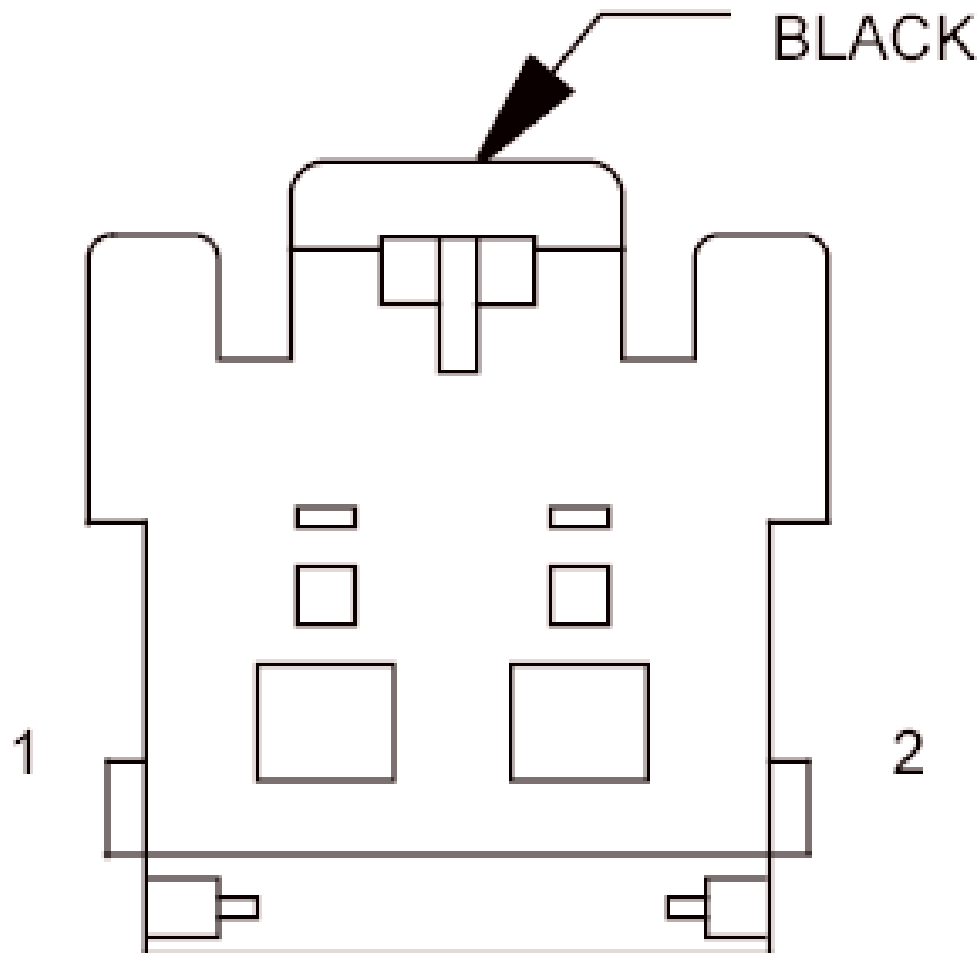
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**HEATER-
SEAT
BACK-
LEFT**

CAV	CIRCUIT	FUNCTION
1	P187 18DG/RD	LEFT SEAT HEATER B(+) DRIVER
2	Z914 18BK	GROUND

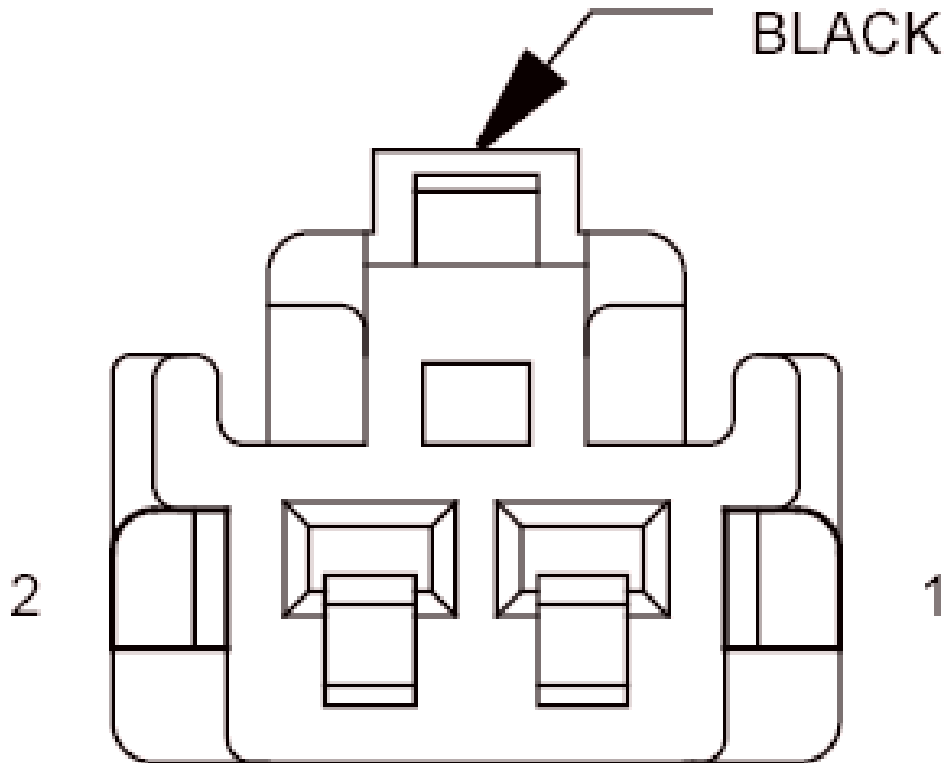
HEATER-SEAT BACK-LEFT - BLACK 2 WAY (COMPONENT SIDE)



HEATER-SEAT BACK-LEFT (COMPONENT SIDE)

CAV	CIRCUIT	FUNCTION
1	P187 18DG/RD	LEFT SEAT HEATER B(+) DRIVER
2	Z914 18BK	GROUND

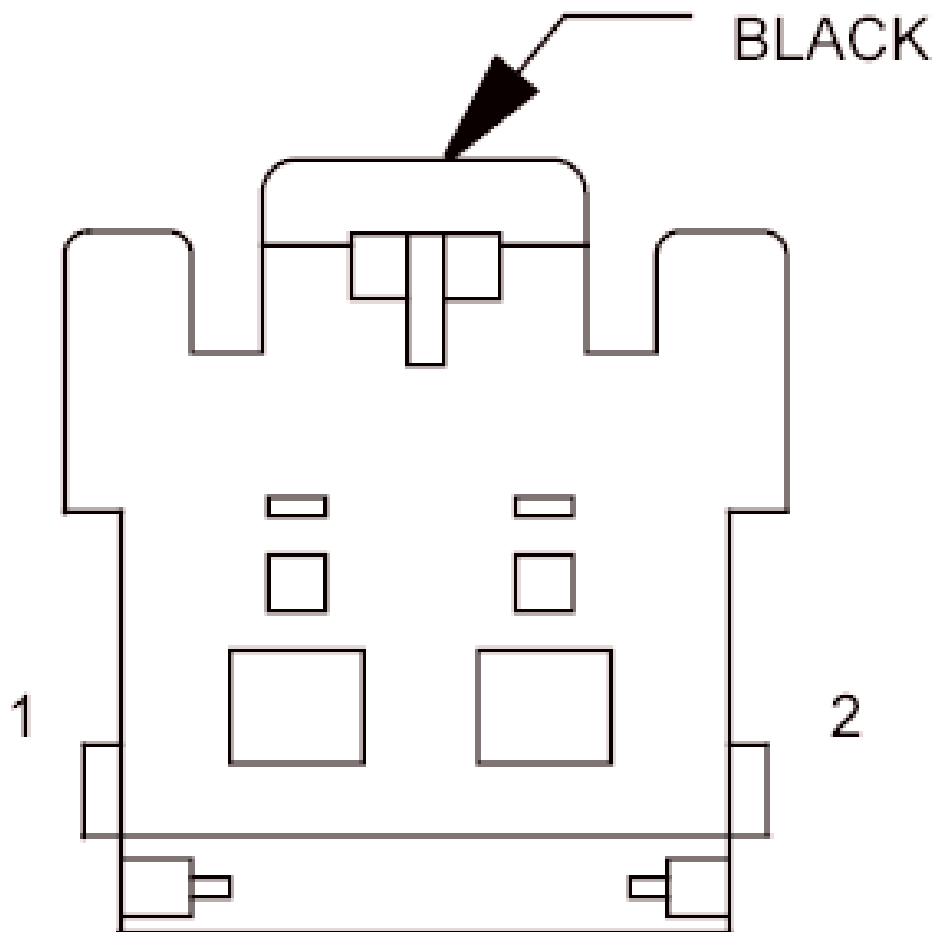
HEATER-SEAT BACK-RIGHT - BLACK 2 WAY



HEATER- SEAT BACK- RIGHT

CAV	CIRCUIT	FUNCTION
1	P188 18DG/RD	RIGHT SEAT HEATER B(+) DRIVER
2	Z914 18BK	GROUND

HEATER-SEAT BACK-RIGHT - BLACK 2 WAY (COMPONENT SIDE)



HEATER-SEAT BACK-RIGHT (COMPONENT SIDE)

CAV	CIRCUIT	FUNCTION
1	P188 18DG/RD	RIGHT SEAT HEATER B(+) DRIVER
2	Z914 18BK	GROUND

HEATER-SEAT CUSHION-LEFT - 2 WAY

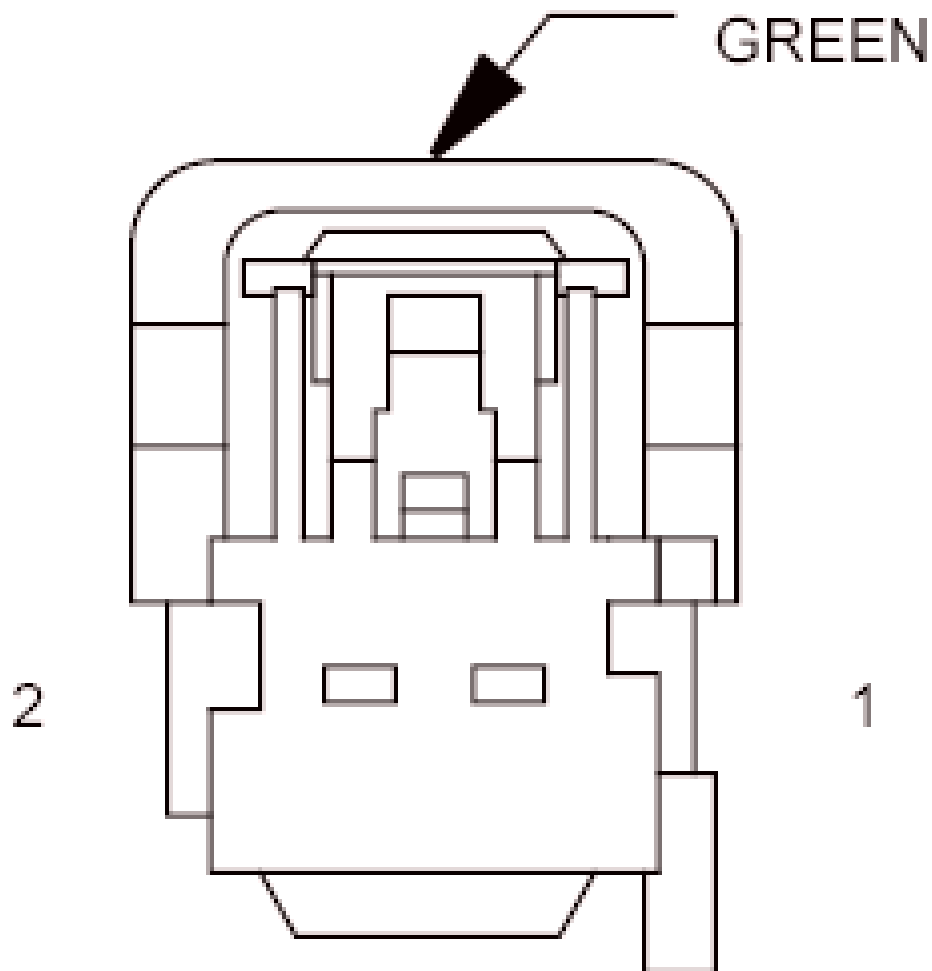
1

2

**HEATER-
SEAT
CUSHION-
LEFT**

CAV	CIRCUIT	FUNCTION
1	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER
2	Z914 16BK	GROUND

HEATER-SEAT CUSHION-LEFT - GREEN 2 WAY (COMPONENT SIDE)



HEATER- SEAT CUSHION- LEFT

(COMPONENT SIDE)

CAV

1

CIRCUIT

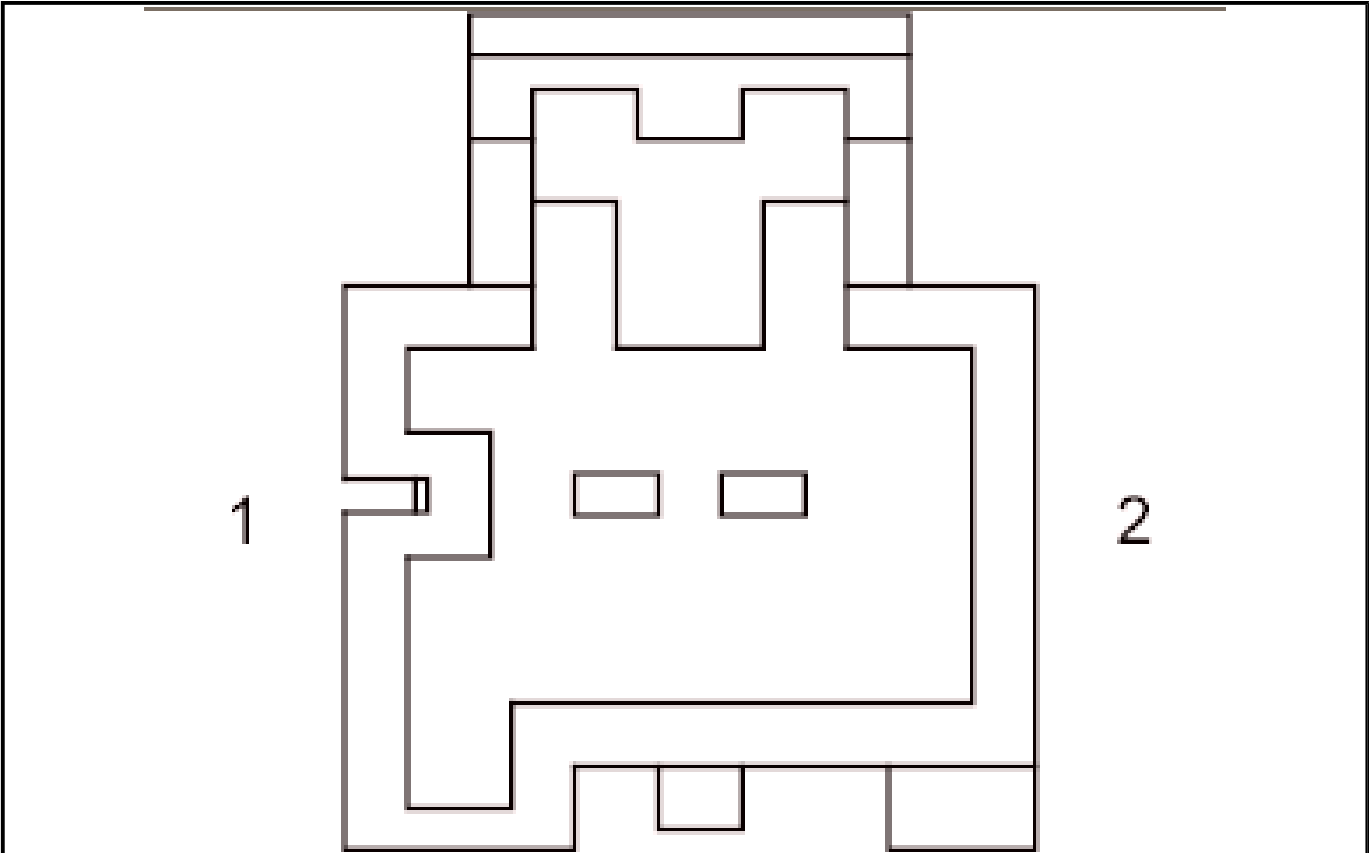
P187 18DG/RD

FUNCTION

LEFT SEAT HEATER B(+)
DRIVER

2	Z914 18BK	GROUND
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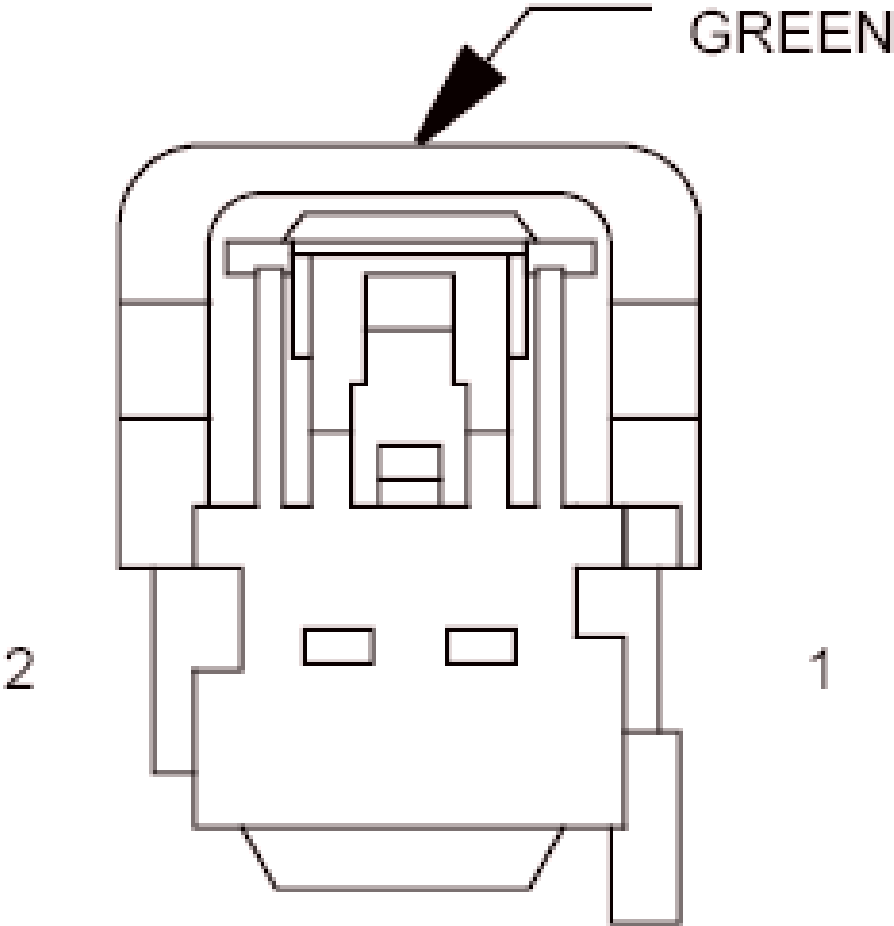
HEATER-SEAT CUSHION-RIGHT - 2 WAY



HEATER-
SEAT
CUSHION-
RIGHT

CAV	CIRCUIT	FUNCTION
1	P188 16LG/VT	RIGHT SEAT HEATER B(+) DRIVER
2	Z914 16BK	GROUND

HEATER-SEAT CUSHION-RIGHT - GREEN 2 WAY (COMPONENT SIDE)

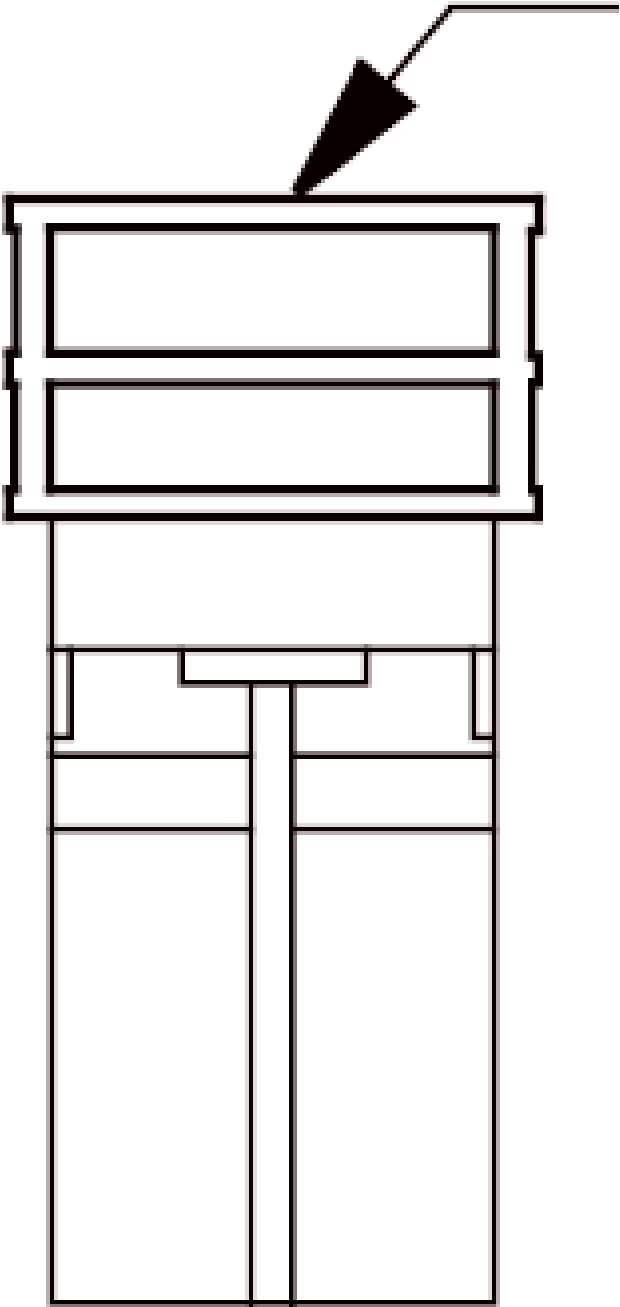


HEATER-
SEAT
CUSHION-
RIGHT

(COMPONENT SIDE)

CAV	CIRCUIT	FUNCTION
1	P188 18DG/RD	RIGHT SEAT HEATER B(+) DRIVER
2	Z914 18BK	GROUND

HORN 1 C1 - BLACK 1 WAY

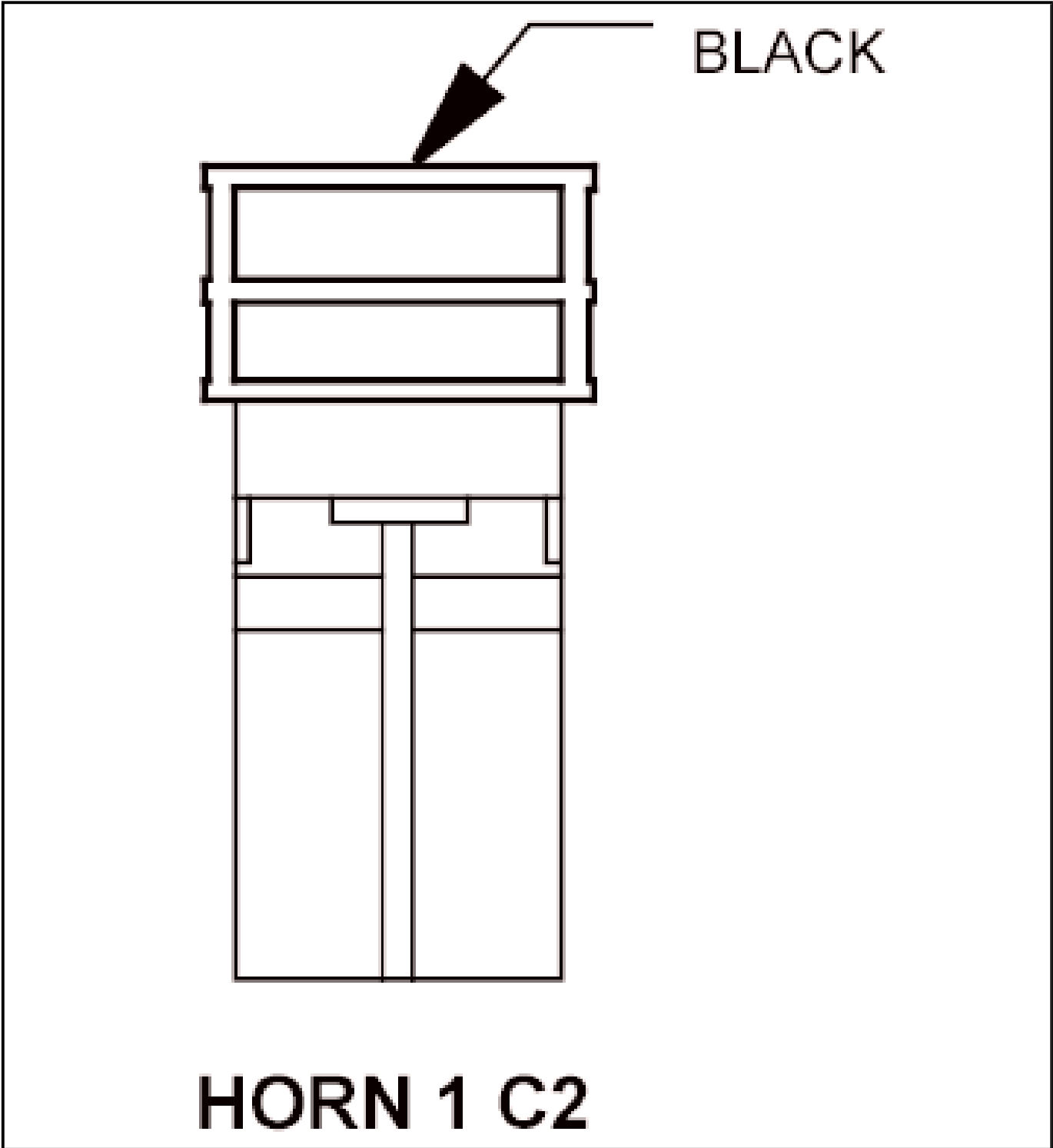


BLACK

HORN 1 C1

CAV	CIRCUIT	FUNCTION
1	X21 18GY/YL	FUSED HORN CONTROL OUTPUT

HORN 1 C2 - BLACK 1 WAY

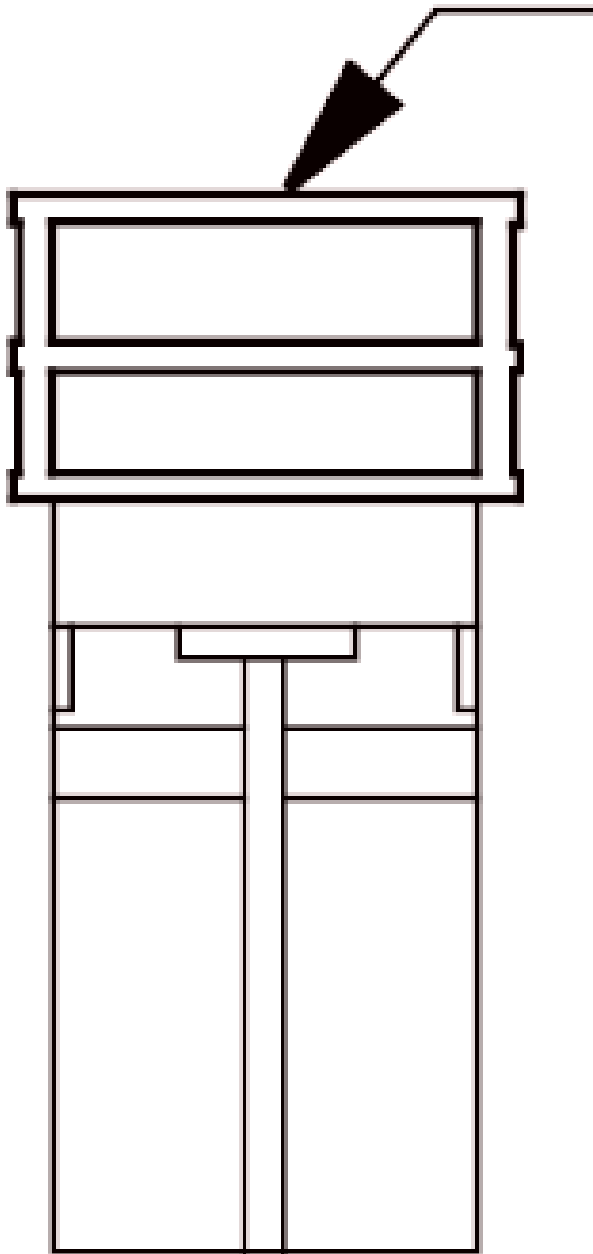


HORN 1 C2

CAV	CIRCUIT	FUNCTION
1	Z907 18BK/GY	GROUND

HORN 2 C1 - BLACK 1 WAY



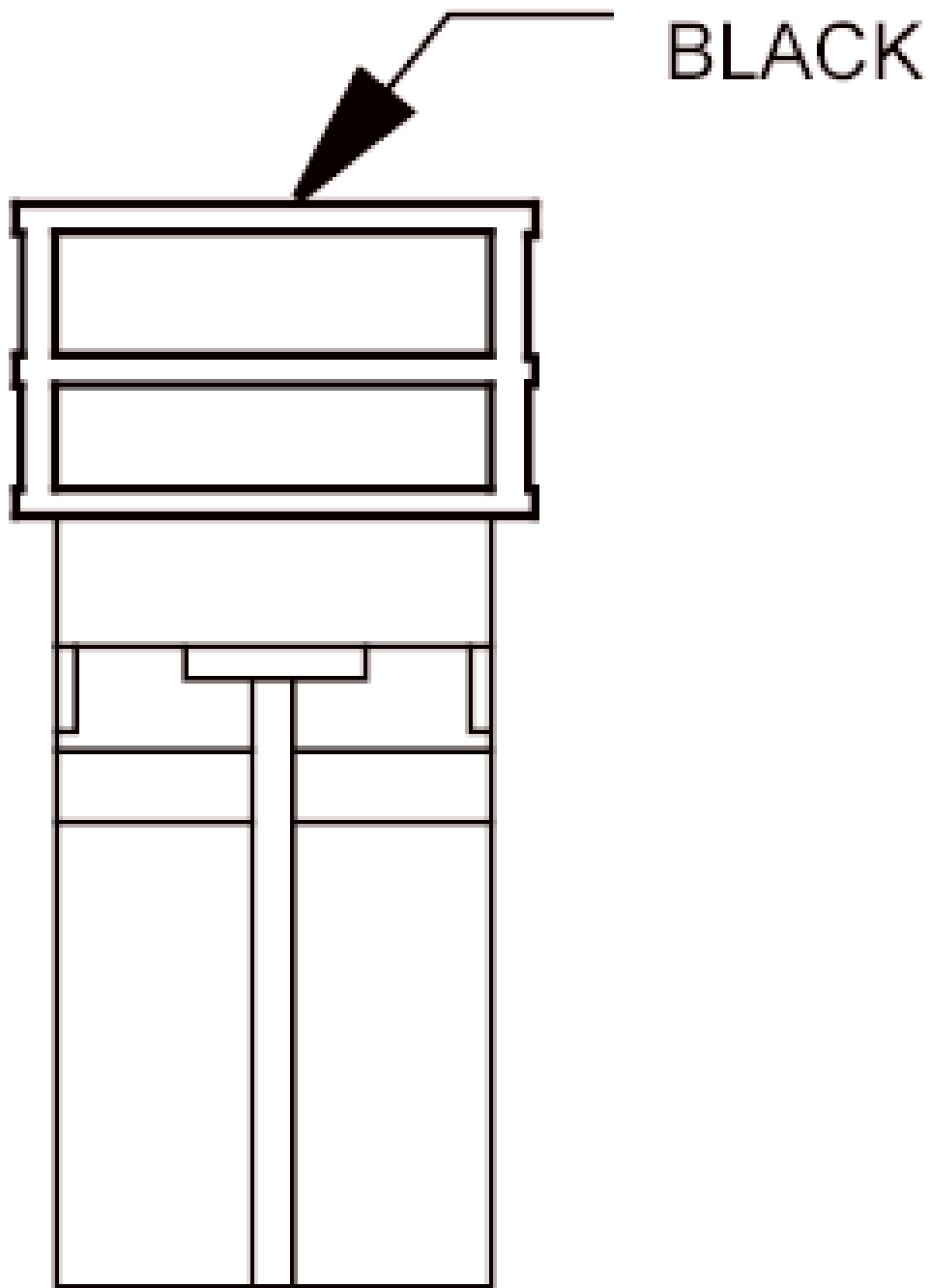


BLACK

HORN 2 C1

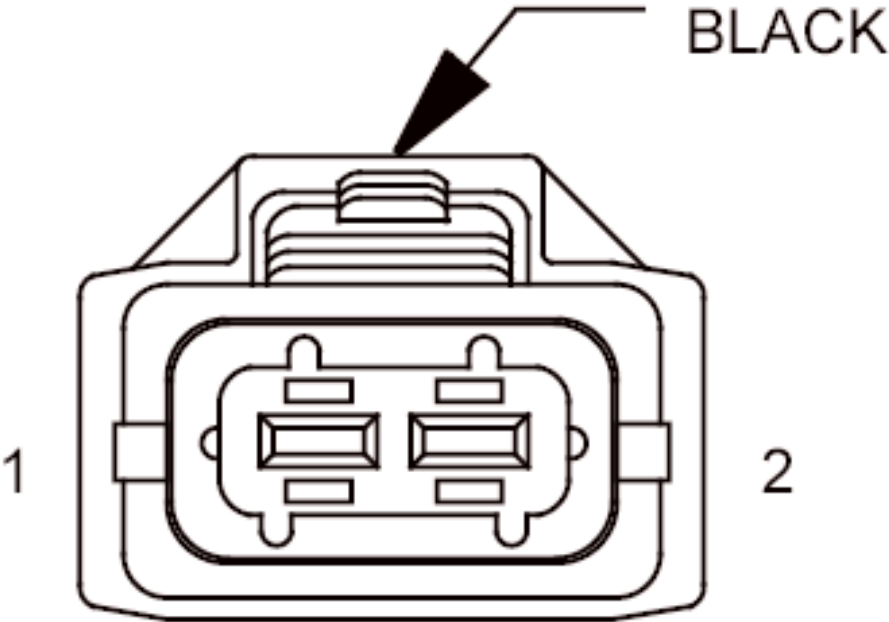
CAV	CIRCUIT	FUNCTION
1	X22 18GY/LB	FUSED HORN CONTROL OUTPUT

HORN 2 C2 - BLACK 1 WAY



CAV	CIRCUIT	FUNCTION
1	Z908C 18BK/PK	GROUND

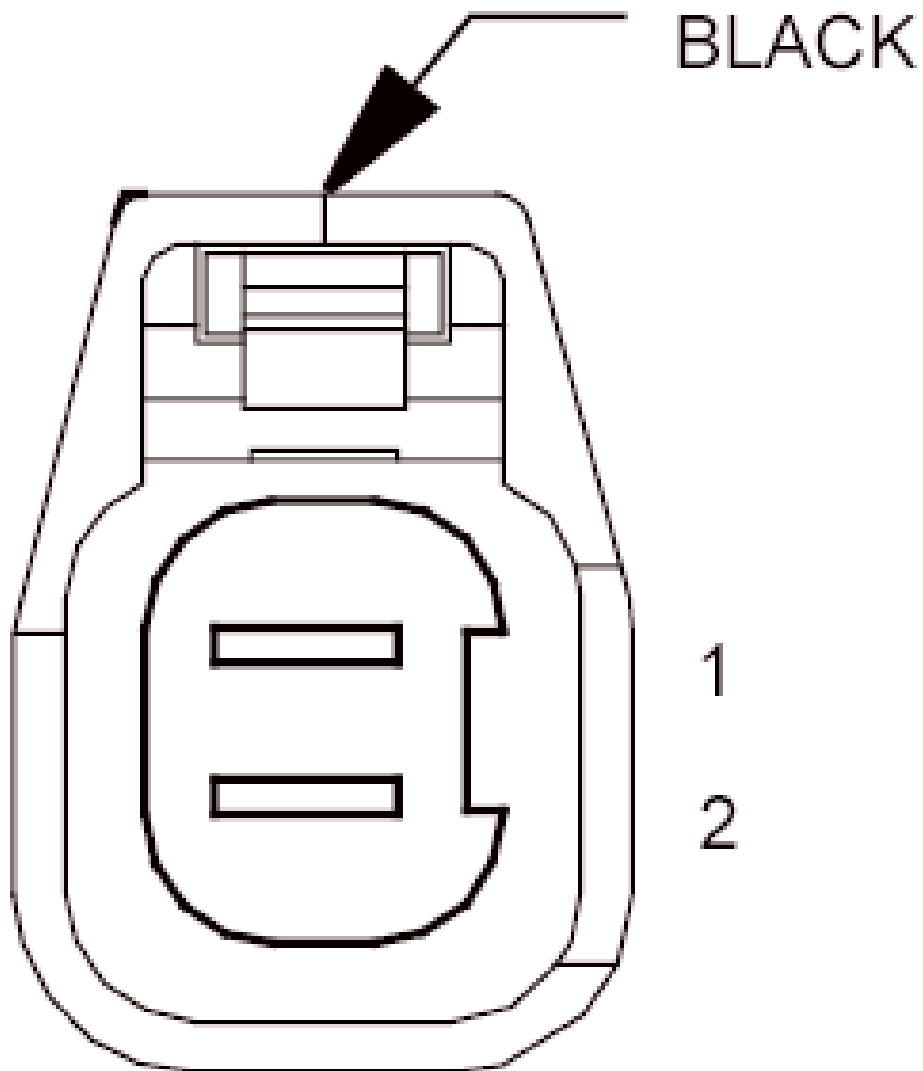
INJECTOR-FUEL 1 - BLACK 2 WAY (DIESEL)



INJECTOR-
FUEL 1
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	K611 16OR/BR	INJECTOR 1 LOW-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
1	K11 16BR/YL	INJECTOR 1 HIGH-SIDE CONTROL (LATE BUILD 2.8L DIESEL)
2	K11 16BR/YL	INJECTOR 1 HIGH-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
2	K611 16OR/BR	INJECTOR 1 LOW-SIDE CONTROL (LATE BUILD 2.8L DIESEL)

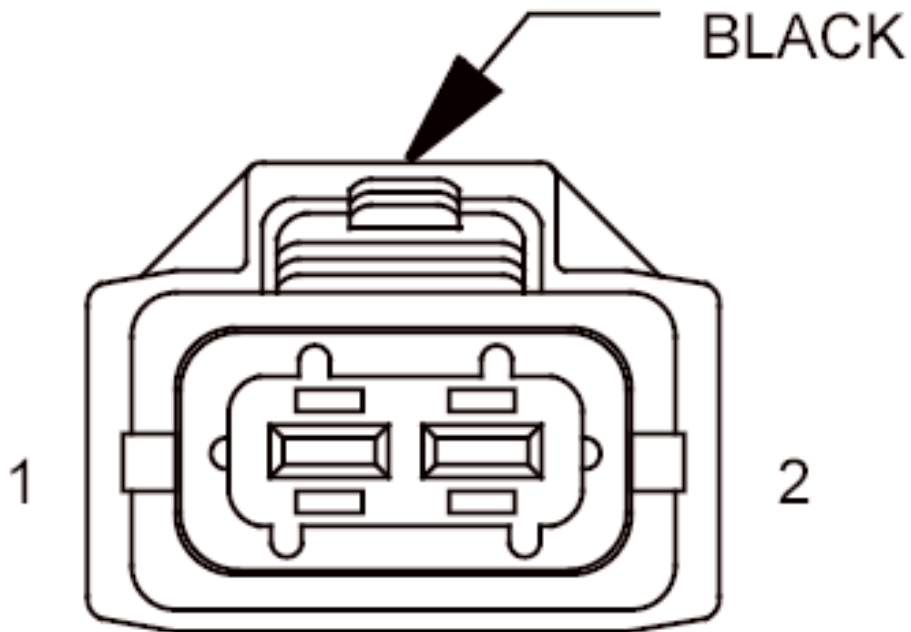
INJECTOR-FUEL 1 - BLACK 2 WAY (GAS)



INJECTOR- FUEL 1 (GAS)

CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT
2	K11 16BR/YL	INJECTOR 1 CONTROL

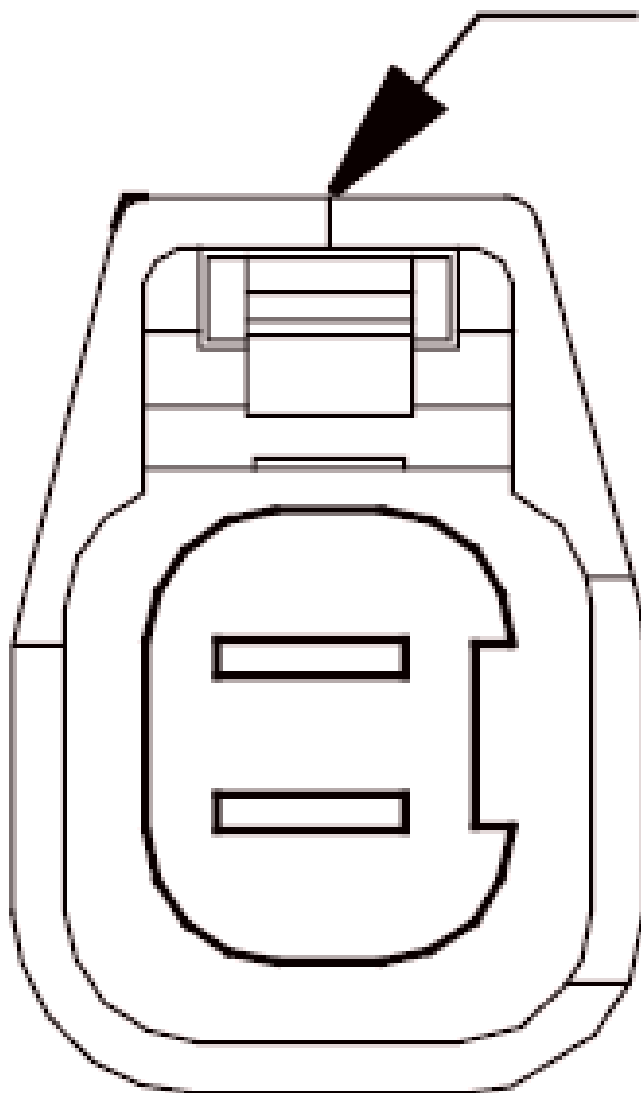
INJECTOR-FUEL 2 - BLACK 2 WAY (DIESEL)



INJECTOR- FUEL 2 (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K612 16YL/BR	INJECTOR 2 LOW-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
1	K12 16BR/DB	INJECTOR 2 HIGH-SIDE CONTROL (LATE BUILD 2.8L DIESEL)
2	K12 16BR/DB	INJECTOR 2 HIGH-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
2	K612 16YL/BR	INJECTOR 2 LOW-SIDE CONTROL (LATE BUILD 2.8L DIESEL)

INJECTOR-FUEL 2 - BLACK 2 WAY (GAS)



BLACK

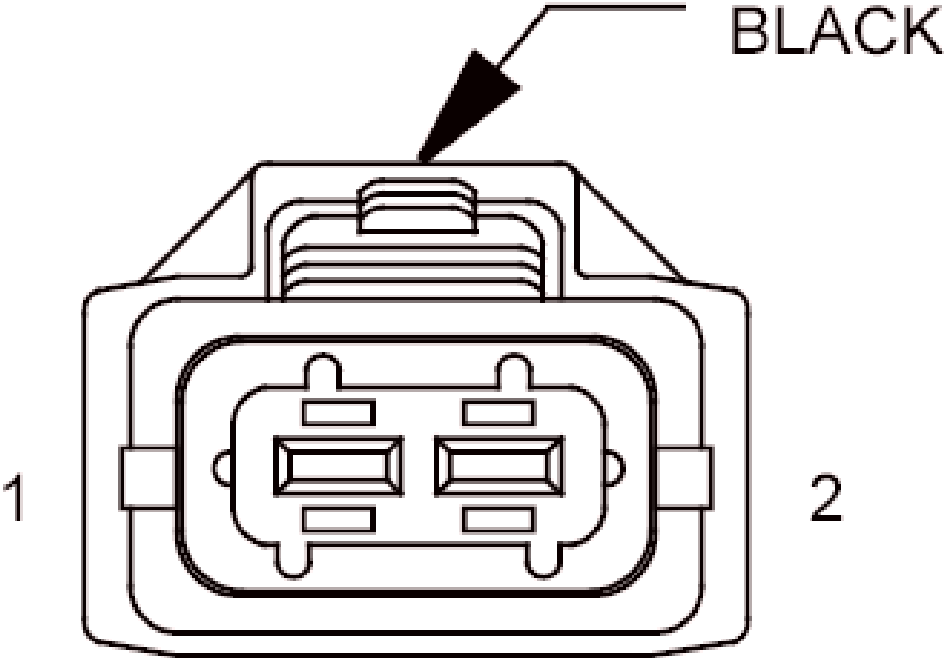
1

2

INJECTOR- FUEL 2 (GAS)

CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT
2	K12 16BR/DB	INJECTOR 2 CONTROL

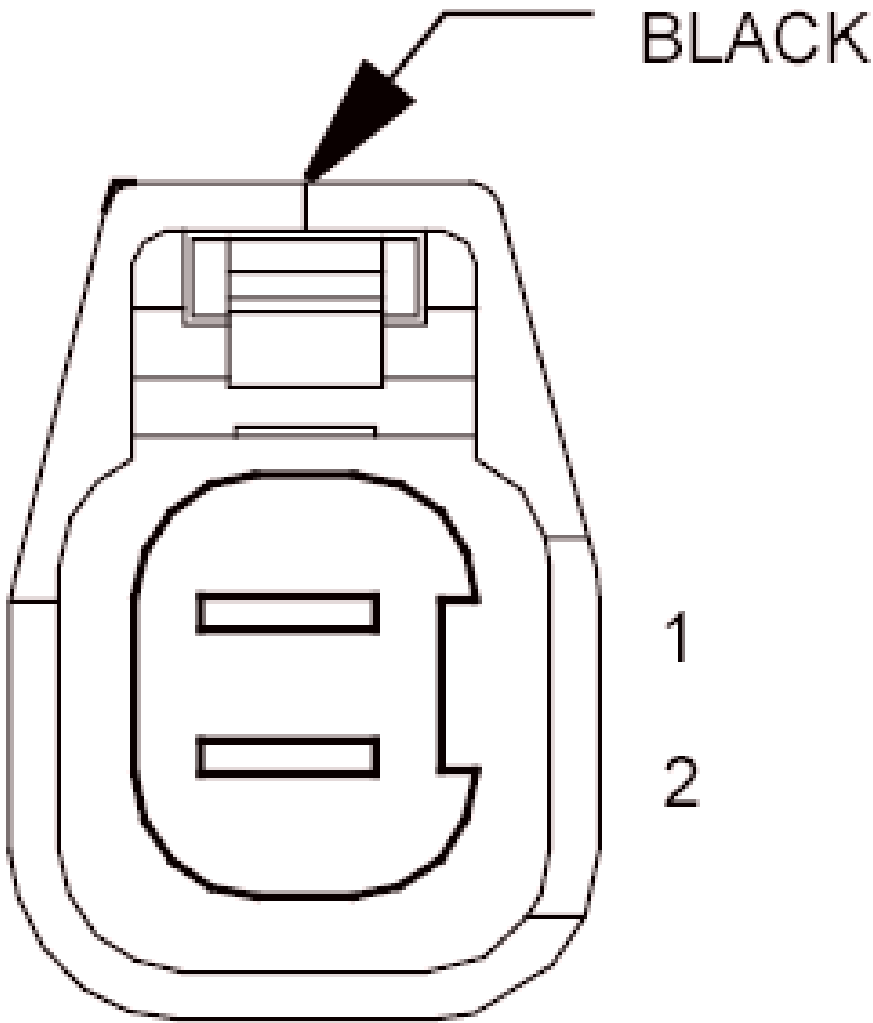
INJECTOR-FUEL 3 - BLACK 2 WAY (DIESEL)



INJECTOR-
FUEL 3
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	K613 16GY/BR	INJECTOR 3 LOW-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
1	K13 16BR/LB	INJECTOR 3 HIGH-SIDE CONTROL (LATE BUILD 2.8L DIESEL)
2	K13 16BR/LB	INJECTOR 3 HIGH-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
2	K613 16GY/BR	INJECTOR 3 LOW-SIDE CONTROL (LATE BUILD 2.8L DIESEL)

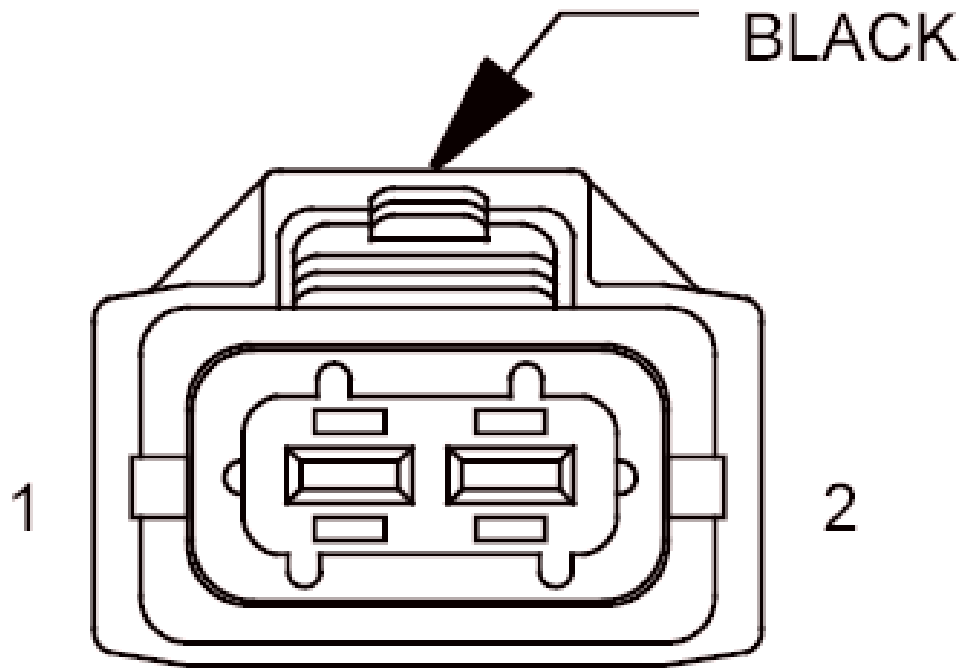
INJECTOR-FUEL 3 - BLACK 2 WAY (GAS)



**INJECTOR-
FUEL 3
(GAS)**

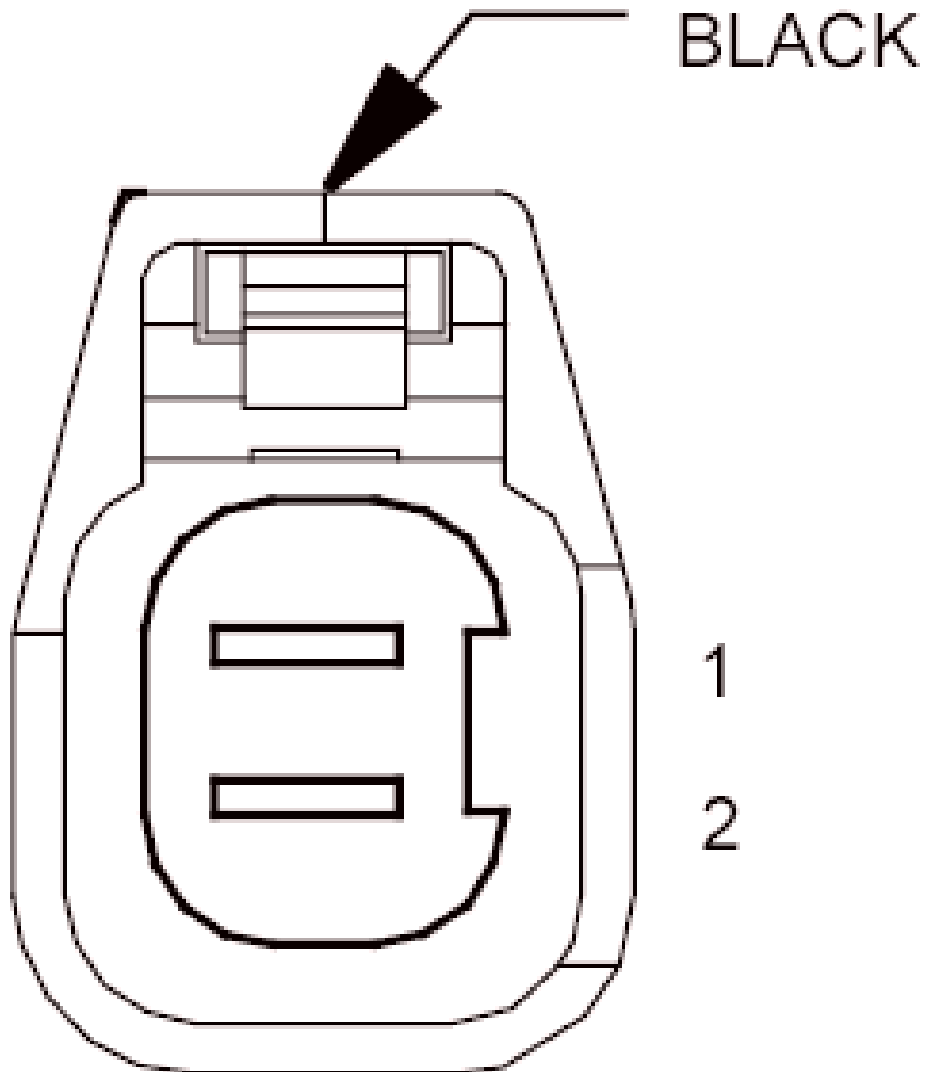
CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT
2	K13 16BR/LB	INJECTOR 3 CONTROL

INJECTOR-FUEL 4 - BLACK 2 WAY (DIESEL)



INJECTOR- FUEL 4 (DIESEL)

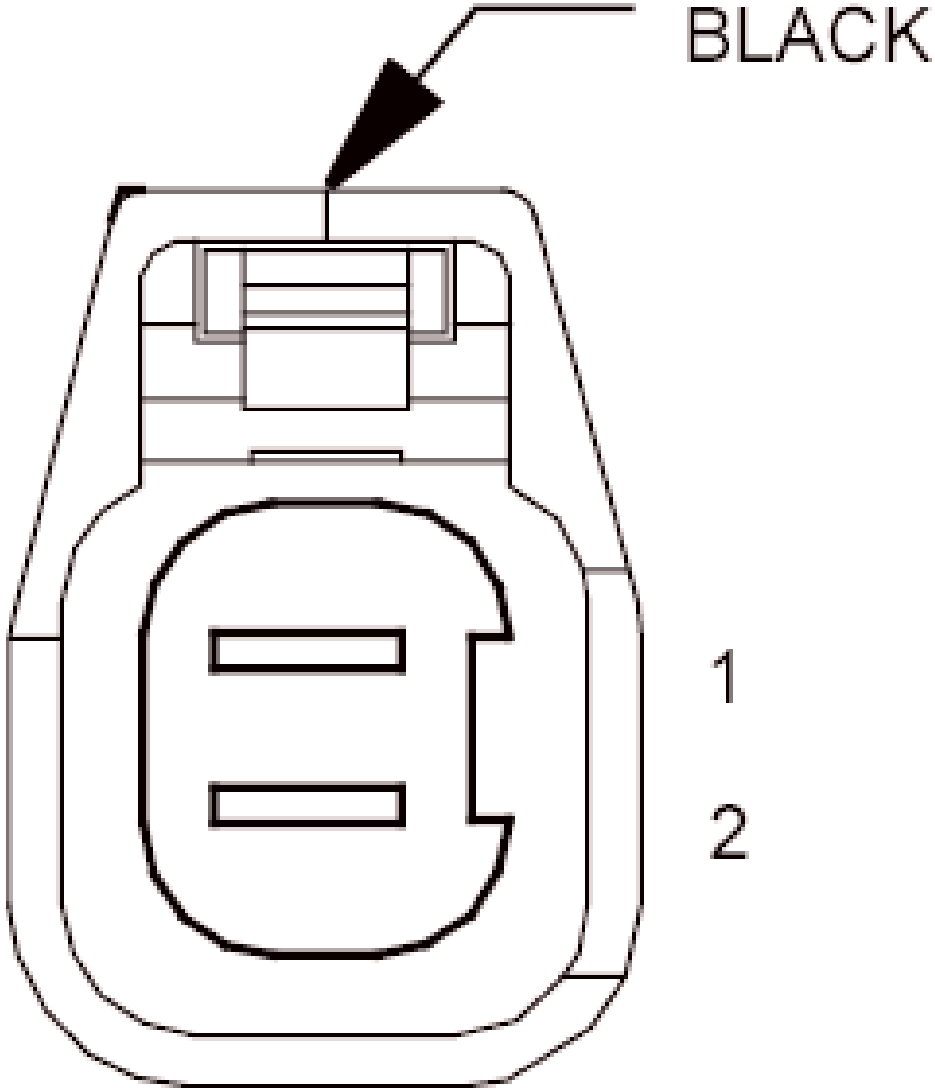
CAV	CIRCUIT	FUNCTION
1	K614 16WT/BR	INJECTOR 4 LOW-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
1	K14 16BR/TN	INJECTOR 4 HIGH-SIDE CONTROL (LATE BUILD 2.8L DIESEL)
2	K14 16BR/TN	INJECTOR 4 HIGH-SIDE CONTROL (EXCEPT LATE BUILD 2.8L DIESEL)
2	K614 16WT/BR	INJECTOR 4 LOW-SIDE CONTROL (LATE BUILD 2.8L DIESEL)



INJECTOR- FUEL 4 (GAS)

CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT (3.7L)
2	K14 16BR/TN	INJECTOR 4 CONTROL (3.7L)

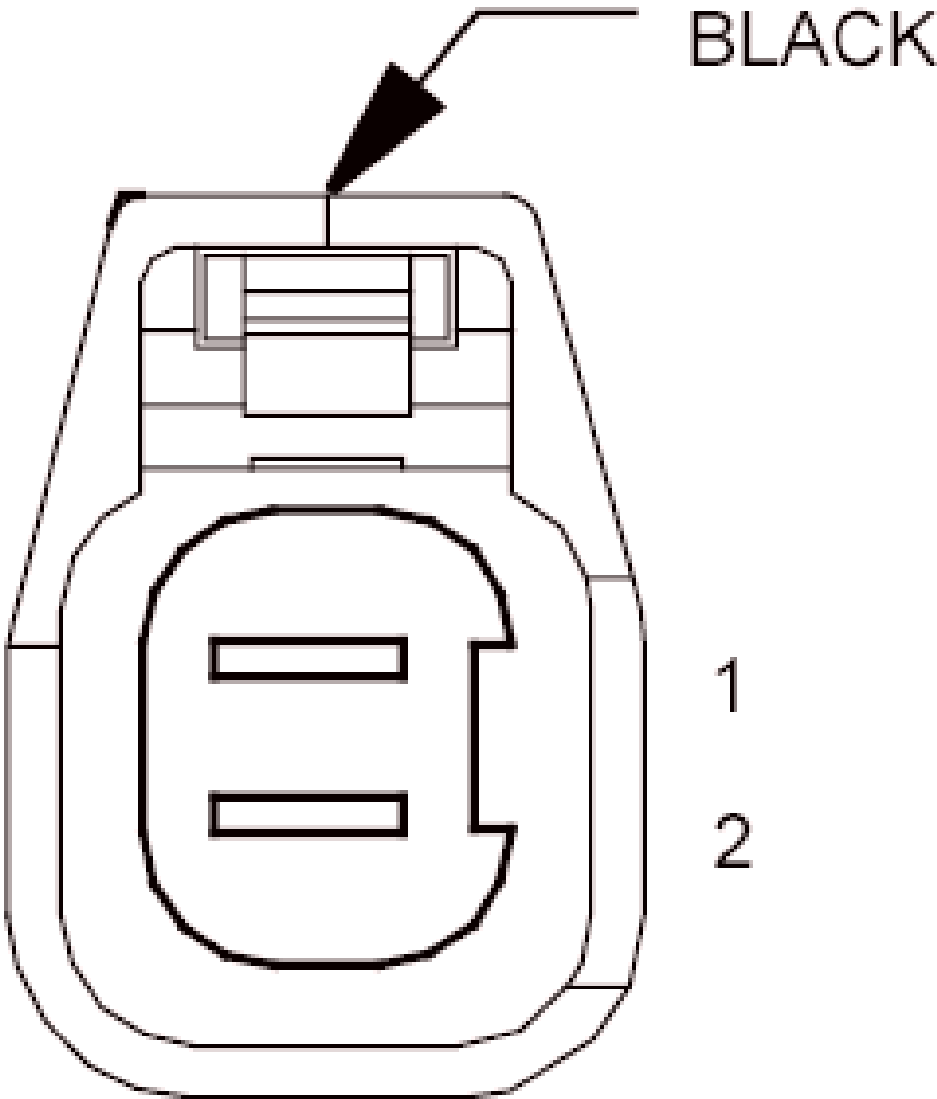
INJECTOR-FUEL 5 - BLACK 2 WAY (GAS)



**INJECTOR-
FUEL 5
(GAS)**

CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT
2	K38 16BR/OR	INJECTOR 5 CONTROL

INJECTOR-FUEL 6 - BLACK 2 WAY (GAS)



INJECTOR-
FUEL 6
(GAS)

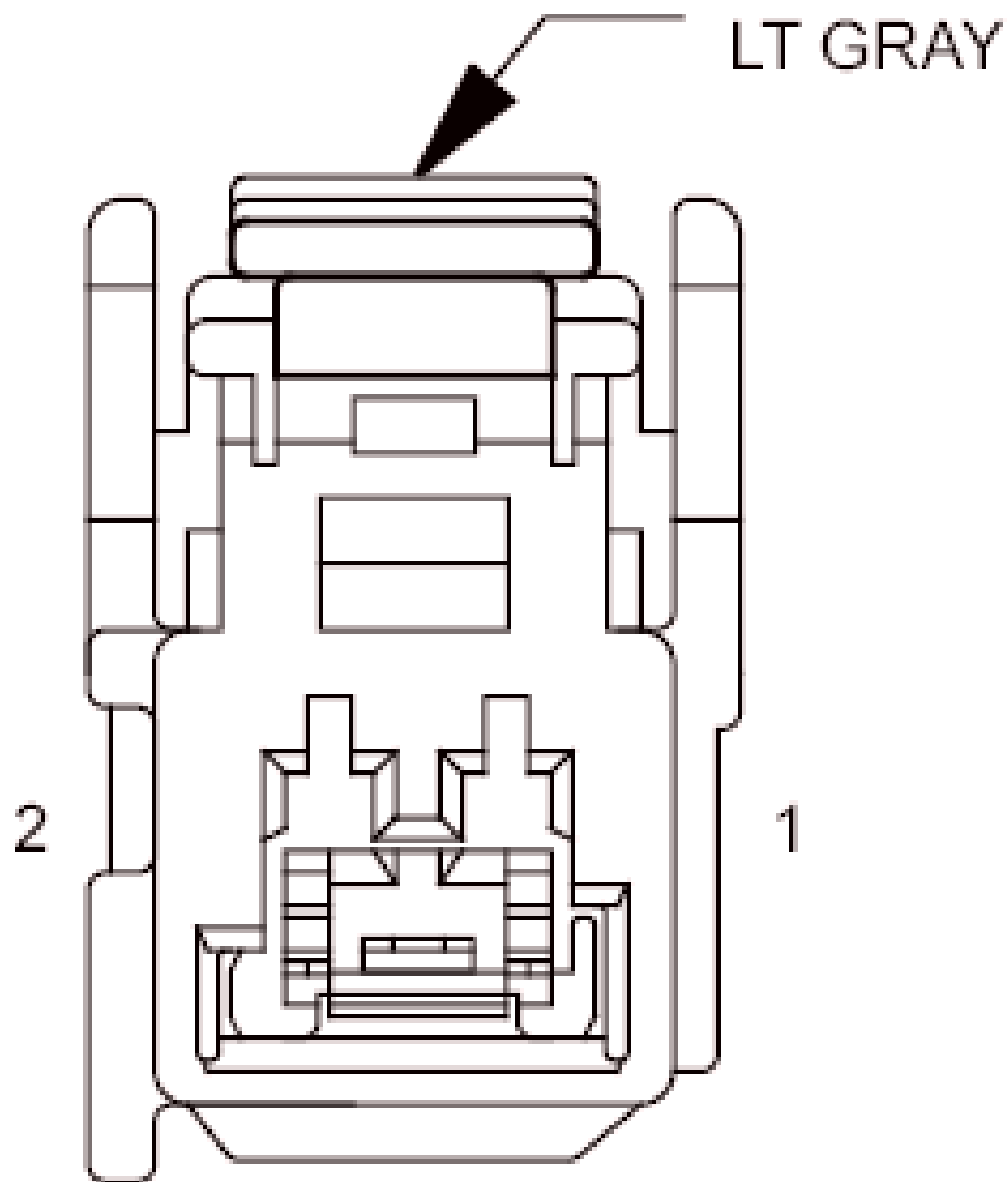
CAV	CIRCUIT	FUNCTION
1	F342 16BR/WT	FUSED ASD RELAY OUTPUT

2

K58 16BR/VT

INJECTOR 6 CONTROL

LAMP-CENTER HIGH MOUNTED STOP - LT. GRAY 2 WAY



LAMP- CENTER HIGH MOUNTED STOP

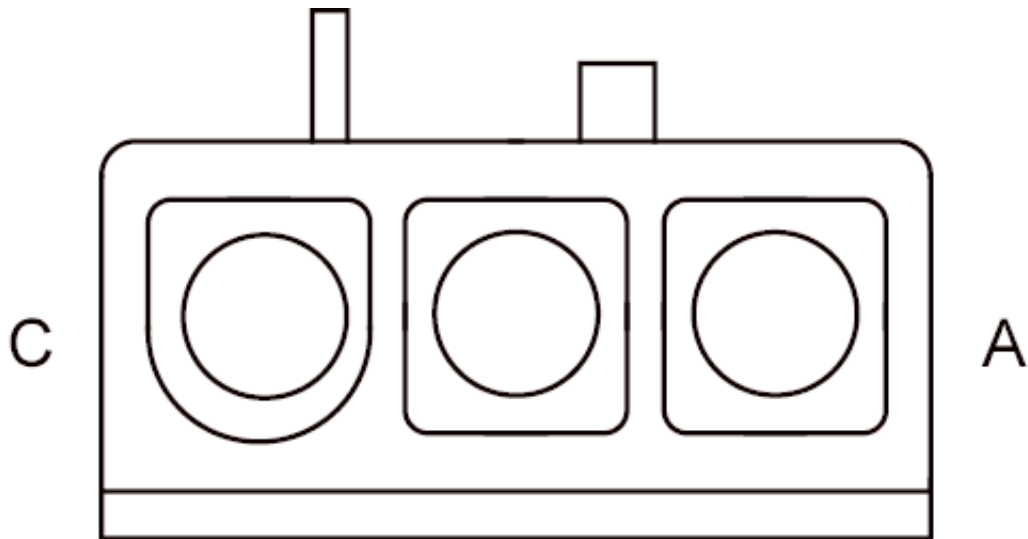
	CIRCUIT	FUNCTION
1	Z920 18BK/LB	GROUND
2	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT

LAMP-COURTESY-LEFT REAR - 3 WAY

LAMP-COURTESY-LEFT REAR

CAV	CIRCUIT	FUNCTION
A	M24 22YL/WT	COURTESY LAMP FEED
B	Z919 20BK	GROUND
C	M27 22YL/LB	DEMAND FEED

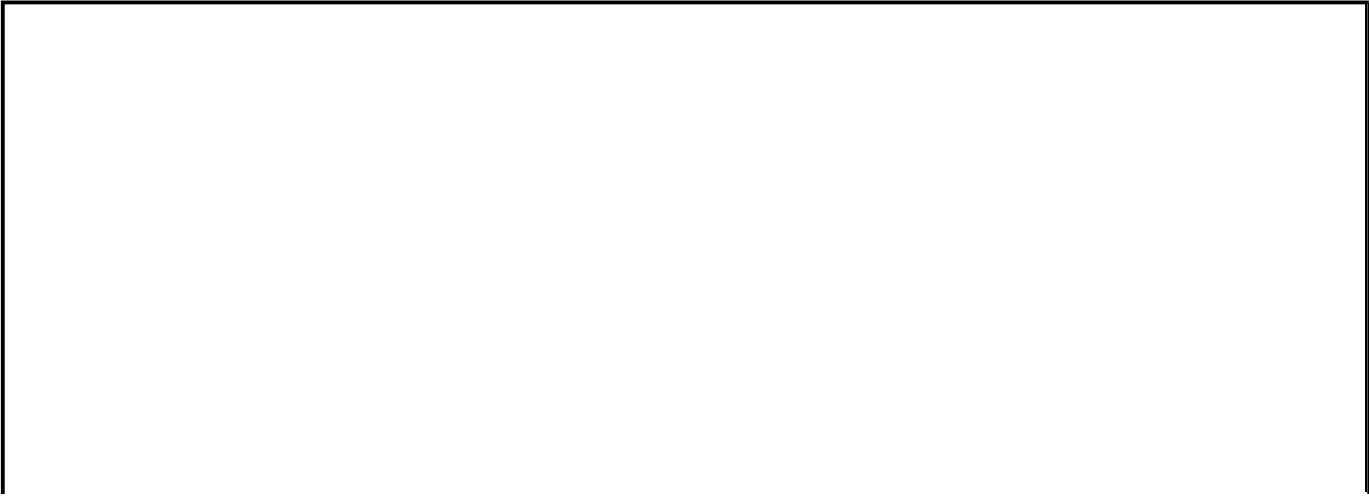
LAMP-COURTESY-RIGHT REAR - 3 WAY

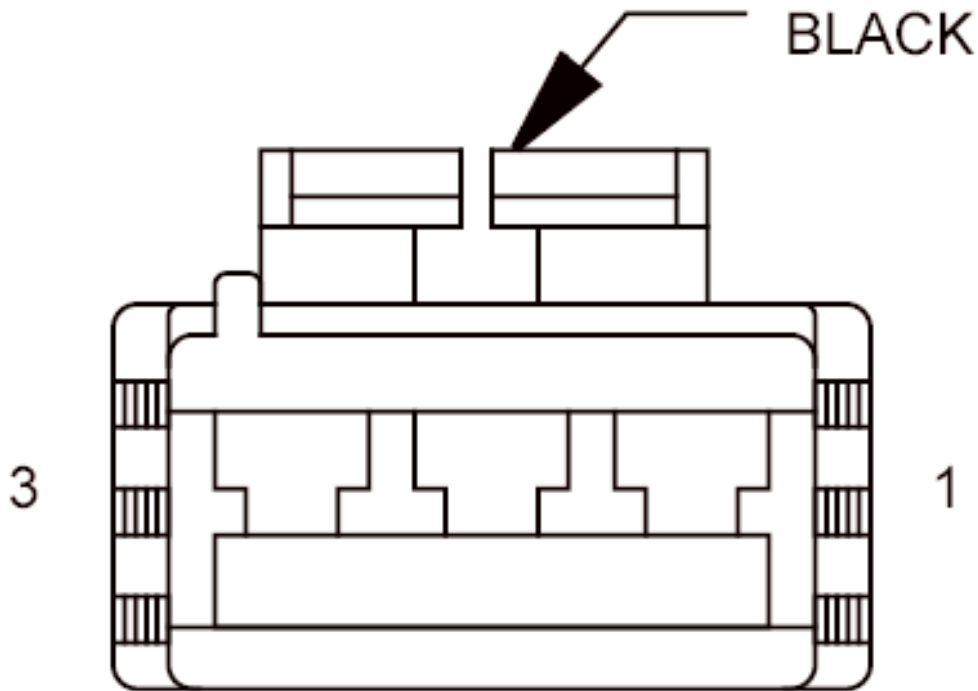


LAMP- COURTESY- RIGHT REAR

CAV	CIRCUIT	FUNCTION
A	M24 22YL/WT	COURTESY LAMP FEED
B	Z919 20BK	GROUND
C	M27 22YL/LB	DEMAND FEED

LAMP-DOME - BLACK 3 WAY

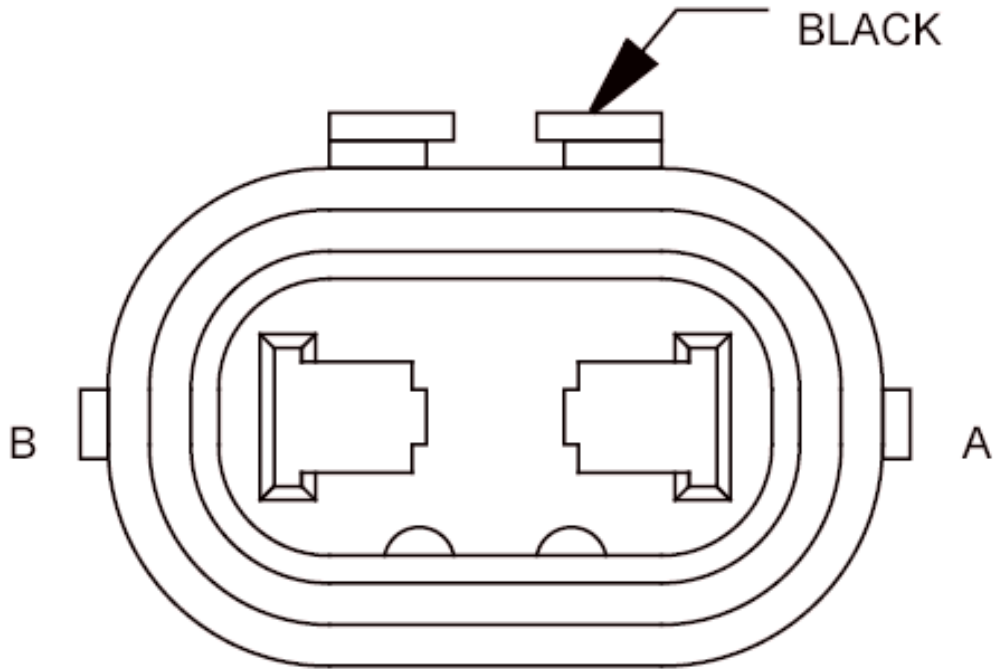




LAMP- DOME

CAV	CIRCUIT	FUNCTION
1	-	-
2	M24 18YL/WT	COURTESY LAMPS DRIVER
3	Z919 18BK/DB	GROUND

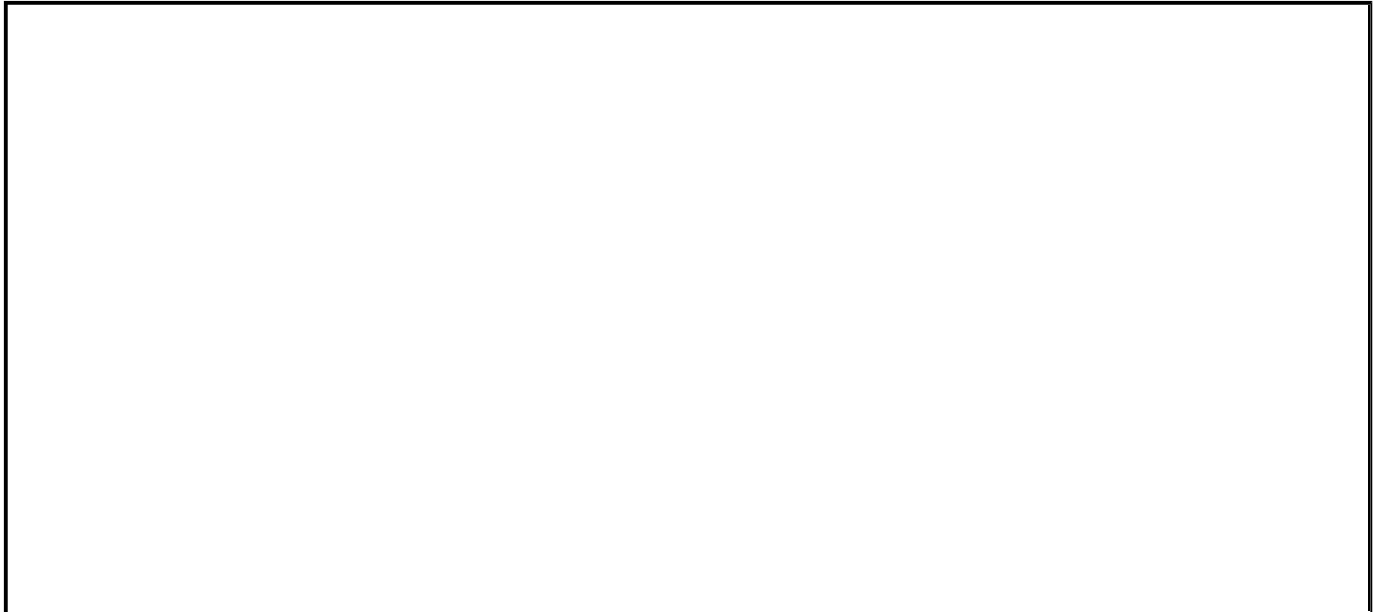
LAMP-FOG-LEFT FRONT - BLACK 2 WAY

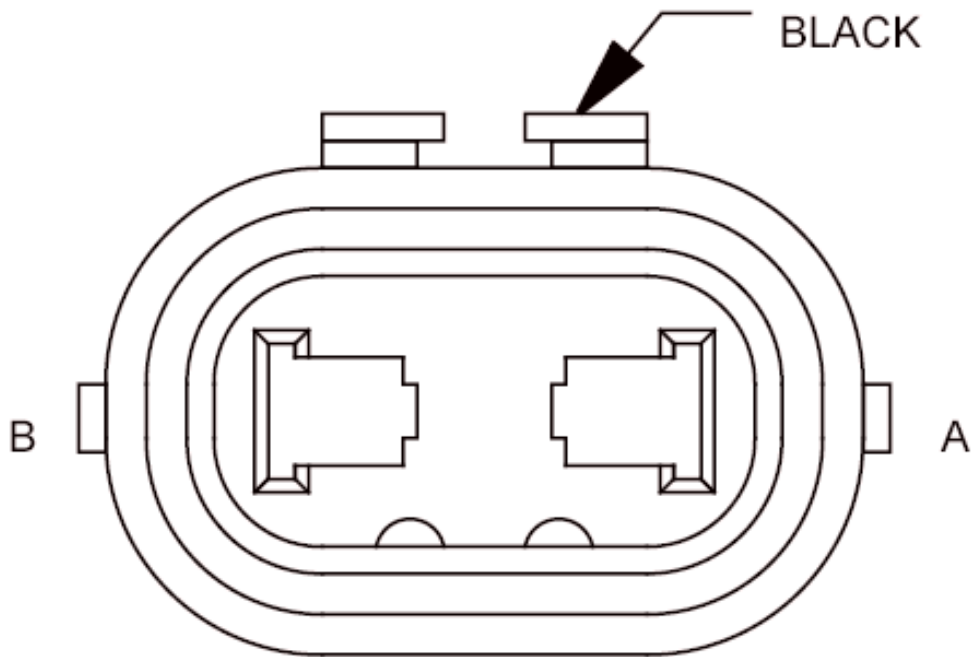


LAMP-FOG- LEFT FRONT

CAV	CIRCUIT	FUNCTION
A	L89 18WT/YL	LEFT FRONT FOG LAMP CONTROL
B	Z907 18BK/WT	GROUND

LAMP-FOG-RIGHT FRONT - BLACK 2 WAY

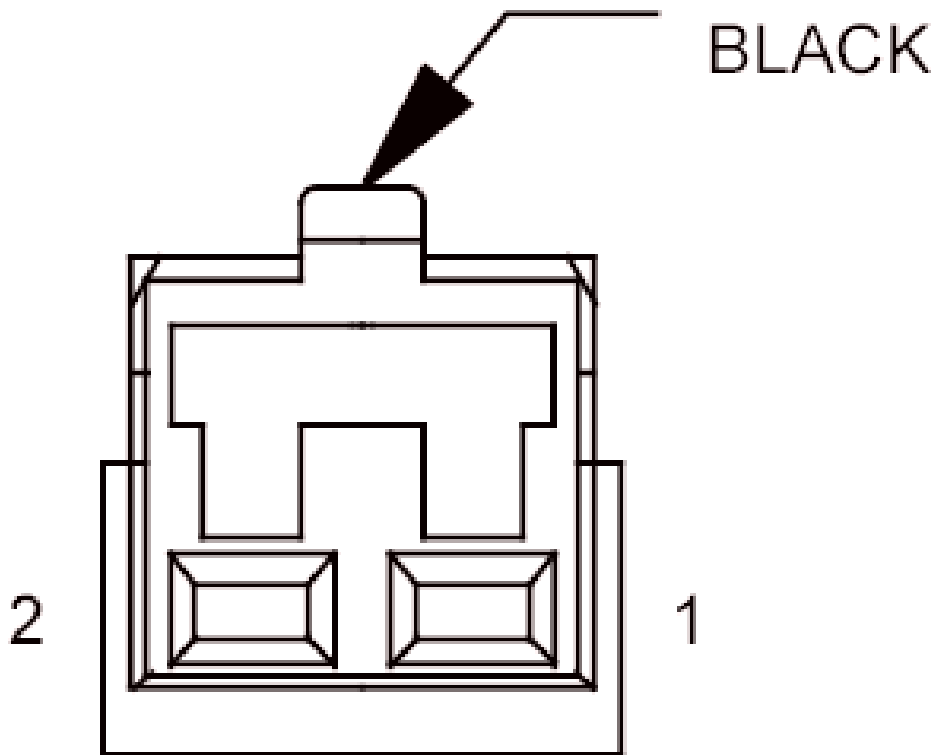




LAMP-FOG- LEFT FRONT

CAV	CIRCUIT	FUNCTION
A	L90 18WT/OR	RIGHT FRONT FOG LAMP CONTROL
B	Z908 18BK/DB	GROUND

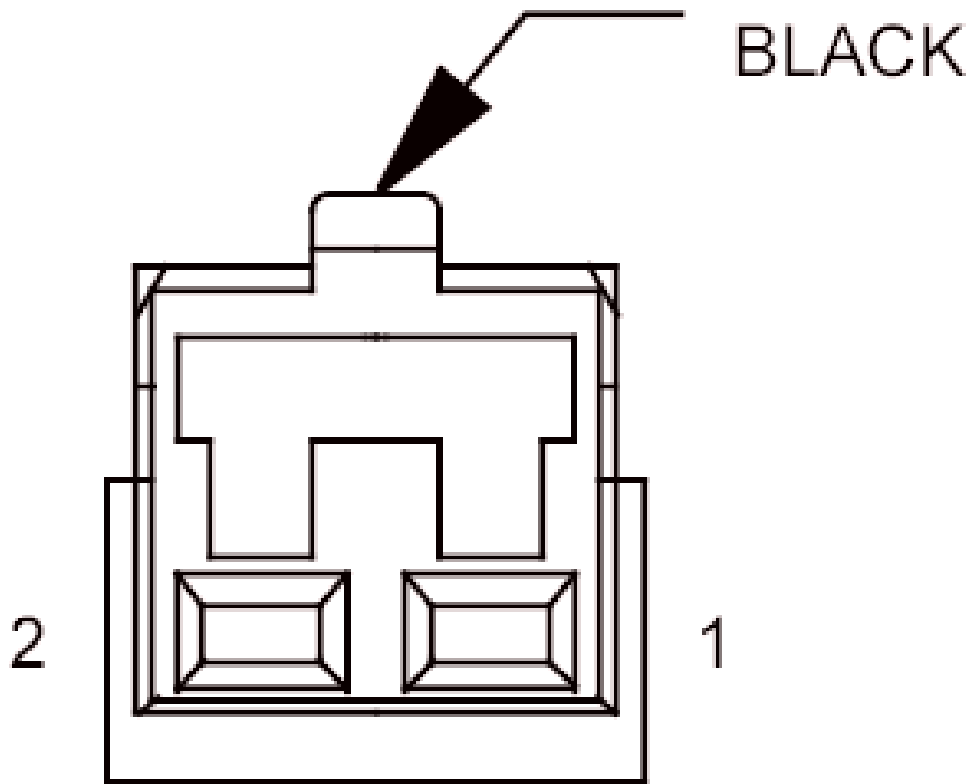
LAMP-FOOTWELL-FRONT LEFT - BLACK 2 WAY



**LAMP-
FOOTWELL-
FRONT
LEFT**

CAV	CIRCUIT	FUNCTION
1	M24 20YL/WT	COURTESY LAMPS DRIVER
2	Z911 18BK/LG	GROUND

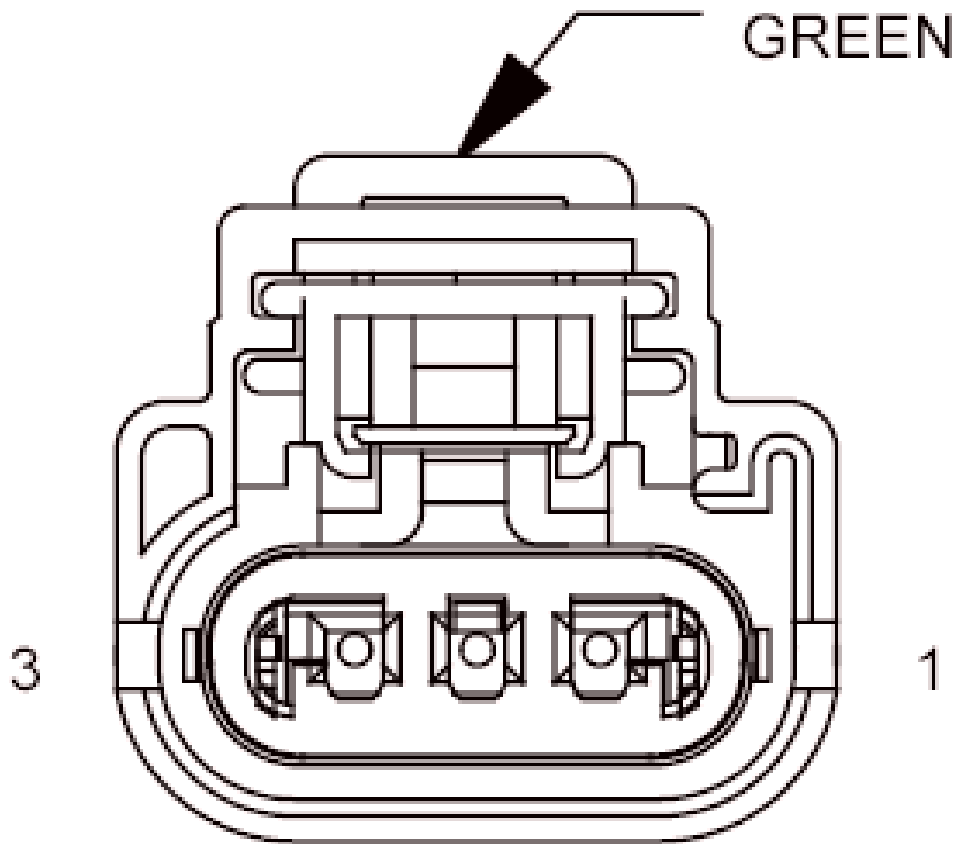
LAMP-FOOTWELL-FRONT RIGHT - BLACK 2 WAY



**LAMP-
FOOTWELL-
FRONT
RIGHT**

CAV	CIRCUIT	FUNCTION
1	M24 20YL/WT	COURTESY LAMPS DRIVER
2	Z911 18BK/PK	GROUND

LAMP-HEADLAMP-LEFT - GREEN 3 WAY (EXCEPT EXPORT) FEMALE

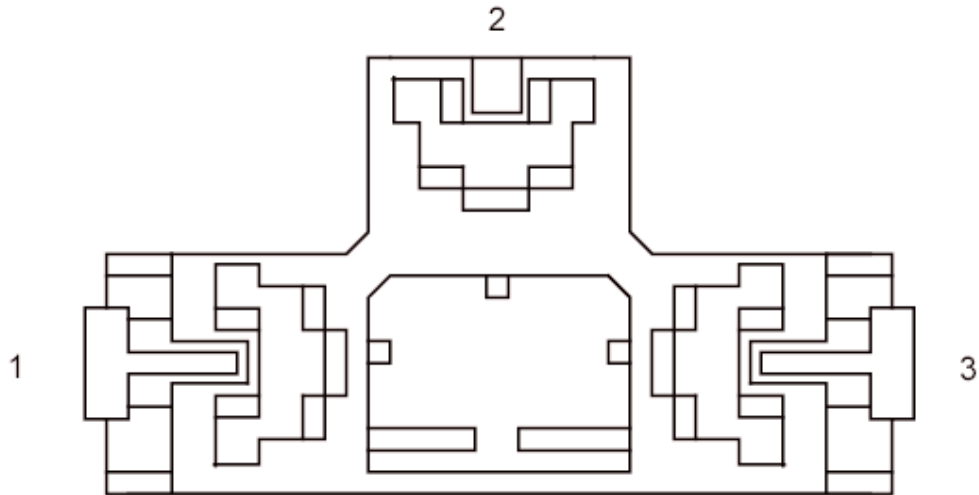


**LAMP-
HEADLAMP-
LEFT**

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	L43 18WT/DB	LEFT LOW BEAM DRIVER
2	L911 18BK/LG	LEFT HEADLAMP RETURN SIGNAL
3	L33 18WT/LG	LEFT HIGH BEAM DRIVER

LAMP-HEADLAMP-LEFT - 3 WAY (EXPORT)

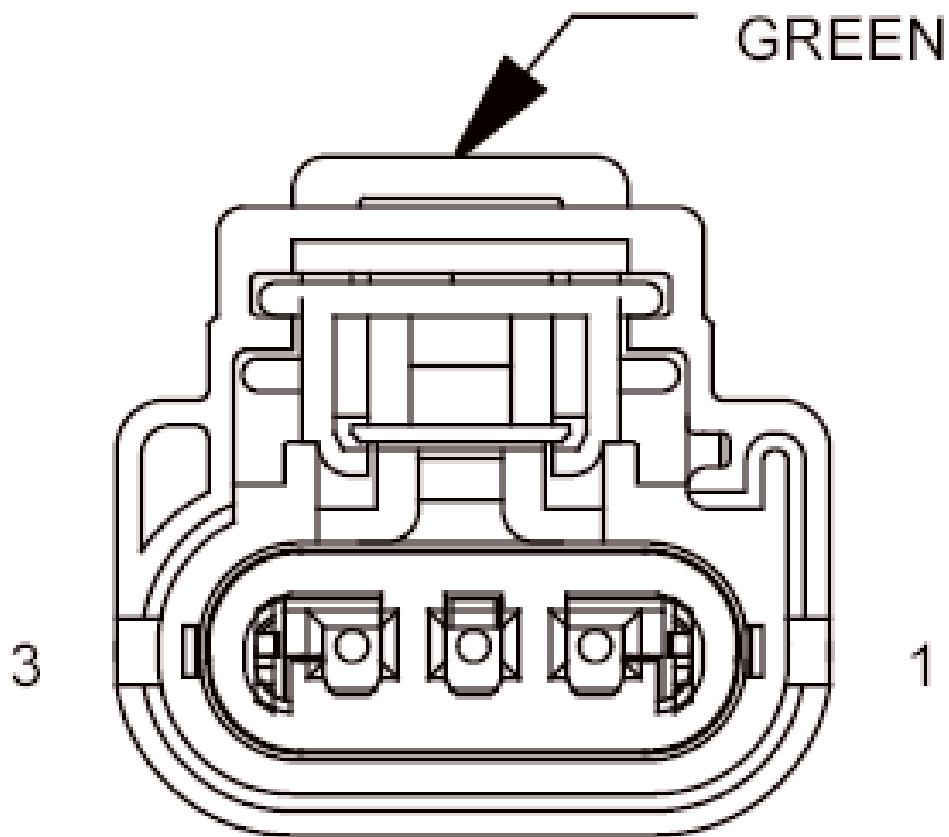


LAMP-
HEADLAMP-
LEFT

(EXPORT)

CAV	CIRCUIT	FUNCTION
1	L33 18WT/LG	LEFT HIGH BEAM DRIVER
2	L43 18WT/DB	LEFT LOW BEAM DRIVER
3	L911 18BK/LG	LEFT HEADLAMP RETURN SIGNAL

LAMP-HEADLAMP-RIGHT - GREEN 3 WAY (EXCEPT EXPORT) FEMALE

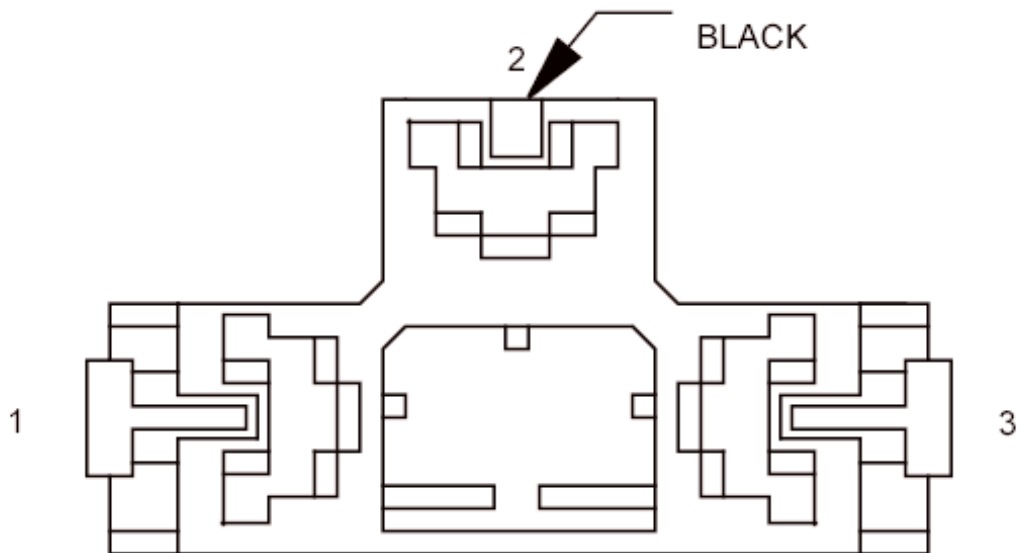


**LAMP-
HEADLAMP-
RIGHT**

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	L44 18WT/TN	RIGHT LOW BEAM DRIVER
2	L910 18BK/TN	RIGHT HEADLAMP RETURN SIGNAL
3	L34 18WT/GY	RIGHT HIGH BEAM DRIVER

LAMP-HEADLAMP-RIGHT - BLACK 3 WAY (EXPORT)

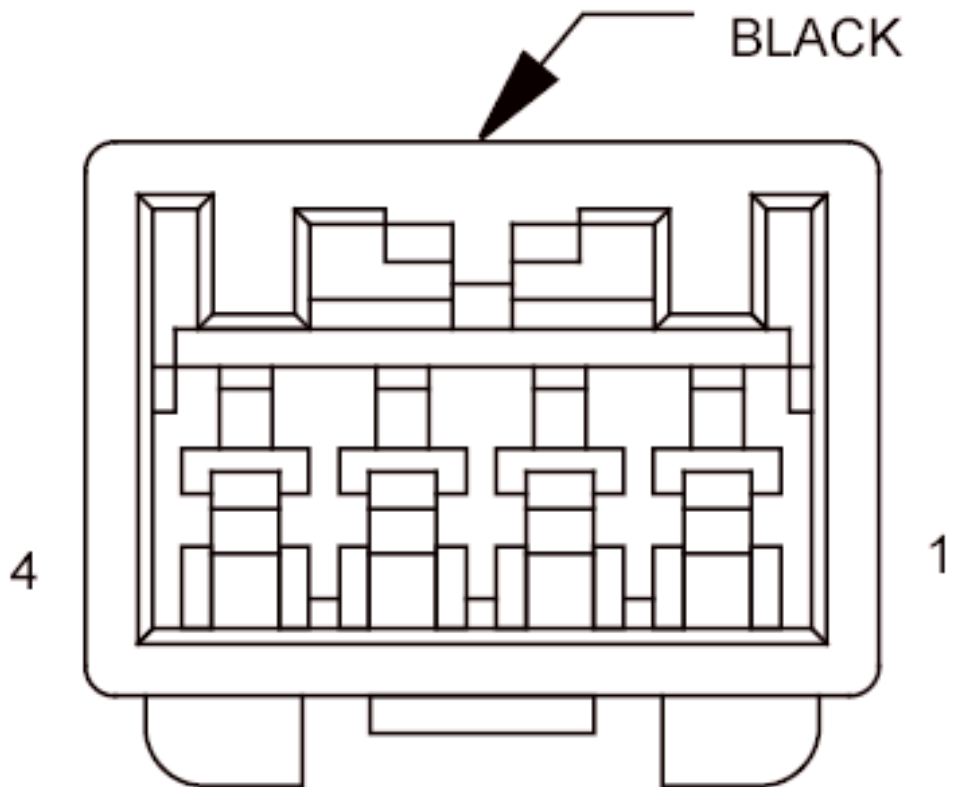


**LAMP-
HEADLAMP-
RIGHT**

(EXPORT)

CAV	CIRCUIT	FUNCTION
1	L34 18WT/GY	RIGHT HIGH BEAM DRIVER
2	L44 18WT/TN	RIGHT LOW BEAM DRIVER
3	L910 18BK/TN	RIGHT HEADLAMP RETURN SIGNAL

LAMP-LICENSE - BLACK 4 WAY



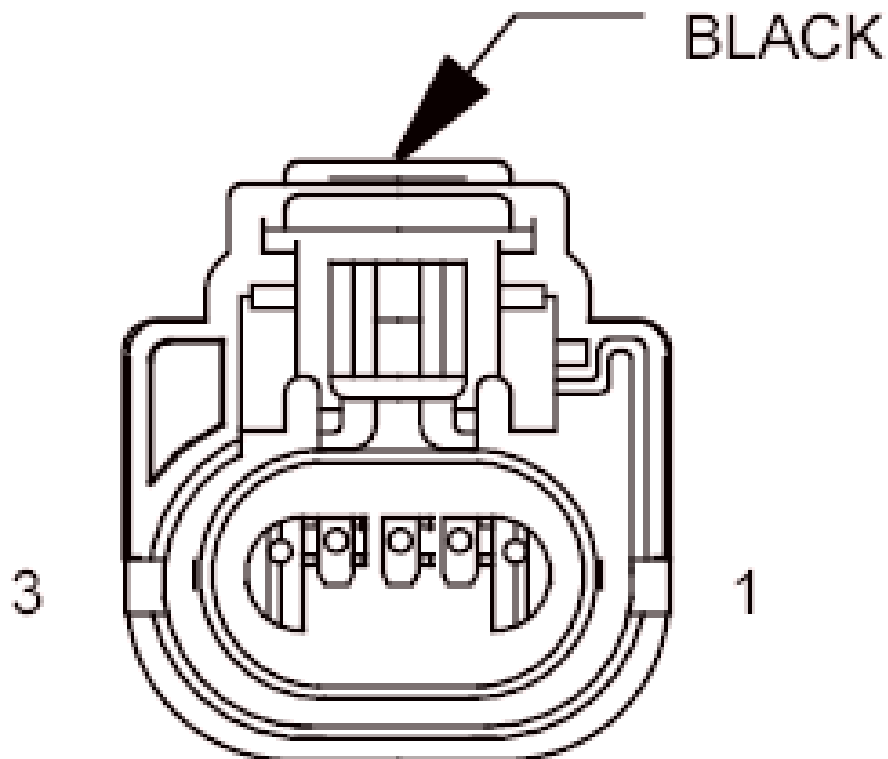
LAMP-LICENSE

CAV	CIRCUIT	FUNCTION
1	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
2	Z920 18BK/GY	GROUND
3	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
4	-	-

LAMP-MAP-MIRROR MOUNTED - 4 WAY



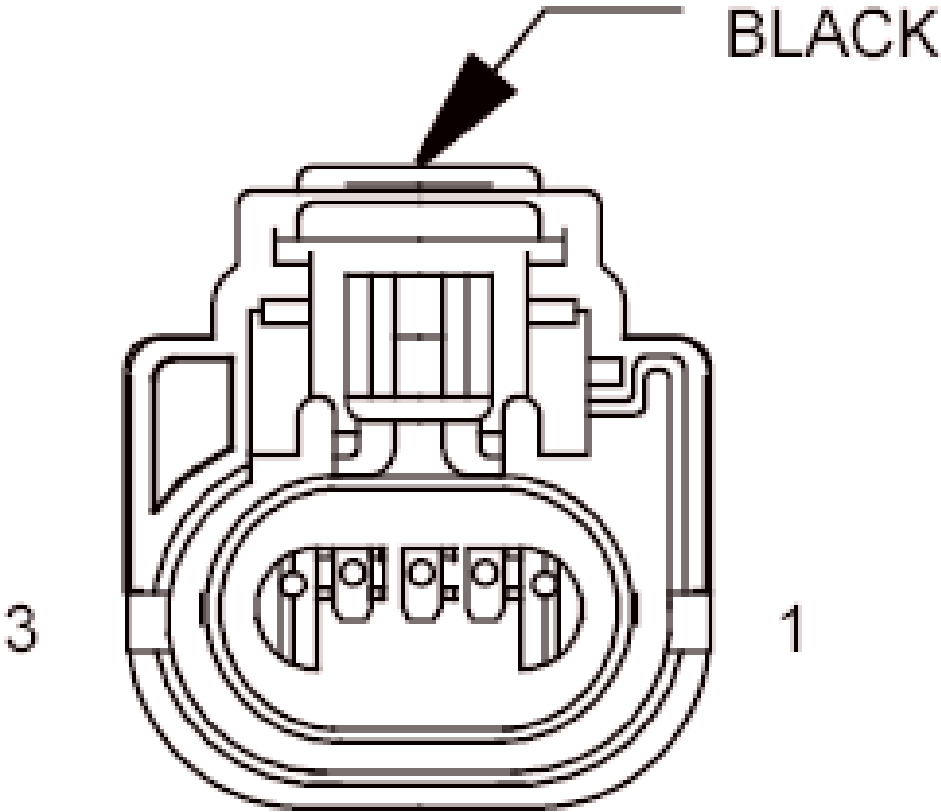
LAMP-PARK/TURN-LEFT FRONT - BLACK 3 WAY (EXCEPT EXPORT)



**LAMP-
PARK/
TURN-
LEFT
FRONT
(EXCEPT EXPORT)**

CAV	CIRCUIT	FUNCTION
1	Z907 18BK/DG	GROUND
2	L61 18WT/LG	LEFT FRONT PARK SIGNAL CONTROL
3	L161 18WT/LG	LEFT FRONT TURN SIGNAL CONTROL

LAMP-PARK/TURN-RIGHT FRONT - BLACK 3 WAY (EXCEPT EXPORT)



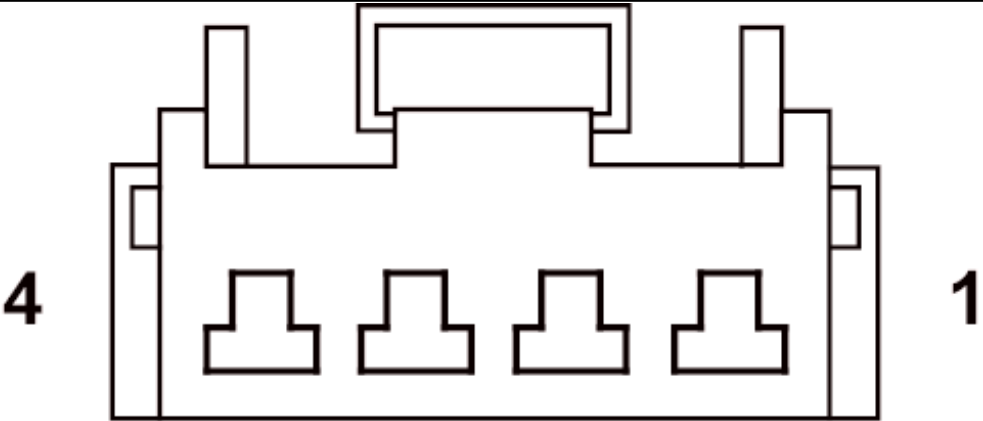
LAMP-
PARK/
TURN-
RIGHT
FRONT

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	Z908 18BK/RD	GROUND
2	L60 18WT/TN	RIGHT FRONT PARK SIGNAL

		CONTROL
3	L160 18WT/TN	RIGHT FRONT TURN SIGNAL CONTROL

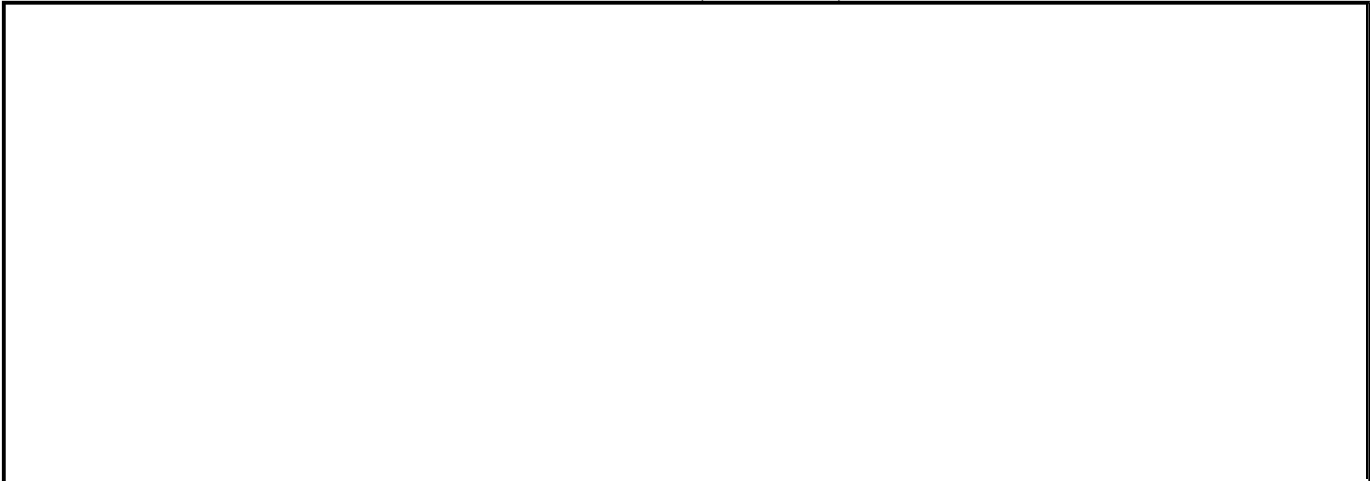
LAMP-PARK-LEFT FRONT - BLACK 2 WAY (EXPORT)

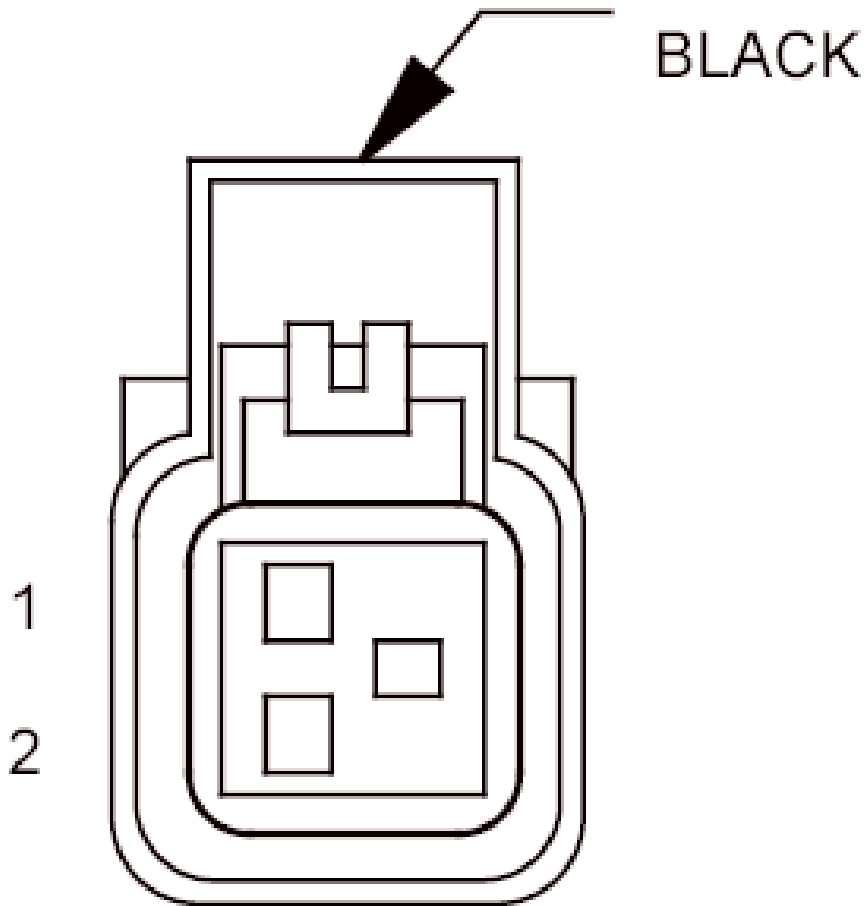


**LAMP-
MAP-
MIRROR
MOUNTED**

CAV	CIRCUIT	FUNCTION
1	Z907 18BK/WT	GROUND
2	L61 18WT/LG	LEFT FRONT PARK SIGNAL CONTROL

LAMP-PARK-RIGHT FRONT - BLACK 2 WAY (EXPORT)

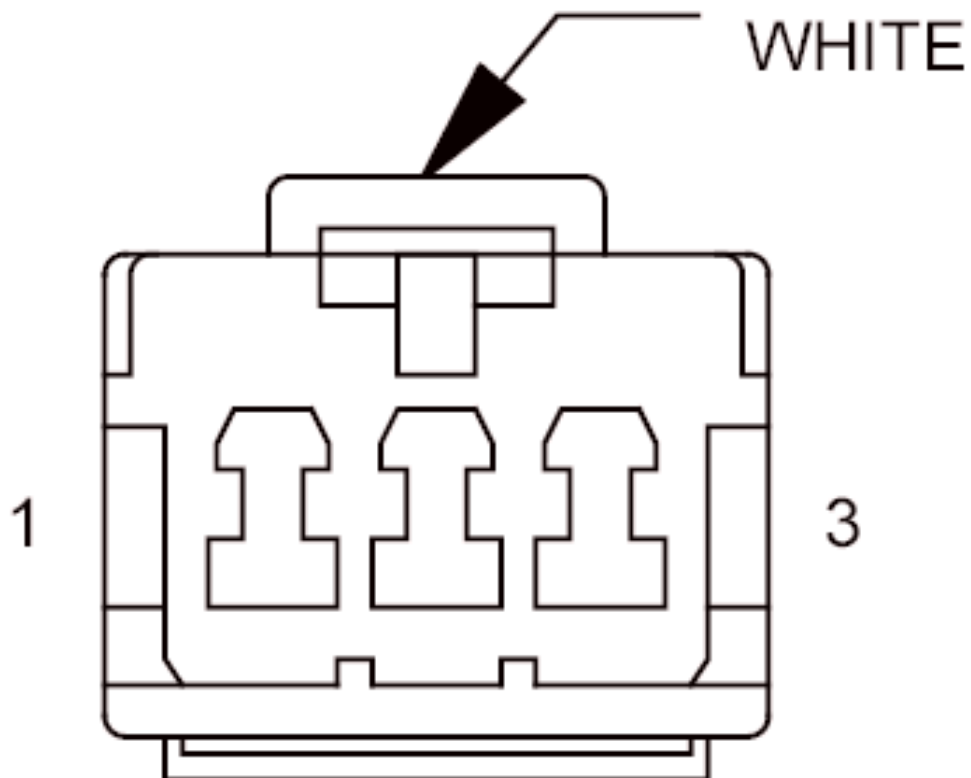




LAMP- PARK-RIGHT FRONT

CAV	CIRCUIT	FUNCTION
1	Z908 18BK/VT	GROUND
2	L60 18WT/TN	RIGHT FRONT PARK SIGNAL CONTROL

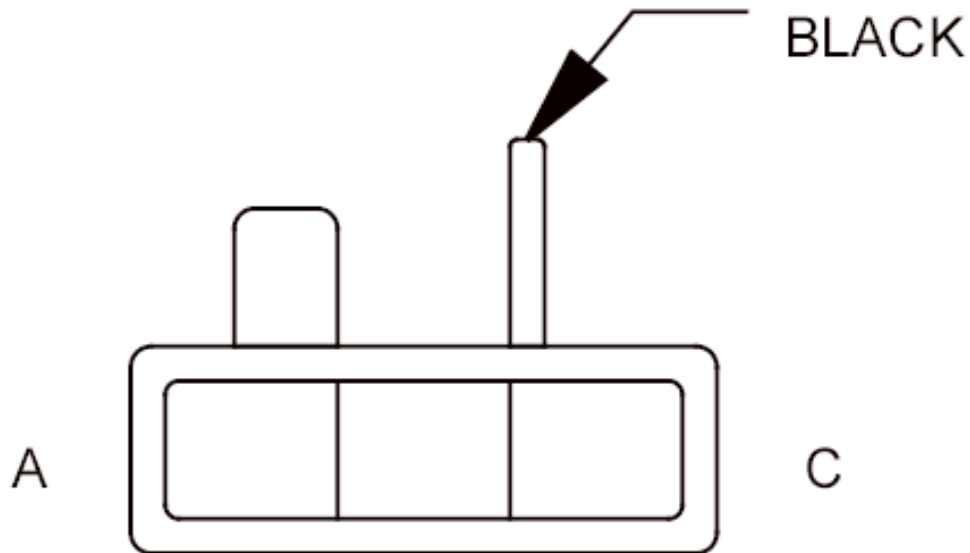
LAMP-PRNDL - WHITE 3 WAY



LAMP- PRNDL

CAV	CIRCUIT	FUNCTION
1	E12 20OR/GY	PANEL LAMPS DRIVER
2	-	-
3	Z910 18BK	GROUND (HIGHLINE/BASE LHD DIESEL)
3	Z910 20BK	GROUND (MIDLINE/EXCEPT BASE LHD DIESEL)

LAMP-READING-FRONT - BLACK 3 WAY

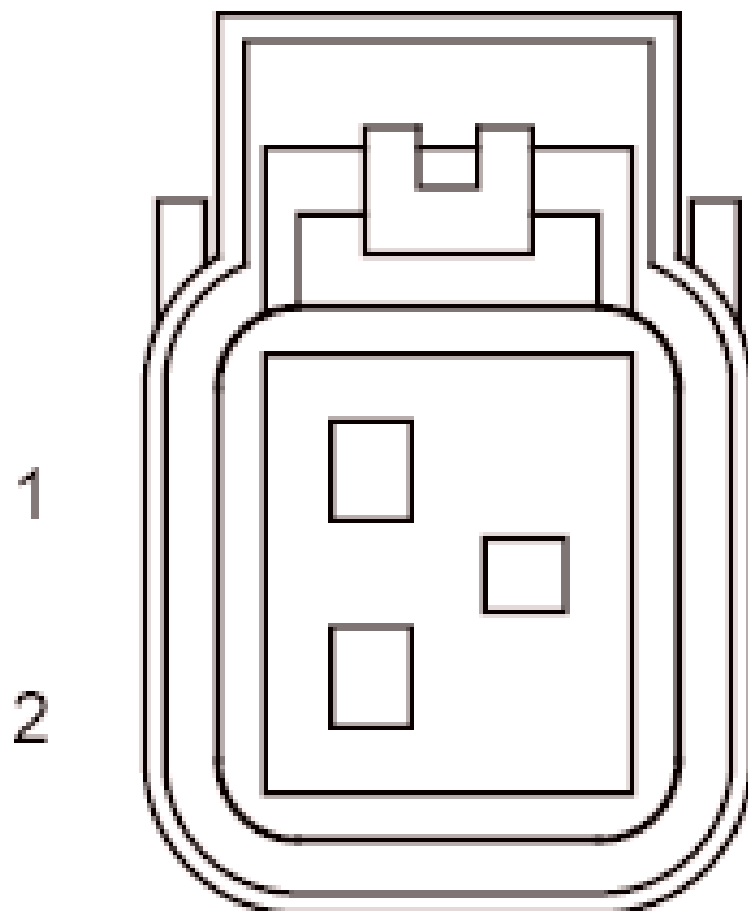


LAMP- READING- FRONT

CAV	CIRCUIT	FUNCTION
A	M27 20YL/LB	READING/RAIL LAMPS DRIVER
B	Z919 20BK/DB	GROUND
C	M24 20YL/WT	COURTESY LAMPS DRIVER

LAMP-SIDE MARKER-LEFT FRONT - 2 WAY (EXCEPT EXPORT)





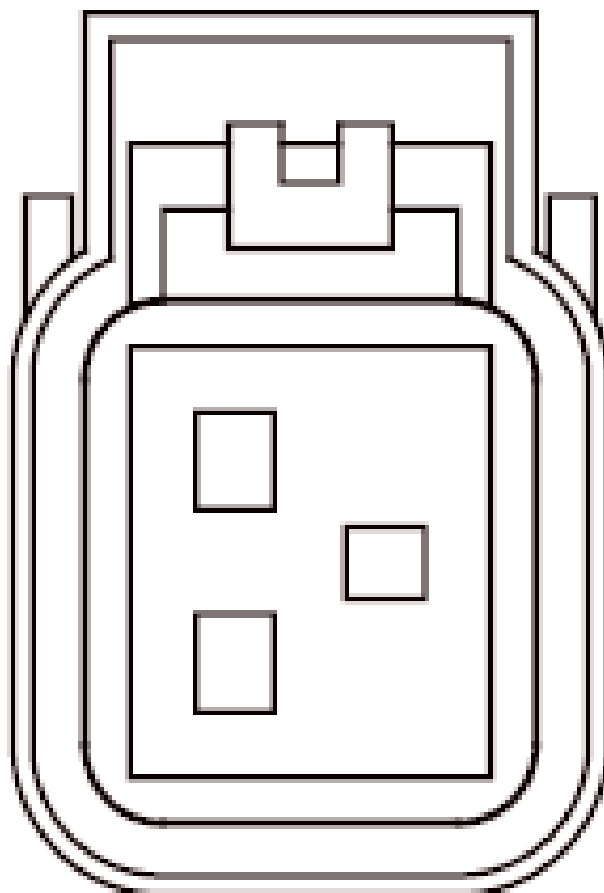
**LAMP-
SIDE
MARKER-
LEFT
FRONT
(EXCEPT EXPORT)**

	CIRCUIT	FUNCTION
1	Z907 18BK	GROUND
2	L61 18WT/LG	LEFT FRONT PARK SIGNAL CONTROL

LAMP-SIDE MARKER-RIGHT FRONT - 2 WAY (EXCEPT EXPORT)

1

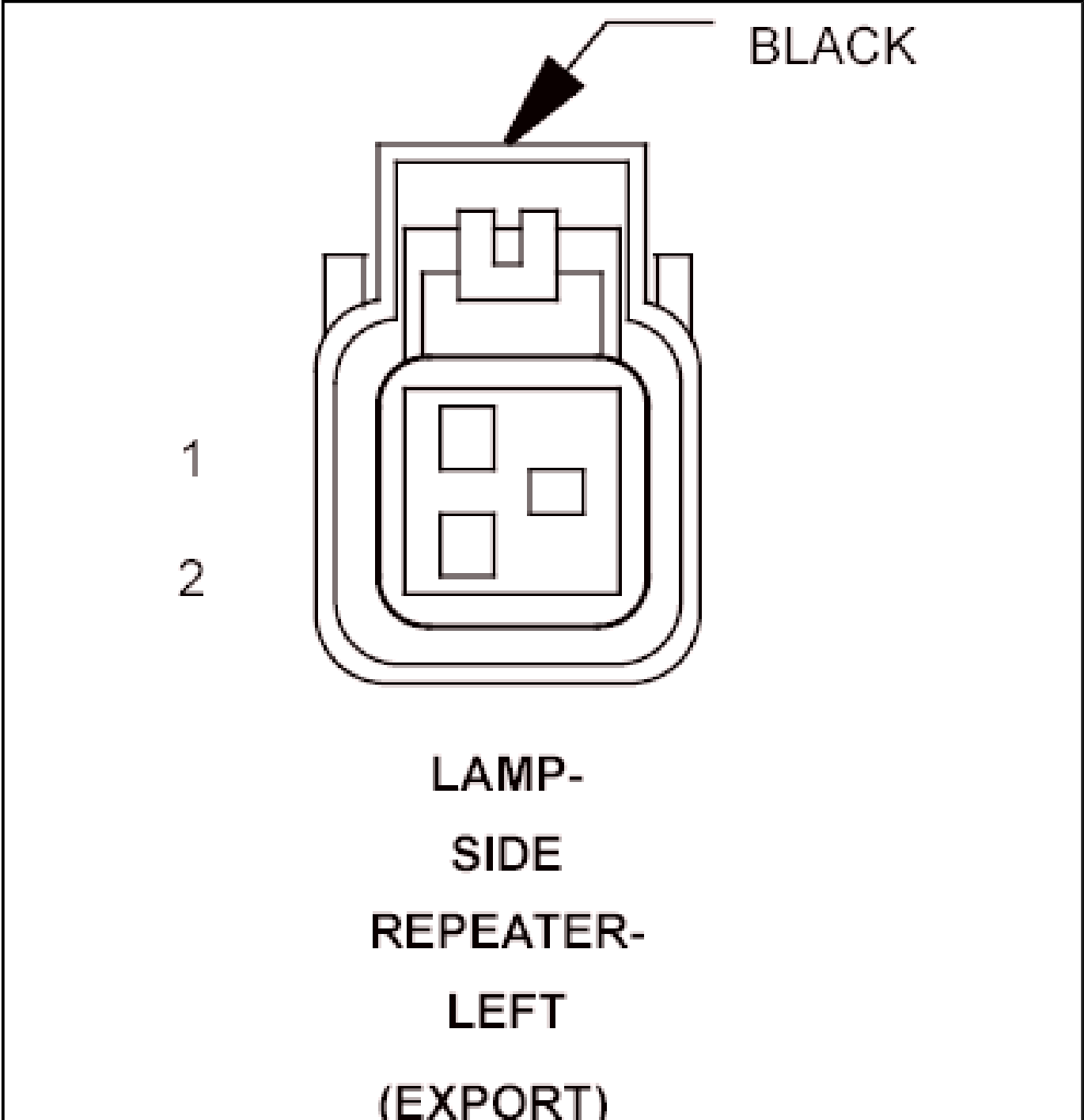
2



**LAMP-
SIDE
MARKER-
RIGHT
FRONT
(EXCEPT EXPORT)**

	CIRCUIT	FUNCTION
1	-	-
2	-	-

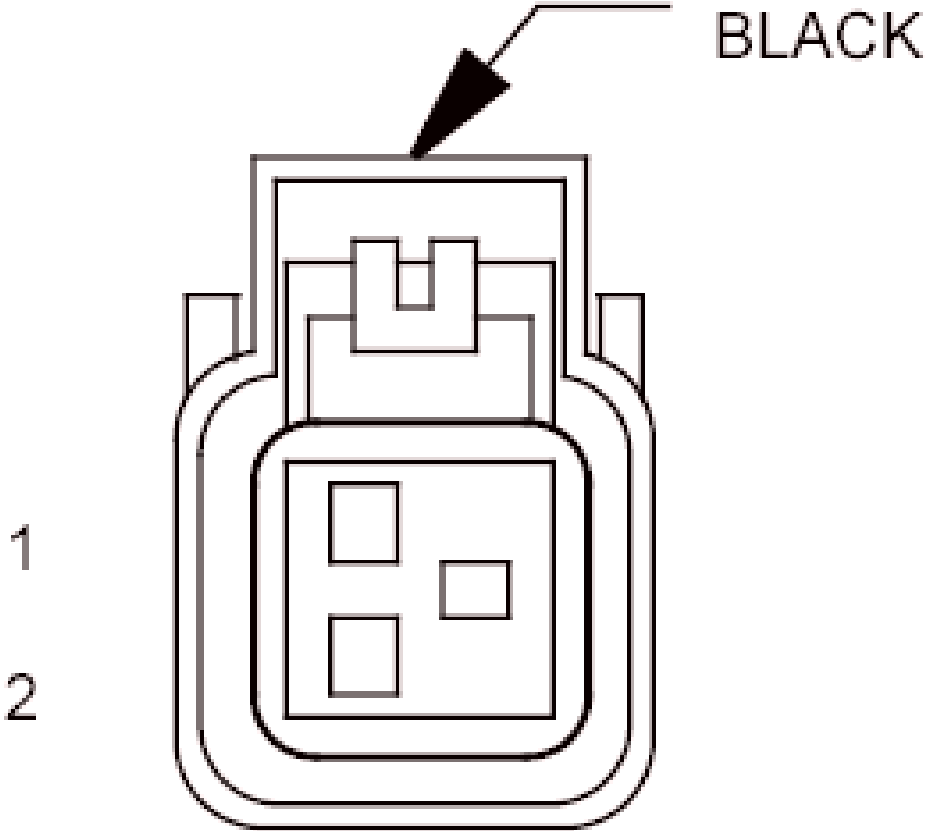
LAMP-SIDE REPEATER-LEFT - BLACK 2 WAY (EXPORT)



CAV	CIRCUIT	FUNCTION
1	L163 18WT/VT	LEFT SIDE REPEATER LAMP

		CONTROL OUTPUT
2	Z907 18BK/PK	GROUND

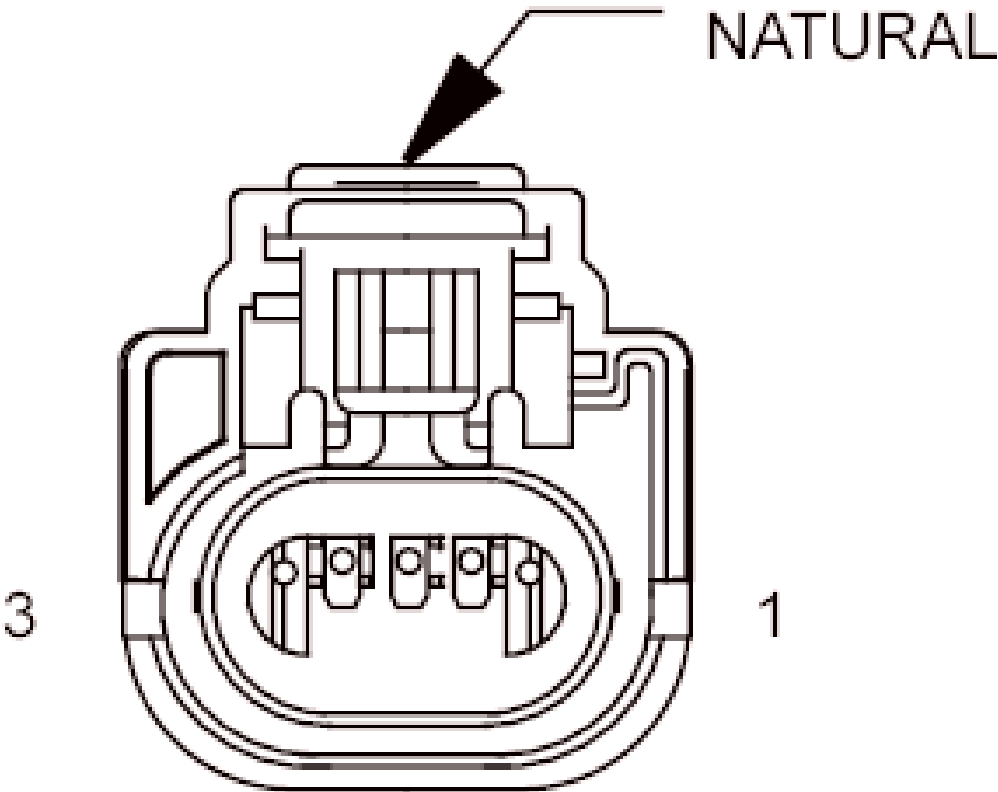
LAMP-SIDE REPEATER-RIGHT - BLACK 2 WAY (EXPORT)



LAMP-
SIDE
REPEATER-
RIGHT
(EXPORT)

CAV	CIRCUIT	FUNCTION
1	L162 18WT/BR	RIGHT SIDE REPEATER LAMP CONTROL OUTPUT
2	Z908 18BK/OR	GROUND

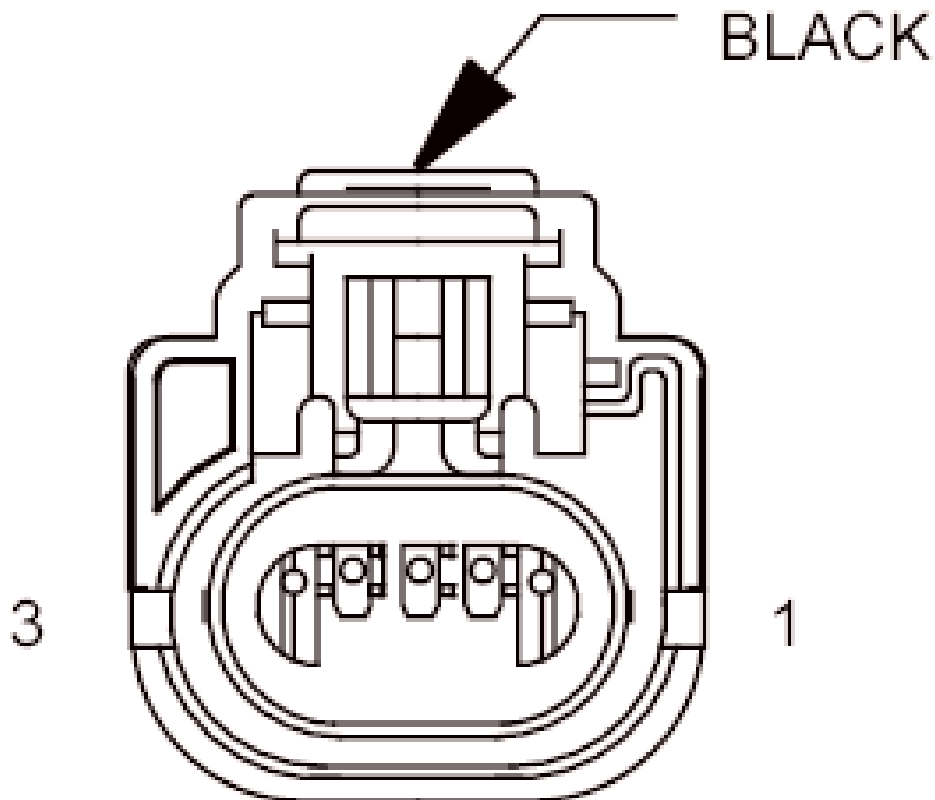
LAMP-TURN-LEFT FRONT - NATURAL 3 WAY (EXPORT) FEMALE



LAMP-TURN-LEFT FRONT (EXPORT)

CAV	CIRCUIT	FUNCTION
1	Z907 18BK/DG	GROUND
2	-	-
3	L161 18WT/LG	LEFT FRONT TURN SIGNAL CONTROL

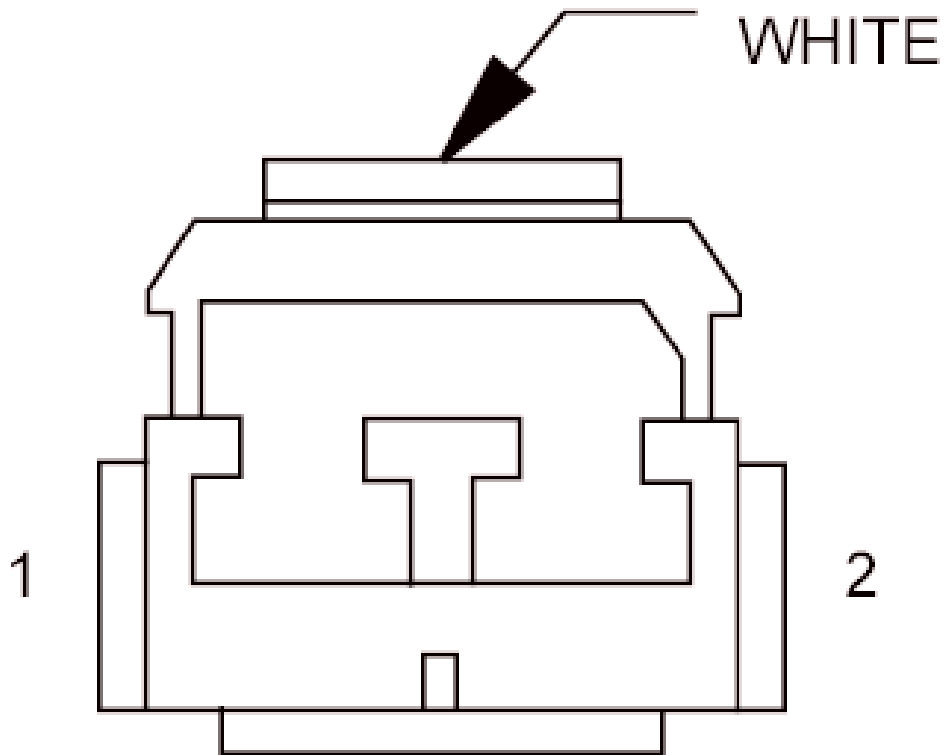
LAMP-TURN-RIGHT FRONT - NATURAL 3 WAY (EXPORT) FEMALE



**LAMP-
TURN-
RIGHT
FRONT
(EXPORT)**

CAV	CIRCUIT	FUNCTION
1	Z908 18BK/RD	GROUND
2	-	-
3	L160 18WT/TN	RIGHT FRONT TURN SIGNAL CONTROL

LAMP-VANITY-LEFT - 2 WAY (EXCEPT UGDO)

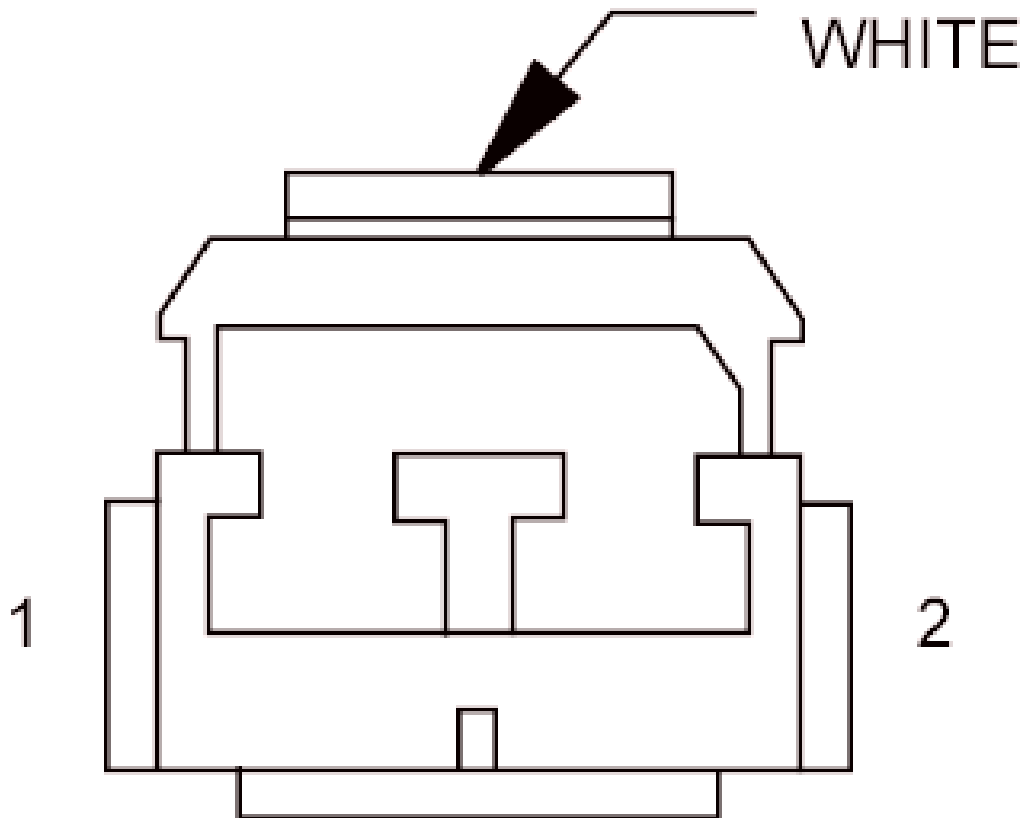


LAMP- VANITY-LEFT (EXCEPT UGDO)

CAV	CIRCUIT	FUNCTION
1	M27 20YL/LB	READING/RAIL LAMPS DRIVER
2	Z919 18BK/RD	GROUND

LAMP-VANITY-RIGHT - WHITE 2 WAY

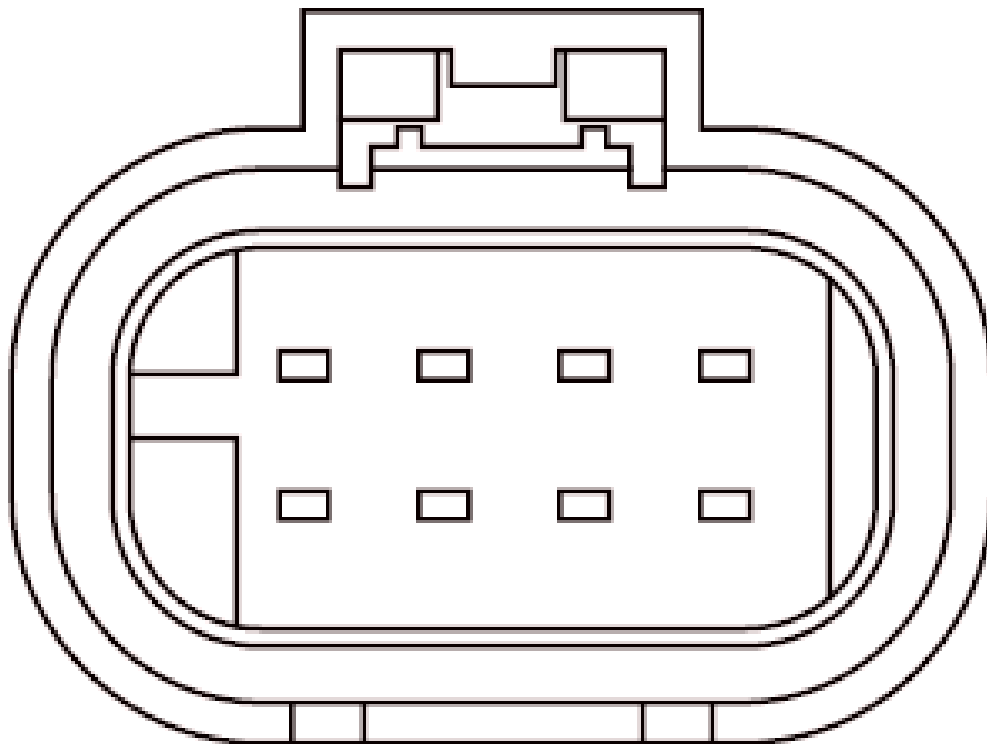




LAMP- VANITY- RIGHT

CAV	CIRCUIT	FUNCTION
1	M27 20YL/LB	READING/RAIL LAMPS DRIVER (EXCEPT UGDO)
1	A414 18RD	FUSED B(+) (UGDO)
2	Z919 18BK/YL	GROUND (EXCEPT UGDO)
2	G38 18GY	UGDO ENABLE CONTROL CIRCUIT (UGDO)

LATCH-DOOR-DRIVER - BLACK 4 WAY (LHD) MALE

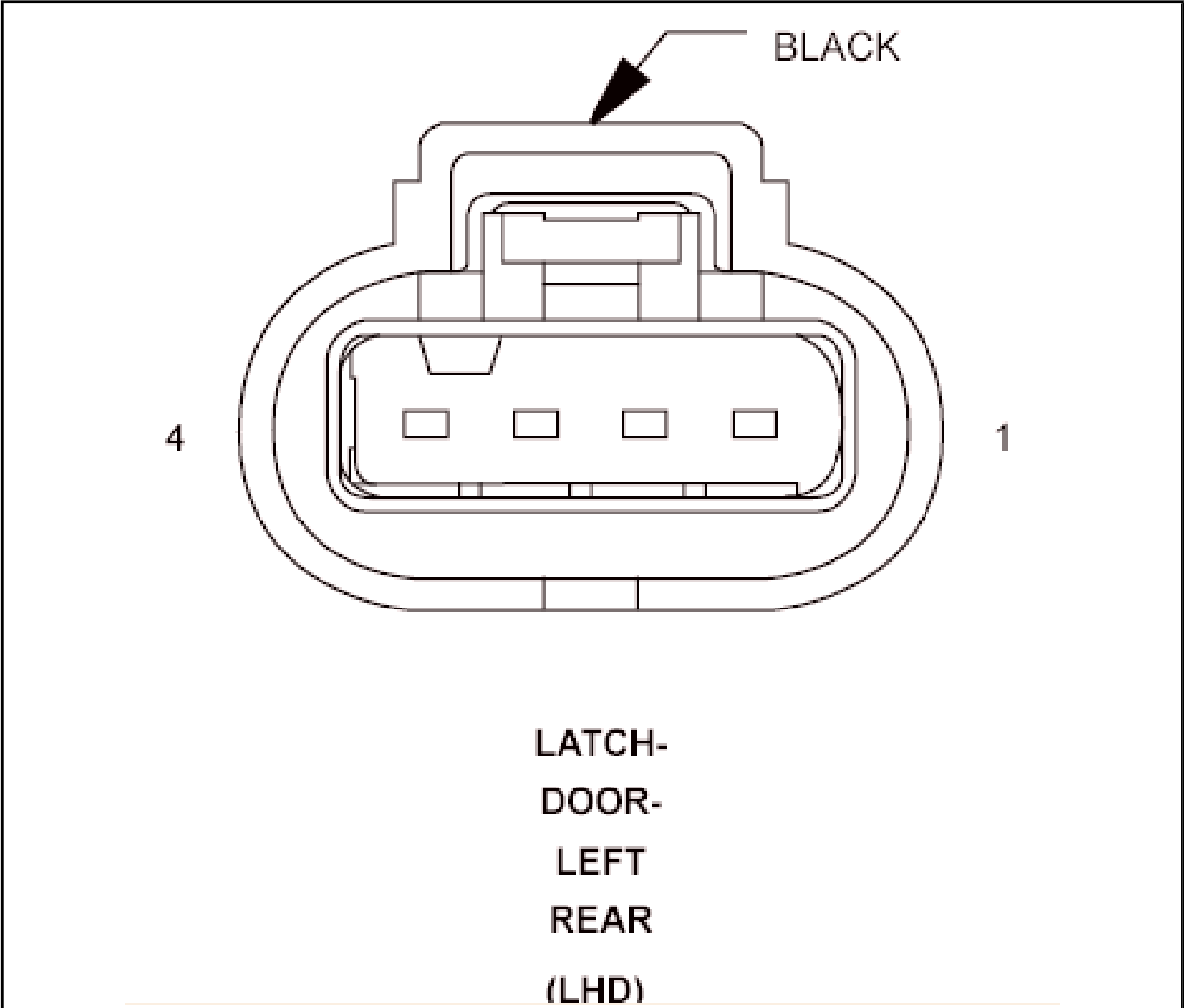


**LATCH-
DOOR-
DRIVER
(RHD)**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
4	P235 16LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT
5	P910 18TN/LG	DRIVER DOOR UNLOCK DRIVER

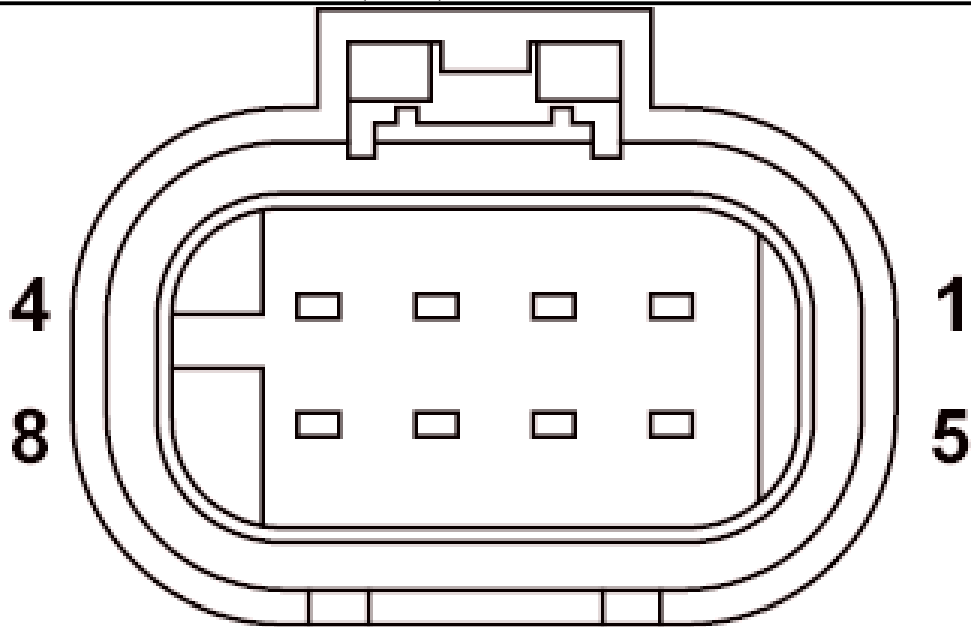
6	P930 18TN/WT	DRIVER DOOR LOCK DRIVER
7	G75 20VT	PASSENGER DOOR AJAR SWITCH SENSE
8	Z913 18BK/PK	GROUND

LATCH-DOOR-LEFT REAR - BLACK 4 WAY (LHD) MALE



CAV	CIRCUIT	FUNCTION
1	P5 18TN/OR	LEFT REAR DOOR UNLOCK DRIVER
2	P32 18TN/VT	LEFT REAR DOOR LOCK DRIVER
3	G77 20VT/GY	LEFT REAR DOOR AJAR SWITCH SENSE
4	Z913 18BK/LG	GROUND

LATCH-DOOR-LEFT REAR - 8 WAY (RHD)

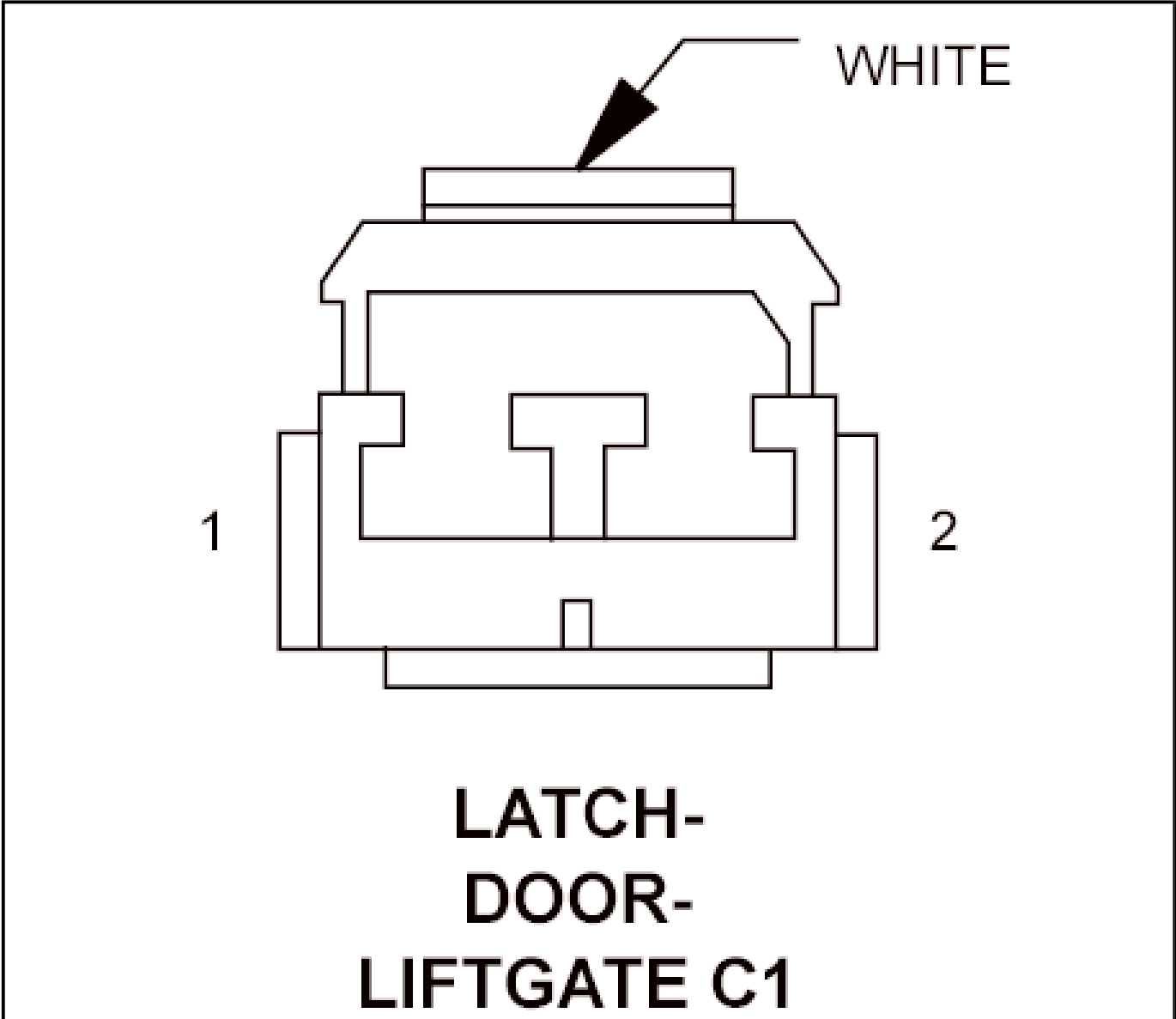


LATCH-
DOOR-
LEFT
REAR
(RHD)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
4	P235 16LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT
5	P5 18TN/OR	LEFT REAR DOOR UNLOCK DRIVER
6	P32 18TN/VT	LEFT REAR DOOR LOCK DRIVER
7	G77 20 VT/GY	LEFT REAR DOOR AJAR

		SWITCH SENSE
8	Z913 16BK/LG	GROUND

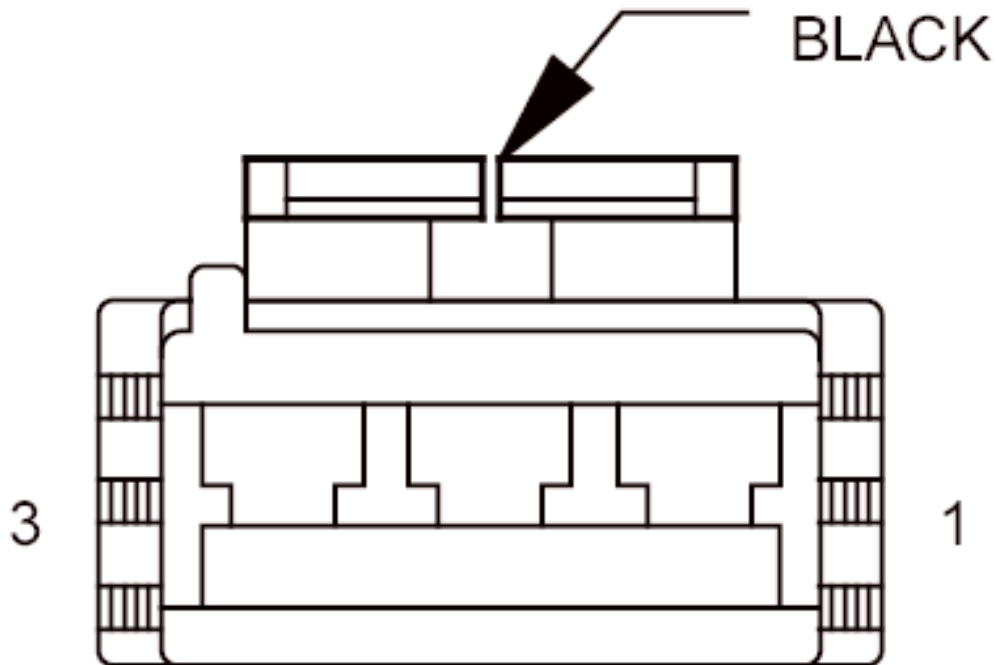
LATCH-DOOR-LIFTGATE C1 - WHITE 2 WAY



CAV	CIRCUIT	FUNCTION
1	Z920 20BK/DG	GROUND
2	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE

LATCH-DOOR-LIFTGATE C2 - BLACK 3 WAY

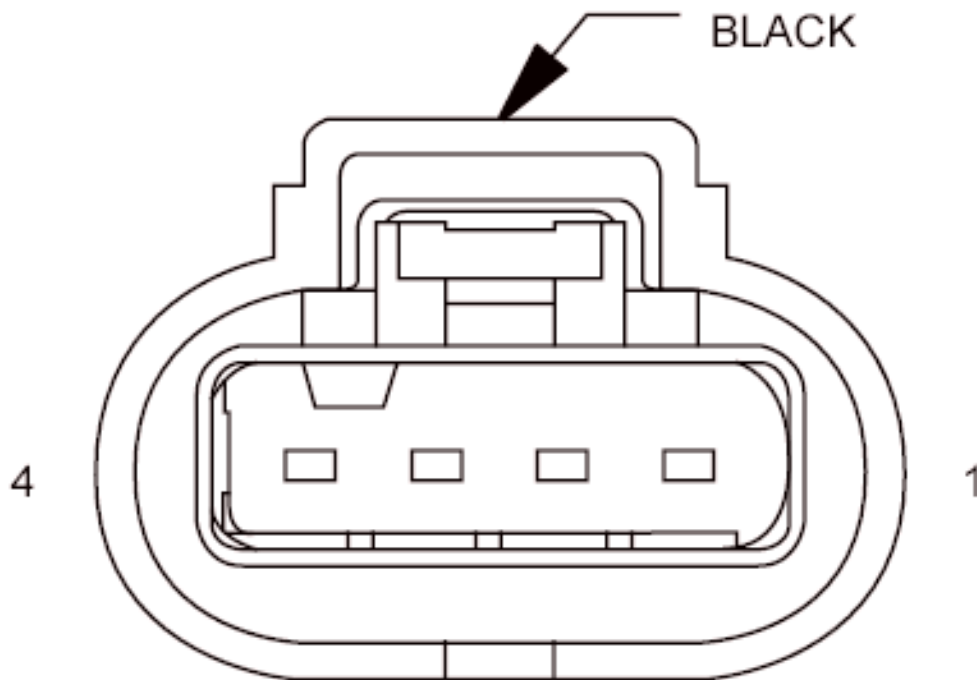




LATCH- DOOR- LIFTGATE C2

CAV	CIRCUIT	FUNCTION
1	P304 16LG/DB	LIFTGATE LOCK DRIVER
2	-	-
3	P306 16LG/LB	LIFTGATE UNLOCK DRIVER

LATCH-DOOR-PASSENGER - BLACK 4 WAY (LHD)

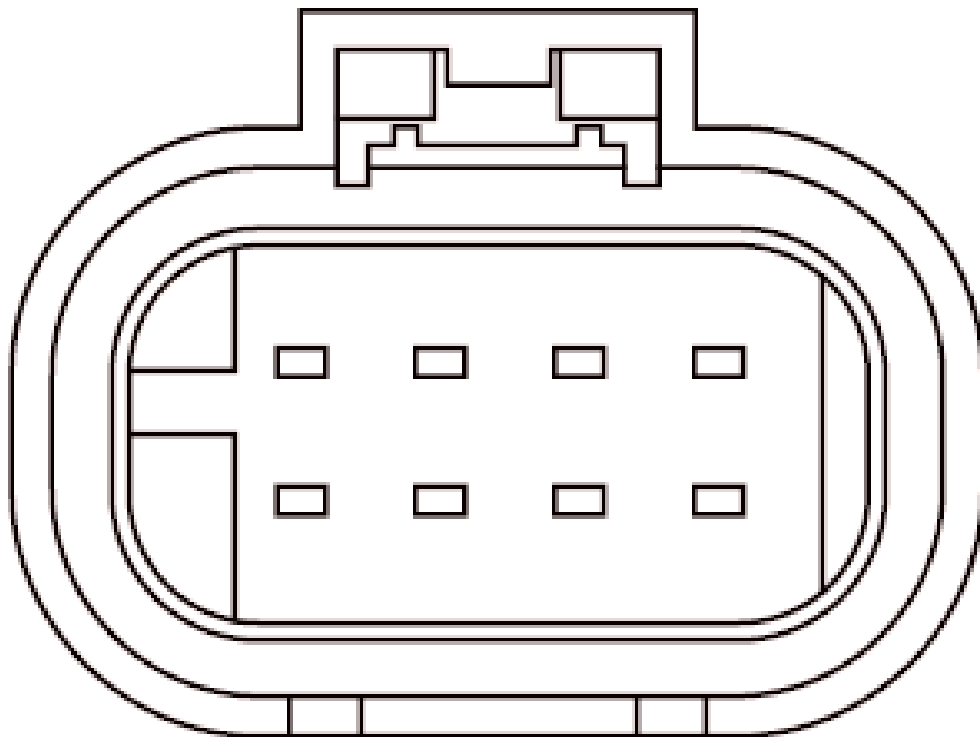


**LATCH-
DOOR-
PASSENGER**

CAV	CIRCUIT	FUNCTION
1	P940 16TN/BR	PASSENGER DOOR UNLOCK DRIVER
2	P920 18LG/GY	PASSENGER DOOR LOCK DRIVER
3	G74 20VT/WT	PASSENGER DOOR AJAR SWITCH SENSE
4	Z913 18BK/YL	GROUND

LATCH-DOOR-PASSENGER - 8 WAY (RHD)

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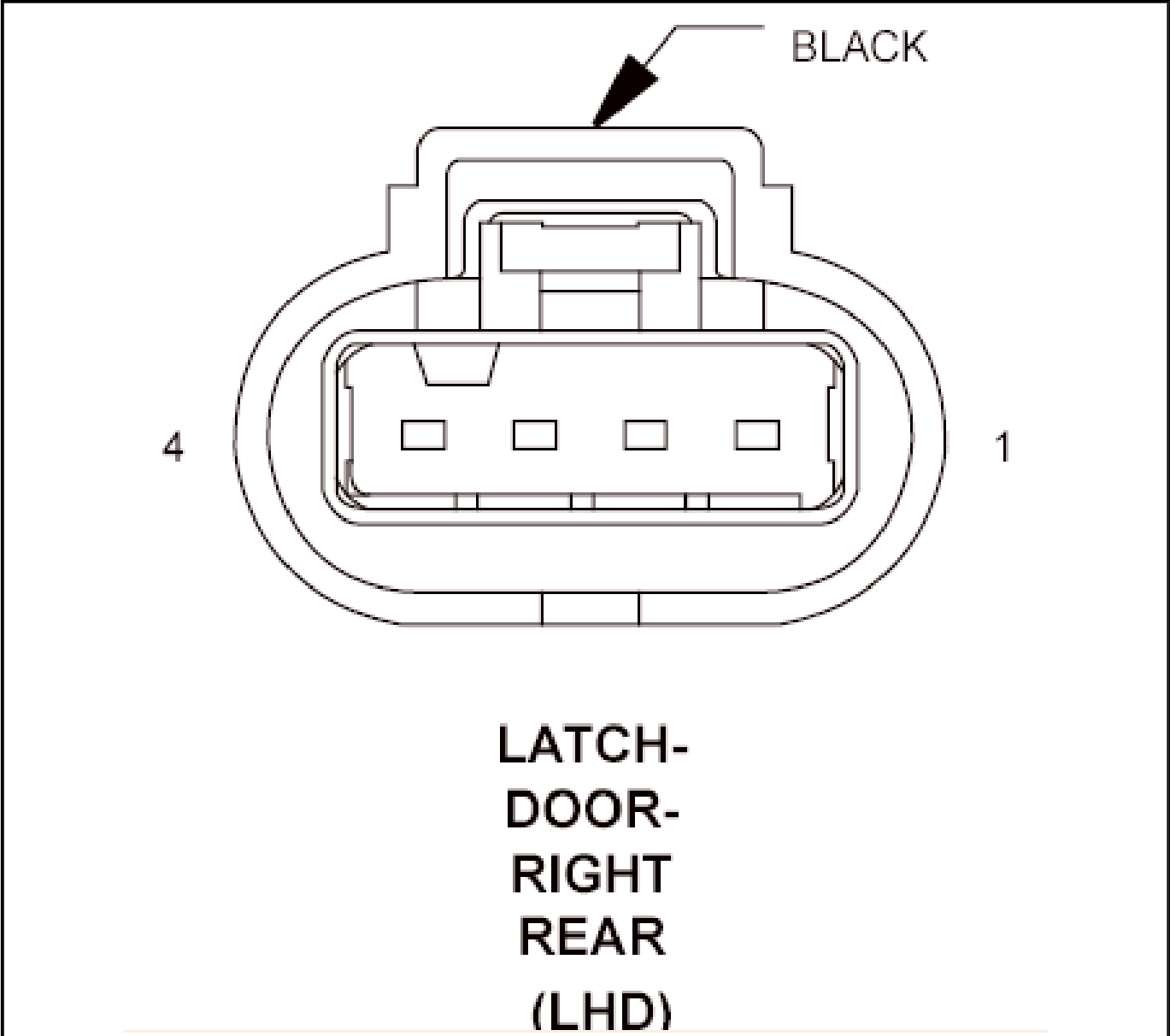


LATCH- DOOR- PASSENGER (RHD)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
4	P235 16LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT
5	P940 18TN/BR	PASSENGER DOOR UNLOCK DRIVER

6	P920 18LG/GY	PASSENGER DOOR LOCK DRIVER
7	G75 20VT	DRIVER DOOR AJAR SWITCH SENSE
8	Z913 18BK/YL	GROUND

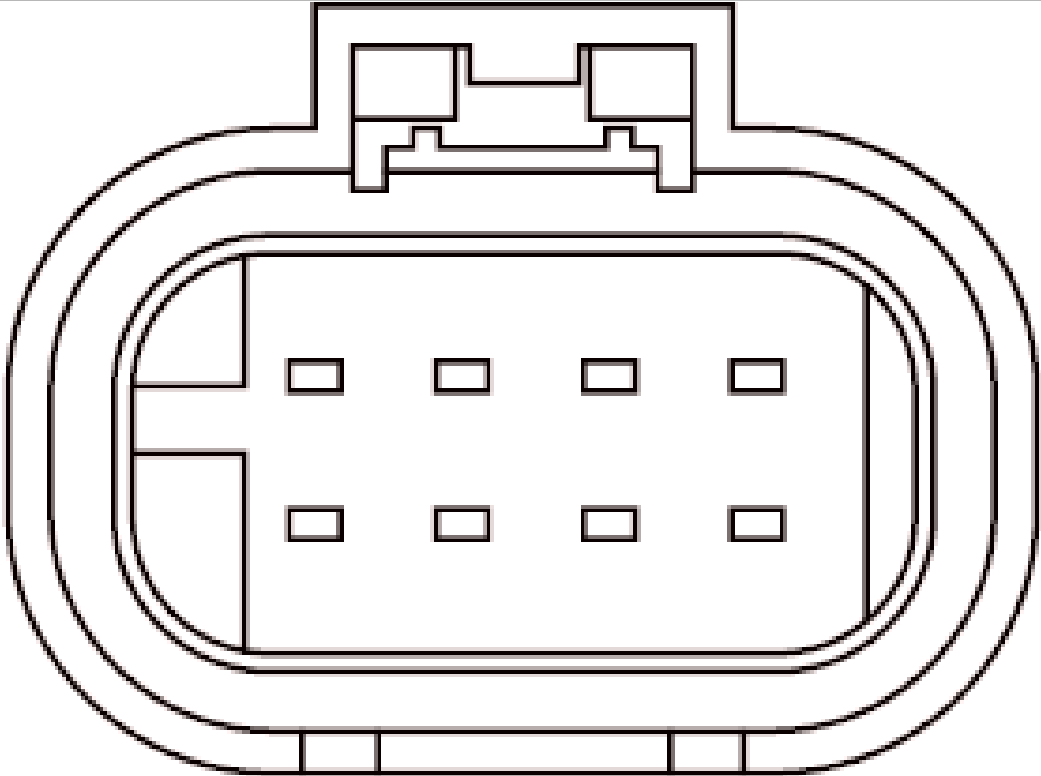
LATCH-DOOR-RIGHT REAR - BLACK 4 WAY (LHD)



CAV	CIRCUIT	FUNCTION
1	P34 16TN/LB	RIGHT REAR DOOR UNLOCK DRIVER
2	P38 16TN/DB	RIGHT REAR DOOR LOCK DRIVER
3	G76 20VT/YL	RIGHT REAR DOOR AJAR

		SWITCH SENSE
4	Z913 18BK/GY	GROUND

LATCH-DOOR-RIGHT REAR - 8 WAY (RHD) MALE

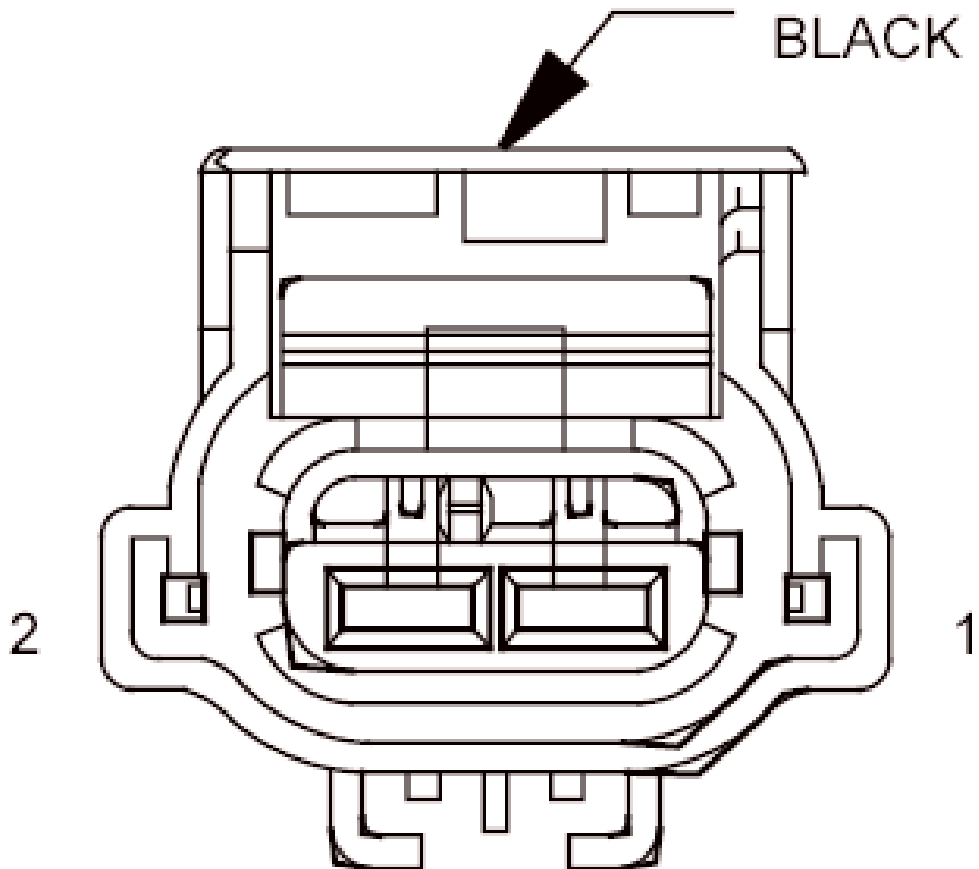


LATCH-
DOOR-
RIGHT
REAR
(RHD)

CAV	CIRCUIT	FUNCTION
-----	---------	----------

1	-	-
2	-	-
3	P237 16DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
4	P235 16LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT
5	P34 16TN/LB	RIGHT REAR DOOR UNLOCK DRIVER
6	P38 16TN/DB	RIGHT REAR DOOR LOCK DRIVER
7	G76 20VT/YL	RIGHT REAR DOOR AJAR SWITCH SENSE
8	Z913 18BK/GY	GROUND

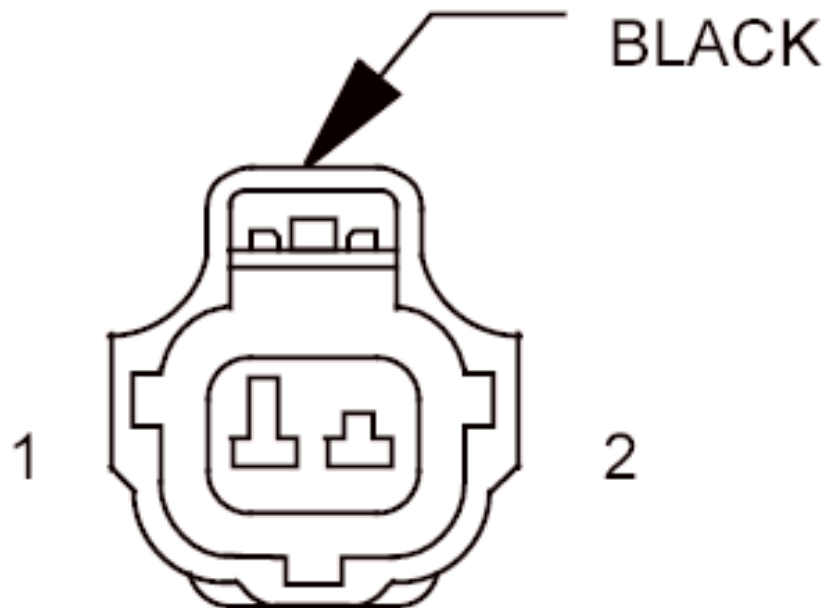
LATCH-FLIP-UP GLASS C1 - 2 WAY



LATCH- FLIP-UP GLASS C1

CAV	CIRCUIT	FUNCTION
1	Z920 20BK/GY	GROUND
2	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT

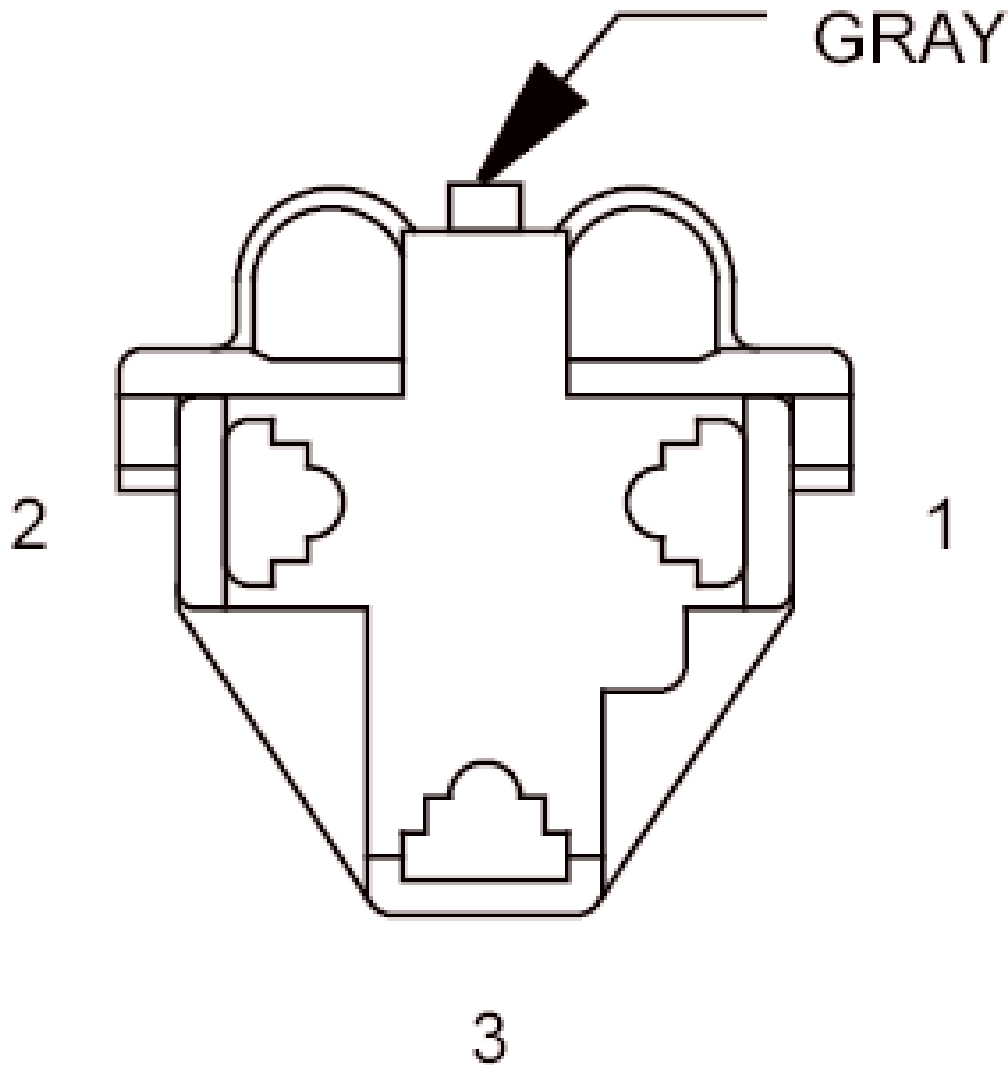
LATCH-FLIP-UP GLASS C2 - 2 WAY



LATCH- FLIP-UP GLASS LIFTGATE C2

CAV	CIRCUIT	FUNCTION
1	Z920 20BK/GY	GROUND
2	G80 20VT/YL	LIFTGATE FLIP-UP AJAR SWITCH SENSE

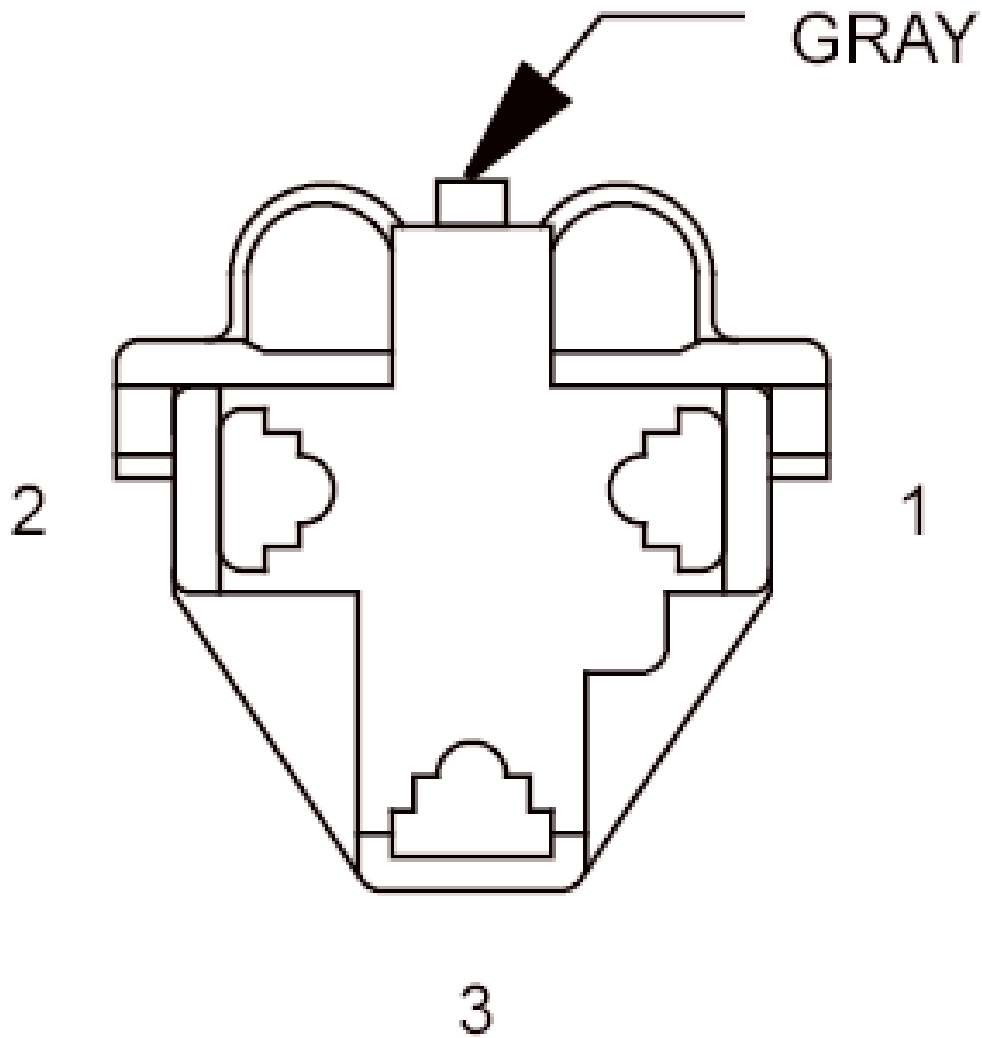
LIGHTER-CIGAR - GRAY 3 WAY



LIGHTER- CIGAR

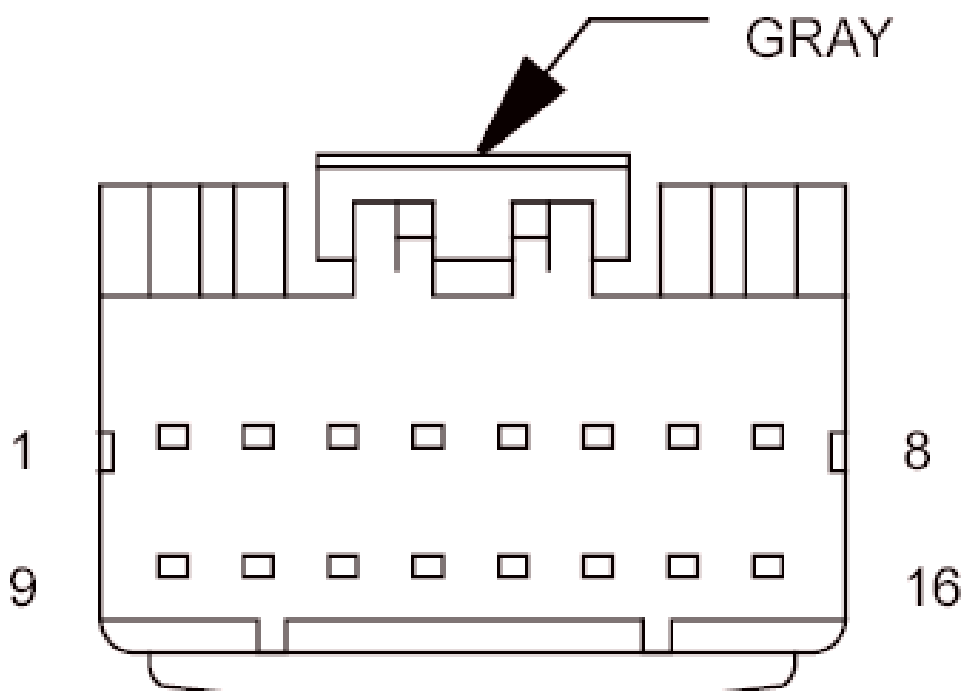
CAV	CIRCUIT	FUNCTION
1	F307 18LB/PK	FUSED RUN/ACCESSORY RELAY OUTPUT
2	-	-
3	Z911 18BK/WT	GROUND

MIRROR-INSIDE REARVIEW - 7 WAY (EXCEPT HANDS FREE)



LIGHTER- CIGAR

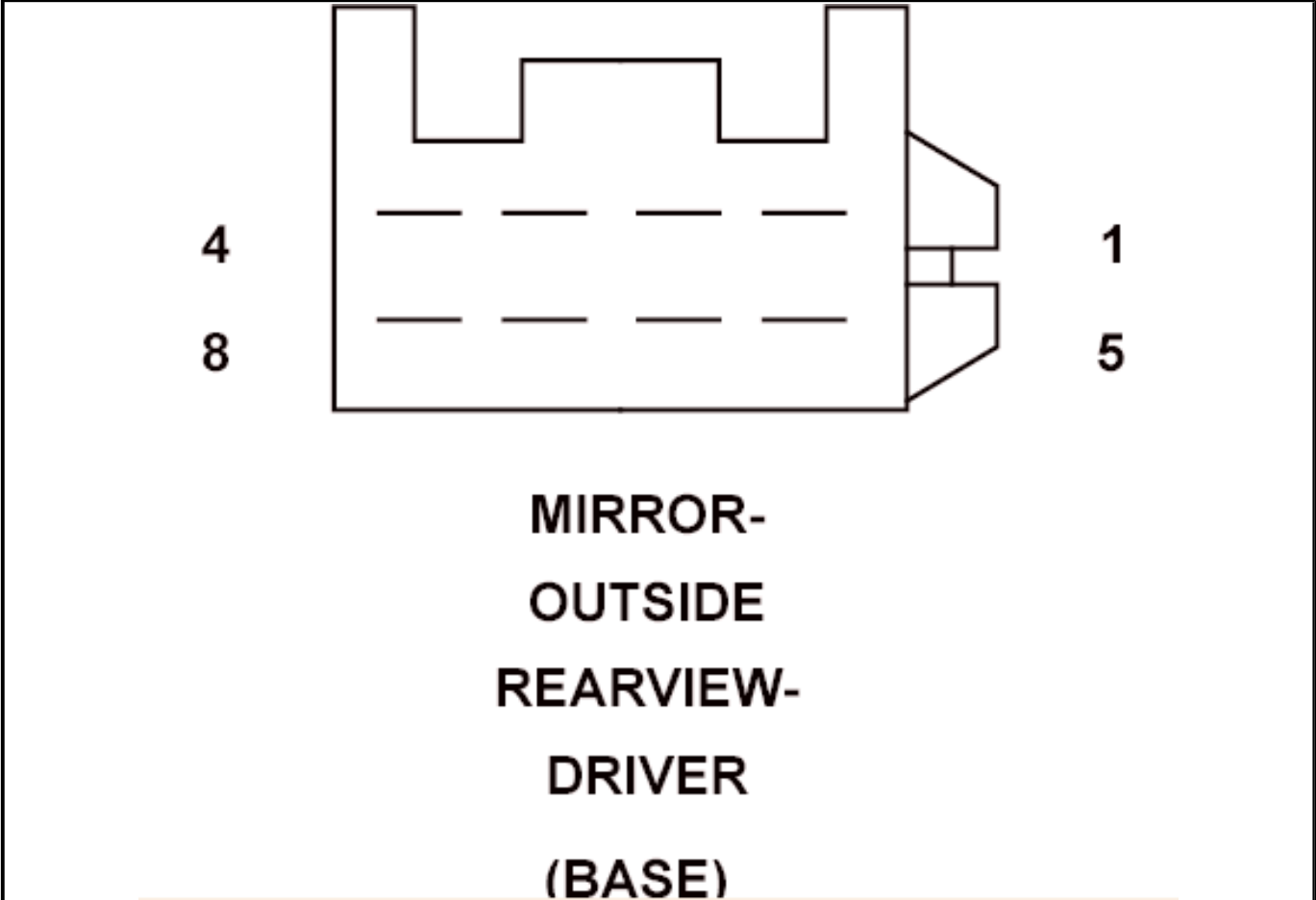
CAV	CIRCUIT	FUNCTION
1	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	Z919 20BK	GROUND
3	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
4	-	-
5	-	-
6	-	-

MIRROR-INSIDE REARVIEW - GRAY 16 WAY (HANDS FREE)**MIRROR-
INSIDE
REARVIEW
(HANDS FREE)**

CAV	CIRCUIT	FUNCTION
1	X712 18DG/LB	MICROPHONE 1 IN (+)
2	X792 18LB/DG	MICROPHONE IN (-)
3	X722 18LB/DG	MICROPHONE 2 IN (+)
4	-	-
5	-	-
6	-	-
7	-	-
8	Z919 20BK/DG	GROUND
9	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT

10	X835 18OR/GY	SENSOR GROUND
11	-	-
12	-	-
13	F921 20PK/YL	FUSED RUN RELAY OUTPUT
14	-	-
15	X793 18DG/YL	MICROPHONE FEED
16	-	-

MIRROR-OUTSIDE REARVIEW-DRIVER - 8 WAY (BASE)



CAV	CIRCUIT	FUNCTION
1	P71 20TN/DG	DRIVER MIRROR VERTICAL DRIVER
2	P76 20TN/LB	MIRROR COMMON DRIVER
3	P75 20TN/LG	DRIVER MIRROR HORIZONTAL DRIVER
4	-	-
5	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
6	Z913 20BK/OR	GROUND

7	-	-
8	-	-

MIRROR-OUTSIDE REARVIEW-PASSENGER - 8 WAY (BASE)

4

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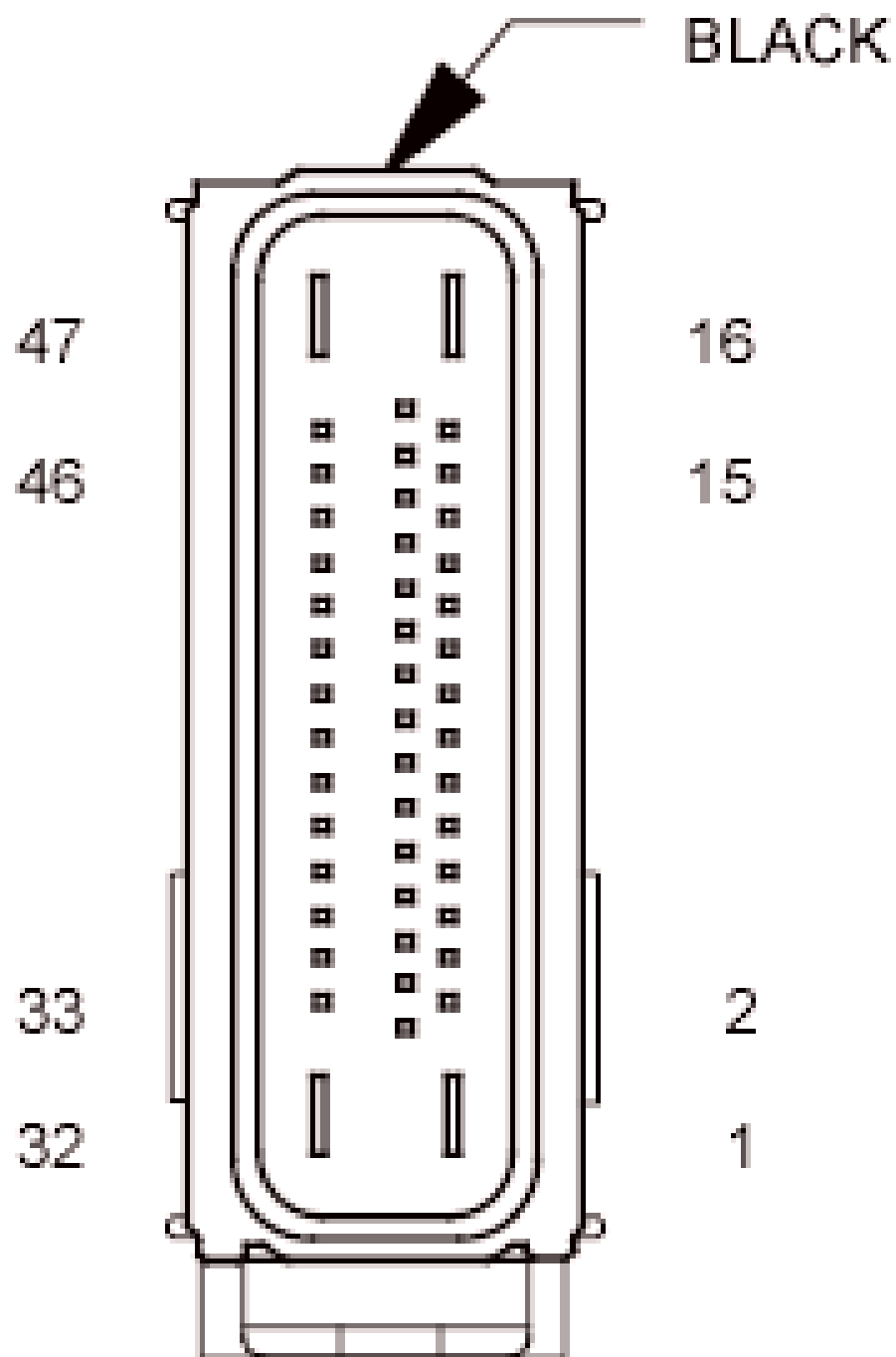
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MIRROR-OUTSIDE
REARVIEW-
PASSENGER
(BASE)

CAV	CIRCUIT	FUNCTION
1	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER
2	P76 20TN/LB	MIRROR COMMON DRIVER
3	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER
4	-	-
5	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
6	Z913 20BK/BR	GROUND
7	-	-
8	-	-

MODULE-ANTI-LOCK BRAKES - BLACK 47 WAY (ESP) FEMALE

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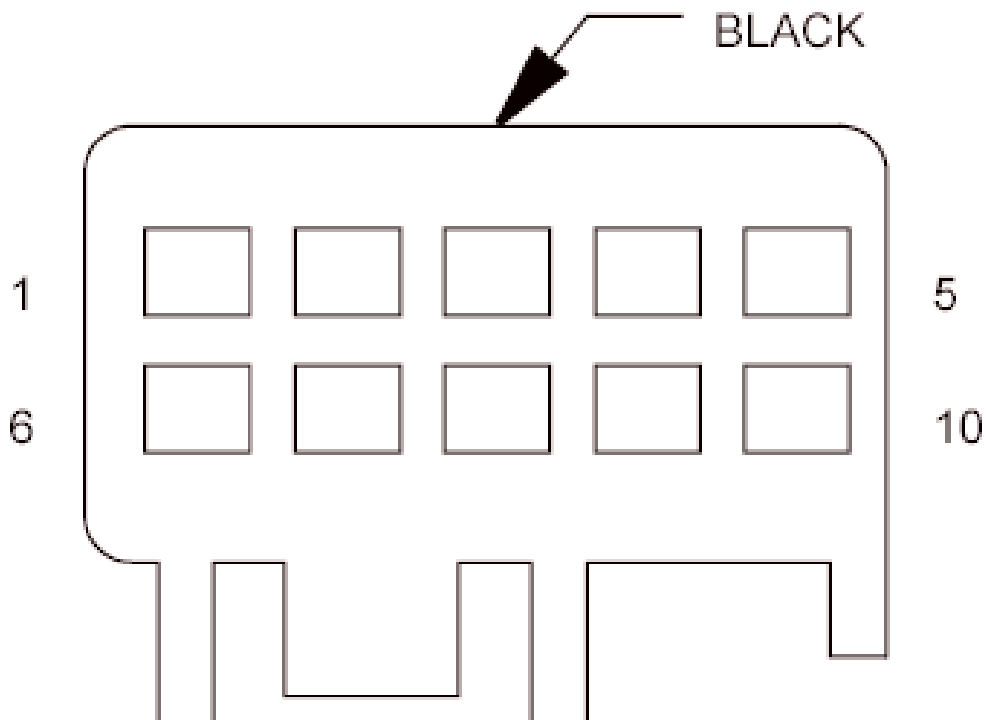


MODULE-
ANTI-

CAV	CIRCUIT	FUNCTION
1	A107 12TN/RD	FUSED B(+) (PUMP)
2	-	-
3	-	-
4	-	-
5	-	-
6	B6 18DG/WT	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12		
13	Z903 12BK	GROUND
14	D64 20WT/LB	CAN C BUS (-)
15	-	-
16	-	-
17	-	-
18	B7 18DG/VT	RIGHT FRONT WHEEL SPEED SENSOR SUPPLY
19	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR SUPPLY
20	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL
21	B9 18DG/LG	LEFT FRONT WHEEL SPEED SENSOR SUPPLY
22	-	-
23	-	-
24	D464 20WT/YL	DYNAMICS SENSOR LOW DATA LINK
25	A111 14DG/RD	FUSED B(+)
26	D65 20WT/BK	CAN C BUS (+)
27	-	-
28	-	-
29	-	-
30	-	-
31	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL
32	F941 20PK/LG	IGNITION SWITCH OUTPUT (RUN-START)
33	B4 18LG	LEFT REAR WHEEL SPEED

		SENSOR SUPPLY
34	B8 18DG/TN	LEFT FRONT WHEEL SPEED SENSOR SIGNAL
35	-	-
36	B401 18DG/DB	STOP LAMP RELAY CONTROL
37	D465 20WT/DB	DYNAMICS SENSOR HIGH DATA LINK
38	Z903 12BK	GROUND
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	-	-
45	-	-
46	-	-
47	-	-

MODULE-COMPASS - BLACK 4 WAY



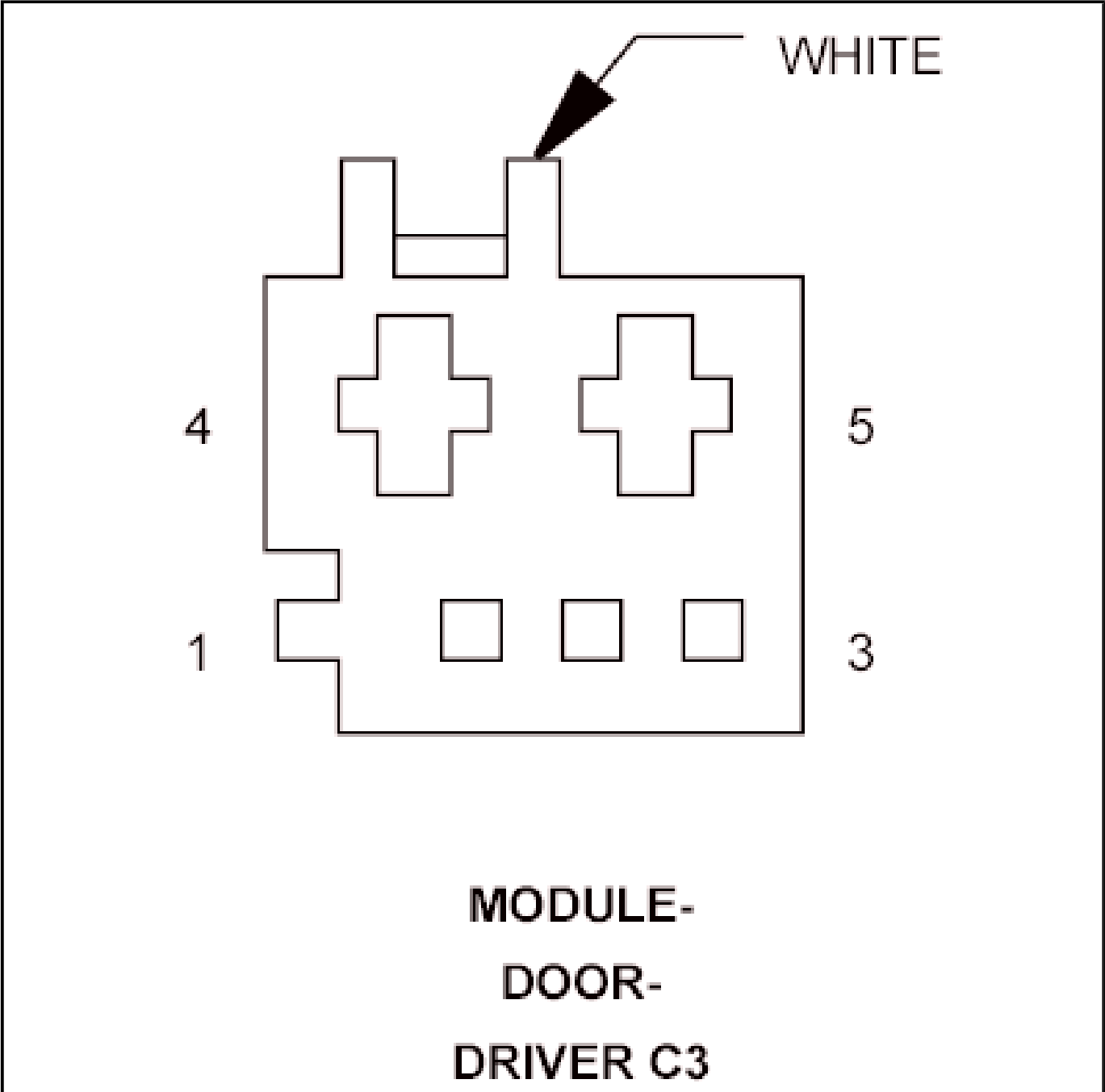
**MODULE-
DOOR-
DRIVER C2**

(EXPRESS UP)

CAV	CIRCUIT	FUNCTION
1	P694 20LG/BL	DRIVER FOLDING MIRROR FOLD DRIVER
2	P691 20LG/YL	DRIVER FOLDING MIRROR UNFOLD DRIVER
3	C160 20DB	DRIVER MIRROR HEATER RETURN
4	C16 20DB/GY	DRIVER MIRROR HEATER DRIVER
5	-	-
6	P71 20TN/GY	DRIVER MIRROR VERTICAL DRIVER
7	P73 20TN/VT	DRIVER MIRROR COMMON DRIVER

8	P75 20TN/LG	DRIVER MIRROR HORIZONTAL DRIVER
9	-	-
10	-	-

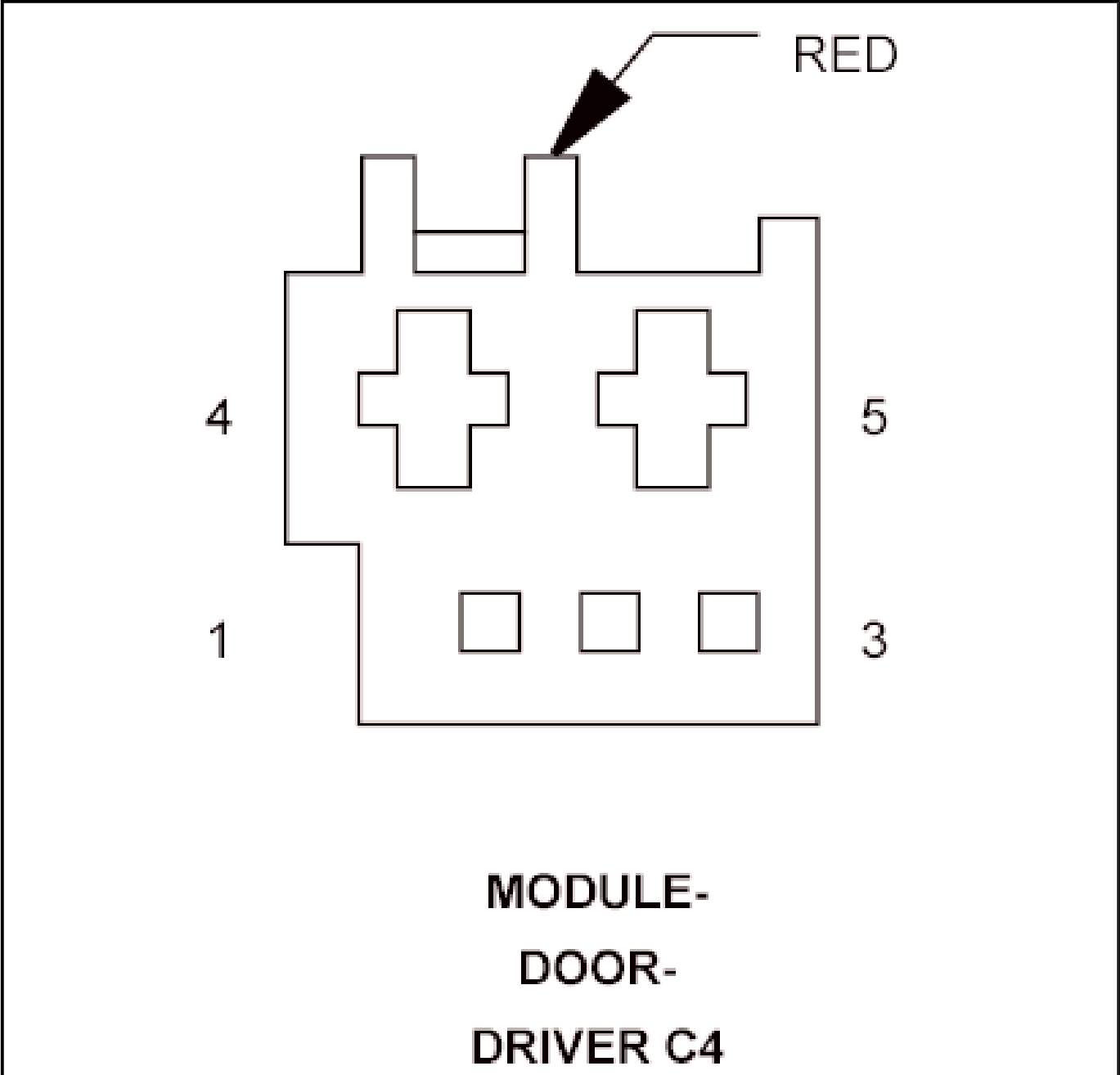
MODULE-DOOR-DRIVER C3 - 5 WAY



CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-)
2	D265 20WT/GY	CAN INTERIOR BUS (+)

3	-	-
4	Z913 14BK/WT	GROUND
5	A215 14RD/LG	FUSED B(+)

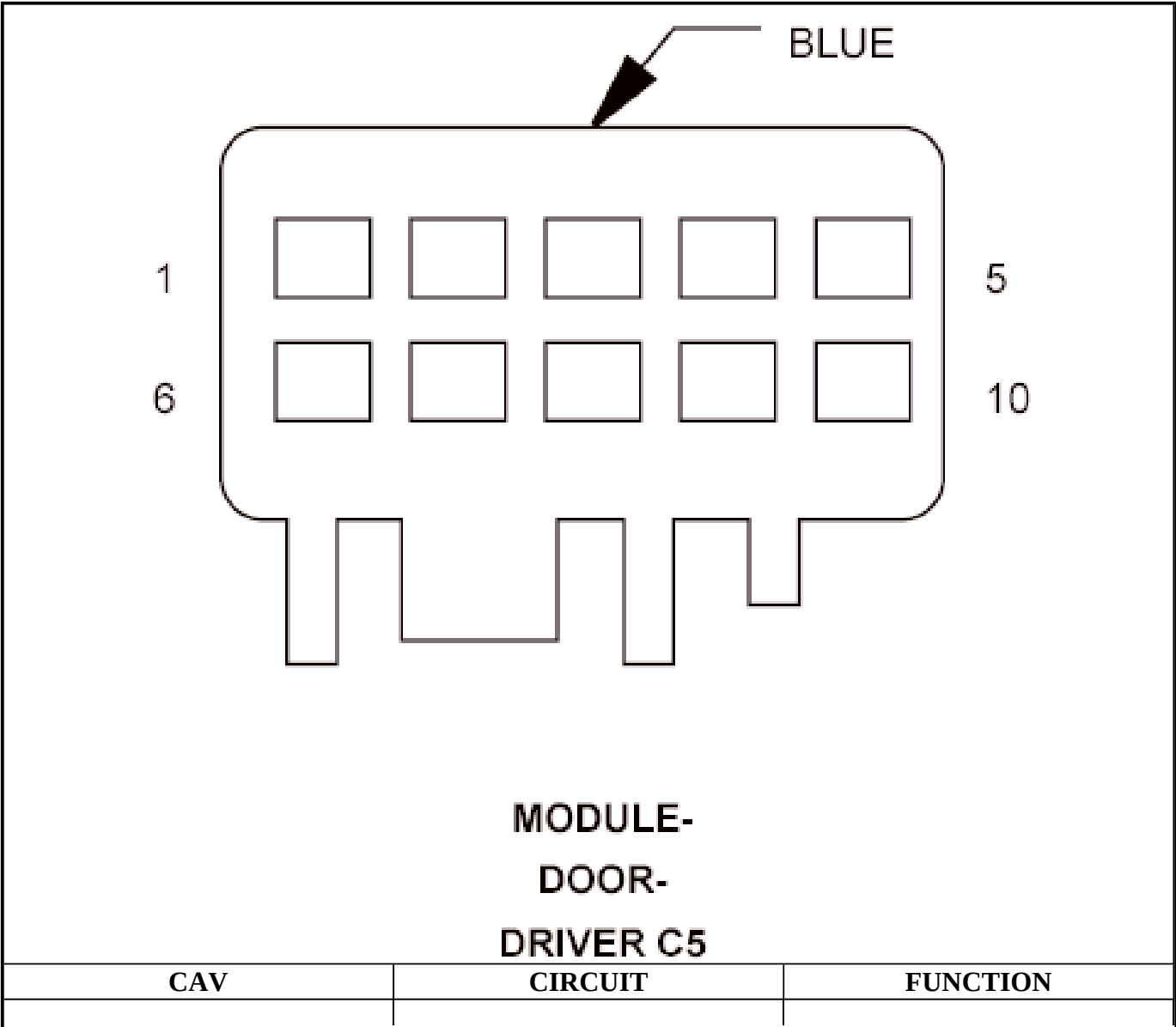
MODULE-DOOR-DRIVER C4 - RED 3 WAY

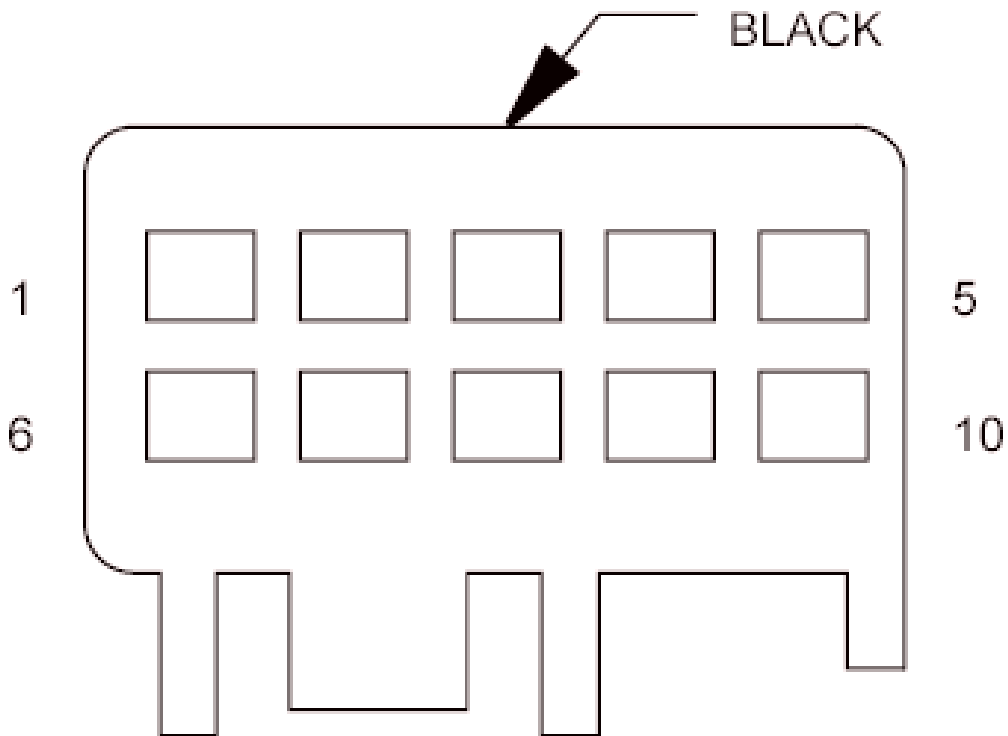


CAV	CIRCUIT	FUNCTION
1	Q301 20OR/WT	DRIVER WINDOW HALL SENSOR A SIGNAL
2	Q305 20OR	DRIVER WINDOW HALL SENSOR SUPPLY

3	Q991 20BK/OR	DRIVER WINDOW HALL SENSOR RETURN
4	Q311 14OR/LB	LEFT FRONT WINDOW EXPRESS UP DRIVER (LHD)
4	Q312 14DB/OR	RIGHT FRONT WINDOW EXPRESS UP DRIVER (RHD)
5	Q321 14OR/DB	LEFT FRONT WINDOW EXPRESS DOWN DRIVER (LHD)
5	Q322 14LG/OR	RIGHT FRONT WINDOW EXPRESS DOWN DRIVER (RHD)

MODULE-DOOR-DRIVER C5 - BLUE 10 WAY FEMALE





**MODULE-
DOOR-
PASSENGER C2
(EXPRESS UP)**

CAV	CIRCUIT	FUNCTION
1	P695 20LG/DB	PASSENGER FOLDING MIRROR FOLD DRIVER
2	P692 20LG/YL	PASSENGER FOLDING MIRROR UNFOLD DRIVER
3	C170 20DB	PASSENGER MIRROR HEATER RETURN
4	C17 LB/WT	PASSENGER MIRROR HEATER DRIVER
5	-	-
6	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER
7	P70 20TN/LB	PASSENGER MIRROR COMMON DRIVER

8	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER
9	-	-
10	-	-

MODULE-DOOR-PASSENGER C3 - WHITE 5 WAY FEMALE

WHITE

4

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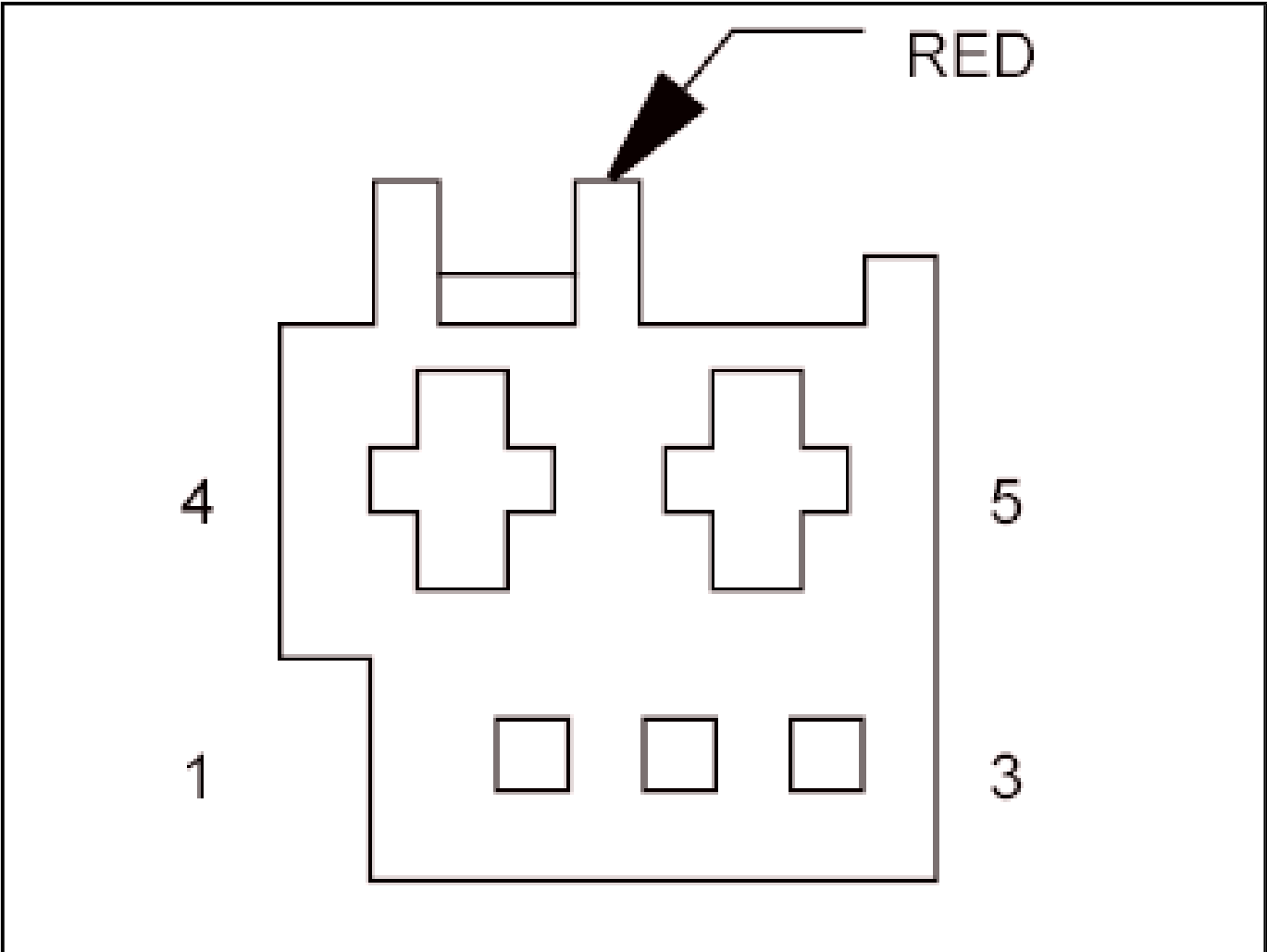
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**MODULE-
DOOR-
PASSENGER C3**

CAV	CIRCUIT	FUNCTION
1	D264 20WT/OR	CAN INTERIOR BUS (-)
2	D265 20WT/GY	CAN INTERIOR BUS (+)

3	-	-
4	Z913 14BK/WT	GROUND
5	A214 14RD/LB	FUSED B(+)

MODULE-DOOR-PASSENGER C4 - RED 5 WAY FEMALE

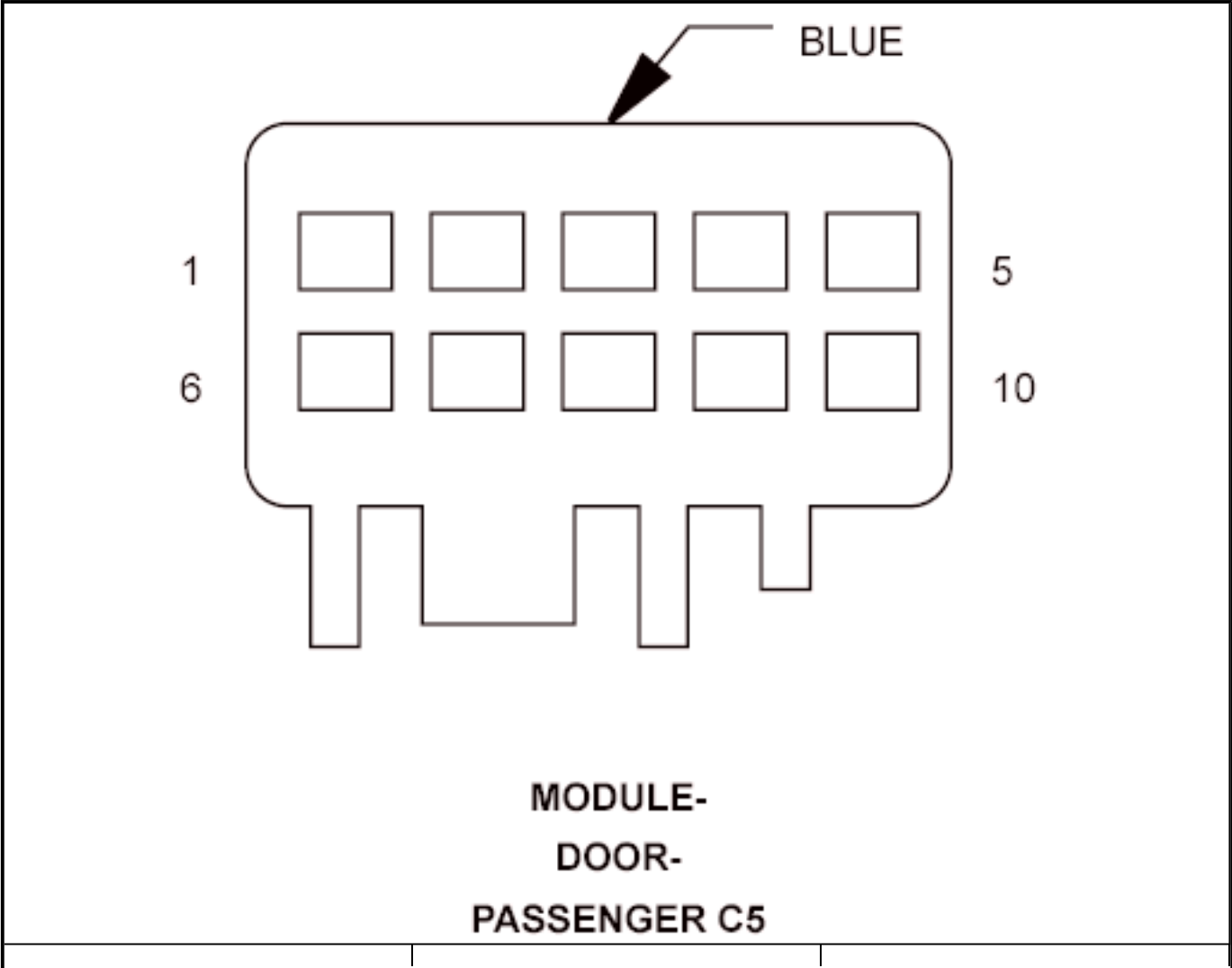


**MODULE-
DOOR-
PASSENGER C4**

CAV	CIRCUIT	FUNCTION
1	Q302 20OR/LG	PASSENGER WINDOW HALL

		SENSOR A SIGNAL (RHD)
2	Q306 20OR/DB	PASSENGER WINDOW HALL SENSOR SUPPLY (RHD)
3	Q992 20BK/GY	PASSENGER WINDOW HALL SENSOR RETURN (RHD)
4	Q312 14DB/OR	RIGHT FRONT WINDOW EXPRESS UP DRIVER (LHD)
4	Q311 OR/LB	LEFT FRONT WINDOW EXPRESS UP DRIVER (RHD)
5	Q322 14LG/OR	RIGHT FRONT WINDOW EXPRESS DOWN DRIVER (LHD)
5	Q321 OR/DB	LEFT FRONT WINDOW EXPRESS DOWN DRIVER (RHD)

MODULE-DOOR-PASSENGER C5 - 10 WAY

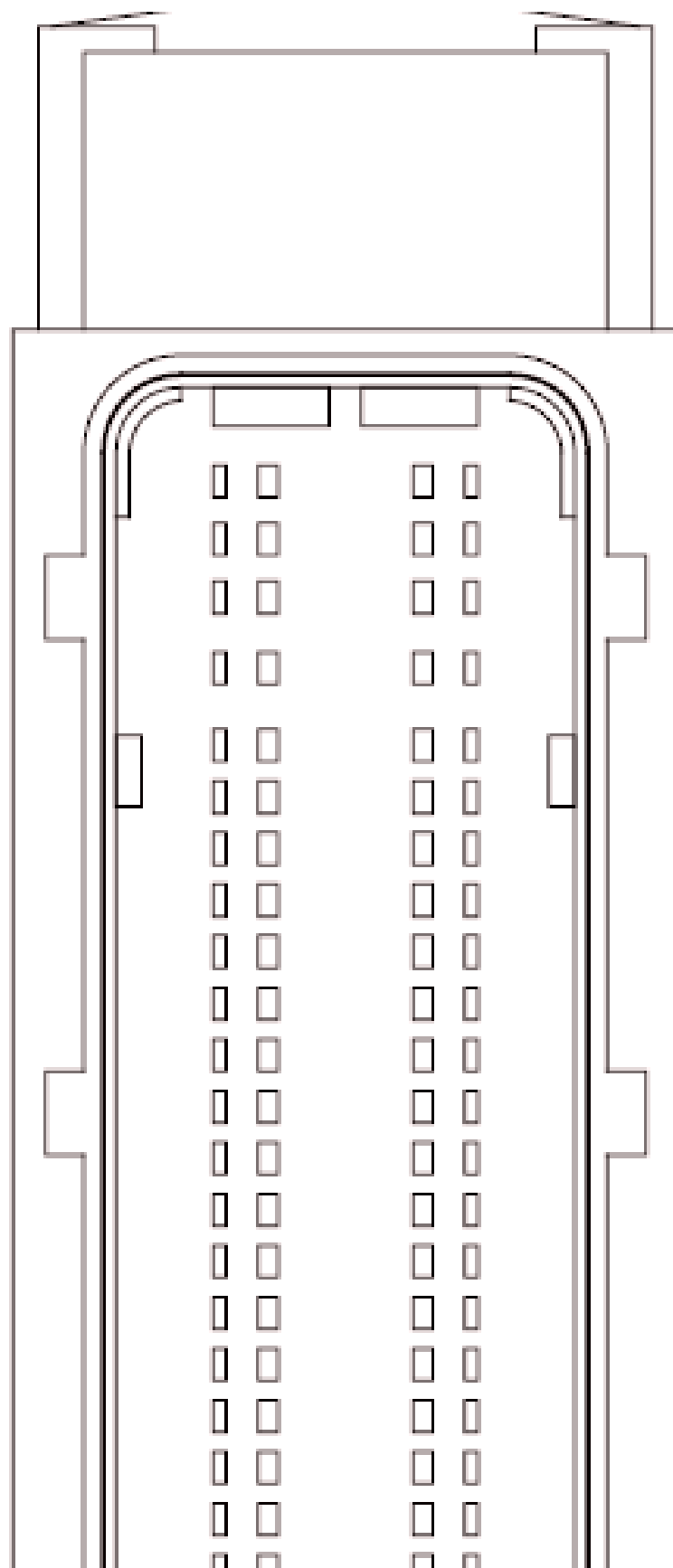


CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	G160 20VT/LG	PASSENGER DOOR LOCK SWITCH MUX
5	-	-
6	Q336 20OR/GY	PASSENGER WINDOW EXPRESS SWITCH MUX
7	Q936 20OR/LG	PASSENGER WINDOW EXPRESS SWITCH RETURN
8	E34 20OR/TN	SWITCH ILLUMINATION DRIVER
9	-	-
10	-	-

MODULE-ENGINE CONTROL C1 - 96 WAY (DIESEL)

73

1



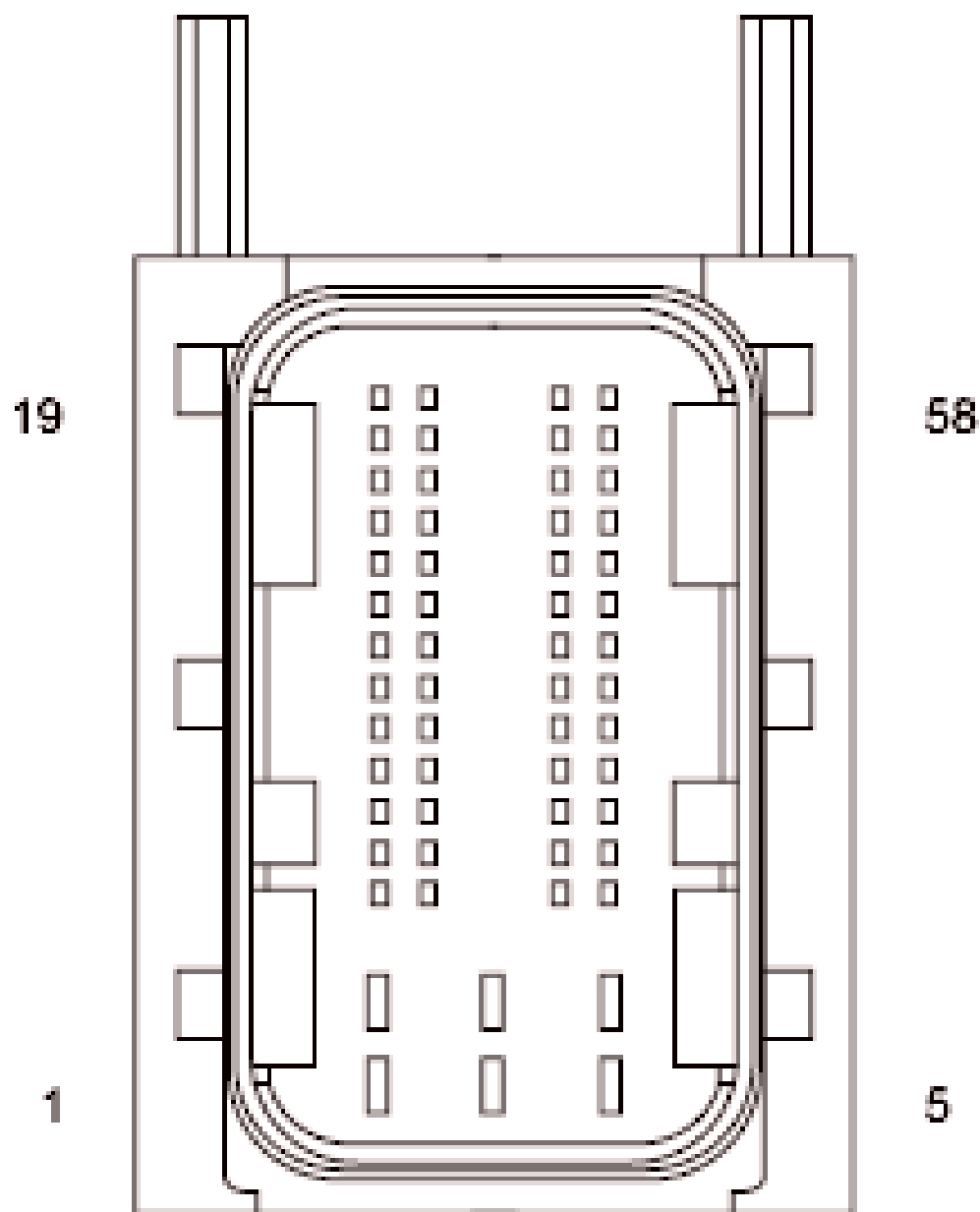
CAV	CIRCUIT	FUNCTION
1	K11 16BR/YL	INJECTOR 1 HIGH-SIDE CONTROL
2	K14 16BR/TN	INJECTOR 4 HIGH-SIDE CONTROL
3	-	-
4	-	-
5	-	-
6	K103 20BR/LB	O2 1/1 PUMP CELL CURRENT TRIM (RHD)
7	K853 20DB/BR	CKP 5 VOLT SUPPLY
8	K901 20BR/GY	INLET AIR PRESSURE RETURN
9	-	-
10	K944 20BK/GY	CMP RETURN
11	K48 20DB/WT	INTAKE AIR TEMPERATURE SIGNAL
12	-	-
13	-	-
14	-	-
15	K844 20DB/YL	CMP 5 VOLT SUPPLY
16	-	-
17	-	-
18	K357 20BR/WT	EOP 5 VOLT SUPPLY
19	K356 20BR/GY	BOOST PRESSURE 5 VOLT SUPPLY
20	-	-
21	K54 20DB/WT	THROTTLE VALVE CONTROL
22	-	-
23	K369 20BR/OR	FUEL PRESSURE 12 VOLT SUPPLY
24	-	-
25	K13 16BR/LB	INJECTOR 3 HIGH-SIDE CONTROL
26	K12 16BR/DB	INJECTOR 2 HIGH-SIDE CONTROL
27	-	-
28	-	-
29	-	-
30	-	-
31	K41 20DB/LB	O2 1/1 REFERENCE SIGNAL (RHD)
32	K202 20DB/BR	GLOW PLUG RELAY

		CONTROL
33	K44 20DB/GY	CMP SIGNAL
34	D330 20VT/WT	GLOW PLUG MODULE SIGNAL
35	-	-
36	K923 20BR/WT	WATER IN FUEL RETURN
37	K936 20BR/YL	EOP RETURN
38	-	-
39	G123 20VT/LG	WATER IN FUEL SIGNAL
40	F888 20BR/PK	MAF 8 VOLT SUPPLY
41	K354 20BR/LG	EXHAUST DIFFERENTIAL PRESSURE 5 VOLT SUPPLY (DPF)
42	K668 20BR	INLET AIR PRESSURE 5 VOLT SUPPLY
43	K350 20BR/YL	FUEL PRESSURE 5 VOLT SUPPLY
44	K355 20BR/DG	EXHAUST DIFFERENTIAL PRESSURE SIGNAL (DPF)
45	-	-
46	-	-
47	K366 20BR/LG	FUEL QUANTITY 12 VOLT SUPPLY
48	K79 18BR/LB	O2 1/1 HEATER CONTROL (RHD)
49	K612 16YL/BR	INJECTOR 2 LOW-SIDE CONTROL
50	K611 16OR/BR	INJECTOR 1 LOW-SIDE CONTROL
51	-	-
52	-	-
53	K925 18DB/GY	CKP RETURN
54	-	-
55	-	-
56	K914 20BR/WT	SENSOR RETURN
57	K902 20BR/DG	O2 1/1 NEGATIVE CURRENT CONTROL (RHD)
58	-	-
59	-	-
60	K2 20VT/OR	ECT SIGNAL
61	K156 20BR/YL	FUEL TEMPERATURE SIGNAL
62	-	-
63	K915 20BR/WT	POST-CATALYST EXHAUST

		GAS TEMPERATURE RETURN (DPF)
64	K359 20YL/BR	FUEL PRESSURE RETURN
65	K181 20BR/YL	FUEL PRESSURE SIGNAL
65	K181 20BR/OR	FUEL PRESSURE SIGNAL (RHD)
66	-	-
67	K951 20BR/DB	EXHAUST DIFFERENTIAL PRESSURE RETURN (DPF)
68	K137 20DB/OR	BOOST PRESSURE CONTROL
69	-	-
70	-	-
71	K35 20DB/VT	EGR CONTROL
72	-	-
73	K614 16WT/BR	INJECTOR 4 LOW-SIDE CONTROL
74	-	-
75	K613 16GY/BR	INJECTOR 3 LOW-SIDE CONTROL
76	K957 18BK/OR	MAF RETURN
77	K24 20BR/LB	CKP SIGNAL (LHD)
77	K24 18BR/LB	CKP SIGNAL (RHD)
78	-	-
79	-	-
80	K89 20BR/LG	O2 1/1 POSITIVE CURRENT CONTROL (RHD)
81	K157 20BR/OR	MAF SIGNAL
82	K37 20BR/OR	BOOST PRESSURE SIGNAL
83	-	-
84	-	-
85	K68 20BR/LG	INLET AIR PRESSURE SIGNAL
86	-	-
87	K656 20GY/BR	SENSOR RETURN
88	D509 20WT/OR	ECM LIN BUS
89	K353 20OR/BR	POST-CATALYST EXHAUST GAS TEMPERATURE SIGNAL (DPF)
90	-	-
91	-	-
92	-	-
93	K370 20BR	FUEL PRESSURE CONTROL
94	K365 20DB/BR	FUEL QUANTITY CONTROL

95	-	-
96	-	-

MODULE-ENGINE CONTROL C2 - 58 WAY (DIESEL)

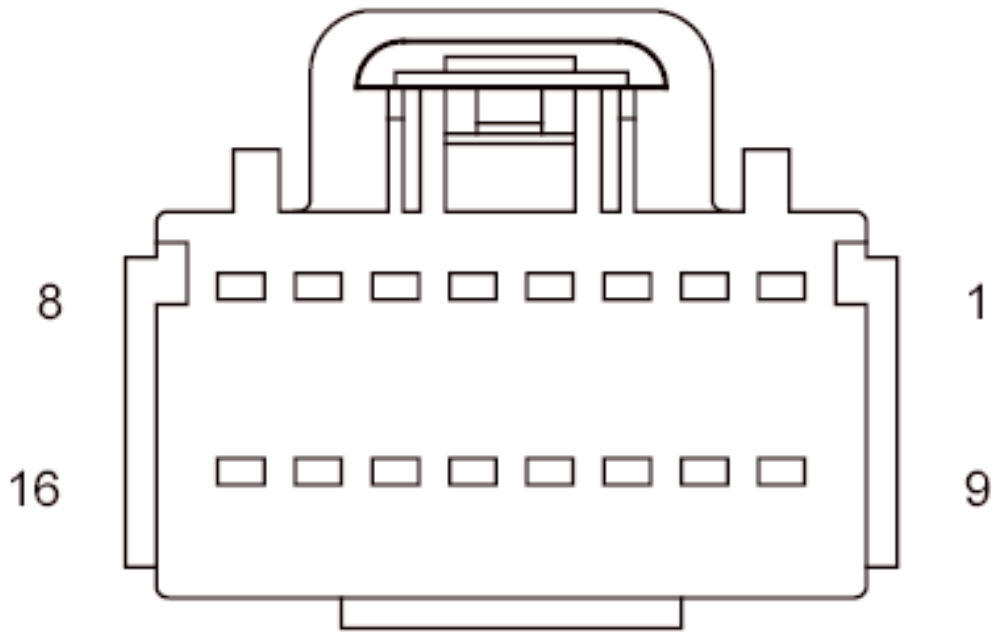


**MODULE-
ENGINE
CONTROL C2
(DIESEL)**

	CIRCUIT	FUNCTION
1	F344 14BR/GY	FUSED ASD RELAY OUTPUT
2	Z933 14BK	GROUND
3	F344 14BR/GY	FUSED ASD RELAY OUTPUT
4	Z933 14BK	GROUND
5	F342 14BR/WT	FUSED ASD RELAY OUTPUT
6	Z933 14BK	GROUND
7	K167 18BR/YL	APP SENSOR GROUND 1
7	K167 20BR/YL	APP SENSOR GROUND 1 (MTX)
8	-	-
9	-	-
10	-	-
11	-	-
12	K29 20WT/BR	APP SIGNAL 2
13	-	-
14	G6 20VT/GY	EOP SIGNAL
15	K855 20BR/OR	5 VOLT SUPPLY
16	-	-
17	K857 20BR/LG	5 VOLT SUPPLY
18	-	-
19	-	-
20	-	-
21	-	-
22	V71 20VT/OR	S/C SIGNAL 1
23	-	-
24	K23 20BR/WT	APP SIGNAL 1
25	-	-
26	V72 20OR/VT	S/C SIGNAL 2
27	-	-
28	V937 20VT/BR	S/C RETURN
29	-	-
30	-	-
31	-	-
32	K31 20BR	FUEL PUMP CONTROL
33	-	-
34	T141 18YL/OR	CLUTCH INTERLOCK SIGNAL (MTX)
34	T41 20YL/OR	CLUTCH INTERLOCK SIGNAL (NON-PDF)
35	T26 18DG/OR	CLUTCH UPSTOP SIGNAL (MTX)

35	T26 20DG/OR	CLUTCH UPSTOP SIGNAL (NON-PDF)
36	B16 20LB/DG	BRAKE SIGNAL 2
37	-	-
38	-	-
39	-	-
40	K400 20BR/VT	APP SENSOR GROUND 2
41	F202 20PK/GY	FUSED RUN/START RELAY OUTPUT
42	K51 20BR/OR	ASD RELAY CONTROL
42	K334 18BR/LG	ASD RELAY OUTPUT (RHD)
43	D21 20WT/BR	SCI TRANSMIT (RHD)
44	T752 20DG/OR	STARTER RELAY CONTROL
45	-	-
46	B15 20DG/WT	BRAKE SIGNAL 1
47	-	-
48	-	-
49	-	-
50	-	-
51	D65 20WT/LG	CAN C BUS (+)
52	D64 20WT/LB	CAN C BUS (-)
53	-	-
54	C13 20LB/OR	A/C CLUTCH CONTROL
55	-	-
56	-	-
57	-	-
58	-	-

MODULE-FINAL DRIVE C1 - 16 WAY

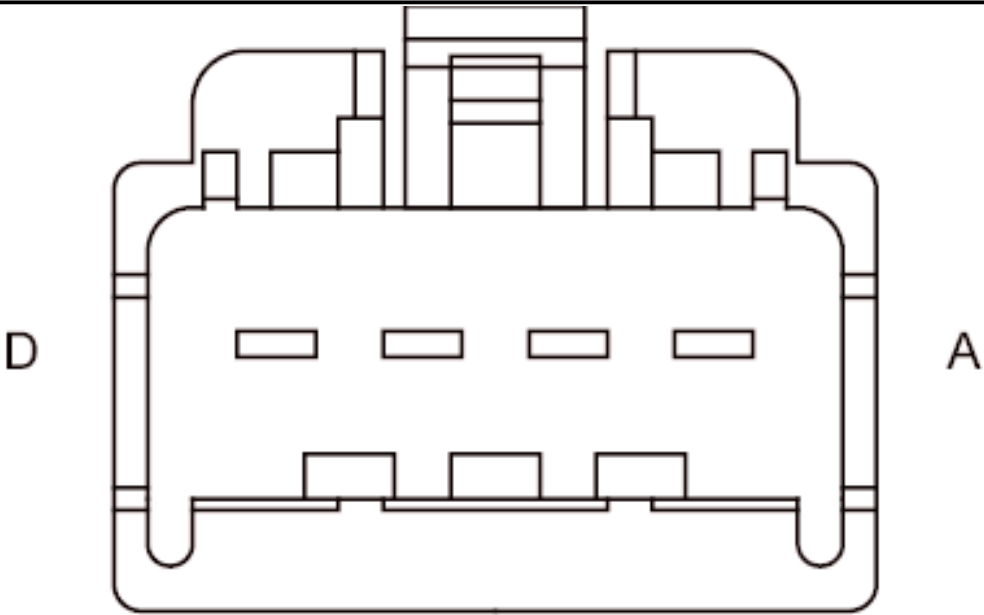


MODULE- FINAL DRIVE C1

CAV	CIRCUIT	FUNCTION
1	T301 18DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
2	-	-
3	T313 20YL/LG	MODE SENSOR SIGNAL
4	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
5	D64 20WT/LB	CAN C BUS (-)
6	D65 20WT/BK	CAN C BUS (+)
7	-	-
8	-	-
9	T317 20YL/TN	STEP MOTOR CONTROL D
10	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
11	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
12	-	-
13	-	-
14	-	-

15	-	-
16	-	-

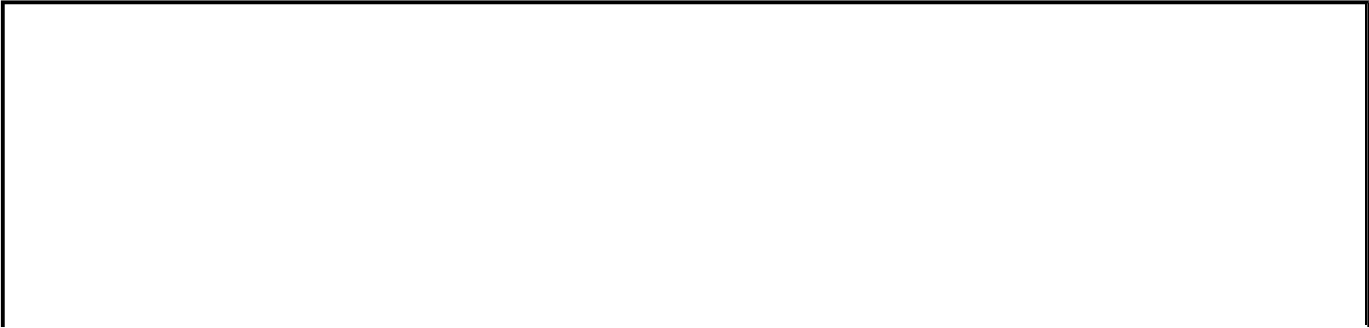
MODULE-FINAL DRIVE C2 - 4 WAY

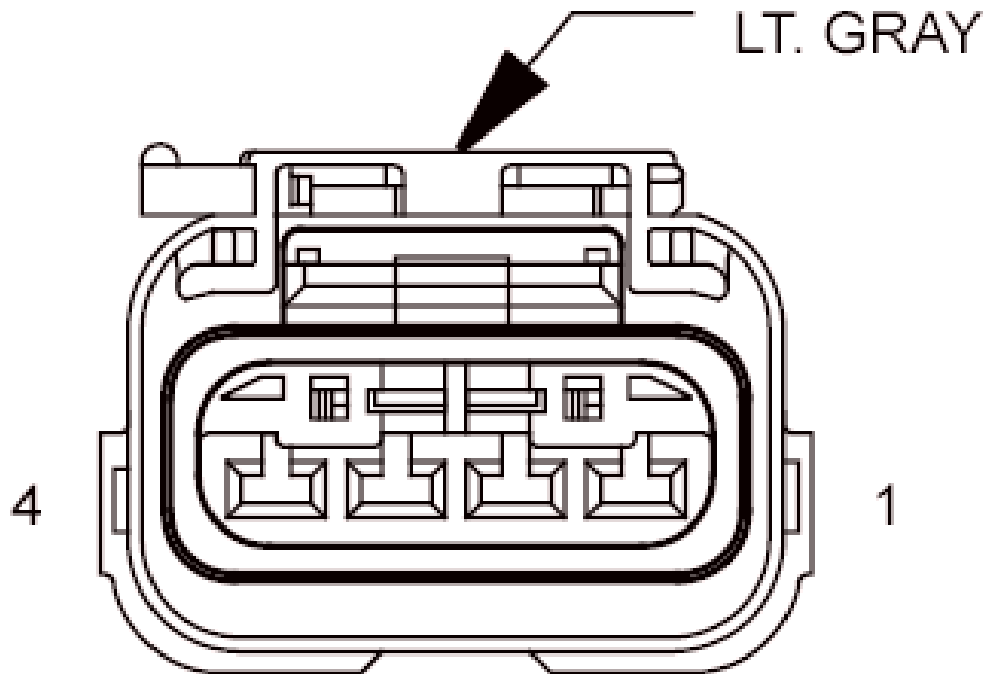


MODULE-FINAL DRIVE C2

CAV	CIRCUIT	FUNCTION
A	T316 12YL/GY	STEP MOTOR CONTROL B
B	T315 12YL/BR	SHIFT MOTOR CONTROL A
C	A115 12RD	FUSED B(+)
D	Z911 14BK	GROUND

MODULE-FUEL PUMP - LT. GRAY 4 WAY



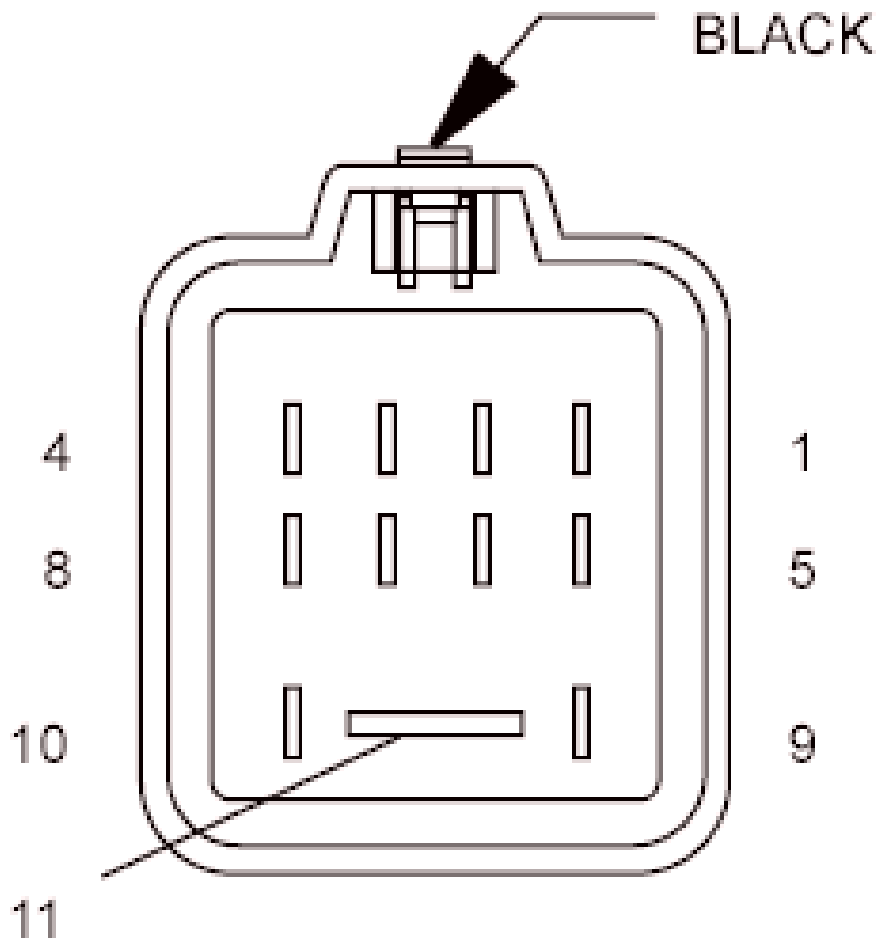


MODULE- FUEL PUMP

CAV	CIRCUIT	FUNCTION
1	Z918 16BK	GROUND
2	K91 18DB/YL	SENSOR GROUND
3	N4 18DB/WT	FUEL LEVEL SIGNAL
4	N1 16DB/OR	FUSED FUEL PUMP OUTPUT

MODULE-GLOW PLUG - BLACK 11 WAY (DIESEL)



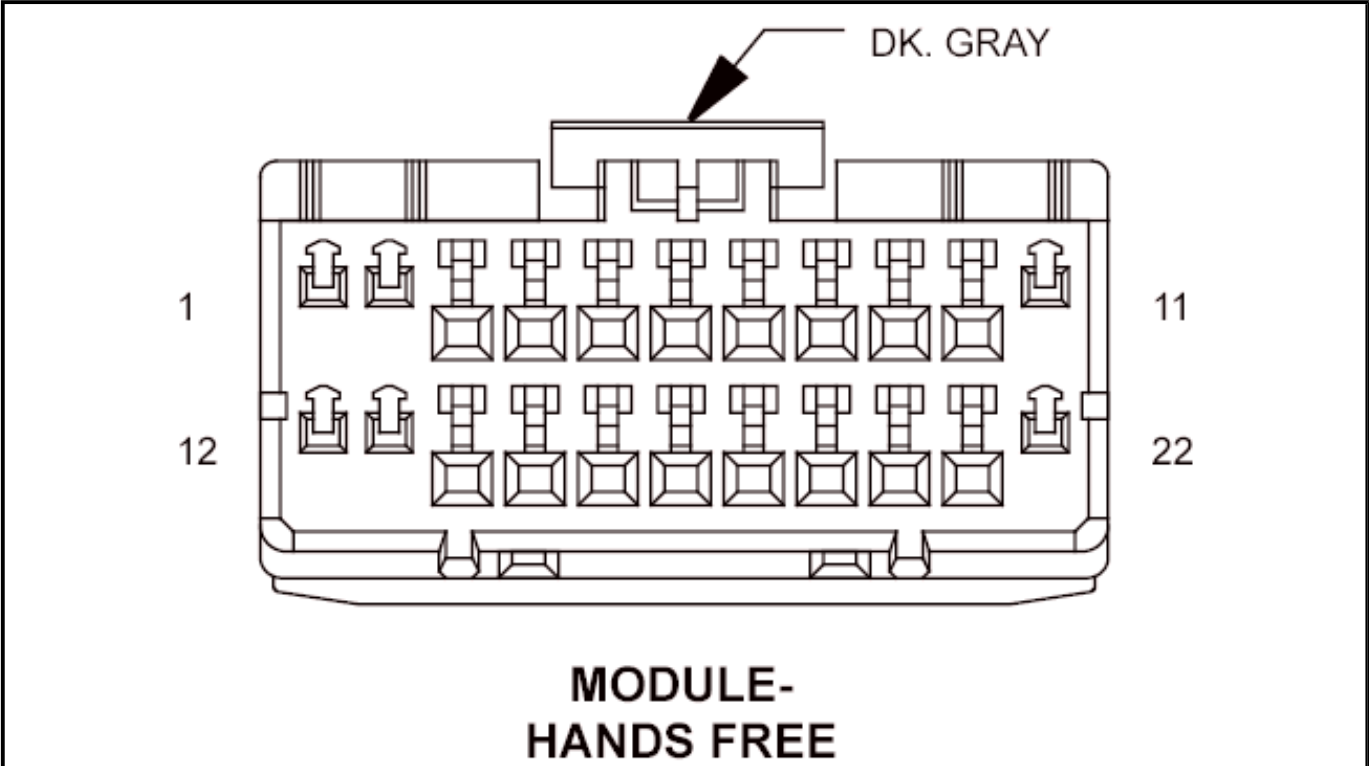


MODULE- GLOW PLUG (DIESEL)

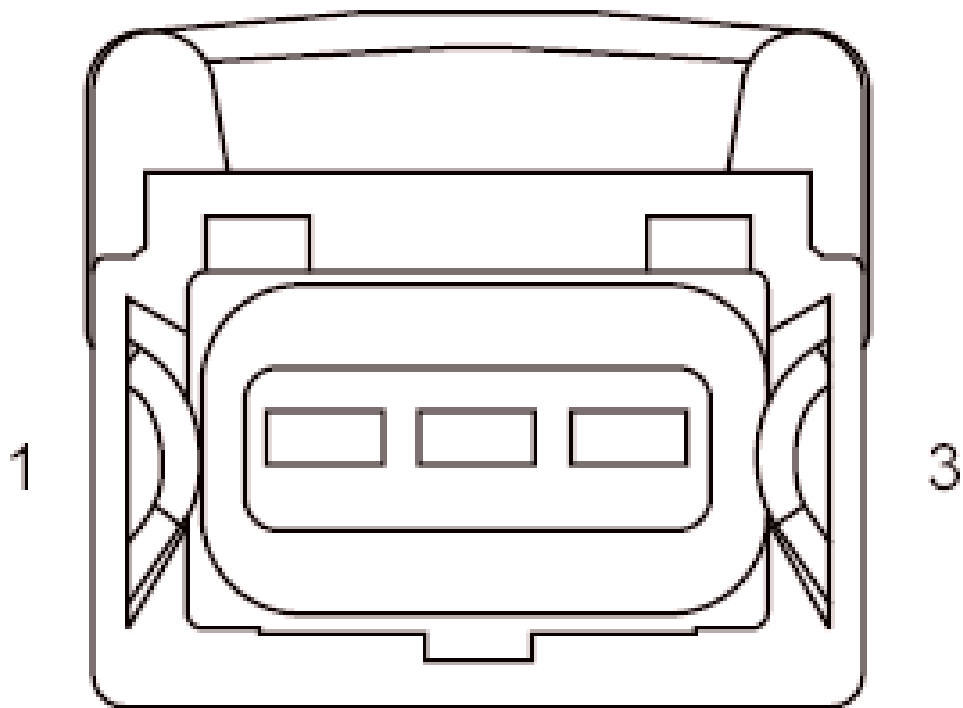
CAV	CIRCUIT	FUNCTION
1	A202 16RD/WT	GLOW PLUG 1 CONTROL
2	A203 16RD/BR	GLOW PLUG 2 CONTROL
3	A204 16RD/YL	GLOW PLUG 3 CONTROL
4	A208 16RD/OR	GLOW PLUG 4 CONTROL
5	-	-
6	F344 16BR/GY	FUSED ASD RELAY OUTPUT
7	Z904 14BK	GROUND

	-	-
9	D330 20VT/WT	GLOW PLUG MODULE SIGNAL
10	K202 20DB/BR	GLOW PLUG RELAY CONTROL
11	A29 10RD/GY	FUSED B(+)

MODULE-HANDS FREE - DK. GRAY 22 WAY



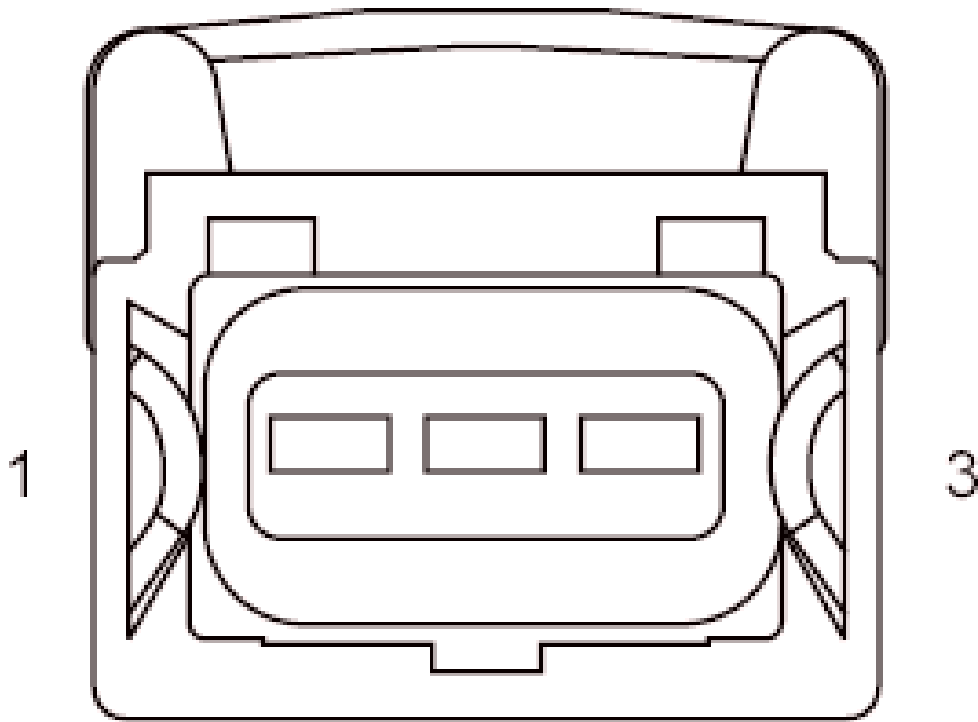
MODULE-HANDS FREE		
CAV	CIRCUIT	FUNCTION
1	A416 18RD	FUSED B(+) (I.O.D.)
2	-	-
3	-	-
4	D264 20WT/OR	CAN INTERIOR BUS (-)
5	X722B 22LB/DG	MICROPHONE 2 IN (+)
6	-	-
7	-	-
8	X703 18OR/GY	LEFT AUDIO OUTPUT
9	X704 18DG/YL	RIGHT AUDIO OUTPUT
10	X795 18DG	COMMON AUDIO OUTPUT
11	-	-
12	-	-
13	-	-
14	D265 20WT/GY	CAN INTERIOR BUS (+)



**MODULE-
HEADLAMP
LEVELING-
LEFT
(EXPORT)**

CAV	CIRCUIT	FUNCTION
1	Z907D 18BK/YL	GROUND
2	L135 20LG/WT	HEADLAMP LEVEL CONTROL SIGNAL
3	L13 20WT/LG	HEADLAMP ADJUST SIGNAL

MODULE-HEADLAMP LEVELING-RIGHT - 3 WAY (EXPORT)

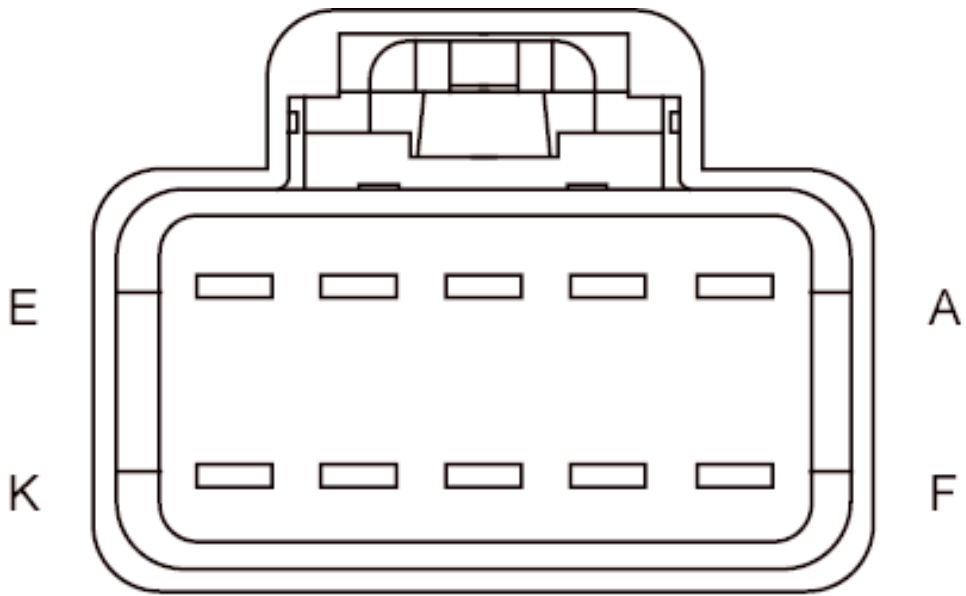


**MODULE-
HEADLAMP
LEVELING-
RIGHT
(EXPORT)**

CAV	CIRCUIT	FUNCTION
1	Z908 18BK	GROUND
2	L135 20LG/WT	HEADLAMP LEVEL CONTROL SIGNAL
3	L13 20WT/LG	HEADLAMP ADJUST SIGNAL

MODULE-HEATED SEATS - 10 WAY

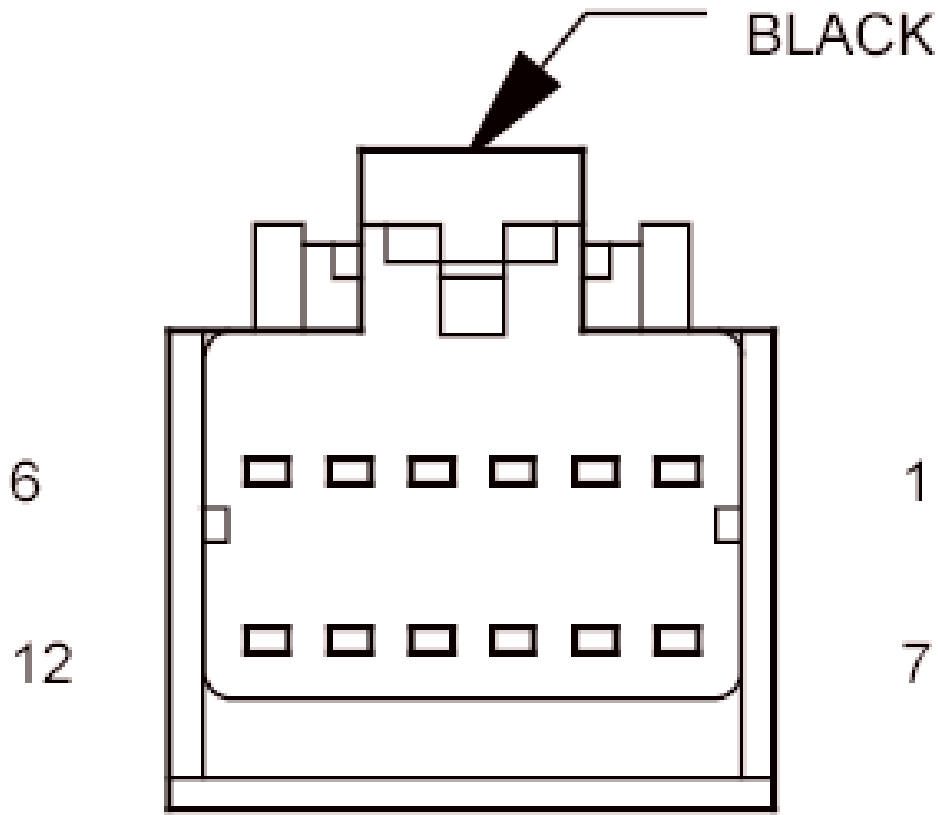
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MODULE- HEATED SEATS

CAV	CIRCUIT	FUNCTION
A	-	-
B	-	-
C	-	-
D	P187 16LG/BR	LEFT SEAT HEATER B(+) DRIVER
E	P693 16LG/WT	HEATED SEAT MODULE SUPPLY
F	Z914 16BK	GROUND
G	-	-
H	-	-
J	D506 20WT/DG	LIN BUS
K	P188 16LG/VT	RIGHT SEAT HEATER B(+) DRIVER

MODULE-INTRUSION TRANSCEIVER - BLACK 12 WAY

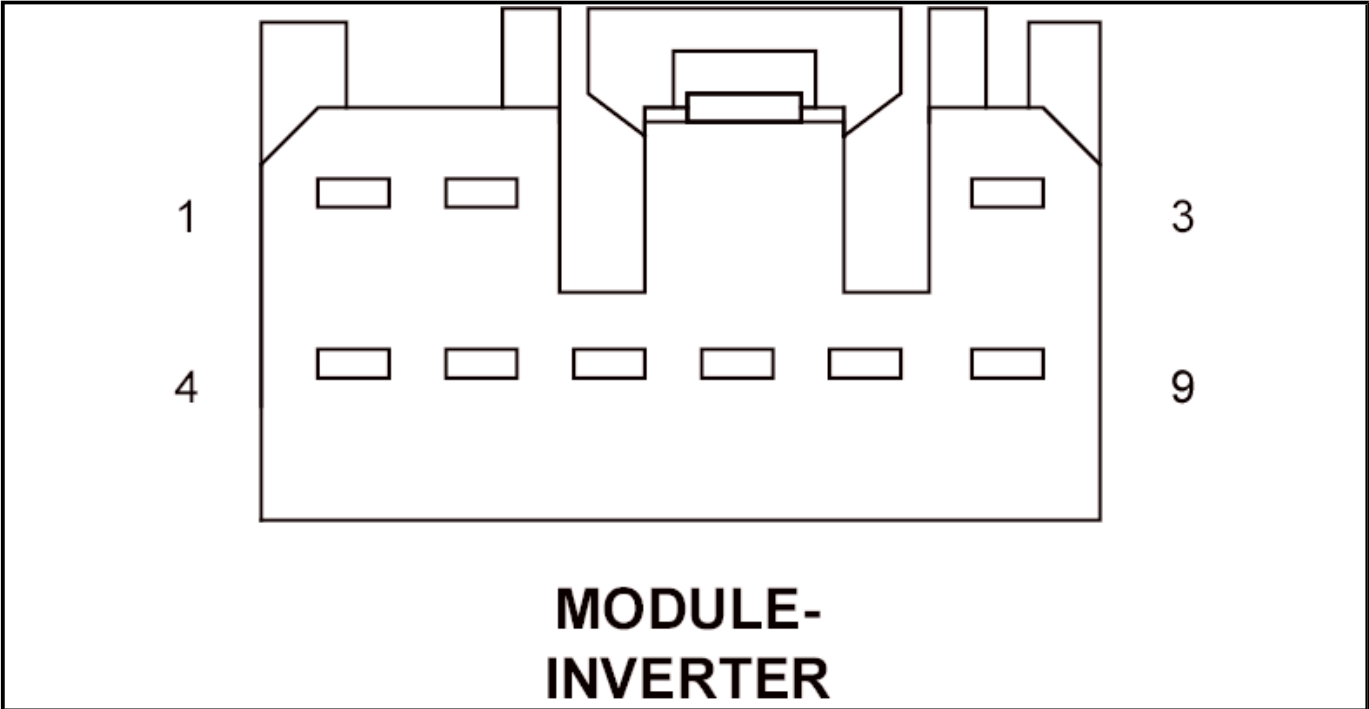


MODULE- INTRUSION TRANSCIEVER (RHD)

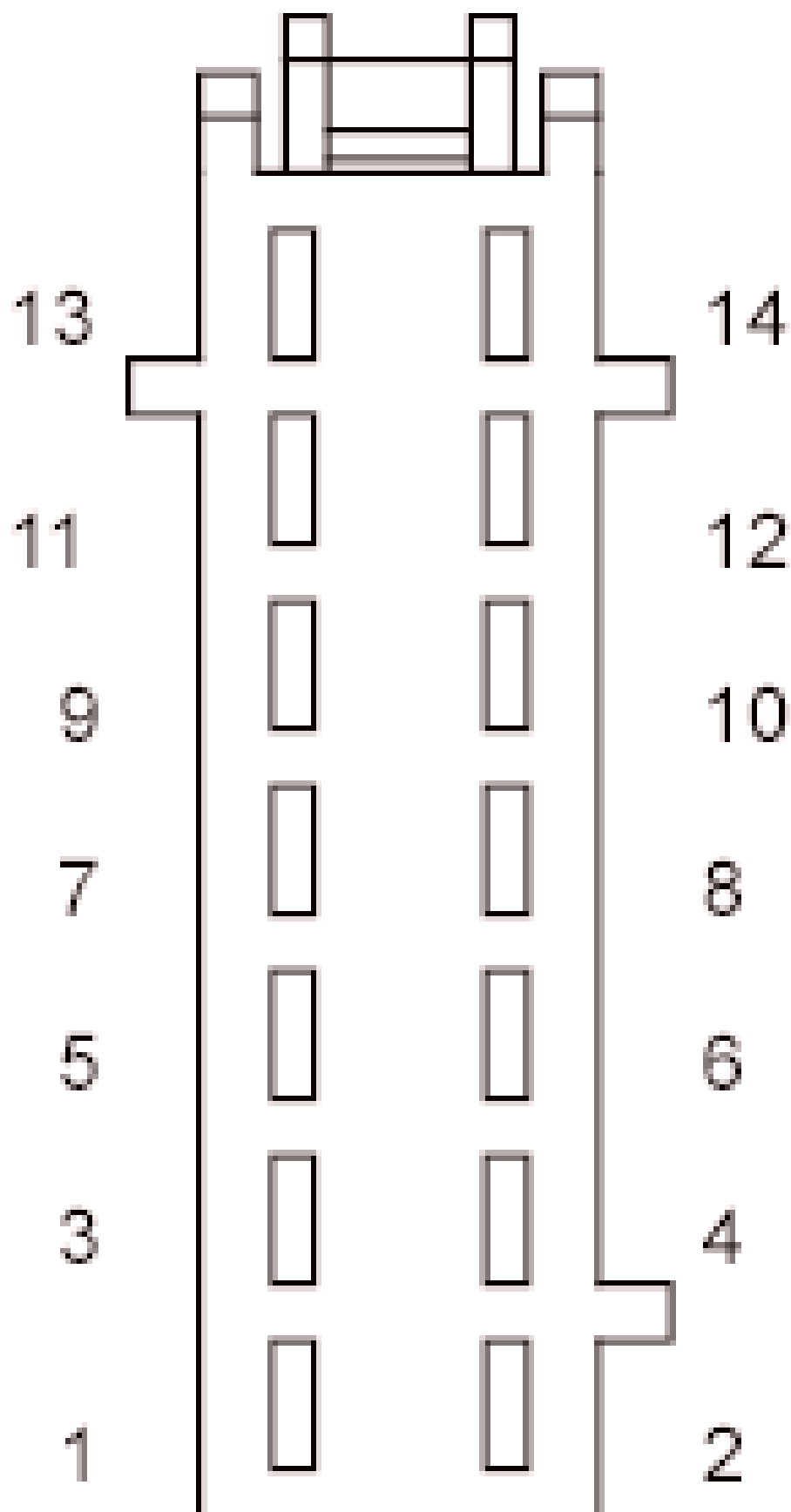
CAV	CIRCUIT	FUNCTION
1	A412 18RD	FUSED B(+)
2	-	-
3	A645 20RD/VT	INTRUSION TRANSMITTER SENSOR SIGNAL
4	G460 20DG/VT	INTRUSION RECEIVER SENSOR SIGNAL
5	D96 18WT/LB	SIREN SIGNAL CONTROL
6	D265 20WT/GY	CAN INTERIOR BUS (+)

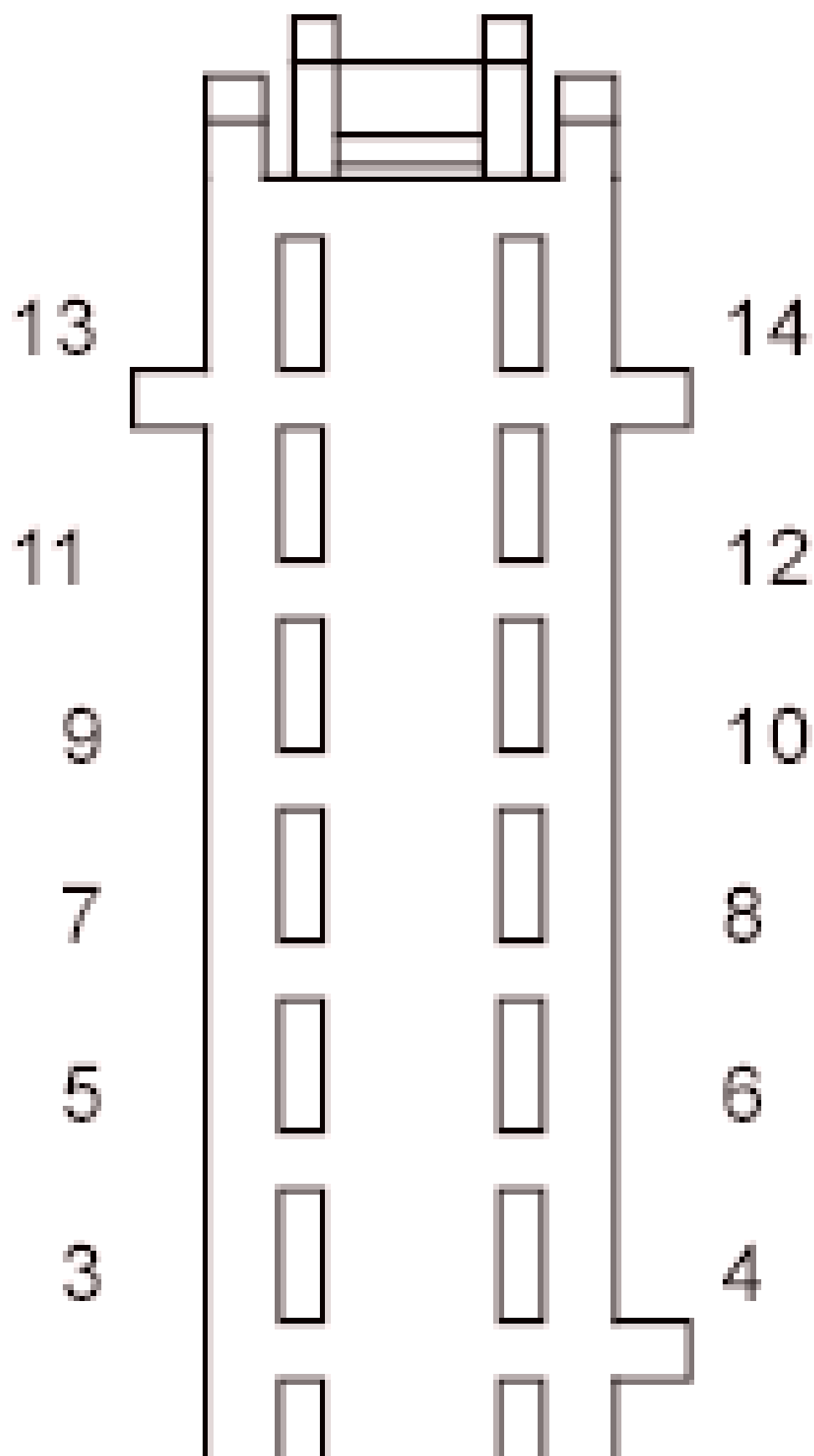
		(EXCEPT EXPRESS UP BASE)
6	D265 20WT/OR	CAN INTERIOR BUS (+) (EXPRESS UP BASE)
7	Z919 20BK/WT	GROUND
8	-	-
9	G945 20VT/DG	INTRUSION TRANSMITTER SENSOR GROUND
10	G946 20LG/VT	INTRUSION RECEIVER SENSOR GROUND
11	-	-
12	D264 20WT/OR	CAN INTERIOR BUS (-) (EXCEPT EXPRESS UP BASE)
12	D264 20WT	CAN INTERIOR BUS (-) (EXPRESS UP BASE)

MODULE-INVERTER - 9 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	A904 14RD	FUSED B(+)
2	P806 18LG/WT	INVERTER STATUS INDICATOR DRIVER
3	P801 18LG	110 VOLT AC LINE 1
4	Z917 14BK	GROUND
5	P805 18LG/LB	INVERTER ENABLE SWITCH SIGNAL
6	-	-

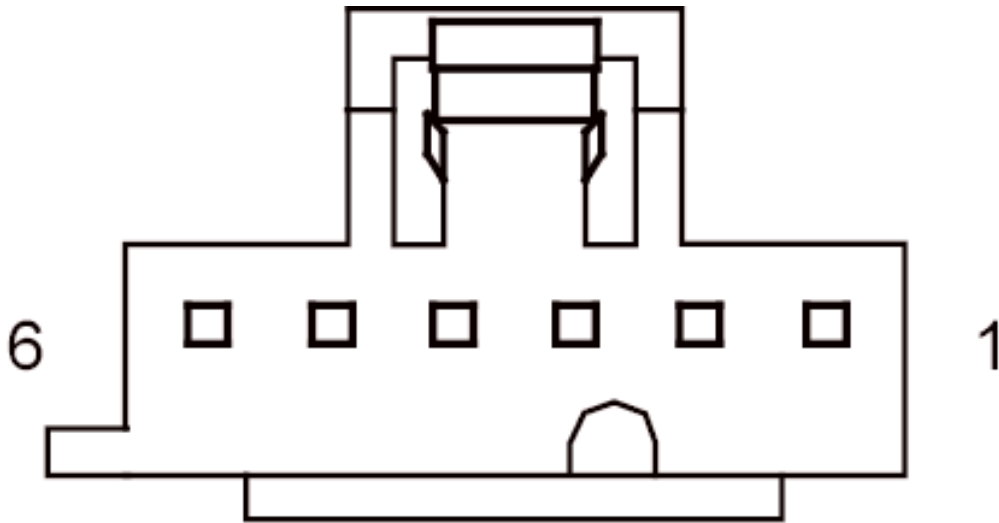




CAV	CIRCUIT	FUNCTION
1	G404 22VT/YL	DRIVER SEAT FRONT VERTICAL POSITION SENSE
2	G402 18VT/DB	DRIVER SEAT REAR VERTICAL POSITION SENSE
3	G401 22VT/LG	DRIVER SEAT HORIZONTAL POSITION SENSE
4	G494 22YL/VT	DRIVER SEAT FRONT VERTICAL SENSOR GROUND
5	G492 18LB/VT	DRIVER SEAT REAR VERTICAL SENSOR GROUND
6	G491 22VT/GY	DRIVER SEAT HORIZONTAL SENSOR GROUND
7	-	-
8	P115 18LG	DRIVER SEAT HORIZONTAL FORWARD DRIVER
9	P117 18LG/LB	DRIVER SEAT HORIZONTAL REARWARD DRIVER
10	P113 18LG/WT	DRIVER SEAT REAR DOWN DRIVER
11	-	-
12	P111 18LG/YL	DRIVER SEAT REAR UP DRIVER
13	P121 18LG/DB	DRIVER SEAT FRONT DOWN DRIVER
14	P119 18LG/DG	DRIVER SEAT FRONT UP DRIVER

MODULE-MEMORY SEAT C3 - 6 WAY

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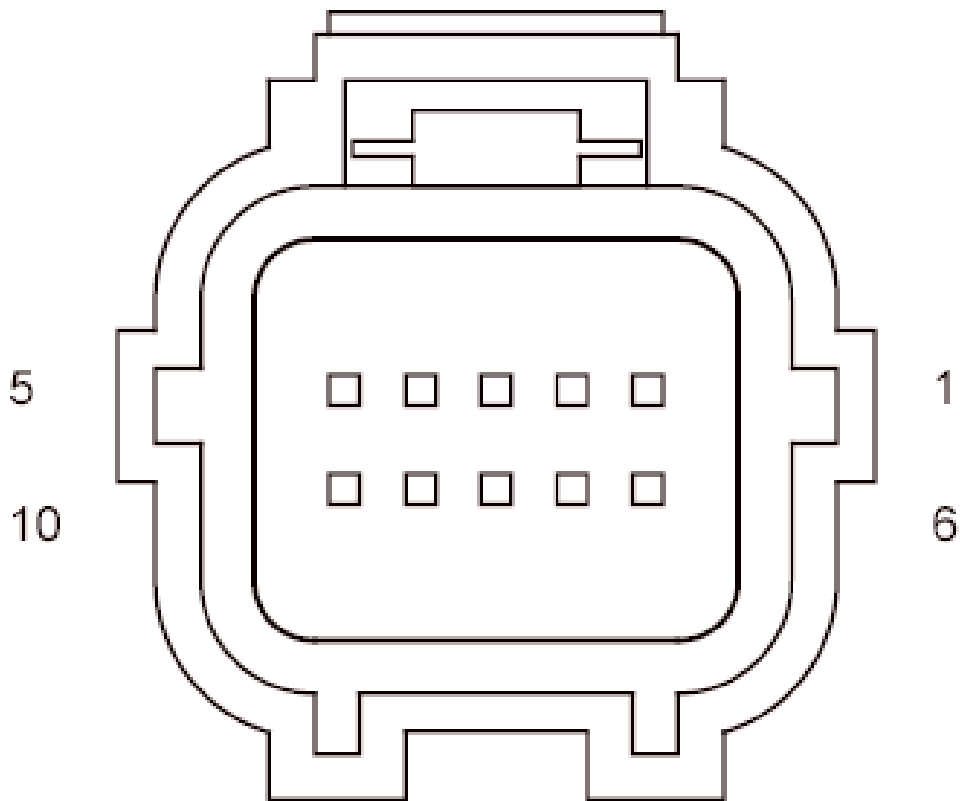


MODULE- MEMORY SEAT C3

CAV	CIRCUIT	FUNCTION
1	P28 22LG/BR	DRIVER SEAT SWITCH MUX RETURN
2	P311 18LG/VT	DRIVER SEAT FRONT RISER SWITCH MUX
3	P309 18LG/BR	DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX
4	-	-
5	-	-
6	P29 22LG/WT	DRIVER SEAT SWITCH MUX SUPPLY

MODULE-OCCUPANT CLASSIFICATION C1 - 10 WAY (EXCEPT EXPORT)

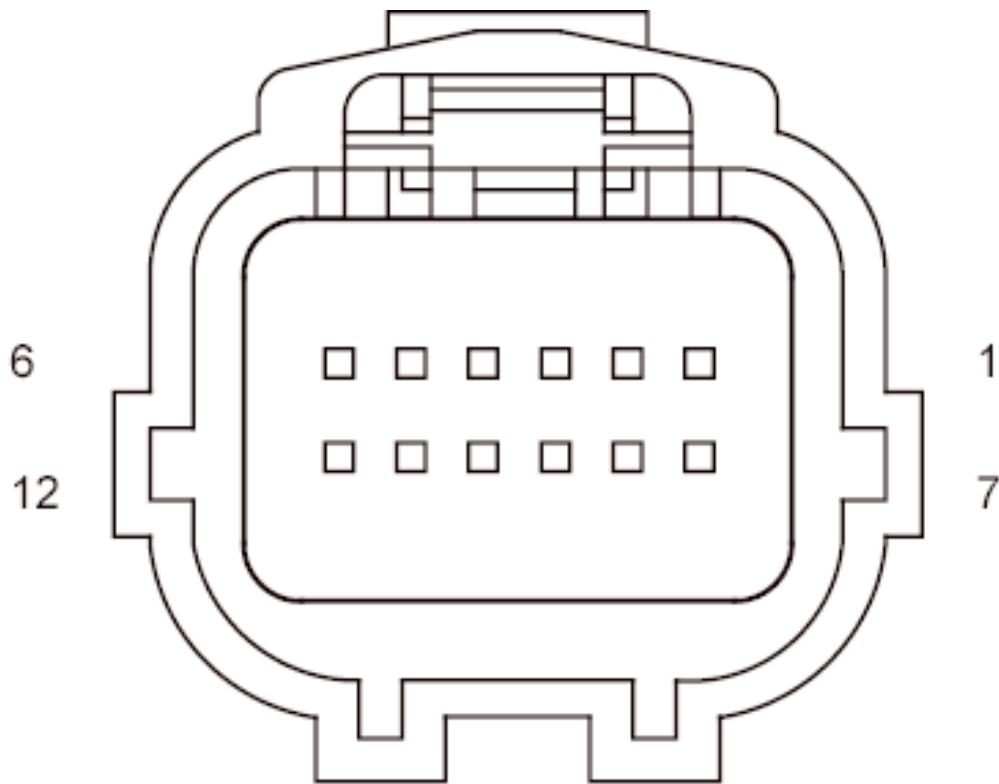
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**MODULE-
OCCUPANT
CLASSIFICATION C1
(EXCEPT EXPORT)**

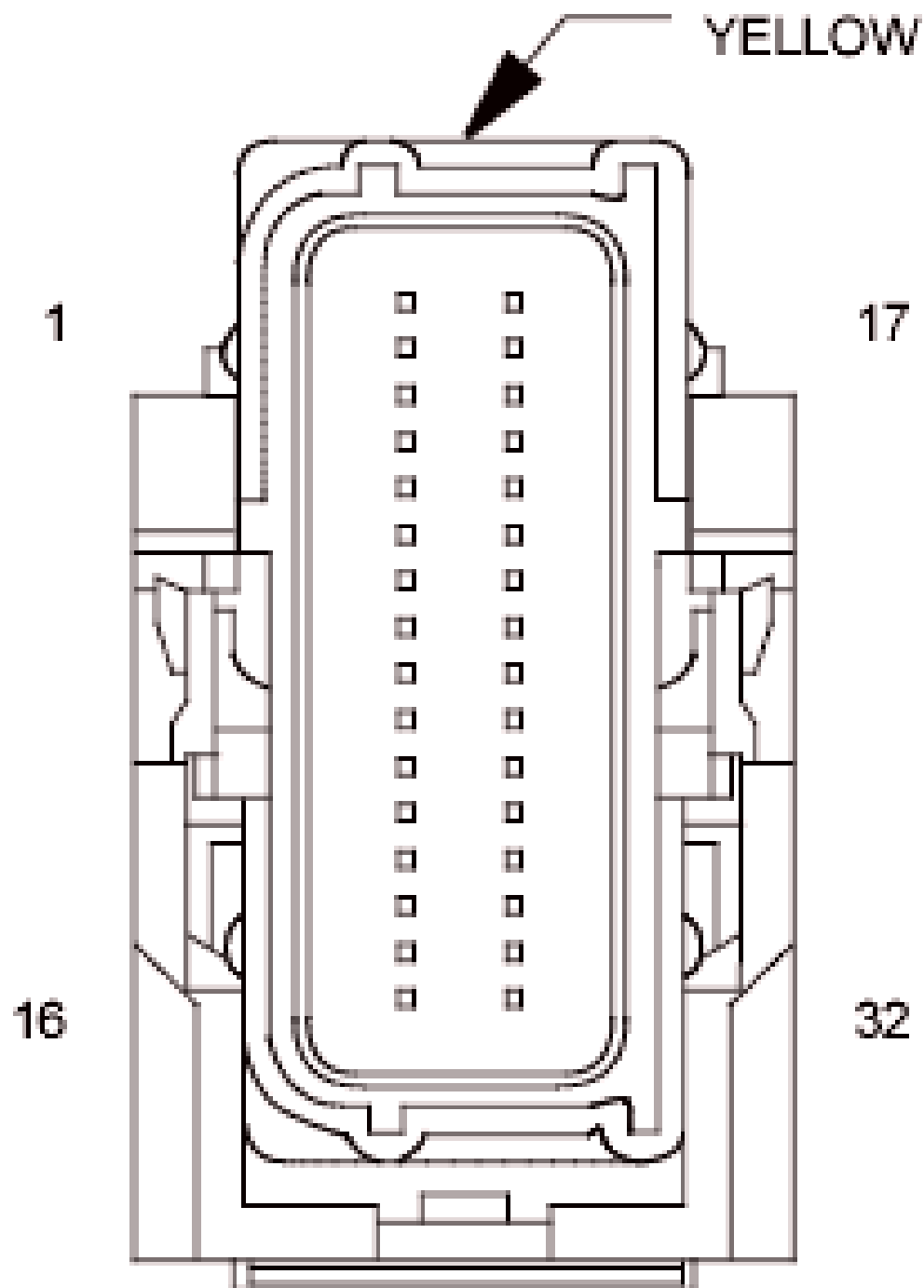
CAV	CIRCUIT	FUNCTION
1	A27 20RD/LB	FUSED B(+)
2	-	-
3	-	-
4	D65A 20WT/BK	CAN C BUS (+)
5	D64 20WT/LB	CAN C BUS (-)
6	-	-
7	-	-
8	-	-
9	-	-
10	Z913 20BK	GROUND

MODULE-OCCUPANT CLASSIFICATION C2 - 12 WAY (EXCEPT EXPORT)



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

CAV	CIRCUIT	FUNCTION
1	R701 20LG	SEAT WEIGHT SENSOR 5 VOLT SUPPLY
2	-	-
3	R717 20LG/DG	SEAT WEIGHT LEFT FRONT SENSOR SIGNAL
4	-	-
5	R718 20LB/DG	SEAT WEIGHT RIGHT FRONT SENSOR SIGNAL
6	-	-
7	R706 20LB/OR	SEAT WEIGHT RIGHT REAR SENSOR SIGNAL
8	-	-
9	R705 20LG/OR	SEAT WEIGHT LEFT REAR SENSOR SIGNAL

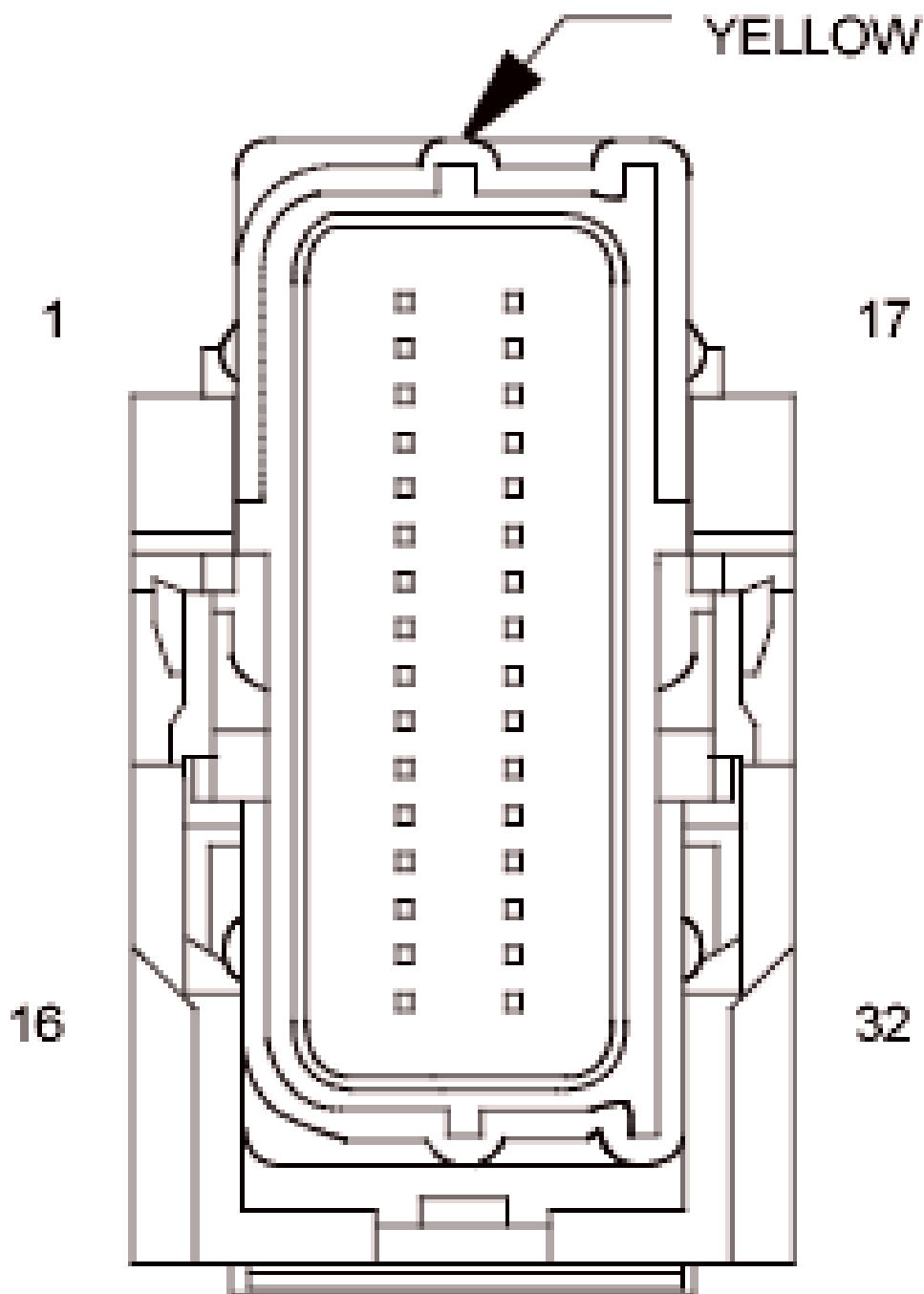


**MODULE-
OCCUPANT**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	
9	R43 20LG/BR	DRIVER SQUIB 1 LINE 2
10	R45 20LG/OR	DRIVER SQUIB 1 LINE 1
11	R44 20LB/OR	PASSENGER SQUIB 1 LINE 1
12	R42 20LB/BR	PASSENGER SQUIB 1 LINE 2
13	R61 20LG/VT	DRIVER SQUIB 2 LINE 2
14	R63 20LG/WT	DRIVER SQUIB 2 LINE 1
15	R64 20LB/WT	PASSENGER SQUIB 2 LINE 1
16	R62 20LB/VT	PASSENGER SQUIB 2 LINE 2
17	-	-
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	D65 20WT/BK	CAN C BUS (+)
24	D64 20WT/LB	CAN C BUS (-)
25	-	-
26	-	-
27	-	-
28	R81 20LB/WT	LEFT FRONT IMPACT SENSOR GROUND
29	R79 20LB/VT	LEFT FRONT IMPACT SENSOR SIGNAL
30	R82 20WT/LB	RIGHT FRONT IMPACT SENSOR GROUND
31	R80 20VT/LB	RIGHT FRONT IMPACT SENSOR SIGNAL
32	Z912 18BK	GROUND

MODULE-OCCUPANT RESTRAINT CONTROLLER C2 (ORC) - YELLOW 32 WAY

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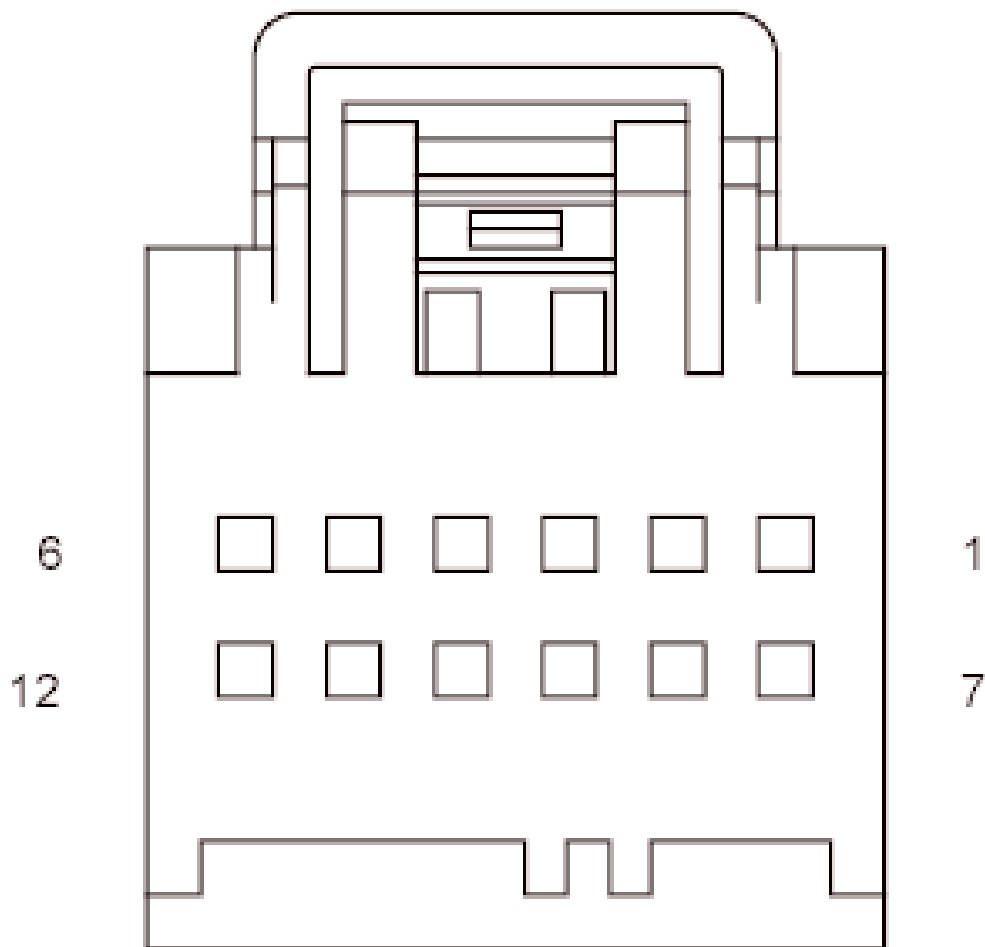


**MODULE-
OCCUPANT
RESTRAINT**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	R504 20LB/YL	PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2
6	R506 20LB/DG	PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1
7	R505 20LG/DG	DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1
8	R503 20LG/YL	DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2
9	R54 20LB/YL	LEFT SEAT BELT TENSIONER LINE 2
10	R56 20LB/DG	LEFT SEAT BELT TENSIONER LINE 1
11	R55 20LB/VT	DRIVER SEAT BELT TENSIONER LINE 1 (BASE)
11	R55 20LG/DG	DRIVER SEAT BELT TENSIONER LINE 1 (EXCEPT BASE)
12	R53 20LG/YL	DRIVER SEAT BELT TENSIONER LINE 2
13	R1 20LB/WT	LEFT CURTAIN SQUIB 1 LINE 2
14	R3 20LB/OR	LEFT CURTAIN SQUIB 1 LINE 1
15	R4 20OR/LB	RIGHT CURTAIN SQUIB 1 LINE 1
16	R2 20WT/LB	RIGHT CURTAIN SQUIB 1 LINE 2
17	R262 20WT/LB	PASSENGER SEAT TRACK POSITION SENSOR SIGNAL (EXCEPT EXPORT)
18	R264 20VT/LB	PASSENGER SEAT TRACK POSITION SENSOR SUPPLY (EXCEPT EXPORT)
19	R13 20LG/TN	LEFT SIDE IMPACT SENSOR 1 SIGNAL

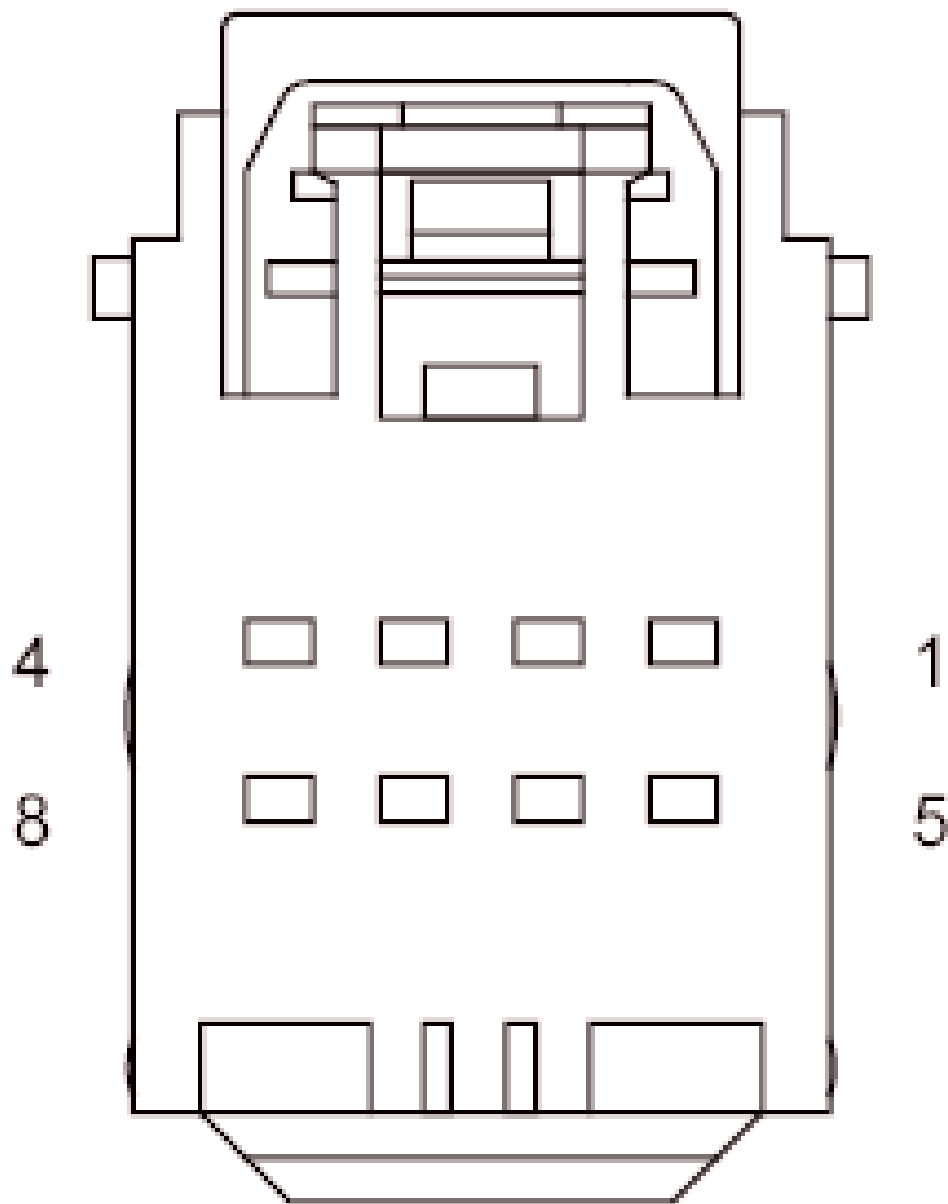
20	R15 20LG/BR	LEFT SIDE IMPACT SENSOR 1 GROUND
21	R16 20BR/LG	RIGHT SIDE IMPACT SENSOR 1 GROUND
22	R14 20TN/LG	RIGHT SIDE IMPACT SENSOR 1 SIGNAL
23	R263 20LB/VT	DRIVER SEAT TRACK POSITION SENSOR SUPPLY (EXCEPT EXPORT)
24	R261 20LB/WT	DRIVER SEAT TRACK POSITION SENSOR SIGNAL (EXCEPT EXPORT)
25	R58 20LB/GY	PASSENGER SEAT BELT SWITCH SIGNAL (EXCEPT EXPORT)
26	-	-
27	-	-
28	R60 20LB/TN	PASSENGER SEAT BELT SWITCH GROUND (EXCEPT EXPORT)
29	Z915 18BK	GROUND
30	-	-
31	F100 20PK/VT	FUSED RUN RELAY OUTPUT
32	F201 20PK/OR	FUSED RUN/START RELAY OUTPUT

MODULE-PARK ASSIST C1 - 12 WAY (PARKTRONICS)



**MODULE-
PARK
ASSIST C1
(PARKTRONICS)**

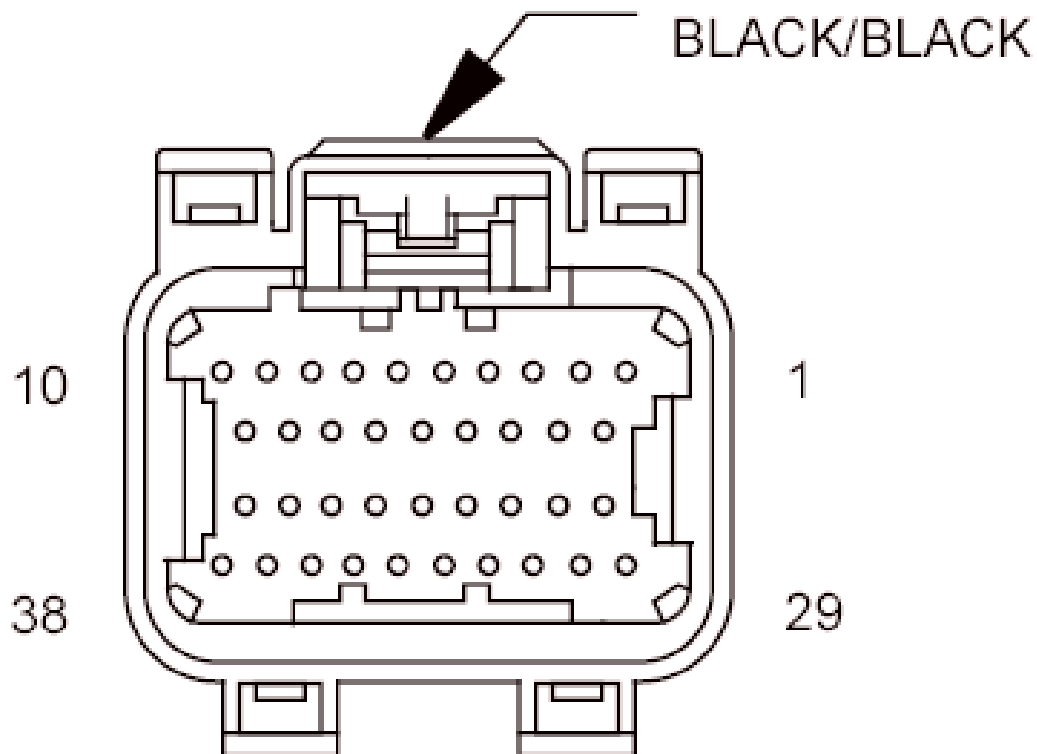
CAV	CIRCUIT	FUNCTION
1	F921 20PK/YL	FUSED RUN RELAY OUTPUT
2	X777 20DG/GY	PARK ASSIST DISPLAY SUPPLY
3	-	-
4	D777 20WT/GY	PARK ASSIST DISPLAY SIGNAL
5	-	-



**MODULE-
PARK
ASSIST C2**

CAV	CIRCUIT	FUNCTION
1	D701 20WT/LB	PARK ASSIST SENSOR NO. 8 SIGNAL
2	D703 20WT/OR	PARK ASSIST SENSOR NO. 9 SIGNAL
3	D704 20WT/DG	PARK ASSIST SENSOR NO. 10 SIGNAL
4	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
5	D710 20WT	PARK ASSIST SENSOR NO. 11 SIGNAL
6	X750 20GY/LB	PARK ASSIST SENSOR GROUND
7	-	-
8	-	-

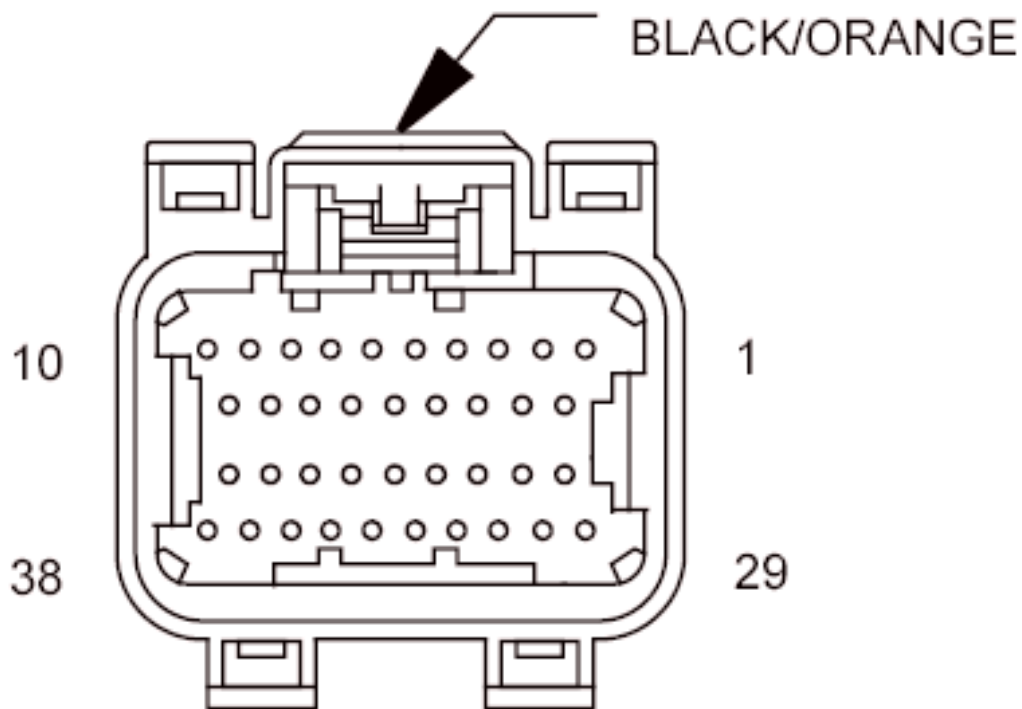
MODULE-POWERTRAIN CONTROL C1 - BLACK/BLACK 38 WAY (GAS)



MODULE- POWERTRAIN CONTROL C1 (GAS)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	Z933 16BK	GROUND
10	A209 18RD	FUSED B(+)
11	F202 20PK/GY	FUSED RUN/START RELAY OUTPUT

12	F1 18PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START)
13	-	-
14	-	-
15	-	-
16	-	-
17	-	-
18	Z933 16BK	GROUND
19	-	-
20	G6 16VT/GY	EOP SIGNAL
21	-	-
22	-	-
23	-	-
24	A803 18GY/RD	GEN SENSE
25	-	-
26	-	-
27	K857 18BR/LG	5 VOLT SUPPLY
28	-	-
29	A209 18RD	FUSED B(+)
30	-	-
31	K141 18DB/YL	O2 1/2 SIGNAL
32	K904 18DB/DG	O2 RETURN (DOWN)
33	K243 18BR	O2 2/2 SIGNAL
34	D65B 20WT/BK	CAN C BUS (+)
35	D64 20WT/LB	CAN C BUS (-)
36	-	-
37	-	-
38	F342 16BR/WT	FUSED ASD RELAY OUTPUT



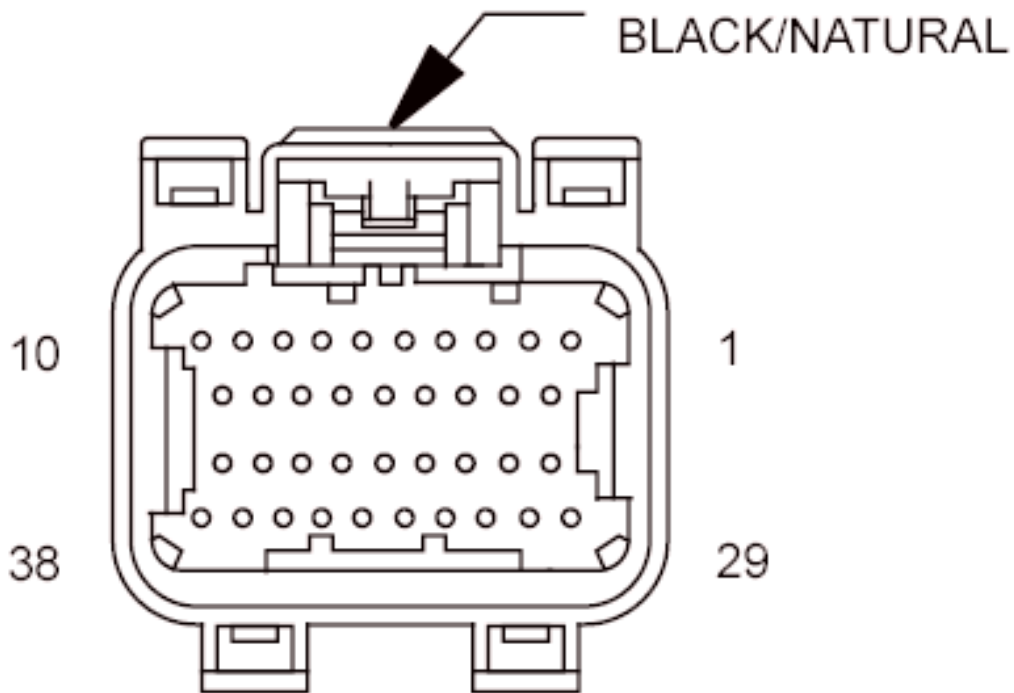
MODULE- POWERTRAIN CONTROL C2 (GAS)

CAV	CIRCUIT	FUNCTION
1	K10 16DB/OR	COIL CONTROL 6
2	K16 16DB/YL	COIL CONTROL 5
3	K15 16DB/GY	COIL CONTROL 4
4	K58 16BR/VT	INJECTOR 6 CONTROL
5	K38 16BR/OR	INJECTOR 5 CONTROL
6	K124 20DB/GY	ETC MOTOR (+)
7	K93 16DB	COIL CONTROL 3
8	K35 18DB/VT	EGR CONTROL
9	K85 16DB/YL	COIL CONTROL 2
10	K86 16YL/DB	COIL CONTROL 1
11	K14 16BR/TN	INJECTOR 4 CONTROL
12	K13 16BR/LB	INJECTOR 3 CONTROL
13	K12 16BR/DB	INJECTOR 2 CONTROL
14	K11 16BR/YL	INJECTOR 1 CONTROL
15		

	K922 20BR/DB	TP SENSOR GROUND
16	-	-
17	K199 18BR/VT	O2 2/1 HEATER CONTROL
18	K99 18BR/LG	O2 1/1 HEATER CONTROL
19	K125 16BR/DG	GEN FIELD CONTROL (3.7L)
19	K125 18BR/DG	GEN FIELD CONTROL (4.0L)
20	K2 20VT/OR	ECT SIGNAL
21	K22 20DG/OR	TP SIGNAL 1
22	K34 18DB/LG	EGR SIGNAL
23	K1 20VT/BR	MAP SIGNAL
24	K942 18BR/LG	KS RETURN 1
25	K42 18DB/YL	KS SIGNAL 1
26	-	-
27	K900 18DB/DG	SENSOR GROUND
28	K122 20DB/GY	TP SIGNAL 2
29	K855 18BR/OR	5 VOLT SUPPLY
30	K21 18DB/LG	IAT SIGNAL
31	K41 18DB/LB	O2 1/1 SIGNAL
32	K902 18BR/DG	O2 RETURN (UP)
33	K43 18DB/LG	O2 2/1 SIGNAL
34	K44 18DB/GY	CMP SIGNAL
35	K24 18BR/LB	CKP SIGNAL
36	K242 18BR/WT	KS SIGNAL 2 (3.7L)
37	K924 18WT/BR	KS RETURN 2 (3.7L)
38	K126 20DB/LG	ETC MOTOR (-)

MODULE-POWERTRAIN CONTROL C3 - BLACK/NATURAL 38 WAY (GAS)

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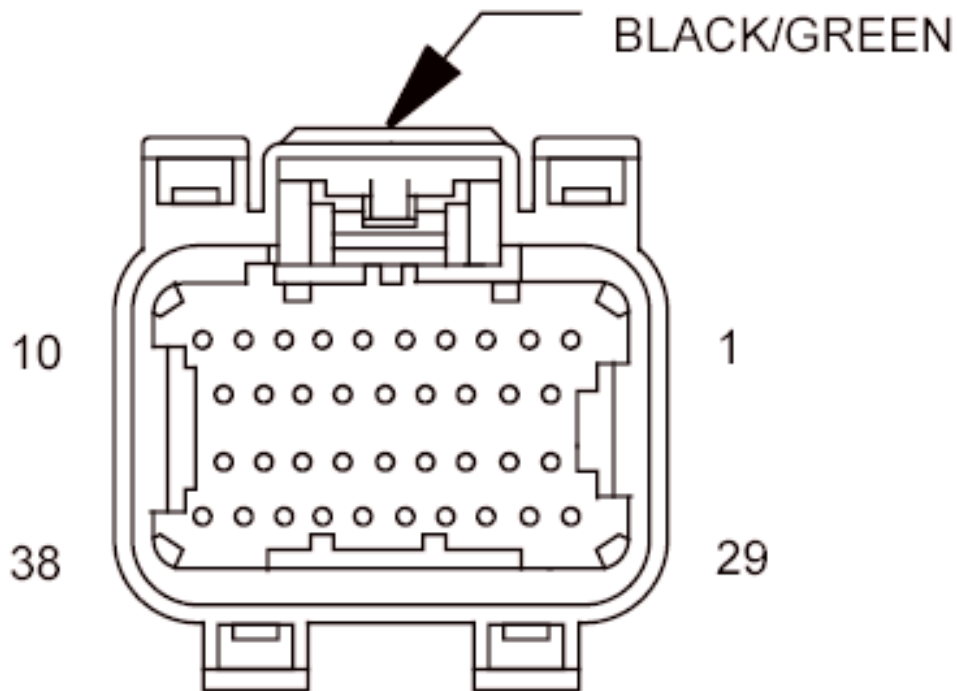


MODULE- POWERTRAIN CONTROL C3 (GAS)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	K51 18BR/WT	ASD RELAY CONTROL
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	K299 18BR/WT	O2 1/2 HEATER CONTROL
10	K399 18BR/GY	O2 2/2 HEATER CONTROL
11	C13 18LB/OR	A/C CLUTCH CONTROL (3.7L)
12	-	-
13	-	-
14	B16 18LB/DG	BRAKE SIGNAL 2 (3.7L)
15		

	V937 18VT/BR	S/C RETURN
16	K167 18BR/YL	APP SENSOR GROUND 1
17	K400 18BR/VT	APP SENSOR GROUND 2
18	V72 18OR/VT	S/C SIGNAL 2
19	F342 16BR/WT	FUSED ASD RELAY OUTPUT
20	K52 18DB/WT	EVAP PURGE CONTROL
21	T41 18YL/DB	CLUTCH INTERLOCK SIGNAL (MTX)
22	-	-
23	B15 18DG/WT	BRAKE SIGNAL 1 (3.7L)
24	-	-
25	K23 18BR/WT	APP SIGNAL 1
26	-	-
27	-	-
28	F342 16BR/WT	FUSED ASD RELAY OUTPUT
29	K70 18DB/BR	EVAP PURGE RETURN
30	-	-
31	-	-
32	-	-
33	-	-
34	V71 18VT/OR	S/C SIGNAL 1
35	K107 18VT/WT	ESM SIGNAL
36	K29 18WT/BR	APP SIGNAL 2
37	K31 18BR	FUEL PUMP CONTROL
38	T752 18DG/OR	STARTER RELAY CONTROL

MODULE-POWERTRAIN CONTROL C4 - BLACK/GREEN 38 WAY (RLE)

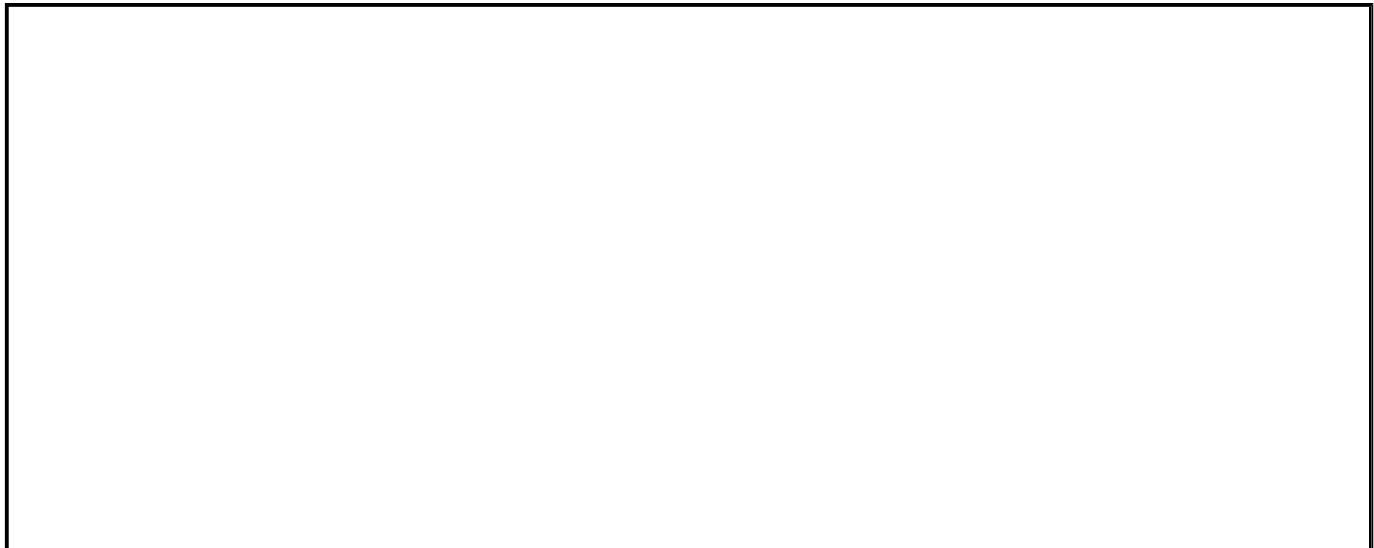


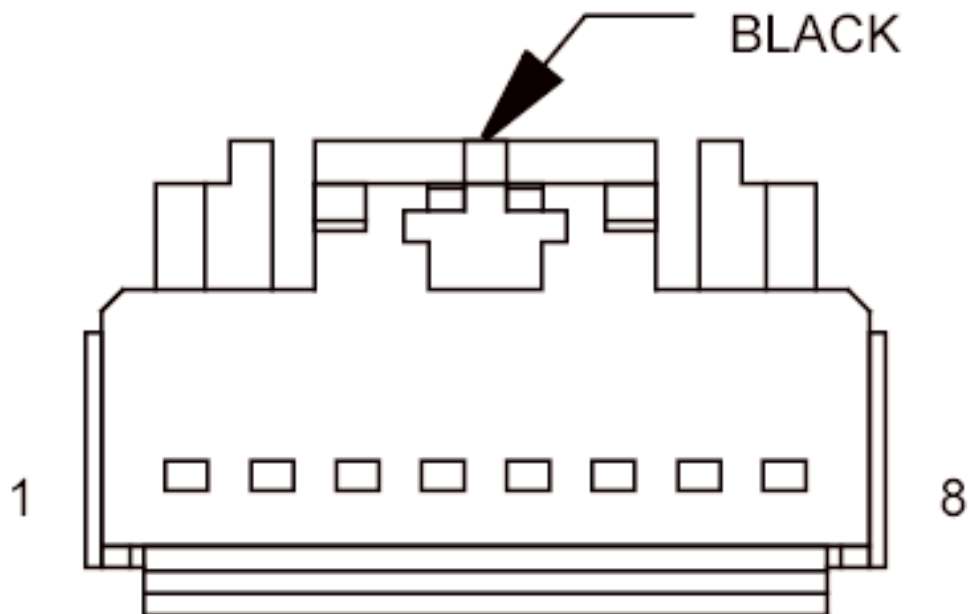
MODULE- POWERTRAIN CONTROL C4 (RLE)

CAV	CIRCUIT	FUNCTION
1	T60 18YL/GY	OD CONTROL
2	T59 18YL/LB	UD CONTROL
3	-	-
4	-	-
5	-	-
6	T19 18YL/DB	2/4 CONTROL
7	-	-
8	-	-
9	-	-
10	T20 18DG/WT	L/R CONTROL
11	T118 18DG	LP VFS CONTROL
12	-	-
13	Z933 16BK	GROUND
14	Z933 16BK	GROUND
15		

	T1 18DG/LB	TRS T1 SIGNAL
16	T3 18DG/DB	TRS T3 SIGNAL
17	-	-
18	T15 18YL/BR	TRANSMISSION CONTROL
19	-	-
20	-	-
21	-	-
22	T9 18DG/TN	OD PRESSURE SIGNAL
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT
29	T50 18YL/TN	L/R PRESSURE SIGNAL
30	T47 18YL/DG	2/4 PRESSURE SIGNAL
31	T38 18YL/BR	LINE PRESSURE SIGNAL
32	T14 18DG/BR	OUTPUT SPEED SIGNAL
33	T52 18DG/OR	INPUT SPEED SIGNAL
34	T13 18DG/VT	SENSOR GROUND
35	T54 18DG/OR	TRANSMISSION TEMPERATURE SIGNAL
36	-	-
37	T42 18DG/YL	TRS T42 SIGNAL
38	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT

MODULE-SENTRY KEY REMOTE ENTRY/WCM - BLACK 8 WAY

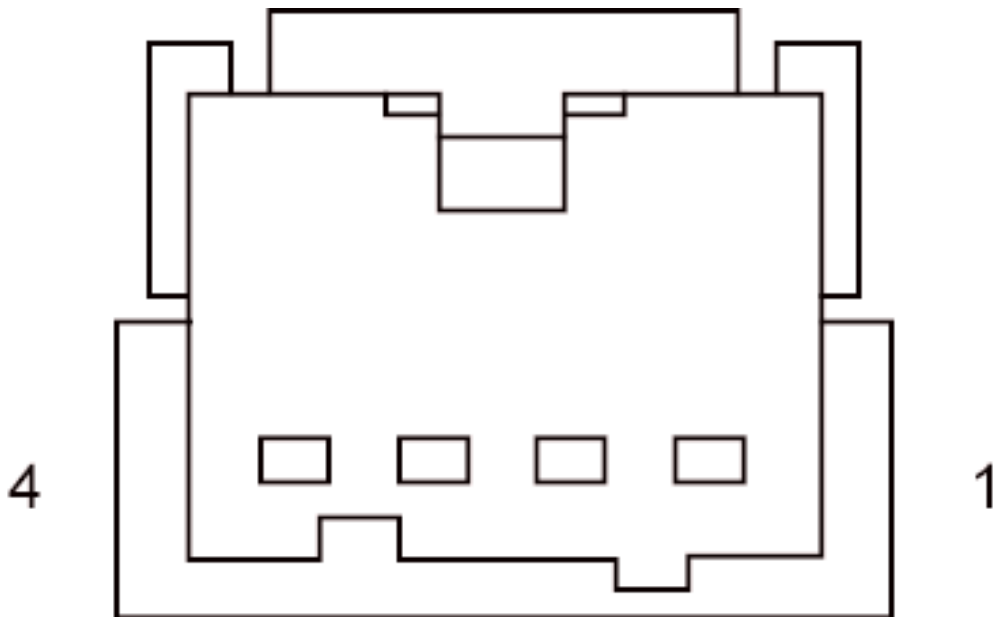




MODULE- SENTRY KEY REMOTE ENTRY/WCM

CAV	CIRCUIT	FUNCTION
1	G20 20VT/BR	IGNITION SWITCH SENSE
2	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
3	F20 20PK/WT	IGNITION SWITCH OUTPUT (RUN-START)
4	Z910 18BK	GROUND
5	A412 18RD	FUSED B(+)
6	D65B 20WT/BK	CAN C BUS (+)
7	D64 20WT/LB	CAN C BUS (-)
8	-	-

MODULE-STEERING CONTROL C1 - 4 WAY

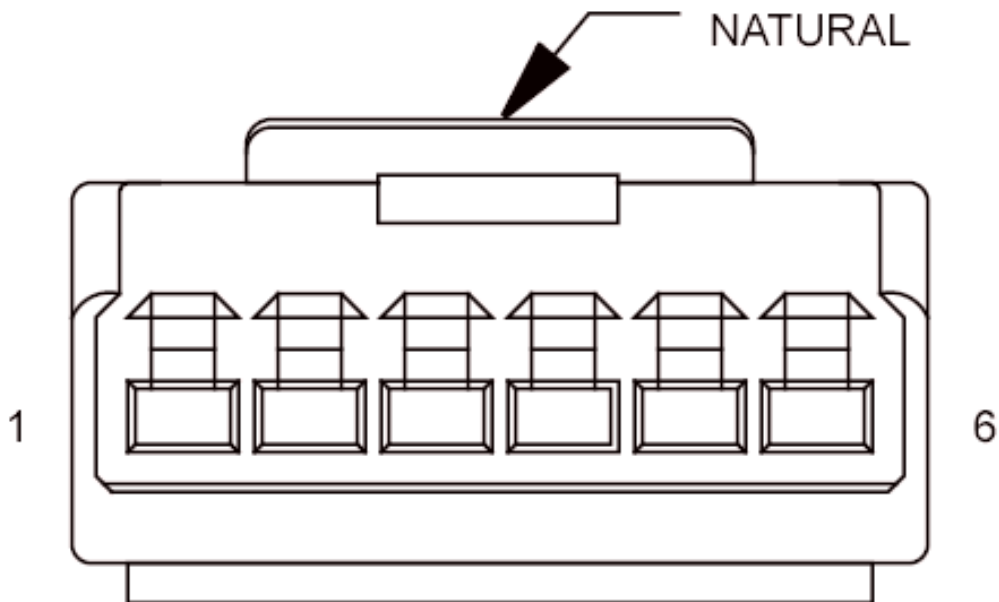


MODULE- STEERING CONTROL C1

CAV	CIRCUIT	FUNCTION
1	Z910 18BK/BR	GROUND
2	A412 18RD	FUSED B(+)
3	D506 20WT/DG	LIN BUS
4	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)

MODULE-STEERING CONTROL C2 - NATURAL 6 WAY

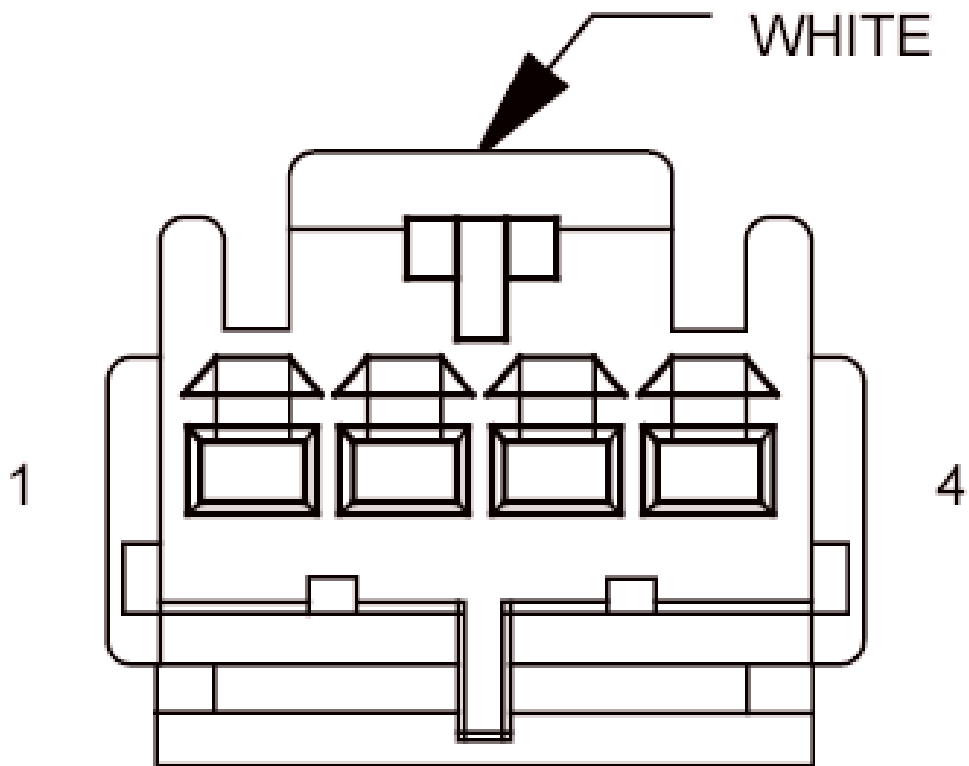
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MODULE- STEERING CONTROL C2

CAV	CIRCUIT	FUNCTION
1	Z910 18BK	GROUND (W/ TWILIGHT SENSOR)
1	X20 22GY/WT	RADIO CONTROL MUX (W/OUT TWILIGHT SENSOR)
2	D506 20WT/DG	LIN BUS (W/ TWILIGHT SENSOR)
2	Y13 20VT/YL	SIGNAL RETURN (W/OUT TWILIGHT SENSOR)
3	A909 18RD	FUSED B(+) (W/ TWILIGHT SENSOR)
3	X3 22DG/VT	HORN SWITCH SENSE (W/OUT TWILIGHT SENSOR)
4	V72 22OR/VT	S/C SIGNAL 2
5	V937 22VT/BR	S/C RETURN
6	V71 22VT/OR	S/C SIGNAL 1

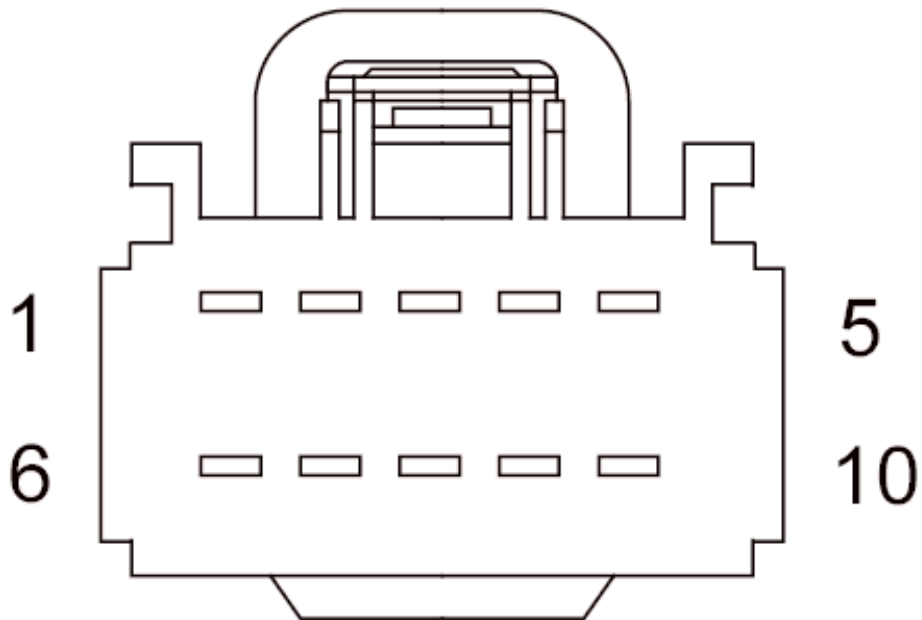
MODULE-STEERING CONTROL C4 - WHITE 4 WAY



MODULE- STEERING CONTROL C4

CAV	CIRCUIT	FUNCTION
1	R63 20LG/WT	DRIVER SQUIB 2 LINE 1
2	R61 20LG/VT	DRIVER SQUIB 2 LINE 2
3	R45 20LG/OR	DRIVER SQUIB 1 LINE 1
4	R43 20LG/BR	DRIVER SQUIB 1 LINE 2

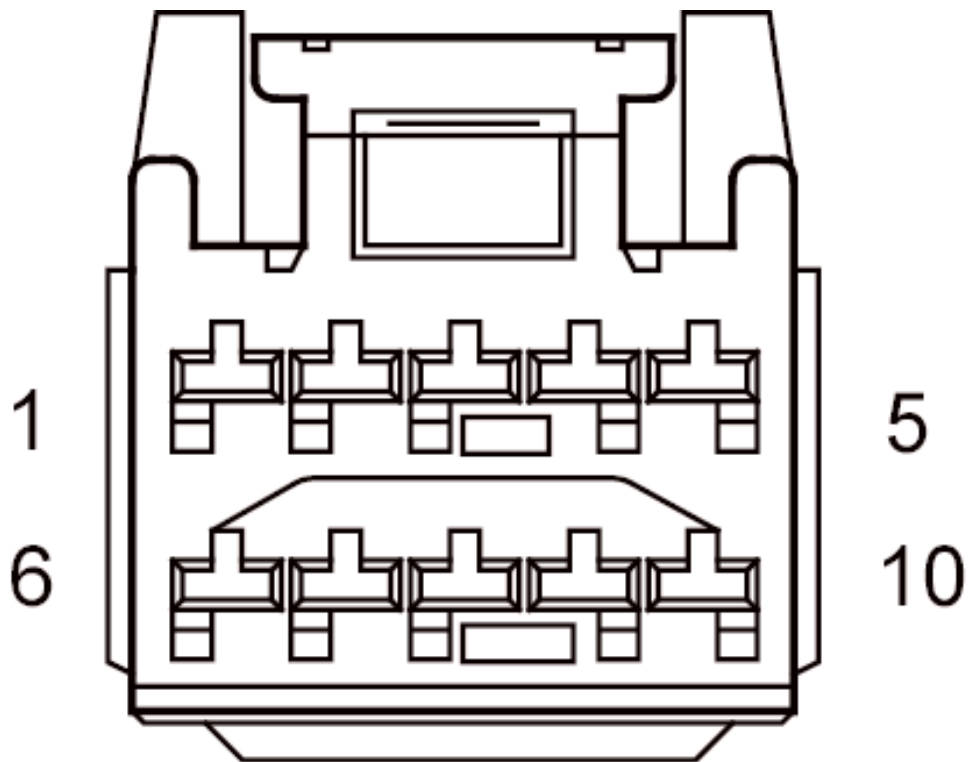
MODULE-STEERING CONTROL C5 - WHITE 6 WAY



MODULE-SUNROOF (RETRACTABLE ROOF)

CAV	CIRCUIT	FUNCTION
1	Z919 12BK	GROUND
2	Q6 20OR/LG	SUNROOF SWITCH RETURN
3	-	-
4	Q5 20OR/LB	SUNROOF CLOSE SWITCH
5	Q3 20OR/TN	SUNROOF OPEN SWITCH
6	A906 18RD	FUSED B(+)
7	-	-
8	D265 20WT/GY	CAN INTERIOR BUS (125K) (+)
9	D264 20WT/OR	CAN INTERIOR BUS (125K) (-)
10	Q7 20OR/DB	SUNROOF OPEN FORWARD SWITCH

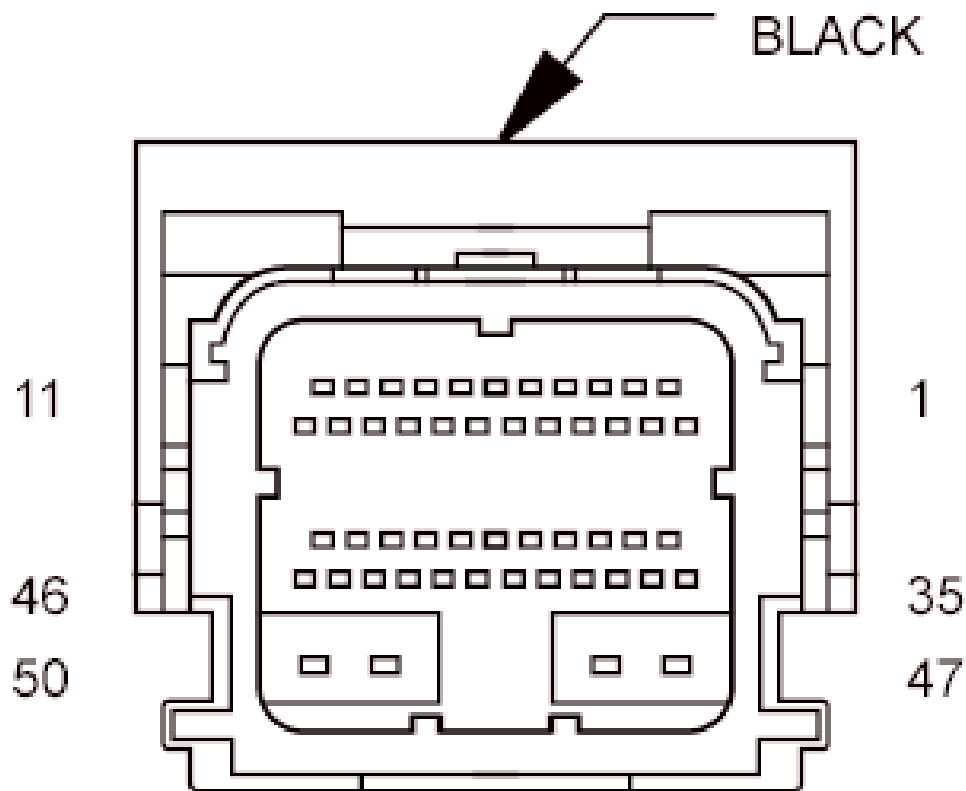
MODULE-SUNROOF - 10 WAY (SUNROOF)



MODULE- SUNROOF (SUNROOF)

CAV	CIRCUIT	FUNCTION
1	Z919 12BK	GROUND
2	Q6 20OR/LG	SUNROOF SWITCH RETURN
3	F306 18DB/PK	FUSED ACCESSORY RELAY OUTPUT
4	Q4 20OR/YL	SUNROOF VENT SWITCH SENSE
5	Q3 20OR/TN	SUNROOF OPEN SWITCH SENSE
6	A906 18RD	FUSED B(+)
7	-	-
8	-	-
9	-	-
10	Q5 20OR/LB	SUNROOF CLOSE SWITCH SENSE

MODULE-TOTALLY INTEGRATED POWER C1 - BLACK 50 WAY



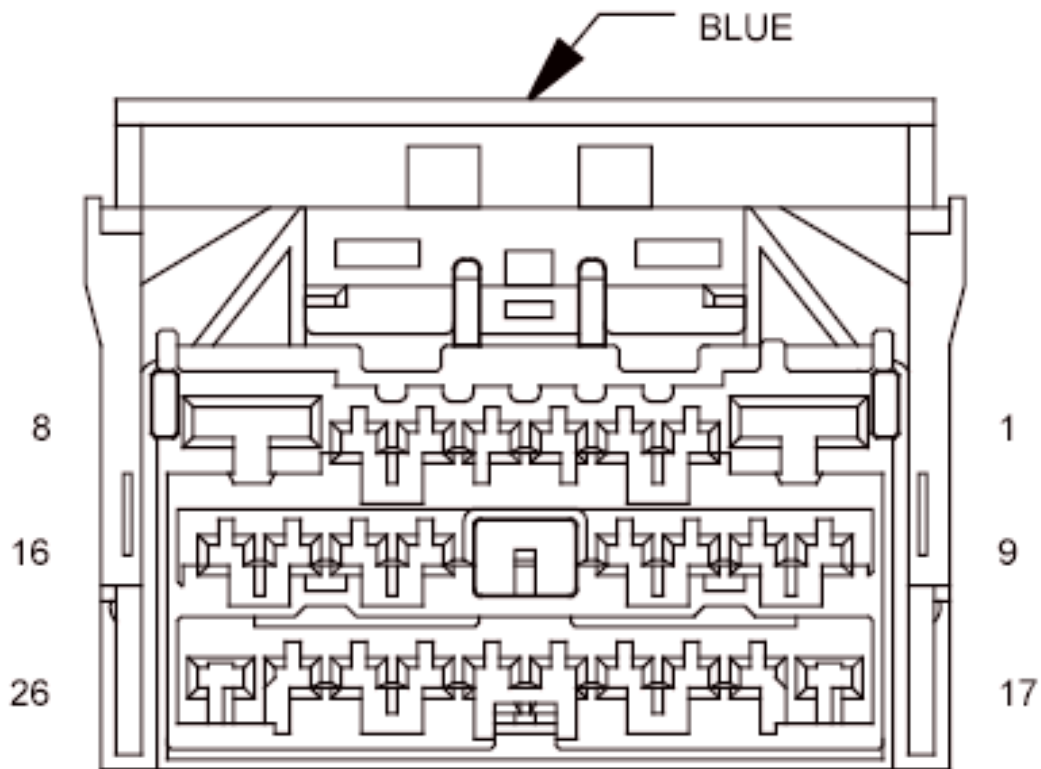
MODULE-
TOTALLY
INTEGRATED
POWER C1

CAV	CIRCUIT	FUNCTION
1	-	-
2	C18 20LB/BR	A/C PRESSURE TRANSDUCER SIGNAL
3	-	-
4	-	-
5	-	-
6	C13 18LB/OR	A/C CLUTCH CONTROL (3.7L)
6	C13 20LB/OR	A/C CLUTCH CONTROL (DIESEL)

7	T2 18DG/WT	BACKUP LAMP SWITCH SIGNAL (MTX)
8	-	-
9	-	-
10	F941 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START) (GAS)
10	T15 18YL/BR	TRANSMISSION CONTROL (RLE)
11	C818 20LB/OR	A/C PRESSURE 5 VOLT SUPPLY
12	-	-
13	-	-
14	-	-
15	D64 20WT/LB	CAN C BUS (-)
16	D65 20WT/BK	CAN C BUS (+)
16	D65 20WT/LG	CAN C BUS (+) (DIESEL)
17	C918 20BK/LB	A/C PRESSURE SENSOR GROUND
18	-	-
19	-	-
20	-	-
21	-	-
22	-	-
23	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL (DIESEL)
24	K363 18OR/BR	CABIN HEATER 3 RELAY CONTROL (DIESEL)
25	K360 18GY/BR	CABIN HEATER 1 RELAY CONTROL (DIESEL)
26	-	-
27	Z933 18BK	GROUND
27	Z905 18BK	GROUND
28	K91 18DB/YL	SENSOR GROUND (GAS)
29	-	-
30	-	-
31	-	-
32	-	-
33	-	-
34	Z903 18BK	GROUND
35	-	-
36	-	-
37	-	-

38	-	-
39	-	-
40	K31 18BR	FUEL PUMP CONTROL
40	K31 20BR	FUEL PUMP CONTROL (DIESEL)
41	-	-
42	-	-
43	-	-
44	-	-
45	-	-
46	-	-
47	-	-
48	-	-
49	F1 20PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) (DIESEL)
49	F1 18PK/WT	IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) (GAS)
50	C3 18DB/YL	A/C CLUTCH CONTROL OUTPUT

MODULE-TOTALLY INTEGRATED POWER C2 - BLUE 26 WAY

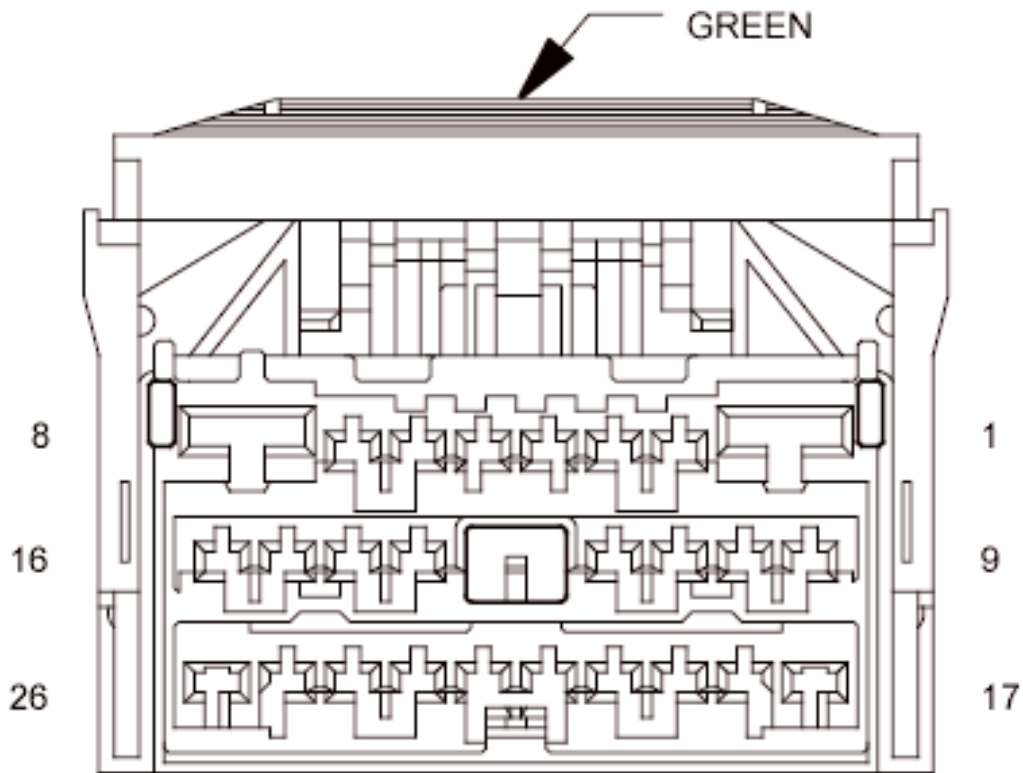


**MODULE-
TOTALLY
INTEGRATED
POWER C2**

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	F344 16BR/GY	FUSED ASD RELAY OUTPUT
4	-	-
5	-	-
6	-	-
7	F942 20PK/LG	-
8	T750 12YL/GY	STARTER RELAY OUTPUT
9	A209 18RD	FUSED B(+)
10	-	-
11	-	-
12	-	-
13	-	-
14	K51 20BR/OR	ASD RELAY CONTROL

	K51 18BR/WT	ASD RELAY CONTROL
15	-	-
16	-	-
17	Z933 14BK	GROUND (4X4)
17	Z905A 14BK	- (EXCEPT 4X4)
18	-	-
19	-	-
20	-	-
21	-	-
22	F202 20PK/GY	FUSED RUN/START RELAY OUTPUT
23	-	-
24	T752 18DG/OR	STARTER RELAY CONTROL
25	-	-
26	T16 14YL/OR	TRANSMISSION CONTROL OUTPUT

MODULE-TOTALLY INTEGRATED POWER C3 - GREEN 26 WAY

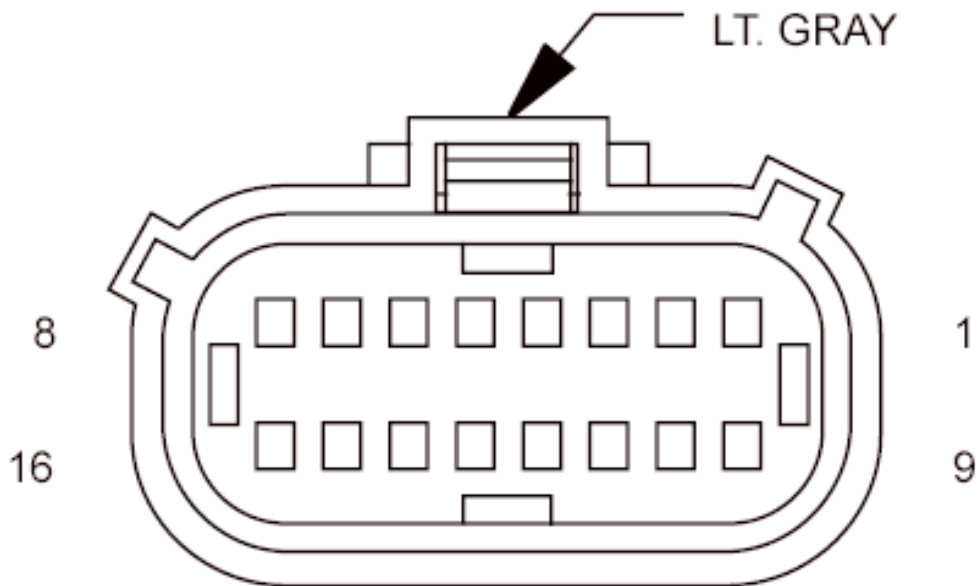


**MODULE-
TOTALLY
INTEGRATED
POWER C3**

CAV	CIRCUIT	FUNCTION
1	A16 10RD/BR	FUSED B(+)
2	K175 18BR/LB	HIGH SPEED RAD FAN RELAY CONTROL
3	L43 18WT/DB	LEFT LOW BEAM DRIVER
4	-	-
5	-	-
6	L910 18BK/TN	RIGHT HEADLAMP RETURN SIGNAL
7	-	-
8	N23 10DB/DG	LOW SPEED RAD FAN CONTROL (PWM)
9	-	-
10	L33 18WT/LG	LEFT HIGH BEAM DRIVER
11	L44 18WT/TN	RIGHT LOW BEAM DRIVER

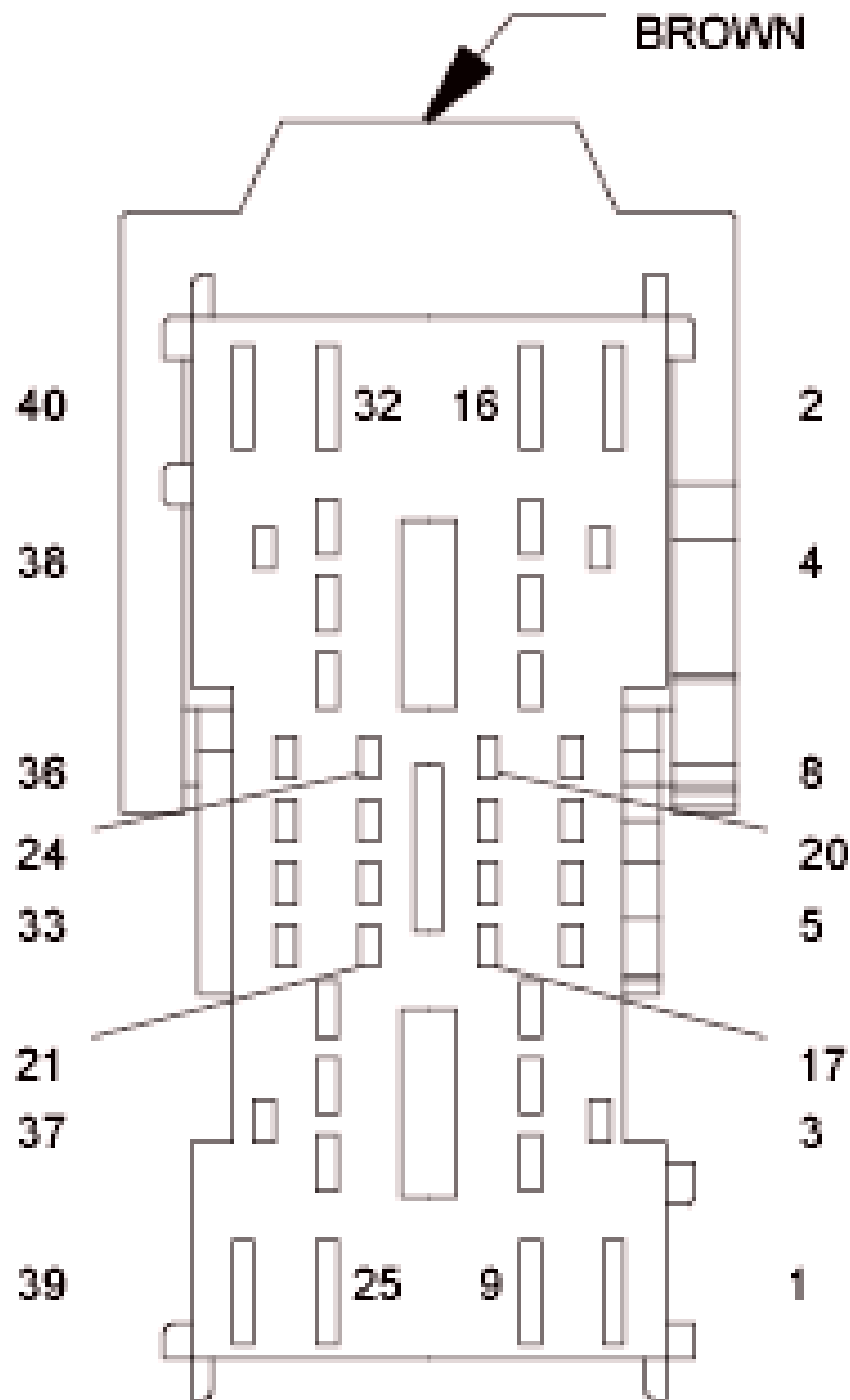
12	L60 18WT/TN	RIGHT FRONT PARK SIGNAL CONTROL
13	L911 18BK/LG	LEFT HEADLAMP RETURN SIGNAL
14	-	-
15	-	-
16	-	-
17	-	-
18	X21 18GY/YL	FUSED HORN CONTROL OUTPUT
19	L34 18WT/GY	RIGHT HIGH BEAM DRIVER
20	L61 18WT/LG	LEFT FRONT PARK SIGNAL CONTROL
21	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
22	W24 18BR/OR	FUSED RUN RELAY OUTPUT
23	-	-
24	X22 18GY/LB	FUSED HORN CONTROL OUTPUT
25	W10 16BR	FRONT WASHER PUMP MOTOR CONTROL
26	-	-

MODULE-TOTALLY INTEGRATED POWER C4 - LT. GRAY 16 WAY



**MODULE-
TOTALLY
INTEGRATED
POWER C4**

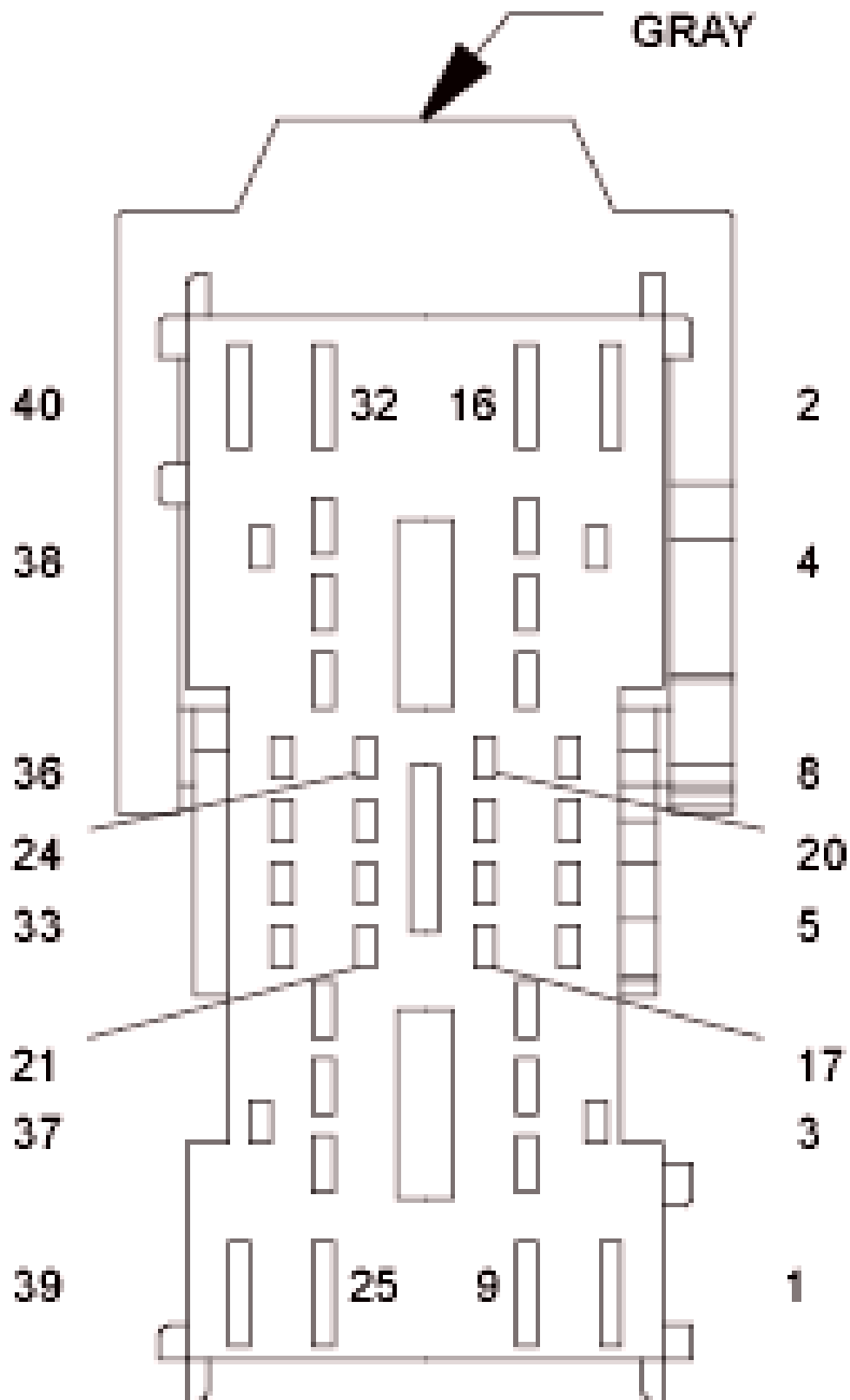
CAV	CIRCUIT	FUNCTION
1	-	-
2	L162 18WT/BR	RIGHT SIDE REPEATER LAMP CONTROL OUTPUT (EXPORT)
3	G70 18VT/LB	HOOD AJAR SWITCH SENSE
4	-	-
5	-	-
6	L163 18WT/VT	LEFT SIDE REPEATER LAMP CONTROL OUTPUT (EXPORT)
7	L160 18WT/TN	RIGHT FRONT TURN SIGNAL CONTROL
8	-	-
9	L161 18WT/LG	LEFT FRONT TURN SIGNAL CONTROL
10	-	-
11	L90 18WT/OR	RIGHT FRONT FOG LAMP CONTROL
12	L13 18WT/YL	HEADLAMP ADJUST SIGNAL



CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	A901 18RD	FUSED B(+)
4	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
5	P940 18TN/BR	PASSENGER DOOR UNLOCK DRIVER
6	A855 20DG/RD	FUSED B(+) (BASE)
6	A855 18DG/RD	FUSED B(+) (EXCEPT BASE)
7	P34 18TN/LB	RIGHT REAR DOOR UNLOCK DRIVER
8	L17 18WT/LG	LEFT REAR PARK LAMP CONTROL OUTPUT
9	F342 16BR/WT	FUSED ASD RELAY OUTPUT
10	N1 16DB/OR	FUSED FUEL PUMP OUTPUT
11	W4 14BR/OR	FRONT WIPER HIGH/LOW RELAY HIGH SPEED OUTPUT
12	W3 14BR/WT	FRONT WIPER HIGH/LOW RELAY LOW SPEED OUTPUT
13	A115 14RD	FUSED B(+)
14	Z907 14BK/PK	GROUND
15	L1 18WT/LG	BACKUP LAMP RELAY OUTPUT
16	A107 12TN/RD	FUSED B(+) (PUMP)
17	P306 16LG/LB	LIFTGATE UNLOCK DRIVER
18	P5 18TN/OR	LEFT REAR DOOR UNLOCK DRIVER
19	C110 20DB/LB	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
20	-	-
21	-	-
22	A408 18WT/RD	FUSED B(+)
23	A413 18RD	FUSED B(+) (I.O.D.)
24	-	-
25	-	-
26	-	-
27	W13 16BR/LG	FUSED REAR WIPER MOTOR CONTROL OUTPUT
28	Z903 14BK	GROUND
29	A116 14YL/RD	FUSED B(+) (I.O.D.) (AMPLIFIER)
30	A417 18RD	FUSED B(+) (EXCEPT

		EXPORT)
30	A417 20RD	FUSED B(+) (EXPORT)
31	A111 14DG/RD	FUSED B(+) (VALVE)
32	C15 12DB/WT	FUSED REAR WINDOW DEFOGGER RELAY OUTPUT
33	A414 18RD	FUSED B(+) (I.O.D.)
34	-	-
35	A416 18RD	FUSED B(+) (I.O.D.)
36	L217 18WT/VT	RIGHT REAR PARK LAMP CONTROL OUTPUT
37	-	-
38	F941 20PK/LG	FUSED RUN/START RELAY OUTPUT
39	-	-
40	A959 14RD	FUSED B(+) (RHD)

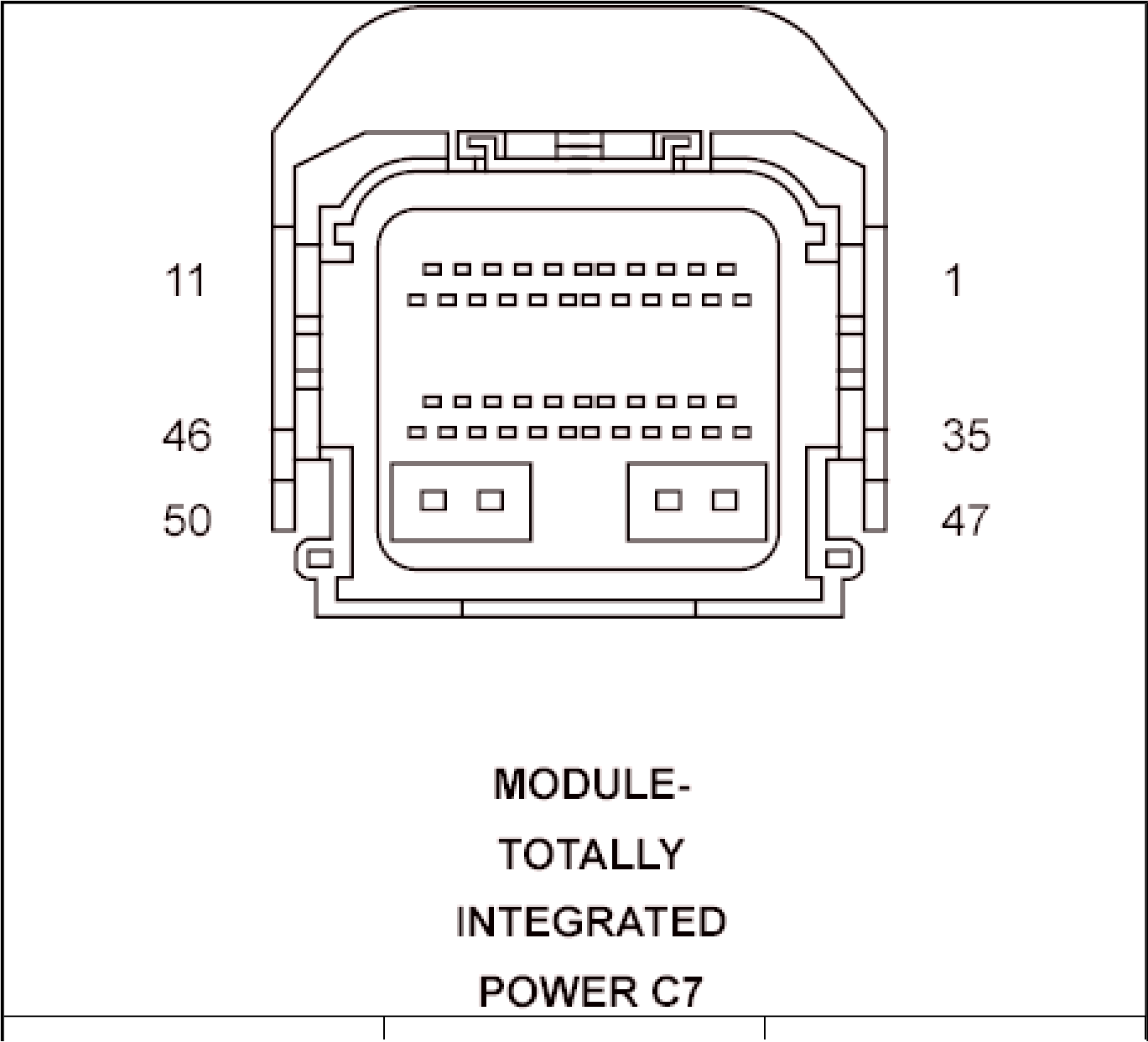
MODULE-TOTALLY INTEGRATED POWER C6 - GRAY 40 WAY



CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	P910 18TN/LG	DRIVER DOOR UNLOCK DRIVER
4	P920 18LG/GY	PASSENGER DOOR LOCK DRIVER
5	A412 18RD	FUSED B(+)
6	P304 16LG/DB	LIFTGATE LOCK DRIVER
7	F201 20PK/OR	FUSED RUN/START RELAY OUTPUT
8	P930 18TN/WT	DRIVER DOOR LOCK DRIVER
9	-	-
10	-	-
11	C7 10DB	BLOWER MOTOR SUPPLY
12	F307 18LB/PK	FUSED ACCESSORY RELAY OUTPUT
13	-	-
14	P693 16LG/WT	HEATED SEAT MODULE SUPPLY
15	A906 12RD	FUSED B(+) (LHD)
15	A906 16RD	FUSED B(+) (RHD)
16	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT
17	F71 16PK/TN	TRAILER TOW IGNITION FEED
18	P32 18TN/VT	LEFT REAR DOOR LOCK DRIVER
19	F921 20PK/YL	FUSED RUN RELAY OUTPUT
20	P38 18TN/DB	RIGHT REAR DOOR LOCK DRIVER
21	A106 20LB/RD	FUSED B(+)
22	-	-
23	-	-
24	-	-
25	-	-
26	F306 16DB/PK	FUSED ACCESSORY RELAY OUTPUT
27	A904 14RD	FUSED B(+)
28	-	-
29	A909 18RD	FUSED B(+)
30	A206 18RD	TRAILER TOW BRAKE B(+)
31	A108 18LG/RD	FUSED B(+)

32	A907 12RD	FUSED B(+)
33	A27 20RD/LB	FUSED B(+) (EXCEPT EXPORT)
34	-	-
35	-	-
36	-	-
37	-	-
38	F100 20PK/VT	FUSED RUN RELAY OUTPUT
39	A215 14RD/LG	FUSED B(+)
40	A214 14RD/LB	FUSED B(+)

MODULE-TOTALLY INTEGRATED POWER C7 - 50 WAY

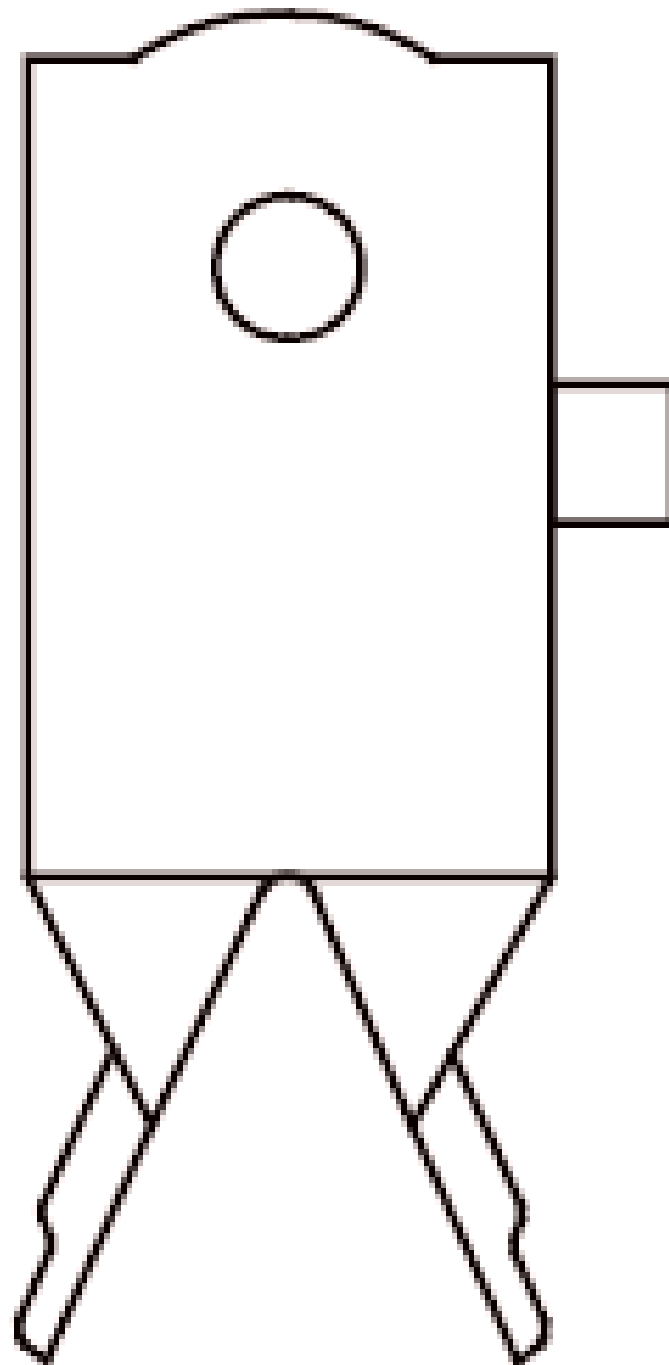


CAV	CIRCUIT	FUNCTION
1	B20 20DG/OR	BRAKE FLUID LEVEL SIGNAL
2	G161 20VT/DG	DRIVER DOOR LOCK SWITCH MUX (BASE)
3	G160 20VT/LG	PASSENGER DOOR LOCK SWITCH MUX (BASE)
4	-	-
5	Q80 20OR/VT	FLIP-UP GLASS SWITCH SENSE
6	L899 18WT/OR	REAR FOG LAMP SIGNAL CONTROL
7	N4 18DB/WT	FUEL LEVEL SIGNAL
8	W7 20BR/GY	FRONT WIPER PARK SWITCH SENSE
9	L91 18WT/DB	HAZARD SWITCH SENSE
10	L51 18WT/DG	BRAKE LAMP SWITCH OUTPUT (EXCEPT LHD REAR SEAT VIDEO)
10	L51 18WT/TN	BRAKE LAMP SWITCH OUTPUT (LHD REAR SEAT VIDEO)
11	G75 20VT	DRIVER DOOR AJAR SWITCH SENSE
12	G74 20VT/WT	PASSENGER DOOR AJAR SWITCH SENSE
13	-	-
14	G76 20VT/YL	RIGHT REAR DOOR AJAR SWITCH SENSE
15	G78 20VT/OR	LIFTGATE AJAR SWITCH SENSE
16	G77 20VT/GY	LEFT REAR DOOR AJAR SWITCH SENSE
17	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE
18	-	-
19	-	-
20	R57 20LG/GY	DRIVER SEAT BELT SWITCH SENSE
21	-	-
22	-	-
23	-	-
24	D72 20WT/LB	DIAGNOSTIC CAN C (+)
25	D71 20WT/DB	DIAGNOSTIC CAN C (-)

26	D265 20WT/GY	CAN INTERIOR BUS (+)
27	D264 20WT/OR	CAN INTERIOR BUS (-)
28	-	-
29	-	-
30	F20 20PK/WT	IGNITION SWITCH OUTPUT (RUN-START)
31	-	-
32	-	-
33	-	-
34	P37 20LG/TN	DOOR LOCK SWITCH RETURN
35	-	-
36	-	-
37	-	-
38	P391 18LG/DB	SECONDARY DOOR UNLOCK RELAY CONTROL (RHD)
39	-	-
40	P805 18LG/LB	INVERTOR CONTROL OUTPUT
41	P390 18LG/LB	SECONDARY DOOR LOCK RELAY CONTROL (RHD)
42	Q81 20OR/GY	FLIP-UP GLASS RELAY OUTPUT
43	-	-
44	L655 18WT/OR	LEFT TRAILER TOW RELAY CONTROL
45	L656 18WT/DG	RIGHT TRAILER TOW RELAY CONTROL
46	-	-
47	L53 18DG/WT	LEFT REAR STOP SIGNAL CONTROL
48	L54 18WT/LG	RIGHT REAR STOP SIGNAL CONTROL
49	L63 18WT/DG	LEFT REAR STOP/TURN SIGNAL CONTROL
49	L63 18DG/WT	LEFT REAR STOP/TURN SIGNAL CONTROL (BASE AUDIO)
50	L62 18WT/OR	RIGHT REAR STOP/TURN SIGNAL CONTROL

MODULE-TOTALLY INTEGRATED POWER C8 - 1 WAY

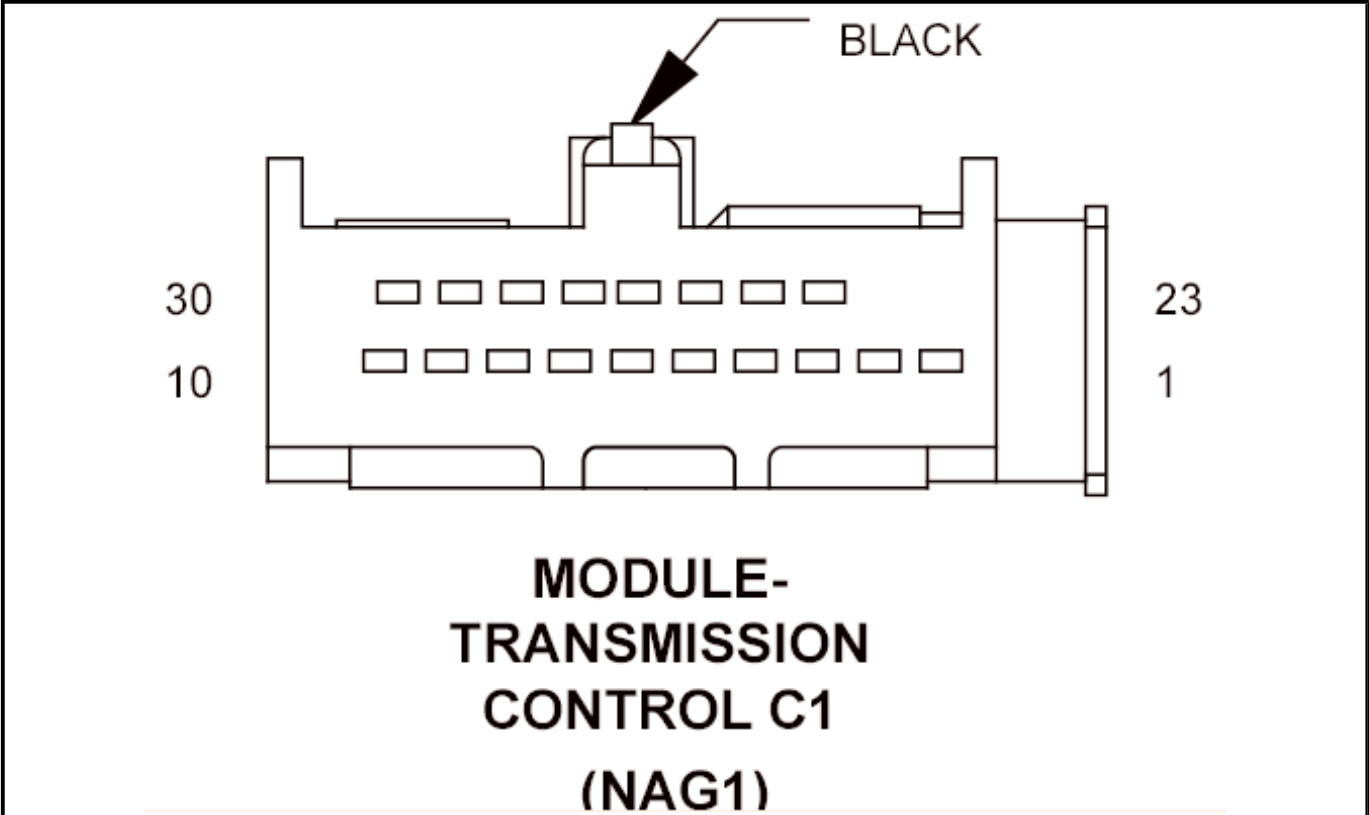
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MODULE-

CAV	CIRCUIT	FUNCTION
1	A0 4RD	B(+) (4.0L)
1	A0 6RD	B(+) (EXCEPT 4.0L)

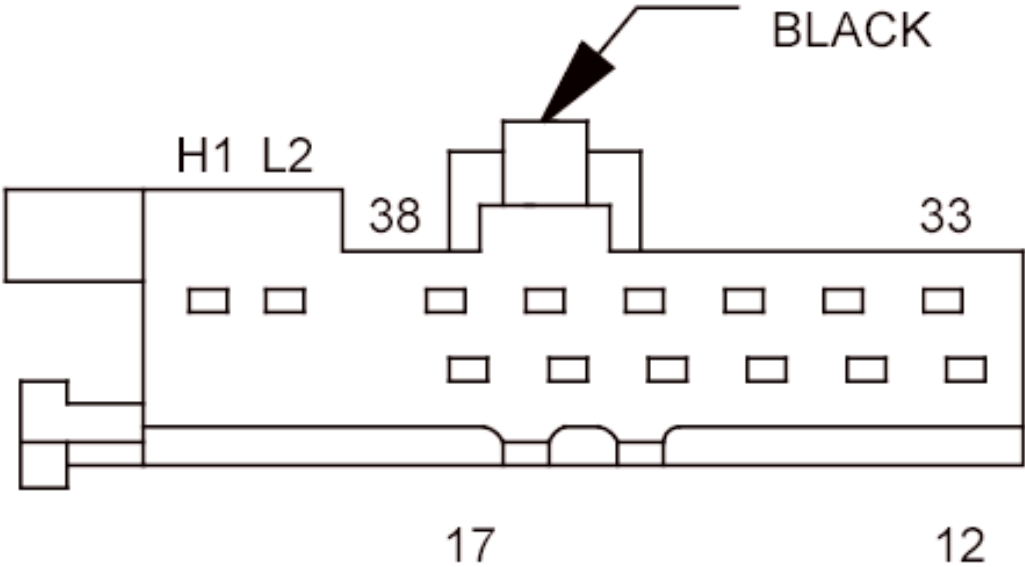
MODULE-TRANSMISSION CONTROL C1 - BLACK 18 WAY (NAG1)



CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
15	-	-
16	-	-

17	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT
18	Z910 14BK	GROUND

MODULE-TRANSMISSION CONTROL C2 - BLACK 12 WAY (NAG1)

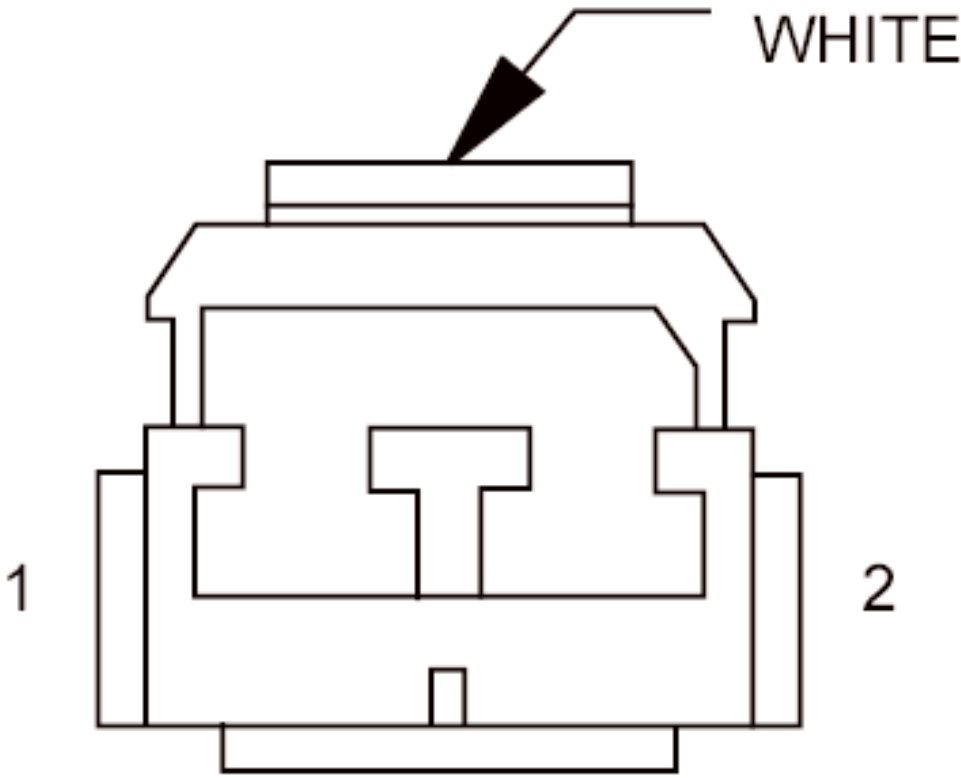


**MODULE-
TRANSMISSION
CONTROL C2
(NAG1)**

CAV	CIRCUIT	FUNCTION
12	T70 18YL	INPUT SPEED 1 (N2) SIGNAL
13	T72 18YL/DB	SENSOR SUPPLY VOLTAGE
14	T60 18YL/GY	1-2/4-5 CONTROL
15	T73 18YL/GY	3-4 CONTROL
16	T74 18YL/LG	2-3 CONTROL
17	T75 18YL/LB	TCC CONTROL
33	T13 18DG/VT	SENSOR GROUND
34	T54 18VT	TRANSMISSION TEMPERATURE SIGNAL
35	T71 18YL/OR	INPUT SPEED 2 (N3) SIGNAL
36	T76 18YL/TN	MODULATION PRESSURE CONTROL
37	T77 18YL/BR	SHIFT PRESSURE CONTROL

38	T78 18YL	SOLENOID SUPPLY VOLTAGE
H1	D65 20WT/BK	CAN C BUS(+)
L2	D64 20WT/LB	CAN C BUS(-) (LHD)
L2	D64 20WT/LG	CAN C BUS(-) (RHD)

MODULE-UGDO - 2 WAY



WHITE

1

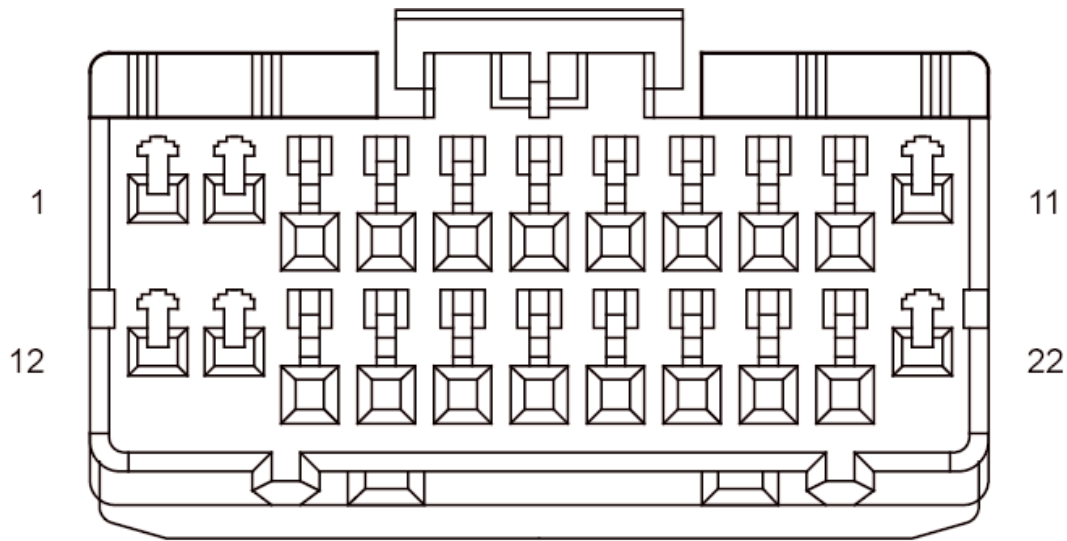
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MODULE-UGDO

CAV	CIRCUIT	FUNCTION
1	A414 18RD	FUSED B(+)
2	G38 18GY	UGDO ENABLE CONTROL CIRCUIT

MONITOR-DVD C1 - 22 WAY

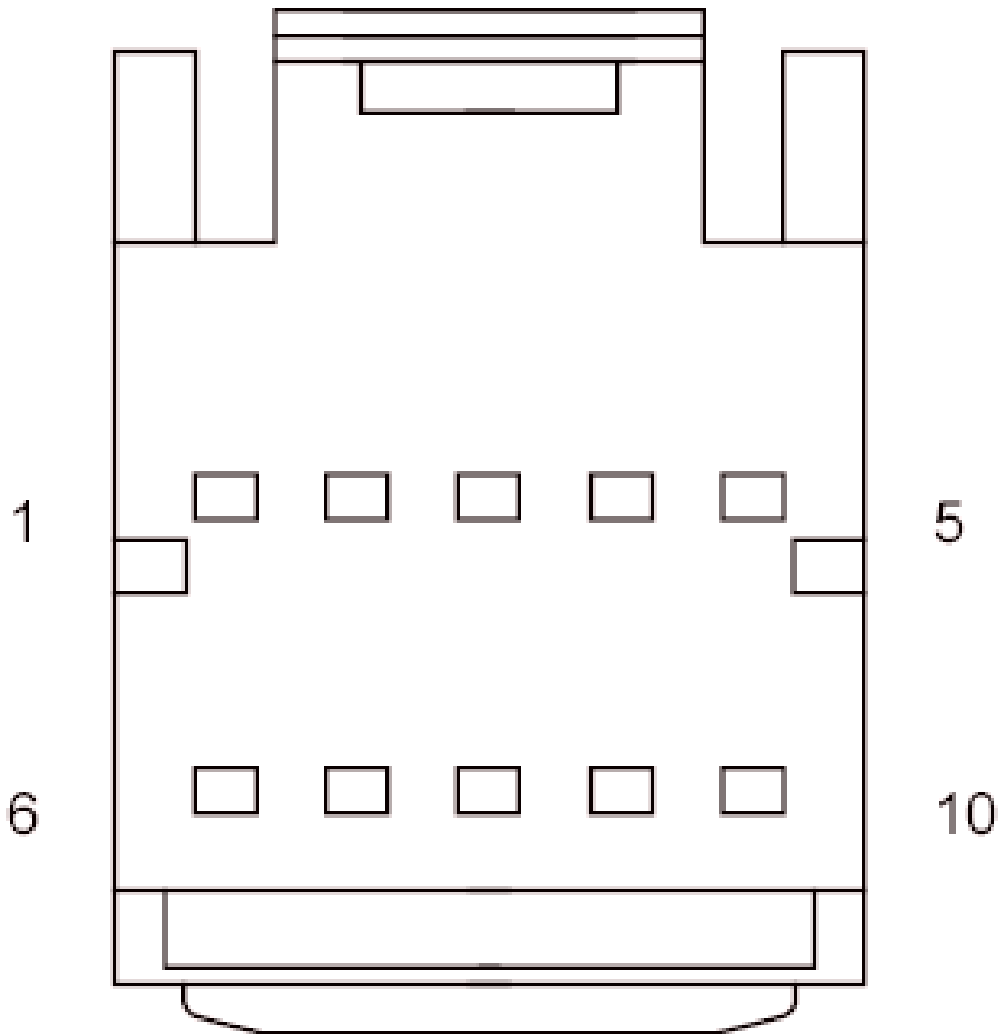
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MONITOR-DVD C1

CAV	CIRCUIT	FUNCTION
1	A116 14YL/RD	FUSED B(+) (I.O.D.)
2	X540 18GY/VT	AUDIO RETURN 1
3	X545 18DG/LB	AUDIO LEFT 2
4	X544 18DG/DB	AUDIO RIGHT 2
5	D265 20WT/GY	CAN INTERIOR BUS (+)
6	D264 20WT/OR	CAN INTERIOR BUS (-)
7	X536 18BK/BK	VDO-VIDEO SHIELD 1
8	X551 18DG/VT	AUDIO LEFT 3
9	X550 18DG/YL	AUDIO RIGHT 3
10	X542 18GY/YL	VIDEO COMMON 2
11	X541 18GY/LB	VIDEO SIGNAL 2
12	X539 18DG/TN	AUDIO LEFT 1
13	X538 18DG/WT	AUDIO RIGHT 1
14	X546 18GY/OR	AUDIO RETURN 2
15	-	-
16	-	-
17	-	-
18	X534 18GY/BR	VIDEO SIGNAL 1
19	X535 18GY/YL	VIDEO COMMON 1
20	X552 18GY/LB	AUDIO RETURN 3
21	X543 18BK/BK	VIDEO SHIELD 2
22	Z919 18BK/DB	GROUND

MONITOR-DVD C4 - 10 WAY

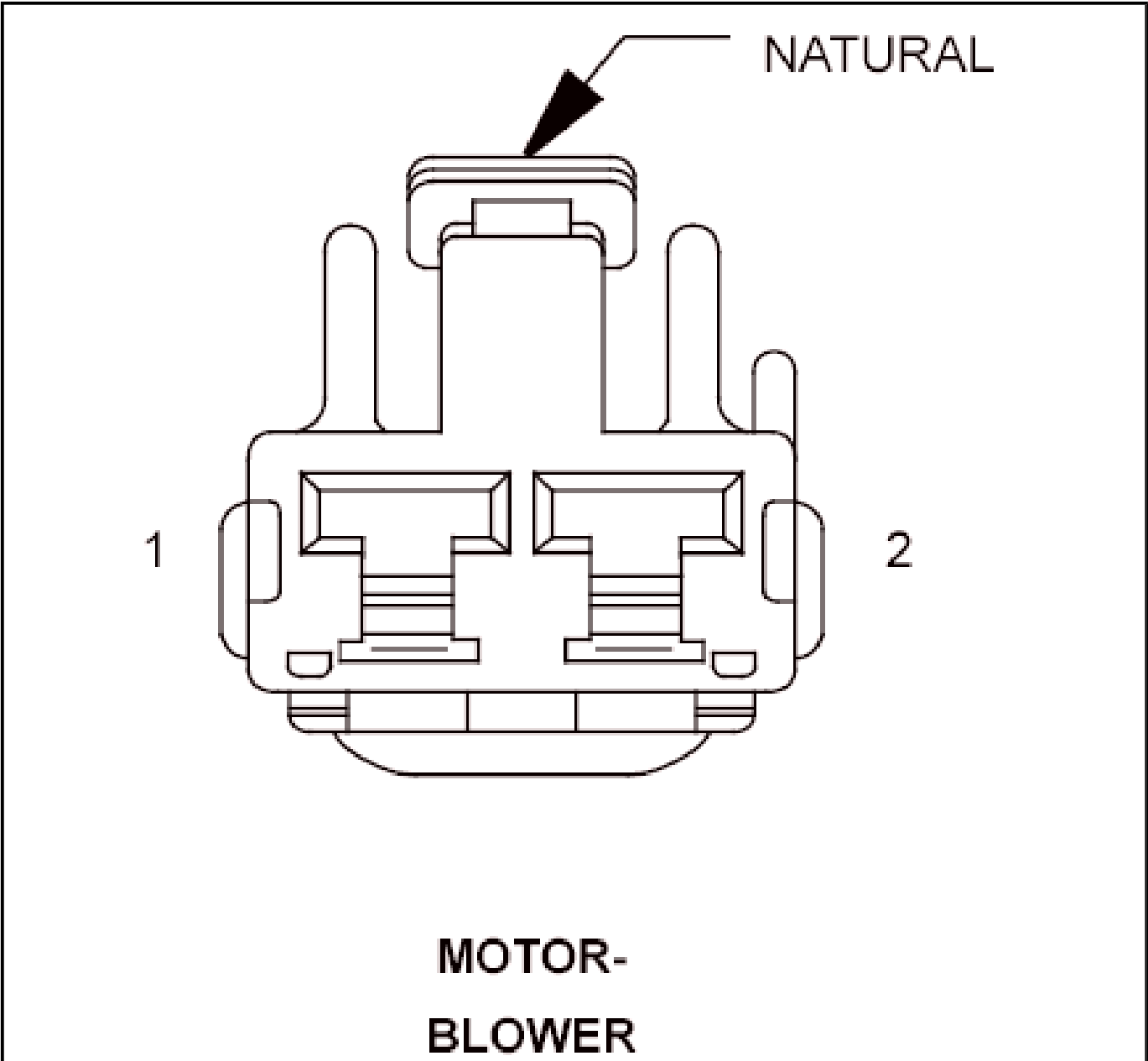


MONITOR-DVD C4

CAV	CIRCUIT	FUNCTION
1	X521 20GY/LB	AUX AUDIO LEFT SIGNAL NO. 2
2	X533 20DG/OR	AUX VIDEO SHIELD NO. 2
3	X531 20GY/LB	AUX VIDEO SIGNAL NO. 2
4	-	-
5	-	-
6	X519 20DG/VT	AUX AUDIO COMMON NO. 2
7	X522 20GY/DB	AUX AUDIO RIGHT SIGNAL NO. 2

8	X532 20BK	AUX VIDEO COMMON NO. 2
9	-	-
10	-	-

MOTOR-BLOWER - NATURAL 2 WAY FEMALE



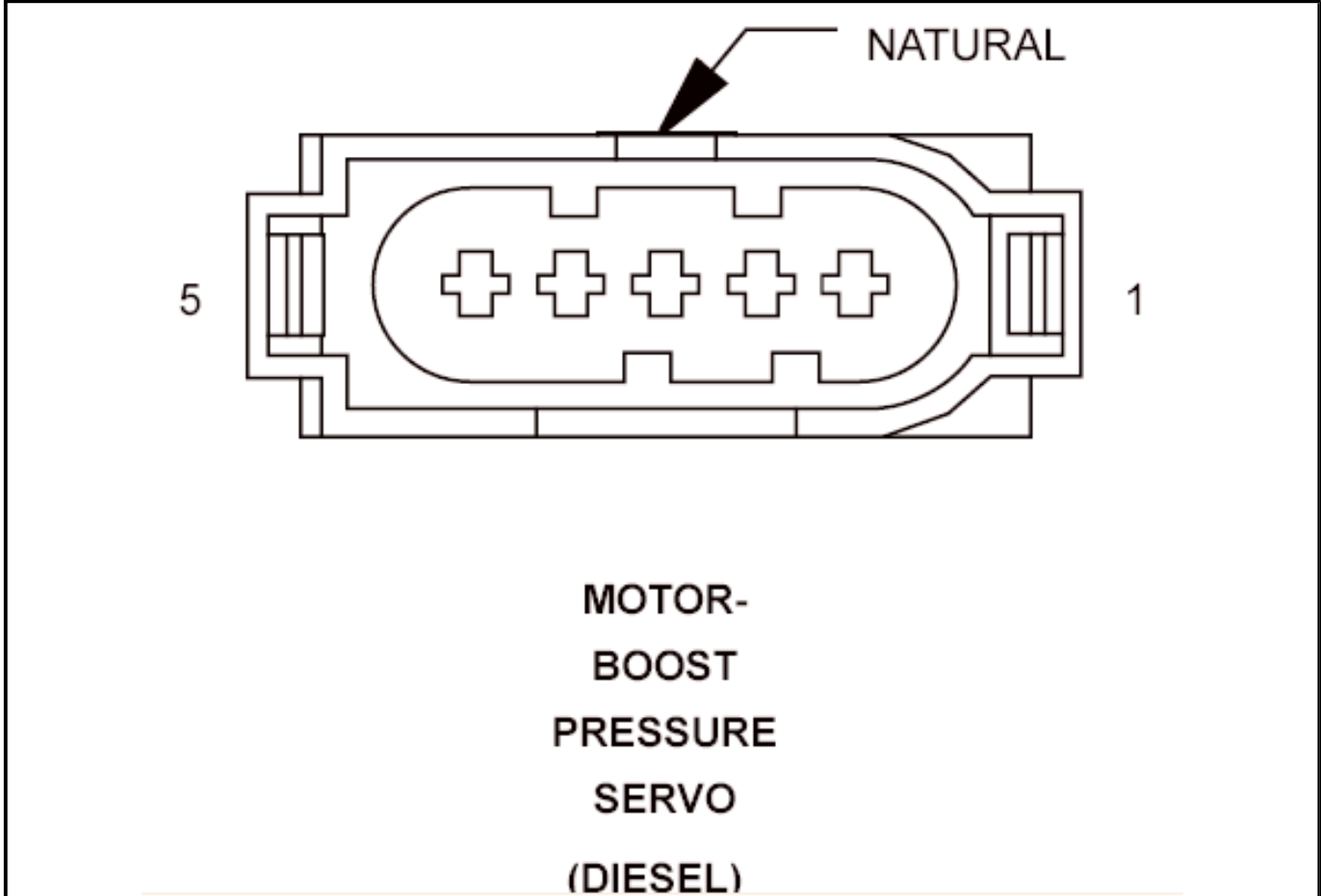
**MOTOR-
BLOWER**

CAV	CIRCUIT	FUNCTION
1	C806 10DB/BR	(W/ TWILIGHT SENSOR)
1	C75 12DB/GY	BLOWER MOTOR HIGH DRIVER (W/OUT TWILIGHT SENSOR)
2	C7 10DB	BLOWER MOTOR SUPPLY

NATURAL

5 1

MOTOR-
BOOST
PRESSURE
SERVO
(DIESEL)



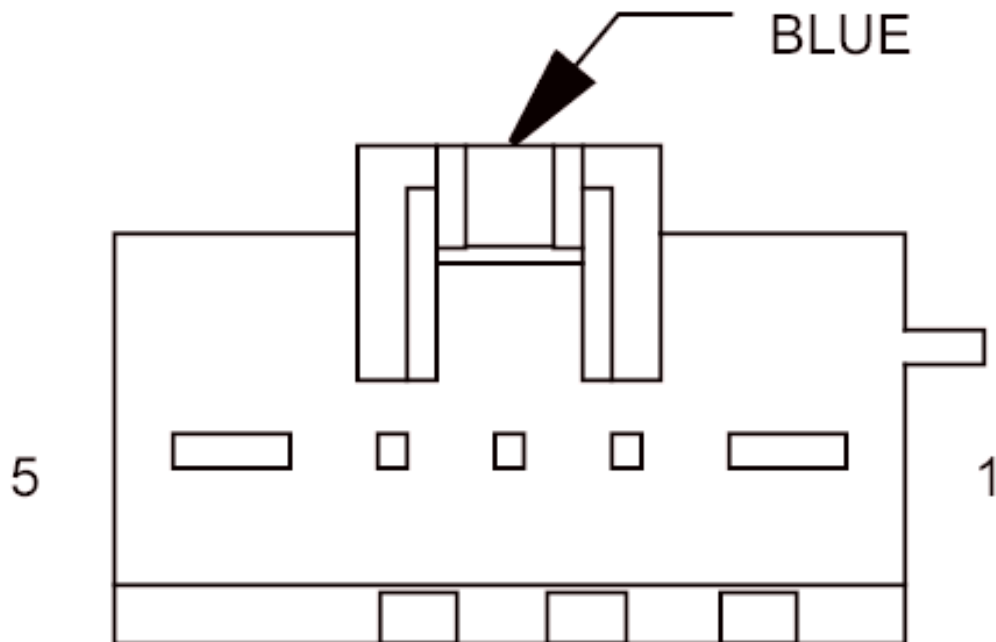
NATURAL

5 1

MOTOR-
BOOST
PRESSURE
SERVO
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	F344 16BR/GY	FUSED ASD RELAY OUTPUT
2	Z904 18BK	GROUND
3	-	-
4	K137 20DB/OR	BOOST PRESSURE CONTROL
5	-	-

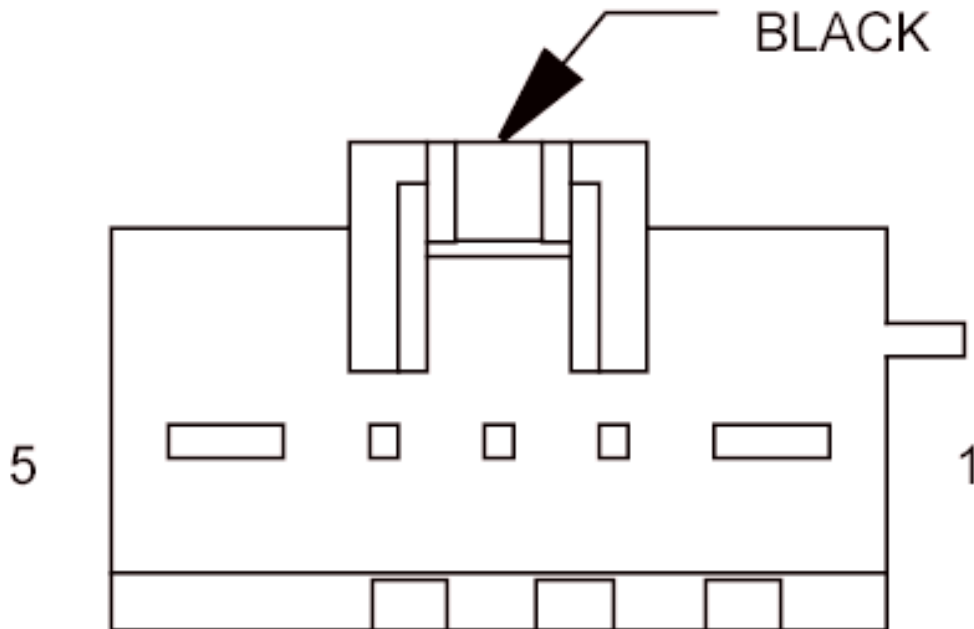
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MOTOR- SEAT ADJUSTER- DRIVER HORIZONTAL

CAV	CIRCUIT	FUNCTION
1	P15 14LG/WT	DRIVER SEAT HORIZONTAL FORWARD DRIVER EXCEPT MEMORY
1	P115 18LG	DRIVER SEAT HORIZONTAL FORWARD DRIVER MEMORY
2	G491 22VT/GY	DRIVER SEAT HORIZONTAL SENSOR GROUND MEMORY
3	-	-
4	G401 22VT/LG	DRIVER SEAT HORIZONTAL POSITION SENSE MEMORY
5	P17 14LG/DG	DRIVER SEAT HORIZONTAL REARWARD DRIVER EXCEPT MEMORY
5	P117 18LG/LB	DRIVER SEAT HORIZONTAL REARWARD DRIVER MEMORY

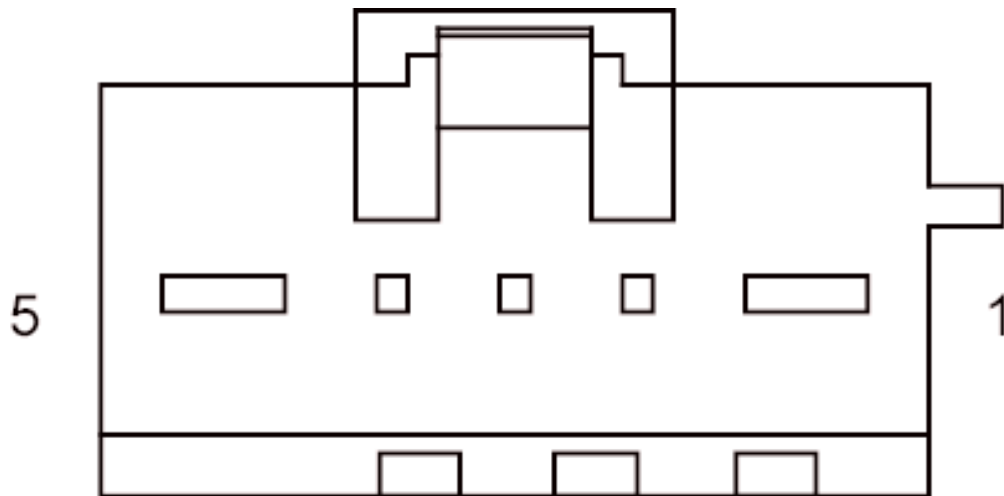
MOTOR-SEAT ADJUSTER-FRONT DRIVER VERTICAL - BLACK 5 WAY FEMALE



MOTOR- SEAT ADJUSTER- FRONT DRIVER VERTICAL

CAV	CIRCUIT	FUNCTION
1	P21 14LG/TN	DRIVER SEAT FRONT DOWN DRIVER EXCEPT MEMORY
1	P121 18LG/DB	DRIVER SEAT FRONT DOWN DRIVER MEMORY
2	G494 22YL/VT	DRIVER SEAT FRONT VERTICAL SENSOR GROUND MEMORY
3	-	-
4	G404 22VT/YL	DRIVER SEAT FRONT VERTICAL POSITION SENSE MEMORY
5	P19 14LG/LB	DRIVER SEAT FRONT UP DRIVER EXCEPT MEMORY
5	P119 18LG/DG	DRIVER SEAT FRONT UP DRIVER MEMORY

MOTOR-SEAT ADJUSTER-PASSENGER HORIZONTAL - 5 WAY MALE

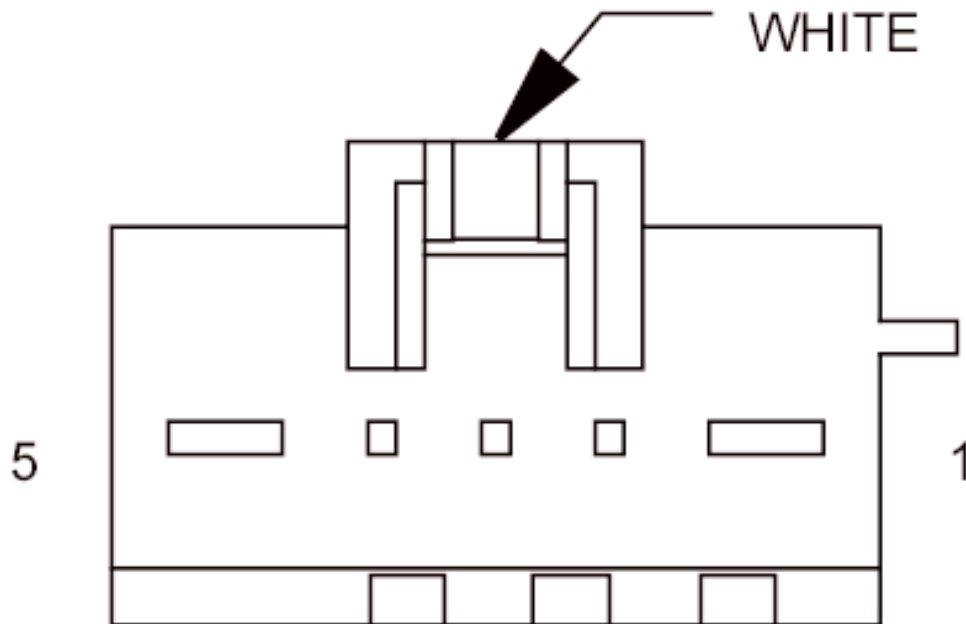


**MOTOR-
SEAT
ADJUSTER-
PASSENGER
HORIZONTAL**

CAV	CIRCUIT	FUNCTION
1	P14 14LG/OR	PASSENGER SEAT FORWARD DRIVER
2	-	-
3	-	-
4	-	-
5	P16 14LG/WT	PASSENGER SEAT REARWARD DRIVER

MOTOR-SEAT ADJUSTER-REAR DRIVER VERTICAL - WHITE 5 WAY FEMALE

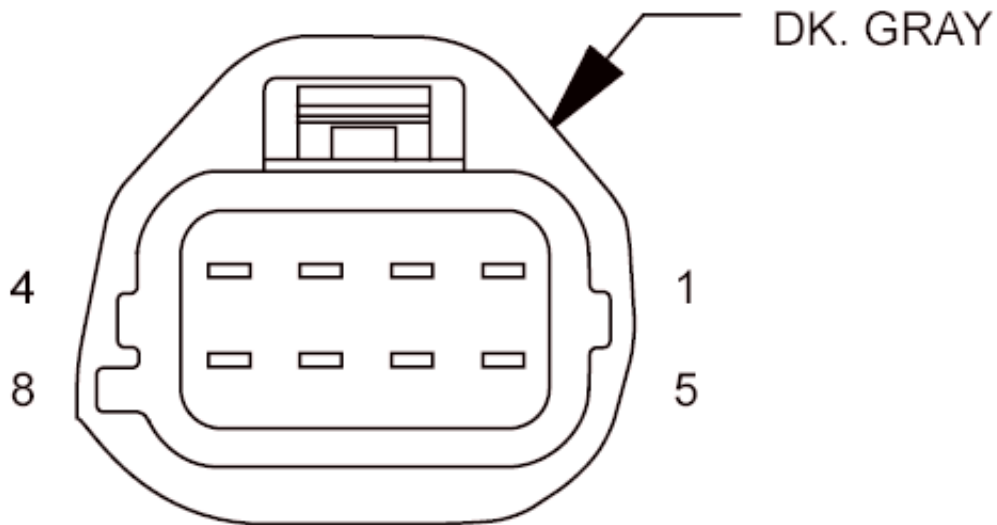




MOTOR- SEAT ADJUSTER- REAR DRIVER VERTICAL

CAV	CIRCUIT	FUNCTION
1	P11 14LG/YL	DRIVER SEAT REAR UP DRIVER EXCEPT MEMORY
1	P111 18LG/YL	DRIVER SEAT REAR UP DRIVER MEMORY
2	G492 18LB/VT	DRIVER SEAT REAR VERTICAL SENSOR GROUND MEMORY
3	-	-
4	G402 18VT/DB	DRIVER SEAT REAR VERTICAL POSITION SENSE MEMORY
5	P13 14LG/OR	DRIVER SEAT REAR DOWN DRIVER EXCEPT MEMORY
5	P113 18LG/WT	DRIVER SEAT REAR DOWN DRIVER MEMORY

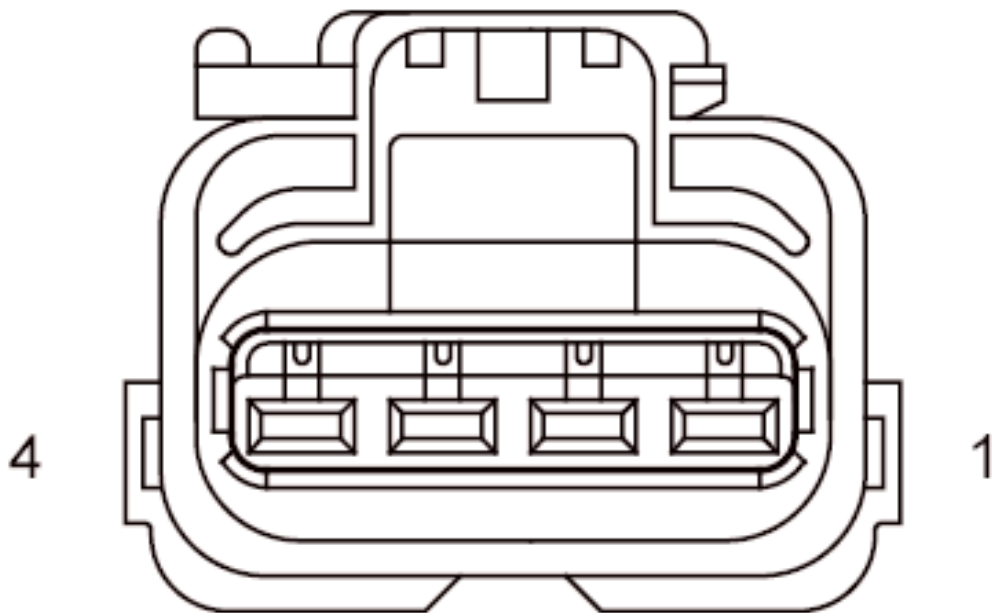
MOTOR-TRANSFER CASE - DK. GRAY 8 WAY FEMALE



MOTOR- TRANSFER CASE

CAV	CIRCUIT	FUNCTION
1	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
2	T313 18YL/LG	MODE SENSOR SIGNAL
2	T313 20YL/LG	MODE SENSOR SIGNAL
3	K594 20BR/LG	DRIVETRAIN SENSOR RETURN
4	T315 14YL/BR	SHIFT MOTOR CONTROL A
5	T316 14YL/GY	SHIFT MOTOR CONTROL B
6	-	-
7	-	-
8	-	-

MOTOR-TRANSFER CASE C1 - 4 WAY (MP3022) MALE



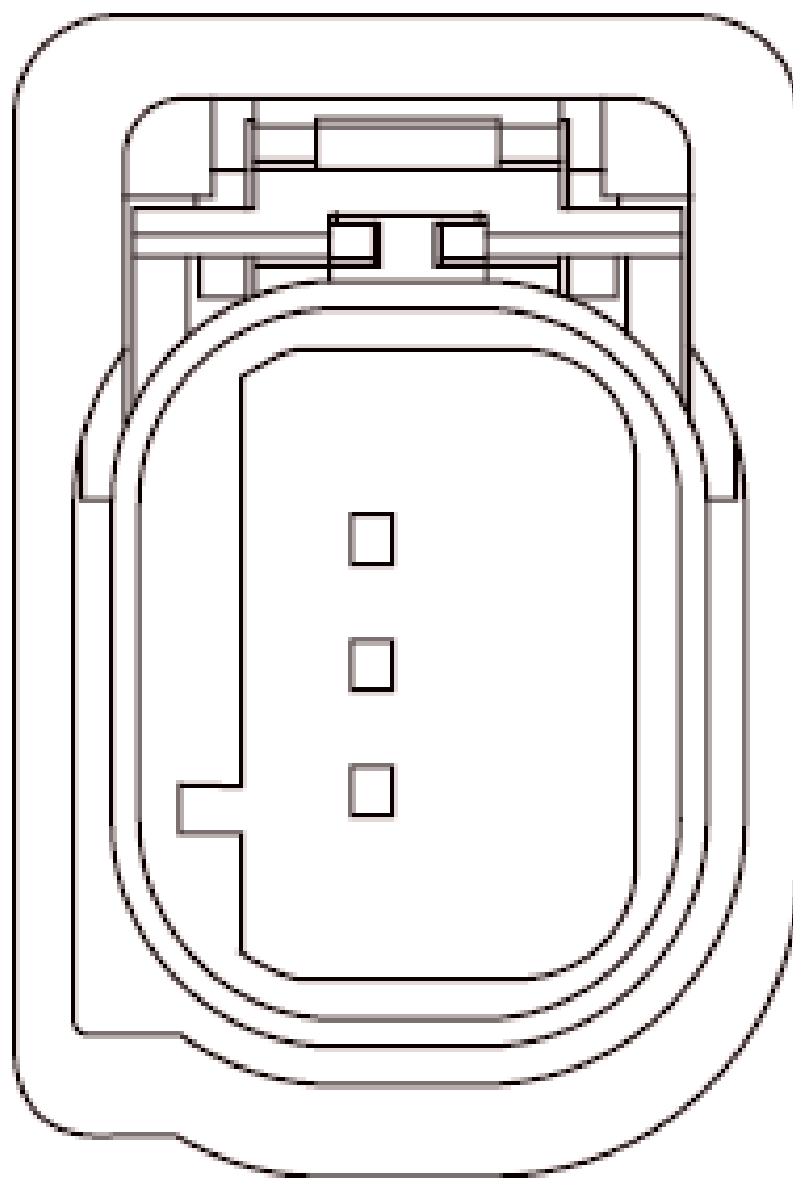
MOTOR- TRANSFER CASE (MP3022)

CAV	CIRCUIT	FUNCTION
1	T315 12YL/BR	SHIFT MOTOR CONTROL A
2	T301 20DG/YL	SWITCHED BATTERY SOLENOID SUPPLY
3	T317 20YL/TN	STEP MOTOR CONTROL D
4	T316 12YL/GY	SHIFT MOTOR CONTROL B

MOTOR-TRANSFER CASE C2 - 3 WAY (MP3022) MALE

1

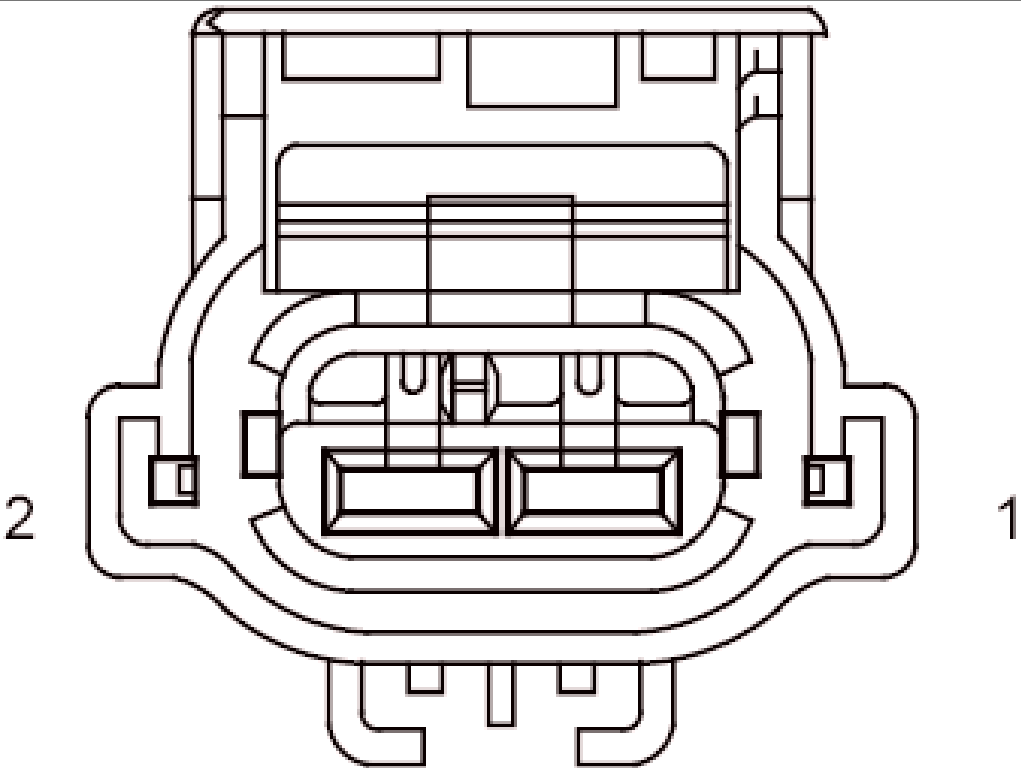
3



**MOTOR-
TRANSFER
CASE C2
(MP3022)**

	CIRCUIT	FUNCTION
1	K504 20BR	DRIVETRAIN 5 VOLT SUPPLY
2	T313 20YL/LG	MODE SENSOR SIGNAL
3	K594 20BR/LG	DRIVETRAIN SENSOR RETURN

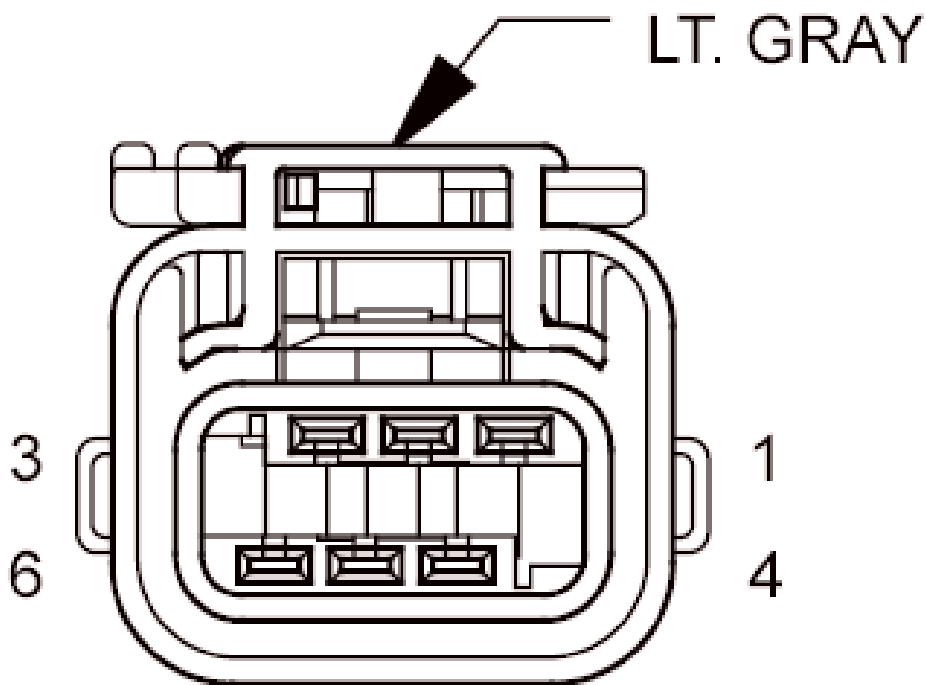
MOTOR-WINDOW-DRIVER - 2 WAY (BASE)



MOTOR-
WINDOW-
DRIVER
(BASE)

CAV	CIRCUIT	FUNCTION
1	Q11 14OR/LG	DRIVER WINDOW DRIVER (UP)
2	Q21 14OR/WT	DRIVER WINDOW DRIVER (DOWN)

MOTOR-WINDOW-DRIVER EXPRESS - LT. GRAY 6 WAY (EXCEPT BASE) FEMALE

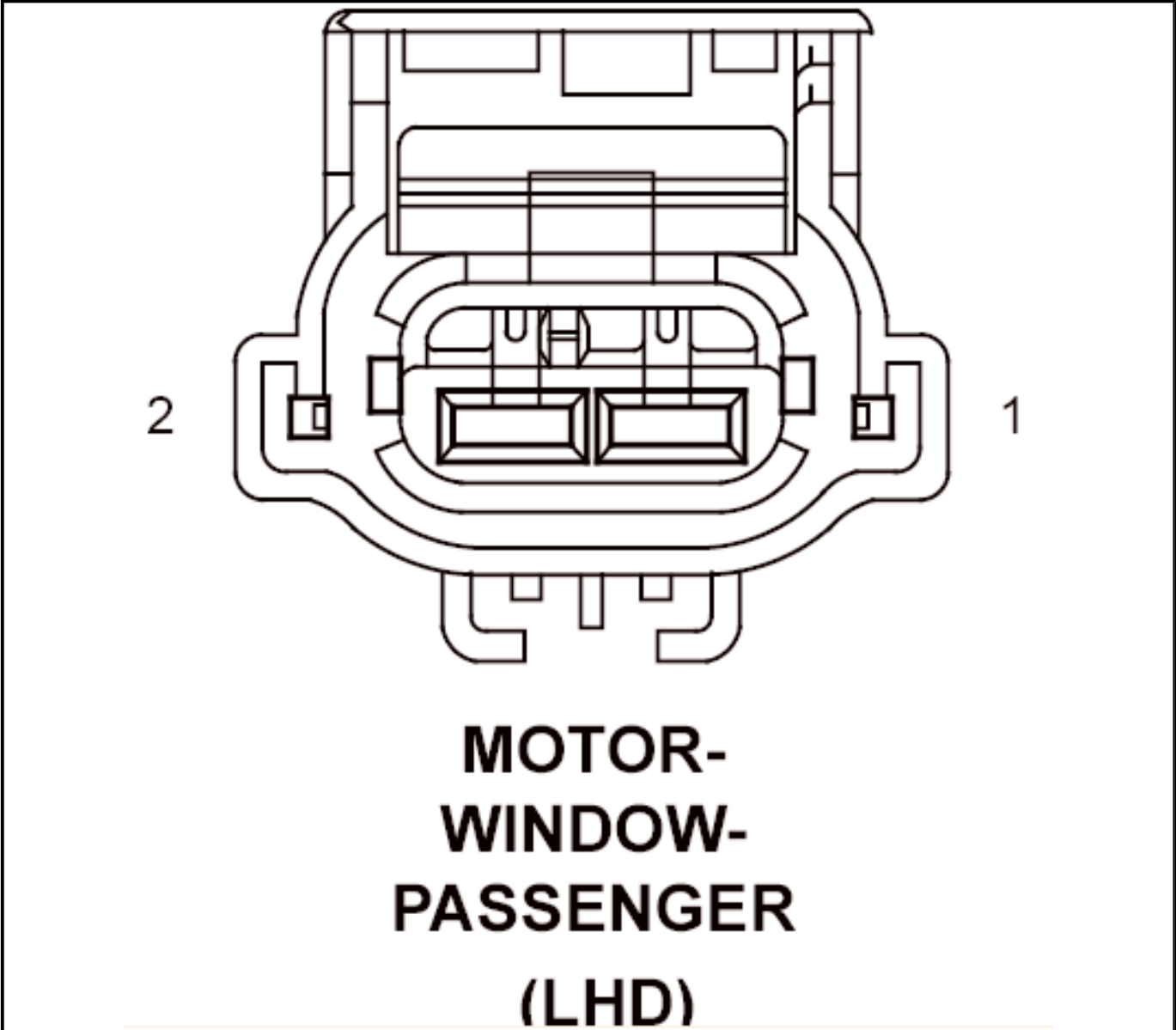


MOTOR-
WINDOW-
DRIVER
EXPRESS
(EXCEPT BASE)

CAV	CIRCUIT	FUNCTION
1	Q991 20BK/OR	DRIVER WINDOW HALL SENSOR RETURN
2	-	-
3	Q311 14OR/LB	LEFT FRONT WINDOW EXPRESS UP DRIVER (LHD)
3	Q312 14DB/OR	RIGHT FRONT WINDOW EXPRESS UP DRIVER (RHD)
4	Q305 20OR	DRIVER WINDOW HALL SENSOR SUPPLY
5	Q301 20OR/WT	DRIVER WINDOW HALL SENSOR A SIGNAL

2	Q211 14TN/LB	LEFT REAR WINDOW DRIVER (DOWN)
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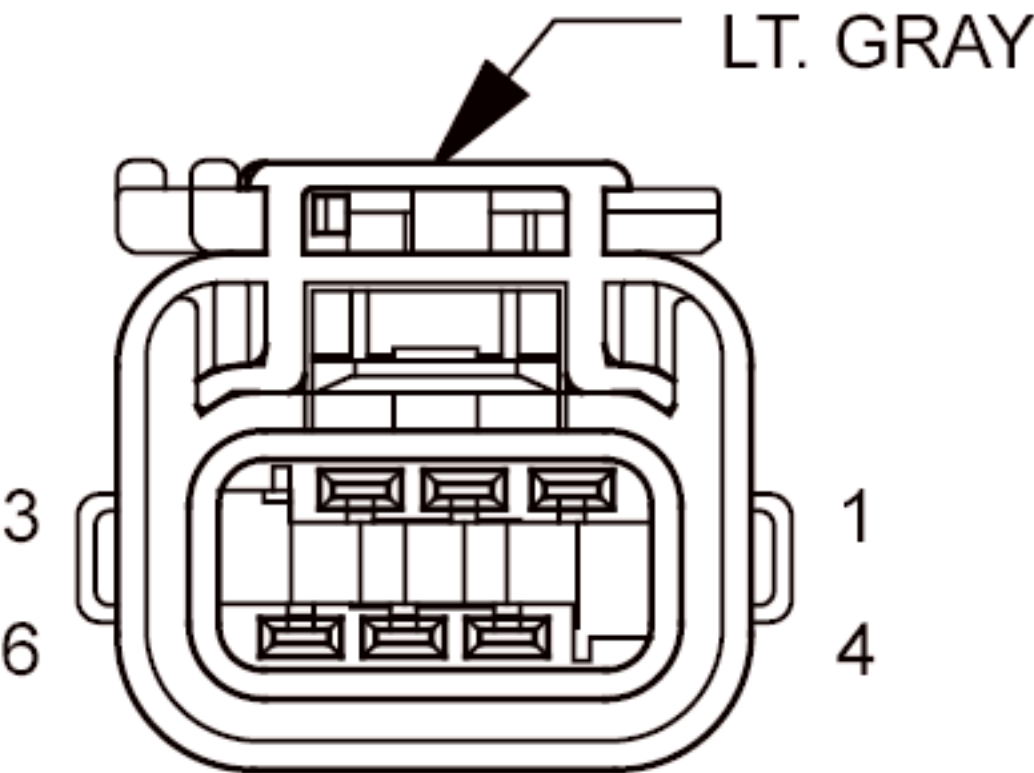
MOTOR-WINDOW-PASSENGER - 2 WAY (LHD)



**MOTOR-
WINDOW-
PASSENGER
(LHD)**

CAV	CIRCUIT	FUNCTION
1	Q12 14OR/BR	PASSENGER WINDOW DRIVER (DOWN) (BASE)
1	Q312 14DB/OR	RIGHT FRONT WINDOW EXPRESS UP DRIVER (EXCEPT BASE)
2	Q22 14OR/VT	PASSENGER WINDOW DRIVER (UP) (BASE)
2	Q322 14LG/OR	RIGHT FRONT WINDOW

MOTOR-WINDOW-PASSENGER - LT. GRAY 6 WAY (RHD)

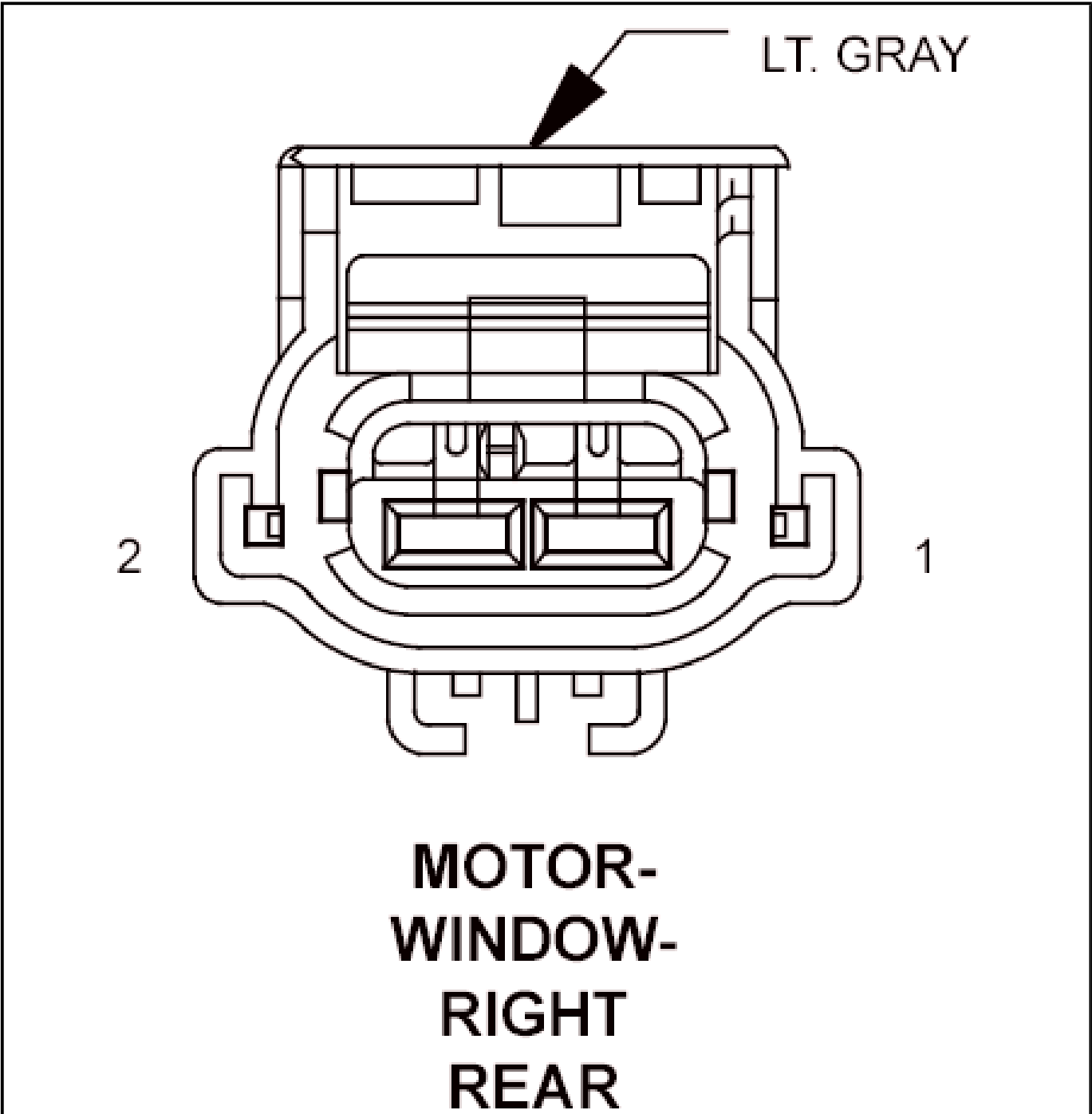


MOTOR-
WINDOW-
PASSENGER
(RHD)

CAV	CIRCUIT	FUNCTION
1	Q992 20BK/GY	PASSENGER WINDOW HALL SENSOR RETURN
2	-	-
3	Q311 14OR/LB	LEFT FRONT WINDOW EXPRESS UP DRIVER
4	Q306 20OR/DB	PASSENGER WINDOW HALL SENSOR SUPPLY

5	Q302 20OR/LG	PASSENGER WINDOW HALL SENSOR A SIGNAL
6	Q321 14OR/DB	LEFT FRONT WINDOW EXPRESS DOWN DRIVER

MOTOR-WINDOW-RIGHT REAR - LT. GRAY 2 WAY



CAV	CIRCUIT	FUNCTION
1	Q112 14OR/BR	RIGHT REAR WINDOW

		DRIVER (UP) (LHD)
1	Q112 16OR/BR	RIGHT REAR WINDOW DRIVER (UP) (RHD)
2	Q212 14OR/VT	RIGHT REAR WINDOW DRIVER (DOWN) (LHD)
2	Q212 16OR/VT	RIGHT REAR WINDOW DRIVER (DOWN) (RHD)

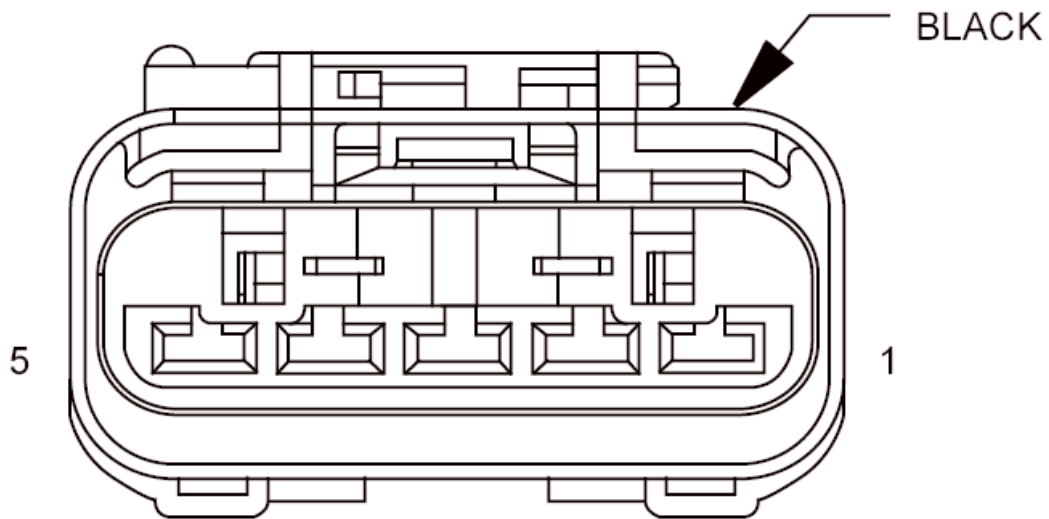
MOTOR-WIPER-FRONT - 4 WAY FEMALE

MOTOR-
WIPER-
FRONT

CAV	CIRCUIT	FUNCTION
A	W7 20BR/GY	FRONT WIPER PARK SWITCH SENSE
B	Z908 14BK	GROUND
C	W3 14BR/WT	FRONT WIPER HIGH/LOW RELAY LOW SPEED OUTPUT
D	W4 14BR/OR	FRONT WIPER HIGH/LOW RELAY HIGH SPEED OUTPUT

MOTOR-WIPER-REAR - BLACK 5 WAY

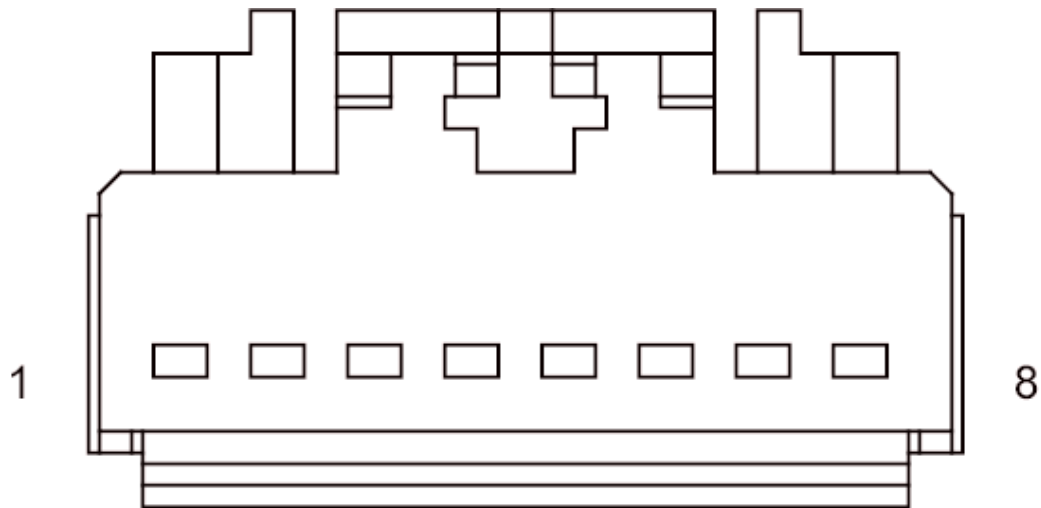
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MOTOR- WIPER- REAR

CAV	CIRCUIT	FUNCTION
1	A408 16WT/RD	FUSED B(+)
2	Z920 16BK/LG	GROUND
3	W13 16BR/LG	REAR WIPER MOTOR CONTROL
4	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
5	G80 20VT/YL	FLIP-UP GLASS AJAR SWITCH SENSE

PORT-AUXILIARY AUDIO VIDEO - 10 WAY

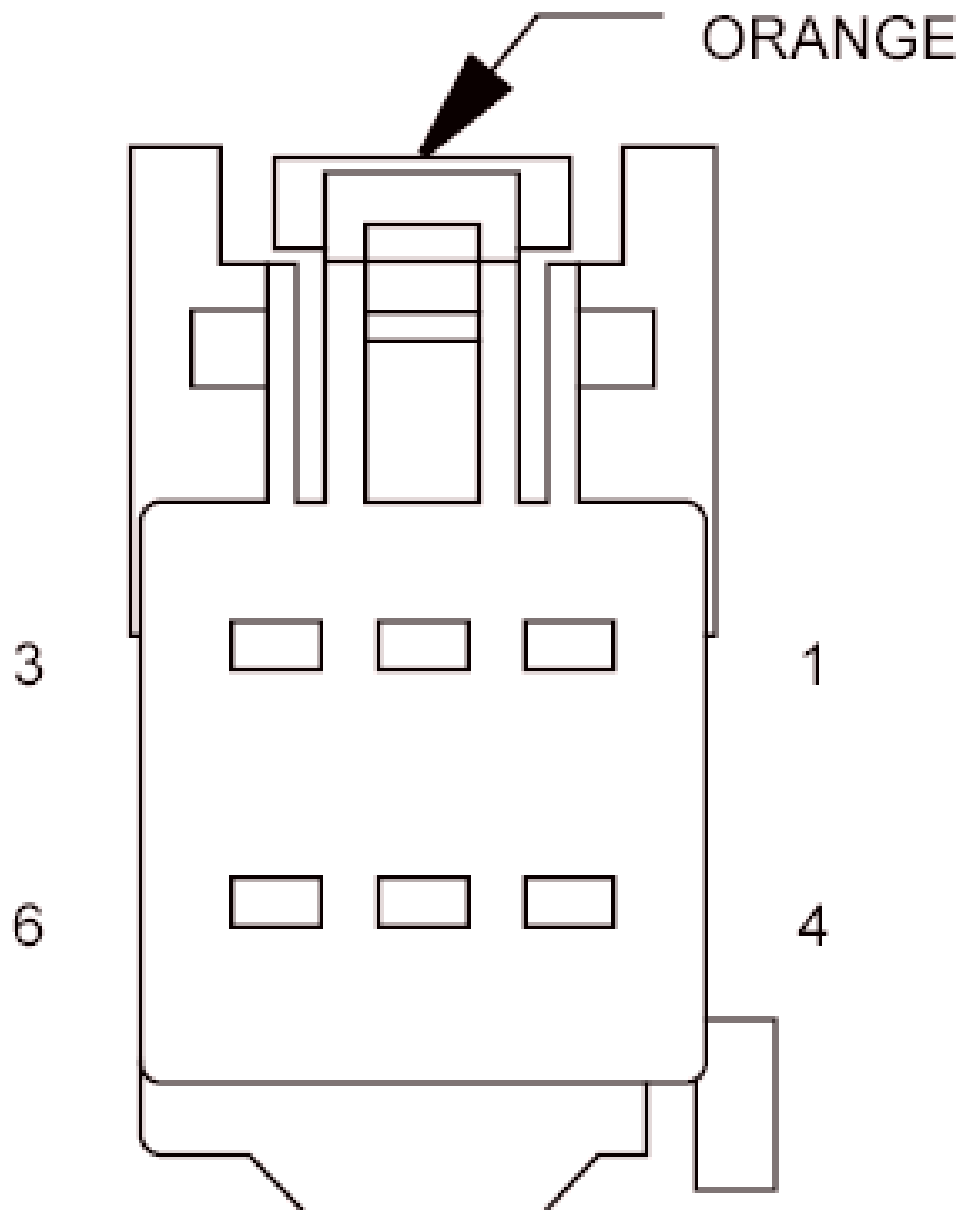


**PORT-
AUXILIARY
AUDIO
VIDEO**

CAV	CIRCUIT	FUNCTION
1	X521 20GY/LB	AUX AUDIO LEFT SIGNAL NO. 2
2	X522 20GY/DB	AUX AUDIO RIGHT SIGNAL NO. 2
3	X519 20DG/VT	AUX AUDIO COMMON NO. 2
4	-	-
5	-	-
6	X531 20GY/LB	AUX VIDEO SIGNAL NO. 2
7	X532 20BK	AUX VIDEO COMMON NO. 2
8	X533 20DG/OR	AUX VIDEO SHIELD NO. 2

POWER OUTLET-AC - ORANGE 6 WAY FEMALE





POWER OUTLET-AC

CAV	CIRCUIT	FUNCTION
1	P801 18LG	110 VOLT AC LINE 1
2	-	-
3	-	-

	P802 18LG/OR	110 VOLT AC LINE 2
5	-	-
6	-	-

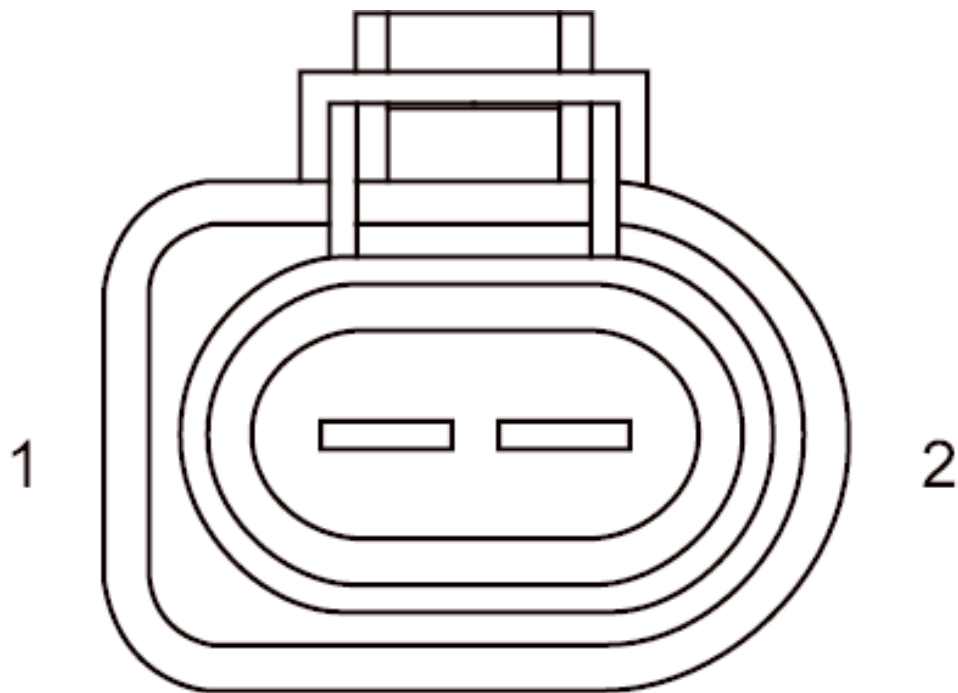
PUMP-WASHER-WINDSHIELD - 2 WAY FEMALE

**PUMP-
WASHER-
WINDSHIELD**

CAV	CIRCUIT	FUNCTION
1	W20 16BR/YL	REAR WASHER PUMP MOTOR CONTROL
2	W10 16BR	FRONT WASHER PUMP MOTOR CONTROL

RADIO C1 - GRAY 10 WAY (HANDS FREE)

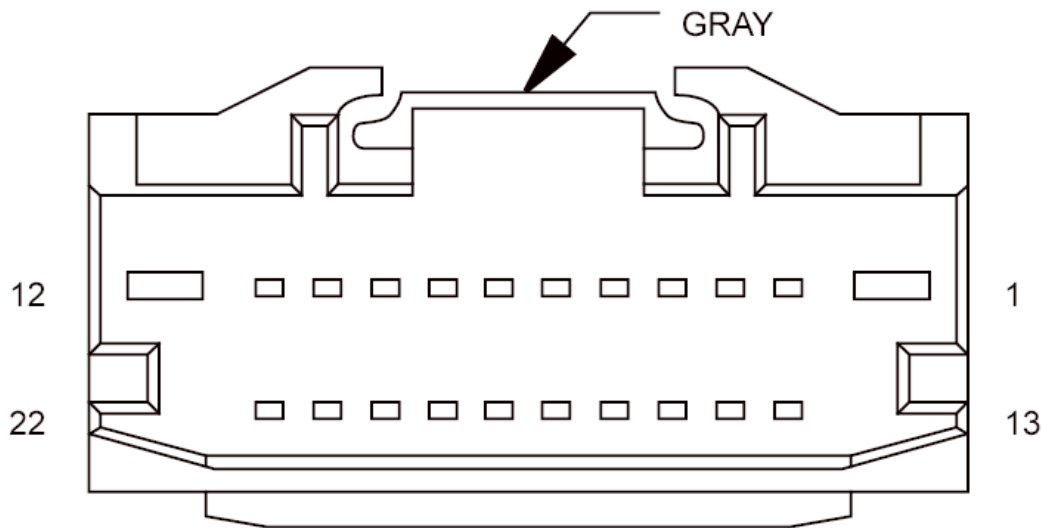
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PUMP- WASHER- WINDSHIELD

CAV	CIRCUIT	FUNCTION
1	X722 18LB/DG	MICROPHONE 2 IN (+)
2	X712 18DG/LB	MICROPHONE 1 IN (+)
3	-	-
4	X793 18DG/YL	MICROPHONE FEED
5	-	-
6	X795 18DG	COMMON AUDIO OUTPUT
7	X792 18LB/DG	MICROPHONE IN (-)
8	X835 18OR/GY	SENSOR GROUND
9	-	-
10	-	-

RADIO C2 - GRAY 22 WAY

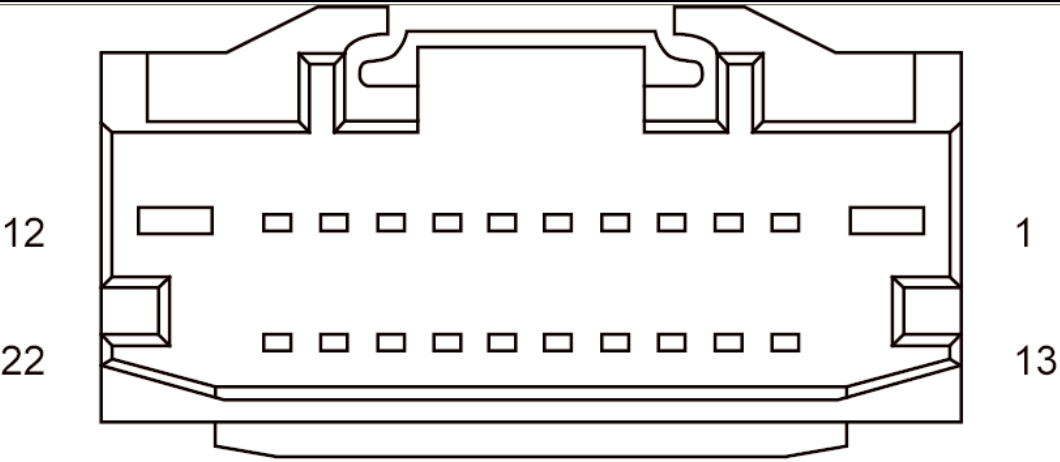


RADIO C2

CAV	CIRCUIT	FUNCTION
1	A116 14YL/RD	- (W/ TWILIGHT SENSOR)
1	A413 18RD	FUSED B(+) (I.O.D.) (W/OUT TWILIGHT SENSOR)
2	D264 20WT	CAN INTERIOR BUS (-)
3	-	-
4	-	-
5	-	-
6	-	-
7	X62 18GY/OR	AMPLIFIED ANTENNA FEED
8	X205 18GY/LG	LEFT REAR SPEAKER (+)
9	X295 18GY/DG	LEFT REAR SPEAKER (-)
10	X206 18DG/LG	RIGHT REAR SPEAKER (+)
11	X296 18DG/GY	RIGHT REAR SPEAKER (-)
12	Z910 18BK/WT	GROUND
13	D265 20WT/OR	CAN INTERIOR BUS (+)
14	-	-
15	-	-
16	-	-
17	-	-
18	-	-
19	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (EXCEPT AMPLIFIER)
20	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (EXCEPT AMPLIFIER)

21	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (EXCEPT AMPLIFIER)
22	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (EXCEPT AMPLIFIER)

RADIO C3 - 22 WAY

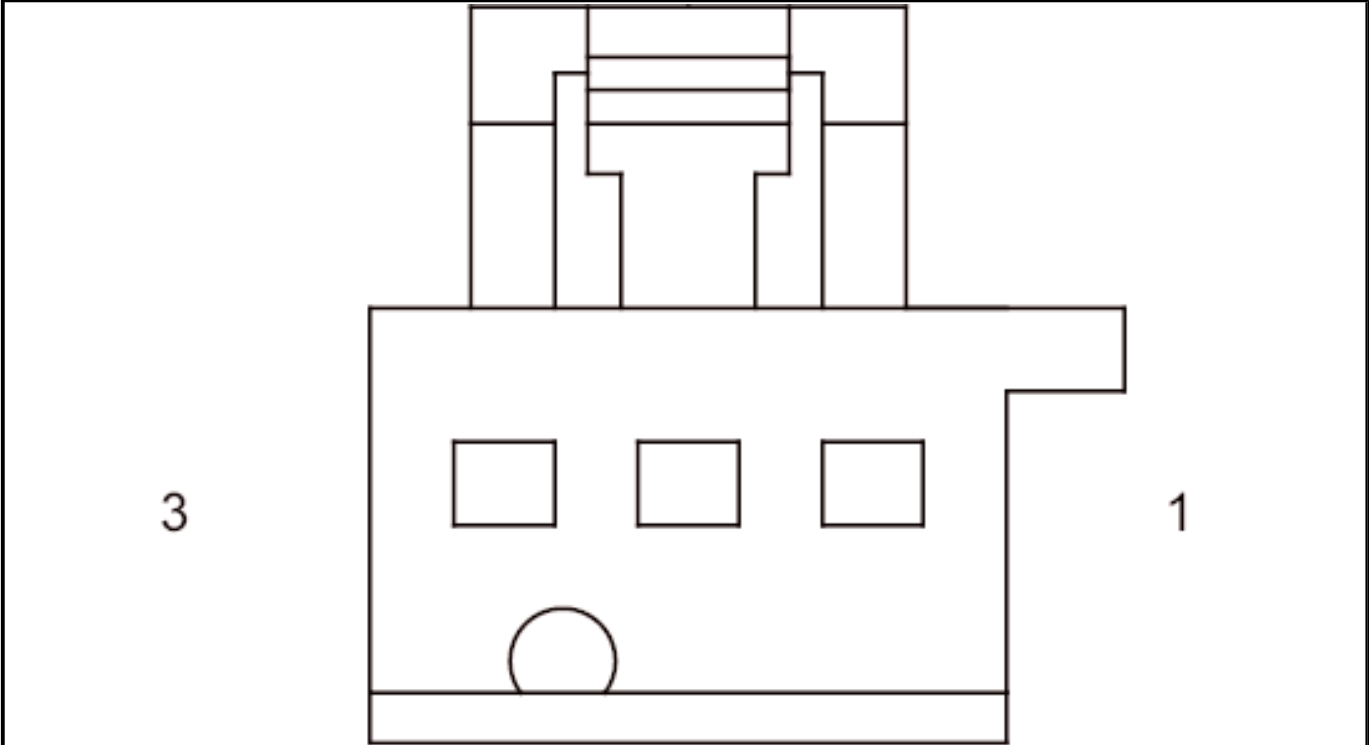


RADIO C3

CAV	CIRCUIT	FUNCTION
1	X552 18GY/LB	AUDIO RETURN 3
2	-	-
3	-	-
4	-	-
5	-	-
6	X534 18GY/BR	VIDEO SIGNAL 1
7	X535 18GY/YL	VIDEO COMMON 1
8	X536	VDO-VIDEO SHIELD 1
9	X541 18GY/LB	VIDEO SIGNAL 2
10	X542 18GY/YL	VIDEO COMMON 2
11	X543	VIDEO SHIELD 2
12	X546 18GY/OR	AUDIO RETURN 2
13	X551 18DG/VT	AUDIO LEFT 3
14	X550 18DG/YL	AUDIO RIGHT 3
15	-	-
16	-	-
17	-	-
18	X539 18DG/TN	AUDIO LEFT 1
19	X540 18GY/VT	AUDIO RETURN 1
20	X538 18DG/WT	AUDIO RIGHT 1

21	X545 18DG/LB	AUDIO LEFT 2
22	X544 18DG/DB	AUDIO RIGHT 2

RECEIVER-INTRUSION SENSOR - 3 WAY (VTSS)

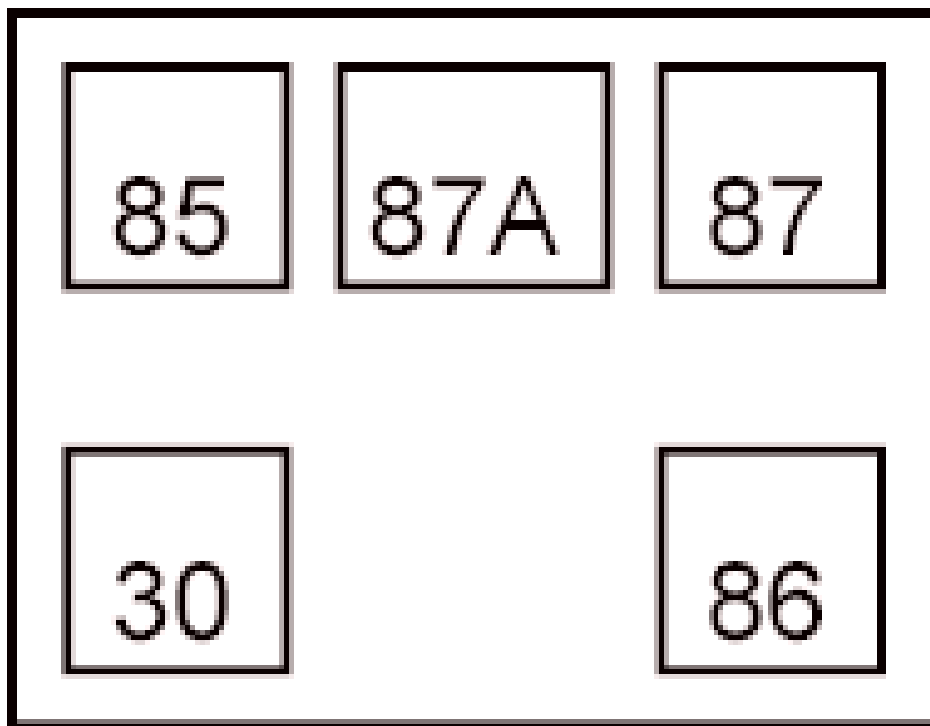


RECEIVER-
INTRUSION
SENSOR
(VTSS)

CAV	CIRCUIT	FUNCTION
1	G460 20DG/VT	INTRUSION RECEIVER SENSOR SIGNAL
2	-	-
3	G946 20LG/VT	INTRUSION RECEIVER SENSOR GROUND

RELAY-AUTO SHUT DOWN - 0 WAY

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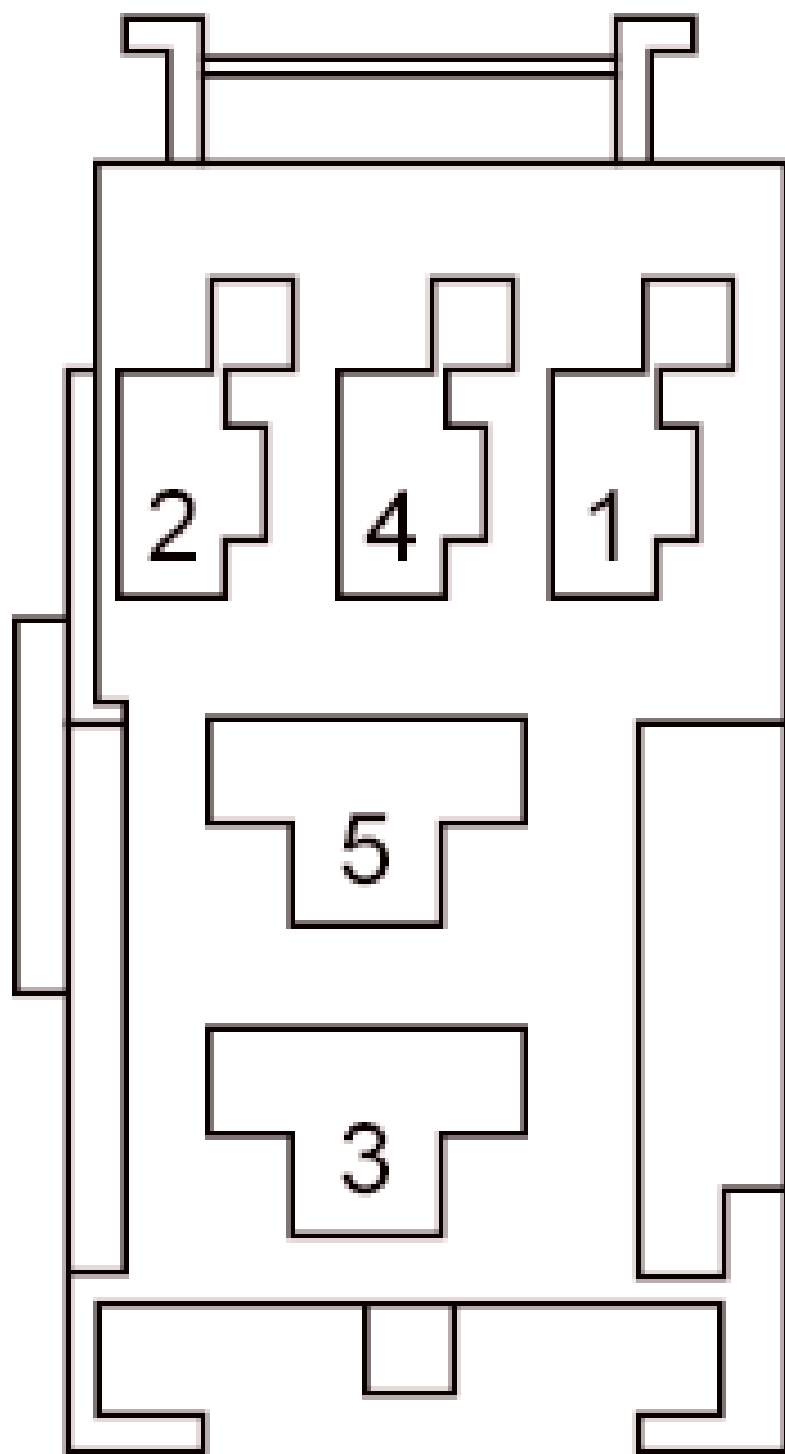


RELAY- AUTO SHUT DOWN (IN TIPM)

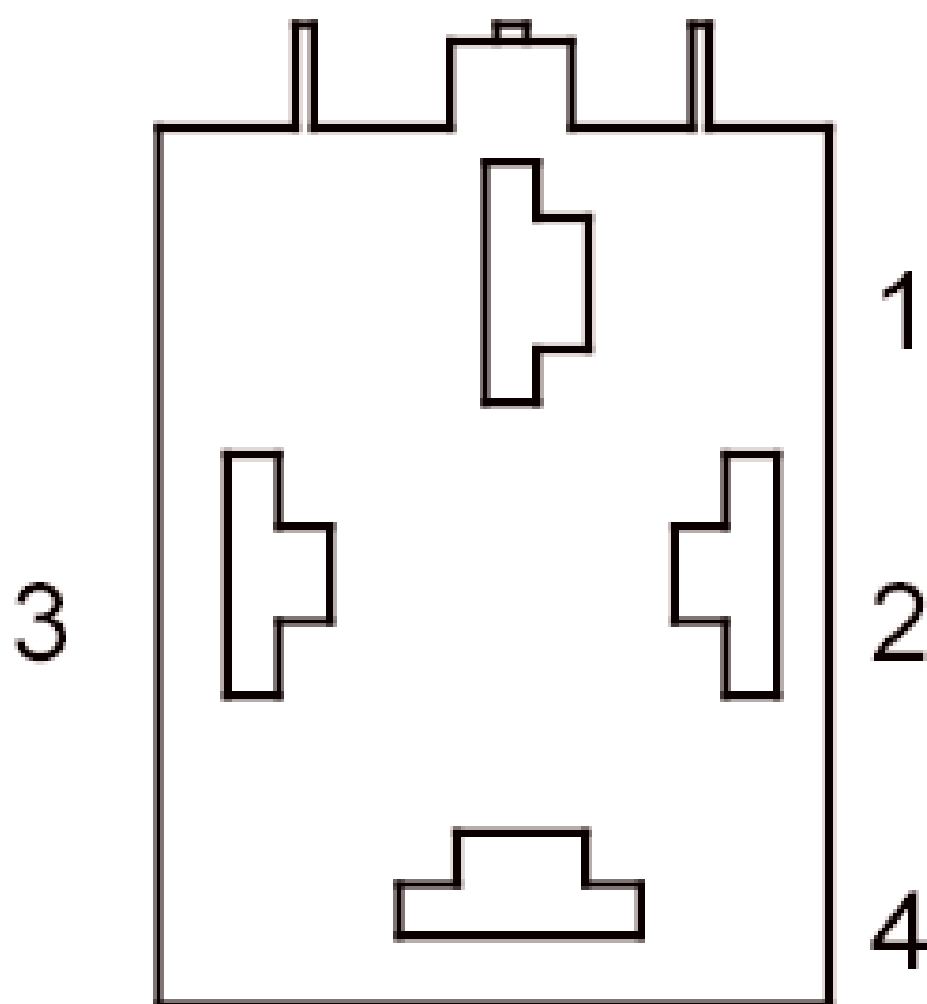
CAV	CIRCUIT	FUNCTION
30	INTERNAL	B(+)
85	INTERNAL	B(+)
86	K51 20BR/WT	ASD RELAY CONTROL

	INTERNAL	ASD RELAY OUTPUT
87A	-	-

RELAY- BRAKE LAMP ACTIVATION - 5 WAY MALE



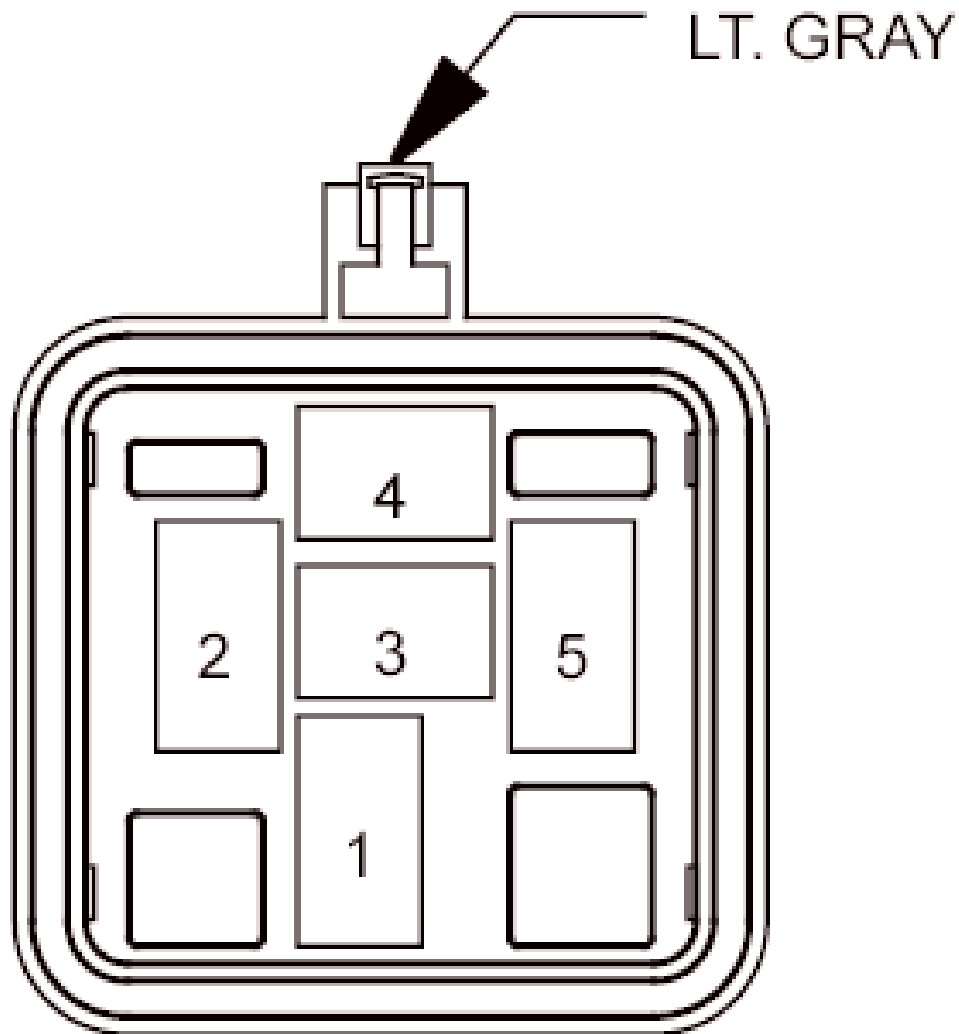
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**RELAY-
CABIN
HEATER 1
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	F921 18BR/OR	FUSED RUN RELAY OUTPUT
2	A285 10RD/DB	CABIN HEATER 1 RELAY OUTPUT
3	-	-
4	A281 10RD/GY	FUSED B(+)
5	K360 18GY/BR	CABIN HEATER 1 RELAY CONTROL
6	F921 18BR/OR	FUSED RUN RELAY OUTPUT
7	A286 10RD/WT	CABIN HEATER 2 RELAY OUTPUT
8	-	-
9	A282 10RD/OR	FUSED B(+)
10	K361 18WT/BR	CABIN HEATER 2 RELAY CONTROL

RELAY-CABIN HEATER C2 - 10 WAY (DIESEL)



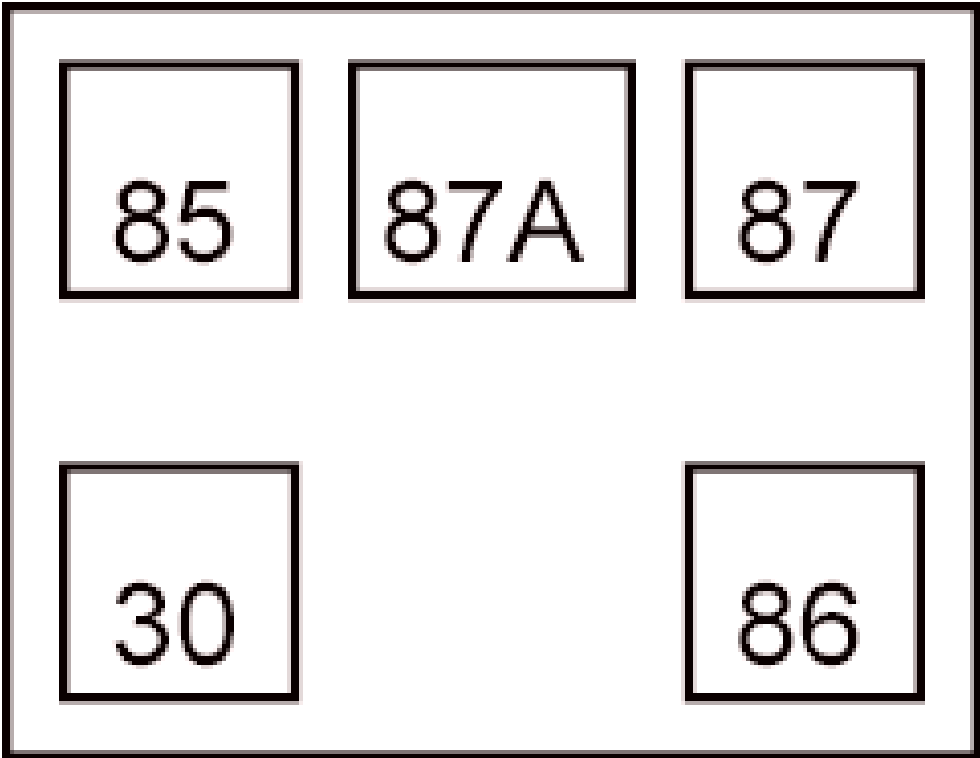
**RELAY-
CABIN
HEATER 2
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	F921 18BR/OR	FUSED RUN RELAY OUTPUT
2	A288 10RD/LB	CABIN HEATER 3 RELAY

		OUTPUT
3	-	-
4	A287 10RD/DB	FUSED B(+)
5	K363 18OR/BR	CABIN HEATER 3 RELAY CONTROL
6	N1 18DB/OR	FUSED FUEL PUMP OUTPUT
7	A993 10RD	FUEL HEATER RELAY OUTPUT
8	-	-
9	A109 10OR/RD	FUSED B(+)
10	Z930 18BK	GROUND

RELAY-RADIATOR FAN CONTROL - 0 WAY





**RELAY-
RADIATOR
FAN CONTROL
(IN TIPM)**

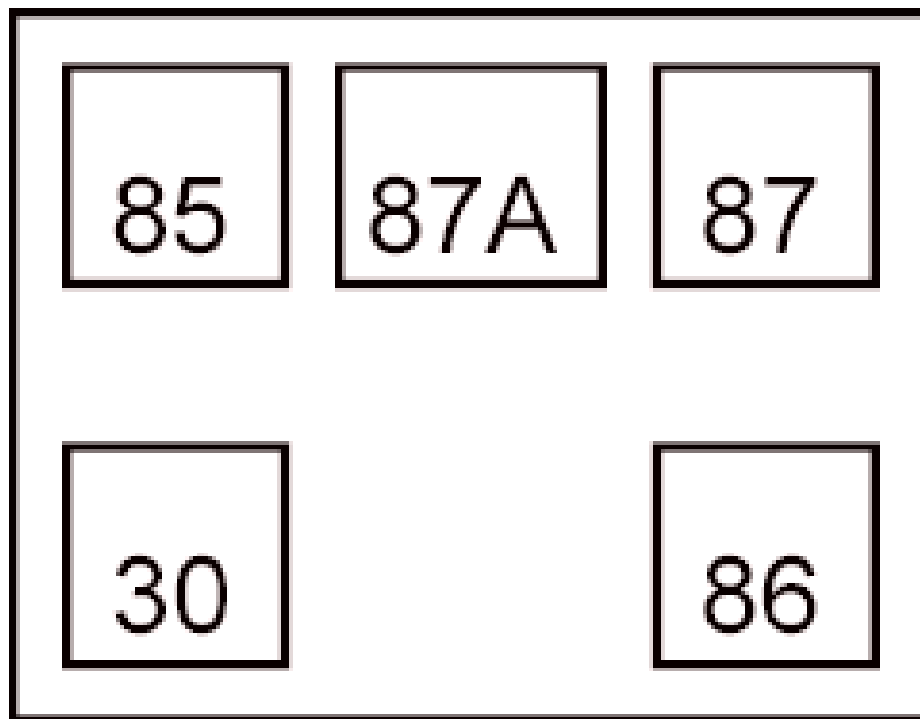
CAV	CIRCUIT	FUNCTION
30	INTERNAL	FUSED B(+)
85		

	INTERNAL	FUSED B(+)
86	INTERNAL	RAD FAN CONTROL RELAY CONTROL
87	N173 10DB/VT	HIGH SPEED RAD FAN RELAY OUTPUT
87A	-	-

RELAY-RADIATOR FAN HIGH - 9 WAY FEMALE

**RELAY-
RADIATOR
FAN HIGH**

CAV	CIRCUIT	FUNCTION
1	-	-

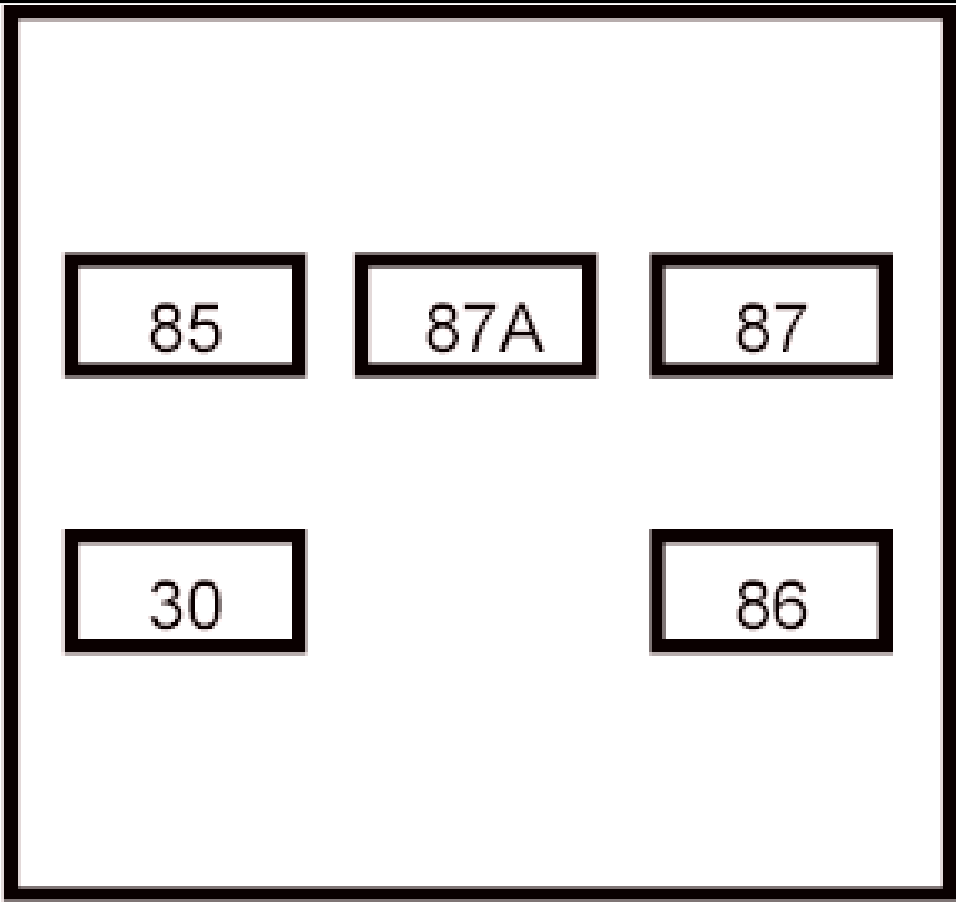


RELAY- REAR WINDOW DEFOGGER (IN TIPM)

CAV	CIRCUIT	FUNCTION
30	INTERNAL	B(+)
85	INTERNAL	B(+)
86	INTERNAL	REAR WINDOW DEFOGGER

		RELAY CONTROL
87	INTERNAL	REAR WINDOW DEFOGGER RELAY OUTPUT
87A	-	-

RELAY-RUN - 0 WAY



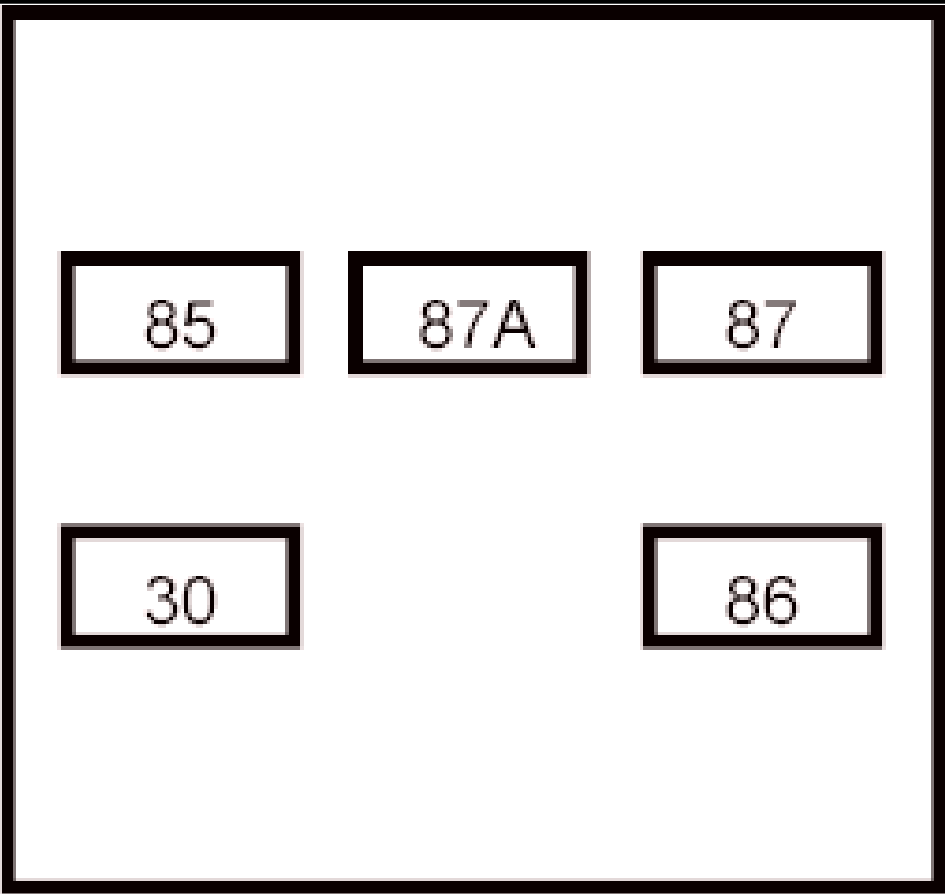
RELAY-RUN

(IN TIPM)

CAV	CIRCUIT	FUNCTION
30	INTERNAL	B(+)
85	INTERNAL	B(+)

86	INTERNAL	RUN RELAY CONTROL
87	INTERNAL	RUN RELAY OUTPUT
87A	-	-

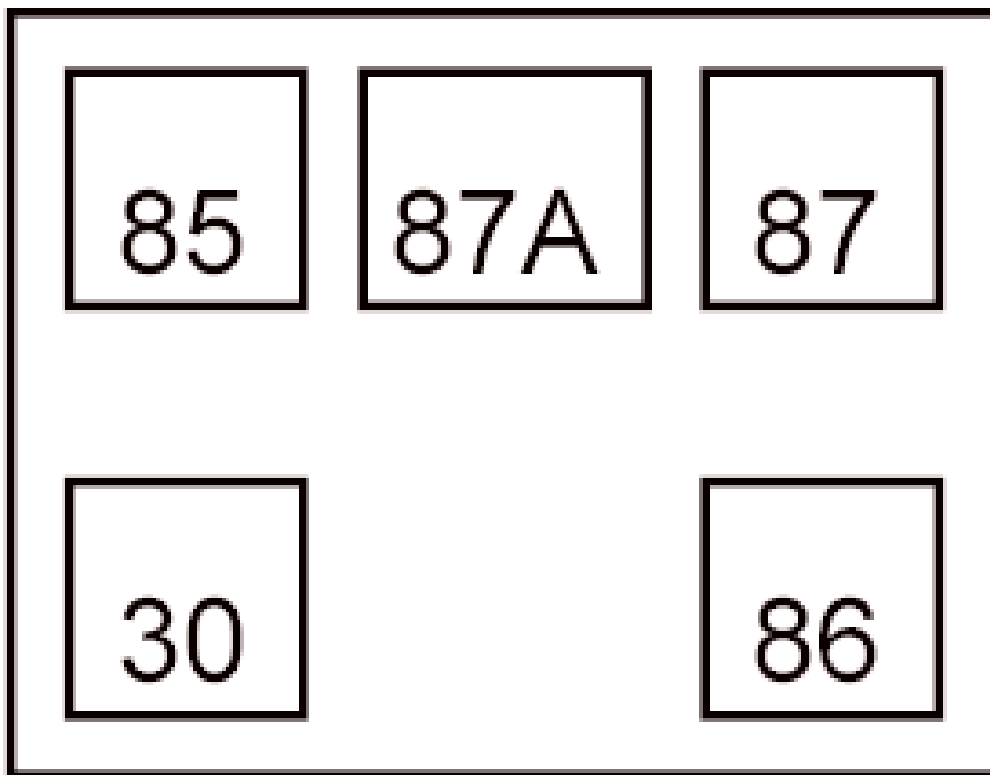
RELAY-RUN/ACCESSORY - 0 WAY



**RELAY-RUN/
ACCESSORY
(IN TIPM)**

CAV	CIRCUIT	FUNCTION
30	INTERNAL	B(+)
85	INTERNAL	B(+)
86	INTERNAL	RUN/ACCESSORY RELAY CONTROL
87	INTERNAL	RUN/ACCESSORY RELAY OUTPUT
87A	-	-

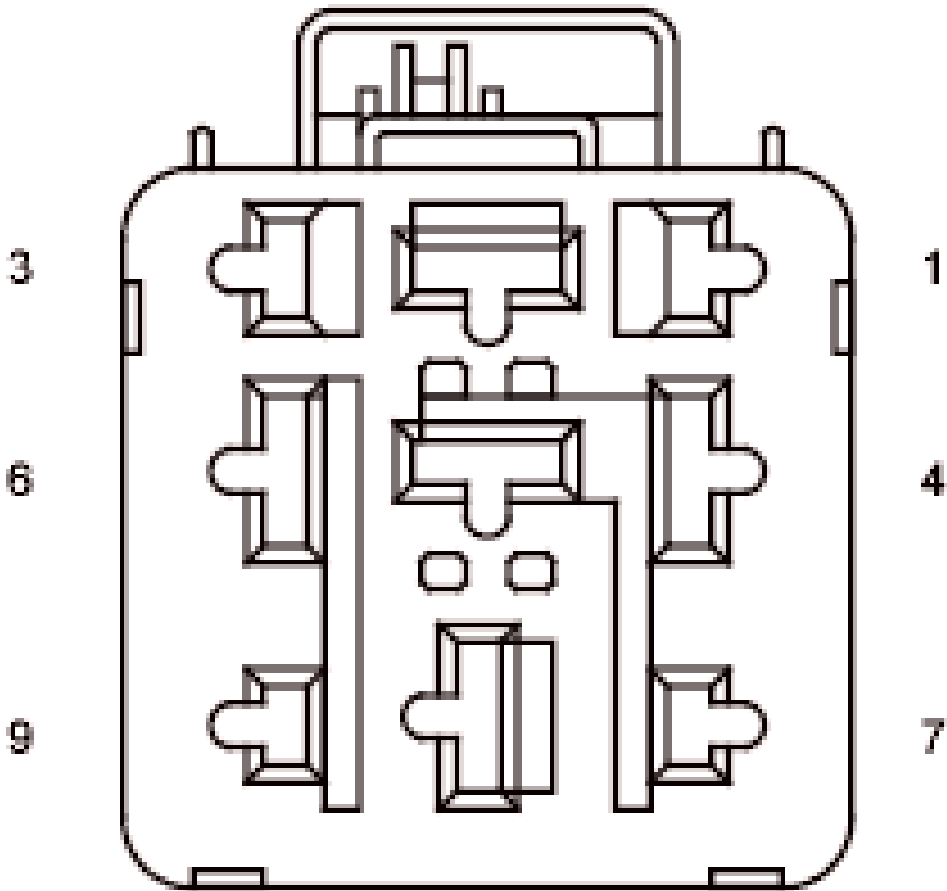
RELAY-RUN/START - 0 WAY



RELAY-RUN/ START (IN TIPM)

CAV	CIRCUIT	FUNCTION
30	INTERNAL	B(+)
85	INTERNAL	B(+)
86	INTERNAL	RUN/START RELAY CONTROL
87	INTERNAL	RUN/START RELAY OUTPUT

RELAY-SECONDARY DOOR LOCK - 9 WAY (RHD) FEMALE

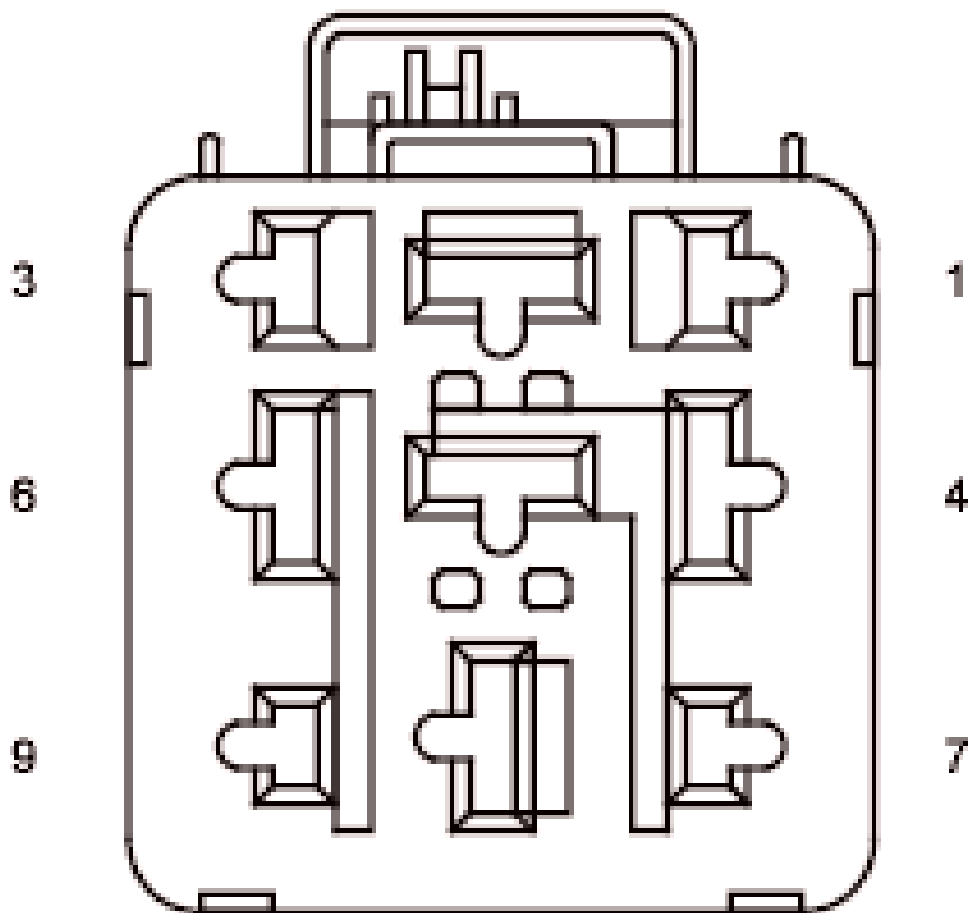


RELAY-
SECONDARY
DOOR LOCK
(RHD)

CAV	CIRCUIT	FUNCTION
1	P235 14LG/TN	SECONDARY DOOR LOCK RELAY OUTPUT
2	P390 18LG/LB	SECONDARY DOOR LOCK

		RELAY CONTROL
3	Z913 18BK/DB	GROUND
4	A959 14RD	FUSED B(+)
5	A959 14RD	FUSED B(+)
6	-	-
7	-	-
8	-	-
9	-	-

RELAY-SECONDARY DOOR UNLOCK - 9 WAY (RHD) FEMALE

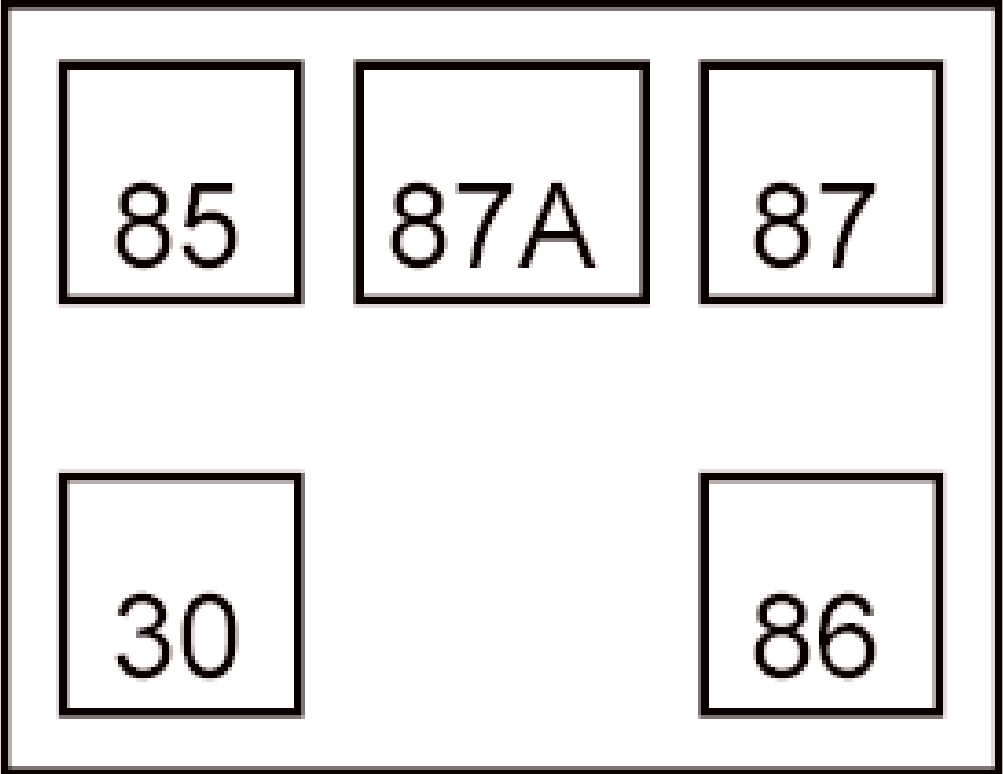


RELAY- SECONDARY DOOR UNLOCK (RHD)

CAV	CIRCUIT	FUNCTION
1	P237 14DG/TN	SECONDARY DOOR UNLOCK RELAY OUTPUT
2	P391 18LG/DB	SECONDARY DOOR UNLOCK RELAY CONTROL
3	Z913 18BK/DG	GROUND
4	A959 14RD	FUSED B(+)

5	A959 14RD	FUSED B(+)
6	-	-
7	-	-
8	-	-
9	-	-

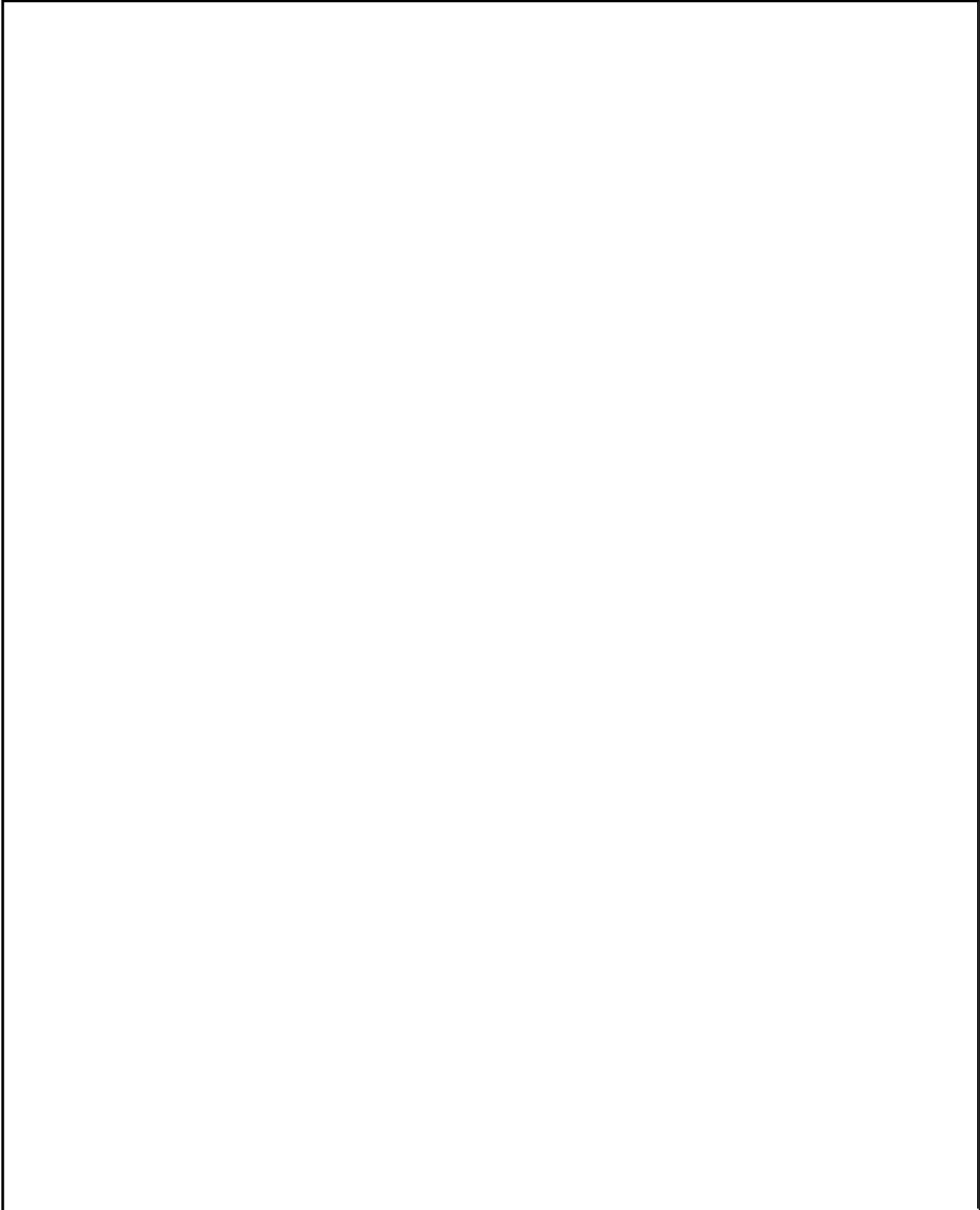
RELAY-STARTER - 0 WAY

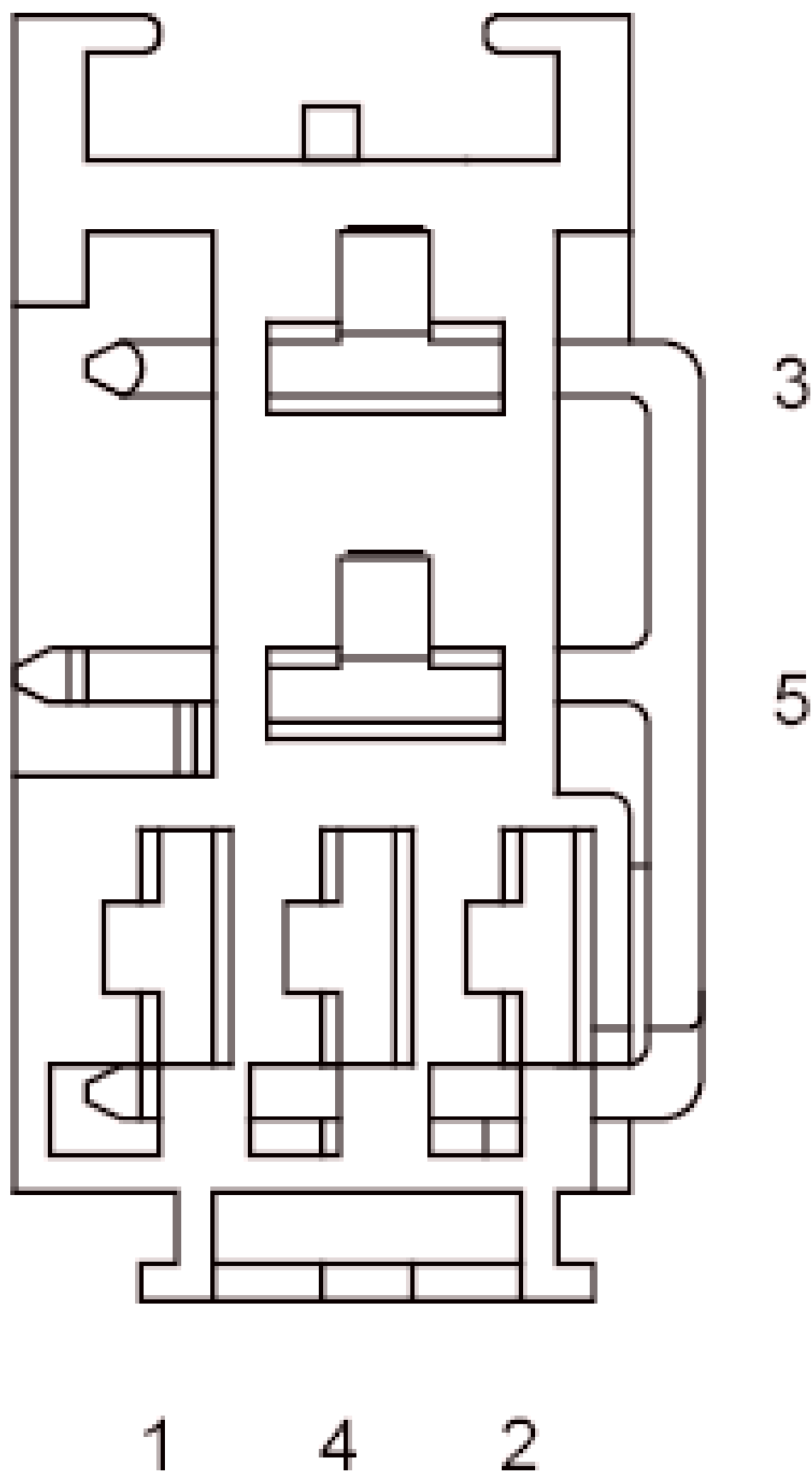


**RELAY-
STARTER
(IN TIPM)**

CAV	CIRCUIT	FUNCTION
30	INTERNAL	FUSED B(+)
85	INTERNAL	STARTER COIL DRIVER
86	T752 18DG/OR	STARTER RELAY CONTROL
87	T750 12YL/GY	STARTER RELAY OUTPUT
87A	-	-

RELAY-TRAILER TOW-LEFT - 5 WAY FEMALE

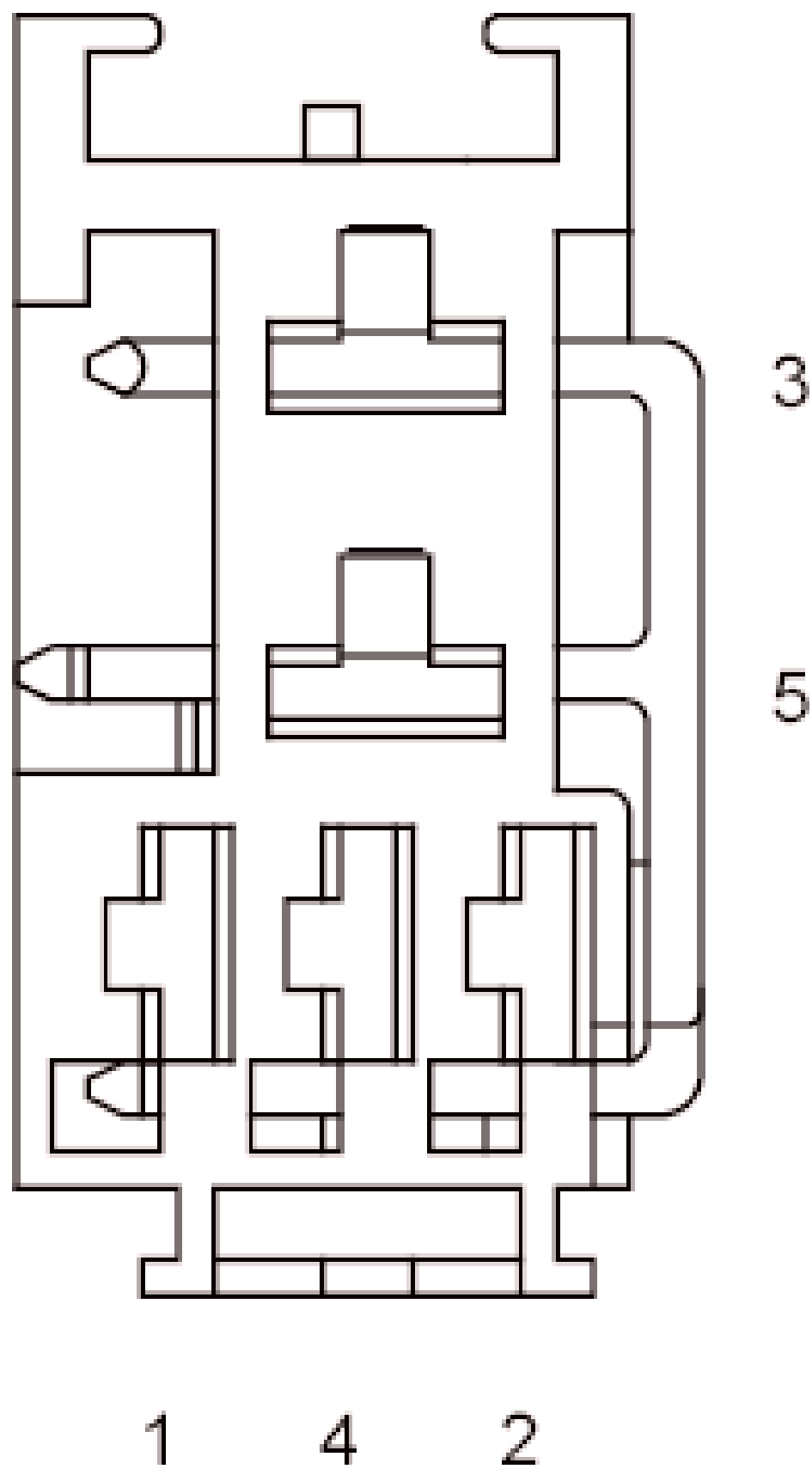




CAV	CIRCUIT	FUNCTION
1	A206 18RD	FUSED B(+)
2	L655 18WT/OR	LEFT TRAILER TOW RELAY CONTROL
3	L673 16YL	LEFT REAR STOP/TURN SIGNAL FEED
4	-	-
5	A206 18RD	FUSED B(+)

RELAY-TRAILER TOW-RIGHT - 5 WAY FEMALE

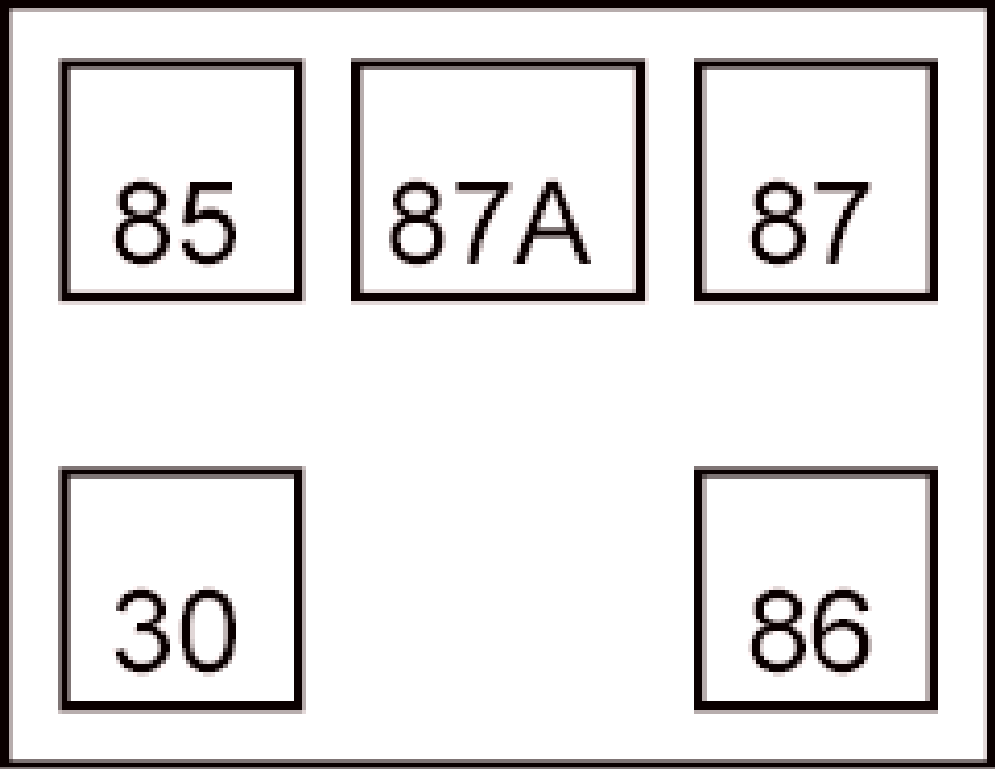




CAV	CIRCUIT	FUNCTION
1	A206 18RD	FUSED B(+)
2	L656 18WT/DG	RIGHT TRAILER TOW RELAY CONTROL
3	L674 16LG	RIGHT REAR STOP/TURN SIGNAL FEED
4	-	-
5	A206 18RD	FUSED B(+)

RELAY-TRANSMISSION CONTROL - 0 WAY





**RELAY-
TRANSMISSION
CONTROL
(IN TIPM)**

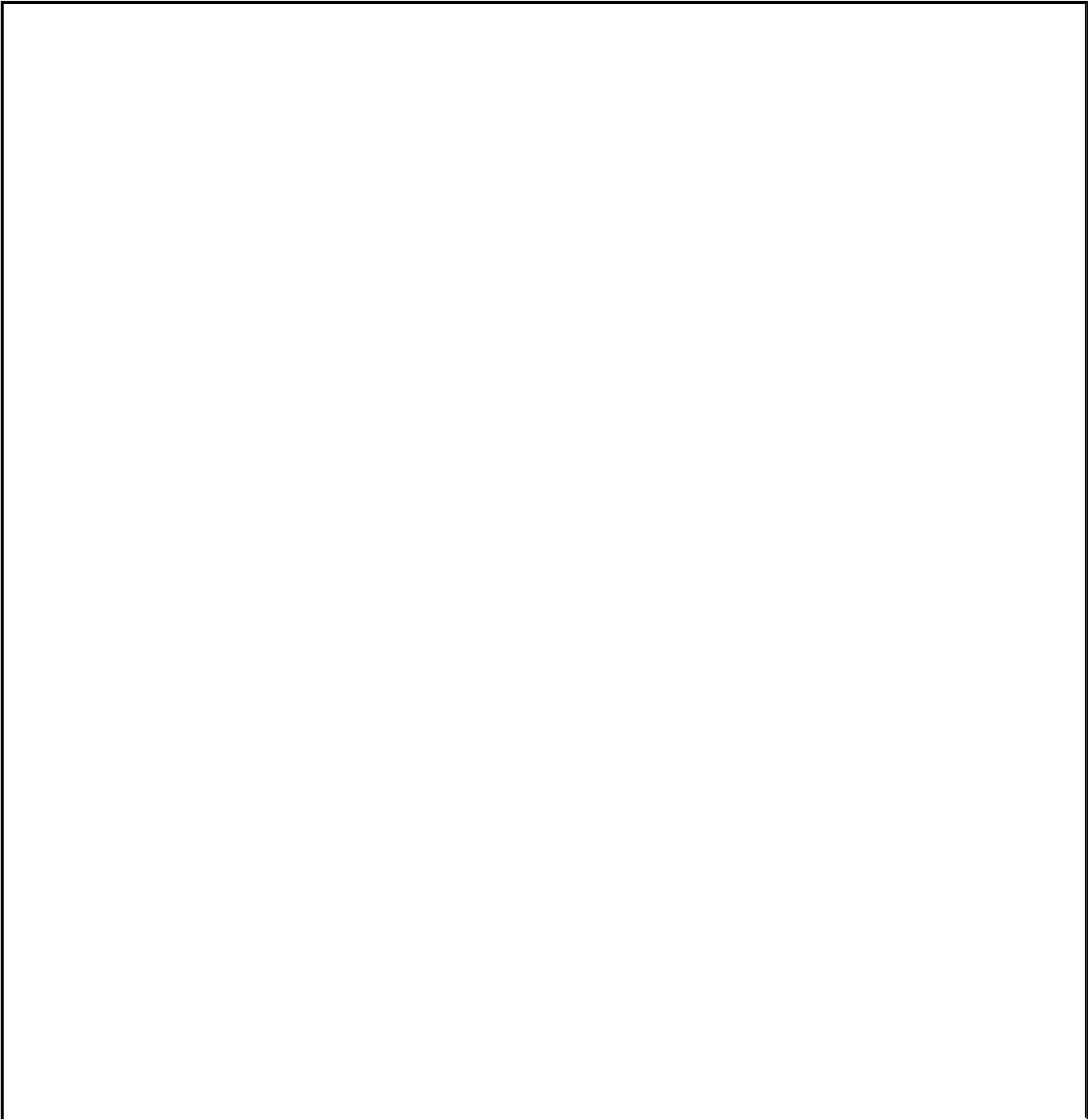
CAV
30

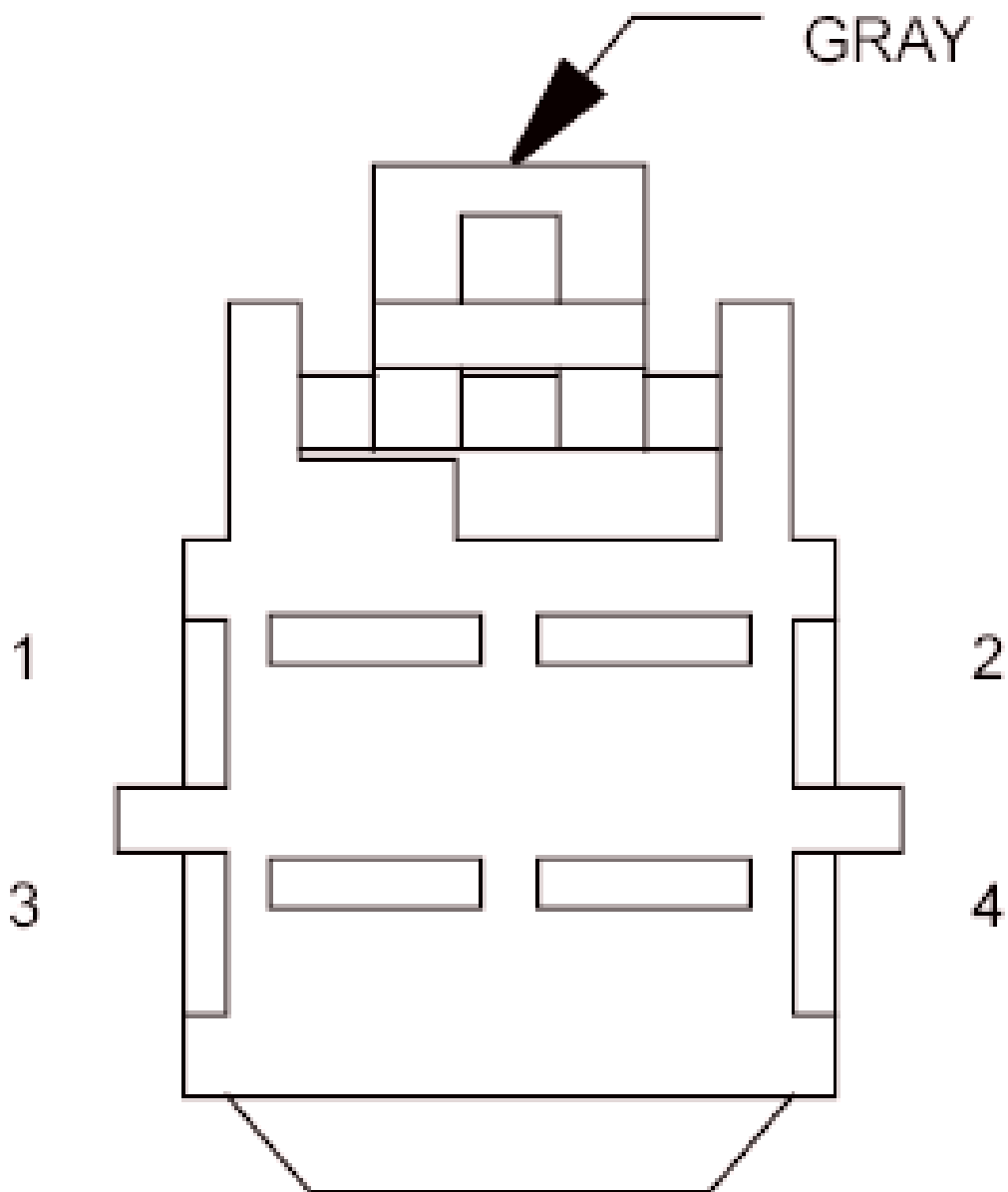
CIRCUIT

FUNCTION

	INTERNAL	FUSED B(+)
85	INTERNAL	FUSED B(+)
86	INTERNAL	TRANSMISSION CONTROL
87	T16 16YL/OR	TRANSMISSION CONTROL OUTPUT
87A	-	-

RESISTOR BLOCK-BLOWER MOTOR - GRAY 4 WAY

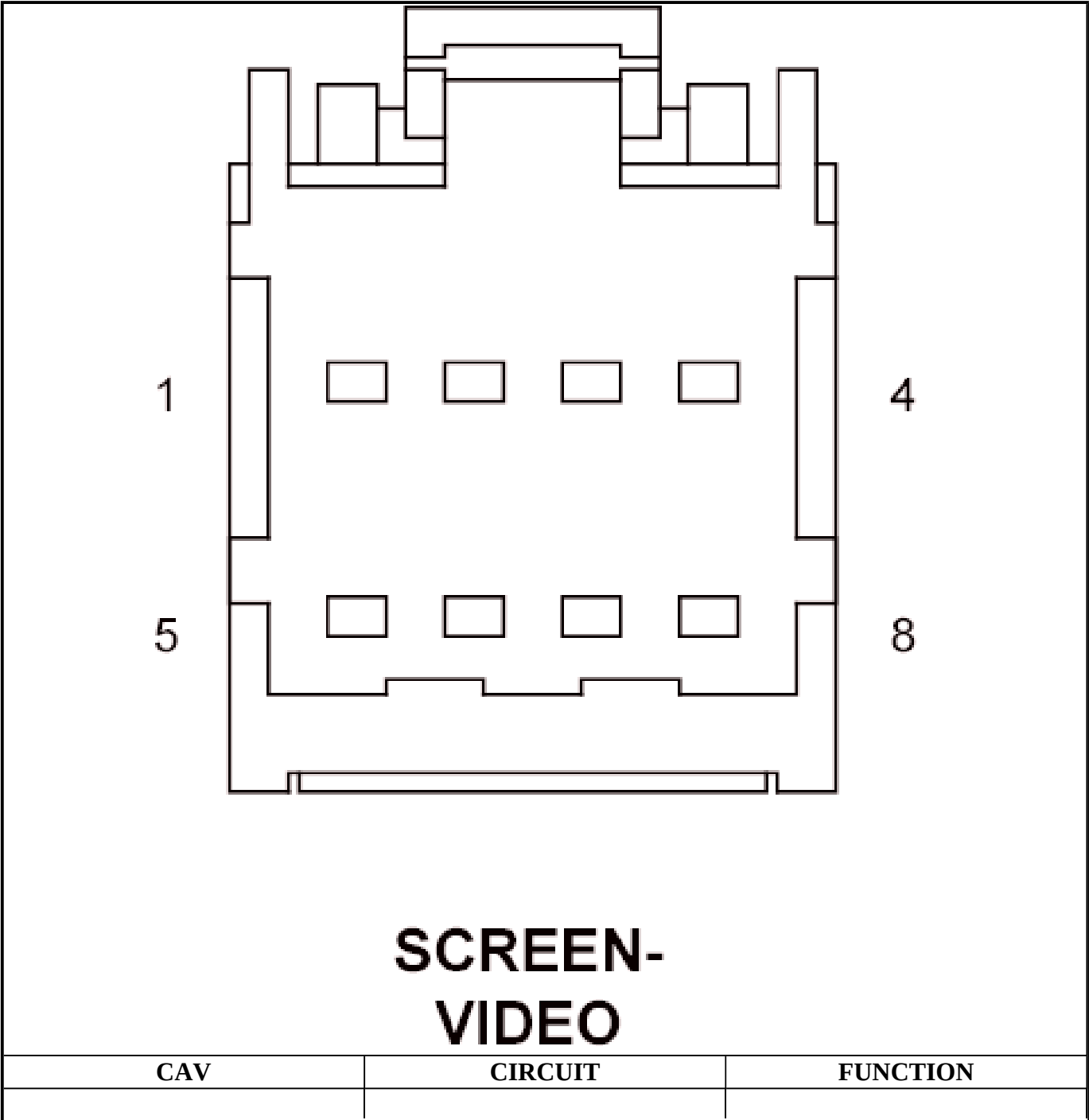




**RESISTOR
BLOCK-
BLOWER
MOTOR**

CAV	CIRCUIT	FUNCTION
1	C73 12DB/VT	FRONT BLOWER M2 SPEED
2	C72 16DB/OR	FRONT BLOWER M1 SPEED
3	C75 12DB/GY	BLOWER MOTOR HIGH DRIVER
4	C71 16DB/BR	FRONT BLOWER LOW SPEED

SCREEN-VIDEO - 8 WAY FEMALE



1	D264 20WT	CAN C BUS (-)
2	-	-
3	Z910 18BK	GROUND
4	A413 18RD	FUSED B(+) (I.O.D.)
5	D265 20WT/OR	CAN C BUS (+)
6	-	-
7	-	-
8	-	-

SEAT BELT-BUCKLE TENSIONER-DRIVER - 4 WAY

SEAT BELT-
BUCKLE
TENSIONER-
DRIVER

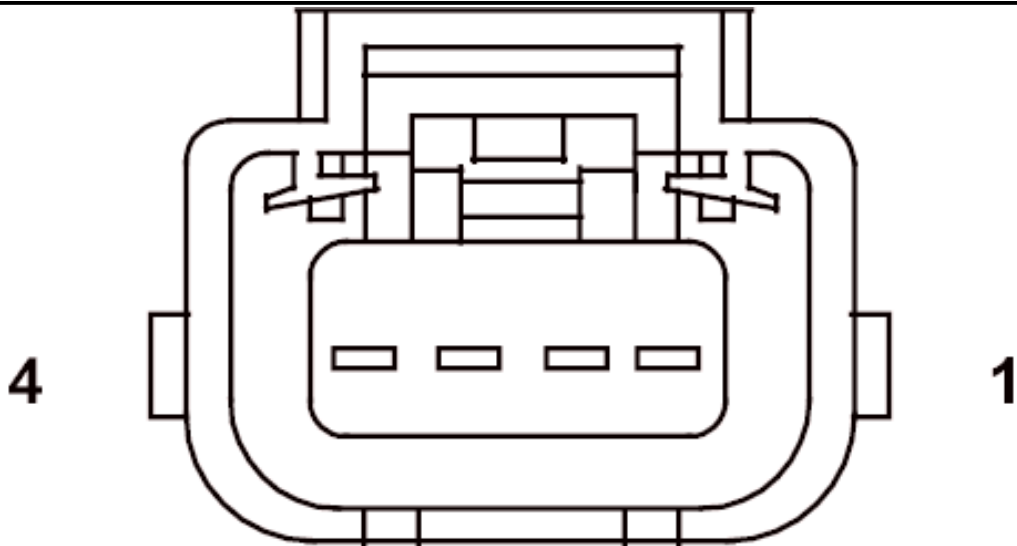
CAV	CIRCUIT	FUNCTION
1	R55 20LG/DG	DRIVER SEAT BELT BUCKLE TENSIONER LINE 1
2	R53 20LG/YL	DRIVER SEAT BELT BUCKLE TENSIONER LINE 2
3	R57 20LG/GY	DRIVER SEAT BELT SWITCH SENSE

4

Z913 20BK/WT

GROUND

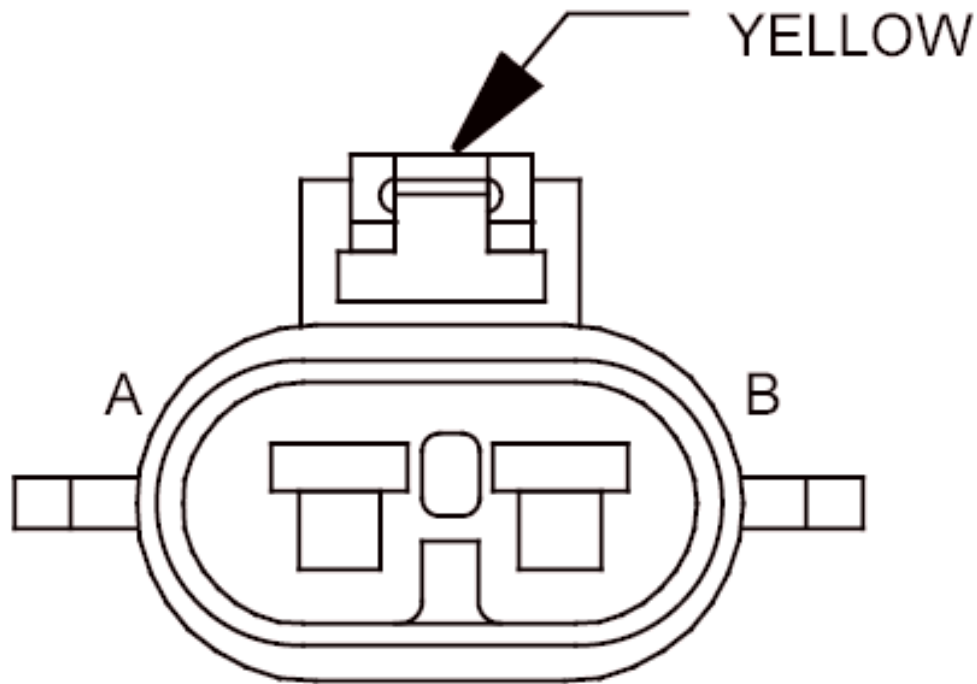
SEAT BELT-BUCKLE TENSIONER-PASSENGER - 4 WAY



SEAT BELT-
BUCKLE
TENSIONER-
PASSENGER

CAV	CIRCUIT	FUNCTION
1	R54 20LB/YL	LEFT SEAT BELT TENSIONER LINE 2
2	R56 20LB/DG	LEFT SEAT BELT TENSIONER LINE 1
3	R58 20LB/GY	PASSENGER SEAT BELT SWITCH SIGNAL
4	R60 20LB/TN	PASSENGER SEAT BELT SWITCH GROUND

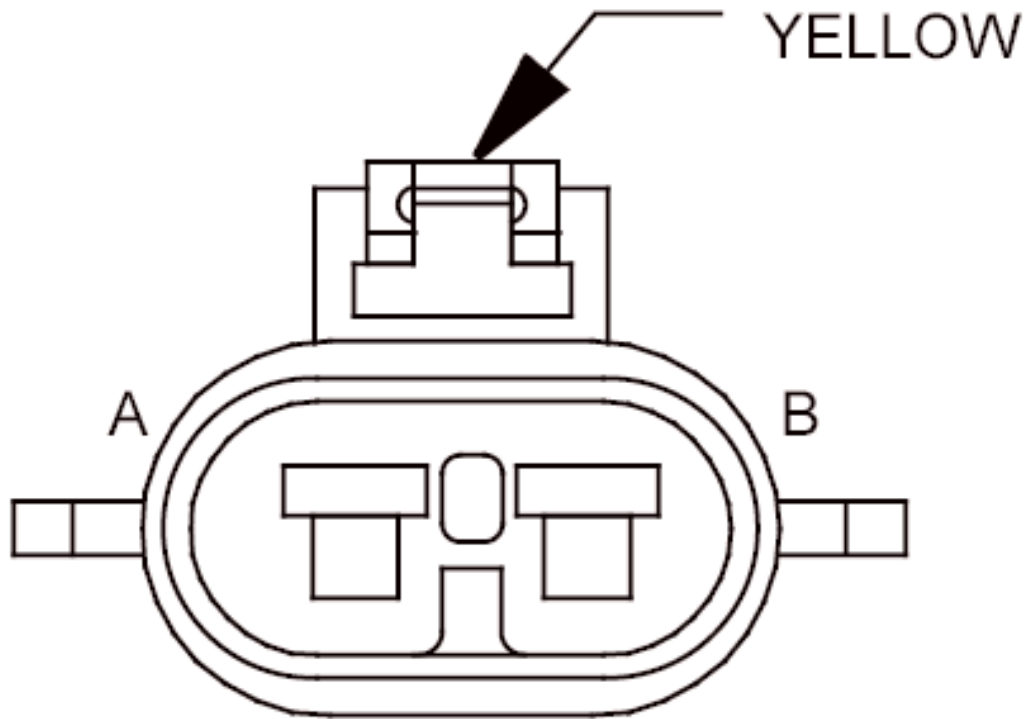
SEAT BELT-RETRACTOR TENSIONER-DRIVER - YELLOW 2 WAY



SEAT BELT- RETRACTOR TENSIONER- DRIVER

CAV	CIRCUIT	FUNCTION
A	R505 20LG/DG	DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1
B	R503 20LG/YL	DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2

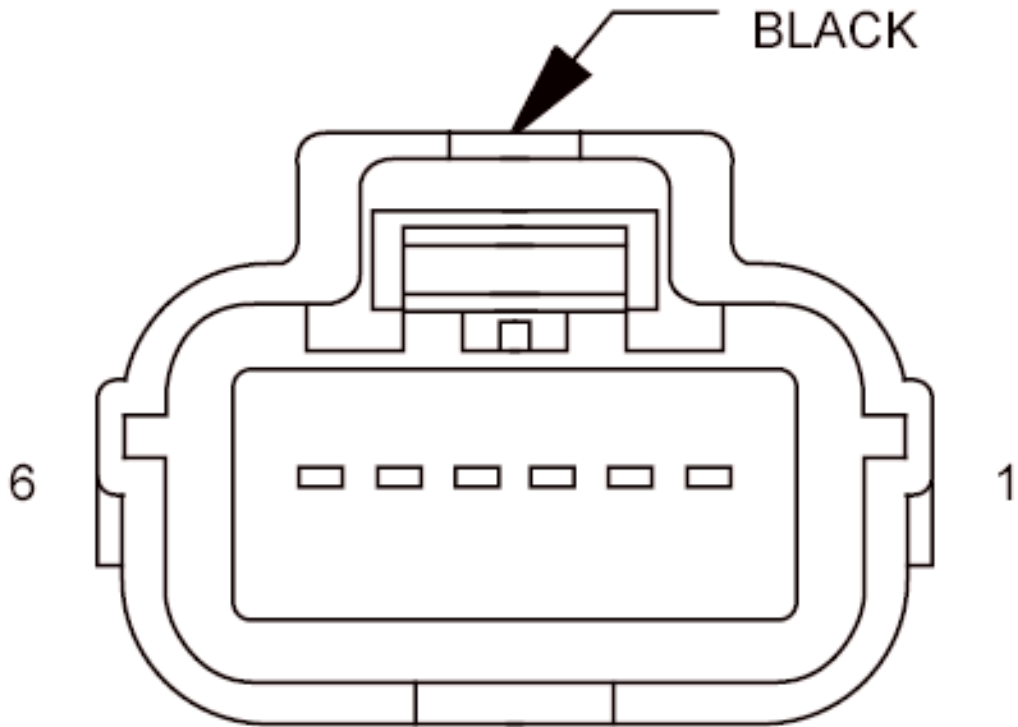
SEAT BELT-RETRACTOR TENSIONER-PASSENGER - YELLOW 2 WAY



SEAT BELT- RETRACTOR TENSIONER- PASSENGER

CAV	CIRCUIT	FUNCTION
A	R504 20LB/YL	PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2
B	R506 20LB/DG	PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1

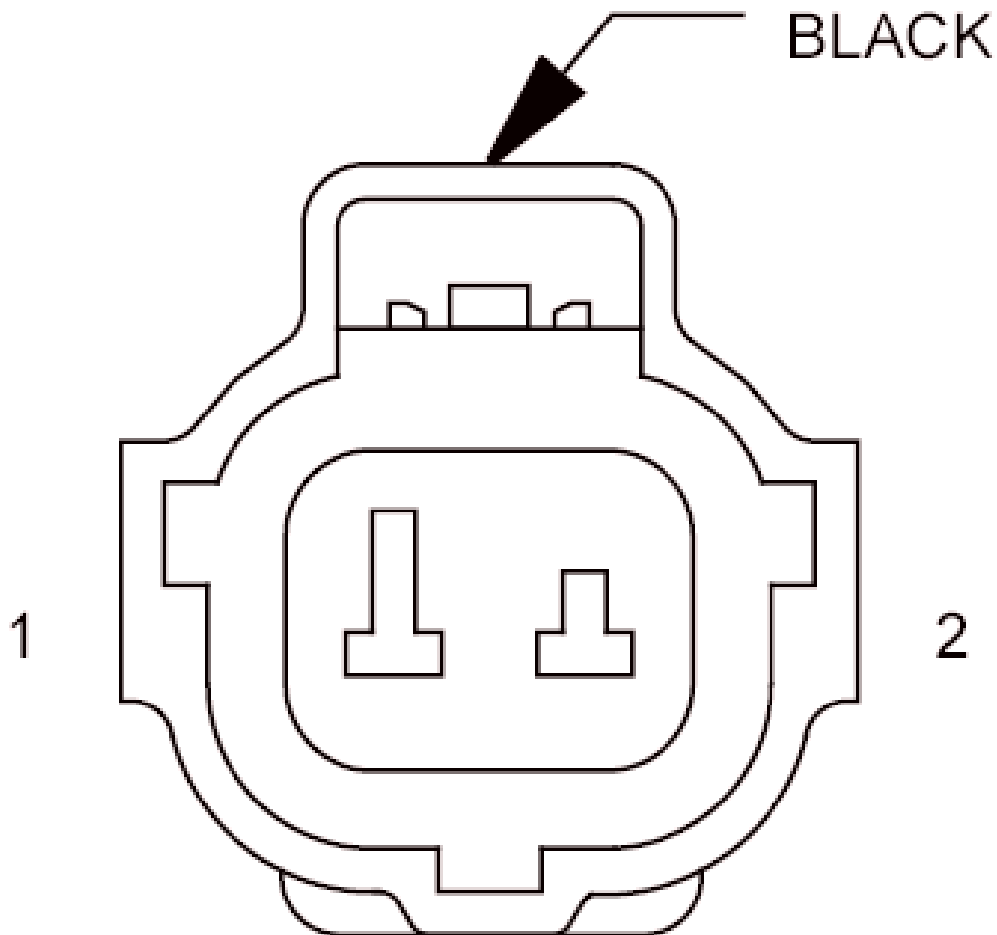
SENSOR-ACCELERATOR PEDAL POSITION - BLACK 6 WAY



SENSOR- ACCELERATOR PEDAL POSITION

CAV	CIRCUIT	FUNCTION
1	K855 18BR/OR	5 VOLT SUPPLY
2	K23 18BR/WT	APP SIGNAL 1
3	K167 18BR/YL	APP SENSOR GROUND 1
4	K400 18BR/VT	APP SENSOR GROUND 2
5	K29 18WT/BR	APP SIGNAL 2
6	K857 18BR/LG	5 VOLT SUPPLY

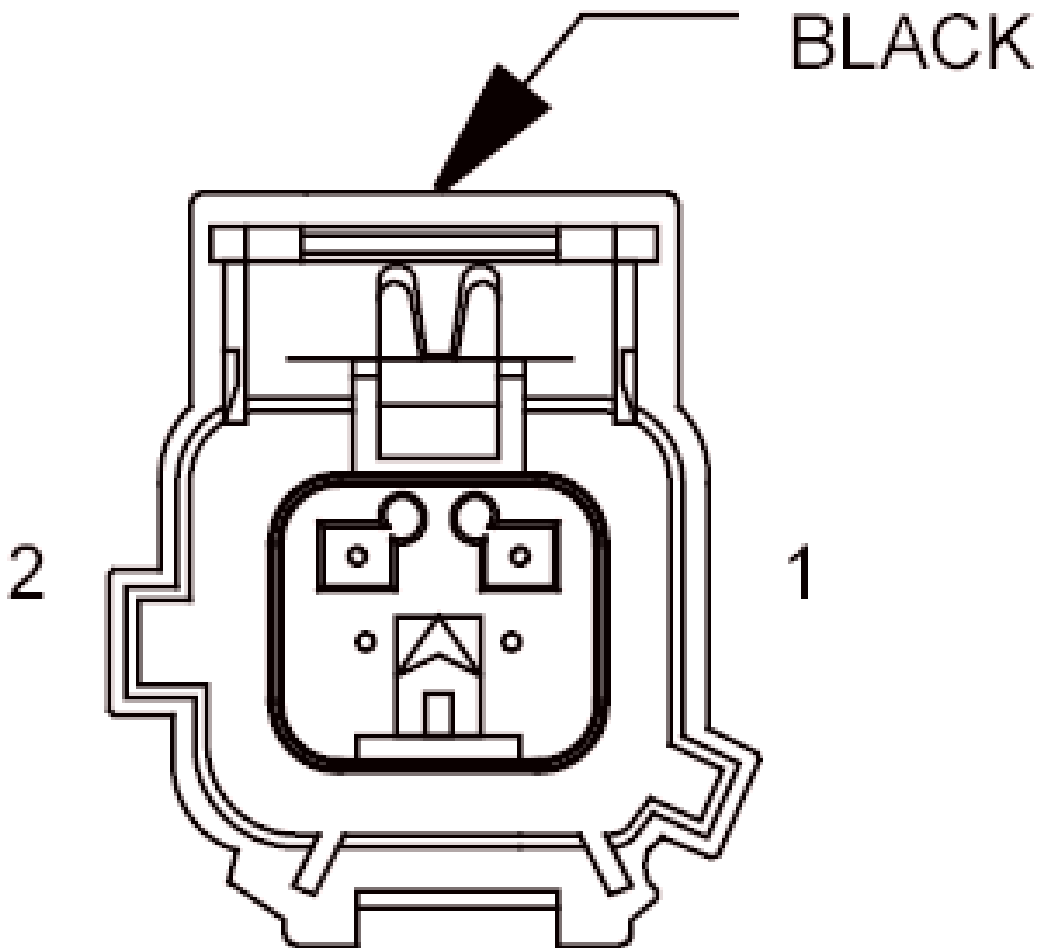
SENSOR-AMBIENT AIR TEMPERATURE - BLACK 2 WAY



**SENSOR-
AMBIENT AIR
TEMPERATURE**

CAV	CIRCUIT	FUNCTION
1	G31 18VT/LG	AAT SIGNAL
2	G931 18VT/BR	SENSOR GROUND

SENSOR-BRAKE FLUID LEVEL - BLACK 2 WAY



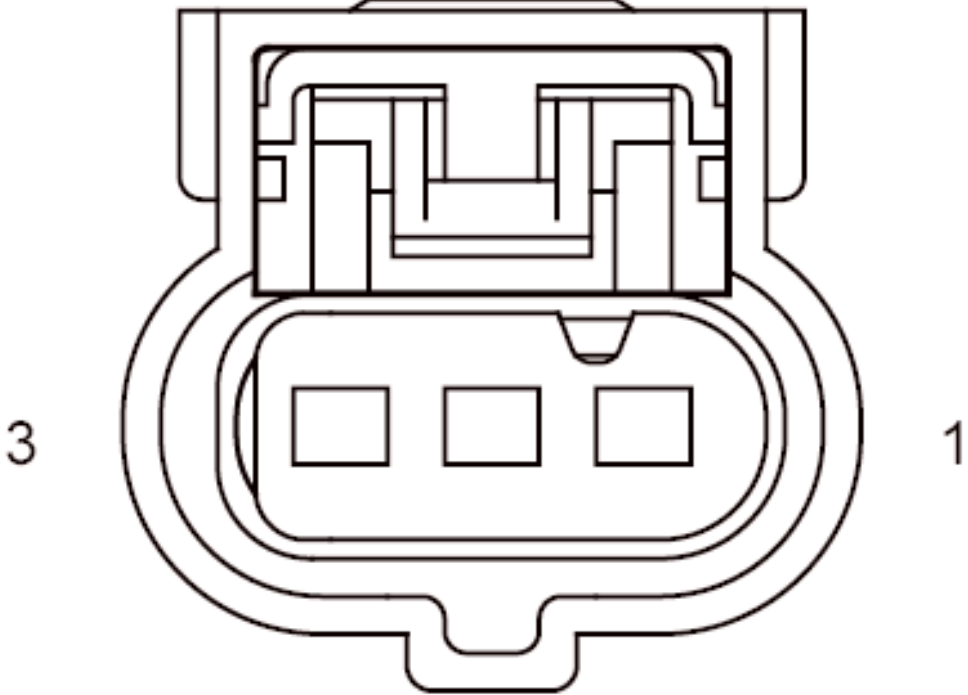
**SENSOR-
BRAKE
FLUID
LEVEL**

CAV	CIRCUIT	FUNCTION
1	B20 20DG/OR	BRAKE FLUID LEVEL SIGNAL
2	P37 20LG/TN	SWITCH RETURN

K91 18DB/YL

SENSOR GROUND (4X4)

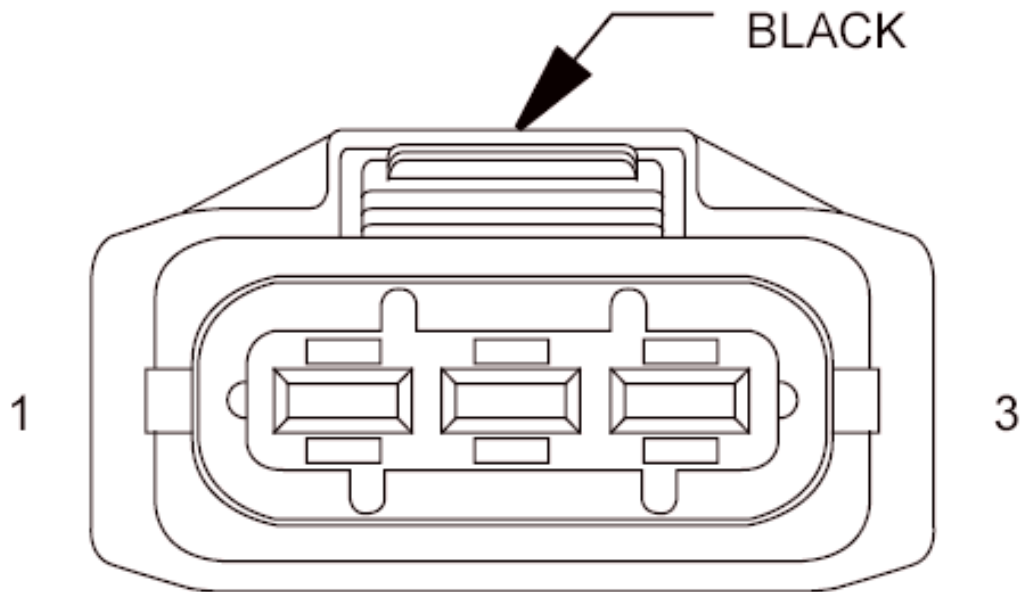
SENSOR-CAMSHAFT POSITION - GRAY 3 WAY (3.7L)



SENSOR-
CAMSHAFT
POSITION
(3.7L)

CAV	CIRCUIT	FUNCTION
1	K857 18BR/LG	5 VOLT SUPPLY
2	K900 18DB/DG	SENSOR GROUND
3	K44 18DB/GY	CMP SIGNAL

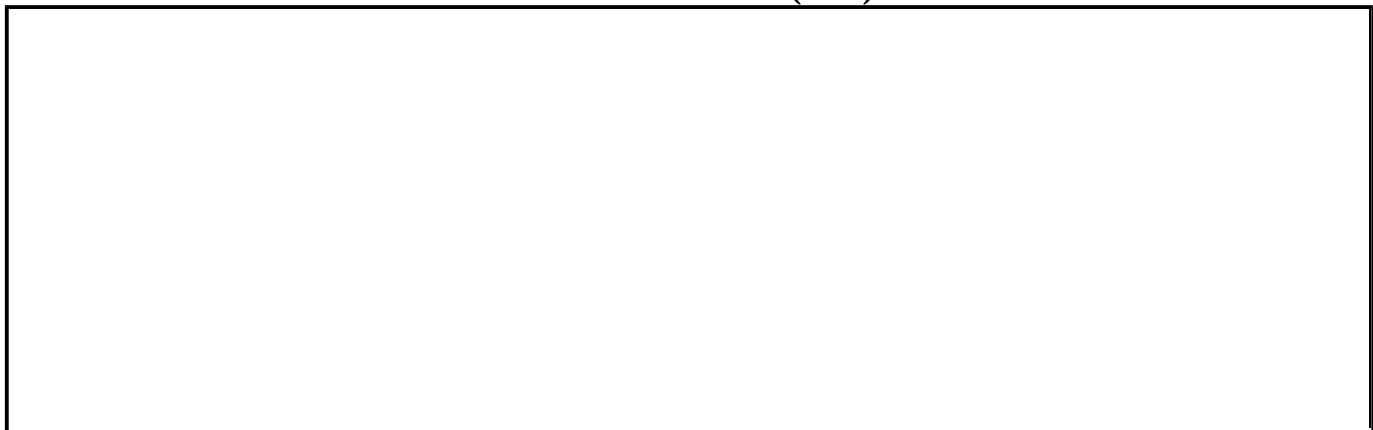
SENSOR-CAMSHAFT POSITION - BLACK 3 WAY (DIESEL)

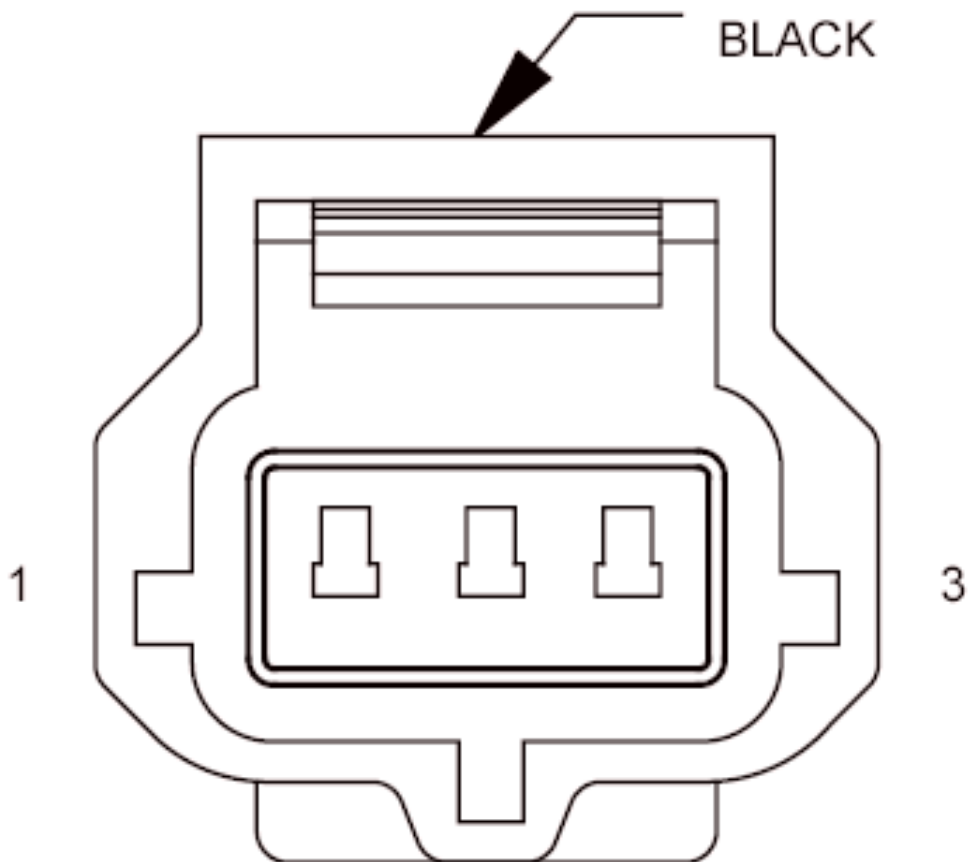


**SENSOR-
CAMSHAFT
POSITION
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	K944 20BK/GY	CMP RETURN
2	K44 20DB/GY	CMP SIGNAL
3	K844 20DB/YL	CMP 5 VOLT SUPPLY

SENSOR-CRANKSHAFT POSITION - BLACK 3 WAY (3.7L)



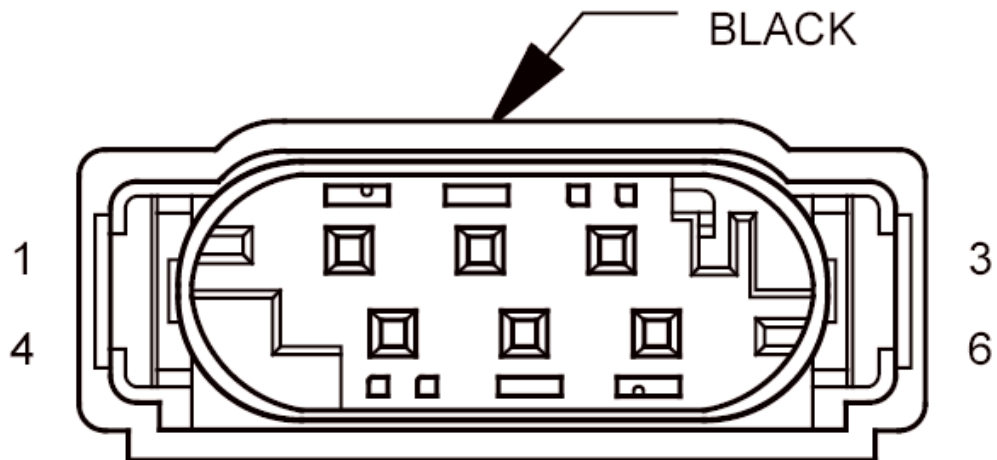


**SENSOR-
CRANKSHAFT
POSITION**

(3.7L)

CAV	CIRCUIT	FUNCTION
1	K24 18BR/LB	CKP SIGNAL
2	K900 18DB/DG	SENSOR GROUND
3	K855 18BR/OR	5 VOLT SUPPLY

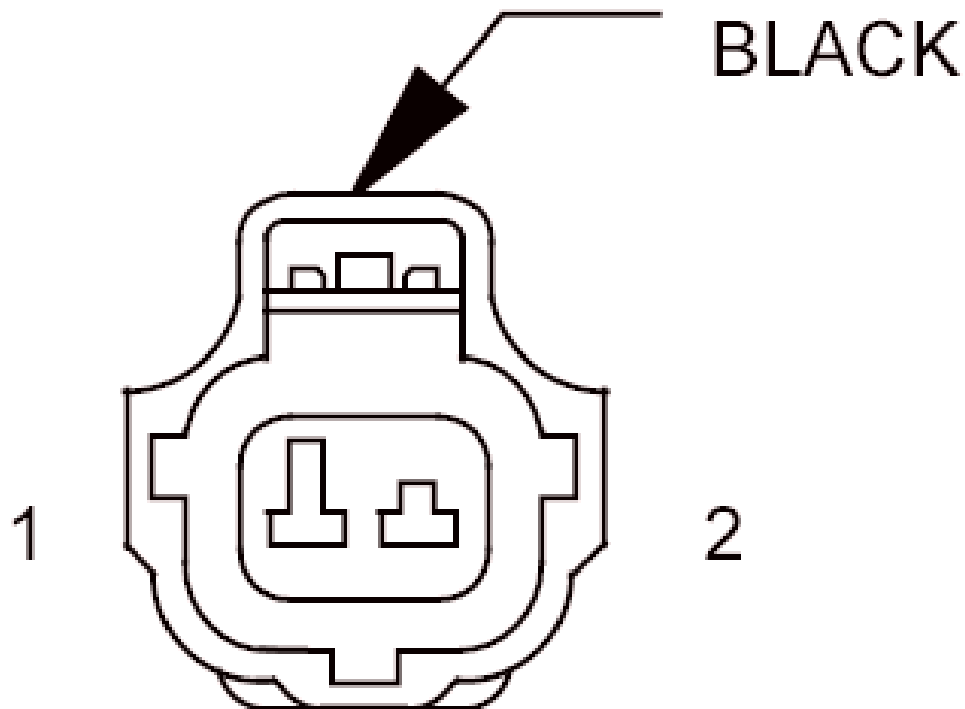
SENSOR-CRANKSHAFT POSITION - BLACK 3 WAY (DIESEL)



**SENSOR-
DYNAMICS
(ESP)**

CAV	CIRCUIT	FUNCTION
1	Z914 16BK	GROUND
2	D464 20WT/YL	DYNAMICS SENSOR LOW DATA LINK
3	D465 20WT/DB	DYNAMICS SENSOR HIGH DATA LINK
4	F941 20PK/LG	IGNITION SWITCH OUTPUT (RUN-START)
5	-	-
6	-	-

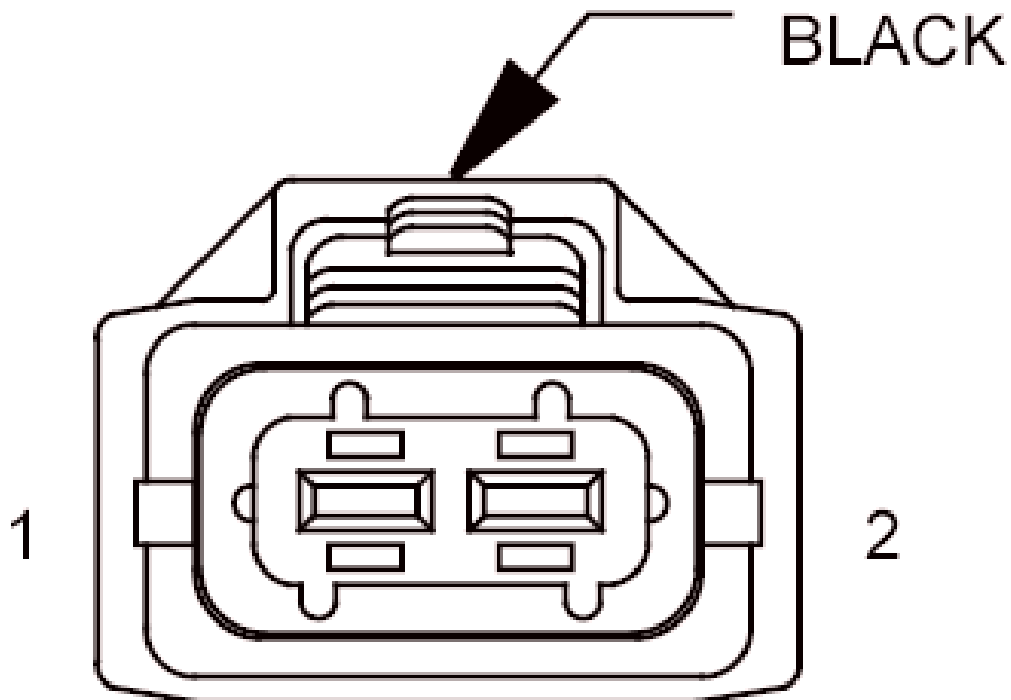
SENSOR-ENGINE COOLANT TEMPERATURE - BLACK 2 WAY (3.7L) FEMALE



SENSOR- ENGINE COOLANT TEMPERATURE (3.7L)

CAV	CIRCUIT	FUNCTION
1	K2 20VT/OR	ECT SIGNAL
2	K900E 20DB/DG	SENSOR GROUND

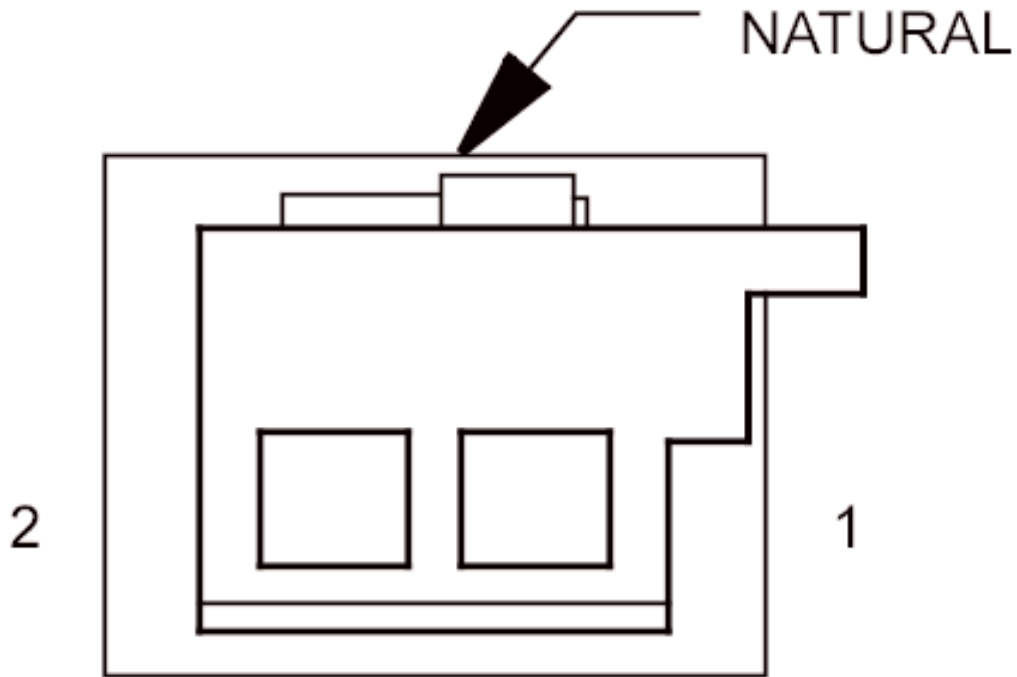
SENSOR-ENGINE COOLANT TEMPERATURE - BLACK 2 WAY (DIESEL)



SENSOR- ENGINE COOLANT TEMPERATURE (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K2 20VT/OR	ECT SIGNAL
2	K914 18BR/WT	SENSOR RETURN

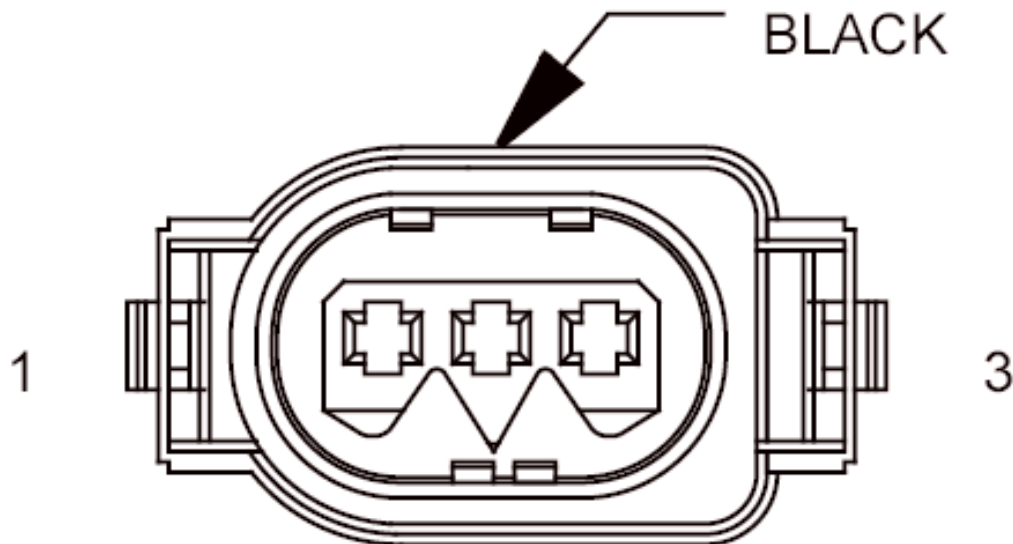
SENSOR-EVAPORATOR TEMPERATURE - NATURAL 2 WAY FEMALE



SENSOR- EVAPORATOR TEMPERATURE

CAV	CIRCUIT	FUNCTION
1	C121 20DB/DG	SENSOR GROUND
2	C21 20DB/LG	EVAPORATOR TEMPERATURE SENSOR SIGNAL

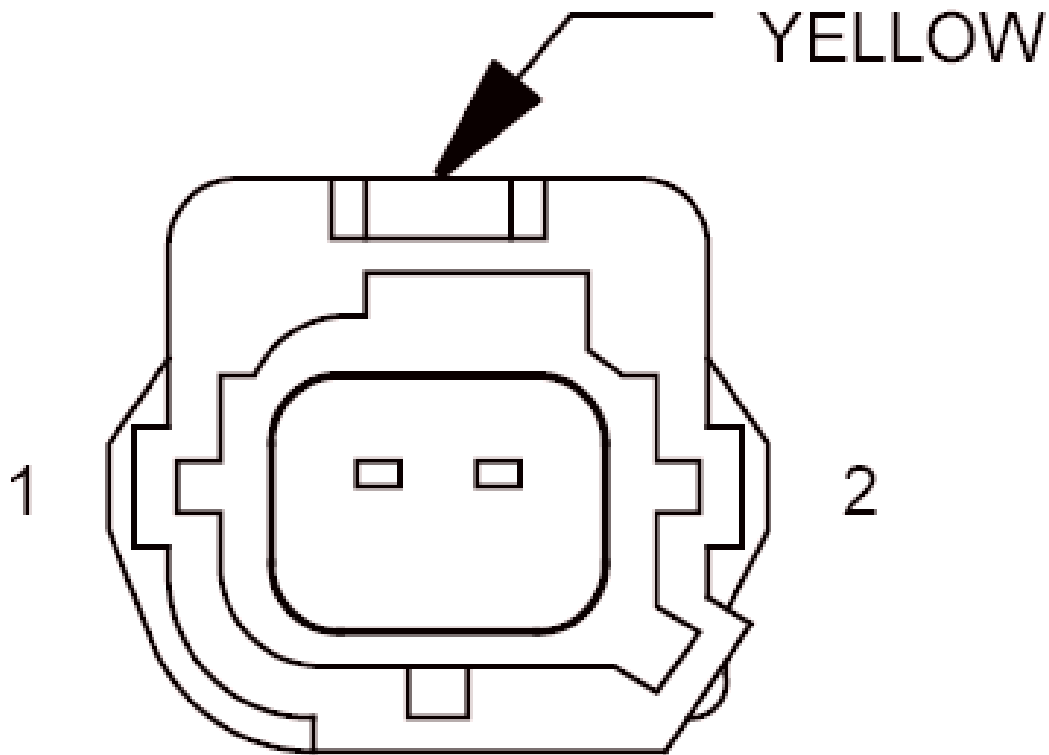
SENSOR-EXHAUST DIFFERENTIAL PRESSURE - BLACK 3 WAY (DIESEL DPF)



SENSOR- EXHAUST DIFFERENTIAL PRESSURE (DIESEL DPF)

CAV	CIRCUIT	FUNCTION
1	K355 20BR/DG	EXHAUST DIFFERENTIAL PRESSURE SIGNAL
2	K951 20BR/DB	EXHAUST DIFFERENTIAL PRESSURE RETURN
3	K354 20BR/LG	EXHAUST DIFFERENTIAL PRESSURE 5 VOLT SUPPLY

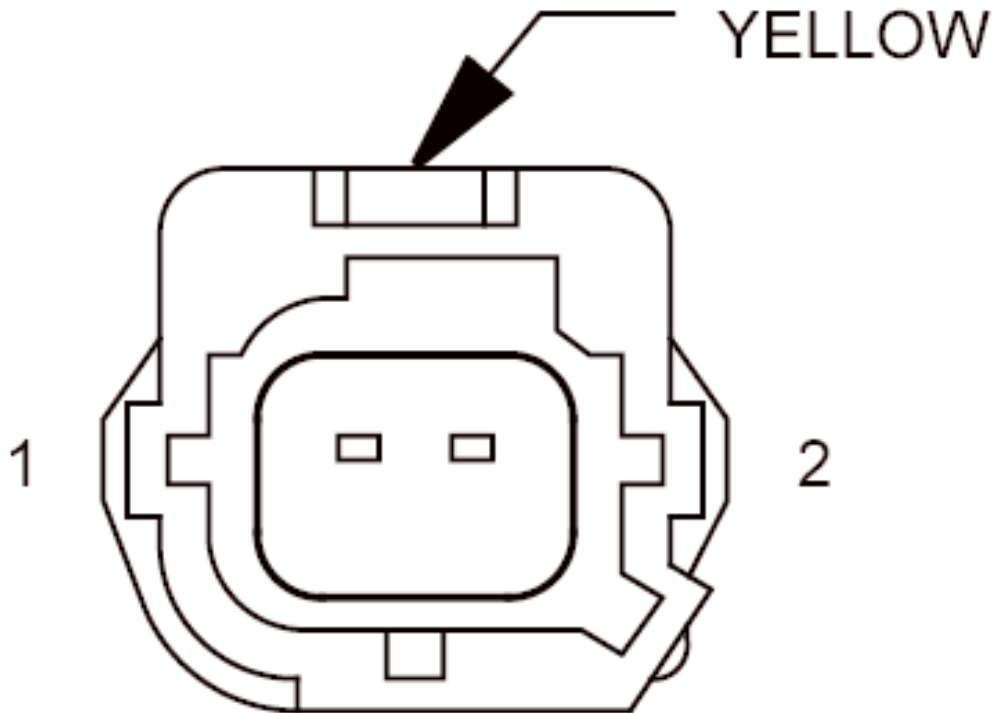
SENSOR-FRONT IMPACT-LEFT - YELLOW 2 WAY



**SENSOR-
FRONT
IMPACT-
LEFT**

CAV	CIRCUIT	FUNCTION
1	R81 20LB/WT	LEFT FRONT IMPACT SENSOR GROUND
2	R79 20LB/VT	LEFT FRONT IMPACT SENSOR SIGNAL

SENSOR-FRONT IMPACT-RIGHT - YELLOW 2 WAY

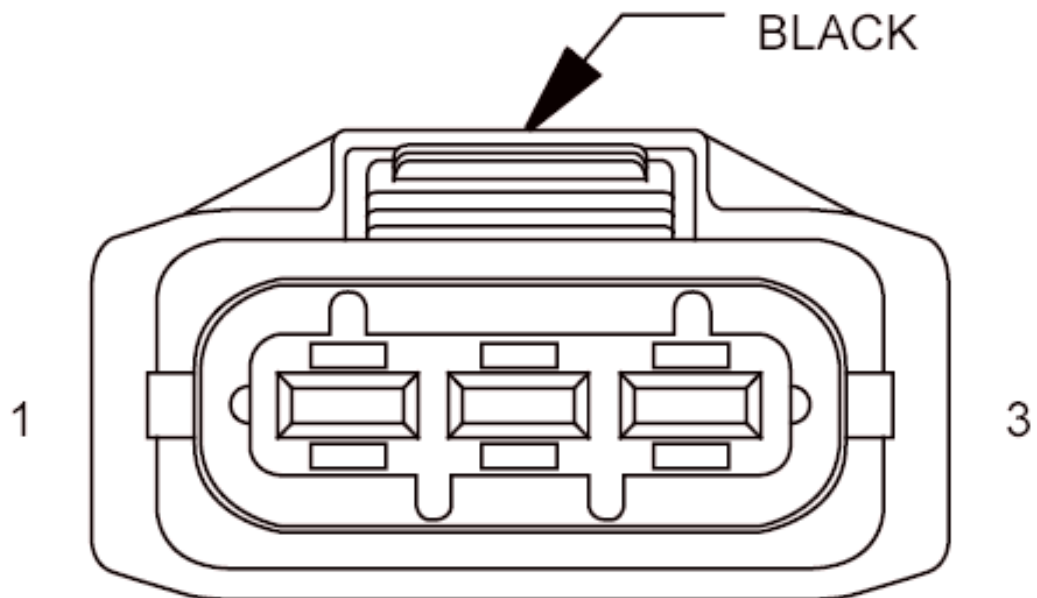


**SENSOR-
FRONT
IMPACT-
RIGHT**

CAV	CIRCUIT	FUNCTION
1	R82 20WT/LB	RIGHT FRONT IMPACT SENSOR GROUND
2	R80 20VT/LB	RIGHT FRONT IMPACT SENSOR SIGNAL

SENSOR-FUEL PRESSURE - BLACK 3 WAY (DIESEL)

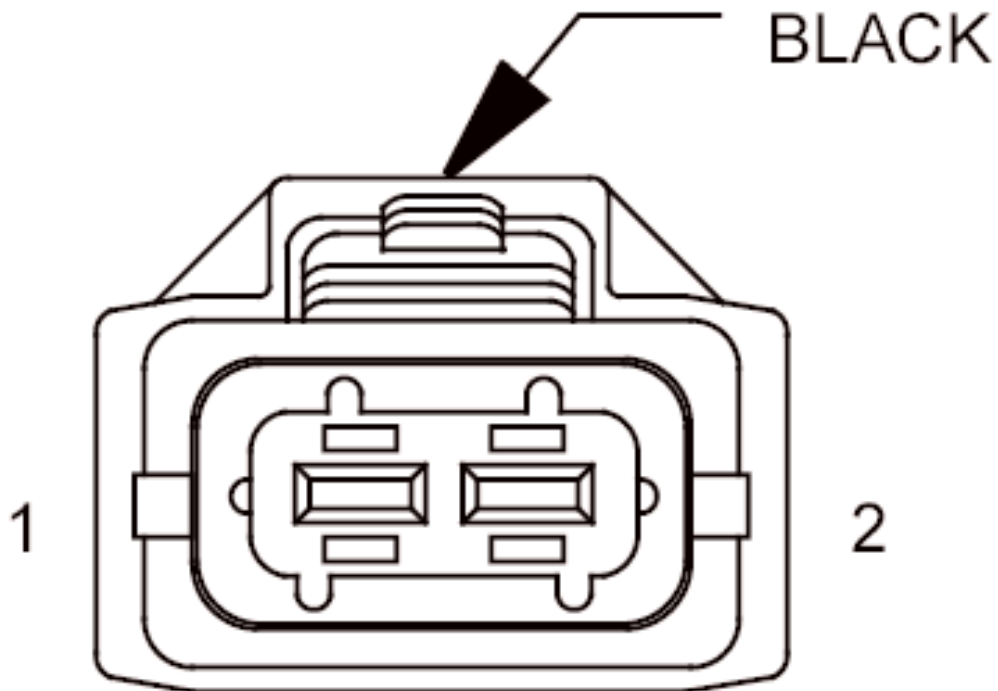
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**SENSOR-
FUEL
PRESSURE
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	K359 20YL/BR	FUEL PRESSURE RETURN
2	K181 20BR/YL	FUEL PRESSURE SIGNAL
3	K350 20BR/YL	FUEL PRESSURE 5 VOLT SUPPLY

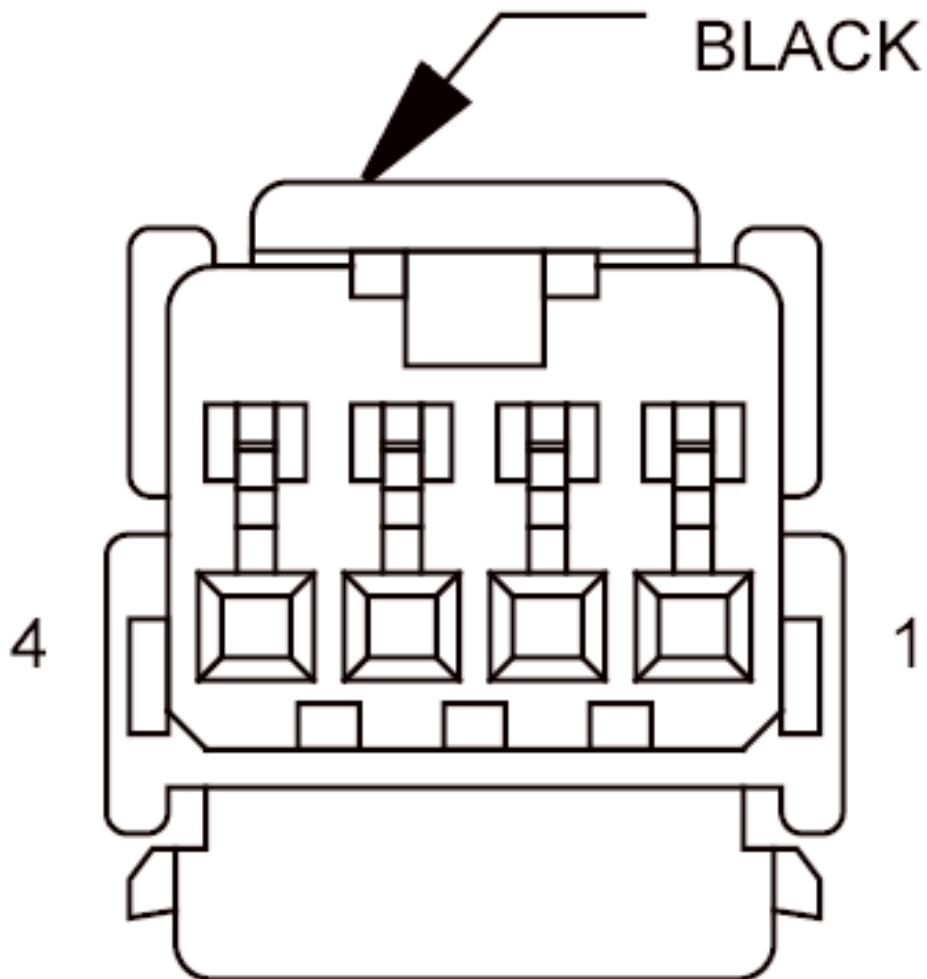
SENSOR-FUEL TEMPERATURE - BLACK 2 WAY (DIESEL)



SENSOR- FUEL TEMPERATURE (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K914 18BR/WT	SENSOR RETURN
2	K156 20BR/YL	FUEL TEMPERATURE SIGNAL

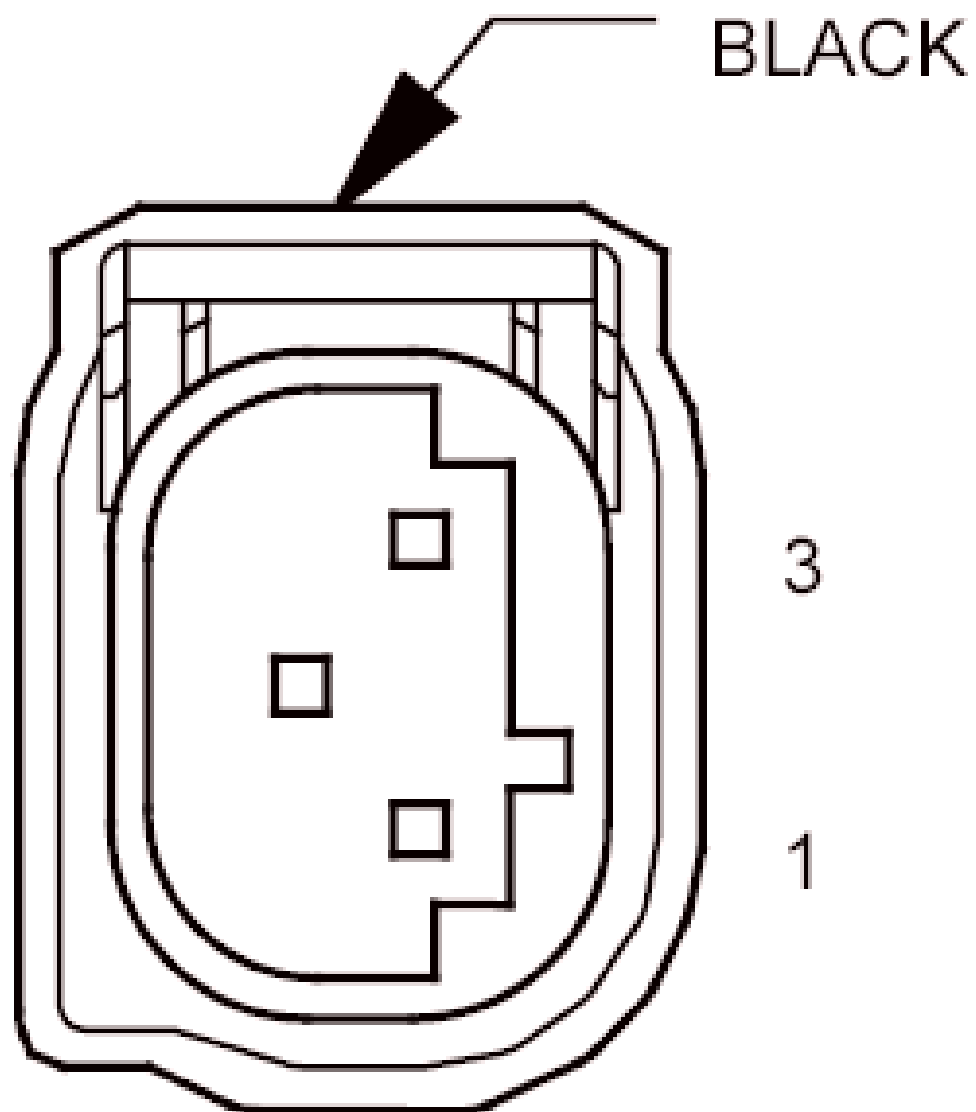
SENSOR-INFRARED - BLACK 4 WAY



SENSOR- INFRARED

CAV	CIRCUIT	FUNCTION
1	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	-	-
3	C83 20DB/LG	INFRARED SENSOR SIGNAL
4	C830 20DB/YL	INFRARED SENSOR RETURN

SENSOR-INLET AIR PRESSURE - BLACK 3 WAY (DIESEL)

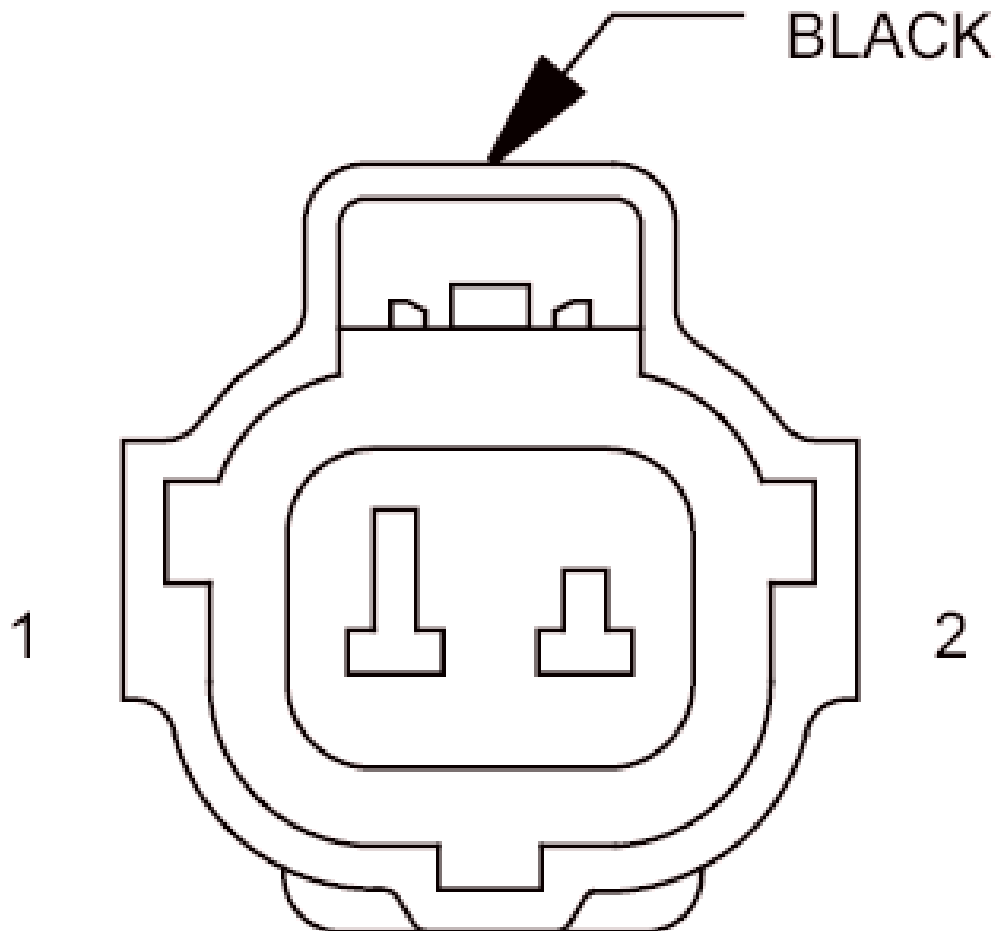


**SENSOR-
INLET AIR
PRESSURE**

(B15051)

CAV	CIRCUIT	FUNCTION
1	K901 20BR/GY	INLET AIR PRESSURE RETURN
2	K68 20BR/LG	INLET AIR PRESSURE SIGNAL
3	K668 20BR	INLET AIR PRESSURE 5 VOLT SUPPLY

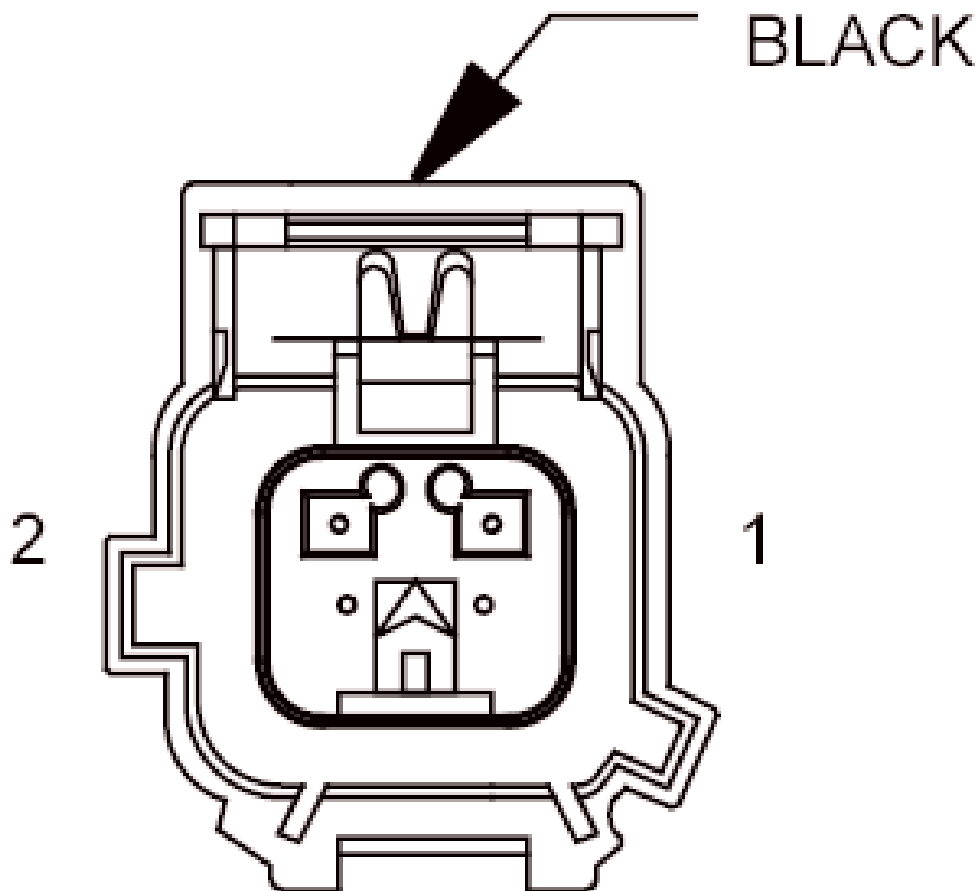
SENSOR-INPUT SPEED - BLACK 2 WAY (RLE)



**SENSOR-
INPUT
SPEED
(RLE)**

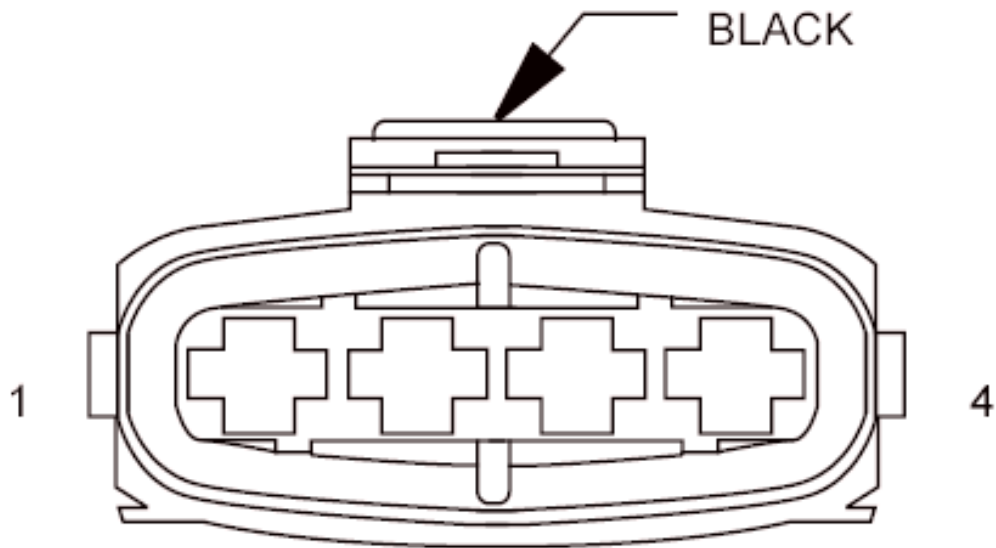
CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SENSOR GROUND
2	T52 18DG/OR	INPUT SPEED SIGNAL

SENSOR-INTAKE AIR TEMPERATURE - BLACK 2 WAY (GAS)



**SENSOR-
INTAKE AIR
TEMPERATURE
(GAS)**

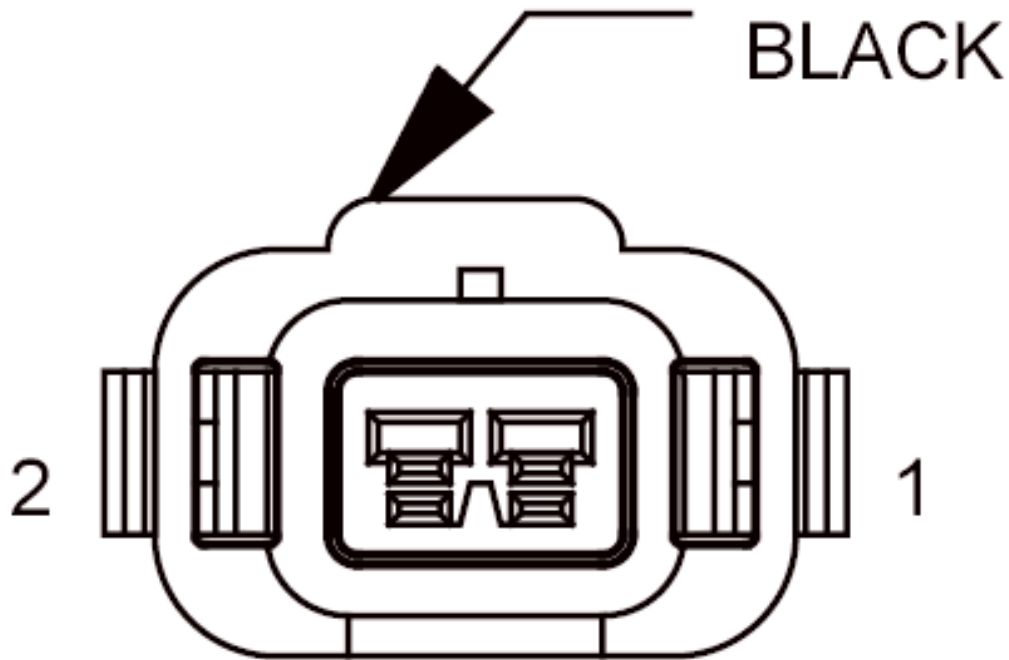
CAV	CIRCUIT	FUNCTION
1	K21 18DB/LG	IAT SIGNAL
2	K900 18DB/DG	SENSOR GROUND



**SENSOR-
INTAKE AIR
TEMPERATURE/
BOOST
PRESSURE
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	K656 20GY/BR	SENSOR RETURN
2	K48 20DB/WT	INTAKE AIR TEMPERATURE SIGNAL
3	K356 20BR/GY	BOOST PRESSURE 5 VOLT SUPPLY
4	K37 20BR/OR	BOOST PRESSURE SIGNAL

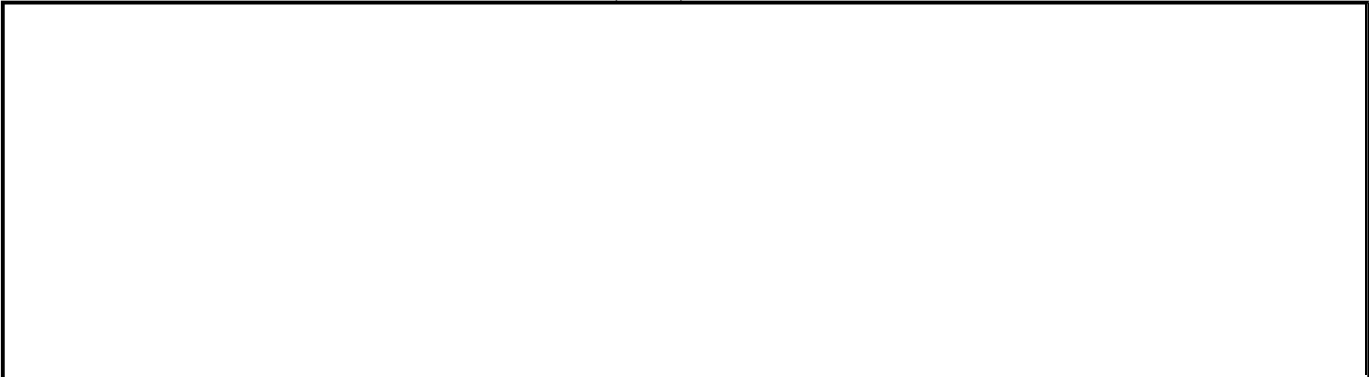
SENSOR-KNOCK NO. 1 - BLACK 2 WAY (3.7L)

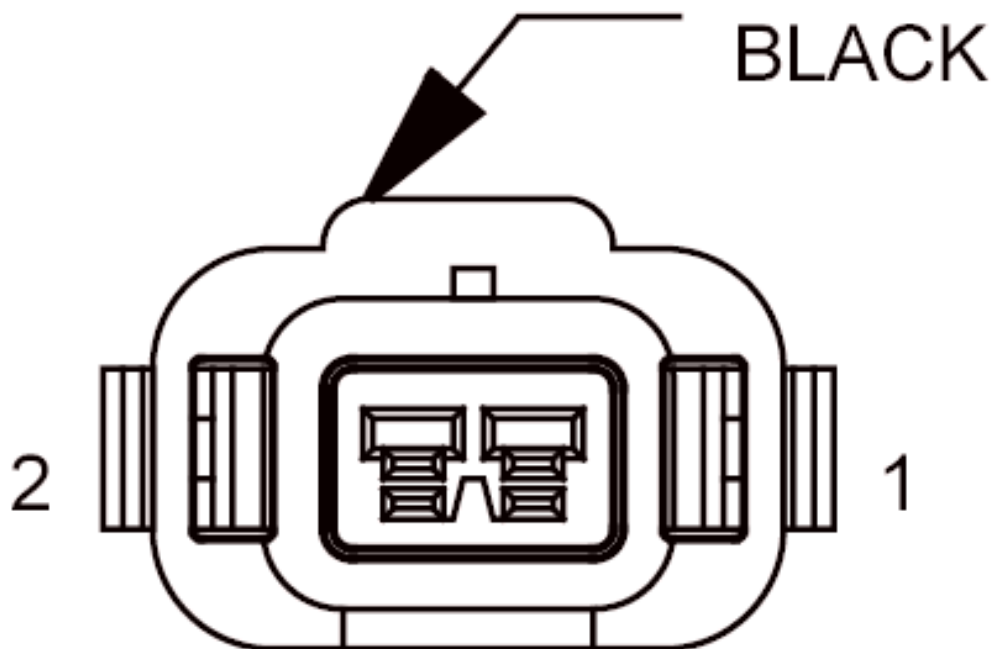


SENSOR- KNOCK NO. 1 (3.7L)

CAV	CIRCUIT	FUNCTION
1	K42 18DB/YL	KS SIGNAL 1
2	K942 18BR/LG	KS RETURN 1

SENSOR-KNOCK NO. 2 - BLACK 2 WAY (3.7L)

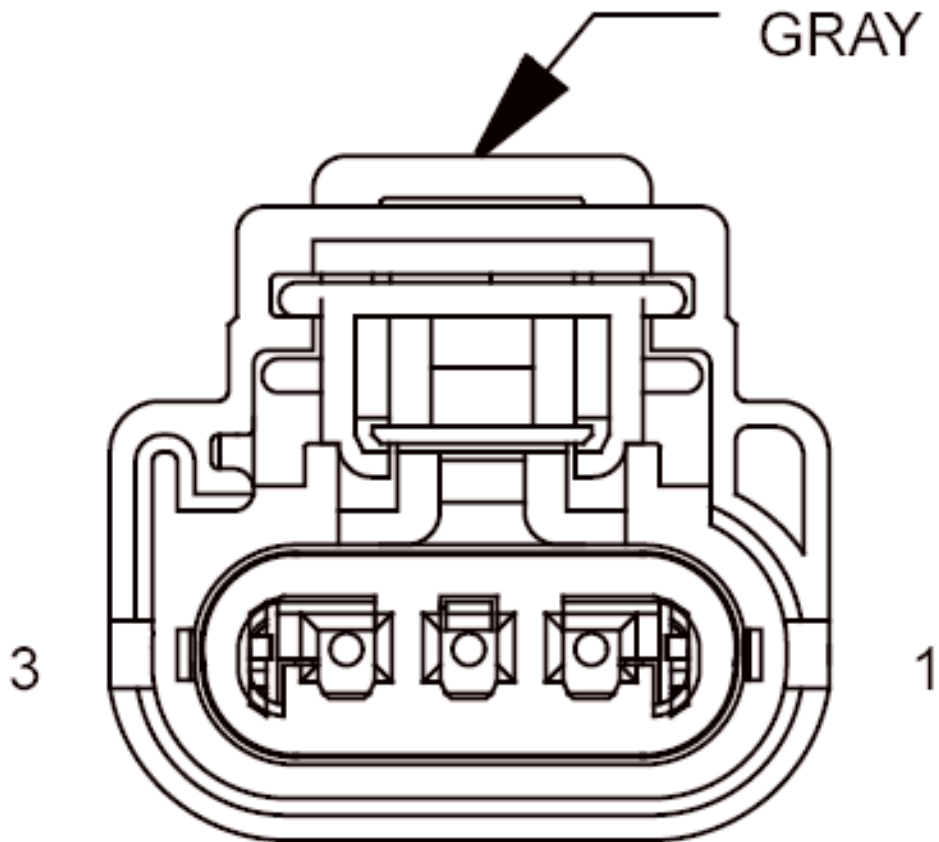




SENSOR- KNOCK NO. 2 (3.7L)

CAV	CIRCUIT	FUNCTION
1	K242 18BR/WT	KS SIGNAL 2
2	K924 18WT/BR	KS RETURN 2

SENSOR-MAP - GRAY 3 WAY (GAS)

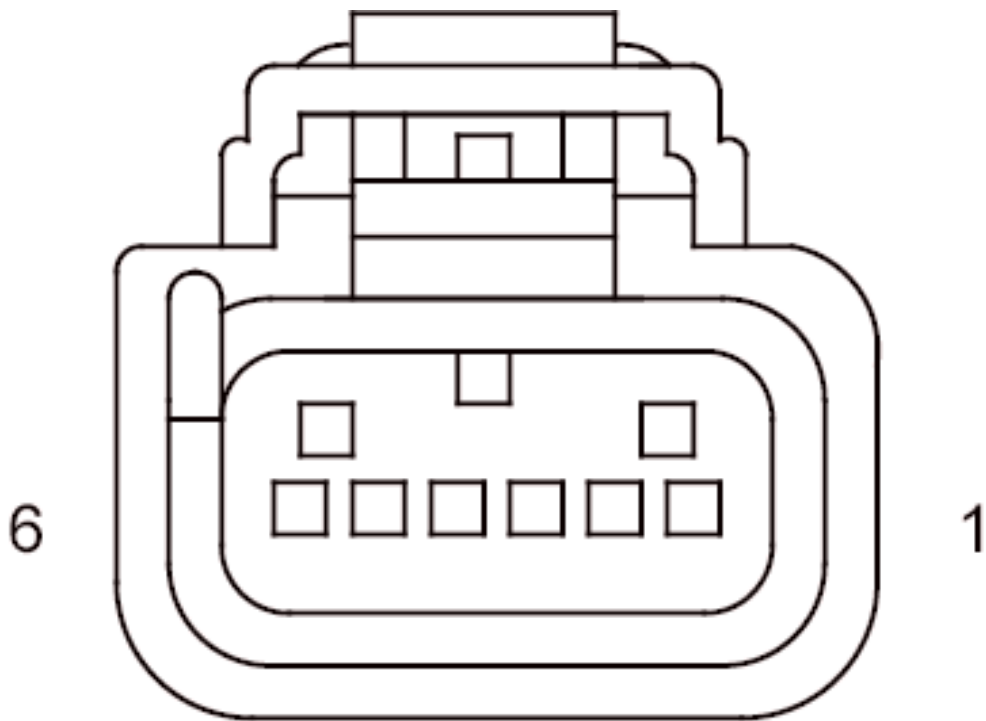


SENSOR-MAP

(GAS)

CAV	CIRCUIT	FUNCTION
1	K1 20VT/BR	MAP SIGNAL
2	K900 18DB/DG	SENSOR GROUND
3	K857 18BR/LG	5 VOLT SUPPLY

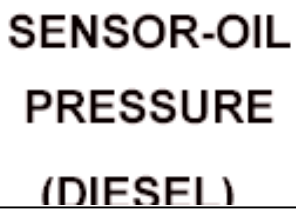
SENSOR-MASS AIR FLOW - 6 WAY (DIESEL)



**SENSOR-
MASS AIR
FLOW
(DIESEL)**

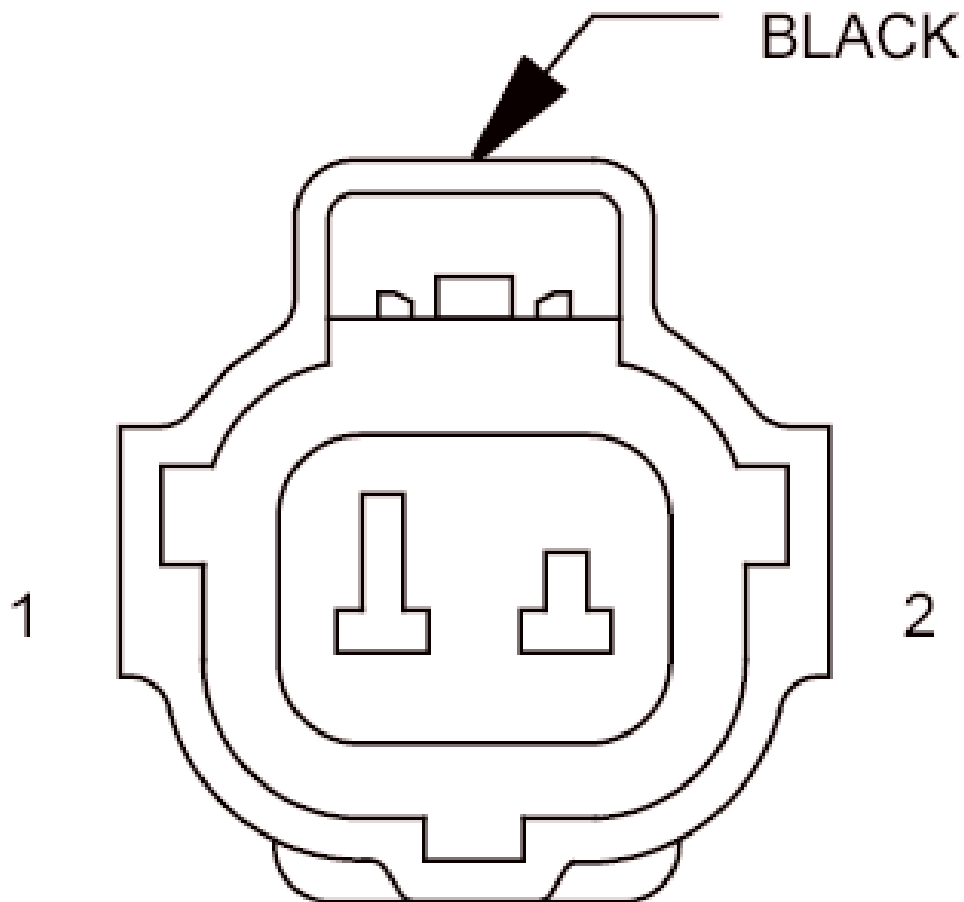
CAV	CIRCUIT	FUNCTION
1	-	-
2	F888 20BR/PK	MAF 8 VOLT SUPPLY
3	F344 18BR/GY	FUSED ASD RELAY OUTPUT
4	-	-
5	K957 18BK/OR	MAF RETURN
6	K157 20BR/OR	MAF SIGNAL

SENSOR-OIL PRESSURE - DK. GREEN 3 WAY (DIESEL)



CAV	CIRCUIT	FUNCTION
1	K357 20BR/WT	EOP 5 VOLT SUPPLY
2	G6 20VT/GY	EOP SIGNAL
3	K936 20BR/YL	EOP RETURN

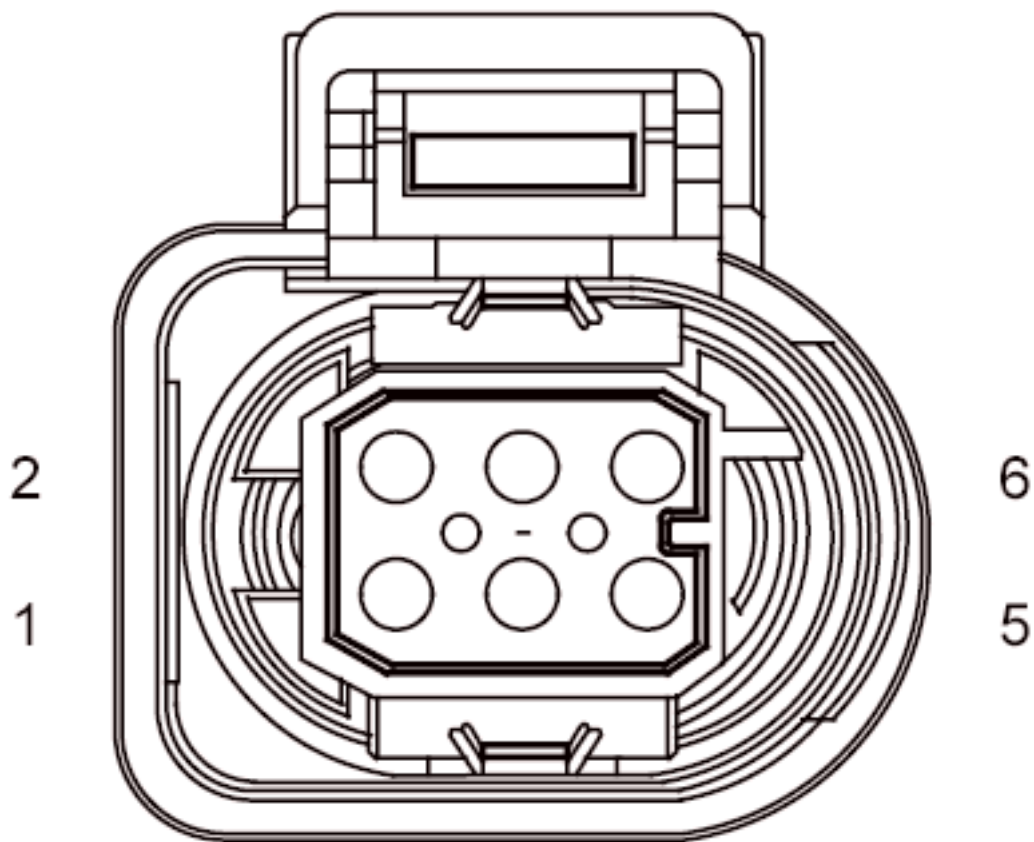
SENSOR-OUTPUT SPEED - BLACK 2 WAY (RLE)



**SENSOR-
OUTPUT
SPEED
(RLE)**

CAV	CIRCUIT	FUNCTION
1	T13 18DG/VT	SENSOR GROUND
2	T14 18DG/BR	OUTPUT SPEED SIGNAL

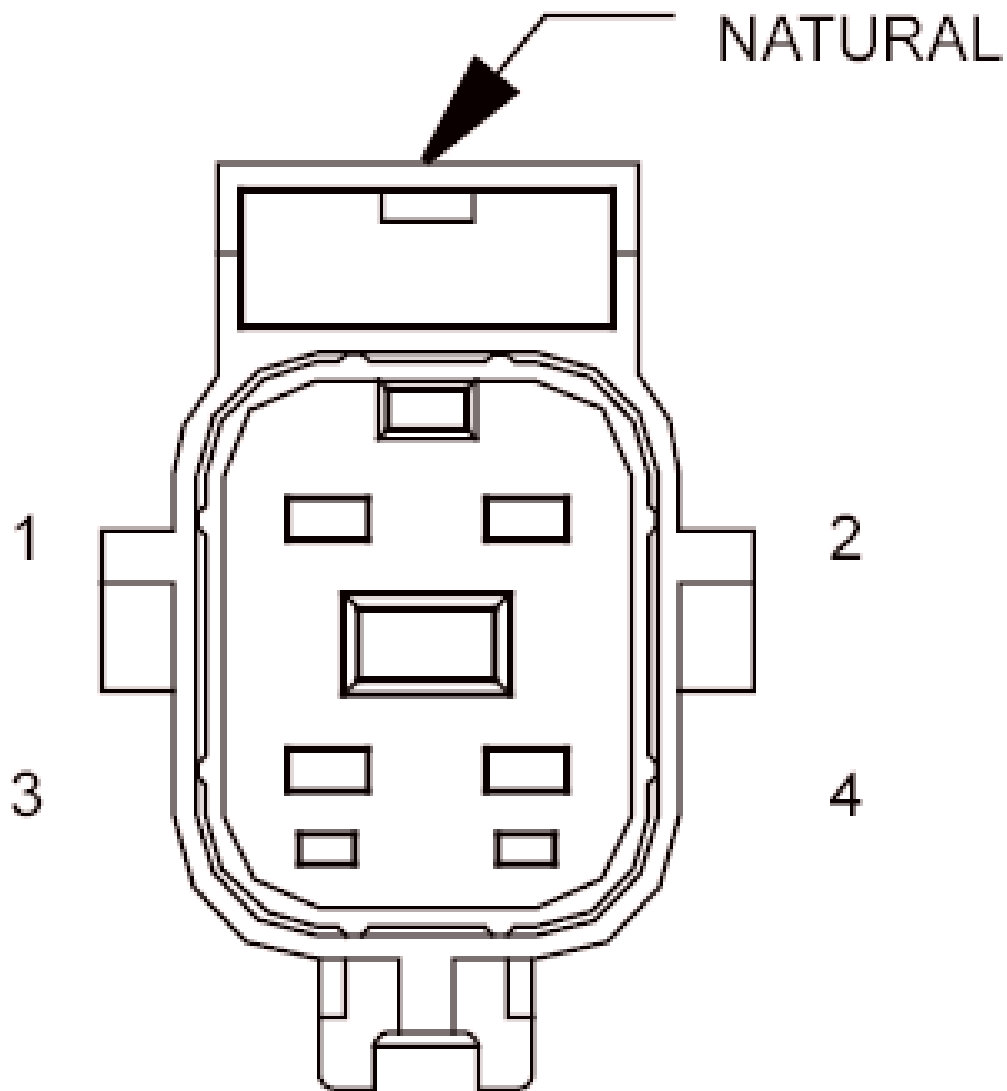
SENSOR-OXYGEN - 6 WAY (DIESEL)



SENSOR- OXYGEN (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K89 20BR/LG	O2 1/1 POSITIVE CURRENT CONTROL
2	K902 20BR/DG	O2 1/1 NEGATIVE CURRENT CONTROL
3	K79 18BR/LB	O2 1/1 HEATER CONTROL
4	F344 16BR/GY	FUSED ASD RELAY OUTPUT
5	K103 20BR/LB	O2 1/1 PUMP CELL CURRENT TRIM
6	K41 20DB/LB	O2 1/1 REFERENCE SIGNAL

SENSOR-OXYGEN 1/1 - NATURAL 4 WAY (GAS)



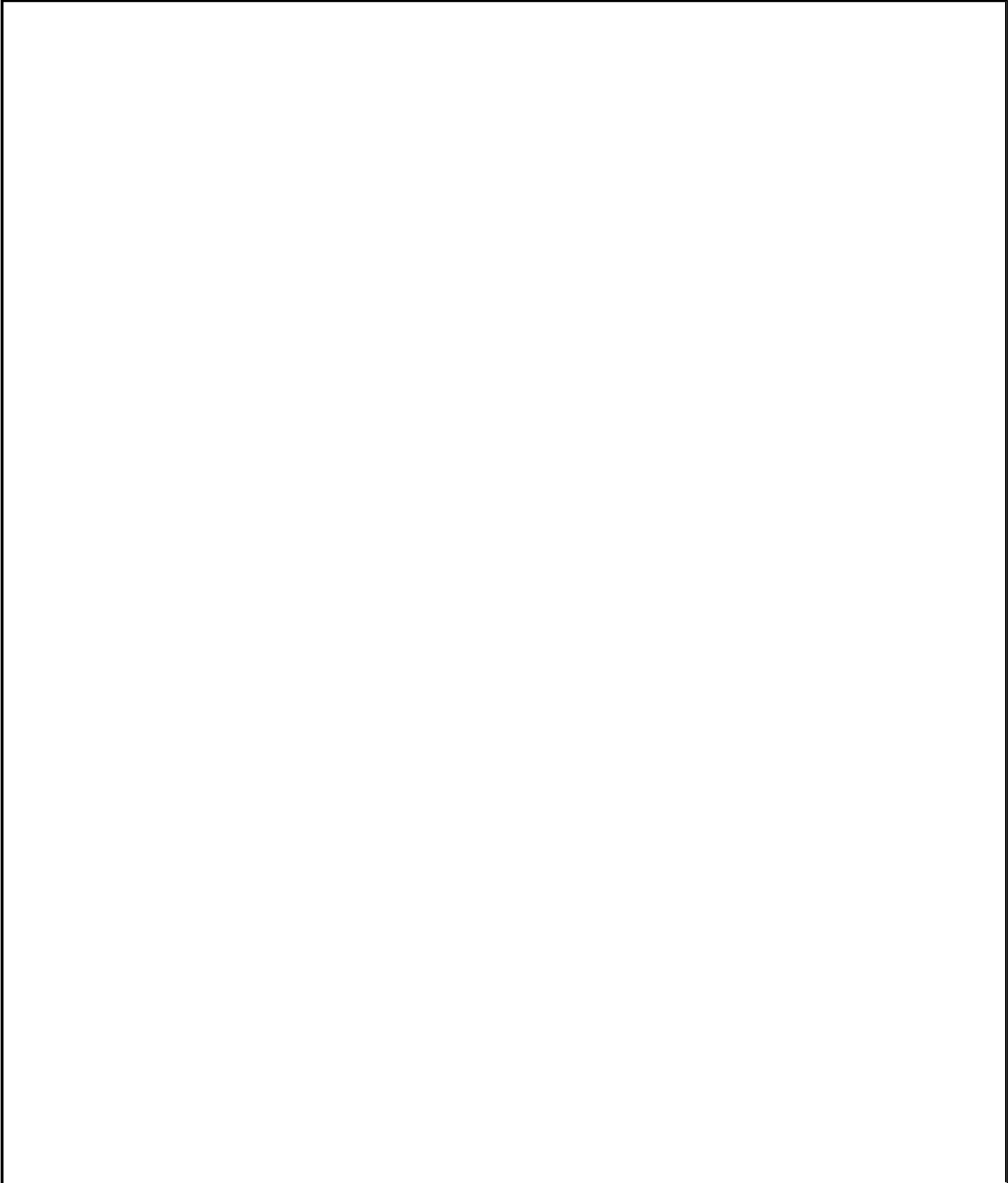
**SENSOR-
OXYGEN 1/1
(GAS)**

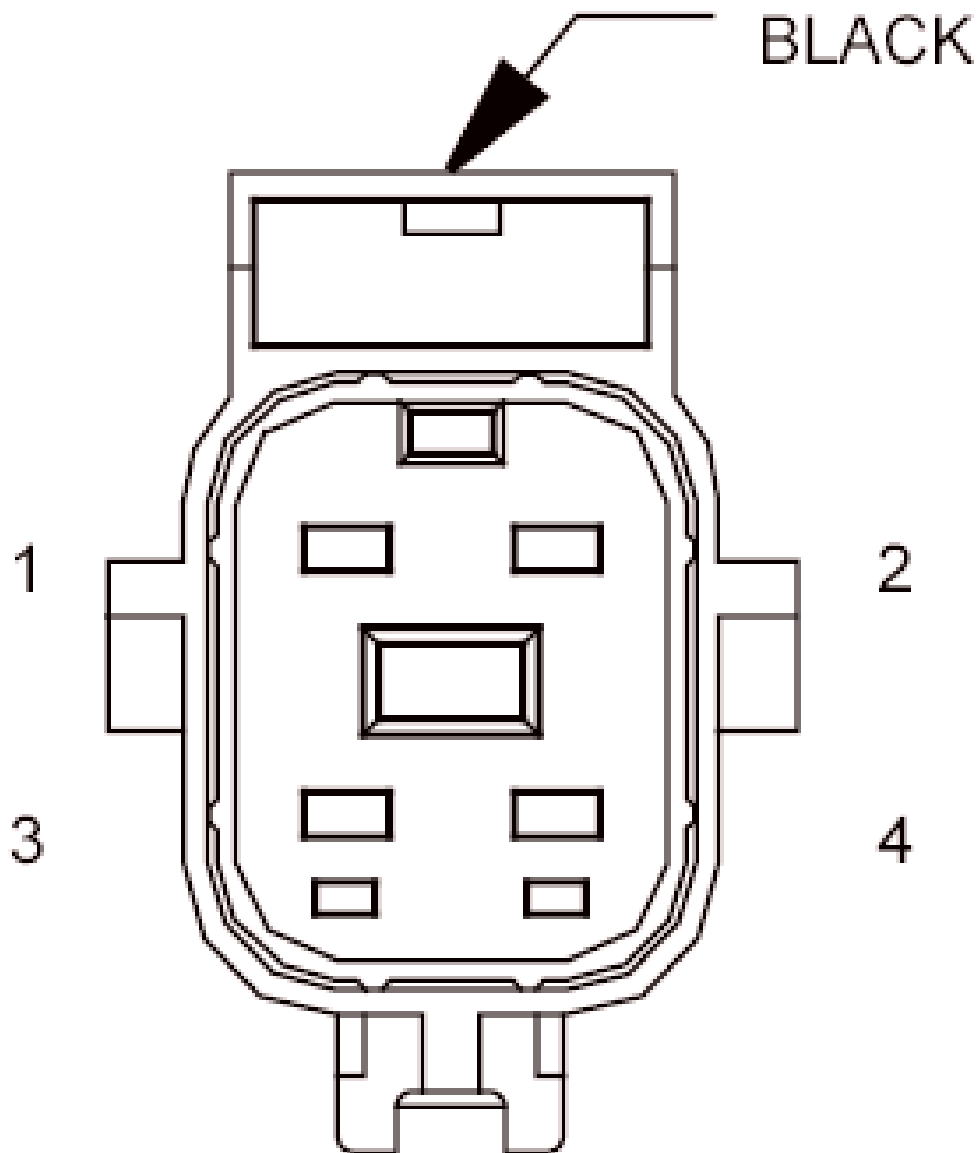
CAV	CIRCUIT	FUNCTION
1	K99 18BR/LG	O2 1/1 HEATER CONTROL
2	Z933 18BK	GROUND
3	K902 18BR/DG	O2 RETURN (UP)
4		

K41 18DB/LB

O2 1/1 SIGNAL

SENSOR-OXYGEN 1/2 - BLACK 4 WAY (GAS)



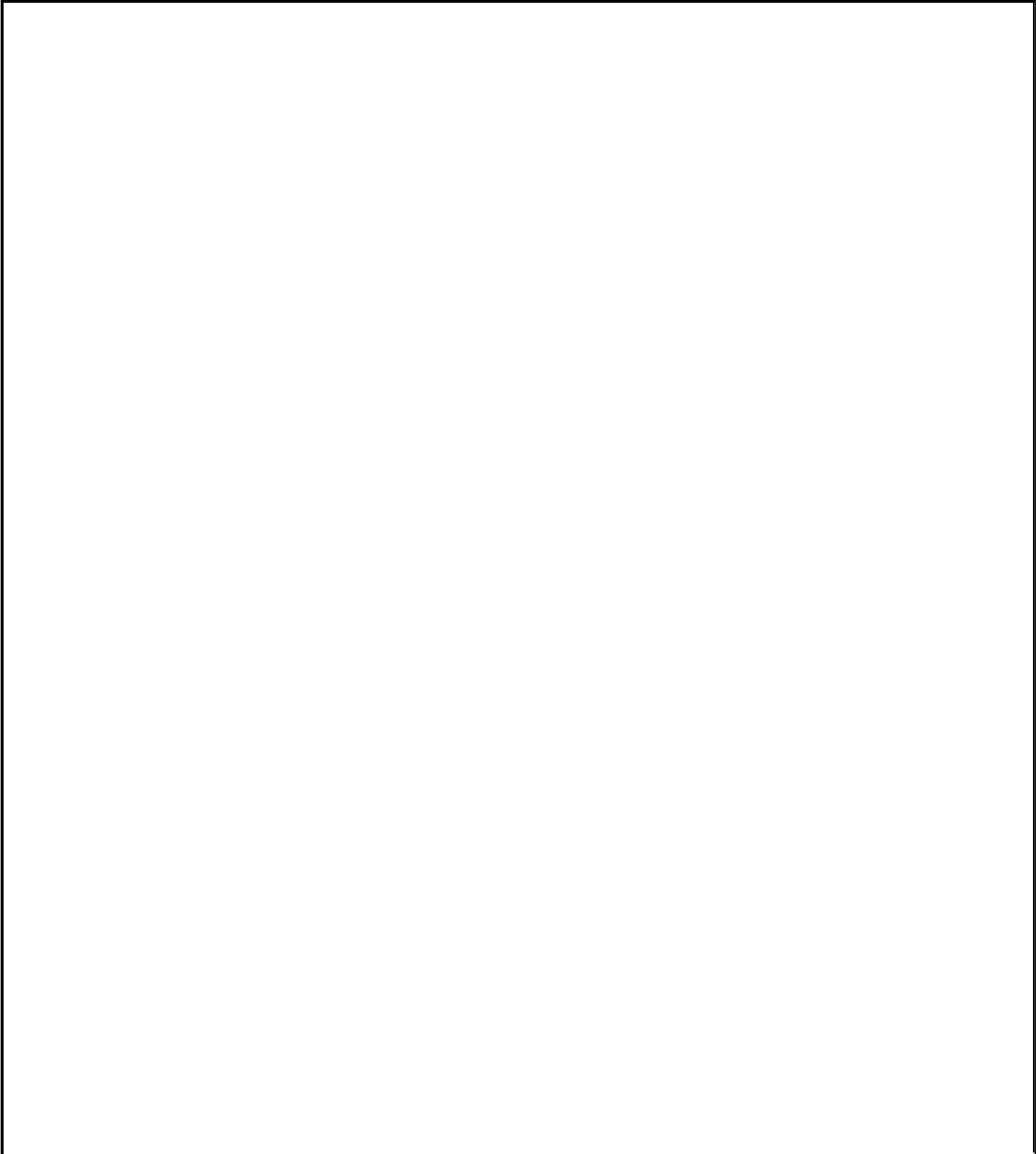


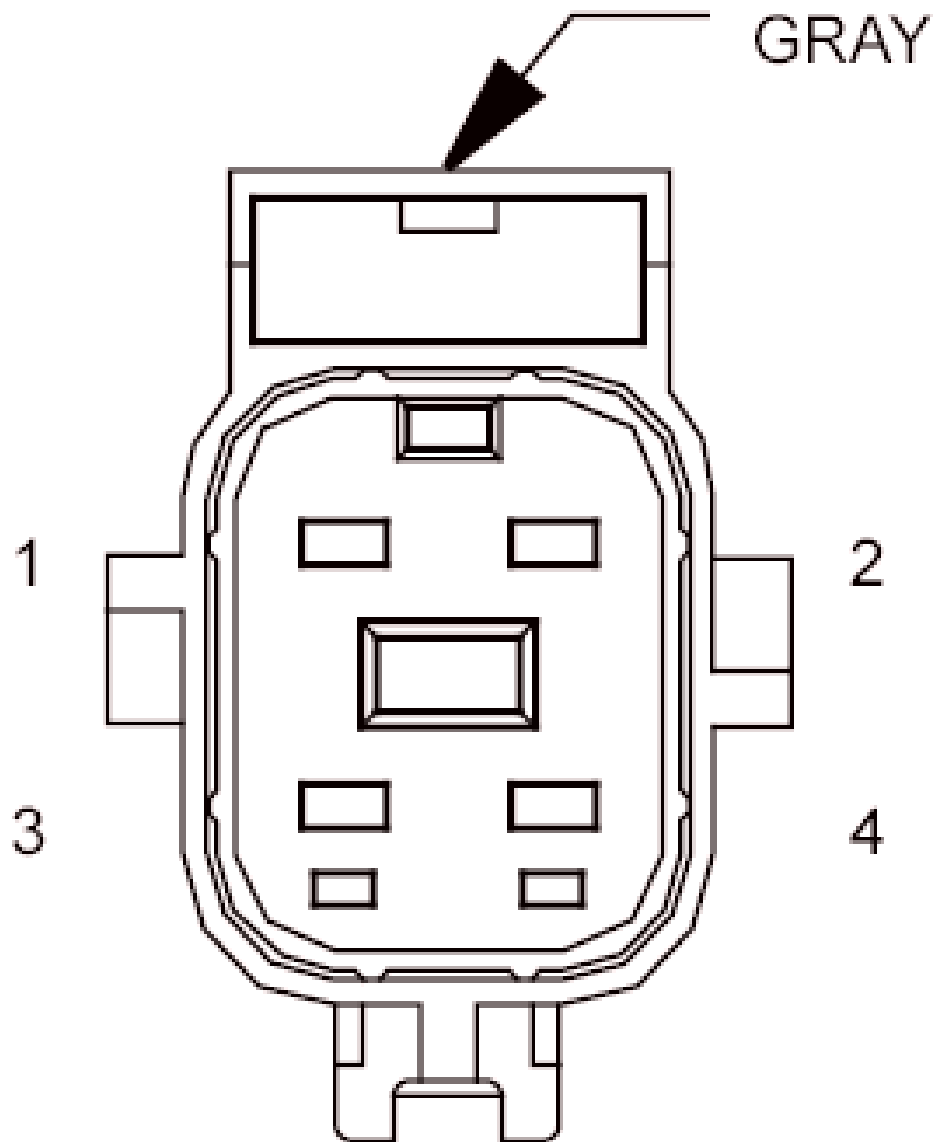
**SENSOR-
OXYGEN 1/2
(GAS)**

CAV	CIRCUIT	FUNCTION
1	K299 18BR/WT	O2 1/2 HEATER CONTROL

	Z933 18BK	GROUND
3	K904 18DB/DG	O2 RETURN (DOWN)
4	K141 18DB/YL	O2 1/2 SIGNAL

SENSOR-OXYGEN 2/1 - GRAY 4 WAY (GAS LHD)



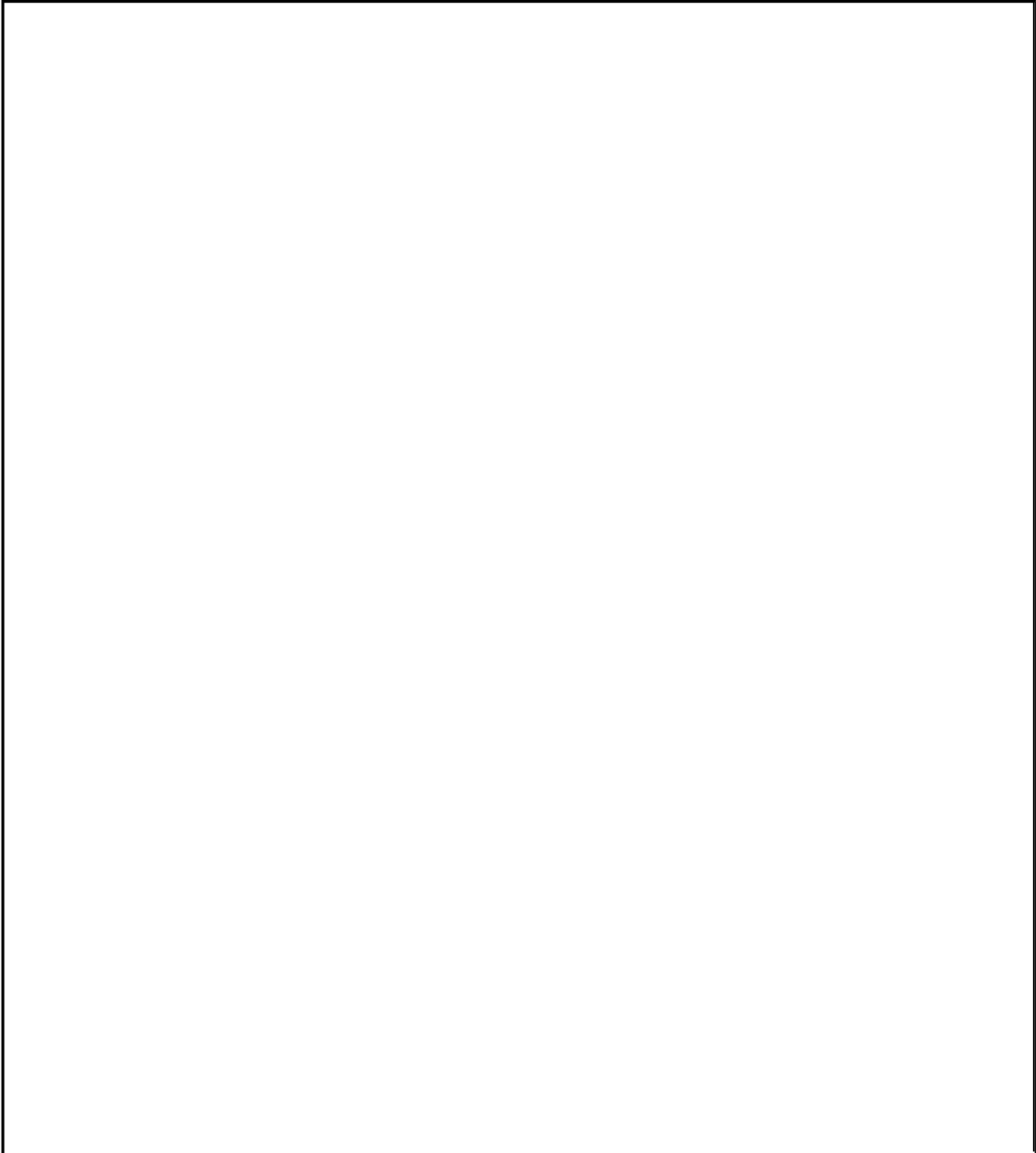


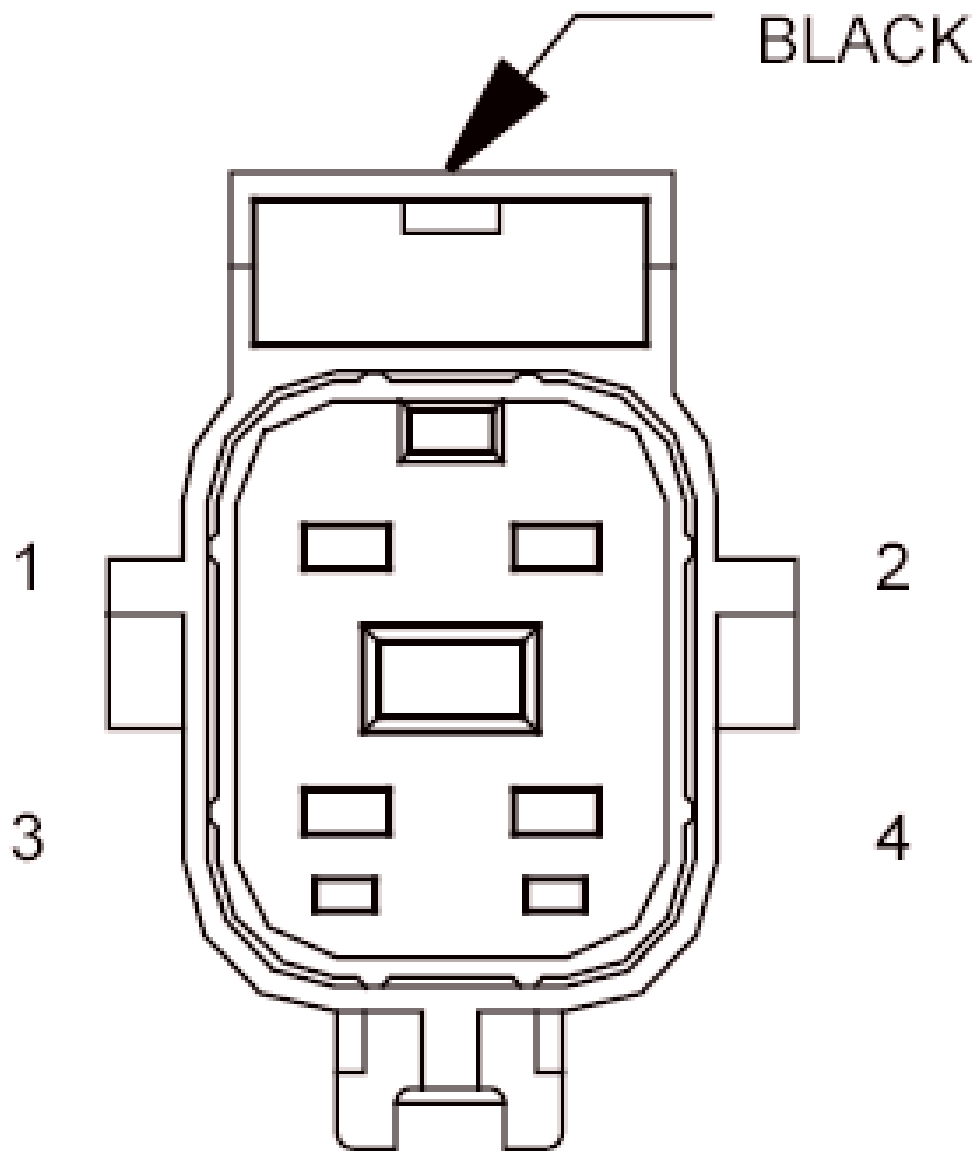
**SENSOR-
OXYGEN 2/1
(GAS LHD)**

CAV	CIRCUIT	FUNCTION
1	K199 18BR/VT	O2 2/1 HEATER CONTROL
2		

	Z933 18BK	GROUND
3	K902 18BR/DG	O2 RETURN (UP)
4	K43 18DB/LG	O2 2/1 SIGNAL

SENSOR-OXYGEN 2/1 - BLACK 4 WAY (GAS RHD)



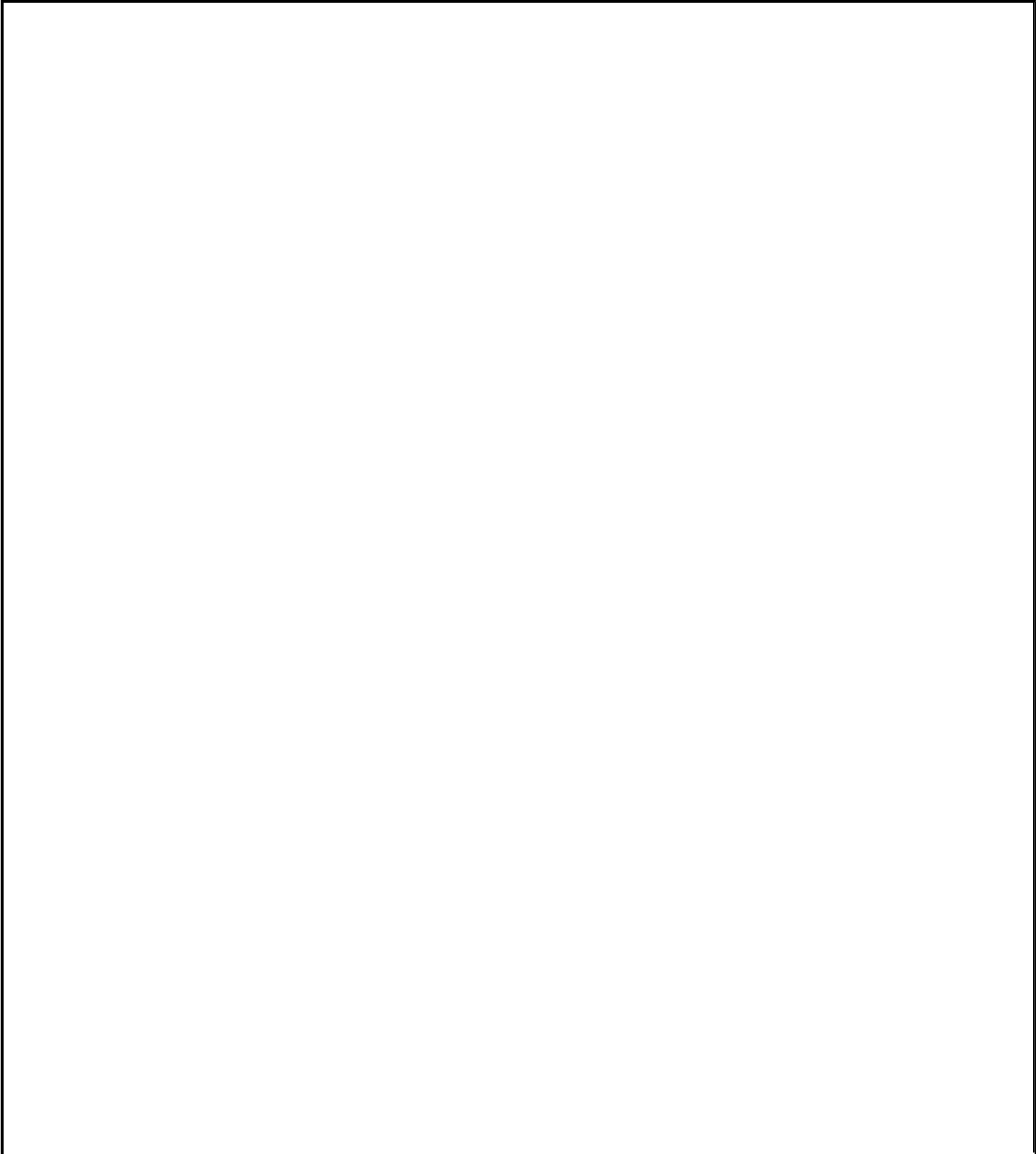


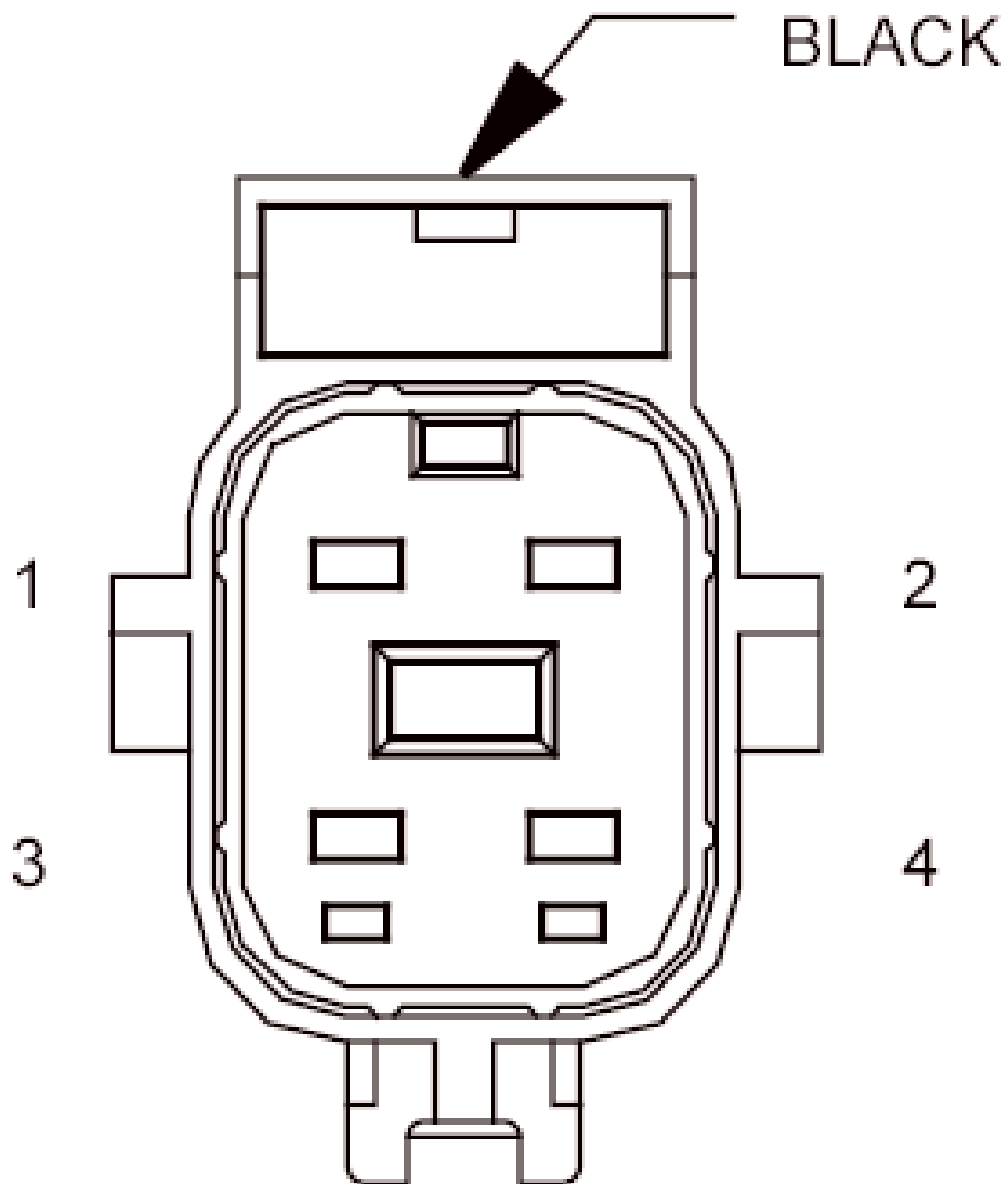
**SENSOR-
OXYGEN 2/1
(GAS RHD)**

CAV	CIRCUIT	FUNCTION
1	K199 18BR/VT	O2 2/1 HEATER CONTROL

	Z933 18BK	GROUND
3	K902 18BR/DG	O2 RETURN (UP)
4	K43 18DB/LG	O2 2/1 SIGNAL

SENSOR-OXYGEN 2/2 - BLACK 4 WAY (GAS)





**SENSOR-
OXYGEN 2/2
(GAS)**

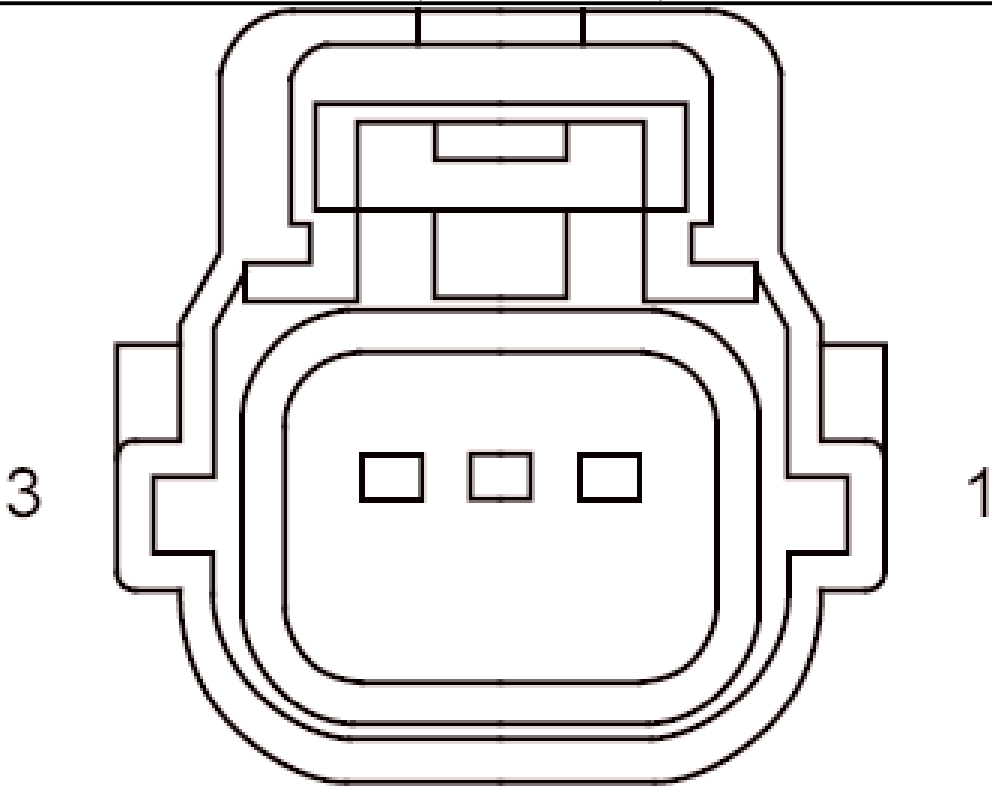
CAV

CIRCUIT

FUNCTION

	K399 18BR/GY	O2 2/2 HEATER CONTROL
2	Z933 18BK	GROUND
3	K904 18DB/DG	O2 RETURN (DOWN)
4	K243 18BR	O2 2/2 SIGNAL

SENSOR-PARK ASSIST-NO. 10 - 3 WAY (PARKTRONICS)

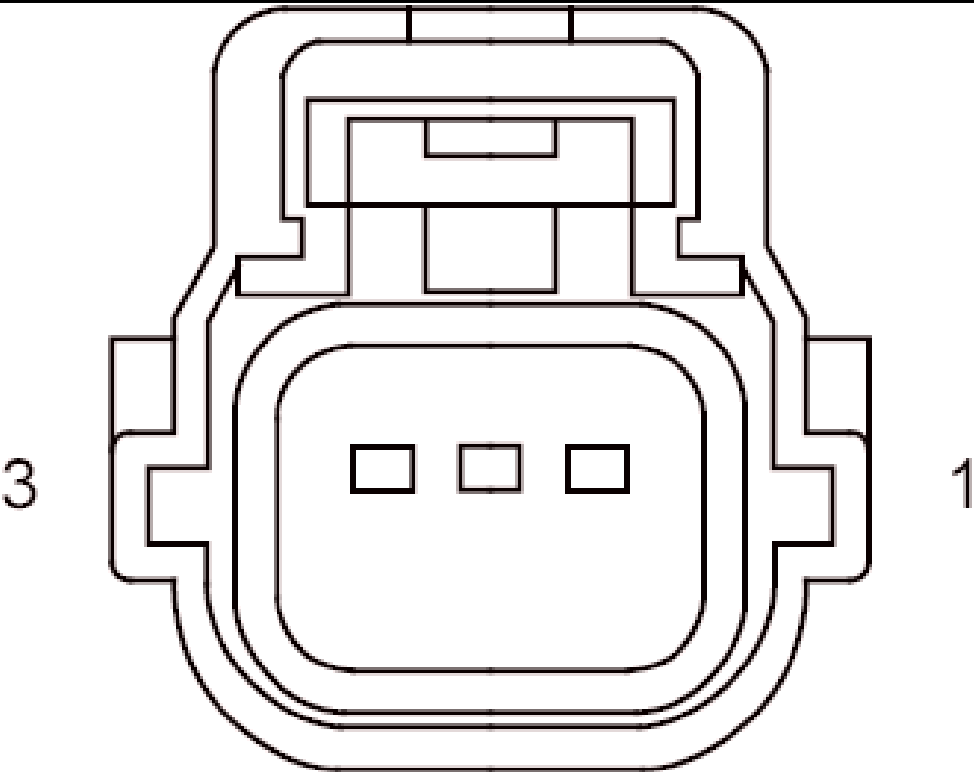


SENSOR-
PARK
ASSIST NO. 10
(PARKTRONICS)

CAV	CIRCUIT	FUNCTION

1	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
2	X750 20GY/LB	PARK ASSIST SENSOR GROUND
3	D704 20WT/DG	PARK ASSIST SENSOR NO. 10 SIGNAL

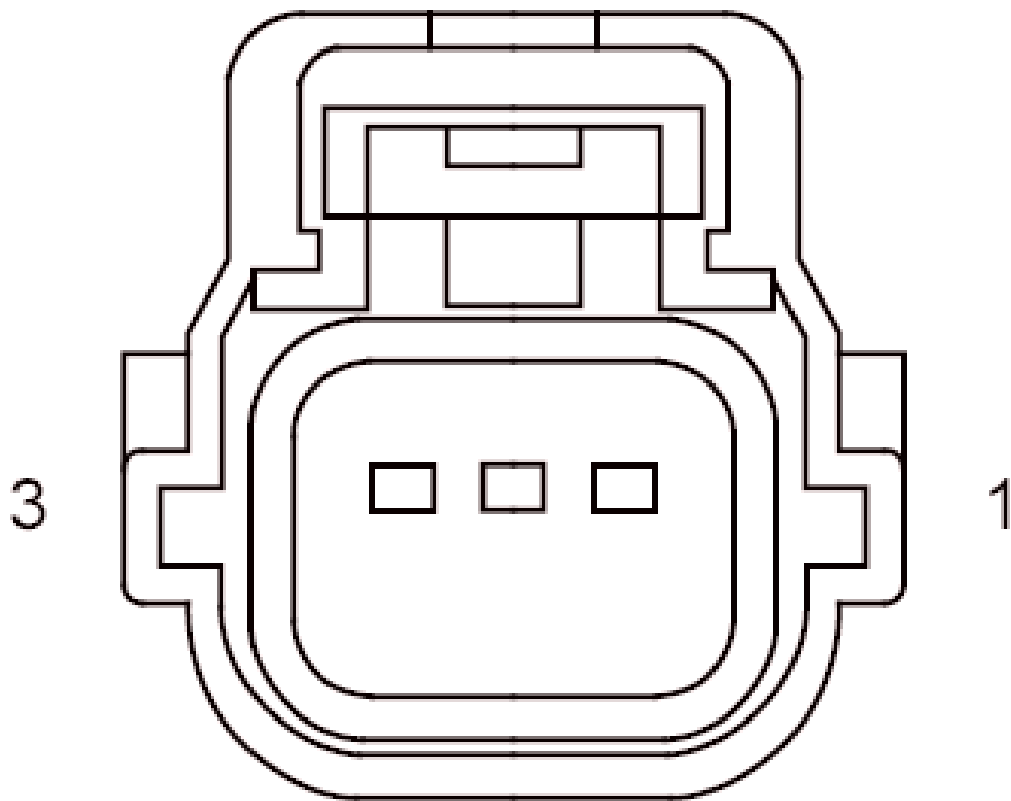
SENSOR-PARK ASSIST-NO. 11 - 3 WAY (PARKTRONICS)



**SENSOR-
PARK
ASSIST NO. 11
(PARKTRONICS)**

CAV	CIRCUIT	FUNCTION
1	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
2	X750 20GY/LB	PARK ASSIST SENSOR GROUND
3	D710 20WT	PARK ASSIST SENSOR NO. 11 SIGNAL

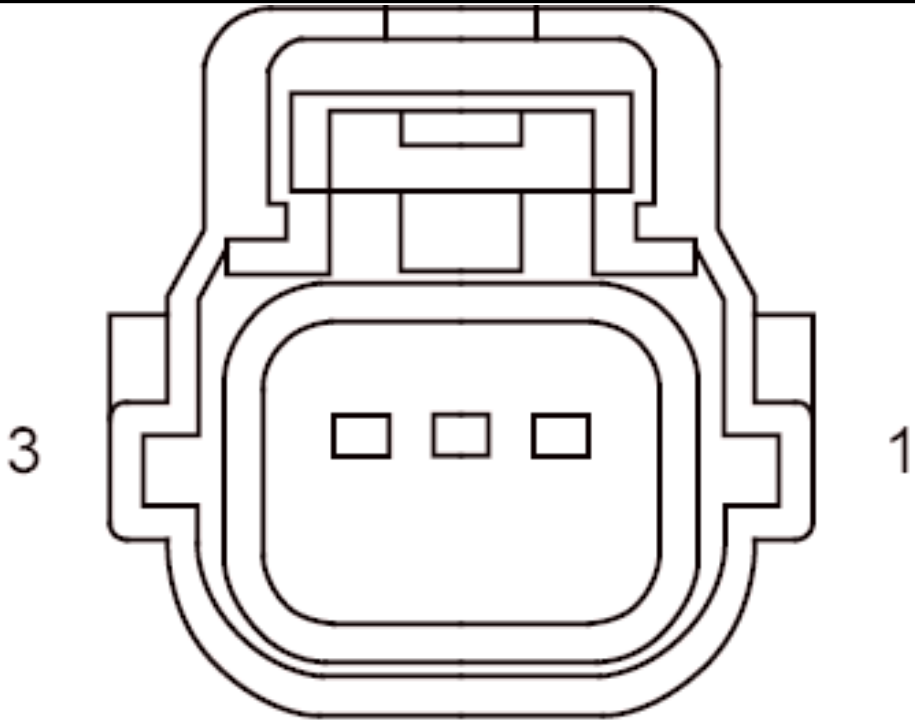
SENSOR-PARK ASSIST-NO. 8 - 3 WAY (PARKTRONICS)



SENSOR- PARK ASSIST NO. 8 (PARKTRONICS)

CAV	CIRCUIT	FUNCTION
1	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
2	X750 20GY/LB	PARK ASSIST SENSOR GROUND
3	D701 20WT/LB	PARK ASSIST SENSOR NO. 8 SIGNAL

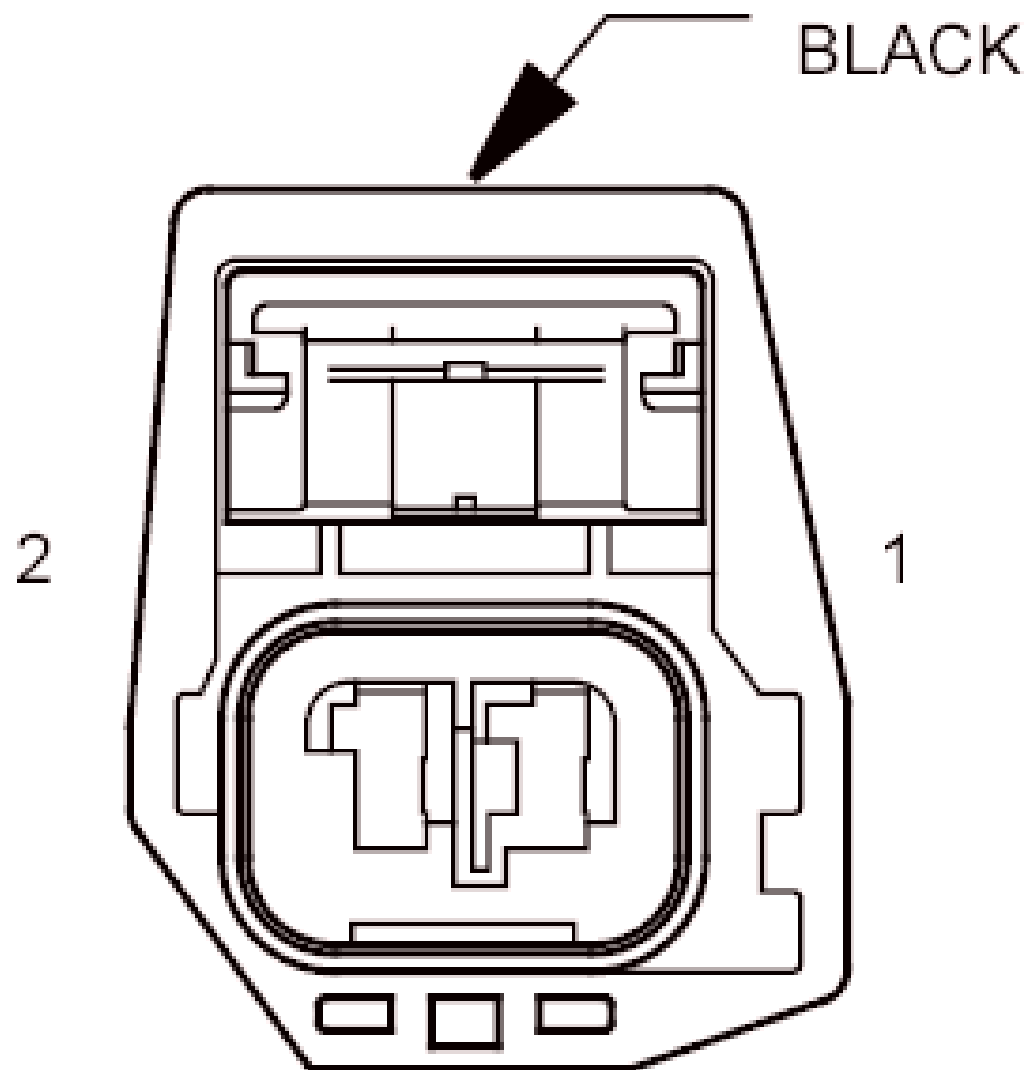
SENSOR-PARK ASSIST-NO. 9 - 3 WAY (PARKTRONICS)



SENSOR-
PARK
ASSIST NO. 9
(PARKTRONICS)

CAV	CIRCUIT	FUNCTION
1	X700 20GY/OR	PARK ASSIST SENSOR SUPPLY
2	X750 20GY/LB	PARK ASSIST SENSOR GROUND
3	D703 20WT/OR	PARK ASSIST SENSOR NO. 9 SIGNAL

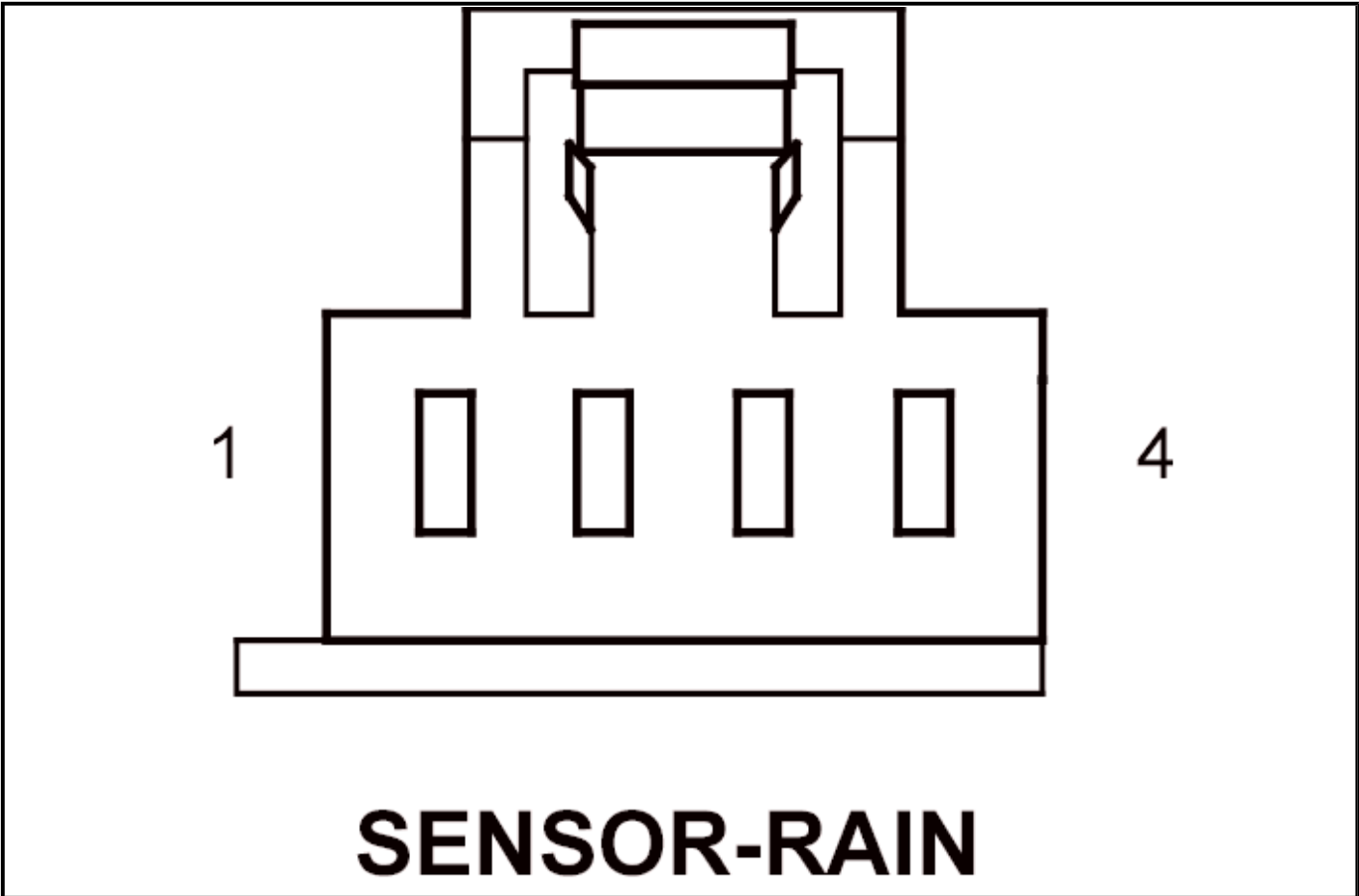
SENSOR-POST-CATALYST EXHAUST GAS TEMPERATURE - BLACK 2 WAY (DIESEL)



**SENSOR-
POST-
CATALYST
EXHAUST GAS
TEMPERATURE
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	K915 20BR/WT	POST-CATALYST EXHAUST GAS TEMPERATURE RETURN
2	K353 20OR/BR	POST-CATALYST EXHAUST GAS TEMPERATURE SIGNAL

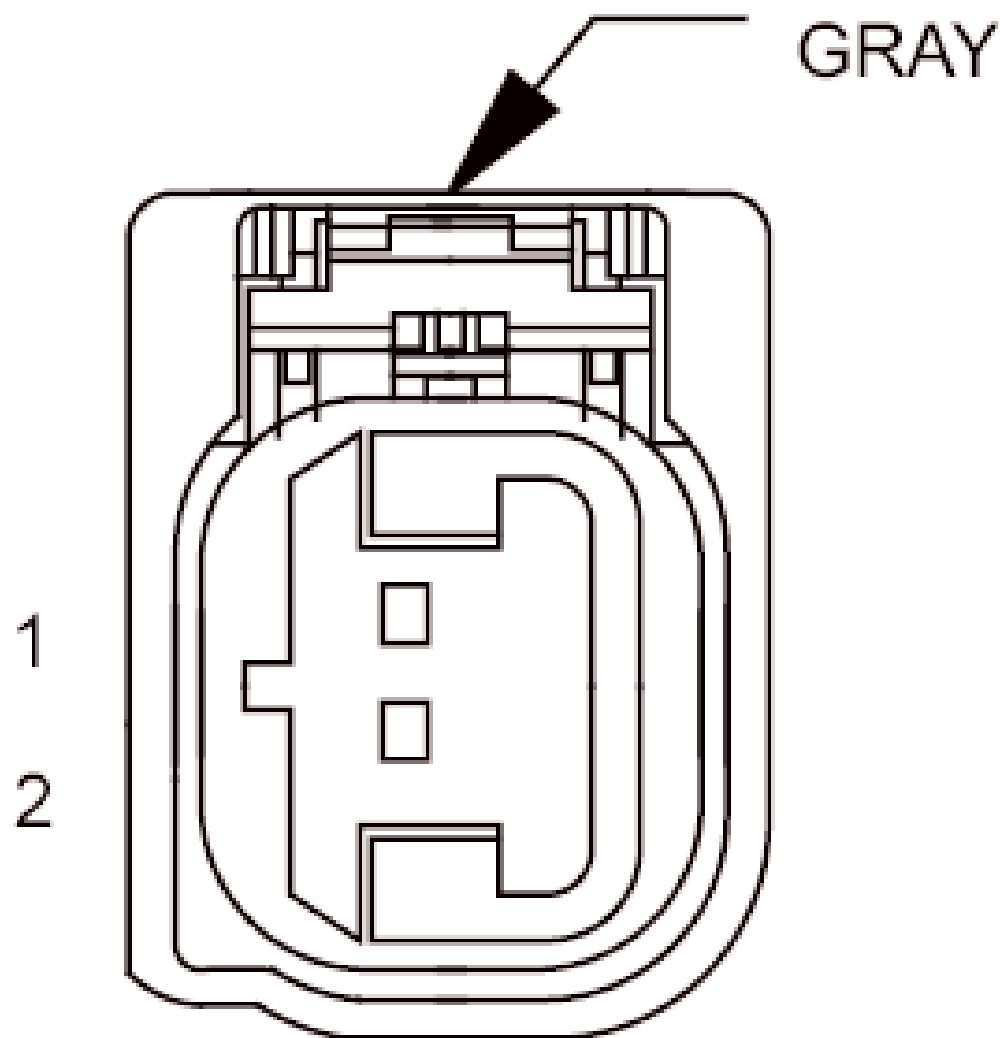
SENSOR-RAIN - 4 WAY



CAV	CIRCUIT	FUNCTION
1	F306 16DB/PK	FUSED ACCESSORY RELAY OUTPUT
2	Z919 20BK	GROUND
3	D508 20WT/GY	COM LIN
4	-	-

SENSOR-SEAT TRACK POSITION-DRIVER - GRAY 2 WAY (EXCEPT EXPORT)

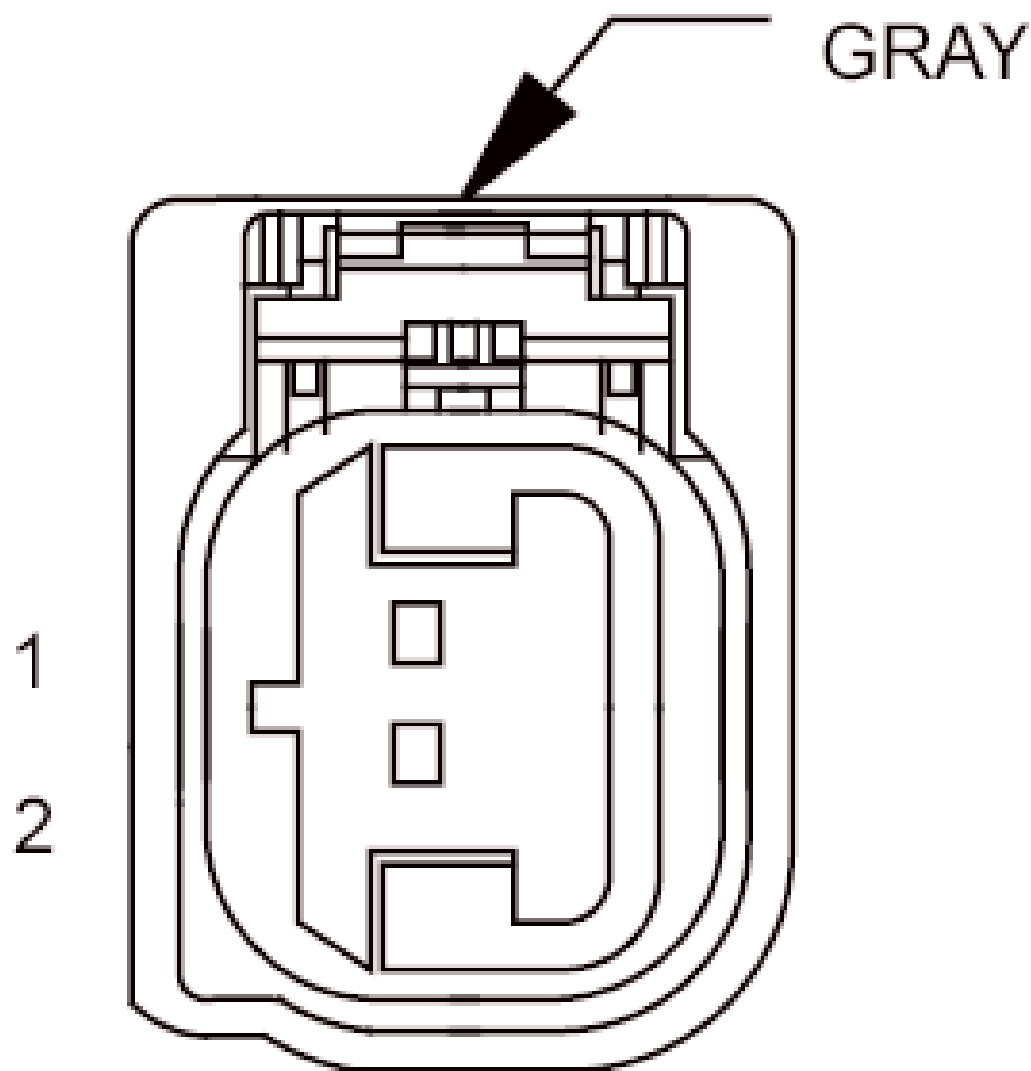




**SENSOR-
SEAT TRACK
POSITION-
DRIVER
(EXCEPT EXPORT)**

	CIRCUIT	FUNCTION
1	R261 20LB/WT	DRIVER SEAT TRACK POSITION SENSOR SIGNAL
2	R263 20LB/VT	DRIVER SEAT TRACK POSITION SENSOR SUPPLY

SENSOR-SEAT TRACK POSITION-PASSENGER - GRAY 2 WAY (EXCEPT EXPORT)

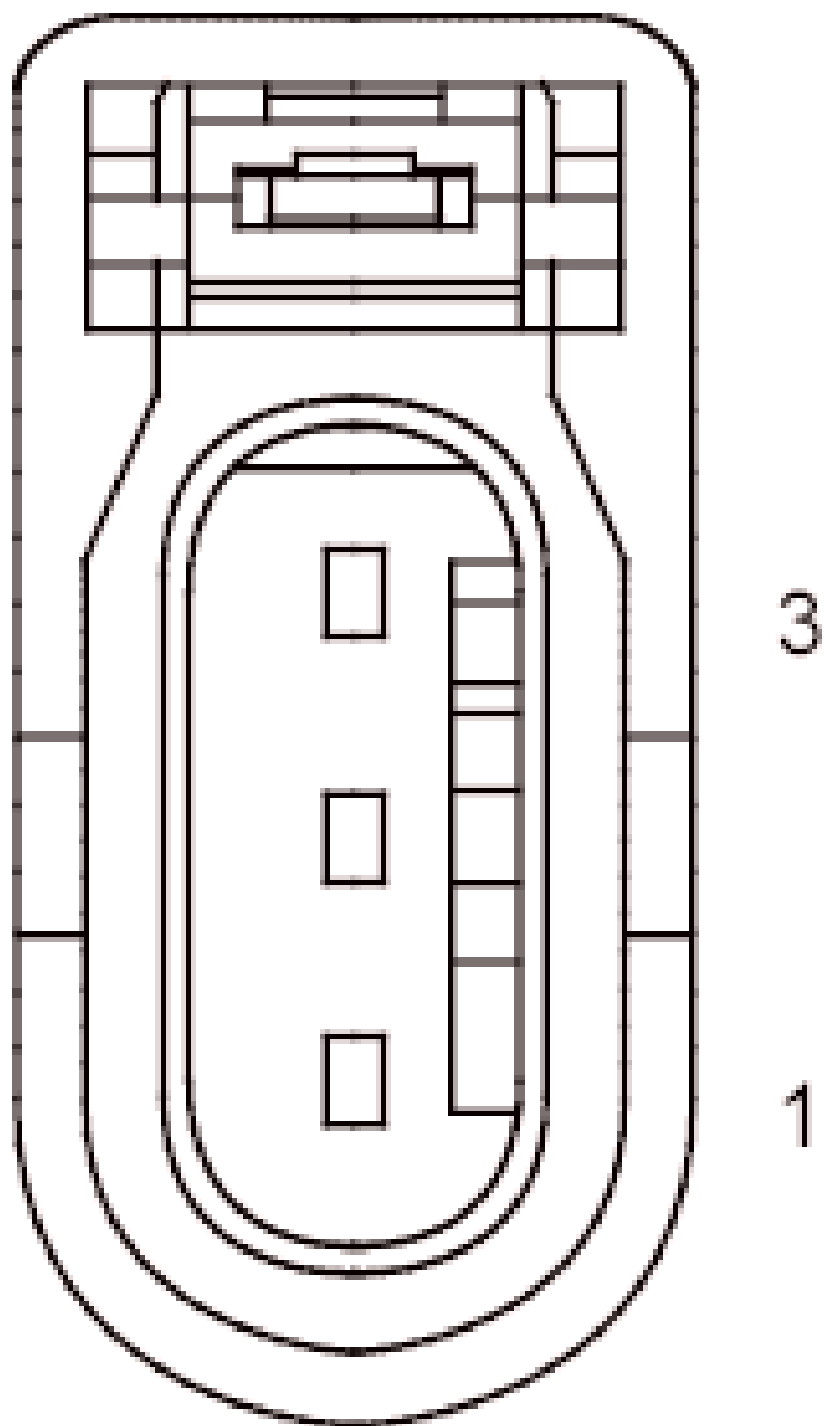


**SENSOR-
SEAT TRACK
POSITION-
PASSENGER**

(EXCEPT EXPORT)

CAV	CIRCUIT	FUNCTION
1	R262 20WT/LB	PASSENGER SEAT TRACK POSITION SENSOR SIGNAL
2	R264 20VT/LB	PASSENGER SEAT TRACK POSITION SENSOR SUPPLY

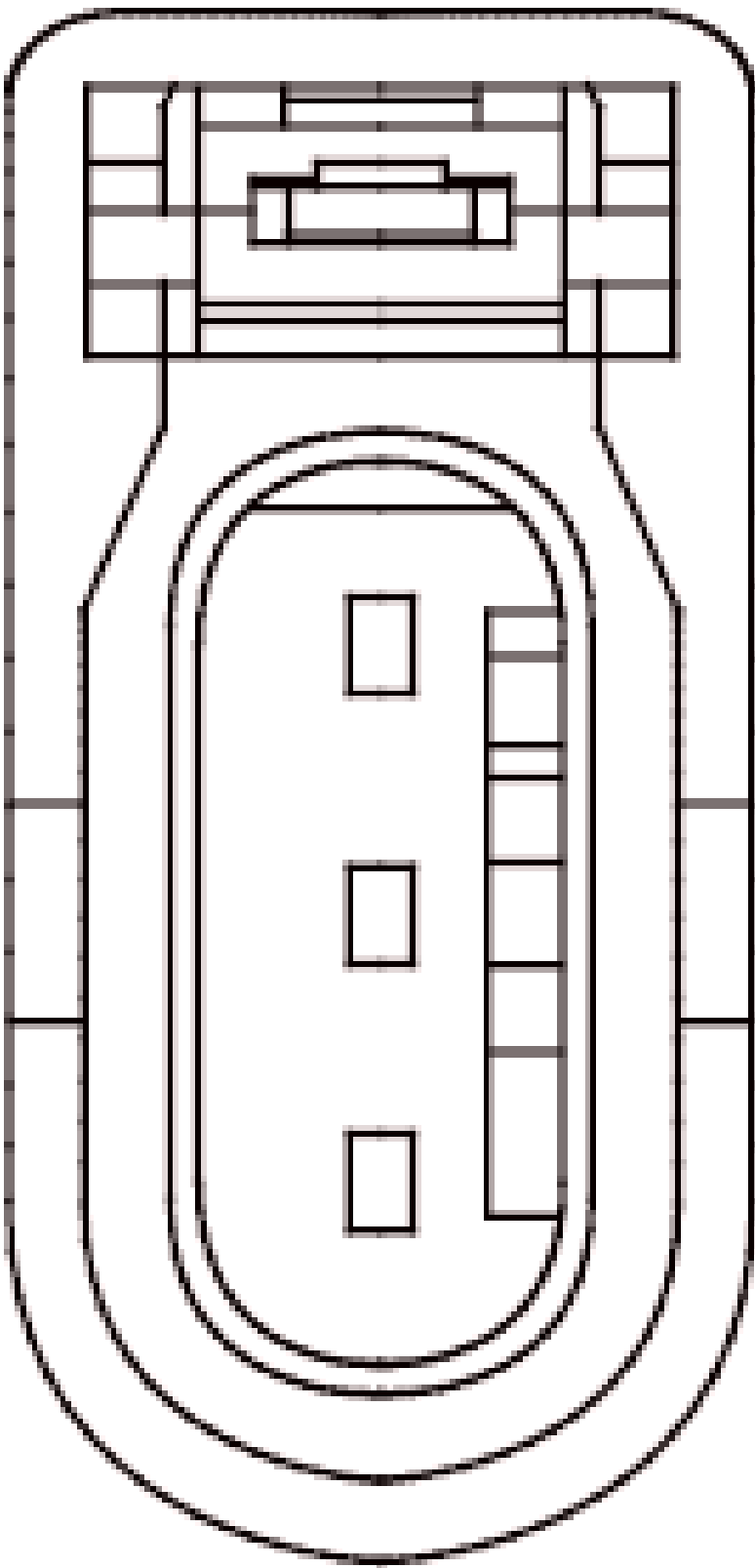
SENSOR-SEAT WEIGHT-LEFT FRONT - 3 WAY (EXCEPT EXPORT)



SENSOR-

CAV	CIRCUIT	FUNCTION
1	R728 20LB/YL	SEAT WEIGHT SENSOR GROUND
2	R717 20LG/DG	SEAT WEIGHT LEFT FRONT SENSOR SIGNAL
3	R701 20LG	SEAT WEIGHT SENSOR 5 VOLT SUPPLY

SENSOR-SEAT WEIGHT-LEFT REAR - 3 WAY (EXCEPT EXPORT)

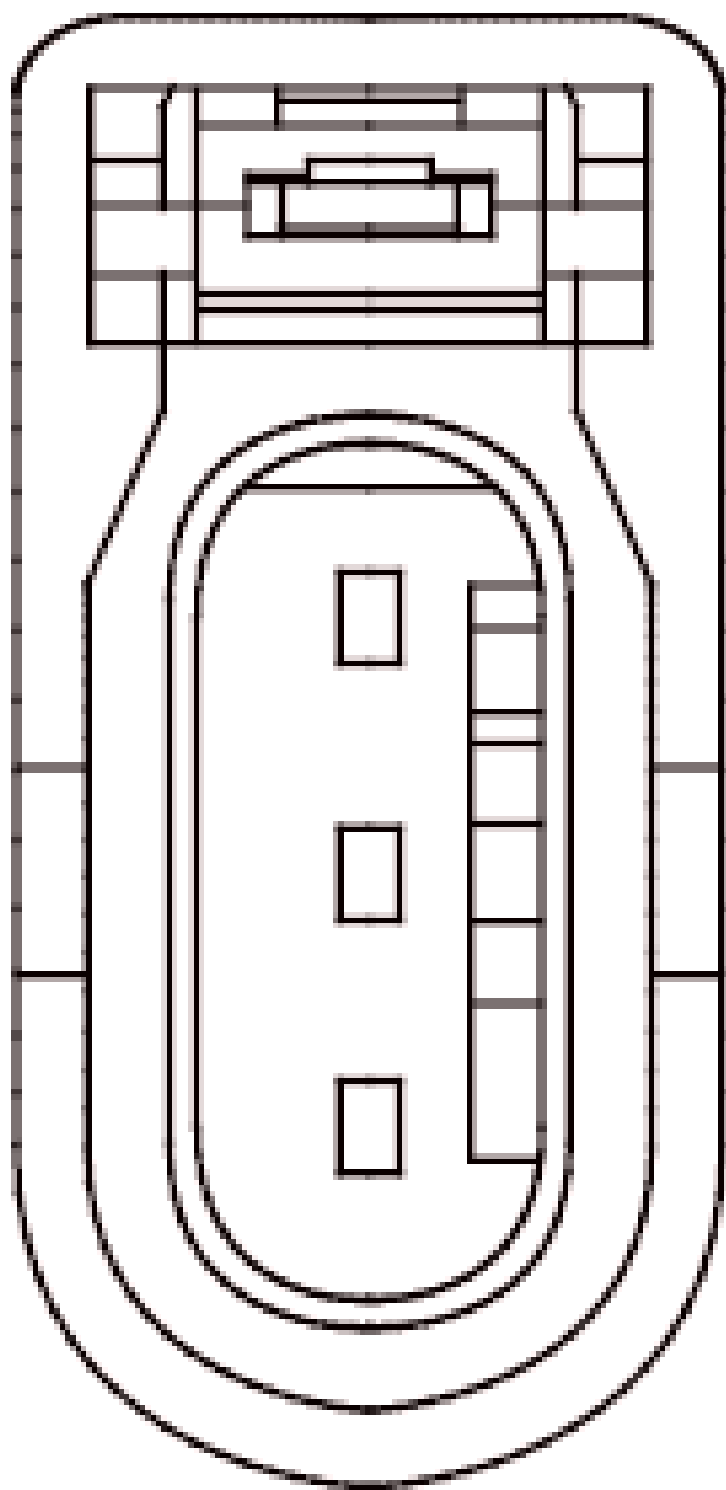


3

1

CAV	CIRCUIT	FUNCTION
1	R728 20LB/YL	SEAT WEIGHT SENSOR GROUND
2	R705 20LG/OR	SEAT WEIGHT LEFT REAR SENSOR SIGNAL
3	R701 20LG	SEAT WEIGHT SENSOR 5 VOLT SUPPLY

SENSOR-SEAT WEIGHT-RIGHT FRONT - 3 WAY (EXCEPT EXPORT)



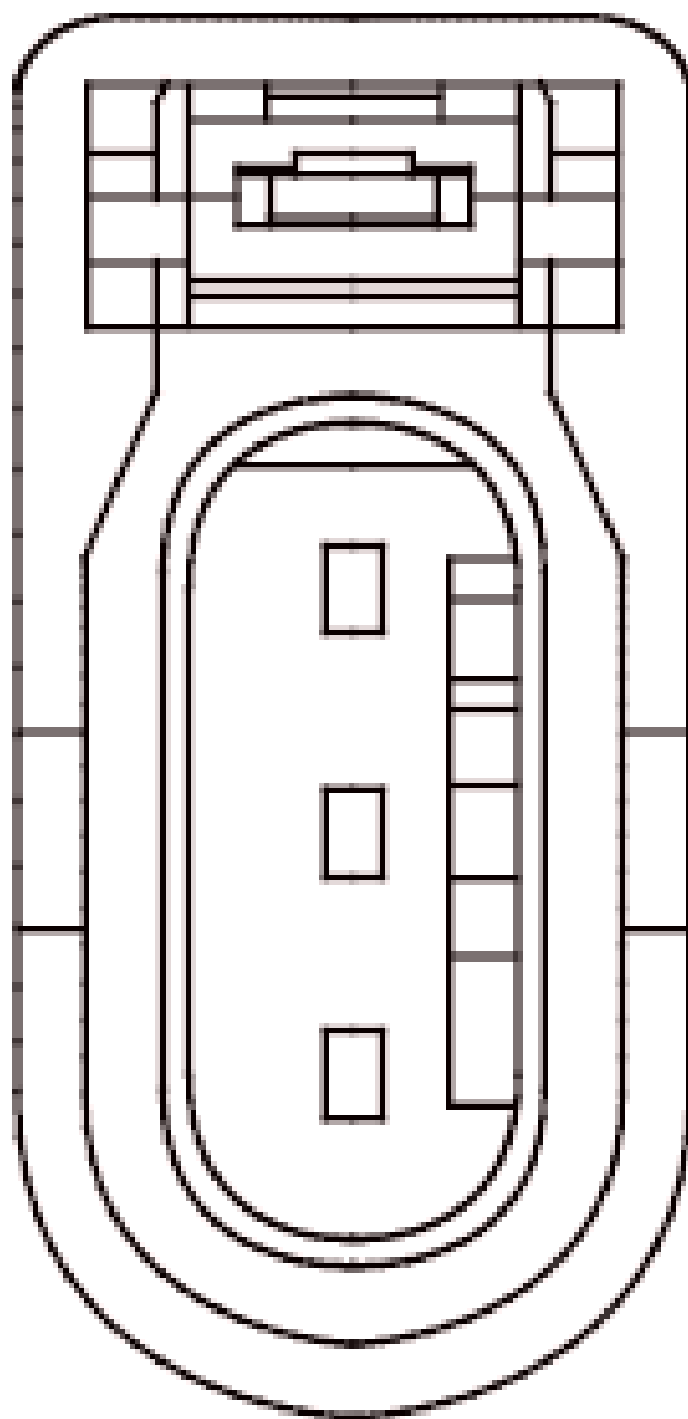
3

1

SENSOR

CAV	CIRCUIT	FUNCTION
1	R728 20LB/YL	SEAT WEIGHT SENSOR GROUND
2	R718 20LB/DG	SEAT WEIGHT RIGHT FRONT SENSOR SIGNAL
3	R701 20LG	SEAT WEIGHT SENSOR 5 VOLT SUPPLY

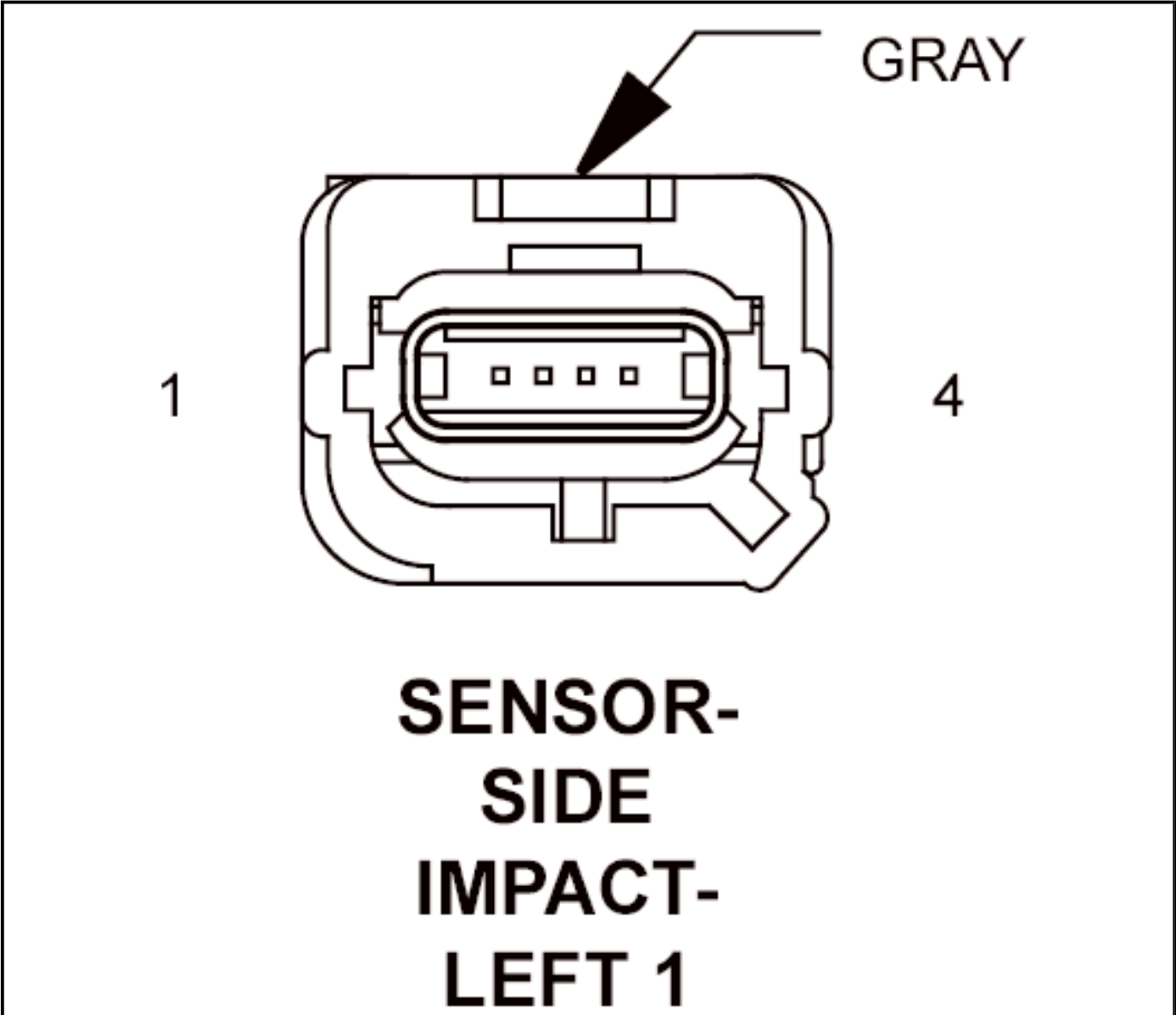
SENSOR-SEAT WEIGHT-RIGHT REAR - 3 WAY (EXCEPT EXPORT)



SENSOR-

CAV	CIRCUIT	FUNCTION
1	R728 20LB/YL	SEAT WEIGHT SENSOR GROUND
2	R706 20LB/OR	SEAT WEIGHT RIGHT REAR SENSOR SIGNAL
3	R701 20LG	SEAT WEIGHT SENSOR 5 VOLT SUPPLY

SENSOR-SIDE IMPACT-LEFT 1 - GRAY 4 WAY



CAV	CIRCUIT	FUNCTION
1	R13 20LG/TN	LEFT SIDE IMPACT SENSOR 1 SIGNAL
2	R15 20LG/BR	LEFT SIDE IMPACT SENSOR 1

		GROUND
3	R19 20LG/WT	LEFT SIDE IMPACT SENSOR 2 GROUND
4	R17 20LG	LEFT SIDE IMPACT SENSOR 2 SIGNAL

SENSOR-SIDE IMPACT-LEFT 2 - GRAY 4 WAY

GRAY

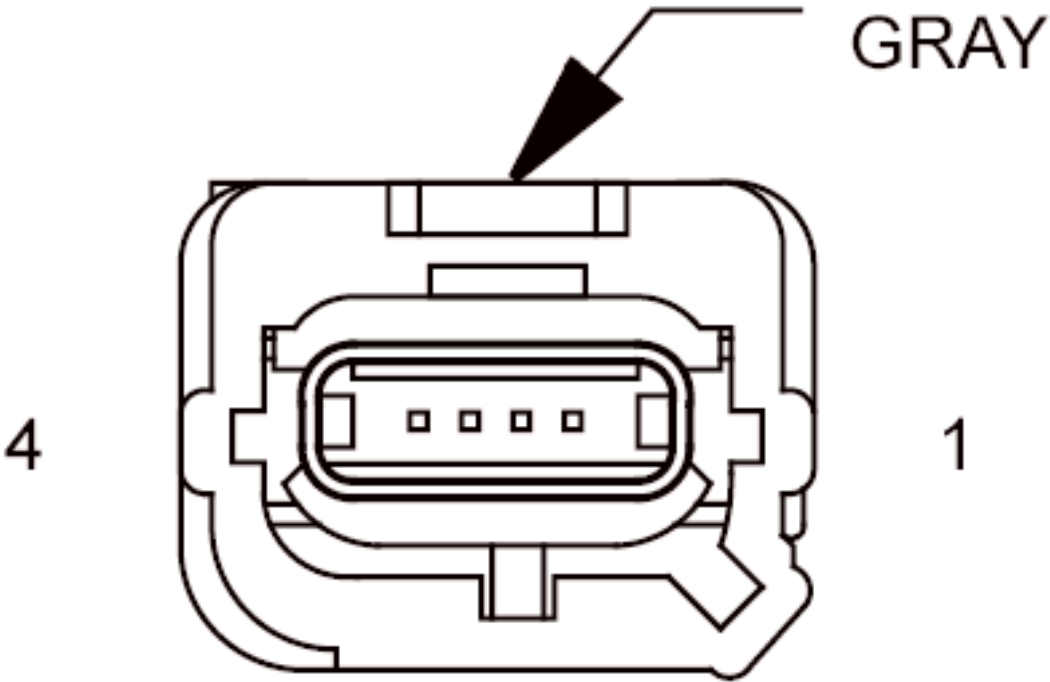
4

1

SENSOR-SIDE IMPACT-LEFT 2

CAV	CIRCUIT	FUNCTION
1	R17 20LG	LEFT SIDE IMPACT SENSOR 2 SIGNAL
2	R19 20LG/WT	LEFT SIDE IMPACT SENSOR 2 GROUND
3	-	-
4	-	-

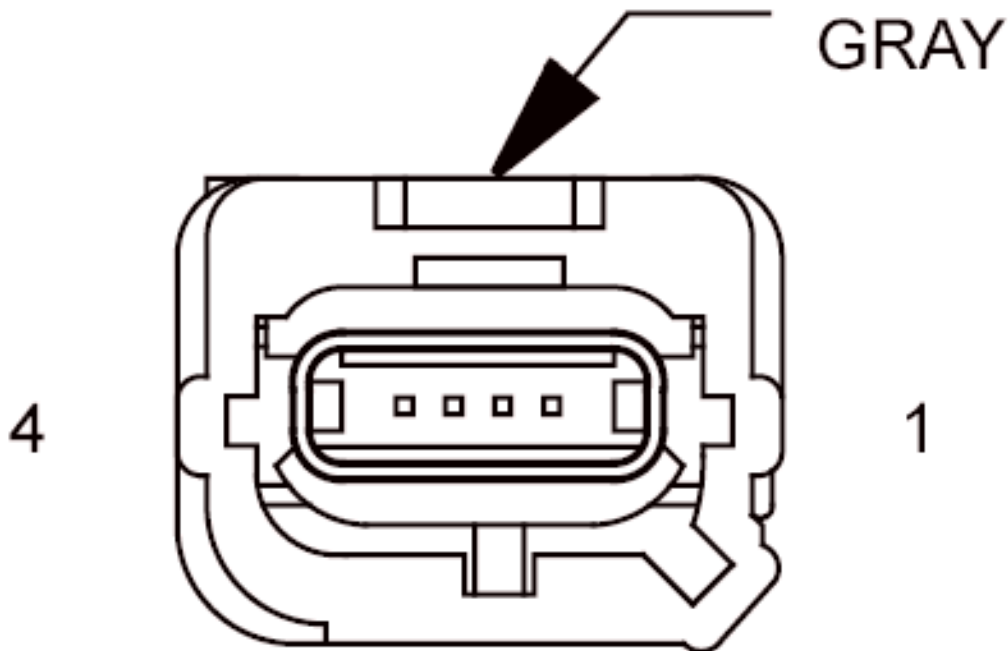
SENSOR-SIDE IMPACT-RIGHT 1 - GRAY 4 WAY



SENSOR-SIDE
IMPACT-
RIGHT 1

CAV	CIRCUIT	FUNCTION
1	R14 20TN/LG	RIGHT SIDE IMPACT SENSOR 1 SIGNAL
2	R16 20BR/LG	RIGHT SIDE IMPACT SENSOR 1 GROUND
3	R20 20WT/LG	RIGHT SIDE IMPACT SENSOR 2 GROUND
4	R18 20LB	RIGHT SIDE IMPACT SENSOR 2 SIGNAL

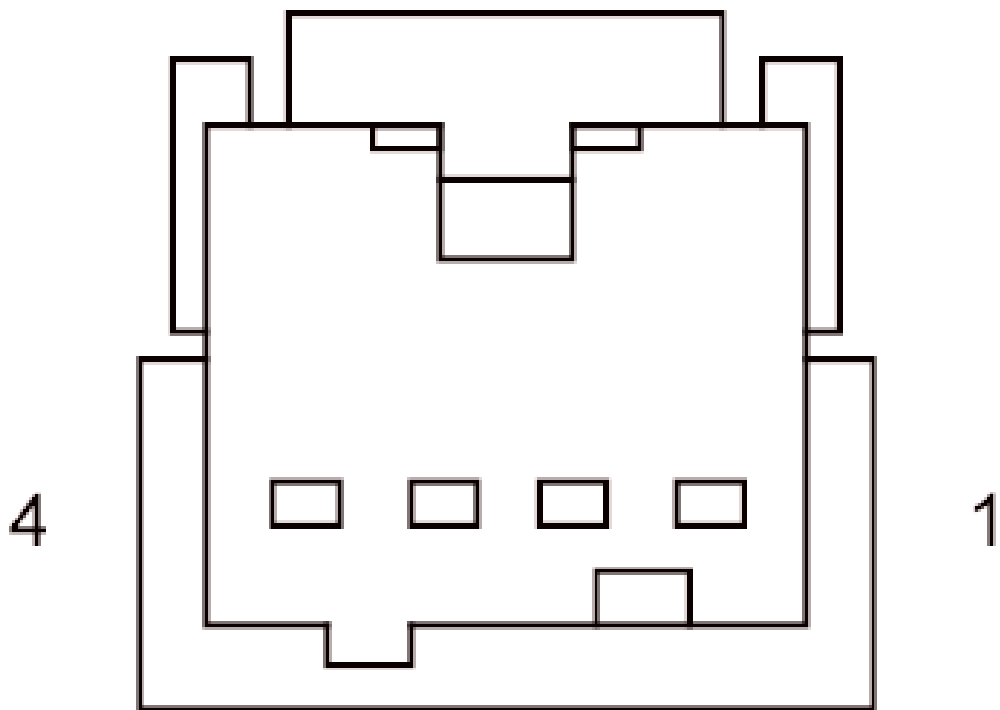
SENSOR-SIDE IMPACT-RIGHT 2 - GRAY 4 WAY



SENSOR- SIDE IMPACT- RIGHT 2

CAV	CIRCUIT	FUNCTION
1	R18 20LB	RIGHT SIDE IMPACT SENSOR 2 SIGNAL
2	R20 20WT/LG	RIGHT SIDE IMPACT SENSOR 2 GROUND
3	-	-
4	-	-

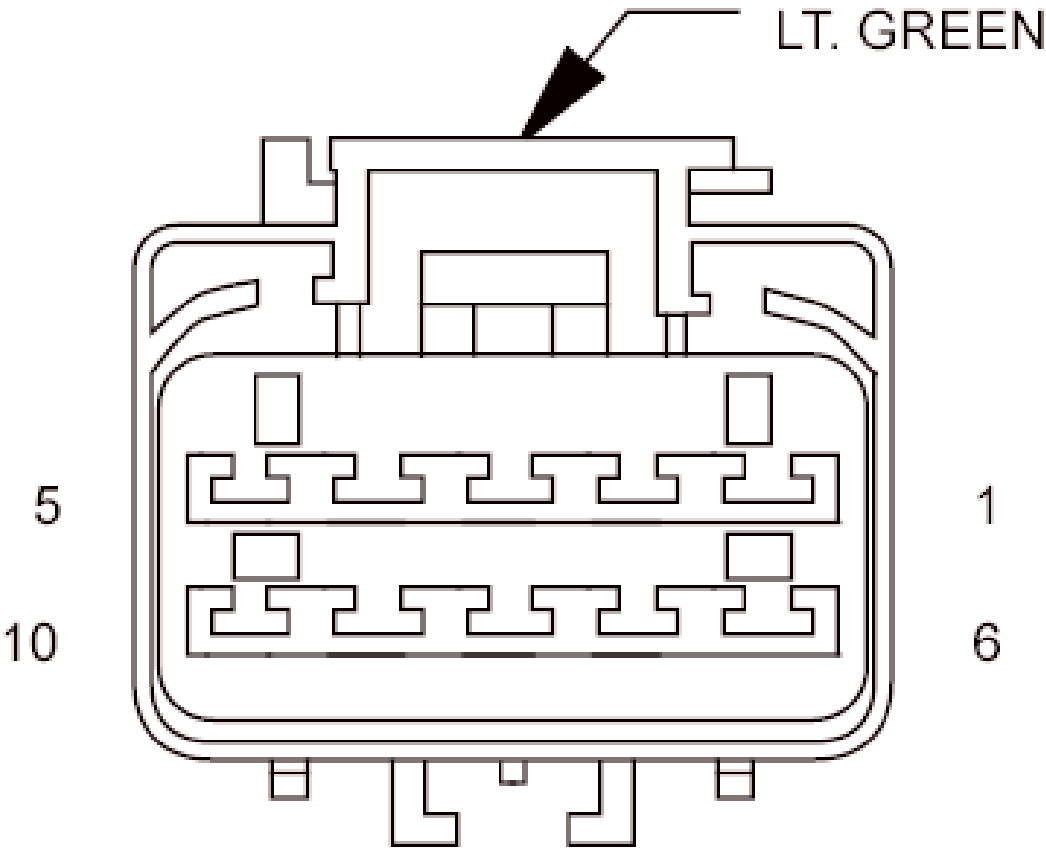
SENSOR-STEERING ANGLE - 4 WAY (ESP)



SENSOR- STEERING ANGLE (ESP)

CAV	CIRCUIT	FUNCTION
1	D65 20WT/BK	CAN C BUS (+)
2	D64 20WT/LB	CAN C BUS (-)
3	Z910 20BK/RD	GROUND (EXCEPT EVIC/EXCEPT REAR SEAT VIDEO)
3	Z910 20BK/TN	GROUND (EXCEPT EVIC/REAR SEAT VIDEO)
3	Z910C 20BK	GROUND (RHD GAS)

SENSOR-TRANSMISSION RANGE - LT. GREEN 10 WAY (RLE)

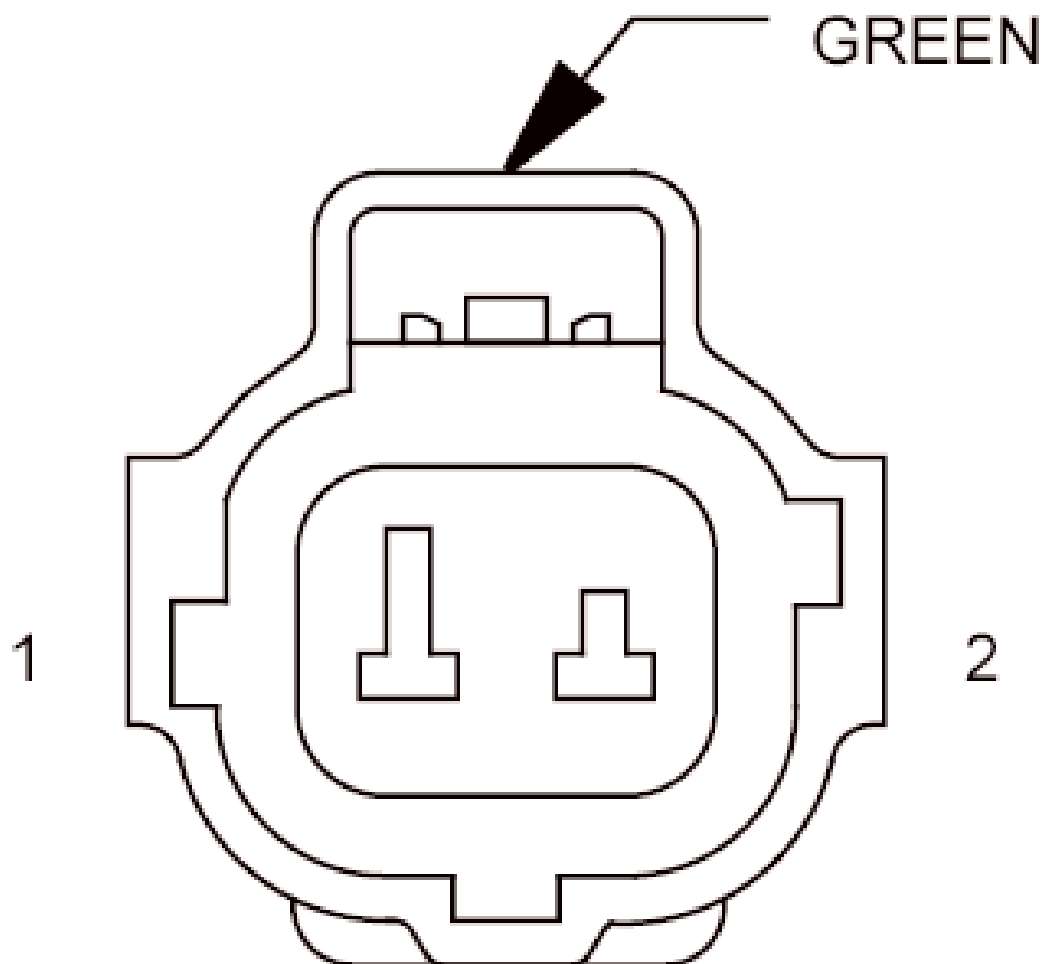


SENSOR-
TRANSMISSION
RANGE
(RLE)

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	T13 18DG/VT	SENSOR GROUND
4	T54 18DG/OR	TRANSMISSION

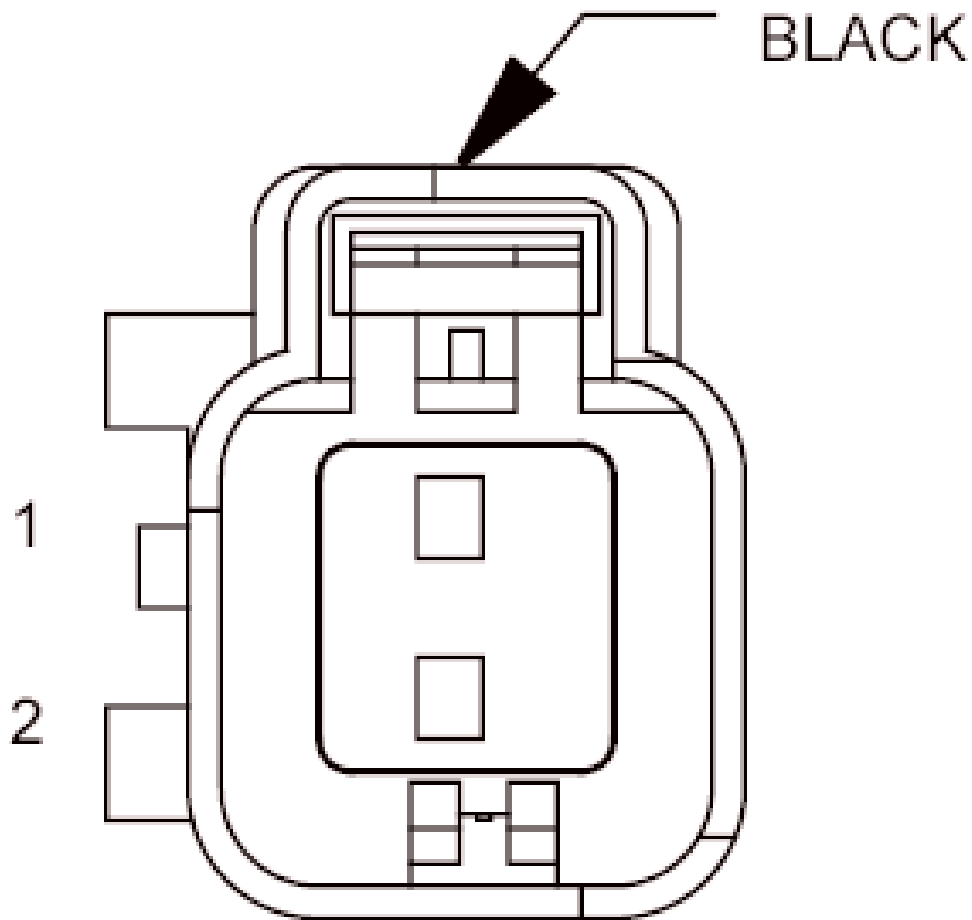
		TEMPERATURE SIGNAL
5	-	-
6	-	-
7	T1 18DG/LB	TRS T1 SIGNAL
8	T3 18DG/DB	TRS T3 SIGNAL
9	T42 18DG/YL	TRS T42 SIGNAL
10	T41 18YL/DB	TRS T41 SIGNAL

SENSOR-WATER IN FUEL - GREEN 2 WAY (DIESEL)



**SENSOR-
WATER IN
FUEL
(DIESEL)**

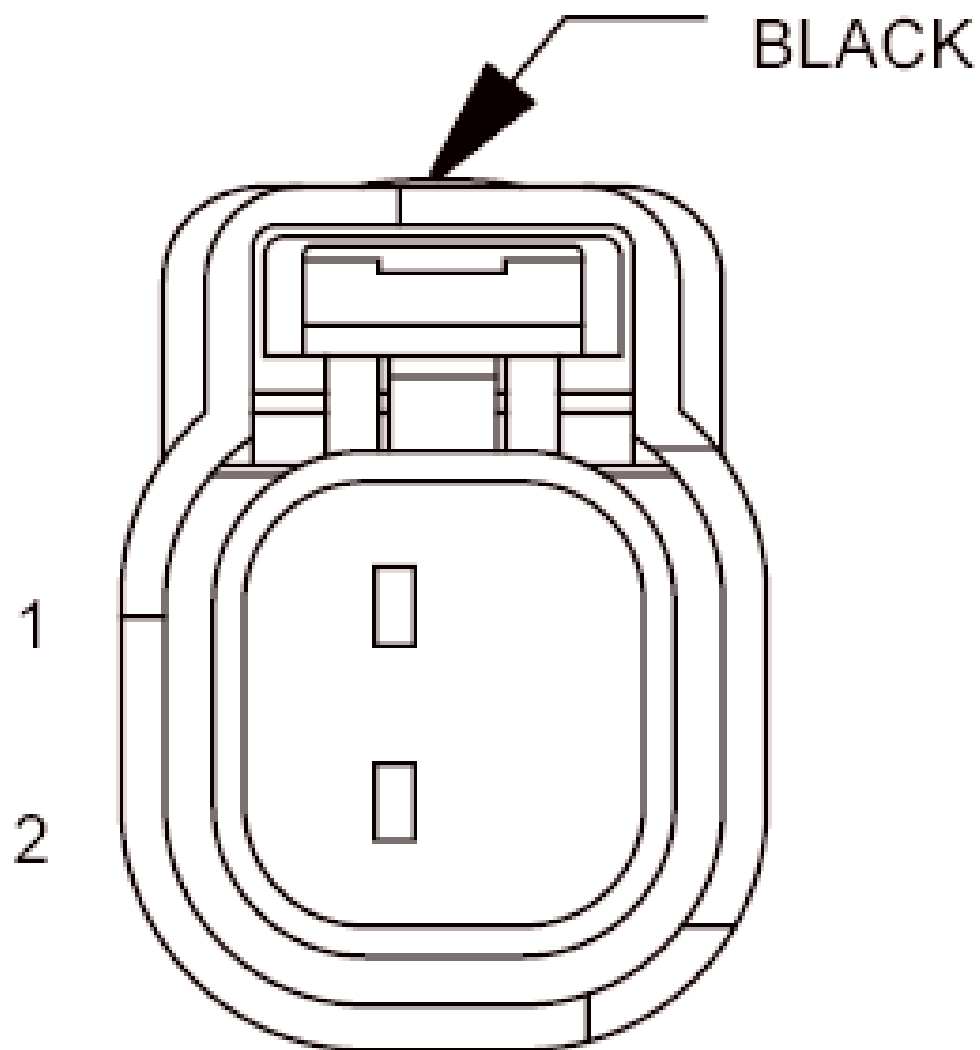
CAV	CIRCUIT	FUNCTION
1	G123 20VT/LG	WATER IN FUEL SIGNAL
1	K923 20BR/WT	WATER IN FUEL RETURN (4X4)
2	K923 20BR/WT	WATER IN FUEL RETURN

SENSOR-WHEEL SPEED-ABS-LEFT FRONT - BLACK 2 WAY

**SENSOR-
WHEEL
SPEED-ABS-
LEFT
FRONT**

CAV	CIRCUIT	FUNCTION
1	B9 18DG/LG	LEFT FRONT WHEEL SPEED SENSOR SUPPLY
2	B8 18DG/TN	LEFT FRONT WHEEL SPEED SENSOR SIGNAL

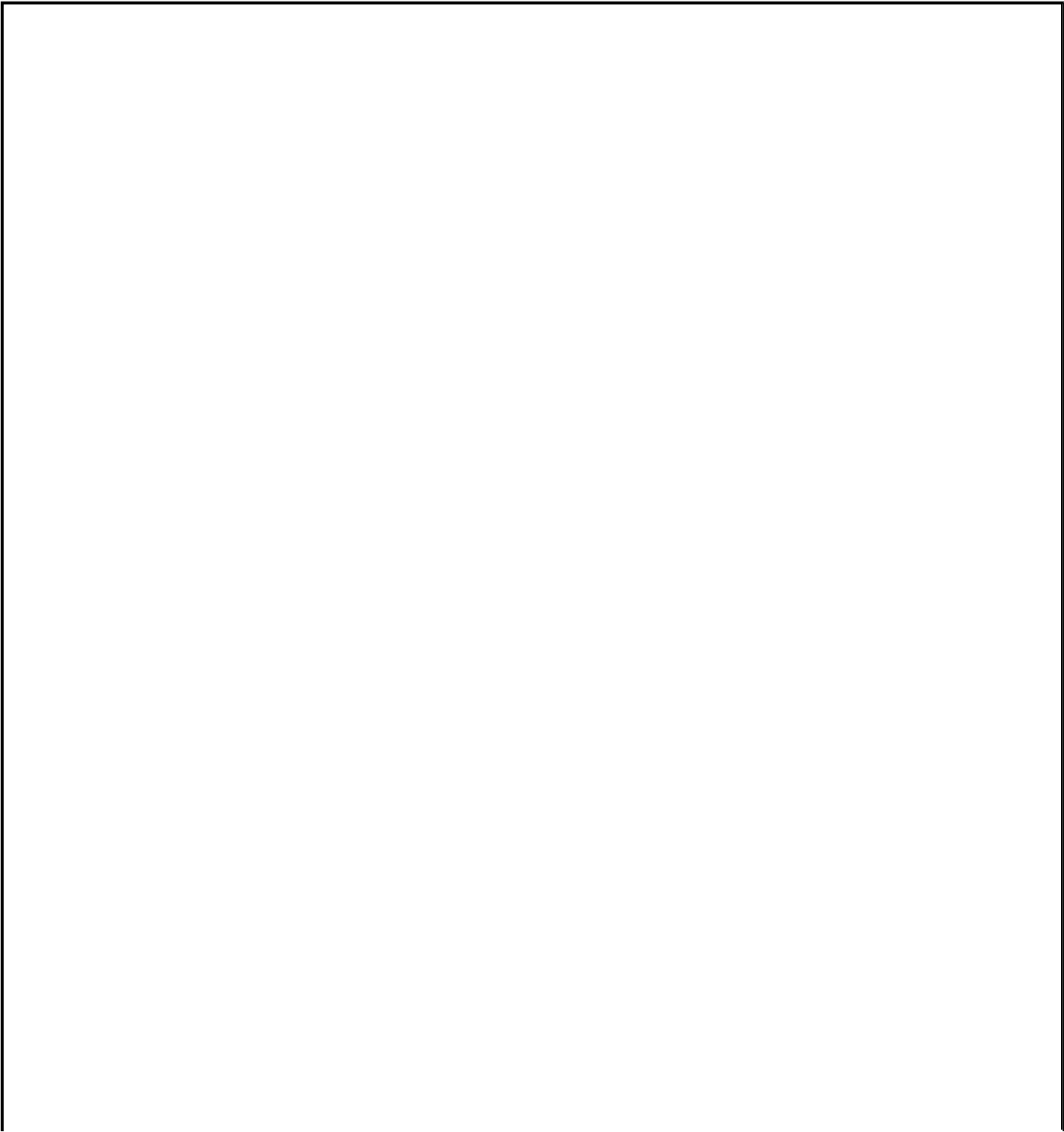
SENSOR-WHEEL SPEED-ABS-LEFT REAR - BLACK 2 WAY

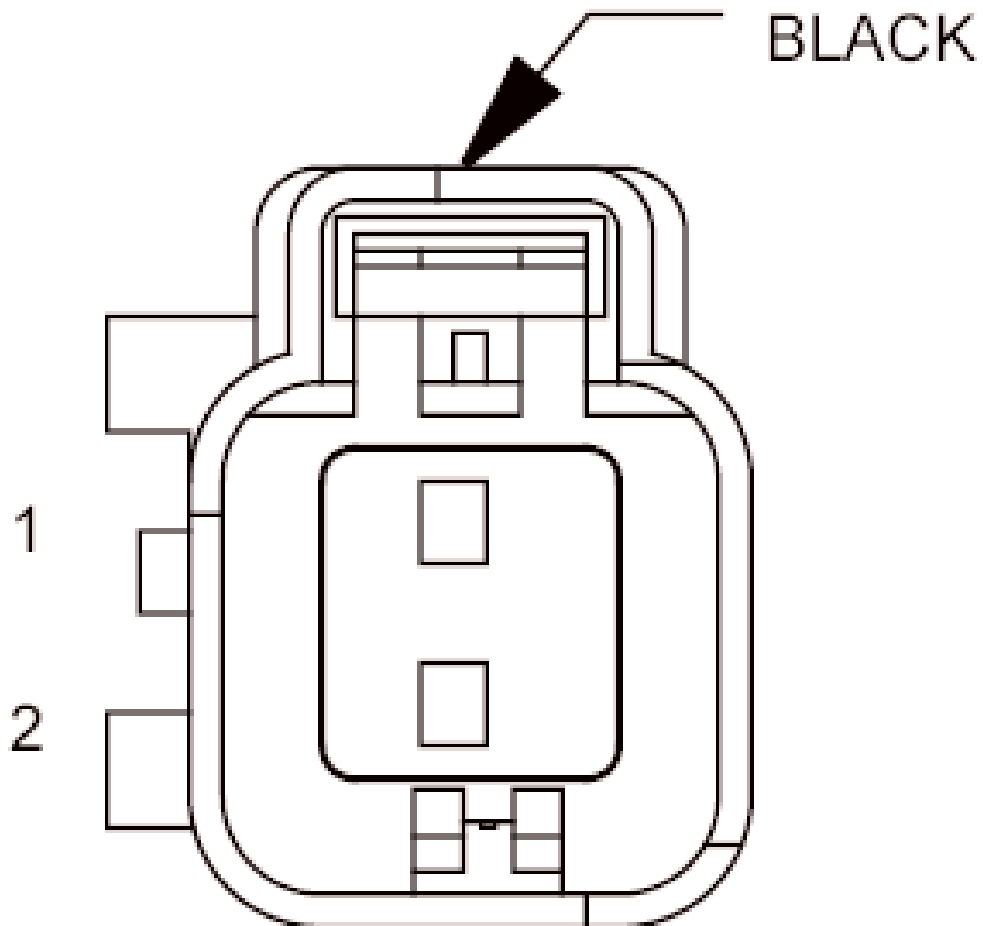


SENSOR-
WHEEL
SPEED-ABS-
LEFT
REAR

	CIRCUIT	FUNCTION
1	B4 18LG	LEFT REAR WHEEL SPEED SENSOR SUPPLY
2	B3 18LG/DB	LEFT REAR WHEEL SPEED SENSOR SIGNAL

SENSOR-WHEEL SPEED-ABS-RIGHT FRONT - BLACK 2 WAY



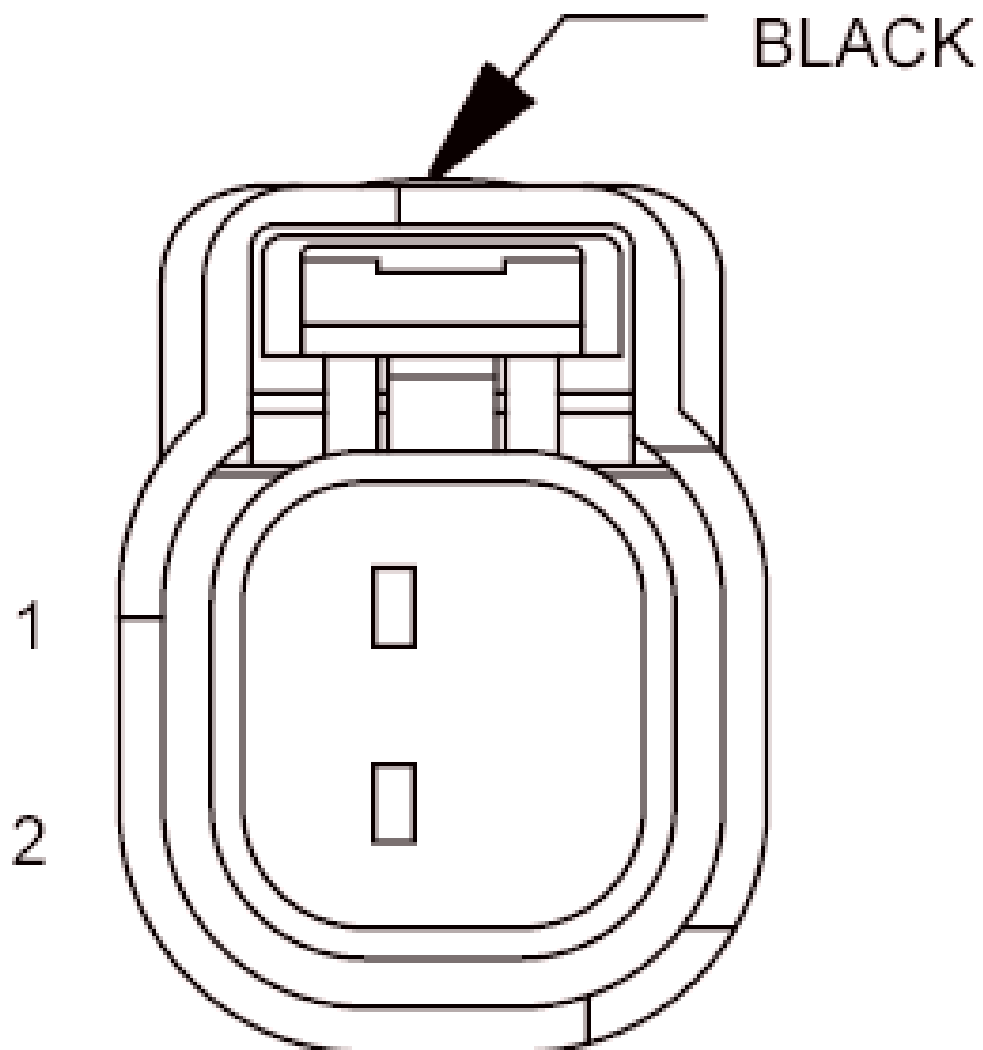


**SENSOR-
WHEEL
SPEED-ABS-
RIGHT
FRONT**

CAV	CIRCUIT	FUNCTION
1	B7 18DG/VT	RIGHT FRONT WHEEL SPEED SENSOR SUPPLY

2	B6 18DG/WT	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL
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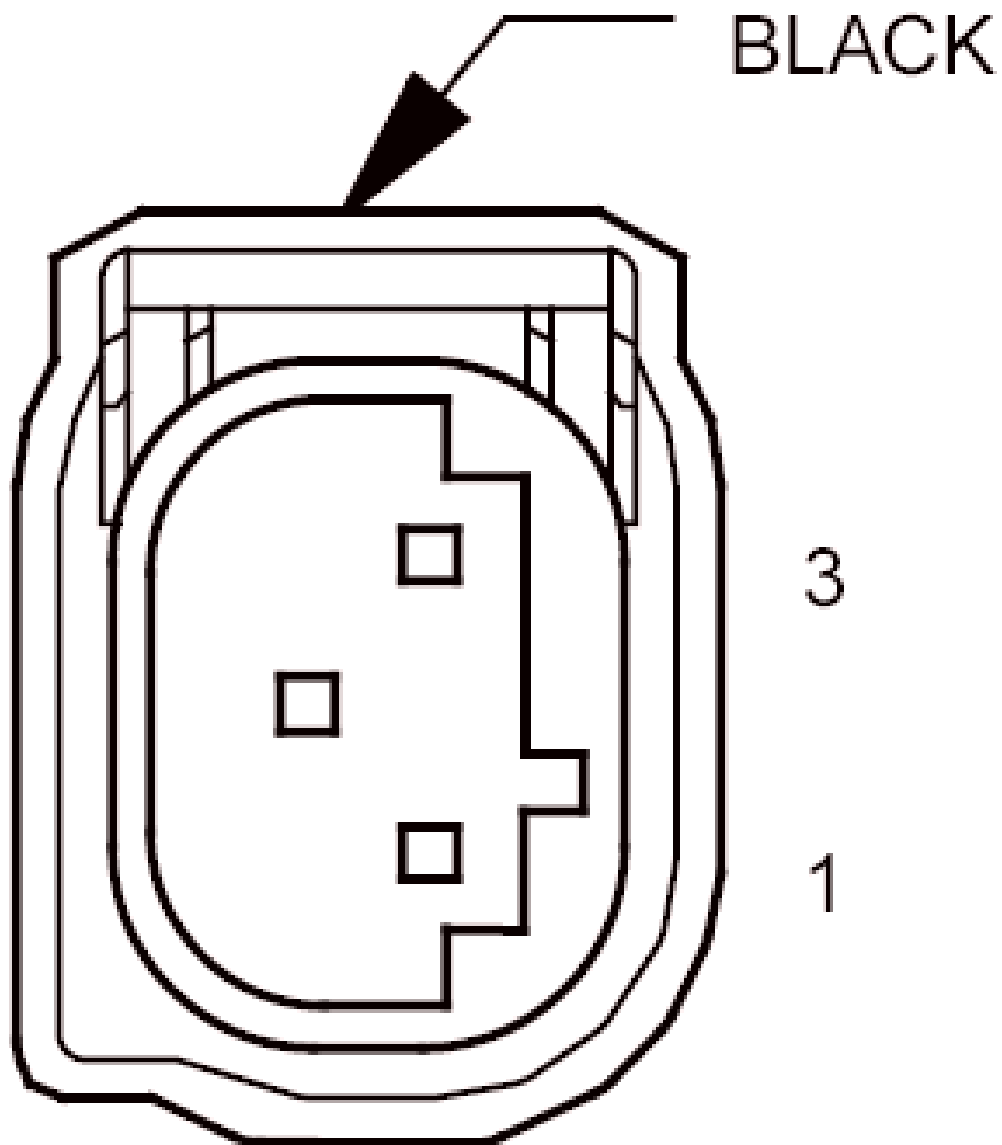
SENSOR-WHEEL SPEED-ABS-RIGHT REAR - BLACK 2 WAY



SENSOR-
WHEEL
SPEED-ABS-
RIGHT
REAR

CAV	CIRCUIT	FUNCTION
1	B2 18YL	RIGHT REAR WHEEL SPEED SENSOR SUPPLY
2	B1 18YL/DB	RIGHT REAR WHEEL SPEED SENSOR SIGNAL

SIREN - BLACK 3 WAY (EXPORT)



SIREN

(EXPORT)

CAV

1

2

CIRCUIT

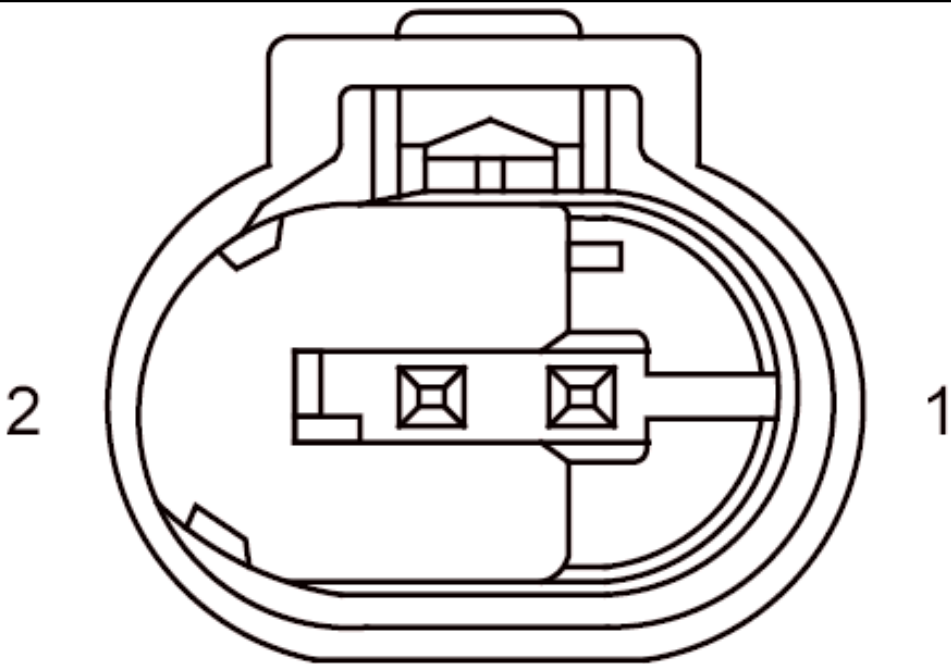
A412 18RD

FUNCTION

FUSED B(+)

	Z908 18BK/LG	GROUND
3	D96 18WT/LB	SIREN SIGNAL CONTROL

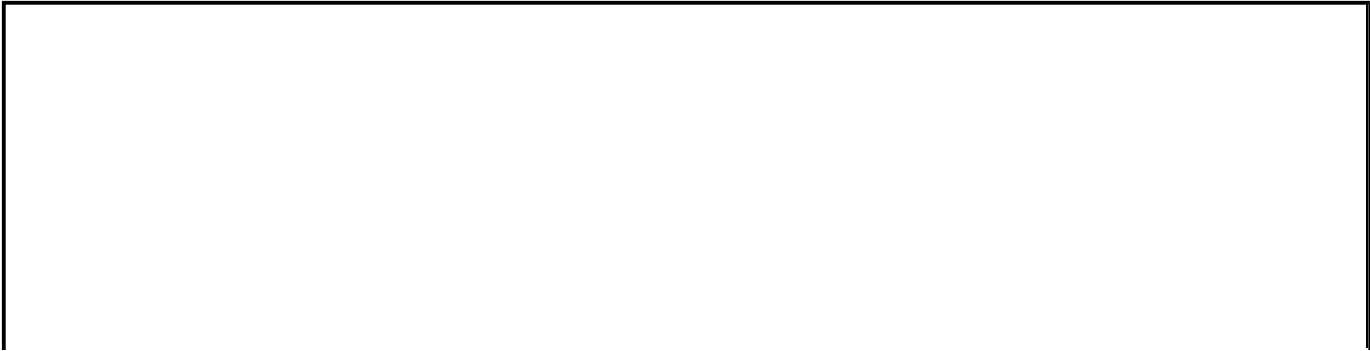
SOLENOID-EGR - 2 WAY (DIESEL)

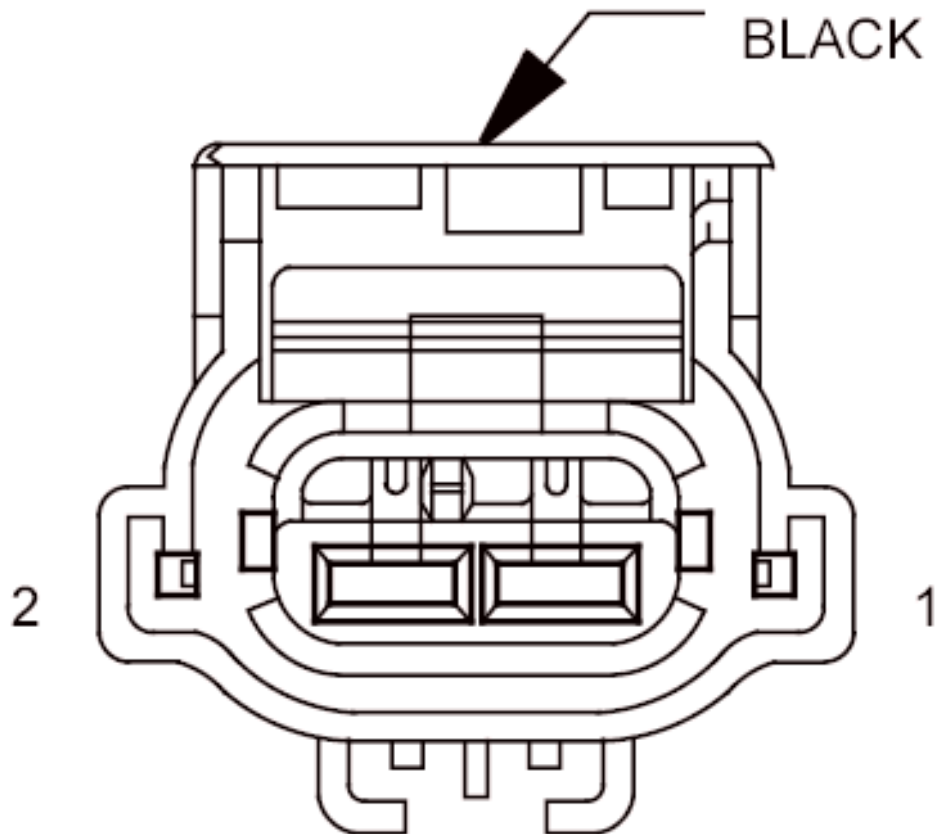


SOLENOID-EGR
(DIESEL)

CAV	CIRCUIT	FUNCTION
1	F344 16BR/GY	FUSED ASD RELAY OUTPUT
2	K35 20DB/VT	EGR CONTROL

SOLENOID-EVAP/PURGE - BLACK 2 WAY

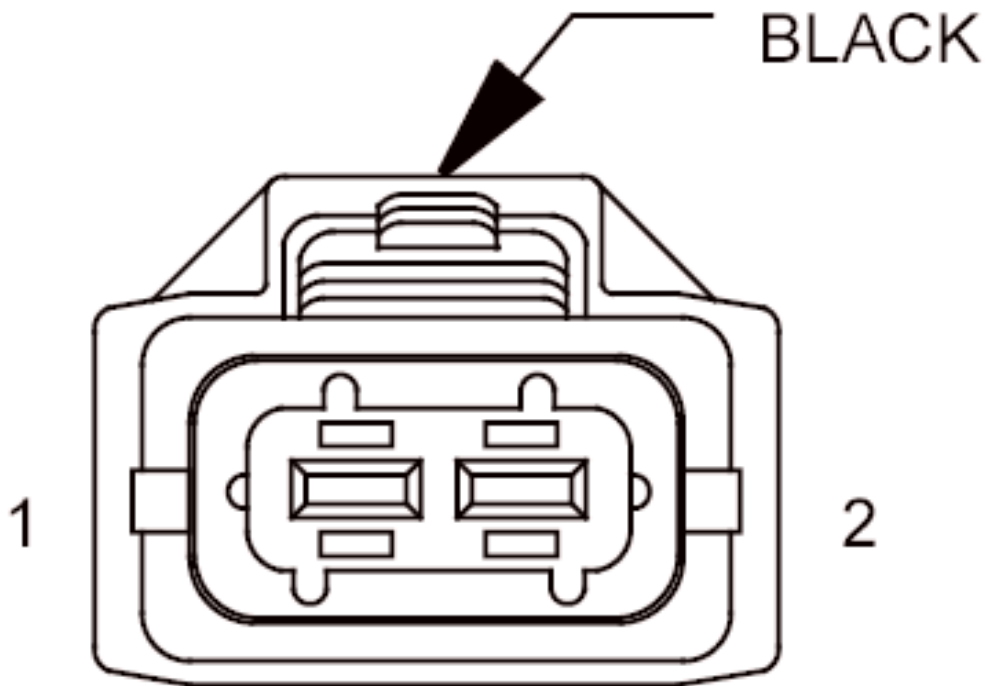




SOLENOID- EVAP/ PURGE

CAV	CIRCUIT	FUNCTION
1	K70 18DB/BR	EVAP PURGE RETURN
2	K52 18DB/WT	EVAP PURGE CONTROL

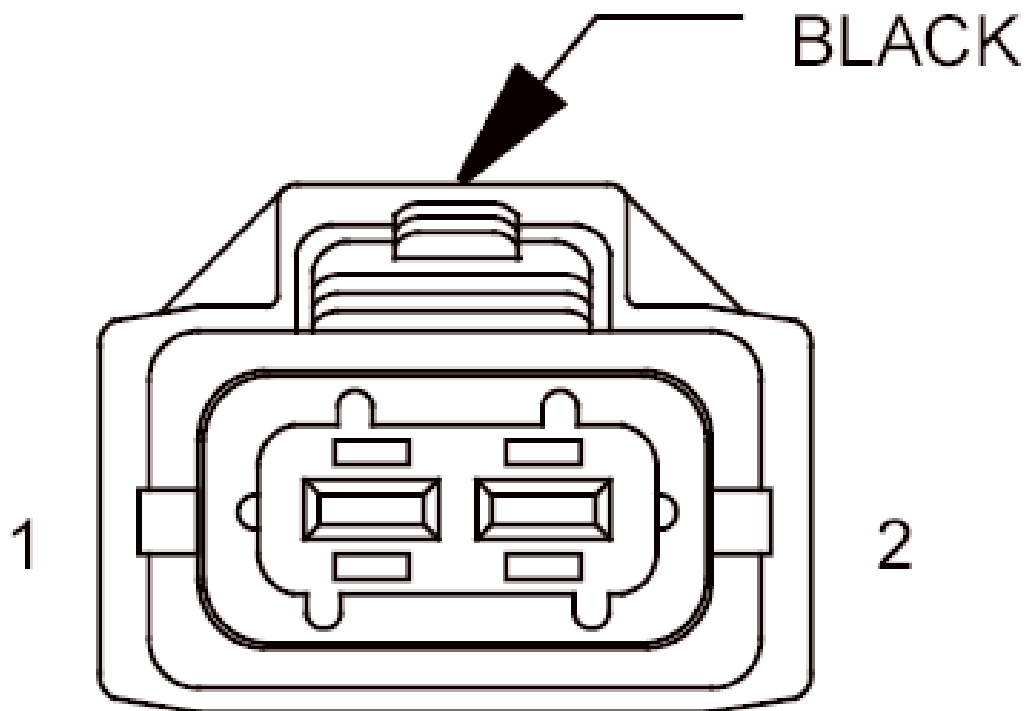
SOLENOID-FUEL PRESSURE - BLACK 2 WAY (DIESEL)



SOLENOID- FUEL PRESSURE (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K369 20BR/OR	FUEL PRESSURE 12 VOLT SUPPLY
1	K369 18BR/OR	FUEL PRESSURE 12 VOLT SUPPLY (4X4)
2	K370 20BR	FUEL PRESSURE CONTROL
2	K370 18BR	FUEL PRESSURE CONTROL (4X4)

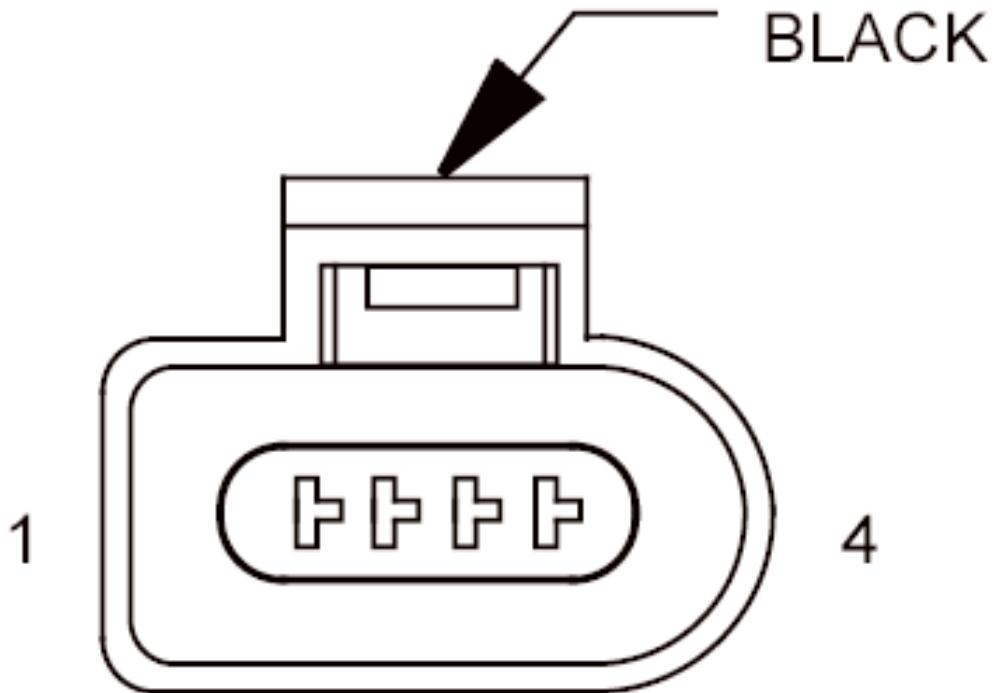
SOLENOID-FUEL QUANTITY - BLACK 2 WAY (DIESEL)



SOLENOID- FUEL QUANTITY (DIESEL)

CAV	CIRCUIT	FUNCTION
1	K366 20BR/LG	FUEL QUANTITY 12 VOLT SUPPLY
2	K365 20DB/BR	FUEL QUANTITY CONTROL

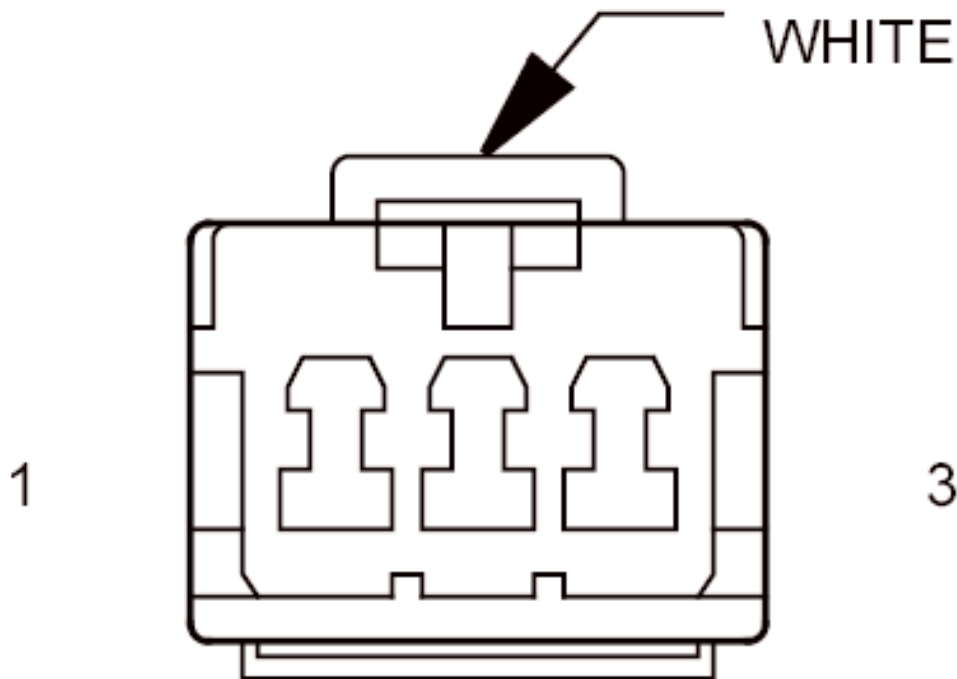
SOLENOID-THROTTLE VALVE - BLACK 4 WAY (DIESEL)



**SOLENOID-
THROTTLE
VALVE
(DIESEL)**

CAV	CIRCUIT	FUNCTION
1	Z904 16BK/TN	GROUND
2	F344 16BR/GY	FUSED ASD RELAY OUTPUT
3	K54 20DB/WT	THROTTLE VALVE CONTROL
4	-	-

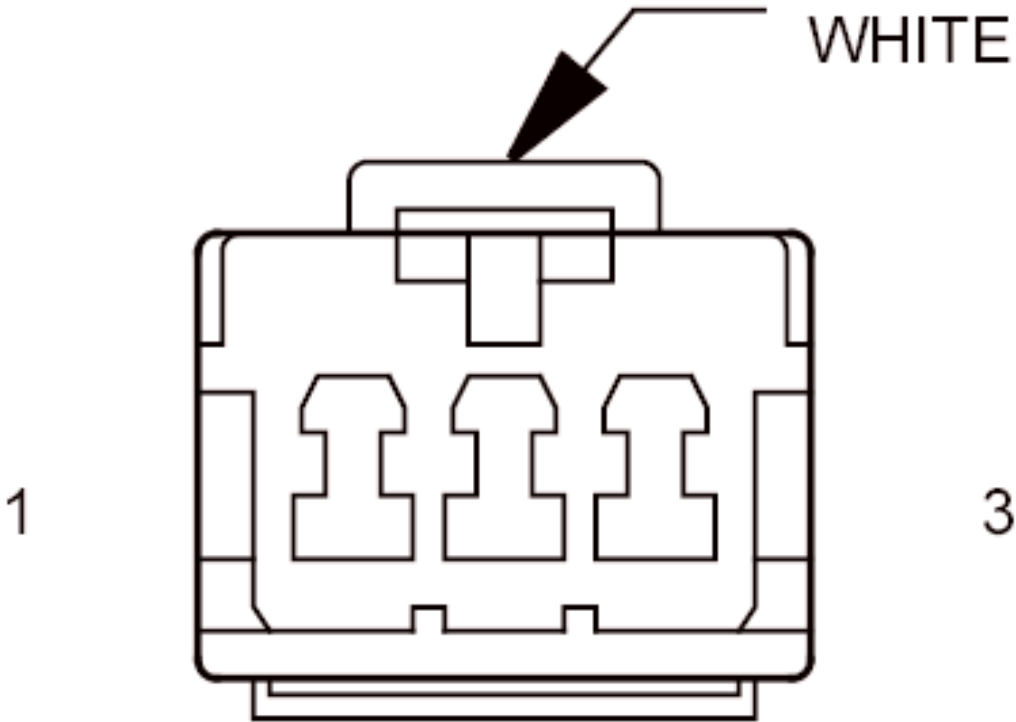
SPEAKER-LEFT FRONT DOOR - WHITE 3 WAY



SPEAKER- LEFT FRONT DOOR

CAV	CIRCUIT	FUNCTION
1	X201 18GY/VT	LEFT FRONT SPEAKERS (+) (EXCEPT AMPLIFIER)
2	-	-
3	X291 18GY/YL	LEFT FRONT SPEAKERS (-) (EXCEPT AMPLIFIER)

SPEAKER-LEFT REAR DOOR - WHITE 3 WAY

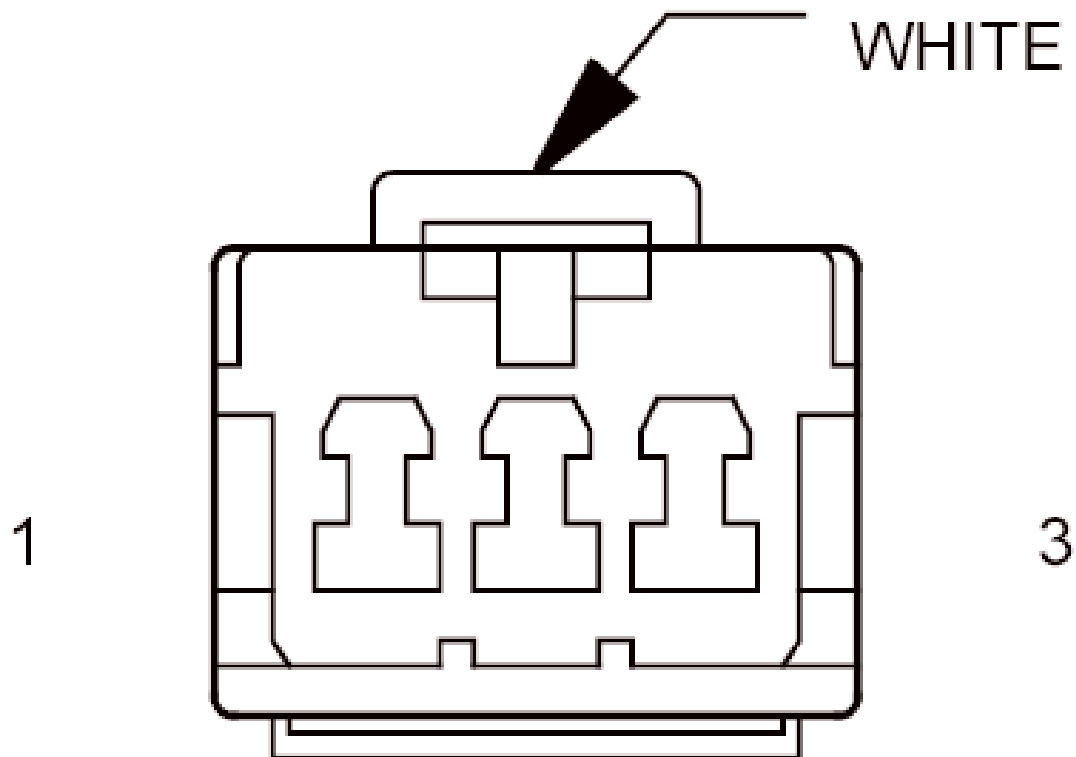


**SPEAKER-
LEFT
REAR
DOOR**

CAV	CIRCUIT	FUNCTION
1	X205 18GY/LG	LEFT REAR SPEAKER (+)
2	-	-
3	X295 18GY/DG	LEFT REAR SPEAKER (-)

SPEAKER-RIGHT FRONT DOOR - WHITE 3 WAY

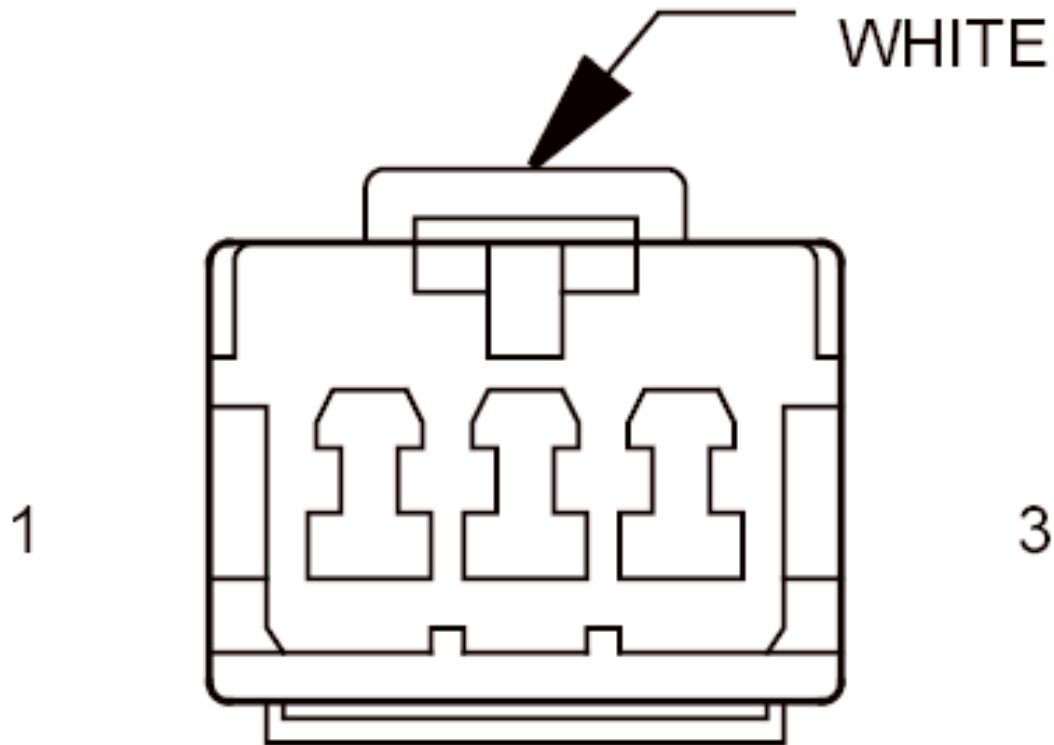
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SPEAKER- RIGHT FRONT DOOR

CAV	CIRCUIT	FUNCTION
1	X202 18DG/VT	RIGHT FRONT SPEAKERS (+) (EXCEPT AMPLIFIER)
2	-	-
3	X292 18DG/YL	RIGHT FRONT SPEAKERS (-) (EXCEPT AMPLIFIER)

SPEAKER-RIGHT REAR DOOR - WHITE 3 WAY

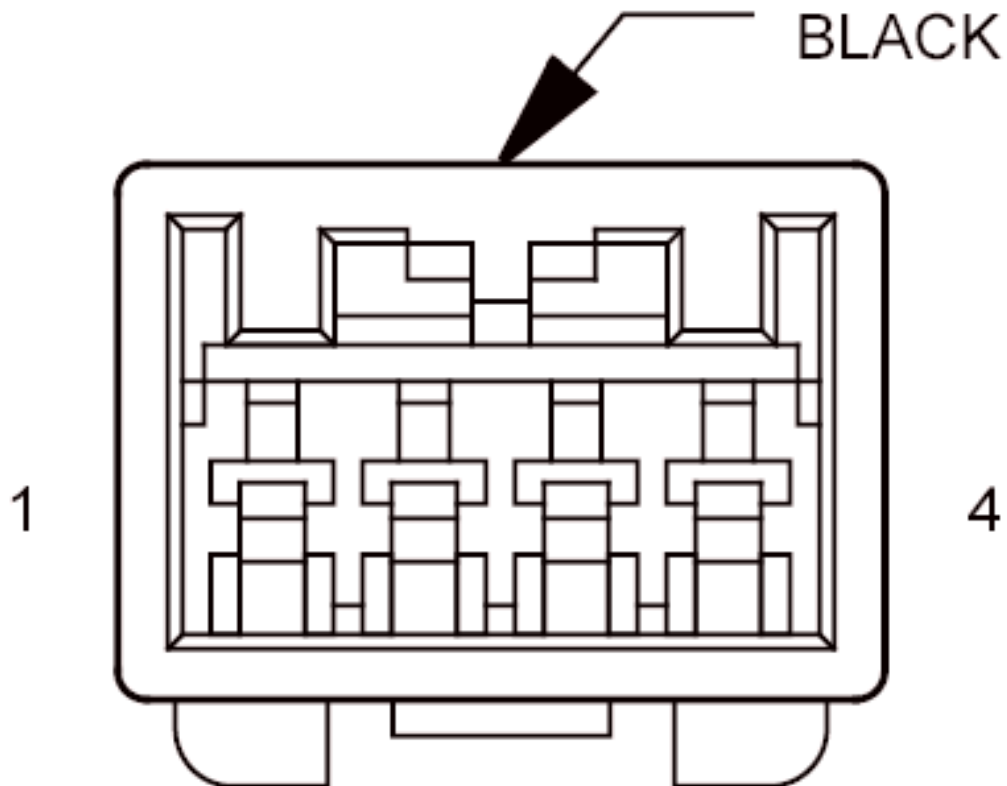


SPEAKER- RIGHT REAR DOOR

CAV	CIRCUIT	FUNCTION
1	X206 18DG/LG	RIGHT REAR SPEAKER (+)
2	-	-
3	X296 18DG/GY	RIGHT REAR SPEAKER (-)

SPEAKER-SUBWOOFER - BLACK 4 WAY (PREMIUM)

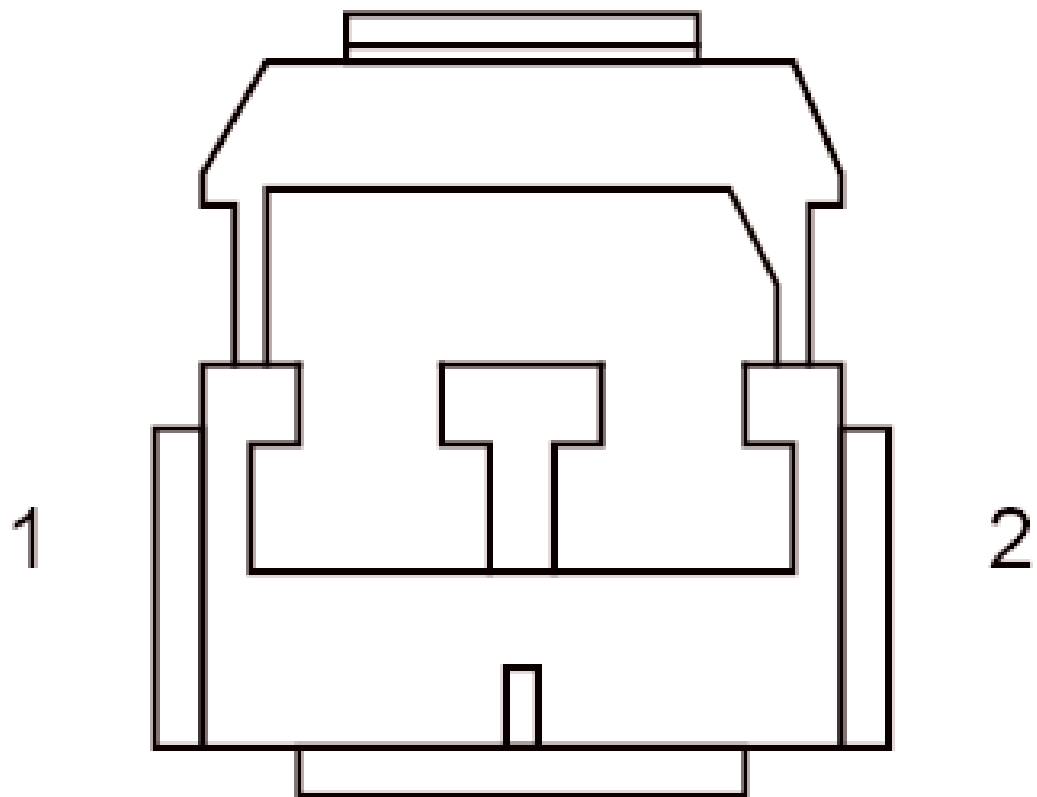




**SPEAKER-
SUBWOOFER
(PREMIUM)**

CAV	CIRCUIT	FUNCTION
1	X300 18GY/BR	AMPLIFIED SUBWOOFER 1 (+)
2	X390 18DG/BR	AMPLIFIED SUBWOOFER 1 (-)
3	X301 18GY/WT	AMPLIFIED SUBWOOFER 2 (+)
4	X391 18DG/WT	AMPLIFIED SUBWOOFER 2 (-)

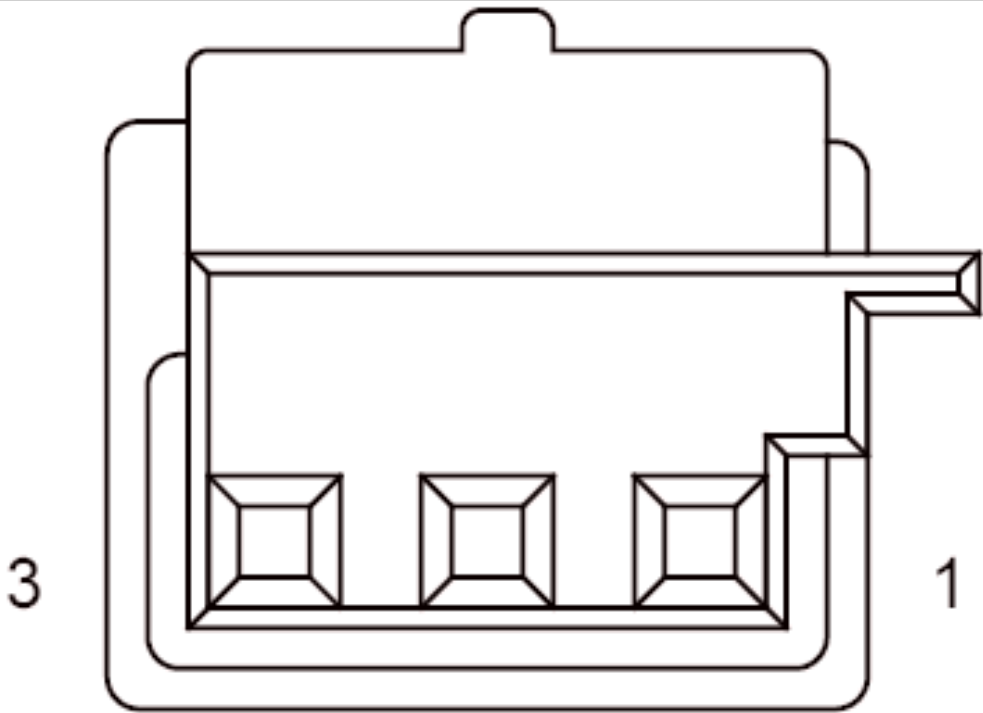
SPEAKER-TWEETER-LEFT FRONT - 2 WAY



**SPEAKER-
TWEETER-
LEFT
FRONT**

CAV	CIRCUIT	FUNCTION
1	X201 18GY/VT	AMPLIFIED LEFT I/P SPEAKER (+)
2	X291 18GY/YL	AMPLIFIED LEFT I/P SPEAKER (-)

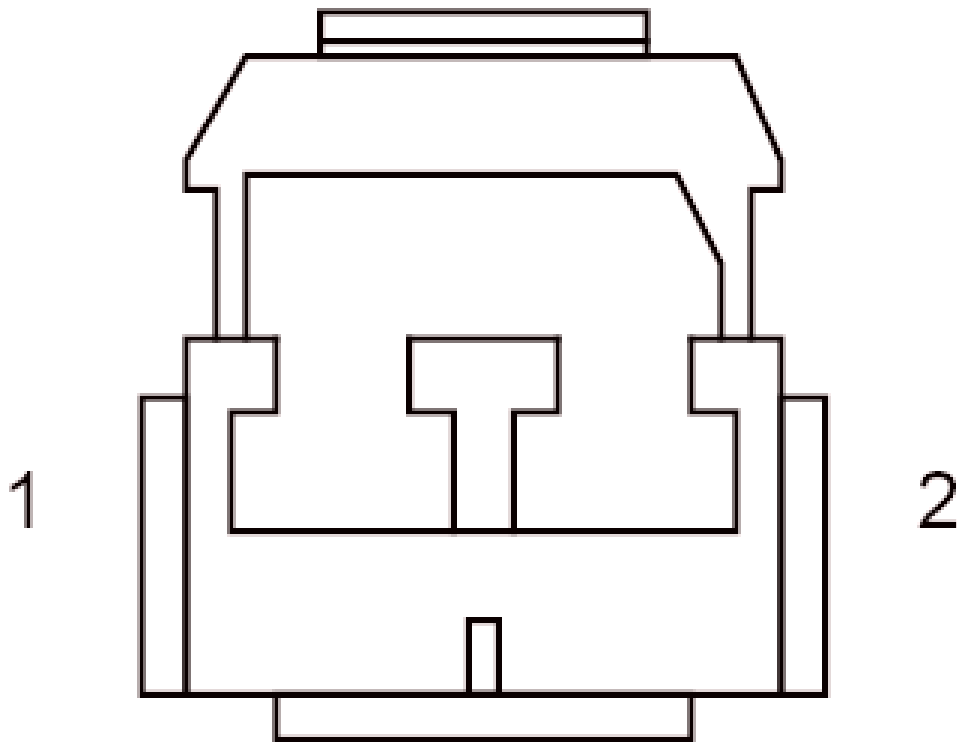
SPEAKER-TWEETER-LEFT REAR - 2 WAY



**SPEAKER-
TWEETER-
LEFT
REAR**

CAV	CIRCUIT	FUNCTION
1	X205 18GY/LG	AMPLIFIED LEFT REAR SPEAKER (+)
2	-	-
3	X295 18GY/DG	AMPLIFIED LEFT REAR SPEAKER (-)

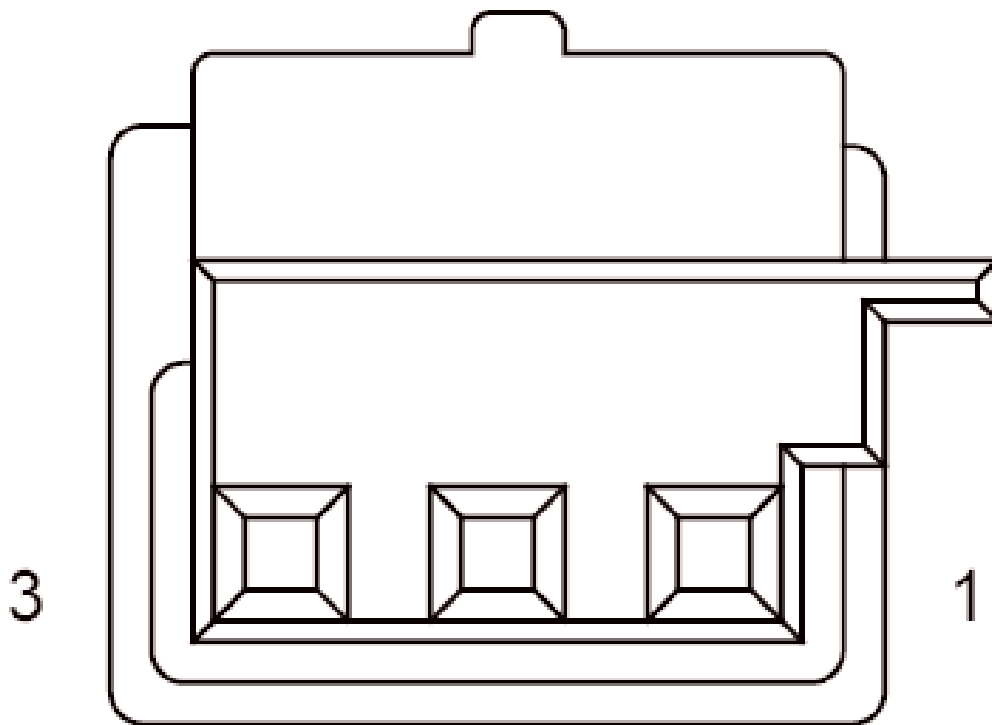
SPEAKER-TWEETER-RIGHT FRONT - 2 WAY



**SPEAKER-
TWEETER-
RIGHT
FRONT**

CAV	CIRCUIT	FUNCTION
1	X202 18DG/VT	AMPLIFIED RIGHT I/P SPEAKER (+)
2	X292 18DG/YL	AMPLIFIED RIGHT I/P SPEAKER (-)

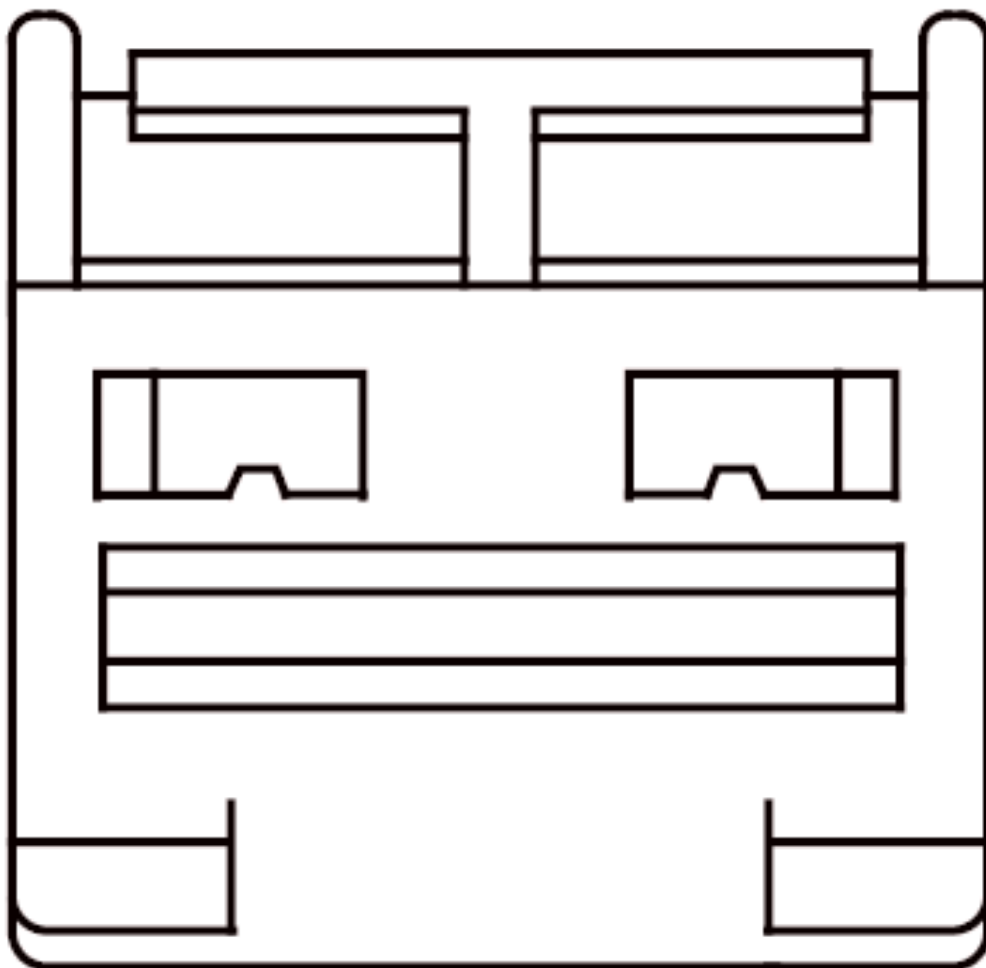
SPEAKER-TWEETER-RIGHT REAR - 2 WAY



**SPEAKER-
TWEETER-
RIGHT
REAR**

CAV	CIRCUIT	FUNCTION
1	X206 18DG/LG	AMPLIFIED RIGHT REAR SPEAKER (+)
2	X296 18DG/GY	AMPLIFIED RIGHT REAR SPEAKER (-)

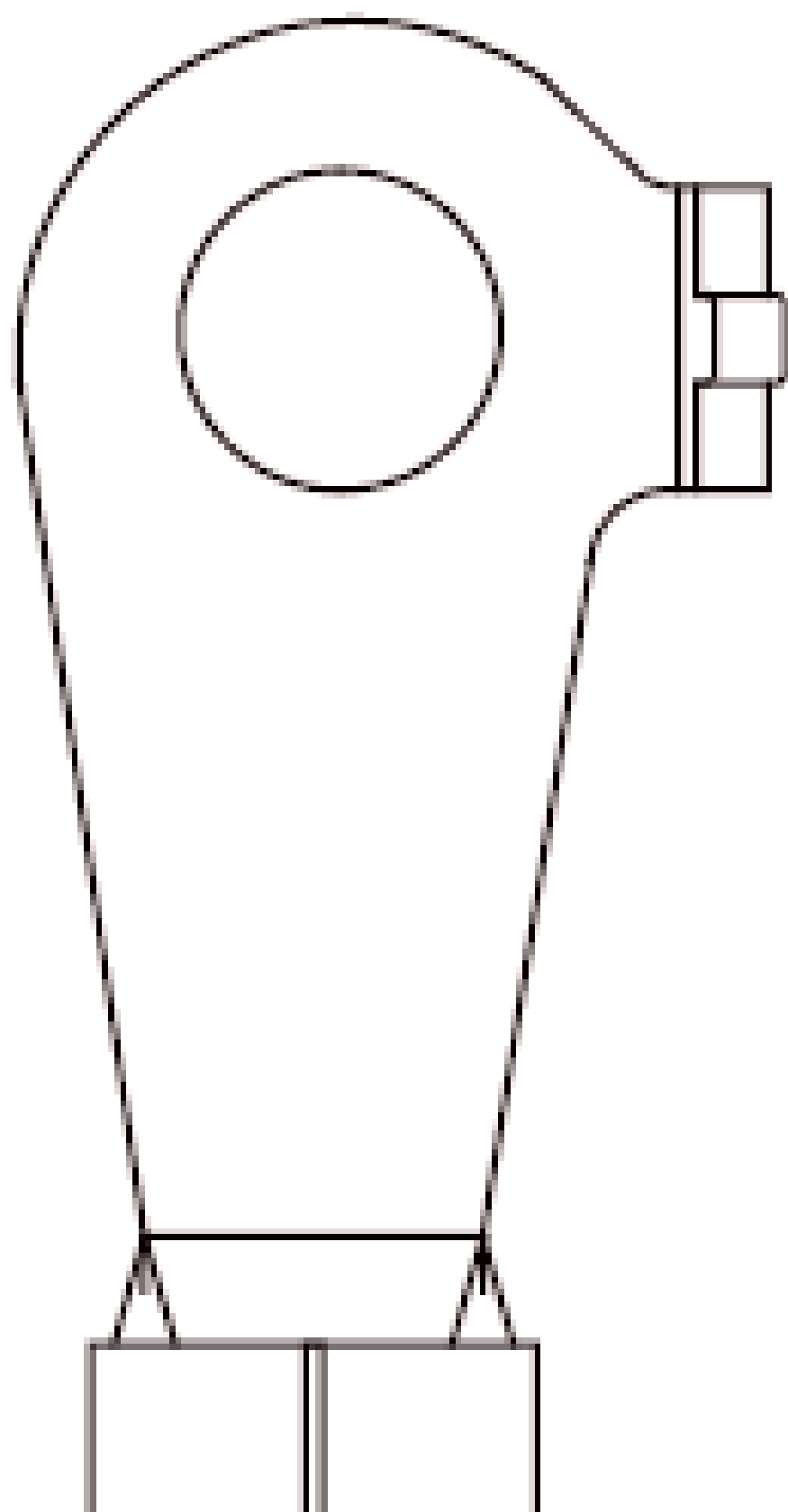
STARTER - 1 WAY



STARTER

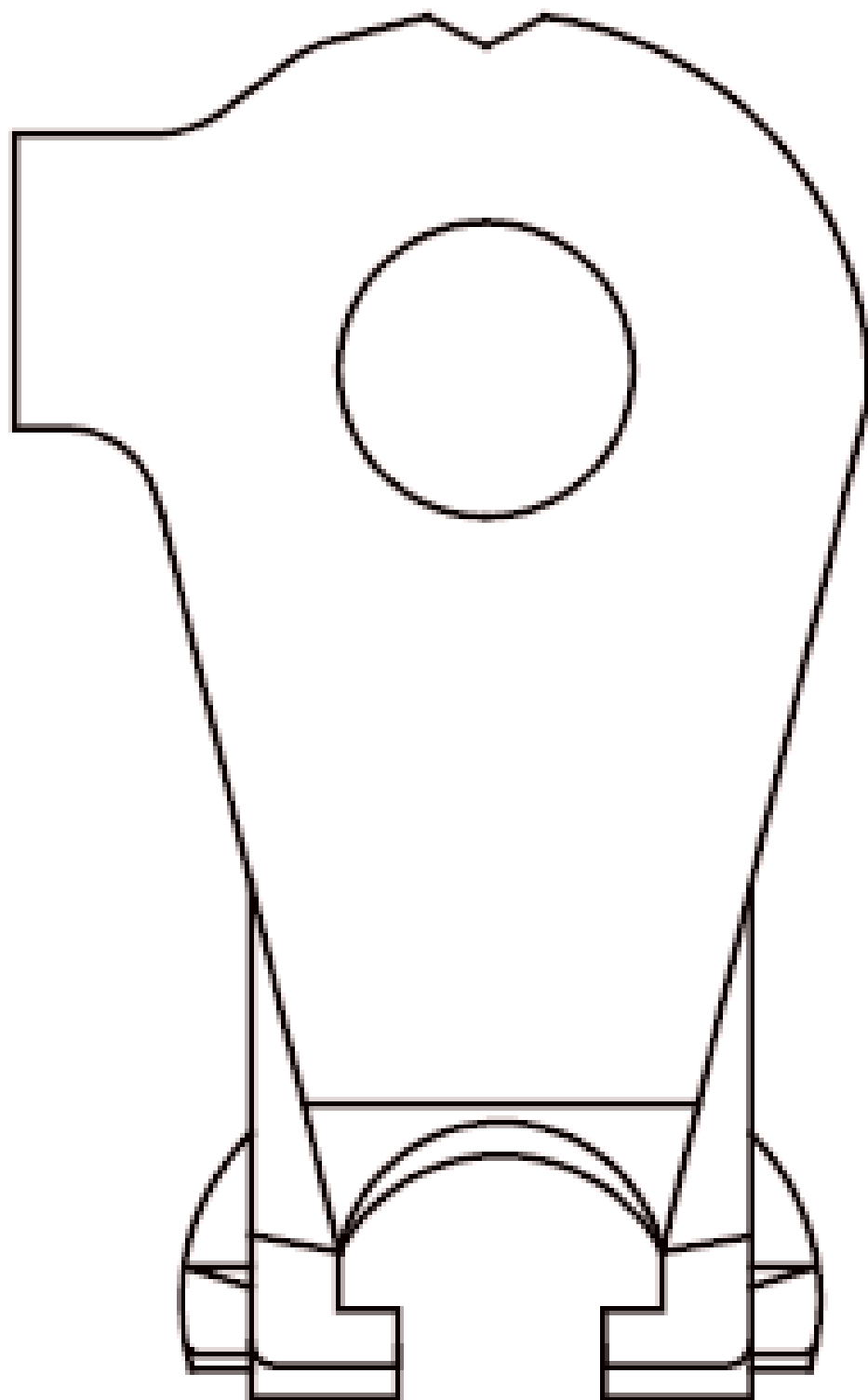
CAV	CIRCUIT	FUNCTION
1	T750 12YL/GY	STARTER RELAY OUTPUT

STARTER-EYELET - 1 WAY (DIESEL)



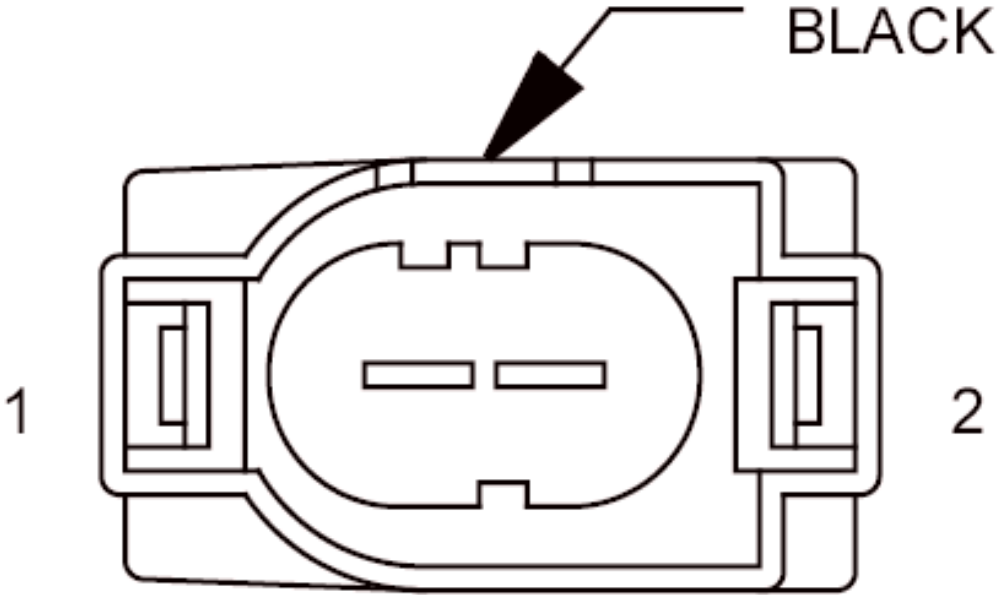
CAV	CIRCUIT	FUNCTION
1	A0 2RD	B(+)

STARTER-EYELET - 1 WAY (GAS)



CAV	CIRCUIT	FUNCTION
1	A0 4RD	B(+)

SWITCH-BACKUP LAMP - BLACK 2 WAY (MTX)



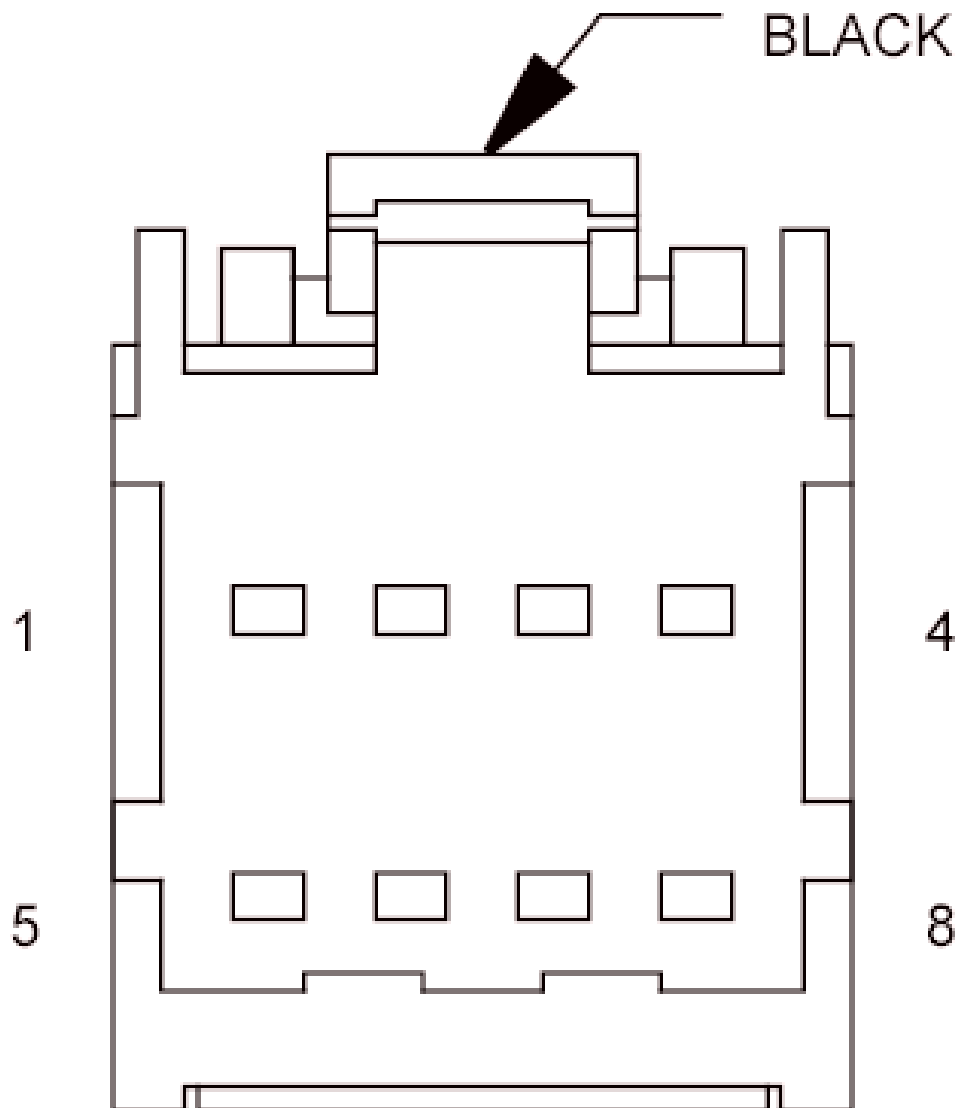
SWITCH-
BACKUP
LAMP

(MTX)

CAV	CIRCUIT	FUNCTION
1	Z904A 18BK/LG	GROUND (2.8L)
1	Z904 18BK	GROUND (LHD 3.7L)
2	T2 18DG/WT	BACKUP LAMP SWITCH SIGNAL

SWITCH-BANK - BLACK 8 WAY

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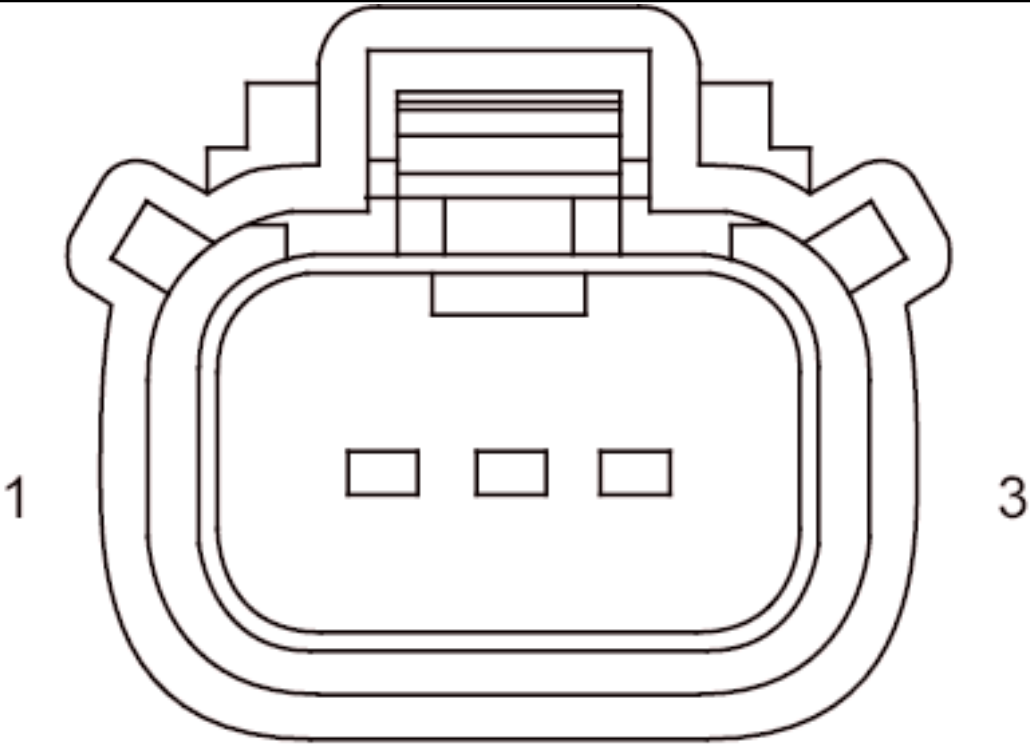


SWITCH- BANK

CAV	CIRCUIT	FUNCTION
1	L91 18WT/DB	HAZARD SWITCH SENSE
2	-	-
3	-	-
4	-	-
5	-	-
6	A909 18RD	FUSED B(+)
7		

	Z910 18BK/VT	GROUND
8	D506 20WT/DG	LIN BUS

SWITCH-CLUTCH INTERLOCK - 3 WAY (MTX)

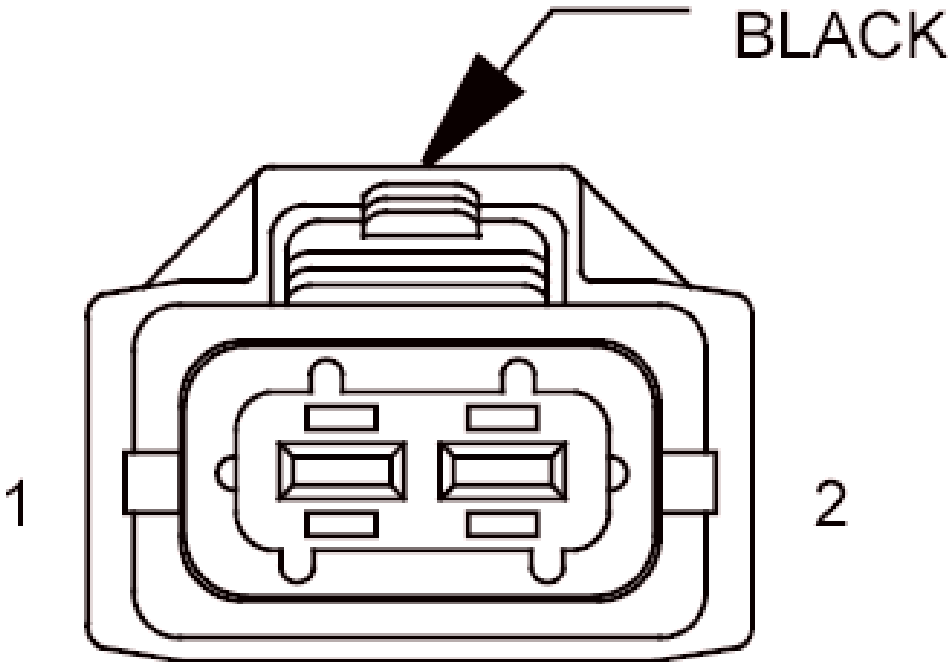


**SWITCH-
CLUTCH
INTERLOCK
(MTX)**

CAV	CIRCUIT	FUNCTION
1	T26 18DG/OR	CLUTCH UPSTOP SIGNAL
2	T41 20YL/OR	CLUTCH INTERLOCK SIGNAL (2.8L 4X4)
2	T141 18YL/OR	CLUTCH INTERLOCK SIGNAL (2.8L)
2	T41 18YL/DB	CLUTCH INTERLOCK SIGNAL

		(3.7L)
3	Z904 18BK	GROUND
3	Z904J 18BK/PK	GROUND (RHD)

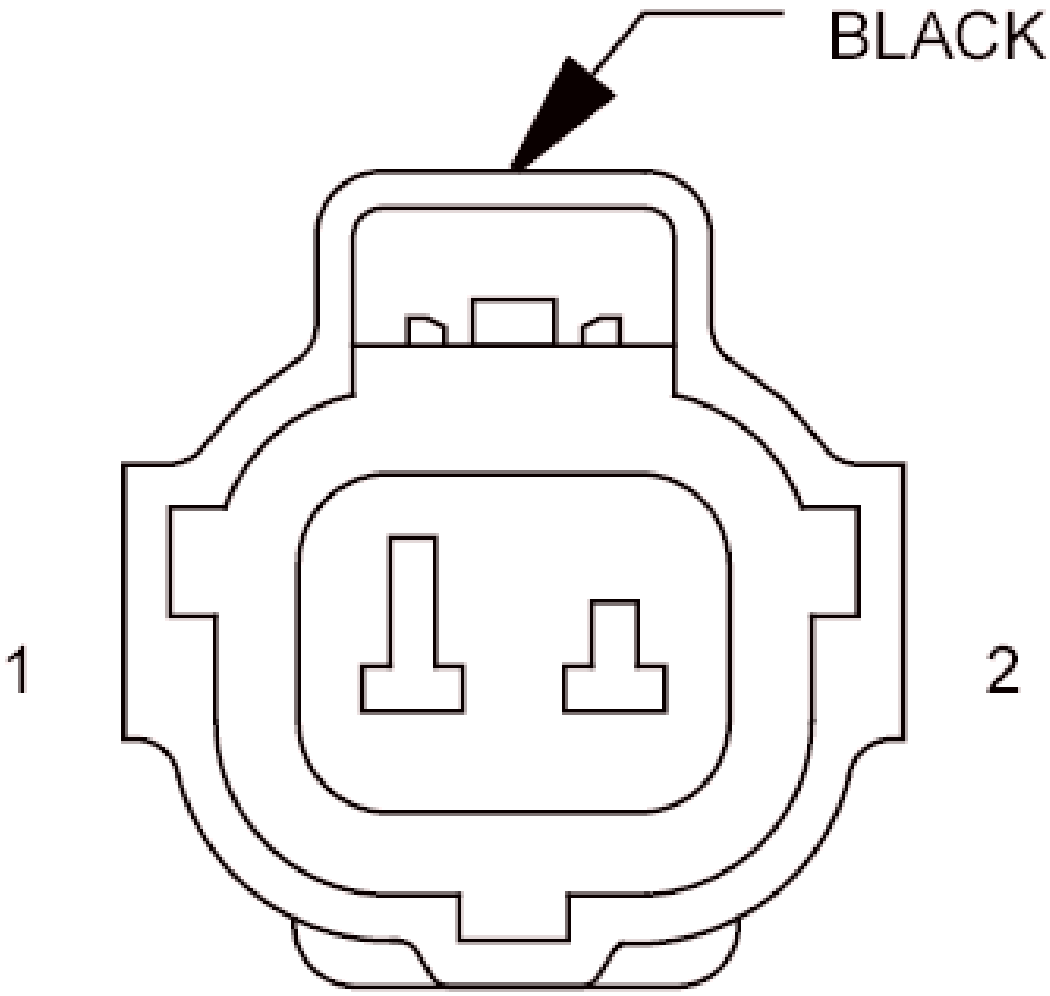
SWITCH-EVAP SYSTEM MONITOR - BLACK 2 WAY (GAS)



SWITCH-
EVAP
SYSTEM
MONITOR
(GAS)

CAV	CIRCUIT	FUNCTION
1	Z913 18BK/LB	GROUND
2	K107 18VT/WT	ESM SIGNAL

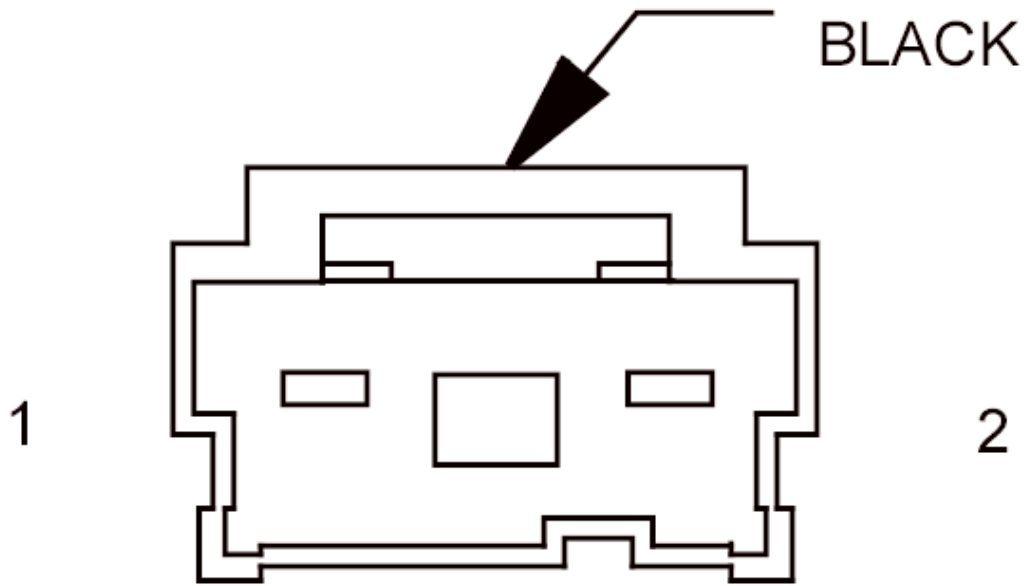
SWITCH-HOOD AJAR - BLACK 2 WAY



**SWITCH-
HOOD
AJAR**

CAV	CIRCUIT	FUNCTION
1	G70 18VT/LB	HOOD AJAR SWITCH SENSE
2	G931 18VT/BR	SENSOR GROUND

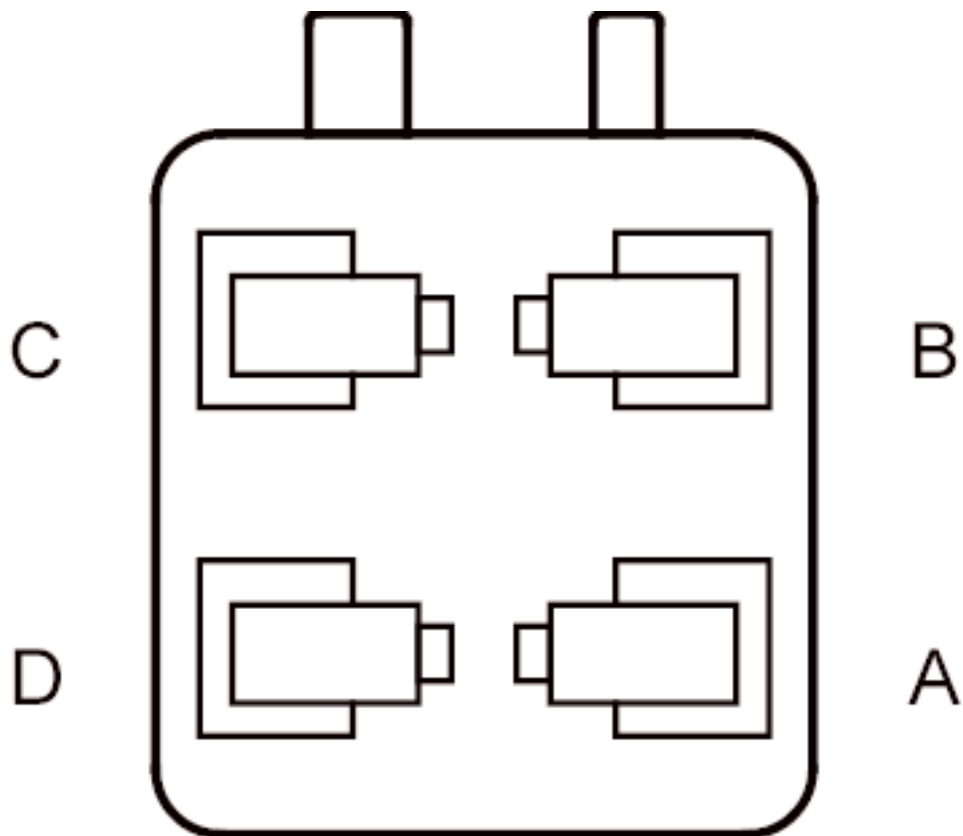
SWITCH-HORN - BLACK 2 WAY



**SWITCH-
HORN**

CAV	CIRCUIT	FUNCTION
1	X3 20DB	HORN SWITCH SENSE
2	Y13 20VT/YL	SIGNAL RETURN

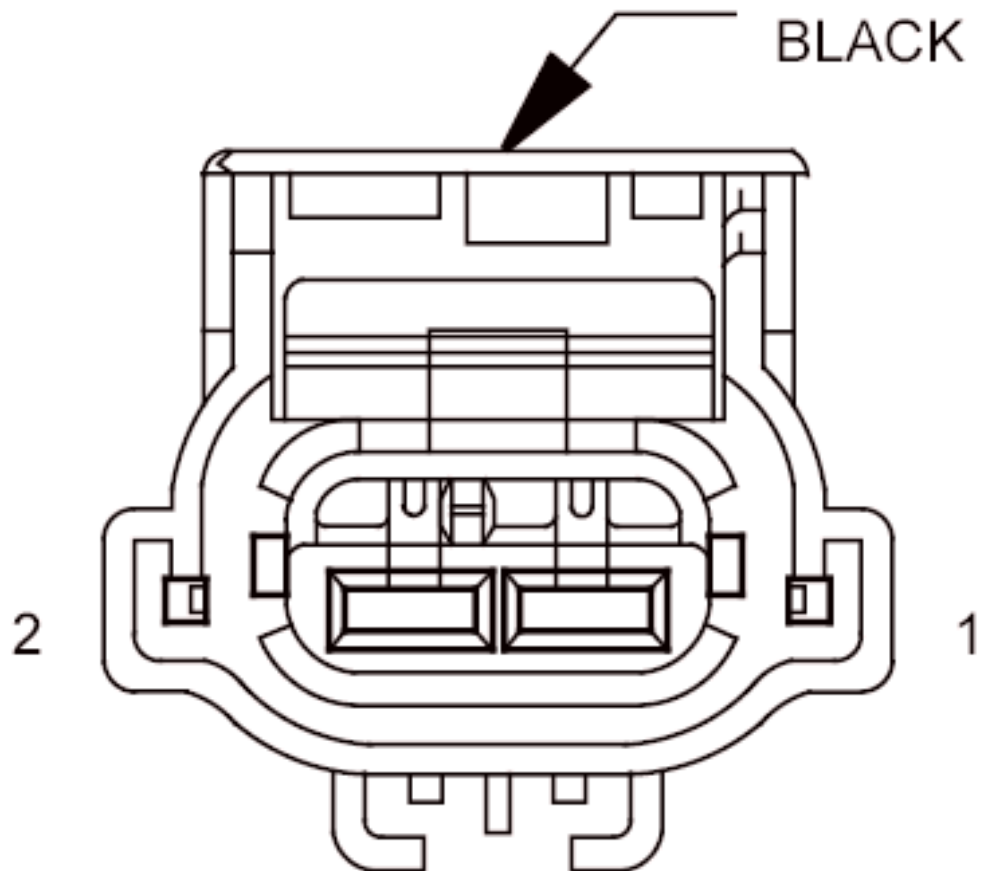
SWITCH-IGNITION - BLACK 5 WAY



SWITCH-MEMORY

CAV	CIRCUIT	FUNCTION
1	-	-
2	G920 20VT/YL	MEMORY SELECT SWITCH RETURN
3	G200 20VT/BR	MEMORY SELECT SWITCH MUX
4	-	-

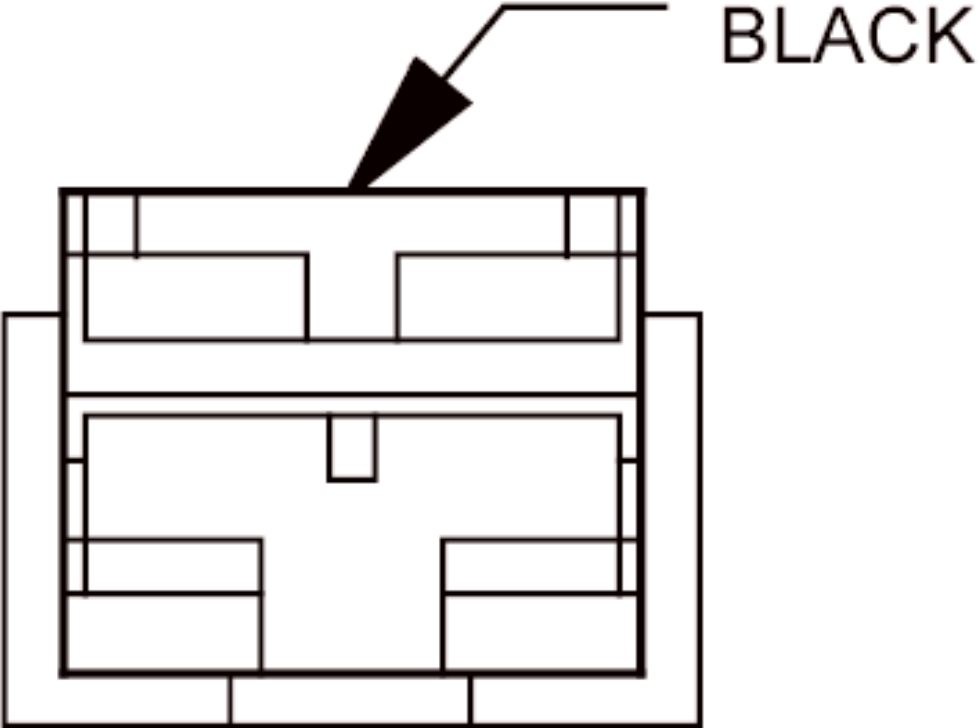
SWITCH-OIL PRESSURE - BLACK 2 WAY (GAS)



SWITCH-OIL PRESSURE (GAS)

CAV	CIRCUIT	FUNCTION
1	G6 16VT/GY	EOP SIGNAL
2	-	-

SWITCH-PARKING BRAKE - BLACK 1 WAY

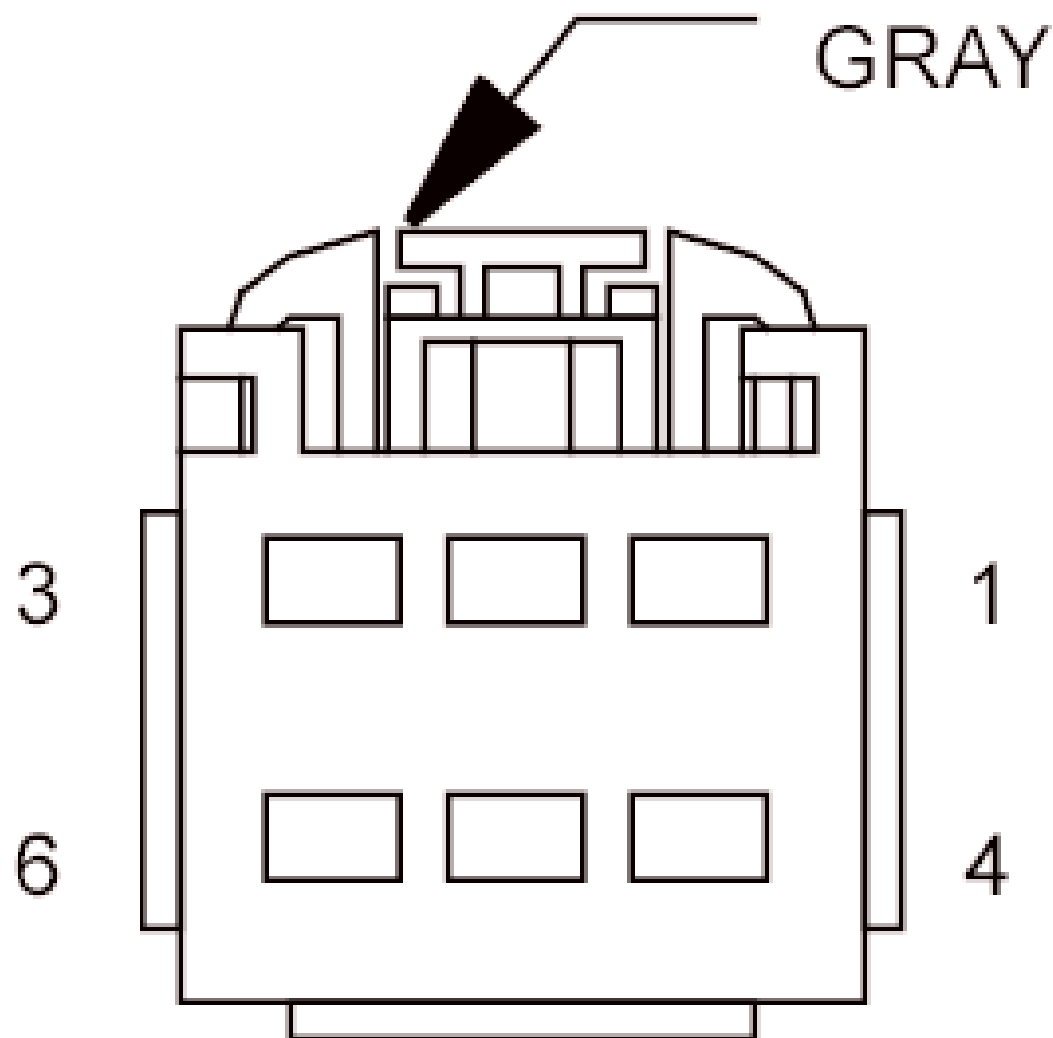


**SWITCH-
PARKING
BRAKE**

CAV	CIRCUIT	FUNCTION
1	B25 18DG/WT	PARK BRAKE SWITCH SENSE

SWITCH-POWER WINDOW-LEFT REAR - GRAY 6 WAY

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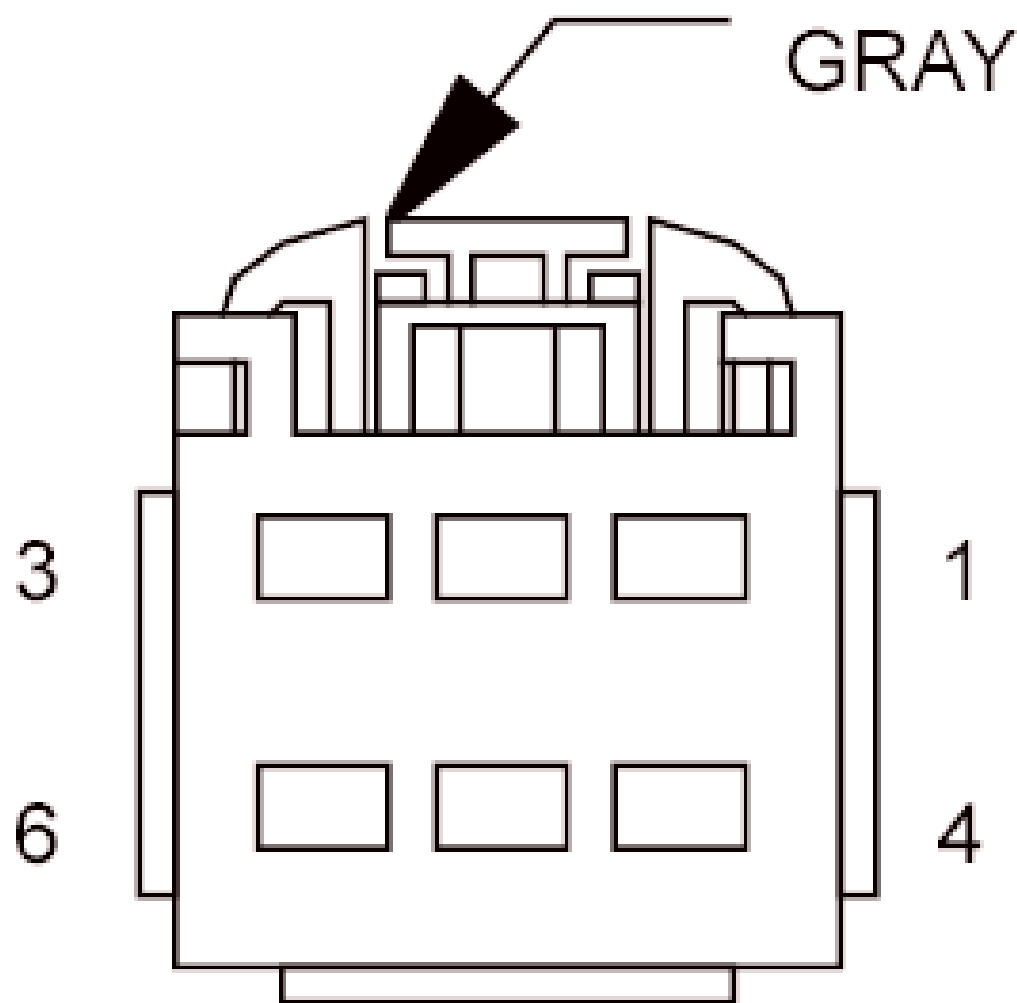
**SWITCH-
POWER
WINDOW-
LEFT**

REAR

CAV	CIRCUIT	FUNCTION
1	Q411 14OR/WT	MASTER WINDOW SWITCH LEFT REAR (UP)
2	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
3	Q211 14TN/LB	LEFT REAR WINDOW DRIVER (DOWN)
4	Q111 14TN/YL	LEFT REAR WINDOW DRIVER (UP)
5	Z913 14BK/LB	GROUND
6	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)

SWITCH-POWER WINDOW-RIGHT REAR - GRAY 6 WAY

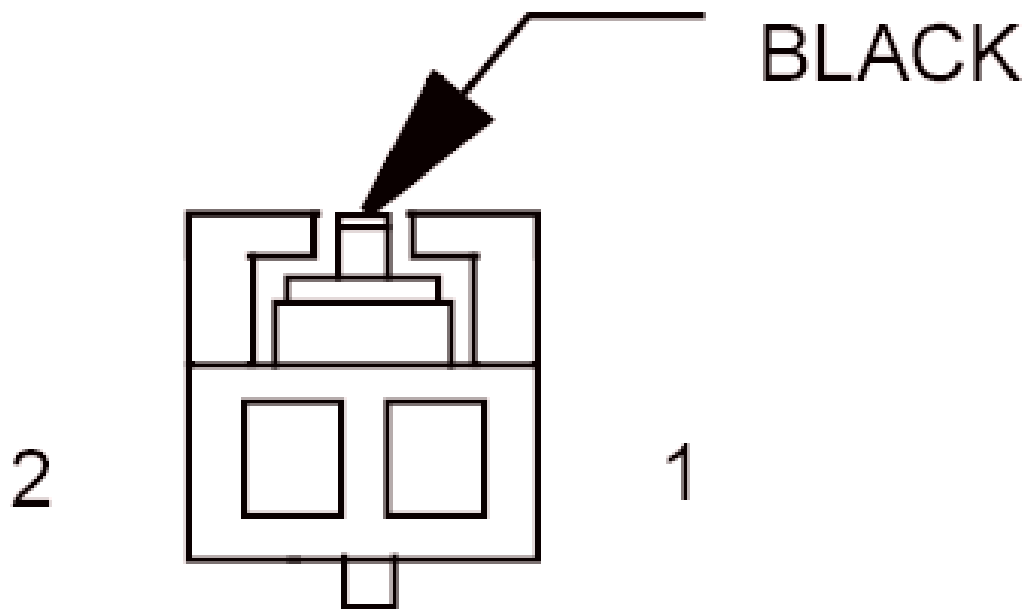




**SWITCH-
POWER
WINDOW-
RIGHT
REAR**

CAV	CIRCUIT	FUNCTION
1	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP)
2	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
3	Q212 14OR/VT	RIGHT REAR WINDOW DRIVER (DOWN)
4	Q112 14OR/BR	RIGHT REAR WINDOW DRIVER (UP)
5	Z913 14BK/VT	GROUND
6	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN)

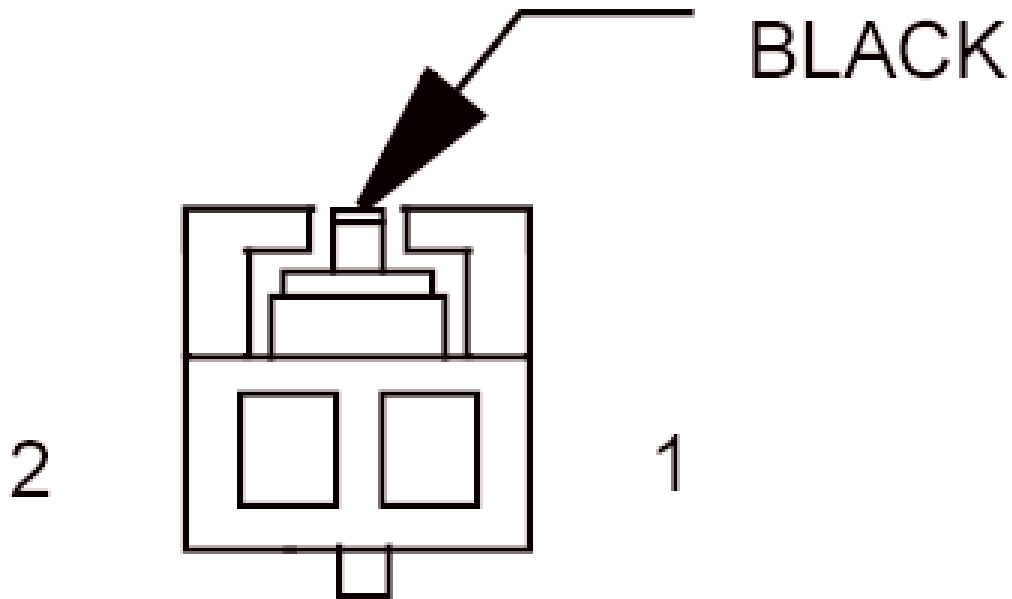
SWITCH-REMOTE RADIO-LEFT - 2 WAY



SWITCH- REMOTE RADIO- RIGHT

CAV	CIRCUIT	FUNCTION
1	X20 22GY/WT	RADIO CONTROL MUX
2	Y13 20VT/YL	RADIO CONTROL RETURN

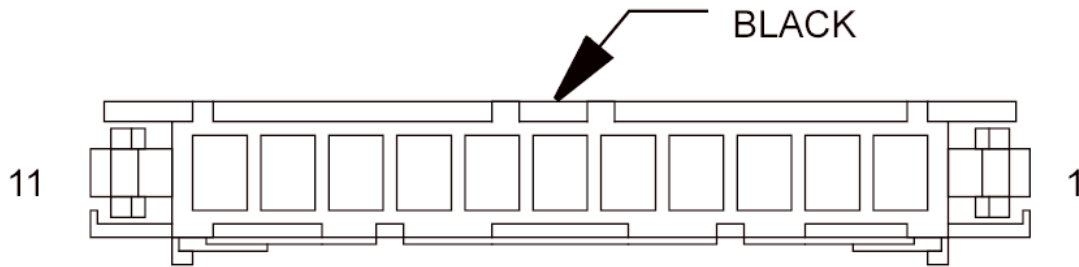
SWITCH-REMOTE RADIO-RIGHT - 2 WAY



SWITCH- REMOTE RADIO- RIGHT

CAV	CIRCUIT	FUNCTION
1	X20 22GY/WT	RADIO CONTROL MUX
2	Y13 20VT/YL	RADIO CONTROL RETURN

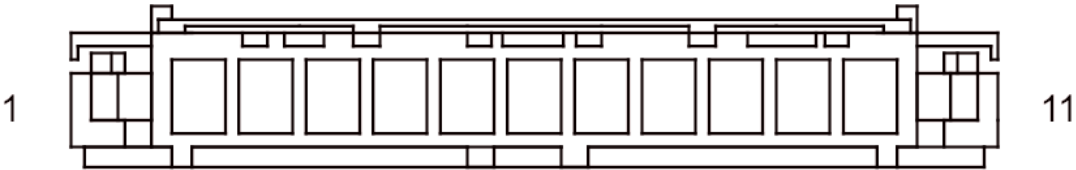
SWITCH-SEAT-DRIVER - BLACK 11 WAY FEMALE



SWITCH- SEAT- DRIVER

CAV	CIRCUIT	FUNCTION
1	P28 22LG/BR	DRIVER SEAT POSITION SENSOR GROUND (MEMORY)
2	-	-
3	-	-
4	P17 14LG/DG	DRIVER SEAT HORIZONTAL REARWARD DRIVER (EXCEPT MEMORY)
4	P311 18LG/VT	DRIVER SEAT FRONT RISER SWITCH MUX (MEMORY)
5	P21 14LG/TN	DRIVER SEAT FRONT DOWN DRIVER (EXCEPT MEMORY)
6	A210 14OR/RD	FUSED B(+) (EXCEPT MEMORY)
7	Z913 14BK/OR	GROUND (EXCEPT MEMORY)
8	P15 14LG/WT	DRIVER SEAT HORIZONTAL FORWARD DRIVER (EXCEPT MEMORY)
9	P19 14LG/LB	DRIVER SEAT FRONT UP DRIVER (EXCEPT MEMORY)
10	P13 14LG/OR	DRIVER SEAT REAR DOWN DRIVER (EXCEPT MEMORY)
10	P29 22LG/WT	DRIVER SEAT SWITCH MUX SUPPLY (MEMORY)
11	P11 14LG/YL	DRIVER SEAT REAR UP DRIVER (EXCEPT MEMORY)
11	P309 18LG/BR	DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX (MEMORY)

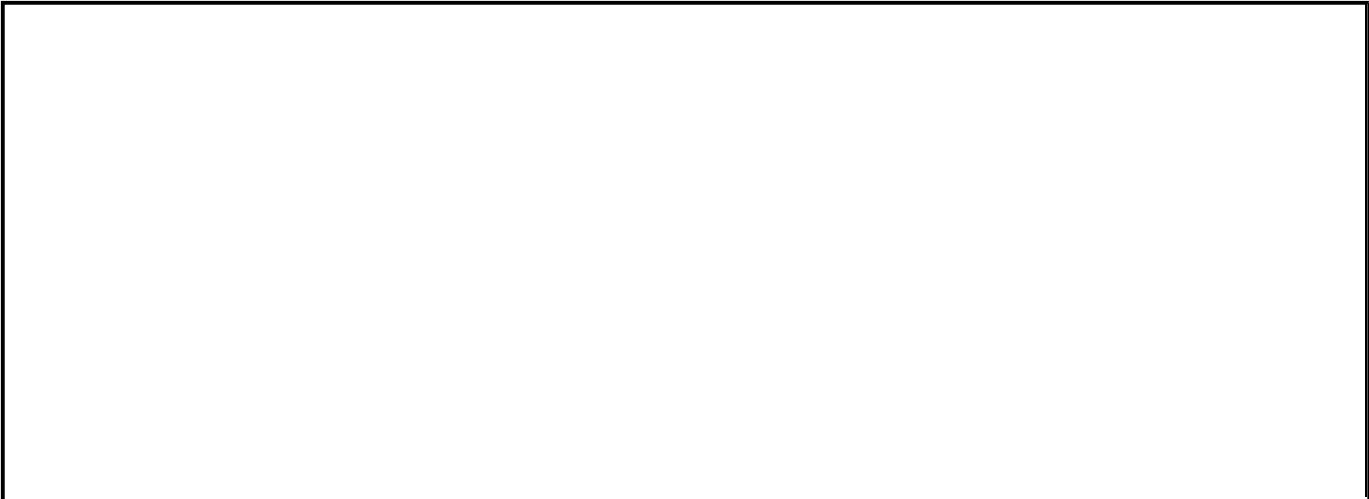
SWITCH-SEAT-PASSENGER - 11 WAY MALE

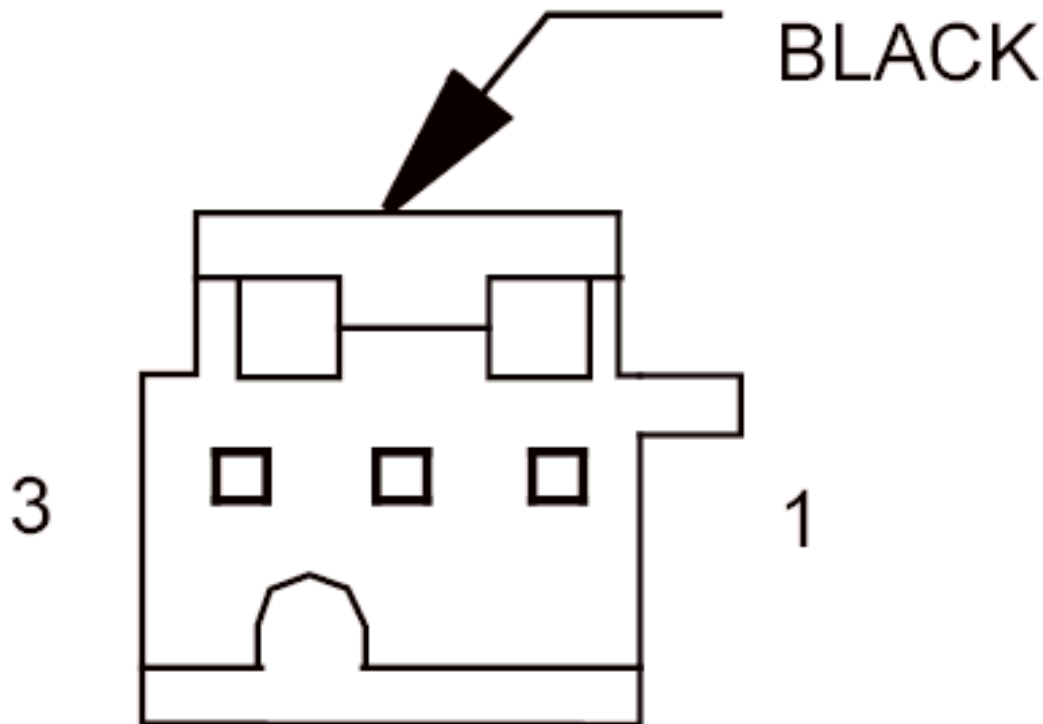


SWITCH-
SEAT-
PASSENGER

CAV	CIRCUIT	FUNCTION
1	-	-
2	-	-
3	-	-
4	P16 14LG/WT	PASSENGER SEAT HORIZONTAL REARWARD DRIVER
5	-	-
6	A210 14OR/RD	FUSED B(+)
7	Z913 14BK	GROUND
8	P14 14LG/OR	PASSENGER SEAT HORIZONTAL FORWARD DRIVER
9	-	-
10	-	-
11	-	-

SWITCH-SPEED CONTROL - BLACK 3 WAY





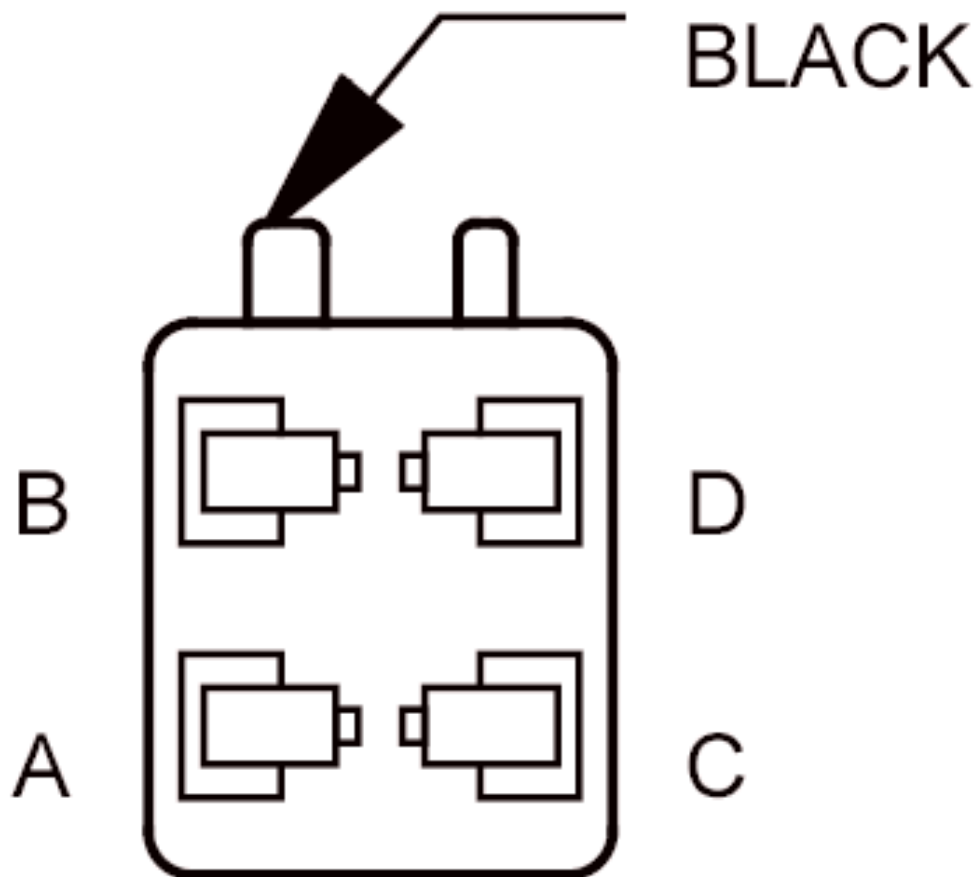
SWITCH- SPEED CONTROL

CAV	CIRCUIT	FUNCTION
1	V72 20PK	S/C SIGNAL 2
2	V71 20VT	S/C RETURN
3	V937 20YL	S/C SIGNAL 1

SWITCH-STOPLAMP - BLACK 6 WAY



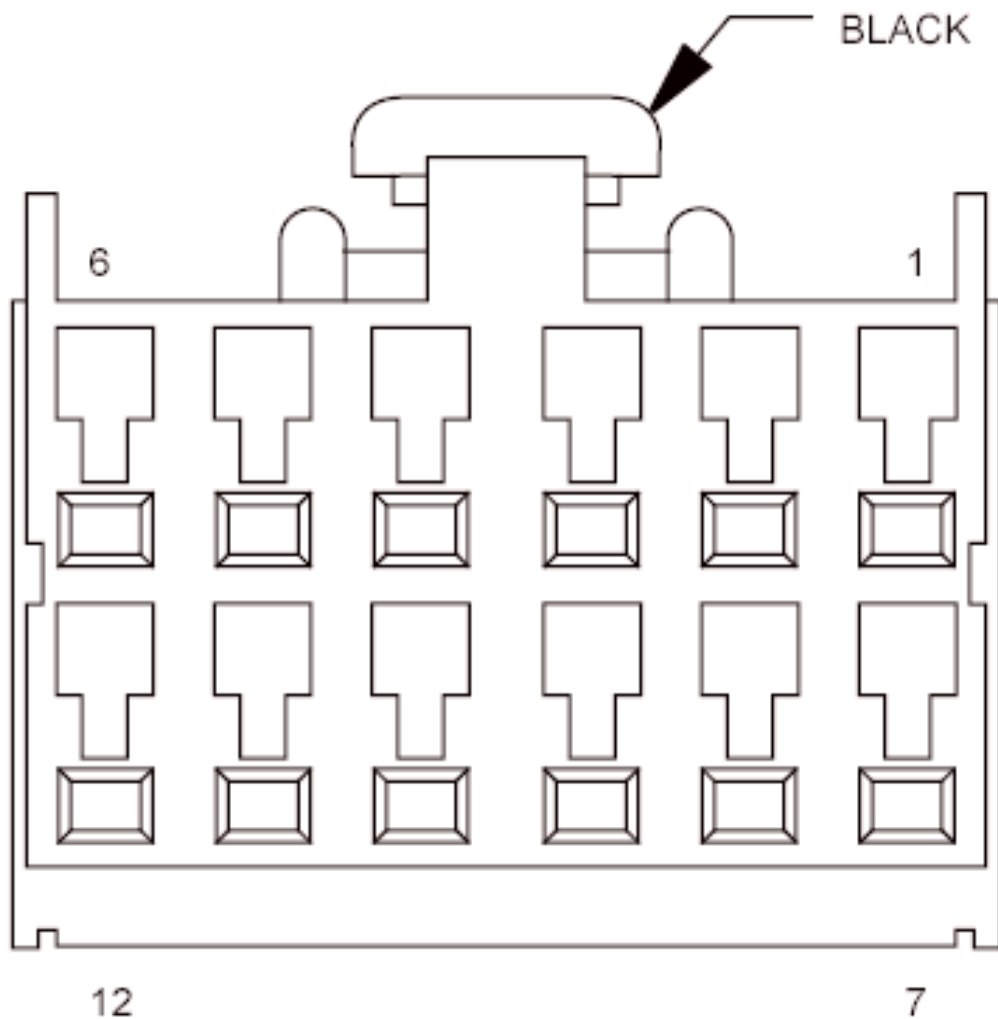
SWITCH-SUNROOF - BLACK 4 WAY



SWITCH- SUNROOF

CAV	CIRCUIT	FUNCTION
A	Q5 20OR/LB	SUNROOF CLOSE
B	Q6 20OR/LG	RETURN
C	Q7 20OR/DB	SUNROOF VENT
D	Q3 20OR/TN	SUNROOF OPEN

SWITCH-TRANSFER CASE SELECTOR - BLACK 12 WAY

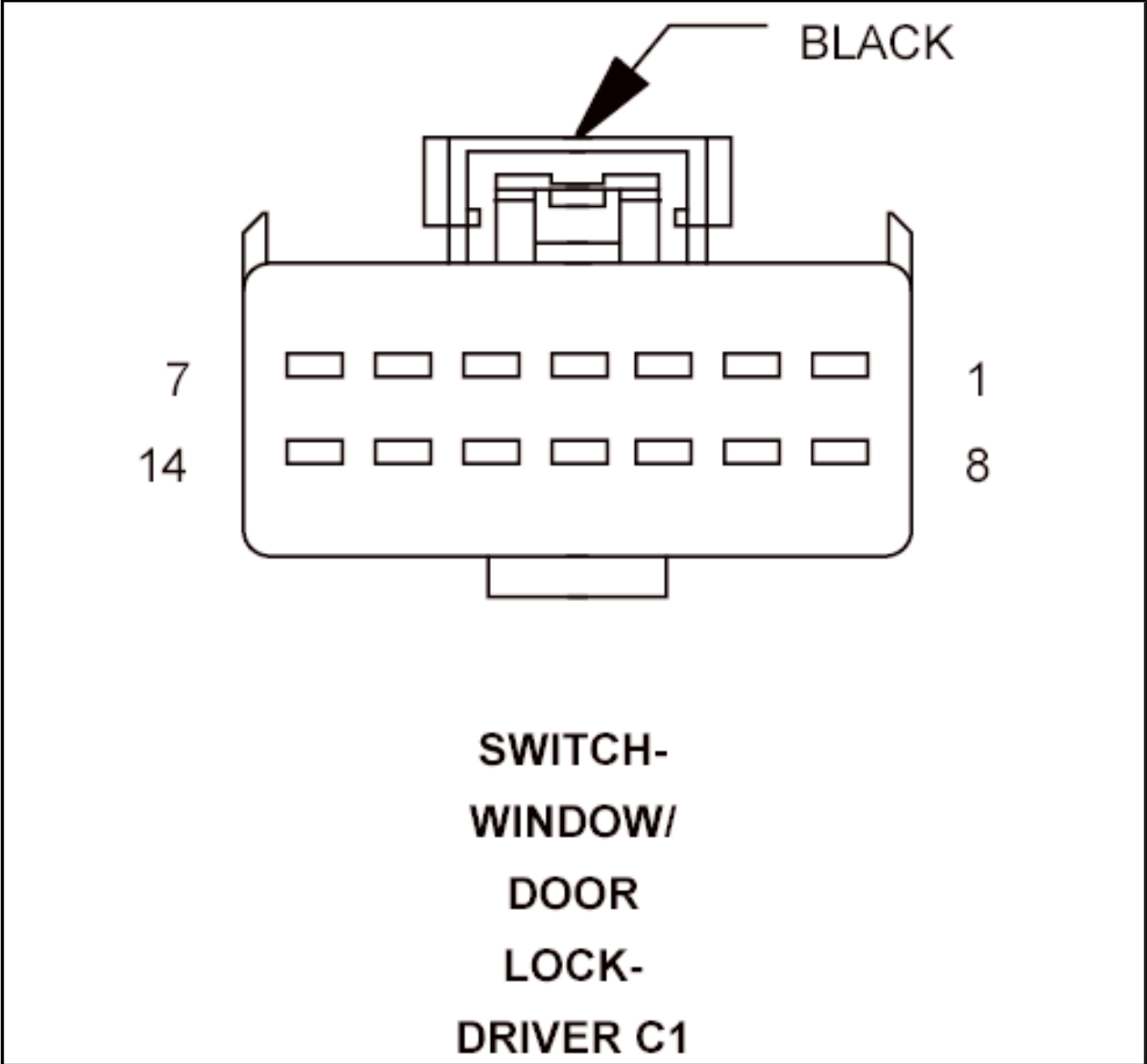


SWITCH- TRANSFER CASE SELECTOR

CAV	CIRCUIT	FUNCTION
1	Z911 20BK/VT	GROUND
2	-	-
3	-	-
4	-	-
5	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
6	K77 22BR/WT	TRANSFER CASE POSITION SIGNAL
7	E12 20OR/GY	PANEL LAMPS DRIVER

8	-	-
9	-	-
10	-	-
11	G95 18VT/BR	NEUTRAL INDICATOR
12	Y13 20VT/YL	RADIO CONTROL RETURN

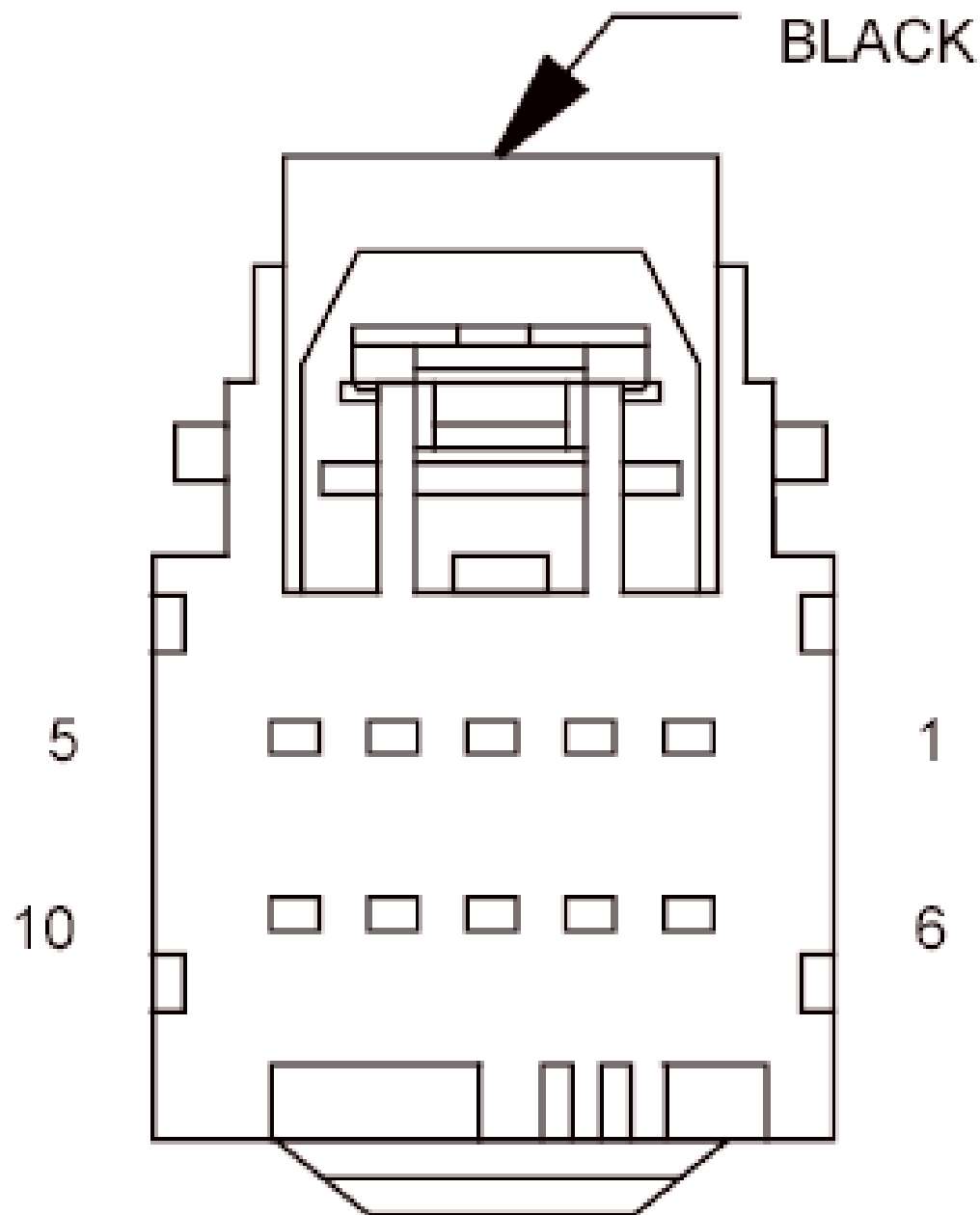
SWITCH-WINDOW/DOOR LOCK-DRIVER C1 - BLACK 14 WAY FEMALE



CAV	CIRCUIT	FUNCTION
1	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT
2	Q411 14OR/WT	MASTER WINDOW SWITCH

		LEFT REAR (UP)
3	Q611 14OR/GY	MASTER WINDOW SWITCH LEFT REAR (DOWN)
4	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
5	Z913 14BK/RD	GROUND
6	Q412 14OR/LB	MASTER WINDOW SWITCH RIGHT REAR (UP)
7	Q612 14OR/DB	MASTER WINDOW SWITCH RIGHT REAR (DOWN)
8	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT
9	Q21 14OR/WT	DRIVER WINDOW DRIVER (DOWN)
10	Q11 14OR/LG	DRIVER WINDOW DRIVER (UP)
11	-	-
12	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP)
13	Z913 14BK/TN	GROUND
14	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN)

SWITCH-WINDOW/DOOR LOCK-DRIVER C2 - BLACK 10 WAY FEMALE

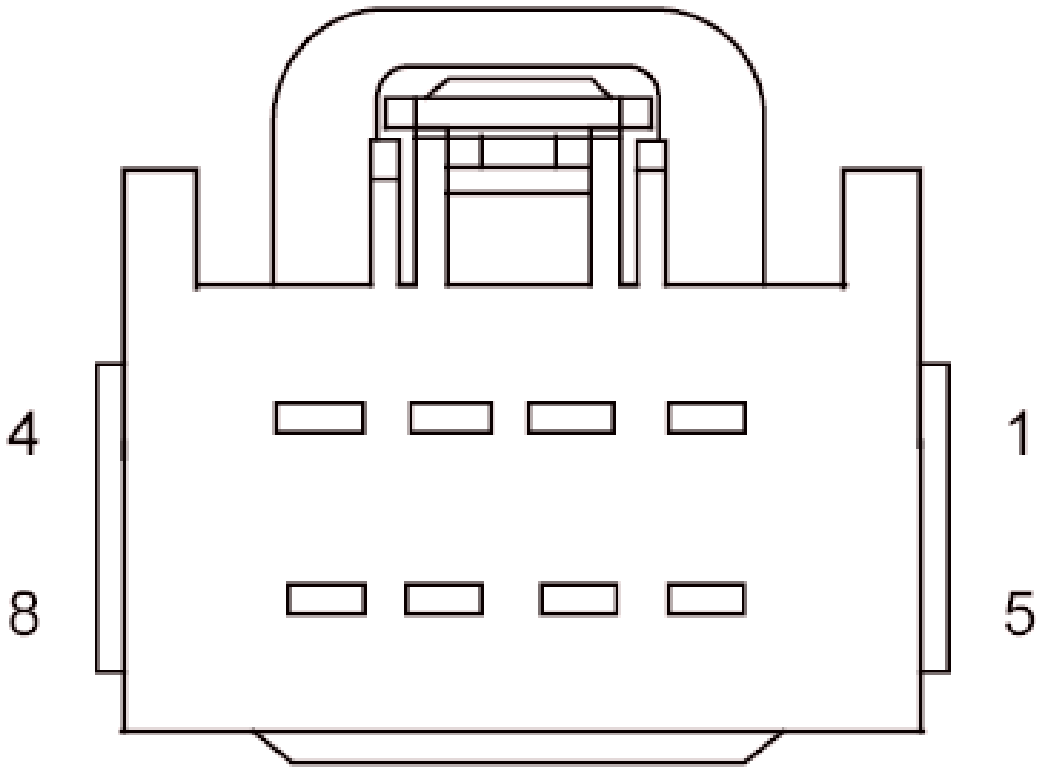


**SWITCH-
WINDOW/DOOR
LOCK-
DRIVER C2**

CAV	CIRCUIT	FUNCTION
1	P74 20TN/OR	PASSENGER MIRROR HORIZONTAL DRIVER (BASE)
1	A855 18DG/RD	FUSED B(+) (EXPRESS UP)
2	P71 20TN/DG	DRIVER MIRROR VERTICAL DRIVER (BASE)
2	D501 20WT/LG	LIN BUS RETURN (EXPRESS UP)
3	G161 20VT/DG	DRIVER DOOR LOCK SWITCH MUX (BASE)
4	P37 20LG/TN	DOOR LOCK SWITCH RETURN (BASE)
5	-	-
6	P72 20TN/GY	PASSENGER MIRROR VERTICAL DRIVER (BASE)
6	D500 20WT	LIN BUS (EXPRESS UP)
7	P76 20TN/LB	MIRROR COMMON DRIVER (BASE)
8	P75 20TN/LG	DRIVER MIRROR HORIZONTAL DRIVER (BASE)
9	A855 20DG/RD	FUSED B(+)
10	-	-

SWITCH-WINDOW/DOOR LOCK-PASSENGER - 8 WAY (BASE)





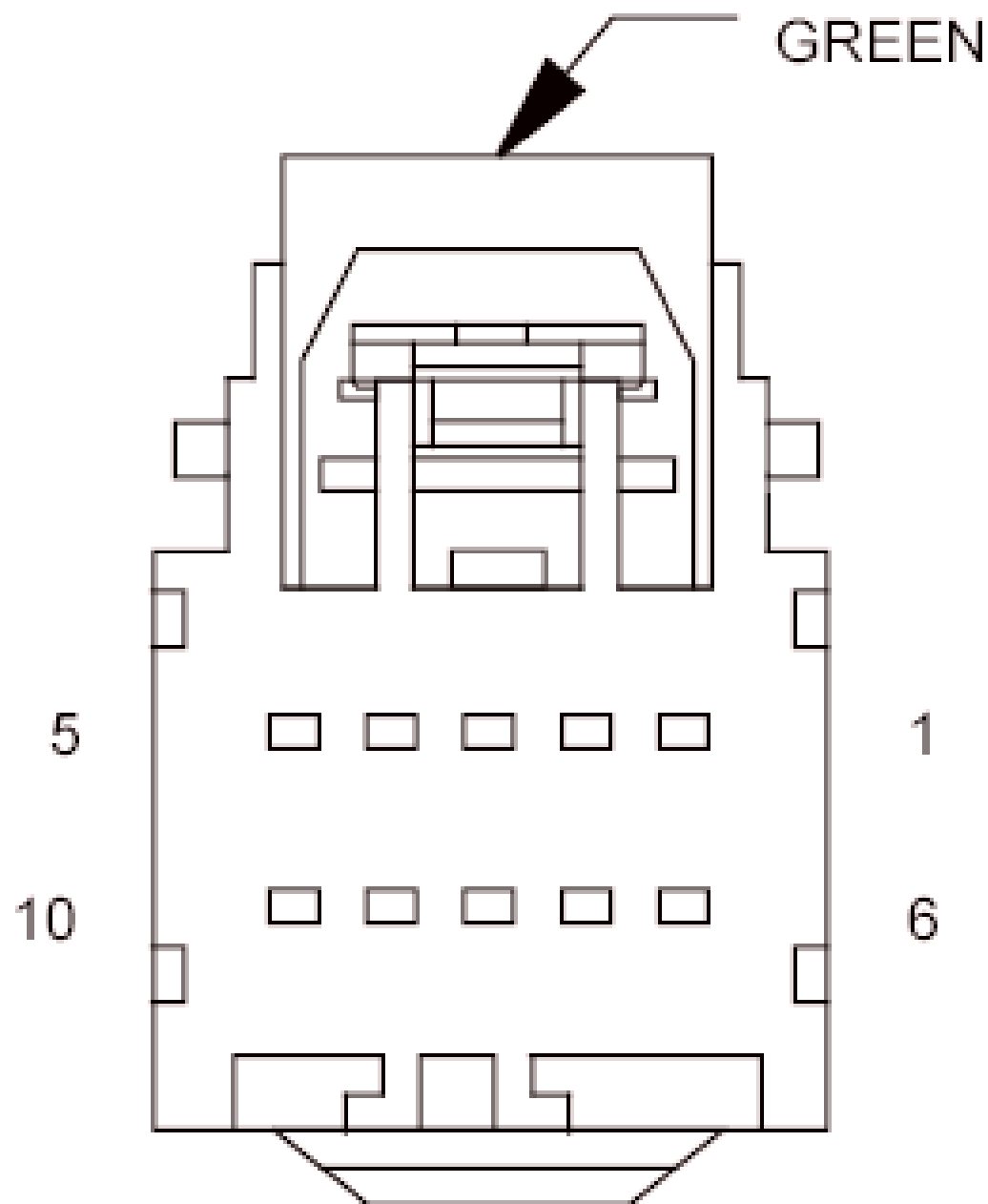
SWITCH- WINDOW/DOOR LOCK- PASSENGER (BASE)

CAV	CIRCUIT	FUNCTION
1	Q26 14OR/GY	MASTER WINDOW SWITCH PASSENGER (DOWN)
2	Q15 14OR/LB	WINDOW LOCK OUT SWITCH OUTPUT
3	Q12 14OR/BR	PASSENGER WINDOW DRIVER (DOWN)
4	Q16 14OR/TN	MASTER WINDOW SWITCH PASSENGER (UP)

5	Q22 14OR/VT	PASSENGER WINDOW DRIVER (UP)
6	G160 20VT/LG	PASSENGER DOOR LOCK SWITCH MUX
7	F30 14PK/YL	FUSED RUN/ACCESSORY RELAY OUTPUT
8	P37 20LG/TN	DOOR LOCK SWITCH RETURN

SWITCH-WINDOW/DOOR LOCK-PASSENGER - GREEN 10 WAY (EXPRESS UP) FEMALE

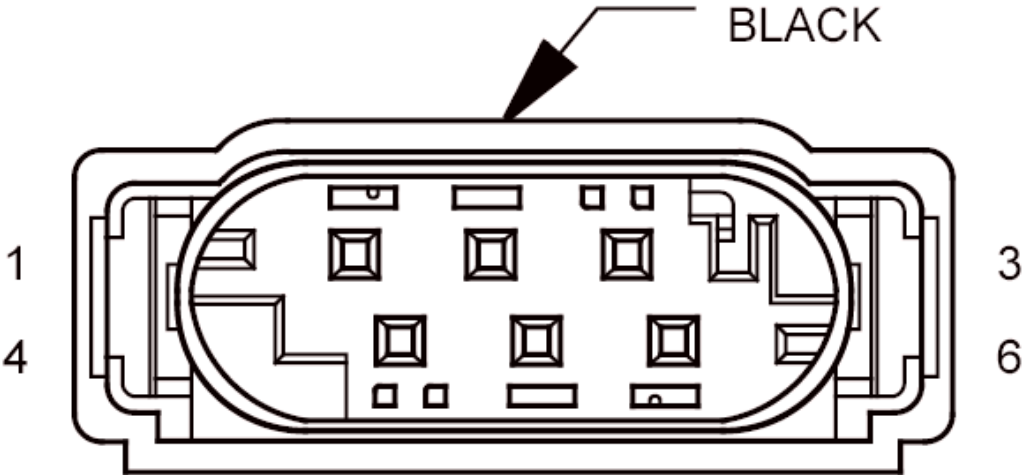




**SWITCH-
WINDOW/DOOR
LOCK-
PASSENGER**

CAV	CIRCUIT	FUNCTION
1	-	-
2	E34 20OR/TN	SWITCH ILLUMINATION DRIVER
3	F306 18DB/PK	FUSED RUN/ACCESSORY RELAY OUTPUT
4	Q936 20OR/LG	PASSENGER WINDOW EXPRESS SWITCH RETURN
5	-	-
6	-	-
7	-	-
8	G160 20VT/LG	PASSENGER DOOR LOCK SWITCH MUX
8	G160 20VT/DG	PASSENGER DOOR LOCK SWITCH MUX (RHD)
9	Q336 20OR/GY	PASSENGER WINDOW EXPRESS SWITCH MUX
10	-	-

THROTTLE BODY - BLACK 6 WAY (3.7L) FEMALE



**THROTTLE
BODY
(3.7L)**

CAV	CIRCUIT	FUNCTION
1	K124 20DB/GY	ETC MOTOR (+)

2	K855 20BR/OR	5 VOLT SUPPLY
3	K922 20BR/DB	TP SENSOR GROUND
4	K126 20DB/LG	ETC MOTOR (-)
5	K122 20DB/GY	TP SIGNAL 2
6	K22 20DG/OR	TP SIGNAL 1

TRANSDUCER-A/C PRESSURE - GRAY 4 WAY

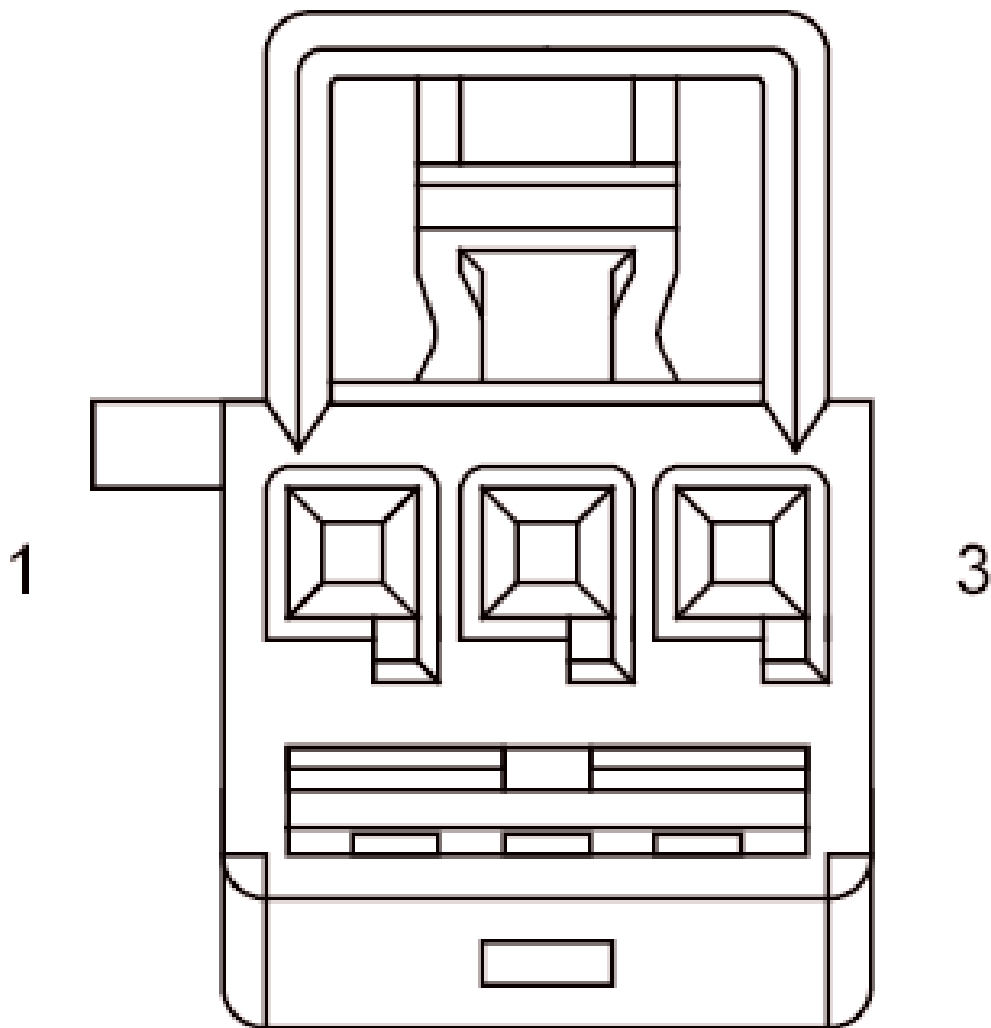
The diagram shows a top-down view of a rectangular component with rounded corners and a central square area containing four pins arranged in a 2x2 grid. The pins are labeled with numbers: 1 is at the top right, 2 is at the top left, 3 is at the bottom right, and 4 is at the bottom left. The component has a multi-layered, concentric rectangular border.

TRANSDUCER- A/C PRESSURE

CAV	CIRCUIT	FUNCTION
-----	---------	----------

1	C918 20BK/LB	A/C PRESSURE SENSOR GROUND
2	C818 20LB/OR	A/C PRESSURE 5 VOLT SUPPLY
3	C18 20LB/BR	A/C PRESSURE TRANSDUCER SIGNAL
4	-	-

TRANSMITTER-INTRUSION SENSOR - 3 WAY (VTSS)

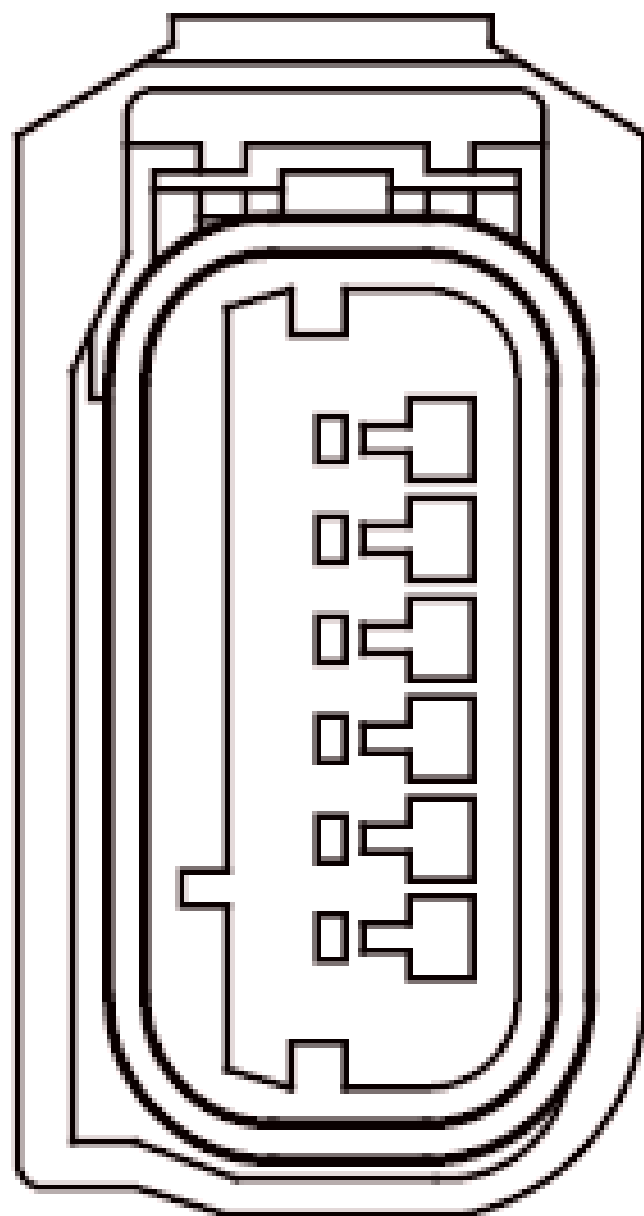


TRANSMITTER- INTRUSION SENSOR (VTSS)

CAV	CIRCUIT	FUNCTION
1	A645 20RD/VT	INTRUSION TRANSMITTER SENSOR SIGNAL
2	-	-
3	G945 20VT/DG	INTRUSION TRANSMITTER

SENSOR GROUND

TRANSPONDER-TIRE PRESSURE-LEFT FRONT - 6 WAY FEMALE



1

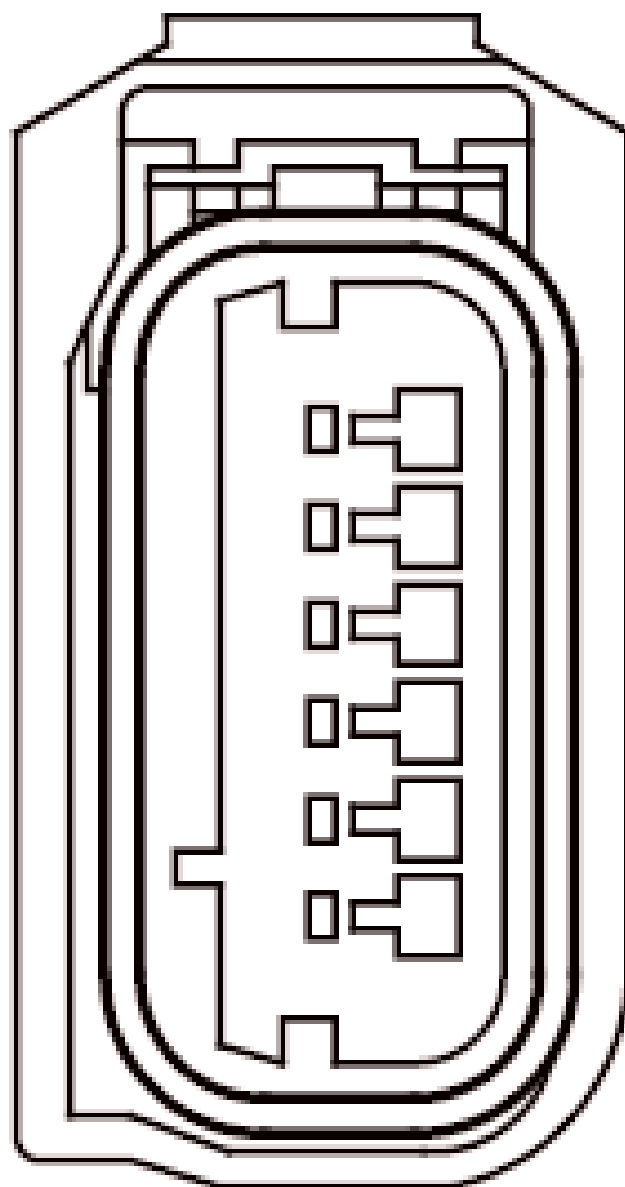
6

**TRANSPONDER-
TIRE**

— — — — —

CAV	CIRCUIT	FUNCTION
1	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
3	Z907 20BK/VT	GROUND
4	Z907 20BK/VT	GROUND
5	-	
6	-	

TRANSPONDER-TIRE PRESSURE-LEFT REAR - 6 WAY FEMALE



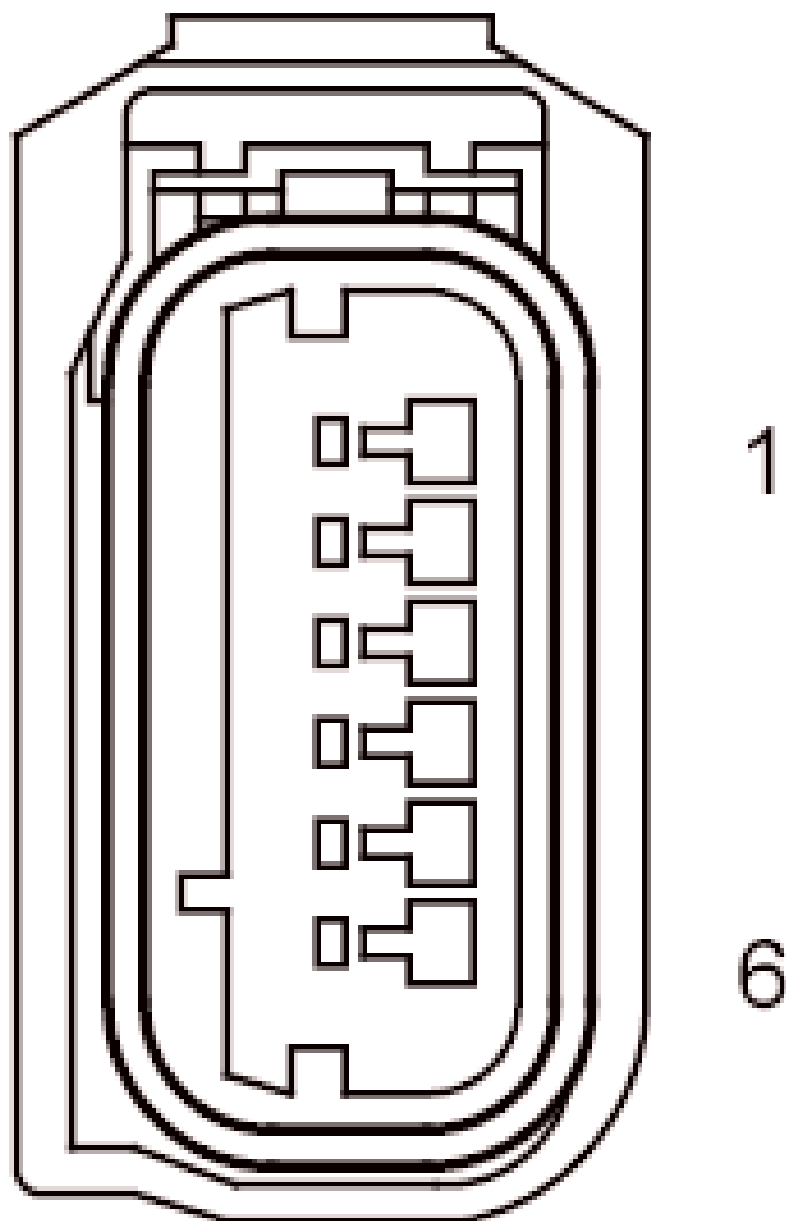
1

6

**TRANSPONDER-
TIRE
PRESSURE**

CAV	CIRCUIT	FUNCTION
1	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
3	Z919 20BK/RD	GROUND
4	-	
5	-	
6	-	-

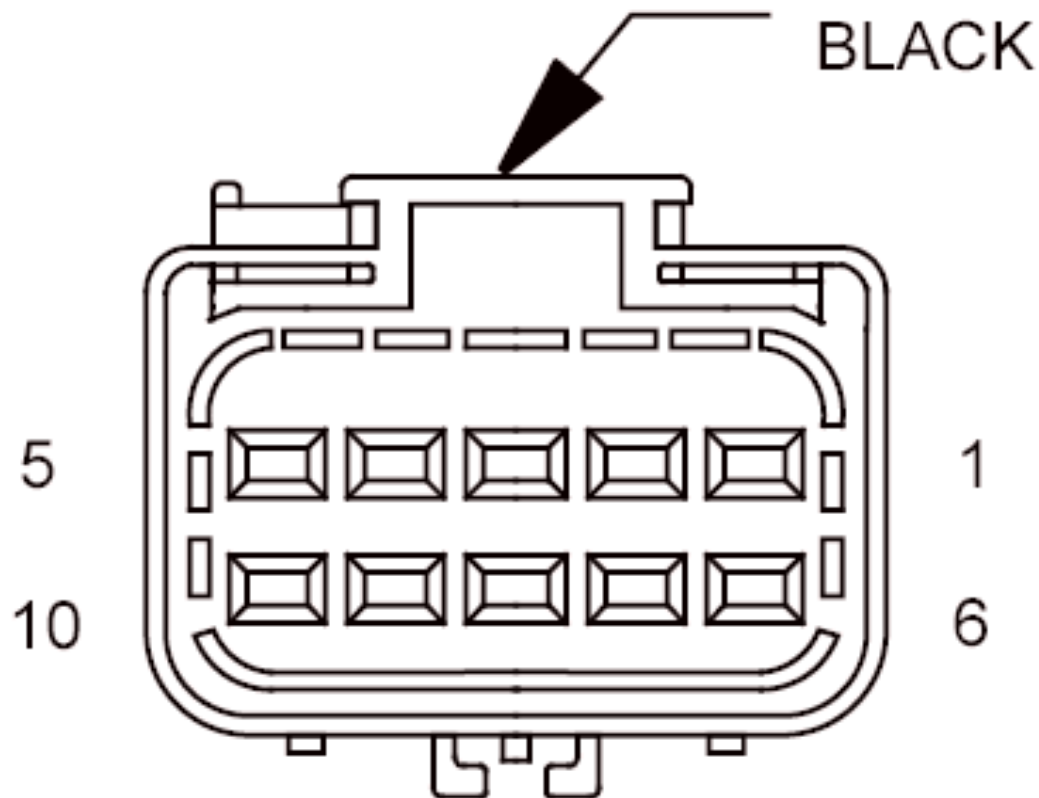
TRANSPONDER-TIRE PRESSURE-RIGHT FRONT - 6 WAY FEMALE



**TRANSPONDER-
TIRE**

CAV	CIRCUIT	FUNCTION
1	F943 18PK/LG	FUSED IGNITION SWITCH OUTPUT (RUN-START)
2	D508 20WT/GY	COM-LIN TIRE PRESSURE MONITOR LAN
3	Z908 20BK/BR	GROUND
4	-	
5	Z908 20BK/BR	GROUND
6	-	

WIRING-TRAILER TOW 7-WAY - BLACK 10 WAY FEMALE



WIRING- TRAILER TOW 7-WAY

CAV	CIRCUIT	FUNCTION
1	L1 18WT/LG	BACKUP LAMP FEED
2	Z919 14BK/LB	GROUND
3	B400 14RD	TRAILER TOW ELECTRIC BRAKE OUTPUT
4	L674 16LG	RIGHT REAR STOP/TURN SIGNAL FEED
5	F71 16PK/TN	TRAILER TOW IGNITION FEED
6	L17 18WT/LG	TRAILER TOW PARK LAMP SIGNAL

7	L673 16YL	LEFT REAR STOP/TURN SIGNAL FEED
8	-	-
9	-	-
10	-	-

2008 ELECTRICAL

Connector/Ground/Splice Location - Liberty

CONNECTOR/GROUND/SPLICE LOCATION

DESCRIPTION

CONNECTOR/GROUND/SPLICE LOCATIONS

This information provides illustrations identifying connector, ground, and splice locations in the vehicle. Connector, ground, and splice indexes are provided. Use the wiring diagrams in each article for connector, ground, and splice identification. For items that are not shown in this information N/S is placed in the FIG. column.

CONNECTORS

CONNECTOR NAME/NUMBER	COLOR	LOCATION	FIG.
Actuator-Blend Door	Black	Lower Center of Instrument Panel	Fig. 33. Fig. 35.
Actuator-Mode Door	Black	Top Center of Instrument Panel	Fig. 33. Fig. 36.
Actuator-Recirculation Door	Black	Left Lower Instrument Panel	Fig. 35.
Airbag-Driver Squib 1	Black/Yellow	Steering Wheel	Fig. 37.
Airbag-Driver Squib 2	Natural/Yellow	Steering Wheel	Fig. 37.
Airbag-Passenger Squib 1	Black/Yellow	At Airbag-Passenger	Fig. 33. Fig. 35.
Airbag-Passenger Squib 2	Lt. Gray/Yellow	At Airbag-Passenger	Fig. 33. Fig. 35.
Airbag-Side Curtain-Left	-	Left Quarter Panel	Fig. 47.
Airbag-Side Curtain-Right	-	Right Quarter Panel	Fig. 48.
Amplifier-Radio C1	-	Right Quarter Panel	Fig. 48.
Amplifier-Radio C2	Black	Right Quarter Panel	Fig. 48.
Antenna-Global Positioning System	-	At Headliner	N/S
Antenna-Radio	Black	Left Rear Headliner	Fig. 50.
Antenna-Satellite Radio	-	Left Rear Headliner	Fig. 30. Fig. 50.
Assembly-EGR Valve (3.7L)	Black	Left Rear of Engine	Fig. 11. Fig. 13.
Assembly-Electrohydraulic Control Unit (NAG1)	Black	Valve Body	Fig. 19.
Assembly-Glow Plug (Diesel)	Black	Front Center of Engine	Fig. 8.
Assembly-HVAC C1	-	Instrument Panel	Fig. 35.
Assembly-HVAC C2	-	Instrument Panel	Fig. 35.

Assembly-Line Pressure Sensor/Variable Force Solenoid	Black	Left Side of Transmission	<u>Fig. 15.</u>
Assembly-Shift Lever	-	At Shift Lever	<u>Fig. 34,</u> <u>Fig. 36.</u>
Assembly-Tail Lamp-Left (Except Export)	Dk Gray	Left Quarter Panel	<u>Fig. 47,</u> <u>Fig. 53.</u>
Assembly-Tail Lamp-Left (Export)	Dk Gray	Left Quarter Panel	<u>Fig. 47,</u> <u>Fig. 53.</u>
Assembly-Tail Lamp-Right (Except Export)	Dk Gray	Right Quarter Panel	<u>Fig. 48.</u>
Assembly-Tail Lamp-Right (Export)	Dk Gray	Right Quarter Panel	<u>Fig. 48.</u>
Assembly-Transmission Solenoid/Pressure Switch (RLE)	Brown	Right Front of Transmission	<u>Fig. 13.</u>
Backlite-Electric Heated (Ground)	Black	At Rear Window	<u>Fig. 51.</u>
Backlite-Electric Heated (Power)	Black	At Rear Window	<u>Fig. 51.</u>
Battery-Negative (Diesel)	-	Left Front Engine Compartment	<u>Fig. 7.</u>
Battery-Negative (Gas)	-	Left Front Engine Compartment	<u>Fig. 9.</u>
Battery-Positive (Diesel)	-	Left Front Engine Compartment	<u>Fig. 6,</u> <u>Fig. 7.</u>
Battery-Positive (Gas)	-	Left Front Engine Compartment	<u>Fig. 9.</u>
Battery-Positive-Generator (Diesel)	-	Connected to Battery Positive at Battery	<u>Fig. 7.</u>
Battery-Positive-Generator (Gas)	-	Battery	<u>Fig. 9.</u>
C101 (Diesel)	-	Left Engine Compartment below Battery	<u>Fig. 7,</u> <u>Fig. 21.</u>
C104 (Export)	-	Next to Battery	<u>Fig. 6.</u>
C105	-	Left Rear of Engine	<u>Fig. 21,</u> <u>Fig. 24.</u>
C127 (4.0L)	-	Lower Right Rear of Engine in Front of Sensor-Crankshaft Position	<u>Fig. 27.</u>
C127 (Diesel)	-	Right Front of Engine	<u>Fig. 19.</u>
C201	-	Left Kick Panel	<u>Fig. 31.</u>
	C202	Left Kick Panel	<u>Fig. 31.</u>
C228 (Diesel)	-	Instrument Panel to HVAC	<u>Fig. 35.</u>
C231	-	Right Center of Instrument Panel	<u>Fig. 33.</u>
C232	-	Right Front of Engine Compartment	<u>Fig. 27,</u> <u>Fig. 33,</u> <u>Fig. 35.</u>

C304	-	Next to Module-Totally Integrated Power	<u>Fig. 3,</u> <u>Fig. 22,</u> <u>Fig. 23.</u>
C306	-	Right Quarter Panel	<u>Fig. 48.</u>
C307	-	Left Kick Panel	<u>Fig. 31,</u> <u>Fig. 39.</u>
C308	-	Right Kick Panel	<u>Fig. 31,</u> <u>Fig. 39.</u>
C309	-	Front of Rear Door	<u>Fig. 40,</u> <u>Fig. 43.</u>
C310	-	Front of Rear Door	<u>Fig. 40,</u> <u>Fig. 44.</u>
C311	-	Left Side Body Floor Pan Under Seat	<u>Fig. 38,</u> <u>Fig. 42.</u>
C312	-	Right Side Body Floor Pan Under Seat	<u>Fig. 38,</u> <u>Fig. 42.</u>
C313	-	Right Quarter Panel	<u>Fig. 48.</u>
C314	-	Rear Center of Right Side Body	<u>Fig. 44,</u> <u>Fig. 45,</u> <u>Fig. 46.</u>
C315	-	Left Quarter Panel	<u>Fig. 47,</u> <u>Fig. 50.</u>
C316	-	Right Kick Panel	<u>Fig. 31,</u> <u>Fig. 39.</u>
C317	-	Left Kick Panel	<u>Fig. 31,</u> <u>Fig. 39.</u>
C318		Left Quarter Panel	<u>Fig. 47,</u> <u>Fig. 50.</u>
C319		Left Side Body Floor Pan Under Seat	<u>Fig. 38,</u> <u>Fig. 42.</u>
C320		Right Side Body Floor Pan Under Seat	<u>Fig. 38,</u> <u>Fig. 42.</u>
C321	-	Trailer Tow Harness	<u>Fig. 49.</u>
C322	-	Right Quarter Panel	<u>Fig. 48.</u>
C323	-	Rear Center of Headliner	<u>Fig. 51.</u>
C324	-	Behind Left Headlamp	<u>Fig. 2,</u> <u>Fig. 22.</u>
C326	-	Top of Liftgate	<u>Fig. 51.</u>
C329	-	Driver Side of Instrument Panel	<u>Fig. 33,</u> <u>Fig. 35.</u>
Circuit Breaker-Power Seat	-	Driver Seat	<u>Fig. 42.</u>
Cluster C1	Black	Drivers Side of Instrument Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
Cluster C2	Brown	Drivers Side of	<u>Fig. 34,</u>

		Instrument Panel	<u>Fig. 36.</u>
Cluster C3	Black	Drivers Side of Instrument Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
Clutch-A/C Compressor	Black	At A/C Compressor	<u>Fig. 11,</u> <u>Fig. 18.</u>
Coil-Ignition 1 (3.7L)	Black	Top Left of Engine	<u>Fig. 11.</u>
Coil-Ignition 2 (3.7L)	Black	Top Right of Engine	<u>Fig. 12.</u>
Coil-Ignition 3 (3.7L)	Black	Top Left of Engine	<u>Fig. 11.</u>
Coil-Ignition 4 (3.7L)	Black	Top Right of Engine	<u>Fig. 12.</u>
Coil-Ignition 5 (3.7L)	Black	Top Left of Engine	<u>Fig. 11.</u>
Coil-Ignition 6 (3.7L)	Black	Top Right of Engine	<u>Fig. 12.</u>
Control-A/C-Heater C1	-	Center of Instrument Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
Control-A/C-Heater C2	-	Center of Instrument Panel	<u>Fig. 15,</u> <u>Fig. 36.</u>
Data Link Connector	Black	Lower Center of Instrument panel	<u>Fig. 34,</u> <u>Fig. 35.</u>
Display-Park Assist (Parktronics)	Black	Instrument Panel	N/S
Fan Module-Radiator Cooling	Dk Gray	At Fan	<u>Fig. 1.</u>
Generator (Diesel)	-	Left Front of Engine	<u>Fig. 18.</u>
Generator (Gas)	Black	Left Front of Engine	<u>Fig. 11,</u> <u>Fig. 12.</u>
Generator-Eyelet (Diesel)	-	Top of Generator	<u>Fig. 8.</u>
Generator-Eyelet (Gas)	-	Top of Generator	<u>Fig. 10.</u>
Heater-Cabin (Diesel)	Black	Center of Instrument Panel	<u>Fig. 35.</u>
Heater-Fuel (Diesel)	Black	Left Rear of Engine Compartment	<u>Fig. 21.</u>
Heater-Seat Back-Left	Black	Left Seat	N/S
Heater-Seat Back-Right	Black	Right Seat	N/S
Heater-Seat Cushion-Left	Green	Left Seat	<u>Fig. 42.</u>
Heater-Seat Cushion-Right	Green	Right Seat	<u>Fig. 42.</u>
Horn 1 C1	Black	Next to Left Headlamp	<u>Fig. 2.</u>
Horn 1 C2	Black	Next to Left Headlamp	<u>Fig. 2.</u>
Horn 2 C1	Black	Next to Left Headlamp	<u>Fig. 2.</u>
Horn 2 C2	Black	Next to Left Headlamp	<u>Fig. 2.</u>
Injector-Fuel 1 (Diesel)	Black	At Fuel Injector	<u>Fig. 18.</u>
Injector-Fuel 1 (Gas)	Black	At Fuel Injector	<u>Fig. 11.</u>
Injector-Fuel 2 (Diesel)	Black	At Fuel Injector	<u>Fig. 18.</u>
Injector-Fuel 2 (Gas)	Black	At Fuel Injector	<u>Fig. 12.</u>
Injector-Fuel 3 (Diesel)	Black	At Fuel Injector	<u>Fig. 18.</u>
Injector-Fuel 3 (Gas)	Black	At Fuel Injector	<u>Fig. 11.</u>

Injector-Fuel 4 (Diesel)	Black	At Fuel Injector	<u>Fig. 18.</u>
Injector-Fuel 4 (Gas)	Black	At Fuel Injector	<u>Fig. 12.</u>
Injector-Fuel 5 (Gas)	Black	At Fuel Injector	<u>Fig. 11.</u>
Injector-Fuel 6 (Gas)	Black	At Fuel Injector	<u>Fig. 12.</u>
Lamp-Center High Mounted Stop	Lt. Gray	Upper Liftgate	<u>Fig. 51.</u>
Lamp-Courtesy-Left Rear	-	On Headliner Harness	N/S
Lamp-Courtesy-Right Rear	-	On Headliner Harness	N/S
Lamp-Dome	Black	Center of Headliner	N/S
Lamp-Fog-Left Front	Black	Lower Left Front Fascia	<u>Fig. 2.</u>
Lamp-Fog-Right Front	Black	Lower Right Front Fascia	N/S
Lamp-Footwell-Front Left	Black	Lower Left of Instrument Panel	<u>Fig. 33.</u> <u>Fig. 35.</u>
Lamp-Footwell-Front Right	Black	Lower Right of Instrument Panel	<u>Fig. 33.</u> <u>Fig. 35.</u>
Lamp-Headlamp-Left	Green	Behind Left Headlamp	<u>Fig. 2.</u>
Lamp-Headlamp-Right	Green	Behind Right Headlamp	<u>Fig. 1.</u>
Lamp-License	Black	Liftgate	<u>Fig. 51.</u>
Lamp-Map-Mirror Mounted	-	Center of Headliner	N/S
Lamp-Park-Left Front	Black	At Lamp	<u>Fig. 2.</u>
Lamp-Park-Right Front	Black	At Lamp	<u>Fig. 1.</u>
Lamp-Park/Turn-Left Front (Except Export)	Black	At Lamp	<u>Fig. 2.</u>
Lamp-Park/Turn-Right Front (Except Export)	Black	At Lamp	<u>Fig. 1.</u>
Lamp-PRNDL	White	At Assembly-Shift Lever	<u>Fig. 34.</u> <u>Fig. 36.</u>
Lamp-Reading-Front	Black	Front Headliner	<u>Fig. 29.</u>
Lamp-Side Marker-Left Front	-	On Front End Module Harness	<u>Fig. 4.</u>
Lamp-Side Marker-Right Front	-	On Front End Module Harness	<u>Fig. 5.</u>
Lamp-Side Repeater-Left	Black	Left Front Fender	<u>Fig. 4.</u>
Lamp-Side Repeater-Right	Black	Right Front Fender	<u>Fig. 5.</u>
Lamp-Turn-Left Front (Export)	Natural	At Lamp	N/S
Lamp-Turn-Right Front (Export)	Natural	At Lamp	N/S
Lamp-Vanity-Left (Except UGDO)	White	At Left Visor	<u>Fig. 29.</u>
Lamp-Vanity-Right	White	At Right Visor	<u>Fig. 29.</u>
Latch-Door-Driver (LHD)	Black	In Driver Door	<u>Fig. 39.</u>
Latch-Door-Driver (RHD)	-	In Driver Door	<u>Fig. 39.</u>
Latch-Door-Left Rear (LHD)	Black	In Left Rear Door	<u>Fig. 40.</u>
Latch-Door-Left Rear (RHD)	-	In Left Rear Door	<u>Fig. 40.</u>
Latch-Door-Liftgate C1	White	Liftgate	<u>Fig. 52.</u>

Latch-Door-Liftgate C2	Black	Liftgate	<u>Fig. 52.</u>
Latch-Door-Passenger (LHD)	Black	In Passenger Door	<u>Fig. 39.</u>
Latch-Door-Passenger (RHD)	-	In Passenger Door	<u>Fig. 39.</u>
Latch-Door-Right Rear (LHD)	Black	In Right Rear Door	<u>Fig. 40.</u>
Latch-Door-Right Rear (RHD)	-	In Right Rear Door	<u>Fig. 40.</u>
Latch-Flip-UP Glass C1	-	On Liftgate	<u>Fig. 51.</u>
Latch-Flip-UP Glass C2	-	On Liftgate	<u>Fig. 51.</u>
Lighter-Cigar	Gray	Center of Instrument Panel	<u>Fig. 34.</u> <u>Fig. 36.</u>
Mirror-Inside Rearview (Hands Free)	Gray	Top Center Windshield	<u>Fig. 28.</u> <u>Fig. 29.</u>
Mirror-Inside Rearview (Except Hands Free)	-	Top Center Windshield	<u>Fig. 28.</u> <u>Fig. 29.</u>
Mirror-Outside Rearview-Driver	-	Driver Door	<u>Fig. 39.</u>
Mirror-Outside Rearview-Passenger	-	Passenger Door	<u>Fig. 39.</u>
Module-Anti-Lock Brakes (ESP)	Black	Left Rear Engine of Compartment	<u>Fig. 22.</u>
Module-Compass	Black	Right Rear Headliner	N/S
Module-Door-Driver C2	Black	Driver Door	<u>Fig. 39.</u>
Module-Door-Driver C3	White	Driver Door	<u>Fig. 39.</u>
Module-Door-Driver C4	Red	Driver Door	<u>Fig. 39.</u>
Module-Door-Driver C5	Blue	Driver Door	<u>Fig. 39.</u>
Module-Door-Passenger C2	Black	Passenger Door	<u>Fig. 39.</u>
Module-Door-Passenger C3	White	Passenger Door	<u>Fig. 39.</u>
Module-Door-Passenger C4	Red	Passenger Door	<u>Fig. 39.</u>
Module-Door-Passenger C5	Blue	Passenger Door	<u>Fig. 39.</u>
Module-Engine Control C1 (Diesel)	-	Left Rear of Engine Compartment	<u>Fig. 21.</u>
Module-Engine Control C2 (Diesel)	-	Left Rear of Engine Compartment	<u>Fig. 21.</u>
Module-Fuel Pump	Lt Gray	At Fuel Tank	<u>Fig. 46.</u>
Module-Glow Plug (Diesel)	Black	Left Engine Compartment behind Battery	<u>Fig. 7.</u>
Module-Final Drive C1	-	In Instrument Panel	<u>Fig. 33.</u>
Module-Final Drive C2	-	In Instrument Panel	<u>Fig. 33.</u>
Module-Hands Free	Dk Gray	Right Quarter Panel	<u>Fig. 48.</u>
Module-Headlamp Leveling-Left (Export)	-	Next to Left Headlamp	N/S
Module-Headlamp Leveling-Right (Export)	-	Next to Right Headlamp	N/S
Module-Heated Seats	-	Under Driver Seat	<u>Fig. 42.</u>
Module-Intrusion Transceiver (Export)	Black	Left Quarter Panel	<u>Fig. 47.</u>

Module-Inverter	-	Rear Center of Right Side Body	<u>Fig. 44.</u>
Module-Memory Seat C1	-	Driver Seat	N/S
Module-Memory Seat C2	-	Driver Seat	N/S
Module-Memory Seat C3	-	Driver Seat	N/S
Module-Occupant Classification C1	-	Under Passenger Seat	<u>Fig. 42.</u>
Module-Occupant Classification C2	-	Under Passenger Seat	<u>Fig. 42.</u>
Module-Occupant Restraint Controller C1 (ORC)	Yellow	Under Console	<u>Fig. 34.</u> <u>Fig. 36.</u>
Module-Occupant Restraint Controller C2 (ORC)	Yellow	Instrument Panel	<u>Fig. 38.</u>
Module-Park Assist C1 (Parktronics)	-	Right Quarter Panel	<u>Fig. 48.</u>
Module-Park Assist C2 (Parktronics)	-	Right Quarter Panel	<u>Fig. 48.</u>
Module-Powertrain Control C1 (Gas)	Black/Black	At Powertrain Control Module	<u>Fig. 24.</u> <u>Fig. 25.</u>
Module-Powertrain Control C2 (Gas)	Black/Orange	At Powertrain Control Module	<u>Fig. 24.</u> <u>Fig. 25.</u>
Module-Powertrain Control C3 (Gas)	Black/Natural	At Powertrain Control Module	<u>Fig. 24.</u> <u>Fig. 25.</u>
Module-Powertrain Control C4 (RLE)	Black/Green	At Powertrain Control Module	<u>Fig. 24.</u> <u>Fig. 25.</u>
Module-Sentry Key Remote Entry/WCM	Black	Under Left Side of Instrument Panel	<u>Fig. 33.</u> <u>Fig. 35.</u>
Module-Steering Control C1	-	At Steering Column	<u>Fig. 34.</u> <u>Fig. 36.</u>
Module-Steering Control C2	Natural	At Steering Column	<u>Fig. 34.</u> <u>Fig. 36.</u>
Module-Steering Control C4	White	At Steering Column	<u>Fig. 34.</u> <u>Fig. 36.</u>
Module-Steering Control C5	White	At Steering Column	<u>Fig. 37.</u>
Module-Sunroof	-	In Overhead Harness	<u>Fig. 29.</u> <u>Fig. 30.</u>
Module-Totally Integrated Power C1	Black	Left Side of Engine Compartment	<u>Fig. 21.</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C2	Blue	Left Side of Engine Compartment	<u>Fig. 21.</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C3	Green	Under Hood Left Side	<u>Fig. 3.</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C4	Lt Gray	Left Side of Engine Compartment	<u>Fig. 3.</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C5	Brown	Left Side of Engine Compartment	<u>Fig. 22.</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C6	Gray	Left Side of Engine Compartment	<u>Fig. 22.</u> <u>Fig. 23.</u>

Module-Totally Integrated Power C7	-	Left Side of Engine Compartment	<u>Fig. 22,</u> <u>Fig. 23.</u>
Module-Totally Integrated Power C8	-	Left Side of Engine Compartment	<u>Fig. 23.</u>
Module-Transmission Control C1 (NAG1)	Black	Below Steering Column	N/S
Module-Transmission Control C2 (NAG1)	Black	Below Steering Column	N/S
Module-UGDO	-	Left Visor	N/S
Monitor-DVD C1	-	At DVD Monitor	<u>Fig. 28.</u>
Monitor-DVD C4	-	At DVD Monitor	<u>Fig. 28.</u>
Motor-Blower (LHD)	Natural	Right Instrument Panel above Kick Panel	<u>Fig. 33.</u>
Motor-Blower (RHD)	Natural	Left Instrument Panel above Kick Panel	<u>Fig. 35.</u>
Motor-Boost Pressure Servo (Diesel)	Natural	Right Side of Engine	<u>Fig. 17.</u>
Motor-Seat Adjuster-Driver Horizontal	Blue	Driver Seat	<u>Fig. 42.</u>
Motor-Seat Adjuster-Front Driver Vertical	Black	Driver Seat	<u>Fig. 42.</u>
Motor-Seat Adjuster-Passenger Horizontal	-	Passenger Seat	N/S
Motor-Seat Adjuster-Rear Driver Vertical	White	Driver Seat	<u>Fig. 42.</u>
Motor-Transfer Case	Dk Gray	Left Rear of Transfer Case	<u>Fig. 15,</u> <u>Fig. 16,</u> <u>Fig. 19.</u>
Motor-Window-Driver (Base)	-	Front Door	<u>Fig. 39.</u>
Motor-Window-Driver Express (Except Base)	Lt Gray	Driver Door	<u>Fig. 39.</u>
Motor-Window-Left Rear	Lt. Gray	Left Rear Door	<u>Fig. 40.</u>
Motor-Window-Passenger (LHD)	-	Front Door	<u>Fig. 39.</u>
Motor-Window-Passenger Express (RHD)	Lt Gray	Passenger Door	<u>Fig. 39.</u>
Motor-Window-Right Rear	Lt Gray	Right Rear Door	<u>Fig. 40.</u>
Motor-Wiper-Front	-	At Motor	<u>Fig. 26.</u>
Motor-Wiper-Rear	Black	Liftgate	<u>Fig. 52.</u>
Port-Auxiliary Audio Video	-	Rear of Console	<u>Fig. 38,</u> <u>Fig. 41.</u>
Power Outlet-AC	Orange	Rear of Console	<u>Fig. 38,</u> <u>Fig. 41.</u>
Pump-Washer-Windshield	-	Attached to Washer Reservoir	<u>Fig. 2.</u>
			<u>Fig. 34,</u>

Radio C1 (Hands Free)	Gray	Rear of Radio	<u>Fig. 36.</u>
Radio C2	Gray	Rear of Radio	<u>Fig. 34,</u> <u>Fig. 36.</u>
Radio C3		Rear of Radio	<u>Fig. 34,</u> <u>Fig. 36.</u>
Receiver-Intrusion Sensor (VTSS)	-	At Headliner	N/S
Relay-Brake Lamp Activation	-	On Body Harness	<u>Fig. 47.</u>
Relay-Cabin Heater C1 (Diesel)	Black	Cooling Jumper	N/S
Relay-Cabin Heater C2 (Diesel)	-	Cooling Jumper	N/S
Relay-Radiator Fan High	-	Below Right Headlamp	<u>Fig. 1.</u>
Relay-Secondary Door Lock (RHD)	-	Right Kick Panel	<u>Fig. 31,</u> <u>Fig. 32.</u>
Relay-Secondary Door Unlock (RHD)	-	Right Kick Panel	<u>Fig. 31,</u> <u>Fig. 32.</u>
Relay-Trailer Tow-Left	-	Left Quarter Panel	<u>Fig. 47.</u>
Relay-Trailer Tow-Right	-	Left Quarter Panel	<u>Fig. 47.</u>
Resistor Block-Blower Motor	Gray	Right Instrument Panel above Kick Panel	<u>Fig. 33.</u>
Screen-Video	-	On Instrument Panel Harness	N/S
Seat Belt-Buckle Tensioner-Driver	-	Driver Seat	N/S
Seat Belt-Buckle Tensioner-Passenger	-	Passenger Seat	N/S
Seat Belt-Retractor Tensioner-Driver	Yellow	Left B-Pillar	<u>Fig. 43.</u>
Seat Belt-Retractor Tensioner-Passenger	Yellow	Right B-Pillar	<u>Fig. 43.</u>
Sensor-Accelerator Pedal Position (Diesel)	Black	Near Accelerator Pedal	<u>Fig. 33,</u> <u>Fig. 35.</u>
Sensor-Ambient Air Temperature	Black	Right Front Engine Compartment	N/S
Sensor-Brake Fluid Level	Black	At Reservoir	<u>Fig. 20,</u> <u>Fig. 22,</u> <u>Fig. 26.</u>
Sensor-Camshaft Position (3.7L)	Gray	Right Front of Engine	<u>Fig. 12,</u> <u>Fig. 14.</u>
Sensor-Camshaft Position (Diesel)	Black	Front of Engine	<u>Fig. 17.</u>
Sensor-Crankshaft Position (3.7L)	Black	Lower Right Rear of Engine	<u>Fig. 12,</u> <u>Fig. 14.</u>
Sensor-Crankshaft Position (Diesel)	Black	Lower Left of Engine Near Starter	<u>Fig. 18.</u>
Sensor-Dynamics (ESP)	Black	Right Side of Body	<u>Fig. 38.</u>
Sensor-Engine Coolant Temperature (3.7L)	Black	Front Center of Engine	<u>Fig. 11.</u>

Sensor-Engine Coolant Temperature (Diesel)	Black	Left Rear of Engine	<u>Fig. 18.</u>
Sensor-Evaporator Temperature	Natural	Center of Instrument Panel	<u>Fig. 33,</u> <u>Fig. 35.</u>
Sensor-Exhaust Differential Pressure	Black	Right Rear of Transmission	<u>Fig. 19.</u>
Sensor-Front Impact-Left	-	Below Left Headlamp	<u>Fig. 2.</u>
Sensor-Front Impact-Right	Yellow	Below Right Headlamp	<u>Fig. 1.</u>
Sensor-Fuel Pressure (Diesel)	Black	Top Front Center of Engine	<u>Fig. 18.</u>
Sensor-Fuel Temperature (Diesel)	Black	Left Rear of Engine Compartment	<u>Fig. 21.</u>
Sensor-Infrared	-	On Headliner Harness	N/S
Sensor-Inlet Air Pressure (Diesel)	Black	Right Front of Engine	<u>Fig. 17.</u>
Sensor-Input Speed (RLE)	Black	Left Front of Transmission	<u>Fig. 15.</u>
Sensor-Intake Air Temperature (Gas)	Black	Top Right of Engine	<u>Fig. 12,</u> <u>Fig. 13.</u>
Sensor-Intake Air Temperature/Boost Pressure (Diesel)	Black	Top Front Center of Engine	<u>Fig. 18.</u>
Sensor-Knock No. 1 (3.7L)	Black	Left Rear of Engine	<u>Fig. 13,</u> <u>Fig. 15.</u>
Sensor-Knock No. 2 (3.7L)	Black	Right Rear of Engine	<u>Fig. 13.</u>
Sensor-MAP (Gas)	Gray	Top Front of Engine	<u>Fig. 11.</u>
Sensor-Mass Air Flow (Diesel)	-	Right Front of Engine	<u>Fig. 17.</u>
Sensor-Oil Pressure (Diesel)	Dk Green	Front Center of Lower Engine	<u>Fig. 17.</u>
Sensor-Output Speed (RLE)	Black	Left Rear of Transmission	<u>Fig. 15.</u>
Sensor-Oxygen (Diesel)	-	Right Rear of Engine	<u>Fig. 17.</u>
Sensor-Oxygen 1/1 (3.7L)	Natural	Left Side of Engine Near Transmission	<u>Fig. 15,</u> <u>Fig. 16.</u>
Sensor-Oxygen 1/2 (3.7L)	Black	Left Side Near Transmission	<u>Fig. 15,</u> <u>Fig. 16.</u>
Sensor-Oxygen 2/1 (3.7L)	Black	Right Rear of Engine Near Transmission	<u>Fig. 16.</u>
Sensor-Oxygen 2/2 (3.7L)	Black	Left Rear of Engine Near Transmission	<u>Fig. 13,</u> <u>Fig. 16.</u>
Sensor-Park Assist-No. 8 (Parktronics)	-	Right Rear Fascia	N/S
Sensor-Park Assist-No. 11 (Parktronics)	-	Left Rear Fascia	N/S
Sensor-Park Assist-No. 9 (Parktronics)	-	Right Center Rear Fascia	N/S
Sensor-Park Assist-No. 10			

(Parktronics)	-	Left Center Rear Fascia	N/S
Sensor-Post-Catalyst Exhaust Gas Temperature (Diesel)	Black	Left Rear of Engine	<u>Fig. 18.</u>
Sensor-Rain	-	On Overhead Harness	N/S
Sensor-Seat Track Position-Driver	Gray	Driver Seat	<u>Fig. 42.</u>
Sensor-Seat Track Position-Passenger	Gray	Passenger Seat	<u>Fig. 42.</u>
Sensor-Seat Weight-Left Front	-	Passenger Seat	<u>Fig. 42.</u>
Sensor-Seat Weight-Left Rear	-	Passenger Seat	<u>Fig. 42.</u>
Sensor-Seat Weight-Right Front	-	Passenger Seat	<u>Fig. 42.</u>
Sensor-Seat Weight-Right Rear	-	Passenger Seat	<u>Fig. 42.</u>
Sensor-Side Impact-Left 1	Gray	Left B-Pillar	<u>Fig. 43.</u>
Sensor-Side Impact-Left 2	Gray	Left Quarter Panel	<u>Fig. 47.</u>
Sensor-Side Impact-Right 1	Gray	Right B-Pillar	<u>Fig. 44.</u>
Sensor-Side Impact-Right 2	Gray	Right Quarter Panel	<u>Fig. 48.</u>
Sensor-Steering Angle (ESP)	-	At Steering Column	<u>Fig. 34.</u> <u>Fig. 36.</u>
Sensor-Sun-Load	-	On Overhead Harness	N/S
Sensor-Transmission Range (RLE)	Lt Green	Left Side of Transmission	<u>Fig. 15.</u>
Sensor-Water in Fuel (Diesel)	Green	Left Side Engine Compartment	<u>Fig. 21.</u>
Sensor-Wheel Speed-ABS-Left Front	Black	Left Front Wheel Opening	<u>Fig. 22.</u>
Sensor-Wheel Speed-ABS-Left Rear	Black	Left Rear Underbody	<u>Fig. 45.</u>
Sensor-Wheel Speed-ABS-Right Front	Black	Right Side Engine Compartment	<u>Fig. 27.</u> <u>Fig. 33.</u> <u>Fig. 35.</u>
Sensor-Wheel Speed-ABS-Right Rear	Black	Right Rear Underbody	<u>Fig. 45.</u>
Siren (Export)	Black	Left Front Engine Compartment	<u>Fig. 5.</u>
Solenoid-EGR (Diesel)	-	Top Center of Engine	<u>Fig. 17.</u>
Solenoid-EVAP/Purge	Black	Top Left Front of Engine	<u>Fig. 11.</u>
Solenoid-Fuel Pressure (Diesel)	Black	Top Left Rear of Engine	<u>Fig. 18.</u>
Solenoid-Fuel Quantity (Diesel)	Black	Left Side of Engine	<u>Fig. 18.</u>
Solenoid-Throttle Valve (Diesel)	Black	Left Side of Engine at Throttle Body	<u>Fig. 18.</u>
Speaker-Left Front Door	White	In Door	<u>Fig. 39.</u>
Speaker-Left Rear Door	White	In Door	<u>Fig. 40.</u>
Speaker-Right Front Door	White	In Door	<u>Fig. 39.</u>
Speaker-Right Rear Door	White	In Door	<u>Fig. 40.</u>
Speaker-Subwoofer (Premium)	Black	Right Quarter Panel	<u>Fig. 48.</u>
		Top Left of Instrument	<u>Fig. 33.</u>

Speaker-Tweeter-Left Front	-	Panel	<u>Fig. 35.</u>
Speaker-Tweeter-Left Rear	-	Left Rear Door	<u>Fig. 40.</u>
Speaker-Tweeter-Right Front	-	Top Right of Instrument Panel	<u>Fig. 33.</u> <u>Fig. 35.</u>
Speaker-Tweeter-Right Rear	-	Right Rear Door	<u>Fig. 40.</u>
Starter	-	Lower Left of Engine	<u>Fig. 10.</u> <u>Fig. 11.</u> <u>Fig. 18.</u>
Starter-Eyelet (Diesel)	-	Lower Left of Engine	<u>Fig. 8.</u>
	Starter-Eyelet (Gas)	Lower Left of Engine	<u>Fig. 10.</u>
Switch-Backup Lamp (MTX)	Black	Top Left Side of Transmission	<u>Fig. 16.</u>
Switch-Bank	Black	Lower Center of Instrument Panel	<u>Fig. 34.</u> <u>Fig. 36.</u>
Switch-Clutch Interlock (LHD MTX)	Yellow	Left Rear of Engine at Transmission	<u>Fig. 21.</u>
Switch-Clutch Interlock (RHD MTX)	Yellow	Right Rear of Engine at Transmission	<u>Fig. 20.</u>
Switch-EVAP System Monitor (Gas)	Black	Rear Center Underbody	<u>Fig. 49.</u>
Switch-Hood Ajar	Black	Engine Compartment	<u>Fig. 2.</u>
Switch-Horn	Black	At Steering Wheel	N/S
Switch-Ignition	Black	At Steering Column	<u>Fig. 34.</u> <u>Fig. 36.</u>
Switch-Memory	-	On Instrument Panel	<u>Fig. 34.</u>
Switch-Oil Pressure (Gas)	Black	Left Front of Engine	<u>Fig. 11.</u>
Switch-Parking Brake	Black	At Parking Brake Lever	<u>Fig. 38.</u>
Switch-Power Window-Left Rear	Gray	Left Rear Door	<u>Fig. 40.</u>
Switch-Power Window-Right Rear	Gray	Right Rear Door	<u>Fig. 40.</u>
Switch-Remote Radio-Left	-	Steering Wheel	N/S
Switch-Remote Radio-Right	-	Steering Wheel	N/S
Switch-Seat-Driver	Black	Driver Seat	<u>Fig. 42.</u>
Switch-Seat-Passenger	-	Passenger Seat	N/S
Switch-Speed Control	Black	Steering Wheel	N/S
Switch-Stop Lamp	Black	At Brake Pedal	<u>Fig. 33.</u> <u>Fig. 35.</u>
Switch-Sunroof	Black	Overhead Console	<u>Fig. 29.</u>
Switch-Transfer Case Selector	Black	Lower Center of Instrument Panel	<u>Fig. 41.</u>
Switch-Window/Door Lock-Driver C1	Black	Driver Door	<u>Fig. 39.</u>
Switch-Window/Door Lock-Driver C2	Black	Driver Door	<u>Fig. 39.</u>
Switch-Window/Door Lock-			

Passenger (Base)	-	Passenger Door	<u>Fig. 39.</u>
Switch-Window/Door Lock-Passenger (Express up)	Green	Passenger Door	<u>Fig. 39.</u>
Throttle Body (3.7L/Diesel)	Black	Top Center of Engine	<u>Fig. 11.</u>
Transmitter-Intrusion Sensor (VTSS)	-	Headliner	N/S
Transducer-A/C Pressure (LHD)	Gray	Right Rear of Engine Compartment	<u>Fig. 20,</u> <u>Fig. 24.</u>
Transducer-A/C Pressure (RHD)	Gray	Left Rear of Engine Compartment	<u>Fig. 25.</u>
Transponder-Tire Pressure-Left Front	-	Lower Left Front Fender	<u>Fig. 2,</u> <u>Fig. 4.</u>
Transponder-Tire Pressure-Left Rear	-	Rear Center Underbody	<u>Fig. 49.</u>
Transponder-Tire Pressure-Right Front	-	Lower Right Front Fender	<u>Fig. 1,</u> <u>Fig. 5.</u>
Wiring-Trailer Tow 7-Way	Black	At Trailer Hitch	<u>Fig. 49.</u>

GROUND S

GROUND NUMBER	LOCATION	FIG.
G100 (Diesel)	Left Side of Engine above Starter	<u>Fig. 8.</u>
G100 (Gas)	Left Lower Engine in Front of Starter	<u>Fig. 10.</u>
G101 (3.7L)	Right Lower Engine Below Sensor-Camshaft Position	<u>Fig. 12,</u> <u>Fig. 14.</u>
G101 (Diesel)	Left Rear of Engine Near Transmission	<u>Fig. 18.</u>
G102	Left Rear of Engine Near Transmission	<u>Fig. 24.</u>
G103	Left Engine Compartment behind Battery	<u>Fig. 7,</u> <u>Fig. 9,</u> <u>Fig. 24.</u>
G105	Left Rear of Engine Compartment	<u>Fig. 21.</u>
G106	Left Rear of Engine Compartment Near ABS Module	<u>Fig. 22.</u>
G107	Left Side of Engine Compartment	<u>Fig. 22.</u>
G108	Left Side of Engine Compartment	<u>Fig. 2.</u>
G200	Left Kick Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
G201	Left Kick Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
G300	Left Quarter Panel	<u>Fig. 47.</u>
G301	Right Quarter Panel	<u>Fig. 48.</u>
G302	Rear Center of Right Body	<u>Fig. 44.</u>
G303	Rear Center of Right Body	<u>Fig. 44.</u>
G304	Left Floor Pan	<u>Fig. 38.</u>
G305	Left Floor Pan	<u>Fig. 38.</u>
G306	Center Rear of Instrument Panel	<u>Fig. 34,</u> <u>Fig. 36.</u>
G307	Body Right Floor Pan	<u>Fig. 38.</u>

SPLICES

SPLICE NUMBER	LOCATION	FIG.
S101	Left Front Engine Compartment	<u>Fig. 2.</u>
S102	Left Front Engine Compartment	<u>Fig. 2.</u>
S103	Underhood-Left Side, Near T/O for Headlamp	<u>Fig. 3.</u>
S104	Underhood-Left Side, Near Module-Totally Integrated Power C3 and C4	<u>Fig. 3.</u>
S108	Left Front Engine Compartment	<u>Fig. 2.</u>
S109	Left Front Engine Compartment	<u>Fig. 2.</u>
S114 (Diesel)	Left Rear Engine Compartment	<u>Fig. 21.</u>
S114 (Gas)	Rear Engine Compartment	<u>Fig. 24.</u> <u>Fig. 25.</u>
S115 (Diesel)	Left Rear Engine Compartment	<u>Fig. 18.</u>
S115 (Gas)	Rear Engine Compartment	<u>Fig. 24.</u> <u>Fig. 25.</u>
S116	Rear of Engine	<u>Fig. 11.</u>
S117	Rear of Engine	<u>Fig. 11.</u>
S118 (LHD)	Right Rear Engine Compartment	<u>Fig. 24.</u>
S118 (RHD)	Rear of Engine	<u>Fig. 13.</u>
S119	Rear of Engine	<u>Fig. 11.</u>
S120	Rear of Engine	<u>Fig. 13.</u>
S121 (LHD)	Right Rear of Engine	<u>Fig. 13.</u>
S121 (RHD)	In T/O for Right Front O2 Sensor	<u>Fig. 16.</u>
S122 (3.7L)	Left Side of Transmission	<u>Fig. 16.</u>
S125	Rear Engine Compartment	<u>Fig. 24.</u> <u>Fig. 25.</u>
S126 (RLE)	Rear of Engine	<u>Fig. 13.</u>
S130 (Diesel)	Left Side of Transmission	<u>Fig. 15.</u>
S131	Rear Engine Compartment	<u>Fig. 24.</u> <u>Fig. 25.</u>
S133 (Diesel)	Right Front of Engine Compartment	<u>Fig. 17.</u>
S134	Left Rear Engine	<u>Fig. 11.</u> <u>Fig. 21.</u>
S135 (Diesel)	Right Front Engine Compartment	<u>Fig. 18.</u>
S135 (Gas)	Rear of Engine	<u>Fig. 13.</u>
S136 (Diesel)	In T/O for Battery-Positive-Cooling Module	<u>Fig. 18.</u>
S137	In T/O for Battery-Negative	<u>Fig. 7.</u>
S138 (Diesel)	In T/O for Battery-Negative	<u>Fig. 7.</u>
S138 (Gas)	In T/O for Battery-Positive	<u>Fig. 9.</u>
S139 (Diesel)	In T/O for Battery-Positive-Cooling Module	<u>Fig. 6.</u>
S140 (Diesel)	In T/O for Battery-Positive-Cooling Module	<u>Fig. 6.</u>
S141 (Diesel)	In T/O for Battery-Positive-Cooling Module	<u>Fig. 6.</u>
S142 (Diesel)	In T/O for Battery-Positive-Cooling Module	<u>Fig. 6.</u>
S143	Cooling Jumper Harness	N/S
S144	Battery Harness	N/S
S145	In T/O for Engine Control Module C1	<u>Fig. 21.</u>

S146	In T/O for Engine Control Module C1	<u>Fig. 21.</u>
S201	Driver Side Instrument Panel	<u>Fig. 34, Fig. 35.</u>
S202	Center of Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S203	Driver Side Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S204	Right Side of Instrument Panel Near Resistor Block-Blower Motor	<u>Fig. 33.</u>
S205	Passenger Side Center of Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S206	Center Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S207	Left Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S208	Left Kick Panel Near C202	<u>Fig. 33, Fig. 35.</u>
S209	Right Center of Instrument Panel	<u>Fig. 33, Fig. 36.</u>
S211	Right Center of Instrument Panel	<u>Fig. 33, Fig. 36.</u>
S213	Left Kick Panel Near C202	<u>Fig. 33, Fig. 35.</u>
S216	Passenger Side of Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S220	Driver Side Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S221 (LHD)	Next to T/O for Cluster	<u>Fig. 34.</u>
S221 (RHD)	Lower Center Instrument Panel	<u>Fig. 36.</u>
S222	Right Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S223	Passenger Side Instrument Panel	<u>Fig. 33, Fig. 35.</u>
S230	Lower Center Instrument Panel	<u>Fig. 34, Fig. 36.</u>
S231	In Steering Wheel Harness	N/S
S232	In Steering Wheel Harness	N/S
S300	Body Harness In C311 T/O	<u>Fig. 38.</u>
S301	Right Rear Body	<u>Fig. 48.</u>
S302	Right Rear Body	<u>Fig. 48.</u>
S303	Body Harness In C311 T/O	<u>Fig. 38.</u>
S304	Left Rear Body	<u>Fig. 43.</u>
S305	Left Front Engine Compartment	<u>Fig. 3.</u>
S306	In Driver Seat	N/S
S307	Left Center Body	<u>Fig. 43.</u>
S308	Left Rear Body	<u>Fig. 43.</u>
S309	Left Center Body	<u>Fig. 43.</u>
S310	Left Center Body	<u>Fig. 43.</u>
S311	Left Side of Body at T/O for C202	<u>Fig. 31.</u>
S312	Left Side of Body at T/O for G305	<u>Fig. 38.</u>
S313	Left Rear Engine Compartment	<u>Fig. 22.</u>
S314	Left Center Body	<u>Fig. 43.</u>
S315	In T/O for ABS Module	<u>Fig. 22.</u>
S316	Floor Near Left Front Door	<u>Fig. 31.</u>
S317	Front Left Floor Near Left Kick Panel	<u>Fig. 31.</u>
S318	Left Rear Body	<u>Fig. 47.</u>

S319	Front Left Floor Near Left Kick Panel	<u>Fig. 31.</u>
S320	Left Rear Body	<u>Fig. 47.</u>
S321	Left Rear Body	<u>Fig. 47.</u>
S322	Passenger Seat	<u>Fig. 42.</u>
S323	Passenger Seat	<u>Fig. 42.</u>
S324	Passenger Seat	N/S
S325	Front Left Floor Near Left Kick Panel	<u>Fig. 31.</u>
S326	Left Kick Panel Near C202	<u>Fig. 31.</u>
S328	Floor Near Left Front Door	<u>Fig. 31.</u>
S329	Body Left Floor Pan Near Front Door	<u>Fig. 31.</u>
S330	Left Rear Engine Compartment	<u>Fig. 22.</u>
S332	Left Rear Engine Compartment	<u>Fig. 22.</u>
S333	Right Kick Panel	<u>Fig. 31.</u>
S334	Floor Near Right Front Door	<u>Fig. 31.</u>
S335	In Passenger Door	N/S
S341	Left Kick Panel	<u>Fig. 31.</u>
S345	Right Side of Liftgate	<u>Fig. 51.</u>
S346	Rear Door Near T/O for Rear Speaker	<u>Fig. 40.</u>
S347	Rear Door Near T/O for Rear Speaker	<u>Fig. 40.</u>
S348	Rear Door Near T/O for Rear Speaker	<u>Fig. 40.</u>
S349	Rear Door Near T/O for Rear Speaker	<u>Fig. 40.</u>
S351	In Liftgate	N/S
S353	in Passenger Seat	<u>Fig. 42.</u>
S354	In Passenger Seat	<u>Fig. 42.</u>
S357	Left Side of Body at T/O for C202	<u>Fig. 31.</u>
S358	Left Front Door	<u>Fig. 39.</u>
S359	Right Rear of Headliner	N/S
S360	Right Front Engine Compartment	<u>Fig. 1.</u>
S362	Right Kick Panel	<u>Fig. 31.</u>
S363	In Body Harness	N/S
S365	Right Kick Panel	<u>Fig. 31.</u>
S366	Left Rear Body	<u>Fig. 43.</u>
S367	Right Rear Headliner	N/S
S368	Left Rear Body	<u>Fig. 43.</u>
S369	Rear Fascia Between Park Assist Sensors 9 and 10	N/S
S370	Rear Fascia Between Park Assist Sensors 10and 11	N/S
S371	Left Front Body Harness	<u>Fig. 31.</u>
S372	In Liftgate	N/S
S374	In Left Front Door	<u>Fig. 39.</u>

S375	Rear Fascia Between Park Assist Sensors 10and 11	N/S
S376	DVD	N/S

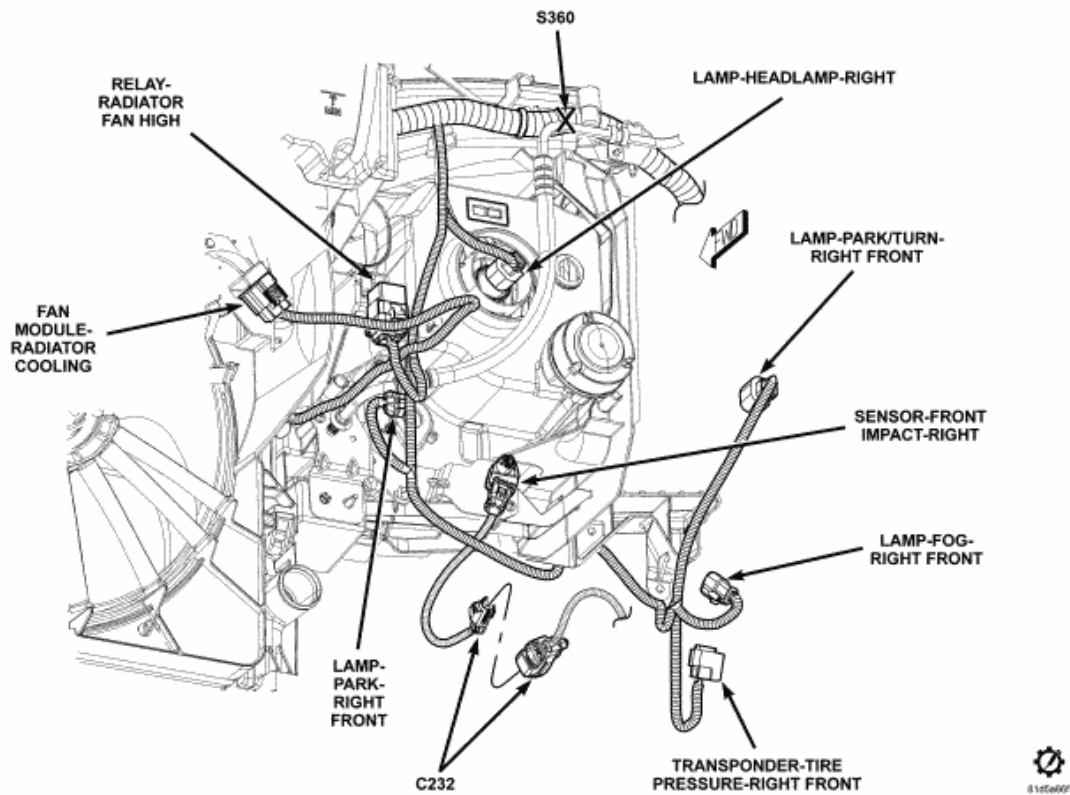


Fig. 1: UNDERHOOD-RIGHT FRONT
Courtesy of CHRYSLER LLC

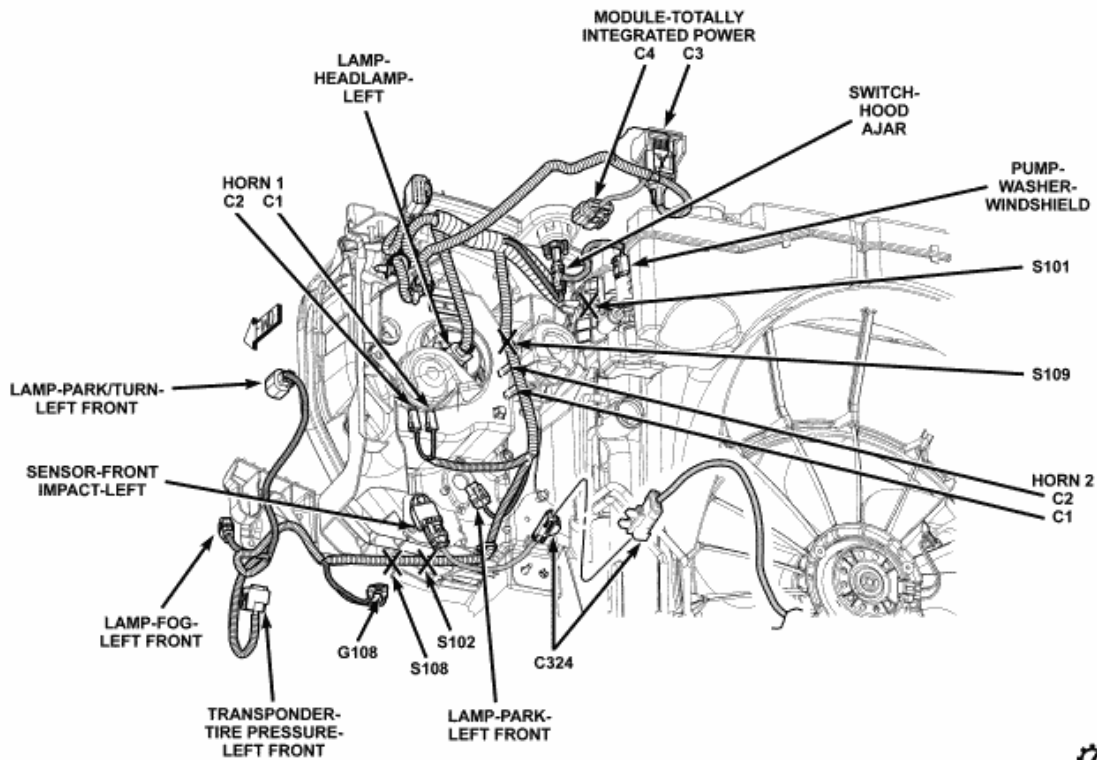


Fig. 2: UNDERHOOD-LEFT FRONT
 Courtesy of CHRYSLER LLC

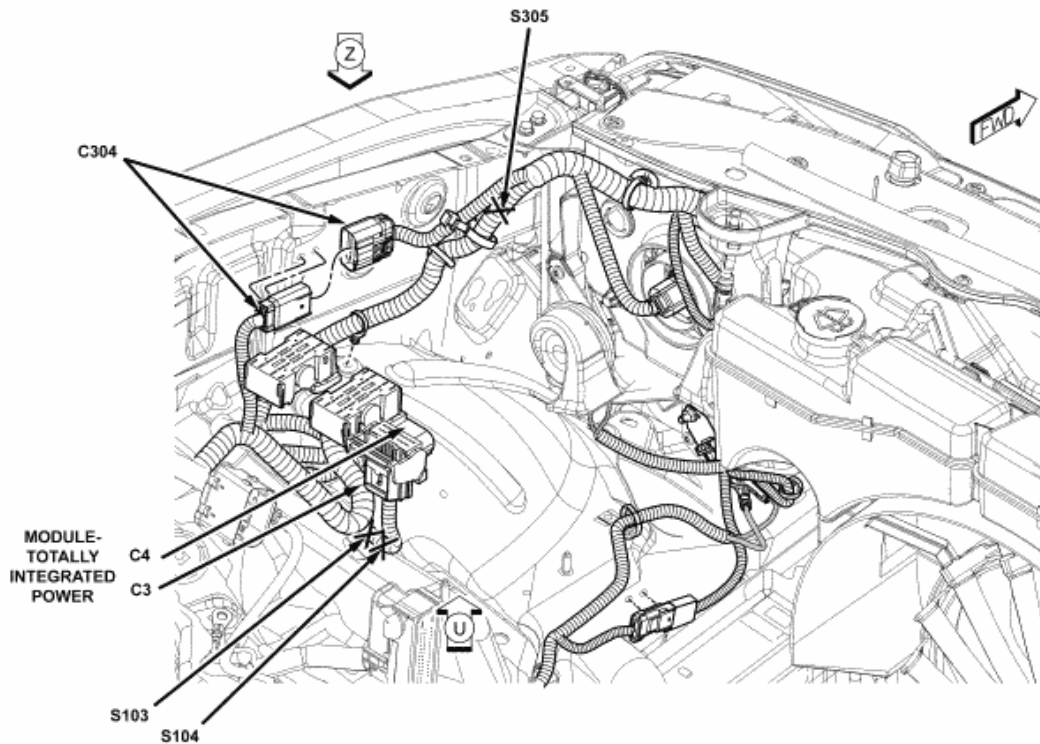


Fig. 3: UNDERHOOD-LEFT SIDE
Courtesy of CHRYSLER LLC

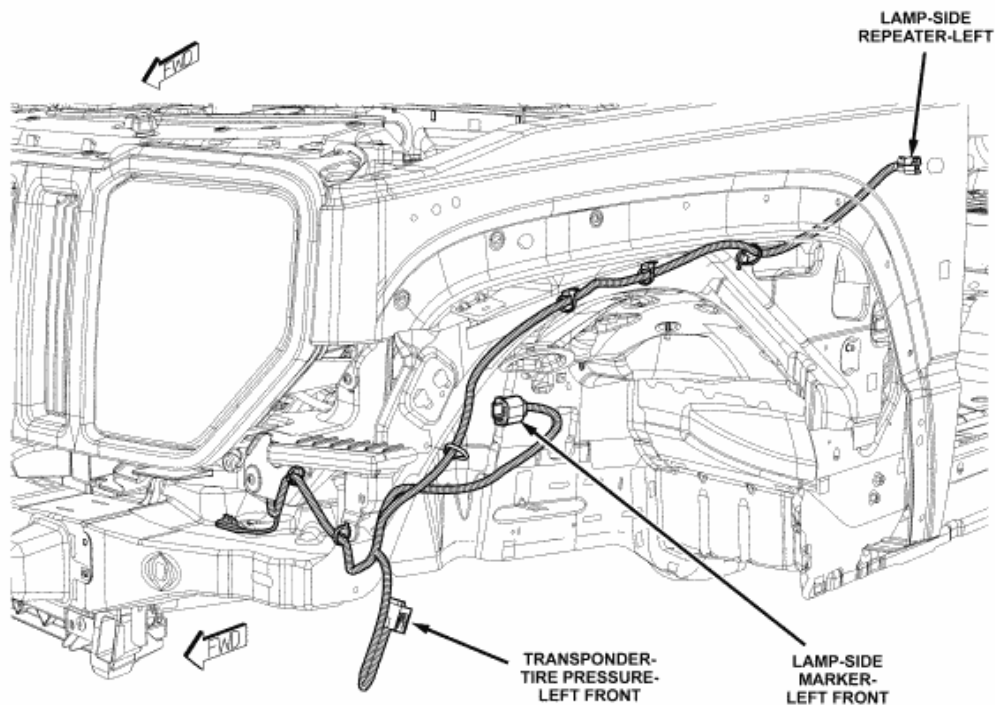


Fig. 4: UNDERHOOD-LEFT SIDE (EXPORT)
Courtesy of CHRYSLER LLC

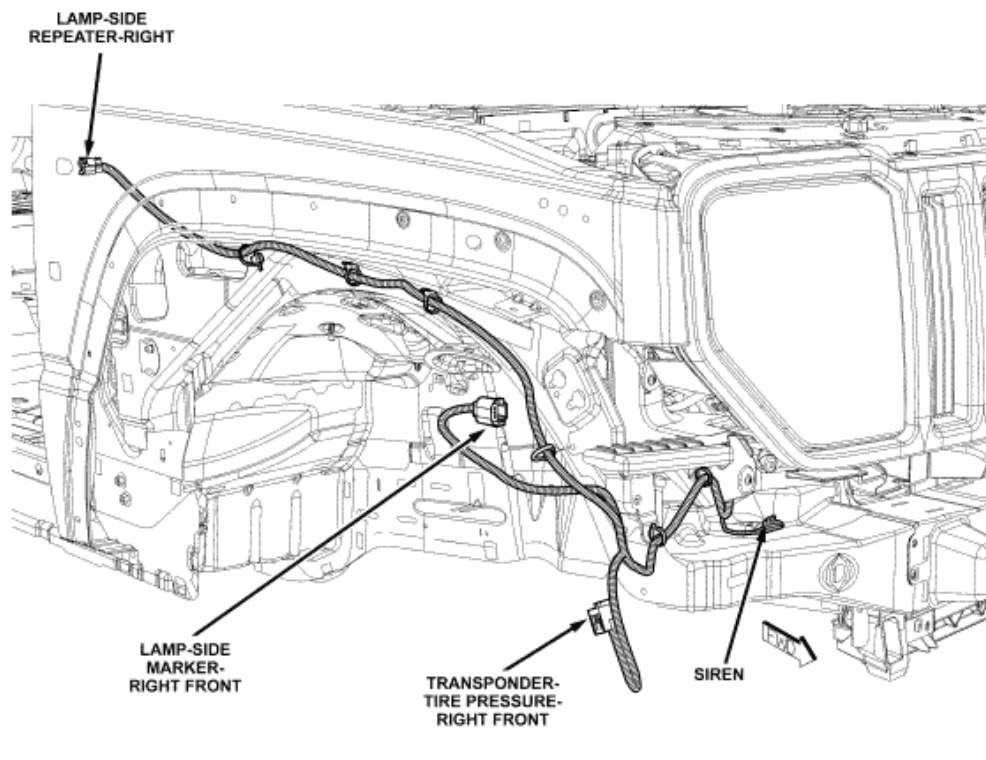


Fig. 5: UNDERHOOD-RIGHT SIDE (EXPORT)
 Courtesy of CHRYSLER LLC

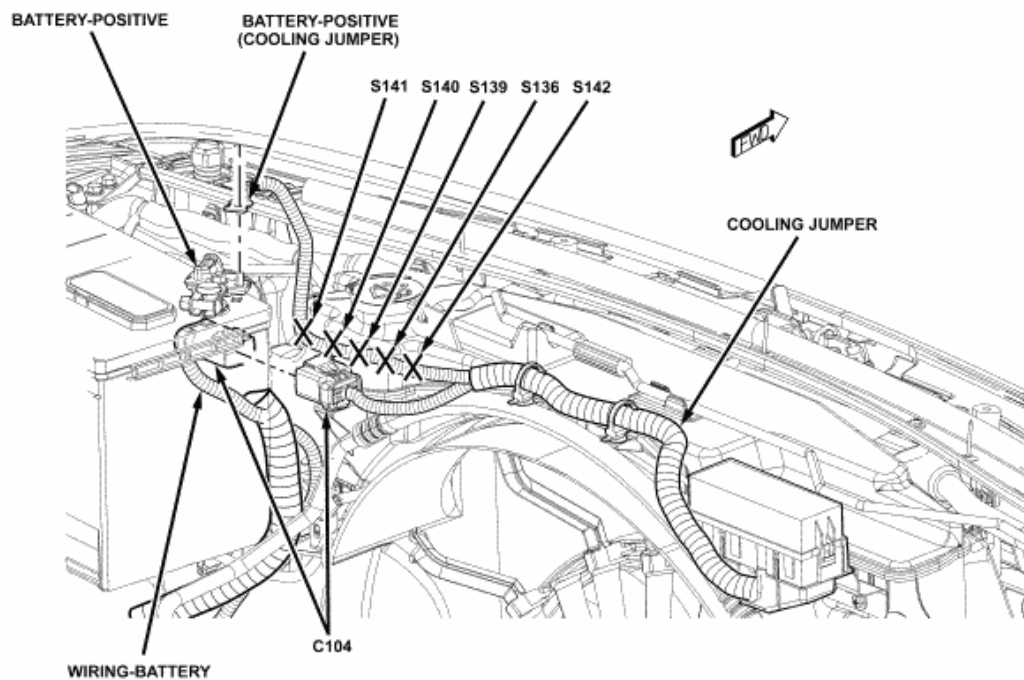


Fig. 6: UNDERHOOD (DIESEL)
Courtesy of CHRYSLER LLC

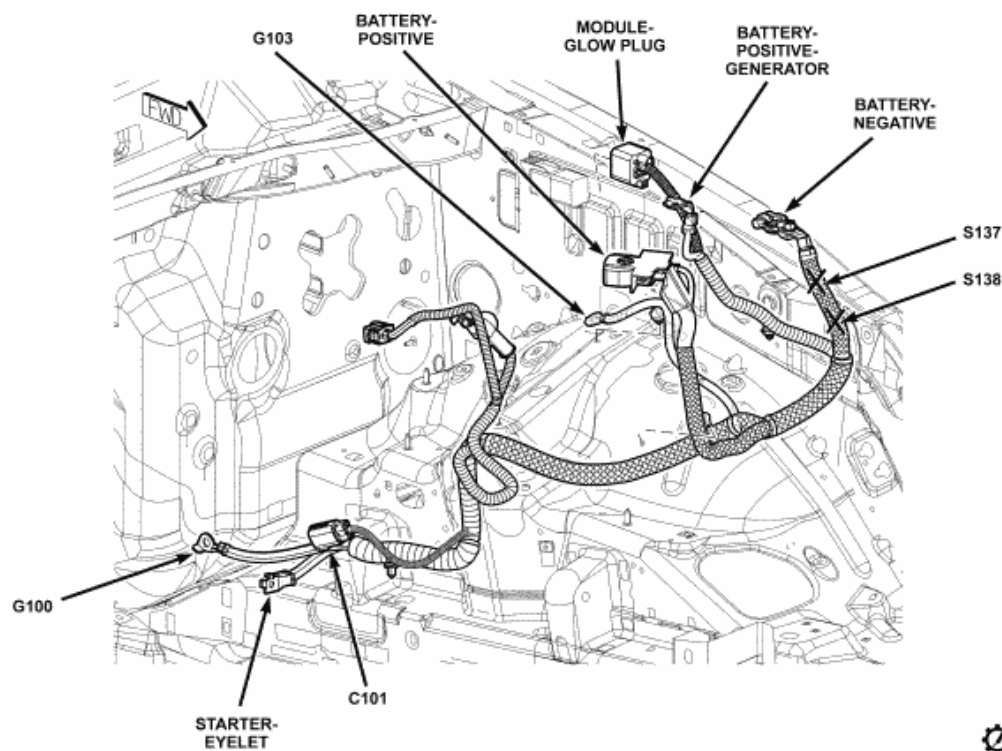


Fig. 7: BATTERY CABLES (DIESEL)
Courtesy of CHRYSLER LLC

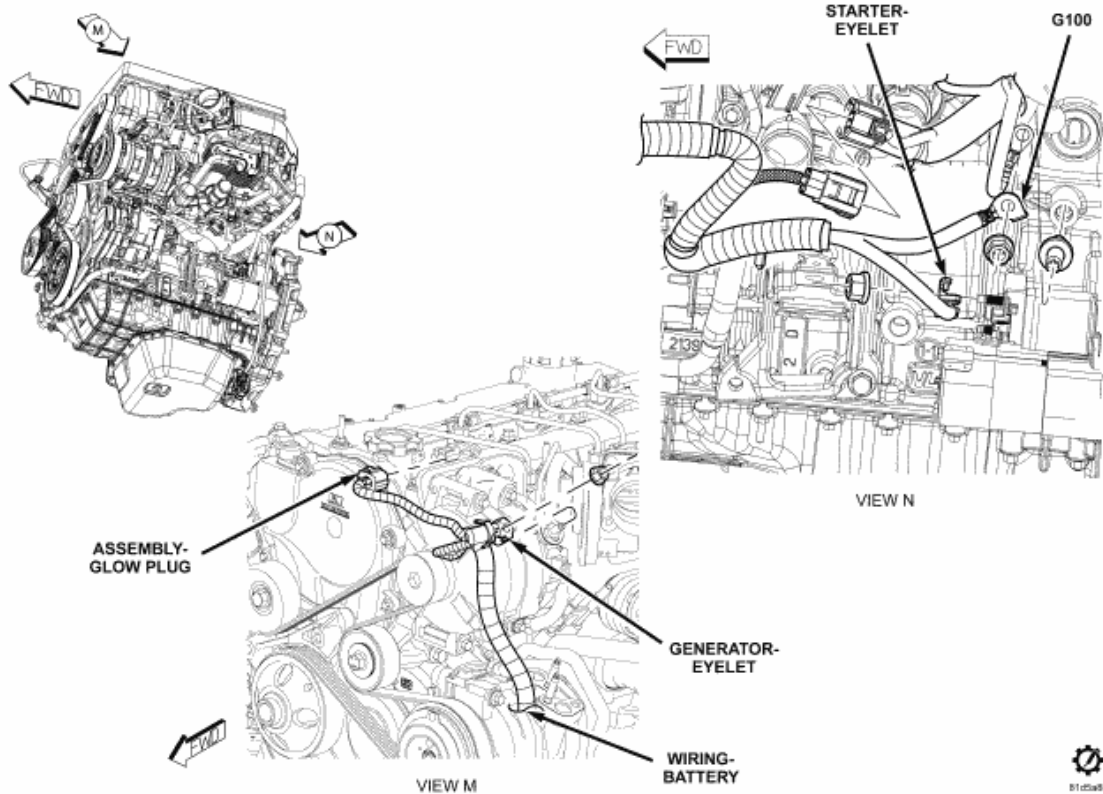


Fig. 8: DIESEL ENGINE-FRONT
 Courtesy of CHRYSLER LLC

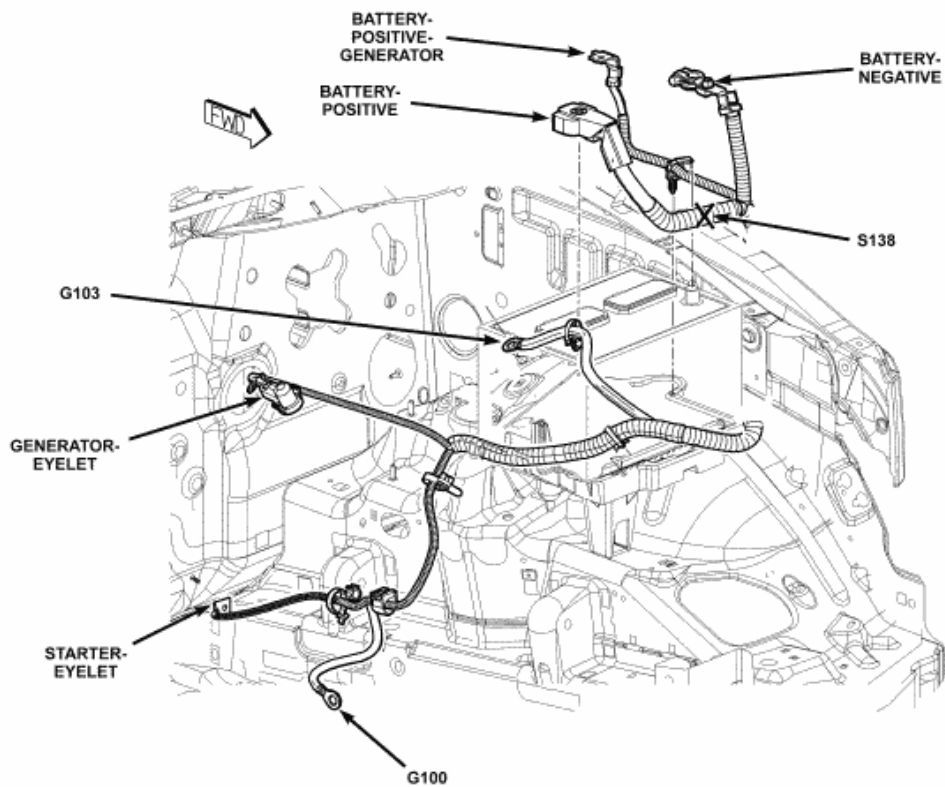


Fig. 9: BATTERY CABLES (GAS)
Courtesy of CHRYSLER LLC

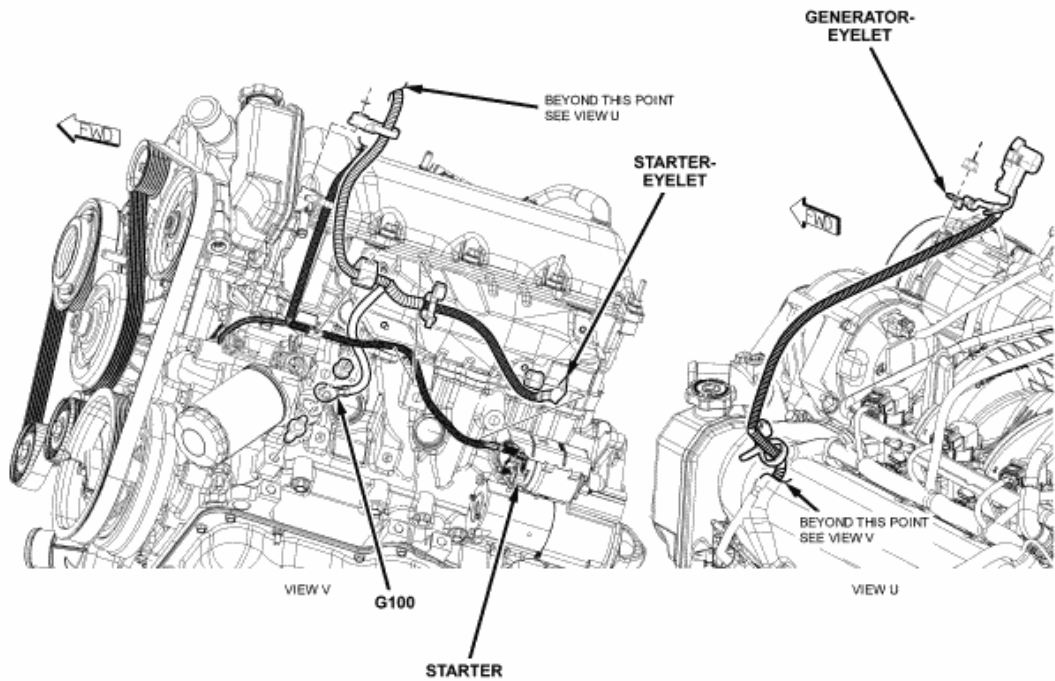


Fig. 10: ENGINE-LEFT SIDE (3.7L)
Courtesy of CHRYSLER LLC

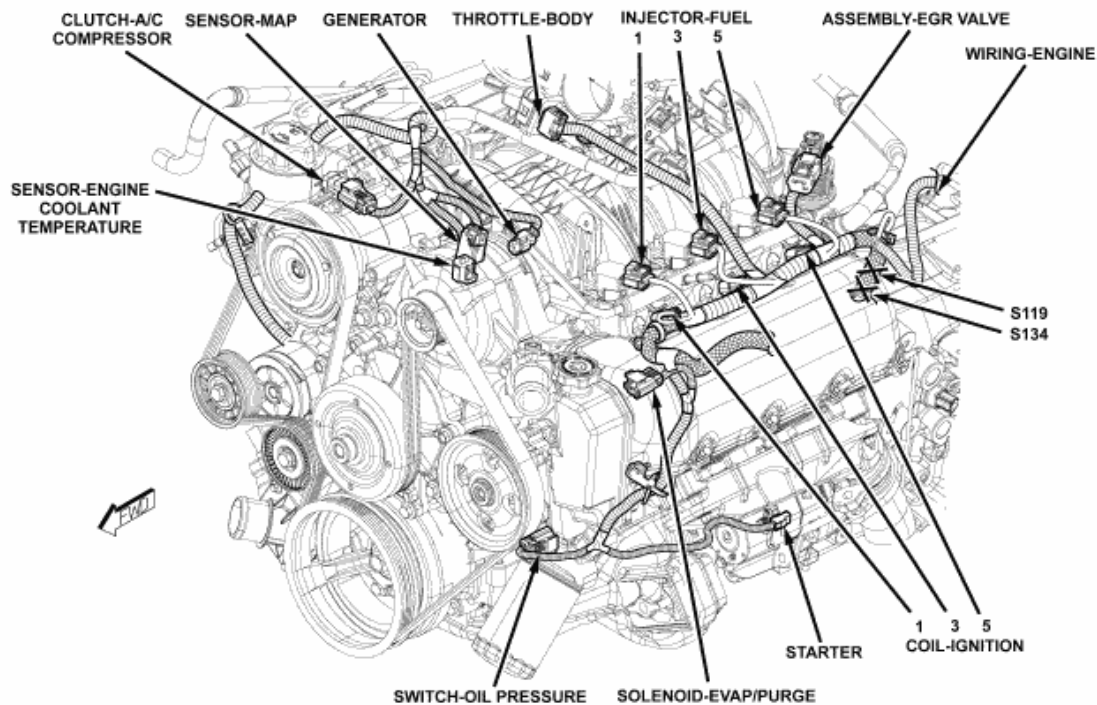


Fig. 11: LEFT SIDE ENGINE 3.7L
 Courtesy of CHRYSLER LLC

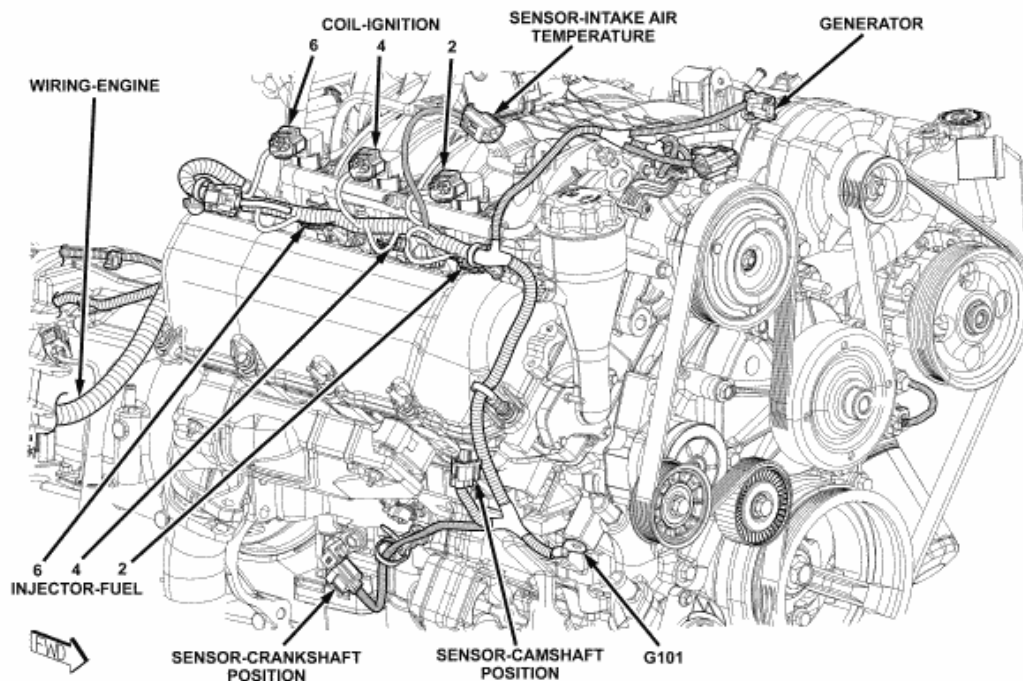


Fig. 12: RIGHT SIDE ENGINE 3.7L
Courtesy of CHRYSLER LLC

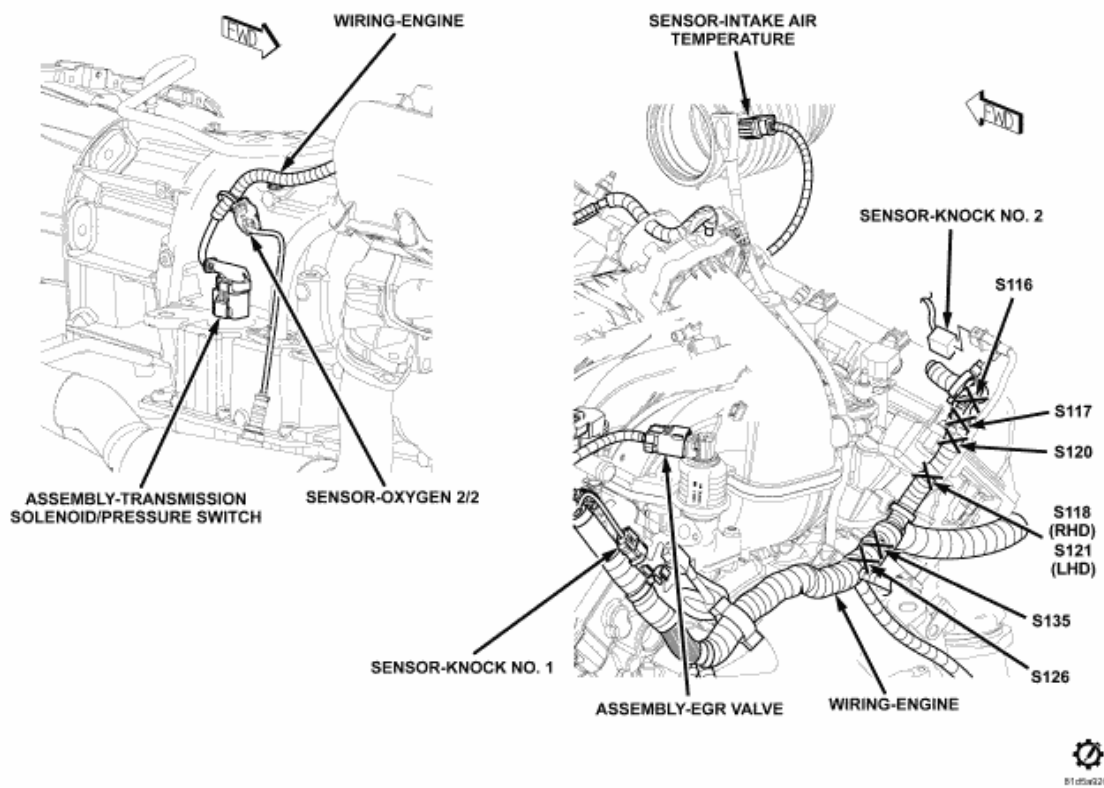


Fig. 13: ENGINE REAR (3.7L)
Courtesy of CHRYSLER LLC

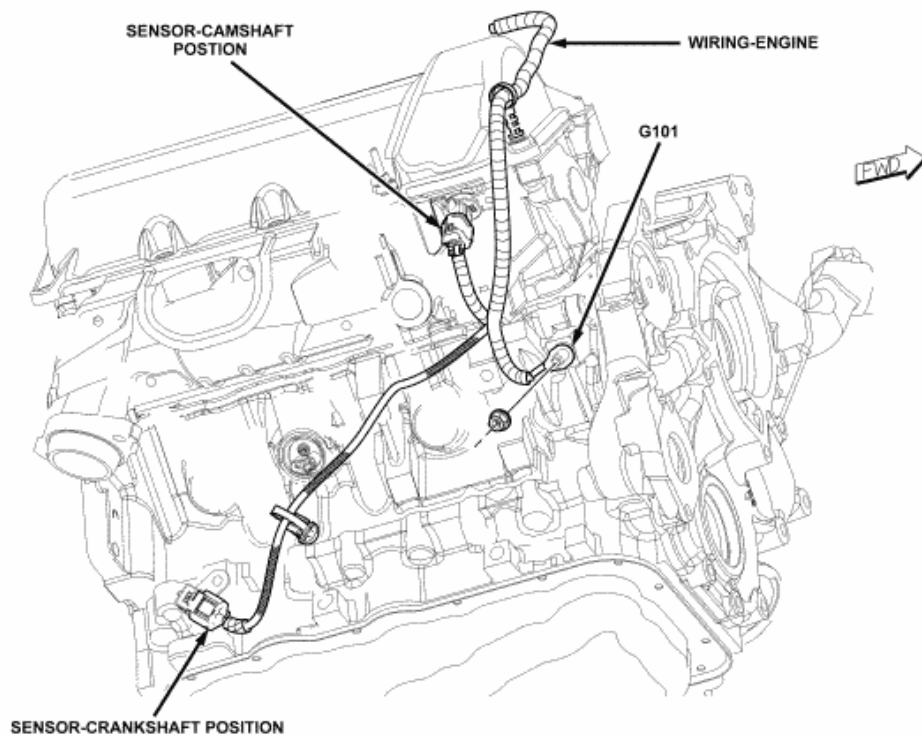


Fig. 14: ENGINE RIGHT SIDE 3.7L
 Courtesy of CHRYSLER LLC

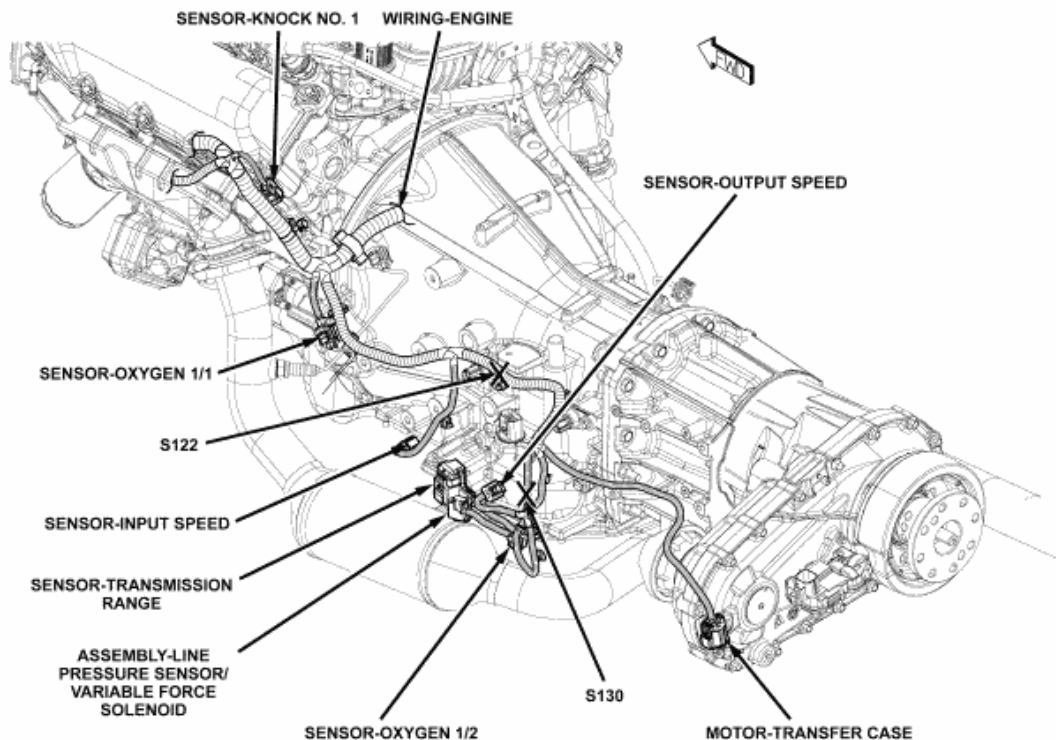


Fig. 15: TRANSFER CASE 3.7L (EXPORT)
Courtesy of CHRYSLER LLC

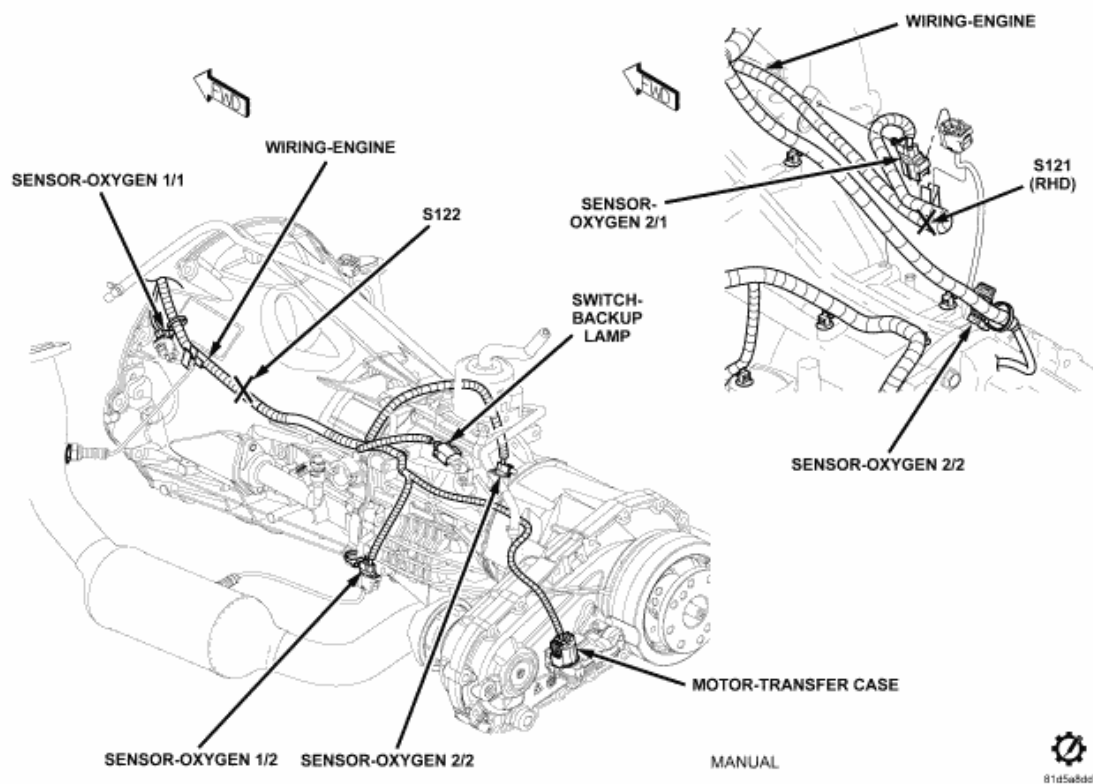


Fig. 16: TRANSFER CASE 3.7L
Courtesy of CHRYSLER LLC

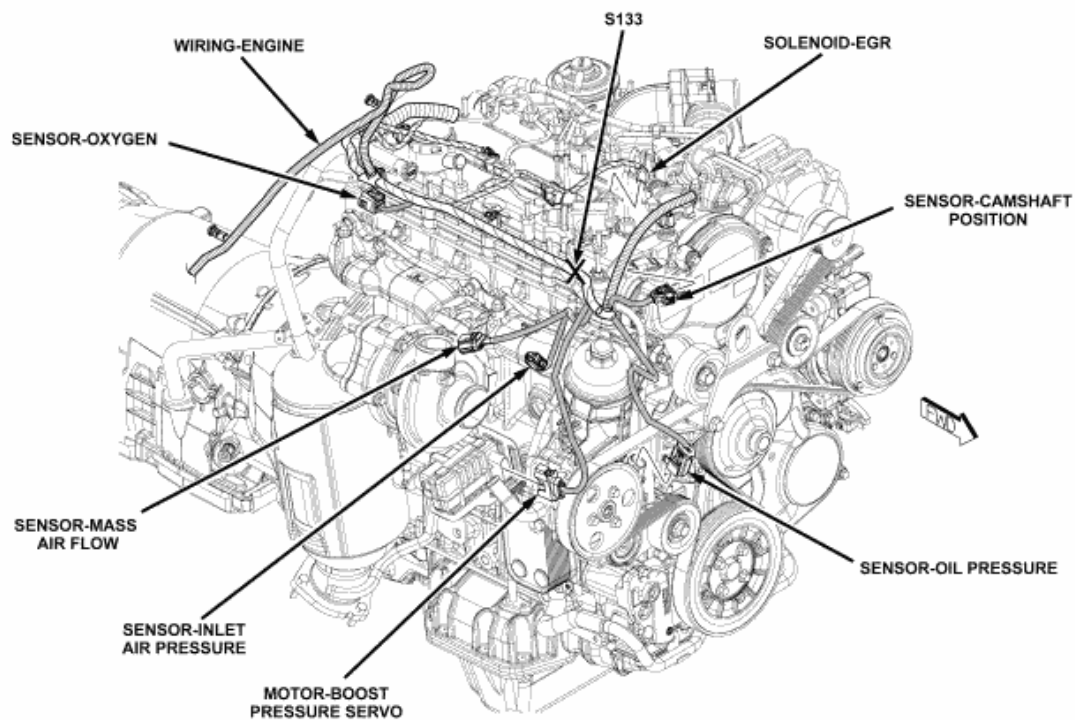


Fig. 17: ENGINE-RIGHT FRONT (DIESEL)
 Courtesy of CHRYSLER LLC

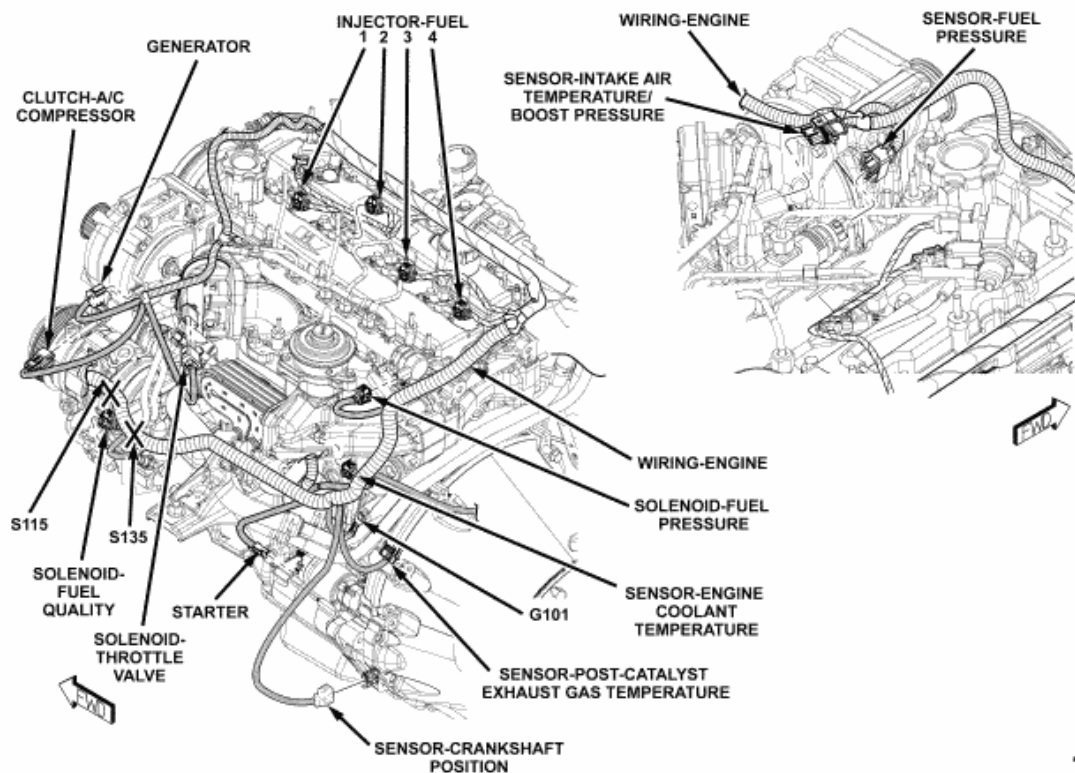


Fig. 18: ENGINE-LEFT SIDE (DIESEL)
Courtesy of CHRYSLER LLC

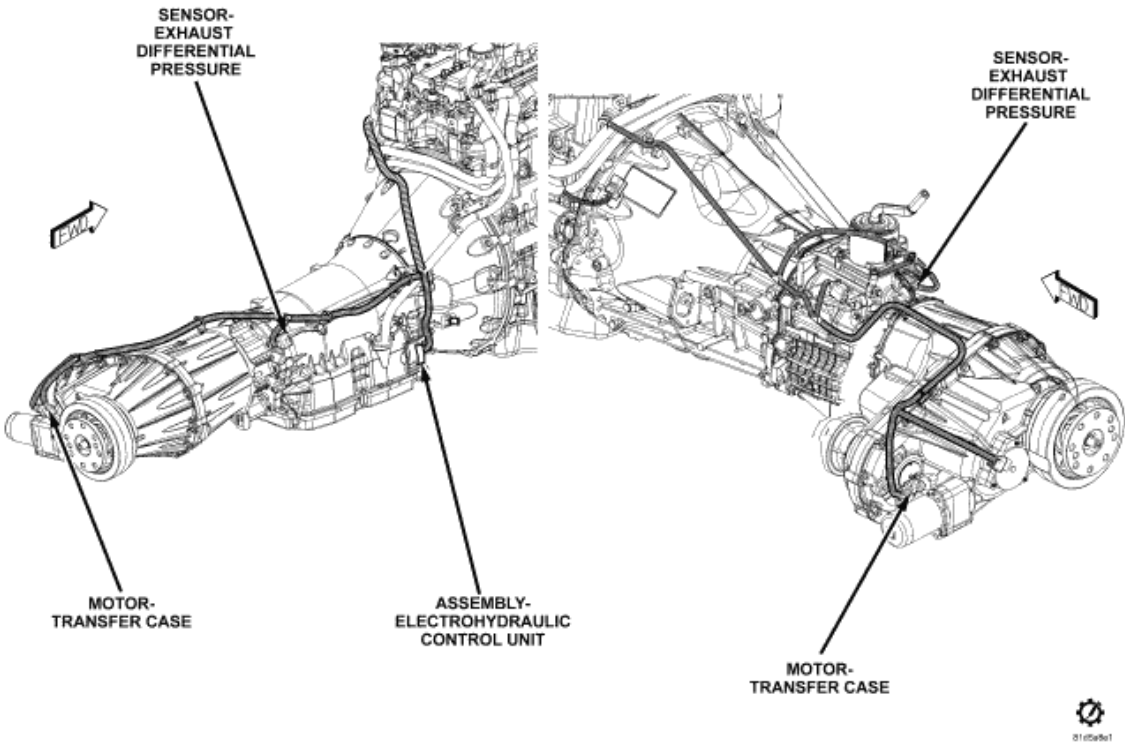


Fig. 19: TRANSMISSION-DIESEL ENGINE
Courtesy of CHRYSLER LLC

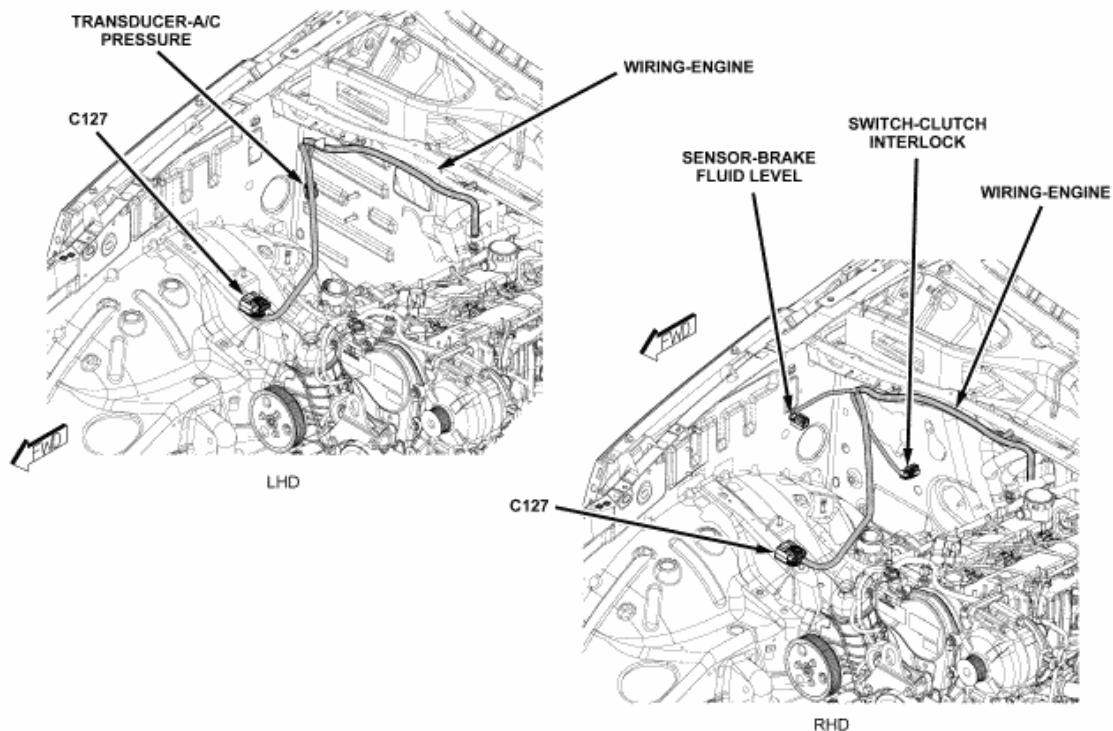


Fig. 20: DIESEL ENGINE COMPARTMENT
 Courtesy of CHRYSLER LLC

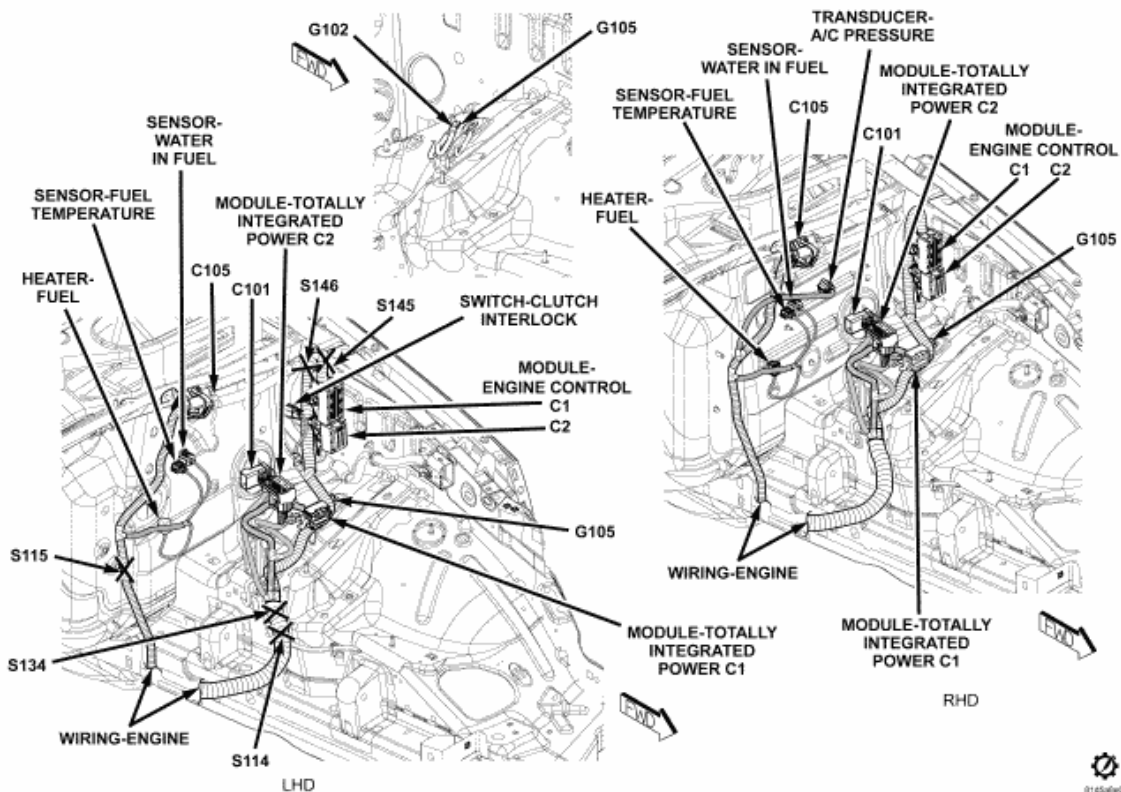


Fig. 21: DIESEL ENGINE COMPARTMENT-LEFT SIDE
Courtesy of CHRYSLER LLC

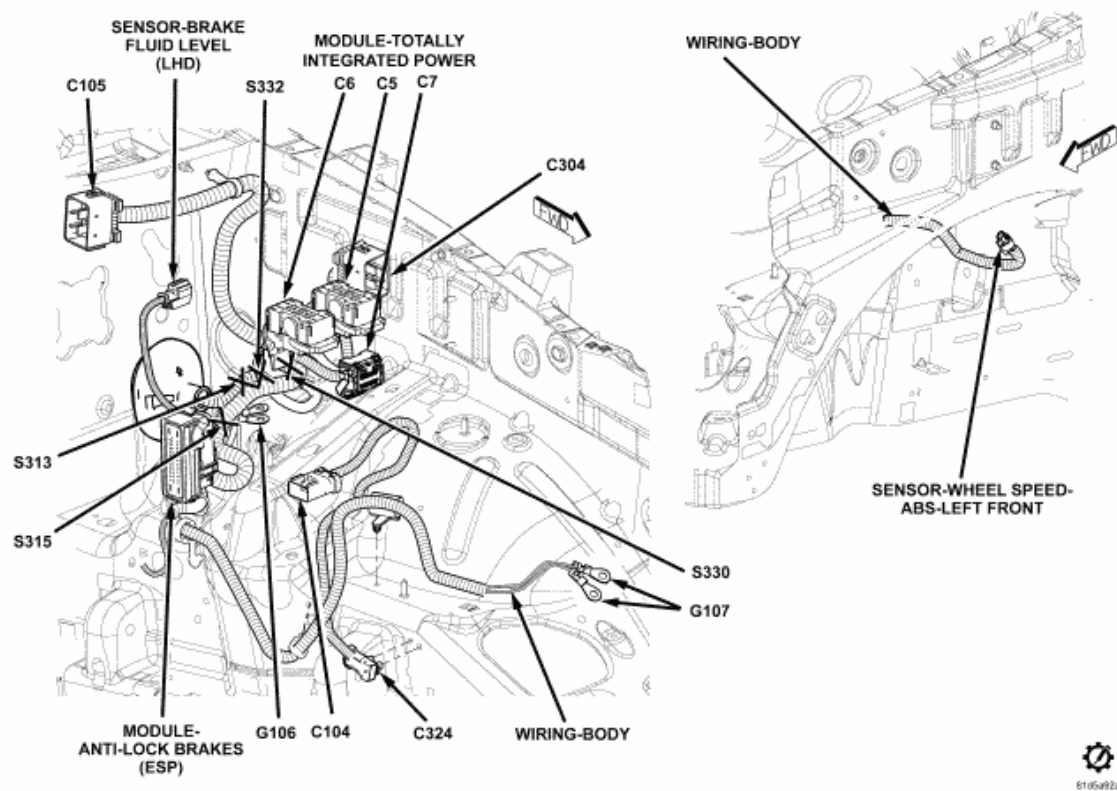


Fig. 22: ENGINE COMPARTMENT-LEFT REAR
Courtesy of CHRYSLER LLC

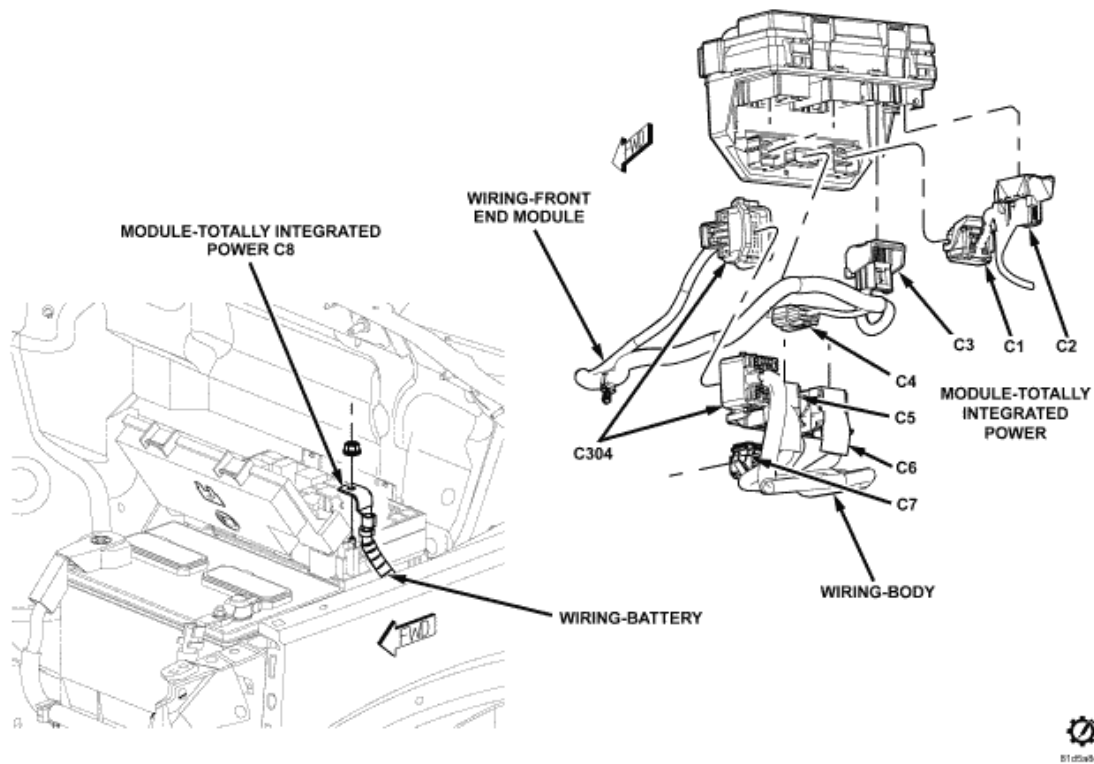


Fig. 23: TOTALLY INTEGRATED POWER MODULE
 Courtesy of CHRYSLER LLC

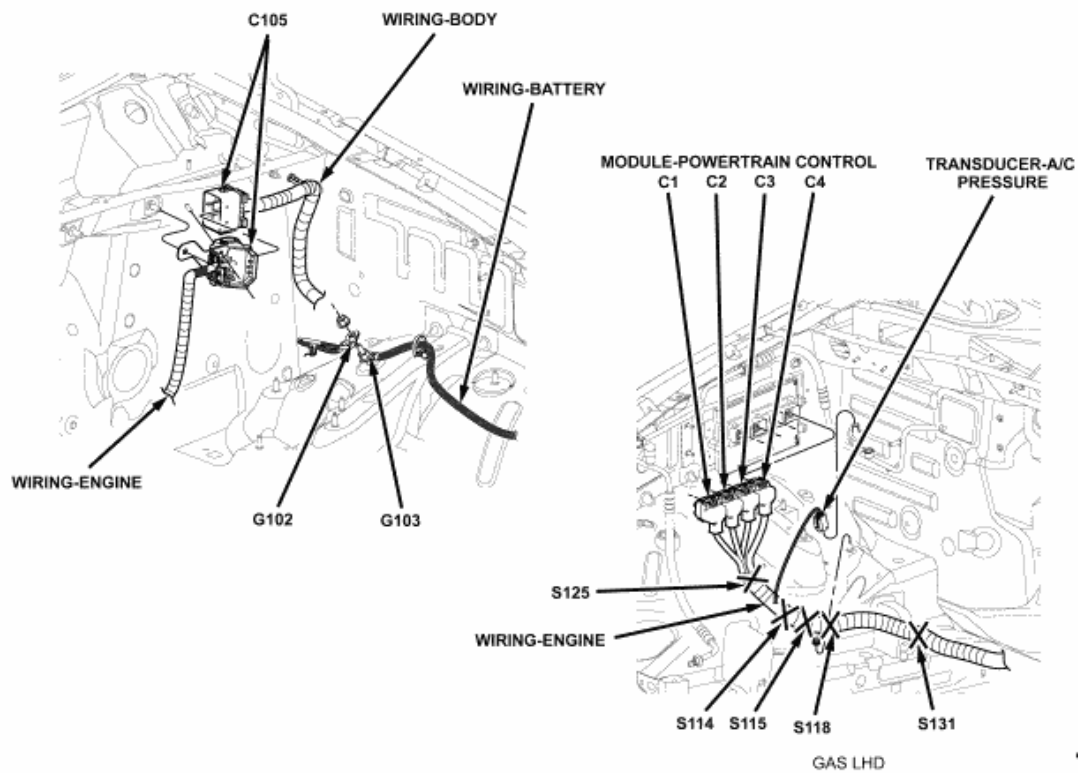


Fig. 24: POWERTRAIN CONTROL MODULE
Courtesy of CHRYSLER LLC

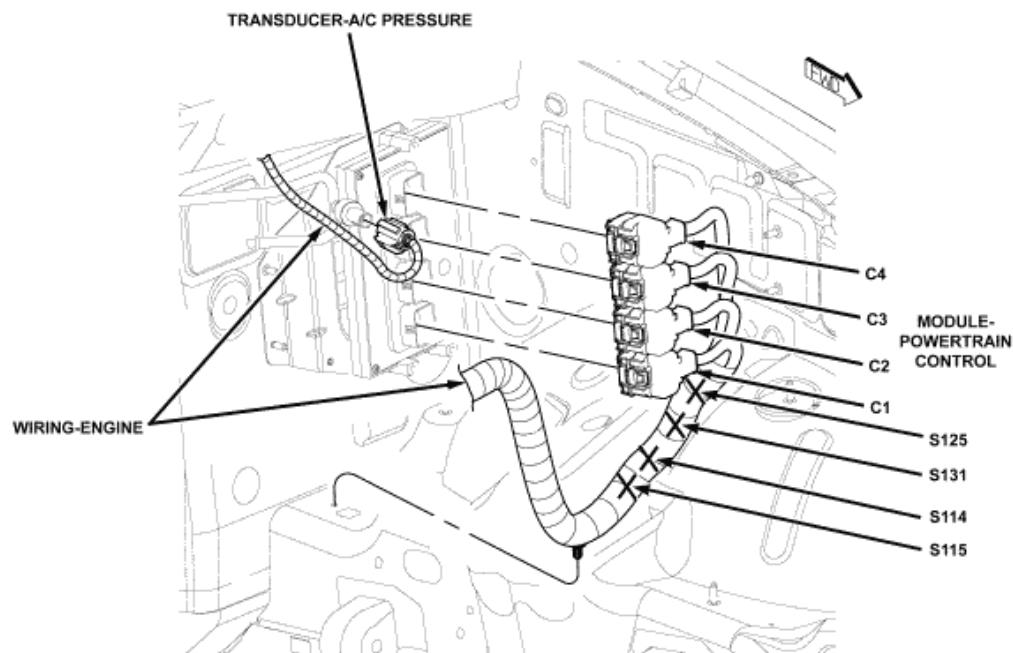


Fig. 25: POWERTRAIN CONTROL MODULE (RHD)
Courtesy of CHRYSLER LLC

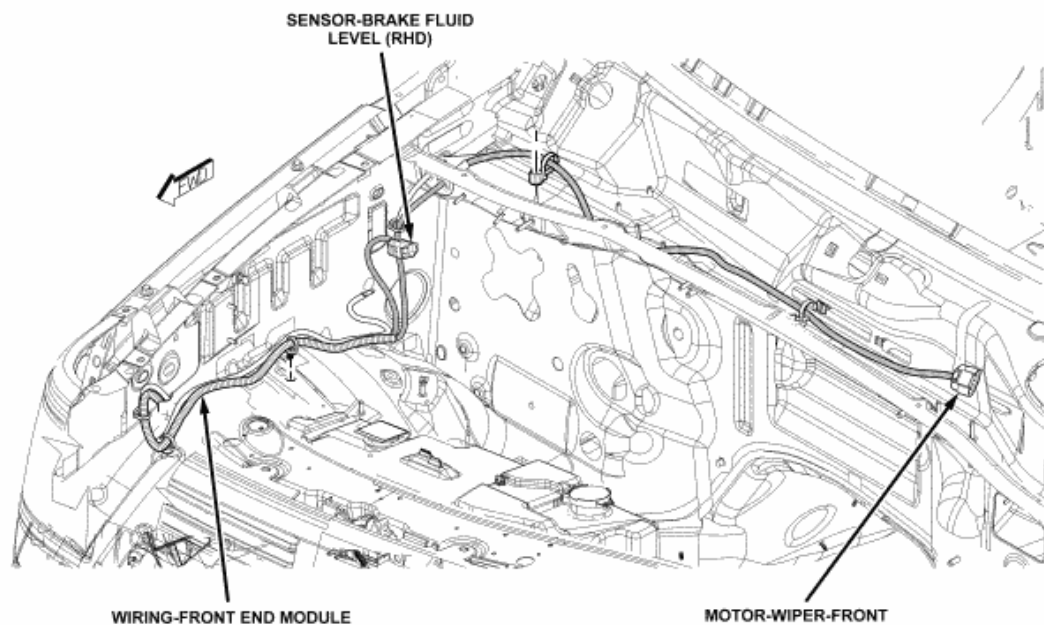


Fig. 26: ENGINE COMPARTMENT-REAR
 Courtesy of CHRYSLER LLC

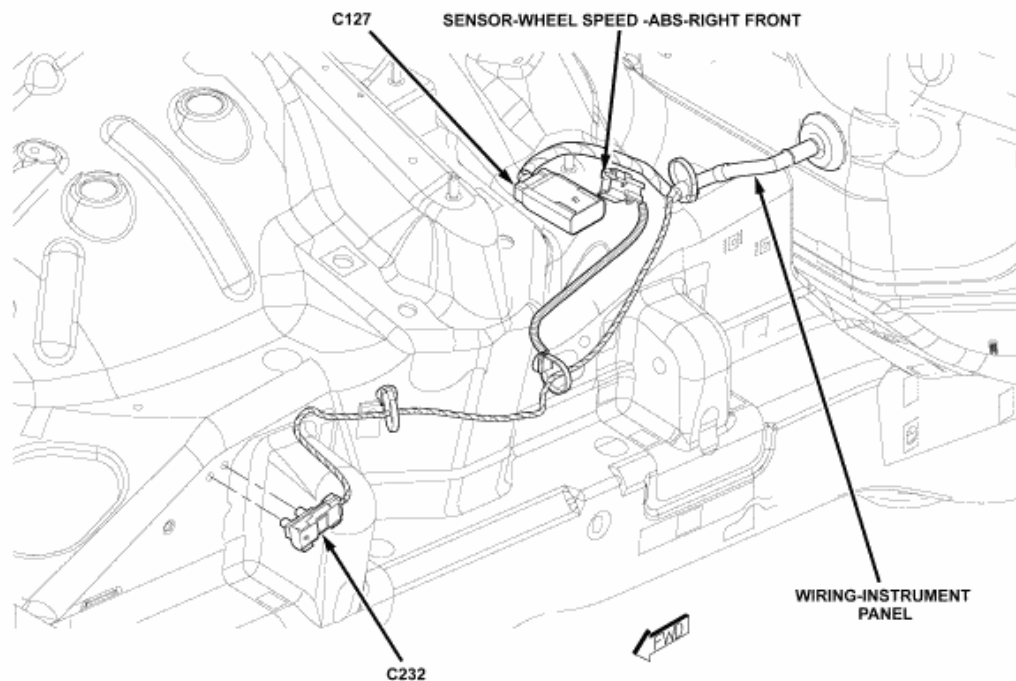


Fig. 27: WHEEL SPEED SENSOR
Courtesy of CHRYSLER LLC

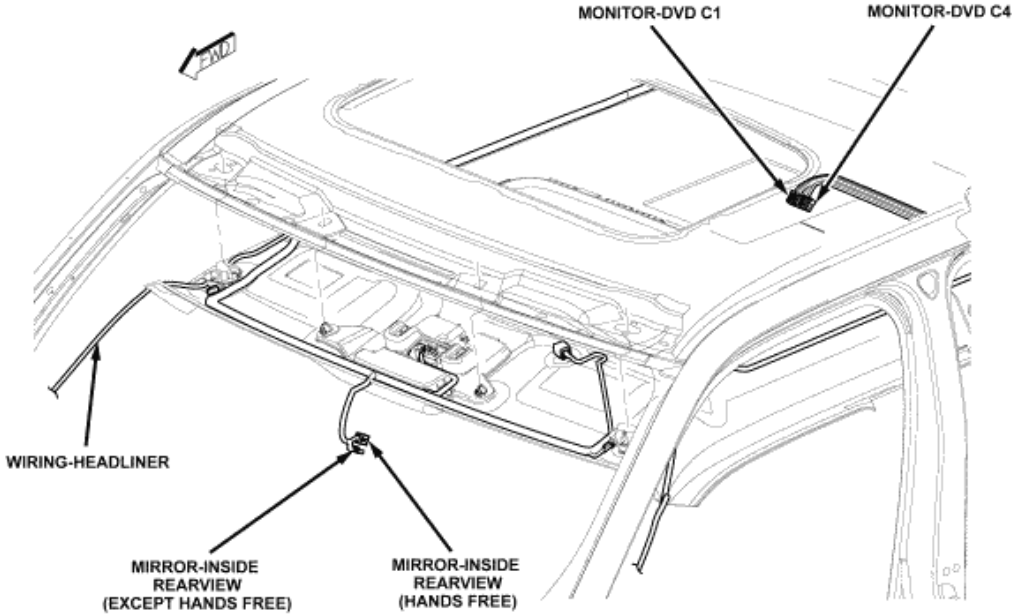


Fig. 28: HEADLINER
Courtesy of CHRYSLER LLC

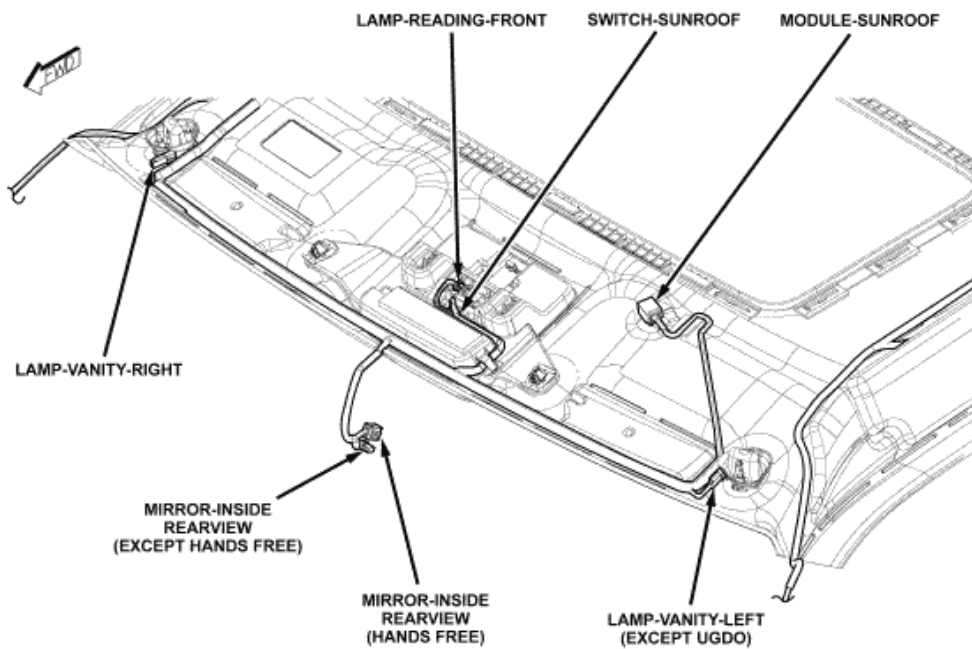


Fig. 29: VANITY LAMPS
 Courtesy of CHRYSLER LLC

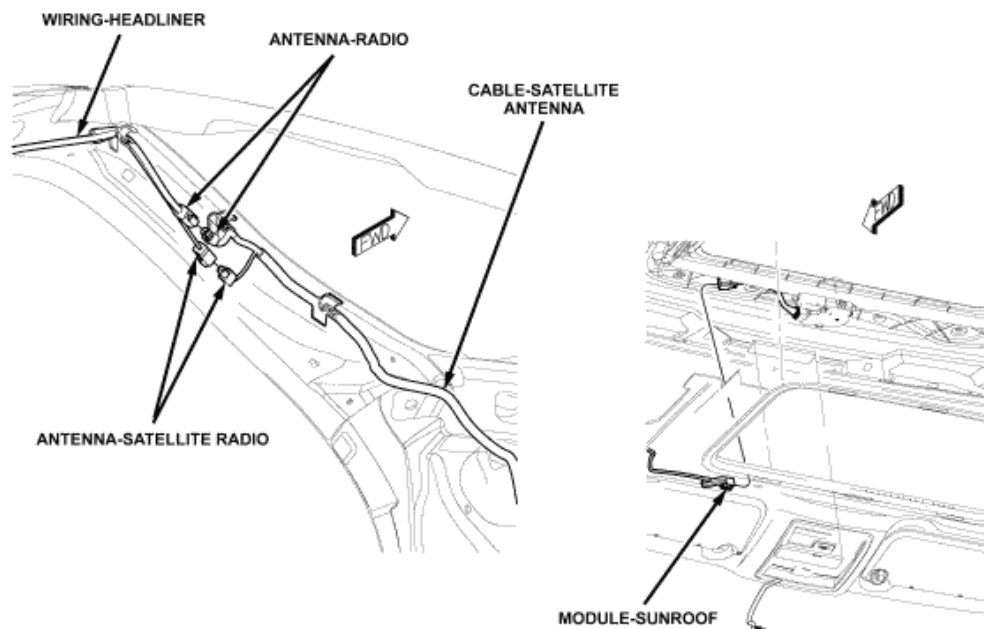


Fig. 30: SATELLITE ANTENNA
Courtesy of CHRYSLER LLC

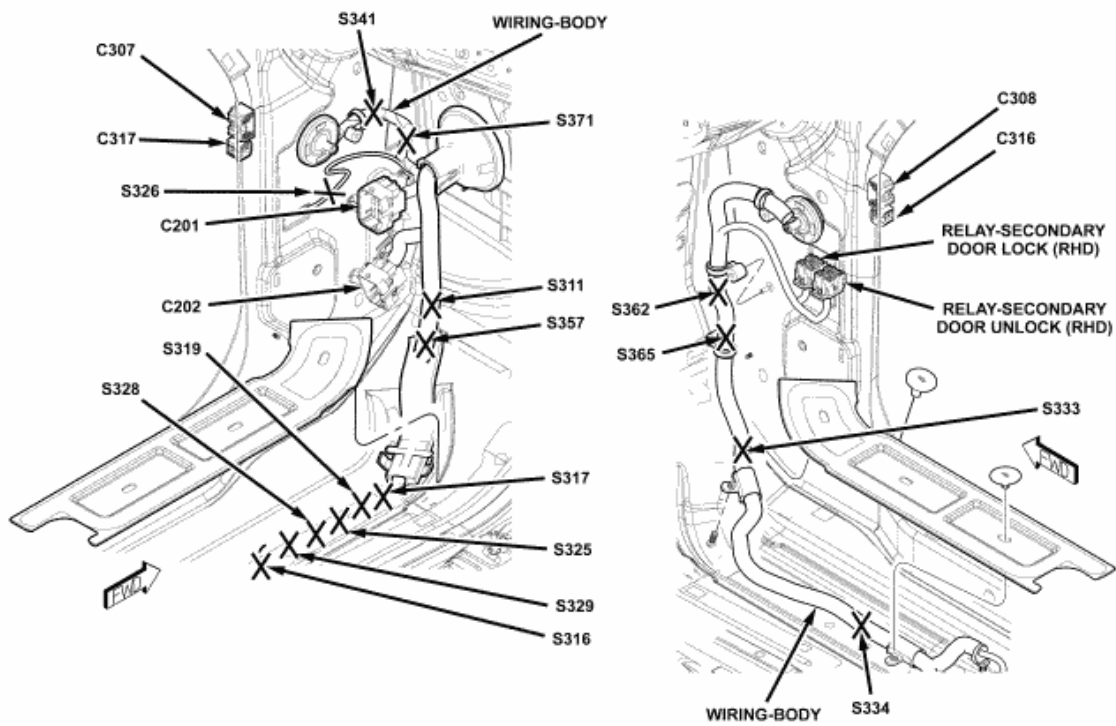


Fig. 31: COWL PANELS
Courtesy of CHRYSLER LLC

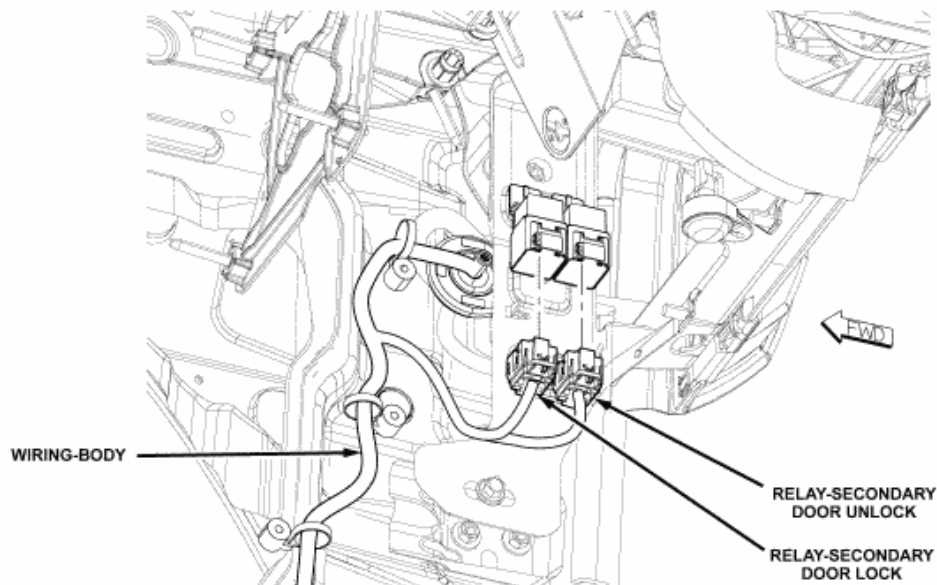


Fig. 32: RIGHT SIDE INSTRUMENT PANEL
 Courtesy of CHRYSLER LLC

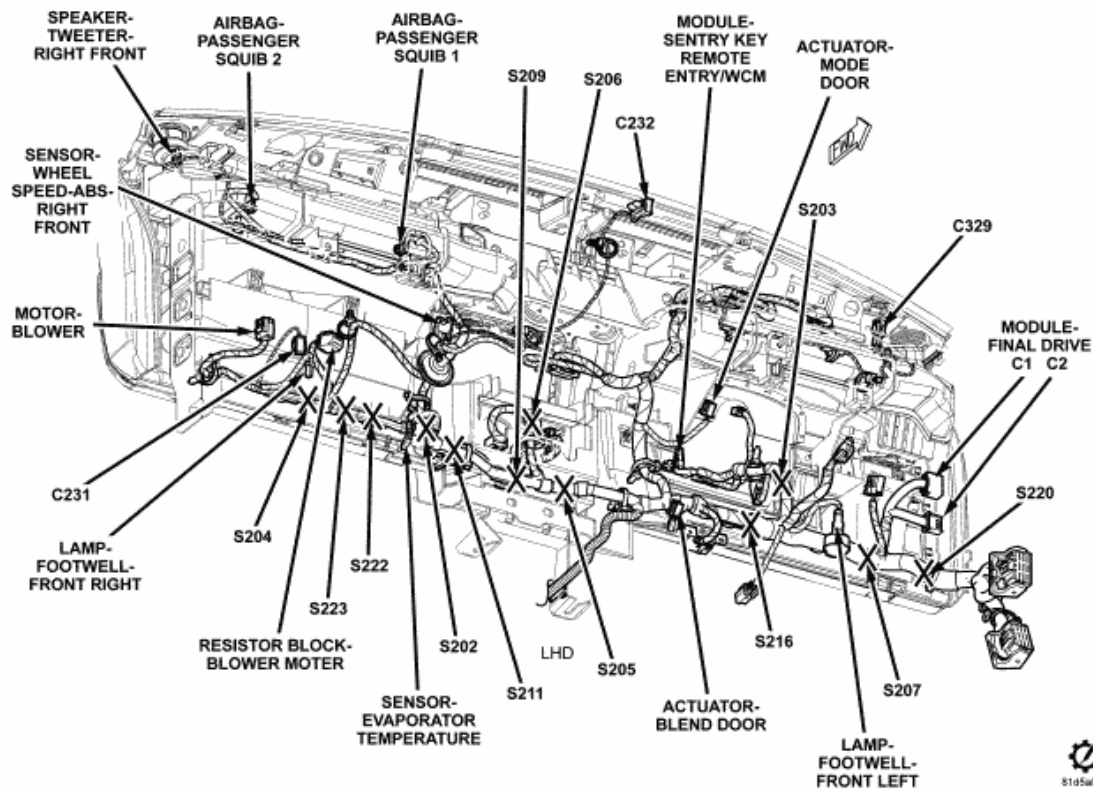


Fig. 33: INSTRUMENT PANEL (LHD)
Courtesy of CHRYSLER LLC

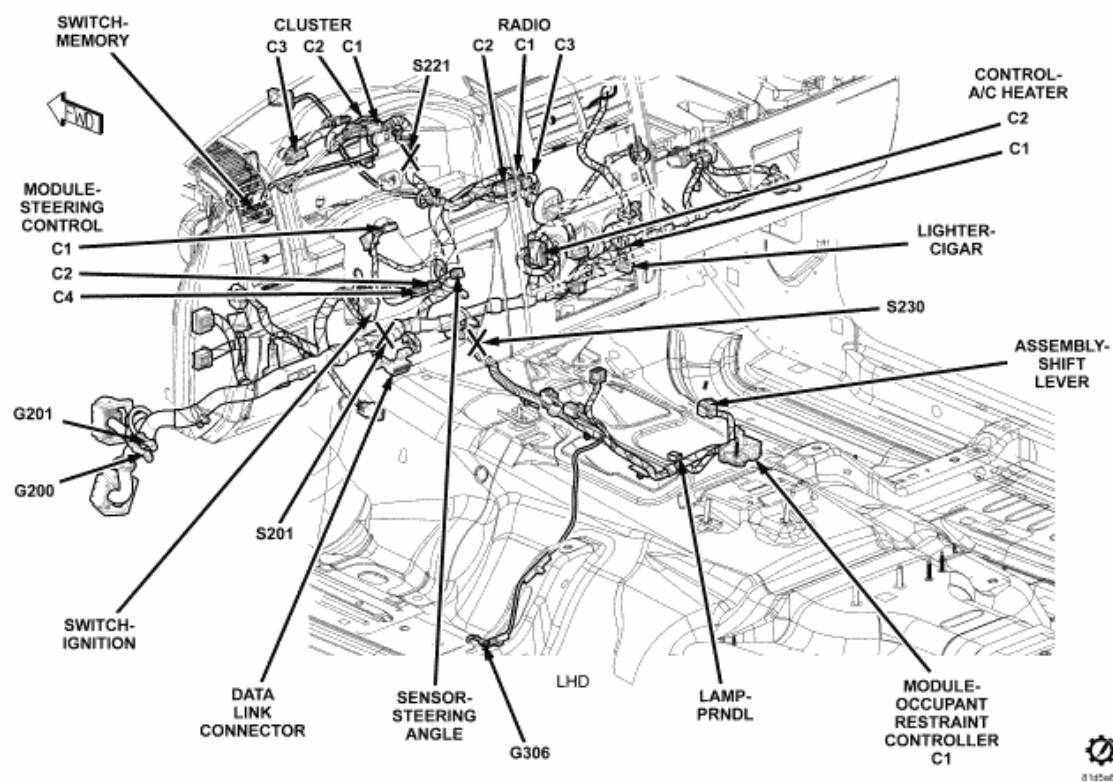


Fig. 34: INSTRUMENT PANEL INTERIOR SIDE (LHD)
Courtesy of CHRYSLER LLC

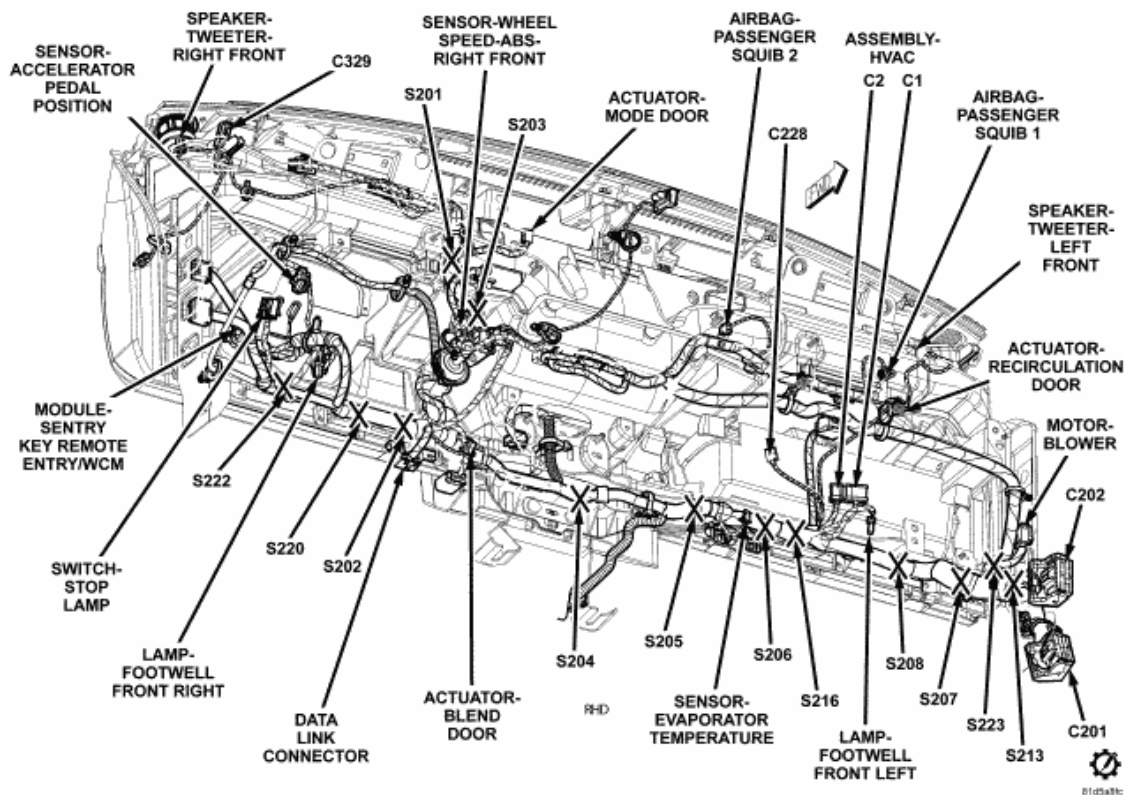


Fig. 35: INSTRUMENT PANEL (RHD)
 Courtesy of CHRYSLER LLC

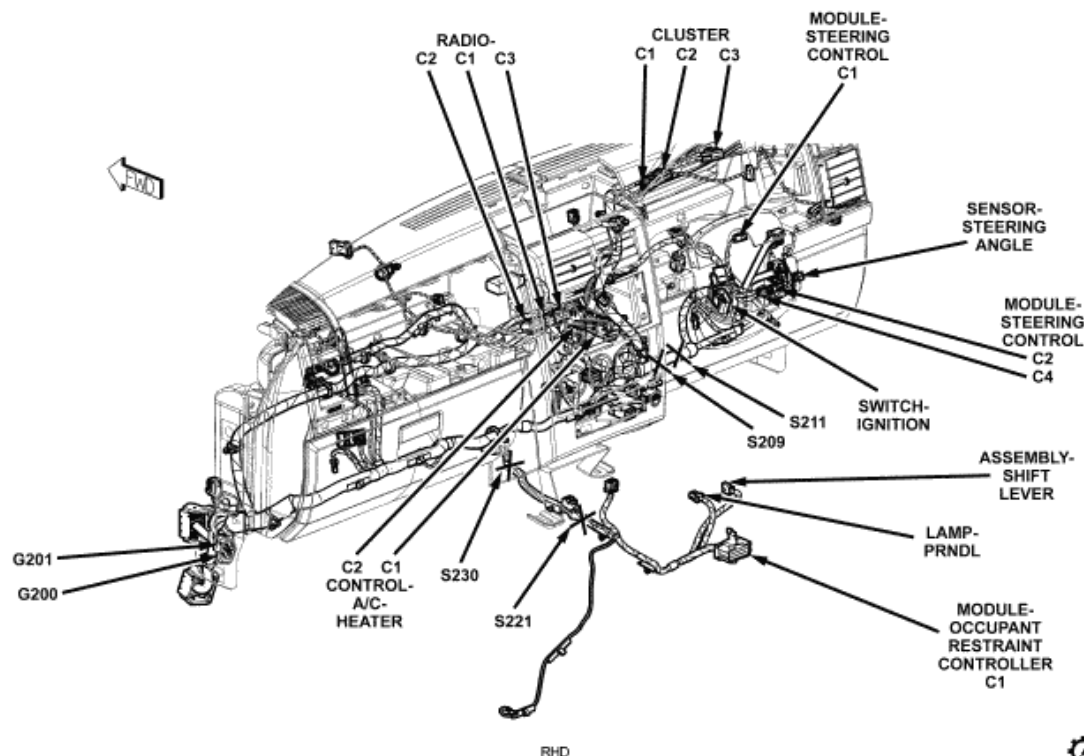


Fig. 36: INSTRUMENT PANEL-INTERIOR SIDE (RHD)
Courtesy of CHRYSLER LLC

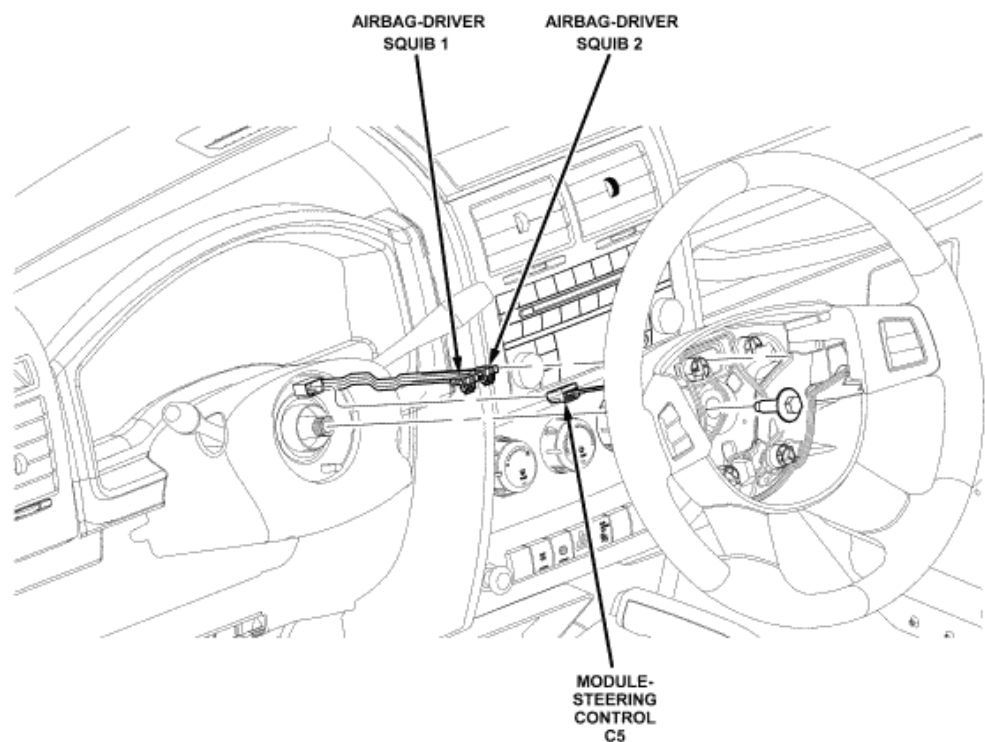


Fig. 37: STEERING WHEEL
Courtesy of CHRYSLER LLC

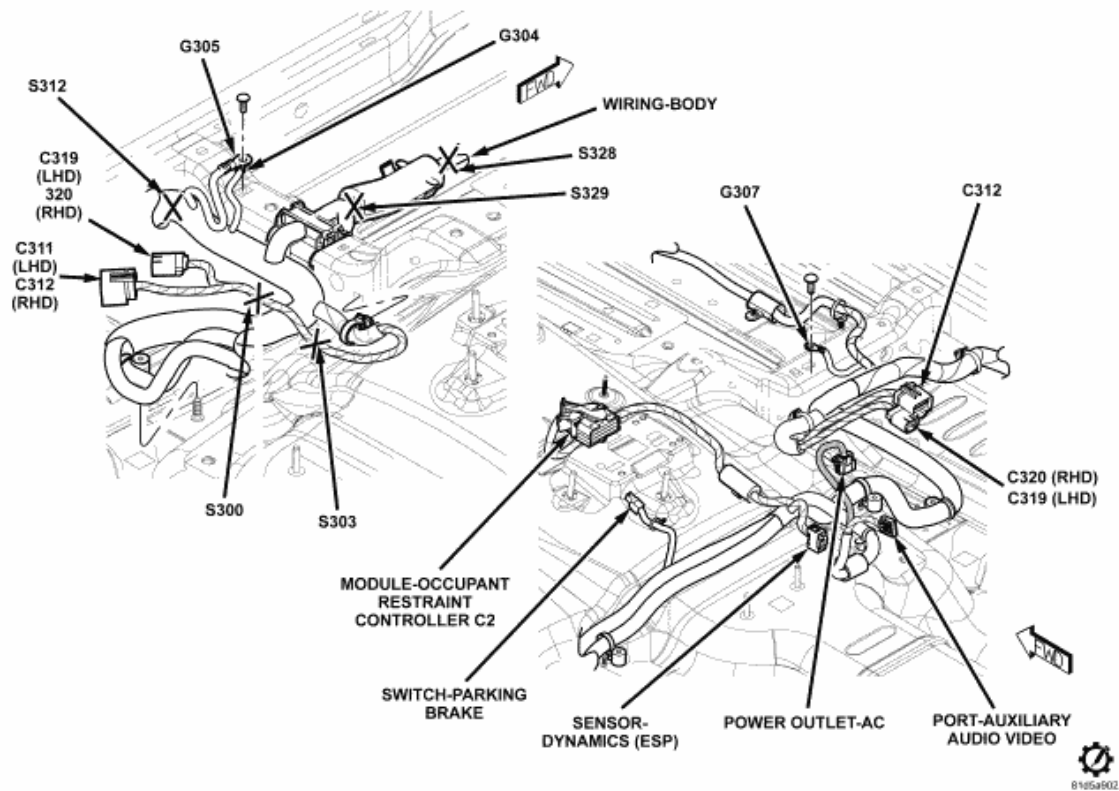


Fig. 38: BODY WIRING
 Courtesy of CHRYSLER LLC

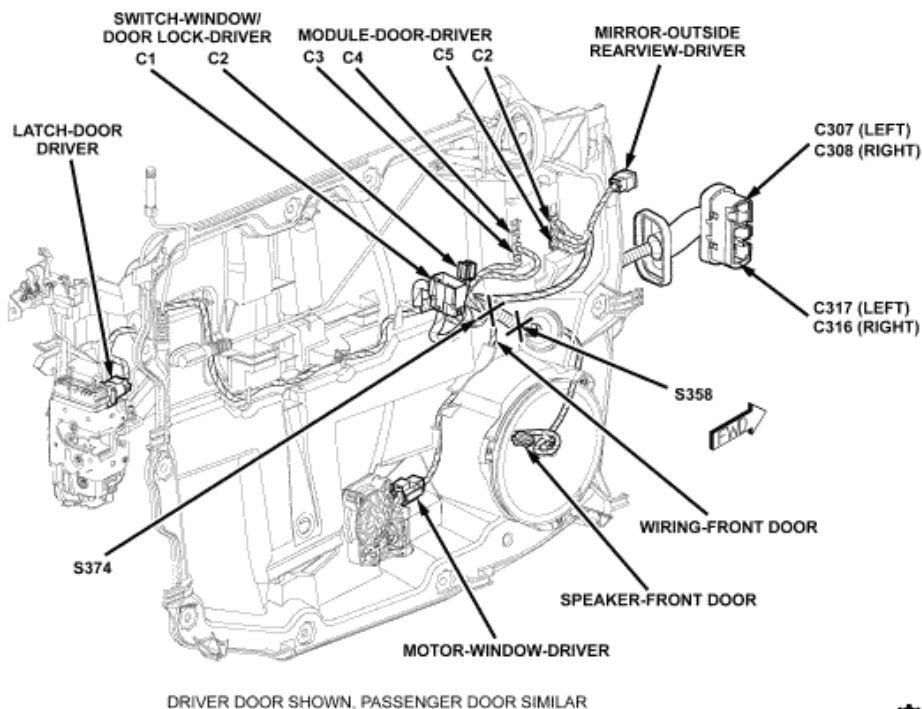
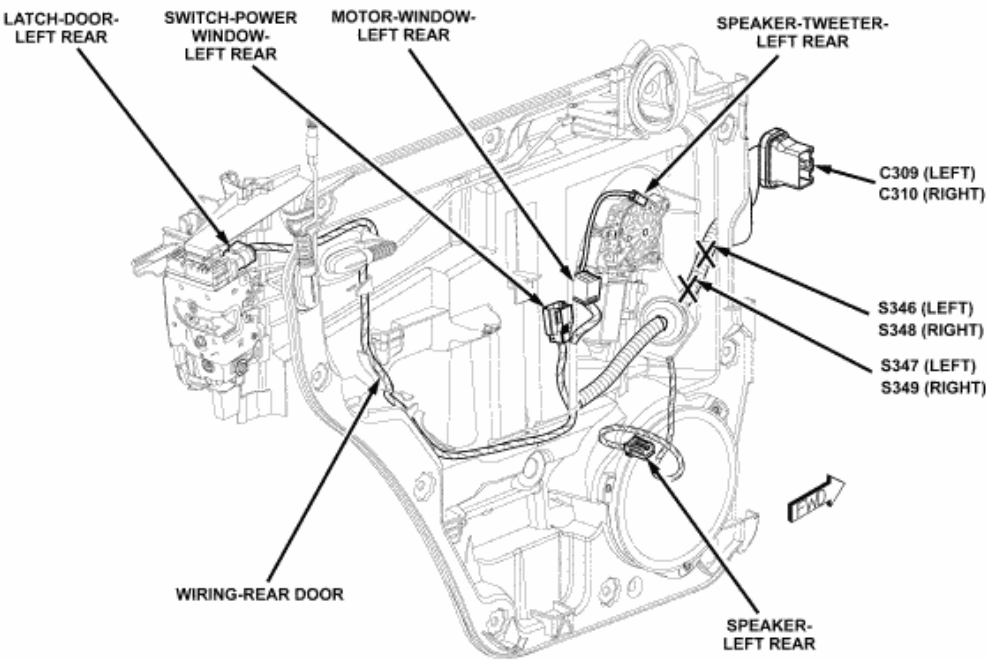


Fig. 39: LEFT FRONT DOOR
Courtesy of CHRYSLER LLC



LEFT REAR DOOR SHOWN, RIGHT REAR DOOR SIMILAR



Fig. 40: LEFT REAR DOOR
Courtesy of CHRYSLER LLC

Fig. 42: FRONT SEATS
Courtesy of CHRYSLER LLC

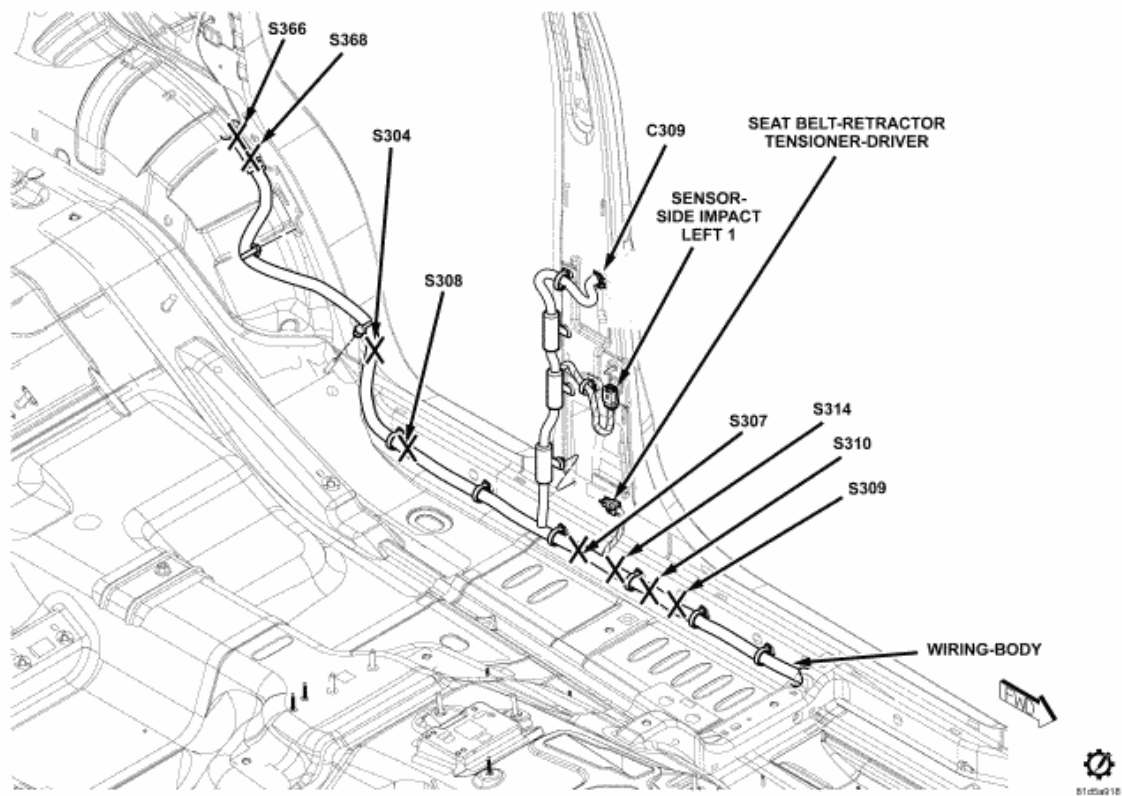
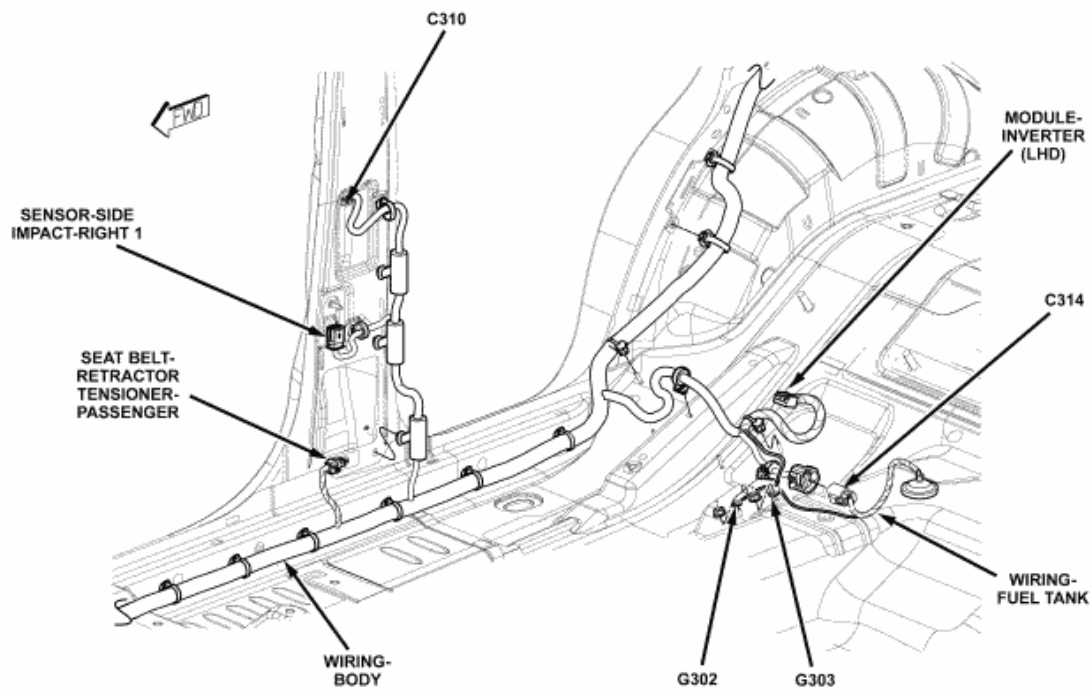
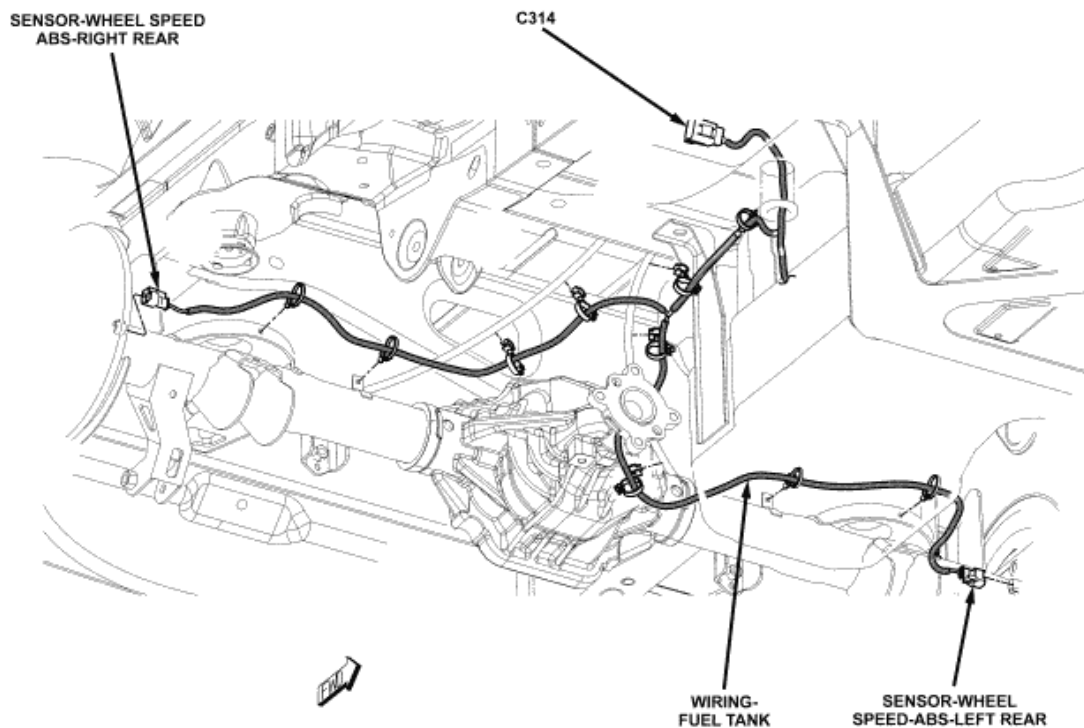


Fig. 43: LEFT SIDE BODY
Courtesy of CHRYSLER LLC



81d5a2 10

Fig. 44: RIGHT SIDE BODY
Courtesy of CHRYSLER LLC



81d5a2 1a

Fig. 45: REAR UNDERBODY
Courtesy of CHRYSLER LLC

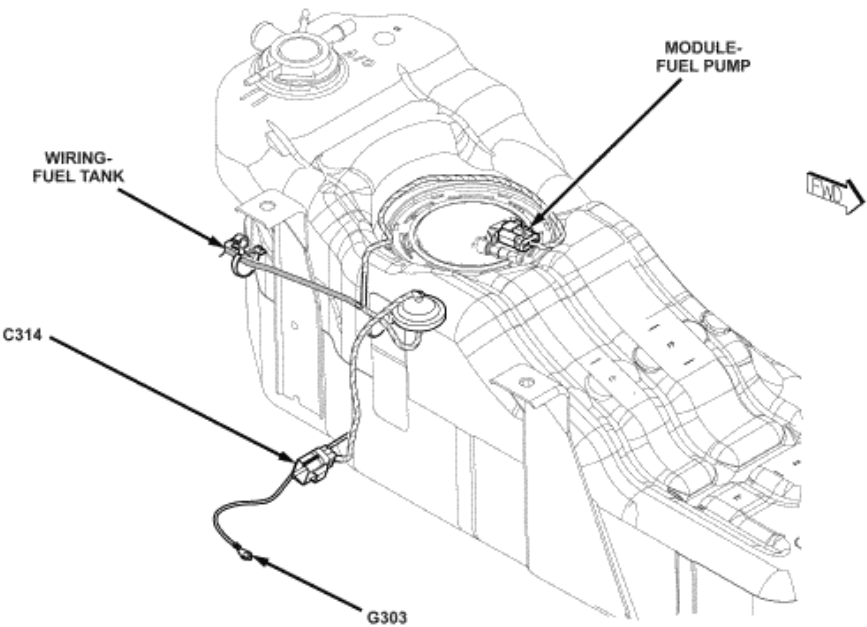


Fig. 46: FUEL TANK
Courtesy of CHRYSLER LLC

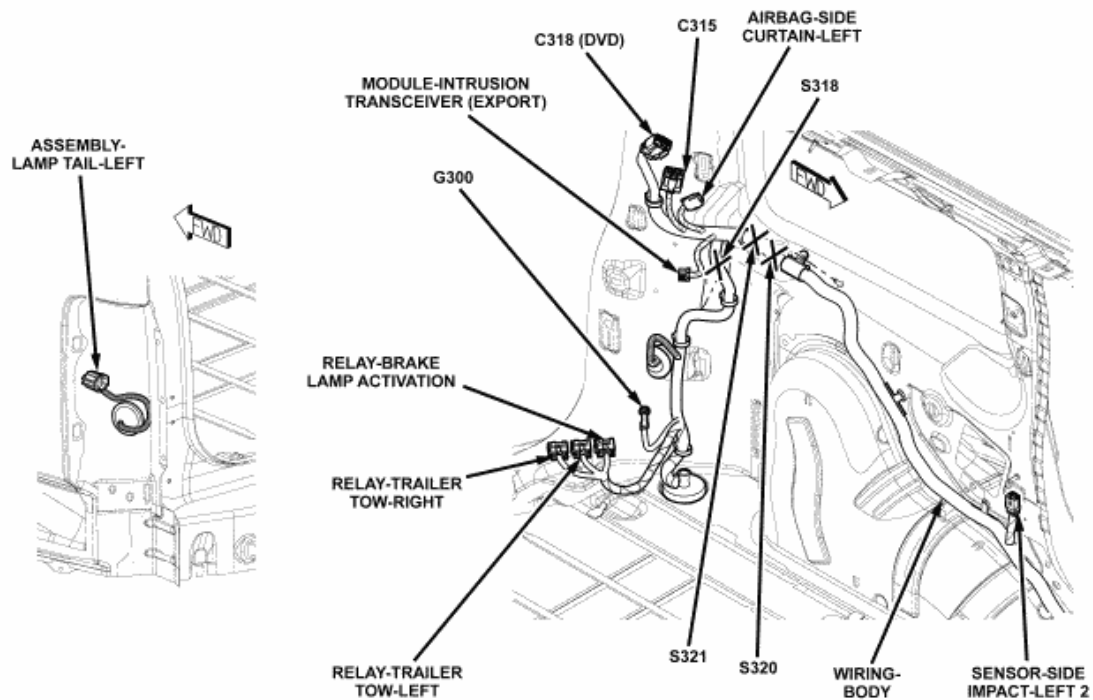


Fig. 47: LEFT QUARTER PANEL
Courtesy of CHRYSLER LLC

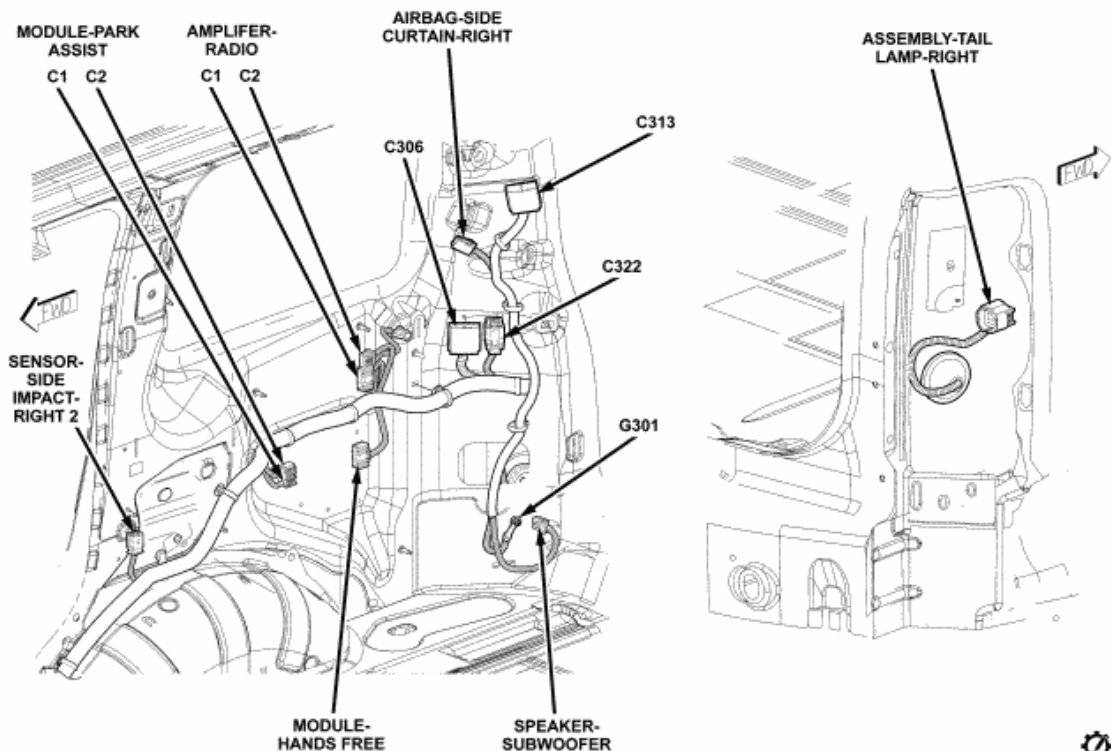


Fig. 48: RIGHT QUARTER PANEL
Courtesy of CHRYSLER LLC

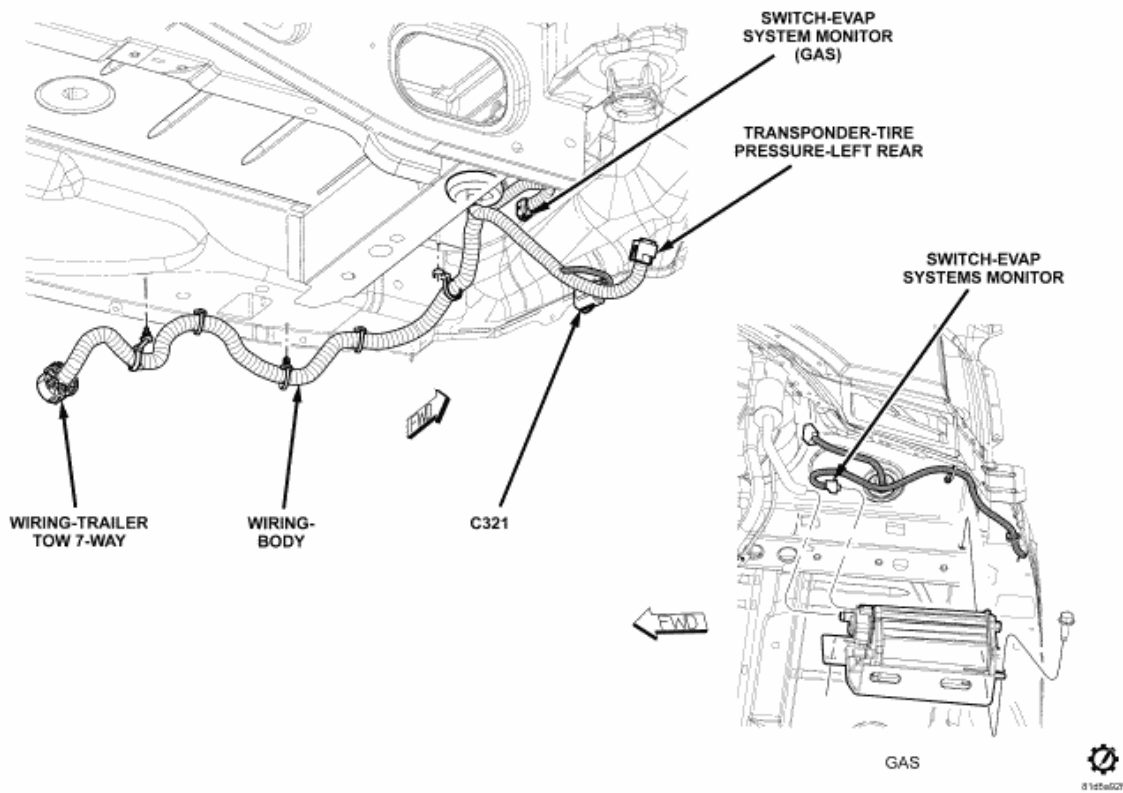


Fig. 49: TRAILER TOW CABLES
Courtesy of CHRYSLER LLC

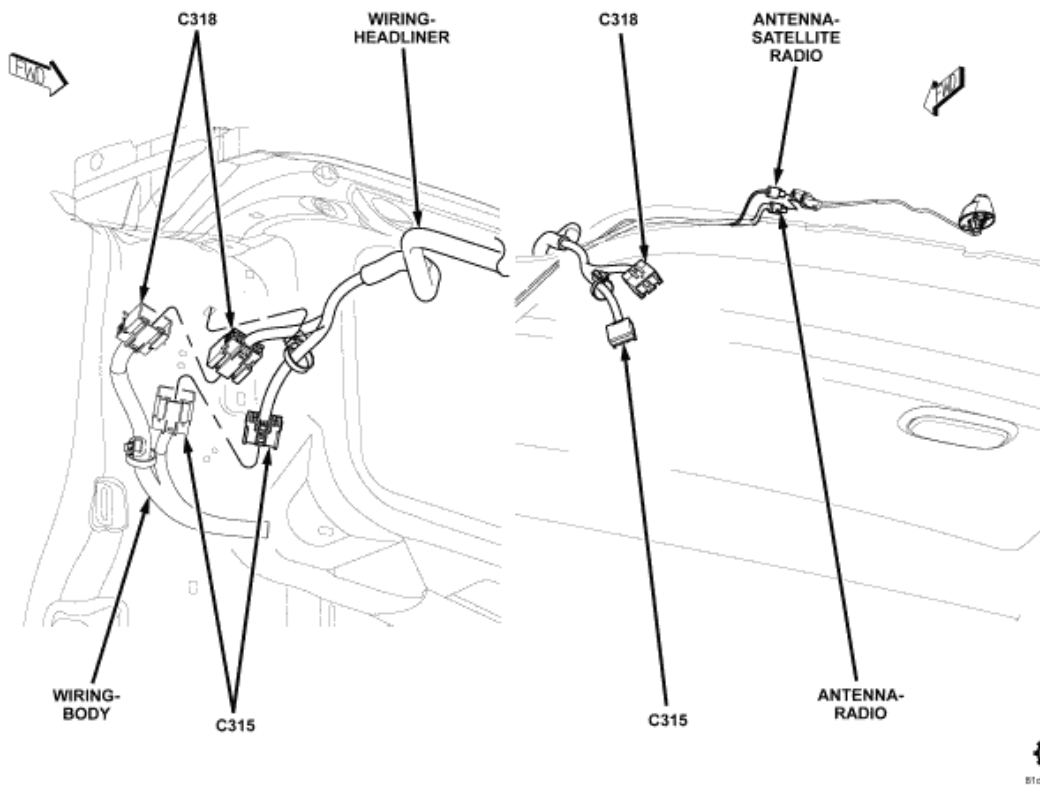


Fig. 50: DVD PLAYER CABLES
 Courtesy of CHRYSLER LLC

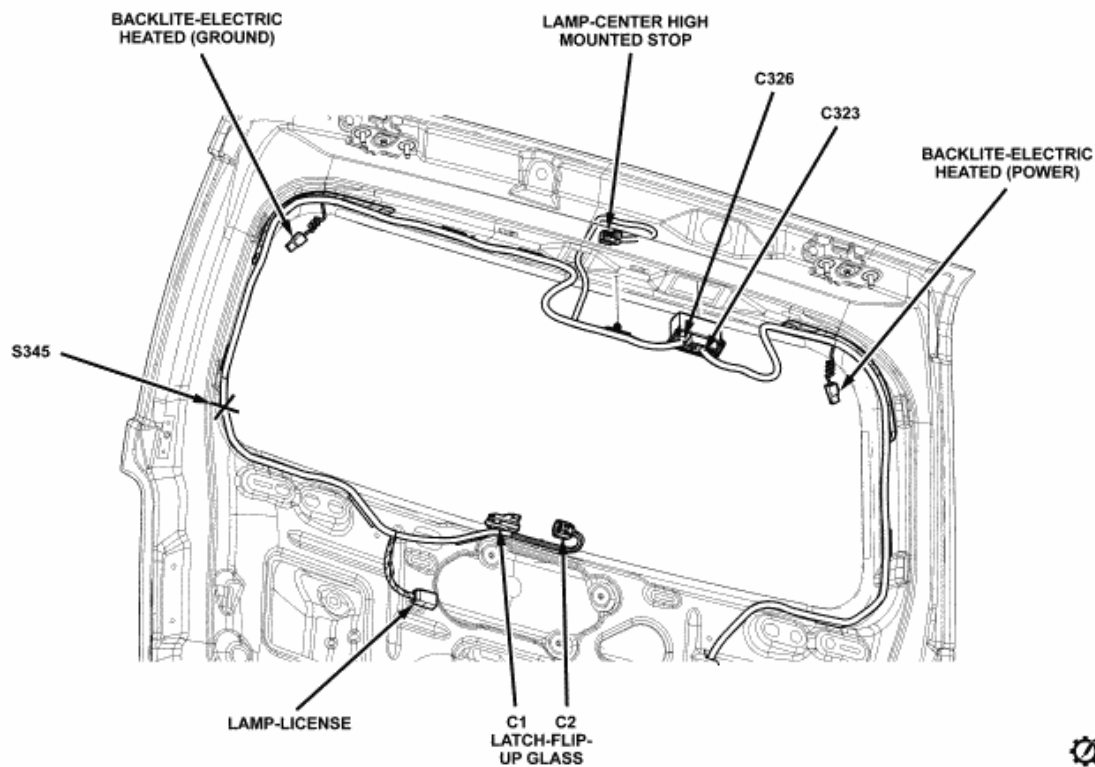


Fig. 51: LIFTGATE-UPPER
Courtesy of CHRYSLER LLC

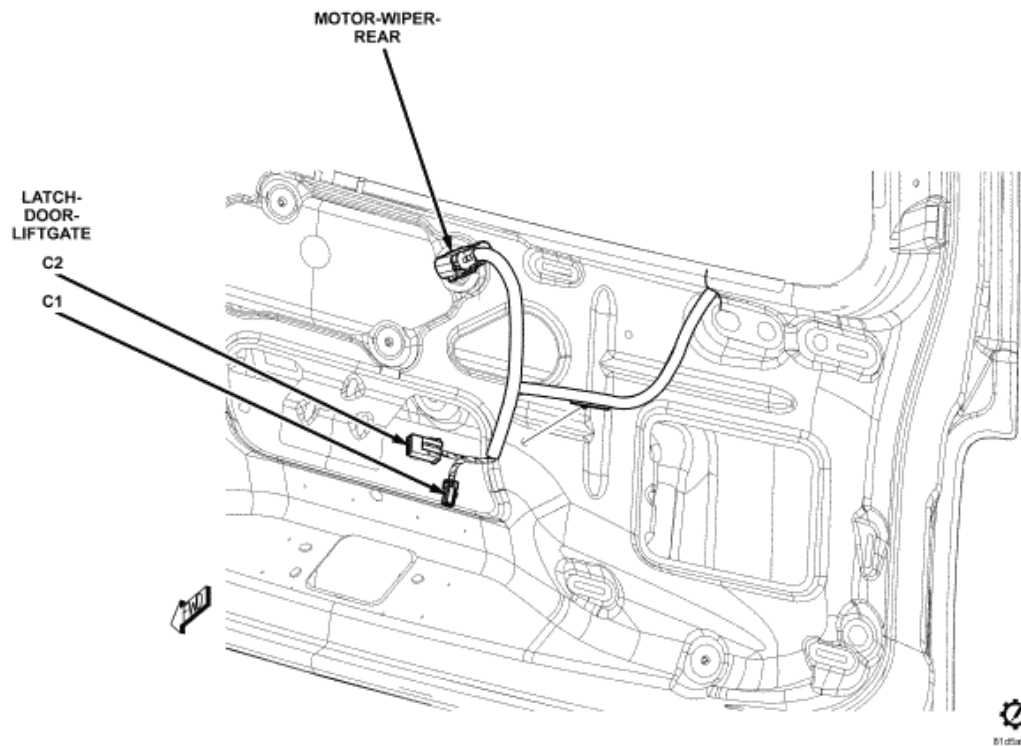


Fig. 52: LIFTGATE-LOWER
Courtesy of CHRYSLER LLC

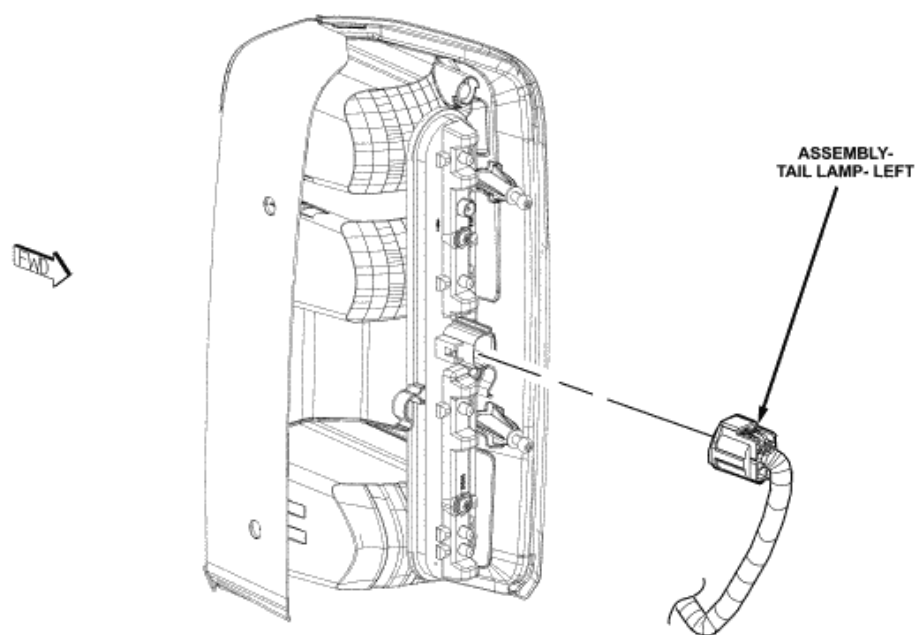


Fig. 53: TAIL LAMPS
Courtesy of CHRYSLER LLC

2008 ENGINE

Cooling - Liberty

DESCRIPTION

DESCRIPTION

The cooling system regulates engine operating temperature. It allows the engine to reach normal operating temperature as quickly as possible, maintains normal operating temperature and prevents overheating.

The cooling system also provides a means of heating the passenger compartment. The cooling system is pressurized and uses a centrifugal water pump to circulate coolant throughout the system. A separate and remotely mounted, pressurized coolant tank using a pressure/vent cap is used.

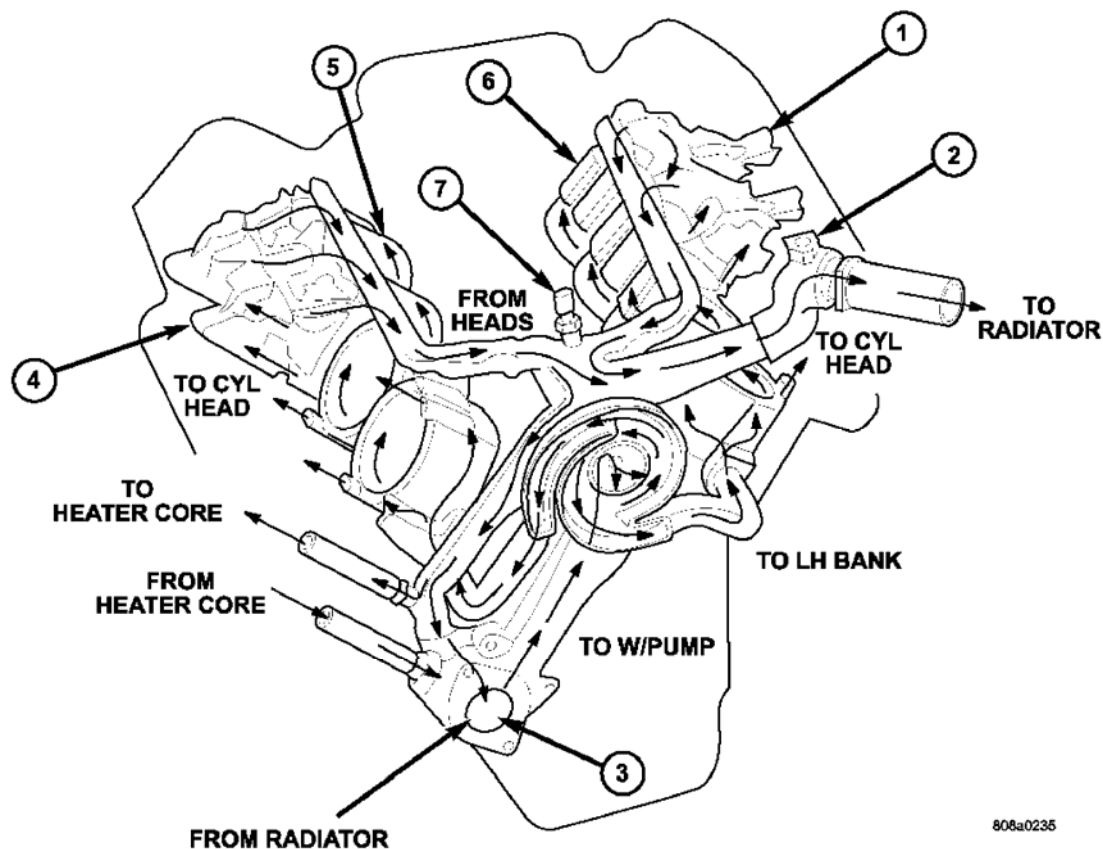
COOLING SYSTEM COMPONENTS

The cooling system consists of:

- Charge Air Cooler (Turbocharged vehicles only)
- 2 Speed Electric Cooling Fan
- Engine driven fan with viscous clutch (Diesel Engine)
- A aluminum-core radiator with plastic side tanks
- Combined Coolant Recover Container/Washer Reservoir (Gas Engine)
- Combined coolant pressure bottle/overflow system with pressure cap
- Radiator
- Water pump
- Combination A/C condenser/transmission oil cooler (automatic transmission)
- Thermostat
- Coolant
- Water pump
- Hoses and hose clamps

OPERATION

OPERATION



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Fig. 1: Coolant Flow - 3.7L/4.7L
 Courtesy of CHRYSLER LLC

- 1 - LH CYL. HEAD
- 2 - AIR BLEED
- 3 - THERMOSTAT LOCATION
- 4 - RH CYL. HEAD
- 5 - RH BANK CYL. BLOCK
- 6 - LH BANK CYL. BLOCK
- 7 - COOLANT TEMP. SENSOR

The cooling system regulates engine operating temperature. It allows the engine to reach normal operating temperature as quickly as possible. It also maintains normal operating temperature and prevents overheating.

The cooling system also provides a means of heating the passenger compartment. The cooling system is pressurized and uses a centrifugal water pump to circulate coolant throughout the system.

DIAGNOSIS AND TESTING

AERATION

Low coolant level in a cross flow radiator will equalize in both tanks with engine off. With engine running and at operating temperature, the high pressure inlet tank runs full and the low pressure outlet tank drops, resulting in cooling system aeration. Aeration will draw air into the water pump resulting in the following:

High reading shown on the temperature gauge.

Loss of coolant flow through the heater core.

Corrosion in the cooling system.

Water pump seal may run dry, increasing the risk of premature seal failure.

Combustion gas leaks into the coolant can also cause aeration.

DEAERATION

Air can only be removed from the system by gathering under the pressure cap. On the next heat up it will be pushed past the pressure cap into the coolant recovery bottle by thermal expansion of the coolant. It then escapes to the atmosphere in the coolant recovery bottle and is replaced with coolant on cool down.

To effectively deaerate the system, multiple thermal cycles of the system may be required.

NOTE: Deaeration does not occur at engine idle, higher engine speeds are required. Normal driving will deaerate cooling system.

FLOW CHECK-DIESEL

To determine whether coolant is flowing through the cooling system, use the following procedures:

1. If engine is cold, idle engine until normal operating temperature is reached. Then feel the upper radiator hose. If it is hot, coolant is circulating.

WARNING: Do not remove the cooling system pressure cap with the system hot and under pressure because serious burns from coolant can occur.

2. Remove pressure/vent cap when engine is cold, idle engine until thermostat opens, you should observe coolant flow while looking down in the coolant recovery pressure container. Once flow is detected install the pressure/vent cap.

LEAK TESTING

ULTRAVIOLET LIGHT METHOD

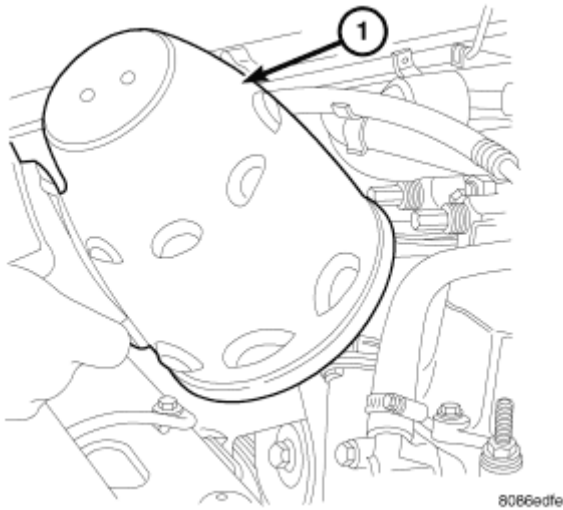


Fig. 2: Identifying Ultraviolet Light Method
Courtesy of CHRYSLER LLC

1 - TYPICAL BLACK LIGHT TOOL

A leak detection additive is available through the parts department that can be added to cooling system. The additive is highly visible under ultraviolet light (black light). Pour one ounce of additive into cooling system. Place heater control unit in HEAT position. Start and operate engine until radiator upper hose is warm to touch. Aim the commercially available black light tool at components to be checked. If leaks are present, black light will cause additive to glow a bright green color.

The black light (1) can be used in conjunction with a pressure tester to determine if any external leaks exist.

PRESSURE TESTER METHOD

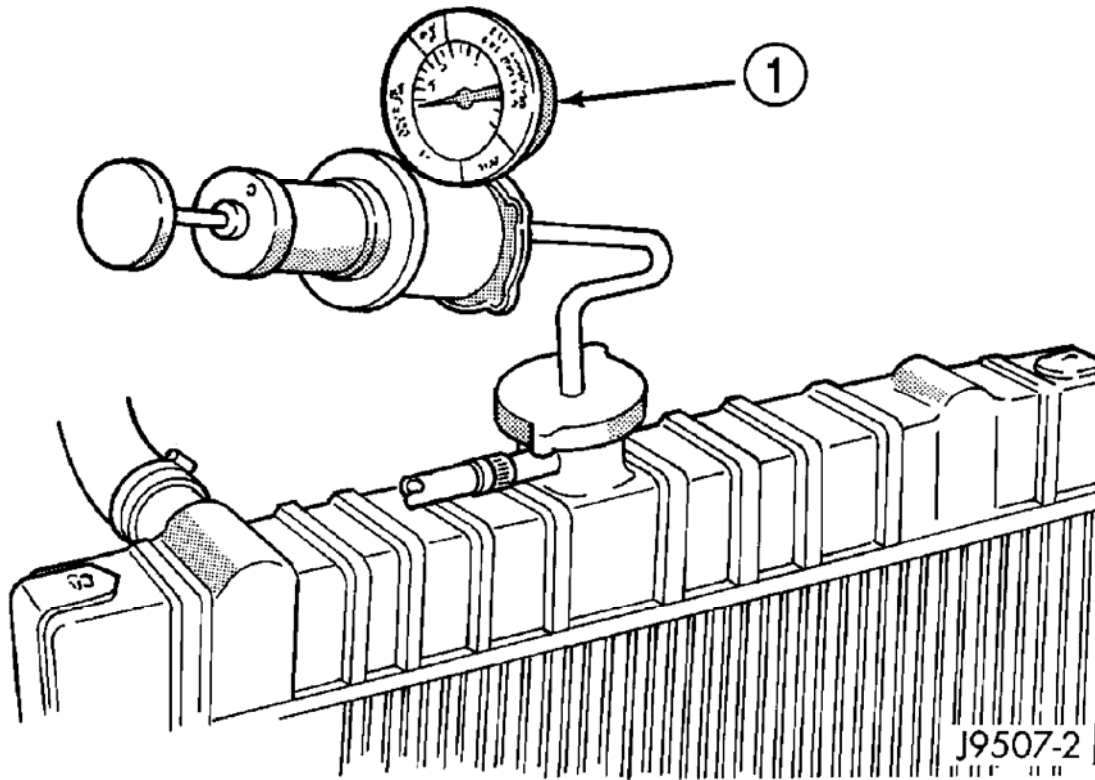


Fig. 3: Pressure Testing Cooling System - Typical
Courtesy of CHRYSLER LLC

1 - TYPICAL COOLING SYSTEM PRESSURE TESTER
--

The engine should be at normal operating temperature. Recheck the system cold if cause of coolant loss is not located during the warm engine examination.

WARNING: Hot, pressurized coolant can cause injury by scalding.

Carefully remove radiator pressure cap from pressure bottle and check coolant level. Push down on cap to disengage it from stop tabs. Wipe inside of filler neck and examine lower inside sealing seat for nicks, cracks, paint, and dirt. Inspect radiator-to- reserve/overflow tank hose for internal obstructions. Insert a wire through the hose to be sure it is not obstructed.

Inspect cams on outside of filler neck. If cams are damaged, seating of pressure cap valve and tester seal will be affected.

Attach pressure tester (7700 or an equivalent) to radiator filler neck.

Operate tester pump (1) to apply 110 kPa (16 psi) pressure to system. If hoses enlarge excessively or bulges

while testing, replace as necessary. Observe gauge pointer and determine condition of cooling system according to following criteria:

Holds Steady: If pointer remains steady for two minutes, serious coolant leaks are not present in system. However, there could be an internal leak that does not appear with normal system test pressure. If it is certain that coolant is being lost and leaks cannot be detected, inspect for interior leakage or perform **INTERNAL LEAKAGE INSPECTION**.

Drops Slowly: Indicates a small leak or seepage is occurring. Examine all connections for seepage or slight leakage with a flashlight. Inspect radiator, hoses, gasket edges and heater. Seal small leak holes with a Sealer Lubricant (or equivalent). Repair leak holes and inspect system again with pressure applied.

Drops Quickly: Indicates that serious leakage is occurring. Examine system for external leakage. If leaks are not visible, inspect for internal leakage. Large radiator leak holes should be repaired by a reputable radiator repair shop.

INTERNAL LEAKAGE INSPECTION

Remove engine oil pan drain plug and drain a small amount of engine oil. If coolant is present in the pan, it will drain first because it is heavier than oil. An alternative method is to operate engine for a short period to churn the oil. After this is done, remove engine dipstick and inspect for water globules. Also inspect transmission dipstick for water globules and transmission fluid cooler for leakage.

WARNING: With radiator pressure tester tool installed on radiator, do not allow pressure to exceed 124 kPa (18 psi). Pressure will build up quickly if a combustion leak is present. To release pressure, rock tester from side to side. When removing tester, do not turn tester more than 1/2 turn if system is under pressure.

Operate engine without pressure cap on radiator until thermostat opens. Attach a Pressure Tester to filler neck. If pressure builds up quickly it indicates a combustion leak exists. This is usually the result of a cylinder head gasket leak or crack in engine. Repair as necessary.

If there is not an immediate pressure increase, pump the Pressure Tester. Do this until indicated pressure is within system range of 110 kPa (16 psi). Fluctuation of gauge pointer indicates compression or combustion leakage into cooling system.

Because the vehicle is equipped with a catalytic converter, **do not** remove spark plug cables or short out cylinders to isolate compression leak.

If the needle on dial of pressure tester does not fluctuate, race engine a few times to check for an abnormal amount of coolant or steam. This would be emitting from exhaust pipe. Coolant or steam from exhaust pipe may indicate a faulty cylinder head gasket, cracked engine cylinder block or cylinder head.

A convenient check for exhaust gas leakage into cooling system is provided by a commercially available Block Leak Check tool. Follow manufacturers instructions when using this product.

COMBUSTION LEAKAGE TEST - WITHOUT PRESSURE TESTER

DO NOT WASTE reusable coolant. If solution is clean, drain coolant into a clean container for reuse.

WARNING: Do not remove cylinder block drain plugs or loosen radiator draincock with system hot and under pressure. Serious burns from coolant can occur.

Drain sufficient coolant to allow thermostat removal. See **REMOVAL**. Remove accessory drive belt, see **BELT-ACCESSORY DRIVE**.

Add coolant to radiator to bring level to within 6.3 mm (1/4 in) of top of thermostat housing.

CAUTION: Avoid overheating. Do not operate engine for an excessive period of time. Open draincock immediately after test to eliminate boil over.

Start engine and accelerate rapidly three times, to approximately 3000 RPM while observing coolant. If internal engine combustion gases are leaking into cooling system, bubbles will appear in coolant. If bubbles do not appear, internal combustion gas leakage is not present.

ON-BOARD DIAGNOSTICS (OBD)

COOLING SYSTEM RELATED DIAGNOSTICS

The Powertrain Control Module (PCM) has been programmed to monitor certain cooling system components:

If the engine has remained cool for too long a period, such as with a stuck open thermostat, a Diagnostic Trouble Code (DTC) can be set.

If an open or shorted condition has developed in the relay circuit controlling the electric radiator fan, a Diagnostic Trouble Code (DTC) can be set.

If the problem is sensed in a monitored circuit often enough to indicate an actual problem, a DTC is stored. The DTC will be stored in the PCM memory for eventual display to the service technician. Refer to **OPERATION**.

ACCESSING DIAGNOSTIC TROUBLE CODES

To read DTC's and to obtain cooling system data. Refer to **OPERATION**.

ERASING TROUBLE CODES

After the problem has been repaired, use the diagnostic scan tool to erase a DTC. Refer to the appropriate Powertrain Diagnostic Procedures information for operation of the diagnostic scan tool.

PRELIMINARY CHECKS

ENGINE COOLING SYSTEM OVERHEATING

Establish what driving conditions caused the complaint. Abnormal loads on the cooling system such as the following may be the cause:

- Prolonged idle
- Very high ambient temperature
- Slight tail wind at idle
- Slow traffic
- Traffic jams
- High speed or steep grades
- Any accessory that fully or partially blocks grill opening

RECENT SERVICE OR ACCIDENT REPAIR:

- Engine adjustments (incorrect timing)
- Slipping accessory drive belt
- Brakes (possibly dragging)
- Changed parts (incorrect water pump)
- Reconditioned radiator or cooling system refilling (possibly under filled or air trapped in system).

NOTE: **If investigation reveals none of the previous items as a cause for an engine overheating complaint, refer to following Cooling System Diagnosis charts.**

TRAILER TOWING:

Consult Trailer Towing section of owners manual. Do not exceed limits.

These charts are to be used as a quick-reference only.

CONDITION	POSSIBLE CAUSES	CORRECTION
TEMPERATURE GAUGE READS LOW	1. Has a Diagnostic Trouble Code (DTC) been set indicating a stuck open thermostat? 2. Is the temperature sending unit connected? 3. Is the temperature gauge operating OK? 4. Coolant level low in cold ambient temperatures accompanied with poor heater performance.	1. Refer to <u>OPERATION</u> . Replace thermostat if necessary. 2. Check the temperature sensor connector. See <u>DESCRIPTION</u>. Repair connector if necessary. 3. Check gauge operation. Repair as necessary. 4. Check coolant level in the coolant pressure bottle and the radiator. Inspect system for leaks. Repair leaks as necessary.

	5. Improper operation of internal heater doors or heater controls. 6. Electric fan functioning when not required.	5. Inspect heater and repair as necessary. Refer to <u>DIAGNOSIS AND TESTING (ELECTRICAL DIAGNOSTICS)</u>. Refer to <u>DIAGNOSIS AND TESTING (SERVICE INFORMATION)</u>. 6. Inspect electric fan for proper operation. Refer to <u>FAN-RADIATOR-ELECTRIC</u>.
TEMPERATURE GAUGE READS HIGH OR THE COOLANT WARNING LAMP ILLUMINATES. COOLANT MAY OR MAY NOT BE LOST OR LEAKING FROM THE COOLING SYSTEM.	1. Trailer is being towed, a steep hill is being climbed, vehicle is operated in slow moving traffic, or engine is being idled with very high ambient (outside) temperatures and the air conditioning is on. Higher altitudes could aggravate these conditions. 2. Is the temperature gauge reading correctly? 3. Is the temperature warning illuminating unnecessarily? 4. Coolant low in coolant pressure bottle and radiator? 5. Pressure cap not installed tightly. If cap is loose, boiling point of coolant will be lowered. Also refer to the following Step 6. 6. Poor seals at the radiator cap.	1. This may be a temporary condition and repair is not necessary. Turn off the air conditioning and attempt to drive the vehicle without any of the previous conditions. Observe the temperature gauge. The gauge should return to the normal range. If the gauge does not return to the normal range, determine the cause for overheating and repair. 2. Check gauge. (Refer to <u>INSTRUMENT CLUSTER - ELECTRICAL DIAGNOSTICS</u>). Repair as necessary. 3. Check warning lamp operation. (Refer to <u>INSTRUMENT CLUSTER - ELECTRICAL DIAGNOSTICS</u>). Repair as necessary. 4. Check for coolant leaks and repair as necessary. 5. Tighten cap. 6. (a) Check condition of cap and cap seals. See <u>DIAGNOSIS AND TESTING</u>. (b) Check condition of radiator filler neck. If neck is bent or damaged, replace radiator.

7. Coolant not flowing through system.	7. (a) Check condition of pressure bottle cap and cap seals. See <u>DIAGNOSIS AND TESTING</u> . (b) Check condition of the hose from the radiator to the coolant tank. It should fit tight at both ends without any kinks or tears. Replace hose if necessary. (c) Check pressure bottle/overflow tank and tank's hoses for blockage. Repair as necessary.
8. Incorrect coolant concentration	8. Check coolant. See <u>DESCRIPTION</u> for correct coolant/water mixture ratio.
9. Radiator or A/C condenser fins are dirty or clogged.	9. Remove insects and debris.
10. Radiator core is corroded or plugged.	10. Replace radiator.
11. Fuel or ignition system problems.	11. Refer to <u>FUEL SYSTEM</u> or <u>IGNITION CONTROL - SERVICE INFORMATION</u> for diagnosis.
12. Dragging brakes.	12. Check and correct as necessary. Refer to <u>DIAGNOSIS AND TESTING</u> (BASE - SERVICE INFORMATION). Refer to <u>DIAGNOSIS AND TESTING</u> (ABS - ELECTRICAL DIAGNOSTICS). Refer to <u>DIAGNOSIS AND TESTING</u> (ABS - SERVICE INFORMATION). for correct procedures.
13. Bug screen or cardboard is being used, reducing airflow.	13. Remove bug screen or cardboard.
14. Thermostat partially or completely shut.	14. Check thermostat operation and replace as necessary. See <u>REMOVAL</u> .
15. Viscous fan drive not operating properly.	15. Check fan drive operation and replace as necessary. See <u>DIAGNOSIS AND TESTING</u> .
16. Cylinder head gasket leaking.	16. Check for cylinder head gasket leaks. See <u>DIAGNOSIS</u>

	17. Heater core leaking. 18. Electric fan not functioning.	<u>AND TESTING.</u> For repair, refer to <u>REMOVAL</u> . 17. Check heater core for leaks. Refer to <u>REMOVAL</u> . Repair as necessary. 18. Inspect electric fan for proper operation. See <u>DIAGNOSIS AND TESTING.</u>
TEMPERATURE GAUGE READING IS INCONSISTENT (FLUCTUATES, CYCLES OR IS ERRATIC)	1. During cold weather operation, with the heater blower in the high position, the gauge reading may drop slightly. 2. Temperature gauge or engine mounted gauge sensor defective or shorted. Also, corroded or loose wiring in this circuit. 3. Gauge reading rises when vehicle is brought to a stop after heavy use (engine still running). 4. Gauge reading high after re-starting a warmed up (hot) engine. 5. Coolant level low in cooling system (air build up in the cooling system causing the thermostat to open late). 6. Cylinder head gasket leaking allowing exhaust gas to enter cooling system causing a thermostat to open late. 7. Water pump impeller loose on shaft. 8. Loose accessory drive belt. 9. Air leak on the suction side	1. A normal condition. No correction is necessary. 2. Check operation of gauge and repair if necessary. Refer to <u>INSTRUMENT CLUSTER - ELECTRICAL DIAGNOSTICS</u> . Refer to <u>DIAGNOSIS AND TESTING</u> (SERVICE INFORMATION). 3. A normal condition. No correction is necessary. Gauge should return to normal range after vehicle is driven. 4. A normal condition. No correction is necessary. The gauge should return to normal range after a few minutes of engine operation. 5. Check and correct coolant leaks. See <u>DIAGNOSIS AND TESTING.</u> 6. (a) Check for cylinder head gasket leaks. Refer to engine articles. (b) Check for coolant in the engine oil. Inspect for white steam emitting from the exhaust system. Repair as necessary. 7. Check water pump and replace as necessary. 8. See <u>DIAGNOSIS AND TESTING.</u> Check and correct as necessary. 9. Locate leak and repair as

	of the water pump allows air to build up in cooling system causing thermostat to open late.	necessary.
PRESSURE CAP IS BLOWING OFF STEAM OR COOLANT TO COOLANT RECOVERY CONTAINER. TEMPERATURE GAUGE READING MAY BE ABOVE NORMAL BUT NOT HIGH. COOLANT LEVEL MAY BE HIGH IN COOLANT RECOVERY CONTAINER.	1. Pressure relief valve in radiator pressure cap is defective.	1. Check condition of radiator cap and cap seals. See <u>DIAGNOSIS AND TESTING</u> . Replace cap as necessary.
	2. Overfilled cooling system or extremely low coolant level.	2. Wait for engine to cool and adjust coolant level.
COOLANT LOSS TO THE GROUND WITHOUT PRESSURE CAP BLOWOFF. GAUGE READING HIGH OR HOT	1. Coolant leaks in radiator, cooling system hoses, water pump or engine.	1. Pressure test and repair as necessary. See <u>DIAGNOSIS AND TESTING</u> .
DETONATION OR PRE-IGNITION (NOT CAUSED BY IGNITION SYSTEM). GAUGE MAY OR MAY NOT BE READING HIGH	1. Engine overheating. 2. Freeze point of coolant not correct. Mixture is too rich or too lean.	1. Check reason for overheating and repair as necessary. 2. Check coolant concentration. See <u>DESCRIPTION</u> , and adjust ratio as required.
HOSE OR HOSES COLLAPSE WHILE ENGINE IS RUNNING	1. Vacuum created in cooling system on engine cool-down is not being relieved through coolant reserve/overflow system.	1. (a) Radiator cap relief valve stuck. See <u>DIAGNOSIS AND TESTING</u> . Replace if necessary. (b) Hose between coolant reserve/overflow tank and radiator is kinked. Repair as necessary. (c) Vent at coolant reserve/overflow tank is plugged. Clean vent and repair as necessary. (d) Reserve/overflow tank is internally blocked or plugged. Check for blockage and repair as necessary.
INADEQUATE HEATER PERFORMANCE.	1. Has a Diagnostic Trouble Code (DTC) been set? 2. Coolant level low. 3. Obstructions in heater hose/fittings. 4. Heater hose kinked. 5. Water pump is not pumping	1. Refer to <u>EMISSIONS CONTROL</u> 2. See <u>DIAGNOSIS AND TESTING</u> . 3. Remove heater hoses at both ends and check for obstructions. 4. Locate kinked area and repair as necessary. 5. If a slipping belt is detected,

	water to/through the heater core. When the engine is fully warmed up, both heater hoses should be hot to the touch. If only one of the hoses is hot, the water pump may not be operating correctly or the heater core may be plugged. Accessory drive belt may be slipping causing poor water pump operation.	see <u>BELT-ACCESSORY DRIVE</u>. If heater core obstruction is detected, see <u>STANDARD PROCEDURE</u> for cooling system reverse flushing.
STEAM IS COMING FROM THE FRONT OF VEHICLE NEAR THE GRILLE AREA WHEN WEATHER IS WET, ENGINE IS WARMED UP AND RUNNING, AND VEHICLE IS STATIONARY. TEMPERATURE GAUGE IS IN NORMAL RANGE	1. During wet weather, moisture (snow, ice or rain condensation) on the radiator or condenser will evaporate when the thermostat opens. This opening allows heated water into the radiator. When the moisture contacts the hot radiator or condenser, steam may be emitted. This usually occurs in cold weather with no fan or airflow to blow it away.	1. Occasional steam emitting from this area is normal. No repair is necessary.
COOLANT COLOR	1. Coolant color is not necessarily an indication of adequate corrosion or temperature protection. Do not rely on coolant color for determining condition of coolant.	1. See <u>DESCRIPTION</u> for coolant concentration information. Adjust coolant mixture as necessary.
COOLANT LEVEL CHANGES IN COOLANT RESERVE/OVERFLOW TANK. TEMPERATURE GAUGE IS IN NORMAL RANGE	1. Level changes are to be expected as coolant volume fluctuates with engine temperature. If the level in the tank was between the FULL and ADD marks at normal operating temperature, the level should return to within that range after operation at elevated temperatures.	1. A normal condition. No repair is necessary.
FAN RUNS ALL THE TIME	1. Fan control sensors inoperative. 2. Transmission temperature too high. 3. Engine coolant temperature too high.	1. Check for DTCs. Verify sensor readings. 2. Check for transmission over temp DTC. 3. (a) Check coolant level. Correct level as required. (b) Thermostat stuck. Replace

		thermostat. (c) Water pump failed. Replace water pump. (d) Coolant flow restricted. Clean radiator. (e) Air flow over radiator obstructed. Remove obstruction.
	4. ECM or TIPM defective.	4. Replace ECM or TIPM

STANDARD PROCEDURE

CLEANING/REVERSE FLUSHING

CAUTION: The cooling system normally operates at 97-110 kPa (14-16 psi) pressure. Exceeding this pressure may damage the radiator or hoses.

Reverse flushing of the cooling system is the forcing of water through the cooling system. This is done using air pressure in the opposite direction of normal coolant flow. It is usually only necessary with very dirty systems with evidence of partial plugging.

CHEMICAL CLEANING

If visual inspection indicates the formation of sludge or scaly deposits, use a radiator cleaner (Mopar® Radiator Kleen or equivalent) before flushing. This will soften scale and other deposits and aid the flushing operation.

CAUTION: Be sure instructions on the container are followed.

REVERSE FLUSHING RADIATOR

Disconnect the radiator hoses from the radiator fittings. Attach a section of radiator hose to the radiator bottom outlet fitting and insert the flushing gun. Connect a water supply hose and air supply hose to the flushing gun.

CAUTION: The cooling system normally operates at 97-110 kPa (14 -16 psi) pressure. Exceeding this pressure may damage the radiator or hoses.

Allow the radiator to fill with water. When radiator is filled, apply air in short blasts allowing radiator to refill between blasts. Continue this reverse flushing until clean water flows out through rear of radiator cooling tube passages. For more information, refer to operating instructions supplied with flushing equipment. Have radiator cleaned more extensively by a radiator repair shop.

REVERSE FLUSHING ENGINE

Drain the cooling system. See STANDARD PROCEDURE. Remove the thermostat housing and thermostat.

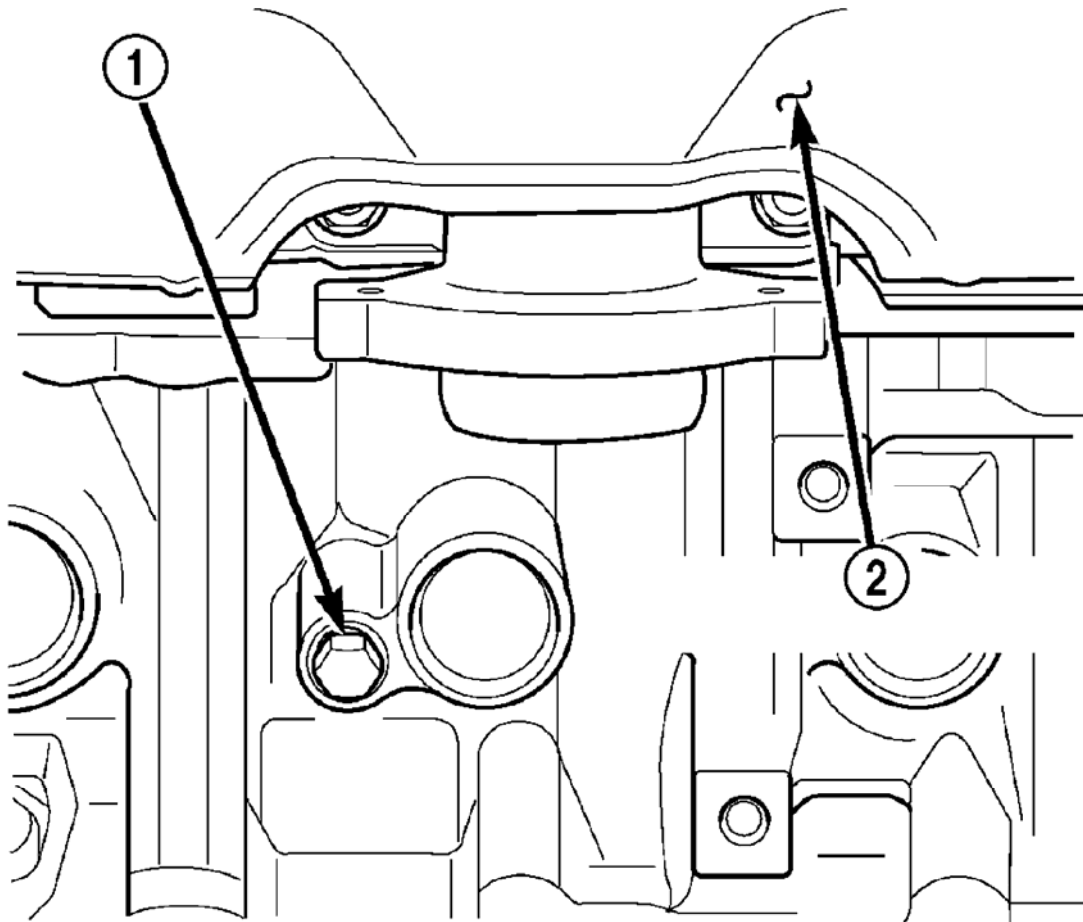
Install the thermostat housing. Disconnect the radiator upper hose from the radiator and attach the flushing gun to the hose. Disconnect the radiator lower hose from the water pump. Attach a lead away hose to the water pump inlet fitting.

CAUTION: Be sure that the heater control valve is closed (heat off). This is done to prevent coolant flow with scale and other deposits from entering the heater core.

Connect the water supply hose and air supply hose to the flushing gun. Allow the engine to fill with water. When the engine is filled, apply air in short blasts, allowing the system to fill between air blasts. Continue until clean water flows through the lead away hose. For more information, refer to operating instructions supplied with flushing equipment.

Remove the lead away hose, flushing gun, water supply hose and air supply hose. Remove the thermostat housing. See **REMOVAL**. Install the thermostat and housing with a replacement gasket . See **INSTALLATION**. Connect the radiator hoses. Refill the cooling system with the correct antifreeze/water mixture . See **STANDARD PROCEDURE**.

DRAINING



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Fig. 4: Drain Plug - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - CYLINDER BLOCK DRAIN PLUG
2 - EXHAUST MANIFOLD AND HEAT SHIELD |
|---|

WARNING: Do not remove the cylinder block drain plugs (1) or loosen the radiator draincock with system hot and under pressure. Serious burns from coolant can occur.

1. DO NOT remove radiator cap first. With engine cold, raise vehicle on a hoist and locate radiator draincock.

NOTE: Radiator draincock is located on the left/lower side of radiator facing to rear of vehicle.

2. Attach one end of a hose to the draincock. Put the other end into a clean container. Open draincock and drain coolant from radiator. This will empty the coolant reserve/overflow tank. The coolant does not have to be removed from the tank unless the system is being refilled with a fresh mixture. When tank is empty, remove radiator cap and continue draining cooling system.

FILLING-DIESEL

1. Tighten the radiator draincock and the cylinder block drain plug(s) (if removed).

CAUTION: Failure to purge air from the cooling system can result in an overheating condition and severe engine damage.

2. Fill cooling system with the antifreeze mixture. Refer to **DESCRIPTION** . Fill pressure bottle to service line and install cap.

NOTE: The engine cooling system will push any remaining air into the coolant bottle within about an hour of normal driving. As a result, a drop in coolant level in the pressure bottle may occur.
If the engine cooling system overheats and pushes coolant into the overflow side of the coolant bottle, this coolant will be sucked back into the cooling system **ONLY IF THE PRESSURE CAP IS LEFT ON THE BOTTLE**. Removing the pressure cap breaks the vacuum path between the two bottle sections and the coolant will not return to cooling system.

3. With heater control unit in the HEAT position, operate engine with pressure bottle cap in place.
4. Add coolant to pressure bottle as necessary. **Only add coolant to the pressure bottle when the engine is cold. Coolant level in a warm engine will be higher due to thermal expansion.**

NOTE: The coolant bottle has two chambers. Coolant will normally only be in the outboard (larger) of the two. The inboard chamber is only to recover coolant in the event of an overheat or after a recent service fill. The inboard chamber should normally be empty. If there is coolant in the overflow side of the coolant bottle (after several warm/cold cycles of the engine) and coolant level is above cold full when cold, disconnect the end of the overflow hose at the fill neck and lower it into a clean container. Allow coolant to drain into the container until emptied. Reconnect overflow hose to fill neck.

SPECIFICATIONS

FILL VOLUMES

DESCRIPTION	SPECIFICATION	
Metric	US	14.0 qts.
3.7L	13.2L	

4.0L	13.2 L	14.0 qts.
2.8L Diesel	12.5 L	11.8 qts

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Engine Air Tubes			
Turbocharger to Intercooler	4.7	-	42
Intercooler to Intake Manifold	4.7	-	42
Automatic Belt Tensioner to Mounting Bracket - 3.7L	41	30	-
Automatic Belt Tensioner Pulley Bolt - 3.7L	61	45	-
Accessory Drive Belt Idler Pulley Bolt - 2.8L Diesel	53	39	-
Accessory Drive Belt Tensioner Bolt - 2.8L Diesel	47.1	35	-
Viscous Fan Drive to Engine - 3.7L	95	70	-
Viscous Fan Drive to Engine - 2.8L Diesel	149	110	-
Cooling Fan Support Bolts	47.1	35	-
Block Heater Bolt - 3.7L	2	-	17
Transmission Oil/Condenser to Radiator Bolts	11.9	-	105
Coolant Pressure Bottle to Plenum mounting Bolts -3.7L only	8.5	-	75
Electric Fan to Fan Shroud Bolts	9	-	80
Fan Blade Assy. to Viscous Drive Bolts - 3.7L/2.8L HD Cooling	23.7	-	210
Fan Shroud to Radiator Mounting Bolts	9	-	80
Radiator Upper Isolator to Crossmember - Bolts	10.7	-	95
Thermostat Housing Bolts	-	-	-
2.8L Diesel	27.5	21	-
3.7L	13	-	115
Water Pump Bolts			
3.7L	54	40	-
Water Pump Housing Nuts - 2.8L Diesel	24.4	18	-

SPECIAL TOOLS

SPECIAL TOOLS

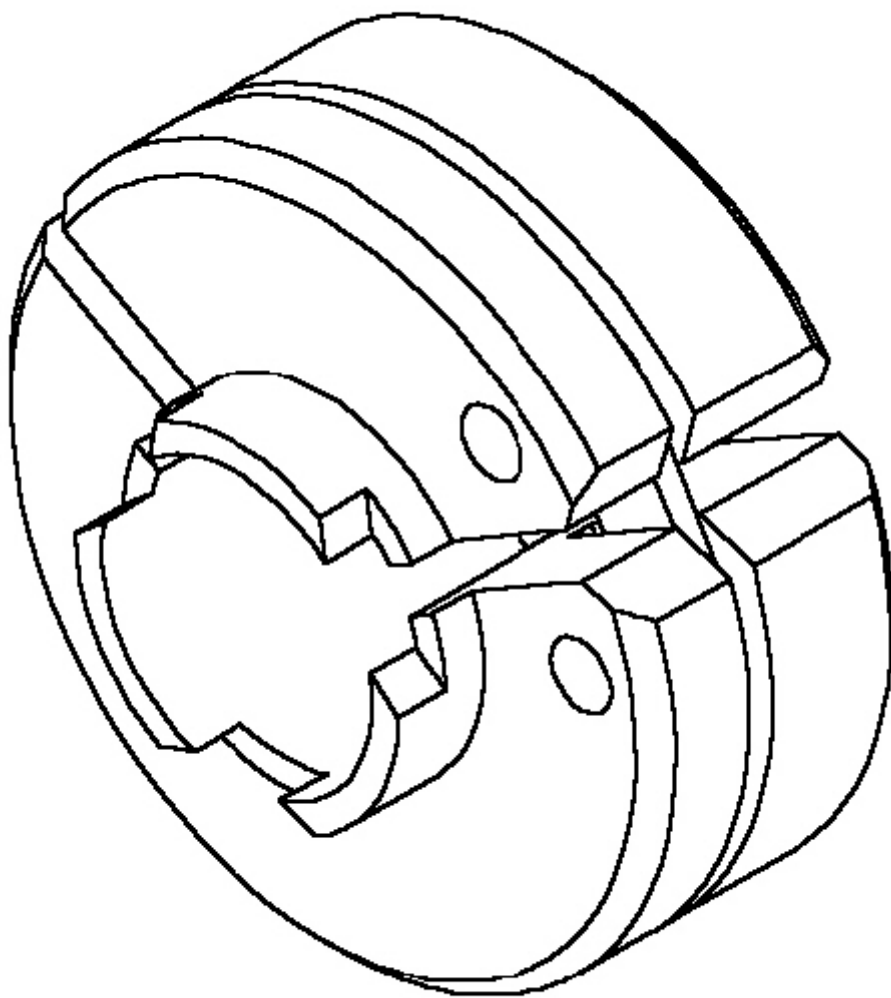


Fig. 5: Release Tool 8875A
Courtesy of CHRYSLER LLC

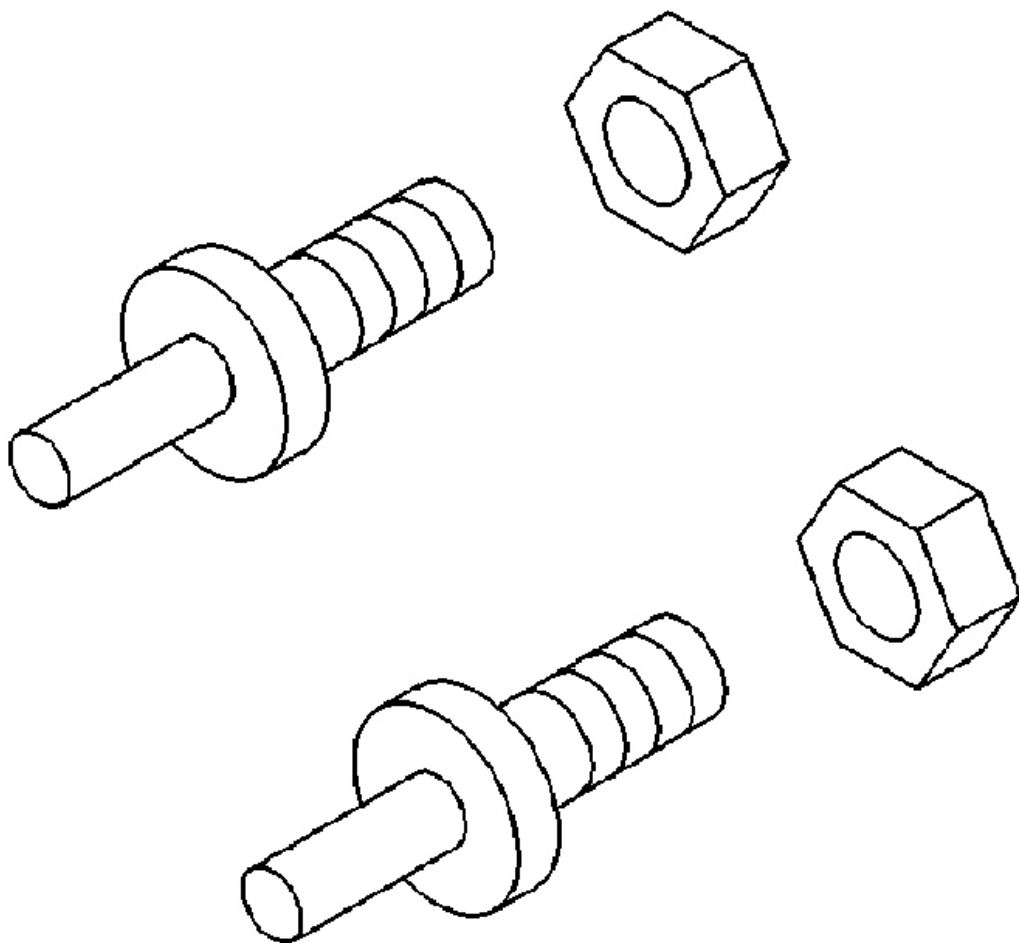


Fig. 6: Adapter Pins 8346
Courtesy of CHRYSLER LLC

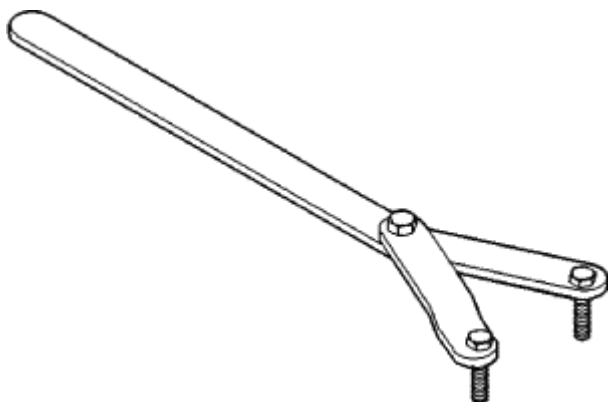


Fig. 7: Spanner Wrench - 6958

Courtesy of CHRYSLER LLC

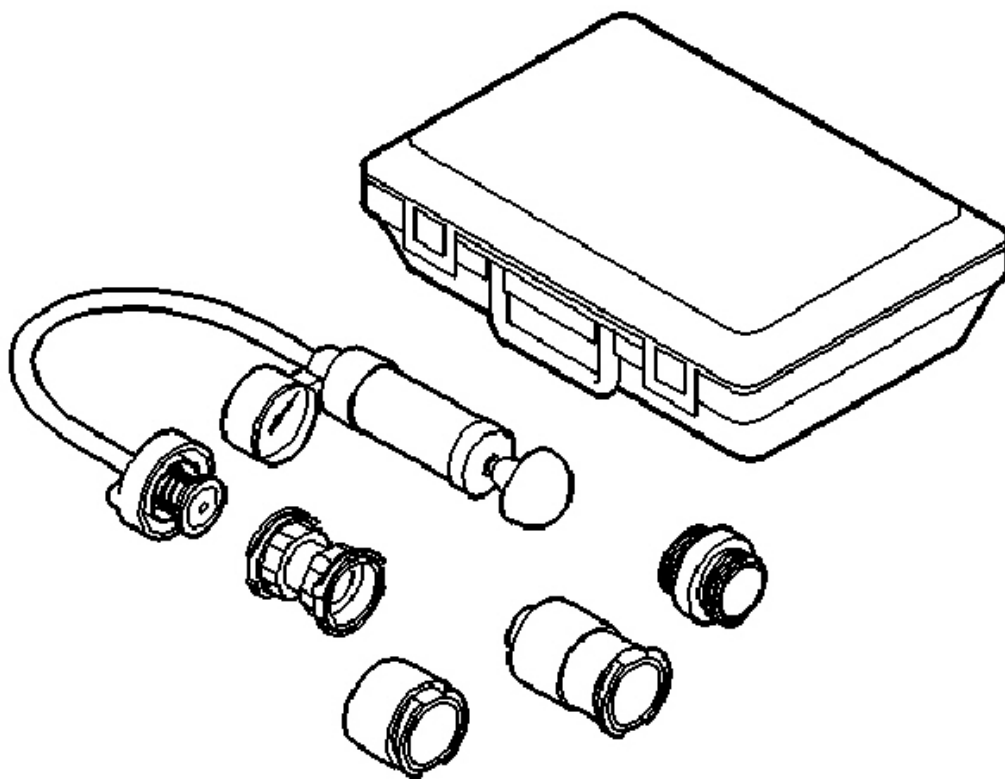


Fig. 8: Cooling System Pressure Tester - 7700A
Courtesy of CHRYSLER LLC

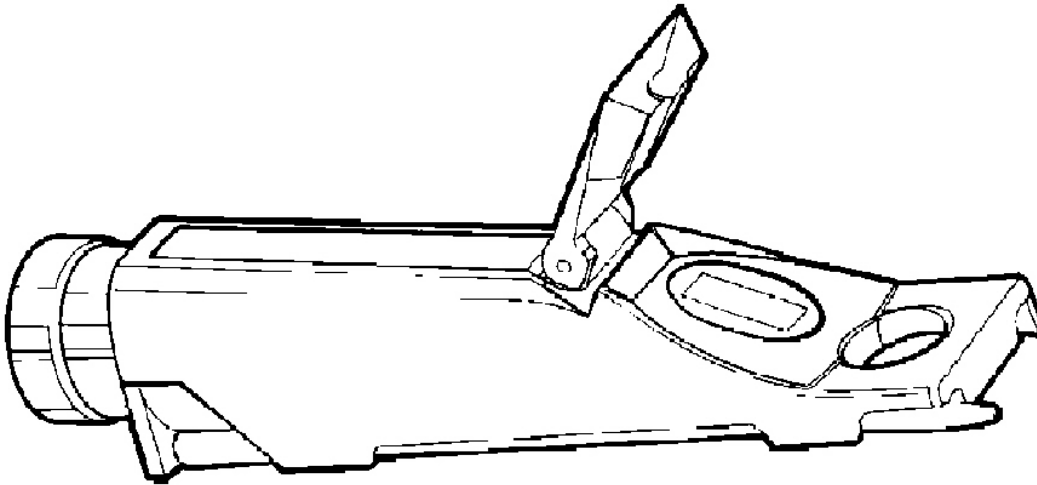


Fig. 9: Coolant Refractometer - 8286
Courtesy of CHRYSLER LLC

ACCESSORY DRIVE

BELT-ACCESSORY DRIVE

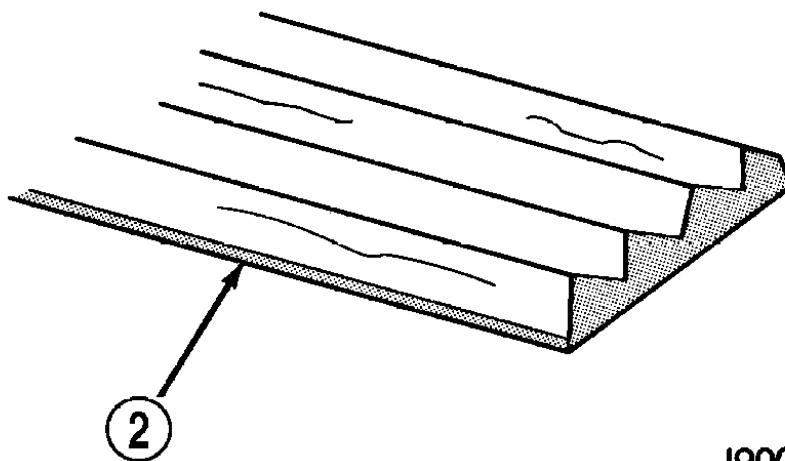
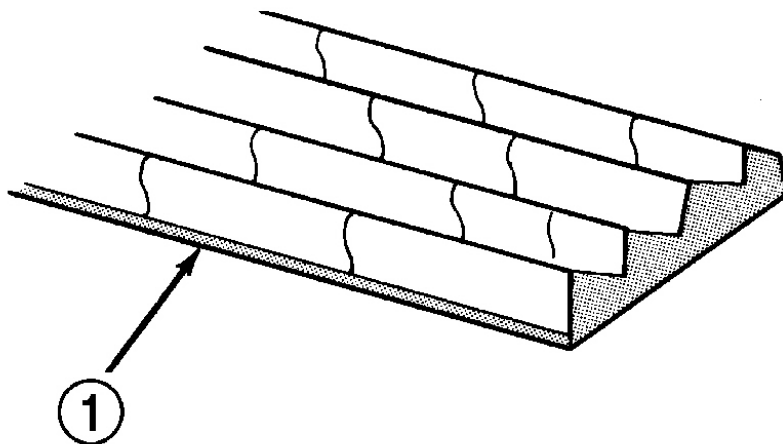
DESCRIPTION

DESCRIPTION

The accessory drive belt is a serpentine type belt. Satisfactory performance of these belts depends on belt condition and proper belt tension.

DIAGNOSIS AND TESTING

ACCESSORY DRIVE BELT



J9007-44

Fig. 10: Belt Wear Patterns
Courtesy of CHRYSLER LLC

- | |
|------------------------------------|
| 1 - NORMAL CRACKS BELT OK |
| 2 - NOT NORMAL CRACKS REPLACE BELT |

When diagnosing serpentine drive belts, small cracks (1) that run across ribbed surface of belt from rib to rib, are considered normal. These are not a reason to replace belt. However, cracks running along a rib (not across) are **not** normal. Any belt with cracks running along a rib must be replaced. Also replace belt if it has excessive wear, frayed cords or severe glazing.

SERPENTINE DRIVE BELT DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSES	CORRECTION
-----------	-----------------	------------

RIB CHUNKING (ONE OR MORE RIBS HAS SEPARATED FROM BELT BODY)	1. Foreign objects imbedded in pulley grooves. 2. Installation damage.	1. Remove foreign objects from pulley grooves. Replace belt. 2. Replace belt.
RIB OR BELT WEAR	1. Pulley(s) misaligned. 2. Abrasive environment. 3. Rusted pulley(s). 4. Sharp or jagged pulley groove tips. 5. Rubber deteriorated.	1. Align pulley(s). 2. Clean pulley(s). Replace belt if necessary. 3. Clean rust from pulley(s). 4. Replace pulley. 5. Replace belt.
LONGITUDINAL BELT CRACKING (CRACKS BETWEEN TWO RIBS)	1. Belt has mistracked from pulley groove. 2. Pulley groove tip has worn away rubber to tensile member.	1. Replace belt. 2. Replace belt.
BELT SLIPS	1. Belt slipping because of insufficient tension. 2. Belt routed incorrectly. 3. Incorrect belt. 4. Belt or pulley subjected to substance (belt dressing, oil ethylene glycol) that has reduced friction. 5. Driven component bearing failure. 6. Belt glazed and hardened from heat and excessive slippage.	1. Replace automatic belt tensioner. 2. Verify belt routing. 3. Replace belt. 4. Replace belt and clean pulleys. 5. Replace faulty component bearing. 6. Replace belt.
"GROOVE JUMPING" (BELT DOES NOT MAINTAIN CORRECT POSITION ON PULLEY)	1. Belt tension either too high or too low. 2. Belt routed incorrectly. 3. Incorrect belt. 4. Pulley(s) not within design tolerance. 5. Foreign object(s) in grooves. 6. Pulley misalignment. 7. Belt cord line is broken.	1. Replace automatic belt tensioner. 2. Verify belt routing. 3. Replace belt. 4. Replace pulley(s). 5. Remove foreign objects from grooves. 6. Check and replace. 7. Replace belt.
BELT BROKEN (NOTE: IDENTIFY AND CORRECT PROBLEM BEFORE NEW BELT IS INSTALLED)	1. Excessive tension. 2. Incorrect belt. 3. Tensile member damaged during belt installation. 4. Severe misalignment. 5. Bracket, pulley, or bearing failure.	1. Replace belt and automatic belt tensioner. 2. Replace belt. 3. Replace belt. 4. Check and replace. 5. Replace defective component and belt.
NOISE (OBJECTIONABLE)	1. Belt slippage.	1. Replace belt or automatic belt

SQUEAL, SQUEAK, OR RUMBLE IS HEARD OR FELT WHILE DRIVE BELT IS IN OPERATION)	2. Bearing noise. 3. Belt misalignment. 4. Belt-to-pulley mismatch.	tensioner. 2. Locate and repair. 3. Replace belt. 4. Install correct belt.
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REMOVAL

REMOVAL-2.8L DIESEL

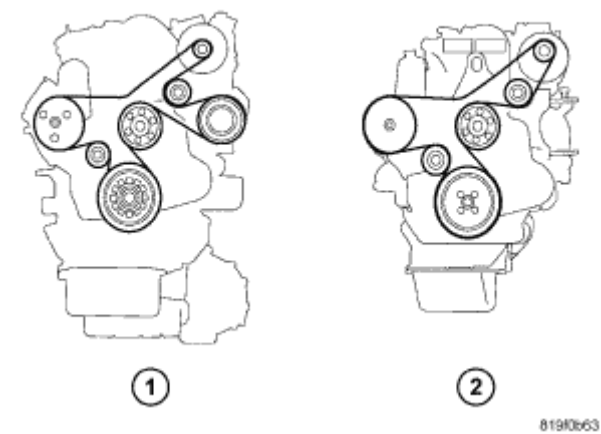
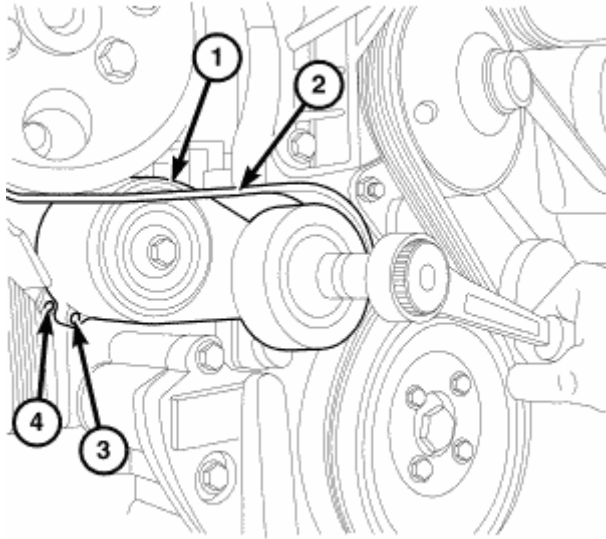


Fig. 11: Belt Routing
Courtesy of CHRYSLER LLC

1 - WITH A/C
2 - WITHOUT A/C

CAUTION: Do not let tensioner arm snap back to the freearm position, severe damage may occur to the tensioner.

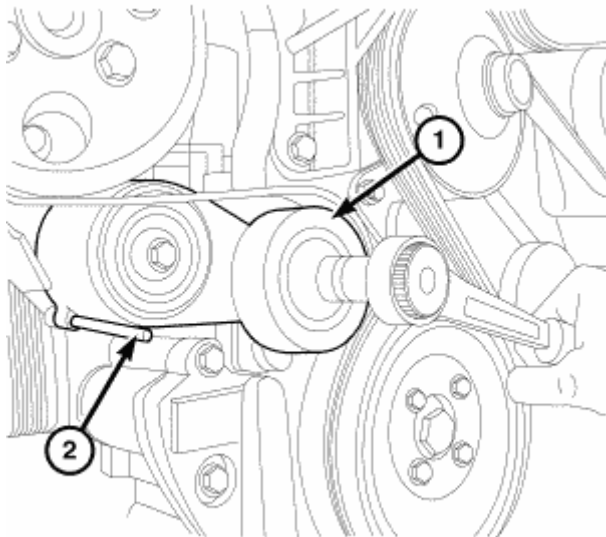
1. Disconnect negative battery cable.



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Fig. 12: Identifying Belt Tensioner & Locking Tabs
 Courtesy of CHRYSLER LLC

2. Rotate the belt tensioner (1) until the position locking tabs (3 and 4) line up.



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Fig. 13: Removing/Installing Belt Tensioner Retaining Bolt And Tensioner
 Courtesy of CHRYSLER LLC

3. Install a drift into the belt tensioner (1) at position 2.

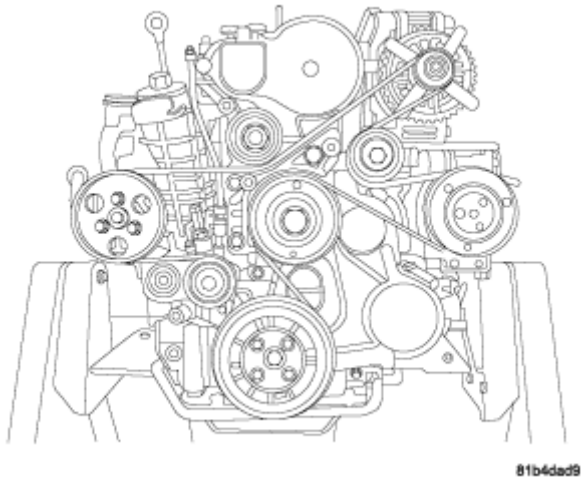


Fig. 14: Identifying Pulley Assembly - 2.8L Diesel
Courtesy of CHRYSLER LLC

4. Remove the accessory drive belt (1).

REMOVAL-3.7L

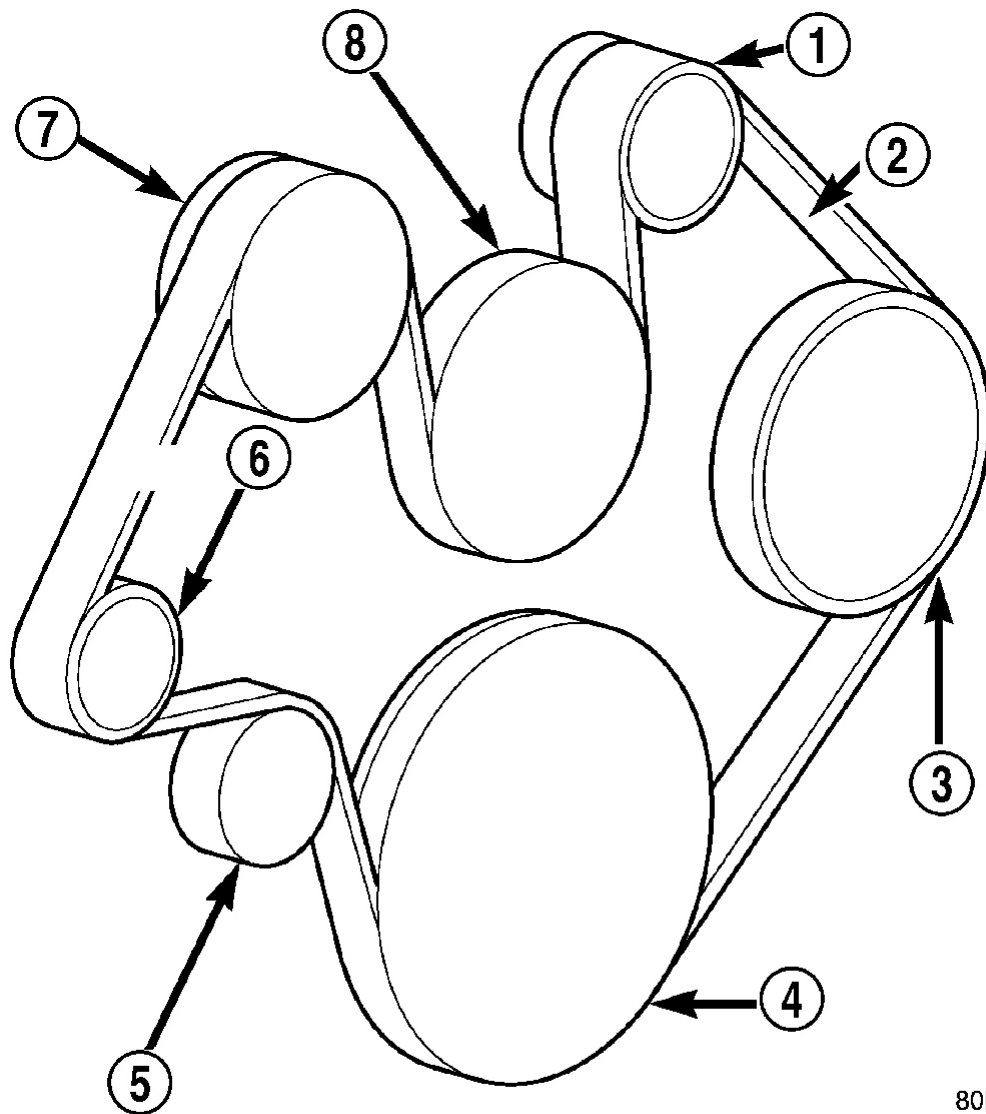


Fig. 15: Identifying Belt Routing - 3.7L/4.7L
Courtesy of CHRYSLER LLC

- 1 - GENERATOR PULLEY
- 2 - ACCESSORY DRIVE BELT
- 3 - POWER STEERING PUMP PULLEY
- 4 - CRANKSHAFT PULLEY
- 5 - IDLER PULLEY
- 6 - TENSIONER
- 7 - A/C COMPRESSOR PULLEY
- 8 - WATER PUMP PULLEY

CAUTION: Do not let tensioner arm snap back to the freearm position, severe damage may occur to the tensioner.

1. Disconnect negative battery cable.
2. Remove combination washer reservoir/coolant recovery container. See **REMOVAL**.
3. Rotate belt tensioner (6) until it contacts its stop. Remove belt, then slowly rotate the tensioner into the freearm position.

REMOVAL-4.0L

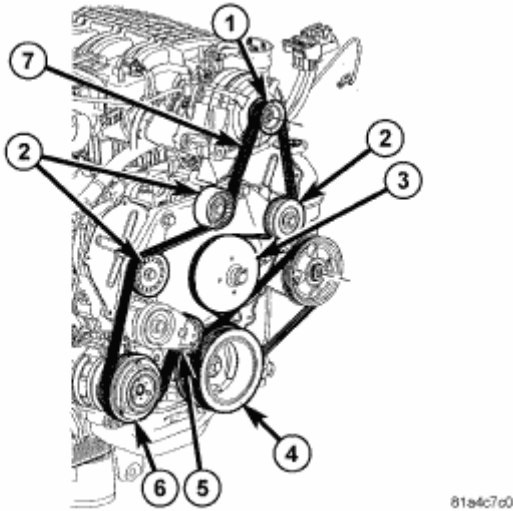


Fig. 16: Accessory Drive Belt Routing - 4.0L
Courtesy of CHRYSLER LLC

1 - GENERATOR
2 - IDLER PULLEY
3 - WATER PUMP PULLEY
4 - CRANKSHAFT PULLEY
5 - ACCESSORY DRIVE BELT TENSIONER
6 - A/C COMPRESSOR
7 - ACCESSORY DRIVE BELT

1. Remove combination coolant recovery/washer reservoir. See **REMOVAL**.
2. Insert a suitable square drive ratchet into the square hole on belt tensioner arm.
3. Rotate accessory drive belt tensioner clockwise to release belt tension.
4. Remove accessory drive belt.

CLEANING

CLEANING

Clean all foreign debris from belt pulley grooves. The belt pulleys must be free of oil, grease, and coolants before installing the drive belt.

INSTALLATION

INSTALLATION-2.8L DIESEL

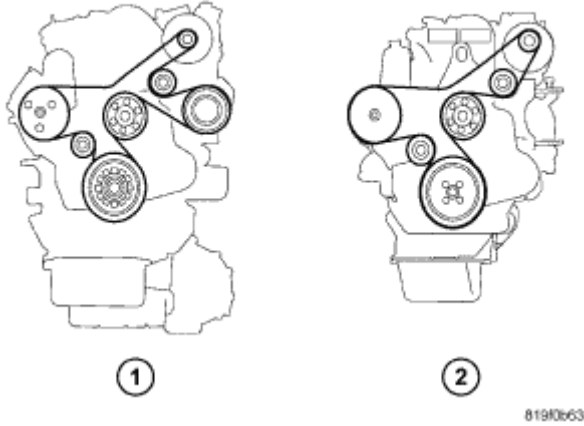


Fig. 17: Belt Routing
Courtesy of CHRYSLER LLC

- | |
|---------------------------------|
| 1 - WITH A/C
2 - WITHOUT A/C |
|---------------------------------|

1. Check condition of all pulleys.

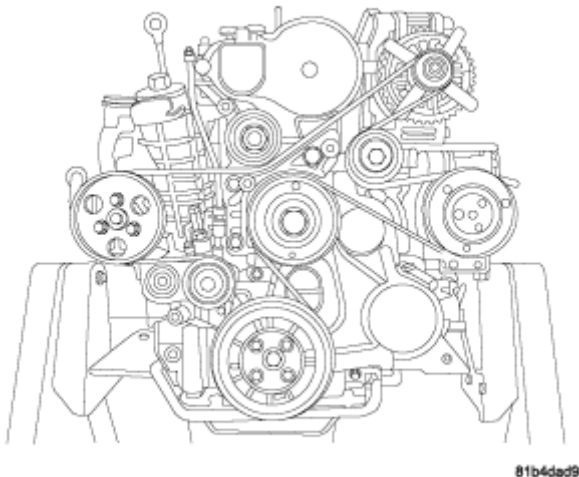
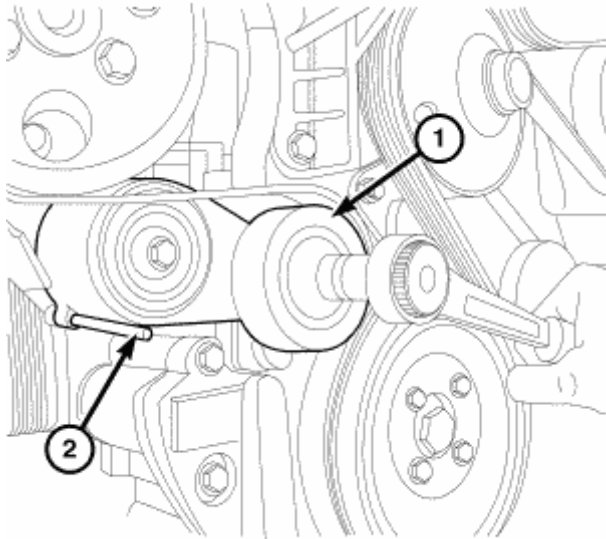


Fig. 18: Identifying Pulley Assembly - 2.8L Diesel

Courtesy of CHRYSLER LLC

CAUTION: When installing the accessory drive belt, the belt **MUST** be routed correctly. If not, the engine may overheat due to the water pump rotating in the wrong direction.

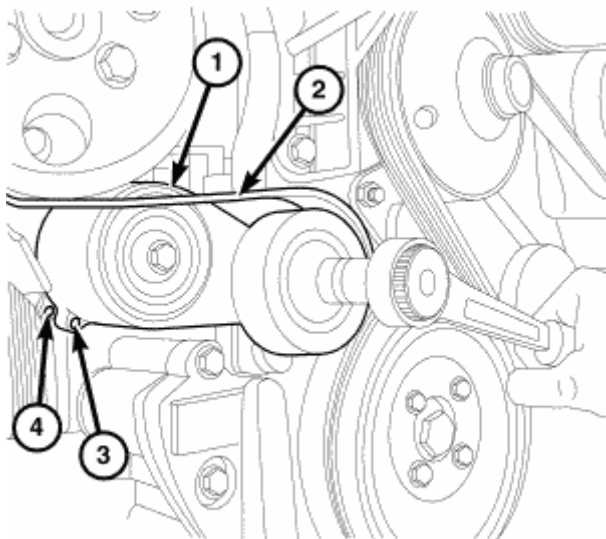
2. Install accessory drive belt. Route the belt around all pulleys (1 or 2) except the idler pulley.



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Fig. 19: Removing/Installing Belt Tensioner Retaining Bolt And Tensioner
Courtesy of CHRYSLER LLC

3. Rotate the tensioner arm until it contacts its stop position. Route the belt around the idler and slowly let the tensioner rotate into the belt. Make sure the belt is seated onto all pulleys.



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Fig. 20: Identifying Belt Tensioner & Locking Tabs
Courtesy of CHRYSLER LLC

4. Remove the drift from the belt tensioner.

INSTALLATION-3.7L

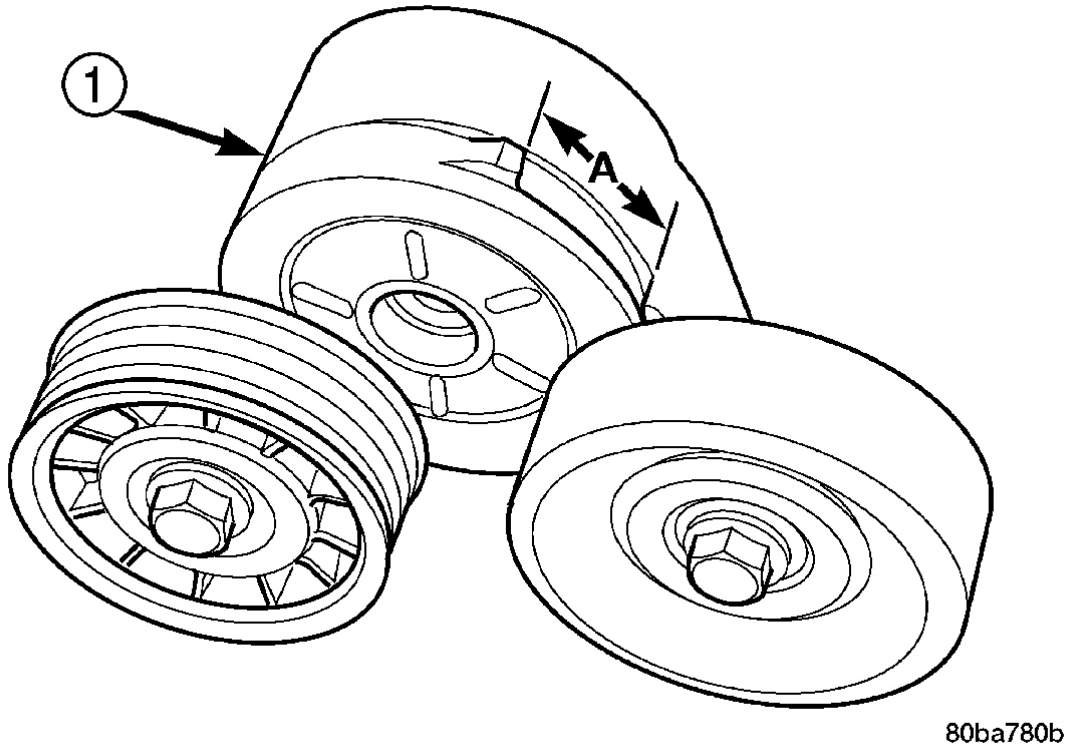


Fig. 21: Automatic Belt Tensioner
Courtesy of CHRYSLER LLC

1 - AUTOMATIC TENSIONER ASSEMBLY

1. Check condition of all pulleys.

CAUTION: When installing the accessory drive belt, the belt **MUST** be routed correctly. If not, the engine may overheat due to the water pump rotating in the wrong direction.

2. Install new belt. Route the belt around all pulleys except the idler pulley. Rotate the tensioner arm (1) until it contacts its stop position. Route the belt around the idler and slowly let the tensioner rotate into the belt. Make sure the belt is seated onto all pulleys.
3. With the drive belt installed, inspect the belt wear indicator. On 3.7L Engines the gap between the tang

- and the housing stop (measurement A) must not exceed 24 mm (0.94 inches).
4. Install combination washer reservoir/coolant recovery container. See **INSTALLATION**.

INSTALLATION-4.0L

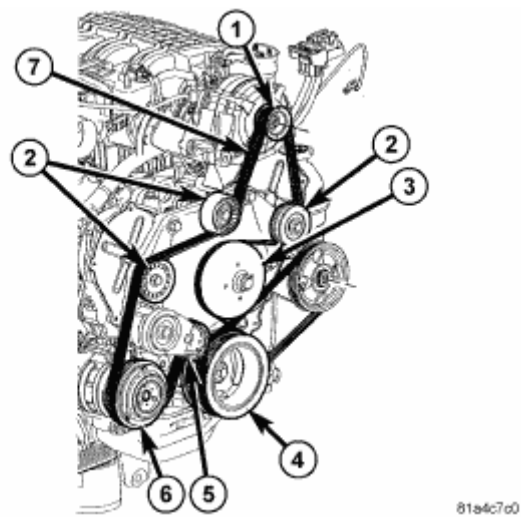


Fig. 22: Accessory Drive Belt Routing - 4.0L
Courtesy of CHRYSLER LLC

1 - GENERATOR
2 - IDLER PULLEY
3 - WATER PUMP PULLEY
4 - CRANKSHAFT PULLEY
5 - ACCESSORY DRIVE BELT TENSIONER
6 - A/C COMPRESSOR
7 - ACCESSORY DRIVE BELT

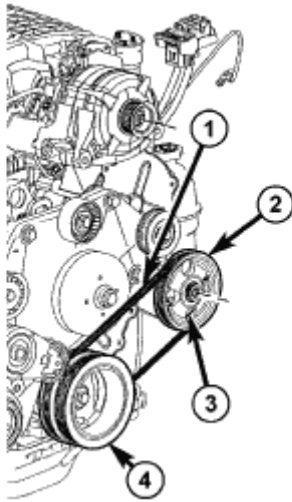
NOTE: When installing accessory drive belt onto pulleys, make sure that belt is properly routed and all V-grooves make proper contact with pulleys.

1. Rotate tensioner **clockwise** and position accessory drive belt over all pulleys.
2. Gently release tensioner.
3. Install combination coolant recovery/washer reservoir. See **INSTALLATION**.

BELTS-DRIVE-POWER STEERING

REMOVAL

REMOVAL



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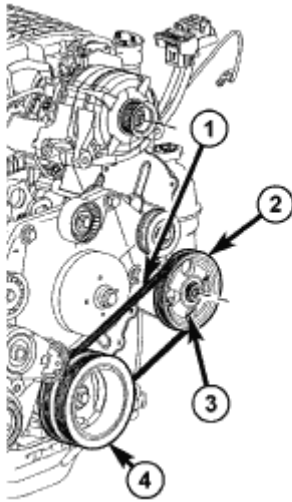
Fig. 23: Removing/Installing Power Steering Belt
Courtesy of CHRYSLER LLC

1 - POWER STEERING BELT
2 - POWER STEERING PULLEY
3 - ACCESS HOLE
4 - CRANKSHAFT PULLEY

1. Remove accessory drive belt. See **BELT-ACCESSORY DRIVE**.
2. Position suitable tool between power steering belt (1) and power steering pulley (2) at the top of the pulley.
3. Use a socket and ratchet to rotate the crankshaft clockwise.
4. While rotating the crankshaft clockwise, walk the power steering belt (1) off of the power steering pulley (2).

INSTALLATION

INSTALLATION



81a4c96c

Fig. 24: Removing/Installing Power Steering Belt
Courtesy of CHRYSLER LLC

1 - POWER STEERING BELT
2 - POWER STEERING PULLEY
3 - ACCESS HOLE
4 - CRANKSHAFT PULLEY

1. Position power steering belt (1) on crankshaft pulley (4). Make sure belt is fully seated in crankshaft pulley grooves.
2. Position top of power steering belt on the top of the power steering pulley (2).

NOTE: Use only wire ties with nylon locks, not metal.

3. Working from the back side of the power steering pulley (2) , insert a nylon wire tie, 7.75X1/8x.0.050 in, through one of the access holes (3) in the pulley.
4. Tighten the wire tie to hold the drive belt in position.
5. While holding the drive belt to make sure it stays in position, slowly rotate the engine clockwise.
6. Once the belt is in position on the pulley, continue rotating the engine until the wire tie snaps.
7. Remove the wire tie from the vehicle.

TENSIONER-ACCESSORY DRIVE BELT

DESCRIPTION

BELT TENSIONERS-DESCRIPTION

The automatic belt tensioner is a spring loaded arm and pulley assembly. The tensioner assembly is designed to apply constant pressure on the accessory drive belt to maintain proper belt tension.

OPERATION

BELT TENSIONER-OPERATION

WARNING: The automatic belt tensioner assembly is spring loaded. Do not attempt to disassemble the tensioner assembly.

The automatic belt tensioner maintains correct belt tension using a coiled spring within the tensioner housing. The spring applies pressure to the tensioner arm pressing the arm into the belt, tensioning the belt.

If a new belt is being installed, the arrow must be within approximately 3 mm (1/8 in.) of indexing mark. Belt is considered new if it has been used 15 minutes or less. If this specification cannot be met, check for:

The wrong belt being installed (incorrect length/width)

Worn bearings on an engine accessory (A/C compressor, power steering pump, water pump, idler pulley or generator)

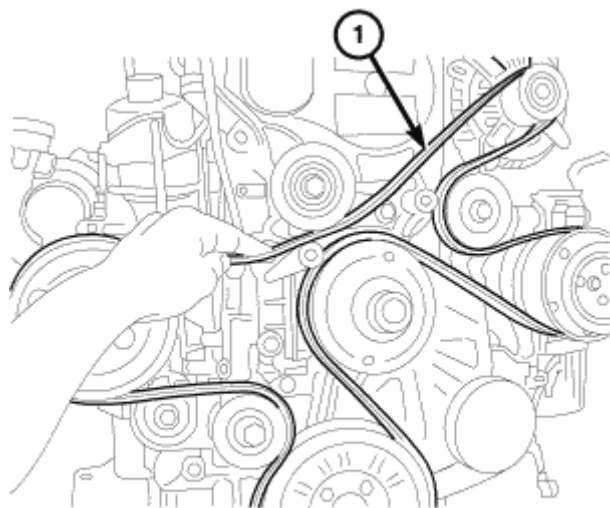
A pulley on an engine accessory being loose

Misalignment of an engine accessory

Belt incorrectly routed.

REMOVAL

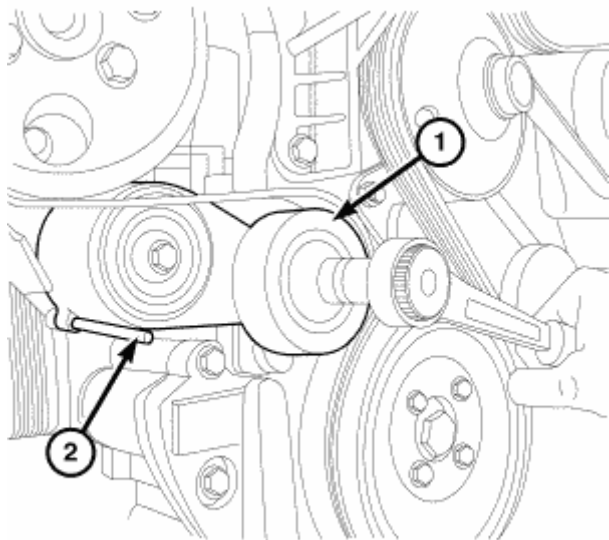
REMOVAL-2.8L DIESEL



81b4a203

Fig. 25: Removing/Installing Accessory Drive Belt
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove accessory drive belt (9). See **Fig. 25**. See **BELT-ACCESSORY DRIVE**.

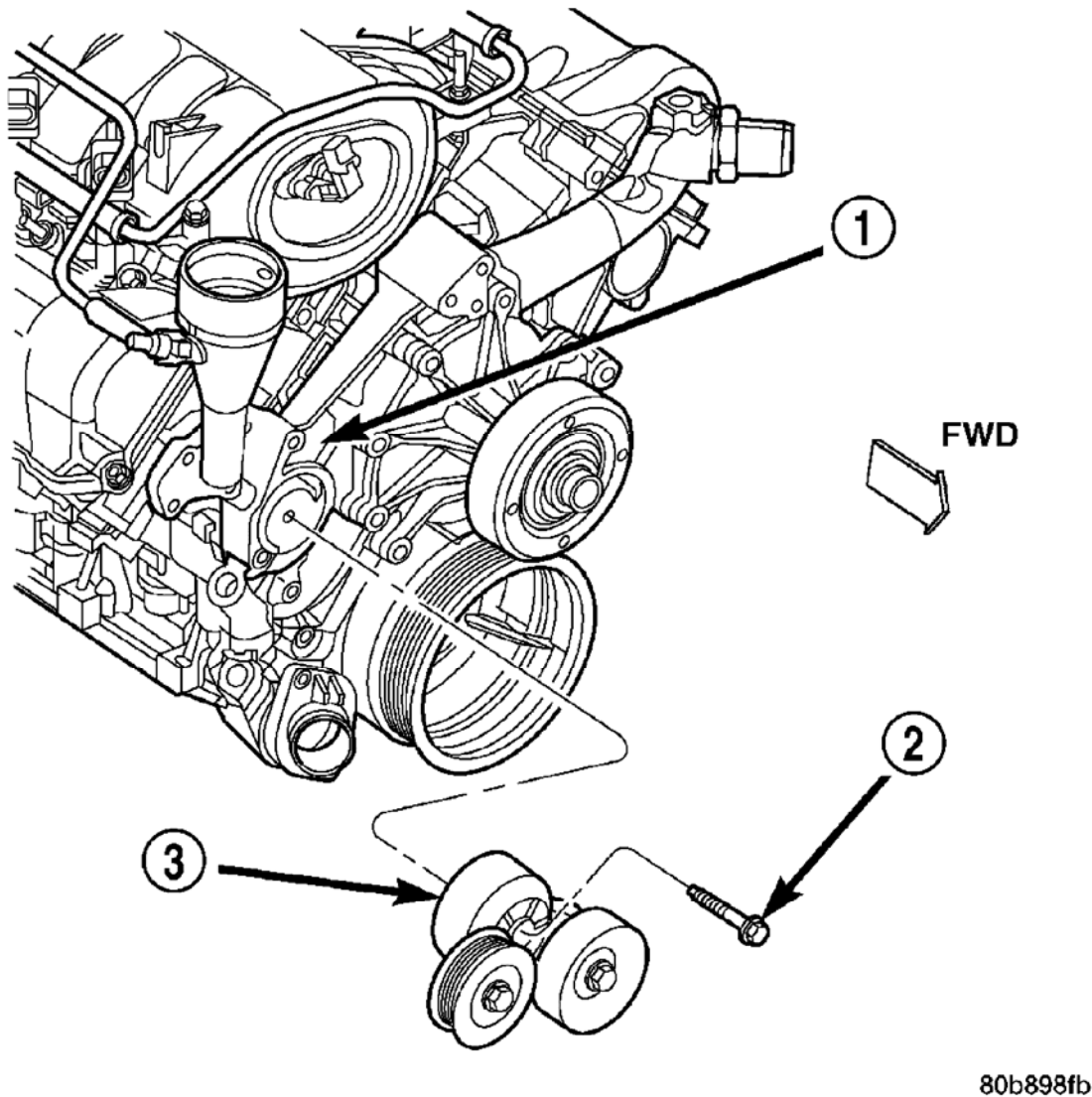


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Fig. 26: Removing/Installing Belt Tensioner Retaining Bolt And Tensioner
Courtesy of CHRYSLER LLC

3. Remove belt tensioner retaining bolt and remove tensioner (1).

REMOVAL-3.7L



80b898fb

Fig. 27: Automatic Belt Tensioner - 3.7L/4.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - TIMING CHAIN COVER2 - BOLT TORQUE TO 41 N.m (30 FT LBS)3 - AUTOMATIC BELT TENSIONER |
|---|

1. Remove accessory drive belt (Refer to **BELT-ACCESSORY DRIVE**).
2. Remove tensioner assembly (3) from engine front cover.

WARNING: Because of high spring tension, do not attempt to disassemble automatic tensioner. Unit is serviced as an assembly (except for pulley on tensioner).

3. Remove pulley bolt. Remove pulley from tensioner.

REMOVAL-4.0L

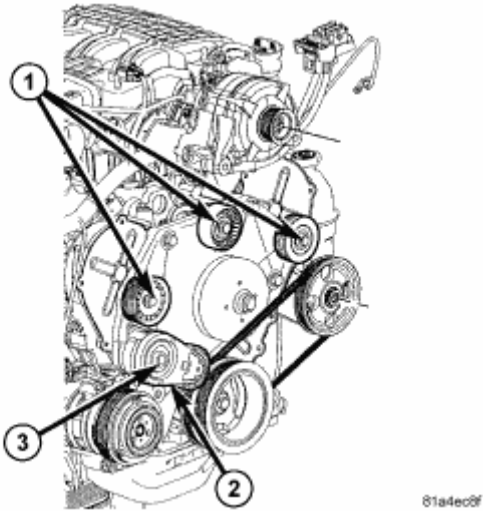


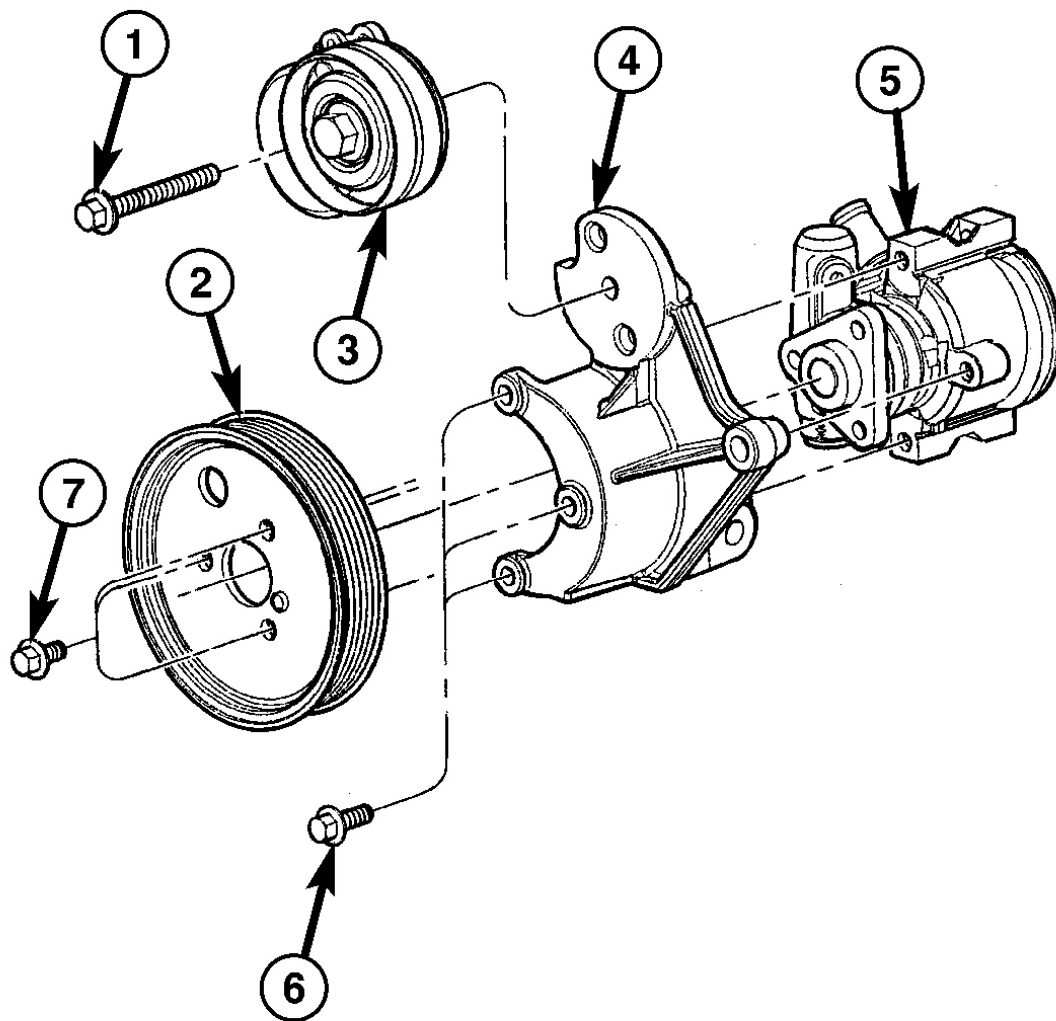
Fig. 28: Removing/Installing Accessory Drive Belt Tensioner - 4.0L
Courtesy of CHRYSLER LLC

1 - IDLER PULLEY
2 - ACCESSORY DRIVE BELT TENSIONER
3 - MOUNTING BOLT

1. Remove accessory drive belt. See **BELT-ACCESSORY DRIVE**.
2. Remove accessory drive belt tensioner.

INSTALLATION

INSTALLATION-2.8L DIESEL

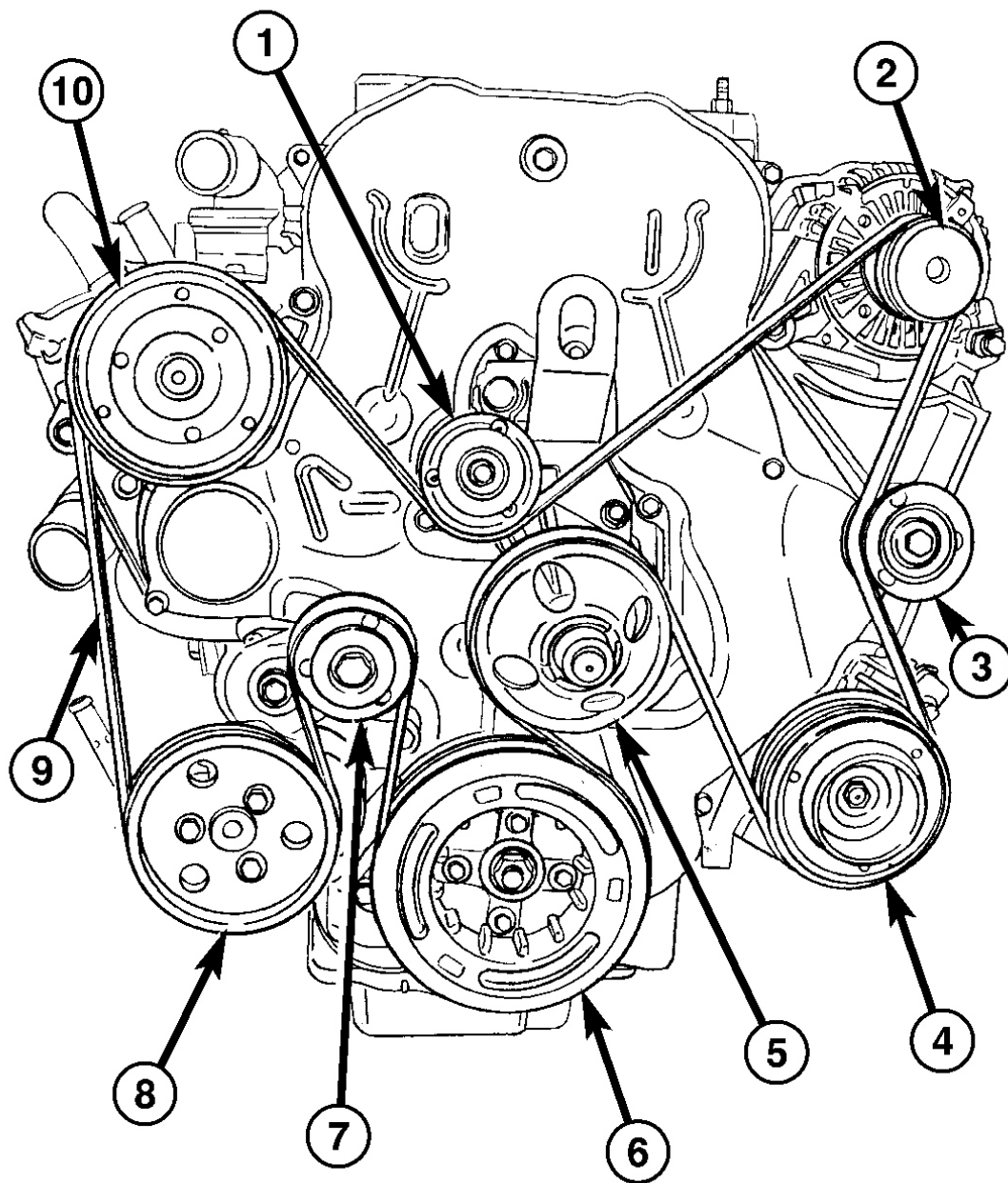


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Fig. 29: Belt Tensioner Assembly
Courtesy of CHRYSLER LLC

- 1 - ACCESSORY BELT TENSIONER RETAINING BOLT
- 2 - POWER STEERING PUMP PULLEY
- 3 - BELT TENSIONER
- 4 - BRACKET
- 5 - POWER STEERING PUMP
- 6 - POWER STEERING PUMP RETAINING BOLTS
- 7 - POWER STEERING PUMP PULLEY RETAINING BOLTS

1. Install belt tensioner on bracket. Tighten retaining bolt to 47 N.m (35 ft. lbs.).



80cdd35c

Fig. 30: Accessory Belt Routing
Courtesy of CHRYSLER LLC

1 - IDLER PULLEY
2 - GENERATOR

- 3 - IDLER PULLEY
- 4 - A/C COMPRESSOR
- 5 - COOLING FAN SUPPORT
- 6 - VIBRATION DAMPER
- 7 - BELT TENSIONER
- 8 - POWER STEERING PUMP
- 9 - ACCESSORY DRIVE BELT
- 10 - VISCOUS HEATER

2. Install accessory drive belt. See **INSTALLATION**.
3. Connect negative battery cable.

INSTALLATION-3.7L

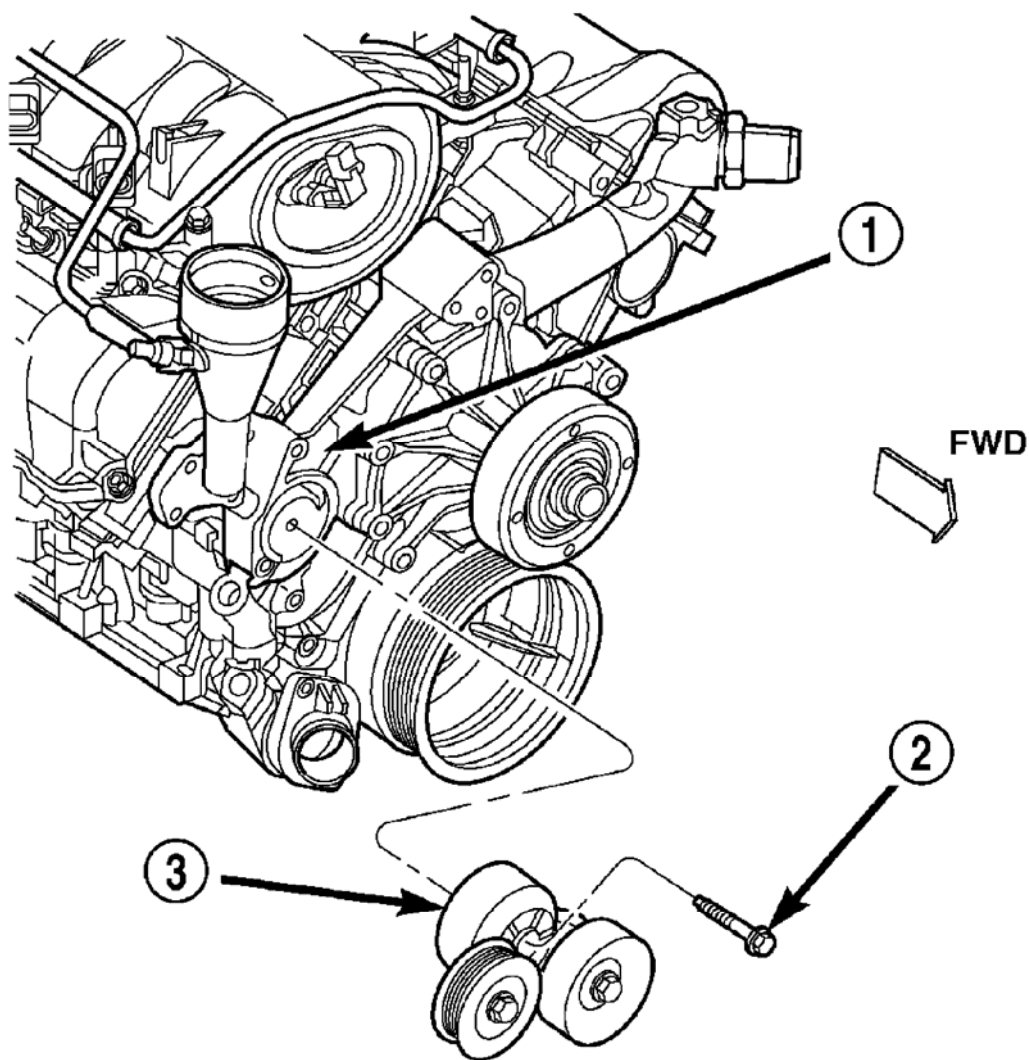


Fig. 31: Automatic Belt Tensioner - 3.7L/4.7L
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - TIMING CHAIN COVER |
| 2 - BOLT TORQUE TO 41 N.m (30 FT LBS) |
| 3 - AUTOMATIC BELT TENSIONER |

1. Install pulley and pulley bolt to tensioner. Tighten bolt to 61 N.m (45 ft. lbs.) torque.
2. An indexing slot is located on back of tensioner. Align this slot to the head of the bolt on the front cover. Install the mounting bolt. Tighten bolt to 41 N.m (30 ft. lbs.).
3. Install drive belt (Refer to **INSTALLATION**).
4. Check belt indexing marks (Refer to **INSTALLATION**).

INSTALLATION-4.0L

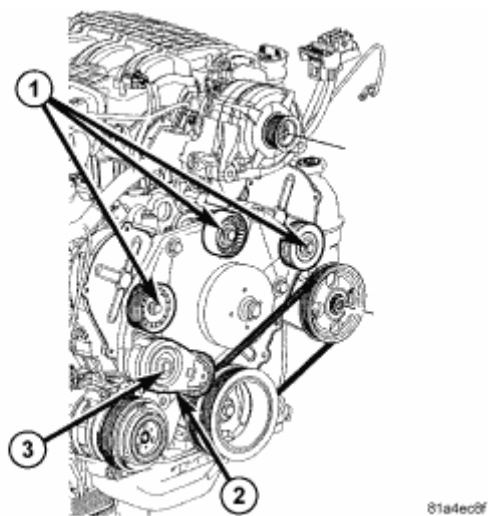


Fig. 32: Removing/Installing Accessory Drive Belt Tensioner - 4.0L
Courtesy of CHRYSLER LLC

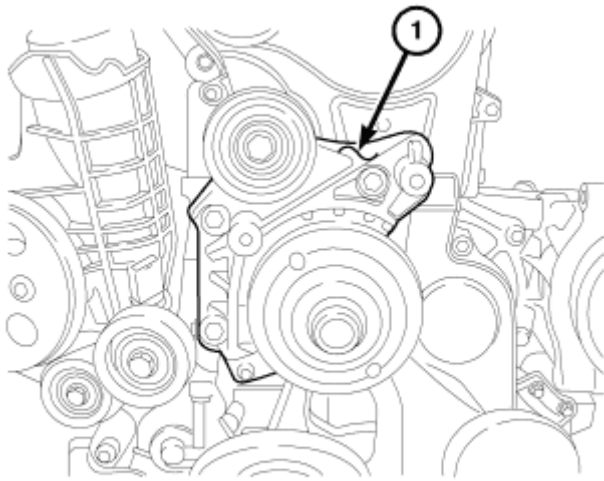
- | |
|------------------------------------|
| 1 - IDLER PULLEY |
| 2 - ACCESSORY DRIVE BELT TENSIONER |
| 3 - MOUNTING BOLT |

1. Position accessory drive belt tensioner (2).
2. Install mounting bolt (3). Tighten bolt to Tighten bolt to 61 N.m (45 ft. lbs.).
3. Install accessory drive belt. See **INSTALLATION**.

PULLEY-IDLER

REMOVAL

IDLER PULLEY-REMOVAL-2.8L DIESEL



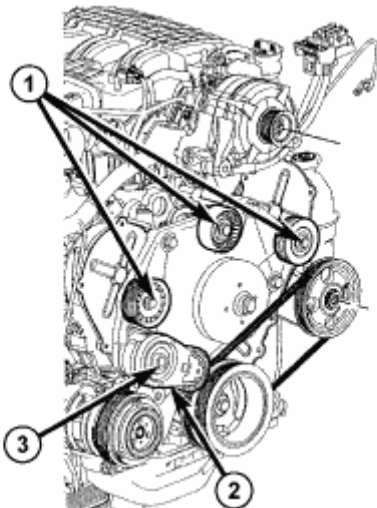
61aba736

Fig. 33: Idler Pulley
Courtesy of CHRYSLER LLC

CAUTION: The retaining bolts on the idler pulleys are left hand thread.

1. Disconnect negative battery cable.
2. Remove accessory drive belt. See **BELT-ACCESSORY DRIVE**.
3. Remove idler pulley retaining bolts and pulley.

REMOVAL-4.0L



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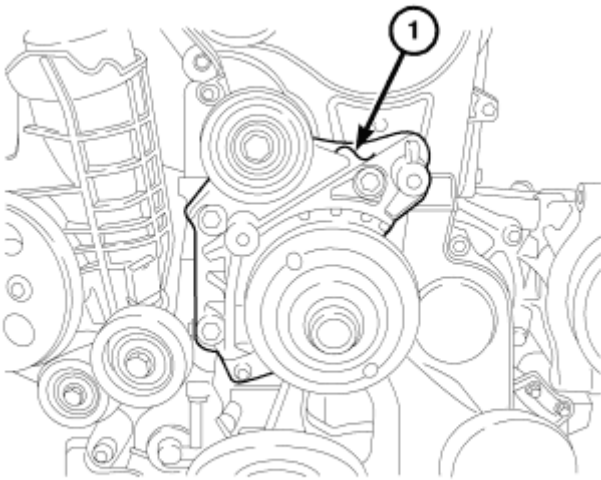
Fig. 34: Removing/Installing Accessory Drive Belt Tensioner - 4.0L
Courtesy of CHRYSLER LLC

- | |
|------------------------------------|
| 1 - IDLER PULLEY |
| 2 - ACCESSORY DRIVE BELT TENSIONER |
| 3 - MOUNTING BOLT |

1. Remove accessory drive belt. See **BELT-ACCESSORY DRIVE**.
2. Remove cover.
3. Remove bolt and pulley (1).

INSTALLATION

IDLER PULLEY-INSTALLATION-2.8L DIESEL



61aba736

Fig. 35: Idler Pulley
Courtesy of CHRYSLER LLC

1. Install idler pulley and retaining bolt. Tighten bolts to 53 N.m (39 ft. lbs.)
2. Install accessory drive belt. See **INSTALLATION**.
3. Connect negative battery cable.

INSTALLATION-4.0L

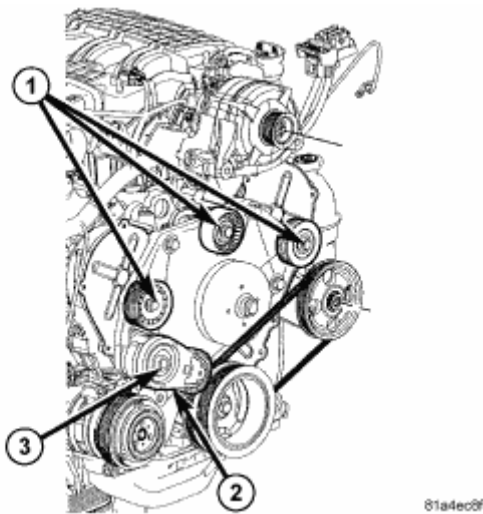


Fig. 36: Removing/Installing Accessory Drive Belt Tensioner - 4.0L
 Courtesy of CHRYSLER LLC

1 - IDLER PULLEY
2 - ACCESSORY DRIVE BELT TENSIONER
3 - MOUNTING BOLT

1. Position idler pulley (1).
2. Tighten bolt to (3) 28 N.m (250 in. lbs.).
3. Install cover.
4. Install accessory drive belt. See INSTALLATION.

ENGINE

COOLANT

DESCRIPTION

COOLANT-DESCRIPTION

ETHYLENE-GLYCOL MIXTURES

CAUTION: Richer antifreeze mixtures cannot be measured with normal field equipment and can cause problems associated with 100 percent ethylene-glycol.

The required ethylene-glycol (antifreeze) and water mixture depends upon the climate and vehicle operating conditions. The recommended mixture of 50/50 ethylene-glycol and water will provide protection against freezing to -37° C (-35° F). The antifreeze concentration **must always** be a minimum of 44 percent, year-round in all climates. **If percentage is lower than 44 percent, engine parts may be eroded by cavitation, and cooling system components may be severely damaged by corrosion.** Maximum protection against freezing is provided with a 68 percent antifreeze concentration, which prevents freezing down to -67.7° C (-90° F). A

higher percentage will freeze at a warmer temperature. Also, a higher percentage of antifreeze can cause the engine to overheat because the specific heat of antifreeze is lower than that of water.

Use of 100 percent ethylene-glycol will cause formation of additive deposits in the system, as the corrosion inhibitive additives in ethylene-glycol require the presence of water to dissolve. The deposits act as insulation, causing temperatures to rise to as high as 149° C (300° F). This temperature is hot enough to melt plastic and soften solder. The increased temperature can result in engine detonation. In addition, 100 percent ethylene-glycol freezes at 22° C (-8° F).

PROPYLENE-GLYCOL MIXTURES

It's overall effective temperature range is smaller than that of ethylene-glycol. The freeze point of 50/50 propylene-glycol and water is -32° C (-26° F). 5° C higher than ethylene-glycol's freeze point. The boiling point (protection against summer boil-over) of propylene-glycol is 125° C (257° F) at 96.5 kPa (14 psi), compared to 128° C (263° F) for ethylene-glycol. Use of propylene-glycol can result in boil-over or freeze-up on a cooling system designed for ethylene-glycol. Propylene glycol also has poorer heat transfer characteristics than ethylene glycol. This can increase cylinder head temperatures under certain conditions.

Propylene-glycol/ethylene-glycol mixtures can cause the destabilization of various corrosion inhibitors, causing damage to the various cooling system components. Also, once ethylene-glycol and propylene-glycol based coolants are mixed in the vehicle, conventional methods of determining freeze point will not be accurate. Both the refractive index and specific gravity differ between ethylene glycol and propylene glycol.

DESCRIPTION

GAS ENGINES

WARNING: Antifreeze is an ethylene glycol based coolant and is harmful if swallowed or inhaled. If swallowed, drink two glasses of water and induce vomiting. If inhaled, move to fresh air area. Seek medical attention immediately. Do not store in open or unmarked containers. Wash skin and clothing thoroughly after coming in contact with ethylene glycol. Keep out of reach of children. Dispose of glycol based coolant properly, contact your government agency for location of collection center in your area. Do not open a cooling system when the engine is at operating temperature or hot under pressure, personal injury can result. Avoid radiator cooling fan when engine compartment related service is performed, personal injury can result.

CAUTION: Use of Propylene Glycol based coolants is not recommended, as they provide less freeze protection and less boiling protection.

The cooling system is designed around the coolant. The coolant must accept heat from engine metal, in the cylinder head area near the exhaust valves and engine block. Then coolant carries the heat to the radiator where the tube/fin radiator can transfer the heat to the air.

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection.

Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769), or the equivalent ethylene glycol based coolant with hybrid organic corrosion inhibitors (called HOAT, for Hybrid Organic Additive Technology) is recommended. This coolant offers the best engine cooling without corrosion when mixed with 50% Ethylene Glycol and 50% distilled water to obtain a freeze point of -37°C (-35°F). If it loses color or becomes contaminated, drain, flush, and replace with fresh properly mixed coolant solution.

The green coolant **MUST NOT BE MIXED** with the orange or magenta coolants. When replacing coolant the complete system flush must be performed before using the replacement coolant.

CAUTION: Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769) may not be mixed with any other type of antifreeze. Doing so will reduce the corrosion protection and may result in premature water pump seal failure. If non-HOAT coolant is introduced into the cooling system in an emergency, it should be replaced with the specified coolant as soon as possible.

DIESEL ENGINE

CAUTION: Use of Propylene Glycol based coolants is not recommended, as they provide less freeze protection and less boiling protection.

The cooling system is designed around the coolant. The coolant must accept heat from engine metal, in the cylinder head area near the exhaust valves and engine block. Then coolant carries the heat to the radiator where the tube/fin radiator can transfer the heat to the air.

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection. Glysantin G 30-91 Antifreeze/Coolant, 5 Year/150,000 Mile Formula (ASTM D3306), or the equivalent ethylene glycol based coolant. This coolant offers the best engine cooling without corrosion when mixed with 50% coolant and 50% distilled water to obtain a freeze point of -36°C (-34°F). It is dyed purple to distinguish its unique chemistry from traditional green and yellow silicate coolants. If it loses color or becomes contaminated, drain, flush, and replace with fresh properly mixed coolant solution.

The purple coolant **MUST NOT BE MIXED** with the orange, green or magenta coolants. When replacing coolant the complete system flush must be performed before using the replacement coolant.

CAUTION: Glysantin G 30-91 Antifreeze/Coolant, 5 Year/150,00 Mile Formula (ASTM D3306) may not be mixed with any other type of antifreeze. Doing so will reduce the corrosion protection and may result in premature water pump seal failure.

OPERATION

OPERATION

Coolant flows through the engine block absorbing the heat from the engine, then flows to the radiator where the cooling fins in the radiator transfers the heat from the coolant to the atmosphere. During cold weather the ethylene-glycol or coolant prevents water present in the cooling system from freezing within temperatures

indicated by mixture ratio of coolant to water.

DIAGNOSIS AND TESTING

COOLANT-CONCENTRATION TESTING

Coolant concentration should be checked when any additional coolant was added to system or after a coolant drain, flush and refill. The coolant mixture offers optimum engine cooling and protection against corrosion when mixed to a freeze point of -37°C (-34°F) to -46°C (-50°F). The use of a hydrometer or Tool 8266, refractometer can be used to test coolant concentration.

A hydrometer will test the amount of glycol in a mixture by measuring the specific gravity of the mixture. The higher the concentration of ethylene glycol, the larger the number of balls that will float, and higher the freeze protection (up to a maximum of 60% by volume glycol).

A Refractometer Tool 8286 will test the amount of glycol in a coolant mixture by measuring the amount a beam of light bends as it passes through the fluid.

Some coolant manufactures use other types of glycols into their coolant formulations. Propylene glycol is the most common new coolant. However, propylene glycol based coolants do not provide the same freezing protection and corrosion protection and are not recommended.

CAUTION: Do not mix types of coolant - corrosion protection will be severely reduced.

CONTAINER-COOLANT RECOVERY

DESCRIPTION

DESCRIPTION-NON-PRESSURE SYSTEM

This system works on the principal of a closed and completely deaerated system using thermally generated pressure. The bottle acts as a reserve coolant source to keep air out of the system but must have a specified minimum amount of coolant in the bottle at all times. The expansion and contraction of the coolant in the pressurized closed coolant loop allows the reserve bottle to accept and give up excess fluid via a hose from the radiator neck. It provides:

A non-pressurized reserve coolant tank volume for expansion and contraction of coolant.

A pressurized cap on the radiator. This keeps the main loop of the cooling system at an elevated operating pressure and prevents coolant boiling at lower temperatures.

Reserve coolant is included in the non-pressurized tank in enough quantity to account for minor leaks and evaporation or boiling losses, and to keep the return line back to the radiator full at all times. Failure to do so could allow air to be sucked back into the radiator as the engine and engine coolant cool down and the coolant volume contracts.

DESCRIPTION-PRESSURE SYSTEM

This system works on the principal of a closed and deaerated system using thermally generated pressure. The expansion and contraction of the coolant in the pressurized closed system keeps it free of trapped air. It provides:

- A pressurized surge tank volume for expansion and contraction.

- A non-pressurized overflow volume to capture excess coolant expansion and allow for it's return to the pressurized system.

- A pressurized cap on the pressure bottle rather than the radiator. This facilitates deaeration of the system.

- Reserve coolant is included in the pressurized volume to account for minor leaks and evaporation or boiling losses.

- Provides a warning light for low coolant level.

OPERATION

OPERATION-NON PRESSURE SYSTEM

The coolant reserve/overflow system works in conjunction with the radiator pressure cap. It utilizes thermal expansion and contraction of coolant to keep coolant free of trapped air. It provides a volume for expansion and contraction of coolant. It also provides a convenient and safe method for checking coolant level and adjusting level at atmospheric pressure. This is done without removing the radiator pressure cap. The system also provides some reserve coolant to the radiator to cover minor leaks and evaporation or boiling losses.

As the engine cools, a vacuum is formed in the cooling system of both the radiator and engine. Coolant will then be drawn from the coolant tank and returned to a proper level in the radiator.

OPERATION-PRESSURE SYSTEM

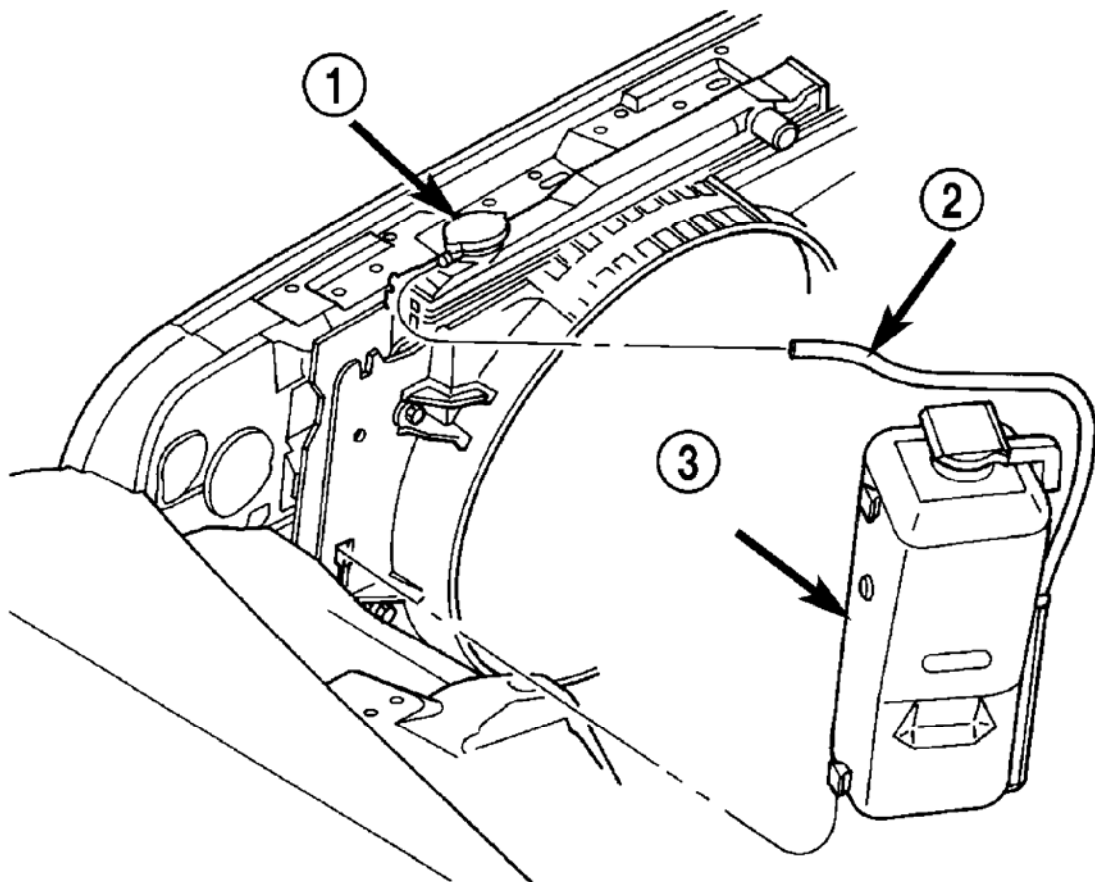
As the engine warms, the coolant in the closed system expands. The pressurized bottle accepts the expanding fluid. Then, when the thermostat opens and a high demand for coolant is placed on the system, the pressurized surge tank side of the bottle can supply the temporary additional volume of coolant demanded by the system. Once the water pump catches up with the flow demand, the tank returns to equilibrium. A separate compartment in the bottle accepts the overflow coolant which is then drawn back into the primary side of the bottle when the engine and coolant cool down

The advantage of the pressurized system is that any excess air in the cooling system is routed to the top of the bottle via a vent hose at the thermostat housing to the bottle. This air accumulates at the top of the pressurized volume in the bottle (the highest point in the system) and is forced out of the system through the pressure cap. This keeps the system properly deaerated and maintains pressure in the cooling system to prevent water pump cavitation

The diesel bottle has an additional vent line back to the radiator that is immersed in the coolant bath at the bottle. This also ensures air at the radiator is routed back to bottle for expulsion and that a constant head of liquid is present at the radiator.

REMOVAL

REMOVAL-NON PRESSURE SYSTEM



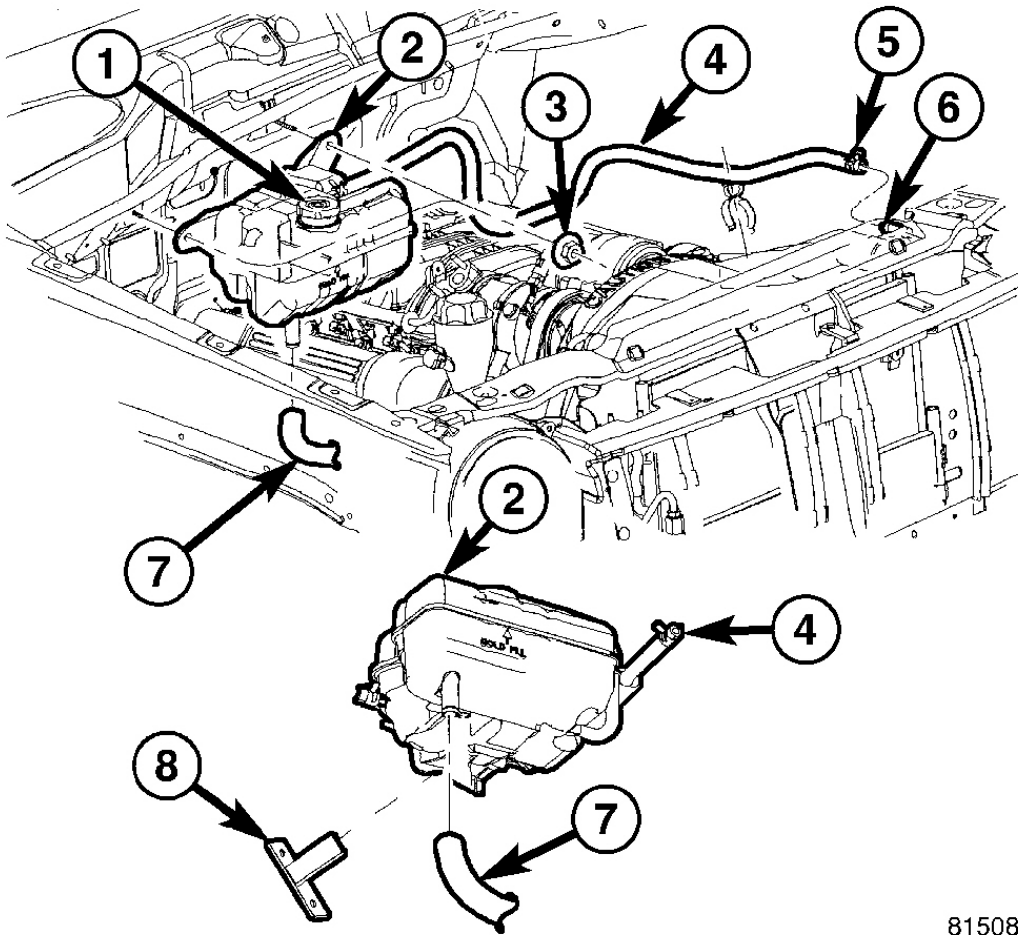
80abd2b8

Fig. 37: Coolant Reserve/Overflow Bottle
Courtesy of CHRYSLER LLC

- | |
|-----------------------------|
| 1 - RADIATOR PRESSURE CAP |
| 2 - HOSE |
| 3 - COOLANT RECOVERY BOTTLE |

1. Remove hose (2) from radiator.
2. Remove recovery container mounting bolts.
3. Remove recovery container (3).

REMOVAL-PRESSURE SYSTEM



81508b41

Fig. 38: Coolant Bottle - Pressure System
 Courtesy of CHRYSLER LLC

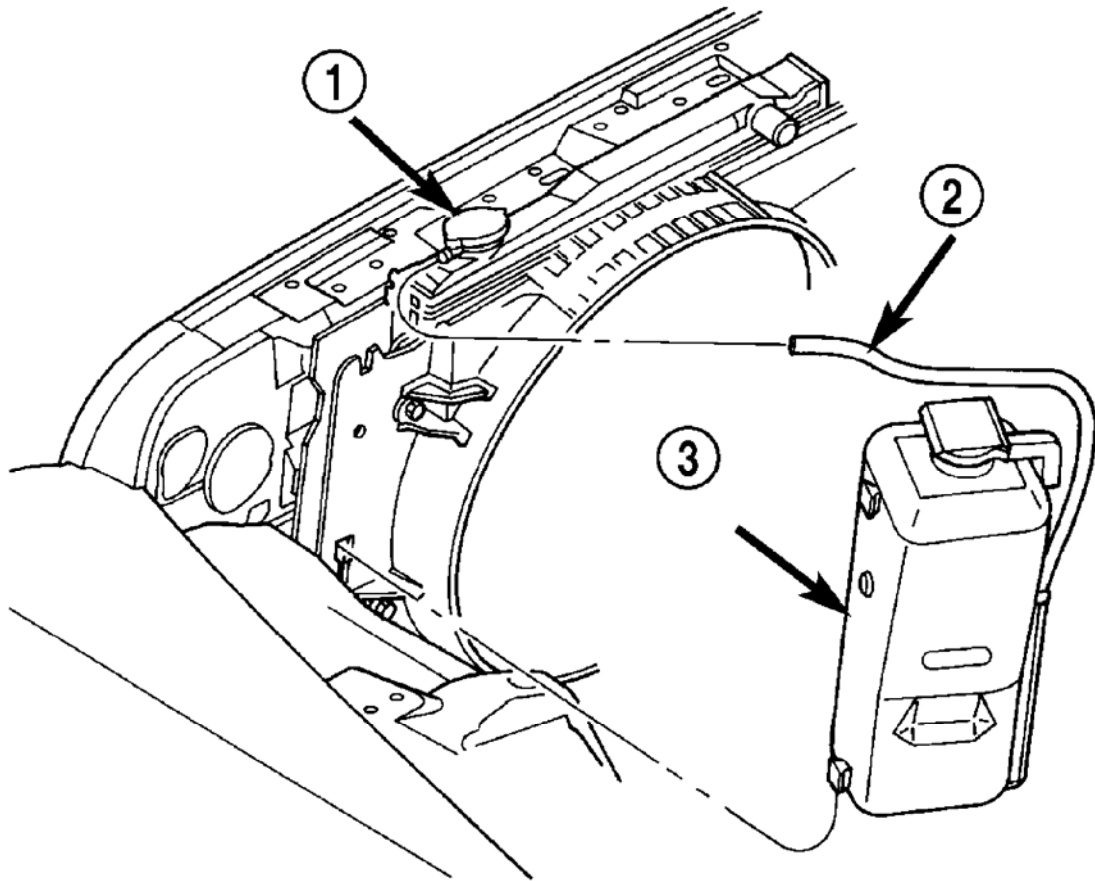
- 1 - PRESSURE CAP
- 2 - COOLANT BOTTLE
- 3 - MOUNTING NUTS
- 4 - COOLANT BOTTLE TO RADIATOR HOSE
- 5 - CLAMP
- 6 - RADIATOR
- 7 - LOWER HOSE
- 8 - MOUNTING BRACKET

1. Remove pressure cap from bottle.
2. Siphon coolant from pressure bottle (2) into a contaminant free container.
3. Disconnect coolant bottle to radiator hose at coolant bottle.

4. Disconnect lower hose at coolant bottle.
5. Remove mounting nuts.
6. Remove coolant bottle from bracket.

INSTALLATION

INSTALLATION-NON PRESSURE SYSTEM



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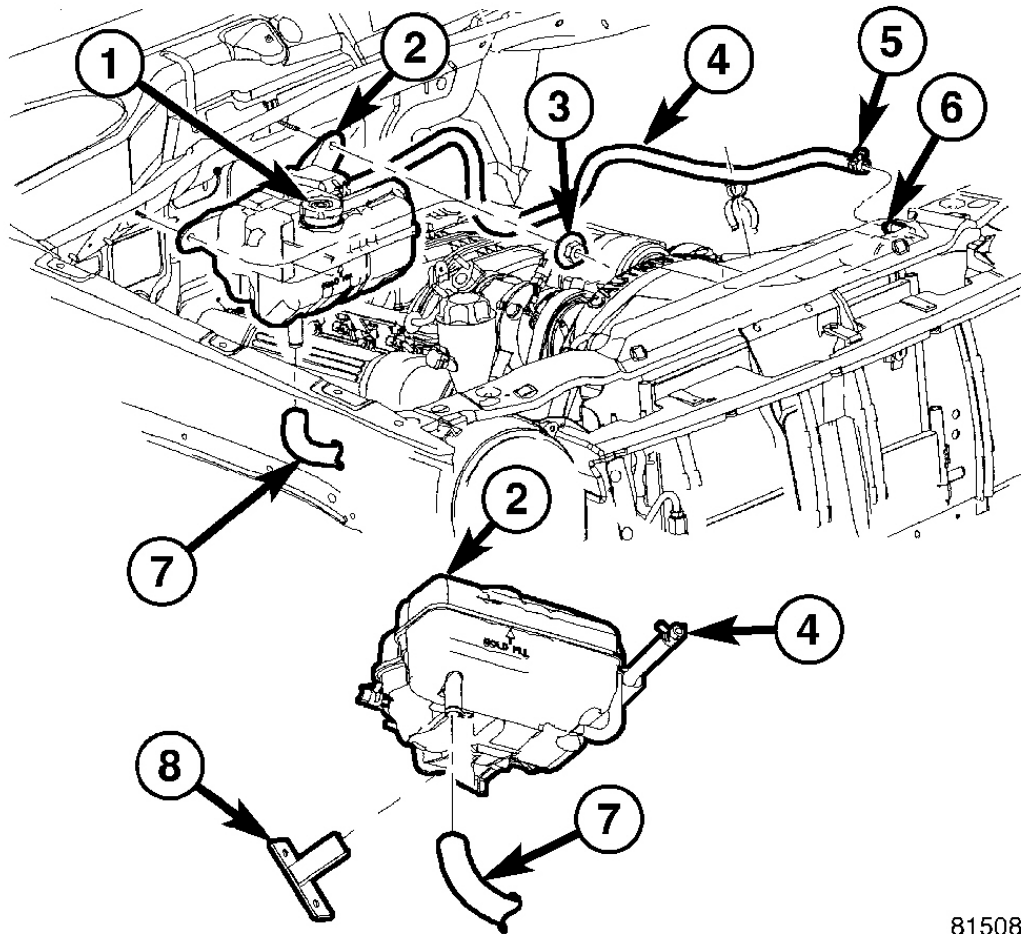
Fig. 39: Coolant Reserve/Overflow Bottle
Courtesy of CHRYSLER LLC

- | |
|-----------------------------|
| 1 - RADIATOR PRESSURE CAP |
| 2 - HOSE |
| 3 - COOLANT RECOVERY BOTTLE |

1. Position coolant recovery container (3).
2. Install coolant recovery container mounting bolts.

3. Install hose (2).

INSTALLATION-PRESSURE SYSTEM



81508b41

Fig. 40: Coolant Bottle - Pressure System
Courtesy of CHRYSLER LLC

- 1 - PRESSURE CAP
- 2 - COOLANT BOTTLE
- 3 - MOUNTING NUTS
- 4 - COOLANT BOTTLE TO RADIATOR HOSE
- 5 - CLAMP
- 6 - RADIATOR
- 7 - LOWER HOSE
- 8 - MOUNTING BRACKET

1. Position pressure bottle on mounting bracket.
2. Install mounting nuts. Tighten nuts to 8.5 N.m (75 in. lbs.).
3. Install lower hose at coolant bottle.
4. Install radiator to coolant bottle hose at coolant bottle.
5. Fill cooling system. See **STANDARD PROCEDURE**.

HOSES-COOLING SYSTEM-2.8L DIESEL

REMOVAL

REMOVAL

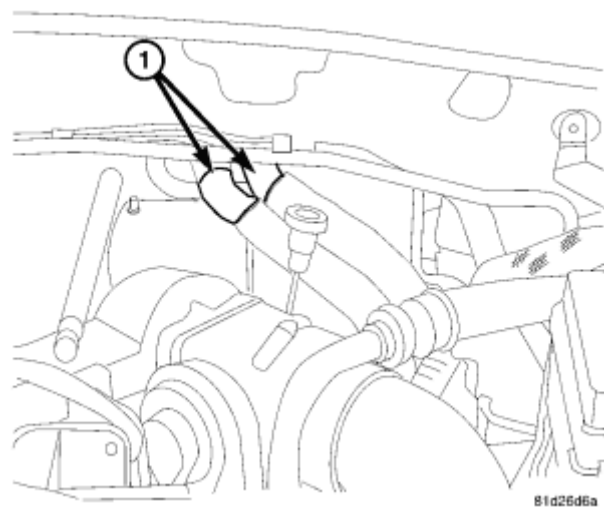
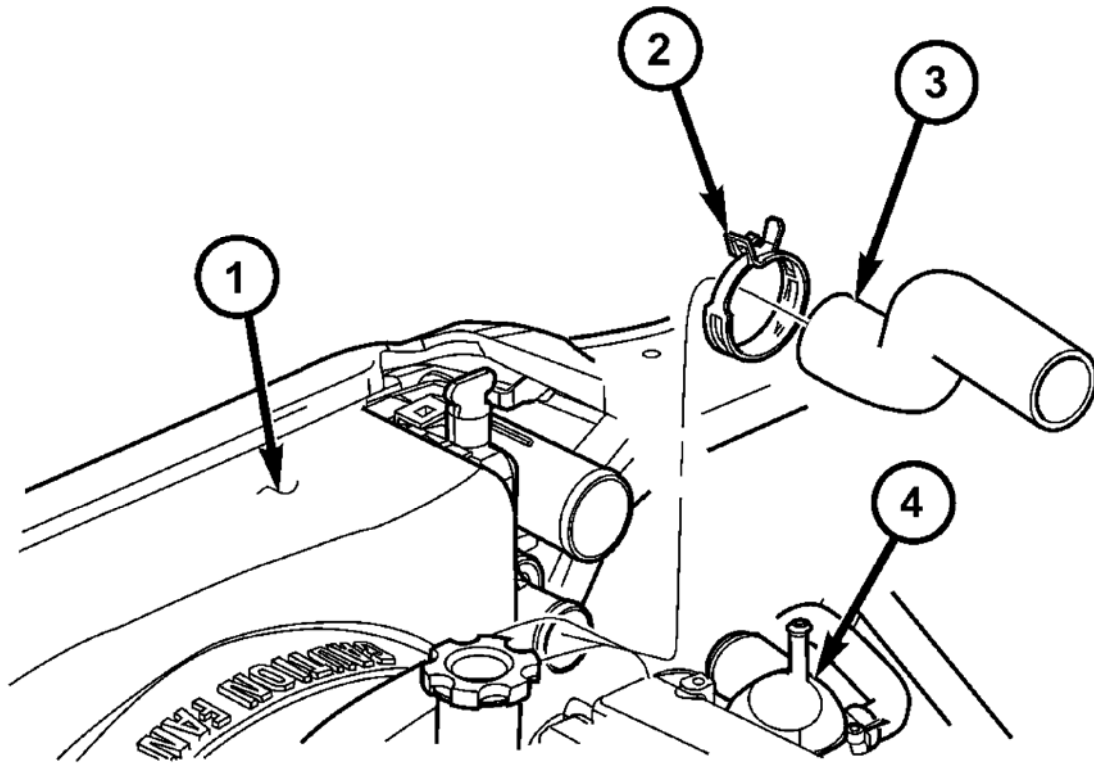


Fig. 41: Heater Core Return Hoses
Courtesy of CHRYSLER LLC

1. Drain cooling system. See **STANDARD PROCEDURE**.
2. Remove engine cover from engine. Refer to **REMOVAL** .
3. Disconnect heater core supply line at heater core and viscous heater. Remove hose from vehicle.
4. Disconnect heater core return line (5) from heater core and EGR cooler. Remove hose from vehicle.

REMOVAL-UPPER HOSE-2.8L DIESEL



80cd9deb

Fig. 42: Upper Radiator Hose
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FAN SHROUD
2 - HOSE CLAMP
3 - UPPER RADIATOR HOSE
4 - THERMOSTAT HOUSING |
|---|

1. Drain cooling system. See **STANDARD PROCEDURE**.
2. Disconnect upper radiator hose (3) from thermostat housing.
3. Disconnect upper radiator hose from radiator and remove from vehicle.

INSTALLATION

INSTALLATION

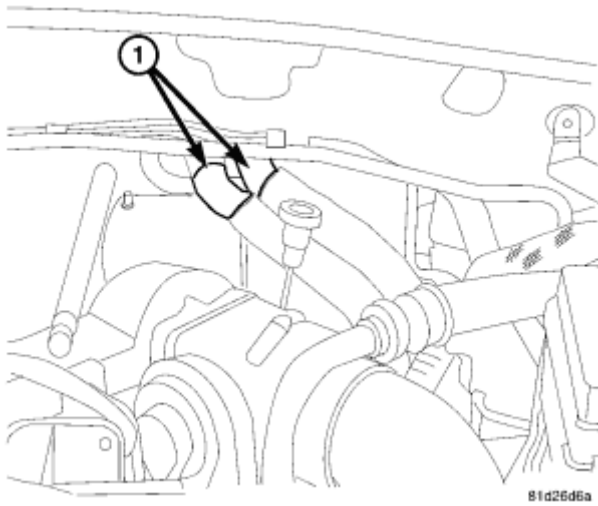
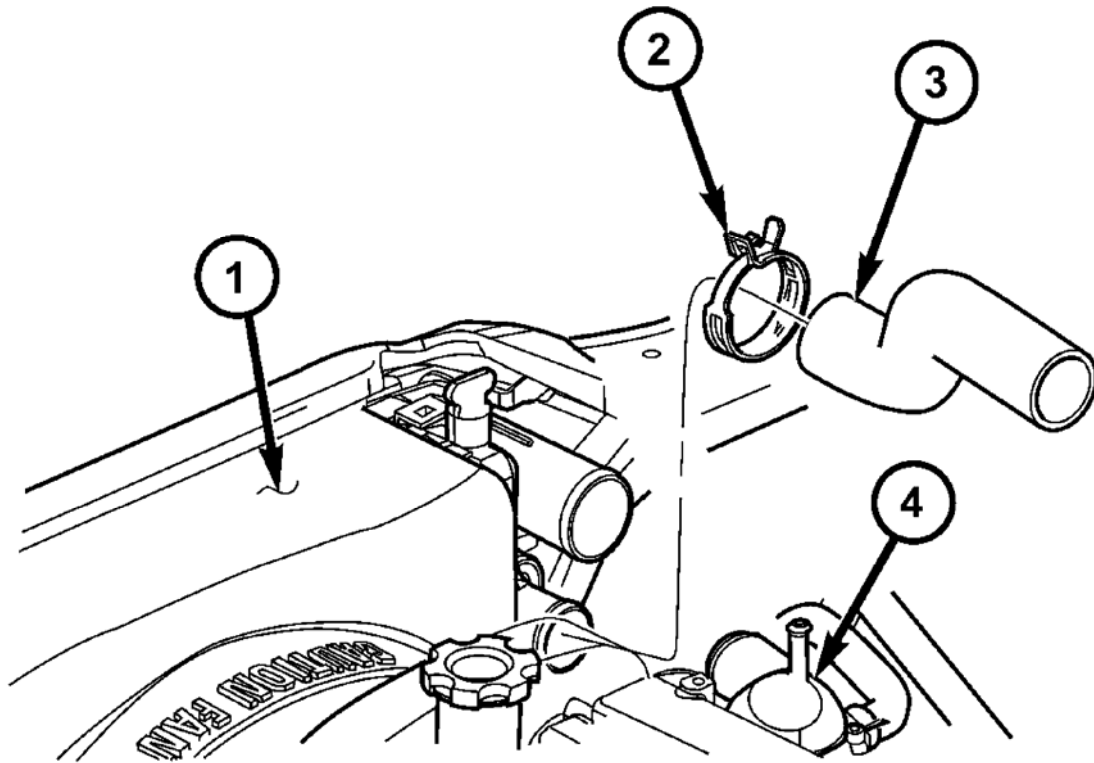


Fig. 43: Heater Core Return Hoses
Courtesy of CHRYSLER LLC

1. Connect heater core supply hose to heater core and viscous heater. Position hose clamps into proper position.
2. Connect heater core return hose to heater core and EGR cooler. Position hose clamps into proper position.
3. Install engine cover to engine. Refer to **INSTALLATION**.
4. Refill cooling system. See **STANDARD PROCEDURE**.

INSTALLATION-UPPER HOSE-2.8L DIESEL



80cd9deb

Fig. 44: Upper Radiator Hose
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FAN SHROUD
2 - HOSE CLAMP
3 - UPPER RADIATOR HOSE
4 - THERMOSTAT HOUSING |
|---|

1. Install upper radiator hose on radiator and thermostat housing.
2. Reposition hose clamps in proper position.
3. Refill cooling system to proper level. See **STANDARD PROCEDURE**.

HEATER-ENGINE BLOCK

DESCRIPTION

DESCRIPTION

The block heater is operated by ordinary house current (110 Volt A.C.) through a power cord and connector located in the engine compartment. The heater is mounted in a core hole (in place of a core hole plug) in the engine block, with the heating element immersed in coolant.

CAUTION: The power cord must be secured in its retainer clips, and not positioned so it could contact linkages or exhaust manifolds and become damaged.

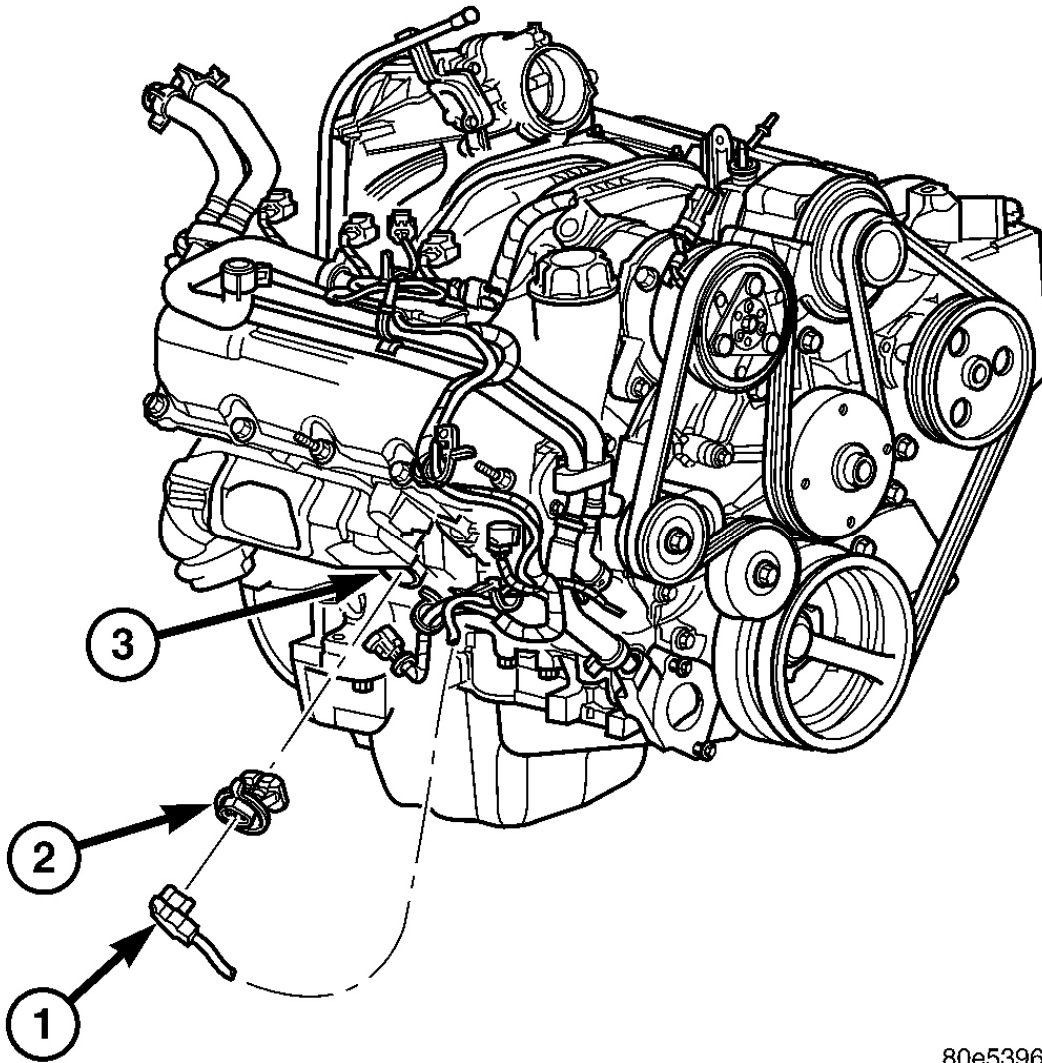
OPERATION

OPERATION

The block heater element is submerged in the cooling system's coolant. When electrical power (110 volt A.C.) is applied to the element, it creates heat. This heat is transferred to the engine coolant. This provides easier engine starting and faster warm-up when vehicle is operated in areas having extremely low temperatures.

REMOVAL

REMOVAL-3.7L



80e53968

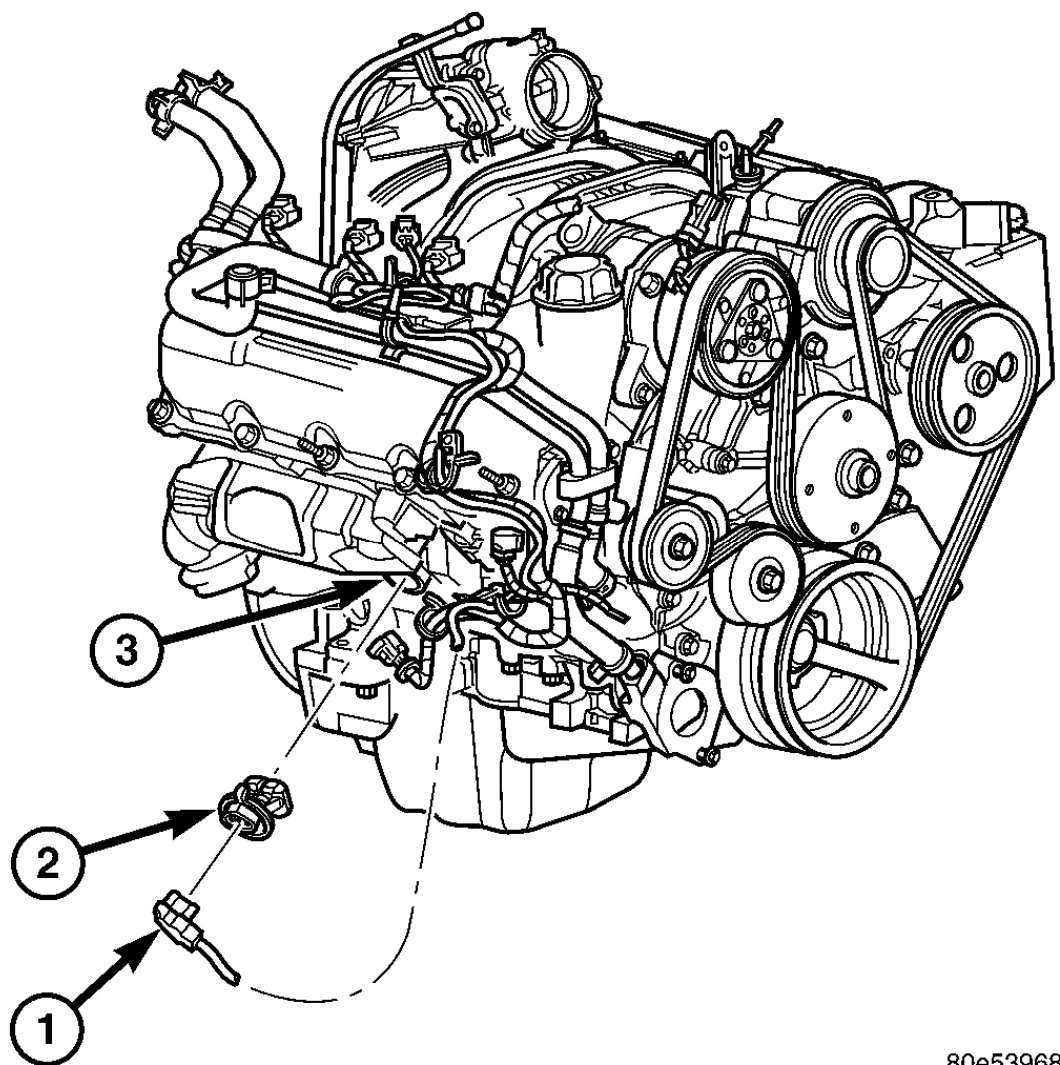
Fig. 45: Engine Block Heater 3.7L
Courtesy of CHRYSLER LLC

- 1 - POWER CORD
- 2 - BLOCK HEATER
- 3 - CORE HOLE

1. Drain cooling system. See **STANDARD PROCEDURE**.
2. Raise vehicle on hoist.
3. Detach power cord plug from heater.
4. Loosen screw in center of heater. Remove heater assembly.

INSTALLATION

INSTALLATION-3.7L



80e53968

Fig. 46: Engine Block Heater 3.7L
Courtesy of CHRYSLER LLC

- 1 - POWER CORD
- 2 - BLOCK HEATER
- 3 - CORE HOLE

1. Thoroughly clean core hole and heater seat.
2. Insert heater assembly (2) with element loop positioned **upward** .

3. With heater seated, tighten center screw securely to assure a positive seal.

CAUTION: To prevent damage, the power cord must be secured in its retaining clips, and not positioned so it could contact linkages or exhaust manifold.

4. Connect power cord to heater.
5. Lower vehicle.
6. Fill cooling system. See **STANDARD PROCEDURE**.

SENSOR-ENGINE COOLANT TEMPERATURE

DESCRIPTION

DESCRIPTION

The Engine Coolant Temperature (ECT) sensor is used to sense engine coolant temperature. The sensor protrudes into an engine water jacket.

The ECT sensor is a two-wire Negative Thermal Coefficient (NTC) sensor. Meaning, as engine coolant temperature increases, resistance (voltage) in the sensor decreases. As temperature decreases, resistance (voltage) in the sensor increases.

OPERATION

OPERATION

At key-on, the Powertrain Control Module (PCM) sends out a regulated 5 volt signal to the ECT sensor. The PCM then monitors the signal as it passes through the ECT sensor to the sensor ground (sensor return).

When the engine is cold, the PCM will operate in Open Loop cycle. It will demand slightly richer air-fuel mixtures and higher idle speeds. This is done until normal operating temperatures are reached.

The PCM uses inputs from the ECT sensor for the following calculations:

- for engine coolant temperature gauge operation through the bus communications

- Injector pulse-width

- Spark-advance curves

- ASD relay shut-down times

- Idle Air Control (IAC) motor key-on steps

- Pulse-width prime-shot during cranking

- O2 sensor closed loop times

- Purge solenoid on/off times

- EGR solenoid on/off times (if equipped)

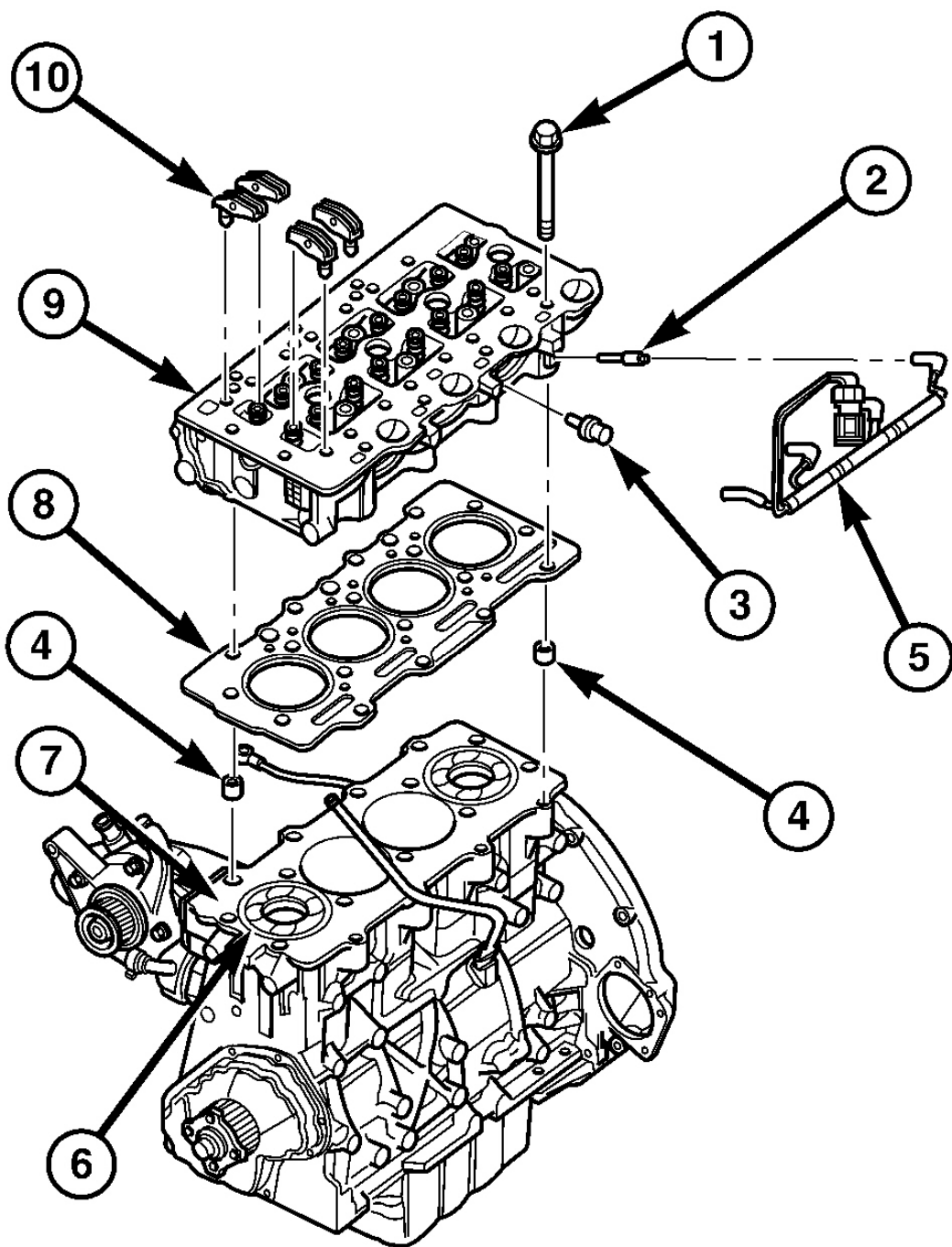
Leak Detection Pump operation (if equipped)

Radiator fan relay on/off times (if equipped)

Target idle speed

REMOVAL

REMOVAL-2.8L DIESEL



80d368c5

Fig. 47: Cylinder Head Assembly
Courtesy of CHRYSLER LLC

- 1 - CYLINDER HEAD BOLT
- 2 - GLOW PLUG
- 3 - COOLANT FITTING
- 4 - CYLINDER HEAD ALIGNMENT DOWEL
- 5 - GLOW PLUG HARNESS
- 6 - CYLINDER LINER
- 7 - CYLINDER BLOCK
- 8 - CYLINDER HEAD GASKET
- 9 - CYLINDER HEAD
- 10 - ROCKER ARM ASSEMBLIES

WARNING: Do not remove or loosen the coolant pressure/vent cap, cylinder block drain plugs, or the draincock when the system is hot and under pressure because serious burns from the coolant can occur.

1. Disconnect negative battery cable.
2. Drain the cooling system. See **STANDARD PROCEDURE**.
3. Disconnect coolant temperature sensor electrical connector.
4. Remove coolant temperature sensor (3) from cylinder head.

REMOVAL-3.7L ENGINE

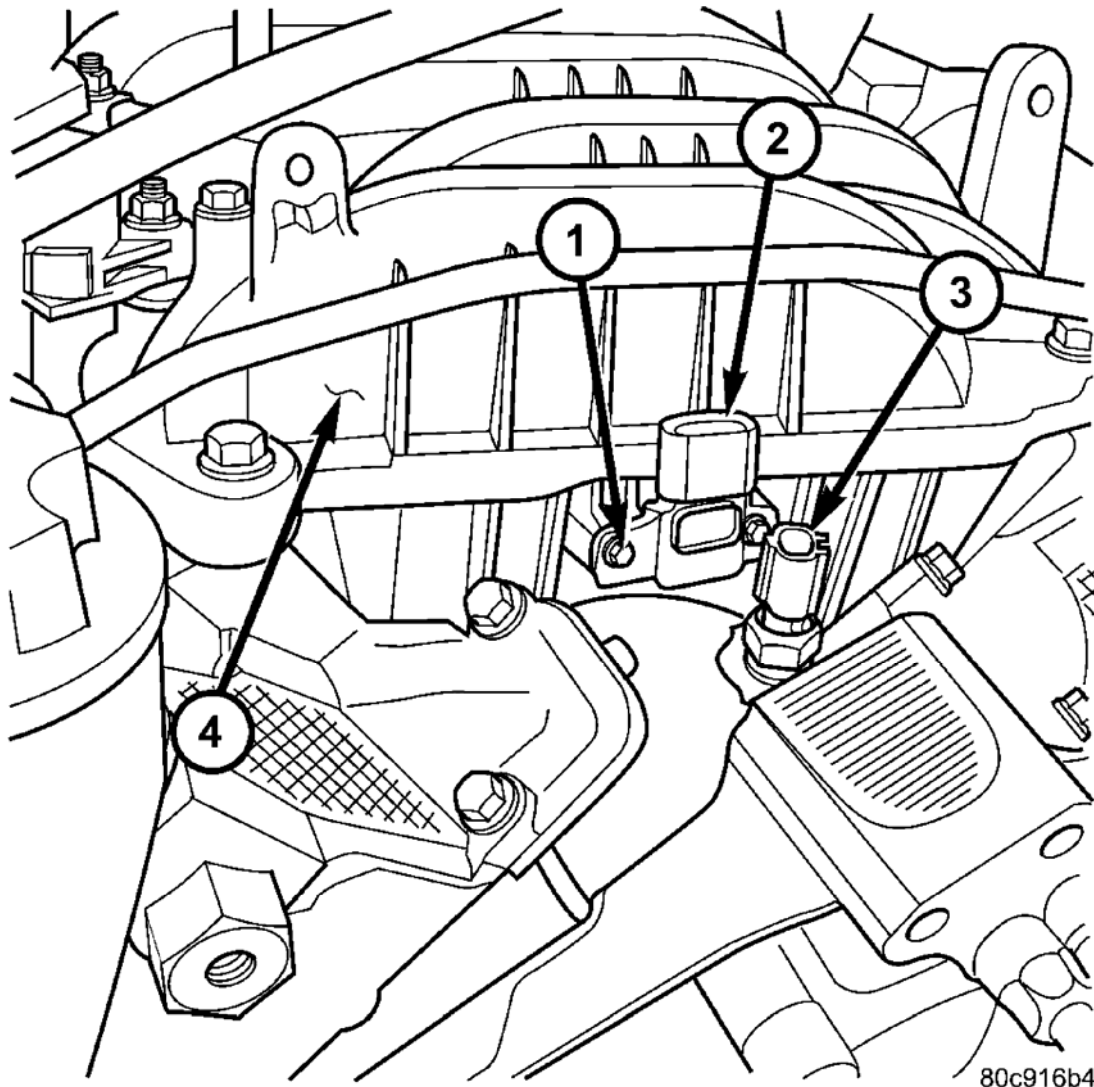


Fig. 48: Removing/Installing MAP Sensor/ECT Sensor
Courtesy of CHRYSLER LLC

- 1 - MOUNTING SCREWS
- 2 - MAP SENSOR
- 3 - ECT SENSOR
- 4 - FRONT OF INTAKE MANIFOLD

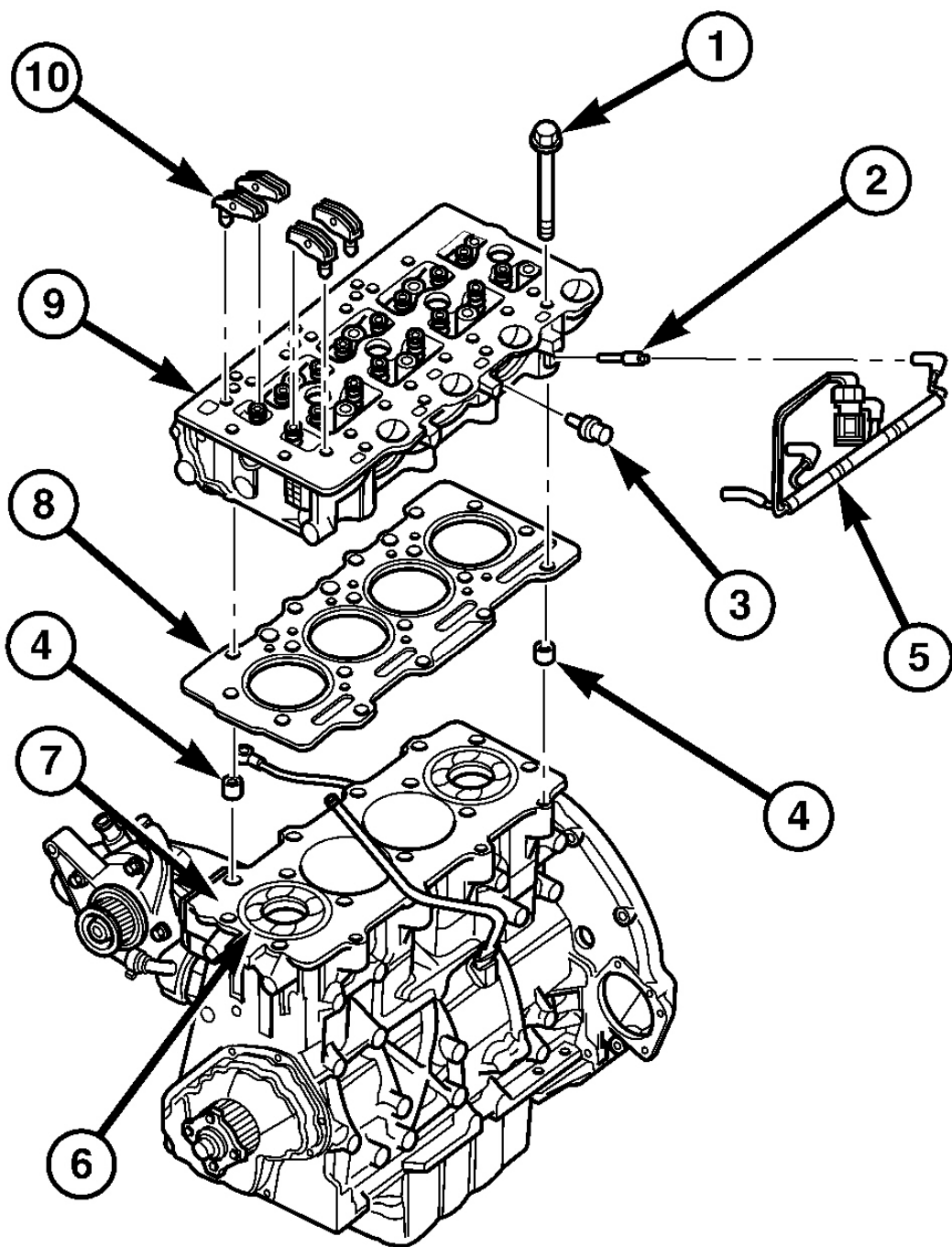
The Engine Coolant Temperature (ECT) sensor (3) is installed into a water jacket at front of intake manifold near rear of generator.

WARNING: Hot, pressurized coolant can cause injury by scalding. Cooling system must be partially drained before removing the coolant temperature sensor.

1. Partially drain cooling system.
2. Disconnect electrical connector from sensor.
3. Remove sensor from intake manifold.

INSTALLATION

ENGINE COOLANT TEMPERATURE SENSOR-INSTALLATION-2.8L DIESEL ENGINE



80d368c5

Fig. 49: Cylinder Head Assembly
Courtesy of CHRYSLER LLC

- 1 - CYLINDER HEAD BOLT
- 2 - GLOW PLUG
- 3 - COOLANT FITTING
- 4 - CYLINDER HEAD ALIGNMENT DOWEL
- 5 - GLOW PLUG HARNESS
- 6 - CYLINDER LINER
- 7 - CYLINDER BLOCK
- 8 - CYLINDER HEAD GASKET
- 9 - CYLINDER HEAD
- 10 - ROCKER ARM ASSEMBLIES

- 1. Install coolant temperature sensor in thermostat housing.
- 2. Connect coolant temperature sensor electrical connector.
- 3. Refill cooling system. See **STANDARD PROCEDURE**.
- 4. Connect negative battery cable.

INSTALLATION-3.7L ENGINE

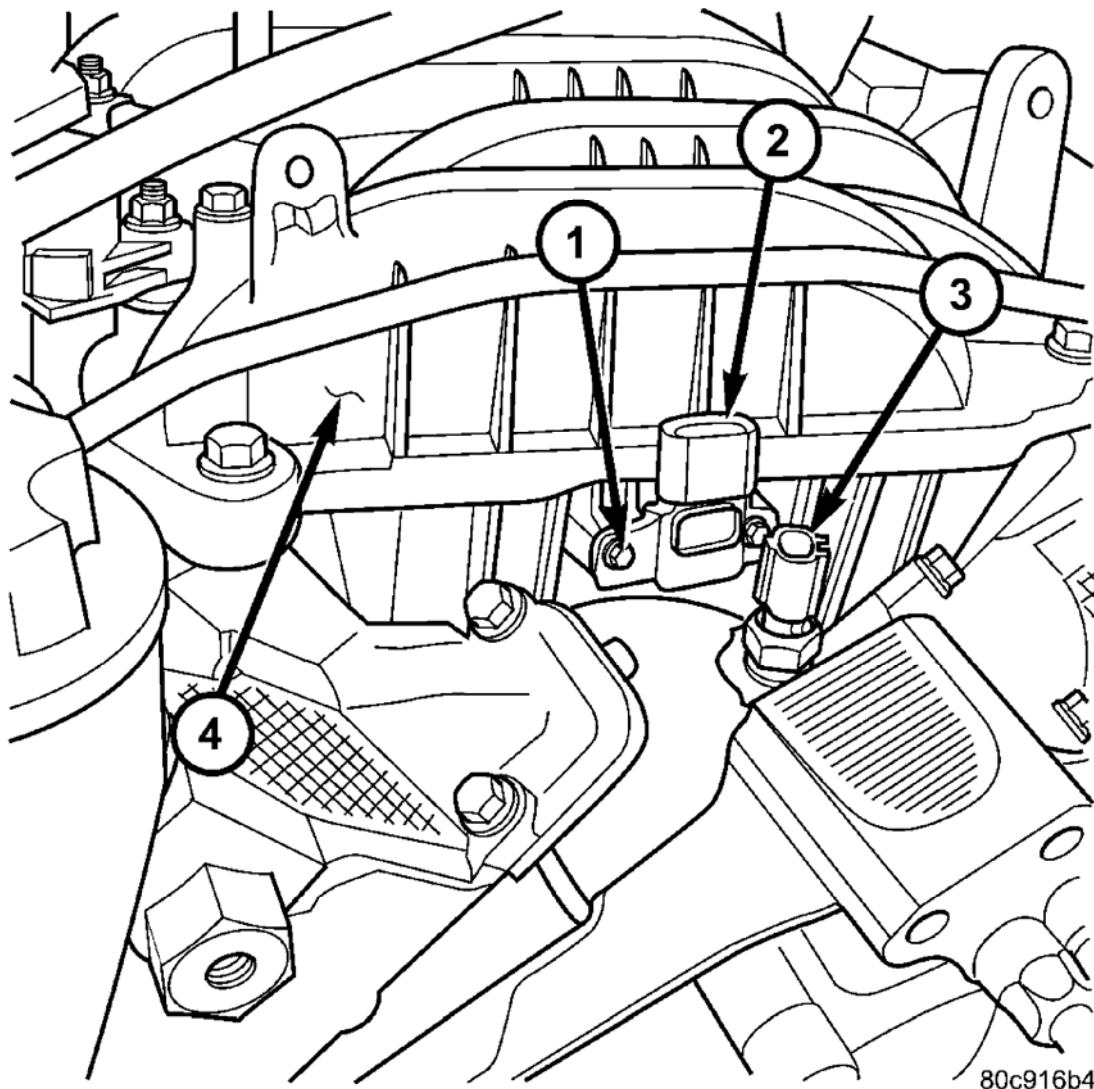


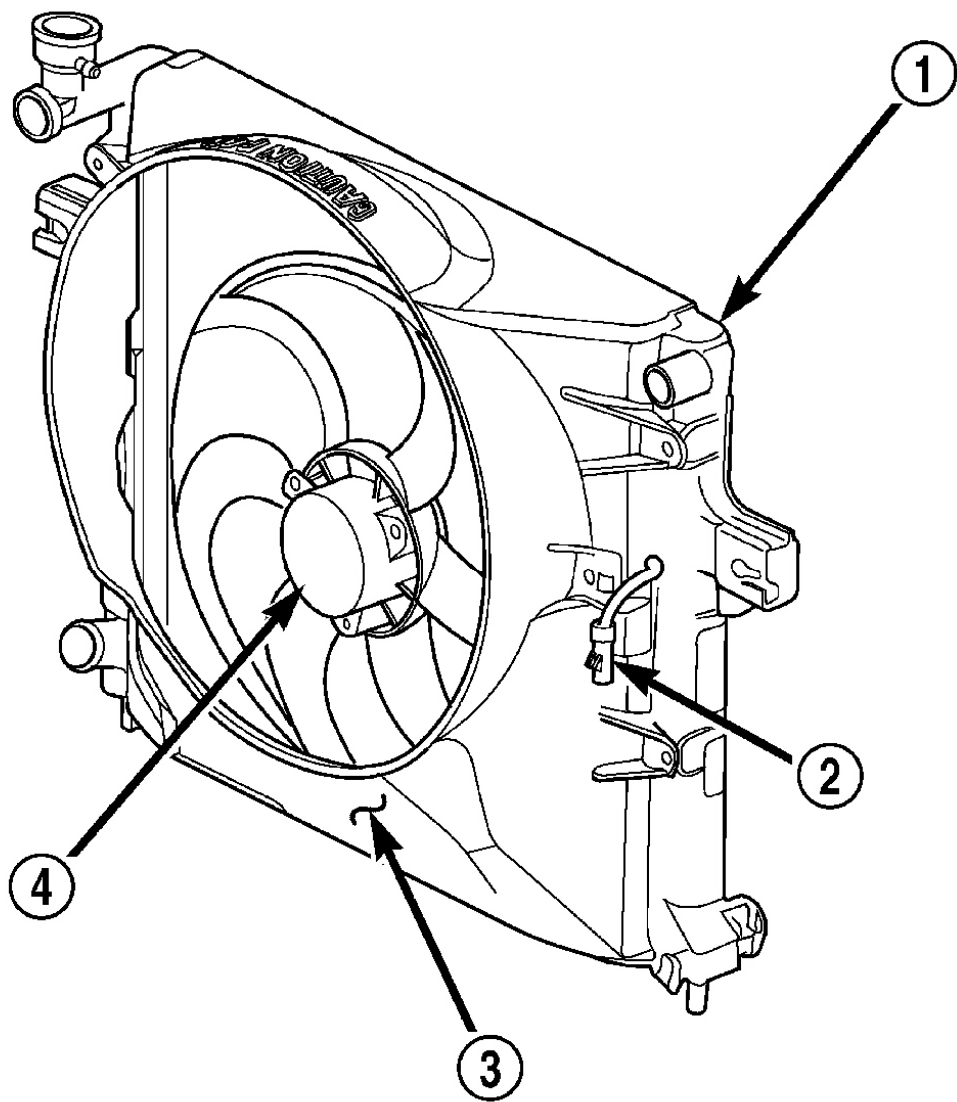
Fig. 50: Removing/Installing MAP Sensor/ECT Sensor
Courtesy of CHRYSLER LLC

- | |
|--|
| <ul style="list-style-type: none">1 - MOUNTING SCREWS2 - MAP SENSOR3 - ECT SENSOR4 - FRONT OF INTAKE MANIFOLD |
|--|

1. Apply thread sealant to sensor threads.
2. Install sensor to engine.
3. Tighten coolant temperature sensor to 11 N.m (8 ft. lbs.) torque.
4. Replace any lost engine coolant.

DESCRIPTION

DESCRIPTION



80b8991e

Fig. 51: Radiator Cooling Fan - Typical
Courtesy of CHRYSLER LLC

1 - RADIATOR
2 - ELECTRIC COOLING FAN CONNECTOR
3 - FAN SHROUD
4 - 2 SPEED ELECTRIC COOLING FAN

The fan (4) is electrically controlled by the Powertrain Control Module (PCM) through the fan control relays. The relays are located in the PDC in the engine compartment.

OPERATION

OPERATION

The electric radiator cooling fan is controlled by the Powertrain Control Module (PCM) through the radiator cooling fan relays. The PCM regulates fan operation based on input from the engine coolant temperature sensor, battery temperature sensor, air conditioning select switch and vehicle speed.

The fan is not energized during engine cranking regardless of the electrical input from the temperature sensors and air conditioning switch. However, if engine operation conditions warrant fan engagement, the fan will run once engine starts.

On vehicles NOT equipped with AC: The relay is energized when the coolant temperature is above 80° C (176° F), or battery temperature sensor above -12° C (10° F). It will then de-energize when coolant temperature drops below 82° C (180° F), or battery temperature sensor below -9° C (16° F).

Vehicles Equipped with AC: In addition to using coolant temperature and battery temperature sensor to control cooling fan operation, the cooling fan will also be engaged when the, air conditioning system is activated. The relay is also energized when air conditioning is selected and coolant temperature is above 95° C (203° F), or, air conditioning is selected and battery temperature sensor is above 41° C (106° F). It will then de-energize when air conditioning is selected and coolant temperature is below 92° C (198° F), or air conditioning is selected and battery temperature is below 38° C (100° F).

REMOVAL

REMOVAL

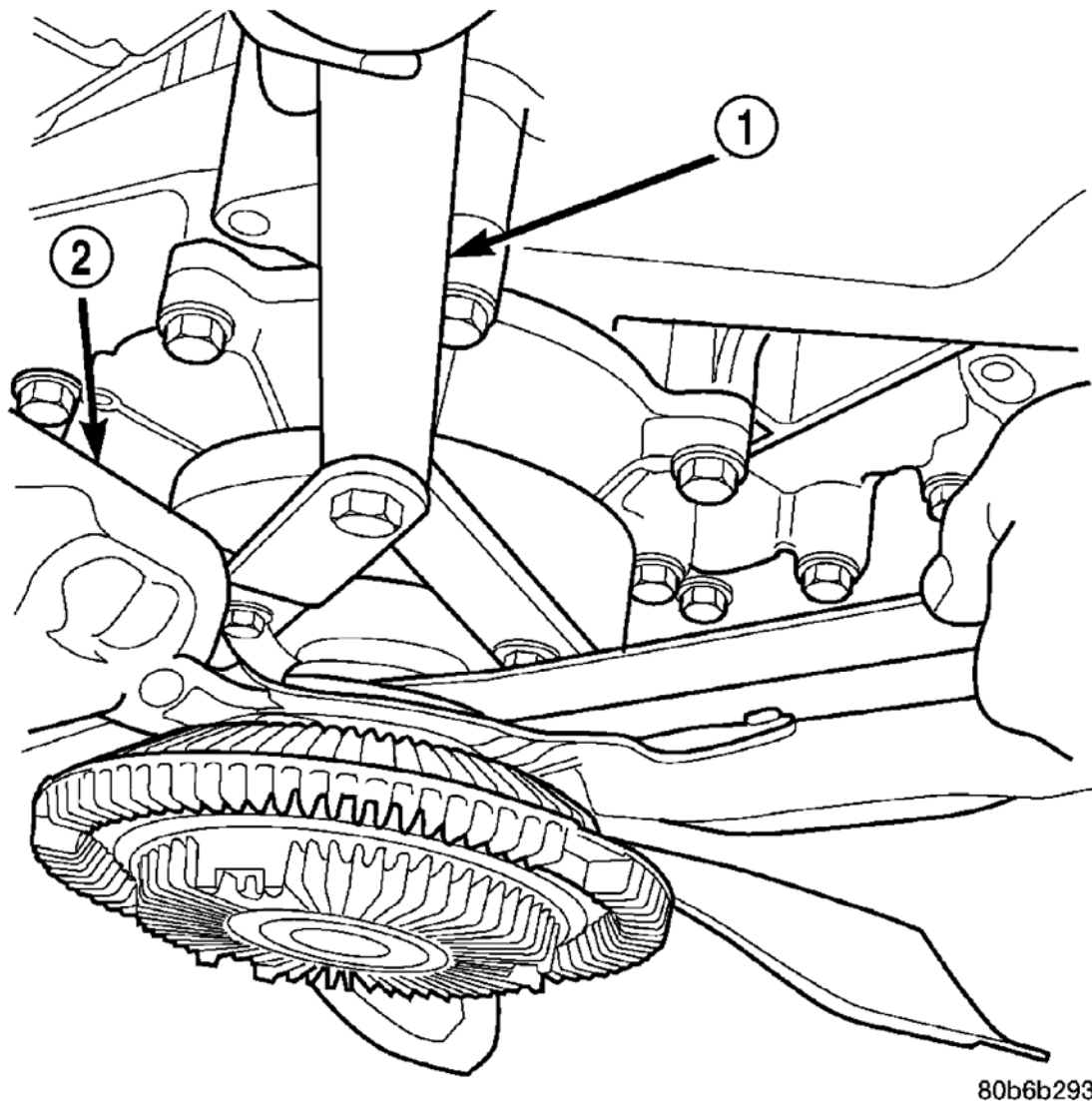


Fig. 52: Removing Viscous Fan and Fan Drive - 3.7L/4.7L/5.7L
Courtesy of CHRYSLER LLC

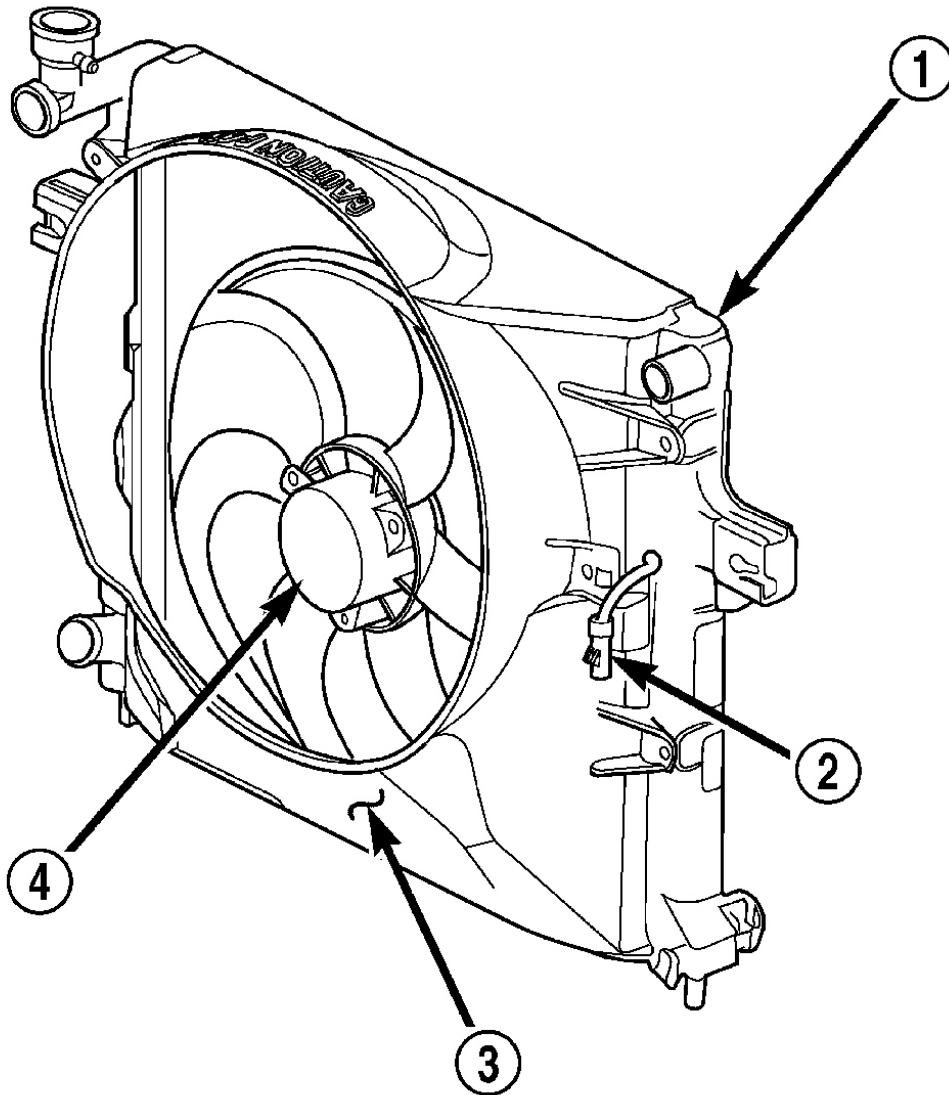
- | |
|--|
| 1 - SPECIAL TOOL 6958 SPANNER WRENCH WITH ADAPTER PINS 8346
2 - FAN |
|--|

If the fan blade is bent, warped, cracked or damaged in any way, it must be replaced **only** with a replacement fan blade. **Do not attempt to repair a damaged fan blade.**

NOTE: For 3.7L Heavy Duty/Max Cool/Trailer Tow cooling package, the viscous fan cannot be removed separate from the shroud. Both fan and shroud must be removed together.

1. Disconnect battery negative cable.

2. Using special tool 6958 spanner wrench and 8346 adapters, remove the viscous fan from the water pump.
See **Fig. 52**.



80b8991e

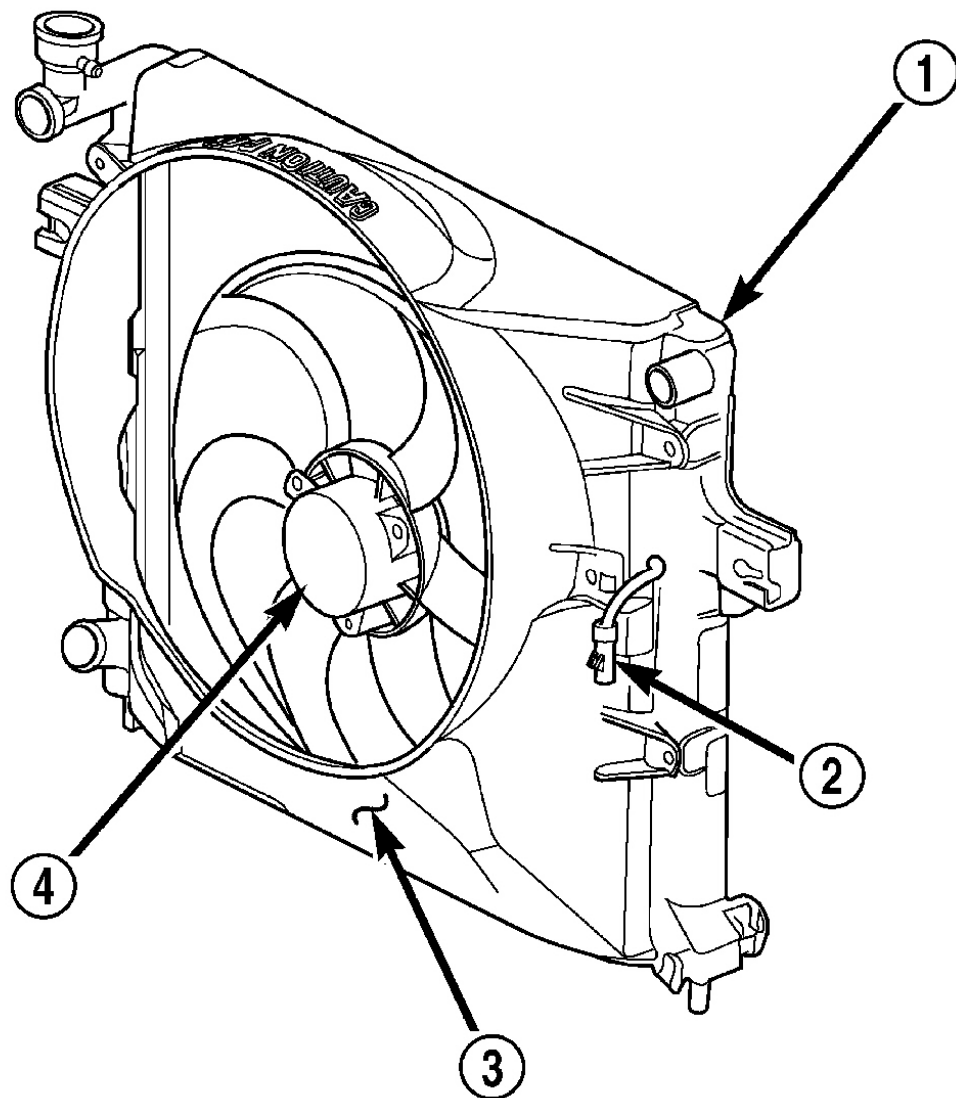
Fig. 53: Radiator Cooling Fan - Typical
Courtesy of CHRYSLER LLC

1 - RADIATOR
2 - ELECTRIC COOLING FAN CONNECTOR
3 - FAN SHROUD
4 - 2 SPEED ELECTRIC COOLING FAN

3. Gently lay fan into shroud.
4. Disconnect the electrical connector (2) for the electric fan, then disconnect connector from shroud.
5. Remove the two fan shroud mounting bolts connecting the fan shroud to the radiator. See **Fig. 53**.
6. Remove the shroud and fan from the vehicle.

INSTALLATION

INSTALLATION



80b8991e

Fig. 54: Radiator Cooling Fan - Typical
Courtesy of CHRYSLER LLC

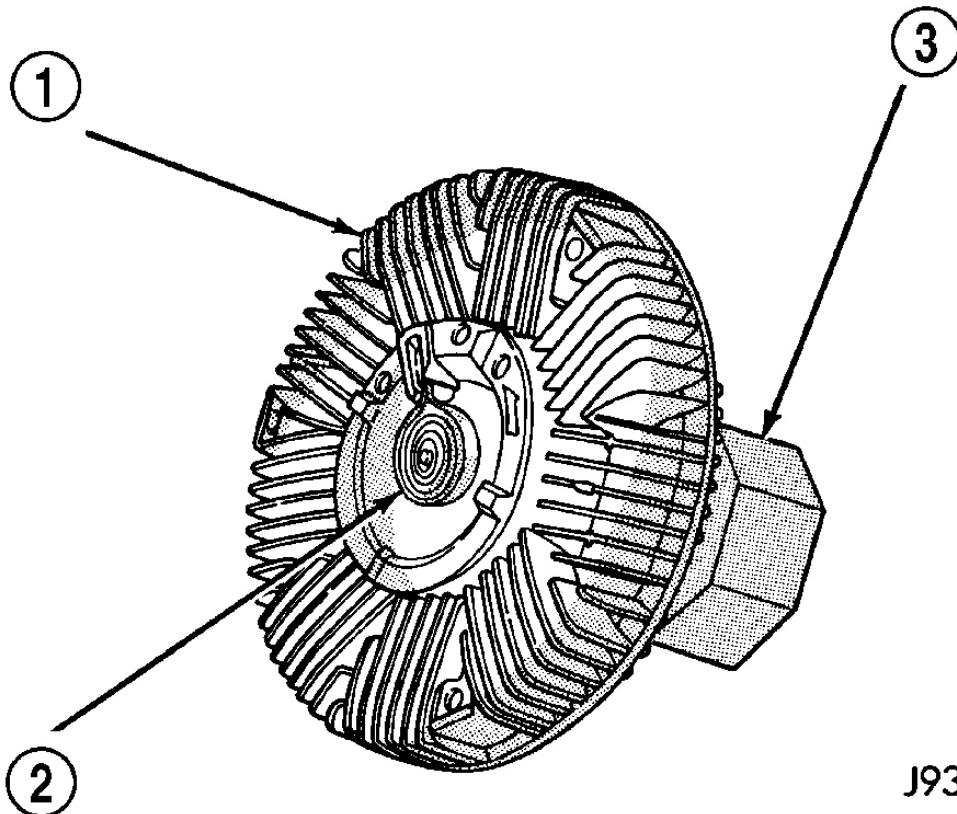
1 - RADIATOR
2 - ELECTRIC COOLING FAN CONNECTOR
3 - FAN SHROUD
4 - 2 SPEED ELECTRIC COOLING FAN

1. Install fan shroud assembly into the vehicle. Tighten fan shroud to radiator bolts to (5.5 N.m (50 in. lbs.).
2. Install shroud mounting bolts tighten bolts to 10 N.m (89 in. lbs.).
3. Connect fan motor wire connector to harness connector, and attach connector to shroud.
4. Connect battery negative cable.
5. Start engine and check fan operation.

FAN-VISCOUS RADIATOR

DESCRIPTION

DESCRIPTION



J9307-31

Fig. 55: Locating Viscous Fan Drive Components - Typical
 Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - VISCOUS FAN DRIVE
2 - THERMOSTATIC SPRING
3 - MOUNTING NUT TO WATER PUMP HUB |
|--|

CAUTION: If the viscous fan drive is replaced because of mechanical damage, the cooling fan blades should also be inspected. Inspect for fatigue cracks, loose blades, or loose rivets that could have resulted from excessive vibration. Replace fan blade assembly if any of these conditions are found. Also inspect water pump bearing and shaft assembly for any related damage due to a viscous fan drive malfunction.

The thermal viscous fan drive (1) is a silicone-fluid-filled coupling used to connect the fan blades to the water pump shaft. The coupling allows the fan to be driven in a normal manner. This is done at low engine speeds while limiting the top speed of the fan to a predetermined maximum level at higher engine speeds. See **Fig. 55**.

OPERATION

OPERATION

A thermostatic bimetallic spring coil is located on the front face of the viscous fan drive unit. This spring coil reacts to the temperature of the radiator discharge air. It engages the viscous fan drive for higher fan speed if the air temperature from the radiator rises above a certain point. Until additional engine cooling is necessary, **the fan will remain at a reduced RPM regardless of engine speed. Normally less than 800 RPM.**

Only when sufficient heat is present, will the viscous fan drive engage. This is when the air flowing through the radiator core causes a reaction to the bimetallic coil. It then increases fan speed to provide the necessary additional engine cooling.

Once the engine has cooled, the radiator discharge temperature will drop. The bimetallic coil again reacts and the fan speed is reduced to the previous disengaged speed.

DIAGNOSIS AND TESTING

VISCOUS RADIATOR FAN

If the fan assembly free-wheels without drag (the fan blades will revolve more than five turns when spun by hand), replace the fan drive. This spin test must be performed when the engine is cool.

For the following test, the cooling system must be in good condition. It also will ensure against excessively high coolant temperature.

WARNING: Be sure that there is adequate fan blade clearance before drilling.

1. Drill a 3.18-mm (1/8-in) diameter hole in the top center of the fan shroud.
2. Obtain a dial thermometer with an 8 inch stem (or equivalent). It should have a range of -18° to 105°C (0°

to 220° F). Insert thermometer through the hole in the shroud. Be sure that there is adequate clearance from the fan blades.

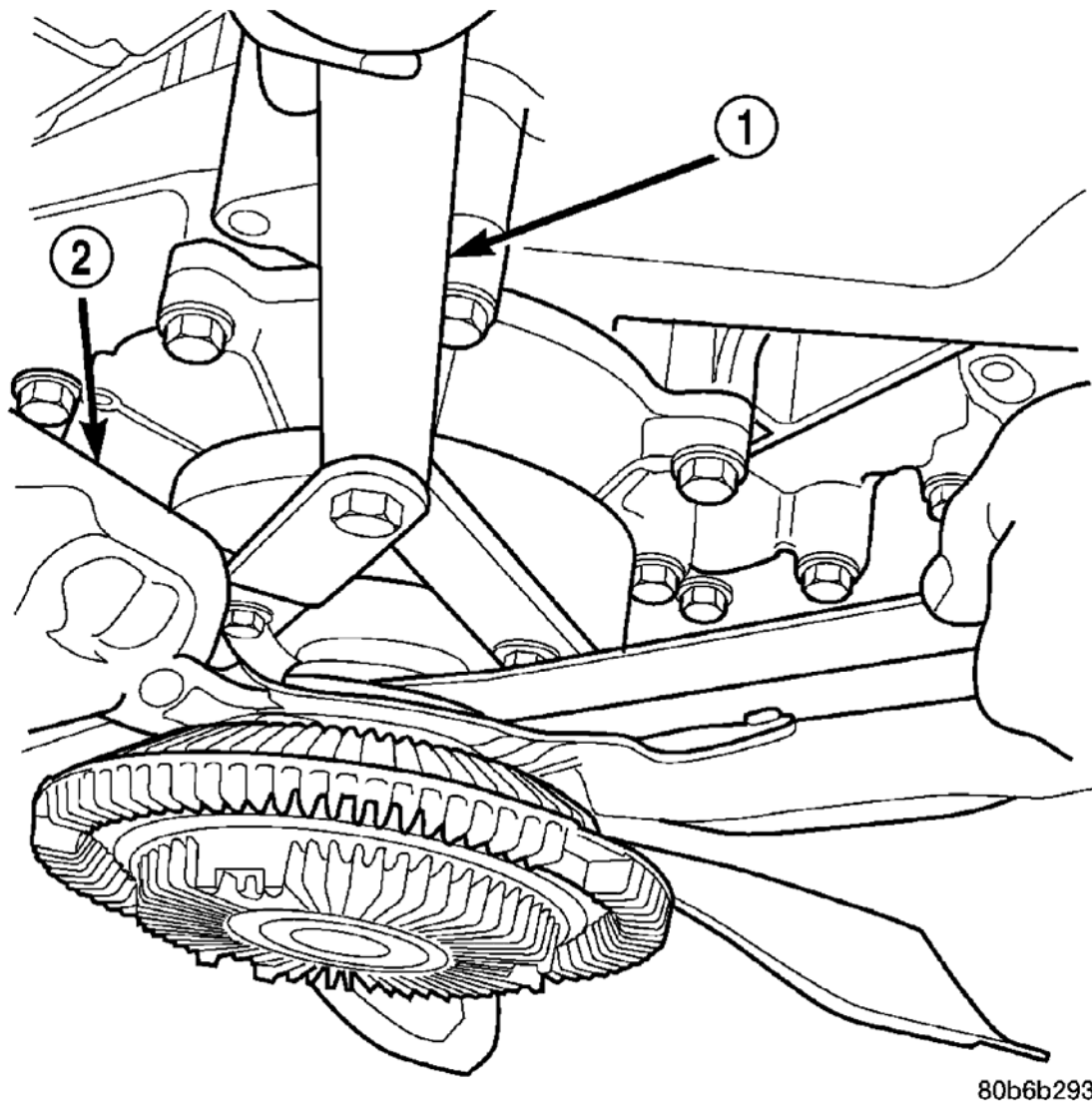
3. Connect a tachometer and an engine ignition timing light (timing light is to be used as a strobe light).
4. Block the air flow through the radiator. Secure a sheet of plastic in front of the radiator (or air conditioner condenser). Use tape at the top to secure the plastic and be sure that the air flow is blocked.
5. Be sure that the air conditioner (if equipped) is turned off.

WARNING: Use extreme caution when the engine is operating. Do not stand in a direct line with the fan. Do not put your hands near the pulleys, belts or fan. Do not wear loose clothing.

6. Start the engine and operate at 2400 RPM. Within ten minutes the air temperature (indicated on the dial thermometer) should be up to 93° C (200° F). Fan drive **engagement** should have started to occur at between 91° to 96° C (195° to 205° F). Engagement is distinguishable by a definite **increase** in fan flow noise (roaring). The timing light also will indicate an increase in the speed of the fan.
7. When the air temperature reaches 93° C (200° F), remove the plastic sheet. Fan drive **disengagement** should have started to occur at between 62° to 85° C (145° to 185° F). A definite **decrease** of fan flow noise (roaring) should be noticed. If not, replace the defective viscous fan drive unit.

REMOVAL

REMOVAL-2.8L DIESEL



80b6b293

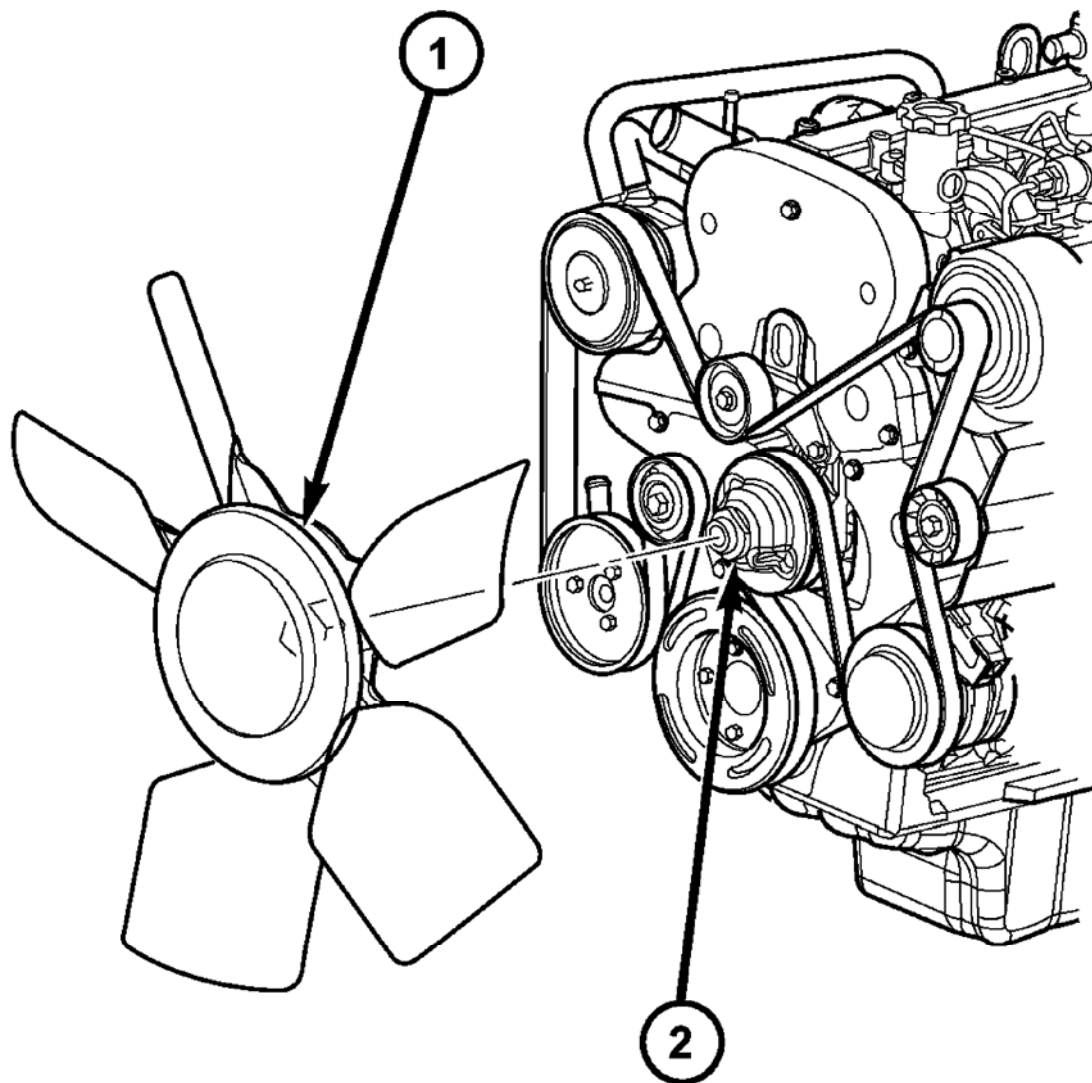
Fig. 56: Fan Drive Viscous Clutch - Typical
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 6958 SPANNER WRENCH 2 - FAN

1. Disconnect negative battery cable.

NOTE: **The thermal viscous fan drive/fan blade assembly is attached (threaded) to fan support.**

2. Remove fan blade/viscous fan drive assembly from water pump using special tool 6958 spanner wrench, by turning mounting nut counterclockwise as viewed from front. Threads on viscous fan drive are **RIGHT HAND**.

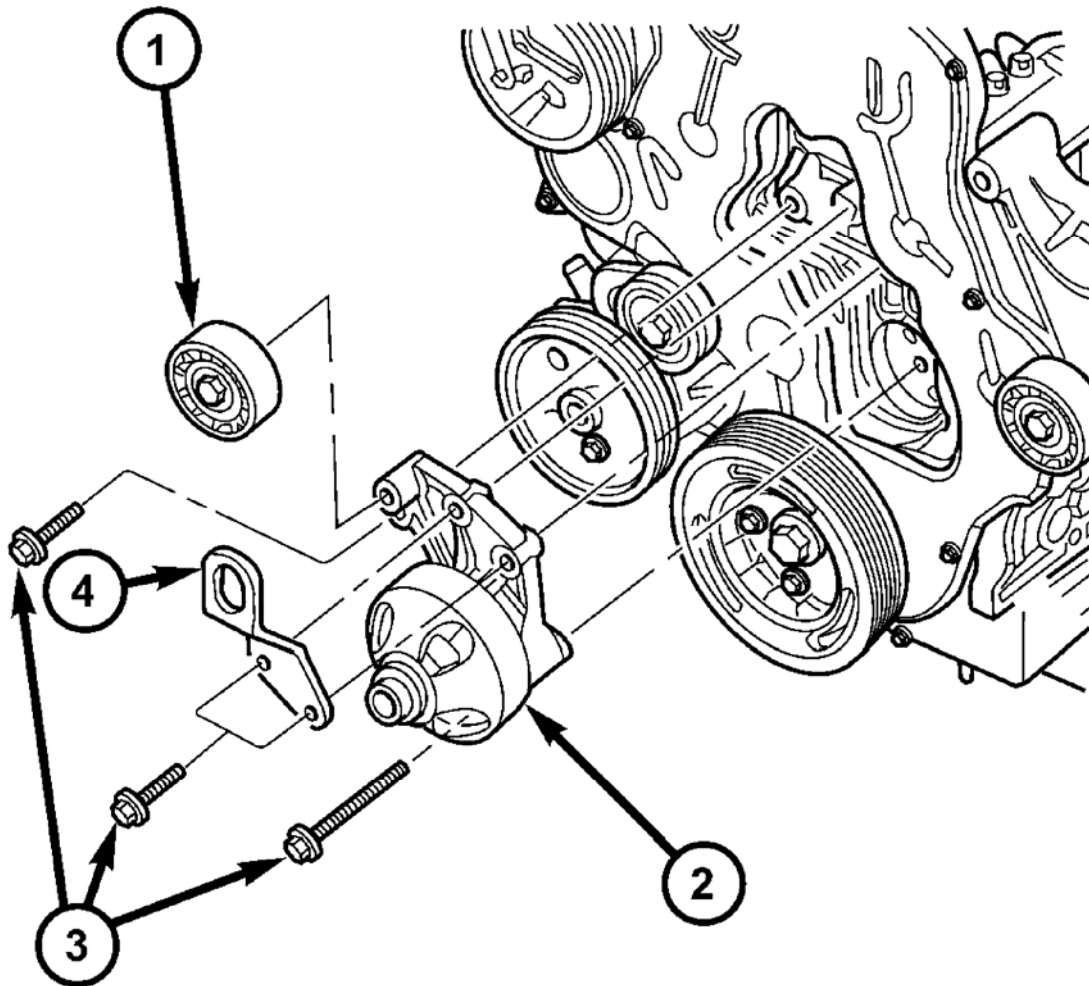


80cda6e4

Fig. 57: Cooling Fan & Viscous Clutch
Courtesy of CHRYSLER LLC

1 - COOLING FAN AND FAN DRIVE VISCOUS CLUTCH ASSEMBLY 2 - FAN SUPPORT

3. Do not attempt to remove fan/fan drive viscous clutch assembly (1) from vehicle at this time.
4. Do not unbolt fan blade assembly from fan drive viscous clutch at this time.



80cb41ec

Fig. 58: Cooling Fan Support
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - IDLER PULLEY
2 - COOLING FAN SUPPORT
3 - RETAINING BOLTS
4 - ENGINE LIFT HOOK |
|--|

5. Remove fan shroud to radiator bolts.
6. Remove fan shroud and fan blade/fan drive viscous clutch assembly as a complete unit from vehicle.
7. After removing fan blade/fan drive viscous clutch assembly, **do not** place viscous clutch in horizontal position. If stored horizontally, silicone fluid in the fan drive viscous clutch could drain into its bearing assembly and contaminate lubricant.
8. Remove four bolts securing fan blade assembly to fan drive viscous clutch.
9. Remove cooling fan support (2) from engine block.

REMOVAL-3.7L/4.0L

1. Partially drain the cooling system. See **STANDARD PROCEDURE**.
2. Remove the upper radiator hose.
3. Remove the air filter housing assembly. Refer to **REMOVAL** .

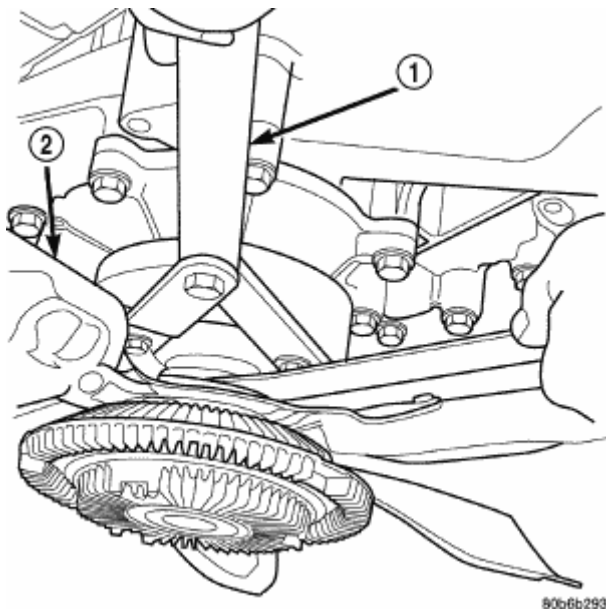


Fig. 59: Using Tool 6958 And Adapter Pins 8346 To Remove Fan/Viscous Fan Drive Assembly From Water Pump

Courtesy of CHRYSLER LLC

4. Using Tool 6958 and adapter pins 8346 (1), remove fan/viscous fan drive assembly from water pump. Do not attempt to remove fan/viscous fan drive assembly from vehicle at this time.
5. Position the fan/fan drive assembly in the radiator shroud.
6. Remove the two shroud mounting screws.
7. Remove the radiator shroud and fan drive assembly.
8. After removing fan blade/viscous fan drive assembly, **do not** place viscous fan drive in horizontal position. If stored horizontally, silicone fluid in the viscous fan drive could drain into its bearing assembly and contaminate lubricant.
9. Remove four bolts securing fan blade assembly to viscous fan drive.

CLEANING

CLEANING

Clean the fan blades using a mild soap and water. Do not use an abrasive to clean the blades.

INSPECTION

INSPECTION

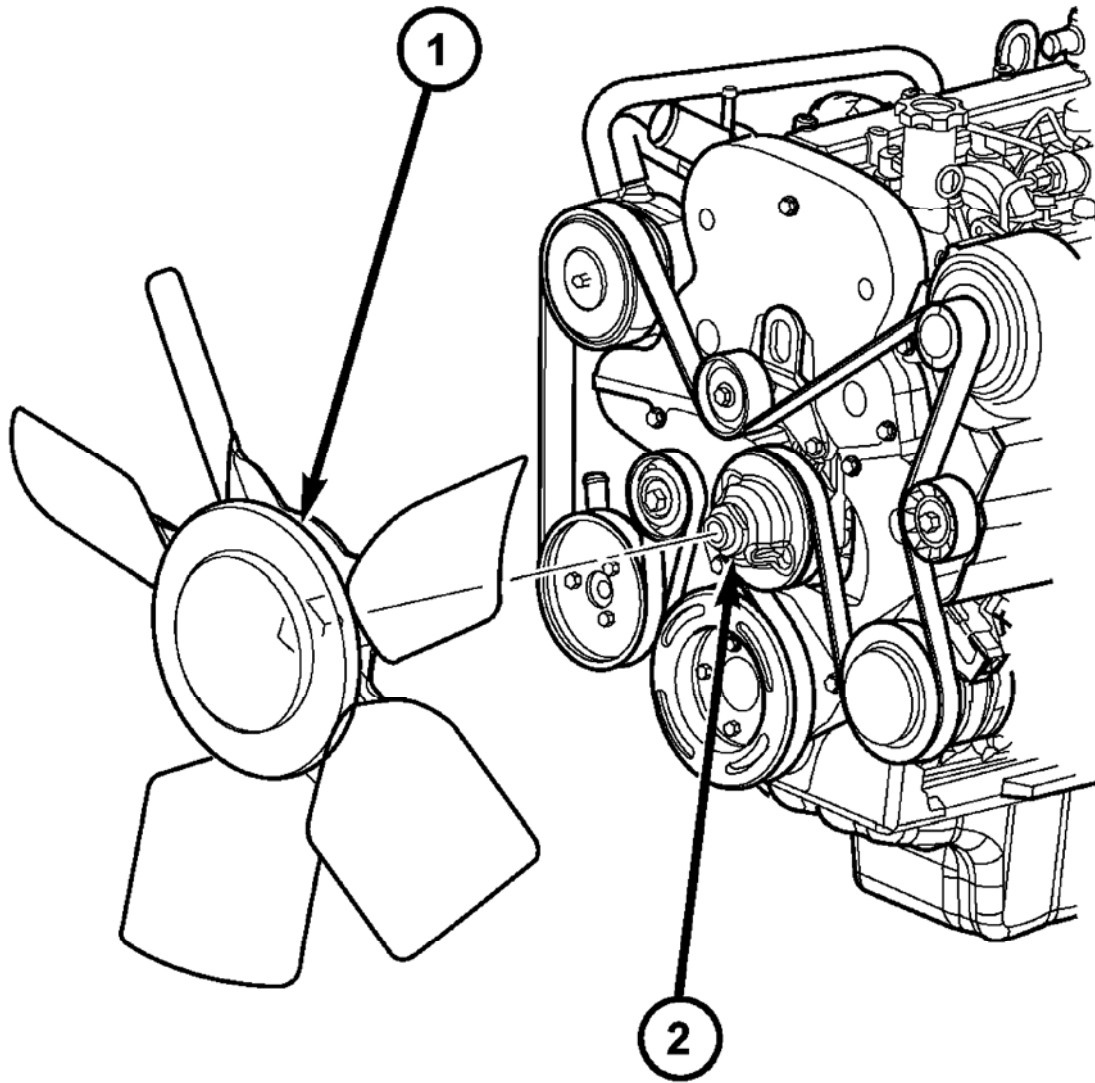
WARNING: Do not attempt to bend or straighten fan blades if fan is not within specifications.

CAUTION: If fan blade assembly is replaced because of mechanical damage, water pump and viscous fan drive should also be inspected. These components could have been damaged due to excessive vibration.

1. Remove fan blade assembly from viscous fan drive unit (four bolts).
2. Lay fan on a flat surface with leading edge facing down. With tip of blade touching flat surface, replace fan if clearance between opposite blade and surface is greater than 2.0 mm (.090 inch). Rocking motion of opposite blades should not exceed 2.0 mm (.090 inch). Test all blades in this manner.
3. Inspect fan assembly for cracks, bends, loose rivets or broken welds. Replace fan if any damage is found.

INSTALLATION

INSTALLATION-2.8L DIESEL



80cda6e4

Fig. 60: Cooling Fan & Viscous Clutch
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - COOLING FAN AND FAN DRIVE VISCOUS CLUTCH ASSEMBLY
2 - FAN SUPPORT |
|--|

1. Assemble fan blade to viscous fan drive. Tighten mounting bolts to 23.7 N.m (210 in. lbs.) torque.

NOTE: **The viscous fan and fan shroud must be installed as an assembly.**

2. Gently lay fan and viscous drive into fan shroud.

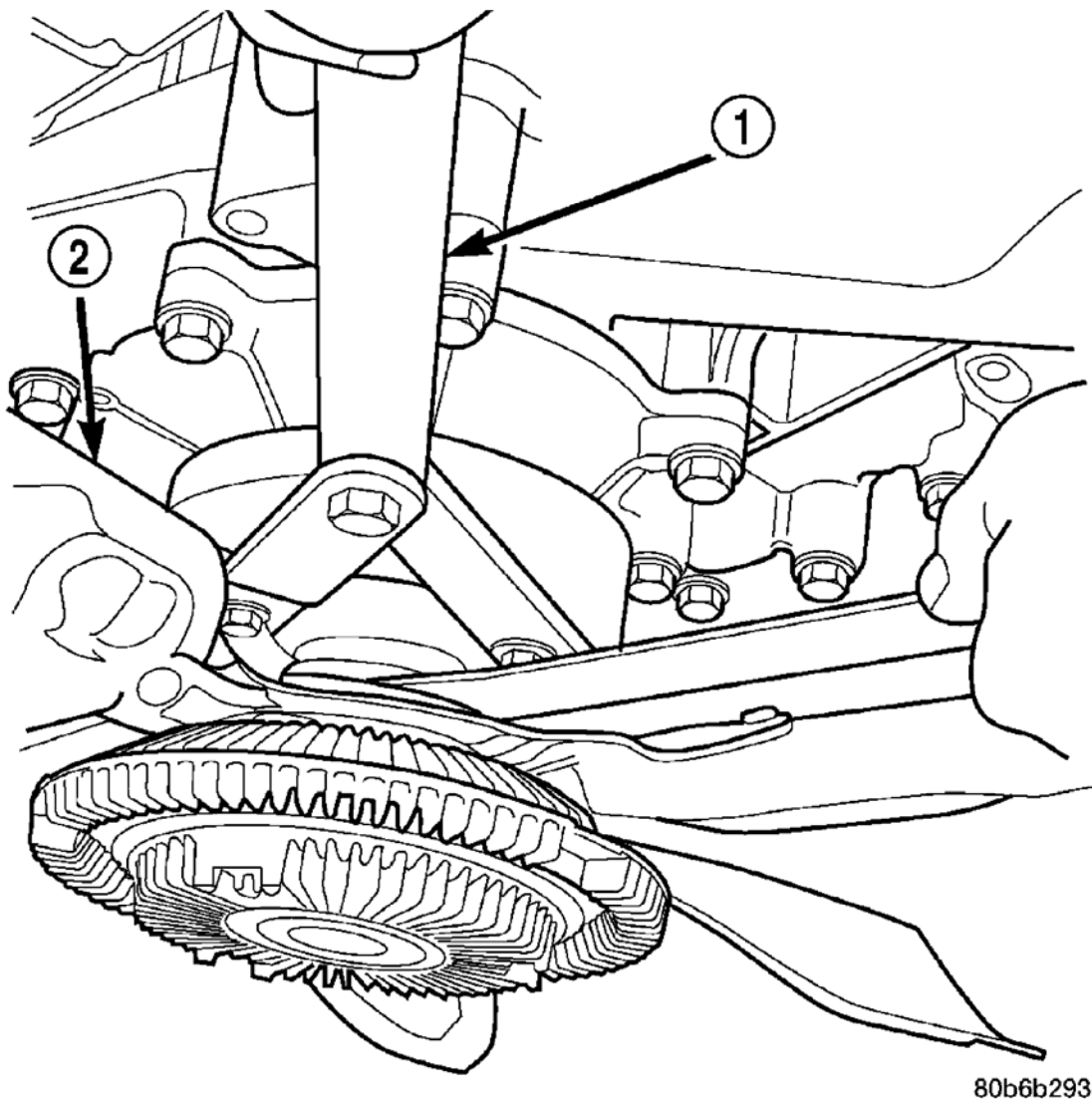
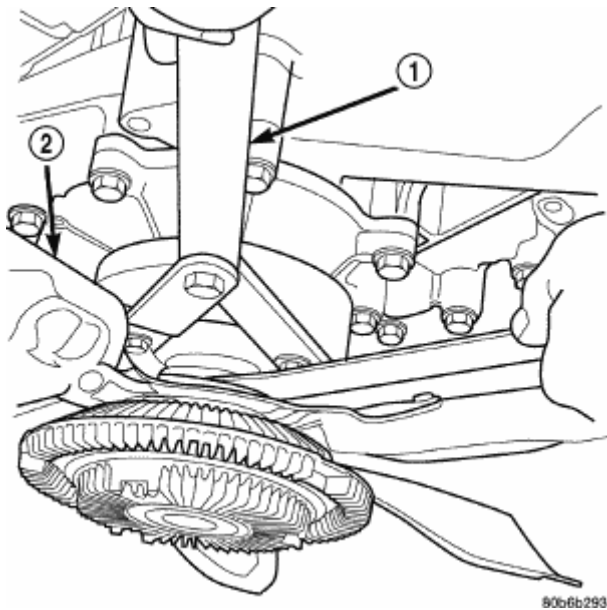


Fig. 61: Fan Drive Viscous Clutch - Typical
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 6958 SPANNER WRENCH 2 - FAN

3. Install the fan shroud to radiator mounting bolt. Tighten bolts to 9 N.m (80 in. lbs.) torque.
4. Thread the fan and viscous drive onto the fan support and tighten nut using special tool 6958 spanner wrench.
5. Install cooling fan support to engine block. Torque bolts to 149 N.m.(110 ft. lbs.).
6. Connect negative battery cable.



90c6b293

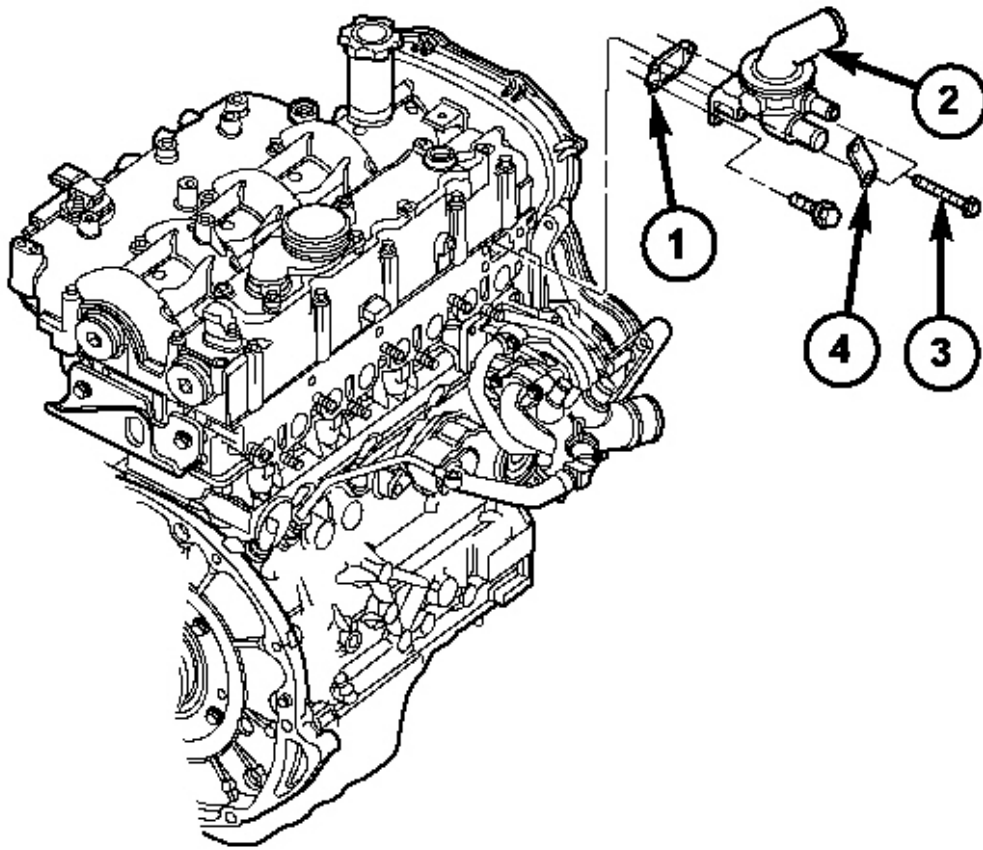
Fig. 62: Using Tool 6958 To Install Fan Blade/Viscous Fan Drive Assembly To Water Pump Shaft
Courtesy of CHRYSLER LLC

1. Install fan blade assembly to viscous fan drive. Tighten bolts to 23 N.m (17 ft. lbs.) torque.
2. Position fan blade/viscous fan drive assembly into the radiator shroud.
3. Install the radiator shroud and fan drive assembly into the vehicle.
4. Install fan shroud retaining screws. Tighten screws to 6 N.M (50 lbs. in.)
5. Using Tool 6958, install the fan blade/viscous fan drive assembly to the water pump shaft. Tighten mounting nut to 50 N.m (37 ft. lbs.).
6. Install the upper radiator hose.
7. Fill cooling system. See **STANDARD PROCEDURE**.
8. Connect battery negative cable.

THERMOSTAT-ENGINE COOLANT

DESCRIPTION

DESCRIPTION-THERMOSTAT-2.8L DIESEL



812093dd

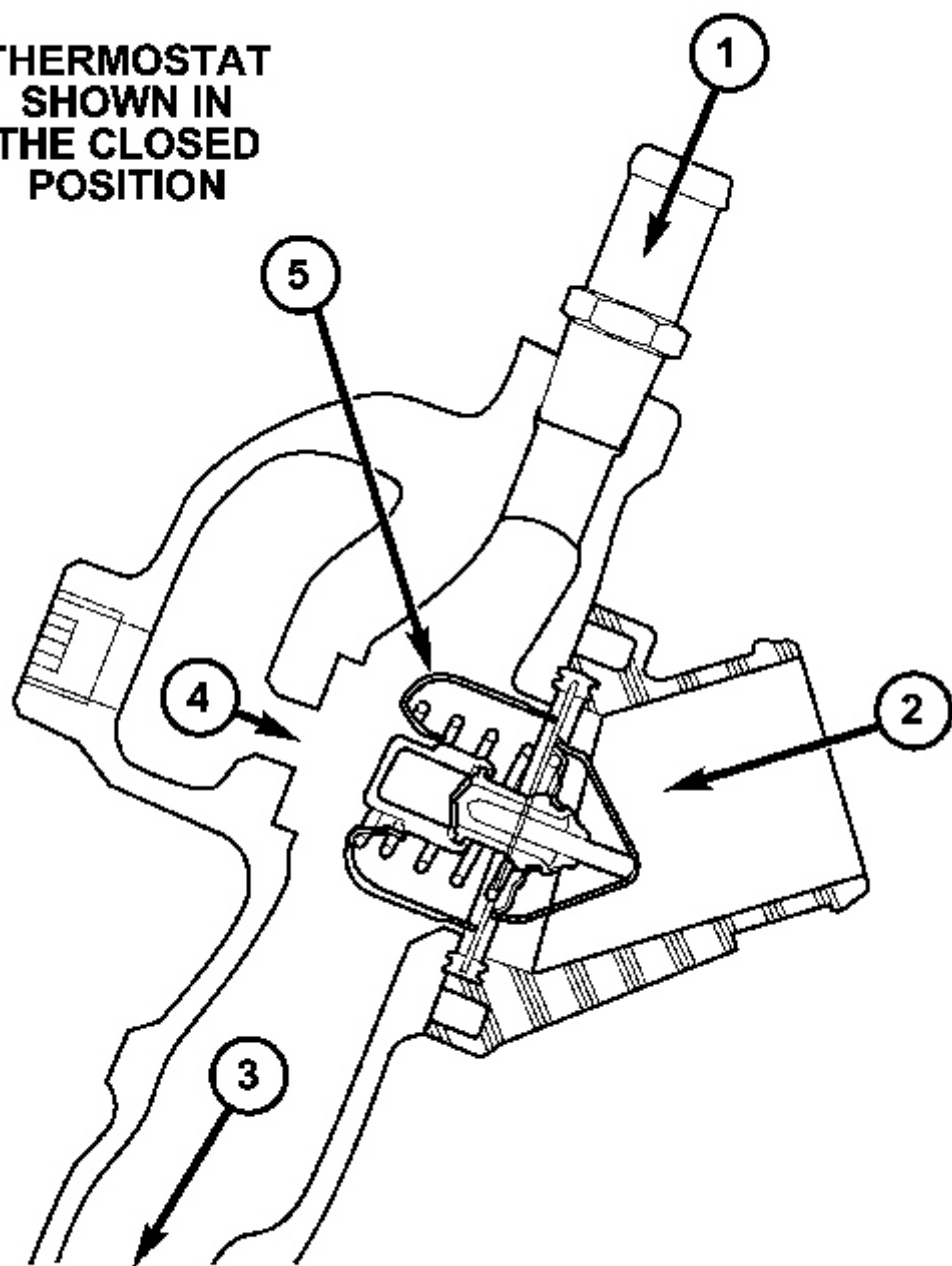
Fig. 63: Thermostat Housing
Courtesy of CHRYSLER LLC

- 1 - GASKET
- 2 - THERMOSTAT HOUSING
- 3 - BOLT(S)
- 4 - BRACKET

A pellet-type thermostat controls the operating temperature of the engine by controlling the amount of coolant flow to the radiator.

DESCRIPTION-THERMOSTAT-3.7L

**THERMOSTAT
SHOWN IN
THE CLOSED
POSITION**



808a025e

Fig. 64: Cutaway View Of Thermostat & Bypass
Courtesy of CHRYSLER LLC

- 1 - FROM HEATER
- 2 - FROM RADIATOR
- 3 - TO WATER PUMP
- 4 - ENGINE BYPASS
- 5 - THERMOSTAT

CAUTION: Do not operate an engine without a thermostat, except for servicing or testing.

A pellet-type thermostat (5) controls the operating temperature of the engine by controlling the amount of coolant flow to the radiator. On all engines the thermostat is closed below 195°F (90°C). Above this temperature, coolant is allowed to flow to the radiator. This provides quick engine warm up and overall temperature control. On the 3.7L engine the thermostat is designed to block the flow of the coolant bypass journal by 50% instead of completely blocking the flow. This design controls coolant temperature more accurately.

The same thermostat is used for winter and summer seasons. An engine should not be operated without a thermostat, except for servicing or testing. Operating without a thermostat causes other problems. These are: longer engine warmup time, unreliable warmup performance, increased exhaust emissions and crankcase condensation. This condensation can result in sludge formation.

OPERATION

OPERATION

The thermostat starts to open at 80°C (176°F). Above this temperature, coolant is allowed to flow to the radiator. This provides quicker engine warmup and overall temperature control.

The same thermostat is used for winter and summer seasons. An engine should not be operated without a thermostat, except for servicing or testing. Operating without a thermostat causes other problems. These are: longer engine warmup time, unreliable warmup performance, increased exhaust emissions and crankcase condensation. This condensation can result in sludge formation.

DIAGNOSIS AND TESTING

ENGINE COOLANT THERMOSTAT

ON-BOARD DIAGNOSTICS

All models are equipped with On-Board Diagnostics for certain cooling system components. If the Powertrain Control Module (PCM) detects low engine coolant temperature, it will record a Diagnostic Trouble Code (DTC). For other DTC numbers, refer to **OPERATION** .

REMOVAL

REMOVAL- 3.7L

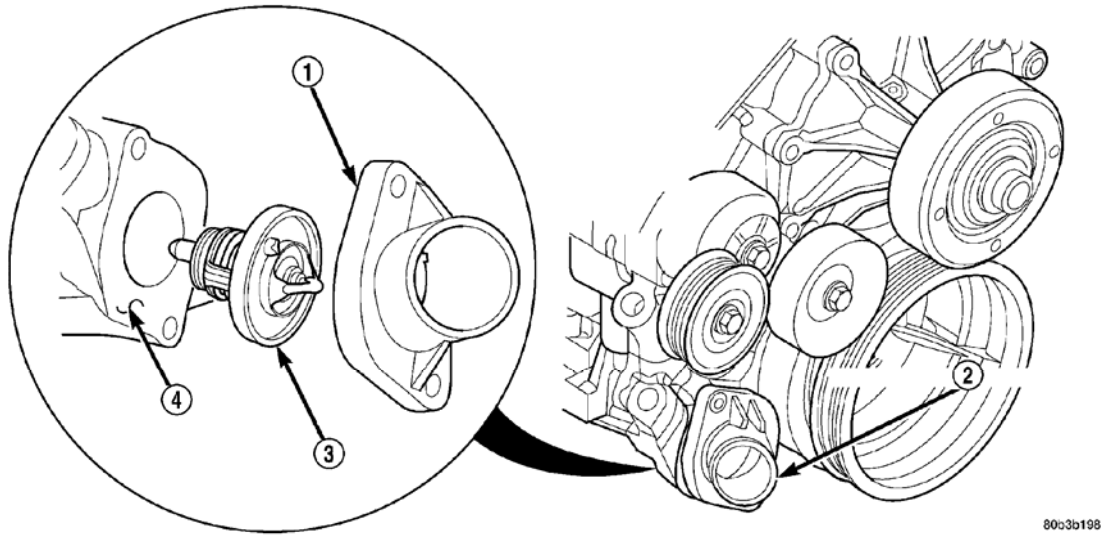


Fig. 65: Thermostat & Thermostat Housing
Courtesy of CHRYSLER LLC

- 1 - THERMOSTAT HOUSING
- 2 - THERMOSTAT LOCATION
- 3 - THERMOSTAT AND GASKET
- 4 - TIMING CHAIN COVER

WARNING: Do not loosen radiator draincock with system hot and pressurized.
Serious burns from coolant can occur.

Do not waste reusable coolant. If solution is clean, drain coolant into a clean container for reuse.

If thermostat (3) is being replaced, be sure that replacement is specified thermostat for vehicle model and engine type.

1. Disconnect negative battery cable at battery.
2. Drain cooling system. See **STANDARD PROCEDURE**.
3. Raise vehicle on hoist.
4. Remove splash shield.
5. Remove lower radiator hose clamp and lower radiator hose at thermostat housing.
6. Remove thermostat housing mounting bolts, thermostat housing and thermostat.

REMOVAL-2.8L DIESEL

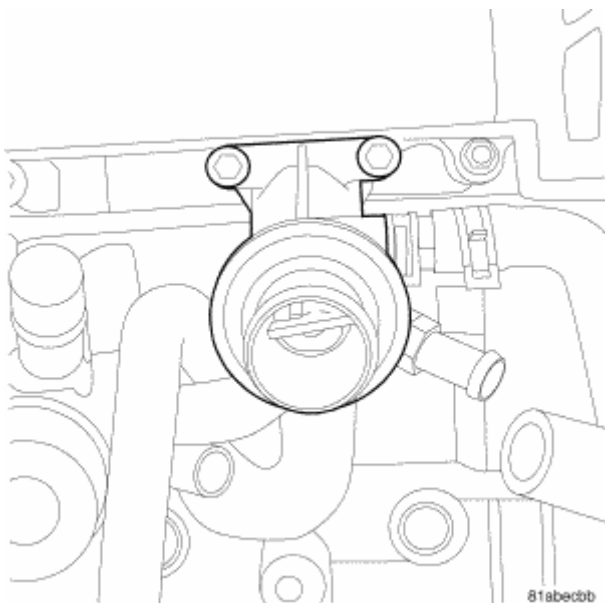


Fig. 66: Identifying Thermostat
 Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove engine cover. Refer to **REMOVAL** .
3. Partially drain cooling system. See **STANDARD PROCEDURE**.
4. Disconnect upper radiator hose and bypass hoses at thermostat housing (2).
5. Remove thermostat housing retaining bolts, support bracket and housing from cylinder head, discard gasket.

REMOVAL-4.0L

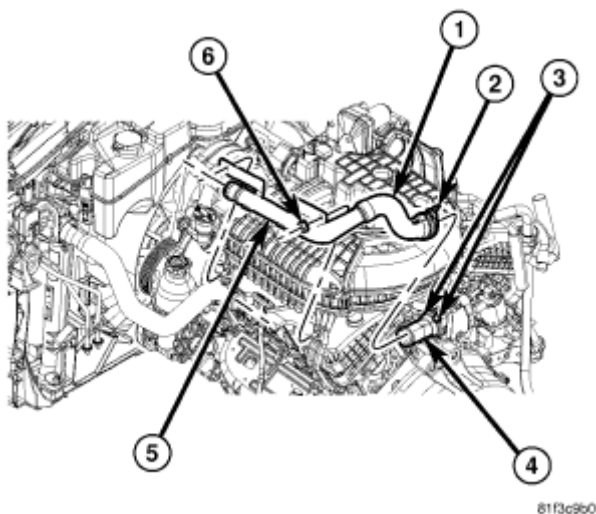


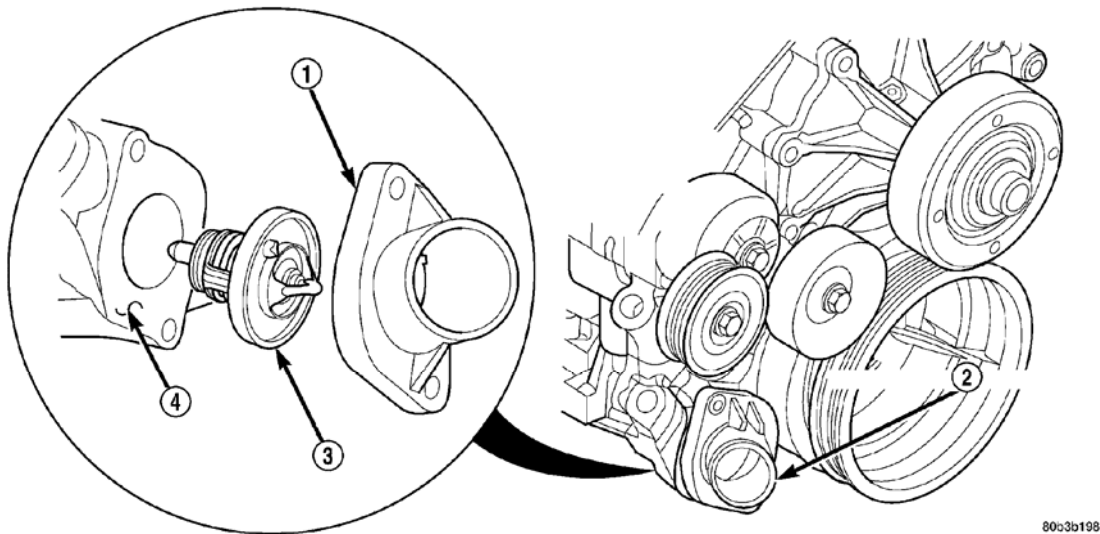
Fig. 67: Thermostat Assembly - 4.0L
 Courtesy of CHRYSLER LLC

1 - UPPER RADIATOR HOSE
2 - HOSE CLAMP
3 - THERMOSTAT HOUSING MOUNTING BOLT
4 - THERMOSTAT HOUSING
5 - UPPER RADIATOR HOSE TUBE
6 - UPPER RADIATOR HOSE TUBE MOUNTING NUTS

1. Disconnect and isolate negative battery cable
2. Drain cooling system. See **STANDARD PROCEDURE**.
3. Remove air housing (Refer to **REMOVAL**).
4. Remove upper intake manifold. Refer to **REMOVAL** .
5. Remove radiator tube mounting nuts.
6. Remove radiator hose at thermostat housing.
7. Remove thermostat housing bolts, thermostat housing and thermostat.
8. Clean thermostat housing mating surface on lower intake manifold.

INSTALLATION

INSTALLATION- 3.7L



80c3b198

Fig. 68: Thermostat & Thermostat Housing
Courtesy of CHRYSLER LLC

1 - THERMOSTAT HOUSING
2 - THERMOSTAT LOCATION
3 - THERMOSTAT AND GASKET
4 - TIMING CHAIN COVER

1. Clean mating areas of timing chain cover and thermostat housing.
2. Install thermostat (spring side down) into recessed machined groove on housing assembly. Make sure rubber seal locating tab is positioned in the corresponding notch in the housing.
3. Position thermostat housing on timing chain cover.
4. Install two housing-to-timing chain cover bolts. Tighten bolts to 12 N.m (105 in. lbs.) torque.
5. Install lower radiator hose on thermostat housing.
6. Install splash shield.
7. Lower vehicle.
8. Fill cooling system. See **STANDARD PROCEDURE**.
9. Connect negative battery cable to battery.
10. Start and warm the engine. Check for leaks.

INSTALLATION

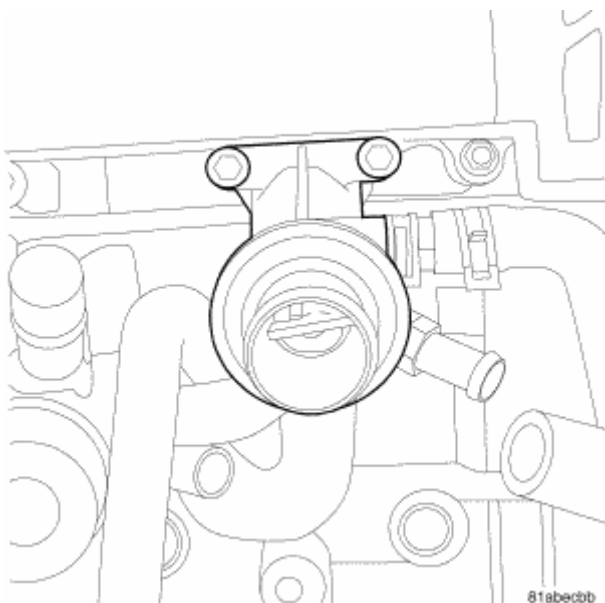


Fig. 69: Identifying Thermostat
Courtesy of CHRYSLER LLC

1. Clean old gasket material from cylinder head and thermostat housing.
2. Install thermostat housing with gasket and support bracket to cylinder head. Torque bolts to 28 N.m. (250 in. lbs.).
3. Connect coolant bypass hose and upper radiator hose to thermostat housing.
4. Refill cooling system. See **STANDARD PROCEDURE**.
5. Install engine cover. Refer to **INSTALLATION**.
6. Connect negative battery cable.

INSTALLATION-4.0L

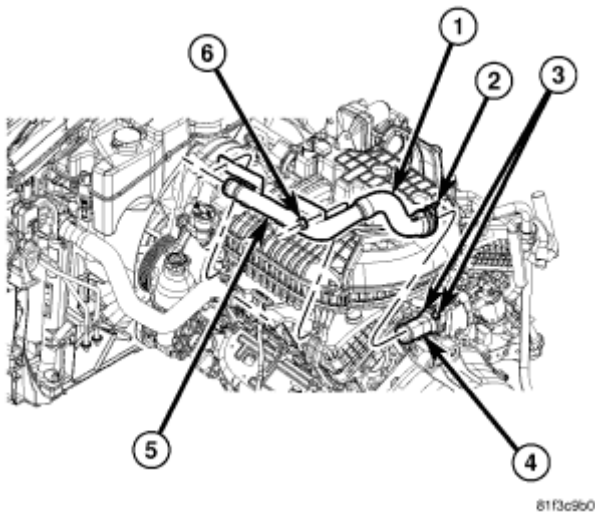


Fig. 70: Thermostat Assembly - 4.0L
Courtesy of CHRYSLER LLC

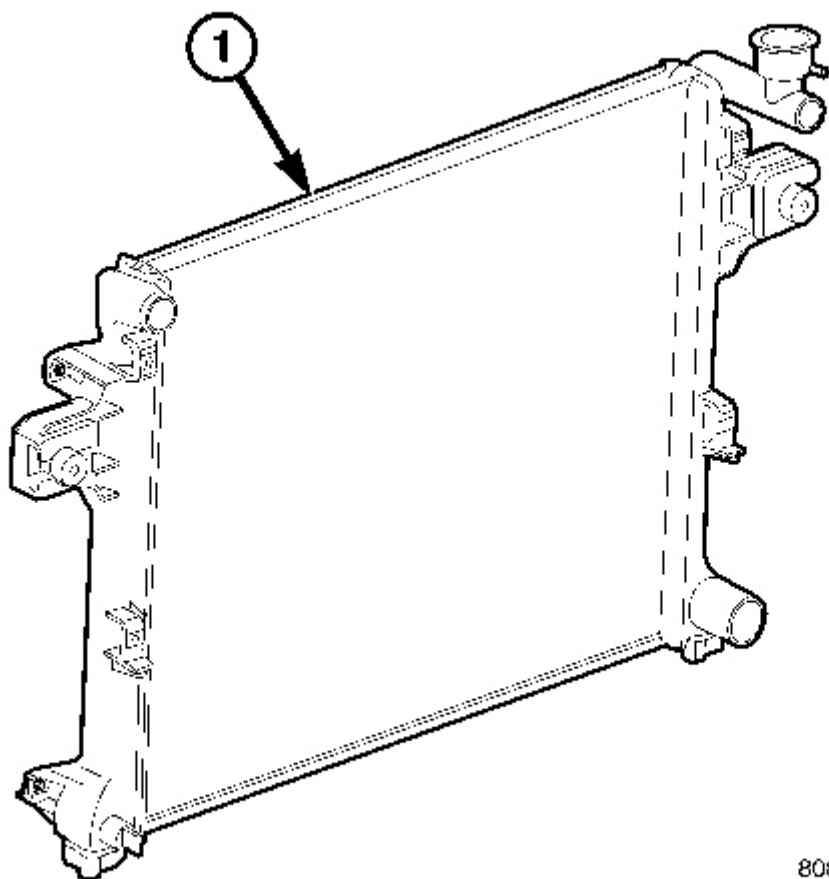
1 - UPPER RADIATOR HOSE
2 - HOSE CLAMP
3 - THERMOSTAT HOUSING MOUNTING BOLT
4 - THERMOSTAT HOUSING
5 - UPPER RADIATOR HOSE TUBE
6 - UPPER RADIATOR HOSE TUBE MOUNTING NUTS

1. Make sure jiggle pin is at the 12 O'clock position. Position thermostat and thermostat housing lower intake manifold.
2. Install thermostat housing bolts. Tighten bolts to 35 N.m (25 ft. lbs.).
3. Install upper radiator hose onto thermostat housing
4. Position upper radiator hose tube and install mounting nuts. Tighten nuts to 9 N.m, (85 in. lbs.).
5. Install upper intake manifold. Refer to **INSTALLATION** .
6. Install air cleaner housing (Refer to **INSTALLATION**).
7. Fill cooling system. See **STANDARD PROCEDURE**.

RADIATOR

DESCRIPTION

DESCRIPTION



8086ed7b

Fig. 71: Cross Flow Radiator - Typical
Courtesy of CHRYSLER LLC

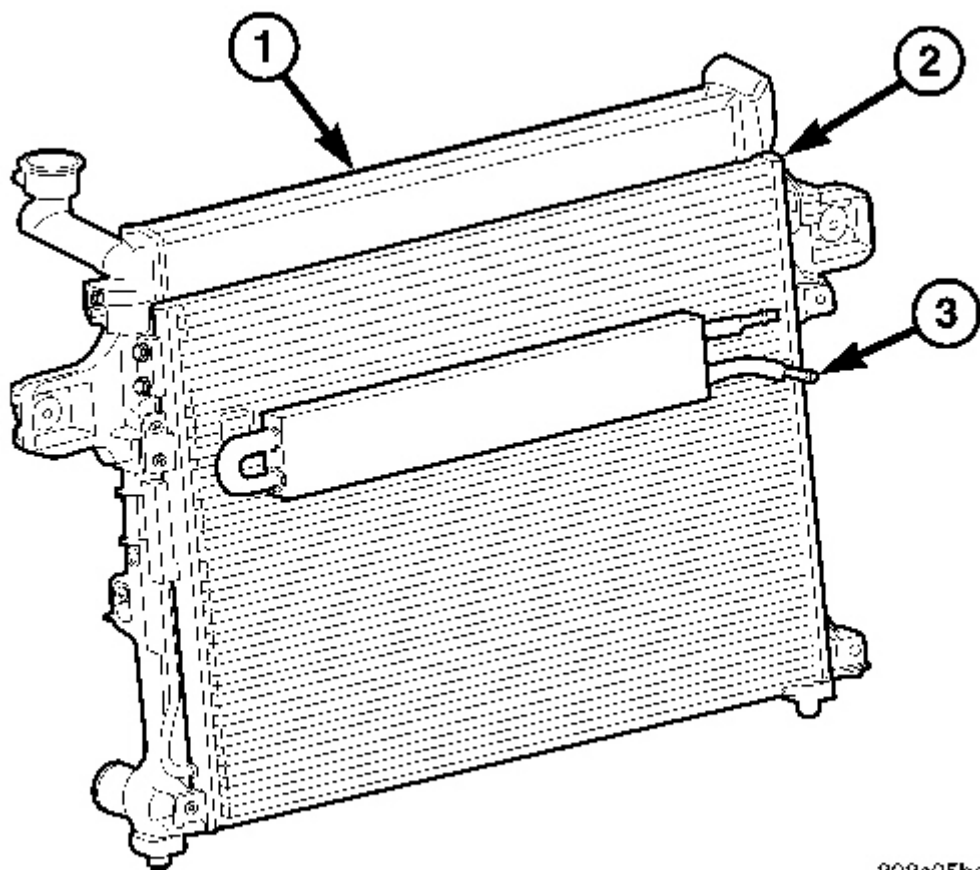
1 - RADIATOR

All vehicles are equipped with a cross flow type radiator (1) with plastic side tanks.

Plastic tanks, while stronger than brass, are subject to damage by impact, such as from tools or wrenches. Handle radiator with care.

REMOVAL

REMOVAL



808c05be

Fig. 72: Air Seals - Typical
Courtesy of CHRYSLER LLC

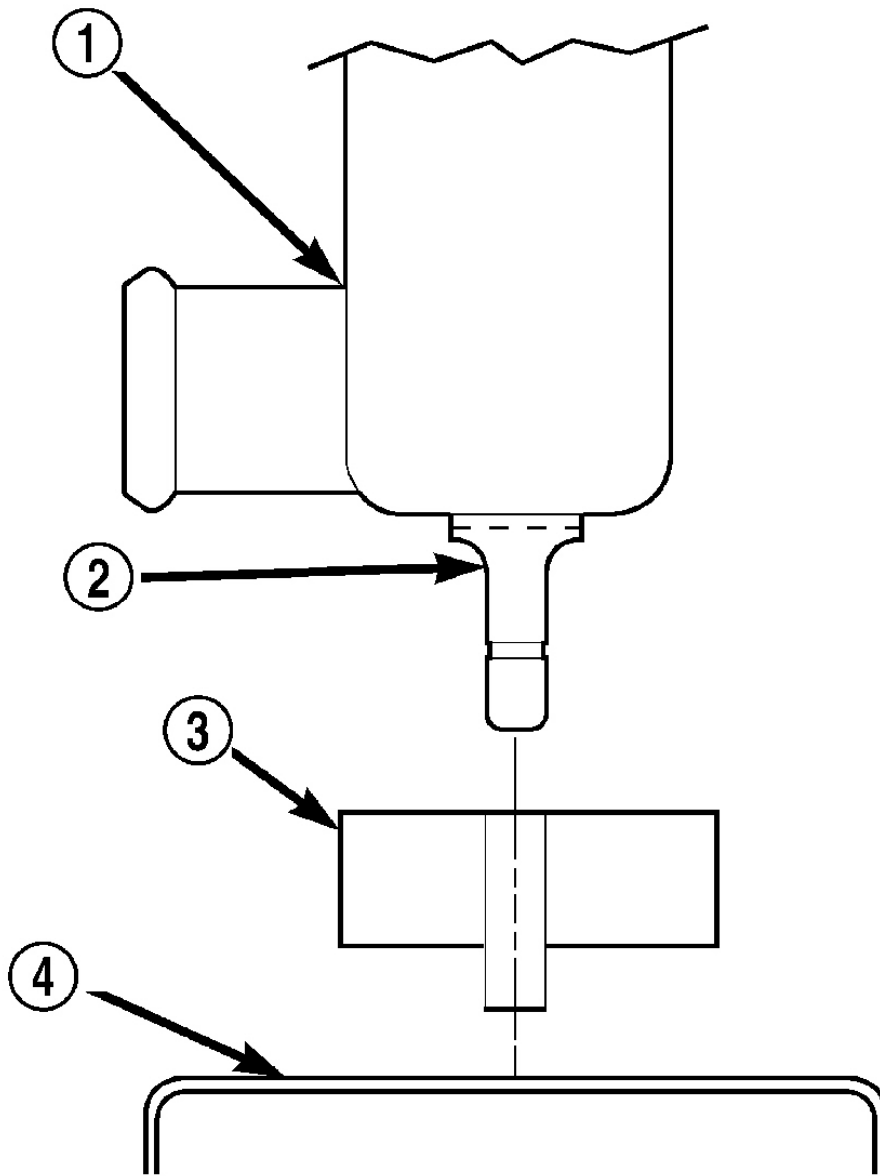
- 1 - AIR DAM
- 2 - RADIATOR
- 3 - AIR DAM
- 4 - A/C CONDENSER
- 5 - AIR SEAL

WARNING: Do not remove the cylinder block drain plugs or loosen the radiator draincock with the system hot and under pressure. Serious burns from coolant can occur. Refer to cooling system draining.

Do not waste reusable coolant. If the solution is clean, drain the coolant into a clean container for reuse.

CAUTION: When removing the radiator or A/C condenser for any reason, note the location of all radiator-to-body and radiator-to-A/C condenser rubber air seals. These are used at the top, bottom and sides of the radiator and A/C condenser. To prevent overheating, these seals must be installed to their original positions.

1. Disconnect the negative battery cable at battery.
2. Drain coolant from radiator. See **STANDARD PROCEDURE**.
3. Remove the front grille. Refer to **REMOVAL** .
4. Remove the cooling fan from the engine, if equipped.
5. Remove the two radiator mounting bolts.
6. Disconnect the connector for the electric fan.
7. Disconnect the power steering cooler line from cooler.
8. Disconnect the radiator upper and lower hoses.
9. Disconnect the overflow hose from radiator (2).



80c07222

Fig. 73: Radiator Alignment Dowels - Typical
Courtesy of CHRYSLER LLC

- | |
|--------------------------------|
| 1 - RADIATOR |
| 2 - ALIGNMENT DOWEL |
| 3 - RADIATOR LOWER ISOLATOR |
| 4 - RADIATOR LOWER CROSSMEMBER |

10. The lower part of radiator is equipped with two alignment dowel pins (2). They are located on the bottom

of radiator tank and fit into rubber grommets. These rubber grommets are pressed into the radiator lower crossmember.

WARNING: The air conditioning system (if equipped) is under a constant pressure even with the engine off. Refer to refrigerant warnings in, heating and air conditioning before handling any air conditioning component.

NOTE: The radiator and radiator cooling fan can be removed as an assembly. It is not necessary to remove the cooling fan before removing or installing the radiator.

11. Gently lift up and remove radiator from vehicle. Be careful not to scrape the radiator fins against any other component. Also be careful not to disturb the air conditioning condenser (if equipped).

CLEANING

CLEANING

Clean radiator fins With the engine cold, apply cold water and compressed air to the back (engine side) of the radiator to flush the radiator and/or A/C condenser of debris.

INSPECTION

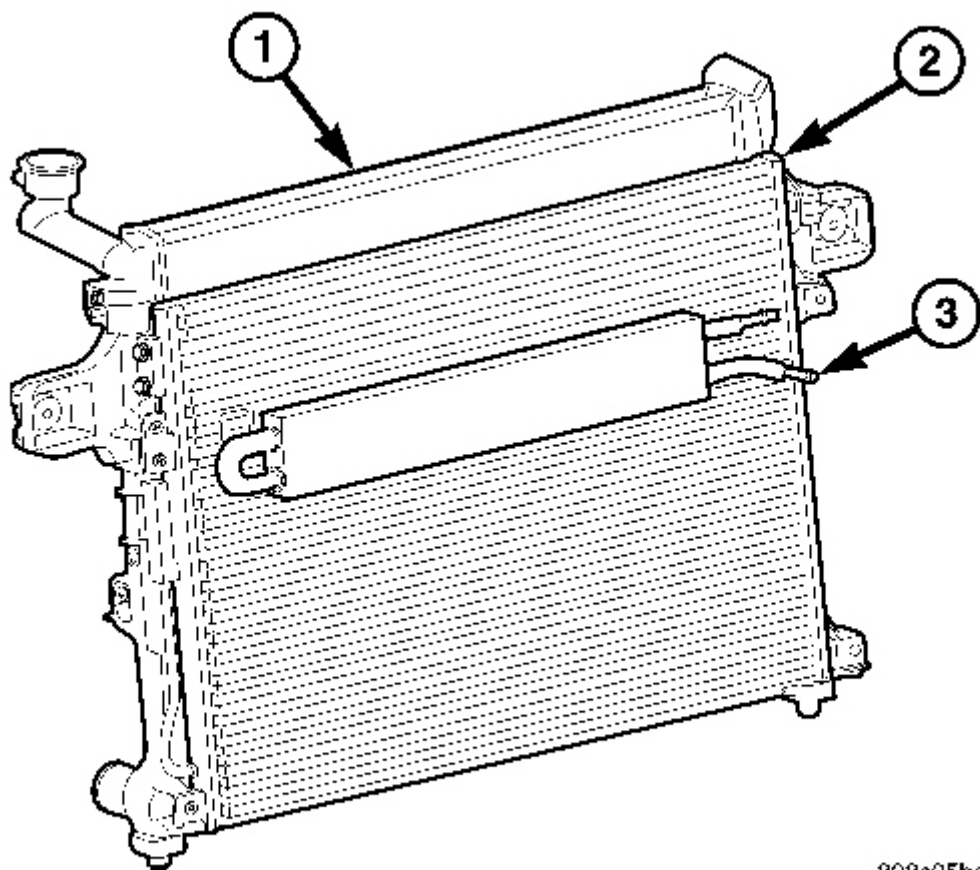
INSPECTION

The radiator cooling fins should be checked for damage or deterioration. Inspect cooling fins to make sure they are not bent or crushed, these areas result in reduced heat exchange causing the cooling system to operate at higher temperatures. Inspect the plastic end tanks for cracks, damage or leaks.

Inspect the radiator neck for damage or distortion.

INSTALLATION

INSTALLATION

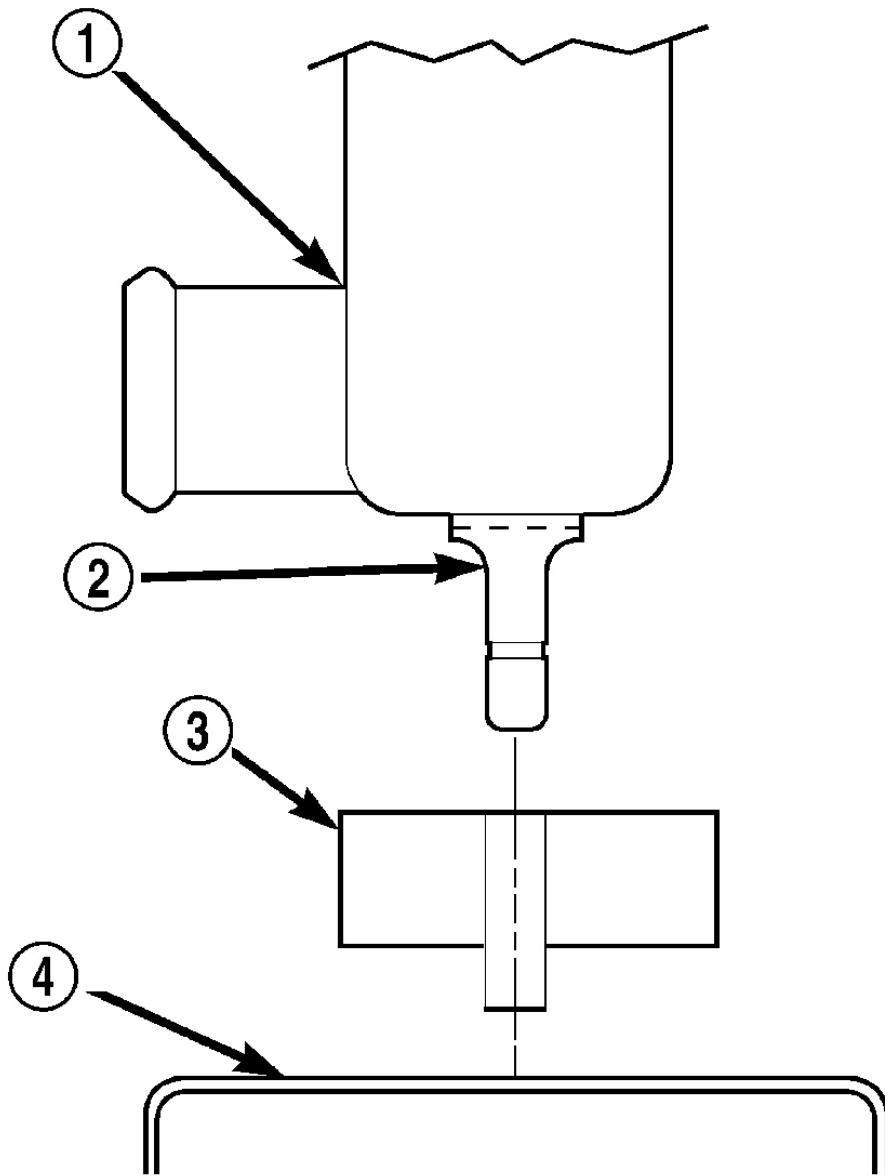


808c05be

Fig. 74: Air Seals - Typical
Courtesy of CHRYSLER LLC

- 1 - AIR DAM
- 2 - RADIATOR
- 3 - AIR DAM
- 4 - A/C CONDENSER
- 5 - AIR SEAL

CAUTION: Before installing the radiator or A/C condenser, be sure the radiator-to-body and radiator-to-A/C condenser rubber air seals are properly fastened to their original positions. These are used at the top, bottom and sides of the radiator and A/C condenser. To prevent overheating, these seals must be installed to their original positions.



80c07222

Fig. 75: Radiator Alignment Dowels - Typical
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - RADIATOR2 - ALIGNMENT DOWEL3 - RADIATOR LOWER ISOLATOR4 - RADIATOR LOWER CROSSMEMBER |
|---|

1. Gently lower the radiator and fan shroud into the vehicle. Guide the two radiator alignment dowels into

the rubber grommets located in lower radiator crossmember.

2. Connect the radiator upper and lower hoses and hose clamps to radiator.

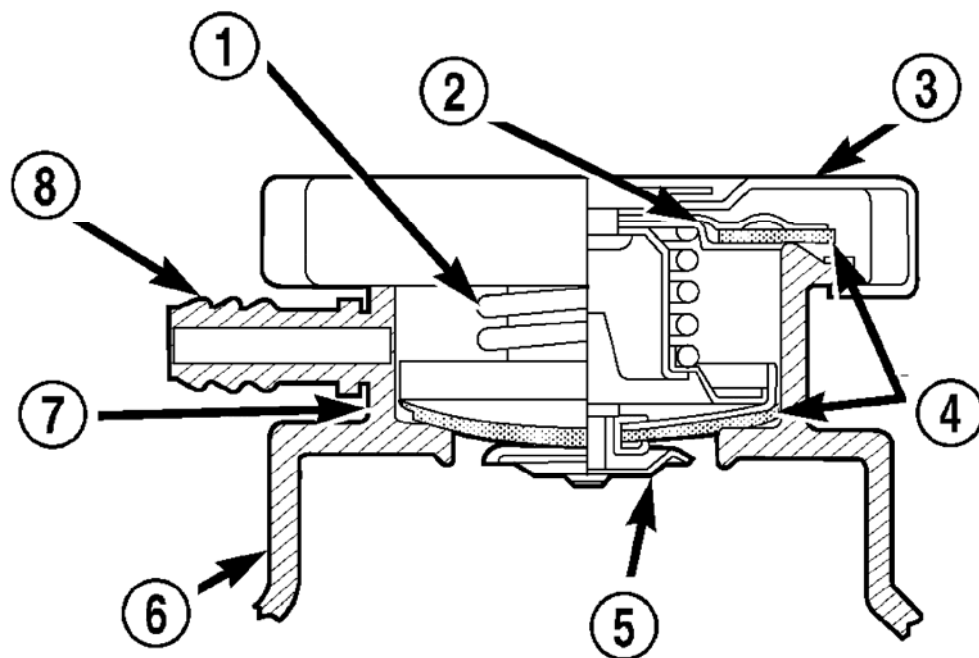
CAUTION: The tangs on the hose clamps must be positioned straight down.

3. Install coolant reserve/overflow tank hose at radiator.
4. Install both radiator mounting bolts.
5. Reconnect the electric cooling fan.
6. Install the grille. Refer to **INSTALLATION**.
7. Reinstall the cooling fan to the engine.
8. Rotate the fan blades (by hand) and check for interference at fan shroud.
9. Refill cooling system. See **STANDARD PROCEDURE**.
10. Connect battery cable at battery.
11. Start and warm engine. Check for leaks.

CAP-RADIATOR PRESSURE

DESCRIPTION

DESCRIPTION



80ac6a1e

Fig. 76: Pressure Cap

- 1 - MAIN SPRING
 - 2 - GASKET RETAINER
 - 3 - STAINLESS STEEL SWIVEL TOP
 - 4 - RUBBER SEALS
 - 5 - SPRING LOADED VALVE
 - 6 - COOLANT PRESSURE BOTTLE
 - 7 - FILLER NECK
 - 8 - OVERFLOW NIPPLE

The cooling system cap is located on the coolant pressure bottle for 3.7L/2.8L. The cap construction includes; stainless steel swivel top, rubber seals and retainer, main spring (1), and a spring loaded valve (5).

OPERATION

OPERATION

The pressure cap allows the cooling system to operate at higher than atmospheric pressure which raises the coolant boiling point, thus allowing increased radiator cooling capacity. The pressure cap releases pressure at some point within a range of 110 kPa ± 14 kPa (16 psi ± 2 psi).

A spring-loaded vent valve in the center of the cap allows the system to pressurize and depressurize without creating a vacuum. If the valve is stuck open, coolant will escape to the overflow hose. There is also a gasket in the cap to seal to the top of the filler neck.

CAUTION: Use only the pressure cap specified for this vehicle. Use of other pressure caps can lead to coolant loss and overheating.

DIAGNOSIS AND TESTING

PRESSURE RELIEF TEST

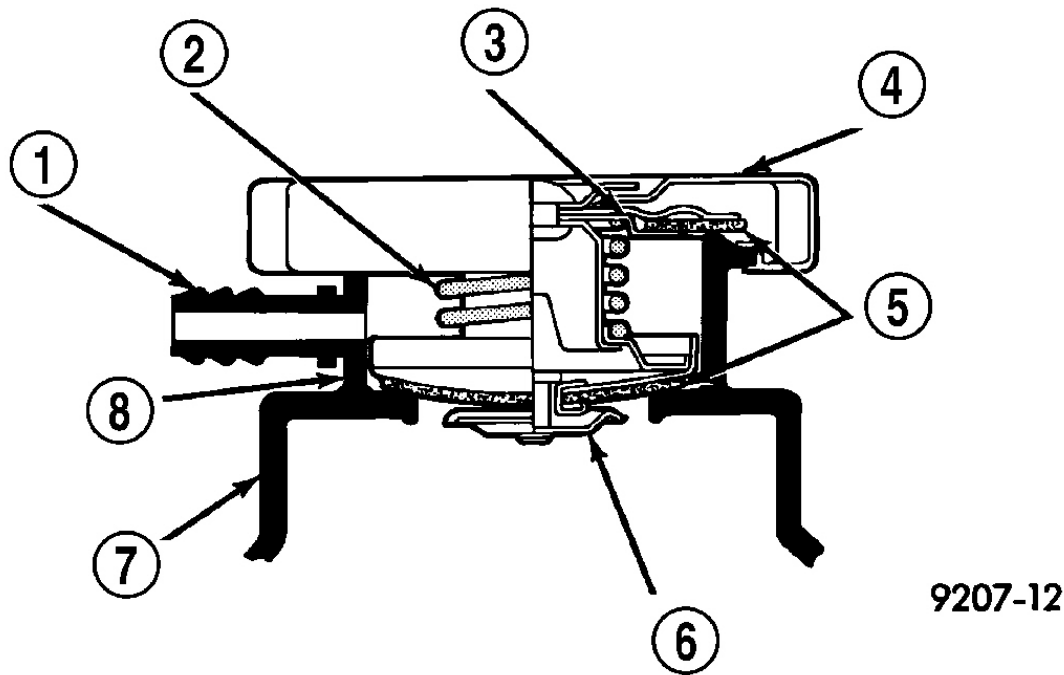


Fig. 77: Radiator Pressure Cap Filler Neck
Courtesy of CHRYSLER LLC

- 1 - OVERFLOW NIPPLE
- 2 - MAIN SPRING
- 3 - GASKET RETAINER
- 4 - STAINLESS-STEEL SWIVEL TOP
- 5 - RUBBER SEALS
- 6 - VENT VALVE
- 7 - PRESSURE BOTTLE
- 8 - FILLER NECK

The pressure cap upper gasket (seal) pressure relief can be checked by removing the overflow hose at the radiator filler neck nipple. Attach the Pressure Tester 7700 to the filler neck nipple (1) and pump air into the radiator. Pressure cap upper gasket should relieve at 69-124 kPa (10-18 psi) and hold pressure at 55 kPa (8 psi) minimum.

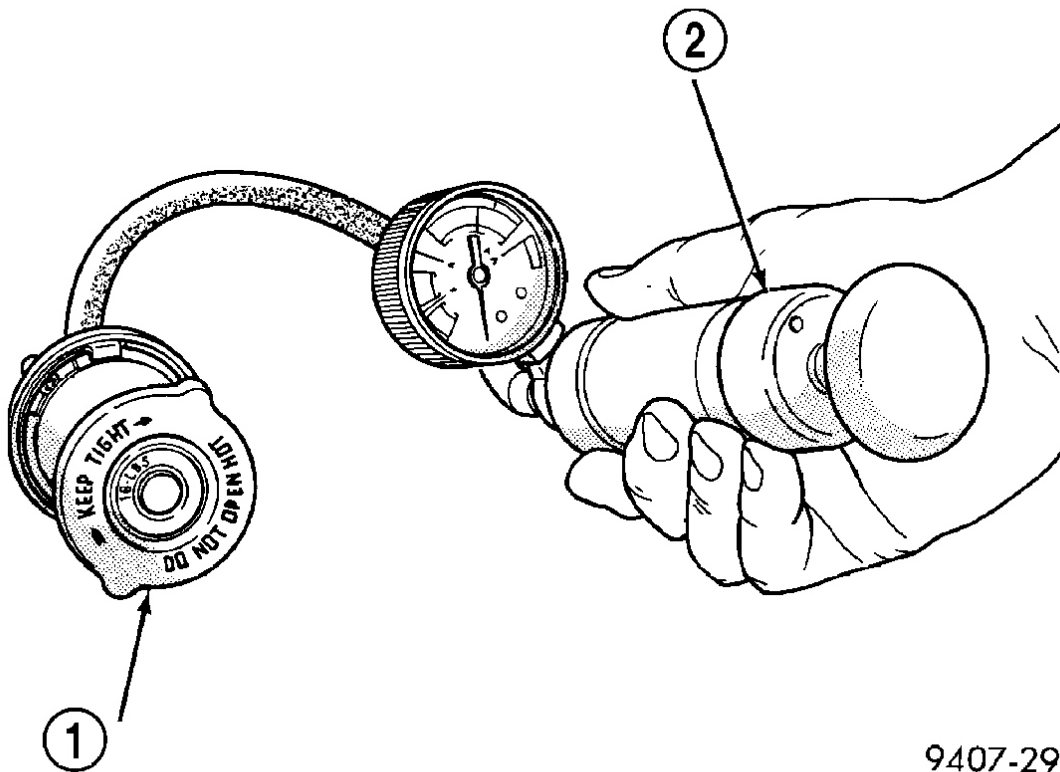
WARNING: The warning words "do not open hot" on the radiator pressure cap is a safety precaution. When hot, pressure builds up in cooling system. To prevent scalding or injury, the radiator cap should not be removed while the system is hot or under pressure.

There is no need to remove the radiator cap at any time **except** for the following purposes:

1. Check and adjust coolant freeze point.
2. Refill system with new coolant.
3. Conducting service procedures.
4. Checking for vacuum leaks.

WARNING: If vehicle has been run recently, wait 15 minutes before removing cap. Then place a shop towel over the cap and without pushing down rotate counterclockwise to the first stop. Allow fluids to escape through the overflow tube and when the system stops pushing coolant and steam into the crs tank and pressure drops push down and remove the cap completely. Squeezing the radiator inlet hose with a shop towel (to check pressure) before and after turning to the first stop is recommended.

RADIATOR PRESSURE CAP



9407-29

Fig. 78: Testing Cooling System Pressure Cap
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - PRESSURE CAP
2 - PRESSURE TESTER |
|---|

Dip the pressure cap (1) in water. Clean any deposits off the vent valve or its seat and apply cap to end of the Pressure Cap Test Adapter that is included with the Pressure Tester 7700. Working the plunger, bring the pressure to 104 kPa (15 psi) on the gauge. If the pressure cap fails to hold pressure of at least 97 kPa (14 psi), replace the pressure cap.

CAUTION: The Cooling System Tester Tool is very sensitive to small air leaks that will not cause cooling system problems. A pressure cap that does not have a history of coolant loss should not be replaced just because it leaks slowly when tested with this tool. Add water to the tool. Turn tool upside down and recheck pressure cap to confirm that cap is bad.

If the pressure cap tests properly while positioned on Pressure Tester (2), but will not hold pressure or vacuum when positioned on the filler neck. Inspect the filler neck and cap top gasket for irregularities that may prevent the cap from sealing properly.

CLEANING

CLEANING

Clean the radiator pressure cap using a mild soap and water only.

INSPECTION

INSPECTION

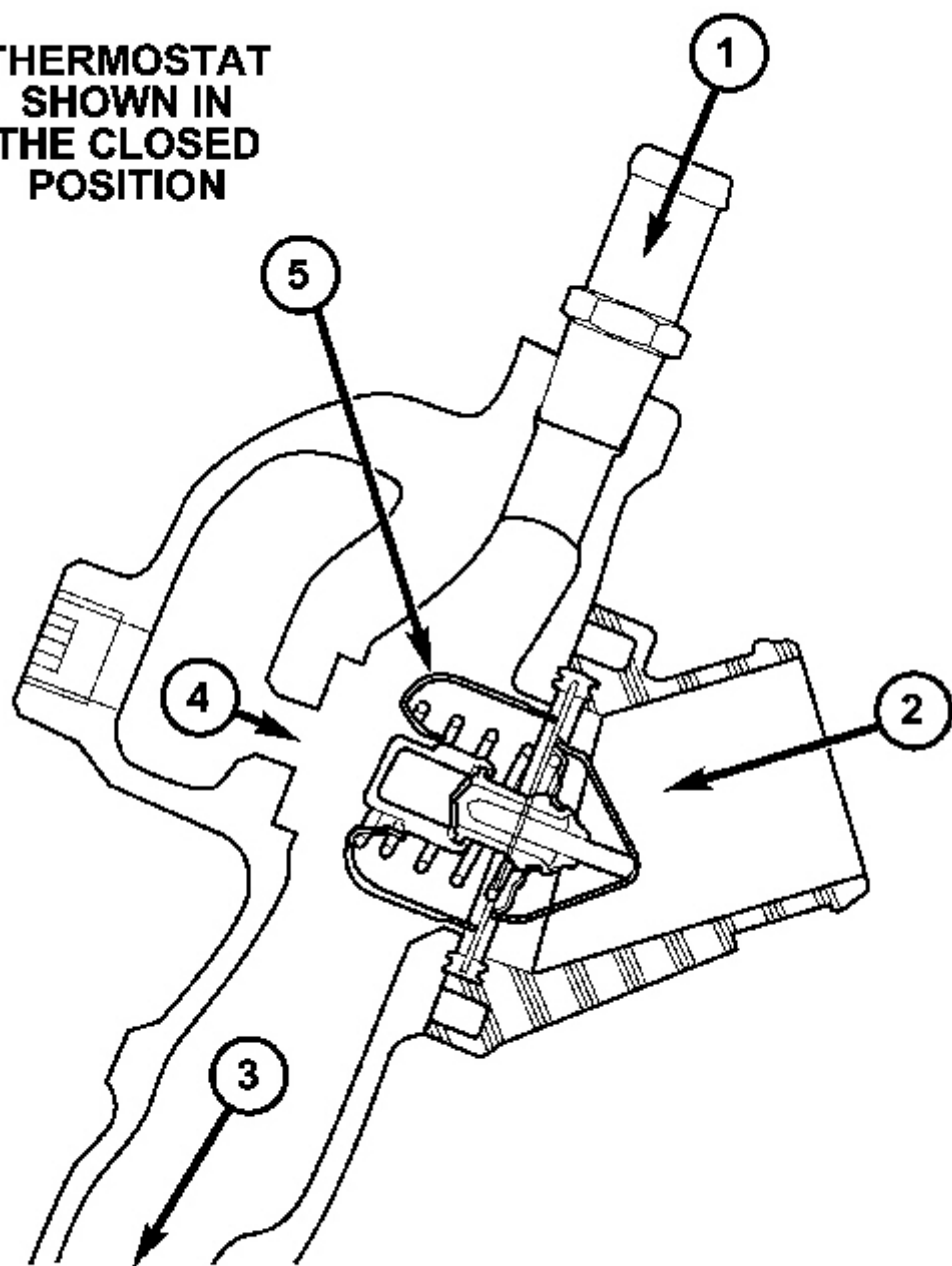
Visually inspect the pressure valve gasket on the cap. Replace cap if the gasket is swollen, torn or worn. Inspect the area around radiator filler neck for white deposits that indicate a leaking cap.

PUMP-WATER

DESCRIPTION

DESCRIPTION

**THERMOSTAT
SHOWN IN
THE CLOSED
POSITION**



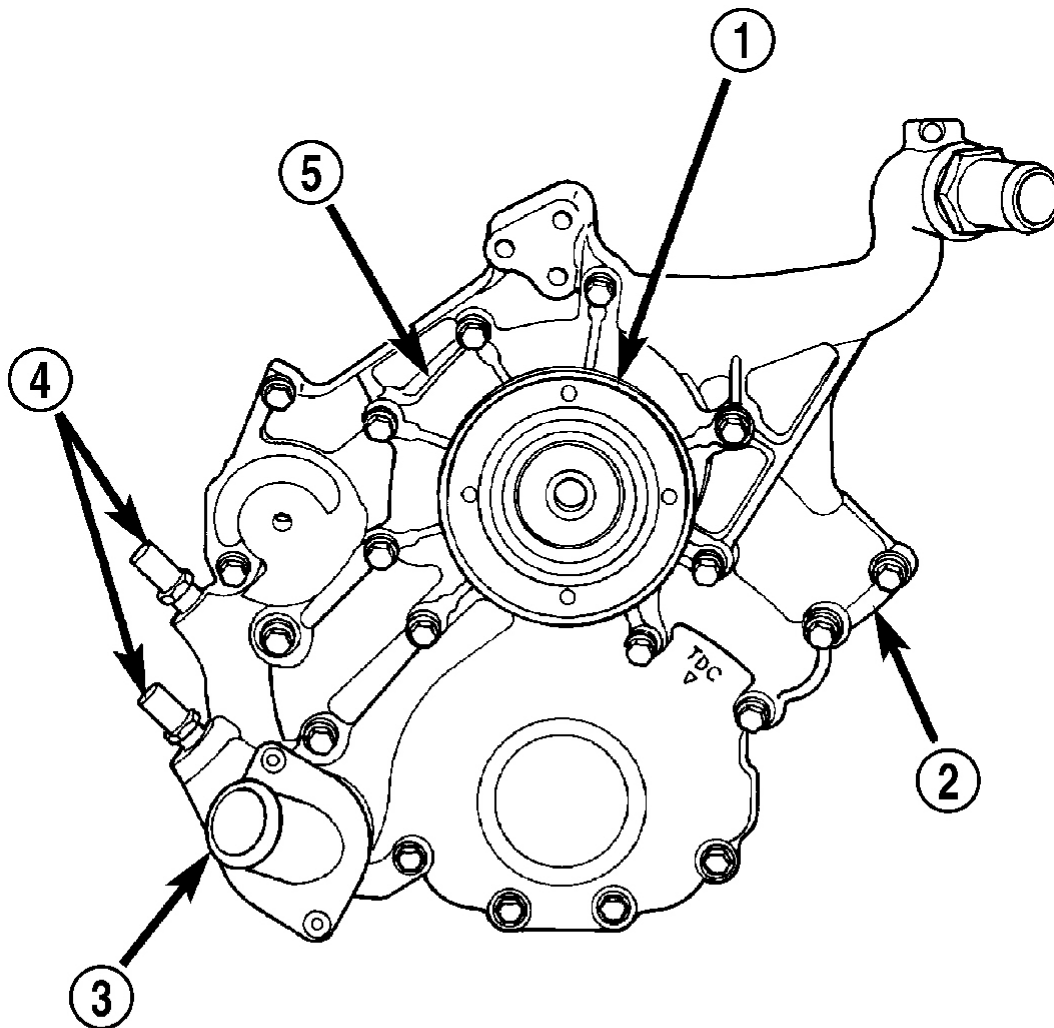
808a025e

Fig. 79: Cutaway View Of Thermostat & Bypass
Courtesy of CHRYSLER LLC

- 1 - FROM HEATER
- 2 - FROM RADIATOR
- 3 - TO WATER PUMP
- 4 - ENGINE BYPASS
- 5 - THERMOSTAT

The 3.7L engine uses an internal water/coolant bypass system. The design uses galleries in the timing chain cover to circulate coolant during engine warm-up preventing the coolant from flowing through the radiator. The thermostat uses a stub shaft located at the rear of the thermostat to control flow through the bypass gallery.

DESCRIPTION-3.7L



80b89884

Fig. 80: Locating Water Pump & Components

Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - INTEGRAL WATER PUMP PULLEY
2 - TIMING CHAIN COVER
3 - THERMOSTAT HOUSING
4 - HEATER HOSE FITTINGS
5 - WATER PUMP |
|--|

A centrifugal water pump (5) circulates coolant through the water jackets, passages, intake manifold, radiator core, cooling system hoses and heater core. The pump is driven from the engine crankshaft by a single serpentine drive belt.

The water pump impeller is pressed onto the rear of a shaft that rotates in bearings pressed into the housing. The housing has two small holes to allow seepage to escape. The water pump seals are lubricated by the antifreeze in the coolant mixture. No additional lubrication is necessary.

Both heater hoses are connected to fittings on the timing chain front cover. The water pump is also mounted directly to the timing chain cover and is equipped with an integral pulley.

WATER PUMP-DESCRIPTION-2.8L DIESEL

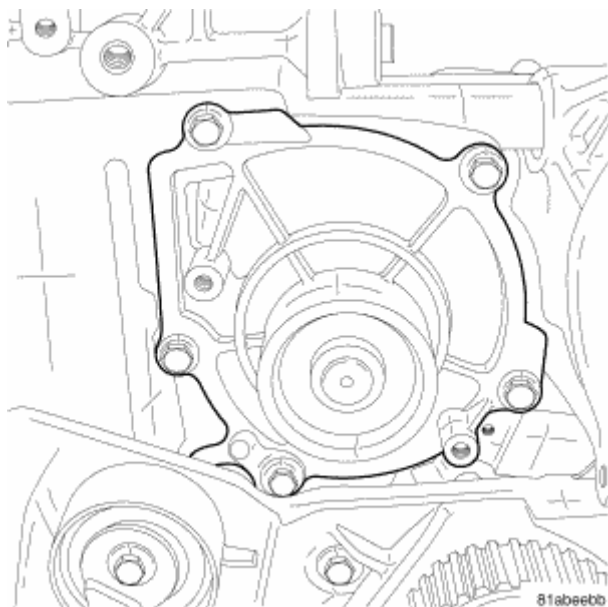


Fig. 81: Identifying Water Pump
Courtesy of CHRYSLER LLC

The water pump on the 2.8L diesel has a die cast aluminum housing. It bolts directly to the engine block.

OPERATION

OPERATION-3.7L

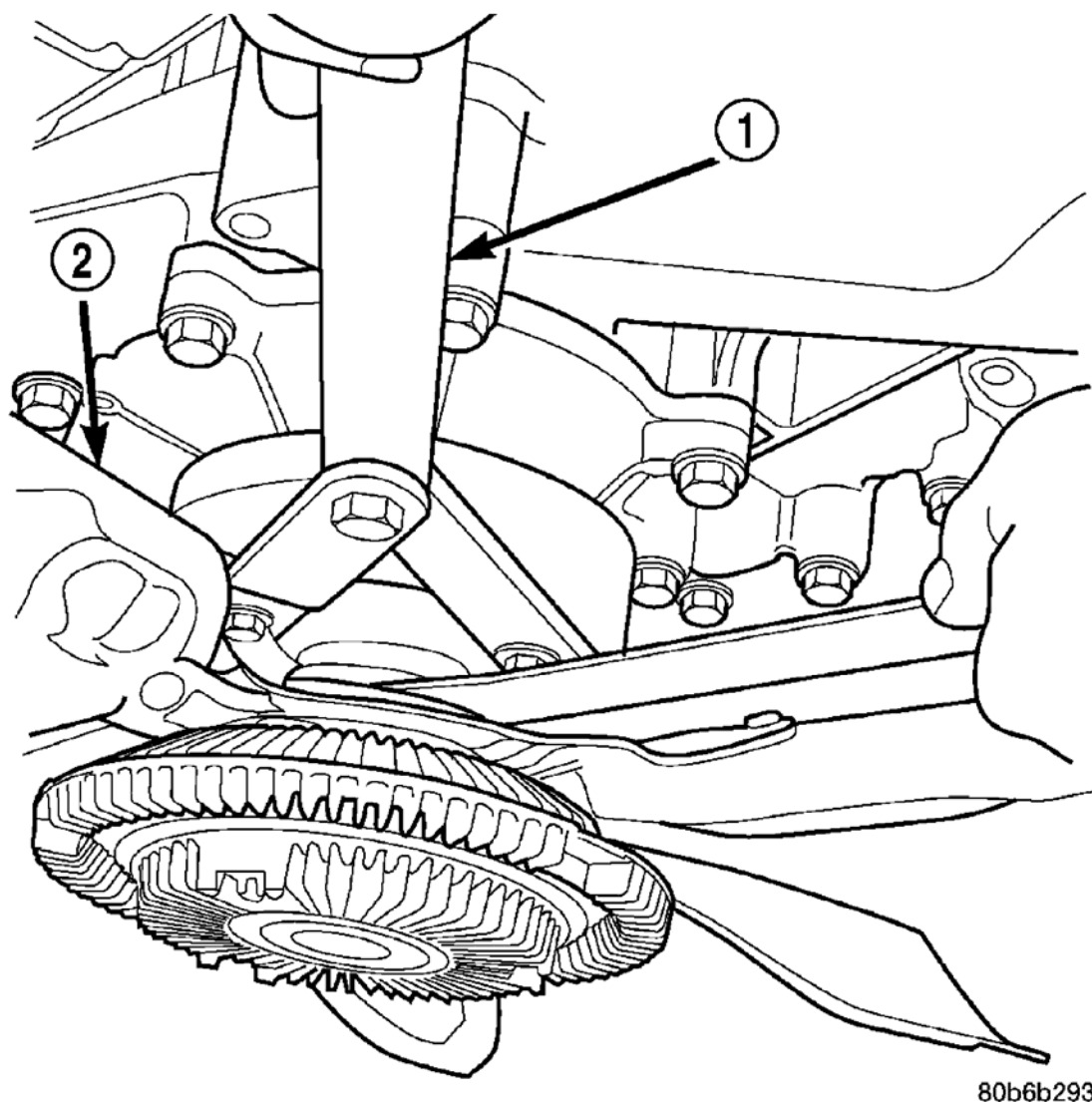
A centrifugal water pump circulates coolant through the water jackets, passages, intake manifold, radiator core, cooling system hoses and heater core, this coolant absorbs the heat generated when the engine is running. The pump is driven by the engine crankshaft via a drive belt.

WATER PUMP-OPERATION-2.8L DIESEL

The water pump is used to circulate coolant through the cooling system. The coolant is pumped through the engine block, cylinder head, heater core, EGR cooler, viscous heater, and radiator.

REMOVAL

REMOVAL-3.7L ENGINE



80b6b293

Fig. 82: Removing Viscous Fan and Fan Drive - 3.7L/4.7L/5.7L
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 6958 SPANNER WRENCH WITH ADAPTER PINS 8346

2 - FAN

1. Disconnect negative battery cable.
2. Drain cooling system. See **STANDARD PROCEDURE**.
3. If water pump is being replaced, do not unbolt fan blade assembly from thermal viscous fan drive.
4. Remove two fan shroud-to-radiator screws. Disconnect the coolant overflow hose.
5. Remove upper fan shroud and fan blade/viscous fan drive assembly from vehicle.
6. After removing fan blade/viscous fan drive assembly, **do not** place thermal viscous fan drive in horizontal position. If stored horizontally, silicone fluid in viscous fan drive could drain into its bearing assembly and contaminate lubricant.

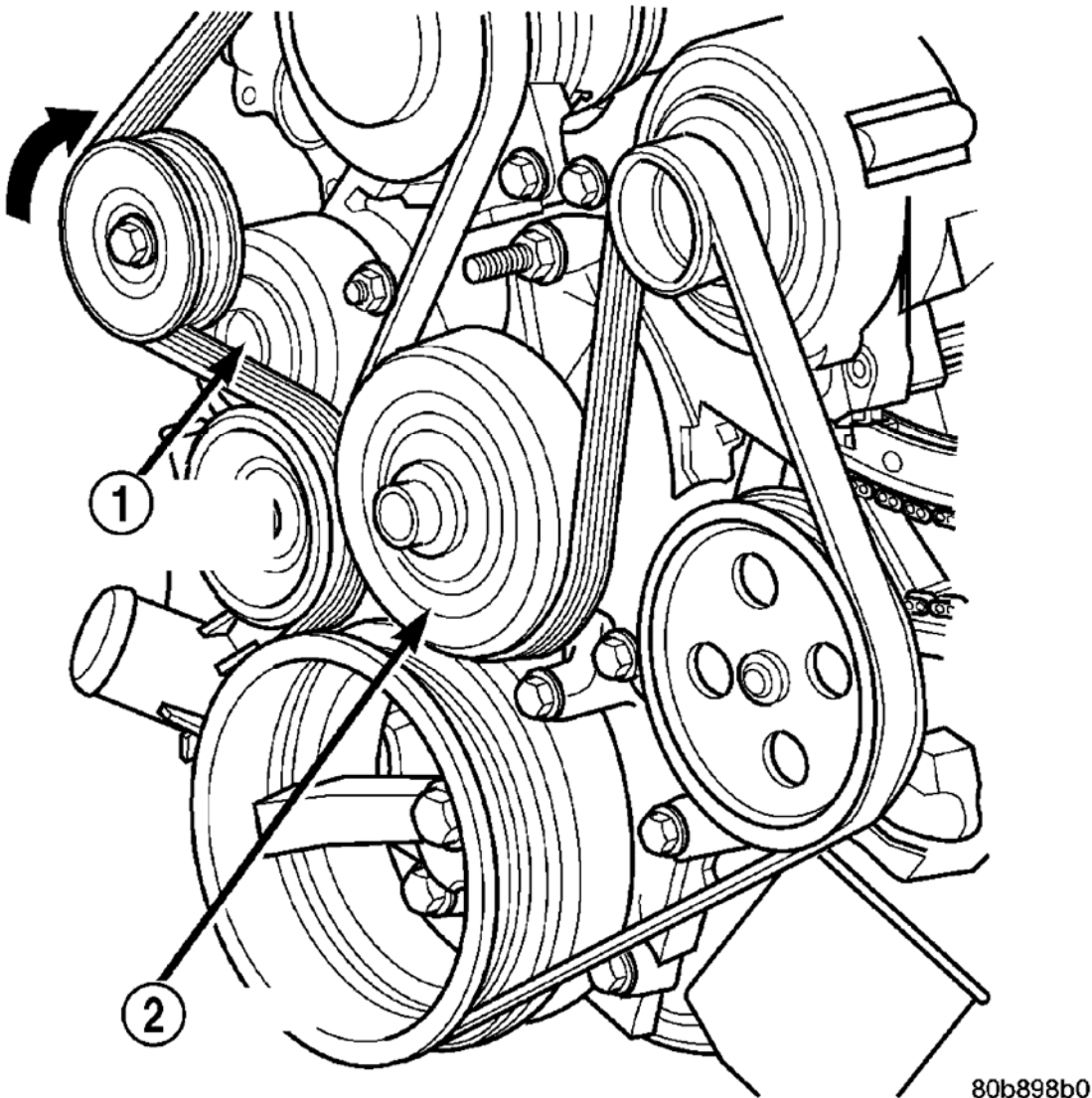


Fig. 83: Removing Accessory Drive Belt - 3.7L/4.7L

Courtesy of CHRYSLER LLC

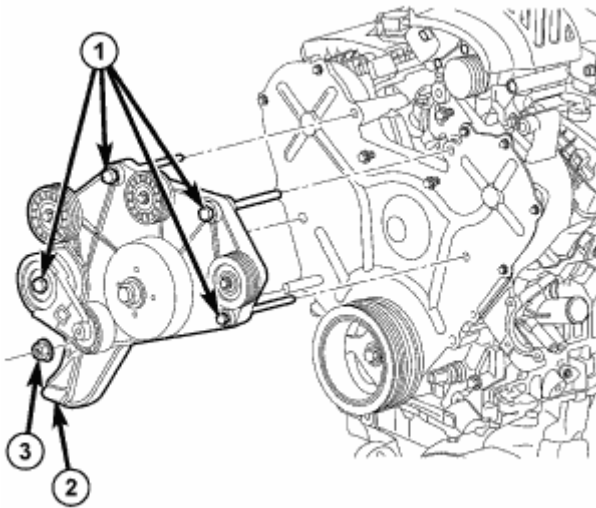
1 - AUTOMATIC TENSIONER
2 - WATER PUMP PULLEY

7. Remove accessory drive belt (1). See **BELT-ACCESSORY DRIVE**.
8. Remove lower radiator hose clamp and remove lower hose at water pump.
9. Remove seven water pump mounting bolts and one stud bolt.

CAUTION: Do not pry water pump at timing chain case/cover. The machined surfaces may be damaged resulting in leaks.

10. Remove water pump and gasket. Discard gasket.

REMOVAL-4.0L



81b85569

Fig. 84: Removing/Installing Accessory Drive Bracket
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove air filter housing (Refer to **REMOVAL**)
3. Drain cooling system. See **STANDARD PROCEDURE**.
4. Remove coolant recover container. See **REMOVAL**.
5. Remove viscous radiator fan. See **REMOVAL**.

6. Remove RH engine mount through bolt.
7. Raise engine assembly.
8. Remove front A/C compressor front mounting nuts and studs
9. Remove accessory drive belt bracket.
10. Remove engine timing belt. Refer to **REMOVAL** .

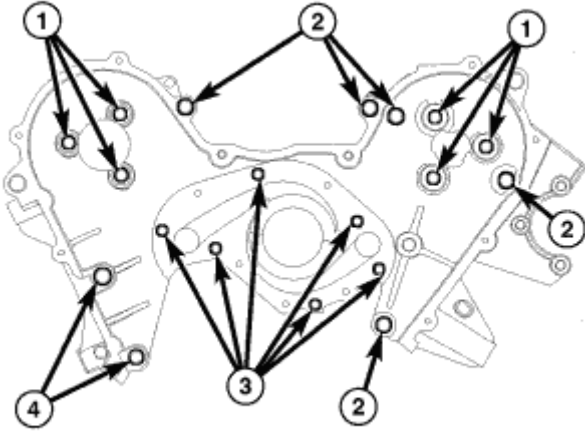
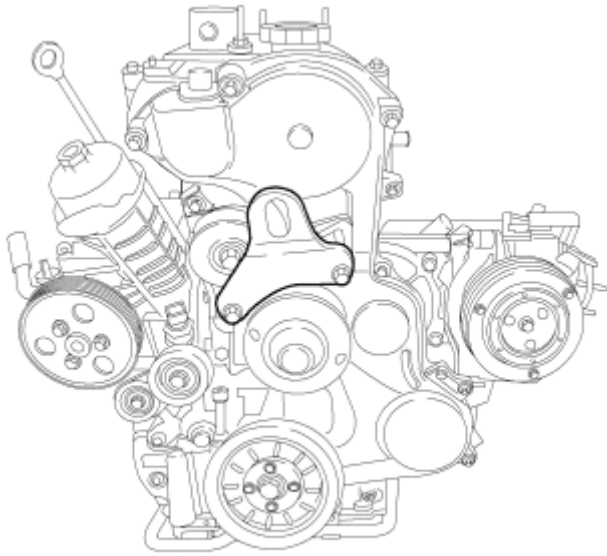


Fig. 85: Timing Belt Rear Cover Fasteners
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - M8 FASTENERS (APPLY THREAD SEALANT) |
| 2 - M10 FASTENERS |
| 3 - M6 FASTENERS |
| 4 - M10 FASTENERS (STUD/NUT) |

11. Remove water pump mounting bolts (3).
12. Remove water pump.
13. Clean mounting surface.

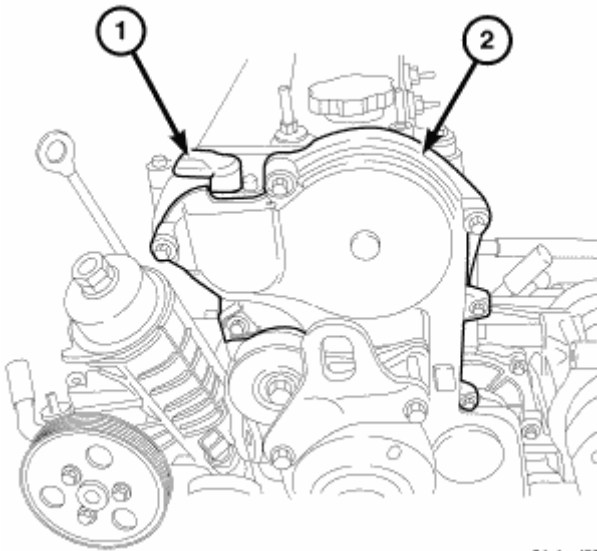
WATER PUMP-REMOVAL-2.8L DIESEL ENGINE



61ab0616

Fig. 86: Front Lifting Bracket
Courtesy of CHRYSLER LLC

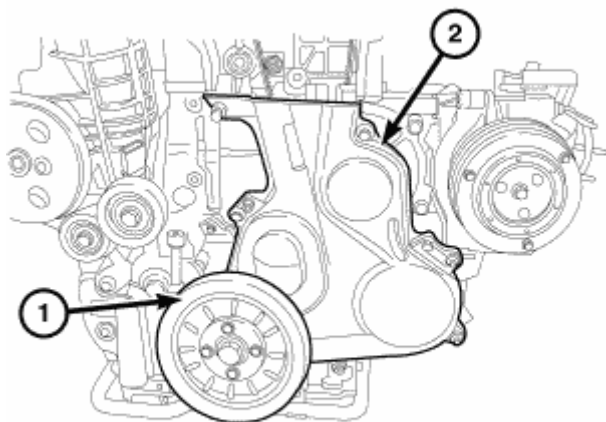
1. Remove the radiator fan. See **REMOVAL**.
2. Disconnect negative battery cable.
3. Drain cooling system. See **STANDARD PROCEDURE**.



61abed33

Fig. 87: Identifying Upper Front Cover & Lifting Bracket
Courtesy of CHRYSLER LLC

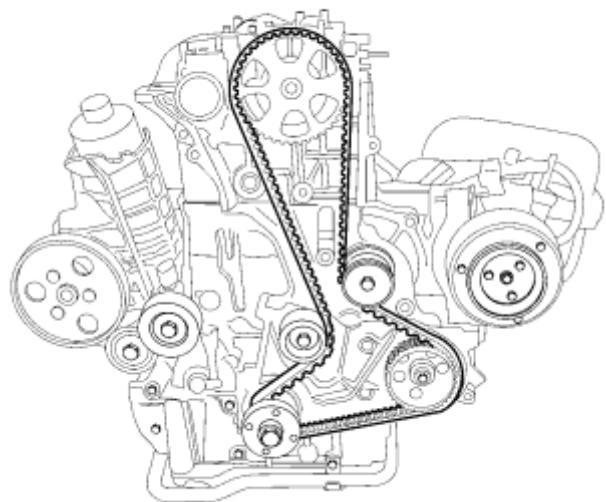
4. Remove the upper front cover.



81aba764

Fig. 88: Identifying Outer Front Cover & Crankshaft Damper
 Courtesy of CHRYSLER LLC

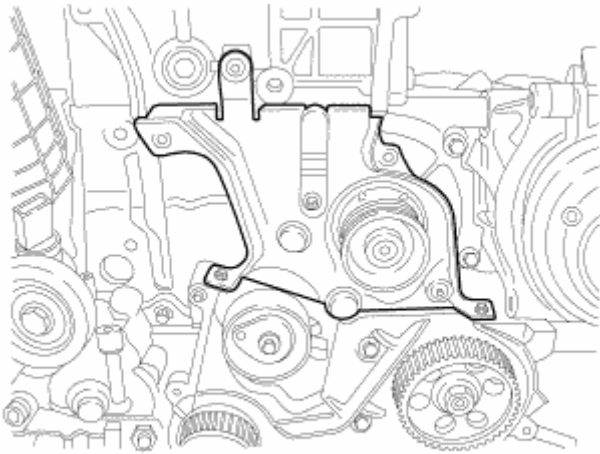
5. Remove the crankshaft damper and lower front cover.



81abec7

Fig. 89: Removing/Installing Timing Belt
 Courtesy of CHRYSLER LLC

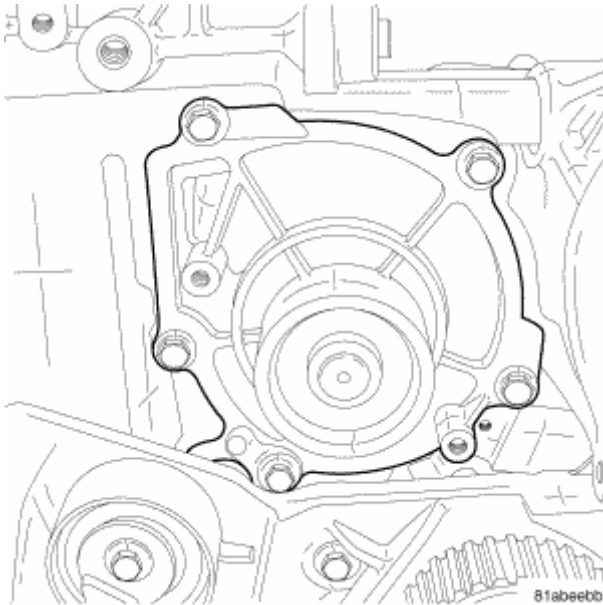
6. Remove the timing belt.



81aba73a

Fig. 90: Removing/Installing Inner Front Cover
Courtesy of CHRYSLER LLC

7. Remove the inner front cover.



81abe6bb

Fig. 91: Identifying Water Pump
Courtesy of CHRYSLER LLC

8. Remove water pump retaining bolts and pump.

CLEANING

WATER PUMP-CLEANING

Clean the gasket mating surface. Use caution not to damage the gasket sealing surface.

INSPECTION

WATER PUMP-INSPECTION

Inspect the water pump assembly for cracks in the housing, Water leaks from shaft seal, loose or rough turning bearing or impeller rubbing either the pump body or timing chain case/cover.

INSTALLATION

INSTALLATION-3.7L ENGINE

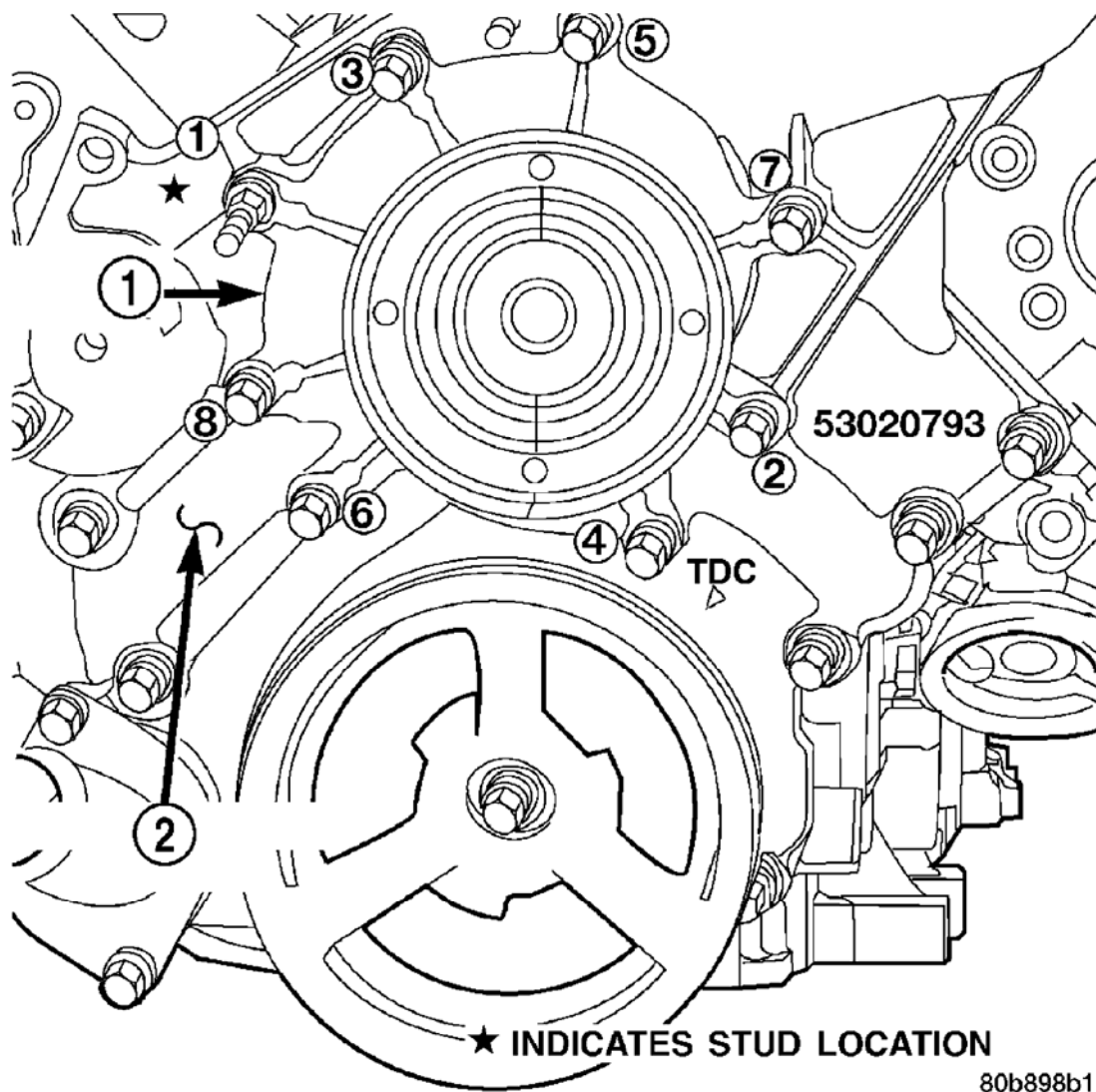
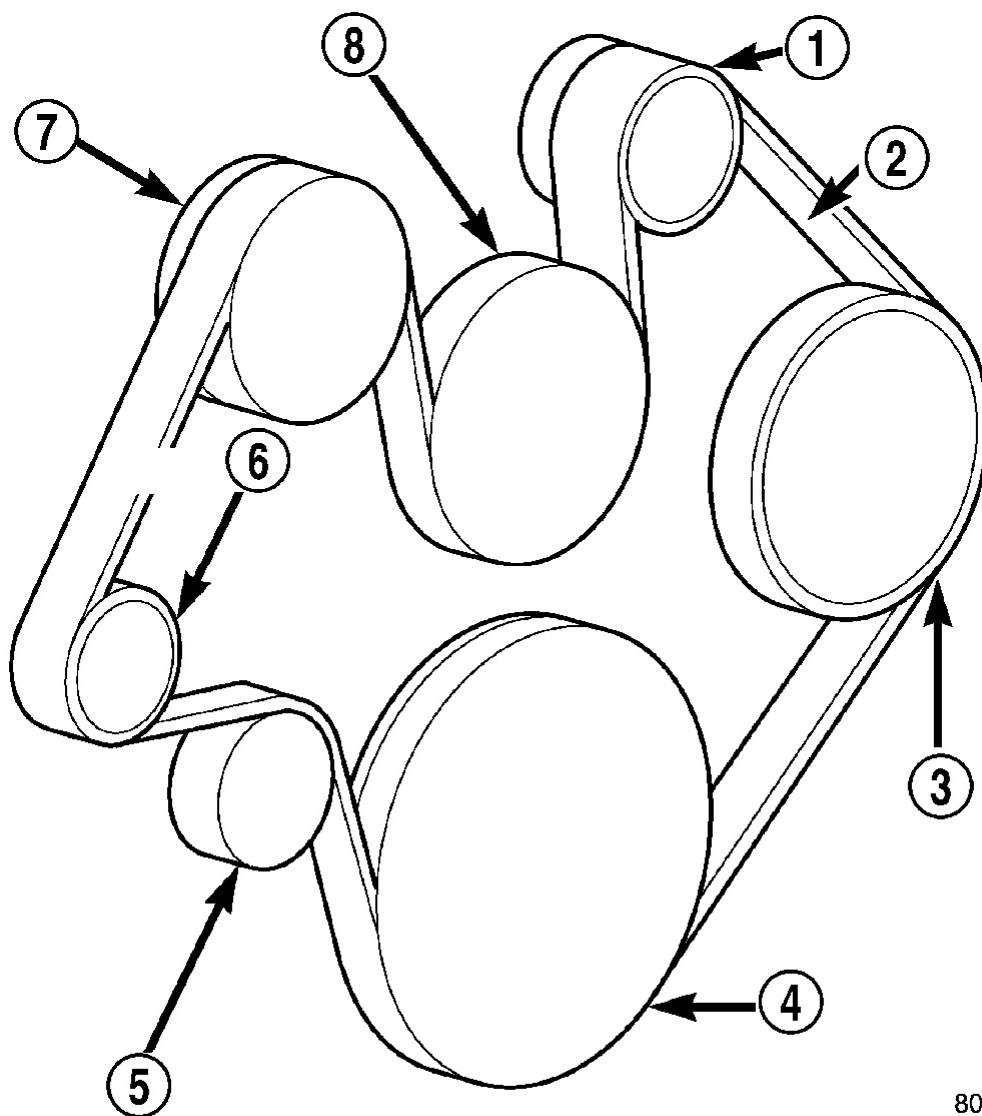


Fig. 92: View Of Water Pump & Bolt Tightening Sequence - 3.7L/4.7L - Typical
Courtesy of CHRYSLER LLC

1 - WATER PUMP
2 - TIMING CHAIN COVER

The water pump (1) on 3.7L engines is bolted directly to the engine timing chain case cover (2).

1. Clean gasket mating surfaces.
2. Using a new gasket, position water pump and install mounting bolts as shown. See **Fig. 92**. Tighten water pump mounting bolts to 54 N.m (40 ft. lbs.) torque.
3. Spin water pump to be sure that pump impeller does not rub against timing chain case/cover.
4. Connect radiator lower hose to water pump.



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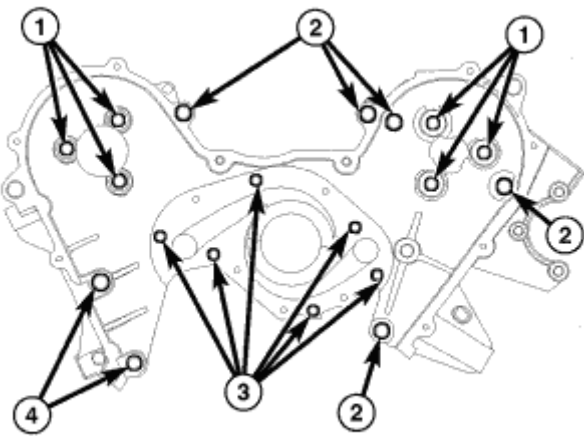
Fig. 93: Identifying Belt Routing - 3.7L/4.7L

Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - GENERATOR PULLEY
2 - ACCESSORY DRIVE BELT
3 - POWER STEERING PUMP PULLEY
4 - CRANKSHAFT PULLEY
5 - IDLER PULLEY
6 - TENSIONER
7 - A/C COMPRESSOR PULLEY
8 - WATER PUMP PULLEY |
|--|

5. Install accessory drive belt (2). See **INSTALLATION**.
6. Position upper fan shroud and fan blade/viscous fan drive assembly.
7. Be sure the upper and lower portions of the fan shroud are firmly connected. All air must flow through the radiator.
8. Install two fan shroud-to-radiator screws.
9. Be sure of at least 25 mm (1.0 inches) between tips of fan blades and fan shroud.
10. Fill cooling system. See **STANDARD PROCEDURE**.
11. Connect negative battery cable.
12. Start and warm the engine. Check for leaks.

INSTALLATION-4.0L



813a7295

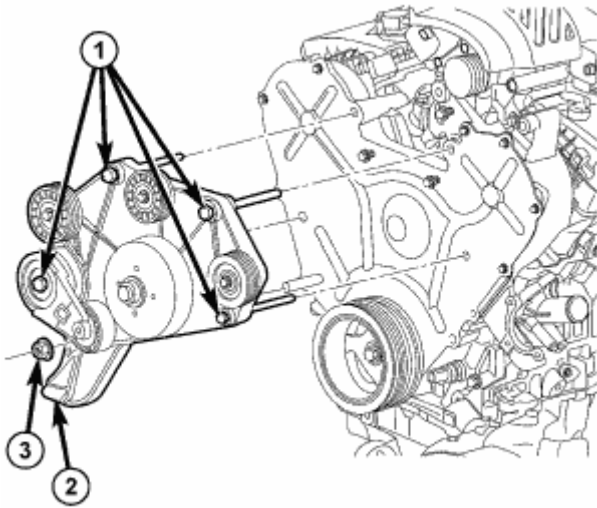
Fig. 94: Timing Belt Rear Cover Fasteners

Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - M8 FASTENERS (APPLY THREAD SEALANT) |
|---|

- 2 - M10 FASTENERS
- 3 - M6 FASTENERS
- 4 - M10 FASTENERS (STUD/NUT)

1. Position water pump and new gasket.
2. Install water pump mounting bolts. Tighten to 54 N.m (40 ft. lbs.).
3. Install engine timing belt. Refer to **INSTALLATION**.
4. Install accessory drive bracket. Tighten bolts to Tighten to 54 N.m (40 ft. lbs.).



81b85569

Fig. 95: Removing/Installing Accessory Drive Bracket
Courtesy of CHRYSLER LLC

- | |
|------------|
| 1 - Item_1 |
| 2 - Item 2 |

5. Install front A/C compressor mounting studs. and nuts. Tighten studs to
6. Install A/C compressor mounting nuts. Tighten nuts to 28 N.m (21 ft. lbs.).
7. Lower engine and install RH engine mount through bolt. Tighten bolt to 54 N.m (40 lbs. ft.).
8. Install accessory drive belt. See **INSTALLATION**.
9. Install viscous radiator fan. See **INSTALLATION**.
10. Install coolant recover container. See **INSTALLATION**.
11. Install air filter assembly (Refer to **INSTALLATION**).
12. Connect negative battery cable.
13. Fill cooling system. See **STANDARD PROCEDURE**.

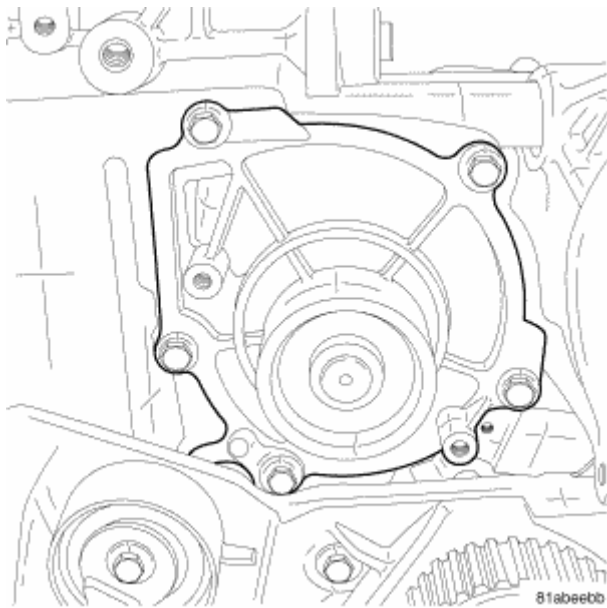


Fig. 96: Identifying Water Pump
 Courtesy of CHRYSLER LLC

1. Clean mating surfaces of water pump housing and engine block as necessary.
2. Place new O-ring in groove in water pump housing. Install water pump and retaining bolts. Torque bolts to 24 N.m (212 in. lbs.).
3. Install the water pump torque the water pump bolts to 32 Nm (23 ft. lbs.)

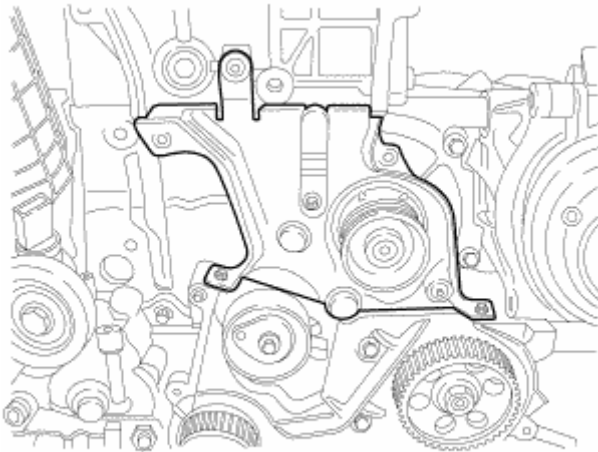
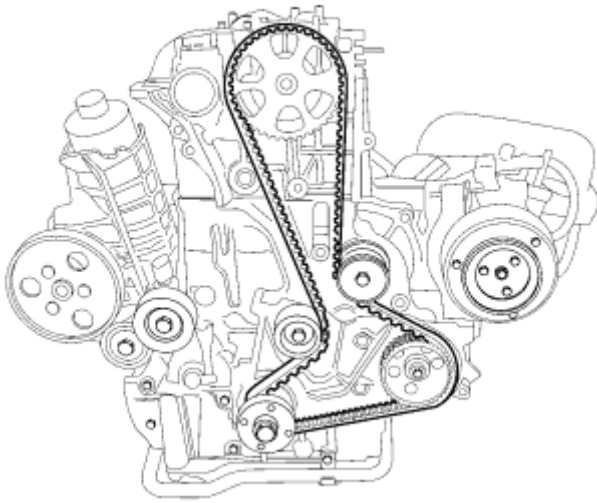


Fig. 97: Removing/Installing Inner Front Cover
 Courtesy of CHRYSLER LLC

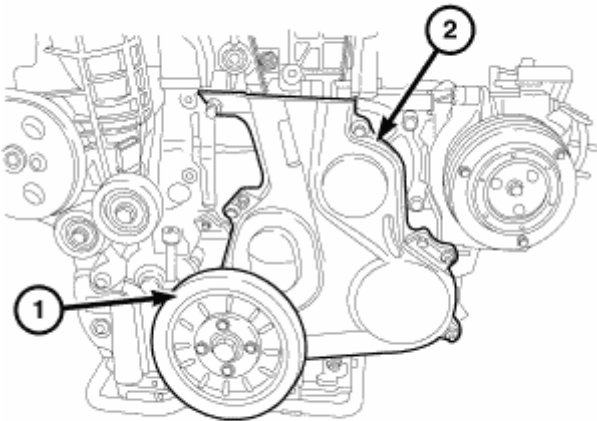
Install the inner front cover.



81abecc7

Fig. 98: Removing/Installing Timing Belt
Courtesy of CHRYSLER LLC

Install the timing belt.

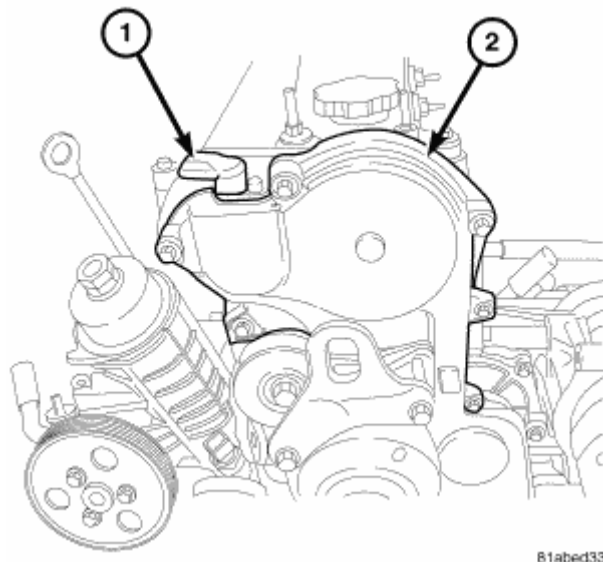


81abe764

Fig. 99: Identifying Outer Front Cover & Crankshaft Damper
Courtesy of CHRYSLER LLC

Install the outer front cover (2).

4. Install the crankshaft damper (1).



61abed33

Fig. 100: Identifying Upper Front Cover & Lifting Bracket
Courtesy of CHRYSLER LLC

5. Install the upper front cover.
6. Install the lifting bracket.
7. Install the fan. See **INSTALLATION**.
8. Refill cooling system. See **STANDARD PROCEDURE**.
9. Connect negative battery cable.

TRANSMISSION

COOLER-TRANSMISSION

DESCRIPTION

DESCRIPTION

The automatic transmission cooler is located in the front of the condenser and behind the front fascia. The transmission cooler is a heat exchanger that allows heat in the transmission fluid to be transferred to the air passing over the cooler fins.

The transmission oil cooler for the 2.8L Diesel with automatic transmission integrated into the A/C condenser.

The Transmission oil cooler assembly is equipped with quick connect fitting for the transmission oil cooler lines.

REMOVAL

TRANSMISSION OIL COOLER-REMOVAL

1. Remove electric cooling fan. See **REMOVAL**.
2. Position cooling fan out of the way.
3. Remove the transmission cooler line retaining block nut.
4. Remove transmission cooler lines from transmission lines.
5. Using Release Tool 8875A, disconnect transmission cooler tube from the transmission, see **STANDARD PROCEDURE**.
6. Remove the transmission cooler mounting bolts.
7. Remove transmission cooler from vehicle.

INSTALLATION

TRANSMISSION OIL COOLER-INSTALLATION

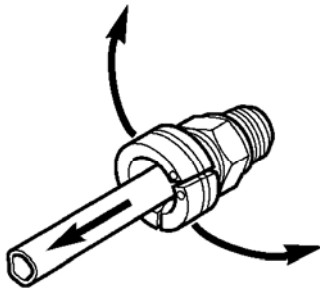
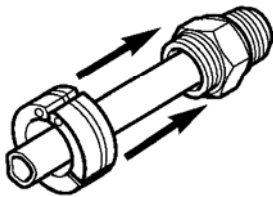
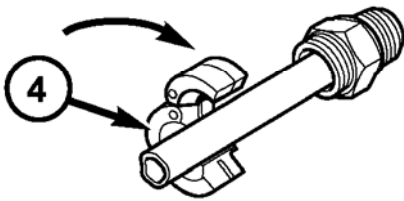
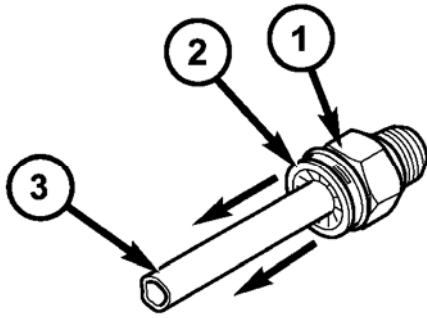
1. Position transmission cooler in vehicle.
2. Install transmission mounting bolts. Tighten to 14 N.m (123 in. lbs.)
3. Install transmission cooler lines into transmission, see **STANDARD PROCEDURE**.
4. Install locking plate and nut. Tighten nut to 22.5 N.m (200 in. lbs.)
5. Install electric cooling fan. See **INSTALLATION**.

LINES-TRANSMISSION COOLER

STANDARD PROCEDURE

QUICK CONNECT FITTING ASSEMBLY/DISASSEMBLY

DISCONNECT



81019138

Fig. 101: Oil Cooler Line Quick Connect Fitting - Disassembly
Courtesy of CHRYSLER LLC

2 - DUST CAP 3 - OIL COOLER LINE 4 - SPECIAL TOOL 8875A

1. Remove dust cap by pulling it straight back off of quick connect fitting (1).
2. Place properly sized Release Tool (4) onto transmission cooler line with the fingers of the tool facing the quick connect fitting.
3. Slide Release Tool down the transmission line and engage the fingers of the tool into the retaining clip. When properly engaged in the clip, the tool will fit flush against the quick connect fitting.
4. Rotate the release tool 60° to expand the retaining clip.
5. While holding the release tool against the quick connect fitting, pull back on the transmission cooler line to remove.
6. If quick connect fitting is damaged or leaking at transmission oil cooler or transmission, remove fitting.

CONNECT

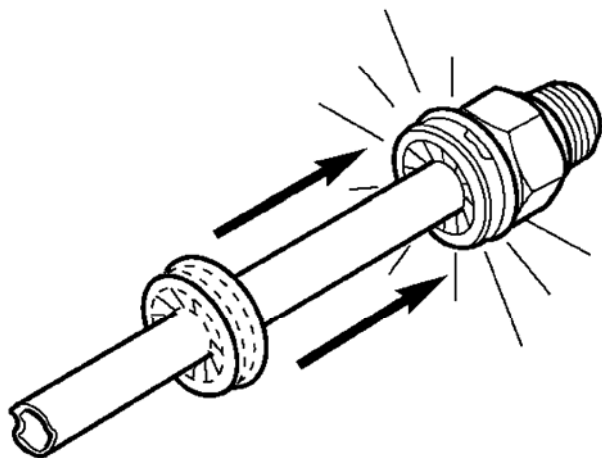
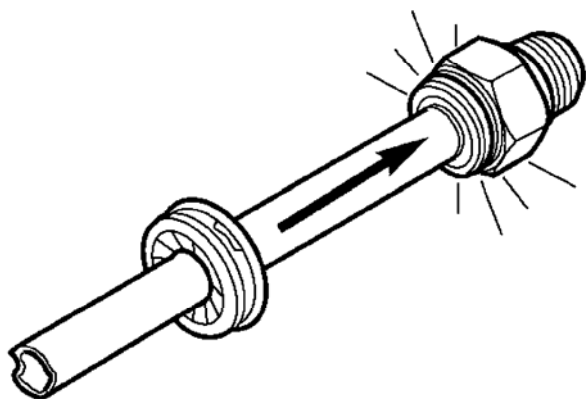
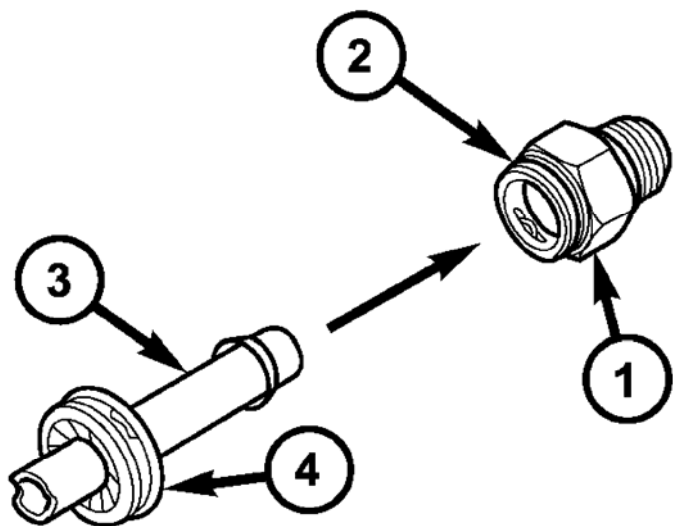


Fig. 102: Oil Cooler Line Quick Connect Fitting - Assembly
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - QUICK CONNECT FITTING2 - CLIP3 - OIL COOLER LINE4 - DUST CAP |
|---|

1. If removed, install quick connect fitting into transmission oil cooler or transmission. Tighten fitting to 15 N.m (132 in. lbs.).
2. Align transmission cooler line (3) with quick connect fitting while pushing straight into the fitting.
3. Push in on transmission cooler line until a "click" is heard or felt.
4. Slide dust cap (4) down the transmission cooler line and snap it over the quick connect fitting until it is fully seated and rotates freely. Dust cap will only snap over quick connect fitting when the transmission cooler line is properly installed.

NOTE: **If dust cap will not snap into place, repeat assembly step #2.**

GENERAL INFORMATION

Diagnostic Connector (DLC) Locations

DOMESTIC CARS

CHRYSLER GROUP LLC

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

CHRYSLER GROUP LLC - DOMESTIC CARS

Application	Connector Location
Acclaim	
1989-90	Under Left Side Of Dash
1991-92	On Left Front Fender Panel, Near Shock Tower
1993-94	Near Battery
1995	Behind Left Side Of Dash, Near Fuse Block
Aries, Caravelle, Dynasty, E Class, Executive Sedan, LeBaron Sedan, New Yorker, Reliant, Town & Country, 400 & 600	
1984-85	On Left Fender Apron, Behind Battery (2.2L Only)
1986-87	On Front Of Right Shock Tower (2.2L & 2.5L Only)
1988-89	On Left Fenderwell
1990	Under Left Side Of Dash
1991-92	On Left Front Fender Panel, Near Shock Tower
1993 (Except New Yorker)	Near Battery
1993 (New Yorker)	On Left Fender Panel Near PCM
Avenger (1995-00)	Under Center Of Dash, Near Center Console
Breeze, Cirrus & Stratus (1995)	Left Of Steering Column, On BCM
Charger, Horizon, Omni, Rampage, Scamp & Turismo	
1985-89	
2.2L Carbureted	On Left Fender Apron
2.2L Turbo	On Front Of Right Shock Tower
Concorde, Intrepid, LHS, New Yorker, Vision & 300M	
1993-95	Behind Left Side Of Dash
1996-97	Under Left Side Of Dash, Near Center Console
Daytona	

1984-87	On Front Of Right Shock Tower
1988-89	On Left Fenderwell
1990-92	On Left Front Fender Panel, Near Shock Tower
1993	On Left Front Inner Fender Or Under Steering Column
Dynasty	
1990	Under Left Side Of Dash
1991-93	On Left Fender Panel, Near SBEC/PCM
Fifth Avenue	
1990	Under Left Side Of Dash
1991-93	On Left Fender Panel Near SBEC/PCM
Horizon & Omni (1989-90)	Under Left Side Of Dash
Imperial	
1981-83	CCC Connector Left Of Air Cleaner
1990	Under Left Side Of Dash
1991-93	On Left Fender Panel Near SBEC/PCM
LeBaron Coupe & Convertible	
1985-87	On Right Front Shock Tower
1988-89	On Left Fenderwell
1990-92	On Left Front Fender Panel, Near Shock Tower
1993	On Left Front Inner Fender Or Under Steering Column
1994	Near Battery
1995	Behind Left Side Of Dash, Near Fuse Block
Lancer	
1985-87	On Right Front Shock Tower
1988-89	On Left Fenderwell
Laser	
1990-94	Above Left Kick Panel, Near Fuse Block
1995	Under Left Side Of Dash, Near Center Console
Monaco & Premier	
1990	On Right Front Fender Panel
1991-92	On Left Fender Panel, Next To SBEC
Neon (1995)	Under Headlight Switch, Under Left Side Of Dash
Shadow	
1985-87	On Right Front Shock Tower
1988	On Left Fenderwell
1989	Under Dash, To Right Of Steering Column

1990	On Left Fender Front Panel, Near SBEC
1991-92	On Left Front Fender Panel, Near Shock Tower
1993-94	Near Battery
Spirit & Sundance	
1985-87	On Right Front Shock Tower
1989-90	Under Left Side Of Dash
1991-92	On Left Front Fender Panel, Near Shock Tower
1993-94	Near Battery
1995	Behind Left Side Of Dash, Near Fuse Block
Talon	
1990-94	Above Left Kick Panel, Near Fuse Block
1995-98	Under Left Side Of Dash, Near Center Console

FORD MOTOR CO.

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

FORD MOTOR CO. - DOMESTIC CARS

Application	Connector Location
Bobcat & Pinto	On Center Of Right Fender Apron
Capri	
1980-85	On Center Of Left Front Fender Apron
1986	On Left Rear Corner Of Engine Compartment
Continental	
1984-89	On Right Rear Corner Of Engine Compartment
1990-91	On Right Rear Corner Of Firewall, On Electronic Assembly Cover
1992	On Right Fender Apron
1993-94	VIP Connectors (2) On Right Rear Of Engine Compartment, On PCM Cover
Contour & Mystique	
1995	On Left Rear Corner Of Engine Compartment
Cougar & Thunderbird	
1982-90	On Left Fender Apron
1991	On Rear Of Right Front Fender Panel
1992	Front Of Right Shock Tower
1993	2 Connectors In Right Rear Corner Of Engine Compartment

1994	On Right Side Of Engine Compartment & Below Glove Box
1995	
3.8L	On Right Side Of Engine Compartment & Below Glove Box
4.6L	Behind Right Side Of Dash, Below Glove Box
1996	Lower Right Side Of Dash, Below Glove Box
Crown Victoria, Grand Marquis & Lincoln Town Car	
1983 & 1987	On Right Fender Apron
1985-86 & 1988-90	On Left Fender Apron
1992	On Left Front Fender Panel
1993-94	On Top Of Left Front Wheelwell
Escort, EXP, Lynx & Tracer	
1985-90	On Right Fender Apron Near Firewall
1991	On Left Rear Of Engine Compartment
1992	On Right Rear Of Engine Compartment, Near Cowl
1993-95	On Left Side Of Firewall
LTD & Marquis	
1983	On Left Fender Apron
1984-86	On Left Rear Corner Of Engine Compartment
Mark VII	
1984-87	On Right Rear Corner Of Engine Compartment
1988-90	Front Of Right Fender Apron
1991	On Right Side Of Engine Compartment, Near Thermactor Solenoids
Mark VIII	
1993-96	On Top Of Left Wheelwell
Mustang	
1980-85	On Center Of Left Front Fender Apron
1986-91	On Left Rear Corner Of Engine Compartment
1992	On Left Shock Tower, Near Ignition Coil
1993	2 Connectors On Right Front Strut Tower
1994-95	Behind Right Front Strut Tower & Right Of Steering Column
Probe	
1991-92	On Left Rear Corner Of Engine Compartment
1993	DLC - Behind Left Side Of Dash; STI Connector - On Left Inner Fender Panel
1994-95	On Left Front Inner Fender Panel
Sable & Taurus	
1986-87 (3.0L Only)	Near Alternator
1988-90	
2.5L	On Engine Harness Near PCV Hose
3.0L	On Right Rear Corner Of Engine Compartment

1991	On Right Rear Corner Of Engine Compartment, On ECA Cover
1992	On Right Rear Corner Of Engine Compartment, Below MAP Sensor
1993-95	Right Rear Of Engine Compartment
Tempo & Topaz	
1984-92	On Right Rear Corner Of Engine Compartment
1993-94	In Engine Compartment, On Left Strut Tower

GENERAL MOTORS

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

GENERAL MOTORS - DOMESTIC CARS

Application	Connector Location
Allante	Enter Diagnostic Mode By Pressing OFF & WARM Buttons On Instrument Panel
Bonneville (1980-81)	ECU Connector On Upper Right Kick Panel
Brougham (1987-92)	Bottom Center Of Instrument Panel
Camaro & Firebird (1980)	Diagnostic Ground Lead Connector On Right Shroud Above ECM
Caprice Classic	
1980-81	ECU Connector On Upper Right Kick Panel
1982-88	Under Center Of Instrument Panel
Catalina	ECU Connector On Upper Right Kick Panel
Cavalier (1982-88)	On Side Of Fuse Block
Cimarron	On Side Of Fuse Block
Century	Under Left Of Dash Ashtray
Corvette (1980-83)	In Center Console, Under Ashtray
Custom Cruiser	
1980-81	ECU Connector On Upper Right Kick Panel
1982-88	Under Center Of Instrument Panel
DeVille (1981-88)	Enter Diagnostic Mode By Pressing OFF & WARMER Buttons On Instrument Panel
Delta 88	ECU Connector On Upper Right Kick Panel
Eldorado (1981-88)	Enter Diagnostic Mode By Pressing OFF & WARMER Buttons On Instrument Panel
Electra (1980-81)	ECU Connector On Upper Right Kick Panel
Estate Wagon	ECU Connector On Upper Right Kick Panel
Fiero	Under Ashtray Or Cigar Lighter Panel Within Center Console
Firenza	On Side Of Fuse Block

Fleetwood (1981-88)	Enter Diagnostic Mode By Pressing OFF & WARMER Buttons On Instrument Panel
Fleetwood Brougham	On Bottom Center Of Dash, Near Ashtray
Impala (1982-88)	Under Center Of Instrument Panel
LeMans	ECM Connector On Right Kick Panel Or Under Left Side Of Dash
LeSabre (1980-81)	ECU Connector On Upper Right Kick Panel
LeSabre Wagon (1982-88)	Under Center Of Instrument Panel
Monza	Under Right Side Of Dash
Ninety-Eight (1980-81)	ECU Connector On Upper Right Kick Pane
Nova	Behind Right Strut Tower
Parisienne	Under Center Of Instrument Panel
Reatta	
1988-92 (MFI)	Enter Diagnostic Mode By Pressing OFF & WARM Buttons On Instrument Panel
1991-93	Above Parking Brake Pedal
Riviera	
1980-85 (Carbureted)	Under Left Or Center Of Dash
1986-92 (MFI)	Enter Diagnostic Mode By Pressing OFF & WARM Buttons On Instrument Panel
Safari	Under Center Of Instrument Panel
Seville (1981-88)	Enter Diagnostic Mode By Pressing OFF & WARMER Buttons On Instrument Panel
Skyhawk	Under Right Side Of Dash
Starfire	Under Right Side Of Dash
Sunbird	On Side Of Fuse Block, Under Right Side Of Dash
Toronado	
1980-85 (Carbureted)	Under Left Or Center Of Dash
1986-92 (MFI)	Enter Diagnostic Mode By Pressing OFF & WARM Buttons On Instrument Panel
Trofeo	
1988-92 (MFI)	Enter Diagnostic Mode By Pressing OFF & WARM Buttons On Instrument Panel
1991-93	Above Parking Brake Pedal
2000	On Side Of Fuse Block

DOMESTIC LIGHT TRUCKS & VANS

CHRYSLER GROUP LLC

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

CHRYSLER GROUP LLC - DOMESTIC LIGHT TRUCKS & VANS

Application	Connector Location
Caravan, Grand Caravan, Grand Voyager, Mini Ram Van, Town & Country, & Voyager	
1984-92	On Left Side Fender Apron
1993	On Left Fender Front Fender Panel, Near SBEC
1994-95	On Wiring Harness, On Center Of Firewall
Dakota	
1987-88	On Right Side Fender Apron
1989	On Left Side Of Firewall
1990-92	On Right Side Of Firewall
1993-95	On Right Rear Corner Of Engine Compartment
Jeep	
Cherokee (1992-95)	On Left Front Fender Apron, Behind Air Cleaner
Comanche	On Left Front Fender Apron, Behind Air Cleaner
Grand Cherokee & Wagoneer	
1993-95	
PCM	On Right Rear Of Engine Compartment, Near PCM
TCM	Behind Left Side Of Instrument Panel
Wrangler (1992-95)	On Left Side Of Firewall, Near PCM
Pickup & Ramcharger	
1985-90	On Left Side Of Firewall
1991-93	On Left Front Fender Panel, Next To SBEC/PCM
1995 Pickup	On Right Side Of Firewall
Ram Wagon & Van	
1985-90	On Left Side Of Firewall
1991-95	On Center Of Firewall, Near SBEC/PCM

FORD MOTOR CO.

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

FORD MOTOR CO. - DOMESTIC LIGHT TRUCKS & VANS

Application	Connector Location
Aerostar	
1986-90	On Left Front Fender
1991	Near Starter Relay
1992	On Left Front Inner Fender Panel
1993-95	On Left Side Of Firewall

Bronco	
1982-85	
6-Cylinder	On Left Front Fender
V8	On Right Inner Fender Panel
1986-87	On Right Front Fender, Near Starter Relay
1988-92	On Left Fender Apron
1993-95	2 Connectors In Left Rear Of Engine Compartment, On Bracket
1996-	Below Glove Box
Bronco II	
1983-85	On Right Front Inner Fender Panel (2.3L Only)
1986-90	On Right Front Fender Apron
Excursion	Behind Center Of Dash
Explorer & Mountaineer (1991-94)	On Right Rear Of Engine Compartment, Near A/C-Heater Blower
Pickup	
1982-85	
6-Cylinder	On Left Front Fender
V8	On Right Inner Fender Panel
1986-87	On Right Front Fender, Near Starter Relay
1988-92	On Left Fender Apron
1993-95	2 Connectors In Left Rear Of Engine Compartment, On Bracket
1996-	Below Center Of Instrument Panel
Pickup (F250 Heavy Duty & F350)	Under Right Side Of Dash
Ranger	
1983-85	On Right Front Inner Fender Panel (2.3L Only)
1986-90	On Right Front Fender Apron
1991	Behind Engine Compartment Fuse/Relay Block
1992	On Left Front Inner Fender Panel
1993-95	On Rear Of Engine Compartment Fuse/Relay Block
Van	
1986-92	On Right Fender Apron
1993-95	On Left Front Corner Of Engine Compartment
1996	
5.8L (49 State, Over 8600 GVW) & 7.5L (Except Calif.)	On Left Front Corner Of Engine Compartment

All Others	Under Left Side Of Dash
1997-98	
Diesel	Under Left Side Of Dash
All Others	Left Front Corner Of Engine Compartment
Villager (1993)	On Left Side Of Engine Compartment, Below Coolant Reservoir

GENERAL MOTORS

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

GENERAL MOTORS - DOMESTIC LIGHT TRUCKS & VANS

Application	Connector Location
Astro & Safari Van (1986-87)	Under Left Corner Of Cowl
"S" & "T" Series Blazer, Bravada, Envoy, Jimmy, Pickup & Sonoma	
1982-85	
1.9L	Under Left Side Of Dash, Behind ECM
2.0L & 2.8L	Under Ashtray
2.5L	Under Left Side Of Dash
1986-87	Under Ashtray
Van ("G" Series) (1982-87)	Under Driver's Seat

IMPORTED CARS & TRUCKS

ACURA

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

ACURA - IMPORTED CARS & TRUCKS

Application	Connector Location
Integra	
1991-93	Behind Right Kick Panel
1994-97	Behind Glove Compartment
1998-02	Behind Right Side Of Center Console
Legend	
1991-93	Under Right Side Of Dash, Above PGM-FI ECU/PCM
1994-95	Behind Glove Compartment
NSX (1997-01)	Under Glove Compartment

SLX	Behind Lower Left Corner Of Dash, Behind Cover
Vigor	
1992-93	Under Right Side Of Dash, Near Center Console
1994	Behind Glove Compartment
2.2CL & 2.3CL	In Front Of Shift Lever, Behind Ashtray
2.5TL	In Front Of Shift Lever, Behind Ashtray
3.0CL	In Front Of Shift Lever, Behind Ashtray
3.2TL & 3.5RL	In Front Of Shift Lever, Behind Ashtray

AUDI

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

AUDI - IMPORTED CARS & TRUCKS

Application	Connector Location
A4	
1996	Next To Rear Ashtray
1997-01 (1.8L Turbo)	Behind Cover, Under Left Side Of Steering Column
1997-99 (2.8L V6)	Under Cover, Next To Rear Ashtray
1997-	Under Left Side Of Dash, Behind Cover
A6	
1995	Under Ashtray, In Front Storage Compartment Of Center Console
1996-97	Under Cover, Next To Parking Brake Handle
Cabriolet	
1994-96	In Fuse/Relay Block, On Left Side Of Dash
1997-98	Under Ashtray, At Rear Of Center Console
Coupe GT, 4000S & 4000S Quattro	In Fuse Socket, On Fuel Pump Relay
80	In Fuse Socket, On Fuel Pump Relay
90	
1988-92	In Fuse Socket, On Fuel Pump Relay
1993	In Main Fuse/Relay Block, On Plenum Tray
1994-95	In Fuse/Relay Block, On Left Side Of Dash
100	
1989-91	Under Left Side Of Dash
1992-94	In Auxiliary Relay Station No. 1, On Left

	Rear Of Engine Compartment
5000CS Quattro, 5000CS Turbo & 5000S	In Fuse Socket, On Fuel Pump Relay

BENTLEY

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

BENTLEY - IMPORTED CARS & TRUCKS

Application	Connector Location
1996-00	
All Models	In Glove Compartment
2001-04	
Arnage	Below Left Side Of Dash
2001-	
Azure Convertible	In Glove Compartment
Continental	In Glove Compartment

BMW

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

BMW - IMPORTED CARS & TRUCKS

Application	Connector Location
Z3	Behind Cover, On Right Side Of Center Console
Z4 & Z8	Under Left Side Of Dash, Left Of Steering Column, Behind Cover
318 & 325	
1991	On Bracket, Above Thermostat Housing
1992-95	On Right Rear Of Engine Compartment
1996	Under Left Side Of Dash, Behind Panel Labeled OBD
330	Behind Cover, On Right Side Of Center Console
524t	On Top Rear Of Engine
525i & 535i	
1990-91 (Black 20-Pin Connector)	Left Rear Corner Of Engine Compartment

1992-95	Outside Of Engine Compartment Fuse/Relay Block
528e	On Intake Manifold Bracket, Behind Thermostat Housing
635CSi	On Bracket, Next To Fuse/Relay Block
735i	
1986-87	On Bracket, On Top Of Engine
1988-92	On Right Side Of Engine Compartment, On Shock Tower
740 & 750	Under Left Side Of Dash, Behind Panel Labeled OBD
740i & 740iL (1993-01)	Behind Cover On Lower Left Corner Of A/C Control Panel
750iL	Behind Cover On Lower Left Corner Of A/C Control Panel

DAIHATSU

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

DAIHATSU - IMPORTED CARS & TRUCKS

Application	Connector Location
Charade	At Upper Section Of Transmission
Rocky	On Right Front Fender Panel

CHRYSLER GROUP LLC

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

CHRYSLER GROUP LLC - IMPORTED CARS & TRUCKS

Application	Connector Location
Colt & Summit	
1986-87	Above Inside Of Glove Compartment
1988	On Left Rear Corner Of Engine Compartment
1989-98	Under Left Side Of Dash, Near Fuse/Relay Block
Colt Vista	
1987	Behind Glove Compartment

1988-89	Under Left Side Of Dash, Near Hood Release Handle
1990-96	Under Right Side Of Dash
Conquest & Starion	Behind Glove Compartment
Expo	Under Left Side Of Dash, Near Fuse/Relay Block
Medallion	On Left Side Of Firewall
Pickup	Under Left Side Of Dash, Near Fuse/Relay Block
Ram-50	Under Left Side Of Dash, Near Fuse/Relay Block
Sigma	In Glove Compartment
Stealth	
1991-98	Under Left Side Of Dash, On Fuse/Relay Block
1999	Under Left Side Of Dash, Left Of Center Console
Summit Wagon	Under Right Side Of Dash
Vista Wagon	Under Right Side Of Dash

FERRARI

FERRARI - IMPORTED CARS & TRUCKS

Application	Connector Location
All Models	
1996-	Behind Left Side Of Dash

FORD MOTOR CO.

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

FORD MOTOR CO. - IMPORTED CARS & TRUCKS

Application	Connector Location
Aspire	
1994-95	On Left Rear Corner Of Engine Compartment
1996-97	Under Left Side Of Dash
Capri	
1991	Behind Right Side Of Dash, Behind Glove Compartment
1992	
1.3L	On Left Rear Corner Of Engine

	Compartment
1.6L	On Right Rear Corner Of Engine Compartment
1993-94	On Right Rear Corner Of Engine Compartment
Festiva	
1992-93	
1.3L	On Left Rear Corner Of Engine Compartment
1.6L	On Right Rear Corner Of Engine Compartment
Merkur XR4Ti	On Right Front Fender Apron, Near Battery
Scorpio	On Right Rear Corner Of Engine Compartment
Tracer	On Left Rear Corner Of Engine Compartment

GENERAL MOTORS

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

GENERAL MOTORS & GEO - IMPORTED CARS & TRUCKS

Application	Connector Location
LeMans	Behind Right Kick Panel, Above ECM
Metro	
1989-95	Under Left Side Of Dash, Near Fuse Block
1996	Under Right Side Of Dash, Near Center Console
1997-01	Under Left Side Of Dash
Prizm & Prizm LSi	
1989-95	On Left Front Strut Tower
1996-02	Under Left Side Of Dash
Spectrum	Under Right Side Of Dash, Above A/C-Heater Blower Motor
Sprint	On Left Front Shock Tower, Near Battery
Storm	
1990-91	Behind Right Side Of Dash, Above A/C-Heater Blower Motor
1992-93	Behind Right Kick Panel
Tracker	
1989-95	Under Left Side Of Dash, Near Fuse Block
1996	In Engine Compartment, Near MAP Sensor
1997-	Under Left Side Of Dash

HONDA

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

HONDA - IMPORTED CARS & TRUCKS

Application	Connector Location
Accord	
1990-95	Behind Right Side Of Dash, Above Kick Panel
1996-97	Behind Ashtray In Center Console
Civic (1992-95)	Behind Right Side Of Dash, Near PGM-FI ECM
Civic Del Sol	
1992-95	Behind Right Side Of Dash, Near PGM-FI ECM
1996-97	Under Removable Cover On Right Side Of Center Console
CR-V	Behind Passenger Side Of Center Console
Element	
2003-11	Above Gas Pedal, Below Fuse Block
Insight (2010-11)	Below Left-of-Center Of Dash
Odyssey	
1995	Behind Right Side Of Dash, Above Kick Panel
1996-98	Behind Passenger Side Of Center Console
Passport (1995)	Behind Left Kick Panel
Prelude	
1992-95	Behind Center Console
1996	Under Beverage Holder In Center Console
1997-02	Under Removable Cover On Right Side Of Center Console
S2000	Behind Right Side Of Center Console

HYUNDAI

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

HYUNDAI - IMPORTED CARS & TRUCKS

Application	Connector Location
Accent (1995)	In Coin Box
Sonata	
1989	Under Left Side Of Dash, In Fuse Block
1990	
W/Passive Seat Belt Restraints	In Fuse Block

W/O Passive Seat Belt Restraints

On Lower Left Of Steering Column

INFINITI

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

INFINITI - IMPORTED CARS & TRUCKS

Application	Connector Location
G20 (1993-95)	In ECCS Control Unit, Behind Center Console
I30 (1995)	Beside Fuse Box
J30	
1993	Under Left Side Of Dash
1994-95	In ECM, Behind Right Kick Panel
1996-98	Under Left Side Of Dash
M30	Under Left Side Of Dash, Near Fuse Block
Q45	
1990-93	Under Left Side Of Dash, Near Fuse Block
1994-95	In ECM, Behind Right Kick Panel

ISUZU

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that **ARE NOT** located at the lower left side of the dash, as mandated in 1996 by the Federal government.

ISUZU - IMPORTED CARS & TRUCKS

Application	Connector Location
Amigo & Pickup	
1986-89	Under Left Side Of Dash
1990-95	Behind Left Kick Panel, Near ECM
1998-00	Lower Left Corner Of Dash, Behind Small Cover
Hombre	Under Lower Left Side Of Dash, Behind Cover
Impulse	
1986-89	Under Left Side Of Dash, Above ECU
1990-92	Behind Right Kick Panel
1993-95	Behind Left Kick Panel, Near ECM
I-Mark	Behind Right Side Of Dash, Above A/C-Heater Blower Motor
Oasis	Behind Right Side Of Center Console

Rodeo	
1991-95	Behind Left Kick Panel
1996-	Lower Left Side Of Dash, Behind Small Cover
Stylus	Behind Right Kick Panel
Trooper & Trooper II	
1986	Under Left Side Of Dash
1987-91	Under Center Console
1992	
DOHC	Behind Center Of Dash, Right Of Steering Column
SOHC	Under Left Side Of Dash
1993-95	Under Left Side Of Dash, Right Of Steering Column
1996-02	Lower Left Side Of Dash, Behind Small Cover
VehiCROSS	Under Left Side Of Dash

JAGUAR

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

JAGUAR - IMPORTED CARS & TRUCKS

Application	Connector Location
XJR (1995-97)	Near Center Console
XJS	
1992	On Left Rear Trunk Wheel Arch, Behind Trim Panel
1993-94	Under Battery Tray, On Right Front Of Luggage Compartment
1995-96	Near Center Console
XJ6	
1992	On Left Rear Of Engine Compartment
1993-94	Under Battery Tray, On Right Front Of Luggage Compartment
1995-97	Under Left Side Of Dash, Near Center Console
XJ12	Near Center Console

KIA

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

KIA - IMPORTED CARS & TRUCKS

Application	Connector Location
Sephia	
1994	On Center Of Firewall
1995 & 1996	
1.6L	Under Center Of Dash, Mounted On Floorboard
2.0L	Under Right Side Of Dash, Near Kick Panel
Sportage	
1994	On Center Of Firewall
1995 & 1996	
1.6L	Under Center Of Dash, Mounted On Floorboard
2.0L	Under Right Side Of Dash, Near Kick Panel

LAND ROVER

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

LAND ROVER - IMPORTED CARS & TRUCKS

Application	Connector Location
Defender 90	Behind Fuse Cover, In Center Of Console
Range Rover	Under Right Side Of Dash, In Footwell

LEXUS

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

LEXUS - IMPORTED CARS & TRUCKS

Application	Connector Location
ES Series	
1990-91	
DLC	Near Left Shock Tower

Total Diagnostic Communication Link Connector	Under Left Side Of Dash
1992-94	
DLC No. 1	On Bracket, Behind Right Front Strut Tower
DLC No. 2 & 3	Under Left Side Of Dash
1995-97	In Fuse Box At Lower Left Of Dash
GS Series	
1990-95	
DLC No. 1	On Bracket, On Top Of Engine
DLC No. 2	Under Left Side Of Dash
1996-00	In Fuse Box At Lower Left Of Dash
LS Series	
1990-94	
DLC No. 1	On Bracket, On Top Of Engine
DLC No. 2	Under Left Side Of Dash
1995-00	In Fuse Box At Lower Left Of Dash
SC Series	
1992-95	
DLC No. 1	On Bracket, Behind Right Front Strut Tower
DLC No. 2 & 3	Under Left Side Of Dash
1996-00	In Fuse Box At Lower Left Of Dash

MAZDA

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

MAZDA - IMPORTED CARS & TRUCKS

Application	Connector Location
B-Series	
1987-88	On Right Front Fender Apron
1989-93	
Engine Control Check Connector (Black 6-Pin)	Near Windshield Washer Motor
Trouble Codes Connector (Green 1-Pin)	Near Black 6-Pin Connector (Engine Control)
1994-95	On Right Front Fender Panel
Miata (1990-95)	On Left Rear Of Engine Compartment, Near Master Cylinder
MPV (1989-95)	
Engine Control Unit (Green 6-Pin & 1-Pin)	On Left Side Of Engine Compartment, Near

Connectors)	Inner Fender Panel
MX-3	Mounted On Bracket, On Left Front Strut Tower
MX-6 & 626	
1988	Behind Left Front Shock Tower
1989	On Left Front Corner Of Engine Compartment
1990-91	At ECU Connector Terminal
1992	On Left Rear Corner Of Engine Compartment
1993	On Side Of Fuse/Relay Block, Near Battery
1994-95	On Left Front Fender Apron
Navajo	
1991-93	On Right Rear Corner Of Engine Compartment
1994-95	On Right Front Fender Panel
Protege	
1987-89	On Passenger's Footwell (Left Foot Area)
1990-95	On Left Side Of Firewall, Near Wiper Motor
RX7	
1986-88 (3 Check Connectors)	At Left & Right Corners Of Engine Compartment
1989-91 (Green 6-Pin Connector)	Behind Ignition Coil
1993-95	On Bracket, On Left Front Strut Tower
323	
1986-88	Front Left Of Engine Compartment, Near Ignition Coil
1989 (Green 6-Pin & Green 1-Pin Connectors)	On Left Side Of Firewall
1990-95	On Left Side Of Firewall, Near Wiper Motor
929	
1989	Near Air Cleaner
1990-91 (Green 6-Pin Connector)	In Left Front Corner Of Engine Compartment
1992-93	Mounted On Air Cleaner Housing
1994-95	On Left Front Strut Tower

MERCEDES-BENZ

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

MERCEDES-BENZ - IMPORTED CARS & TRUCKS

Application	Connector Location
C-Class (1994)	On Right Rear Of Engine Compartment

E-Class	
1994-97	On Right Rear Of Engine Compartment
G-Class	
Under Left Side Of Dash, Behind Cover	
ML-Class	
Under Left Side Of Dash, Behind Cover	
S-Class	
140 Platform (1994-99)	On Right Rear Of Engine Compartment
190 Series	
1986-87	On Left Rear Of Engine Compartment
1988-93	
All Models	In Engine Compartment, On Left Front Fender
California (OBD)	On Right Side Of Firewall, Near Battery
1994	On Right Rear Of Engine Compartment
260E	
1987	On Left Front Fender Apron, Next To Ignition Control Module
1988-89	
All Models	In Engine Compartment, On Left Front Fender
California (OBD)	On Right Side Of Firewall, Near Battery
300 Series	
1986-87	On Left Front Fender Apron, Next To Ignition Control Module
1988-92	
All Models	In Engine Compartment, On Left Front Fender
California (OBD)	On Right Side Of Firewall, Near Battery
1993	
Except 300E	Left Fender Apron
300E	Right Rear Corner Of Engine Compartment
1994-95 (All Models)	On Right Rear Of Engine Compartment
400 & 500 Series	
1993	
12-Pin Connector	On Rear Of Left Front Inner Fender Panel
38-Pin (Impulse Readout)	In Module Box, On Right Rear Of Engine Compartment
1994-95	On Right Rear Of Engine Compartment
420SEL & 560 Series (Except 2.2L)	
1986-89	
All Models	In Engine Compartment, On Left Front Fender

California (OBD)	On Right Side Of Firewall, Near Battery
1990-91	In Engine Compartment, On Left Front Fender
560 Series (2.2L)	On Lower Left Side Of Engine Connector

MITSUBISHI

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

MITSUBISHI - IMPORTED CARS & TRUCKS

Application	Connector Location
Diamante (1992-98)	Under Left Side Of Dash, Near Fuse/Relay Block
Expo	Under Left Side Of Dash, Near Fuse/Relay Block
Montero	
1986-88	Left Rear Corner Of Engine Compartment
1989-91	Behind Glove Compartment
Pickup	Under Left Side Of Dash, Near Fuse/Relay Block
Raider	
1987-88	Left Rear Corner Of Engine Compartment
1989	Behind Glove Compartment
3000GT	
1991-98	Under Left Side Of Dash, On Fuse/Relay Block
1999	Under Left Side Of Dash, Left Of Center Console

NISSAN

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

NISSAN - IMPORTED CARS & TRUCKS

Application	Connector Location
Altima	
1993-94	On Driver-Side Of Center Console, Above Accelerator Pedal
1995-96	Below Fuse Box

Maxima	
1989-94	Under Left Side Of Dash
1995-96	Below Fuse Box
NX & Sentra	Under Left Side Of Dash, Near Fuse Block
Pulsar NX	
1986	Above Right Side Of Dash, Below Wiper Motor
1987	Above Steering Column
Quest (1993-95)	
CONSULT Tester Connector	On Driver-Side Of Center Console, Above Accelerator Pedal
Self-Test Connector	Located Near Starter
Stanza	Below Center Of Dash, Near Center Console
Van	On Right Side Of Engine Compartment, Behind Fuel Filter
200SX (1995-96)	Below Fuse Box
240SX	
1991-94	Under Left Side Of Dash, Below Fuse Block
1995-96	In Glove Box
300ZX (1990)	Near Parking Brake

PEUGEOT

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

PEUGEOT - IMPORTED CARS & TRUCKS

Application	Connector Location
505 Series	On Lower Left Side Of Engine Connector

PORSCHE

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

PORSCHE - IMPORTED CARS & TRUCKS

Application	Connector Location
911 Series	
1992-95	In Passenger's Footwell
1996	Left Side Of Center Console

928S	Top Front Of Engine
944 Series	On Left Side Of Engine Compartment

RENAULT

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

RENAULT - IMPORTED CARS & TRUCKS

Application	Connector Location
Sportwagon	
Engine Diagnostic	On Center Of Firewall
Fuel Injection Diagnostic	Right Rear Of Engine Compartment, Behind Airflow Meter

ROLLS-ROYCE

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

ROLLS-ROYCE - IMPORTED CARS & TRUCKS

Application	Connector Location
All Models	
1996-00	In Glove Compartment
2001-	Under Left Side Of Dash

SAAB

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

SAAB - IMPORTED CARS & TRUCKS

Application	Connector Location
900 Series	
1986-90	In Front Of Fuse/Relay Panel
1991-93	Under Back Seat, On Right Side
1994	
Convertible	Under Rear Seat
Hatchback	Under Steering Column
All Others	Under Right Front Seat

9000 Series	
1990	On Left Side Of Engine Compartment
1991-92	Under Passenger's Seat
1993	On Left Of Firewall
1994-95	Under Right Front Seat

SUBARU

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

SUBARU - IMPORTED CARS & TRUCKS

Application	Connector Location
Brat, Coupe, Hatchback, Sedan & Wagon	
1987	
Read Memory Connector	Under Left Side Of Dash, Next To MFI/SMFI Control Unit
Test Mode Connector	
MFI	On Left Side Of Dash, Next To MFI Control Unit
Sequential MFI	On Left Side Of Firewall
1988-89	On Left Side Of Dash, Next To ECU
Forester	Under Left Side of Dash, Behind Cover
Justy	
1987-88	
Read Memory Connector (Factory)	On Right Front Fender, Near Strut Tower
Test Mode Connector	On Driver-Side Kick Panel Or ECU
1989-95	
Read Memory Connector (Factory)	Under Left Side Of Dash
Test Mode Connector	On Driver-Side Kick Panel Or ECU
Legacy	
1990-94	
Check Connector (Black Connector)	Behind Right Side Of Steering Column, Near Heater Case
Diagnostic Connector (Black 4-Pin Connector)	Behind Right Side Of Steering Column, Near Heater Case
Read Memory Connector (Black Connector)	Behind Knee Panel, Right Of Steering Column
Select Monitor Connector (Yellow Connector)	Behind Right Side Of Steering Column, Near Heater Case
Test Mode Connector (Green Connector)	Behind Knee Panel, Right Of Steering Column

1995-	Under Left Side Of Dash, Behind Cover
Loyale	
1990-91	
MFI (5-Pin Connector)	In Front Of ECU
SMFI (Yellow 9-Pin & Black 13-Pin Connectors)	Near Brake Booster
1992-95	
Diagnostic Check Connector (Yellow 9-Pin & Black 13-Pin Connectors)	Behind Brake Booster
Diagnostic Read-Memory Connector (2-Single Wire Connectors)	Behind Left Front Strut Tower
Outback & Outback Sport	Under Center Of Dash
SVX	
1992-96	Under Left Side Of Dash
1997	Right Of Steering Column, On Center Console

SUZUKI

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

SUZUKI - IMPORTED CARS & TRUCKS

Application	Connector Location
Esteem (1995)	Near Battery
Samurai	
1986-90	Under Right Side Of Dash, Behind Glove Compartment
1991-92	On Right Side Of Firewall
1993-95	Under Left Side Of Dash, In Fuse Block
Sidekick & X90	
1989-91	Under Left Side Of Dash, In Fuse Block
1992-93	
ALDL Connector	Under Left Side Of Dash
Engine Connector	Under Left Side Of Dash, Near Fuse Block
1994-96	In Engine Compartment, Near Battery
Swift	
1989-91	Under Left Side Of Dash, In Fuse Block
1992	
ALDL Connector	Under Left Side Of Dash

Diagnostic Test Terminal	In Fuse Block
1993-95	Under Left Side Of Dash, In Fuse Block

TOYOTA

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

TOYOTA - IMPORTED CARS & TRUCKS

Application	Connector Location
Camry	
1983-90	Next To Brake Master Cylinder
1991	Near Left Front Shock Tower
1992-95	
4-Cylinder	Near Wiper Motor
V6	Under Left Side Of Dash
Celica	
1983-84	Next To Battery
1985-95	Behind Left Front Shock Tower
Celica Supra	Rear Of Battery, Near Relay Panel (2-Pin Connector)
Corolla	
Front Wheel Drive	
1987	Side Of Left Front Shock Tower (2-Pin Connector)
1988-94	Behind Left Front Shock Tower
Rear Wheel Drive	
1985-86	Side Of Right Front Shock Tower (2-Pin Connector)
1987	Right Rear Corner Of Engine Compartment
Cressida	
1988-93	
Check Connector	On Left Front Shock Tower
Total Diagnostic Communication Link Connector	Under Left Side Of Dash
Land Cruiser (1988-94)	Near Wiper Motor
MR2	
1986-90	Near Airflow Meter
1992-95	On Right Rear Of Engine Compartment, Near MAP Sensor
Paseo (1992-95)	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery

Pickup	
1984-86	Near Ignition Coil, Near Master Cylinder (2-Pin Connector)
1987-90	Right Front Inner Fender Panel, Near Relay Block
1992-94	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery
Previa	
1992-93	Under Front Of Driver's Seat
1994	
Except Supercharged	Under Center Console, Near Parking Brake Lever
Supercharged	Under Cover, On Top Center Of Instrument Panel
1995-97	On Top Center Of Instrument Panel
RAV4	Under Dash, Near Center Console
Starlet	
1981-82	On Instrument Panel Fuse Block, On Top Of Dash
1983-84	Right Rear Of Engine Compartment
Supra	
1986-90	Rear Of Battery, Near Relay Panel
1991-92	On Left Front Shock Tower
1993-94	
DLC No. 1	On Right Side Of Firewall
DLC No. 2	Under Left Side Of Dash, Near Kick Panel
Tacoma & T100	
1993	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery
1994-95	
Except OBD-II DLC	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery
OBD-II DLC	Under Left Side Of Dash
Tercel	
1987-90	In Engine Compartment, Next To Master Cylinder
1991-94	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery
1995-98	Near Steering Column
Van	Near Airflow Meter
4Runner	
1985-86	Near Ignition Coil, Next To Master Cylinder (2-Pin Connector)

1987-95	On Side Of Engine Compartment Fuse/Relay Block No. 2, Near Battery
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VOLKSWAGEN

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

VOLKSWAGEN - IMPORTED CARS & TRUCKS

Application	Connector Location
Cabrio	
1996	In Center Console, Below Tachometer
1997-02	On Center Dash, Behind Panel Near Ashtray
Corrado	Under Center Console Trim Plate
Fox	Under Center Console, Near Shift Lever
Golf	
1993	On Center Of Dash, Below A/C-Heater Control Knobs
1994	Under Center Console
1998-03	In Center Console
Golf III 2.0L	
1995-96	Below A/C-Heater Control Panel
1997-98	On Center Dash, Behind Panel Adjacent To Ashtray
GTI	
1993	On Center Of Dash, Below A/C-Heater Control Knobs
1994	Under Center Console
GTI 2.8L	On Center Dash, Behind Panel Adjacent To Ashtray
Jetta	
1993	On Center Of Dash, Below A/C-Heater Control Knobs
1994	Under Center Console
Jetta III 2.0L	
1995-96	Below A/C-Heater Control Panel
1997-98	On Center Dash, Behind Panel Adjacent To Ashtray
Jetta/Jetta III 2.8L	On Center Dash, Behind Panel Adjacent To Ashtray
New Beetle	Lower Part of Dash, In Front Of Shift Lever

Passat	
1992-94	Under Center Console, Forward Of Shift Lever
1995-97	On Center Dash, Behind Panel Near Ashtray

VOLVO

NOTE: This table provides a quick reference for self-diagnostic connector locations, when available from manufacturer, that ARE NOT located at the lower left side of the dash, as mandated in 1996 by the Federal government.

VOLVO - IMPORTED CARS & TRUCKS

Application	Connector Location
C30	Under Left Center Of Dash
C70	Behind Cover, Below Parking Brake Lever
S40	Under Left Center Of Dash
S70	Behind Cover, Below Parking Brake Lever
S90	Behind Cover, Below Parking Brake Lever
V40	Under Left Center Of Dash
V70 (1997-00)	Behind Cover Below Parking Brake Lever
V90	Behind Cover, Below Parking Brake Lever
240	
1986-92	Left Rear Corner Of Engine Compartment
1993	Behind Left Front Strut Tower
740 & 760	
1986-92	
Ignition System	On Left Front Fender Apron
Fuel Injection (1990-92 Only)	Left Rear Corner Of Engine Compartment
780	On Left Front Fender, Behind Air Cleaner Housing
850	
1993	On Center Console, Forward Of Shift Lever & Near ECM
1994-95	
Non-Turbo	On Right Front Strut Tower
Turbo	Behind Cover, Forward Of Shift Lever
1996-97	Behind Cover, Forward Of Shift Lever
940	
1991-93	
Ignition System	On Left Front Fender Apron
Fuel Injection	Left Rear Corner Of Engine Compartment

1994-95	Behind Left Front Strut Tower
960	
1992-95	On Left Front Strut Tower
1996	In Center Console, To Right Of Parking Brake Lever
1997	Behind Cover, Forward Of Shift Lever

2008 DRIVELINE

Differential & Driveline - Liberty

PROPELLER SHAFT

DIAGNOSIS AND TESTING

PROPELLER SHAFT

PROPELLER SHAFT VIBRATION

DRIVELINE VIBRATION

Drive Condition	Possible Cause	Correction
Propeller Shaft Noise	1. Undercoating or other foreign material on shaft. 2. Loose propeller shaft. 3. Loose or bent joint or excessive runout. 4. Incorrect driveline angularity. 5. Worn joint. 6. Propeller shaft damaged or out of balance. 7. Broken rear spring. 8. Excessive runout or unbalanced condition. 9. Excessive drive pinion gear shaft runout. 10. Excessive pinion flange deflection. 11. Excessive transfer case runout.	1. Clean exterior of shaft and wash with solvent. 2. Install new screws and tighten to proper torque. 3. Install new propeller shaft. 4. Measure and correct driveline angles. 5. Install new propeller shaft 6. Install new propeller shaft. 7. Install new rear spring. 8. Re-index propeller shaft, test, and evaluate. 9. Re-index propeller shaft and evaluate. 10. Inspect and replace propeller shaft if necessary. 11. Inspect and repair as necessary.
Joint Noise	1. Loose screws. 2. Lack of lubrication.	1. Install new screws and tighten to proper torque. 2. Replace propeller shaft as necessary.

A out of round tire or wheel that is out of balance, will cause a low frequency vibration.

Brake rotors that are unbalanced will cause a harsh, low frequency vibration.

Driveline vibration can be caused by loose or damaged engine mounts.

Propeller shaft vibration increases with vehicle speed. A vibration that occurs at a specific speed is not usually

caused by a out of balance propeller shaft. Worn universal joints or an incorrect propeller shaft angle, can cause such a vibration.

BALANCE

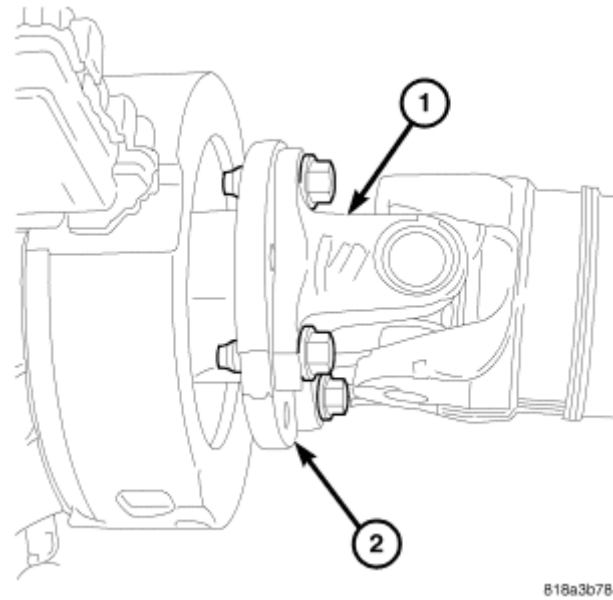


Fig. 1: Identifying Propeller Shaft & Flange
Courtesy of CHRYSLER LLC

NOTE: Indexing the propeller shaft (1) 90° relative to the flange (2) may eliminate some vibrations.

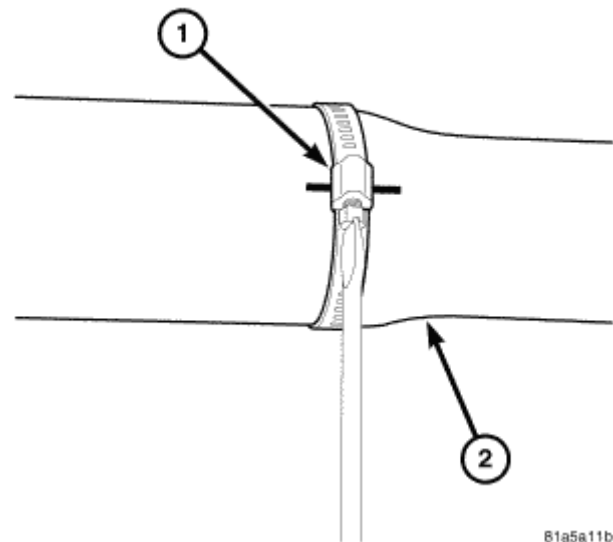
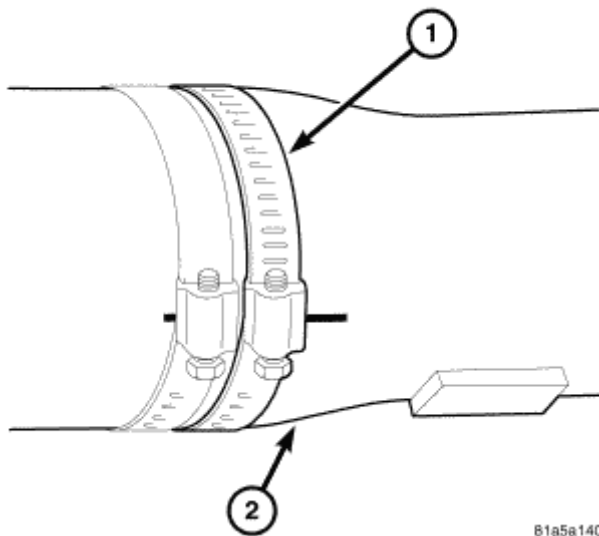


Fig. 2: Identifying Screw Clamp & Propeller Shaft
Courtesy of CHRYSLER LLC

1. Raise the vehicle.
2. Clean all the foreign material from the propeller shaft and universal joints.
3. Inspect propeller shaft for missing balance weights, broken welds, and bent areas.

NOTE: If the propeller shaft is bent, it must be replaced.

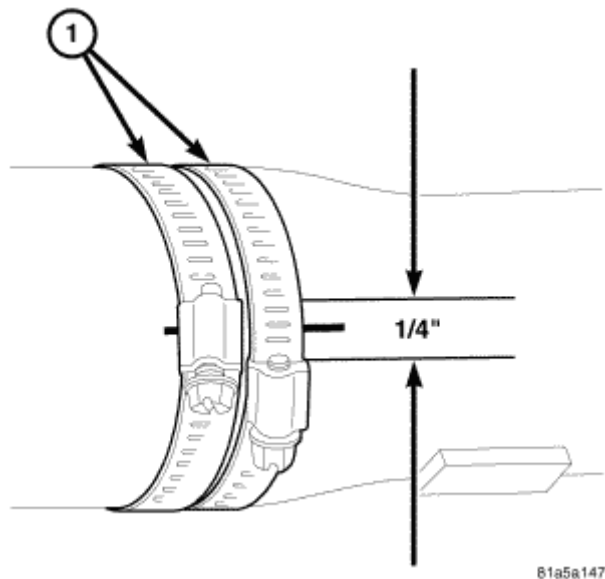
4. Inspect joints for wear, proper installation and correct alignment with the shaft.
5. Remove wheels and tires and install wheel lug nuts to retain brake drums/rotors.
6. Mark and number the shaft six inches from the pinion flange end at four positions 90 degrees apart.
7. Run and accelerate the vehicle until vibration occurs. Note the intensity and speed the vibration occurred. Stop the engine.
8. Position one screw clamp (1) on the propeller shaft (2) at one of the 90 degree marks.
9. Start the engine and check for vibration. If there is little or no change in vibration, move the clamp to the next mark. Repeat the vibration test. If there is no difference in vibration at the other positions, the source of the vibration may not be propeller shaft.



81a5a140

Fig. 3: Identifying Second Clamp & Propeller Shaft
Courtesy of CHRYSLER LLC

10. If vibration is decreased, install a second clamp (1) in the same position on the propeller shaft (2) and repeat the test.



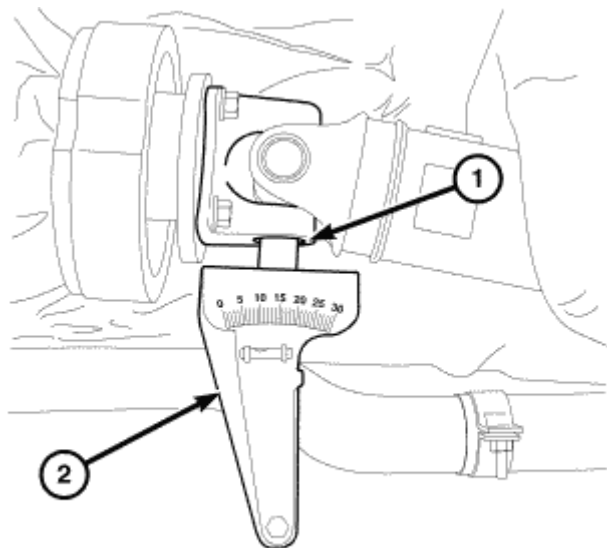
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Fig. 4: Separating Clamps 1/4 Inch
Courtesy of CHRYSLER LLC

11. If the additional clamp causes an additional vibration, separate the clamps (1) 1/4 inch above and below the mark. Repeat the vibration test.
12. Increase distance between the clamps and repeat the test until the amount of vibration is at the lowest level. Bend the slack end of the clamps so the screws will not loosen.
13. If vibration remains unacceptable, repeat the procedure to the front end of the propeller shaft.
14. Install wheel and tires, and lower vehicle.

STANDARD PROCEDURE

PROPELLER SHAFT



61a5989a

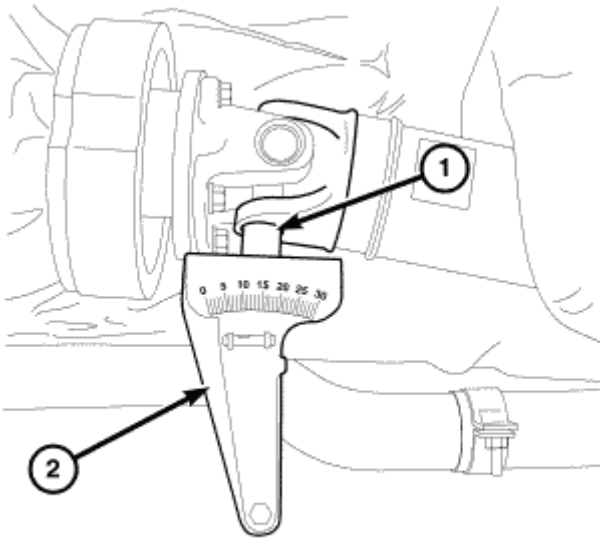
Fig. 5: Identifying Yoke Bearing Cap & Inclinometer
Courtesy of CHRYSLER LLC

This procedure applies to the front and rear propeller shaft. To obtain front (output) angle on the C/V front propeller shaft, place Inclinometer 7663 on the machined ring of the pinion flange. To obtain propeller shaft angle measurement transfer case C/V front propeller shaft, place inclinometer on the propeller shaft tube.

1. Raise and support the vehicle at the axles as level as possible. Allow the wheels and propeller shaft to turn.
2. Rotate shaft until transmission/transfer case output yoke bearing cap is facing downward.

NOTE: **Always make measurements from front to rear and from the same side of the vehicle.**

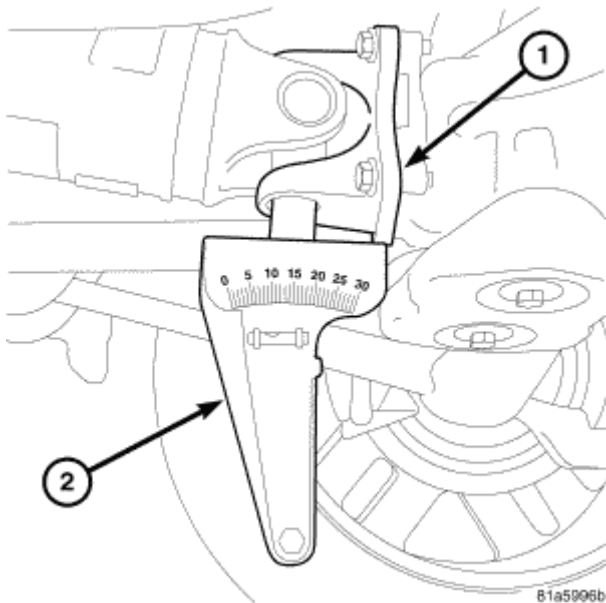
3. Place inclinometer (2) on yoke bearing cap (1) or pinion flange ring parallel to the shaft. Center bubble in sight glass and record measurement. This measurement will give you the transmission or Output Yoke Angle (A).



81a59930

Fig. 6: Identifying Yoke Bearing Cap & Inclinometer
 Courtesy of CHRYSLER LLC

4. Rotate propeller shaft 90 degrees and place inclinometer (2) on yoke bearing cap (1) or propeller shaft tube on C/V propeller shaft, parallel to the shaft. Center bubble in sight glass and record measurement. This measurement can also be taken at the rear end of the shaft. This measurement will give you the propeller shaft angle (C).
5. Subtract smaller figure from larger (C minus A) to obtain transmission output operating angle.



81a5996b

Fig. 7: Identifying Pinion Yoke Bearing Cap & Inclinometer
 Courtesy of CHRYSLER LLC

6. Rotate propeller shaft 90 degrees and place inclinometer (2) on pinion yoke bearing cap (1) parallel to the

shaft. Center bubble in sight glass and record measurement. This measurement will give you the pinion shaft or input yoke angle (B).

7. Subtract smaller figure from larger (C minus B) to obtain axle Input Operating Angle.

RULES

Good cancellation of U-joint operating angles is within 1 degree.

Operating angles less than 4 degrees single cardan U-joint.

Operating angles less than 10 degrees for CV joints.

SPECIFICATIONS

PROPELLER SHAFT

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Front Shaft - Transfer case CV Bolts	30	22	-
Front Shaft - Axle Flange Bolts	108	80	-
Rear Shaft - Flange Bolts	108	80	-

SPECIAL TOOLS

PROPELLER SHAFT

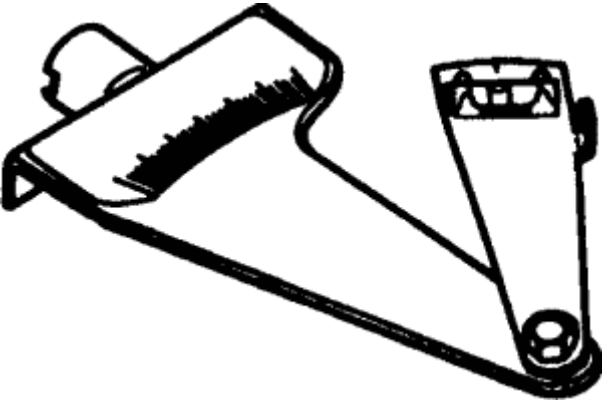
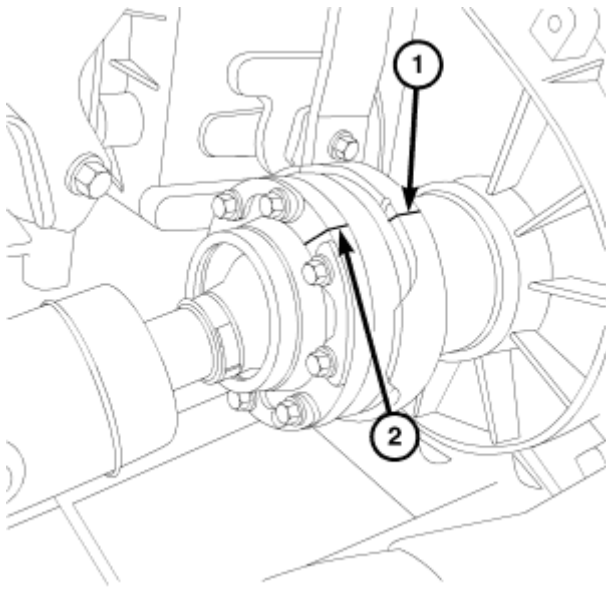


Fig. 8: Inclinometer 7663
Courtesy of CHRYSLER LLC

SHAFT-PROPELLER FRONT

REMOVAL

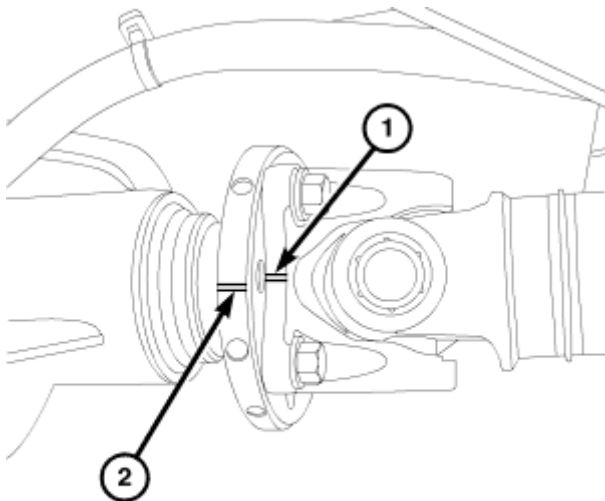
SHAFT-PROPELLER FRONT



81665365

Fig. 9: Identifying Front Propeller Shaft CV Joint & Transfer Case Flange
 Courtesy of CHRYSLER LLC

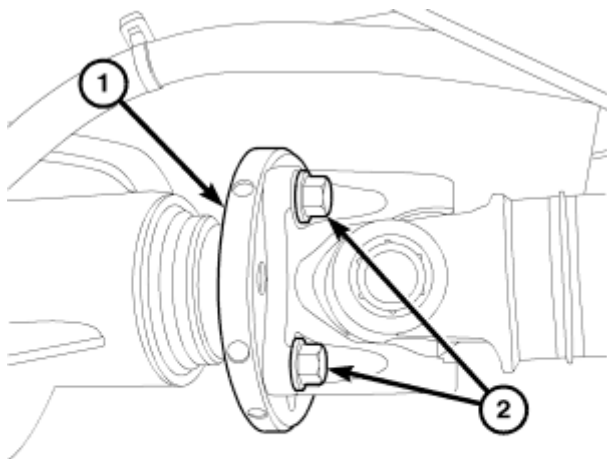
1. With vehicle in neutral, position vehicle on hoist.
2. Mark an installation reference line across the front propeller shaft CV joint (1) and transfer case flange (2).



81665360

Fig. 10: Identifying Front Propeller Shaft Flange & Axle Flange
 Courtesy of CHRYSLER LLC

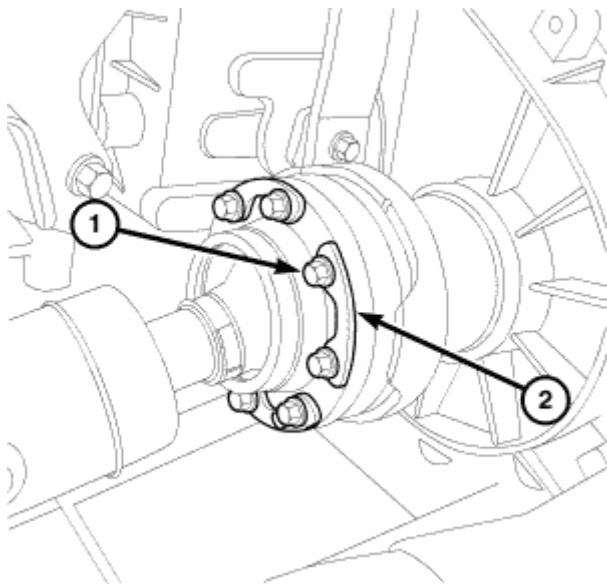
3. Mark an installation reference line across the front propeller shaft flange (1) and the axle flange (2).



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Fig. 11: Removing Axle Flange Bolts
 Courtesy of CHRYSLER LLC

4. Remove the axle flange (1) bolts (2).



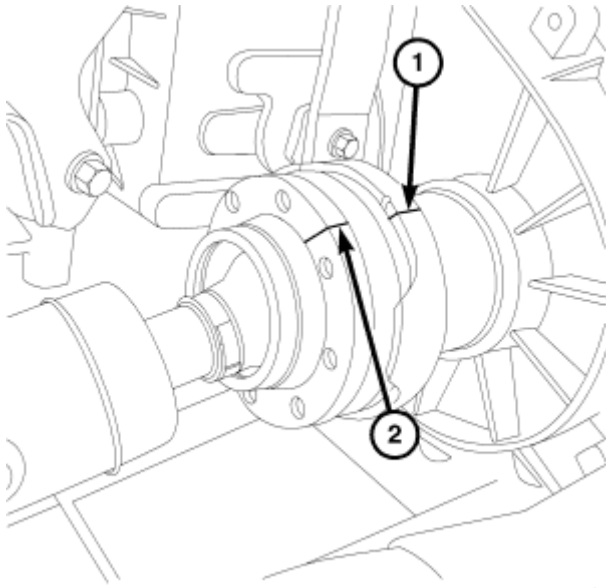
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Fig. 12: Removing CV Joint Bolts And Retainers
 Courtesy of CHRYSLER LLC

5. Remove the CV joint bolts (1) and retainers (2).
6. Compress the propeller shaft enough to remove the shaft from the flanges.

INSTALLATION

SHAFT-PROPELLER FRONT

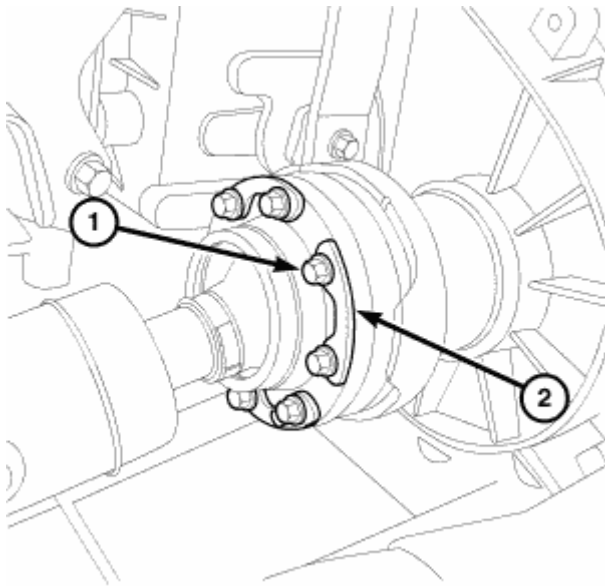


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Fig. 13: Aligning Installation Reference Marks On Transfer Case Flange Front Shaft CV Joint
 Courtesy of CHRYSLER LLC

NOTE: Clean all propeller shaft bolts and apply Mopar® Lock & Seal Adhesive or equivalent to the threads before installation.

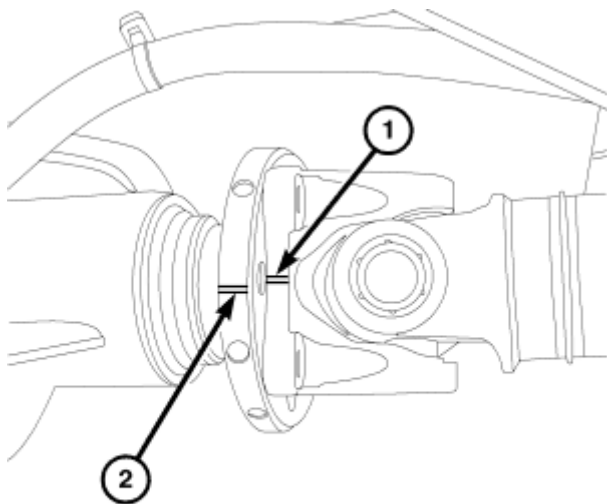
1. Compress the propeller shaft enough to install the shaft into the axle and transfer case flanges.
2. Align installation reference marks on the transfer case flange (1) front shaft CV joint (2).



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Fig. 14: Installing CV Joint Retainers And Bolts
 Courtesy of CHRYSLER LLC

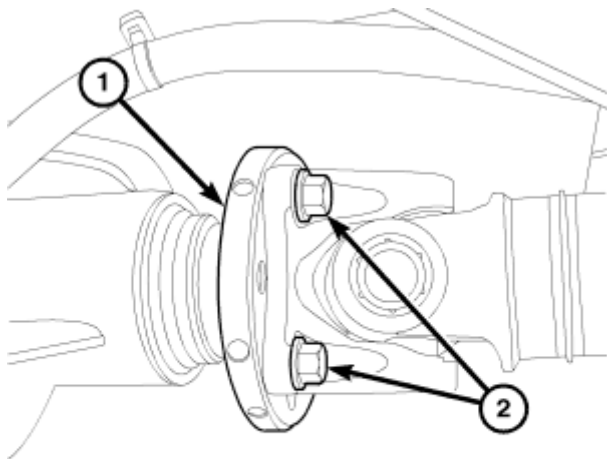
3. Install CV joint retainers (2) and bolts (1). Tighten bolts to 30 N.m (22 ft. lbs.).



818706fb

Fig. 15: Identifying Front Propeller Shaft Flange & Axle Flange
 Courtesy of CHRYSLER LLC

4. Align installation reference marks on the front propeller shaft flange (1) and axle flange (2).



818653e7

Fig. 16: Installing Axle Flange Bolts
 Courtesy of CHRYSLER LLC

5. Install the axle flange (1) bolts (2) and tighten to 108 N.m (80 ft. lbs.).

SHAFT-PROPELLER REAR

REMOVAL

REAR PROPELLER SHAFT

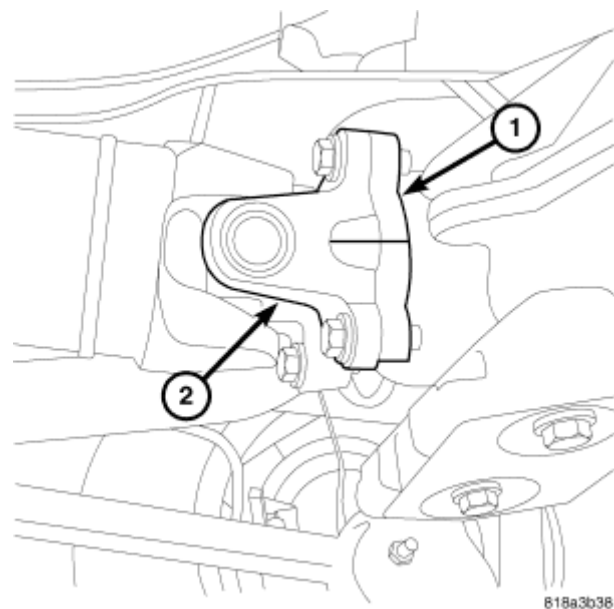


Fig. 17: Identifying Line Across Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Mark a reference line across axle flange (1) and propeller shaft flange (2) for installation.

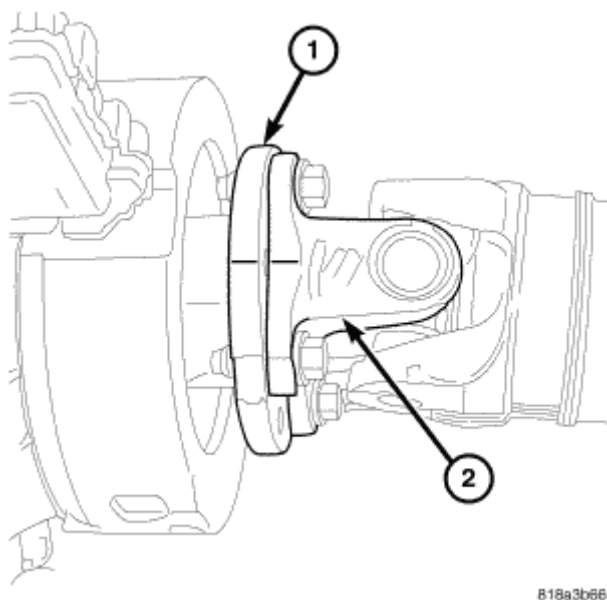


Fig. 18: Identifying Line Across Transmission/Transfer Case Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

3. Mark a reference line across transmission/transfer case flange (1) and propeller shaft flange (2) for installation.

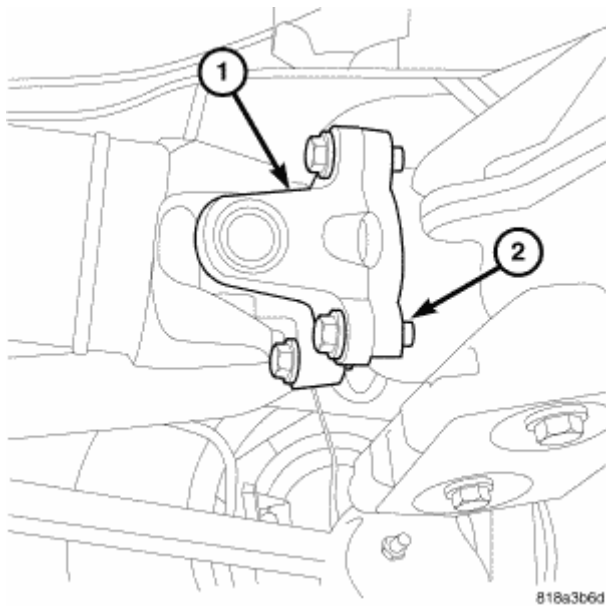


Fig. 19: Identifying Propeller Shaft Flange & Axle Flange
 Courtesy of CHRYSLER LLC

4. Remove propeller shaft flange (1) bolts from axle flange (2).

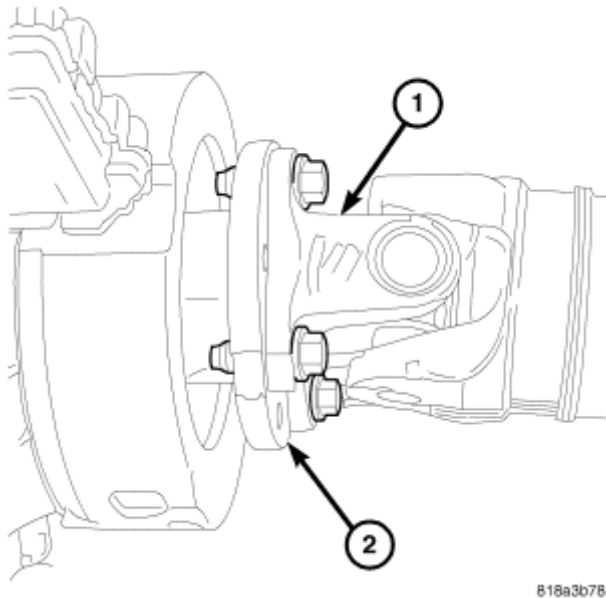


Fig. 20: Identifying Propeller Shaft & Flange
 Courtesy of CHRYSLER LLC

5. Remove propeller shaft flange (1) bolts from transmission/transfer case flange (2).
6. Remove propeller shaft.

INSTALLATION

REAR PROPELLER SHAFT

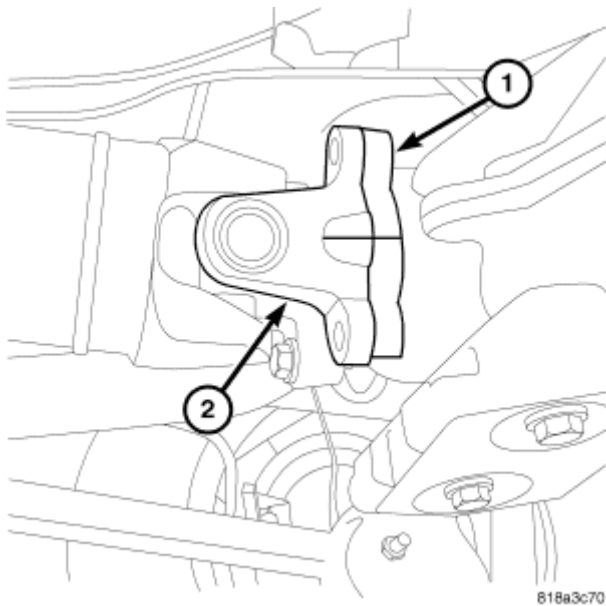


Fig. 21: Identifying Axle Flange & Propeller Shaft Flange
 Courtesy of CHRYSLER LLC

NOTE: Clean all propeller shaft bolts and apply Mopar® Lock & Seal Adhesive or equivalent to the threads before installation.

1. Install propeller shaft.
2. Align reference mark on axle flange (1) with propeller shaft flange (2).

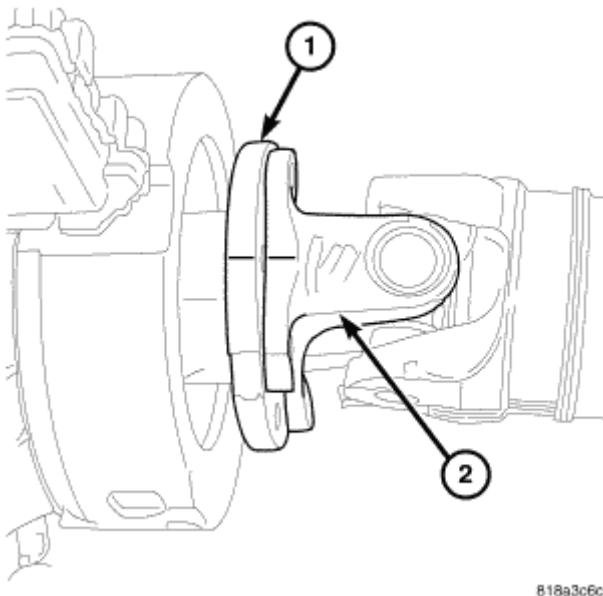


Fig. 22: Identifying Transmission/Transfer Case Flange & Propeller Shaft Flange
 Courtesy of CHRYSLER LLC

3. Align reference mark on transmission/transfer case flange (1) with propeller shaft flange (2).

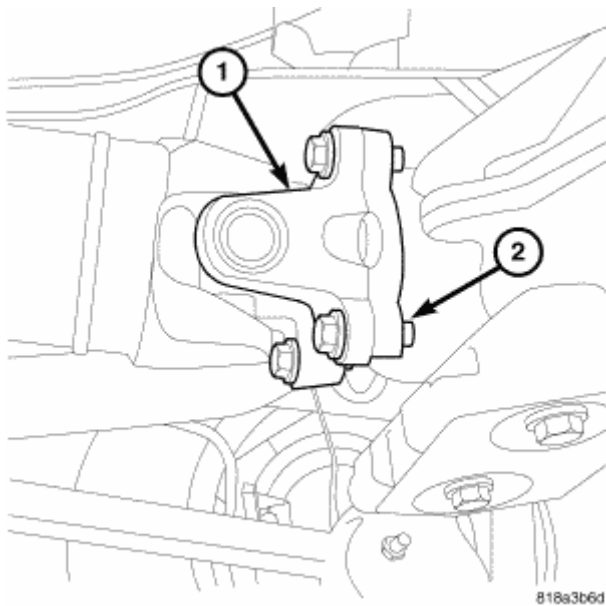


Fig. 23: Identifying Propeller Shaft Flange & Axle Flange
 Courtesy of CHRYSLER LLC

4. Install propeller shaft bolts (2) in axle flange (1) and tighten to 108 N.m (80 ft. lbs.).

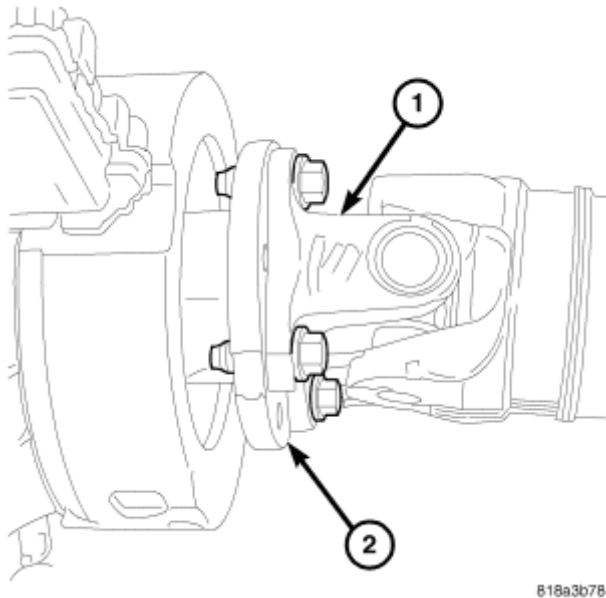


Fig. 24: Identifying Propeller Shaft & Flange
 Courtesy of CHRYSLER LLC

5. Install propeller shaft bolts in transmission/transfer case flange (2) and tighten to 108 N.m (80 ft. lbs.).

HALF SHAFT

CAUTION

HALF SHAFT

CAUTION: Never grasp half shaft assembly by the boots. This may cause the boot to pucker or crease and reduce the service life of the boot.

Avoid over angulating or stroking the C/V joints when handling the half shaft.

Half shafts exposed to battery acid, transmission fluid, brake fluid, differential fluid or gasoline may cause the boots to deteriorate. Failure to follow these instructions will result in damage.

DIAGNOSIS AND TESTING

HALF SHAFT

Check inboard and outboard C/V joint for leaking grease. This is a sign of boot or boot clamp damage.

NOISE/VIBRATION IN TURNS

A clicking noise or vibration in turns could be caused by a damaged outer C/V or inner tripod joint seal boot or seal boot clamps. This will result in the loss/contamination of the joint grease, resulting in inadequate lubrication of the joint. Noise could also be caused by another component of the vehicle coming in contact with the half shafts.

CLUNKING NOISE DURING ACCELERATION

This noise may be a damaged or worn C/V joint. A torn boot or loose/missing clamp on the inner/outer joint which has allowed the grease to be lost will damage the C/V joint.

SHUDDER/VIBRATION DURING ACCELERATION

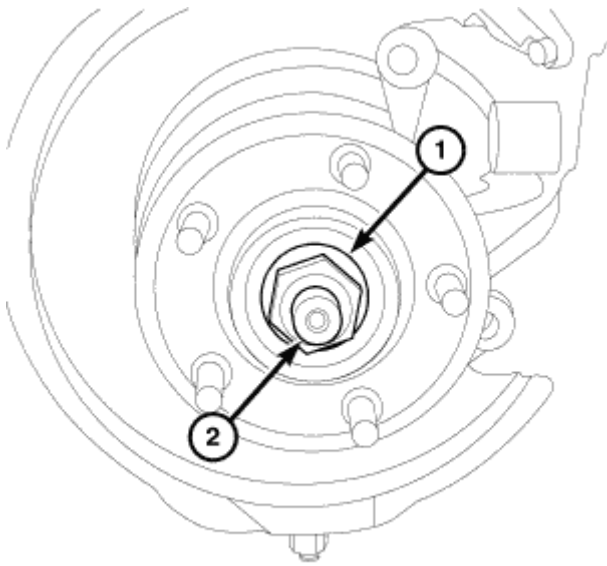
This could be a worn/damaged inner tripod joint or a sticking tripod joint. Improper wheel alignment may also cause a shudder or vibration.

VIBRATION AT HIGHWAY SPEEDS

This problem could be a result of out of balance front tires or tire/wheel runout. Foreign material (mud, etc.) packed on the backside of the wheel(s) will also cause a vibration.

REMOVAL

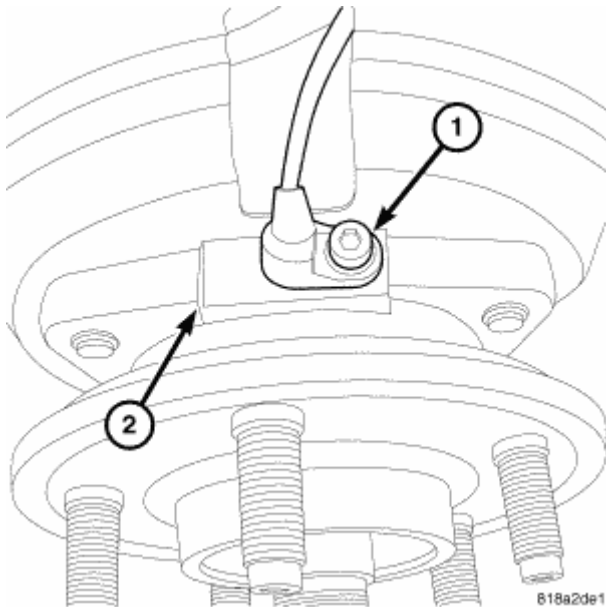
HALF SHAFT



618a2de5

Fig. 25: Identifying Hub Nut & Half Shaft
 Courtesy of CHRYSLER LLC

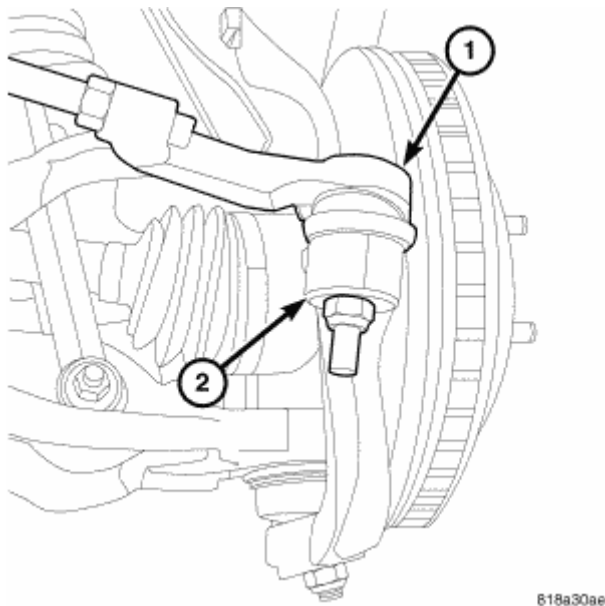
1. With vehicle in neutral, position vehicle on hoist.
2. Remove brake caliper and rotor.
3. Remove nut (1) from half shaft (2).



618a2de1

Fig. 26: Identifying Sensor & Hub Bearing
 Courtesy of CHRYSLER LLC

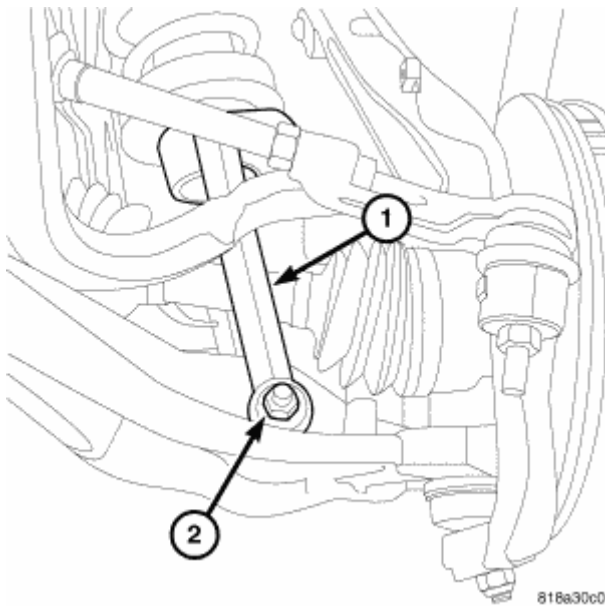
4. Remove sensor (1) from hub bearing (2).



618a30ae

Fig. 27: Identifying Tie Rod End & Steering Knuckle
 Courtesy of CHRYSLER LLC

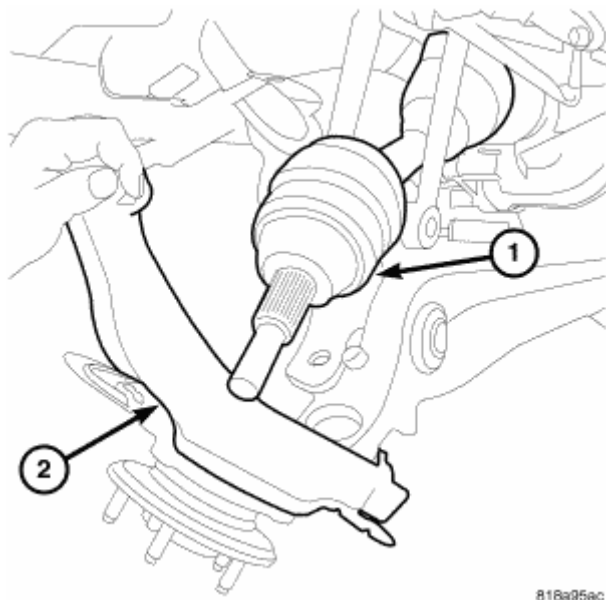
5. Remove stabilizer link from stabilizer bar.
6. Remove tie rod end (1) nut and remove tie rod from steering knuckle (2).



618a30c0

Fig. 28: Identifying Shocks Clevis & Nuts
 Courtesy of CHRYSLER LLC

7. Remove clevis bracket (1) lower nut (2) and bolt.



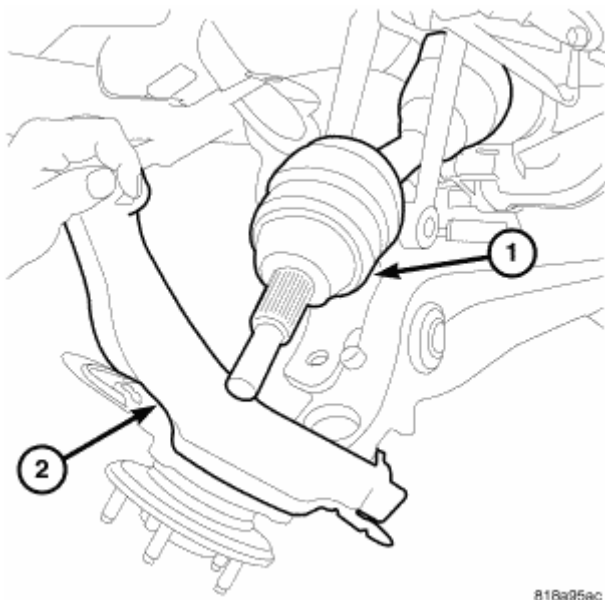
816a95ac

Fig. 29: Identifying Half Shaft & Knuckle
 Courtesy of CHRYSLER LLC

8. Remove upper ball joint nut and separate upper control arm from steering knuckle.
9. Pull out on the steering knuckle and push half shaft (1) out of the hub bearing and knuckle (2).
10. With a pry bar remove the half shaft from the axle.

INSTALLATION

HALF SHAFT



816a95ac

Fig. 30: Identifying Half Shaft & Knuckle
 Courtesy of CHRYSLER LLC

1. Apply a light coat of wheel bearing grease on the female splines of the inner C/V joint.
2. Clean hub bearing bore and apply a light coat of wheel bearing grease.
3. Install half shaft (1) in axle and push firmly to engage the snap ring.
4. Pull out on the steering knuckle (2) and push the half shaft (1) through the knuckle and hub bearing.
5. Install upper control arm on steering knuckle and tighten ball joint nut to specifications.

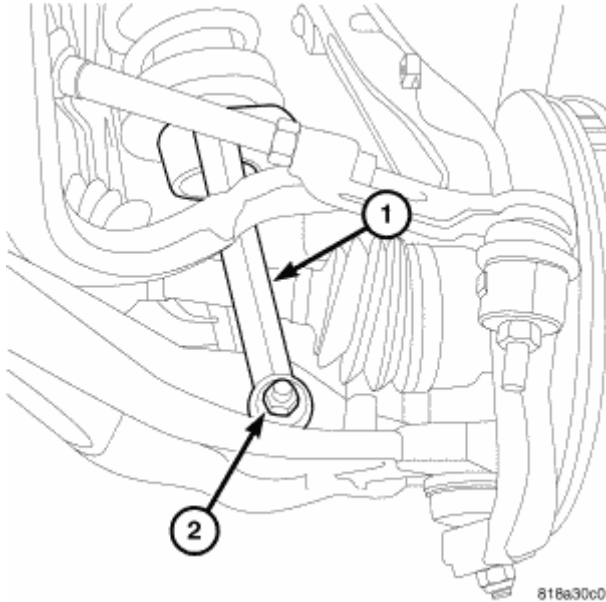


Fig. 31: Identifying Shocks Clevis & Nuts
Courtesy of CHRYSLER LLC

6. Align clevis (1) with lower control arm. Install lower clevis (1) and tighten nut (2) to specifications.

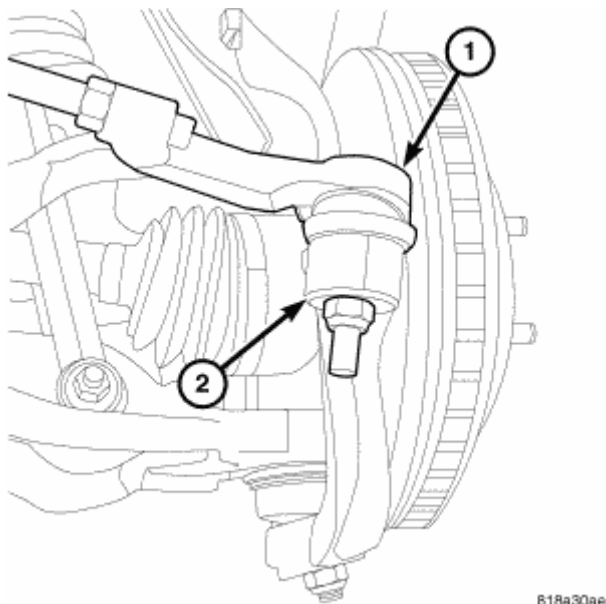
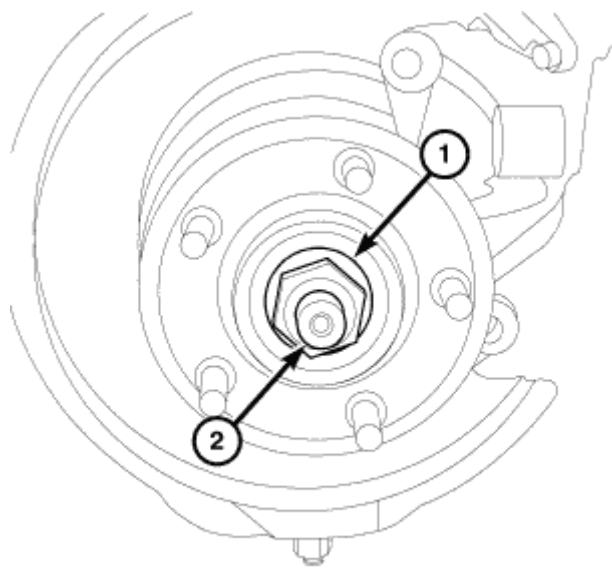


Fig. 32: Identifying Tie Rod End & Steering Knuckle

Courtesy of CHRYSLER LLC

- 7. Install tie rod end (1) in steering knuckle (2) and tighten nut to specifications.
- 8. Install stabilizer bar link and tie rod end.



618a2de5

Fig. 33: Identifying Hub Nut & Half Shaft
Courtesy of CHRYSLER LLC

- 9. Install half shaft (2) hub nut (1) and tighten to specifications.

SPECIFICATIONS

HALF SHAFT

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Half Shaft Nut	136	100	-

SPECIAL TOOLS

HALF SHAFT

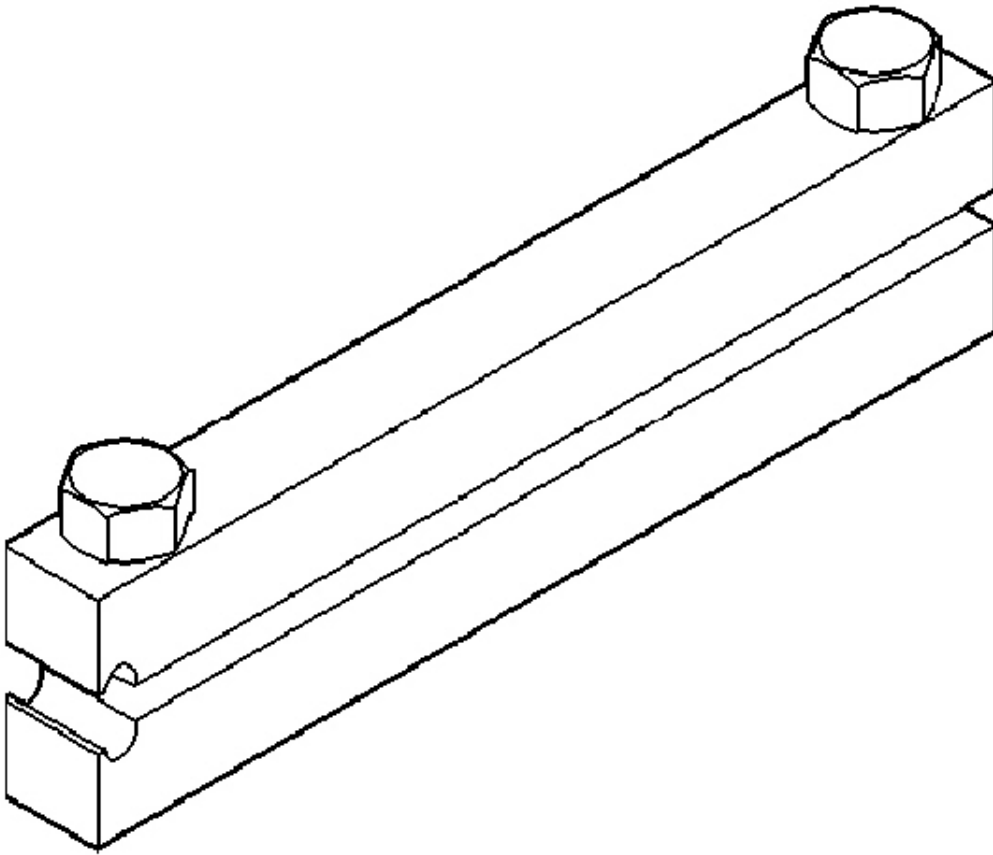
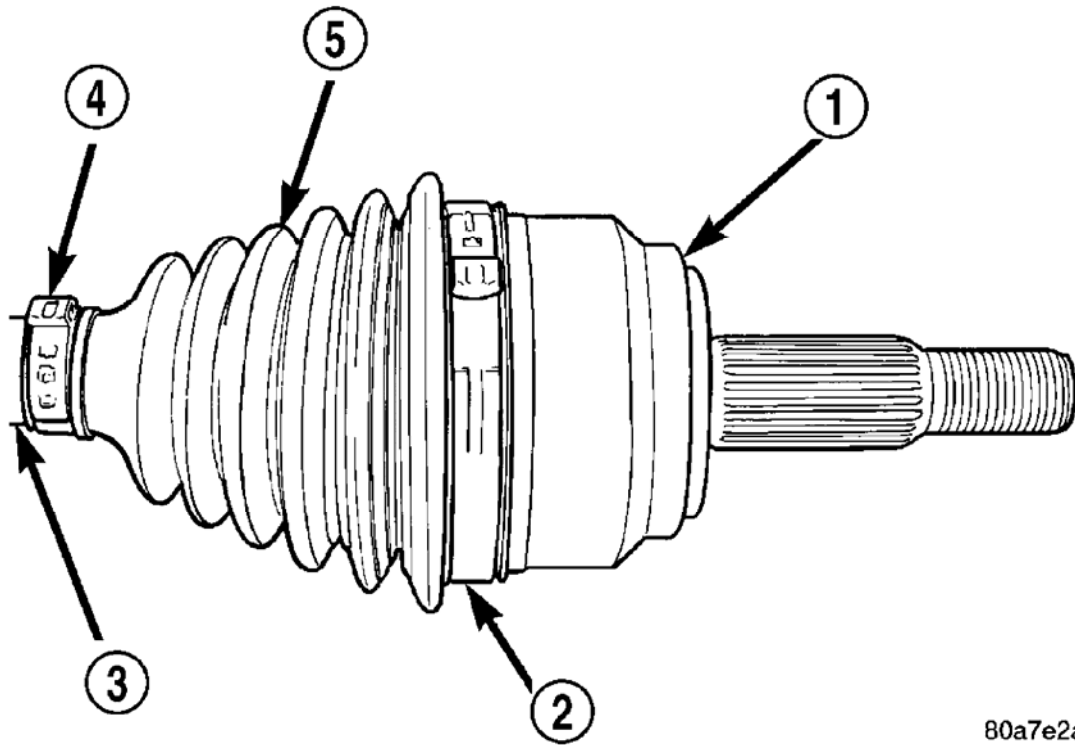


Fig. 34: Clamp Installer C-4975-A
Courtesy of CHRYSLER LLC

JOINT/BOOT-C/V OUTER

REMOVAL

C/V JOINT-OUTER



80a7e2ab

Fig. 35: Boot Clamp Locations
Courtesy of CHRYSLER LLC

1. Place shaft in vise with soft jaws and support C/V joint.

CAUTION: Do not damage C/V housing or half shaft.

2. Remove clamps (2) (4) with a cut-off wheel or grinder.

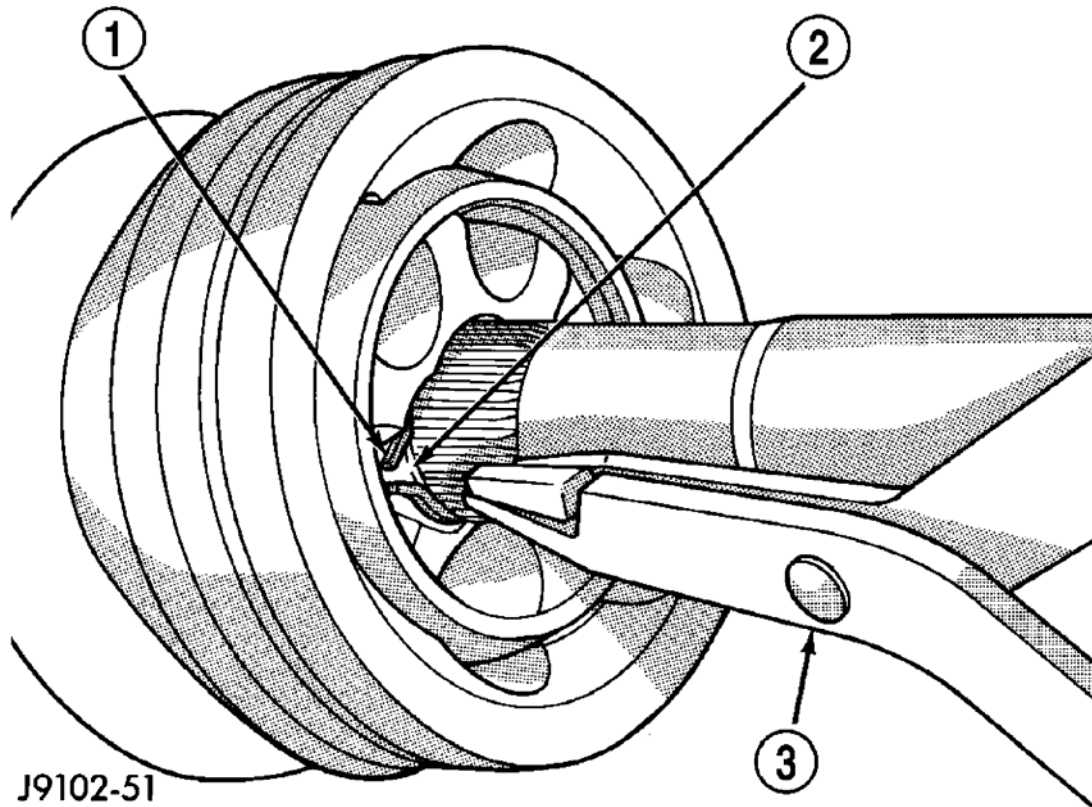


Fig. 36: Outer C/V Joint
Courtesy of CHRYSLER LLC

3. Slide the boot down the shaft.
4. Remove lubricant to expose the C/V joint snap ring.
5. Spread snap ring (1) and slide the joint off the shaft.

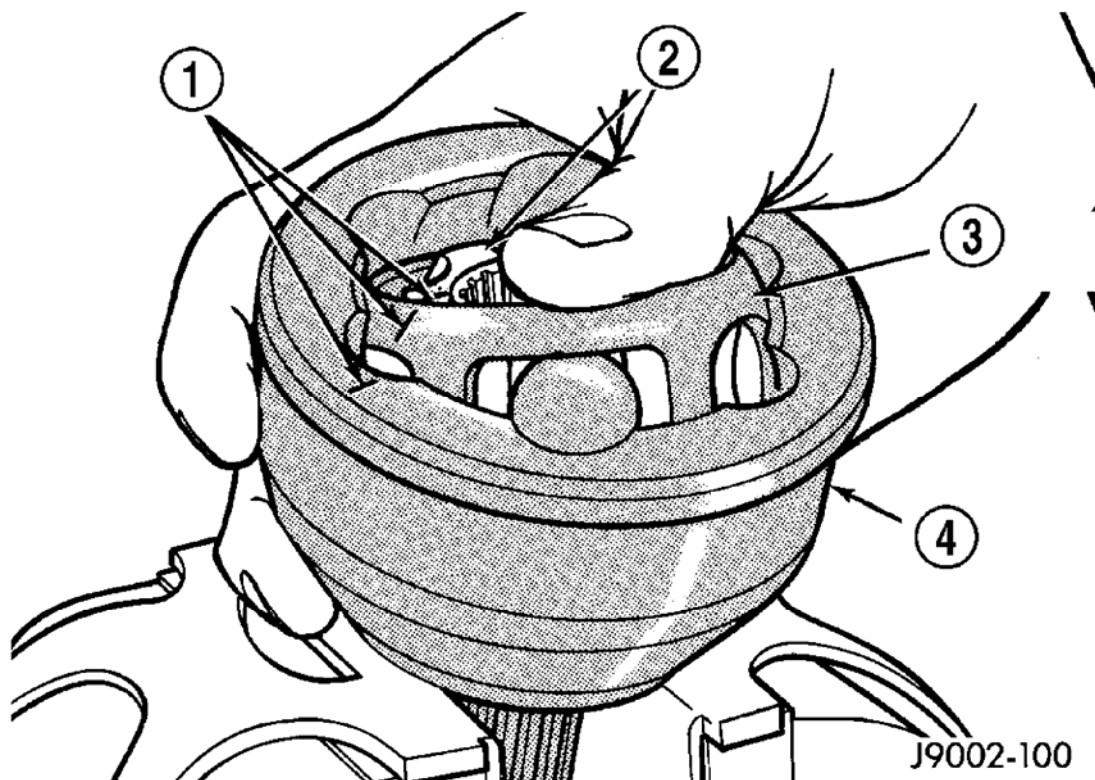
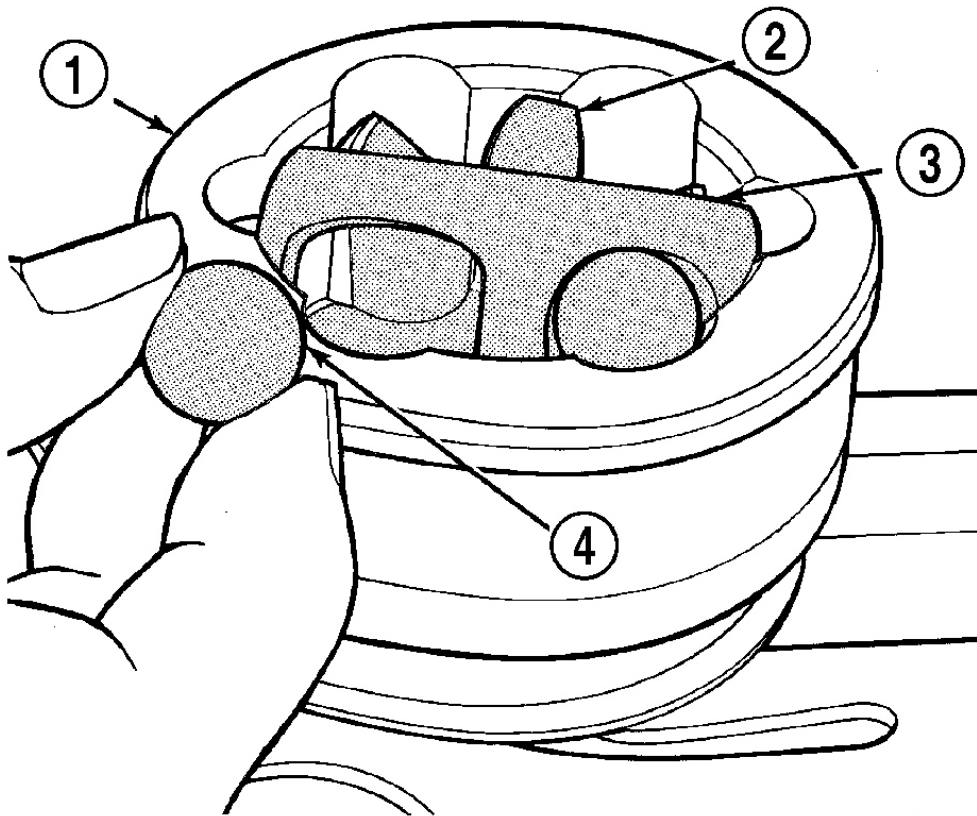


Fig. 37: Bearing Access
Courtesy of CHRYSLER LLC

6. Slide boot off the shaft and discard old boot.
7. Mark alignment marks (1) on the inner race/hub (2), bearing cage (3) and housing with dabs of paint.



J9002-101

Fig. 38: Bearing

Courtesy of CHRYSLER LLC

8. Clamp C/V joint in a vertical position in a soft jawed vise.
9. Press down one side of the bearing cage (3) to gain access to the ball at the opposite side.

NOTE: If joint is tight, use a hammer and brass drift to loosen the bearing hub. Do not contact the bearing cage with the drift.

10. Remove ball (4) from the bearing cage (3).

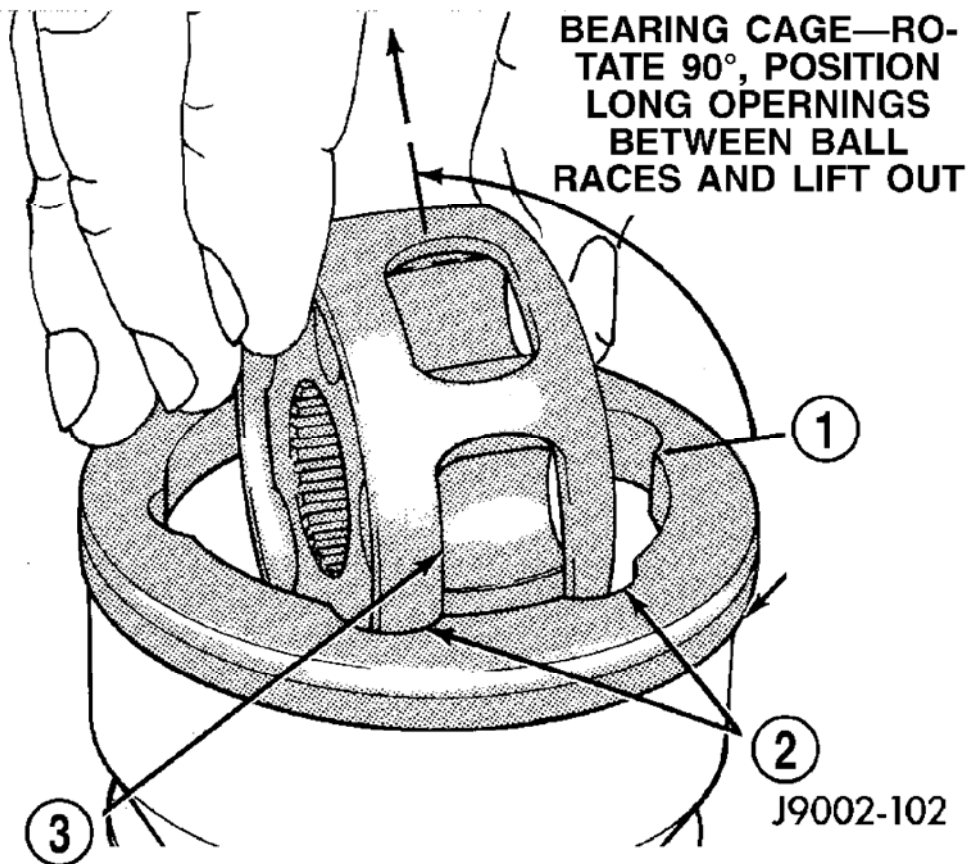


Fig. 39: Cage & Inner Race/Hub
Courtesy of CHRYSLER LLC

11. Repeat step above until all six balls are removed from the bearing cage.
12. Lift cage and inner race (2) upward and out from the housing (1).

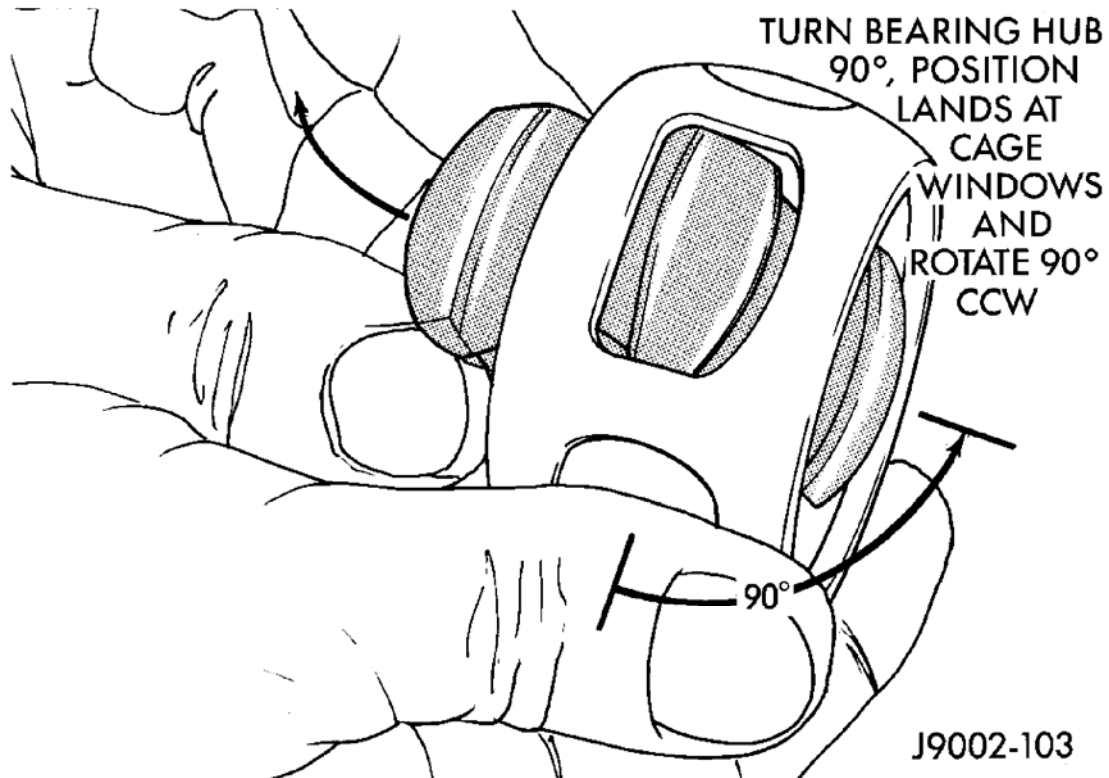


Fig. 40: Inner Race/Hub
Courtesy of CHRYSLER LLC

13. Turn inner race 90° in the cage and rotate the inner race/hub out of the cage.

INSTALLATION

C/V JOINT-OUTER

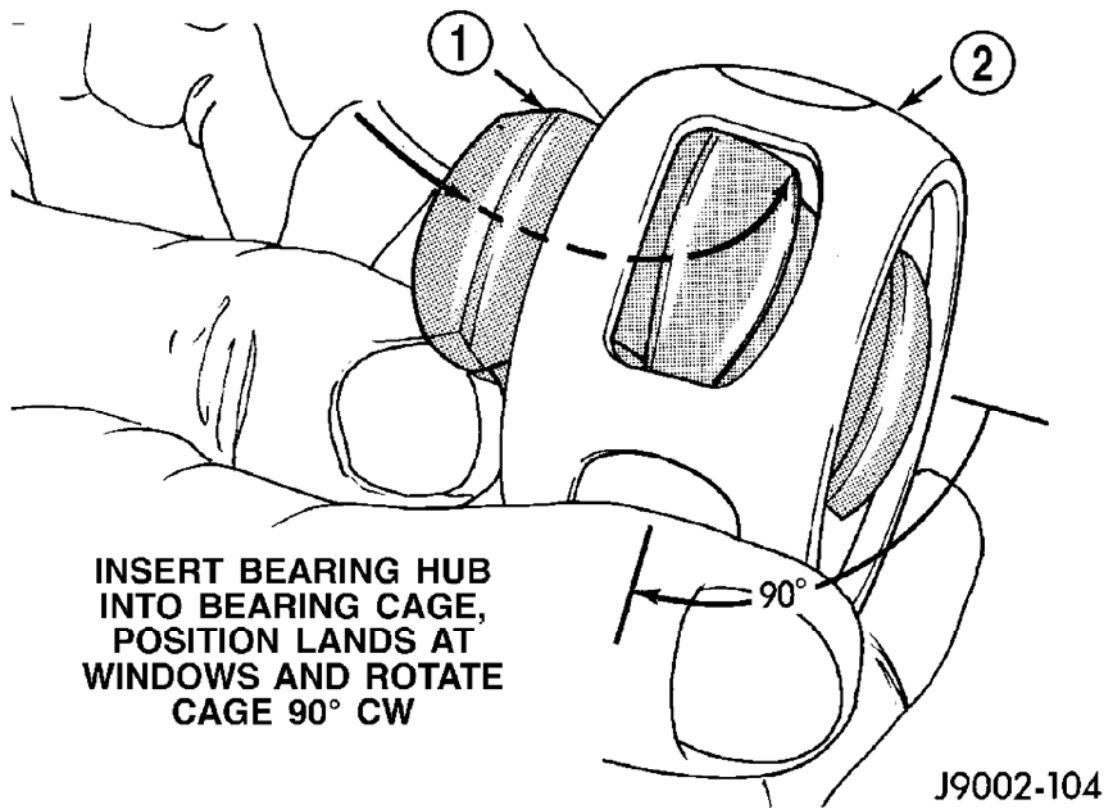
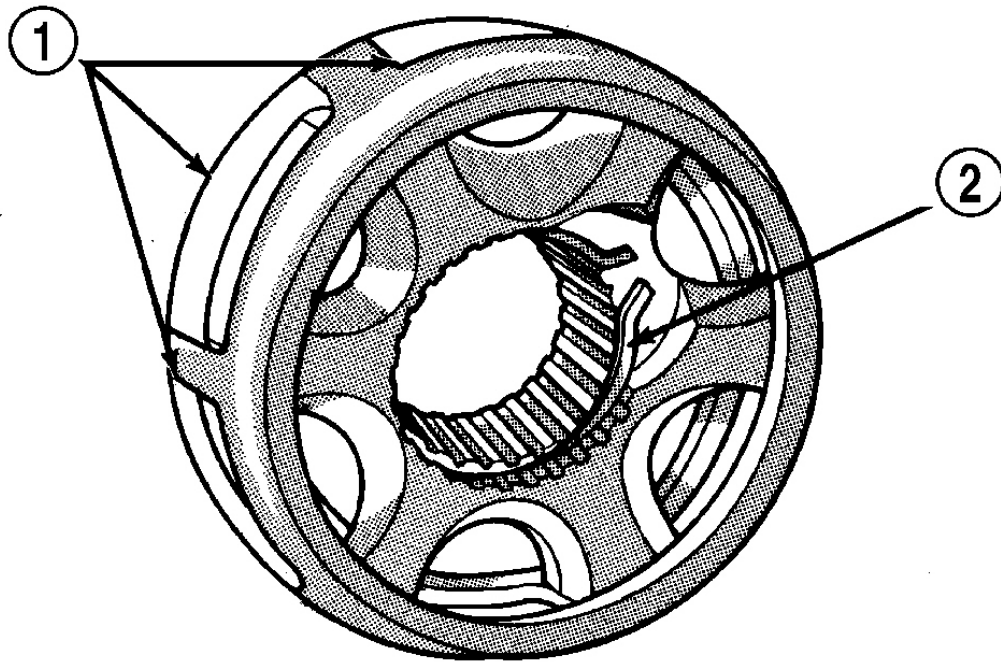


Fig. 41: Inner Race/Hub
Courtesy of CHRYSLER LLC

1. Apply a light coat of grease to the C/V joint components before assembling them.
2. Align inner race, cage and housing according to the alignment reference marks.
3. Insert inner race (1) into the cage (2) and rotate race into the cage.



RN312

Fig. 42: Cage & Inner Race/Hub
Courtesy of CHRYSLER LLC

4. Rotate inner race/hub in the cage (1).

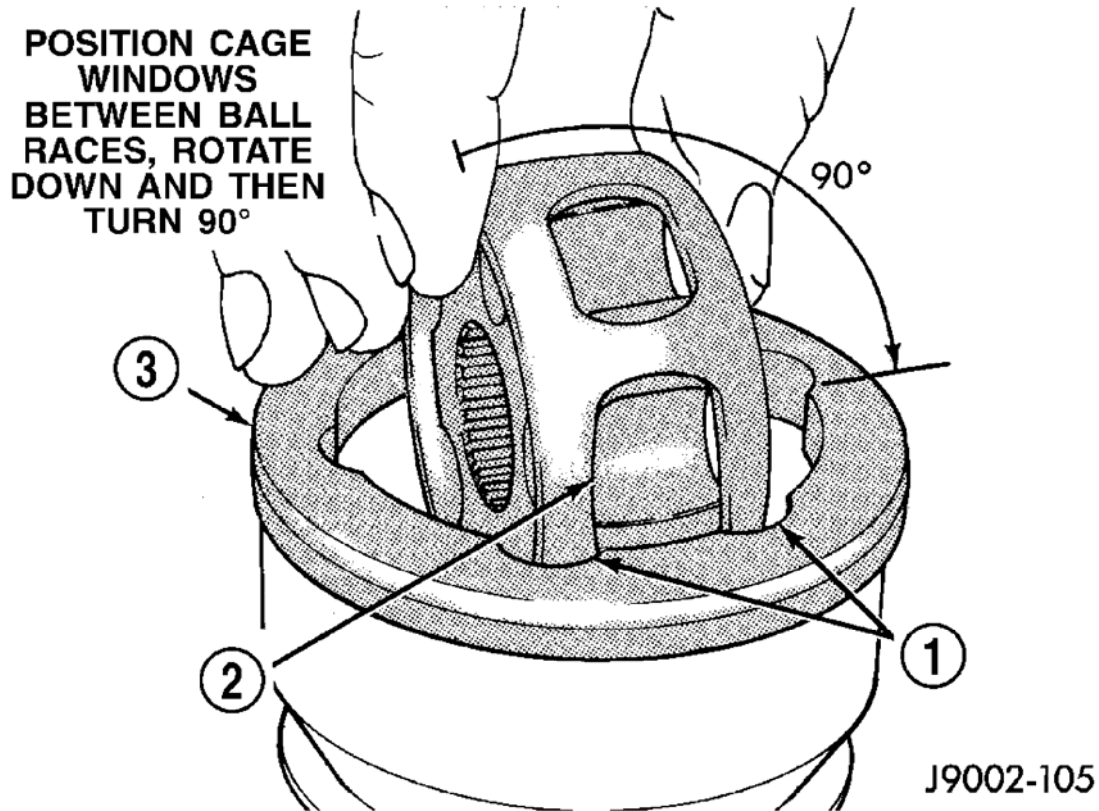
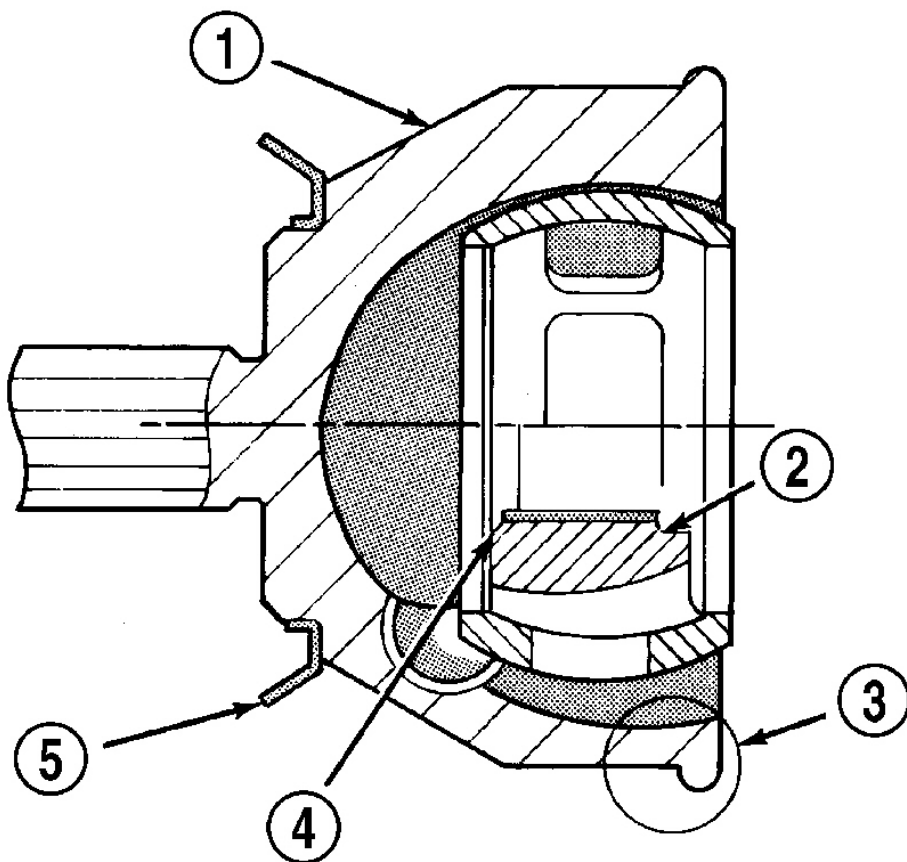


Fig. 43: Bearing Cage & Housing
Courtesy of CHRYSLER LLC

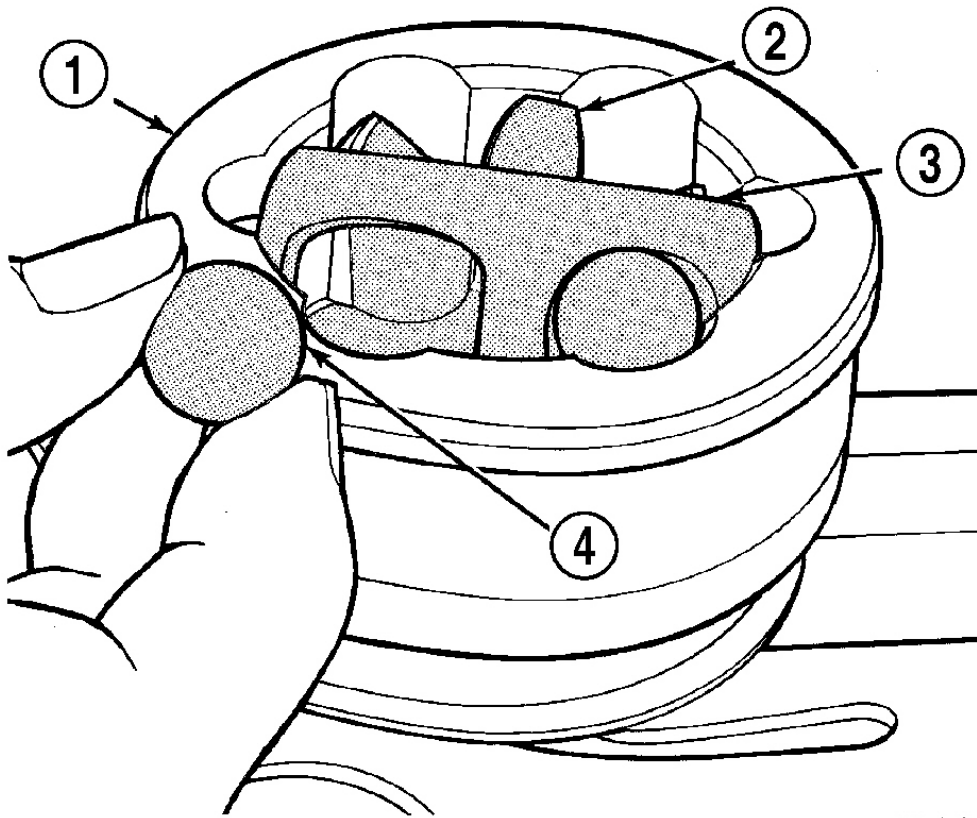
5. Insert cage into the housing (3).



J9102-43

Fig. 44: Rotating Cage Into Housing
Courtesy of CHRYSLER LLC

6. Rotate cage 90° into the housing (1).



J9002-101

Fig. 45: Ball Bearing

Courtesy of CHRYSLER LLC

7. Apply lubricant included with replacement boot/joint to the ball races. Spread lubricant equally between all the races.
8. Tilt inner race/hub (2) and cage (3) and install the balls (4).

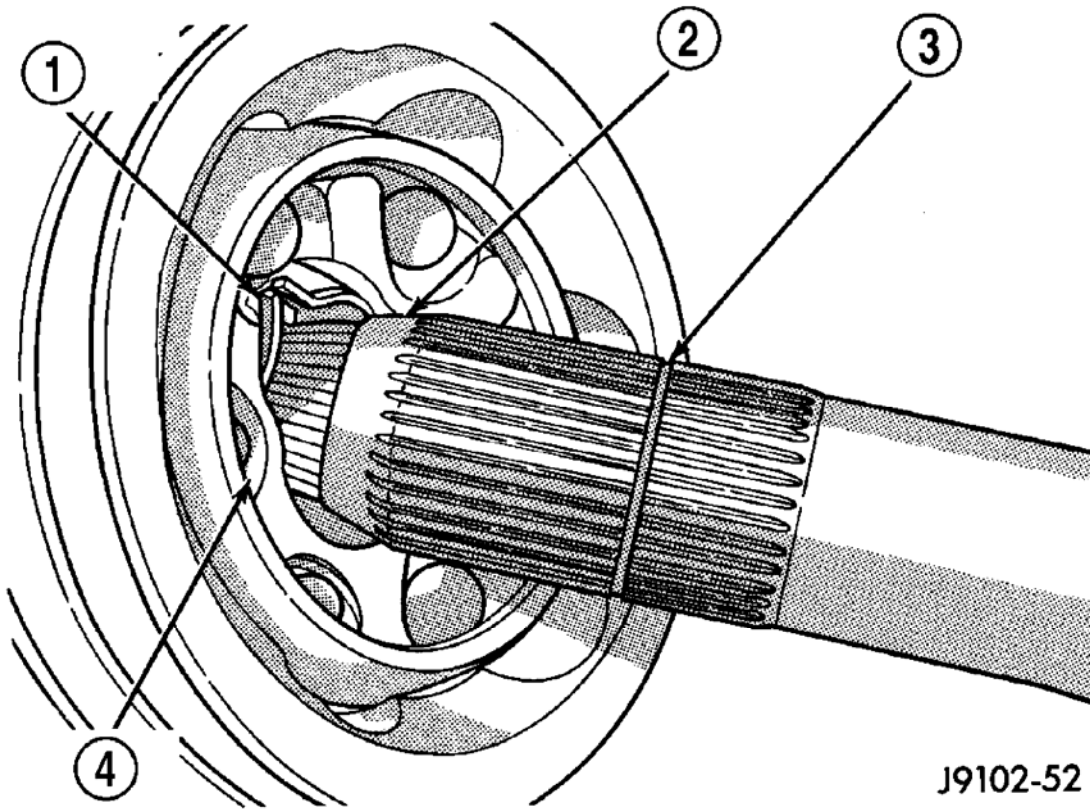
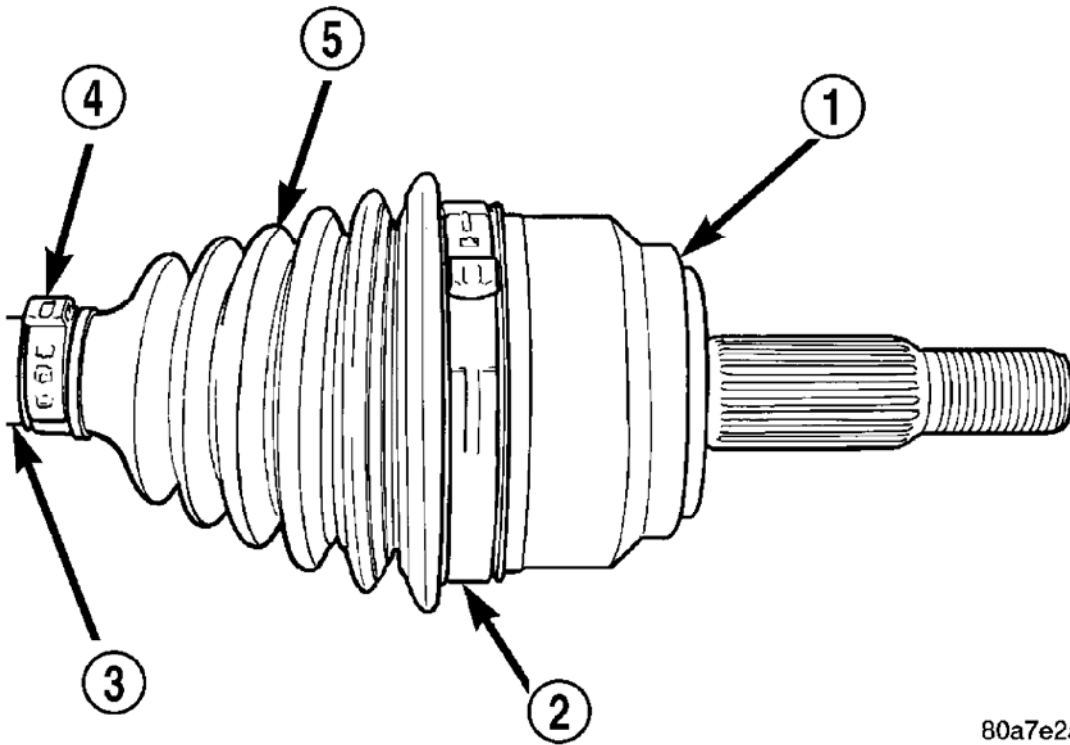


Fig. 46: Outer C/V Joint
Courtesy of CHRYSLER LLC

9. Place new clamps onto new boot and slide boot onto the shaft to its original position.
10. Apply the rest of lubricant to the C/V joint and boot.
11. Push the joint onto the shaft until the snap ring (1) seats in the groove (3). Pull on the joint to verify the span ring has engaged.



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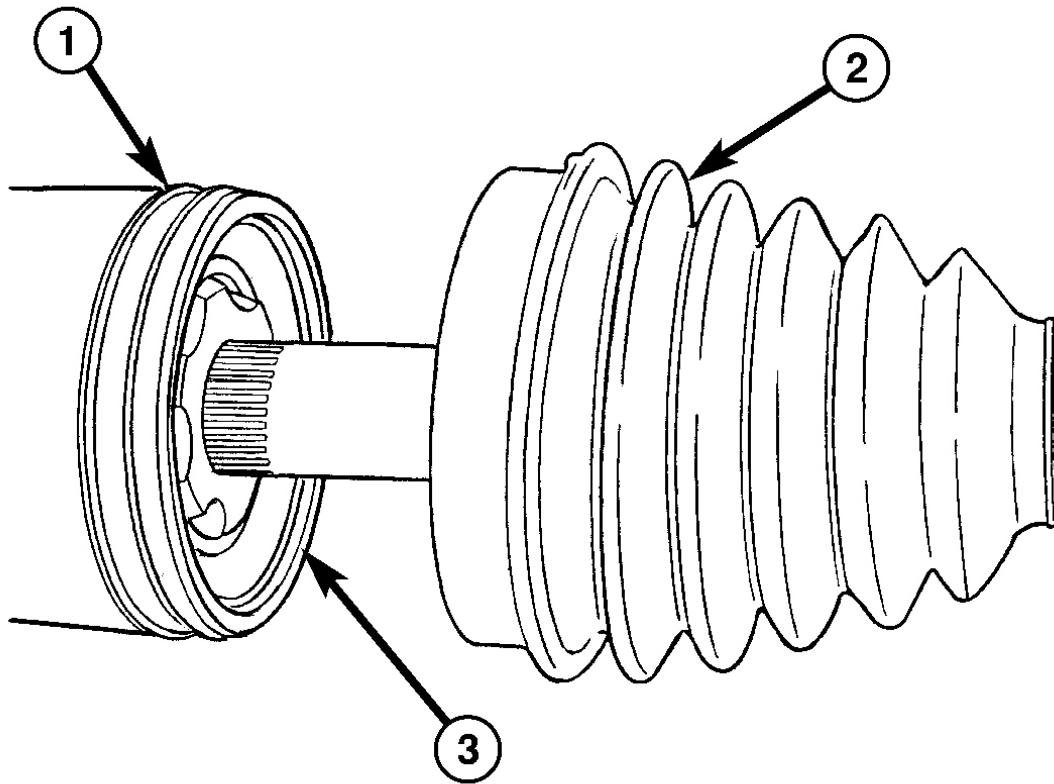
Fig. 47: Boot Clamp Locations
Courtesy of CHRYSLER LLC

12. Position boot on the joint in its original position. Ensure boot is not twisted and remove any excess air.
13. Secure both boot clamps (2) (4) with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until the jaws of the tool are closed.

JOINT/BOOT-C/V INNER

REMOVAL

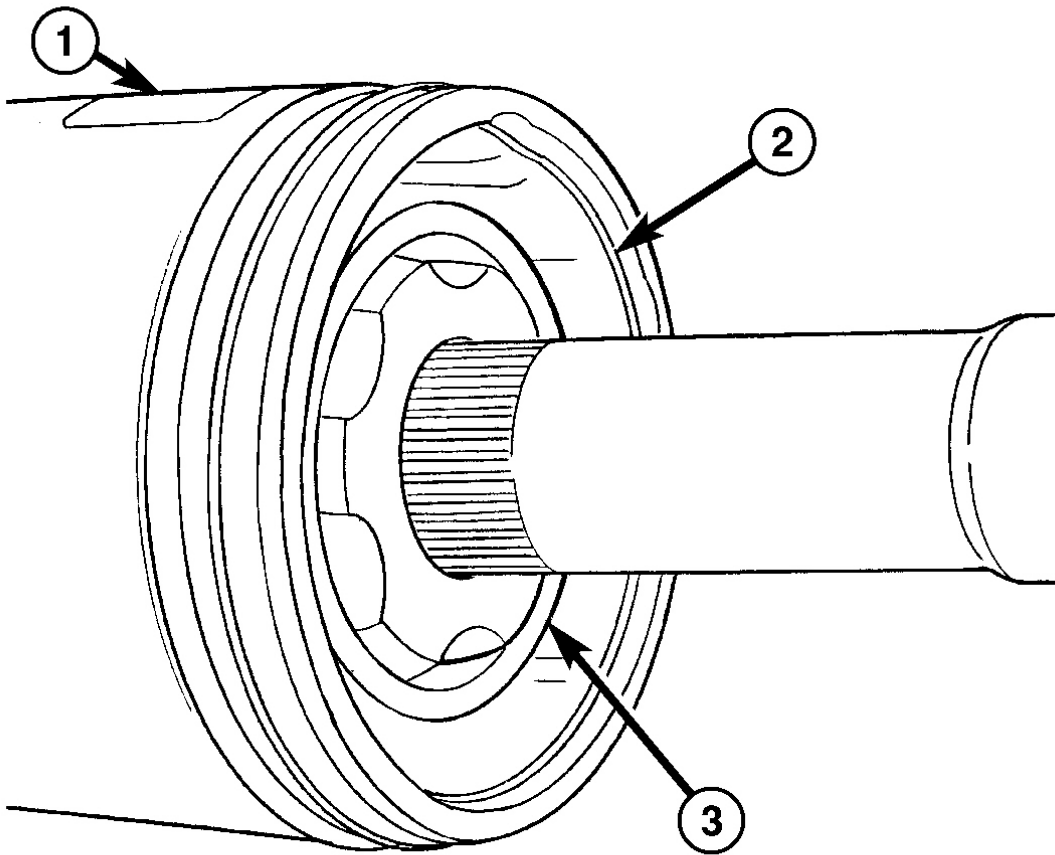
C/V JOINT-INNER



80cac344

Fig. 48: Inner C/V Boot
Courtesy of CHRYSLER LLC

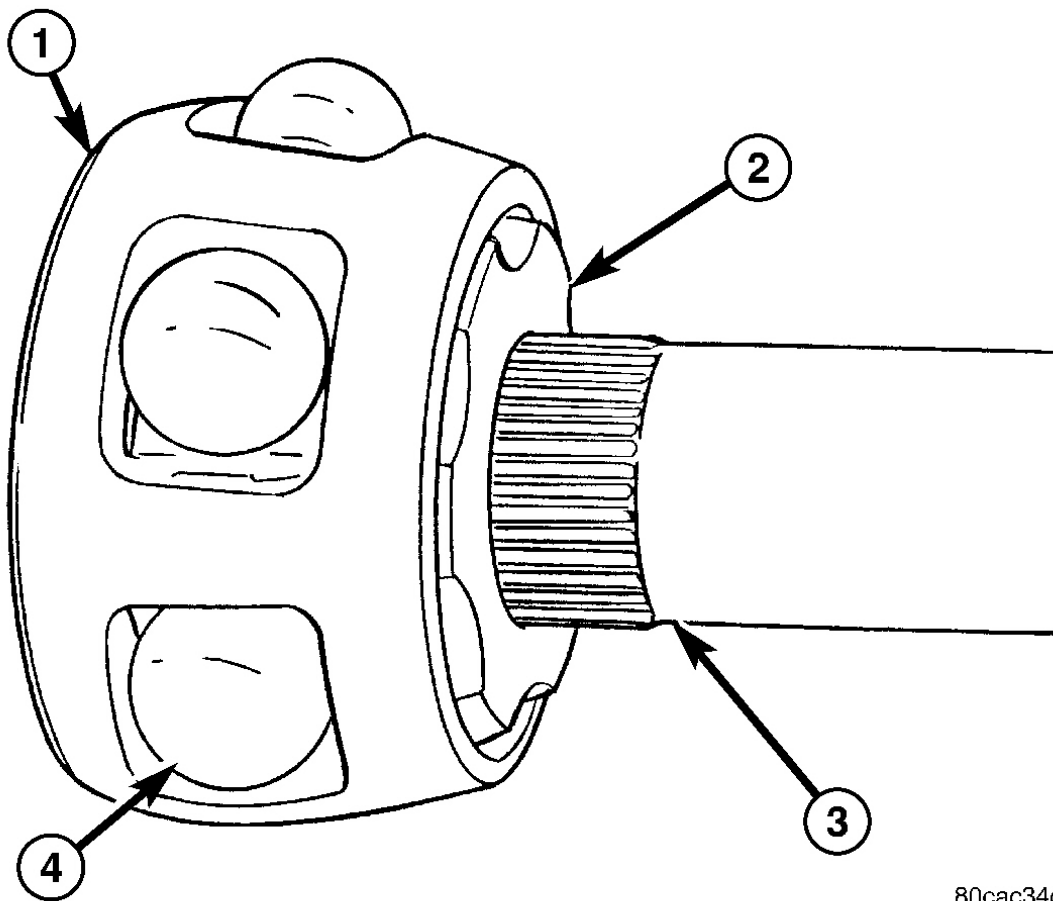
1. Clamp shaft in a vise (with soft jaws) and support C/V joint (1).
2. Remove clamps with a cut-off wheel or grinder.
3. Slide boot down (2) the shaft.



80cac348

Fig. 49: Housing Snap Ring
Courtesy of CHRYSLER LLC

4. Remove lubricant from housing (1) to expose the C/V snap ring (2) and remove snap ring.

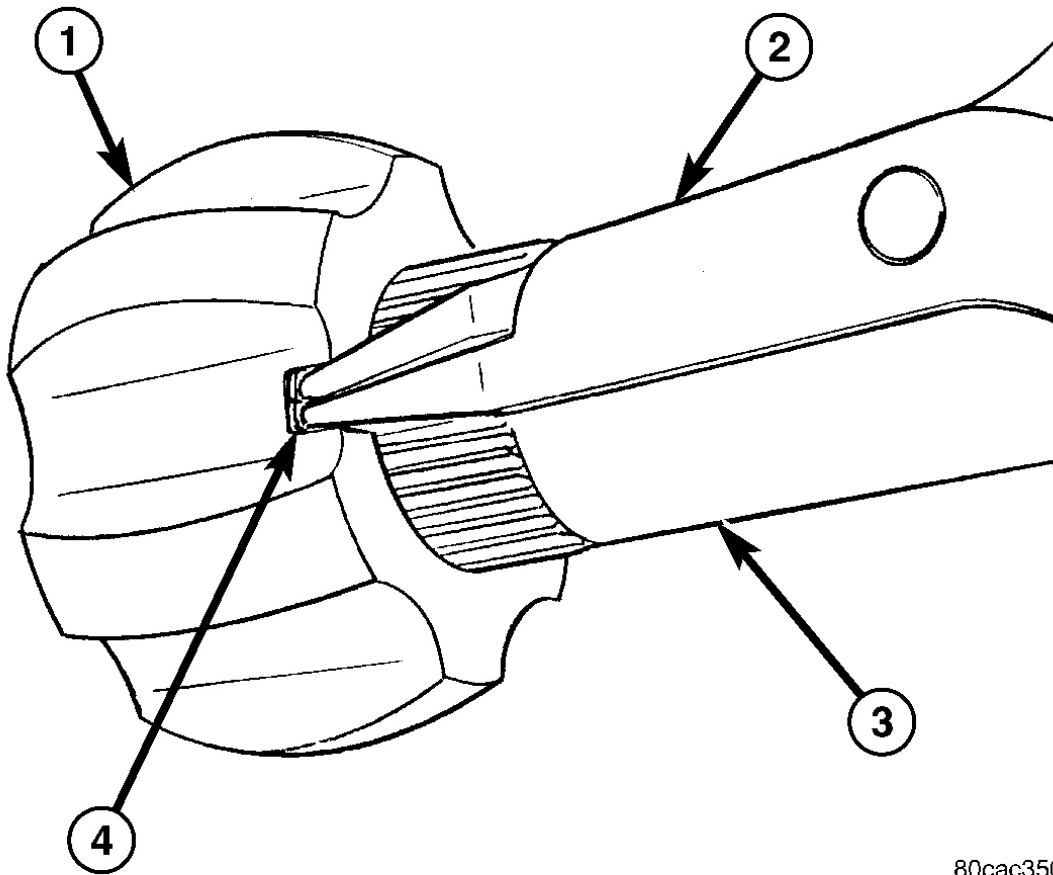


80cac34c

Fig. 50: C/V Bearings

Courtesy of CHRYSLER LLC

5. Remove bearings (4) from the cage (1).
6. Rotate cage (1) 30° and slide cage off the inner race (2) and down the shaft (3).

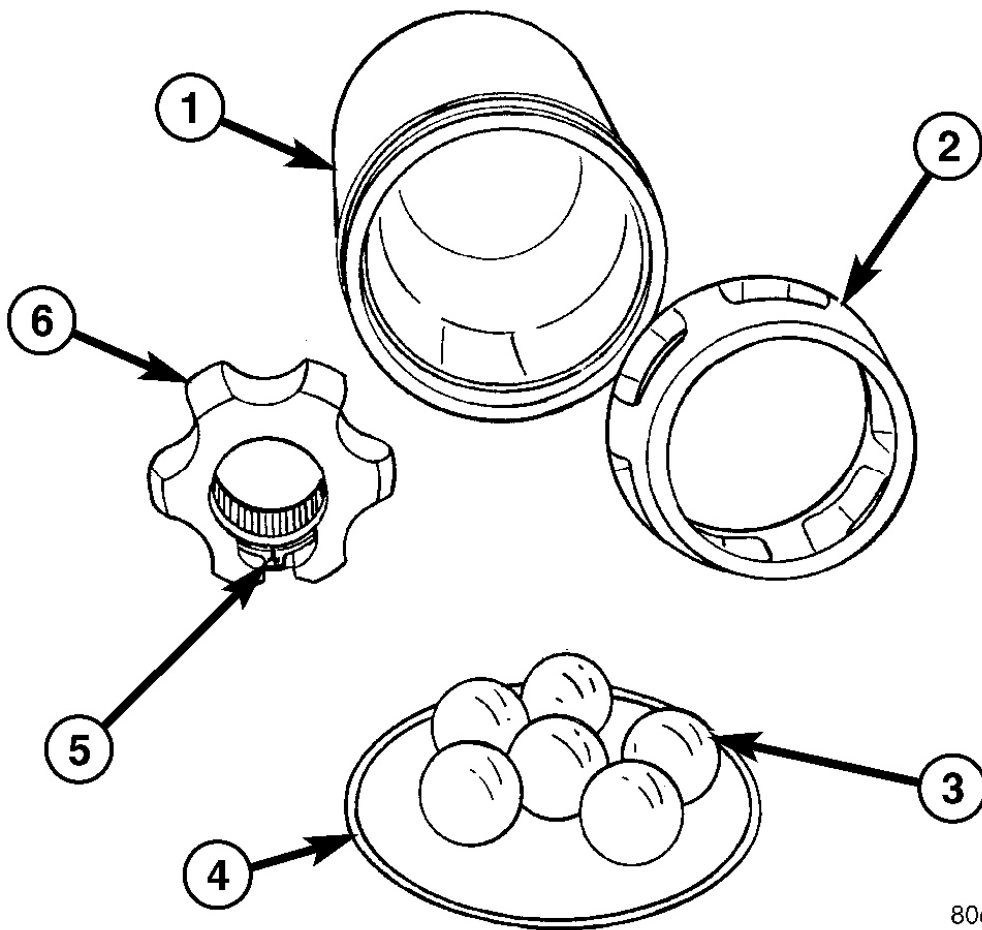


80cac350

Fig. 51: Inner Race

Courtesy of CHRYSLER LLC

7. Remove spread inner race (1) snap ring (4) and remove race (1) from the shaft (3).
8. Remove boot from the shaft and discard.



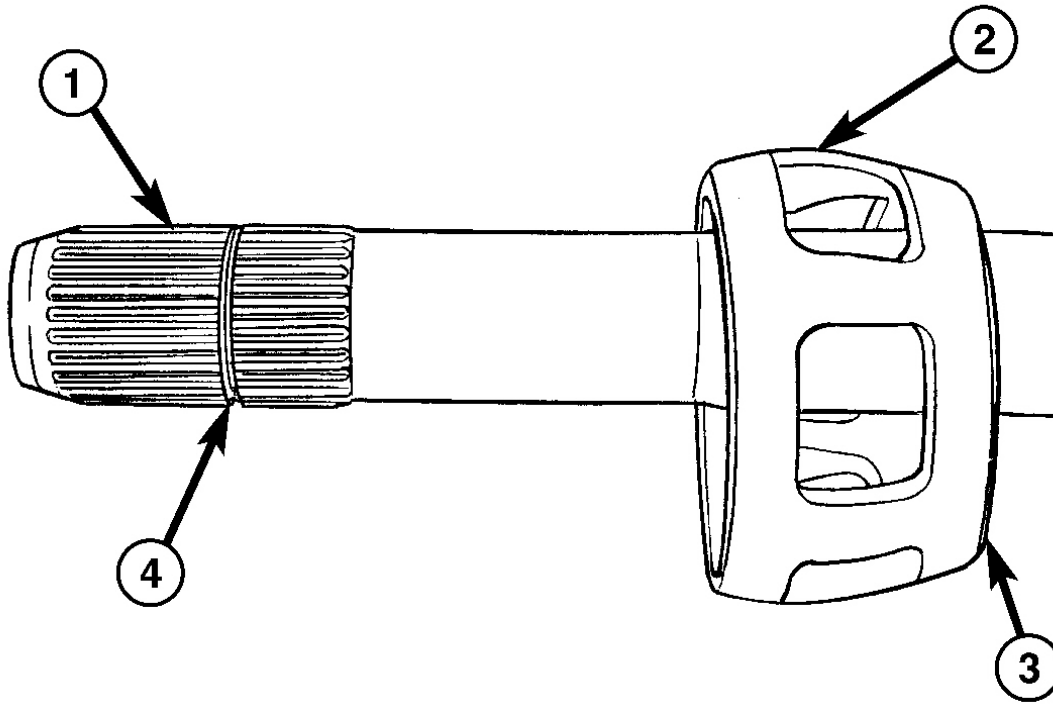
80cac3a6

Fig. 52: Inner C/V Joint
Courtesy of CHRYSLER LLC

9. Clean and inspect housing (1), cage (2), bearings (3), housing snap-ring (4), inner race snap-ring (5) and inner race (6) for wear or damage.

INSTALLATION

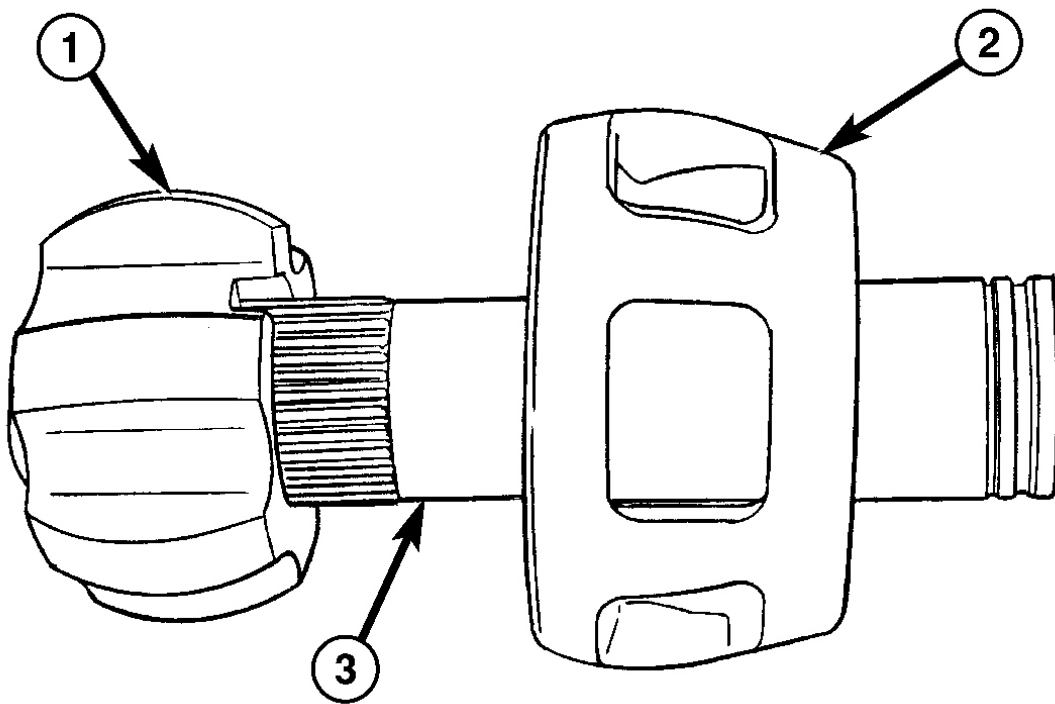
C/V JOINT-INNER



80cac512

Fig. 53: Bearing Cage
Courtesy of CHRYSLER LLC

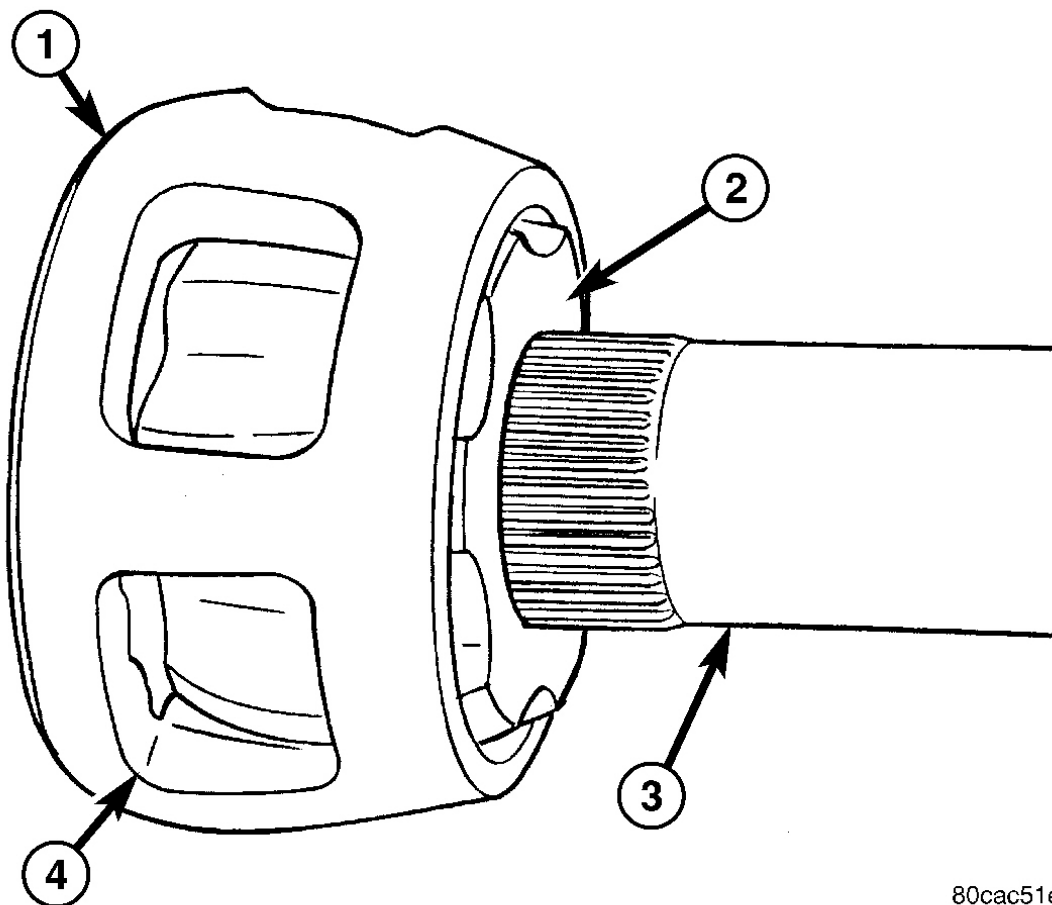
1. Apply a coat of grease supplied with the joint/boot to the C/V joint components before assembling them.
2. Place new clamps on the new boot and slide boot down the shaft.
3. Slide cage (2) onto the shaft (1) with the small diameter (3) end towards the boot.



80cac517

Fig. 54: Inner Race
Courtesy of CHRYSLER LLC

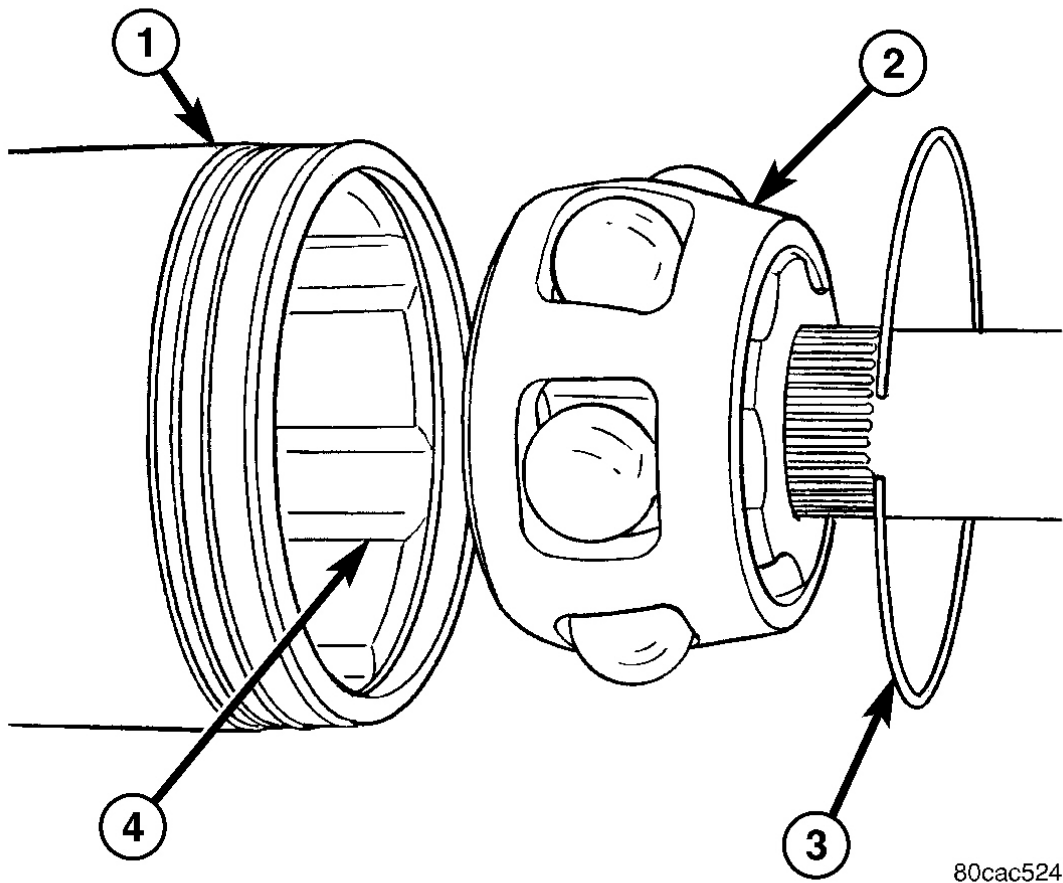
4. Install the inner race (1) onto the shaft (3). Pull on the race to verify snap ring has engaged.



80cac51e

Fig. 55: Cage/Inner Race
Courtesy of CHRYSLER LLC

5. Align cage (1) with the inner race (2) and slide over the race.
6. Turn the cage 30° to align the cage windows (4) with the race (2).



80cac524

Fig. 56: C/V Components
Courtesy of CHRYSLER LLC

7. Apply grease to the inner race and bearings and install the bearings.
8. Apply grease to the housing bore (4) then install the bearing assembly (2) into the housing (1).
9. Install the housing snap ring (3) and verify it is seated in the groove.
10. Fill the housing and boot with the remaining grease.
11. Slide the boot onto the C/V housing into its original position. Ensure boot is not twisted and remove any excess air.
12. Secure both boot clamps with Clamp Installer C-4975A. Place tool on clamp bridge and tighten tool until the jaws of the tool are closed.

FRONT AXLE - 186FIA

DIAGNOSIS AND TESTING

FRONT AXLE - 186FIA

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, tooth contact, worn/damaged gears or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant
- Incorrect ring gear backlash
- Gear damage

Differential side and pinions gears, usually do not cause noise during straight-ahead driving, when the gears are unloaded. The side gears are loaded during turns. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

Bearing noise can be either a whining or a growling sound.

Pinion bearings have a constant high pitch noise, because it rotates at a faster rate. This noise changes with vehicle speed. If noise is heard under a load, the rear pinion bearing is the source. If noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. The differential bearing noise is constant and varies only with vehicle speed.

Axle shaft bearing noise generally changes when the bearings are loaded. Turn vehicle sharply to the left and the right during a road test. This will load and unload the bearings and change the noise level. If axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joints/CV joint
- Worn side-gear thrust washers
- Worn pinion shaft bore

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft
- Missing drive shaft balance weight(s)
- Worn or out-of-balance wheels
- Loose wheel lug nuts
- Worn U-joints/CV joint
- Loose/broken springs
- Damaged axle shaft bearing(s)
- Loose pinion gear nut
- Excessive pinion yoke run out
- Bent axle shaft(s)

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be an axle vibration. Also look at engine accessories, brackets and drive belts.

NOTE: **All driveline components should be examined before starting any repair.**

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear or the clutch engaged, can be caused by:

- High engine idle speed
- Transmission shift operation
- Loose engine/transmission/transfer case mounts
- Worn U-joints/CV joint
- Loose spring mounts
- Loose pinion gear nut and yoke
- Excessive ring gear backlash
- Excessive side gear to case clearance

To determined the source of a snap/clunk noise, raise vehicle on a hoist with the wheels free to rotate. Have a helper shift the transmission into gear and listen for the noise.

DIAGNOSTIC CHART

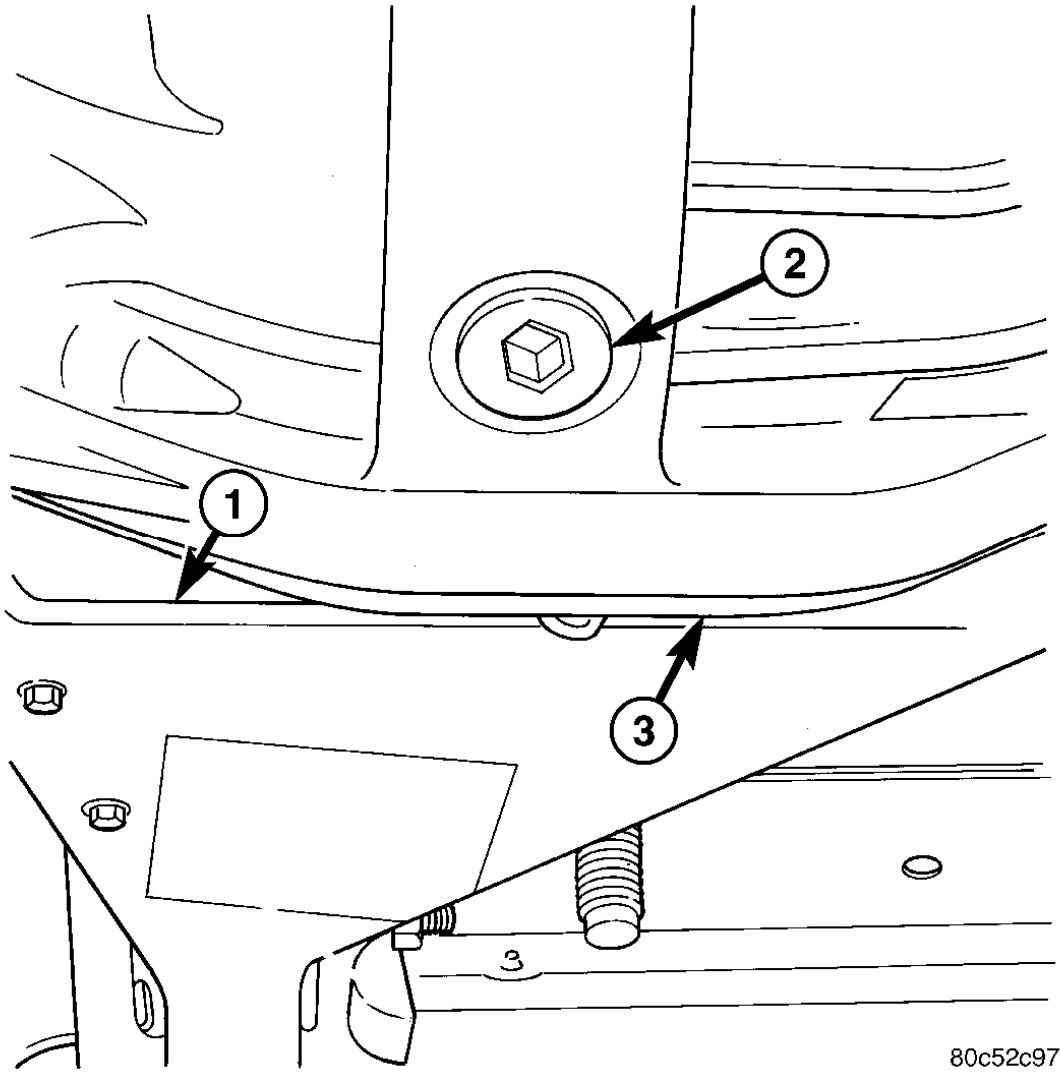
Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose. 2. Worn wheel bearing.	1. Tighten loose nuts. 2. Replace bearing.
Axle Noise	1. Misaligned axle tube. 2. Bent or sprung axle shaft. 3. End-play in pinion bearings.	1. Inspect axle tube alignment. Correct as necessary. 2. Inspect and correct as necessary. 3. Refer to pinion pre-load information and correct as

	4. Excessive gear backlash between the ring gear and pinion. 5. Improper adjustment of pinion gear bearings. 6. Loose pinion yoke nut. 7. Scuffed gear tooth contact surfaces.	necessary. 4. Check adjustment of the ring gear and pinion backlash. Correct as necessary. 5. Adjust the pinion bearings pre-load. 6. Tighten the pinion yoke nut. 7. Inspect and replace as necessary.
Axle Shaft Broke	1. Misaligned axle tube. 2. Vehicle overloaded. 3. Erratic clutch operation. 4. Grabbing clutch.	1. Replace the broken shaft after correcting tube mis-alignment. 2. Replace broken shaft and avoid excessive weight on vehicle. 3. Replace broken shaft and avoid or correct erratic clutch operation. 4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings. 2. Excessive ring gear backlash. 3. Vehicle overloaded. 4. Erratic clutch operation.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly. 2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly. 3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight. 4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication. 2. Improper grade of lubricant. 3. Excessive spinning of one wheel/tire.	1. Replace scored gears. Fill differential with the correct fluid type and quantity. 2. Replace scored gears. Fill differential with the correct fluid type and quantity. 3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high. 2. Worn axle shaft seals. 3. Cracked differential housing. 4. Worn pinion seal. 5. Worn/scored yoke.	1. Drain lubricant to the correct level. 2. Replace seals. 3. Repair as necessary. 4. Replace seal. 5. Replace yoke and seal.

	6. Axle cover not properly sealed.	6. Remove, clean and seal cover.
Axle Overheating	1. Lubricant level low. 2. Improper grade of lubricant. 3. Bearing pre-loads too high. 4. Insufficient ring gear backlash.	1. Fill differential to correct level. 2. Fill differential with the correct fluid type and quantity. 3. Adjust bearing pre-loads. 4. Adjust ring gear backlash.
Gear Teeth Broke	1. Overloading. 2. Erratic clutch operation. 3. Ice-spotted pavement. 4. Improper adjustments.	1. Replace gears. Examine other gears and bearings for possible damage. 2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation. 3. Replace gears and examine remaining parts for damage. 4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant. 2. Improper ring gear and pinion adjustment. 3. Unmatched ring gear and pinion. 4. Worn teeth on ring gear or pinion. 5. Loose pinion bearings. 6. Loose differential bearings. 7. Ring gear run-out. 8. Loose differential bearing cap bolts. 9. Housing not machined properly.	1. Fill differential with the correct fluid type and quantity. 2. Check ring gear and pinion contact pattern. 3. Replace gears with a matched ring gear and pinion. 4. Replace ring gear and pinion. 5. Adjust pinion bearing pre-load. 6. Adjust differential bearing pre-load. 7. Measure ring gear run-out. Replace components as necessary. 8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued to specifications. 9. Replace housing.

REMOVAL

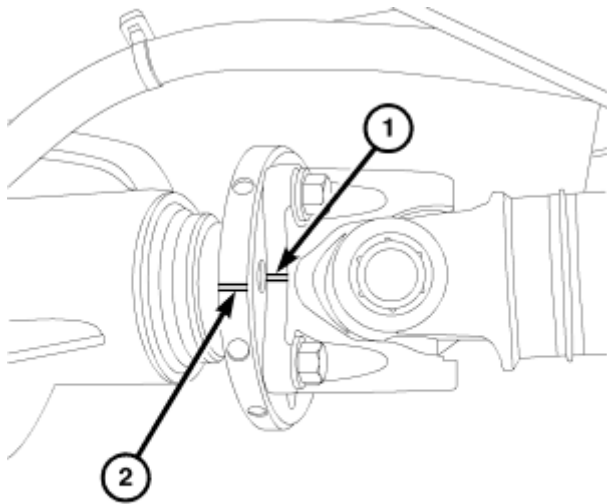
FRONT AXLE - 186FIA



80c52c97

Fig. 57: Drain Plug
Courtesy of CHRYSLER LLC

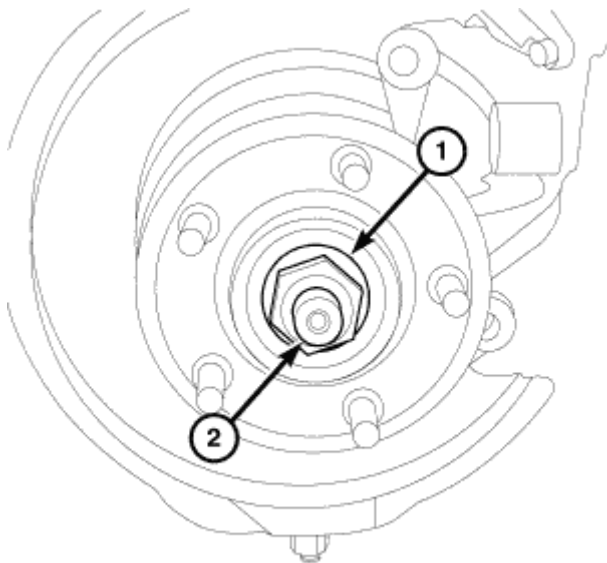
1. With vehicle in neutral, position vehicle on hoist.
2. Remove skid plate.
3. Remove differential housing (3) drain plug (2) and drain fluid.



81665360

Fig. 58: Identifying Front Propeller Shaft Flange & Axle Flange
 Courtesy of CHRYSLER LLC

4. Mark front propeller shaft (1) and pinion flange (2) for installation reference. Remove propeller shaft from pinion flange.



818a2de5

Fig. 59: Identifying Hub Nut & Half Shaft
 Courtesy of CHRYSLER LLC

5. Remove hub nuts (1) from half shafts (2).

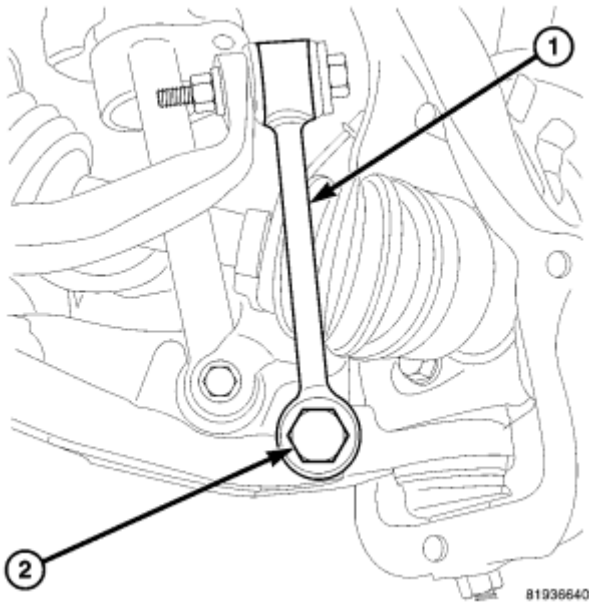


Fig. 60: Identifying Stabilizer Bar Link & Bolts
 Courtesy of CHRYSLER LLC

6. Remove stabilizer bar link (1) bolts (2) from lower control arm.

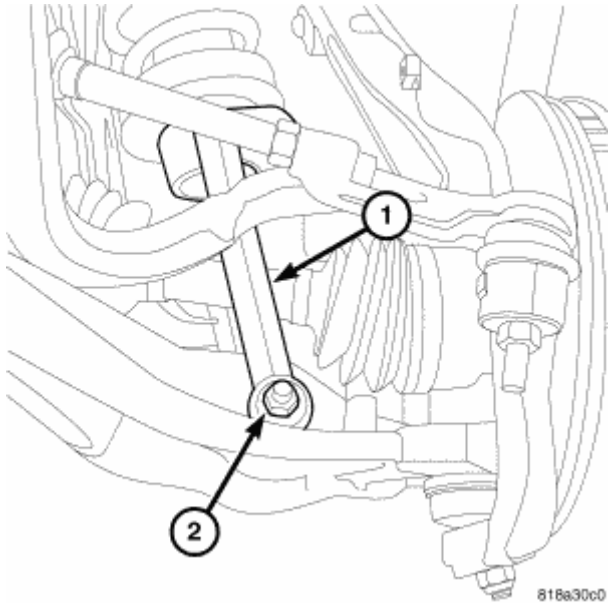


Fig. 61: Identifying Shocks Clevis & Nuts
 Courtesy of CHRYSLER LLC

7. Remove shocks clevis (1) nut (2) and bolt.

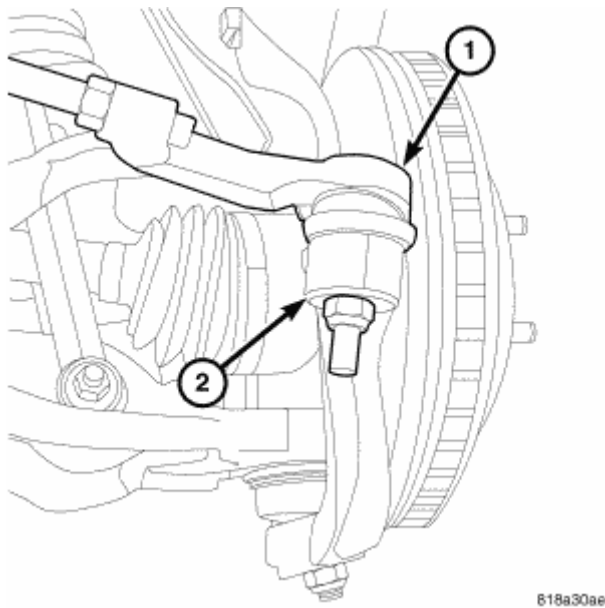


Fig. 62: Identifying Tie Rod End & Steering Knuckle
 Courtesy of CHRYSLER LLC

8. Remove tie rod end (1) nuts and separate ends from the steering knuckles (2).

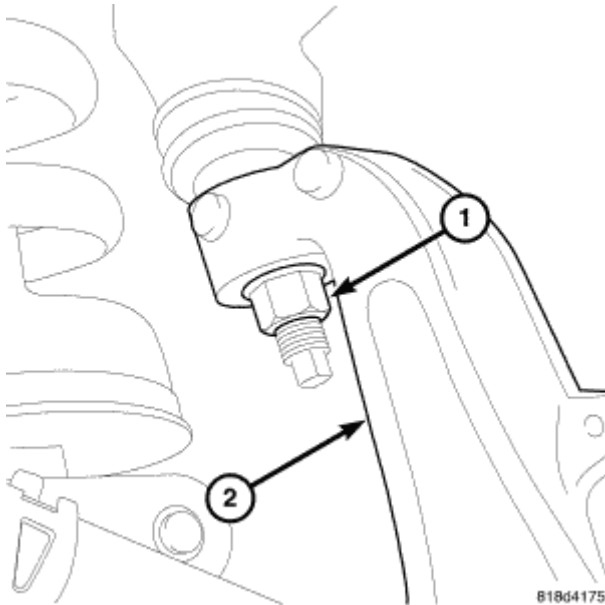
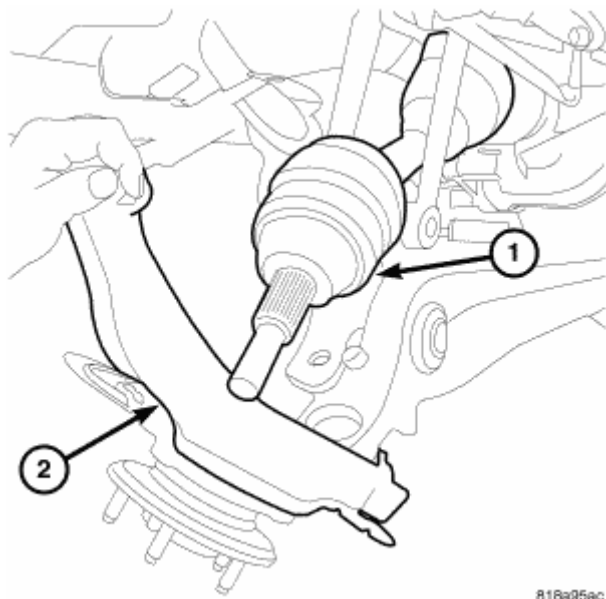


Fig. 63: Identifying Upper Ball Joint Nuts & Steering Knuckles
 Courtesy of CHRYSLER LLC

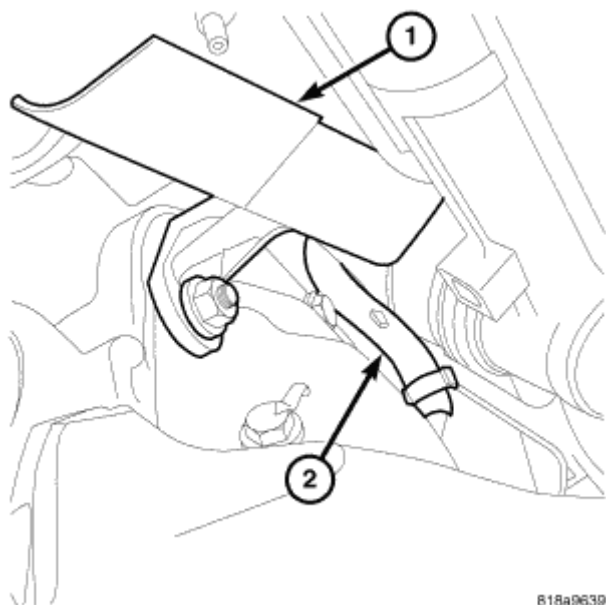
9. Remove upper ball joint nuts (1) from steering knuckles (2) and separate ball joints from steering knuckles (2).



816a95ac

Fig. 64: Identifying Half Shaft & Knuckle
Courtesy of CHRYSLER LLC

10. Pull out on the steering knuckles (2) and push the half shaft (1) out of the knuckles.
11. With a pry bar remove the half shafts (1) from the axle.



816a9639

Fig. 65: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

12. Remove oil filter drain tray (1) and vent hose (2) from differential cover.

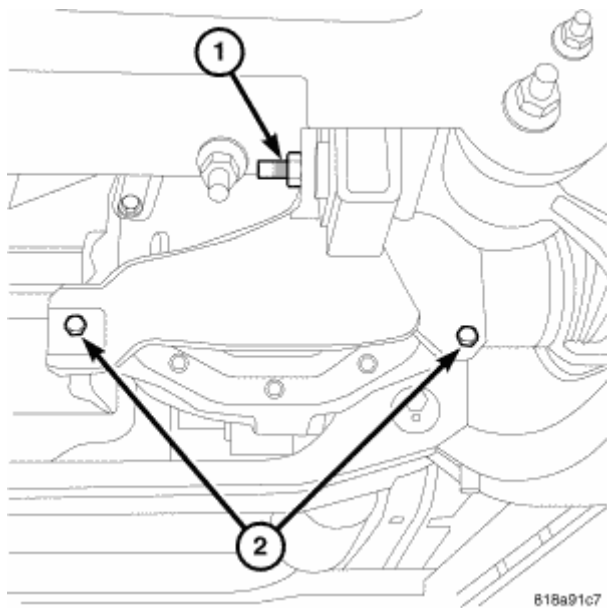


Fig. 66: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
 Courtesy of CHRYSLER LLC

13. Support axle with a lift/jack.
14. Remove front axle bracket nut and bolt (1) from crossmember. Remove front axle bracket nuts and bolts (2) from axle housing and remove bracket.

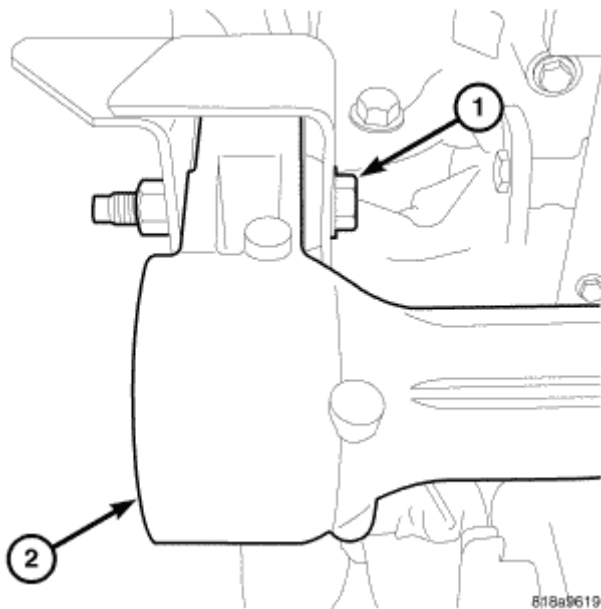
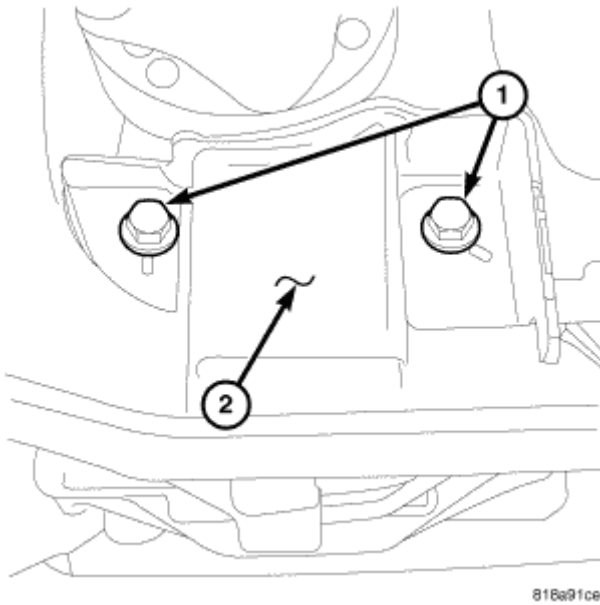


Fig. 67: Identifying Nut/Bolt & Right Axle
 Courtesy of CHRYSLER LLC

15. Remove nut and bolt (1) from right axle (2) bracket.



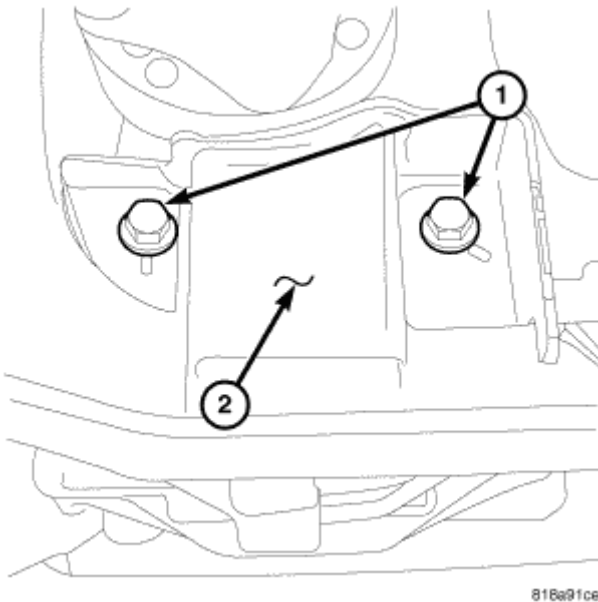
81Ba91ce

Fig. 68: Identifying Bolts & Rear Axle Bracket
 Courtesy of CHRYSLER LLC

16. Remove bolts (1) from rear axle bracket (2).
17. Lower axle and from vehicle.

INSTALLATION

FRONT AXLE - 186FIA



81Ba91ce

Fig. 69: Identifying Bolts & Rear Axle Bracket
 Courtesy of CHRYSLER LLC

1. Lift axle into vehicle.
2. Install bolts (1) in rear axle bracket (1) and tighten to 88 N.m (65 ft. lbs.).

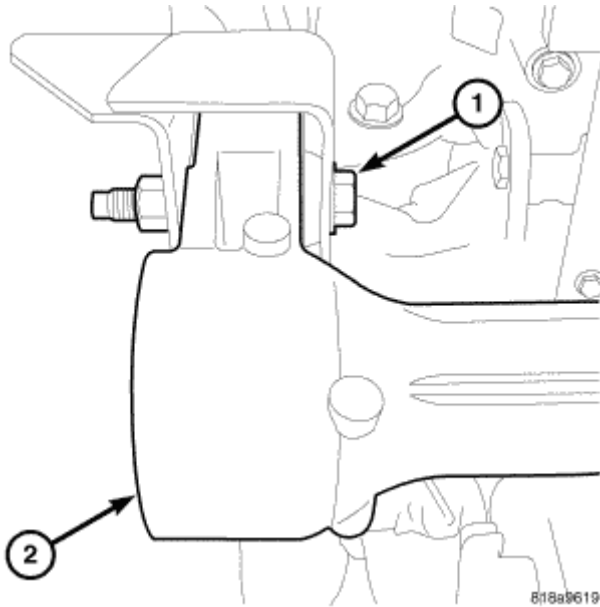


Fig. 70: Identifying Nut/Bolt & Right Axle
Courtesy of CHRYSLER LLC

3. Install bolt (1) and nut in right axle (2) bracket and tighten to 61 N.m (45 ft. lbs.).

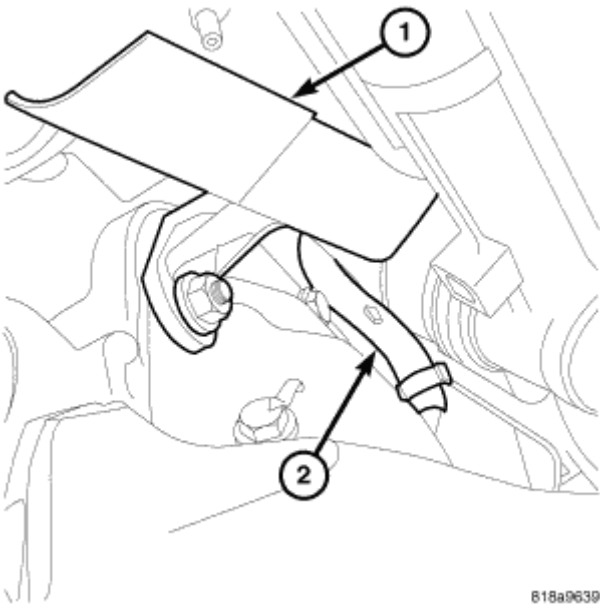
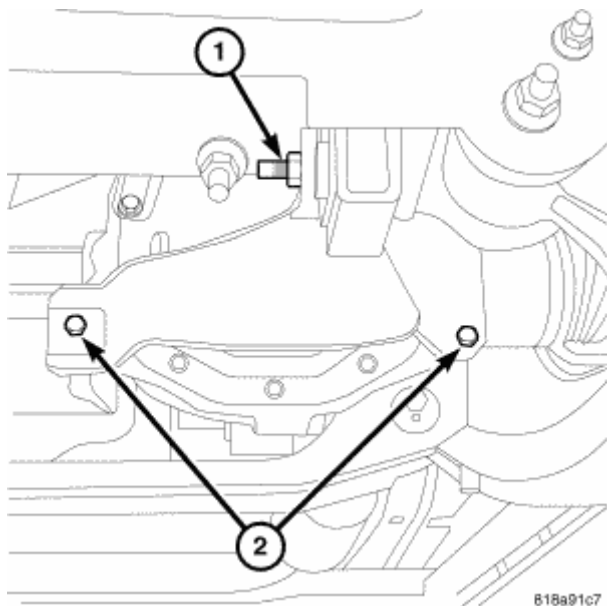


Fig. 71: Identifying Oil Filter Drain Tray & Vent Hose
Courtesy of CHRYSLER LLC

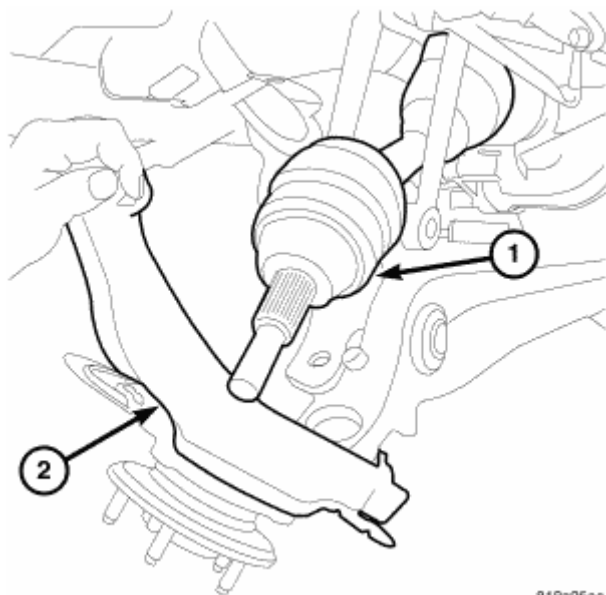
4. Install oil filter drain tray (1) and vent hose (2) on differential cover.



818a91c7

Fig. 72: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
 Courtesy of CHRYSLER LLC

5. Install front axle bracket, bolts (2) and nuts on axle housing. Install front axle bracket bolt (1) and nut in front crossmember. Tighten front axle bracket nuts to 61 N.m (45 ft. lbs.).



818a95ac

Fig. 73: Identifying Half Shaft & Knuckle
 Courtesy of CHRYSLER LLC

6. Install half shafts (1) into axle and steering knuckle (2) and hub bearing.

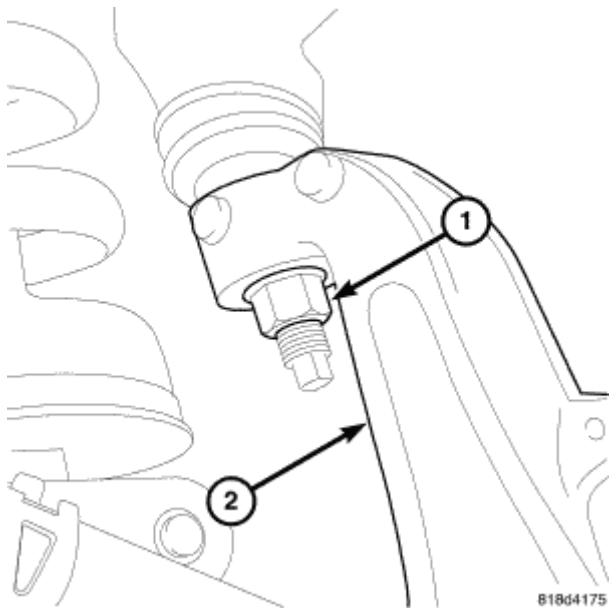


Fig. 74: Identifying Upper Ball Joint Nuts & Steering Knuckles
 Courtesy of CHRYSLER LLC

7. Install upper ball joint into steering knuckles (2) and tighten nuts (1) to specifications.

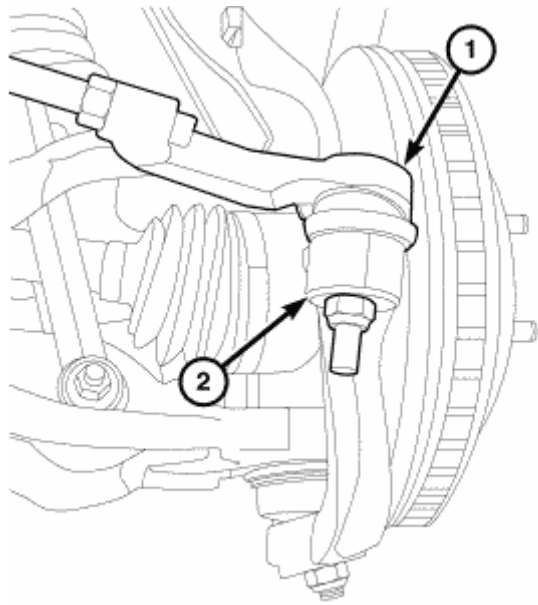


Fig. 75: Identifying Tie Rod End & Steering Knuckle
 Courtesy of CHRYSLER LLC

8. Install tie rod ends (1) on steering knuckles (2) and tighten to specifications.

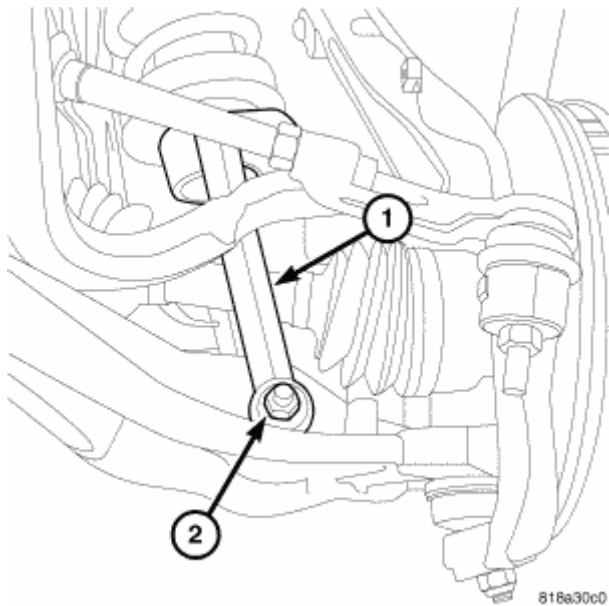


Fig. 76: Identifying Shocks Clevis & Nuts
 Courtesy of CHRYSLER LLC

9. Align clevis (1) with lower control arm and install clevis bolts. Tighten clevis and nuts (2) to specifications.

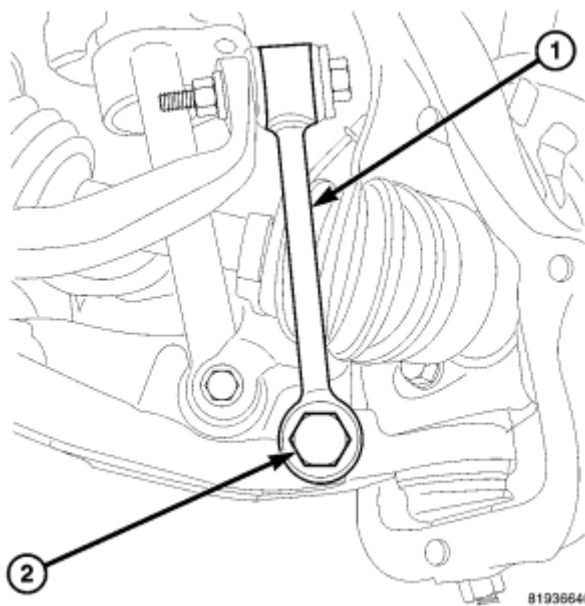
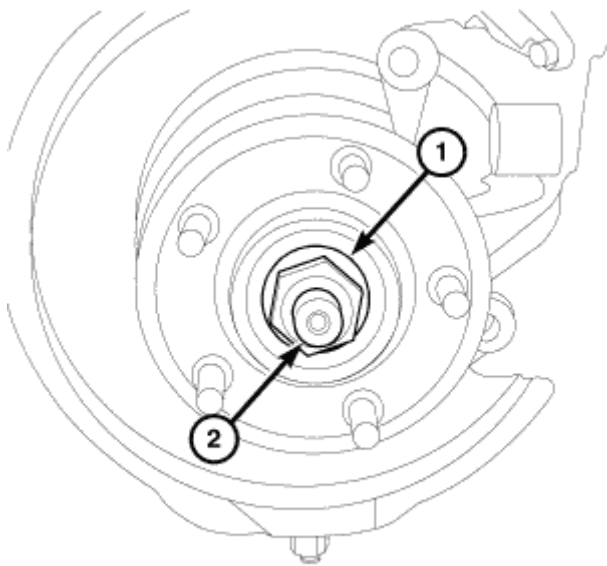


Fig. 77: Identifying Stabilizer Bar Link & Bolts
 Courtesy of CHRYSLER LLC

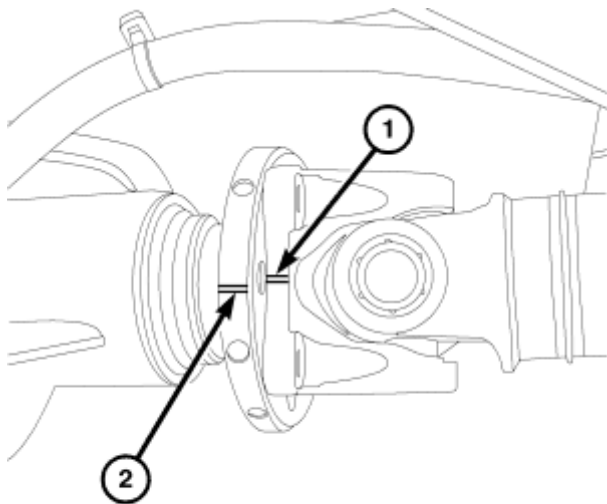
10. Install stabilizer bar links (1) and tighten bolts (2) to specifications.



818a2de5

Fig. 78: Identifying Hub Nut & Half Shaft
Courtesy of CHRYSLER LLC

11. Install new half shaft (2) hub nuts (1) and tighten to 136 N.m (100 ft. lbs.).



818706fb

Fig. 79: Identifying Front Propeller Shaft Flange & Axle Flange
Courtesy of CHRYSLER LLC

12. Install propeller shaft with reference marks (1, 2) aligned.

NOTE: Clean propeller shaft bolts and apply Mopar Lock & Seal Adhesive or equivalent to the threads before installation.

13. Install propeller shaft bolts and tighten to specifications.
14. Fill differential with gear lubricant.
15. Install skid plate, if equipped.

ADJUSTMENTS

FRONT AXLE - 186FIA

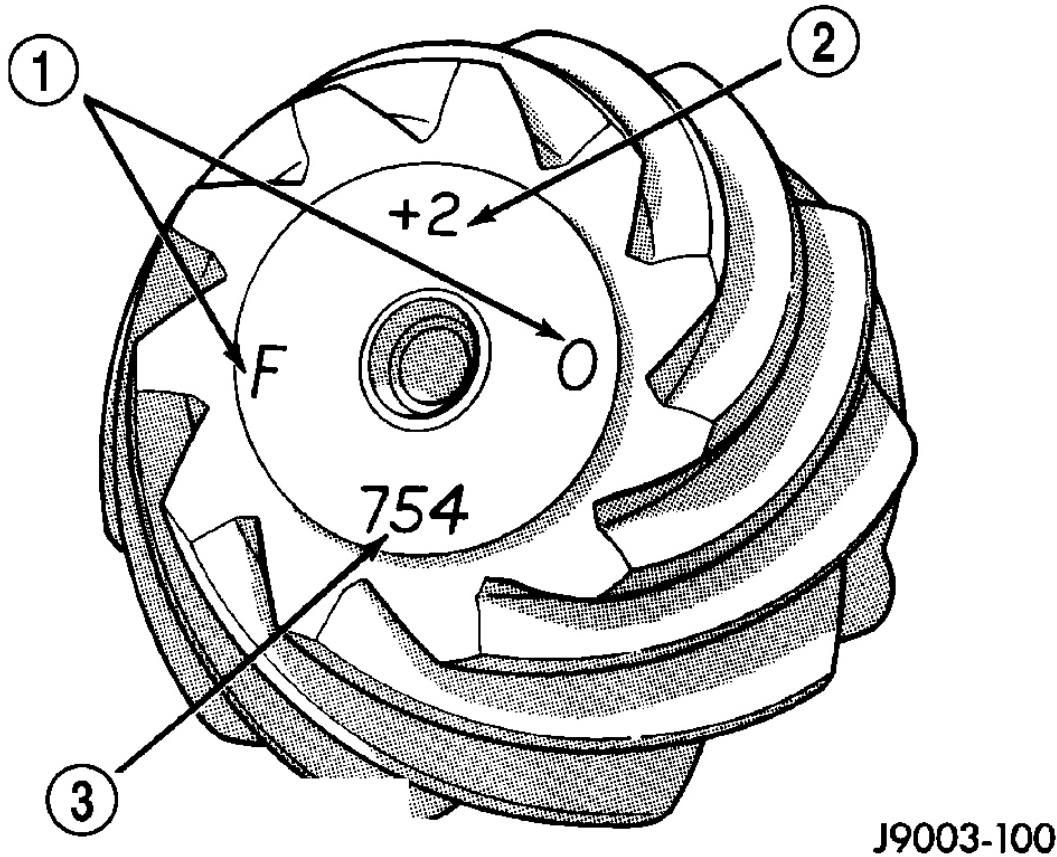


Fig. 80: Pinion Gear ID Numbers
Courtesy of CHRYSLER LLC

Ring and pinion gears are supplied as matched sets. Gear match numbers (3) for the ring and pinion gear are etched onto each gear. A plus (+) number, minus (-) number or zero (0) is etched into the face of the pinion gear (2). This number is the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion etched with a (0).

If installing a new gear, note the depth variance number of the original and replacement pinion. The numbers represent thousands of an inch deviation from the standard. Add or subtract this number from the original depth

shim/oil slinger to compensate for the difference in the depth variances. If the number is negative, add that value to the required thickness of the depth shims. If the number is positive, subtract that value from the thickness of the depth shim.

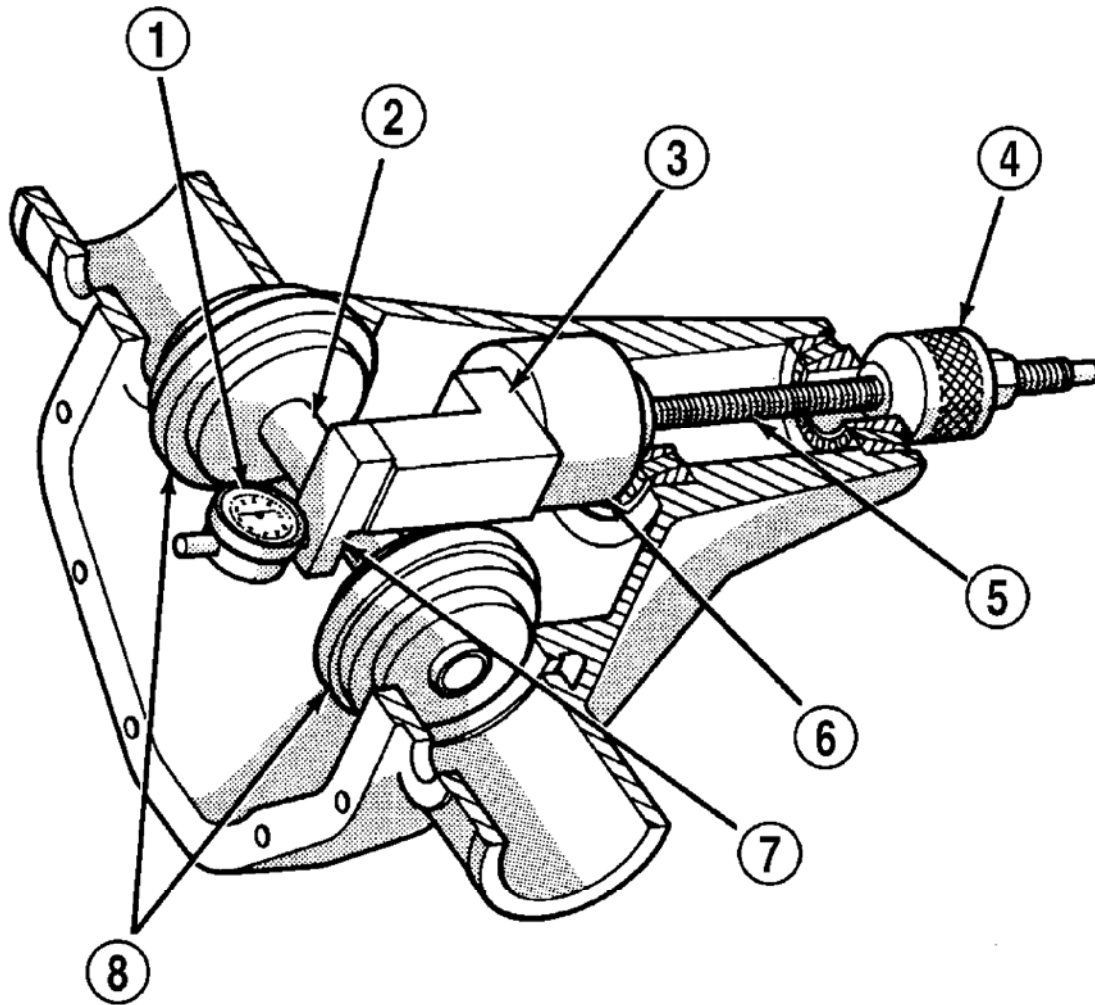
Compensation for pinion depth variance is achieved with a select shim/oil slinger. The shims are placed between the rear pinion bearing and pinion gear head.

Pinion Gear Depth Variance Chart : Note where Old and New Pinion Marking columns intersect. Intersecting figure represents plus or minus the amount needed.

PINION GEAR DEPTH VARIANCE

Original Pinion Gear Depth Variance	Replacement Pinion Gear Depth Variance								
	-4	-3	-2	-1	0	+1	+2	+3	+4
+4	+0.008	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0
+3	+0.007	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001
+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003
0	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004
-1	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005
-2	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006
-3	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007
-4	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007	-0.008

PINION DEPTH MEASUREMENT

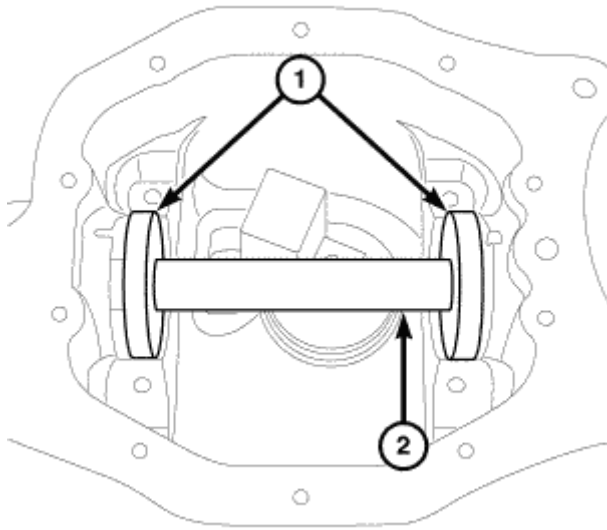


J9403-45

Fig. 81: Pinion Gear Depth Tools
 Courtesy of CHRYSLER LLC

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take measurements with Pinion Gauge Set and Dial Indicator C-3339A (1).

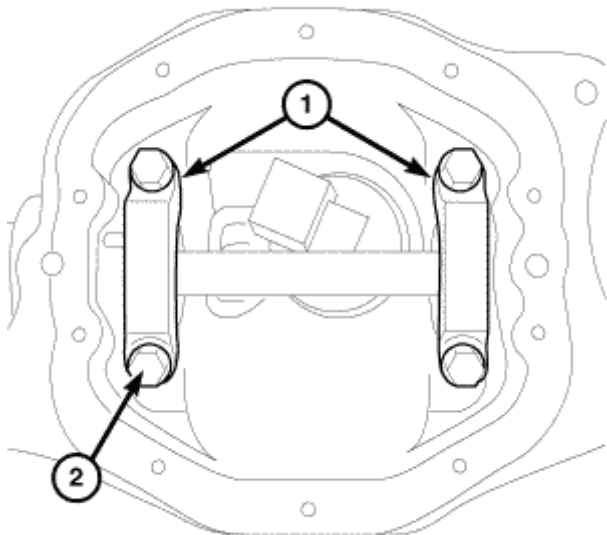
1. Assemble Pinion Height Block 6739 (3), Pinion Block 8804 (6) and rear pinion bearing onto Screw 6741 (5).
2. Insert height gauge components into the housing through pinion bearing cups.
3. Install front pinion bearing and Cone-nut 6740 (4) onto the screw. Tighten Cone-Nut until Torque To Rotate screw is 1.7 N.m (15 in. lbs.).



818d47ad

Fig. 82: Positioning Arbor Discs 6927A And Arbor D-115-3 Into Housing Bearing Cradles
 Courtesy of CHRYSLER LLC

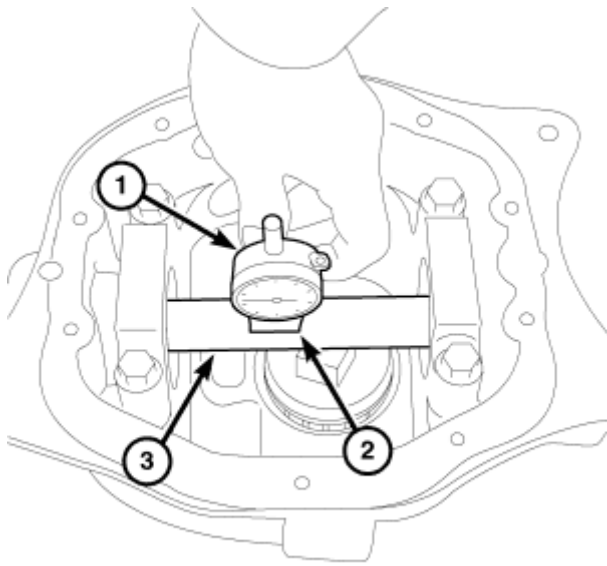
4. Position Arbor Discs 6927A (1) and Arbor D-115-3 (2) into the housing bearing cradles.



818d4944

Fig. 83: Installing Differential Bearing Caps On Arbor Discs And Tightening Bolts
 Courtesy of CHRYSLER LLC

5. Install differential bearing caps (1) on Arbor Discs and tighten bolts (2) to 61 N.m (45 ft. lbs.).

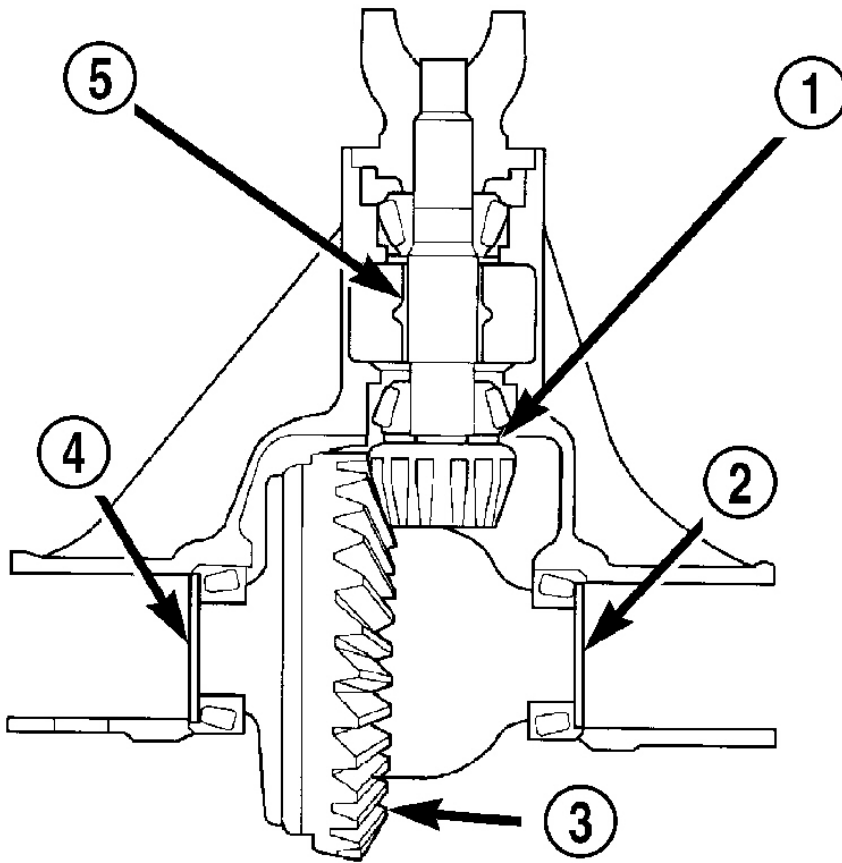


818d458c

Fig. 84: Identifying Dial Indicator, Scooter Block & Arbor
Courtesy of CHRYSLER LLC

6. Assemble Dial Indicator C-3339A into Scooter Block D-115-2 and secure set screw.
7. Position Dial Indicator (1) with Scooter Block (2) flush on the pinion height block. Hold scooter block and zero the dial indicator.
8. Slowly slide the scooter block (2) across the pinion block over to the arbor (3). Move the scooter block till the dial indicator probe crests the arbor (3) and record the highest reading.
9. Select a shim equal to the dial indicator reading plus or minus the pinion depth variance number on the face of the pinion. For example: If the depth variance is -2, add 0.002 in. to the dial indicator reading. If the depth variance is +2, subtract 0.002 in. from the dial indicator reading.

DIFFERENTIAL SIDE BEARING PRELOAD AND GEAR BACKLASH



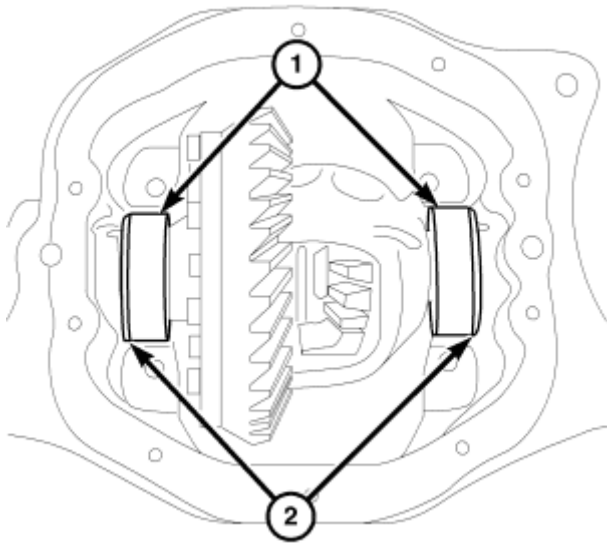
80a5037a

Fig. 85: Shim Locations
Courtesy of CHRYSLER LLC

Differential bearing preload and gear backlash is achieved with selective shims (2) (4) located between the differential bearing cups and differential housing. Shim thickness is determined using Dummy Bearings D-348 and Dummy Shims 8107 in place of the differential side bearings and preload shims.

Before measuring differential bearing preload and gear backlash, pinion gear depth must be established and pinion gear prepared for installation. Pinion gear depth is essential to establishing gear backlash and tooth contact patterns.

PRELOAD SHIM SELECTION

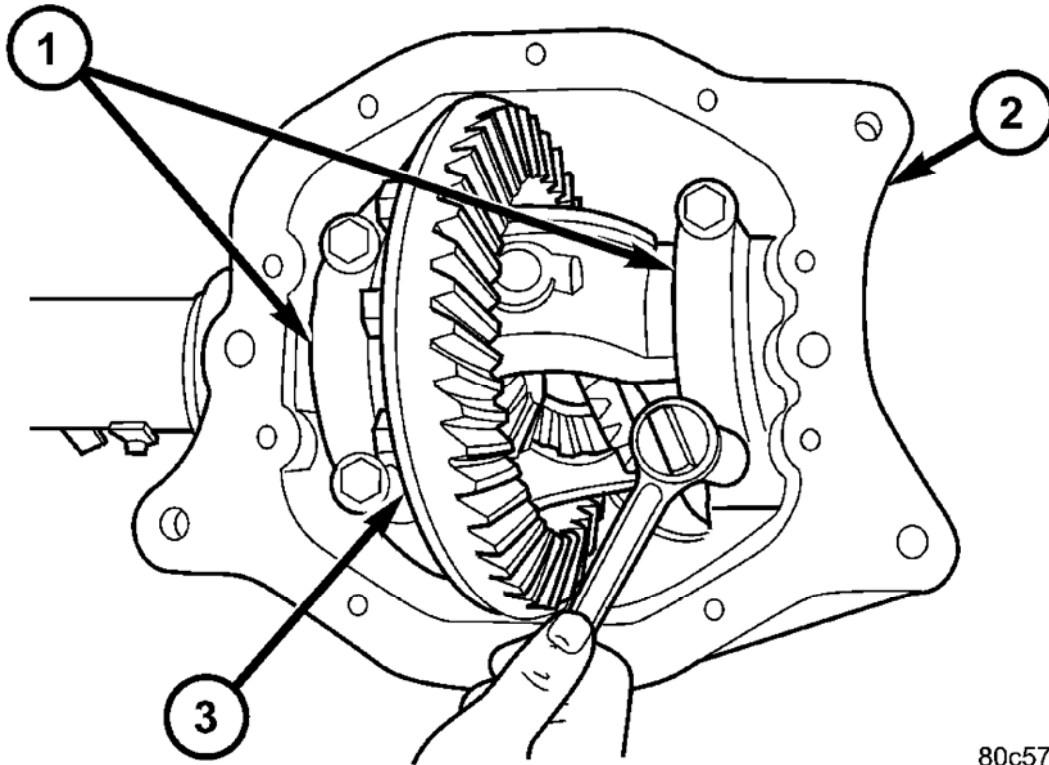


818d5572

Fig. 86: Identifying Dummy Bearings D-348 & Dummy Shims 8107
Courtesy of CHRYSLER LLC

1. Remove differential side bearings from differential case.
2. Install ring gear on differential case and tighten bolts to specification.
3. Install Dummy Bearings D-348 (1) on differential case.
4. Install differential case in the housing.
5. Record thickness of Dummy Shims 8107 (2) then install shims between dummy bearings and differential housing.

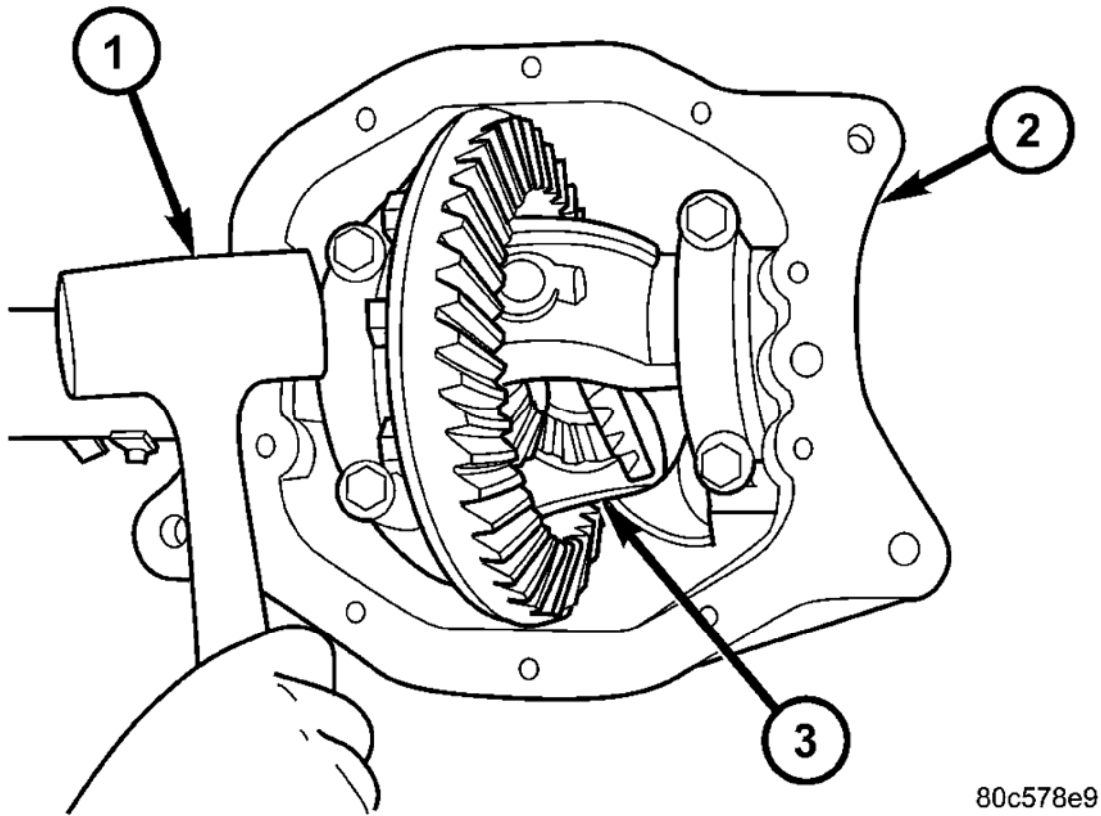
NOTE: **Each dummy shim is 3 mm (0.118 in.) thick.**



80c5786b

Fig. 87: Bearing Cap Bolts
Courtesy of CHRYSLER LLC

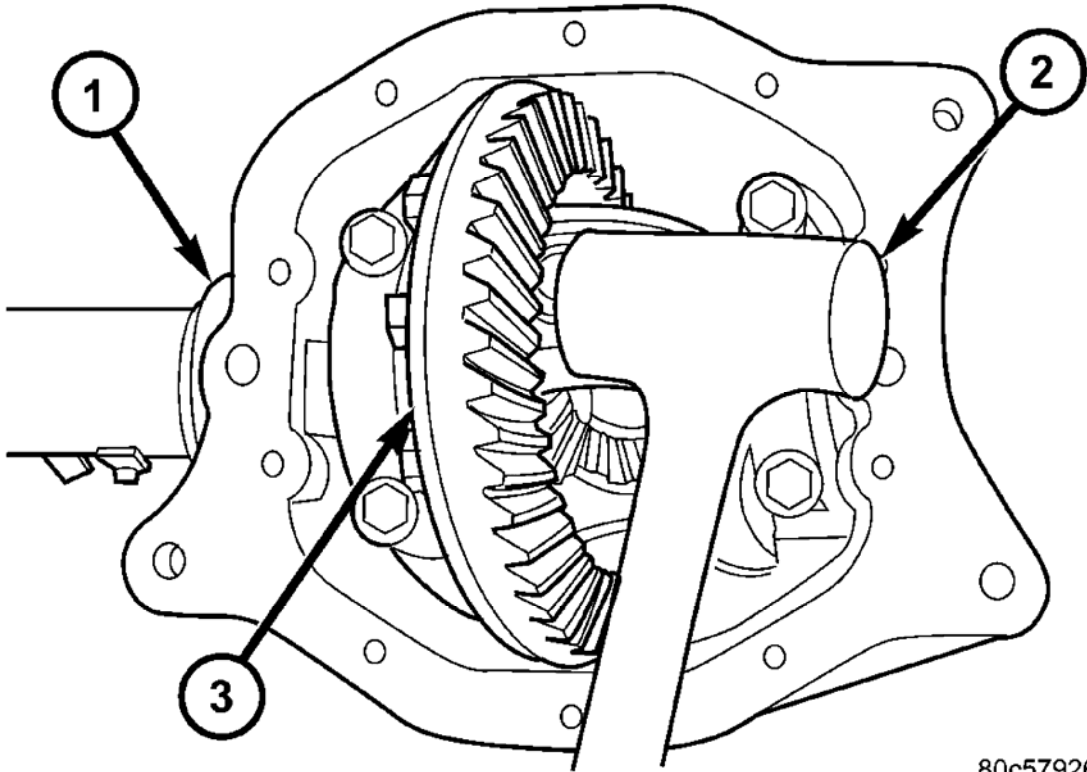
6. Install bearing caps (1) in their correct positions and snug bearing cap bolts (3).



80c578e9

Fig. 88: Seat Dummy Bearings Pinion Side
Courtesy of CHRYSLER LLC

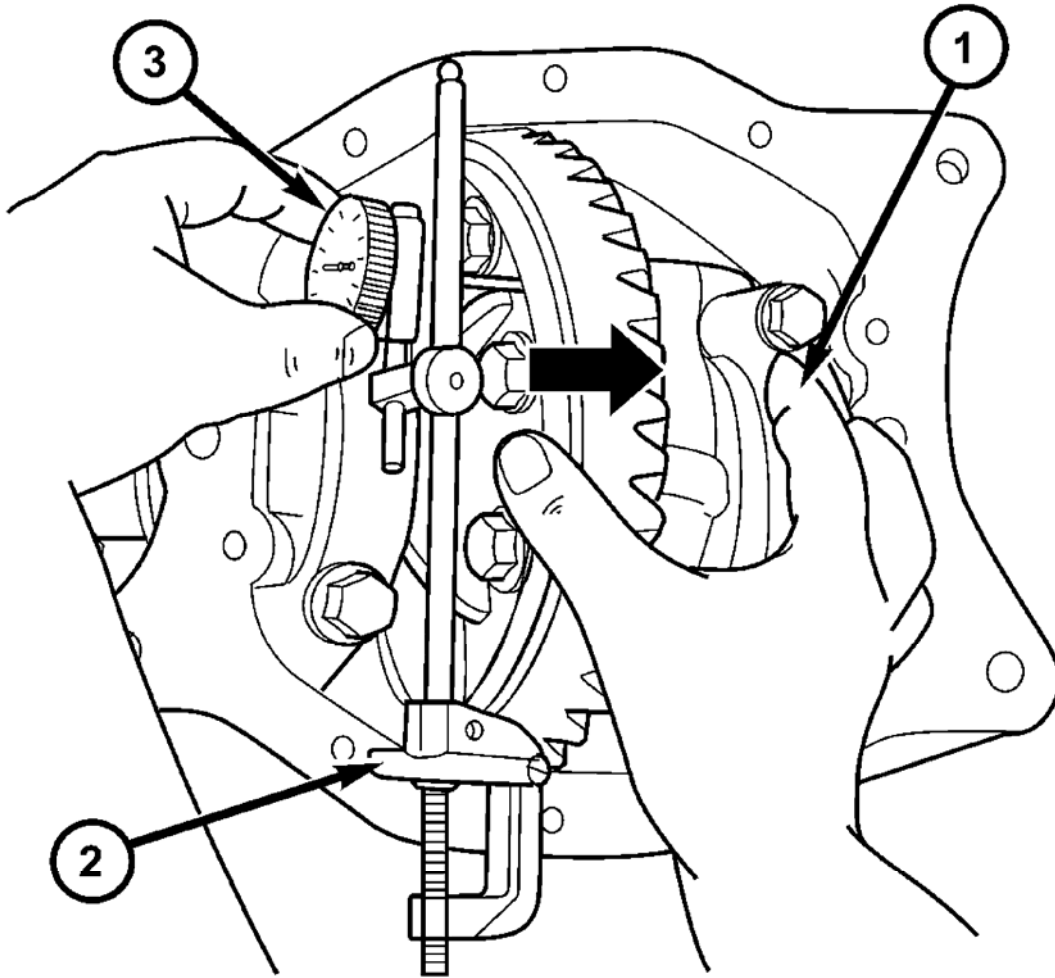
7. With a dead-blow hammer (1), seat differential dummy bearing to pinion side of the housing (2).



80c57926

Fig. 89: Seat Dummy Bearing Ring Gear Side
Courtesy of CHRYSLER LLC

8. With a dead-blow hammer (2), seat differential dummy bearing to ring gear (3) side of the housing (1).



80c57a19

Fig. 90: Differential Pinion Gear Side
Courtesy of CHRYSLER LLC

9. Thread Pilot Stud C-3288-B (2) into rear cover bolt hole below ring gear.
10. Attach a Dial Indicator C-3339A (3) to the Pilot Stud. Position the dial indicator plunger on flat surface between the ring gear bolts.
11. Push and hold differential case to pinion gear side (1) of the housing and zero dial indicator.

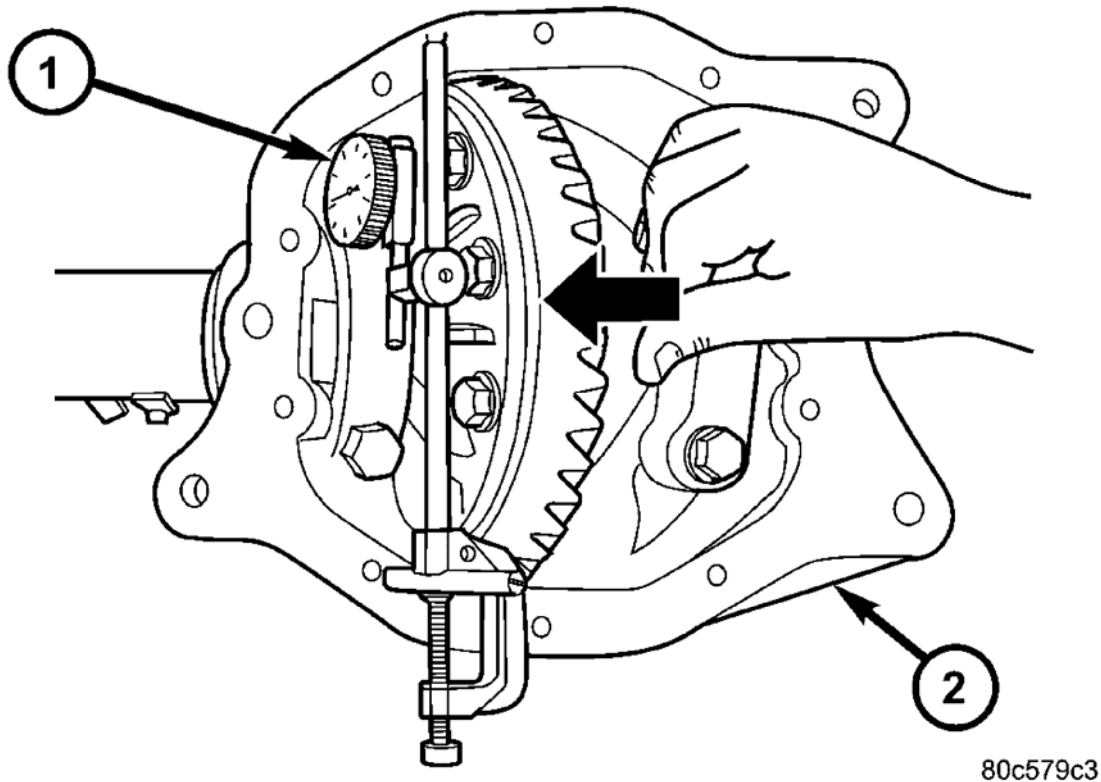
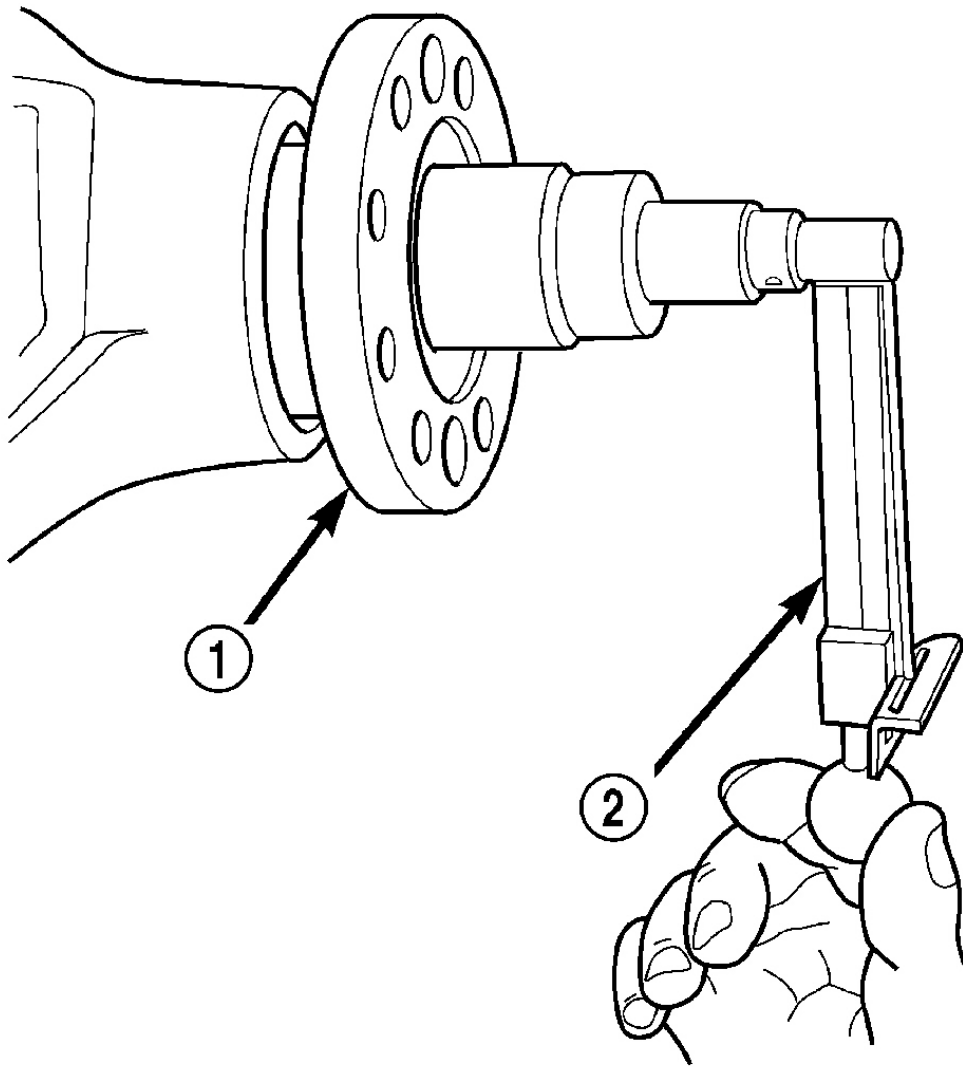


Fig. 91: Differential Ring Gear Side
Courtesy of CHRYSLER LLC

12. Push and hold differential case to ring gear side of the housing (2) and record dial indicator (1) reading.
13. Add dummy shims thickness 6 mm (0.236 in.) plus preload specification 0.152 mm (0.006 in.) to the dial indicator reading. This is the total shim thickness needed to preload the new bearings when the differential is installed.

EXAMPLE: Differential Dial Indicator Reading + Dummy Shims 6 mm (0.236 in.) + Preload Specification 0.152 mm (0.006 in.) = Total Differential Shim

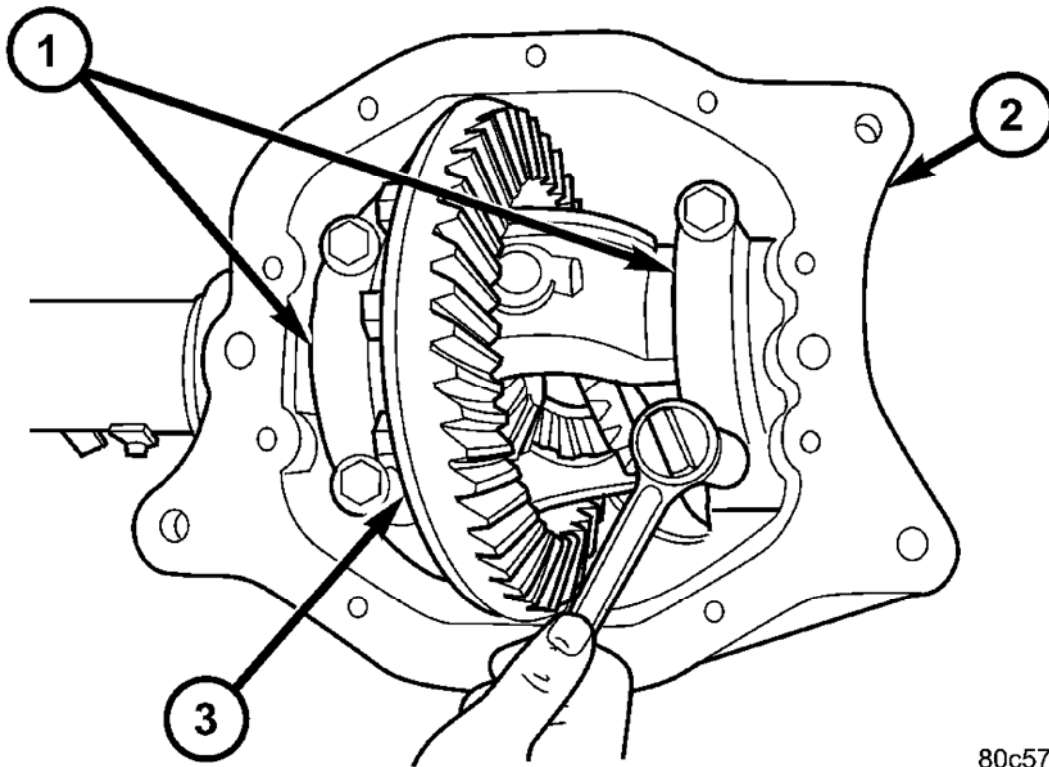
14. Rotate dial indicator out of the way on the pilot stud.
15. Remove differential case and dummy bearings from the housing.



80c07132

Fig. 92: Pinion Rotation Torque
Courtesy of CHRYSLER LLC

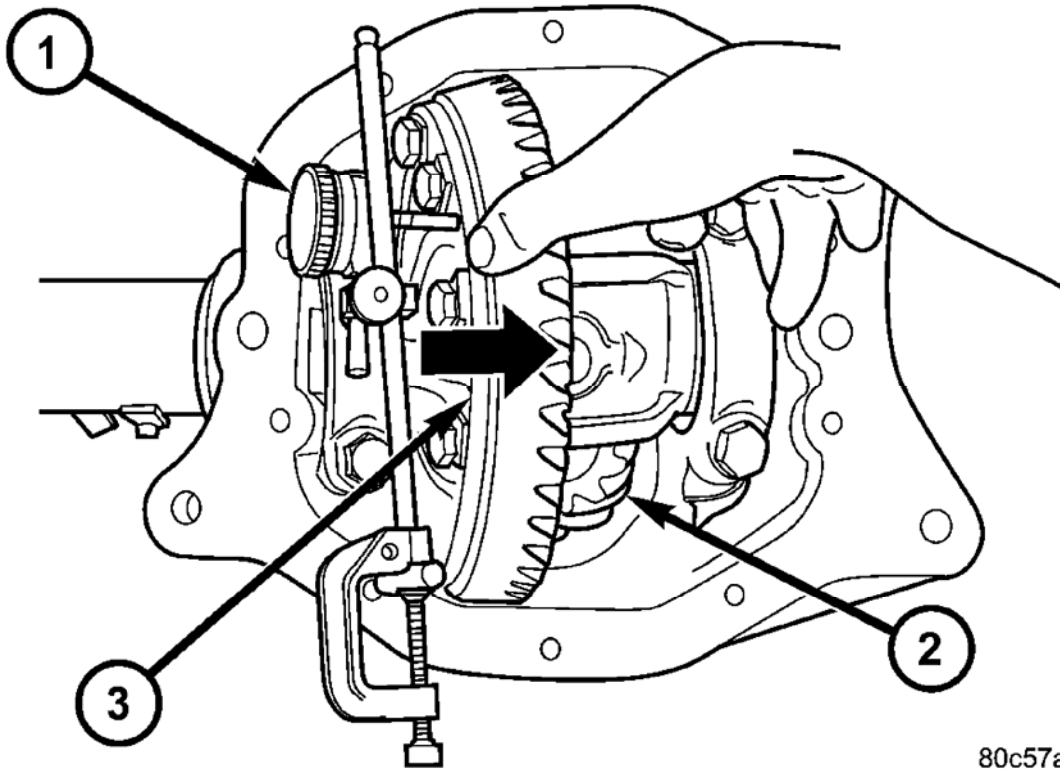
16. Install pinion gear in the housing. Install the pinion flange (1) and establish pinion torque to rotate with an inch pound torque wrench (2).



80c5786b

Fig. 93: Bearing Cap Bolts
Courtesy of CHRYSLER LLC

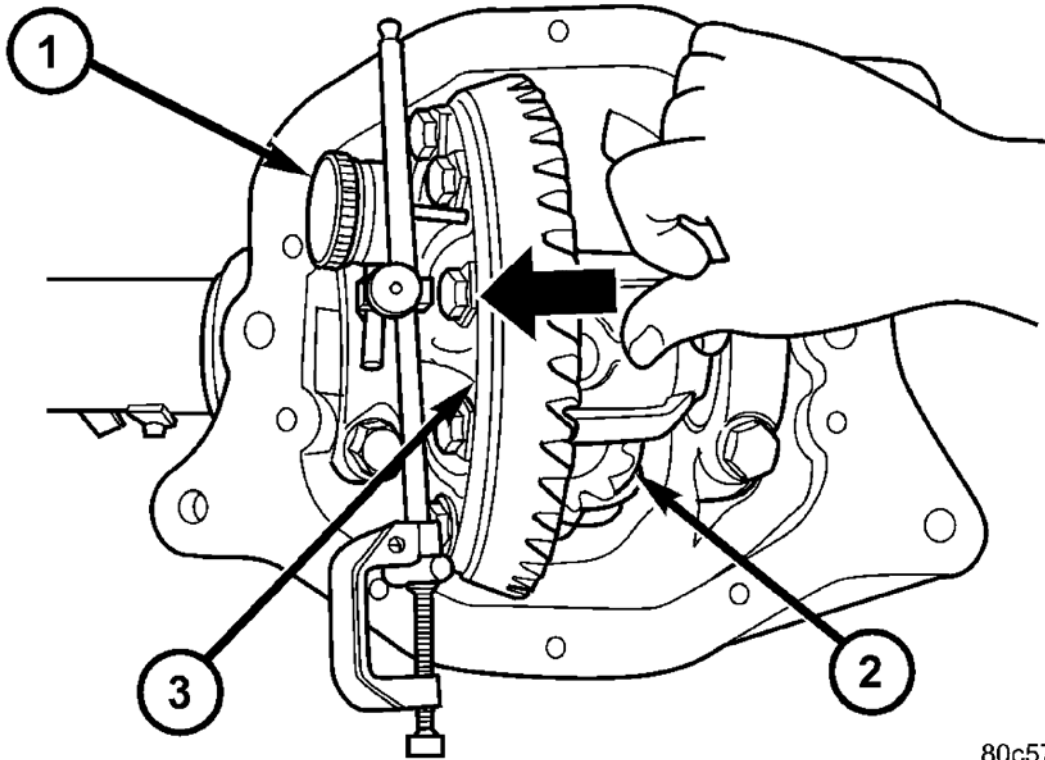
17. Install differential case and Dummy Bearings D-348 in the housing.
18. Install a single dummy shim in the ring gear side. Install bearing caps (1) and tighten bearing cap bolts (3) snug.



80c57a39

Fig. 94: Differential Pinion Gear Side
Courtesy of CHRYSLER LLC

19. Seat ring gear side dummy bearing.
20. Position the dial indicator (1) plunger on a flat surface between the ring gear (3) bolt heads.
21. Push and hold differential case toward pinion gear (2) and zero dial indicator (1).



80c57a31

Fig. 95: Differential Ring Gear Side
Courtesy of CHRYSLER LLC

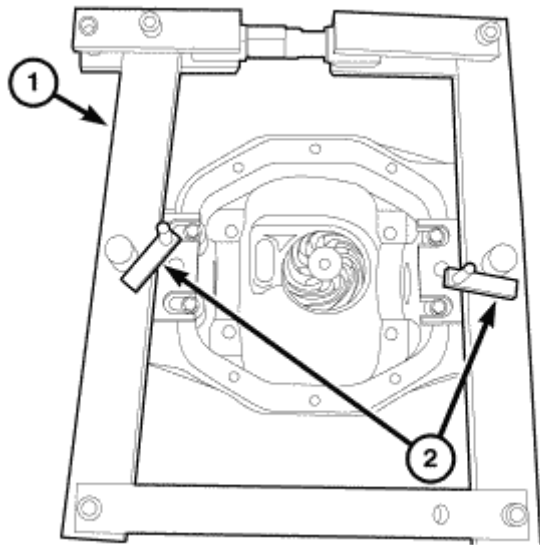
22. Push and hold differential case (2) to ring gear side (3) of the housing and record ring gear side dial indicator (1) reading. Add 3 mm (0.118 in.) one dummy shim thickness to ring gear side reading.
23. Subtract backlash specification 0.076 mm (0.003 in.) from total ring gear side reading for ring gear backlash. This is the shim needed on the ring gear side of the differential.

EXAMPLE: Ring Gear Side Dial Indicator Reading + One Dummy Shim 3 mm (0.118 in.) - Backlash Specification 0.076 mm (0.003 in.) = Ring Gear Side Shim

24. Subtract ring gear shim total from preload shim total thickness. The remainder is the shim thickness needed on the pinion side of the differential.

EXAMPLE : Total Differential Shim - Ring Gear Side Shim = Pinion Gear Side Shim

25. Rotate dial indicator out of the way on pilot stud.
26. Remove differential case and dummy bearings from the housing.
27. Install side bearings and cups on differential case.



618ed1ad

Fig. 96: Identifying Spreader W-129-B & Spreader Retainers W-129-1
Courtesy of CHRYSLER LLC

28. Install Spreader Adapters 9959, Spreader W-129-B (1) and Spreader Retainers W-129-1 (2) on housing tighten spreader turnbuckle finger-tight.
29. Attach Dial Indicator C-3339 to spreader retainer stud. Load indicator plunger against opposite side of the housing and zero the indicator
30. Spread the differential case 0.34 mm (0.013 in).

CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instruction could result in distorting the housing.

31. Install differential case with shims.

GEAR BACKLASH

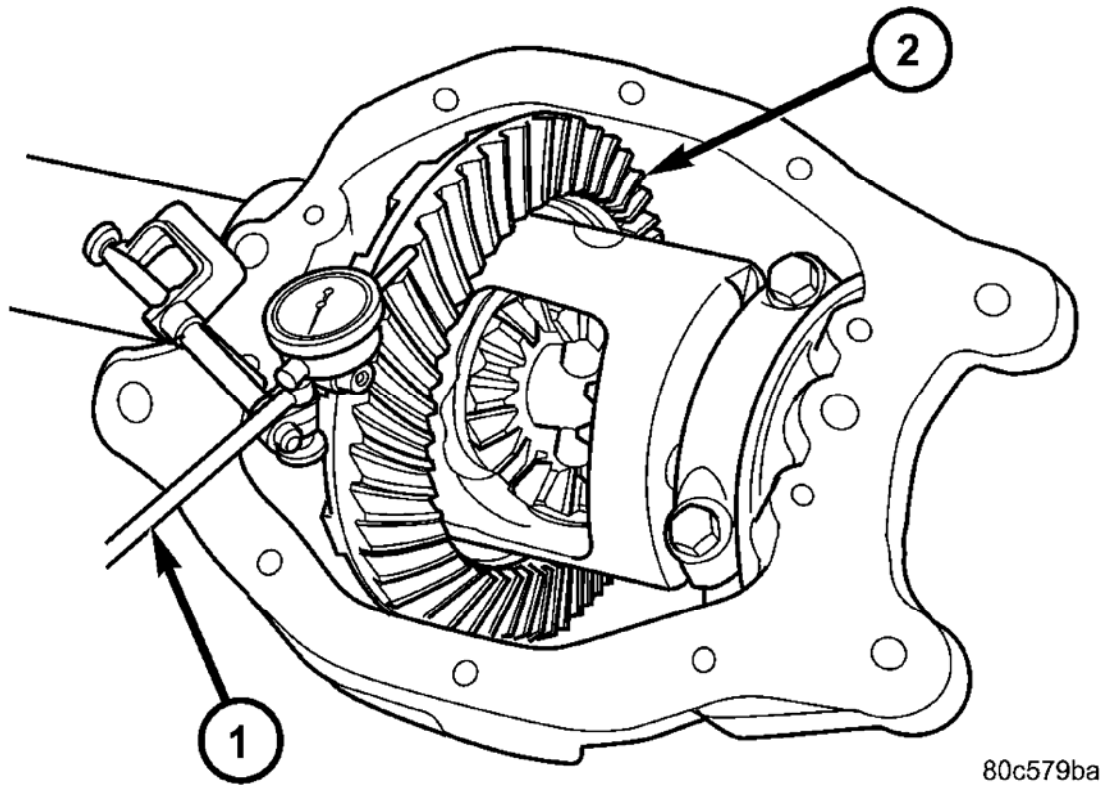


Fig. 97: Ring Gear Backlash
Courtesy of CHRYSLER LLC

1. Rotate the differential case several times to seat the side bearings.
2. Position the indicator plunger (1) against a ring gear tooth (2).
3. Push and hold ring gear upward while not allowing the pinion gear to rotate.
4. Zero dial indicator face to pointer.
5. Push and hold ring gear downward while not allowing the pinion gear to rotate. Dial indicator reading (backlash) should be between 0.12 - 0.20 mm (0.005 - 0.008 in.).

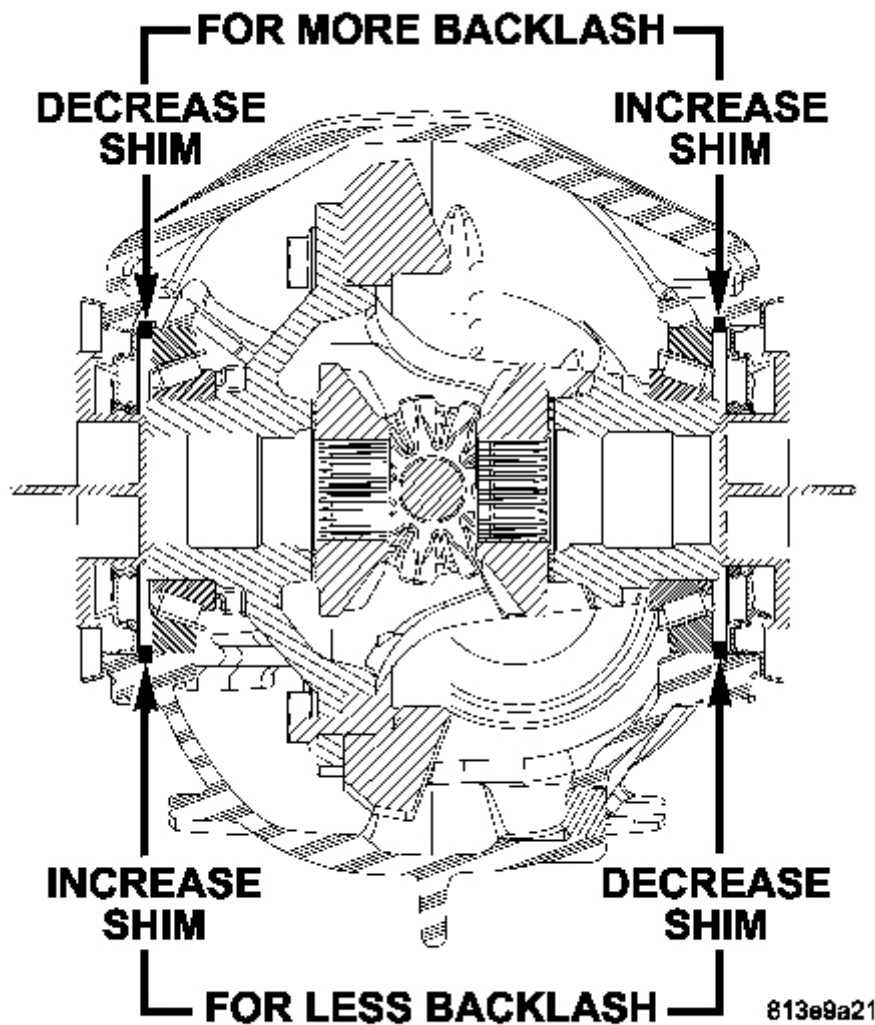


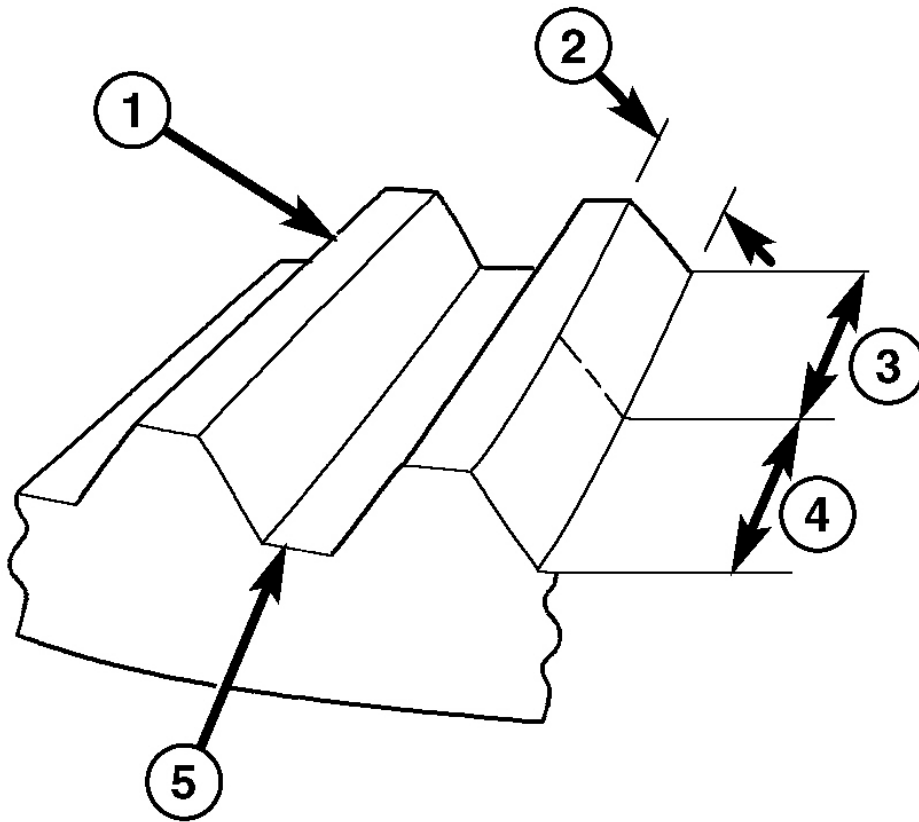
Fig. 98: Backlash Shim Correction
Courtesy of CHRYSLER LLC

NOTE: If backlash is not within specifications, transfer the necessary shim thickness from one side of the housing to the other.

6. Verify differential case and ring gear runout by measuring ring to pinion gear backlash at eight locations around the ring gear. Readings should not vary more than 0.05 mm (0.002 in.). If readings vary more than specified, the ring gear or the differential case is defective.

After the proper backlash is achieved, perform Gear Contact Pattern Analysis procedure.

GEAR CONTACT PATTERN



810630a0

Fig. 99: Gear Description
Courtesy of CHRYSLER LLC

The ring gear and pinion teeth contact patterns will show if the pinion depth is correct in the housing. It will also show if the ring gear backlash has been adjusted correctly. The backlash can be adjusted within specifications to achieve desired tooth contact patterns.

The TOP LAND (1) of the gear tooth is the top surface of the tooth. The PROFILE (2) of the gear tooth is the depth of the tooth. The TOE (3) of the gear is the portion of the tooth surface at the end towards the center. The HEEL (4) of the gear is the portion of the tooth at the outer-end. The ROOT (5) of the gear tooth is the lowest portion of the tooth.

NOTE: If the PROFILE across the tooth is the same it is a 3 Axis cut gear. If the PROFILE across the tooth is tapered, it is a 2 Axis cut gear.

1. Apply a thin coat of hydrated ferric oxide or equivalent to the drive and coast side of the ring gear teeth.
2. Wrap, twist and hold a shop towel around the pinion yoke to increase the turning resistance of the pinion.

This will provide a more distinct contact pattern.

3. With a boxed end wrench on a ring gear bolt, rotate the differential case one complete revolution in both directions while a load is being applied from shop towel.

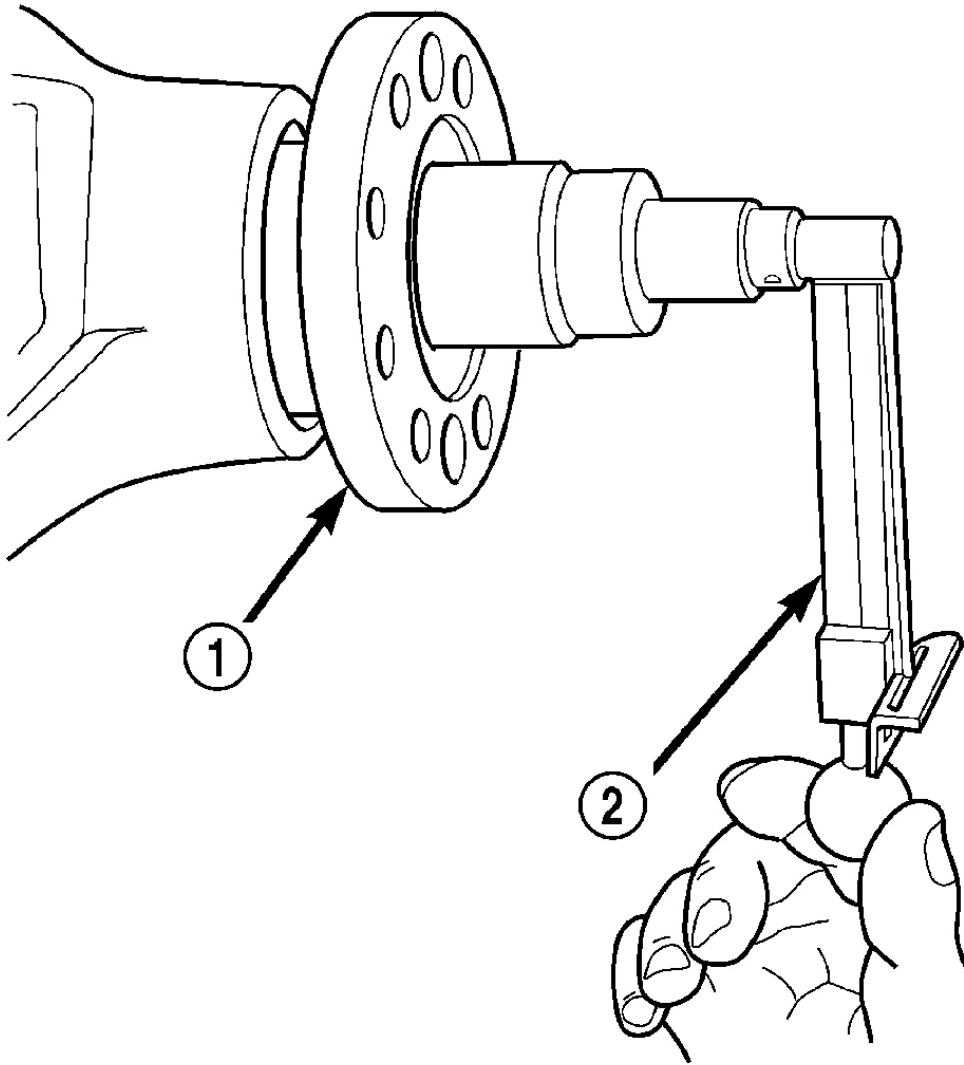
The areas on the ring gear teeth with the greatest degree of contact against the pinion teeth will squeegee the compound to the areas with the least amount of contact. Note and compare patterns on the ring gear teeth to Gear Tooth Contact Patterns chart and adjust pinion depth and gear backlash as necessary.

DRIVE SIDE HEEL TOE	CONDITION	COAST SIDE TOE HEEL	CONDITION	ACTION REQUIRED
	Desirable pattern. The drive pattern should be centered on the tooth. There should be some clearance between the pattern and the top of the tooth.		Desirable pattern. The coast pattern should be centered on the tooth, but may be slightly toward the toe. There should be some clearance between the pattern and the top of the tooth.	None
	Top heel contact		Top toe contact	Backlash correct. Thicker pinion position shim required.
	Root toe contact		Root heel contact	Backlash correct. Thinner pinion position shim required.
	Top heel contact		Top heel contact	Pinion position shim correct. Decrease backlash.
	Root toe contact		Root toe contact	Pinion position shim correct. Increase backlash.

8106312d

Fig. 100: Pattern Interpretation (Gear Cut 2 Axis)
Courtesy of CHRYSLER LLC

DIFFERENTIAL BEARING PRELOAD CHECK



80c07132

Fig. 101: Pinion Rotation Torque
Courtesy of CHRYSLER LLC

With an inch pound torque wrench (2) measure Total Torque To Rotate (TTTR). This is the final check on the differential assembly before installing the axle shafts. This will verify the correct differential bearing preload.

Total Torque to Rotate is, Pinion Torque To Rotate (PTTR) plus:

Gear Ratio 3.21: 0.34 - 1.24 N.m (3 - 10.9 in. lbs.)

Gear Ratio 3.73: 0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)

NOTE: If TTTR is high, decrease the shim thickness equally on both sides of the differential and check TTTR again. If TTTR is low, increase the shims thickness equally on both sides of the differential and check TTTR again.

SPECIFICATIONS

FRONT AXLE - 186FIA

AXLE

DESCRIPTION	SPECIFICATION	
Axle Ratio	3.21/3.73	
Ring Gear Diameter	186 mm (7.33 in.)	
Ring Gear Runout	0.12 mm (0.005 in.)	
Ring Gear Backlash	0.12 - 0.20 mm (0.005 - 0.008 in.)	
Pinion Torque To Rotate: Original Bearings	1 - 2.2 N.m (10 - 20 in. lbs.)	
Pinion Torque To Rotate: New Bearings	1.7 - 2.8 N.m (15 - 25 in. lbs.)	
Total Torque To Rotate is Pinion Torque To Rotate plus:		-
Gear Ratio 3.21	0.53 - 0.87 N.m (4.6 - 7.7 in. lbs.)	
Gear Ratio 3.73	0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)	

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Ring Gear Bolts	108	80	-
Differential Bearing Cap Bolts	54 - 68	39 - 50	-
Drain Trough Nut	23	-	200
Differential Cover Bolts	19 - 26	14 - 19	-
Pinion Nut	217 - 352	160 - 260	-
Rear Axle Bracket Bolts	88	65	-
Front Axle Brackets To Frame Nut	61	45	-
Front Axle Bracket to Axle Nuts	61	45	-
Right Axle Bracket Nut	61	45	-

SPECIAL TOOLS

FRONT AXLE - 186FIA

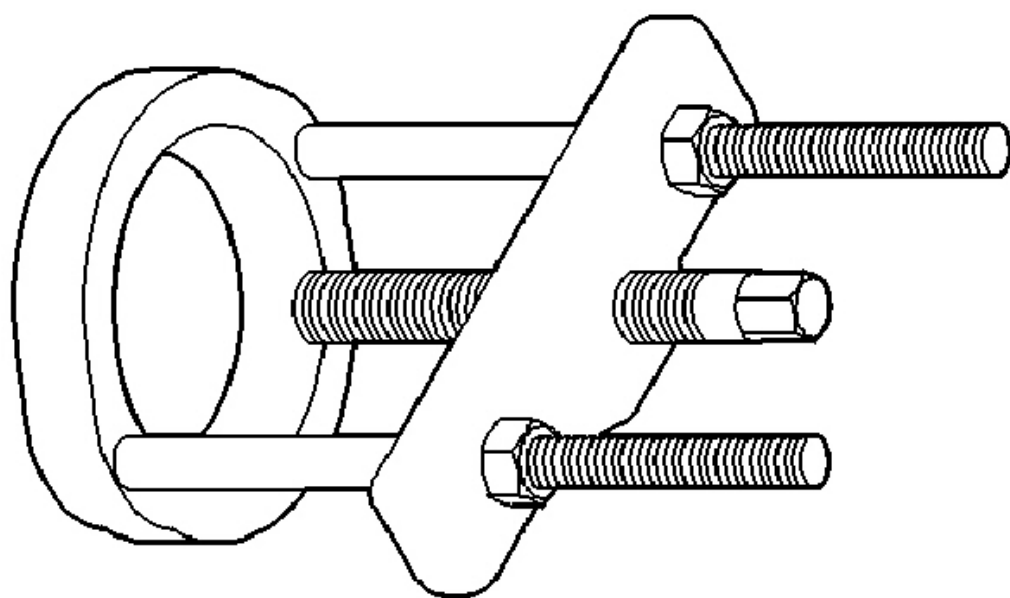


Fig. 102: Puller C-293-PA
Courtesy of CHRYSLER LLC

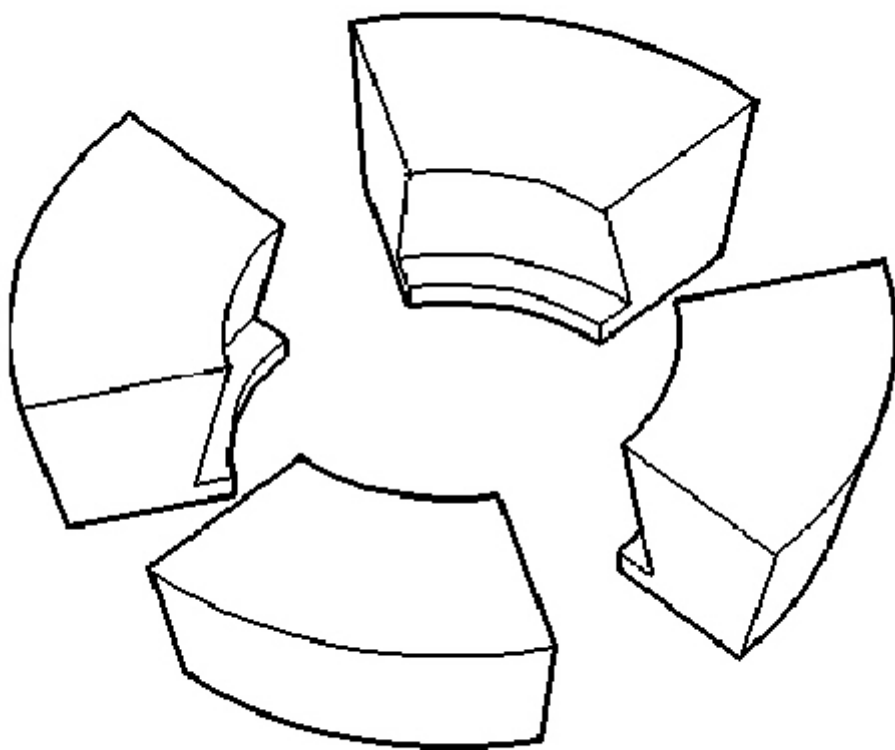


Fig. 103: Adapter C-293-39
Courtesy of CHRYSLER LLC

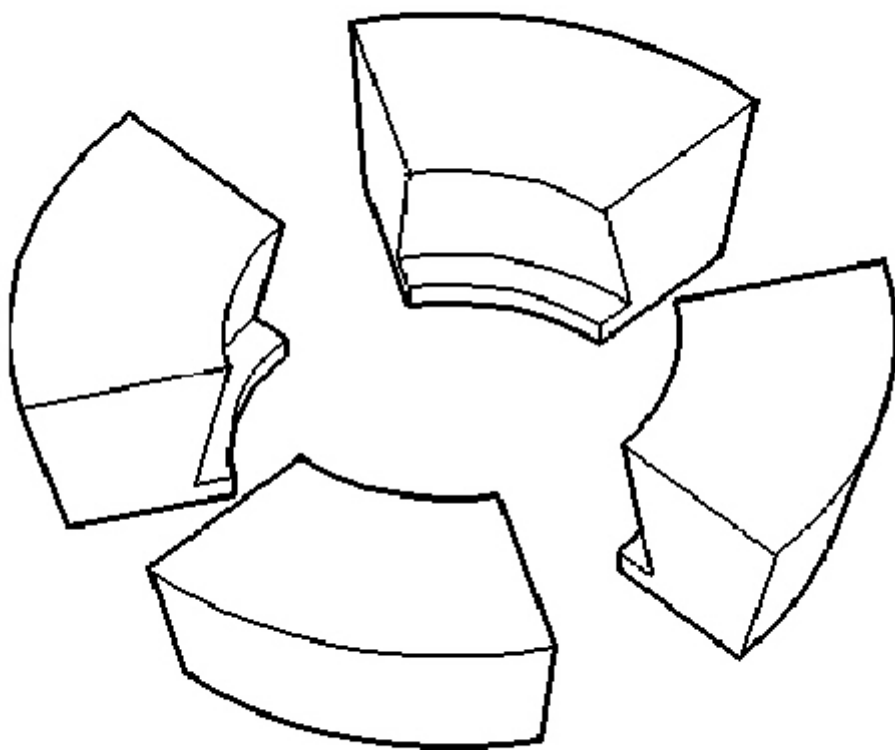


Fig. 104: Adapter C-293-42
Courtesy of CHRYSLER LLC

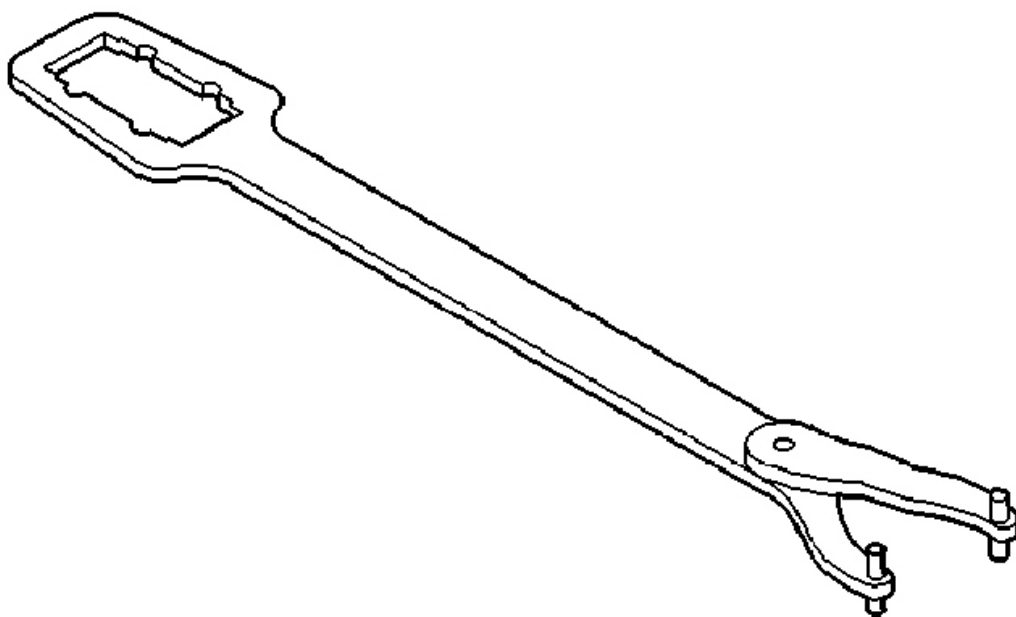


Fig. 105: Flange Holder C-3281
Courtesy of CHRYSLER LLC

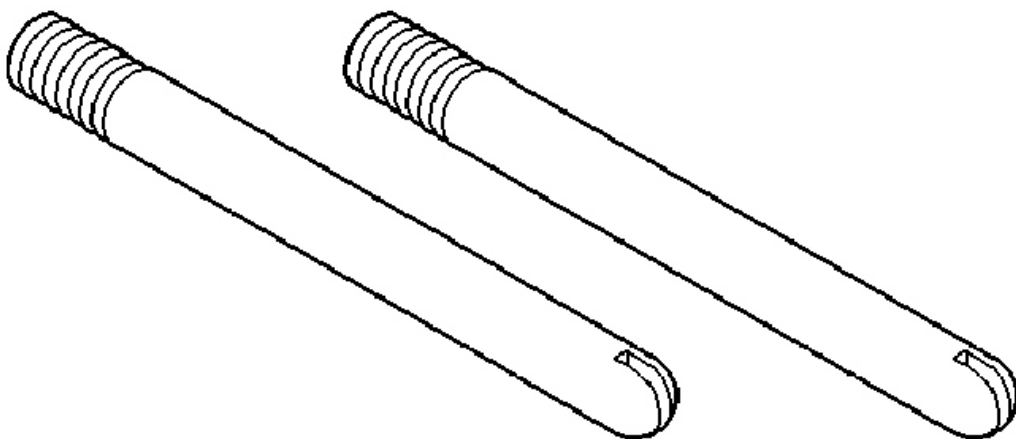
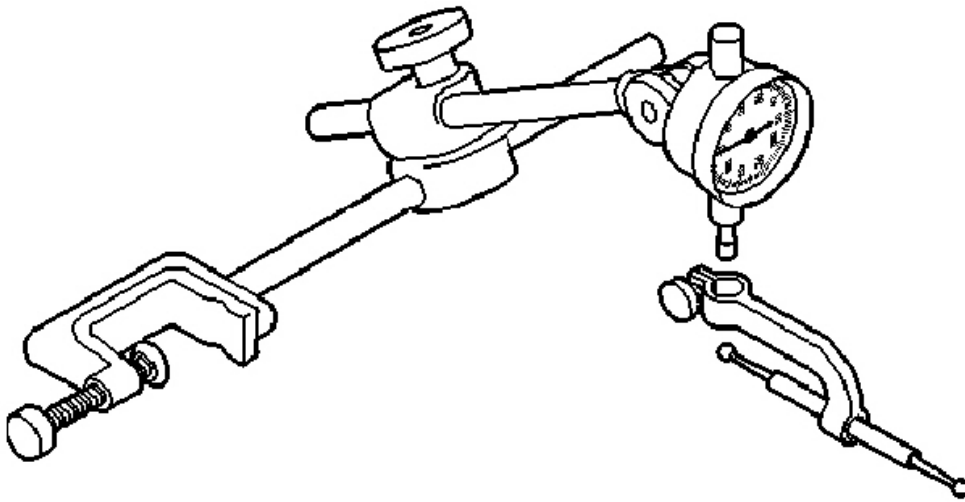


Fig. 106: Pilot Stud C-3288-B
Courtesy of CHRYSLER LLC



8011d42b

Fig. 107: Dial Indicator C-3339
Courtesy of CHRYSLER LLC

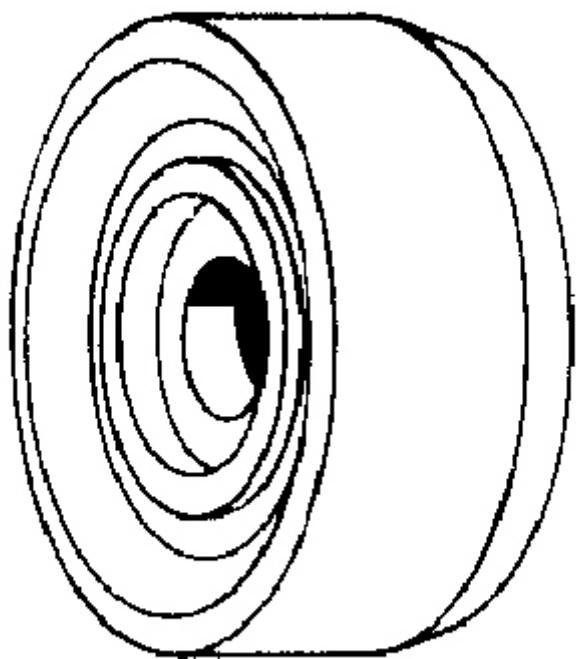


Fig. 108: Installer C-3716-A
Courtesy of CHRYSLER LLC

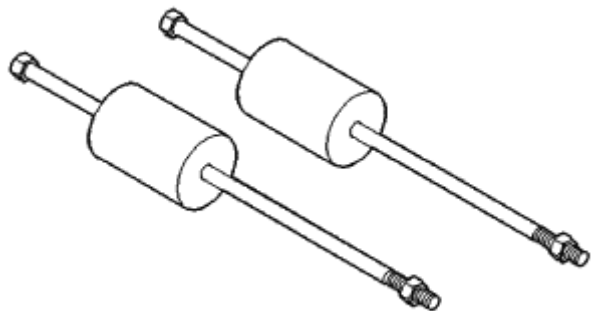


Fig. 109: Slide Hammer C-3752
Courtesy of CHRYSLER LLC

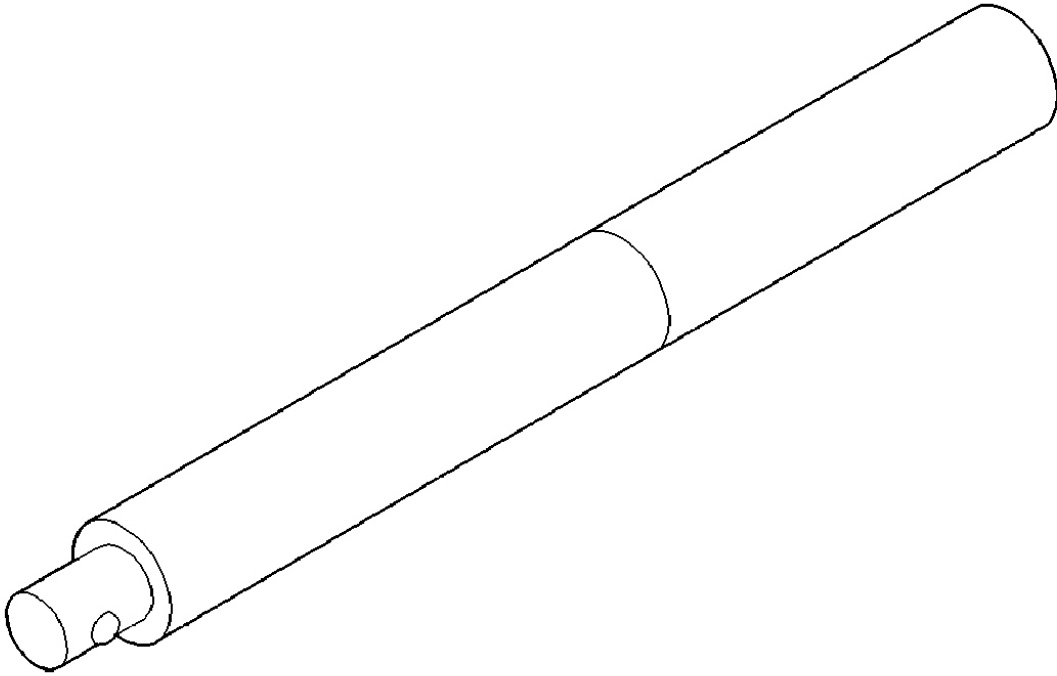


Fig. 110: Handle C-4171
Courtesy of CHRYSLER LLC

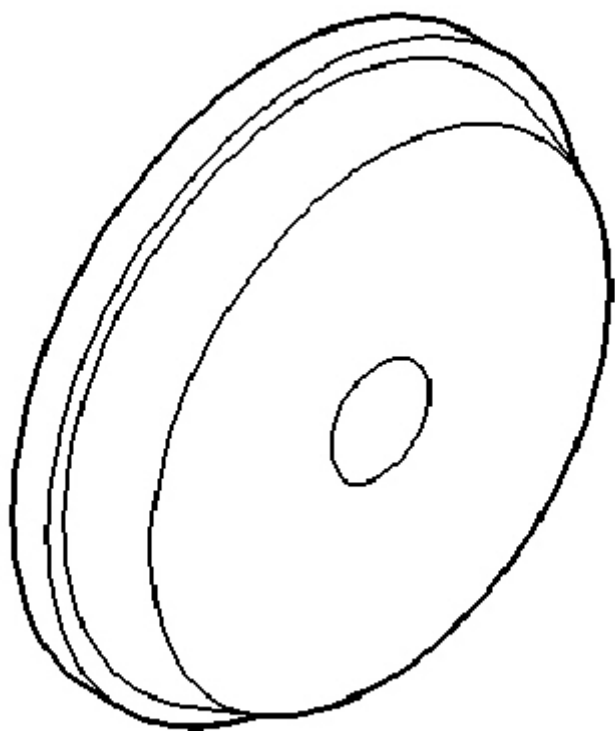


Fig. 111: Installer C-4308
Courtesy of CHRYSLER LLC

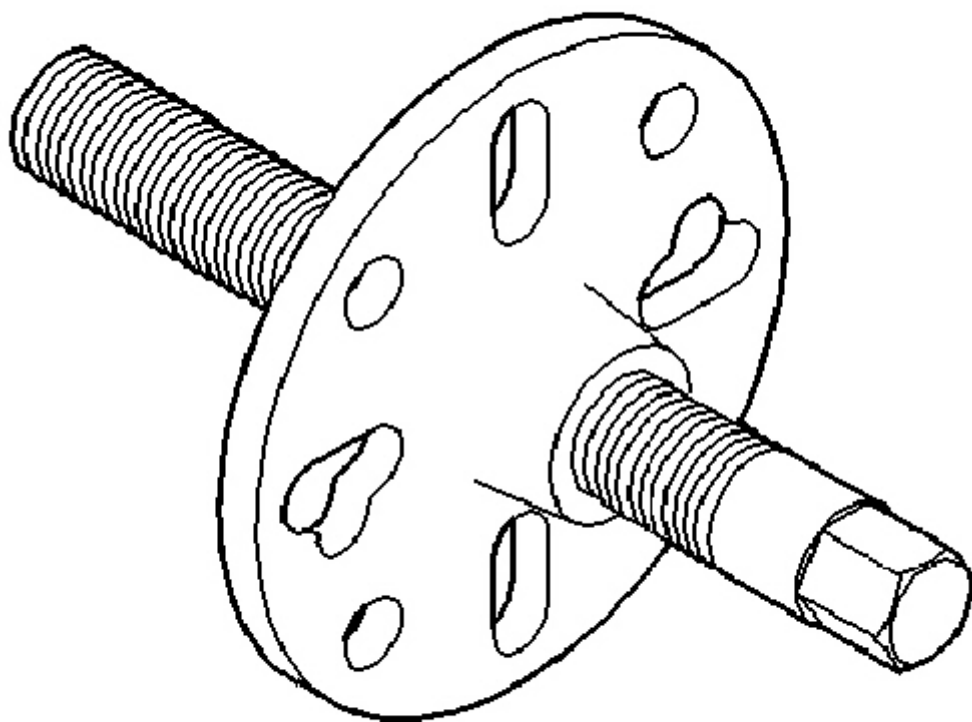


Fig. 112: Puller C-452
Courtesy of CHRYSLER LLC

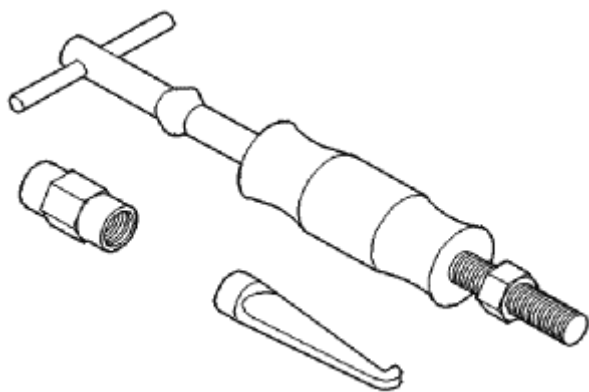


Fig. 113: Slide Hammer C-637
Courtesy of CHRYSLER LLC

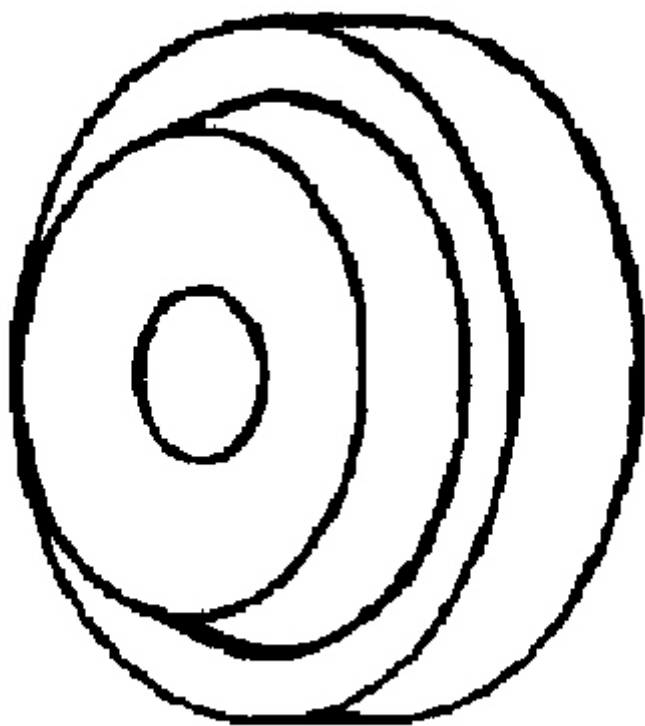


Fig. 114: Installer D-146
Courtesy of CHRYSLER LLC

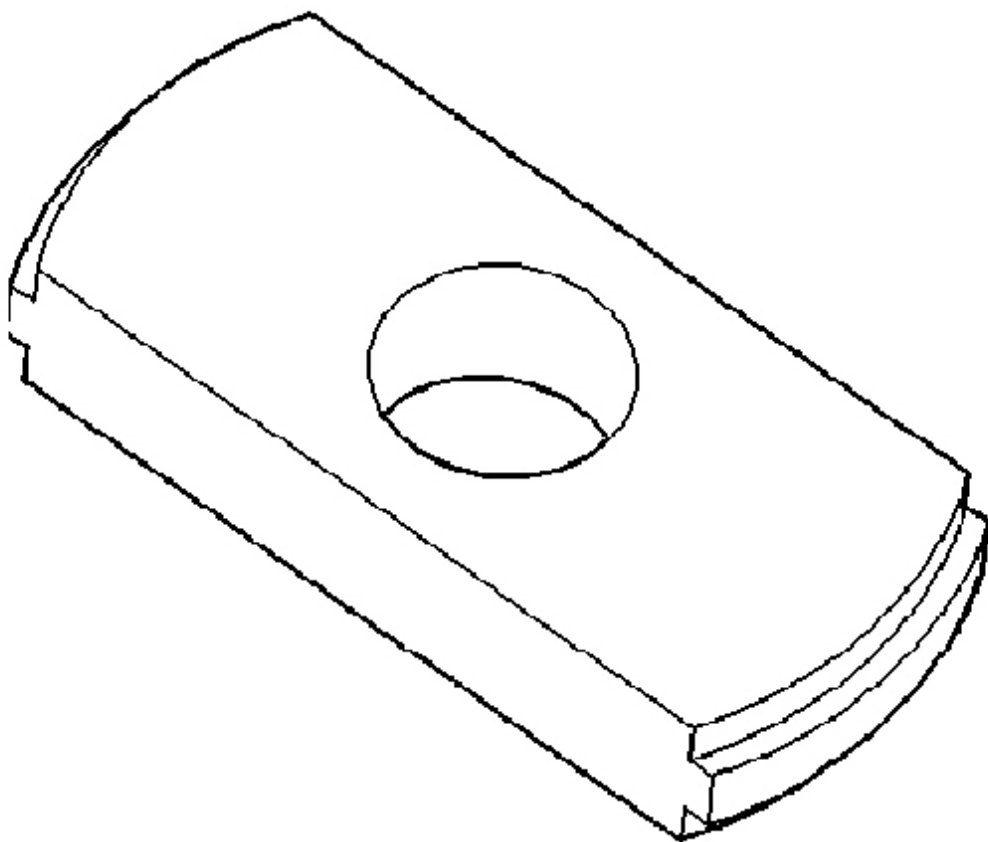


Fig. 115: Remover D-149
Courtesy of CHRYSLER LLC

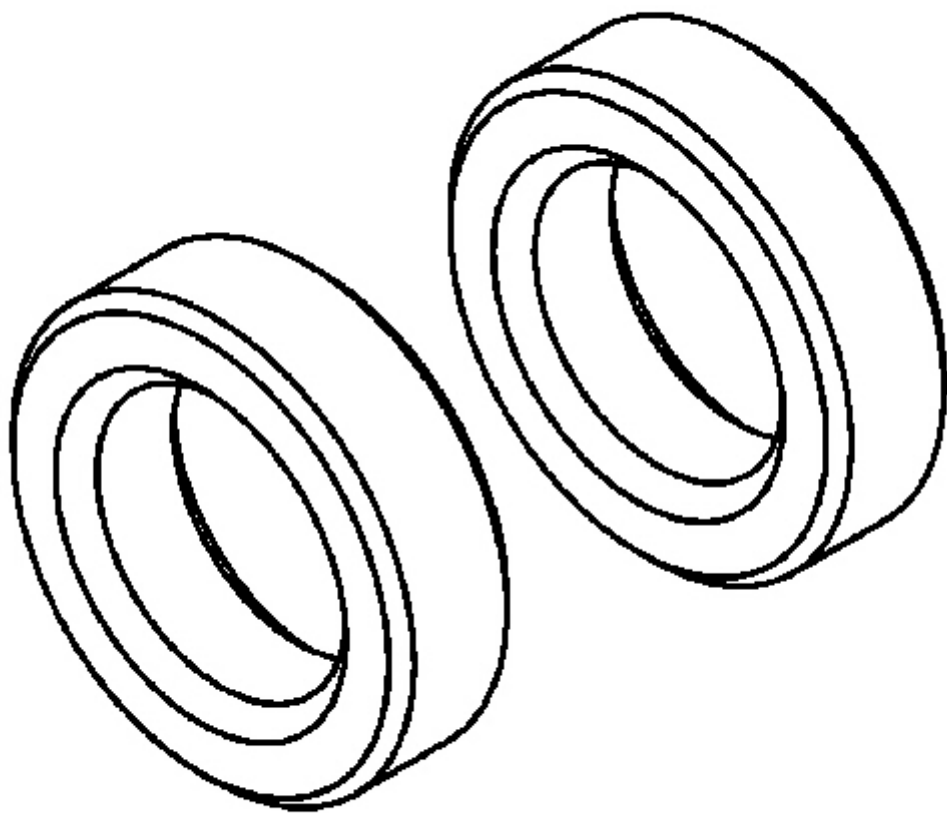


Fig. 116: Dummy Bearings D-348
Courtesy of CHRYSLER LLC

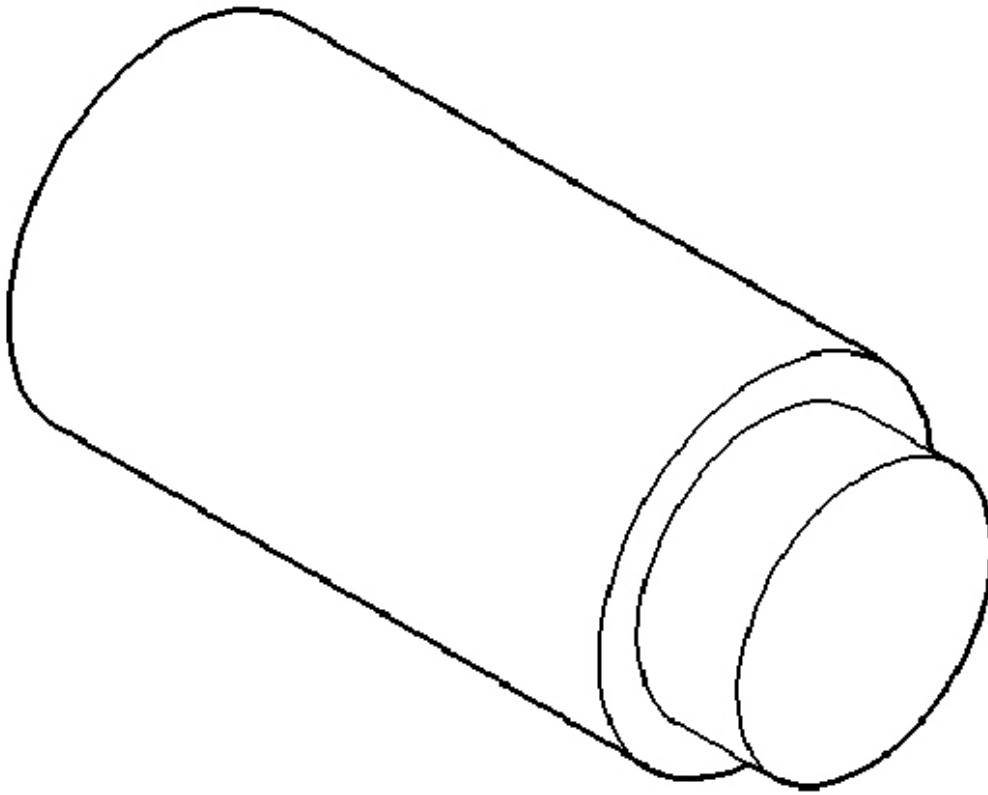


Fig. 117: Plug SP-3289
Courtesy of CHRYSLER LLC

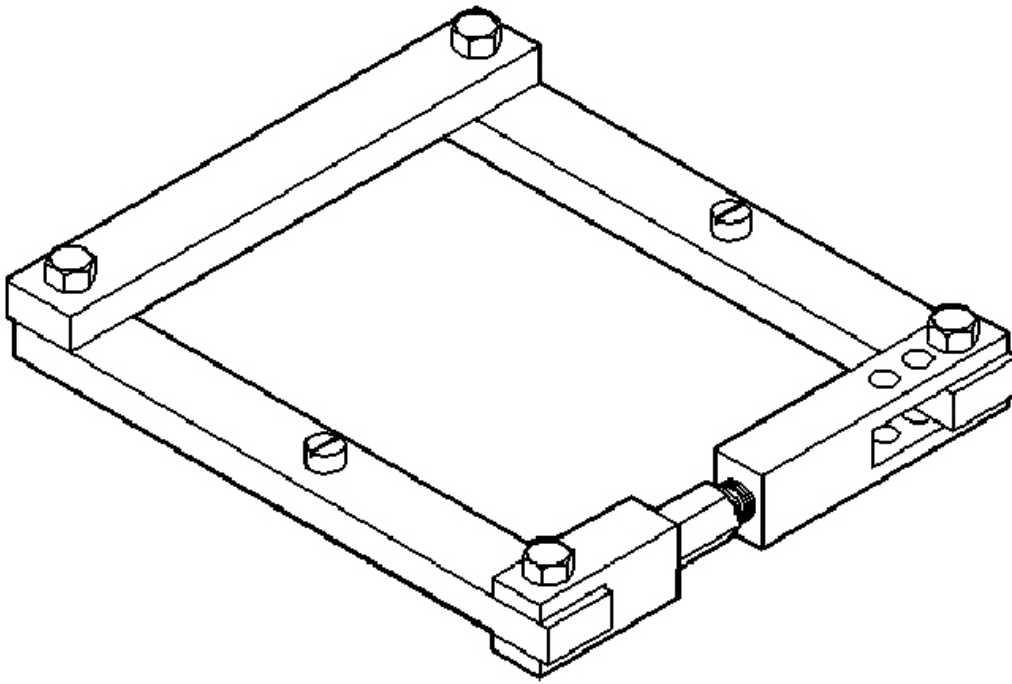


Fig. 118: Spreader W-129-B
Courtesy of CHRYSLER LLC

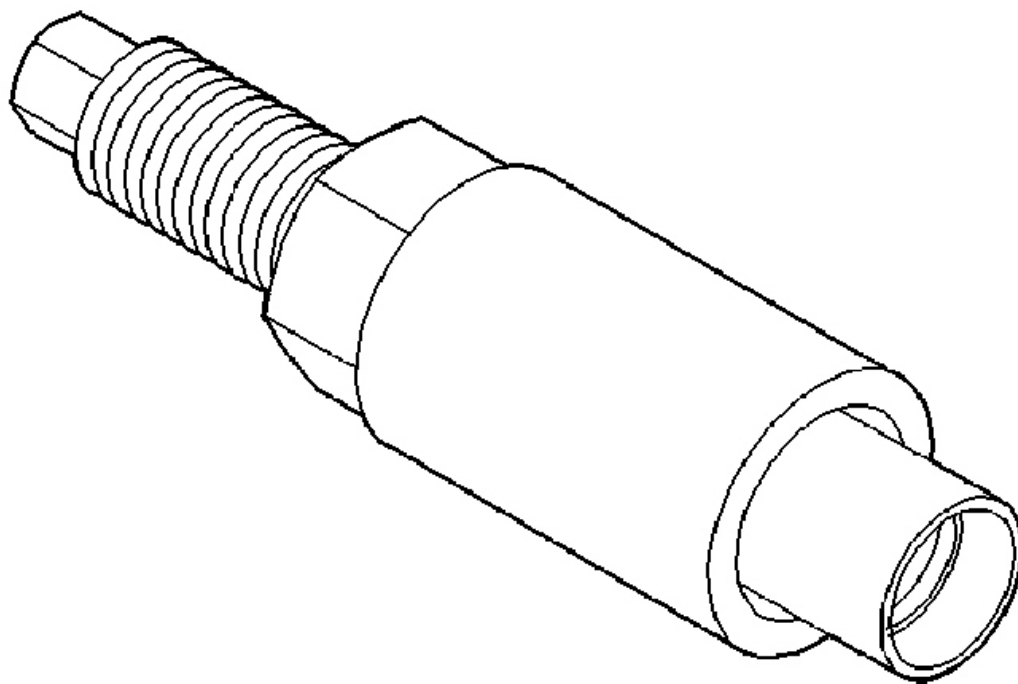


Fig. 119: Installer W-162-D
Courtesy of CHRYSLER LLC

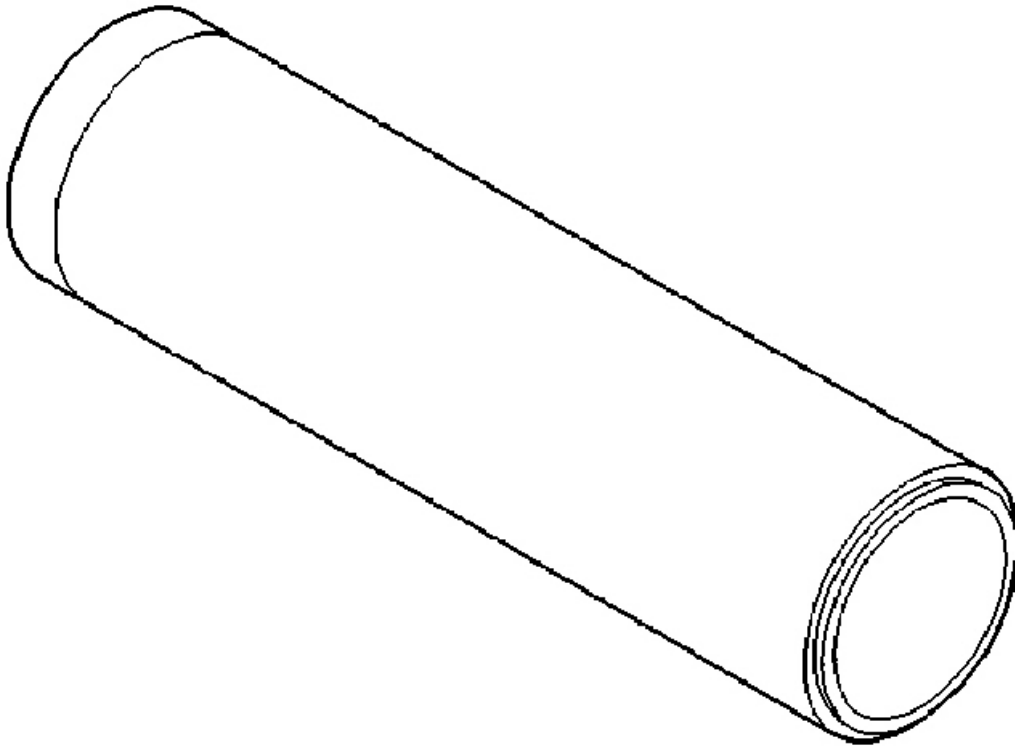


Fig. 120: Installer 6448
Courtesy of CHRYSLER LLC

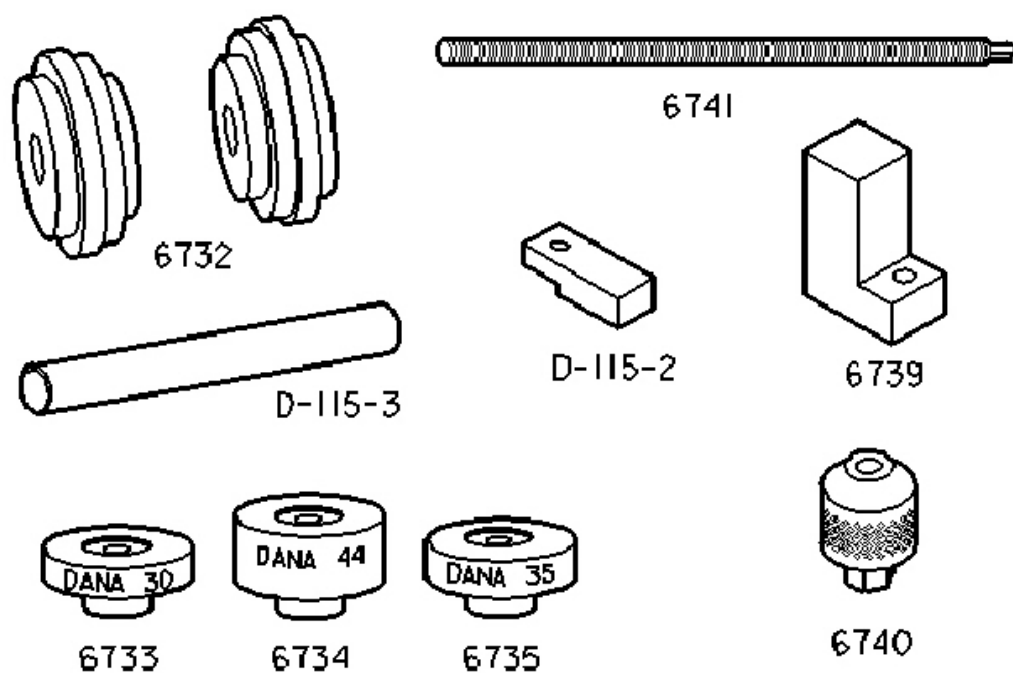


Fig. 121: Pinion Depth Set 6774
Courtesy of CHRYSLER LLC



Fig. 122: Arbor Discs 6927A
Courtesy of CHRYSLER LLC

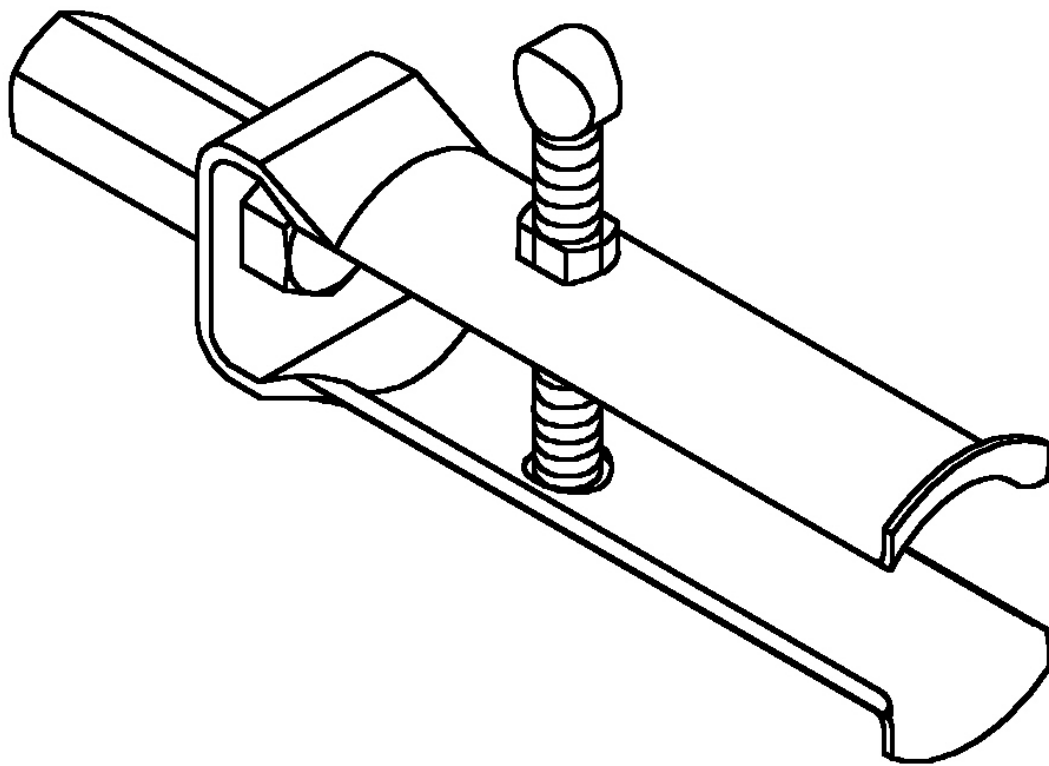


Fig. 123: Remover 7794-A
Courtesy of CHRYSLER LLC

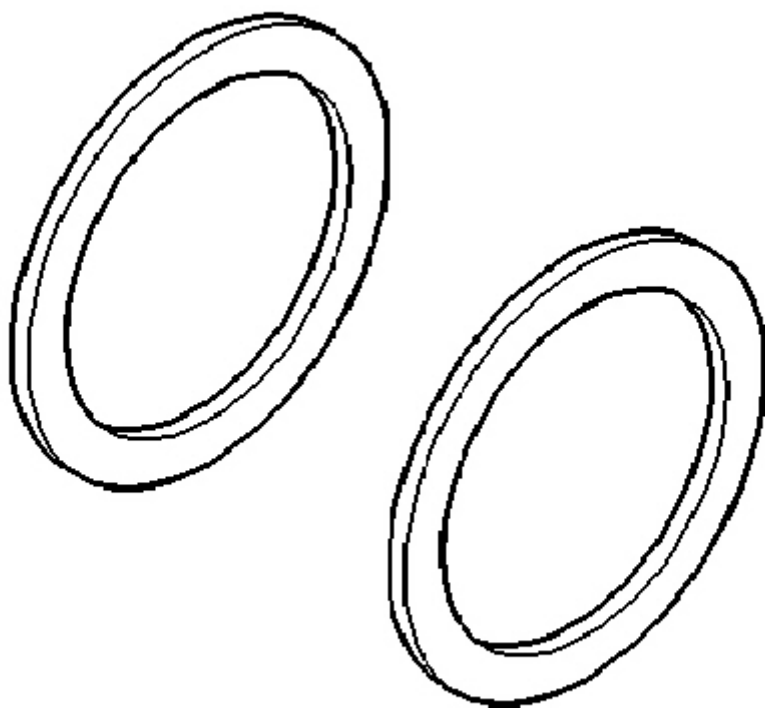


Fig. 124: Dummy Shims 8107
Courtesy of CHRYSLER LLC

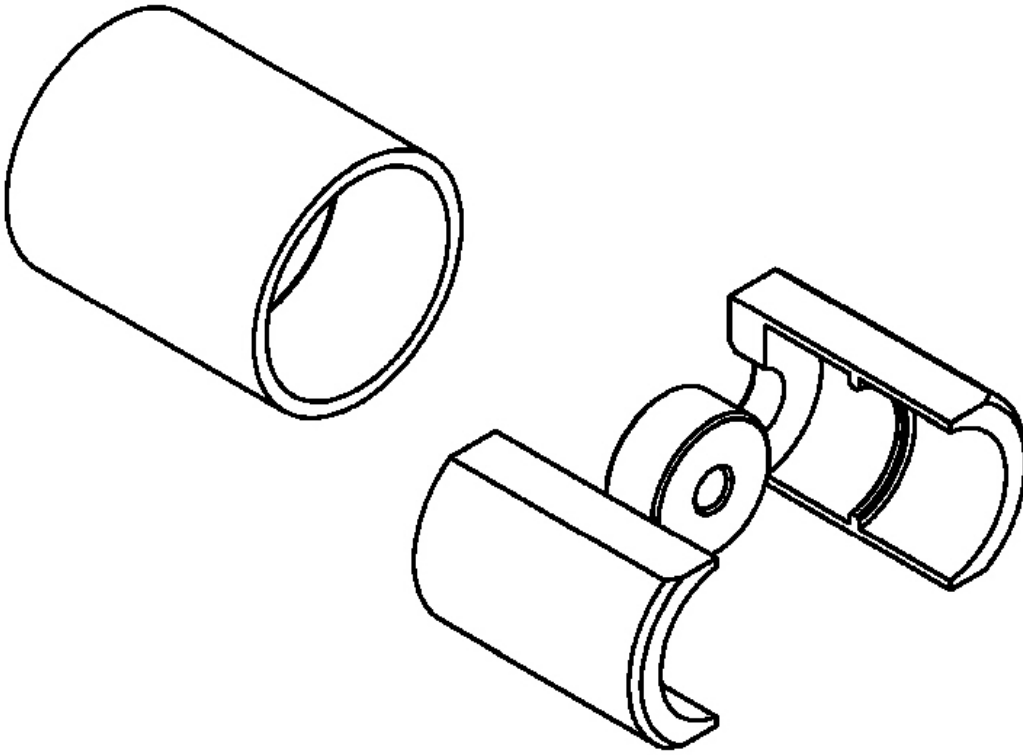


Fig. 125: Remover 8420A
Courtesy of CHRYSLER LLC

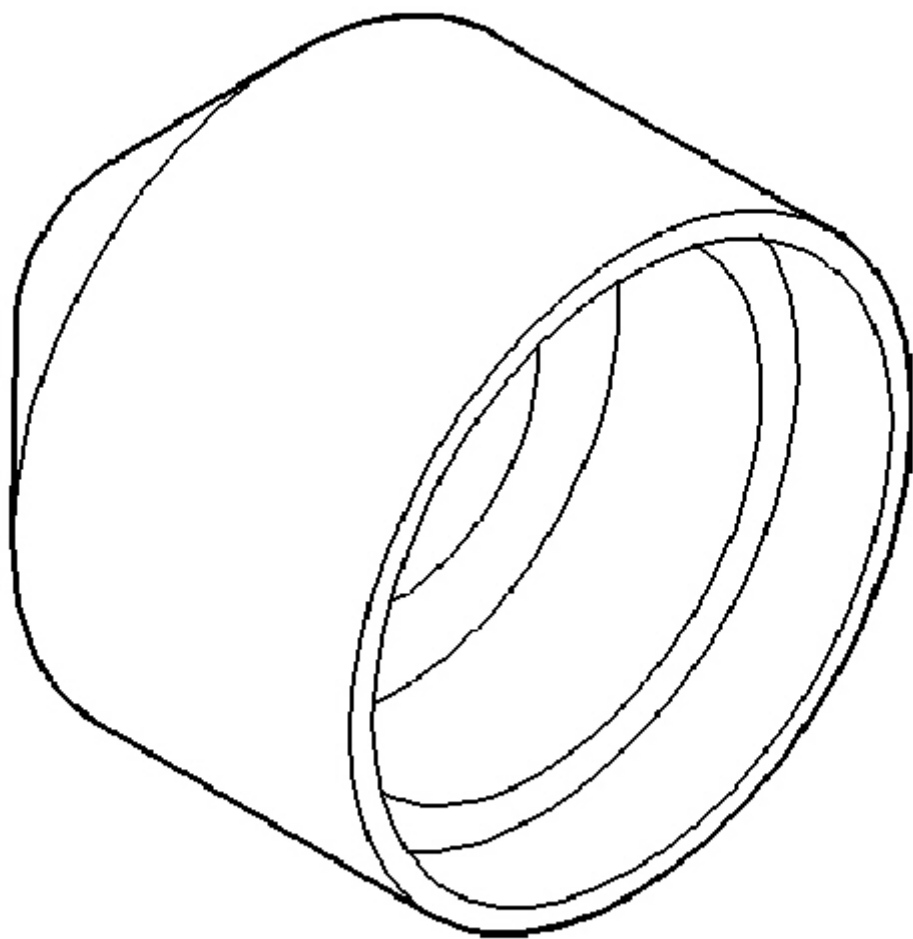


Fig. 126: Installer 8681
Courtesy of CHRYSLER LLC

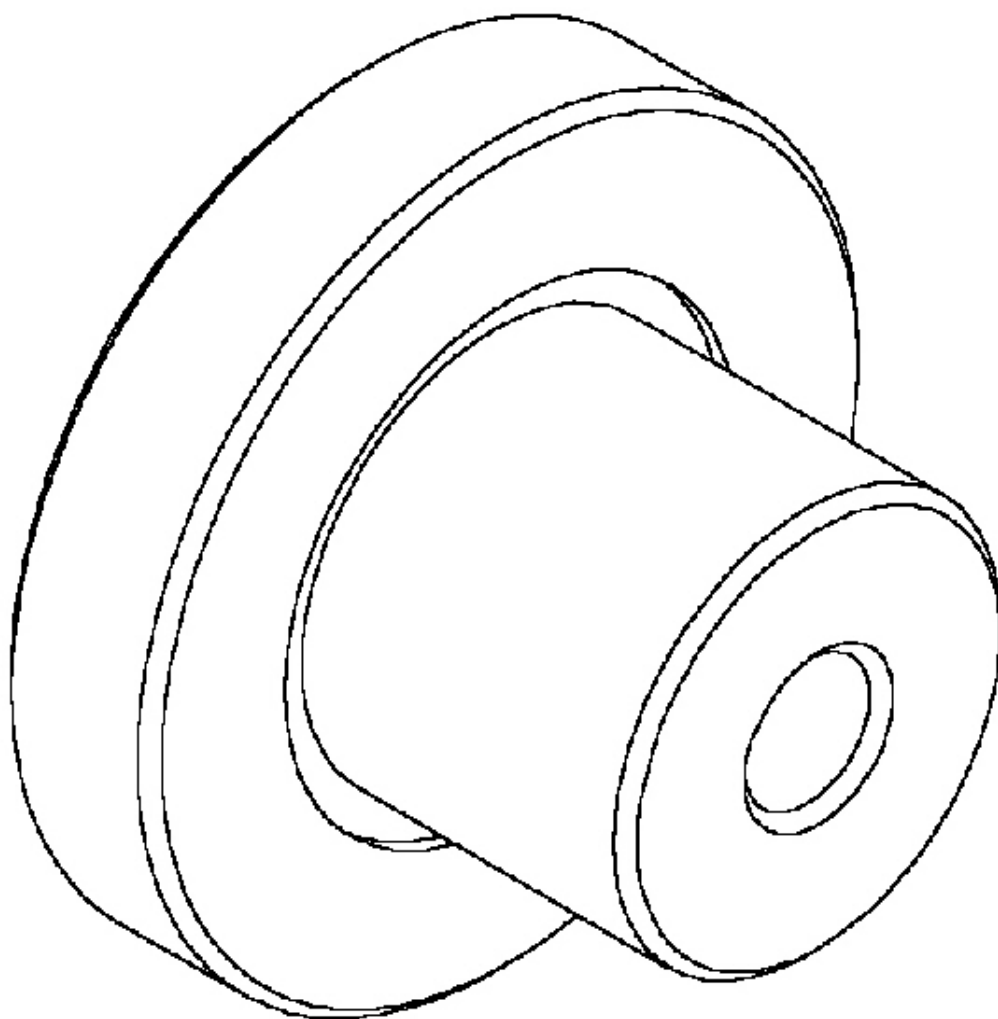


Fig. 127: Pinion Block 8804
Courtesy of CHRYSLER LLC

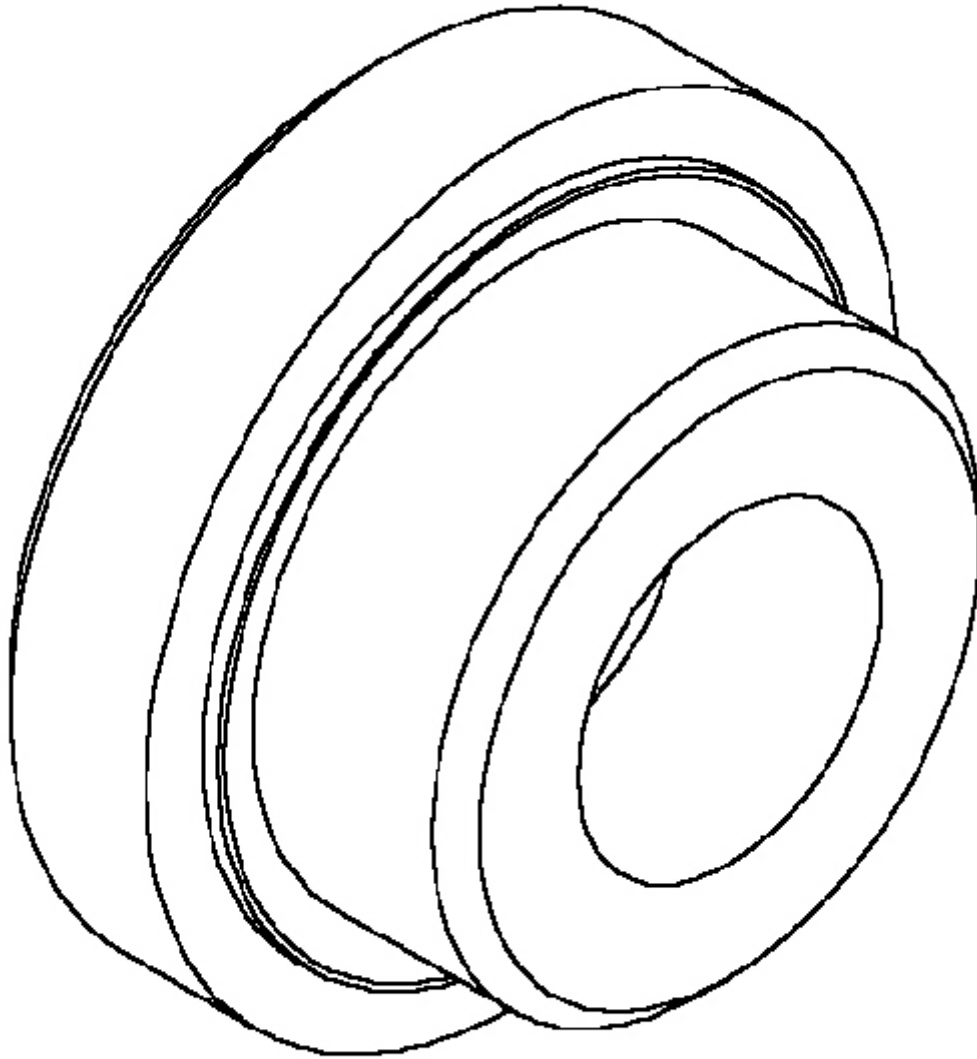


Fig. 128: Installer 8805
Courtesy of CHRYSLER LLC

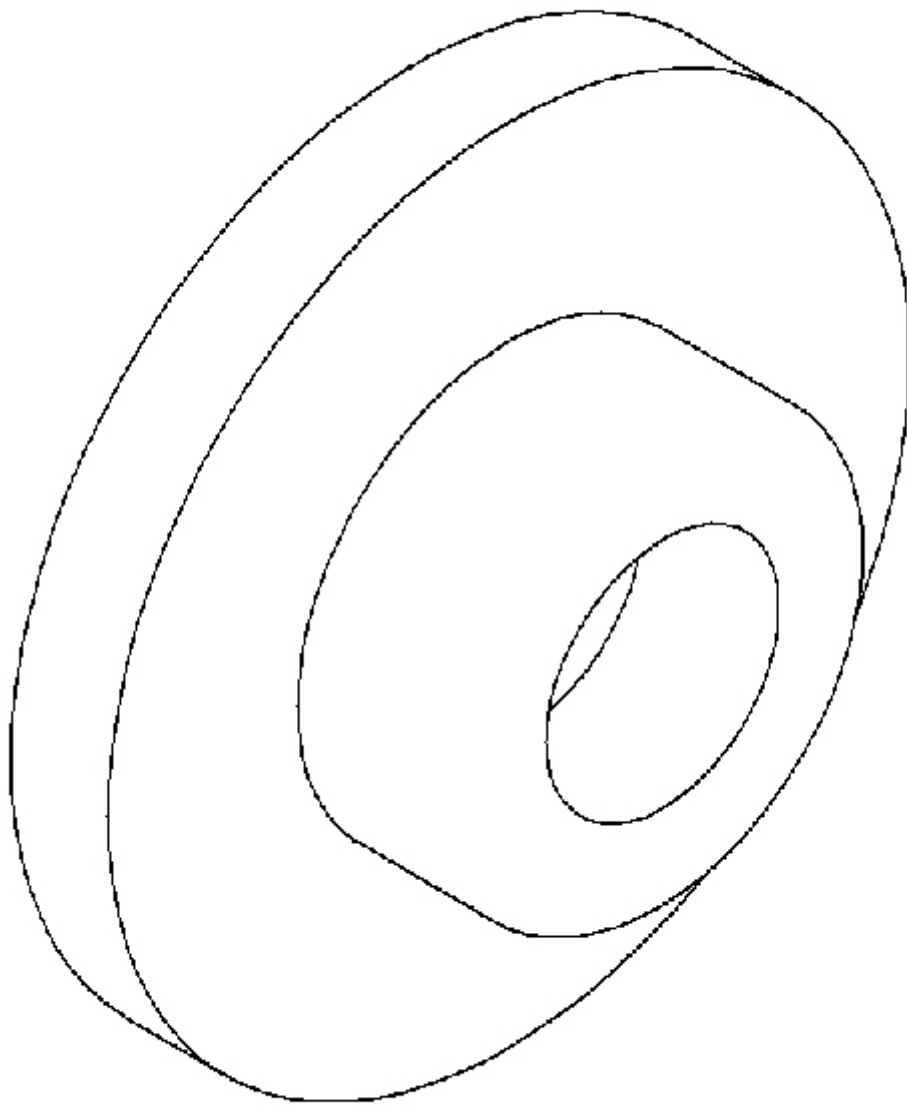


Fig. 129: Installer 8806
Courtesy of CHRYSLER LLC

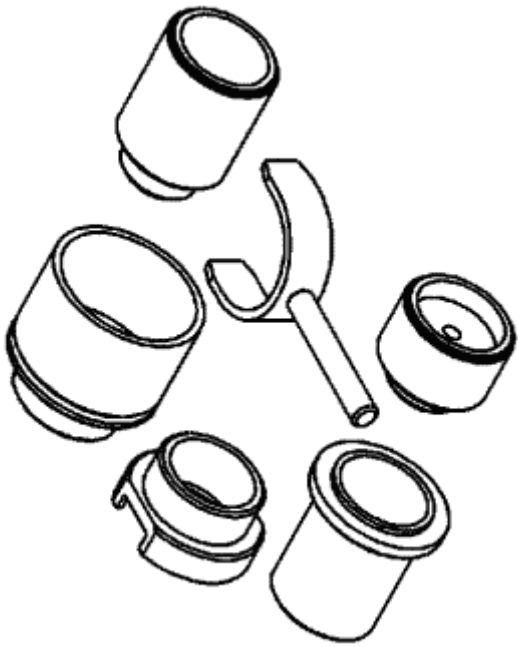


Fig. 130: Remover/Installer 9958
Courtesy of CHRYSLER LLC

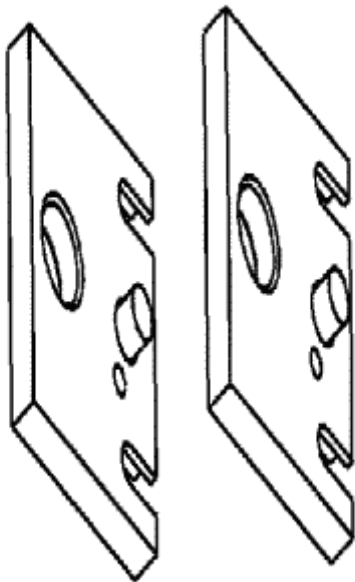


Fig. 131: Adapters 9959
Courtesy of CHRYSLER LLC

COVER-DIFFERENTIAL

REMOVAL

COVER-DIFFERENTIAL

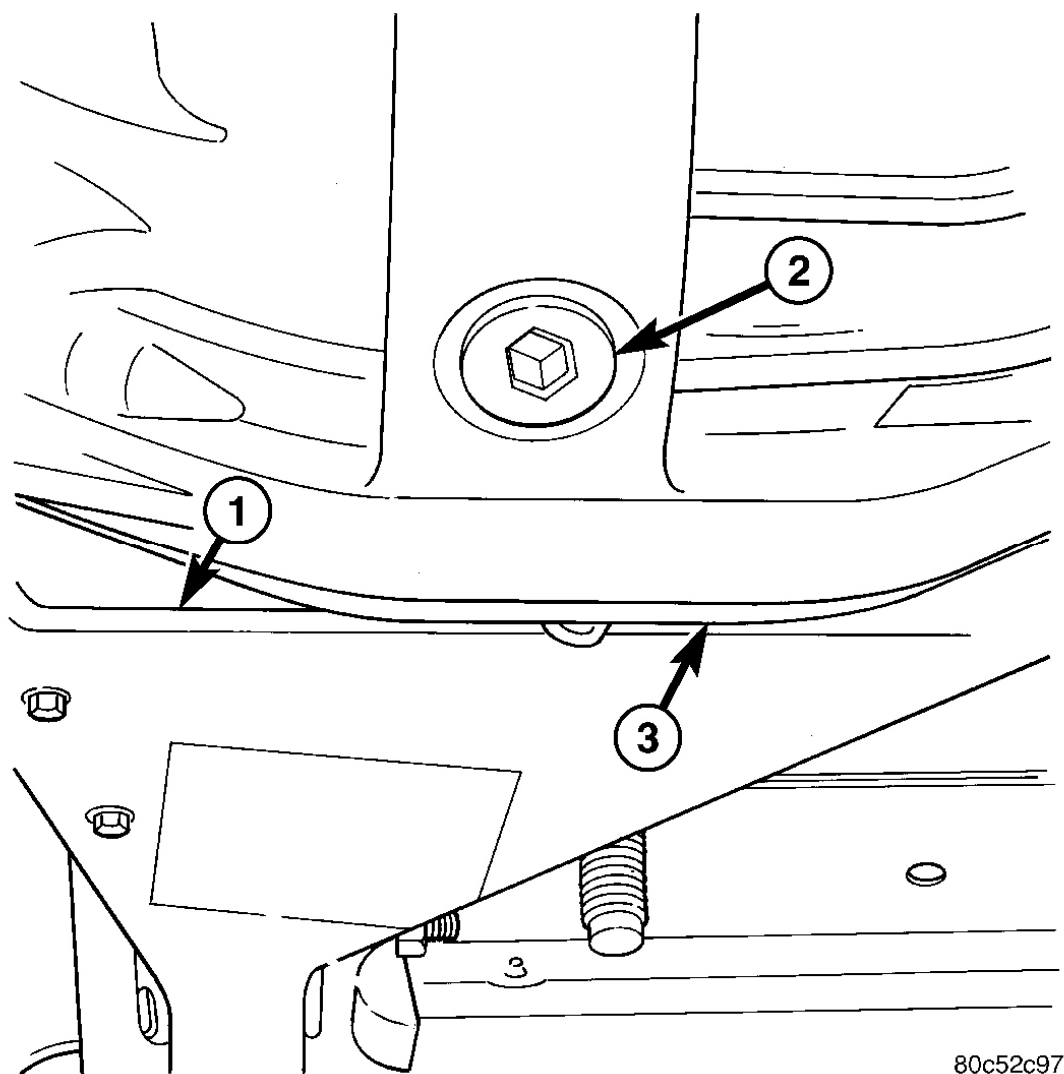
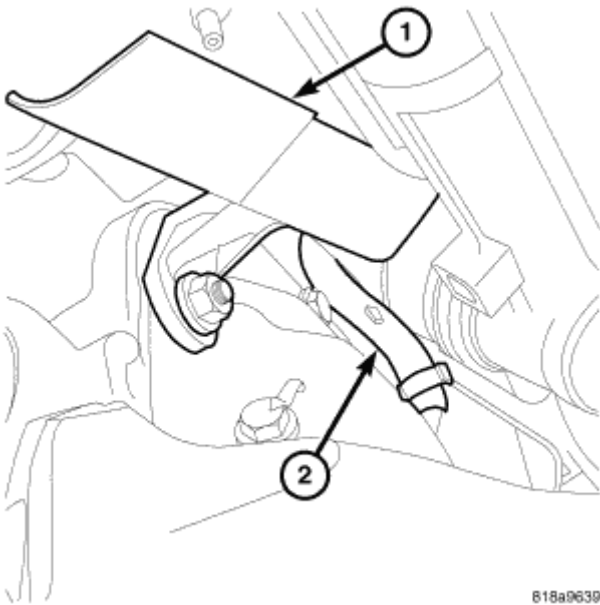


Fig. 132: Drain Plug
Courtesy of CHRYSLER LLC

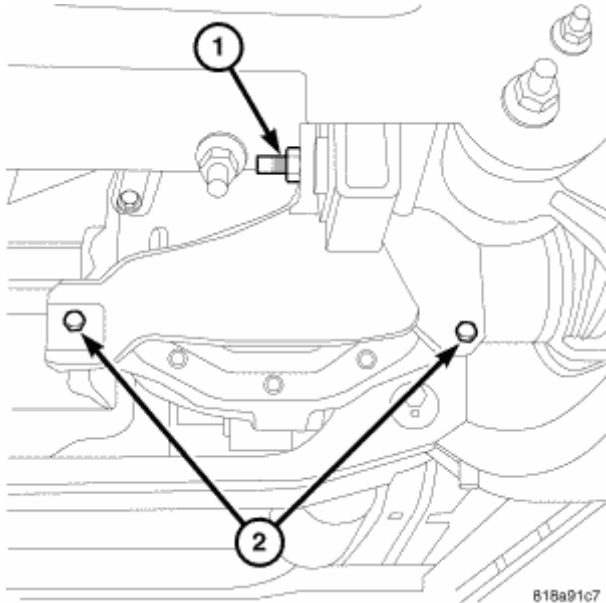
1. With vehicle in neutral, position vehicle on hoist.
2. Remove skid plate.
3. Remove drain plug (2) from housing (3) and drain fluid.



618a9639

Fig. 133: Identifying Oil Filter Drain Tray & Vent Hose
 Courtesy of CHRYSLER LLC

4. Remove oil filter drain tray (1) and vent hose from differential cover.



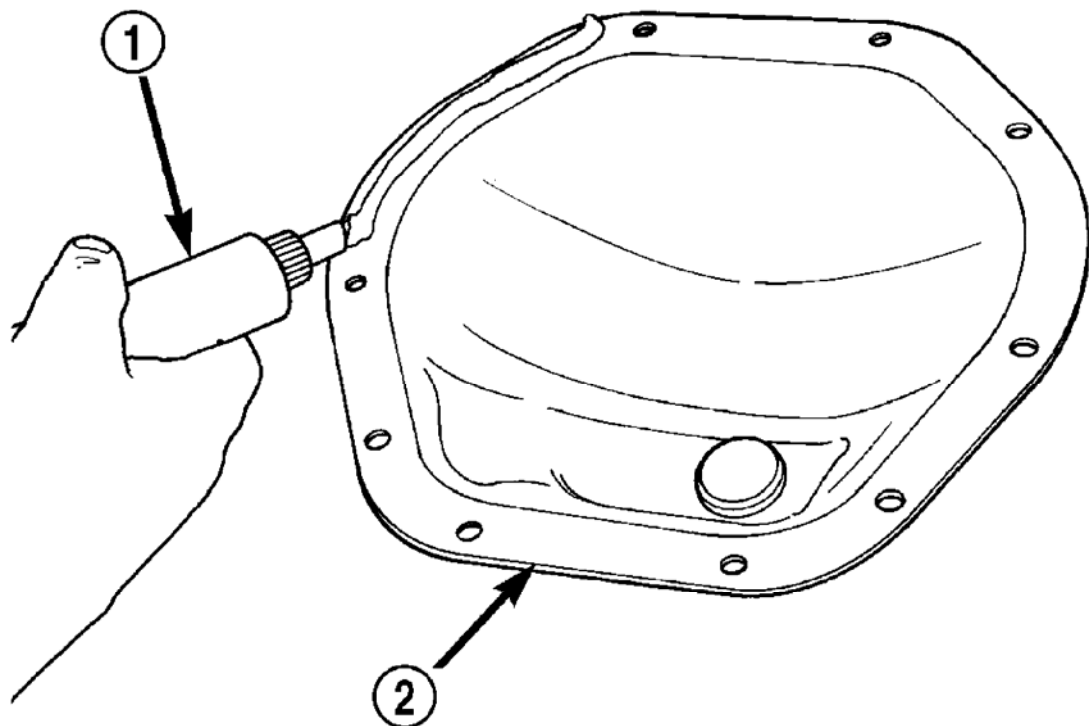
618a91c7

Fig. 134: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
 Courtesy of CHRYSLER LLC

5. Loosen front axle bracket bolt (1).
6. Remove front axle bracket bolts (2) from the axle and let bracket hang forward of the axle.
7. Remove differential cover bolts and remove cover.

INSTALLATION

COVER-DIFFERENTIAL

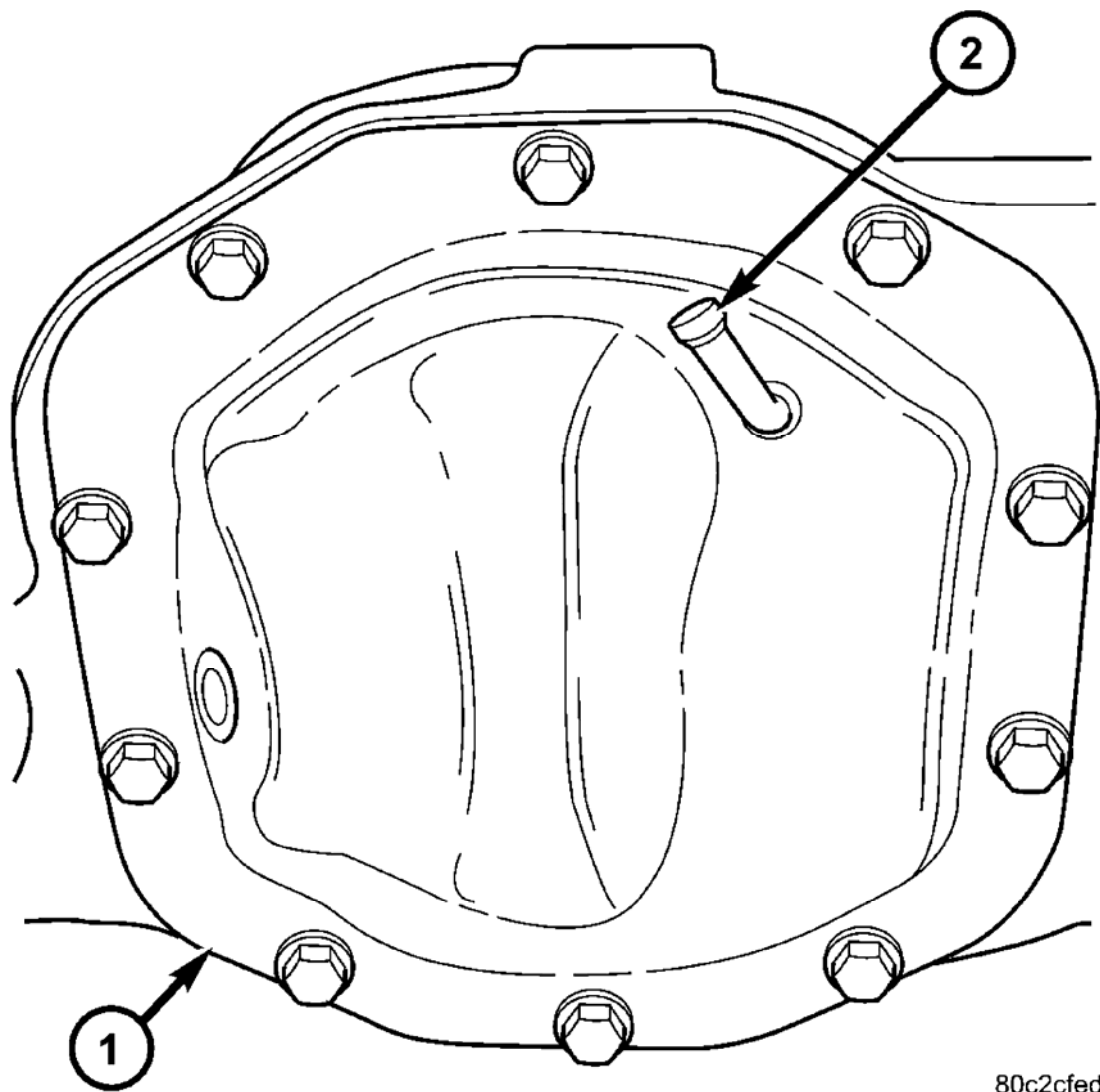


80a534a8

Fig. 135: Apply Sealant
Courtesy of CHRYSLER LLC

1. Clean cover and mating surface.
2. Apply a bead of Mopar Axle RTV sealant (1) or equivalent to the differential cover (2).

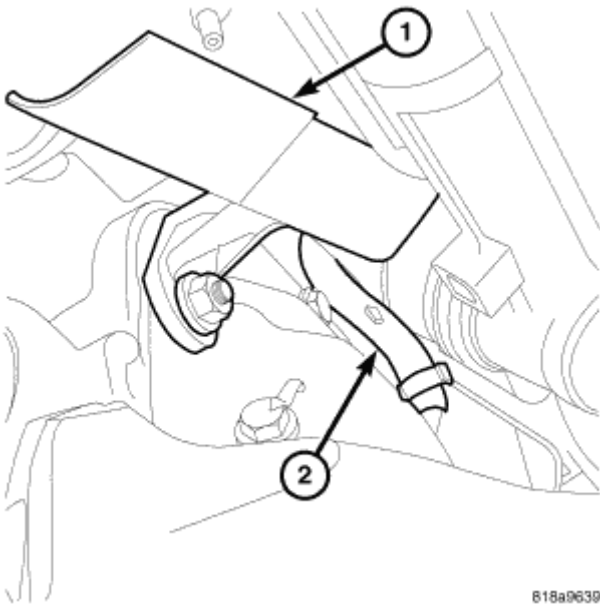
CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will result in a leak.



80c2cfed

Fig. 136: Differential Cover
Courtesy of CHRYSLER LLC

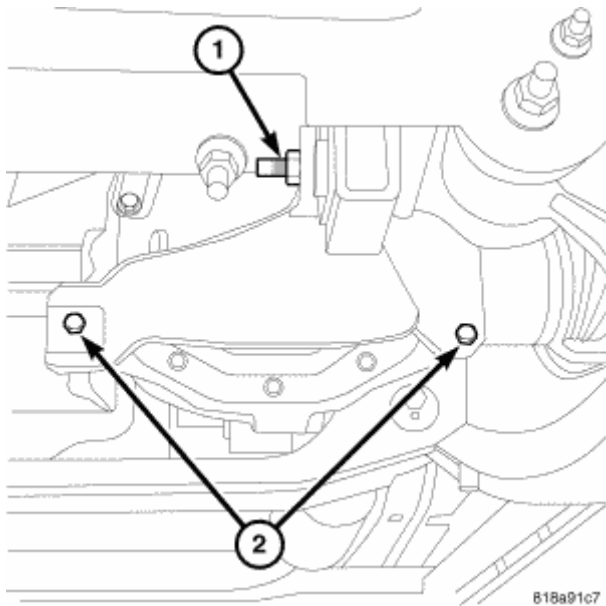
3. Install differential housing cover (1) and tighten bolts in a criss-cross pattern to 19-26 N.m (14-19 ft. lbs.).



818a9639

Fig. 137: Identifying Oil Filter Drain Tray & Vent Hose
 Courtesy of CHRYSLER LLC

4. Install oil filter drain tray (1) and tighten nut to 23 N.m (200 in. lbs.).
5. Install vent hose (2) on differential cover with new clamp.



818a91c7

Fig. 138: Identifying Front Axle Bracket Cradle Nut & Front Axle Bracket Bolts
 Courtesy of CHRYSLER LLC

6. Install front axle bracket bolts (2) and nuts. Tighten nuts to 61 N.m (45 ft. lbs.).
7. Tighten front axle bracket cradle nut (1) to 61 N.m (45 ft. lbs.).
8. Install skid plate.

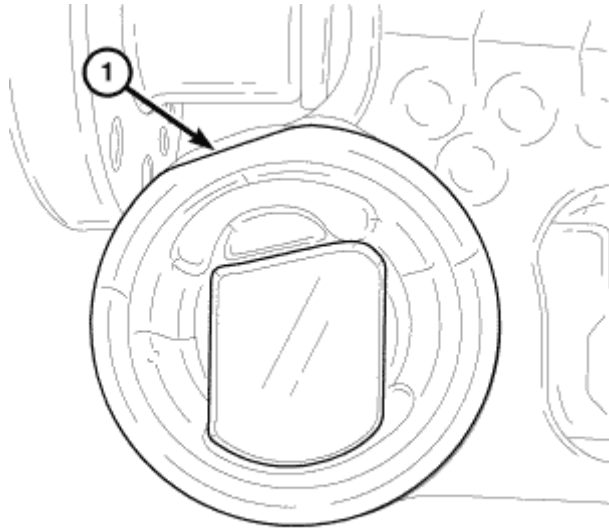
BUSHING-AXLE

REMOVAL

BUSHING-AXLE

CAUTION: Bushing must be installed in the original location ± 2 degrees. Failure to follow these instructions will result in a NVH problem.

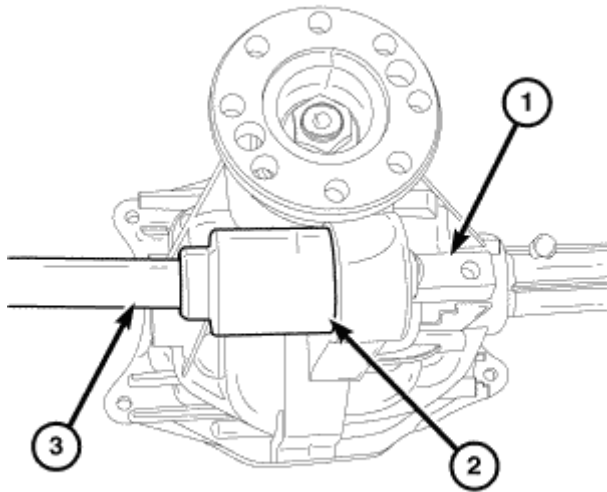
PINION NOSE BUSHING



81d0f7c3

Fig. 139: Marking Bushing Flange Flat Location On Axle For Installation Reference
Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle for installation reference.

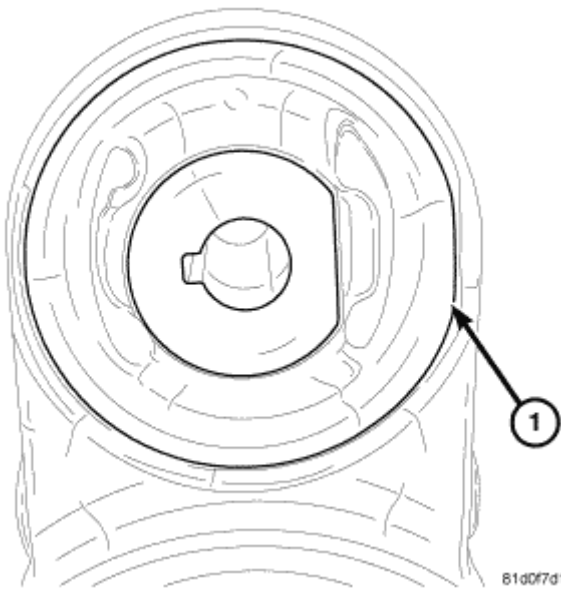


81d0fb1f

Fig. 140: Removing Pinion Nose Bushing With Remover 9958-5 And Handle C-4171
 Courtesy of CHRYSLER LLC

2. Remove pinion nose bushing (1) with Remover 9958-5 (2) and Handle C-4171 (3). Drive bushing out with a hammer.

AXLE TUBE BUSHING



81d0f7d1

Fig. 141: Marking Bushing Flange Flat Location On Axle For Installation Reference
 Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle for installation reference.

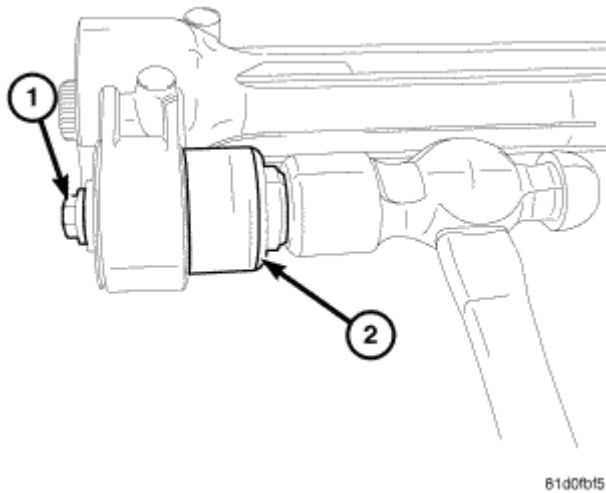


Fig. 142: Identifying Bolt & Remover 9958-3
 Courtesy of CHRYSLER LLC

2. Bolt (1) Remover 9958-3 (2) to axle tube bushing. Drive bushing out with a hammer.

AXLE BRACKET BUSHING

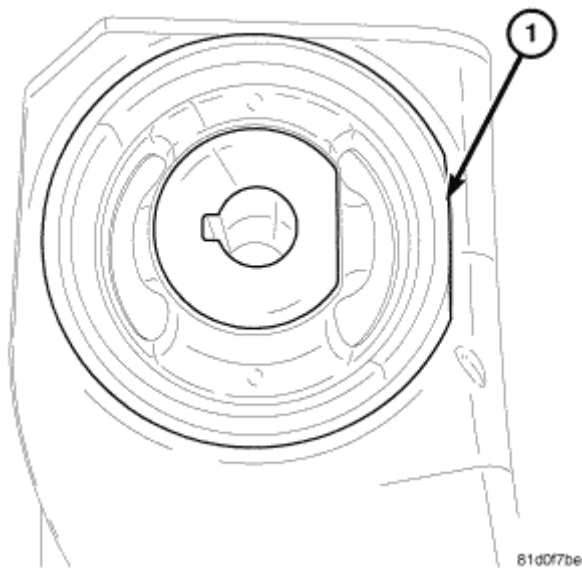


Fig. 143: Identifying Bushing Flange Flat Location
 Courtesy of CHRYSLER LLC

1. Mark bushing flange flat location (1) on the axle bracket for installation reference.

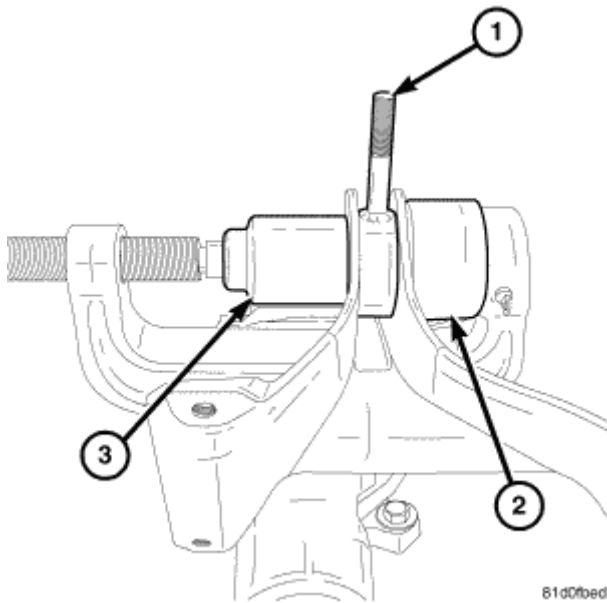


Fig. 144: Identifying Spacer 9958-1, Receiver 9958-6 & Remover 9958-5
Courtesy of CHRYSLER LLC

2. Clamp Press C-4212F into vise.
3. Place Spacer 9958-1 (1) over bushing in the bracket. Press bushing out of the bracket into Receiver 9958-6 (1) with Remover 9958-5 (3) and Press C-4212F.

INSTALLATION

BUSHING-AXLE

CAUTION: Bushing must be installed in the original location ± 2 degrees. Failure to follow these instruction will result in damaging the bushing and a NVH problem.

PINION NOSE BUSHING

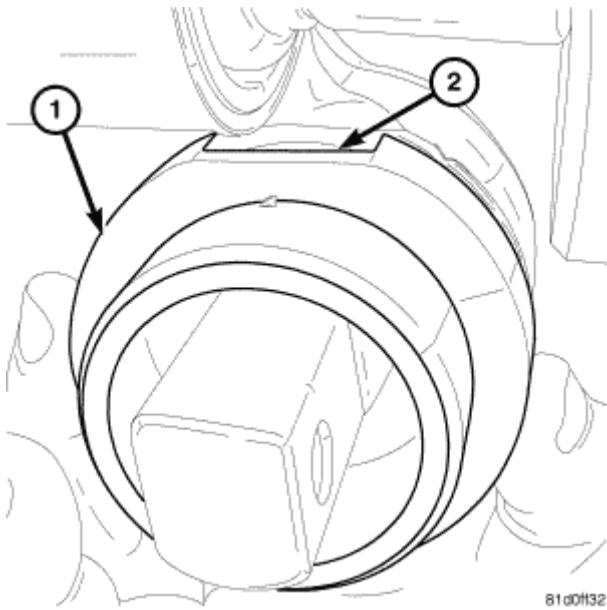


Fig. 145: Identifying Receiver 9958-2 & Flat Spots
 Courtesy of CHRYSLER LLC

1. Start bushing in axle housing with bushing reference mark aligned.
2. Center one of the Receiver 9958-2 (1) flat spots (2) under pinion for tool clearance.

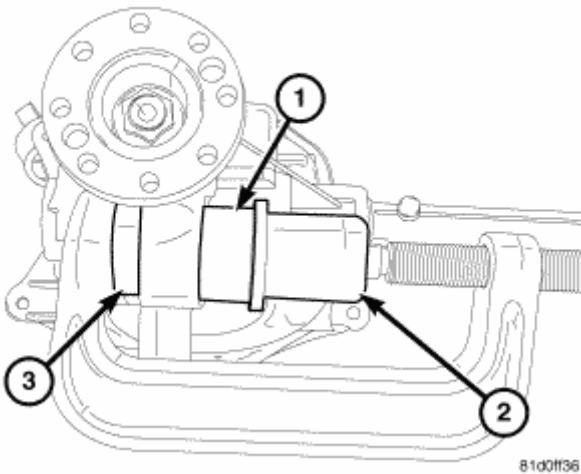
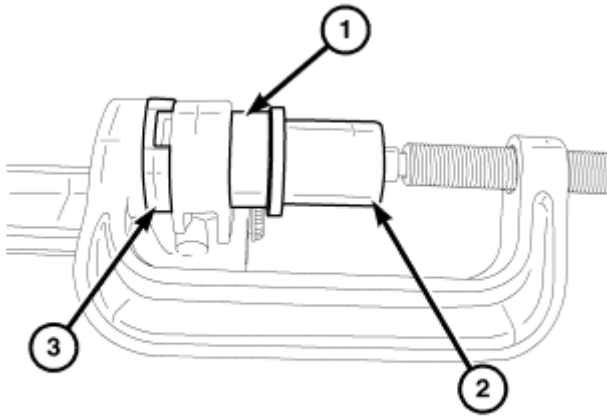


Fig. 146: Installing Bushing With Installer 9958-3, Receiver 9958-2 And Press C-4212F
 Courtesy of CHRYSLER LLC

3. Install bushing (1) with Installer 9958-3 (2) Receiver 9958-2 (3) and Press C-4212F.

AXLE TUBE BUSHING

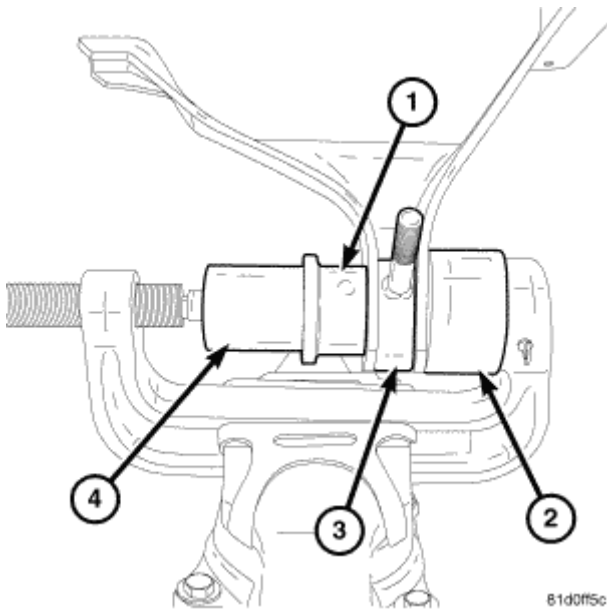


81d0ff55

Fig. 147: Installing Bushing With Installer 9958-3, Receiver 9958-2 And Press C4212F
 Courtesy of CHRYSLER LLC

1. Start bushing in axle tube with bushing reference mark aligned.
2. Center one of the Receiver 9958-2 (3) flat spots over the axle tube for tool clearance.
3. Install bushing (1) with Installer 9958-3 (2) Receiver 9958-2 (3) and Press C4212F.

AXLE BRACKET BUSHING



81d0ff5c

Fig. 148: Identifying Bushing, Receiver 9958-6, Spacer 9958-1 & Installer 9958-3
 Courtesy of CHRYSLER LLC

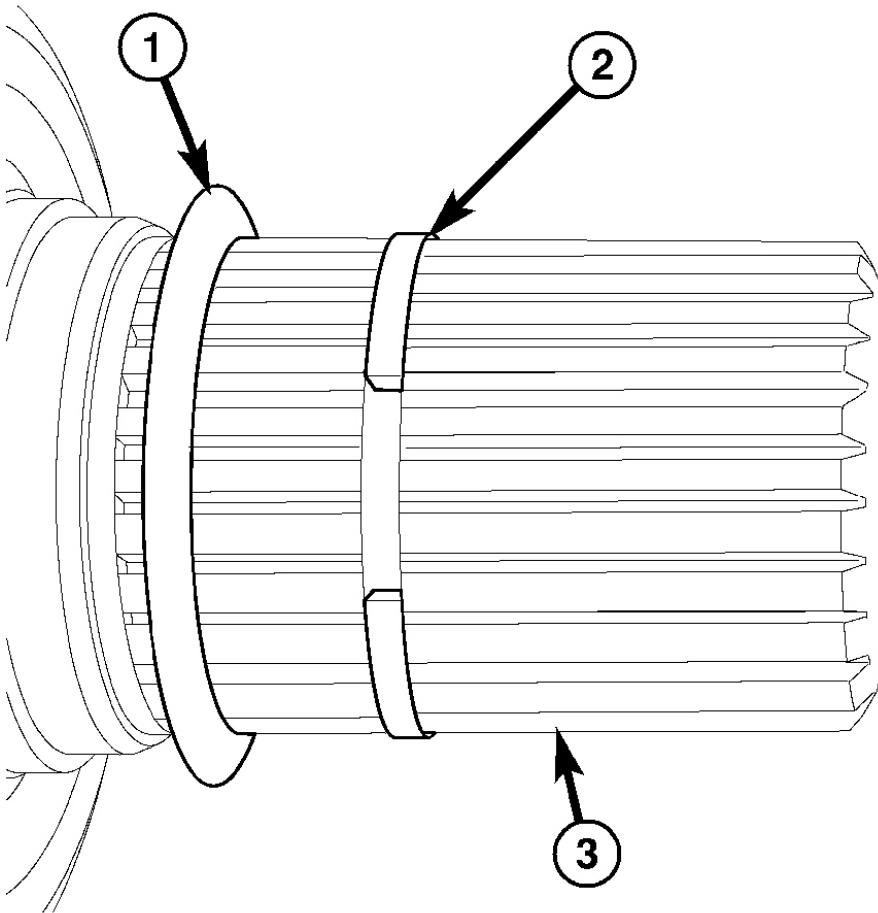
1. Start bushing in axle bracket with bushing reference mark aligned.
2. Install bushing (1) with Receiver 9958-6 (2) Spacer 9958-1 (3) position in bracket, Installer 9958-3 (4) and Press C4212F. Press bushing through the first side of the bracket then remove Spacer 9958-1 (3). Verify bushing is aligned with the second side of the bracket. Install Spacer 9958-1 (3) and press

bushing through the second side of the bracket.

SHAFT-AXLE

REMOVAL

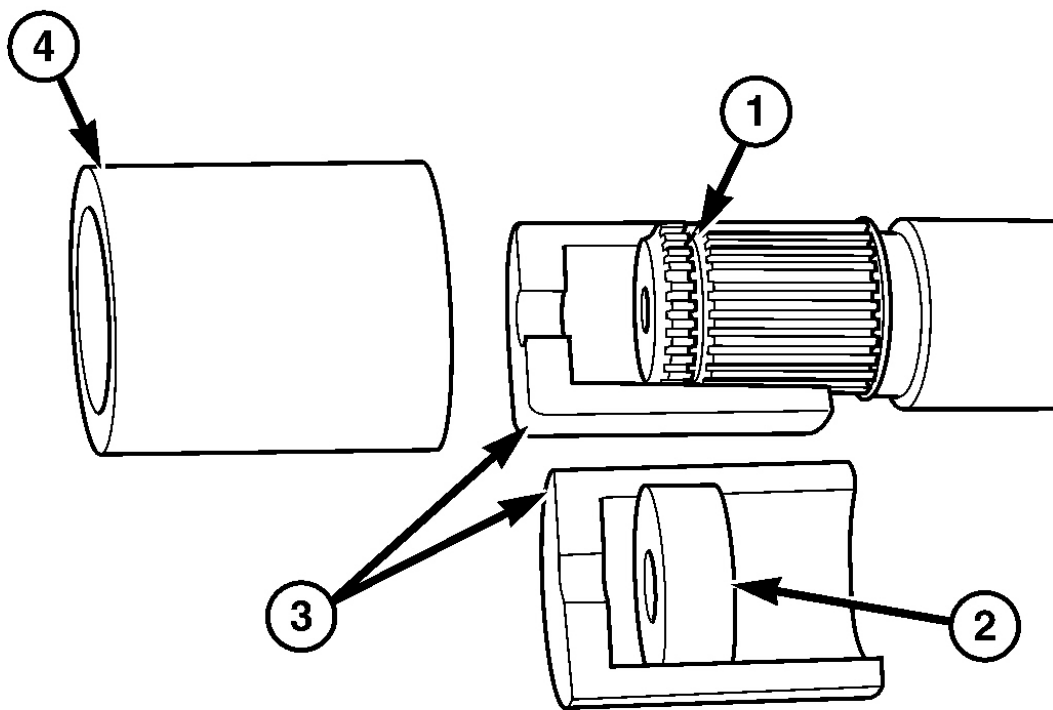
SHAFT-AXLE



815b2e58

Fig. 149: Identifying Snap Ring, O-Ring And Shaft
Courtesy of CHRYSLER LLC

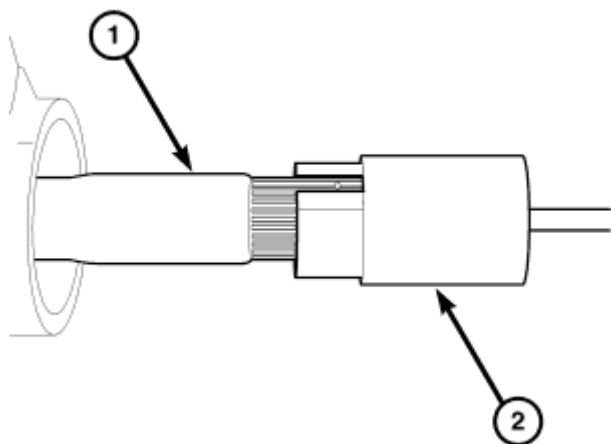
1. Remove right half shaft from vehicle.
2. Remove O-ring (1) and snap ring (2) and from axle shaft (3).



80c52f58

Fig. 150: Axle Shaft Puller
 Courtesy of CHRYSLER LLC

3. Assemble Remover 8420A blocks (3) with hammer threads (2) on snap ring groove (1) on right axle shaft. Slide collar (4) over blocks and thread Slide Hammer C-3752.



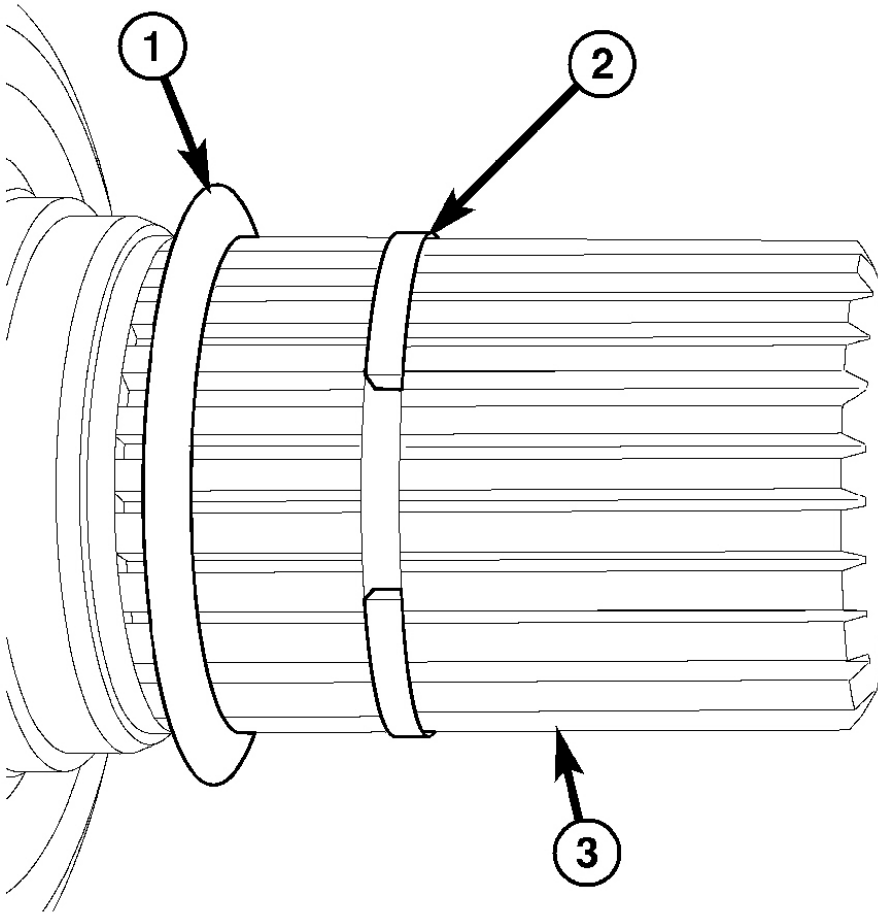
818d5bd7

Fig. 151: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

4. Remover right axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.
5. Slide axle shaft out of the axle tube.

INSTALLATION

SHAFT-AXLE



815b2e58

Fig. 152: Identifying Snap Ring, O-Ring And Shaft
Courtesy of CHRYSLER LLC

1. Lubricate bearing bore and seal lip with gear lubricant. Insert axle shaft through seal, bearing and engage it into side gear splines.

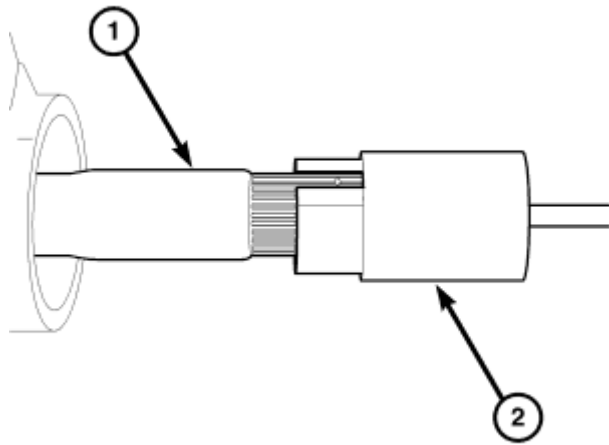
NOTE: Use care to prevent shaft splines from damaging axle shaft seal.

2. Install O-ring (1) and snap ring (2) on axle shaft (3).
3. Push the axle shaft until the axle shaft snap-ring passes through the side gear.
4. Install right half shaft.
5. Check differential fluid level.

SEAL-AXLE SHAFT

REMOVAL

SEAL-AXLE SHAFT

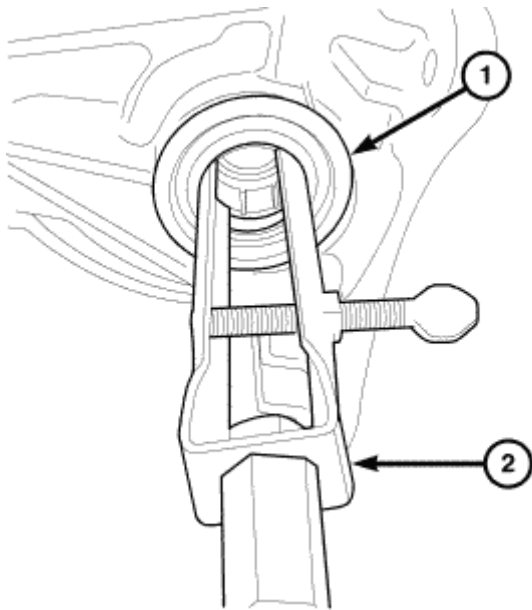


816d5bd7

Fig. 153: Identifying Right Axle Shaft & Remover 8420A

Courtesy of CHRYSLER LLC

1. Remove haft shafts.
2. On the right side, remove axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



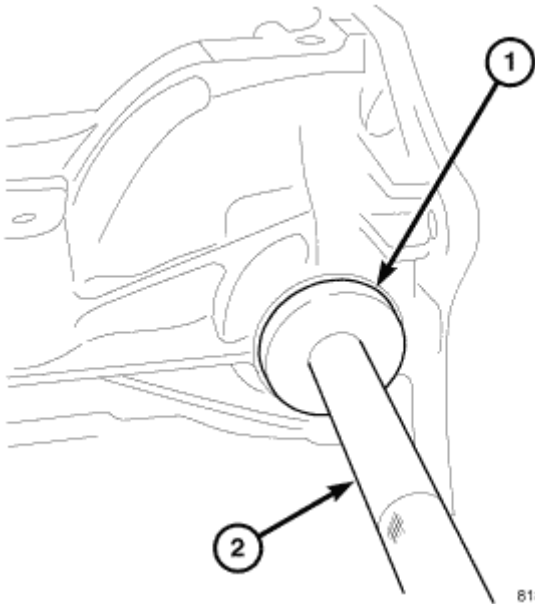
618d6cc5

Fig. 154: Removing Shaft Seal From Axle With Remover 7794-A And Slide Hammer C-637
 Courtesy of CHRYSLER LLC

3. Remove shaft seal (1) from axle with Remover 7794-A (2) and a Slide Hammer C-637.

INSTALLATION

SEAL-AXLE SHAFT



618d7566

Fig. 155: Installing Shaft Seal With Installer 8806 And Handle C-4171
 Courtesy of CHRYSLER LLC

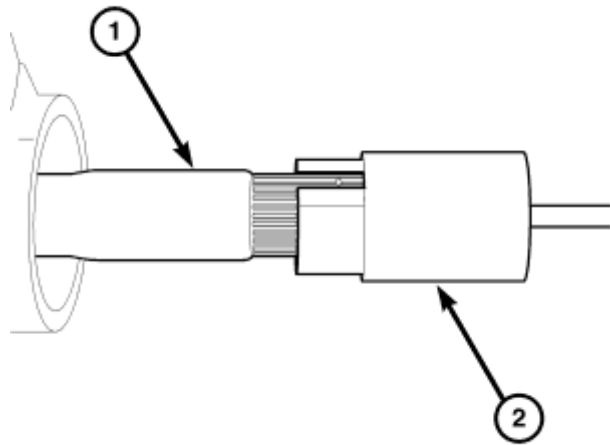
1. Apply a light coat of lubricant on the lip of the shaft seal.
2. Install **new** shaft seal with Installer 8806 (1) and Handle C-4171 (2).

3. Install right axle shaft and half shafts.

BEARING-AXLE

REMOVAL

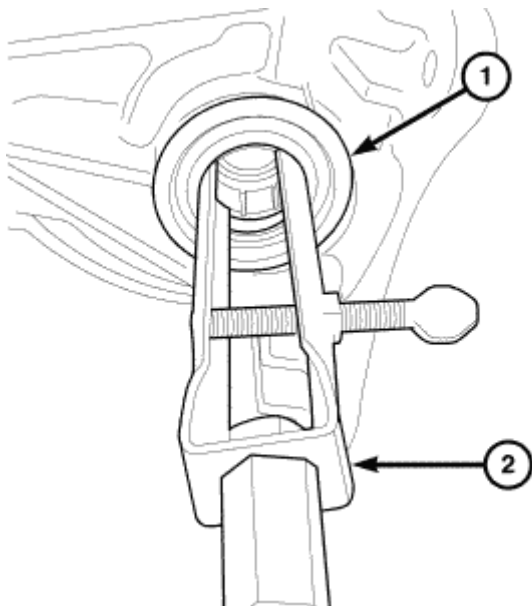
BEARING-AXLE



818d9bd7

Fig. 156: Identifying Right Axle Shaft & Remover 8420A
Courtesy of CHRYSLER LLC

1. Remove haft shafts.
2. On the right side, remove axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



818d6cc5

Fig. 157: Removing Shaft Seal From Axle With Remover 7794-A And Slide Hammer C-637
Courtesy of CHRYSLER LLC

3. Remove shaft seal (1) with Remover 7794-A (2) and a Slide Hammer C-637.

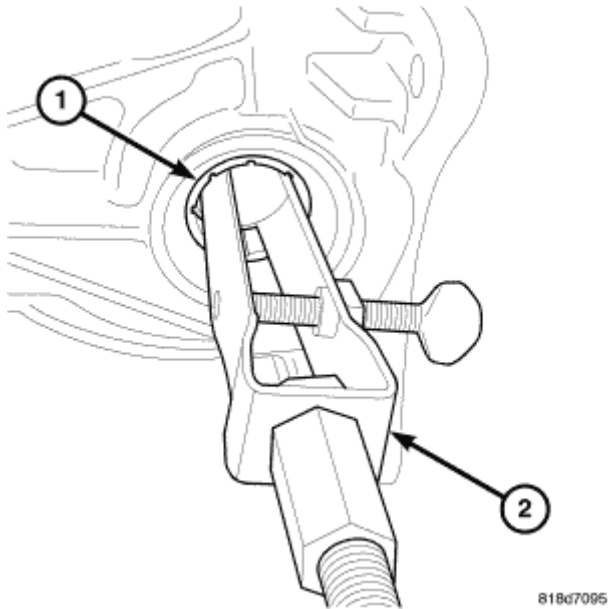


Fig. 158: Removing Shaft Bearing/Bushing With Remover 7794-A And Slide Hammer C-637
Courtesy of CHRYSLER LLC

4. Remove shaft bearing/bushing (1) with Remover 7794-A (2) and a Slide Hammer C-637.

INSTALLATION

BEARING-AXLE

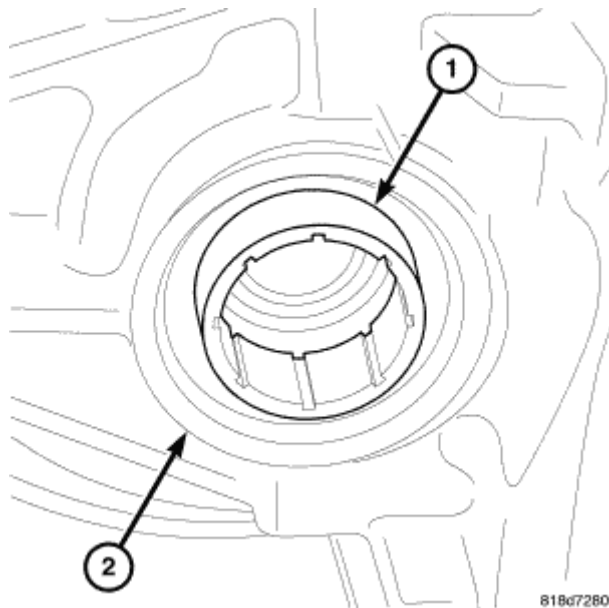


Fig. 159: Positioning Bearing/Bushing In Housing Bore
Courtesy of CHRYSLER LLC

1. Position bearing/bushing (1) in the housing (2) bore.

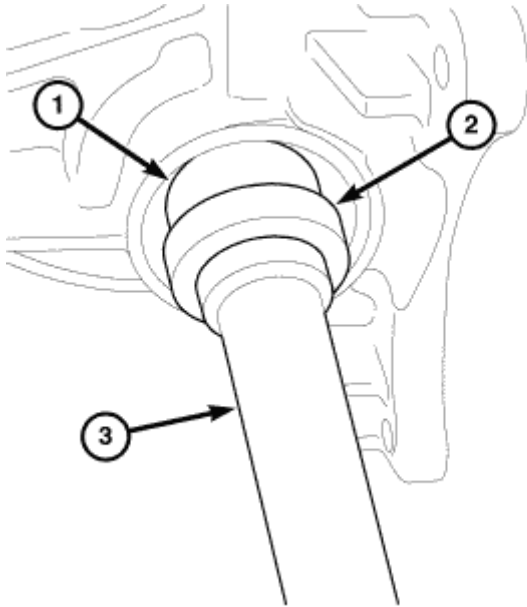


Fig. 160: Identifying Shaft Bearing/Bushing, Installer 8805 & Handle C-4171
Courtesy of CHRYSLER LLC

2. Install shaft bearing/bushing (1) with **large diameter end** of Installer 8805 (2) and Handle C-4171 (3). Drive bearing/bushing in flush with housing bore.

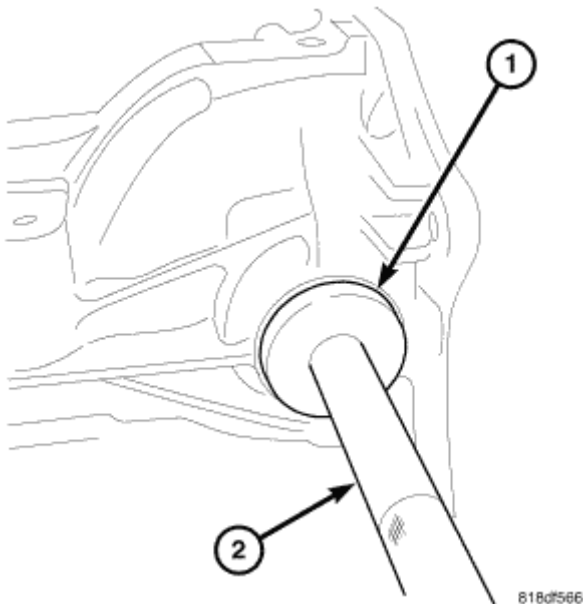


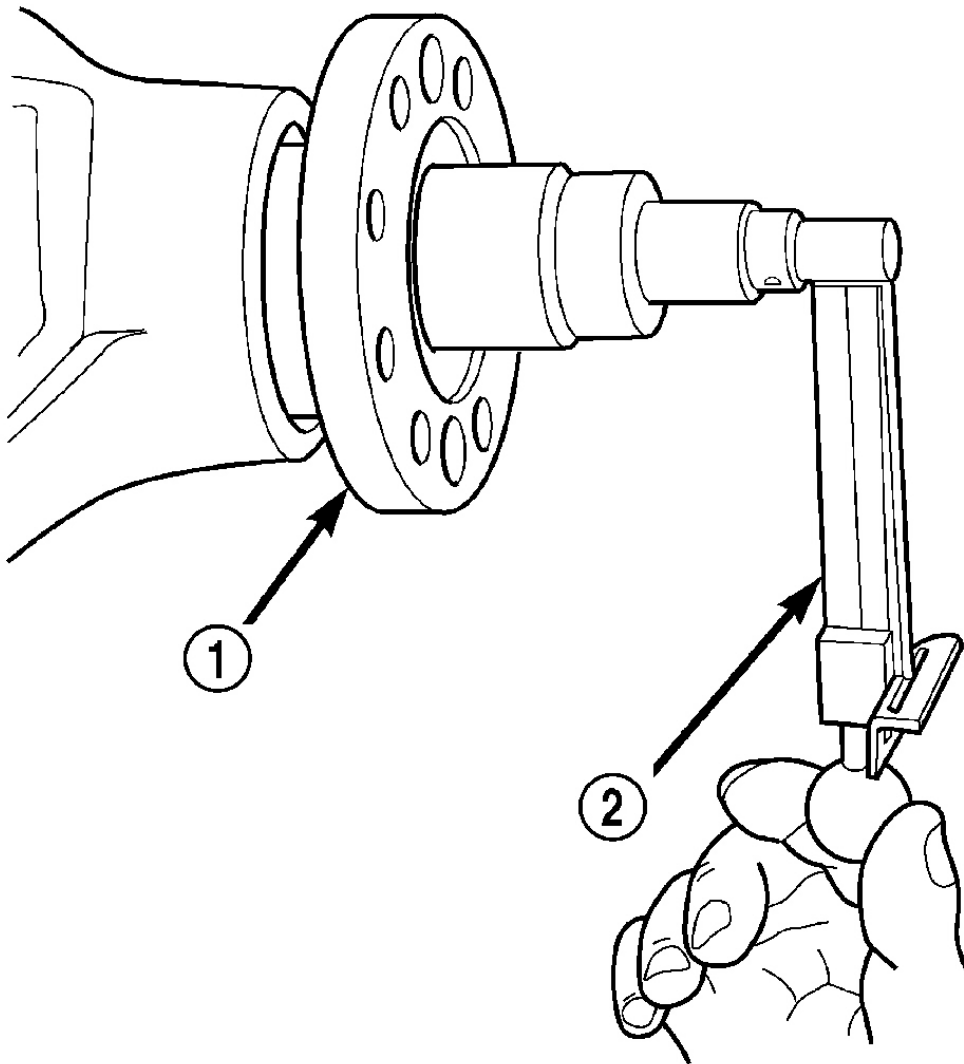
Fig. 161: Installing Shaft Seal With Installer 8806 And Handle C-4171
Courtesy of CHRYSLER LLC

3. Apply a light coat of lubricant on the lip of the shaft seal.
4. Install **new** shaft seal in axle with Installer 8806 (1) and Handle C-4171 (2).
5. Install right axle shaft and half shafts.

SEAL-PINION

REMOVAL

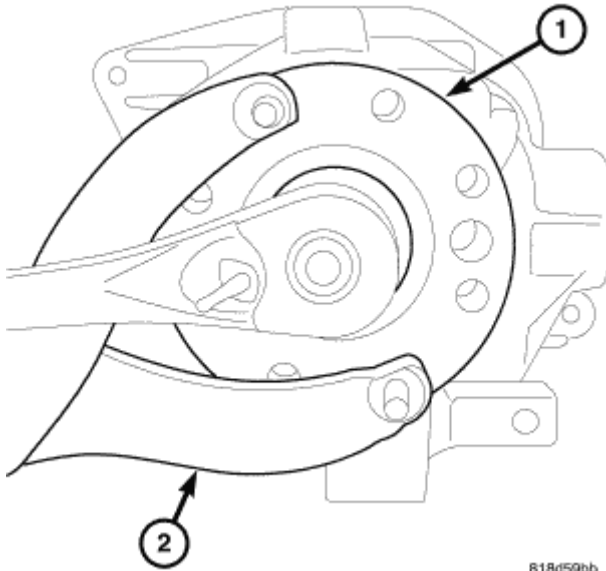
SEAL-PINION



80c07132

Fig. 162: Pinion Rotation Torque
Courtesy of CHRYSLER LLC

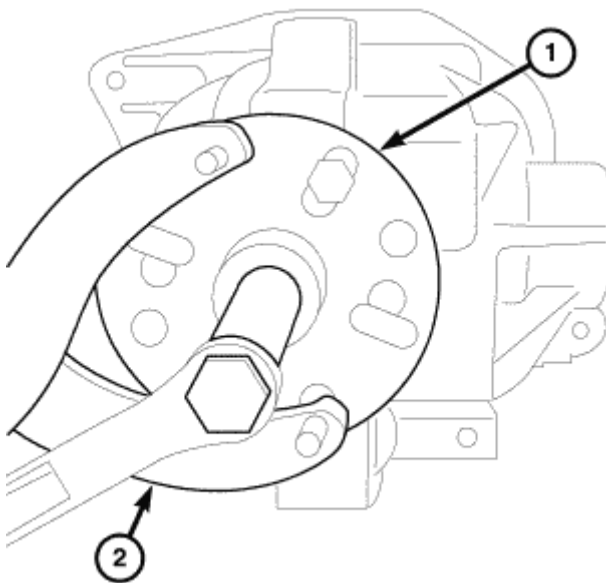
1. Remove brake calipers and rotors.
2. Remove propeller shaft.
3. Rotate pinion gear several times and verify the pinion rotates smoothly.
4. Record pinion torque to rotate (1) with an inch pound torque wrench (2).



818d59bb

Fig. 163: Holding Pinion Flange With Flange Holder C-3281
Courtesy of CHRYSLER LLC

5. Hold pinion flange (1) with Flange Holder C-3281 (2) and remove pinion nut.
6. Mark a line on the pinion shaft and flange for installation reference.



818d59c3

Fig. 164: Removing Pinion Flange With Puller C-452 And Flange Holder C-3281

Courtesy of CHRYSLER LLC

7. Remove pinion flange with Puller C-452 (1) and Flange Holder C-3281 (2).
8. Remove pinion seal with a seal puller.

INSTALLATION

SEAL-PINION

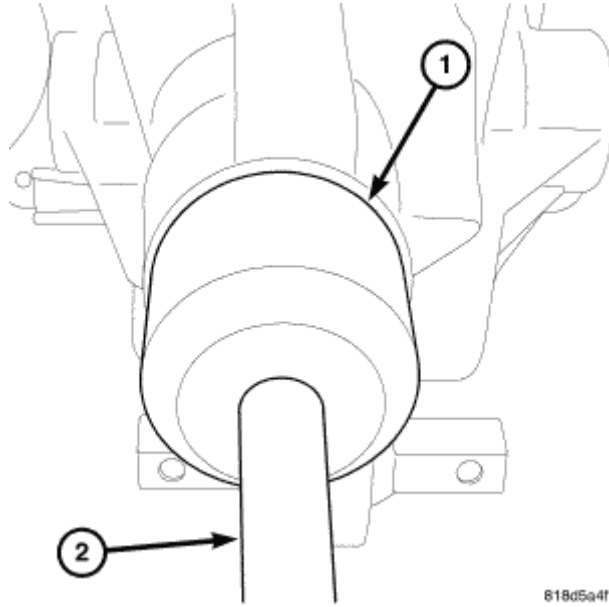


Fig. 165: Identifying Installer 8681 & Handle C-4171
Courtesy of CHRYSLER LLC

1. Apply a light coating of gear lubricant on the lip of pinion seal. Install with Installer 8681 (1) and Handle C-4171 (2).

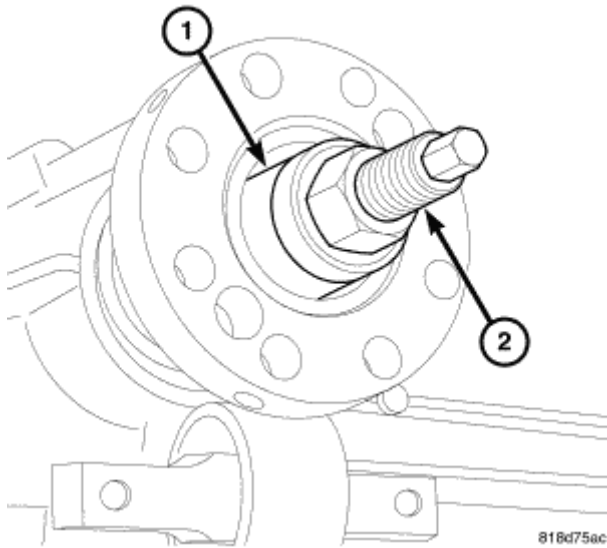


Fig. 166: Identifying Installer W-162-D & Screw 8112
 Courtesy of CHRYSLER LLC

2. Position flange on the pinion shaft with the reference marks aligned.
3. Install flange with Installer W-162-D (1) and Screw 8112 (2).

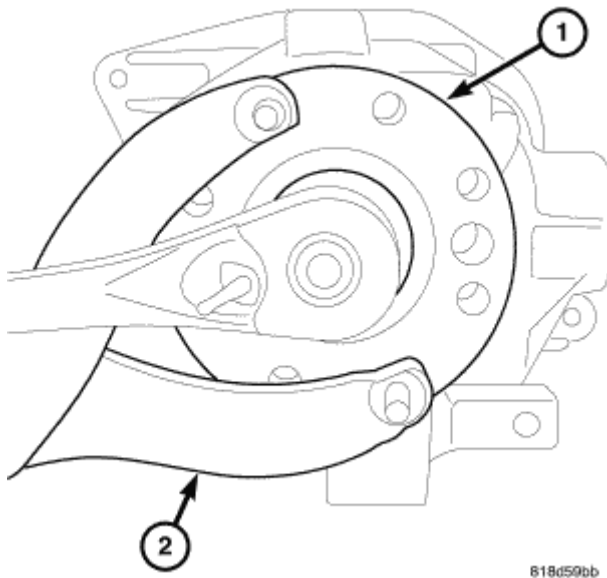
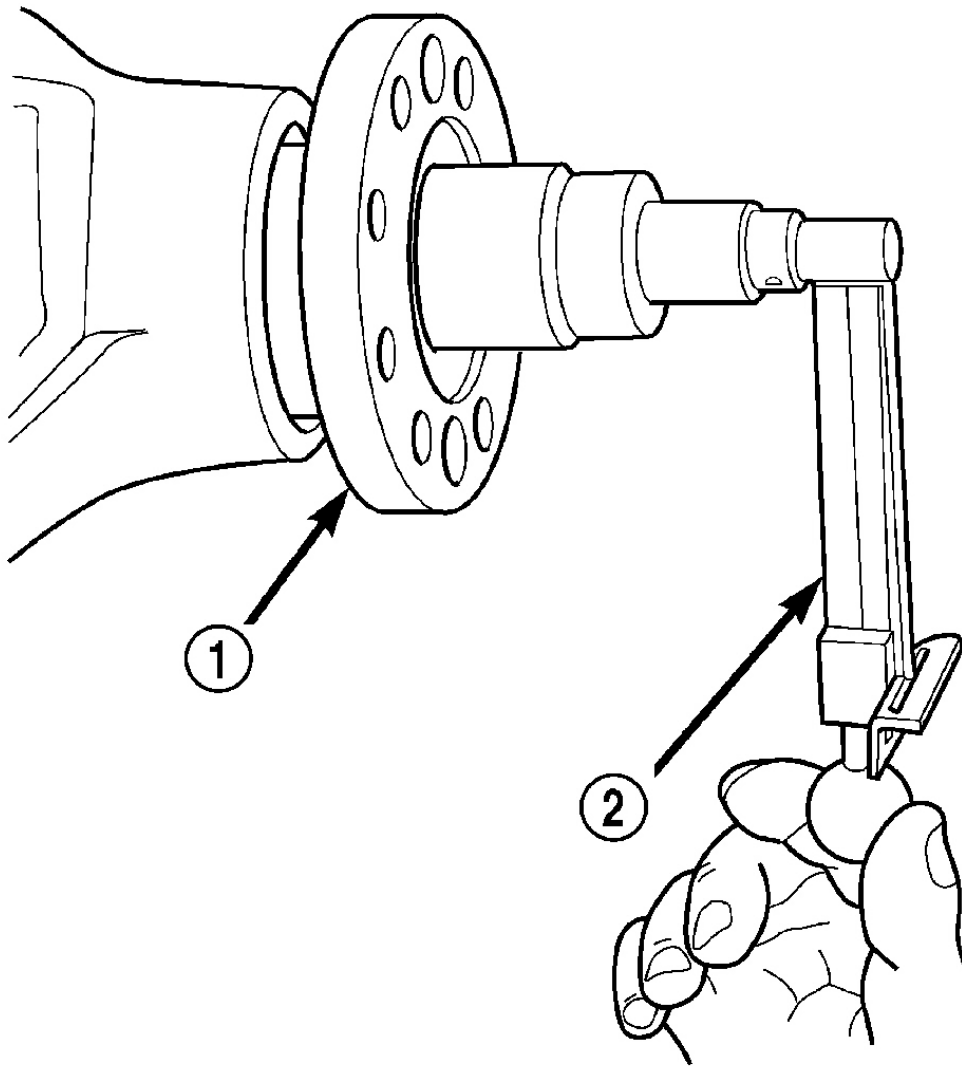


Fig. 167: Holding Pinion Flange With Flange Holder C-3281
 Courtesy of CHRYSLER LLC

4. Install a **new** nut on the pinion gear. Hold pinion flange (1) with Flange Holder C-3281 (2) and tighten pinion nut to 217 N.m (160 ft. lbs.).

NOTE: Do not exceed minimum tightening torque 217 N.m (160 ft. lbs.) at this

point.



80c07132

Fig. 168: Pinion Rotation Torque
Courtesy of CHRYSLER LLC

5. Rotate pinion several times and verify pinion rotates smoothly.
6. Measure pinion torque to rotate (1) with an inch pound torque wrench (2). Pinion torque to rotating should be equal to recorded reading plus 0.56 N.m (5 in. lbs.).

If rotating torque is low, tighten the pinion nut in 6.8 N.m (5 ft. lbs.) increments until proper rotating torque is achieved.

CAUTION: If maximum tightening torque is reached 352 N.m (260 ft. lbs.) prior to reaching required rotating torque, the collapsible spacer may have been damaged.

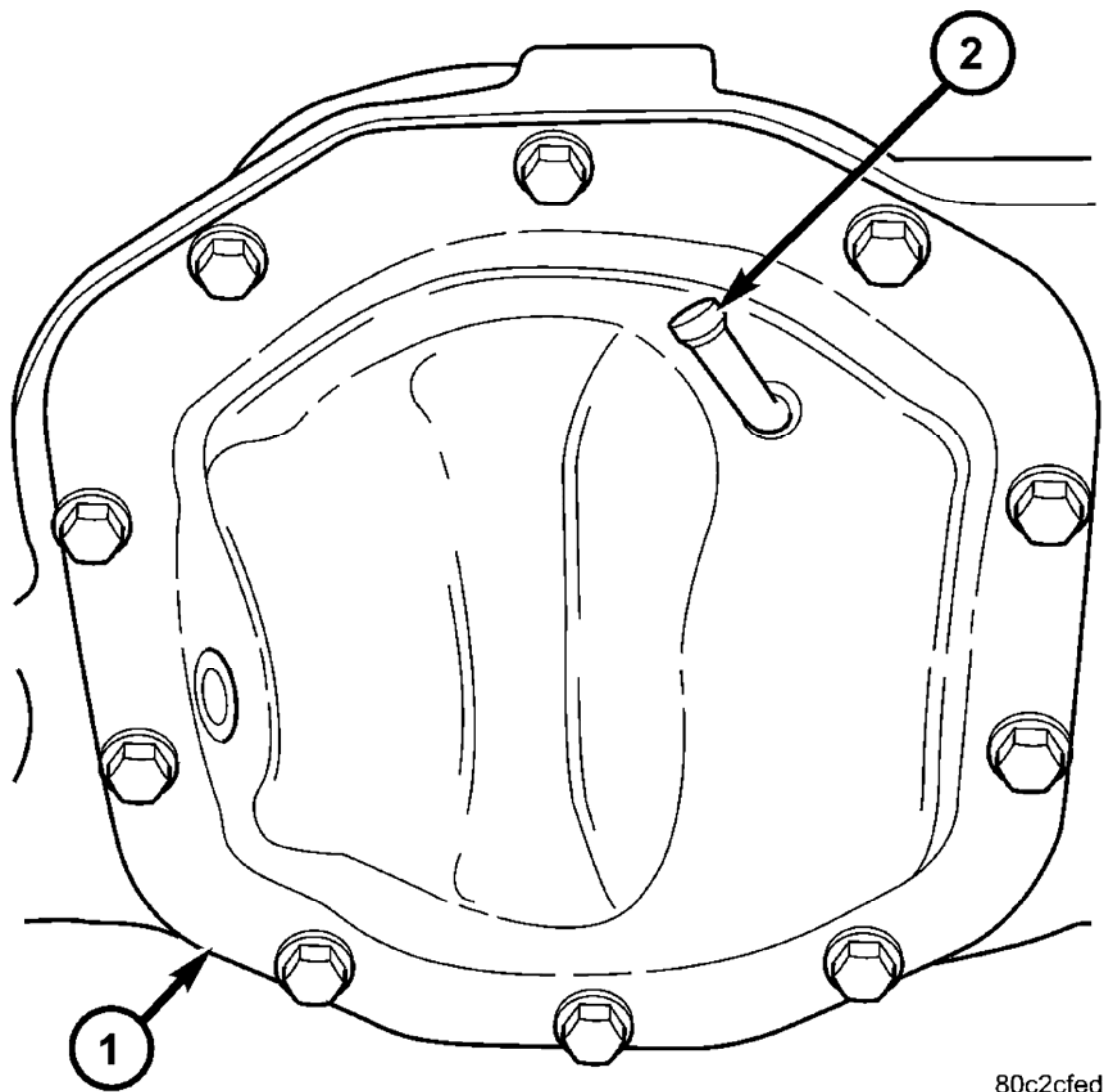
Never loosen pinion nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instructions will result in damage.

7. Install brake rotors, calipers and propeller shaft.
8. Fill differential with gear lubricant.

DIFFERENTIAL

REMOVAL

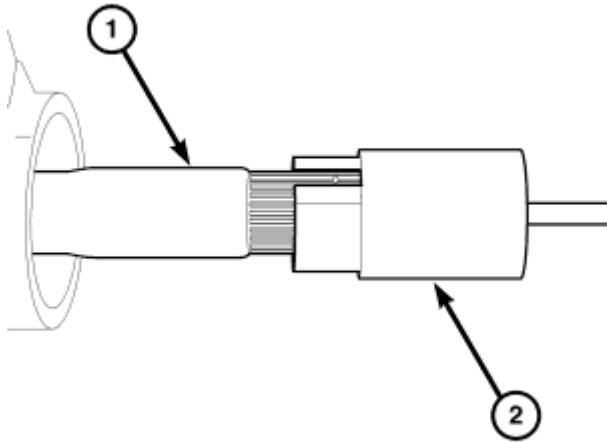
DIFFERENTIAL



80c2cfed

Fig. 169: Differential Cover
Courtesy of CHRYSLER LLC

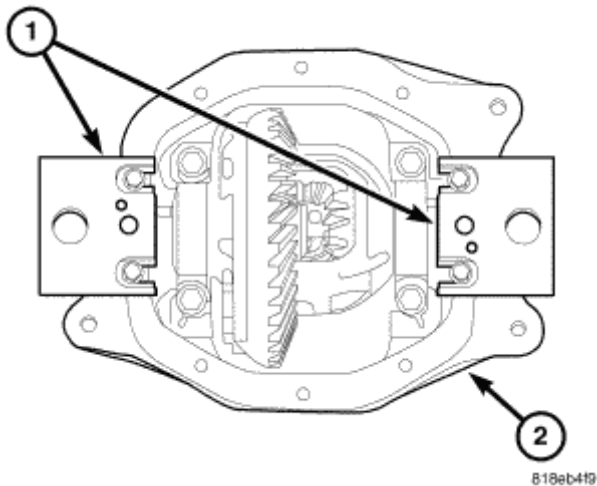
1. Remove differential housing cover (1).



818d6bd7

Fig. 170: Identifying Right Axle Shaft & Remover 8420A
 Courtesy of CHRYSLER LLC

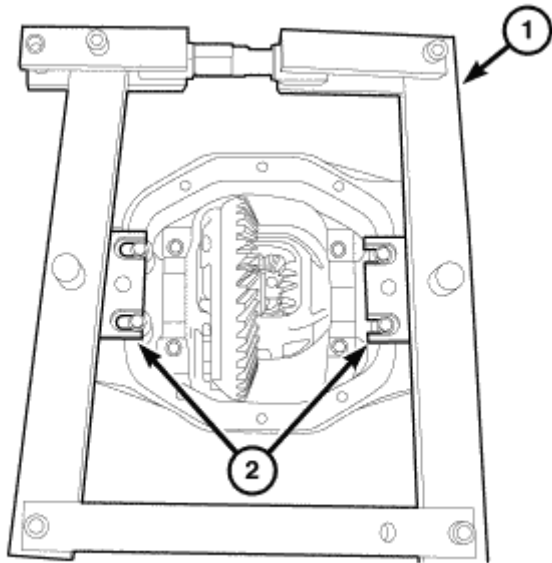
2. Remove half shafts and remove right axle shaft (1) with Remover 8420A (2) and Slide Hammer C-3752.



818eb4f9

Fig. 171: Removing/Installing Spreader Adapters 9959 On Differential Housing
 Courtesy of CHRYSLER LLC

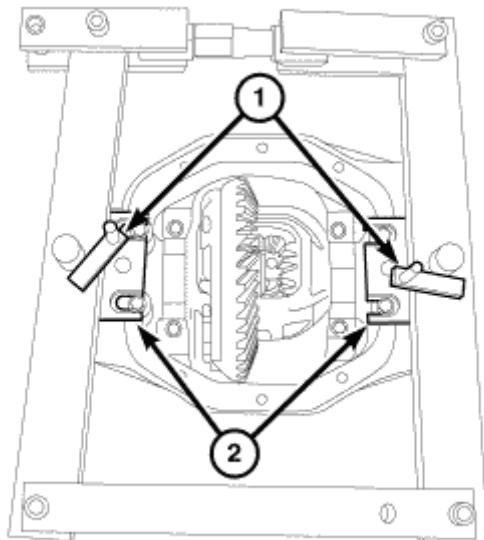
3. Mark differential bearing caps for installation reference.
4. Loosen bearing cap bolts.
5. Install Spreader Adapters 9959 (1) on differential housing (2).



818ec353

Fig. 172: Installing Spreader W-129-B On Spreader Adapters 9959 And Tightening Spreader Turnbuckle Finger-Tight
 Courtesy of CHRYSLER LLC

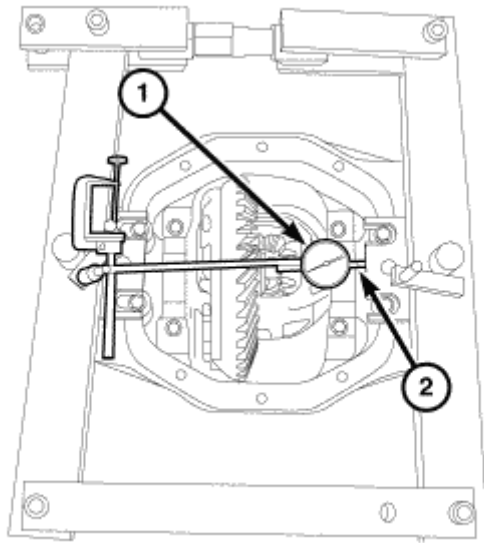
6. Install Spreader W-129-B (1) on Spreader Adapters 9959 (2) and tighten spreader turnbuckle finger-tight.



818ec392

Fig. 173: Installing Spreader Retainers W-129-1 On Spreader Adapters 9959 And Across Spreader
 Courtesy of CHRYSLER LLC

7. Install Spreader Retainers W-129-1 (1) on Spreader Adapters 9959 (2) and across spreader.

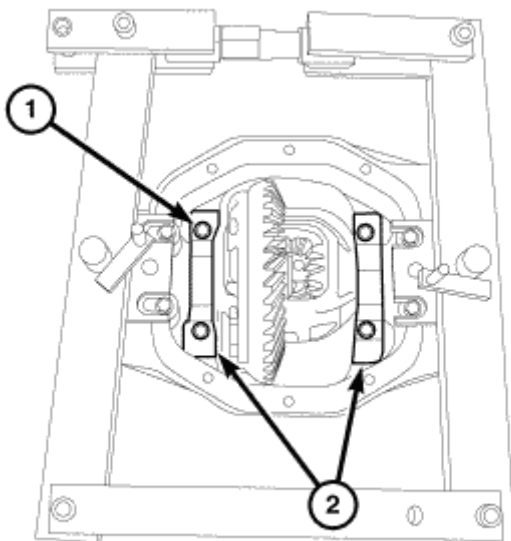


818ec3a8

Fig. 174: Attaching Dial Indicator C-3339A To Spreader Retainer Stud And Loading Indicator Plunger Against Opposite Side Of Housing
 Courtesy of CHRYSLER LLC

8. Attach Dial Indicator C-3339A (1) to spreader retainer stud. Load indicator plunger (2) against the opposite side of the housing and zero the indicator
9. Spread the differential case 0.34 mm (0.013 in).

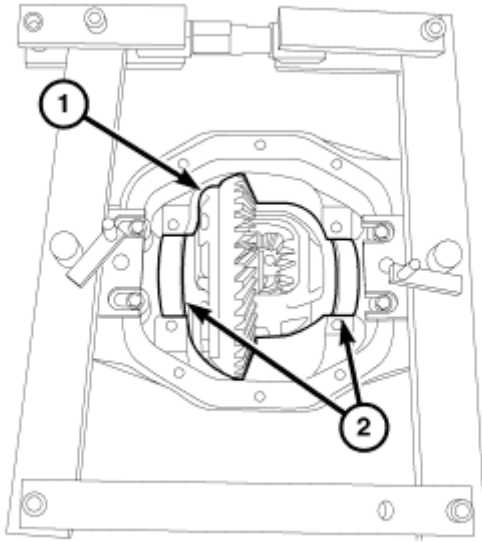
CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instructions will damage the housing.



818ec6fc

Fig. 175: Holding Differential Case And Removing Bearing Cap Bolts/Bearing Caps
 Courtesy of CHRYSLER LLC

10. Remove dial indicator.
11. Hold differential case and remove bearing cap bolts (1) and bearing caps (2).



81Bec3d7

Fig. 176: Removing/Installing Differential Case, Bearing Cups And Shims
Courtesy of CHRYSLER LLC

12. Remove differential case (1), bearing cups (2) and shims from housing.
13. Tag differential bearing cups and shims to indicate location.
14. Remove spreader from housing.

DISASSEMBLY

DIFFERENTIAL

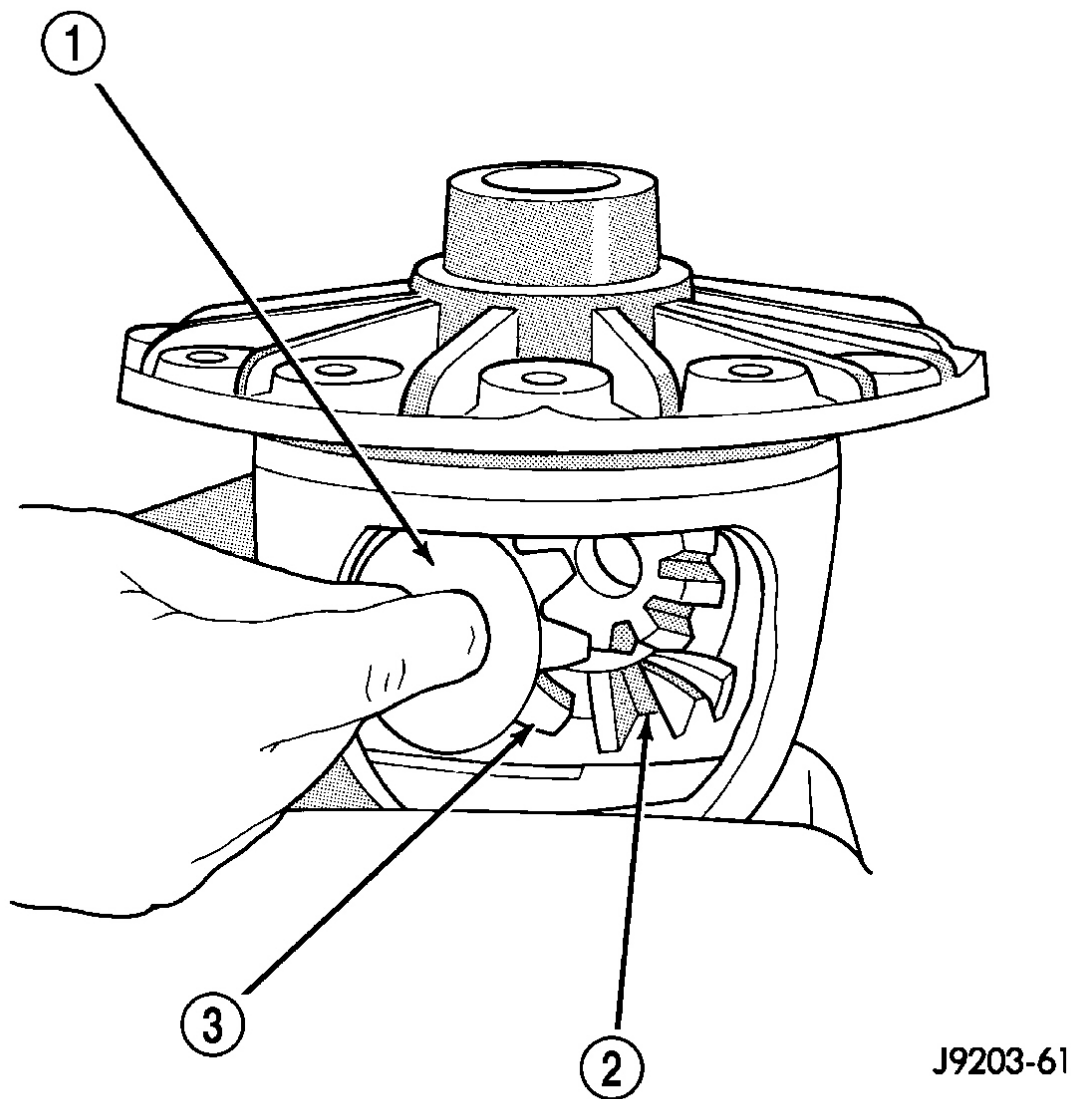
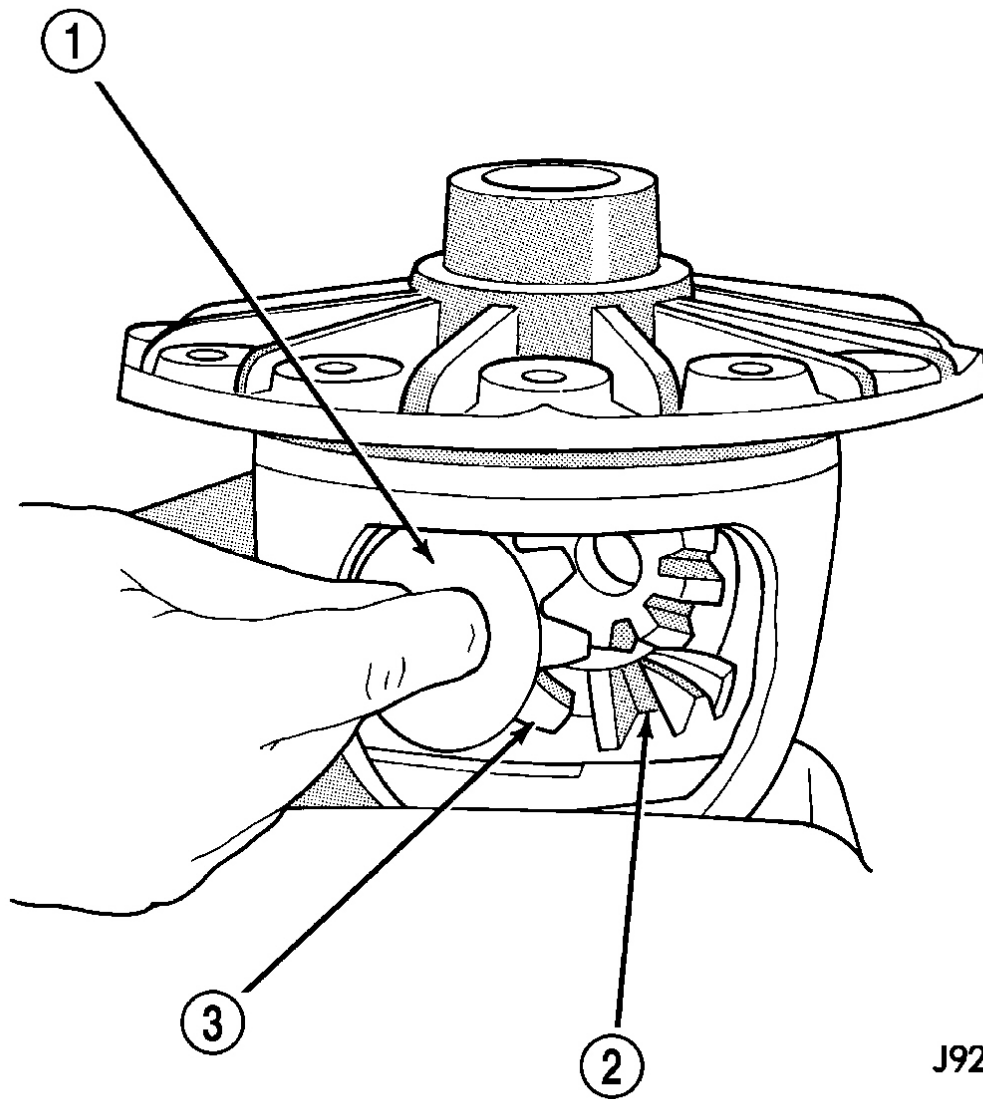


Fig. 177: Pinion Mate Gear
Courtesy of CHRYSLER LLC

1. Remove ring gear.
2. Remove roll-pin holding mate shaft in housing.
3. Remove pinion gear mate shaft.
4. Rotate differential side gears (2) and remove pinion gears (3) and thrust washers (1).
5. Remove differential side gears and thrust washers.

ASSEMBLY

DIFFERENTIAL



J9203-61

Fig. 178: Pinion Mate Gear
Courtesy of CHRYSLER LLC

1. Install differential side gears (2) and thrust washers.
2. Install pinion mate gears (3) and thrust washers (1).
3. Install pinion gear mate shaft.

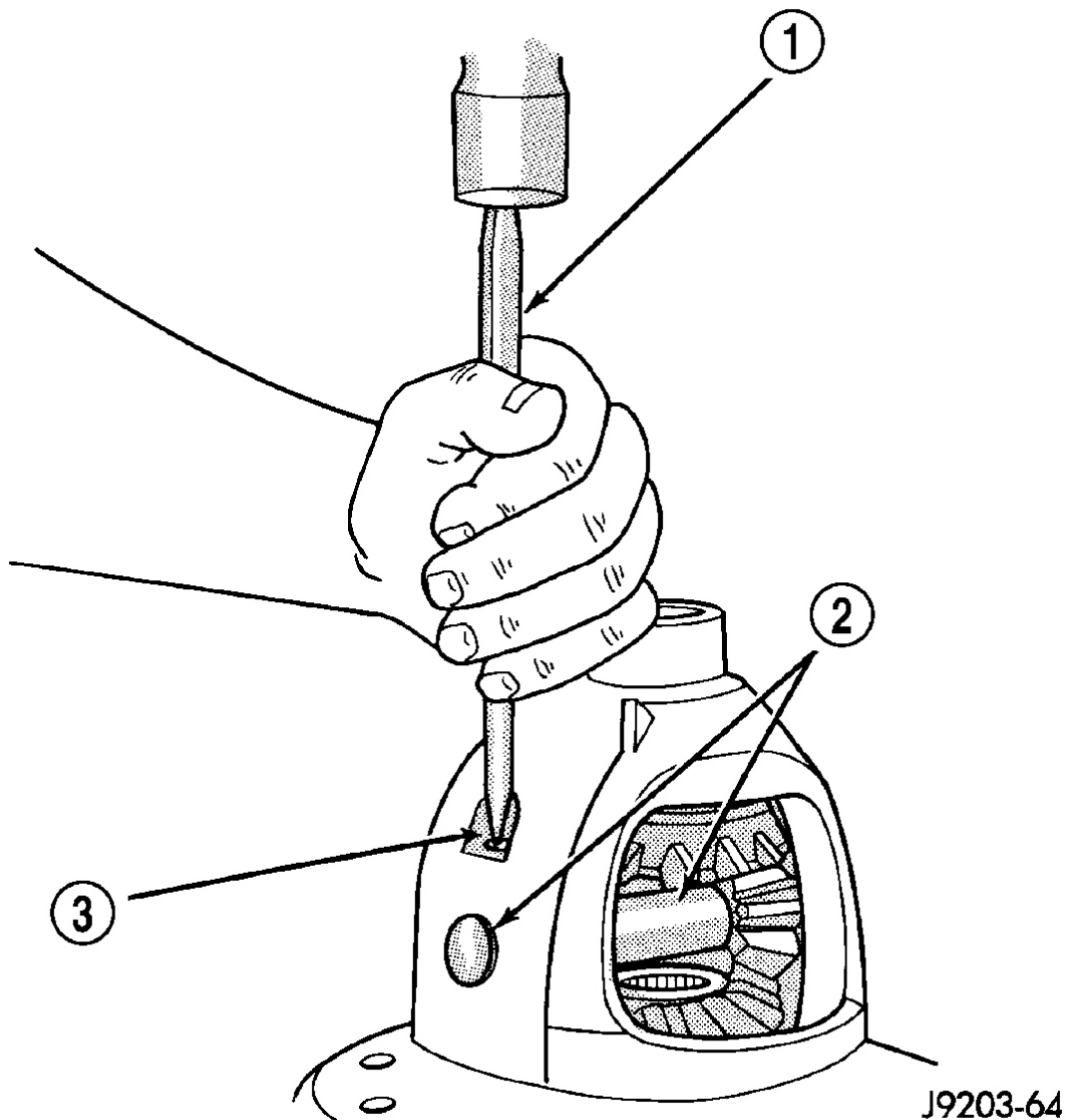
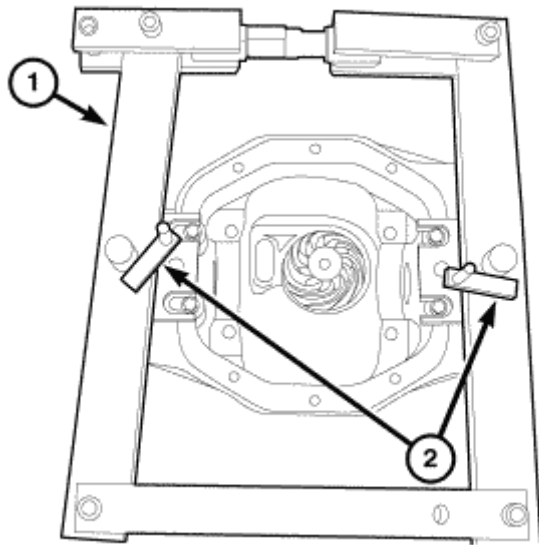


Fig. 179: Pinion Mate Shaft Roll-Pin
Courtesy of CHRYSLER LLC

4. Align hole in the pinion gear mate shaft (2) with the hole in the differential case.
5. Install the roll-pin (3) in the differential case with a hammer and punch (1). Peen the edge of the roll-pin hole in the differential case in two places 180° apart.
6. Lubricate all differential components with gear lubricant.
7. Install ring gear.

INSTALLATION

DIFFERENTIAL

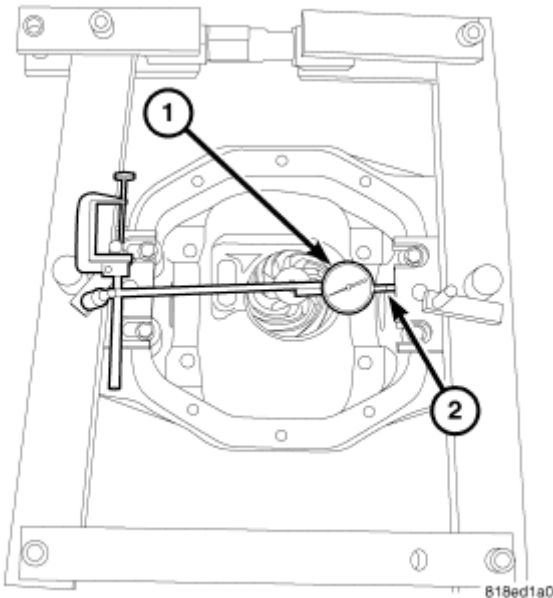


818ed1ad

Fig. 180: Identifying Spreader W-129-B & Spreader Retainers W-129-1
 Courtesy of CHRYSLER LLC

NOTE: If differential bearings or differential case are replaced, differential bearing preload and gear backlash must be adjusted.

1. Install Spreader W-129-B (1) and Spreader Retainers W-129-1 (2) on Spreader Adapters 9959 and tighten spreader turnbuckle finger-tight.



818ed1a0

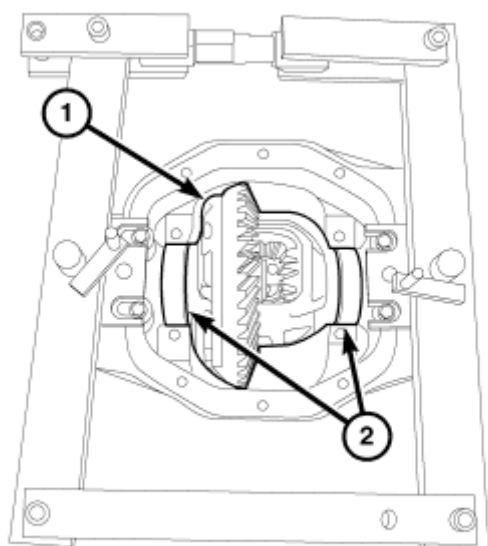
Fig. 181: Identifying Dial Indicator C-3339A & Indicator Plunger
 Courtesy of CHRYSLER LLC

2. Attach Dial Indicator C-3339A (1) to spreader retainer stud. Load indicator plunger (2) against opposite

side of the housing and zero the indicator

3. Spread the differential case 0.34 mm (0.013 in).

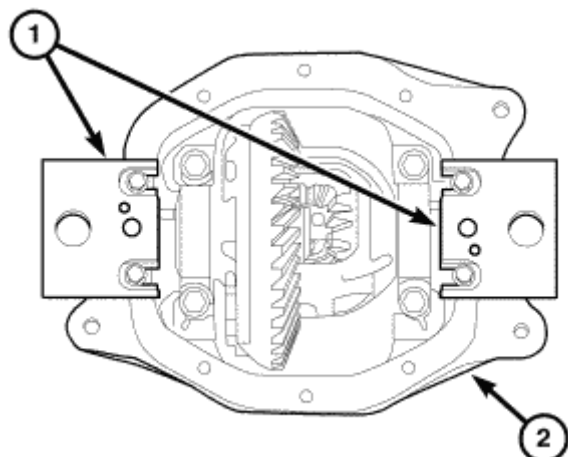
CAUTION: Never spread the differential housing over 0.34 mm (0.013 in). Failure to follow these instructions will damage the housing.



818ec3d7

Fig. 182: Removing/Installing Differential Case, Bearing Cups And Shims
Courtesy of CHRYSLER LLC

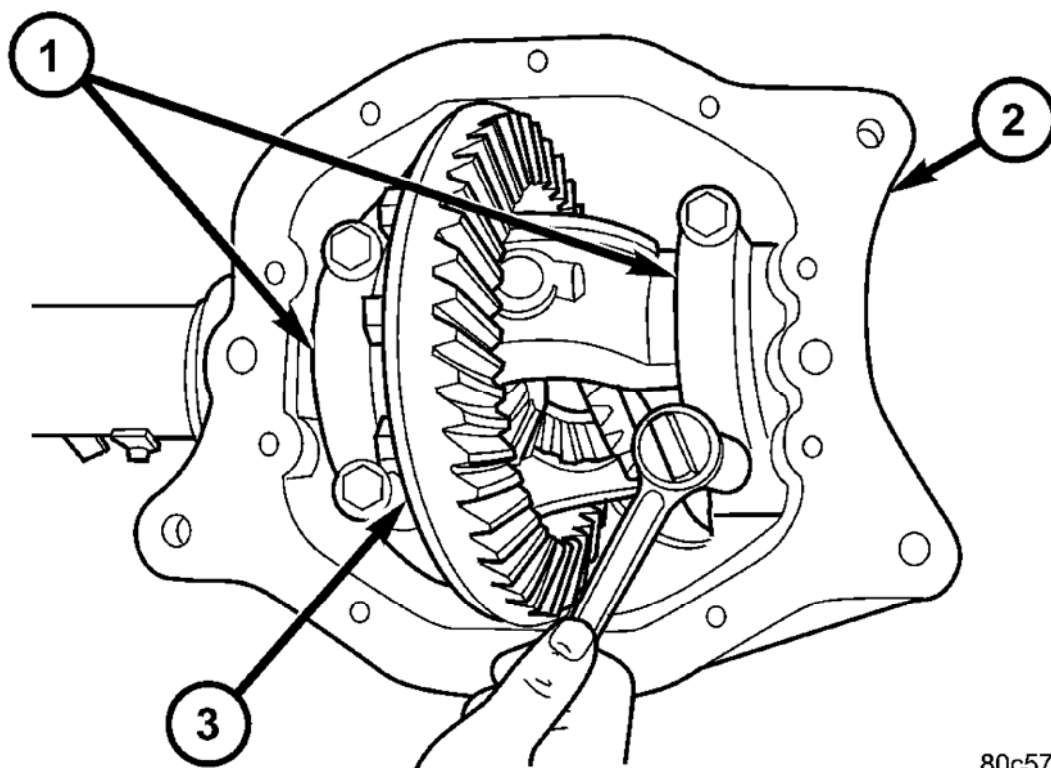
4. Remove dial indicator.
5. Install differential case (1) bearing cups (2) and shims into housing.
6. Install bearing caps and loosely install bolts.
7. Loosen turnbuckle remove spreader retainers and spreader.



818eb4f9

Fig. 183: Removing/Installing Spreader Adapters 9959 On Differential Housing
Courtesy of CHRYSLER LLC

8. Remove spreader adapters (1) from differential housing (2).



80c5786b

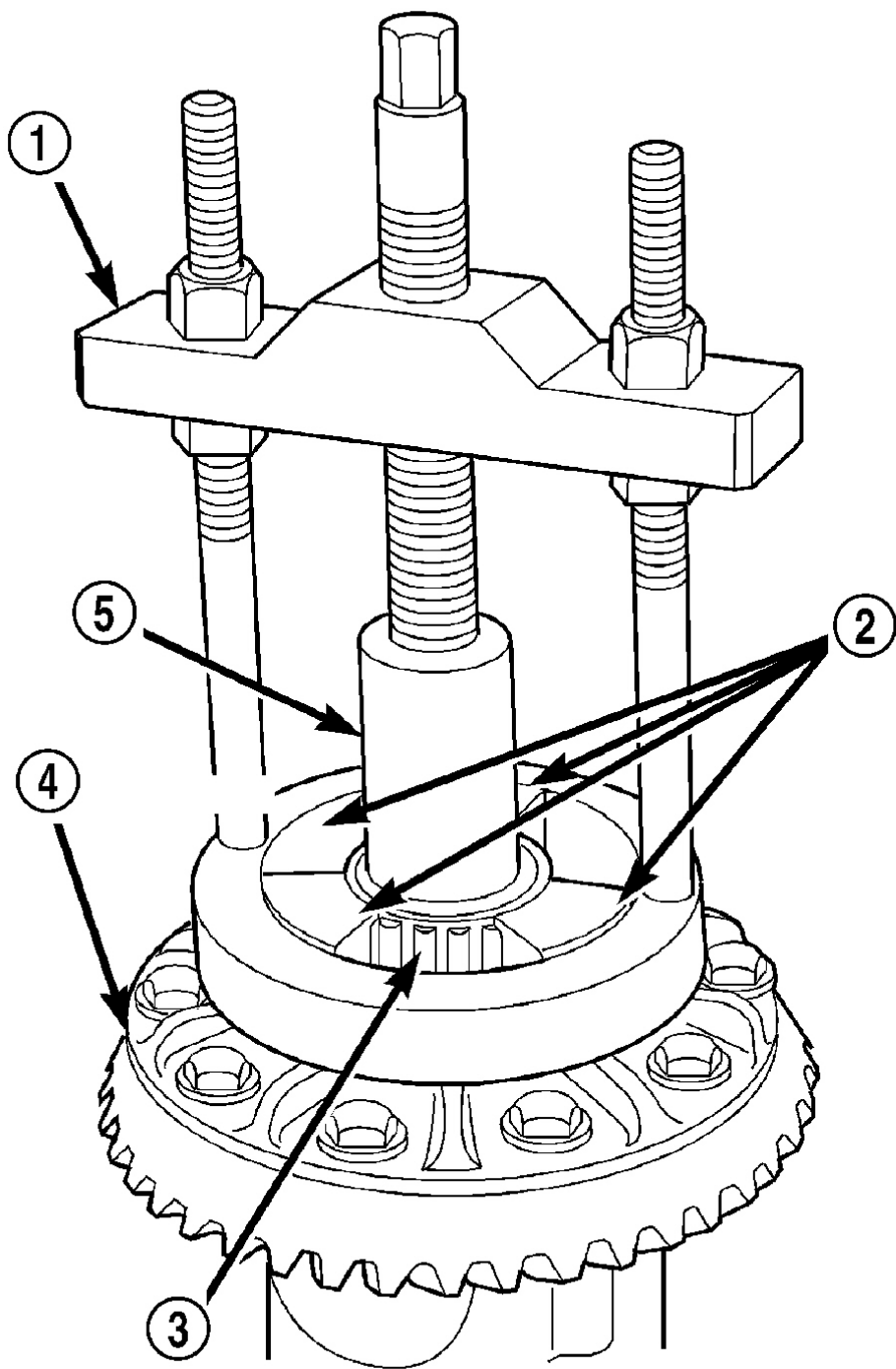
Fig. 184: Bearing Cap Bolts
Courtesy of CHRYSLER LLC

9. Tighten bearing cap (1) bolts in a criss-cross pattern to 54-68 N.m (39-50 ft. lbs.).
10. Install right axle shaft and half shafts.
11. Install differential housing cover.

BEARING-DIFFERENTIAL CASE

REMOVAL

BEARINGS-DIFFERENTIAL CASE



80a982f2

Fig. 185: Differential Bearing Puller
Courtesy of CHRYSLER LLC

1. Remove differential from the housing.

2. Remove bearings (3) from the differential case (4) with Puller C-293-PA (1), Adapters C-293-48 (2) and Plug SP-3289 (5).

INSTALLATION

BEARINGS-DIFFERENTIAL CASE

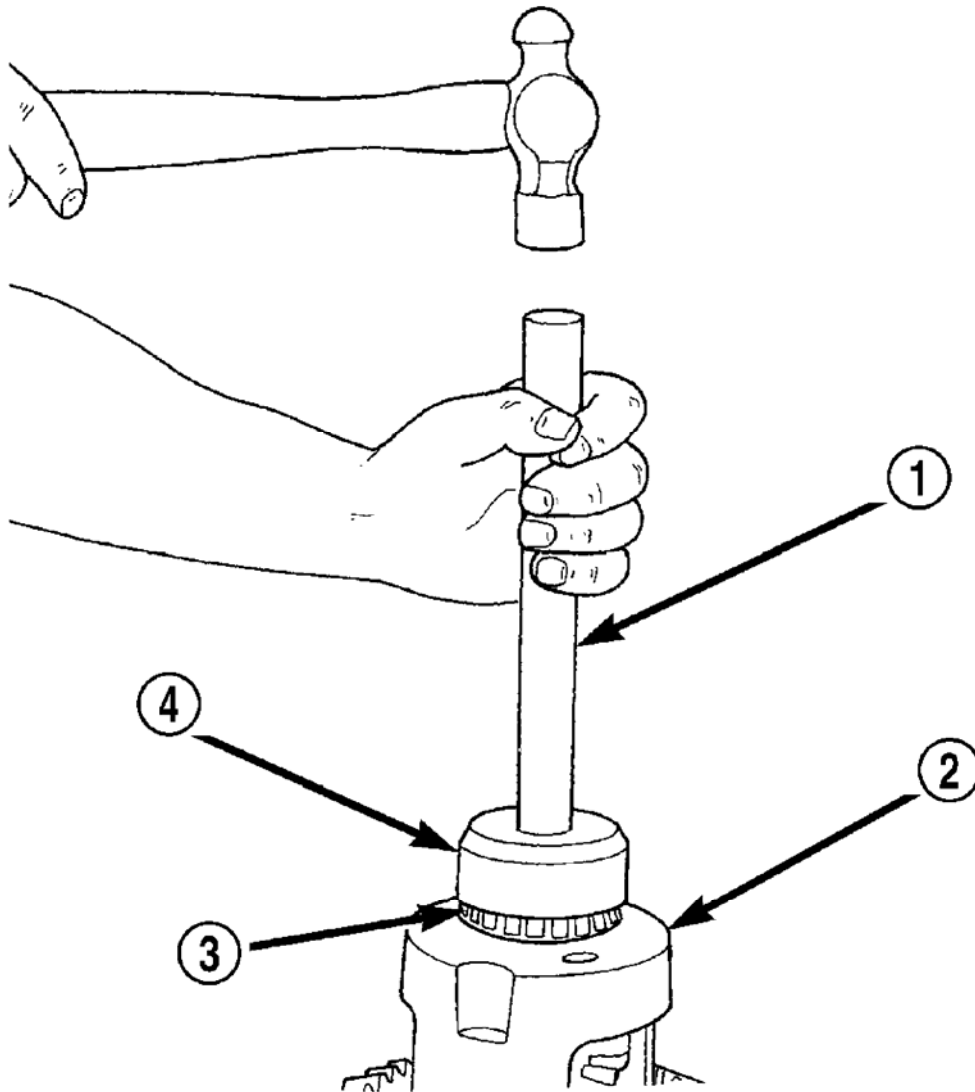


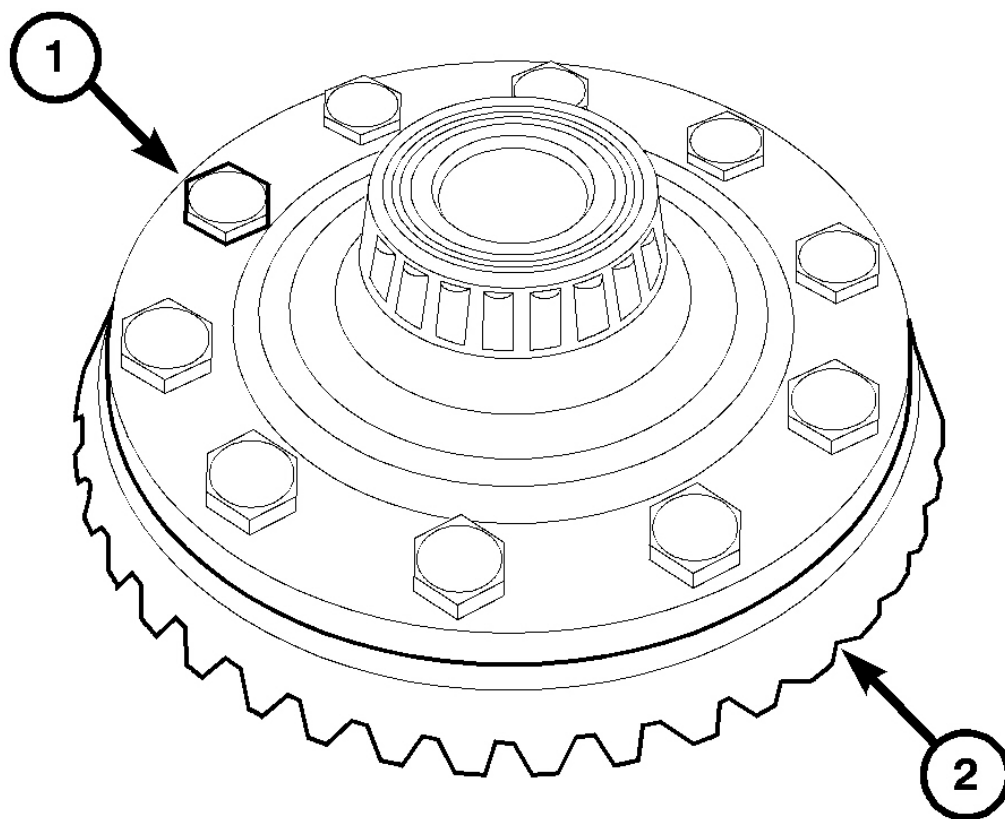
Fig. 186: Differential Case Bearings
Courtesy of CHRYSLER LLC

1. Install differential case (2) bearings (3) with Installer C-3716-A (4) and Handle C-4171(1).
2. Install differential into the housing.

GEAR-PINION/RING

REMOVAL

GEAR-PINION/RING

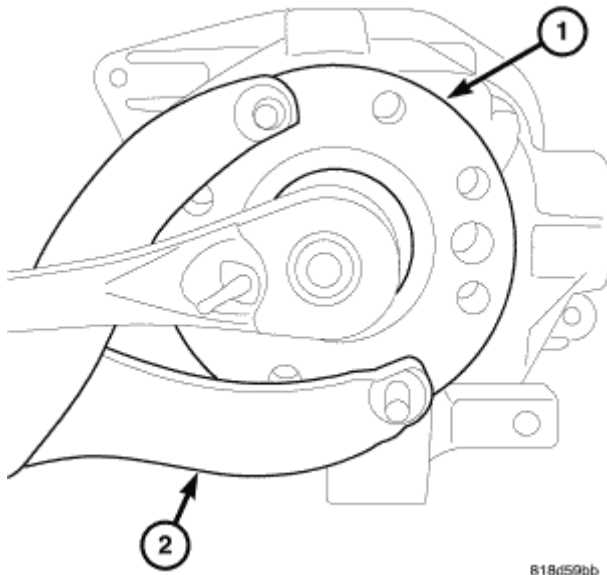


816f133e

Fig. 187: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

NOTE: The ring gear and pinion are serviced as a matched set. Never replace ring gear without replacing the matched pinion gear.

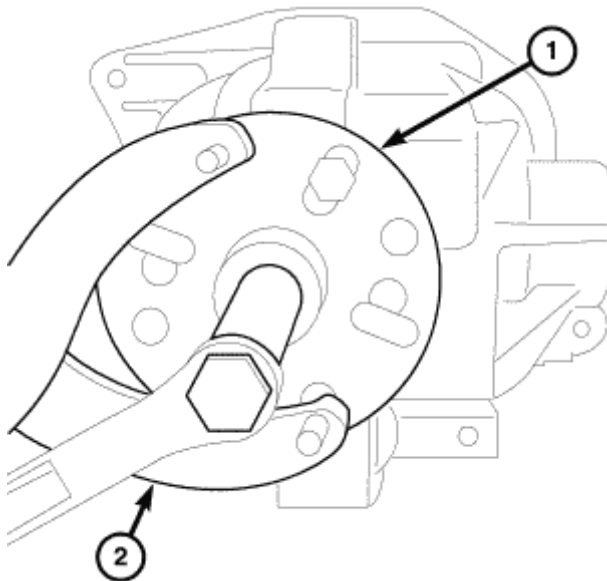
1. Remove differential from axle housing.
2. Place differential case in a vise with soft jaws.
3. Remove ring gear bolts (1) and tap ring gear (2) off differential case with a dead-blow hammer.



818d59bb

Fig. 188: Holding Pinion Flange With Flange Holder C-3281
 Courtesy of CHRYSLER LLC

4. Hold pinion flange (1) with Flange Holder C-3281 (2) and remove pinion nut.



818d59c3

Fig. 189: Removing Pinion Flange With Puller C-452 And Flange Holder C-3281
 Courtesy of CHRYSLER LLC

5. Remove pinion flange with Puller C-452 (1) and Flange Holder C-3281 (2).
6. Remove pinion gear from housing with dead-blow hammer.

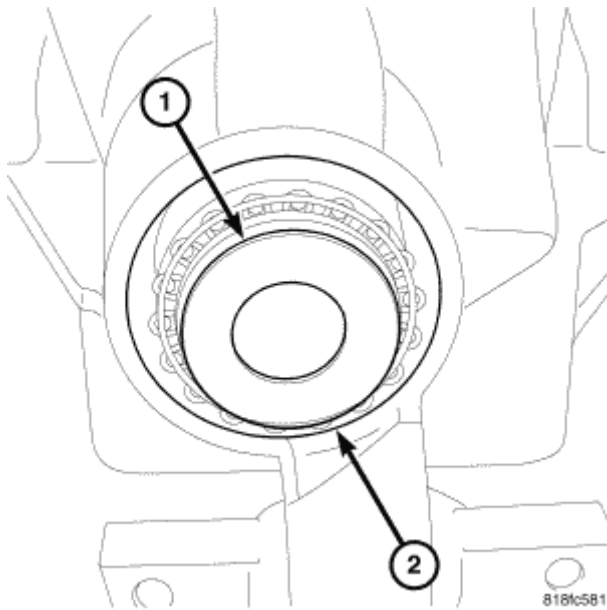


Fig. 190: Removing Oil Slinger From Housing
Courtesy of CHRYSLER LLC

7. Remove pinion seal with seal puller.
8. Remove oil slinger (1) from housing (2).

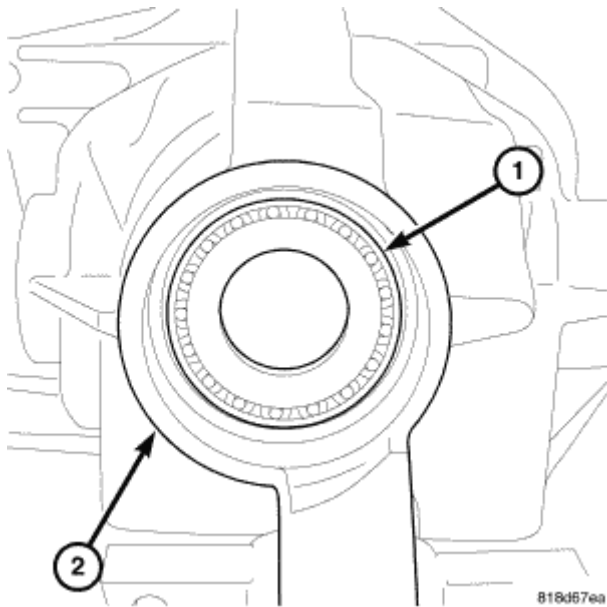
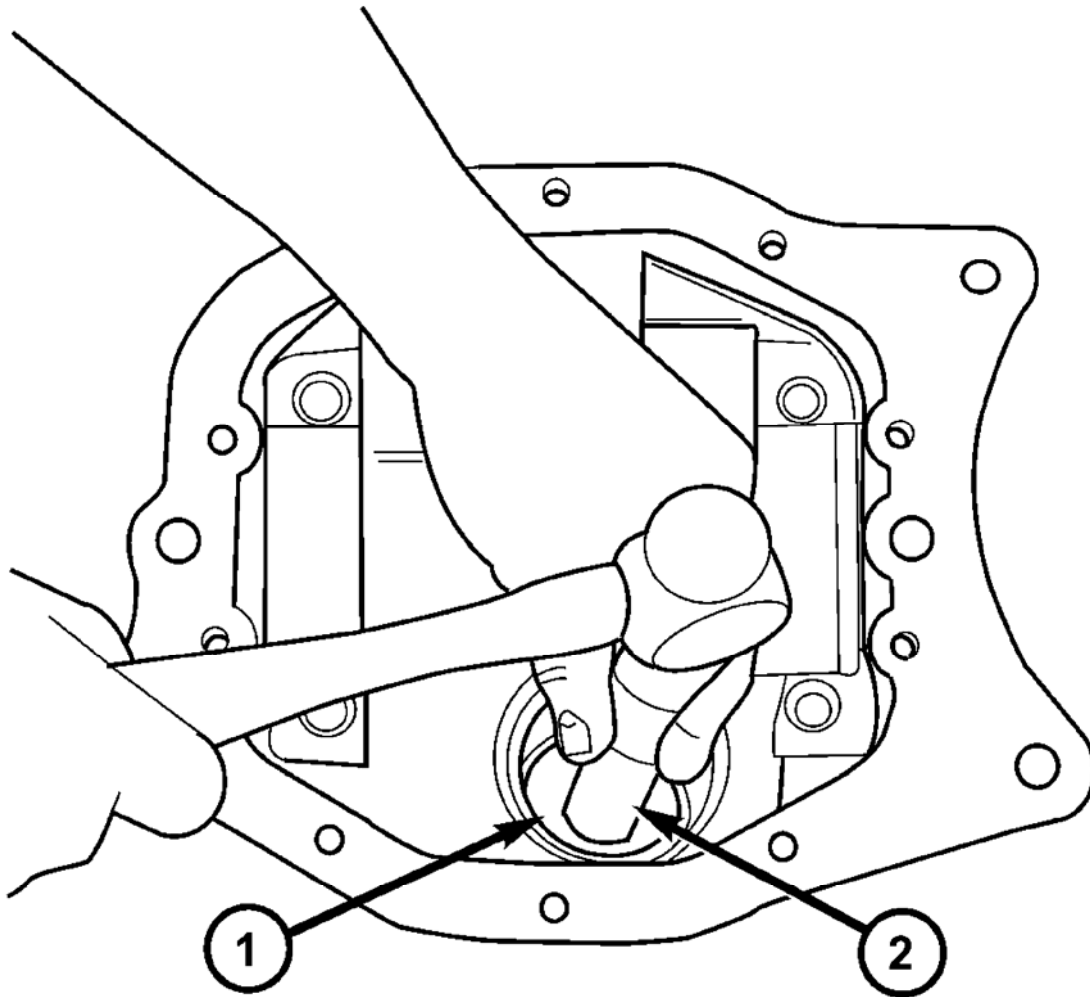


Fig. 191: Removing Front Pinion Bearing From Housing
Courtesy of CHRYSLER LLC

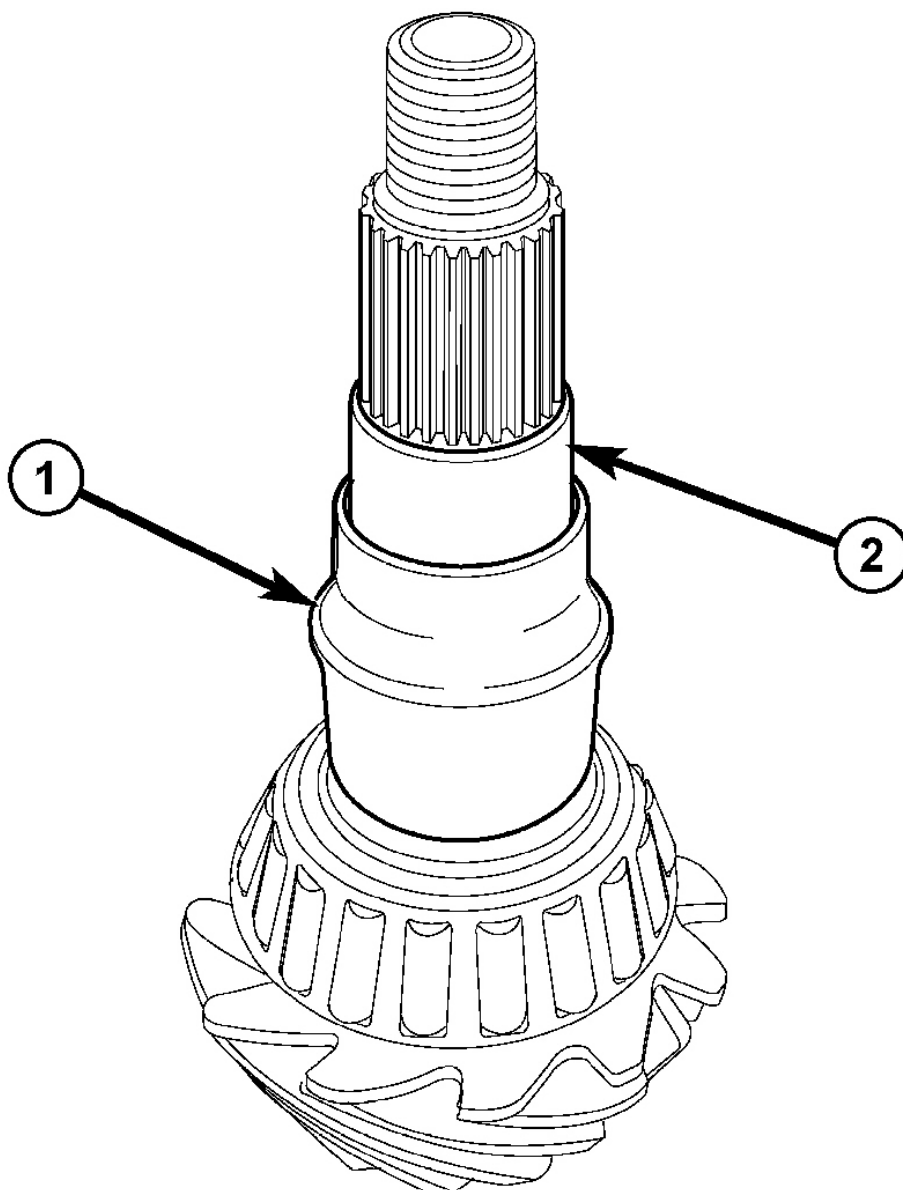
9. Remove front pinion bearing (1) from housing (2).



80c58955

Fig. 192: Front Pinion Bearing Cup
Courtesy of CHRYSLER LLC

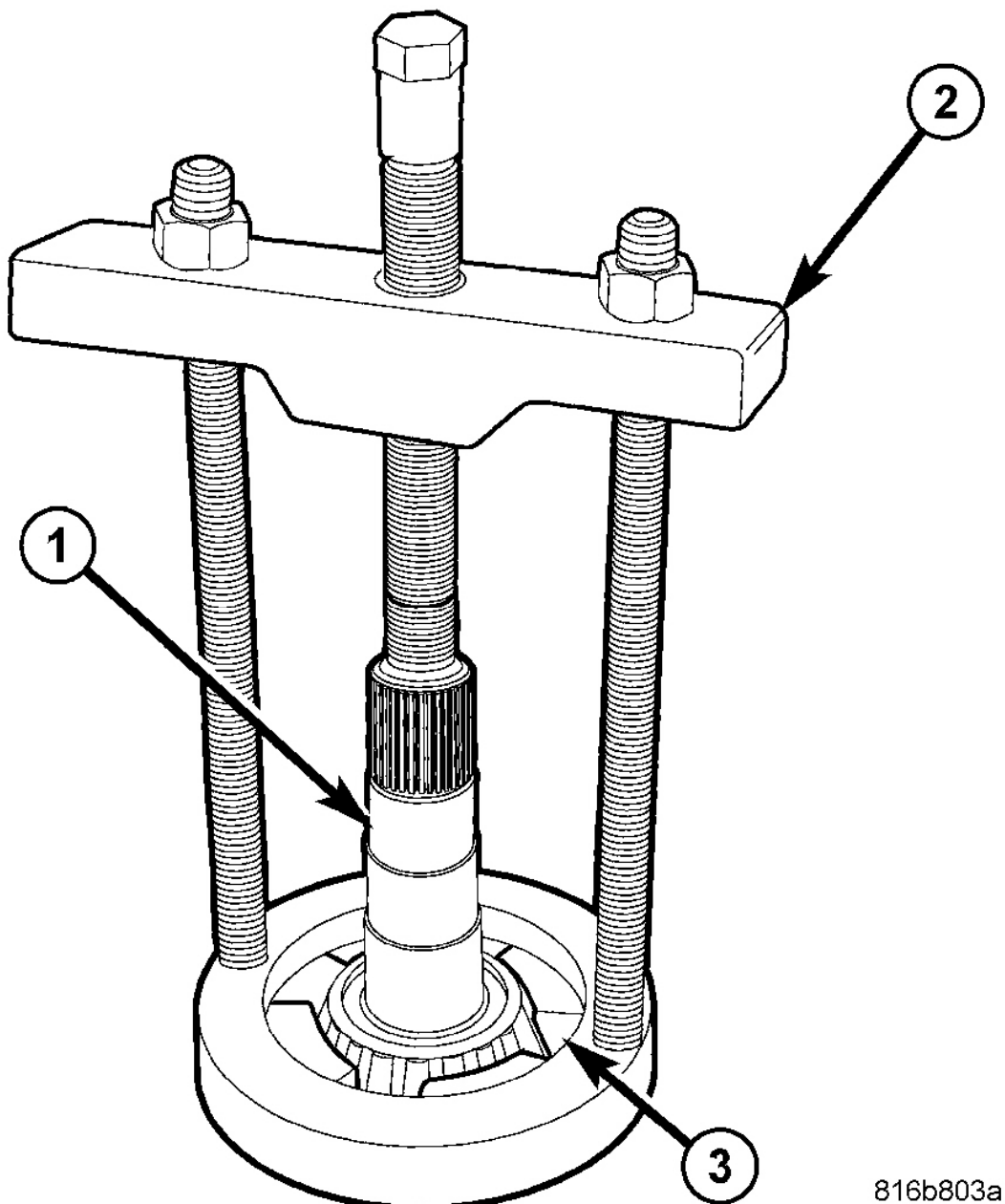
10. Remove rear pinion bearing cup with a hammer and drift.
11. Remove front pinion bearing cup with Remover D-149 (1) and Handle C-4171 (2).



816b5dcb

Fig. 193: Removing/Installing Collapsible Spacer From Pinion Shaft
Courtesy of CHRYSLER LLC

12. Remove collapsible spacer (1) from pinion shaft (2).



816b803a

Fig. 194: Removing Rear Pinion Bearing From Pinion With Puller C-293-PA And Adapters C-293-42

Courtesy of CHRYSLER LLC

13. Remove rear pinion bearing from the pinion (1) with Puller C-293-PA (2) and Adapters C-293-42 (3).

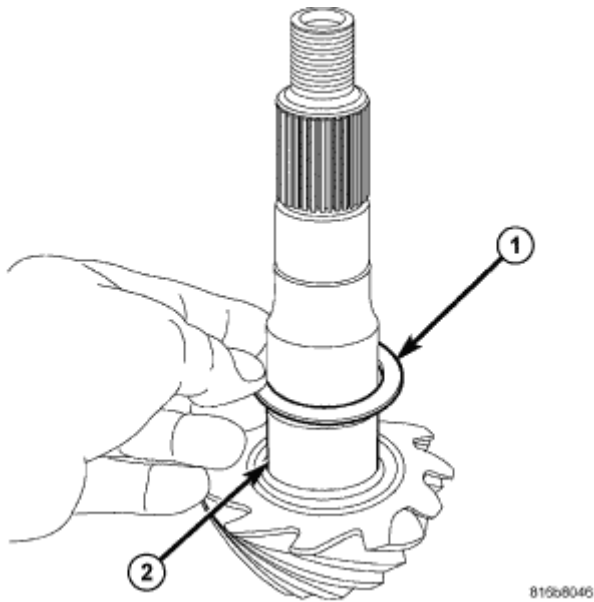


Fig. 195: Identifying Pinion Depth Shim And Pinion Shaft
 Courtesy of CHRYSLER LLC

14. Remove pinion depth shim (1) from the pinion shaft (2) and record thickness.

INSTALLATION

GEAR-PINION/RING

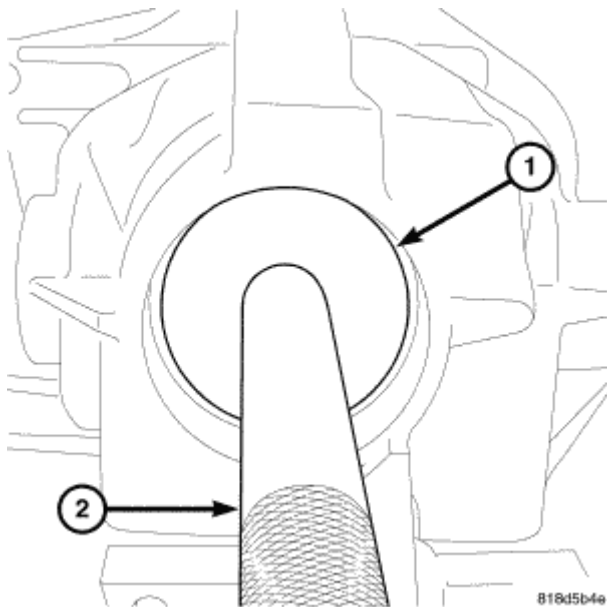


Fig. 196: Installing Front Bearing Cup With Installer D-146 And Handle C-4171
 Courtesy of CHRYSLER LLC

NOTE: Pinion depth shims are located under the rear pinion bearing. Refer to **PINION DEPTH MEASUREMENT** to select the proper thickness shim before installing

pinion gear. If ring and pinion gears are reused, the pinion depth shim should not require replacement.

1. Install front bearing cup with Installer D-146 (1) and Handle C-4171 (2).

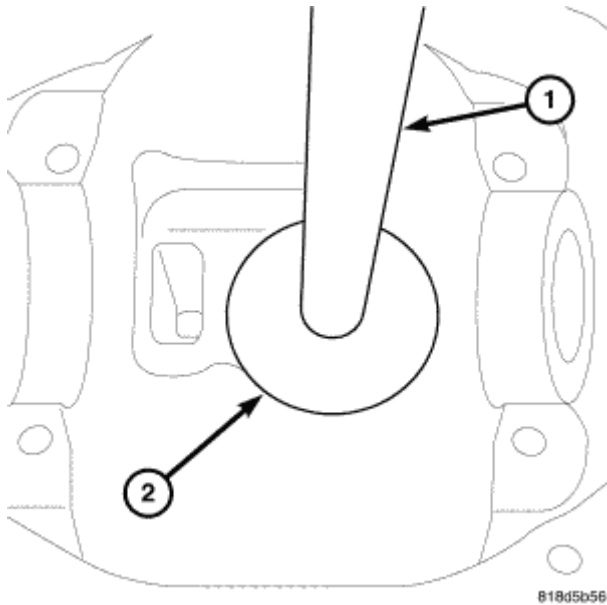


Fig. 197: Installing Rear Bearing Cup With Installer C-4308 And Handle C-4171
Courtesy of CHRYSLER LLC

2. Install rear bearing cup with Installer C-4308 (2) and Handle C-4171 (1).

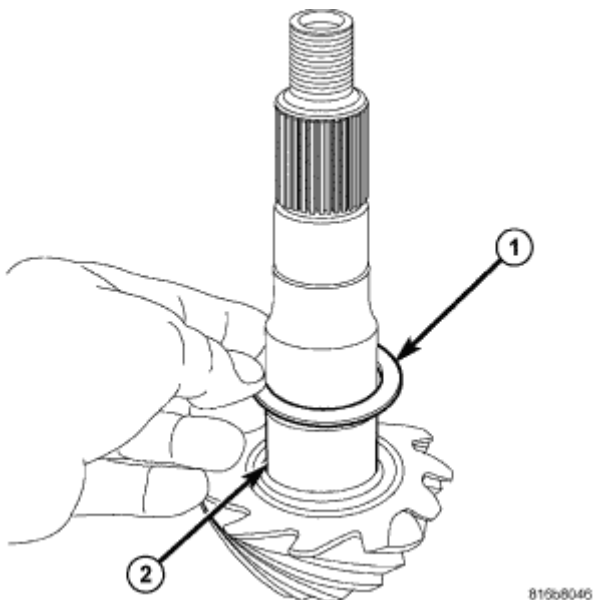
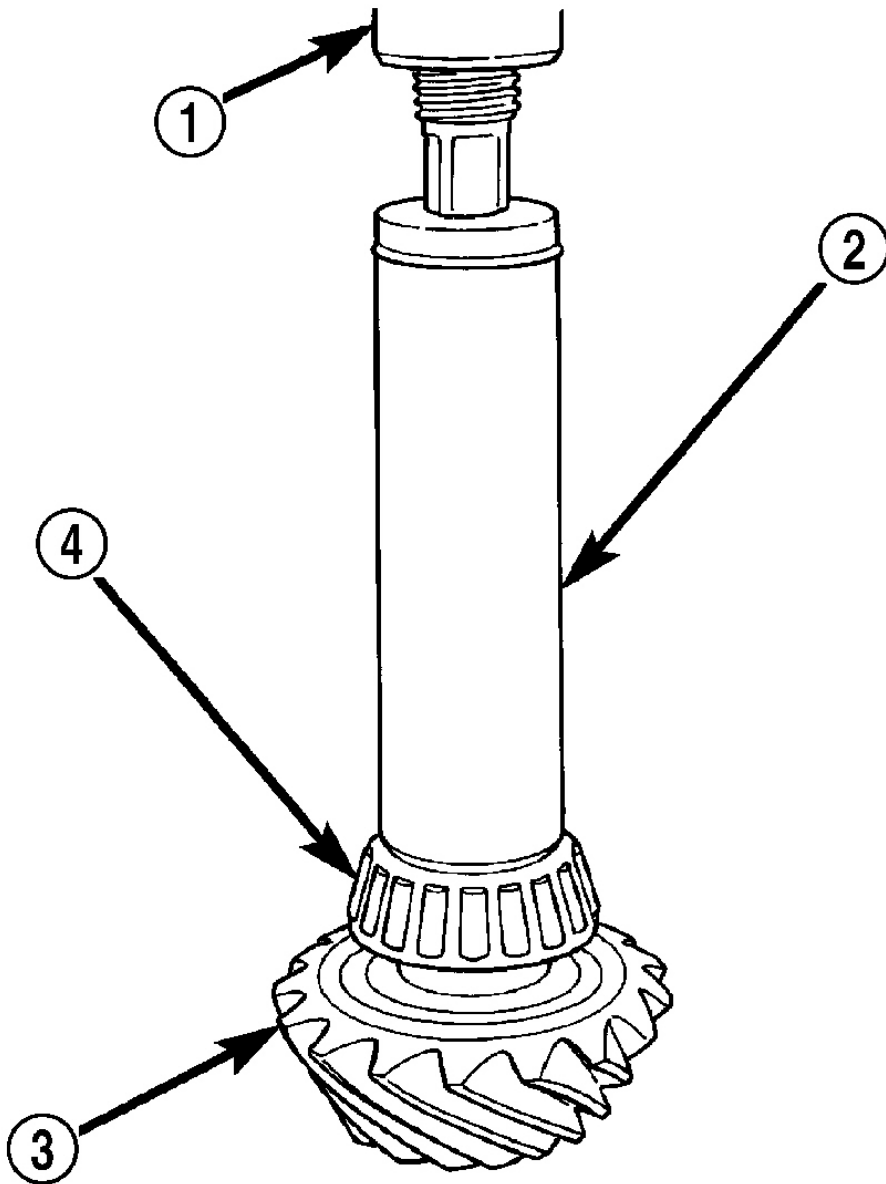


Fig. 198: Identifying Pinion Depth Shim And Pinion Shaft
Courtesy of CHRYSLER LLC

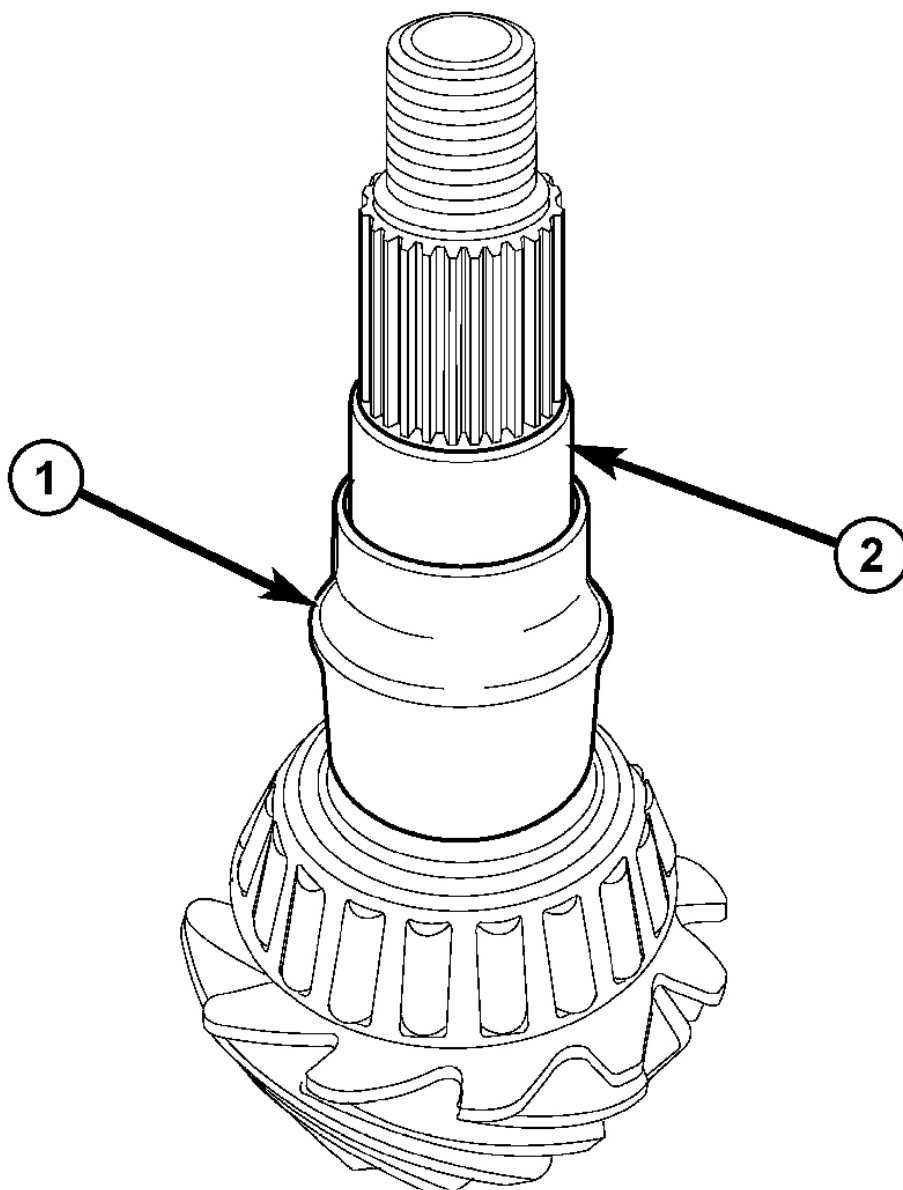
3. Install pinion depth shim (1) on pinion shaft (2).



80be4607

Fig. 199: Rear Pinion Bearing
Courtesy of CHRYSLER LLC

4. Install rear pinion bearing (4) on pinion (3) with Installer C-4040 (2) and a press (1).



816b5dcb

Fig. 200: Collapsible Spacer
Courtesy of CHRYSLER LLC

5. Install a **new** collapsible spacer (1) on pinion shaft (2).
6. Install pinion in housing.

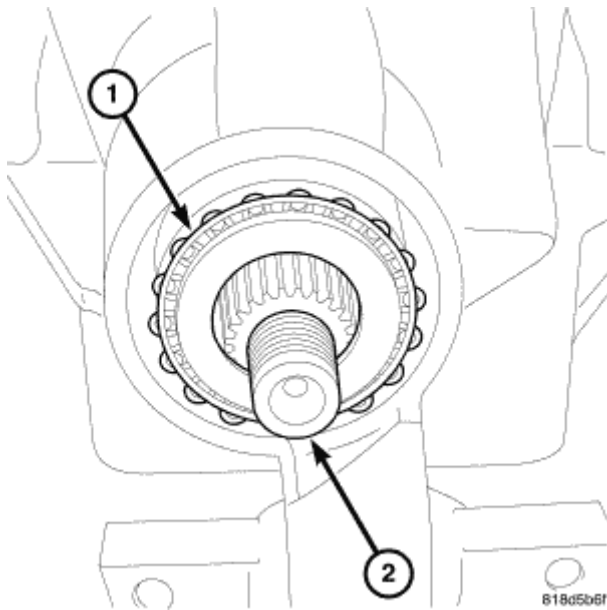


Fig. 201: Installing Front Pinion Bearing On Pinion Shaft
Courtesy of CHRYSLER LLC

7. Install front pinion bearing (1) on pinion shaft (2).

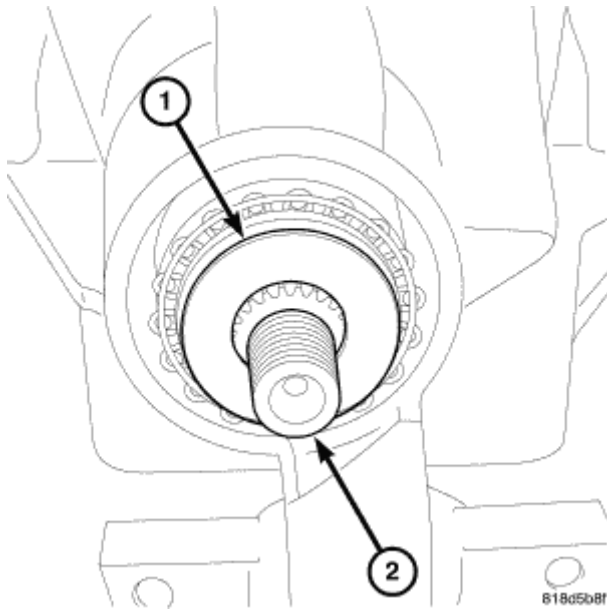
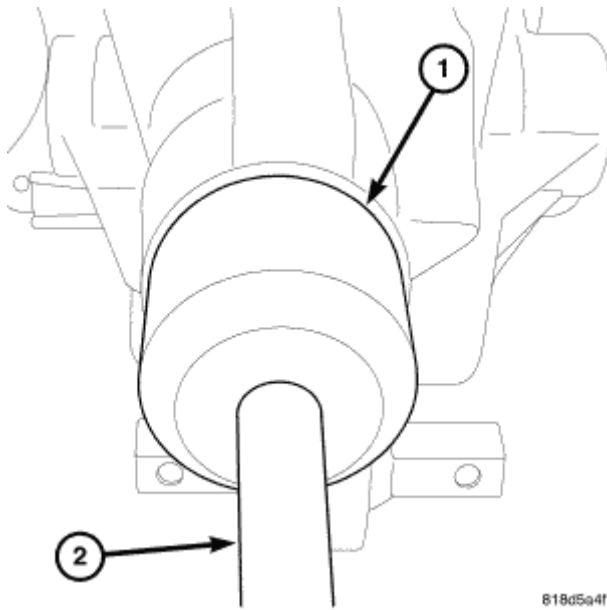


Fig. 202: Installing Front Pinion Bearing Oil Slinger On Pinion Shaft
Courtesy of CHRYSLER LLC

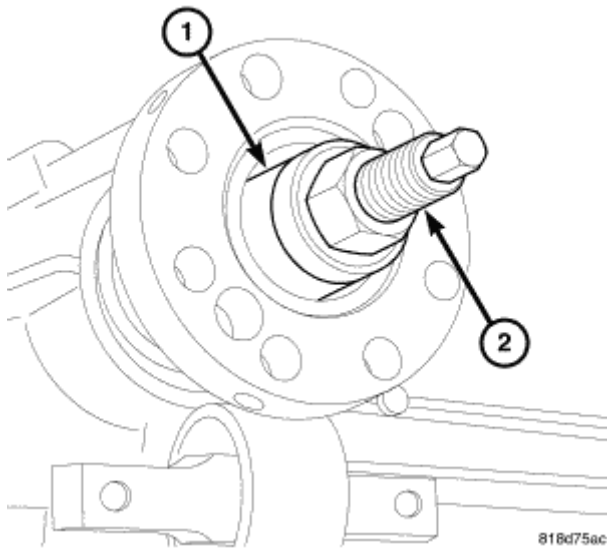
8. Install front pinion bearing oil slinger (1) on pinion shaft (2).



818d5a4f

Fig. 203: Identifying Installer 8681 & Handle C-4171
Courtesy of CHRYSLER LLC

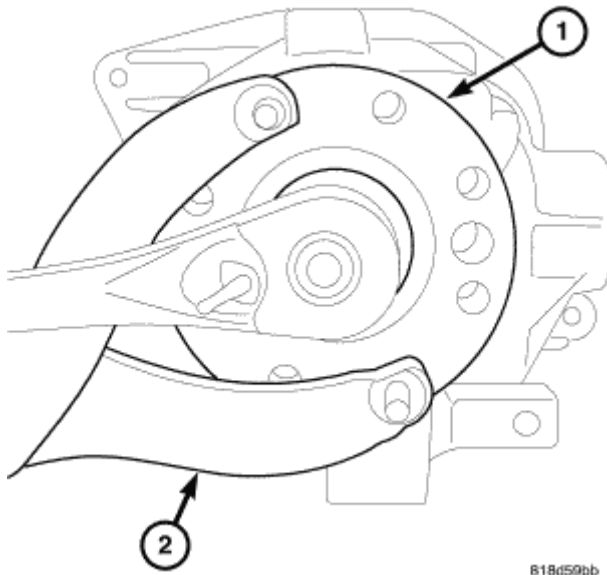
9. Apply a light coating of gear lubricant on the lip of pinion seal. Install seal with Installer 8681 (1) and Handle C-4171 (2).



818d75ac

Fig. 204: Identifying Installer W-162-D & Screw 8112
Courtesy of CHRYSLER LLC

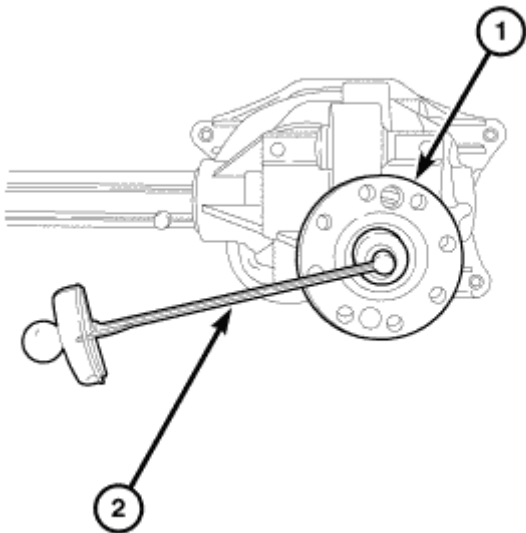
10. Install pinion flange with Installer W-162-D (1) Screw 8112 (2).



818d59bb

Fig. 205: Holding Pinion Flange With Flange Holder C-3281
 Courtesy of CHRYSLER LLC

11. Install **new** pinion nut. Hold flange (1) with Holder C-3281 (2) and tighten the nut to 217 N.m (160 ft. lbs.). **Do not exceed minimum tighten torque 217 N.m (160 ft. lbs.).**
12. With a torque wrench set at 352 N.m (260 ft. lbs.) tighten pinion nut until pinion end play is eliminated.



818df5cf

Fig. 206: Measuring Pinion Torque To Rotate (PTTR) With An Inch Pound Torque Wrench
 Courtesy of CHRYSLER LLC

13. Rotate pinion several times to seat bearings and verify pinion (1) rotates smoothly.
14. Slowly tighten the pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotate is achieved. Measure rotating torque frequently to avoid over crushing the collapsible spacer.

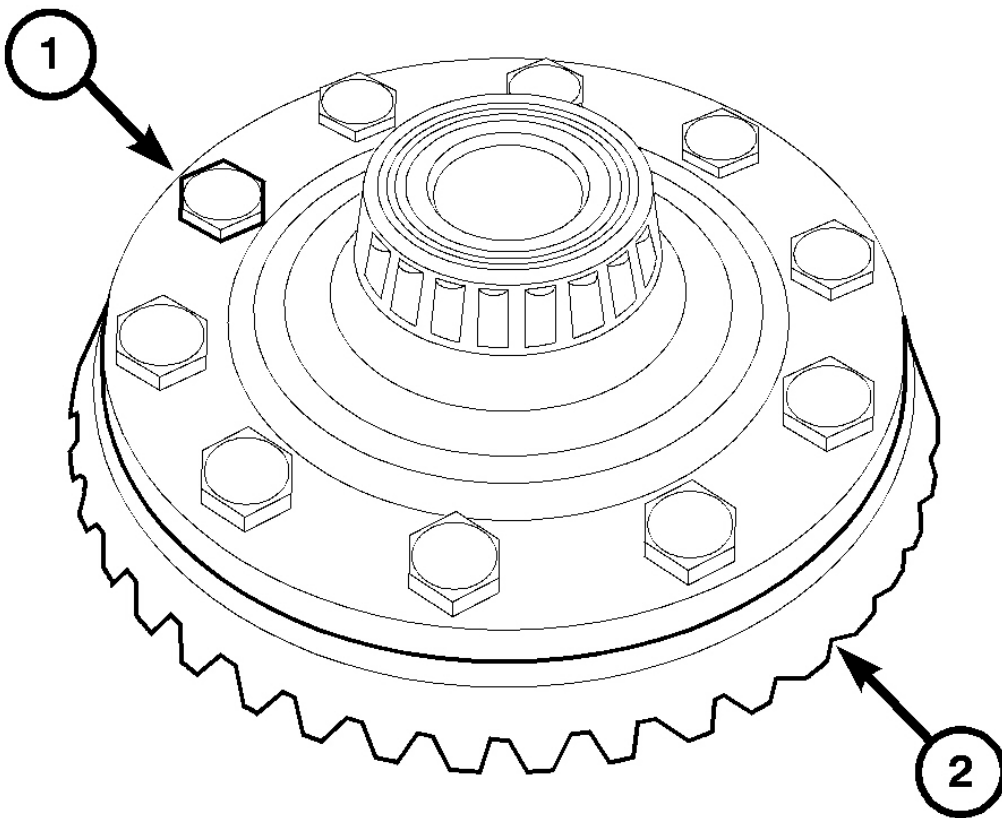
15. Measure pinion torque to rotate (PTTR) with an inch pound torque wrench (2).

Pinion Torque To Rotate is:

Original Bearings: 1.0 - 2.2 N.m (10 - 20 in. lbs.).

New Bearings: 1.7 - 2.8 N.m (15 - 25 in. lbs.).

CAUTION: Never loosen pinion gear nut to decrease pinion rotating torque and never exceed specified preload torque. Failure to follow these instructions will result in damage.



816f133e

Fig. 207: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

16. Invert differential case and start two ring gear bolts. This will provide case-to-ring gear bolt hole

alignment.

17. Invert differential case in the vise. Install **new** ring gear (2) bolts (1) and alternately tighten to 108 N.m (80 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

18. Install differential in housing.

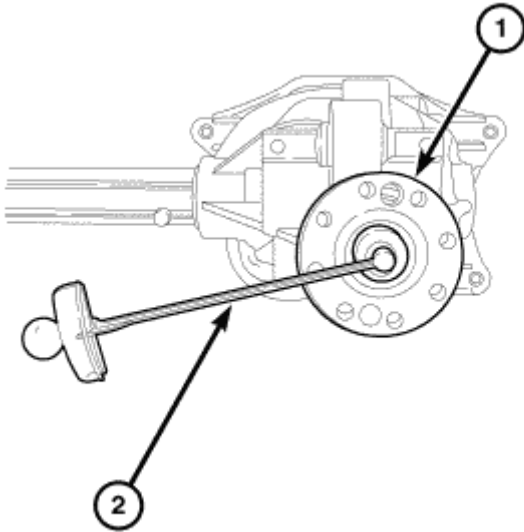


Fig. 208: Measuring Pinion Torque To Rotate (PTTR) With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

19. Measure Total Torque to Rotate (TTTR) with an inch pound torque wrench (2). This will verify the correct differential bearing preload.

Total Torque to Rotate (TTTR) is Pinion Torque To Rotate (PTTR) plus:

Gear Ratio 3.21: 0.53 - 0.87 N.m (4.6 - 7.7 in. lbs.)

Gear Ratio 3.73: 0.45 - 0.75 N.m (3.9 - 6.6 in. lbs.)

If TTTR is high, decrease shim thickness equally on both sides of the differential and check TTTR again. If TTTR is low, increase shim thickness equally on both sides of the differential and check TTTR again.

20. Verify differential gear contact pattern.

REAR AXLE - 8 1/4

DIAGNOSIS AND TESTING

REAR AXLE - 8 1/4

GEAR NOISE

Axle gear noise can be caused by insufficient lubricant, incorrect backlash, incorrect pinion depth, tooth contact, worn/damaged gears, or the carrier housing not having the proper offset and squareness.

Gear noise usually happens at a specific speed range. The noise can also occur during a specific type of driving condition. These conditions are acceleration, deceleration, coast, or constant load.

When road testing, first warm-up the axle fluid by driving the vehicle at least 5 miles and then accelerate the vehicle to the speed range where the noise is the greatest. Shift out-of-gear and coast through the peak-noise range. If the noise stops or changes greatly check for:

- Insufficient lubricant.

- Incorrect ring gear backlash.

- Gear damage.

Differential side and pinions gears, usually do not cause noise during straight-ahead driving, when the gears are unloaded. The side gears are loaded during turns. A worn pinion mate shaft can also cause a snapping or a knocking noise.

BEARING NOISE

Bearing noise can be either a whining or a growling sound.

Pinion bearings have a constant high pitch noise, because it rotates at a faster rate. This noise changes with vehicle speed. If noise is heard under a load, the rear pinion bearing is the source. If noise is heard during a coast, the front pinion bearing is the source.

Differential bearings usually produce a low pitch noise. The differential bearing noise is constant and varies only with vehicle speed.

Axle shaft bearing noise generally changes when the bearings are loaded. Turn vehicle sharply to the left and the right during a road test. This will load and unload the bearings and change the noise level. If axle bearing damage is slight, the noise is usually not noticeable at speeds above 30 m.p.h.

LOW SPEED KNOCK

Low speed knock is generally caused by:

- Worn U-joints/CV joint.

- Worn side-gear thrust washers.

- Worn pinion shaft bore.

VIBRATION

Vibration at the rear of the vehicle is usually caused by:

- Damaged drive shaft.
- Missing drive shaft balance weight(s).
- Worn or out-of-balance wheels.
- Loose wheel lug nuts.
- Worn U-joints/CV joint.
- Loose/broken springs.
- Damaged axle shaft bearing(s).
- Loose pinion gear nut.
- Excessive pinion yoke run out.
- Bent axle shaft(s).

Check for loose or damaged front-end components or engine/transmission mounts. These components can contribute to what appears to be an axle vibration. Also look at engine accessories, brackets and drive belts.

NOTE: **All driveline components should be examined before starting any repair.**

DRIVELINE SNAP

A snap or clunk noise when the vehicle is shifted into gear or the clutch engaged, can be caused by:

- High engine idle speed.
- Transmission shift operation.
- Loose engine/transmission/transfer case mounts.
- Worn U-joints/CV joint.
- Loose spring mounts.
- Loose pinion gear nut and yoke.
- Excessive ring gear backlash.
- Excessive side gear to case clearance.

To determined the source of a snap/clunk noise, raise vehicle on a hoist with the wheels free to rotate. Have a helper shift the transmission into gear and listen for the noise.

DIAGNOSTIC CHART

Condition	Possible Causes	Correction
Wheel Noise	1. Wheel loose. 2. Worn wheel bearing.	1. Tighten loose nuts. 2. Replace bearing.
Axle Shaft Noise	1. Misaligned axle tube. 2. Bent or sprung axle shaft.	1. Inspect axle tube alignment. Correct as necessary. 2. Inspect and correct as necessary.

Axle Shaft Broke	1. Misaligned axle tube. 2. Vehicle overloaded. 3. Erratic clutch operation. 4. Grabbing clutch.	1. Replace the broken shaft after correcting tube mis-alignment. 2. Replace broken shaft and avoid excessive weight on vehicle. 3. Replace broken shaft and avoid or correct erratic clutch operation. 4. Replace broken shaft and inspect and repair clutch as necessary.
Differential Cracked	1. Improper adjustment of the differential bearings. 2. Excessive ring gear backlash. 3. Vehicle overloaded. 4. Erratic clutch operation.	1. Replace case and inspect gears and bearings for further damage. Set differential bearing pre-load properly. 2. Replace case and inspect gears and bearings for further damage. Set ring gear backlash properly. 3. Replace case and inspect gears and bearings for further damage. Avoid excessive vehicle weight. 4. Replace case and inspect gears and bearings for further damage. Avoid erratic use of clutch.
Differential Gears Scored	1. Insufficient lubrication. 2. Improper grade of lubricant. 3. Excessive spinning of one wheel/tire.	1. Replace scored gears. Fill differential with the correct fluid type and quantity. 2. Replace scored gears. Fill differential with the correct fluid type and quantity. 3. Replace scored gears. Inspect all gears, pinion bores, and shaft for damage. Service as necessary.
Loss Of Lubricant	1. Lubricant level too high. 2. Worn axle shaft seals. 3. Cracked differential housing. 4. Worn pinion seal. 5. Worn/scored yoke. 6. Axle cover not properly sealed.	1. Drain lubricant to the correct level. 2. Replace seals. 3. Repair as necessary. 4. Replace seal. 5. Replace yoke and seal. 6. Remove, clean and seal cover.
Axle Overheating	1. Lubricant level low. 2. Improper grade of lubricant. 3. Bearing pre-loads too high. 4. Insufficient ring gear backlash.	1. Fill differential to correct level. 2. Fill differential with the correct fluid type and quantity. 3. Adjust bearing pre-loads. 4. Adjust ring gear backlash.
Gear Teeth Broke	1. Overloading.	1. Replace gears. Examine other gears and bearings for possible

	2. Erratic clutch operation. 3. Ice-spotted pavement. 4. Improper adjustments.	damage. 2. Replace gears and examine the remaining parts for damage. Avoid erratic clutch operation. 3. Replace gears and examine remaining parts for damage. 4. Replace gears and examine remaining parts for damage. Ensure ring gear backlash is correct.
Axle Noise	1. Insufficient lubricant. 2. Improper ring gear and pinion adjustment. 3. Unmatched ring gear and pinion. 4. Worn teeth on ring gear or pinion. 5. Loose pinion bearings. 6. Loose differential bearings. 7. Ring gear run-out. 8. Loose differential bearing cap bolts. 9. Housing not machined properly.	1. Fill differential with the correct fluid type and quantity. 2. Check ring gear and pinion contact pattern. Adjust backlash or pinion depth. 3. Replace gears with a matched ring gear and pinion. 4. Replace ring gear and pinion. 5. Adjust pinion bearing pre-load. 6. Adjust differential bearing pre-load. 7. Measure ring gear run-out. Replace components as necessary. 8. Inspect differential components and replace as necessary. Ensure that the bearing caps are torqued to t specifications. 9. Replace housing.

REMOVAL

REAR AXLE - 8 1/4

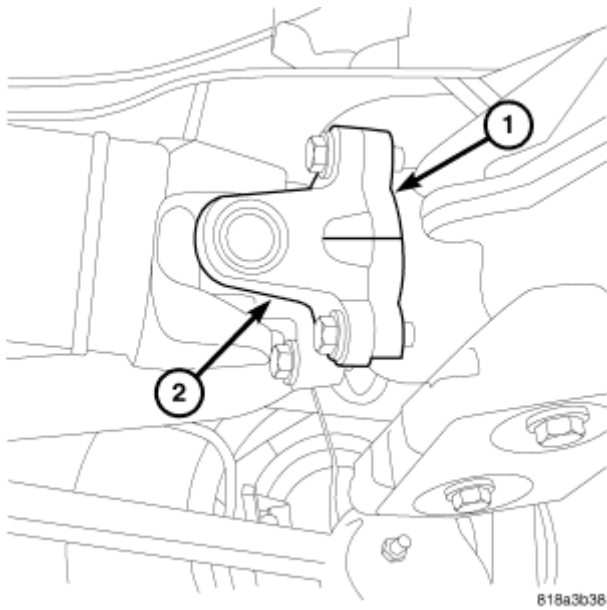


Fig. 209: Identifying Line Across Axle Flange & Propeller Shaft Flange
 Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Position a lift/jack under the axle and secure axle to device.
3. Mark axle pinion flange (1) and propeller shaft flange (2) for installation reference.
4. Remove propeller shaft and suspend under the vehicle.

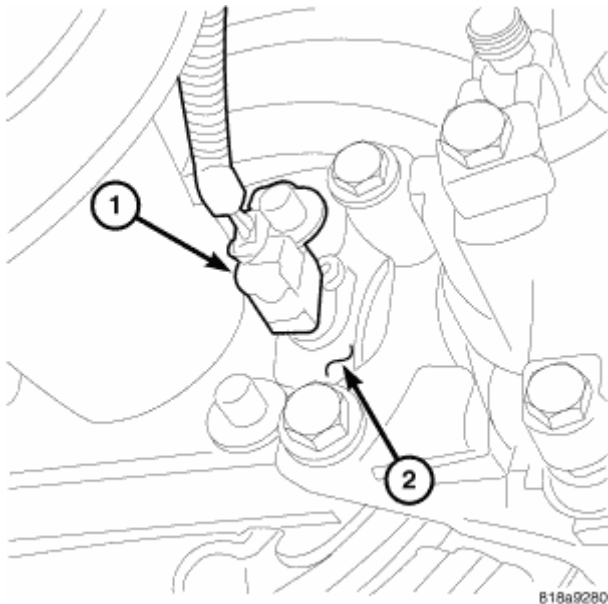


Fig. 210: Identifying Brake Sensor & Axle
 Courtesy of CHRYSLER LLC

5. Remove brake sensor (1) from axle (2) and remove calipers, rotors and cables.

NOTE: The parking brake is self-adjusting, and cables must be locked out before removal. Refer to ADJUSTMENTS .

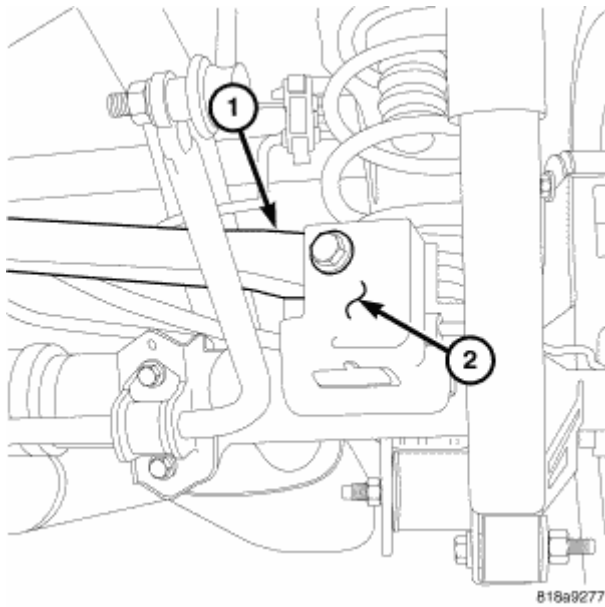


Fig. 211: Identifying Track Bar & Axle Bracket
Courtesy of CHRYSLER LLC

6. Remove track bar (1) bolt from axle bracket (2).

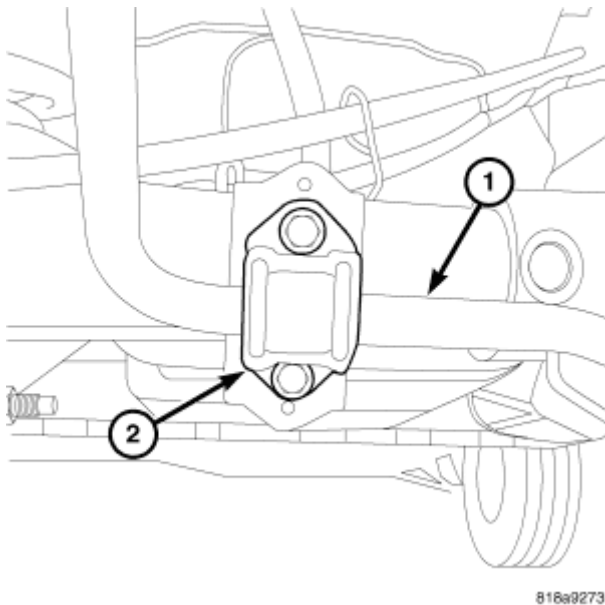
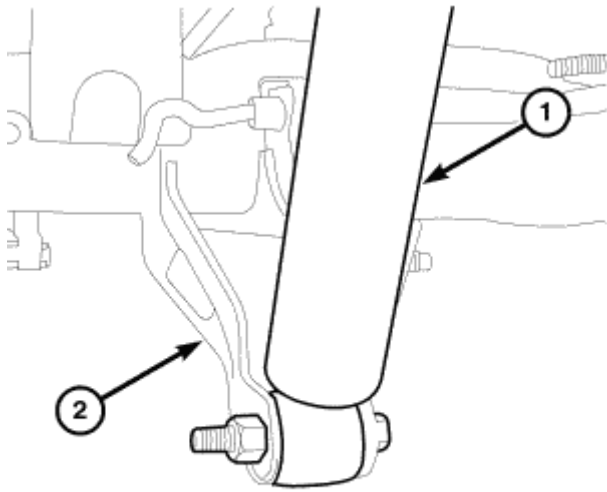


Fig. 212: Identifying Stabilizer Bar & Axle Bracket
Courtesy of CHRYSLER LLC

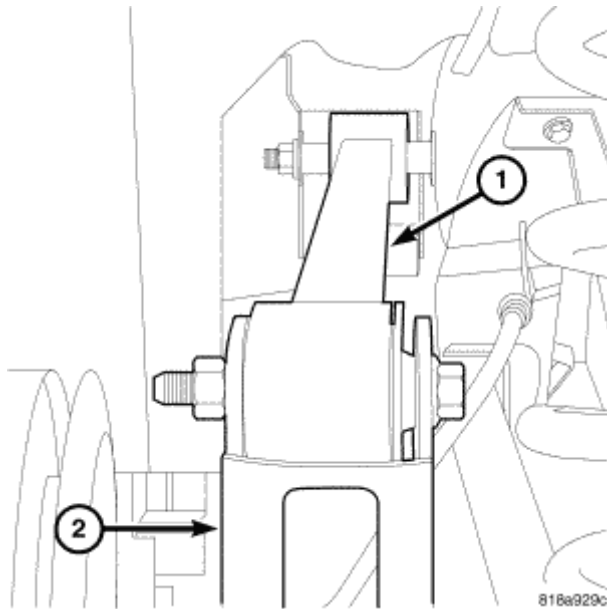
7. Remove vent hose from the axle shaft tube.
8. Remove stabilizer bar (1) axle bracket (2).



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Fig. 213: Identifying Shock Absorbers & Axle Brackets
 Courtesy of CHRYSLER LLC

9. Remove shock absorbers (1) from axle brackets (2).



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Fig. 214: Identifying Upper Control Arm & Axle Brackets
 Courtesy of CHRYSLER LLC

10. Remove upper control arm (1) nuts and bolts from the axle brackets (2).

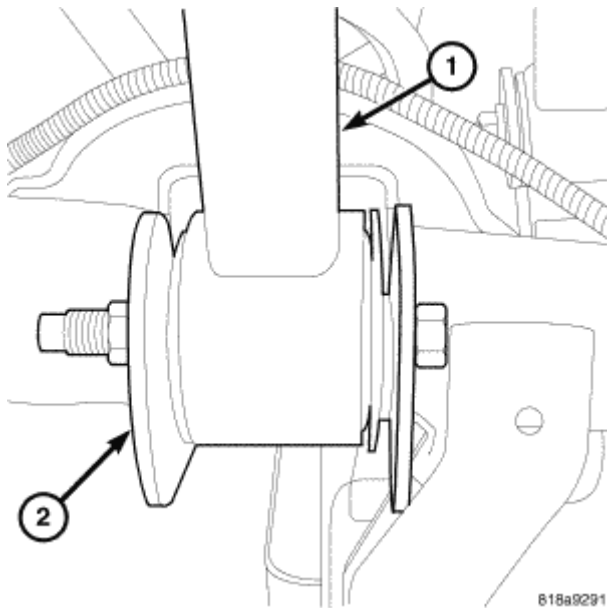


Fig. 215: Identifying Lower Control Arm & Axle Brackets
 Courtesy of CHRYSLER LLC

11. Lower axle enough to remove coil springs and spring insulators.
12. Remove lower control arm (1) mounting bolts from axle brackets (2).
13. Lower and remove the axle.

INSTALLATION

REAR AXLE - 8 1/4

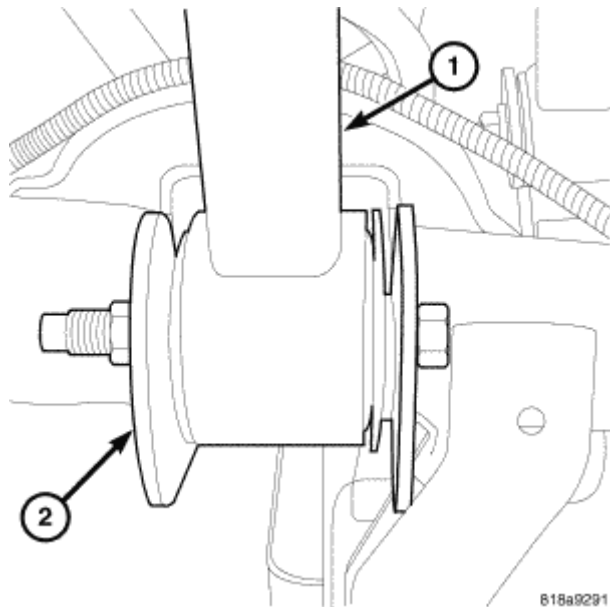


Fig. 216: Identifying Lower Control Arm & Axle Brackets
 Courtesy of CHRYSLER LLC

CAUTION: The weight of the vehicle must be supported by the springs before the control arms and track bar are tightened. Failure to follow these instructions will cause premature bushing failure.

1. Raise the axle under the vehicle.
2. Install lower control arms (1) onto the axle brackets (2). Loosely install mounting bolts and nuts.
3. Install coil spring isolators and springs.
4. Raise axle up until springs are seated.

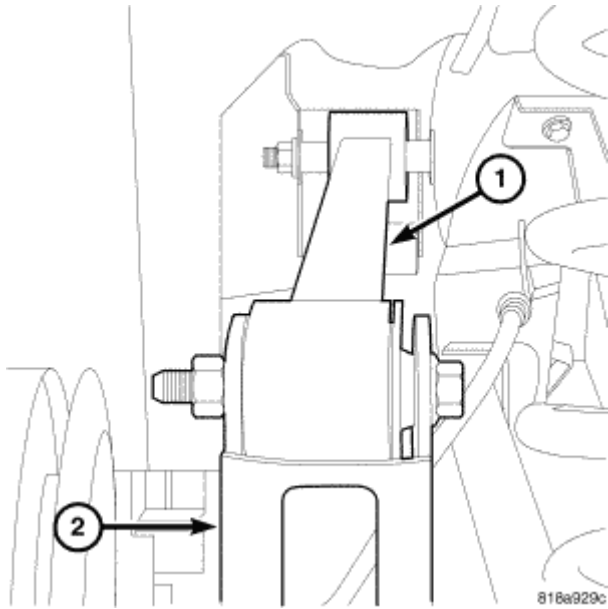
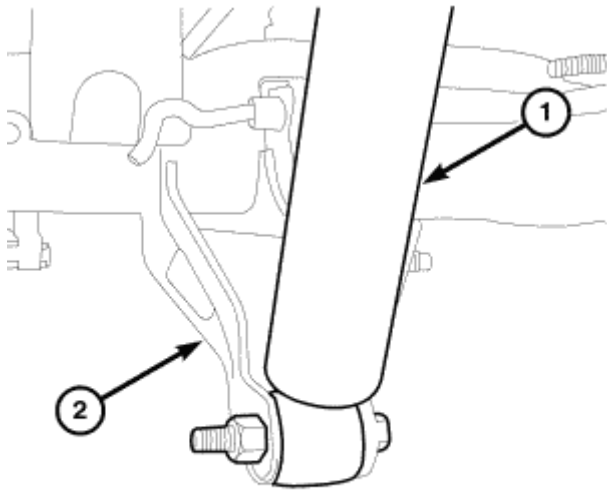


Fig. 217: Identifying Upper Control Arm & Axle Brackets
Courtesy of CHRYSLER LLC

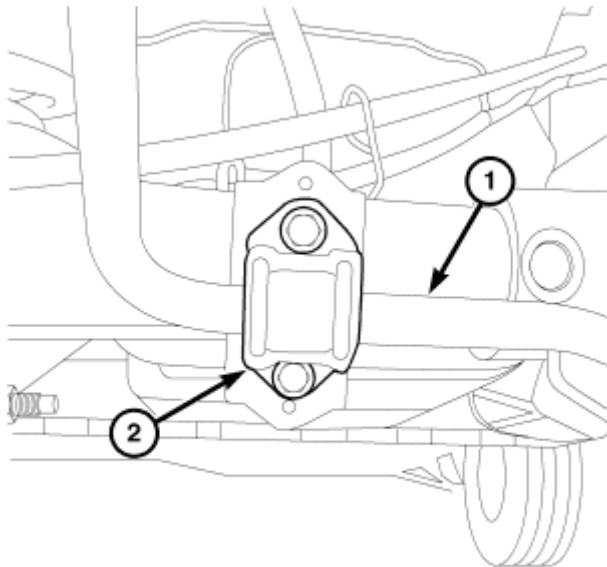
5. Install upper control arms (1) into axle brackets (2). Loosely install mounting bolts and nuts.



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Fig. 218: Identifying Shock Absorbers & Axle Brackets
 Courtesy of CHRYSLER LLC

6. Install shock absorbers (1) in axle brackets (2). Install shock bolts and nuts and tighten nuts to specifications.



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Fig. 219: Identifying Stabilizer Bar & Axle Bracket
 Courtesy of CHRYSLER LLC

7. Install stabilizer bar (1) and clamps (2) on axle. Tighten clamp (2) bolts to torque specifications.
8. Install vent hose to axle shaft tube.

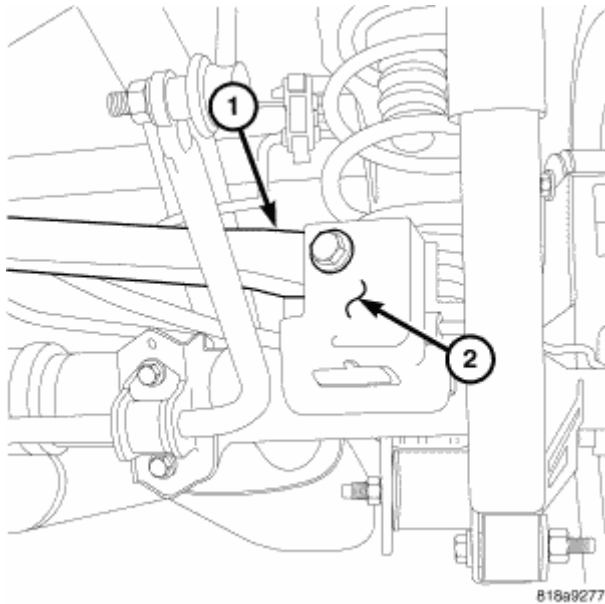


Fig. 220: Identifying Track Bar & Axle Bracket
 Courtesy of CHRYSLER LLC

9. Install track bar (1) in axle bracket (2). Loosely install track bar (1) bolt.

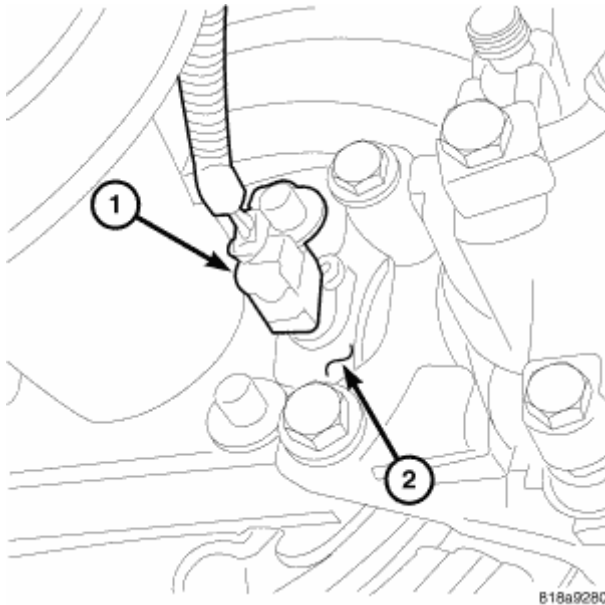


Fig. 221: Identifying Brake Sensor & Axle
 Courtesy of CHRYSLER LLC

10. Install brake rotors, calipers and brake sensor (1) on axle (2).
11. Install parking brake cables. Refer to **INSTALLATION**.

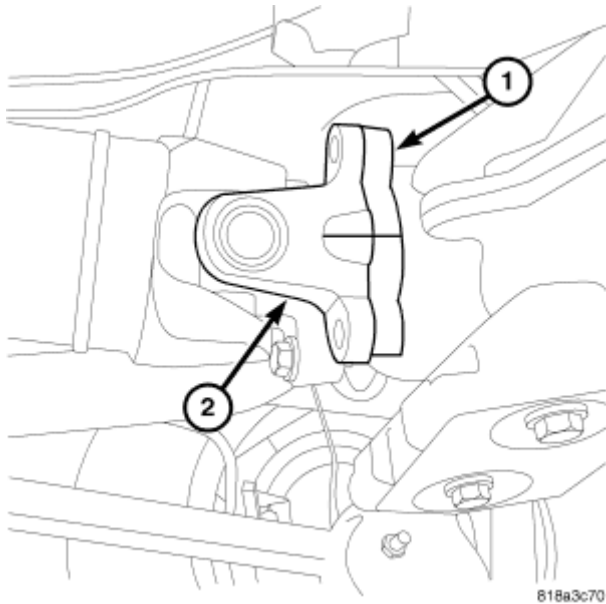


Fig. 222: Identifying Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

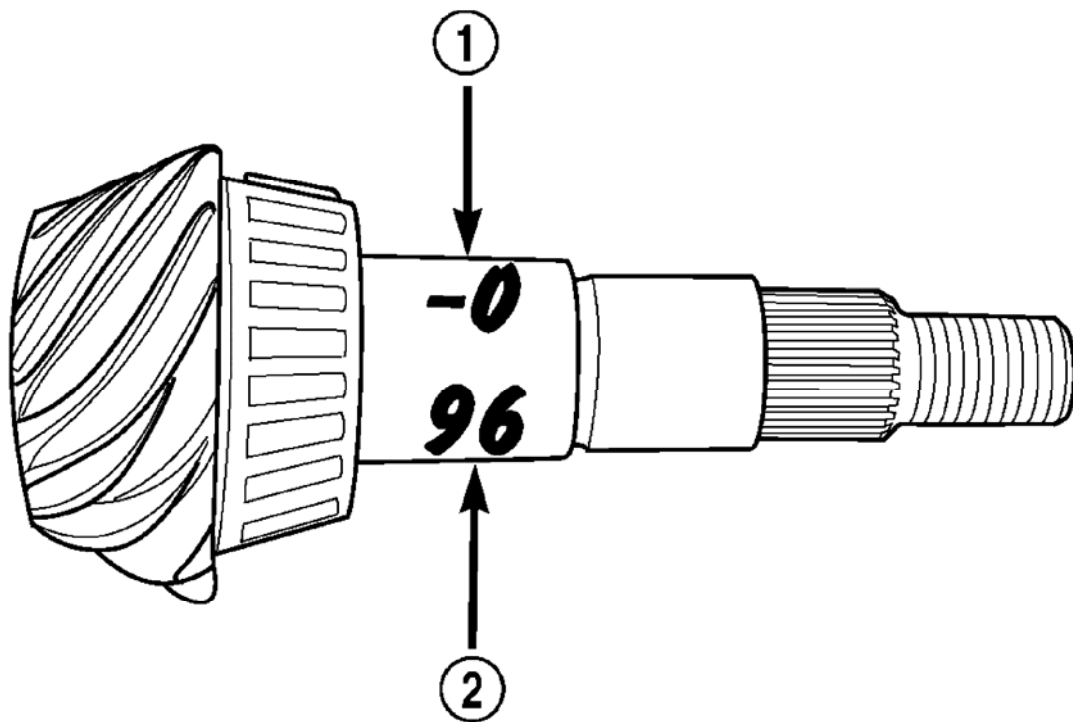
12. Install propeller shaft with pinion flange (1) and propeller shaft flange (2) reference marks aligned.

NOTE: **Clean all propeller shaft bolts and apply Mopar Lock & Seal Adhesive or equivalent to the threads before installation.**

13. Install propeller shaft bolts and tighten to specifications.
14. Install the wheels and tires.
15. Remove lifting device from axle and lower the vehicle.
16. Tighten lower control arms, upper control arms and track bar bolts to torque specifications.

ADJUSTMENTS

REAR AXLE - 8 1/4



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Fig. 223: Pinion ID Numbers
Courtesy of CHRYSLER LLC

Ring gear and pinion are supplied as matched sets. Identifying numbers for the ring gear and pinion are painted onto the pinion gear shaft and the side of the ring gear. A plus (+) number, minus (-) number or zero (0) along with the gear set sequence number (2) (01 to 99) is on each gear. This first number (1) the amount (in thousandths of an inch) the depth varies from the standard depth setting of a pinion marked with a (0). The next two numbers are the sequence number of the gear set. The standard depth provides the best teeth contact pattern.

+2	+0.006	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002
+1	+0.005	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003
0	+0.004	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004
-1	+0.003	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005
-2	+0.002	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006
-3	+0.001	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007
-4	0	-0.001	-0.002	-0.003	-0.004	-0.005	-0.006	-0.007	-0.008

PINION DEPTH MEASUREMENT

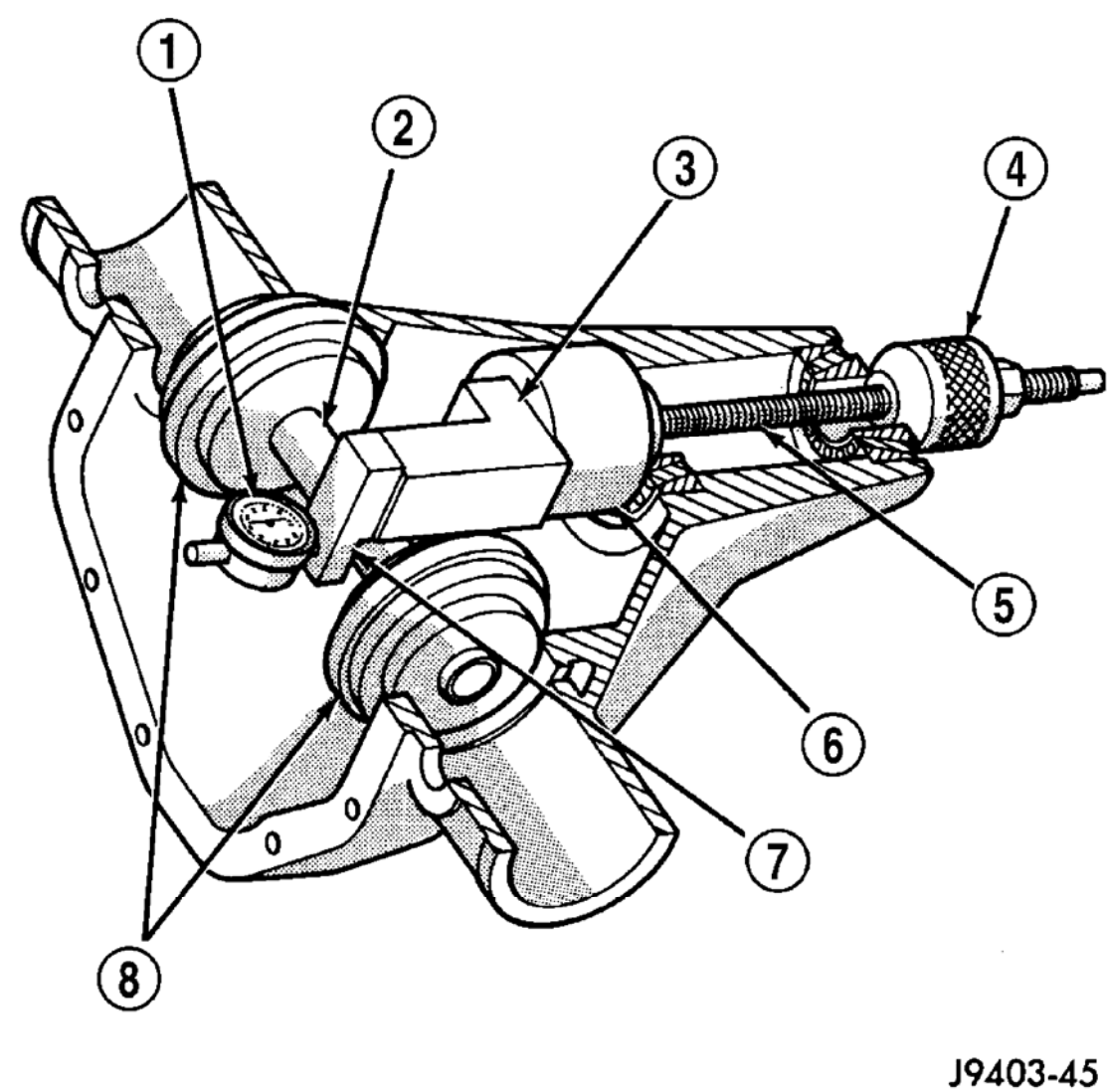


Fig. 225: Pinion Depth Gauge Tools - Typical
Courtesy of CHRYSLER LLC

Measurements are taken with pinion bearing cups and pinion bearings installed in the housing. Take

measurements with Pinion Gauge Set 6730 and Dial Indicator C-3339A (1).

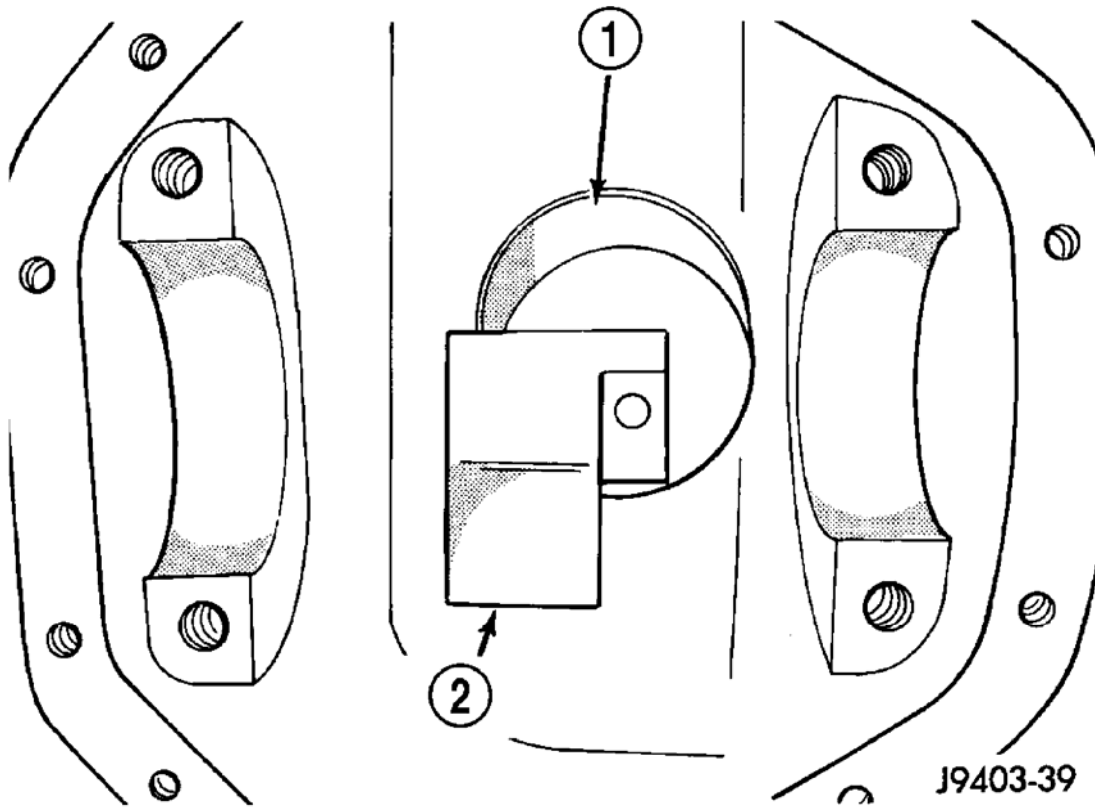


Fig. 226: Pinion Height Block
Courtesy of CHRYSLER LLC

1. Assemble Pinion Height Block 6739 (2), Pinion Block 8540 (1) and rear pinion bearing onto Screw 6741.
2. Insert assembled height gauge components, rear bearing and screw into housing through pinion bearing cups.

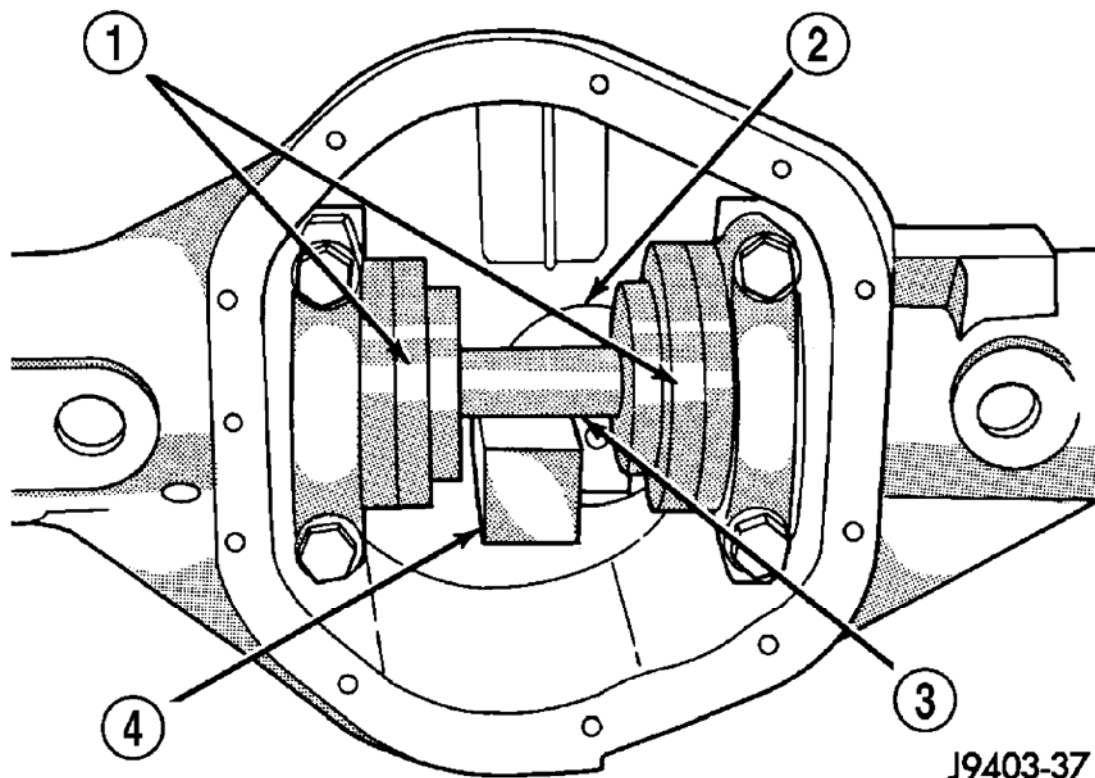


Fig. 227: Gauge Tools In Housing
Courtesy of CHRYSLER LLC

3. Install front pinion bearing and Cone-Nut 6740 on the screw. Tighten Cone-Nut until Torque To Rotate screw is 1.7 N.m (15 in. lbs.).
4. Place Arbor Disc 8541 (1) on Arbor D-115-3 (3) in position in the housing side bearing cradles. Install differential bearing caps on arbor discs and tighten cap bolts to 41 N.m (30 ft. lbs.).

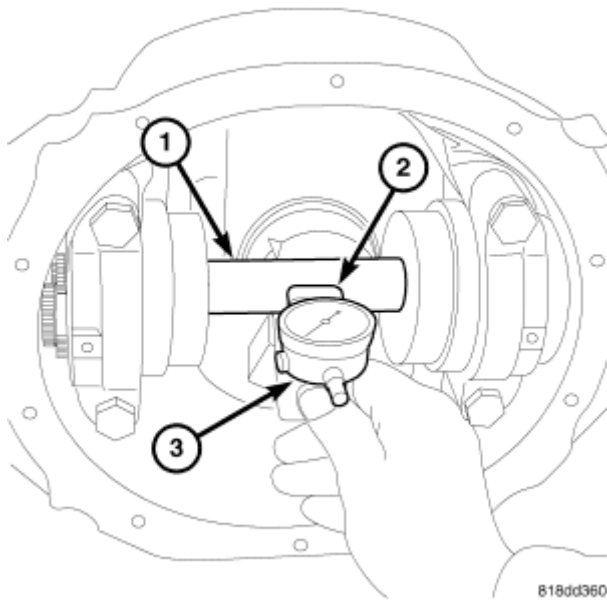
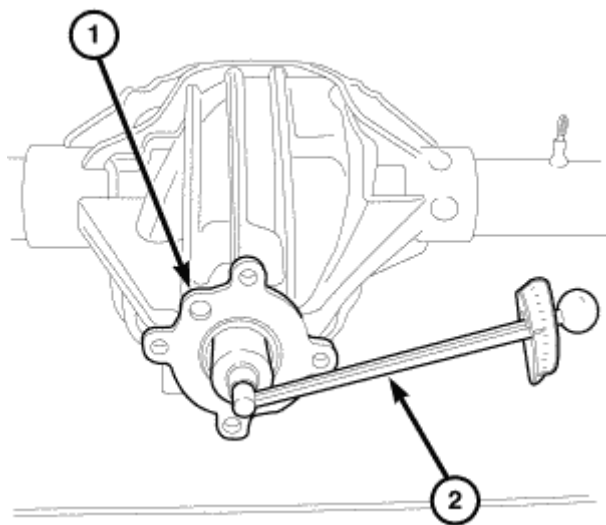


Fig. 228: Assembling Dial Indicator C-3339A Into Scooter Block D-115-2A And Securing Set Screw
Courtesy of CHRYSLER LLC

5. Assemble Dial Indicator C-3339A (3) into Scooter Block D-115-2A (2) and secure set screw.
6. Place Scooter Block/Dial Indicator in position in axle housing so dial probe and scooter block are flush against the rearward surface of the pinion height block. Hold scooter block in place and zero the dial indicator. Tighten dial indicator face lock screw.
7. Slowly slide the dial indicator probe over the edge of the pinion height block.
8. Slide the dial indicator probe across the gap between the pinion height block and the arbor bar (1) with the scooter block against the pinion height block. When dial probe contacts the arbor bar, the dial pointer will turn clockwise. Continue moving the dial probe to the crest of the arbor bar and record the highest reading. If the dial indicator can not achieve a zero reading, the rear bearing cup or the pinion depth gauge set is not installed correctly.
9. Select a shim equal to the dial indicator reading, plus the drive pinion gear depth variance number marked on the shaft of the pinion. If the depth variance is -2, add 0.002 in. to the dial indicator reading. If the depth variance is -2, add 0.002 in. subtract dial indicator reading. Then subtract 0.041 mm (0.0016 in.) from the total measurement. This will be the correct pinion height shim selection.

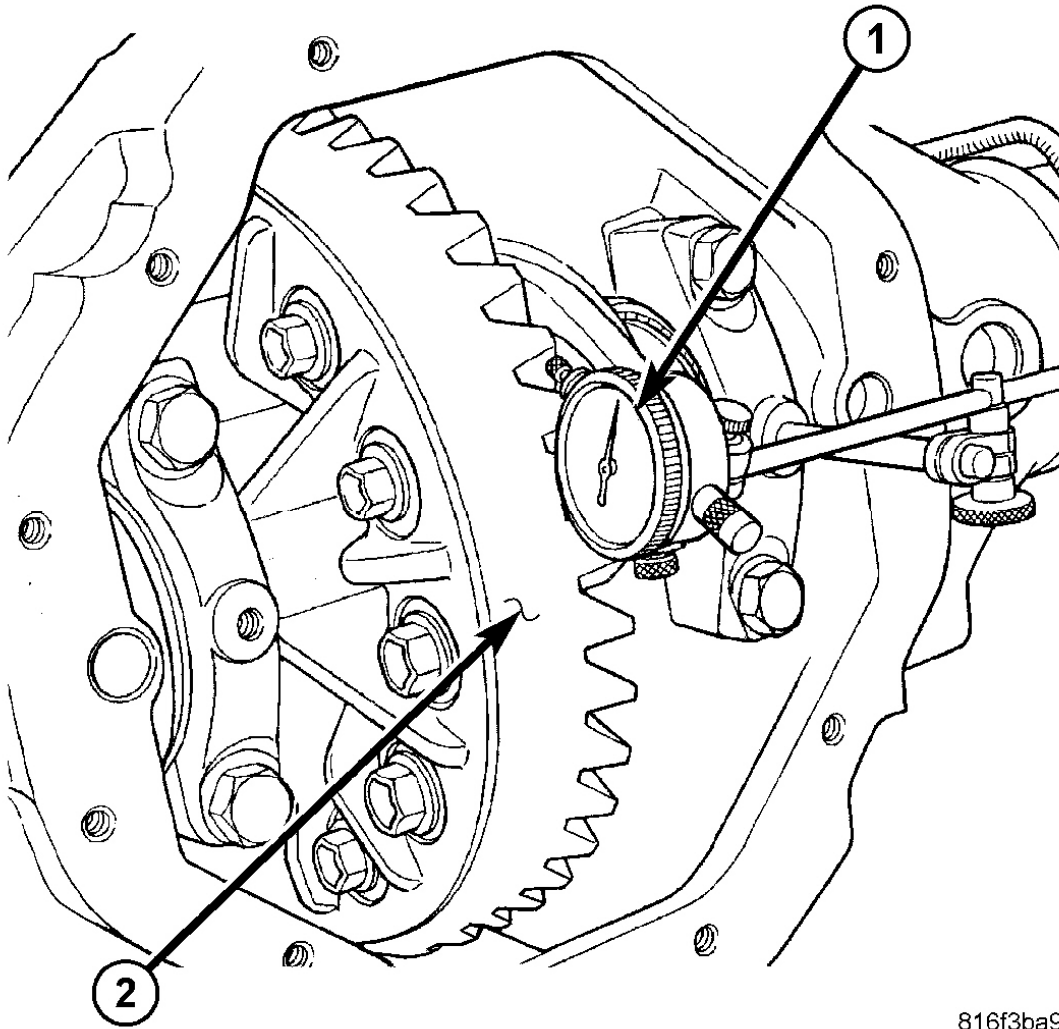


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Fig. 229: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

10. Install pinion gear and establish Pinion Torque To Rotate (PTTR) with an inch pound torque wrench (1).

DIFFERENTIAL BEARING PRELOAD AND GEAR BACKLASH



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Fig. 230: Ring Gear Backlash
Courtesy of CHRYSLER LLC

1. Turn each thread adjuster inward with Wrench C-4164 until differential bearing end-play is eliminate and ring gear backlash is approximately 0.25 mm (0.01 in.). Seat bearing cups by rapidly rotating the pinion gear a half turn back and forth several times.
2. Install Dial Indicator C-3339A (1) with plunger position against drive side of a ring gear (2) tooth. Measure and record backlash at 4 positions, 90 degrees apart around the ring gear.

Mark lowest backlash position on the ring gear and make all backlash measurements at this location.

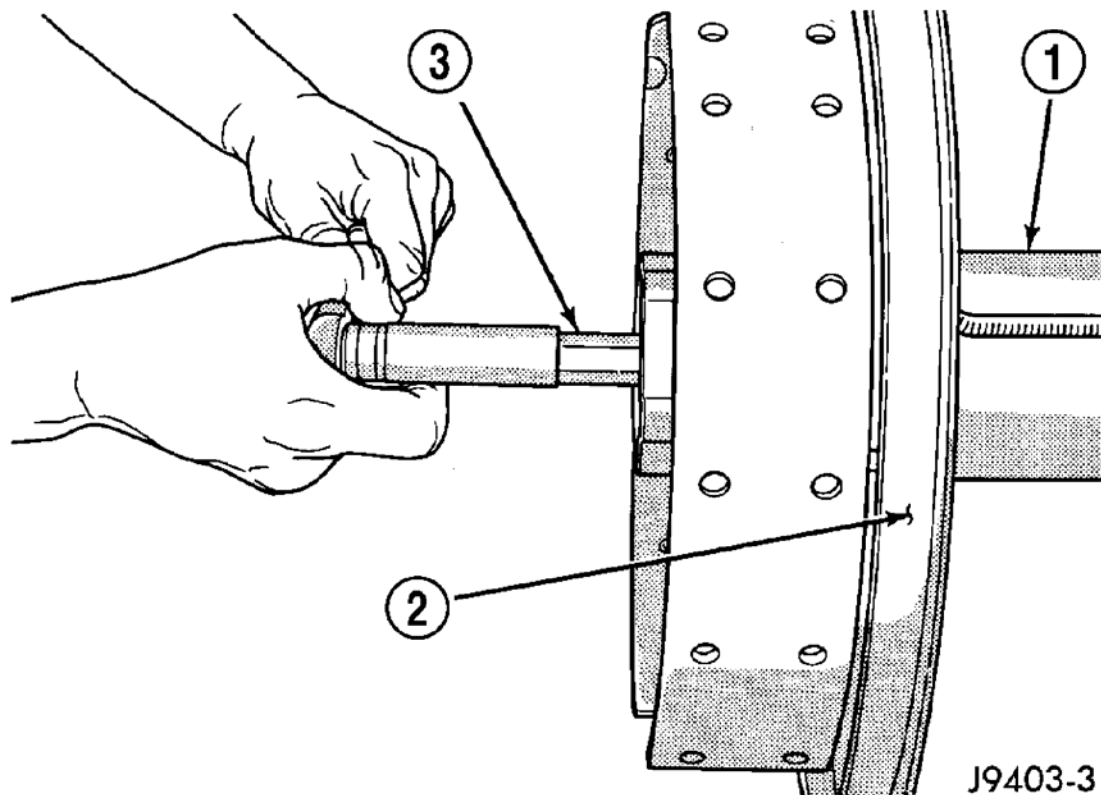


Fig. 231: Threaded Adjuster Tool
Courtesy of CHRYSLER LLC

3. Loosen left-side adjuster and tighten right-side threaded adjuster with Wrench C-4164 (3) to obtain a backlash of 0.076 - 0.102 mm (0.003 - 0.004 in.).
4. Tighten both adjusters to 14 N.m (10 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times.
5. Tighten differential bearing cap bolts 95 N.m (70 ft. lbs.).
6. Tighten right-side threaded adjuster to 102 N.m (75 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times. Continue this procedure until right-side adjuster torque remains a constant 102 N.m (75 ft. lbs.).
7. Measure the ring gear backlash. Backlash should be 0.12 - 0.20 mm (0.005 - 0.008 in.).

If backlash is less than 0.12 (0.005 in.) increase right-side threaded adjuster torque until specified backlash is obtained.

If backlash is more than 0.20 (0.008 in.) repeat procedure from the beginning.

8. Tighten left-side threaded adjuster to 102 N.m (75 ft. lbs.). Seat differential bearing cups by rapidly rotating the pinion gear a half turn back and forth several times. Continue this procedure until left-side adjuster torque remains a constant 102 N.m (75 ft. lbs.).
9. Install threaded adjuster locks and tighten the lock screws to 10 N.m (90 in. lbs.).

10. Measure and backlash at 4 positions, 90 degrees apart around the ring gear. Maximum ring gear backlash variation is 0.076 mm (0.003 in.).

After backlash is achieved, perform Gear Contact procedure.

GEAR CONTACT PATTERN

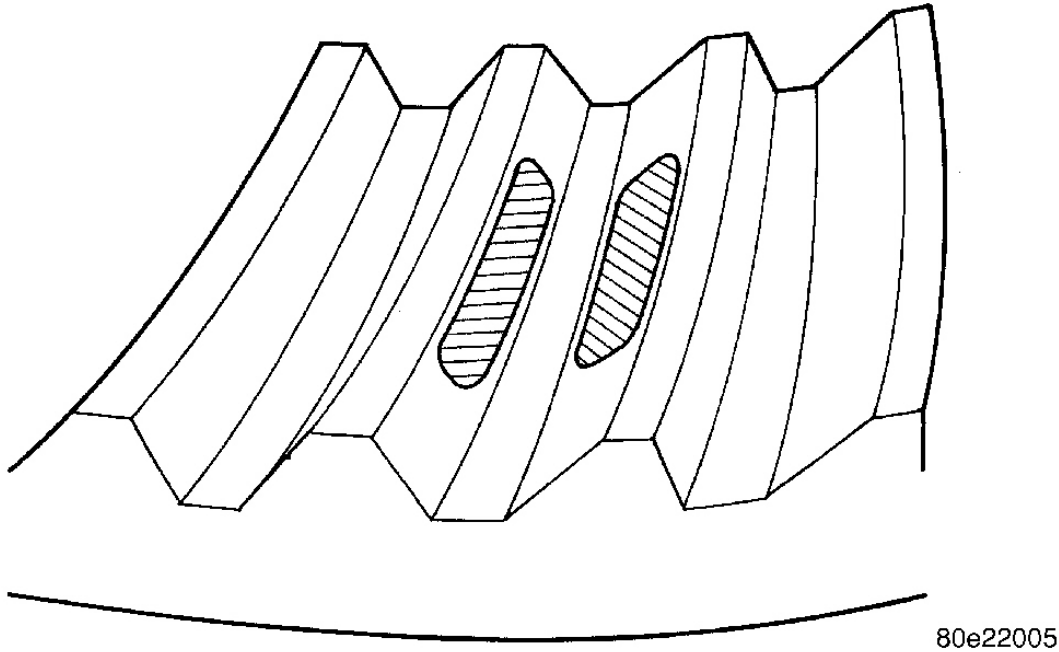


Fig. 232: Gear Contact Pattern Is Correct
Courtesy of CHRYSLER LLC

1. Wipe clean each tooth of the ring gear.
2. Apply gear marking compound to all of the ring gear teeth.
3. Verify bearing cap bolts are torque specifications.
4. Apply parking brakes lightly to create at 14 N.m (10 ft. lbs.) pinion rotating torque.
5. Rotate the pinion/pinion yoke 4 full revolutions in each directions.
6. Read gear tooth contact pattern.

Gear contact pattern is correct. Backlash and pinion depth is correct.

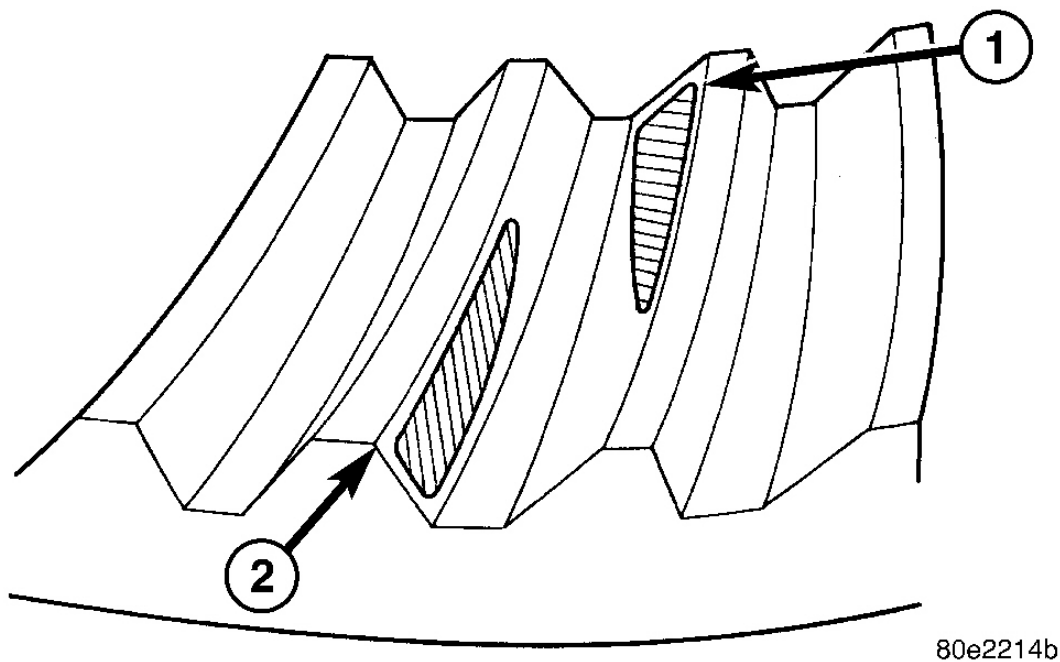


Fig. 233: Ring Gear Is Too Far Away
Courtesy of CHRYSLER LLC

Ring gear is too far away from the pinion gear, coast side toe (1) drive side heel (2). Decrease backlash by moving ring closer to the pinion gear using the adjusters.

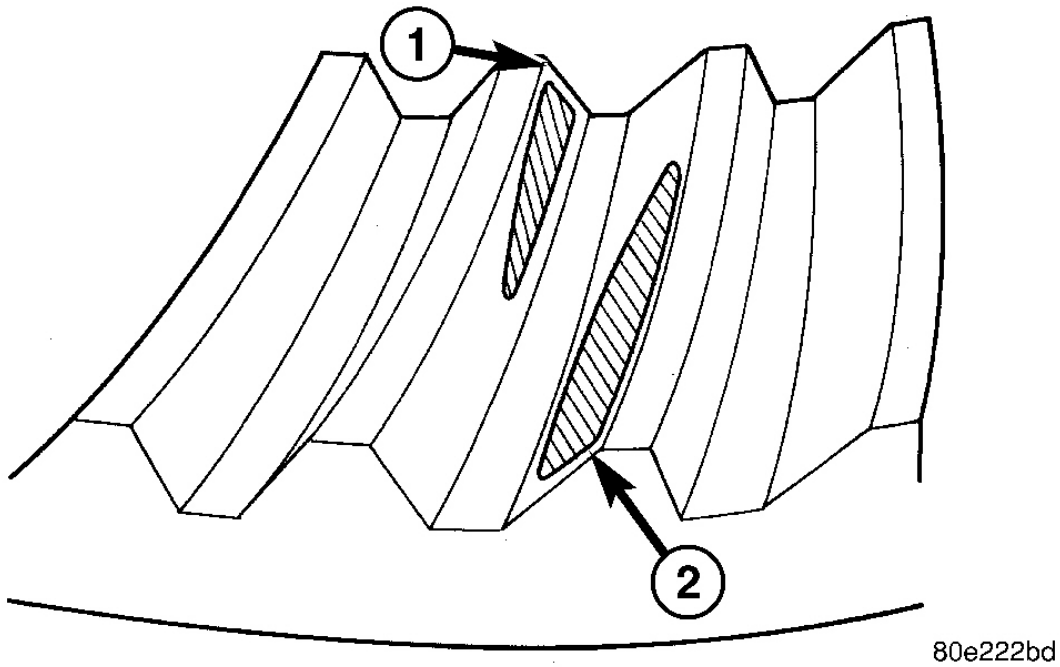
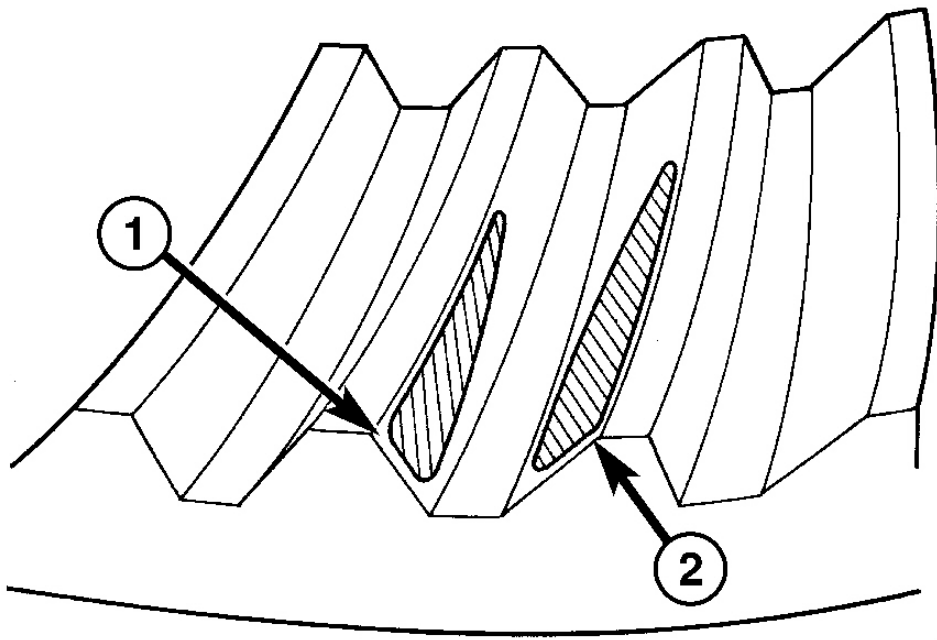


Fig. 234: Ring Gear Is Too Close
Courtesy of CHRYSLER LLC

Ring gear is too close to the pinion gear, drive side toe (1) coast side heel (2). Increase backlash by moving ring away from the pinion gear using the adjusters.



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Fig. 235: Ring Gear Is Too Far Away
Courtesy of CHRYSLER LLC

Ring gear is too far away from the pinion gear, drive side heel (1) coast side heel (2). Decrease backlash by moving ring gear closer to the pinion gear using the adjusters.

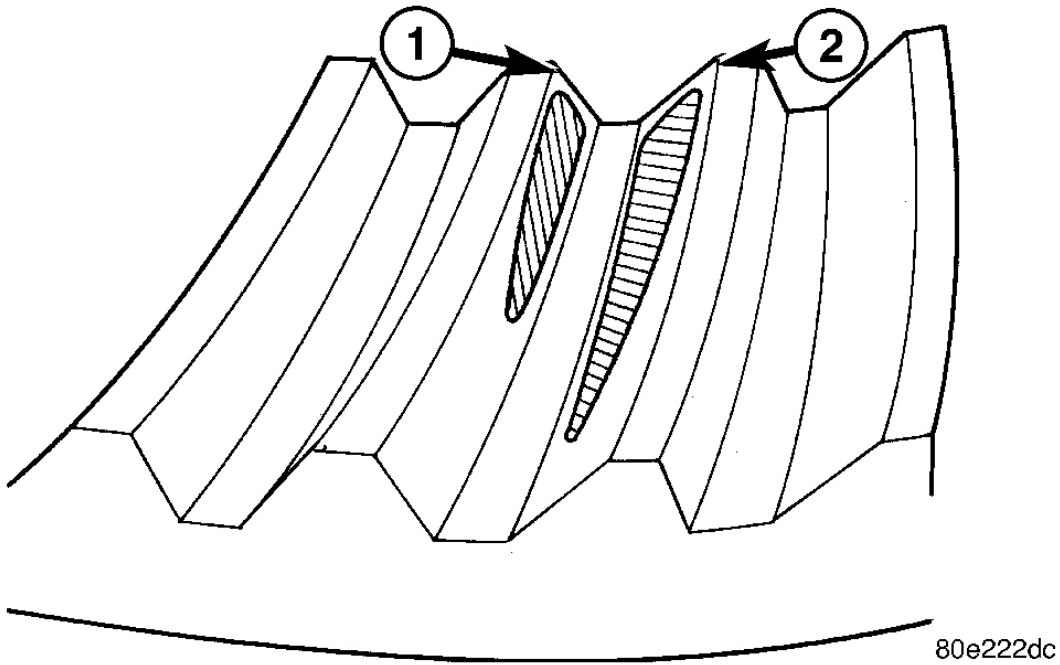
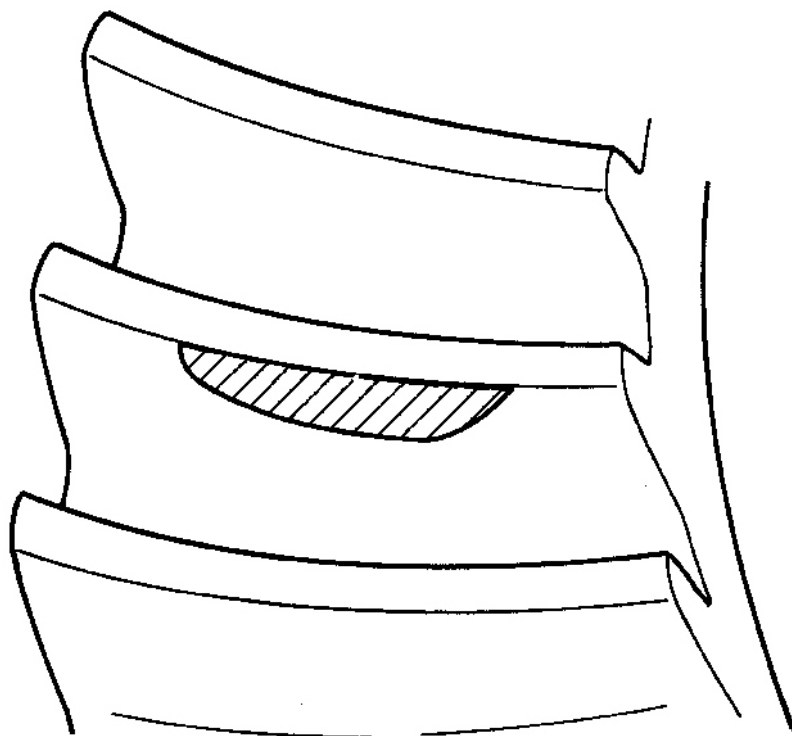


Fig. 236: Ring Gear Is Too Close
Courtesy of CHRYSLER LLC

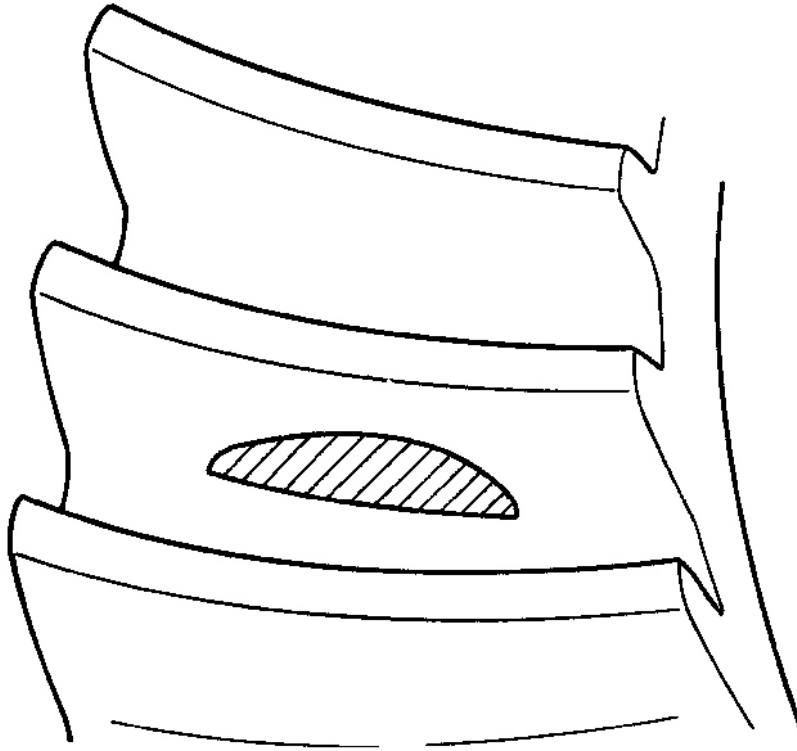
Ring gear is too close to the pinion gear, drive side toe (1) coast side toe (2). Increase backlash by moving ring gear away from the pinion gear using the adjusters.



80e2238f

Fig. 237: Pinion Gear Is Set Too Low
Courtesy of CHRYSLER LLC

Pinion gear is set too low. Increase pinion gear height, by increasing pinion depth shim thickness.



80e223a6

Fig. 238: Pinion Gear Is Set Too High
Courtesy of CHRYSLER LLC

Pinion gear is set too high. Decrease pinion height by decreasing the pinion depth shim thickness.

AXLE SHAFT END-PLAY

Visual inspect differential case, pinion mate shaft, axle shaft end button, C-lock, differential pinion gears, differential side gears and washers for damage or excessive wear. Replace damaged components.

1. Assemble differential and install.
2. Install differential pinion mate shaft locking screw to locate the shaft without torque it down.
3. Mount dial indicator base on the axle tube flange.
4. Push axle shaft inward until its end touches differential pinion mate shaft. Set dial indicator plunger on the end of axle shaft flange surface and zero dial indicator.
5. Pull axle shaft out until it stops and record dial indicator end-play reading. Rotate axle shaft about 180 degrees and record dial indicator end-play reading again. Two readings should be within 0.05 mm (0.002 in.).
6. Conduct the same procedure on the axle shaft on the opposite side.

End-play specifications should be 0.13 - 0.38 mm (0.005 - 0.015 in.). If specifications can not be met, shim side gears and/or replace differential case.

SPECIFICATIONS

REAR AXLE - 8 1/4

AXLE

DESCRIPTION	SPECIFICATION
Axle Ratio	3.21/3.73
Differential Case Flange Runout	0.076 mm (0.003 in.)
Differential Case Clearance	0.12 mm (0.005 in.)
Ring Gear Diameter	213 mm (8.25 in.)
Ring Gear Backlash	0.12 - 0.20 mm (0.005 - 0.008 in.)
Ring Gear Runout	0.12 mm (0.005 in.)
Pinion Torque To Rotate - Original Bearings	1 - 2.2 N.m (10 - 20 in. lbs.)
Pinion Torque To Rotate - New Bearings	1 - 3.4 N.m (10 - 30 in. lbs.)

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Differential Cover Bolts	41	30	-
Bearing Cap Bolts	135	100	-
Ring Gear Bolts	122	90	-
Pinion Nut Minimum	285	210	-
Pinion Mate Shaft Screw	26	19	-
Axle Damper	61	45	-
Adjuster Lock Screw	26	19	-

Ring Gear Bolts - Diesel Engines: Follow service procedure to tighten ring gear bolts on vehicles equipped with diesel engine and 3.21 gear ratio.

SPECIAL TOOLS

REAR AXLE - 8 1/4

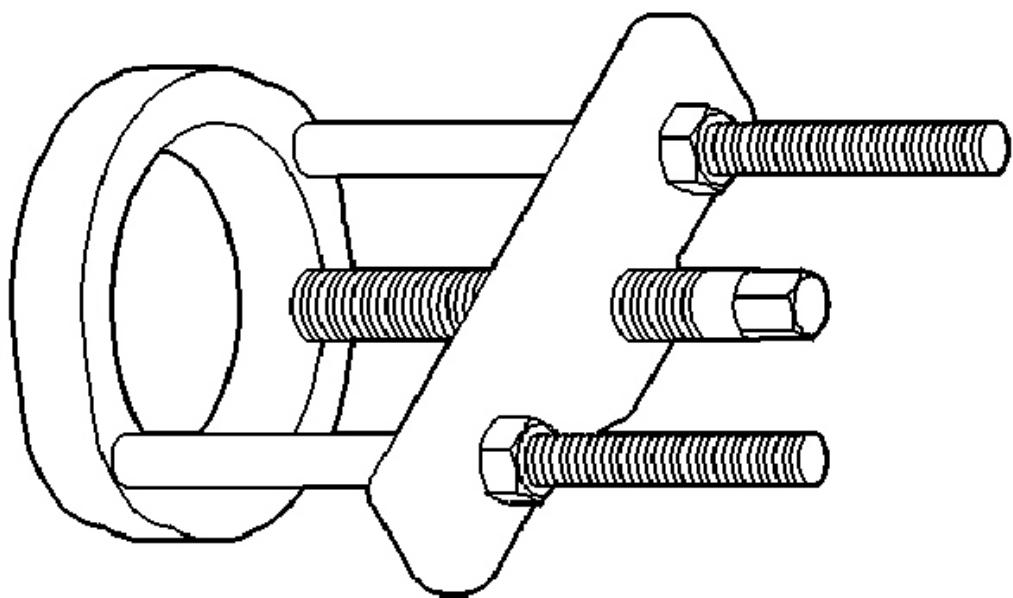


Fig. 239: Puller/Press C-293-Pa
Courtesy of CHRYSLER LLC

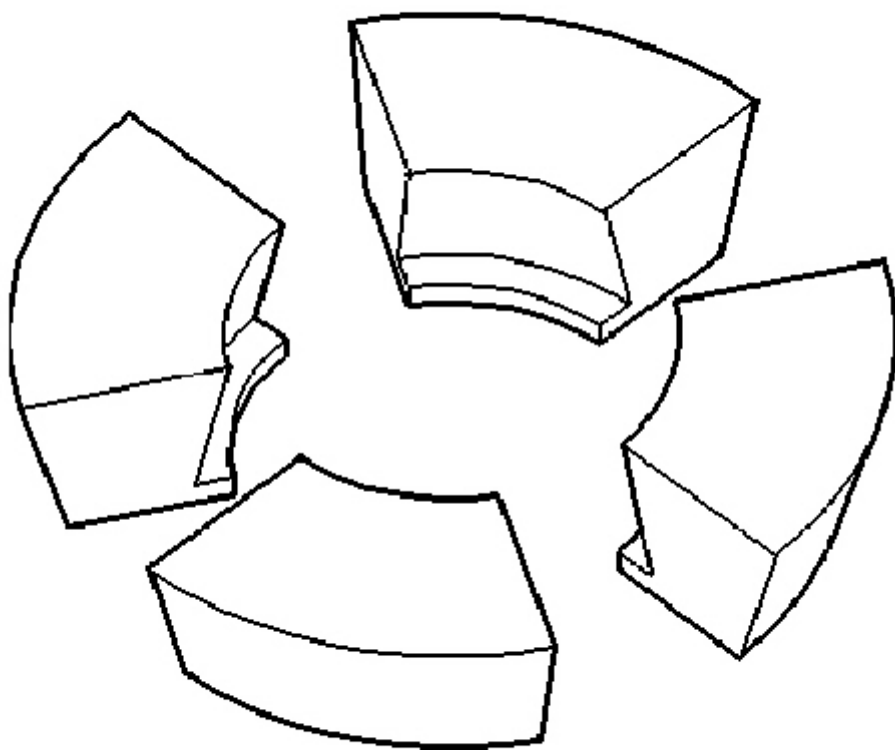


Fig. 240: Adapters C-293-47
Courtesy of CHRYSLER LLC

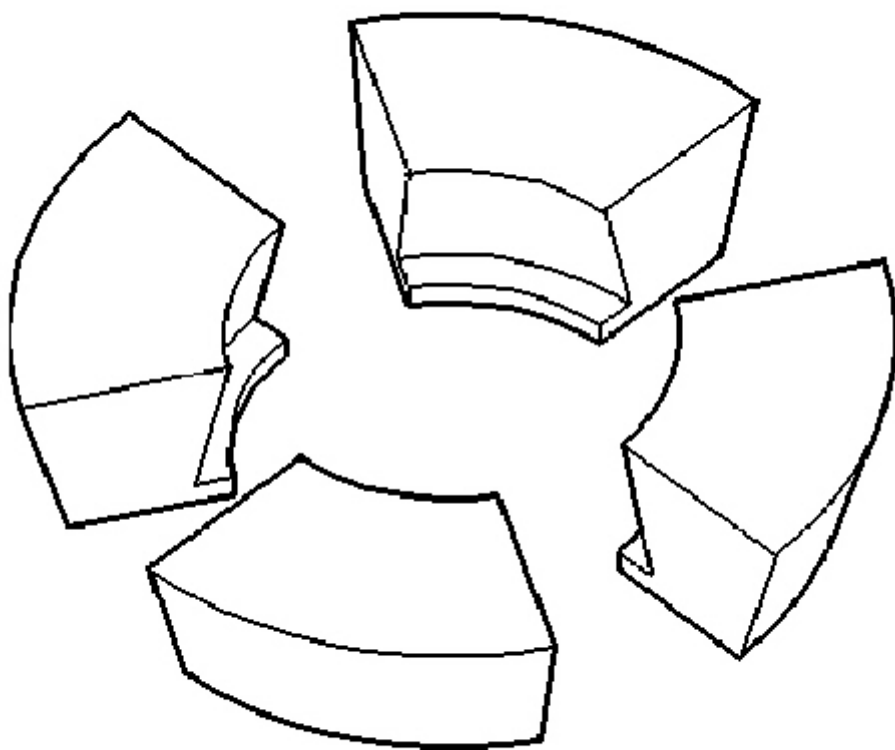


Fig. 241: Blocks, Adapter - C-293-48
Courtesy of CHRYSLER LLC

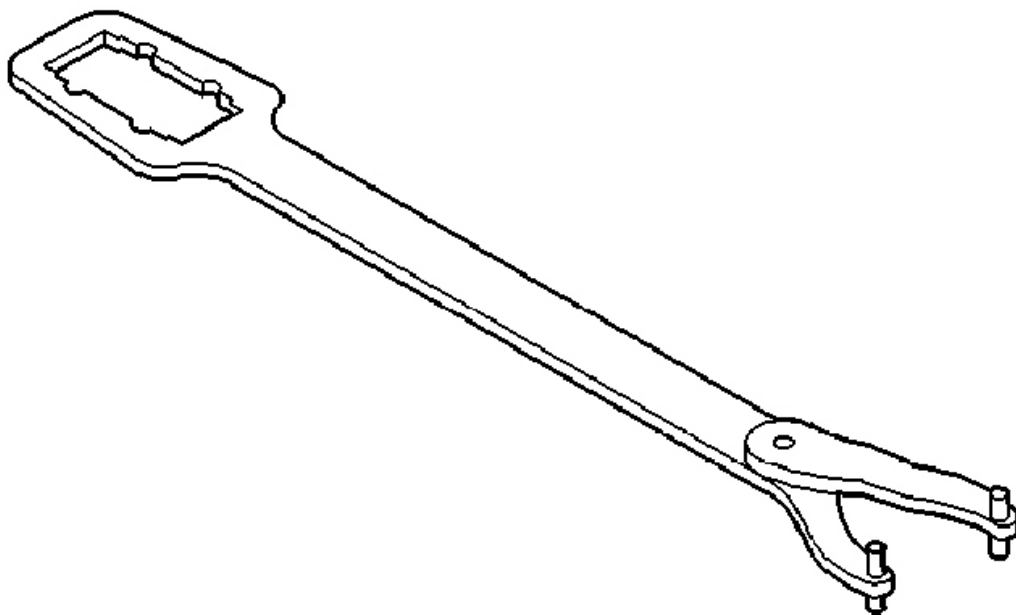
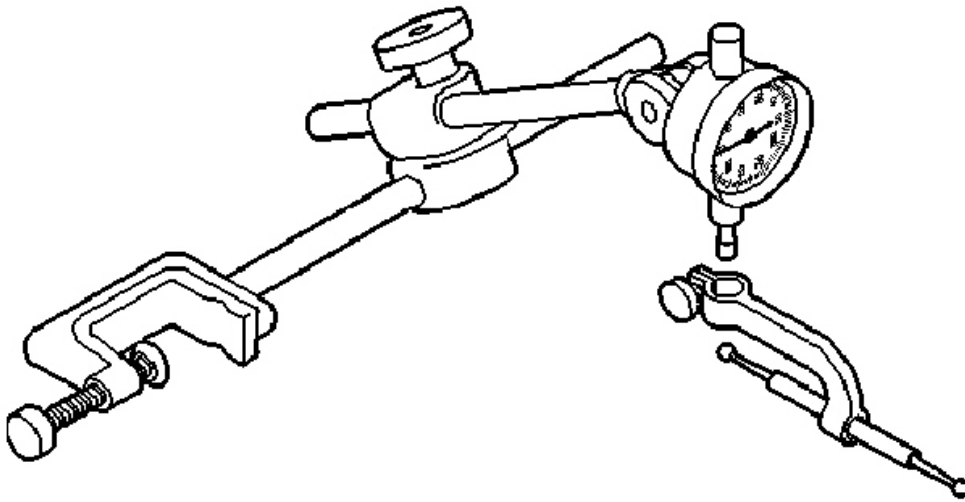


Fig. 242: Flange Holder C-3281
Courtesy of CHRYSLER LLC



8011d42b

Fig. 243: Dial Indicator C-3339
Courtesy of CHRYSLER LLC

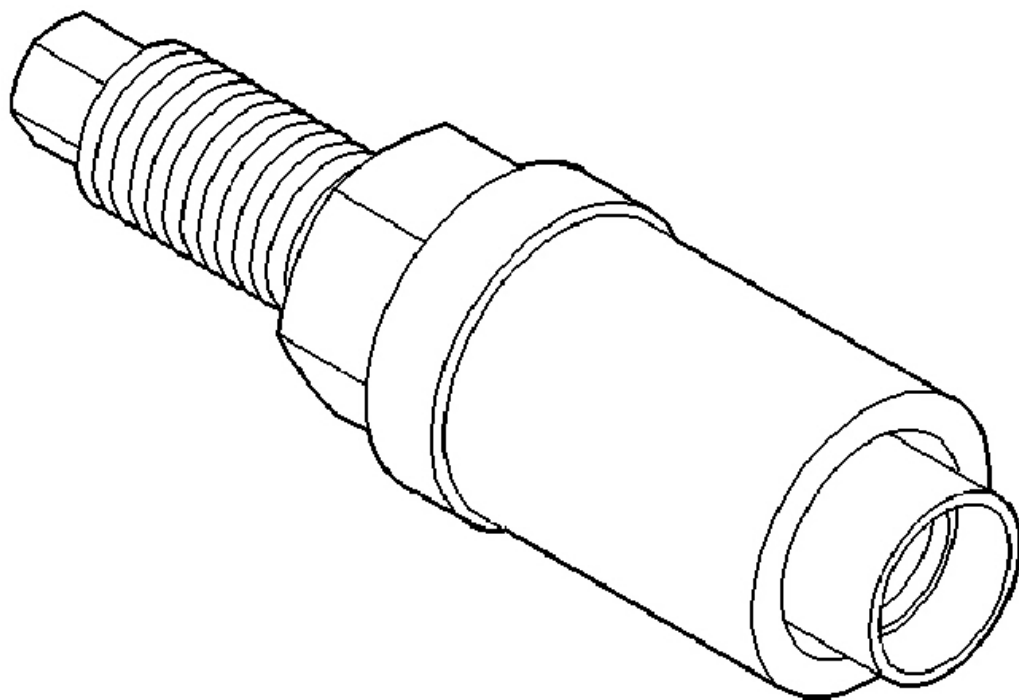


Fig. 244: Installer C-3718
Courtesy of CHRYSLER LLC

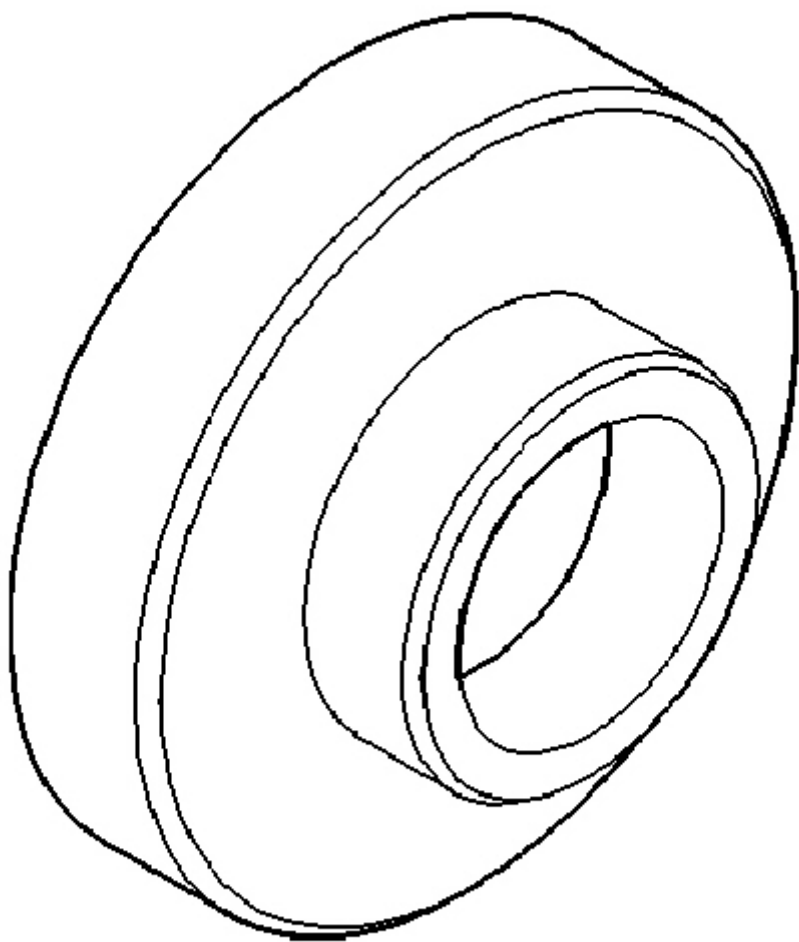


Fig. 245: Installer C-4076-B
Courtesy of CHRYSLER LLC

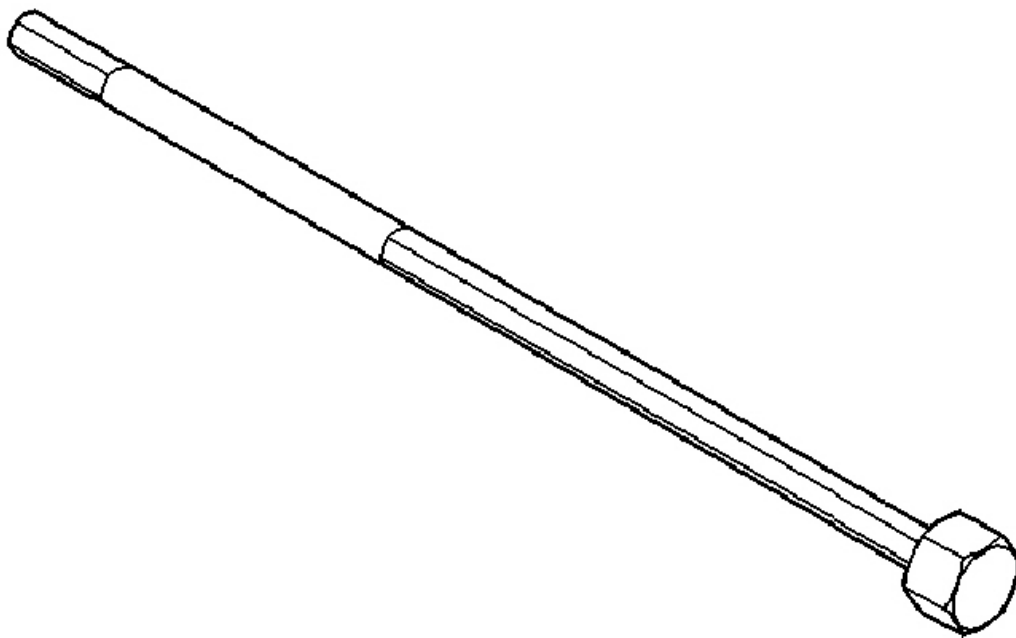


Fig. 246: Adjustment Wrench C-4164
Courtesy of CHRYSLER LLC

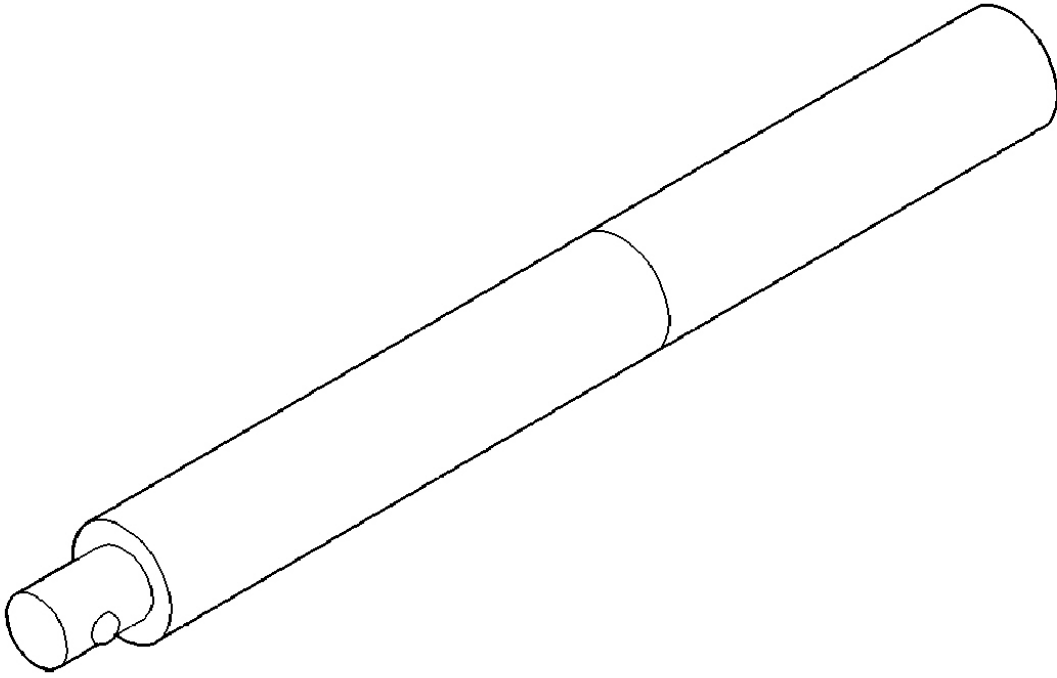


Fig. 247: Handle C-4171
Courtesy of CHRYSLER LLC

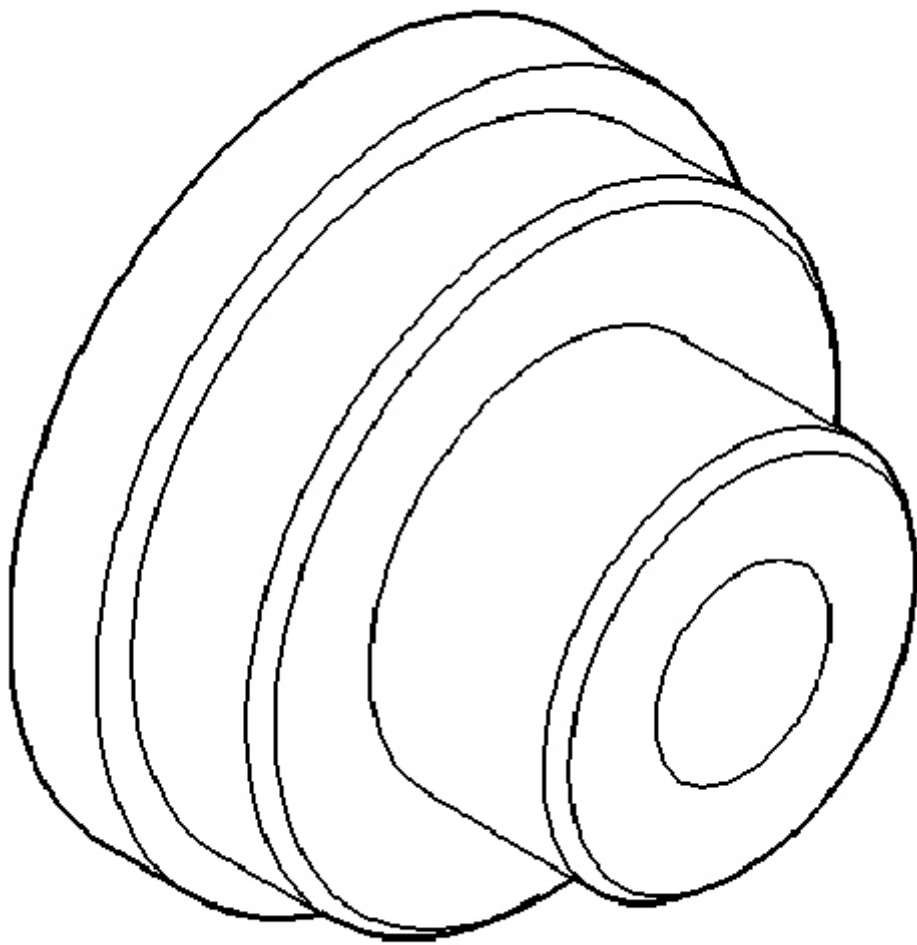


Fig. 248: Installer C-4198
Courtesy of CHRYSLER LLC

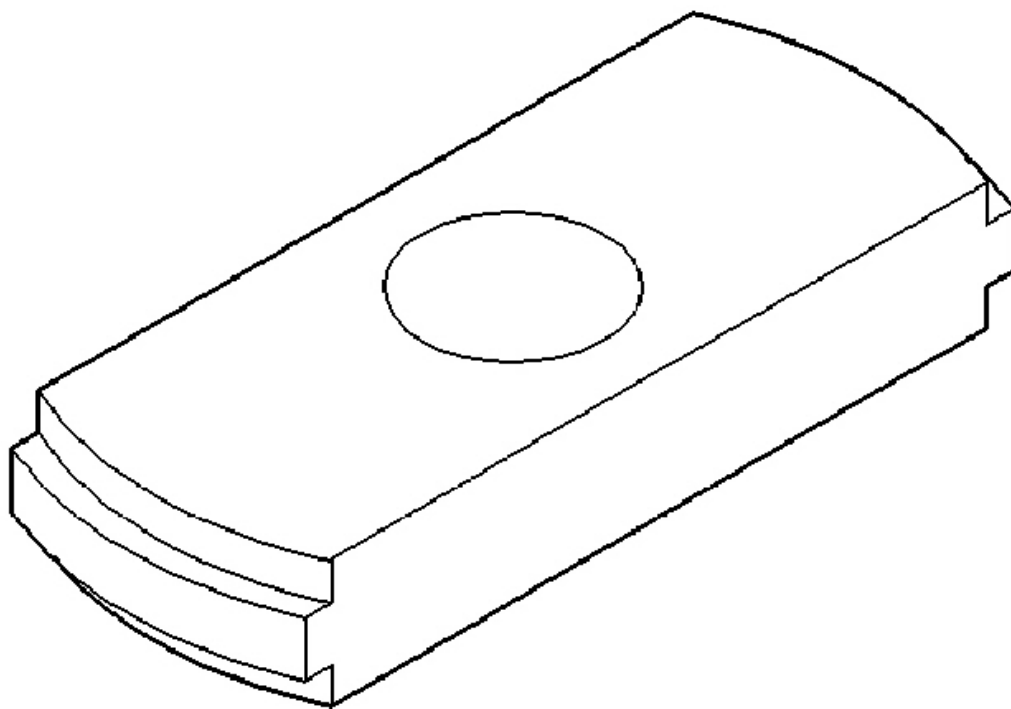


Fig. 249: Remover C-4307
Courtesy of CHRYSLER LLC

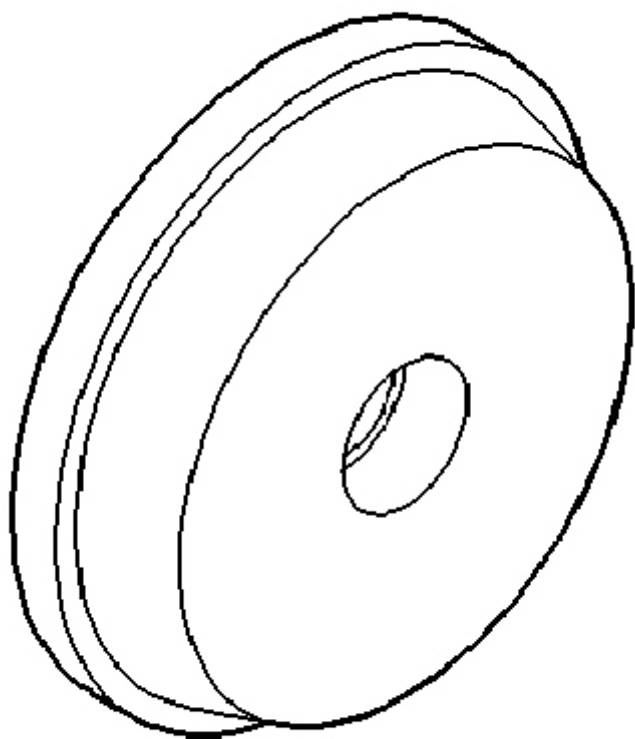


Fig. 250: Installer C-4308
Courtesy of CHRYSLER LLC

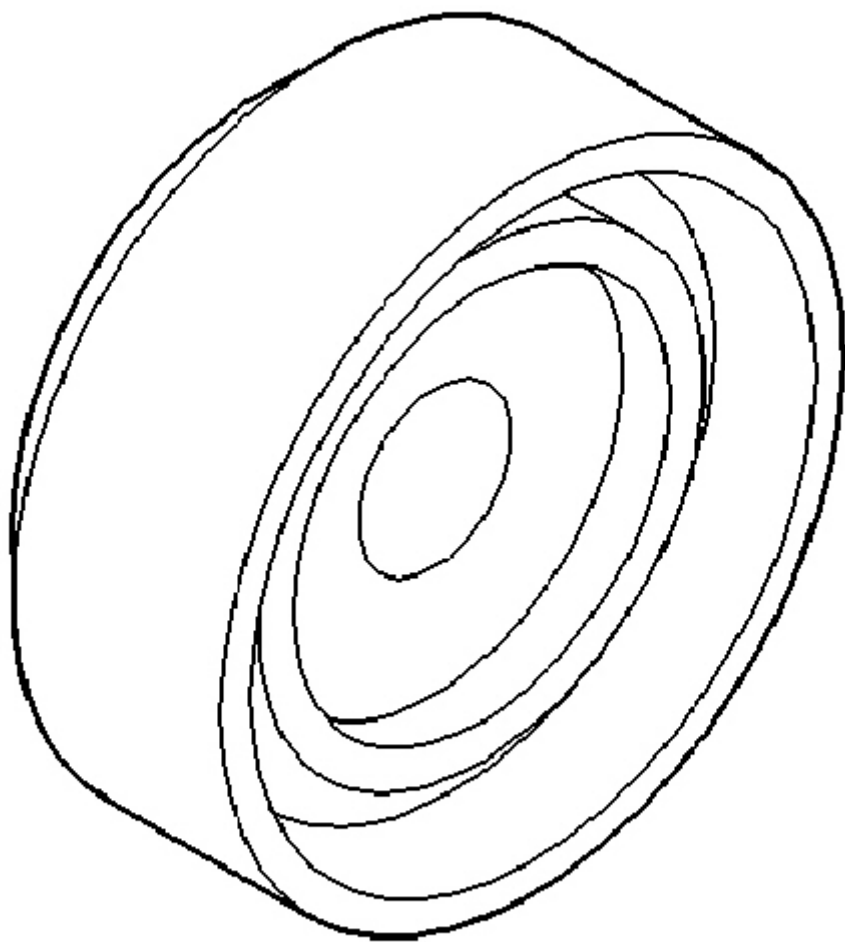


Fig. 251: Installer C-4340
Courtesy of CHRYSLER LLC

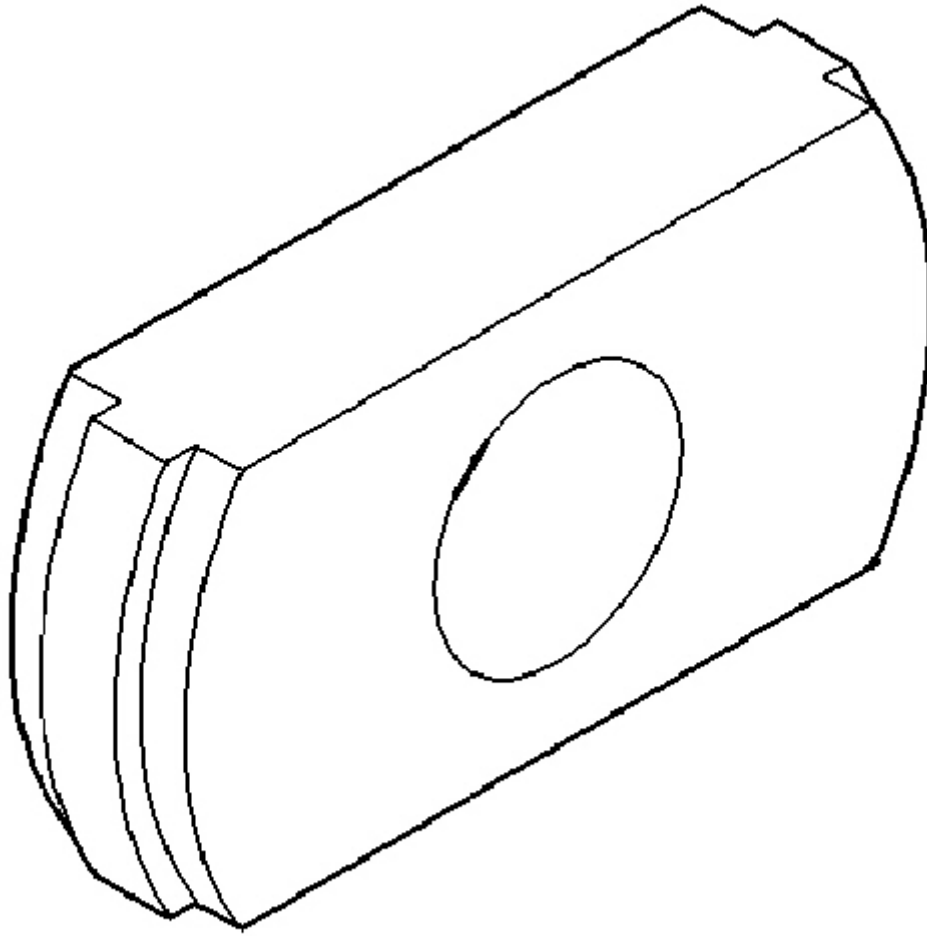


Fig. 252: Remover C-4345
Courtesy of CHRYSLER LLC

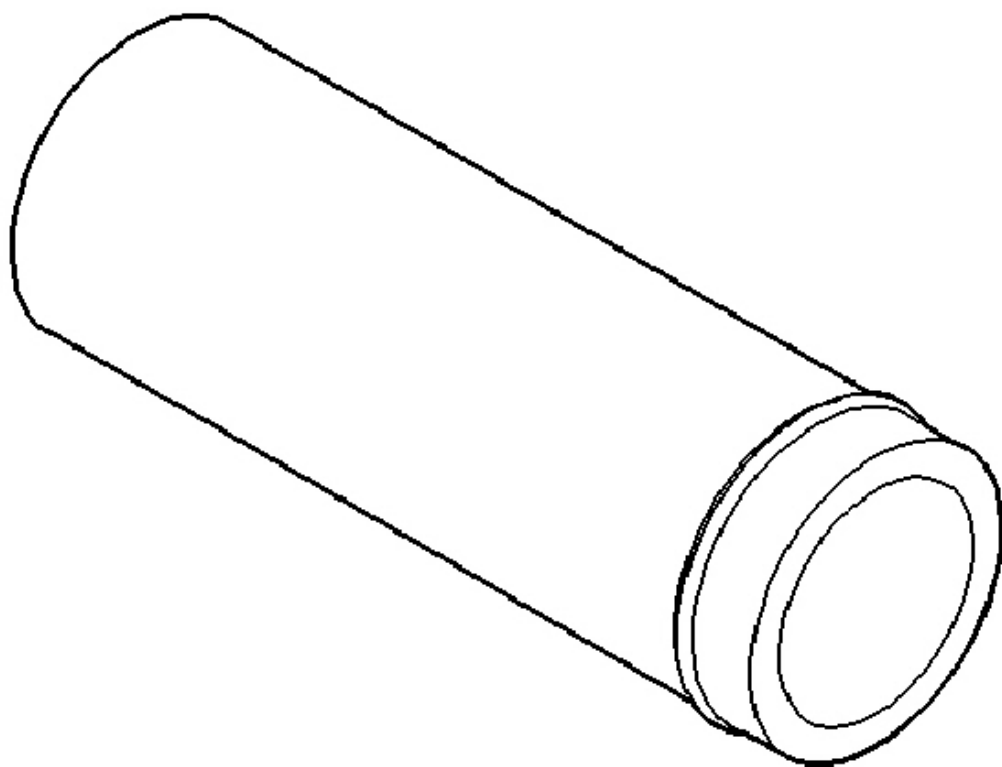


Fig. 253: Handle C-4735
Courtesy of CHRYSLER LLC

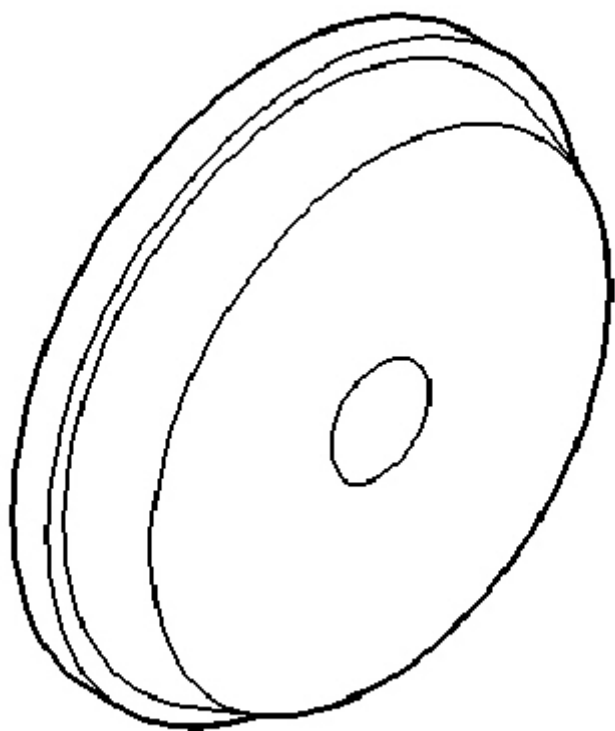


Fig. 254: Installer - D-130
Courtesy of CHRYSLER LLC

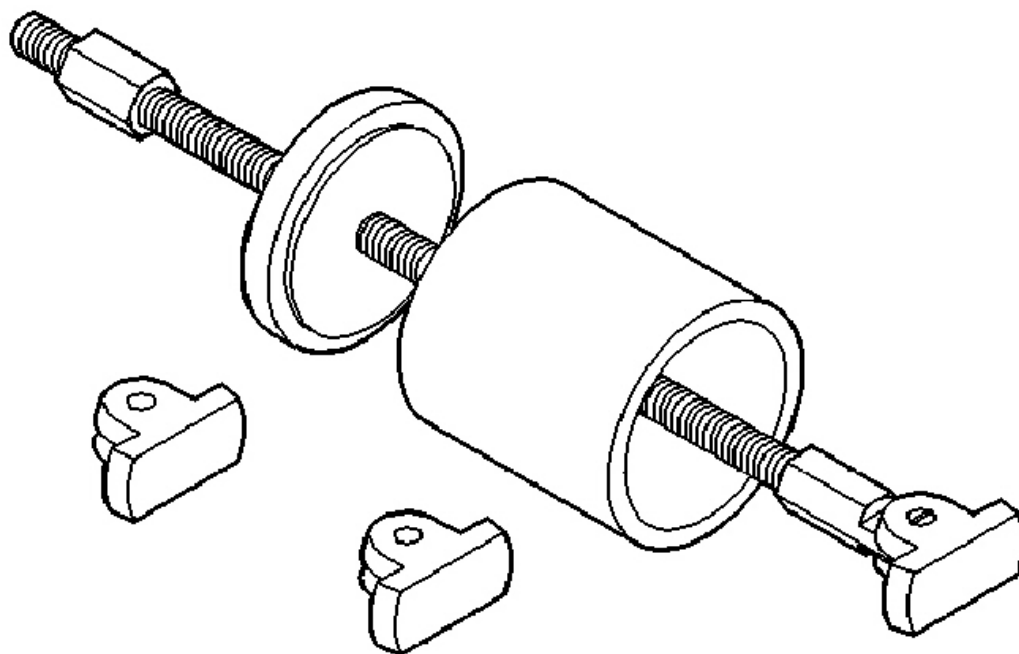


Fig. 255: Remover 6310
Courtesy of CHRYSLER LLC

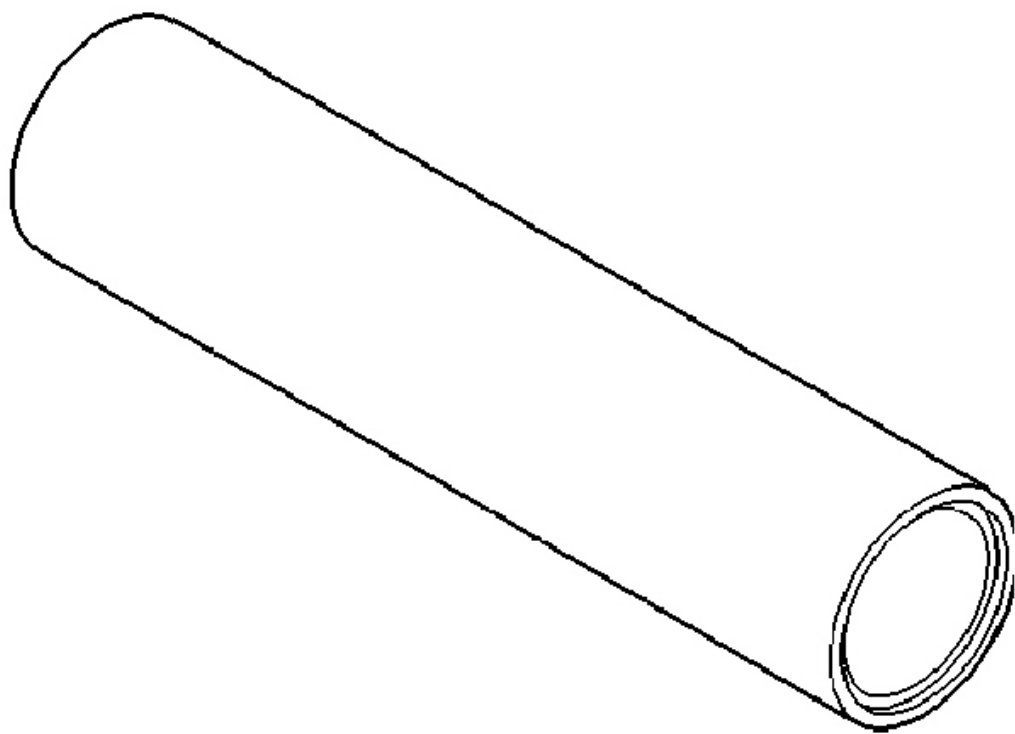


Fig. 256: Installer 6448
Courtesy of CHRYSLER LLC

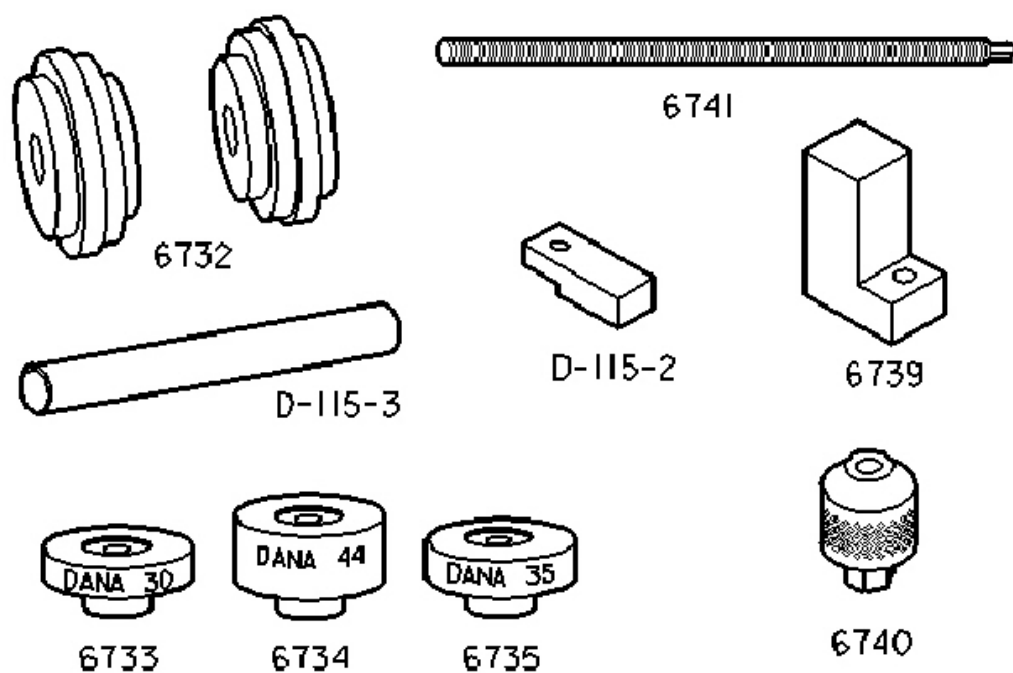


Fig. 257: Pinion Gauge Set 6774
 Courtesy of CHRYSLER LLC

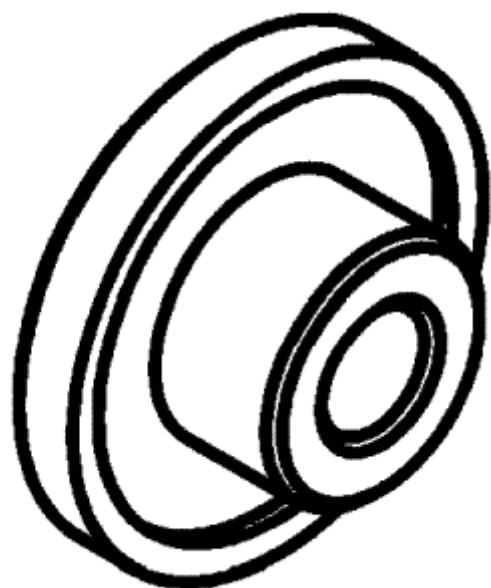


Fig. 258: Installer 8493

Courtesy of CHRYSLER LLC

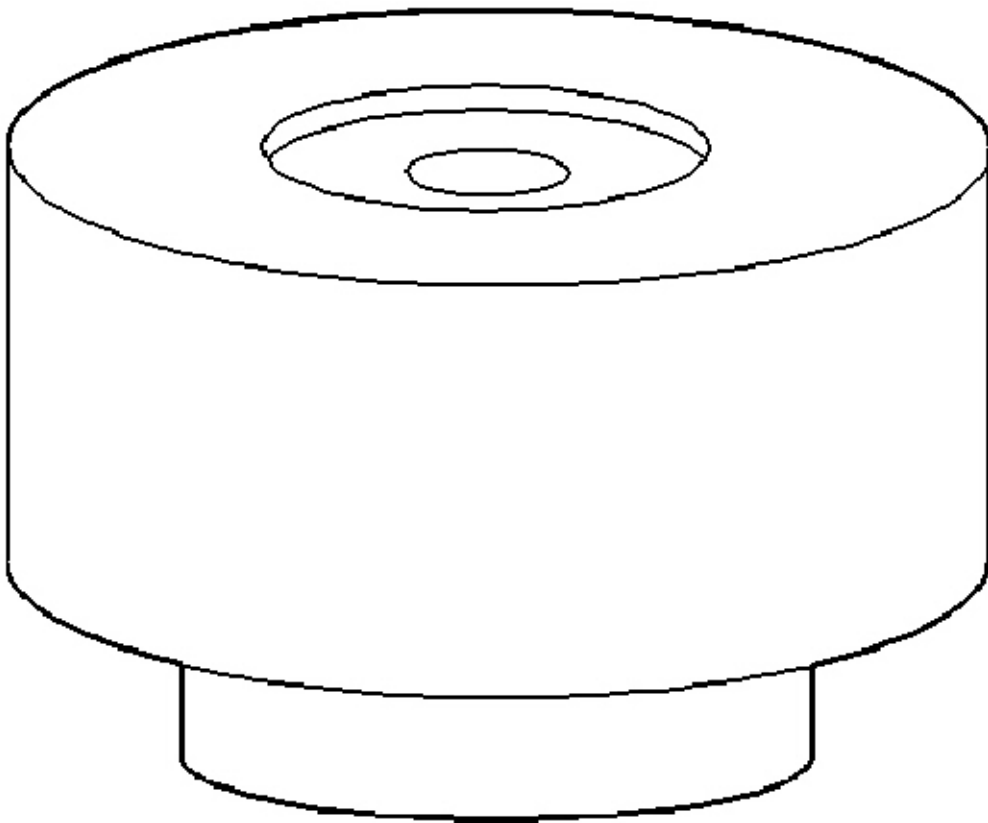


Fig. 259: Pinion Block 8540
Courtesy of CHRYSLER LLC

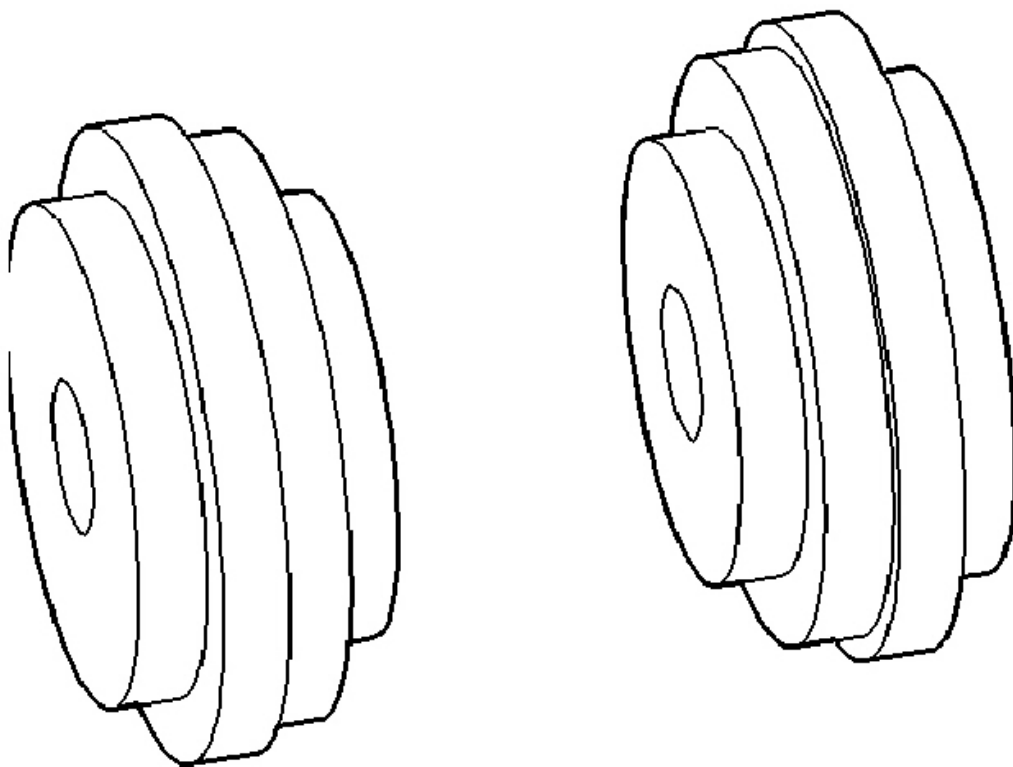


Fig. 260: Arbor Discs 8541
Courtesy of CHRYSLER LLC

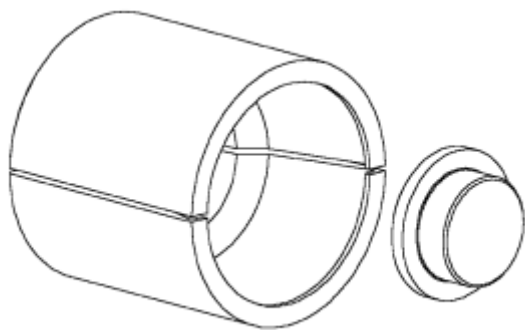


Fig. 261: Plug 8926-2
Courtesy of CHRYSLER LLC

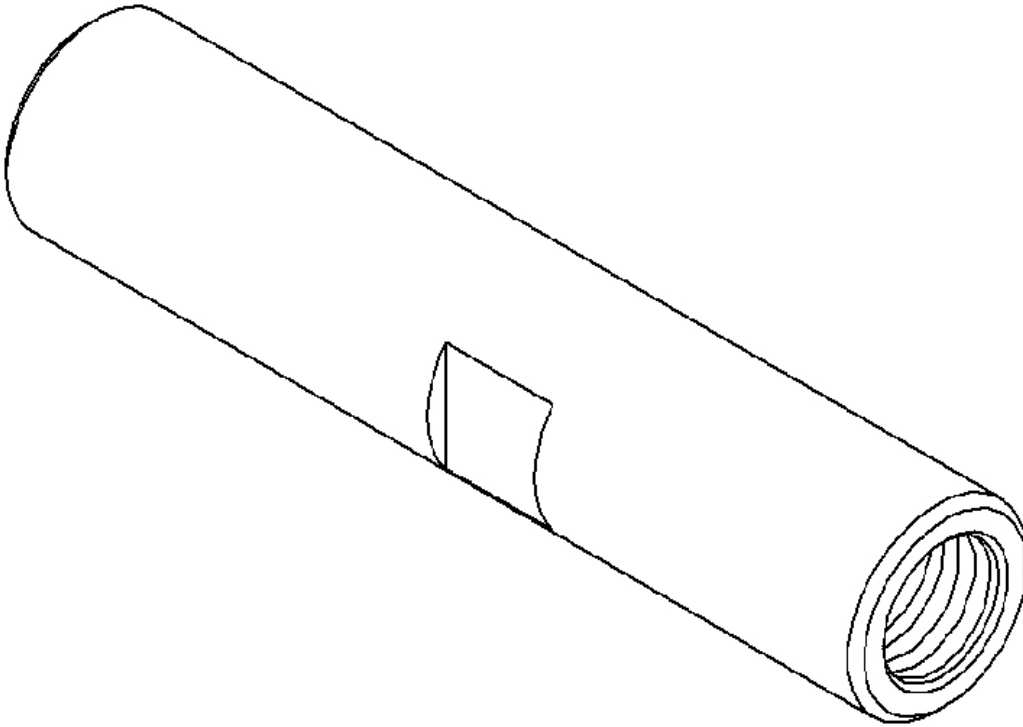


Fig. 262: Pinion Driver 8976
Courtesy of CHRYSLER LLC

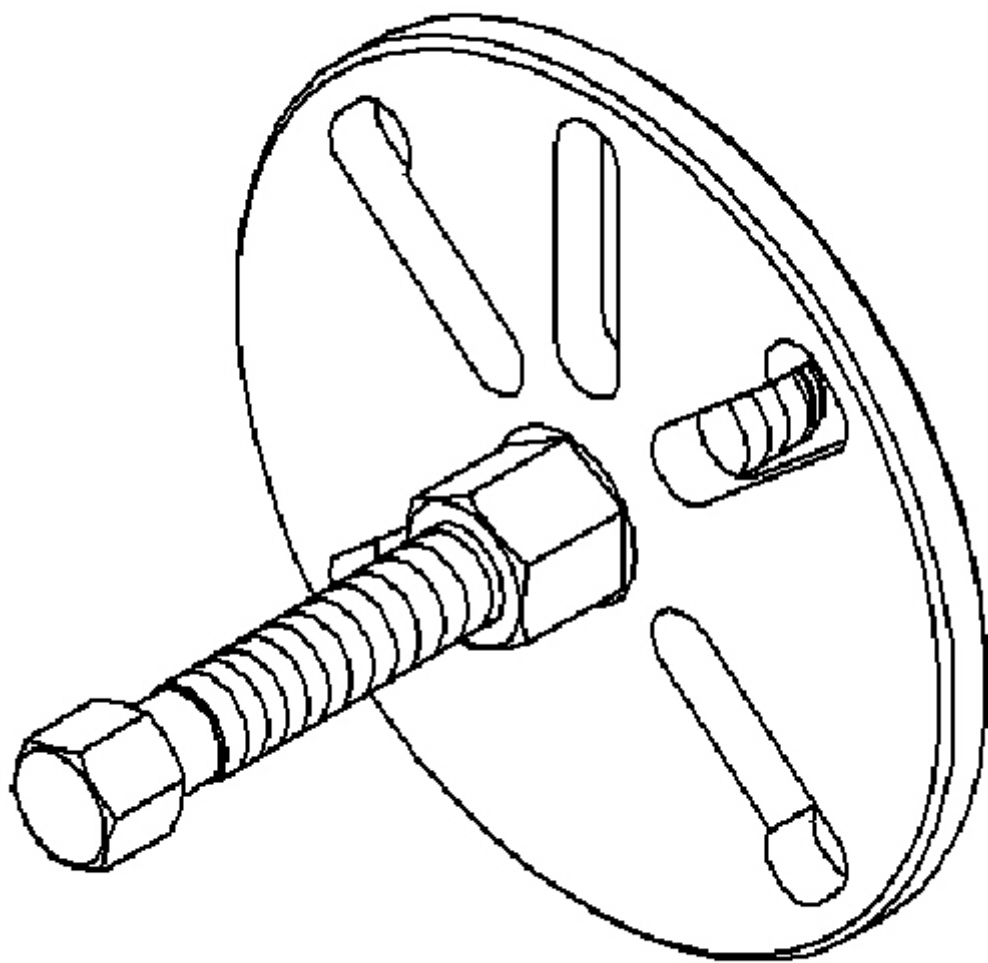


Fig. 263: Flange Puller 8992
Courtesy of CHRYSLER LLC

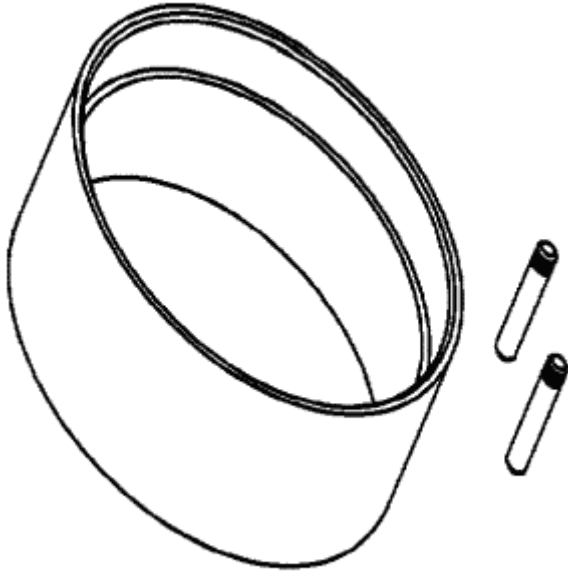


Fig. 264: Remover/Installer 10126
Courtesy of CHRYSLER LLC

COVER-DIFFERENTIAL

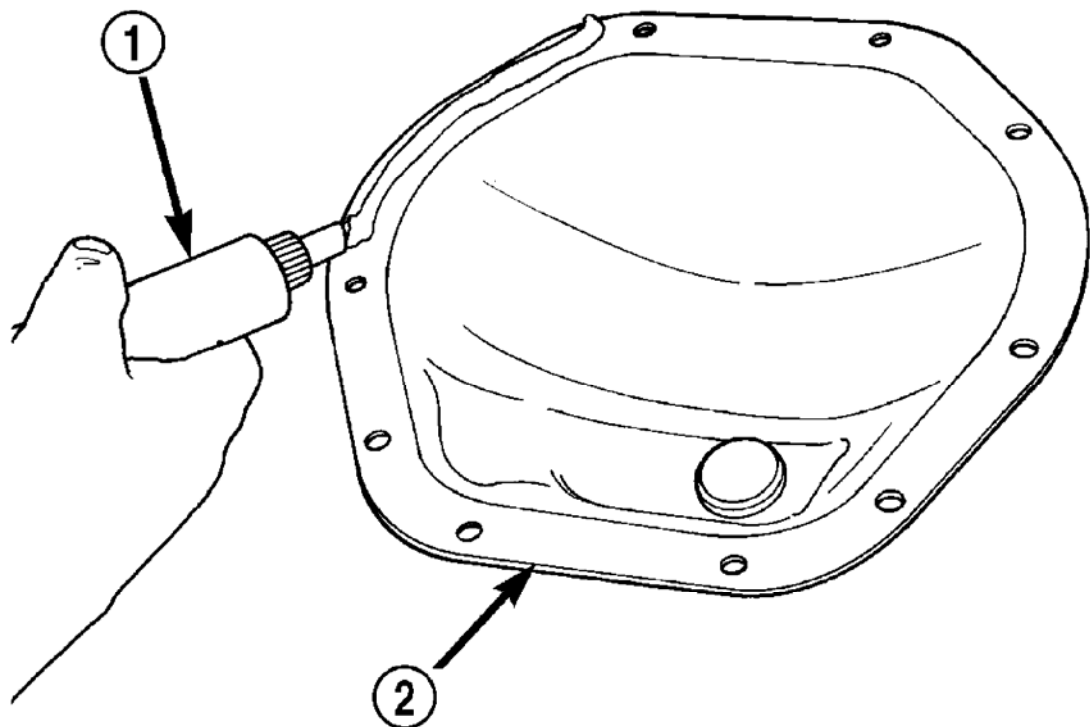
REMOVAL

COVER-DIFFERENTIAL

1. With vehicle in neutral, position vehicle on hoist.
2. Remove cover bolts.
3. Remove cover and drain lubricant.

INSTALLATION

COVER-DIFFERENTIAL



80a534a8

Fig. 265: Cover Sealant
Courtesy of CHRYSLER LLC

1. Apply a bead of orange Mopar™ Axle RTV sealant (1) or equivalent to the housing cover (2).

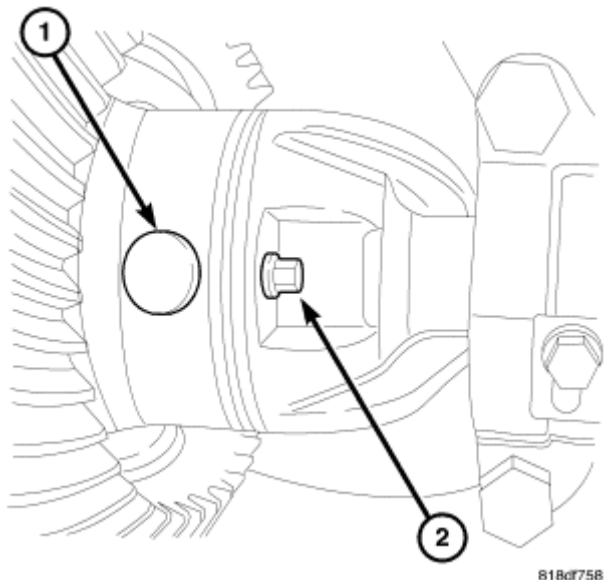
CAUTION: If cover is not installed within 3 to 5 minutes, the cover must be cleaned and new RTV applied. Failure to follow these instructions will cause a leak.

2. Install cover and identification tag. Tighten cover bolts in a criss-cross pattern to 41 N.m (30 ft. lbs.).
3. Fill differential to specifications.
4. Install fill plug.

SHAFT-AXLE

REMOVAL

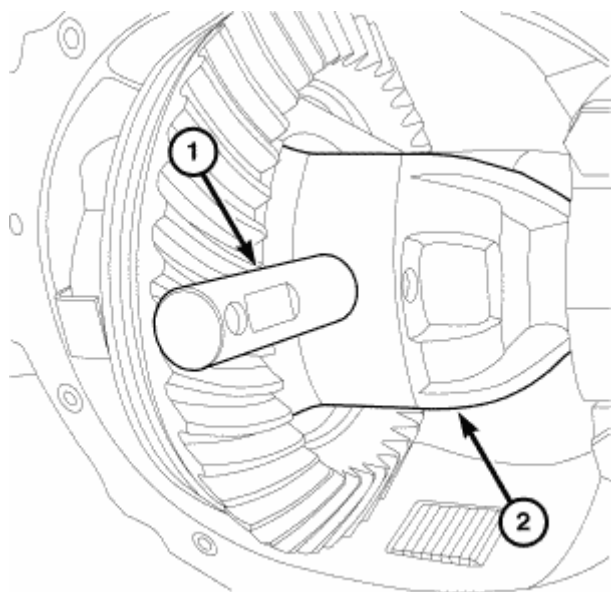
SHAFT-AXLE



818df758

Fig. 266: Mate Shaft Lock Screw
 Courtesy of CHRYSLER LLC

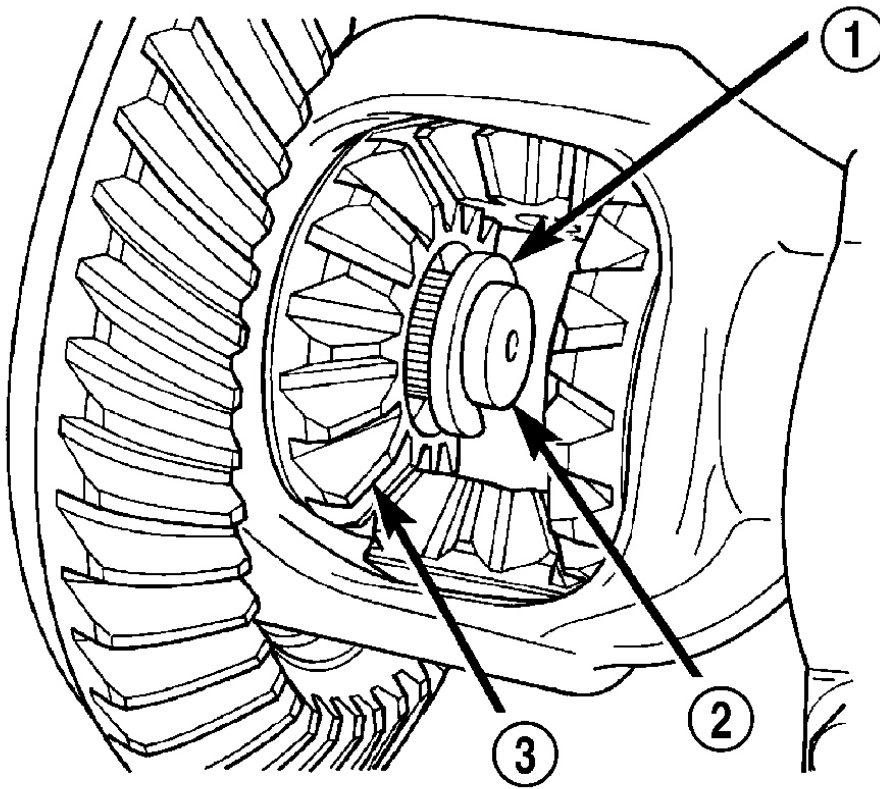
1. With vehicle in neutral, position vehicle on hoist.
2. Remove rear brake components.
3. Remove wheel speed sensor.
4. Remove differential housing cover and drain lubricant.
5. Rotate differential case so pinion mate shaft (1) lock screw (2) is accessible. Remove pinion mate shaft lock screw (2) from differential case.



818dcb14

Fig. 267: Pinion Mate Shaft
 Courtesy of CHRYSLER LLC

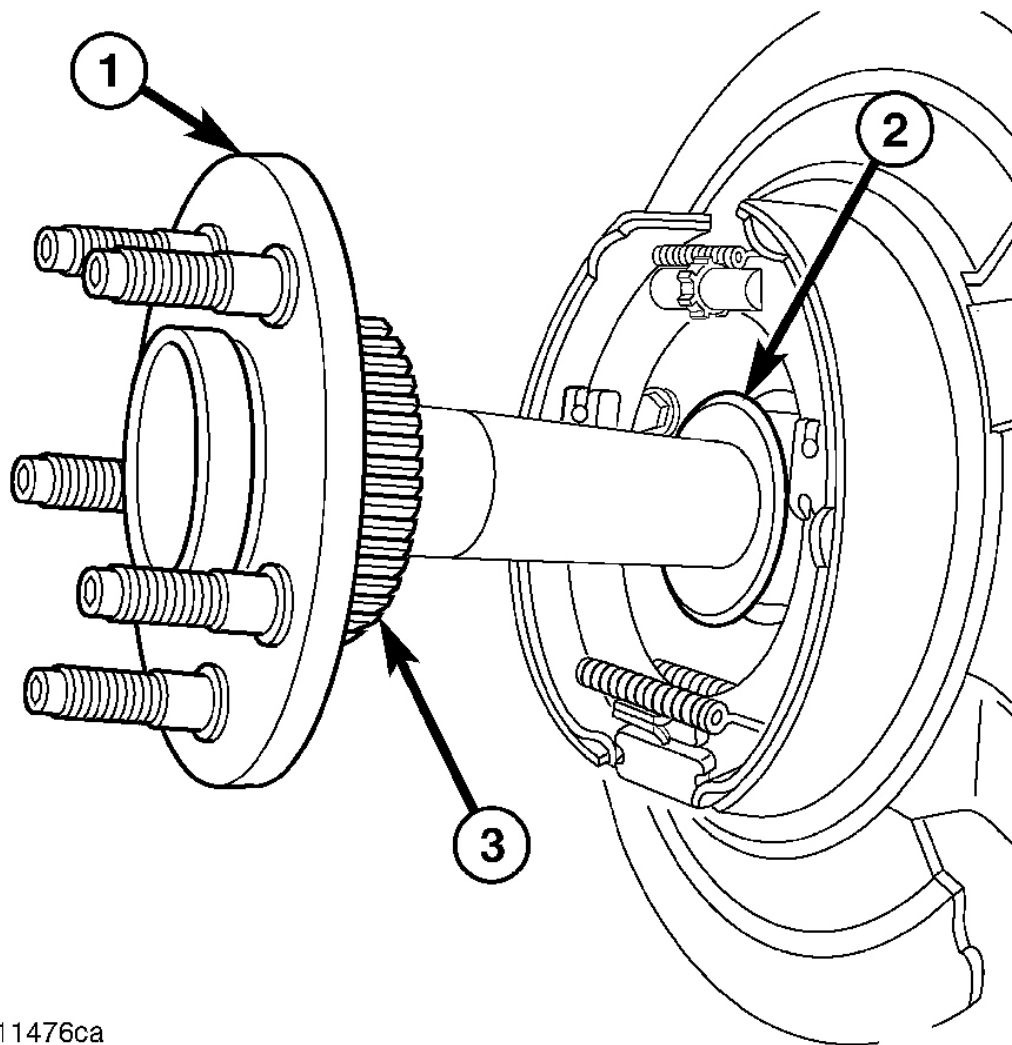
6. Remove pinion mate shaft (1) from differential case (2).



80be4603

Fig. 268: Axle Shaft C-Lock
Courtesy of CHRYSLER LLC

7. Push axle shaft inward and remove axle shaft C-lock (1) from the axle shaft (2).



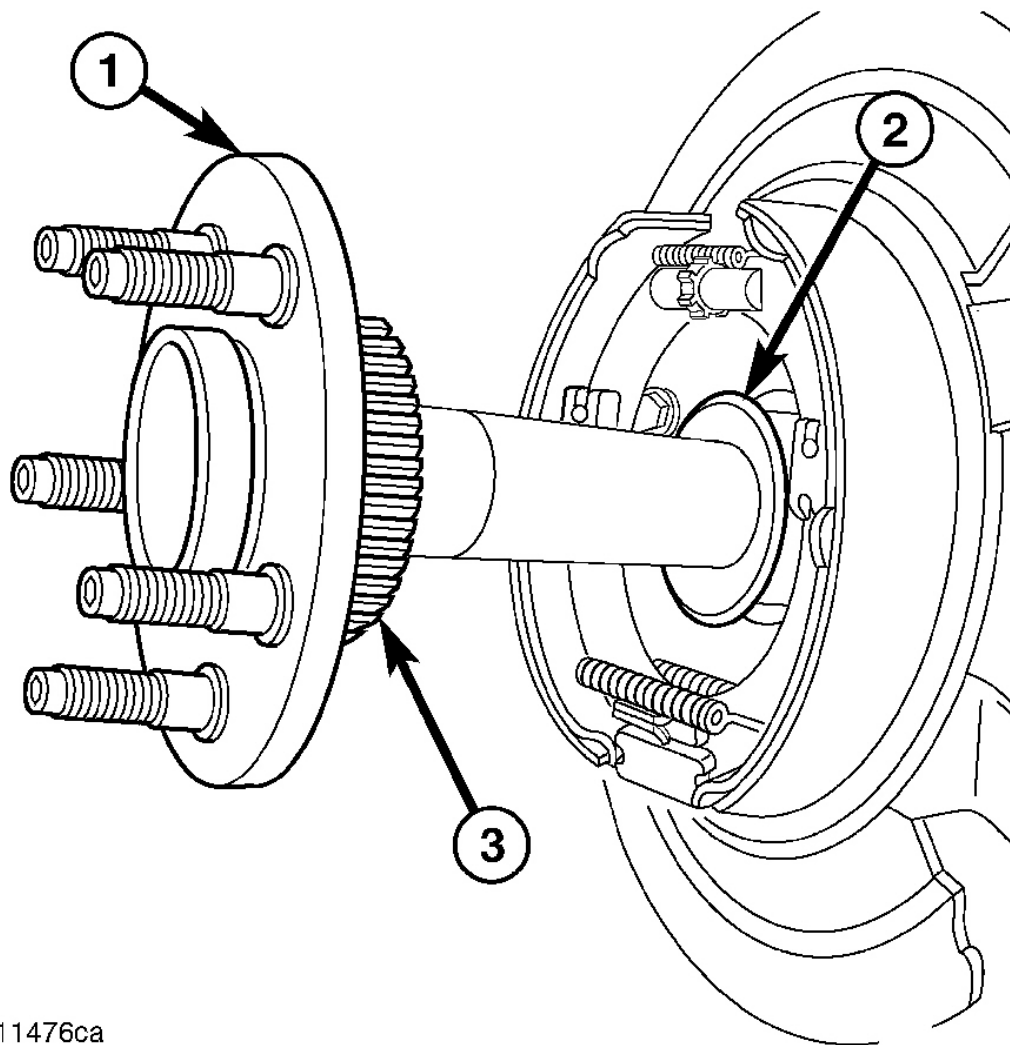
811476ca

Fig. 269: Axle Shaft
Courtesy of CHRYSLER LLC

8. Remove axle shaft (1) from side gear and axle tube (2).

INSTALLATION

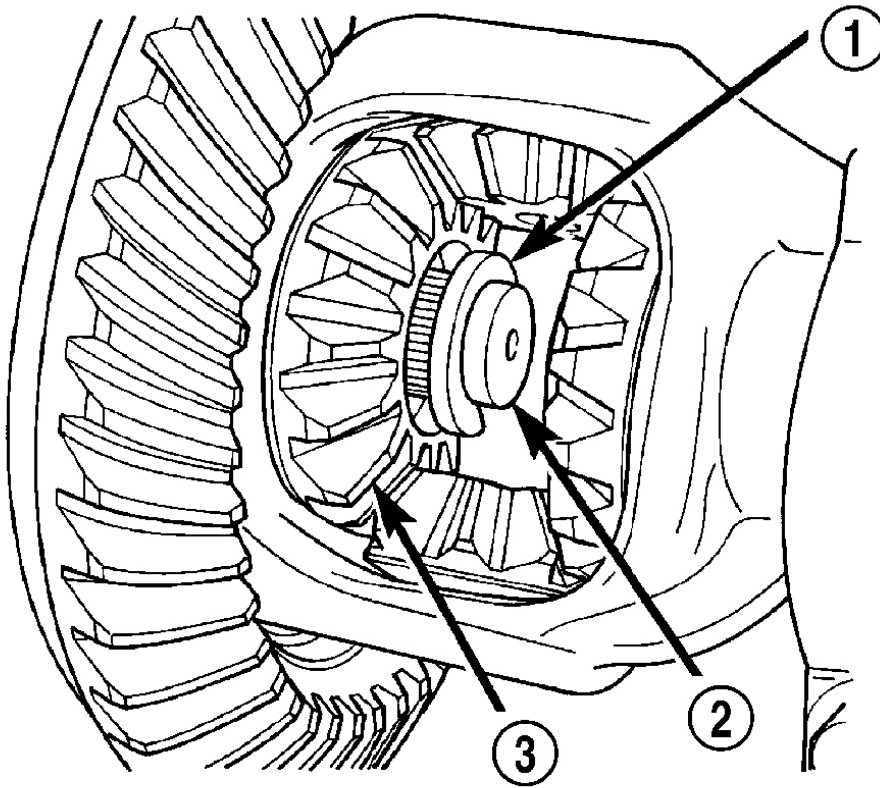
SHAFT-AXLE



811476ca

Fig. 270: Axle Shaft
Courtesy of CHRYSLER LLC

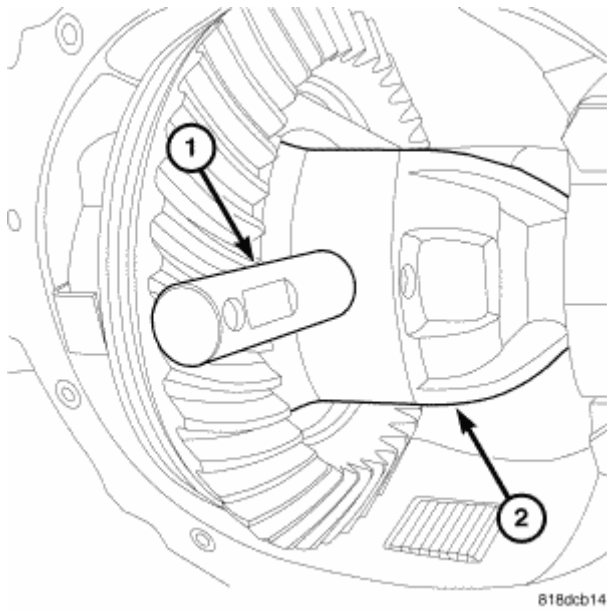
1. Install axle shaft (1) in axle tube (2) and engage into side gear splines.



80be4603

Fig. 271: Axle Shaft C-Lock
Courtesy of CHRYSLER LLC

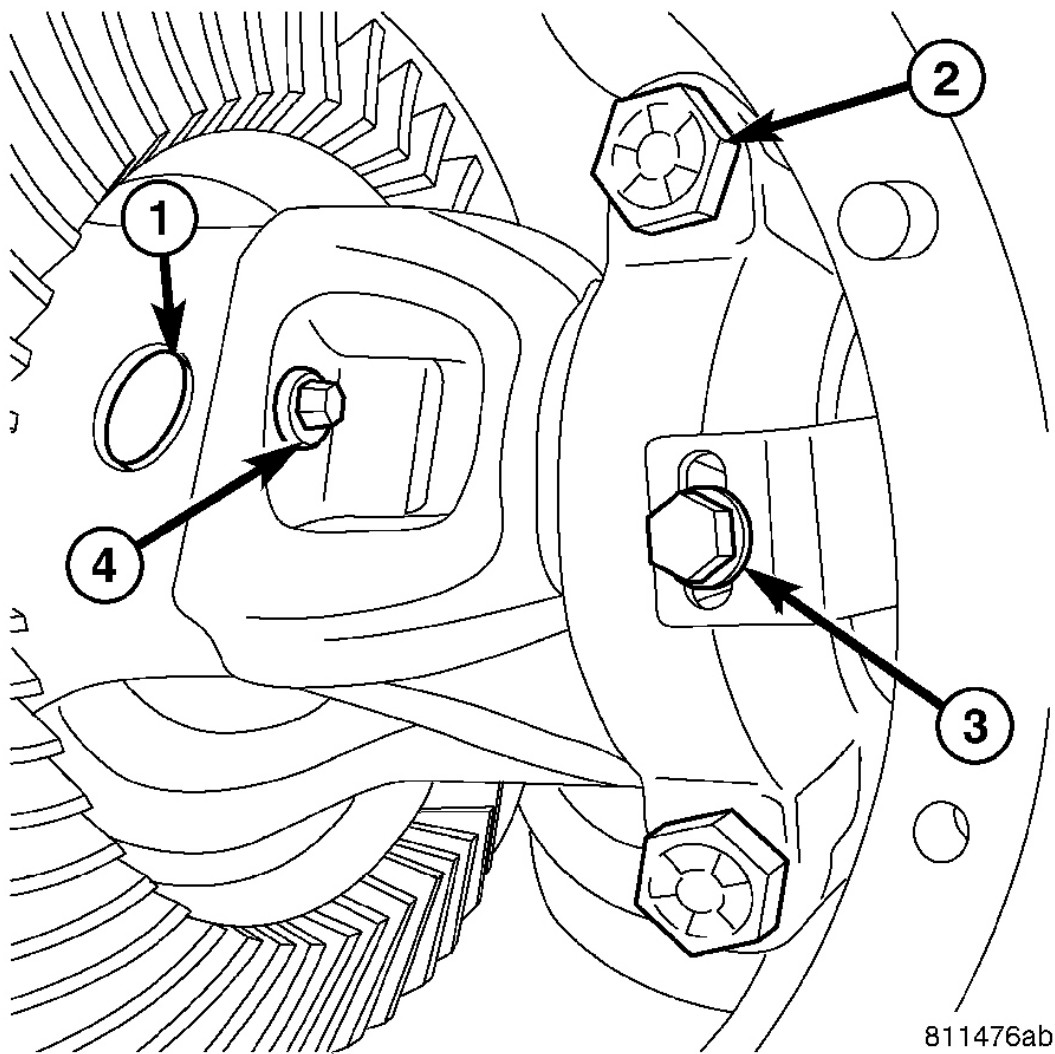
2. Lubricate bearing bore and seal lip with gear lubricant.
3. Install C-lock (1) in axle shaft end, then push axle shaft outward to seat C-lock in side gear.



618dcb14

Fig. 272: Pinion Mate Shaft
Courtesy of CHRYSLER LLC

4. Install pinion mate shaft (1) into differential case (2) and through thrust washers and differential pinions.



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Fig. 273: Lock Screw

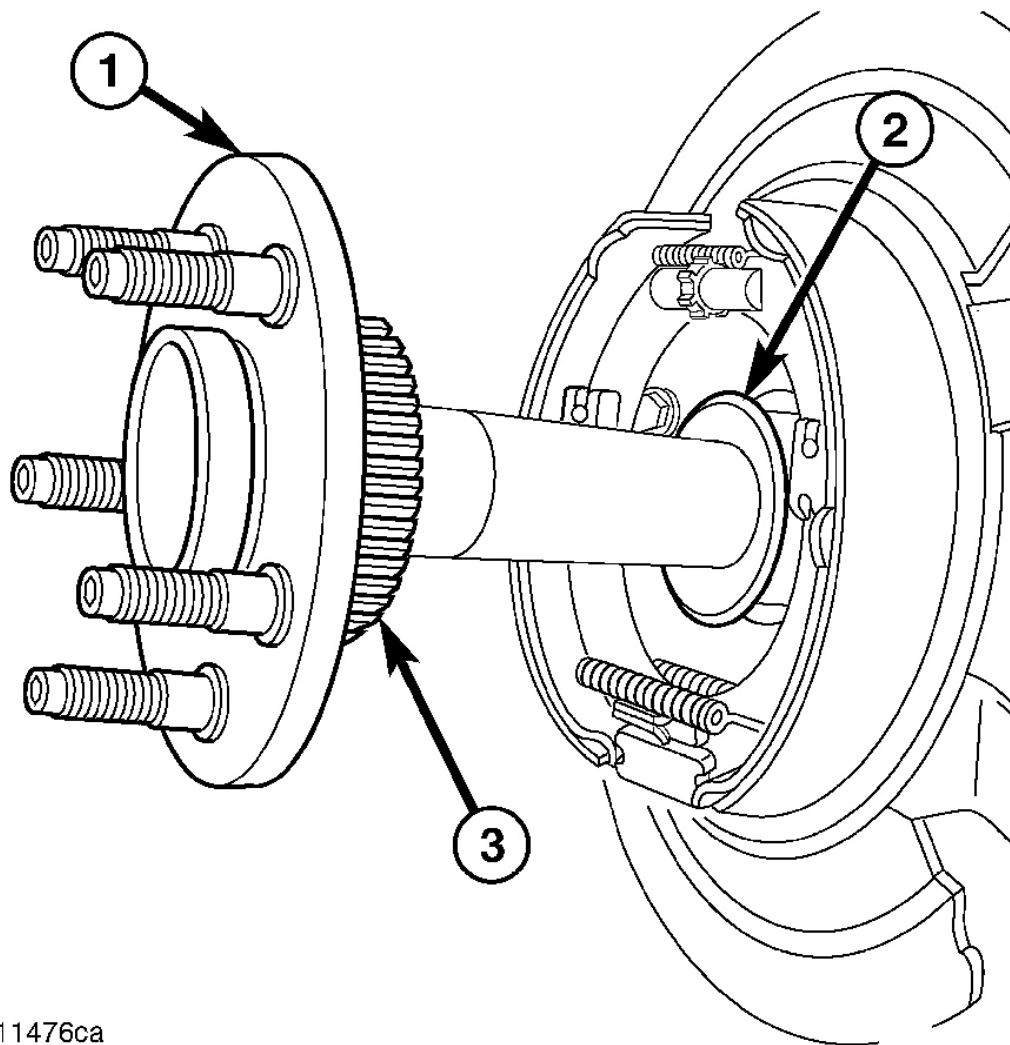
Courtesy of CHRYSLER LLC

5. Align hole in shaft with hole in the differential case and install lock screw (4) with Mopar Lock & Seal or equivalent on the threads. Tighten lock screw to 26 N.m (19 ft. lbs.).
6. Install differential cover.
7. Install rear brake components.

SEAL-AXLE SHAFT

REMOVAL

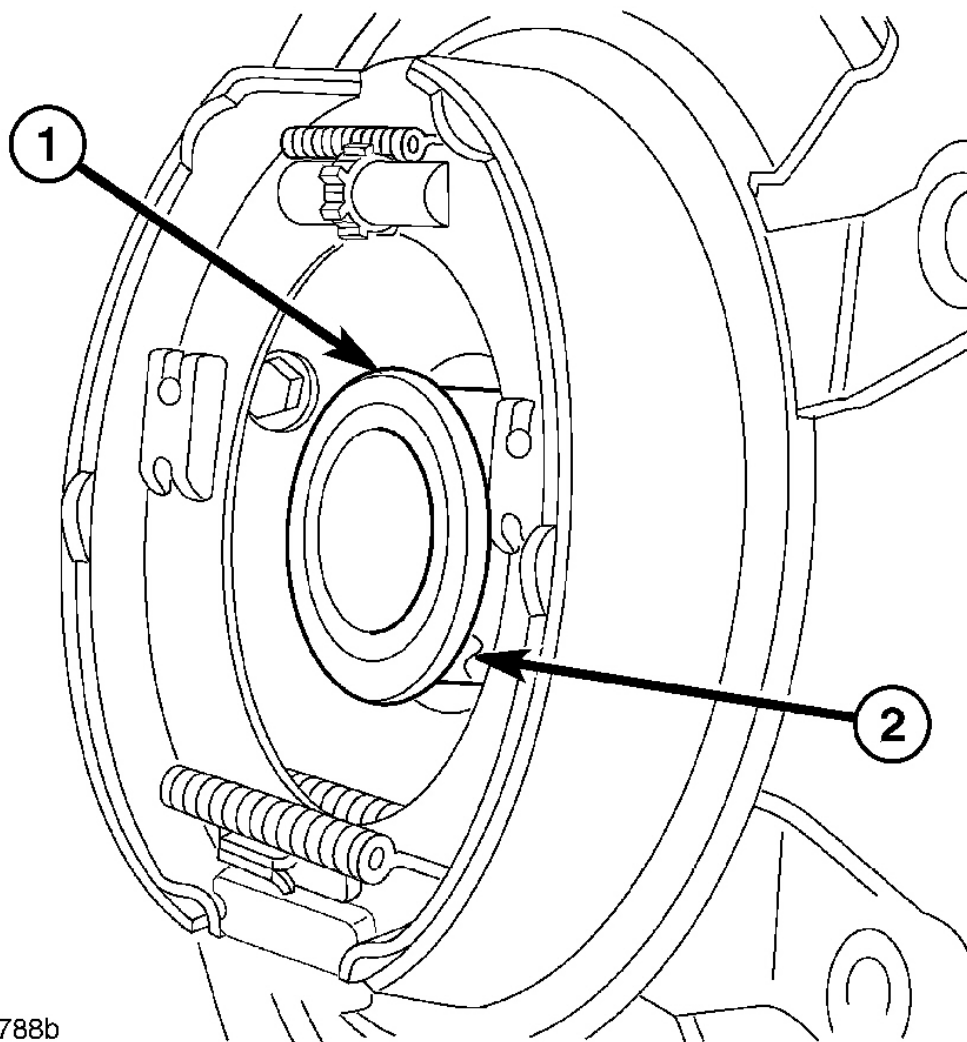
SEAL-AXLE SHAFT



811476ca

Fig. 274: Axle Shaft
Courtesy of CHRYSLER LLC

1. Remove axle shaft (1) from axle tube (2).



8114788b

Fig. 275: Axle Shaft Seal
Courtesy of CHRYSLER LLC

2. Remove axle shaft seal (1) from axle tube (2) with seal puller.

INSTALLATION

SEAL-AXLE SHAFT

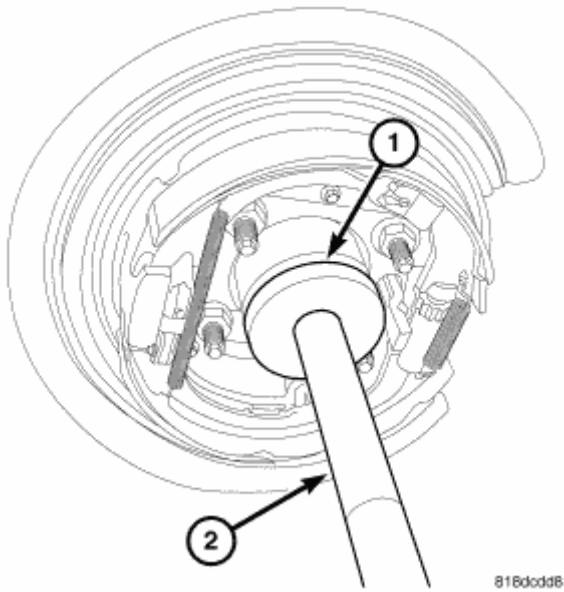
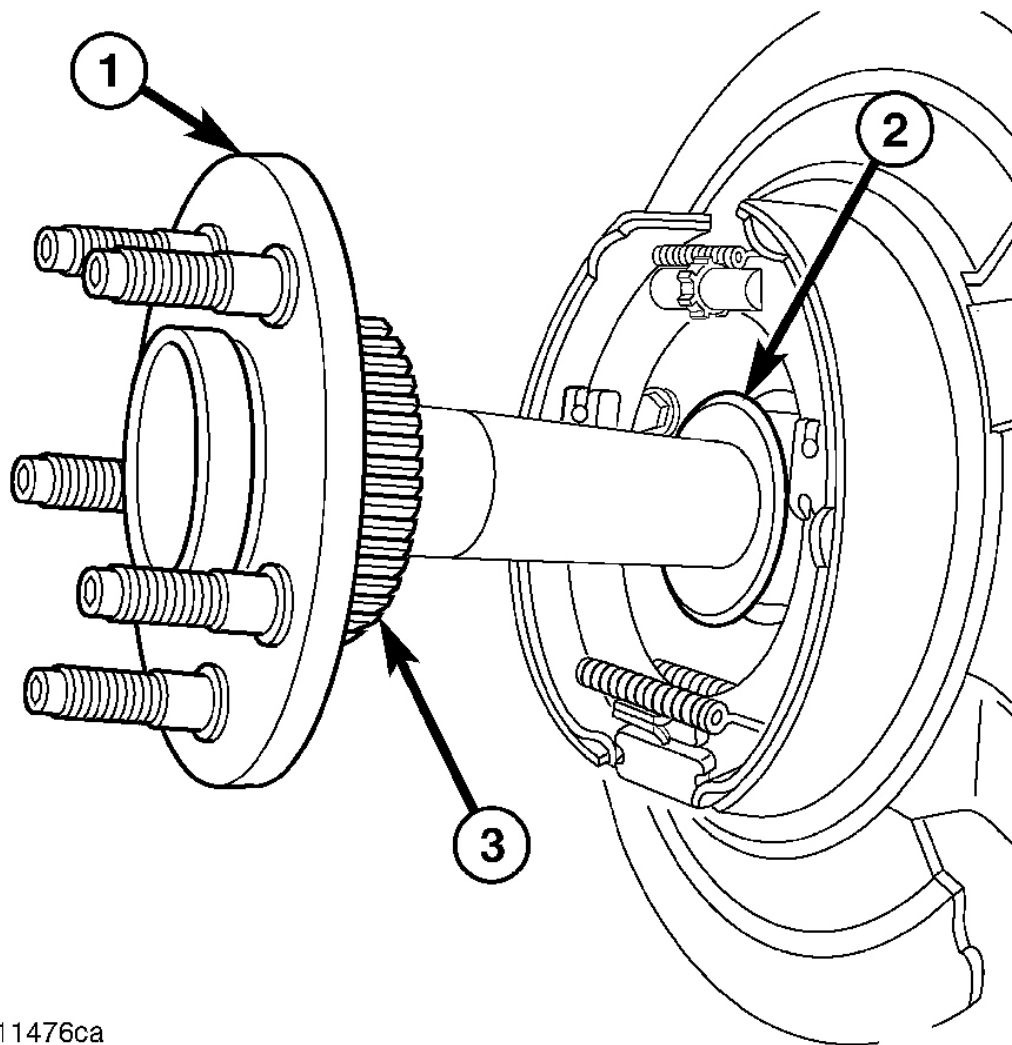


Fig. 276: View Of Axle Seal Installer
Courtesy of CHRYSLER LLC

1. Remove any old sealer/burrs from axle tube.
2. Coat **new** seal lip with axle lubricant and install seal with Installer 8493 (1) and Handle C-4171 (1).



811476ca

Fig. 277: Axle Shaft
Courtesy of CHRYSLER LLC

3. Install axle shaft (1) in axle tube (2).

BEARING-AXLE

REMOVAL

BEARING-AXLE

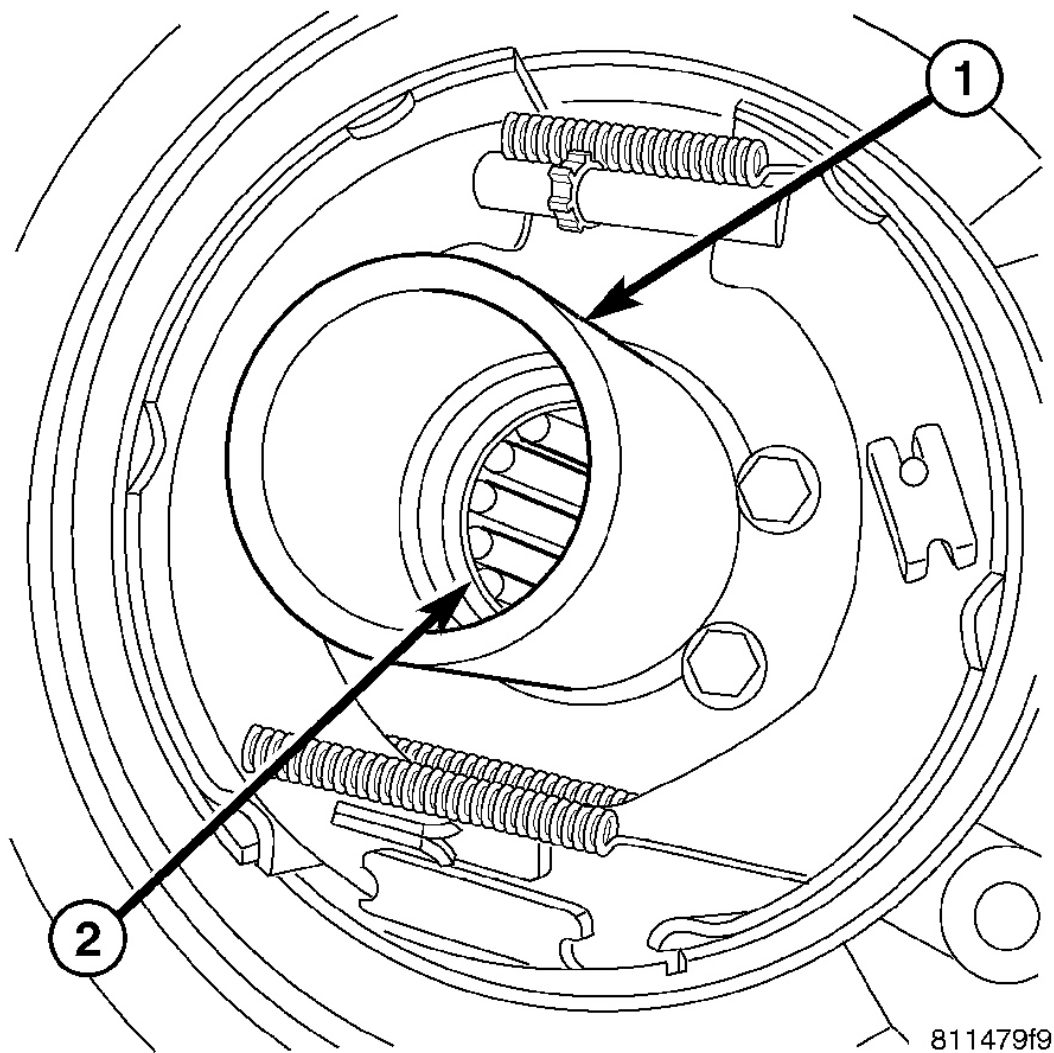
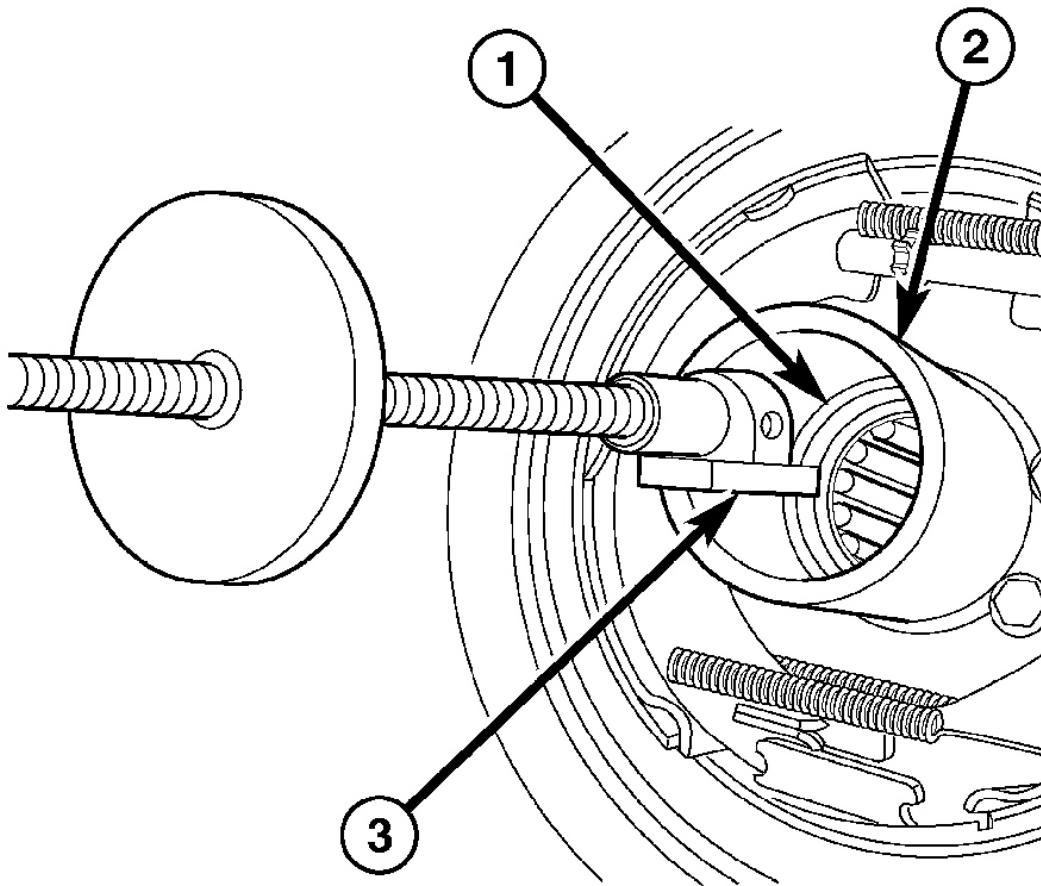


Fig. 278: Bearing Receiver
Courtesy of CHRYSLER LLC

NOTE: Remove bearing with Bearing Remover 6310 and Foot 6310-9.

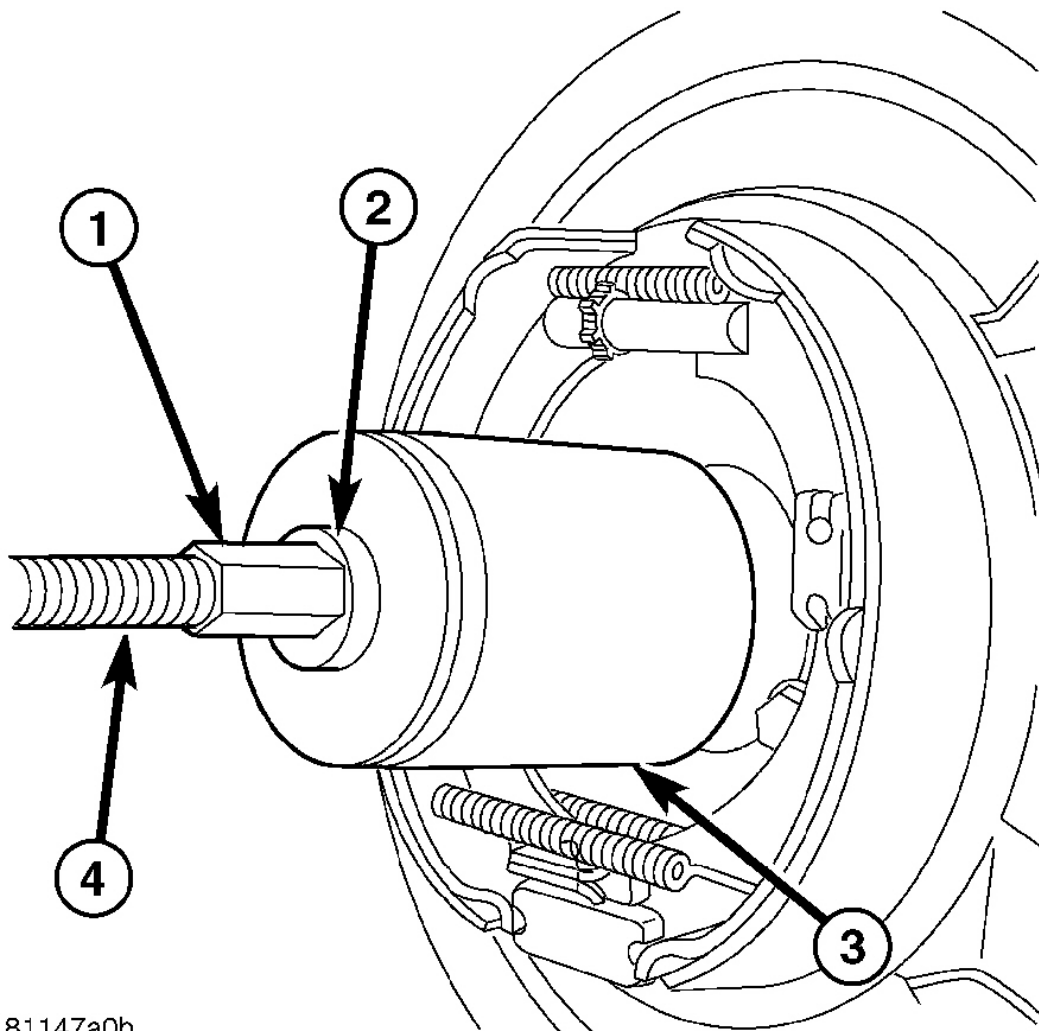
1. Remove axle shaft.
2. Remove axle seal with seal pick.
3. Position bearing (2) receiver (1) on axle tube.



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Fig. 279: Bearing Remover Foot
Courtesy of CHRYSLER LLC

4. Insert bearing remover Foot 6310-9 (3) through receiver (2) and bearing (1).



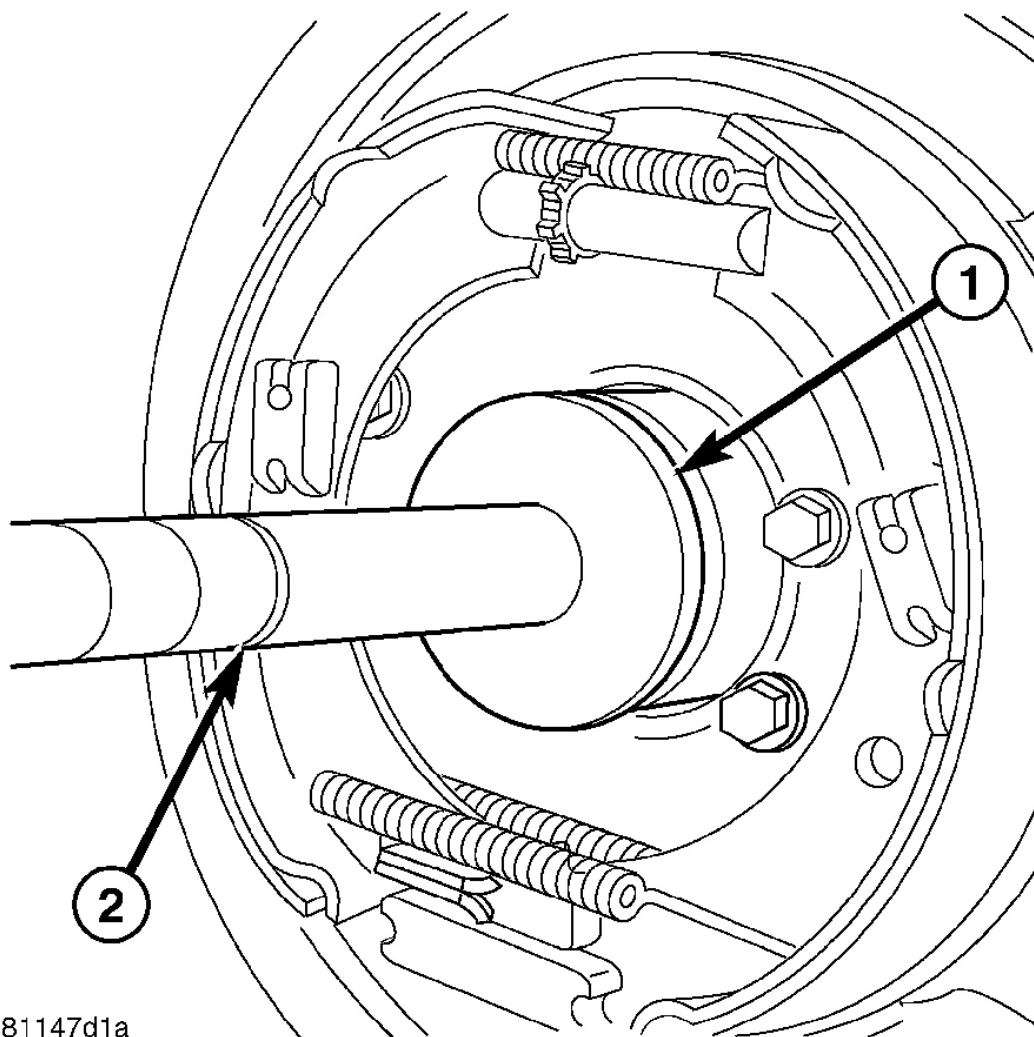
81147a0b

Fig. 280: Bearing Remover Assembly
Courtesy of CHRYSLER LLC

5. Tighten remove nut (1) on the shaft (4) to pull bearing into the receiver (3).

INSTALLATION

BEARING-AXLE



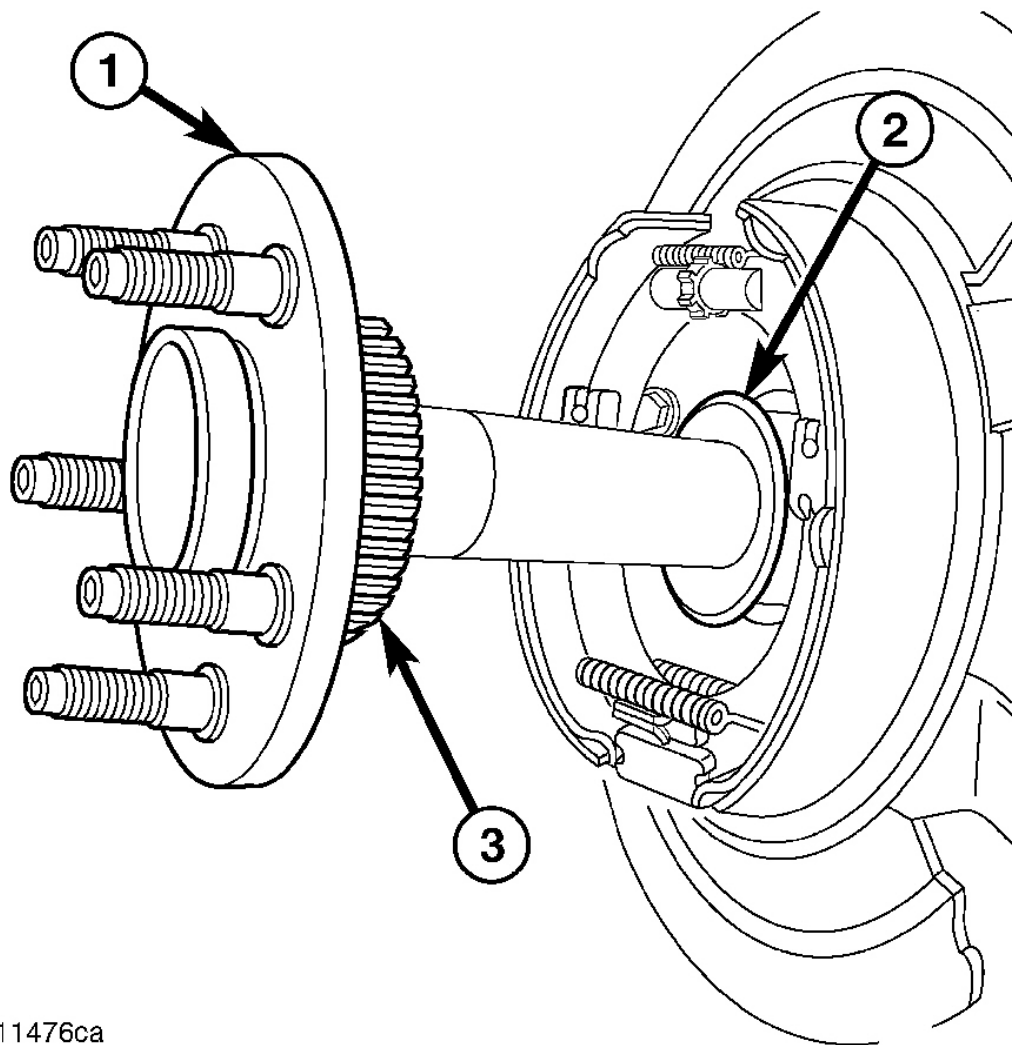
81147d1a

Fig. 281: Bearing Installer
Courtesy of CHRYSLER LLC

1. Remove any old sealer/burrs from axle tube.
2. Install axle shaft bearing with Installer C-4198 (1) and Handle C-4171 (2). Drive bearing in until tool contacts the axle tube.

NOTE: **Bearing is installed with the bearing part number against installer.**

3. Coat **new** axle seal lip with axle lubricant. Install seal with Installer 8493 and Handle C-4171.



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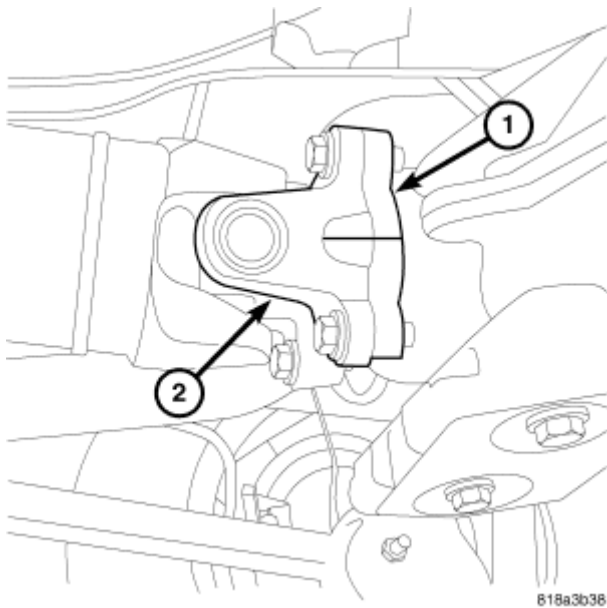
Fig. 282: Axle Shaft
Courtesy of CHRYSLER LLC

4. Install axle shaft (1) in axle tube (2).

SEAL-PINION

REMOVAL

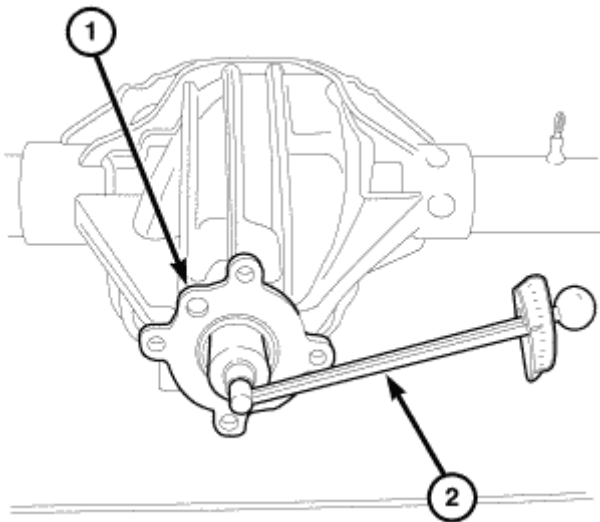
SEAL-PINION



818a3b38

Fig. 283: Identifying Line Across Axle Flange & Propeller Shaft Flange
 Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Remove wheel and tire assemblies.
3. Mark a reference line across the axle flange (1) and propeller shaft flange (2).
4. Remove companion flange bolts and remove propeller shaft.
5. Remove brake calipers and rotors to prevent any drag.



818ded97

Fig. 284: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
 Courtesy of CHRYSLER LLC

6. Rotate companion flange three or four times and verify flange rotates smoothly.

7. Record pinion torque to rotating (1) with an inch pound torque wrench (2) for installation reference.

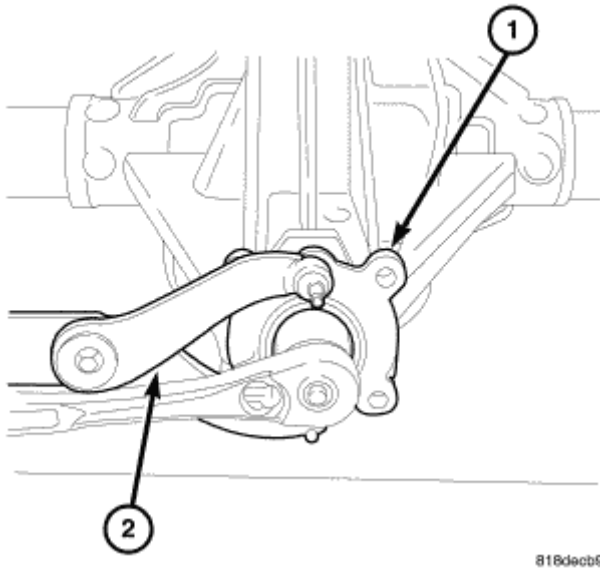


Fig. 285: Holding Pinion Flange With Holder C-3281
Courtesy of CHRYSLER LLC

8. Hold pinion flange (1) with Holder C-3281 (2) and remove pinion nut.
9. Mark a line across the pinion shaft and flange for installation reference.

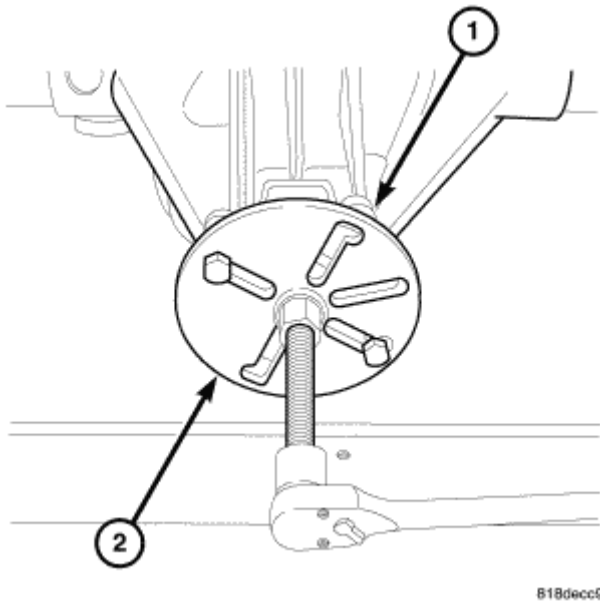
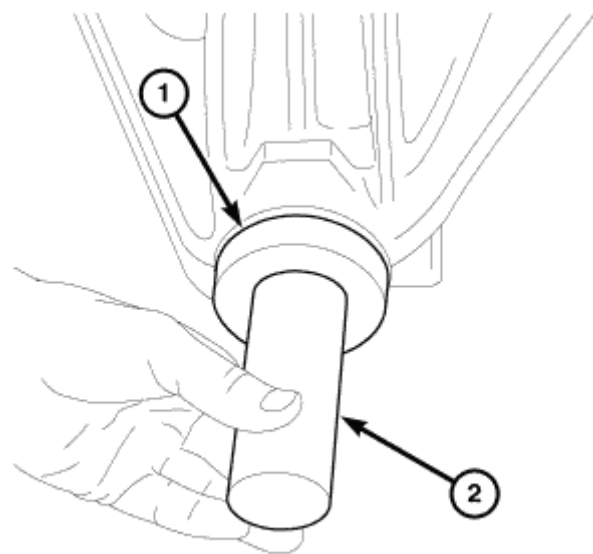


Fig. 286: Identifying Pinion Flange & Puller 8992
Courtesy of CHRYSLER LLC

10. Remove pinion flange (1) with Puller 8992 (2).
11. Remove pinion seal with a seal puller.

INSTALLATION

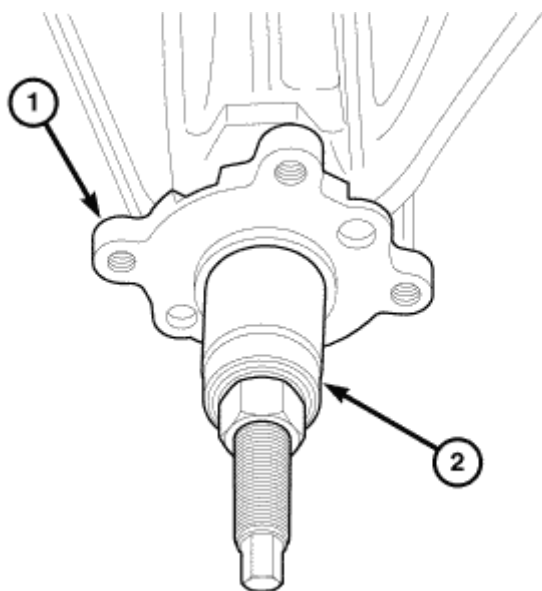
SEAL-PINION



818ddc4f

Fig. 287: Pinion Seal Installer
Courtesy of CHRYSLER LLC

1. Apply a light coating of gear lubricant on the lip of pinion seal.
2. Install **new** pinion seal with Installer C-4076-B (1) and Handle C-4735 (2).

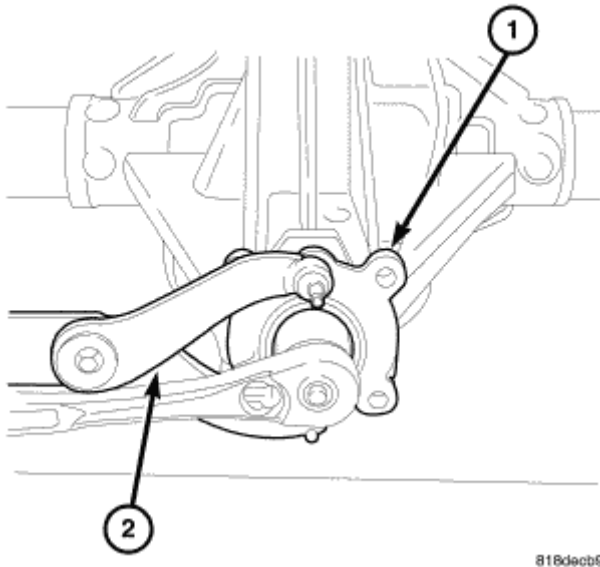


818ddc43

Fig. 288: Installing Flange With Installer C-3718
Courtesy of CHRYSLER LLC

3. Install flange on the pinion shaft with the reference marks aligned.

4. Install flange (1) with Installer C-3718 (2).



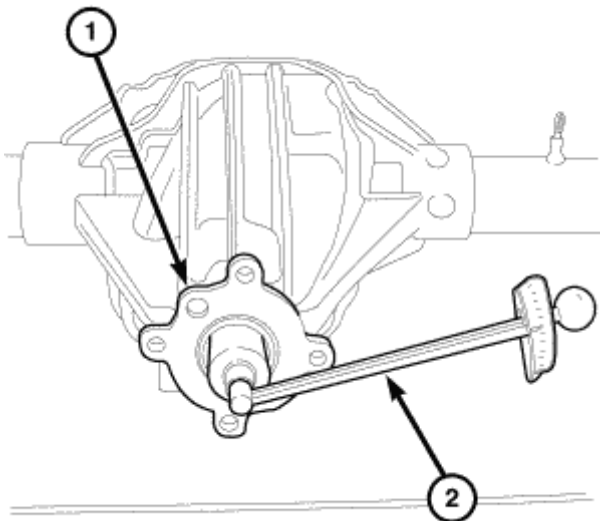
818dec09

Fig. 289: Holding Pinion Flange With Holder C-3281

Courtesy of CHRYSLER LLC

5. Install new pinion nut. Hold flange (1) with Holder C-3281 (2) and tighten pinion nut to 285 N.m (210 ft. lbs.). Rotate pinion several revolutions to ensure the bearing rollers are seated.

NOTE: Do not exceed the minimum torque 285 N.m (210 ft. lbs.) when installing the pinion nut at this point.



818ded97

Fig. 290: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench

Courtesy of CHRYSLER LLC

6. Measure pinion torque to rotate (1) with an inch pound torque wrench (2). Pinion torque to rotating should be equal to recorded reading plus an additional 0.56 N.m (5 in. lbs.).

If pinion torque to rotate is low, tighten pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotating is achieved.

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque. If pinion torque to rotating is exceeded, a new collapsible spacer must be installed. Failure to follow these instructions will result in damage to the axle.

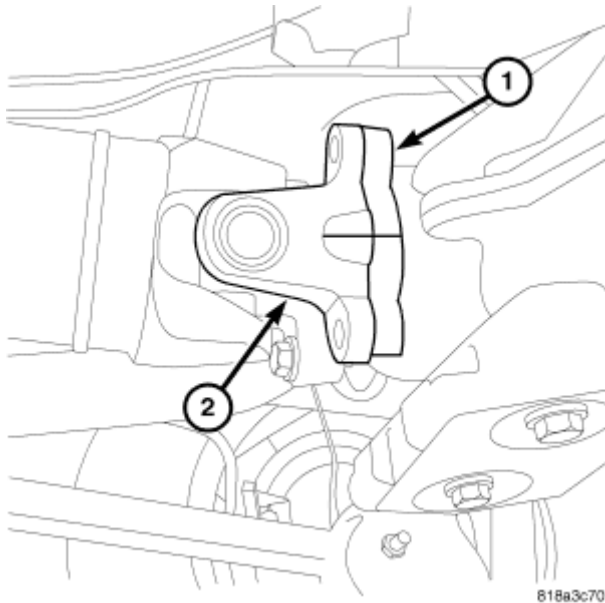


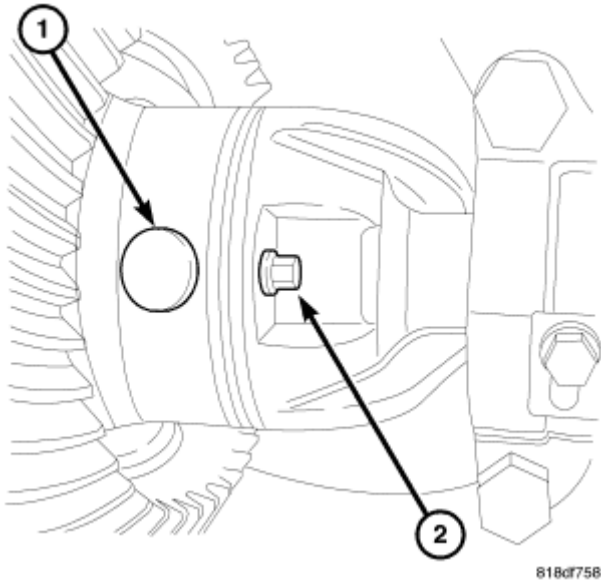
Fig. 291: Identifying Axle Flange & Propeller Shaft Flange
Courtesy of CHRYSLER LLC

7. Install propeller shaft (1) with axle flange (2) installation reference marks aligned.
8. Install rear brake components.

DIFFERENTIAL

REMOVAL

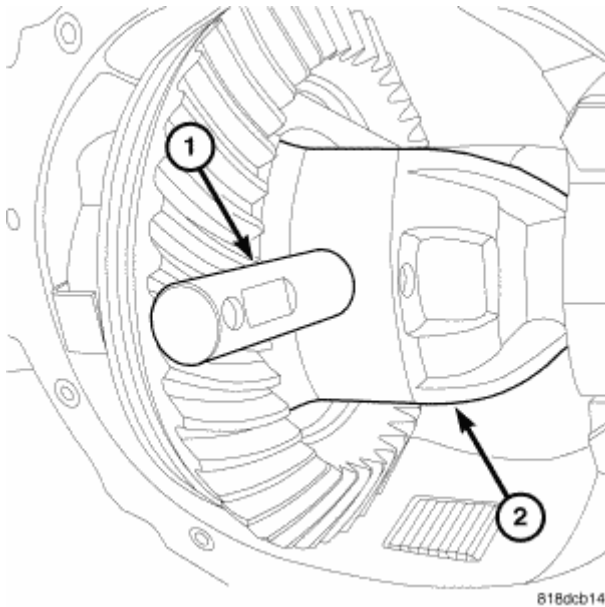
DIFFERENTIAL



818df758

Fig. 292: Mate Shaft Lock Screw
 Courtesy of CHRYSLER LLC

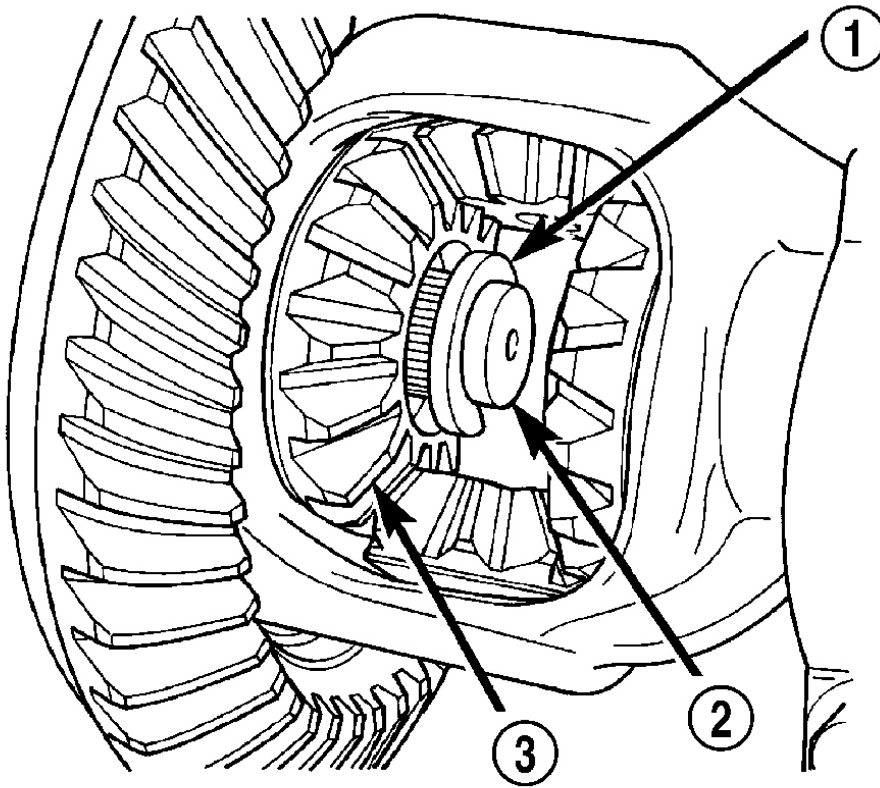
1. Remove differential fill plug.
2. Remove differential cover and drain lubricant.
3. Remove pinion mate shaft (1) lock screw (2) from differential case.



818dcb14

Fig. 293: Pinion Mate Shaft
 Courtesy of CHRYSLER LLC

4. Remove pinion mate shaft (1) from differential case (2).



80be4603

Fig. 294: Axle Shaft C-Lock
Courtesy of CHRYSLER LLC

5. Push axle shaft inward and remove axle shaft C-lock (1) from the axle shaft (2). Slide axle shafts (2) out of differential side gears (3).

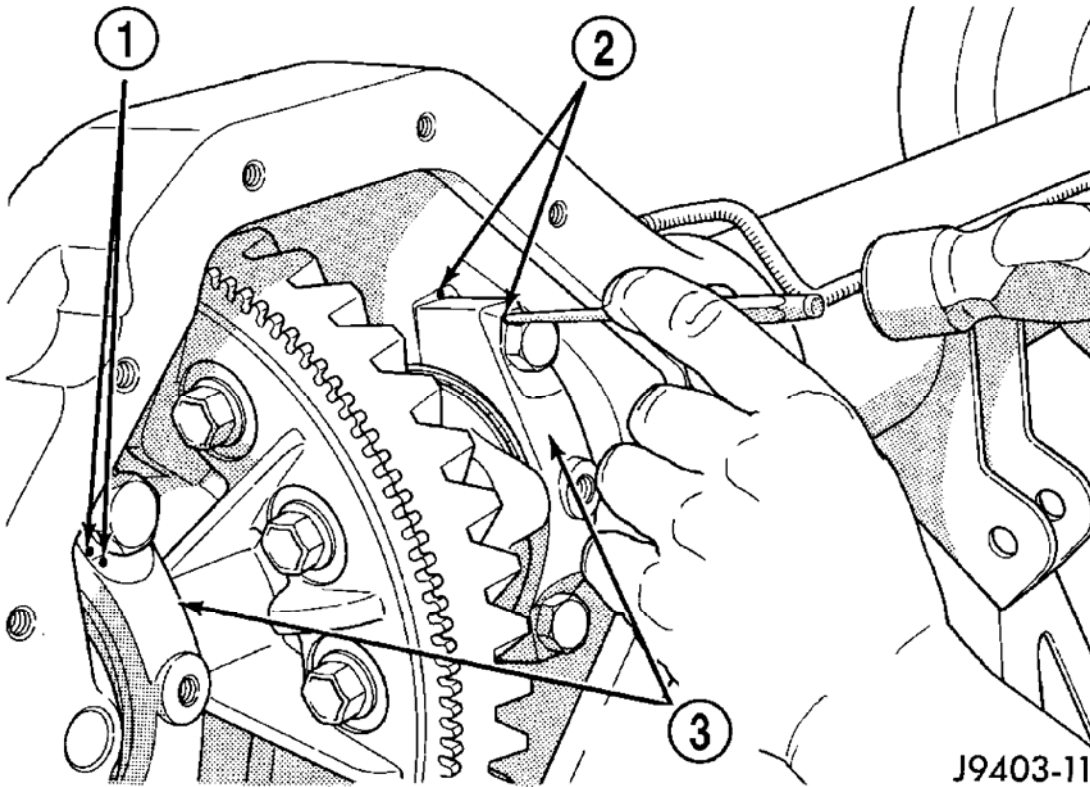


Fig. 295: Reference Marks
Courtesy of CHRYSLER LLC

6. Mark (1) (2) differential housing and bearing caps (3) for installation reference.

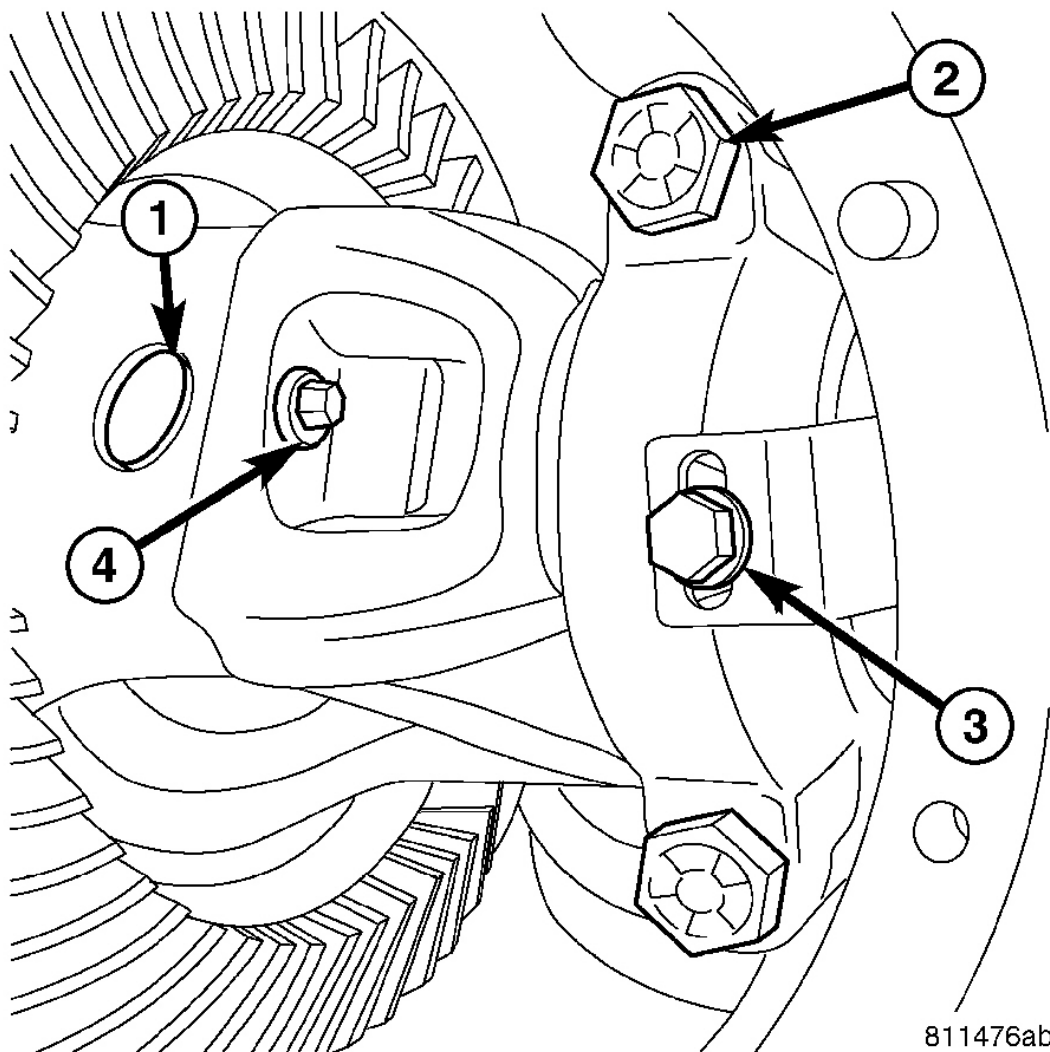


Fig. 296: Lock Screw
Courtesy of CHRYSLER LLC

7. Remove bearing adjuster lock bolt (3) from bearing caps.
8. Loosen differential bearing cap bolts (2).

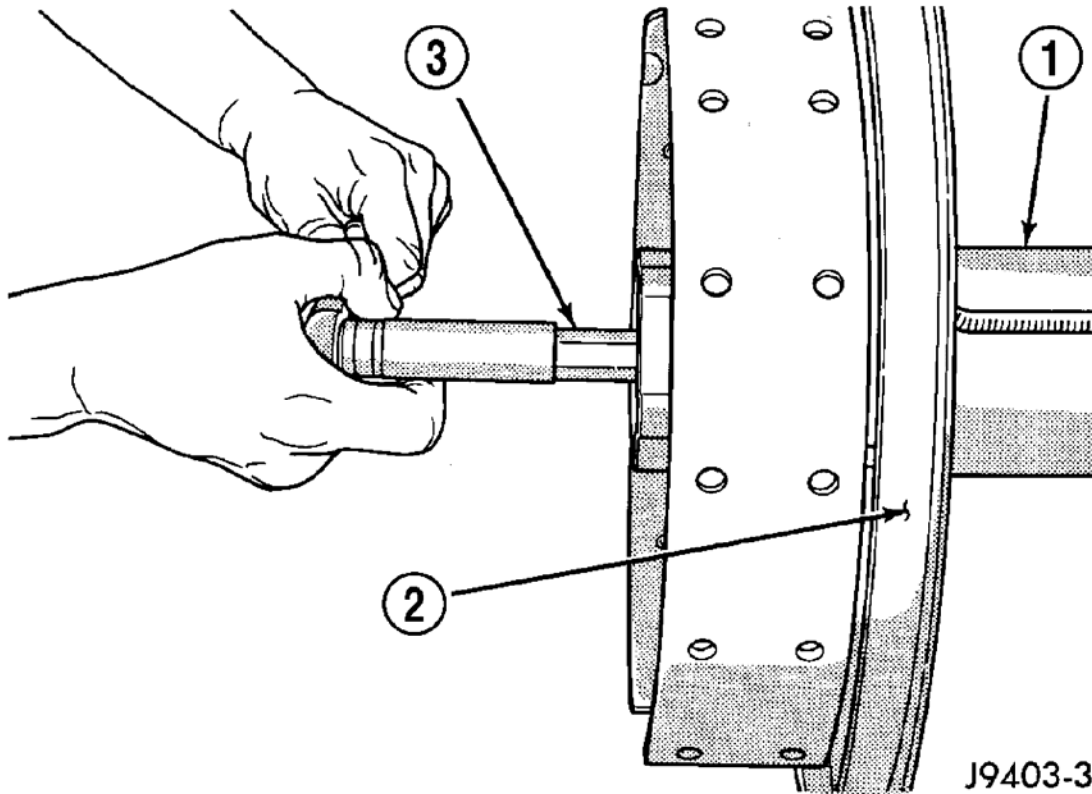
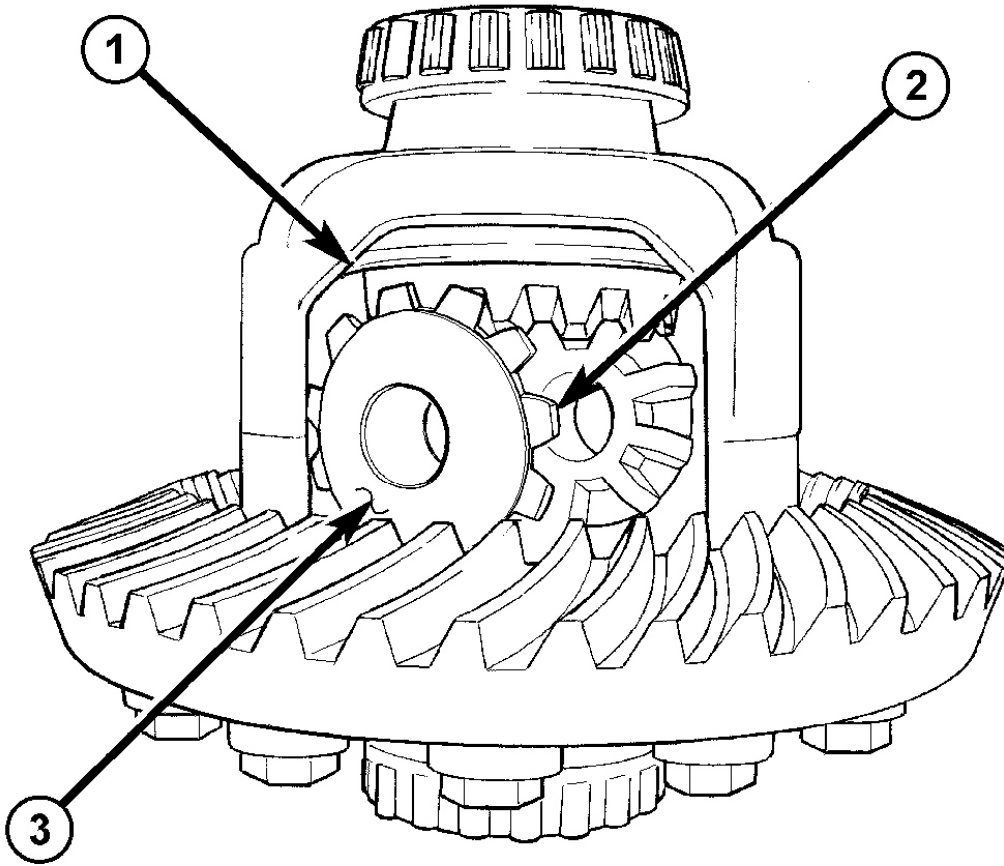


Fig. 297: Threaded Adjuster Tool
Courtesy of CHRYSLER LLC

9. Loosen differential bearing adjusters through the axle tubes (1) with Adjuster C-4164 (3).
10. Hold differential case while removing bearing caps and adjusters.
11. Remove differential case and tag differential bearing cups and adjusters to indicate location.
12. Clean housing cavity with flushing oil, light engine oil or a lint free cloth.

DISASSEMBLY

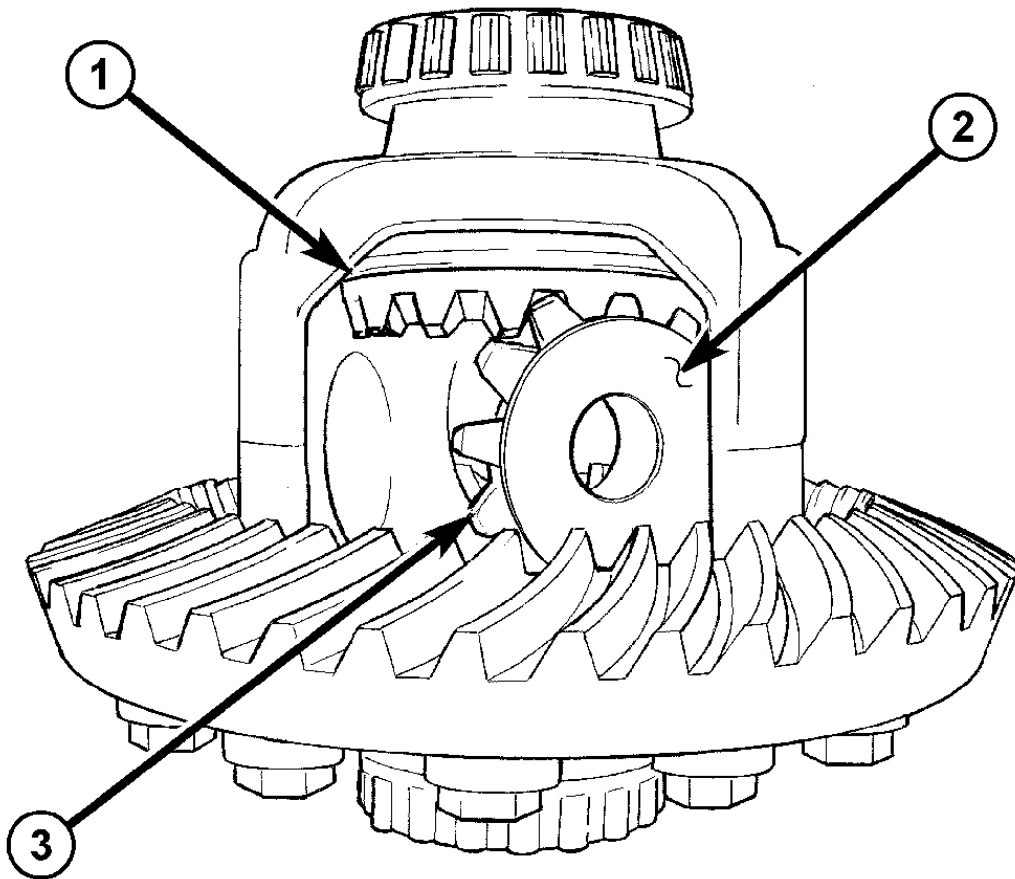
DIFFERENTIAL



816f3cb7

Fig. 298: First Pinion Gear
Courtesy of CHRYSLER LLC

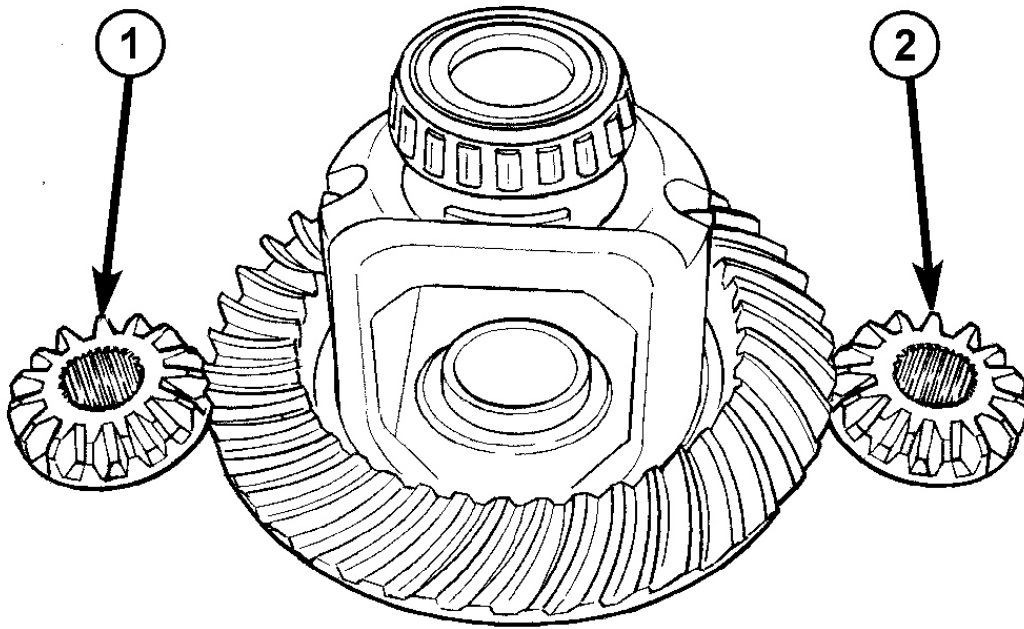
1. Rotate one pinion gear (2) with thrust washer (3) to the differential window (1) and remove gear and thrust washer.



816f3cd1

Fig. 299: Second Pinion Gear
Courtesy of CHRYSLER LLC

2. Rotate remaining pinion gear (3) with thrust washer (2) to the differential window (1) and remove gear and washer.



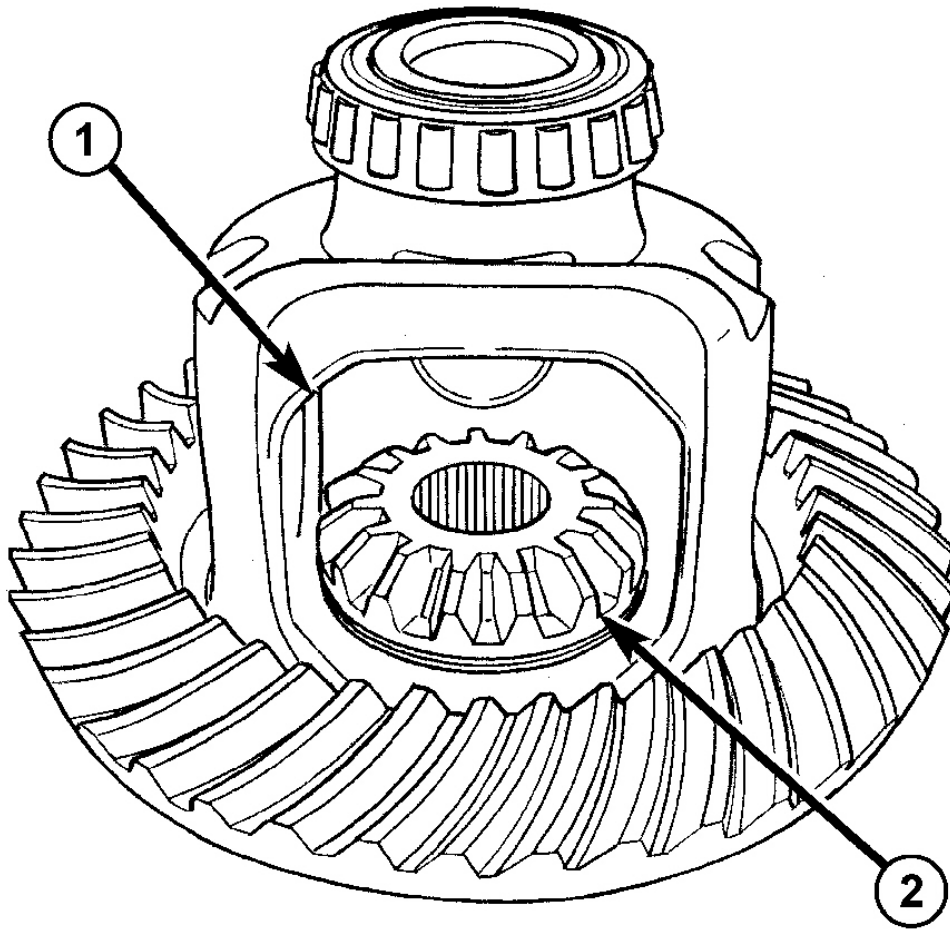
816f3cea

Fig. 300: Side Gears
Courtesy of CHRYSLER LLC

3. Remove differential side gears (1) (2) and thrust washers.

ASSEMBLY

DIFFERENTIAL

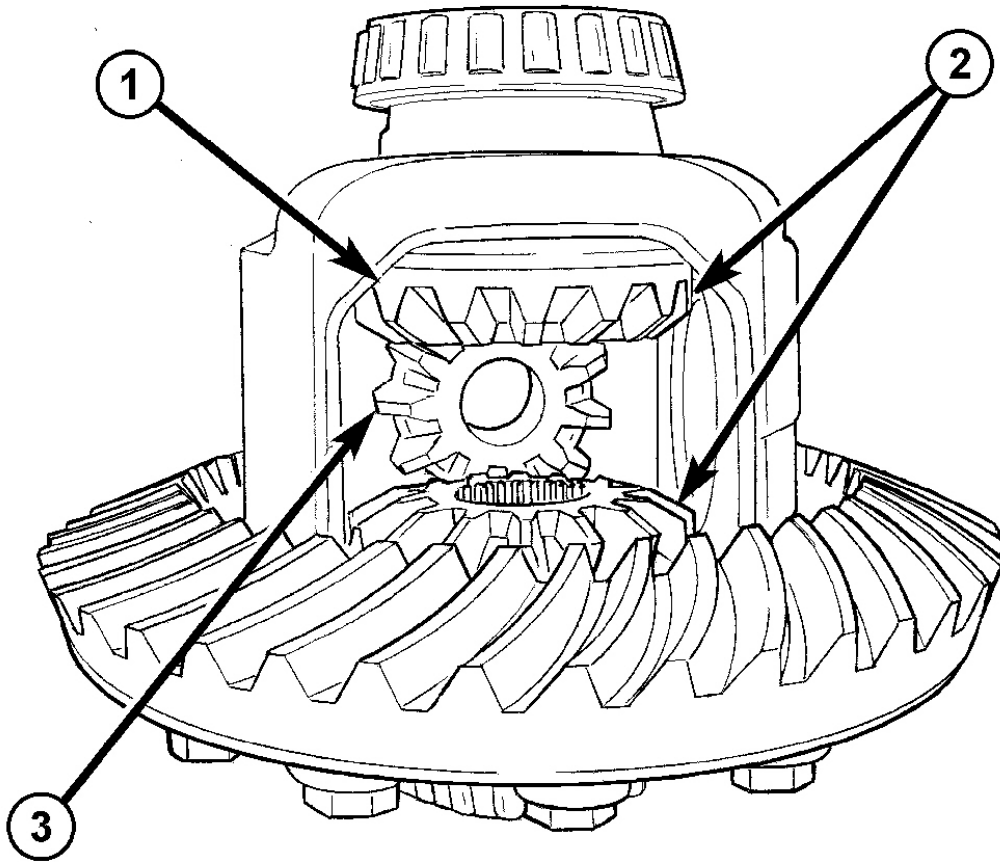


816f3db1

Fig. 301: Side Gear
Courtesy of CHRYSLER LLC

NOTE: If same gears and thrust washers are being used, install them into their original locations.

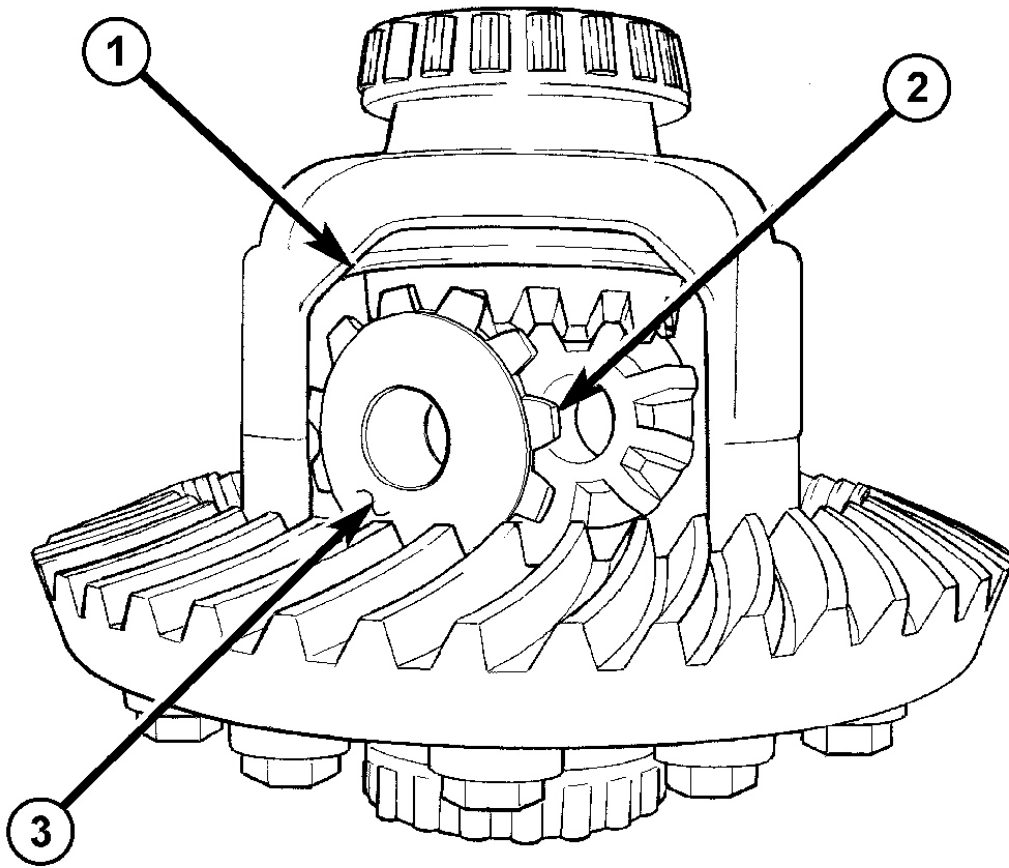
1. Lubricate all differential components with axle lubricant.
2. Install differential side gears (2) and thrust washers through differential window (1).



816f3e23

Fig. 302: Pinion Gear
Courtesy of CHRYSLER LLC

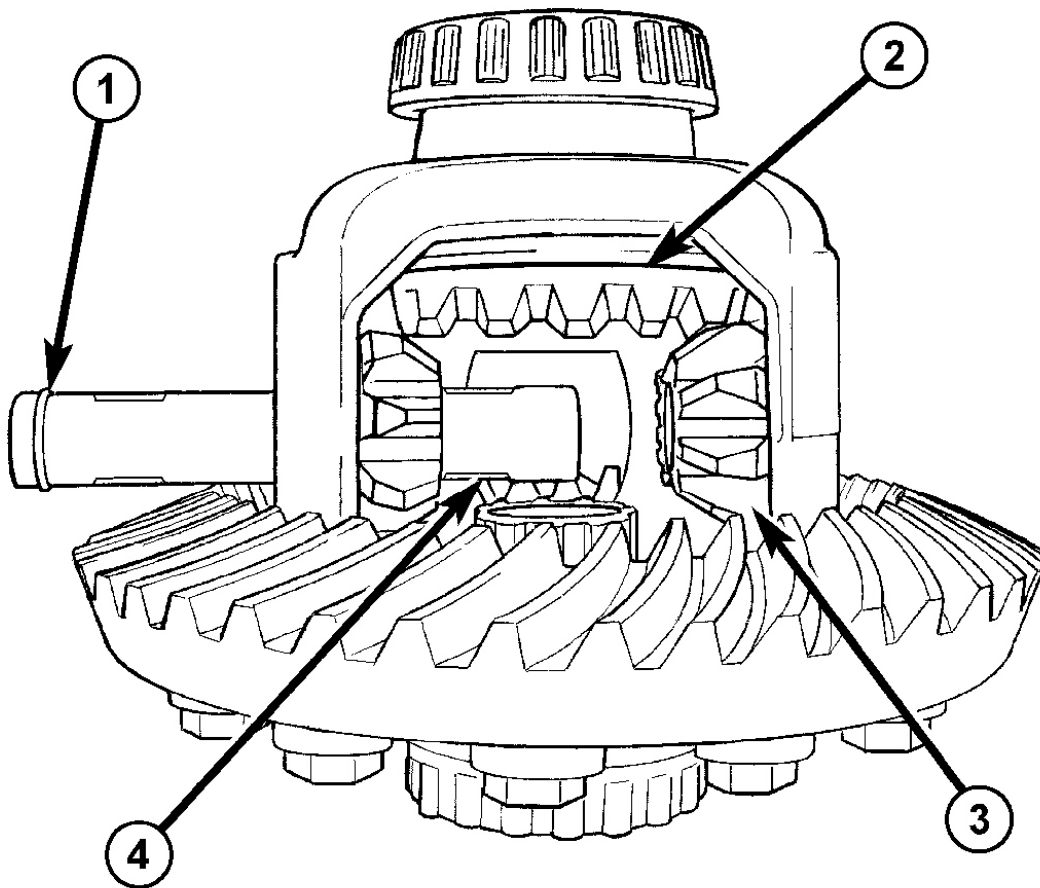
3. Install first pinion gear (3) with thrust washer into differential window (1) and side gears (2). Rotate pinion gear into the case.



816f3cb7

Fig. 303: First Pinion Gear
Courtesy of CHRYSLER LLC

4. Install remaining pinion gear (2) and thrust washer (3). Rotate gears to align hole in the pinion gears with hole in the differential case.



816f3da7

Fig. 304: Pinion Mate Shaft
Courtesy of CHRYSLER LLC

5. Slide pinion shaft (1) into the case and through the pinion gears (3) to align the gears.

INSTALLATION

DIFFERENTIAL

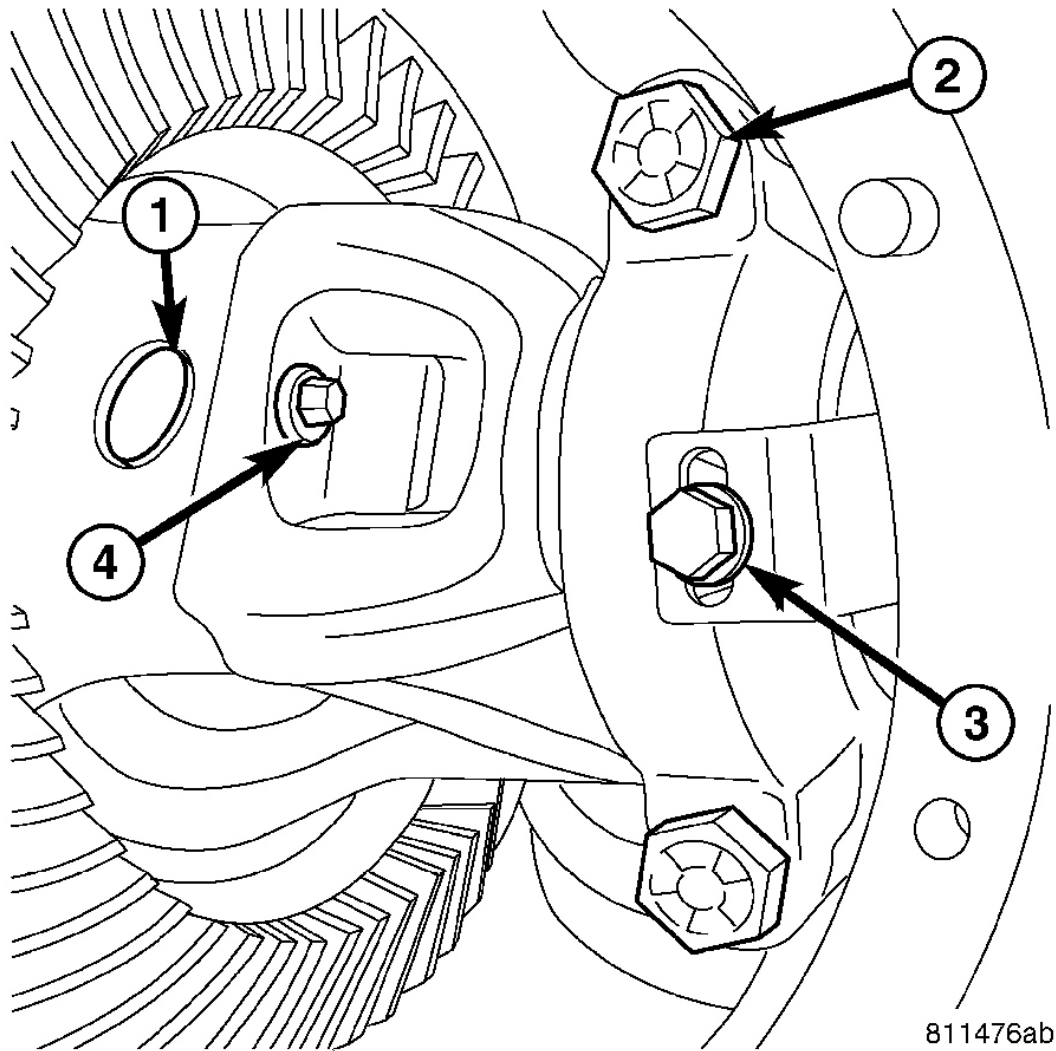


Fig. 305: Lock Screw
Courtesy of CHRYSLER LLC

1. Apply a coat of hypoid gear lubricant to differential bearings, bearing cups and threaded adjusters.

NOTE: Grease can be used to keep the adjusters in position.

2. Install differential assembly into the housing.
3. Install differential bearing caps in their original locations.
4. Install bearing cap bolts (2) and tighten upper bolts to 14 N.m (10 ft. lbs.). Tighten lower bolts finger-tight until bolt head is seated.

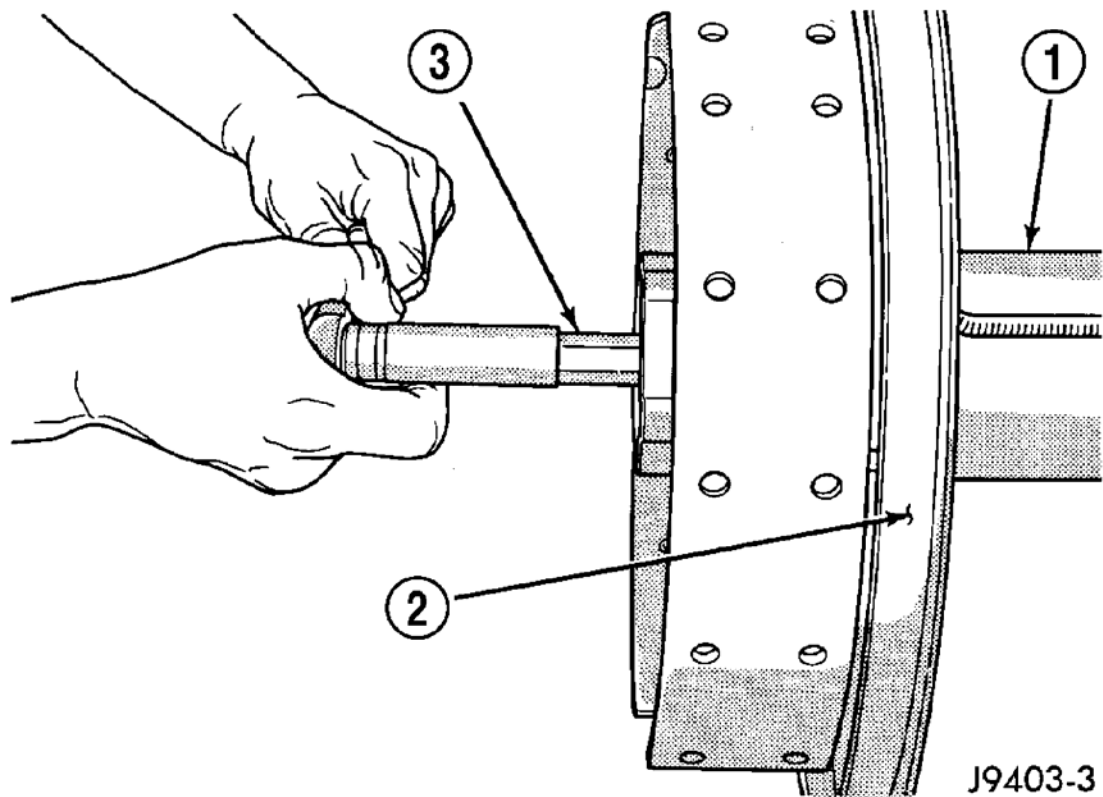
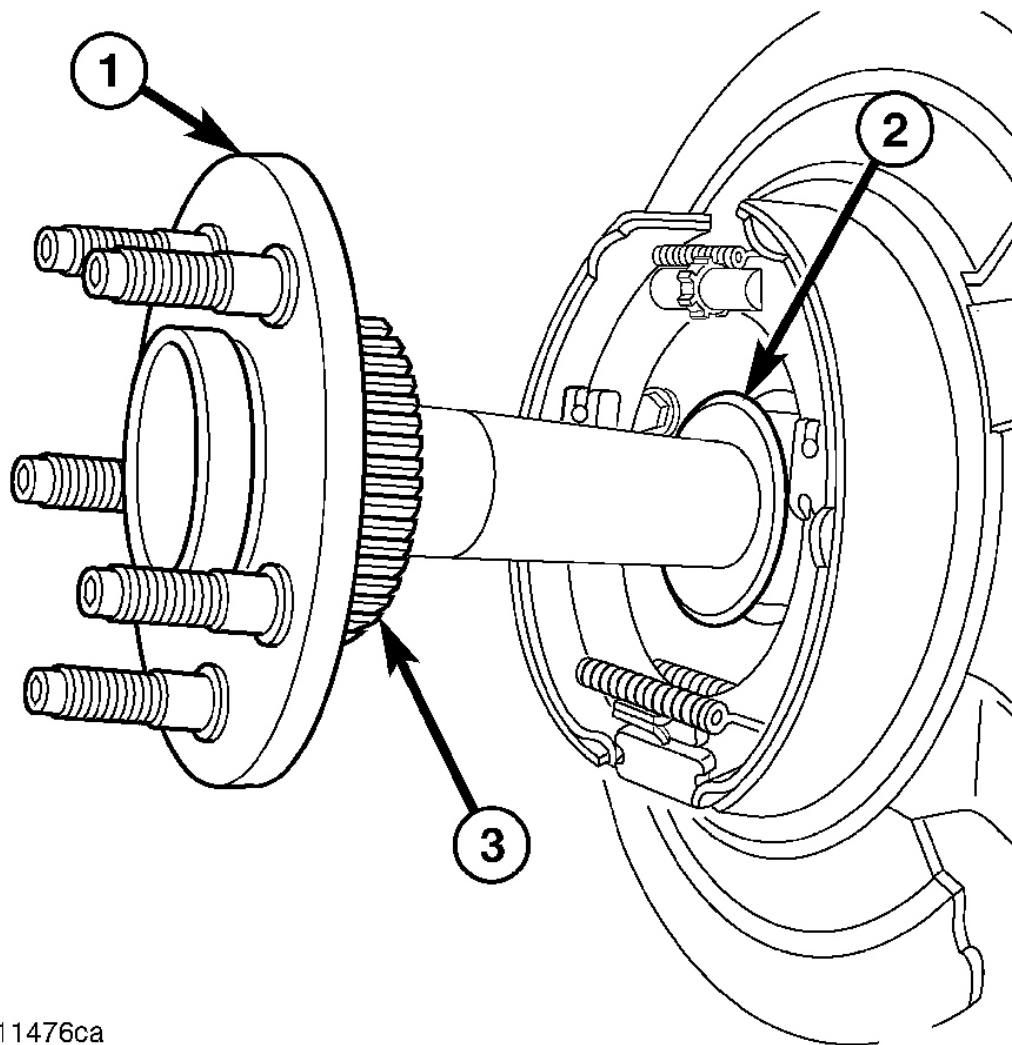


Fig. 306: Threaded Adjuster Tool
Courtesy of CHRYSLER LLC

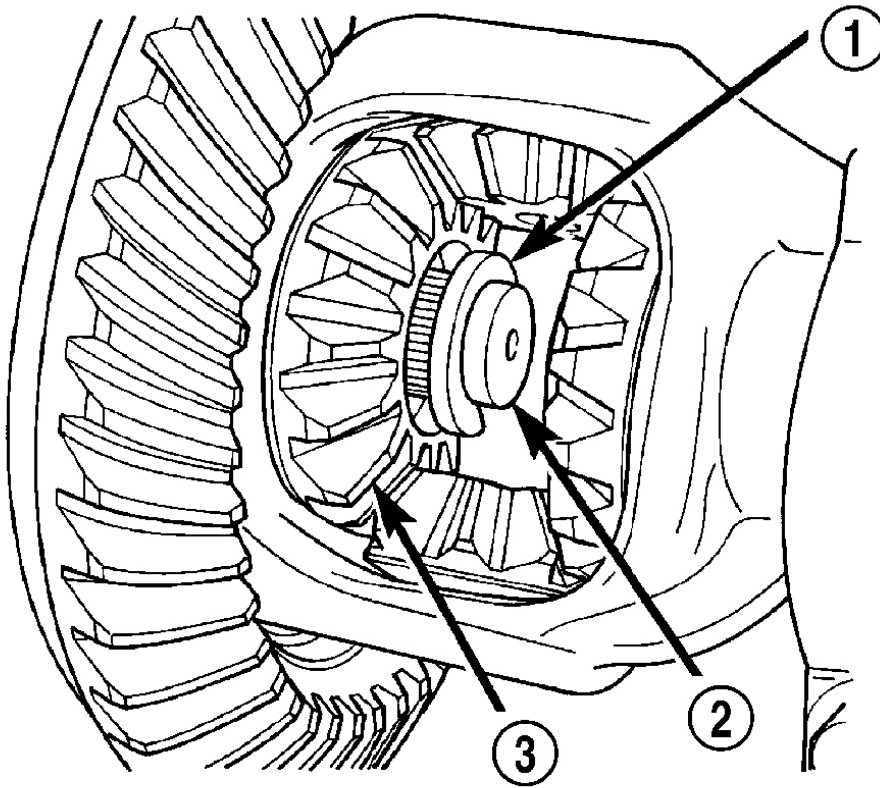
5. Perform differential bearing preload adjustment procedure with Wrench C-4164 (3).
6. Tighten bearing cap bolts in a criss-cross pattern to 135 N.m (100 ft. lbs.).
7. Install adjuster locks on bearing caps and tighten to 10 N.m (90 in. lbs.).



811476ca

Fig. 307: Axle Shaft
Courtesy of CHRYSLER LLC

8. Install axle shaft (1) in axle tube (2) and engage into side gear splines.



80be4603

Fig. 308: View Of Axle Shaft C-Lock
Courtesy of CHRYSLER LLC

9. Lubricate bearing bore and seal lip with gear lubricant.
10. Install C-lock (1) in axle shaft end, then push axle shaft outward to seat C-lock in side gear.

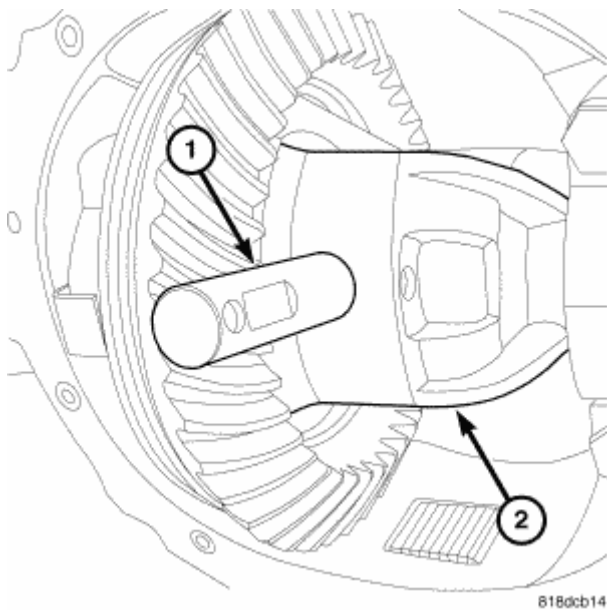


Fig. 309: Pinion Mate Shaft
 Courtesy of CHRYSLER LLC

11. Install pinion mate shaft (1) into differential case (2) and through thrust washers and differential pinions.

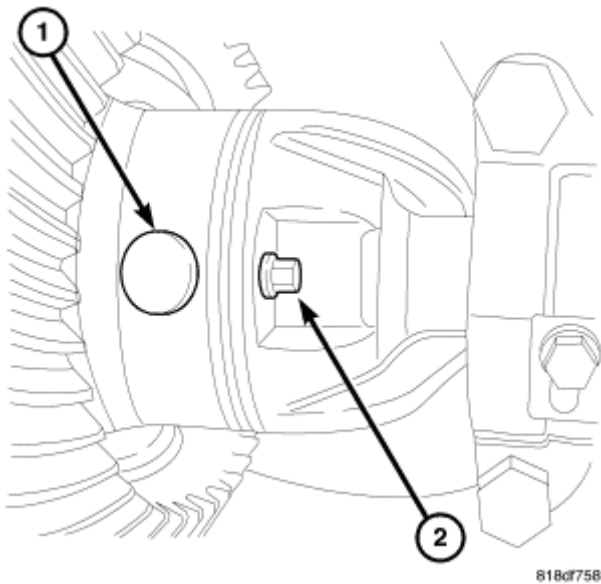


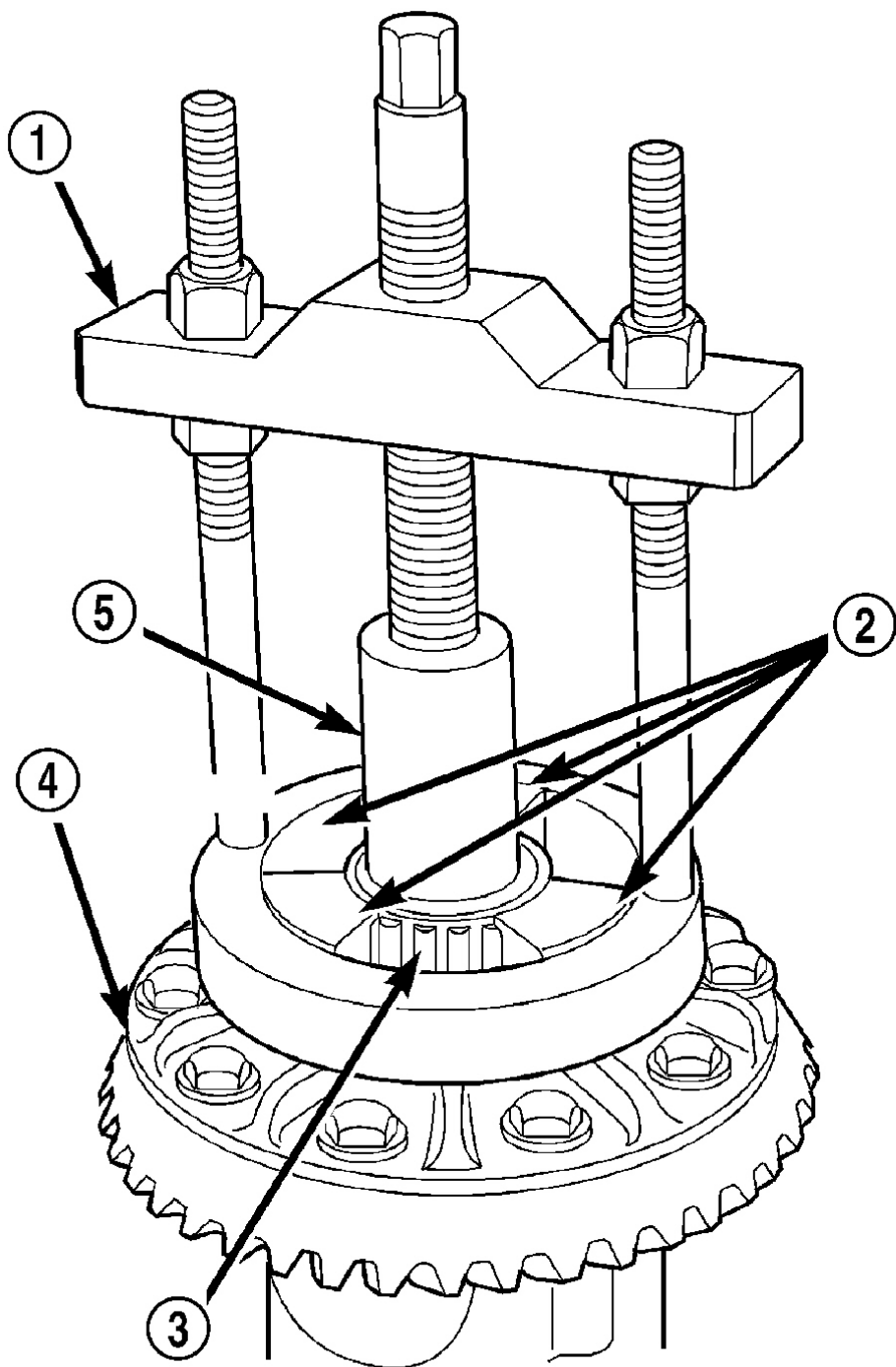
Fig. 310: Mate Shaft Lock Screw
 Courtesy of CHRYSLER LLC

12. Align hole in mate shaft (1) with hole in the differential case. Apply Mopar Lock & Seal Adhesive or equivalent to lock screw (2) threads. Install lock screw and tighten to 26 N.m (19 ft. lbs.).
13. Install differential cover.

BEARING-DIFFERENTIAL CASE

REMOVAL

BEARINGS-DIFFERENTIAL CASES



80a982f2

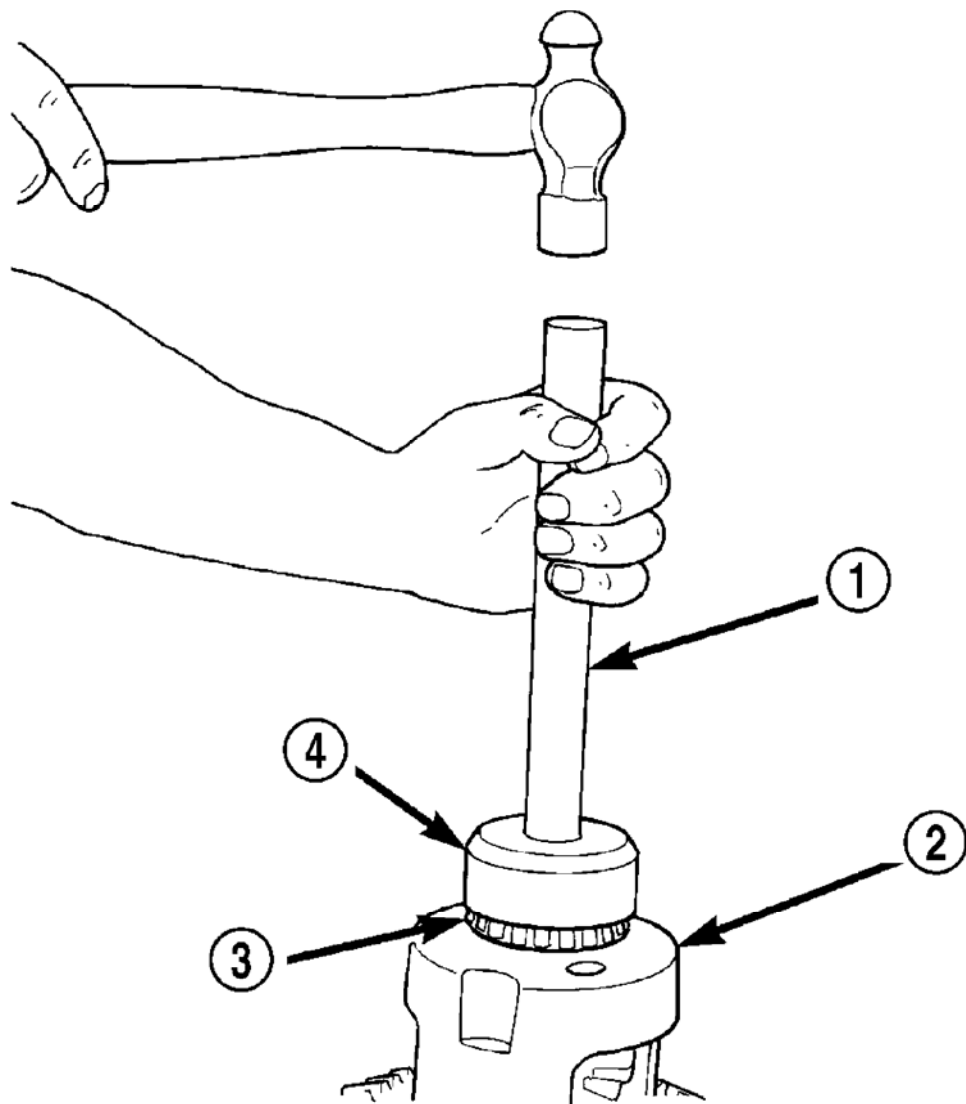
Fig. 311: Differential Bearing Puller

Courtesy of CHRYSLER LLC

1. Remove differential case from axle.
2. Remove differential bearings (3) from the case with Puller/Press C-293-PA (1) and Adapters C-293-48 (2) and Plug 8926-2 (5).

INSTALLATION

BEARINGS-DIFFERENTIAL CASE



80a0c4fe

Fig. 312: Differential Bearing Installer
Courtesy of CHRYSLER LLC

1. Install differential (2) bearings (3) with Installer C-4340 (4) and Handle C-4171(1).

2. Install differential case in axle.

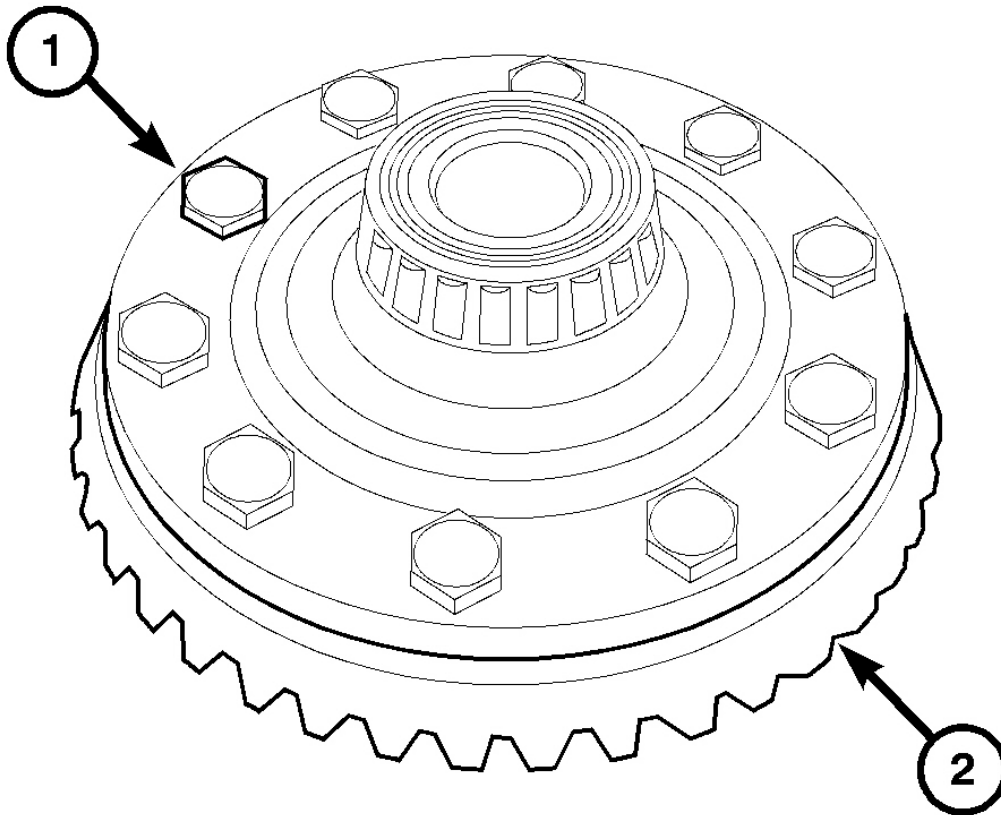
GEAR-PINION/RING

REMOVAL

GEAR-PINION/RING

NOTE: The ring and pinion gears are serviced in a matched set. Never replace one gear without replacing the other matched gear.

RING GEAR REMOVAL - GAS ENGINE

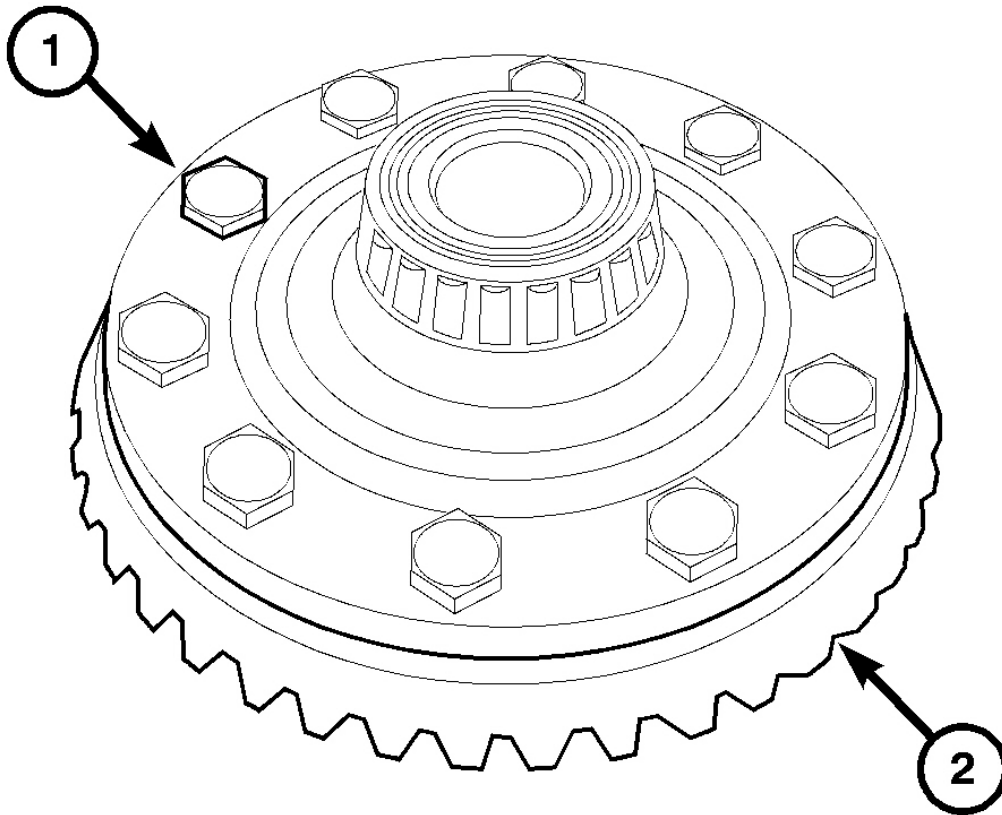


816f133e

Fig. 313: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

1. Remove differential from axle housing.
2. Place differential case in a vise with soft metal jaw.
3. Remove bolts (1) holding ring gear (2) to differential case.
4. Drive ring gear from differential case with a dead-blow hammer.

RING GEAR REMOVAL - DIESEL ENGINE



816f133e

Fig. 314: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

1. Remove differential from axle housing.
2. Place differential case in a vise with soft metal jaw.
3. Remove **left hand threaded bolts** (1) holding ring gear (2) to differential case.

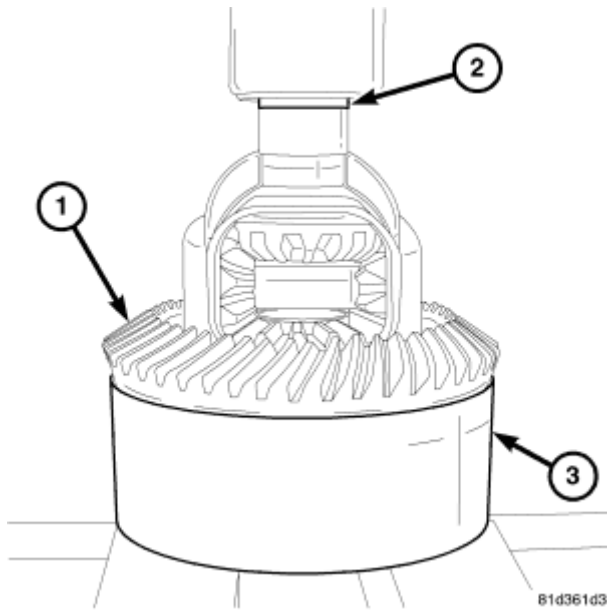


Fig. 315: Pressing Ring Gear Off Differential With Plug 8926-2 And Removing 10126-1
 Courtesy of CHRYSLER LLC

4. Press ring gear (1) off differential with Plug 8926-2 (2) and Remover 10126-1 (3).

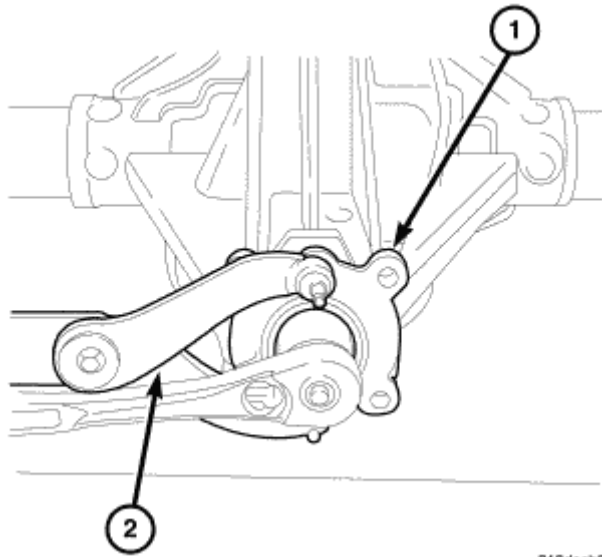
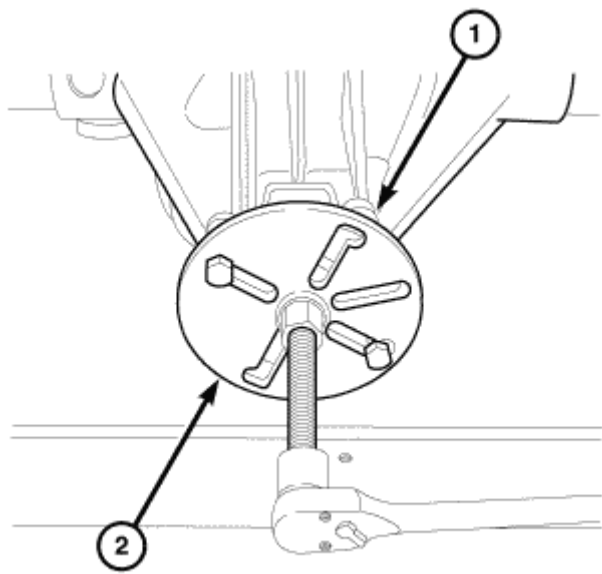


Fig. 316: Holding Pinion Flange With Holder C-3281
 Courtesy of CHRYSLER LLC

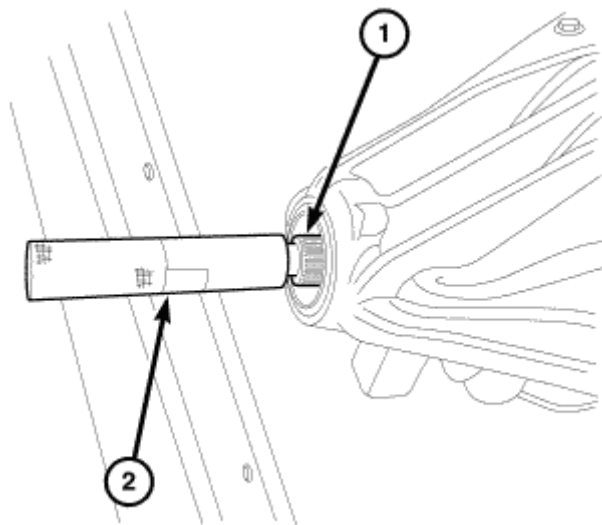
5. Hold pinion flange (1) with Holder C-3281 (2) and remove flange nut.



818decc9

Fig. 317: Identifying Pinion Flange & Puller 8992
 Courtesy of CHRYSLER LLC

6. Remove pinion flange (1) from pinion shaft with Puller 8992 (2).



818df0aa

Fig. 318: Removing Pinion From Housing With Driver 8976 And Hammer
 Courtesy of CHRYSLER LLC

7. Remove pinion (1) from the housing with Driver 8976 (2) and hammer.
8. Remove pinion shaft seal with a seal puller.
9. Remove front pinion bearing.

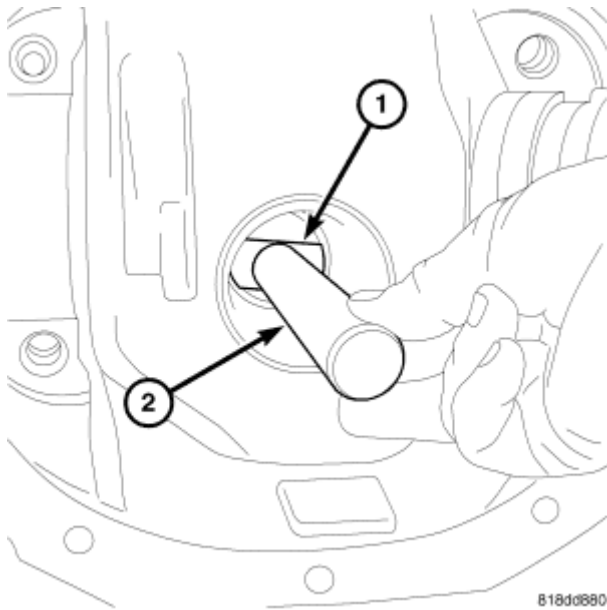


Fig. 319: Removing Front Pinion Bearing Cup With Remover C-4345 And Handle C-4171
 Courtesy of CHRYSLER LLC

10. Remove front pinion bearing cup with Remover C-4345 (1) and Handle C-4171 (2).

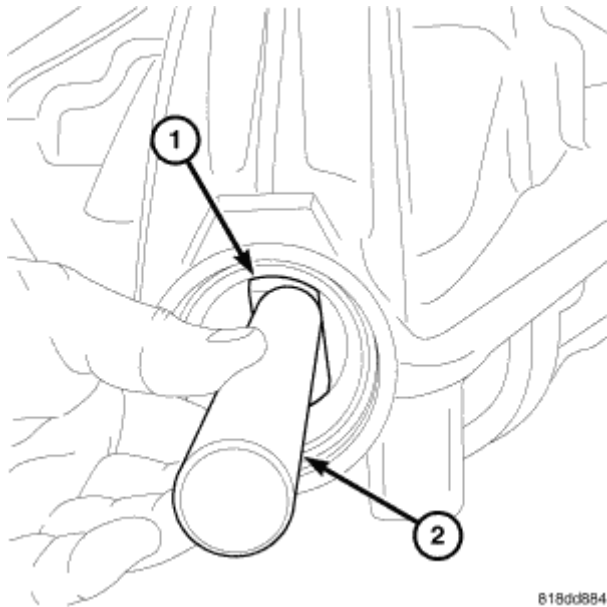
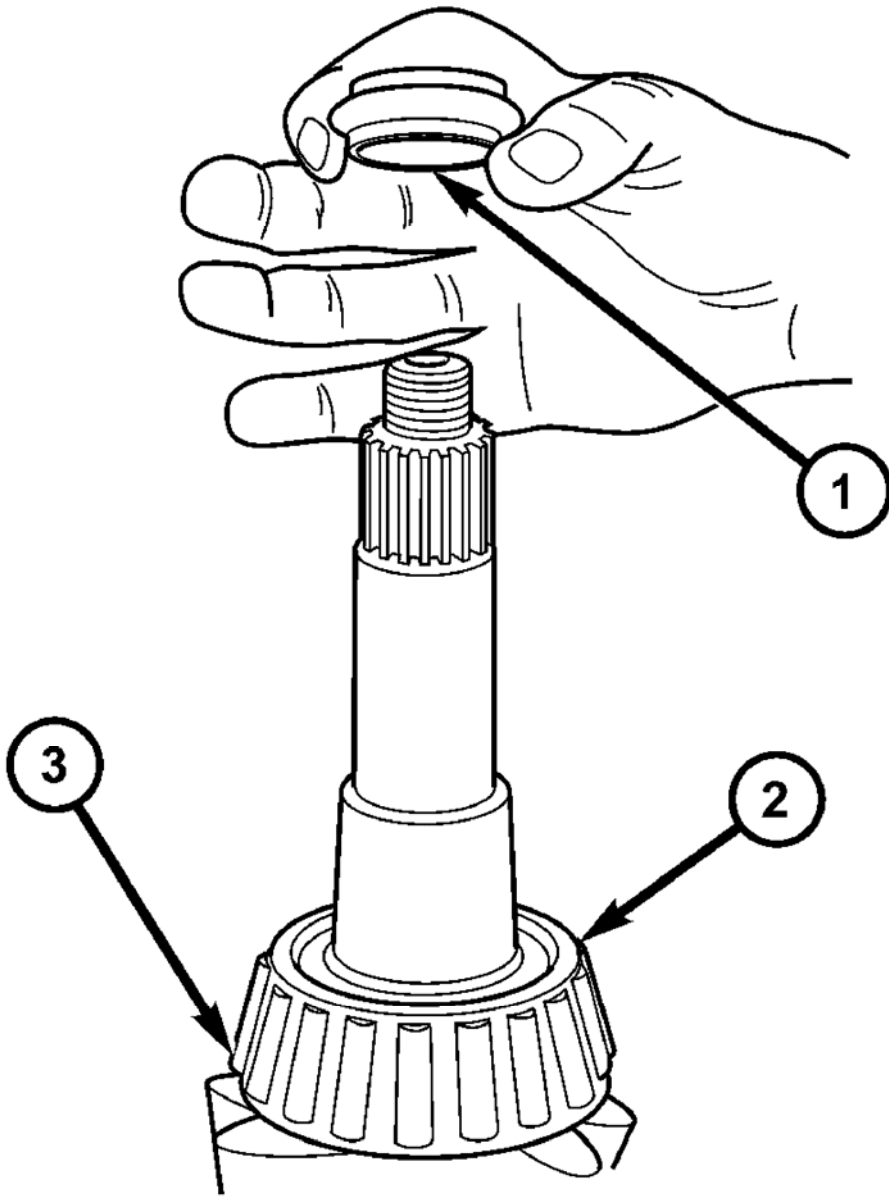


Fig. 320: Removing Rear Bearing Cup With Remover C-4307 And Handle C-4171
 Courtesy of CHRYSLER LLC

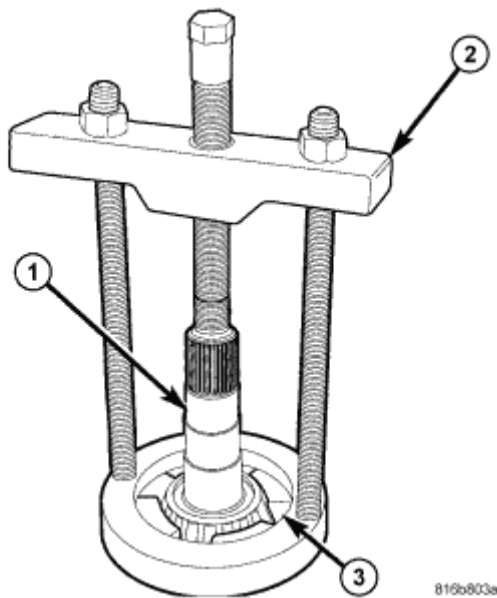
11. Remove rear bearing cup with Remover C-4307 (1) and Handle C-4171 (2).



80cfe262

Fig. 321: Removing/Installing Collapsible Preload Spacer
Courtesy of CHRYSLER LLC

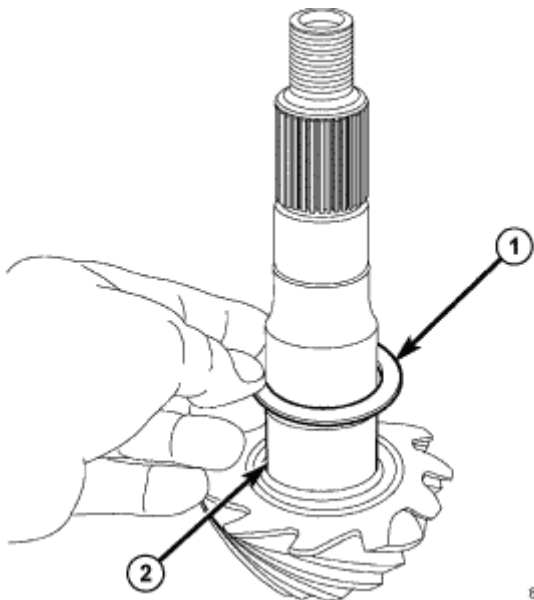
12. Remove collapsible spacer (1) from pinion shaft (3).



816b803a

Fig. 322: Removing Rear Pinion Bearing From Pinion Shaft With Puller/Press C-293-PA And Adapters C-293-47
 Courtesy of CHRYSLER LLC

13. Remove rear pinion bearing from pinion shaft (1) with Puller/Press C-293-PA (2) and Adapters C-293-47 (3).



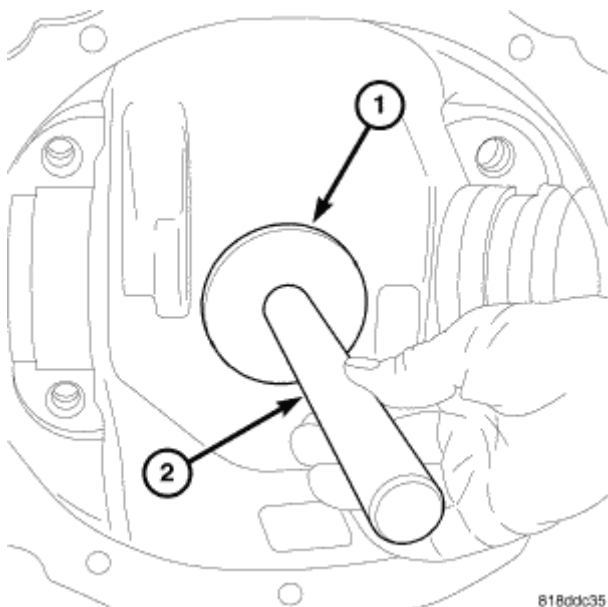
816b8046

Fig. 323: Removing/Installing Depth Shims From Pinion Shaft
 Courtesy of CHRYSLER LLC

14. Remove depth shims (1) from the pinion shaft (2) and record the shims thickness.

INSTALLATION

GEAR-PINION/RING

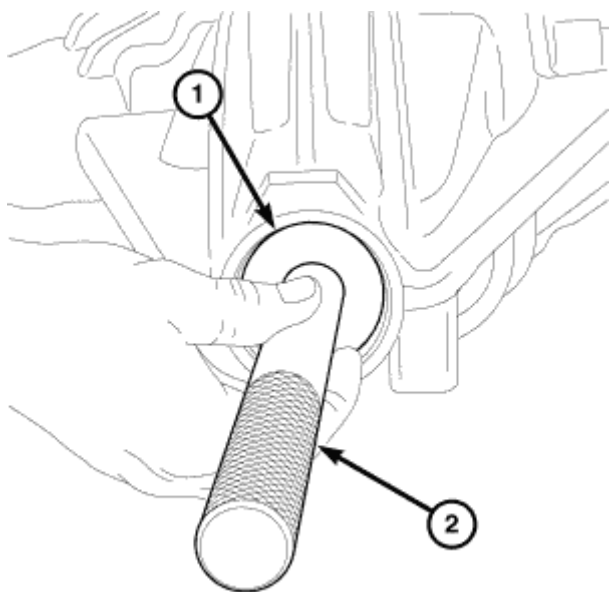


818ddc35

Fig. 324: Installing Rear Pinion Bearing Cup With Installer C-4308 And Handle C-4171
Courtesy of CHRYSLER LLC

NOTE: A pinion depth shim is located under the rear pinion bearing. If ring and pinion gears are reused, the original pinion depth shim/oil baffle can be used. Refer to **PINION DEPTH MEASUREMENT** to select the proper shim thickness if ring and pinion gear are replaced.

1. Install rear pinion bearing cup with Installer C-4308 (1) and Handle C-4171 (2).

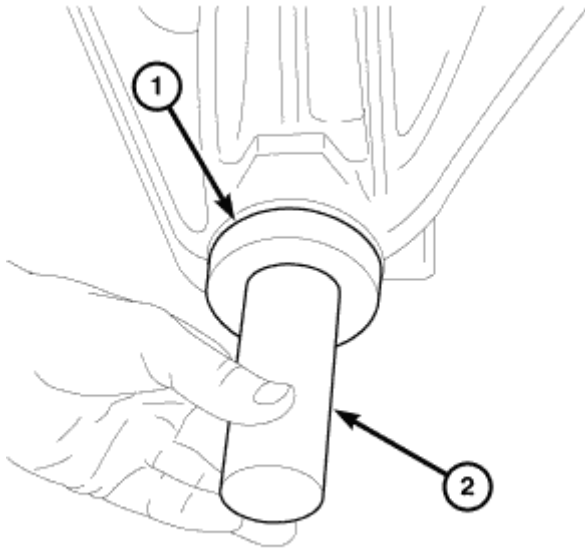


818ddc3e

Fig. 325: Installing Front Pinion Bearing Cup With Installer D-130 And Handle C-4171

Courtesy of CHRYSLER LLC

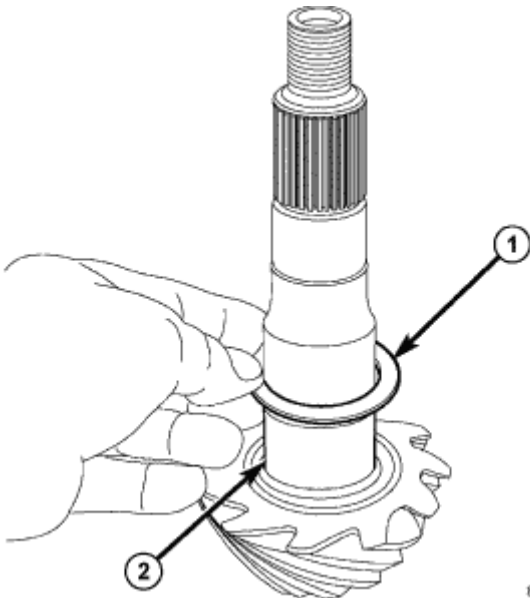
2. Install front pinion bearing cup with Installer D-130 (1) and Handle C-4171 (2).



818ddc4f

Fig. 326: Pinion Seal Installer
Courtesy of CHRYSLER LLC

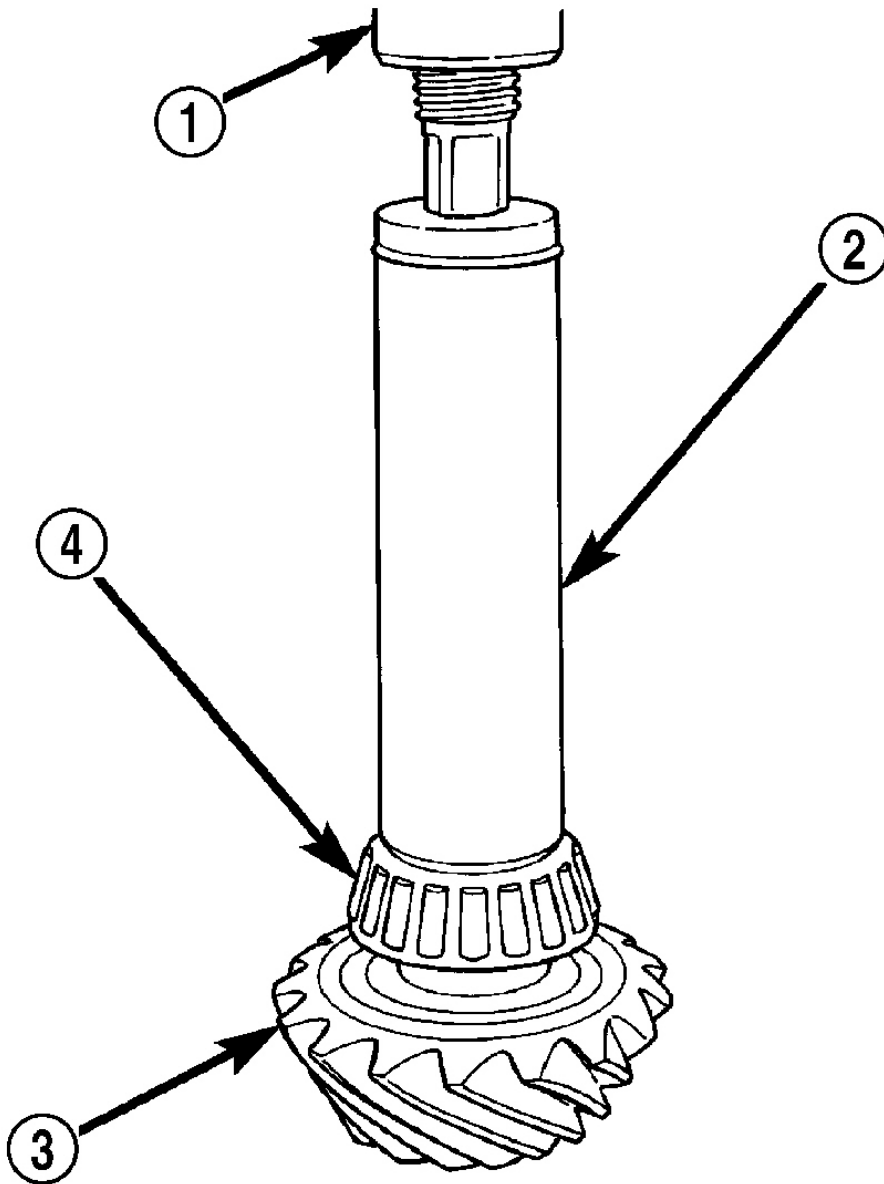
3. Install pinion front bearing in housing.
4. Apply a light coating of gear lubricant on the lip of pinion seal and install seal with Installer C-4076-B (1) and Handle C-4735 (2).



819b8046

Fig. 327: Removing/Installing Depth Shims From Pinion Shaft
Courtesy of CHRYSLER LLC

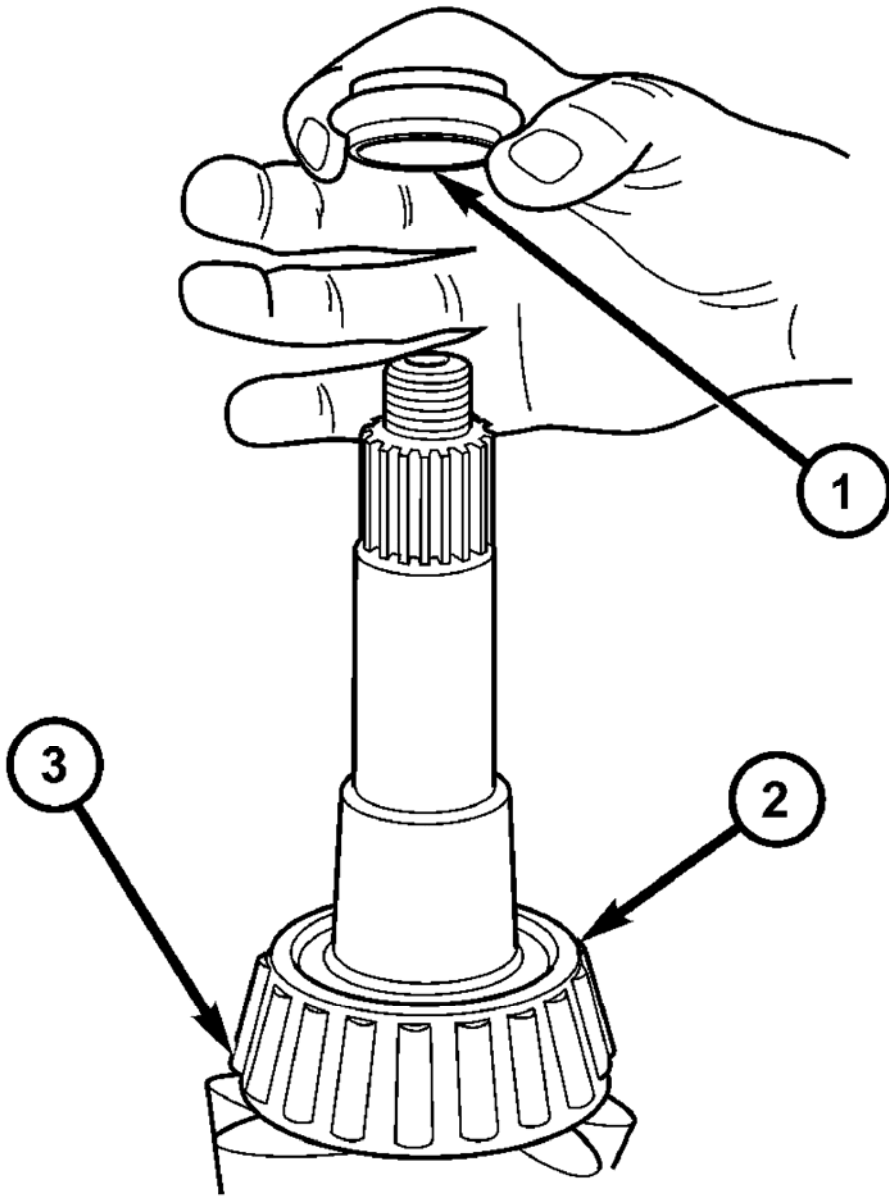
5. Install pinion depth shim (1) on pinion shaft (2).



80be4607

Fig. 328: Rear Pinion Bearing
Courtesy of CHRYSLER LLC

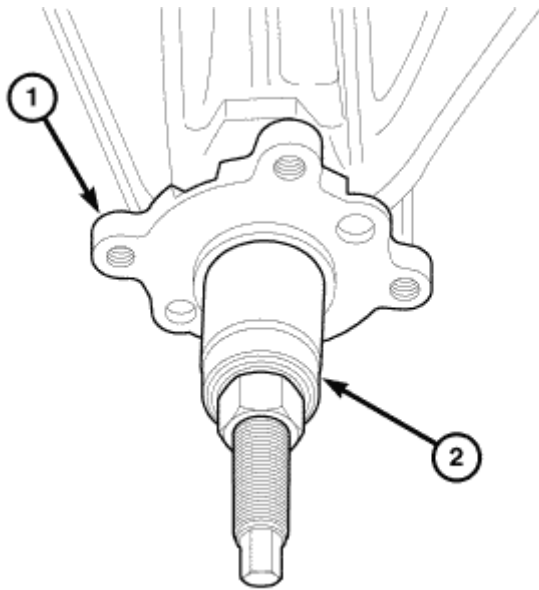
6. Install rear bearing (4) on pinion gear (3) and slinger if equipped, with Installer 6448A (2) and a press (1).



80cfe262

Fig. 329: Removing/Installing Collapsible Preload Spacer
Courtesy of CHRYSLER LLC

7. Install a **new** collapsible spacer (1) on pinion shaft (3) and install pinion in housing.

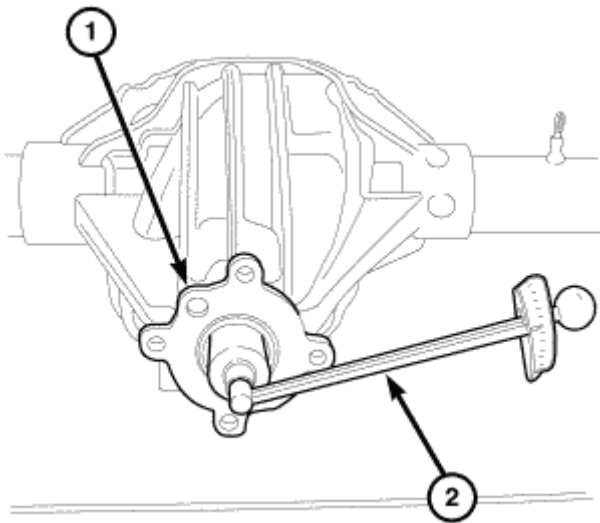


818ddc43

Fig. 330: Installing Flange With Installer C-3718
Courtesy of CHRYSLER LLC

8. Install pinion flange (1) with Installer C-3718 (2).
9. Install a new nut on the pinion.
10. Holding flange (1) with Holder C-3281 and tighten nut with torque wrench to 285 N.m (210 ft. lbs.).

NOTE: Do not exceed the minimum torque 285 N.m (210 ft. lbs.) when installing the pinion nut at this point.



818ded97

Fig. 331: Measuring Pinion Torque To Rotating With An Inch Pound Torque Wrench
Courtesy of CHRYSLER LLC

11. Measure pinion torque to rotating (1) with an inch pound torque wrench (2). Measure pinion torque to rotating frequently to avoid over over-crushing the collapsible spacer.

Pinion Torque To Rotate is:

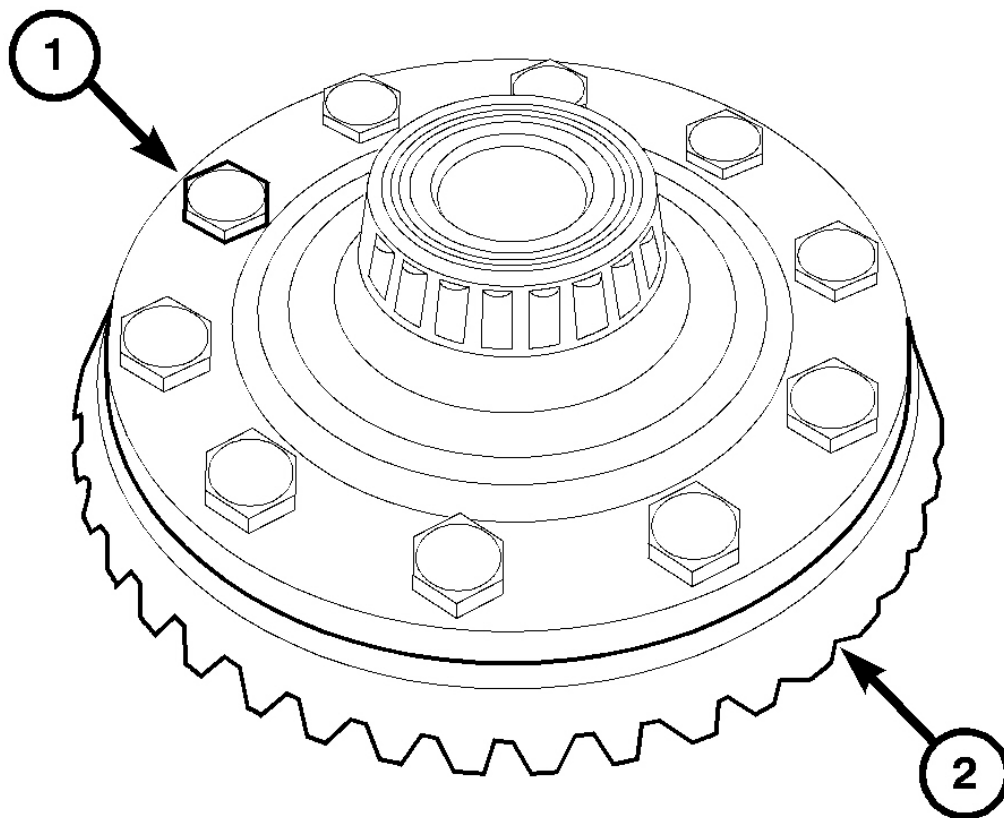
Original Bearings 1 - 2.2 N.m (10 - 20 in. lbs.)

New Bearings 1- 5 N.m (10 - 30 in. lbs.)

If pinion torque to rotate is low, tighten pinion nut in 6.8 N.m (5 ft. lbs.) increments until pinion torque to rotate is achieved.

CAUTION: Never loosen pinion nut to decrease pinion bearing rotating torque. If pinion torque to rotating is exceeded a new collapsible spacer must be installed. Failure to follow these instructions will damage the axle.

RING GEAR INSTALLATION - GAS ENGINES



816f133e

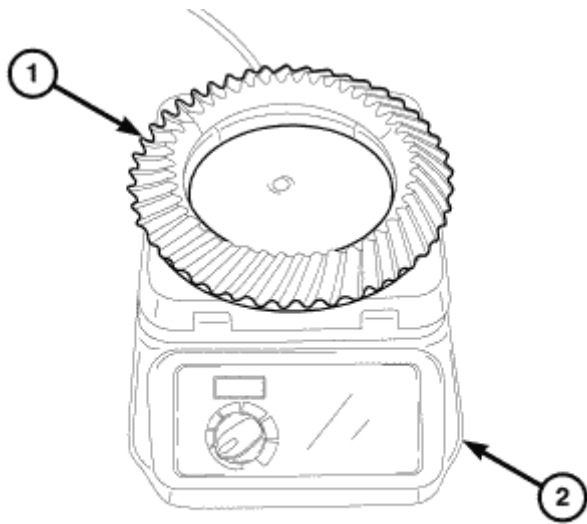
Fig. 332: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

1. Install ring gear on differential case.
2. Invert differential case in the vise.
3. Install **new** ring gear (2) bolts (1) and alternately tighten to 122 N.m (90 ft. lbs.).

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

4. Install differential in axle housing and verify gear mesh refer to **GEAR CONTACT PATTERN**.

RING GEAR INSTALLATION - DIESEL ENGINES



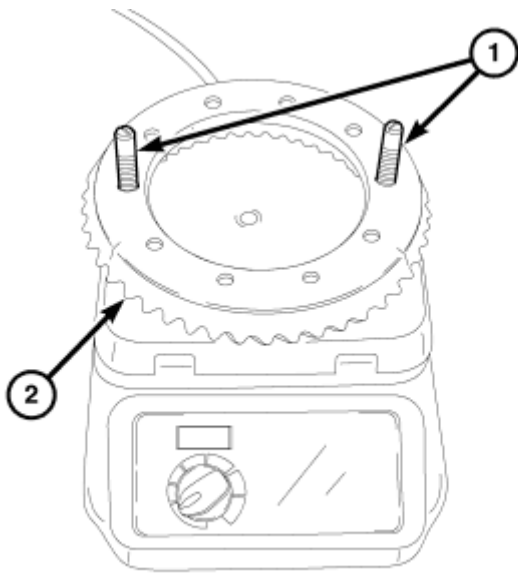
81d3635e

Fig. 333: Heating Ring Gear On Bearing Heater
Courtesy of CHRYSLER LLC

WARNING: Use welding gloves when handling heated components. Failure to follow these instructions will result in personal injury.

CAUTION: A bearing heater is used to install the ring gear on the differential. Use only a bearing heater/hot plate and follow manufacture's instructions. Heat components to 107 - 121 Celsius (225° Min. - 250° Max Fahrenheit). Never use an open flame to heat components. Never leave components on heater for and extended amount of time. If component is discolored after heating, the component has been overheated and must not be used. Failure to follow these instructions will result in component damage.

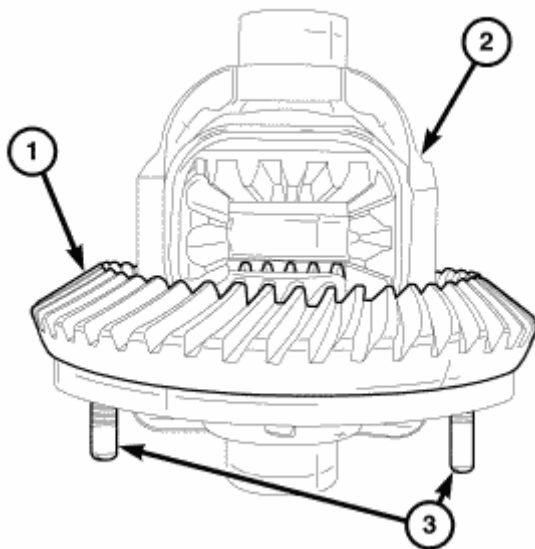
1. Heat ring gear (1) on bearing heater (2) to 107 - 121 Celsius (225° Min. - 250° Max Fahrenheit).



81d36387

Fig. 334: Installing Left Hand Threaded Pins 10126-2 Into Ring Gear
 Courtesy of CHRYSLER LLC

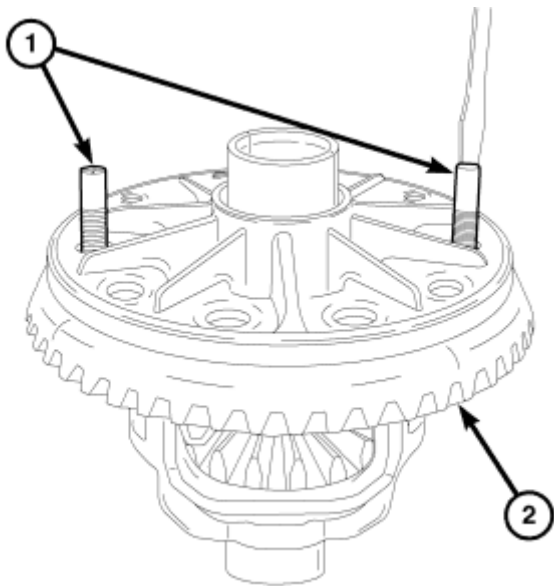
2. Turn ring gear over on bearing heater with welding gloves once the temperature has been reached.
3. Install left hand threaded Pins 10126-2 (1) into ring gear (2).



81d3639b

Fig. 335: Installing Ring Gear On Differential Using Pins 10126-2 To Align Ring Gear Bolts Hole
 Courtesy of CHRYSLER LLC

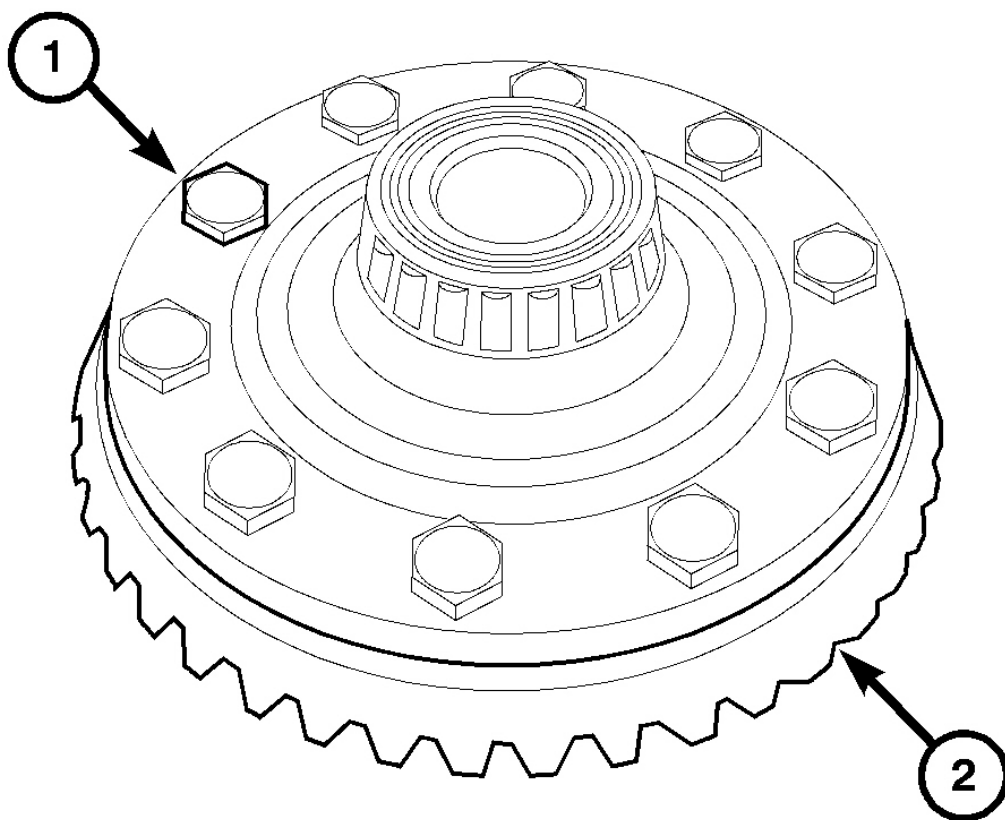
4. Install ring gear (1) on differential (2) using Pins 10126-2 (3) to align ring gear bolts hole.



61d363d4

Fig. 336: Turning Differential Over And Removing Pins 10126-2 From Ring Gear
Courtesy of CHRYSLER LLC

5. Allow ring gear time to cool, then turn the differential over and remove Pins 10126-2 (1) from ring gear (2).



816f133e

Fig. 337: Identifying Ring Gear & Bolts
Courtesy of CHRYSLER LLC

6. Install **new** left hand threaded ring gear (2) bolts (1) and alternately tighten to 27 N.m (20 ft. lbs.). Then with torque angle gauge alternately tighten to 95 degrees $\pm$ 5 degrees.

CAUTION: Never reuse the ring gear bolts. Failure to follow these instructions will result in damage.

7. Install differential in axle housing and verify gear mesh refer to **GEAR CONTACT PATTERN**.

2008 DTC INDEX

Liberty

ABS BRAKES DTCS

ABS BRAKES DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>C1000</u>	BRAKE PEDAL SWITCH 1 CIRCUIT PERFORMANCE
<u>C1008</u>	BRAKE FLUID LEVEL CIRCUIT HIGH
<u>C100A</u>	LEFT FRONT WHEEL SPEED SENSOR CIRCUIT
<u>C1011</u>	LEFT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C1014</u>	LEFT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1015</u>	RIGHT FRONT WHEEL SPEED SENSOR CIRCUIT
<u>C101C</u>	RIGHT FRONT WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C101F</u>	RIGHT FRONT WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1020</u>	LEFT REAR WHEEL SPEED SENSOR CIRCUIT
<u>C1027</u>	LEFT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C102A</u>	LEFT REAR WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C102B</u>	RIGHT REAR WHEEL SPEED SENSOR CIRCUIT
<u>C1032</u>	RIGHT REAR WHEEL SPEED SENSOR SIGNAL ERRATIC PERFORMANCE
<u>C1035</u>	RIGHT REAR WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C1041</u>	LEFT FRONT TONE WHEEL PERFORMANCE
<u>C1042</u>	RIGHT FRONT TONE WHEEL PERFORMANCE
<u>C1043</u>	LEFT REAR TONE WHEEL PERFORMANCE
<u>C1044</u>	RIGHT REAR TONE WHEEL PERFORMANCE
<u>C1073</u>	ABS PUMP MOTOR CONTROL CIRCUIT
<u>C1074</u>	ABS PUMP MOTOR CONTROL CIRCUIT PERFORMANCE
<u>C1078</u>	TIRE REVOLUTIONS RANGE PERFORMANCE
<u>C107B</u>	WHEEL SPEED COMPARATIVE PERFORMANCE
<u>C107C</u>	BRAKE PEDAL SWITCH 1/2 STUCK
<u>C1086</u>	ABS SYSTEM CONTROL TOO LONG
<u>C1090</u>	ABS BRAKE LAMP CONTROL CIRCUIT LOW
<u>C1091</u>	ABS BRAKE LAMP CONTROL CIRCUIT HIGH
<u>C1219</u>	STEERING ANGLE SENSOR ERRATIC PERFORMANCE
<u>C121A</u>	STEERING ANGLE SENSOR NOT INITIALIZED
<u>C121C</u>	TORQUE REQUEST SIGNAL DENIED
<u>C121D</u>	BRAKE PRESSURE SENSOR CIRCUIT
<u>C121E</u>	BRAKE PRESSURE SENSOR COMPARATIVE PERFORMANCE
<u>C1231</u>	DRIVE TEST: STEERING ANGLE SENSOR
<u>C1232</u>	DRIVE TEST: PRESSURE SENSOR
<u>C1234</u>	DRIVE TEST: SENSOR CLUSTER INSTALLATION

<u>C1238</u>	DRIVE TEST: UNSUCCESSFUL
<u>C1239</u>	EMISSIONS ROLLS TEST ACTIVE
<u>C123B</u>	ESP SYSTEM CONTROL TOO LONG
<u>C123C</u>	DYNAMICS SENSOR MOUNTING/INSTALLATION PERFORMANCE
<u>C123F</u>	STEERING ANGLE SENSOR COMPARATIVE PERFORMANCE
<u>C1240</u>	STEERING ANGLE SENSOR OVERTRAVEL PERFORMANCE
<u>C1243</u>	G SENSOR NOT INITIALIZED
<u>C2100</u>	BATTERY VOLTAGE LOW
<u>C2101</u>	BATTERY VOLTAGE HIGH
<u>C2105</u>	ABS VALVE SUPPLY VOLTAGE CIRCUIT LOW
<u>C2114</u>	DYNAMICS SENSOR SUPPLY VOLTAGE LOW
<u>C2115</u>	DYNAMICS SENSOR SUPPLY VOLTAGE HIGH
<u>C2116</u>	ABS PUMP MOTOR SUPPLY LOW VOLTAGE
<u>C2200</u>	ANTI-LOCK BRAKE MODULE INTERNAL
<u>C2202</u>	ORIGINAL VIN MISMATCH/MISSING
<u>C2204</u>	DYNAMICS SENSOR INTERNAL
<u>C2205</u>	STEERING ANGLE SENSOR INTERNAL
<u>C2206</u>	VEHICLE CONFIGURATION MISMATCH
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0125</u>	LOST COMMUNICATION WITH DYNAMICS SENSOR
<u>U0126</u>	LOST COMMUNICATION WITH STEERING ANGLE SENSOR
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0401</u>	IMPLAUSIBLE DATA RECEIVED FROM ECM/PCM
<u>U0429</u>	IMPLAUSIBLE DATA RECEIVED FROM SCM
<u>U1003</u>	ESP CAN C BUS PERFORMANCE
<u>U1501</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM ECM/PCM
<u>U1502</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM TCM
<u>U1503</u>	IMPLAUSIBLE MESSAGE DATA LENGTH RECEIVED FROM FCM

AIR BAG RESTRAINTS DTC

AIR BAG RESTRAINTS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1B00</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT LOW
<u>B1B01</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT HIGH
<u>B1B02</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT OPEN
<u>B1B03</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B04</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT LOW
<u>B1B05</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT HIGH

<u>B1B06</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT OPEN
<u>B1B07</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER
<u>B1B08</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT LOW
<u>B1B09</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT HIGH
<u>B1B0A</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT OPEN
<u>B1B0B</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B0C</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT LOW
<u>B1B0D</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT HIGH
<u>B1B0E</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT OPEN
<u>B1B0F</u>	PASSENGER AIRBAG SQUIB 2 CIRCUITS SHORTED TOGETHER
<u>B1B18</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT LOW
<u>B1B19</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH
<u>B1B1A</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN
<u>B1B1B</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B20</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT LOW
<u>B1B21</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH
<u>B1B22</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN
<u>B1B23</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B54</u>	1ST ROW PASSENGER SEAT BELT SENSOR CIRCUIT LOW
<u>B1B55</u>	1st ROW PASSENGER SEAT BELT SENSOR CIRCUIT HIGH
<u>B1B70</u>	UP-FRONT LEFT SATELLITE ACCELERATION SENSOR INTERNAL
<u>B1B71</u>	UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR INTERNAL
<u>B1B72</u>	LEFT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL
<u>B1B73</u>	LEFT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL
<u>B1B75</u>	RIGHT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL
<u>B1B76</u>	RIGHT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL
<u>B1B78</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT PERFORMANCE
<u>B1B79</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW
<u>B1B7A</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH
<u>B1B7D</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT PERFORMANCE
<u>B1B7E</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW
<u>B1B7F</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH
<u>B1B82</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR PERFORMANCE
<u>B1B83</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW
<u>B1B84</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH
<u>B1B87</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR PERFORMANCE
<u>B1B88</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW

<u>B1B89</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH
<u>B1B8D</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT LOW
<u>B1B8E</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH
<u>B1B8F</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN
<u>B1B93</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT LOW
<u>B1B94</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH
<u>B1B95</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN
<u>B1B97</u>	PASSENGER SEAT TRACK POSITION SENSOR CONFIGURATION MISMATCH
<u>B1BA5</u>	AIRBAG SQUIB CONFIGURATION MISMATCH
<u>B1BA6</u>	OCCUPANT CLASSIFICATION UNDETERMINED
<u>B1BA7</u>	OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED
<u>B1BA8</u>	OCM SYSTEM OUT OF CALIBRATION/NOT CALIBRATED
<u>B1BAA</u>	OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH
<u>B1BBA</u>	PASSENGER SEAT WEIGHT SENSOR SUPPLY CIRCUIT
<u>B1BBB</u>	PASSENGER SEAT WEIGHT SENSOR INPUTS SHORTED TOGETHER
<u>B1BBC</u>	OCS NEGATIVE SYSTEM WEIGHT
<u>B1BBD</u>	OCM CURRENT CONFIGURATION TABLE UNPROGRAMMED
<u>B1BC7</u>	DEPLOYMENT DATA RECORD FULL
<u>B1BCF</u>	ROLL OVER SENSOR
<u>B1C23</u>	PASSENGER SEAT WEIGHT 3 - LEFT FRONT CONFIGURATION MISMATCH
<u>B1C24</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT CONFIGURATION MISMATCH
<u>B1C25</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR CONFIGURATION MISMATCH
<u>B1C26</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR CONFIGURATION MISMATCH
<u>B1C38</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT LOW
<u>B1C39</u>	1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT HIGH
<u>B1C3A</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT OPEN
<u>B1C3B</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C3D</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW
<u>B1C3E</u>	1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT HIGH
<u>B1C3F</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN
<u>B1C40</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C47</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT LOW
<u>B1C48</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT HIGH
<u>B1C49</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT OPEN

<u>B1C4A</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C4C</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW
<u>B1C4D</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT HIGH
<u>B1C4E</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN
<u>B1C4F</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B212C</u>	IGNITION RUN/START INPUT CIRCUIT OPEN
<u>B212D</u>	IGNITION RUN ONLY INPUT CIRCUIT OPEN
<u>B2206</u>	CURRENT VIN MISSING / MISMATCH
<u>B2207</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 1
<u>B2208</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 2
<u>B2209</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 3
<u>B220A</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 4
<u>B220B</u>	OCCUPANT RESTRAINT CONTROLLER FIRING STORED ENERGY
<u>B220C</u>	OCCUPANT RESTRAINT CONTROLLER ACCELEROMETER 1 INTERNAL
<u>B2212</u>	OCCUPANT CLASSIFICATION MODULE INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B223B</u>	VEHICLE CONFIGURATION MISMATCH
<u>B223D</u>	OCCUPANT CLASSIFICATION MODULE DTC PRESENT
<u>B2255</u>	OCCUPANT RESTRAINT CONTROLLER ROLL OVER FEATURE DISABLE
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0170</u>	LOST COMMUNICATION W/UP-FRONT LEFT SATELLITE ACCELERATION SENSOR
<u>U0171</u>	LOST COMMUNICATION W/UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR
<u>U0172</u>	LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 1
<u>U0173</u>	LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 2
<u>U0175</u>	COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 1
<u>U0176</u>	LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 2

<u>U1414</u>	IMPLAUSIBLE/MISSING ECU NETWORK CONFIGURATION DATA
<u>U1415</u>	IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA
<u>U1419</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 3 - LEFT FRONT
<u>U141A</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 2 - RIGHT FRONT
<u>U141B</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 4 - LEFT REAR
<u>U141C</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 1 - RIGHT REAR

AUTOMATIC TRANSMISSION 42RLE DTCS

AUTOMATIC TRANSMISSION 42RLE DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>P0122</u>	TPS/APPS CIRCUIT LOW
<u>P0123</u>	TPS/APP CIRCUIT HIGH
<u>P0124</u>	TPS/APP INTERMITTENT
<u>P0218</u>	HIGH TEMPERATURE OPERATION ACTIVATED
<u>P0562</u>	BATTERY VOLTAGE LOW
<u>P0602</u>	CONTROL MODULE PROGRAMMING ERROR/NOT PROGRAMMED
<u>P0604</u>	INTERNAL CONTROL MODULE RAM
<u>P0605</u>	INTERNAL CONTROL MODULE ROM
<u>P0613</u>	INTERNAL TRANSMISSION PROCESSOR
<u>P0706</u>	TRANSMISSION RANGE SENSOR RATIONALITY
<u>P0711</u>	TRANSMISSION TEMPERATURE SENSOR PERFORMANCE
<u>P0712</u>	TRANSMISSION TEMPERATURE SENSOR LOW
<u>P0713</u>	TRANSMISSION TEMPERATURE SENSOR HIGH
<u>P0714</u>	TRANSMISSION TEMPERATURE SENSOR INTERMITTENT
<u>P0716</u>	INPUT SPEED SENSOR 1 CIRCUIT PERFORMANCE
<u>P0721</u>	OUTPUT SPEED SENSOR CIRCUIT PERFORMANCE
<u>P0726</u>	ENGINE SPEED INPUT CIRCUIT RANGE/PERFORMANCE
<u>P0731</u>	GEAR RATIO ERROR IN 1ST
<u>P0732</u>	GEAR RATIO ERROR IN 2ND
<u>P0733</u>	GEAR RATIO ERROR IN 3RD
<u>P0734</u>	GEAR RATIO ERROR IN 4TH
<u>P0736</u>	GEAR RATIO ERROR IN REVERSE
<u>P0740</u>	TCC OUT OF RANGE
<u>P0750</u>	LR SOLENOID CIRCUIT
<u>P0755</u>	2/4 SOLENOID CIRCUIT
<u>P0760</u>	OD SOLENOID CIRCUIT
<u>P0765</u>	UD SOLENOID CIRCUIT
<u>P0841</u>	LR PRESSURE SWITCH RATIONALITY
<u>P0845</u>	2/4 HYDRAULIC PRESSURE TEST
<u>P0846</u>	2/4 PRESSURE SWITCH RATIONALITY

<u>P0868</u>	LINE PRESSURE LOW
<u>P0869</u>	LINE PRESSURE HIGH
<u>P0870</u>	OD HYDRAULIC PRESSURE TEST
<u>P0871</u>	OD PRESSURE SWITCH RATIONALITY
<u>P0882</u>	TCM POWER INPUT LOW
<u>P0883</u>	TCM POWER INPUT HIGH
<u>P0884</u>	POWER UP AT SPEED
<u>P0888</u>	TRANSMISSION RELAY ALWAYS OFF
<u>P0890</u>	SWITCHED BATTERY
<u>P0891</u>	TRANSMISSION RELAY ALWAYS ON
<u>P0897</u>	TRANSMISSION FLUID DETERIORATED
<u>P0933</u>	LINE PRESSURE SENSOR CIRCUIT PERFORMANCE
<u>P0934</u>	LINE PRESSURE SENSOR CIRCUIT LOW
<u>P0935</u>	LINE PRESSURE SENSOR CIRCUIT HIGH
<u>P0944</u>	LOSS OF HYDRAULIC PUMP PRIME
<u>P0992</u>	2/4/OD HYDRAULIC PRESSURE TEST
<u>P128B</u>	TCM POWER CONTROL CIRCUIT 2 LOW - TIPM
<u>P128C</u>	TCM POWER CONTROL CIRCUIT 2 HIGH - TIPM
<u>P128D</u>	TCM POWER CONTROL CIRCUIT 2 OPEN - TIPM
<u>P128E</u>	TCM POWER CONTROL CIRCUIT 2 OVERCURRENT - TIPM
<u>P1684</u>	BATTERY WAS DISCONNECTED
<u>P1713</u>	RESTRICTED MANUAL VALVE IN T2 RANGE
<u>P1745</u>	TRANSMISSION LINE PRESSURE TOO HIGH FOR TOO LONG
<u>P1775</u>	SOLENOID SWITCH VALVE LATCHED IN TCC POSITION
<u>P1776</u>	SOLENOID SWITCH VALVE LATCHED IN LR POSITION
<u>P1790</u>	FAULT IMMEDIATELY AFTER SHIFT
<u>P1794</u>	SPEED SENSOR GROUND ERROR
<u>P1797</u>	MANUAL SHIFT OVERHEAT
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0141</u>	LOST COMMUNICATION WITH FCM

AUDIO/VIDEO SYSTEMS DTCS

AUDIO/VIDEO SYSTEMS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1401</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1402</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1403</u>	FRONT LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1405</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW

<u>B1406</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1407</u>	FRONT RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1409</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140A</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140B</u>	REAR LEFT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B140D</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B140E</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B140F</u>	REAR RIGHT AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1420</u>	AUDIO CASSETTE ERROR/INOPERABLE CASSETTE
<u>B1421</u>	AUDIO CD READ ERROR/INOPERABLE DISC
<u>B1422</u>	AUDIO DVD READ ERROR/INOPERABLE DISC
<u>B1423</u>	VES DVD READ ERROR/INOPERABLE DISC
<u>B1424</u>	IMPROPER DVD-WRONG REGION
<u>B1429</u>	RADIO DISPLAY HIGH TEMPERATURE
<u>B142A</u>	RADIO UNIT HIGH TEMPERATURE
<u>B142C</u>	VES VIDEO SCREEN DISCONNECTED
<u>B142D</u>	AUDIO ANTENNA NOT CONNECTED
<u>B142E</u>	GPS ANTENNA NOT CONNECTED
<u>B142F</u>	SATELLITE RADIO ANTENNA NOT CONNECTED
<u>B1460</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1461</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1462</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1463</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1464</u>	CHANNEL 1 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1465</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1466</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1467</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1468</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1469</u>	CHANNEL 2 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146A</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B146B</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B146C</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B146D</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B146E</u>	CHANNEL 3 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B146F</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1470</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1471</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1472</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1473</u>	CHANNEL 4 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1474</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B1475</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B1476</u>	

	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B1477</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B1478</u>	CHANNEL 5 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B1479</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT PERFORMANCE
<u>B147A</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT LOW
<u>B147B</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT HIGH
<u>B147C</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT OPEN
<u>B147D</u>	CHANNEL 6 AUDIO SPEAKER OUTPUT CIRCUIT SHORTED TOGETHER
<u>B2222</u>	SATELLITE RADIO RECEIVER INTERNAL
<u>U0019</u>	CAN INTERIOR BUS (+)/(-) CIRCUIT
<u>U0020</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0195</u>	LOST COMMUNICATION WITH SDAR
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE MODULE
<u>U0199</u>	LOST COMMUNICATION WITH DRIVERS DOOR MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE

CHIME/BUZZER DTCS

CHIME/BUZZER DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1230</u>	PTS SENSOR 8 CIRCUIT PERFORMANCE
<u>B1231</u>	PTS SENSOR 8 CIRCUIT LOW
<u>B1233</u>	PTS SENSOR 8 RING TIME TOO SHORT
<u>B1234</u>	PTS SENSOR 8 RING TIME TOO LONG
<u>B1236</u>	PTS SENSOR 9 CIRCUIT LOW
<u>B1238</u>	PTS SENSOR 9 RING TIME TOO SHORT
<u>B1239</u>	PTS SENSOR 9 RING TIME TOO LONG
<u>B123B</u>	PTS SENSOR 10 CIRCUIT LOW
<u>B123D</u>	PTS SENSOR 10 RING TIME TOO SHORT
<u>B123E</u>	PTS SENSOR 10 RING TIME TOO LONG
<u>B127C</u>	PTS SENSOR 11 CIRCUIT LOW
<u>B127E</u>	PTS SENSOR 11 RING TIME TOO SHORT
<u>B127F</u>	PTS SENSOR 11 RING TIME TOO LONG
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B2126</u>	SENSOR SUPPLY VOLTAGE LOW
<u>B2127</u>	SENSOR SUPPLY VOLTAGE HIGH

<u>B212A</u>	PTS DISPLAY SUPPLY VOLTAGE LOW
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B2232</u>	(PTS) PARKTRONICS INTERNAL
<u>B2234</u>	(PTS) PARKTRONICS REAR DISPLAY INTERNAL
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0423</u>	IMPLAUSIBLE DATA RECEIVED FROM CLUSTER/CCN
<u>U1101</u>	LOST COMMUNICATION WITH PTS DISPLAY

ELECTRONIC CONTROL MODULES DTCS

ELECTRONIC CONTROL MODULES DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>U0001</u>	CAN C BUS CIRCUIT
<u>U0010</u>	CAN INTERIOR BUS
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0100</u>	LOST COMMUNICATION WITH TCM
<u>U0103</u>	LOST COMMUNICATION WITH ESM
<u>U0114</u>	LOST COMMUNICATION WITH FDCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0126</u>	LOST COMMUNICATION WITH SAS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0151</u>	LOST COMMUNICATION WITH ORC
<u>U0154</u>	LOST COMMUNICATION WITH OCM
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARK ASSIST MODULE
<u>U0164</u>	LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER MODULE (ITM)
<u>U0168</u>	LOST COMMUNICATION WITH WCM
<u>U0169</u>	LOST COMMUNICATION WITH SUNROOF CONTROL MODULE (SUNR)
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE MODULE (HFM)
<u>U0203</u>	LOST COMMUNICATION WITH DRIVER DOOR MODULE (DDM)
<u>U0204</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE (PDM)
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE (MSMD)
<u>U1147</u>	ADDITIONAL CAN INTERIOR BUS ECU DETECTED

ENGINE PERFORMANCE DTCS

ENGINE PERFORMANCE DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
P0016	CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT
P0031	O2 SENSOR 1/1 HEATER CIRCUIT LOW
P0032	O2 SENSOR 1/1 HEATER CIRCUIT HIGH
P0037	O2 SENSOR 1/2 HEATER CIRCUIT LOW
P0038	O2 SENSOR 1/2 HEATER CIRCUIT HIGH
P0051	O2 SENSOR 2/1 HEATER CIRCUIT LOW
P0052	O2 SENSOR 2/1 HEATER CIRCUIT HIGH
P0057	O2 SENSOR 2/2 HEATER CIRCUIT LOW
P0058	O2 SENSOR 2/2 HEATER CIRCUIT HIGH
P0071	AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE
P0072	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW
P0073	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT HIGH
P0107	MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW
P0108	MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH
P0111	INTAKE AIR TEMPERATURE SENSOR RATIONALITY
P0112	INTAKE AIR TEMPERATURE SENSOR CIRCUIT LOW
P0113	INTAKE AIR TEMPERATURE SENSOR CIRCUIT HIGH
P0116	ENGINE COOLANT TEMPERATURE SENSOR PERFORMANCE
P0117	ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW
P0118	ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH
P0121	THROTTLE POSITION SENSOR 1 PERFORMANCE
P0122	THROTTLE POSITION SENSOR 1 CIRCUIT LOW
P0123	THROTTLE POSITION SENSOR 1 CIRCUIT HIGH
P0125	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED-LOOP FUEL CONTROL
P0128	THERMOSTAT RATIONALITY
P0129	BAROMETRIC PRESSURE OUT-OF-RANGE LOW
P0131	O2 SENSOR 1/1 CIRCUIT LOW
P0132	O2 SENSOR 1/1 CIRCUIT HIGH
P0133	O2 SENSOR 1/1 SLOW RESPONSE
P0135	O2 SENSOR 1/1 HEATER PERFORMANCE
P0137	O2 SENSOR 1/2 CIRCUIT LOW
P0138	O2 SENSOR 1/2 CIRCUIT HIGH
P0139	O2 SENSOR 1/2 SLOW RESPONSE
P013A	O2 SENSOR 1/2 SLOW RESPONSE - RICH TO LEAN

<u>P013C</u>	O2 SENSOR 2/2 SLOW RESPONSE - RICH TO LEAN
<u>P0141</u>	O2 SENSOR 1/2 HEATER PERFORMANCE
<u>P0151</u>	O2 SENSOR 2/1 CIRCUIT LOW
<u>P0152</u>	O2 SENSOR 2/1 CIRCUIT HIGH
<u>P0153</u>	O2 SENSOR 2/1 SLOW RESPONSE
<u>P0155</u>	O2 SENSOR 2/1 HEATER PERFORMANCE
<u>P0157</u>	O2 SENSOR 2/2 CIRCUIT LOW
<u>P0158</u>	O2 SENSOR 2/2 CIRCUIT HIGH
<u>P0159</u>	O2 SENSOR 2/2 SLOW RESPONSE
<u>P0161</u>	O2 SENSOR 2/2 HEATER PERFORMANCE
<u>P0171</u>	FUEL SYSTEM 1/1 LEAN
<u>P0172</u>	FUEL SYSTEM 1/1 RICH
<u>P0174</u>	FUEL SYSTEM 2/1 LEAN
<u>P0175</u>	FUEL SYSTEM 2/1 RICH
<u>P0201</u>	FUEL INJECTOR 1 CIRCUIT
<u>P0202</u>	FUEL INJECTOR 2 CIRCUIT
<u>P0203</u>	FUEL INJECTOR 3 CIRCUIT
<u>P0204</u>	FUEL INJECTOR 4 CIRCUIT
<u>P0205</u>	FUEL INJECTOR 5 CIRCUIT
<u>P0206</u>	FUEL INJECTOR 6 CIRCUIT
<u>P0221</u>	THROTTLE POSITION SENSOR 2 PERFORMANCE
<u>P0222</u>	THROTTLE POSITION SENSOR 2 CIRCUIT LOW
<u>P0223</u>	THROTTLE POSITION SENSOR 2 CIRCUIT HIGH
<u>P0300</u>	MULTIPLE CYLINDER MISFIRE
<u>P0301</u>	CYLINDER 1 MISFIRE
<u>P0302</u>	CYLINDER 2 MISFIRE
<u>P0303</u>	CYLINDER 3 MISFIRE
<u>P0304</u>	CYLINDER 4 MISFIRE
<u>P0305</u>	CYLINDER 5 MISFIRE
<u>P0306</u>	CYLINDER 6 MISFIRE
<u>P0315</u>	NO CRANK SENSOR LEARNED
<u>P0325</u>	KNOCK SENSOR 1 CIRCUIT
<u>P0330</u>	KNOCK SENSOR 2 CIRCUIT
<u>P0335</u>	CRANKSHAFT POSITION SENSOR CIRCUIT
<u>P0339</u>	CRANKSHAFT POSITION SENSOR INTERMITTENT
<u>P0340</u>	CAMSHAFT POSITION SENSOR CIRCUIT
<u>P0344</u>	CAMSHAFT POSITION SENSOR INTERMITTENT
<u>P0401</u>	EGR SYSTEM PERFORMANCE
<u>P0403</u>	EGR SOLENOID CIRCUIT
<u>P0404</u>	EGR POSITION SENSOR RATIONALITY OPEN
<u>P0405</u>	EGR POSITION SENSOR CIRCUIT LOW
<u>P0406</u>	

	EGR POSITION SENSOR CIRCUIT HIGH
<u>P0420</u>	CATALYST EFFICIENCY (BANK 1)
<u>P0430</u>	CATALYST EFFICIENCY (BANK 2)
<u>P0440</u>	GENERAL EVAP SYSTEM FAILURE
<u>P0441</u>	EVAP PURGE SYSTEM PERFORMANCE
<u>P0443</u>	EVAP PURGE SOLENOID CIRCUIT
<u>P0452</u>	EVAP PRESSURE SWITCH STUCK CLOSED
<u>P0455</u>	EVAP PURGE SYSTEM LARGE LEAK
<u>P0456</u>	EVAP PURGE SYSTEM SMALL LEAK
<u>P0457</u>	LOOSE FUEL CAP
<u>P0461</u>	FUEL LEVEL SENSOR 1 PERFORMANCE
<u>P0462</u>	FUEL LEVEL SENSOR 1 CIRCUIT LOW
<u>P0463</u>	FUEL LEVEL SENSOR 1 CIRCUIT HIGH
<u>P0480</u>	COOLING FAN 1 CONTROL CIRCUIT
<u>P0481</u>	COOLING FAN 2 CONTROL CIRCUIT
<u>P0501</u>	VEHICLE SPEED SENSOR 1 PERFORMANCE
<u>P0503</u>	VEHICLE SPEED SENSOR 1 ERRATIC
<u>P0506</u>	IDLE SPEED PERFORMANCE LOWER THAN EXPECTED
<u>P0507</u>	IDLE SPEED PERFORMANCE HIGHER THAN EXPECTED
<u>P050B</u>	COLD START IGNITION TIMING PERFORMANCE
<u>P050D</u>	COLD START ROUGH IDLE
<u>P0513</u>	INVALID SKIM KEY
<u>P0522</u>	ENGINE OIL PRESSURE TOO LOW
<u>P0532</u>	A/C PRESSURE SENSOR CIRCUIT LOW
<u>P0533</u>	A/C PRESSURE SENSOR CIRCUIT HIGH
<u>P0562</u>	BATTERY VOLTAGE LOW
<u>P0563</u>	BATTERY VOLTAGE HIGH
<u>P0571</u>	BRAKE SWITCH 1 PERFORMANCE
<u>P0572</u>	BRAKE SWITCH 1 STUCK ON
<u>P0573</u>	BRAKE SWITCH 1 STUCK OFF
<u>P0579</u>	SPEED CONTROL SWITCH 1 PERFORMANCE
<u>P0580</u>	SPEED CONTROL SWITCH 1 CIRCUIT LOW
<u>P0581</u>	SPEED CONTROL SWITCH 1 CIRCUIT HIGH
<u>P0585</u>	SPEED CONTROL SWITCH 1/2 CORRELATION
<u>P0591</u>	SPEED CONTROL SWITCH 2 PERFORMANCE
<u>P0592</u>	SPEED CONTROL SWITCH 2 CIRCUIT LOW
<u>P0593</u>	SPEED CONTROL SWITCH 2 CIRCUIT HIGH
<u>P0600</u>	SERIAL COMMUNICATION LINK
<u>P0601</u>	INTERNAL MEMORY CHECKSUM INVALID
<u>P0606</u>	INTERNAL ECM PROCESSOR
<u>P060B</u>	ETC A/D GROUND PERFORMANCE
<u>P060D</u>	

	ETC LEVEL 2 APP PERFORMANCE
<u>P060E</u>	ETC LEVEL 2 TPS PERFORMANCE
<u>P060F</u>	ETC LEVEL 2 ECT PERFORMANCE
<u>P061A</u>	ETC LEVEL 2 TORQUE PERFORMANCE
<u>P061C</u>	ETC LEVEL 2 RPM PERFORMANCE
<u>P0622</u>	GENERATOR FIELD CONTROL CIRCUIT
<u>P0627</u>	FUEL PUMP CONTROL CIRCUIT
<u>P062C</u>	ETC LEVEL 2 MPH PERFORMANCE
<u>P0630</u>	VIN NOT PROGRAMMED IN PCM
<u>P0632</u>	ODOMETER NOT PROGRAMMED IN PCM
<u>P0633</u>	SKIM KEY NOT PROGRAMMED IN PCM
<u>P063A</u>	GENERATOR VOLTAGE SENSE CIRCUIT
<u>P0642</u>	SENSOR REFERENCE VOLTAGE 1 CIRCUIT LOW
<u>P0643</u>	SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH
<u>P0645</u>	A/C CLUTCH CONTROL CIRCUIT
<u>P0652</u>	SENSOR REFERENCE VOLTAGE 2 CIRCUIT LOW
<u>P0653</u>	SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH
<u>P0685</u>	AUTO SHUTDOWN CONTROL CIRCUIT
<u>P0688</u>	AUTO SHUTDOWN SENSE CIRCUIT LOW
<u>P0691</u>	COOLING FAN 1 CONTROL CIRCUIT LOW
<u>P0692</u>	COOLING FAN 1 CONTROL CIRCUIT HIGH
<u>P0693</u>	COOLING FAN 2 CONTROL CIRCUIT LOW
<u>P0694</u>	COOLING FAN 2 CONTROL CIRCUIT HIGH
<u>P0700</u>	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)
<u>P0703</u>	BRAKE SWITCH 2 PERFORMANCE
<u>P0850</u>	PARK/NEUTRAL SWITCH PERFORMANCE
<u>P1115</u>	GENERAL TEMPERATURE RATIONALITY
<u>P1128</u>	CLOSED LOOP FUELING NOT ACHIEVED - BANK 1
<u>P1129</u>	CLOSED LOOP FUELING NOT ACHIEVED - BANK 2
<u>P1273</u>	A/C CLUTCH CONTROL CIRCUIT 2 HIGH (TIPM)
<u>P1275</u>	A/C CLUTCH CONTROL CIRCUIT 2 OVERCURRENT (TIPM)
<u>P129C</u>	INVERTER CONTROL CIRCUIT HIGH (TIPM)
<u>P129E</u>	INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)
<u>P1404</u>	EGR POSITION SENSOR RATIONALITY CLOSED
<u>P1501</u>	VEHICLE SPEED SENSOR 1/2 CORRELATION - DRIVE WHEELS
<u>P1502</u>	VEHICLE SPEED SENSOR 1/2 CORRELATION - NON DRIVE WHEELS
<u>P1572</u>	BRAKE PEDAL STUCK ON
<u>P1573</u>	BRAKE PEDAL STUCK OFF
<u>P1593</u>	SPEED CONTROL SWITCH 1/2 STUCK
<u>P1607</u>	PCM INTERNAL SHUTDOWN TIMER RATIONALITY
<u>P1618</u>	SENSOR REFERENCE VOLTAGE 1 CIRCUIT ERRATIC
<u>P1628</u>	

	SENSOR REFERENCE VOLTAGE 2 CIRCUIT ERRATIC
<u>P1696</u>	EEPROM MEMORY WRITE DENIED/INVALID
<u>P1697</u>	EMR (SRI) MILEAGE NOT STORED
<u>P1897</u>	LEVEL 1 RPM BUS UNLOCK
<u>P2072</u>	ELECTRONIC THROTTLE CONTROL SYSTEM - ICE BLOCKAGE
<u>P2096</u>	DOWNSTREAM FUEL TRIM SYSTEM 1 LEAN
<u>P2097</u>	DOWNSTREAM FUEL TRIM SYSTEM 1 RICH
<u>P2098</u>	DOWNSTREAM FUEL TRIM SYSTEM 2 LEAN
<u>P2099</u>	DOWNSTREAM FUEL TRIM SYSTEM 2 RICH
<u>P2100</u>	ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT
<u>P2101</u>	ELECTRONIC THROTTLE CONTROL MOTOR PERFORMANCE
<u>P2107</u>	ELECTRONIC THROTTLE CONTROL MODULE PROCESSOR
<u>P2110</u>	ELECTRONIC THROTTLE CONTROL - FORCED LIMITED RPM
<u>P2111</u>	ELECTRONIC THROTTLE CONTROL - UNABLE TO CLOSE
<u>P2112</u>	ELECTRONIC THROTTLE CONTROL - UNABLE TO OPEN
<u>P2115</u>	ACCELERATOR PEDAL POSITION SENSOR 1 MINIMUM STOP PERFORMANCE
<u>P2116</u>	ACCELERATOR PEDAL POSITION SENSOR 2 MINIMUM STOP PERFORMANCE
<u>P2118</u>	ELECTRONIC THROTTLE CONTROL MOTOR CURRENT PERFORMANCE
<u>P2122</u>	ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT LOW
<u>P2123</u>	ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT HIGH
<u>P2127</u>	ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT LOW
<u>P2128</u>	ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT HIGH
<u>P2135</u>	THROTTLE POSITION SENSOR 1/2 CORRELATION
<u>P2138</u>	ACCELERATOR PEDAL POSITION SENSOR 1/2 CORRELATION
<u>P2166</u>	ACCELERATOR PEDAL POSITION SENSOR 1 MAXIMUM STOP PERFORMANCE
<u>P2167</u>	ACCELERATOR PEDAL POSITION SENSOR 2 MAXIMUM STOP PERFORMANCE
<u>P2172</u>	HIGH AIRFLOW / VACUUM LEAK DETECTED (INSTANTANEOUS ACCUMULATION)
<u>P2173</u>	HIGH AIRFLOW / VACUUM LEAK DETECTED (SLOW ACCUMULATION)
<u>P2174</u>	LOW AIRFLOW / RESTRICTION DETECTED (INSTANTANEOUS ACCUMULATION)
<u>P2175</u>	LOW AIRFLOW / RESTRICTION DETECTED (SLOW ACCUMULATION)
<u>P2181</u>	COOLING SYSTEM PERFORMANCE
<u>P2299</u>	BRAKE PEDAL POSITION / ACCELERATOR PEDAL POSITION INCOMPATIBLE
<u>P2302</u>	IGNITION COIL 1 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2305</u>	IGNITION COIL 2 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2308</u>	IGNITION COIL 3 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION

<u>P2311</u>	IGNITION COIL 4 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2314</u>	IGNITION COIL 5 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2317</u>	IGNITION COIL 6 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2503</u>	CHARGING SYSTEM OUTPUT LOW
<u>P2504</u>	CHARGING SYSTEM OUTPUT HIGH
<u>P2610</u>	PCM INTERNAL SHUTDOWN TIMER RATIONALITY TOO FAST
<u>U0001</u>	CAN C BUS
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0121</u>	LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM-WCM)
<u>U110C</u>	LOST FUEL LEVEL MESSAGE
<u>U110E</u>	LOST AMBIENT TEMPERATURE MESSAGE
<u>U1110</u>	LOST VEHICLE SPEED MESSAGE
<u>U1113</u>	LOST A/C PRESSURE MESSAGE
<u>U1120</u>	LOST WHEEL DISTANCE MESSAGE
<u>U1403</u>	IMPLAUSIBLE FUEL LEVEL SIGNAL RECEIVED
<u>U1411</u>	IMPLAUSIBLE FUEL VOLUME SIGNAL RECEIVED
<u>U1412</u>	IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED
<u>U1417</u>	IMPLAUSIBLE LEFT WHEEL DISTANCE SIGNAL RECEIVED
<u>U1418</u>	IMPLAUSIBLE RIGHT WHEEL DISTANCE SIGNAL RECEIVED

HEATED MIRRORS DTCS

HEATED MIRRORS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1D33</u>	MIRROR HEATER CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D34</u>	MIRROR HEATER CONTROL CIRCUIT HIGH - DDM/PDM
<u>B1D37</u>	MIRROR HEATER CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D38</u>	MIRROR HEATER CONTROL CIRCUIT HIGH - DDM/PDM

HEATED SEATS DTCS

HEATED SEATS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1092</u>	FRONT LEFT SEAT HEATER CONTROL CIRCUIT LOW
<u>B1094</u>	FRONT LEFT SEAT HEATER CONTROL CIRCUIT OPEN
<u>B1096</u>	FRONT RIGHT SEAT HEATER CONTROL CIRCUIT LOW
<u>B1098</u>	FRONT RIGHT SEAT HEATER CONTROL CIRCUIT OPEN

<u>B10BB</u>	LEFT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER
<u>B10BC</u>	RIGHT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER
<u>B2181</u>	HEATED SEAT MODULE POWER SUPPLY LOW
<u>B2182</u>	HEATED SEAT MODULE POWER SUPPLY HIGH

HEATING & AIR CONDITIONING DTCS

HEATING & AIR CONDITIONING DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>1006</u>	BI-LEVEL SWITCH REQUEST INPUT CIRCUIT PERFORMANCE
<u>B1000</u>	A/C SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1003</u>	A/C PANEL MODE SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1009</u>	RECIRCULATION SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B100C</u>	FLOOR MODE SWITCH REQUEST INPUT CIRCUIT PER
<u>B100F</u>	MIX SWITCH REQUEST INPUT CIRCUIT PER
<u>B1012</u>	DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1015</u>	REAR DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1031</u>	EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT LOW
<u>B1032</u>	EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT HIGH
<u>B1034</u>	INFRARED TEMPERATURE SENSOR INPUT CIRCUIT LOW
<u>B1034</u>	INFRARED TEMPERATURE SENSOR THERMISTOR CIRCUIT LOW
<u>B1035</u>	INFRARED TEMPERATURE SENSOR INPUT CIRCUIT HIGH
<u>B1040</u>	PANEL MODE DOOR 1 CONTROL CIRCUIT/PERFORMANCE
<u>B1043</u>	PANEL MODE DOOR 1 CONTROL CIRCUIT OPEN
<u>B1044</u>	PANEL MODE DOOR 1 TRAVEL RANGE TOO SMALL
<u>B1045</u>	PANEL MODE DOOR 1 TRAVEL RANGE TOO LARGE
<u>B1058</u>	RECIRCULATION DOOR CONTROL CIRCUIT/PERFORMANCE
<u>B105B</u>	RECIRCULATION DOOR CONTROL CIRCUIT OPEN
<u>B105B</u>	RECIRCULATION DOOR CONTROL CIRCUIT OPEN (TIPM)
<u>B105C</u>	RECIRCULATION DOOR TRAVEL RANGE TOO SMALL
<u>B105D</u>	RECIRCULATION DOOR TRAVEL RANGE TOO LARGE
<u>B10A2</u>	LEFT BLEND DOOR CONTROL CIRCUIT/PERFORMANCE
<u>B10A5</u>	LEFT BLEND DOOR CONTROL CIRCUIT OPEN
<u>B10B1</u>	INFRARED SENSOR THERMISTOR CIRCUIT HIGH
<u>B10B4</u>	CABIN HEATER 1 CONTROL CIRCUIT LOW (TIPM)
<u>B10B8</u>	CABIN HEATER 2 CONTROL CIRCUIT LOW (TIPM)
<u>B10B9</u>	CABIN HEATER 2 CONTROL CIRCUIT HIGH (TIPM)
<u>B10EA</u>	BLOWER MOTOR CONTROL CIRCUIT HIGH
<u>B10EC</u>	BLOWER MOTOR CONTROL CIRCUIT OVERCURRENT (TIPM)
<u>B1138</u>	CABIN HEATER 3 CONTROL CIRCUIT LOW (TIPM)
<u>B1139</u>	CABIN HEATER 3 CONTROL CIRCUIT HIGH (TIPM)

<u>B1610</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT LOW
<u>B1610</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT PERFORMANCE
<u>B1611</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT HIGH
<u>B210A</u>	SYSTEM VOLTAGE LOW
<u>B210B</u>	SYSTEM VOLTAGE HIGH
<u>B2214</u>	(HVAC) CLIMATE CONTROL INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>U0010</u>	CAN INTERIOR BUS
<u>U0141</u>	LOST COMM W/INTEGRATED POWER MODULE/FRONT CONTROL MODULE/TIPM
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE
<u>U0168</u>	LOST COM WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
<u>U0169</u>	LOST COMMUNICATION WITH SUNROOF CONTROL MODULE
<u>U0181</u>	LOST COMMUNICATION WITH HEADLAMP LEVELING TRANSLATOR
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE PHONE MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE
<u>U0201</u>	LOST COMMUNICATION WITH LEFT REAR DOOR MODULE
<u>U0202</u>	LOST COMMUNICATION WITH RIGHT REAR DOOR MODULE
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

HORN SYSTEM DTCS

HORN SYSTEM DIAGNOSTIC TROUBLE CODE (DTC) LIST

<u>DTC</u>	<u>Description</u>
<u>B2339</u>	HORN SWITCH STUCK

IGNITION CONTROL DTCS

IGNITION CONTROL DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B2101</u>	IGNITION RUN/START INPUT CIRCUIT LOW
<u>B2102</u>	IGNITION RUN/START INPUT CIRCUIT HIGH
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B2142</u>	IGNITION OFF DRAW (IOD) FUSE NOT PRESENT
<u>B219A</u>	IGNITION UNLOCK RUN/START CONTROL CIRCUIT OVERCURRENT
<u>B219F</u>	IGNITION OFF DRAW (IOD) FUSE BLOWN
<u>B2206</u>	CURRENT VIN MISSING / MISMATCH
<u>B222C</u>	VEHICLE CONFIGURATION NOT PROGRAMMED
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0114</u>	LOST COMMUNICATION WITH FINAL DRIVE CONTROL MODULE
<u>U0121</u>	LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER

INSTRUMENT CLUSTER DTCS

INSTRUMENT CLUSTER DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B123F</u>	MENU SWITCH STUCK
<u>B127A</u>	COMPASS PERFORMANCE
<u>B1286</u>	COMPASS/TEMP BUTTON PERFORMANCE
<u>B1287</u>	RESET SWITCH PERFORMANCE
<u>B1288</u>	TRIP/TOGGLE SWITCH PERFORMANCE
<u>B1502</u>	STEERING WHEEL CONTROL DOWN SWITCH PERFORMANCE
<u>B1503</u>	STEERING WHEEL CONTROL RIGHT SWITCH PERFORMANCE
<u>B1613</u>	PANEL ILLUMINATION CONTROL CIRCUIT LOW
<u>B1615</u>	PANEL ILLUMINATION CONTROL CIRCUIT OPEN
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0161</u>	LOST COMMUNICATION WITH COMPASS MODULE

<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0208</u>	LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE
<u>U1008</u>	LIN 1 BUS
<u>U1109</u>	LOST COMMUNICATION WITH LIN STEERING WHEEL CONTROLS
<u>U113B</u>	LOST COMMUNICATION WITH SWITCH BANK MODULE
<u>U1149</u>	LOST COMMUNICATION WITH MULTIFUNCTION SWITCH

LAMPS/LIGHTING DTCS

LAMPS/LIGHTING - EXTERIOR - DTCS

LAMPS/LIGHTING - EXTERIOR - DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B162B</u>	LEFT LOW BEAM CONTROL CIRCUIT LOW
<u>B162C</u>	LT LOW BEAM CONTROL CKT HI
<u>B162F</u>	RIGHT LOW BEAM CONTROL CIRCUIT LOW
<u>B1630</u>	RIGHT LOW BEAM CONTROL CIRCUIT HIGH
<u>B1633</u>	LEFT HI BEAM CONTROL CIRCUIT LOW
<u>B1634</u>	LEFT HI BEAM CONTROL CIRCUIT HIGH
<u>B1637</u>	RIGHT HI BEAM CONTROL CIRCUIT LOW
<u>B1638</u>	RIGHT HI BEAM CONTROL CIRCUIT HIGH
<u>B163B</u>	FRONT LEFT TURN CONTROL CIRCUIT LOW
<u>B163C</u>	FRONT LEFT TURN CONTROL CIRCUIT HIGH
<u>B163F</u>	FRONT RIGHT TURN CONTROL CIRCUIT LOW
<u>B1640</u>	FRONT RIGHT TURN CONTROL CIRCUIT HIGH
<u>B1643</u>	REAR LEFT TURN CONTROL CIRCUIT LOW
<u>B1644</u>	REAR LEFT TURN CONTROL CIRCUIT HIGH
<u>B1644</u>	RIGHT STOP LAMP CONTROL CIRCUIT HIGH
<u>B1647</u>	REAR RIGHT TURN CONTROL CIRCUIT LOW
<u>B1648</u>	REAR RIGHT TURN CONTROL CIRCUIT HIGH
<u>B165C</u>	PARK LAMP CONTROL CIRCUIT LOW
<u>B165D</u>	PARK LAMP CONTROL CIRCUIT HIGH
<u>B166C</u>	LEFT TRAILER TOW LAMP CONTROL CIRCUIT HIGH
<u>B166F</u>	RIGHT TRAILER TOW LAMP CONTROL CIRCUIT LOW
<u>B1670</u>	RIGHT TRAILER TOW LAMP CONTROL CIRCUIT HIGH
<u>B16B1</u>	LEFT STOP LAMP CONTROL CIRCUIT HIGH
<u>B16F8</u>	FRONT LEFT FOG LAMP CONTROL CIRCUIT LOW
<u>B16F9</u>	FRONT LEFT FOG LAMP CONTROL CIRCUIT HIGH
<u>B16FC</u>	FRONT RIGHT FOG LAMP CONTROL CIRCUIT LOW
<u>B16FD</u>	FRONT RIGHT FOG LAMP CONTROL CIRCUIT HIGH
<u>B17B8</u>	LEFT STOP LAMP CONTROL CIRCUIT OVERCURRENT

<u>B17BA</u>	HEADLAMP LEVELING MOTOR CONTROL CIRCUIT OVERCURRENT
<u>B17BD</u>	LEFT SIDEMARKER LAMP CONTROL CIRCUIT HIGH
<u>B17BF</u>	LEFT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT
<u>B17C2</u>	RIGHT SIDEMARKER LAMP CONTROL CIRCUIT HIGH
<u>B17C4</u>	RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT

LAMPS/LIGHTING - INTERIOR - DTCS

LAMPS/LIGHTING - INTERIOR - DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B161A</u>	COURTESY/DOME LAMP CONTROL CIRCUIT
<u>B161E</u>	READING LAMP CONTROL CIRCUIT

NAVIGATION/TELECOMMUNICATION DTCS

NAVIGATION/TELECOMMUNICATION DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B143B</u>	MICROPHONE 1 CIRCUIT LOW
<u>B143B</u>	MICROPHONE 1 CIRCUIT LOW (RADIO)
<u>B143C</u>	MICROPHONE 1 CIRCUIT HIGH
<u>B143C</u>	MICROPHONE 1 CIRCUIT HIGH (RADIO)
<u>B143E</u>	MICROPHONE 2 CIRCUIT LOW
<u>B143E</u>	MICROPHONE 2 CIRCUIT LOW (RADIO)
<u>B143F</u>	MICROPHONE 2 CIRCUIT HIGH
<u>B143F</u>	MICROPHONE 2 CIRCUIT HIGH (RADIO)
<u>B1459</u>	TELEMATICS MIRROR CONTROL CIRCUIT LOW
<u>B145A</u>	TELEMATICS MIRROR CONTROL CIRCUIT HIGH
<u>B145B</u>	TELEMATICS MIRROR CONTROL CIRCUIT OPEN
<u>B2205</u>	ORIGINAL VIN MISSING/MISMATCH
<u>B2223</u>	(HFM) HANDS FREE PHONE INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B222E</u>	FLASH CHECKSUM PERFORMANCE
<u>B2230</u>	RAM WRITE PERFORMANCE
<u>U0019</u>	CAN B BUS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0156</u>	LOST COMMUNICATION WITH EOM
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)

<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0195</u>	LOST COMMUNICATION WITH SDARS
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE
<u>U0199</u>	LOST COMMUNICATION WITH DRIVER DOOR MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE
<u>U0208</u>	LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

POWER DISTRIBUTION DTCS

POWER DISTRIBUTION DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>P129C</u>	INVERTER CONTROL CIRCUIT HIGH (TIPM)
<u>P129E</u>	INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)

POWER LOCKS DTCS

POWER LOCKS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1801</u>	DRIVER DOOR LOCK/UNLOCK SWITCH CIRCUIT LOW - TIPM
<u>B1803</u>	DRIVER DOOR LOCK/UNLOCK SWITCH INPUT CIRCUIT STUCK LOCK - DDM
<u>B1806</u>	PASSENGER DOOR LOCK/UNLOCK SWITCH CIRCUIT LOW - TIPM
<u>B1808</u>	PASSENGER DOOR LOCK/UNLOCK SWITCH CIRCUIT STUCK LOCK - PDM
<u>B186F</u>	ALL DOOR SECONDARY LOCK CONTROL CIRCUIT LOW - TIPM
<u>B1870</u>	ALL DOOR SECONDARY LOCK CONTROL CIRCUIT HIGH - TIPM
<u>B1934</u>	DRIVER DOOR LOCK/UNLOCK SWITCH CIRCUIT STUCK - TIPM
<u>B1935</u>	PASSENGER DOOR LOCK/UNLOCK SWITCH CIRCUIT STUCK - TIPM
<u>B1937</u>	FLIPPER GLASS RELEASE SWITCH CIRCUIT LOW
<u>B198A</u>	ALL DOOR SECONDARY UNLOCK CONTROL CIRCUIT LOW - TIPM
<u>B198B</u>	ALL DOOR SECONDARY UNLOCK CONTROL CIRCUIT HIGH - TIPM
<u>B1A08</u>	RKE FOB 1 PERFORMANCE
<u>B1A09</u>	RKE FOB 2 PERFORMANCE
<u>B1A0A</u>	RKE FOB 3 PERFORMANCE
<u>B1A0B</u>	RKE FOB 4 PERFORMANCE
<u>B1A0C</u>	RKE FOB 5 PERFORMANCE
<u>B1A0D</u>	RKE FOB 6 PERFORMANCE
<u>B1A0E</u>	RKE FOB 7 PERFORMANCE
<u>B1A0F</u>	RKE FOB 8 PERFORMANCE

<u>B1A10</u>	RKE FOB 1 BATTERY LOW
<u>B1A11</u>	RKE FOB 2 BATTERY LOW
<u>B1A12</u>	RKE FOB 3 BATTERY LOW
<u>B1A13</u>	RKE FOB 4 BATTERY LOW
<u>B1A14</u>	RKE FOB 5 BATTERY LOW
<u>B1A15</u>	RKE FOB 6 BATTERY LOW
<u>B1A16</u>	RKE FOB 7 BATTERY LOW
<u>B1A17</u>	RKE FOB 8 BATTERY LOW
<u>B1A23</u>	RKE RECEIVER PERFORMANCE

POWER MIRRORS DTCS

POWER MIRRORS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1D07</u>	MIRROR ADJUST SWITCH INPUT CIRCUIT STUCK - DDM
<u>B1D09(DDM), B1D12(PDM)</u>	MIRROR POSITION SENSOR POWER SUPPLY CIRCUIT LOW
<u>B1D0A(DDM), B1D13(PDM)</u>	MIRROR POSITION SENSOR POWER SUPPLY CIRCUIT HIGH
<u>B1D0C(DDM), B1D15(PDM)</u>	MIRROR VERTICAL POSITION SENSOR INPUT CIRCUIT LOW
<u>B1D0D(DDM), B1D16(PDM)</u>	MIRROR VERTICAL POSITION SENSOR INPUT CIRCUIT HIGH
<u>B1D0F(DDM), B1D18(PDM)</u>	MIRROR HORIZONTAL POSITION SENSOR INPUT CIRCUIT LOW
<u>B1D10(DDM), B1D19(PDM)</u>	MIRROR HORIZONTAL POSITION SENSOR INPUT CIRCUIT HIGH
<u>B1D1F, B1D2B</u>	MIRROR VERTICAL MOTOR CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D20, B1D2C</u>	MIRROR VERTICAL MOTOR CONTROL CIRCUIT HIGH - DDM/PDM
<u>B1D21, B1D2D</u>	MIRROR VERTICAL MOTOR CONTROL CIRCUIT OPEN - DDM/PDM
<u>B1D23, B1D2F</u>	MIRROR HORIZONTAL MOTOR CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D24, B1D30</u>	MIRROR HORIZONTAL MOTOR CONTROL CIRCUIT HIGH - DDM/PDM
<u>B1D25, B1D31</u>	MIRROR HORIZONTAL MOTOR CONTROL CIRCUIT OPEN - DDM/PDM
<u>B1D33, B1D37</u>	MIRROR HEATER CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D34, B1D38</u>	MIRROR HEATER CONTROL CIRCUIT HIGH - DDM/PDM
<u>B1D4D</u>	MEMORY SWITCH INPUT CIRCUIT STUCK
<u>B1DF2</u>	MIRROR FOLD SWITCH STUCK
<u>B1E64, B1E65</u>	MIRROR SELECT SWITCH STUCK
<u>B1E65</u>	RIGHT MIRROR SELECT SWITCH STUCK
<u>B1E67(DDM), B1E6B(PDM)</u>	MIRROR FOLD CONTROL CIRCUIT LOW
<u>B1E68(DDM),</u>	MIRROR FOLD CONTROL CIRCUIT HIGH

POWER SEATS DTCS

POWER SEATS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B1D62</u>	POWER SEAT SWITCH STUCK
<u>B1D63</u>	POWER SEAT SWITCH OPEN
<u>B1D6D</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT LOW
<u>B1D6E</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT HIGH
<u>B1D71</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D72</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D75</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D76</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D7B</u>	SEAT HORIZONTAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D7F</u>	SEAT FRONT VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D83</u>	SEAT REAR VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D9B</u>	SEAT HORIZONTAL FRONT STOP NOT LEARNED
<u>B210D</u>	BATTERY VOLTAGE LOW - MSM
<u>B210E</u>	BATTERY VOLTAGE HIGH - MSM
<u>B221C</u>	MEMORY SEAT MODULE INTERNAL
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE LEFT FRONT
<u>U0204</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

POWER TOP-FULL OPEN RETRACTABLE DTCS

POWER TOP-FULL OPEN RETRACTABLE DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B210A</u>	SYSTEM VOLTAGE LOW
<u>B210B</u>	SYSTEM VOLTAGE HIGH
<u>B210D</u>	BATTERY VOLTAGE LOW - MEMORY MIRROR MODULE
<u>B210E</u>	BATTERY VOLTAGE HIGH - MEMORY MIRROR MODULE
<u>B2125</u>	SENSOR SUPPLY VOLTAGE PERFORMANCE
<u>B2206</u>	CURRENT VIN MISSING/MISMATCH
<u>B2227</u>	SUNROOF ECU INTERNAL
<u>B2582</u>	FULL OPEN ROOF REARWARD OPEN SWITCH CIRCUIT PERFORMANCE
<u>B2585</u>	FULL OPEN ROOF FORWARD OPEN SWITCH CIRCUIT PERFORMANCE
<u>B2588</u>	FULL OPEN ROOF CLOSE SWITCH CIRCUIT PERFORMANCE

<u>B258B</u>	FULL OPEN ROOF FRONT MOTOR CONTROL PERFORMANCE
<u>B258F</u>	FULL OPEN ROOF REAR MOTOR CONTROL PERFORMANCE
<u>B2593</u>	FULL OPEN ROOF FORWARD POSITION SENSOR 1 PERFORMANCE
<u>B2594</u>	FULL OPEN ROOF FORWARD POSITION SENSOR 2 PERFORMANCE
<u>B2595</u>	FULL OPEN ROOF REARWARD POSITION SENSOR 1 PERFORMANCE
<u>B2596</u>	FULL OPEN ROOF REARWARD POSITION SENSOR 2 PERFORMANCE
<u>U0010</u>	CAN INTERIOR BUS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN

POWER WINDOWS DTCS

POWER WINDOWS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B16A4</u>	PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT LOW - PDM
<u>B16A5</u>	PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT HIGH - PDM
<u>B1854</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT LOW - DDM
<u>B1855</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM
<u>B1856</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM
<u>B1858</u>	DRIVER WINDOW POSITION SENSOR POWER SUPPLY LOW - DDM
<u>B1859</u>	DRIVER WINDOW POSITION SENSOR POWER SUPPLY HIGH - DDM
<u>B185D</u>	PASSENGER WINDOW SWITCH CIRCUIT STUCK - PDM
<u>B185F</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT LOW - PDM
<u>B1860</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM
<u>B1861</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM
<u>B1863</u>	WINDOW POSITION SENSOR POWER SUPPLY LOW - RHD ONLY - PDM
<u>B1864</u>	PASSENGER WINDOW POSITION SENSOR POWER SUPPLY HIGH - RHD ONLY - PDM
<u>B18B5</u>	MASTER SWITCH - FRONT LEFT WINDOW SWITCH STUCK
<u>B18B6</u>	MASTER SWITCH - FRONT RIGHT WINDOW SWITCH STUCK
<u>B210D</u>	BATTERY VOLTAGE LOW - DDM/PDM
<u>B210E</u>	BATTERY VOLTAGE HIGH - DDM/PDM
<u>B225D,B225E</u>	DOOR MODULE FRONT LEFT/RIGHT INTERNAL
<u>B226E</u>	MASTER POWER WINDOW SWITCH INTERNAL
<u>B2577</u>	PASSENGER WINDOW NOT CALIBRATED/LOST CALIBRATION - PDM
<u>B2578</u>	DRIVER WINDOW NOT CALIBRATED/LOST CALIBRATION - DDM
<u>B2580</u>	DRIVER WINDOW POSITION SENSOR(S) NO SIGNAL - DDM
<u>B2581</u>	PASSENGER WINDOW POSITION SENSOR(S) NO SIGNAL - RHD ONLY - PDM
<u>U0010</u>	CAN INTERIOR BUS
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE

<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - FIRST ROW
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE PHONE MODULE
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT
<u>U0204</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT
<u>U0249</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - LAST ROW
<u>U113D</u>	LOST COMMUNICATION WITH MASTER POWER WINDOW SWITCH

STARTING DTCS

STARTING DIAGNOSTIC TROUBLE CODE (DTC) LIST

<u>DTC</u>	<u>Description</u>
<u>B1820</u>	HOOD AJAR INPUT CIRCUIT HIGH

TIRES/WHEELS DTCS

TIRES/WHEELS DIAGNOSTIC TROUBLE CODE (DTC) LIST

<u>DTC</u>	<u>Description</u>
<u>C0077</u>	LOW TIRE PRESSURE
<u>C1501</u>	TIRE PRESSURE SENSOR 1 INTERNAL
<u>C1502</u>	TIRE PRESSURE SENSOR 2 INTERNAL
<u>C1503</u>	TIRE PRESSURE SENSOR 3 INTERNAL
<u>C1504</u>	TIRE PRESSURE SENSOR 4 INTERNAL
<u>C1506</u>	LEFT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C1507</u>	RIGHT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C1508</u>	LEFT REAR TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C150A</u>	LEFT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C150B</u>	RIGHT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C150C</u>	LEFT REAR TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C151D</u>	TIRE PRESSURE SENSOR LOCATION UNDETERMINED
<u>U1114</u>	LOST COMMUNICATION WITH LEFT FRONT TIRE PRESSURE TRIGGER MODULE
<u>U1115</u>	LOST COMMUNICATION WITH RIGHT FRONT TIRE PRESSURE TRIGGER

	MODULE
<u>U1116</u>	LOST COMMUNICATION WITH LEFT REAR TIRE PRESSURE TRIGGER MODULE

TRANSFER CASE DTCS

TRANSFER CASE DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>C1403</u>	TRANSFER CASE RANGE POSITION SENSOR PERFORMANCE
<u>C1404</u>	TRANSFER CASE RANGE POSITION SENSOR CIRCUIT LOW
<u>C1405</u>	TRANSFER CASE RANGE POSITION SENSOR CIRCUIT HIGH
<u>C1406</u>	TRANSFER CASE BRAKE PERFORMANCE
<u>C1407</u>	TRANSFER CASE BRAKE CONTROL CIRCUIT LOW
<u>C1408</u>	TRANSFER CASE BRAKE CONTROL CIRCUIT HIGH
<u>C140A</u>	TRANSFER CASE MOTOR PERFORMANCE
<u>C140D</u>	TRANSFER CASE MOTOR CONTROL CIRCUIT OPEN
<u>C140E</u>	TRANSFER CASE MOTOR BLOCKED
<u>C140F</u>	TRANSFER CASE RANGE POSITION SENSOR ERRATIC PERFORMANCE
<u>C1415</u>	TRANSFER CASE MOTOR "CURRENT" PERFORMANCE
<u>C1438</u>	TRANSFER CASE DIFFERENTIAL CLUTCH WORN
<u>C1444</u>	TRANSFER CASE MOTOR OVERUSE
<u>C1472</u>	TRANSFER CASE CLUTCH CONTROL CIRCUIT PERFORMANCE
<u>C1476</u>	TRANSFER CASE CLUTCH POSITION OUT OF RANGE
<u>C1477</u>	TRANSFER CASE CLUTCH OVERTEMPERATURE
<u>C2100</u>	BATTERY VOLTAGE LOW (FDCM)
<u>C2101</u>	BATTERY VOLTAGE HIGH (FDCM)
<u>C2111</u>	SENSOR SUPPLY 1 VOLTAGE CIRCUIT LOW (FDCM)
<u>C2112</u>	SENSOR SUPPLY 1 VOLTAGE CIRCUIT HIGH (FDCM)
<u>C2201</u>	INTERNAL CONTROLLER (FDCM)
<u>C2206</u>	VEHICLE CONFIGURATION MISMATCH
<u>U0001</u>	CAN C BUS
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0141</u>	LOST COMMUNICATION WITH FCM
<u>U0212</u>	LOST COMMUNICATION WITH SCM (SAS)
<u>U0401</u>	IMPLAUSIBLE DATA RECEIVED FROM ECM (FDCM)
<u>U0402</u>	IMPLAUSIBLE DATA RECEIVED FROM TCM (FDCM)
<u>U0415</u>	IMPLAUSIBLE DATA RECEIVED FROM ABS (FDCM)
<u>U0429</u>	IMPLAUSIBLE DATA RECEIVED FROM SCM (FDCM)
<u>U0431</u>	IMPLAUSIBLE DATA RECEIVED FROM FCM (FDCM)

VEHICLE THEFT SECURITY DTCS

VEHICLE THEFT SECURITY DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
B1A20	PRE-ARM TIMEOUT
B1A24	KEY NOT PROGRAMMED
B1A25	INVALID KEY
B1A26	MAXIMUM NUMBER OF KEYS PROGRAMMED
B1A27	SKREEM PROGRAMMING PERFORMANCE
B1A28	ECM MISMATCH WITH SKIM
B1A29	SKIM BASE STATION MISMATCH
B1A37	SECURITY TRANSMITTER SENSOR CIRCUIT LOW
B1A38	SECURITY TRANSMITTER SENSOR CIRCUIT HIGH
B1A3A	SECURITY RECEIVER SENSOR CIRCUIT LOW
B1A3B	SECURITY RECEIVER SENSOR CIRCUIT HIGH
B1A3C	INTERNAL SIREN BATTERY
B1A3D	SIREN BATTERY / LOSS OF POWER SUPPLY
B1A3E	SIREN/ITM MISMATCH
B1A3F	ITM ARMING SEQUENCE PERFORMANCE
B1A41	SECURITY TRANSMITTER SENSOR CIRCUIT OPEN
B1A42	SECURITY TRANSMITTER SENSOR CIRCUIT SHORTED TOGETHER
B1A43	SECURITY TRANSMITTER SENSOR RETURN CIRCUIT LOW
B1A44	SECURITY RECEIVER SENSOR CIRCUIT OPEN
B1A45	SECURITY RECEIVER SENSOR CIRCUIT SHORTED TOGETHER
B1A46	SECURITY RECEIVER SENSOR RETURN CIRCUIT LOW
B1A47	SECURITY TRANSMITTER/RECEIVER SENSOR RETURN CIRCUIT HIGH
B210A	SYSTEM VOLTAGE LOW (WCM)
B210B	SYSTEM VOLTAGE HIGH (WCM)
B210D	BATTERY VOLTAGE LOW (WCM)
B210E	BATTERY VOLTAGE HIGH (WCM)
B2204	ECU CONFIGURATION MISMATCH
B2205	ORIGINAL VIN MISSING/MISMATCH
B2206	CURRENT VIN MISSING/MISMATCH
B2224	SKREEM INTERNAL
B2229	SKREEM INTERNAL - SKIM IMMOBILIZER
B222A	VEHICLE LINE MISMATCH
B223C	INTRUSION TRANSCEIVER MODULE INTERNAL
B2254	COLUMN LOCK MODULE INTERNAL
U0100	LOST COMMUNICATION WITH ECM/PCM
U0141	LOST COMMUNICATION WITH FRONT CONTROL MODULE
U0141	LOST COMMUNICATION WITH FRONT CONTROL MODULE

<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARK ASSIST MODULE
<u>U0164</u>	LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0236</u>	NO RESPONSE WITH COLUMN LOCK MODULE
<u>U110D</u>	LOST COMMUNICATION WITH SECURITY SIREN
<u>U1416</u>	IMPLAUSIBLE SECURITY SIREN SIGNAL RECEIVED

WIPERS/WASHERS DTCS

WIPERS/WASHERS DIAGNOSTIC TROUBLE CODE (DTC) LIST

DTC	Description
<u>B2304</u>	WIPER PARK SWITCH INPUT CIRCUIT LOW
<u>B2305</u>	WIPER PARK SWITCH INPUT CIRCUIT HIGH
<u>B230D</u>	REAR WIPER PARK SWITCH INPUT CIRCUIT LOW (STUCK LOW)
<u>B230E</u>	REAR WIPER PARK SWITCH INPUT CIRCUIT HIGH (STUCK HIGH)
<u>B2324</u>	HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P0203-FUEL INJECTOR 3 CIRCUIT

CIRCUIT SCHEMATIC

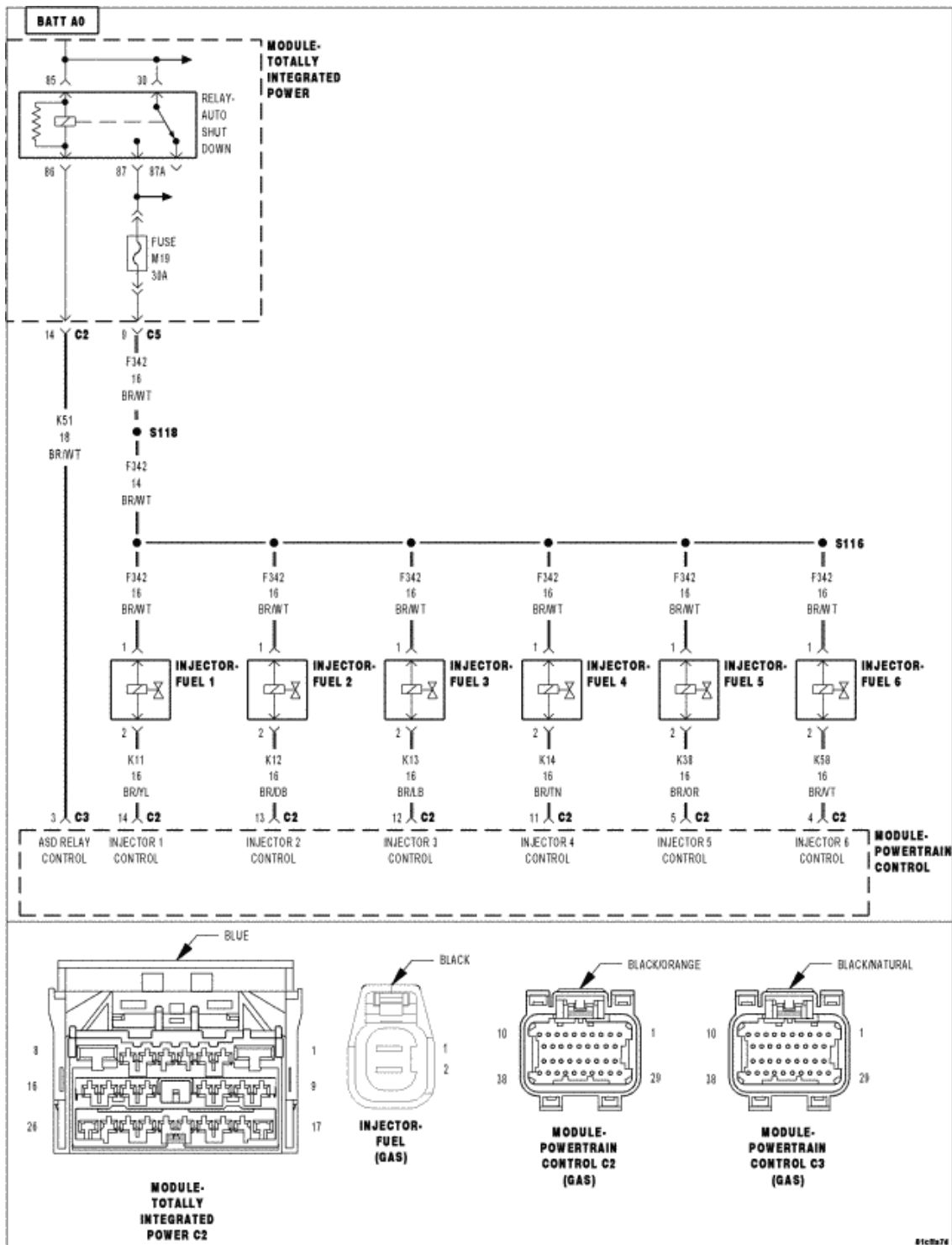


Fig. 1: Fuel Injector Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD OUTPUT CIRCUIT
(K13) INJECTOR CONTROL NO.3 CIRCUIT OPEN
(K13) INJECTOR CONTROL NO.3 CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

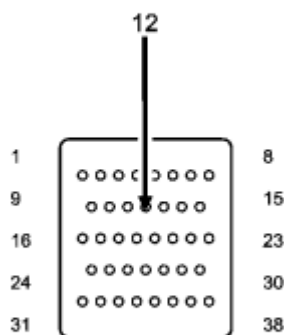
Yes

Go To 2.

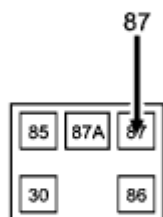
No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 3 CIRCUIT RESISTANCE



PCM PINOUT
BOX 8815



RELAY-
AUTO
SHUT DOWN
(IN TIPM)

819bedfc

Fig. 2: Measuring Resistance Of Fuel Injector 3 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 3 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 3 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 3 is properly connected to the injector. Disconnect the Fuel Injector 3 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 3 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

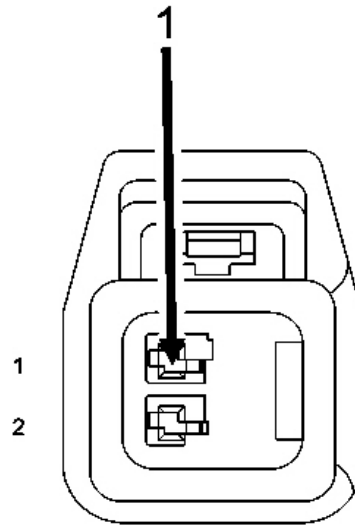
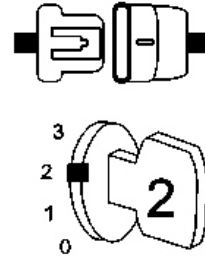
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 3: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 3 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes.

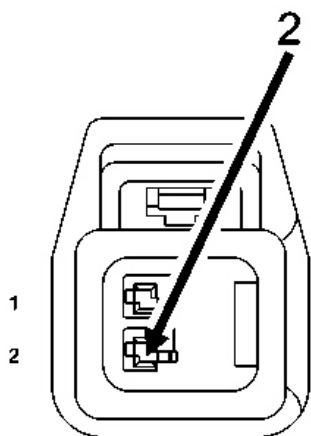
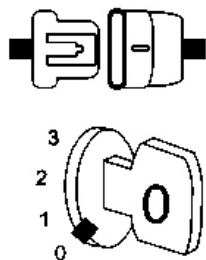
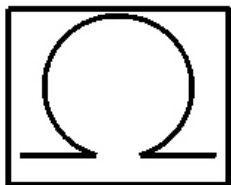
Go To 5.

No.

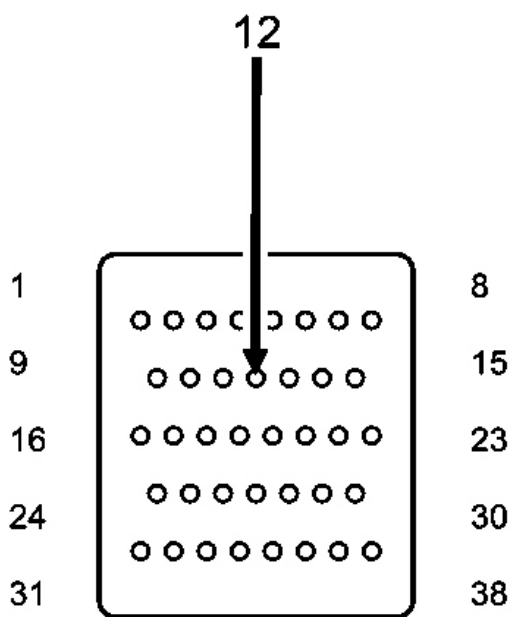
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K13) INJECTOR 3 CONTROL CIRCUIT OPEN



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f3d

Fig. 4: Checking Injector Control No. 3 Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K13) Injector 3 Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K13) Injector 3 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 3

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 3 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

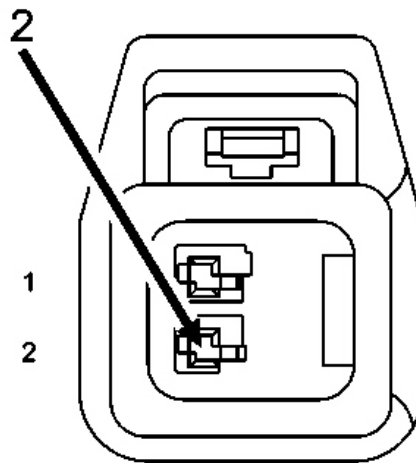
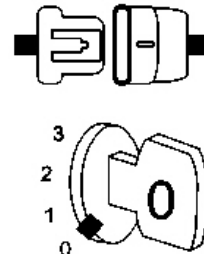
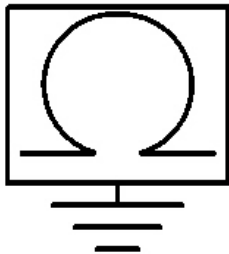
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 3 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K13) INJECTOR 3 CONTROL CIRCUIT SHORTED TO GROUND**



**INJECTOR-
FUEL**

81654d74

Fig. 5: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K13) Injector 3 Control circuit in the Injector harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K13) Injector 3 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 3 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0204-FUEL INJECTOR 4 CIRCUIT

CIRCUIT SCHEMATIC

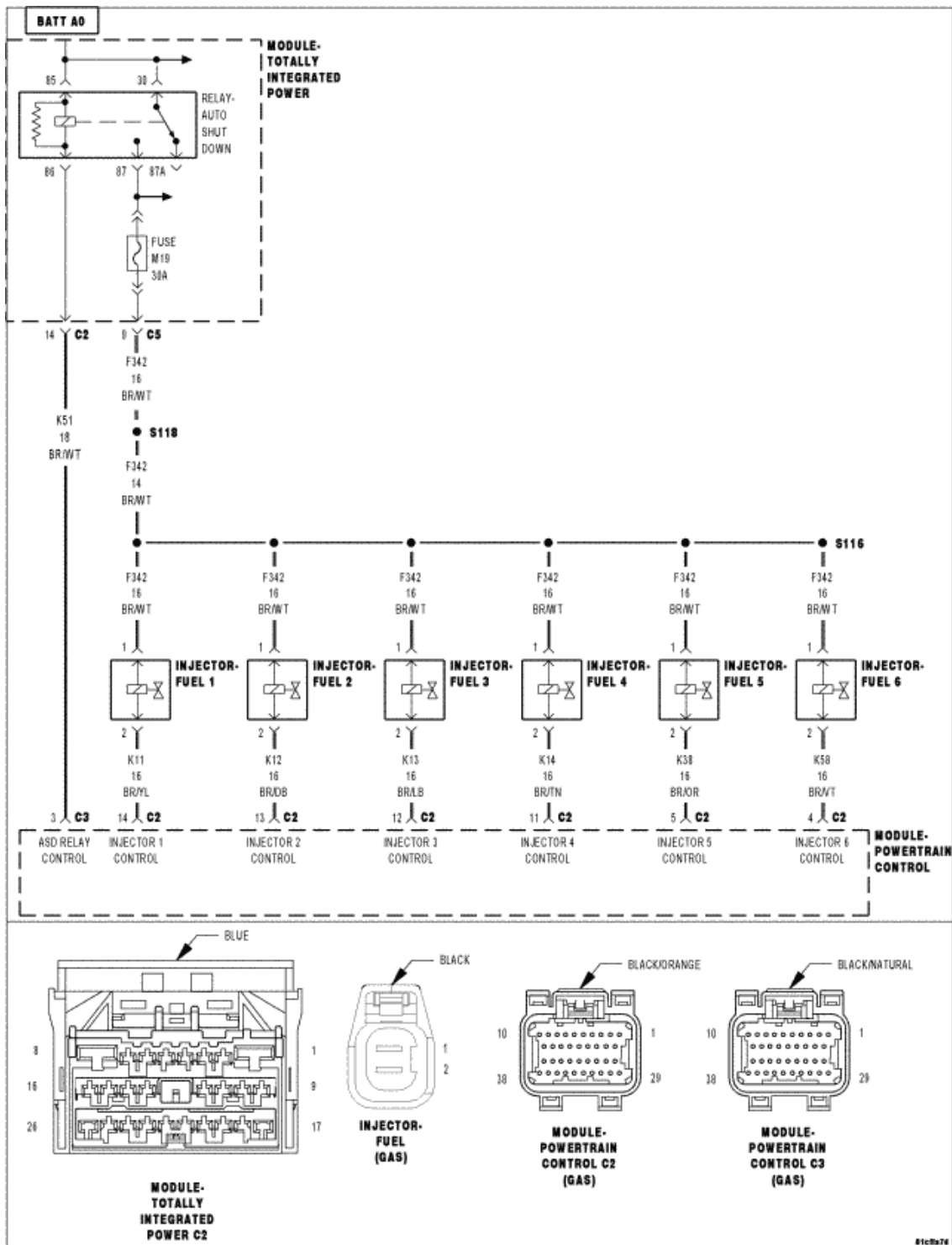


Fig. 6: Fuel Injector Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- **Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD OUTPUT CIRCUIT
(K14) INJECTOR 4 CONTROL CIRCUIT OPEN
(K14) INJECTOR 4 CONTROL CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

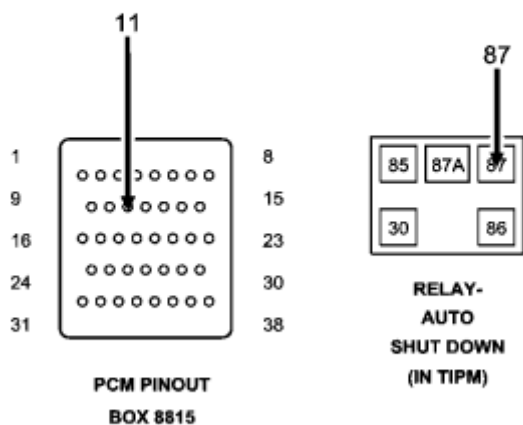
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 4 CIRCUIT RESISTANCE



819c0ac1

Fig. 7: Measuring Resistance Of Fuel Injector 4 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 4 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 4 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 4 is properly connected to the injector. Disconnect the Fuel Injector 4 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 4 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

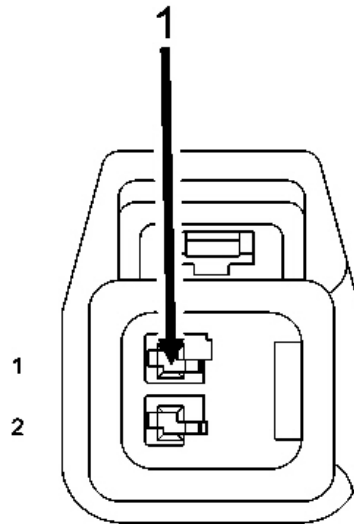
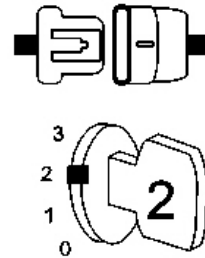
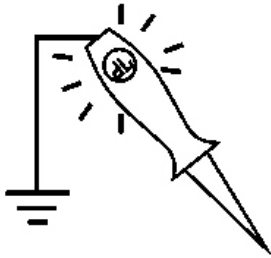
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 8: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 4 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes.

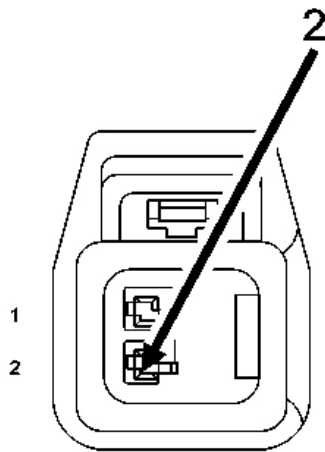
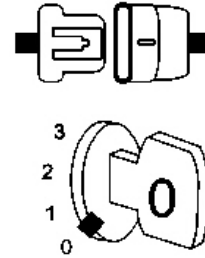
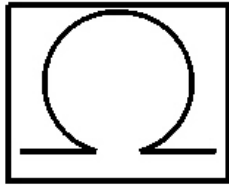
Go To 5.

No.

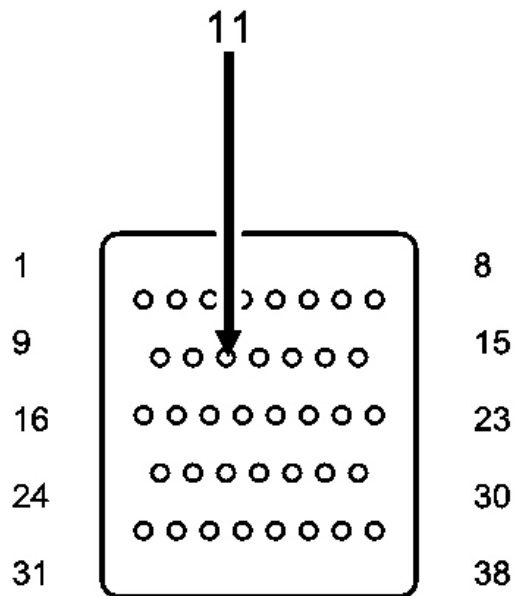
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K14) INJECTOR 4 CONTROL CIRCUIT OPEN



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f52

Fig. 9: Checking Injector Control No. 4 Circuit for Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the Ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K14) Injector 4 Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K14) Injector 4 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 4

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 4 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

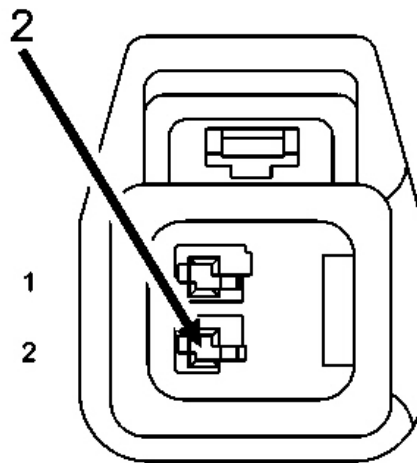
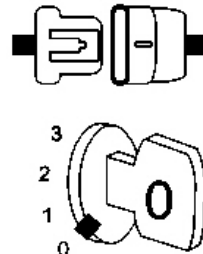
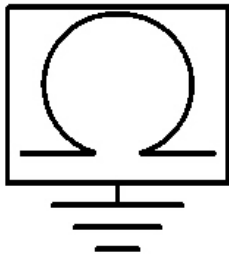
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 4 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K14) INJECTOR 4 CONTROL CIRCUIT SHORTED TO GROUND**



**INJECTOR-
FUEL**

81654d74

Fig. 10: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K14) Injector 4 Control circuit in the Injector harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K14) Injector 4 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 4 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0205-FUEL INJECTOR 5 CIRCUIT

CIRCUIT SCHEMATIC

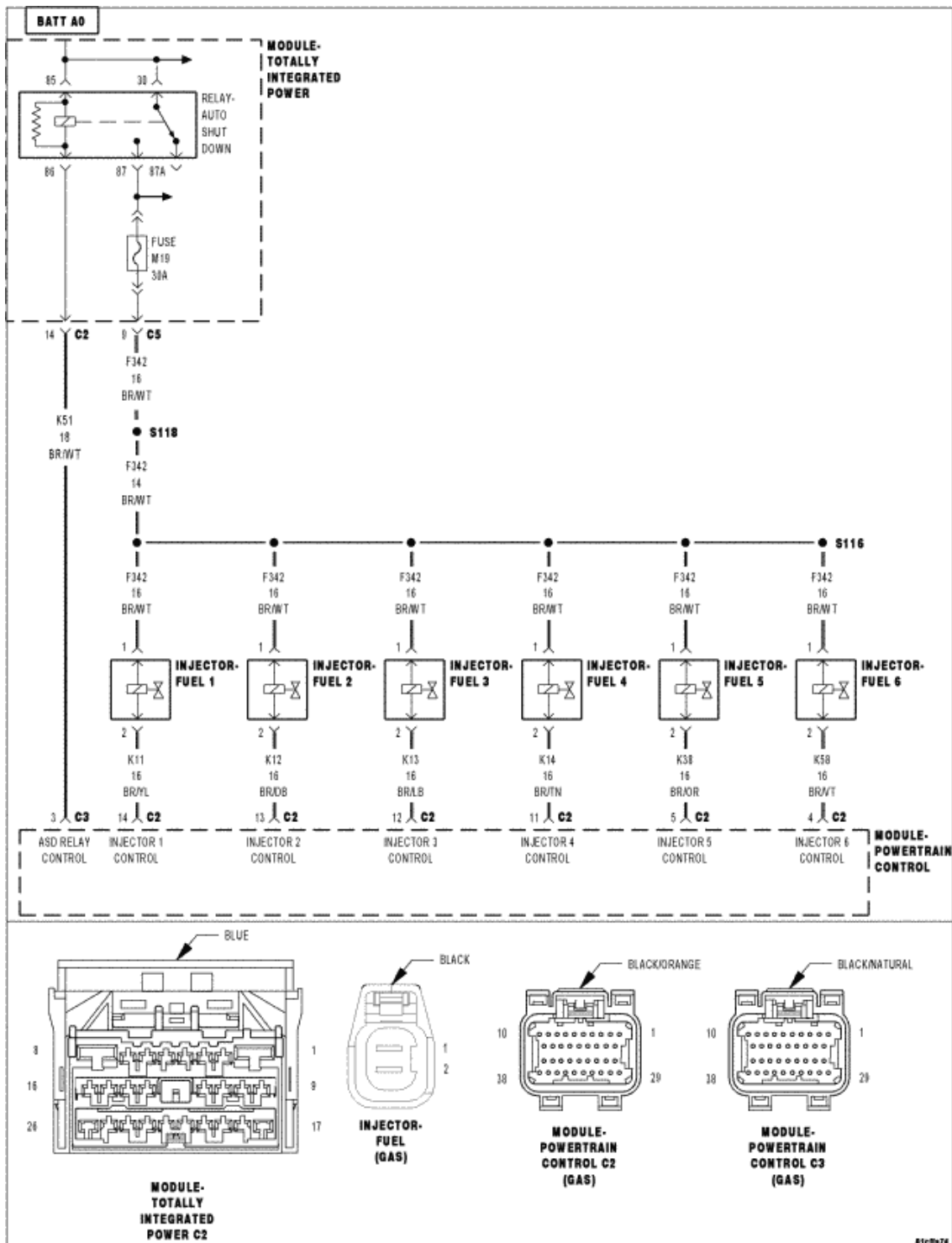


Fig. 11: Fuel Injector Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- **Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD OUTPUT CIRCUIT
(K38) INJECTOR 5 CONTROL CIRCUIT OPEN
(K38) INJECTOR 5 CONTROL CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

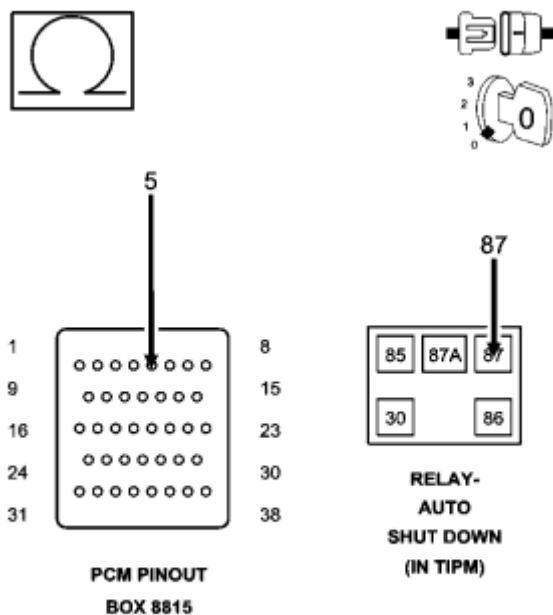
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 5 CIRCUIT RESISTANCE



819c0d8e

Fig. 12: Measuring Resistance Of Fuel Injector 5 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 5 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 5 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 5 is properly connected to the injector. Disconnect the Fuel Injector 5 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 5 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

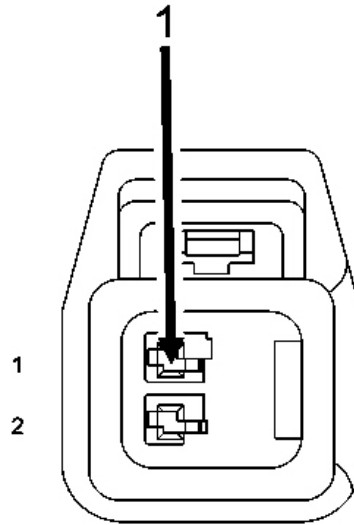
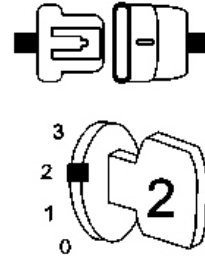
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 13: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 5 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes.

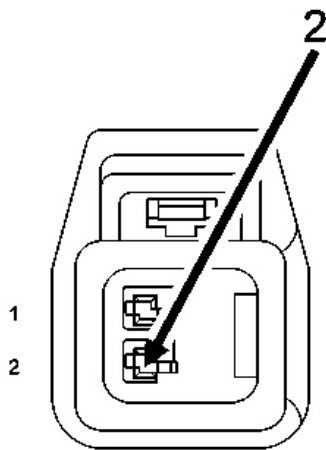
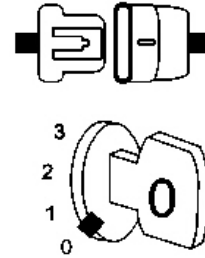
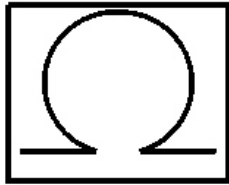
Go To 5.

No.

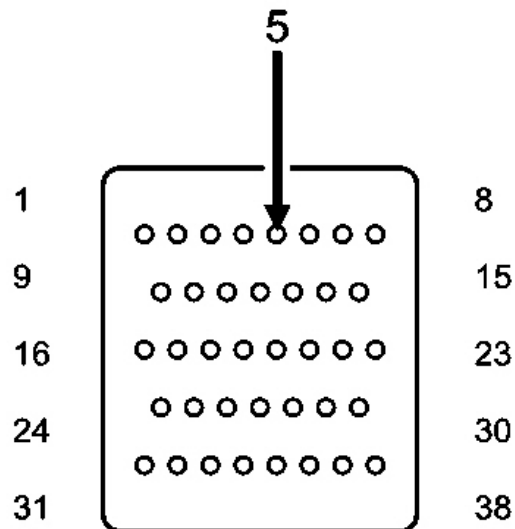
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K38) INJECTOR 5 CONTROL CIRCUIT OPEN



INJECTOR-
FUEL



PCM PINOUT
BOX 8815

81654f6d

Fig. 14: Checking Injector Control No. 5 Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K38) Injector 5 Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K38) Injector 5 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 5

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 5 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

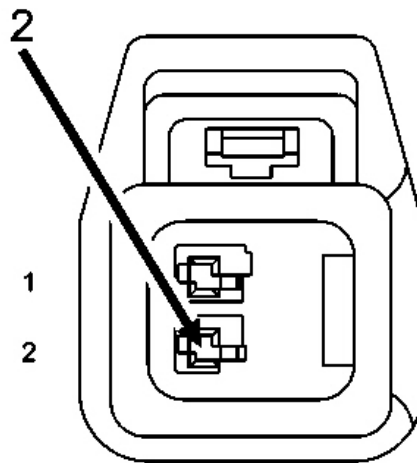
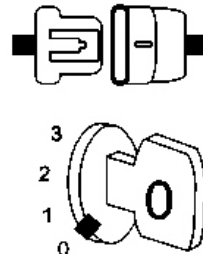
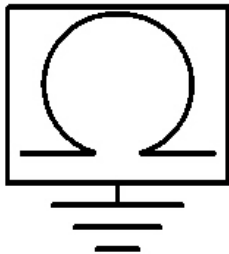
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 5 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K38) INJECTOR 5 CONTROL CIRCUIT SHORTED TO GROUND**



**INJECTOR-
FUEL**

81654d74

Fig. 15: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K38) Injector 5 Control circuit in the Injector harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K38) Injector 5 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 5 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0206-FUEL INJECTOR 6 CIRCUIT

CIRCUIT SCHEMATIC

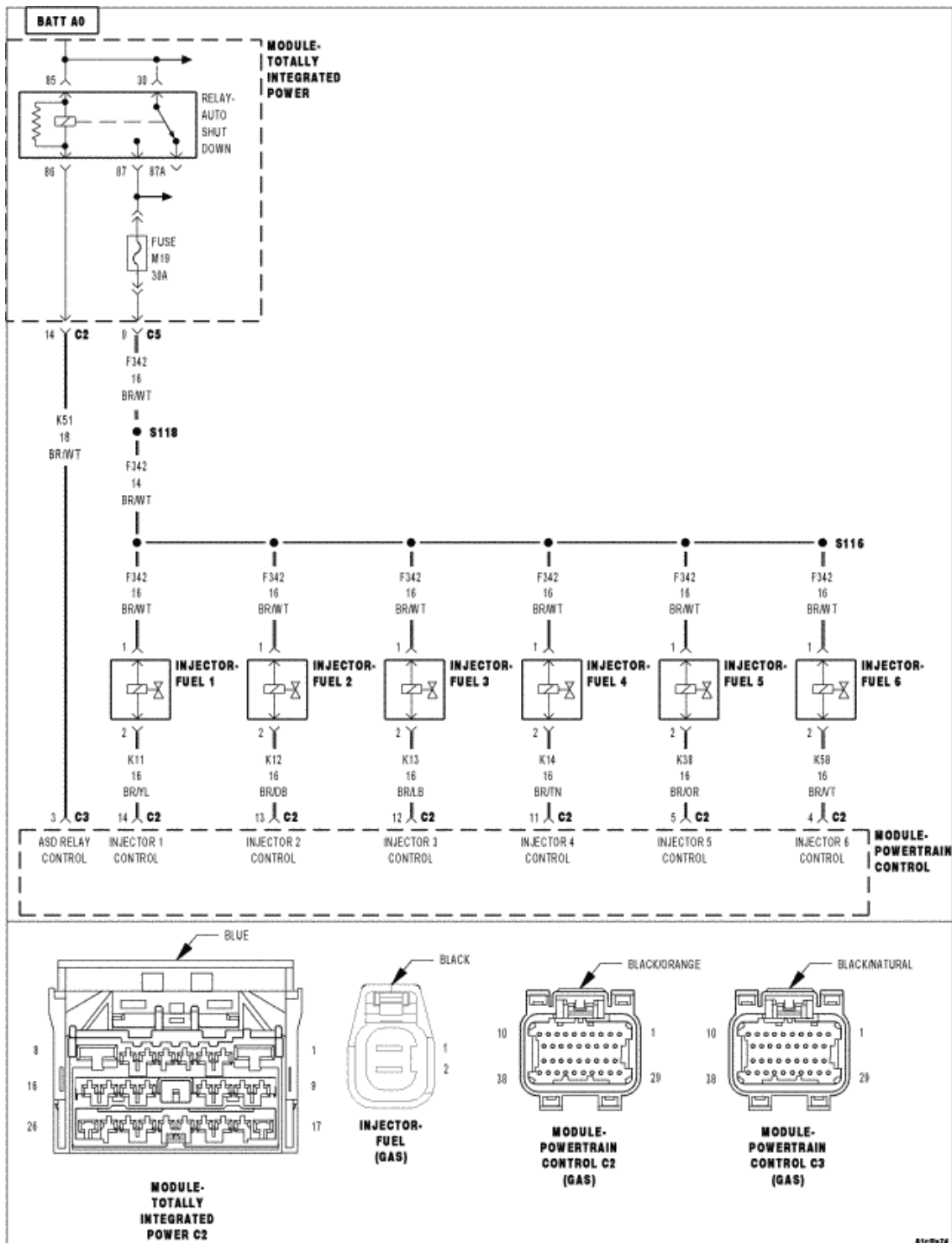


Fig. 16: Fuel Injector Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD OUTPUT CIRCUIT
(K58) INJECTOR 6 CONTROL CIRCUIT OPEN
(K58) INJECTOR 6 CONTROL CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

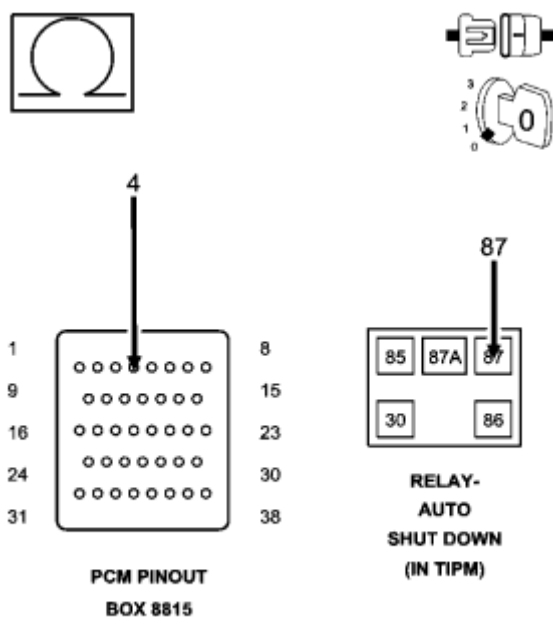
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 6 CIRCUIT RESISTANCE



819c1210

Fig. 17: Measuring Resistance Of Fuel Injector 6 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 6 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 6 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 6 is properly connected to the injector. Disconnect the Fuel Injector 6 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 6 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

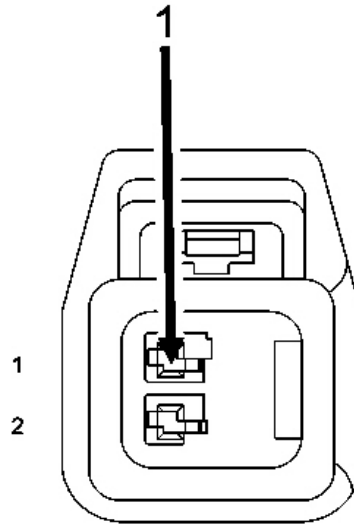
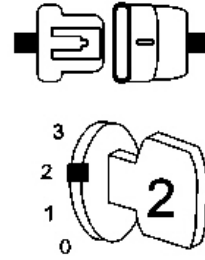
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT CHECK



**INJECTOR-
FUEL**

81654d0c

Fig. 18: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 6 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes.

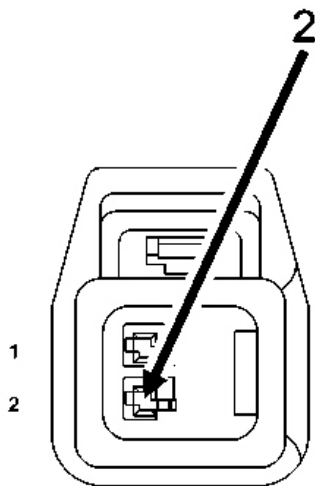
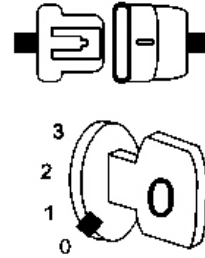
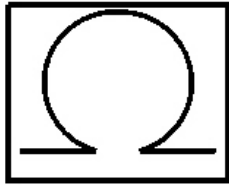
Go To 5.

No.

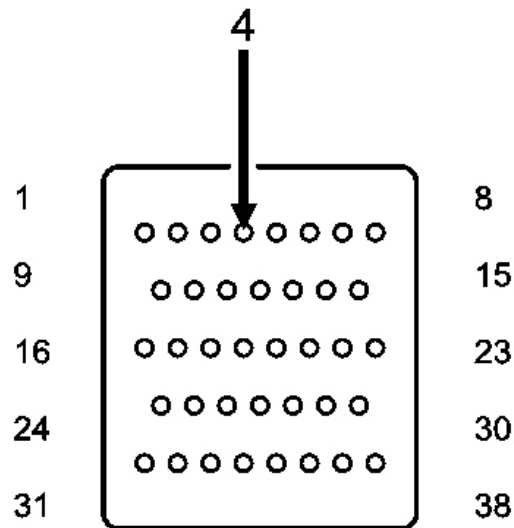
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K58) INJECTOR 6 CONTROL CIRCUIT OPEN



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f75

Fig. 19: Checking Injector Control No. 6 Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8816 to perform diagnosis.

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K58) Injector 6 Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 6.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K58) Injector 6 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 6

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 6 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

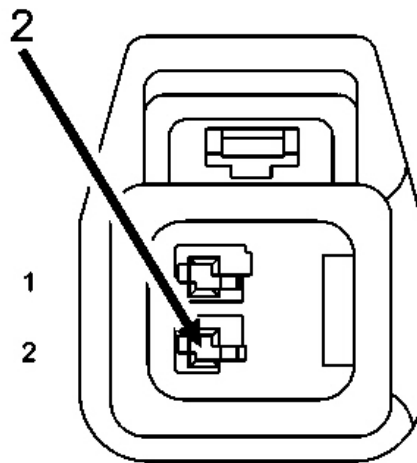
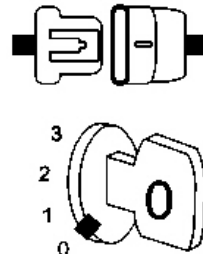
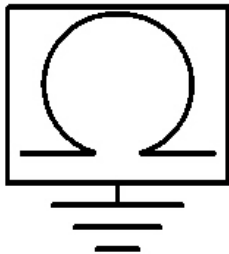
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 6 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K58) INJECTOR 6 CONTROL CIRCUIT SHORTED TO GROUND**



**INJECTOR-
FUEL**

81654d74

Fig. 20: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K58) Injector 6 Control circuit in the Injector harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K58) Injector 6 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 6 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

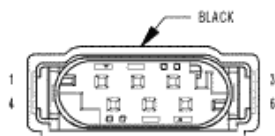
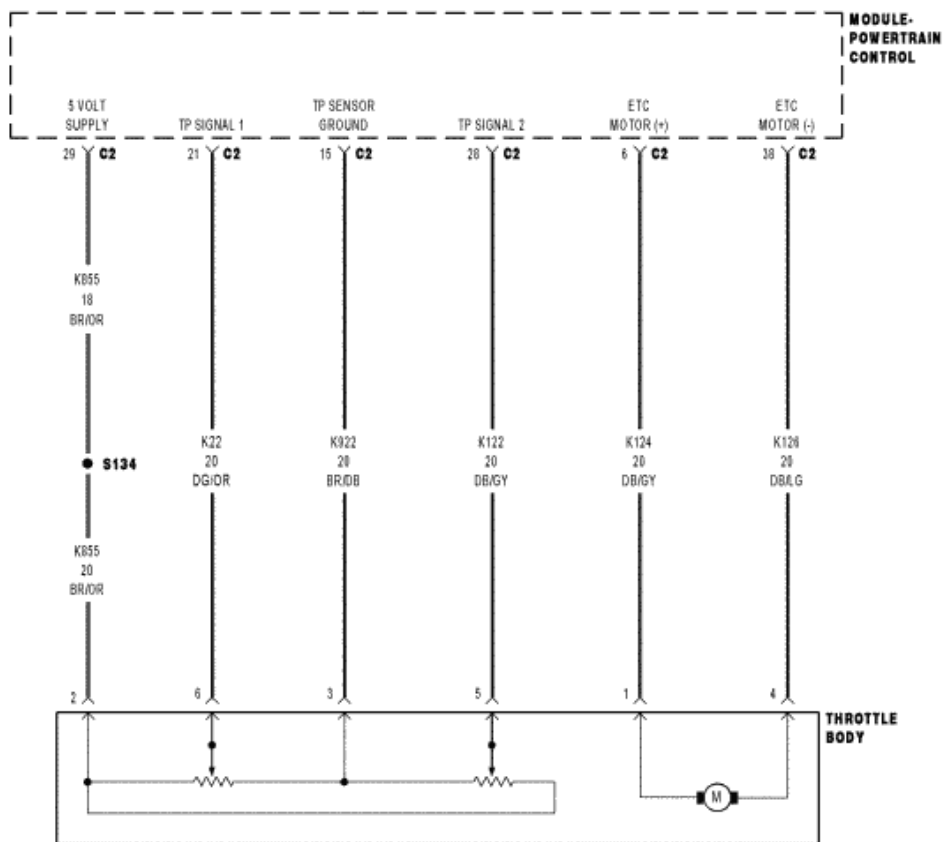
No

Replace and program the Powertrain Control Module per Service Information.

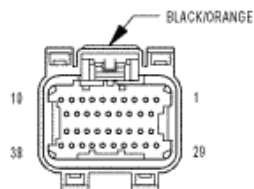
Perform **POWERTRAIN VERIFICATION TEST** .

P0221-THROTTLE POSITION SENSOR 2 PERFORMANCE

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 21: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and No MAP Sensor DTCs set.

SET CONDITIONS

• Set Condition:

TP Sensor signals do not correlate to the MAP Sensor signal. Two Trip Fault. ETC light will illuminate. P2135 should set with this code also.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT
EXCESSIVE RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT
(K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K122) TP SIGNAL 2 CIRCUIT
THROTTLE POSITION SENSOR/THROTTLE BODY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.
- NOTE:

Diagnose any other TP Sensor DTC(s) before continuing.
- NOTE:

The throttle plate and linkage should be free from binding and carbon build up.
- NOTE:

Make sure the throttle plate is at the idle position.
- NOTE:

Inspect the engine for vacuum leaks.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 9.

2. EXCESSIVE RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K122) TP Signal 2 circuit at the Throttle Body harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 3.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

3. EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K22) TP Signal 1 circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 4.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K855) 5-volt Supply circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 5.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. EXCESSIVE RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K922) TP Sensor Ground circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

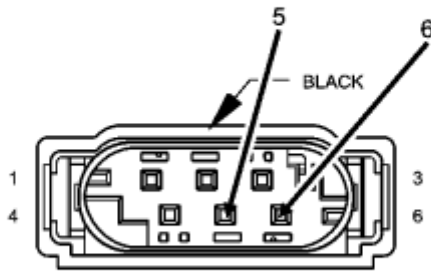
Go To 6.

No

Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K122) TP SIGNAL 2 CIRCUIT



THROTTLE
BODY
(GAS)

819128ac

Fig. 22: Measuring Resistance Between TP Sensor No. 1 Signal Circuit & TP Sensor No. 2 Signal Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (K22) TP Signal 1 circuit and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K122) TP Signal 2 circuit and the (K22) TP Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. THROTTLE POSITION SENSOR

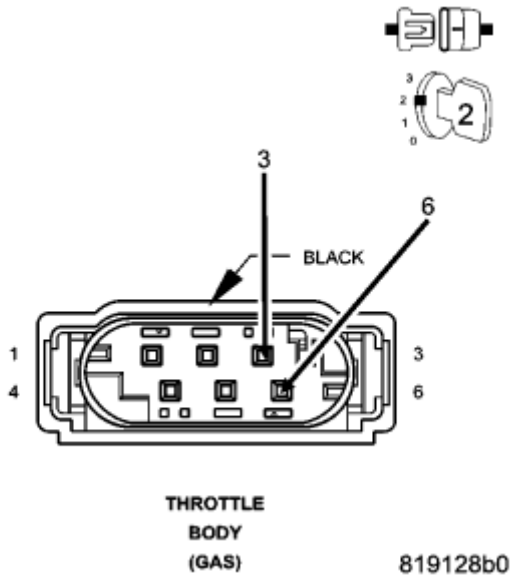


Fig. 23: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

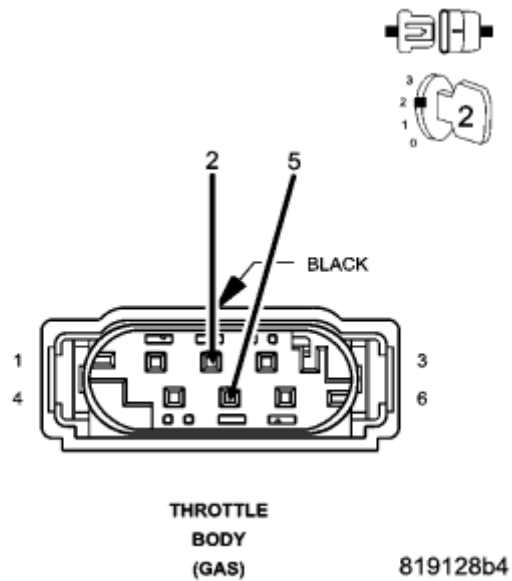


Fig. 24: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C2 PCM harness connector.

Ignition on, engine not running.

With the scan tool, monitor the TP Signal 1 and 2 voltage.

Connect a jumper wire between the (K922) TP Sensor Ground circuit and the (K22) TP Signal 1 circuit.

NOTE: **TP Sensor 1 voltage should change from approximately 4.7 volts to 0.3 of a volt.**

For TP Sensor 2, connect a jumper wire between (K855) 5-volt supply circuit and the (K122) TP Signal 2 circuit.

NOTE: **TP Sensor 2 voltage should change from approximately 0 volts to 5.0 volts.**

Is the voltage reading within the listed specification with the jumper wire installed?

Yes

Disconnect the Battery when replacing the Throttle Body Assembly. Replace the Throttle Body Assembly. After installation is complete, using a scan tool, select the ETC RELEARN function. Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

NOTE: **Remove the jumper wire before continuing.**

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

9. THROTTLE FOLLOWER TEST

Ignition on, engine not running.

With the scan tool, perform the ETC Throttle Follower Test and monitor the TP Sensor 1 or 2 voltage.

Slowly press the throttle pedal down.

The voltage for TP Sensor 1 should start at approximately 0.7 of a volt and increase to approximately 4.3 volts.

The voltage for TP Sensor 2 should start at approximately 4.3 volts and decrease to approximately 0.7 of a volt.

Is the voltage within the range of the listed specification for the appropriate Sensor?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

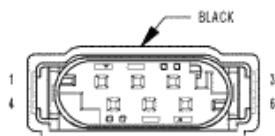
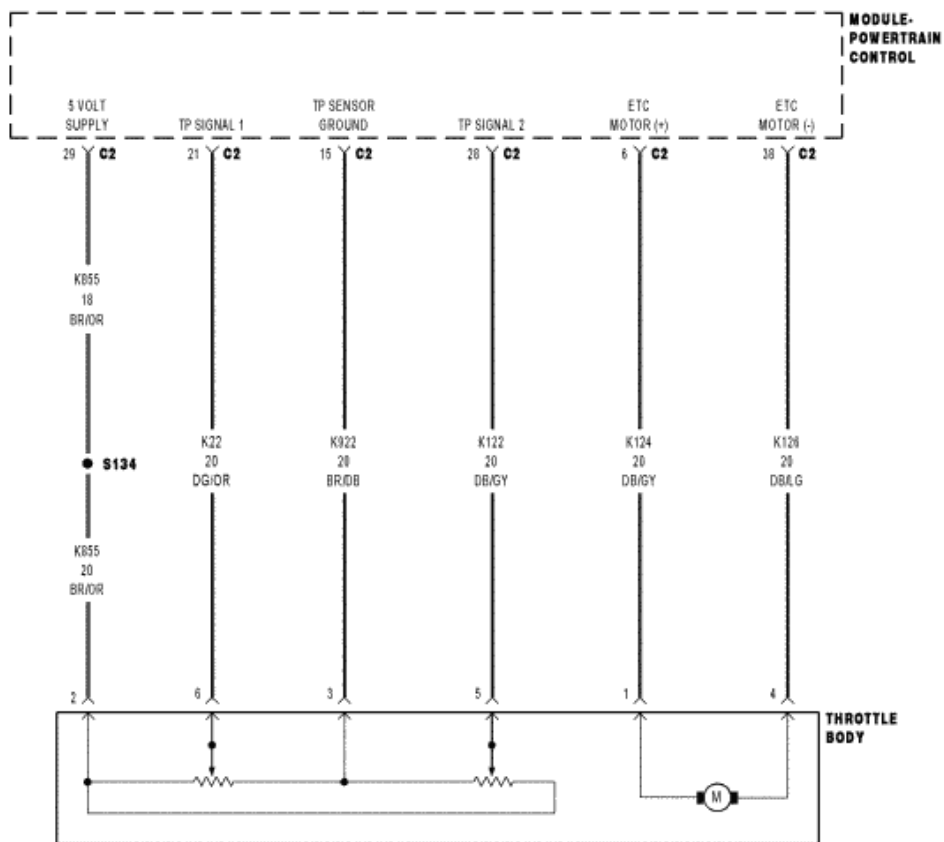
No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

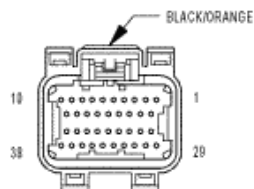
Perform **POWERTRAIN VERIFICATION TEST** .

P0222-THROTTLE POSITION SENSOR 2 CIRCUIT LOW

CIRCUIT SCHEMATIC



THROTTLE BODY (3.7L)



MODULE-POWERTRAIN CONTROL C2 (GAS)

07101644

Fig. 25: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

For a complete Engine wiring diagram refer to appropriate Wiring Diagram article.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

The PCM recognizes that the TP Sensor 2 voltage is lower than the acceptable value. One Trip Fault. Three good trips to turn off the MIL. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
(K855) 5-VOLT SUPPLY CIRCUIT OPEN
(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND
(K122) TP SIGNAL 2 CIRCUIT SHORTED TO THE (K922) TP SENSOR GROUND CIRCUIT
(K122) TP SIGNAL 2 CIRCUIT OPEN
THROTTLE POSITION SENSOR/THROTTLE BODY
THROTTLE PLATE JAMMED AGAINST THE MAXIMUM STOP
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose and repair any Throttle Body circuit, system voltage, or sensor supply voltage DTCs before continuing with this test.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 11.

2. **P0122 ALSO SET**

Was the P0122-TP SENSOR NO.1 VOLTAGE LOW DTC set along with the P0222?

Yes

Go To 3.

No

Go To 4.

3. **(K855) 5-VOLT SUPPLY CIRCUIT**

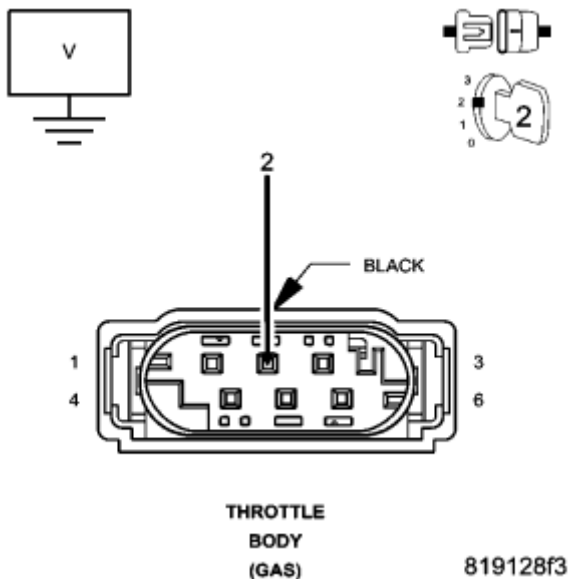


Fig. 26: Checking 5-Volt Sensor Circuit For Open Or Short
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

Is the voltage between 4.5 to 5.2 volts?

Yes

Go To 4.

No

Go To 8.

4. THROTTLE POSITION SENSOR

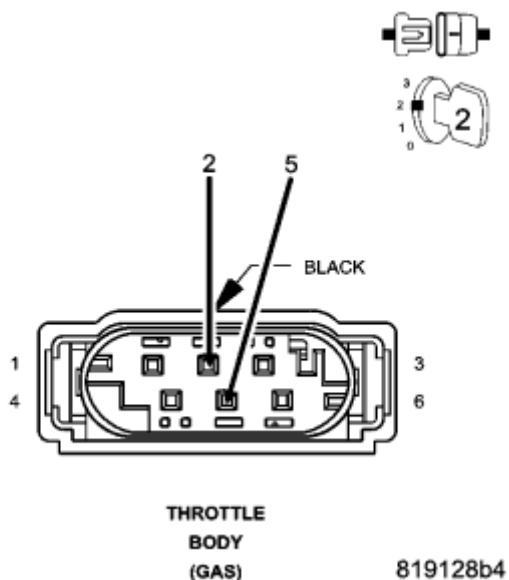


Fig. 27: View Of Throttle Body Connector
Courtesy of CHRYSLER LLC

With the scan tool, monitor the TP Sensor No.2 voltage.

Connect a jumper wire between the (K855) 5-volt Supply circuit and the (K122) TP Signal 2 circuit in the Throttle Body harness connector.

NOTE: The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the jumper wire installed.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K122) TP SIGNAL 2 CIRCUIT OPEN

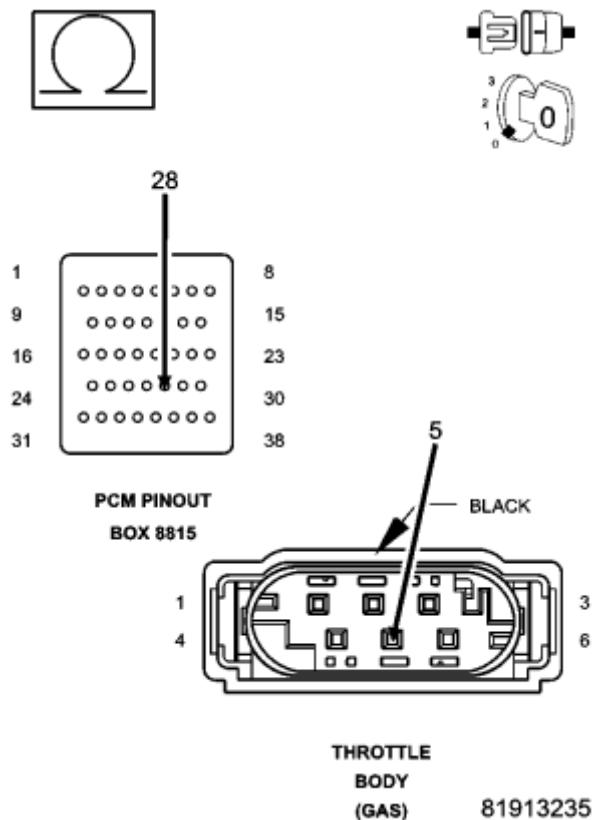


Fig. 28: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND

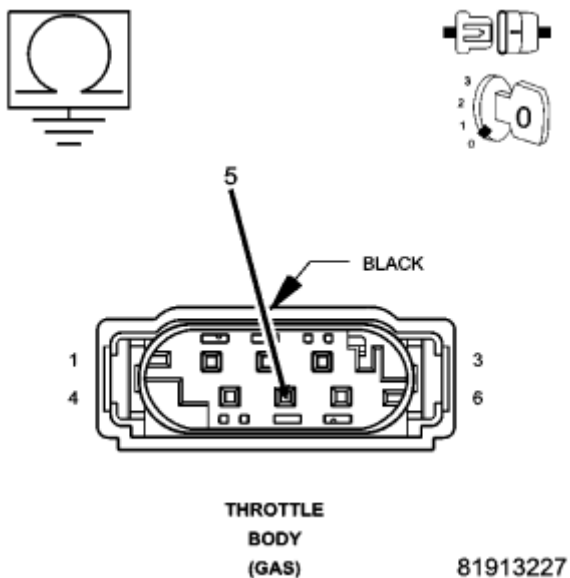


Fig. 29: Checking TP Sensor No. 2 Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K122) TP Signal 2.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO THE (K922) TP SENSOR GROUND CIRCUIT

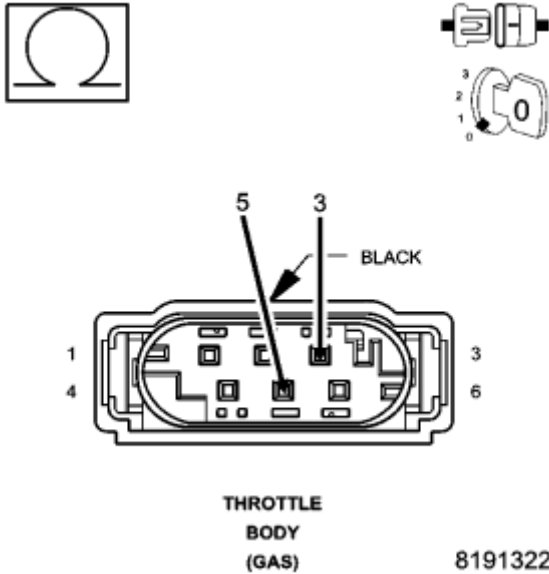


Fig. 30: Checking TP Sensor No. 2 Signal Circuit For Short To TP Sensor Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K122) TP Signal 2 circuit and the (K922) TP Sensor Ground circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K922) TP Sensor Ground circuit and the (K122) TP Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

8. (K855) 5-VOLT SUPPLY CIRCUIT OPEN

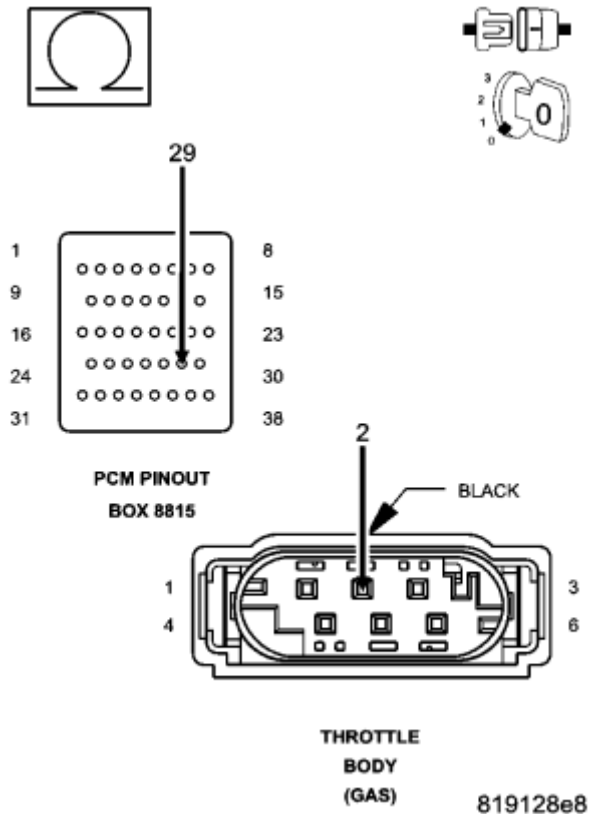


Fig. 31: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**

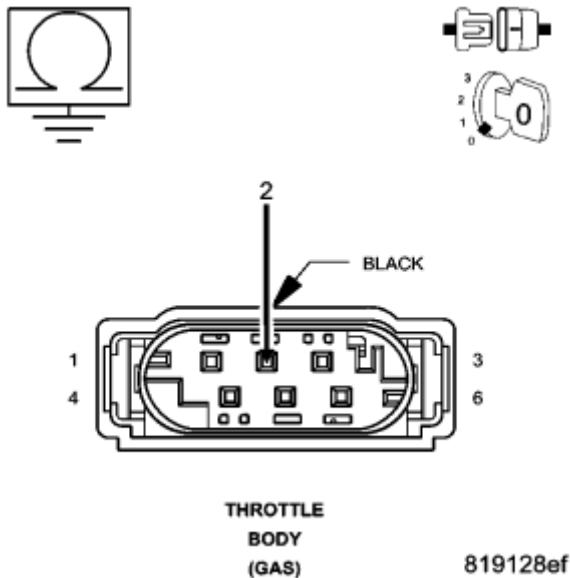


Fig. 32: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. THROTTLE FOLLOWER TEST

Ignition on, engine not running.

With the scan tool, perform the ETC Throttle Follower Test.

Monitor the TP Sensor No.2 voltage while slowly pressing the Throttle pedal down.

Is there a smooth voltage change from approximately 4.3 volts and decrease to approximately 0.7 of a volt?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

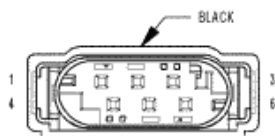
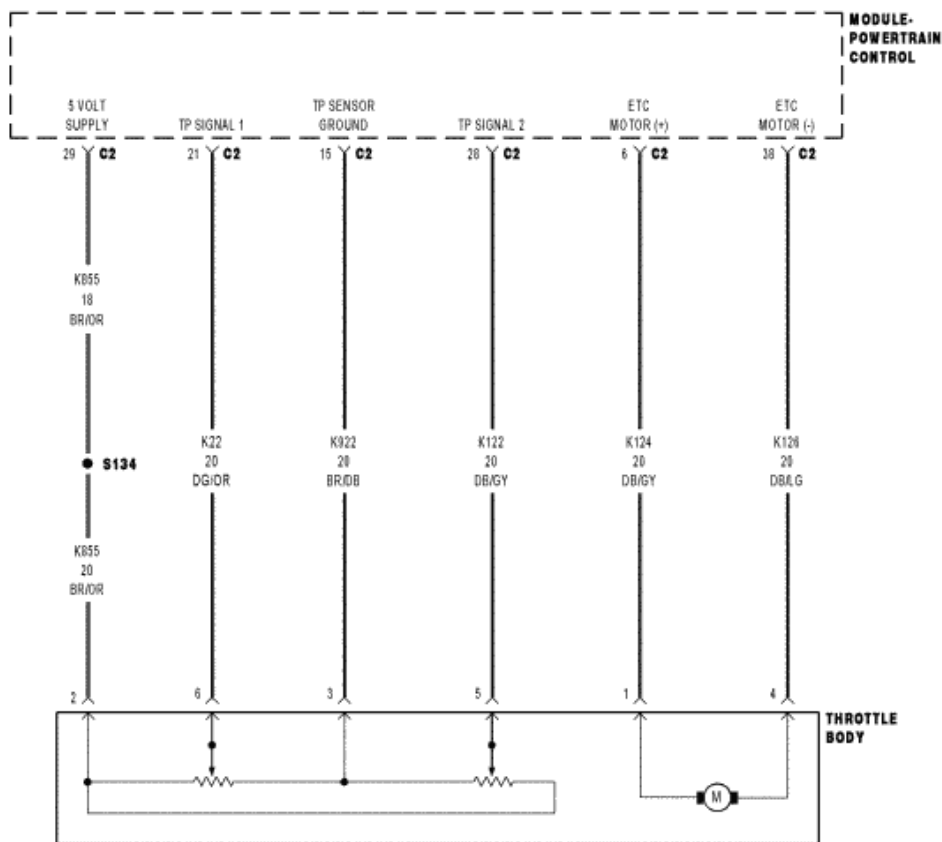
No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

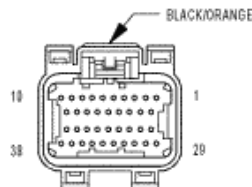
Perform **POWERTRAIN VERIFICATION TEST** .

P0223-THROTTLE POSITION SENSOR 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 33: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

• Set Condition:

Throttle Position Sensor No.2 Signal circuit voltage is greater than the maximum acceptable value. One Trip Fault. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
(K122) TP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(K122) TP SIGNAL 2 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
(K922) TP SENSOR GROUND CIRCUIT OPEN
THROTTLE POSITION SENSOR/THROTTLE BODY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose and repair any Throttle Body circuit, system voltage, or sensor supply voltage DTCs before continuing with this test.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 7.

2. THROTTLE POSITION SENSOR

Turn the ignition off.

Disconnect the Throttle Body Assembly harness connector.

Ignition on, engine not running.

With the scan tool monitor the TP Sensor No.2 voltage.

Is the voltage below 0.5 volt?

Yes

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

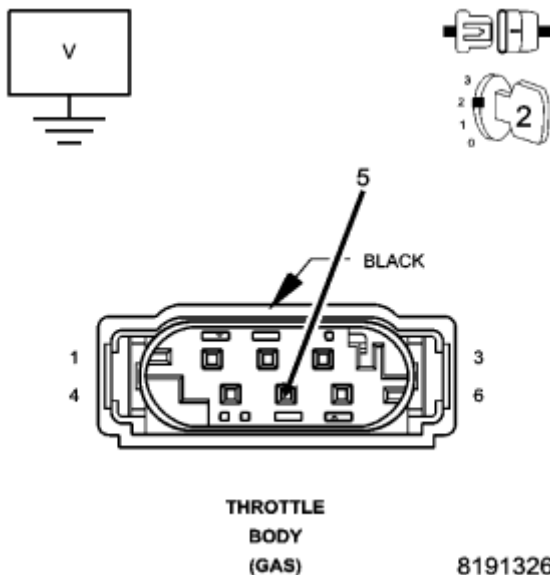


Fig. 34: Checking TP Signal 2 Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT

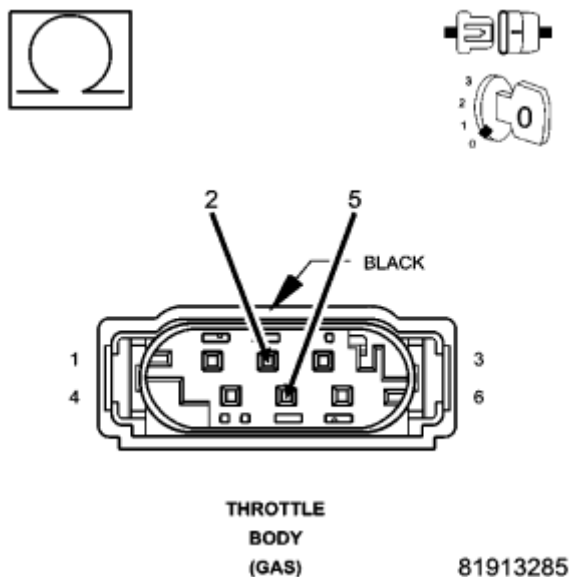


Fig. 35: Measuring Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K922) TP SENSOR GROUND CIRCUIT OPEN

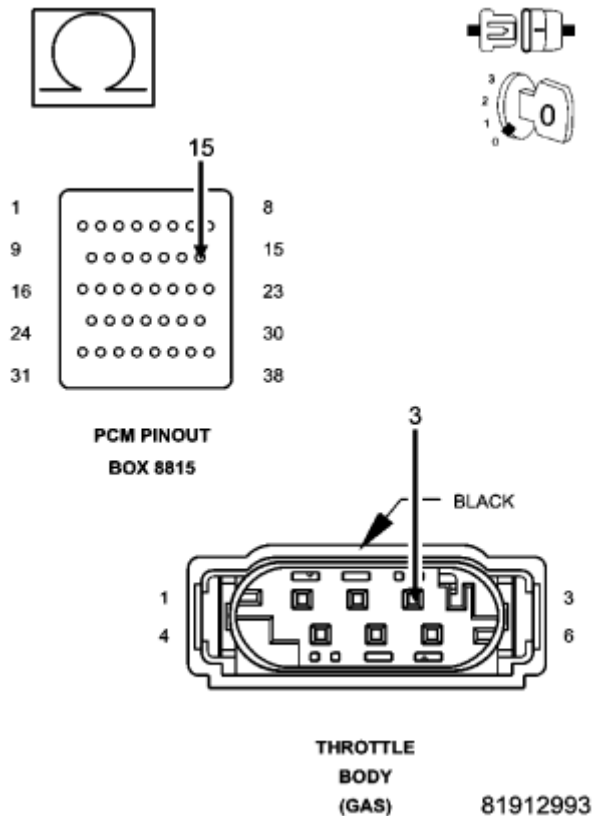


Fig. 36: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

7. THROTTLE FOLLOWER TEST

With the scan tool, perform the ETC Throttle Follower Test.

Monitor the TP Sensor No.2 voltage while slowly pressing the Throttle pedal down.

Is there a smooth voltage change from approximately 4.3 volts and decrease to approximately 0.7 of a volt?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

P0300-MULTIPLE CYLINDER MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
INJECTOR CONTROL CIRCUIT
COIL CONTROL CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Check for any TSBs that apply to a Misfire condition. Review the vehicle repair history for any misfire condition repairs that have been performed.

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause a misfire DTC.

NOTE: When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.

- Visually inspect the engine for any of the following conditions.

- Worn serpentine belt
- Binding Engine-Driven accessories: A/C Compressor, P/S Pump, Water pump.
- Misalignment of the Water pump, P/S Pump and A/C Compressor pulleys
- Corroded PCM power and ground circuits.
- Improper CKP, CMP, MAP, and TP Sensor mounting
- Poor connector/terminal to component connection. i.e, CKP sensor, Fuel Injector, Ignition coil, etc.
- Vacuum leaks
- Restricted Air Induction system or Exhaust system.
- Internal engine component failures.

Were any of the above conditions present?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT

Turn the ignition off.

Disconnect the Ignition Coil harness connector of the misfiring cylinders.

Disconnect the Fuel Injector harness connector of the misfiring cylinders.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

4. **IGNITION SYSTEM OPERATION**

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Connect the Ignition Coil harness connector.

Remove the Spark Plug wire/boot from the spark plug of the cylinder being tested.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Spark plug wire/boot.

While cranking the engine observe the spark coming from the spark tester.

NOTE: A crisp blue spark that is able to jump the gap of the spark tester should be generated.

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: Connect the Fuel Injector harness connector before continuing.

5. **SPARK PLUG**

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.

Does the Spark Plug have any problems?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using the scan tool, actuate the Fuel Injector for the cylinder that indicated the misfire.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. FUEL INJECTOR

Turn the ignition off.

Disconnect the Fuel Injector harness connector of one of the cylinders detecting a mis-fire.

Ignition on, engine not running.

NOTE: When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Fuel Injector.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. INJECTOR CONTROL CIRCUIT

Turn the ignition off.

Disconnect the Fuel Injector harness connector.

Disconnect the PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the Injector Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the Injector Control circuit?

Yes

Repair the excessive resistance or short in the Injector Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 13.

13. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the Ignition Coil Control circuit.

Crank the engine for 5 seconds while observing the test light.

Does the test light brightly blink/flicker?

Yes

Verify that there is good pin to terminal contact in the related Coil and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **COIL CONTROL CIRCUIT**

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the Coil Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the Coil Control circuit?

Yes

Repair the Coil Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0301-CYLINDER 1 MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- **Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
(K11) INJECTOR 1 CONTROL CIRCUIT
(K86) COIL CONTROL 1 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: **Attempt to operate the vehicle under conditions similar to which the DTC was set.**

NOTE: **It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.**

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: **Anything that affects the speed of the crankshaft can cause this DTC to set.**

NOTE: **When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.**

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.
- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: **Misfire may occur and may not be caused by component failure. Any of**

the following conditions can cause a misfire:

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

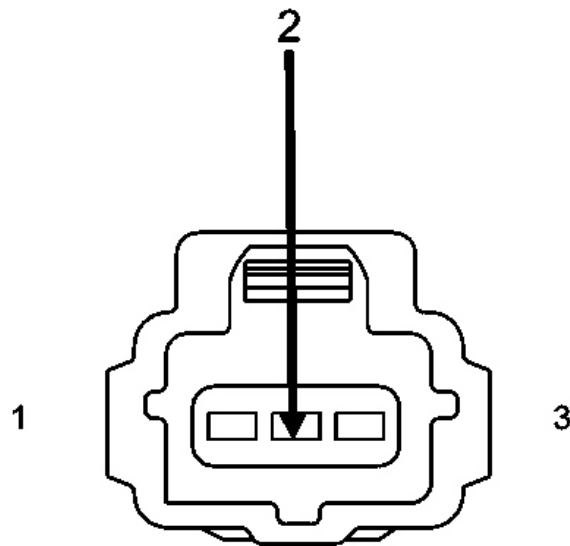
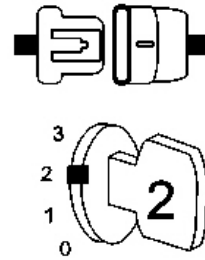
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

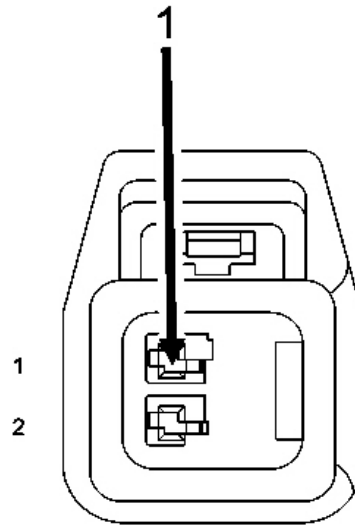
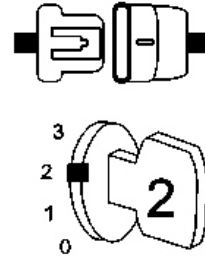
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION-NO. 1**

8132f60e

Fig. 37: Checking ASD Relay Output
Courtesy of CHRYSLER LLC



INJECTOR-
FUEL

81654d0c

Fig. 38: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the Fuel Injector No.1 harness connector.

Ignition on, engine not running.

With the scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Connect the Ignition Coil harness connector.

Remove the Ignition wire/coil from the Cylinder 1 Spark Plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: A crisp blue spark that is able to jump the gap of the spark tester should be generated.

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: Connect the Fuel Injector harness connector before continuing.

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi).

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using the scan tool, actuate the No.1 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. FUEL INJECTOR

Turn the ignition off.

Disconnect the No.1 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

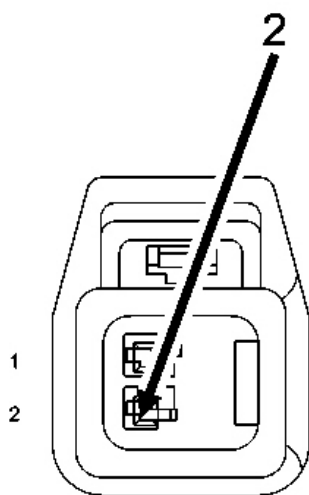
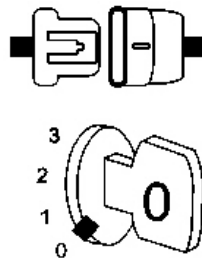
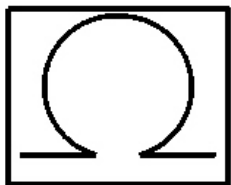
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Fuel Injector.

Perform **POWERTRAIN VERIFICATION TEST** .

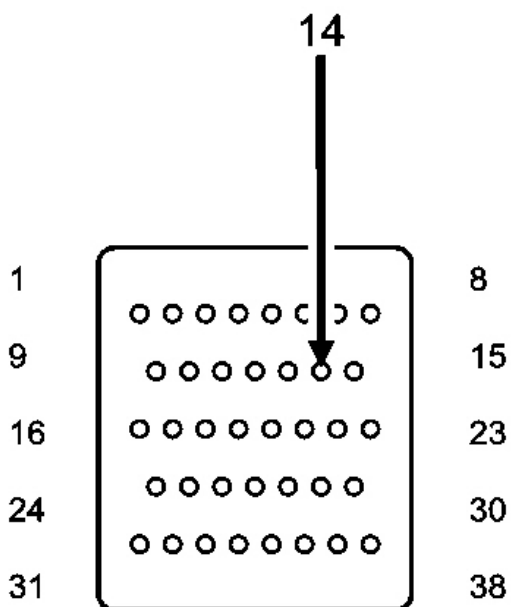
No

Go To 11.

11. **(K11) INJECTOR 1 CONTROL CIRCUIT**



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654d9e

Fig. 39: Checking Injector Control No. 1 Circuit Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K11) Injector 1 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K11) Injector Control No.1 circuit?

Yes

Repair the excessive resistance or short in the (K11) Injector 1 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

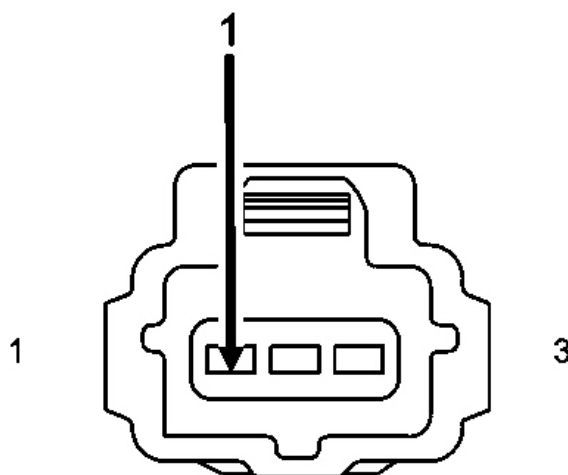
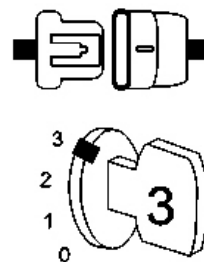
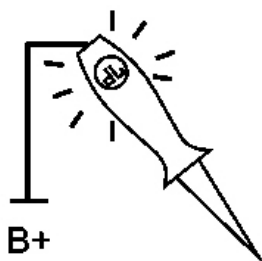
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 1**

8132f612

Fig. 40: Checking Ignition Coil
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K86) Coil Control 1 circuit.

Crank the engine for 5 seconds while observing the test light.

Does the test light brightly blink/flicker while the engine was cranking?

Yes

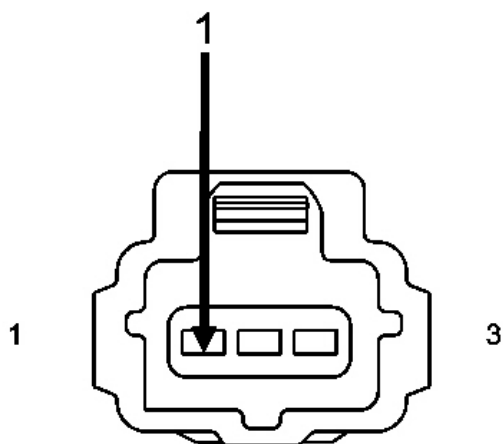
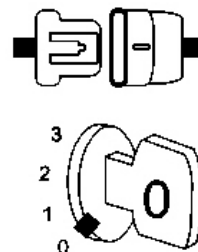
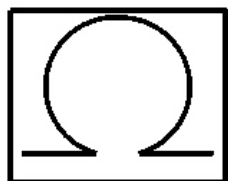
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

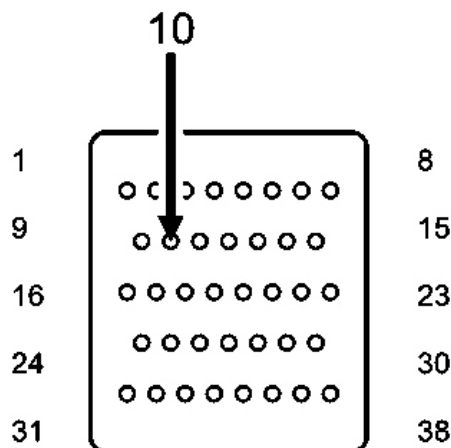
No

Go To 15.

15. **(K86) COIL CONTROL 1 CIRCUIT**



**COIL-
IGNITION-NO. 1**



**PCM PINOUT
BOX 8815**

8132f616

Fig. 41: Checking Coil Control No. 1 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K86) Coil Control 1 circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K86) Coil Control 1 circuit?

Yes

Repair the (K86) Coil Control 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0302-CYLINDER 2 MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- **Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
(K12) INJECTOR 2 CONTROL CIRCUIT
(K85) COIL CONTROL 2 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause this DTC to set.

NOTE: When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.
- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: Misfire may occur and may not be caused by component failure. Any of the following conditions can cause a misfire:

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

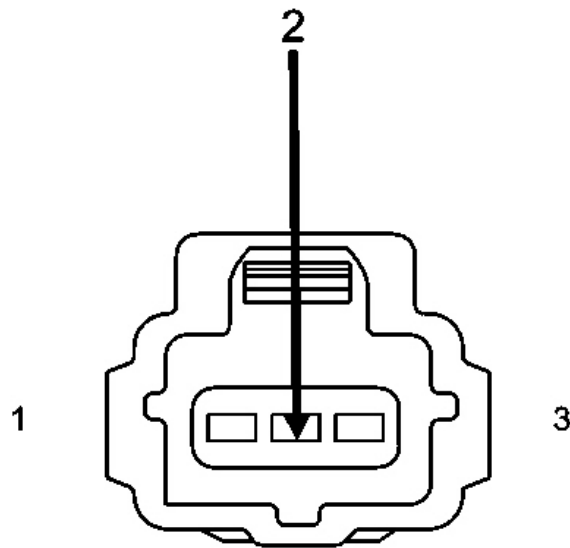
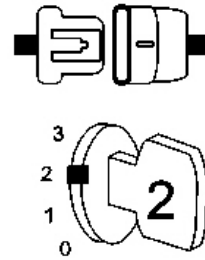
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

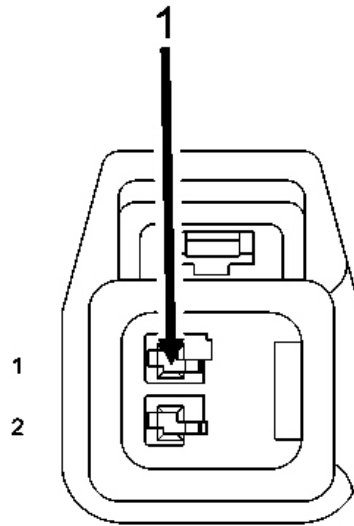
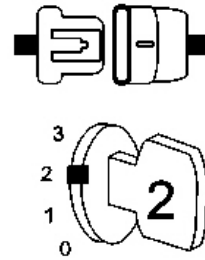
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION-NO. 2**

8132f686

Fig. 42: Checking ASD Relay Output
Courtesy of CHRYSLER LLC



INJECTOR-
FUEL

81654d0c

Fig. 43: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the Fuel Injector No.2 harness connector.

Ignition on, engine not running.

With the scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Connect the Ignition harness connector.

Remove the Ignition wire/coil from the Cylinder 2 Spark Plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: A crisp blue spark that is able to jump the gap of the spark tester should be generated.

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: Connect the Fuel Injector harness connector before continuing.

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using scan tool, actuate the No.2 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. FUEL INJECTOR

Turn the ignition off.

Disconnect the No.2 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

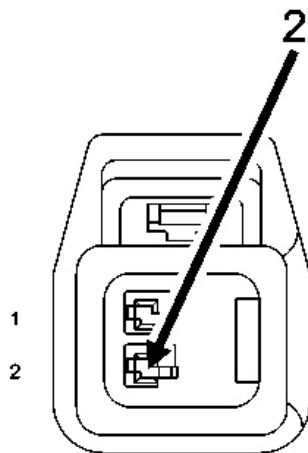
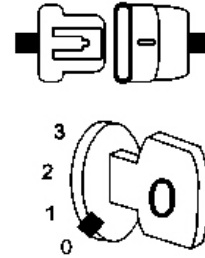
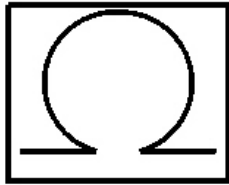
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Fuel Injector.

Perform **POWERTRAIN VERIFICATION TEST** .

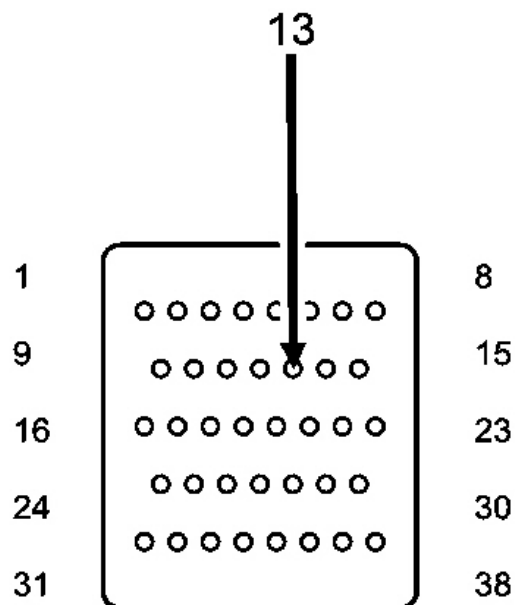
No

Go To 11.

11. **(K12) INJECTOR 2 CONTROL CIRCUIT**



INJECTOR-
FUEL



PCM PINOUT
BOX 8815

81654e1d

Fig. 44: Checking Injector Control No. 2 Circuit Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K12) Injector 2 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K12) Injector 2 Control circuit?

Yes

Repair the excessive resistance or short in the (K12) Injector 2 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

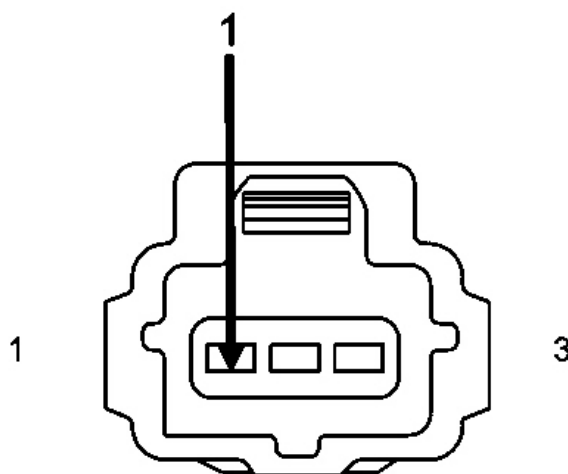
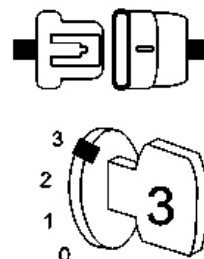
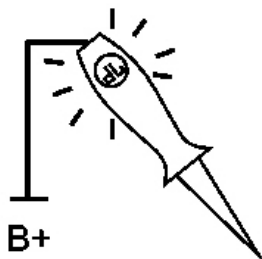
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 2**

8132f68a

Fig. 45: Checking Ignition Coil
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K85) Coil Control 2 circuit.

Crank the engine for 5 seconds.

Does the test light brightly blink/flicker while the engine is cranking?

Yes

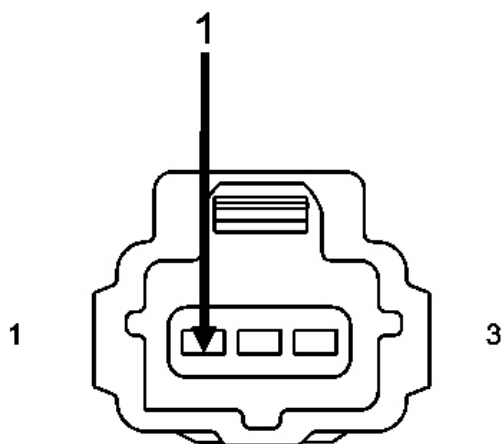
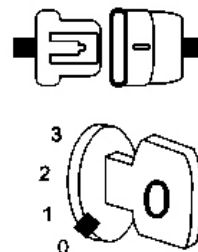
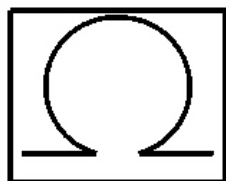
Verify that there is good pin to terminal contact in the related Coils and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

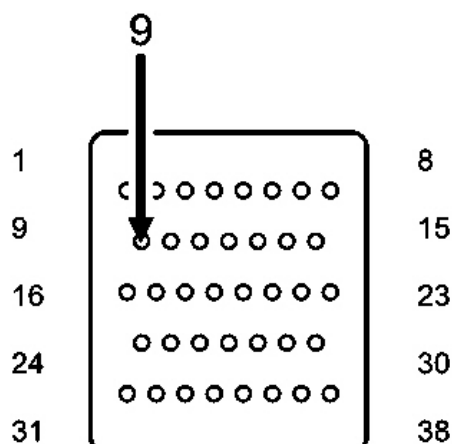
No

Go To 15.

15. **(K85) COIL CONTROL 2 CIRCUIT**



**COIL-
IGNITION-NO. 2**



**PCM PINOUT
BOX 8815**

8132f68e

Fig. 46: Checking Coil Control No. 2 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K85) Coil Control 2 circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K85) Coil Control 2 circuit?

Yes

Repair the (K85) Coil Control 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0303-CYLINDER 3 MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- **Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
(K13) INJECTOR 3 CONTROL CIRCUIT
(K93) COIL CONTROL 3 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause this DTC to set.

NOTE: When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.
- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: Misfire may occur and may not be caused by component failure. Any of the following conditions can cause a misfire:

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

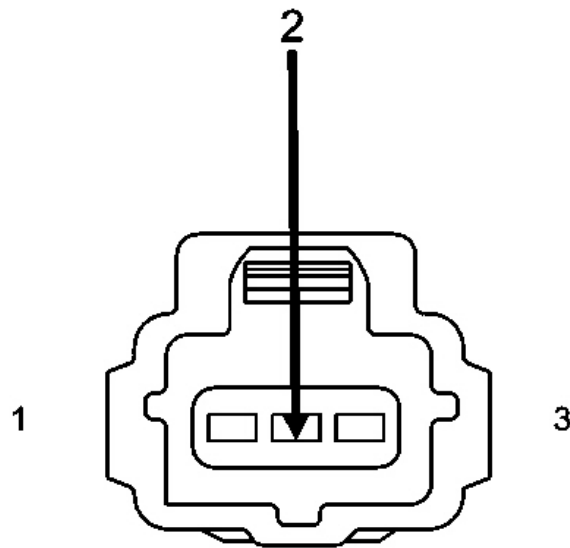
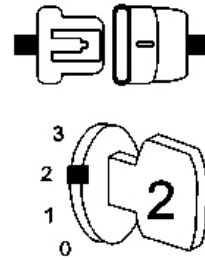
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

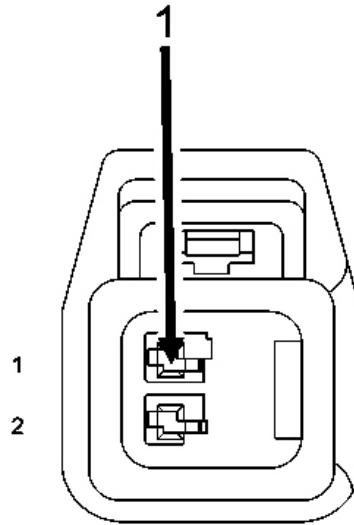
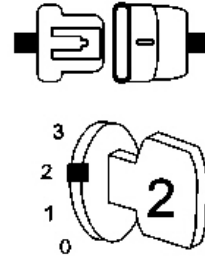
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION-NO. 3**

8132f866

Fig. 47: Checking ASD Relay Output
Courtesy of CHRYSLER LLC



INJECTOR-
FUEL

81654d0c

Fig. 48: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the No.3 Fuel Injector harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Connect the Ignition coil harness connector.

Remove the Ignition wire/coil from the Cylinder 3 Spark Plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: A crisp blue spark that is able to jump the gap of the spark tester should be generated.

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: Connect the Fuel Injector harness connector before continuing.

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi).

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using a scan tool, actuate the No.3 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. FUEL INJECTOR

Turn the ignition off.

Disconnect the No.3 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

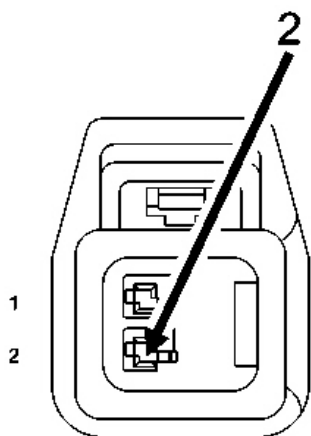
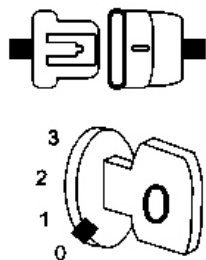
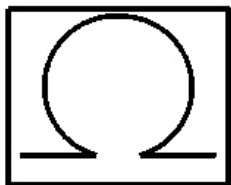
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Fuel Injector.

Perform **POWERTRAIN VERIFICATION TEST** .

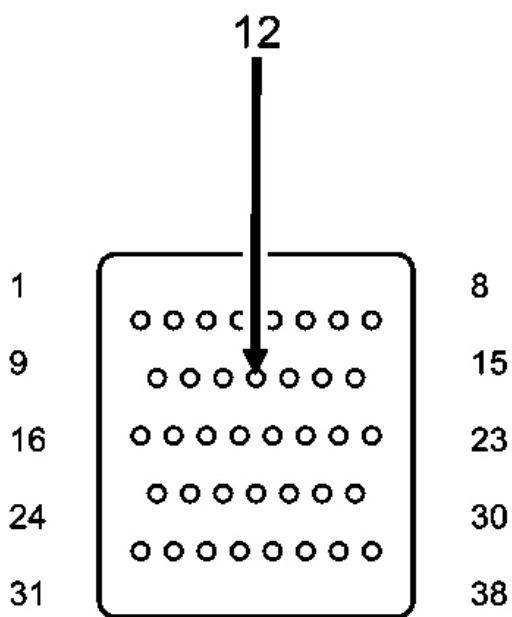
No

Go To 11.

11. **(K13) INJECTOR 3 CONTROL CIRCUIT**



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f3d

Fig. 49: Checking Injector Control No. 3 Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K13) Injector 3 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K13) Injector 3 Control circuit?

Yes

Repair the excessive resistance or short in the (K13) Injector 3 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

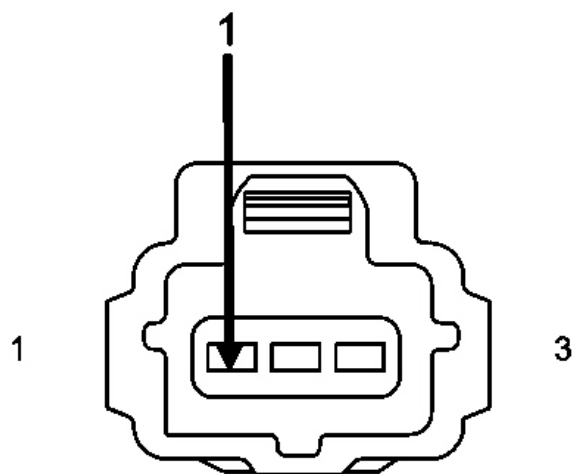
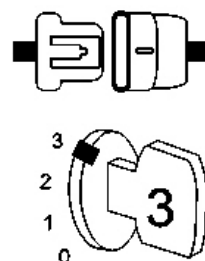
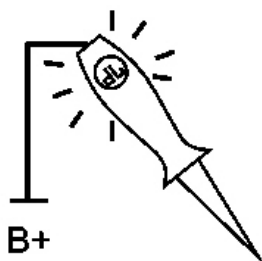
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 3**

8132f86e

Fig. 50: Checking Ignition Coil
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the No.3 Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K93) Coil Control 3 circuit.

NOTE: **Make sure the test light is probing the circuit before actuating the Coil or a DTC may set and not allow the actuation.**

Crank the engine for 5 seconds while observing the test light.

Does the test light brightly blink/flicker while the engine is cranking?

Yes

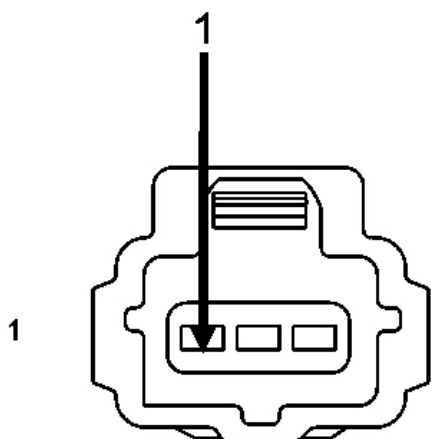
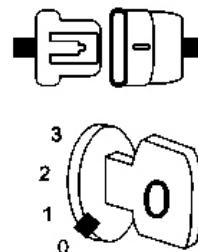
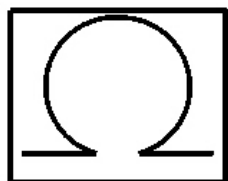
Verify that there is good pin to terminal contact in the related Coil and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

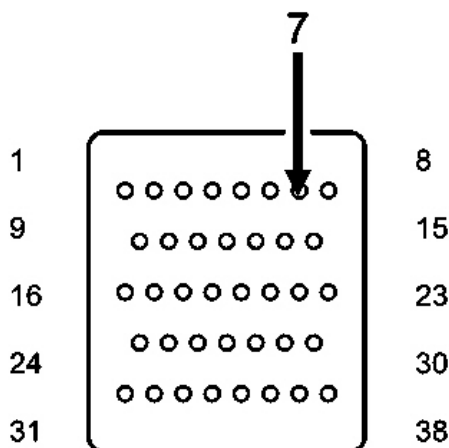
No

Go To 15.

15. **(K93) COIL CONTROL 3 CIRCUIT**



**COIL-
IGNITION-NO. 3**



**PCM PINOUT
BOX 8815**

8132f874

Fig. 51: Checking Coil Control No. 3 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K93) Coil Control 3 circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K93) Coil Control 3 circuit?

Yes

Repair the (K93) Coil Control 3 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0304-CYLINDER 4 MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- **Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344), (F344) ASD RELAY OUTPUT CIRCUIT
(K14) INJECTOR 4 CONTROL CIRCUIT
(K15) COIL CONTROL 4 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause this DTC to set.

NOTE: When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.
- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: Misfire may occur and may not be caused by component failure. Any of the following conditions can cause a misfire:

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

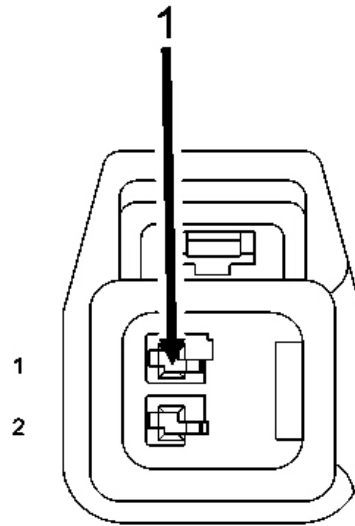
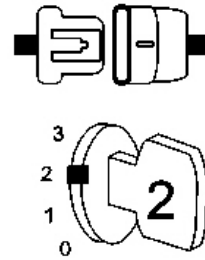
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

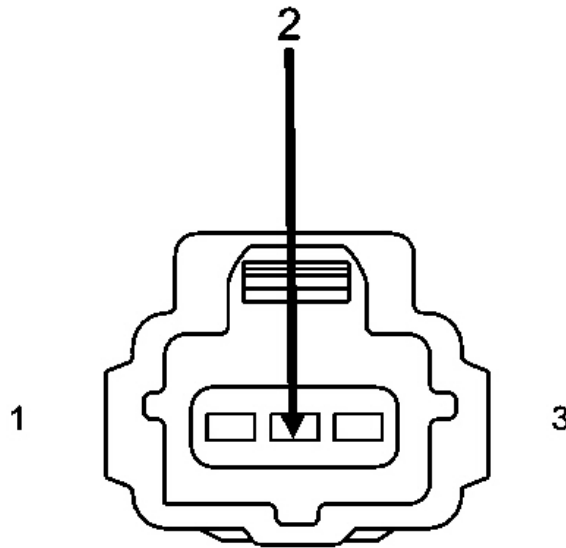
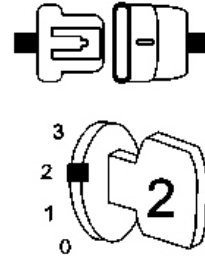
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 52: Checking ASD Relay Output Circuit
 Courtesy of CHRYSLER LLC



**COIL-
IGNITION-NO. 4**

8132f8d5

Fig. 53: Checking ASD Relay Output
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the No.4 Fuel Injector harness connector.

Ignition on, engine not running.

With the scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

Turn the ignition off.

Connect the Ignition Coil harness connector.

Disconnect the Ignition wire/coil from the Cylinder 4 Spark Plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: **A crisp blue spark that is able to jump the gap of the spark tester should be generated.**

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: **Connect the Fuel Injector harness connector before continuing.**

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: **Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.**

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: **Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).**

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using the scan tool, actuate the No.4 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. **FUEL INJECTOR**

Turn the ignition off.

Disconnect the No.4 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

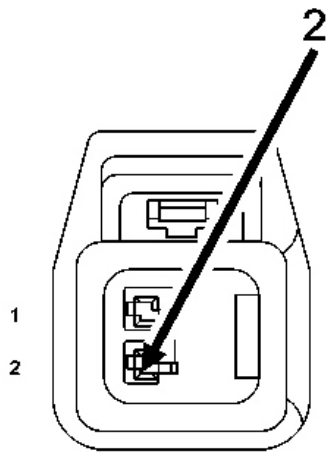
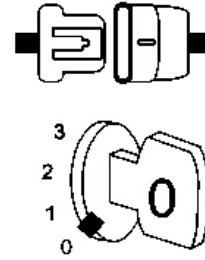
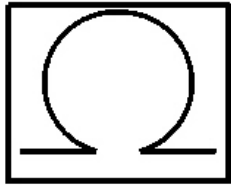
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control

Module connectors. If OK, replace the Fuel Injector.
Perform **POWERTRAIN VERIFICATION TEST** .

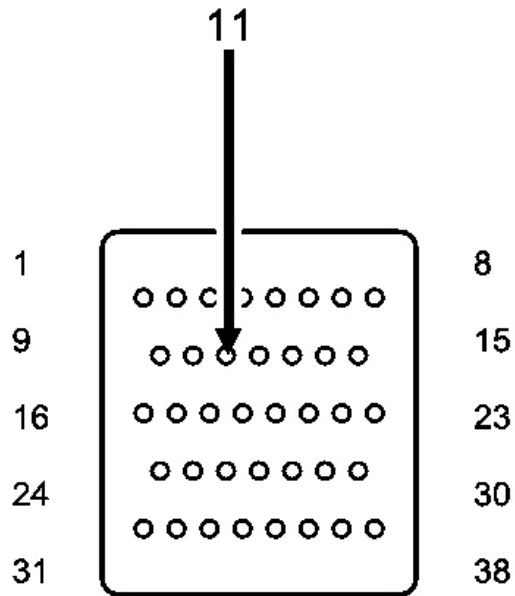
No

Go To 11.

11. **(K14) INJECTOR 4 CONTROL CIRCUIT**



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f52

Fig. 54: Checking Injector Control No. 4 Circuit for Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K14) Injector 4 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K14) Injector 4 Control circuit?

Yes

Repair the excessive resistance or short in the (K14) Injector 4 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

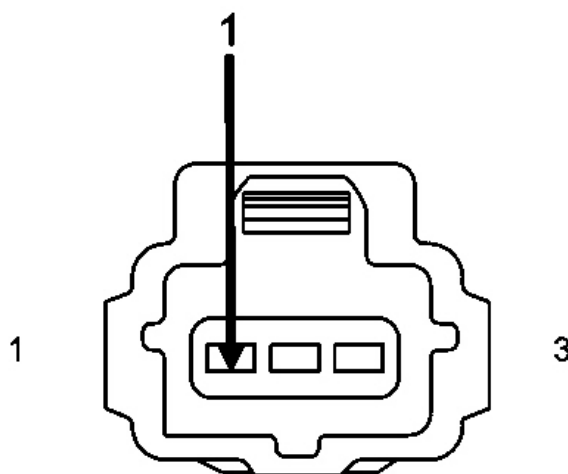
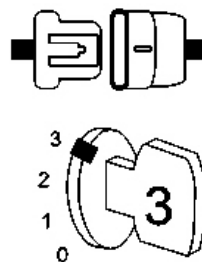
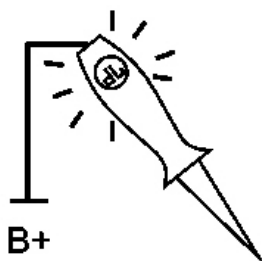
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 4**

8132f8da

Fig. 55: Checking Ignition Coil
Courtesy of CHRYSLER LLC

Disconnect the No.4 Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K15) Coil Control 4 circuit.

With a scan tool, actuate the No.4 Ignition Coil.

Does the test light brightly blink/flicker during the actuation?

Yes

Verify that there is good pin to terminal contact in the related Coil and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **(K15) COIL CONTROL 4 CIRCUIT**

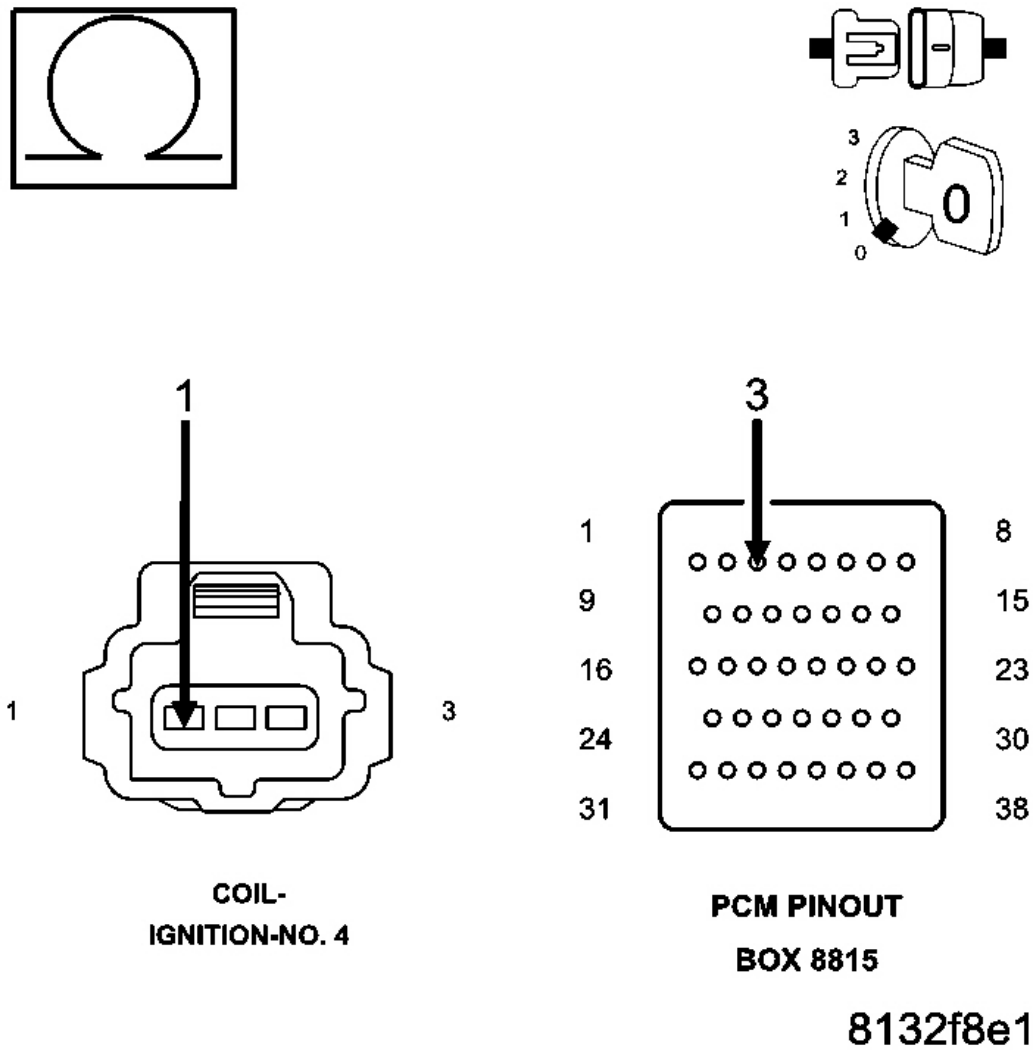


Fig. 56: Checking Coil Control No. 4 Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K15) Coil Control 4 circuit.

Crank the engine for 5 seconds while observing the test light.

Does the test light brightly blink/flicker while the engine was cranking?

Yes

Repair the (K15) Coil control 4 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
(K38) INJECTOR 5 CONTROL CIRCUIT
(K16) COIL CONTROL 5 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause this DTC to set.

NOTE: When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.

- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: **Misfire may occur and may not be caused by component failure. Any of the following conditions can cause a misfire:**

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

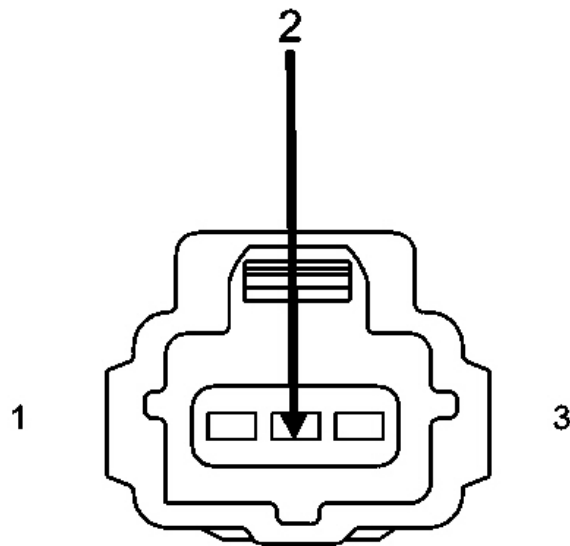
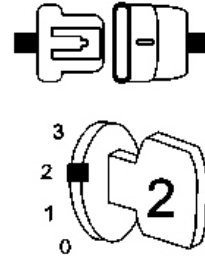
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

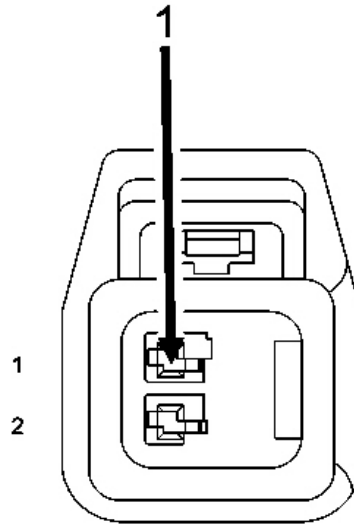
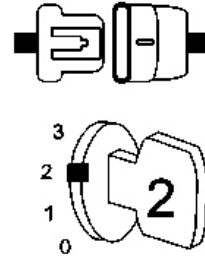
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION-NO. 5**

8132f955

Fig. 57: Checking ASD Relay Output
Courtesy of CHRYSLER LLC



INJECTOR-
FUEL

81654d0c

Fig. 58: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ignition Coil harness connector.

Disconnect the No.5 Fuel Injector harness connector.

Ignition on, engine not running.

With the scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

Turn the ignition off.

Connect the Ignition Coil harness connector.

Disconnect the Ignition wire/coil from the cylinder 5 spark plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: **A crisp blue spark that is able to jump the gap of the spark tester should be generated.**

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: **Connect the Fuel Injector harness connector before continuing.**

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: **Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.**

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

NOTE: **Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).**

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi).

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using the scan tool, actuate the No.5 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

10. **FUEL INJECTOR**

Turn the ignition off.

Disconnect the No.5 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

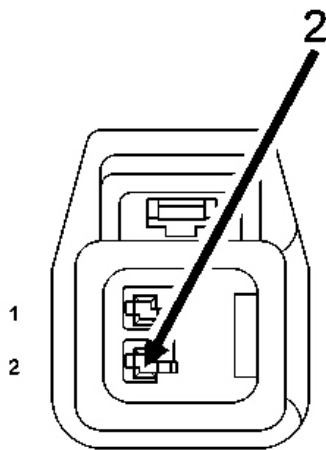
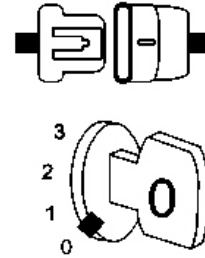
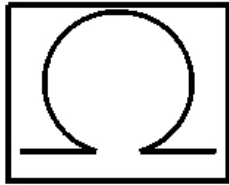
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control

Module connectors. If OK, replace the Fuel Injector.
Perform **POWERTRAIN VERIFICATION TEST** .

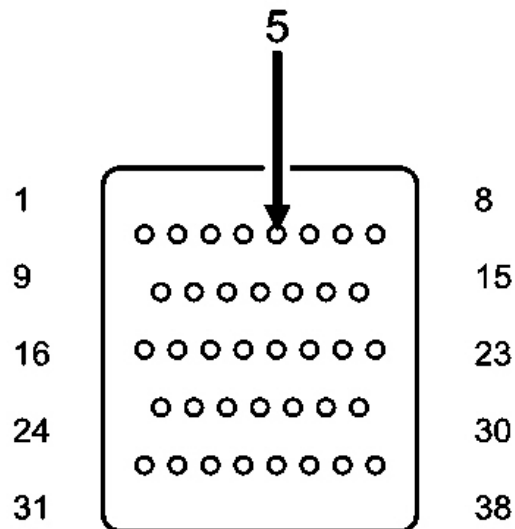
No

Go To 11.

11. **(K38) INJECTOR 5 CONTROL CIRCUIT**



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f6d

Fig. 59: Checking Injector Control No. 5 Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K38) Injector 5 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K38) Injector 5 Control circuit?

Yes

Repair the excessive resistance or short in the (K38) Injector 5 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

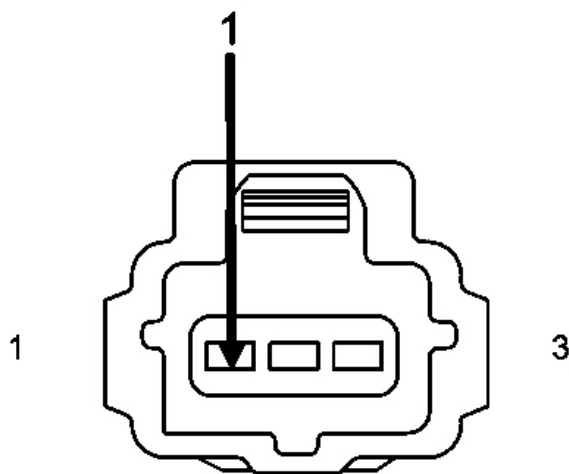
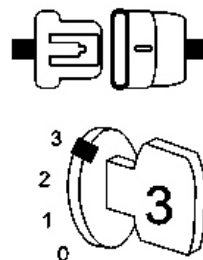
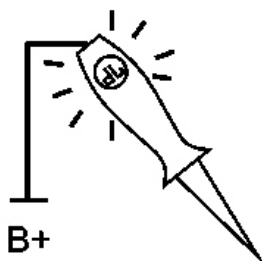
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 5**

8132f95c

Fig. 60: Checking Ignition Coil
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the No.5 Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K16) Coil Control 5 circuit.

Crank the engine for 5 seconds while observing the test light.

Does the test light brightly blink/flicker while the engine was cranking?

Yes

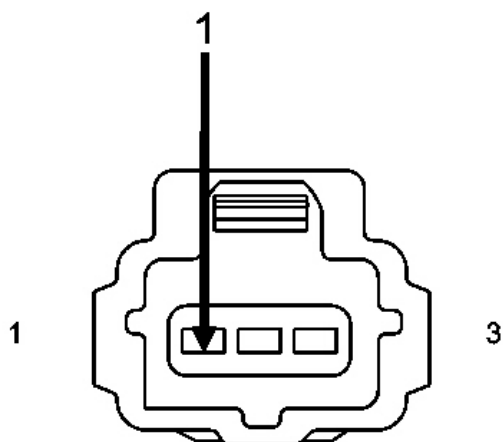
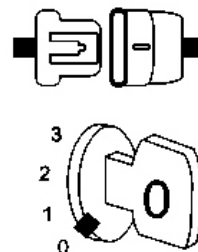
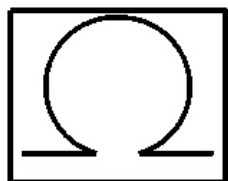
Verify that there is good pin to terminal contact in the related Coil and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

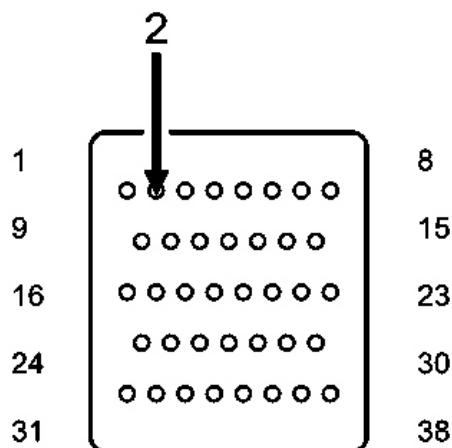
No

Go To 15.

15. **(K16) COIL CONTROL 5 CIRCUIT**



**COIL-
IGNITION-NO. 5**



**PCM PINOUT
BOX 8815**

8132f963

Fig. 61: Checking Coil Control No. 5 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K16) Coil Control 5 circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K16) Coil Control 2 circuit?

Yes

Repair the (K16) Coil Control 5 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0306-CYLINDER 6 MISFIRE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Any time the engine is running, and the adaptive numerator has been successfully updated.

SET CONDITIONS

- **Set Condition:**

The threshold to set the fault is application specific; it is tied to the level of misfire that will cause emissions to increase to 1.5 times the standard or in some cases 1%. It is always a two trip fault above the calibrated RPM. It takes 1 soft fail to set a malfunction and two trips to set the MIL. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342), (F344) ASD RELAY OUTPUT CIRCUIT
(K58) INJECTOR 6 CONTROL CIRCUIT
(K10) COIL CONTROL 6 CIRCUIT
SPARK PLUG
IGNITION COIL
FUEL PUMP INLET STRAINER PLUGGED
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP MODULE
FUEL PRESSURE LEAK DOWN
FUEL INJECTOR
ENGINE MECHANICAL
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Diagnose and repair any other active component or circuit DTCs before continuing with this procedure.

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: Anything that affects the speed of the crankshaft can cause this DTC to set.

NOTE: When a misfire is detected, the PCM will shut down the injector control circuit for the misfiring cylinder.

Inspect the engine for any of the following conditions:

- Worn serpentine belt
- Misalignment or binding water pump, P/S pump or A/C compressor pulleys
- Improper CKP, CMP, MAP, or TP Sensor mounting.
- Poor connector/terminal to component connection for CKP sensor, CMP sensor, MAP sensor, TP sensor, fuel injector, ignition coil, etc.
- Corroded PCM power or ground circuits.
- Vacuum leaks.
- Restriction in the air induction or exhaust system.
- Internal engine component malfunction.

NOTE: Misfire may occur and may not be caused by component failure. Any of the following conditions can cause a misfire:

- Moisture on ignition system components
- Insufficient fuel
- Low quality fuel
- Manual transmission bog
- Towing overload

Were any problems found?

Yes

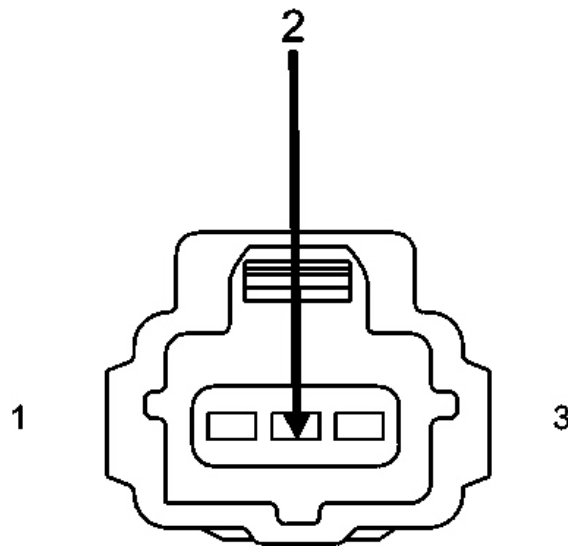
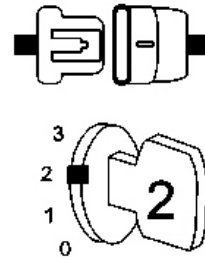
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

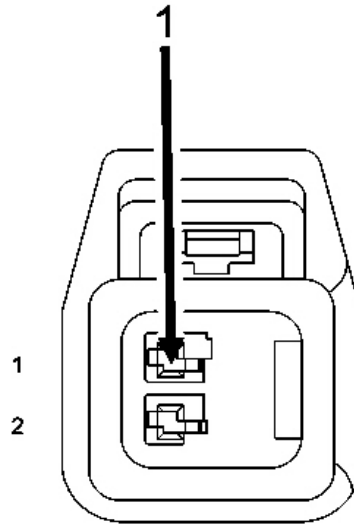
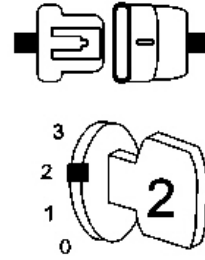
3. (F342), (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION-NO. 6**

8132f9cb

Fig. 62: Checking ASD Relay Output
Courtesy of CHRYSLER LLC



INJECTOR-
FUEL

81654d0c

Fig. 63: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the No. 6 Ignition Coil harness connector.

Disconnect the No.6 Fuel Injector harness connector.

Ignition on, engine not running.

With the scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F342), (F344) ASD Relay Output circuit in the Ignition Coil harness connector and Fuel Injector harness connector while the ASD Relay is actuating.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance or short to ground in the (F342), (F344) ASD Relay Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

4. IGNITION SYSTEM OPERATION

Turn the ignition off.

Connect the Ignition Coil harness connector.

Disconnect the Ignition wire/coil from the spark plug.

Leave the Fuel Injector harness connector of the cylinder being tested disconnected.

Install a spark tester on the Ignition wire.

While cranking the engine observe the spark coming from the spark tester.

NOTE: **A crisp blue spark that is able to jump the gap of the spark tester should be generated.**

Is good spark present?

Yes

Go To 5.

No

Go To 14.

NOTE: **Connect the Fuel Injector harness connector before continuing.**

5. SPARK PLUG

Turn the ignition off.

Remove the Spark Plug.

Inspect the Spark Plug for the following conditions.

- Cracks
- Carbon Tracking
- Foreign Material
- Gap size out of specifications
- Loose or broken electrode

NOTE: **Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.**

Were any of the above conditions present?

Yes

Replace the Spark Plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. FUEL PRESSURE CHECK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Install a fuel pressure gauge to the fuel rail.

Start the engine and observe the fuel pressure reading.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 7.

Below Specification

Go To 12.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

7. FUEL PRESSURE LEAK DOWN

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi).

Does the pressure fall below the listed specification?

Yes

Replace the leaking Fuel Injector(s).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. FUEL INJECTOR OPERATION

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

CAUTION: After each Fuel Injector actuation, start the engine to clean the cylinder of fuel. Failure to do so could cause engine damage.

Remove special tool #C4390.

Start the engine and allow the fuel pressure to reach maximum pressure.

Ignition on, engine not running.

Using the scan tool, actuate the No.6 Fuel Injector.

Monitor the fuel pressure gauge.

Does the fuel pressure gauge indicate a drop in fuel pressure?

Yes

Go To 9.

No

Go To 10.

NOTE: Turn the ignition off, remove the Fuel Pressure gauge, and connect the fuel lines before continuing.

9. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

CAM LOBES - must not be worn excessively

CYLINDER LEAKAGE TEST - must be within specifications

VALVE SPRINGS - cannot be weak or broken

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

10. **FUEL INJECTOR**

Turn the ignition off.

Disconnect the No.6 Fuel Injector harness connector.

Ignition on, engine not running.

NOTE: **When a Misfire is detected for a particular cylinder, the PCM will shut down that cylinder's Injector Control circuit.**

With the scan tool, erase DTCs.

Install an Injector Noid light.

With the scan tool, actuate the Fuel Injector.

Does the Noid light blink/flicker during the actuation?

Yes

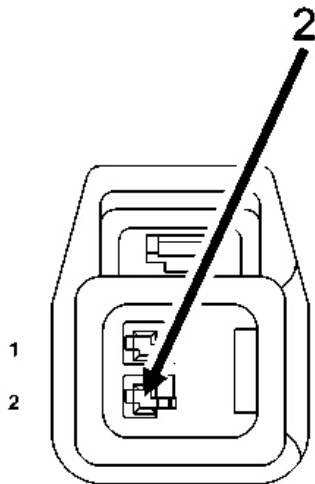
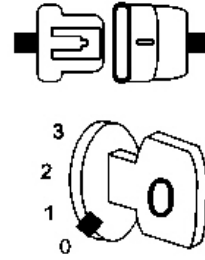
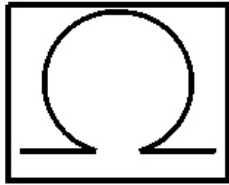
Verify that there is good pin to terminal contact in the related Injector and the Powertrain Control Module connectors. If OK, replace the Fuel Injector.

Perform **POWERTRAIN VERIFICATION TEST** .

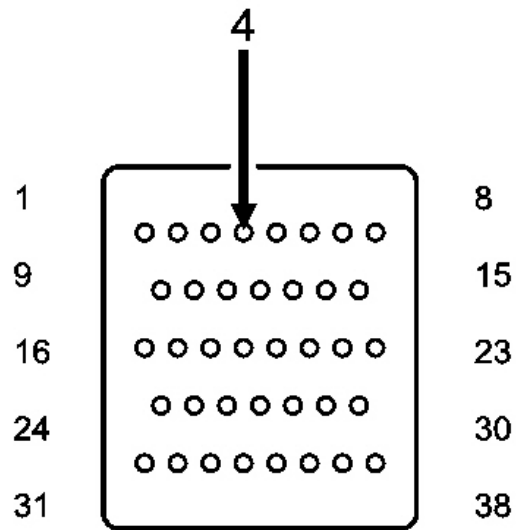
No

Go To 11.

11. (K58) INJECTOR 6 CONTROL CIRCUIT



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654f75

Fig. 64: Checking Injector Control No. 6 Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K58) Injector 6 Control circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K58) Injector 6 Control circuit?

Yes

Repair the excessive resistance or short in the (K58) Injector 6 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 16.

12. FUEL SUPPLY LINE RESTRICTED

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **FUEL PUMP INLET STRAINER**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

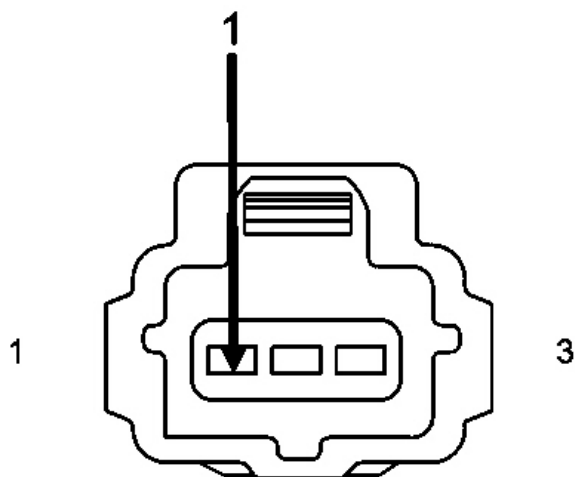
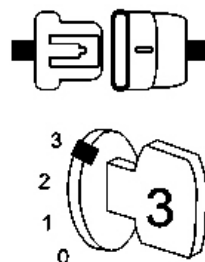
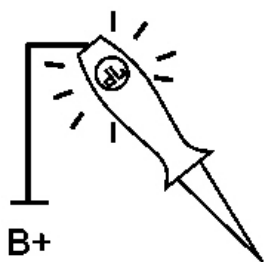
Perform **POWERTRAIN VERIFICATION TEST** .

No

Before continuing, check the Fuel Pump Module harness connector terminals for corrosion, damage, or terminal push out. Make sure the ground circuit is functional. Repair as necessary. Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **IGNITION COIL**



**COIL-
IGNITION-NO. 6**

8132f9d1

Fig. 65: Checking Ignition Coil
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Disconnect the Ignition Coil harness connector.

Using a 12-volt test light connected to 12-volts, probe the (K10) Coil Control 6 circuit.

Using a scan tool, actuate the No.6 Ignition Coil.

Does the test light brightly blink/flicker during the actuation?

Yes

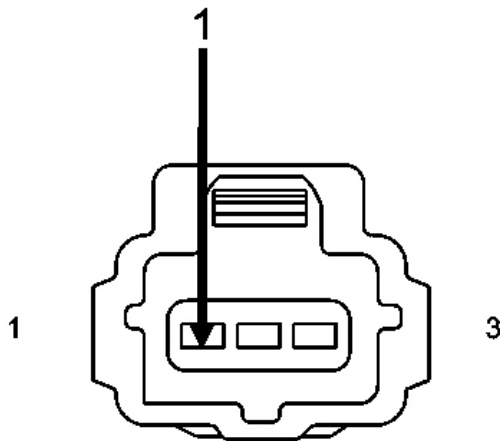
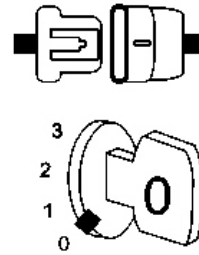
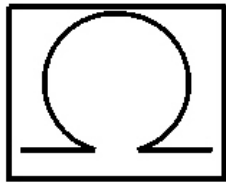
Verify that there is good pin to terminal contact in the related Coil and the Powertrain Control Module connectors. If OK, replace the Ignition Coil.

Perform **POWERTRAIN VERIFICATION TEST** .

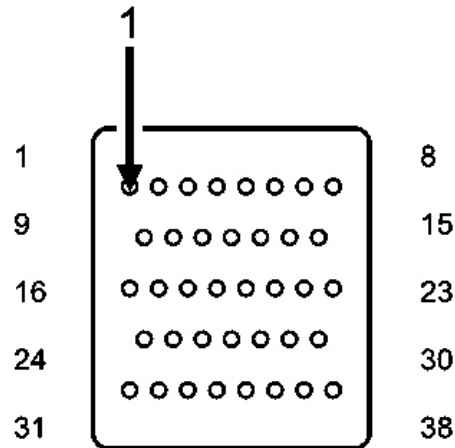
No

Go To 15.

15. **(K10) COIL CONTROL 6 CIRCUIT**



**COIL-
IGNITION-NO. 6**



**PCM PINOUT
BOX 8815**

8132f9d7

Fig. 66: Checking Coil Control No. 6 Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Check the (K10) Coil Control 6 circuit for an open, short to ground, and short to voltage.

Was a problem found with the (K10) Coil Control 6 circuit?

Yes

Repair the (K10) COIL CONTROL 6 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 16.

16. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor, Coil, Injector, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors, Coils, Injectors, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

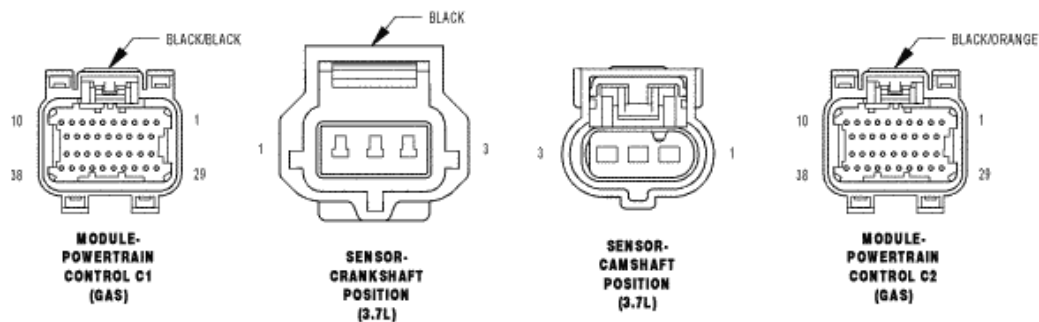
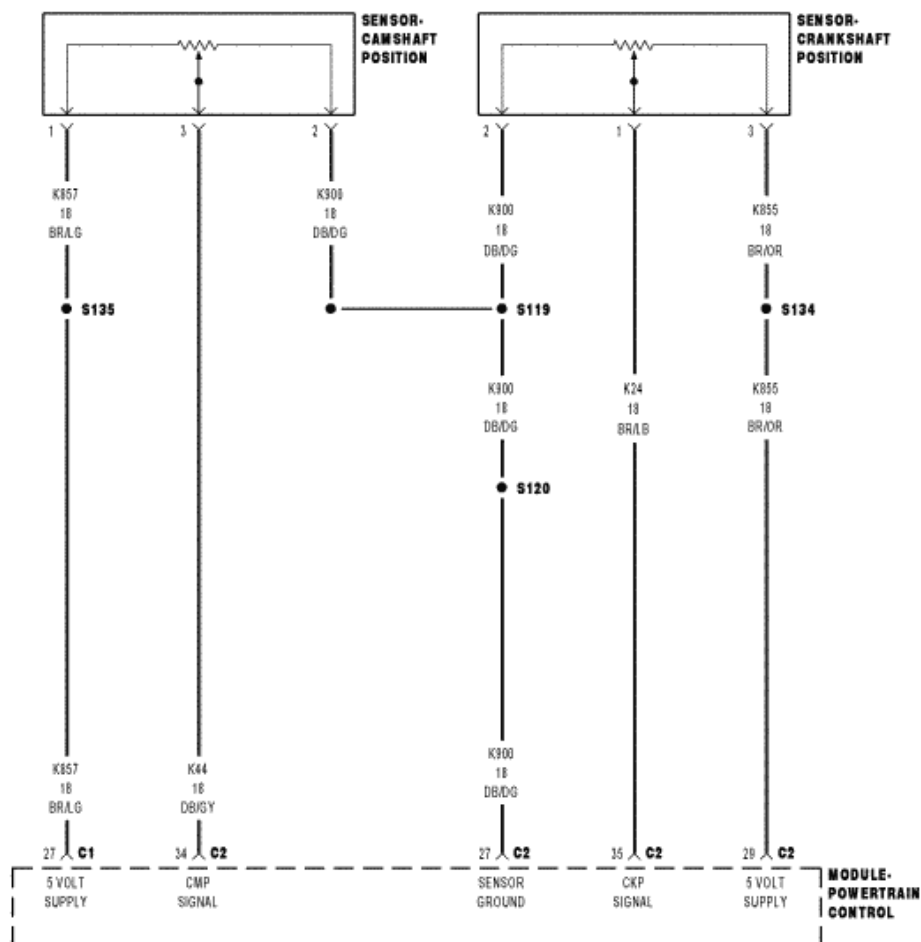
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0315-NO CRANK SENSOR LEARNED

CIRCUIT SCHEMATIC



01c1a8a3

Fig. 67: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Under closed throttle decel and A/C off. ECT above 75° C (167° F). Engine start time is greater than 50 seconds.

SET CONDITIONS

- **Set Condition:**

One of the CKP sensor target windows has more than 2.86% variance from the reference. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
TONE WHEEL/PULSE RING
WIRE HARNESS
CRANKSHAFT POSITION SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs and read and record the related Freeze Frame data.

With a scan tool, clear DTCs, PCM battery disconnect to reset the PCM.

Start the engine.

If the MIL has not yet illuminated, test drive the vehicle to try to get the code to reset.

Does the code reset while cranking or during the test drive?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. WIRE HARNESS INSPECTION

Turn the ignition off.

Visually inspect the CKP wire harness. Look for any chafed, pierced, pinched, or partially broken wires.

Visually inspect the CKP wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.

Verify that there is good pin to terminal contact in the Sensor and Powertrain Control Module connectors.

Make sure the Crankshaft Position Sensor is properly installed and the mounting bolt(s) are torqued to the proper specification.

Were any of the above conditions present?

Yes

Repair as necessary

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. TONE WHEEL/FLEX PLATE INSPECTION

Remove the Crankshaft Position Sensor.

Inspect the Tone Wheel/Flex Plate slots for damage, foreign material, or excessive movement.

Were any problems found?

Yes

Repair or replace the Tone Wheel/Flex Plate as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CRANKSHAFT POSITION SENSOR

If there are no possible causes remaining, view repair.

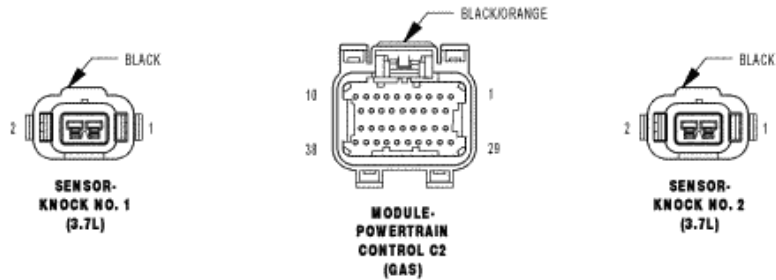
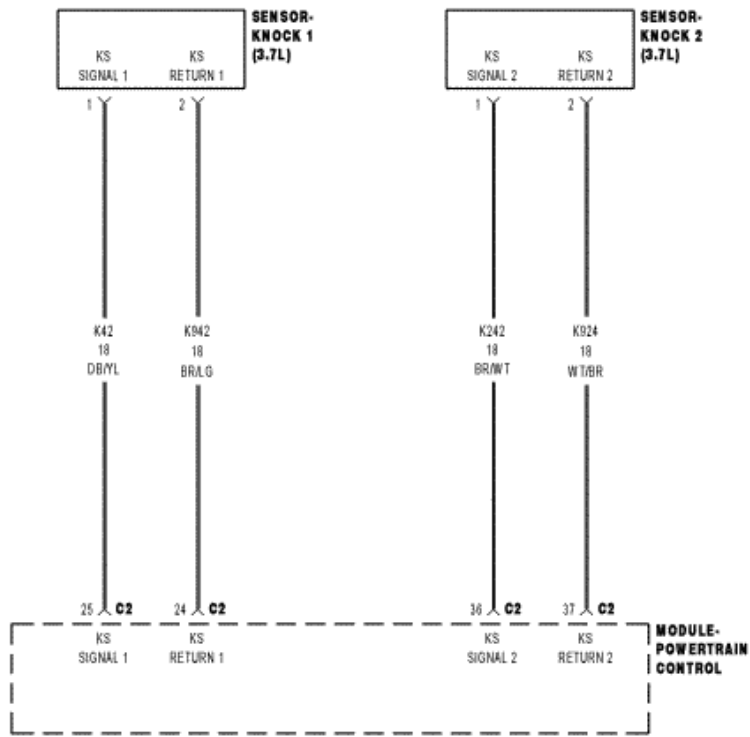
Repair

Replace the Crankshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

P0325-KNOCK SENSOR 1 CIRCUIT

CIRCUIT SCHEMATIC



01000216

Fig. 68: Knock Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Knock is the spontaneous auto-ignition of the remaining fuel/air mixture in the engine combustion chamber that occurs after normal combustion has started. It can occur under extreme vehicle operating conditions such as high engine temperature, high MAP, low humidity, and heavy loads to the engine. Knock is caused by excessive spark advance for the given engine operating conditions. Severe, continuous knock may be caused by carbon deposits, bad gasoline, and/or low octane fuel. Avoiding light audible knock is important for customer satisfaction while preventing excessive knock is important to protect engine components. The output voltage from the knock circuit represents the strength of the engine knock and is read by the engine controller. The knock system output voltage is not zero due to engine background noise, even when knock is not present. When the engine is operated under high load conditions where knock is possible, the knock voltage is tested to decide if it exceeds the knock voltage threshold. Knock has occurred when the knock voltage is at or above this knock threshold. When knock is detected a calibrated short term knock spark retard to be subtracted from the spark advance is calculated. The amount of retarded spark advance is based off a calibrated severity of the knock event. This retarded spark advance is used in the next ignition event to prevent further knock events. If knock continues, an additional amount of short term spark advance retard is added. When knock stops, short term knock spark retard is eliminated, the long term knock spark retard is reduced by a calibrated amount to recover some previously retarded spark advance. This decreases spark retard to improve engine performance.

MONITOR CONDITIONS

When Monitored:

This monitor runs above 2000 rpm, under open throttle conditions. The Knock diagnostic does not run at idle or during decelerations. The high voltage test runs all the times the engine is running.

SET CONDITIONS

- Set Condition:**

The High voltage fault will set at 4.8 volts. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K42) KS SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE
(K42) KS SIGNAL 1 CIRCUIT OPEN
(K942) KS RETURN 1 CIRCUIT OPEN
(K42) KS SIGNAL 1 CIRCUIT SHORTED TO THE (K942) KS RETURN 1 CIRCUIT
(K42) KS SIGNAL 1 CIRCUIT SHORTED TO GROUND
KNOCK SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K42) KS SIGNAL 1 SHORTED TO VOLTAGE

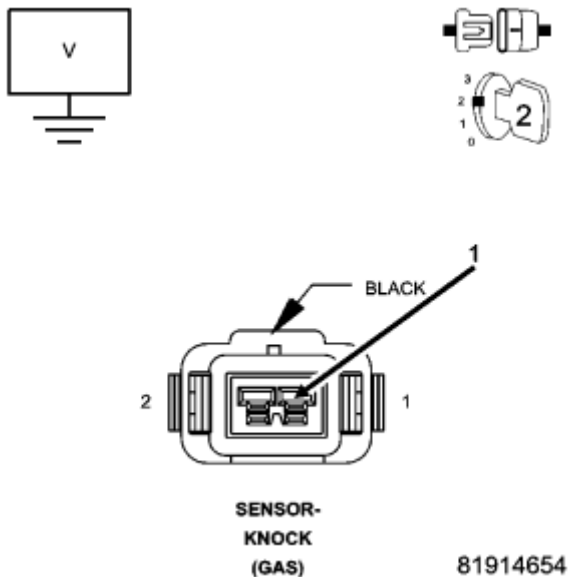


Fig. 69: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Knock Sensor harness connector.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K42) KS Signal 1 circuit in the Knock Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K42) KS Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K42) KS SIGNAL 1 CIRCUIT OPEN

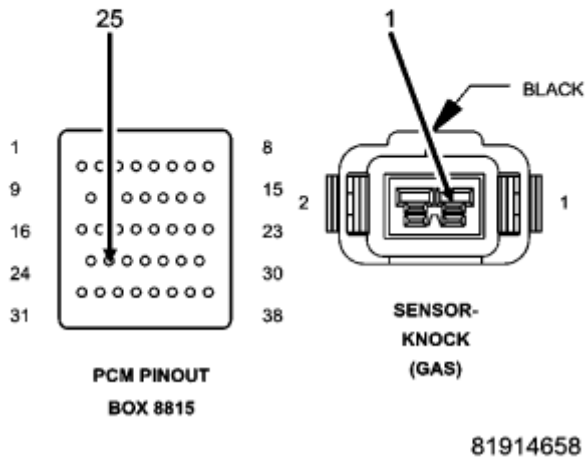


Fig. 70: Checking Knock Sensor No. 1 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K42) KS Signal 1 circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

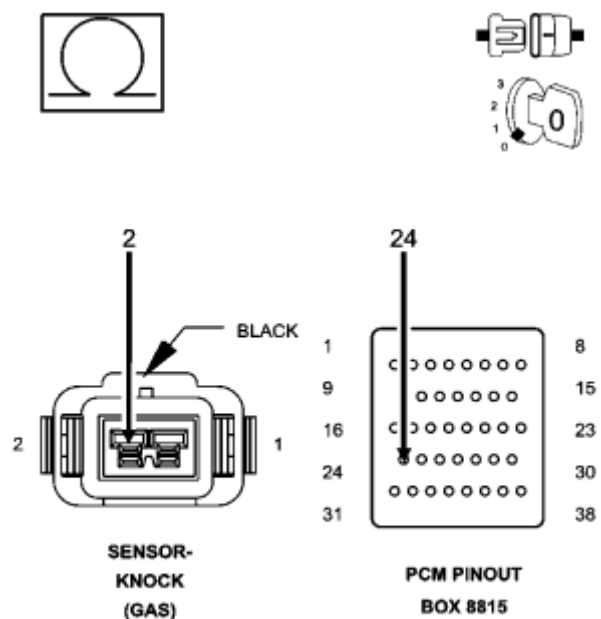
Go To 4.

No

Repair the open in the (K42) KS Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K942) KS RETURN 1 CIRCUIT OPEN



8191465c

Fig. 71: Checking Knock Sensor No. 1 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K942) KS Return 1 circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K942) KS Return 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K42) KS SIGNAL 1 SHORTED TO THE (K942) KS RETURN 1 CIRCUIT

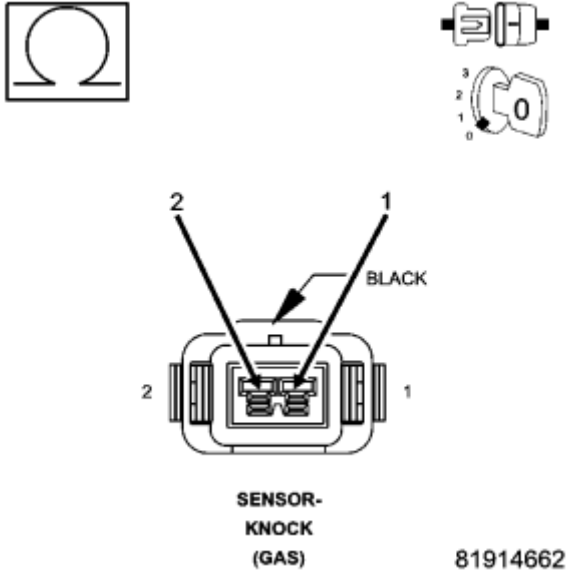


Fig. 72: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Knock Sensor No. 1 Return Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (K42) KS Signal 1 circuit and the (K942) KS Return 1 circuit in the Knock Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K42) KS Signal 1 circuit and the (K942) KS Return 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K42) KS SIGNAL 1 SHORTED TO GROUND

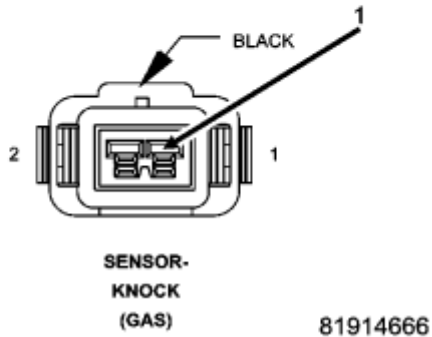


Fig. 73: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K42) KS Signal 1 circuit in the Knock Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K42) KS Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. KNOCK SENSOR 1

Turn the ignition off.

Verify that there is good pin to terminal contact in the Knock Sensor and Powertrain Control Module connectors.

If the connectors are OK, replace the Knock Sensor 1.

Connect the Powertrain Control Module (PCM) connector.

Turn the ignition on.

With the scan tool, clear DTCs.

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to reset.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 8.

No

Test complete.

Perform **POWERTRAIN VERIFICATION TEST** .

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Knock Sensor 1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0330-KNOCK SENSOR 2 CIRCUIT

CIRCUIT SCHEMATIC

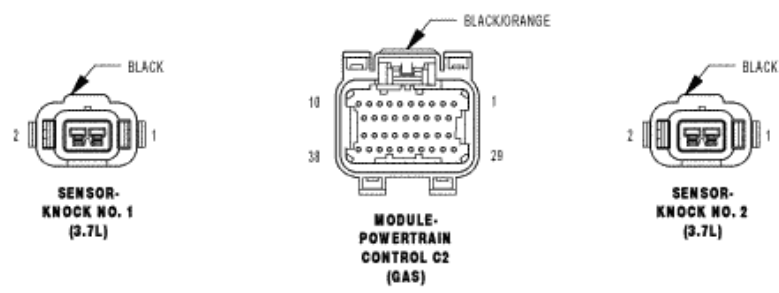
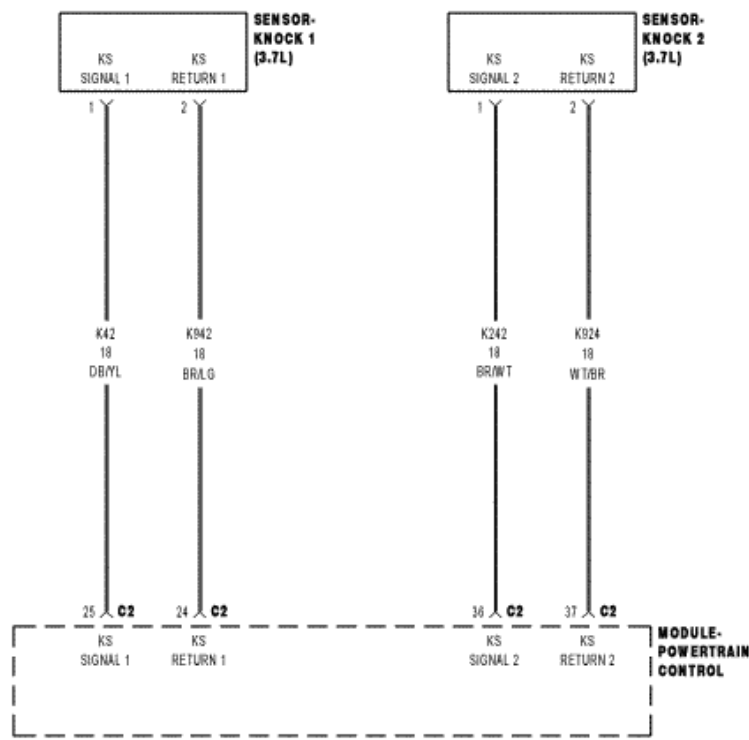


Fig. 74: Knock Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Knock is the spontaneous auto-ignition of the remaining fuel/air mixture in the engine combustion chamber that occurs after normal combustion has started. It can occur under extreme vehicle operating conditions such as high engine temperature, high MAP, low humidity, and heavy loads to the engine. Knock is caused by excessive spark advance for the given engine operating conditions. Severe, continuous knock may be caused by carbon deposits, bad gasoline, and/or low octane fuel. Avoiding light audible knock is important for customer satisfaction while preventing excessive knock is important to protect engine components. The output voltage from the knock circuit represents the strength of the engine knock and is read by the engine controller. The knock system output voltage is not zero due to engine background noise, even when knock is not present. When the engine is operated under high load conditions where knock is possible, the knock voltage is tested to decide if it exceeds the knock voltage threshold. Knock has occurred when the knock voltage is at or above this knock threshold. When knock is detected a calibrated short term knock spark retard to be subtracted from the spark advance is calculated. The amount of retarded spark advance is based off a calibrated severity of the knock event. This retarded spark advance is used in the next ignition event to prevent further knock events. If knock continues, an additional amount of short term spark advance retard is added. When knock stops, short term knock spark retard is eliminated, the long term knock spark retard is reduced by a calibrated amount to recover some previously retarded spark advance. This decreases spark retard to improve engine performance.

MONITOR CONDITIONS

When Monitored:

This monitor runs above 2000 rpm, under open throttle conditions. The Knock diagnostic does not run at idle or during decelerations. The high voltage test runs all the times the engine is running.

SET CONDITIONS

- **Set Condition:**

The High voltage fault will set at 4.8 volts. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K242) KS SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(K242) KS SIGNAL 2 CIRCUIT OPEN
(K924) KS RETURN 2 CIRCUIT OPEN
(K242) KS SIGNAL 2 CIRCUIT SHORTED TO THE (K924) KS RETURN 2 CIRCUIT
(K242) KS SIGNAL 2 CIRCUIT SHORTED TO GROUND
KNOCK SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K242) KS SIGNAL 2 SHORTED TO VOLTAGE

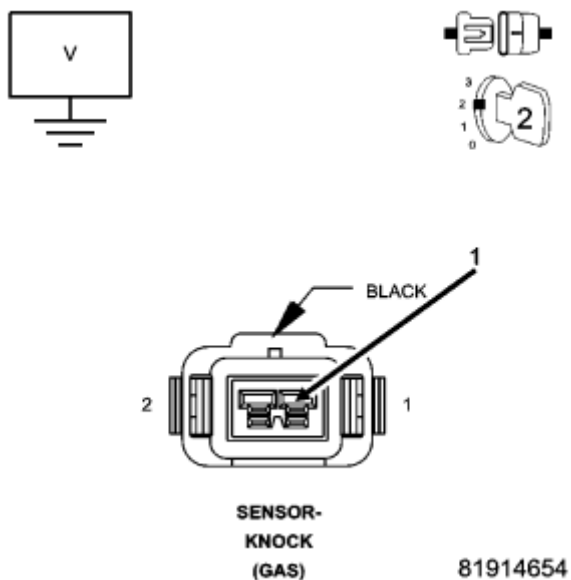


Fig. 75: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the No.2 Knock Sensor harness connector.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K242) KS Signal 2 circuit in the Knock Sensor harness connector.

Is there any voltage present?

Yes

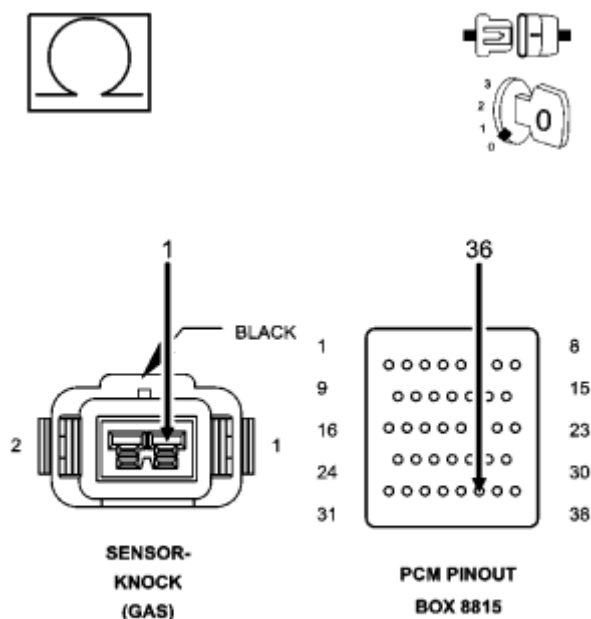
Repair the short to voltage in the (K242) KS Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K242) KS SIGNAL 2 CIRCUIT OPEN



8197d3ea

Fig. 76: Checking Knock Sensor No. 2 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K242) KS Signal 2 circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

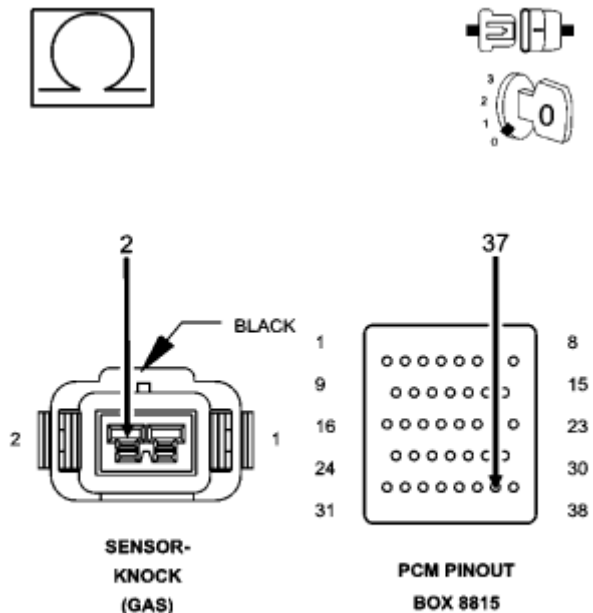
Go To 4.

No

Repair the open in the (K242) KS Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K924) KS RETURN 2 CIRCUIT OPEN



8197d40f

Fig. 77: Checking Knock Sensor No. 2 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K924) KS Return 2 circuit from the Knock Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K924) KS Return 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K242) KS SIGNAL 2 SHORTED TO THE (K924) KS RETURN 2 CIRCUIT

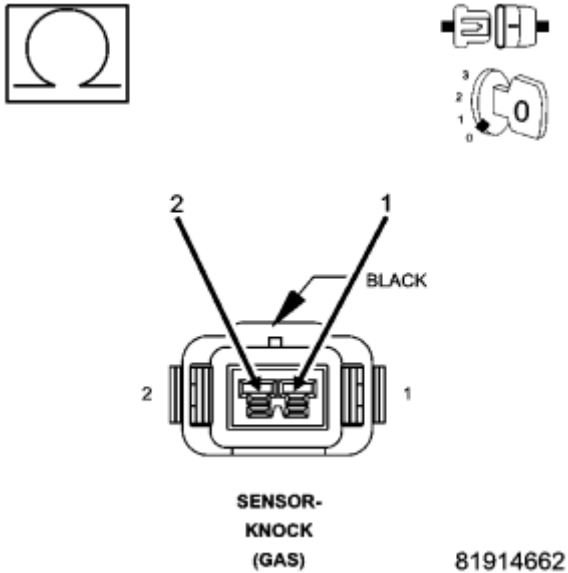


Fig. 78: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Knock Sensor No. 1 Return Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (K242) KS Return 2 circuit and the (K924) KS Return 2 circuit in the Knock Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K242) KS Signal 2 circuit and the (K924) KS Return 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K242) KS SIGNAL 2 SHORTED TO GROUND

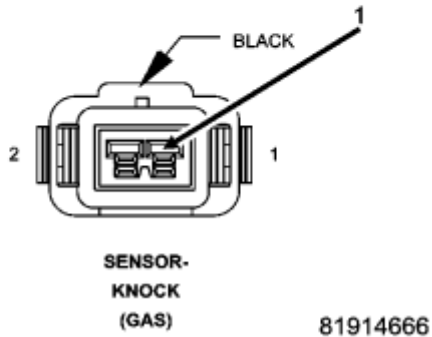


Fig. 79: Checking Knock Sensor No. 1 or 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K242) KS Signal 2 circuit in the Knock Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K242) KS Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. KNOCK SENSOR 2

Turn the ignition off.

Verify that there is good pin to terminal contact in the Knock Sensor and Powertrain Control Module connectors.

If the connectors are OK, replace the Knock Sensor 2.

Connect the Powertrain Control Module (PCM) connector.

Turn the ignition on.

With the scan tool, clear DTCs.

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to reset.

With the scan tool, select View DTCs.

Is the status Active for this DTC?

Yes

Go to 8.

No

Test complete.

Perform **POWERTRAIN VERIFICATION TEST** .

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Knock Sensor 2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0335-CRANKSHAFT POSITION SENSOR CIRCUIT

CIRCUIT SCHEMATIC

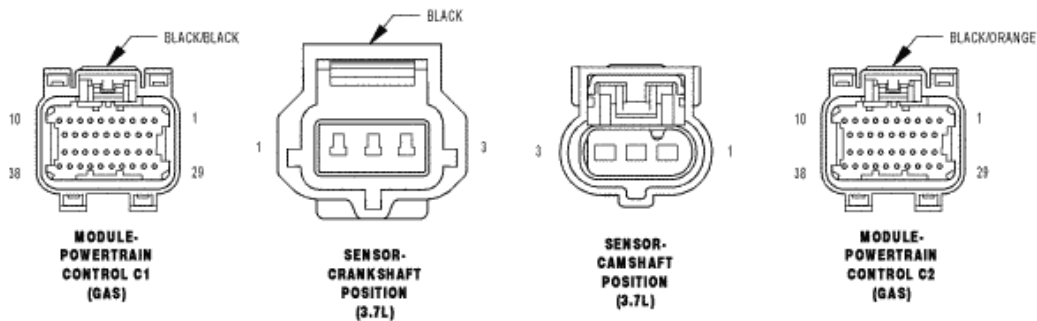
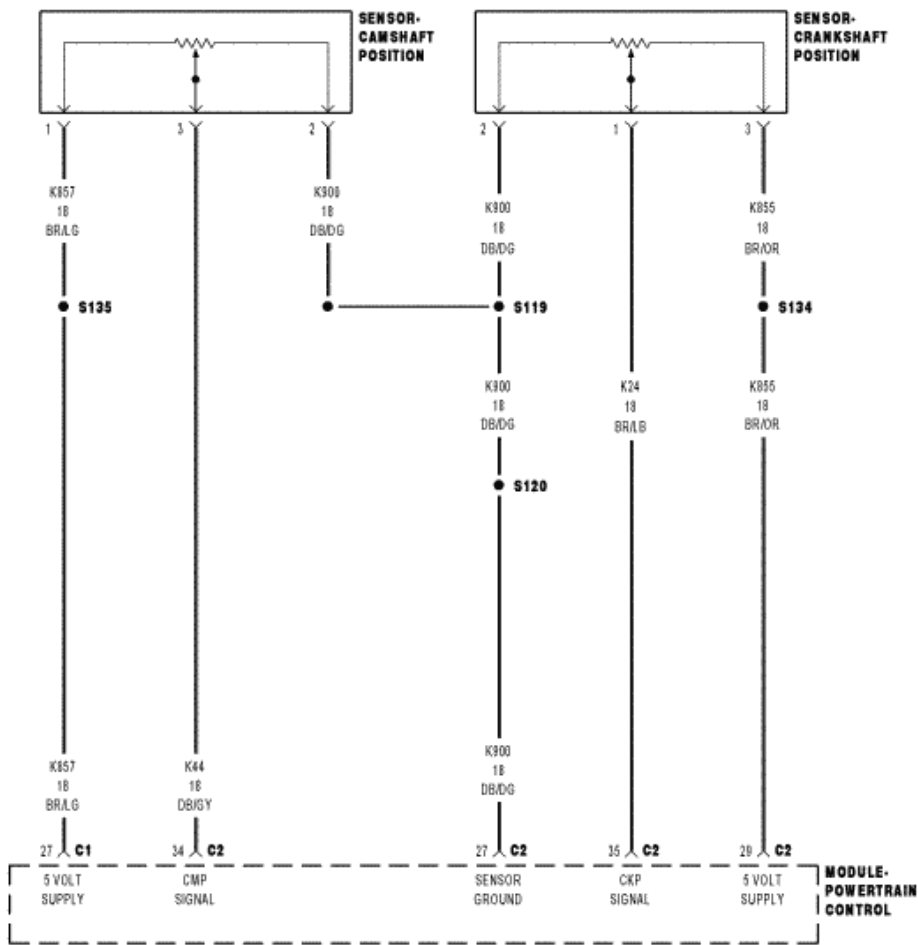


Fig. 80: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

During engine cranking and with the engine running. Battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

No CKP signal is present during engine cranking, and at least 8 camshaft position sensor signals have occurred within 8 seconds. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K855) 5-VOLT SUPPLY CIRCUIT OPEN
(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K24) CKP SIGNAL CIRCUIT OPEN
(K24) CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K24) CKP SIGNAL CIRCUIT SHORTED GROUND
(K24) CKP SIGNAL CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
(K900) SENSOR GROUND CIRCUIT OPEN
CRANKSHAFT POSITION SENSOR
CAMSHAFT POSITION SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan.

Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 14.

2. (K855) 5-VOLT SUPPLY CIRCUIT

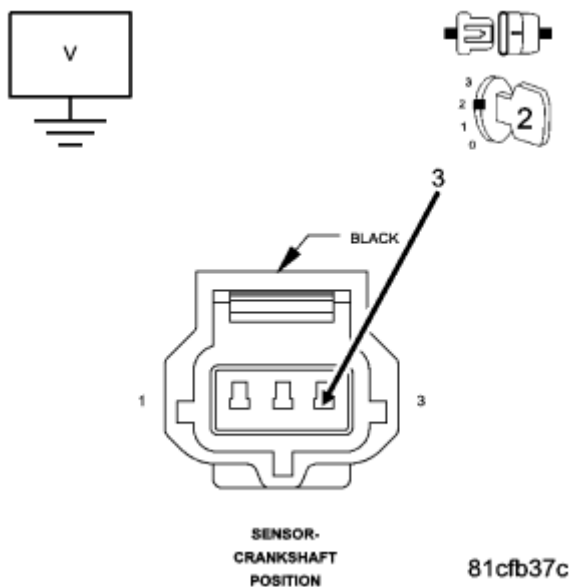


Fig. 81: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the CKP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the CKP Sensor harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 3.

No

Go To 10.

3. (K24) CKP SIGNAL CIRCUIT

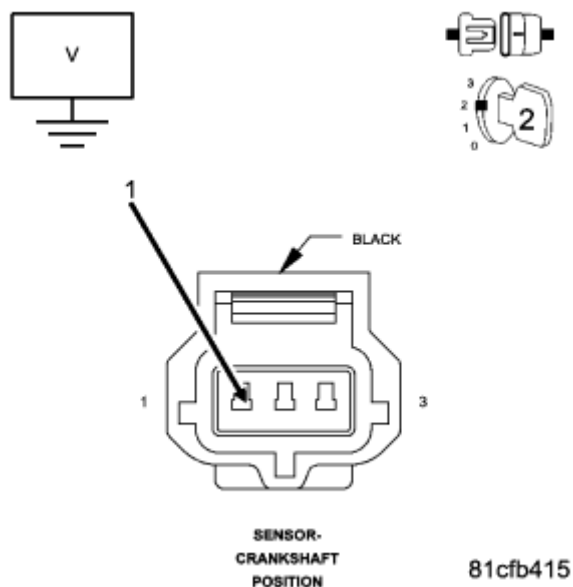


Fig. 82: Measuring The Voltage On The CKP Signal Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage on the (K24) CKP Signal circuit in the CKP Sensor harness connector.

NOTE: The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.

Does the scan tool display the voltage as described above?

Yes

Go To 4.

No

Go To 7.

4. (K900) SENSOR GROUND CIRCUIT OPEN

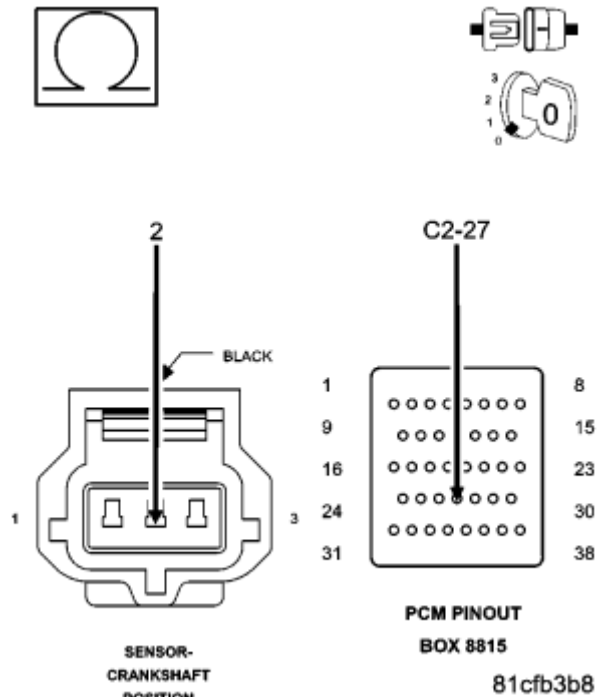


Fig. 83: Measuring The Resistance Of The Sensor Ground Circuit From The CKP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K900) Sensor ground circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K24) CKP SIGNAL CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT**

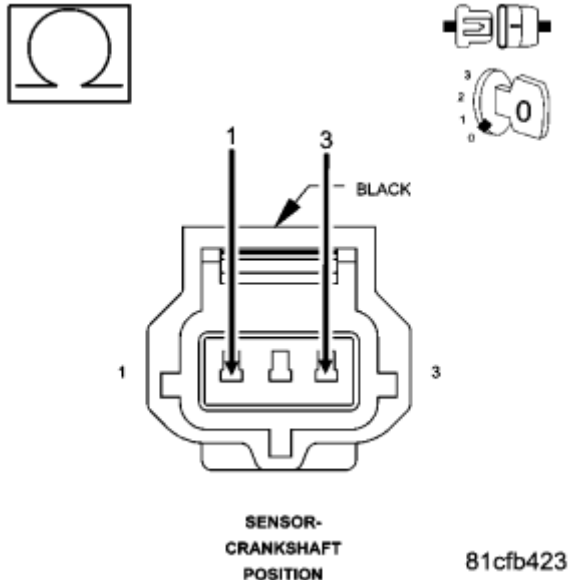


Fig. 84: Measuring The Resistance Between The CKP Signal Circuit And The 5-Volt Supply Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (K24) CKP Signal circuit and the (K855) 5-volt Supply circuit in the CKP Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K24) CKP Signal circuit and the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **CRANKSHAFT POSITION SENSOR**

NOTE: **Inspect the slots on the flywheel for damage. If a problem is found repair as necessary.**

Verify that there is good pin to terminal contact in the Crankshaft Position Sensor and Powertrain Control Module connectors.

If there are no possible causes remaining, view repair.

Repair

If no problems were found in the connectors, replace the Crankshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K24) CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE

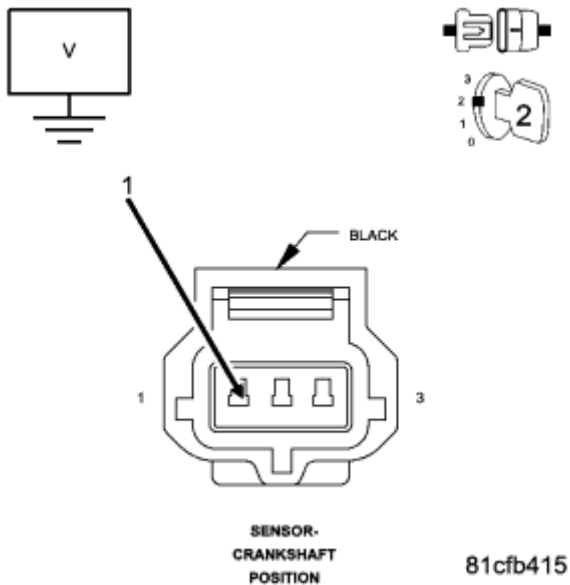


Fig. 85: Measuring The Voltage On The CKP Signal Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K24) CKP Signal circuit in the CKP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K24) CKP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K24) CKP SIGNAL CIRCUIT OPEN

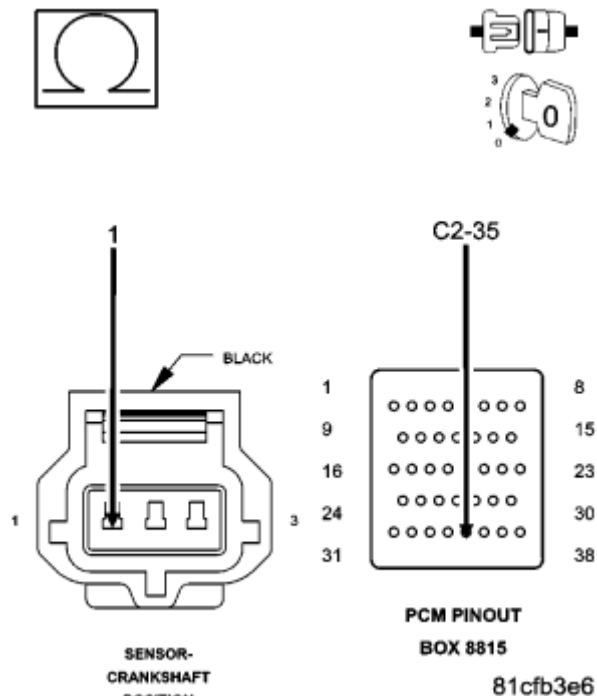


Fig. 86: Measuring The Resistance Of The CKP Signal Circuit From The CKP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815

Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K24) CKP Signal circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K24) CKP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **(K24) CKP SIGNAL CIRCUIT SHORTED TO GROUND**

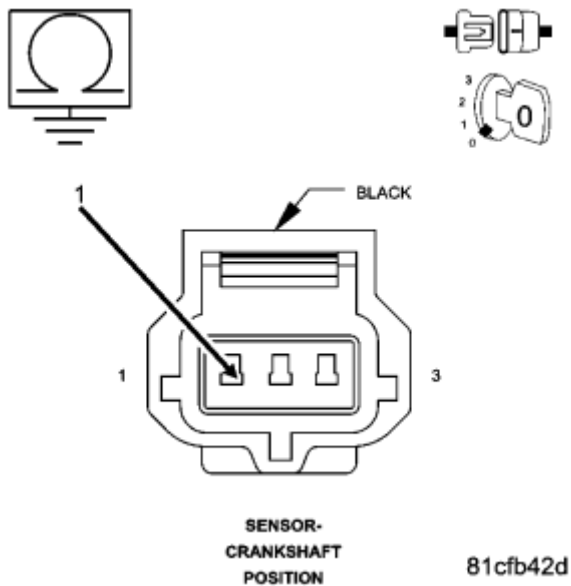


Fig. 87: Measuring The Resistance Between Ground And The CKP Signal Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K24) CKP Signal circuit in the CKP Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short to ground in the (K24) CKP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

10. **(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**

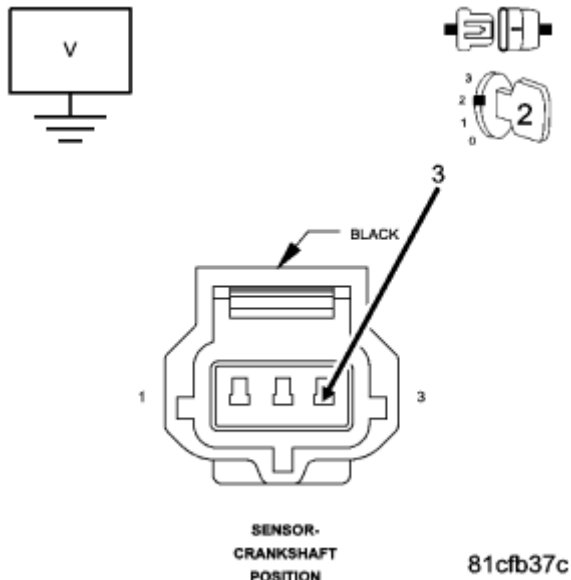


Fig. 88: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the CKP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **(K855) 5-VOLT SUPPLY CIRCUIT OPEN**

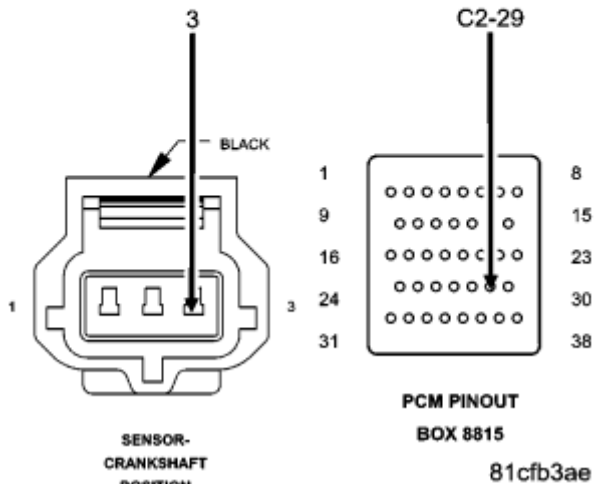


Fig. 89: Measuring The Resistance Of The 5-Volt Supply Circuit From The CKP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the CKP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 12.

No

Repair the open in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

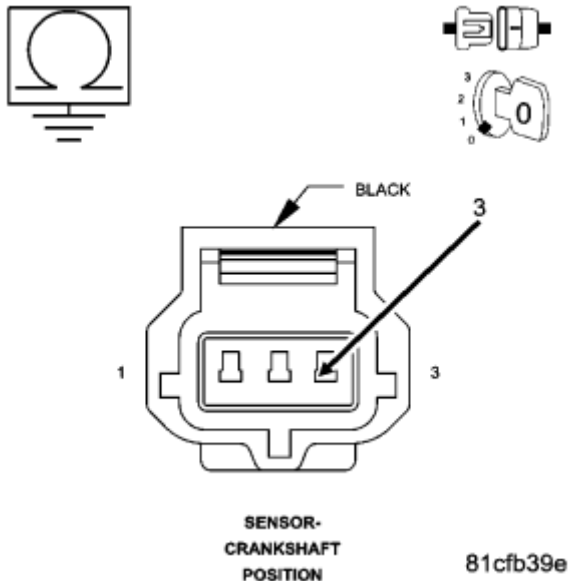


Fig. 90: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K855) 5-volt Supply circuit in the CKP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) 5-volt Supply circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **ERRATIC CKP SENSOR SIGNAL**

Turn the ignition off.

With a lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the CKP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap on the Crankshaft Position Sensor.

Observe the lab scope screen.

Look for any pulses generated by the CKP Sensor.

Allow the engine to idle.

Observe the lab scope screen.

Did the CKP Sensor generate any erratic pulses?

Yes

Verify that there is good pin to terminal contact in the Crank Position Sensor and Powertrain Control Module connectors. Replace the Crank Position Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **ERRATIC CMP SIGNAL**

Turn the ignition off.

With a lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the CMP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap on the Cam Position Sensor.

Observe the lab scope screen.

Look for any pulses generated by the CMP Sensor.

Allow the engine to idle.

Observe the lab scope screen.

Did the CMP Sensor generate any pulses?

Yes

Verify that there is good pin to terminal contact in the CMP Sensor and Powertrain Control Module connectors. Replace the Camshaft Position Sensor if no problems were found with the connectors.

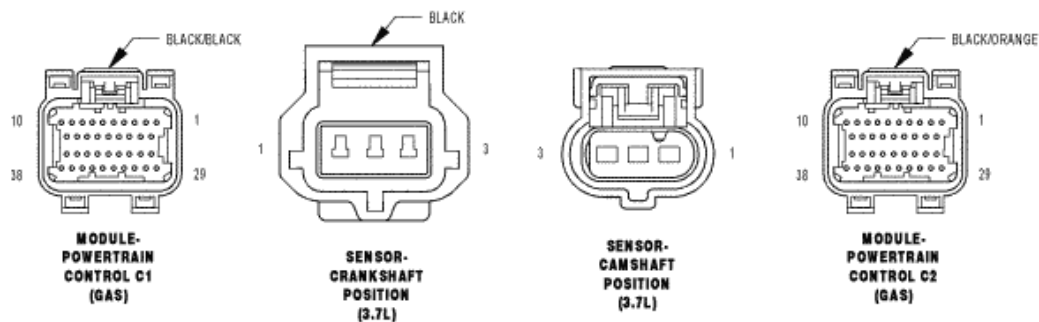
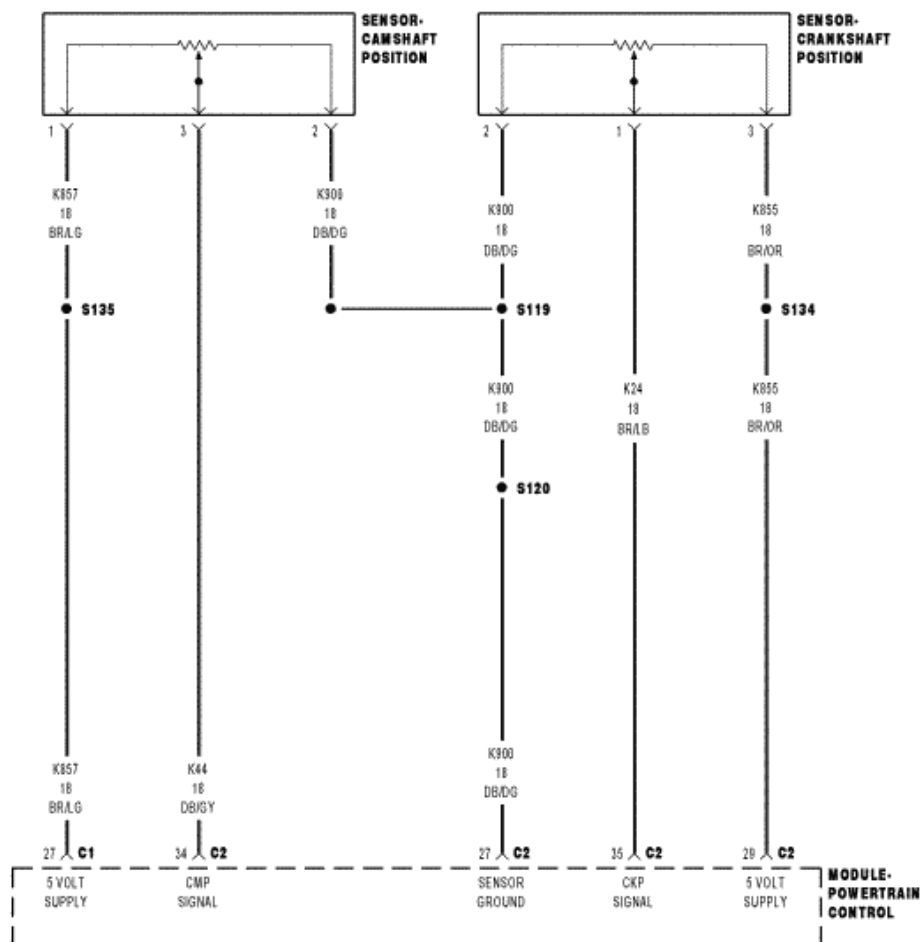
Perform **POWERTRAIN VERIFICATION TEST** .

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

P0339-CRANKSHAFT POSITION SENSOR INTERMITTENT

CIRCUIT SCHEMATIC



01c1a8a3

Fig. 91: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

During engine cranking and with the engine running. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

When the CKP Sensor failure counter reaches 20. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K855) 5-VOLT SUPPLY CIRCUIT OPEN
(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K24) CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K24) CKP SIGNAL CIRCUIT OPEN
(K24) CKP SIGNAL CIRCUIT SHORTED TO GROUND
(K24) CKP SIGNAL CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
CRANKSHAFT POSITION SENSOR
CRANK PULLEY/TONE WHEEL/PULSE RING
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CHECKING CRANKSHAFT POSITION SENSOR SIGNAL WITH A LAB SCOPE**

Turn the ignition off.

With a lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the Sensor harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Observe the lab scope screen.

Start the engine.

Observe the lab scope screen.

Are there any irregular or missing signals?

Yes

Go To 3.

No

Go To 8.

3. **WIRE HARNESS INSPECTION**

Turn the ignition off.

Visually inspect the related wire harness including the ground circuit. Look for any chafed, pierced, pinched, or partially broken wires.

Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.

Make sure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) are torqued to the proper specification.

Refer to any TSBs that may apply.

Were any of the above conditions present?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K855) 5-VOLT SUPPLY CIRCUIT OPEN OR SHORTED TO GROUND

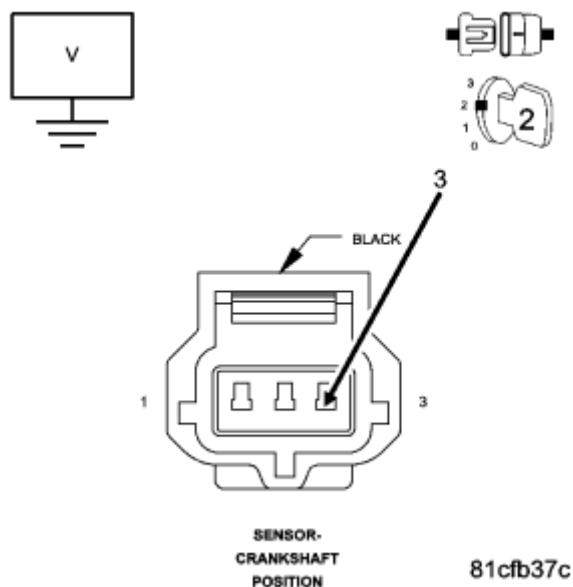


Fig. 92: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Disconnect the CKP Sensor connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the Sensor harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 5.

No

Repair the open or short to ground in the (K855) 5-volt Supply circuit. Use Miller special tool #8815 when checking for an open circuit to prevent PCM harness connector terminal damage.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **-tone wheel/flex plate inspection**

Turn the ignition off.

Carefully disconnect the Negative Battery (Ground) cable.

Remove the Crankshaft Position Sensor.

Inspect the Tone Wheel/Flex Plate slots for damage, foreign material, or excessive movement.

Were any problems found?

Yes

Repair or replace the Tone Wheel/Flex Plate as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **Checking Camshaft Position Sensor Signal with a Lab Scope**

Install the CKP Sensor and connect the battery cable.

NOTE: **An intermittent condition in the Cam Position Sensor can cause the P0339 to set.**

With the a lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the Sensor harness connector.

WARNING: **When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear**

loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap on the Camshaft Position Sensor.

Observe the lab scope screen.

Start the engine.

Observe the lab scope screen.

Are there any irregular or missing signals?

Yes

Verify that there is good pin to terminal contact in the CMP Sensor and the Powertrain Control Module connectors. If OK, replace the Camshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. CRANKSHAFT POSITION SENSOR

Verify that there is good pin to terminal contact in the CKP Sensor and the Powertrain Control Module connectors.

If there are no possible causes remaining, view repair.

Repair

Replace the Crankshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (K24) CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE

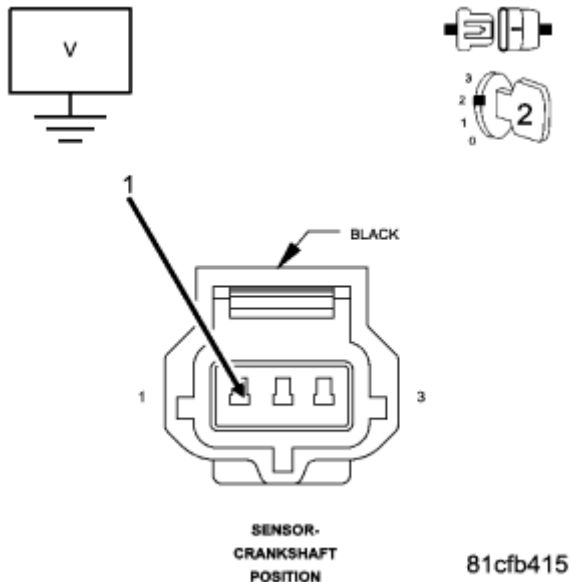


Fig. 93: Measuring The Voltage On The CKP Signal Circuit In The CKP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect the CKP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K24) CKP Signal circuit in the Sensor harness connector.

Wiggle the related wire harness while taking this measurement.

Is there any voltage present?

Yes

Repair the short to voltage in the (K24) CKP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (K24) CKP SIGNAL CIRCUIT OPEN

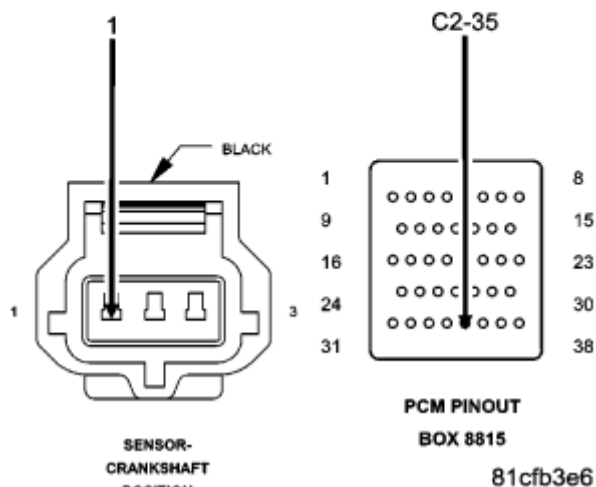


Fig. 94: Measuring The Resistance Of The CKP Signal Circuit From The CKP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance in the (K24) CKP Signal circuit from the CKP harness connector to the appropriate terminal of special tool #8815.

Wiggle the wire harness while taking this measurement.

Is the resistance below 1.0 ohm?

Yes

Go To 10.

No

Repair the excessive resistance in the (K24) CKP Signal circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

10. **(K24) CKP SIGNAL CIRCUIT SHORTED TO GROUND**

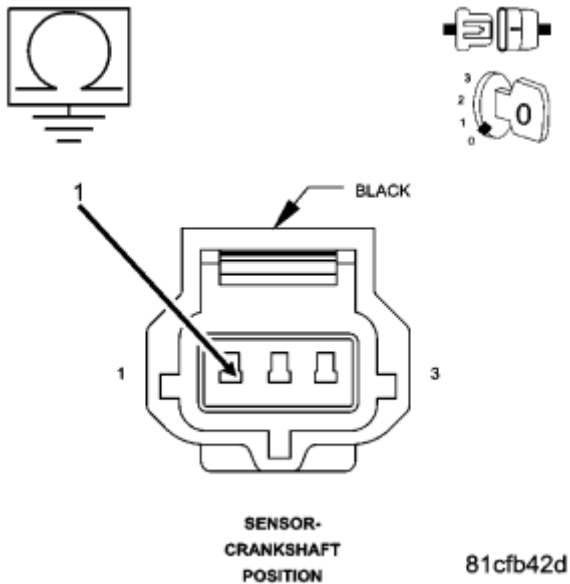


Fig. 95: Measuring The Resistance Between Ground And The CKP Signal Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K24) CKP Signal circuit in the CKP Sensor harness connector.

Wiggle the related wire harness while monitoring the resistance value.

Does the resistance ever go below 100 ohms?

Yes

Repair the short to ground in the (K24) Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **(K24) CKP SIGNAL CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT**

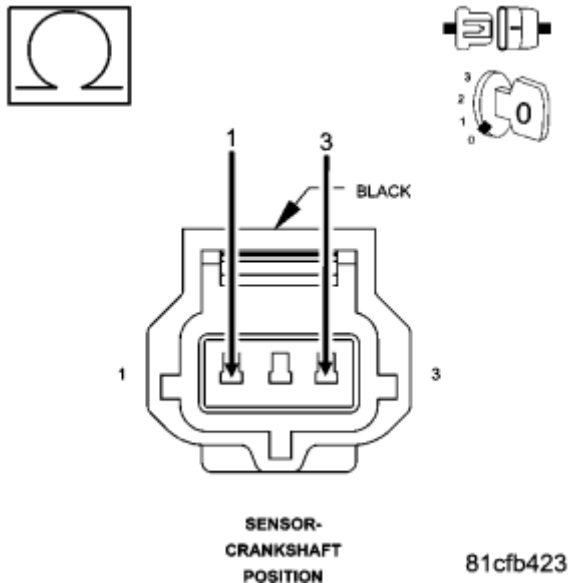


Fig. 96: Measuring The Resistance Between The CKP Signal Circuit And The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between the (K855) 5-volt Supply circuit and the (K24) CKP Signal circuit in the CKP harness connector.

Wiggle the related wire harness while taking this measurement.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K855) 5-volt Supply circuit and the (K24) CKP Signal circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the CKP Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the CKP Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

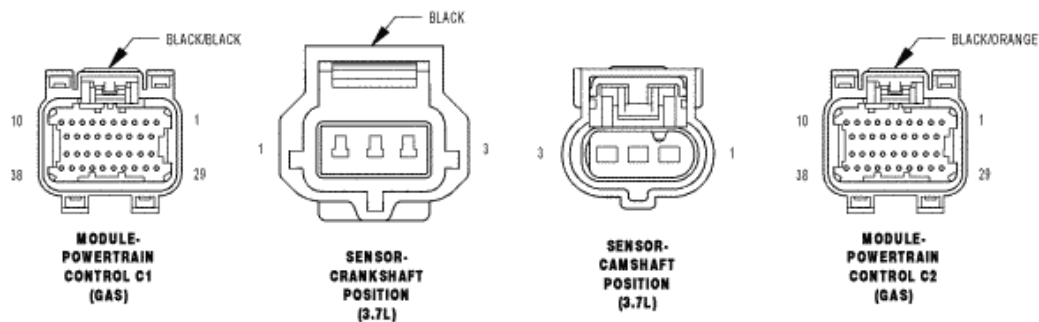
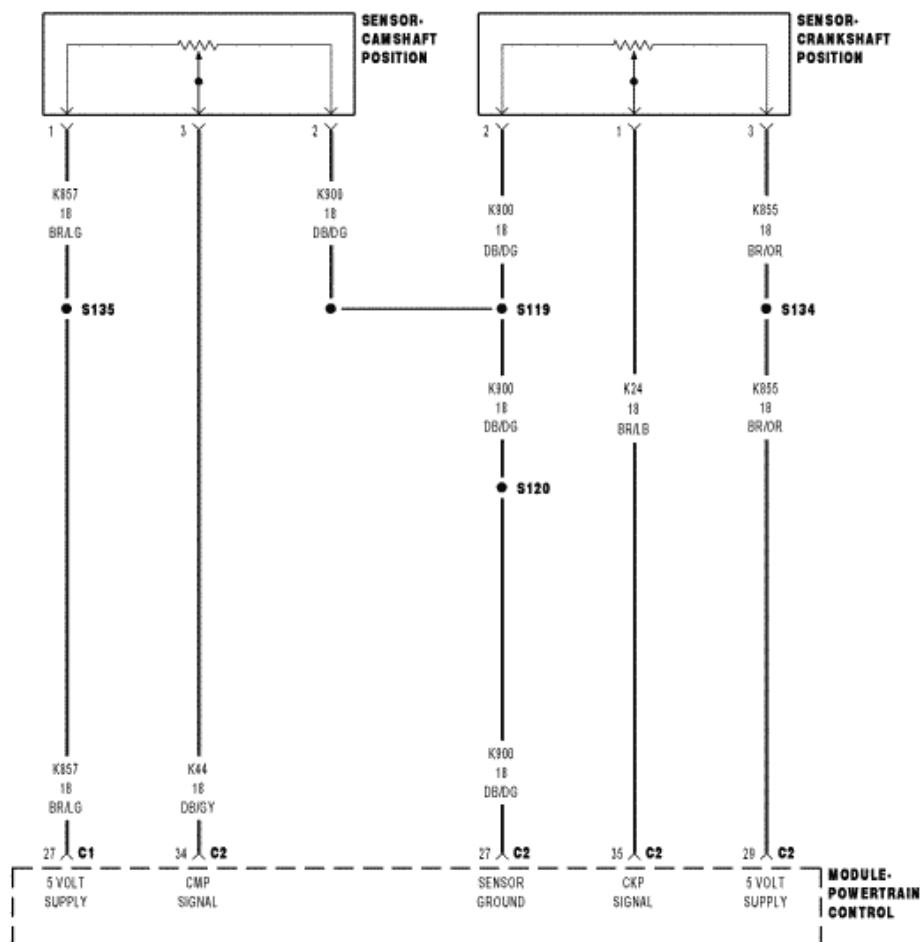
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0340-CAMSHAFT POSITION SENSOR CIRCUIT

CIRCUIT SCHEMATIC



01c1a8a3

Fig. 97: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

During engine cranking and with the engine running. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

At least 5 seconds or 2.5 engine revolutions have elapsed with crankshaft position sensor signals present but no camshaft position sensor signal. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K857) 5-VOLT SUPPLY CIRCUIT OPEN
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K44) CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K44) CMP SIGNAL CIRCUIT OPEN
(K44) CMP SIGNAL CIRCUIT SHORTED GROUND
(K44) CMP SIGNAL SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT
(K900) SENSOR GROUND CIRCUIT OPEN
CAMSHAFT POSITION SENSOR
CRANKSHAFT POSITION SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 14.

2. (K857) 5-VOLT SUPPLY CIRCUIT

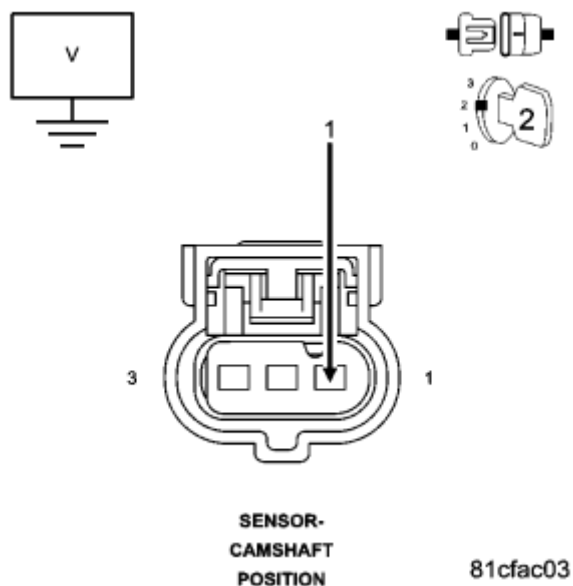


Fig. 98: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the CMP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the CMP Sensor harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 3.

No

Go To 10.

3. (K44) CMP SIGNAL CIRCUIT

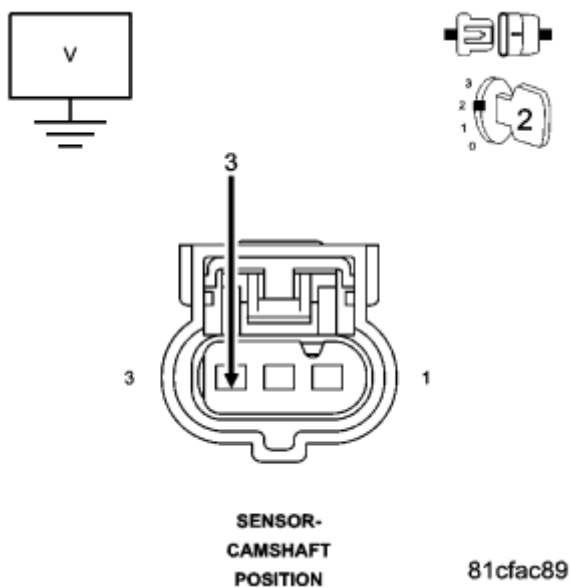


Fig. 99: Measuring The Voltage On The CMP Signal Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage on the (K44) CMP Signal circuit in the CMP Sensor harness connector.

Is the voltage between 4.5 and 5.0 volts?

Yes

Go To 4.

No

Go To 7.

4. (K900) SENSOR GROUND CIRCUIT OPEN

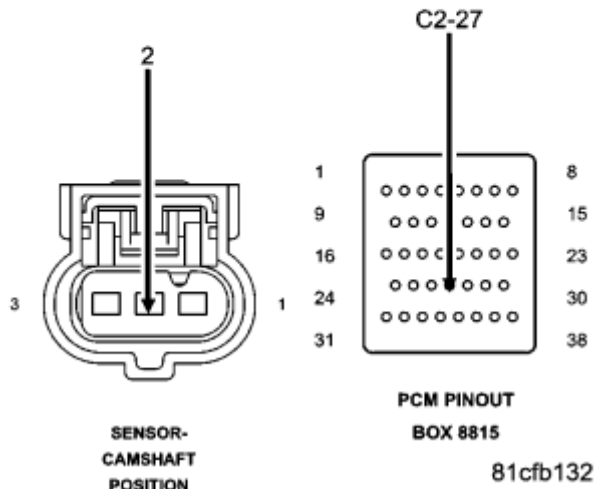


Fig. 100: Measuring The Resistance Of The Sensor Ground Circuit From The CMP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K900) Sensor ground circuit from the CMP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K900) Sensor ground circuit.
Perform **POWERTRAIN VERIFICATION TEST**.

5. **(K44) CMP SIGNAL SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT**

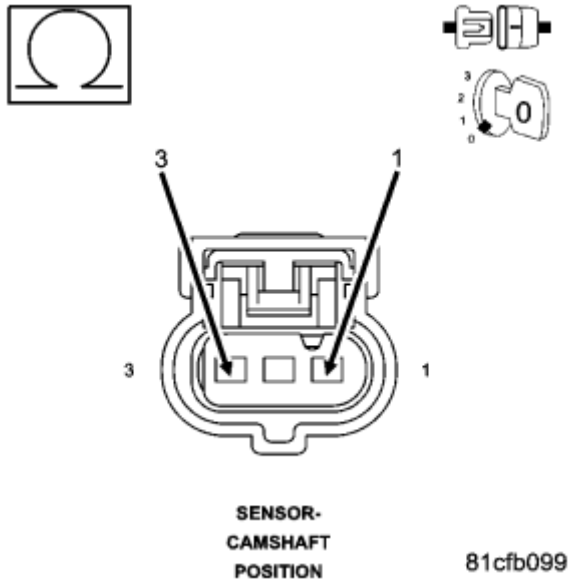


Fig. 101: Measuring The Resistance Between The CMP Signal Circuit And The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (K44) CMP Signal circuit and the (K857) 5-volt Supply circuit in the CMP Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K44) CMP Signal circuit and the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **CAMSHAFT POSITION SENSOR**

NOTE: **Inspect the Camshaft sprocket for damage per the Service Information. If a problem is found repair as necessary.**

Verify that there is good pin to terminal contact in the CKP Sensor and the Powertrain Control Module connectors.

If there are no possible causes remaining, view repair.

Repair

If no problems were found in the connectors, replace the Camshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K44) CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE

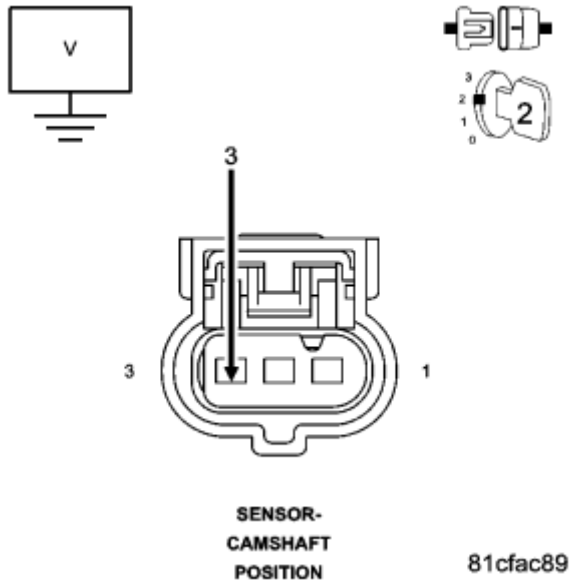


Fig. 102: Measuring The Voltage On The CMP Signal Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K44) CMP Signal circuit in the CMP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K44) CMP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K44) CMP SIGNAL CIRCUIT OPEN

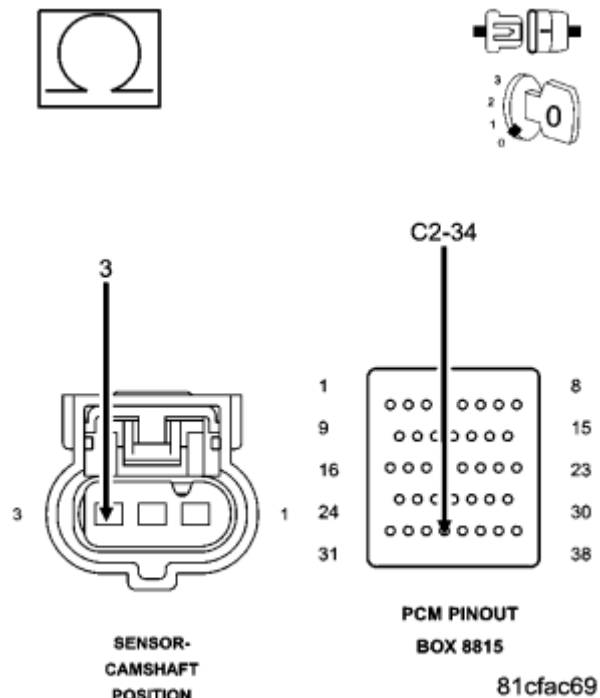


Fig. 103: Measuring The Resistance Of The CMP Signal Circuit From The CMP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K44) CMP Signal circuit from the CMP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K44) CMP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. (K44) CMP SIGNAL CIRCUIT SHORTED TO GROUND

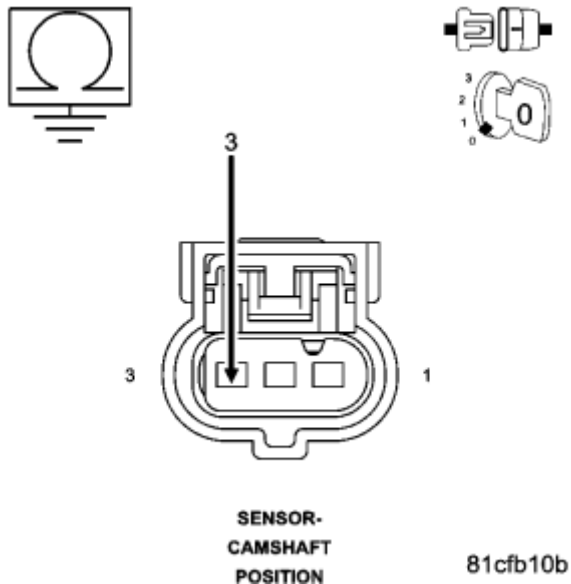


Fig. 104: Measuring The Resistance Between Ground And The CMP Signal Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K44) CMP Signal circuit in the CMP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K44) CMP Signal circuit
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**

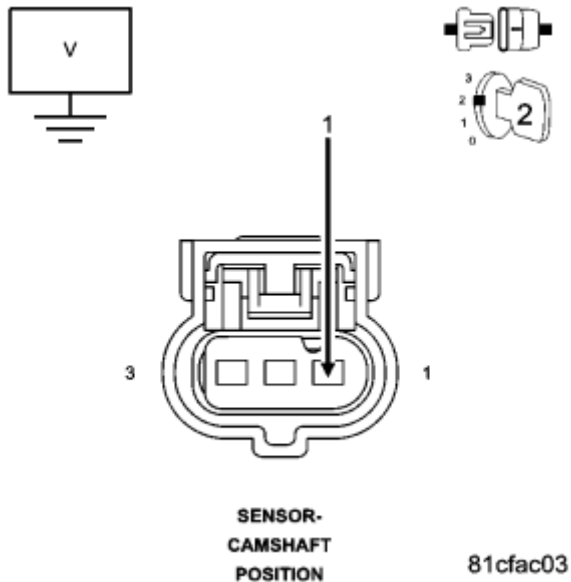


Fig. 105: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the CMP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **(K857) 5-VOLT SUPPLY CIRCUIT OPEN**

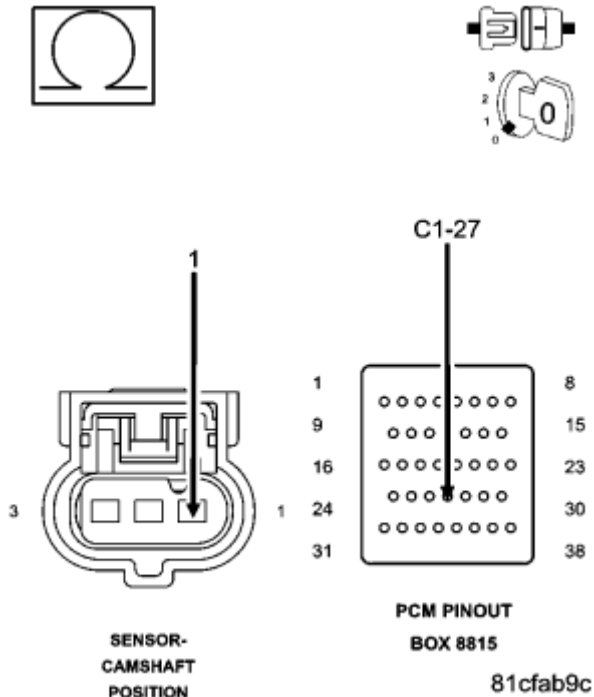


Fig. 106: Measuring The Resistance Of The 5-Volt Supply Circuit Between The CMP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit between the CMP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 12.

No

Repair the open in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

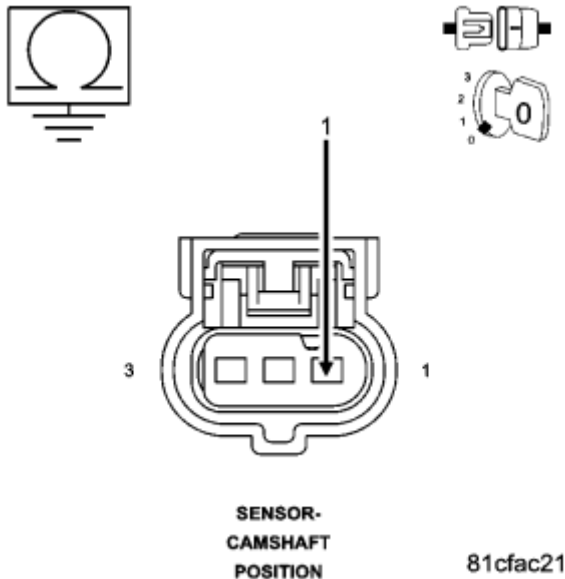


Fig. 107: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the CMP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **ERRATIC CMP SIGNAL**

With a lab scope probe and the Miller special tool #6801, back probe the (K44) CMP Signal circuit in the CMP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap the Camshaft Position Sensor.

Observe the lab scope screen.

Allow the engine to idle.

Observe the lab scope screen.

Did the CMP Sensor generate any erratic pulses?

Yes

Verify that there is good pin to terminal contact in the CMP Sensor and the Powertrain Control Module connectors. If OK, replace the Camshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **ERRATIC CKP SIGNAL**

Turn the ignition off.

With a lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the CKP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap on the Crankshaft Position Sensor.

Observe the lab scope screen.

Allow the engine to idle.

Observe the lab scope screen.

Did the CKP Sensor generate any erratic pulses?

Yes

Verify that there is good pin to terminal contact in the CKP Sensor and the Powertrain Control Module connectors. If OK, replace the Crankshaft Position Sensor.

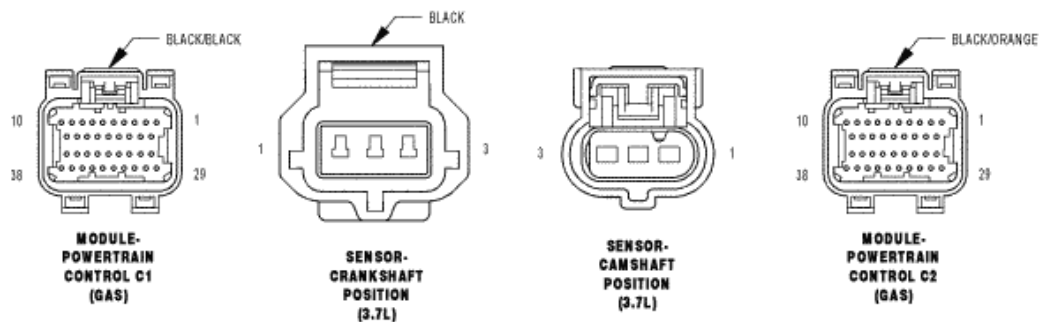
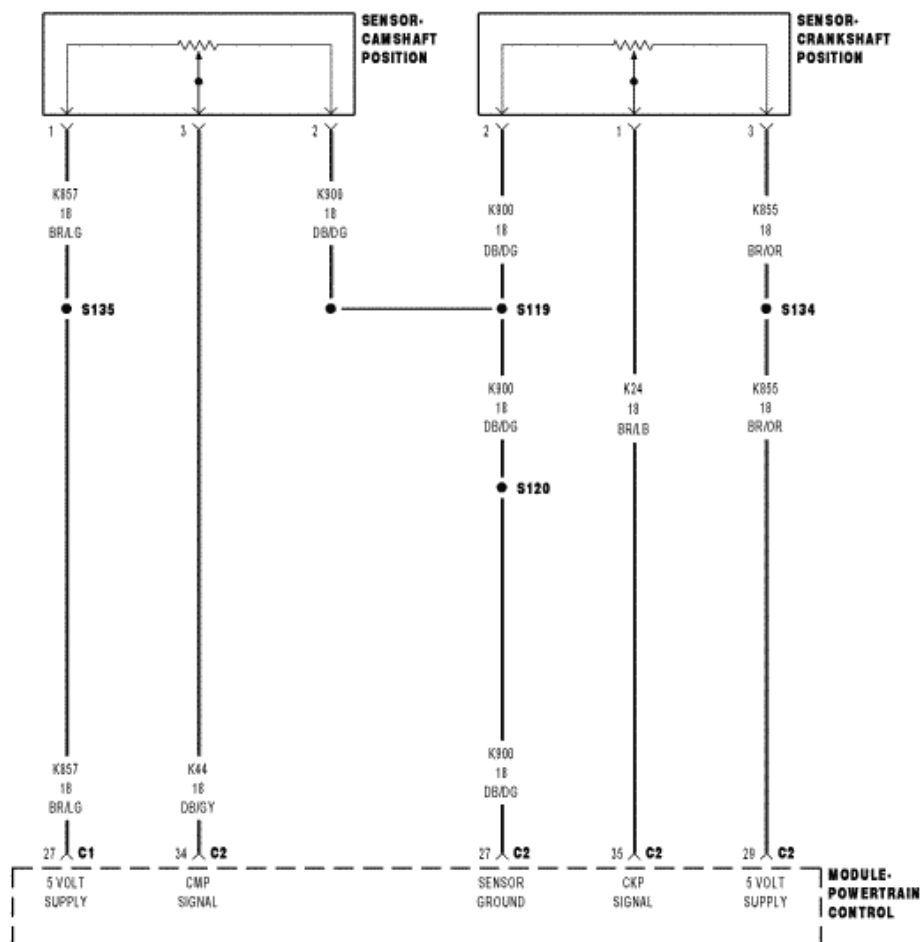
Perform **POWERTRAIN VERIFICATION TEST** .

No

The condition that originally set this DTC is no longer present. Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

P0344-CAMSHAFT POSITION SENSOR INTERMITTENT

CIRCUIT SCHEMATIC



01c1a8a3

Fig. 108: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While cranking the engine and engine running.

SET CONDITIONS

- Set Condition:

When the failure counter reaches 20. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT OPEN
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K44) CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K44) CMP SIGNAL CIRCUIT OPEN
(K44) CMP SIGNAL CIRCUIT SHORTED TO GROUND
(K44) CMP SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT
TONE WHEEL/PULSE RING
CAMSHAFT POSITION SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CHECKING CAMSHAFT POSITION SENSOR SIGNAL WITH A LAB SCOPE**

Turn the ignition off.

With a lab scope probe and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the CMP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Observe the lab scope screen.

Start the engine.

Observe the lab scope screen.

Are there any irregular or missing signals?

Yes

Go To 3.

No

Go To 8.

3. **WIRE HARNESS INSPECTION**

Turn the ignition off.

Visually inspect the related wire harness including the ground circuit. Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Camshaft Position Sensor and the Powertrain Control Module connectors.

Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, or corroded terminals.

Make sure the Crankshaft Position Sensor and the Camshaft Position Sensor are properly installed and the mounting bolt(s) are torqued to the proper specification.

Refer to any TSBs that may apply.

Were any of the above conditions present?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K857) 5-VOLT SUPPLY CIRCUIT OPEN OR SHORTED TO GROUND

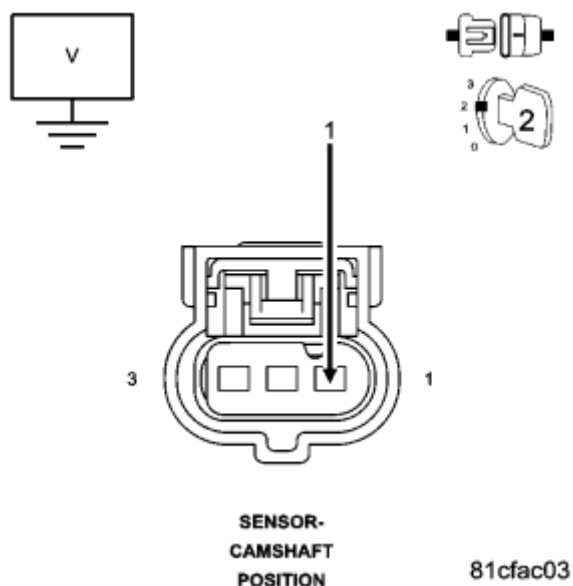


Fig. 109: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Disconnect the CMP Sensor connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the CMP harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 5.

No

Repair the open or short to ground in the (K857) 5-volt Supply circuit. Use Miller special tool #8815 when checking for an open circuit to prevent PCM harness connector terminal damage.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **TONE WHEEL/PULSE RING INSPECTION**

Turn the ignition off.

Carefully disconnect the Battery Ground cable.

Remove the Camshaft Position Sensor.

Inspect the Tone Wheel/Pulse Ring for damage, foreign material, or excessive movement.

Were any problems found?

Yes

Repair or replace the Tone Wheel/Pulse Ring as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **CHECKING CRANKSHAFT POSITION SENSOR SIGNAL WITH A LAB SCOPE**

NOTE: **An intermittent condition in the Crank Position Sensor can cause the P0344 to set.**

Install the CMP Sensor and connect the Battery cable.

With a lab scope probe and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the CKP harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Wiggle the related wire harness and lightly tap on the Crankshaft Position Sensor.

Observe the lab scope screen.

Start the engine.

Observe the lab scope screen.

Are there any irregular or missing signals?

Yes

Verify that there is good pin to terminal contact in the Crankshaft Position Sensor and the Powertrain Control Module connectors. If OK, replace the Crankshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. CAMSHAFT POSITION SENSOR

If there are no possible causes remaining, view repair.

Repair

Verify that there is good pin to terminal contact in the Camshaft Position Sensor and the Powertrain Control Module connectors. If OK, replace the Camshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (K44) CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE

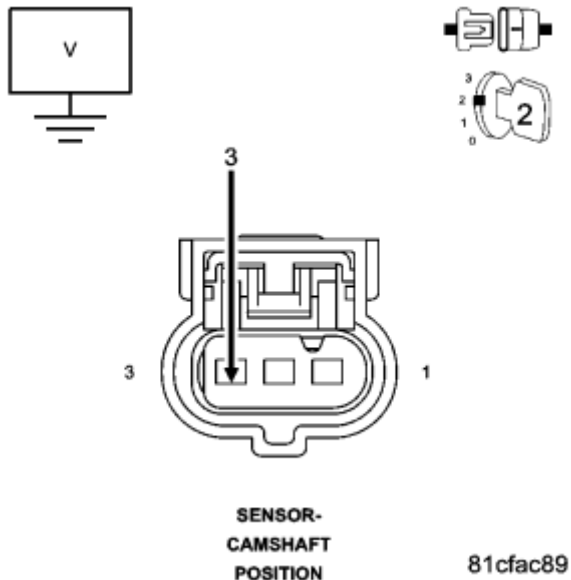


Fig. 110: Measuring The Voltage On The CMP Signal Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the CMP Sensor connector.

Disconnect the C1 and C2 PCM harness connectors.

Ignition on, engine not running.

Measure the voltage on the (K44) CMP Signal circuit.

Wiggle the related wire harness while taking this measurement.

Is there any voltage present?

Yes

Repair the short to voltage in the (K44) CMP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (K44) CMP SIGNAL CIRCUIT OPEN

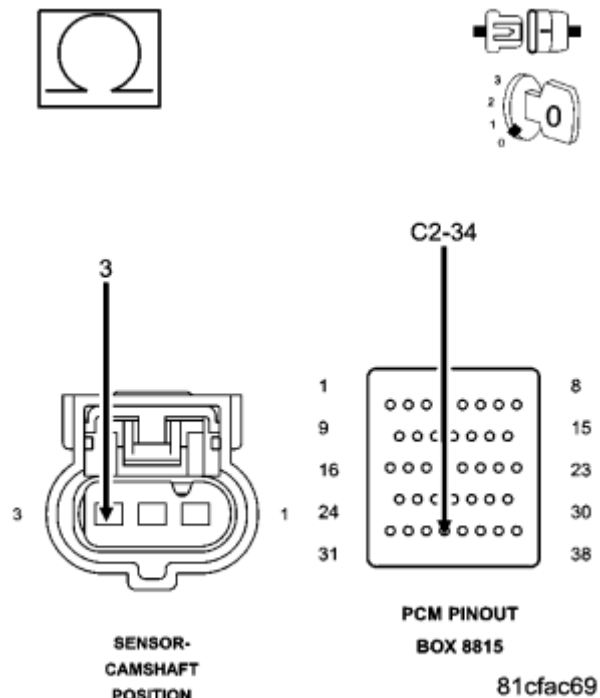


Fig. 111: Measuring The Resistance Of The CMP Signal Circuit From The CMP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance in the (K44) CMP Signal circuit from the CMP harness connector to the appropriate terminal of special tool #8815.

Wiggle the related wire harness while taking this measurement.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (K44) CMP Signal circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

10. **(K44) CMP SIGNAL CIRCUIT SHORTED TO GROUND**

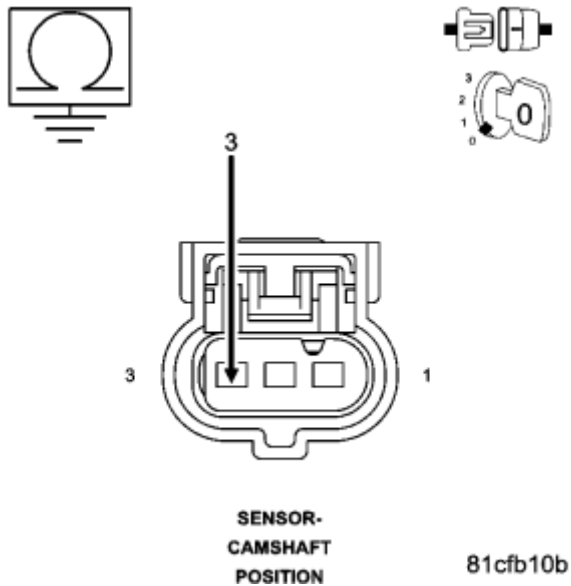


Fig. 112: Measuring The Resistance Between Ground And The CMP Signal Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K44) CMP Signal circuit in the CMP Sensor harness connector.

Wiggle the related wire harness while monitoring the resistance value.

Does the resistance ever go below 100 ohms?

Yes

Repair the short to ground in the (K44) CMP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **(K44) CMP SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT**

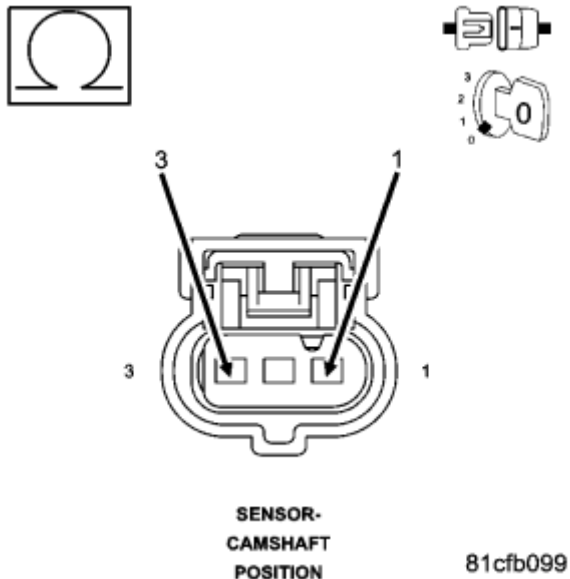


Fig. 113: Measuring The Resistance Between The CMP Signal Circuit And The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (K857) 5-volt Supply circuit and the (K44) CMP Signal circuit in the CMP harness connector.

Wiggle the related wire harness while taking this measurement.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K857) 5-volt Supply circuit and the (K44) CMP Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the CMP Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Camshaft Position Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0401-EGR SYSTEM PERFORMANCE

CIRCUIT SCHEMATIC

Exhaust gas recirculation is a method of reducing emissions of oxides of nitrogen. As the inert exhaust gas is recirculated, the mixture absorbs heat in the combustion chamber without interacting with the fuel/air mixture and reduces the formation of NOx emissions. After the EGR monitor conditions are met, the EGR valve is turned on and off momentarily. The EGR monitor calculated the difference in engine roughness from the EGR off condition to the EGR condition. This engine combustion stability difference as measured by engine roughness is the measure of a functional EGR system.

MONITOR CONDITIONS

When Monitored:

Engine running for greater than two minutes with the Engine Coolant Temp greater than 70° C (158° F).
EGR active. Less than 8500 feet. Ambient temperature greater than -6° C (20° F).

SET CONDITIONS

- **Set Condition:**

The PCM closes the EGR valve while monitoring the O2 Sensor signal. Once a closed EGR fueling sample has been established the PCM then ramps in EGR and additional fueling while monitoring the O2 sensor signal in the open state. A fueling sample is again established. The PCM then compares the different O2 Sensor signal readings (fueling samples). If a larger than expected variation is detected, a soft failure is recorded. Three soft failures set a one trip failure. After two failed trips, a DTC is set and the MIL is illuminated.

POSSIBLE CAUSES

Possible Causes
(Z904) EGR SOLENOID GROUND CIRCUIT OPEN
(K35) EGR SOLENOID CONTROL CIRCUIT SHORTED TO GROUND
(K35) EGR SOLENOID CONTROL CIRCUIT SHORTED TO VOLTAGE
(K35) EGR SOLENOID CONTROL CIRCUIT OPEN
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose and repair any EGR circuit DTCs before continuing with this procedure.**

Turn the ignition on.

With the scan tool, select View DTCs. Copy DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. ROUGH IDLE OR STALLING AT IDLE

Turn the ignition off.

Turn all accessories off.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Does the engine run rough or stall at idle?

Yes

Go To 3.

No

Go To 5.

3. **EGR VALVE ASSEMBLY CONTROL CIRCUIT**

Turn the ignition off.

Disconnect the EGR Valve Assembly harness connector.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Does the engine continue to run rough or stall with the EGR Valve Assembly connector disconnected?

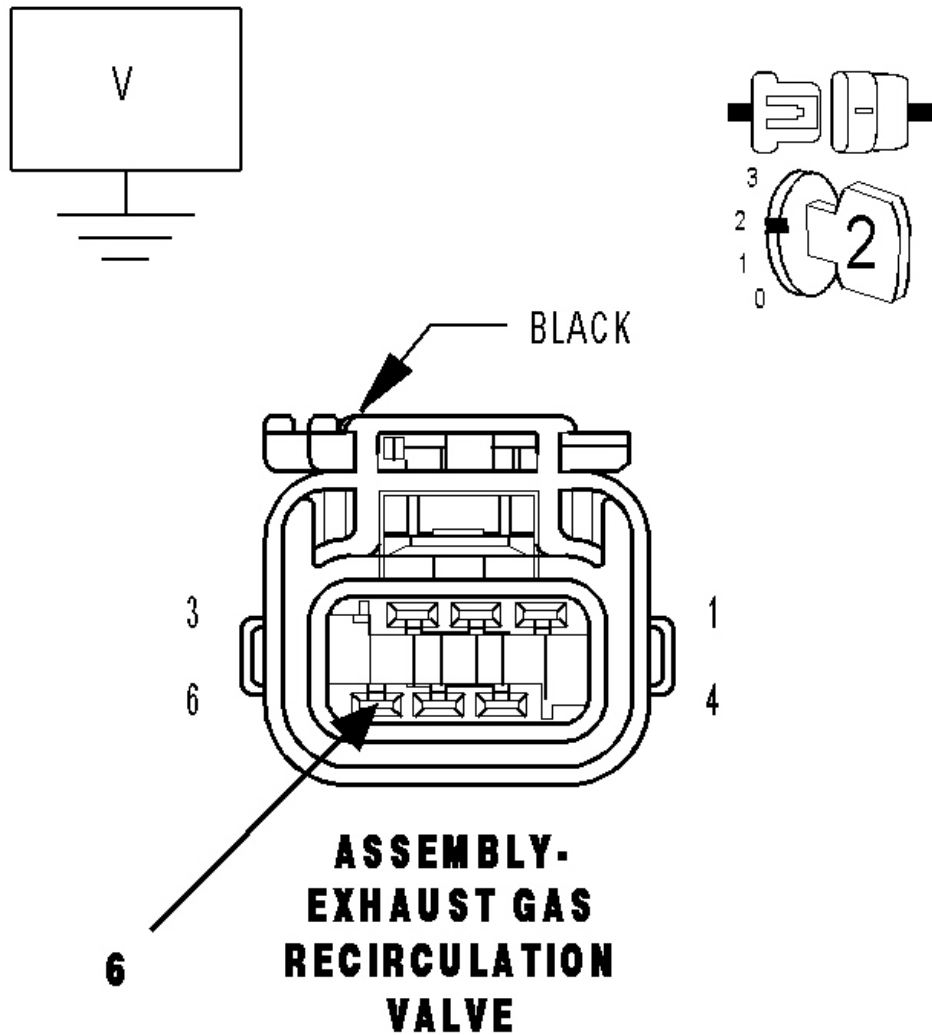
Yes

Go To 8.

No

Go To 4.

4. **(K35) EGR SOLENOID CONTROL CIRCUIT SHORTED TO VOLTAGE**



8134659a

Fig. 115: Checking EGR Solenoid Control Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Disconnect the EGR Solenoid harness connector.

Ignition on, engine not running.

Measure the voltage on the (K35) EGR Solenoid Control circuit in the EGR Solenoid connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K35) EGR Solenoid Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

5. **EGR SYSTEM TEST**

Turn all accessories off.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, perform the EGR System Test.

Select OPEN to open the EGR valve.

Did the engine run rough or stall when the valve was opened during the system test?

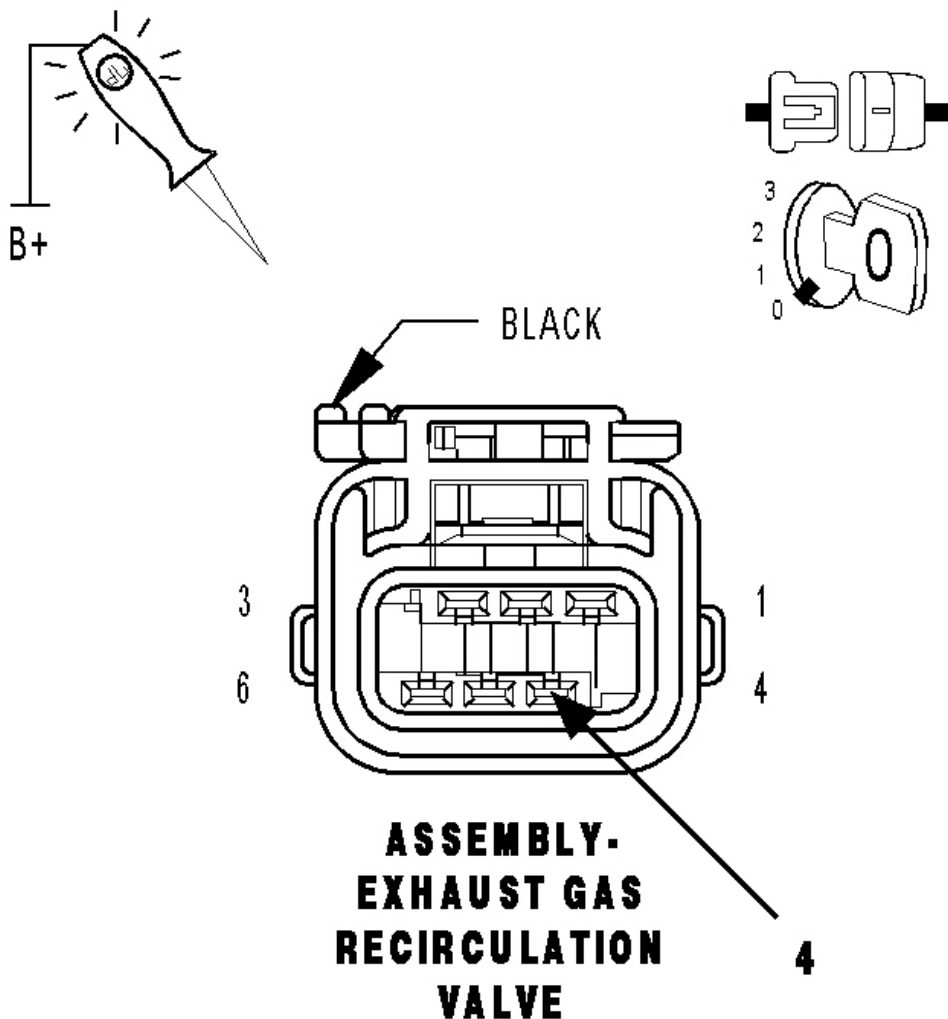
Yes

Go To 8.

No

Go To 6.

6. **(Z904) EGR SOLENOID GROUND CIRCUIT OPEN**



8134651e

Fig. 116: Checking EGR Solenoid Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to battery voltage, probe the (Z904) EGR Solenoid ground circuit in the EGR Solenoid harness connector.

Does the 12-volt test light illuminate brightly?

Yes

Go To 7.

No

Repair the open in the (Z904) EGR Solenoid ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K35) EGR CONTROL CIRCUIT HIGH RESISTANCE

Turn the ignition off.

Connect the EGR Valve Assembly connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K35) EGR Control circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, perform the EGR System Test.

Select OPEN to open the EGR valve.

Monitor the circuit voltage on the voltmeter.

Is the voltage below 0.5 volts when the valve was opened during the system test?

Yes

Go To 8.

No

Repair the (K35) EGR Control circuit for excessive resistance.

Perform **POWERTRAIN VERIFICATION TEST** .

8. EGR VALVE ASSEMBLY

WARNING: The normal operating temperature of the EGR system is very high. Never work around or attempt to service any part of the EGR system until it has cooled.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Valve Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Inspect the EGR Valve Assembly for the following:

- Proper mounting, leaking gasket(s)
- Damaged, leaking, or obstructed EGR tube(s)
- Carbon build up on or near the EGR pintle or within passages.

Were any problem found?

Yes

Repair or replace the EGR system components as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the EGR Valve Assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Solenoid Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0403-EGR SOLENOID CIRCUIT

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

Engine running. Battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

The EGR solenoid control circuit is not in the expected state when requested to operate by the PCM. One Trip Fault.

POSSIBLE CAUSES

Possible Causes
(Z904) EGR SOLENOID GROUND CIRCUIT OPEN
(K35) EGR SOLENOID CONTROL CIRCUIT SHORTED TO VOLTAGE
(K35) EGR SOLENOID CONTROL CIRCUIT SHORTED TO GROUND
(K35) EGR SOLENOID CONTROL CIRCUIT OPEN
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, Clear DTCs in the Powertrain Control Module (PCM).

With the scan tool, actuate the EGR Valve Solenoid Duty Cycle to 79.9%.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go to 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K35) EGR CONTROL CIRCUIT SHORTED TO VOLTAGE

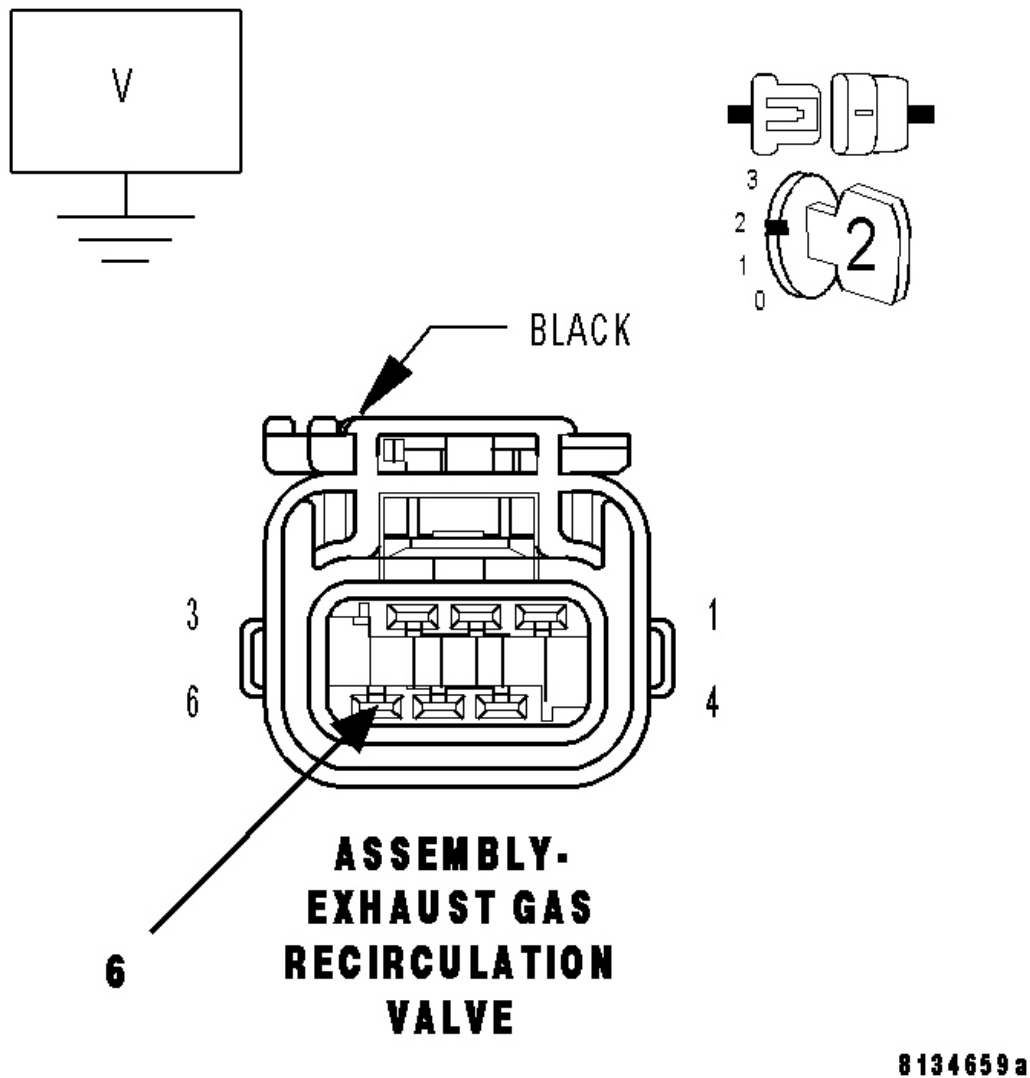


Fig. 118: Checking EGR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Valve Assembly connector.

Disconnect the C2 PCM harness connector.

Turn the ignition on.

Measure the voltage of the (K35) EGR Control circuit in the EGR Valve Assembly harness connector.

Is there any voltage present?

Yes

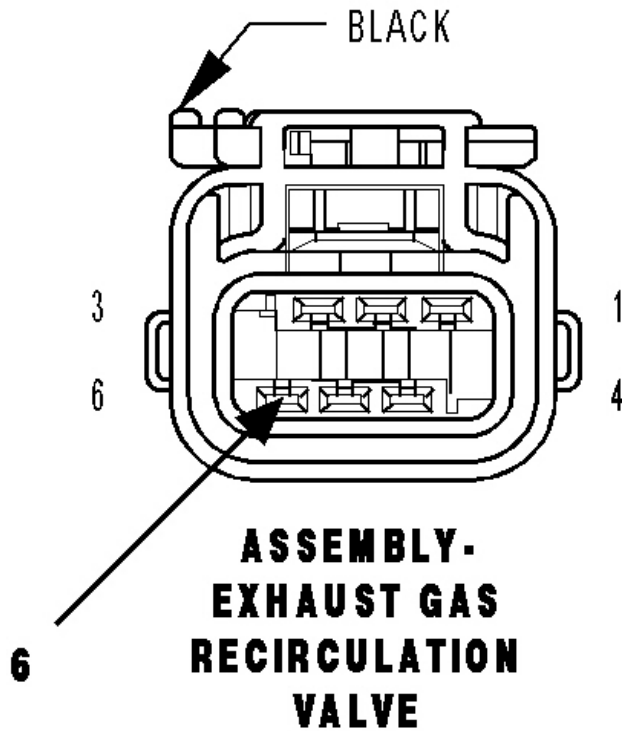
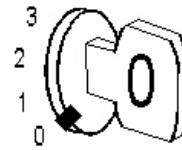
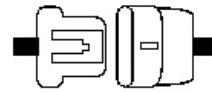
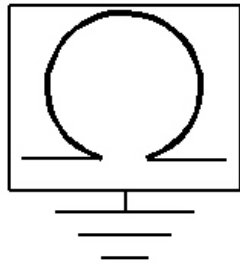
Repair the short to voltage in the (K35) EGR Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to 3.

3. (K35) EGR CONTROL CIRCUIT SHORTED TO GROUND



813465 ab

Fig. 119: Checking EGR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (K35) EGR Control circuit in the EGR Valve Assembly harness connector.

Is the resistance above 100 ohms?

Yes

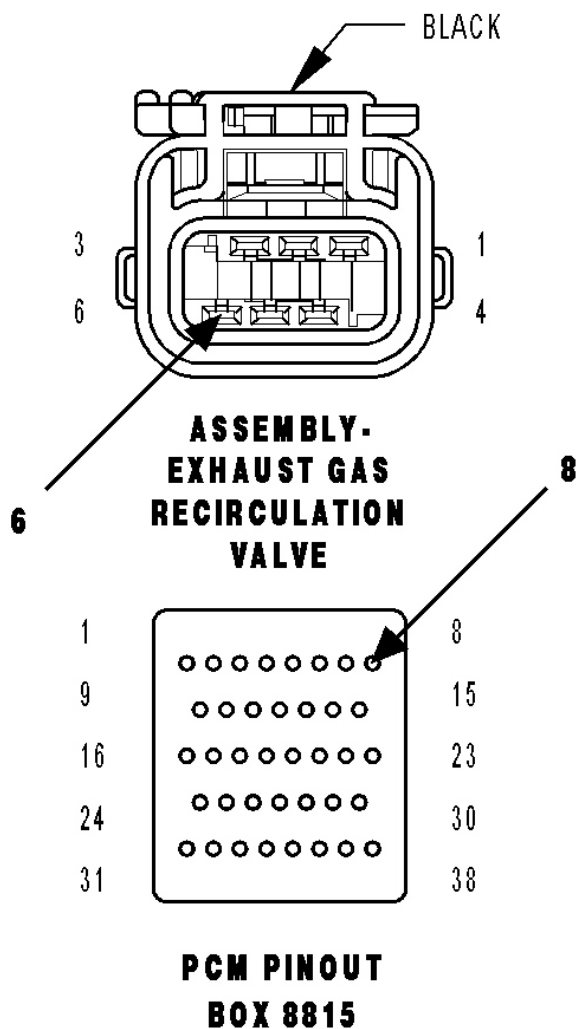
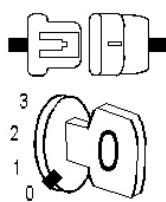
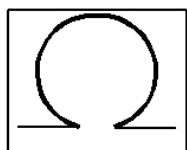
Go to 4.

No

Repair the short to ground in the (K35) EGR Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. **(K35) EGR CONTROL CIRCUIT OPEN OR HIGH RESISTANCE**



813465c1

Fig. 120: Checking EGR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K35) EGR Control circuit between the EGR Valve Assembly harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

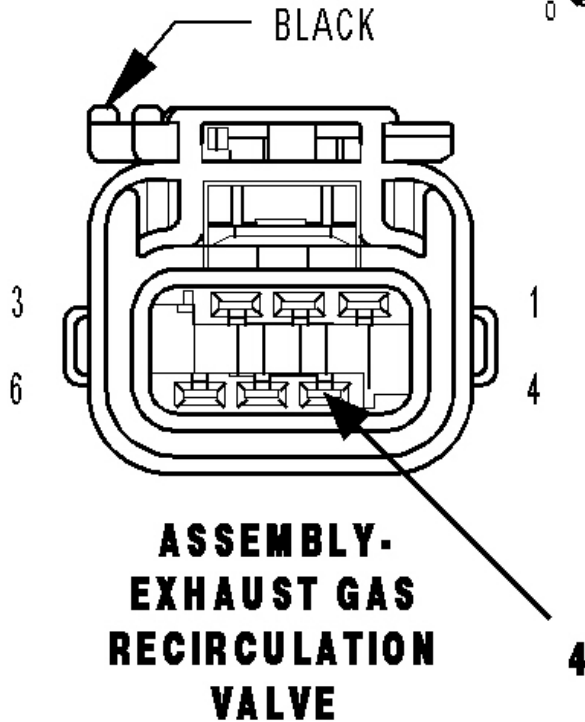
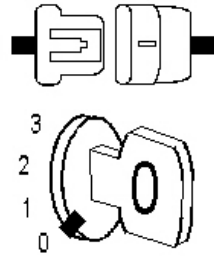
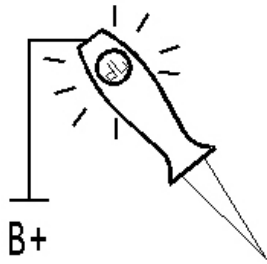
Go to 5.

No

Repair the excessive resistance in the (K35) EGR Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (Z904) GROUND CIRCUIT OPEN OR HIGH RESISTANCE



8134651e

Fig. 121: Checking EGR Solenoid Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12 volt test light connected to 12 volts, check the (Z904) Ground circuit in the EGR Valve Assembly harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 6.

No

Repair the (Z904) Ground circuit for an open circuit or high resistance.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EGR VALVE ASSEMBLY

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the EGR Valve Solenoid Duty Cycle.

Select the Duty Cycle reading of 79.9%

Using a 12 volt test light connected to ground, check the (K35) EGR Control circuit in the EGR Valve Assembly harness connector.

NOTE: If the DTC is active, the actuation test may not be allowed by the PCM. If may be necessary to clear the DTCs before starting the actuation.

NOTE: The voltage supplied to the solenoid circuit during the actuation may be less than battery voltage. The test light should be illuminated, but may not be as bright as a direct connection to the battery.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Is the test light illuminated during the actuation?

Yes

Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors. If OK, replace the EGR Valve Assembly in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to 7.

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Solenoid Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

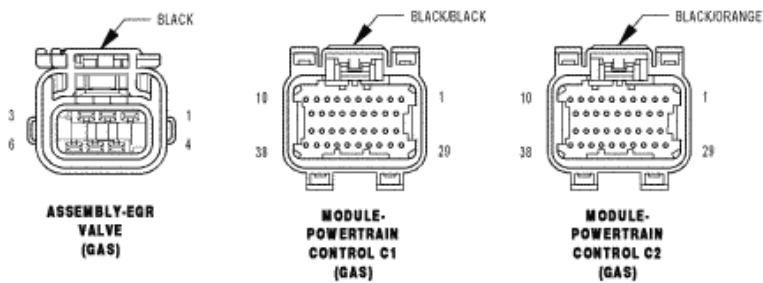
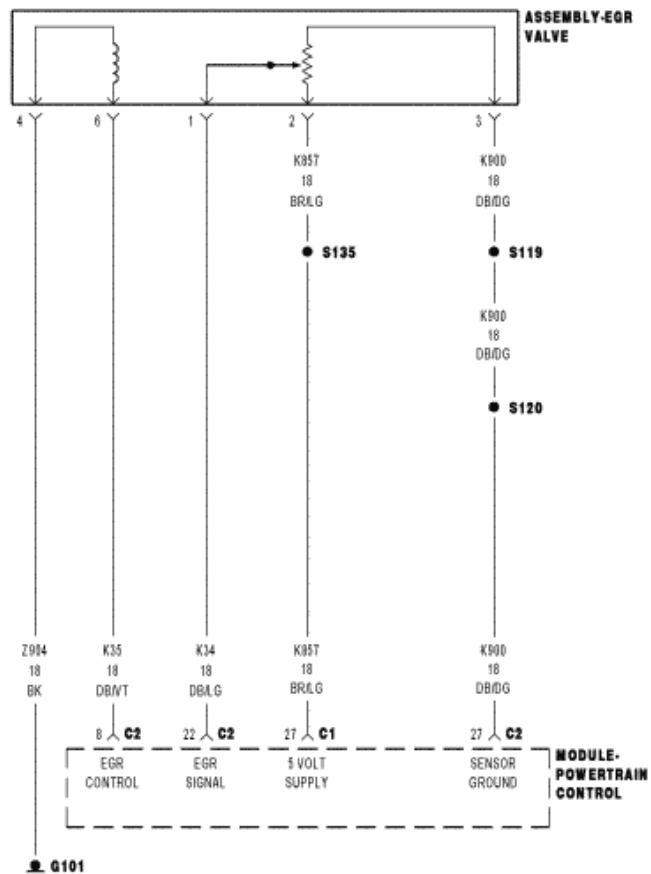
No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0404-EGR POSITION SENSOR RATIONALITY OPEN

CIRCUIT SCHEMATIC



810042a

Fig. 122: EGR System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The EGR valve has a position sensor and the EGR position rationality is designed to make sure that the valve moves freely within its operating range. Closed valve position reference check verifies that the valve is within its allowable upper and lower limits. The EGR position rationality test looks for a sustained error relative to commanded valve position.

MONITOR CONDITIONS

When Monitored:

Engine running.

SET CONDITIONS

- Set Condition:**

The EGR flow or valve movement is not what is expected. A rationality error has been detected fro the EGR Close Position Performance. Two trip fault.

POSSIBLE CAUSES

Possible Causes
(K34) EGR SIGNAL CIRCUIT HIGH RESISTANCE
(K857) 5 VOLT SUPPLY CIRCUIT HIGH RESISTANCE
(K35) EGR CONTROL CIRCUIT HIGH RESISTANCE
(K900) SENSOR GROUND CIRCUIT OPEN
(Z904) EGR SOLENOID GROUND CIRCUIT OPEN
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose and repair any EGR signal circuit high or low DTCs before continuing with this procedure.**

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear

loose clothing. Failure to follow these instructions can result in personal injury or death.

WARNING: The normal operating temperature of the EGR system is very high. Never work around or attempt to service any part of the EGR system until it has cooled.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K857) 5 VOLT SUPPLY CIRCUIT HIGH RESISTANCE

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K857) 5 Volt Supply circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine.

Is the voltage below 0.5 volts?

Yes

Go To 3.

No

Repair the excessive resistance in the (K857) 5 Volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K34) EGR SIGNAL CIRCUIT HIGH RESISTANCE

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K34) EGR Signal circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine.

Is the voltage below 0.5 volts?

Yes

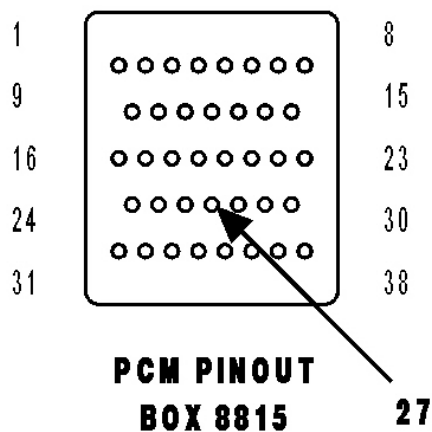
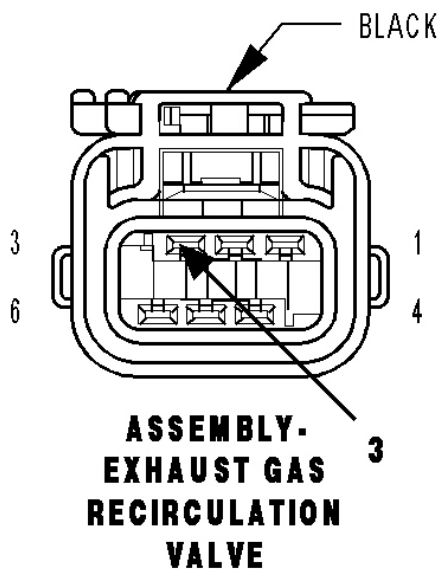
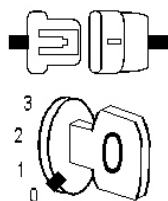
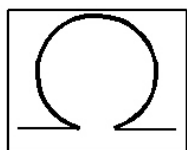
Go To 4.

No

Repair the excessive resistance in the (K34) EGR Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K900) SENSOR GROUND CIRCUIT HIGH RESISTANCE



8134699b

Fig. 123: Checking EGR Position Sensor Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K900) Sensor Ground circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine.

Is the voltage below 0.5 volts?

Yes

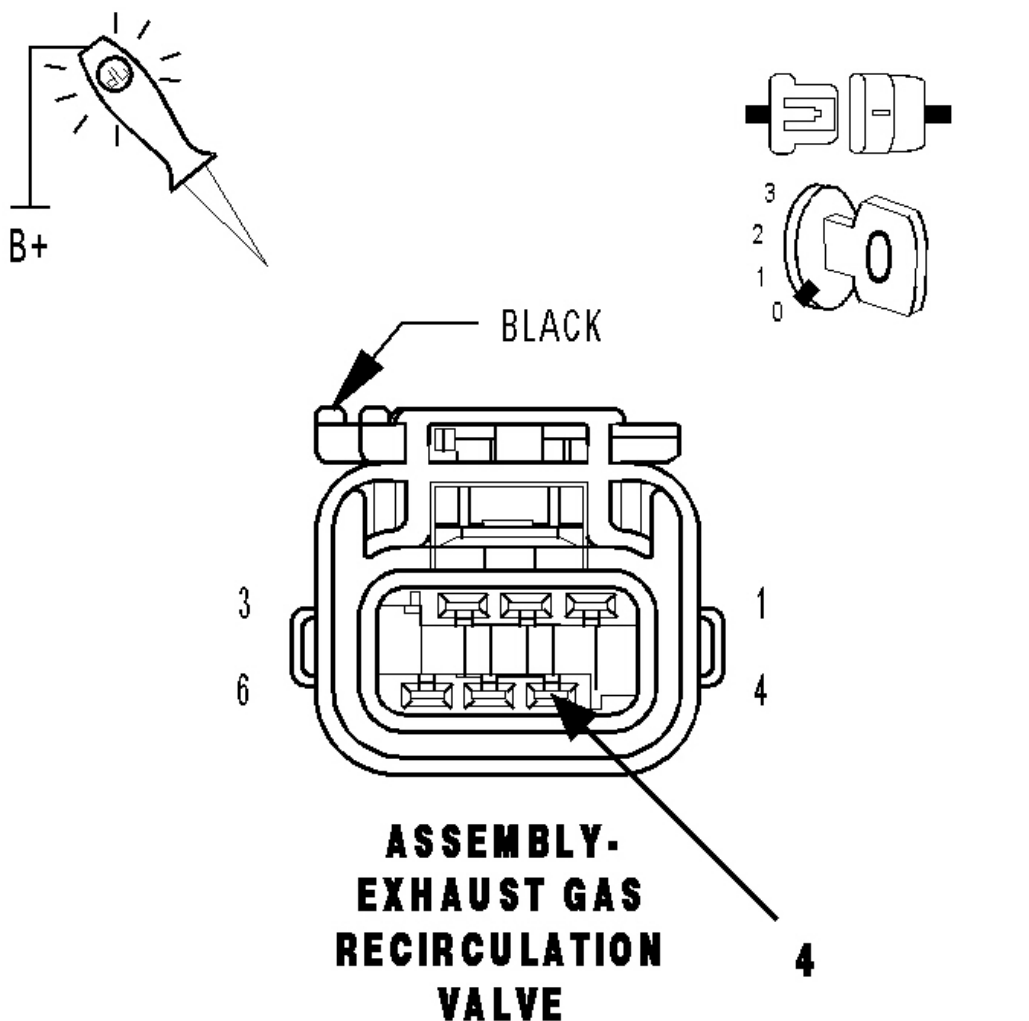
Go To 5.

No

Repair the excessive resistance in the (K900) Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(Z904) GROUND CIRCUIT OPEN OR HIGH RESISTANCE**



8134651e

Fig. 124: Checking EGR Solenoid Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Valve Assembly harness connector.

Using a 12 volt test light connected to the 12 volts, check the (Z904) Ground circuit in the EGR Valve Assembly harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to

that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go To 6.

No

Repair the excessive resistance in the (Z904) Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K35) EGR CONTROL CIRCUIT HIGH RESISTANCE

Turn the ignition off.

Connect the EGR Valve Assembly connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K35) EGR Control circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, perform the EGR System Test.

Select OPEN to open the EGR valve.

Monitor the circuit voltage on the voltmeter.

Is the voltage below 0.5 volts when the valve was opened during the system test?

Yes

Go To 7.

No

Repair the excessive resistance in the (K35) EGR Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EGR VALVE ASSEMBLY

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Valve Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair or replace the EGR system components as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the EGR Valve Assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

P0405-EGR POSITION SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage above 10.0 volts.

SET CONDITIONS

- Set Condition:

EGR Position Sensor Signal is less than the minimum acceptable value. One trip Fault.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K857) 5-VOLT SUPPLY CIRCUIT OPEN
(K34) EGR SIGNAL CIRCUIT SHORTED TO GROUND
(K34) EGR SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (K34) EGR SIGNAL CIRCUIT
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

WARNING: The normal operating temperature of the EGR system is very high. Never work around or attempt to service any part of the EGR system until it has cooled.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

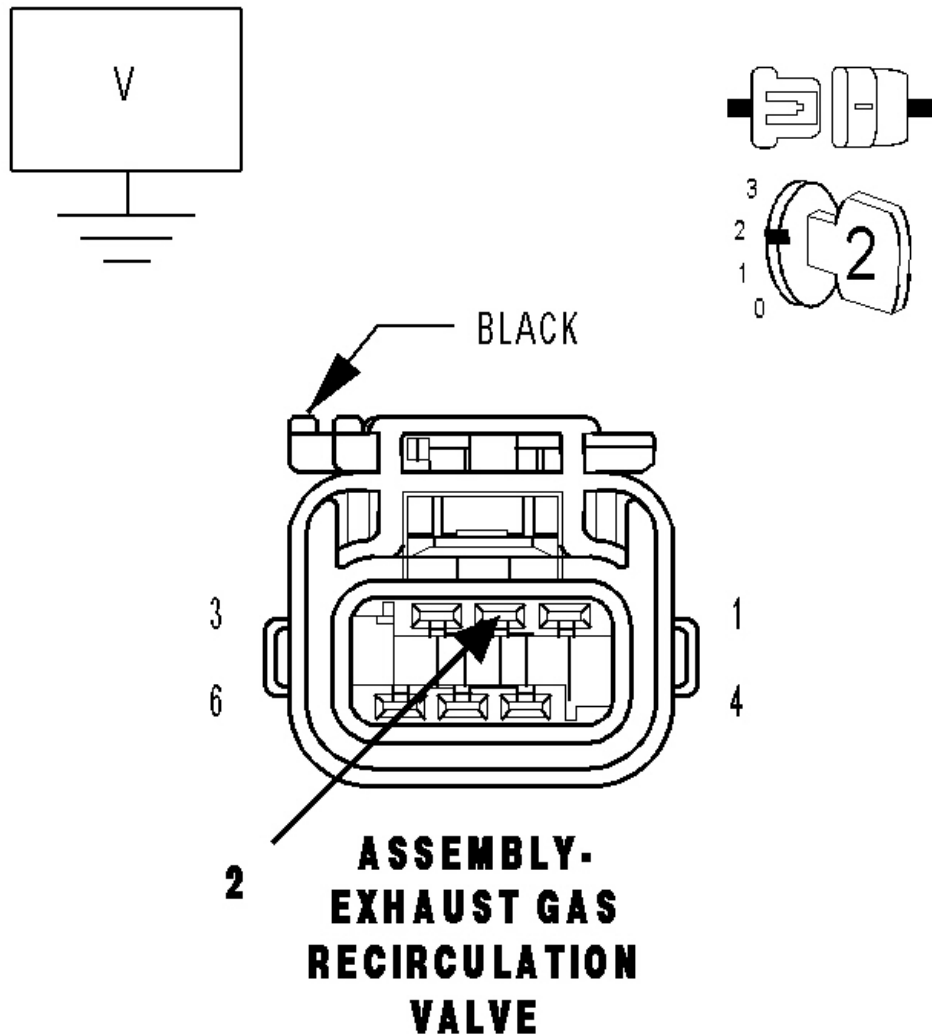
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K857) 5-VOLT SUPPLY CIRCUIT



813466b5

Fig. 126: Checking EGR Position Sensor 5-Volt Supply Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Solenoid harness connector.

Ignition on, engine not running.

Measure the voltage of the (K857) 5-volt Supply circuit in the EGR Solenoid harness connector.

Is the voltage between 4.5 to 5.2 volts?

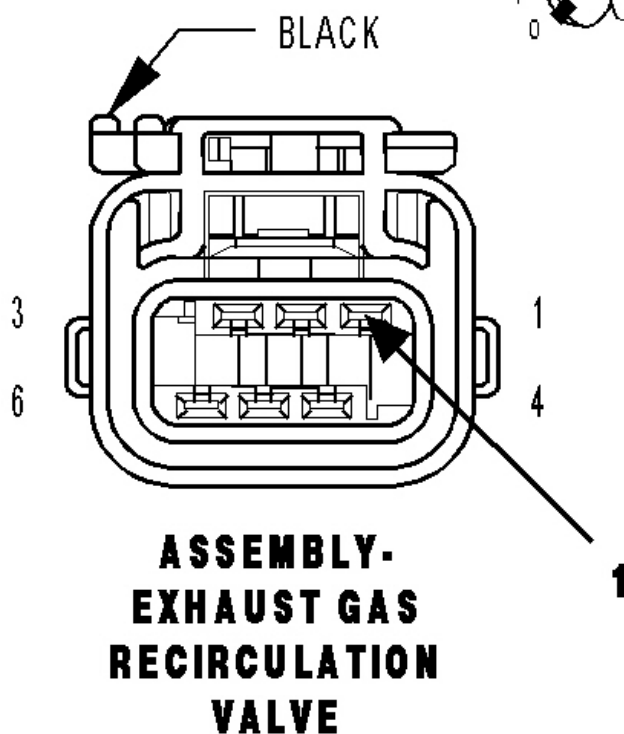
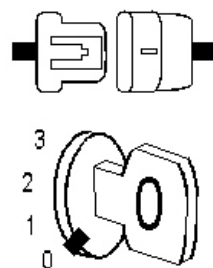
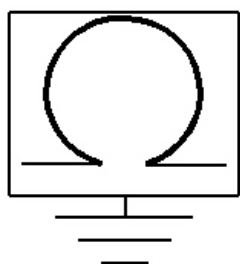
Yes

Go To 3.

No

Go To 7.

3. (K34) EGR POSITION SENSOR SIGNAL CIRCUIT SHORTED TO GROUND



813466ba

Fig. 127: Checking EGR Position Sensor Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K34) EGR Position Sensor Signal circuit in the EGR Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

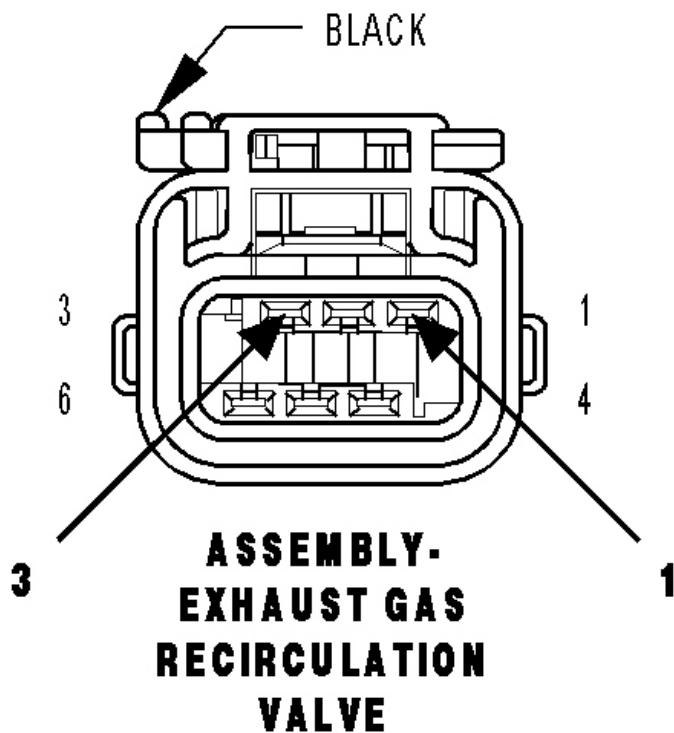
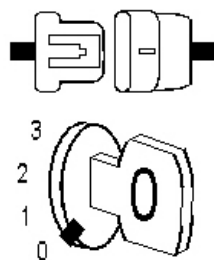
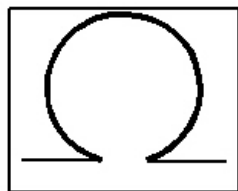
Repair the short to ground circuit in the (K34) EGR Position Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **(K34) EGR SENSOR SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT**



813466d0

Fig. 128: Checking EGR Position Sensor Signal Circuit & Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K34) EGR Position Sensor Signal circuit and (K900) Sensor ground circuit in the EGR Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K900) Sensor ground and the (K34) EGR Position Sensor Signal

circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (K34) EGR SIGNAL CIRCUIT

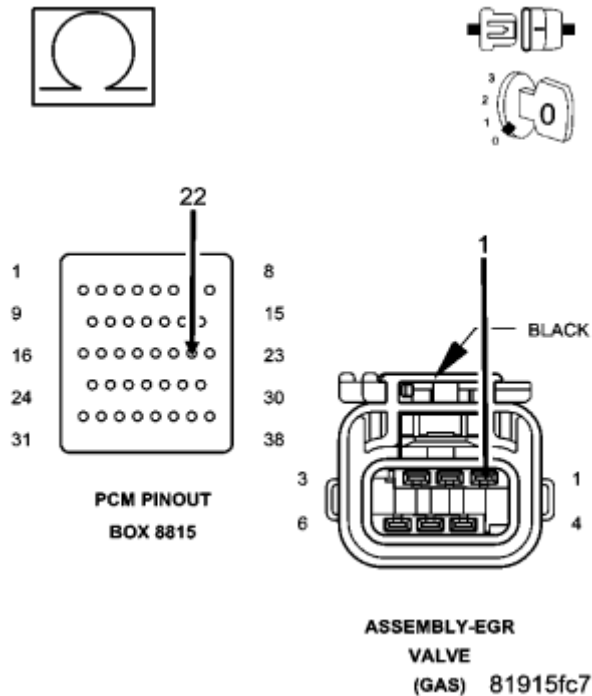


Fig. 129: Checking EGR Valve Signal Circuit For High Resistance
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K34) EGR Signal circuit between the Exhaust Gas Recirculation Valve harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K34) EGR Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **EXHAUST GAS RECIRCULATION VALVE**

Turn the ignition off.

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, read the Exhaust Gas Recirculation Valve signal voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

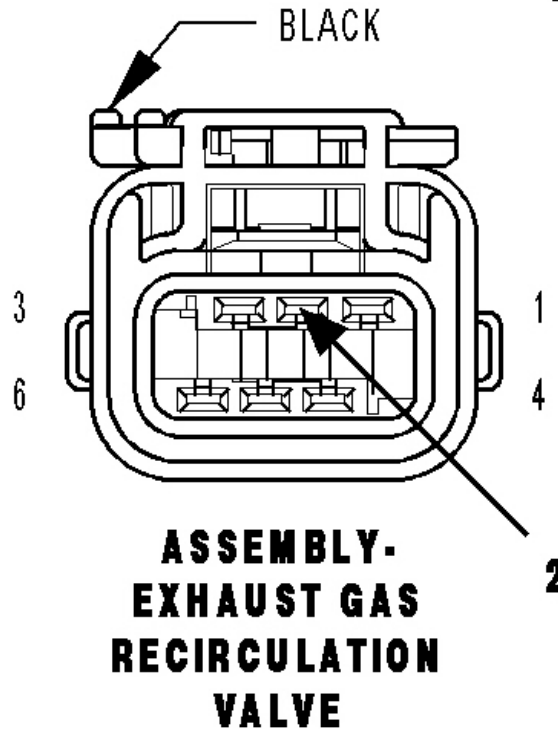
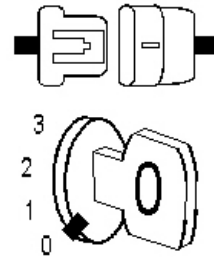
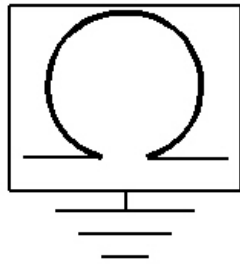
Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors. If OK, replace the EGR Valve Assembly in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

7. **(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**



813466e1

Fig. 130: Checking 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the EGR Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

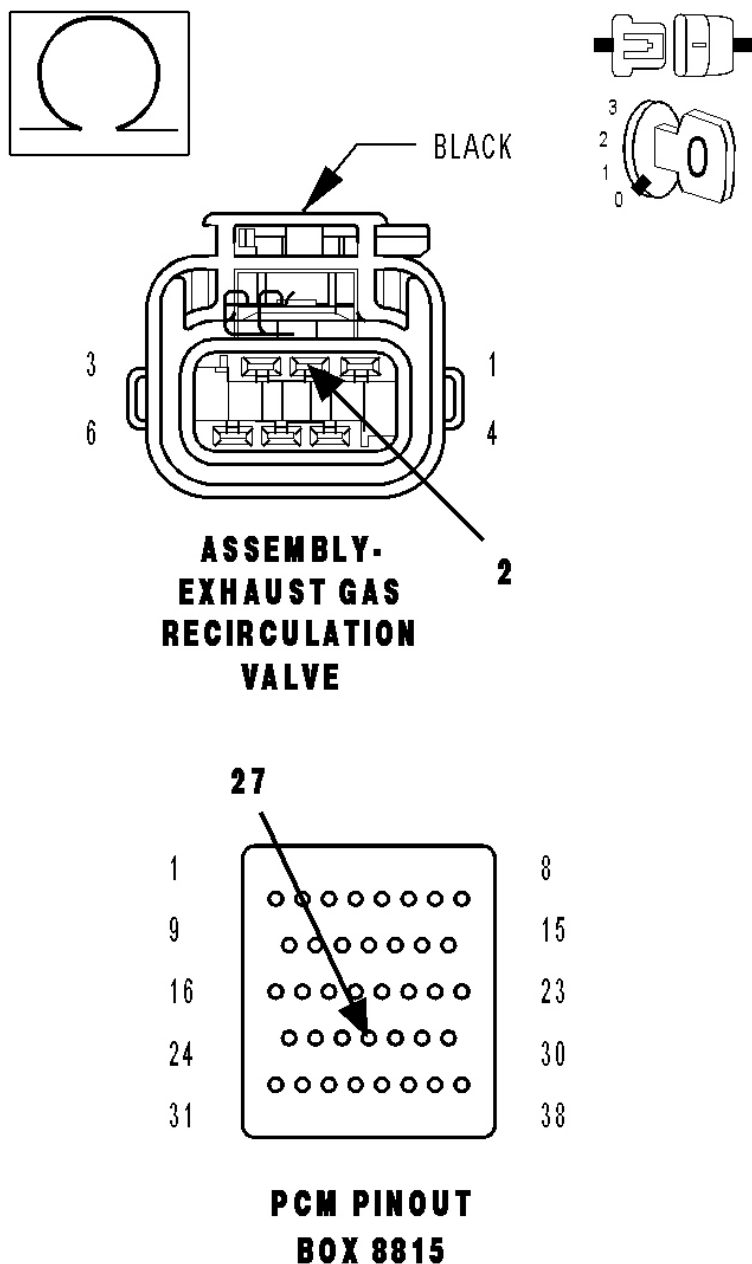
Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. **(K857) 5-VOLT SUPPLY CIRCUIT OPEN**



813466ec

Fig. 131: Checking EGR Position Sensor 5-Volt Supply Circuit
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the EGR Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Solenoid Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

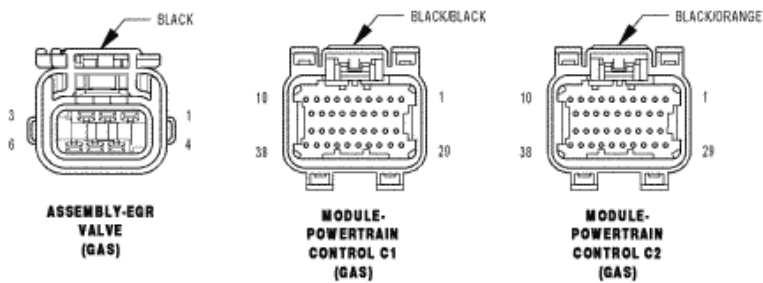
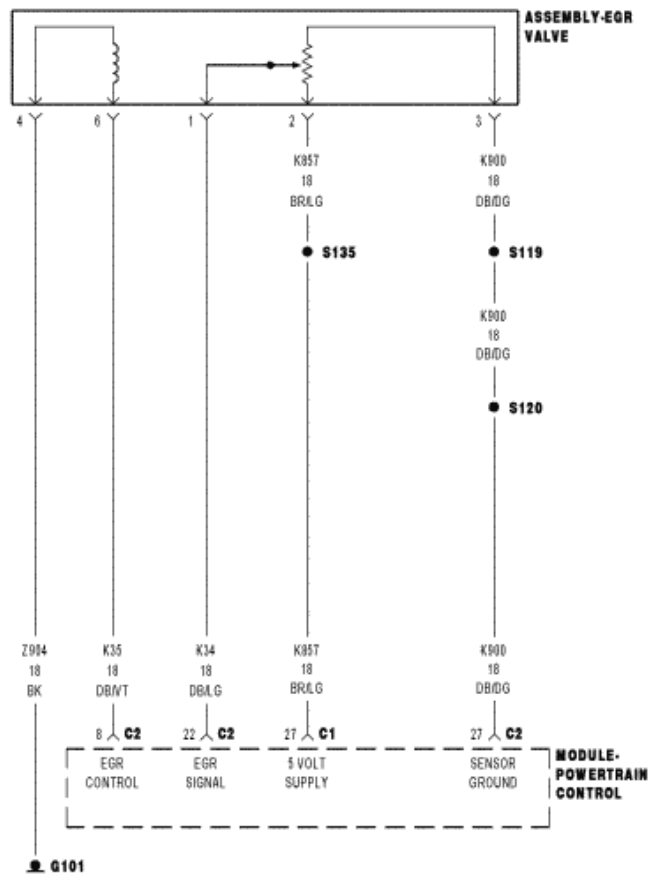
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0406-EGR POSITION SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



810042a

Fig. 132: EGR System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

EGR position sensor signal is greater than the maximum acceptable value. One trip Fault.

POSSIBLE CAUSES

Possible Causes
(K34) EGR POSITION SENSOR SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT
(K34) EGR POSITION SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K34) EGR POSITION SENSOR SIGNAL CIRCUIT OPEN
(K900) SENSOR GROUND CIRCUIT OPEN
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

WARNING: The normal operating temperature of the EGR system is very high. Never work around or attempt to service any part of the EGR system until it has cooled.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC

was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

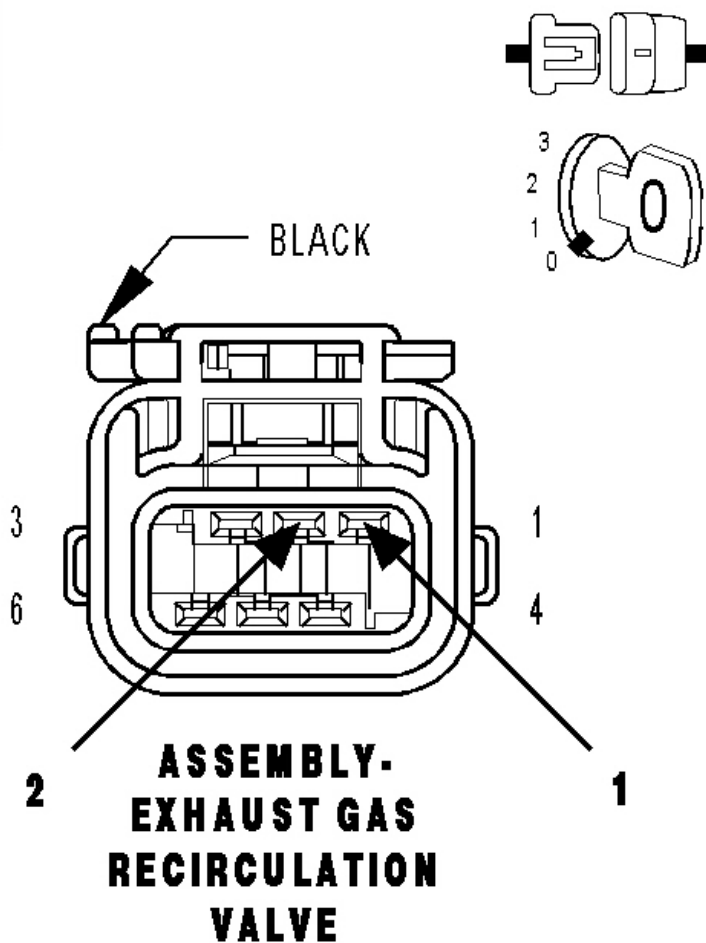
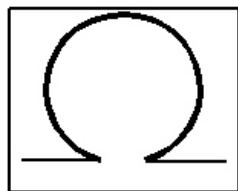
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K34) EGR POSITION SENSOR SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT**



8134693a

Fig. 133: Checking EGR Position Sensor Signal Circuit & 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Solenoid harness connector.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between the (K34) EGR Position Sensor Signal circuit and the (K857) 5-volt Supply circuit in the EGR Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

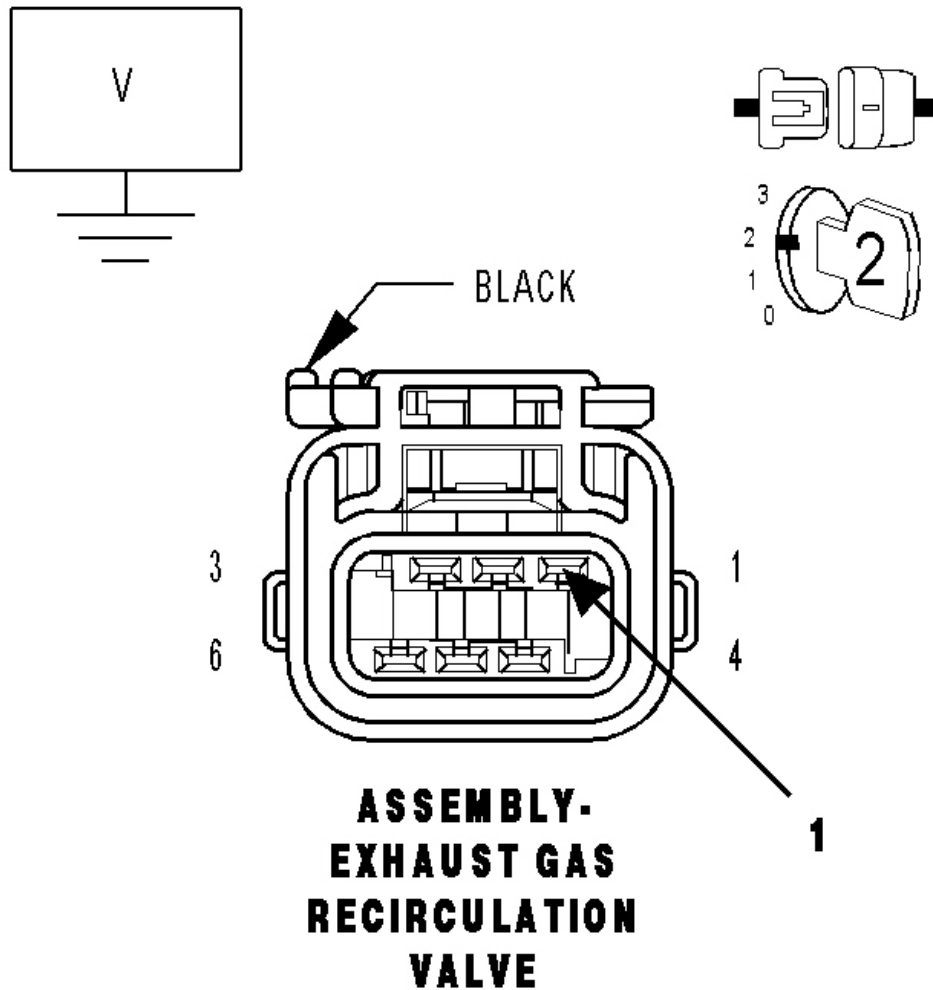
Repair the short between the (K34) EGR Position Sensor Signal circuit and the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K34) EGR POSITION SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE



8134696b

Fig. 134: Checking EGR Position Sensor Signal Circuit
 Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Measure the voltage on the (K34) EGR Sensor Signal circuit in the EGR Solenoid harness connector.

Is there any voltage present?

Yes

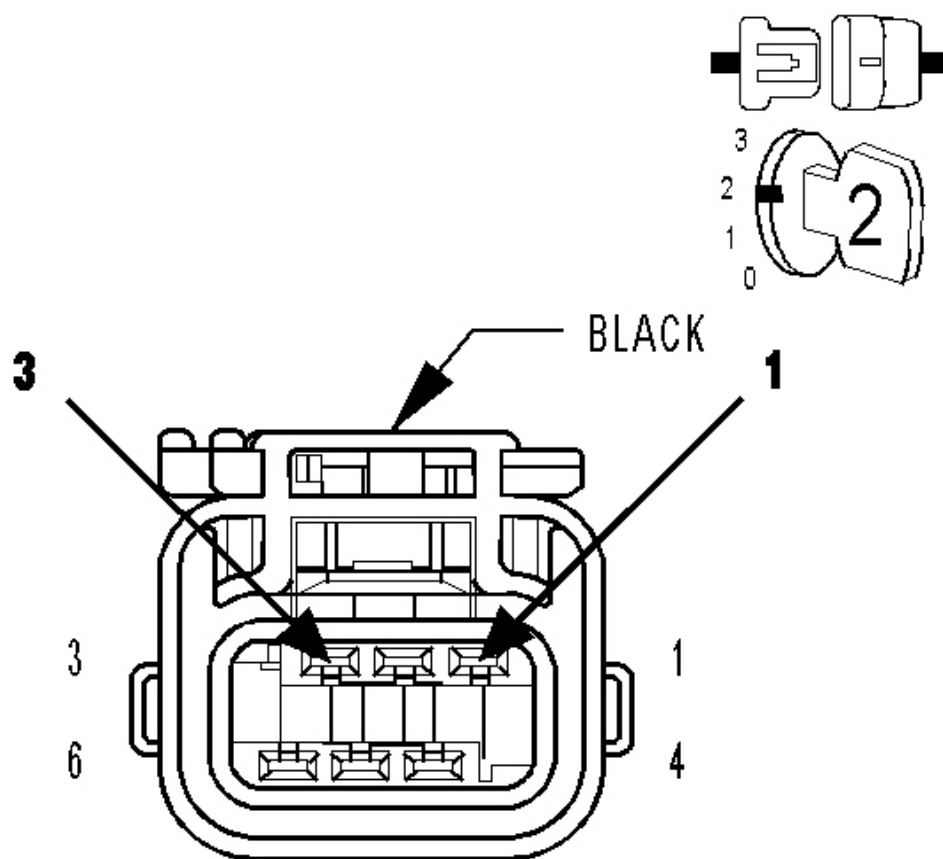
Repair the short to voltage in the (K34) EGR Position Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **EGR SOLENOID ASSEMBLY**



ASSEMBLY- EXHAUST GAS RECIRCULATION VALVE

81346972

Fig. 135: Checking EGR Solenoid Assembly
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the PCM harness connectors.

Ignition on, engine not running.

With the scan tool, monitor the EGR Position Sensor voltage.

Connect a jumper wire between the (K34) EGR Position Sensor Signal circuit and the (K900) Sensor ground circuit.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus .1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors. If OK, replace the EGR Valve Assembly in accordance with the Service Information.

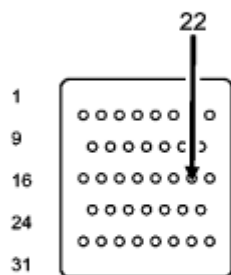
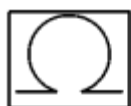
Perform **POWERTRAIN VERIFICATION TEST** .

No

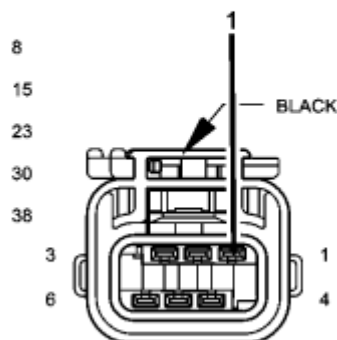
Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K34) EGR POSITION SENSOR SIGNAL CIRCUIT OPEN



PCM PINOUT
BOX 8815



ASSEMBLY-EGR
VALVE
(GAS) 81915fc7

Fig. 136: Checking EGR Valve Signal Circuit For High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K34) EGR Position Sensor Signal circuit from the EGR Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

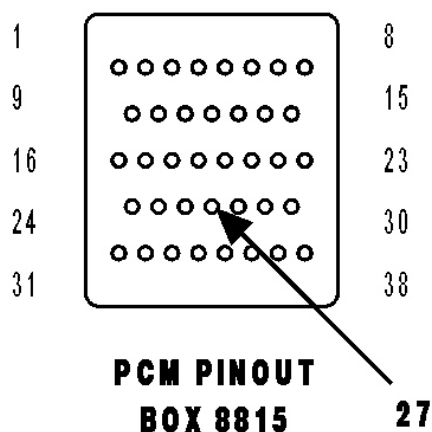
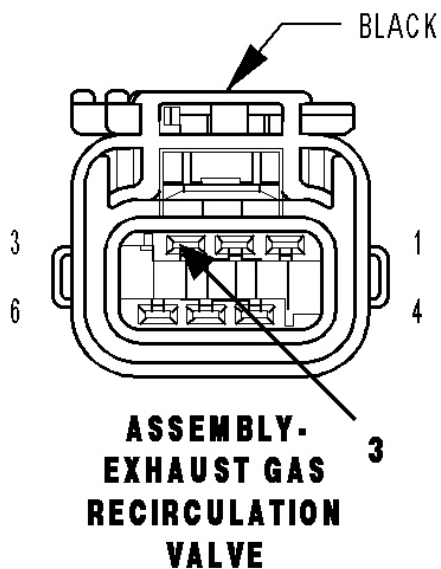
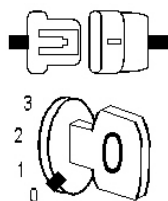
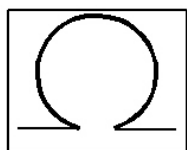
Go To 6.

No

Repair the open in the (K34) EGR Position Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K900) SENSOR GROUND CIRCUIT OPEN



8134699b

Fig. 137: Checking EGR Position Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the EGR Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 30 ohms?

Yes

Go To 7.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Solenoid Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P0571-BRAKE SWITCH 1 PERFORMANCE

CIRCUIT SCHEMATIC

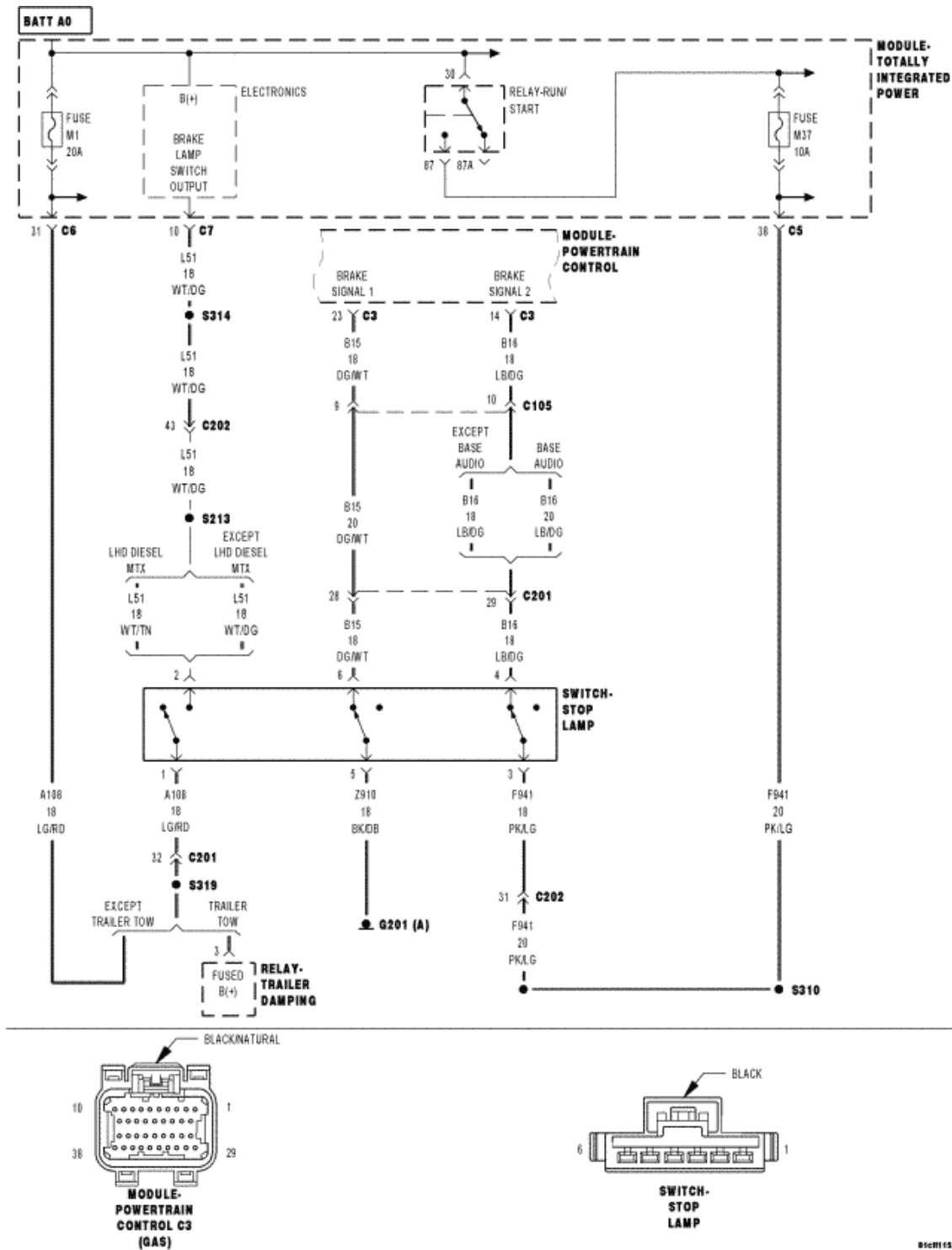


Fig. 1: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The brake switch rationality checks both failure modes of the brake switch. The brake switch stuck on test checks for a high vehicle speed condition where the brake switch is unexpectedly depressed. The brake switch stuck off test checks for repeated vehicle stop maneuvers without the brake switch depressed.

MONITOR CONDITIONS

When Monitored:

With the gear selector in drive, vehicle speed above a minimum value, and battery voltage greater than 10.4 volts.

SET CONDITIONS

- Set Condition:**

If the output of Brake Switch No.1 to the PCM looks like it is not applied, while Brake Lamp Switch Output circuit is applied the fault will mature in 60ms. One Trip Fault.

POSSIBLE CAUSES

Possible Causes
(B15) BRAKE SIGNAL 1 SHORTED TO GROUND
(B16) BRAKE SIGNAL 2 CIRCUIT OPEN
(B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND
(Z910) GROUND CIRCUIT OPEN
STOP LAMP SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: Make sure the Stop Lamp Switch is properly adjusted before continuing.

NOTE: Make sure the Stop Lamp Switch is properly wired, such as (B15) Brake Signal 1 and (B16) Brake Signal 2 circuit are not switched at the harness connector.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

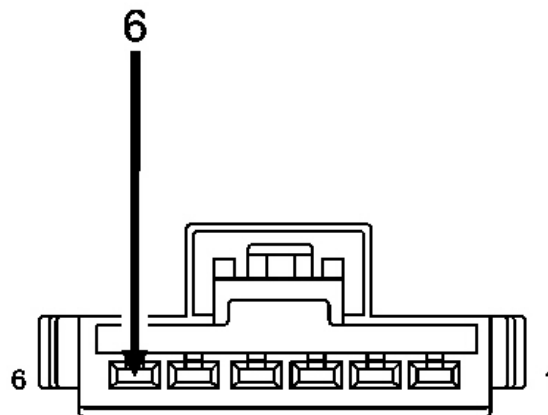
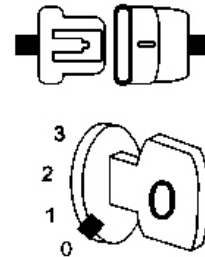
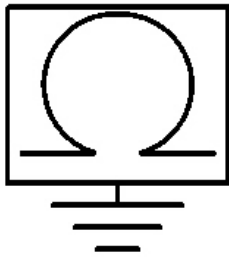
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (B15) BRAKE SIGNAL 1 SHORTED TO GROUND



**SWITCH-
STOP
LAMP**

81336c02

Fig. 2: Checking Brake Switch No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

NOTE: Inspect the related Fuse and Relay.

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connector.

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (B15) Brake Signal 1 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

Yes

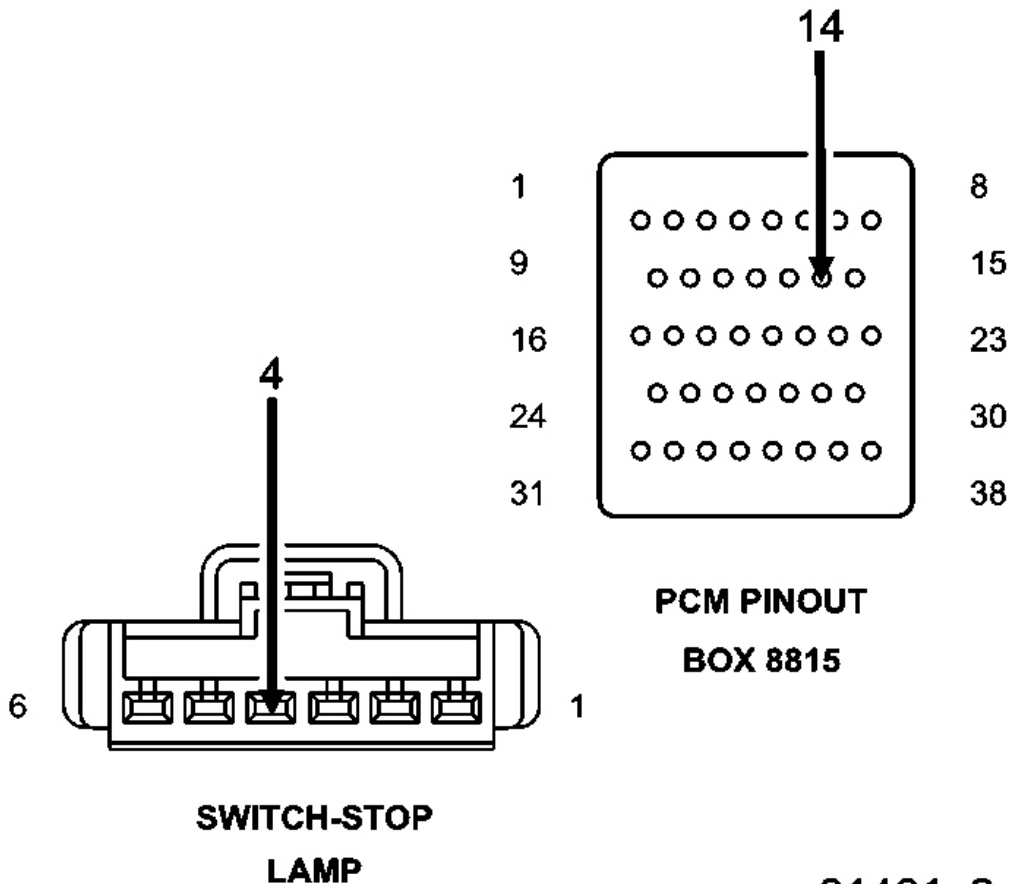
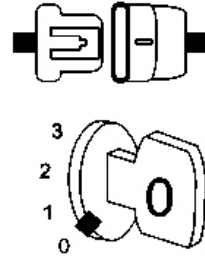
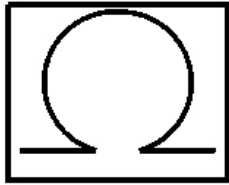
Repair the short to ground in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (B16) BRAKE SIGNAL 2 CIRCUIT OPEN



81461e2c

Fig. 3: Checking Brake Switch No. 2 Signal Circuit For Open
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (B16) Brake Signal 2 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

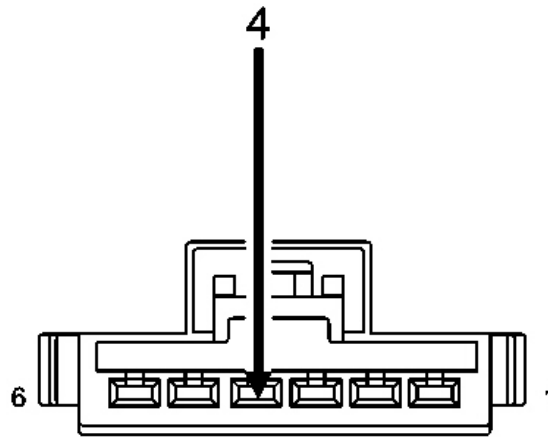
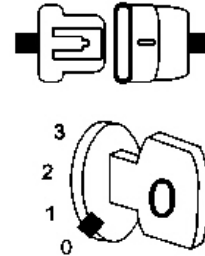
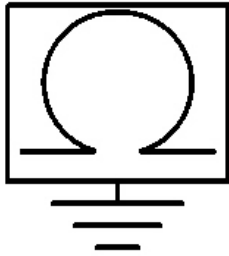
Go To 4.

No

Repair the open in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND



**SWITCH-
STOP
LAMP**

8144a4cd

Fig. 4: Checking Brake Switch No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

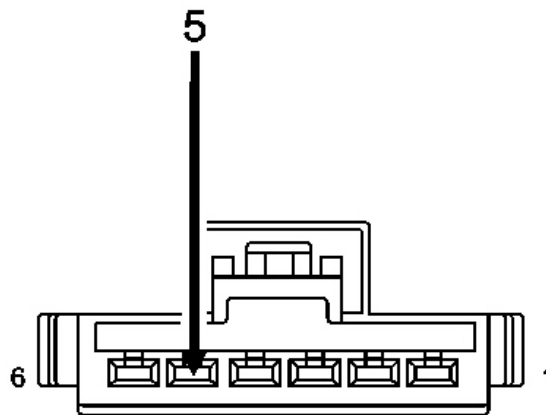
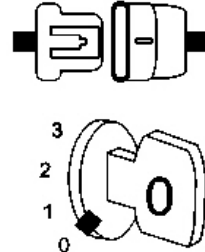
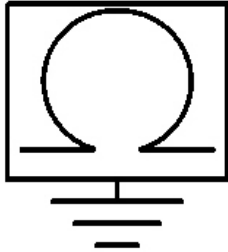
Yes

Repair the short to ground in the (B16) Brake Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 5.

5. (Z910) GROUND CIRCUIT OPEN



**SWITCH-
STOP
LAMP**

81336c3c

Fig. 5: Checking Brake Switch Ground Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (Z910) Ground circuit in the Stop Lamp Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (Z910) Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **STOP LAMP SWITCH**

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 terminal in the Stop Lamp Switch.

Next, measure the resistance between the (F941) Fused Ignition Switch circuit terminal and the (B16) Brake Signal 2 circuit terminal in the Stop Lamp Switch.

Apply and release the brake pedal while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit for one or both of the measurements taken?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors. If OK, replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0572-BRAKE SWITCH 1 STUCK ON

CIRCUIT SCHEMATIC

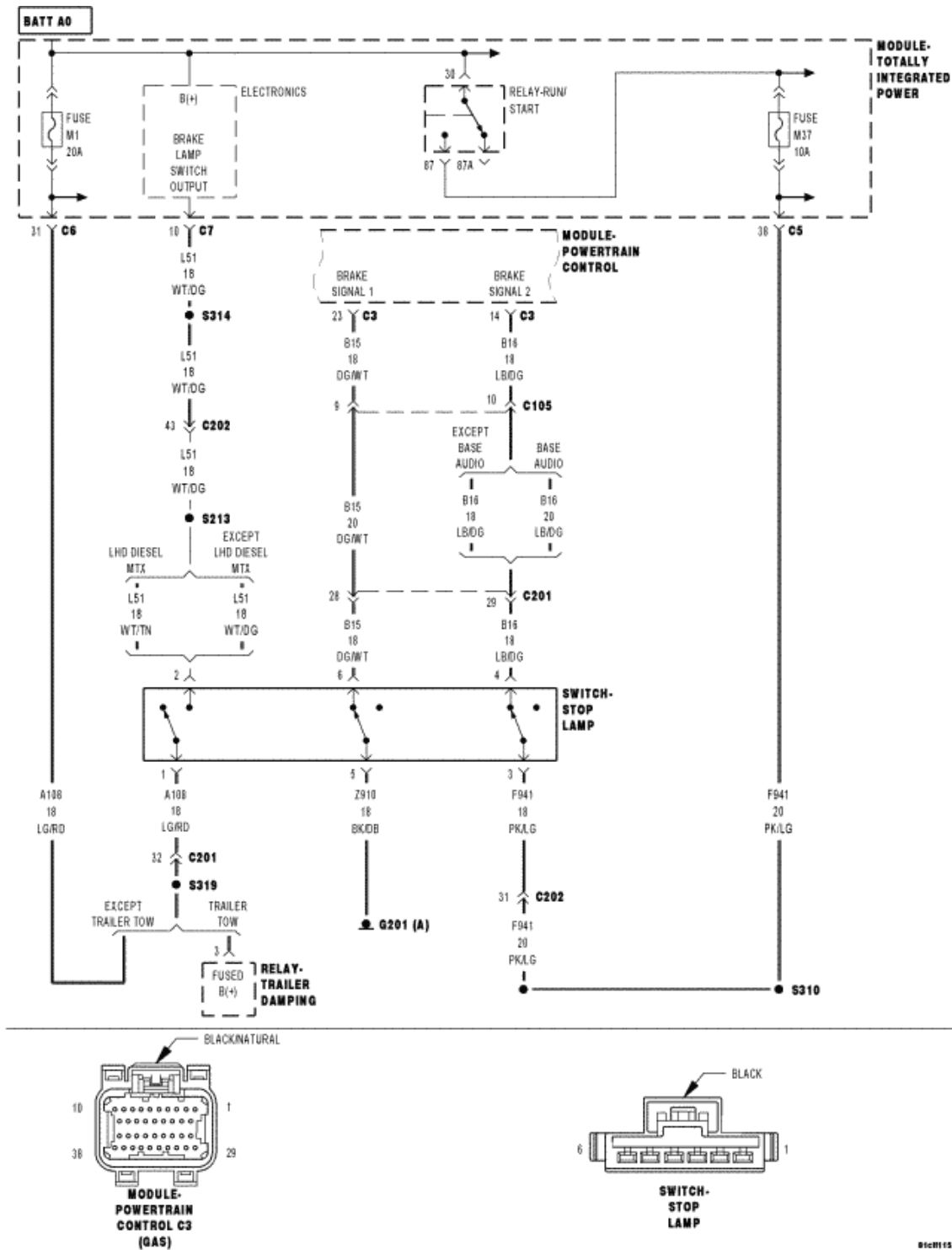


Fig. 6: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

When vehicle speed cycles from 0 kph to 48 kph (30 mph) at least 10 times.

SET CONDITIONS

- Set Condition:

When the PCM recognizes Brake Switch No.1 is mechanically stuck in the low/on position. Two Trip Fault. Three Global Good Trips to Clear.

POSSIBLE CAUSES

Possible Causes
(B15) BRAKE SIGNAL 1 CIRCUIT SHORTED TO GROUND
(B16) BRAKE SIGNAL 2 CIRCUIT OPEN
STOP LAMP SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Verify battery voltage is greater than 10 volts.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **STOP LAMP SWITCH**

NOTE: **Inspect the related Fuse and Relay.**

Turn the ignition off.

Remove the Stop Lamp Switch and disconnect the harness connector.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 terminal in the Stop Lamp Switch.

Measure the resistance between the (F941) Fused Ignition Switch circuit terminal and the (B16) Brake Signal 2 terminal in the Stop Lamp Switch.

Apply and release the stop lamp switch plunger while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit?

Yes

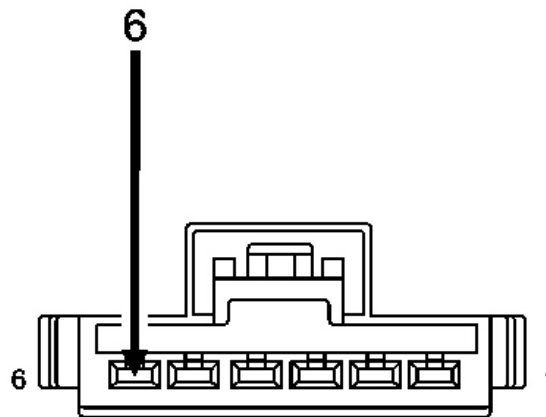
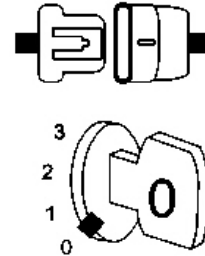
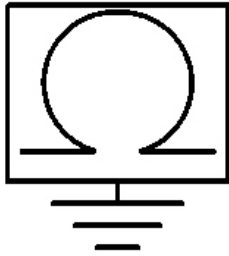
Go To 3.

No

Verify that there is good pin to terminal contact in the Switch and Control Module connectors. If OK, replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(B15) BRAKE SIGNAL 1 CIRCUIT SHORTED TO GROUND**



**SWITCH-
STOP
LAMP**

81336c02

Fig. 7: Checking Brake Switch No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (B15) Brake Signal 1 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

Yes

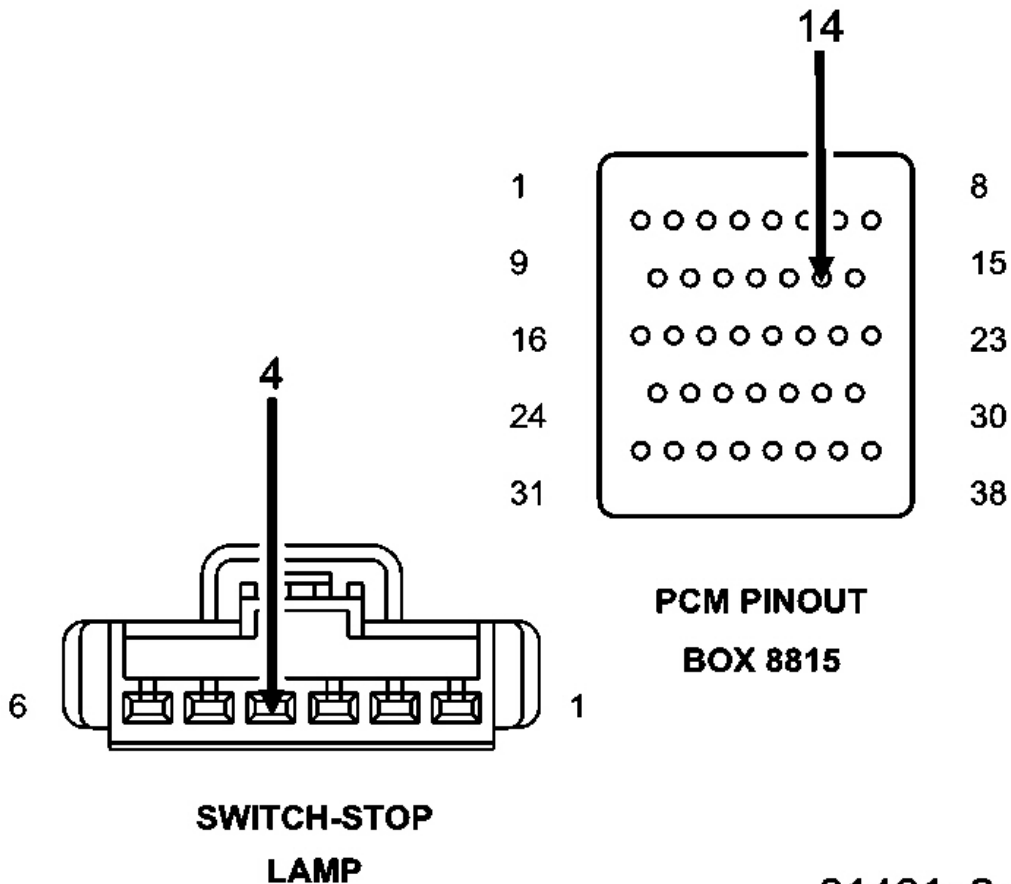
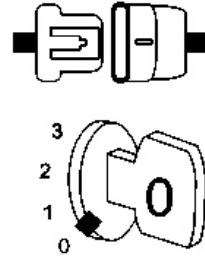
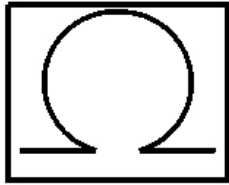
Repair the short to ground in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **(B16) BRAKE SIGNAL 2 CIRCUIT OPEN**



81461e2c

Fig. 8: Checking Brake Switch No. 2 Signal Circuit For Open
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (B16) Brake Signal 2 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0573-BRAKE SWITCH 1 STUCK OFF

CIRCUIT SCHEMATIC

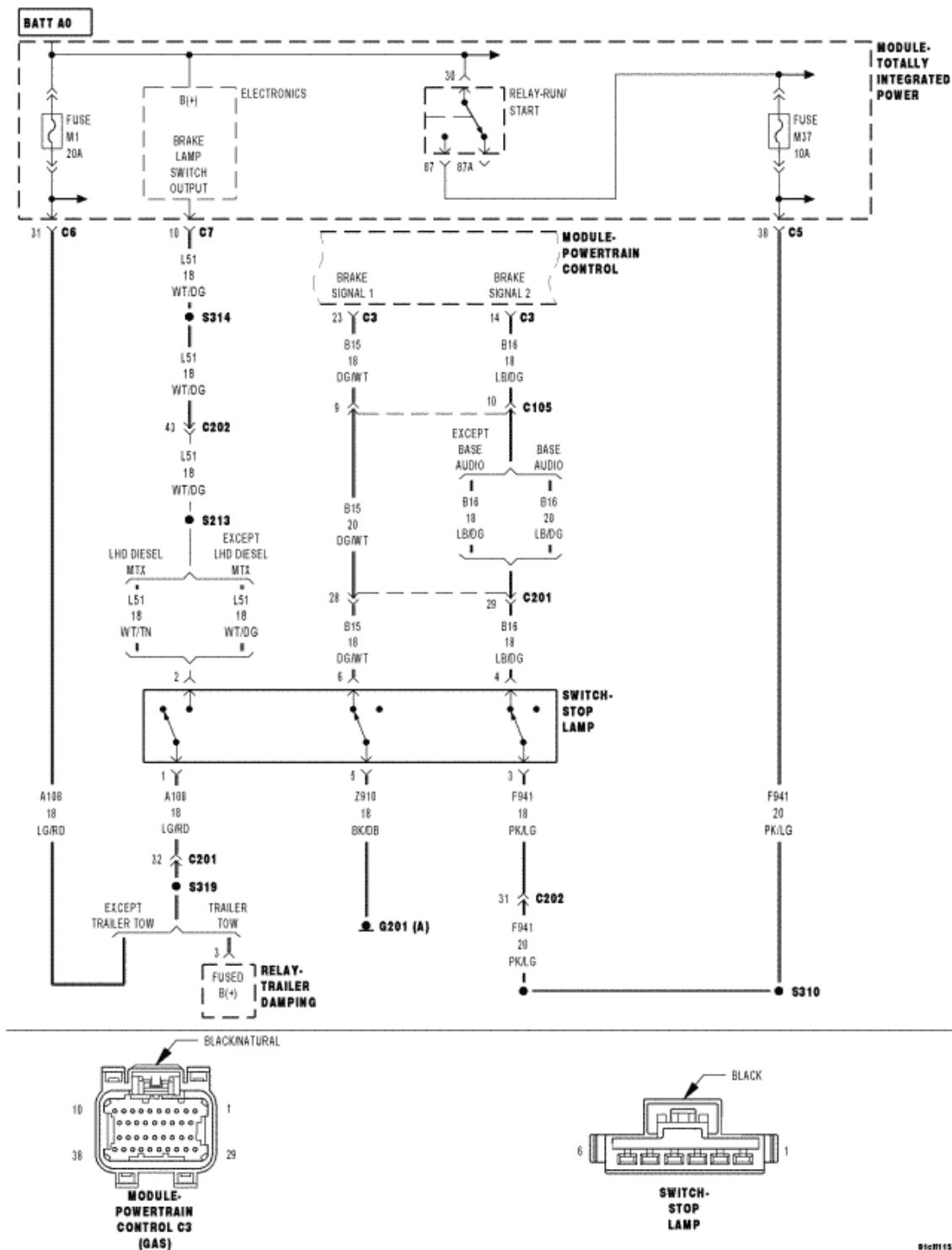


Fig. 9: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

When vehicle speed cycles from 0 kph to 48 kph (30 mph) at least 10 times.

SET CONDITIONS

- **Set Condition:**

When the PCM recognizes Brake Switch No.1 is stuck in the high/off position. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(B15) BRAKE SIGNAL 1 CIRCUIT OPEN
(B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND
(Z910) GROUND CIRCUIT OPEN
STOP LAMP SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **STOP LAMP SWITCH**

NOTE: **Inspect the related Fuse and Relay.**

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connector.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 circuit terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit?

Yes

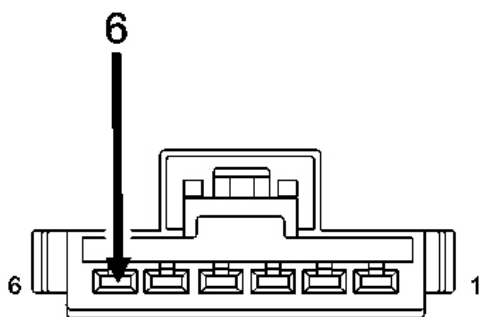
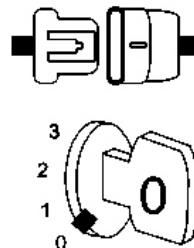
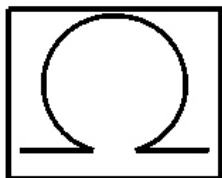
Go To 3.

No

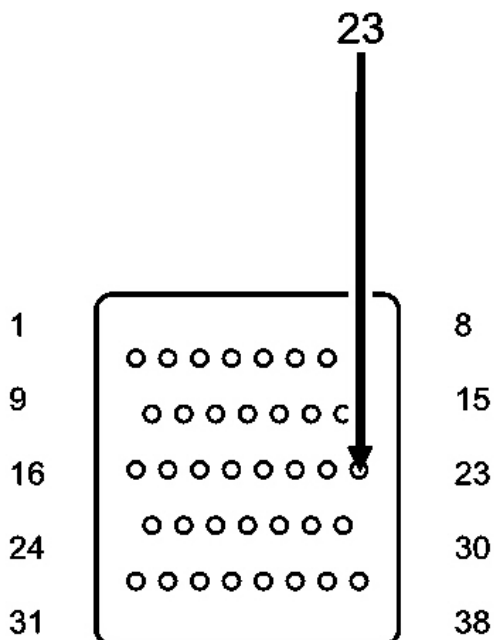
Verify that there is good pin to terminal contact in the Switch and Control Module connectors. If OK, replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(B15) BRAKE SIGNAL 1 CIRCUIT OPEN**



**SWITCH-
STOP
LAMP**



PCM PINOUT

BOX 8815

81336c2e

Fig. 10: Checking Brake Switch No. 1 Signal Circuit Open For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (B15) Brake Signal 1 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

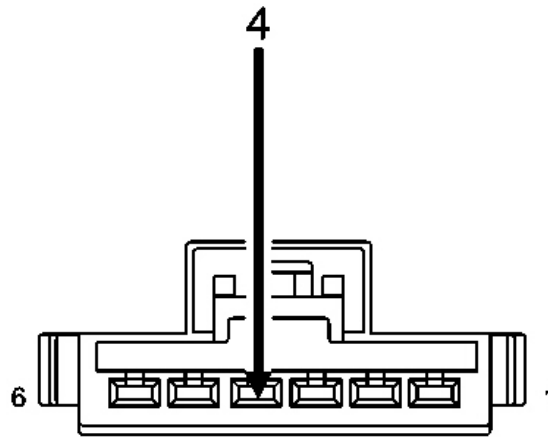
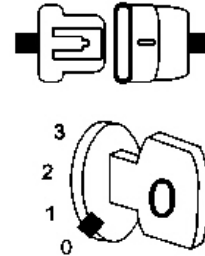
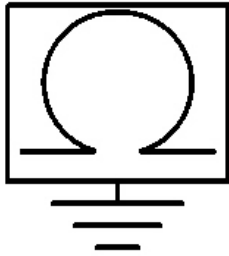
Go To 4.

No

Repair the open in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND



**SWITCH-
STOP
LAMP**

8144a4cd

Fig. 11: Checking Brake Switch No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

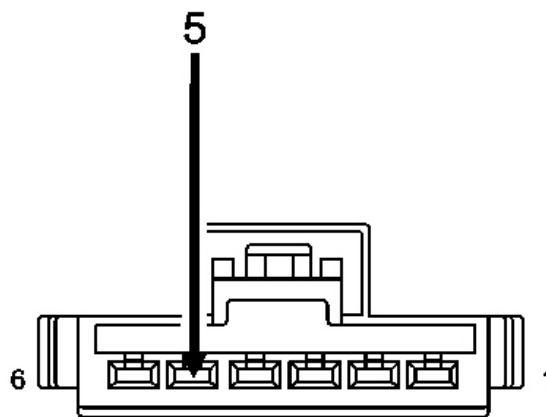
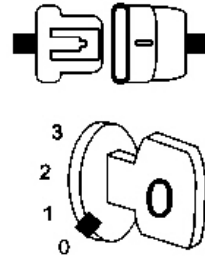
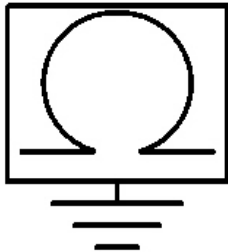
Yes

Repair the short to ground in the (B16) Brake Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 5.

5. (Z910) GROUND CIRCUIT OPEN



**SWITCH-
STOP
LAMP**

81336c3c

Fig. 12: Checking Brake Switch Ground Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance between the (Z910) Ground circuit and ground in the Stop Lamp Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (Z910) Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0579-SPEED CONTROL SWITCH 1 PERFORMANCE

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

• Set Condition:

Cruise switch voltage output is not out of range but it does not equal any of the values for any of the button positions. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE
(V71) S/C SIGNAL 1 CIRCUIT OPEN
(V937) S/C RETURN CIRCUIT OPEN
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO GROUND
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle and operate the speed control in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **SPEED CONTROL SWITCH**

Turn the ignition off.

Remove and disconnect the Speed Control Switch from the steering wheel per Service Information.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button on the switch.

The following resistance specs are taken between terminals (V71) S/C Signal 1 and (V937) S/C Return circuit of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5k ohms

On/Off - 0.47k ohms

Set - 5.49k ohms

Coast - 2.94k ohms

Cancel - 1.24k ohms

Resume/Accel - 15.4k ohms

Does the function on the Speed Control Switches have the correct resistance value?

Yes

Go To 3.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE**

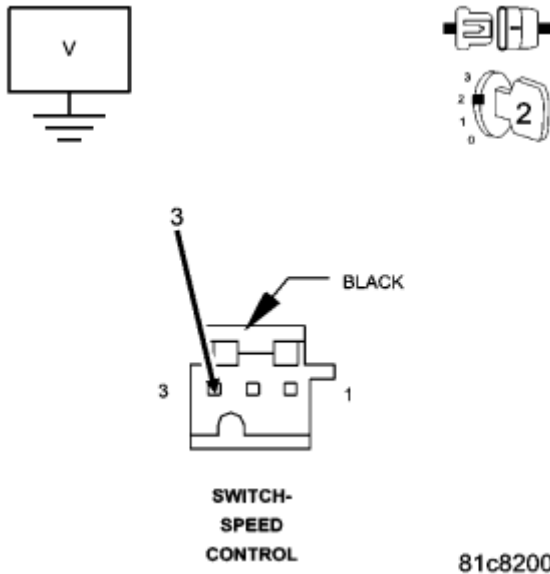


Fig. 14: Measuring Voltage On S/C Signal 1 Circuit At Speed Control Harness Connector
 Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (V71) S/C Signal 1 circuit in the S/C Switch harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (V71) S/C SIGNAL 1 CIRCUIT OPEN

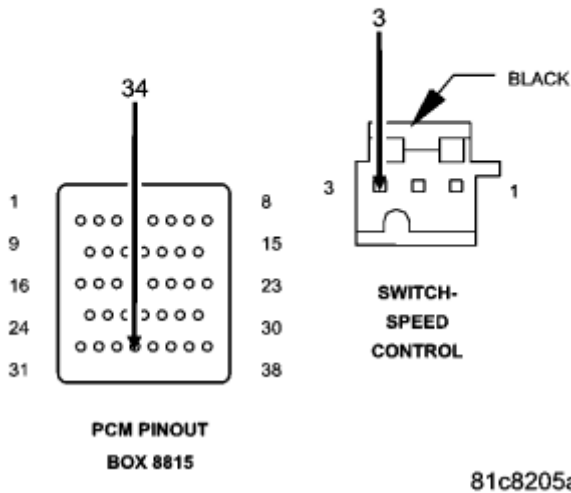


Fig. 15: Measuring Resistance Of (V71) S/C Signal 1 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Measure the resistance of the (V71) S/C Signal 1 circuit from the Speed Control Switch to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

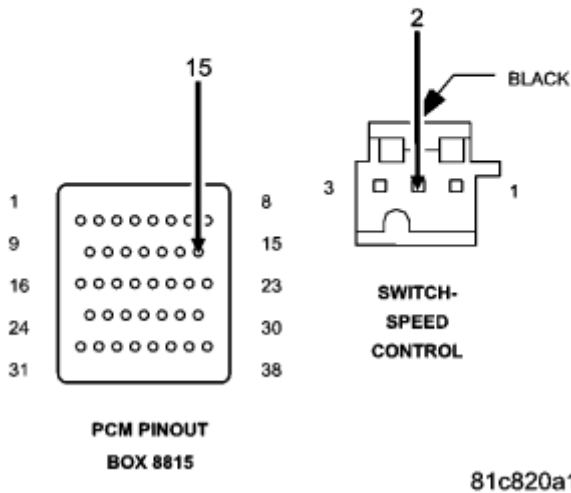
Go To 5.

No

Repair the open in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (V937) S/C RETURN CIRCUIT OPEN



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Fig. 16: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (V937) S/C Return circuit from the S/C Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

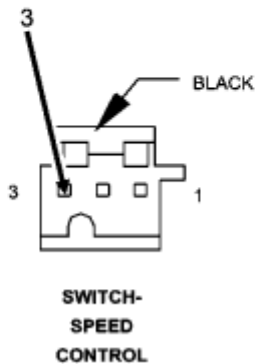
Go To 6.

No

Repair the open in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO GROUND



81c82016

Fig. 17: Measuring Resistance Between Ground And (V71) S/C Signal 1 Circuit In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V71) S/C Signal 1 circuit in the S/C Switch harness connector.

Is the resistance below 100 ohms?

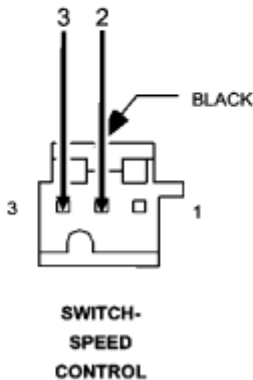
Yes

Repair the short to ground in the (V71) S/C Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT



8196bc41

Fig. 18: Measuring Resistance Between (V937) S/C Return Circuit And (V71) S/C Signal 1 Circuit At S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V71) S/C Signal 1 circuit and the (V937) S/C Return circuit in the S/C Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (V71) S/C Signal 1 circuit and the (V937) S/C Return circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET/DECEL PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch value?

Yes

Verify that there is good pin to terminal contact in the Switches and Powertrain Control Module connectors. If OK, replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

P0580-SPEED CONTROL SWITCH 1 CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

- Set Condition:

Speed control switch input No.1 is below the minimum acceptable voltage at the PCM. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO GROUND
EXCESSIVE RESISTANCE IN THE (V71) S/C SIGNAL 1 CIRCUIT
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle and operate the speed control in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **SPEED CONTROL SWITCH**

Turn the ignition off.

Remove and disconnect the Speed Control Switch from the steering wheel per Service Information.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button for each switch.

The following resistance specs are taken between terminals (V71) S/C Signal 1 circuit and (V937) S/C Return circuit of the Switch when holding the switch button in the following positions.

Not pressing any switch - 20.5k ohms

On/Off - 0.47k ohms

Set - 5.49k ohms

Coast - 2.94k ohms

Cancel - 1.24k ohms

Resume/Accel - 15.4k ohms

Does the function on the Speed Control Switch have the correct resistance value?

Yes

Go To 3.

No

Replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **SPEED CONTROL SWITCH**

With the scan tool, monitor the Speed Control Switch voltage.

Disconnect the Speed Control Switch harness connector per Service Information.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

Replace the Speed Control Resume/Accel Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT

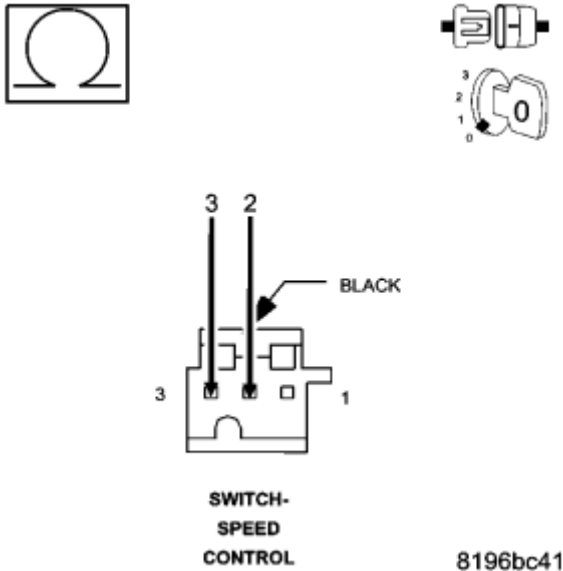


Fig. 20: Measuring Resistance Between (V937) S/C Return Circuit And (V71) S/C Signal 1 Circuit At S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Measure the resistance between the (V937) S/C Return circuit and the (V71) S/C Signal 1 circuit at the S/C Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (V71) S/C Signal 1 circuit and the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO GROUND**

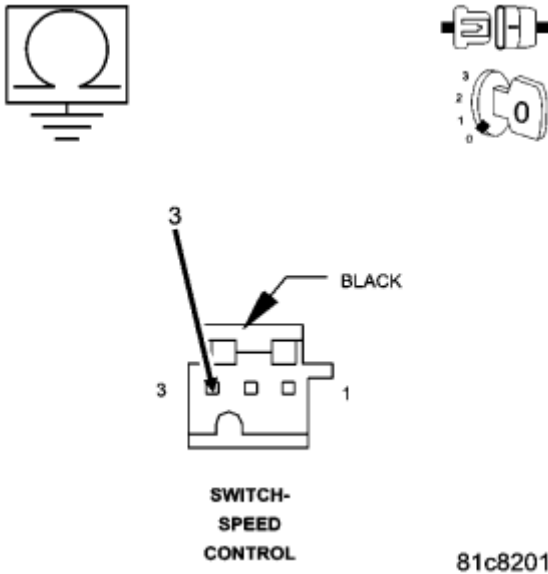


Fig. 21: Measuring Resistance Between Ground And (V71) S/C Signal 1 Circuit In S/C Switch Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V71) S/C Signal 1 circuit in the S/C Switch harness connector.

To help determine the location of a short, disconnect the Steering Column Control Module C2 and C5 harness connectors and see if the short goes away.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **EXCESSIVE RESISTANCE IN THE (V71) S/C SIGNAL 1 CIRCUIT**

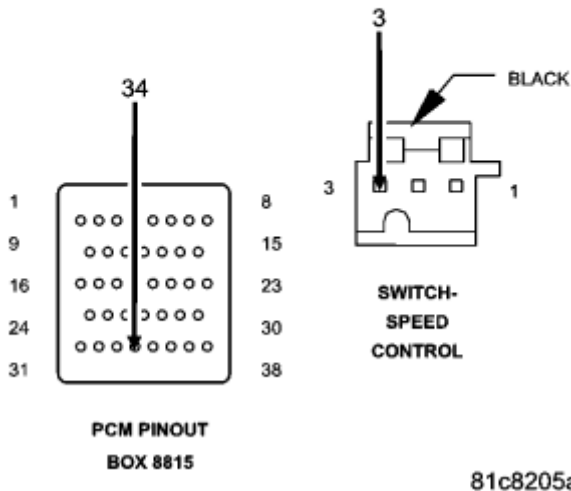


Fig. 22: Measuring Resistance Of (V71) S/C Signal 1 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (V71) S/C Signal 1 circuits from both Speed Control harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the excessive resistance in the (V71) S/C 1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

7. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal

to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch value?

Yes

Verify that there is good pin to terminal contact in the Switches and Powertrain Control Module connectors. If OK, replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0581-SPEED CONTROL SWITCH 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

- **Set Condition:**

Speed control switch input above the maximum acceptable voltage at the PCM. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE
(V71) S/C SIGNAL 1 CIRCUIT OPEN
(V937) S/C RETURN CIRCUIT OPEN
SCCM
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

NOTE: **It may be necessary to drive the vehicle using the Speed Control for the fault to become Active.**

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **SPEED CONTROL SWITCHES**

Turn the ignition off.

Remove and disconnect the Speed Control Switches from the steering wheel.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button on each switch.

The following resistance specs are taken between terminals (V71) S/C Signal 1 and (V937) S/C Return circuits of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5 kohms

On/Off - 0.47 kohms

Set - 5.49 kohms

Coast - 2.94 kohms

Cancel - 1.24 kohms

Resume/Accel - 15.4 kohms

Does the function on the Speed Control Switches have the correct resistance value?

Yes

Go To 3.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE

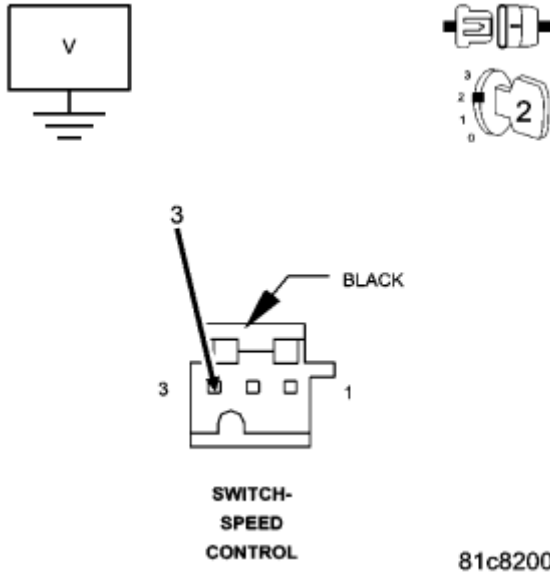


Fig. 24: Measuring Voltage On S/C Signal 1 Circuit At Speed Control Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (V71) S/C Signal 1 circuit in the S/C Switch harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (V71) S/C SIGNAL 1 CIRCUIT OPEN

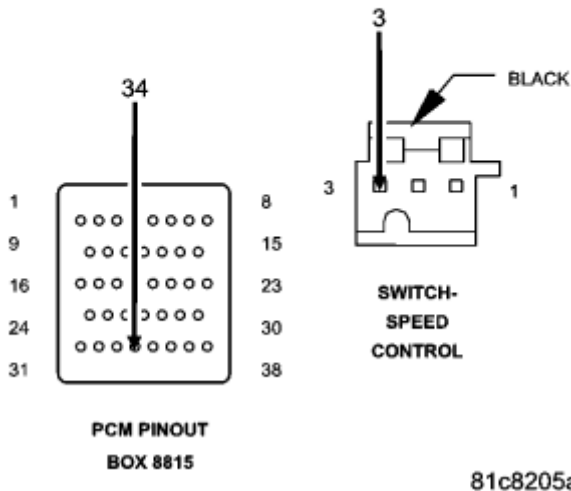


Fig. 25: Measuring Resistance Of (V71) S/C Signal 1 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Measure the resistance of the (V71) S/C Signal 1 circuit from the Speed Control Switch to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

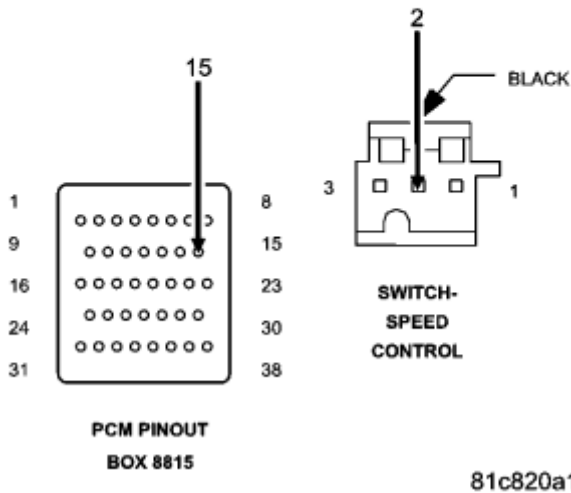
Go To 5.

No

Repair the open in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (V937) S/C RETURN CIRCUIT OPEN



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Fig. 26: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (V937) S/C Return circuit from the S/C Switch harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To 6.

No

Repair the open in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch value?

Yes

Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors. If OK, replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

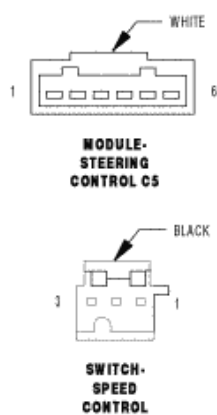
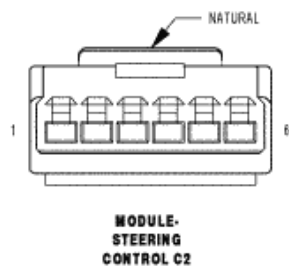
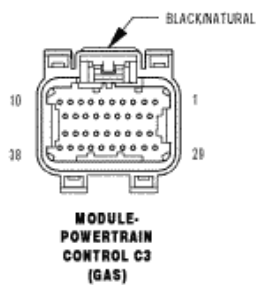
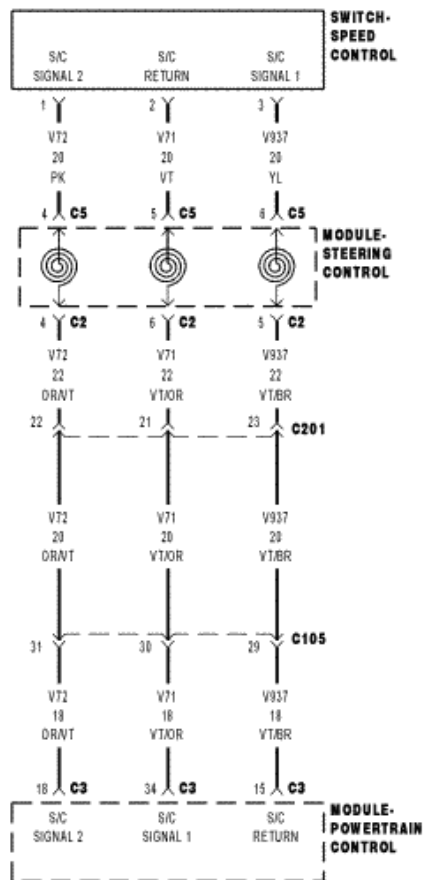
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0585-SPEED CONTROL SWITCH 1/2 CORRELATION

CIRCUIT SCHEMATIC



01010004

Fig. 27: Speed Control Switch Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- Set Condition:

Cruise Switch inputs are not coherent with each other. Example: PCM is reading Switch No.1 as Accel and Switch No.2 as Coast at the same time. One trip fault.

POSSIBLE CAUSES

Possible Causes
S/C SWITCH SIGNAL CIRCUITS SHORTED TO VOLTAGE
RESISTANCE IN THE S/C SWITCH SIGNAL CIRCUITS
RESISTANCE IN THE (V937) S/C RETURN CIRCUIT
S/C SWITCH SIGNAL CIRCUITS SHORTED TO THE (V937) S/C RETURN CIRCUIT
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V72) S/C SIGNAL 2 CIRCUIT
S/C SWITCH SIGNAL CIRCUITS SHORTED TO GROUND
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: This DTC is a two trip fault. If the scan tool indicates a one trip failure, the possible cause may have been the customer pressing the switch in two positions simultaneously. Test drive the vehicle and activate the Speed Control system. If the DTC matures to an active fault a repair is necessary.

Ask the customer if it is possible that button was held in two positions at the same time before this DTC set. If this is the case, no repair is necessary.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. SPEED CONTROL SWITCH

With the scan tool, monitor the Speed Control Switch voltage.

Disconnect the Speed Control Switch harness connector.

NOTE: The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the connector disconnected.

Does the scan tool display the voltage as described above?

Yes

Replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. SPEED CONTROL SWITCHES

Turn the ignition off.

Remove and disconnect the Speed Control Switch from the steering wheel per Service Information.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button on each switch.

The following resistance specs are taken between terminals (V72) S/C Signal 2 and (V937) S/C Return circuit of the Switch when holding the switch button in the following position.

Not pressing any switch - 20.5k ohms

On/Off - 8.87k ohms

Set - 0.825k ohms

Coast - 0.47k ohms

Cancel - 3.92k ohms

Resume/Accel - 1.87k ohms

The following resistance specs are taken between terminals (V71) S/C Signal 1 and (V937) S/C Return circuits of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5k ohms

On/Off - 0.47k ohms

Set - 5.49k ohms

Coast - 2.94k ohms

Cancel - 1.24k ohms

Resume/Accel - 15.4k ohms

Does the function on the Speed Control Switch have the correct resistance value?

Yes

Go To 4.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

4. S/C SWITCH SIGNAL CIRCUIT SHORTED TO VOLTAGE

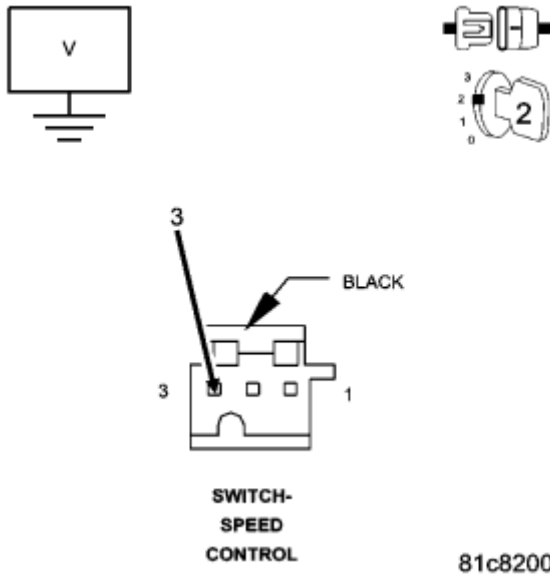


Fig. 28: Measuring Voltage On S/C Signal 1 Circuit At Speed Control Harness Connector
 Courtesy of CHRYSLER LLC

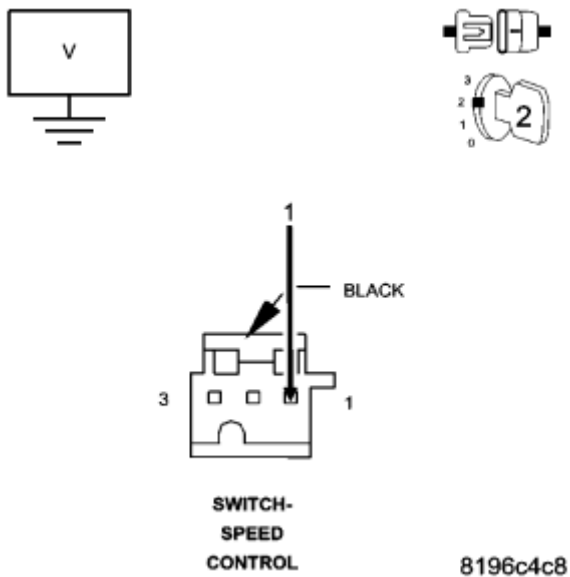


Fig. 29: Measuring Voltage On (V72) S/C Signal 2 Circuit In S/C Switch Harness Connector
 Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the voltage on the (V71) and (V72) S/C Signal circuits at the Speed Control harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V71) or (V72) S/C Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. S/C SWITCH SIGNAL CIRCUIT OPEN

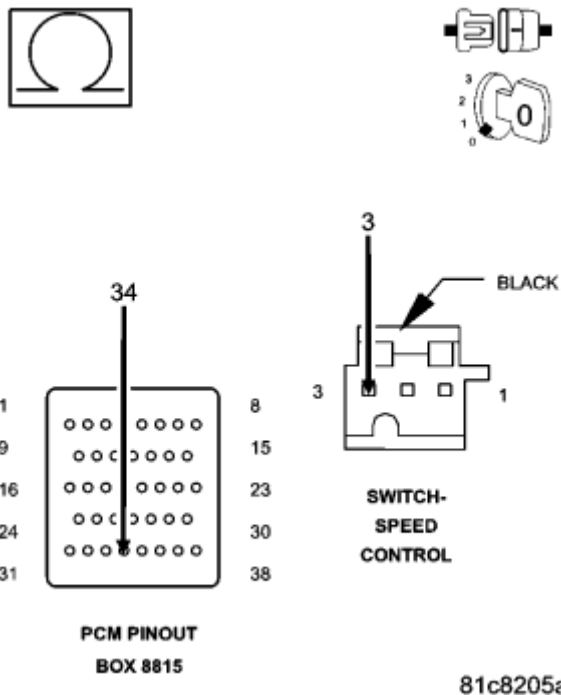


Fig. 30: Measuring Resistance Of (V71) S/C Signal 1 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

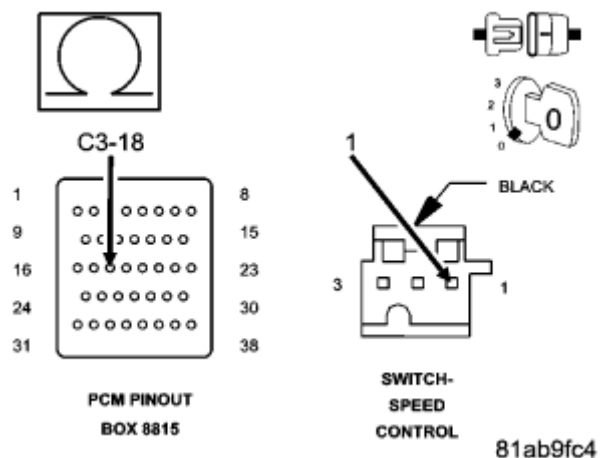


Fig. 31: Measuring Resistance Of (V72) S/C Signal 2 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815

Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (V71) and (V72) S/C Signal circuits from both Speed Control harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To 6.

No

Repair the excessive resistance in the (V71) or (V72) S/C Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (V937) S/C RETURN CIRCUIT OPEN

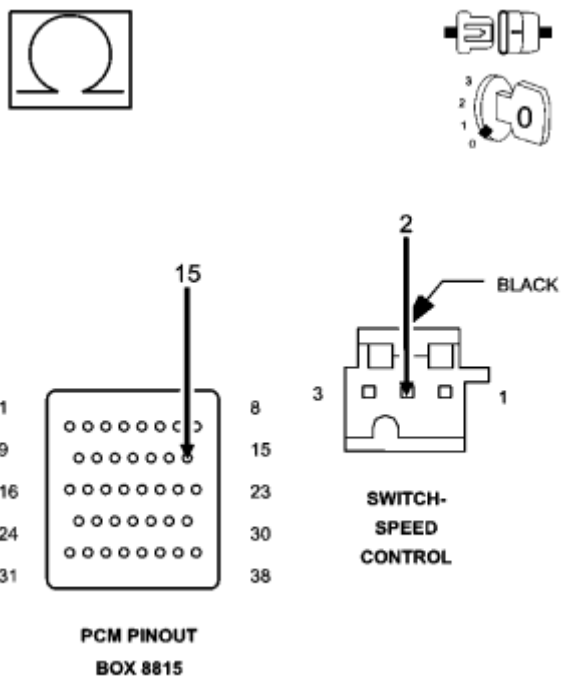


Fig. 32: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (V937) S/C Return circuit at the Speed Control harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

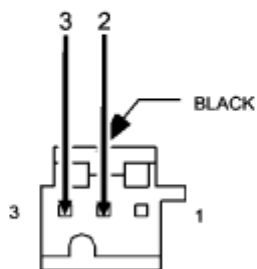
Go To 7.

No

Repair the excessive resistance in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

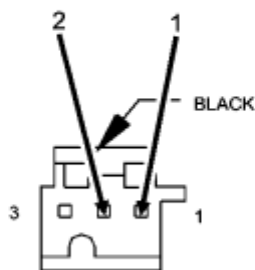
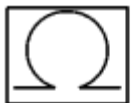
7. S/C SWITCH SIGNAL CIRCUITS SHORTED TO THE (V937) S/C RETURN CIRCUIT



SWITCH-
SPEED
CONTROL

8196bc41

Fig. 33: Measuring Resistance Between (V937) S/C Return Circuit And (V71) S/C Signal 1 Circuit At S/C Switch Harness Connector
Courtesy of CHRYSLER LLC



SWITCH-
SPEED
CONTROL

81c820e4

Fig. 34: Measuring Resistance Between S/C Return Circuit And S/C Signal Circuits In S/C Switch Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (V937) S/C Return circuit and both of the (V71) and (V72) S/C Signal circuits in the S/C Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

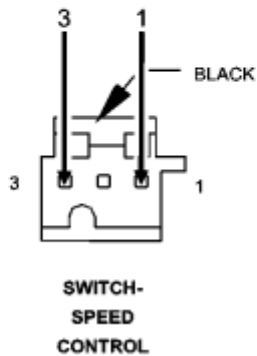
Repair the short between the (V937) S/C Return circuit and the (V71) or (V72) S/C Switch Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V72) S/C SIGNAL 2 CIRCUIT



8196c3ae

Fig. 35: Measuring Resistance Between (V71) S/C Signal 1 Circuit And (V72) S/C Signal 2 Circuit At Speed Control Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V71) S/C Signal 1 circuit and the (V72) S/C Signal 2 circuit at the Speed Control harness connector.

Is the resistance below 100 ohms for each circuit?

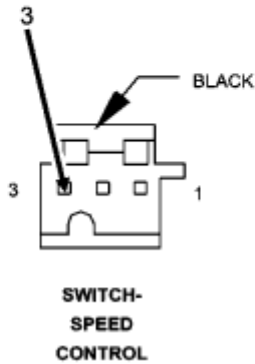
Yes

Repair the short between the (V72) S/C Signal 2 circuit and the (V71) S/C Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

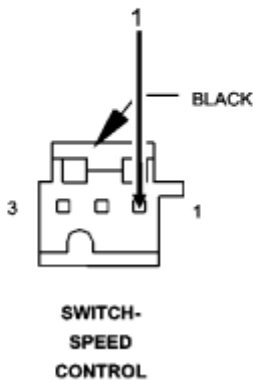
Go To 9.

9. S/C SWITCH SIGNAL CIRCUITS SHORTED TO GROUND



81c82016

Fig. 36: Measuring Resistance Between Ground And (V71) S/C Signal 1 Circuit In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC



8196c362

Fig. 37: Measuring Resistance Between Ground And S/C Switch Signal Circuits At S/C Switch Harness Connectors
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V71) and (V72) S/C Switch Signal circuits at both S/C Switch harness connectors.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (V71) or (V72) S/C Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch values?

Yes

Verify that there is good pin to terminal contact in the Switches and Powertrain Control Module connectors. If OK, replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0591-SPEED CONTROL SWITCH 2 PERFORMANCE

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

• Set Condition:

Cruise switch voltage output is not out of range but it does not equal any of the values for any of the button positions. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V72) S/C SIGNAL 2 CIRCUIT OPEN
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(V937) S/C RETURN CIRCUIT OPEN
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO GROUND
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: This DTC is a two trip fault. If the scan tool indicates a one trip failure, the possible cause may have been the customer pressing both switches simultaneously. Test drive the vehicle and activate the Speed Control system. If the DTC matures to an active fault a repair is necessary.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. SPEED CONTROL SWITCHES

Turn the ignition off.

Remove the Speed Control Switch from the steering wheel.

Measure the resistance across the Speed Control Switch.

Monitor the ohmmeter while pressing each function button on the switch.

The following resistance specs are taken between terminals (V72) S/C Signal 2 circuit and (V937) S/C Return circuit of the Switch when holding the switch button in the following position.

Not pressing any switch - 20.5k ohms

On/Off - 8.87k ohms

Set - 0.825k ohms

Coast - 0.47k ohms

Cancel - 3.92k ohms

Resume/Accel - 1.87k ohms

The following resistance specs are taken between terminals (V71) S/C Signal 1 and (V937) S/C Return circuit of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5k ohms

On/Off - 0.47k ohms

Set - 5.49k ohms

Coast - 2.94k ohms

Cancel - 1.24k ohms

Resume/Accel - 15.4k ohms

Does the function on the Speed Control Switch have the correct resistance value?

Yes

Go To 3.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

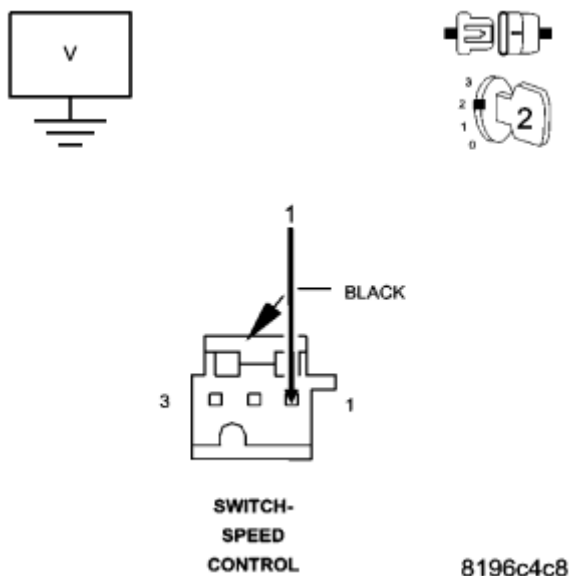


Fig. 39: Measuring Voltage On (V72) S/C Signal 2 Circuit In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (V72) S/C Signal 2 circuit in the Switch harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (V72) S/C SIGNAL 2 CIRCUIT OPEN

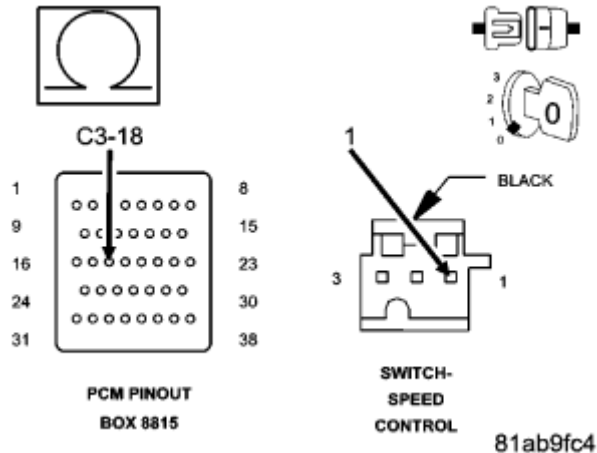


Fig. 40: Measuring Resistance Of (V72) S/C Signal 2 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815

Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (V72) S/C Signal 2 circuit from the Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (V937) S/C RETURN CIRCUIT OPEN

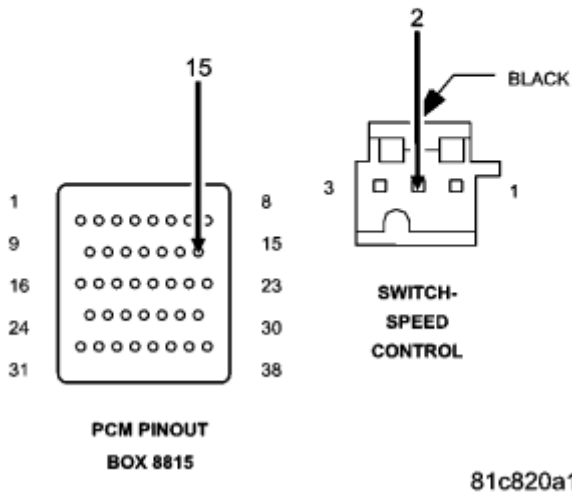


Fig. 41: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (V937) S/C Return circuit from the Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

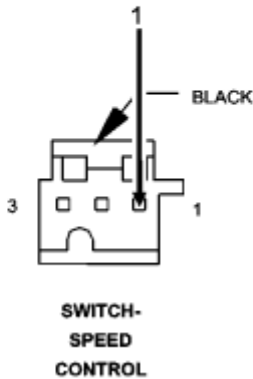
Go To 6.

No

Repair the open in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO GROUND



8196c362

Fig. 42: Measuring Resistance Between Ground And S/C Switch Signal Circuits At S/C Switch Harness Connectors
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V72) S/C Signal 2 circuit in the Switch harness connector.

Is the resistance below 100 ohms?

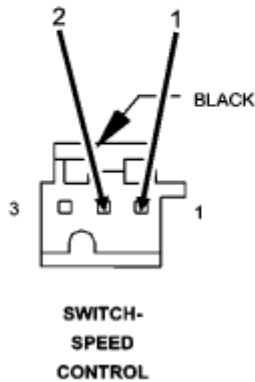
Yes

Repair the short to ground in the (V72) S/C Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT



81c820e4

Fig. 43: Measuring Resistance Between S/C Return Circuit And S/C Signal Circuits In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V72) S/C Signal 2 circuit and the (V937) S/C Return circuit in the Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (V72) S/C Signal 2 circuit and the (V937) S/C Return circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch values?

Yes

Verify that there is good pin to terminal contact in the Switches and Powertrain Control Module connectors. Replace the Speed Control Switch if no problems were found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact

in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0592-SPEED CONTROL SWITCH 2 CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

- Set Condition:

Speed control switch input No.2 is below the minimum acceptable voltage at the PCM. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO GROUND
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT
EXCESSIVE RESISTANCE IN THE (V72) S/C SIGNAL 2 CIRCUIT
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **SPEED CONTROL SWITCH**

With the scan tool, monitor the Speed Control Switch voltage.

Disconnect the Speed Control Switch harness connector.

Did the voltage change to above 4.7 volts?

Yes

Replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO GROUND**

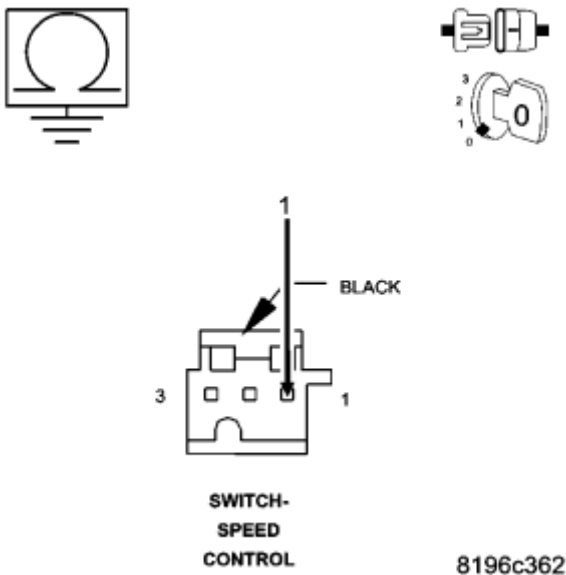


Fig. 45: Measuring Resistance Between Ground And S/C Switch Signal Circuits At S/C Switch Harness Connectors

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (V72) S/C Signal 2 circuit in the Switch harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO THE (V937) S/C SWITCH RETURN CIRCUIT

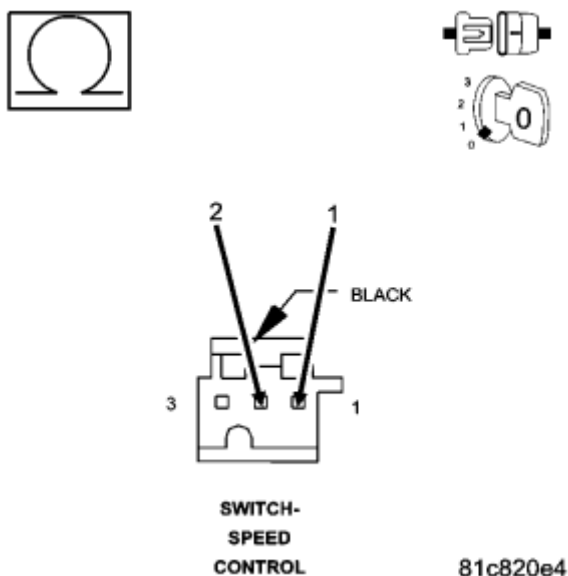


Fig. 46: Measuring Resistance Between S/C Return Circuit And S/C Signal Circuits In S/C Switch Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (V72) S/C Signal 2 circuit and the (V937) S/C Return circuit in the Switch harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (V72) S/C Signal 2 circuit and the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (V72) S/C SIGNAL 2 CIRCUIT OPEN

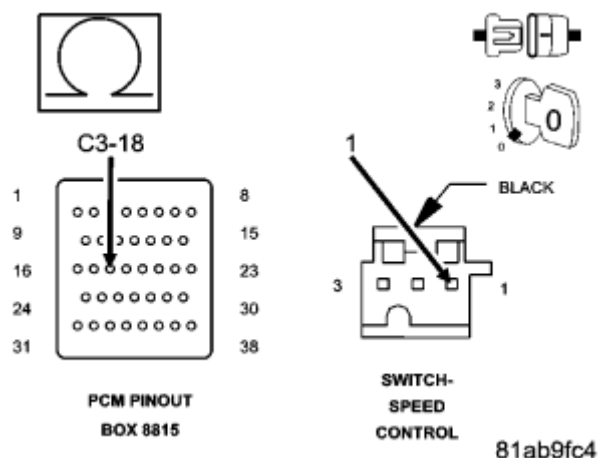


Fig. 47: Measuring Resistance Of (V72) S/C Signal 2 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815

Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (V72) S/C Signal 2 circuit from the Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to

perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch values?

Yes

Verify that there is good pin to terminal contact in the Switches and Powertrain Control Module connectors. Replace the Speed Control Switch if no problems were found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0593-SPEED CONTROL SWITCH 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition key on.

SET CONDITIONS

- **Set Condition:**

Speed control switch input above the maximum acceptable voltage at the PCM. One trip fault.

POSSIBLE CAUSES

Possible Causes
(V72) S/C SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(V72) S/C SIGNAL 2 CIRCUIT OPEN
(V937) S/C RETURN CIRCUIT OPEN
SCCM
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

NOTE: **It may be necessary to drive the vehicle using the Speed Control for the fault to become Active.**

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **SPEED CONTROL SWITCHES**

Turn the ignition off.

Remove and disconnect the Speed Control Switches from the steering wheel.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button on each switch.

The following resistance specs are taken between terminals (V72) S/C Switch No.2 Signal and (V937) S/C Return circuit of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5 kohms

On/Off - 0.47 kohms

Set - 5.49 kohms

Coast - 2.94 kohms

Cancel - 1.24 kohms

Resume/Accel - 15.4 kohms

Does the function on the Speed Control Switches have the correct resistance value?

Yes

Go To 3.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

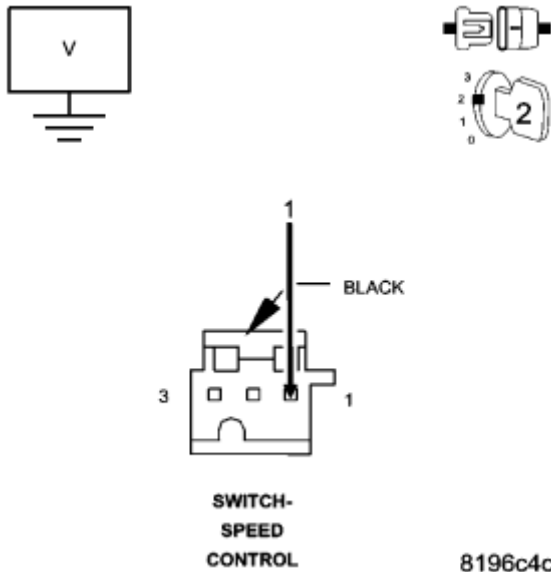


Fig. 49: Measuring Voltage On (V72) S/C Signal 2 Circuit In S/C Switch Harness Connector
 Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (V72) S/C Signal 2 circuit in the S/C Switch harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 4.

4. (V72) S/C SIGNAL 2 CIRCUIT OPEN

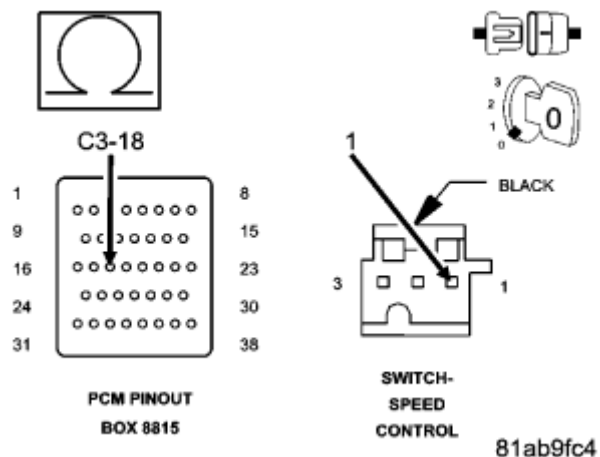


Fig. 50: Measuring Resistance Of (V72) S/C Signal 2 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Measure the resistance of the (V72) S/C Signal 2 circuit from the Speed Control Switch to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

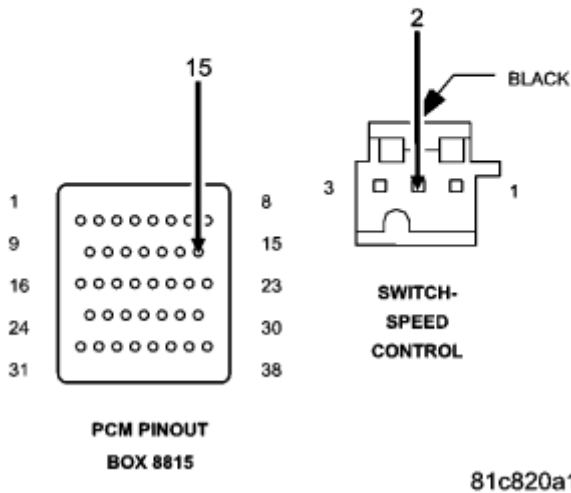
Go To 5.

No

Repair the open in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (V937) S/C RETURN CIRCUIT OPEN



81c820a1

Fig. 51: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (V937) S/C Return circuit from the S/C Switch harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To 6.

No

Repair the open in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch value?

Yes

Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors. If OK, replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0600-SERIAL COMMUNICATION LINK

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

Internal Bus communication failure between processors. One Trip Fault. Three Global Good Trips to Clear.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **POWERTRAIN CONTROL MODULE (PCM)**

NOTE: **Diagnose any CMP or CKP Sensor faults before continuing. Check for intermittent loose CMP or CKP connections.**

The Powertrain Control Module is reporting internal errors, view repair to continue.

Repair

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0601-INTERNAL MEMORY CHECKSUM INVALID

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

• **Set Condition:**

Internal checksum for software failed, does not match calculated value. One Trip Fault, Three Good Trips to clear.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **POWERTRAIN CONTROL MODULE (PCM)**

NOTE: **Diagnose any CMP or CKP Sensor faults before continuing. Check for intermittent loose CMP or CKP connections.**

The Powertrain Control Module is reporting internal errors, view repair to continue.

Repair

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0606-INTERNAL ECM PROCESSOR

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running.

SET CONDITIONS

- Set Condition:**

When the PCM recognizes an internal failure to communicate with the ECM or the CMP and CKP Sensor count periods are too short. One trip fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. POWERTRAIN CONTROL MODULE (PCM)

NOTE: **Diagnose any CMP or CKP Sensor faults before continuing. Check for intermittent loose CMP or CKP connections.**

The Powertrain Control Module is reporting internal errors, view repair to continue.

Repair

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P060B-ETC A/D GROUND PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

MONITOR CONDITIONS

When Monitored:

When the Throttle Motor is powered.

SET CONDITIONS

- **Set Condition:**

When A2D reading does not return to ground within a set period of time of test activation, this fault sets. The test typically runs a couple of times per second, and is the reason why APP2 signal spikes to ground a couple of times per second in normal running. Reprogramming the module may not always fix this fault. One trip fault. ETC lamp is illuminated.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

Verify the PCM is at the latest calibration (flash level).

NOTE: An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.

NOTE: Diagnose any other DTCs that may have set with the P060B.

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P060D-ETC LEVEL 2 APP PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered and no matured faults related to APP Sensors.

SET CONDITIONS

- Set Condition:**

When secondary software determines that APPS 1 and APPS 2 signals do not match for a period of time.
One trip fault. ETC lamp will flash

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

- PROGRAM THE POWERTRAIN CONTROL MODULE**

Verify the PCM is at the latest calibration (flash level).

NOTE: **An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.**

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: **Diagnose any other DTCs that may have set with the P060D.**

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P060E-ETC LEVEL 2 TPS PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered and no matured faults related to TP Sensors.

SET CONDITIONS

- **Set Condition:**

When secondary software determines that TPS 1 and TPS 2 signals do not match for a period of time.
One trip fault. ETC lamp will flash.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

Verify the PCM is at the latest calibration (flash level).

NOTE: **An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.**

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: **Diagnose any other DTCs that may have set with the P060E.**

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P060F-ETC LEVEL 2 ECT PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered and no matured faults related to the Engine Coolant Temp Sensor.

SET CONDITIONS

- Set Condition:

When secondary software determines that the Coolant Temperature is implausible for a period of time.
One trip fault. ETC lamp will flash.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

NOTE: Diagnose any Engine Coolant Temperature Sensor DTCs before continuing.

Verify the PCM is at the latest calibration (flash level).

NOTE: An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: Diagnose any other DTCs that may have set with the P060F.

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P061A-ETC LEVEL 2 TORQUE PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered.

SET CONDITIONS

- **Set Condition:**

When secondary software determines that the customer requested output is not being achieved by the engine for a period of time. One trip fault. ETC lamp will flash.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

NOTE: **Check the engine for air/vacuum leaks and diagnose any Fuel System Lean/Rich as well as MAP Sensor DTCs before continuing.**

Verify the PCM is at the latest calibration (flash level).

NOTE: **An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.**

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: **Diagnose any other DTCs that may have set with the P061A.**

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P061C-ETC LEVEL 2 RPM PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered and no camshaft or crankshaft electrical signal related DTCs are set.

SET CONDITIONS

- **Set Condition:**

When secondary software determines that the engine speed is implausible for a period of time. One trip fault. ETC lamp will flash.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

NOTE: **Diagnose any Camshaft Position and Crankshaft Position Sensor DTCs before continuing.**

Verify the PCM is at the latest calibration (flash level).

NOTE: **An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.**

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: **Diagnose any other DTCs that may have set with the P061C.**

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P0622-GENERATOR FIELD CONTROL CIRCUIT

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the engine running, battery voltage greater than 10.4 volts, and the Generator control active.

SET CONDITIONS

- Set Condition:

When the PCM tries to regulate the generator field with no result during monitoring. One Trip Fault.
Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K125) GEN FIELD CONTROL CIRCUIT SHORTED TO VOLTAGE
(K125) GEN FIELD CONTROL CIRCUIT OPEN
(K125) GEN FIELD CONTROL CIRCUIT SHORTED TO GROUND
GENERATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, Clear DTCs in the Powertrain Control Module (PCM).

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Increase engine speed by pressing the accelerator pedal. Do not exceed 3500 rpm.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. GENERATOR OPERATION

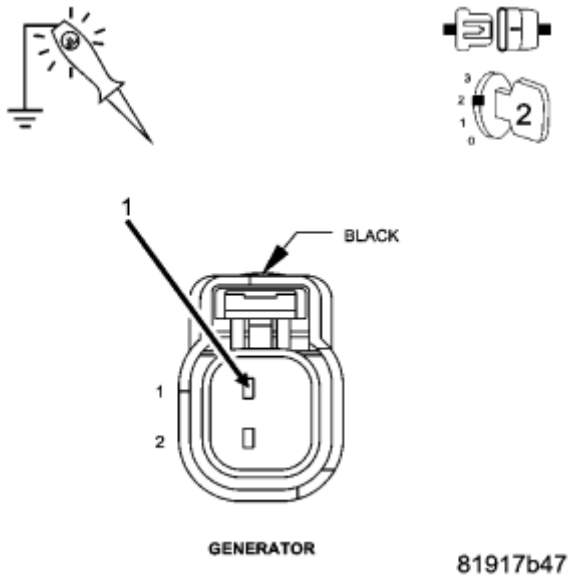


Fig. 53: Probing Generator Field Control Circuit At Generator Field Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Generator Field harness connector.

Using a 12-volt test light connected to ground, probe the (K125) Generator Field Control circuit in the Generator Field harness connector.

Ignition on, engine not running.

NOTE: The DTC needs to be cleared before actuating the Generator Field, if the DTC is not cleared, the Generator Field may not be allowed to actuate.

With the scan tool, actuate the Generator Field Control circuit.

NOTE: The voltage supplied to the solenoid circuit during the actuation will be less than battery voltage. The test light should be illuminated, but not as bright as a direct connection to the battery.

NOTE: The test light should be illuminated and bright proportional to the

maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors. Replace the Generator if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K125) GEN FIELD CIRCUIT SHORTED VOLTAGE

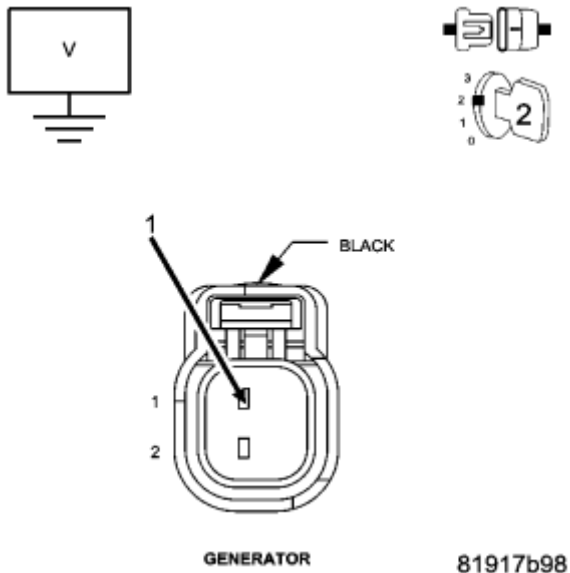


Fig. 54: Checking Generator Field Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K125) Gen Field Control circuit in the Generator Field harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K125) Gen Field Control circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K125) GEN FIELD CIRCUIT OPEN

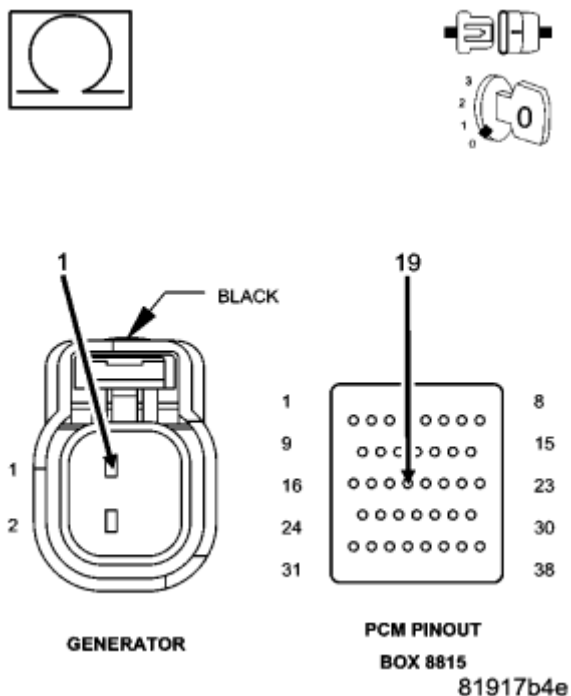


Fig. 55: Checking Generator Field Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K125) Gen Field Control circuit from the Generator Field harness connector to appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K125) Gen Field Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K125) GEN FIELD CIRCUIT SHORTED TO GROUND

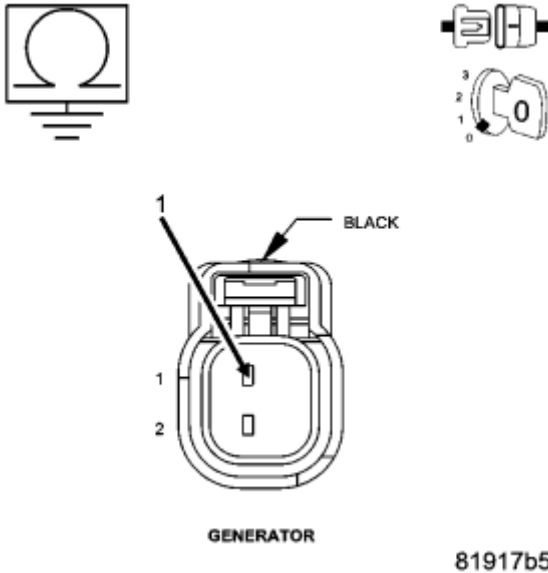


Fig. 56: Checking Generator Field Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K125) Gen Field Control circuit in the Generator Field harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K125) Gen Field Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator

and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

P0627-FUEL PUMP CONTROL CIRCUIT

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts and the ASD sense switch is on.

SET CONDITIONS

- **Set Condition:**

Actual Fuel Pump state is not equal to desired state. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO VOLTAGE
(K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO GROUND
(K31) FUEL PUMP CONTROL CIRCUIT OPEN
(N1) FUSED FUEL PUMP OUTPUT OPEN
(N1) FUSED FUEL PUMP OUTPUT SHORTED TO GROUND
FUEL PUMP MODULE
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **FUEL PUMP CONTROL OPERATION FROM THE PCM**

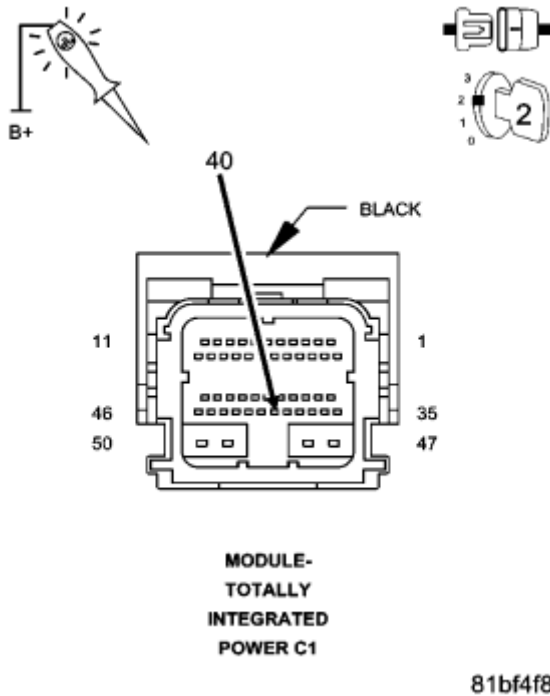


Fig. 58: Using 12-Volt Test Light Connected To B+ To Probe K31 Fuel Pump Control Circuit In C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

NOTE: Before continuing, check the TIPM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Ignition on, engine not running.

Using a 12-volt test light connected to B+, probe the (K31) Fuel Pump Control circuit in the C1 TIPM harness connector.

Using a scan tool actuate the Fuel Pump under the PCM actuations.

Does the test light illuminate accordingly during the actuation?

Yes

Go To 5.

No

Go To 3.

3. (K31) FUEL PUMP CONTROL CIRCUIT OPEN

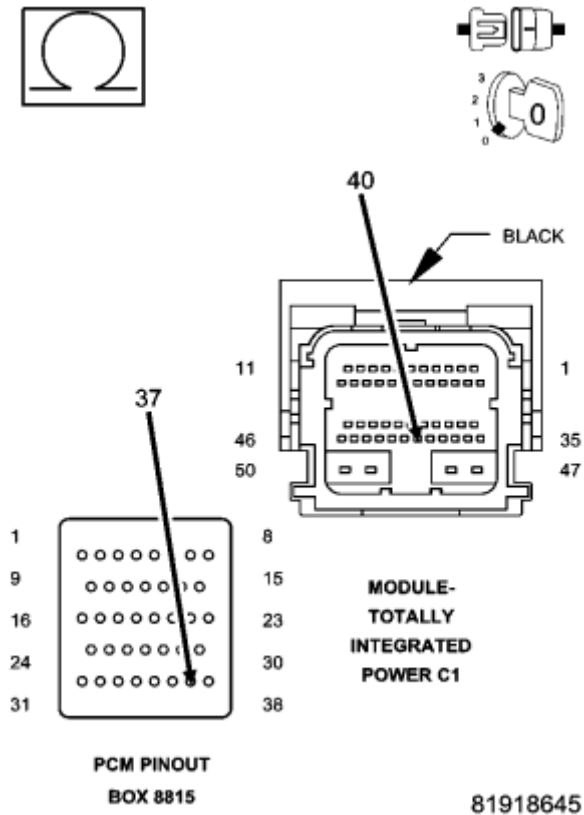


Fig. 59: Measuring Resistance Of (K31) Fuel Pump Control Circuit From C1 TIPM Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K31) Fuel Pump Control circuit from the C1 TIPM harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (K31) Fuel Pump Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO GROUND

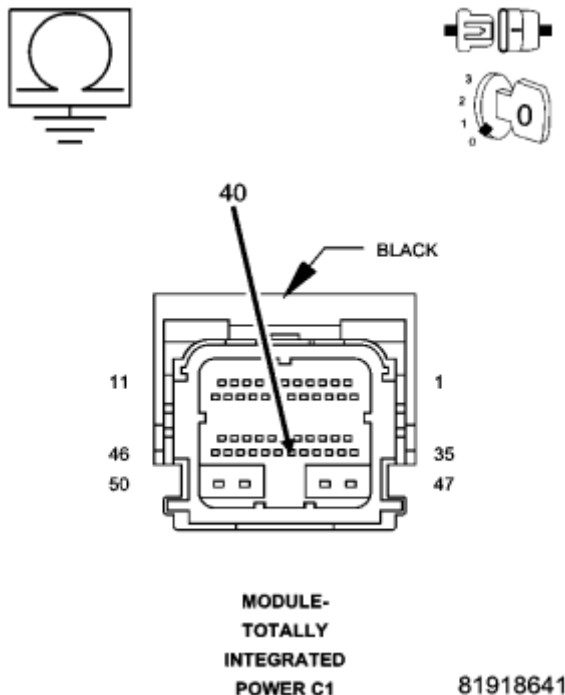


Fig. 60: Measuring Resistance Between Ground And (K31) Fuel Pump Control Circuit In TIPM C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K31) Fuel Pump Control circuit in the TIPM C1 harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K31) Fuel Pump Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

5. (N1) FUEL PUMP OUTPUT CIRCUIT OPEN

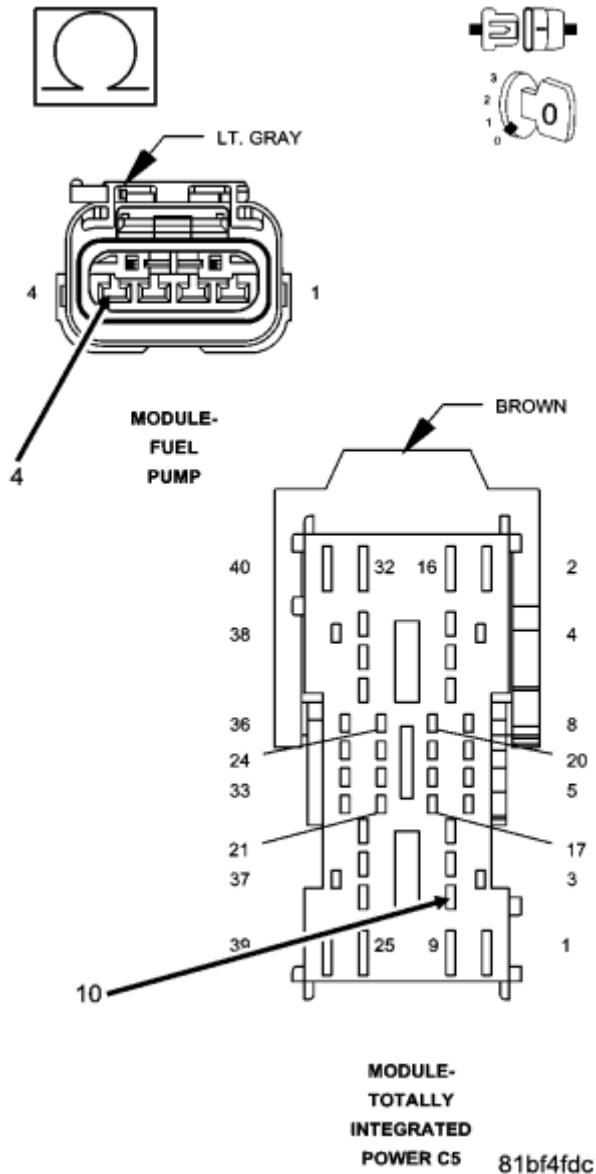


Fig. 61: Measuring Resistance Of (N1) Fused Fuel Pump Output Circuit From C5 TIPM Harness Connector And Fuel Pump Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C5 TIPM harness connector.

Disconnect the Fuel Pump Module harness connector.

Measure the resistance of the (N1) Fused Fuel Pump Output circuit from the C5 TIPM harness connector and the Fuel Pump Module harness connector.

Is the resistance above 5.0 ohms?

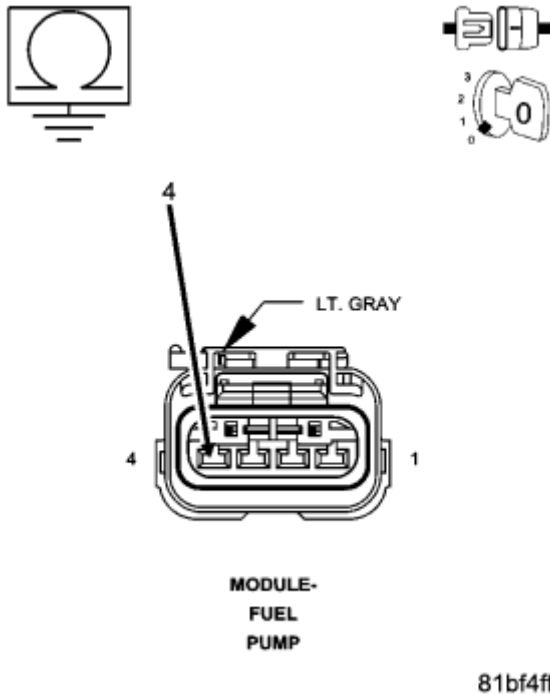
Yes

Repair the open in the (N1) Fused Fuel Pump Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (N1) FUEL PUMP OUTPUT CIRCUIT SHORTED TO GROUND



81bf4ff0

Fig. 62: Measuring Resistance Between Ground And (N1) Fused Fuel Pump Output Circuit At Fuel Pump Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (N1) Fused Fuel Pump Output circuit at the Fuel Pump Module harness connector.

Is the resistance below 100 ohms?

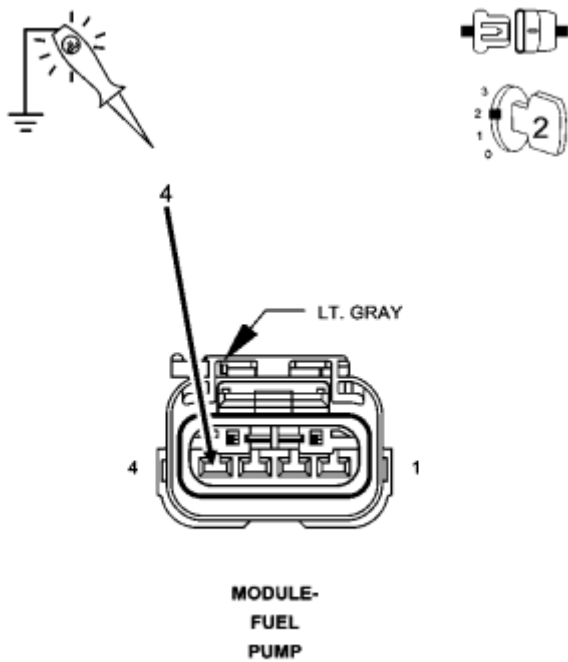
Yes

Repair the short to ground in the (N1) Fused Fuel Pump Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. FUEL PUMP MODULE/TIPM



81bf57ca

Fig. 63: Using 12-Volt Test Light Connected To Ground To Probe (N1) Fused Fuel Pump Output Circuit At Fuel Pump Module Harness Connector
Courtesy of CHRYSLER LLC

Connect the C3 PCM harness connector.

Connect the C1 and C5 TIPM harness connectors.

Turn the ignition on.

Using a scan tool actuate the Fuel Pump Module.

Using a 12-volt test light connected to ground, probe the (N1) Fused Fuel Pump Output circuit at the Fuel Pump Module harness connector.

Does the test light illuminate?

Yes

Replace the Fuel Pump Module in accordance with the Service Information. Refer to **REMOVAL** .
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module in accordance with the Service Information. Refer to **REMOVAL** .

Perform **POWERTRAIN VERIFICATION TEST** .

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Pump Module and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Fuel Pump and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P062C-ETC LEVEL 2 MPH PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Throttle motor is powered and no vehicle speed related DTCs have matured.

SET CONDITIONS

- **Set Condition:**

When secondary software determines that the vehicle speed is implausible for a period of time. One trip fault. ETC lamp will flash.

POSSIBLE CAUSES

Possible Causes
PCM NEEDS TO BE PROGRAMMED POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAM THE POWERTRAIN CONTROL MODULE

Verify the PCM is at the latest calibration (flash level).

NOTE: An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

With a scan tool, select View DTCs.

NOTE: Diagnose any other DTCs that may have set with the P062C.

Does this DTC reset by itself?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P0630-VIN NOT PROGRAMMED IN PCM

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

At initialization.

SET CONDITIONS

- Set Condition:

The VIN has not been programmed into the PCM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
PROGRAMMING VIN INTO PCM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAMMING VIN INTO THE PCM

Ignition on, engine not running.

Using the scan tool, program VIN into the PCM.

Start the engine.

NOTE: If the engine will not start, crank the engine over for 15 seconds. Crank at least 2 times with the ignition switch returning to the off position each time.

Allow the engine to reach normal operating temperature.

With the scan tool, select View DTCs.

Does the DTC reset?

Yes

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

The VIN has been successfully programmed into the PCM. Test is complete.
Perform **POWERTRAIN VERIFICATION TEST** .

P0632-ODOMETER NOT PROGRAMMED IN PCM

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

Odometer is not programed into the PCM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
PROGRAMMING MILEAGE INTO THE PCM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **PROGRAMMING MILEAGE INTO THE PCM**

Ignition on, engine not running.

With the scan tool, erase DTCs.

Using a scan tool, program the mileage into the PCM.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

Does the DTC reset?

Yes

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

The mileage has been successfully programmed into the PCM. Test is complete.
Perform **POWERTRAIN VERIFICATION TEST** .

P0633-SKIM KEY NOT PROGRAMMED IN PCM

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The SKIM Key information has not been programmed into the PCM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
PROGRAMMING SKIM KEY INTO THE PCM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PROGRAMMING SKIM KEY INTO THE PCM

Ignition on, engine not running.

With a scan tool, erase DTCs.

Using the scan tool, program the SKIM Key information into the PCM.

Start the engine.

NOTE: If the engine will not start, crank the engine over for 15 seconds. Crank at least 2 times with the ignition switch returning to the off position each time.

Allow the engine to reach normal operating temperature.

With the scan tool, select View DTCs.

Does the DTC reset?

Yes

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

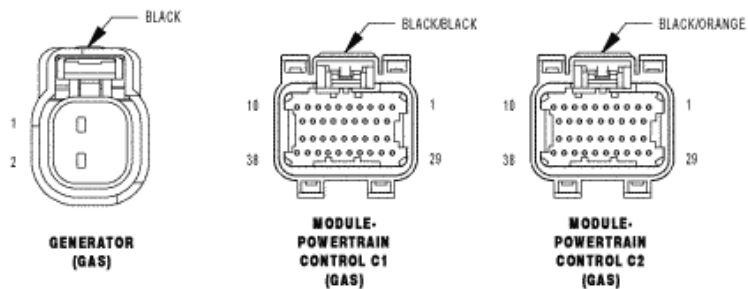
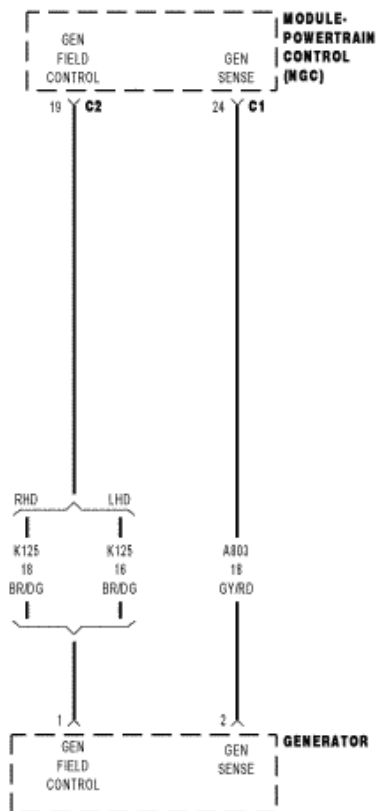
No

The SKIM KEY information has been successfully programmed into the PCM. Test is complete.

Perform **POWERTRAIN VERIFICATION TEST**.

P063A-GENERATOR VOLTAGE SENSE CIRCUIT

CIRCUIT SCHEMATIC



01402070

Fig. 64: Generator Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The engine running. The engine speed greater than 1157 RPM.

SET CONDITIONS

- Set Condition:

The PCM recognizes the alternator output voltage is less than the Battery feed circuit voltage. One trip failure. The Generator light will illuminate. The fault will be checked again on the next key cycle.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (A803) GENERATOR SENSE CIRCUIT
(A803) GENERATOR SENSE CIRCUIT SHORTED TO GROUND
GENERATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.

NOTE: The battery must be fully charged.

NOTE: The Generator belt tension and condition must be checked before continuing.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Start the engine.

Allow the idle to stabilize.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. EXCESSIVE RESISTANCE IN THE (A803) GENERATOR SENSE CIRCUIT

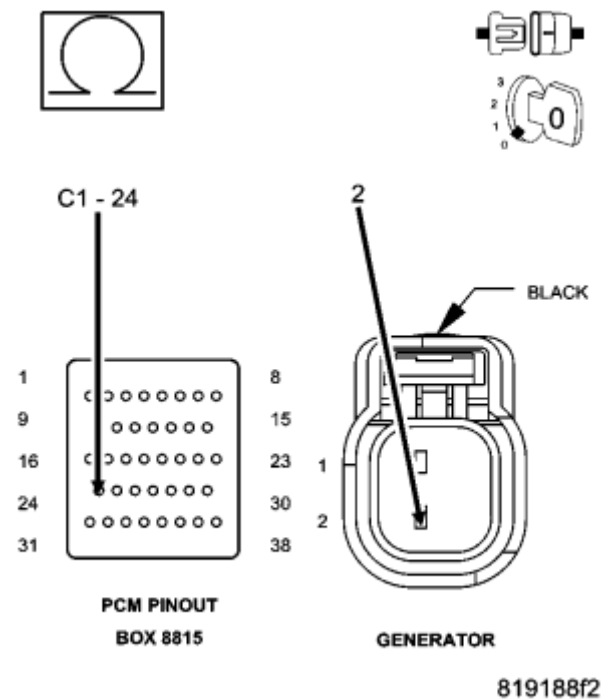


Fig. 65: Measuring Resistance Of (A803) Generator Sense Circuit From Generator Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Generator harness connector.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (A803) Generator Sense circuit from the Generator harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the excessive resistance in the (A803) Generator Sense circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (A803) GENERATOR SENSE CIRCUIT SHORTED TO GROUND

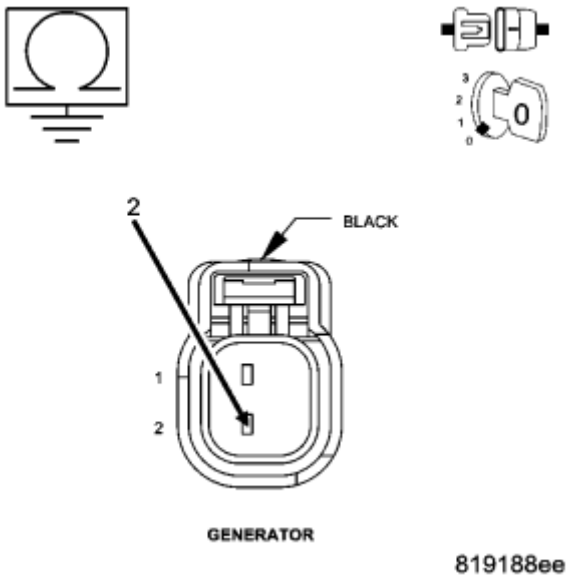


Fig. 66: Measuring Resistance Between Ground And (A803) Generator Sense Circuit At Generator Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (A803) Generator Sense circuit at the Generator harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (A803) Generator Sense circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. GENERATOR OPERATION

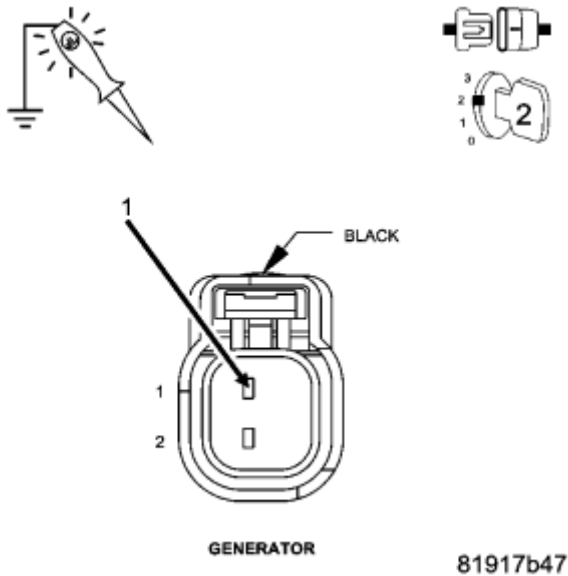


Fig. 67: Probing Generator Field Control Circuit At Generator Field Harness Connector
Courtesy of CHRYSLER LLC

Connect the C1 PCM harness connector.

Using a 12-volt test light connected to ground, probe the (K125) Generator Field Control circuit in the Generator Field harness connector.

Ignition on, engine not running.

NOTE: The DTC needs to be cleared before actuating the Solenoid, if the DTC is not cleared, the Solenoid may not be allowed to actuate.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors. If OK, replace the Generator.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P0420-CATALYST EFFICIENCY (BANK 1)

ADDITIONAL WIRING

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

The State of Change (SOC) catalyst monitor uses the signals from both the upstream and downstream O2 sensors to detect aging of the catalyst. Based on the fact that when a catalyst ages, it loses some of its Oxygen Storage Capacity (OSC). As a result, part of the untreated exhaust gases can breakthrough the catalyst and causes the downstream O2 sensor to deviate from its neutral (Stoichiometric) position. By observing the activities in the downstream O2 signal, the degradation level of catalyst can be detected. In general, the higher the downstream O2 sensor SOC value, the more exhaust gas breakthrough and the lower the OSC of the catalytic converter.

MONITOR CONDITIONS

When Monitored:

The monitor will run at between 1400 and 2300 RPM. It also runs between 40 and 70 kPA.

SET CONDITIONS

- Set Condition:

If the final State of Change index is within the calibrated fail threshold. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND
(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND
(K902) O2 RETURN UPSTREAM CIRCUIT OPEN
(K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN
EXHAUST LEAK
ENGINE MECHANICAL CONDITION
AGING O2 SENSOR
CATALYTIC CONVERTER

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:** A new rear O2 Sensor along with an aging front O2 Sensor may cause the DTC to set. Review the repair history of the vehicle before continuing.
- NOTE:** If an O2 Sensor DTC set along with the Catalytic Converter Efficiency DTC diagnose the O2 Sensor DTC(s) before continuing.
- NOTE:** Check for contaminants that may have damaged the O2 Sensor and Catalytic Converter: contaminated fuel, unapproved silicone, oil and coolant, repair necessary.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

- NOTE:** It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUALLY INSPECT CATALYTIC CONVERTER

Inspect the Catalytic Converter for the following damage.

Damage Catalytic Converter, dents or holes.

Severe discoloration caused by overheating the Catalytic Converter.

Catalytic Converter broke internally.

Inspect both ends of the converter, inlet and outlet.

Leaking Catalytic Converter.

Were any problems found?

Yes

Replace the Catalytic Converter. Repair the condition that may have caused the failure.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K902) O2 RETURN UPSTREAM CIRCUIT VOLTAGE CHECK

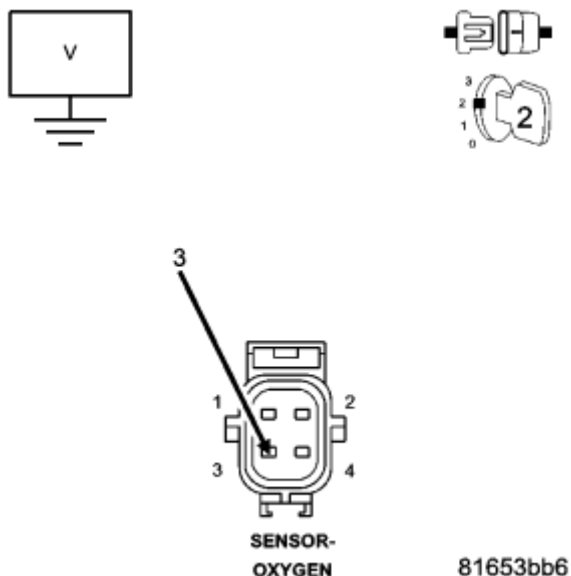


Fig. 1: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 4.

No

Go To 5.

4. **(K904) O2 RETURN DOWNSTREAM CIRCUIT VOLTAGE CHECK**

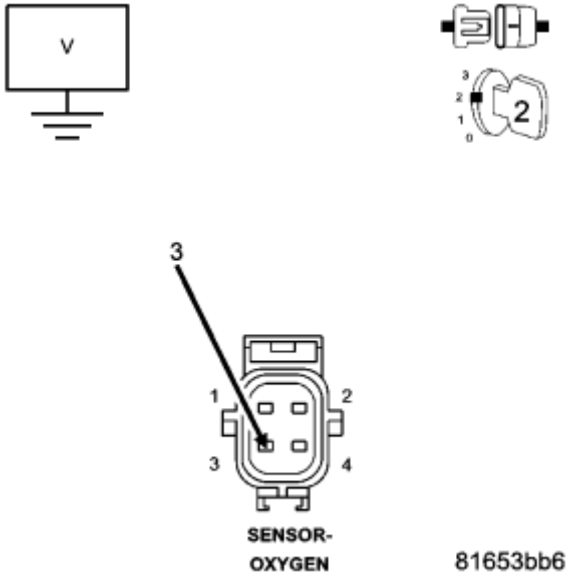


Fig. 2: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/2 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

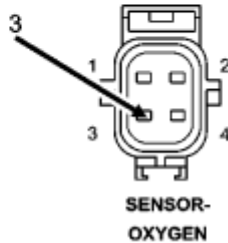
Yes

Go To 10.

No

Go To 7.

5. **(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND**



81653c09

Fig. 3: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K902) O2 Return Upstream circuit in the 1/1 O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

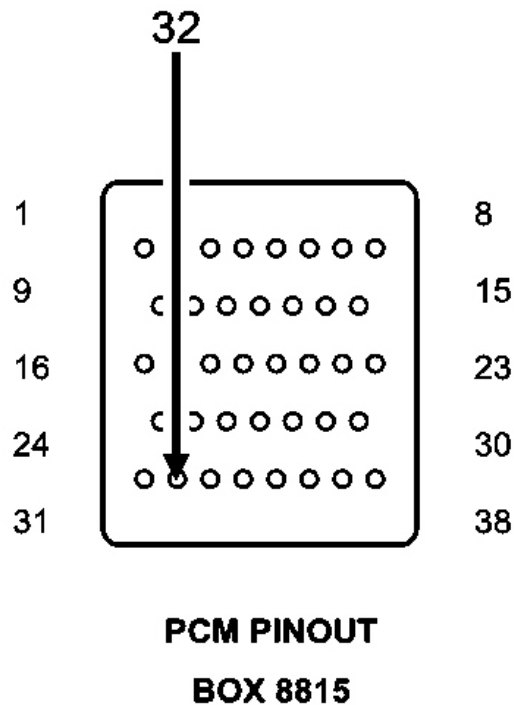
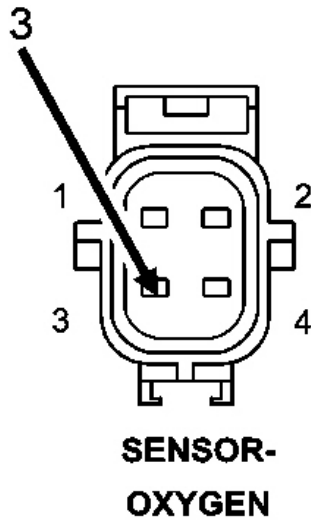
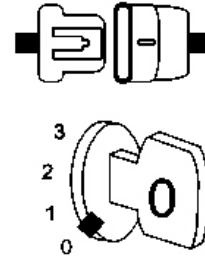
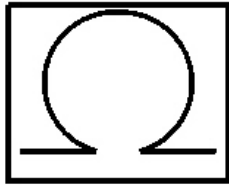
Repair the short to ground in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K902) O2 RETURN UPSTREAM CIRCUIT OPEN



81653d27

Fig. 4: Checking O2 Sensor Return Upstream Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K902) O2 Return Upstream circuit from the 1/1 O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

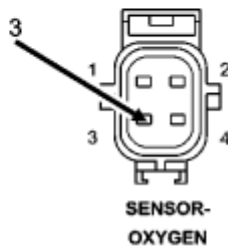
Go To 9.

No

Repair the open in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 5: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/2 O2 harness connector.

Measure the resistance between ground and the (K904) O2 Return Downstream circuit in the 1/2 O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

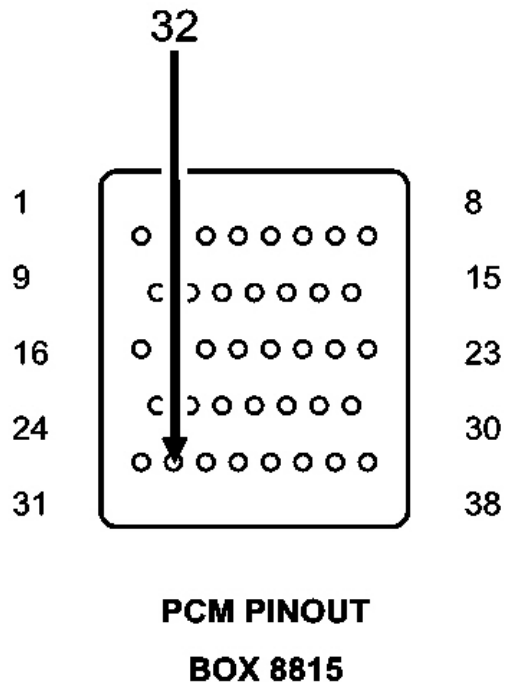
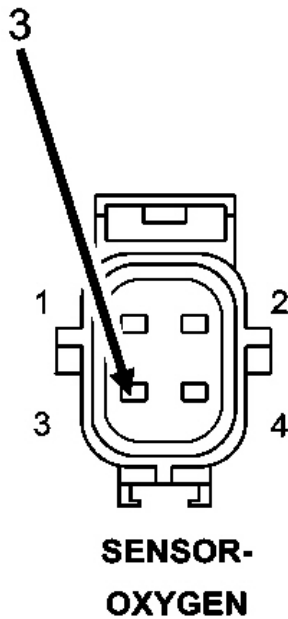
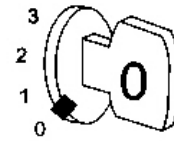
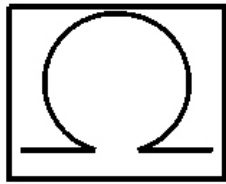
Repair the short to ground in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN



816544d2

Fig. 6: Checking O2 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K904) O2 Return Downstream circuit from the 1/2 O2 Sensor harness

connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

10. **CHECKING THE EXHAUST SYSTEM FOR LEAKS**

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine

operating time.

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 4 psi reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **ENGINE MECHANICAL CONDITION**

Check the exhaust for excessive smoke caused by an internal problem in the engine.

Is an engine mechanical condition present?

Yes

Repair the engine mechanical condition as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

12. **AGING O2 SENSOR**

A new rear O2 Sensor along with an aging front O2 Sensor may cause the DTC to set.

Review the vehicles repair history.

Has the rear O2 Sensor been replaced without replacing the front O2 Sensor?

Yes

Replace the Front O2 Sensor as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. CATALYTIC CONVERTER

If there are no possible cause remaining, view repair.

Repair

Replace the Catalytic Converter.
Perform **POWERTRAIN VERIFICATION TEST** .

P0430-CATALYST EFFICIENCY (BANK 2)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The State of Change (SOC) catalyst monitor uses the signals from both the upstream and downstream O2 sensors to detect aging of the catalyst. Based on the fact that when a catalyst ages, it loses some of its Oxygen Storage Capacity (OSC). As a result, part of the untreated exhaust gases can breakthrough the catalyst and causes the downstream O2 sensor to deviate from its neutral (Stoichiometric) position. By observing the activities in the downstream O2 signal, the degradation level of catalyst can be detected. In general, the higher the downstream O2 sensor SOC value, the more exhaust gas breakthrough and the lower the OSC of the catalytic converter.

MONITOR CONDITIONS

When Monitored:

The monitor will run at between 1400 and 2300 RPM. It also runs between 40 and 70 KPA.

SET CONDITIONS

- **Set Condition:**

If the final State of Change index is within the calibrated fail threshold. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND

(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND
(K902) O2 RETURN UPSTREAM CIRCUIT OPEN
(K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN
EXHAUST LEAK
ENGINE MECHANICAL CONDITION
AGING O2 SENSOR
CATALYTIC CONVERTER

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:** A new rear O2 Sensor along with an aging front O2 Sensor may cause the DTC to set. Review the repair history of the vehicle before continuing.
- NOTE:** If an O2 Sensor DTC set along with the Catalytic Converter Efficiency DTC diagnose the O2 Sensor DTC(s) before continuing.
- NOTE:** Check for contaminants that may have damaged the O2 Sensor and Catalytic Converter: contaminated fuel, unapproved silicone, oil and coolant, repair necessary.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

- NOTE:** It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUALLY INSPECT CATALYTIC CONVERTER

Inspect the Catalytic Converter for the following damage.

Damage Catalytic Converter, dents or holes.

Severe discoloration caused by overheating the Catalytic Converter.

Catalytic Converter broke internally.

Inspect both ends of the converter, inlet and outlet.

Leaking Catalytic Converter.

Were any problems found?

Yes

Replace the Catalytic Converter. Repair the condition that may have caused the failure.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K902) O2 RETURN UPSTREAM CIRCUIT VOLTAGE CHECK

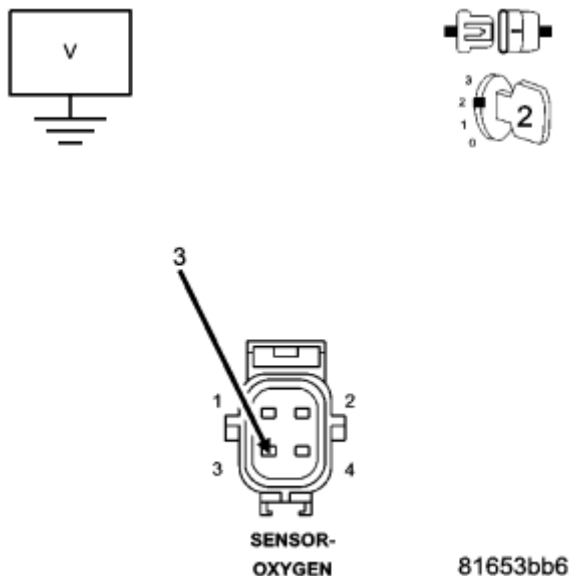


Fig. 7: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/1 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 4.

No

Go To 5.

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT VOLTAGE CHECK

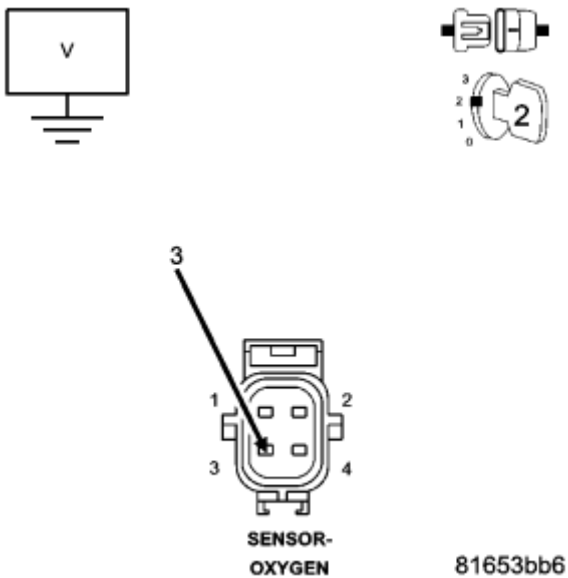


Fig. 8: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/2 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 10.

No

Go To 7.

5. **(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND**

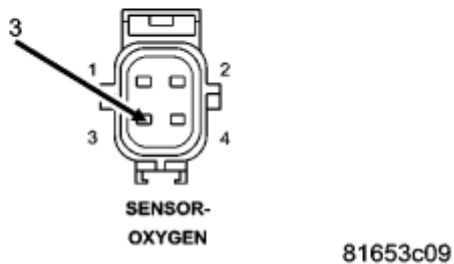


Fig. 9: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K902) O2 Return Upstream circuit in the 2/1 O2 Sensor harness connector.

Is the resistance below 100 ohms?

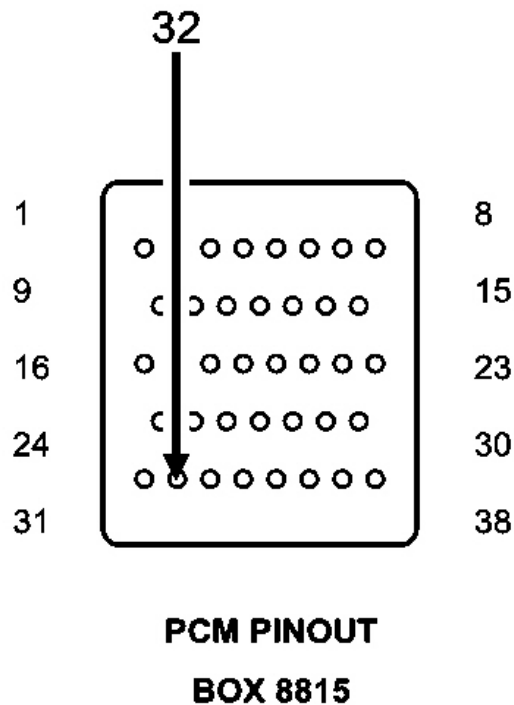
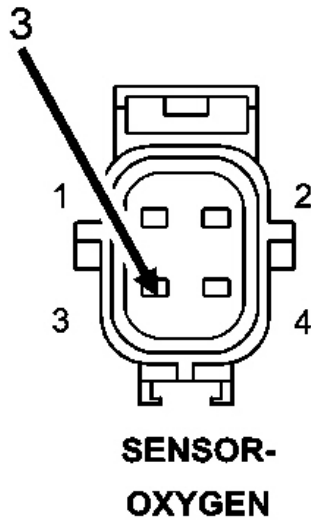
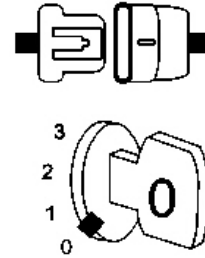
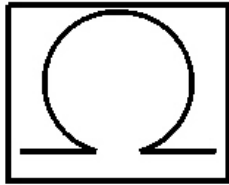
Yes

Repair the short to ground in the (K902) O2 Return Upstream circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K902) O2 RETURN UPSTREAM CIRCUIT OPEN**



81653d27

Fig. 10: Checking O2 Sensor Return Upstream Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K902) O2 Return Upstream circuit from the 2/1 O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

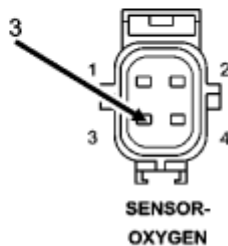
Go To 9.

No

Repair the open in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 11: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/2 O2 harness connector.

Measure the resistance between ground and the (K904) O2 Return Downstream circuit in the 2/2 O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

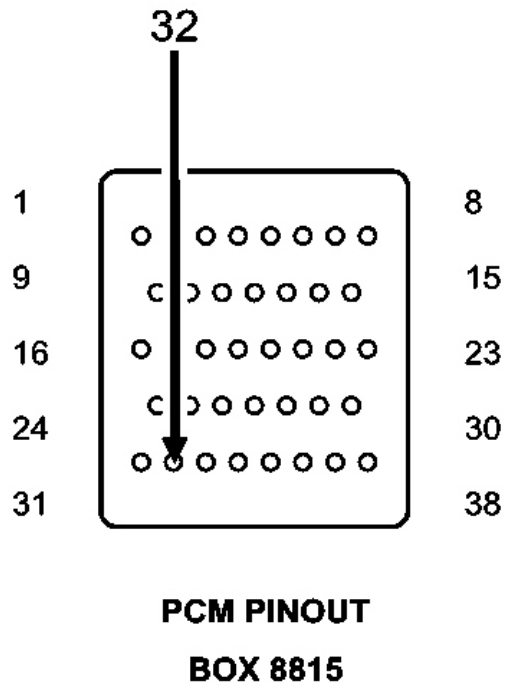
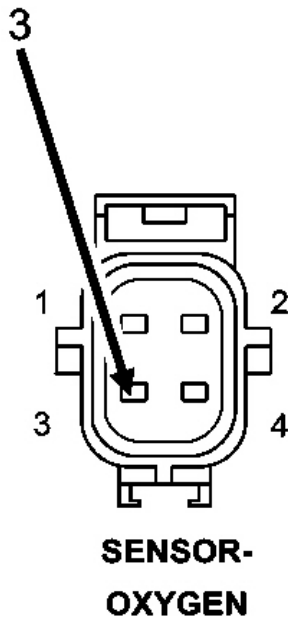
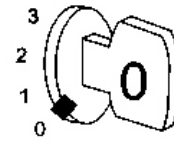
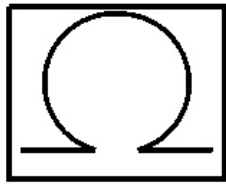
Repair the short to ground in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN



816544d2

Fig. 12: Checking O2 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K904) O2 Return Downstream circuit from the 2/2 O2 Sensor harness

connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

10. **CHECKING THE EXHAUST SYSTEM FOR LEAKS**

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine

operating time.

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 4 psi reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. **ENGINE MECHANICAL CONDITION**

Check the exhaust for excessive smoke caused by an internal problem in the engine.

Is an engine mechanical condition present?

Yes

Repair the engine mechanical condition as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

12. **AGING O2 SENSOR**

A new rear O2 Sensor along with an aging front O2 Sensor may cause the DTC to set.

Review the vehicles repair history.

Has the rear O2 Sensor been replaced without replacing the front O2 Sensor?

Yes

Replace the Front O2 Sensor as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **CATALYTIC CONVERTER**

If there are no possible cause remaining, view repair.

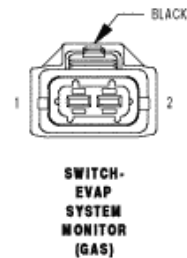
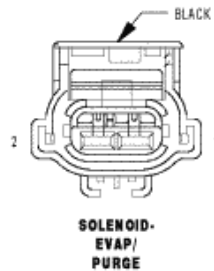
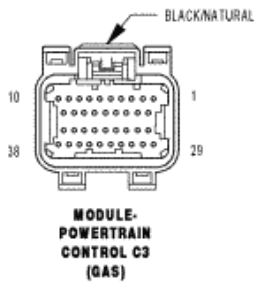
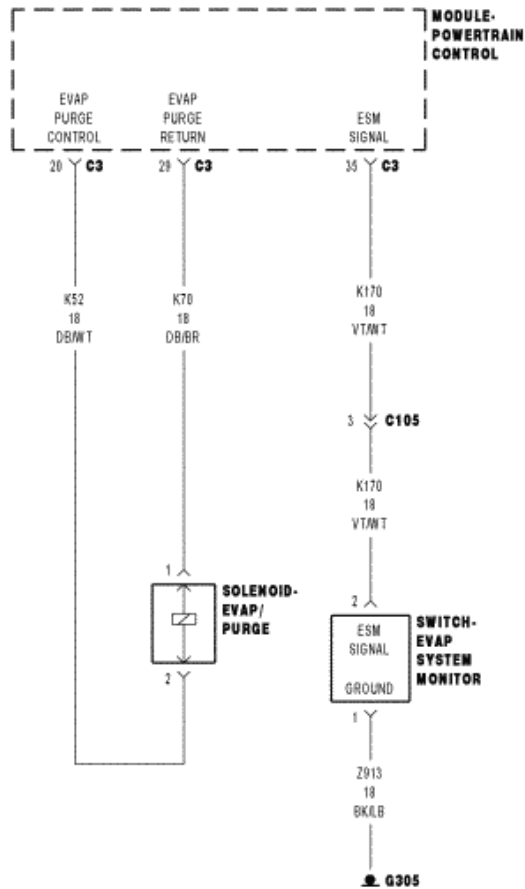
Repair

Replace the Catalytic Converter.

Perform **POWERTRAIN VERIFICATION TEST** .

P0440-GENERAL EVAP SYSTEM FAILURE

CIRCUIT SCHEMATIC



01902496

Fig. 13: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The EVAP Purge Monitor tests the integrity of the hoses/tube between the throttle body/intake and the fuel tank. The monitor is a two stage test and runs only after the EVAP system passes the small leak test. Stage one is non-intrusive. The PCM monitors the purge vapor ratio and the ESM switch closed ratio. If the purge vapor ratio is above a calculated value, the monitor passes. If the ESM switch closed ratio is greater than calculated value when purge flow is greater than a minimum value, the monitor passes. Stage two is an intrusive test and runs only if stage one does not pass. The PCM commands the purge solenoid to flow at a specified rate to force the purge vapor ratio to update. The ratio is compared to a calibrated specification. If it is less than specified, a one trip failure is recorded. This test can detect if the purge hose is off, obstructed, or the purge valve is not operational.

MONITOR CONDITIONS

When Monitored:

Engine running after a cold start with the difference between ECT and AAT is less than 10° C (19° F).
Fuel Level between 12% and 88% full. Manifold vacuum greater than a calculated minimum value.
Ambient Temperature between 4° C and 32° C (39° F and 89° F).

SET CONDITIONS

- **Set Condition:**

When the monitor conditions are met, the PCM will ramp in purge flow. If the PCM does not sense an ESM switch closure after a calculated amount of purge flow accumulation, an error is detected. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EVAP PURGE SOLENOID VACUUM SUPPLY
EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION
(Z913) GROUND CIRCUIT OPEN
(K107) ESM SIGNAL CIRCUIT OPEN
EVAPORATIVE EMISSION LEAK
EVAP SYSTEM MONITOR SWITCH
EVAP PURGE SOLENOID
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTCs. Record the related Freeze Frame data if any DTC(s) are present.

Whether or not any DTC(s) are active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTCs.

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. **ACTIVE DTC**

NOTE: Allow the vehicle to reach ambient temperature before continuing with this procedure.

NOTE: A loose gas cap could have caused this DTC to set. Make sure the gas cap is tight and in good condition.

NOTE: If the customer is experiencing an early fuel shut off during the fuel filling process along with P0440, P0441, and P0452 setting, you need to check for restrictions in the EVAP Purge tubes/hoses as well as the Fresh Air Filter before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by

reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. VISUAL AND PHYSICAL INSPECTION

Turn the ignition off.

Perform a visual and physical inspection of the entire Evaporative Emission system.

Check for the following conditions:

- Hoses disconnected or left off
- Holes or cracks
- Loose seal points
- Evidence of damaged components
- Incorrect routing of hoses and tubes
- Fuel Cap left off or bad gasket seal

Were any of the above conditions found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. EVAP VACUUM SUPPLY HOSE INSPECTION

Carefully inspect the EVAP Purge Solenoid vacuum supply hose for proper routing.

Check for a pinched or plugged hose from the throttle body or intake manifold to the Purge Solenoid.

Make sure the vacuum port at the throttle body or intake manifold is free from any blockage.

Were any problems found?

Yes

Repair the vacuum supply, hose/tube as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EVAP PURGE SOLENOID

NOTE: To continue testing you will need Miller Tool #8404 Evaporative Emission Leak Detector (EELD).

WARNING: Keep lit cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases, Keep the test area well ventilated.

Connect the red power lead of the EELD to the battery positive terminal and the black ground lead to battery negative terminal.

Disconnect the vacuum hoses at the EVAP Purge Solenoid.

Connect the SMOKE supply tip (black hose) to the "CAN" port on the EVAP Purge Solenoid.

Set the smoke/air control switch to SMOKE.

While still holding the remote smoke/air start button, check to see if smoke is exiting the purge valve. This indicates that there is a leak internal to the purge valve.

NOTE: This is an optional method of checking the purge valve for leaks if the EELD is unavailable.

Disconnect the Smoke supply tip from the vacuum supply hoses at the EVAP Purge Solenoid.

Using a hand vacuum pump, apply 10 in Hg to the "CAN" side of the EVAP Purge Solenoid.

Observe the vacuum gauge for at least 15 seconds.

Is smoke visible from the EVAP Purge Solenoid or NOT hold a vacuum?

Yes

Replace the EVAP Purge Solenoid.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **ESIM SWITCH STATE**

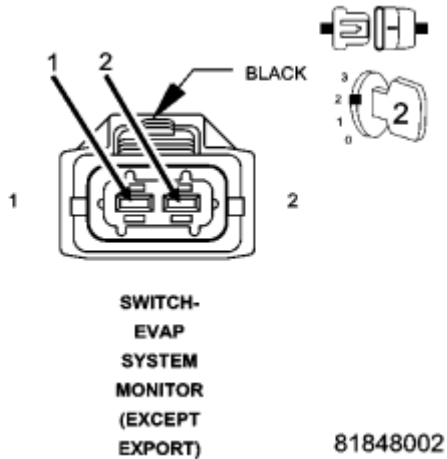


Fig. 14: Checking ESM Switch State
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the previously disconnected vacuum hose.

Disconnect the EVAP System Monitor Switch harness connector.

Ignition on, engine not running.

Monitor the ESIM Switch state on the scan tool.

Carefully connect a jumper wire between the (K107) ESM Signal circuit and the (Z913) Ground circuit in the EVAP System Monitor Switch harness connector.

Monitor the ESIM Switch state on the scan tool.

Did the Switch change from OPEN to CLOSED when the jumper wire was installed?

Yes

Go To 9.

No

Go To 7.

7. EXCESSIVE RESISTANCE IN THE (K107) ESM SIGNAL CIRCUIT

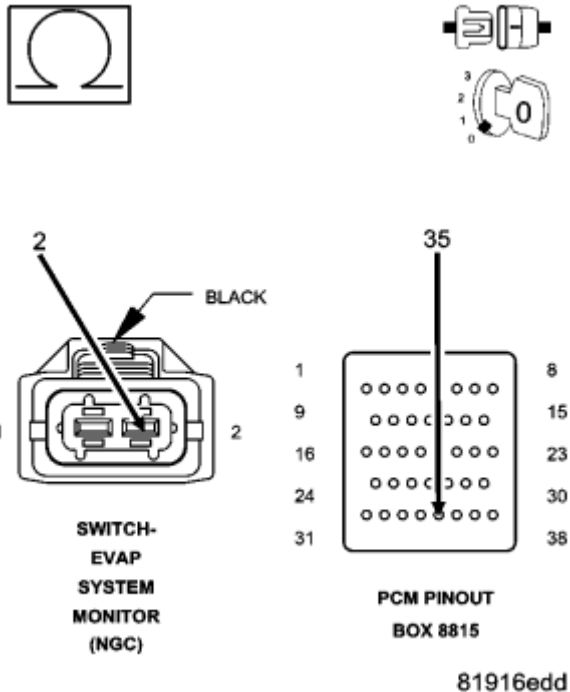


Fig. 15: Checking ESM Signal Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K107) ESM Signal circuit from the ESM harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the excessive resistance in the (K107) ESM Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. EXCESSIVE RESISTANCE IN THE (Z913) GROUND CIRCUIT

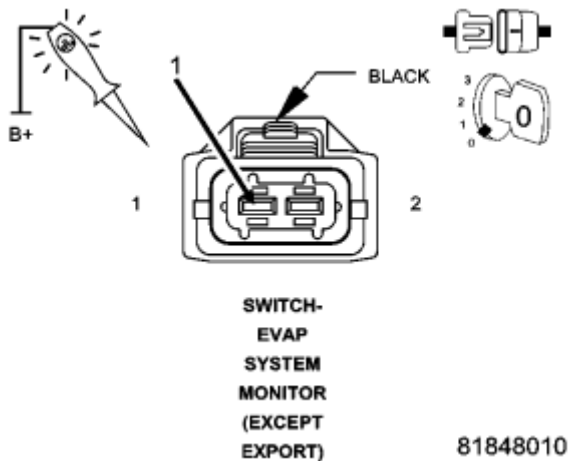


Fig. 16: Checking ESM Switch Ground Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to B+, probe the (Z913) Ground circuit in the ESM harness connector.

NOTE: The test light should illuminate brightly. Compare the brightness to that of a direct connection to B- (ground).

Does the test light illuminate brightly?

Yes

Go To 14.

No

Repair the excessive resistance in the (Z913) Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. VERIFY EVAPORATIVE EMISSION LEAK

WARNING: Keep lit cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases. Keep the test area well ventilated.

Turn the ignition off.

To continue testing you will need Miller Tool #8404 Evaporative Emission Leak Detector (EELD).

NOTE: The fuel tank should have between 20% and 80% of fuel tank capacity to properly test the EVAP system.

Connect the red power lead of EELD to the battery positive terminal and the black ground lead to battery negative terminal.

Block the vent hose of the EVAP Canister.

Connect shop air to the EELD.

Set the smoke/air control switch to AIR.

Insert the tester's AIR supply tip (clear hose) into the .040 orifice on the tester's control panel.

Press the remote smoke/air start button.

Position the red flag on the air flow meter so it is aligned with the indicator ball.

When the calibration is complete, release the remote button. The EELD flow meter is now calibrated in liters per minute.

Install the service port adapter #8404-14 on the vehicle's service port (if equipped) or install the #8404-ADP into the filter line.

Connect the Air supply hose from the EELD to the service port (if equipped) or to the #8404-ADP adapter.

Press the remote button to activate AIR flow.

Compare the flow meter indicator ball reading to the red flag.

ABOVE the red flag indicates a leak present.

BELOW the red flag indicates a sealed system.

Is the indicator ball above the red flag?

Yes

Go To 10.

No

Go To 12.

10. **EVAPORATIVE EMISSION LEAK DETECTION**

NOTE: A thorough visual inspection of the EVAP system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may aid diagnosis also.

Remove the Air supply hose from the service port or the #8404-ADP adapter.

Connect the SMOKE supply tip (black hose) to the service port (if equipped) or to the #8404-ADP adapter.

Set the smoke/air control switch to SMOKE.

NOTE: The flow meter indicator ball will not move at this point.

Press the remote smoke/air start button.

NOTE: Make sure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.

NOTE: For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.

While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke.

If a leak is concealed from view (i.e, top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that are left behind by the smoke.

The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light.

NOTE: The EVAP System is divided into three zones. A leak from any of these zones can cause this DTC to set. The lists below specify the possible leak points in that specific zone. For further assistance see the Zone Identification below.

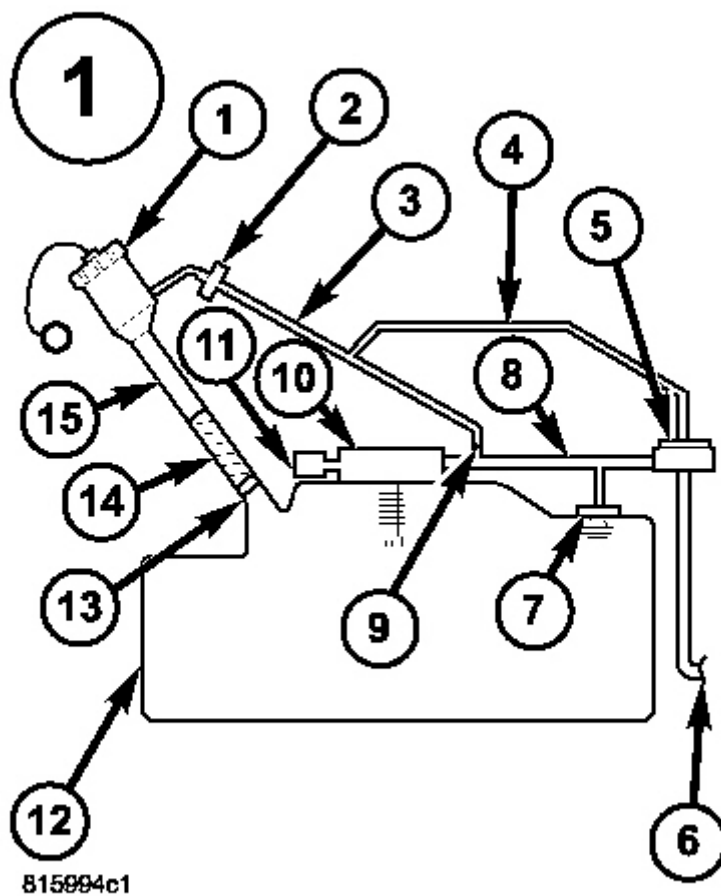


Fig. 17: Identifying EVAP System Zone 1
 Courtesy of CHRYSLER LLC

ZONE 1

- 1 Fuel Cap
- 2 Recirculation Check Valve.
- 3 Vapor Recirculation Line.
- 4 Signal Vapor Line for FVM.
- 5 Flow Management Valve.

6 Fuel Tank to Canister Vapor Line connection.

7 Fuel Tank Vent (Check Valve).

8 Vapor Line to Canister.

9 Flow Control Orifice.

10 Control Valve.

11 Liquid Trap.

12 Fuel Tank.

13 Check valve.

14 Fuel Fill Tube to Tank connector.

15 Fuel Fill Tube

Damaged or disconnected EVAP system components.

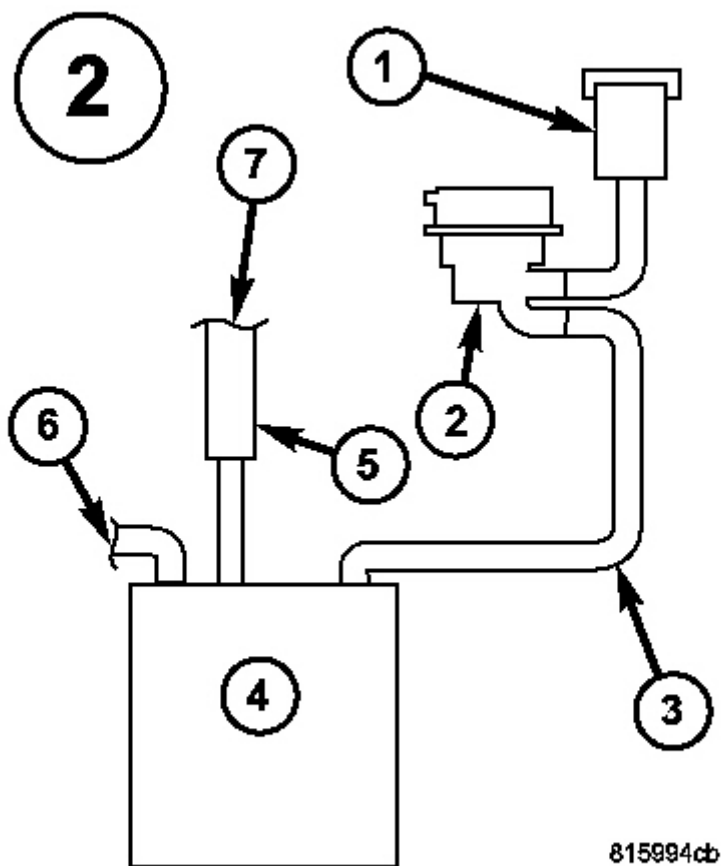


Fig. 18: Identifying EVAP System Zone 2
Courtesy of CHRYSLER LLC

ZONE 2

- 1 Filter.
- 2 ESIM.
- 3 Canister Vent Line.
- 4 EVAP Canister.
- 5 Chassis Purge Valve.

6 Fuel Tank to Canister Vapor Line connection.

7 EVAP Purge connection.

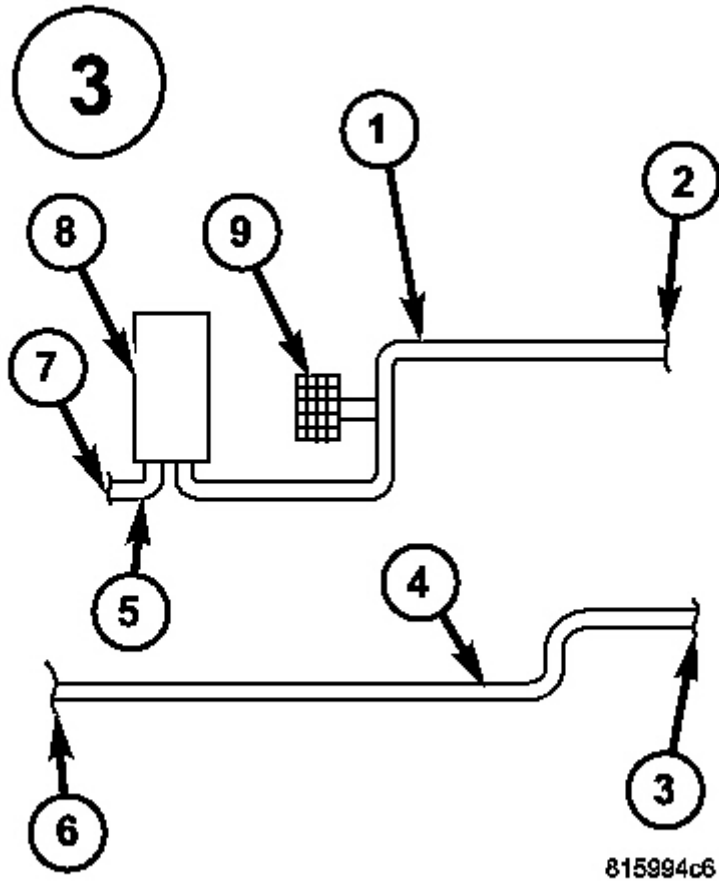


Fig. 19: Identifying EVAP System Zone 3
Courtesy of CHRYSLER LLC

ZONE 3

1 EVAP Purge Vacuum Line.

2 Connection to Chassis Line.

3 Connection to Canister.

4 Chassis Purge Line.

5 EVAP Purge Vacuum Line.

6 Connection to EVAP Purge Harness.

7 Chassis EVAP Purge Line connection to Engine Vacuum.

8 EVAP Purge Valve.

9 Service Port.

NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke or dye may or may not be visible. Introducing smoke into the filtered side of the canister may assist in locating the leak.

Select the appropriate response from the list below:

A leak was found at the gas cap or fuel filler tube.

Go To 11.

A leak was found in one or more of the EVAP System zones.

If the leak is at a hose connection, remove the hose then reconnect the hose and check for a leak again. All other leaks repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No leaks were detected.

Go To 12.

11. LEAK AT GAS CAP

Remove the SMOKE supply tip (black hose) from the service port (if equipped) or to the #8404-ADP adapter.

Install gas cap adapter, Miller Tool #8382 (1/4 turn cap) or #6922 (screw cap) and #8399 (secondary seal depressor) and repeat test 5.

NOTE: The gas cap adapter is being used as a known good cap.

Was a leak found at the gas cap adapter?

Yes

Replace the Fuel Filler tube assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the gas cap.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION**

Inspect the EVAP Purge hose/tube for proper routing and installation between the EVAP Purge Solenoid and the Fuel Tank between the Fuel Tank and the EVAP Purge Canister

Make sure the hose/tube and fresh air filter are not damaged, kinked, and free from any obstructions.

Were any problems found?

Yes

Repair or replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **EVAP SYSTEM MONITOR SWITCH**

Use the wiring diagram/schematic as a guide, inspect the wiring and connections between the EVAP System Monitor Switch and the PCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for any broken, bent, pushed out, or corroded terminals.

Verify that there is good pin to terminal contact in the ESIM Switch and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair and Replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the EVAP System Monitor Switch per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

14. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP Purge Solenoid Assembly, ESIM Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch, Solenoid, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

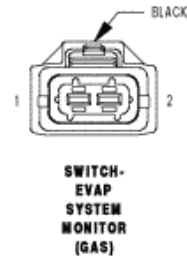
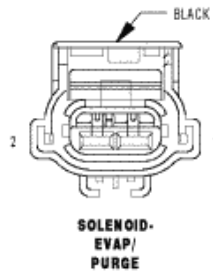
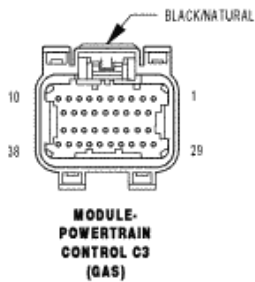
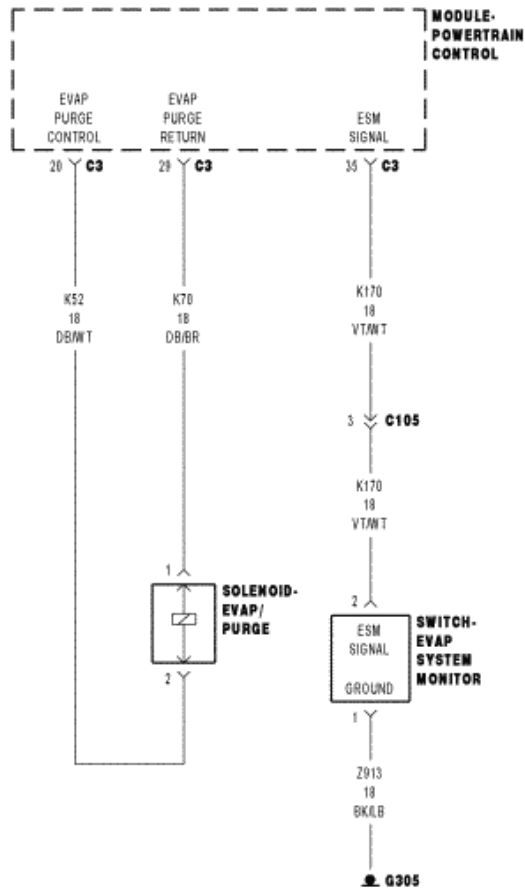
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0441-EVAP PURGE SYSTEM PERFORMANCE

CIRCUIT SCHEMATIC



01902496

Fig. 20: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The EVAP Purge Monitor tests the integrity of the hoses/tube between the throttle body/intake and the fuel tank. The monitor is a two stage test and runs only after the EVAP system passes the small leak test. Stage one is non-intrusive. The PCM monitors the purge vapor ratio and the ESM switch closed ratio. If the purge vapor ratio is above a calculated value, the monitor passes. If the ESM switch closed ratio is greater than calculated value when purge flow is greater than a minimum value, the monitor passes. Stage two is an intrusive test and runs only if stage one does not pass. The PCM commands the purge solenoid to flow at a specified rate to force the purge vapor ratio to update. The ratio is compared to a calibrated specification. If it is less than specified, a one trip failure is recorded. This test can detect if the purge hose is off, obstructed, or the purge valve is not operational.

MONITOR CONDITIONS

When Monitored:

After the EVAP System small leak test has passed, with the engine running, ambient temperature between 4° C (39° F) and 35° (95° F), with the engine at idle after a calibrated amount of drive time has accumulated.

SET CONDITIONS

- **Set Condition:**

If the PCM detects that the purge vapor ratio and the ESM switch closed ratio are below a calculated value, the PCM commands the purge solenoid to flow at a specified rate to update the purge vapor ratio. If the ratio remains below a specified value, a one trip failure is recorded. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EVAP PURGE SOLENOID VACUUM SUPPLY
EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION
EVAP PURGE SOLENOID
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTCs. Record the Freeze Frame data if any DTCs are present.

Whether or not any DTC(s) are Active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTC(s).

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. ACTIVE DTC

NOTE: If P0443 is set along with this DTC, perform the diagnostic procedure for P0443 before continuing with this test.

NOTE: If the customer is experiencing an early fuel shut off during the fuel filling process along with P0440, P0441, and P0452 setting, you need to check for restrictions in the EVAP Purge tubes/hoses as well as the Fresh Air Filter before continuing.

Start the engine.

Allow the engine to idle.

Using the scan tool, perform the ESIM FORCED MONITOR TEST. Allow the test to complete.

With a scan tool, select View DTCs.

NOTE: If any other DTC sets, active or pending, perform the diagnostic procedure for that DTC before proceeding with this test.

Is the DTC Active at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. VISUAL INSPECTION

Inspect the EVAP System for any of the following conditions:

- Holes or cracks
- Loose seal points
- Damaged or missing components
- Incorrect routing of hoses and tubes
- Loose or missing Fuel Cap
- Damaged or missing Fuel Cap seal
- Improper installation of the Fuel Cap
- Damaged Locking tabs on the Fuel Cap and/or filler tube
- Damaged seal points on the Fuel Cap and/or filler tube

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. INSUFFICIENT VACUUM SUPPLY TO THE EVAP PURGE SOLENOID

Turn the ignition off.

Carefully inspect the EVAP Purge Solenoid vacuum supply hose for proper routing.

Check for a pinched or plugged hose from the throttle body or intake manifold to the Purge Solenoid.

Inspect the vacuum port at the throttle body or intake manifold for any damage or obstructions.

Were any problems found?

Yes

Repair the vacuum supply hose/tube as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to 5.

5. EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION

Inspect the EVAP Purge hose/tube for proper routing and installation between the EVAP Purge Solenoid and the Fuel Tank and between the Fuel Tank and the EVAP Purge Canister.

Make sure the hose/tube and fresh air filter are not damaged, kinked, and free from any obstructions.

Were any problems found?

Yes

Repair or replace as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. EVAP PURGE SOLENOID

NOTE: **After disconnecting the EVAP Purge Solenoid vacuum connections, inspect the lines and solenoid for signs of contamination.**

Using a hand vacuum pump, apply 10 in Hg to the "CAN" side of the EVAP Purge Solenoid.

NOTE: **The solenoid should hold vacuum for a minimum of 15 seconds.**

Ignition on, engine not running.

With the scan tool, actuate the EVAP Purge Solenoid to the ON position.

NOTE: **The vacuum should drop when the solenoid is actuated.**

Does the solenoid function as described above?

Yes

Go To 7.

No

Replace the EVAP Purge Solenoid.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP Purge Solenoid Assembly, ESIM Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch, Solenoid, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

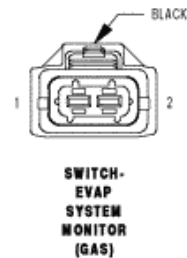
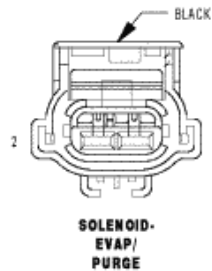
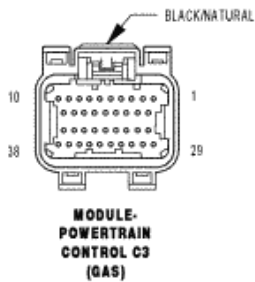
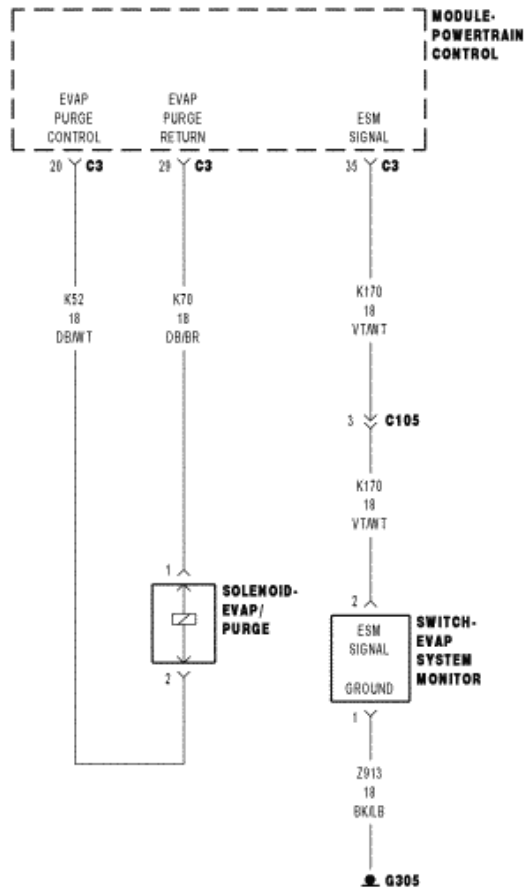
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0443-EVAP PURGE SOLENOID CIRCUIT

CIRCUIT SCHEMATIC



01962496

Fig. 21: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

The ignition on or engine running. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

The PCM will set a trouble code if the actual state of the solenoid does not match the intended state. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO VOLTAGE
(K70) EVAP PURGE RETURN CIRCUIT SHORTED TO VOLTAGE
(K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO GROUND
EXCESSIVE RESISTANCE IN THE (K52) EVAP PURGE CONTROL CIRCUIT
EXCESSIVE RESISTANCE IN THE (K70) EVAP PURGE RETURN CIRCUIT
EVAP PURGE SOLENOID
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data if any DTC(s) are present.

Whether or not any DTC(s) are Active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTC(s).

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. ACTIVE DTC

Ignition on, engine not running.

With the scan tool, Select View DTCs.

Is the DTC Active at this time?

Yes

Go To 3.

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

3. (K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO VOLTAGE

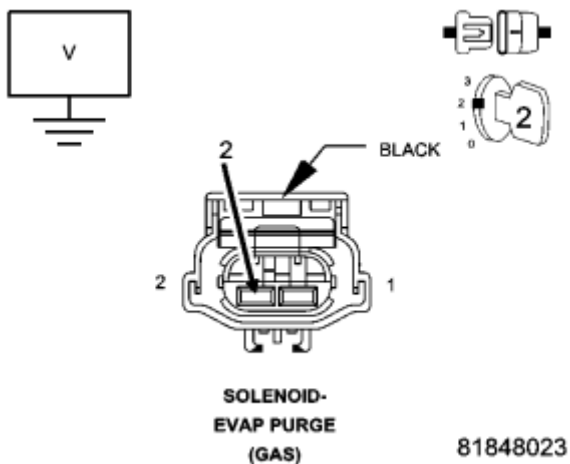


Fig. 22: Checking EVAP Purge Return Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EVAP Purge Solenoid harness connector.

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage of the (K52) EVAP Purge Control circuit in the EVAP Purge Solenoid harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K52) EVAP Purge Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K70) EVAP PURGE RETURN CIRCUIT SHORTED TO VOLTAGE

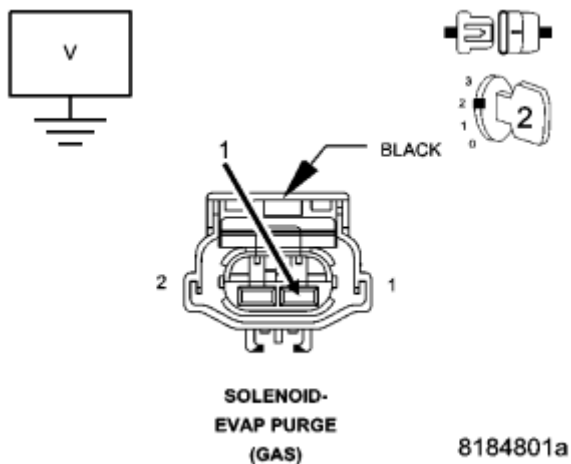


Fig. 23: Checking EVAP Purge Control Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Measure the voltage of the (K70) EVAP Purge Return circuit in the EVAP Purge Solenoid harness connector.

Is there any voltage present?

Yes

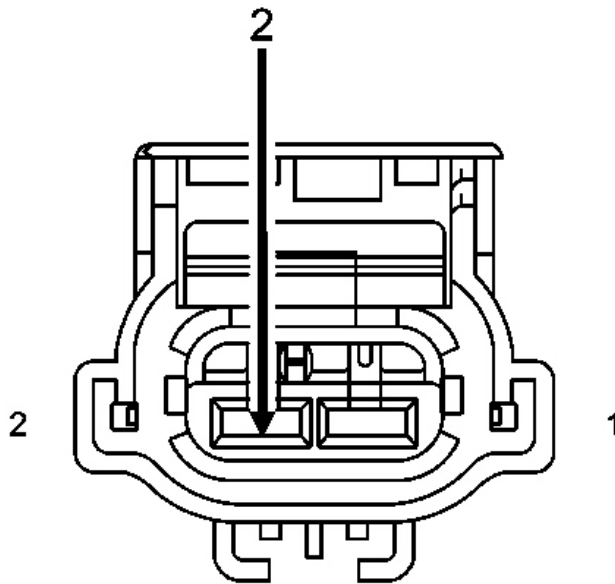
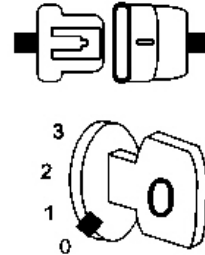
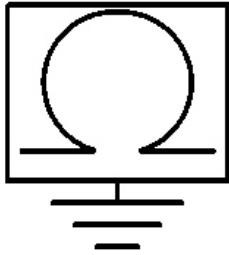
Repair the short to voltage in the (K70) EVAP Purge Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO GROUND**



**SOLENOID-
EVAP/PURGE**

81332ec6

Fig. 24: Checking EVAP Purge Solenoid Control Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (K52) EVAP Purge Control circuit in the EVAP Purge Solenoid harness connector.

Is the resistance below 100 ohms?

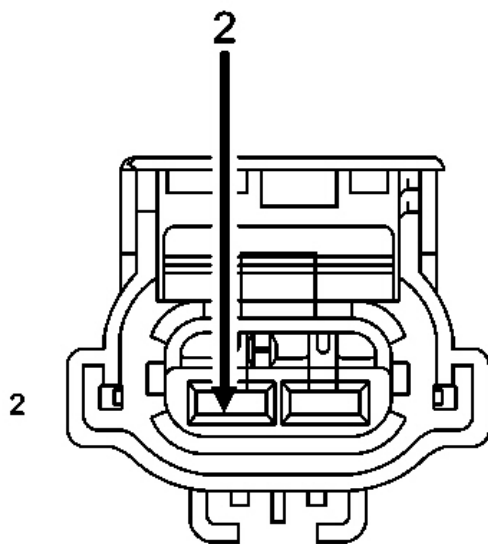
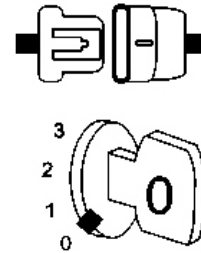
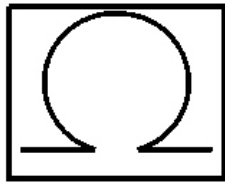
Yes

Repair the (K52) EVAP Purge Control circuit for a short to ground.
Perform **POWERTRAIN VERIFICATION TEST** .

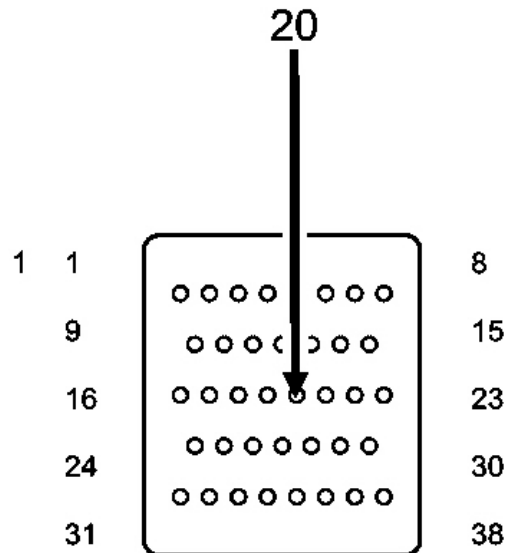
No

Go To 6.

6. **(K52) EVAP PURGE CONTROL CIRCUIT OPEN**



**SOLENOID-
EVAP/PURGE**



**PCM PINOUT
BOX 8815
81332ebb**

Fig. 25: Checking EVAP Purge Solenoid Control Circuit
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K52) EVAP Purge Control circuit from the EVAP Purge Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

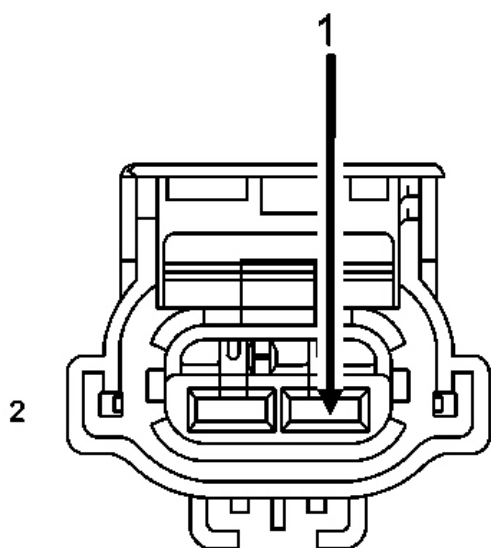
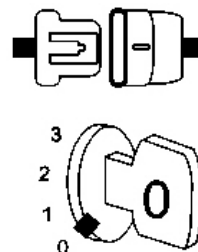
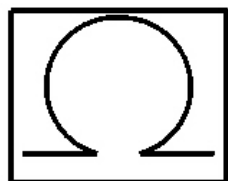
Go To 7.

No

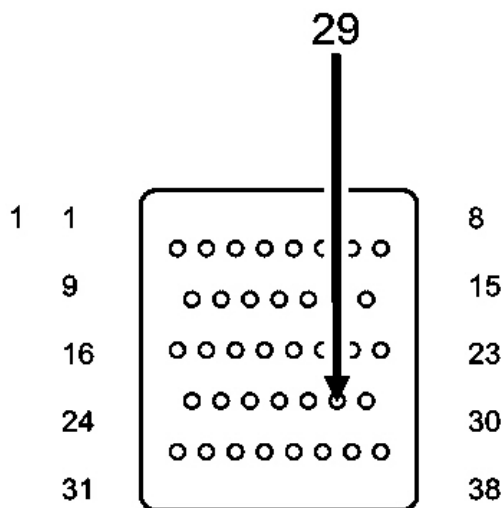
Repair the open in the (K52) EVAP Purge Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K70) EVAP PURGE RETURN CIRCUIT OPEN



**SOLENOID-
EVAP/PURGE**



**PCM PINOUT
BOX 8815
81332ee4**

Fig. 26: Checking EVAP Purge Solenoid Signal Circuit
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K70) EVAP Purge Return circuit from the EVAP Purge Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the open in the (K70) EVAP Purge Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. EVAP PURGE SOLENOID

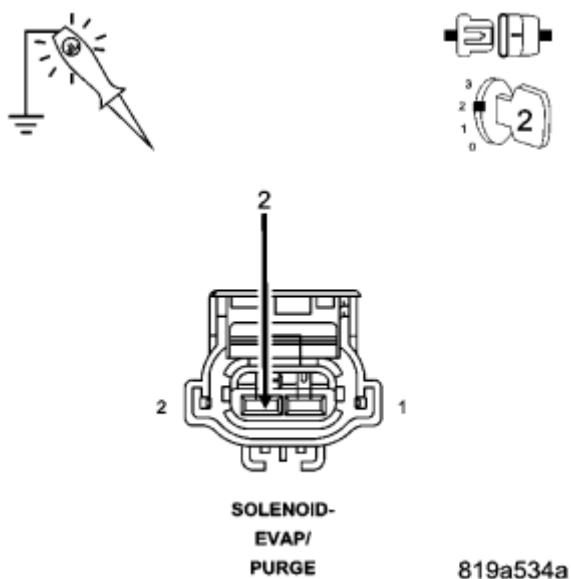


Fig. 27: Checking (K52) EVAP Purge Control Circuit In EVAP Purge Solenoid Harness Connector
Courtesy of CHRYSLER LLC

Connect the C3 PCM harness connector.

Ignition on, engine not running.

NOTE: **The DTC needs to be cleared before actuating the Purge Solenoid, if the DTC is not cleared, the Solenoid may not be allowed to actuate.**

With the scan tool, actuate the EVAP Purge Solenoid control to the ON (100%) position.

Using a 12-volt test light connected to ground, probe the (K52) EVAP Purge Control circuit in the EVAP Purge Solenoid harness connector.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly?

Yes

Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors. If OK, replace the EVAP Purge Solenoid.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP Purge Solenoid Assembly, ESIM Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch, Solenoid, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

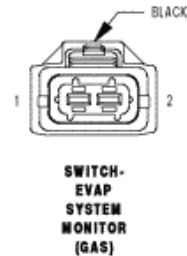
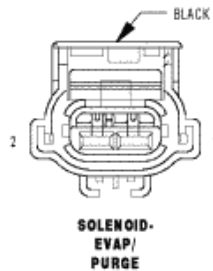
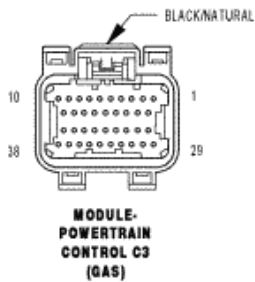
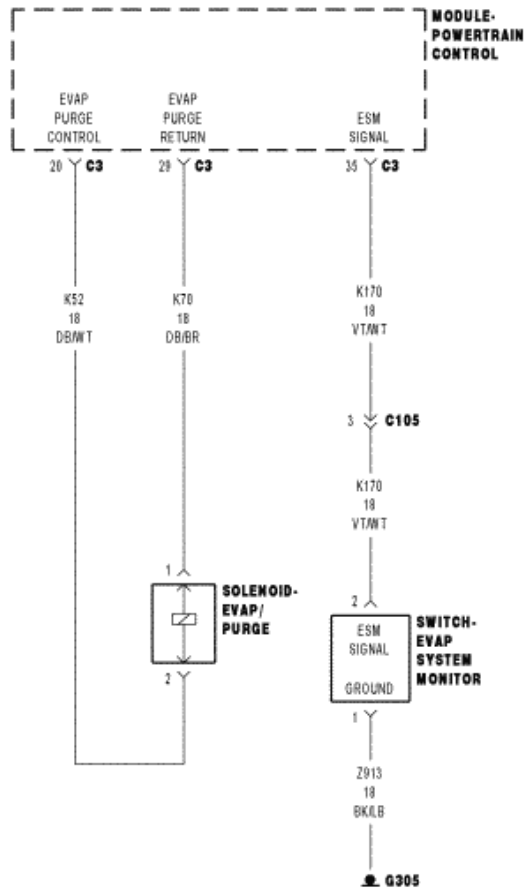
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0452-EVAP PRESSURE SWITCH STUCK CLOSED

CIRCUIT SCHEMATIC



01902496

Fig. 28: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Immediately after the ignition has been turned off.

SET CONDITIONS

• Set Condition:

At key off, the PCM energizes the Purge Solenoid for a calibrated amount of time (30 seconds maximum) and stores the state of the ESIM switch. The state is evaluated again at the next key on. If the PCM does not detect that the ESIM switch is open, an error is detected. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION (K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO GROUND (K107) ESM SIGNAL CIRCUIT SHORTED TO GROUND ESM SWITCH EVAP PURGE SOLENOID POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTC(s) and record the related Freeze Frame data if any DTC(s) are present.

Whether or not any DTC(s) are Active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTC(s).

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. ACTIVE DTC

NOTE: If the customer is experiencing an early fuel shut off during the fuel filling process along with P0440, P0441, and P0452 setting, you need to check for restrictions in the EVAP Purge tubes/hoses as well as the Fresh Air Filter before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs and record the related Freeze Frame data.

It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. ESIM SWITCH STATE

With a scan tool, select Data Display and view the ESIM Switch state.

Disconnect the purge hose from the EVAP canister.

Is the ESIM Switch state change from 'Closed' to 'Open' when the purge hose was disconnected?

Yes

Go To 4.

No

Go To 7.

4. EVAP PURGE HOSE/TUBE AND FRESH AIR FILTER OBSTRUCTION

Turn the ignition off.

Inspect the EVAP Purge hose/tube for proper routing and installation between the EVAP Purge Solenoid and the Fuel Tank and between the Fuel Tank and the EVAP Purge Canister.

Make sure the hose/tube and fresh air filter are not damaged, kinked, and free from any obstructions.

Check for any kink in the purge line connecting the LPV (Linear Purge Valve) to intake manifold.

Were any problems found?

Yes

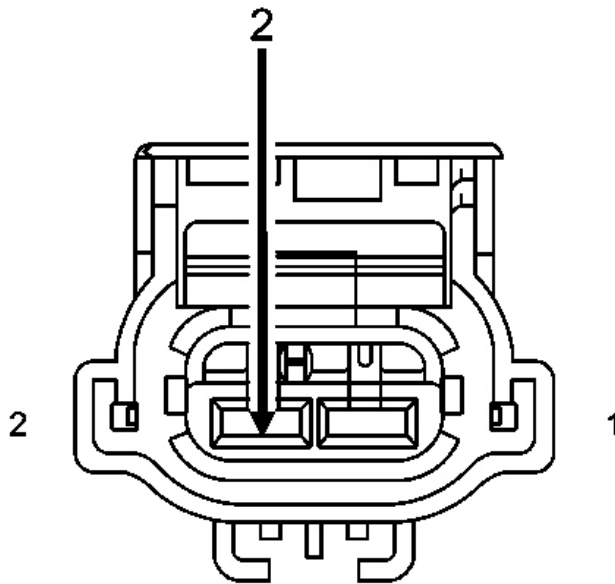
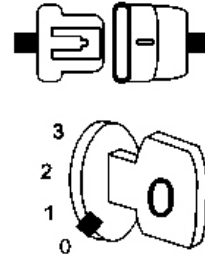
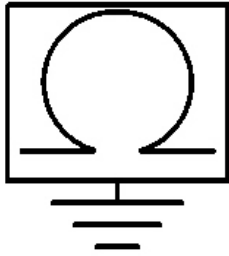
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K52) EVAP PURGE CONTROL CIRCUIT SHORTED TO GROUND



**SOLENOID-
EVAP/PURGE**

81332ec6

Fig. 29: Checking EVAP Purge Solenoid Control Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (K52) EVAP Purge Control circuit in the EVAP Purge Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K52) EVAP Purge Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. EVAP PURGE SOLENOID

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP Purge Solenoid and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the EVAP Purge Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the EVAP Purge Solenoid in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

7. ESIM ASSEMBLY

With a scan tool, select Data Display and view the ESIM Switch state.

Disconnect the EVAP System Monitor Switch electrical connector.

Does the ESIM Switch state change from CLOSED to OPEN when the switch is disconnected?

Yes

Verify that there is good pin to terminal contact in the ESIM and the Powertrain Control Module connectors. If OK, replace the ESIM Assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K107) ESM SIGNAL CIRCUIT SHORTED TO GROUND

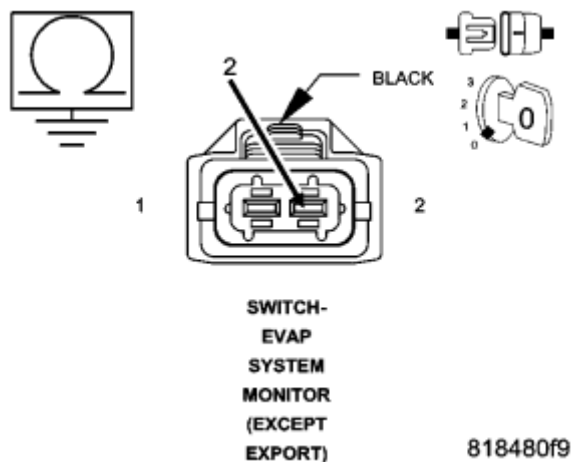


Fig. 30: Checking ESM Switch Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (K107) ESM Signal circuit in the ESIM Assembly harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K107) ESM Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP Purge Solenoid Assembly, ESIM Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact

in the ESIM, EVAP Purge Solenoid, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

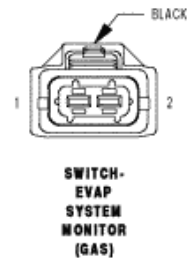
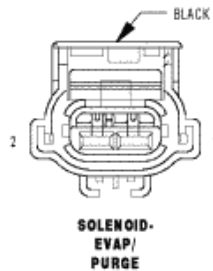
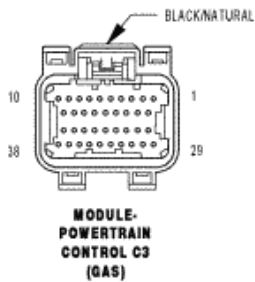
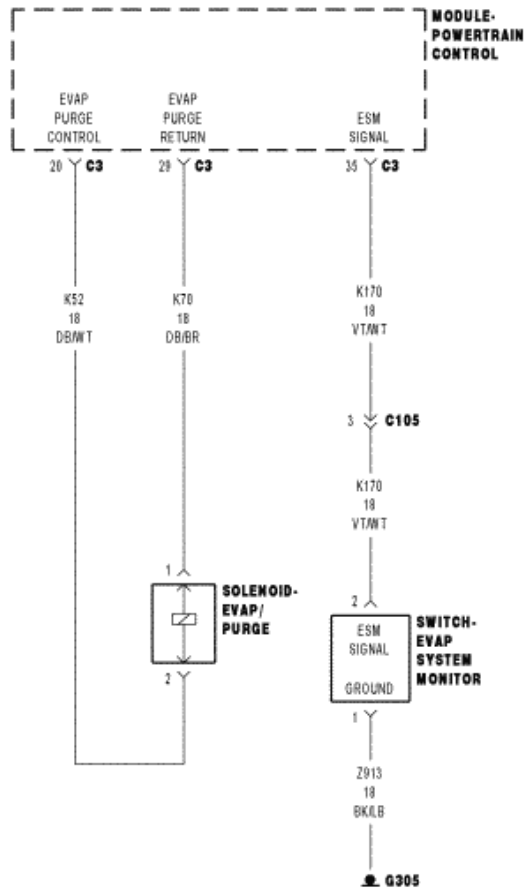
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0455-EVAP PURGE SYSTEM LARGE LEAK

CIRCUIT SCHEMATIC



01962496

Fig. 31: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the engine running, during a cold start test with the fuel level above 12%, ambient temperature between 4° C and 32° C (39° F and 89° F) and the fuel system in closed loop. The test runs when the small leak test is maturing.

SET CONDITIONS

- **Set Condition:**

The PCM activates the EVAP Purge Solenoid to pull the EVAP system into a vacuum to close the ESM switch. Once the ESM switch is closed, the PCM turns the EVAP Purge solenoid off to seal the EVAP system. If the ESM switch reopens before the calibrated amount of time, a large leak error is detected. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EVAP PURGE SYSTEM LEAK EVAP PURGE SOLENOID EVAP SYSTEM MONITOR SWITCH

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data if any DTC(s) are present.

Whether or not any DTC(s) are Active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTC(s).

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. ACTIVE DTC

NOTE: Since a hot vehicle can conceal a leak, it is best to perform this test at room temperature.

NOTE: A loose gas cap could have caused this DTC to set. Make sure gas cap is tight and in good condition. Make sure the gas cap meets OEM specifications.

Start the engine.

Allow the engine to idle.

Using the scan tool, perform the ESIM FORCED MONITOR TEST. Allow the test to complete.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. EVAPORATIVE SYSTEM INSPECTION

Perform a visual and physical inspection of the entire Evaporative Emission system.

Check for the following conditions:

- Holes or cracks
- Loose seal points

- Evidence of damaged components
- Incorrect routing of hoses and tubes
- Loose or missing Fuel Filler Cap
- Improper installation of the Fuel Fill Cap
- Damaged Locking tabs on Cap and/or fill tube
- Damaged seal points on Cap and/or fill tube
- Fuel cap gasket seal

Were any of the above conditions found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. VERIFY EVAPORATIVE EMISSION LEAK

WARNING: Keep lit cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases. Keep the test area well ventilated.

To continue testing you will need Miller Tool #8404A Evaporative Emission Leak Detector (EELD).

NOTE: The fuel tank should have between 20% and 80% of fuel tank capacity to properly test the EVAP system.

Connect the red power lead of the EELD to the battery positive terminal and the black ground lead to battery negative terminal.

Block the vent hose of the canister if using the service port.

Connect shop air to the EELD.

Set the smoke/air control switch to AIR.

Insert the tester's AIR supply tip (clear hose) into the appropriate calibration orifice on the tester's control panel (based on DTC leak size).

Press the remote smoke/air start button.

Position the red flag on the air flow meter so it is aligned with the indicator ball.

When the calibration is complete, release the remote button. The EELD flow meter is now calibrated in liters per minute to the size leak indicated by the DTC set in the PCM.

Install the service port adapter #8404-14 on the vehicle's service port and block the vent hose of the EVAP Canister (if equipped) or install the #8404-ADP service adapter into the filter line.

Connect the Air supply hose from the EELD to the service port (if equipped) or to the #8404-ADP adapter.

Press the remote button to activate AIR flow.

NOTE: Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve may indicate high flow and will require 4 to 5 minutes to fill.

Compare the flow meter indicator ball reading to the red flag.

ABOVE the red flag indicates a leak present.

BELOW the red flag indicates a sealed system.

Is the indicator ball above the red flag?

Yes

Go To 5.

No

Refer to the Freeze Frame data recorded in step 1. If the data indicates that the vehicle was in motion when the DTC was set, verify that all hoses are properly connected.

Perform **POWERTRAIN VERIFICATION TEST** .

5. EVAPORATIVE EMISSION LEAK DETECTION

NOTE: A thorough visual inspection of the EVAP system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may aid diagnosis also.

To continue testing, you will need Miller Tool #8404A Evaporative Emissions Leak Detector (EELD).

Remove the Air supply hose from the service port (if equipped) or from the #8404-ADP adapter.

Connect the SMOKE supply tip (black hose) to the service port (if equipped) or to the #8404-ADP adapter.

Set the smoke/air control switch to SMOKE.

NOTE: **The flow meter indicator ball will not move in the smoke mode.**

Press the remote smoke/air start button.

NOTE: **Make sure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.**

NOTE: **For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.**

While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke.

If a leak is concealed from view (i.e, top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that is left behind by the smoke.

The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light.

NOTE: **The EVAP System is divided into three zones. A leak from any of these zones can cause this DTC to set. The lists below specify the possible leak points in that specific zone. For further assistance see the Zone Identification below.**

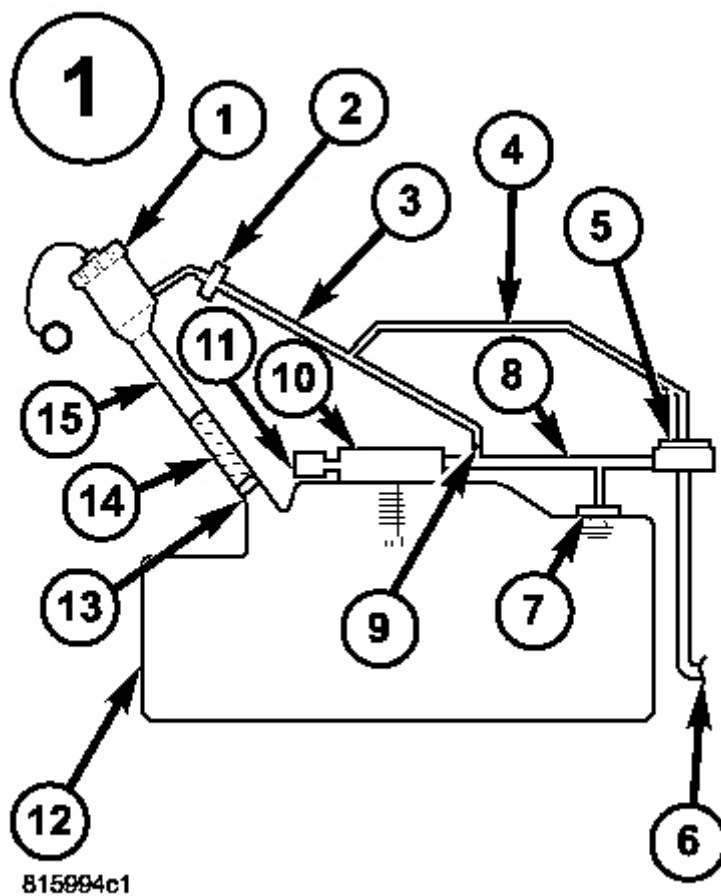


Fig. 32: Identifying EVAP System Zone 1
 Courtesy of CHRYSLER LLC

ZONE 1

- 1 Fuel Cap.
- 2 Recirculation Check Valve.
- 3 Vapor Recirculation Line.
- 4 Signal Vapor Line for FVM.
- 5 Flow Management Valve.

6 Fuel Tank to Canister Vapor Line connection.

7 Fuel Tank Vent (Check Valve).

8 Vapor Line to Canister.

9 Flow Control Orifice.

10 Control Valve.

11 Liquid Trap.

12 Fuel Tank.

13 Check valve.

14 Fuel Fill Tube to Tank connector.

15 Fuel Fill Tube.

Damaged or disconnected EVAP system components.

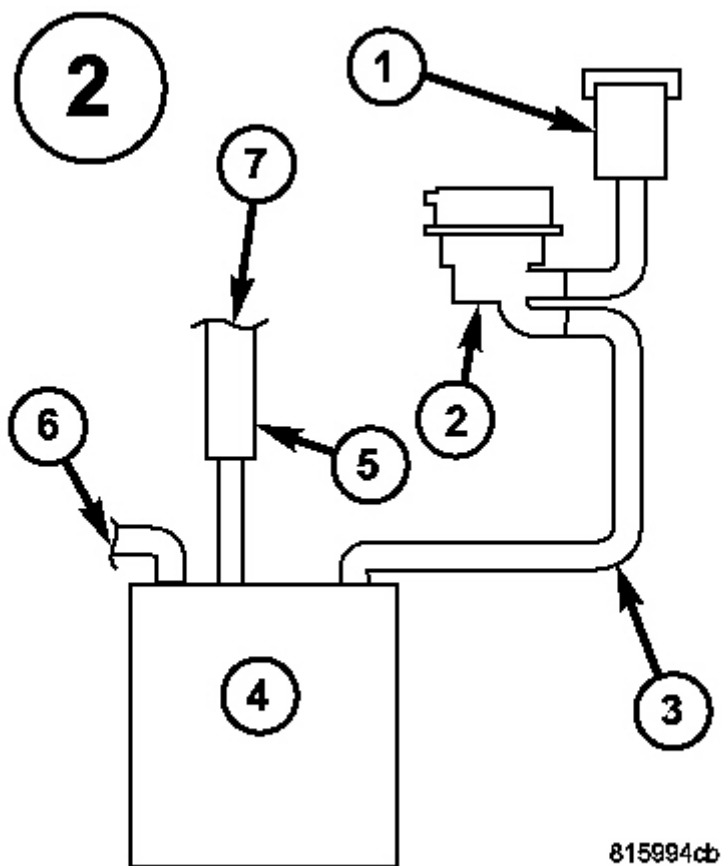


Fig. 33: Identifying EVAP System Zone 2
Courtesy of CHRYSLER LLC

ZONE 2

- 1 Filter.
- 2 ESM.
- 3 Canister Vent Line.
- 4 EVAP Canister.
- 5 Chassis Purge Valve.

7 EVAP Purge connection.



3 Connection to Canister.

4 Chassis Purge Line.

5 EVAP Purge Vacuum Line.

6 Connection to EVAP Purge Harness.

7 Chassis EVAP Purge Line connection to Engine Vacuum.

8 EVAP Purge Valve.

9 Service Port.

NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke may not be as thick. Introducing smoke into the filtered side of the canister may assist in locating the leak.

Select the appropriate response from the list below:

A leak was found at the gas cap or fuel filler tube

Go To 6.

A leak was found in one or more of the EVAP System zones

If the leak is at a hose connection, remove the hose then reconnect the hose and check for a leak again. All other leaks repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No leaks were detected

Go To 7.

6. LEAK AT GAS CAP

Remove the SMOKE supply tip (black hose) from the service port (if equipped) or to the #8404-ADP adapter.

Install gas cap adapter, Miller Tool #8382 (1/4 turn cap) or #6922 (screw cap) and #8399 (secondary seal depressor) and repeat test 5.

NOTE: The gas cap adapter is being used as a known good cap.

Was a leak found at the gas cap adapter?

Yes

Replace the Fuel Filler tube assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the gas cap.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **EVAP PURGE SOLENOID OPERATION**

NOTE: **After disconnecting the EVAP Purge Solenoid vacuum connections, inspect the lines and solenoid for any signs of contamination from the EVAP Canister.**

Turn the ignition off.

Disconnect the EVAP Purge Solenoid Vacuum hose at the Throttle Body.

NOTE: **You are disconnecting the vacuum line at the Throttle Body so you are not disturbing the vacuum connection at the EVAP Purge Solenoid.**

Press the remote smoke/air start button on the EELD.

While holding the remote smoke/air start button, check to see if smoke is exiting the EVAP Purge Solenoid Vacuum hose at the Throttle Body. This indicates that there is a leak internal to the purge valve.

NOTE: **Below is an optional method of checking the purge valve for leaks if the EELD is unavailable.**

Turn the ignition off.

Disconnect the vacuum hoses at the EVAP Purge Solenoid.

Using a hand vacuum pump, apply 10 in HG to the "CAN" of the EVAP Purge Solenoid.

NOTE: **Monitor the vacuum gauge for at least 15 seconds.**

Is smoke visible from the EVAP Purge Solenoid Vacuum hose if using the EELD, or will it not hold a vacuum?

Yes

Replace the EVAP Purge Solenoid.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. **EVAP SYSTEM MONITOR SWITCH**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP System Monitor Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Switch and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

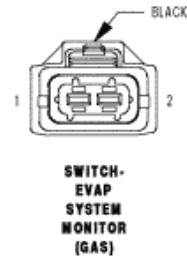
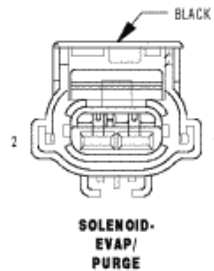
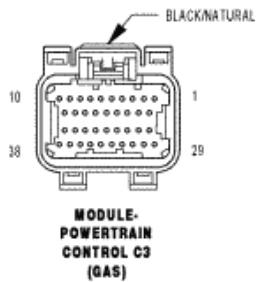
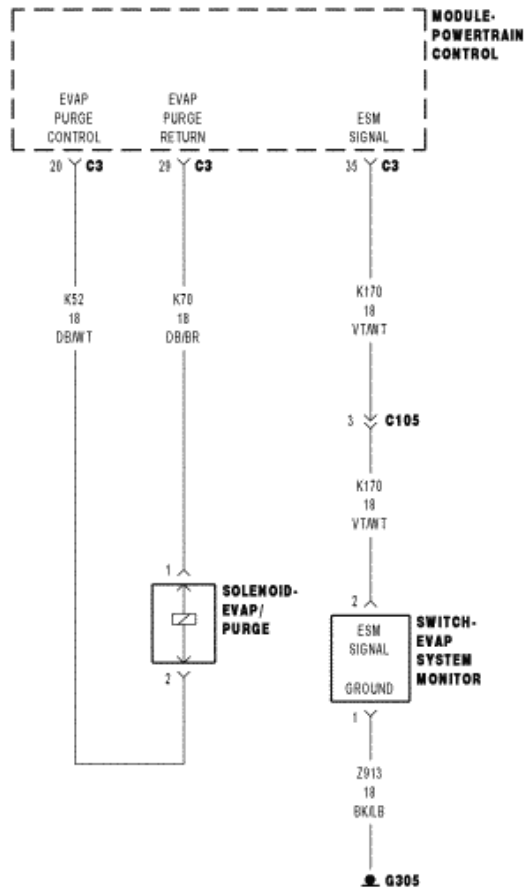
No

Replace the EVAP System Monitor Switch in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0456-EVAP PURGE SYSTEM SMALL LEAK

CIRCUIT SCHEMATIC



01902496

Fig. 35: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition off, fuel level less than 88%, ambient temperature between 4° C and 43° C (39° F and 109° F), and the fuel system in closed loop.

SET CONDITIONS

- **Set Condition:**

As temperatures change, a vacuum is created in the fuel tank and EVAP system. With the EVAP system sealed, the PCM monitors the ESM switch. If the ESM switch does not close within a calibrated time, an error is detected by the PCM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EVAP PURGE SYSTEM LEAK
EVAP PURGE SOLENOID
EVAP SYSTEM MONITOR SWITCH

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. VEHICLE HISTORY AND SERVICE BULLETIN INVESTIGATION

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data if any DTC(s) are present.

Whether or not any DTC(s) are Active you will want to check the following items which may assist in repairing the customer's complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any service bulletin(s) related to the customer's complaint or DTC(s).

If a service bulletin applies, follow the instructions per the service bulletin.

Choose the following scenario that best applies.

The service bulletin repaired the customer's complaint.

Testing complete.

A DTC is present, no service bulletins apply, or the service bulletin didn't repair the customer's complaint.

Go To 2.

2. ACTIVE DTC

NOTE: Since a hot vehicle can conceal a leak, it is best to perform this test at room temperature.

NOTE: A loose gas cap could have caused this DTC to set. Make sure gas cap is tight and in good condition. Make sure the gas cap meets OEM specifications.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. VISUAL AND PHYSICAL INSPECTION

Perform a visual and physical inspection of the entire Evaporative Emission system.

Check for the following conditions:

- Holes or cracks
- Loose seal points
- Evidence of damaged components
- Incorrect routing of hoses and tubes
- Loose or missing Fuel Filler Cap

- Improper installation of the Fuel Fill Cap
- Damaged Locking tabs on Cap and/or fill tube
- Damaged seal points on Cap and/or fill tube
- Fuel cap gasket seal

Were any of the above conditions found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 4.

4. VERIFY EVAPORATIVE EMISSION LEAK

WARNING: Keep lit cigarettes, sparks, flames, and other ignition sources away from the test area to prevent the ignition of explosive gases. Keep the test area well ventilated.

To continue testing you will need Miller Tool #8404A Evaporative Emission Leak Detector (EELD).

NOTE: The fuel tank should have between 20% and 80% of fuel tank capacity to properly test the EVAP system.

Connect the red power lead of the EELD to the battery positive terminal and the black ground lead to battery negative terminal.

Block the vent hose of the canister if using the service port.

Connect shop air to the EELD.

Set the smoke/air control switch to AIR.

Insert the tester's AIR supply tip (clear hose) into the appropriate calibration orifice on the tester's control panel (based on DTC leak size).

Press the remote smoke/air start button.

Position the red flag on the air flow meter so it is aligned with the indicator ball.

When the calibration is complete, release the remote button. The EELD flow meter is now calibrated in

liters per minute to the size leak indicated by the DTC set in the PCM.

Install the service port adapter #8404-14 on the vehicle's service port and block the vent hose of the EVAP Canister (if equipped) or install the #8404-ADP service adapter into the filter line.

Connect the Air supply hose from the EELD to the service port (if equipped) or to the #8404-ADP adapter.

Press the remote button to activate AIR flow.

NOTE: **Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve may indicate high flow and will require 4 to 5 minutes to fill.**

Compare the flow meter indicator ball reading to the red flag.

ABOVE the red flag indicates a leak present.

BELOW the red flag indicates a sealed system.

Is the indicator ball above the red flag?

Yes

Go To 5.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

5. EVAPORATIVE EMISSION LEAK DETECTION

NOTE: **A thorough visual inspection of the EVAP system hoses, tubes, and connections may save time in your diagnosis. Look for any physical damage or signs of wetness at connections. The strong smell of fuel vapors may also aid diagnosis.**

To continue testing, you will need Miller Tool #8404A Evaporative Emissions Leak Detector (EELD).

Remove the Air supply hose from the service port (if equipped) or from the #8404-ADP adapter.

Connect the SMOKE supply tip (black hose) to the service port (if equipped) or to the #8404-ADP adapter.

Set the smoke/air control switch to SMOKE.

NOTE: **The flow meter indicator ball will not move in the smoke mode.**

Press the remote smoke/air start button.

NOTE: **Make sure that smoke has filled the EVAP system by continuing to press the remote smoke/air start button, remove the vehicle fuel cap, and wait for the smoke to exit. Once smoke is indicated reinstall the fuel cap.**

NOTE: **For optimal performance, introduce smoke into the system for an additional 60 seconds; continue introducing smoke at 15 second intervals, as necessary.**

While still holding the remote smoke/air start button, use the white light (#8404-CLL) to follow the EVAP system path, and look for the source of the leak indicated by exiting smoke.

If a leak is concealed from view (i.e, top of fuel tank), release the remote smoke/air start button, and use the ultraviolet (UV) black light #8404-UVL and the yellow goggles 8404-20 to look for residual traces of dye that is left behind by the smoke.

The exiting smoke deposits a residual fluid that is either bright green or bright yellow in color when viewed with a UV light.

NOTE: **The EVAP System is divided into three zones. A leak from any of these zones can cause this DTC to set. The lists below specify the possible leak points in that specific zone. For further assistance see the Zone Identification below.**

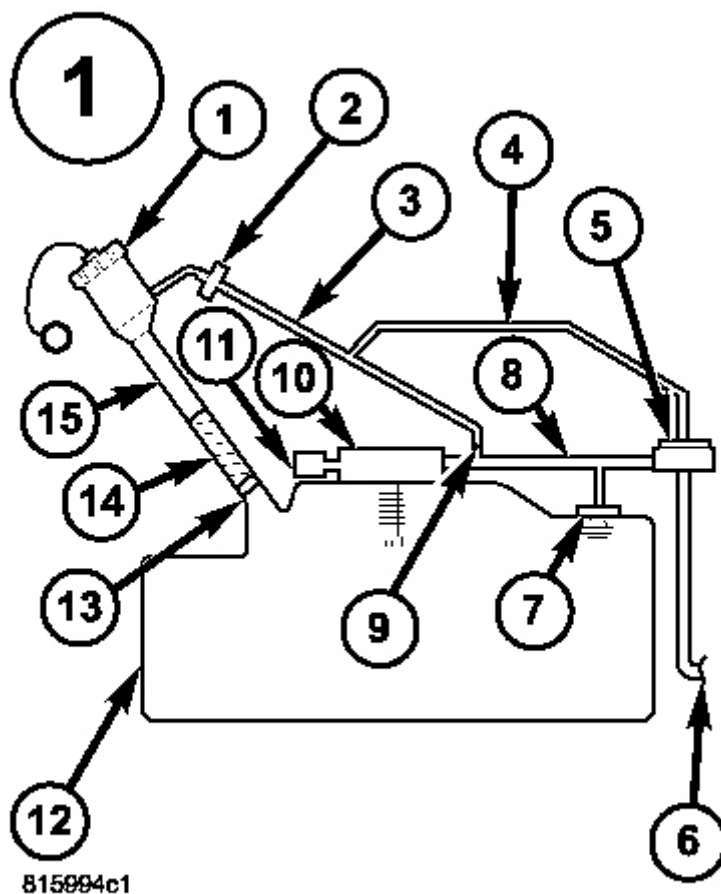


Fig. 36: Identifying EVAP System Zone 1
 Courtesy of CHRYSLER LLC

ZONE 1

- 1 Fuel Cap.
- 2 Recirculation Check Valve.
- 3 Vapor Recirculation Line.
- 4 Signal Vapor Line for FVM.
- 5 Flow Management Valve.

6 Fuel Tank to Canister Vapor Line connection.

7 Fuel Tank Vent (Check Valve).

8 Vapor Line to Canister.

9 Flow Control Orifice.

10 Control Valve.

11 Liquid Trap.

12 Fuel Tank.

13 Check valve.

14 Fuel Fill Tube to Tank connector.

15 Fuel Fill Tube.

Damaged or disconnected EVAP system components.

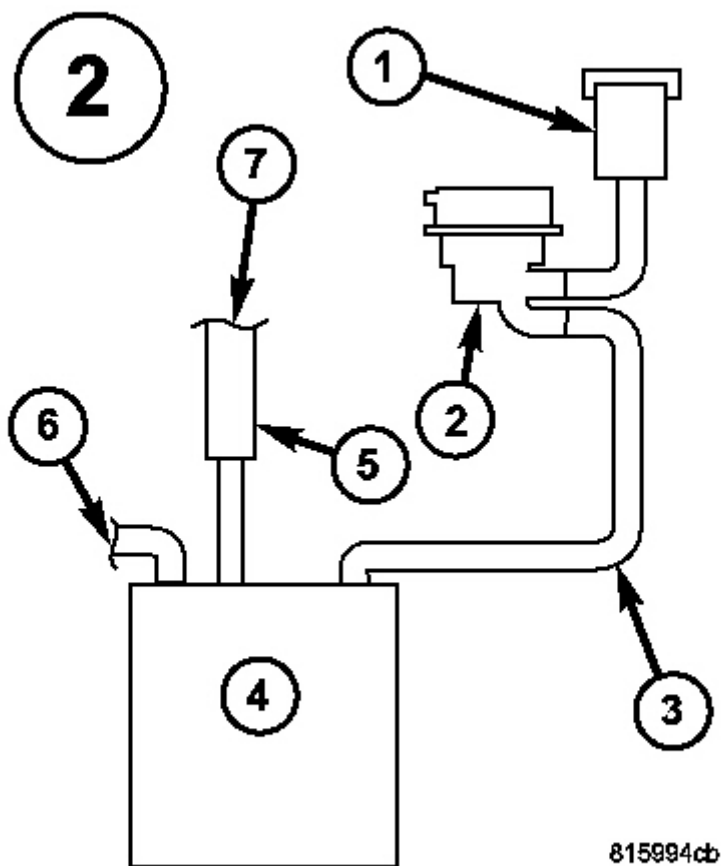


Fig. 37: Identifying EVAP System Zone 2
Courtesy of CHRYSLER LLC

ZONE 2

- 1 Filter.
- 2 ESM.
- 3 Canister Vent Line.
- 4 EVAP Canister.
- 5 Chassis Purge Valve.

6 Fuel Tank to Canister Vapor Line connection.

7 EVAP Purge connection.

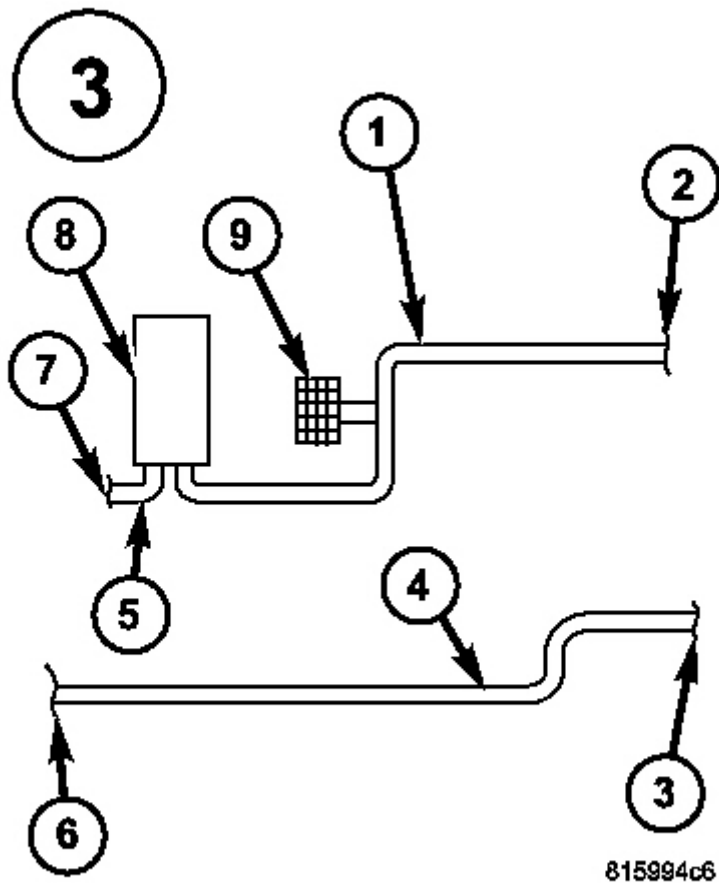


Fig. 38: Identifying EVAP System Zone 3
Courtesy of CHRYSLER LLC

ZONE 3

1 EVAP Purge Vacuum Line.

2 Connection to Chassis Line.

3 Connection to Canister.

4 Chassis Purge Line.

5 EVAP Purge Vacuum Line.

6 Connection to EVAP Purge Harness.

7 Chassis EVAP Purge Line connection to Engine Vacuum.

8 EVAP Purge Valve.

9 Service Port.

NOTE: Carefully inspect the vent side of the EVAP Canister. Due to the filtering system in the canister the smoke may not be as thick. Introducing smoke into the filtered side of the canister may assist in locating the leak.

Select the appropriate response from the list below:

A leak was found at the gas cap or fuel filler tube

Go To 6.

A leak was found in one or more of the EVAP System zones

If the leak is at a hose connection, remove the hose then reconnect the hose and check for a leak again. All other leaks repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No leaks were detected

Go To 7.

6. LEAK AT GAS CAP

Remove the SMOKE supply tip (black hose) from the service port (if equipped) or to the #8404-ADP adapter.

Install gas cap adapter, Miller Tool #8382 (1/4 turn cap) or #6922 (screw cap) and #8399 (secondary seal depressor) and repeat test 5.

NOTE: The gas cap adapter is being used as a known good cap.

Was a leak found at the gas cap adapter?

Yes

Replace the Fuel Filler tube assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the gas cap.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **EVAP PURGE SOLENOID**

NOTE: **After disconnecting the EVAP Purge Solenoid vacuum connections, inspect the lines and solenoid for any signs of contamination from the EVAP Canister. This may indicate a faulty check valve. Replace/repair as necessary.**

Turn the ignition off.

Disconnect the EVAP Purge Solenoid Vacuum hose at the Throttle Body.

NOTE: **You are disconnecting the vacuum line at the Throttle Body so you are not disturbing the vacuum connection at the EVAP Purge Solenoid.**

Press the remote smoke/air start button on the EELD.

While holding the remote smoke/air start button, check to see if smoke is exiting the EVAP Purge Solenoid Vacuum hose at the Throttle Body. This indicates that there is a leak internal to the purge valve.

NOTE: **Below is an optional method of checking the purge valve for leaks if the EELD is unavailable.**

Turn the ignition off.

Disconnect the vacuum supply hose at the EVAP Purge Solenoid.

Using a hand vacuum pump, apply 10 in HG to the "CAN" of the EVAP Purge Solenoid.

NOTE: **Monitor the vacuum gauge for at least 15 seconds.**

Is smoke visible from the EVAP Purge Solenoid if using the EELD, or not hold a vacuum?

Yes

Replace the EVAP Purge Solenoid.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. EVAP SYSTEM MONITOR SWITCH

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EVAP System Monitor Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Switch and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

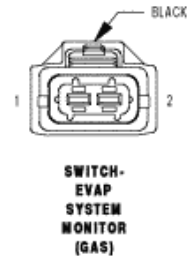
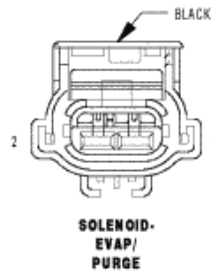
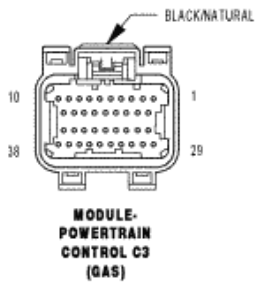
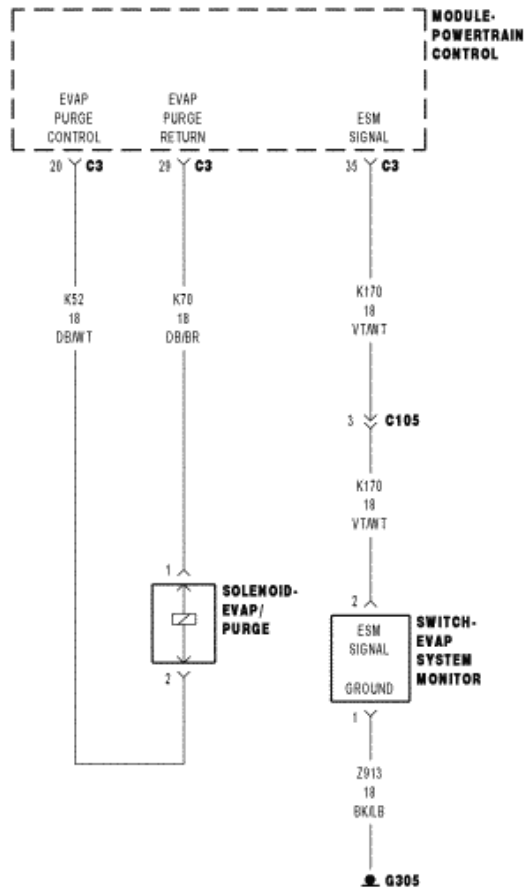
No

Replace the EVAP System Monitor Switch per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0457-LOOSE FUEL CAP

CIRCUIT SCHEMATIC



01962496

Fig. 39: EVAP Purge System Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Fuel level is recorded when the ignition key is turned off and is compared to the fuel level when the ignition key is turned back on. The PCM recognizes an increase in fuel level and will fail the Medium leak test because the fuel cap is broken or not installed properly. GAS CAP will be displayed in odometer to inform the owner that the cap is off of loose.

MONITOR CONDITIONS

When Monitored:

Ignition on. Ambient Temperature between 4° C and 32° C (39° F and 89° F). Close Loop fuel system. Test runs after the medium leak test is inconclusive and the PCM has senses a fuel increase.

SET CONDITIONS

- **Set Condition:**

If a leak greater than.090" is detected by the PCM for two consecutive cold start trips after a significant fuel level change, this DTC will set. One good trip turns off the MIL.

POSSIBLE CAUSES

Possible Causes
LOOSE OR MISSING FUEL CAP

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

- NOTE:**

If DTC P0455-EVAP SYSTEM LARGE LEAK is set along with this DTC, perform the diagnostic procedure for P0455 before continuing with this test.
- NOTE:**

Do not replace the gas cap for DTC P0457-EVAP SYSTEM - LOOSE FUEL CAP.

With a scan tool, select View DTCs.

Is the status Active for DTC P0455-EVAP SYSTEM LARGE LEAK along with this DTC?

Yes

Perform the diagnostic procedure for P0455-EVAP SYSTEM LARGE LEAK.

No

No repair is necessary. Verify that the gas cap is in place and tight. Clear DTCs and follow the directions outlined in the service information under Instrument Cluster on resetting the odometer or message center display.

P0461-FUEL LEVEL SENSOR 1 PERFORMANCE

CIRCUIT SCHEMATIC

The fuel level rationality will set a fault for a fuel level reading that does not change over an accumulated mileage threshold to keep stuck high or stuck low fuel levels from disabling OBD monitors. If the vehicle is fitted with a saddle tank fuel system this feature includes diagnostics for both of the sending units and diagnostics for a siphon tube that has become disconnected or plugged. The power up test looks to see a large enough fuel level voltage change from the last key-off to the following engine run. The engine run test looks to see a fuel level voltage change over an accumulated mileage.

MONITOR CONDITIONS

When Monitored:

TEST No.1: With the ignition on, the fuel level is compared to the previous key down after a 20 second delay. TEST No.2: The PCM monitors the fuel level at ignition on.

SET CONDITIONS

- **Set Condition:**

TEST No.1: If the PCM does not see a difference in fuel level of greater than 0.1 volt the test will fail.
TEST No.2: If the PCM does not see a change in the fuel level of .1765 over a set amount of miles the test will fail. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(N4) FUEL LEVEL SIGNAL CIRCUIT OPEN
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND
(K91) SENSOR GROUND CIRCUIT OPEN
FUEL TANK
FUEL LEVEL SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose any CAN - C or CAN - B Communication DTCs before continuing.**

NOTE: **Diagnose P0462 or P0463 first, if set along with P0461.**

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs and record the related Freeze Frame data.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUALLY INSPECT FUEL TANK

Visually inspect the Fuel Tank for damage that may restrict the Fuel Sending Unit float from moving.

Is the Fuel Tank OK?

Yes

Go To 3.

No

Replace the Fuel Tank as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (N4) FUEL LEVEL SIGNAL CIRCUIT OPEN

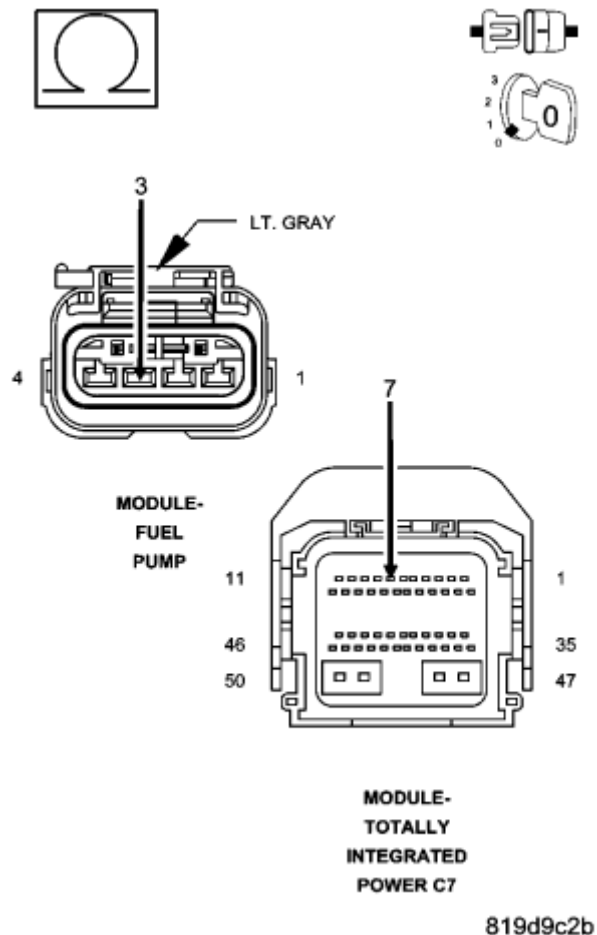


Fig. 41: Measuring Resistance Of (N4) Fuel Level Signal Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Fuel Pump Module harness connector.

Disconnect the C7 TIPM harness connector.

Measure the resistance of the (N4) Fuel Level Signal circuit from the Fuel Pump Module harness connector to the TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

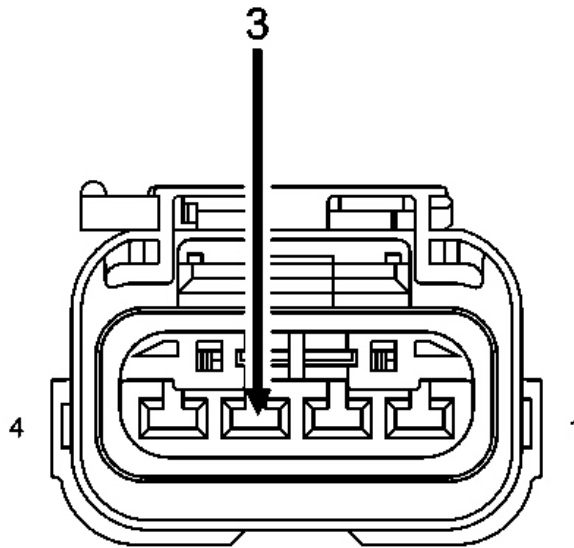
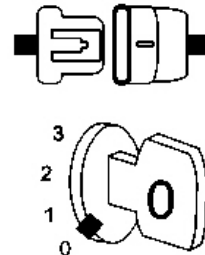
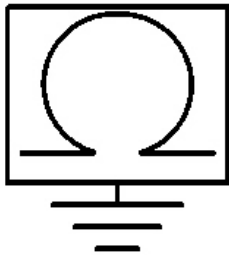
Go To 4.

No

Repair the open in the (N4) Fuel Level Signal circuit.

Perform **BODY VERIFICATION TEST - VER 1**.

4. (N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND



MODULE-
FUEL
PUMP

81335b04

Fig. 42: Checking Fuel Level Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (N4) Fuel Level Signal circuit in the Fuel Pump Module harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K91) SENSOR GROUND CIRCUIT OPEN

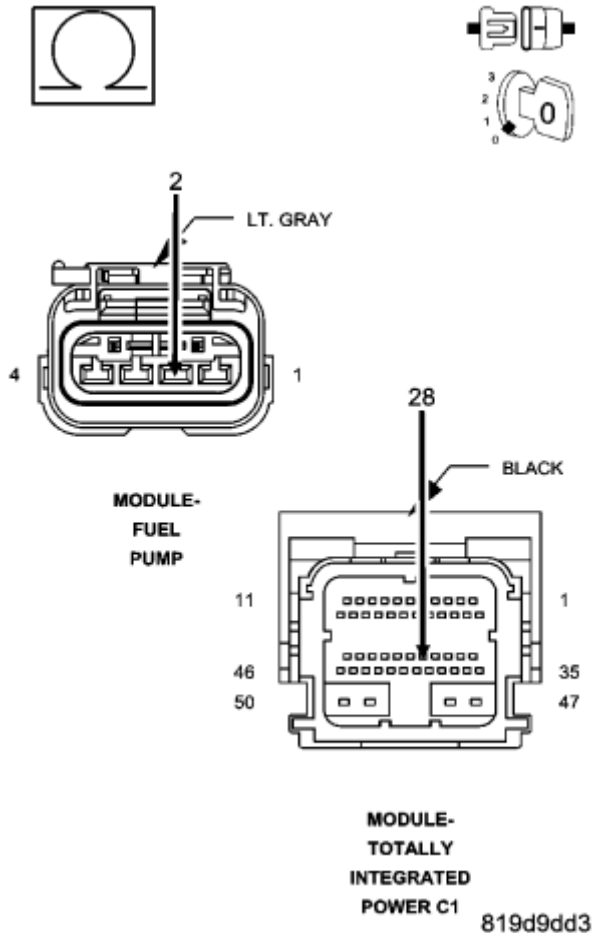


Fig. 43: Measuring Resistance Of (K91) Sensor Ground Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C1 TIPM harness connector.

Measure the resistance of the (K91) Sensor Ground circuit from the Fuel Pump Module harness connector to the C1 TIPM harness connector.

Is the resistance below 100 ohms?

Yes

Repair the open in the (K91) Sensor Ground circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. INTERNAL INSPECTION OF THE FUEL TANK

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Remove the Fuel Tank per Service Information.

Remove the Fuel Pump Module.

Visually inspect the inside of the Fuel Tank for any obstructions or deformities.

Inspect the Fuel Pump Module Float arm for damage.

Were any problems found?

Yes

Repair or replace as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

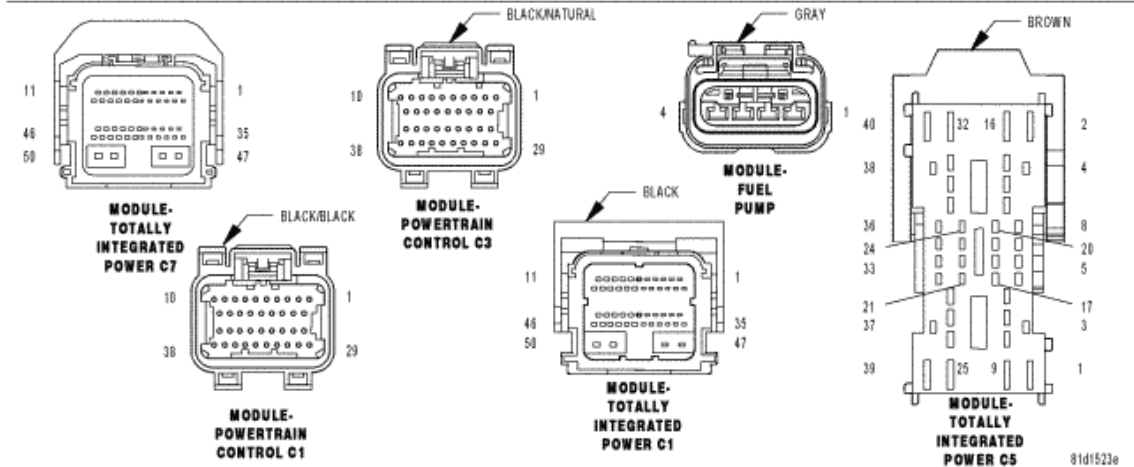
7. FUEL LEVEL SENSOR

If there are no possible causes remaining, view repair.

Repair

Verify that there is good pin to terminal contact at the Fuel Pump Module and the Powertrain Control Module connectors. Replace the Fuel Level Sensor if no problems were found at the connectors.
Perform **POWERTRAIN VERIFICATION TEST** .

ADDITIONAL WIRING



ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage above 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The fuel level sensor signal voltage goes below the minimum acceptable value. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO THE (K91) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (N4) FUEL LEVEL SIGNAL CIRCUIT
FUEL LEVEL SENSOR
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose any CAN - C or CAN - B Communication DTCs before continuing.**

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs and record the related Freeze Frame data.

NOTE: **It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.**

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **FUEL LEVEL SENSOR**

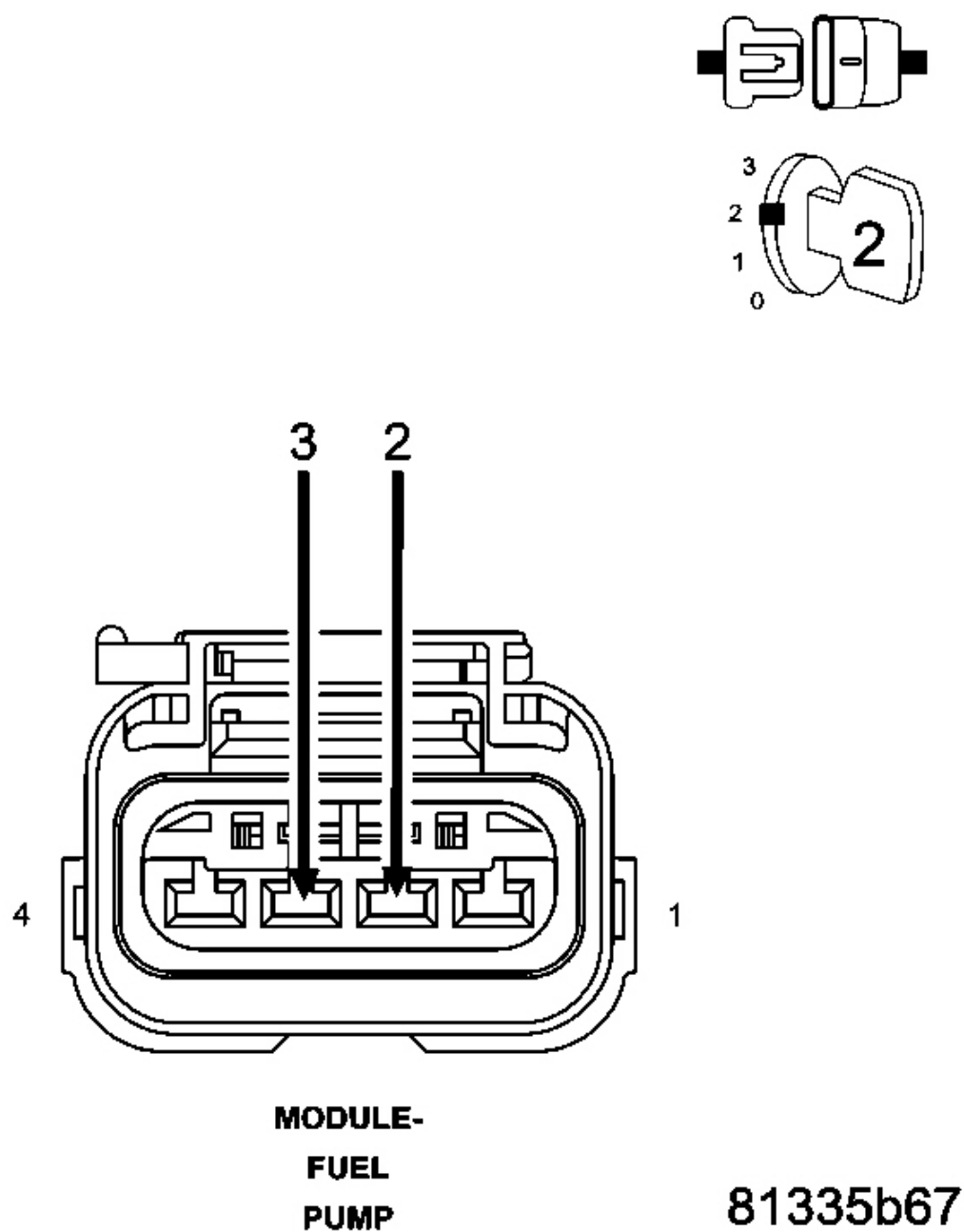


Fig. 45: Checking Fuel Level Sensor
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Fuel Pump Module harness connector.

Ignition on, engine not running.

Using a fused jumper wire, jump the (K91) Sensor Ground circuit to the (N4) Fuel Level Sensor No.1 Signal circuit in the Fuel Pump Motor harness connector.

Did the Fuel gauge level change from empty to full?

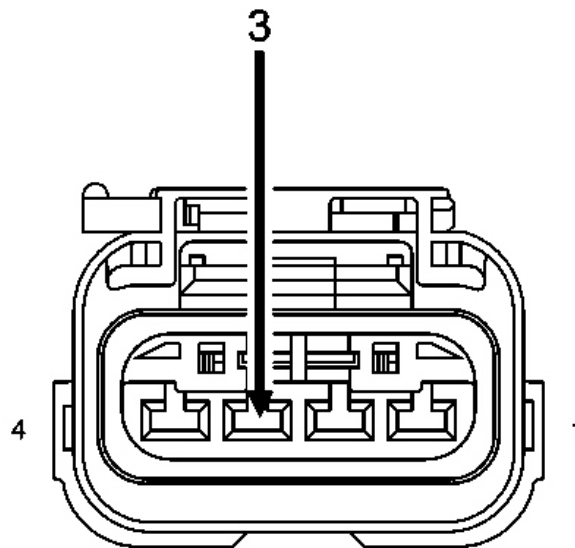
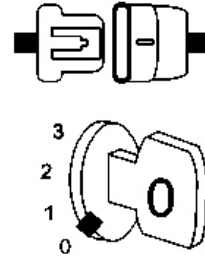
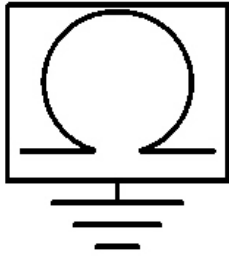
Yes

Verify that there is good pin to terminal contact at the Fuel Pump Module, and the Totally Integrated Power Module connectors. If OK, replace the Fuel Level Sensor/Fuel Pump Module.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND



**MODULE-
FUEL
PUMP**

81335b04

Fig. 46: Checking Fuel Level Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C7 TIPM harness connector.

Measure the resistance between ground and the (N4) Fuel Level Signal circuit in the Fuel Pump Module harness connector.

Is the resistance below 100 ohms?

Yes

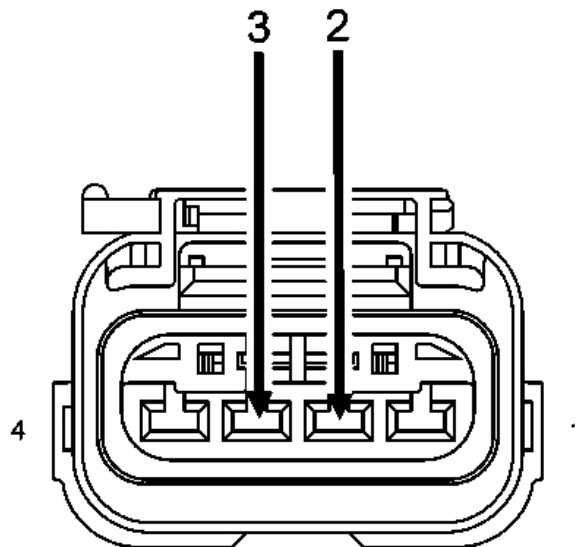
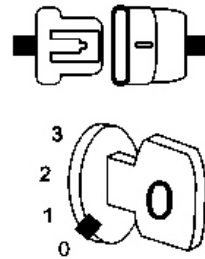
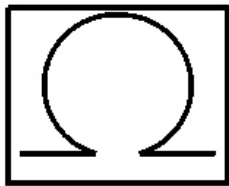
Repair the short to ground in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO THE (K91) SENSOR GROUND CIRCUIT**



**MODULE-
FUEL
PUMP**

81335b4c

Fig. 47: Checking Fuel Level Sensor Signal Circuit & Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (N4) Fuel Level Signal circuit and the (K91) Sensor Ground circuit from the Fuel Pump Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K91) Sensor Ground circuit and the (N4) Fuel Level Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (N4) FUEL LEVEL SIGNAL CIRCUIT

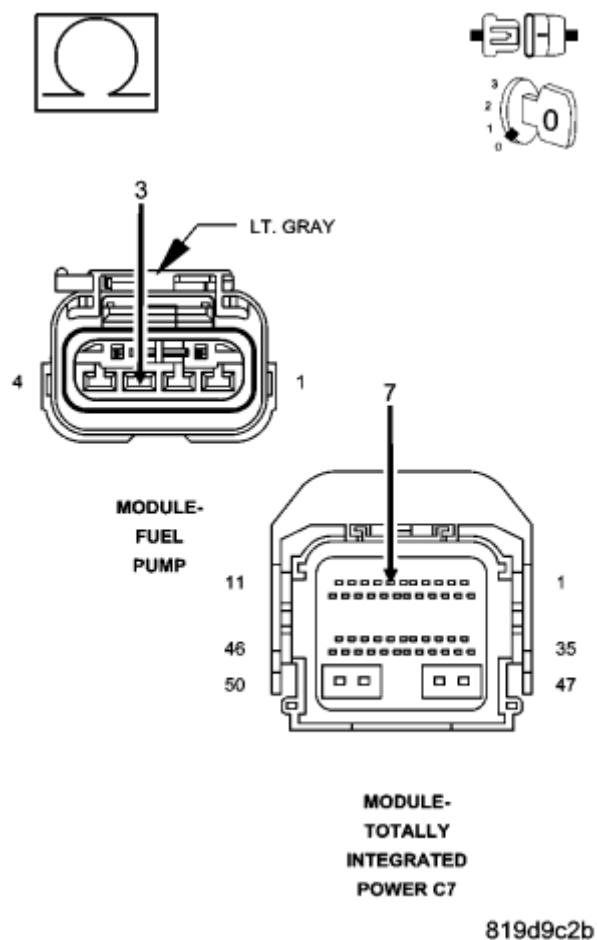


Fig. 48: Measuring Resistance Of (N4) Fuel Level Signal Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (N4) Fuel Level Signal circuit from the Fuel Pump Module harness connector to the C7 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Pump Module and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Fuel Pump Module and the TIPM connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0463-FUEL LEVEL SENSOR 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage above 10.4 volts.

SET CONDITIONS

- Set Condition:

The fuel level sensor signal voltage at the PCM goes above a calibrated voltage for more than 90 seconds.
One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO VOLTAGE
(N4) FUEL LEVEL SIGNAL CIRCUIT OPEN
(K91) SENSOR GROUND CIRCUIT OPEN
FUEL LEVEL SENSOR
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose any CAN - C or CAN - B Communication DTCs before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs and record the related Freeze Frame data.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL LEVEL SENSOR

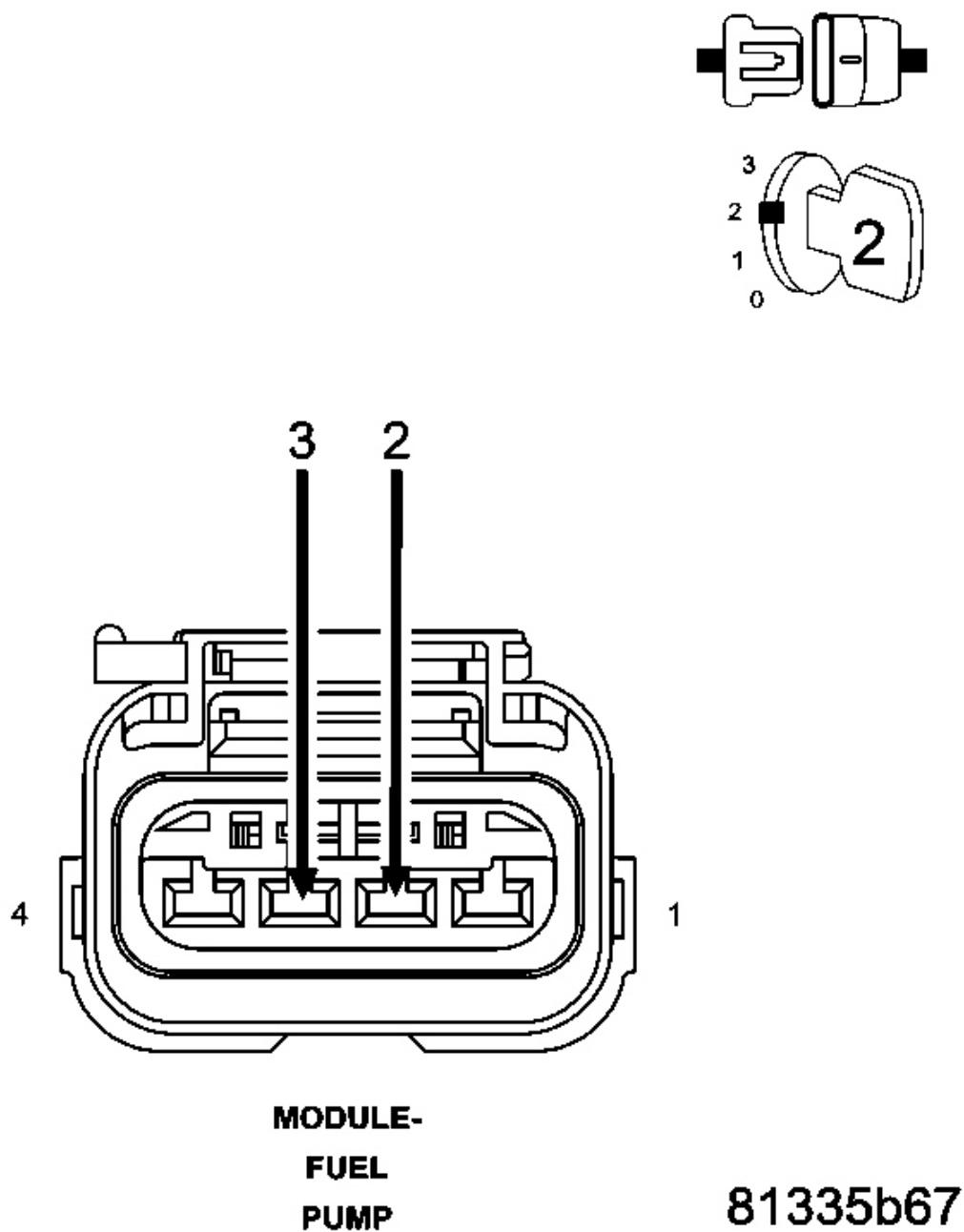


Fig. 50: Checking Fuel Level Sensor
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Fuel Pump Module electrical harness connector.

Ignition on, engine not running.

With a scan tool, monitor the Fuel Level Signal voltage.

Connect a jumper wire between the (N4) Fuel Level Signal circuit and the (K91) Sensor ground circuit.

Did the Fuel Level voltage change from approximately 5 volts to 0 volts?

Yes

Verify that there is good pin to terminal contact in the Fuel Pump Module and the TIPM connectors. If OK, replace the Fuel Level Sensor.

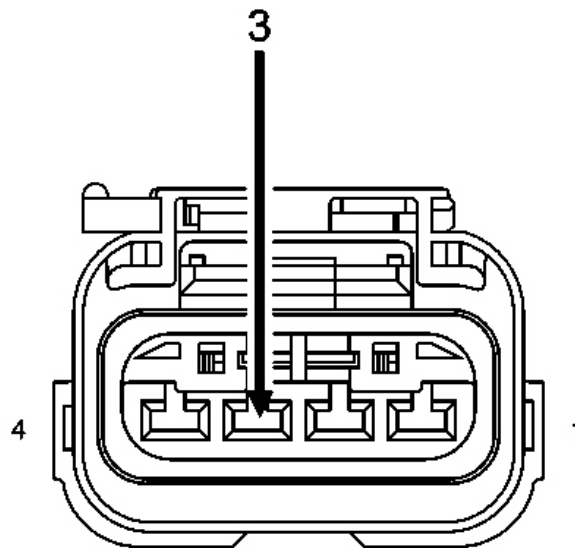
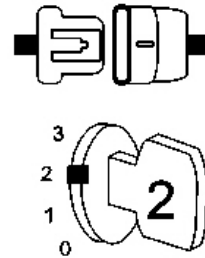
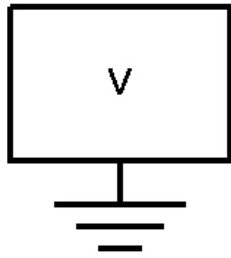
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. (N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO VOLTAGE



**MODULE-
FUEL
PUMP**

81335b63

Fig. 51: Checking Fuel Level Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C7 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (N4) Fuel Level Signal circuit in the Fuel Pump Module harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (N4) FUEL LEVEL SIGNAL CIRCUIT OPEN

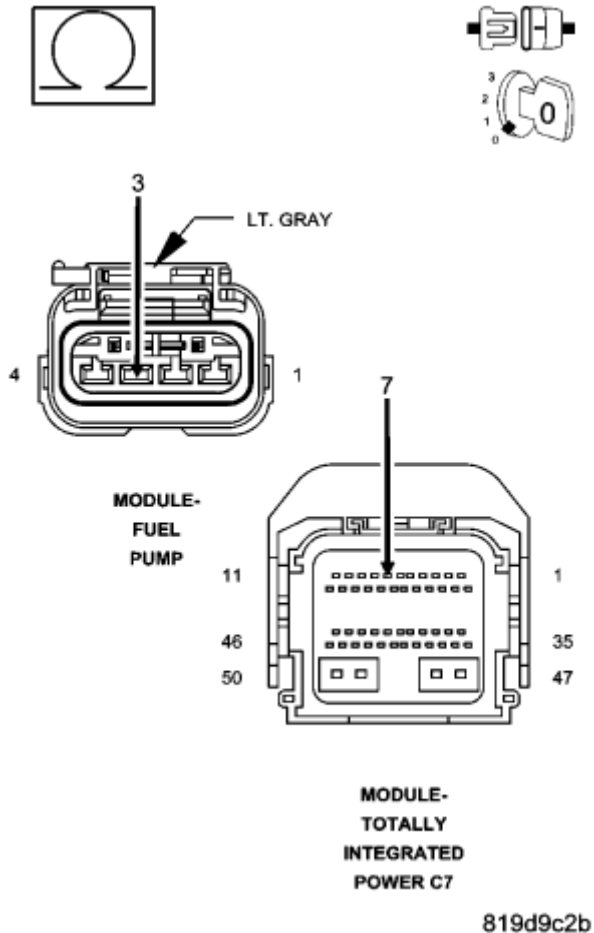


Fig. 52: Measuring Resistance Of (N4) Fuel Level Signal Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (N4) Fuel Level Signal circuit from the Fuel Pump Module harness connector to the C7 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K91) SENSOR GROUND CIRCUIT OPEN

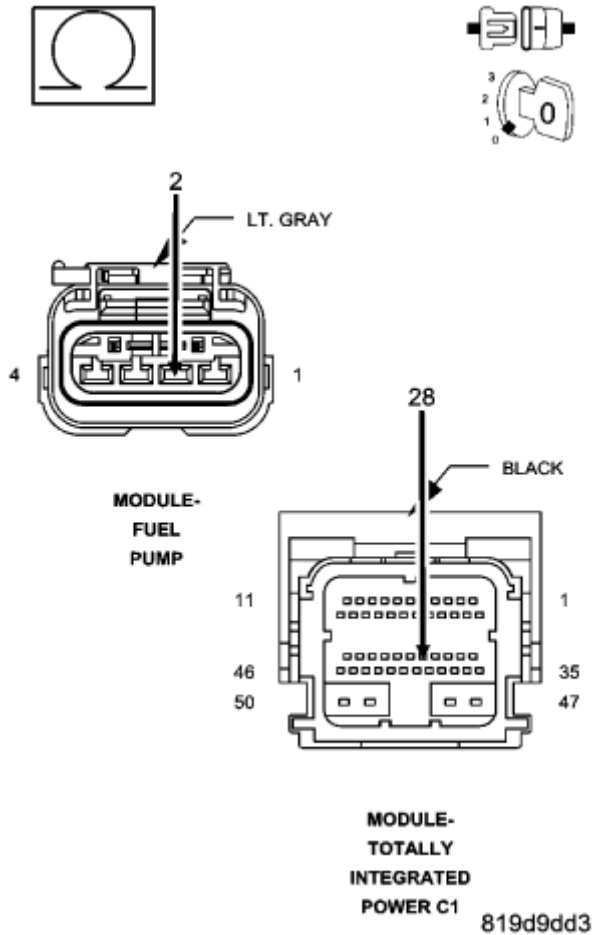


Fig. 53: Measuring Resistance Of (K91) Sensor Ground Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C1 TIPM harness connector.

Measure the resistance of the (K91) Sensor Ground circuit from the Fuel Pump Module harness connector to the TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K91) Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Pump Module and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Fuel Pump Module and the TIPM connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0480-COOLING FAN 1 CONTROL CIRCUIT

CIRCUIT SCHEMATIC

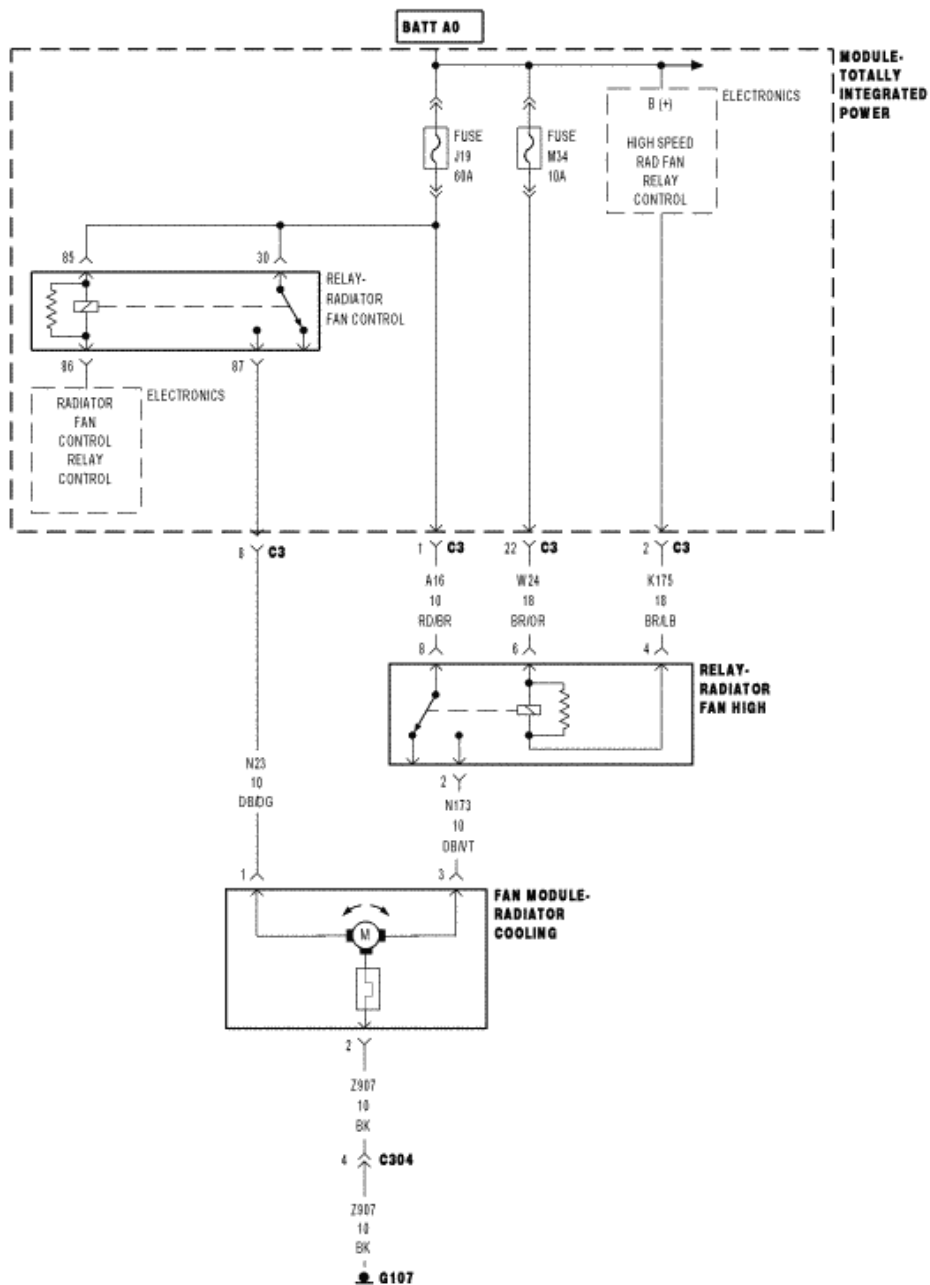


Fig. 54: Cooling Fan Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
CAN C BUS FAILURE ENGINE COOLANT TEMP SENSOR DTCS SET COOLING FAN CONTROL CIRCUIT DTCS SET IN THE TIPM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CAN C or ECT DTCS CURRENTLY ACTIVE**

Are any CAN C or ECT DTCS Active at this time?

Yes

Refer to the appropriate diagnostics for the ECT Sensor or CAN C Bus DTC.

No

Go To 3.

3. **COOLING FAN CONTROL CIRCUIT DTCS SET IN THE TIPM**

Are any Cooling Fan Control Circuit DTCS set in the TIPM?

Yes

Diagnose the appropriate Cooling Fan Control Circuit DTC in the TIPM

No

Go To 4.

4. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Relay, Totally Integrated Power Module (TIPM), and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Relay, Totally Integrated Power Module (TIPM), and the Powertrain Control Module (PCM) connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

P0481-COOLING FAN 2 CONTROL CIRCUIT

CIRCUIT SCHEMATIC

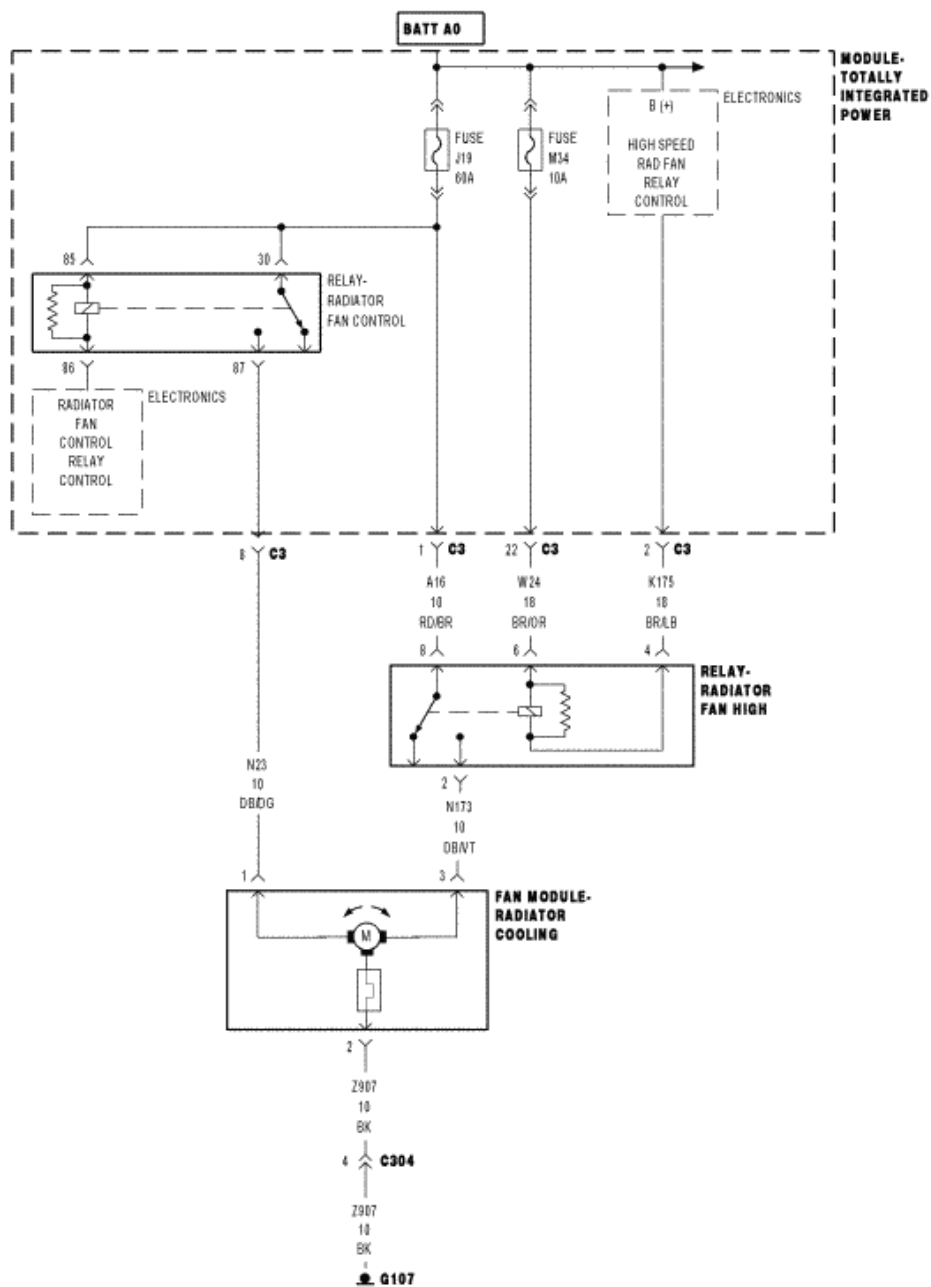


Fig. 55: Cooling Fan Control Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. One Trip Fault.
Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
CAN C BUS FAILURE
ENGINE COOLANT TEMP SENSOR DTCS SET
COOLING FAN CONTROL CIRCUIT DTCS SET IN THE TIPM
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CAN C or ECT DTCS CURRENTLY ACTIVE

Are any CAN C or ECT DTCS Active at this time?

Yes

Refer to the appropriate diagnostics for the ECT Sensor or CAN C Bus DTC.

No

Go To 3.

3. COOLING FAN CONTROL CIRCUIT DTCS SET IN THE TIPM

Are any Cooling Fan Control Circuit DTCS set in the TIPM?

Yes

Diagnose the appropriate Cooling Fan Control Circuit DTC in the TIPM

No

Go To 4.

4. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Relay, Totally Integrated Power Module (TIPM), and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Relay, Totally Integrated Power Module (TIPM), and the Powertrain Control Module (PCM) connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

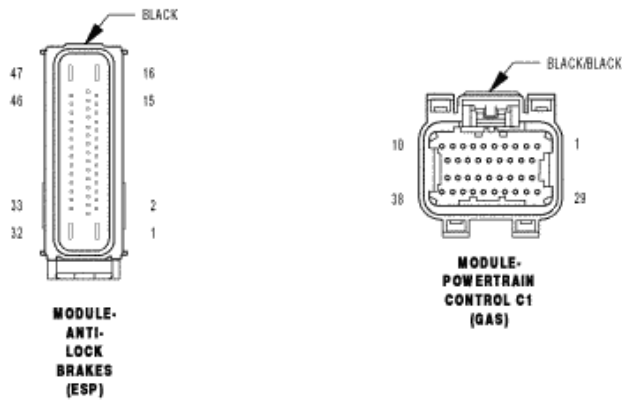
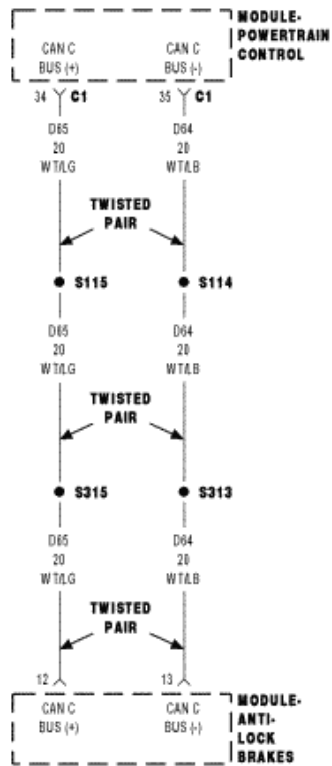
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0501-VEHICLE SPEED SENSOR 1 PERFORMANCE

CIRCUIT SCHEMATIC



01948756

Fig. 56: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The vehicle speed sensor rationality is a continuous test that monitors the vehicle speed sensor for lack of activity. The rationality will not run if a limp-in exists for MAP, Throttle Position, and Engine Coolant Temperature. If vehicle speed sensor is below a minimum threshold for a period of time after the vehicle is operated at a sufficient load, a failure will be indicated.

MONITOR CONDITIONS

When Monitored:

With the engine running, transmission not in park or neutral, brakes not applied, and engine RPM greater than 1500.

SET CONDITIONS

- **Set Condition:**

This code will set if no vehicle speed signal is received from the ABS Module up to 120 seconds for 2 consecutive trips. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
ACTIVE BUS OR COMMUNICATION DTCS
TIRE CIRCUMFERENCE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

NOTE: Check for any Bus Communication DTCs. If no Bus or Communication DTCs are set, check for active DTCs stored in the Anti-Lock Brake Module. Any bus or communication DTCs or VSS DTCs in the Anti-Lock Brake Module must be properly diagnosed before continuing.

Start the engine.

Allow the engine to idle.

NOTE: It may be necessary to drive the vehicle for the fault to become Active.

With a scan tool, select View DTCs.

Is the status Active or Pending for this DTC?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VISUAL INSPECTION

NOTE: **This code can set due to tire circumference differences and from the front or rear wheels being on a slippery surface while the opposite tires are not.**

This code may also set on a hard acceleration on loose gravel or during other off road driving conditions.

Check tire pressure of all the tires.

Check tire wear on all the tires.

Ask the customer what the road and driving conditions were like when the fault set.

Were any problems found?

Yes

Repair as necessary. If the code set during a front OR rear wheel spin condition, no repair is necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Wheel Speed Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Wheel Speed Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

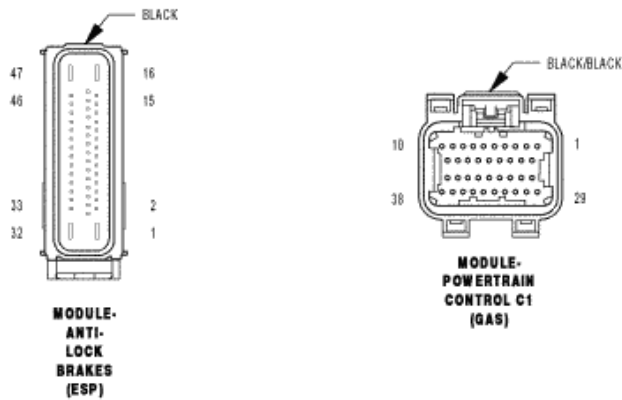
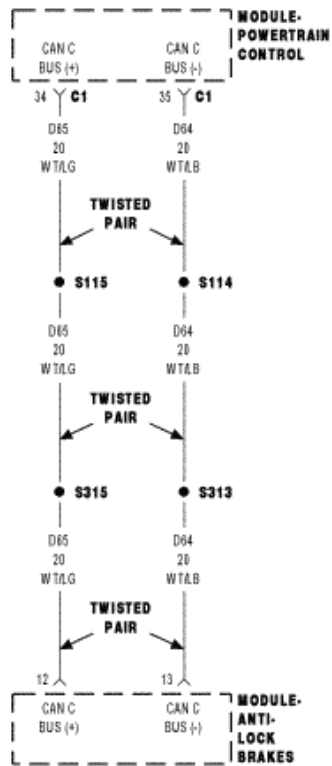
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0503-VEHICLE SPEED SENSOR 1 ERRATIC

CIRCUIT SCHEMATIC



01948756

Fig. 57: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The vehicle speed sensor rationality is a continuous test that monitors the vehicle speed sensor for lack of activity. The rationality will not run if a limp-in exists for MAP, Throttle Position, and Engine Coolant Temperature. If vehicle speed sensor is below a minimum threshold for a period of time after the vehicle is operated at a sufficient load, a failure will be indicated.

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage greater than 10 volts. Transmission in Drive or Reverse.

SET CONDITIONS

- Set Condition:**

This code will set if no vehicle speed signal is received from the ABS Module up to 120 seconds for 2 consecutive trips. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
ACTIVE BUS OR COMMUNICATION DTCs
TIRE CIRCUMFERENCE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

NOTE: Check for any Bus Communication DTCs. If no Bus or Communication DTCs are set, check for active DTCs stored in the Anti-Lock Brake Module. Any bus or communication DTCs or VSS DTCs in the Anti-Lock Brake Module must be properly diagnosed before continuing.

With a scan tool, view DTCs and record the related Freeze Frame data.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **VISUAL INSPECTION**

NOTE: **This code can set due to tire circumference differences and from the front or rear wheels being on a slippery surface while the opposite tires are not.**

This code may also set on a hard acceleration on loose gravel or during other off road driving conditions.

Check tire pressure of all the tires.

Check tire wear on all the tires.

Ask the customer what the road and driving conditions were like when the fault set.

Were any problems found?

Yes

Repair as necessary. If the code set during a front OR rear wheel spin condition, no repair is necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Wheel Speed Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Wheel Speed Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0506-IDLE SPEED PERFORMANCE LOWER THAN EXPECTED

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The objective of the Idle Speed Rationality is to monitor the ability to achieve and maintain a steady idle condition. The monitor will judge the functionality of the idle speed control system by monitoring RPM during idle. If RPM does not come within a calibrated deadband of target idle speed, a timer is started. If the timer reaches its maximum threshold without any sign of the RPM trending towards control, a soft failure is generated.

MONITOR CONDITIONS

When Monitored:

With the engine idling in drive, the brake applied, engine run time above a minimum calibrated value, and no VSS, MAF/MAP, ECT, TPS, ETC, CKP Sensor, fuel system, or injector DTCs present.

SET CONDITIONS

- **Set Condition:**

Engine speed is 100 RPM or more below target idle speed for 30 seconds. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
AIR INDUCTION SYSTEM PCV SYSTEM RESTRICTIONS THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If any other Throttle Body DTCs are present, they must be diagnosed and

repaired before continuing this test.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **AIR INDUCTION SYSTEM**

Inspect the Air Induction System for the following problems:

Restrictions: Dirty Air Cleaner, Foreign material trapped in the air intake tube, etc.

Were any problems found?

Yes

Repair or replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 3.

3. **PCV SYSTEM**

Inspect the PCV system for the following problems:

Restrictions - sticking valve, collapsed hoses or tubes, obstructed passages or ports, etc.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **THROTTLE BODY OPERATION**

Inspect the throttle body for carbon build up, other restrictions, and a bent throttle plate using a straight edge.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

While the vehicle is running, lightly tap on ETC Motor with your hand and listen for idle to raise.

Were any problems found or did the idle fluctuate while tapping on the ETC Motor?

Yes

Verify that there is good pin to terminal contact at the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0507-IDLE SPEED PERFORMANCE HIGHER THAN EXPECTED

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The objective of the Idle Speed Rationality is to monitor the ability to achieve and maintain a steady idle condition. The monitor will judge the functionality of the idle speed control system by monitoring RPM during idle. If RPM does not come within a calibrated deadband of target idle speed, a timer is started. If the timer reaches its maximum threshold without any sign of the RPM trending towards control, a soft failure is generated.

MONITOR CONDITIONS

When Monitored:

With the engine idling in drive, the brake applied, engine run time above a minimum calibrated value, and no VSS, MAF/MAP, ECT, TPS, ETC, CKP Sensor, fuel system, or injector DTCs present.

SET CONDITIONS

- Set Condition:**

Engine speed is 200 RPM or more above target idle speed for 30 seconds. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
AIR INDUCTION SYSTEM LEAKS
PCV SYSTEM LEAKS
ENGINE VACUUM LEAKS

THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If any other Throttle Body DTCs are present, they must be diagnosed and repaired before continuing this test.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. AIR INDUCTION SYSTEM

Inspect the Air Induction System for the following problems:

Leaks: Air Intake tube connection, Air Cleaner housing, etc.

Were any problems found?

Yes

Repair or replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **PCV SYSTEM**

Inspect the PCV system for the following problems:

Leaks - cracked or damaged hoses or tubes, poor hose or tube connections, PCV valve stuck open, etc.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **ENGINE VACUUM LEAKS**

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine.

Inspect the vehicle for external vacuum leaks.

Inspect the engine for internal leaks.

Were any vacuum leaks found?

Yes

Repair the vacuum leak as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. THROTTLE BODY OPERATION

Inspect the throttle body for carbon build up, other restrictions, and a bent throttle plate using a straight edge.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

While the vehicle is running, lightly tap on ETC Motor with your hand and listen for idle to raise.

Were any problems found or did the idle fluctuate while tapping on the ETC Motor?

Yes

Verify that there is good pin to terminal contact at the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

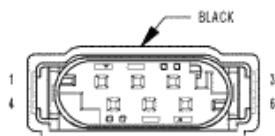
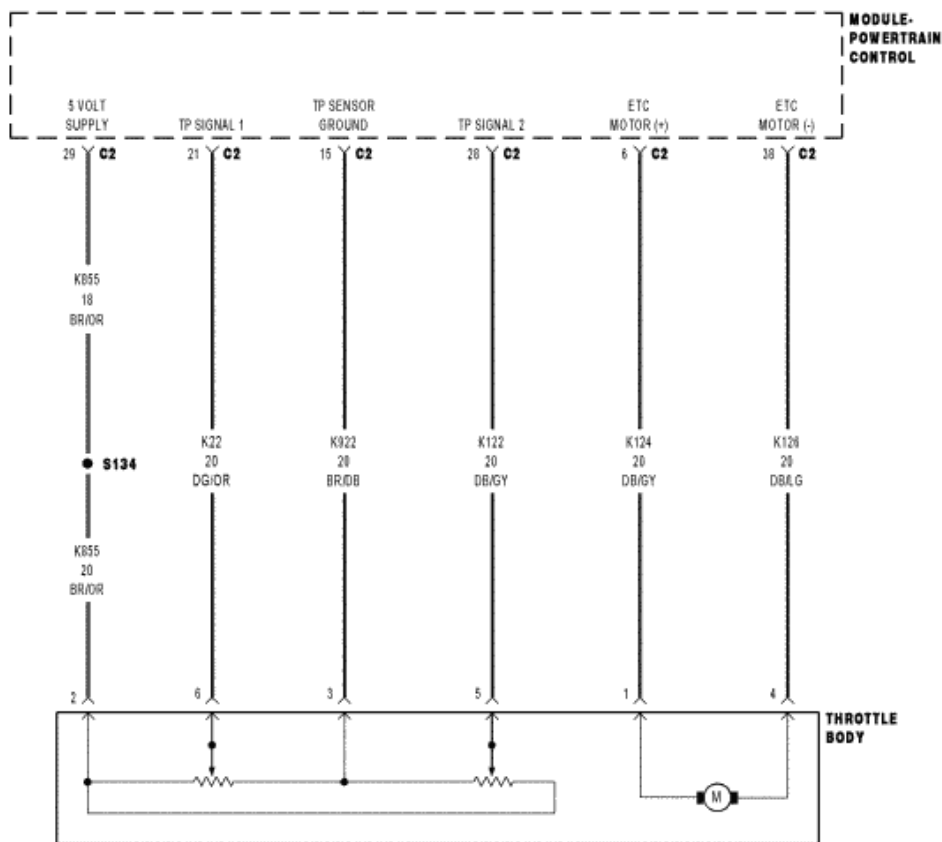
No

Replace and program the Powertrain Control Module per Service Information.

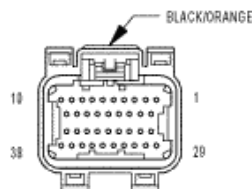
Perform **POWERTRAIN VERIFICATION TEST** .

P050B-COLD START IGNITION TIMING PERFORMANCE

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 58: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Spark adjustment during a cold start is intended to provide quick response to idle speed variations. The spark adjust diagnostics monitors spark advance on a cold start over a period of time, then compares the average spark advance to a threshold.

MONITOR CONDITIONS

When Monitored:

Cold start condition. Ambient Air temperature between -7° C and 50 ° C (19.4° F and 122° F). Engine Coolant temperature between -7° C and 50 ° C (19.4° F and 122° F). The difference between the Ambient Air temp and ECT temp at Start is equal to or less than 10° C (50° F). Engine running at idle only.

SET CONDITIONS

- **Set Condition:**

Engine RPM is 50 RPM or more (depending on vehicle specifications), below idle speed for at least 3 seconds and the average spark advance is above the threshold, too much spark advance, for a specified time limit. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
RESTRICTED INTAKE AIR SYSTEM LOW BATTERY VOLTAGE FUEL CONTAMINATION EXCESSIVE RESISTANCE IN THE (K124) ETC MOTOR (+) CIRCUIT EXCESSIVE RESISTANCE IN THE (K126) ETC MOTOR (-) CIRCUIT ETC MOTOR/THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

NOTE: **Low battery voltage can also cause excessive current draw, in very hot and very cold ambient temperatures. Make sure the battery can pass a load test before continuing.**

With a scan tool, select View DTCs.

Diagnose any other PCM DTCs before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. THROTTLE PLATE INSPECTION

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material (ice, dirt, or excessive carbon build up) on the Throttle Plate or in the bore causing the Throttle Plate to stick.

Were any signs of foreign material or scoring of the throttle plate or bore found?

Yes

Remove the debris if possible or replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. DIRTY AIR FILTER

Remove and inspect the Air Filter.

Is the Air Filter dirty?

Yes

Replace the Air Filter.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CONTAMINATED FUEL

Inspect the Fuel for contamination. (Dirt, water, or other foreign material)

Is the fuel contaminated?

Yes

Drain the Fuel from the fuel tank into an approved gas holding tank and add clean fuel. Refer to **STANDARD PROCEDURE** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (K124) ETC MOTOR (+) CIRCUIT

Turn the ignition off.

Disconnect the C2 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K124) ETC Motor (+) circuit at the Throttle Body harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 6.

No

Repair the excessive resistance in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EXCESSIVE RESISTANCE IN THE (K126) ETC MOTOR (-) CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K126) ETC Motor (-) circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

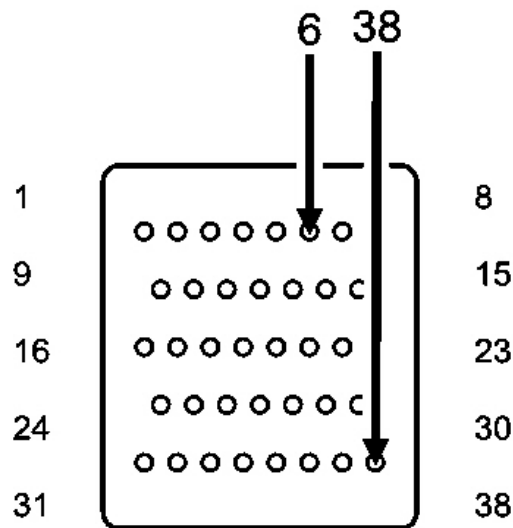
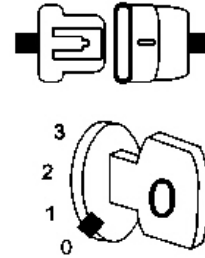
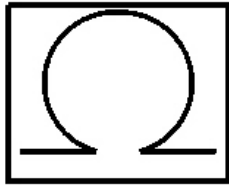
Go To 7.

No

Repair the excessive resistance in the (K126) ETC Negative circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. ETC MOTOR



PCM PINOUT
BOX 8815

8134a49a

Fig. 59: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

NOTE: Take the following measurement using special tool #8815 to avoid possible damage to the Throttle Body harness connector.

Connect the Throttle Body harness connector.

Disconnect special tool #8815-1 from the C2 PCM harness connector.

Measure the resistance of the ETC Motor by probing the appropriate terminals of special tool #8815 for the (K124) ETC Positive circuit and the (K126) ETC Negative circuit.

Is the resistance between 2.5 and 25 ohms at closed throttle?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P050D-COLD START ROUGH IDLE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The objective of the Dynamic Crankshaft Fuel Control is to reduce the fuel as much as possible during a cold start. The DCFC begins subtracting fuel from a high limit upon a cold start and keeps removing fuel in an attempt to get to a calibrated lean limit. DCFC stops removing fuel when rough idle is detected or the lean limit is reached.

MONITOR CONDITIONS

When Monitored:

Cold start condition. Ambient Air temperature between -7° C and 50° C (19.4° F and 122° F). Engine Coolant temperature between -7° C and 50° C (19.4° F and 122° F). The difference between the Ambient Air temp and ECT temp at Start is equal to or less than 10° C (50° F). Engine running at idle only.

SET CONDITIONS

- Set Condition:**

If a rough idle is detected and the Dynamic Crankshaft Fuel Control remains or returns to the high limit window for a calibrated time. Two trip fault.

POSSIBLE CAUSES

Possible Causes
ENGINE MECHANICAL PROBLEM
1/1 O2 SENSOR
MAP SENSOR
ECT SENSOR
IGNITION COIL
SPARK PLUG
FUEL INJECTOR
INTERNAL FUEL LEAK
FUEL PUMP MODULE
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. CHECKING FOR CYLINDER MISFIRE CONDITION PRESENT

- NOTE:**

Check for any TSBs that apply to a Misfire condition. Review the vehicle repair history for any misfire condition repairs that have been performed.
- NOTE:**

Reviewing the vehicle repair history may aid in the repair of the misfire condition.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is P0300 or any other Misfire DTCs set along with the P050D.

Is there a misfire present at this time?

Yes

Refer to the appropriate Cylinder Misfire Diagnostic procedure.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 2.

2. ACTIVE DTC

Diagnose all other trouble codes before continuing.

NOTE: Check for contaminants that may have damaged an O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

3. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: The DTC needs to be cleared before actuating the System Test, if the DTC is not cleared, the System Test may not be allowed to actuate.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 4.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

Below Specification

Go To 13.

CAUTION: Stop All Actuations.

4. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground the scan tool will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.

NOTE: If one of the O2 Sensor Signal or Return circuits are shorted to voltage, the scan tool will display all O2 Sensor voltage readings high.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With a scan tool, monitor all of the O2 Sensor voltage readings.

Is the voltage switching between 2.5 and 3.4 volts for all the O2 Sensors?

Yes

Go To 5.

No

Go To 9.

5. 1/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Ignition on, engine not running.

With a scan tool, actuate the 1/1 O2 Heater Test.

NOTE: The DTC needs to be cleared before actuating the Heater Test, if the DTC is not cleared, the Heater Test may not be allowed to actuate.

With the scan tool, monitor 1/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and the Powertrain Control Module connectors. Replace the 1/1 O2 Sensor if no problems were found in the connectors.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. MAP SENSOR OPERATION

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: If engine will not idle, maintain a constant RPM above idle.

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading within 1" of Hg on the Vacuum Gauge reading?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the MAP Sensor and the Powertrain Control Module connectors. Replace the MAP Sensor if no problems were found in the connectors.
Perform **POWERTRAIN VERIFICATION TEST** .

7. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak)

Ignition on, engine not running.

With a scan tool, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to

cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and did it reach at least 82° C (180° F)?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the ETC Sensor and the Powertrain Control Module connectors. Replace the Engine Coolant Temperature Sensor if no problems were found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

8. ENGINE MECHANICAL PROBLEM

Turn the ignition off.

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

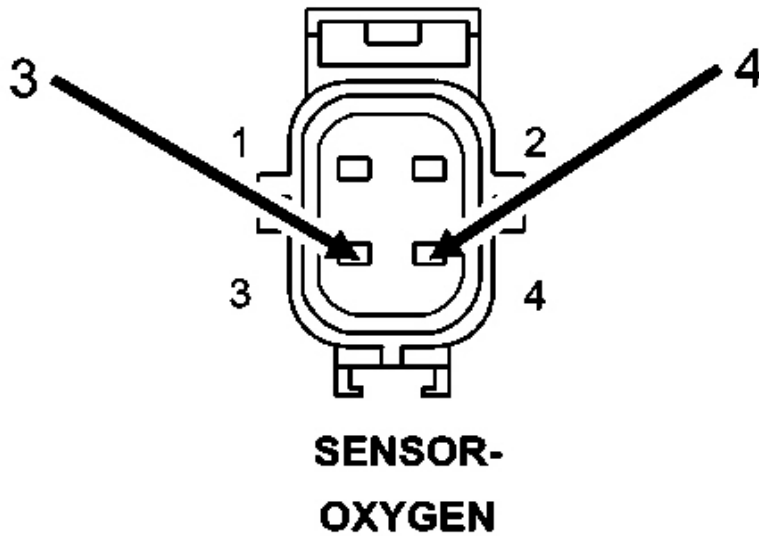
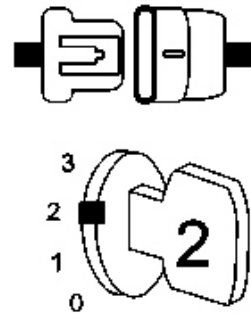
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

9. **1/1 O2 SENSOR**



**SENSOR-
OXYGEN**

81653cbb

Fig. 60: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 1/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K41) O2 1/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: **The voltage should drop from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire in place.**

Did the O2 Sensor voltage change from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the related Sensors and the Powertrain Control Module connectors. Replace the 1/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: **Remove the jumper wire before continuing.**

10. (K41) O2 SENSOR 1/1 SIGNAL CIRCUIT

With a scan tool, monitor the 1/1 O2 Sensor voltage reading with the jumper wire removed.

NOTE: **The scan tool will display all O2 Sensor voltage readings approximately 5.0 volts when only one O2 Sensor's Signal circuit is shorted to voltage.**

NOTE: **The scan tool will display one O2 Sensor voltage close to zero and the others will read lower than normal when one O2 Sensor Signal circuit contains excessive resistance.**

Is the voltage between 4.1 and 5.0 volts?

Yes

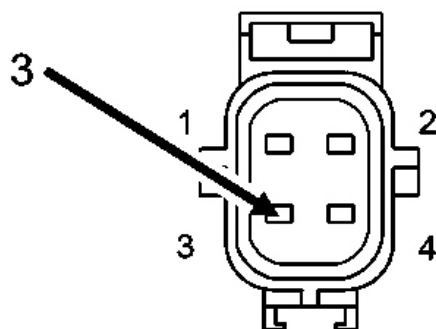
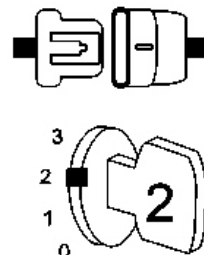
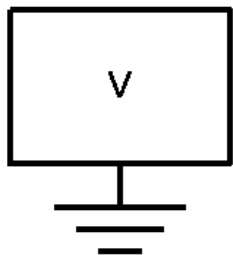
Go To 11.

No

Check the (K41) O2 Sensor 1/1 Signal circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K902) O2 RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 61: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 12.

No

Check the O2 Return circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out, or corroded terminals. Verify that there is good pin to terminal contact in the related Sensors and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESTRICTED FUEL SUPPLY LINE**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special 5/16 fuel line adapter tool #6539 between disconnected fuel line and the fuel pump module.

Attach a fuel pressure test gauge to the T fitting on tool #6539.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: The DTC needs to be cleared before actuating the System Test, if the DTC is not cleared, the System Test may not be allowed to actuate.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

CAUTION: Stop All Actuations.

14. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **FUEL PUMP MODULE**

If there are no possible causes remaining, view repair.

Repair

Verify that there is good pin to terminal contact in the Fuel Pump Module, Relay, Cluster, and Powertrain Control Module connectors. Replace the Fuel Pump Module if no problems were found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

P0513-INVALID SKIM KEY

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM detects an invalid SKIM key. One Trip Fault.

POSSIBLE CAUSES

Possible Causes
INCORRECT VIN PROGRAMMED IN THE PCM
NO COMMUNICATION WITH SKIM
NO VIN PROGRAMMED IN THE PCM
IGNITION KEY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With the scan tool, select View PCM DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 6.

2. NO COMMUNICATION WITH SKIM

With the scan tool, attempt to communicate with the SKIM.

Can the scan tool communicate with the SKIM?

Yes

Go To 3.

No

Refer to **VEHICLE THEFT SECURITY - ELECTRICAL DIAGNOSTICS** and perform the appropriate Diagnostic Procedure.

Perform **SKREEM/SKIM VERIFICATION TEST** .

3. SKIM TROUBLE CODES SET

With the scan tool, check for SKIM DTCs.

Are any DTCs present in the SKIM?

Yes

Refer to **VEHICLE THEFT SECURITY - ELECTRICAL DIAGNOSTICS** and perform the appropriate Diagnostic Procedure.

Perform **SKREEM/SKIM VERIFICATION TEST** .

No

Go To 4.

4. VIN PROGRAMMED INTO PCM

With the scan tool, display the VIN that is programmed in the PCM.

Has a VIN been programmed into the PCM?

Yes

Go To 5.

No

Program the correct VIN into the PCM and retest.

Perform **SKREEM/SKIM VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Turn the ignition off.

Replace and program the SKIM per Service Information.

Ignition on, engine not running.

With the scan tool, erase all SKIM and PCM DTCs.

Attempt to start and idle the engine.

With the scan tool, select View PCM DTCs.

Does the scan tool display this code?

Yes

NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary. Replace and program the Powertrain Control Module per Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST** .

No

Test Complete.

6. IGNITION KEY

NOTE: You must obtain the SKIM pin number.

NOTE: This DTC could have been set if the SKIM harness connector was disconnected, or if the SKIM was replaced recently.

NOTE: All keys that the customer uses for this vehicle must be tested to verify they are operating properly.

Ignition on, engine not running.

Verify the correct VIN is programmed into the PCM and SKIM.

Turn the ignition off.

With the next customer key turn the ignition key on and crank the engine to start.

With the scan tool, read the PCM DTCs. Look for P0513.

Is the DTC P0513 still active?

Yes

Replace the Ignition Key.

Perform **SKREEM/SKIM VERIFICATION TEST** .

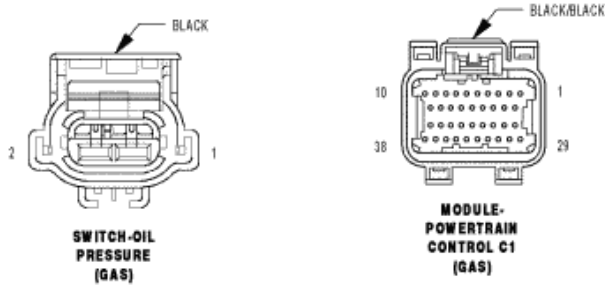
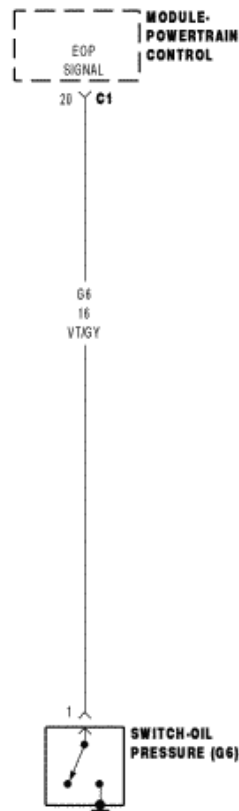
No

Test Complete.

NOTE: If this DTC cannot be reset, it could have been an actual theft attempt.

P0522-ENGINE OIL PRESSURE TOO LOW

CIRCUIT SCHEMATIC



0190c000

Fig. 62: Oil Pressure Signal Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition key on and battery voltage above 10.4 volts.

SET CONDITIONS

• Set Condition:

The PCM detects that the Engine Oil Pressure Sensor input voltage is below the minimum acceptable value. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(G6) OIL PRESSURE SIGNAL CIRCUIT OPEN
(G6) OIL PRESSURE SIGNAL CIRCUIT SHORTED TO VOLTAGE
(G6) OIL PRESSURE SIGNAL CIRCUIT SHORTED TO GROUND
OIL PRESSURE SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

2. OIL PRESSURE SWITCH

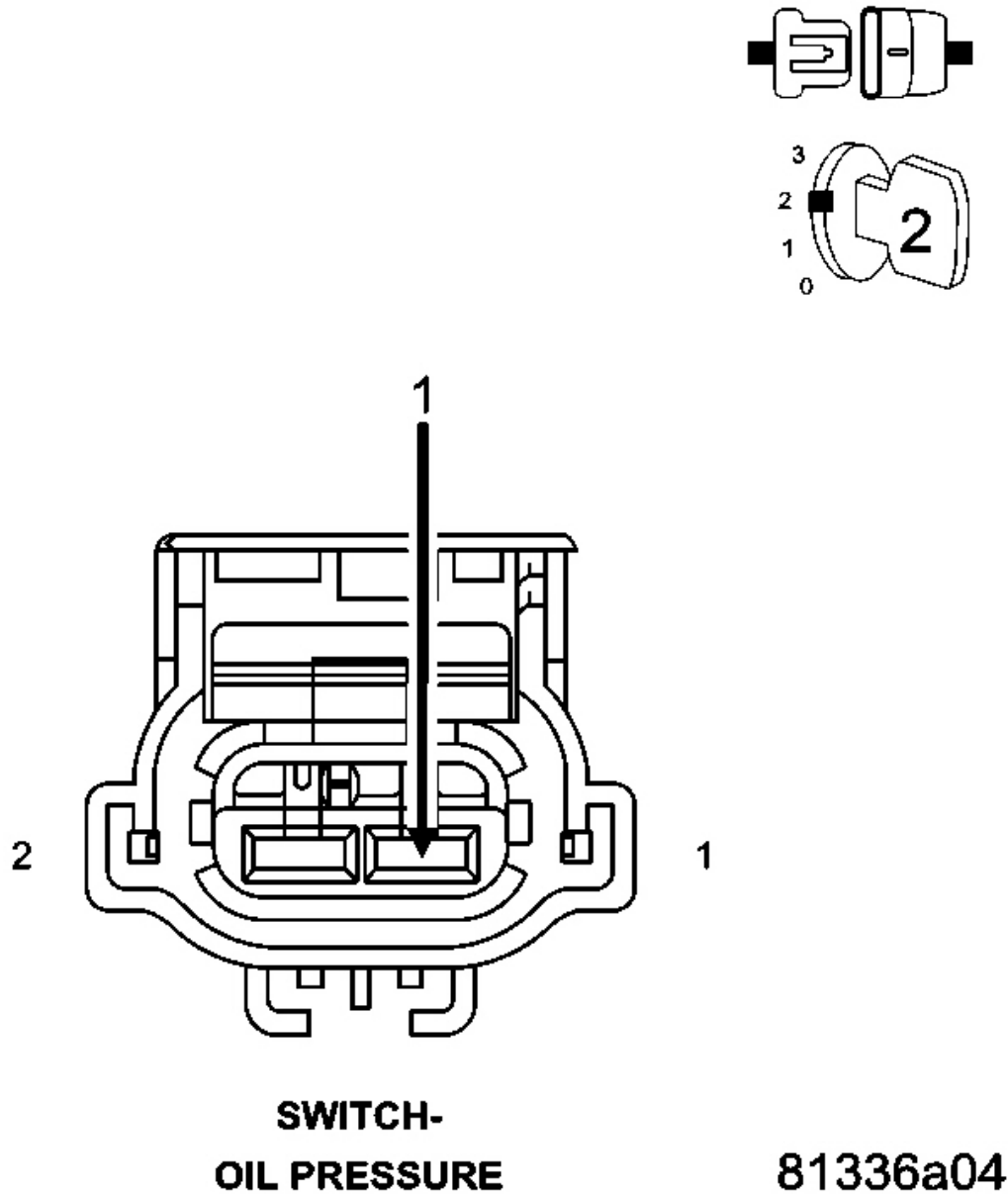


Fig. 63: Locating Oil Pressure Switch Signal Circuit At Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Oil Pressure Switch harness connector.

Ignition on, engine not running.

With the scan tool monitor the Oil Pressure Switch state.

Connect a jumper wire to the (G6) Oil Pressure Signal circuit in the Sensor harness connector.

Touch the other end of the jumper wire to a known good Ground several times.

Did the Oil Pressure Switch state change from High to Low when connecting and disconnecting the jumper wire to ground?

Yes

Verify that there is good pin to terminal contact in the Oil Pressure Switch and the Powertrain Control Module connectors. If OK, replace the Engine Oil Pressure Switch.

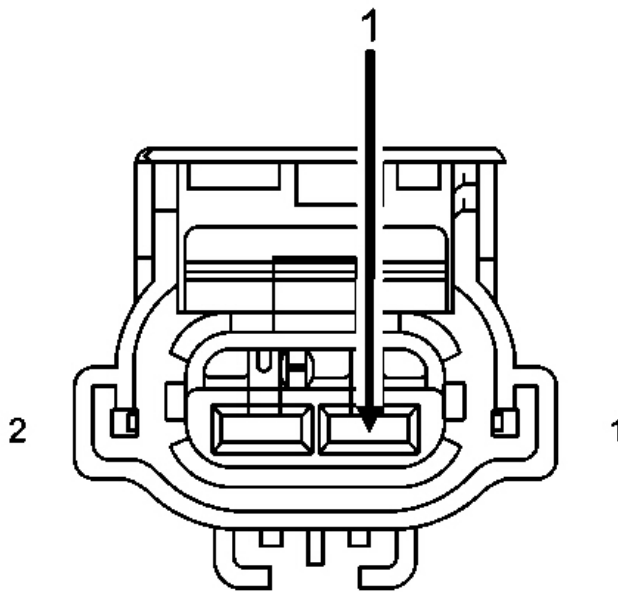
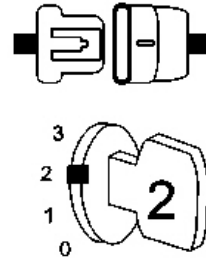
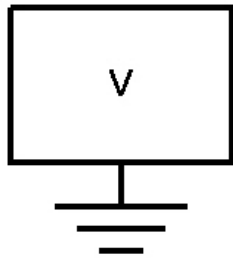
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. (G6) OIL PRESSURE SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SWITCH-
OIL PRESSURE**

81336a11

Fig. 64: Checking Oil Pressure Switch Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (G6) Oil Pressure Signal circuit in the Switch harness connector.

Is there any voltage present?

Yes

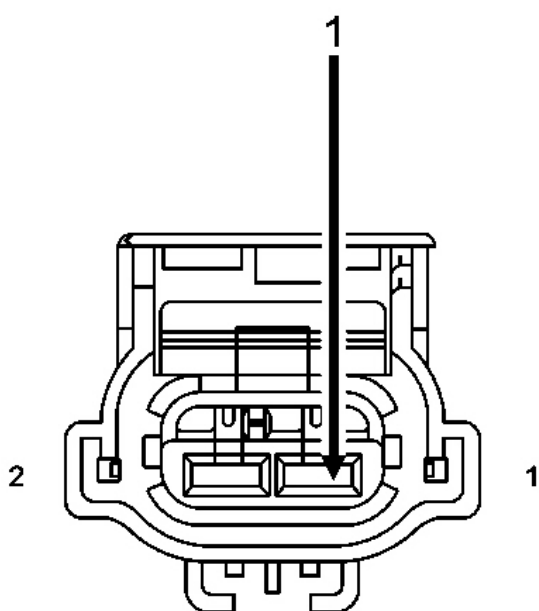
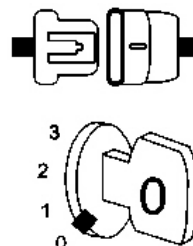
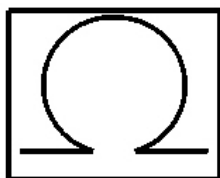
Repair the short to voltage on the (G6) Oil Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

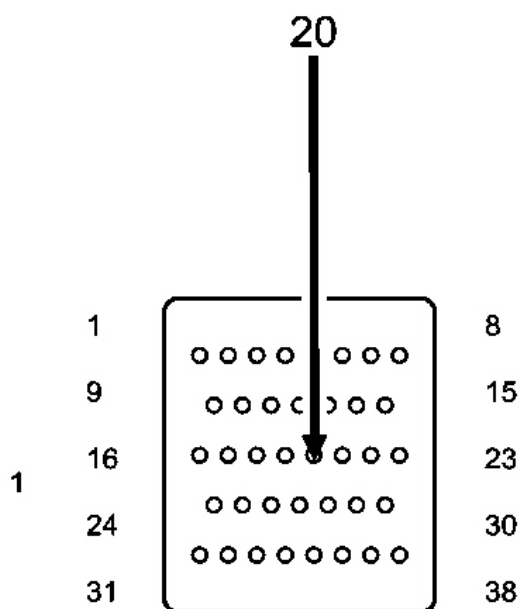
No

Go To 4.

4. **(G6) OIL PRESSURE SWITCH SIGNAL CIRCUIT OPEN**



**SWITCH-
OIL PRESSURE**



**PCM PINOUT
BOX 8815**

81336a08

Fig. 65: Checking Oil Pressure Switch Signal Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (G6) Oil Pressure Signal circuit from the Oil Pressure Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

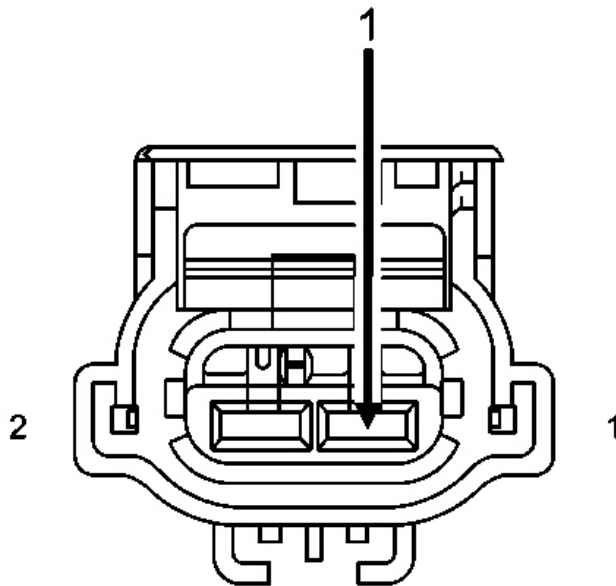
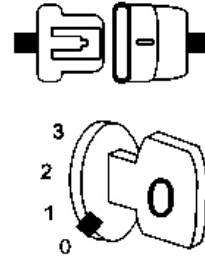
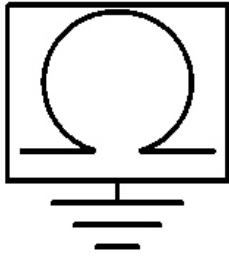
Go To 5.

No

Repair the open in the (G6) Oil Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (G6) SIGNAL CIRCUIT SHORTED TO GROUND



**SWITCH-
OIL PRESSURE**

81336a15

Fig. 66: Checking Oil Pressure Switch Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (G6) Oil Pressure Signal circuit in the Switch connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (G6) Oil Pressure Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Oil Pressure Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Oil Pressure Switch and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

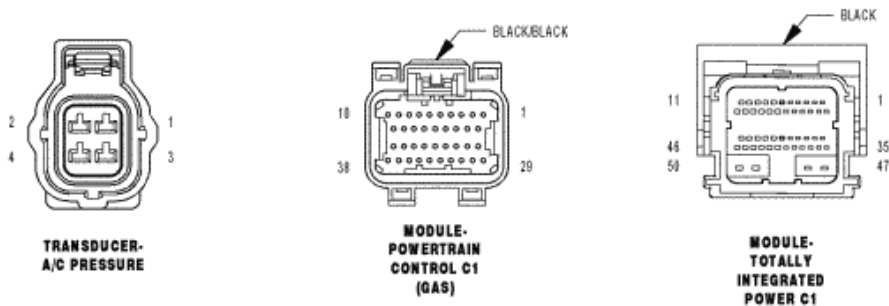
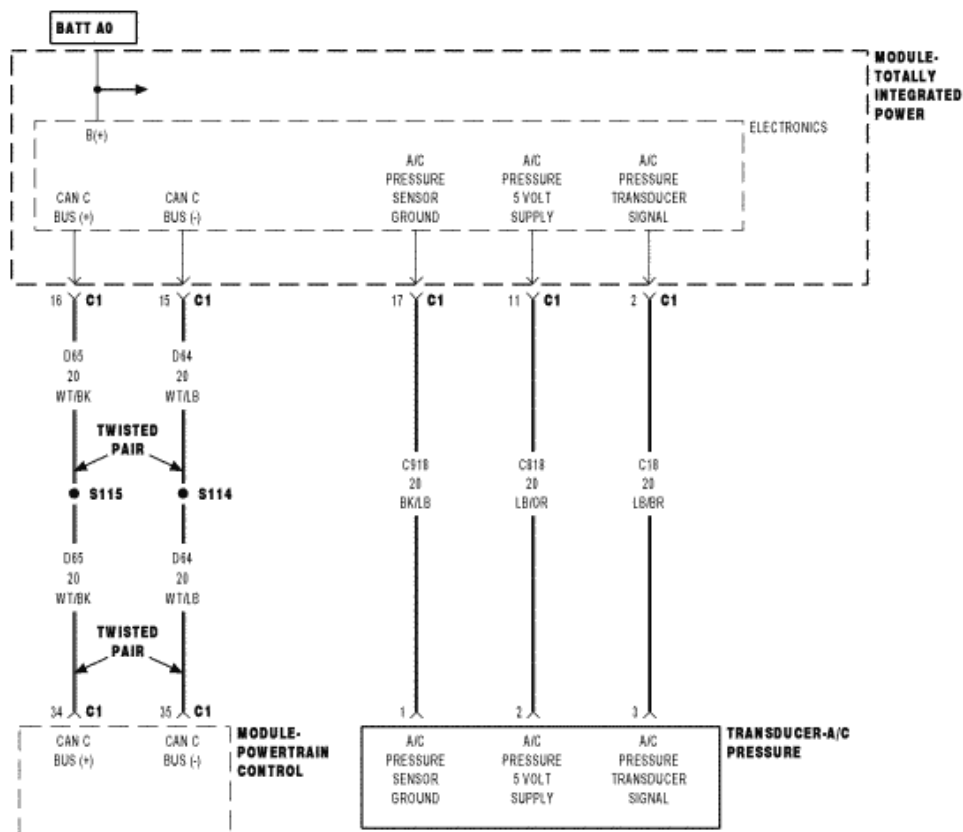
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0532-A/C PRESSURE SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC



81001a1d

Fig. 67: A/C Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running, AC is learned, and AC Clutch Relay energized.

SET CONDITIONS

- Set Condition:

The PCM detects that the A/C Pressure Transducer input voltage is below the minimum acceptable value. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(C818) 5-VOLT SUPPLY CIRCUIT OPEN
(C818) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
A/C PRESSURE TRANSDUCER
(C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO GROUND
(C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO THE (C918) A/C PRESSURE TRANSDUCER GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (C18) A/C PRESSURE SIGNAL CIRCUIT
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose any CAN - C Communication DTCs before continuing.

NOTE: Make sure the A/C refrigerant System is properly charged per Service Information.

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs

before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (C818) 5-VOLT SUPPLY CIRCUIT

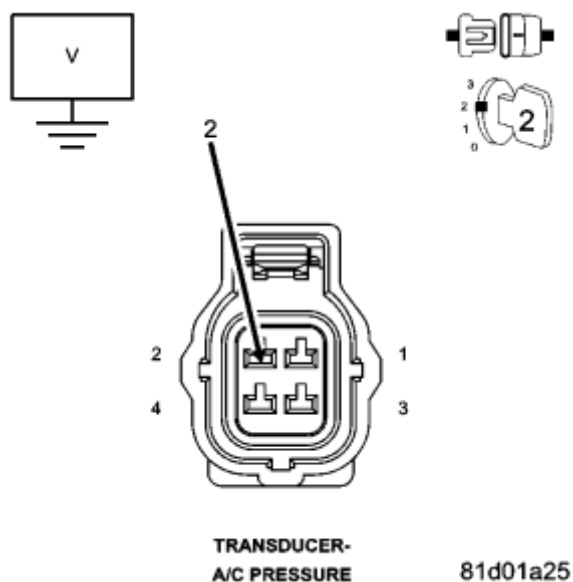


Fig. 68: Measuring The Voltage On The 5-Volt Supply Circuit In The A/C Pressure Transducer Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Pressure Transducer harness connector.

Ignition on, engine not running.

Measure the voltage on the (C818) 5-volt Supply circuit in the A/C Pressure Transducer harness connector.

Is the voltage between 4.5 to 5.2 volts?

Yes

Go To 3.

No

Go To 7.

3. (C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO GROUND

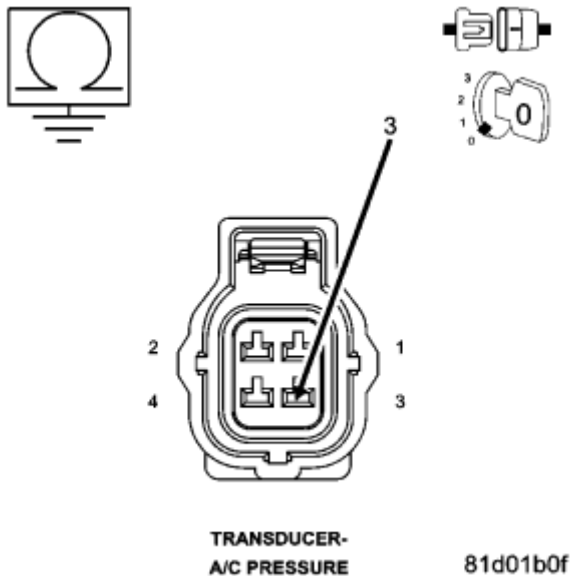


Fig. 69: Measuring The Resistance Between Ground And The (C18) A/C Pressure Signal Circuit In The A/C Pressure Transducer Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

Measure the resistance between ground and the (C18) A/C Pressure Signal circuit in the A/C Pressure Transducer harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (C18) A/C Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO THE (C918) SENSOR GROUND CIRCUIT

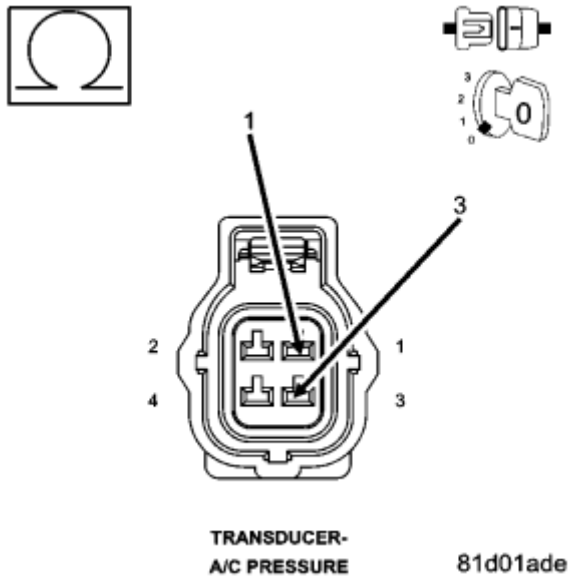


Fig. 70: Measuring The Resistance Between The A/C Pressure Signal Circuit And The Sensor Ground Circuit In The A/C Pressure Transducer Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C18) A/C Pressure Signal circuit and the (C918) Sensor Ground circuit in the A/C Pressure Transducer harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (C918) Sensor Ground circuit and the (C18) A/C Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 5.

5. (C18) A/C PRESSURE SIGNAL CIRCUIT OPEN

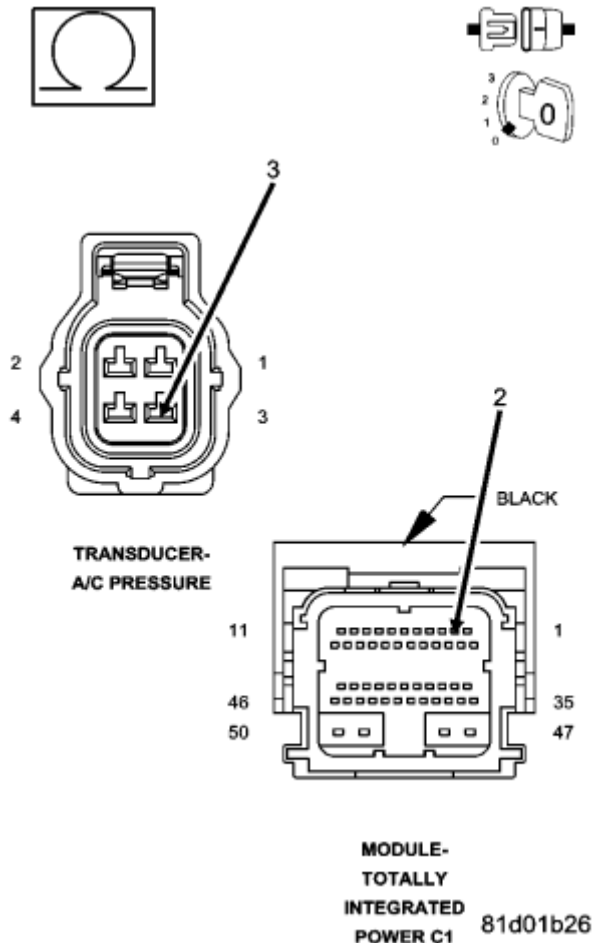


Fig. 71: Measuring The Resistance Of The A/C Pressure Signal Circuit From The A/C Pressure Transducer Harness Connector To C1 TIPM Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (C18) A/C Pressure Signal circuit from the A/C Pressure Transducer harness connector to C1 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (C18) A/C Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. A/C PRESSURE TRANSDUCER

Connect the C1 TIPM harness connector.

Turn the ignition on.

With the scan tool, monitor the A/C Pressure Transducer voltage.

NOTE: The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the connector disconnected.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the A/C Pressure Transducer and the Powertrain Control Module connectors. If OK, replace the A/C Pressure Transducer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

7. (C818) 5-VOLT SUPPLY CIRCUIT OPEN

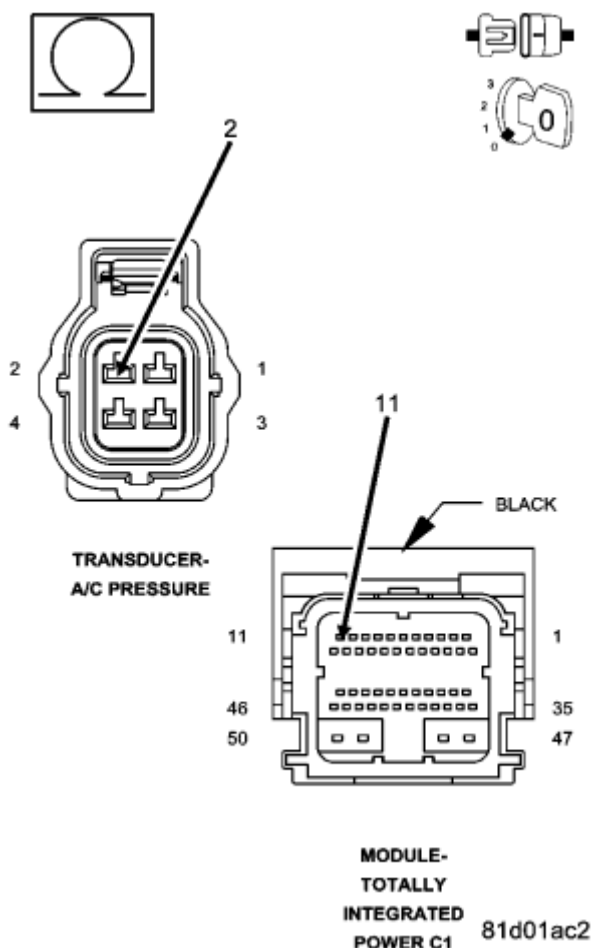


Fig. 72: Measuring The Resistance Of The 5-Volt Supply Circuit From The A/C Pressure Transducer Harness Connector To The C1 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

Measure the resistance of the (C818) 5-volt Supply circuit from the A/C Pressure Transducer harness connector to the C1 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the open in the (C818) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (C818) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

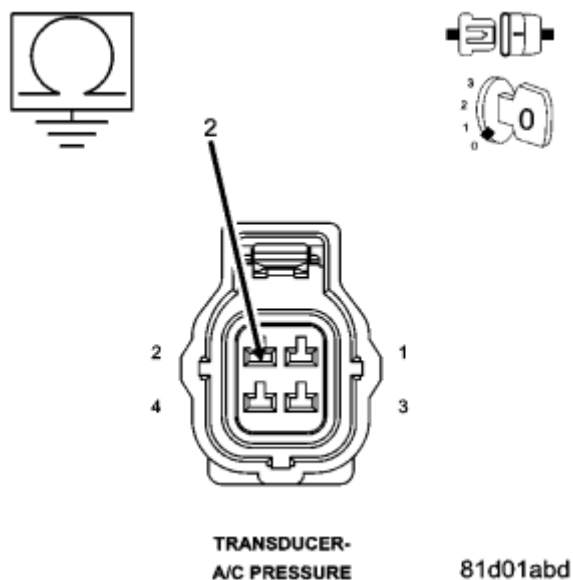


Fig. 73: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The A/C Pressure Transducer Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C818) 5-volt Supply circuit in the A/C Pressure Transducer harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (C818) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. TOTALLY INTEGRATED POWER MODULE

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related A/C Pressure Transducer and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the A/C Pressure Transducer and the Totally Integrated Power Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

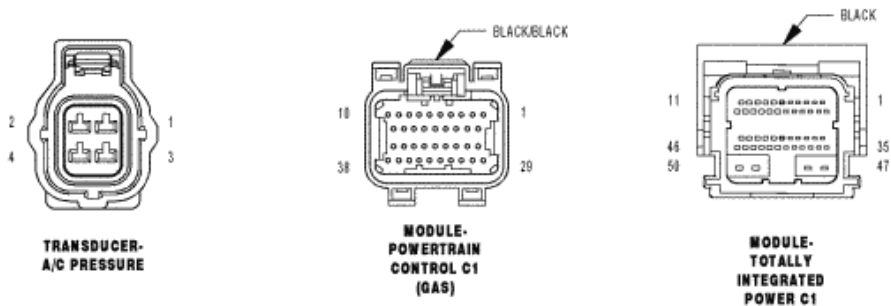
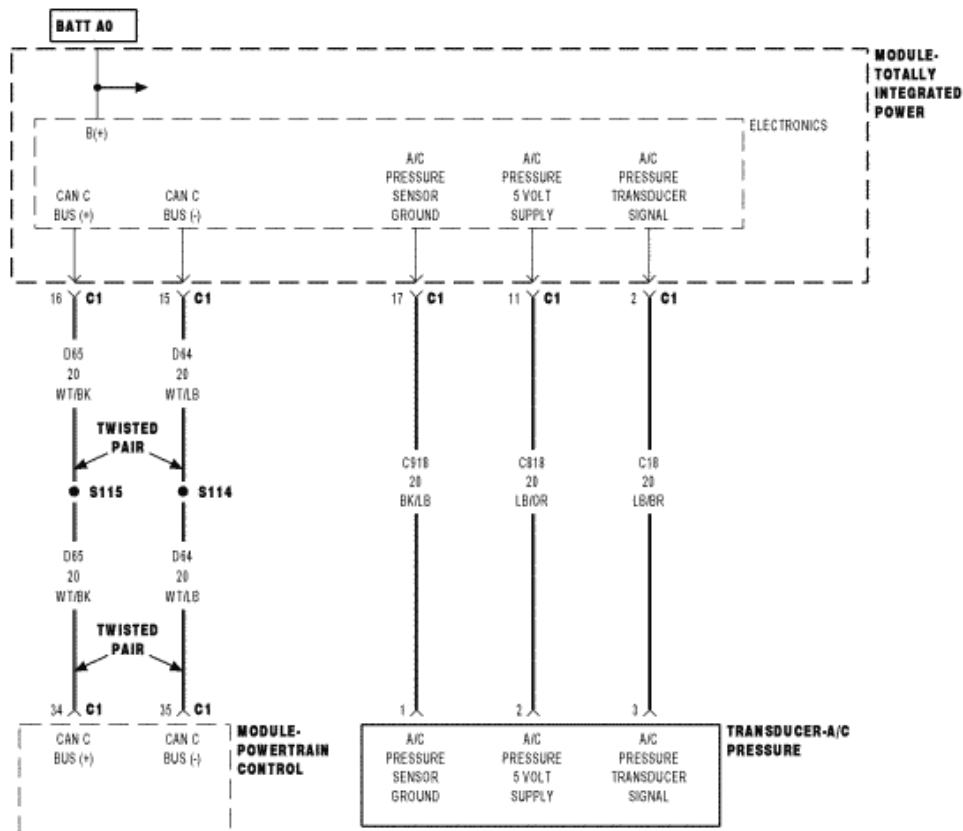
No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0533-A/C PRESSURE SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



81001x1d

Fig. 74: A/C Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and the A/C Clutch Relay energized.

SET CONDITIONS

- Set Condition:

The PCM detects that the A/C Pressure Transducer input voltage is above the maximum acceptable value.
One trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO VOLTAGE
(C18) A/C PRESSURE SIGNAL CIRCUIT OPEN
(C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO THE (C818) 5-VOLT SUPPLY CIRCUIT
(C918) A/C PRESSURE GROUND CIRCUIT OPEN
A/C PRESSURE TRANSDUCER
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose any CAN - C Communication DTCs before continuing.

NOTE: Make sure the A/C refrigerant system is properly charged per Service Information.

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. A/C PRESSURE TRANSDUCER

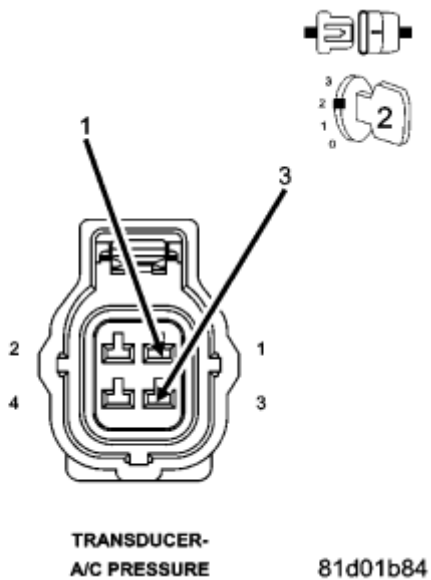


Fig. 75: Measuring Voltage Between The A/C Pressure Signal Circuit And The Sensor Ground Circuit In The Transducer Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Pressure Transducer harness connector.

Ignition on, engine not running.

With the scan tool, monitor the A/C Pressure Transducer voltage.

Connect a jumper wire between the (C18) A/C Pressure Signal circuit and the (C918) Sensor Ground circuit in the Transducer harness connector.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the A/C Pressure Transducer and the Totally Integrated Power Module connectors. If OK, replace the A/C Pressure Transducer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. (C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO VOLTAGE

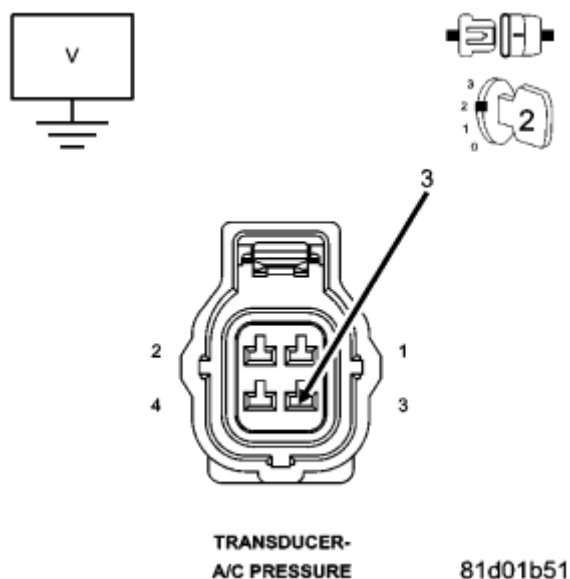


Fig. 76: Measuring The Voltage On The A/C Pressure Signal Circuit In The A/C Pressure Transducer Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (C18) A/C Pressure Signal circuit in the A/C Pressure Transducer harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (C18) A/C Pressure Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (C18) A/C PRESSURE SIGNAL CIRCUIT OPEN

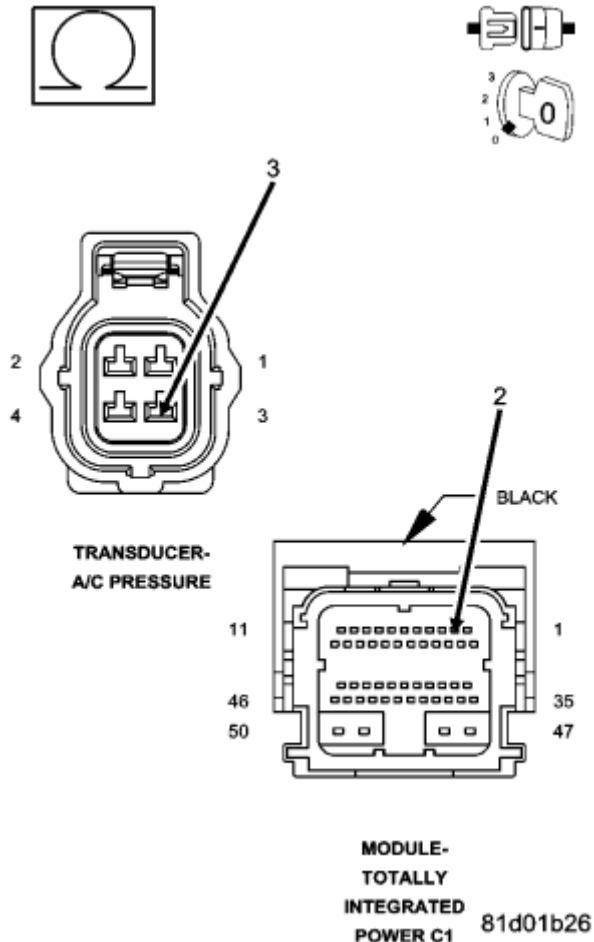


Fig. 77: Measuring The Resistance Of The A/C Pressure Signal Circuit From The A/C Pressure Transducer Harness Connector To C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (C18) A/C Pressure Signal circuit from the A/C Pressure Transducer harness connector to C1 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (C18) A/C Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(C18) A/C PRESSURE SIGNAL CIRCUIT SHORTED TO THE (C818) 5-VOLT SUPPLY CIRCUIT**

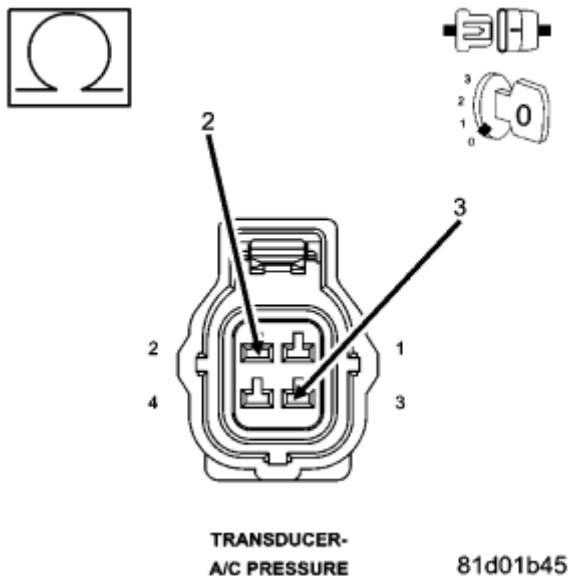


Fig. 78: Measuring The Resistance Between The A/C Pressure Signal Circuit And The 5-Volt Supply Circuit In The A/C Pressure Transducer Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (C18) A/C Pressure Signal circuit and the (C818) 5-volt Supply circuit in the A/C Pressure Transducer harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (C818) 5-volt Supply circuit and the (C18) A/C Pressure Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (C918) SENSOR GROUND CIRCUIT OPEN

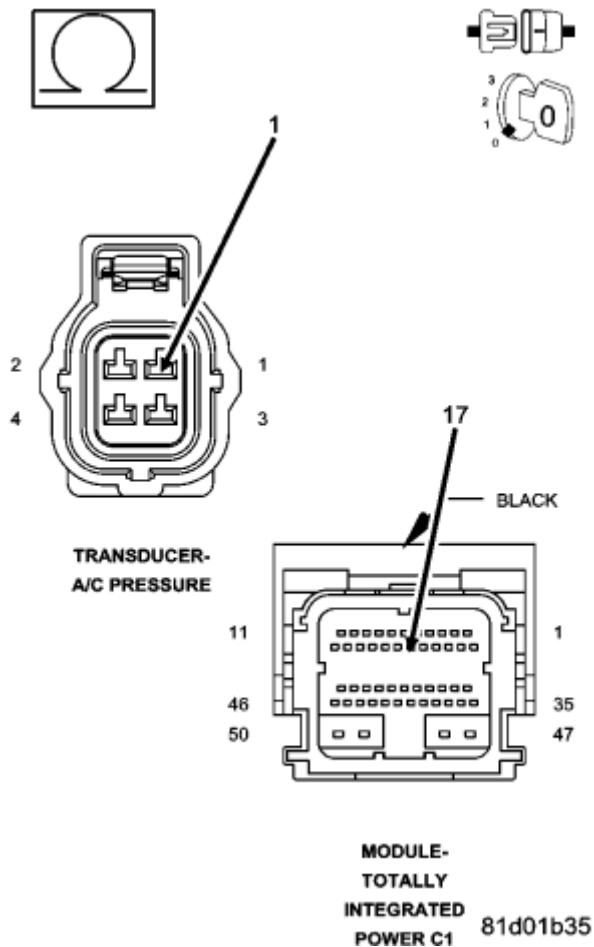


Fig. 79: Measuring The Resistance Of The Sensor Ground Circuit From The A/C Pressure Sensor Harness Connector To The C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (C918) Sensor Ground circuit from the A/C Pressure Sensor harness connector to the C1 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (C918) Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

7. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related A/C Pressure Transducer and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the A/C Pressure Transducer and the Totally Integrated Power Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

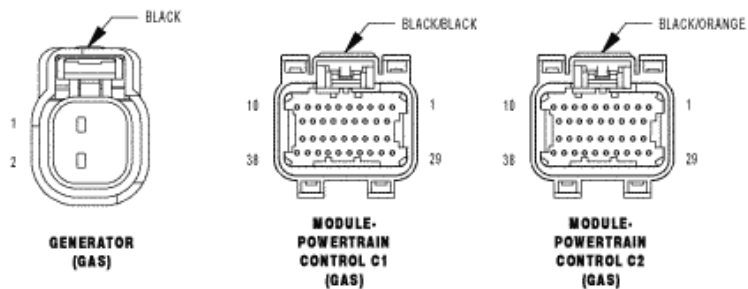
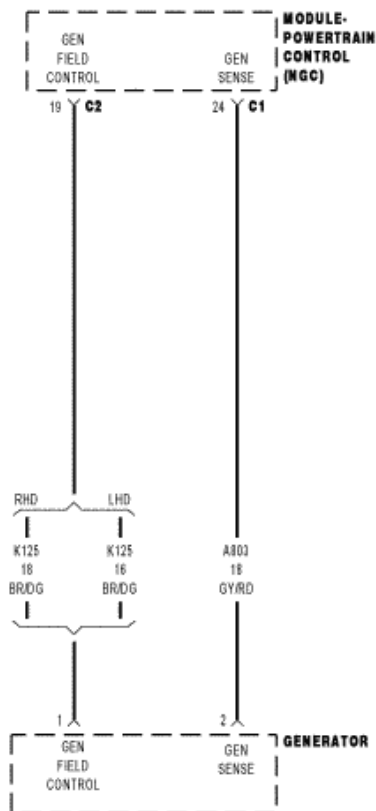
No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0562-BATTERY VOLTAGE LOW

CIRCUIT SCHEMATIC



01402070

Fig. 80: Generator Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Engine RPM greater than 1000 RPM. With no other charging system codes set.

SET CONDITIONS

- Set Condition:

Battery voltage is less than the desired voltage for more than 10 seconds. Battery voltage greater than 15.75 volts. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
RESISTANCE IN THE (A801) BATTERY POSITIVE CIRCUIT
RESISTANCE IN THE GENERATOR CASE GROUND
(K125) GENERATOR FIELD CONTROL CIRCUIT OPEN
(K125) GENERATOR FIELD CONTROL CIRCUIT SHORTED TO GROUND
GENERATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Make sure the generator drive belt is in good operating condition.
- NOTE:

Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. BATTERY

NOTE: Make sure the Battery is in good condition. Using the Midtronics Battery Tester or an equivalent Battery tester, test the Battery before continuing.

Does the Battery pass the load test for this specific application?

Yes

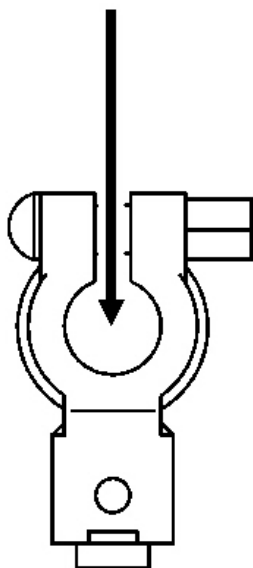
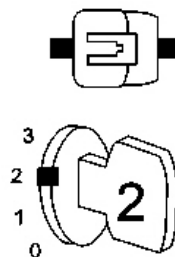
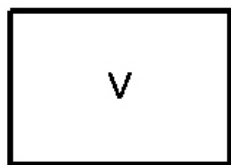
Go To 3.

No

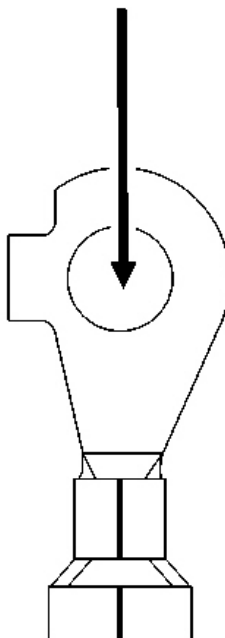
Replace the Battery per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (A801) B+ CIRCUIT HIGH RESISTANCE



**BATTERY
(POSITIVE)**



GENERATOR (B+)81336ba0

Fig. 81: Checking B+ Circuit For High Resistance
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Make sure all wires are clear of the engine's moving parts.

Measure the voltage between the (A801) B+ Terminal at the Generator and the Battery + Post.

Start the engine.

Is the voltage above 0.4 of a volt?

Yes

Repair the excessive resistance in the (A801) B+ circuit between the Generator and Battery.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. GENERATOR CASE GROUND HIGH RESISTANCE

Allow the engine to reach normal operating temperature.

NOTE: Make sure all wires are clear of the engine's moving parts.

Measure the voltage between the Generator case and Battery ground post.

Is the voltage above 0.1 of a volt?

Yes

Repair excessive resistance in the Generator Ground between the Generator Case and Battery ground side.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. GENERATOR OPERATION

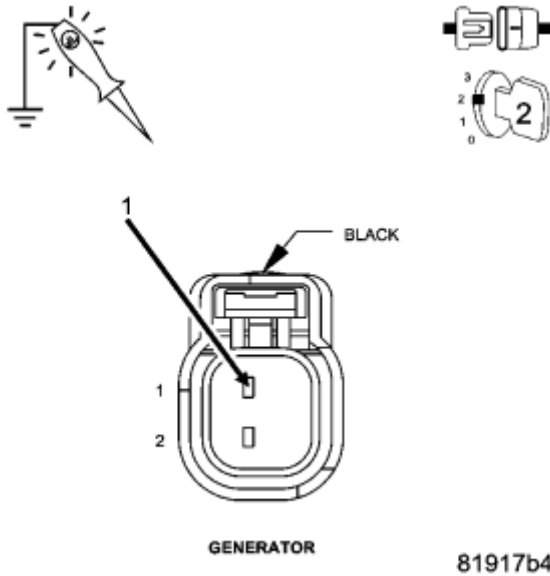


Fig. 82: Probing Generator Field Control Circuit At Generator Field Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Generator Field harness connector.

Using a 12-volt test light connected to ground, probe the (K125) Generator Field Control circuit in the Generator Field harness connector.

NOTE: Make sure the test light is probing the circuit before actuating the Test or a DTC may set and not allow the actuation.

Ignition on, engine not running.

With a scan tool, actuate the Generator Field Driver.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors. Replace the Generator if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K125) GENERATOR FIELD CONTROL CIRCUIT OPEN**

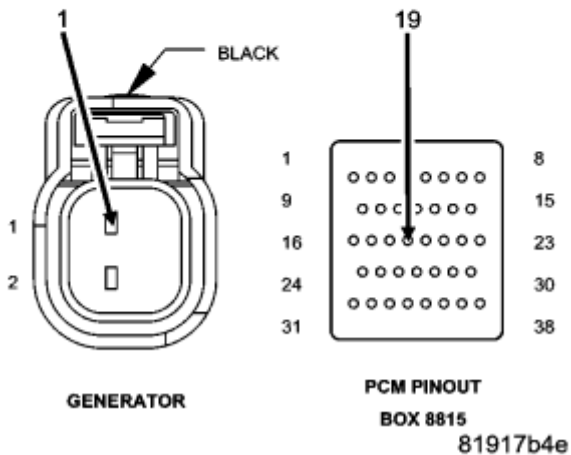


Fig. 83: Checking Generator Field Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K125) Gen Field Control circuit from the Generator harness connector to the appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K125) Gen Field Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K125) GENERATOR FIELD CONTROL CIRCUIT SHORTED TO GROUND

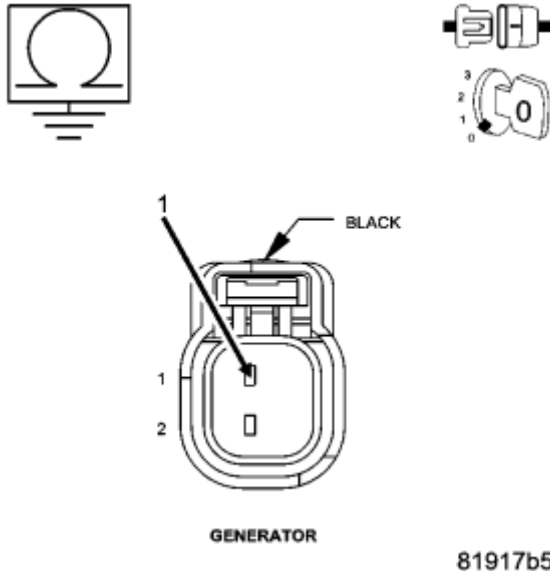


Fig. 84: Checking Generator Field Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K125) Gen Field Control circuit in the Generator Field harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K125) Gen Field Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

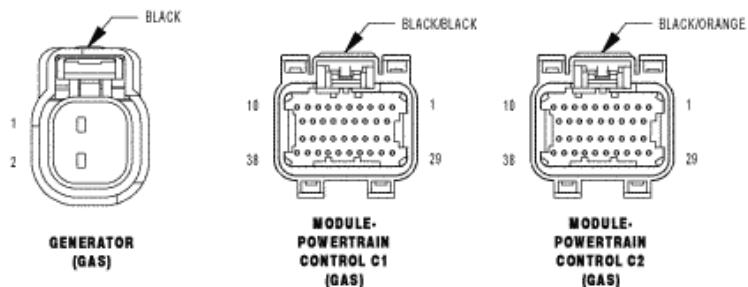
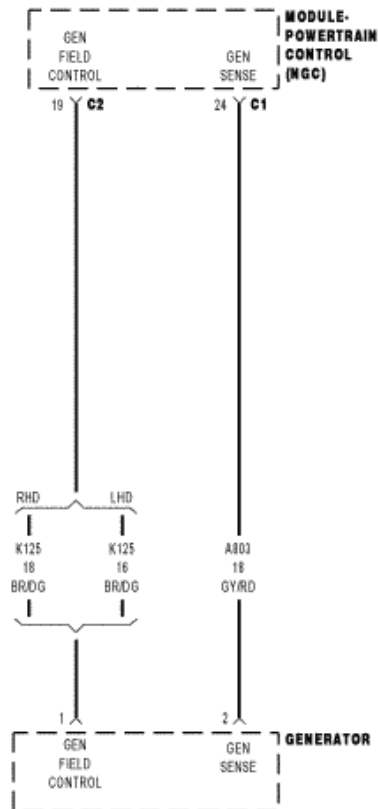
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0563-BATTERY VOLTAGE HIGH

CIRCUIT SCHEMATIC



01402070

Fig. 85: Generator Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Engine RPM greater than 1000 RPM. With no other charging system codes set.

SET CONDITIONS

- Set Condition:

Battery voltage is 1 volt greater than desired voltage for more than 10 seconds. Battery voltage greater than 15.75 volts. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K125) GENERATOR FIELD CONTROL CIRCUIT SHORTED TO VOLTAGE GENERATOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Inspect the fuses in the TIPM. If a fuse is open use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **GENERATOR OPERATION**

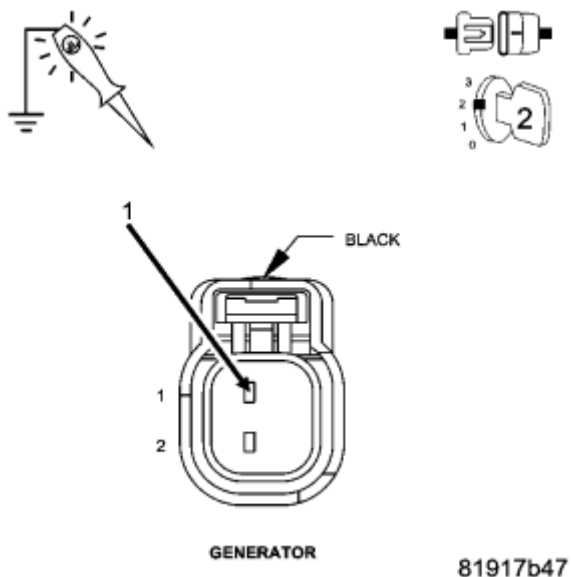


Fig. 86: Probing Generator Field Control Circuit At Generator Field Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Generator Field harness connector.

Using a 12-volt test light connected to ground, probe the (K125) Generator Field Control circuit in the Generator Field harness connector.

Ignition on, engine not running.

With a scan tool, actuate the Generator Field Driver.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection

to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors. Replace the Generator if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K125) FIELD CIRCUIT SHORTED TO VOLTAGE

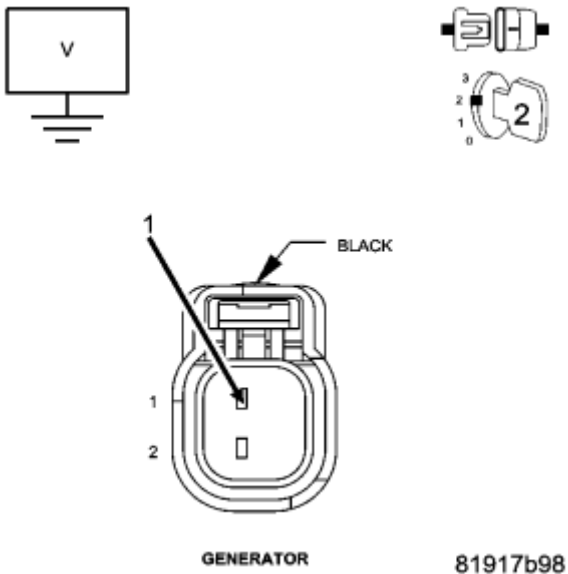


Fig. 87: Checking Generator Field Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K125) Gen Field Control circuit at the Generator Field harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K125) Gen Field Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

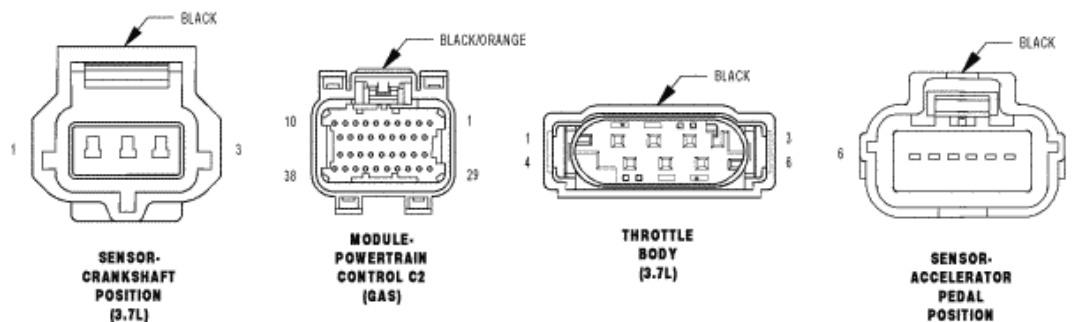
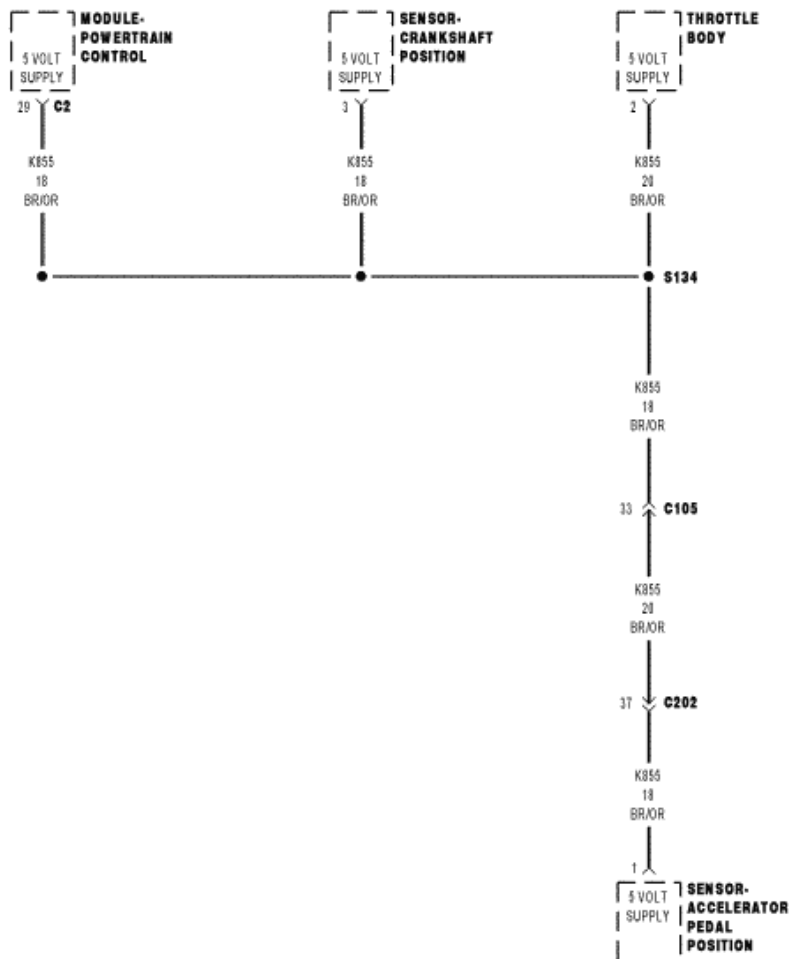
Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P0642-SENSOR REFERENCE VOLTAGE 1 CIRCUIT LOW

CIRCUIT SCHEMATIC



81000028

Fig. 1: Primary 5-Volt Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- Set Condition:

When the PCM recognizes the Primary 5-volt Supply circuit voltage is too low. One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K855) PRIMARY 5-VOLT SUPPLY SHORTED TO GROUND
SENSOR SHORTED TO GROUND
5-VOLT SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set. Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K855) PRIMARY 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**

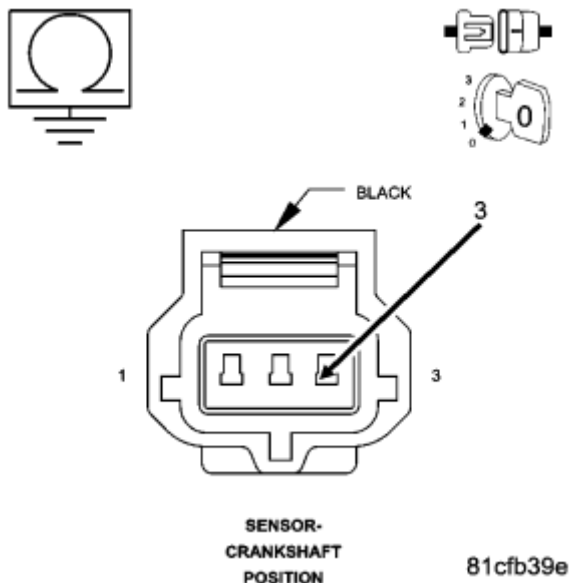


Fig. 2: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect all the Sensors that share the (K855) Primary 5-volt Supply circuit.

Measure the resistance between ground and the (K855) Primary 5-volt Supply circuit in the CKP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) Primary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **5-VOLT SENSOR**

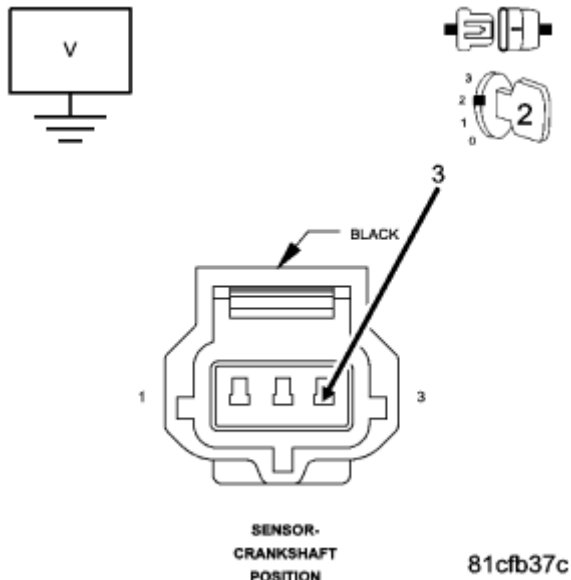


Fig. 3: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect all the previously disconnected Sensors except for the CKP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) Primary 5-volt Supply circuit in the CKP Sensor harness connector.

Is the voltage below 4.5 volts?

Yes

Go To 4.

No

Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors. If OK, replace the CKP Sensor.

Perform **POWERTRAIN VERIFICATION TEST**.

4. 5-VOLT SENSOR SHORTED TO GROUND

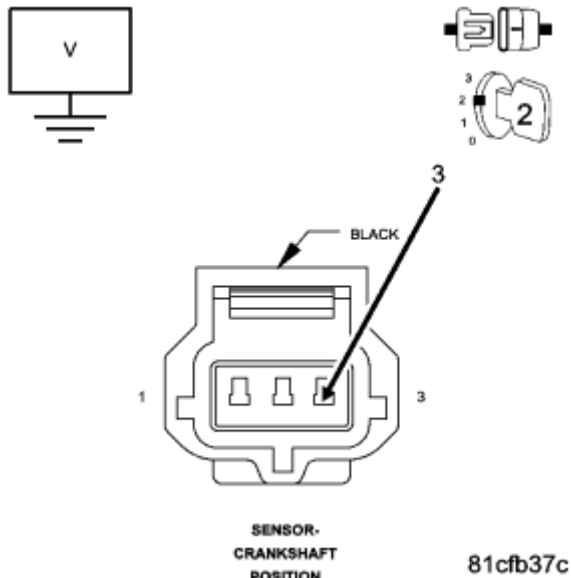


Fig. 4: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage on the (K855) Primary 5-volt Supply circuit at the CKP Sensor harness connector.

NOTE: You must Turn the Ignition OFF when disconnecting any of the Sensor harness connectors and Turn the Ignition On to check the voltage readings.

While monitoring the voltage, disconnect each Sensor harness connector that shares the (K855) Primary 5-volt Supply circuit, one at a time.

NOTE: Reconnect all the Sensors and clear all trouble codes before continuing.

Does the voltage increase above 4.5 volts when disconnecting any of the remaining Sensors?

Yes

Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors. If OK, replace the Sensor that causes the (K855) Primary 5-volt Supply circuit voltage to increase when disconnected.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

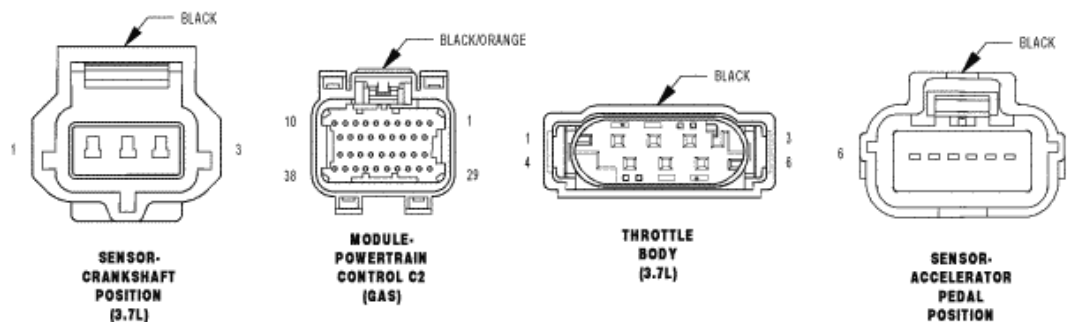
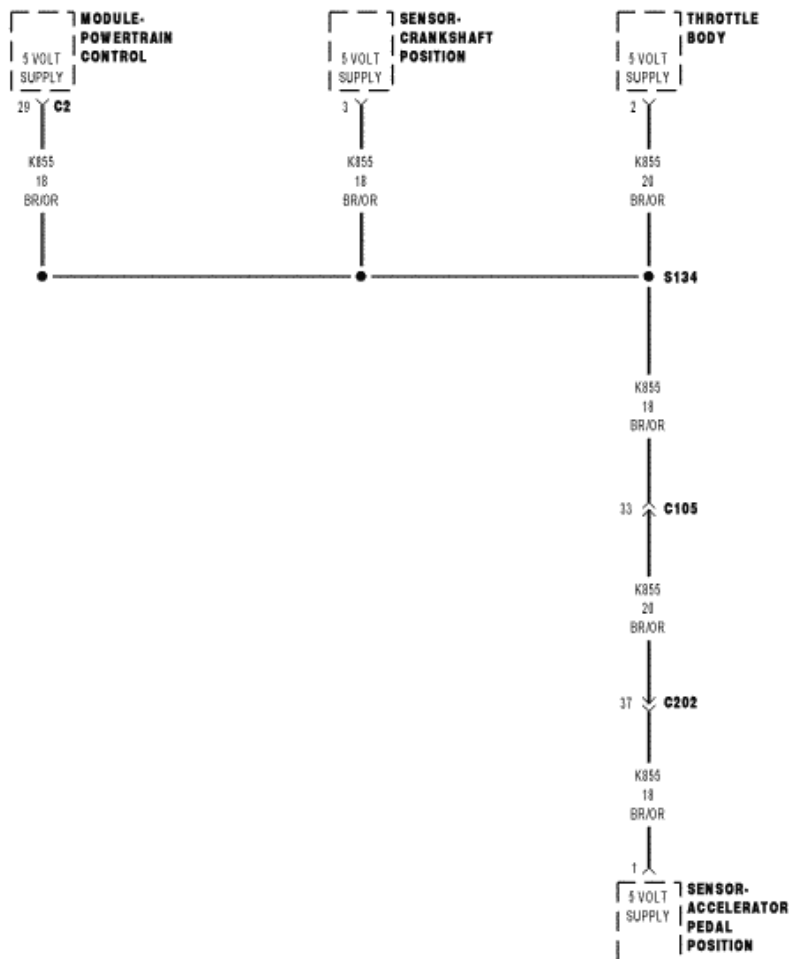
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0643-SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



8100ec28

Fig. 5: Primary 5-Volt Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• Set Condition:

When the PCM recognizes the Primary 5-volt Supply circuit voltage is too high. One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K855) PRIMARY 5-VOLT SUPPLY SHORTED TO VOLTAGE POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set. Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K855) PRIMARY 5-VOLT SUPPLY SHORTED TO VOLTAGE**

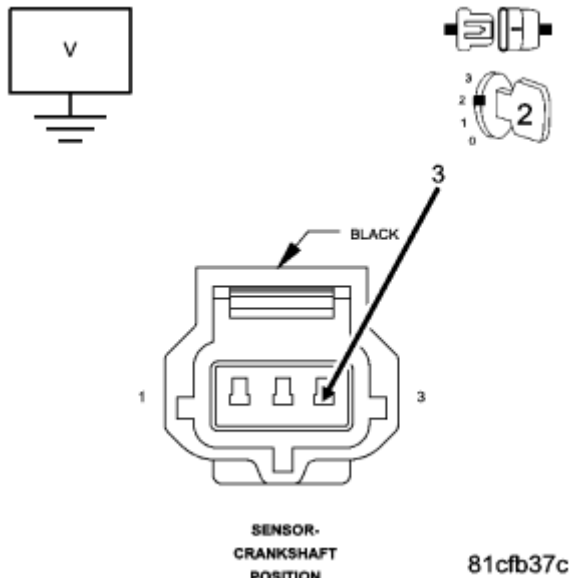


Fig. 6: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect all the Sensors that share the (K855) Primary 5-volt Supply circuit.

NOTE: Improperly installed aftermarket accessories can cause this DTC to set.
Check for wiring added by customer.

Ignition on, engine not running.

Measure the voltage on the (K855) Primary 5-volt Supply circuit at the CKP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K855) Primary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

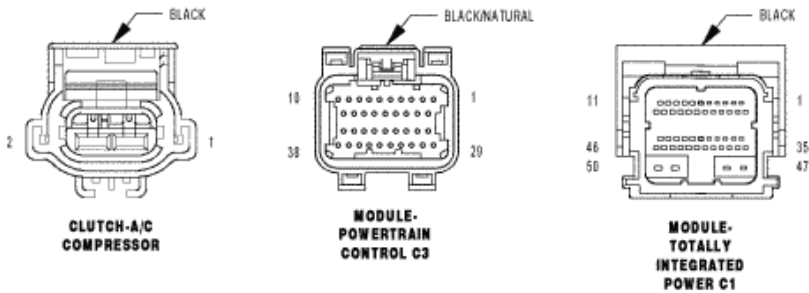
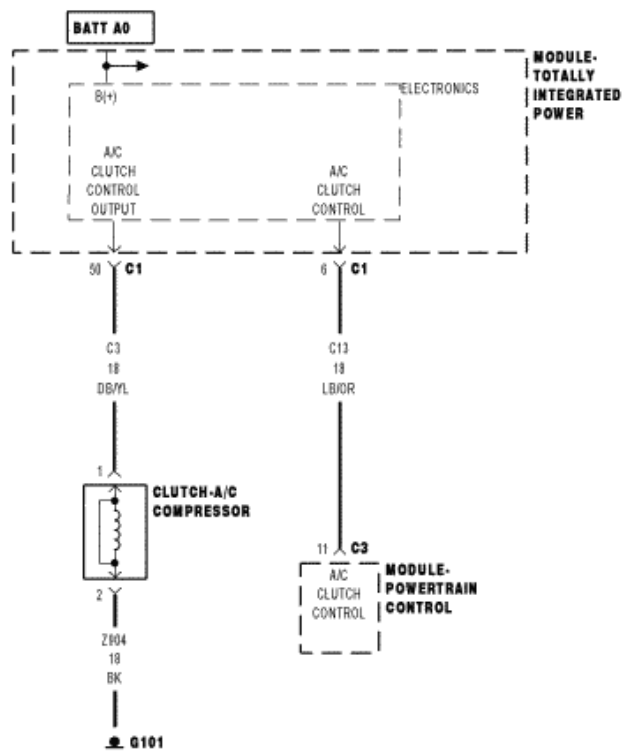
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0645-A/C CLUTCH CONTROL CIRCUIT

CIRCUIT SCHEMATIC



81d1570e

Fig. 7: A/C Clutch Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts. A/C Switch on.

SET CONDITIONS

• Set Condition:

An open or shorted condition is detected in the A/C clutch control circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(C13) A/C CLUTCH CONTROL CIRCUIT SHORTED TO VOLTAGE
(C13) A/C CLUTCH CONTROL CIRCUIT OPEN
(C13) A/C CLUTCH CONTROL CIRCUIT SHORTED TO GROUND
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, Clear DTCs in the Powertrain Control Module (PCM).

With the scan tool, actuate the A/C Compressor Clutch Relay Control State.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

2. (C13) A/C CLUTCH CONTROL CIRCUIT SHORTED TO VOLTAGE

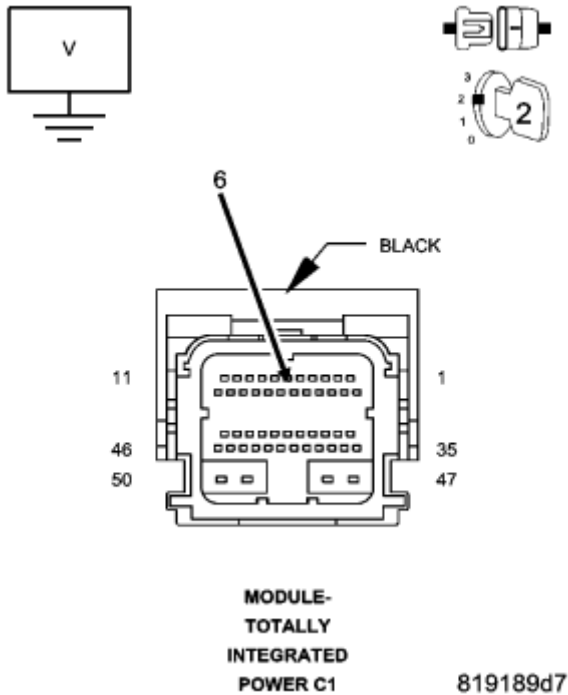


Fig. 8: Measuring Voltage On (C13) A/C Clutch Control Circuit At C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Stop the A/C Clutch actuation.

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Disconnect the C1 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (C13) A/C Clutch Control circuit at the C1 TIPM harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (C13) A/C Clutch Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (C13) A/C CLUTCH CONTROL CIRCUIT OPEN

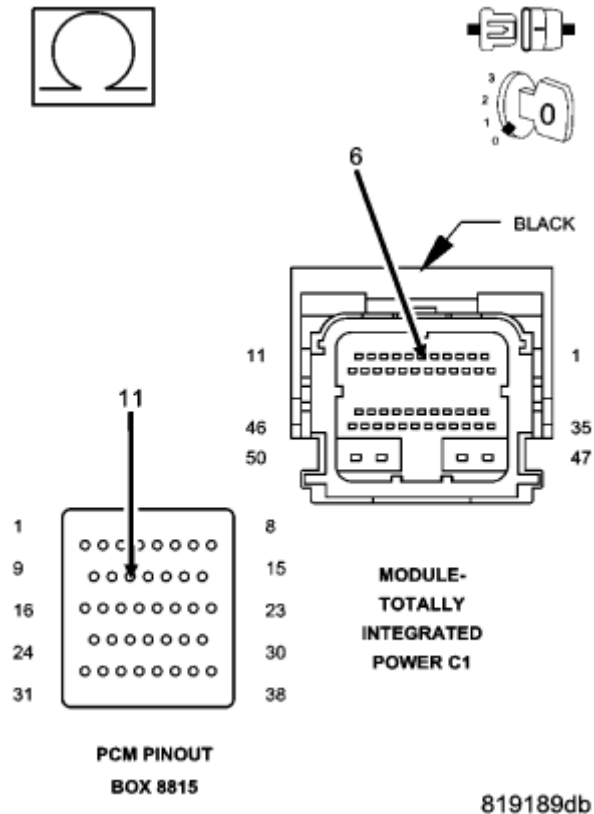


Fig. 9: Measuring Resistance Of (C13) A/C Clutch Control Circuit From C1 TIPM Harness Connector To Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (C13) A/C Clutch Control circuit from the C1 TIPM harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (C13) A/C Clutch Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (C13) A/C CLUTCH CONTROL CIRCUIT SHORTED TO GROUND

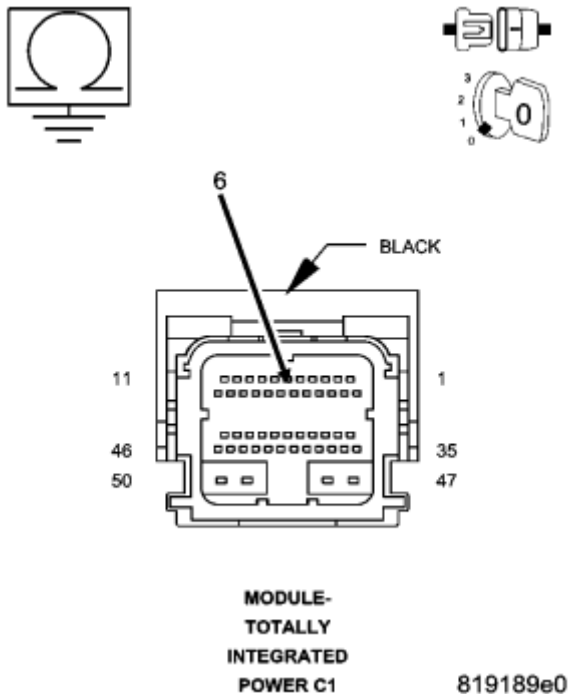


Fig. 10: Measuring Resistance Between Ground And (C13) A/C Clutch Control Circuit At C1 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C13) A/C Clutch Control circuit at the C1 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short to ground in the (C13) A/C Clutch Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. A/C CLUTCH CONTROL OPERATION FROM THE PCM

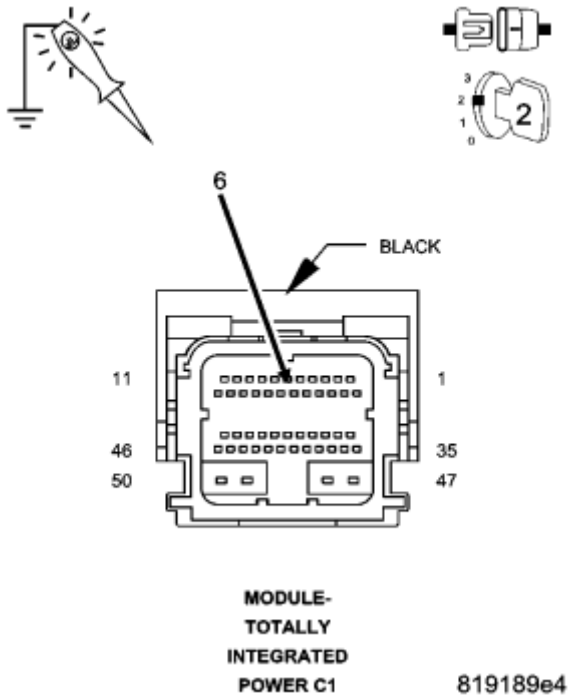


Fig. 11: Using Scan Tool Under PCM Actuators To Actuate A/C Clutch
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C3 PCM harness connector.

Ignition on, engine not running.

Using the scan tool in the PCM, actuate the A/C Clutch.

With a 12-volt test light connected to ground, probe the (C13) A/C Clutch Control circuit in the C1 TIPM harness connector.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

NOTE: Before continuing, check the TIPM harness connector terminals for

corrosion, damage, or terminal push out. Repair as necessary.

If OK, replace the TIPM in accordance with the Service Information.

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the A/C Clutch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the A/C Clutch and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

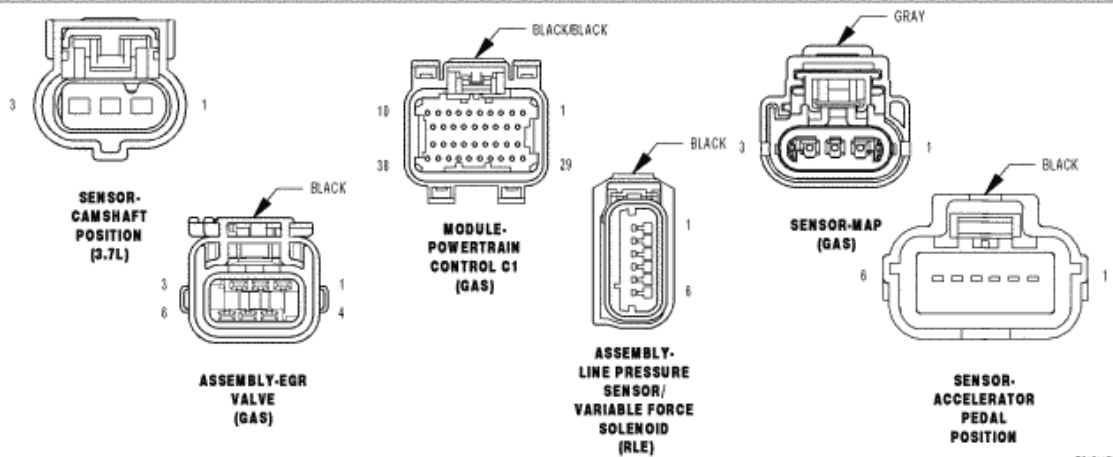
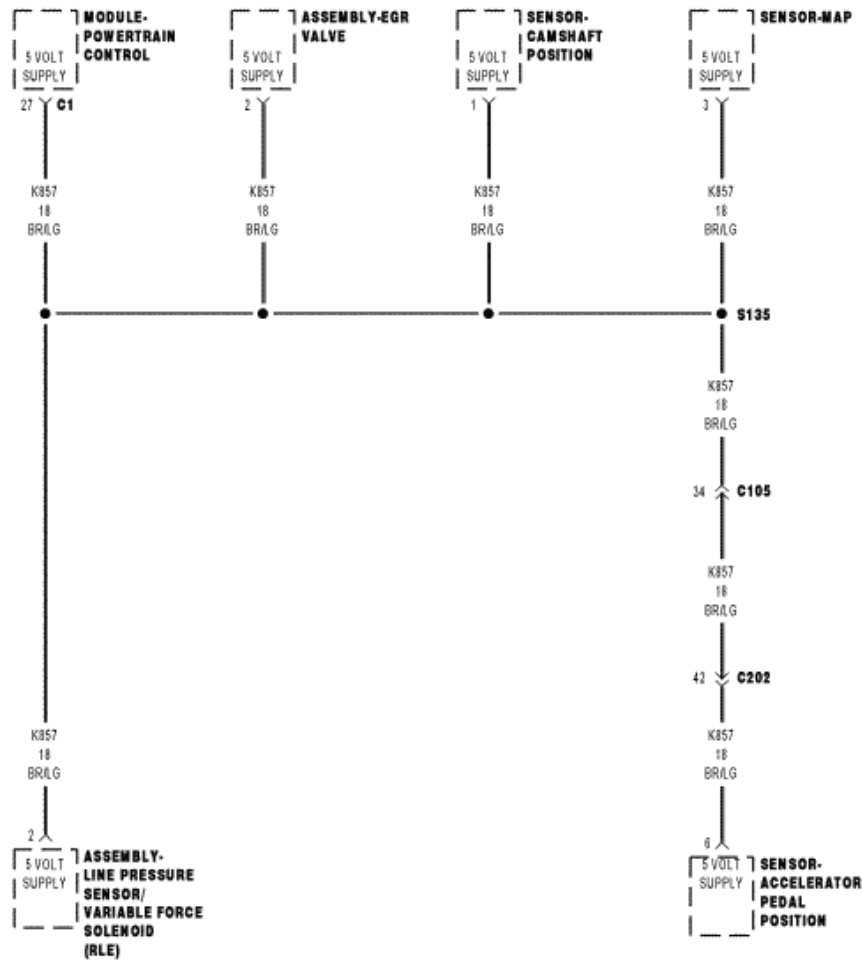
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0652-SENSOR REFERENCE VOLTAGE 2 CIRCUIT LOW

CIRCUIT SCHEMATIC



81cxc99

Fig. 12: Auxiliary 5-Volt Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- Set Condition:

When the PCM recognizes the Auxiliary 5-volt Supply circuit voltage is too low. One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K857) AUXILIARY 5-VOLT SUPPLY SHORTED TO GROUND
SENSOR SHORTED TO GROUND
CAM POSITION SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set. Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K857) AUXILIARY 5-VOLT SUPPLY SHORTED TO GROUND**

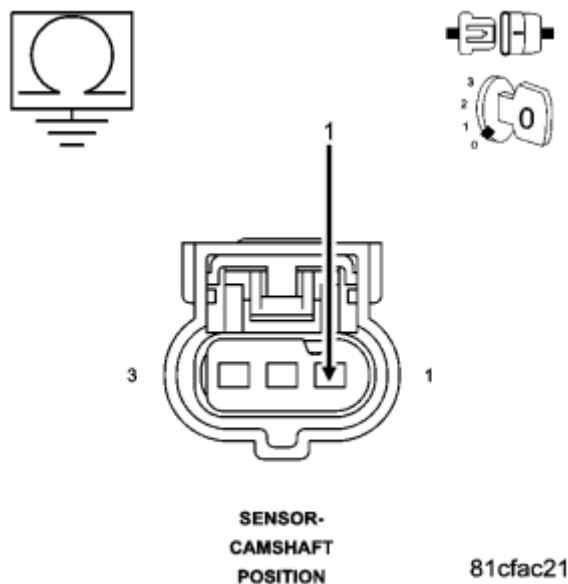


Fig. 13: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect all the Sensors that share the (K857) Auxiliary 5-volt Supply circuit.

Measure the resistance between ground and the (K857) Auxiliary 5-volt Supply circuit in the CMP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) Auxiliary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **CMP SENSOR**

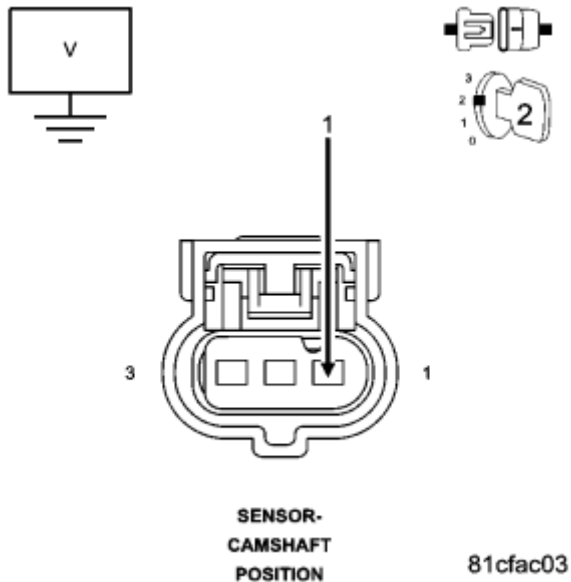


Fig. 14: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect all the previously disconnected Sensors except for the CMP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit in the CMP Sensor harness connector.

Is the voltage below 4.5 volts?

Yes

Go To 4.

No

Verify that there is good pin to terminal contact in the CMP Sensor and Powertrain Control Module connectors. If OK, replace the Camshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

4. 5-VOLT SENSOR SHORTED TO GROUND

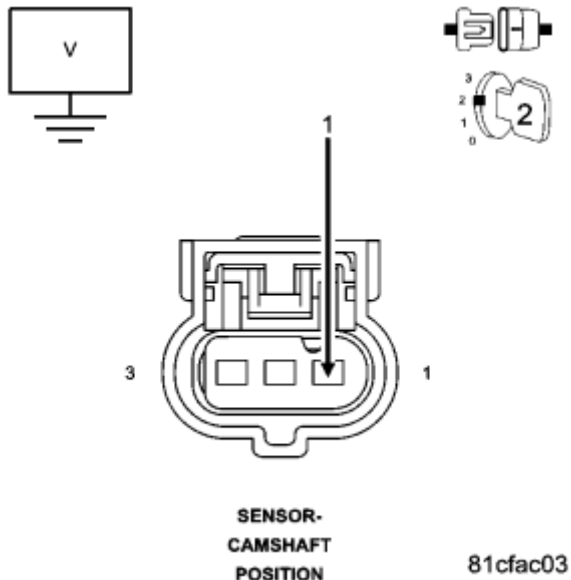


Fig. 15: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit at the CMP Sensor harness connector.

NOTE: You must Turn the Ignition OFF when disconnecting any of the Sensor harness connectors and Turn the Ignition On to check the voltage readings.

While monitoring the voltage, disconnect each Sensor harness connector that shares the (K857) Auxiliary 5-volt Supply circuit, one at a time.

Does the voltage increase above 4.5 volts when disconnecting any of the Sensor harness connectors?

Yes

Replace the Sensor that causes the (K857) Auxiliary 5-volt Supply circuit voltage to increase when disconnected.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

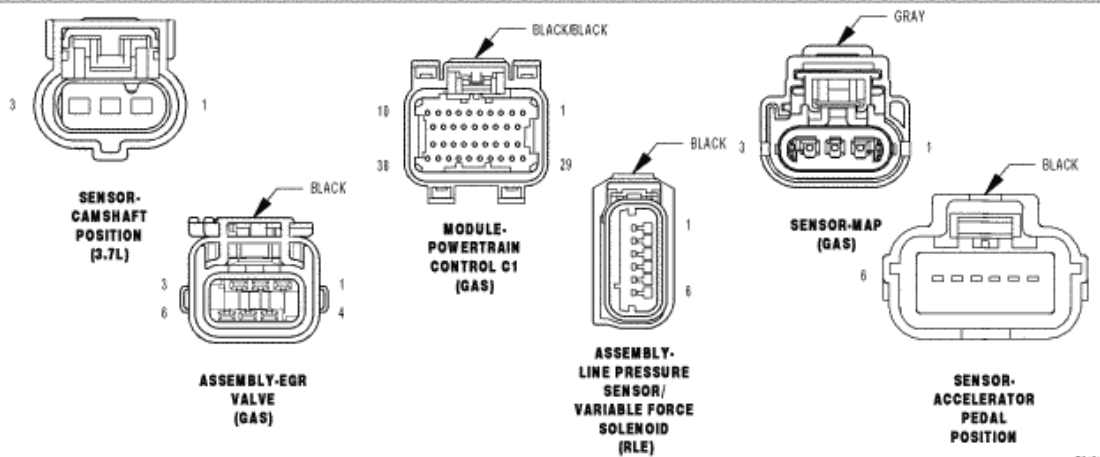
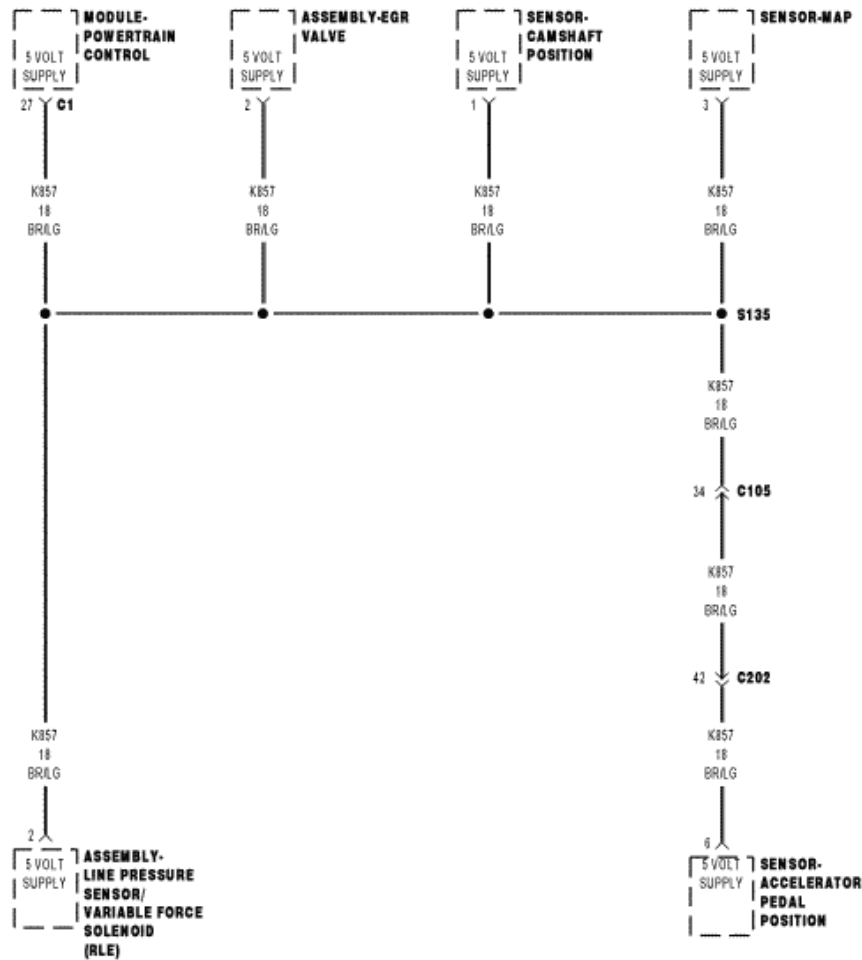
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0653-SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



81c1cc99

Fig. 16: Auxiliary 5-Volt Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- Set Condition:

When the PCM recognizes the Auxiliary 5-volt Supply circuit voltage is too high. One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K857) AUXILIARY 5-VOLT SUPPLY SHORTED TO VOLTAGE POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set. Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K857) AUXILIARY 5-VOLT SUPPLY SHORTED TO VOLTAGE**

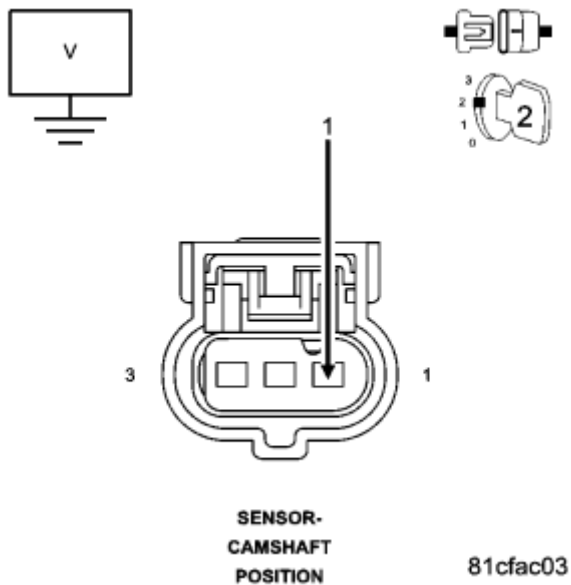


Fig. 17: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect all the Sensors that share the (K857) Auxiliary 5-volt Supply circuit.

NOTE: Improperly installed aftermarket accessories can cause this DTC to set.
Check for wiring added by customer.

Ignition on, engine not running.

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit at the CMP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K857) Auxiliary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0685-AUTO SHUTDOWN CONTROL CIRCUIT

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With ignition on. Battery voltage above 10 volts.

SET CONDITIONS

- Set Condition:**

The actual ASD state is not equal to the desired ASD state. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K51) ASD CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K51) ASD CONTROL CIRCUIT OPEN
(K51) ASD CONTROL CIRCUIT SHORTED TO GROUND
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K51) ASD CONTROL CIRCUIT SHORTED TO VOLTAGE**

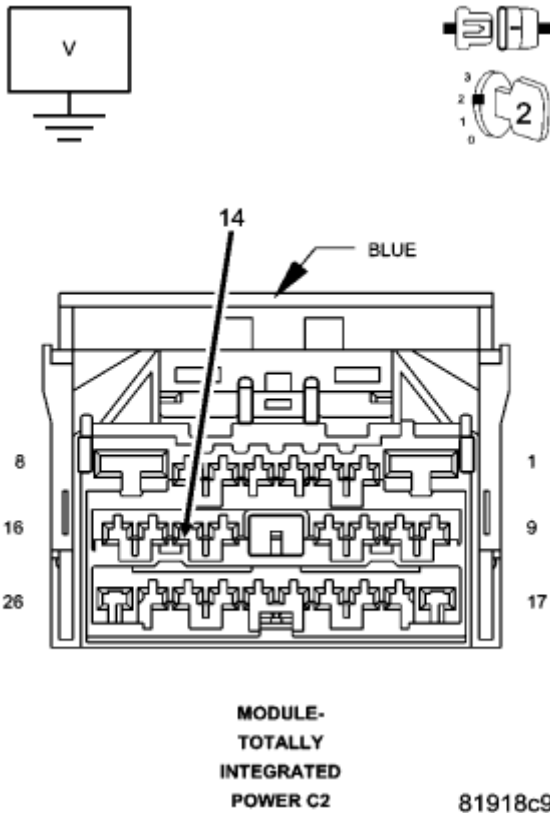


Fig. 19: Measuring Voltage On (K51) ASD Control Circuit At C2 TIPM Harness Connector
 Courtesy of CHRYSLER LLC

Stop the ASD actuation.

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Disconnect the C2 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K51) ASD Control circuit at the C2 TIPM harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K51) ASD Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K51) ASD CONTROL CIRCUIT OPEN

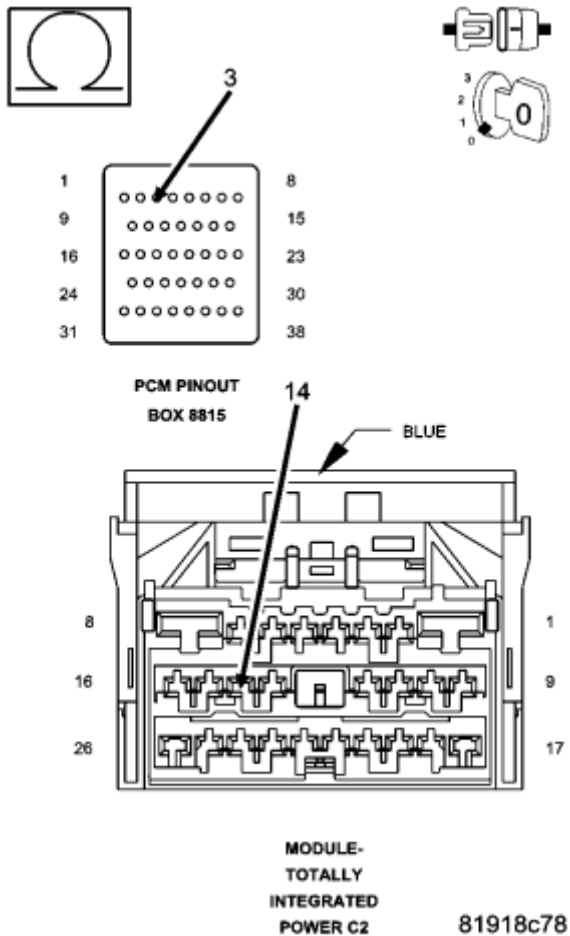


Fig. 20: Measuring Resistance Of (K51) ASD Control Circuit From TIPM Harness Connector To Appropriate Terminals Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K51) ASD Control circuit from the TIPM harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (K51) ASD Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K51) ASD CONTROL CIRCUIT SHORTED TO GROUND

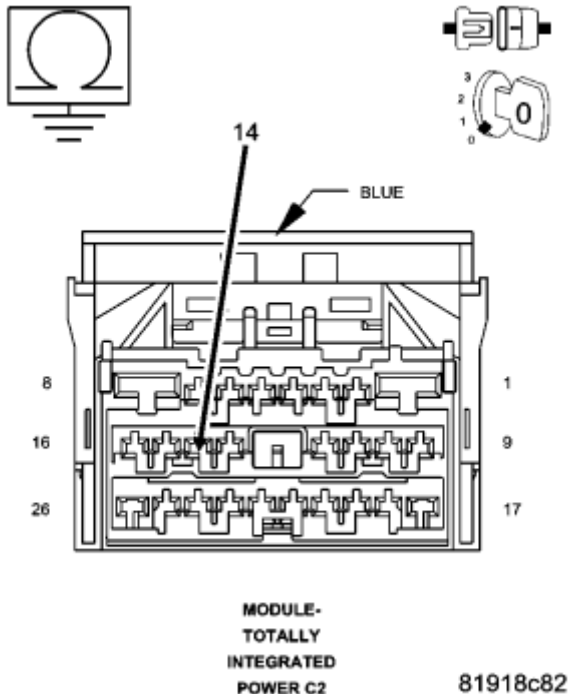


Fig. 21: Measuring Resistance Between Ground And (K51) ASD Control Circuit At C2 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K51) ASD Control circuit at the C2 TIPM harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K51) ASD Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. ASD CONTROL OPERATION FROM THE PCM

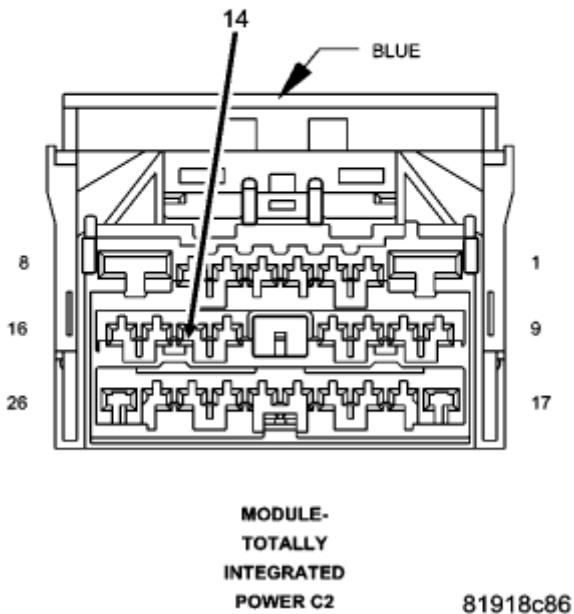


Fig. 22: Probing (K51) ASD Control Circuit At C2 TIPM Terminal Connection
Courtesy of CHRYSLER LLC

Connect the C3 PCM harness connector.

Ignition on, engine not running.

Using the scan tool in the PCM, actuate the ASD.

With a 12-volt test light connected to ground, probe the (K51) ASD Control circuit in the C2 TIPM harness connector.

Does the test light illuminate brightly and flash on and off?

Yes

NOTE: Before continuing, check the TIPM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

If OK, replace the TIPM in accordance with the Service Information.

No

Go To 6.

6. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related TIPM and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the TIPM and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0688-AUTO SHUTDOWN SENSE CIRCUIT LOW

CIRCUIT SCHEMATIC

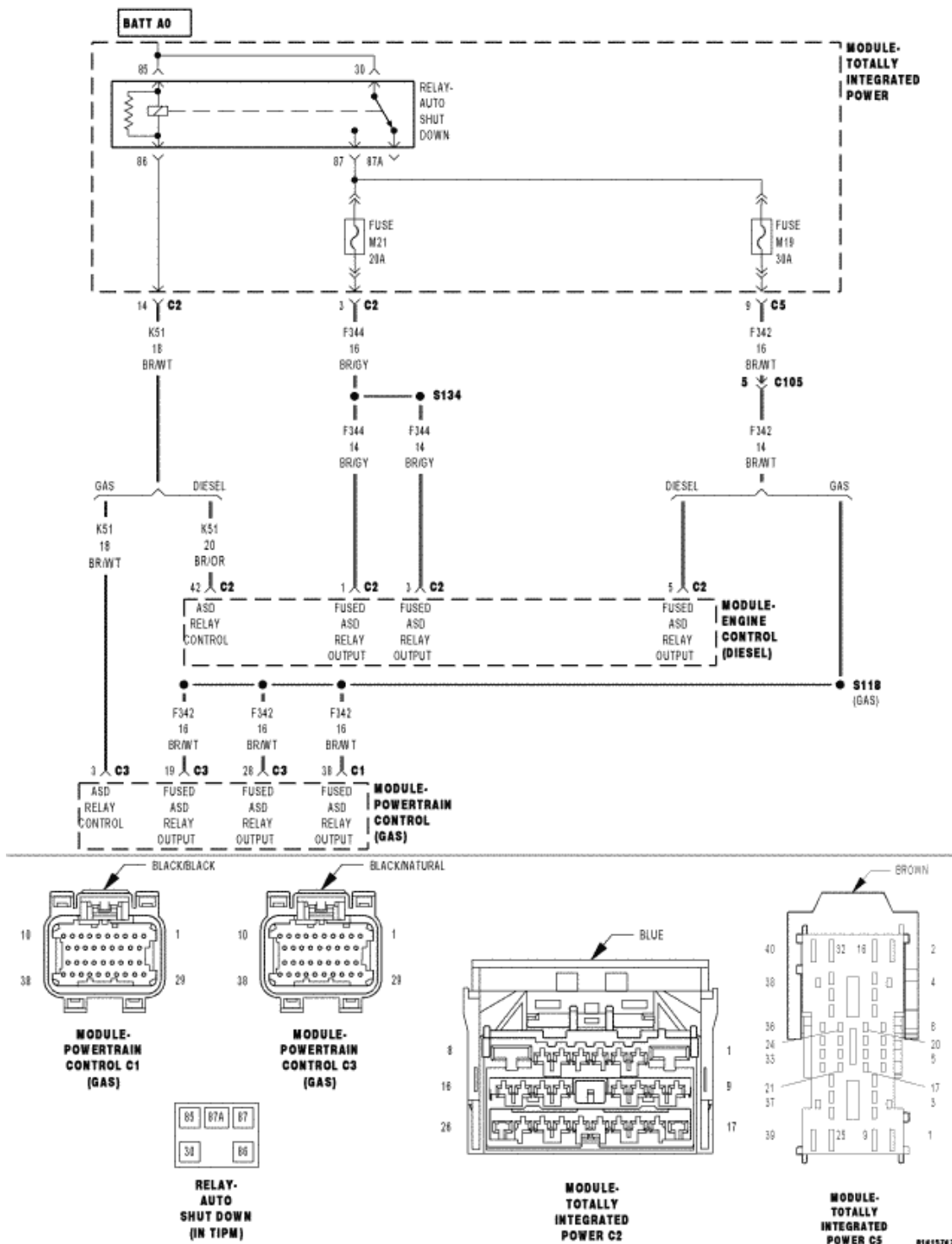


Fig. 23: Auto Shutdown Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With ignition key on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

No voltage sensed at the PCM when the ASD is energized or voltage is sensed when the ASD is not energized. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F342) ASD CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE
(F342) ASD CONTROL OUTPUT CIRCUIT OPEN
(F342) ASD CONTROL OUTPUT CIRCUIT SHORTED TO GROUND
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. VERIFY ASD DTC

NOTE: If any O2 SENSOR HEATER CIRCUIT HIGH DTCs set along with P0688-AUTO SHUTDOWN RELAY SENSE CIRCUIT LOW, all of the O2 Sensor Heater Control circuits need to be checked for a short to battery voltage.

NOTE: If any of the following component DTC(s) have set along with P0688, diagnose them first before continuing.
Ignition Coil(s)
Fuel Injector(s)
ASD Control
ASD Control Output (TIPM DTC)

Turn the ignition on.

With a scan tool, select View DTCs.

Is the DTC currently Active?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. EXCESSIVE RESISTANCE IN THE (F342) ASD CONTROL OUTPUT CIRCUIT

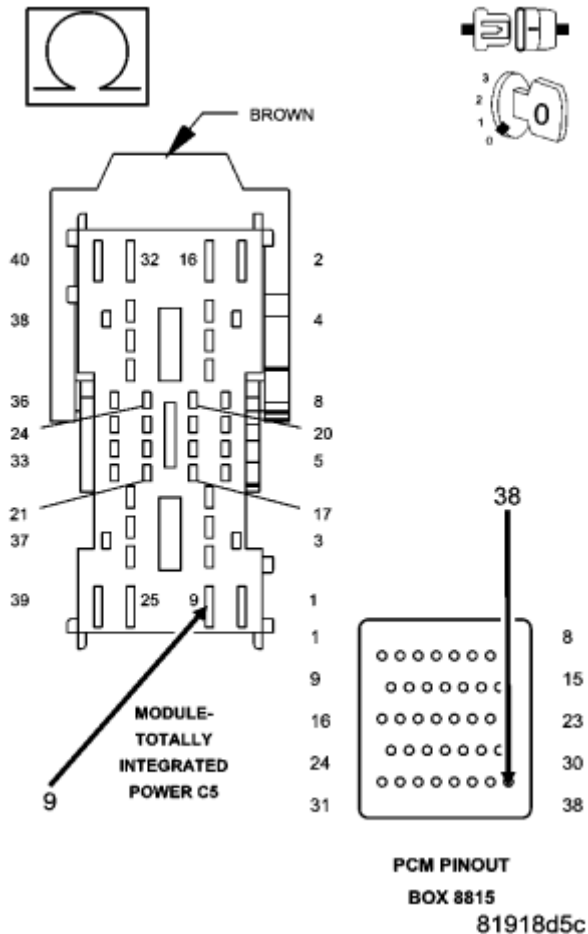


Fig. 24: Measuring Resistance Of (F342) ASD Control Output Circuit From C5 TIPM Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect the C5 TIPM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (F342) ASD Control Output circuit from the C5 TIPM harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the excessive resistance in the (F342) ASD Control Output circuit. Inspect the related in-line connectors and splices.

Perform **POWERTRAIN VERIFICATION TEST**.

3. EXCESSIVE RESISTANCE IN THE (F342) ASD CONTROL OUTPUT CIRCUIT

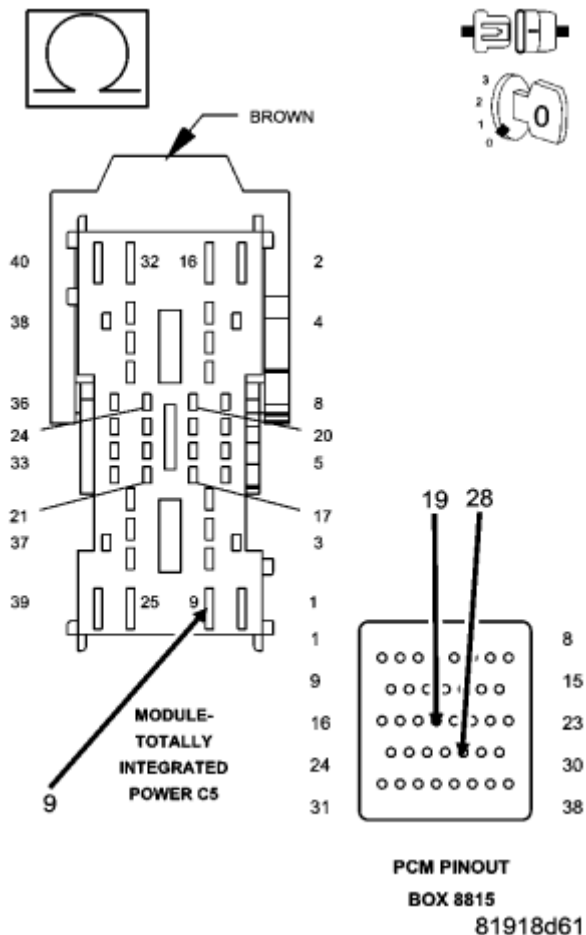


Fig. 25: Measuring Resistance Of (F342) ASD Control Output Circuit From C5 TIPM Harness Connector To Appropriate Terminals Of Special Tool #8815

Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the resistance of the (F342) ASD Control Output circuit from the C5 TIPM harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms at each terminal?

Yes

Go To 6.

No

Repair the open in the (F342) ASD Control Output circuits.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (F342) ASD CONTROL OUTPUT CIRCUIT SHORTED TO GROUND

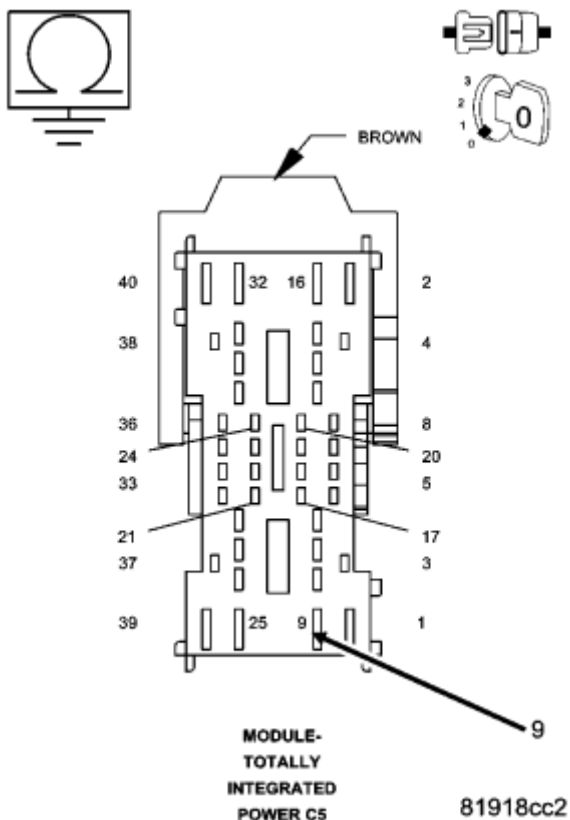


Fig. 26: Measuring Resistance Between Ground And (F342) ASD Control Output Circuit At C5 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (F342) ASD Control Output circuit at the C5 TIPM harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (F342) ASD Control Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (F342) ASD CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE

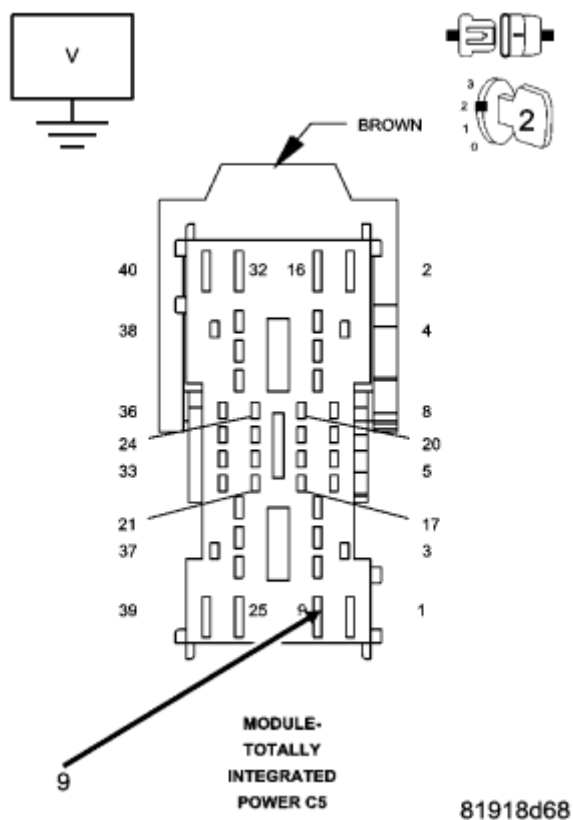


Fig. 27: Using Voltmeter To Measure Voltage On (F342) ASD Control Output Circuit In C5 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using a voltmeter measure the voltage on the (F342) ASD Control Output circuit in the C5 TIPM harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (F342) ASD Control Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

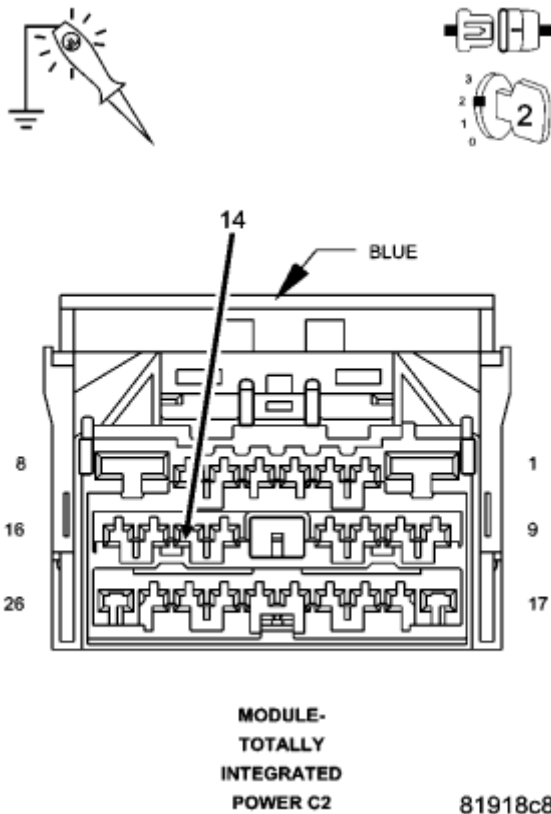


Fig. 28: Probing (K51) ASD Control Circuit At C2 TIPM Terminal Connection
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C1 and C3 PCM harness connectors and the C5 TIPM harness connector.

Ignition on, engine not running.

Using the scan tool in the PCM, actuate the ASD.

With a 12-volt test light connected to ground, probe the (K51) ASD Control circuit at the C2 TIPM terminal connection.

Does the test light illuminate brightly and flash on an off during the actuation?

Yes

NOTE: Before continuing, check the TIPM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

If OK, replace the TIPM in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 7.

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related TIPM and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the TIPM and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

P0691-COOLING FAN 1 CONTROL CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. The TIPM detects an open in the Relay Coil Control circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
LOW SPEED COOLING FAN RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. LOW SPEED COOLING FAN RELAY

NOTE: Inspect the related Fuse.

Turn the ignition off.

Verify the Low Speed Cooling Fan Relay is installed properly and that the terminals are making a tight fit.

Remove the Low Speed Cooling Fan Relay and substitute it with a known good Relay.

Start the engine.

With a scan tool, actuate the Low Speed Cooling Fan Relay.

Is the Cooling Fan operating?

Yes

Replace the Low Speed Cooling Fan Relay.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Cooling Fan Module, TIPM, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Cooling Fan Module, TIPM, and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

CIRCUIT SCHEMATIC

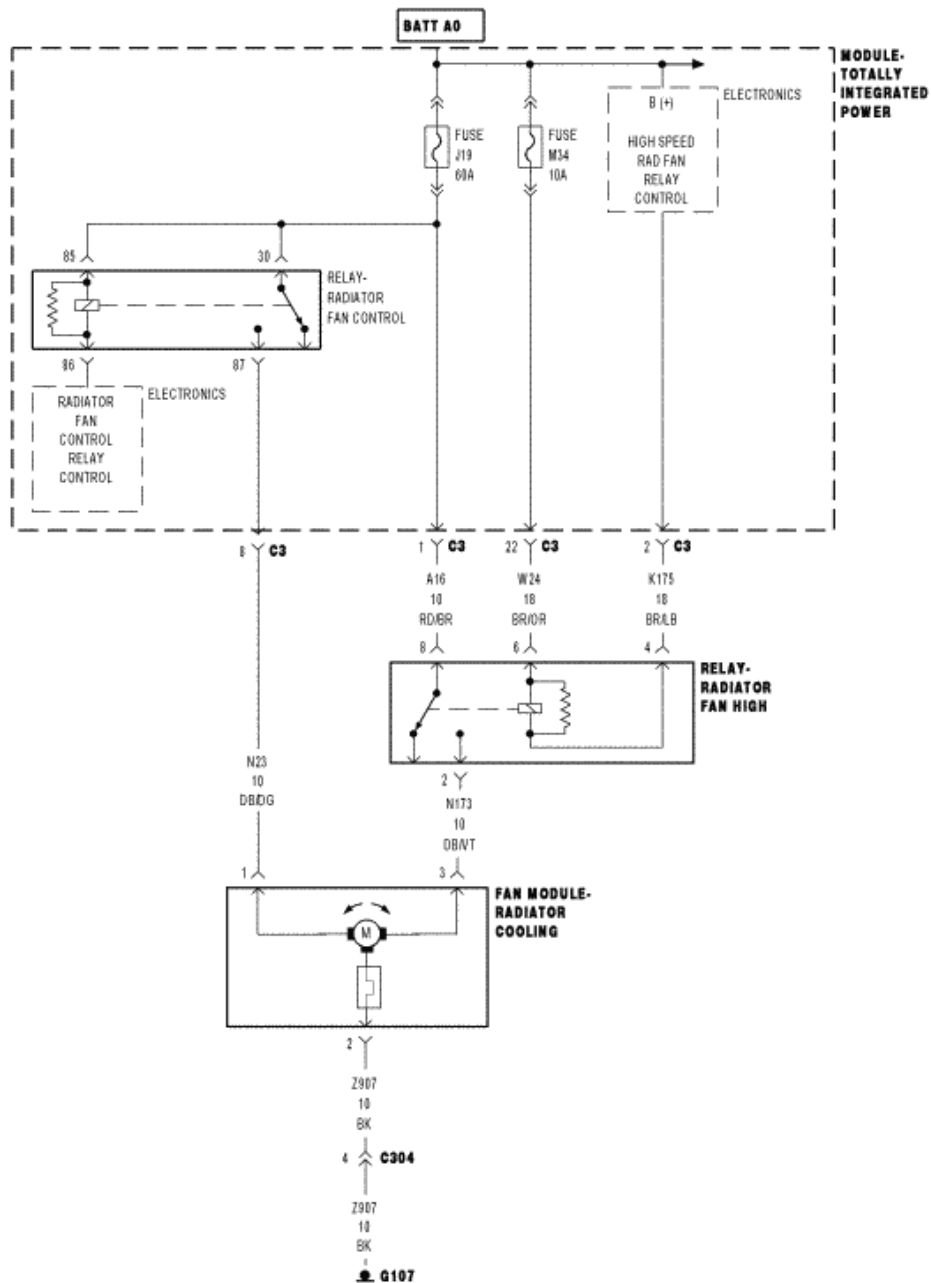


Fig. 30: Cooling Fan Control Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. The TIPM detects a shorted condition in the Relay Coil Control circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
LOW SPEED COOLING FAN RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. LOW SPEED COOLING FAN RELAY

NOTE: **Inspect the related Fuse.**

Turn the ignition off.

Verify the Low Speed Cooling Fan Relay is installed properly and that the terminals are making a tight fit.

Remove the Low Speed Cooling Fan Relay and substitute it with a known good Relay.

Start the engine.

With a scan tool, actuate the Low Speed Cooling Fan Relay.

Is the Cooling Fan operating?

Yes

Replace the Low Speed Cooling Fan Relay.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Cooling Fan Module, TIPM, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Cooling Fan Module, TIPM, and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0693-COOLING FAN 2 CONTROL CIRCUIT LOW

CIRCUIT SCHEMATIC

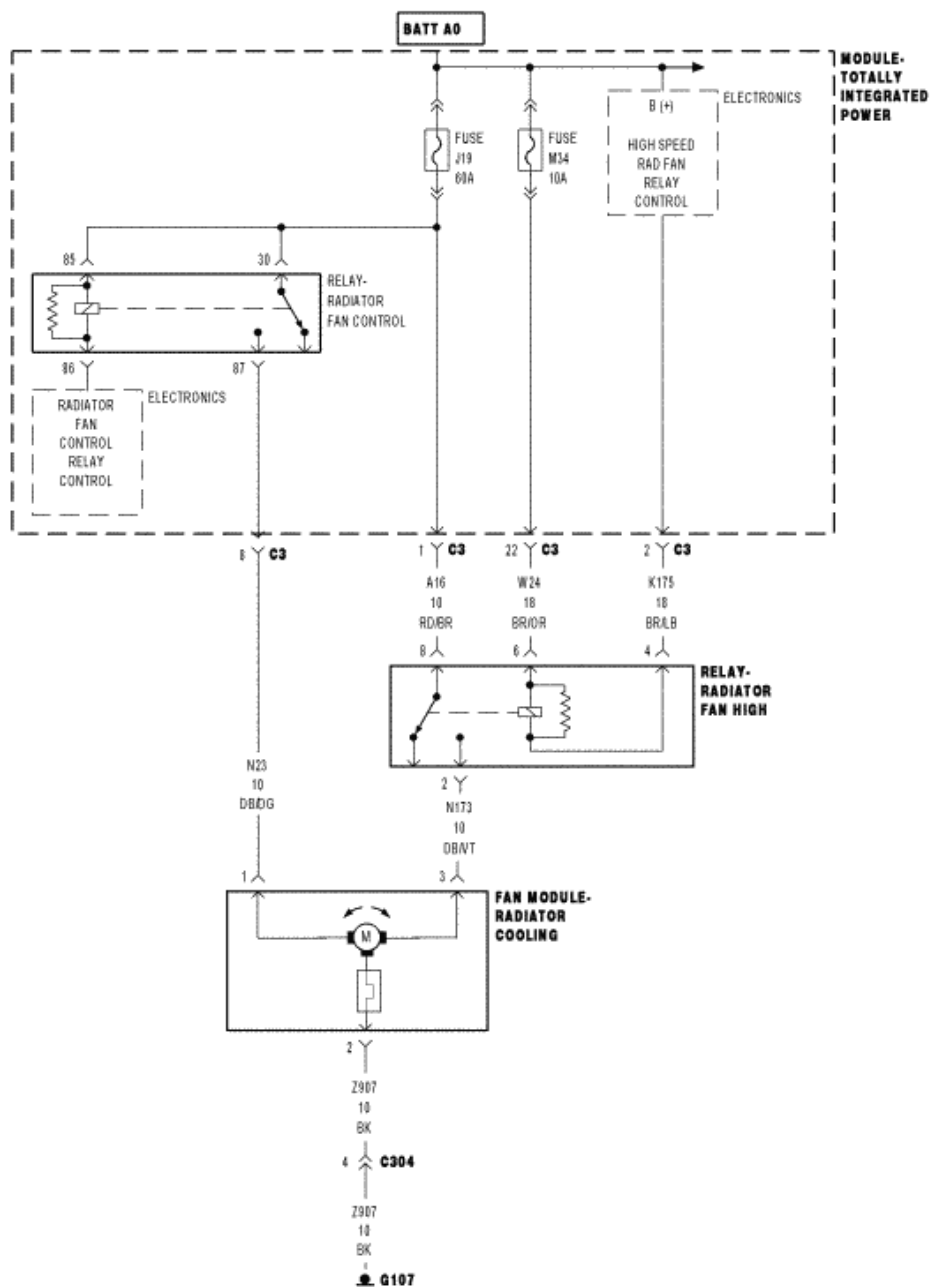


Fig. 31: Cooling Fan Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. The TIPM detects an open or short to ground in the Relay Coil Control circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT SHORTED TO GROUND
(K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT OPEN
HIGH SPEED COOLING FAN RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. HIGH SPEED COOLING FAN RELAY

NOTE: **Inspect the related Fuse.**

Turn the ignition off.

Verify the High Speed Cooling Fan Relay is installed properly and that the terminals are making a tight fit.

Remove the High Speed Cooling Fan Relay and substitute it with a known good Relay.

Start the engine.

With a scan tool, actuate the High Speed Cooling Fan Relay.

Is the Cooling Fan operating?

Yes

Replace the High Speed Cooling Fan Relay.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT SHORT TO GROUND

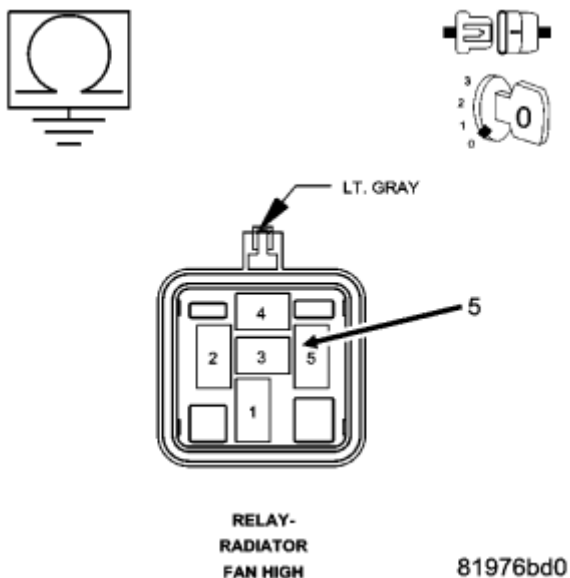


Fig. 32: Measuring Resistance Between Ground And High Speed Cooling Fan Relay Control

Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 TIPM harness connector.

Remove the High Speed Cooling Fan Relay.

Measure the resistance between ground and the (K175) High Speed Cooling Fan Relay Control circuit at the relay connection.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K175) High Speed Cooling Fan Relay Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT OPEN

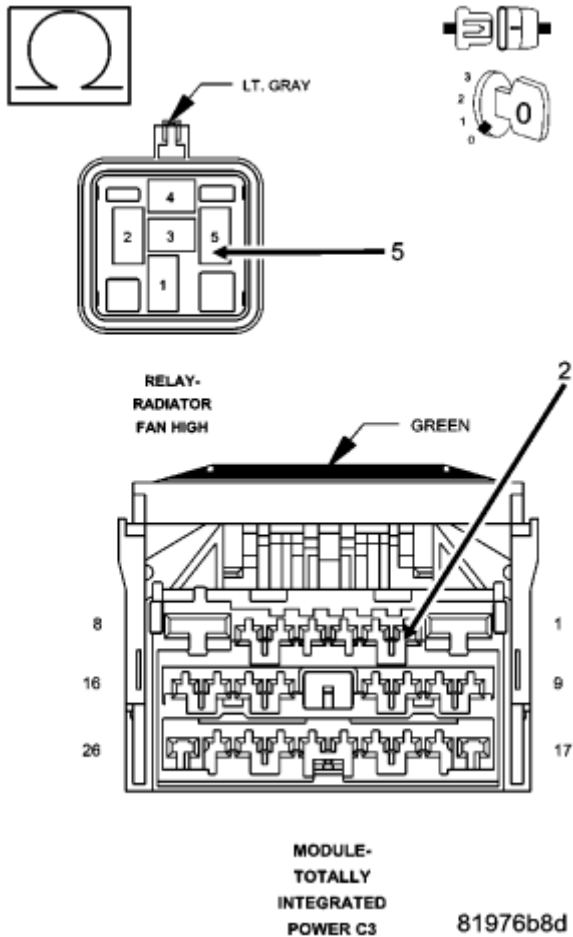


Fig. 33: Measuring Resistance Of High Speed Cooling Fan Relay Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K175) High Speed Cooling Fan Relay Control circuit from the C3 TIPM harness connector to the Relay connection.

Is the resistance above 5.0 ohms?

Yes

Repair the open or excessive resistance in the (K175) High Speed Cooling Fan Relay Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Cooling

Fan Module, TIPM, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Cooling Fan Module, TIPM, and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0694-COOLING FAN 2 CONTROL CIRCUIT HIGH

CIRCUIT SCHEMATIC

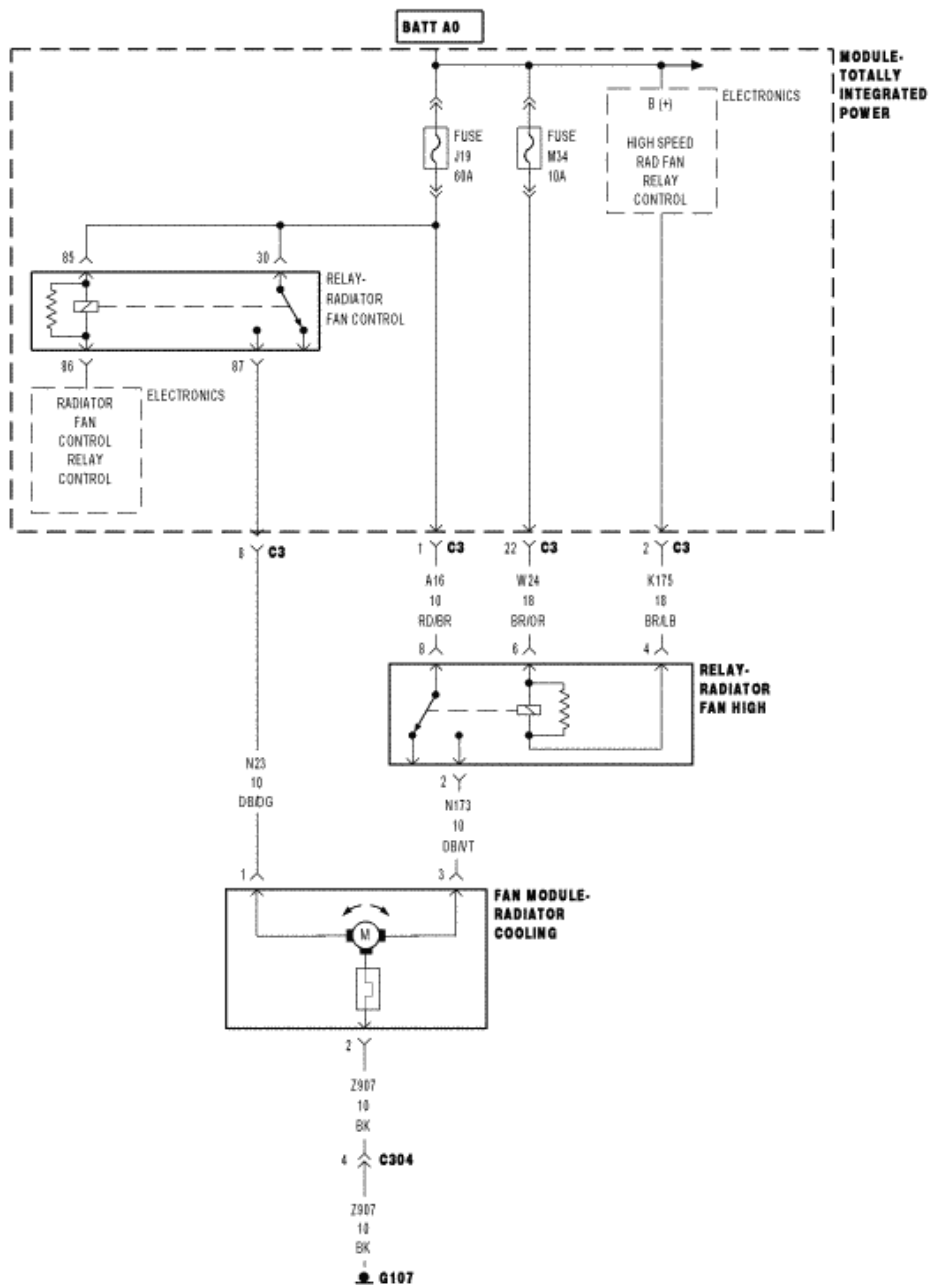


Fig. 34: Cooling Fan Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

The PCM is requesting the TIPM to turn on the Cooling Fan On and it is not operating. The TIPM detects a short to voltage in the Relay Coil Control circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE HIGH SPEED COOLING FAN RELAY TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. HIGH SPEED COOLING FAN RELAY

NOTE: Inspect the related Fuse.

Turn the ignition off.

Verify the High Speed Cooling Fan Relay is installed properly and that the terminals are making a tight fit.

Remove the High Speed Cooling Fan Relay and substitute it with a known good Relay.

Start the engine.

With a scan tool, actuate the High Speed Cooling Fan Relay.

Is the Cooling Fan operating?

Yes

Replace the High Speed Cooling Fan Relay.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K175) HIGH SPEED COOLING FAN RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE

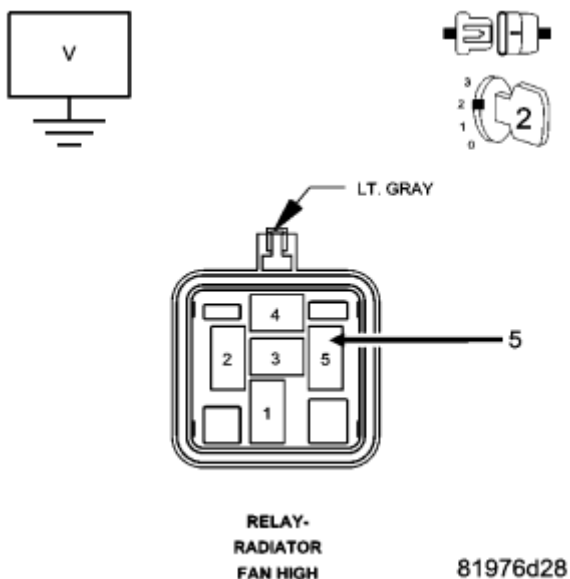


Fig. 35: Measuring Voltage On High Speed Cooling Fan Relay Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 TIPM harness connector.

Remove the High Speed Cooling Fan Relay.

Ignition on, engine not running.

Measure the voltage on the (K175) High Speed Cooling Fan Relay Control circuit at the relay connection.

Is there any voltage present?

Yes

Repair the short to voltage in the (K175) High Speed Cooling Fan Relay Control circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Cooling Fan Module, TIPM, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Cooling Fan Module, TIPM, and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

P0700-TRANSMISSION CONTROL SYSTEM (MIL REQUEST)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:**

An active DTC is stored in the TCM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
DTC PRESENT IN THE TRANSMISSION CONTROL MODULE

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **DTC PRESENT IN EATX CONTROLLER**

This is an informational DTC letting you know that a DTC(s) is stored in the Transmission Control Module.

Erase this DTC from the PCM after all Transmission DTC(s) have been repaired.

Using a scan tool, read the Transmission Controller DTC and refer to **42RLE - ELECTRICAL DIAGNOSTICS** and perform the appropriate symptom.

PCM Diagnostic Information complete.

Continue

Test Complete.

P0703-BRAKE SWITCH 2 PERFORMANCE

CIRCUIT SCHEMATIC

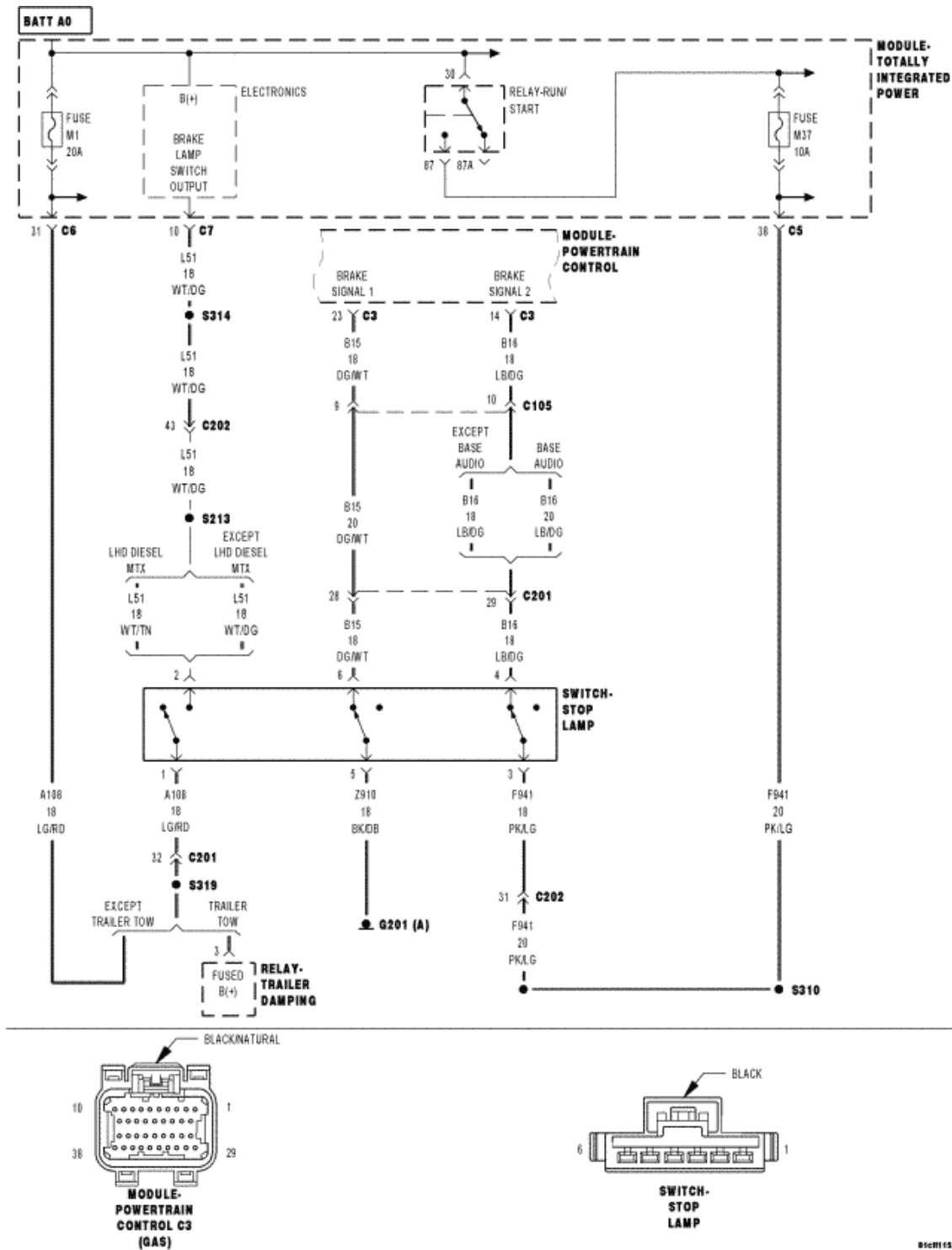


Fig. 36: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• Set Condition:

When the PCM recognizes Brake Switch No.2 voltage is not equal to the applied value at the PCM when Brake Switch No.1 is applied. This could be a normal condition. If this condition is seen repeatedly by the PCM the fault is set. Cruise will not work for the rest of the key cycle.

POSSIBLE CAUSES

Possible Causes
(F941) FUSED IGNITION SWITCH OUTPUT CIRCUIT
(B16) BRAKE SIGNAL 2 CIRCUIT OPEN
(B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND
(B15) BRAKE SIGNAL 1 CIRCUIT OPEN
STOP LAMP SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Make sure the Stop Lamp Switch is adjusted properly before continuing.

NOTE: Make sure the Stop Lamp Switch is properly wired, such as (B15) Brake Signal 1 and (B16) Brake Signal 2 circuit are not switched at the harness connector.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F941) FUSED IGNITION SWITCH CIRCUIT

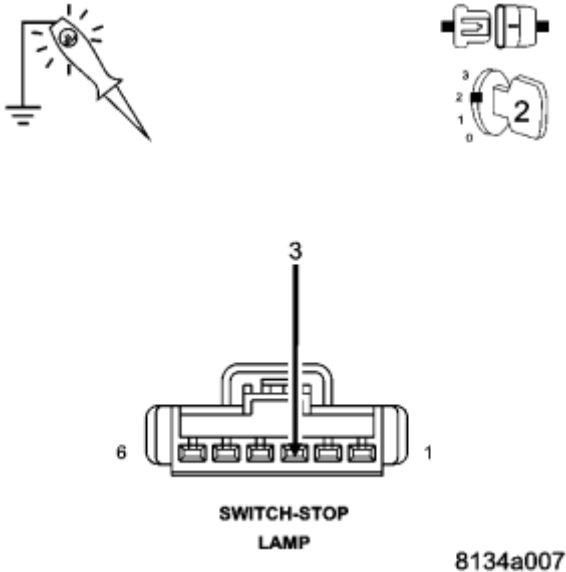


Fig. 37: Checking Fused Ignition Switch Output Circuit
Courtesy of CHRYSLER LLC

NOTE: **Inspect the related Fuse.**

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connector.

Using a 12-volt test light connected to ground, probe the (F941) Fused Ignition Switch Output circuit in the Stop Lamp Switch harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

No

Repair the open or short to ground in the (F941) Fused Ignition Switch Output circuit. Inspect the related fuse and repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

3. STOP LAMP SWITCH

Turn the ignition off.

Measure the resistance between the (F941) Fused Ignition Switch Output circuit terminal and the (B16) Brake Signal 2 circuit terminal in the Stop Lamp Switch.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to open circuit for each circuit check?

Yes

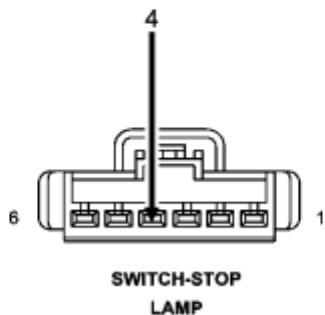
Go To 4.

No

Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors. If OK, replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE



81462fae

Fig. 38: Checking Brake Switch No.2 Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the voltage on the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Ignition on, engine not running.

Is there any voltage present?

Yes

Repair the short to voltage in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (B16) BRAKE SIGNAL 2 CIRCUIT OPEN

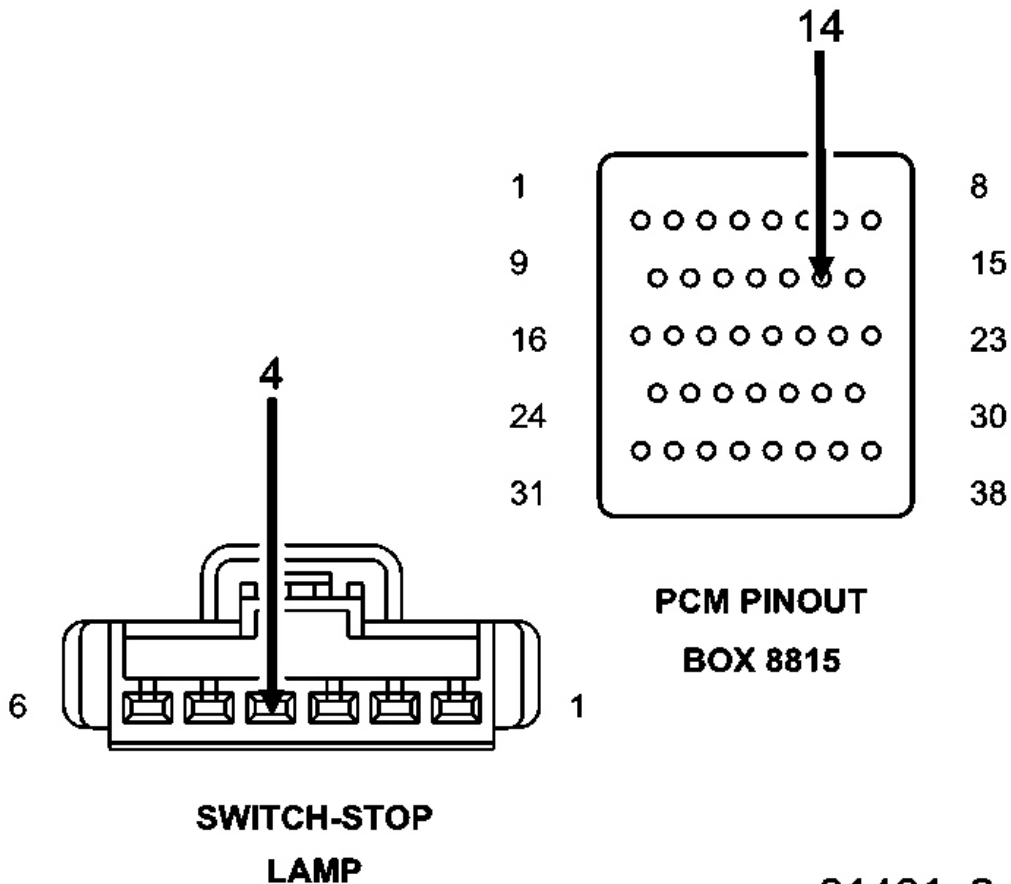
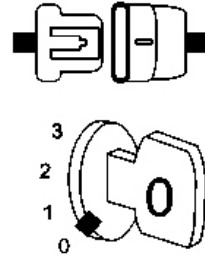
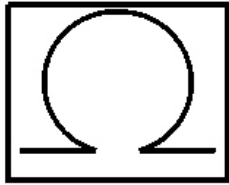


Fig. 39: Checking Brake Switch No. 2 Signal Circuit For Open
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (B16) Brake Signal 2 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

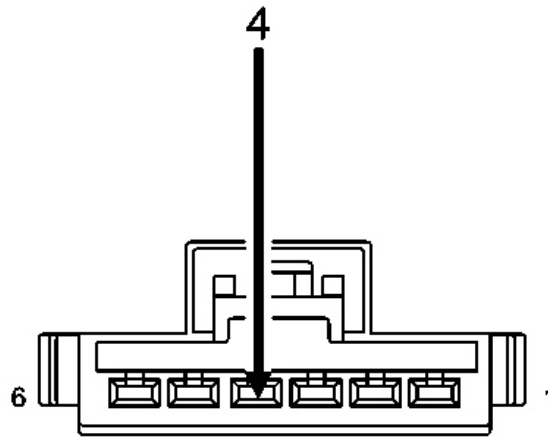
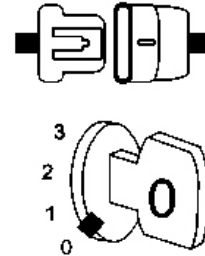
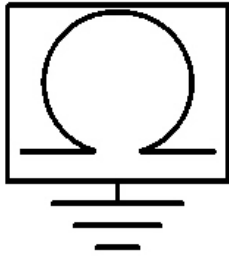
Go To 6.

No

Repair the open in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO GROUND



**SWITCH-
STOP
LAMP**

8144a4cd

Fig. 40: Checking Brake Switch No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 5.0 ohms?

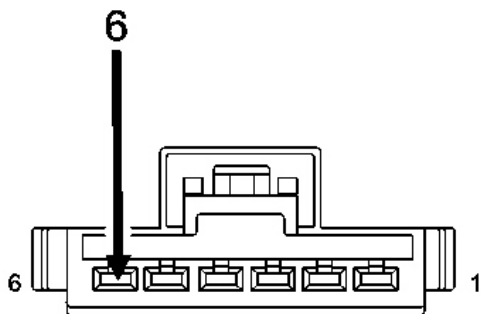
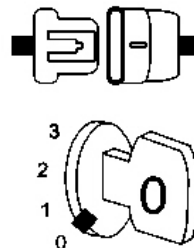
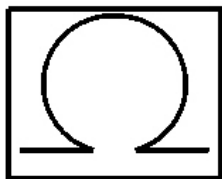
Yes

Repair the short to ground in the (B16) Brake Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST**.

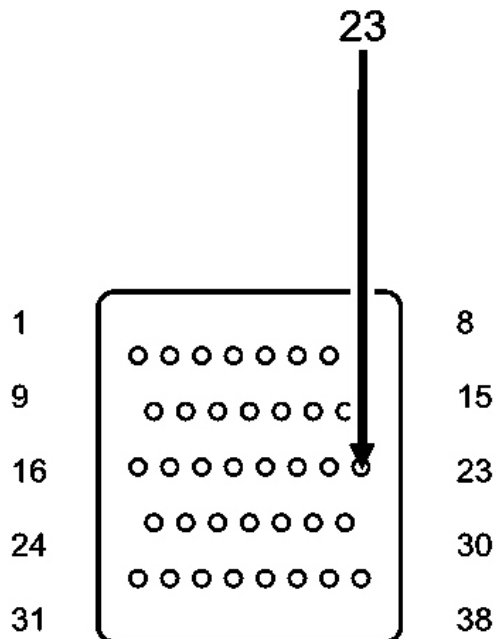
No

Go To 7.

7. (B15) BRAKE SIGNAL 1 CIRCUIT OPEN



**SWITCH-
STOP
LAMP**



PCM PINOUT

BOX 8815

81336c2e

Fig. 41: Checking Brake Switch No. 1 Signal Circuit Open For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (B15) Brake Signal 1 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the open in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

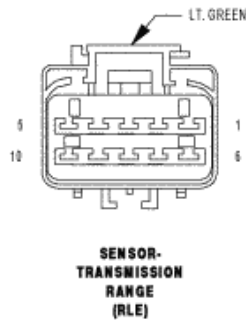
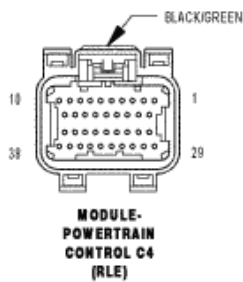
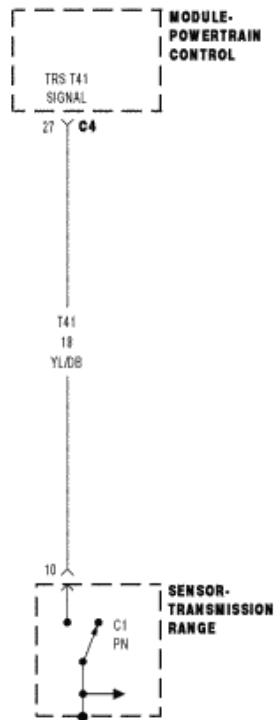
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0850-PARK/NEUTRAL SWITCH PERFORMANCE

CIRCUIT SCHEMATIC



01940010

Fig. 42: Park/Neutral Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Park Neutral switch rationality test is enabled only for vehicles equipped with a 4/5 speed automatic transmission. This diagnostic checks if the park/neutral switch is incorrectly stuck in the neutral position during driving conditions by comparing Vehicle Speed, Engine Speed, Throttle Position, and Pressure Ratio to the fail thresholds and by looking at the state of the Park/Neutral Switch. The stuck in drive condition is not explicitly checked as the starter relay does not energize and therefore render the vehicle inoperable.

MONITOR CONDITIONS

When Monitored:

Continuously with the transmission in Park, Neutral, or Drive and NOT in Limp-in mode.

SET CONDITIONS

- **Set Condition:**

This code will set if the PCM detects an irrational Park/Neutral switch state for at least one minute. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
TRS (T41) SENSE (P/N SENSE) CIRCUIT OPEN
TRS (T41) SENSE (P/N SENSE) CIRCUIT SHORTED TO GROUND
TRANSMISSION RANGE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **P/N & D/R NOT IN CORRECT POSITION**

NOTE: Check the TCM for DTCs, if P0706 is set in the TCM diagnose the TCM code before continuing.

Ignition on, engine not running.

With the scan tool, read the Park/Neutral Position Switch input state.

While moving the gear selector through all gear positions (Park to 1 and back to Park), monitor the scan tool display.

Did the scan tool display show P/N and D/R in the correct gear positions?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 2.

2. TRS (T41) SENSE (P/N SENSE) CIRCUIT OPEN

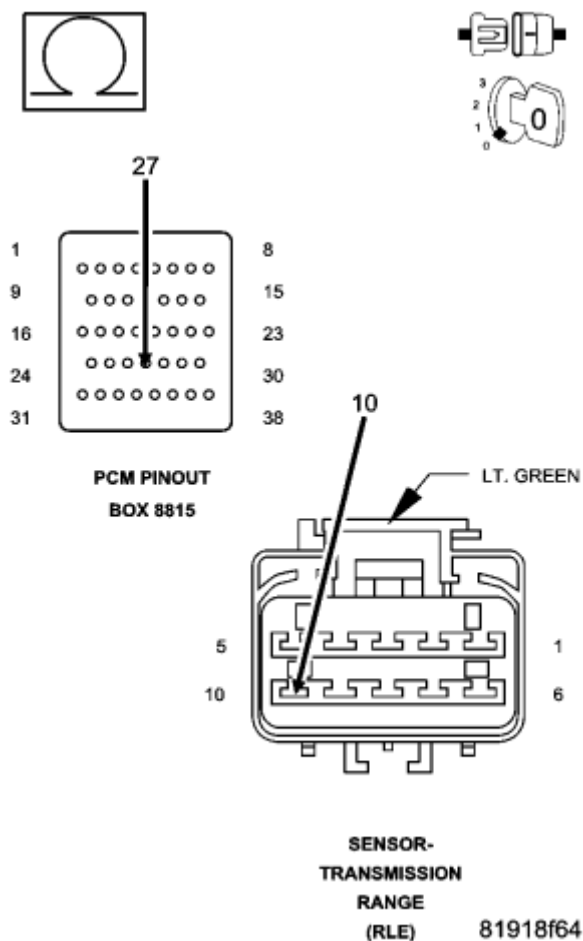


Fig. 43: Checking Park/Neutral Sense) Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Disconnect the Transmission Range Sensor harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the TRS (T41) Sense (P/N Sense) circuit from the TRS harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the open in the TRS (T41) Sense (P/N Sense) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. TRS (T41) SIGNAL CIRCUIT SHORTED TO GROUND

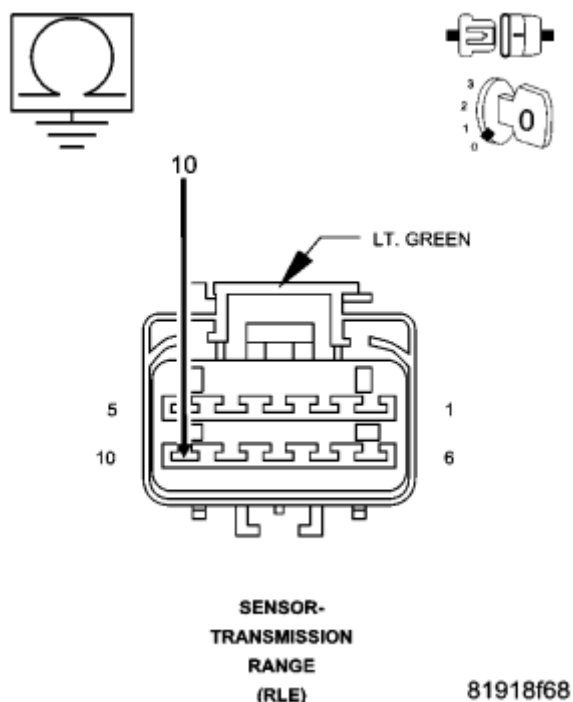


Fig. 44: Measuring Resistance In Transmission Range Sensor Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the TRS (T41) Sense (P/N Sense) circuit at the TRS harness connector.

Is the resistance above 100k ohms?

Yes

Go To 4.

No

Repair the short to ground in the TRS (T41) Sense (P/N Sense) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. TRANSMISSION RANGE SENSOR

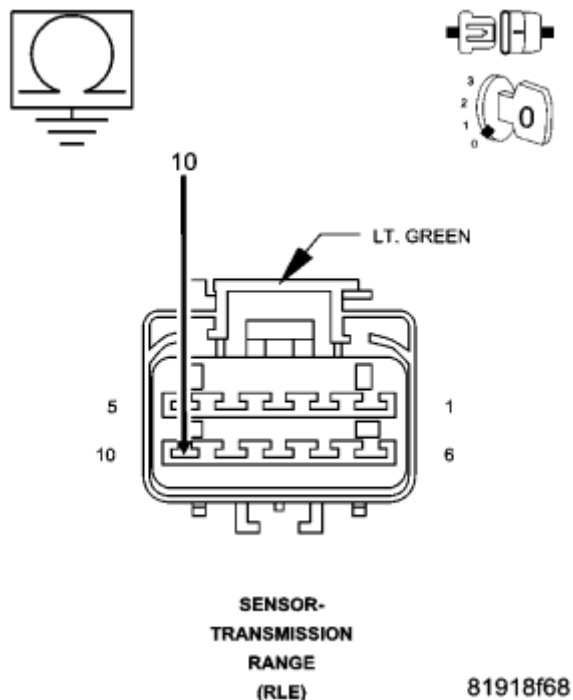


Fig. 45: Measuring Resistance In Transmission Range Sensor Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T41) TRS Sense (P/N Sense) circuit while moving the gear selector through each gear in the TRS connector.

NOTE: The circuit is grounded in Park and Neutral and open in the other positions.

Did the resistance change from above 100k ohms (open) to below 10.0 ohms (grounded)?

Yes

Go To 5.

No

Replace the Transmission Range Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Transmission Solenoid and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1115-GENERAL TEMPERATURE RATIONALITY

CIRCUIT SCHEMATIC

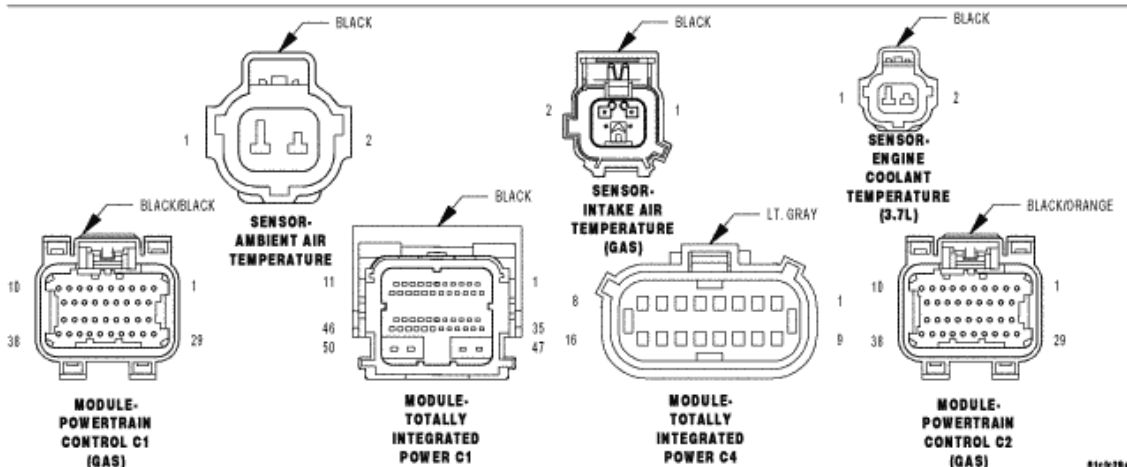
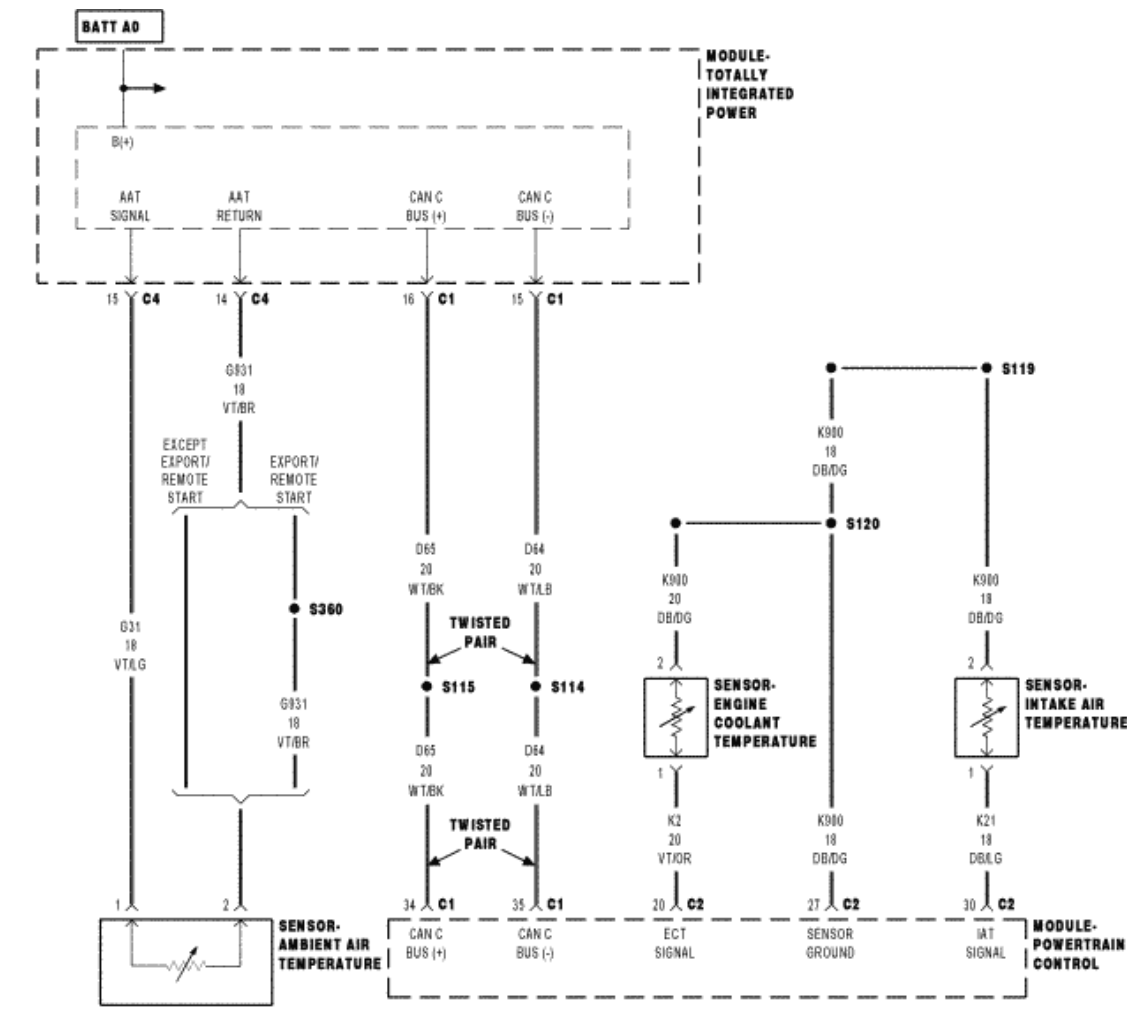


Fig. 46: Thermostat Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The General Temperature Rationality looks at the outputs of the three temperature sensors and compare them under cold start conditions. Following a start to run delay time, the outputs of the ambient, engine coolant, and intake air temperature sensors will be compared. If two sensors agree but not the third, the third sensor is declared as irrational. If all three sensors are irrational the General Temperature Sensor Rationality is failed.

MONITOR CONDITIONS

When Monitored:

Engine off time is greater than 480 minutes and the vehicle has been driven for one minute over 35 mph.
Ambient temperature is greater than -64° C (-83° F).

SET CONDITIONS

- **Set Condition:**

Once the vehicle is soaked for a calibrated engine off time and then driven over calibrated speed and load conditions for some calibrated time, the PCM compares the ambient air, engine coolant, and intake air temperature sensor values. If the values of all the three sensors disagree with one another, a general temperature sensor irrationality is declared. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE SENSOR SIGNAL CIRCUIT
EXCESSIVE RESISTANCE IN THE SENSOR GROUND CIRCUIT
SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition off.

If possible, allow the vehicle to sit with the ignition off for more than 480 minutes in an environment where the temperature is consistent and above -7° C (19.4° F).

Test drive the vehicle. The vehicle must exceed 48 km/h (30 mph) during the test drive. Do not cycle the ignition off when the test drive is completed.

With a scan tool, select View the DTCs.

NOTE: All ECT, Intake Air, and Ambient Air Temperature Sensor codes must be diagnosed and repaired before continuing.

NOTE: In cold weather, this DTC could be set by a high powered block heater and no repair would be required.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. TEMPERATURE SENSOR READINGS

Turn the ignition off.

Allow the vehicle to sit with the ignition off in an environment where the temperature is consistent and above -7° C (19.4° F) until the engine coolant temperature is equal to ambient temperature.

Turn the ignition on.

With a scan tool, compare the AAT, ECT, and IAT sensor values.

Are all of the temperature sensor values within a range of 10° C (18° F)?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 3.

3. TEMPERATURE SENSOR

Ignition on, engine not running.

Disconnect the suspected faulty sensor.

Connect a jumper wire between the Sensor Signal circuit and the Sensor ground circuit.

With the scan tool, read the voltage of the suspected Sensor.

Did the voltage reading start at 4.8 to 5.0 volts and decrease to 0 volts when the jumper wire was

installed?

Yes

Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors. Replace the Sensor if no problems were found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

NOTE: Remove the jumper wire before continuing.

4. EXCESSIVE RESISTANCE IN THE TEMPERATURE SENSOR SIGNAL CIRCUIT

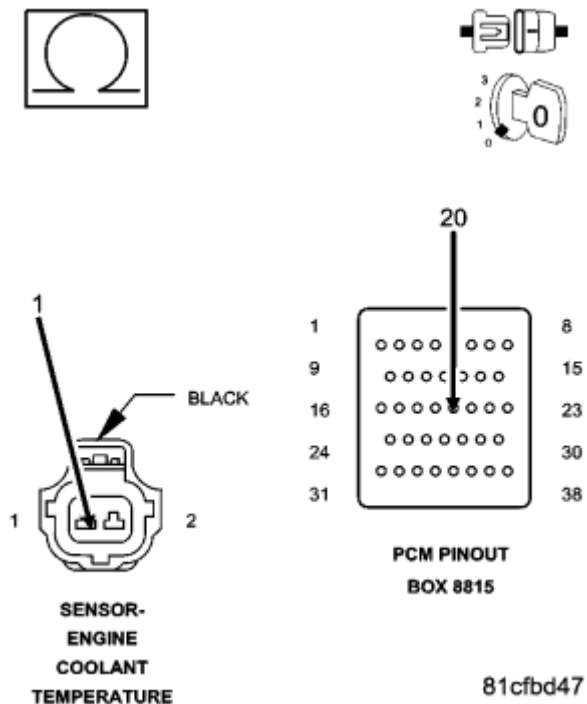


Fig. 47: Checking ECT Sensor Signal Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

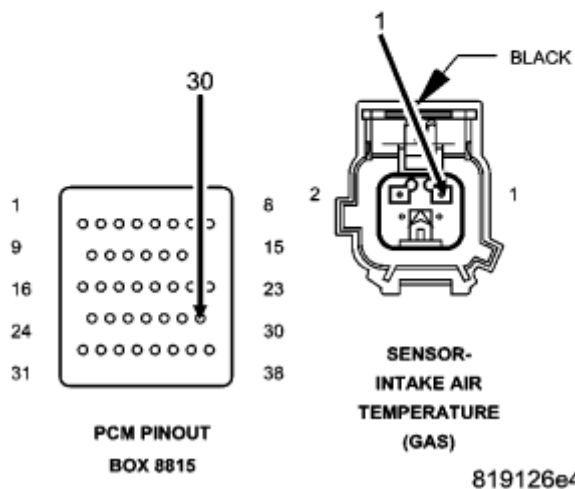


Fig. 48: Measuring Resistance Of AAT Sensor Signal Circuit
Courtesy of CHRYSLER LLC

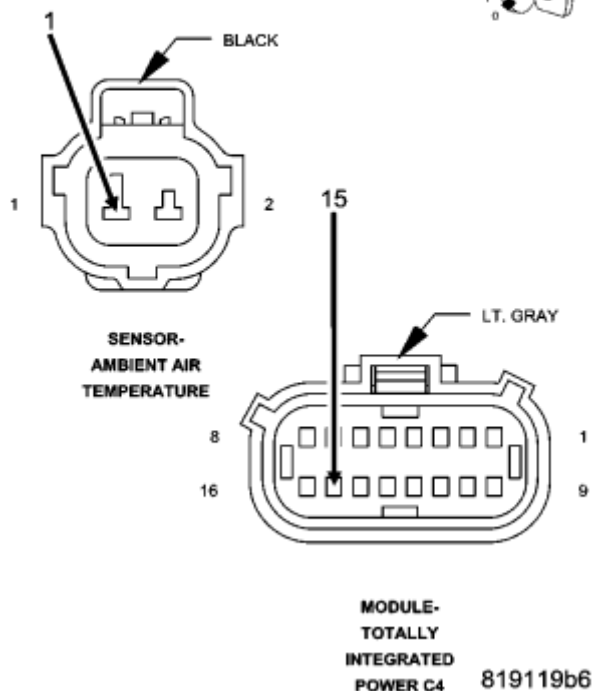
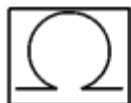


Fig. 49: Measuring Resistance Of (G31) AAT Signal Circuit Between Ambient Air Temperature

Sensor Harness Connector And C4 TIPM Harness Connector
Courtesy of CHRYSLER LLC

NOTE: If the vehicle is equipped with ESP the AAT Sensor Signal circuit is a direct feed to the C2 BCM circuit. The PCM receives AAT Sensor Signal input over the CAN C Bus circuit. If the vehicle is not equipped with ESP, the AAT Sensor is a direct feed to the PCM.

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Disconnect the C4 TIPM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Sensor Signal circuit from the Sensor harness connector to the appropriate terminal of special tool #8815 or the C4 TIPM harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the excessive resistance in the Temperature Sensor Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE SENSOR GROUND CIRCUIT

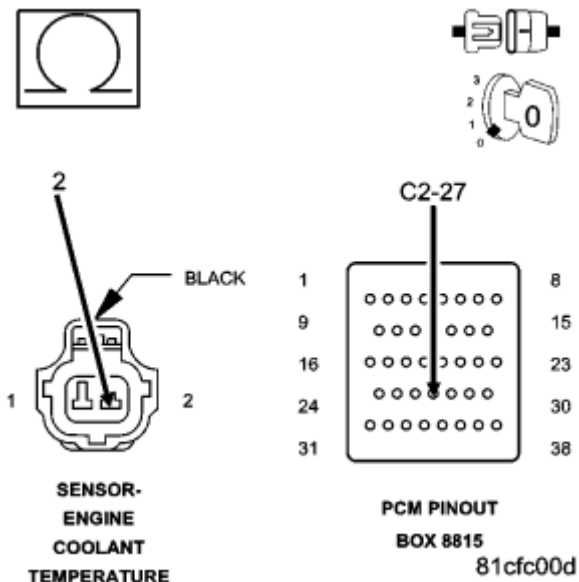


Fig. 50: Checking ECT Sensor Ground Circuit For Open
 Courtesy of CHRYSLER LLC

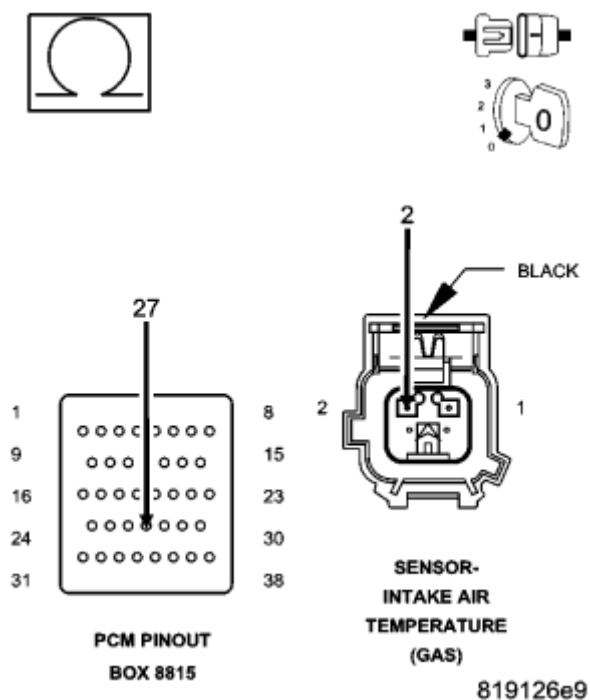


Fig. 51: Measuring Resistance Of (K900) Sensor Ground Circuit From IAT Sensor Harness Connector To Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

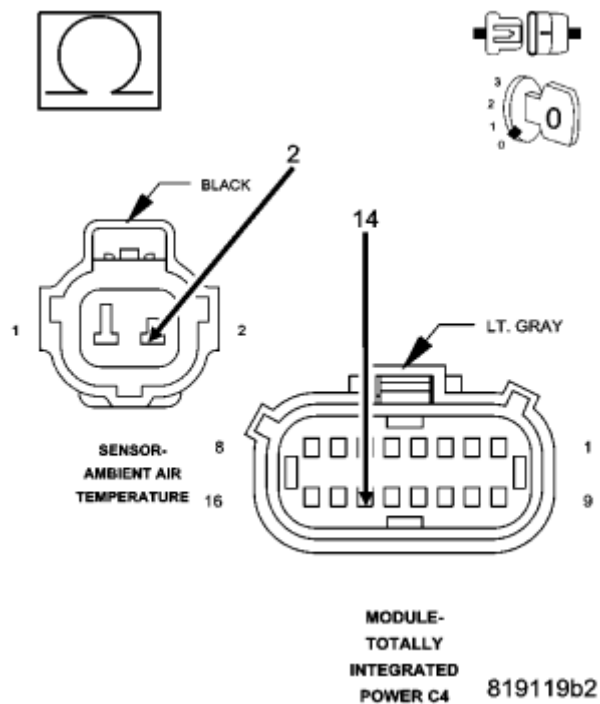


Fig. 52: Measuring Resistance Of (G931) Sensor Ground Circuit From AAT Sensor Harness Connector To C4 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the Sensor ground circuit from the Sensor harness connector to the appropriate terminal of special tool #8815 or the C4 TIPM harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the excessive resistance in the Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. SENSOR SIGNAL CIRCUIT SHORTED TO GROUND

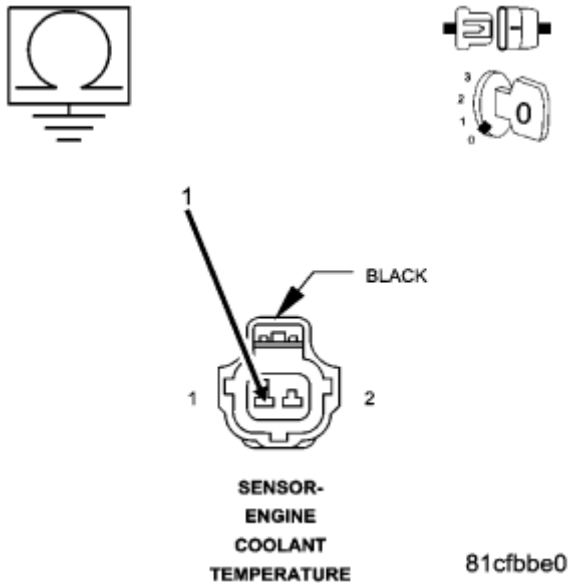


Fig. 53: Checking ECT Sensor Signal Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

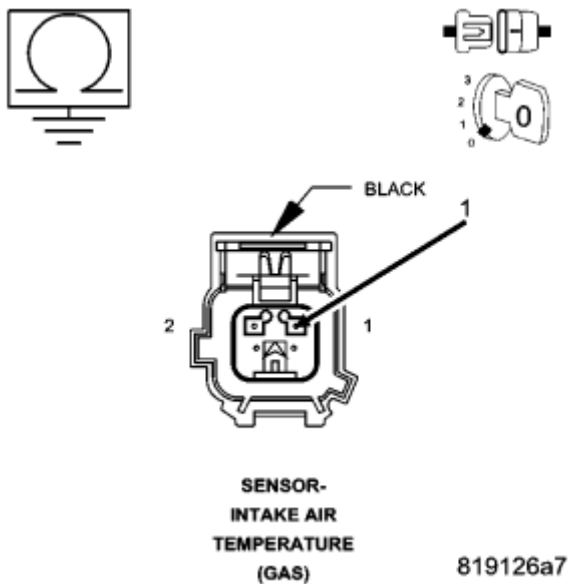
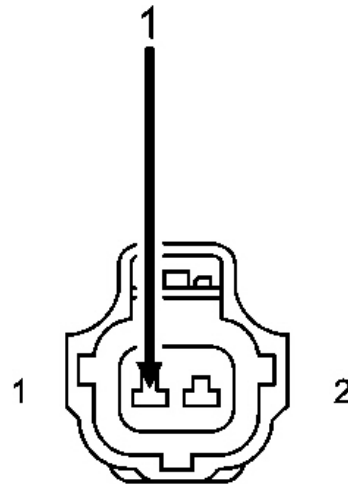
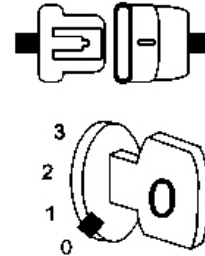
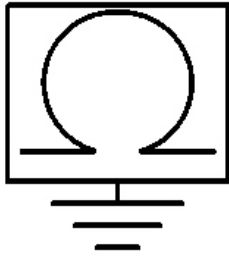


Fig. 54: Measuring Resistance Between Ground And (K21) IAT Signal Circuit In IAT Sensor Harness Connector
 Courtesy of CHRYSLER LLC



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b45d

Fig. 55: Checking Ambient Air Temperature Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the Sensor Signal circuit at the Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the Sensor Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE

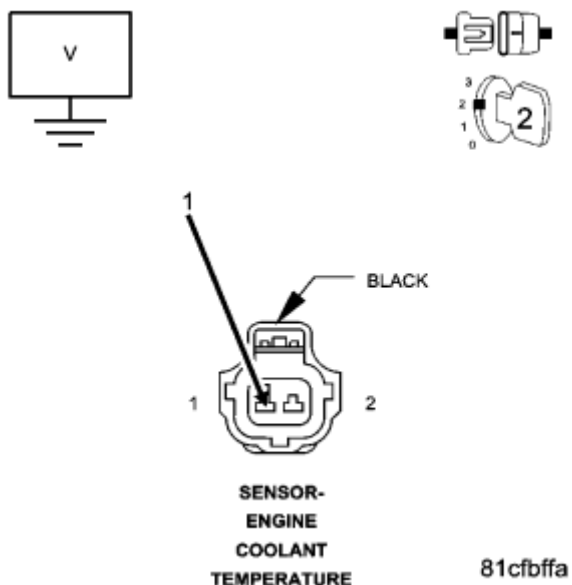


Fig. 56: Checking ECT Sensor Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

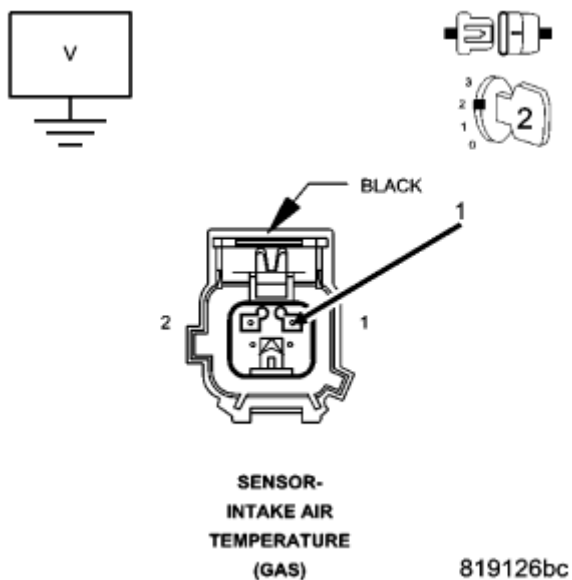
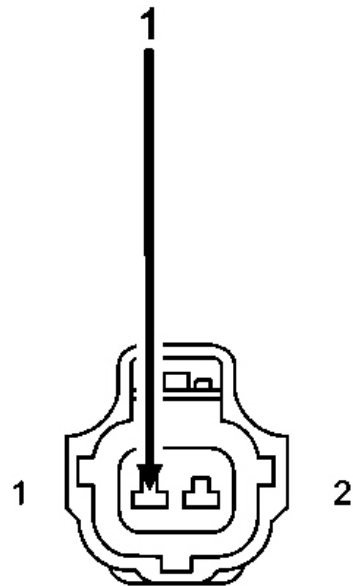
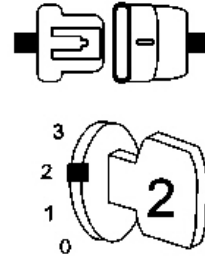
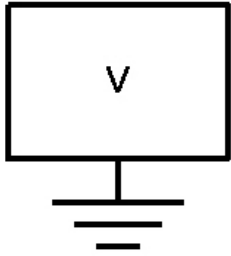


Fig. 57: Measuring Voltage On (K21) IAT Signal Circuit In IAT Sensor Harness Connector
Courtesy of CHRYSLER LLC



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b439

Fig. 58: Checking Ambient Air Temperature Sensor Signal Circuit Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage on the Sensor Signal circuit at the Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1128-CLOSED LOOP FUELING NOT ACHIEVED - BANK 1

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running in closed loop mode.

SET CONDITIONS

- Set Condition:

Enable conditions are met and the O2 sensor has not been in closed loop control at least once on each of the two consecutive trips, the MIL illuminates and the DTC is set. Two Trip Fault. Three good trips to turn off the MIL

POSSIBLE CAUSES

Possible Causes
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
1/1 O2 SENSOR
MAP SENSOR
ECT SENSOR
ENGINE MECHANICAL PROBLEM
FUEL FILTER/PRESSURE REGULATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Diagnose all other trouble codes before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by

reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

Below Specification

Go To 12.

CAUTION: Stop All Actuations.

3. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground the scan tool will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.

NOTE: If one of the O2 Sensor Signal or Return circuits are shorted to voltage, the scan tool will display all O2 Sensor voltage readings high.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With a scan tool, monitor all of the O2 Sensor voltage readings.

Is the voltage switching between 2.5 and 3.4 volts for all the O2 Sensors?

Yes

Go To 4.

No

Go To 8.

4. 1/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Ignition on, engine not running.

With a scan tool, actuate the 1/1 O2 Heater Test.

With the scan tool, monitor 1/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the 1/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. MAP SENSOR OPERATION

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: If engine will not idle, maintain a constant RPM above idle.

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading within 1 inch of HG on the Vacuum Gauge reading?

Yes

Go To 6.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. If OK, replace the MAP Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

6. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak)

Ignition on, engine not running.

With a scan tool, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and did it reach at least 82° C (180° F)?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. If OK, replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **ENGINE MECHANICAL PROBLEM**

Turn the ignition off.

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

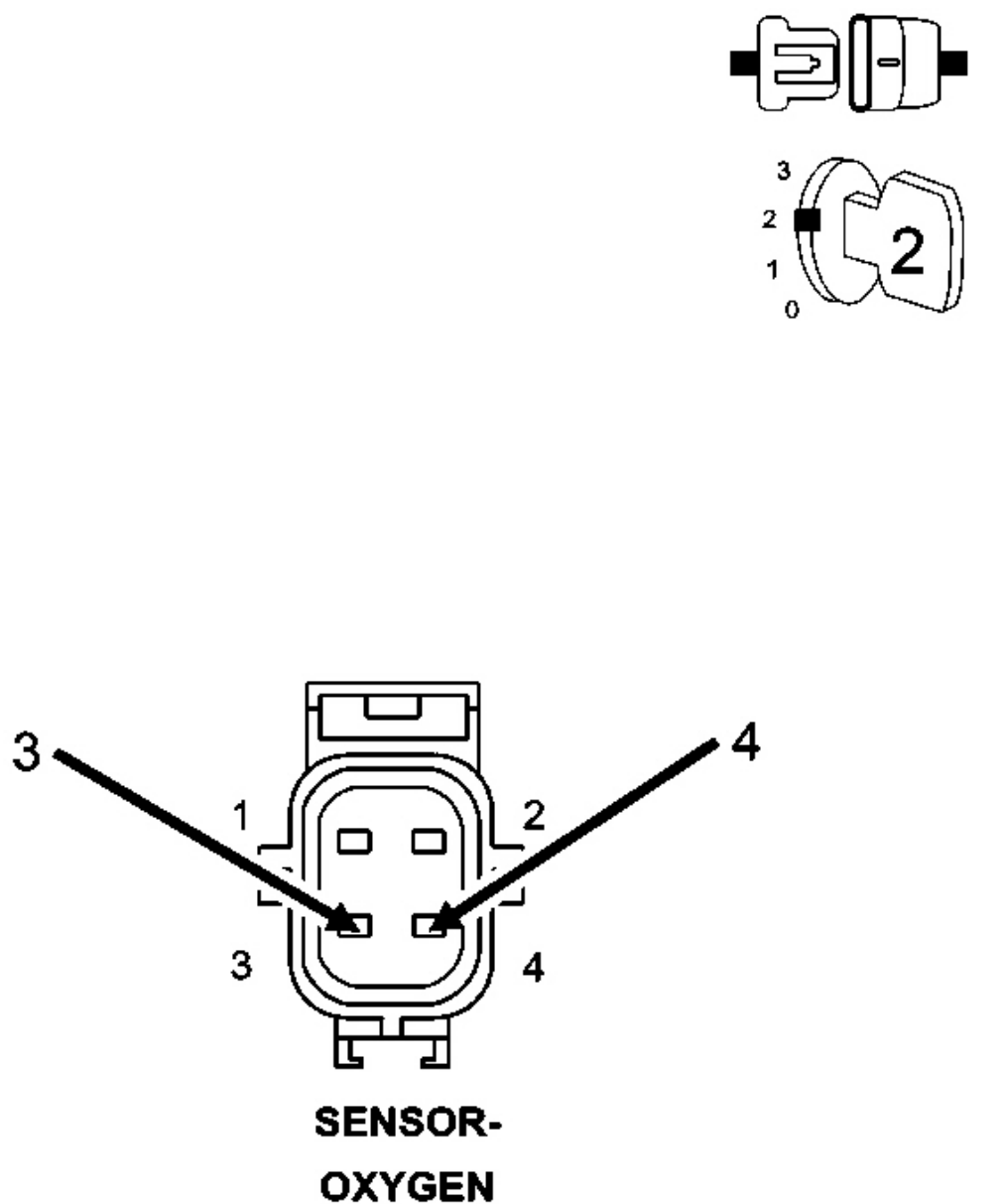
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

8. 1/1 O2 SENSOR



81653cbb

Fig. 59: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 1/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K41) Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: **The voltage should drop from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire in place.**

Did the O2 Sensor voltage change from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the 1/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

NOTE: **Remove the jumper wire before continuing.**

9. (K41) O2 SENSOR 1/1 SIGNAL CIRCUIT

With a scan tool, monitor the 1/1 O2 Sensor voltage reading with the jumper wire removed.

NOTE: **The scan tool will display all O2 Sensor voltage readings approximately 5.0 volts when only one O2 Sensor's Signal circuit is shorted to voltage.**

NOTE: **The scan tool will display one O2 Sensor voltage close to zero and the others will read lower than normal when one O2 Sensor Signal circuit contains excessive resistance.**

Is the voltage between 4.1 and 5.0 volts?

Yes

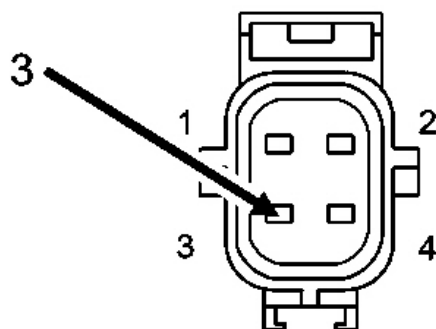
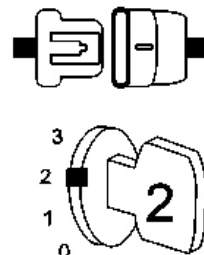
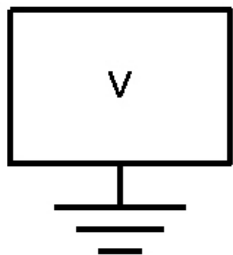
Go To 10.

No

Check the (K41) O2 Sensor 1/1 Signal circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

10. **(K902) O2 RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 60: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 11.

No

Check the O2 Return circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

12. RESTRICTED FUEL SUPPLY LINE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special 5/16 fuel line adapter tool #6539 between disconnected fuel line and the fuel pump module.

Attach a fuel pressure test gauge to the T fitting on tool #6539.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

CAUTION: Stop All Actuations.

13. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

14. FUEL PUMP MODULE

If there are no possible causes remaining, view repair.

Repair

Verify that there is good pin to terminal contact in the Fuel Pump Module, Relay, and Powertrain Control Module connectors. If OK, replace the Fuel Pump Module.
Perform **POWERTRAIN VERIFICATION TEST** .

P1129-CLOSED LOOP FUELING NOT ACHIEVED - BANK 2

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running in closed loop mode.

SET CONDITIONS

• **Set Condition:**

Enable conditions are met and the O2 sensor has not been in closed loop control at least once on each of the two consecutive trips, the MIL illuminates and the DTC is set. Two Trip Fault. Three good trips to turn off the MIL

POSSIBLE CAUSES

Possible Causes
RESTRICTED FUEL SUPPLY LINE FUEL PUMP INLET STRAINER PLUGGED FUEL PUMP MODULE O2 SIGNAL CIRCUIT O2 RETURN CIRCUIT 2/1 O2 SENSOR MAP SENSOR ECT SENSOR ENGINE MECHANICAL PROBLEM FUEL FILTER/PRESSURE REGULATOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Diagnose all other trouble codes before continuing.

NOTE: Check for contaminants that may have damaged an O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

Below Specification

Go To 12.

CAUTION: Stop All Actuations.

3. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground the scan tool will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.

NOTE: If one of the O2 Sensor Signal or Return circuits are shorted to voltage, the scan tool will display all O2 Sensor voltage readings high.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With the scan tool, monitor the 2/1 O2 Sensor voltage reading.

Is the voltage switching between 2.5 and 3.4 volts?

Yes

Go To 4.

No

Go To 8.

4. 2/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

NOTE: Perform the following test on all O2 Sensors.

Ignition on, engine not running.

With a scan tool, actuate the 2/1 O2 Heater Test.

With the scan tool, monitor 2/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the 2/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. MAP SENSOR OPERATION

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: If engine will not idle, maintain a constant RPM above idle.

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading within 1 inch of Hg on the Vacuum Gauge reading?

Yes

Go To 6.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. If OK, replace the MAP Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

6. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak).

Ignition on, engine not running.

With the scan tool, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and did it reach at least 82° C (180° F)?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. If OK, replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

7. ENGINE MECHANICAL PROBLEM

Turn the ignition off.

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks.

ENGINE VACUUM - must be at least 13 inches in neutral.

ENGINE VALVE TIMING - must be within specifications.

ENGINE COMPRESSION - must be within specifications.

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely.

TORQUE CONVERTER STALL SPEED - must be within specifications.

POWER BRAKE BOOSTER - no internal vacuum leaks.

FUEL - must be free of contamination.

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector.

Are there any engine mechanical problems?

Yes

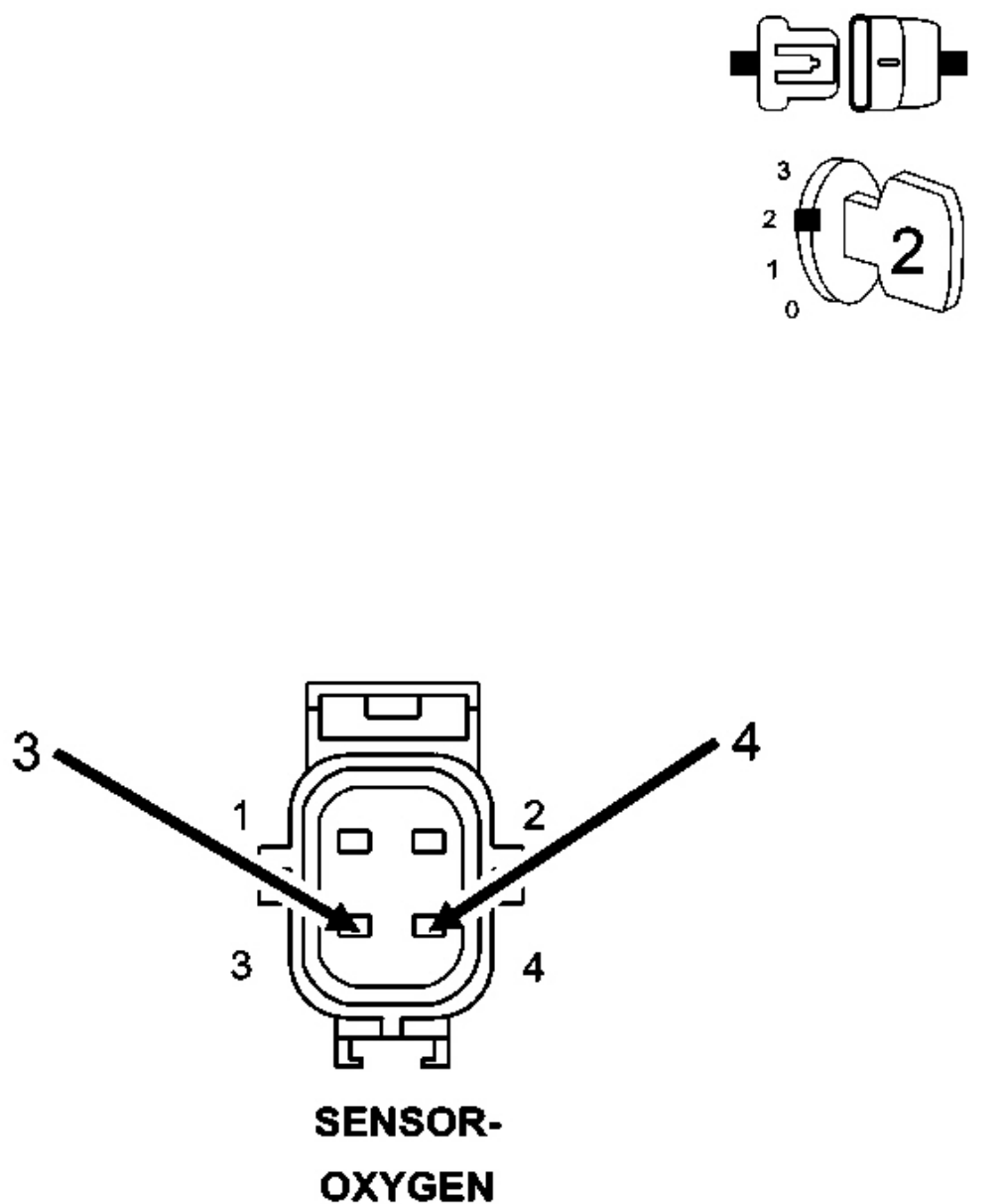
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

8. **O2 SENSOR**



81653cbb

Fig. 61: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/1 O2 Sensor harness connector.

Ignition on, engine not running.

With the scan tool, monitor the 2/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K43) O2 Sensor 2/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: **The voltage should drop from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire in place.**

Did the O2 Sensor voltage change from between 4.1 and 5.0 volts to 2.5 volts when the jumper wire was installed?

Yes

Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the 2/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

NOTE: **Remove the jumper wire before continuing.**

9. O2 SENSOR SIGNAL CIRCUIT

With the scan tool, monitor all the O2 Sensor voltage reading with the jumper wire removed.

NOTE: **The scan tool will display all O2 Sensor voltage readings approximately 5.0 volts when only one O2 Sensor's Signal circuit is shorted to voltage.**

NOTE: **The scan tool will display one O2 Sensor voltage close to zero and the others will read lower than normal when one O2 Sensor Signal circuit contains excessive resistance.**

Is the voltage between 4.1 and 5.0 volts?

Yes

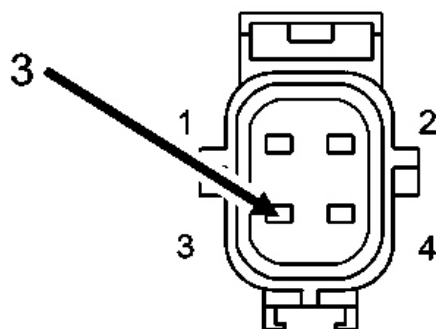
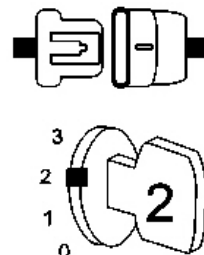
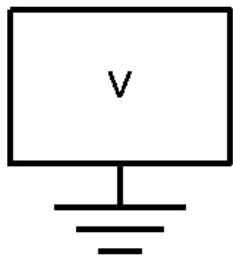
Go To 10.

No

Check all the O2 Signal circuits for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

10. **(K902) O2 RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 62: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 11.

No

Check the (K902) O2 Return Upstream circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the related Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

12. RESTRICTED FUEL SUPPLY LINE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special 5/16 fuel line adapter tool #6539 between disconnected fuel line and the fuel pump module.

Attach a fuel pressure test gauge to the T fitting on tool #6539.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

CAUTION: Stop All Actuations.

13. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

14. FUEL PUMP MODULE

If there are no possible causes remaining, view repair.

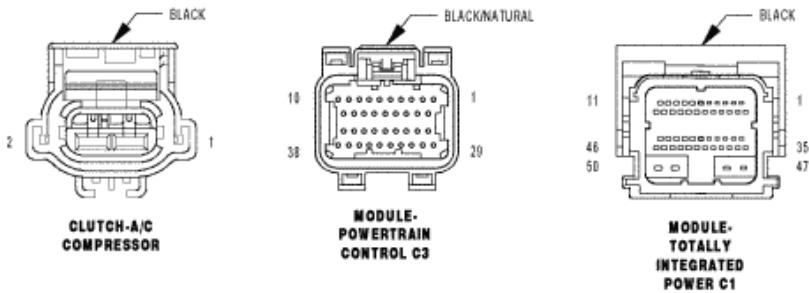
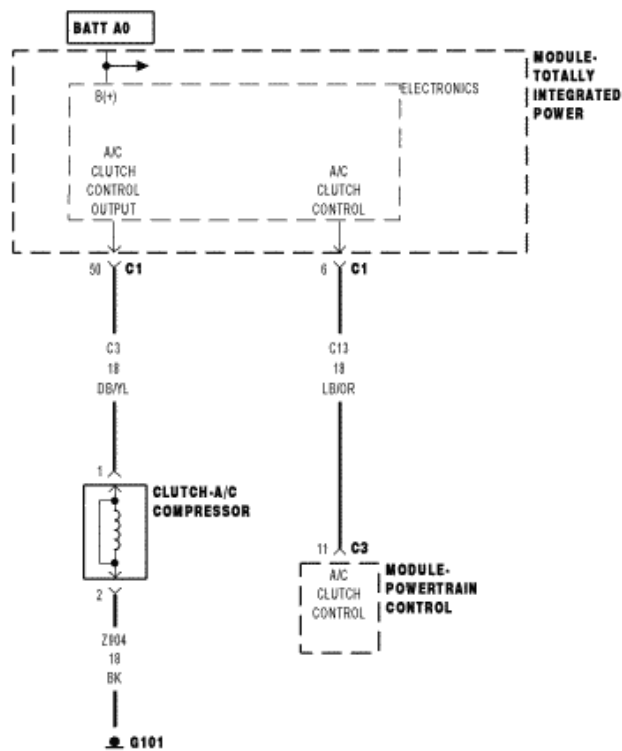
Repair

Verify that there is good pin to terminal contact in the Fuel Pump Module, Relay, and Powertrain Control Module connectors. If OK, replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

P1273-A/C CLUTCH CONTROL CIRCUIT 2 HIGH (TIPM)

CIRCUIT SCHEMATIC



81d1570e

Fig. 63: A/C Clutch Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts. A/C Switch on.

SET CONDITIONS

- Set Condition:**

A shorted high condition has been detected in the A/C Clutch Control output circuit by the TIPM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE EXCESSIVE RESISTANCE IN THE (Z904) A/C CLUTCH GROUND CIRCUIT A/C COMPRESSOR CLUTCH TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. A/C CLUTCH OPERATION

Ignition on, engine not running.

With a scan tool under the PCM Actuators, actuate the A/C Clutch.

Is the A/C Clutch actuating?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 2.

2. A/C CLUTCH CONTROL OPERATION FROM THE PCM

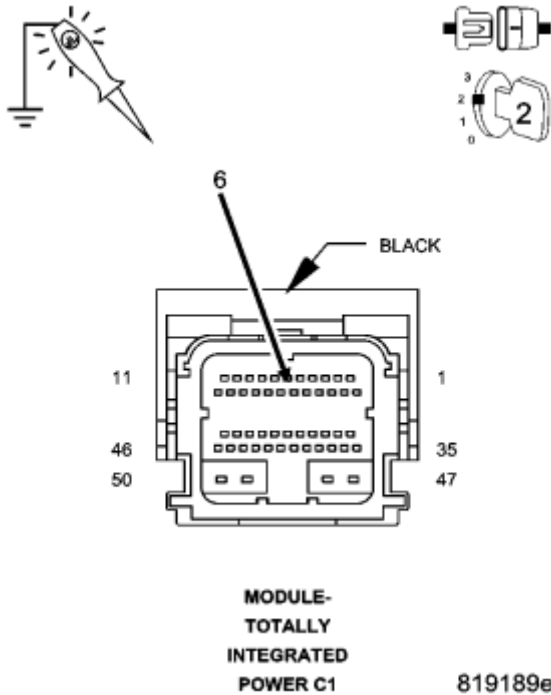


Fig. 64: Using Scan Tool Under PCM Actuators To Actuate A/C Clutch
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

Ignition on, engine not running.

Using the scan tool under the PCM Actuators, actuate the A/C Clutch.

With a 12-volt test light connected to ground, probe the (C13) A/C Clutch Control circuit in the C1 TIPM harness connector.

Does the test light illuminate brightly and flash on and off?

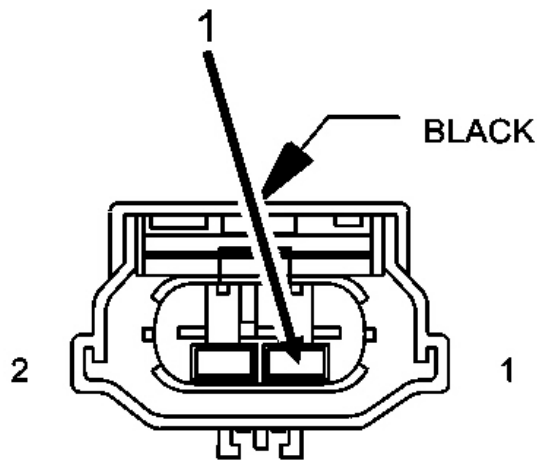
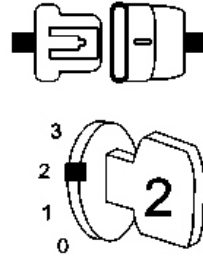
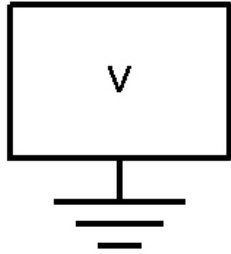
Yes

Go To 3.

No

Perform **P0645-A/C CLUTCH CONTROL CIRCUIT**

3. (C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE



**CLUTCH-A/C
COMPRESSOR**

816402af

Fig. 65: Checking A/C Clutch Control Output Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Compressor Clutch harness connector.

Ignition on, engine not running.

Measure the voltage on the (C3) A/C Clutch Control Output circuit at the A/C Compressor Clutch harness connector.

Is there any voltage present?

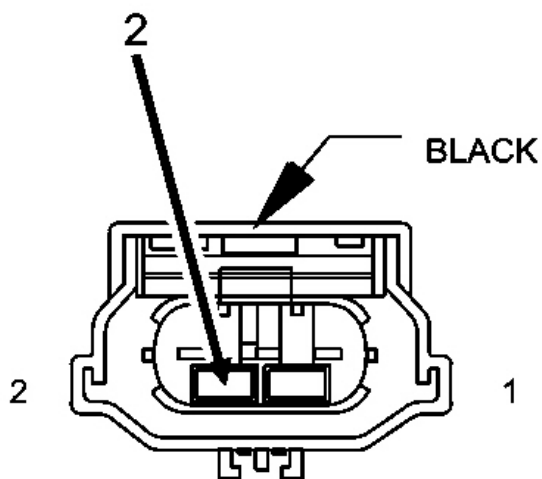
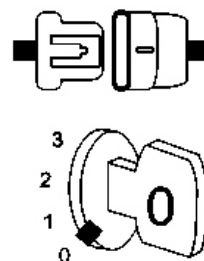
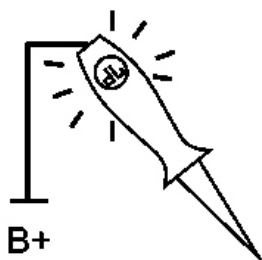
Yes

Repair the short to voltage in the (C3) A/C Clutch Control Output circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. A/C CLUTCH GROUND CIRCUIT OPEN



**CLUTCH-A/C
COMPRESSOR**

816403f0

Turn the ignition off.

Connect the C1 TIPM harness connector.

Using a 12-volt test light connected to 12-volts, probe the (Z904) A/C Clutch ground circuit at the A/C Compressor Clutch harness connector.

Does the test light illuminate brightly?

Yes

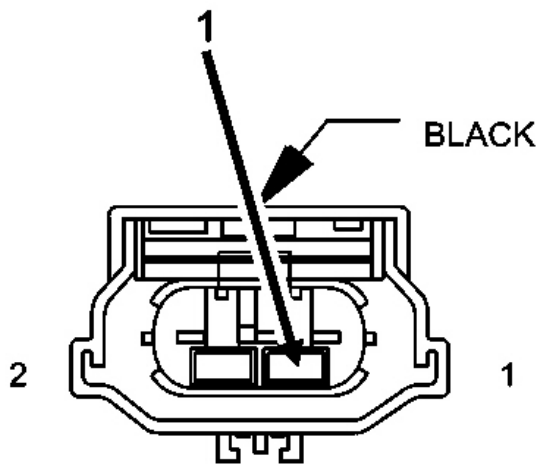
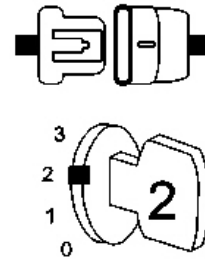
Go To 5.

No

Repair the excessive resistance in the (Z904) A/C Clutch ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **A/C COMPRESSOR CLUTCH**



**CLUTCH-A/C
COMPRESSOR**

81640243

Fig. 67: Checking A/C Clutch Control Output Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using the scan tool under the TIPM Actuators, actuate the A/C Clutch.

With a 12-volt test light connected to ground, probe the (C3) A/C Clutch Control Output circuit at the A/C Compressor Clutch harness connector.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the A/C Clutch, TIPM, and Powertrain Control Module connectors. If OK, replace the A/C Compressor Clutch per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the A/C Clutch, TIPM, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the A/C Clutch, TIPM, and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

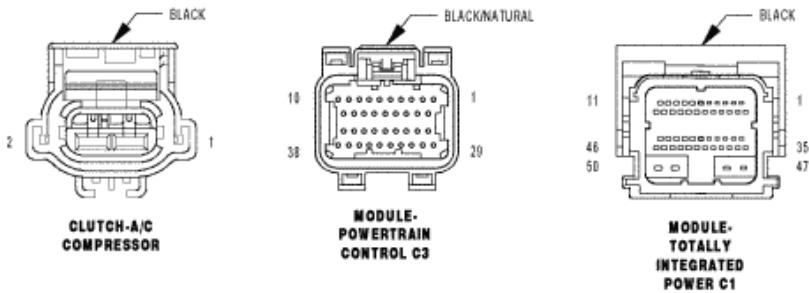
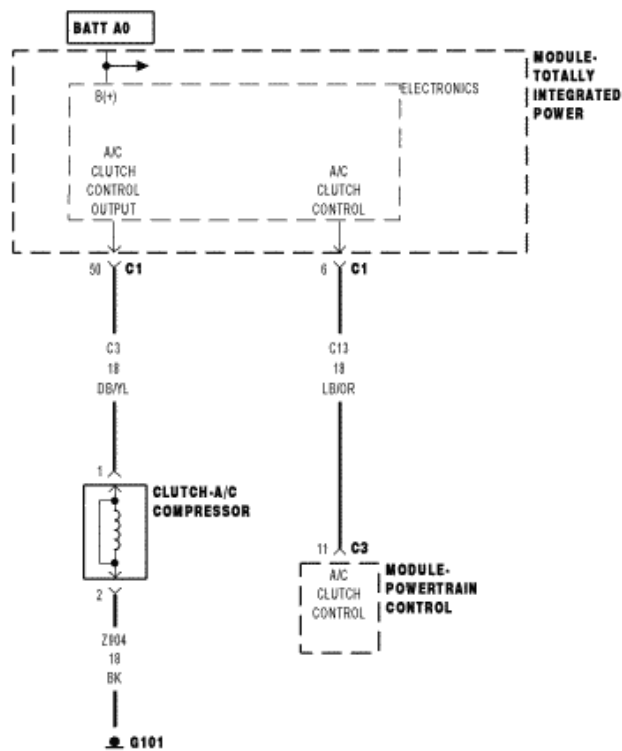
No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P1275-A/C CLUTCH CONTROL CIRCUIT 2 OVERCURRENT (TIPM)

CIRCUIT SCHEMATIC



81d1570e

Fig. 68: A/C Clutch Control Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts. TIPM requesting A/C Clutch operation.

SET CONDITIONS

- Set Condition:

An overcurrent condition is detected in the A/C Clutch control output circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
TERMINAL DAMAGE OR CORROSION
A/C CLUTCH GROUND HIGH RESISTANCE
(C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT HIGH RESISTANCE
(C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT SHORTED TO GROUND
A/C COMPRESSOR CLUTCH
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. A/C CLUTCH OPERATION

Ignition on, engine not running.

With a scan tool in the TIPM Actuators, actuate the A/C Clutch.

Is the A/C Clutch actuating?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 2.

2. VISUAL AND PHYSICAL CONNECTOR AND TERMINAL INSPECTION

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

Disconnect the A/C Clutch harness connector.

Inspect the terminal and connector condition. Check for signs of corrosion build up or damage the would compromise the terminal to controller pin connector.

NOTE: Make sure that all in-line connectors are inspected for corrosion and/or damage.

Visually inspect the wiring harness. Look for any chafed, pierced, pinched or partially broken wires hidden in the wire insulation.

Were any of the above conditions found?

Yes

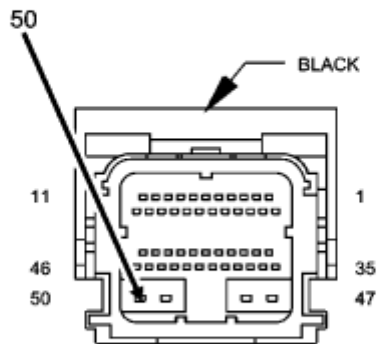
Repair or replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT EXCESSIVE RESISTANCE



MODULE-
TOTALLY
INTEGRATED
POWER C1

81919e58

Fig. 69: Using 12-Volt Test Light Connected To Battery Voltage To Probe (C3) A/C Clutch Control Output Circuit In C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

With a jumper wire, connect one end to the (C3) A/C Clutch Control Output circuit in the A/C Clutch harness connector and the other to a clean chassis ground.

Using a 12-volt test light connected to battery voltage, probe the (C3) A/C Clutch Control Output circuit in the C1 TIPM harness connector.

NOTE: The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the excessive resistance in the (C3) A/C Clutch Control Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (C3) A/C CLUTCH CONTROL OUTPUT CIRCUIT SHORTED TO GROUND

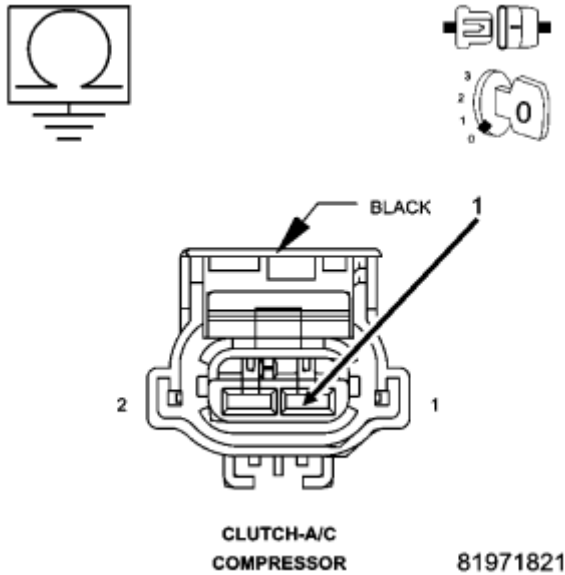


Fig. 70: Measuring Resistance Between Ground And (C3) A/C Clutch Control Output Circuit At A/C Clutch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C3) A/C Clutch Control Output circuit at the A/C Clutch harness connector.

Is the resistance below 100 ohms?

Yes

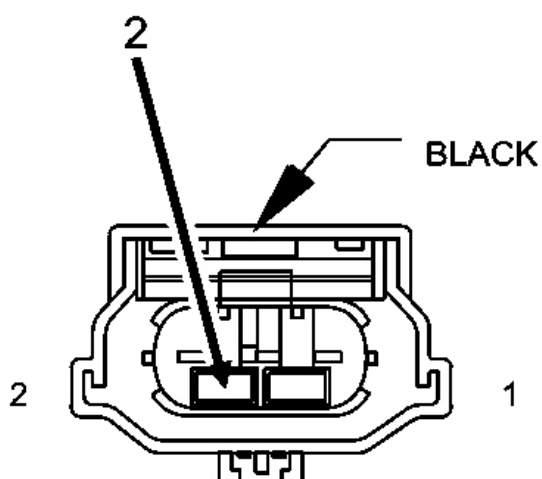
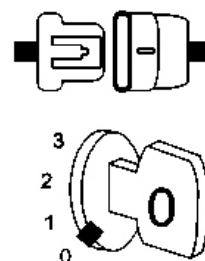
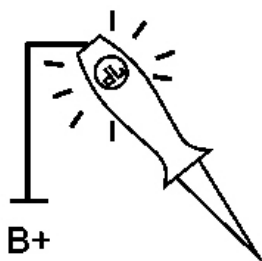
Repair the short to ground in the (C3) A/C Clutch Control Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. A/C CLUTCH GROUND CIRCUIT



**CLUTCH-A/C
COMPRESSOR**

816403f0

Fig. 71: Checking A/C Clutch Ground Circuit For Open
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to battery voltage, probe the (Z904) A/C Clutch Ground circuit in the A/C Clutch harness connector.

NOTE: The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

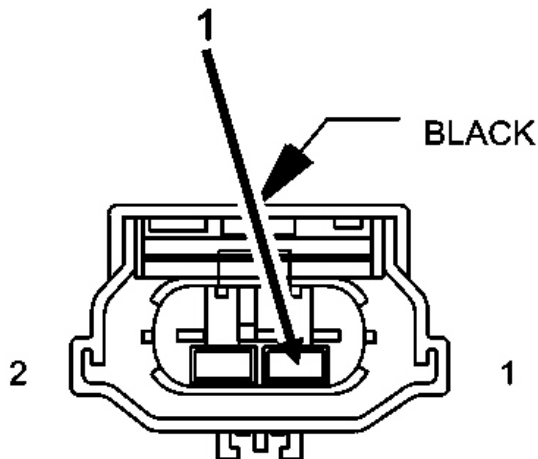
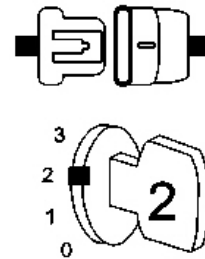
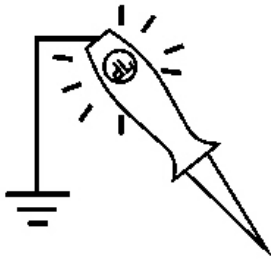
Go To 6.

No

Repair the excessive resistance in the (Z904) A/C Clutch Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **A/C CLUTCH CONTROL OUTPUT FROM TIPM**



**CLUTCH-A/C
COMPRESSOR**

81640243

Fig. 72: Checking A/C Clutch Control Output Circuit
Courtesy of CHRYSLER LLC

Reconnect the C1 TIPM harness connector.

Ignition on, engine not running.

With a scan tool in the TIPM Actuators, actuate the A/C Clutch.

Using the 12-volt test light connected to ground, probe the (C3) A/C Clutch Control Output circuit in the A/C Clutch harness connector.

Does the test light illuminate brightly?

Yes

Replace the A/C Clutch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P129C-INVERTER CONTROL CIRCUIT HIGH (TIPM)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts. Once the inverter switch has been turned on, the CCN sends a request to the TIPM to turn on the Inverter.

SET CONDITIONS

- **Set Condition:**

An open or shorted high condition has been detected in the Inverter Control output circuit by the TIPM. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(P805) INVERTER CONTROL OUTPUT CIRCUIT OPEN
(P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE
INVERTER MODULE
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Inverter Module harness connector.

Disconnect the TIPM C7 harness connector.

Turn the ignition on.

Measure the voltage of the (P805) Inverter Control Output circuit at the Inverter Module harness connector.

Is voltage present?

Yes

Repair the short to voltage in the (P805) Inverter Control Output circuit. Refer to **DIAGNOSIS AND TESTING** .

No

Go To 3.

3. INVERTER MODULE

Turn the ignition off.

Reconnect the TIPM harness connector.

Using a test light connected to ground, probe the Inverter Enable Switch Signal circuit at the Inverter Module harness connector.

Using the scan tool, actuate the Inverter Enable control.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

Replace the Inverter Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (P805) INVERTER CONTROL OUTPUT CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM harness connector.

Disconnect the Inverter Module harness connector.

Measure the resistance of the (P805) Inverter Control Output circuit between the TIPM and Inverter Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the open in the (P805) Inverter Control Output circuit. Refer to **DIAGNOSIS AND TESTING** .

P129E-INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts.

SET CONDITIONS

- Set Condition:

An overcurrent condition is detected in the Inverter Control Output circuit. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
TERMINAL DAMAGE OR CORROSION (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO GROUND INVERTER MODULE TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: Low battery voltage can also cause excessive current draw, in very hot and very cold ambient temperatures. Make sure the battery can pass a load test before continuing.

With a scan tool, select View DTCs.

Look closely at the temperatures at which this DTC set.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the TIPM harness connector.

Disconnect the Inverter Module harness connector.

Inspect the wiring connections for corrosion and repair as necessary.

Measure the resistance between ground and the (P805) Inverter Control Output circuit at the Inverter Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the short to ground in the (P805) Inverter Control Output circuit. Refer to **DIAGNOSIS AND TESTING** .

3. INVERTER MODULE

Turn the ignition off.

Reconnect the TIPM harness connector.

Using a test light connected to ground, probe the Inverter Enable Switch Signal circuit at the Inverter Module harness connector.

Using the scan tool, actuate the Inverter Enable control.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

Replace the Inverter Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

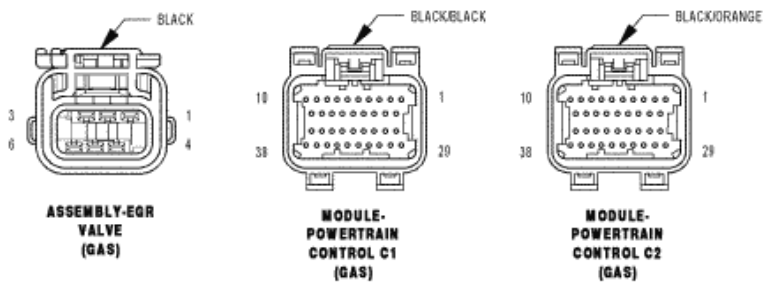
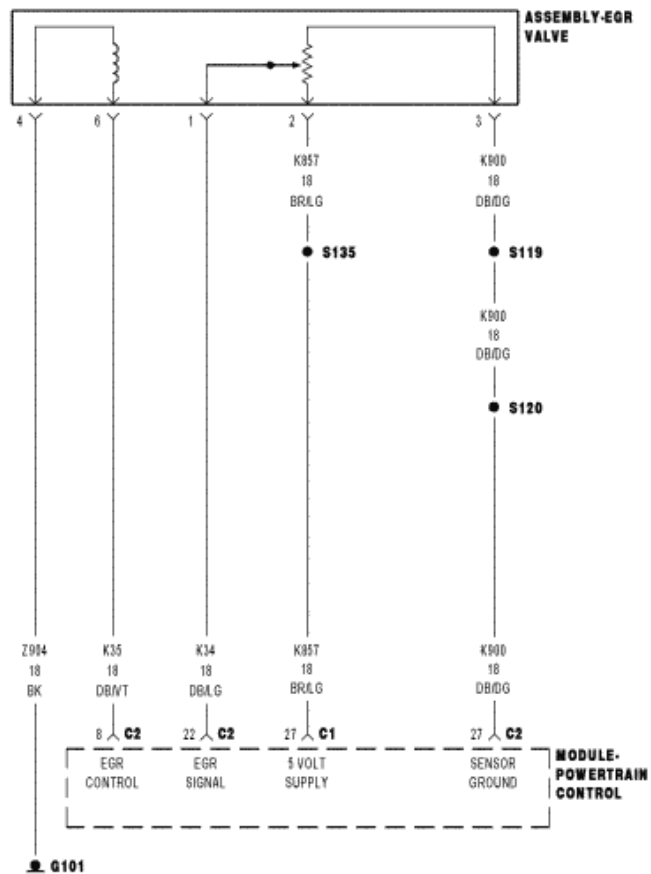
No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P1404-EGR POSITION SENSOR RATIONALITY CLOSED

CIRCUIT SCHEMATIC



810042a

Fig. 73: EGR Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The EGR valve has a position sensor and the EGR position rationality is designed to make sure that the valve moves freely within its operating range. Closed valve position reference check verifies that the valve is within its allowable upper and lower limits. The EGR position rationality test looks for a sustained error relative to commanded valve position.

MONITOR CONDITIONS

When Monitored:

Engine running.

SET CONDITIONS

- **Set Condition:**

The EGR flow or valve movement is not what is expected. A rationality error has been detected for the EGR Open Position Performance. Two trip fault.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT
(K35) EGR SOLENOID CONTROL CIRCUIT OPEN
(K34) EGR SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
(Z904) GROUND CIRCUIT OPEN
EGR SOLENOID ASSEMBLY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose and repair any EGR signal circuit high or low DTCs before continuing with this procedure.**

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose fitting clothing. Failure to follow these instructions can result

in personal or fatal injury.

WARNING: The normal operating temperature of the EGR system is very high. Never work around or attempt to service any part of the EGR system until it has cooled.

NOTE: Attempt to operate the vehicle under conditions similar to which the DTC was set.

NOTE: It may be necessary to test drive the vehicle within the DTC monitoring conditions in order for this DTC to set.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

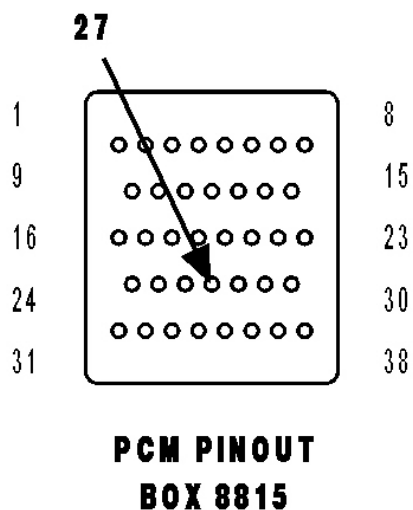
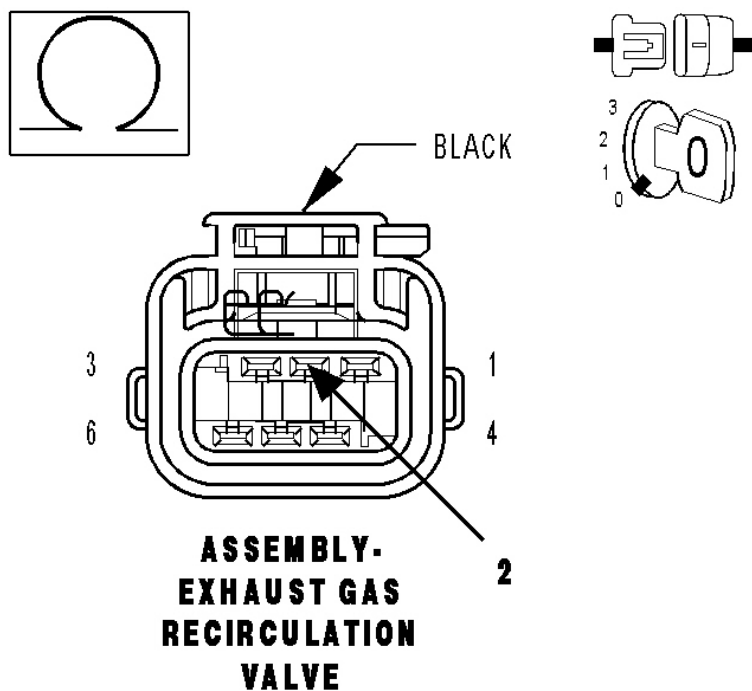
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. EXCESSIVE RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT



813466ec

Fig. 74: Checking EGR Position Sensor 5-Volt Supply Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Solenoid harness connector.

Disconnect the C1 and C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the EGR Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

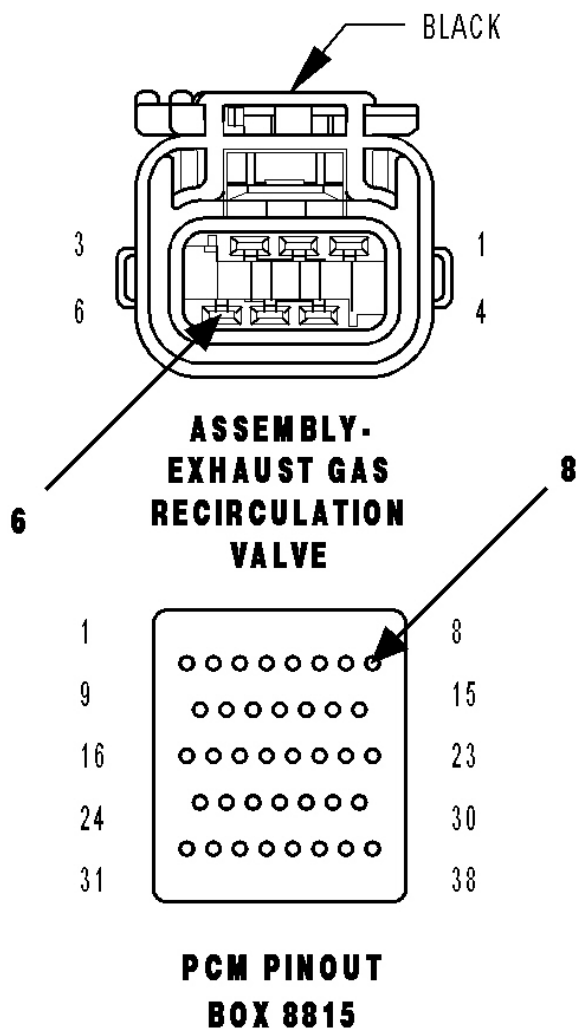
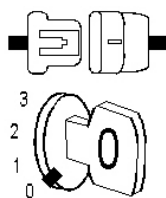
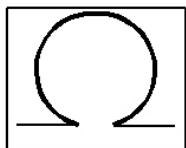
Go To 3.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K35) EGR SOLENOID CONTROL CIRCUIT OPEN



813465c1

Fig. 75: Checking EGR Solenoid Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K35) EGR Solenoid Control circuit from the EGR Solenoid harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

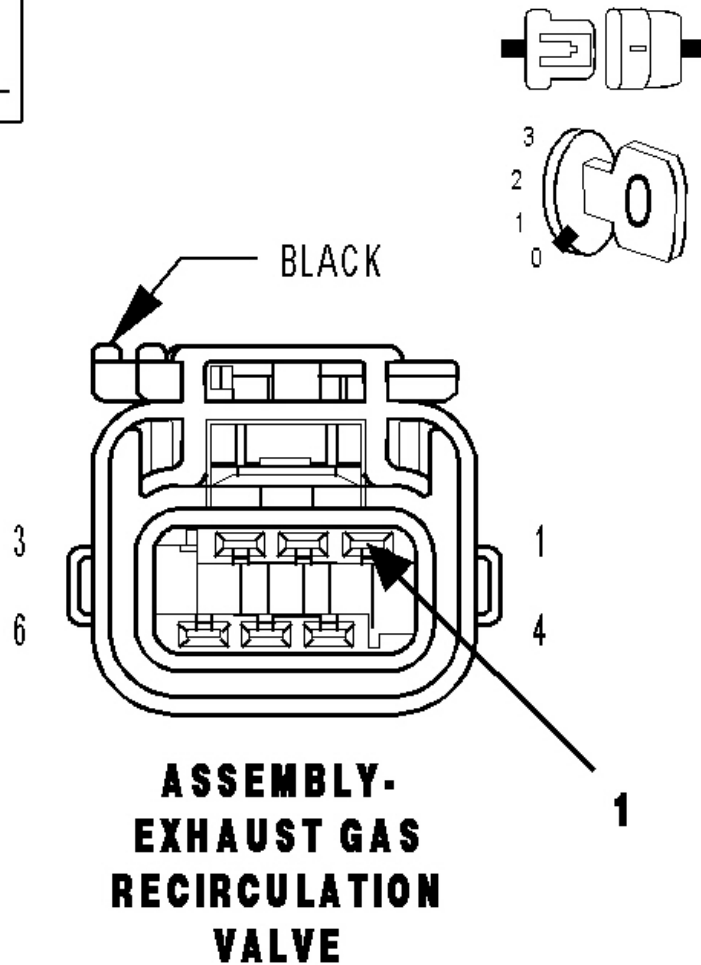
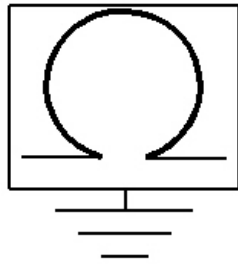
Go To 4.

No

Repair the open in the (K35) EGR Solenoid Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K34) EGR SENSOR SIGNAL CIRCUIT SHORTED TO GROUND



813466ba

Fig. 76: Checking EGR Position Sensor Circuits
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K34) EGR Sensor Signal circuit in the EGR Solenoid harness connector.

Is the resistance below 5.0 ohms?

Yes

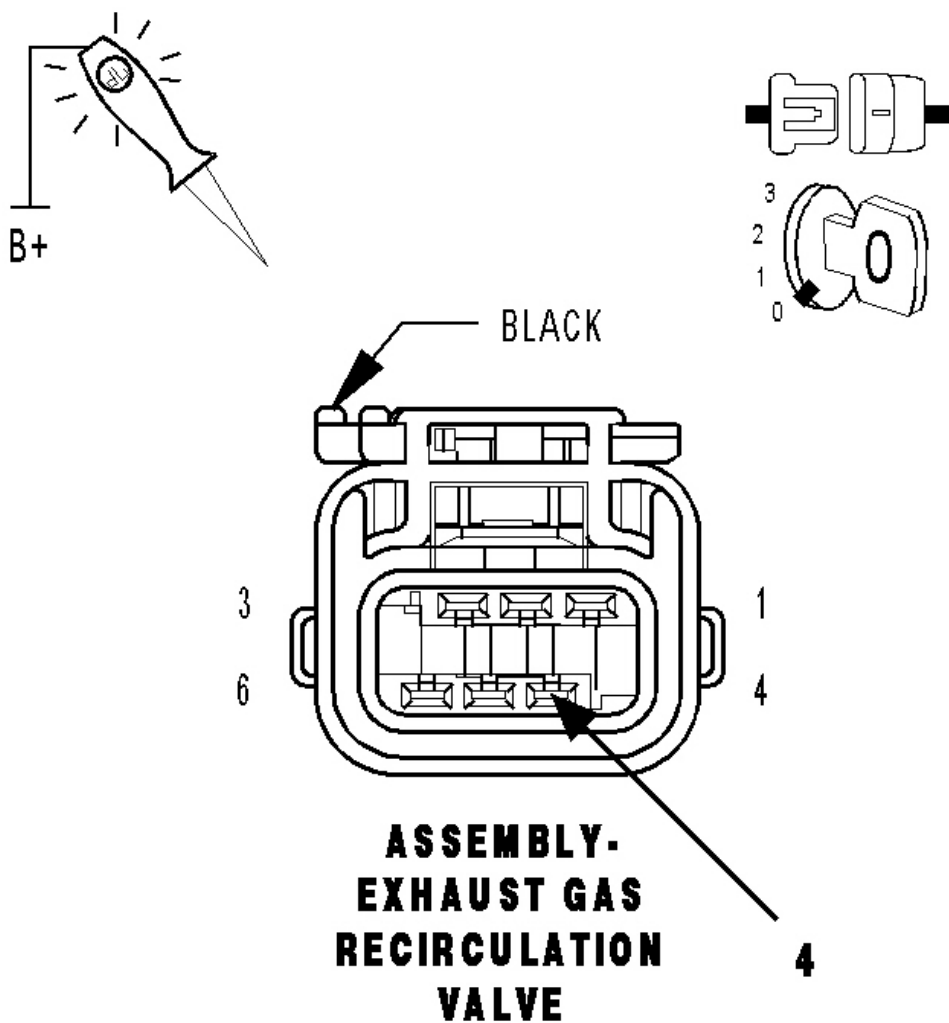
Repair the short to ground in the (K34) EGR Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(Z904) GROUND CIRCUIT OPEN OR HIGH RESISTANCE**



8134651e

Fig. 77: Checking EGR Solenoid Ground Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the EGR Valve Assembly harness connector.

Using a 12 volt test light connected to the 12 volts, check the (Z904) Ground circuit in the EGR Valve Assembly harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 6.

No

Repair the (Z904) Ground circuit for an open circuit of high resistance.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **(K35) EGR CONTROL CIRCUIT HIGH RESISTANCE**

Turn the ignition off.

Connect the EGR Valve Assembly connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter, perform a voltage drop test by backprobing the (K35) EGR Control circuit at the EGR Valve Assembly harness connector and probing the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so that positive polarity is displayed on the voltmeter.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, perform the EGR System Test.

Select OPEN to open the EGR valve.

Monitor the circuit voltage on the voltmeter.

Is the voltage below 0.5 volts when the valve was opened during the system test?

Yes

Go to 7.

No

Repair the (K35) EGR Control circuit for excessive resistance.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EGR SOLENOID ASSEMBLY

Turn the ignition off.

Connect the Powertrain Control Module (PCM) connector.

Turn the ignition on.

With the scan tool, actuate the EGR Valve Solenoid Duty Cycle.

Select the Duty Cycle reading of 79.9%

Using a 12 volt test light connected to ground, check the (K35) EGR Control circuit in the EGR Valve Assembly harness connector.

NOTE: If the DTC is active, the actuation test may not be allowed by the PCM. If may be necessary to clear the DTCs before starting the actuation.

NOTE: The voltage supplied to the solenoid circuit during the actuation may be less than battery voltage. The test light should be illuminated, but may not be as bright as a direct connection to the battery.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors. If OK, replace the EGR Solenoid Assembly per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

8. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the EGR Solenoid Assembly and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Solenoid and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

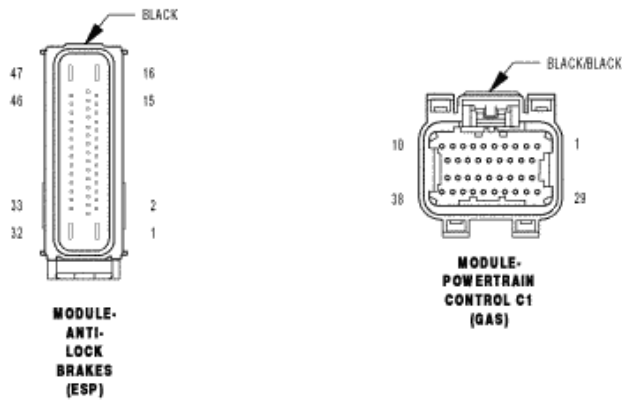
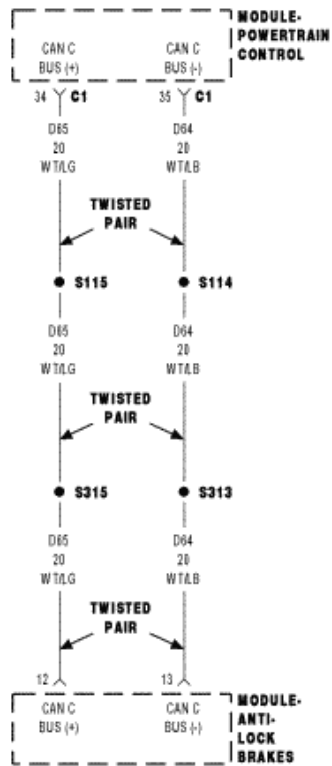
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1501-VEHICLE SPEED SENSOR 1/2 CORRELATION - DRIVE WHEELS

CIRCUIT SCHEMATIC



01948756

Fig. 78: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and vehicle moving. Cruise is learned and customer is trying to use the Cruise.

SET CONDITIONS

- Set Condition:

The PCM recognizes rear wheel speed is greater than front wheel speed. One trip fault.

POSSIBLE CAUSES

Possible Causes
ACTIVE BUS OR COMMUNICATION DTCS
TIRE CIRCUMFERENCE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: Check for any Bus Communication DTCs. If no Bus Communication DTCs are set, check for active DTCs stored in the Anti-Lock Brake Module. Any Bus Communication DTCs or VSS DTCs in the Anti-Lock Brake Module must be properly diagnosed before continuing.

Start the engine.

Allow the engine to idle.

NOTE: It may be necessary to drive the vehicle for the fault to become Active.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **VISUAL INSPECTION**

NOTE: **This code can set due to tire circumference differences and from the front or rear wheels being on a slippery surface while the opposite tires are not.**

This code may also set on a hard acceleration on loose gravel or during other off road driving conditions.

Check tire pressure of all the tires.

Check tire wear on all the tires.

Ask the customer what the road and driving conditions were like when the fault set.

Were any problems found?

Yes

Repair as necessary. If the code sets during a front OR rear wheel spin condition, no repair is necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Wheel Speed Sensors, ABS Module, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Wheel Speed Sensor, ABS Module, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

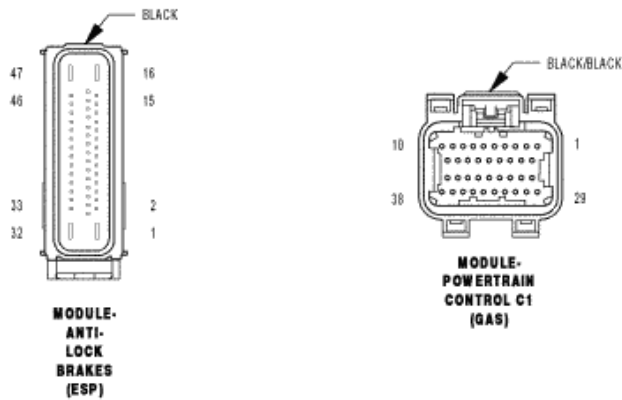
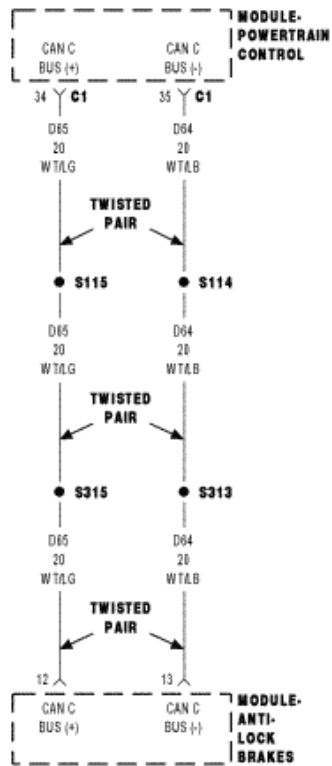
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1502-VEHICLE SPEED SENSOR 1/2 CORRELATION - NON DRIVE WHEELS

CIRCUIT SCHEMATIC



01948756

Fig. 79: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and vehicle moving. Brake pedal must not be applied.

SET CONDITIONS

- Set Condition:

The PCM recognizes front axle speed is greater than rear axle speed. One trip fault.

POSSIBLE CAUSES

Possible Causes
ACTIVE BUS OR COMMUNICATION DTCS TIRE CIRCUMFERENCE POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: Check for any Bus Communication DTCs. If no Bus Communication DTCs are set, check for active DTCs stored in the Anti-Lock Brake Module. Any Bus Communication DTCs or VSS DTCs in the Anti-Lock Brake Module must be properly diagnosed before continuing.

Start the engine.

Allow the engine to idle.

NOTE: It may be necessary to drive the vehicle for the fault to become Active.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **VISUAL INSPECTION**

NOTE: **This code can set due to tire circumference differences and from the front or rear wheels being on a slippery surface while the opposite tires are not.**

This code may also set on a hard acceleration on loose gravel or during other off road driving conditions.

Check tire pressure of all the tires.

Check tire wear on all the tires.

Ask the customer what the road and driving conditions were like when the fault set.

Were any problems found?

Yes

Repair as necessary. If the code sets during a front OR rear wheel spin condition, no repair is necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Wheel Speed Sensors, ABS Module, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Wheel Speed Sensor, ABS Module, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1572-BRAKE PEDAL STUCK ON

CIRCUIT SCHEMATIC

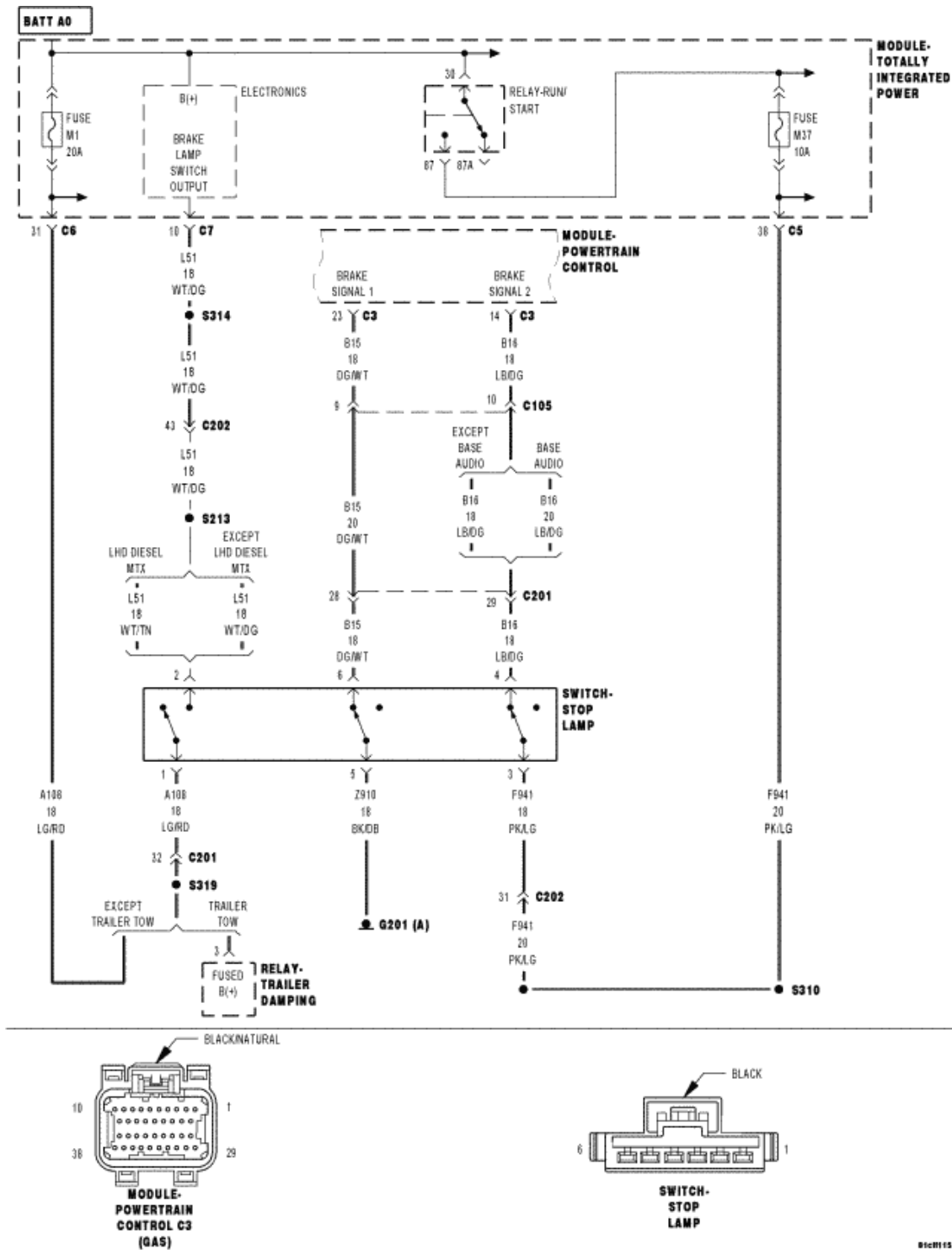


Fig. 80: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on. In plant mode only.

SET CONDITIONS

- **Set Condition:**

PCM recognizes the Brake Pedal could not electrically indicate the applied (On) position with both switch inputs. One trip fault.

POSSIBLE CAUSES

Possible Causes
(B15) BRAKE SIGNAL 1 CIRCUIT OPEN (B16) BRAKE SIGNAL 2 CIRCUIT OPEN STOP LAMP SWITCH POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Make sure the Stop Lamp Switch is adjusted properly before continuing.**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **STOP LAMP SWITCH OPERATION**

NOTE: **Inspect the relate Fuse.**

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connector.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to open circuit when pressing and releasing the brake pedal switch?

Yes

Go To 3.

No

Replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

3. STOP LAMP SWITCH OPERATION

Measure the resistance between the (F941) Fused Ignition Switch terminal and the (B16) Brake Signal 2 circuit terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to open circuit when pressing and releasing the Stop Lamp Switch?

Yes

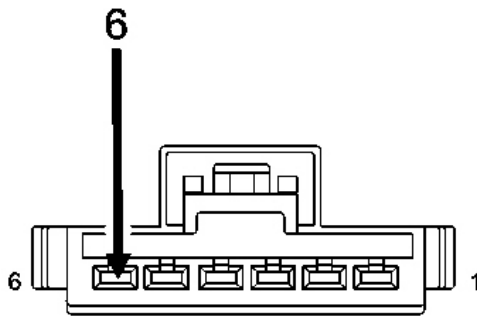
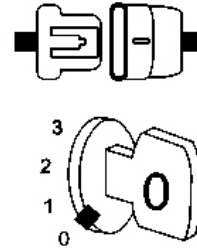
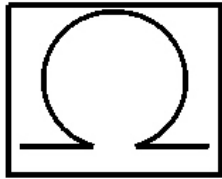
Go To 4.

No

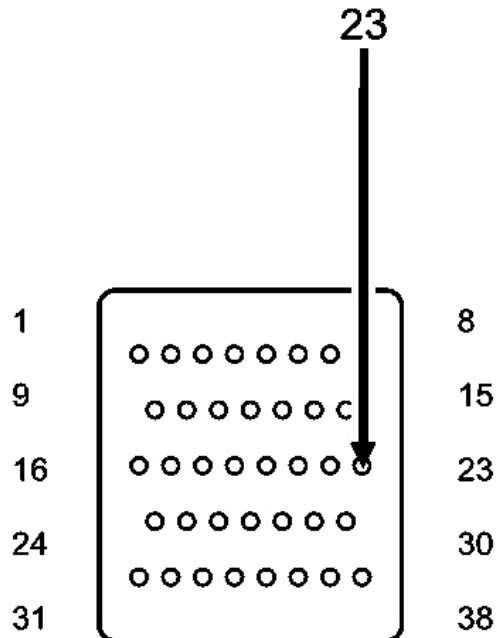
Replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B15) BRAKE SIGNAL 1 CIRCUIT OPEN



**SWITCH-
STOP
LAMP**



PCM PINOUT

BOX 8815

81336c2e

Fig. 81: Checking Brake Switch No. 1 Signal Circuit Open For Open
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal

to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (B15) Brake Signal 1 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

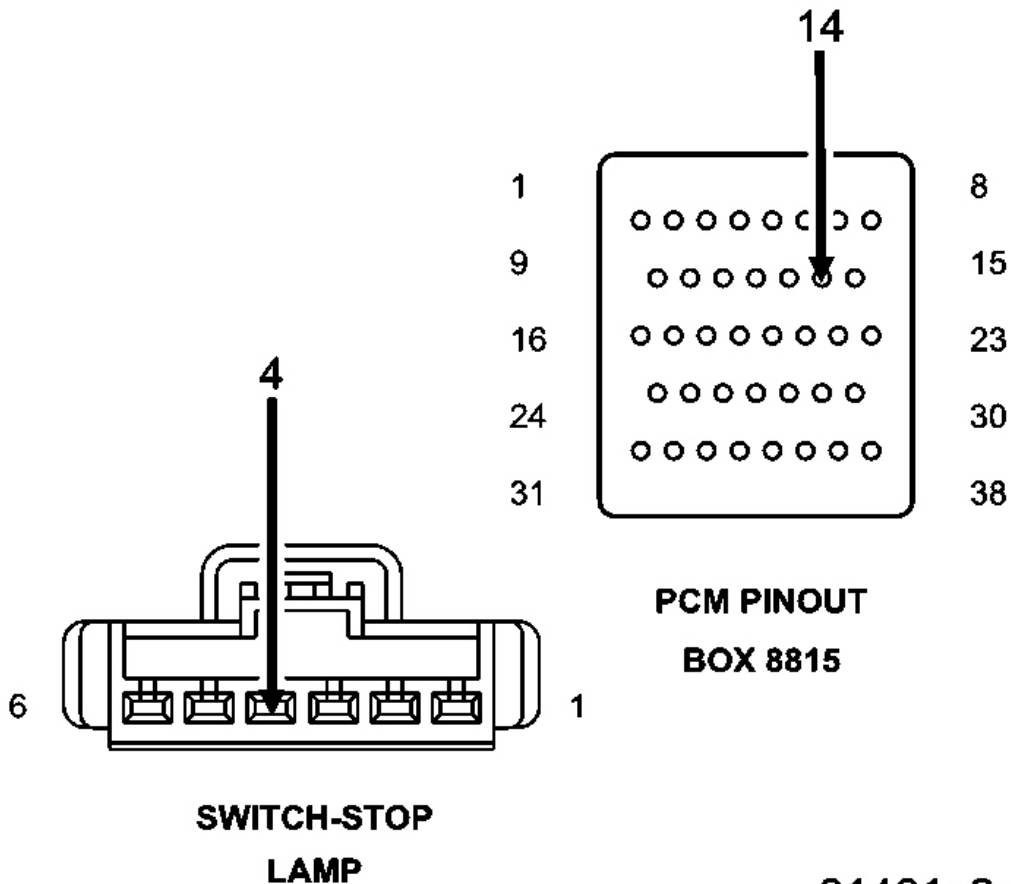
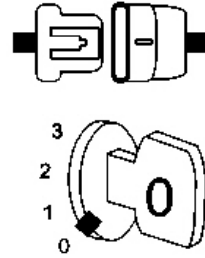
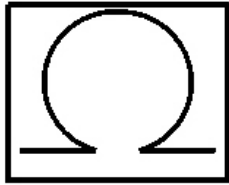
Go To 5.

No

Repair the open in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(B16) BRAKE SIGNAL 2 CIRCUIT OPEN**



81461e2c

Fig. 82: Checking Brake Switch No. 2 Signal Circuit For Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (B16) Brake Signal 2 circuit from the Stop Lamp Switch harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1573-BRAKE PEDAL STUCK OFF

CIRCUIT SCHEMATIC

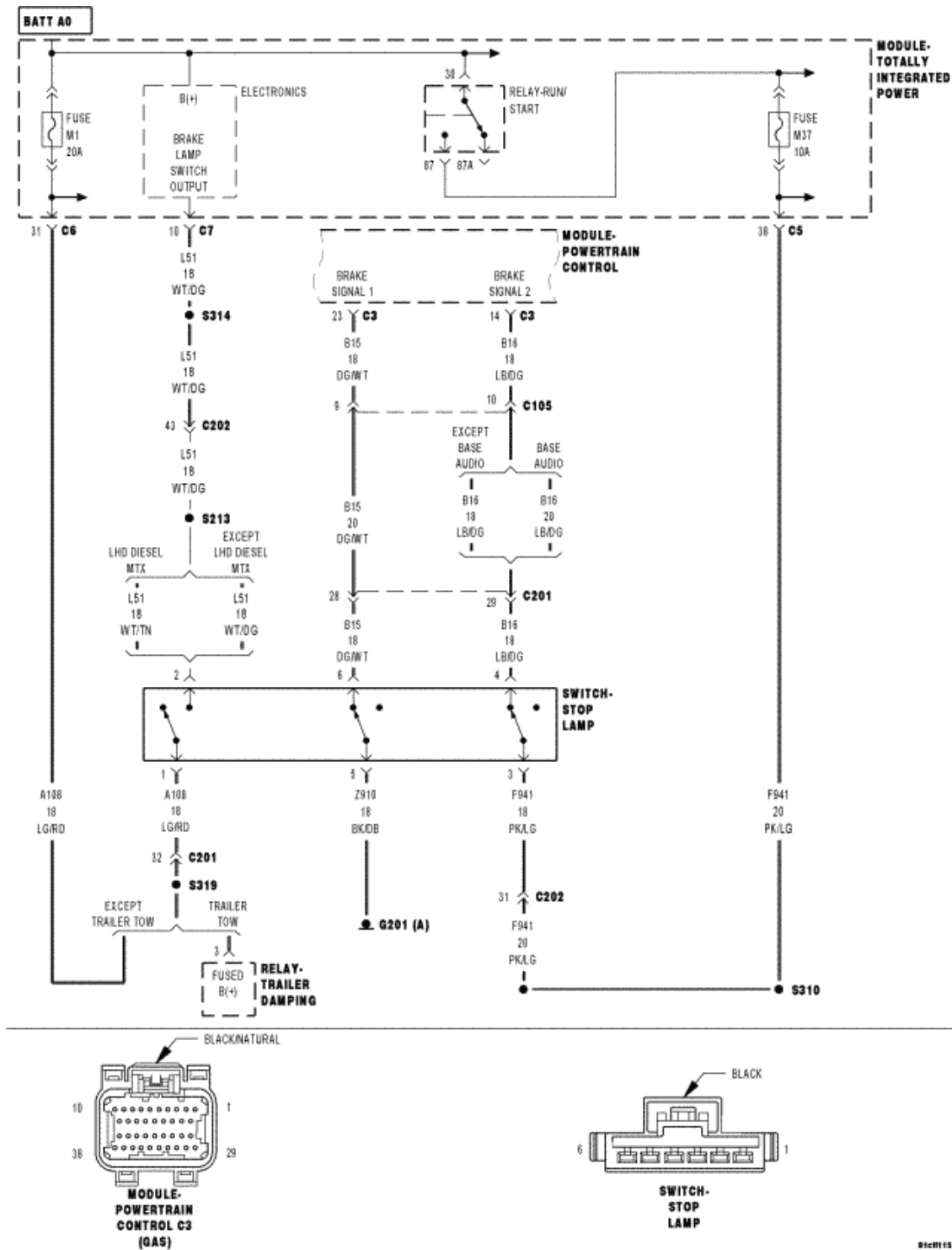


Fig. 83: Brake Lamp Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on, In plant mode passed the Applied test.

SET CONDITIONS

- **Set Condition:**

PCM recognizes the Brake Pedal could not electronically indicate the released (Off) position with both switches. If P1572 sets, P1573 will also set. One trip fault.

POSSIBLE CAUSES

Possible Causes
(B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(B15) BRAKE SIGNAL 1 CIRCUIT SHORTED TO GROUND
STOP LAMP SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Make sure the Stop Lamp Switch is adjusted properly before continuing.**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **STOP LAMP SWITCH OPERATION**

NOTE: **Inspect the relate Fuse.**

Turn the ignition off.

Disconnect the Stop Lamp Switch harness connectors.

Measure the resistance between the (Z910) Ground circuit terminal and the (B15) Brake Signal 1 terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit when pressing and releasing the brake switch?

Yes

Go To 3.

No

Replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

3. STOP LAMP SWITCH OPERATION

Measure the resistance between the (F941) Fused Ignition Switch circuit terminal and the (B16) Brake Signal 2 circuit terminal in the Stop Lamp Switch.

Apply and release the Stop Lamp Switch while monitoring the ohmmeter.

Does the resistance change from below 5.0 ohms to an open circuit when pressing and releasing the Stop Lamp switch?

Yes

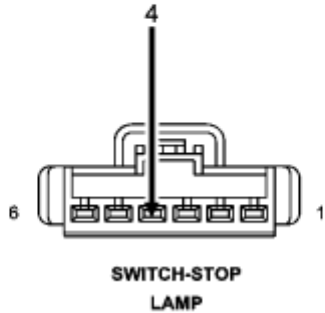
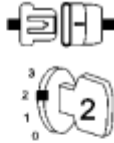
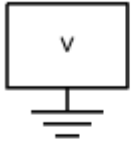
Go To 4.

No

Replace the Stop Lamp Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (B16) BRAKE SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE



81462fae

Fig. 84: Checking Brake Switch No.2 Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (B16) Brake Signal 2 circuit in the Stop Lamp Switch harness connector.

Is there any voltage present?

Yes

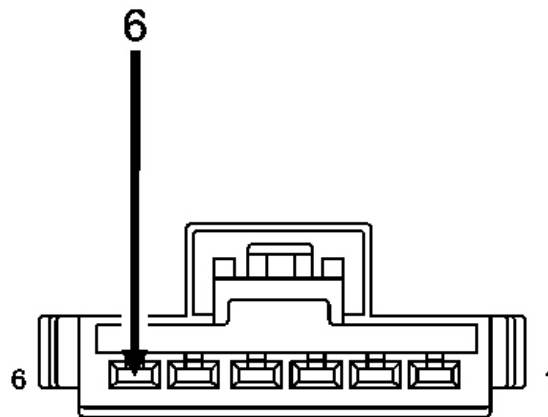
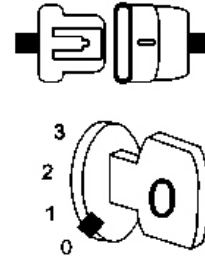
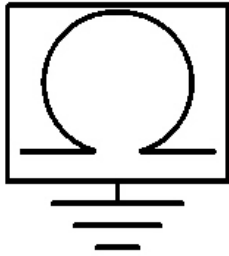
Repair the short to voltage in the (B16) Brake Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 5.

5. (B15) BRAKE SIGNAL 1 CIRCUIT SHORTED TO GROUND



**SWITCH-
STOP
LAMP**

81336c02

Fig. 85: Checking Brake Switch No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (B15) Brake Signal 1 circuit in the Stop Lamp Switch harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (B15) Brake Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Stop Lamp Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P1593-SPEED CONTROL SWITCH 1/2 STUCK

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• Set Condition:

Cruise Switch inputs are not coherent with each other. Example: PCM is reading Switch No.1 as Accel and Switch No.2 as Coast at the same time. One trip fault.

POSSIBLE CAUSES

Possible Causes
S/C SWITCH SIGNAL CIRCUITS SHORTED TO VOLTAGE
RESISTANCE IN THE S/C SWITCH SIGNAL CIRCUITS
RESISTANCE IN THE (V937) S/C RETURN CIRCUIT
S/C SWITCH SIGNAL CIRCUITS SHORTED TO THE (V937) S/C RETURN CIRCUIT
(V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V72) S/C SIGNAL 2 CIRCUIT
S/C SWITCH SIGNAL CIRCUITS SHORTED TO GROUND
SPEED CONTROL SWITCH
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: This DTC is a two trip fault. If the scan tool indicates a one trip failure, the possible cause may have been the customer pressing the switch in two positions simultaneously. Test drive the vehicle and activate the Speed Control system. If the DTC matures to an active fault a repair is necessary.

Ask the customer if it is possible that button was held in two positions at the same time before this DTC set. If this is the case, no repair is necessary.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. SPEED CONTROL SWITCH

With the scan tool, monitor the Speed Control Switch voltage.

Disconnect the Speed Control Switch harness connector.

Did the voltage change to above 4.8 volts?

Yes

Replace the Speed Control Switch.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. SPEED CONTROL SWITCHES

Turn the ignition off.

Remove and disconnect the Speed Control Switch from the steering wheel per Service Information.

Measure the resistance across each Speed Control Switch.

Monitor the ohmmeter while pressing each function button on each switch.

The following resistance specs are taken between terminals (V72) S/C Signal 2 and (V937) S/C Return circuit of the Switch when holding the switch button in the following position.

Not pressing any switch - 20.5 kohms

On/Off - 8.87 kohms

Set - 0.825 kohms

Coast - 0.47 kohms

Cancel - 3.92 kohms

Resume/Accel - 1.87 kohms

The following resistance specs are taken between terminals (V71) S/C Signal 1 and (V937) S/C Return circuit of the Switch when holding the switch button in the following position

Not pressing any switch - 20.5 kohms

On/Off - 0.47 kohms

Set - 5.49 kohms

Coast - 2.94 kohms

Cancel - 1.24 kohms

Resume/Accel - 15.4 kohms

Does the function on the Speed Control Switch have the correct resistance value?

Yes

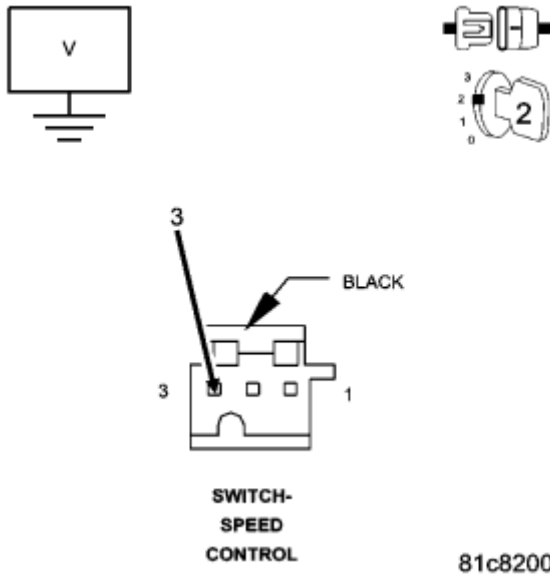
Go To 4.

No

Replace the Speed Control Switch that had the incorrect resistance value.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE



81c82002

Fig. 2: Measuring Voltage On S/C Signal 1 Circuit At Speed Control Harness Connector
 Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the voltage on the (V71) S/C Signal 1 circuit at the Speed Control harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

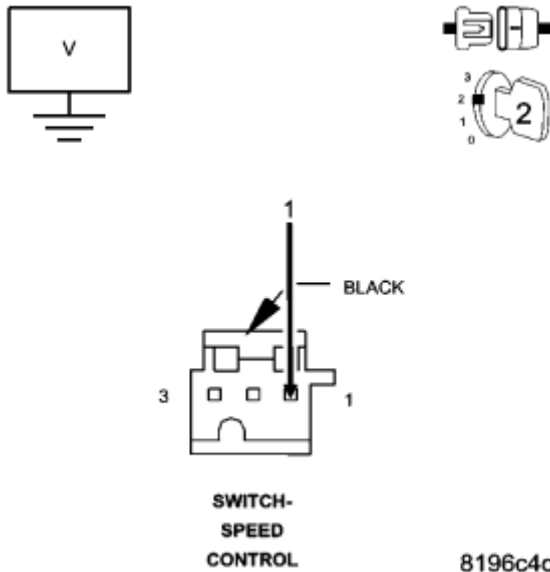


Fig. 3: Measuring Voltage On (V72) S/C Signal 2 Circuit In S/C Switch Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage on the (V72) S/C Signal 2 circuit at the Speed Control harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (V72) S/C Signal 2 circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (V71) S/C SIGNAL 1 CIRCUIT OPEN

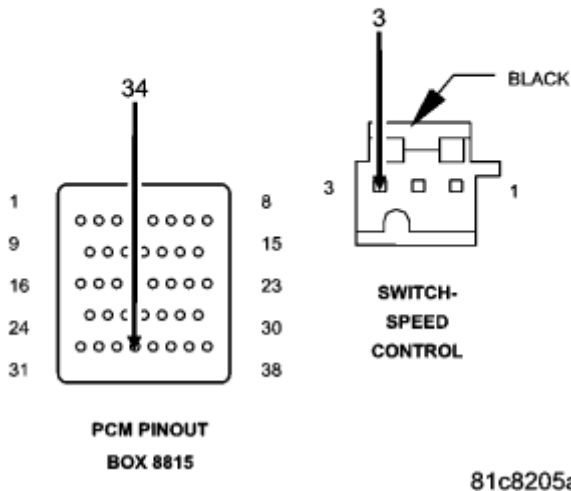


Fig. 4: Measuring Resistance Of (V71) S/C Signal 1 Circuit From Speed Control Switch To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Measure the resistance of the (V71) S/C Signal 1 circuits from the Speed Control harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To 7.

No

Repair the excessive resistance in the (V71) S/C Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (V72) S/C SIGNAL 2 CIRCUIT OPEN

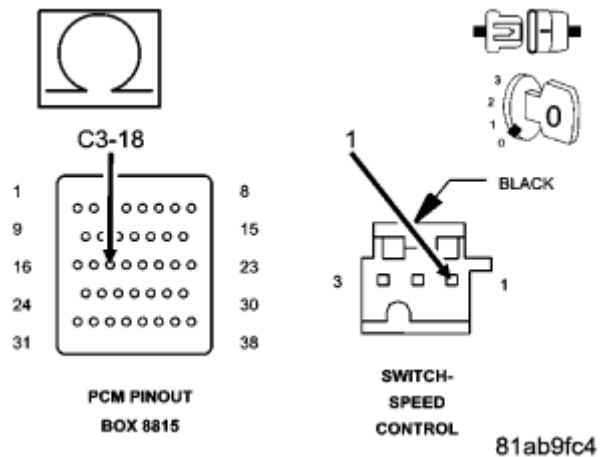


Fig. 5: Measuring Resistance Of (V71) And (V72) S/C Signal Circuits From Speed Control Harness Connector To Appropriate Terminals Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (V72) S/C Signal 2 circuit from the Speed Control harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To 8.

No

Repair the excessive resistance in the (V72) S/C Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (V937) S/C RETURN CIRCUIT OPEN

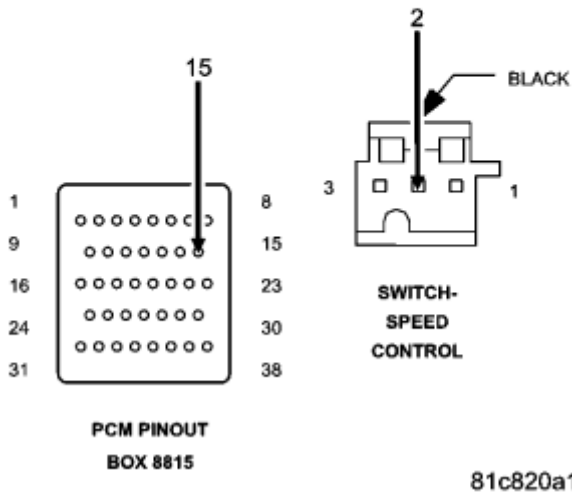


Fig. 6: Measuring Resistance Of (V937) S/C Return Circuit From S/C Switch Harness Connector To Appropriate Terminal Of Special Tool #8815

Courtesy of CHRYSLER LLC

NOTE: The measurement must be taken from both Speed Control Switch harness connectors.

Measure the resistance of the (V937) S/C Return circuit at the Speed Control harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for both measurements?

Yes

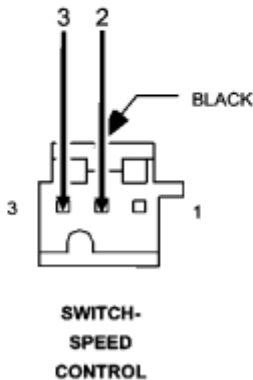
Go To 9.

No

Repair the excessive resistance in the (V937) S/C Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT



8196bc41

Fig. 7: Measuring Resistance Between (V937) S/C Return Circuit And (V71) S/C Signal 1 Circuit At S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V937) S/C Return circuit and both of the (V71) S/C Signal 1 circuit in the S/C Switch harness connector.

Is the resistance below 5.0 ohms?

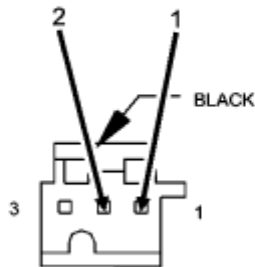
Yes

Repair the short between the (V937) S/C Return circuit and the (V71) S/C Switch Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. (V72) S/C SIGNAL 2 CIRCUIT SHORTED TO THE (V937) S/C RETURN CIRCUIT



SWITCH-
SPEED
CONTROL

81c820e4

Fig. 8: Measuring Resistance Between S/C Return Circuit And S/C Signal Circuits In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V937) S/C Return circuit and both of the (V72) S/C Signal 2 circuit in the S/C Switch harness connector.

Is the resistance below 5.0 ohms?

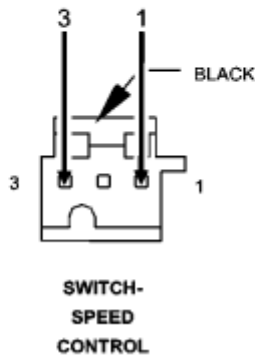
Yes

Repair the short between the (V937) S/C Return circuit and the (V72) S/C Switch Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 11.

11. (V71) S/C SIGNAL 1 CIRCUIT SHORTED TO THE (V72) S/C SIGNAL 2 CIRCUIT



8196c3ae

Fig. 9: Measuring Resistance Between (V71) S/C Signal 1 Circuit And (V72) S/C Signal 2 Circuit At Speed Control Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (V71) S/C Signal 1 circuit and the (V72) S/C Signal 2 circuit at the Speed Control harness connector.

Is the resistance below 100 ohms for each circuit?

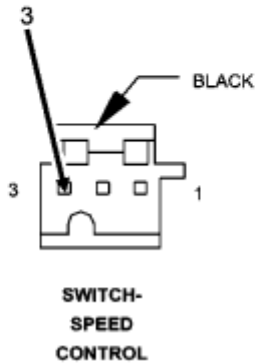
Yes

Repair the short between the (V72) S/C Signal 2 circuit and the (V71) S/C Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

12. (V71) S/C SWITCH SIGNAL 1 CIRCUIT SHORTED TO GROUND



81c82016

Fig. 10: Measuring Resistance Between Ground And (V71) S/C Signal 1 Circuit In S/C Switch Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V71) S/C Switch Signal 1 circuit at the S/C Switch harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (V71) S/C Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. (V72) S/C SWITCH SIGNAL 2 CIRCUIT SHORTED TO GROUND

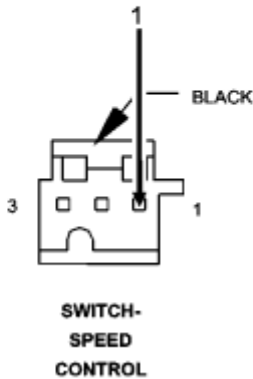


Fig. 11: Measuring Resistance Between Ground And S/C Switch Signal Circuits At S/C Switch Harness Connectors
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (V72) S/C Switch Signal 2 circuit at the S/C Switch harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (V72) S/C Signal 2 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

14. SPEED CONTROL SWITCH VOLTAGE VALUES

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Install Miller Special Tool #8815-1 on the C3 PCM harness connector.

Connect the S/C Switch harness connectors.

Connect the SCCM harness connectors.

Turn the ignition on.

With a scan tool, monitor the S/C Switch voltage readings.

Using a voltmeter check the voltage on the (V37) S/C Signal 1 circuit and the (V38) S/C Signal 2 circuit at the appropriate terminals of the special tool #8815.

Monitor the voltmeter.

With a scan tool, monitor the S/C Switch voltage readings.

SWITCH POSITION	SWITCH No.1 VOLTAGE VALUE	SWITCH No.2 VOLTAGE VALUE
NO SWITCHES PRESSED	4.31 to 4.78 volts	4.31 to 4.78 volts
ON/OFF PRESSED	0.59 to 1.13 volts	3.53 to 3.92 volts
RES/ACCEL PRESSED	3.88 to 4.17 volts	2.04 to 2.47 volts
SET PRESSED	3.16 to 3.56 volts	1.17 to 1.56 volts
COAST PRESSED	2.57 to 2.94 volts	0.77 to 1.09 volts
CANCEL PRESSED	1.59 to 1.99 volts	2.84 to 3.25 volts

Compare the voltage readings on the voltmeter to what the scan tool displayed.

Are the voltage readings out of the listed specification and is there less than a 0.2 of a volt difference between the voltmeter switch values and the scan tool switch values?

Yes

Verify that there is good pin to terminal contact in the Switch and Powertrain Control Module connectors. Replace the Speed Control Switch if no problems are found in the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Speed Control Switch and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact

in the Switch and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1607-PCM INTERNAL SHUTDOWN TIMER RATIONALITY

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The PCM compares actual shutdown time to a calculated shutdown time value. The calculated shut down time value is based on the amount the ECT should drop after a completely warmed up engine is shut down for a minimum of 8 hours. If the difference between actual shutdown time and the calculated shut down time is greater than a maximum value, a one trip failure will set. The shutdown time is measured again after 1 hour of ignition off time following the next engine warm up cycle. The PCM compares the shutdown time to a calculated value. If the difference is greater than a maximum value, the MIL is illuminated and a DTC will set.

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

This DTC sets if the engine coolant temp does not drop enough or drops too much during engine off time. This DTC may also set if the controller timer is inaccurate. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes

ENGINE COOLING CONDITIONS THAT MAY SET THIS DTC ENGINE COOLANT LEVEL PCM INTERNAL TIMER

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ENGINE COOLANT INSPECTION

NOTE: This DTC will set if the engine cools quicker than is should compared to engine off times. If the customer washed a hot engine with the engine off, a One Trip Failure will set. If the vehicle is parked in a highly ventilated area or has a large fan blowing on it which might cause the engine to cool quicker than expected this DTC may set.

WARNING: Do not remove or loosen the radiator cap with the system hot and under pressure. Serious burns from coolant can occur.

Turn the ignition off.

Allow the engine to cool enough to allow the pressure in the coolant system to drop enough to safely remove the radiator cap.

Check the coolant level and condition.

Is the engine coolant level filled to the proper level?

Yes

Go To 2.

No

Add the appropriate type and amount of engine coolant. Refer to **STANDARD PROCEDURE** .
Perform **POWERTRAIN VERIFICATION TEST** .

2. POWERTRAIN CONTROL MODULE (PCM)

Turn the ignition on.

With the scan tool under PCM/NGC Data Display, locate the Ignition Off Time value.

While monitoring a stop watch, turn the Ignition off for 10 minutes, watch the stop watch for those 10 minutes, and then turn the Ignition on.

With the scan tool under Data Functions, check the Ignition Off Time value again.

Does the Ignition Time Off value on the scan tool match the actual time you had the Ignition off on the stop watch?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

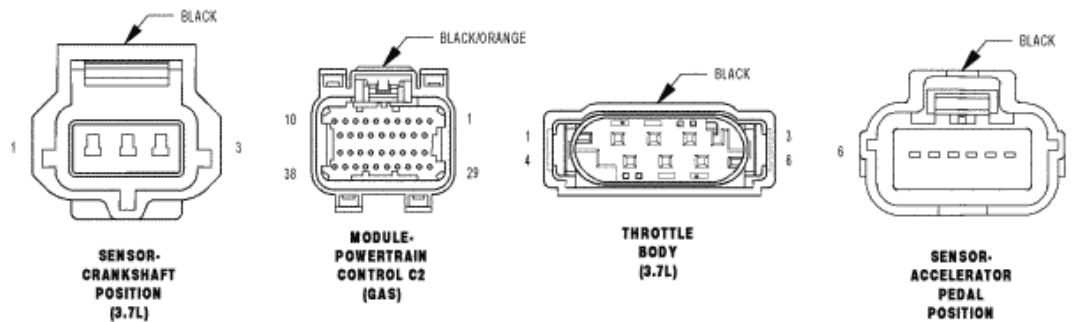
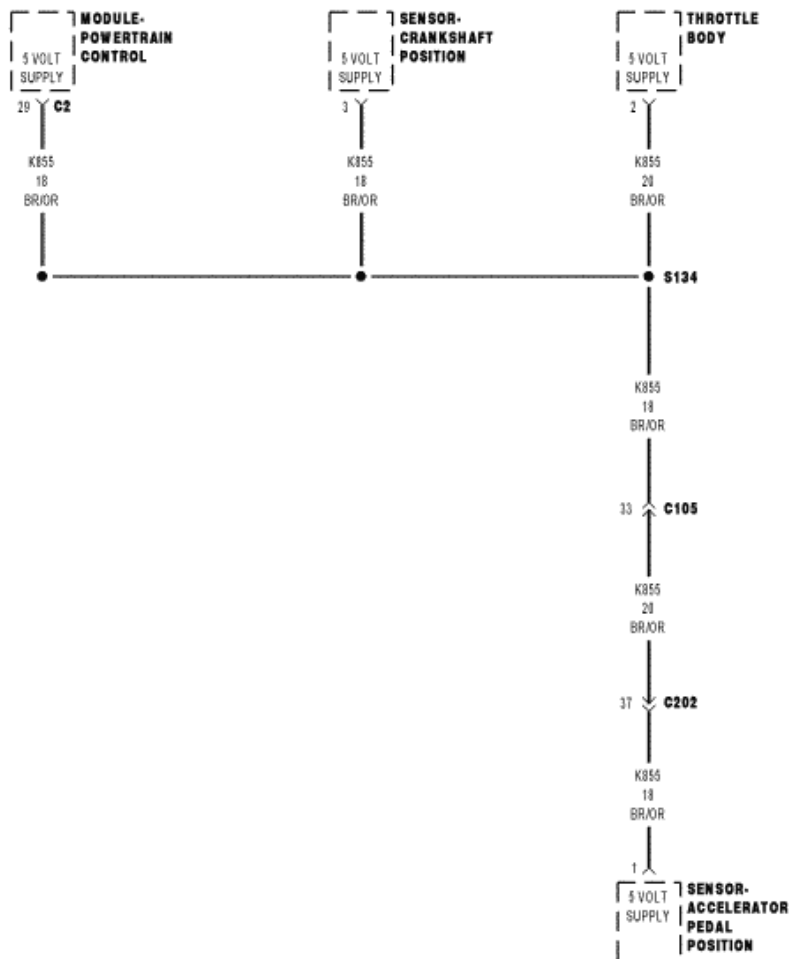
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1618-SENSOR REFERENCE VOLTAGE 1 CIRCUIT ERRATIC

CIRCUIT SCHEMATIC



81000028

Fig. 12: Primary 5-Volt Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• Set Condition:

When the PCM recognizes the Primary 5-volt Supply circuit voltage is varying too much too quickly.
One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K855) PRIMARY 5-VOLT SUPPLY SHORTED TO GROUND
(K855) PRIMARY 5-VOLT SUPPLY SHORTED TO VOLTAGE
(K855) PRIMARY 5-VOLT SUPPLY CIRCUIT OPEN
5-VOLT SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set. Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K855) PRIMARY 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**

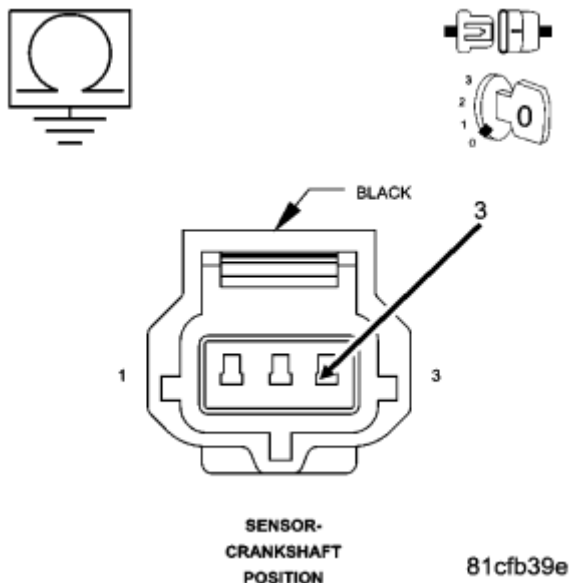


Fig. 13: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect all the Sensors that share the (K855) Primary 5-volt Supply circuit.

NOTE: This code can be caused by the improper installation of after market accessories that may be causing excessive noise on the (K855) 5-volt Supply circuit.

Measure the resistance between ground and the (K855) Primary 5-volt Supply circuit in the CKP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) Primary 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. SENSOR SHORTED TO GROUND

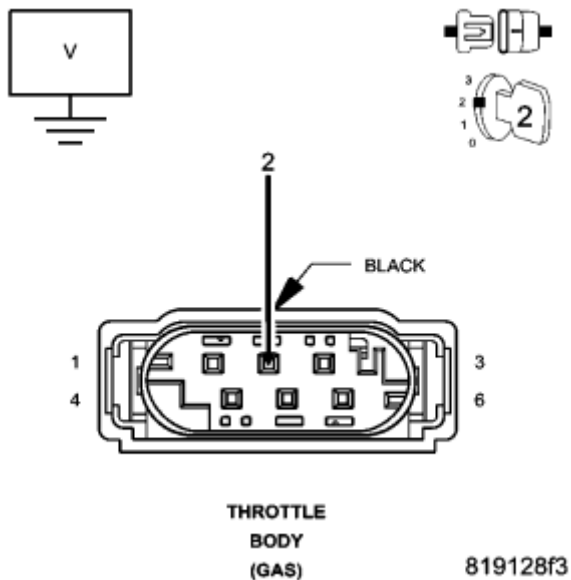


Fig. 14: Measuring Voltage On (F855) 5-Volt Supply Circuit In Throttle Body Harness Connector
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector and all the previously disconnected Sensors except for the CKP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) Primary 5-volt Supply circuit at the Throttle Body harness connector.

NOTE: **You must Turn the Ignition Off when disconnecting any of the Sensor harness connectors and Turn the Ignition On to check the voltage readings.**

While monitoring the voltage, disconnect each Sensor harness connector that shares the (K855) Primary 5-volt Supply circuit, one at a time.

Does the voltage increase above 4.5 volts when disconnecting any of the Sensor harness connectors?

Yes

Verify that there is good pin to terminal contact in the Related Sensor and the Powertrain Control Module connectors. If OK, replace the Sensor that causes the (K855) Primary 5-volt Supply circuit voltage to increase when disconnected.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. 5-VOLT SENSOR

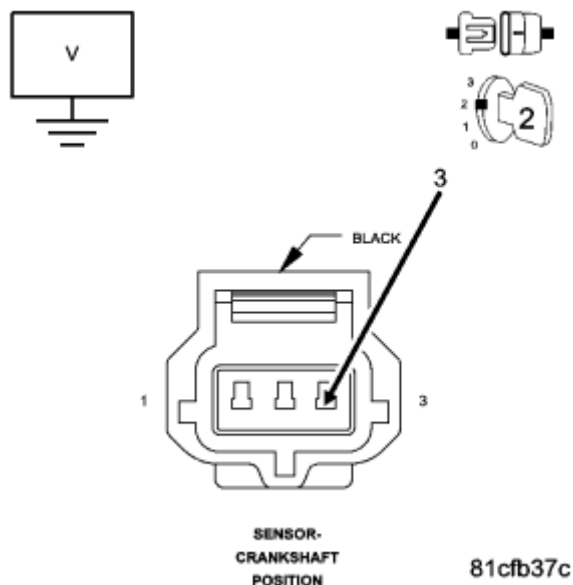


Fig. 15: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect all the previously disconnected Sensors except for the CKP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) Primary 5-volt Supply circuit at the CKP Sensor harness connector.

Is the voltage between 4.8 and 5.2 volts?

Yes

Verify that there is good pin to terminal contact in the Related Sensor and the Powertrain Control Module connectors. If OK, replace the Crank Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K855) PRIMARY 5-VOLT SUPPLY SHORTED TO VOLTAGE

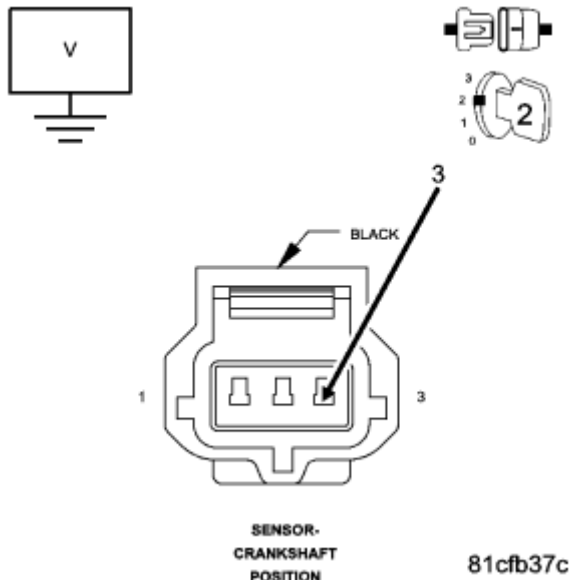


Fig. 16: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect all the Sensors that share the (K855) Primary 5-volt Supply circuit.

Ignition on, engine not running.

Measure the voltage on the (K855) Primary 5-volt Supply circuit in the CKP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K855) Primary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K855) PRIMARY 5-VOLT SUPPLY CIRCUIT OPEN

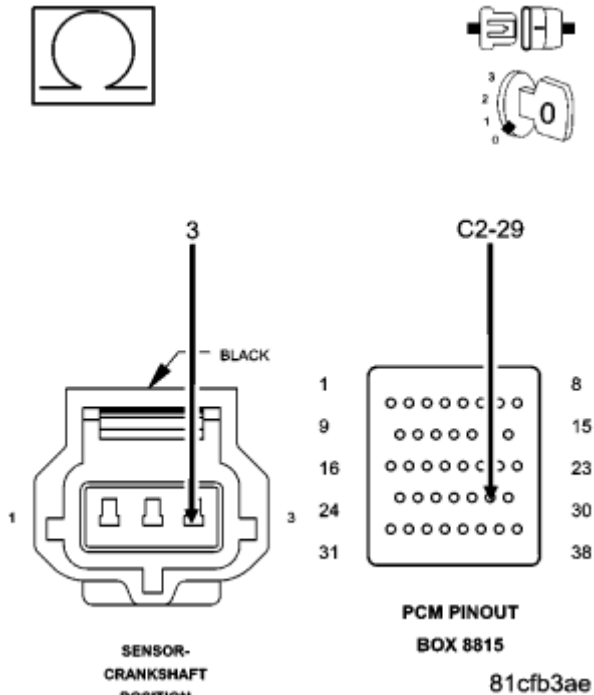


Fig. 17: Measuring The Resistance Of The 5-Volt Supply Circuit From The CKP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect all the sensors that were disconnected in the previous step except for the CKP Sensor harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance in the (K855) Primary 5-volt Supply circuit from the Sensor harness connector to the appropriate terminal of special tool #8815.

It may be necessary to perform this test from every sensor that uses the (K855) Primary 5-volt Supply circuit.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K855) Primary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Related Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

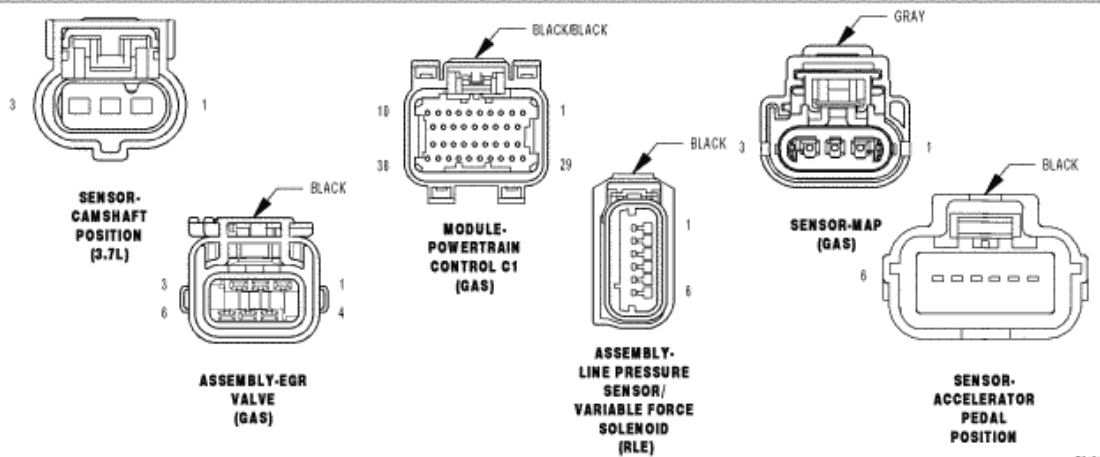
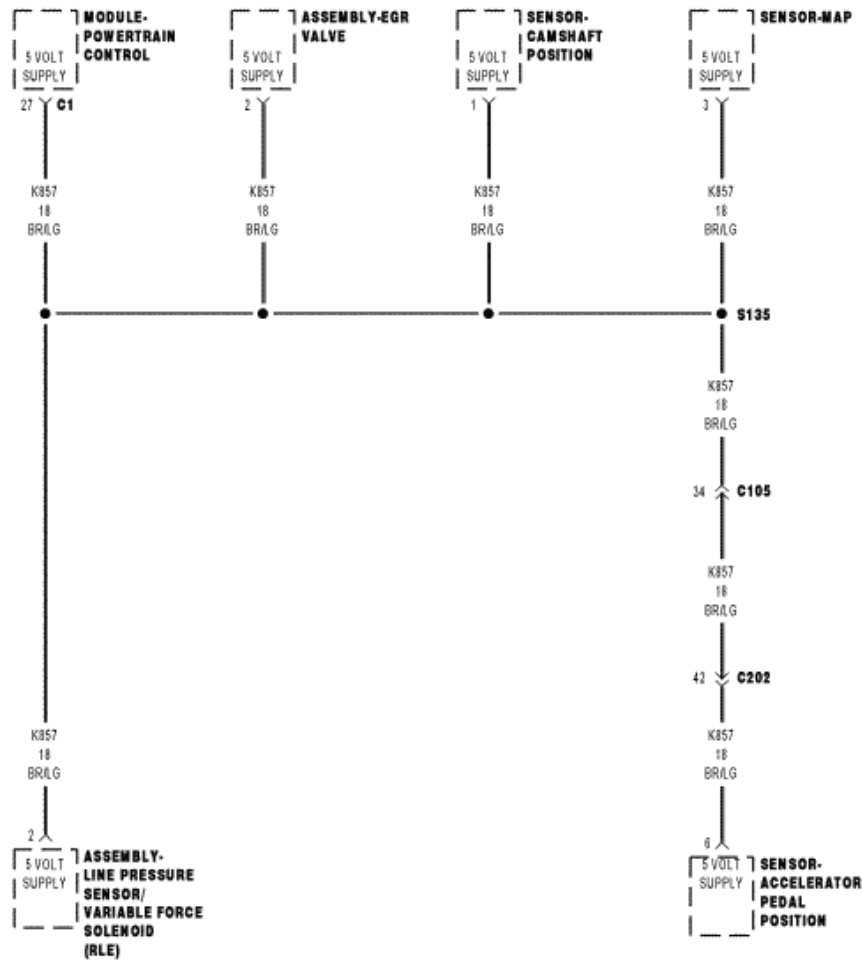
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1628-SENSOR REFERENCE VOLTAGE 2 CIRCUIT ERRATIC

CIRCUIT SCHEMATIC



81c1cc99

Fig. 18: Auxiliary 5-Volt Supply Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• Set Condition:

When the PCM recognizes the Auxiliary 5-volt Supply circuit voltage is varying too much to quickly.
One Trip Fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT OPEN
5-VOLT SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Improperly installed aftermarket accessories can cause this DTC to set.
Check for any improperly installed aftermarket accessories before continuing with this test.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan.
Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**

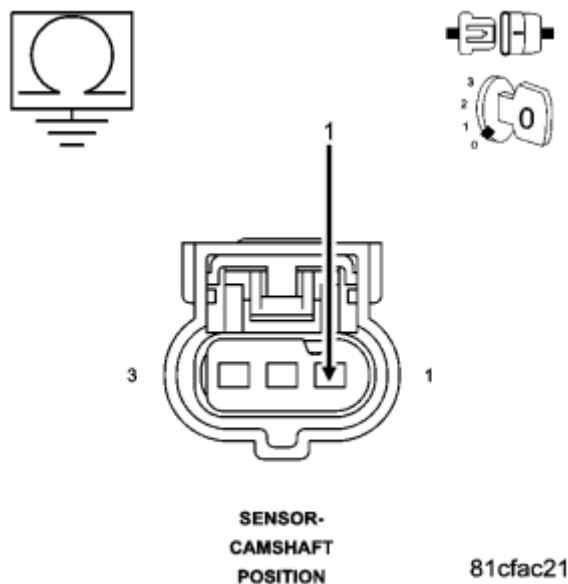


Fig. 19: Measuring The Resistance Between Ground And The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect all the Sensors that share the (K857) Auxiliary 5-volt Supply circuit.

NOTE: This code can be caused by the improper installation of after market accessories that may be causing excessive noise on the (K857) 5-volt Supply circuit.

Measure the resistance between ground and the (K857) Auxiliary 5-volt Supply circuit at the CMP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) Auxiliary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. SENSOR SHORTED TO GROUND

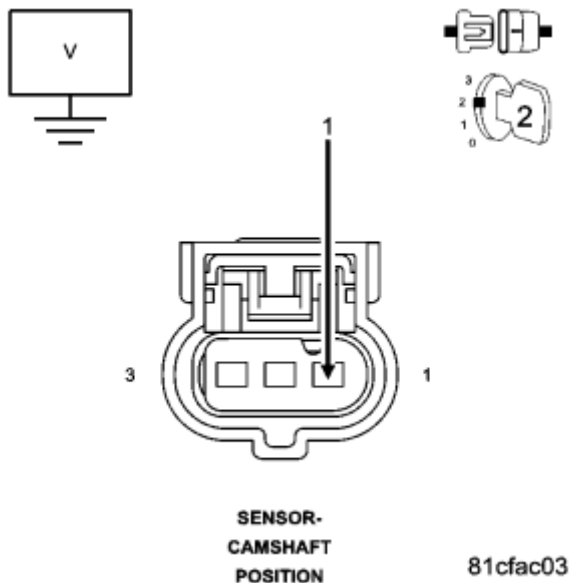


Fig. 20: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Connect the C1 PCM harness connector and all the previously disconnected Sensors except for the CMP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit in the CMP Sensor harness connector.

NOTE: You must Turn the Ignition OFF when disconnecting any of the Sensor harness connectors and Turn the Ignition On to check the voltage readings.

While monitoring the voltage, disconnect each Sensor harness connector that shares the (K857) Auxiliary 5-volt Supply circuit, one at a time.

Does the voltage increase above 4.5 volts when disconnecting any of the Sensor harness connectors?

Yes

Verify that there is good pin to terminal contact in the Related Sensor and the Powertrain Control Module connectors. If OK, replace the Sensor that causes the (K857) Auxiliary 5-volt Supply circuit voltage to increase when disconnected.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. 5-VOLT SENSOR

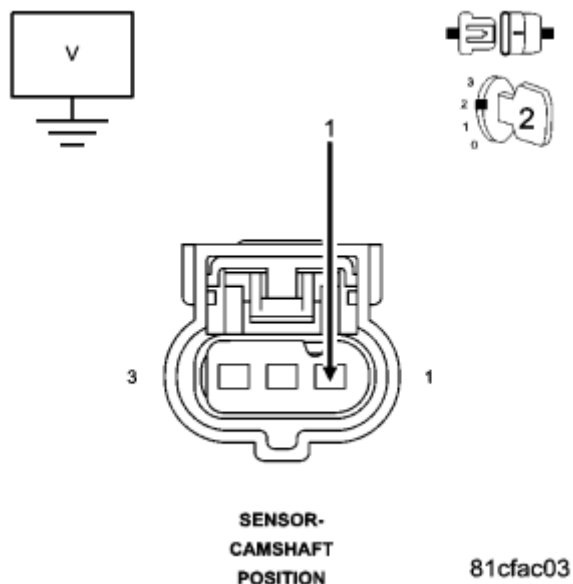


Fig. 21: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect all the previously disconnected Sensors except for the CMP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit in the CMP Sensor harness connector.

Is the voltage below 4.5 volts?

Yes

Go To 5.

No

Verify that there is good pin to terminal contact in the Camshaft Position Sensor and the Powertrain Control Module connectors. If OK, replace the Cam Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE

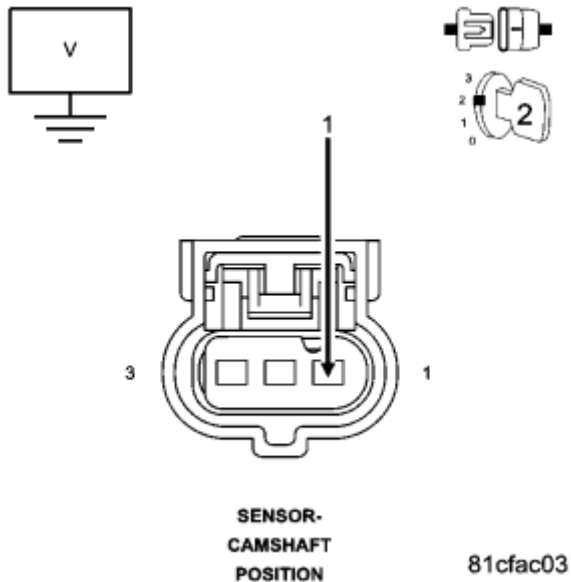


Fig. 22: Measuring The Voltage On The 5-Volt Supply Circuit In The CMP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect all the Sensors that share the (K857) Auxiliary 5-volt Supply circuit.

Ignition on, engine not running.

Measure the voltage on the (K857) Auxiliary 5-volt Supply circuit at the CMP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K857) Auxiliary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K857) AUXILIARY 5-VOLT SUPPLY CIRCUIT OPEN

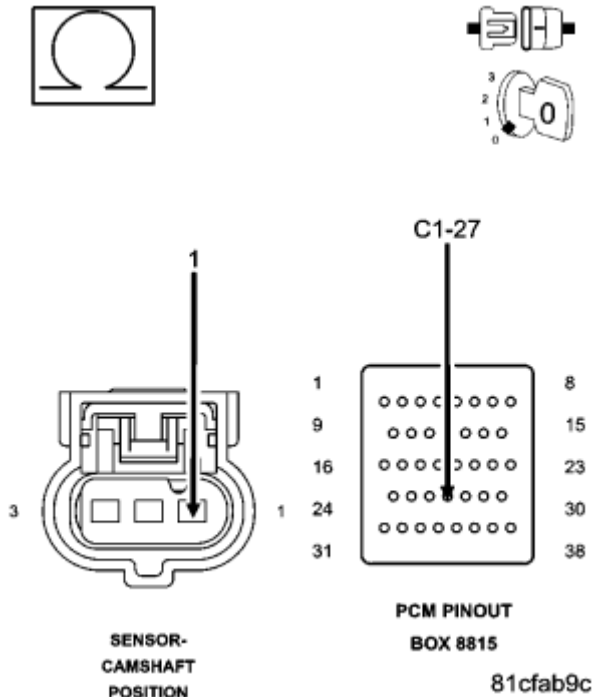


Fig. 23: Measuring The Resistance Of The 5-Volt Supply Circuit Between The CMP Sensor Harness Connector To The Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect all the sensors that were disconnected in the previous step except the CMP Sensor harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance in the (K857) Auxiliary 5-volt Supply circuit from the Sensor harness connector to the appropriate terminal of special tool #8815.

It may be necessary to perform this test from every sensor that uses the (K857) Auxiliary 5-volt Supply circuit.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K857) Auxiliary 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Related Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Related Sensor and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P1696-EEPROM MEMORY WRITE DENIED/INVALID

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the ignition on.

SET CONDITIONS

- **Set Condition:**

An attempt to program/write to the internal EEPROM failed, Also checks at power down. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM) SOFTWARE UPDATE EXCESSIVE RESISTANCE IN THE PCM POWER OR GROUND CIRCUITS POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

NOTE: Diagnose and repair any other DTCs set in the PCM before proceeding with this test.

Turn the ignition on.

With the scan tool, Clear DTCs.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: It may be necessary to test drive the vehicle in order for this DTC to set.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go to 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. PCM ODOMETER MILEAGE NOT PROGRAMMED

Turn the ignition on.

With the scan tool, attempt to perform the Program PCM Odometer function.

With the scan tool, Clear DTCs.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

Is the status Active for this DTC?

Yes

Go to 3.

No

The SRI mileage has been successfully programmed into the PCM. Test is complete.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **CHECKING THE PCM POWER AND GROUND CIRCUITS**

Perform the diagnostic procedure for ***CHECKING THE PCM POWER AND GROUND CIRCUITS** .

Using the wiring diagram/schematic as a guide, inspect the Powertrain Control Module (PCM) wiring and connectors.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to 4.

4. **POWERTRAIN CONTROL MODULE (PCM)**

Turn the ignition on.

With the scan tool, attempt to perform the Program PCM Odometer function.

With the scan tool, Clear DTCs.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

The SRI mileage has been successfully programmed into the PCM. Test is complete.

Perform **POWERTRAIN VERIFICATION TEST** .

P1697-EMR (SRI) MILEAGE NOT STORED

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the ignition on.

SET CONDITIONS

- Set Condition:**

The PCM Odometer mileage has not been programmed into the PCM.

POSSIBLE CAUSES

Possible Causes
PCM ODOMETER MILEAGE NOT PROGRAMMED
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. PCM ODOMETER MILEAGE NOT PROGRAMMED

Turn the ignition on.

With the scan tool, attempt to perform the Program PCM Odometer function.

With the scan tool, clear DTCs.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Replace and program the Powertrain Control Module in accordance with the Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

The SRI mileage has been successfully programmed into the PCM. Test is complete.
Perform **POWERTRAIN VERIFICATION TEST** .

P1897-LEVEL 1 RPM BUS UNLOCK

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running.

SET CONDITIONS

- **Set Condition:**

When the PCM recognizes an internal failure to communicate with the FCM or the CMP and CKP Sensor count periods are too short. One trip fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. POWERTRAIN CONTROL MODULE (PCM)

NOTE: **Diagnose any CMP or CKP Sensor faults before continuing. Check for intermittent loose CMP or CKP connections.**

The Powertrain Control Module is reporting internal errors, view repair to continue.

Repair

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P2072-ELECTRONIC THROTTLE CONTROL SYSTEM - ICE BLOCKAGE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• **Set Condition:**

The PCM recognizes the Throttle plate is stuck during extremely cold Ambient Temperature operation. The throttle plate goes through a de-icing procedure. If the throttle blade still doesn't move this fault sets. The MIL will not illuminate. The vehicle will be in Limp home condition, limiting rpm and vehicle speed.

POSSIBLE CAUSES

Possible Causes

DIAGNOSTIC TEST

1. THROTTLE BODY INSPECTION

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data.

NOTE: This DTC sets in extreme cold Ambient Temperatures with the throttle plate stuck by the time the vehicle gets to the dealership the condition may be corrected.

NOTE: P2110 will set with P2072. P2118 may also set and the customer will experience a Limp-in condition. If either of these two faults are set, it indicates that the ice blockage software has run and no repair is necessary.

NOTE: Diagnose any other DTCs that may also be set before continuing.

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material (ice or dirt) on the Throttle Plate or in the bore causing the Throttle Plate to stick.

Is the throttle blade still stuck because it is frozen?

Yes

Allow the Throttle Body to thaw naturally in a room temperature climate.

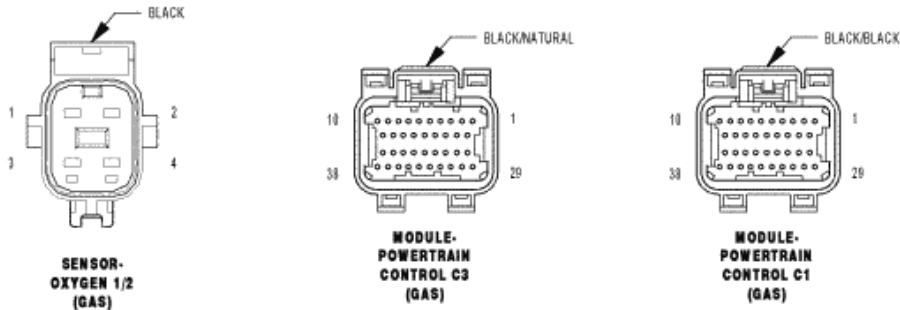
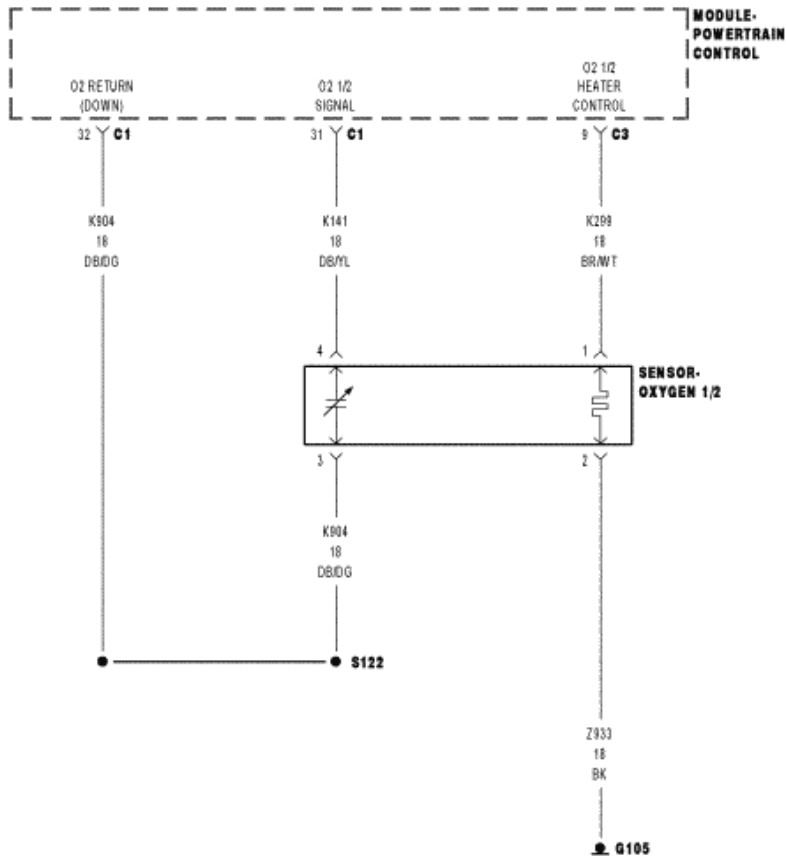
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P2096-DOWNSTREAM FUEL TRIM SYSTEM 1 LEAN

CIRCUIT SCHEMATIC



01993405

Fig. 24: Downstream Fuel Trim System Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- **Set Condition:**

The conditions that cause this diagnostic to fail is when the upstream O2 sensor becomes biased from an exhaust leak, O2 sensor contamination, or some other extreme operating condition. The downstream O2 sensor is considered to be protected from extreme environments by the catalyst. The PCM monitors the downstream O2 sensor feedback control, called downstream fuel trim, to detect any shift in the upstream O2 sensor target voltage from nominal target voltage. The value of the downstream fuel trim is compared with the lean thresholds. Every time the value exceeds the calibrated threshold, a fail timer is incremented and mass flow through the exhaust is accumulated. If the fail timer and accumulated mass flow exceed the fail thresholds, the test fails and the diagnostic stops running for that trip. If the test fails on consecutive trips, a DTC is set.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK FUEL DELIVERY SYSTEM O2 SENSOR, WIRING, OR CONNECTORS ENGINE MECHANICAL SYSTEM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Check the vehicle repair history. If the 1/2 O2 has been replaced make sure that the O2 sensor was properly installed and meets OEM specification.

NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

NOTE: A thorough exhaust leak test must be completed before removing an O2 Sensor or any other part from the exhaust system. Do not remove any parts before an exhaust leak check has been completed.

NOTE: An exhaust leak may cause downstream fuel adaptives to rail out, resulting in a false O2 Sensor failure

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. CHECKING THE FUEL DELIVERY SYSTEM

Perform the diagnostic procedure for ***CHECKING THE FUEL DELIVERY SYSTEM** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CHECKING THE OXYGEN SENSOR OPERATION

Perform the diagnostic procedure for ***CHECKING THE OXYGEN SENSOR OPERATION** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors relative to the components tested in this procedure.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to the components tested in this procedure and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

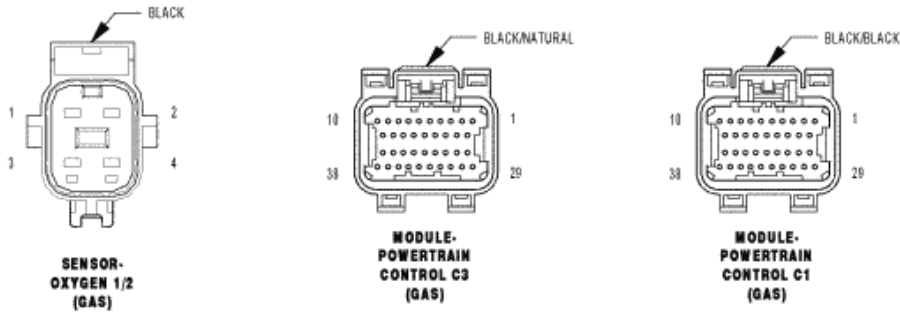
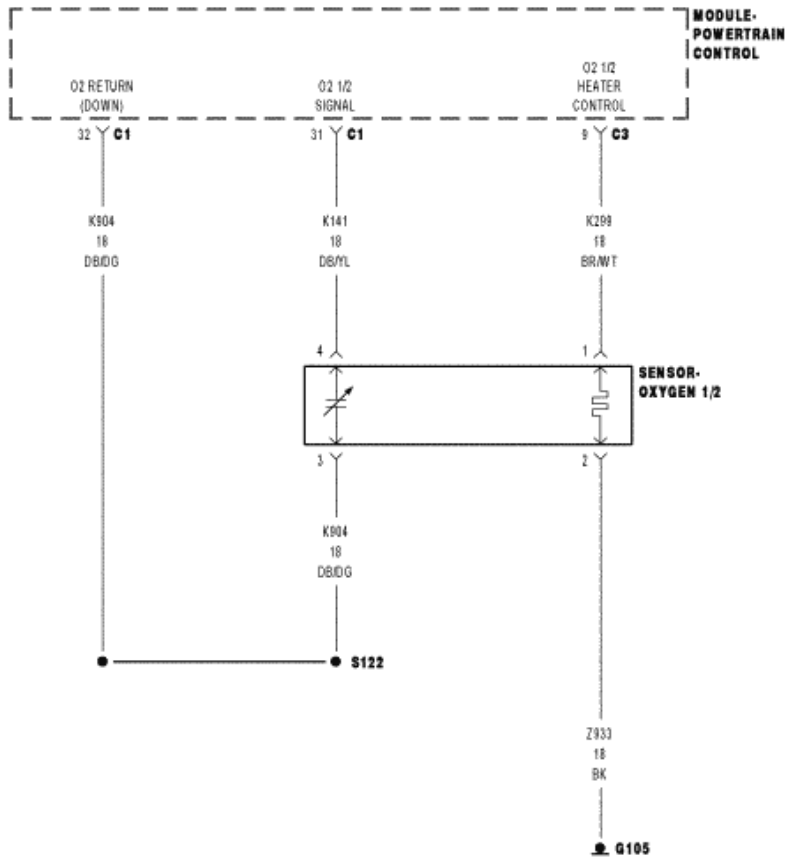
No

Replace and program the PCM in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2097-DOWNSTREAM FUEL TRIM SYSTEM 1 RICH

CIRCUIT SCHEMATIC



01993405

Fig. 25: Downstream Fuel Trim System Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- Set Condition:

The conditions that cause this diagnostic to fail is when the upstream O2 sensor becomes biased from an exhaust leak, O2 sensor contamination, or some other extreme operating condition. The downstream O2 sensor is considered to be protected from extreme environments by the catalyst. The PCM monitors the downstream O2 sensor feedback control, called downstream fuel trim, to detect any shift in the upstream O2 sensor target voltage from nominal target voltage. The value of the downstream fuel trim is compared with the rich thresholds. Every time the value exceeds the calibrated threshold, a fail timer is incremented and mass flow through the exhaust is accumulated. If the fail timer and accumulated mass flow exceed the fail thresholds, the test fails and the diagnostic stops running for that trip. If the test fails on consecutive trips, a DTC is set.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK FUEL DELIVERY SYSTEM O2 SENSOR, WIRING, OR CONNECTORS ENGINE MECHANICAL SYSTEM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Check the vehicle repair history. If the 1/2 O2 has been replaced make sure that the O2 sensor was properly installed and meets OEM specification.

NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

NOTE: A thorough exhaust leak test must be completed before removing an O2 Sensor or any other part from the exhaust system. Do not remove any parts before an exhaust leak check has been completed.

NOTE: An exhaust leak may cause downstream fuel adaptives to rail out, resulting in a false O2 Sensor failure

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. CHECKING THE FUEL DELIVERY SYSTEM

Perform the diagnostic procedure for ***CHECKING THE FUEL DELIVERY SYSTEM** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CHECKING THE OXYGEN SENSOR OPERATION

Perform the diagnostic procedure for ***CHECKING THE OXYGEN SENSOR OPERATION** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors relative to the components tested in this procedure.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to the components tested in this procedure and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

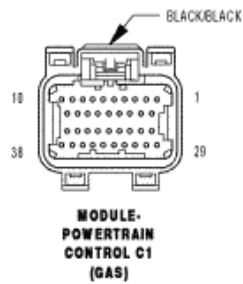
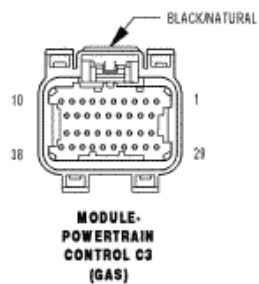
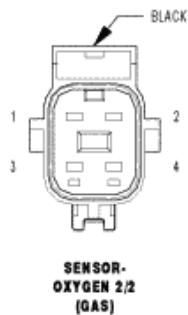
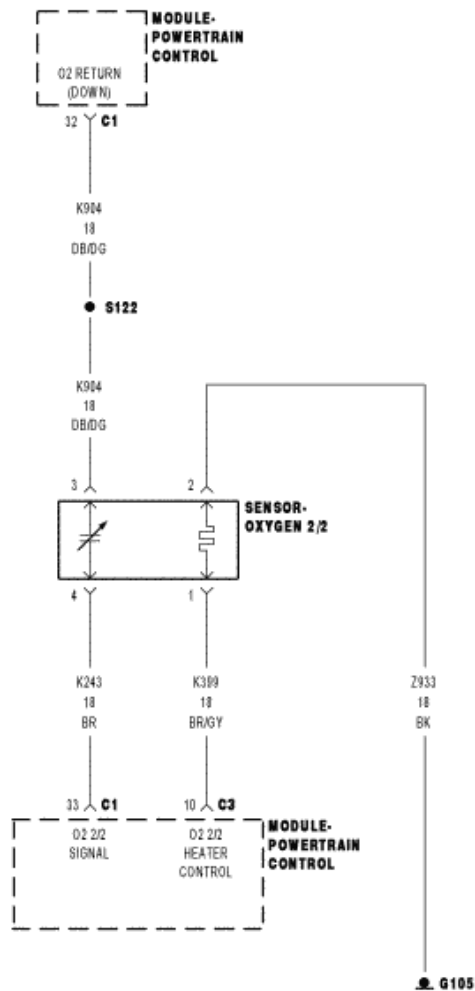
No

Replace and program the PCM in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2098-DOWNSTREAM FUEL TRIM SYSTEM 2 LEAN

CIRCUIT SCHEMATIC



01962075

Fig. 26: Downstream Fuel Trim System 2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft). Fuel level greater than 15%.

SET CONDITIONS

- Set Condition:

The conditions that cause this diagnostic to fail is when the upstream O2 sensor becomes biased from an exhaust leak, O2 sensor contamination, or some other extreme operating condition. The downstream O2 sensor is considered to be protected from extreme environments by the catalyst. The PCM monitors the downstream O2 sensor feedback control, called downstream fuel trim, to detect any shift in the upstream O2 sensor target voltage from nominal target voltage. The value of the downstream fuel trim is compared with the lean thresholds. Every time the value exceeds the calibrated threshold, a fail timer is incremented and mass flow through the exhaust is accumulated. If the fail timer and accumulated mass flow exceed the fail thresholds, the test fails and the diagnostic stops running for that trip. If the test fails on consecutive trips, a DTC is set.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK FUEL DELIVERY SYSTEM O2 SENSOR, WIRING, OR CONNECTORS ENGINE MECHANICAL SYSTEM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Check the vehicle repair history. If the 2/2 O2 has been replaced make sure that the O2 sensor was properly installed and meets OEM specification.

NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

NOTE: A thorough exhaust leak test must be completed before removing an O2 Sensor or any other part from the exhaust system. Do not remove any parts before an exhaust leak check has been completed.

NOTE: An exhaust leak may cause downstream fuel adaptives to rail out, resulting in a false O2 Sensor failure

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. CHECKING THE FUEL DELIVERY SYSTEM

Perform the diagnostic procedure for ***CHECKING THE FUEL DELIVERY SYSTEM** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CHECKING THE OXYGEN SENSOR OPERATION

Perform the diagnostic procedure for ***CHECKING THE OXYGEN SENSOR OPERATION** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors relative to the components tested in this procedure.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to the components tested in this procedure and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the PCM in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2099-DOWNSTREAM FUEL TRIM SYSTEM 2 RICH

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- Set Condition:

The conditions that cause this diagnostic to fail is when the upstream O2 sensor becomes biased from an exhaust leak, O2 sensor contamination, or some other extreme operating condition. The downstream O2 sensor is considered to be protected from extreme environments by the catalyst. The PCM monitors the downstream O2 sensor feedback control, called downstream fuel trim, to detect any shift in the upstream O2 sensor target voltage from nominal target voltage. The value of the downstream fuel trim is compared with the lean thresholds. Every time the value exceeds the calibrated threshold, a fail timer is incremented and mass flow through the exhaust is accumulated. If the fail timer and accumulated mass flow exceed the fail thresholds, the test fails and the diagnostic stops running for that trip. If the test fails on consecutive trips, a DTC is set.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK FUEL DELIVERY SYSTEM O2 SENSOR, WIRING, OR CONNECTORS ENGINE MECHANICAL SYSTEM POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Check the vehicle repair history. If the 2/2 O2 has been replaced make sure that the O2 sensor was properly installed and meets OEM specification.

NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

NOTE: A thorough exhaust leak test must be completed before removing an O2 Sensor or any other part from the exhaust system. Do not remove any parts before an exhaust leak check has been completed.

NOTE: An exhaust leak may cause downstream fuel adaptives to rail out, resulting in a false O2 Sensor failure

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. CHECKING THE FUEL DELIVERY SYSTEM

Perform the diagnostic procedure for ***CHECKING THE FUEL DELIVERY SYSTEM** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CHECKING THE OXYGEN SENSOR OPERATION

Perform the diagnostic procedure for ***CHECKING THE OXYGEN SENSOR OPERATION** .

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. ENGINE MECHANICAL

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors relative to the components tested in this procedure.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to the components tested in this procedure and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

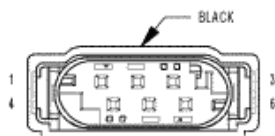
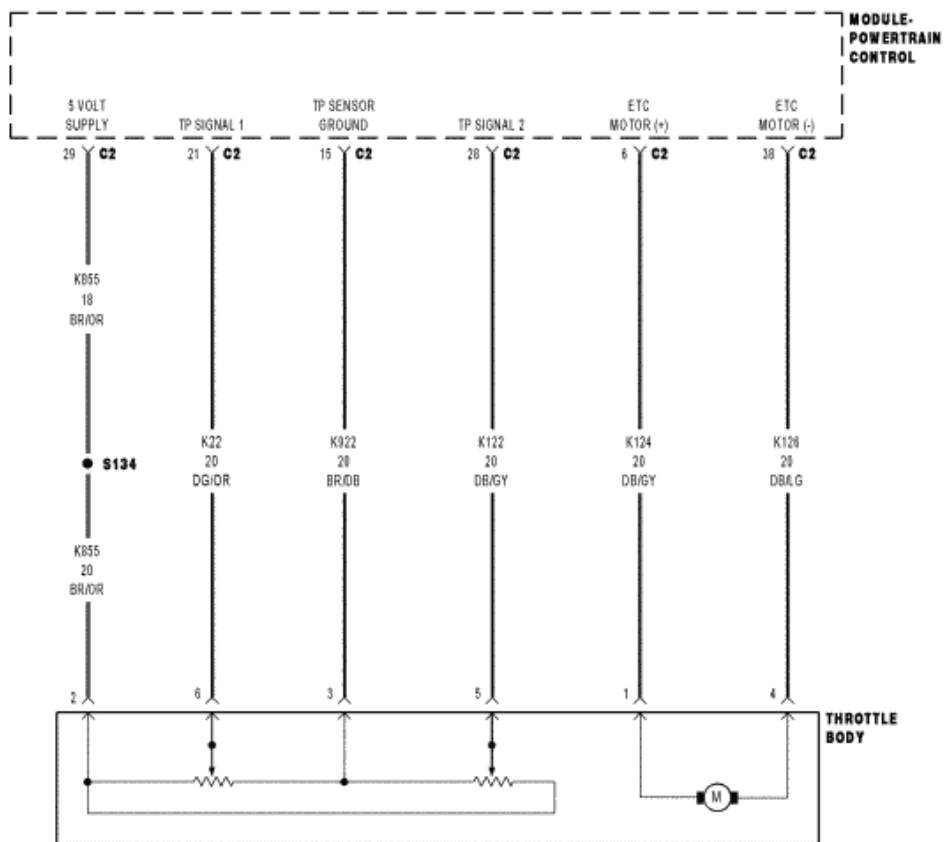
Perform **POWERTRAIN VERIFICATION TEST** .

No

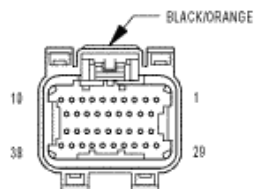
Replace and program the PCM in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2100-ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 28: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and the ETC Motor is not in Limp Home mode.

SET CONDITIONS

- Set Condition:

When the PCM detects an internal error or a short between the ETC Motor- and ETC Motor + circuits in the ETC Motor Driver. One trip fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
THROTTLE PLATE / BORE INSPECTION (K124) ETC MOTOR (+) SHORTED TO VOLTAGE (K126) ETC MOTOR (-) SHORTED TO VOLTAGE (K124) ETC MOTOR (+) SHORTED TO THE (K126) ETC MOTOR (-) (K124) ETC MOTOR (+) OPEN (K124) ETC MOTOR (+) SHORTED TO GROUND (K126) ETC MOTOR (-) OPEN (K126) ETC MOTOR (-) SHORTED TO GROUND LOW BATTERY VOLTAGE ETC MOTOR/THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.

NOTE: If the P2100 is intermittent, it is possible that the controller is overheating in extreme hot temperatures, and this is considered a normal protection operation. No repair is necessary.

NOTE: Low battery voltage can also cause excessive current draw, in very hot and very cold ambient temperatures. Make sure the battery can pass a

load test before continuing.

With a scan tool, select View DTCs.

Look closely at the temperatures at which this DTC set.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. THROTTLE PLATE INSPECTION

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material (ice or dirt) on the Throttle Plate or in the bore causing the Throttle Plate to stick.

Were any signs of foreign material or scoring of the throttle plate or bore found?

Yes

Remove the debris if possible or replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K124) ETC MOTOR (+) SHORTED TO VOLTAGE

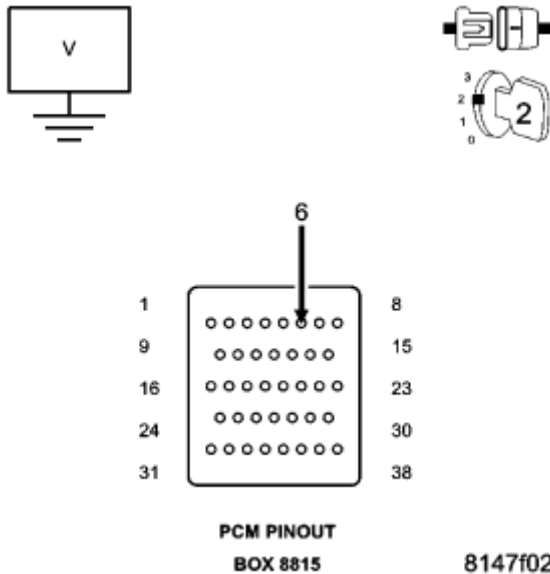


Fig. 29: Checking ETC Positive Circuit For Short To Battery Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform the diagnostics.

Measure the voltage on the (K124) ETC Motor (+) at the appropriate terminal of special tool #8815.

Is there any voltage present?

Yes

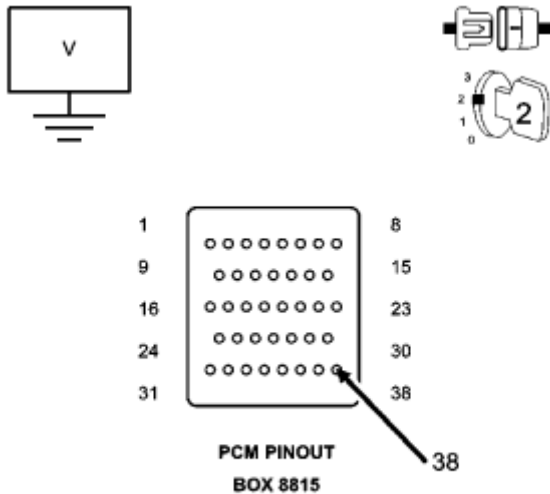
Repair the short to voltage on the (K124) ETC Motor (+).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K126) ETC MOTOR (-) SHORTED TO VOLTAGE



8147f04e

Fig. 30: Checking ETC Negative Circuit For Short To Battery Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K126) ETC Motor (-) at the appropriate terminal of special tool #8815.

Is there any voltage present?

Yes

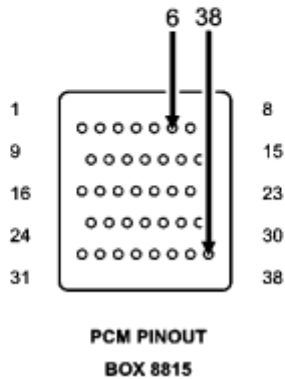
Repair the short to voltage in the (K126) ETC Motor (-).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K124) ETC MOTOR (+) SHORTED TO THE (K126) ETC MOTOR (-)



8147f06f

Fig. 31: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (K124) ETC Motor (+) and the (K126) ETC Motor (-) at the appropriate terminals of special tool #8815.

Is the resistance below 100 ohms?

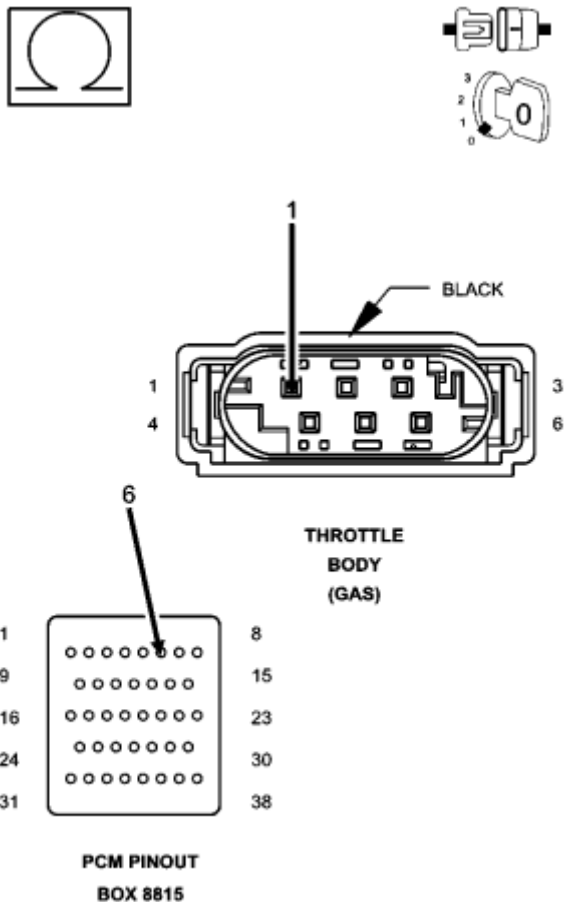
Yes

Repair the short to between the (K124) ETC Motor (+) and the (K126) ETC Motor (-).
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K124) ETC MOTOR (+) OPEN



8191a715

Fig. 32: Checking ETC Positive Circuit For Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (K124) ETC Motor (+) from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K124) ETC Motor (+).

Perform **POWERTRAIN VERIFICATION TEST**.

7. (K124) ETC MOTOR (+) SHORTED TO GROUND

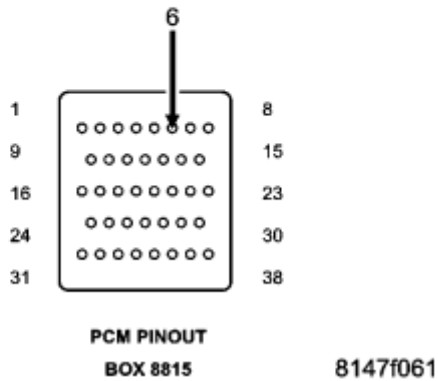


Fig. 33: Checking Electronic Throttle Control Positive Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K124) ETC Motor (+) between the appropriate terminals of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K124) ETC Motor (+).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K126) ETC MOTOR (-) OPEN

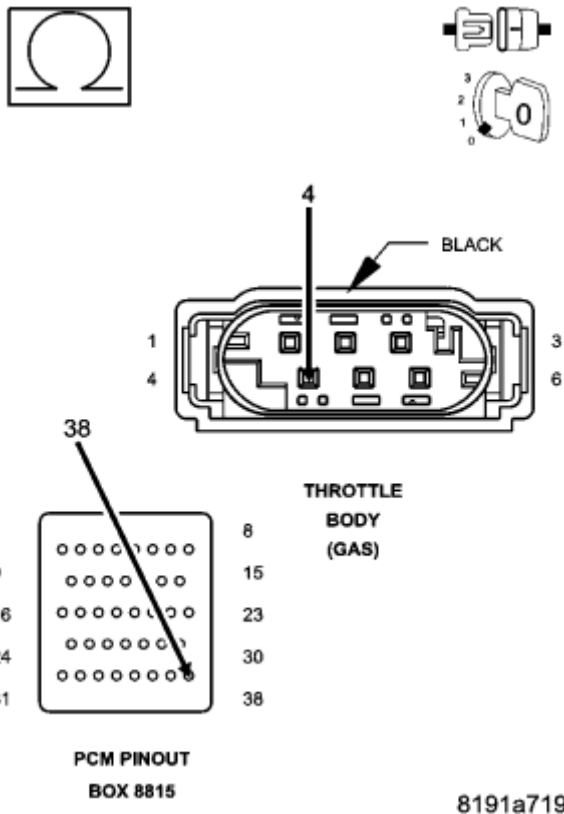


Fig. 34: Checking ETC Negative Circuit For Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (K126) ETC Motor (-) from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K126) ETC Motor (-).

Perform **POWERTRAIN VERIFICATION TEST** .

9. (K126) ETC MOTOR (-) SHORTED TO GROUND

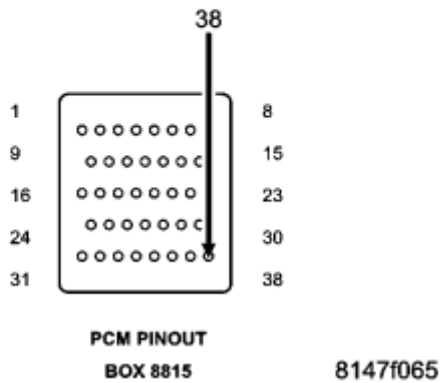


Fig. 35: Checking Electronic Throttle Control Negative Circuit For Short To ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K126) ETC Motor (-) using the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K126) ETC Motor (-).

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **ETC MOTOR**

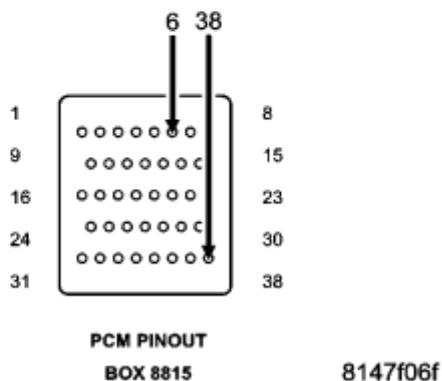


Fig. 36: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

NOTE: Take the following measurement using special tool #8815 to avoid possible damage to the Throttle Body harness connector.

Connect the Throttle Body harness connector.

Measure the resistance of the ETC Motor between the (K124) ETC Motor (+) and the (K126) ETC Motor (-) at the appropriate terminals of special tool #8815.

Is the resistance between 2.5 and 25 ohms at closed throttle?

Yes

Go To 11.

No

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST**.

11. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

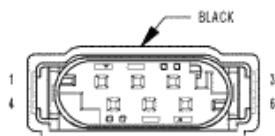
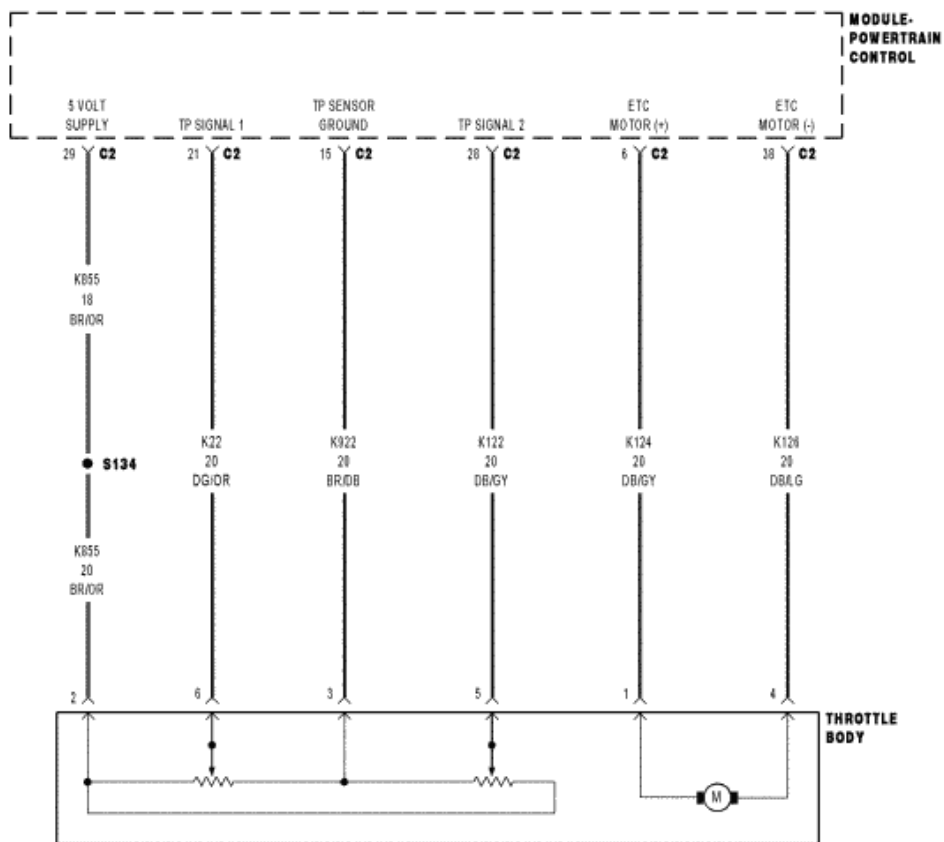
No

Replace and program the Powertrain Control Module per Service Information.

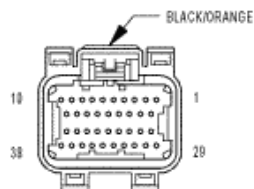
Perform **POWERTRAIN VERIFICATION TEST** .

P2101-ELECTRONIC THROTTLE CONTROL MOTOR PERFORMANCE

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 37: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the vehicle running, ETC Motor not in Limp Home mode, and the TPS adaptation is complete.

SET CONDITIONS

- Set Condition:

The PCM recognizes too large of an error between the actual position of the Throttle Plate and the Set Point position. One trip fault and the code will set within 5 seconds. Three good trips to turn off the MIL ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
THROTTLE BODY ASSEMBLY
LOW BATTERY VOLTAGE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.

NOTE: Before continuing visually inspect the throttle blade and bore for any obstructions. Icing of the throttle body may have caused this code to set.

NOTE: Low battery voltage can also cause excessive current draw, in very hot and very cold ambient temperature. Make sure the battery can pass a load test before continuing.

NOTE: Diagnose any 5-Volt Supply, Battery, and TP Sensor DTCs before continuing.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. THROTTLE POSITION WITHIN 2° DEGREES OF DESIRED THROTTLE POSITION

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, monitor the Actual Throttle Position and Desired Throttle Position.

Compare the Actual Throttle Position and the Set Point Throttle Position.

Is the Actual Throttle Position within 2° degrees of the Desired Throttle Position?

Yes

Go To 3.

No

Replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

3. ETC OPERATION

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test.

NOTE: **It may be necessary to use a mirror to see the throttle blade.**

Observe the throttle blade.

NOTE: **Make sure the motion of the throttle blade is smooth and that it opens and closes.**

Did the ETC motor operate properly?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function. Perform **POWERTRAIN VERIFICATION TEST** .

P2107-ELECTRONIC THROTTLE CONTROL MODULE PROCESSOR

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

• **Set Condition:**

Internal PCM failure. Module will attempt to reset, so you will be able to hear the throttle relearning. If the condition is continuous, the vehicle may not be driveable. One trip fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE NEEDS TO BE REPROGRAMMED

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **REPROGRAM THE POWERTRAIN CONTROL MODULE**

Check for any related TSBs.

Verify the PCM is at the latest calibration (flash level).

NOTE: **An intermittent loss of power to the PCM without performing an ETC Relearn procedure may cause this DTC to set.**

Flash the Powertrain Control Module per Service Information if any updates are available.

Start the engine.

Allow the engine to reach normal operating temperature.

Operate the accelerator pedal. (do not exceed 3500 rpm)

Test drive the vehicle for 10 miles on a flat road surface.

Does this DTC reset?

Yes

Replace and reprogram the Powertrain Control Module per Service Information.

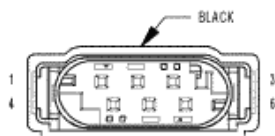
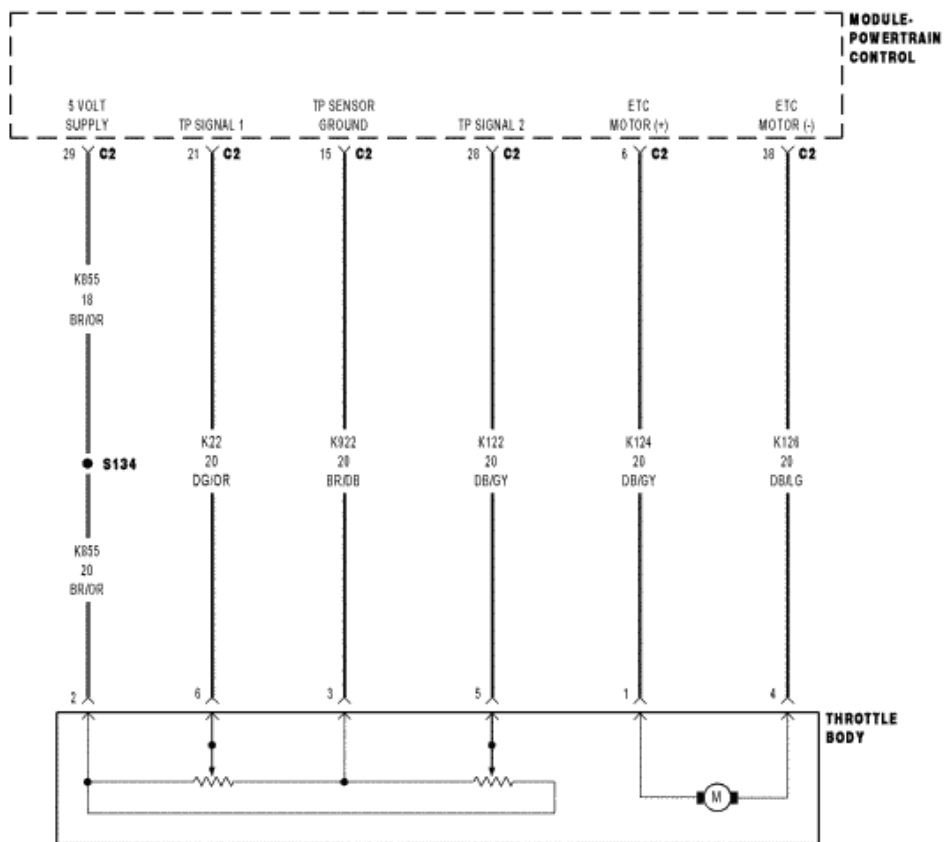
Perform **POWERTRAIN VERIFICATION TEST** .

No

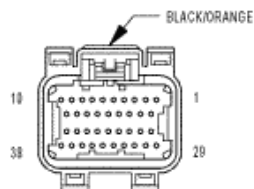
Test Complete.

P2110-ELECTRONIC THROTTLE CONTROL - FORCED LIMITED RPM

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 38: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and ETC motor is working.

SET CONDITIONS

- Set Condition:

When the PCM requests to limit engine speed if PWM is too high for 20.5 seconds and before P2118 sets. One trip fault and the code will set within 5 seconds. ETC light is illuminated.

POSSIBLE CAUSES

Possible Causes
THROTTLE PLATE STUCK (K124) ETC MOTOR (+) CIRCUIT OPEN (K126) ETC MOTOR (-) CIRCUIT OPEN (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND ETC MOTOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.

Ignition on, engine not running.

With a scan tool select View DTCs.

In the Freeze Frame data, look at the temperature at which the fault occurred. If it occurred in extreme cold temperatures, Icing of the throttle body may have caused this code to set.

NOTE: Diagnose any TP Sensor faults, 5-Volt Supply faults, and Battery Voltage High or Low DTCs before continuing.

NOTE: If P2072 is also set, this indicates that the cold weather ice blockage routine has run. No repair action is required.

Is the DTC Active at this time?

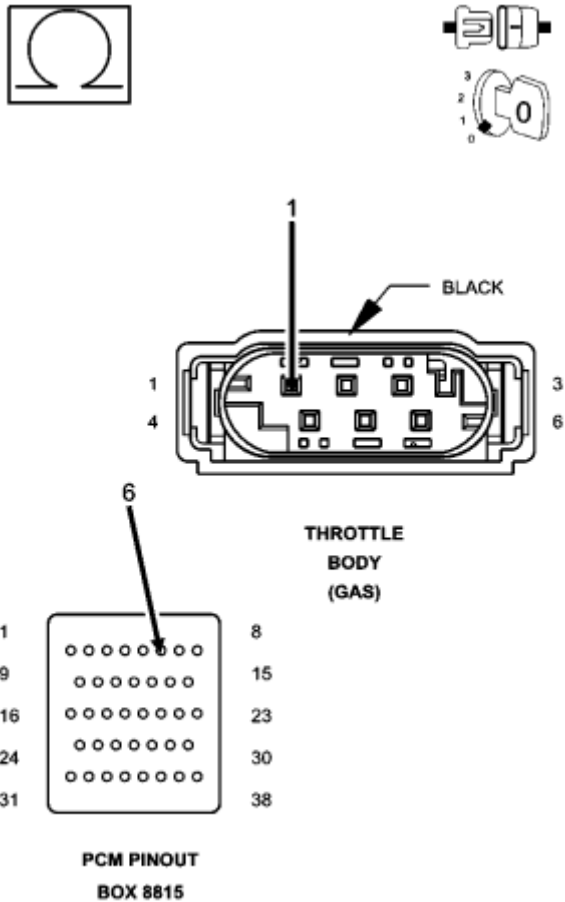
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K124) ETC MOTOR (+) CIRCUIT OPEN



8191a715

Fig. 39: Checking ETC Positive Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K124) ETC Motor (+) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the open in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K126) ETC MOTOR (-) CIRCUIT OPEN

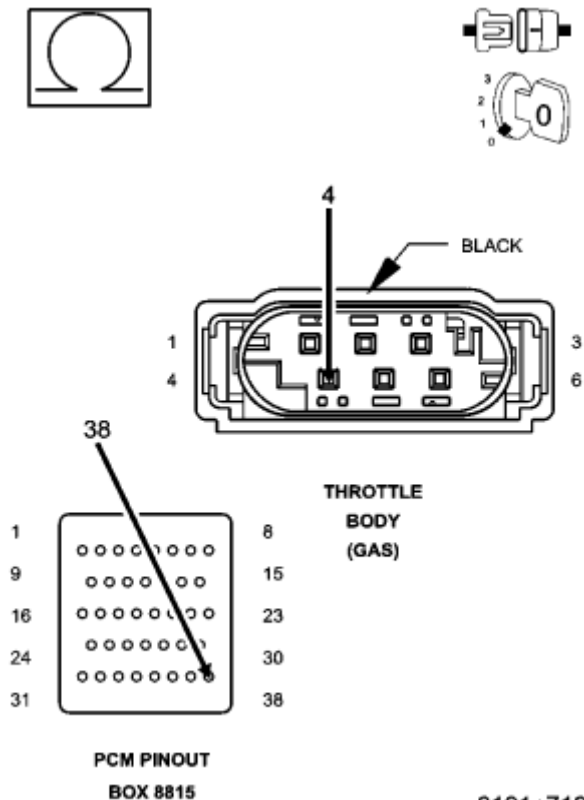


Fig. 40: Checking ETC Negative Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K126) ETC Motor (-) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND

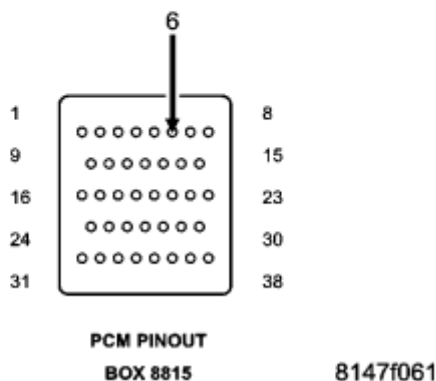


Fig. 41: Checking Electronic Throttle Control Positive Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K124) ETC Motor (+) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND**

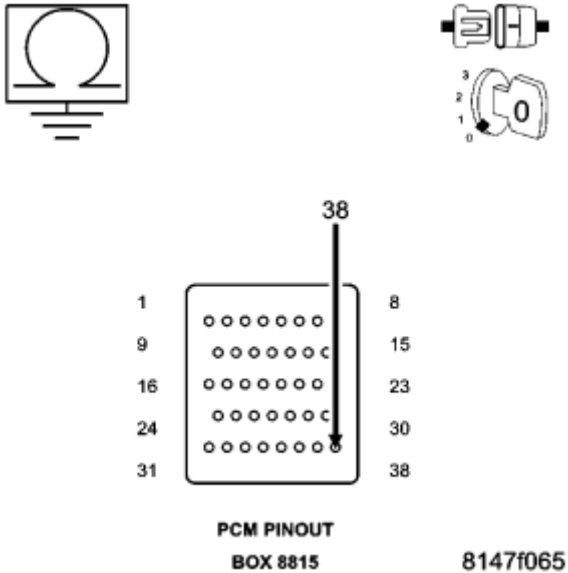


Fig. 42: Checking Electronic Throttle Control Negative Circuit For Short To ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K126) ETC Motor (-) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **ETC MOTOR**

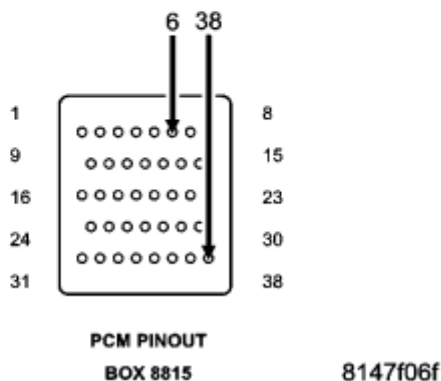
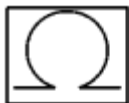


Fig. 43: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

NOTE: Take the following measurement using special tool #8815 to avoid possible damage to the Throttle Body harness connector.

Measure the resistance of the ETC Motor between the (K124) ETC Motor (+) circuit and the (K126) ETC Motor (-) circuit at the appropriate terminals of special tool #8815.

Is the resistance between 2.5 and 25 ohms at closed throttle?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

7. THROTTLE PLATE STUCK

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material (ice or dirt) causing the Throttle to stick.

Ignition on, engine not running.

Using a scan tool, perform the ETC Throttle Follower Test.

You may need an assistant to watch the Throttle Plate move.

Does the Throttle Plate move during the test?

Yes

Go To 8.

No

Remove the debris if possible or replace the Throttle Body Assembly if signs of physical damage are present. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

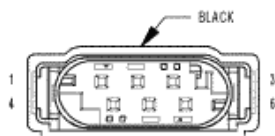
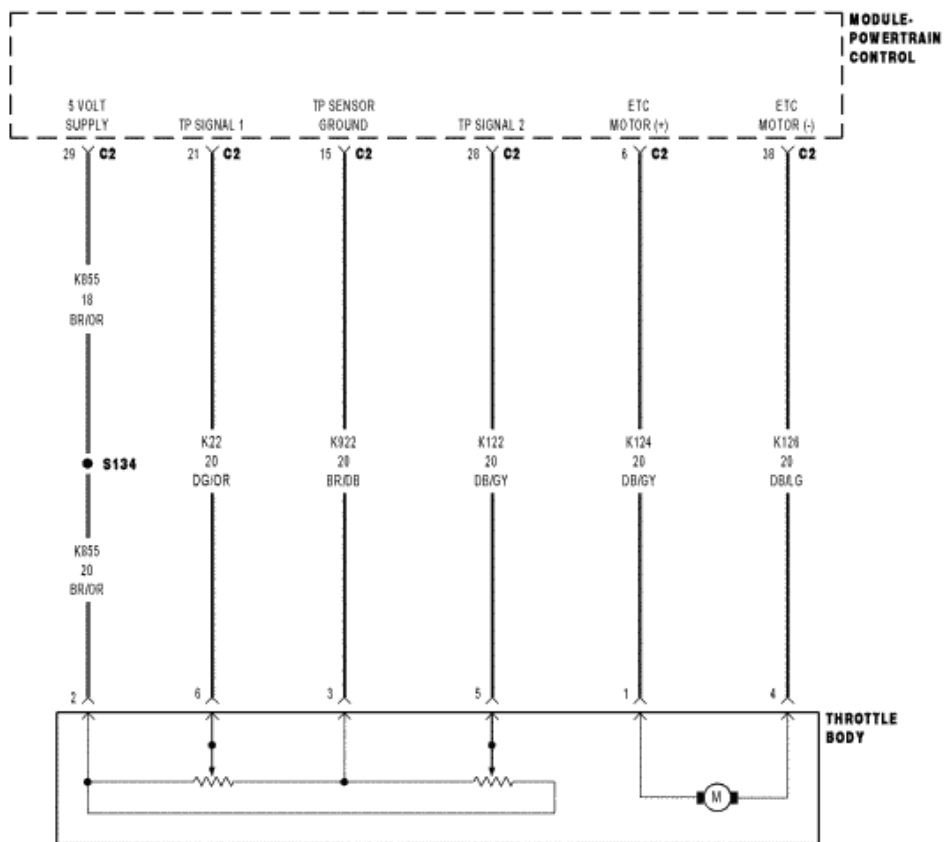
No

Replace and program the Powertrain Control Module per Service Information.

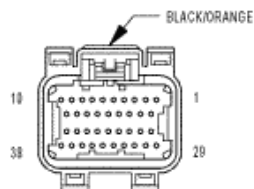
Perform **POWERTRAIN VERIFICATION TEST** .

P2111-ELECTRONIC THROTTLE CONTROL - UNABLE TO CLOSE

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 44: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

Just after key on, the throttle is opened and closed to test the system. If the TP Sensor does not return to Limp Home Position at the end of this test, this DTC will set. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
THROTTLE PLATE STUCK ABOVE LIMP HOME POSITION TP SIGNAL 1 AND TP SIGNAL 2 BOTH READ 2.5 VOLTS (K124) ETC MOTOR (+) CIRCUIT SHORTED TO VOLTAGE (K124) ETC MOTOR (+) CIRCUIT OPEN (K126) ETC MOTOR (-) CIRCUIT OPEN (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Maximum engine speed could be reduced while this fault is active, it just depends where the throttle gets stuck.

Ignition on, engine not running.

NOTE: The PCM tests the ETC Motor by opening and closing the Throttle Plate before starting the engine. If during this test the Throttle plate does not return to the closed position this DTC sets.

With a scan tool select View DTCs.

NOTE: Diagnose any TP Sensor or 5-Volt Supply DTCs before continuing.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. THROTTLE PLATE STUCK OPEN

Turn the ignition off.

NOTE: **The PCM tests the ETC Motor by opening and closing the Throttle Plate before starting the engine. If during this test the Throttle plate does not return to the closed position this DTC sets.**

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material causing the Throttle to remain open.

Using a scan tool, under System Tests, perform the ETC Throttle Follower Test.

Have an assistant watch the throttle plate to verify it moves during the test.

Does the Throttle Plate move?

Yes

Go To 3.

No

Remove the debris if possible or replace the Throttle Body Assembly if signs of physical damage are present. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and perform the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

3. TP SIGNAL 1 AND TP SIGNAL 2 BOTH EQUAL 2.5 VOLTS

With a scan tool, perform the ETC Throttle Follower test while monitoring both TP Sensor voltage readings.

Are both TP Sensor readings stuck at 2.5 volts?

Yes

Check the TP Sensor Signal circuits for excessive resistance, being shorted to each other, or shorted to the Sensor Return circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO VOLTAGE

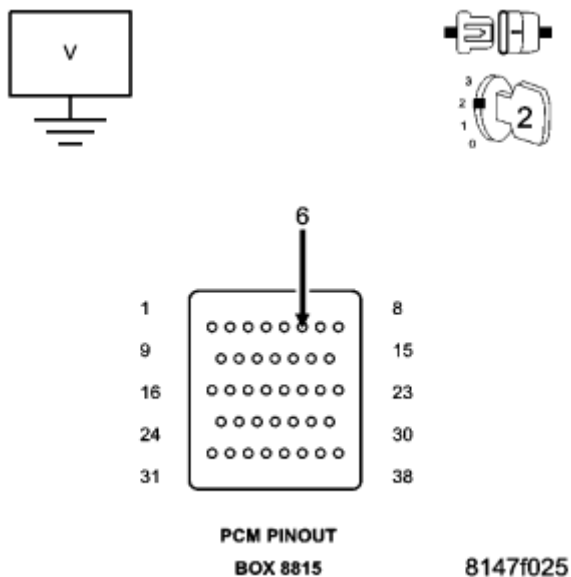


Fig. 45: Checking ETC Positive Circuit For Short To Battery Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform the diagnostics.

Ignition on, engine not running.

Measure the voltage on the (K124) ETC Motor (+) circuit at the appropriate terminal of special tool #8815.

Is there any voltage present?

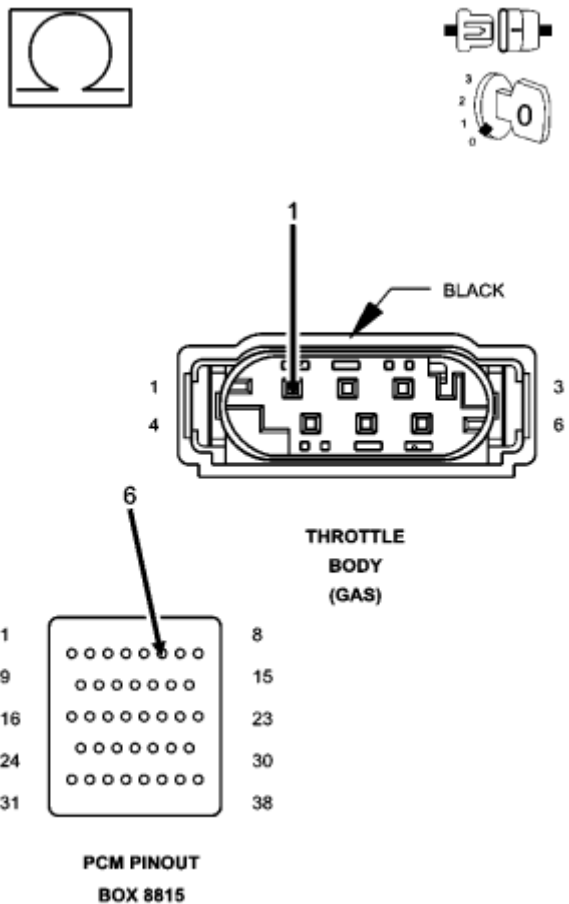
Yes

Repair the short to voltage on the (K124) ETC Motor (+) circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K124) ETC MOTOR (+) CIRCUIT OPEN



8191a715

Fig. 46: Checking ETC Positive Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (K124) ETC Motor (+) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K126) ETC MOTOR (-) CIRCUIT OPEN

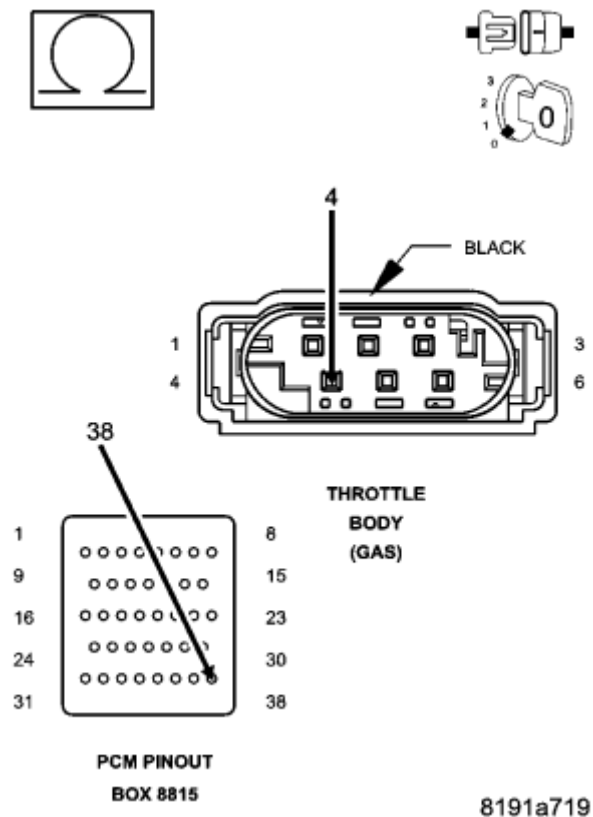


Fig. 47: Checking ETC Negative Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K126) ETC Motor (-) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **(K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND**

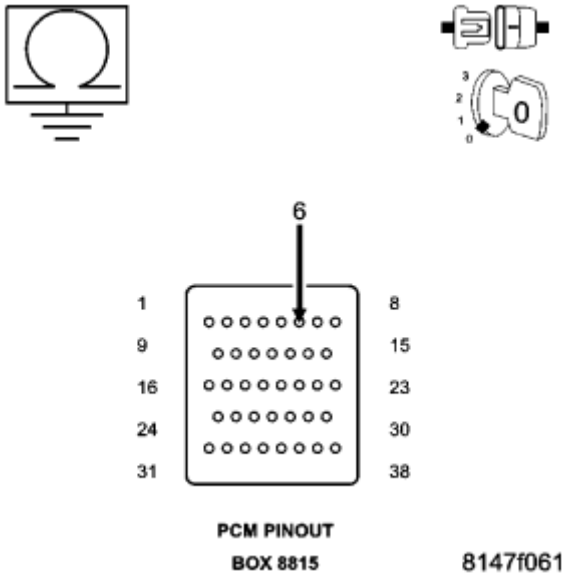


Fig. 48: Checking Electronic Throttle Control Positive Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K124) ETC Motor (+) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. **(K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND**

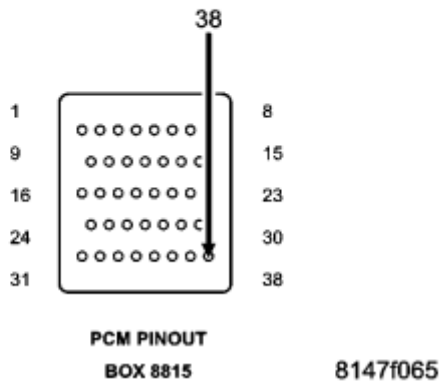


Fig. 49: Checking Electronic Throttle Control Negative Circuit For Short To ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K126) ETC Motor (-) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

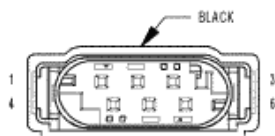
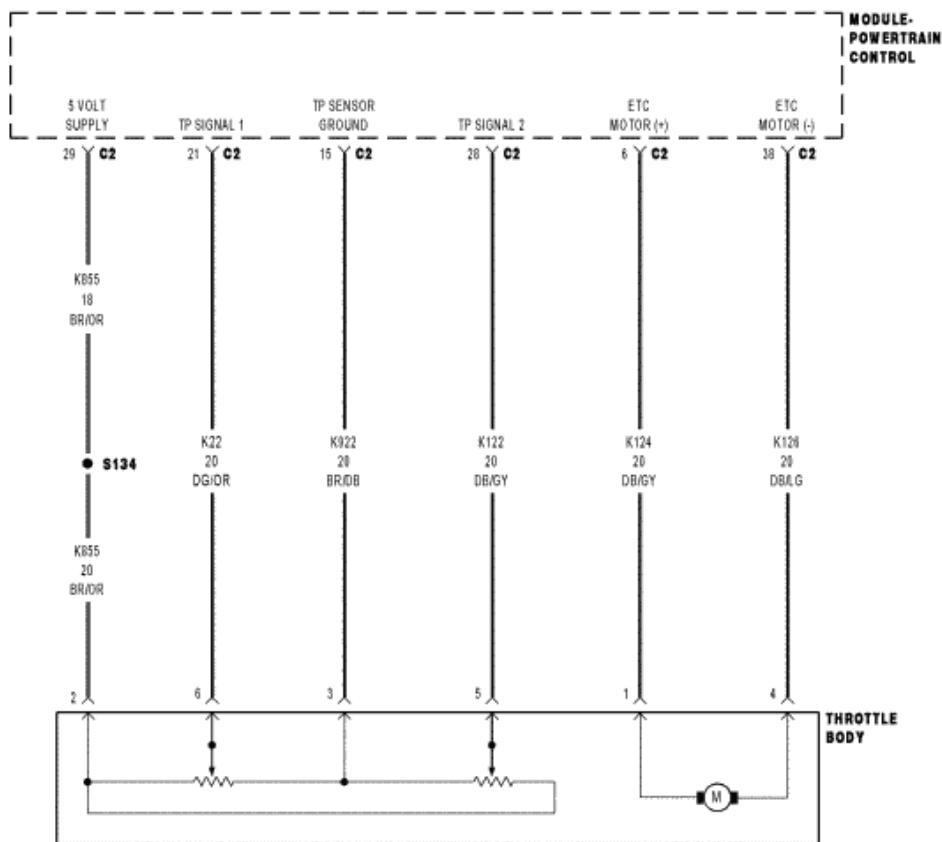
No

Replace and program the Powertrain Control Module per Service Information.

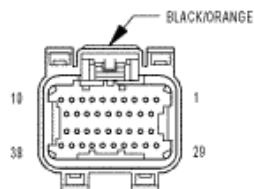
Perform **POWERTRAIN VERIFICATION TEST** .

P2112-ELECTRONIC THROTTLE CONTROL - UNABLE TO OPEN

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 50: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

Just after key on, the throttle is opened and closed to test the system. If the TP Sensor does not return to Limp Home Position at the end of this test, this DTC will set. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
THROTTLE PLATE STUCK AT OR BELOW LIMP HOME POSITION (K126) ETC MOTOR (-) CIRCUIT SHORTED TO VOLTAGE (K124) ETC MOTOR (+) CIRCUIT OPEN (K126) ETC MOTOR (-) CIRCUIT OPEN (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: **The PCM tests the ETC Motor by opening and closing the Throttle Plate before starting the engine. If during this test the Throttle plate does not return to the closed position this DTC sets.**

Ignition on, engine not running.

With a scan tool select View DTCs.

NOTE: **Diagnose any TP Sensor, Battery Voltage, and 5-Volt Supply DTCs before continuing.**

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **THROTTLE PLATE STUCK OPEN**

NOTE: **The PCM tests the ETC Motor by opening and closing the Throttle Plate before starting the engine. If during this test the Throttle plate does not open this DTC sets.**

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material causing the Throttle to remain open.

Using a scan tool under System Tests, perform the ETC Throttle Follower Test.

Have an assistant watch the throttle plate to verify it moves during the test.

Does the Throttle Plate move?

Yes

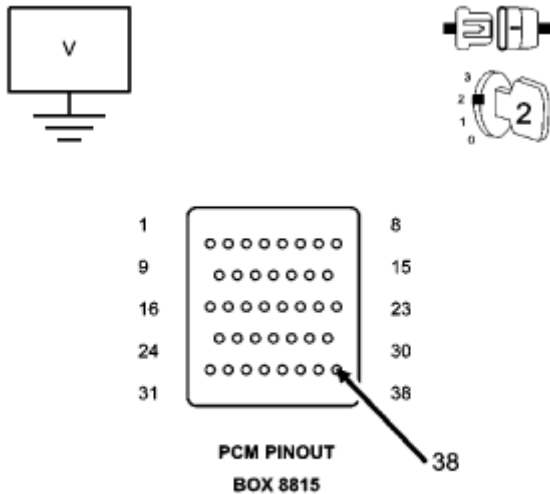
Go To 3.

No

Remove the debris if possible or replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(K126) ETC MOTOR (-) CIRCUIT SHORTED TO VOLTAGE**



8147f04e

Fig. 51: Checking ETC Negative Circuit For Short To Battery Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Ignition on, engine not running.

Measure the voltage on the (K126) ETC Motor (-) circuit at the appropriate terminal of special tool #8815.

Is there any voltage present?

Yes

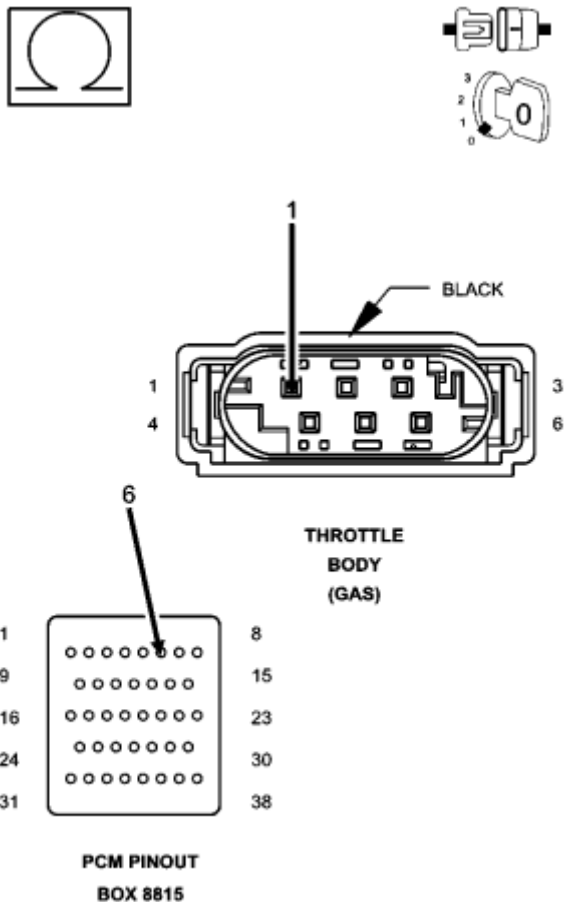
Repair the short to voltage on the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K124) ETC MOTOR (+) CIRCUIT OPEN



8191a715

Fig. 52: Checking ETC Positive Circuit For Open
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (K124) ETC Motor (+) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

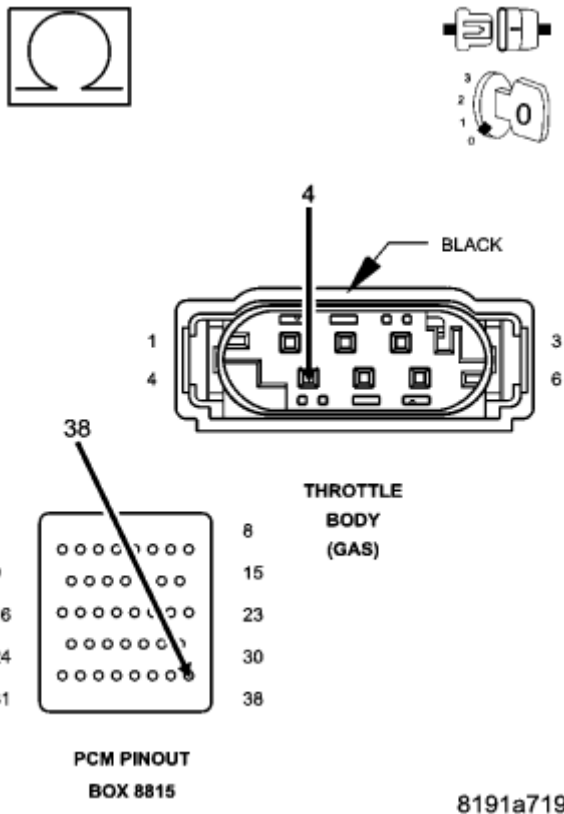
Go To 5.

No

Repair the open in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K126) ETC MOTOR (-) CIRCUIT OPEN



8191a719

Fig. 53: Checking ETC Negative Circuit For Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (K126) ETC Motor (-) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND

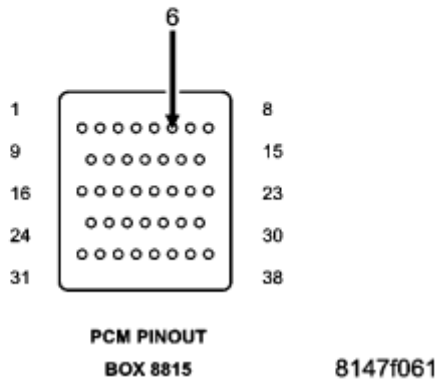


Fig. 54: Checking Electronic Throttle Control Positive Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K124) ETC Motor (+) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND

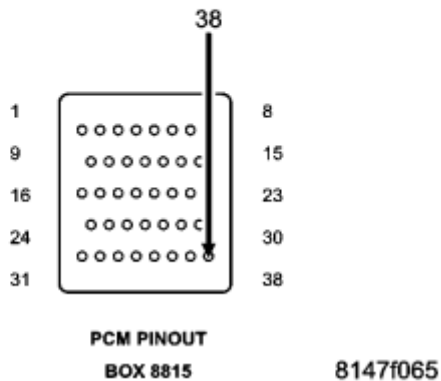


Fig. 55: Checking Electronic Throttle Control Negative Circuit For Short To ground
Courtesy of CHRYSLER LLC

Measure the resistance between a known good ground and the (K126) ETC Motor (-) circuit at the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P2115-ACCELERATOR PEDAL POSITION SENSOR 1 MINIMUM STOP PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on. During in plant mode the APP Sensors need to be checked to make sure that idle and full pedal travel can be reached on both sensors. The test for P2115 is only enabled once test for P2166 has passed.

SET CONDITIONS

• **Set Condition:**

APPS No.1 has failed to achieve the required minimum value during In Plant testing. One trip fault and the code will set within 5 seconds. Engine will only idle. ETC light is illuminated.

POSSIBLE CAUSES

Possible Causes
IN PLANT TEST FAILURE APPS RELEARN

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. IN PLANT TEST FAILURE

Ignition on, engine not running.

NOTE: This DTC is set when the APP Sensors are learned in plant but do not reach the Minimum or Maximum voltage range.

With a scan tool, select View DTCs.

With the scan tool, erase DTCs.

Start the engine.

With the scan tool, view DTCs.

NOTE: Diagnose any APPS out of Range and 5-Volt Supply DTCs before continuing.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **APPS RELEARN**

With a scan tool select the ETC RELEARN function.

Next, erase DTCs.

Start the engine.

Does the DTC return?

Yes

Replace the APPS Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P2116-ACCELERATOR PEDAL POSITION SENSOR 2 MINIMUM STOP PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on. During in plant mode the APP Sensors need to be checked to make sure that idle and full pedal travel can be reached on both sensors. The test for P2116 is only enabled once test for P2167 has passed.

SET CONDITIONS

- **Set Condition:**

APPS No.2 has failed to achieve the required minimum value during In Plant testing. One trip fault and the code will be stored within 5 seconds. Engine will only idle. ETC light is illuminated.

POSSIBLE CAUSES

Possible Causes
IN PLANT TEST FAILURE APPS RELEARN

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. IN PLANT TEST FAILURE

Ignition on, engine not running.

NOTE: **This DTC is set when the APP Sensors are learned in plant but do not reach the Minimum or Maximum voltage range.**

With a scan tool, select View DTCs and record the related Freeze Frame data.

With a scan tool, erase DTCs.

Start the engine.

With a scan tool, view DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. APPS RELEARN

With a scan tool select the ETC RELEARN function.

Next, erase DTCs.

Start the engine.

Does the DTC return?

Yes

Replace the APPS Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function.

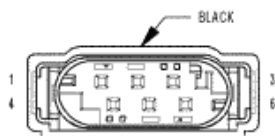
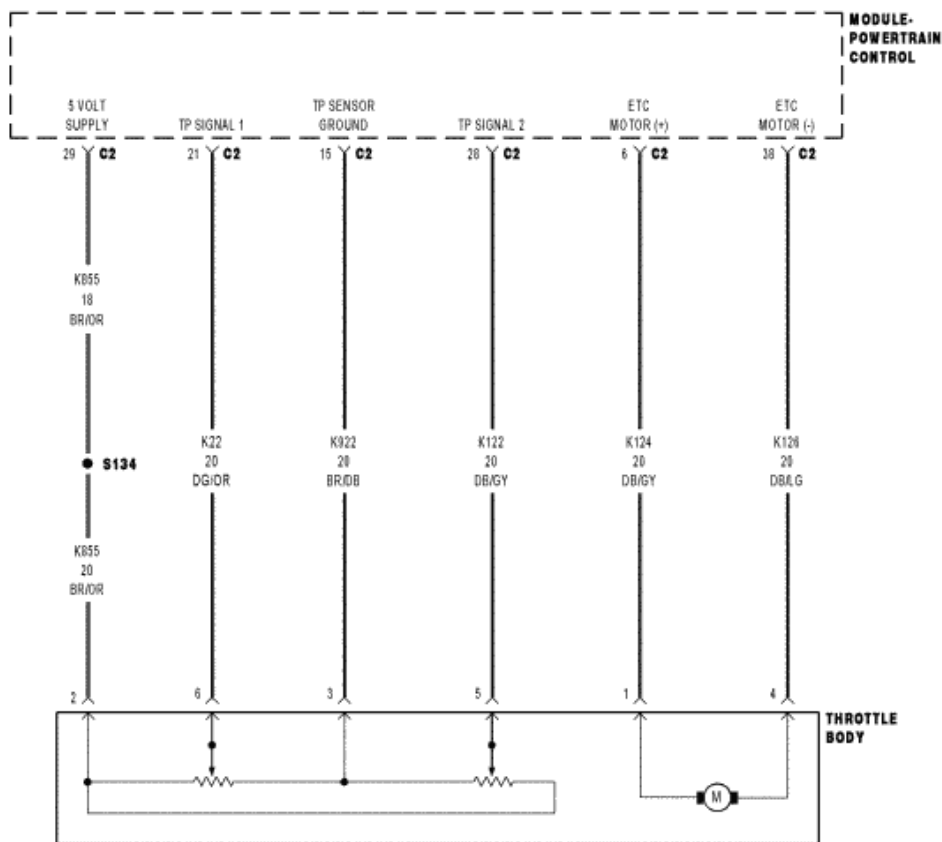
Perform **POWERTRAIN VERIFICATION TEST** .

No

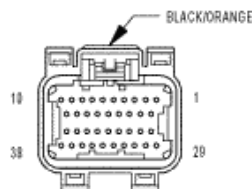
Test Complete.

P2118-ELECTRONIC THROTTLE CONTROL MOTOR CURRENT PERFORMANCE

CIRCUIT SCHEMATIC



THROTTLE BODY (3.7L)



MODULE-POWERTRAIN CONTROL C2 (GAS)

Fig. 56: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and the ETC Motor is not in Limp Home mode.

SET CONDITIONS

- Set Condition:

When the PCM detects an internal error or a short between the ETC Motor (-) and ETC Motor (+) circuits in the ETC Motor Driver. One trip fault. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
THROTTLE PLATE / BORE INSPECTION (K124) ETC MOTOR (+) CIRCUIT SHORTED TO VOLTAGE (K126) ETC MOTOR (-) CIRCUIT SHORTED TO VOLTAGE (K124) ETC MOTOR (+) CIRCUIT SHORTED TO THE (K126) ETC MOTOR (-) CIRCUIT (K124) ETC MOTOR (+) CIRCUIT OPEN (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND (K126) ETC MOTOR (-) CIRCUIT OPEN (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND THROTTLE BODY ASSEMBLY/ETC MOTOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.

NOTE: If P2072 is also set, this indicates that the cold weather ice blockage routine has run. No repair action is necessary.

NOTE: If the P2118 is intermittent, it is possible that the controller is overheating in extreme hot temperatures, and this is considered a normal protection operation. No repair is necessary.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Look closely at the temperatures at which this DTC set.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. THROTTLE PLATE INSPECTION

Turn the ignition off.

Remove the Air Cleaner Assembly from the Throttle Body.

Check for any signs of a foreign material (ice or dirt) on the Throttle Plate or in the bore causing the Throttle Plate to stick.

Were any signs of foreign material or scoring of the throttle plate or bore found?

Yes

Remove the debris if possible or replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO VOLTAGE

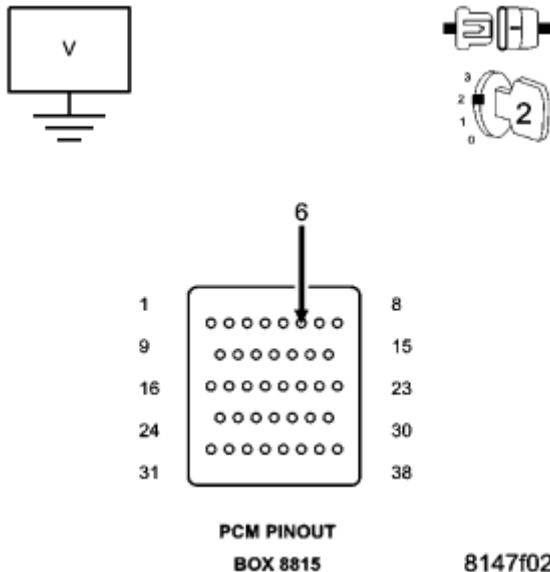


Fig. 57: Checking ETC Positive Circuit For Short To Battery Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the voltage on the (K124) ETC Motor (+) circuit at the appropriate terminal of special tool #8815.

Is there any voltage present?

Yes

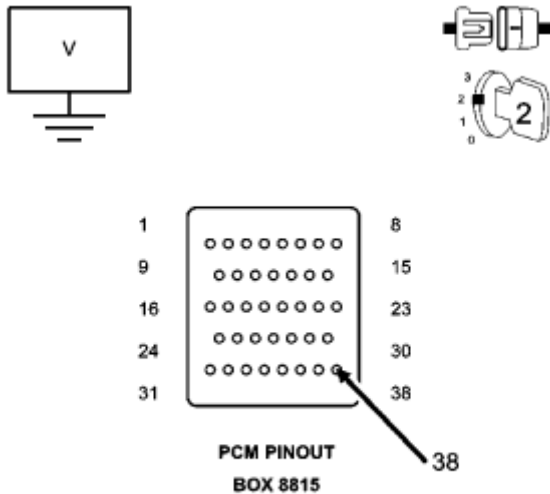
Repair the short to voltage on the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K126) ETC MOTOR (-) CIRCUIT SHORTED TO VOLTAGE



8147f04e

Fig. 58: Checking ETC Negative Circuit For Short To Battery Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K126) ETC Motor (-) circuit at the appropriate terminal of special tool #8815.

Is there any voltage present?

Yes

Repair the short to voltage in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO THE (K126) ETC MOTOR (-) CIRCUIT

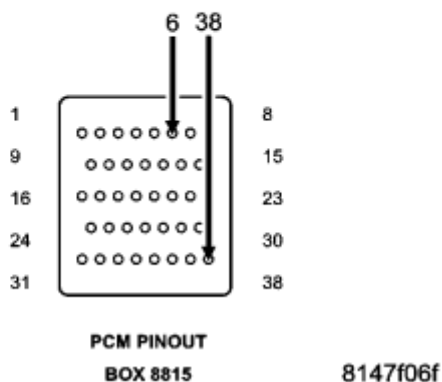
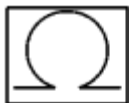


Fig. 59: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (K124) ETC Motor (+) circuit and the (K126) ETC Motor (-) circuit at the appropriate terminals of special tool #8815.

Is the resistance below 100 ohms?

Yes

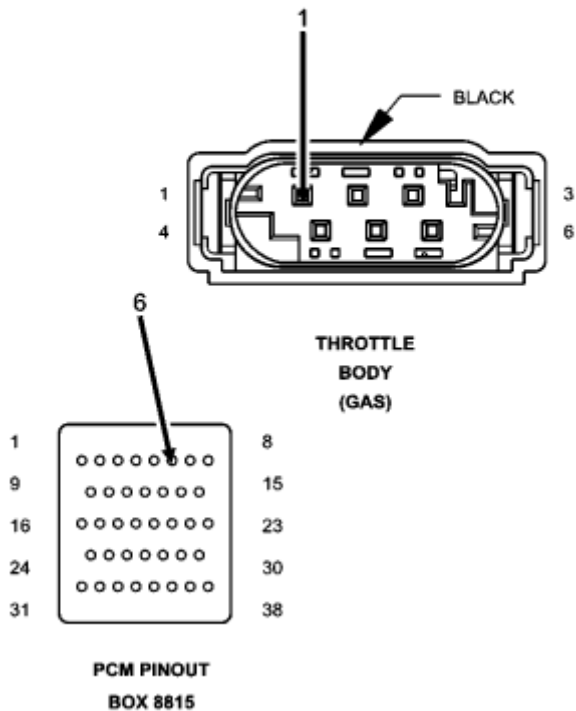
Repair the short to between the (K124) ETC Motor (+) circuit and the (K126) ETC MOTOR (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K124) ETC MOTOR (+) CIRCUIT OPEN



8191a715

Fig. 60: Checking ETC Positive Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K124) ETC Motor (+) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

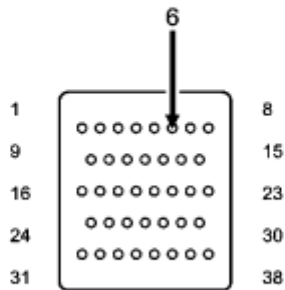
Go To 7.

No

Repair the open in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

7. (K124) ETC MOTOR (+) CIRCUIT SHORTED TO GROUND



PCM PINOUT
BOX 8815

8147f061

Fig. 61: Checking Electronic Throttle Control Positive Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K124) ETC Motor (+) circuit between the appropriate terminals of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K124) ETC Motor (+) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K126) ETC MOTOR (-) CIRCUIT OPEN

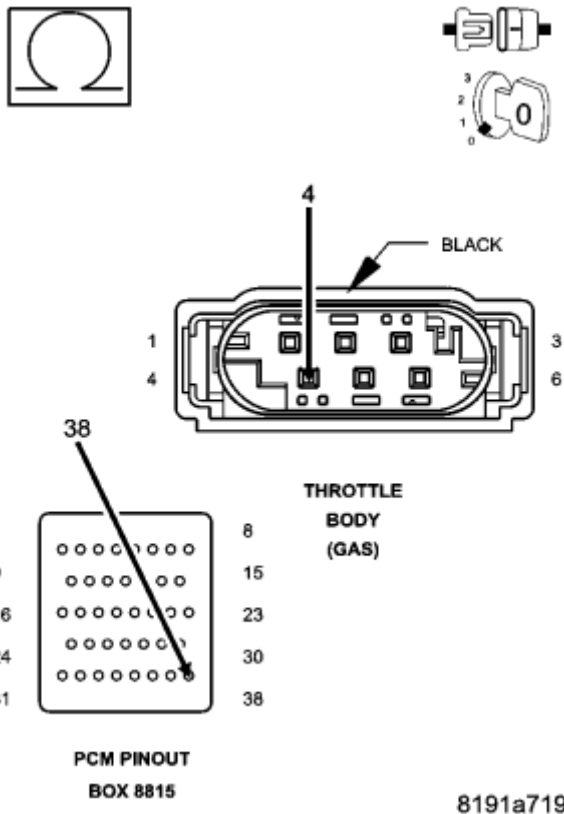


Fig. 62: Checking ETC Negative Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K126) ETC Motor (-) circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

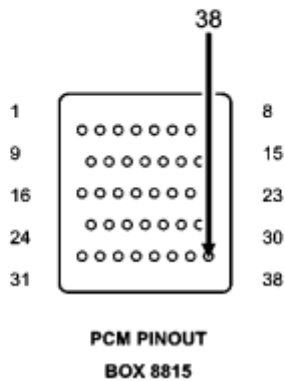
Go To 9.

No

Repair the open in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. (K126) ETC MOTOR (-) CIRCUIT SHORTED TO GROUND



8147f065

Fig. 63: Checking Electronic Throttle Control Negative Circuit For Short To ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K126) ETC Motor (-) circuit between the appropriate terminals of special tool #8815.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K126) ETC Motor (-) circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **ETC MOTOR**

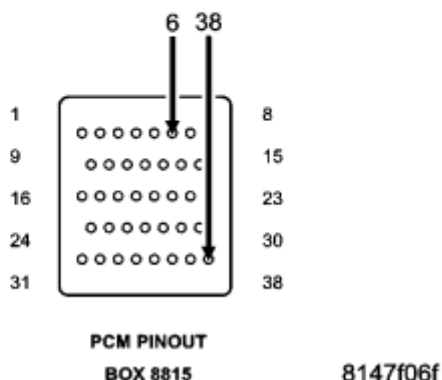
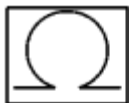


Fig. 64: Checking Electronic Throttle Control Motor Resistance
Courtesy of CHRYSLER LLC

NOTE: Take the following measurement using special tool #8815 to avoid possible damage to the Throttle Body harness connector.

Connect the Throttle Body harness connector.

Measure the resistance of the ETC Motor between the (K124) ETC Motor (+) circuit and the (K126) ETC Motor (-) circuit at the appropriate terminals of special tool #8815.

Is the resistance between 2.5 and 25 ohms at closed throttle?

Yes

Go To 11.

No

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST**.

11. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2122-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition on and no other APPS No.1 DTCs present.

SET CONDITIONS

- Set Condition:

When the APP Sensor No.1 voltage is too low. Engine will additionally idle if the brake pedal is pressed or has failed. Acceleration rate and Engine output are limited. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K855) 5-VOLT SUPPLY CIRCUIT OPEN
(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K23) APP SIGNAL 1 CIRCUIT OPEN
(K23) APP SIGNAL 1 CIRCUIT SHORTED TO GROUND
(K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K167) APP SENSOR GROUND 1 CIRCUIT
(K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K400) APP SENSOR GROUND 2 CIRCUIT
APP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

NOTE: If you are viewing data recorder information or Freeze Frame data the APP Sensor No. 2 is pulled low by the PCM as part of its system testing. This test happens every 320 milliseconds and may not show up on the scan

tool but may show up on a data recorder or lab scope. It is acceptable to see the voltage close to zero with a normal sensor when using a data recorder/lab scope.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 11.

2. (K855) 5-VOLT SUPPLY CIRCUIT

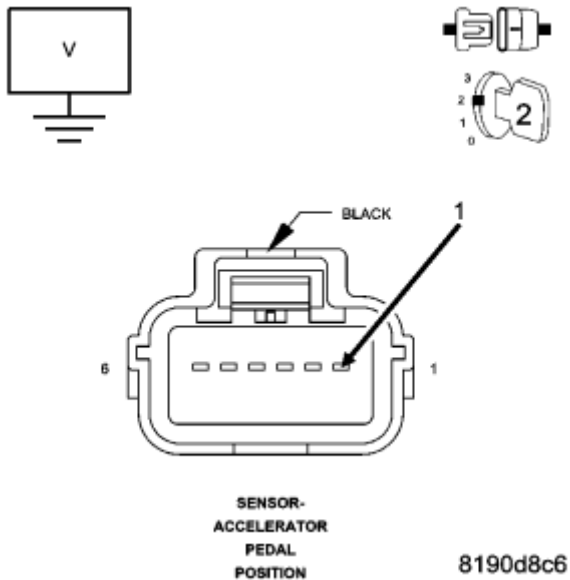


Fig. 66: Measuring Voltage On 5-Volt Supply Circuit At APP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the APP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the APP Sensor harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 3.

No

Go To 8.

3. (K23) APP SIGNAL 1 CIRCUIT OPEN

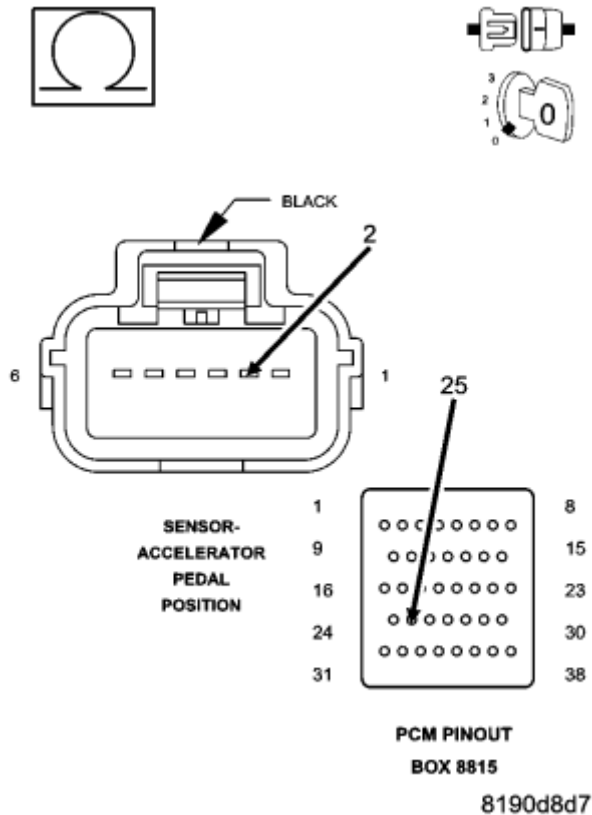


Fig. 67: Checking APP Sensor No. 1 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K23) APP Signal 1 circuit from the APP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K23) APP SIGNAL 1 CIRCUIT SHORTED TO GROUND

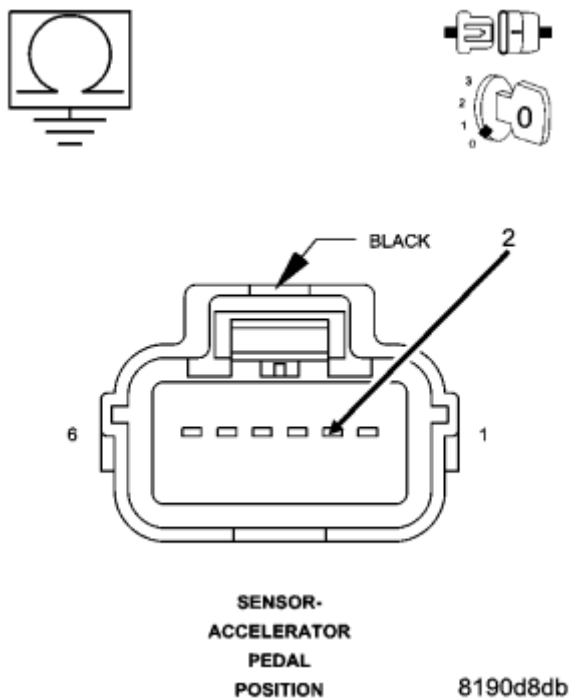


Fig. 68: Checking APP Sensor No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K23) APP Signal 1 circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K167) APP SENSOR GROUND 1 CIRCUIT**

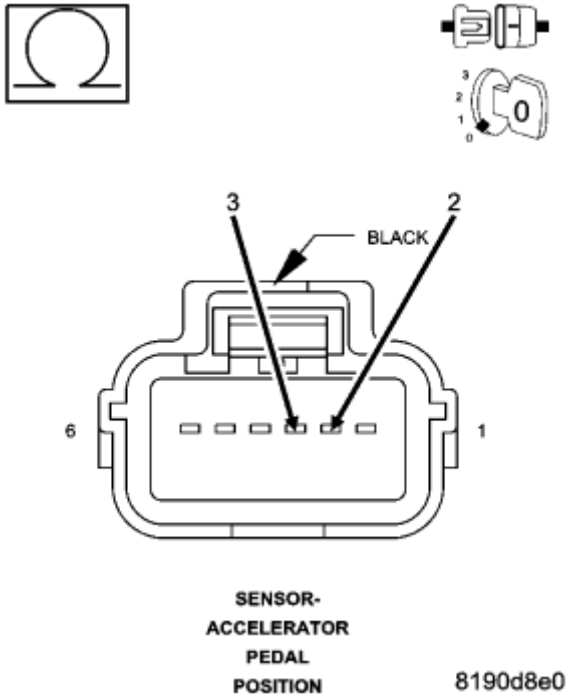


Fig. 69: Checking APP Sensor No. 1 Signal Circuit For Short To APP Sensor No. 1 Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K23) APP Signal 1 circuit and the (K167) APP Sensor Ground 1 circuit at the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K167) APP Sensor Ground 1 circuit and the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K400) APP SENSOR GROUND 2 CIRCUIT**

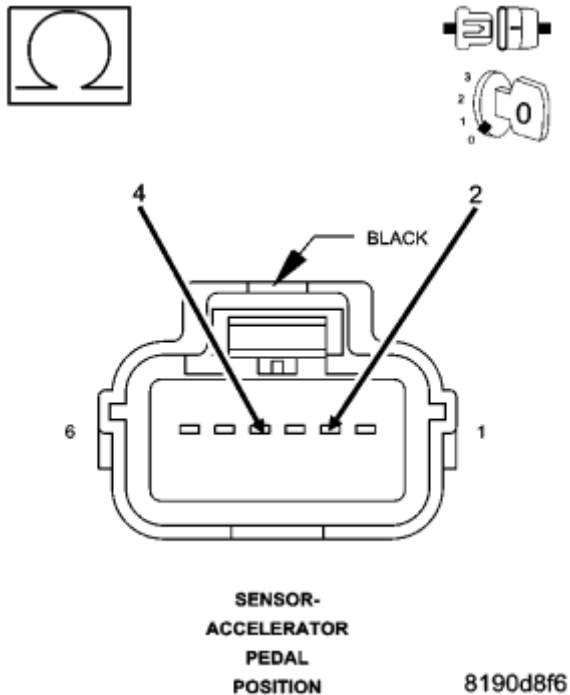


Fig. 70: Checking APP Sensor No. 1 Signal Circuit For Short To APP Sensor No. 2 Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K23) APP Signal 1 circuit and the (K400) APP Sensor Ground 2 circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K400) APP Sensor Ground 2 circuit and the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. ACCELERATOR PEDAL POSITION SENSOR

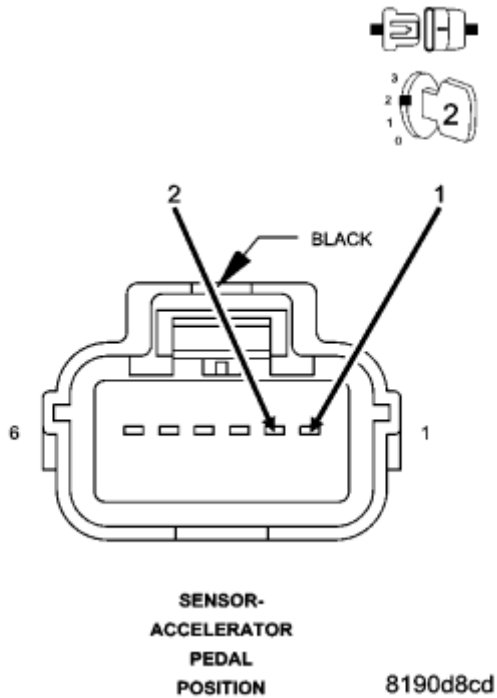


Fig. 71: Connecting Jumper Wire Between 5-Volt Supply Circuit & APP Sensor No. 1 Signal Circuit At Sensor Connector
Courtesy of CHRYSLER LLC

Connect the C3 PCM harness connector.

Ignition on, engine not running.

Connect a jumper wire between the (K855) 5-volt Supply circuit and the (K23) APP Signal 1 circuit in the Sensor harness connector.

With a scan tool, monitor the APP Sensor No.1 voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the jumper wire installed.**

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: Remove the jumper wire before continuing.

8. (K855) 5-VOLT SUPPLY CIRCUIT OPEN

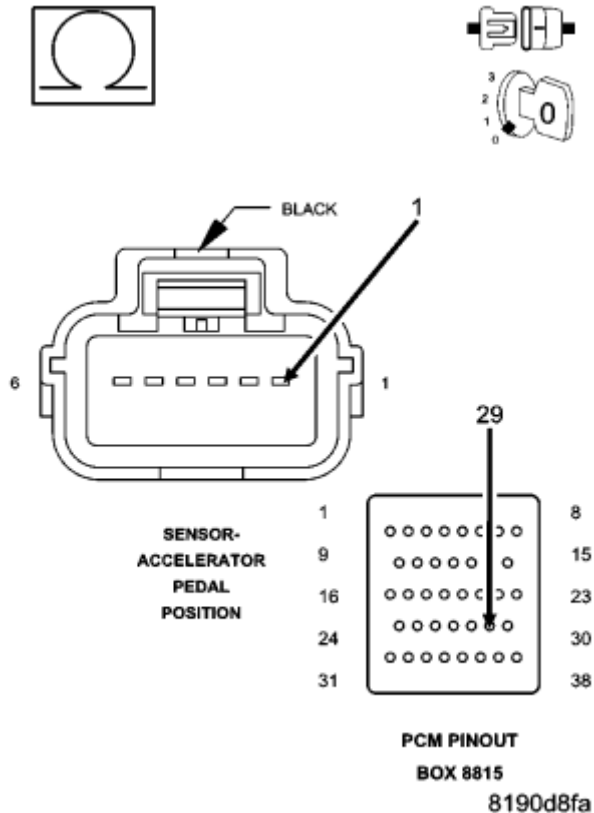


Fig. 72: Checking 5-Volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

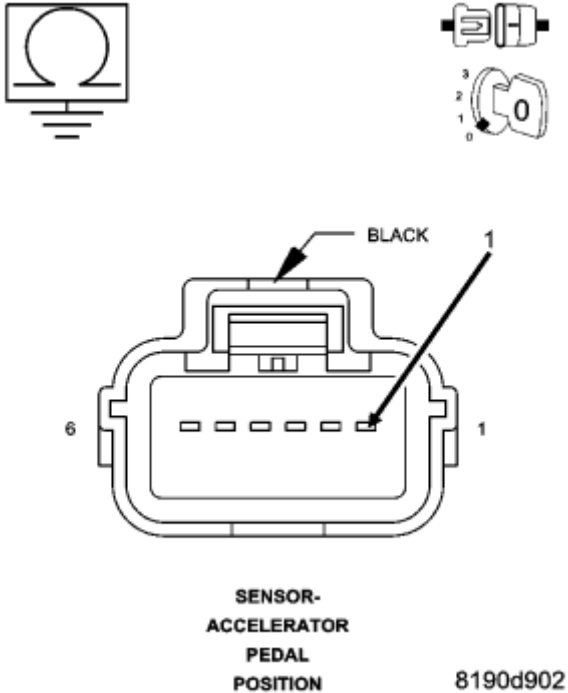


Fig. 73: Checking APPS 1 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K855) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Accelerator Pedal Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **APP SENSOR SWEEP**

Ignition on, engine not running.

With a scan tool, monitor the APP Sensor No.1 voltage.

Slowly press the Accelerator pedal down.

Does voltage start at approximately 0.45 of a volt and go above 4.6 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

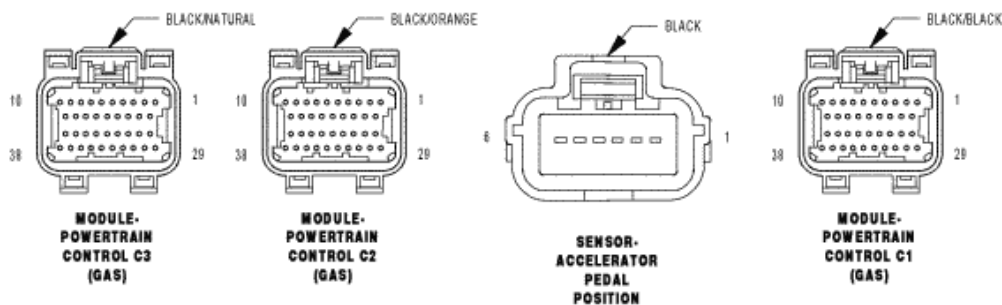
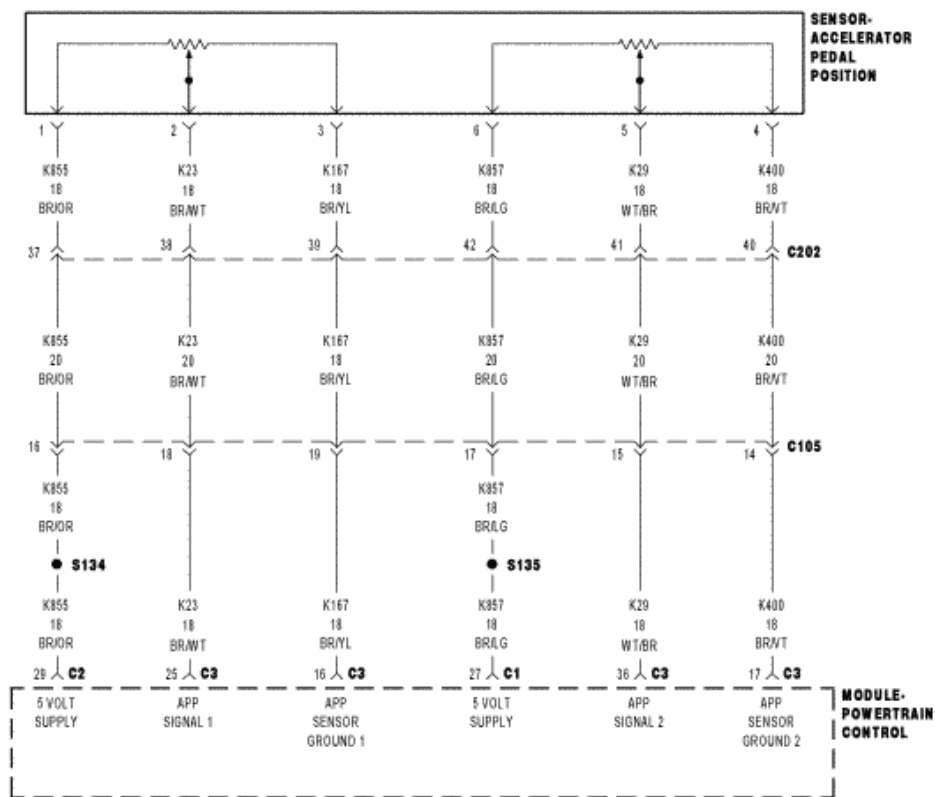
No

Replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

P2123-ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



810000

Fig. 74: Accelerator Pedal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and no other APPS No.1 DTCs present.

SET CONDITIONS

- **Set Condition:**

When APP Sensor No.1 voltage is too high. Engine will additionally idle if the brake pedal is pressed or has failed. Acceleration rate and Engine output are limited. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K23) APP SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE
(K23) APP SIGNAL 1 SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
(K23) APP SIGNAL 1 SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT
(K167) APP SENSOR GROUND 1 CIRCUIT OPEN
APP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

NOTE: If you are viewing data recorder information or Freeze Frame data the APP Sensor No. 2 is pulled low by the PCM as part of its system testing. This test happens every 320 milliseconds and may not show up on the scan tool but may show up on a data recorder or lab scope. It is acceptable to see the voltage close to zero with a normal sensor when using a data

recorder/lab scope.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 8.

2. (K23) APP SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE

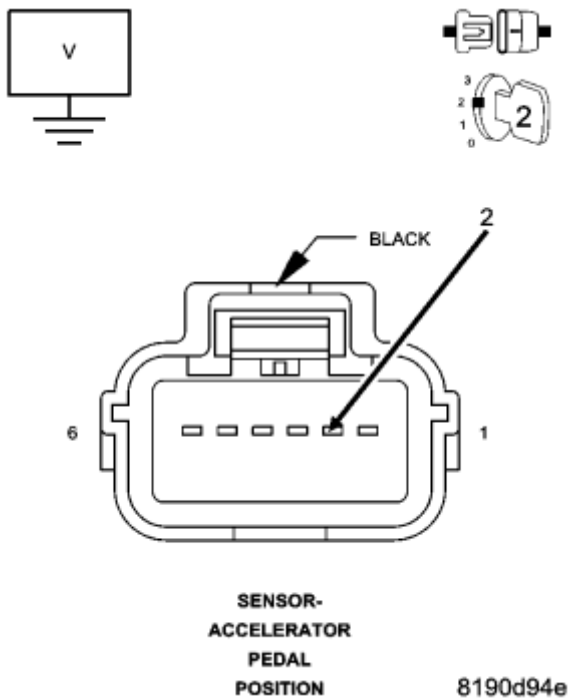


Fig. 75: Checking APP Sensor No. 1 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1, C2, and C3 PCM harness connectors.

Disconnect the APP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K23) APP Signal 1 circuit in the APP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT

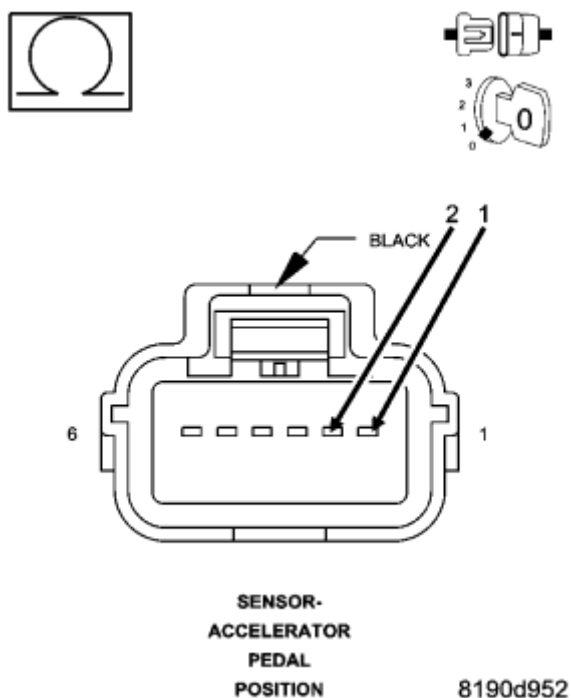


Fig. 76: Checking APPS 1 Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (K23) APP Signal 1 circuit and the (K855) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K23) APP Signal 1 circuit and the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K23) APP SIGNAL 1 CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT

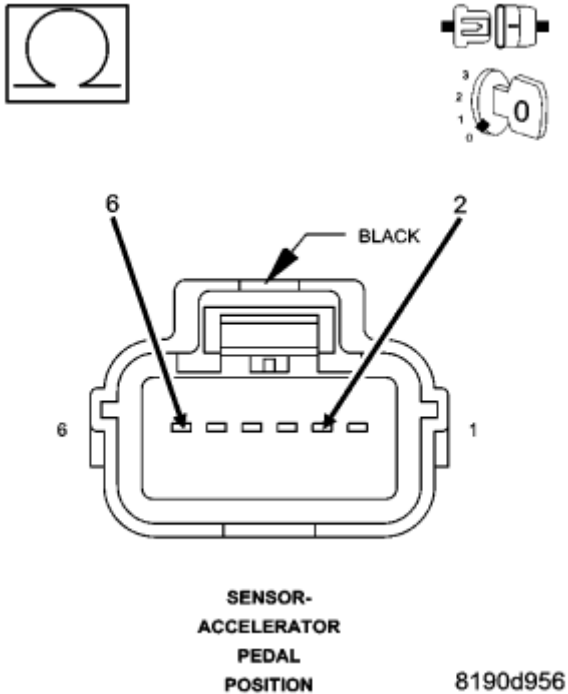


Fig. 77: Checking APPS No. 1 Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K23) APP Signal 1 circuit and the (K857) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K23) APP Signal 1 circuit and the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K167) APP SENSOR GROUND 1 CIRCUIT OPEN

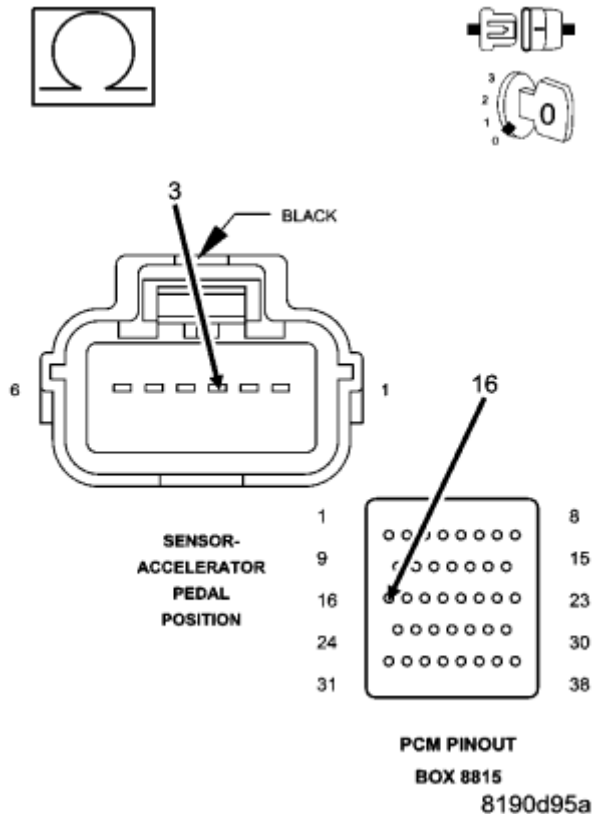


Fig. 78: Checking APP Sensor No. 1 Return Circuit For Open
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K167) APP Sensor Ground 1 circuit from the APP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K167) APP Sensor Ground 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. ACCELERATOR PEDAL POSITION SENSOR

Connect the PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the APP Sensor 1 voltage.

Is the voltage above 0 volts?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Accelerator Pedal Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

8. APP SENSOR NO.1 SWEEP

Ignition on, engine not running.

With a scan tool, monitor the Accelerator Pedal Position Sensor voltage.

Slowly press the Accelerator Pedal down.

Does voltage start at approximately 0.45 of a volt and go above 4.6 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

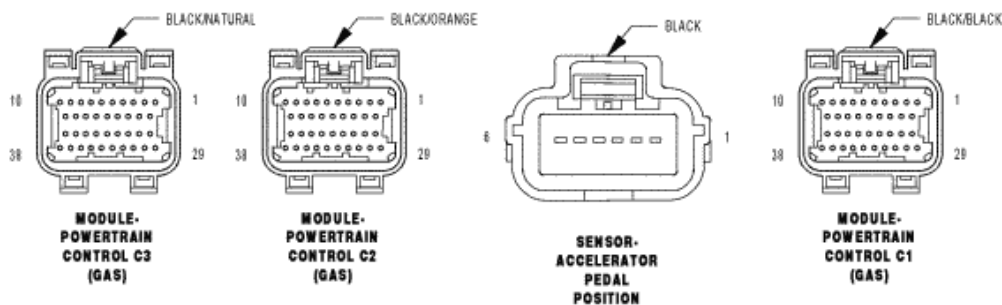
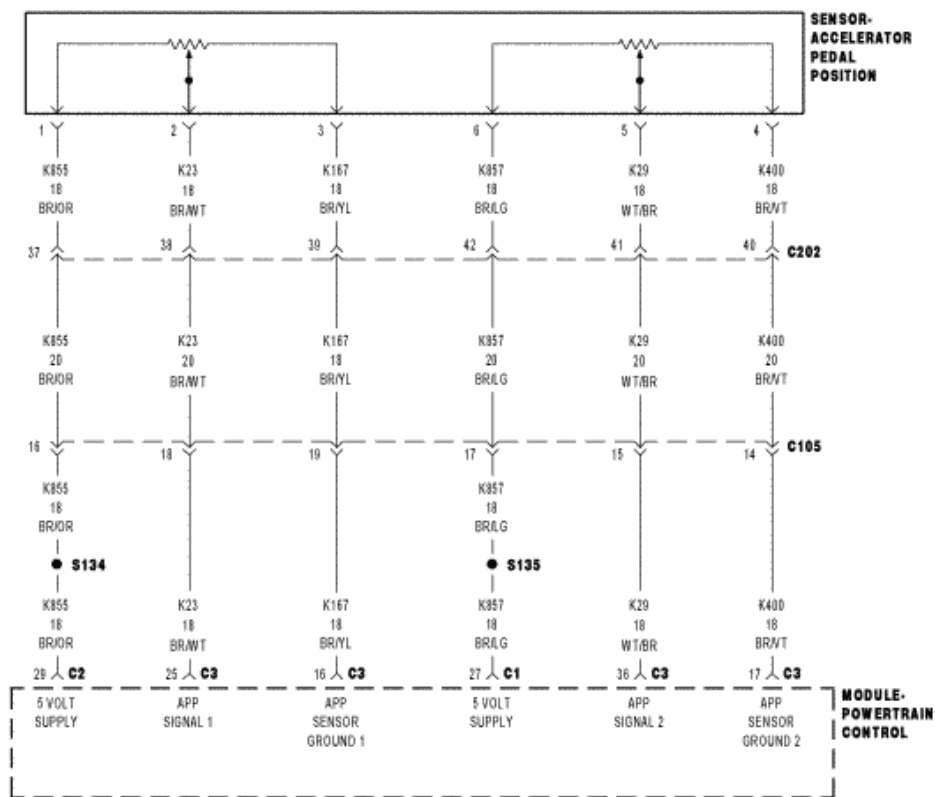
No

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

P2127-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT LOW

CIRCUIT SCHEMATIC



810000

Fig. 79: Accelerator Pedal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and no other APPS No.2 DTCs present.

SET CONDITIONS

• Set Condition:

When the APP Sensor No.2 voltage is too low. Engine will only idle if the Brake pedal is Pressed or has failed. Acceleration rate and Engine output are limited. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT OPEN
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K29) APP SIGNAL 2 CIRCUIT OPEN
(K29) APP SIGNAL 2 CIRCUIT SHORTED TO GROUND
(K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K167) APP SENSOR GROUND 1 CIRCUIT
(K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K400) APP SENSOR GROUND 2 CIRCUIT
APP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

NOTE: If you are viewing data recorder information or Freeze Frame data the APP Sensor No. 2 is pulled low by the PCM as part of its system testing. This test happens every 320 milliseconds and may not show up on the scan

tool but may show up on a data recorder or lab scope. It is acceptable to see the voltage close to zero with a normal sensor when using a data recorder/lab scope.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 11.

2. (K857) 5-VOLT SUPPLY CIRCUIT

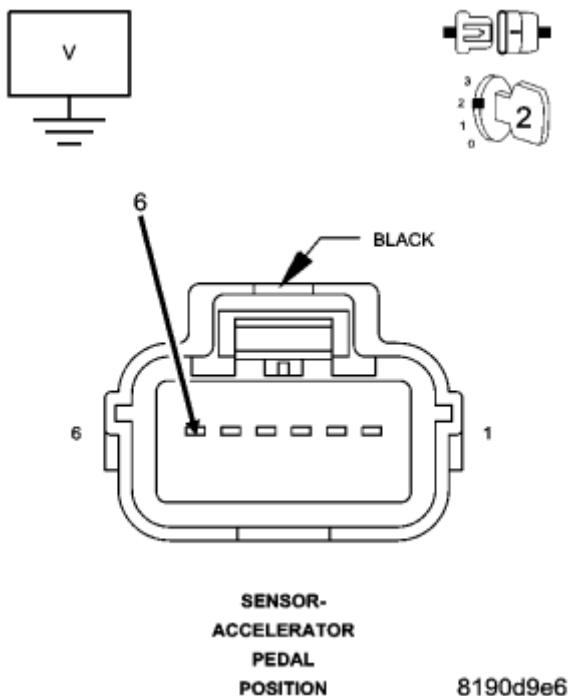


Fig. 80: Measuring Voltage Of 5-Volt Supply Circuit At APP Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the APP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the APP Sensor harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To 3.

No

Go To 8.

3. (K29) APP SIGNAL 2 CIRCUIT OPEN

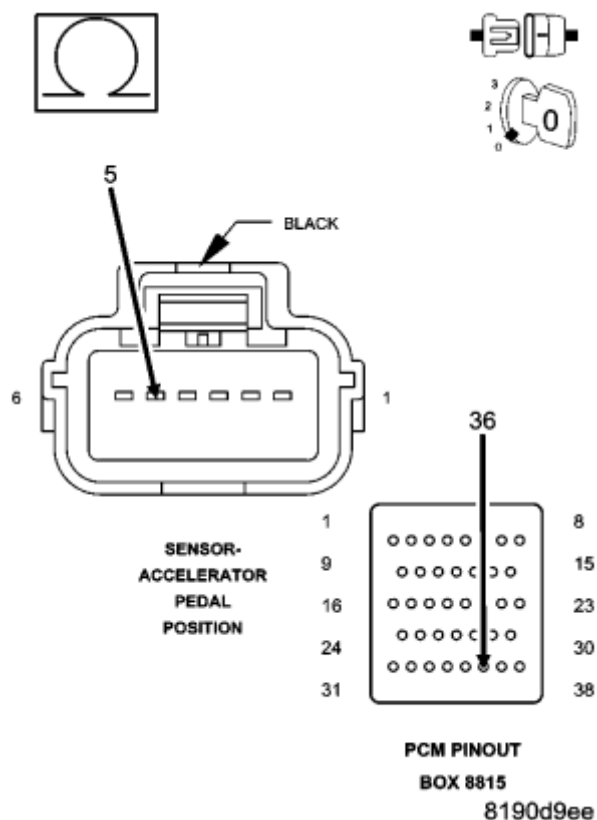


Fig. 81: Checking APP Sensor No. 2 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (K29) APP Signal 2 circuit from the APP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the open in the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

4. (K29) APP SIGNAL 2 CIRCUIT SHORTED TO GROUND

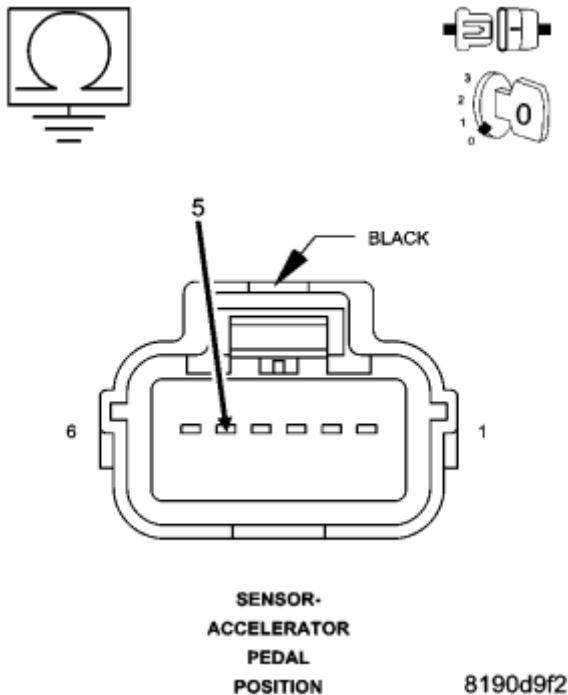


Fig. 82: Checking APPS 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K29) APP Signal 2 circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K400) APP SENSOR GROUND 2 CIRCUIT**

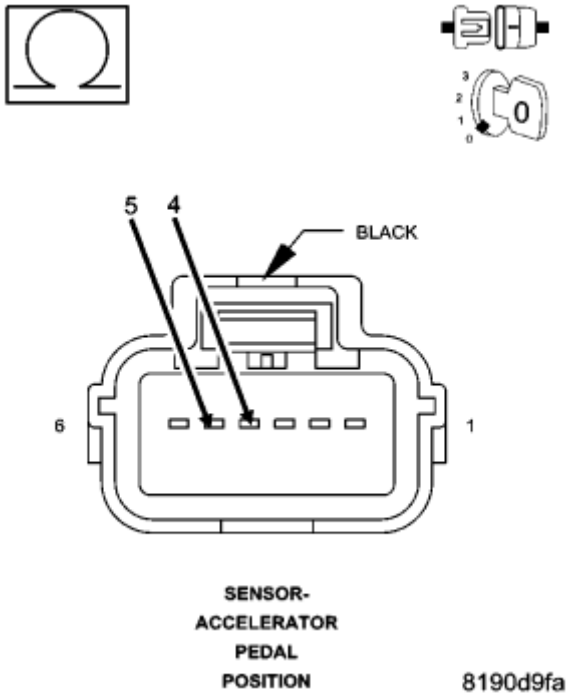


Fig. 83: Checking APP Sensor 2 Signal Circuit For Short To APP Sensor 2 Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K29) APP Signal 2 circuit and the (K400) APP Sensor Ground 2 circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K400) APP Sensor Ground 2 circuit and the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K167) APP SENSOR GROUND 1 CIRCUIT**

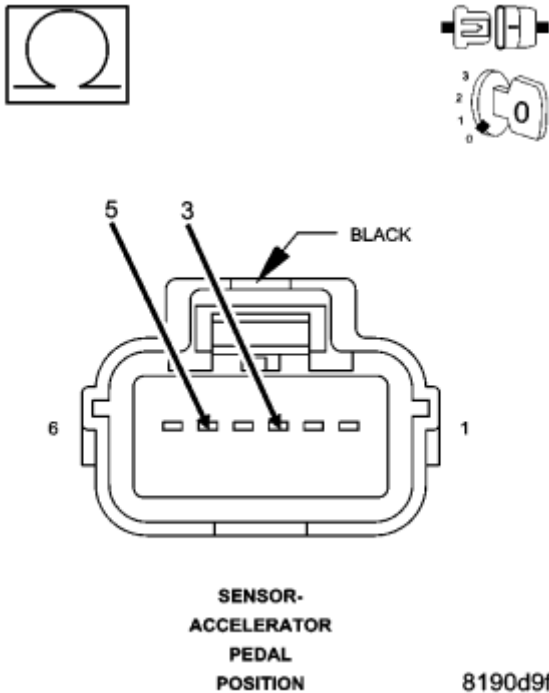


Fig. 84: Checking APP Sensor 2 Signal Circuit For Short To APP Sensor 1 Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K29) APP Signal 2 circuit and the (K167) APP Sensor Ground 1 circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K167) APP Sensor Ground 1 circuit and the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. **ACCELERATOR PEDAL POSITION SENSOR**

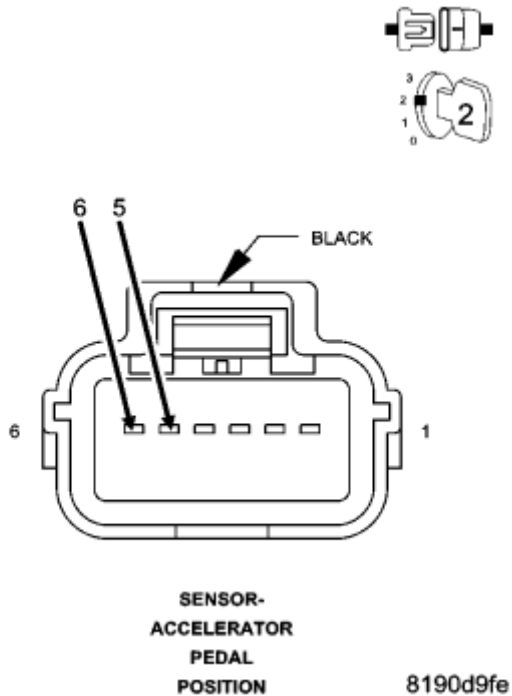


Fig. 85: Connecting Jumper Wire Between 5-Volt Supply Circuit And APP Sensor 2 Signal Circuit At Sensor Harness Connector
 Courtesy of CHRYSLER LLC

Connect the PCM harness connectors.

Ignition on, engine not running.

Connect a jumper wire between the (K857) 5-volt Supply circuit and the (K29) APP Signal 2 circuit in the Sensor harness connector.

With a scan tool, monitor the APP Sensor 2 voltage.

NOTE: The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the jumper wire installed.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: Remove the jumper wire before continuing.

8. (K857) 5-VOLT SUPPLY CIRCUIT OPEN

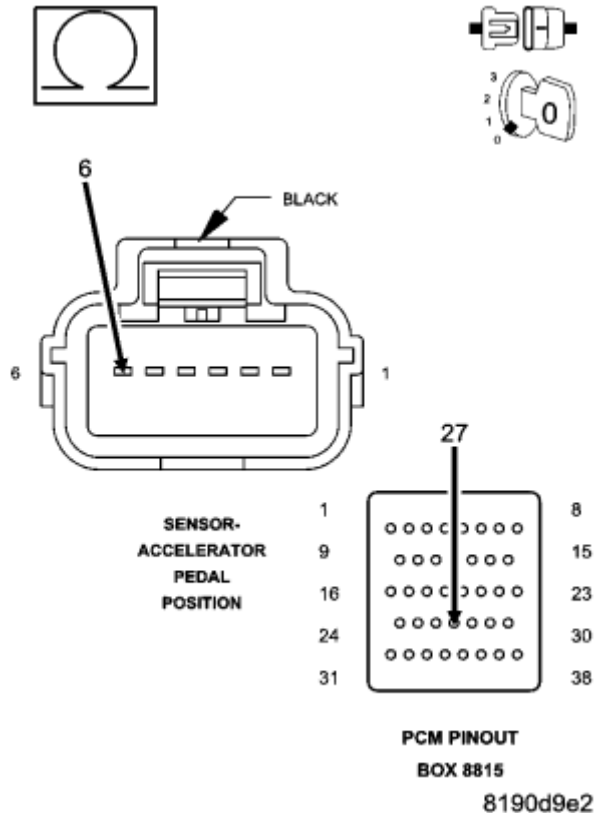


Fig. 86: Checking 5-Volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

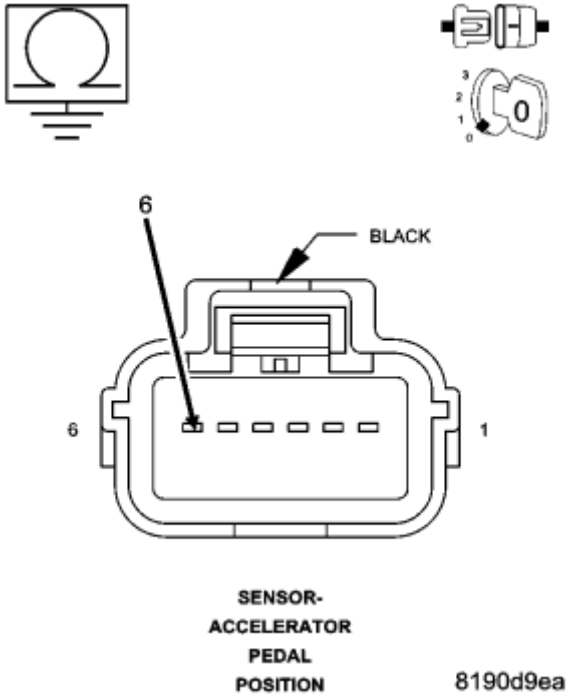


Fig. 87: Checking APPS 2 5-Volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Accelerator Pedal Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **APP SENSOR SWEEP**

Ignition on, engine not running.

With a scan tool, monitor the APP Sensor No.2 voltage.

Slowly press the Accelerator pedal down.

Does voltage start at approximately 0.22 of a volt and go above 2.31 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

P2128-ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC

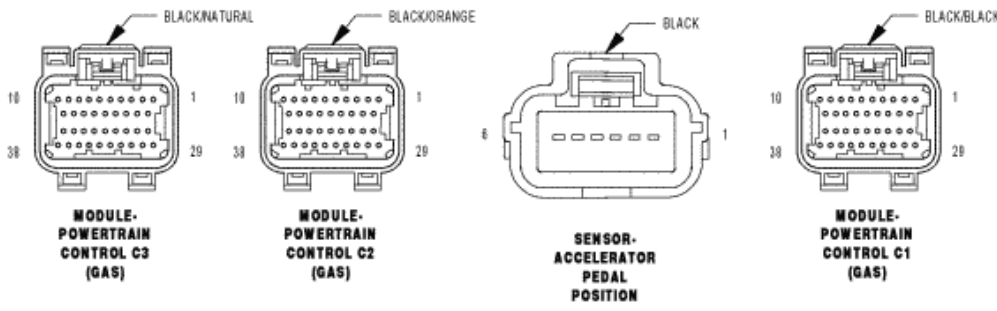
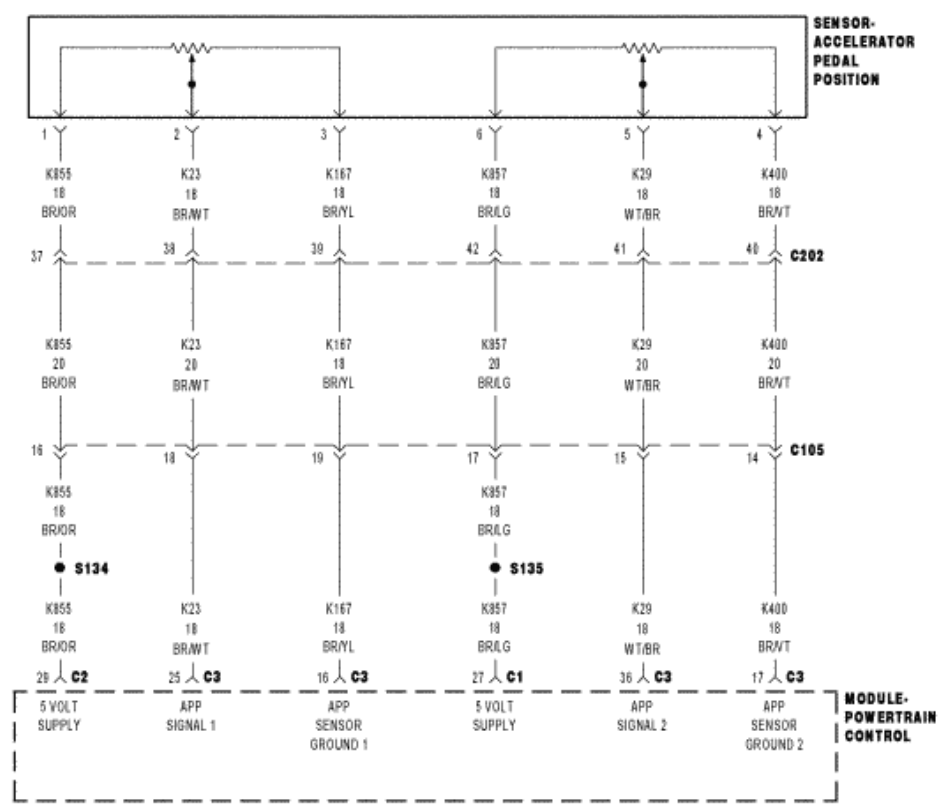


Fig. 88: Accelerator Pedal Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on and no other APPS No.2 DTCs present.

SET CONDITIONS

- **Set Condition:**

When APP Sensor No.2 voltage is too high. Idle is additionally forced any time the brake is applied or failed. Acceleration rate and Engine output are limited. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
(K29) APP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE
(K29) APP SIGNAL 2 SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT
(K29) APP SIGNAL 2 SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
(K400) APP SENSOR GROUND 2 CIRCUIT OPEN
APP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

NOTE: If you are viewing data recorder information or Freeze Frame data the APP Sensor No. 2 is pulled low by the PCM as part of its system testing. This test happens every 320 milliseconds and may not show up on the scan

tool but may show up on a data recorder or lab scope. It is acceptable to see the voltage close to zero with a normal sensor when using a data recorder/lab scope.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 8.

2. (K29) APP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

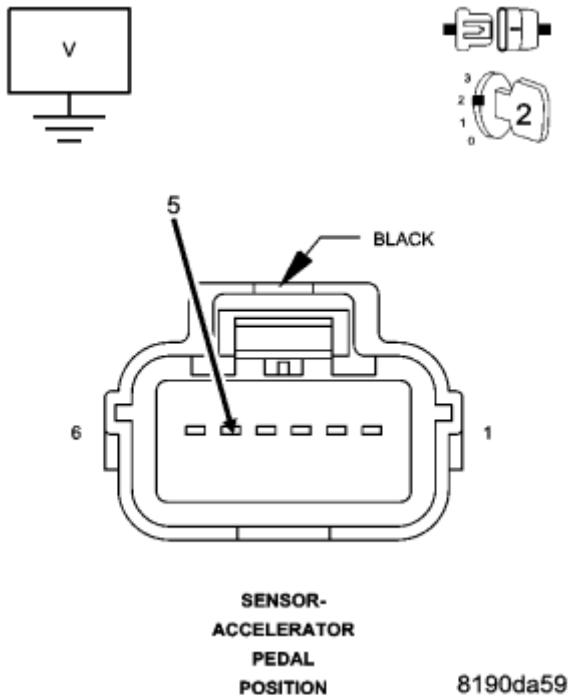


Fig. 89: Checking APP Sensor 2 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1, C2, and C3 PCM harness connectors.

Disconnect the APP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K29) APP Signal 2 circuit in the APP Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT

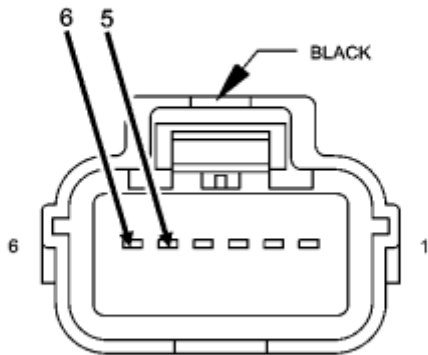


Fig. 90: Checking APPS 2 Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (K29) APP Signal 2 circuit and the (K857) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 10 ohms?

Yes

Repair the short between the (K29) APP Signal 2 circuit and the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **(K29) APP SIGNAL 2 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT**

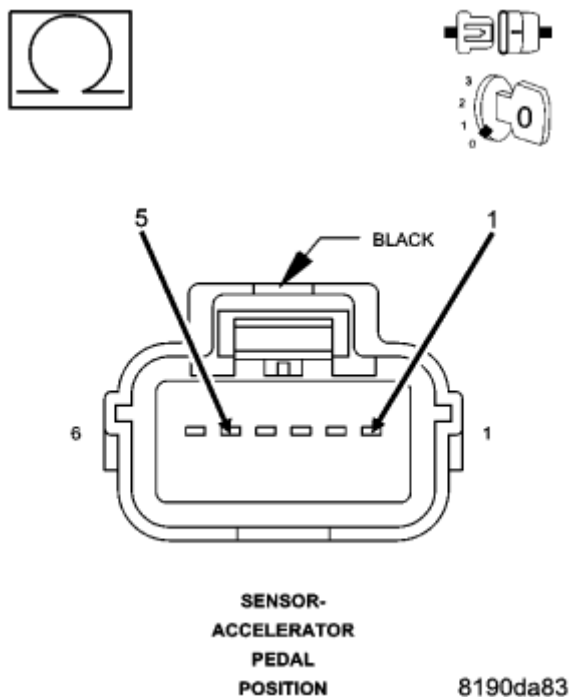


Fig. 91: Checking APPS 2 Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K29) APP Signal 2 circuit and the (K855) 5-volt Supply circuit in the APP Sensor harness connector.

Is the resistance below 10 ohms?

Yes

Repair the short between the (K29) APP Signal 2 circuit and the (K855) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(K400) APP SENSOR GROUND 2 CIRCUIT OPEN**

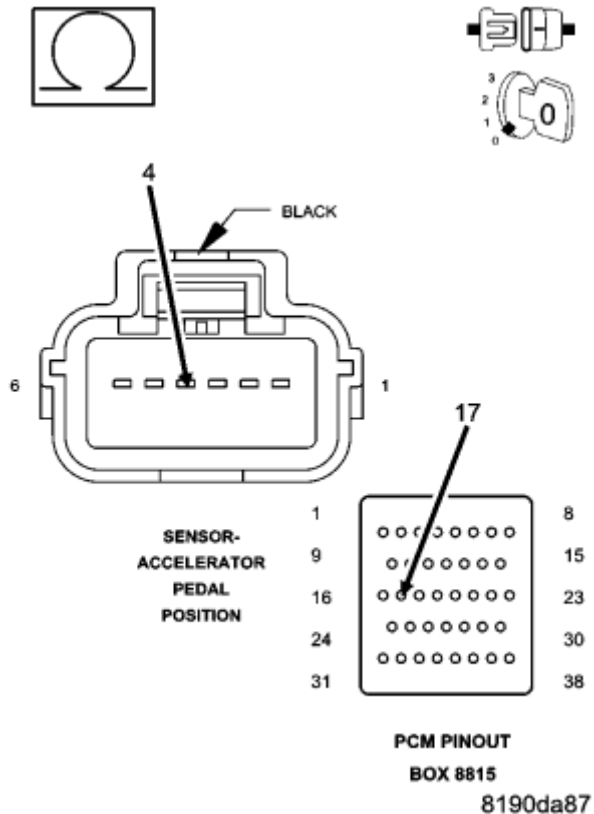


Fig. 92: Checking APP Sensor No. 2 Return Circuit For Open
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K400) APP Sensor Ground 2 circuit from the APP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K400) APP Sensor Ground 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. ACCELERATOR PEDAL POSITION SENSOR

Connect the PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the Accelerator Pedal Position Sensor voltage.

Is the voltage above 0 volts?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Accelerator Pedal Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

8. APP SENSOR NO.2 SWEEP

Ignition on, engine not running.

With a scan tool, monitor the Accelerator Pedal Position Sensor voltage.

Slowly press the Accelerator Pedal down.

Does voltage start at approximately 0.22 of a volt and go above 2.31 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

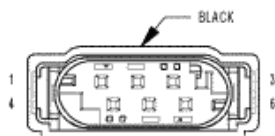
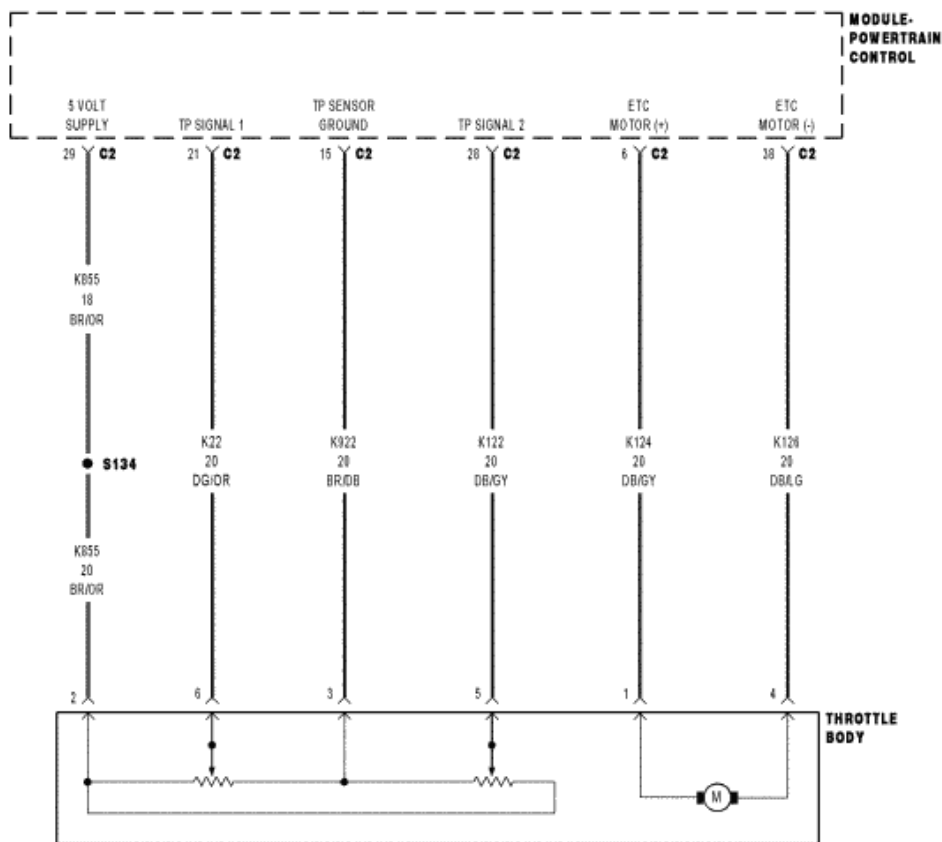
No

Replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

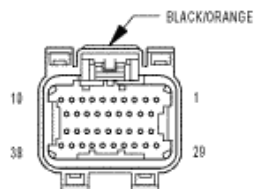
Perform **POWERTRAIN VERIFICATION TEST** .

P2135-THROTTLE POSITION SENSOR 1/2 CORRELATION

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 93: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and no other DTCs present for TP Sensor No.1 or No.2.

SET CONDITIONS

• Set Condition:

PCM recognizes TP Sensors No.1 and No.2 are not coherent. One trip fault and the code will set within 5 seconds. ETC light is illuminated.

POSSIBLE CAUSES

Possible Causes
(K22) TP SIGNAL 1 SHORTED TO VOLTAGE (K122) TP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND (K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (F855) 5-VOLT SUPPLY CIRCUIT (F855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K122) TP SIGNAL 2 CIRCUIT THROTTLE POSITION SENSOR/THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: The throttle plate and linkage should be free from binding and carbon build up.

NOTE: Make sure the throttle plate is at the idle position.

Ignition on, engine not running.

NOTE: Inspect the engine for vacuum leaks.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 14.

2. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE

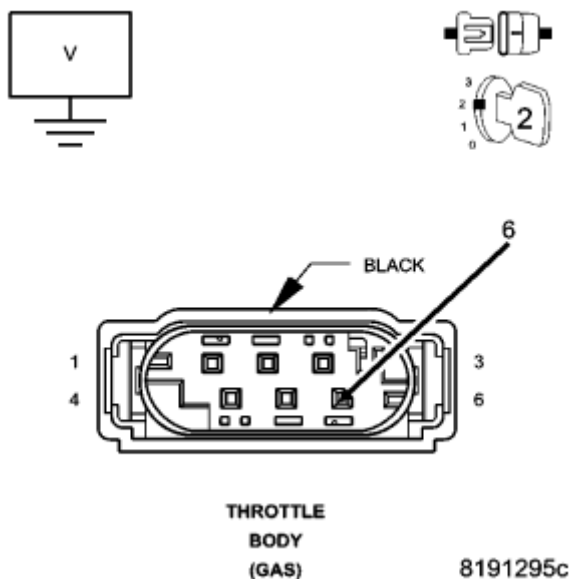


Fig. 94: Checking TP Sensor No.1 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

Measure the voltage on the (K22) TP Signal 1 circuit in the Throttle Body harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO VOLTAGE

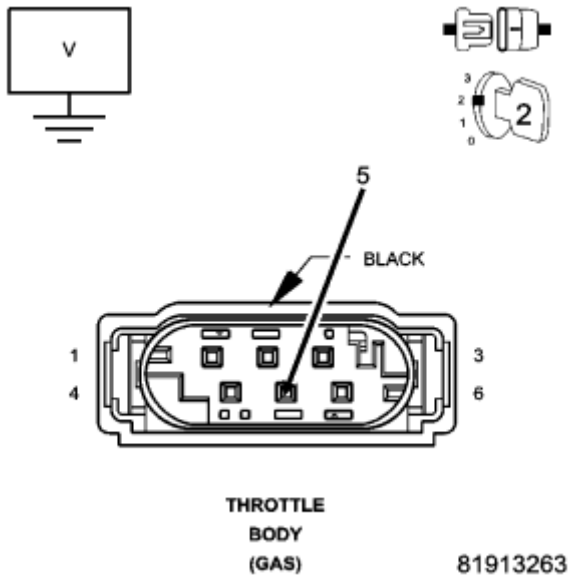


Fig. 95: Checking TP Signal 2 Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K122) TP Signal 2 circuit in the Throttle Body harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. THROTTLE POSITION SENSOR

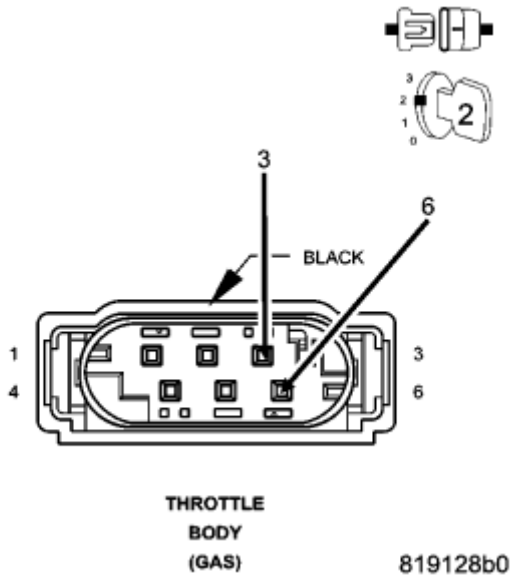


Fig. 96: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

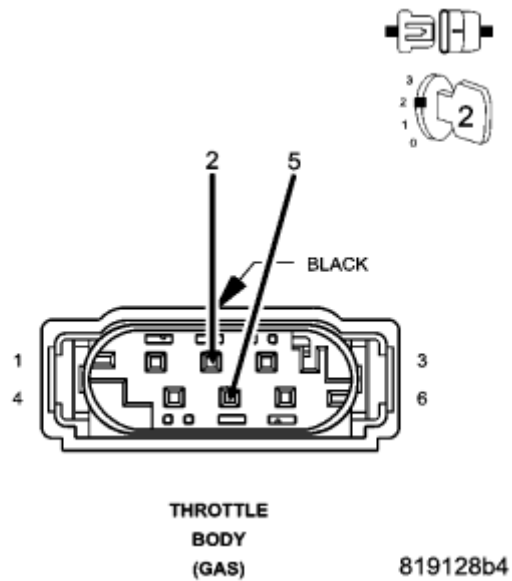


Fig. 97: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C2 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Signal 1 and Signal 2 voltage.

Connect a jumper wire between the (K922) TP Sensor Ground circuit and the (K22) TP Signal 1 circuit.

TP Sensor No.1 voltage should change from approximately 4.9 volts to 0.1 of a volt?

For TP Sensor No.2, connect a jumper wire between (F855) 5-volt supply circuit and the (K122) TP Signal 2 circuit.

TP Sensor No.2 voltage should change from approximately 0 volts to 5.0 volts?

Is the voltage reading within the listed specification with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body in accordance with Service Information. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

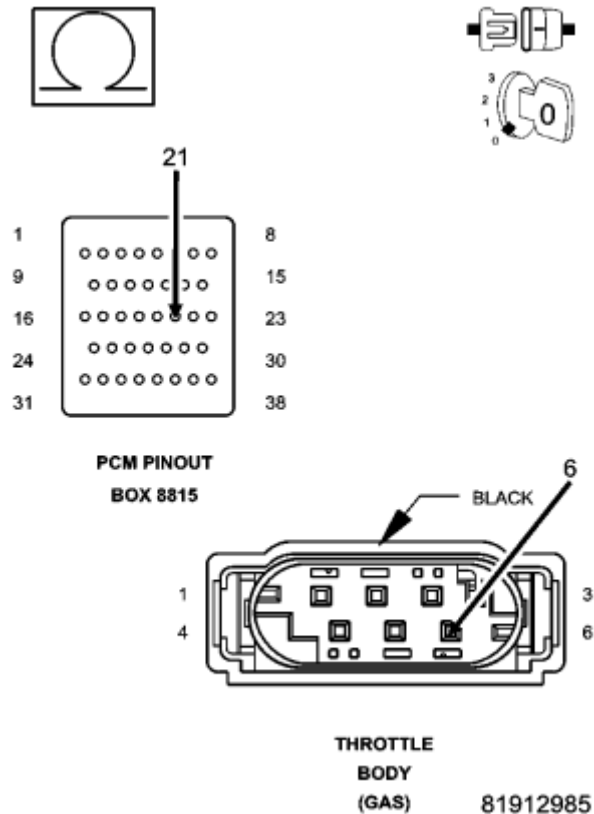


Fig. 98: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 6.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EXCESSIVE RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

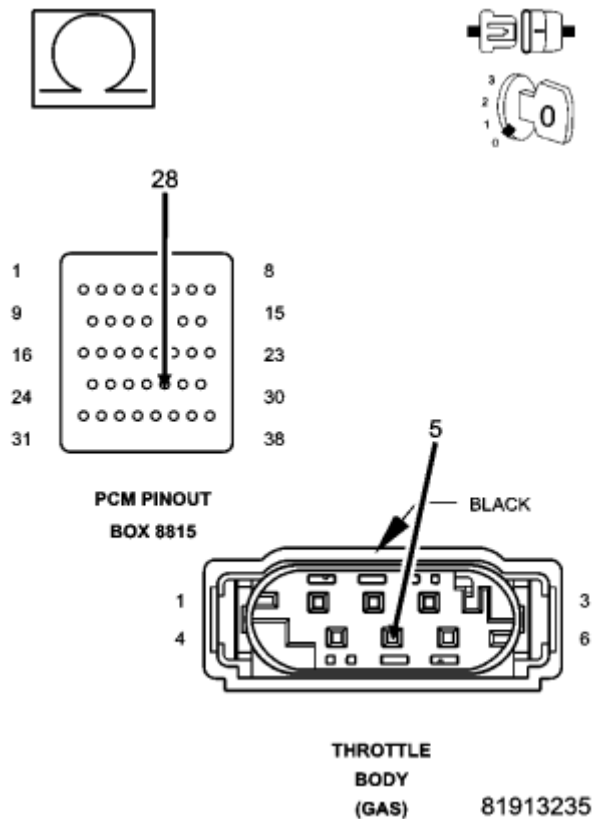


Fig. 99: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 7.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND

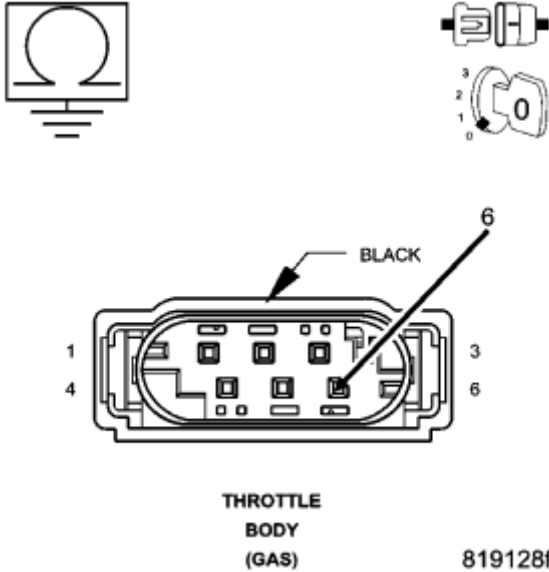


Fig. 100: Checking TP Sensor No. 1 Signal Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K22) TP Signal 1 circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms for each circuit?

Yes

Repair the short to ground in the (K22) TP Signal 1 circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND

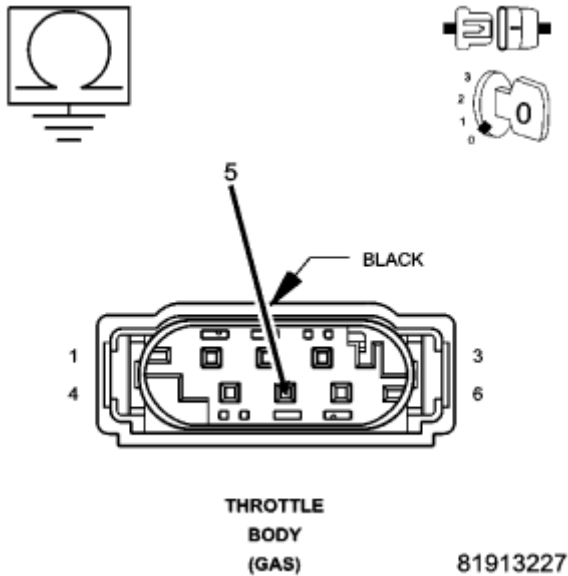


Fig. 101: Checking TP Sensor No. 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms for each circuit?

Yes

Repair the short to ground in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. EXCESSIVE RESISTANCE IN THE (F855) 5-VOLT SUPPLY CIRCUIT

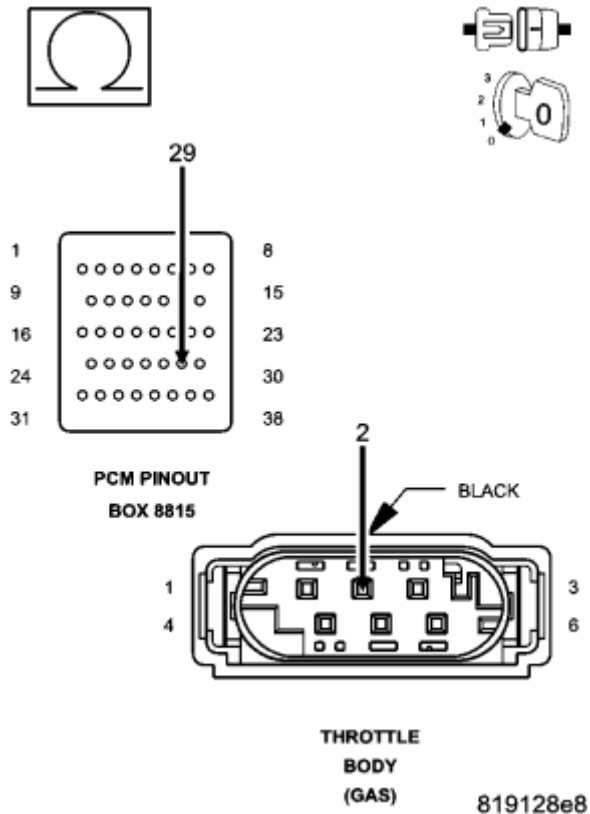


Fig. 102: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (F855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (F855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. (F855) 5-VOLT SUPPLY SHORTED TO GROUND

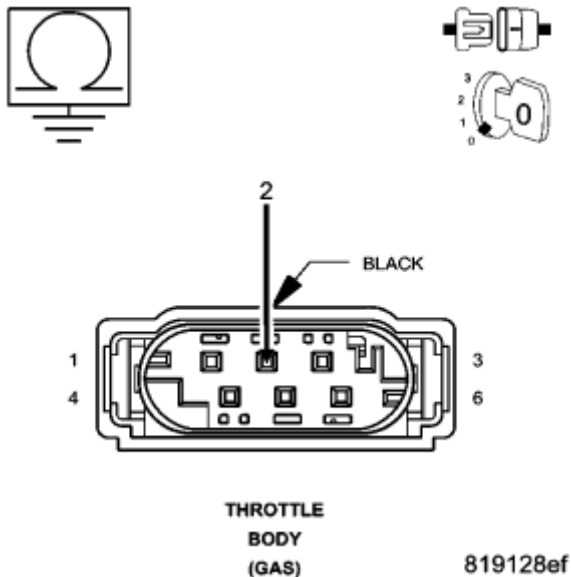


Fig. 103: Checking 5-volt Supply Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (F855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (F855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 11.

11. **EXCESSIVE RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT**

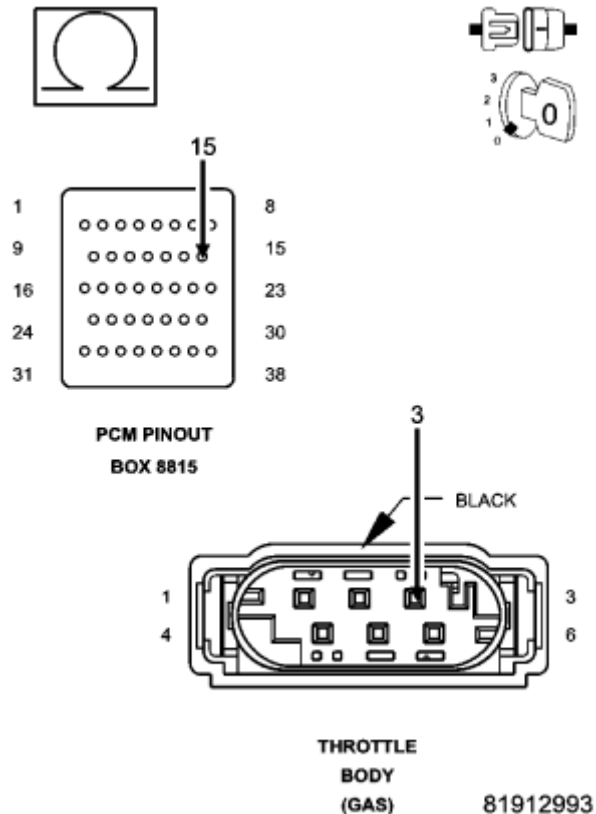


Fig. 104: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 12.

No

Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. (K22) TP SIGNAL 1 SHORTED TO THE (K122) TP SIGNAL 2

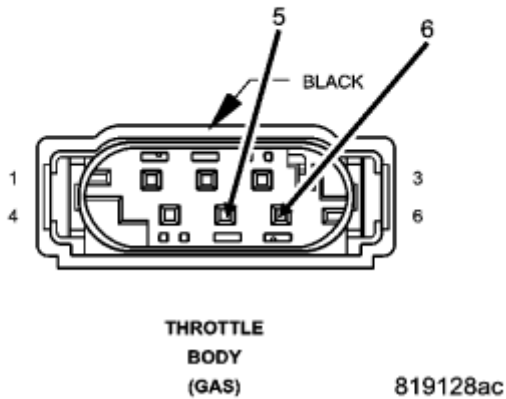


Fig. 105: Measuring Resistance Between TP Sensor No. 1 Signal Circuit & TP Sensor No. 2 Signal Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (K22) TP Signal 1 circuit and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K122) TP Signal 2 circuit and the (K22) TP Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

14. **THROTTLE FOLLOWER TEST**

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test and monitor the TP Sensor No.1 or No.2 voltage.

Slowly press the throttle pedal down.

The voltage for TP Sensor No.1 should start at approximately 0.7 of a volt and increase to approximately 4.3 volts.

The voltage for TP Sensor No.2 should start at approximately 4.3 volts and decrease to approximately 0.7 of a volt.

Is the voltage within the range of the listed specification for the appropriate Sensor?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Verify that there is good pin to terminal contact in the Throttle Body and the Powertrain Control Module connectors. If OK, replace the Throttle Body in accordance with Service Information. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

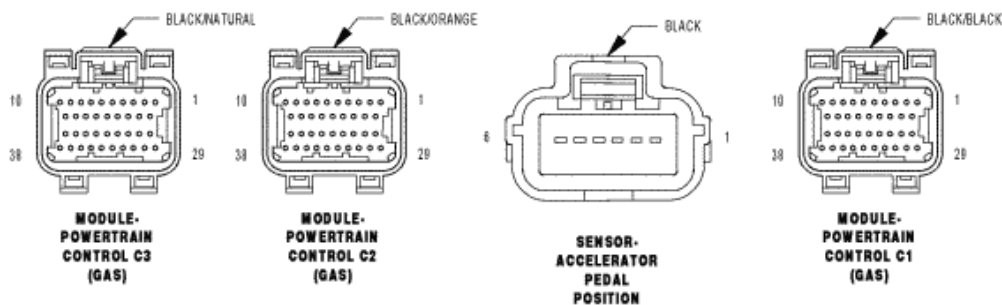
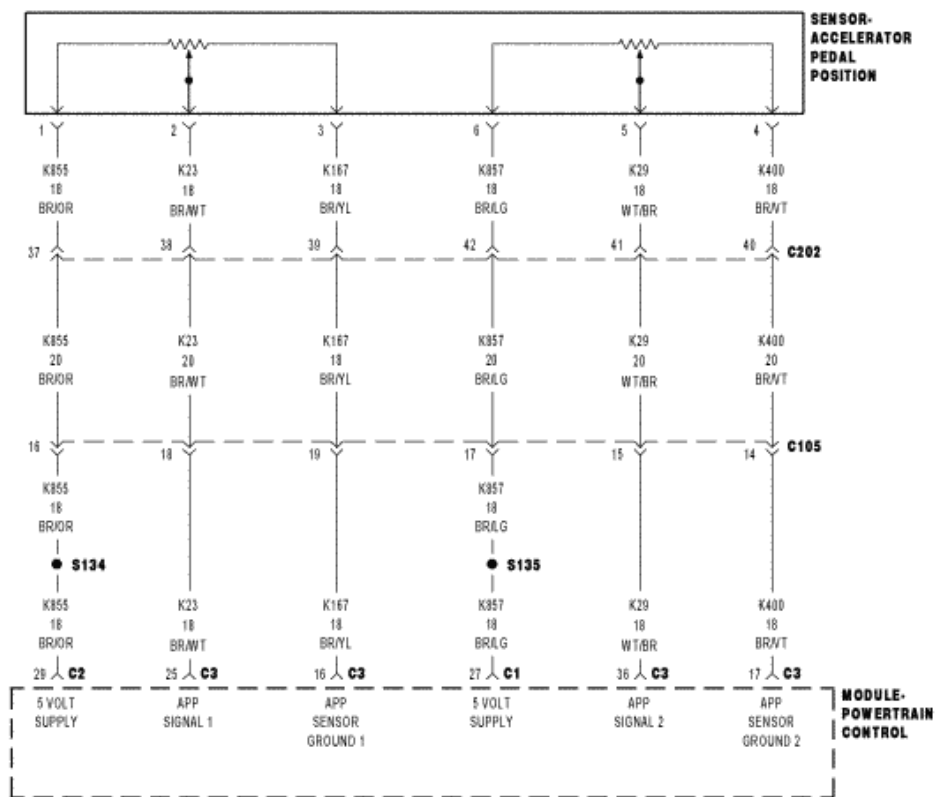
Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P2138-ACCELERATOR PEDAL POSITION SENSOR 1/2 CORRELATION

CIRCUIT SCHEMATIC



810000

Fig. 1: Accelerator Pedal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on and no APPS No.1 and APPS No.2 DTC present.

SET CONDITIONS

- Set Condition:

APPS values No.1 and No.2 are not coherent. Idle is additionally forced when the brake pedal is pressed or failed. Acceleration rate and Engine output are limited. One trip fault and the code will set within 5 seconds. ETC light is flashing.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT
EXCESSIVE RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT
EXCESSIVE RESISTANCE IN THE (K167) APP SENSOR GROUND 1 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K400) APP SENSOR GROUND 2 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K23) APP SIGNAL 1 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K29) APP SIGNAL 2 CIRCUIT
APP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

NOTE: If you are viewing data recorder information or Freeze Frame data the APP Sensor No. 2 is pulled low by the PCM as part of its system testing. This test happens every 320 milliseconds and will not show up on the scan tool

but may show up on a data recorder. It is acceptable to see the voltage close to zero with a normal sensor when using a data recorder.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. EXCESSIVE RESISTANCE IN THE (K23) APP SIGNAL 1 CIRCUIT

Turn the ignition off.

Disconnect the C3 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K23) APP Signal 1 circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 3.

No

Repair the excessive resistance in the (K23) APP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

3. EXCESSIVE RESISTANCE IN THE (K167) SENSOR GROUND 1 CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K167) APP Sensor Ground 1 circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 4.

No

Repair the excessive resistance in the (K167) APP Sensor Ground 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. EXCESSIVE RESISTANCE IN THE (K29) APP SIGNAL 2 CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K29) APP Signal 2 circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 5.

No

Repair the excessive resistance in the (K29) APP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. EXCESSIVE RESISTANCE IN THE (K400) APP SENSOR GROUND 2 CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K400) APP Sensor Ground 2 circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 6.

No

Repair the excessive resistance in the (K400) APP Sensor Ground 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

Turn the Ignition off.

Remove special tool #8815 from the C3 PCM harness connector and Re-Connect the C3 PCM harness connector to the PCM.

Disconnect the C2 PCM harness connector to install special tool #8815 and #8815-1.

Using a voltmeter perform a voltage drop test. Backprobe the (K855) 5-volt Supply circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 7.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EXCESSIVE RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT

Turn the Ignition off.

Remove special tool #8815 from the C2 PCM harness connector and Re-Connect the C2 PCM harness connector to the PCM.

Disconnect the C1 PCM harness connector to install special tool #8815 and #8815-1.

Using a voltmeter perform a voltage drop test. Backprobe the (K857) 5-volt Supply circuit at the APPS harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 8.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. **CHECKING APPS NO.1 AND NO.2 WITH A LAB SCOPE**

Ignition on, engine not running.

Set up a lab scope in a way that you can view two graphs simultaneously.

Backprobe the (K23) APP Signal 1 circuit using Channel 1 at the APP Sensor harness connector.

Backprobe the (K29) APP Signal 2 circuit using Channel 2 at the APP Sensor harness connector.

Slowly press and release the Accelerator Pedal while monitoring the lab scope screen.

Does the scope pattern show any missing or erratic signals?

Yes

Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors. If OK, replace the APP Sensor Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 9.

9. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Accelerator Pedal Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the APPS and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P2166-ACCELERATOR PEDAL POSITION SENSOR 1 MAXIMUM STOP PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on. During in plant mode the APP Sensors need to be checked to make sure that idle and full pedal travel can be reached on both sensors.

SET CONDITIONS

• **Set Condition:**

APPS No.1 has failed to achieve the required maximum value during In Plant testing. One trip fault and the code will set within 5 seconds. Engine will only idle. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
IN PLANT TEST FAILURE APPS RELEARN

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. IN PLANT TEST FAILURE

Ignition on, engine not running.

NOTE: This DTC is set when the APP Sensors are learned in plant but do not reach the Minimum or Maximum voltage range.

With a scan tool, select View DTCs.

With the scan tool, erase DTCs.

Start the engine.

With the scan tool, view DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. APPS RELEARN

With a scan tool select the ETC RELEARN function.

Next, erase DTCs.

Start the engine.

Does the DTC return?

Yes

Replace the APPS Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P2167-ACCELERATOR PEDAL POSITION SENSOR 2 MAXIMUM STOP PERFORMANCE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on. During in plant mode the APP Sensors need to be checked to make sure that idle and full pedal travel can be reached on both sensors.

SET CONDITIONS

- **Set Condition:**

APPS No.2 has failed to achieve the required maximum value during In Plant testing. One trip fault and the code will set within 5 seconds. Engine will only idle. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
IN PLANT TEST FAILURE APPS RELEARN

DIAGNOSTIC TEST

1. IN PLANT TEST FAILURE

Ignition on, engine not running.

NOTE: **This DTC is set when the APP Sensors are learned in plant but do not reach the Minimum or Maximum voltage range.**

With a scan tool, select View DTCs.

With the scan tool, erase DTCs.

Start the engine.

With the scan tool, view DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **APPS RELEARN**

With a scan tool select the ETC RELEARN function.

Next, erase DTCs.

Start the engine.

Does the DTC return?

Yes

Replace the APPS Assembly per Service Information. After installation is complete, use a scan tool and select the ETC RELEARN function.

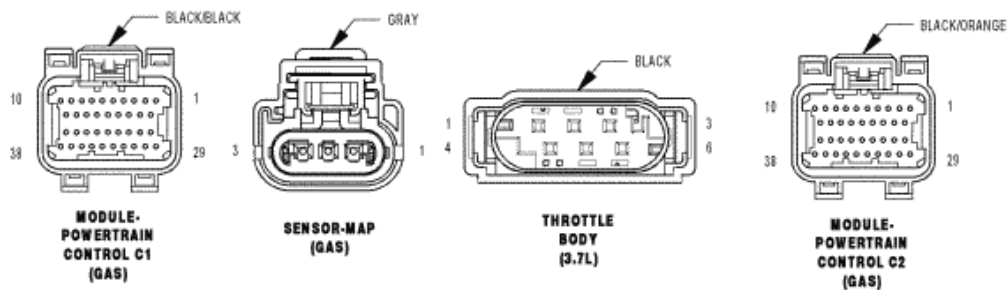
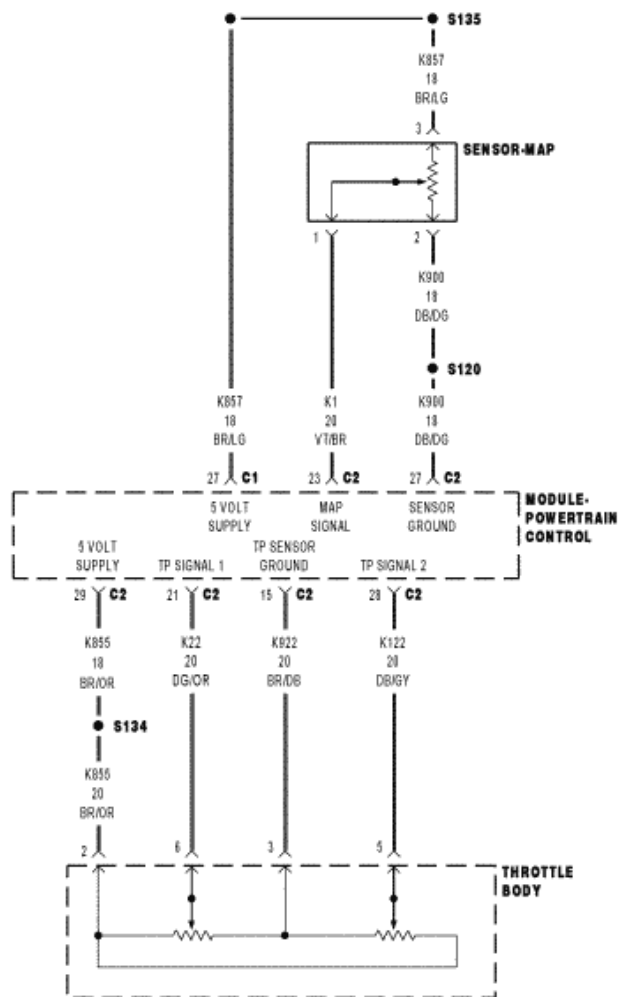
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P2172-HIGH AIRFLOW / VACUUM LEAK DETECTED (INSTANTANEOUS ACCUMULATION)

CIRCUIT SCHEMATIC



0166000

Fig. 2: MAP Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and engine running with no MAP Sensor DTCs.

SET CONDITIONS

• Set Condition:

A large vacuum leak has been detected or both of the TP Sensors have failed based on their position being 2.5 volts and the calculated MAP value is less than the actual MAP minus an Offset value. One trip fault and the code will set within 5 seconds. ETC light will flash.

POSSIBLE CAUSES

Possible Causes
VACUUM LEAK RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE TP SENSOR SIGNAL CIRCUIT TP SENSOR SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT MAP SENSOR THROTTLE BODY/TP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

The most likely cause of this DTC is a vacuum leak.
- NOTE:

This fault code could be present if any Cam/Crank DTCs are set. No repair is necessary for P2172 if any Cam or Crank DTCs are set.
- NOTE:

Diagnose any 5-Volt Supply, TP Sensor, Fuel System Lean or Rich, or MAP Sensor DTCs before continuing.

NOTE: **The throttle plate should be free from binding and carbon build up.**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. VACUUM LEAK

NOTE: **This code is enabled on engines with a plastic intake manifold and is intended to limit the maximum engine speed if a large crack occurs.**

NOTE: **A large vacuum leak is most likely the cause of this DTC.**

Inspect the Intake Manifold and Throttle body for leaks and cracks.

Inspect the Power Brake Booster for any vacuum leaks.

Inspect the PCV system for proper operation or any vacuum leaks.

Inspect the MAP Sensor for proper installation.

Were any vacuum leaks found?

Yes

Repair the vacuum leak as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. MAP SENSOR OPERATION

Start the engine.

With a scan tool, monitor the MAP Sensor voltage.

Snap the Accelerator pedal.

Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts at Wide Open Throttle?

Yes

Go To 4.

No

Go To 13.

4. TP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test.

TP Sensor No.1 should start at approximately 0.7 of a volt and increase to 4.3 volts.

TP Sensor No.2 should start at approximately 4.3 volts and decrease to 0.7 of a volt.

Is the voltage transition smooth between the appropriate values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 5.

5. RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

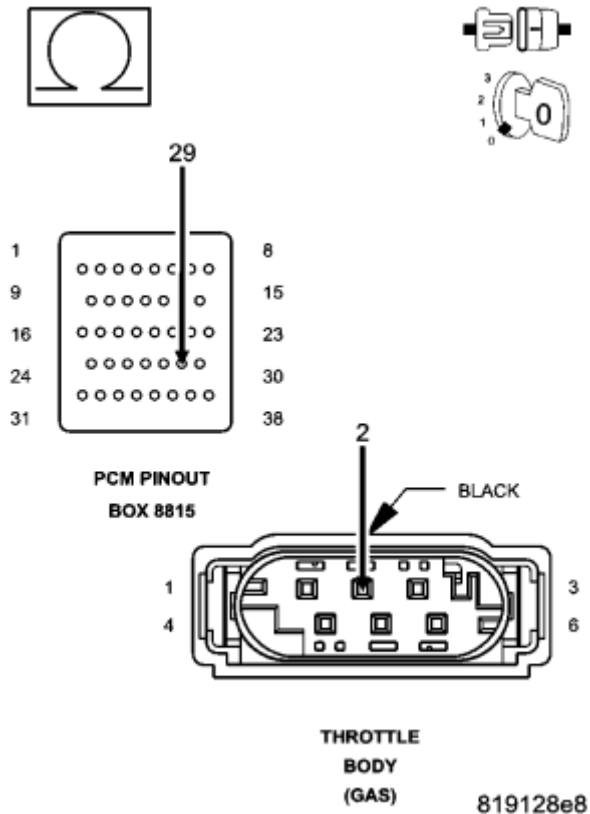


Fig. 3: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance above 100 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

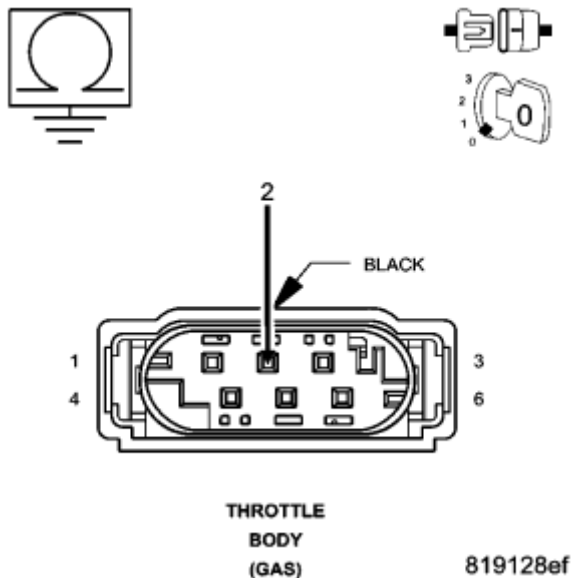


Fig. 4: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance above 100 ohms?

Yes

Go To 7.

No

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. TP SENSOR

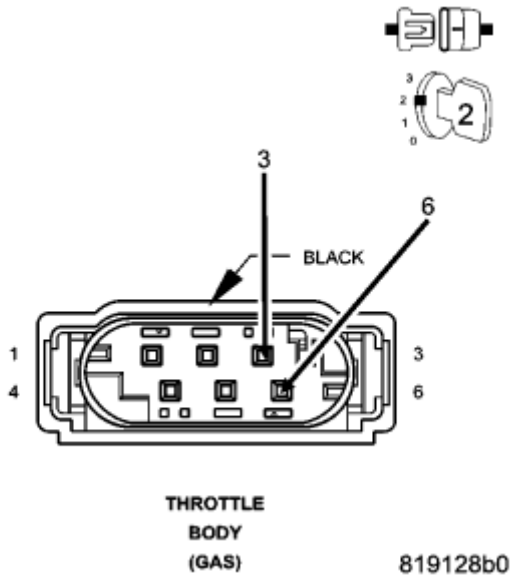


Fig. 5: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

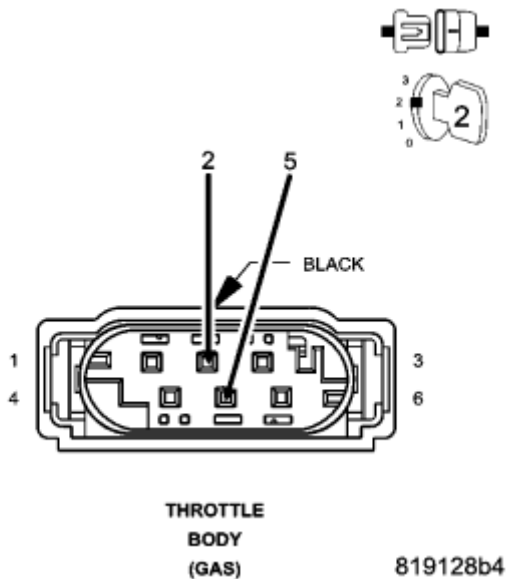


Fig. 6: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor voltage.

Connect a jumper wire between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

TP Sensor No.1 voltage should start at approximately 4.8 volts and decrease to 0.2 of a volt.

Connect a jumper wire between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

TP Sensor No.2 voltage should start at approximately 0 volts and increase to 4.8 to 5.2 volts.

Does the TP Sensor voltage change to the appropriate voltage with the jumper wire installed?

Yes

Disconnect the Battery before replacing the Throttle Body Assembly. Replace the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

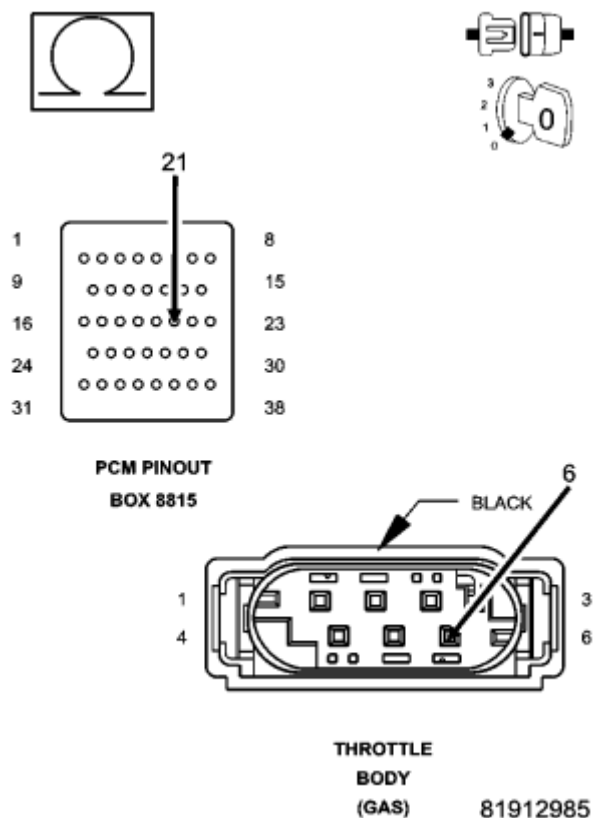


Fig. 7: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

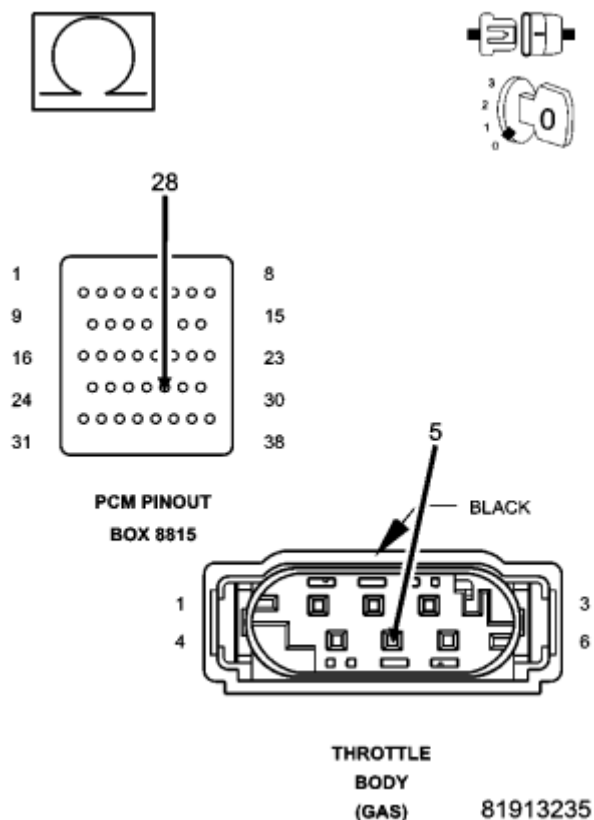


Fig. 8: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND

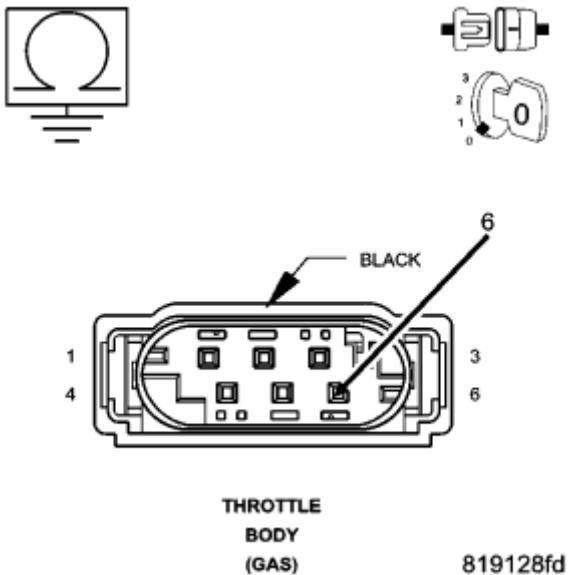


Fig. 9: Checking TP Sensor No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K22) TP Signal 1 circuit at the Throttle Body harness connector.

Is the resistance above 100 ohms?

Yes

Go To 11.

No

Repair the short to ground in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND**

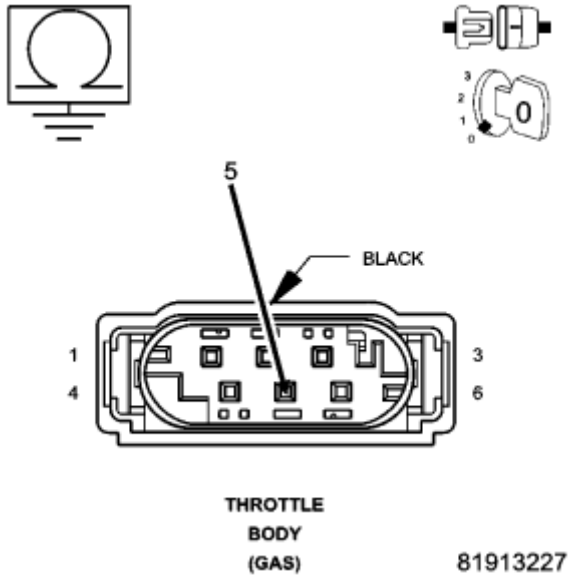


Fig. 10: Checking TP Sensor No. 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance above 100 ohms?

Yes

Go To 12.

No

Repair the short to ground in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT**

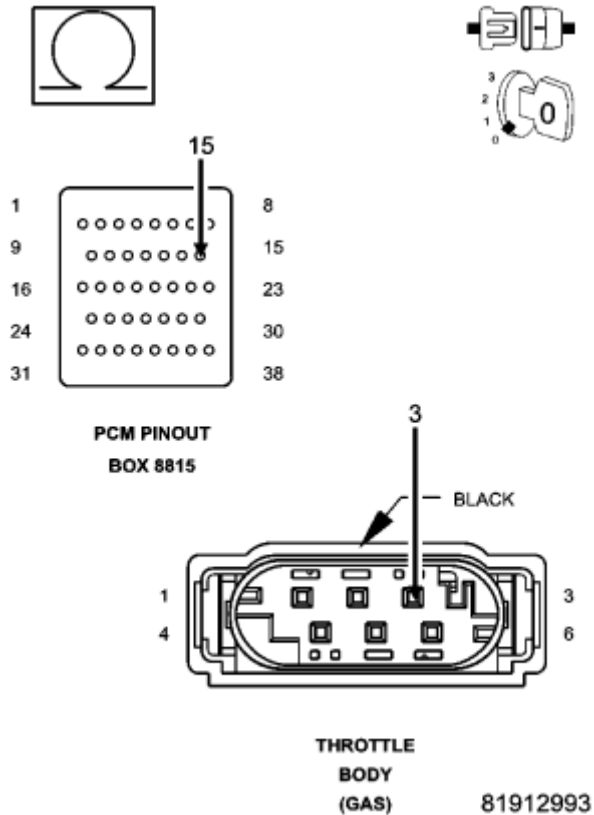


Fig. 11: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

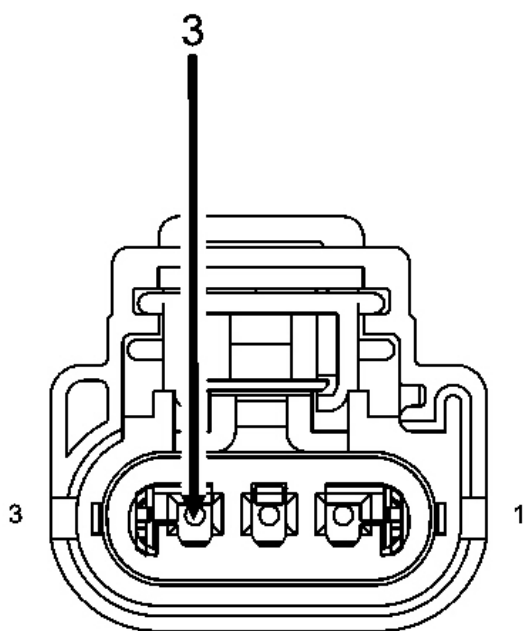
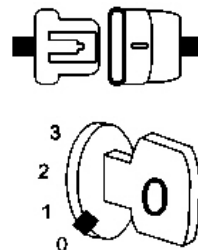
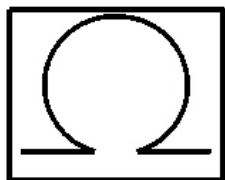
Go To 19.

No

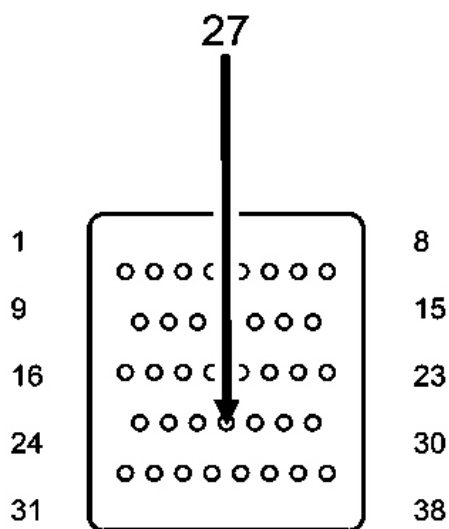
Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT**



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 12: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

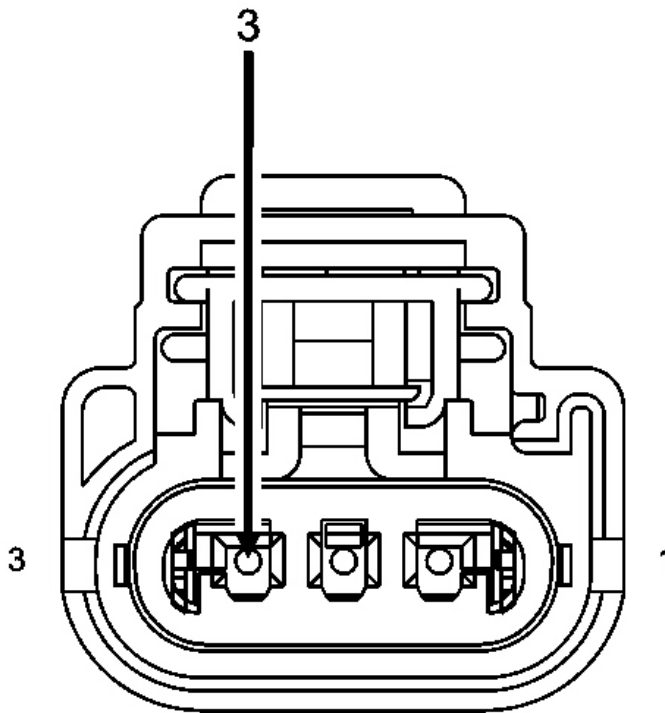
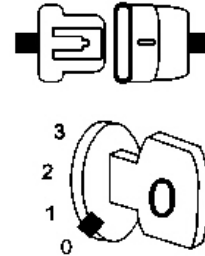
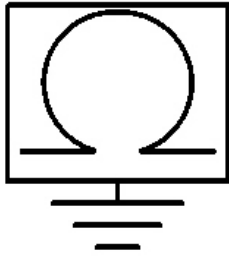
Go To 14.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

14. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 13: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

Go To 15.

No

Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

15. **MAP SENSOR**

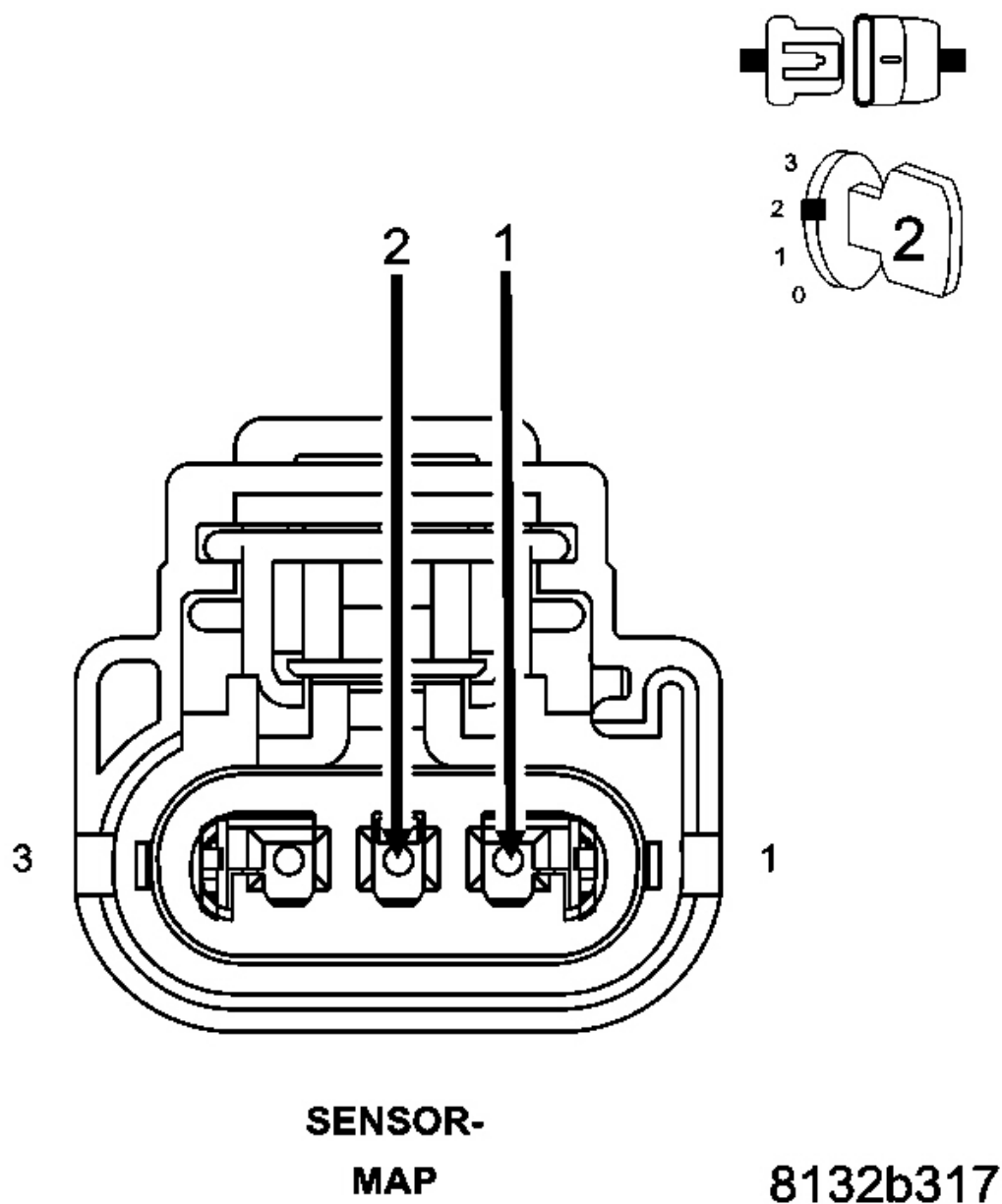


Fig. 14: Identifying MAP Sensor Signal & Ground Circuit
Courtesy of CHRYSLER LLC

Connect the C1 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the MAP Sensor voltage.

Connect a jumper wire between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit in the MAP Sensor harness connector.

Cycle the ignition switch from off to on.

With a scan tool, monitor the MAP Sensor voltage.

Does the scan tool display MAP voltage from approximately 4.9 volts to below 0.5 volt with the jumper wire installed?

Yes

Replace the MAP Sensor.

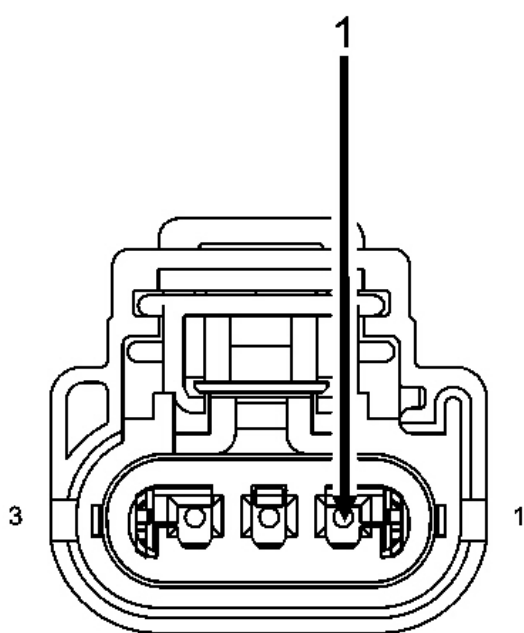
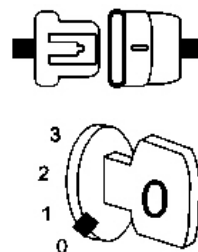
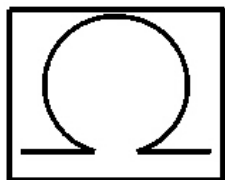
Perform **POWERTRAIN VERIFICATION TEST** .

No

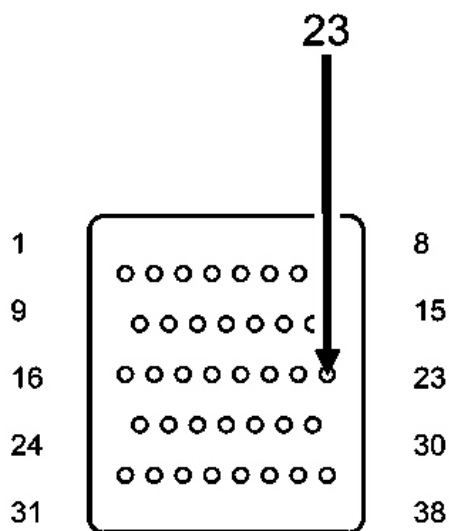
Go To 16.

NOTE: Remove the jumper wire before continuing.

16. RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 15: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

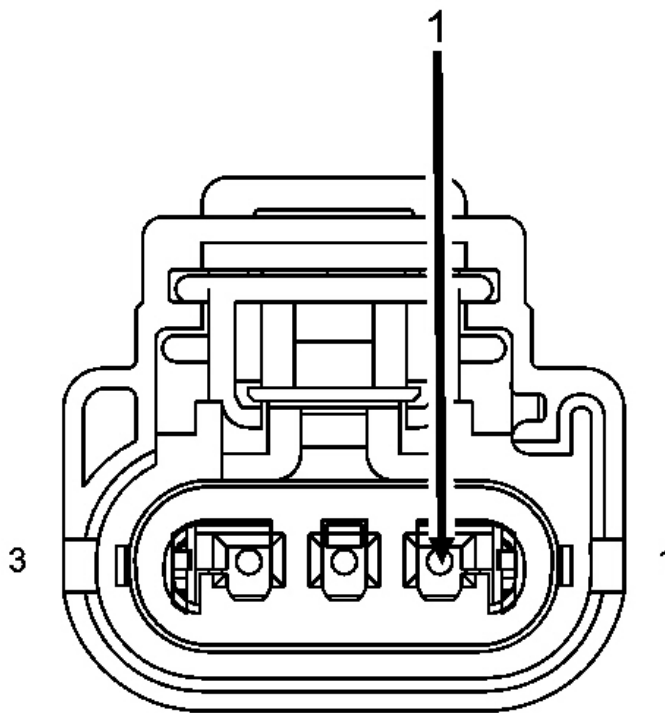
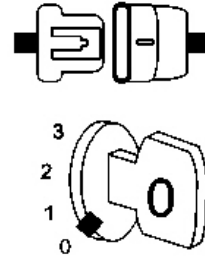
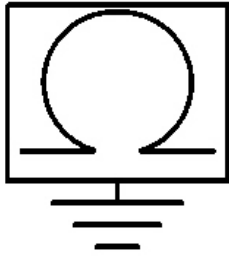
Go To 17.

No

Repair the excessive resistance in the (K1) MAP Signal circuit

Perform **POWERTRAIN VERIFICATION TEST** .

17. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b323

Fig. 16: Checking MAP Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

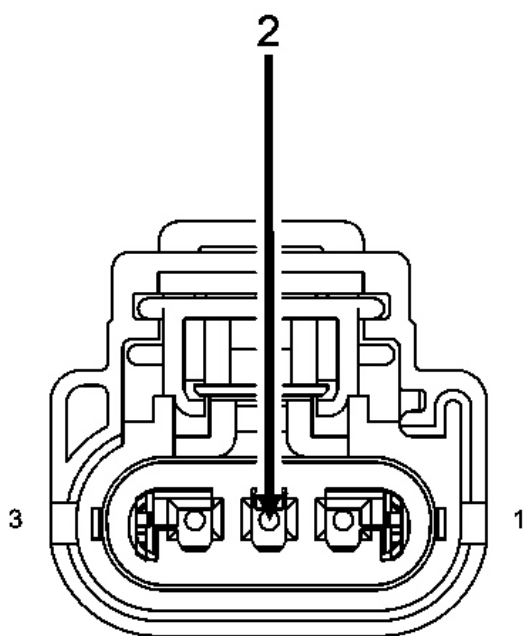
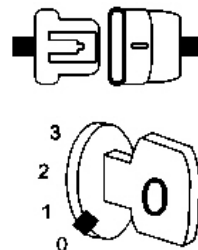
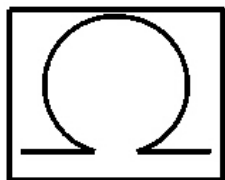
Go To 18.

No

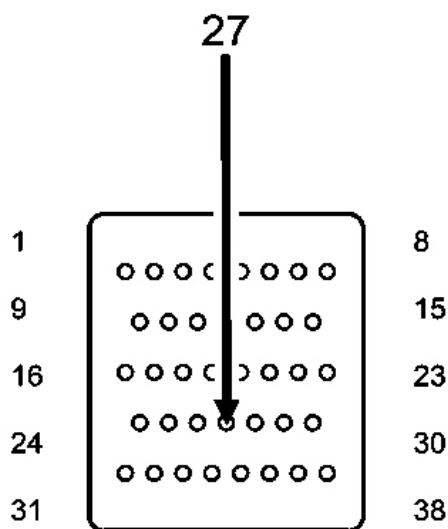
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

18. RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b327

Fig. 17: Checking MAP Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 19.

No

Repair the excessive resistance in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

19. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor, Throttle Body, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor, Throttle Body, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

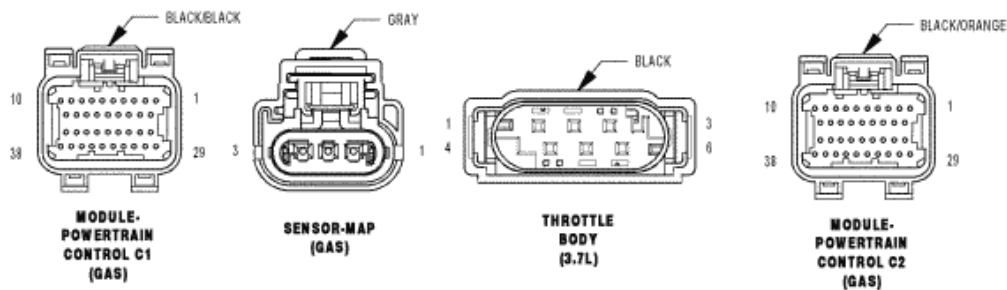
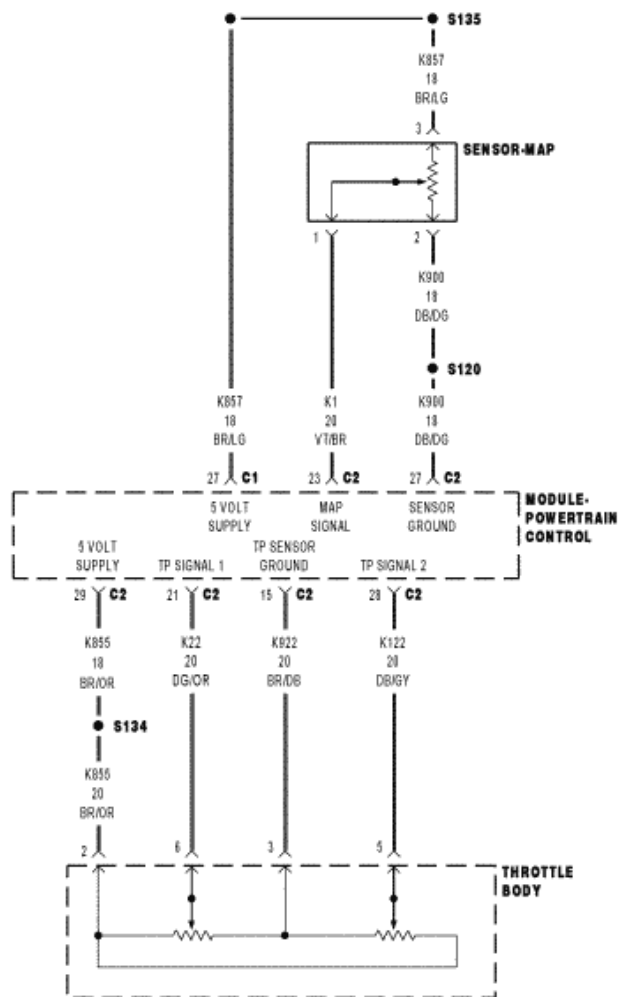
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2173-HIGH AIRFLOW / VACUUM LEAK DETECTED (SLOW ACCUMULATION)

CIRCUIT SCHEMATIC



0166000

Fig. 18: MAP Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and engine running with no MAP Sensor DTCs.

SET CONDITIONS

• Set Condition:

A large vacuum leak has been detected or both of the TP Sensors have failed based on their position being 2.5 volts and the calculated MAP value is less than the Gas Flow Adaptation value is too high. One trip fault the code will set within 5 seconds. ETC light will flash.

POSSIBLE CAUSES

Possible Causes
VACUUM LEAK RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE TP SENSOR SIGNAL CIRCUIT TP SENSOR SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT MAP SENSOR THROTTLE BODY/TP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

The most likely cause of this DTC is a vacuum leak.
- NOTE:

Diagnose any 5-Volt Supply, TP Sensor, Oxygen Sensor, Fuel related, or MAP Sensor DTCs before continuing.
- NOTE:

The throttle plate should be free from binding and carbon build up.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **VACUUM LEAK**

NOTE: This code is enabled on engines with a plastic intake manifold and is intended to limit the maximum engine speed if a large crack occurs.

NOTE: A large vacuum leak is most likely the cause of this DTC.

Inspect the Intake Manifold and Throttle body for leaks and cracks.

Inspect the Power Brake Booster for any vacuum leaks.

Inspect the PCV system for proper operation or any vacuum leaks.

Inspect the MAP Sensor for proper installation.

Were any vacuum leaks found?

Yes

Repair the vacuum leak as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **MAP SENSOR OPERATION**

Start the engine.

With a scan tool, monitor the MAP Sensor voltage.

Snap the Accelerator pedal.

Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts at Wide Open Throttle?

Yes

Go To 4.

No

Go To 13.

4. TP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test.

TP Sensor No.1 should start at approximately 0.7 of a volt and increase to 4.3 volts.

TP Sensor No.2 should start at approximately 4.3 volts and decrease to 0.7 of a volt.

Is the voltage transition smooth between the appropriate values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 5.

5. RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

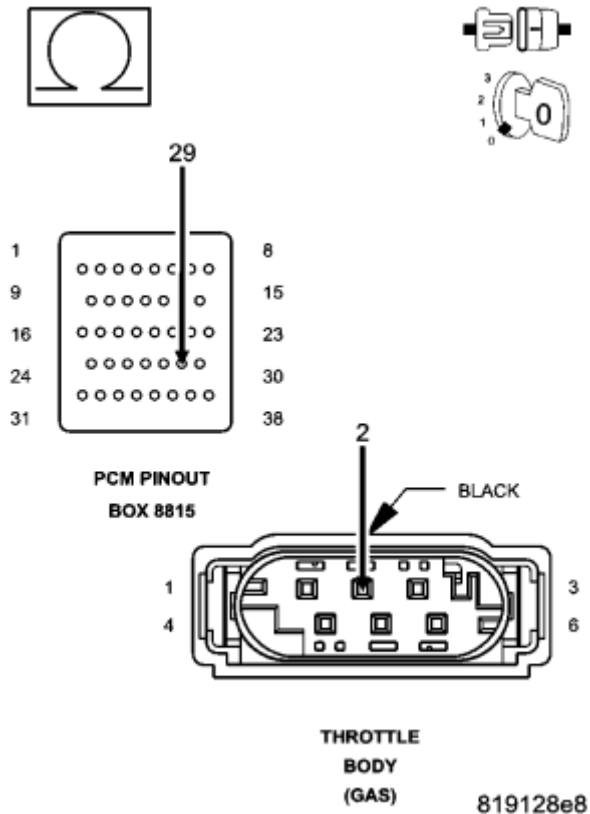


Fig. 19: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

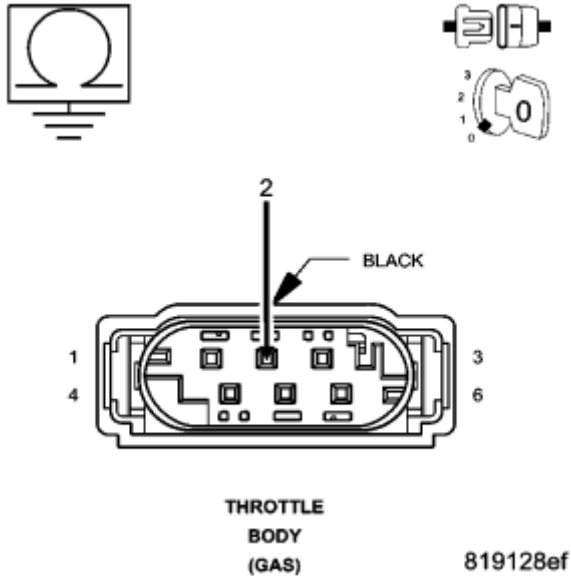


Fig. 20: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance above 100 ohms?

Yes

Go To 7.

No

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. TP SENSOR

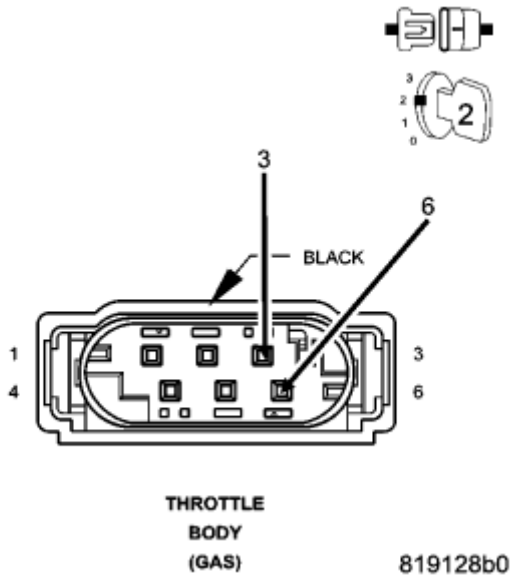


Fig. 21: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

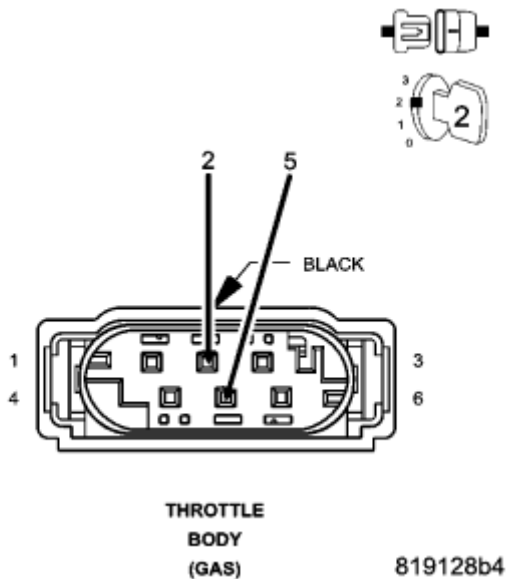


Fig. 22: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor voltage.

Connect a jumper wire between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

TP Sensor No.1 voltage should start at approximately 4.8 volts and decrease to 0.2 of a volt.

Connect a jumper wire between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

TP Sensor No.2 voltage should start at approximately 0 volts and increase to 4.8 to 5.2 volts.

Does the TP Sensor voltage change to the appropriate voltage with the jumper wire installed?

Yes

Disconnect the Battery before replacing the Throttle Body Assembly. Replace the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

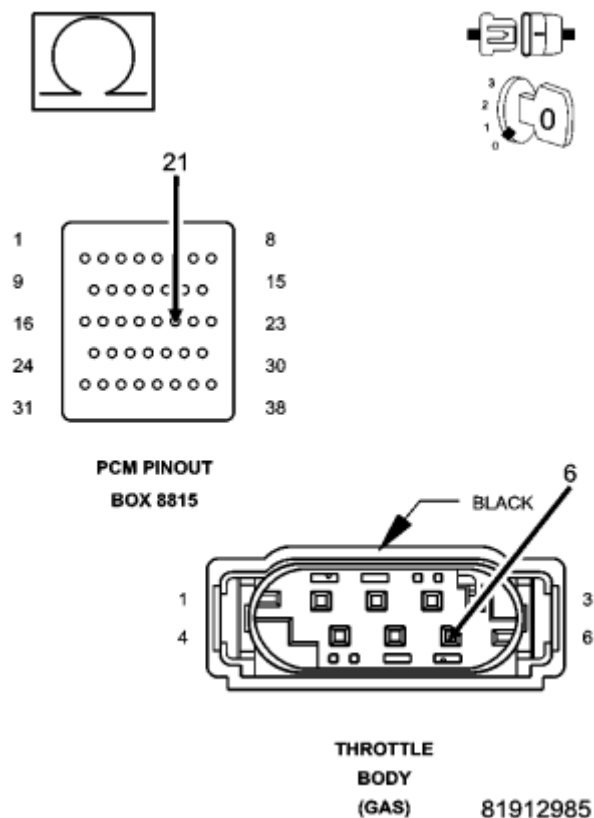


Fig. 23: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

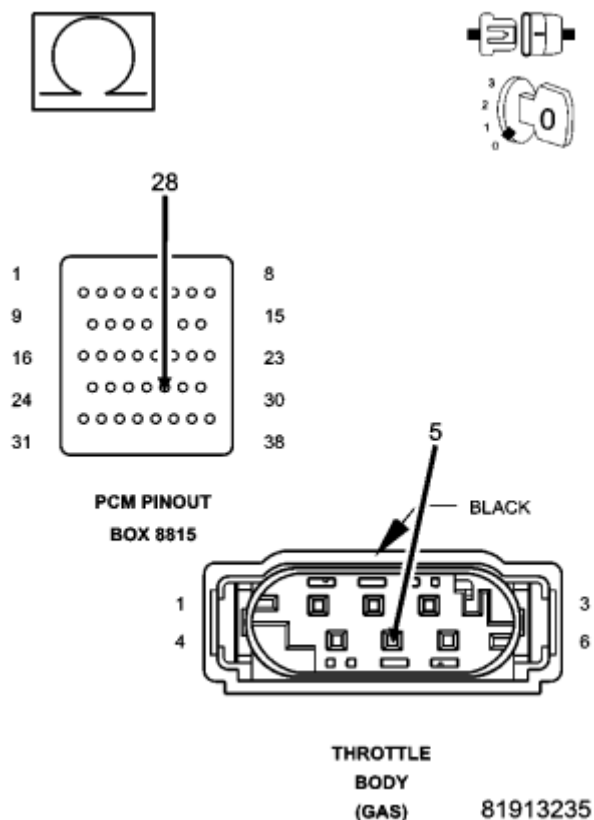


Fig. 24: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND

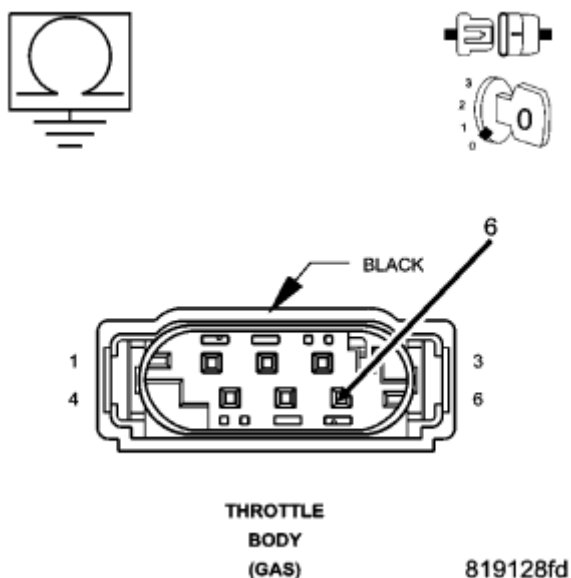


Fig. 25: Checking TP Sensor No. 1 Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K22) TP Signal 1 circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 11.

No

Repair the short to ground in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND**

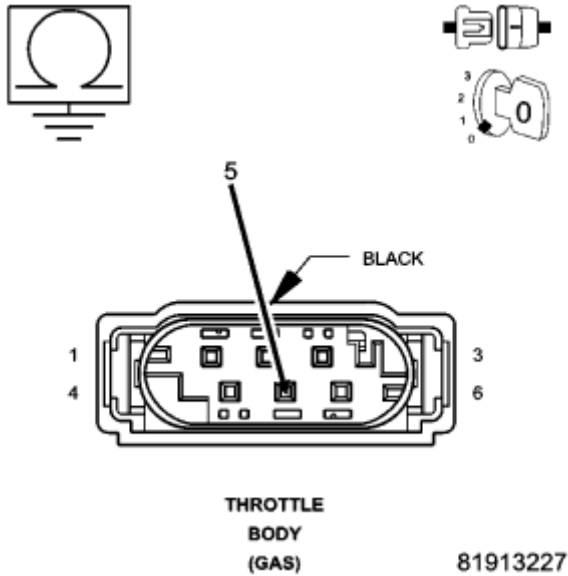


Fig. 26: Checking TP Sensor No. 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 12.

No

Repair the short to ground in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT**

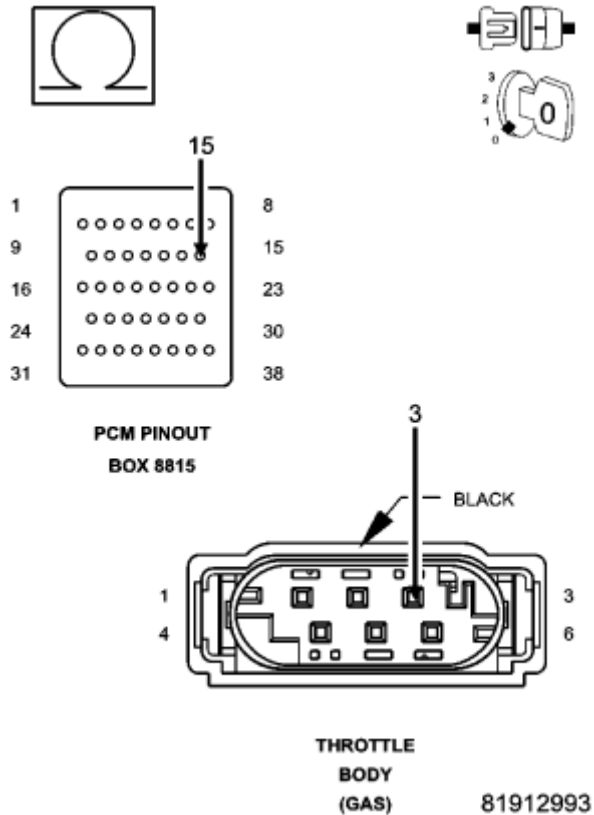


Fig. 27: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

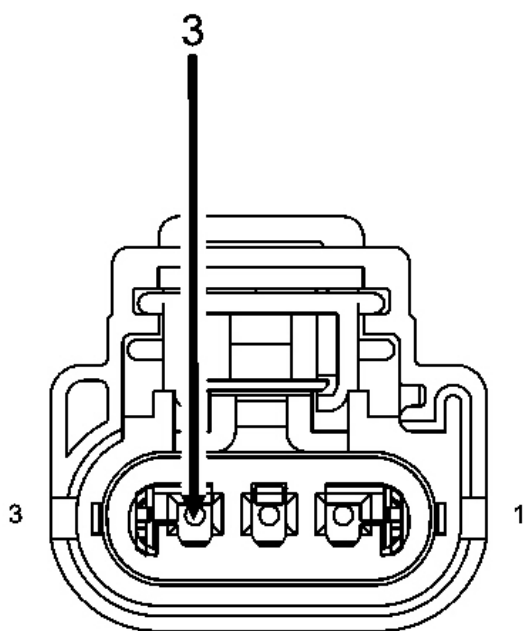
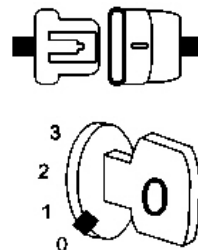
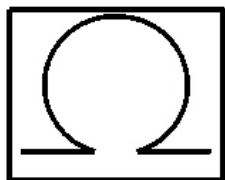
Go To 19.

No

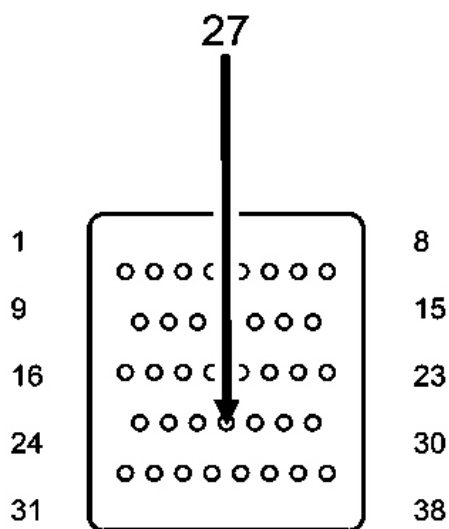
Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT**



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 28: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

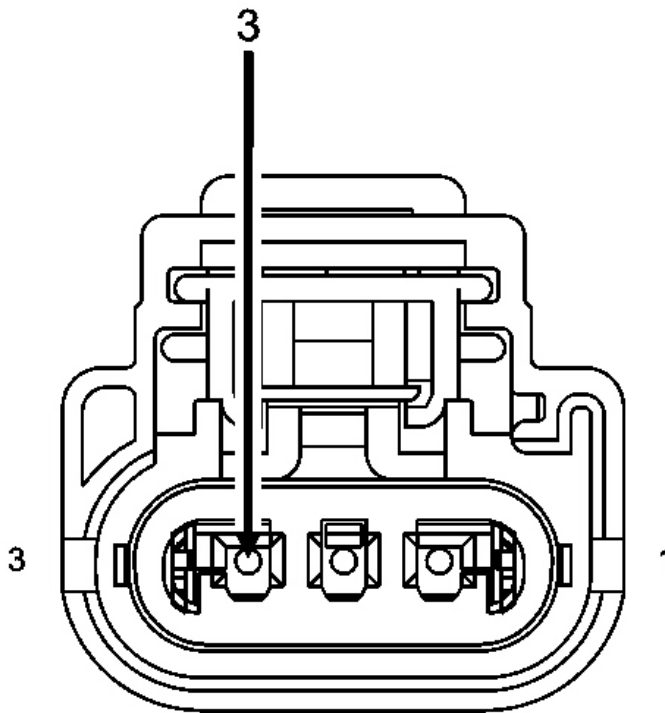
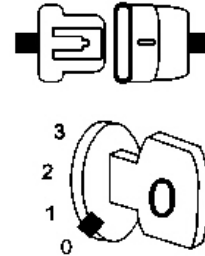
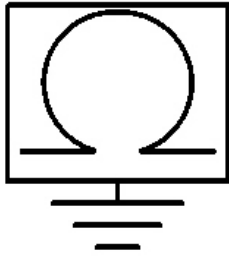
Go To 14.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

14. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 29: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

Go To 15.

No

Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

15. **MAP SENSOR**

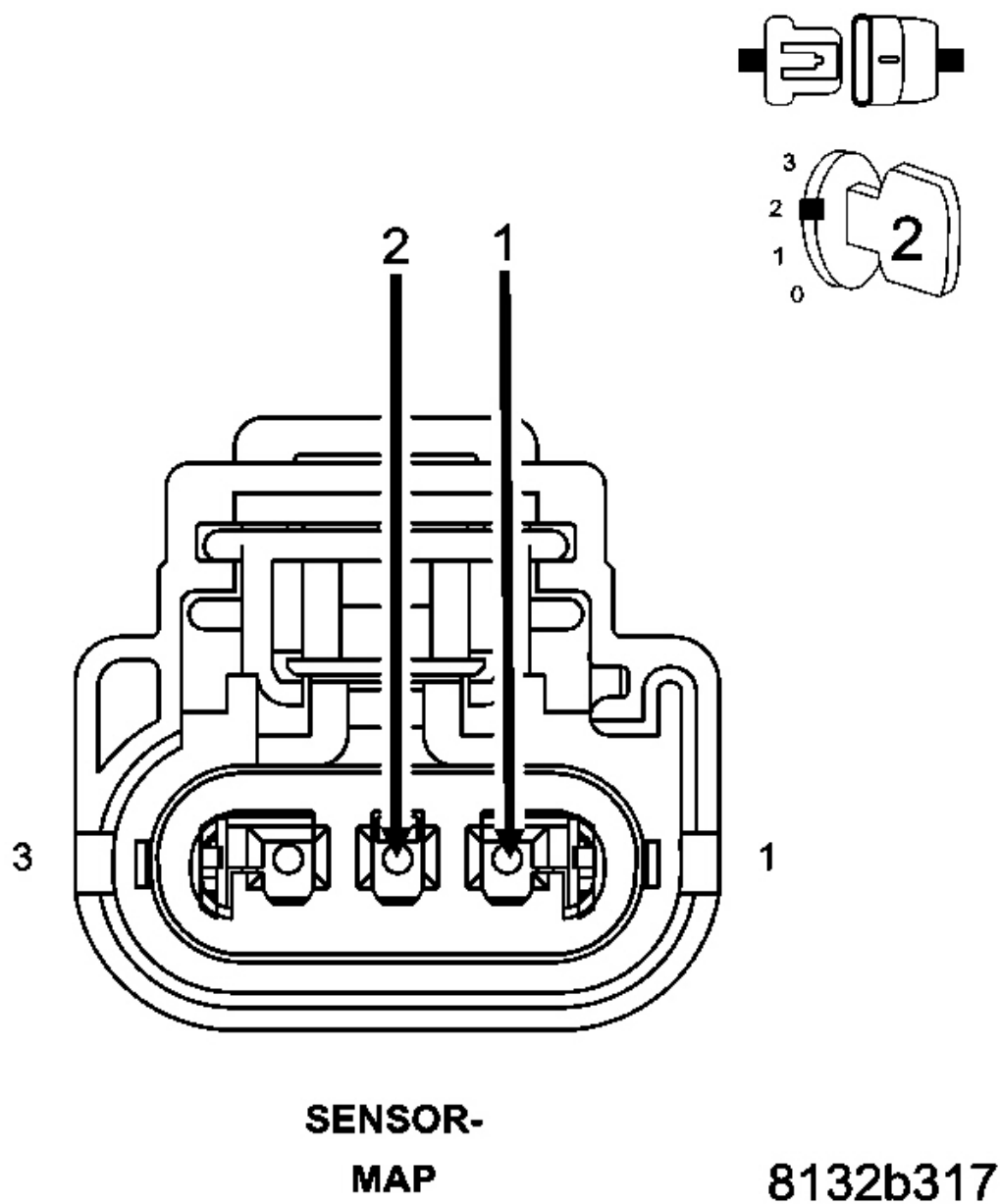


Fig. 30: Identifying MAP Sensor Signal & Ground Circuit
Courtesy of CHRYSLER LLC

Connect the C1 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the MAP Sensor voltage.

Connect a jumper wire between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit in the MAP Sensor harness connector.

Cycle the ignition switch from off to on.

With a scan tool, monitor the MAP Sensor voltage.

Does the scan tool display MAP voltage from approximately 4.9 volts to below 0.5 volt with the jumper wire installed?

Yes

Replace the MAP Sensor.

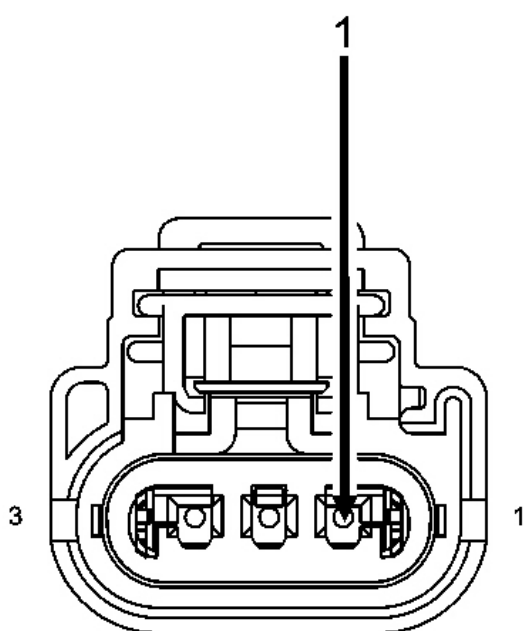
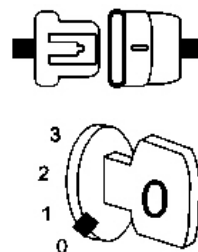
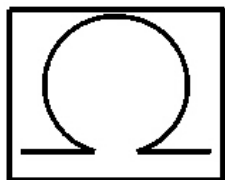
Perform **POWERTRAIN VERIFICATION TEST** .

No

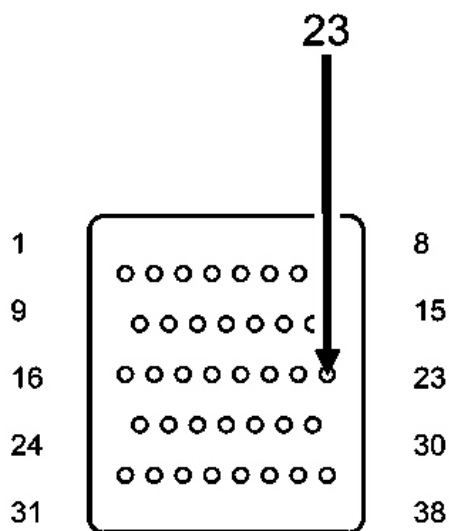
Go To 16.

NOTE: Remove the jumper wire before continuing.

16. RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 31: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

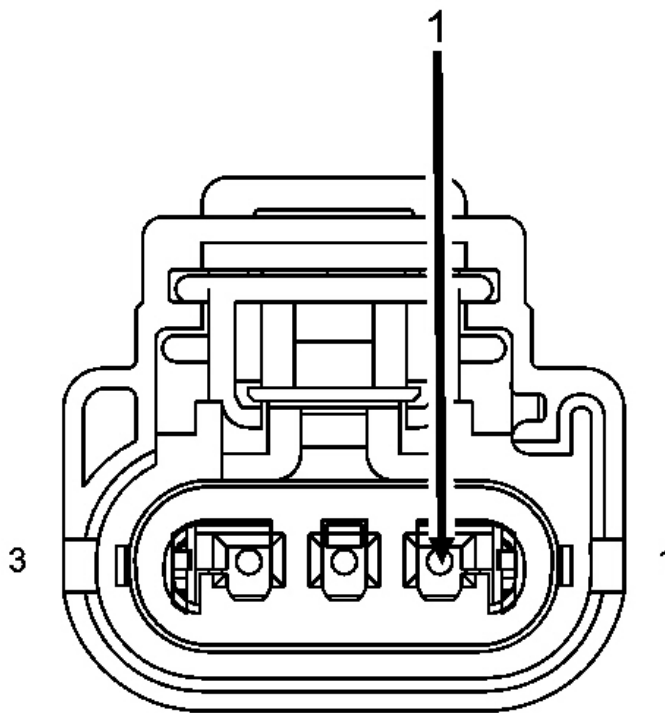
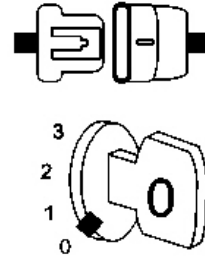
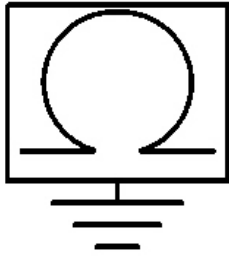
Go To 17.

No

Repair the excessive resistance in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

17. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b323

Fig. 32: Checking MAP Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K1) MAP Signal circuit at the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

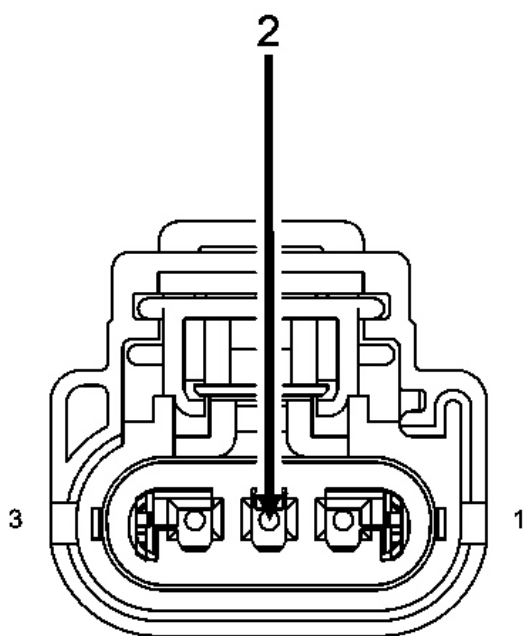
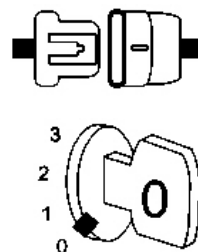
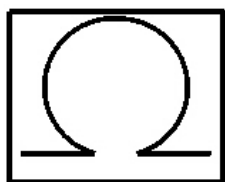
Go To 18.

No

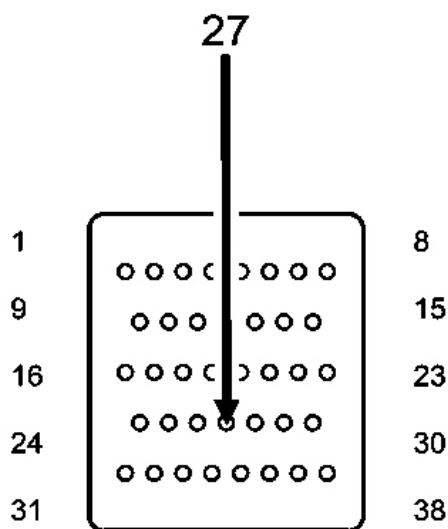
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

18. RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b327

Fig. 33: Checking MAP Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 19.

No

Repair the excessive resistance in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

19. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor, Throttle Body, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor, Throttle Body, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

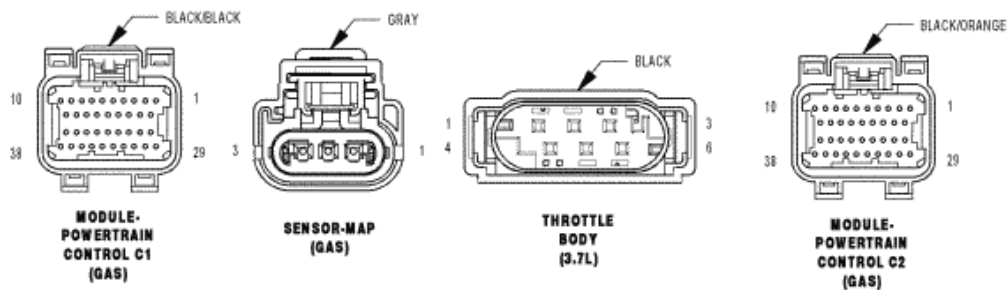
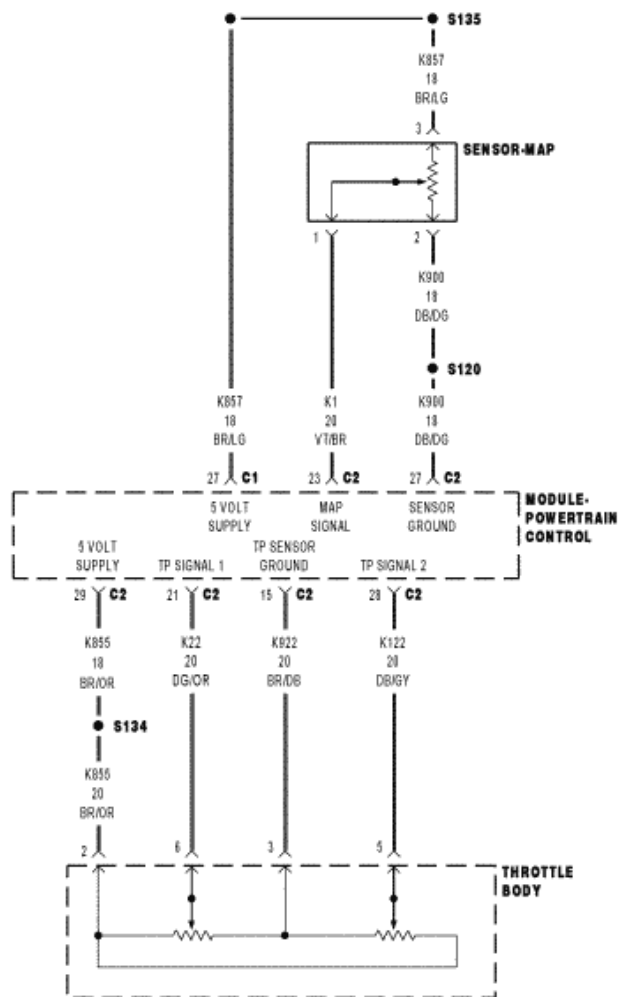
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2174-LOW AIRFLOW / RESTRICTION DETECTED (INSTANTANEOUS ACCUMULATION)

CIRCUIT SCHEMATIC



0166000

Fig. 34: MAP Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and engine running with no MAP Sensor DTCs.

SET CONDITIONS

- Set Condition:

PCM calculated MAP value is greater than actual MAP value plus an offset value. One trip fault. Three good trips to turn of the mil. MIL is on and the ETC light will flash.

POSSIBLE CAUSES

Possible Causes
RESTRICTED AIR INLET SYSTEM RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE TP SENSOR SIGNAL CIRCUIT TP SENSOR SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT MAP SENSOR THROTTLE BODY/TP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

The most likely cause of this DTC is a plugged intake air system or dirty Throttle Body. Check for any TSBs before continuing.
- NOTE:

Diagnose any 5-Volt Supply, TP Sensor, Fuel System Lean or Rich, or MAP Sensor DTCs before continuing.
- NOTE:

The throttle plate should be free from binding and carbon build up.

NOTE: Question the customer about weather conditions, as ICE build up on the blade can cause this fault when ambient is around -10 to +4°C (14 to 39° F) range.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. RESTRICTED AIR INLET SYSTEM

Turn the ignition off.

Remove the Air Cleaner Assembly.

Remove the Air Filter.

Inspect the Throttle Body opening for signs of any foreign materials.

Check the intake tube/air cleaner for obstructions - include snow packing questions to customer.

Were any restrictions found?

Yes

Repair the restriction as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. MAP SENSOR OPERATION

Start the engine.

With a scan tool, monitor the MAP Sensor voltage.

Snap the Accelerator pedal.

Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts at Wide Open Throttle?

Yes

Go To 4.

No

Go To 13.

4. TP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test.

TP Sensor No.1 should start at approximately 0.7 of a volt and increase to 4.3 volts.

TP Sensor No.2 should start at approximately 4.3 volts and decrease to 0.7 of a volt.

Is the voltage transition smooth between the appropriate values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 5.

5. RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

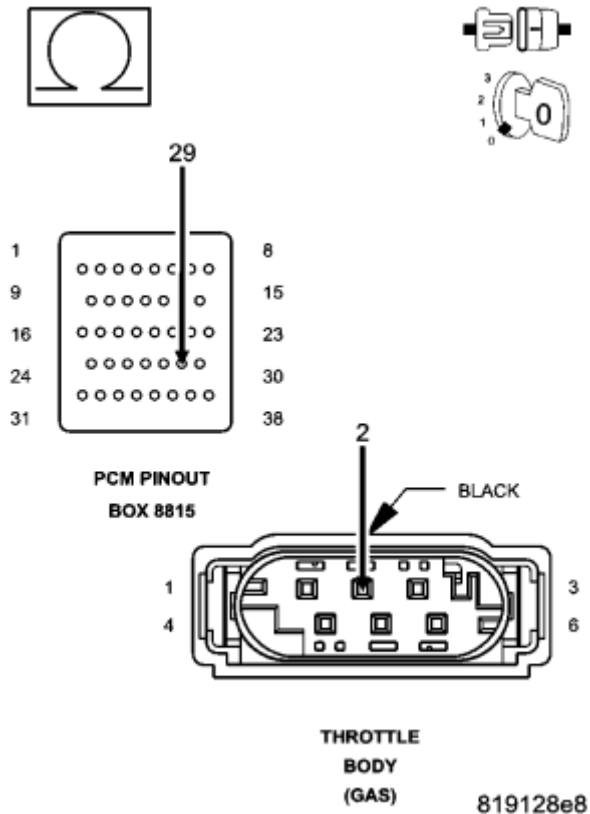


Fig. 35: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

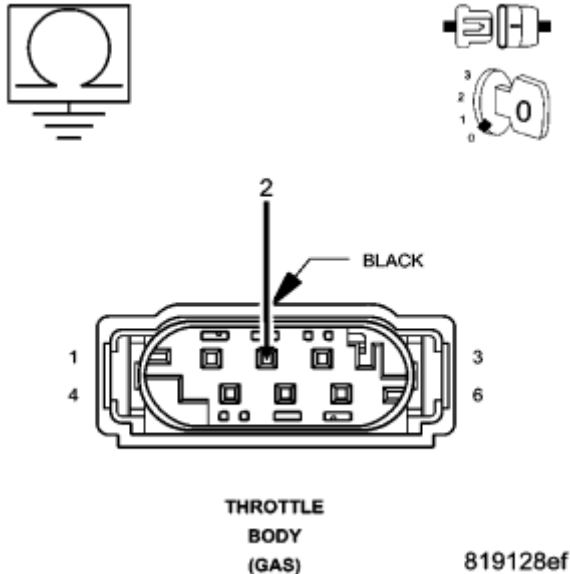


Fig. 36: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 7.

No

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. TP SENSOR

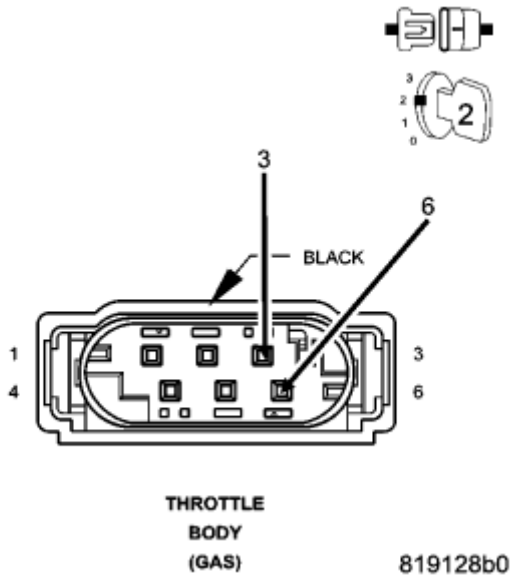


Fig. 37: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

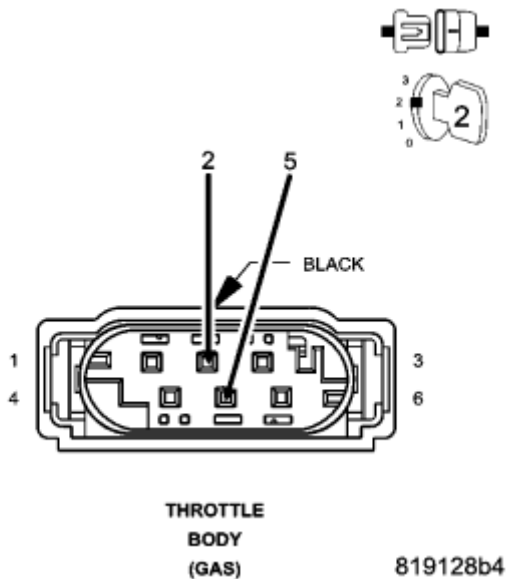


Fig. 38: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Connect the PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor voltage.

Connect a jumper wire between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

TP Sensor No.1 voltage should start at approximately 4.8 volts and decrease to 0.2 of a volt.

Connect a jumper wire between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

TP Sensor No.2 voltage should start at approximately 0 volts and increase to 4.8 to 5.2 volts.

Does the TP Sensor voltage change to the appropriate voltage with the jumper wire installed?

Yes

Disconnect the Battery before replacing the Throttle Body Assembly. Replace the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

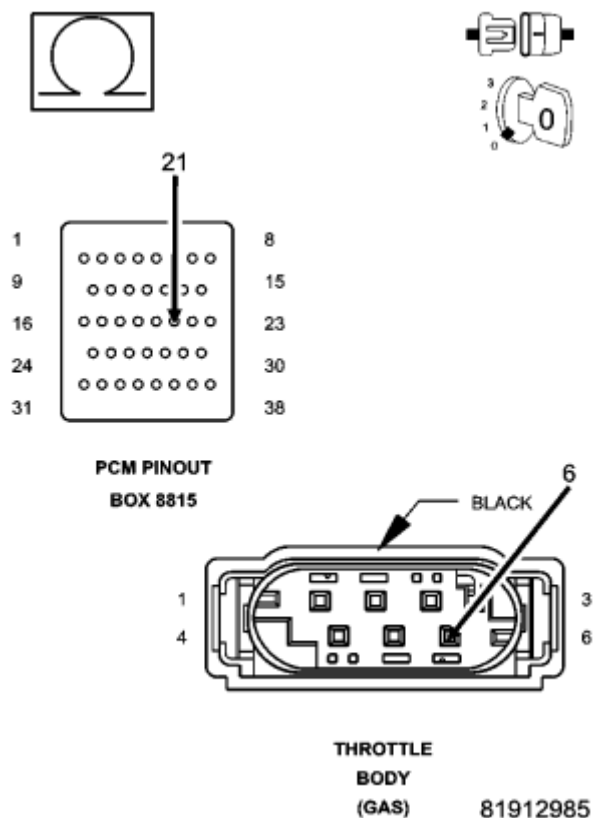


Fig. 39: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K22) TP Signal 1 circuits from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

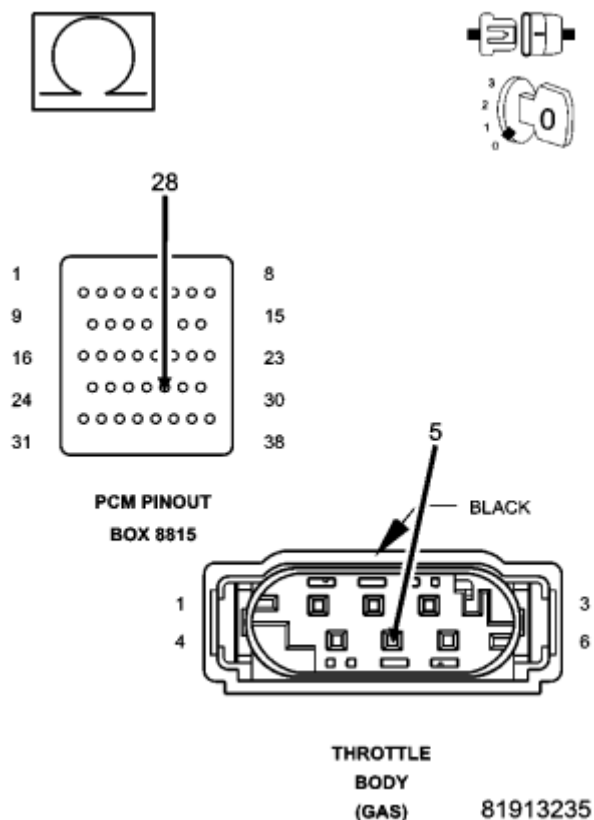


Fig. 40: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND

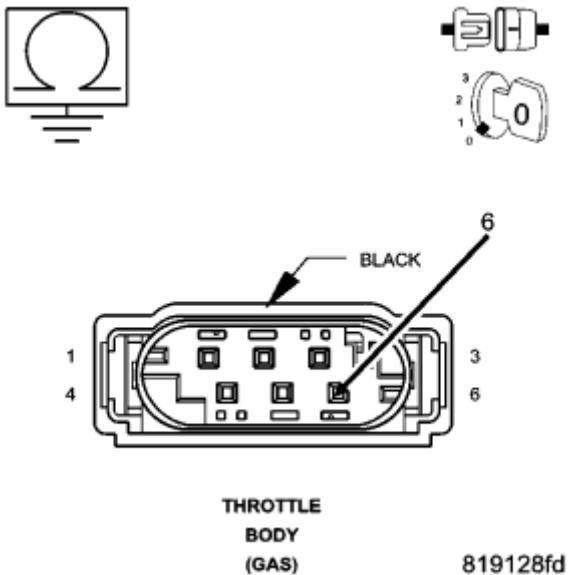


Fig. 41: Checking TP Sensor No. 1 Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K22) TP Signal 1 circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 11.

No

Repair the short to ground in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND**

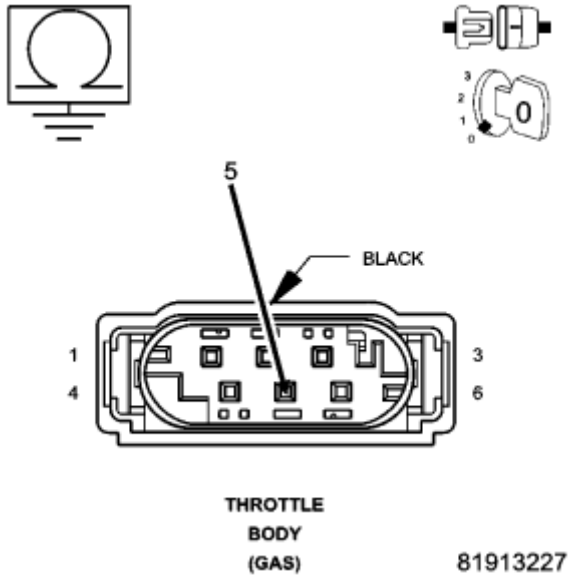


Fig. 42: Checking TP Sensor No. 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 12.

No

Repair the short to ground in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT**

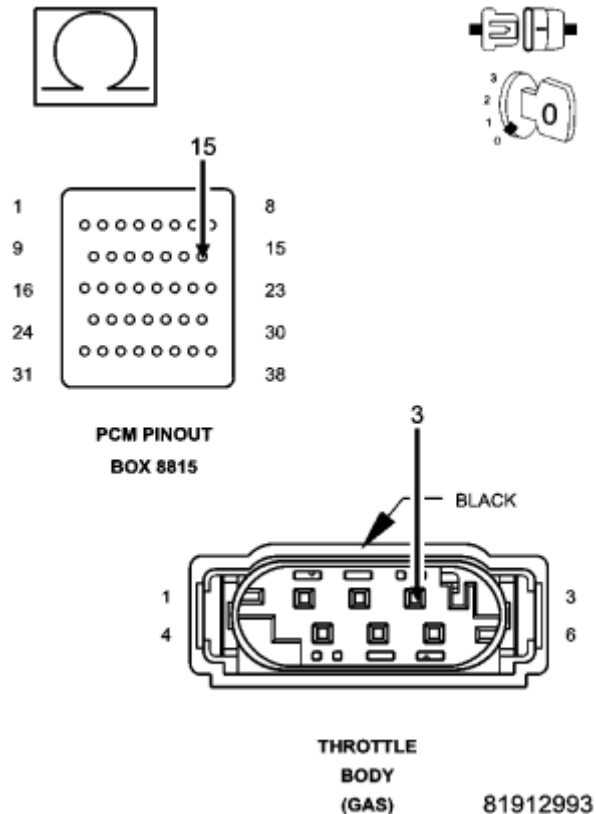


Fig. 43: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

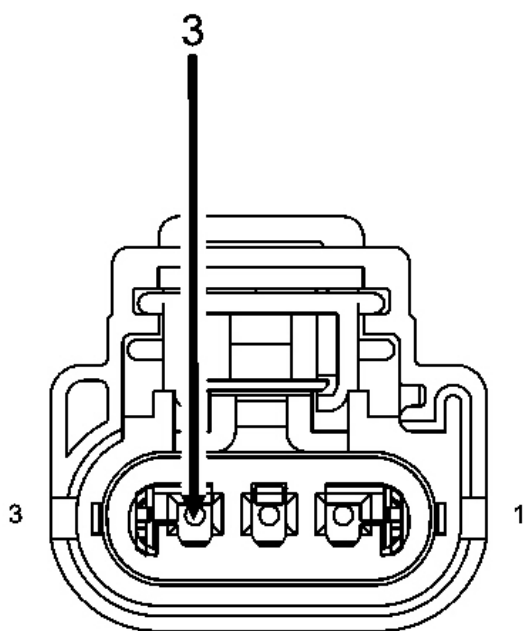
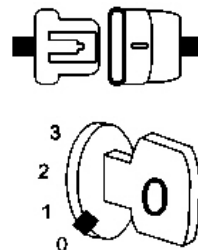
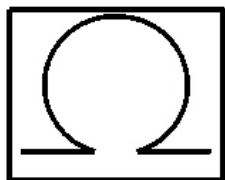
Go To 19.

No

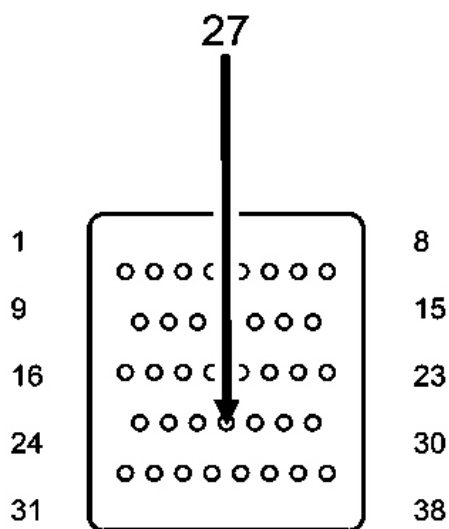
Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT**



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 44: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

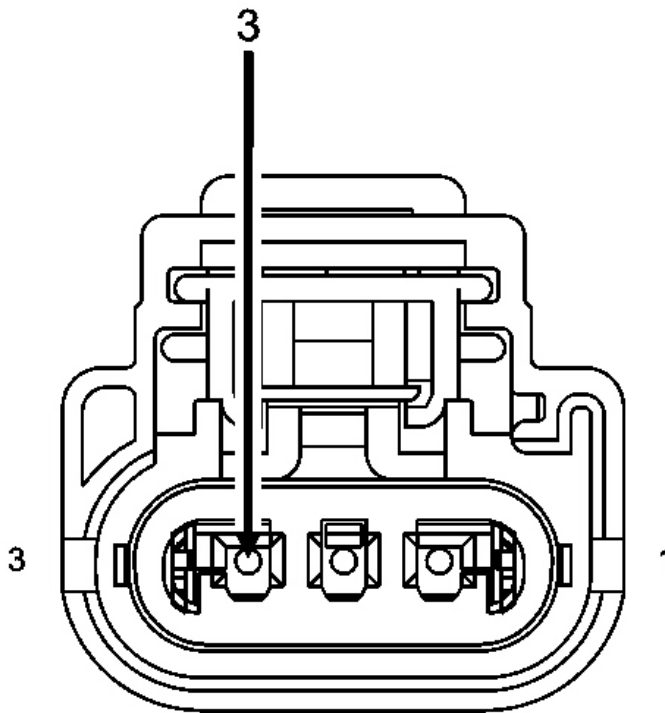
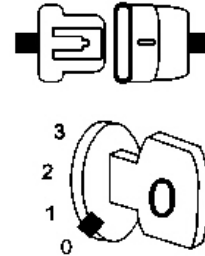
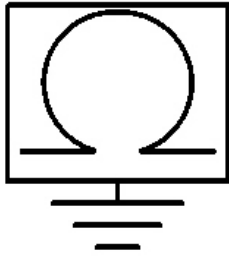
Go To 14.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

14. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 45: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

Go To 15.

No

Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

15. **MAP SENSOR**

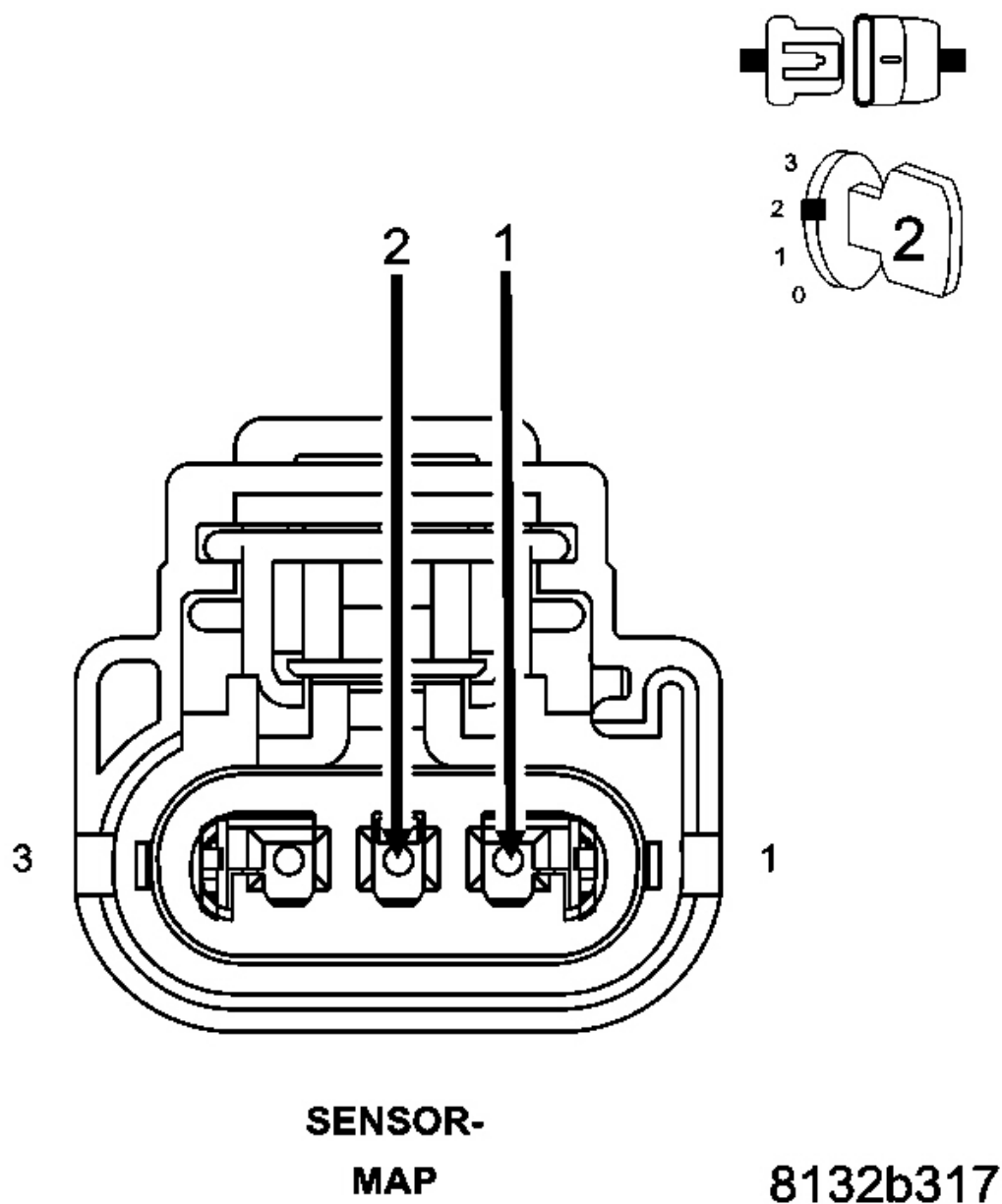


Fig. 46: Identifying MAP Sensor Signal & Ground Circuit
Courtesy of CHRYSLER LLC

Connect the PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the MAP Sensor voltage.

Connect a jumper wire between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit.

Cycle the ignition switch from off to on.

With a scan tool, monitor the MAP Sensor voltage.

Does the scan tool display MAP voltage from approximately 4.9 volts to below 0.5 volt with the jumper wire installed?

Yes

Replace the MAP Sensor.

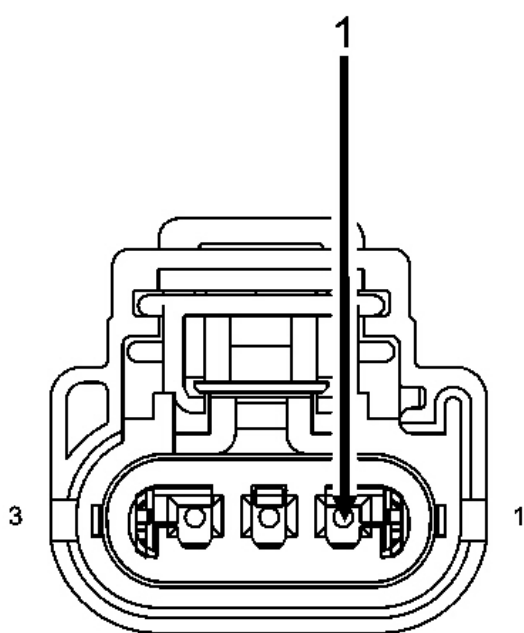
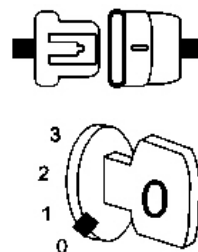
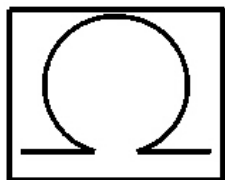
Perform **POWERTRAIN VERIFICATION TEST** .

No

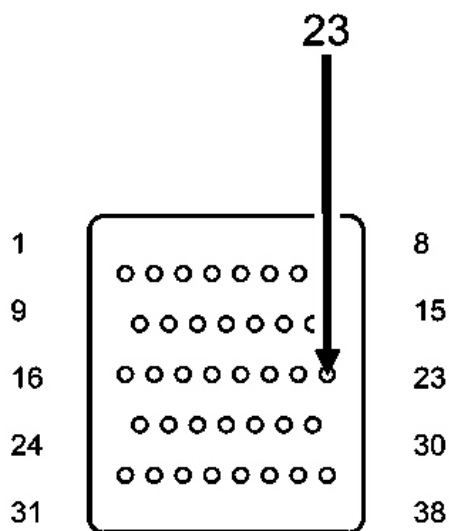
Go To 16.

NOTE: Remove the jumper wire before continuing.

16. RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 47: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

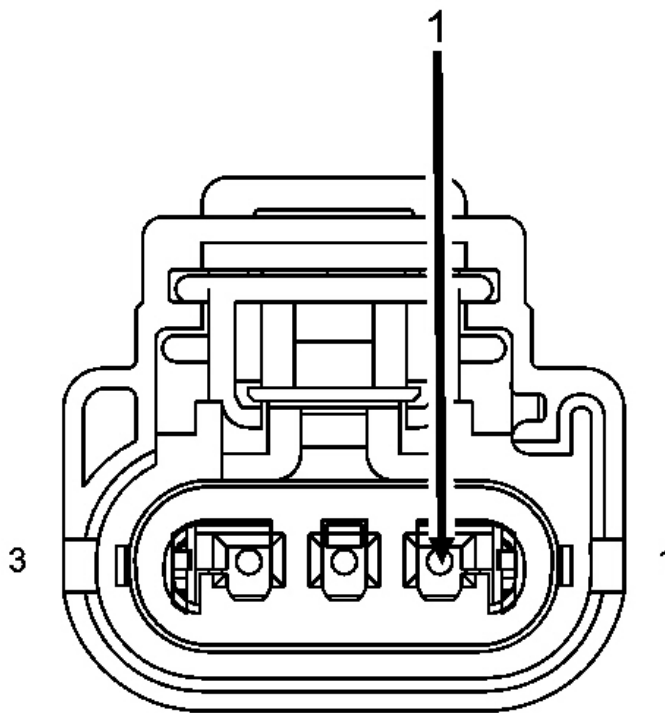
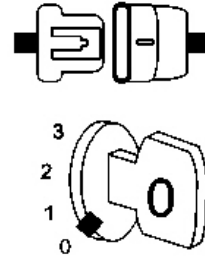
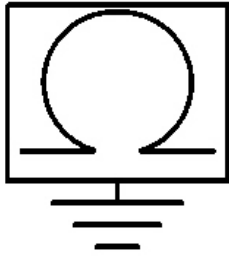
Go To 17.

No

Repair the excessive resistance in the (K1) MAP Signal circuit

Perform **POWERTRAIN VERIFICATION TEST** .

17. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b323

Fig. 48: Checking MAP Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

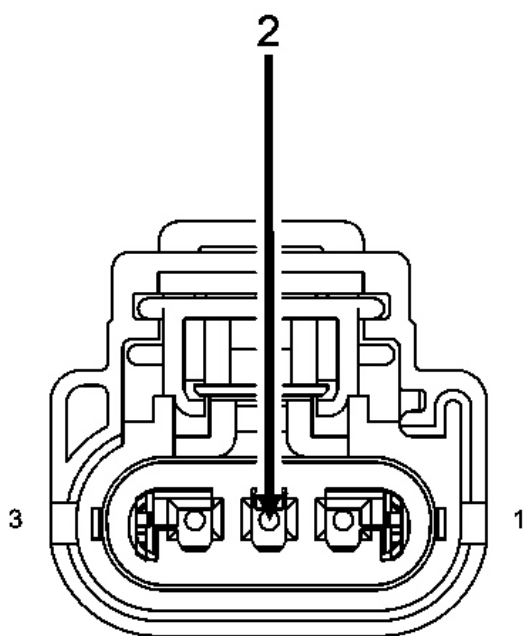
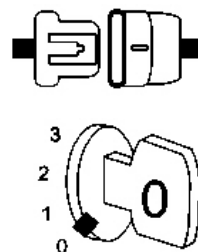
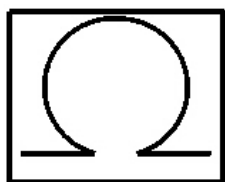
Go To 18.

No

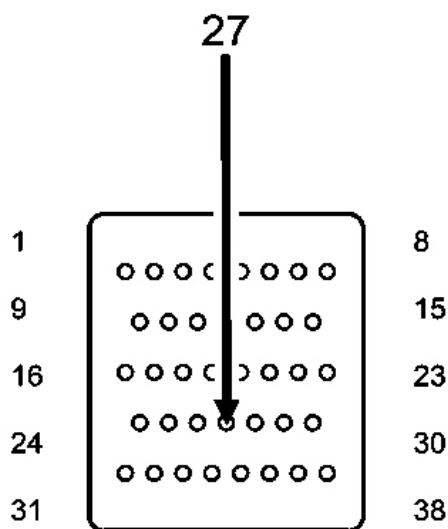
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

18. RESISTANCE IN (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b327

Fig. 49: Checking MAP Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 19.

No

Repair the excessive resistance in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

19. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor, Throttle Body, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor, Throttle Body, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

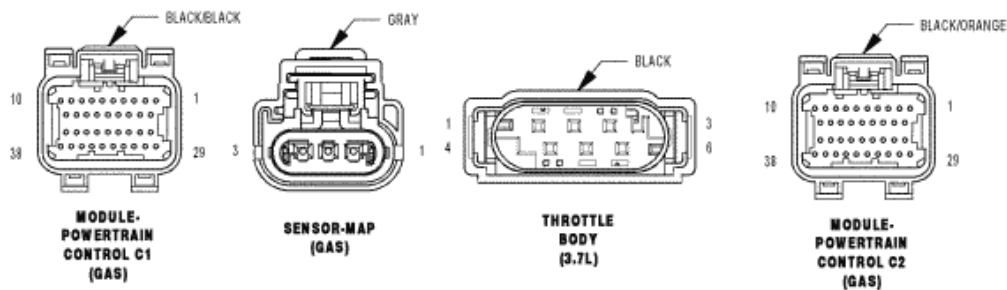
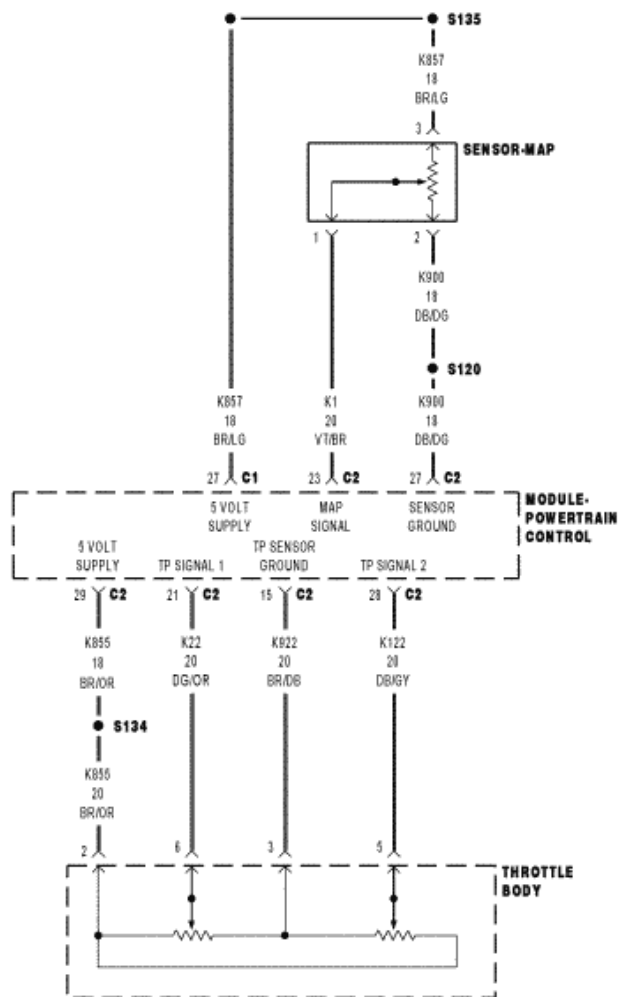
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2175-LOW AIRFLOW / RESTRICTION DETECTED (SLOW ACCUMULATION)

CIRCUIT SCHEMATIC



0166000

Fig. 50: MAP Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and engine running with no MAP Sensor DTCs.

SET CONDITIONS

• Set Condition:

PCM calculated MAP value is greater than actual MAP value plus an offset value. One trip fault and the code will set within 5 seconds. Three good trips to turn of the mil. MIL is on and the ETC light will flash.

POSSIBLE CAUSES

Possible Causes
RESTRICTED AIR INLET SYSTEM RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND RESISTANCE IN THE TP SENSOR SIGNAL CIRCUIT TP SENSOR SIGNAL CIRCUIT SHORTED TO GROUND RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT MAP SENSOR THROTTLE BODY/TP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

The most likely cause of this DTC is a plugged intake air system or dirty Throttle Body. Check for any TSBs before continuing.
- NOTE:

Diagnose any 5-Volt Supply, TP Sensor, Oxygen Sensor, Fuel related or MAP Sensor DTCs before continuing.
- NOTE:

The throttle plate should be free from binding and carbon build up.

NOTE: Question the customer about weather conditions, as ICE build up on the blade can cause this fault when ambient is around -10 to +4°C (14 to 39° F) range.

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. RESTRICTED AIR INLET SYSTEM

Turn the ignition off.

Remove the Air Cleaner Assembly.

Remove the Air Filter.

Inspect the Throttle Body opening for signs of any foreign materials.

Check the intake tube/air cleaner for obstructions - include snow packing questions to customer.

Were any restrictions found?

Yes

Repair the restriction as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. MAP SENSOR OPERATION

Start the engine.

With a scan tool, monitor the MAP Sensor voltage.

Snap the Accelerator pedal.

Does the MAP Sensor voltage vary from below 2.0 volts at idle to above 3.5 volts at Wide Open Throttle?

Yes

Go To 4.

No

Go To 13.

4. TP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test.

TP Sensor No.1 should start at approximately 0.7 of a volt and increase to 4.3 volts.

TP Sensor No.2 should start at approximately 4.3 volts and decrease to 0.7 of a volt.

Is the voltage transition smooth between the appropriate values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 5.

5. RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

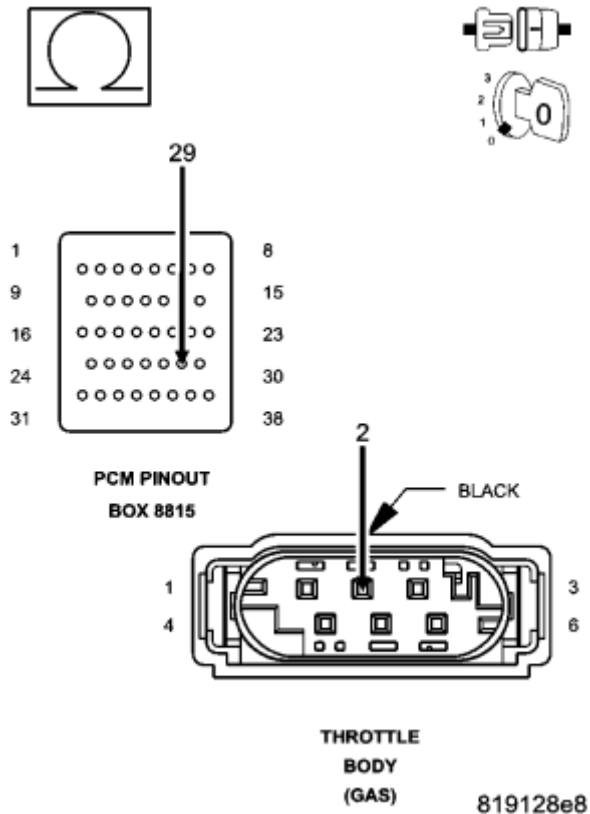


Fig. 51: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 100 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

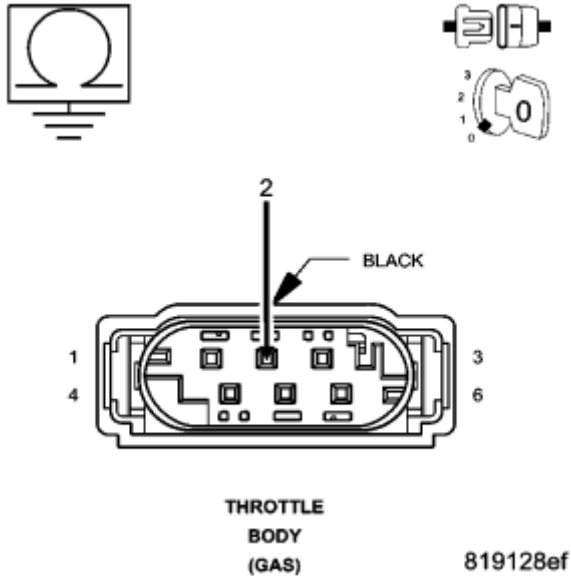


Fig. 52: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and (K855) 5-volt Supply circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 7.

No

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. TP SENSOR

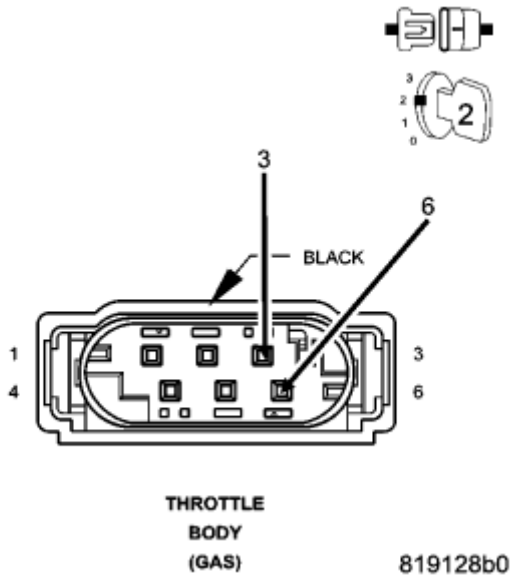


Fig. 53: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

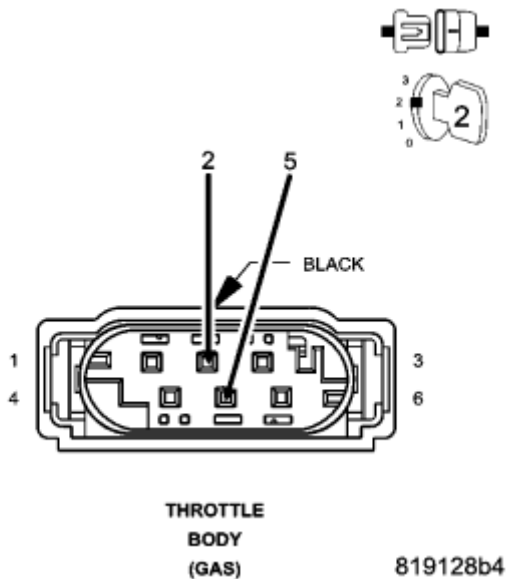


Fig. 54: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Connect the PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor voltage.

Connect a jumper wire between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

TP Sensor No.1 voltage should start at approximately 4.8 volts and decrease to 0.2 of a volt.

Connect a jumper wire between the (K122) TP Signal 2 circuit and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

TP Sensor No.2 voltage should start at approximately 0 volts and increase to 4.8 to 5.2 volts.

Does the TP Sensor voltage change to the appropriate voltage with the jumper wire installed?

Yes

Disconnect the Battery before replacing the Throttle Body Assembly. Replace the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

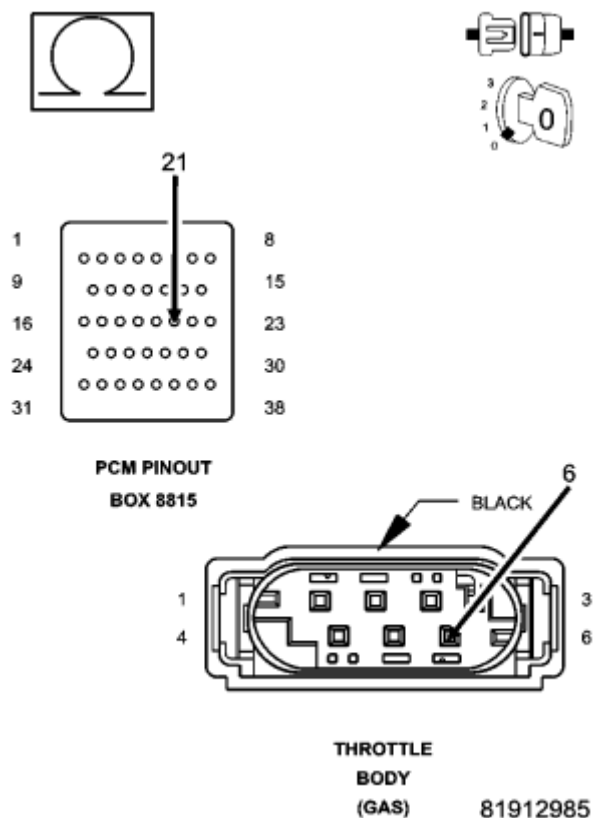


Fig. 55: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 9.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

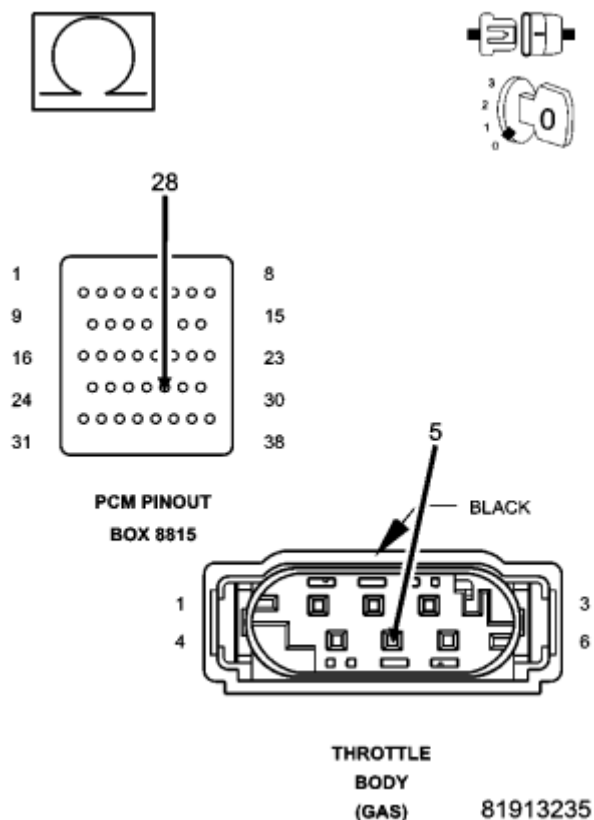


Fig. 56: Checking For Excessive Resistance In TP Sensor No. 2 Signal Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K122) TP Signal 2 circuit from the Throttle Body harness connector to the

appropriate terminals of special tool #8815.

Is the resistance below 5.0 ohms for each circuit?

Yes

Go To 10.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND

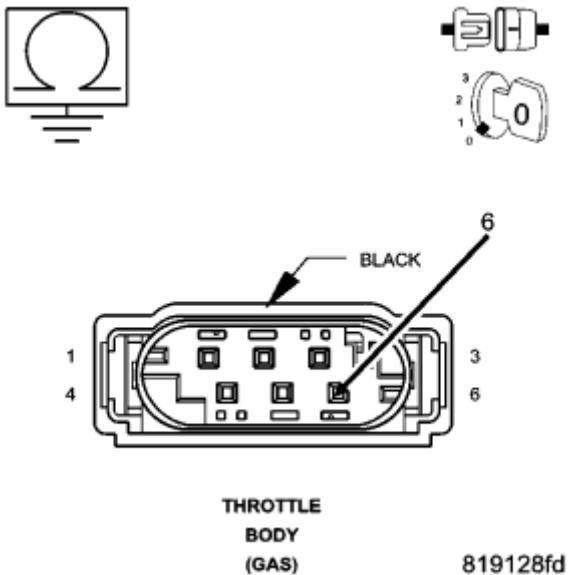


Fig. 57: Checking TP Sensor No. 1 Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K22) TP Signal circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 11.

No

Repair the short to ground in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K122) TP SIGNAL 2 CIRCUIT SHORTED TO GROUND**

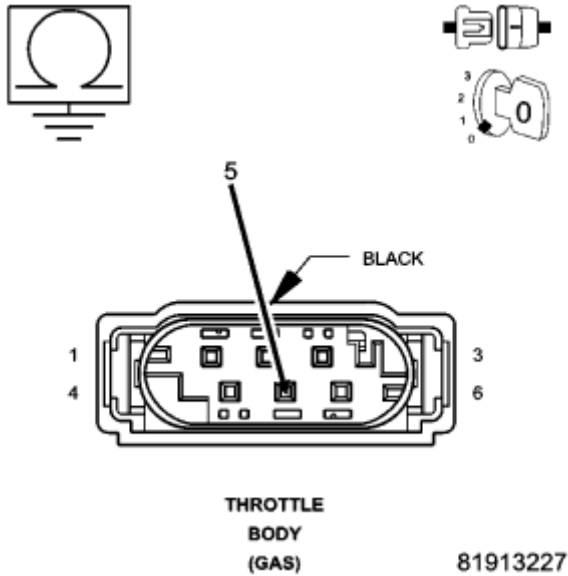


Fig. 58: Checking TP Sensor No. 2 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K122) TP Signal 2 circuit at the Throttle Body harness connector.

Is the resistance above 100k ohms?

Yes

Go To 12.

No

Repair the short to ground in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT**

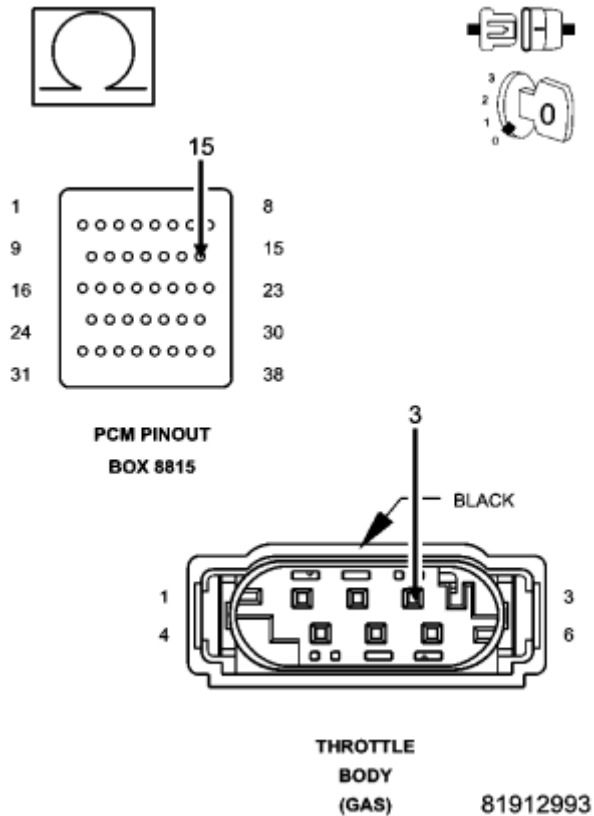


Fig. 59: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

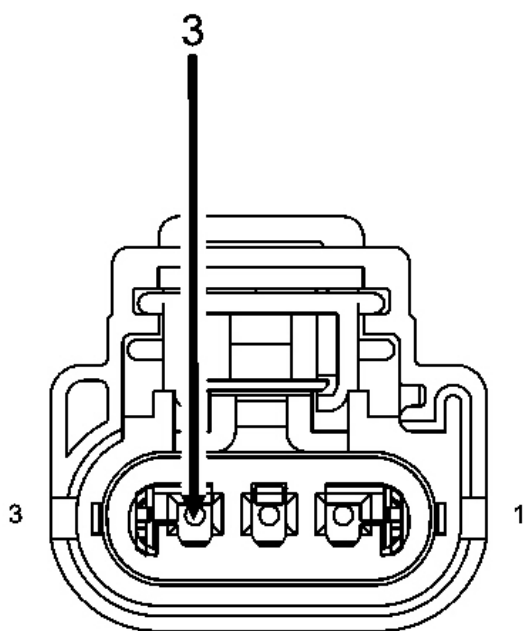
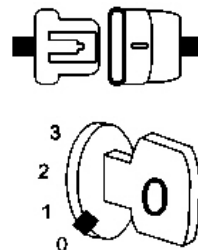
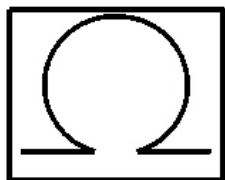
Go To 19.

No

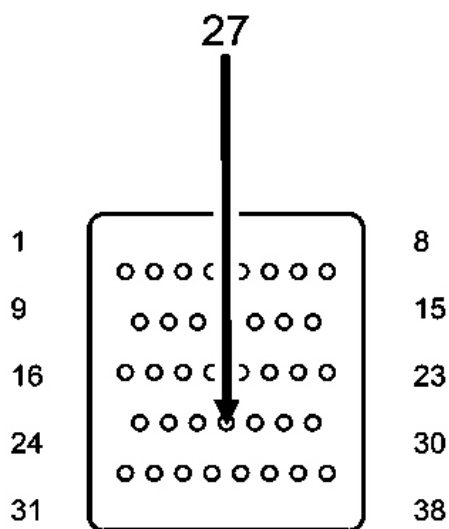
Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESISTANCE IN THE (K857) 5-VOLT SUPPLY CIRCUIT**



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 60: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

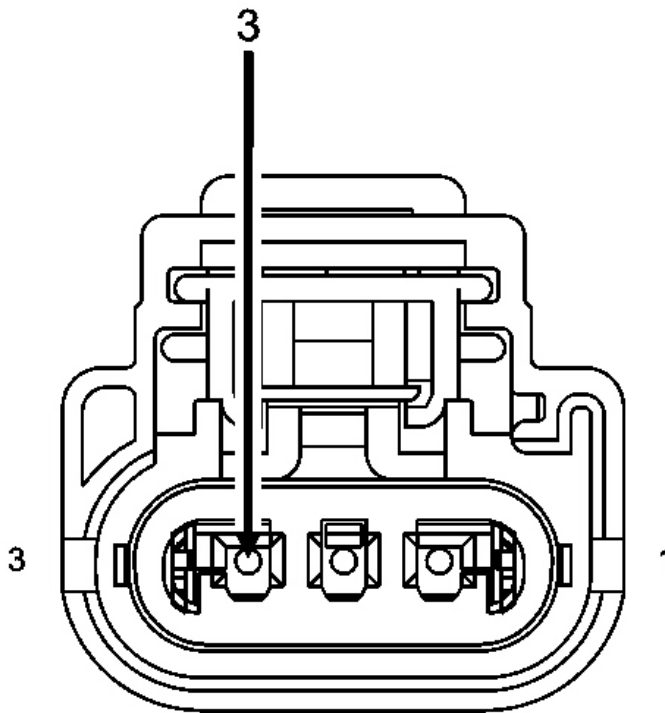
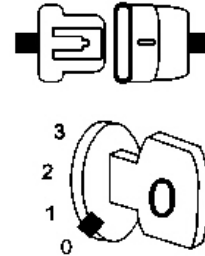
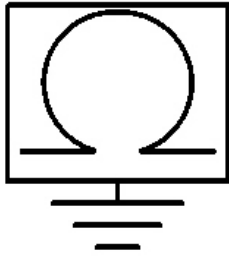
Go To 14.

No

Repair the excessive resistance in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

14. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 61: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

Go To 15.

No

Repair the short to ground in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

15. **MAP SENSOR**

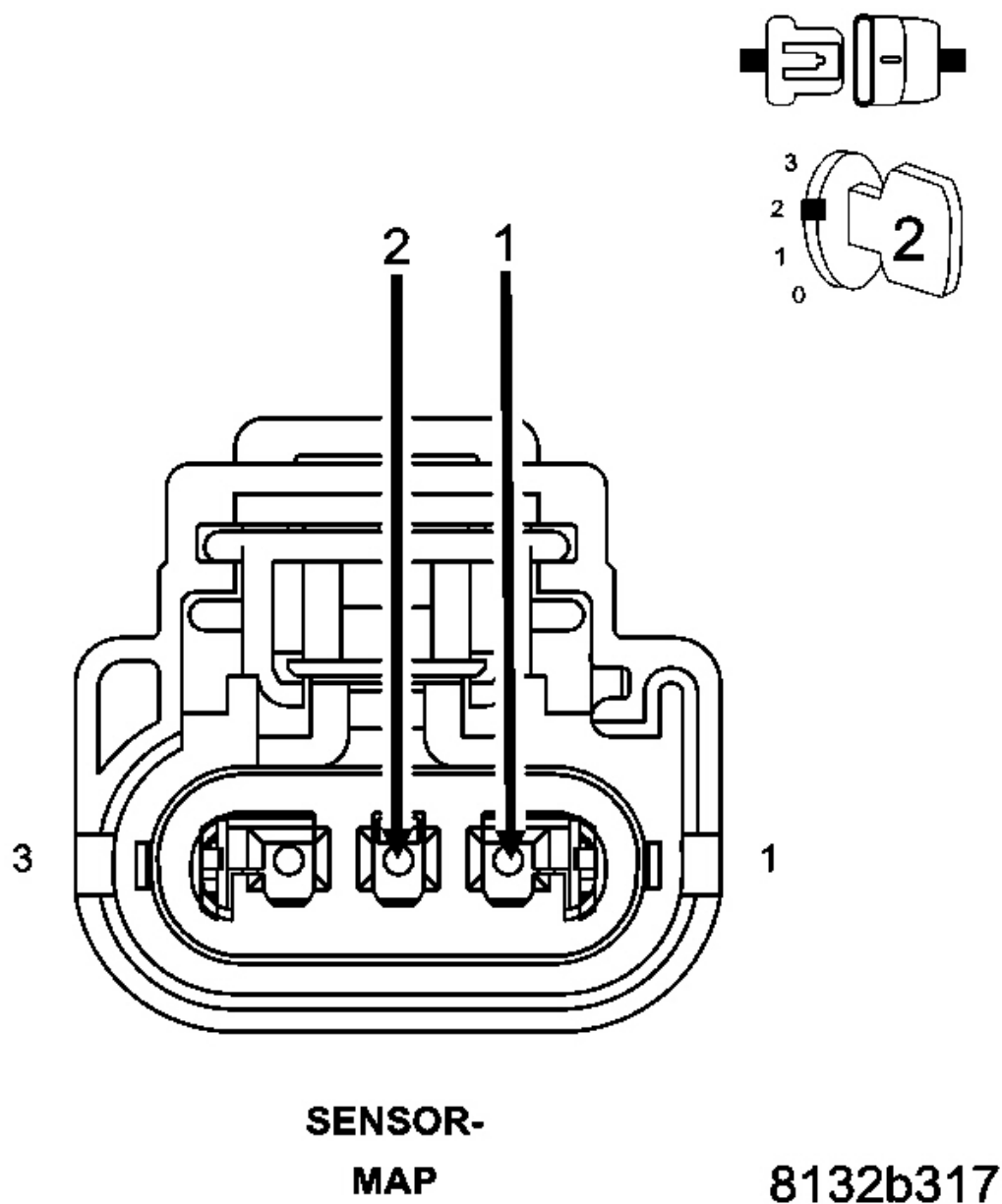


Fig. 62: Identifying MAP Sensor Signal & Ground Circuit
Courtesy of CHRYSLER LLC

Connect the C1 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the MAP Sensor voltage.

Connect a jumper wire between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit.

Cycle the ignition switch from off to on.

With a scan tool, monitor the MAP Sensor voltage.

Does the scan tool display MAP voltage from approximately 4.9 volts to below 0.5 volt with the jumper wire installed?

Yes

Replace the MAP Sensor.

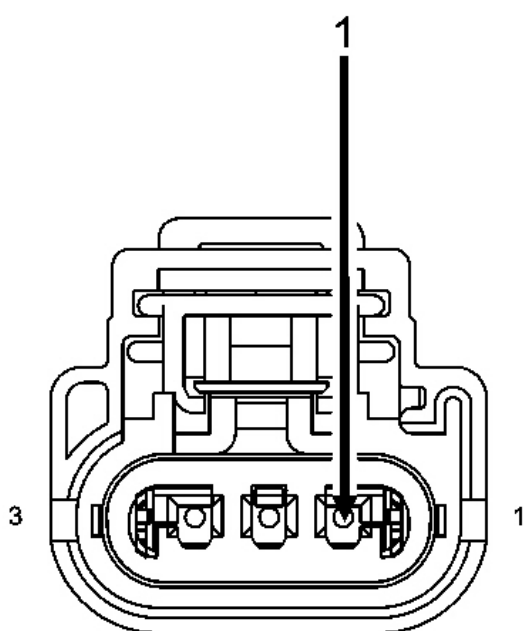
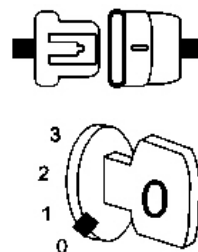
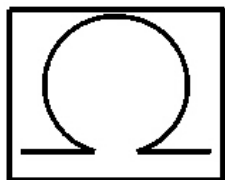
Perform **POWERTRAIN VERIFICATION TEST**.

No

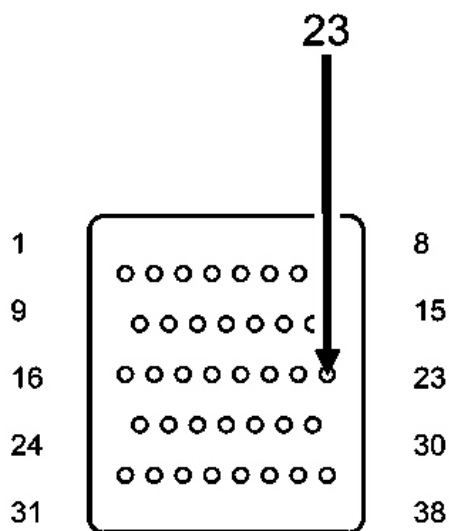
Go To 16.

NOTE: Remove the jumper wire before continuing.

16. RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 63: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the

appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

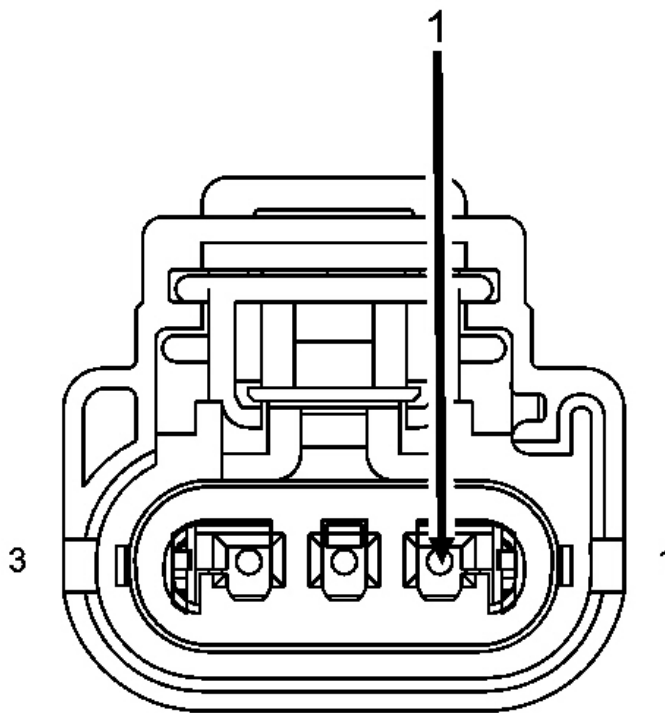
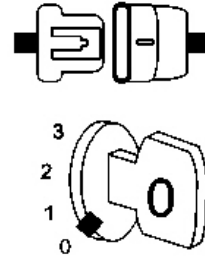
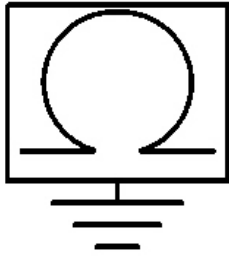
Go To 17.

No

Repair the excessive resistance in the (K1) MAP Signal circuit

Perform **POWERTRAIN VERIFICATION TEST** .

17. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b323

Fig. 64: Checking MAP Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance above 100k ohms?

Yes

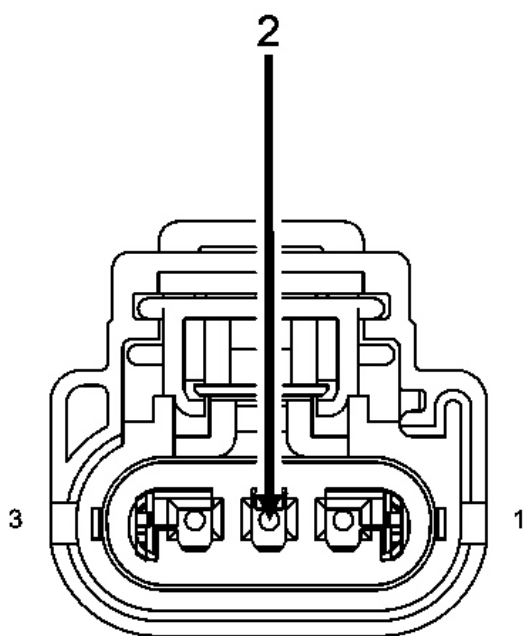
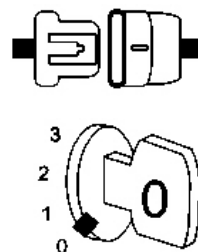
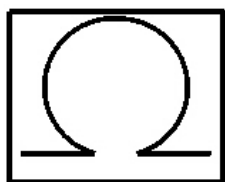
Go To 18.

No

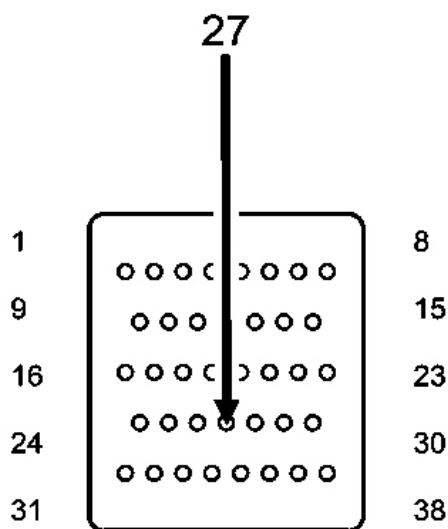
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

18. RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b327

Fig. 65: Checking MAP Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 19.

No

Repair the excessive resistance in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

19. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor, Throttle Body, and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor, Throttle Body, and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

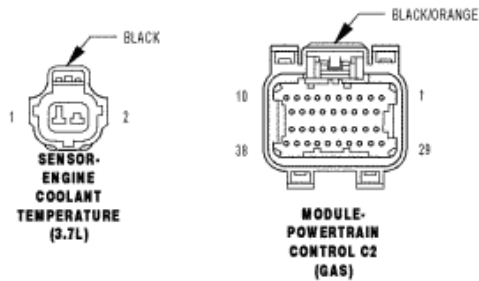
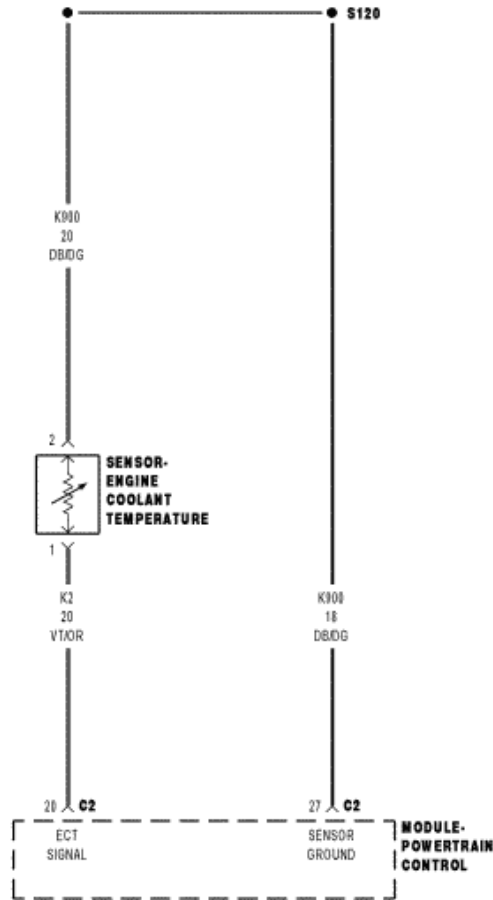
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2181-COOLING SYSTEM PERFORMANCE

CIRCUIT SCHEMATIC



81c0a19

Fig. 66: Engine Coolant Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition on, Engine running, and no ECT DTCs present.

SET CONDITIONS

• Set Condition:

PCM recognizes that the ECT has failed its self coherence test. The coolant temp should only change at a certain rate, if this rate is too slow or too fast this fault will set. Two trip fault. Three good trips to clear MIL. The MIL and ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
LOW COOLANT LEVEL (K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE (K2) ECT SIGNAL CIRCUIT OPEN (K900) SENSOR GROUND CIRCUIT OPEN (K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND (K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT THERMOSTAT ENGINE COOLANT TEMPERATURE SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

NOTE: If this code sets during extreme ambient temperatures, improper installation of a block heater could be the cause of this DTC.

With a scan tool, read DTCs.

Diagnose all other ECT and Cooling System codes before continuing.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **LOW COOLANT LEVEL**

NOTE: If a Engine Coolant Temperature (ECT) DTC is set along with this code, diagnose the ECT DTC first.

NOTE: Inspect the ECT terminals and related PCM terminals. Ensure the terminals are free from corrosion and damage.

NOTE: The best way to diagnose this DTC is to allow the vehicle to sit overnight outside in order to have a totally cold soaked engine.

NOTE: Extremely cold outside ambient temperatures may have caused this DTC to set.

NOTE: Need to make sure that no Cooling System DTCs are set or changes that would make the warm up much slower or much faster: broken water pump can set this, addition of aftermarket auxiliary cooler can set this DTC.

WARNING: Never open the cooling system when the engine is hot. The system is under pressure. Failure to follow these instructions can result in personal injury or death. Allow the engine to cool before opening the cooling system.

Inspect the coolant system for proper level and condition.

Is the coolant level and condition OK?

Yes

Go To 3.

No

Inspect the vehicle for a coolant leak and add the necessary amount of coolant.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **THERMOSTAT**

NOTE: This test works best if performed on a cold engine (cold soak).

Ignition on, engine not running.

With a scan tool, read the Eng Coolant Tmp Deg value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: **If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.**

Start the Engine.

During engine warm-up monitor the Eng Coolant Tmp Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82° C (180° F). Also monitor the actual coolant temperature with a thermometer.

NOTE: **As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the Eng Coolant Tmp Deg on the scan tool should stay relatively close to each other.**

Using the appropriate service information, determine the proper opening temperature of the thermostat.

Did the thermostat open at the proper temperature?

Yes

Go To 4.

No

Replace the thermostat.

Perform **POWERTRAIN VERIFICATION TEST** .

4. ECT SENSOR

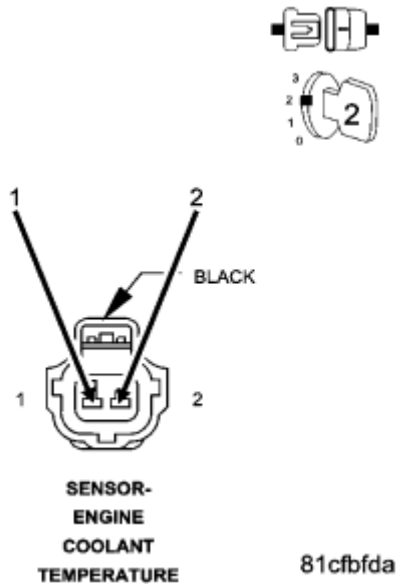


Fig. 67: Checking ECT Sensor
Courtesy of CHRYSLER LLC

Connect a jumper between the (K2) ECT Signal circuit and the (K900) Sensor ground circuit in the ECT Sensor harness connector.

Turn the ignition off.

Disconnect the ECT Sensor harness connector.

With a scan tool, read the ECT voltage.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. If OK, replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE

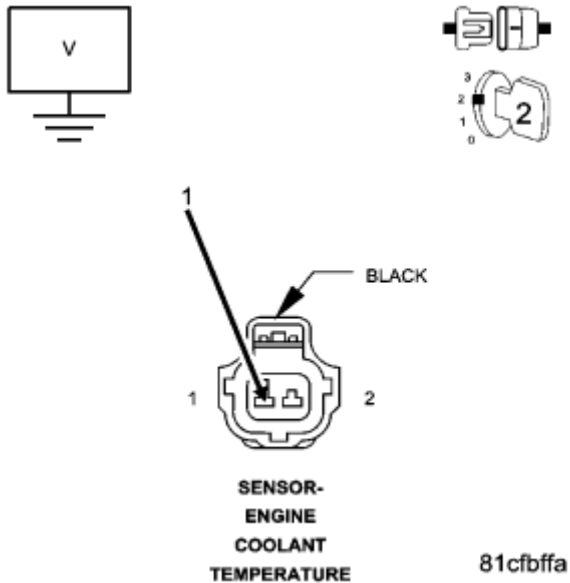


Fig. 68: Checking ECT Sensor Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K2) ECT SIGNAL CIRCUIT OPEN

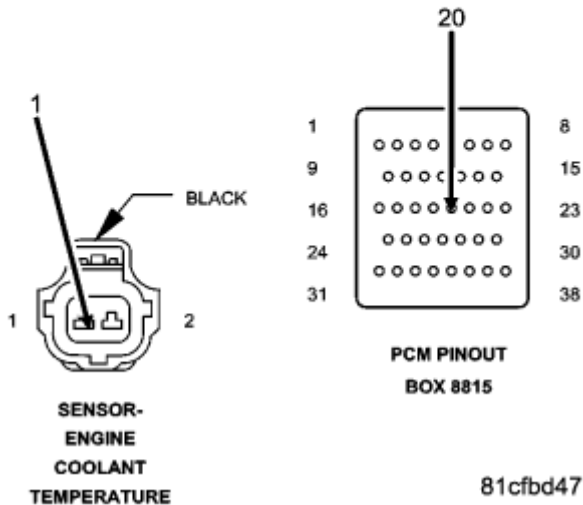


Fig. 69: Checking ECT Sensor Signal Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K2) ECT Signal circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K900) SENSOR GROUND CIRCUIT OPEN

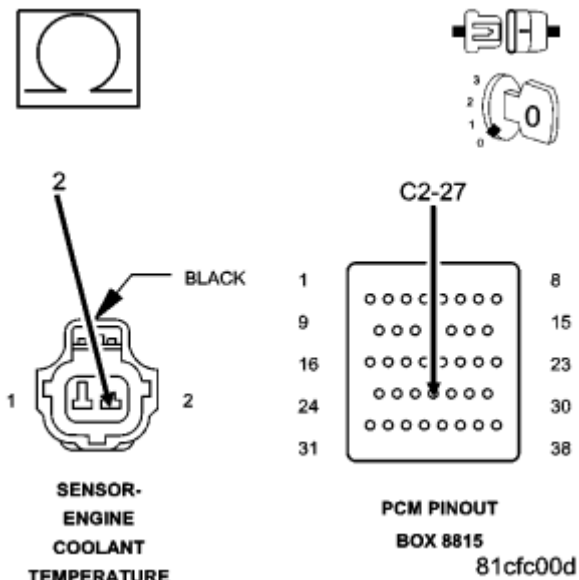


Fig. 70: Checking ECT Sensor Ground Circuit For Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND

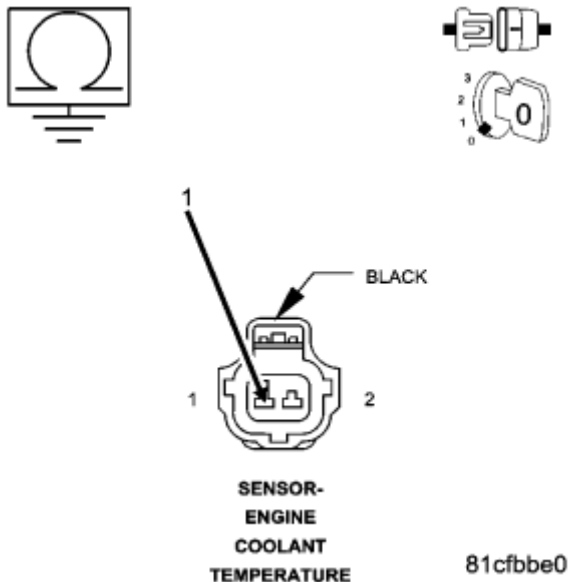


Fig. 71: Checking ECT Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

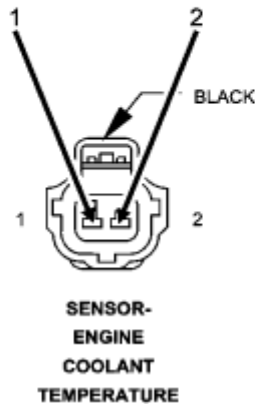
Repair the short to ground in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT



81cfbc01

Fig. 72: Checking ECT Sensor Signal Circuit For Short To Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K2) ECT Signal circuit and the (K900) Sensor ground circuit in the ECT Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K900) Sensor ground and the (K2) ECT Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the ECT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

**P2299-BRAKE PEDAL POSITION / ACCELERATOR PEDAL POSITION
INCOMPATIBLE**

CIRCUIT SCHEMATIC

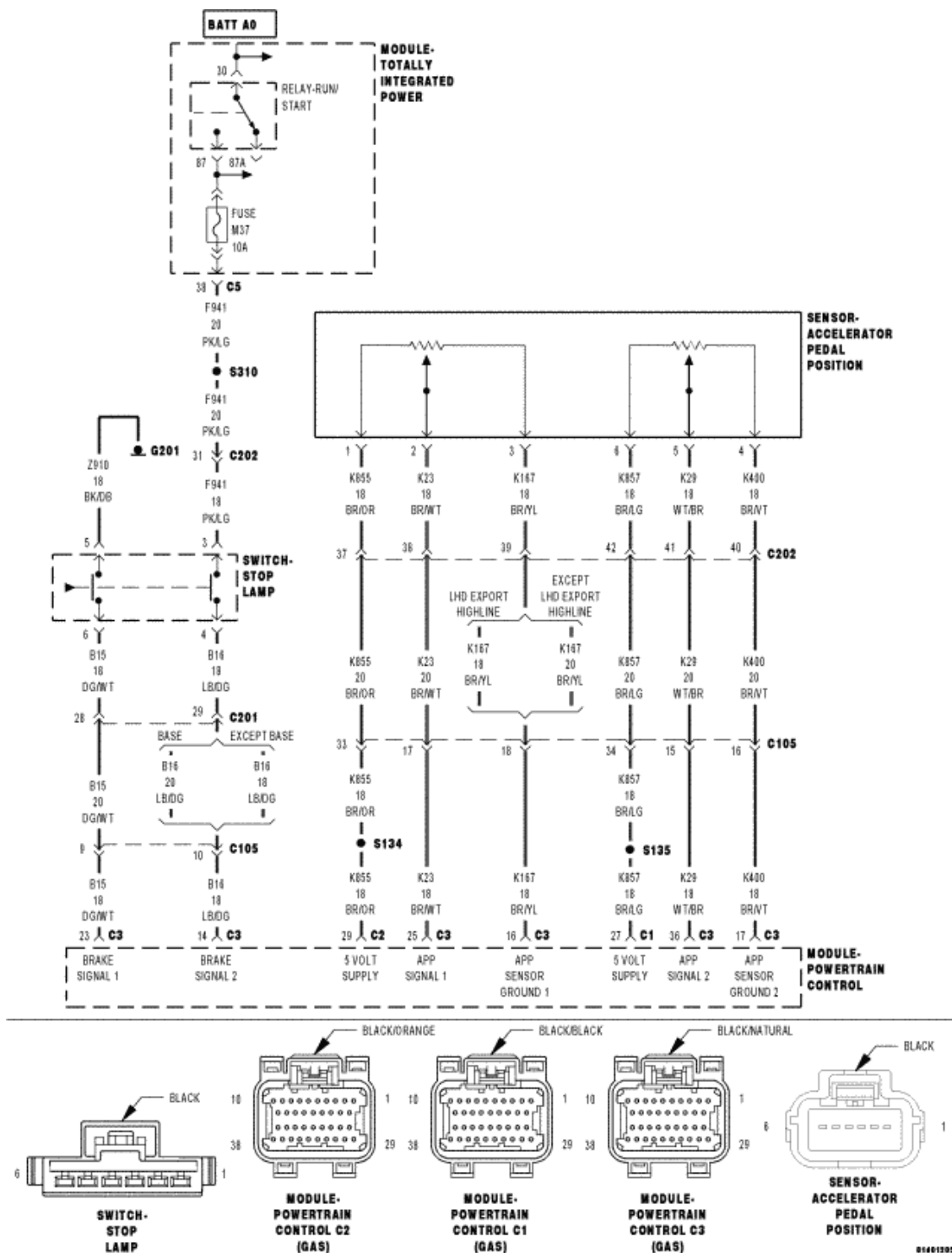


Fig. 73: APPS Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on. No Break or APPS faults present.

SET CONDITIONS

• Set Condition:

The PCM recognizes a brake application following the APPS showing a fixed pedal opening. Temporary or permanent. Internally the PCM will reduce throttle opening below driver demand. One trip fault and the code will be set within 5 seconds. ETC light will illuminate, the light will only stay illuminated while DTC is active.

POSSIBLE CAUSES

Possible Causes
CUSTOMER PRESSING ACCELERATOR PEDAL, THEN PRESSING BRAKE PEDAL, AND CONTINUES HOLDING THEM DOWN SIMULTANEOUSLY STOP LAMP SWITCH APP SENSOR

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. DTC INFORMATION

- NOTE:

If a pedal assembly becomes mechanically stuck the voltage output will stay fixed, if this is also Followed by a long application of the brakes this code will set.
- NOTE:

When this code sets the pedal position in the PCM software will ramp to idle. If the Pedal voltage changes OR the brake pedal is released, the pedal position in the PCM software will ramp up to the pedal position and the ETC light will go out.

With a scan tool, read DTCs and record the related Freeze Frame data.

Diagnose all other Stop Lamp Switch and APP Sensor codes before continuing.

This code can be set by a driver who uses both feet while driving, one for the Accelerator Pedal and the other for the Brake Pedal.

- NOTE:

The most likely cause of this DTC is caused by the customer Brake

Torquing the engine by pressing the Accelerator pedal and the pressing the Brake Pedal.

Ask the driver of the vehicle if these conditions apply to their driving habits.

Are the listed conditions part of the customers driving habits?

Yes

Advise the customer of what caused the DTC. This is normal operation of a ETC equipped vehicle because of safety issues.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 2.

2. STOP LAMP SWITCH OPERATION

With a scan tool, read both Stop Lamp Switch statuses while pressing and releasing the Brake Pedal.

Does the scan tool display the Pressed and Released while pressing and releasing the Pedal?

Yes

Go To 3.

No

Check the Stop Lamp Switch for proper installation and check the related circuits for opens and shorts using the appropriate wiring diagram. If OK, replace the Stop Lamp Switch assembly.

Perform **POWERTRAIN VERIFICATION TEST** .

3. APP SENSOR SWEEP

Ignition on, engine not running.

With a scan tool, monitor both APP Sensor voltage readings.

Slowly press the accelerator pedal from idle until it reaches the end stop near the floor.

APPS No.1 voltage should start at approximately 0.45 of a volt and increase to approximately 4.6 volts with a smooth transition.

APPS No.2 voltage should start at approximately 0.22 of a volt and increase to approximately 2.31 volts with a smooth transition.

Does the voltage for the appropriate sensor follow the list specification?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Check the Signal and Sensor Ground circuits for opens and shorts. If OK, Replace the APP Sensor Assembly per Service Information. After installation is complete, with a scan tool select the ETC RELEARN function to relearn the APPS values.

Perform **POWERTRAIN VERIFICATION TEST** .

P2302-IGNITION COIL 1 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC

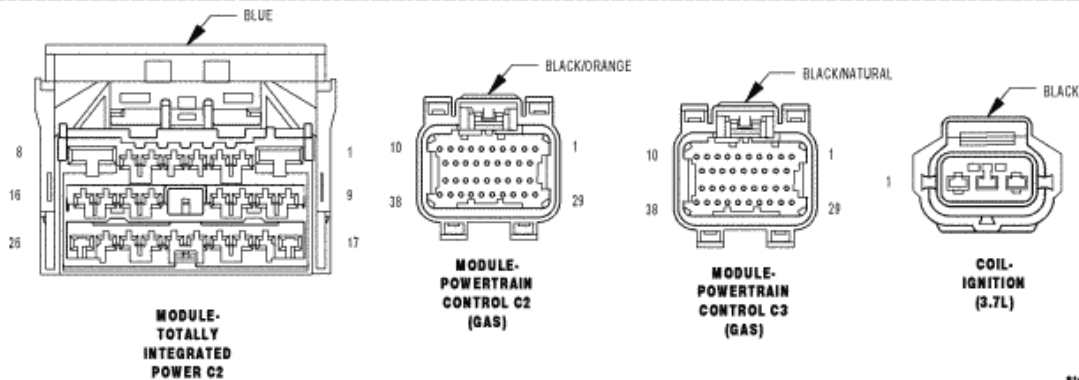
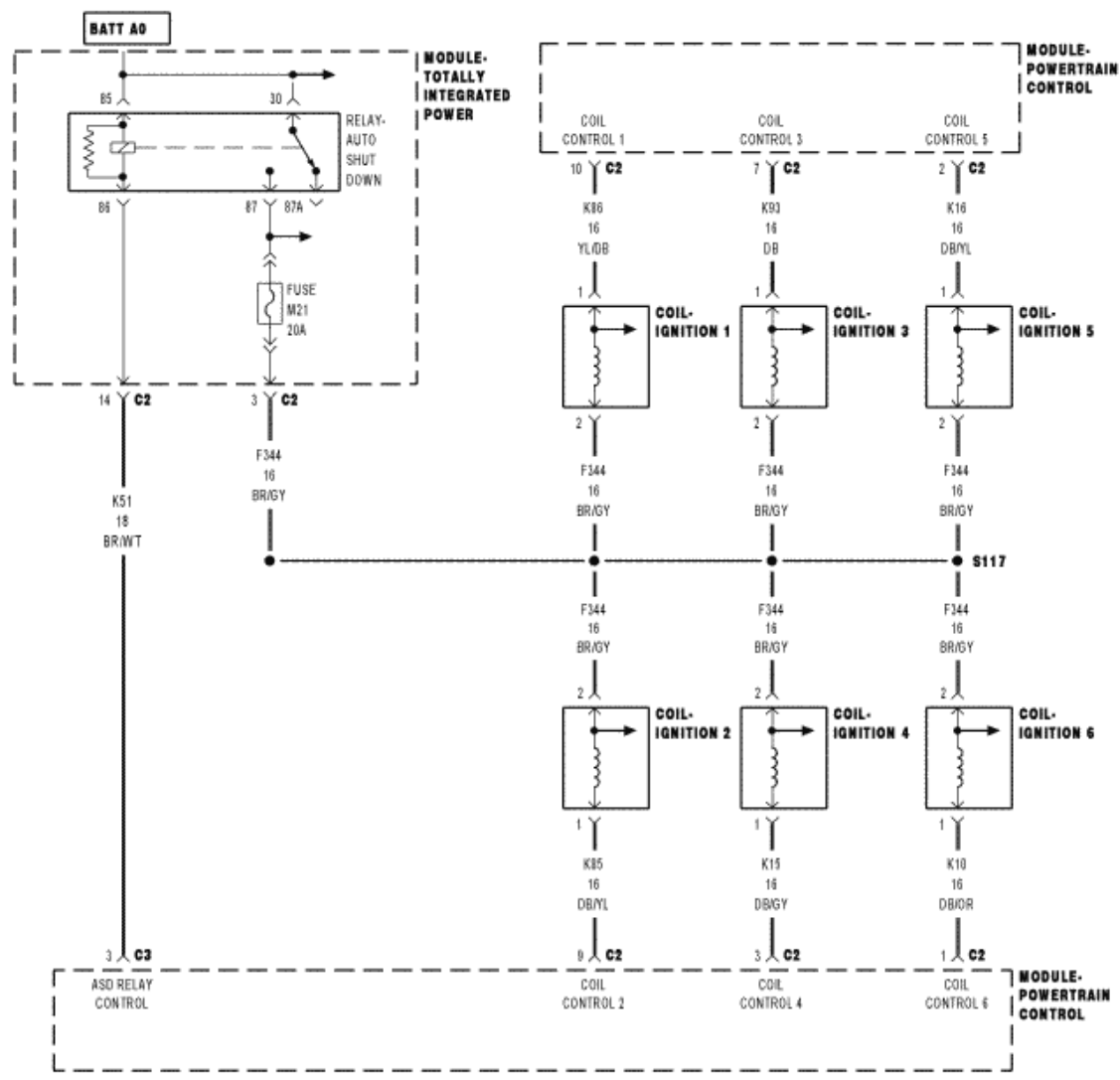


Fig. 74: Ignition Coil Secondary Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K86) COIL CONTROL 1 CIRCUIT OPEN (K86) COIL CONTROL 1 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

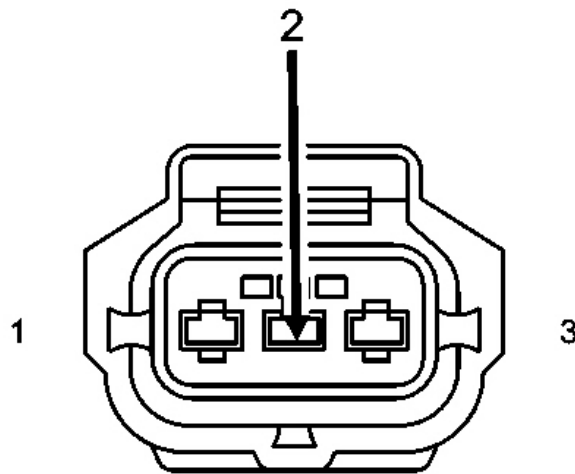
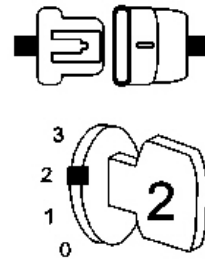
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 75: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on

Plug harness connector.

NOTE: **Make sure the test light is probing the circuit before actuating the Coil or a DTC may set and not allow the actuation.**

With a scan tool, actuate the ASD Relay.

Does the test light illuminate brightly?

Yes

Go To 3.

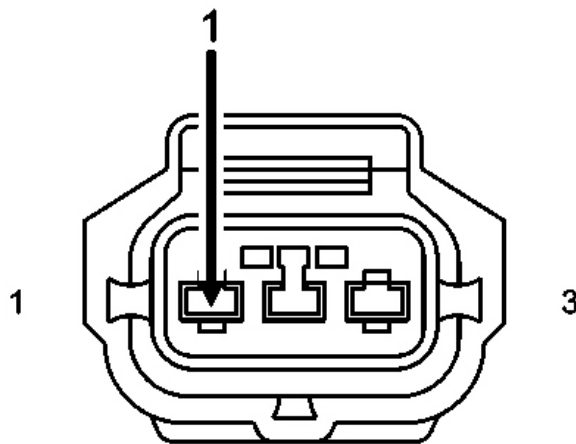
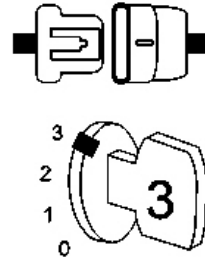
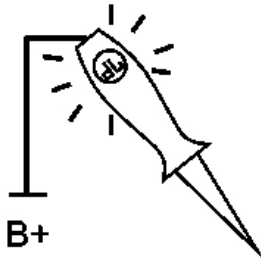
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: **Stop All Actuations.**

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 76: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K86) Coil Control 1 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the condition of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

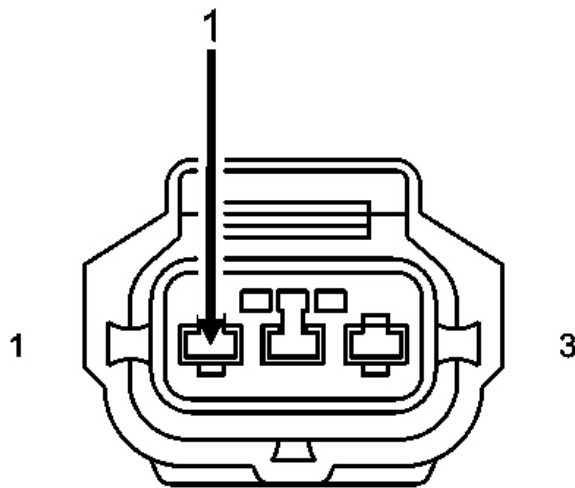
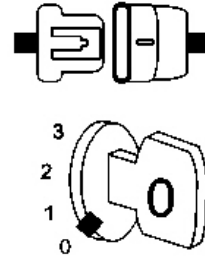
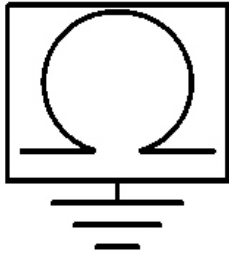
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K86) COIL CONTROL 1 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 77: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K86) Coil Control 1 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

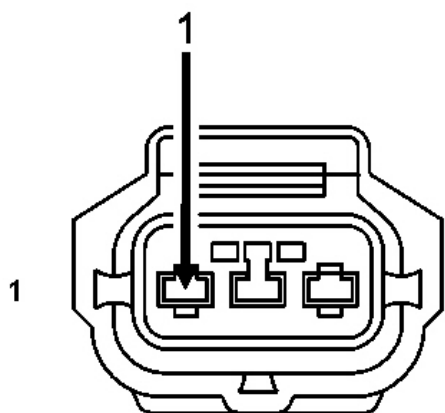
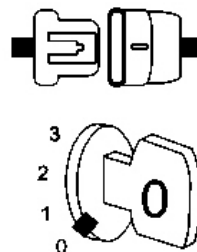
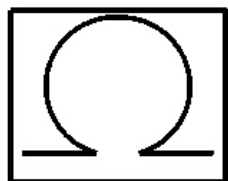
Repair the short to ground in the (K86) Coil Control 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

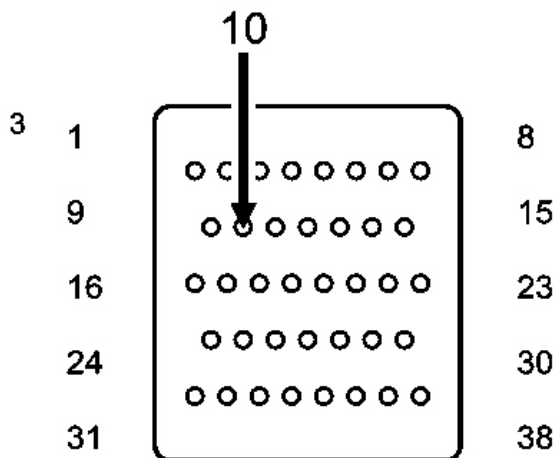
No

Go To 6.

5. (K86) COIL CONTROL 1 CIRCUIT OPEN



**COIL-
IGNITION**



PCM PINOUT

BOX 8815

816344e7

Fig. 78: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K86) Coil Control 1 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K86) Coil Control 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2305-IGNITION COIL 2 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC

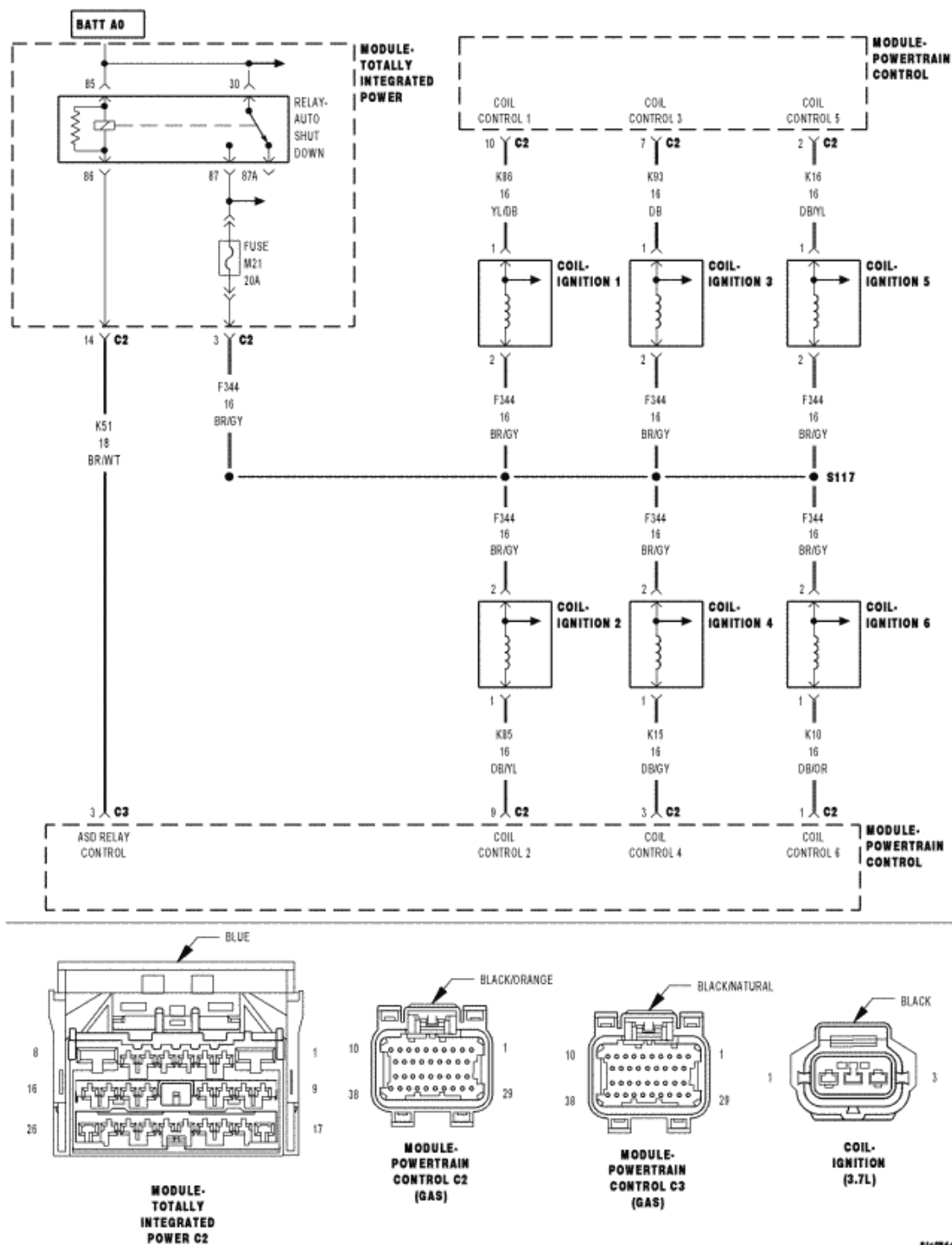


Fig. 79: Ignition Coil Secondary Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K85) COIL CONTROL 2 CIRCUIT OPEN (K85) COIL CONTROL 2 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

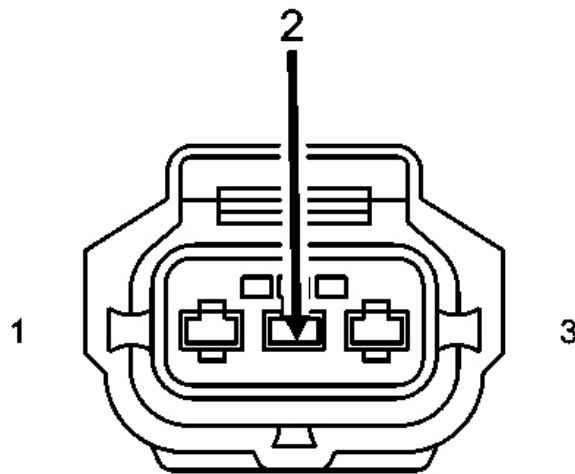
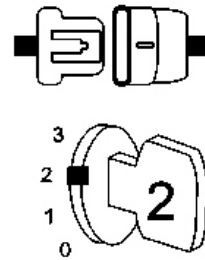
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 80: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on Plug harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

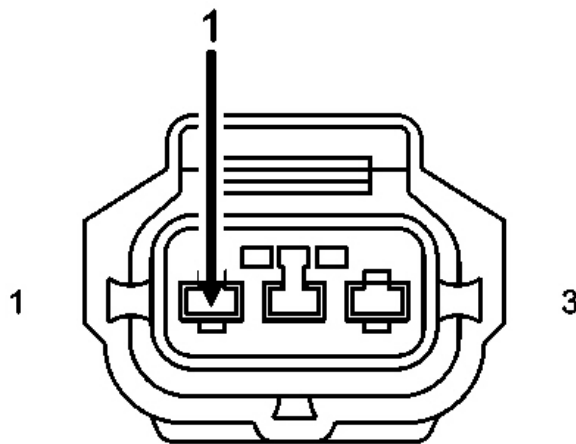
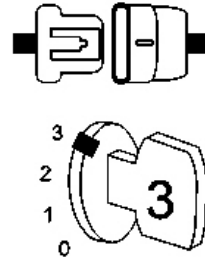
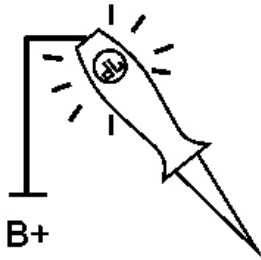
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Stop All Actuations.

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 81: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K85) Coil Control 2 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the state of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

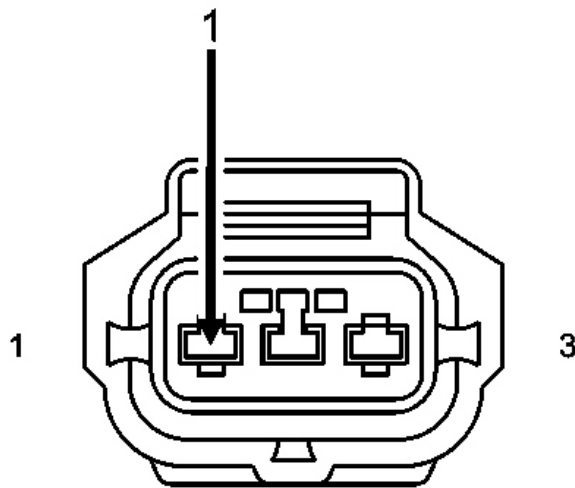
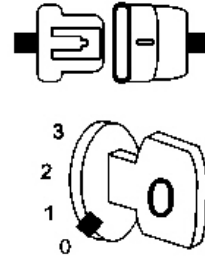
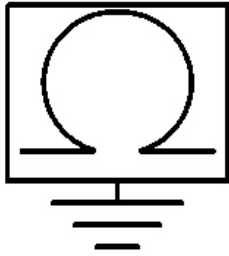
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K85) COIL CONTROL 2 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 82: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K85) Coil Control 2 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

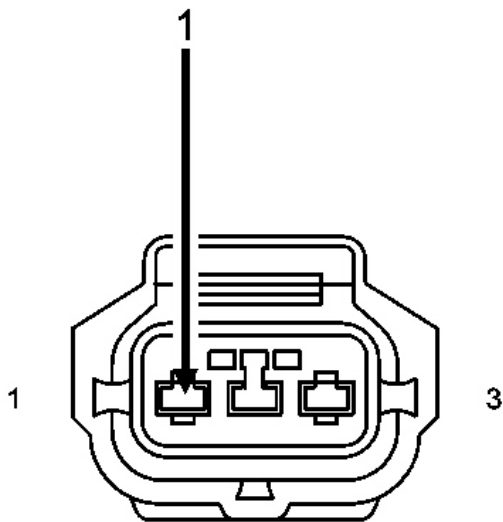
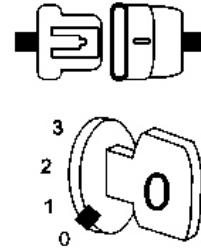
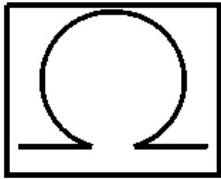
Repair the short to ground in the (K85) Coil Control 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

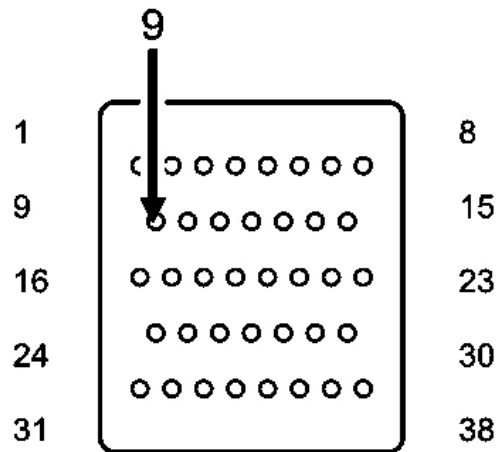
No

Go To 6.

5. **(K85) COIL CONTROL 2 CIRCUIT OPEN**



**COIL-
IGNITION**



**PCM PINOUT
BOX 8815**

81634c5c

Fig. 83: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K85) Coil Control 2 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K85) Coil Control 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2308-IGNITION COIL 3 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC

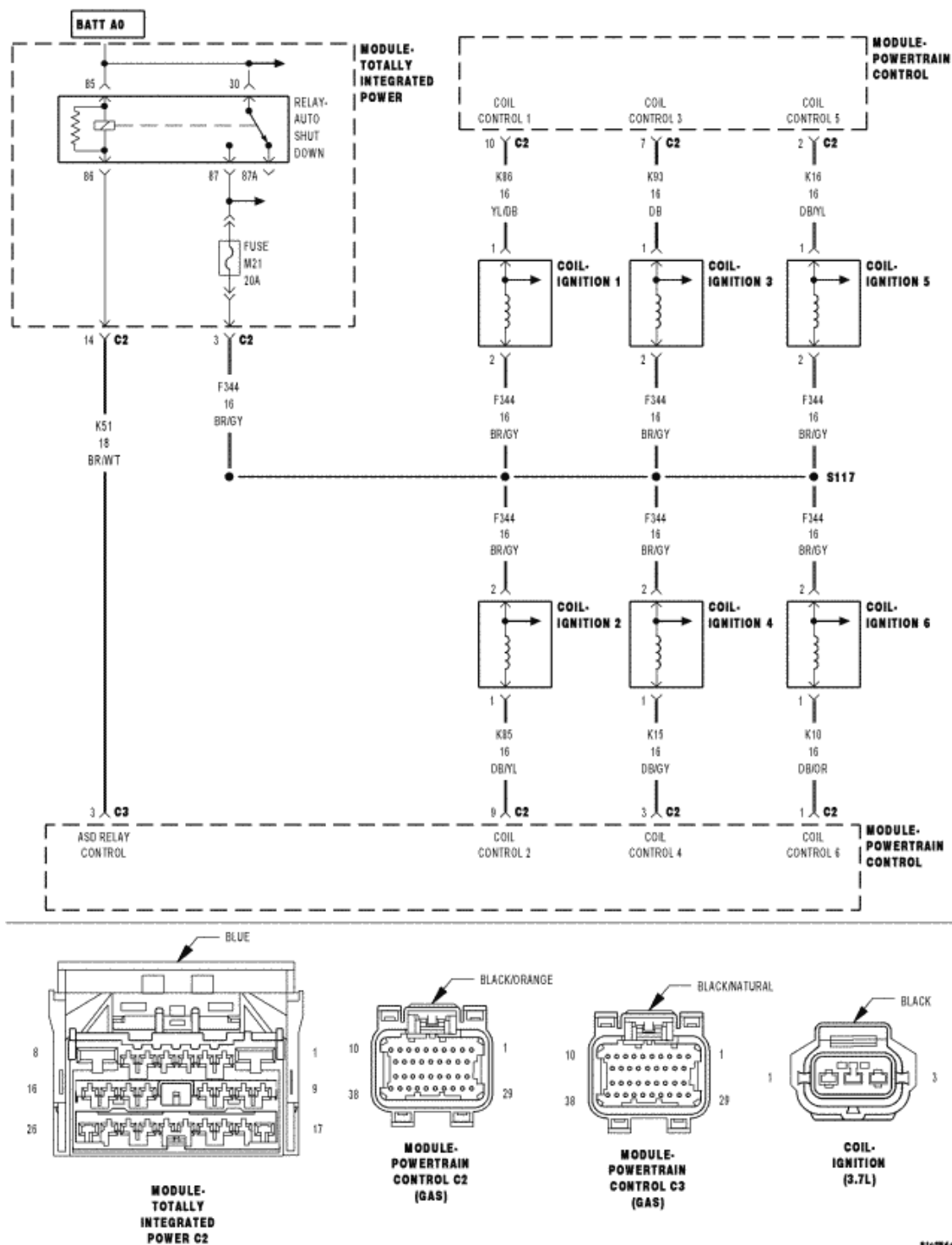


Fig. 84: Ignition Coil Secondary Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K93) COIL CONTROL 3 CIRCUIT OPEN (K93) COIL CONTROL 3 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

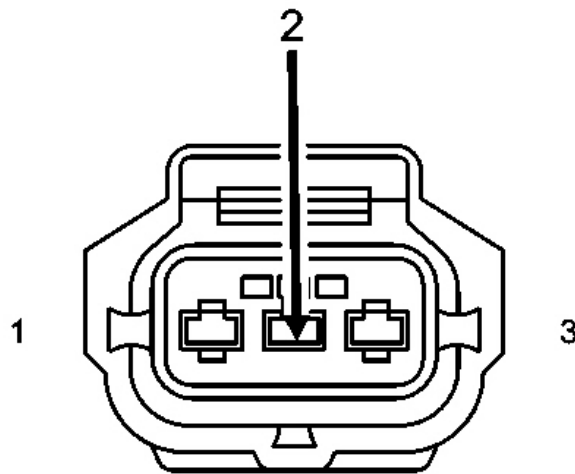
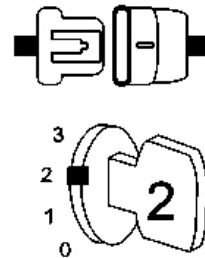
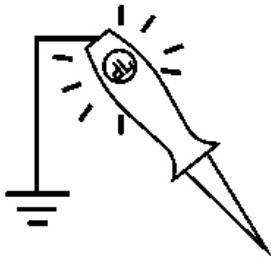
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 85: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on Plug harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

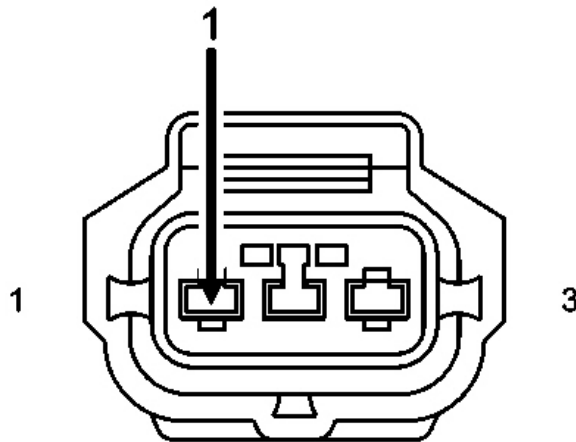
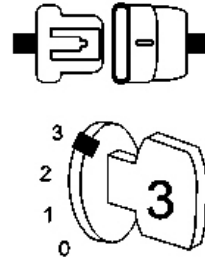
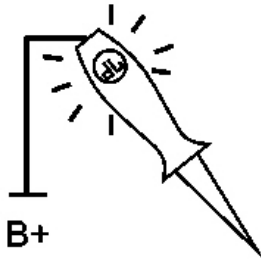
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Stop All Actuations.

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 86: Checking Coil Control Circuit
 Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K93) Coil Control 3 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the state of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

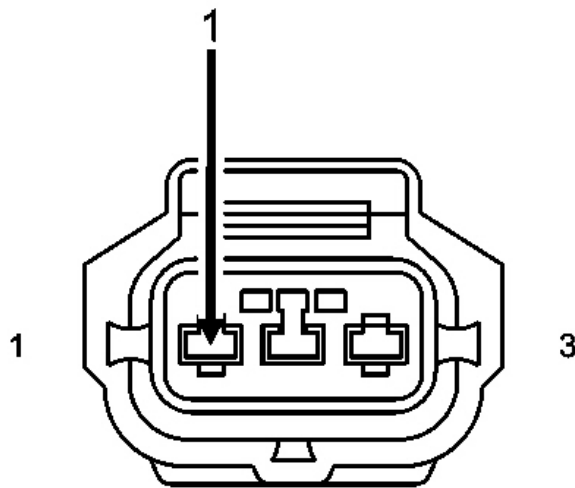
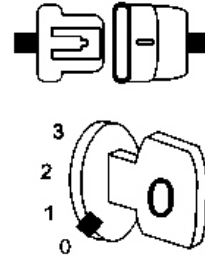
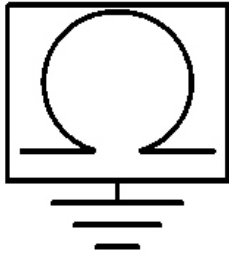
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K93) COIL CONTROL 3 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 87: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K93) Coil Control 3 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

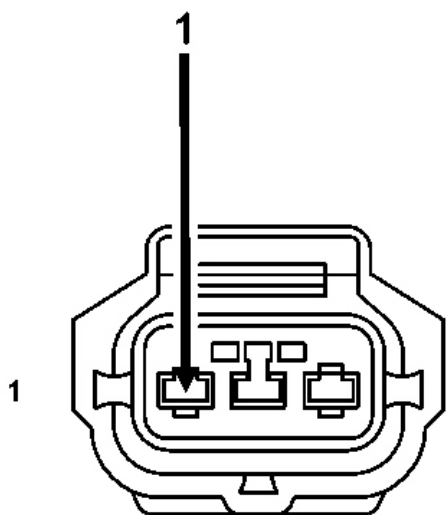
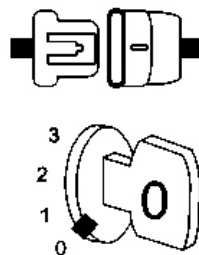
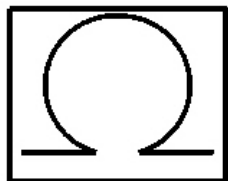
Repair the short to ground in the (K93) Coil Control 3 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

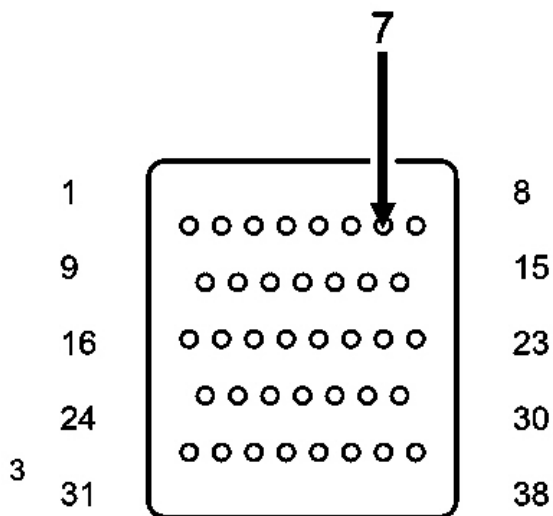
No

Go To 6.

5. (K93) COIL CONTROL 3 CIRCUIT OPEN



**COIL-
IGNITION**



**PCM PINOUT
BOX 8815**

81634c6a

Fig. 88: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K93) Coil Control 3 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K93) Coil Control 3 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

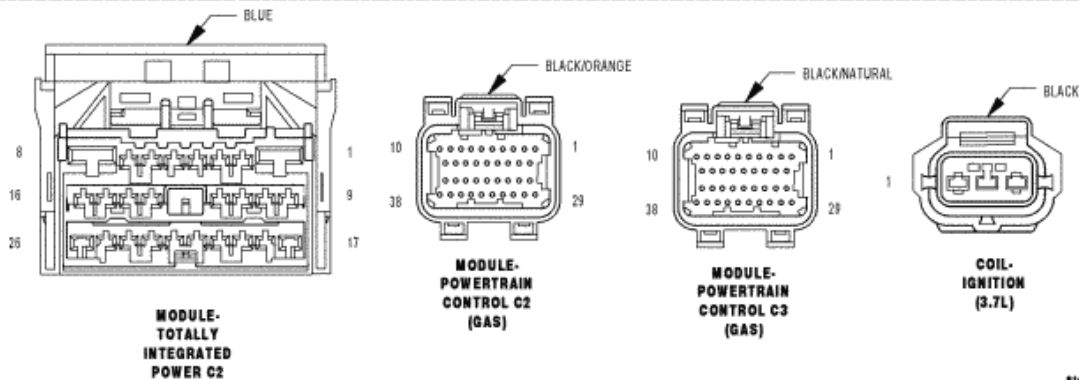
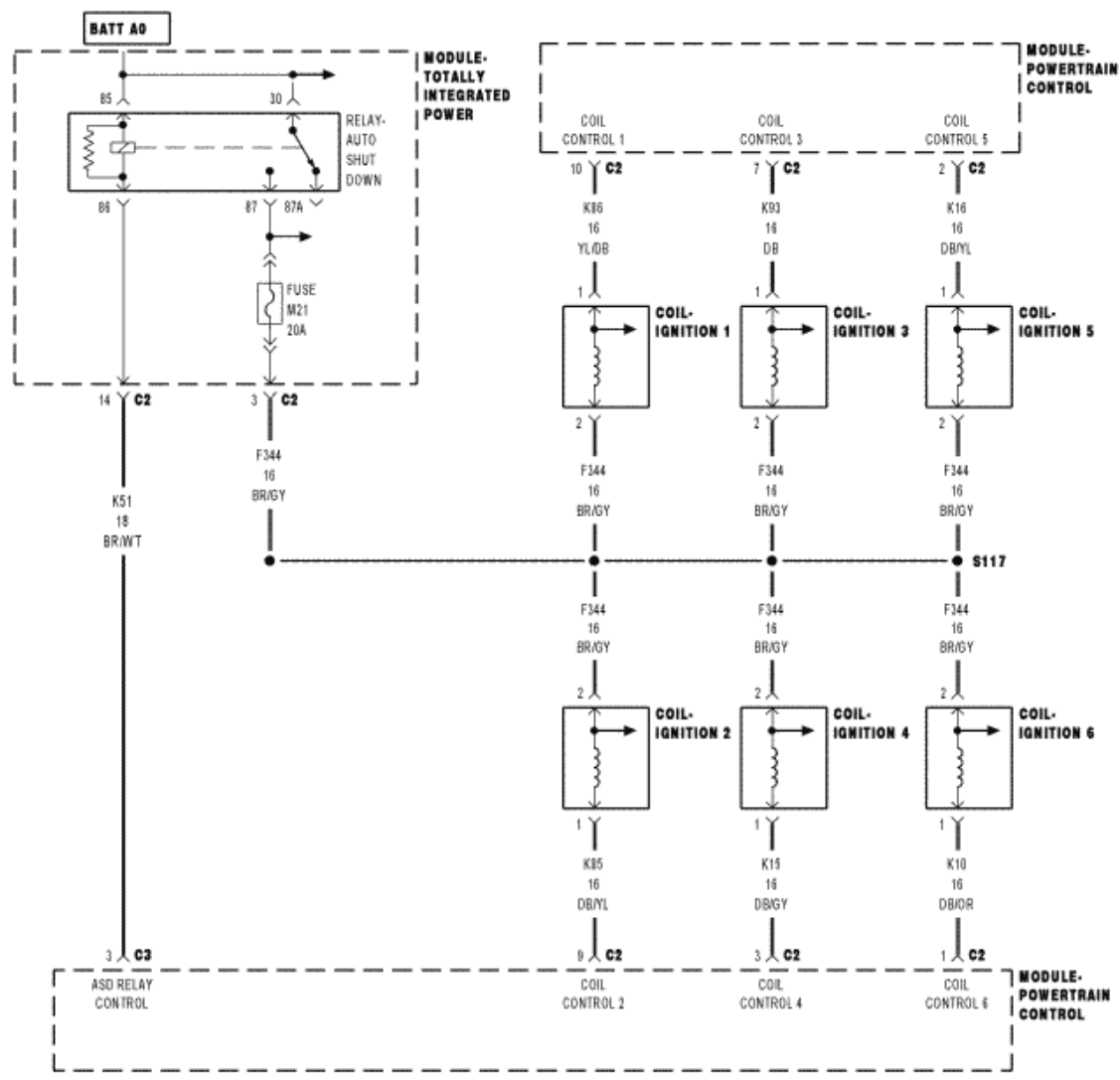
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2311-IGNITION COIL 4 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC



910864a

Fig. 89: Ignition Coil Secondary Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K15) COIL CONTROL 4 CIRCUIT OPEN (K15) COIL CONTROL 4 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

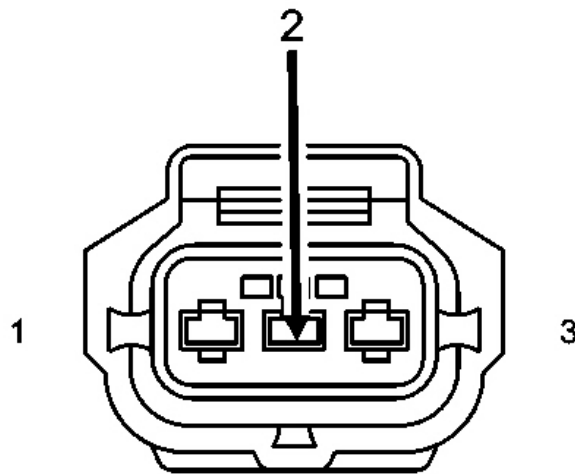
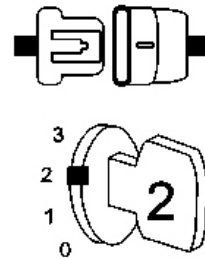
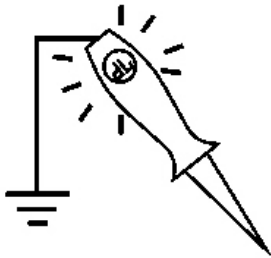
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 90: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on Plug harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

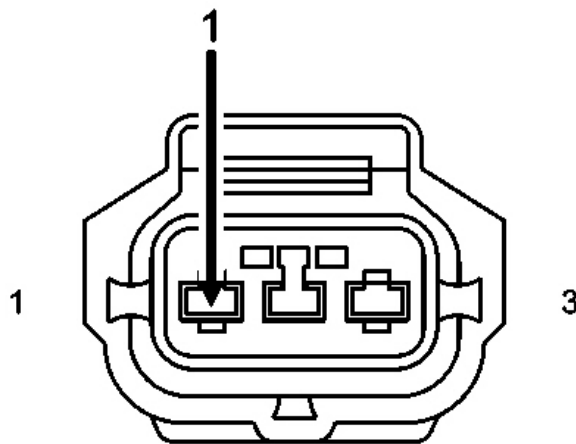
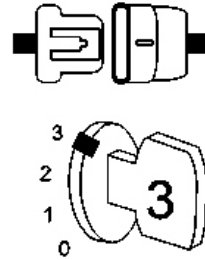
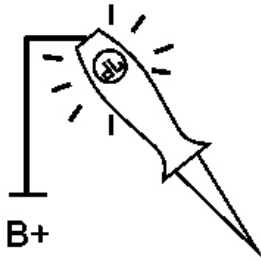
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Stop All Actuations.

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 91: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K15) Coil Control 4 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the state of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

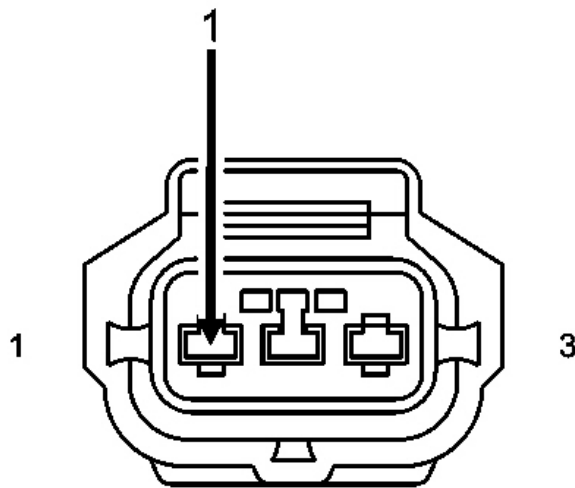
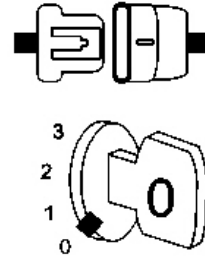
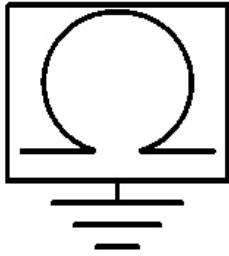
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K15) COIL CONTROL 4 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 92: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K15) Coil Control 4 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

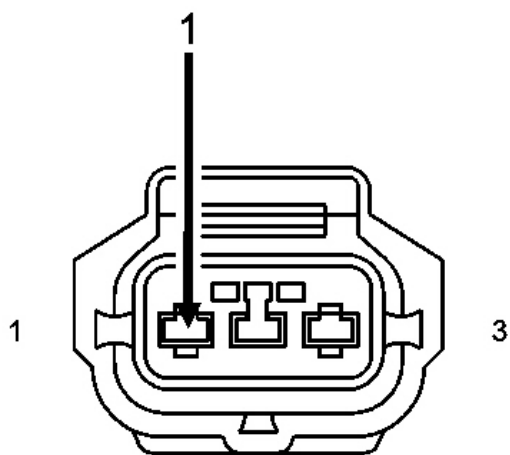
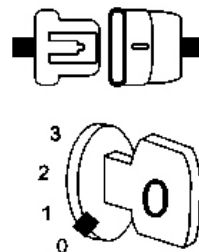
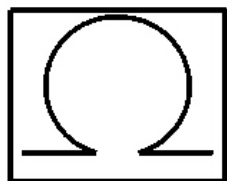
Repair the short to ground in the (K15) Coil Control 4 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

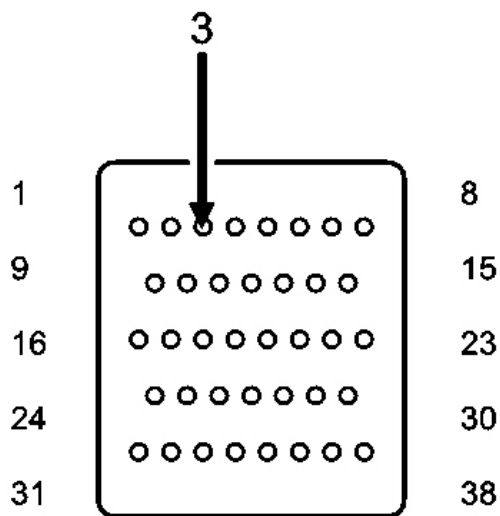
No

Go To 6.

5. (K15) COIL CONTROL 4 CIRCUIT OPEN



**COIL-
IGNITION**



**PCM PINOUT
BOX 8815**

81634c71

Fig. 93: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K15) Coil Control 4 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K15) Coil Control 4 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

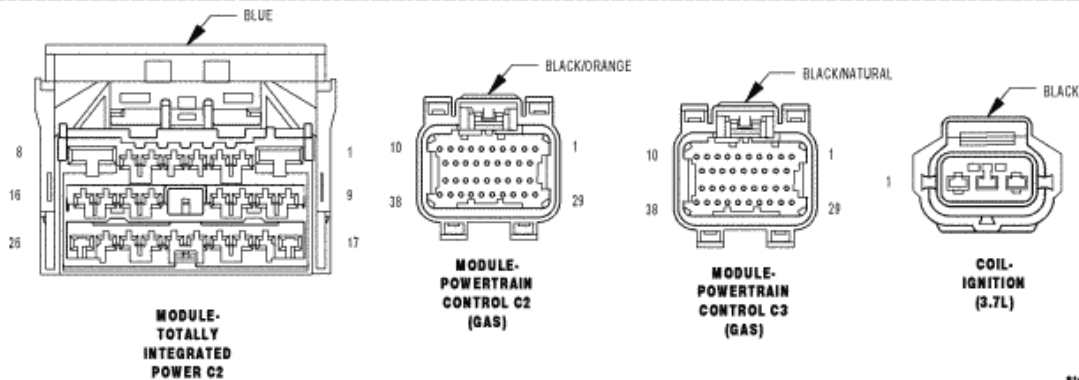
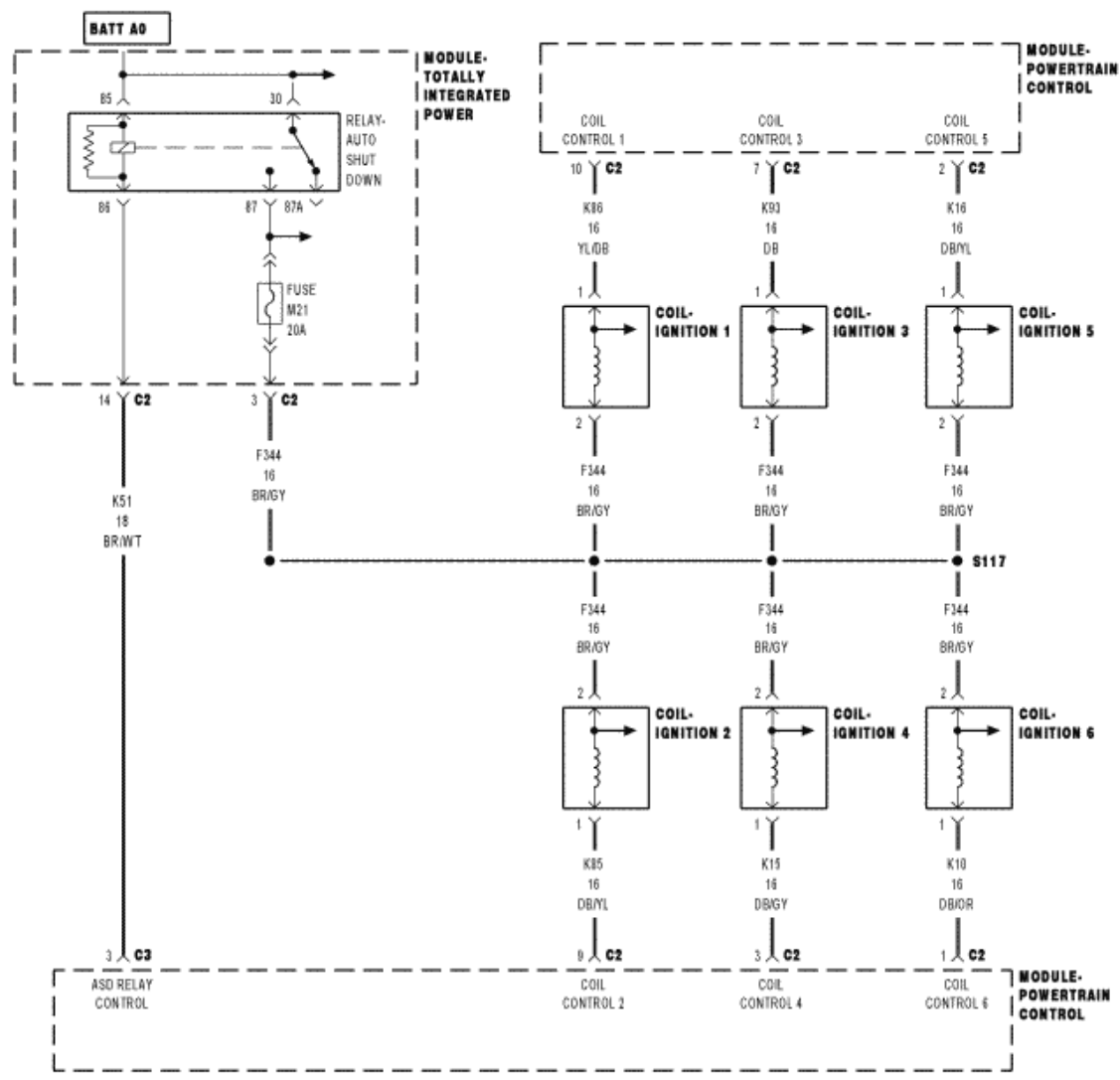
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2314-IGNITION COIL 5 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC



910864a

Fig. 94: Ignition Coil Secondary Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K16) COIL CONTROL 5 CIRCUIT OPEN (K16) COIL CONTROL 5 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

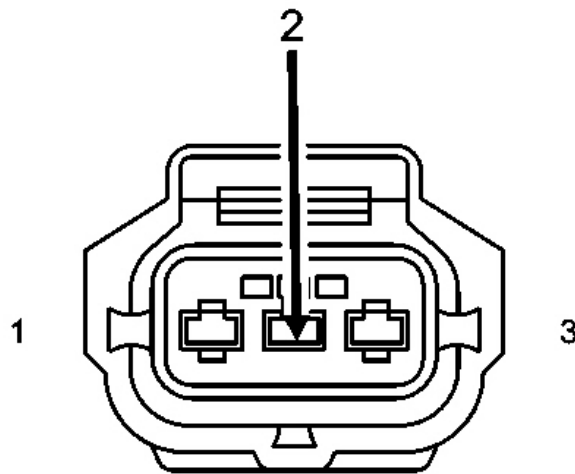
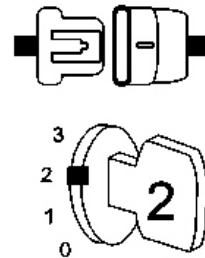
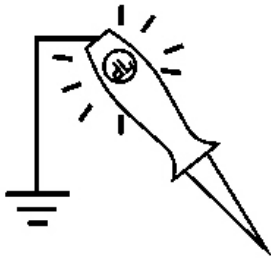
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 95: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on Plug harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

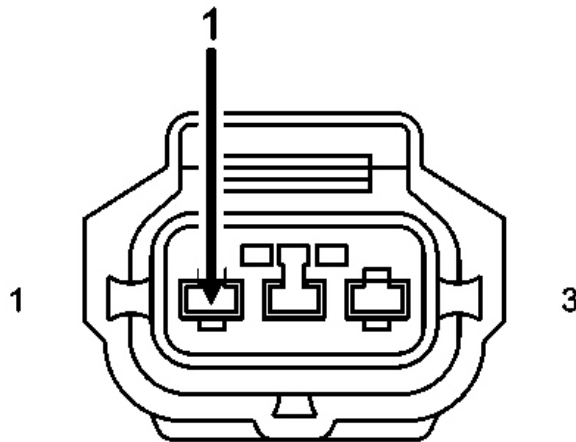
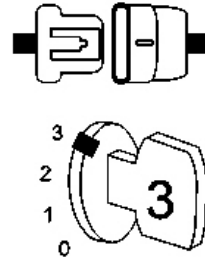
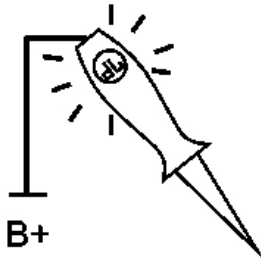
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Stop All Actuations.

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 96: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K16) Coil Control 5 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the state of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

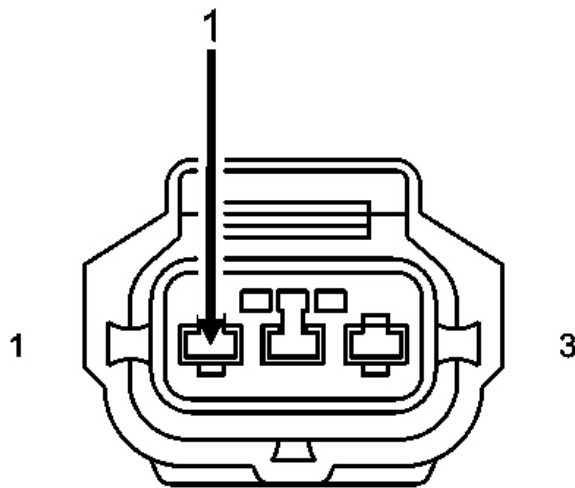
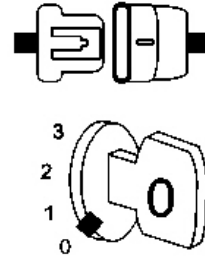
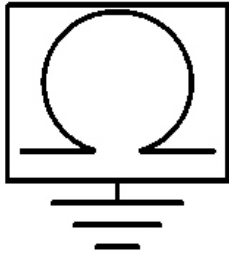
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K16) COIL CONTROL 5 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 97: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K16) Coil Control 5 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

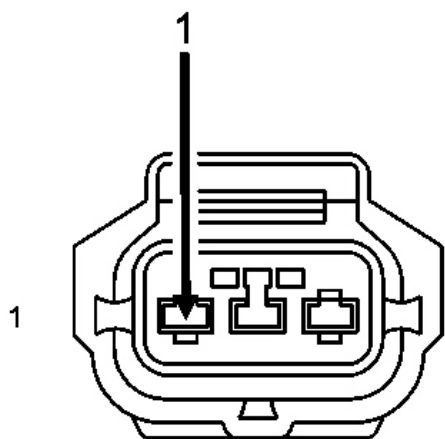
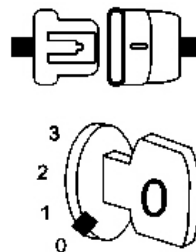
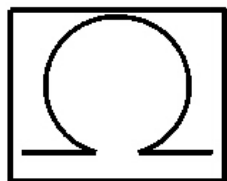
Repair the short to ground in the (K16) Coil Control 5 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

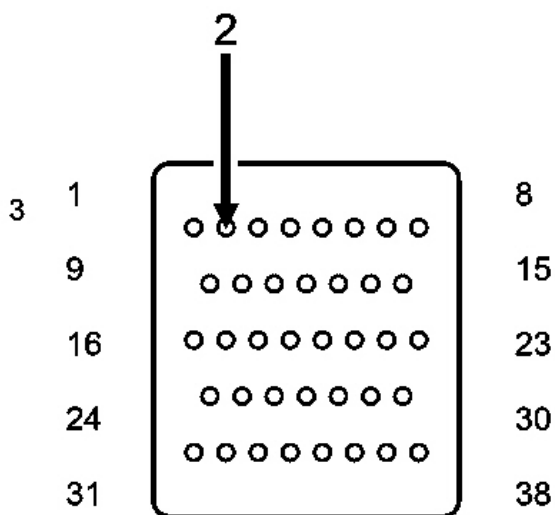
No

Go To 6.

5. **(K16) COIL CONTROL 5 CIRCUIT OPEN**



**COIL-
IGNITION**



**PCM PINOUT
BOX 8815**

81634c75

Fig. 98: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K16) Coil Control 5 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K16) Coil Control 5 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

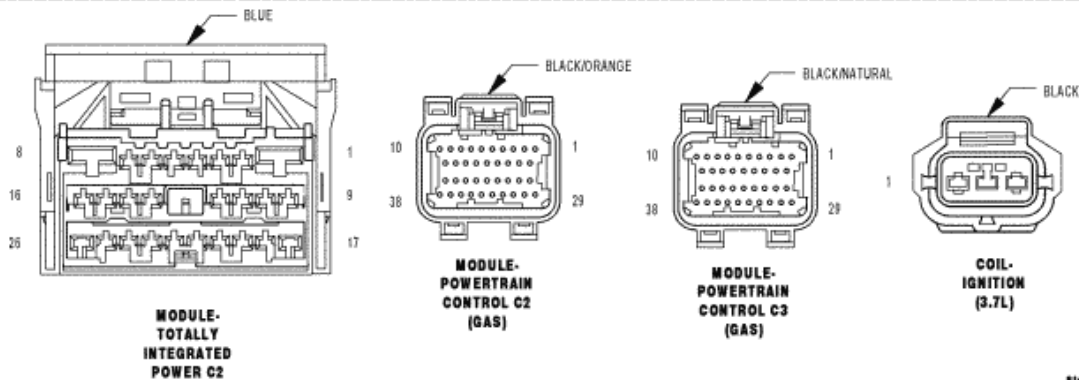
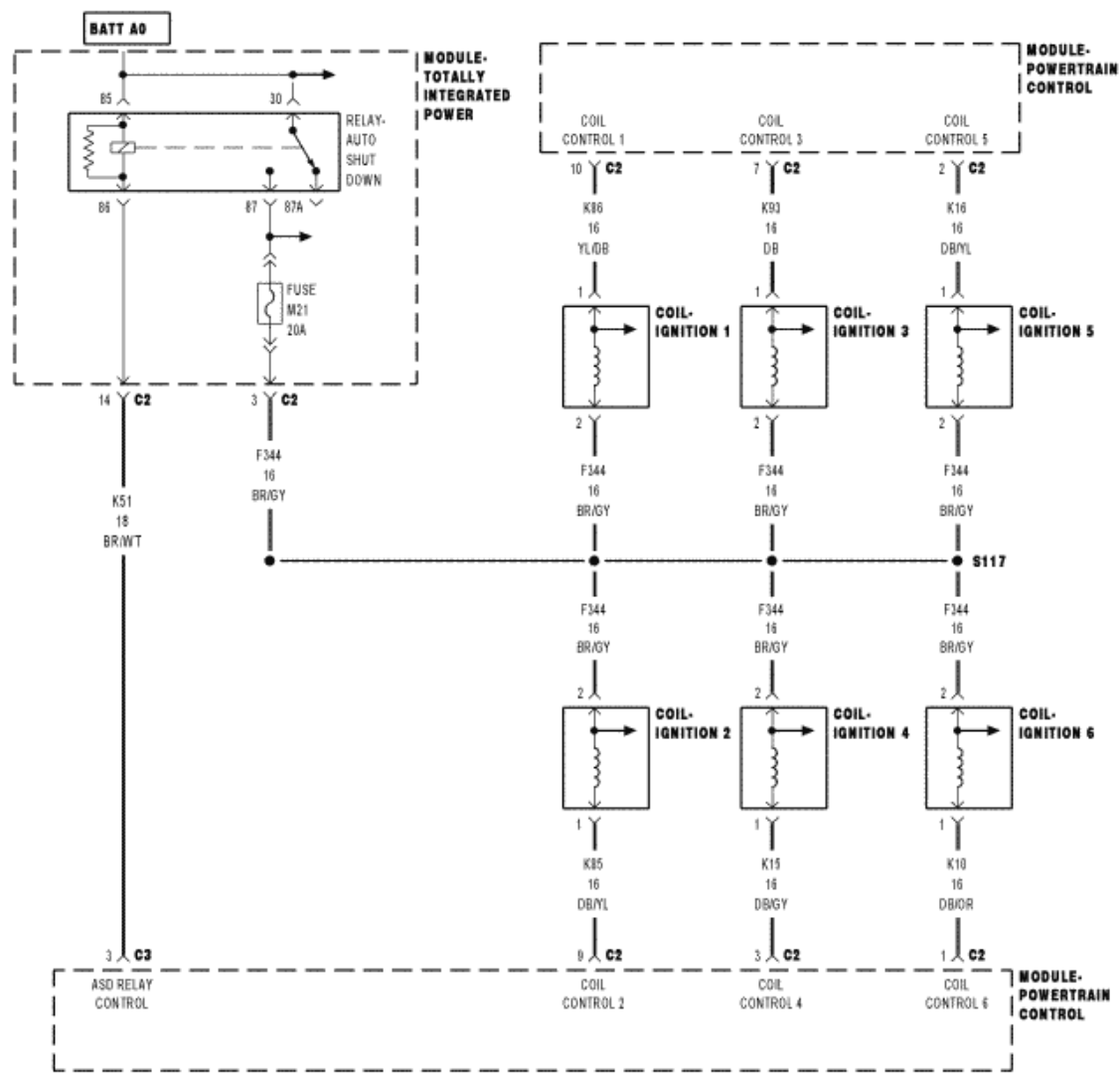
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2317-IGNITION COIL 6 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION CIRCUIT SCHEMATIC



9101064a

Fig. 99: Ignition Coil Secondary Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine running and battery voltage greater than 10 volts.

SET CONDITIONS

• Set Condition:

If PCM detects that the secondary ignition burn time is incorrect, too short, or not present, an error is detected. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(F344) ASD RELAY OUTPUT CIRCUIT (K10) COIL CONTROL 6 CIRCUIT OPEN (K10) COIL CONTROL 6 CIRCUIT SHORTED TO GROUND COIL ON PLUG POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

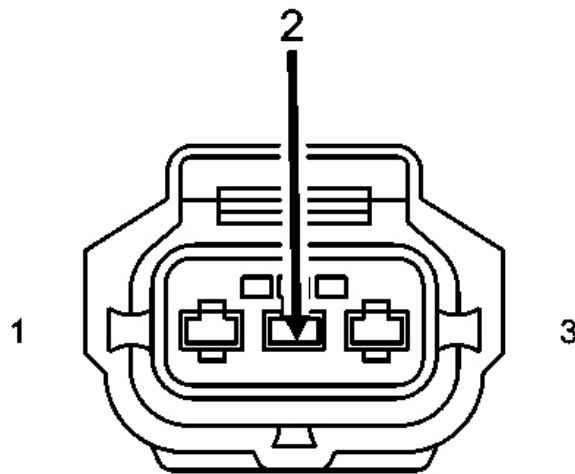
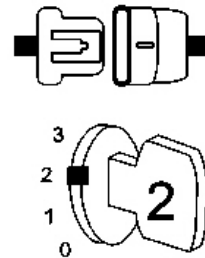
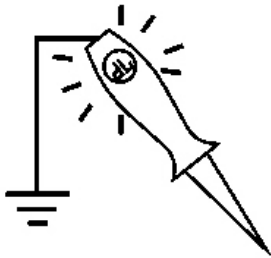
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (F344) ASD RELAY OUTPUT CIRCUIT



**COIL-
IGNITION**

8160d989

Fig. 100: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Coil on Plug harness connector.

Ignition on, engine not running.

With a scan tool, actuate the ASD Relay.

Using a 12-volt test light connected to ground, probe the (F344) ASD Relay Output circuit in the Coil on Plug harness connector.

Does the test light illuminate brightly?

Yes

Go To 3.

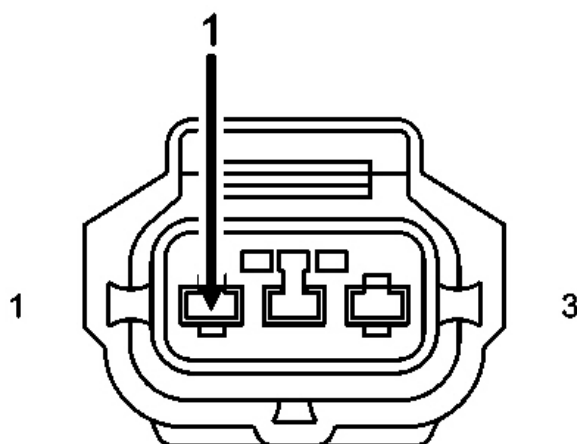
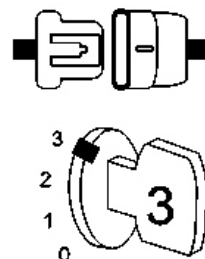
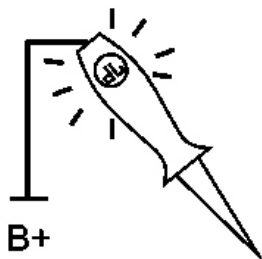
No

Repair the open or short to ground in the (F344) ASD Relay Output circuit between the PDC and Coil harness connector.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Stop All Actuations.

3. IGNITION COIL



**COIL-
IGNITION**

816350bb

Fig. 101: Checking Coil Control Circuit
 Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Using a 12-volt test light connected to a 12-volt source, probe the (K10) Coil Control 6 circuit.

Crank the engine for 5 seconds while observing the test light.

What is the state of the test light while cranking the engine?

Brightly blinking.

Replace the Coil on plug.

Perform **POWERTRAIN VERIFICATION TEST** .

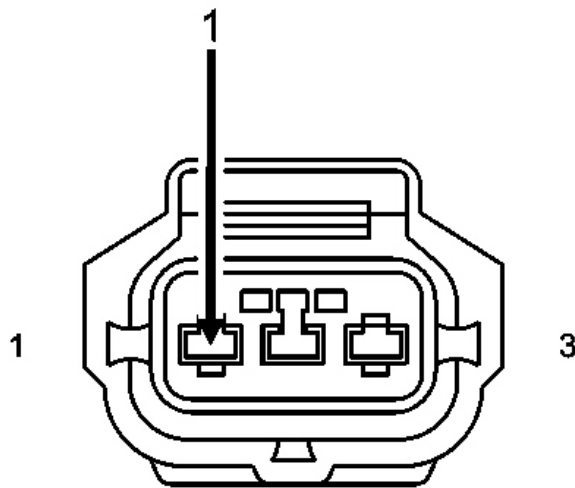
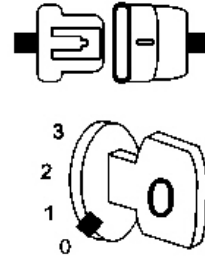
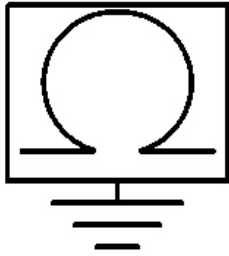
ON constantly.

Go To 4.

OFF constantly.

Go To 5.

4. (K10) COIL CONTROL 6 CIRCUIT SHORTED TO GROUND



**COIL-
IGNITION**

816344c5

Fig. 102: Checking Coil Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K10) Coil Control 6 circuit in the Coil on Plug harness connector.

Is the resistance below 100 ohms?

Yes

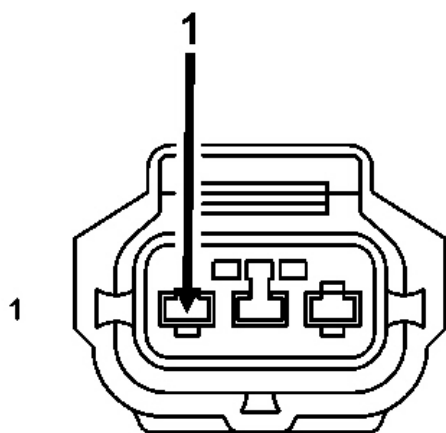
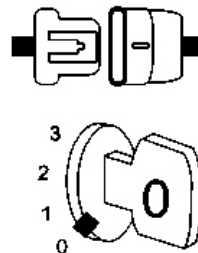
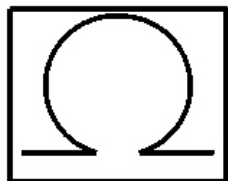
Repair the short to ground in the (K10) Coil Control 6 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

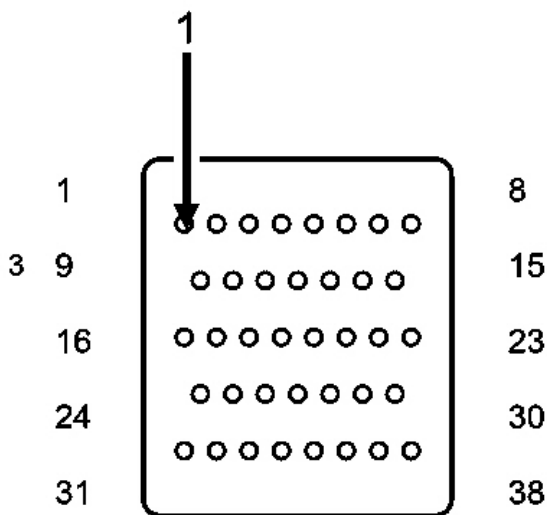
No

Go To 6.

5. (K10) COIL CONTROL 6 CIRCUIT OPEN



**COIL-
IGNITION**



**PCM PINOUT
BOX 8815**

81634c79

Fig. 103: Checking Coil Control Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K10) Coil Control 6 circuit from the Coil on Plug harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K10) Coil Control 6 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Ignition Coil and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ignition Coil and the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

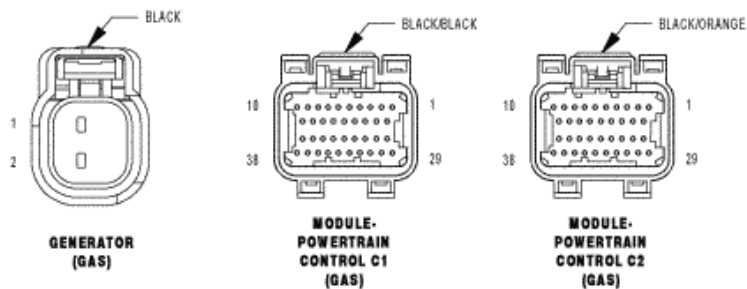
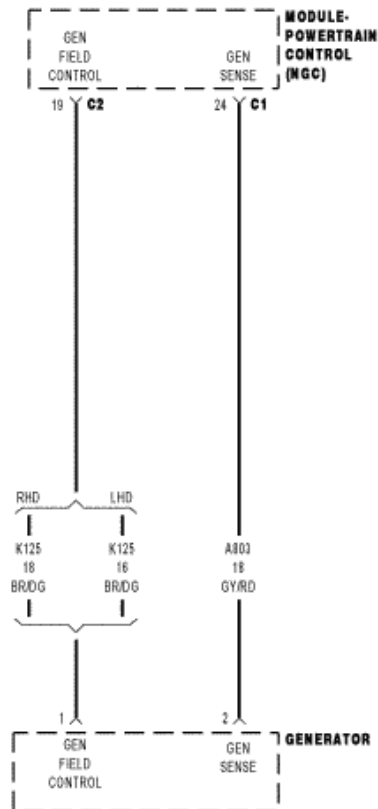
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2503-CHARGING SYSTEM OUTPUT LOW

CIRCUIT SCHEMATIC



01402070

Fig. 104: Generator Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The engine running. The engine RPM is high enough to assure sufficient generator current output to satisfy the electrical loads.

SET CONDITIONS

- Set Condition:

The battery sensed voltage is less than the target charging voltage, during engine operation, for a calibrated amount of time. One Trip Fault. Generator light will illuminate.

POSSIBLE CAUSES

Possible Causes
LOOSE ACCESSORY DRIVE BELT EXCESSIVE RESISTANCE IN THE (A801) BATTERY POSITIVE CIRCUIT GENERATOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.

NOTE: The battery must be fully charged.

NOTE: The Generator belt tension and condition must be checked before continuing.

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data.

With a scan tool, erase DTCs.

Start the engine.

Allow the idle to stabilize.

Ignition on, engine not running.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

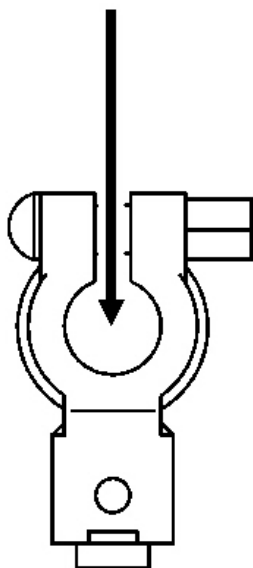
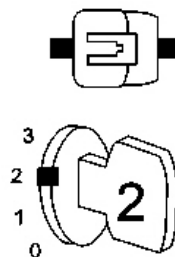
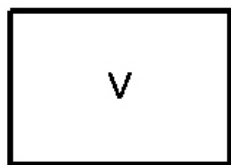
Yes

Go To 2.

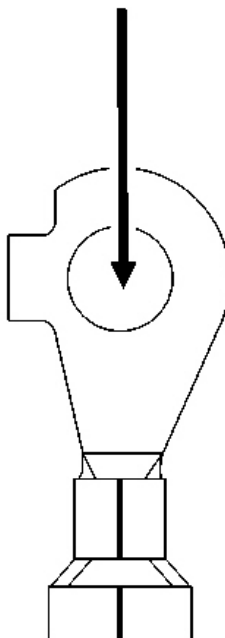
No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUSED B+ CIRCUIT HIGH RESISTANCE



**BATTERY
(POSITIVE)**



GENERATOR (B+)81336ba0

Fig. 105: Checking B+ Circuit For High Resistance
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Ignition on, engine not running.

Measure the voltage between the Generator B+ Output Terminal and the Battery+ Post.

Start the engine.

Is the voltage above 0.4 of a volt?

Yes

Repair the excessive resistance in the battery positive circuit between the Generator and Battery.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. GENERATOR OPERATION

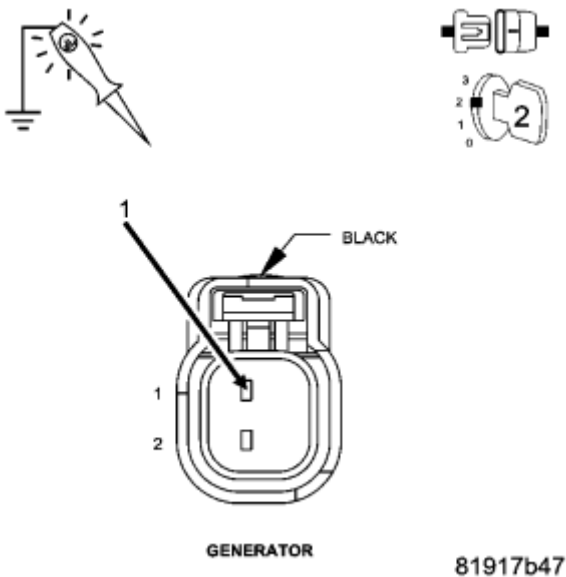


Fig. 106: Probing Generator Field Control Circuit At Generator Field Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Generator Field harness connector.

Using a 12-volt test light connected to ground, probe (K125) Generator Field Control circuit in the Generator Field harness connector.

Ignition on, engine not running.

With a scan tool, actuate the Generator Field Driver.

NOTE: The DTC needs to be cleared before actuating the Solenoid, if the DTC is not cleared, the Solenoid may not be allowed to actuate.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate accordingly during the actuation?

Yes

Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors. Replace the Generator if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

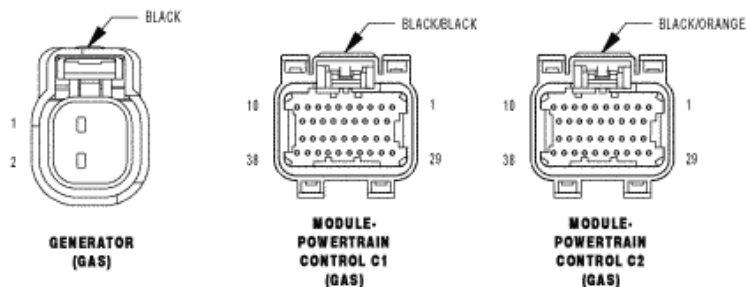
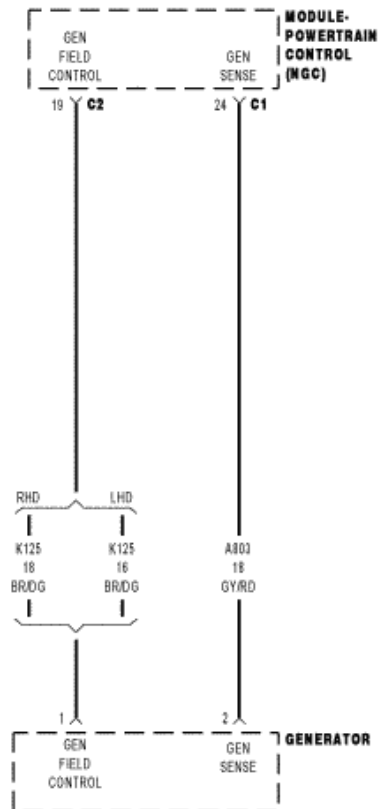
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2504-CHARGING SYSTEM OUTPUT HIGH

CIRCUIT SCHEMATIC



01402070

Fig. 107: Generator Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The engine running. The engine speed greater than 1157 RPM.

SET CONDITIONS

- Set Condition:

The alternator B+ voltage sense circuit voltage reading exceeds the direct Battery B+ sense circuit. The Generator Output terminal is not making a positive connection to the Battery + Post. One trip fault.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (A801) BATTERY FEED CIRCUIT POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

Inspect the vehicle for aftermarket accessories that may exceed the Generator System output.
- NOTE:

The battery must be fully charged.
- NOTE:

The Generator belt tension and condition must be checked before continuing.

Ignition on, engine not running.

With a scan tool, select View DTCs and record the related Freeze Frame data.

With the scan tool erase DTCs.

Start the engine.

Allow the idle to stabilize.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (A801) BATTERY POSITIVE CIRCUIT VISUAL INSPECTION

Turn the ignition off.

Inspect the (A801) Battery Positive circuit at Generator Output post for corrosion and looseness.

Inspect the Battery + and - cables for corrosion and looseness.

Inspect the (A0) Battery Positive circuit at the C8 TIPM harness connector for corrosion and looseness.

Were any problems found?

Yes

Repair and replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. EXCESSIVE RESISTANCE IN THE (A209) BATTERY FEED CIRCUIT

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Disconnect the C1 PCM harness connector.

Perform a voltage drop test on the (A209) Battery Feed circuit from the appropriate terminals of special tool #8815-1 to the C2 TIPM harness.

Using a voltmeter probe the appropriate terminal of special tool #8815-1 with the Negative lead of the voltmeter and back probe the (A209) Battery Feed circuit at the C2 TIPM with the Positive lead of the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in

personal injury or death.

Start the engine

Monitor the voltmeter.

Is the voltage above 0.4 of a volt?

Yes

Repair the excessive resistance in the (A209) Battery Positive circuit between the Generator and TIPM.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Generator and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Generator and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P2610-PCM INTERNAL SHUTDOWN TIMER RATIONALITY TOO FAST

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The PCM compares actual shutdown time to a calculated shutdown time value. The calculated shut down time value is based on the amount of shutdown time necessary for the ECT to drop a specific amount after a completely warmed up engine is shut down. If the difference between actual shutdown time and the calculated shut down time is greater than a maximum value, a one trip failure will set. The shutdown time is measured again after 1 hour of ignition off time following the next engine warm up cycle. The PCM compares the shutdown time to a calculated value. If the difference is greater than a maximum value, the MIL is illuminated and a DTC will set.

MONITOR CONDITIONS

When Monitored:

With the engine running after a cycle when a complete engine warm up was achieved, the difference between engine coolant temperature and ambient air temperature greater than 10° C (50° F), after a minimum temperature drop of 10° C (50° F) during ignition off, and battery voltage greater than 10 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the engine coolant temperature drops a specified amount during the measured engine off time. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
POWERTRAIN CONTROL MODULE (PCM) SOFTWARE UPDATE
EXCESSIVE RESISTANCE IN THE PCM POWER OR GROUND CIRCUITS
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose and repair any other DTCs set in the PCM before proceeding with this test.**

Turn the ignition on.

With the scan tool, Clear DTCs in the Powertrain Control Module (PCM).

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan.

Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. PCM IGNITION CIRCUIT

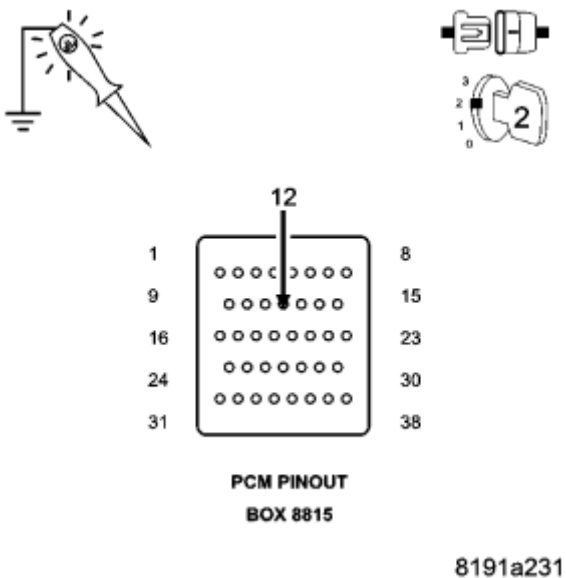


Fig. 108: Probing PCM Ignition Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

With a 12-volt test light connected to ground probe the (F1) Fused Ignition Switch circuit.

Perform the above check with the Ignition key in the off lock position, Ignition on, engine not running position, and during cranking.

Wiggle the related wire harness while probing the special tool with the test light to try to interrupt the circuit.

Does the test light illuminate brightly?

Yes

Go To 3.

No

Repair the open or excessive resistance in the (F1) Fused Ignition Switch circuit. Inspect the related fuse, if the fuse is open check the circuits for a short to ground.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **POWERTRAIN CONTROL MODULE (PCM)**

Verify that the PCM is operating at the latest software version available.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U0001-CAN C BUS

CIRCUIT SCHEMATIC



For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

If the Anti-Lock Brakes Module detects a short in either CAN C Bus circuit.

Perform CAN C Bus Communication Failure diagnostic test procedure.. Refer to **DIAGNOSIS AND TESTING** . .

U0101-LOST COMMUNICATION WITH TCM

CIRCUIT SCHEMATIC

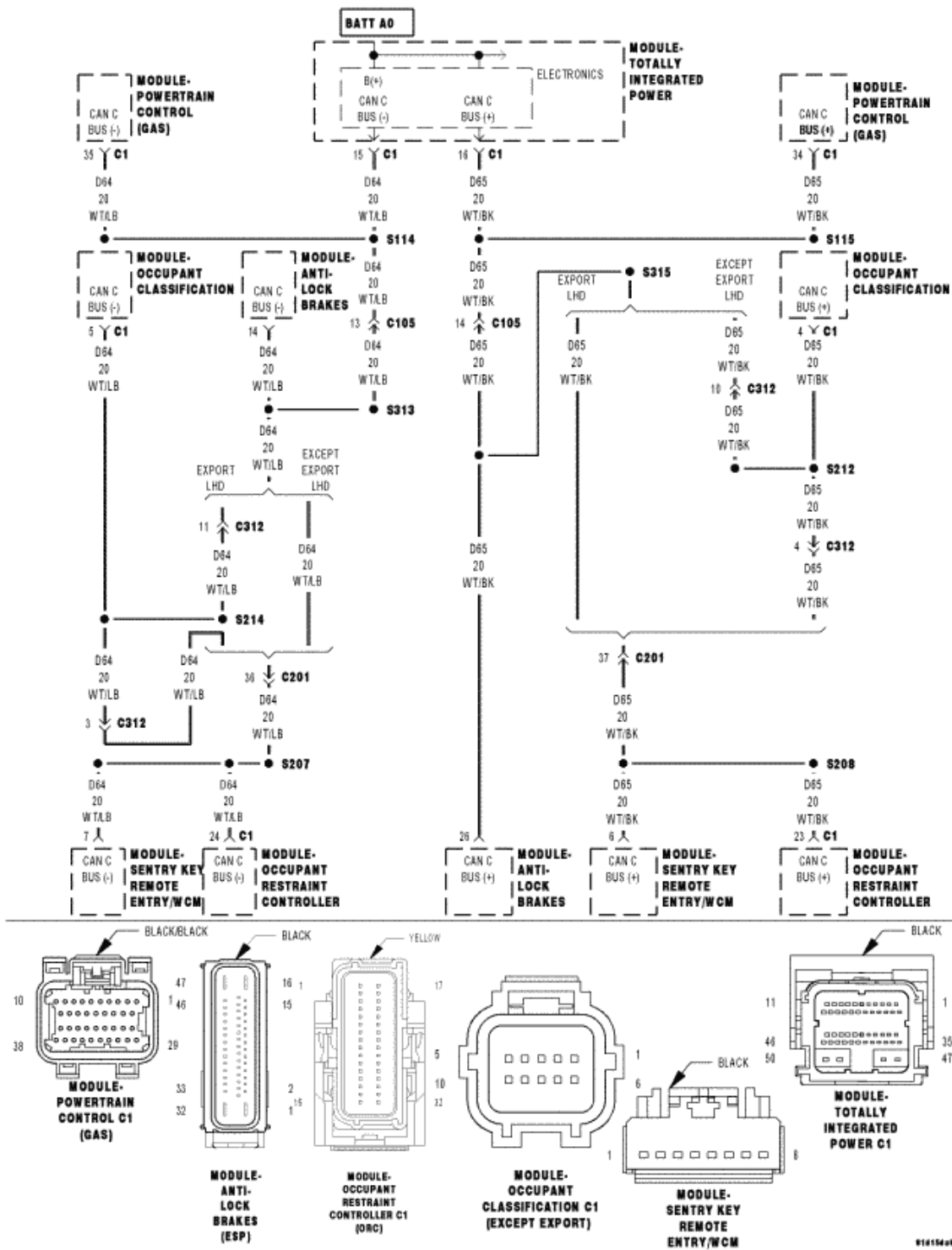


Fig. 110: CAN C Bus Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

SET CONDITIONS

- Set Condition:

If the Powertrain Control Module fails to receive bus messages from the TCM for approximately 500 ms.

POSSIBLE CAUSES

Possible Causes
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
TCM POWER AND GROUND
TCM
ANTI-LOCK BRAKES MODULE

DIAGNOSTIC TEST

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

Turn the ignition on.

With the scan tool, select View DTCs.

Is this DTC Active?

Yes

Go To 2.

No

Perform the Stored Lost Communication test procedure. Refer to DIAGNOSIS AND TESTING .

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC(s).

No

Go To 3.

3. VERIFY THAT THE TCM IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the TCM is active on the bus.

Is the TCM active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSIS AND TESTING** for No Response related diagnostic procedures.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the TCM?

Yes

Replace/update the TCM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Replace the Anti-Lock Brakes Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

U0121-LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE

CIRCUIT SCHEMATIC

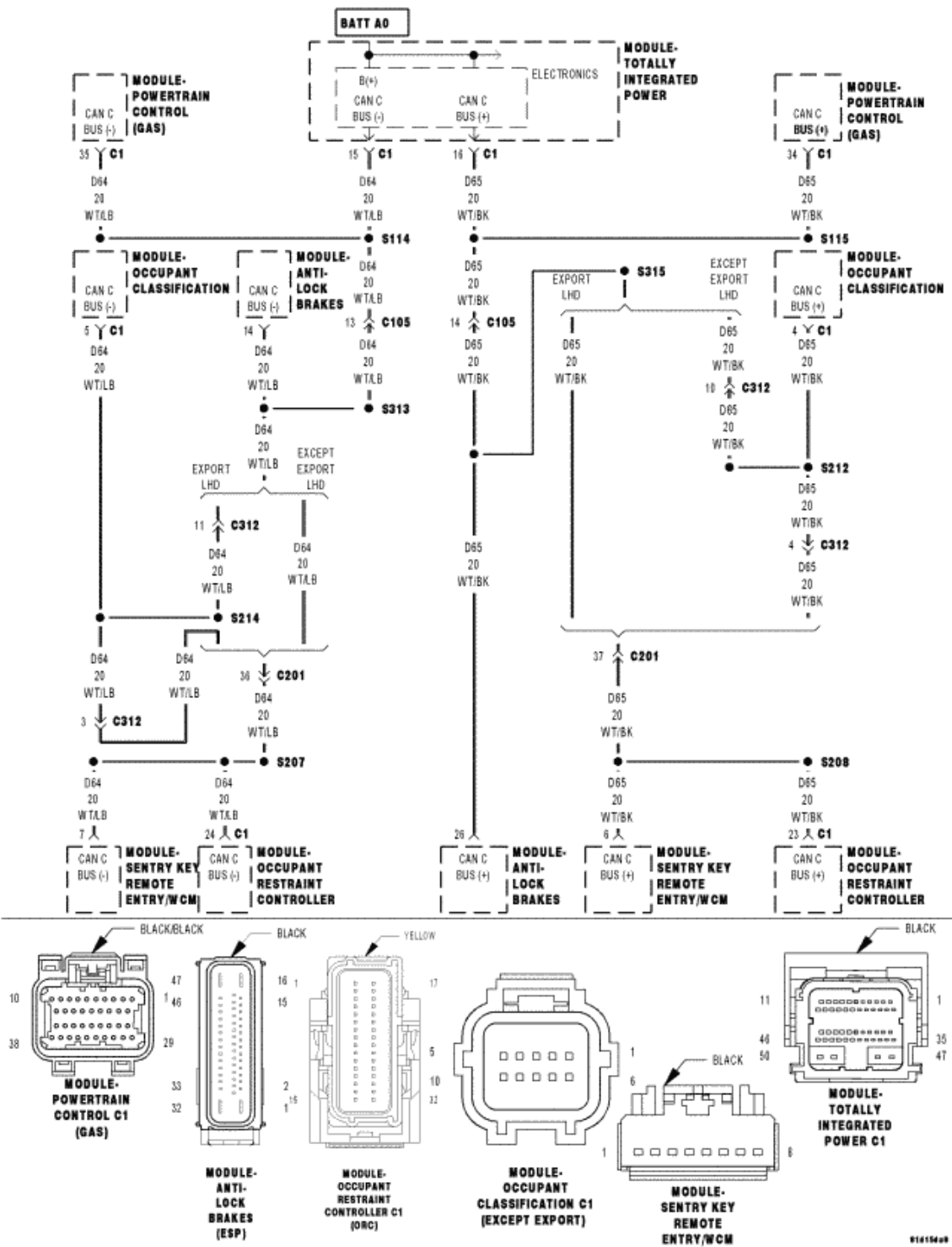


Fig. 111: CAN C Bus Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

SET CONDITIONS

- **Set Condition:**

If the PCM fails to receive bus messages from the ABS M for approximately 500 ms.

POSSIBLE CAUSES

Possible Causes
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
ABS POWER AND GROUND
ABS
POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

Turn the ignition on.

With the scan tool, select View DTCs.

Is this DTC Active?

Yes

Go To 2.

No

Perform the Stored Lost Communication test procedure. Refer to **DIAGNOSIS AND TESTING** .

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC(s).

No

Go To 3.

3. VERIFY THAT THE ABS IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the ABS is active on the bus.

Is the ABS active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSIS AND TESTING** for No Response related diagnostic procedures.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the ABS?

Yes

Replace/update the ABS in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the PCM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)

CIRCUIT SCHEMATIC

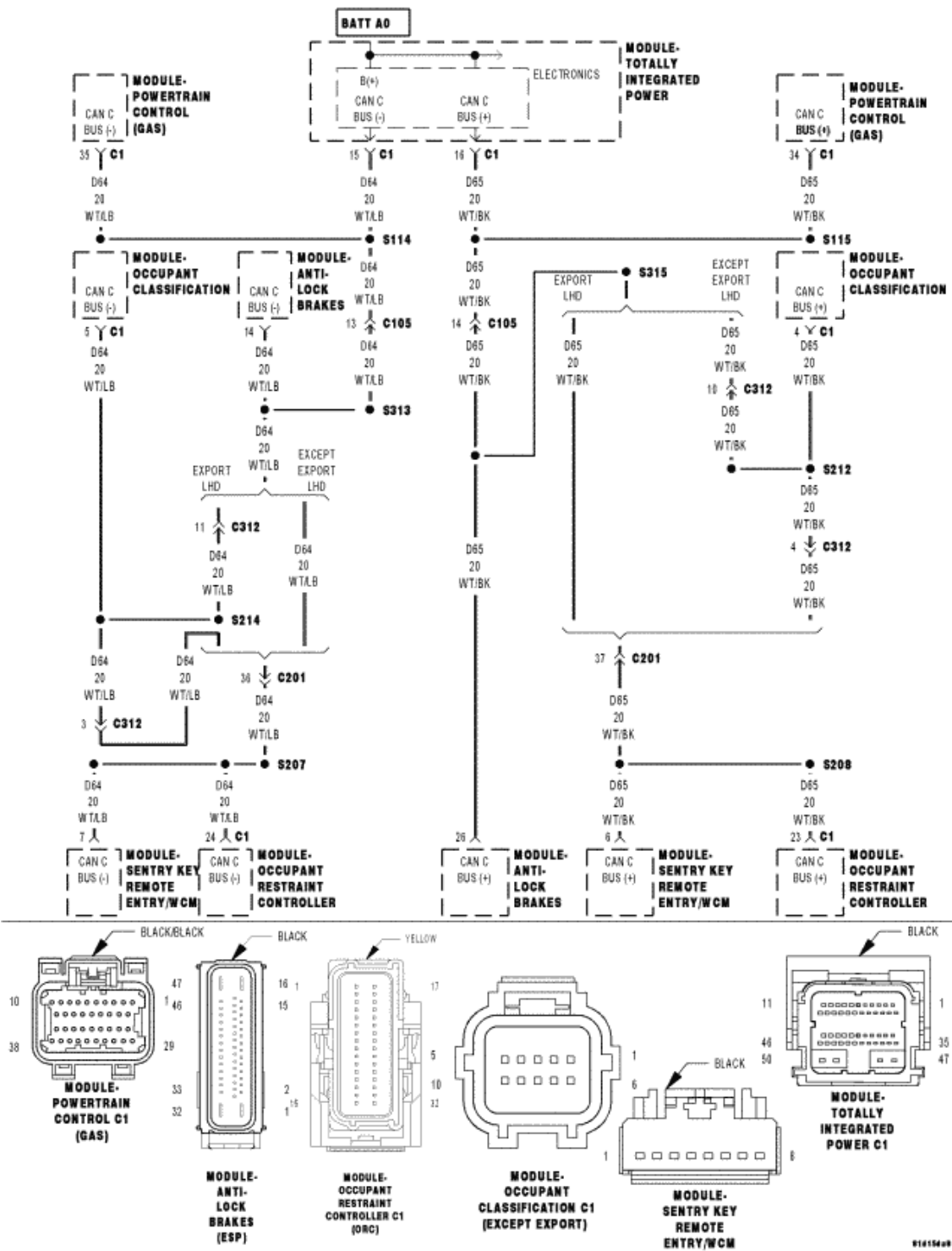


Fig. 112: CAN C Bus Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Ignition run time is greater than 1 second. Battery voltage between 9 and 16 volts.

SET CONDITIONS

- Set Condition:**

The PCM doesn't receive a TIPM message over the CAN C circuit for 7 consecutive seconds. The circuit is continuously monitored. One Trip fault.

POSSIBLE CAUSES

Possible Causes
CAN C BUS OPEN OR SHORTED CONDITION
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View PCM DTCs.

Is the DTC Active at this time?

Yes

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

U0155-LOST COMMUNICATION WITH CLUSTER

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

SET CONDITIONS

- Set Condition:**

If the PCM fails to receive bus messages from the Cluster for approximately 500 ms.

POSSIBLE CAUSES

Possible Causes
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
CLUSTER POWER AND GROUND
CLUSTER
POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

Turn the ignition on.

With the scan tool, select View DTCs.

Is this DTC Active?

Yes

Go To 2.

No

Perform the Stored Lost Communication test procedure. Refer to **DIAGNOSIS AND TESTING** .

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC(s).

No

Go To 3.

3. VERIFY THAT THE CLUSTER IS ACTIVE ON THE BUS

With the scan tool, select ECU View.

Verify that the Cluster is active on the bus.

Is the Cluster active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSIS AND TESTING** for No Response related diagnostic procedures.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the CLUSTER?

Yes

Replace/update the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the PCM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0168-LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM-WCM)

CIRCUIT SCHEMATIC

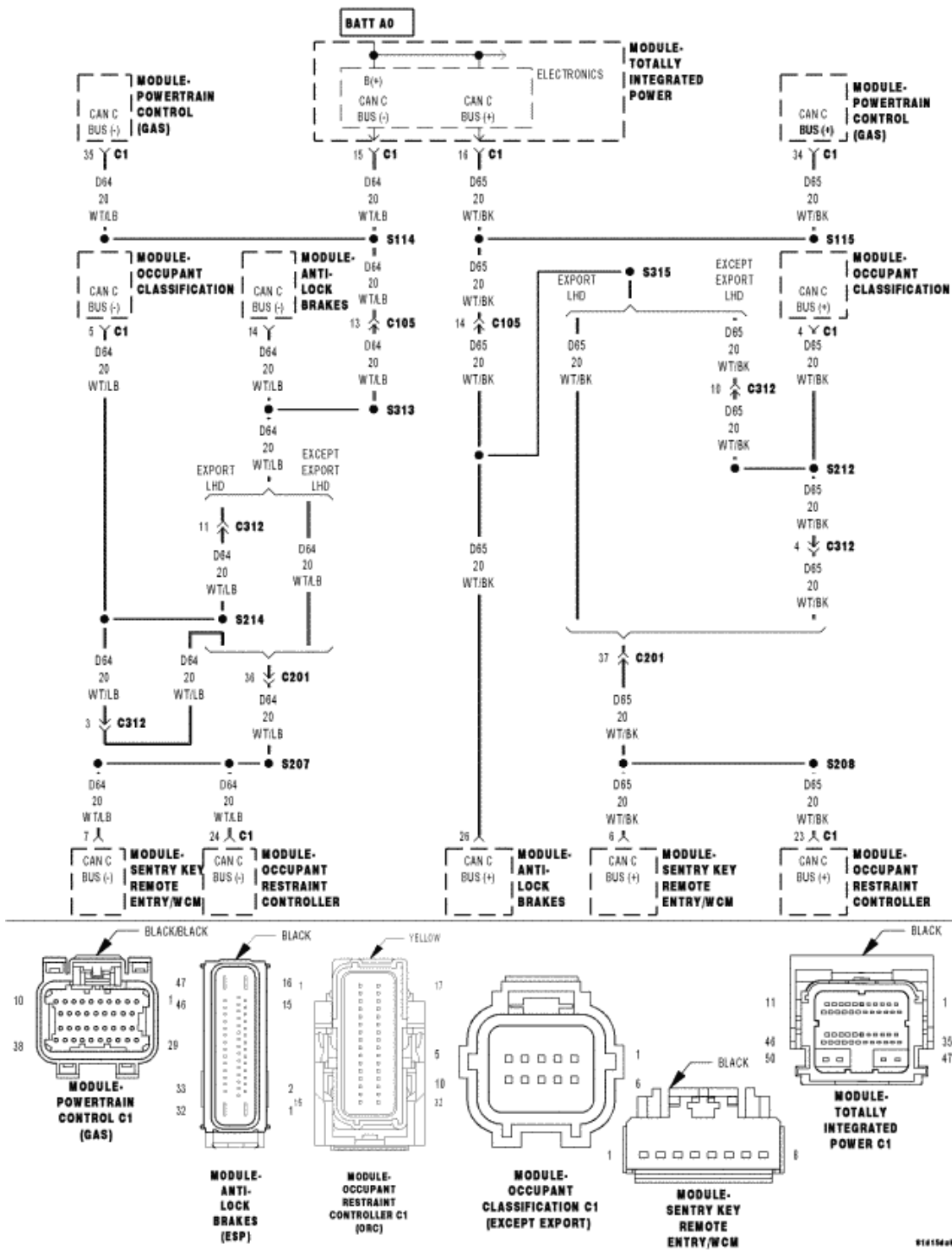


Fig. 113: CAN C Bus Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

SET CONDITIONS

- Set Condition:

If the PCM fails to receive bus messages from the SKREEM (WCM) for approximately 500 ms.

POSSIBLE CAUSES

Possible Causes
CAN C BUS OPEN OR SHORTED CONDITION NO POWER TO VEHICLE SECURITY CONTROL MODULE (SKREEM) - MODULE UNPLUGGED OR OPEN FUSE POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. VERIFY DTC IS ACTIVE

NOTE: For vehicle communication problems, use the scan tool to refer to the Network Review Screen. The screen depicts a high level view of the vehicle network. Fault and problem areas appear in red. Selecting any of the network components allows access to the source of the problem.

NOTE: Check the IOD fuse before continuing. If the fuse is open, check the circuit for a short to ground.

Turn the ignition on.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Refer to DIAGNOSIS AND TESTING for diagnostic procedures and for further possible causes.

No

Fig. 114: Fuel Level Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The TIPM sends the fuel level signal the NGC over the CAN C bus circuit.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

When the PCM does not receive a fuel level signal from the TIPM over the CAN C circuit. The circuit is constantly monitored. One Trip fault.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT OPEN OR SHORTED
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

With the scan tool, select View Powertrain DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM) ALSO ACTIVE**

With the scan tool, select View DTCs.

Is the U0140-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM) also set?

Yes

Follow the diagnostics for U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)

Perform **POWERTRAIN VERIFICATION TEST** .

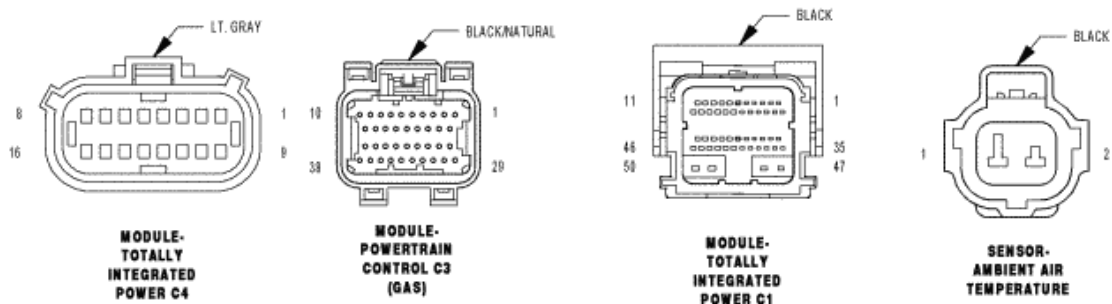
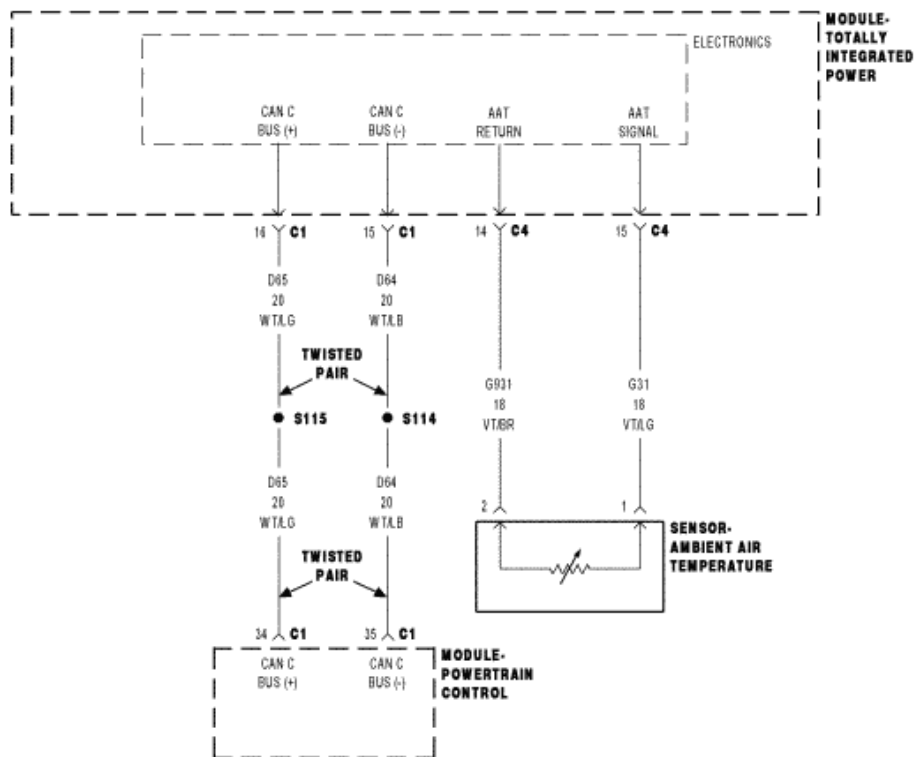
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U110E-LOST AMBIENT TEMPERATURE MESSAGE

CIRCUIT SCHEMATIC



019002-00

Fig. 115: Ambient Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The ambient temperature sensor signal is a direct input to the TIPM. The TIPM sends the PCM the ambient temperature signal over the CAN C bus.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM doesn't receive the ambient temperature signal over the CAN C bus from the TIPM. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT OPEN OR SHORTED TOTALLY INTEGRATED POWER MODULE (TIPM) POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With the scan tool, select View Powertrain DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM) ALSO ACTIVE**

With the scan tool view DTCs.

Is the U0141-NO BUS MESSAGE RECEIVED FROM THE FCM (TIPM) also set?

Yes

Follow the diagnostics for U0141-LOST COMMUNICATION WITH THE FCM (TIPM)
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

P0128-THERMOSTAT RATIONALITY

CIRCUIT SCHEMATIC

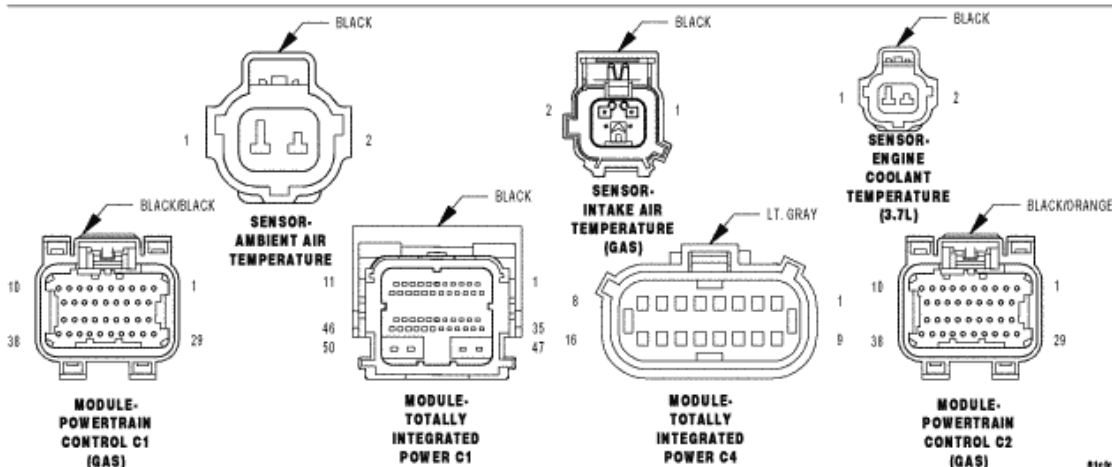
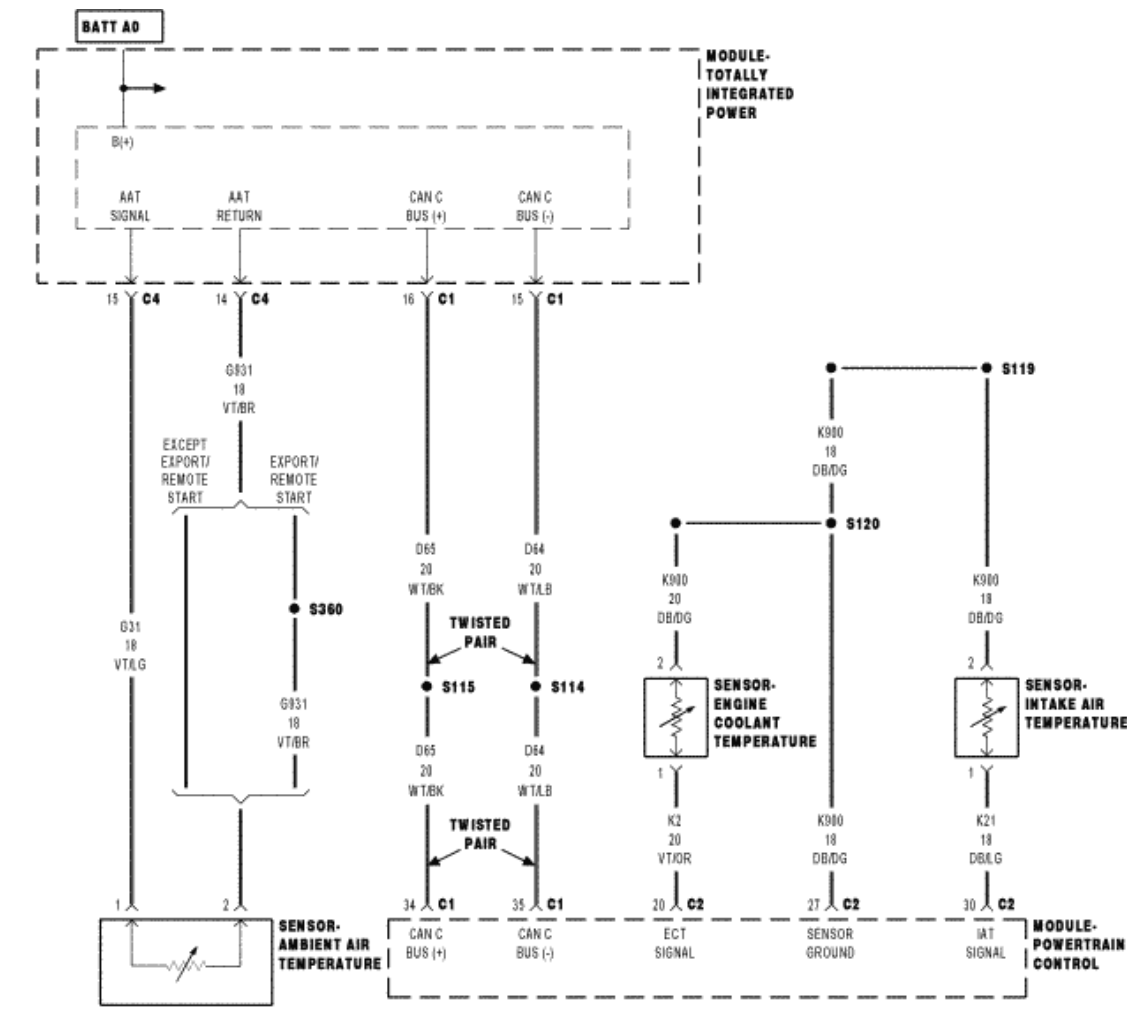


Fig. 1: Thermostat Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The PCM predicts what the engine coolant temperature should be, based on the engine coolant temperature at start-up, ambient temperature and how the vehicle is subsequently driven. The predicted engine coolant temperature is compared to the Engine Coolant Temperature Sensor reading. The error between the two is calculated and integrated with respect to time. When the Thermostat diagnostic runs, the integrated error is compared to a calibrated threshold and pass/fail is determined. Separate pass and fail thresholds are used in order to improve accuracy of the diagnostic.

MONITOR CONDITIONS

When Monitored:

With the engine running, ambient temperature between -8° C (17.6° F) and 50° C (122° F), start up coolant temperature less than 50° C (122° F), and average vehicle speed greater than 16 kph (10 mph) until coolant temperature reaches 85° C (185° F).

SET CONDITIONS

- Set Condition:**

The PCM detects that the actual engine coolant temperature falls too far below the predicted engine coolant temperature and the predicted coolant temperature reaches the predicted target value before the actual coolant temperature reaches the actual coolant temperature target value. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
LOW COOLANT LEVEL
THERMOSTAT OPERATION
SIGNAL CIRCUIT SHORTED TO VOLTAGE
TEMPERATURE SENSOR
SIGNAL CIRCUIT OPEN
SENSOR GROUND CIRCUIT OPEN
SIGNAL CIRCUIT SHORTED TO GROUND
SIGNAL CIRCUIT SHORTED TO THE (K900), (G931) SENSOR GROUND CIRCUIT
OTHER POSSIBLE CAUSES
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If any ECT, AAT, CMP or CKP sensor DTCs have set along with P0128, diagnose them before continuing.

NOTE: Make sure that the Pinion Factor has been programmed correctly into the PCM.

NOTE: Diagnose any CAN - C Communication DTCs before continuing.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. LOW COOLANT LEVEL

NOTE: If an Engine Coolant Temperature (ECT) DTC is set along with this code, diagnose the ECT DTC first.

NOTE: Inspect the ECT terminals and related PCM terminals. Make sure the terminals are free from corrosion and damage.

NOTE: The best way to diagnose this DTC is to allow the vehicle to sit overnight outside in order to have a totally cold soaked engine.

NOTE: Extremely cold outside ambient temperatures may have caused this DTC to set.

WARNING: Never open the cooling system when the engine is hot. The system is under pressure. Failure to follow these instructions can result in personal injury including extreme burns, scalding, or death. Allow the engine to cool before opening the cooling system.

Check the coolant system to make sure that the coolant is in good condition and at the proper level.

Is the coolant level and condition OK?

Yes

Go To 3.

No

Inspect the vehicle for a coolant leak and add the necessary amount of coolant.

Perform **POWERTRAIN VERIFICATION TEST** .

3. THERMOSTAT OPERATION

NOTE: **This test works best if performed on a cold engine (cold soak).**

Ignition on, engine not running.

With a scan tool, read the ECT Deg value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: **If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.**

Start the Engine.

During engine warm-up, monitor the ECT Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82° C (180° F). Also monitor the actual coolant temperature with a thermometer.

NOTE: **As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the scan tool, ECT Temperature value should stay relatively close to each other.**

Using the appropriate service information, determine the proper opening temperature of the thermostat.

Did the thermostat open at the proper temperature?

Yes

Go To 4.

No

Replace the thermostat.

Perform **POWERTRAIN VERIFICATION TEST** .

4. AMBIENT AIR TEMP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, read and record the AAT Sensor Temperature value.

Using the DRB Temperature Probe #CH7050, or an equivalent temperature measuring tool, measure the ambient air temperature near the AAT Sensor.

Is the AAT Sensor value with -15° C (5° F) of the temperature probe reading?

Yes

Go To 5.

No

Go To 7.

5. ECT SENSOR OPERATION

WARNING: Make sure the engine cooling system is cool before removing the pressure cap or any hose. The cooling system is pressurized when hot. Failure to follow these instructions can result in personal injury including extreme burns, scalding, or death.

With a scan tool, read and record the ECT Sensor Temperature value.

Use the DRB Temperature Probe #CH7050, or an equivalent temperature measuring tool, measure the engine coolant temperature.

Is the ECT Sensor value with -15° C (5° F) of the temperature probe reading?

Yes

Go To 6.

No

Go To 7.

6. OTHER POSSIBLE CAUSES

Inspect the Temperature Sensors for any physical damage.

Inspect the engine coolant. Make sure the coolant is at the proper level. Refer to **COOLING** .

Make sure the Temperature Sensors are properly installed.

Make sure the CMP and CKP sensors are installed properly. Check the connectors for any signs of

damage.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Refer to any Technical Service Bulletins (TSBs) that may apply.

With the engine running at normal operating temperature, monitor the Temperature sensor parameters while wiggling the wire harness. Look for parameter values to change.

Visually inspect the related wire harness. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Inspect and clean all PCM, engine, and chassis grounds.

Were any problems found during the above inspections?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete, the conditions that set this DTC are not present at this time.

7. SIGNAL CIRCUIT SHORTED TO VOLTAGE

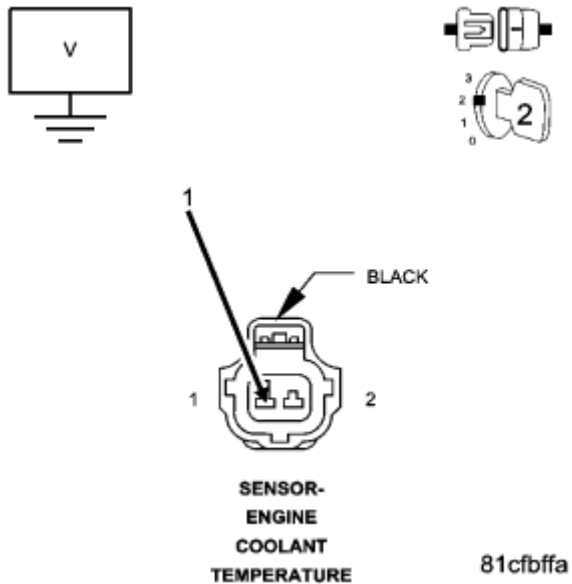
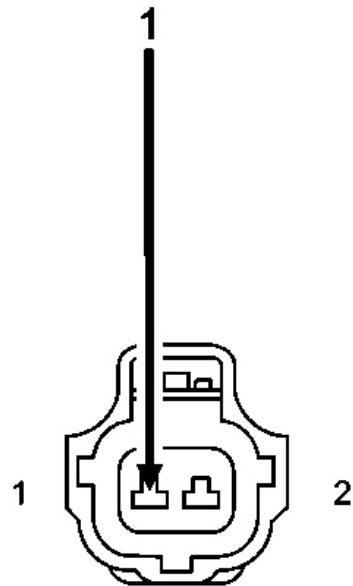
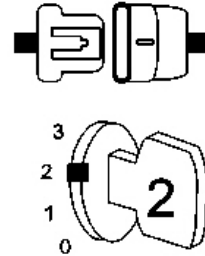
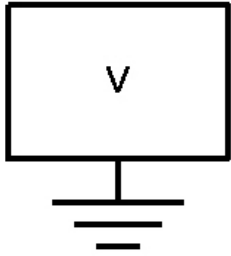


Fig. 2: Checking ECT Sensor Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b439

Fig. 3: Checking Ambient Air Temperature Sensor Signal Circuit Short To Voltage
Courtesy of CHRYSLER LLC

NOTE: **Visually inspect both the component and the PCM connectors. Look for damage, partially broken wires and backed out or corroded terminals**

Turn the ignition off.

Disconnect the applicable Temperature Sensor harness connector.

Disconnect the C4 TIPM harness connector and the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K2) ECT Signal circuit and the (G31) AAT Signal circuit at the appropriate Temperature Sensor harness connector.

Is there any voltage present?

Yes

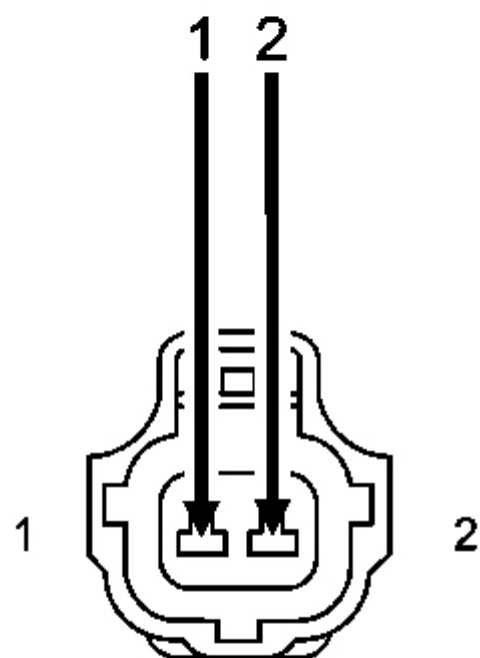
Repair the short to voltage in the Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

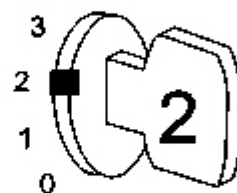
No

Go To 8.

8. TEMPERATURE SENSOR



**SENSOR-
AMBIENT
AIR
TEMPERATURE**



8132b444

Fig. 4: Identifying Ambient Air Temperature Sensor Connector Terminals
Courtesy of CHRYSLER LLC

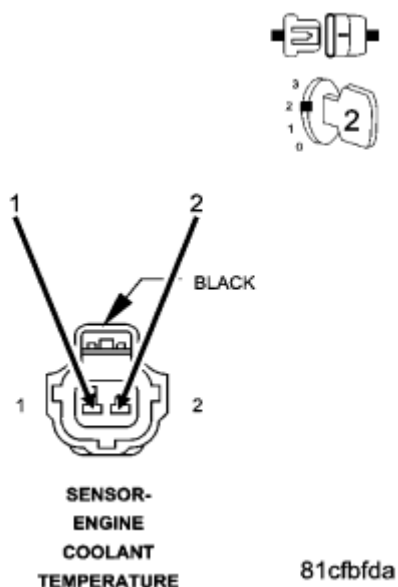


Fig. 5: Checking ECT Sensor
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C4 TIPM harness connector and the C2 PCM harness connector.

Ignition on, engine not running.

With a scan tool, read the Temperature Sensor voltage.

Connect a jumper wire across the ECT and AAT Sensor harness connectors.

Does the voltage start at 5.0 volts and drop below 1.0 volt when the jumper wire is installed?

Yes

Verify that there is good pin to terminal contact in the related Sensor and Powertrain Control Module connectors. If OK, replace the appropriate Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 9.

NOTE: **Disconnect the jumper wire before continuing.**

9. SIGNAL CIRCUIT OPEN

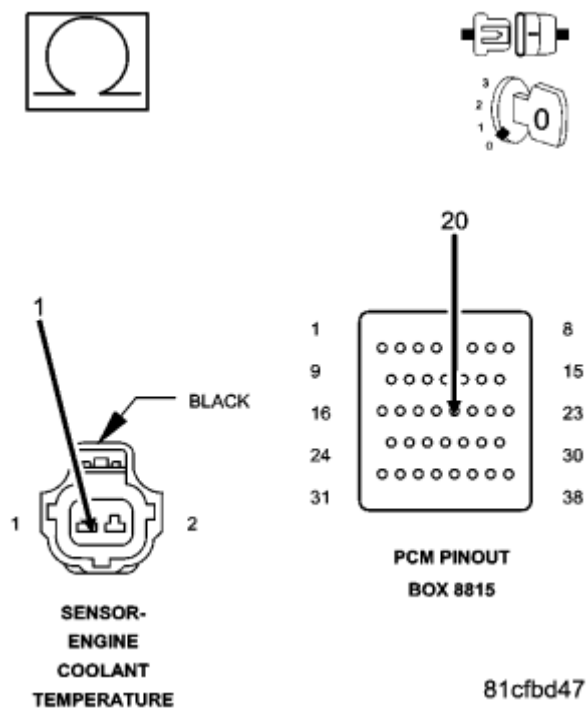


Fig. 6: Checking ECT Sensor Signal Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

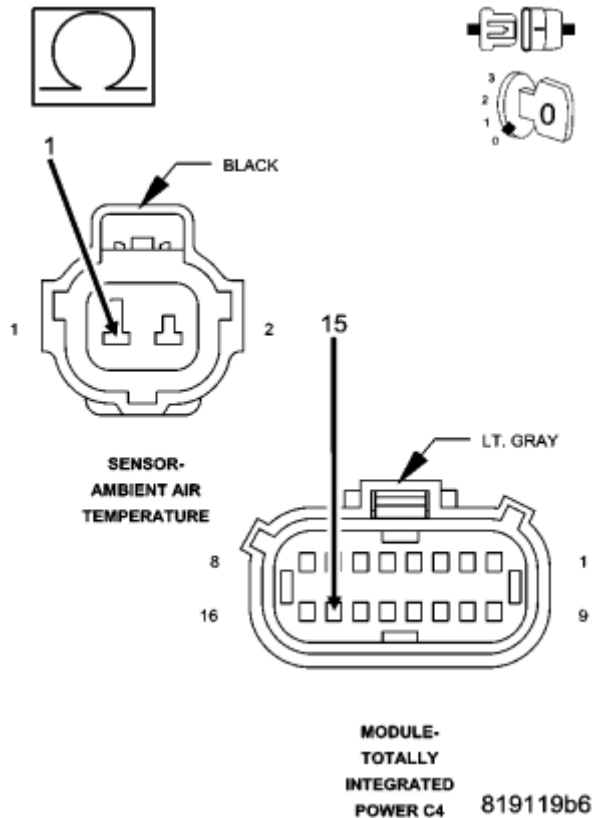


Fig. 7: Measuring Resistance Of (G31) AAT Sensor Signal Circuit From AAT Sensor Harness Connector To C4 TIPM Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K2) ECT Sensor Signal circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815.

Measure the resistance of the (G31) AAT Sensor Signal circuit from the AAT Sensor harness connector to the C4 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the open in the Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

10. SENSOR GROUND CIRCUIT OPEN

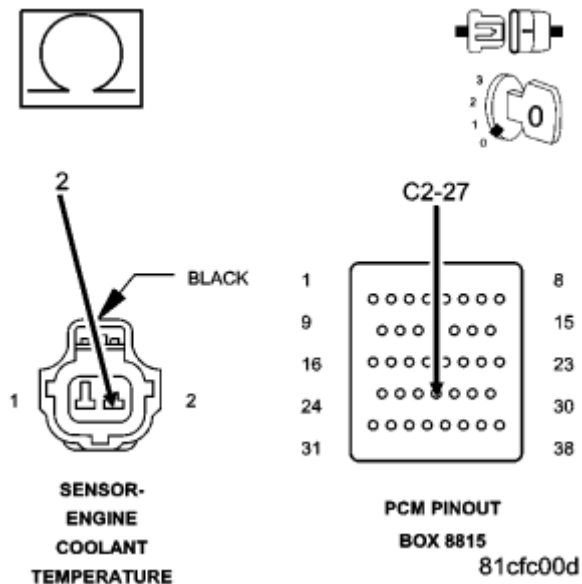


Fig. 8: Checking ECT Sensor Ground Circuit For Open
Courtesy of CHRYSLER LLC

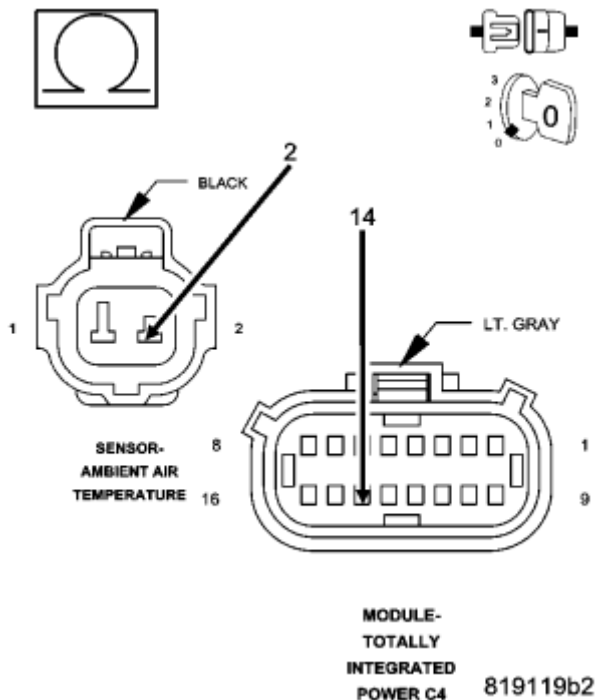


Fig. 9: Measuring Resistance Of (G931) Sensor Ground Circuit From AAT Sensor Harness Connector To C4 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the appropriate Temperature Sensor harness connector to the appropriate terminal of special tool #8815.

Measure the resistance of the (G931) Sensor ground circuit from the AAT Sensor harness connector to the C4 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 11.

No

Repair the open in the Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **SIGNAL CIRCUIT SHORTED TO GROUND**

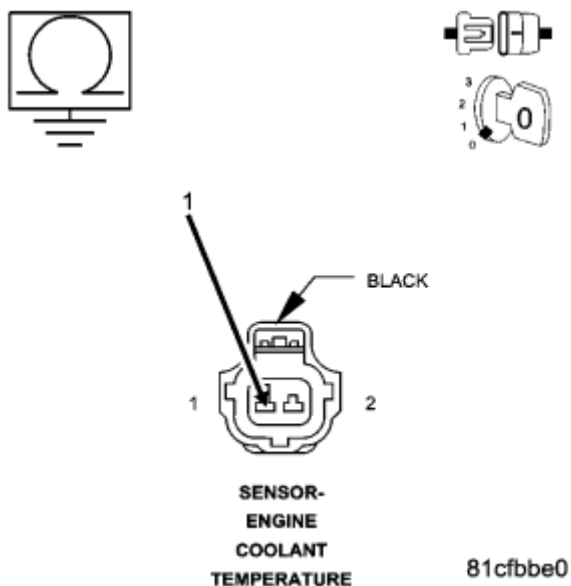
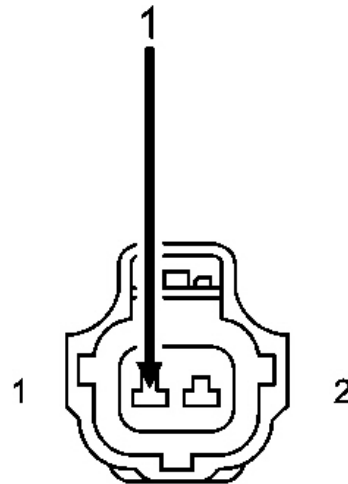
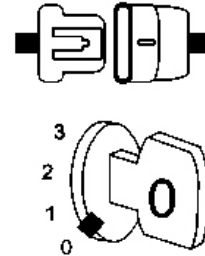
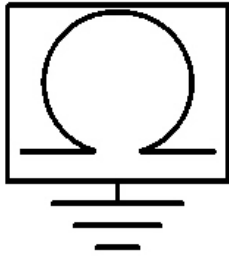


Fig. 10: Checking ECT Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b45d

Fig. 11: Checking Ambient Air Temperature Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the Sensor Signal circuit in the Temperature Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 12.

12. **SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT OR THE (G931) SENSOR GROUND CIRCUIT**

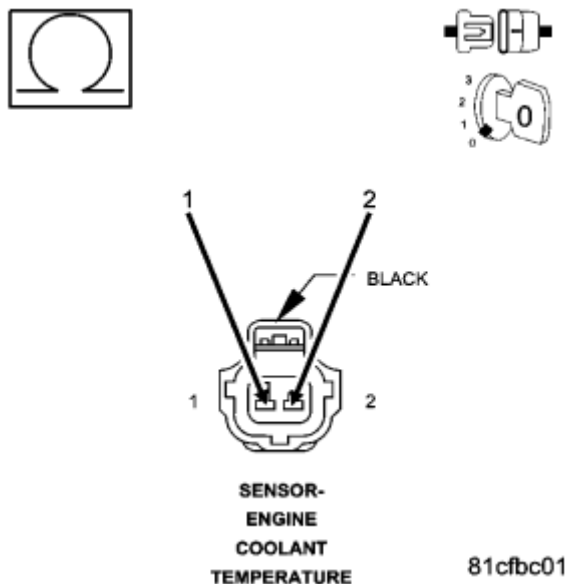
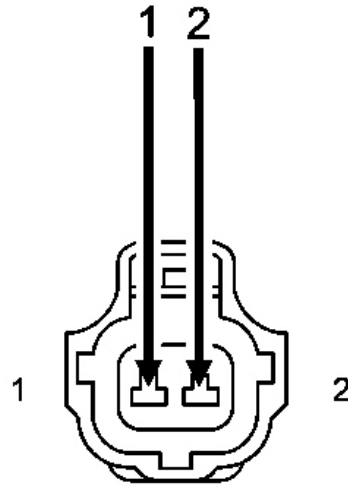
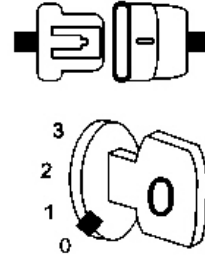
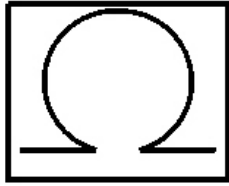


Fig. 12: Checking ECT Sensor Signal Circuit For Short To Sensor Ground Circuit
Courtesy of CHRYSLER LLC



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b459

Fig. 13: Checking AAT Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between the Signal circuit and the (K900) Sensor ground circuit in the (K2) ECT Sensor harness connector.

Measure the resistance between the Signal circuit and the (G931) Sensor ground circuit in the (G31) AAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the Sensor ground circuit and the Sensor Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 13.

13. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Temperature Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

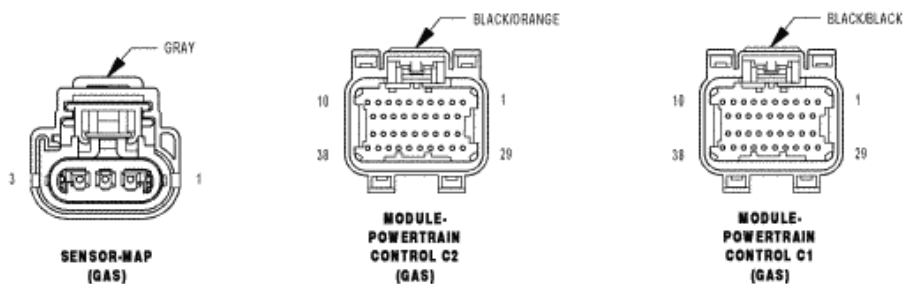
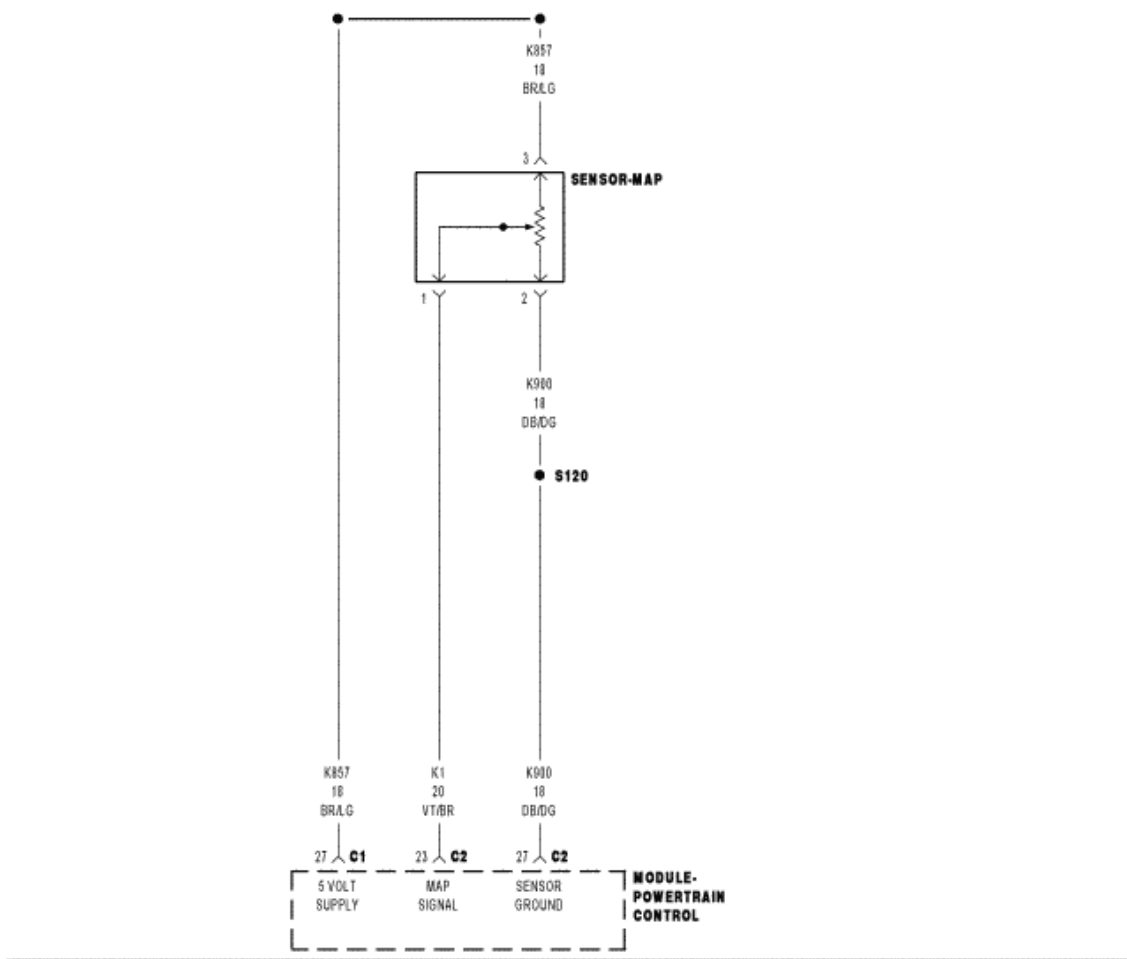
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0129-BAROMETRIC PRESSURE OUT-OF-RANGE LOW

CIRCUIT SCHEMATIC



019805c0

Fig. 14: Manifold Absolute Pressure Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With engine speed within 64 RPM of target idle, MAP sensor voltage between .04 volts and 4.96 volts, no vehicle speed, and the throttle closed.

SET CONDITIONS

- **Set Condition:**

Each time the PCM detects that the MAP sensor value is greater than a calibrated value for BARO, a counter increments. If the counter reaches a calibrated limit, the test fails. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(K857) 5-VOLT SUPPLY CIRCUIT OPEN
(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND
(K1) MAP SIGNAL CIRCUIT OPEN
(K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND
(K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
MAP SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time.

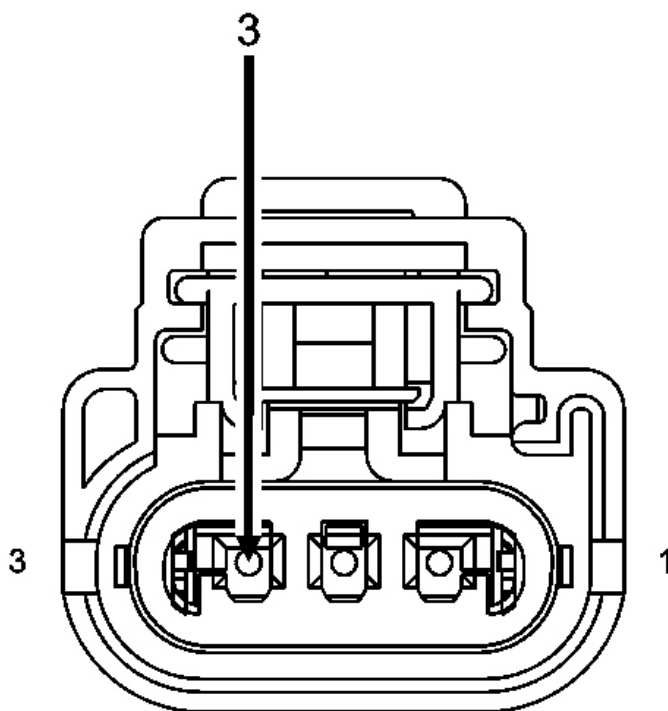
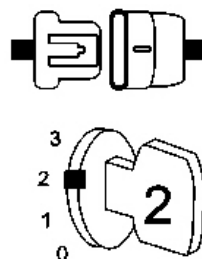
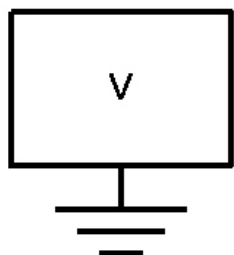
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K857) 5-VOLT SUPPLY CIRCUIT



**SENSOR-
MAP**

8132bc78

Fig. 15: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the voltage between 4.7 to 5.2 volts?

Yes

Go To 3.

No

Go To 7.

3. MAP SENSOR

With a scan tool, monitor the MAP Sensor voltage with the Sensor harness connector disconnected.

Is the voltage above 2.2 volts?

Yes

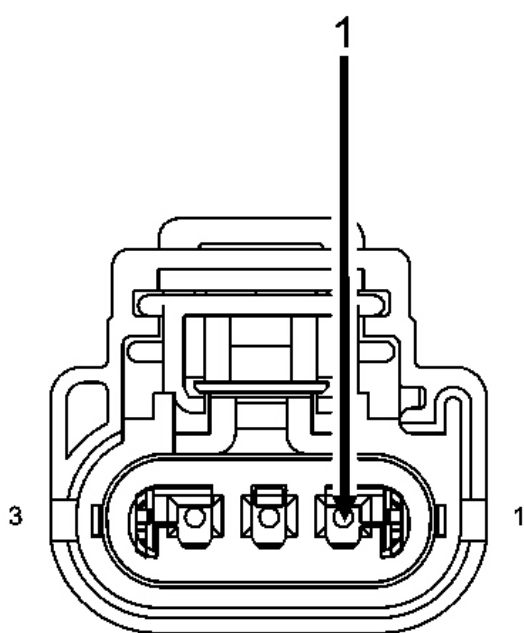
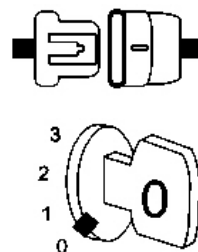
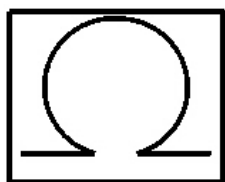
Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. If OK, replace the MAP Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

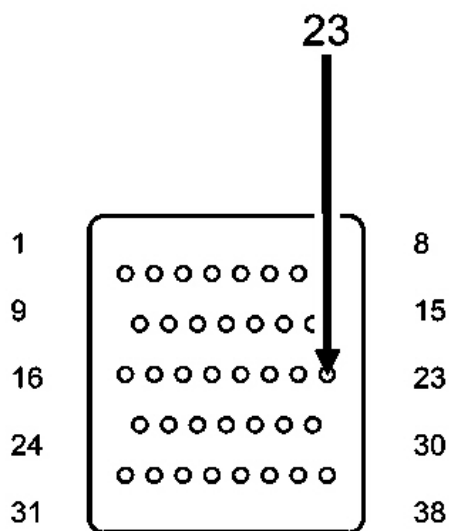
No

Go To 4.

4. (K1) MAP SIGNAL CIRCUIT OPEN



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 16: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

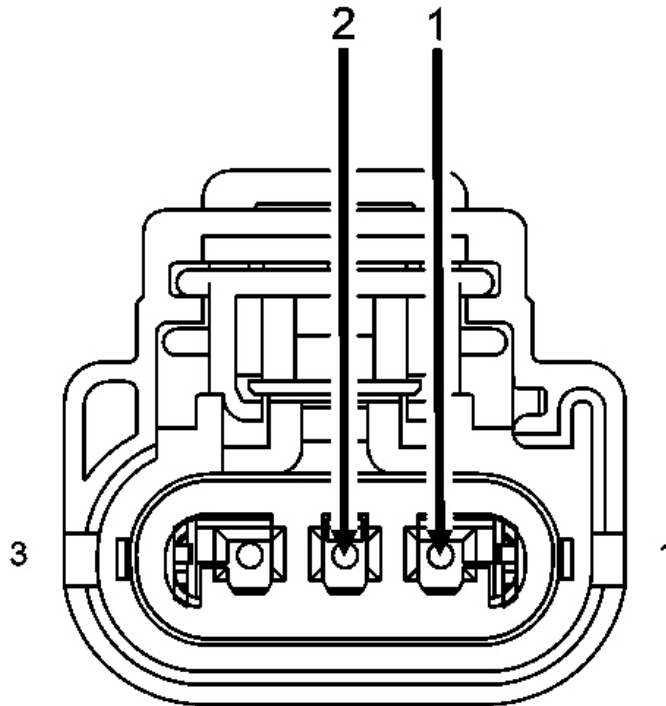
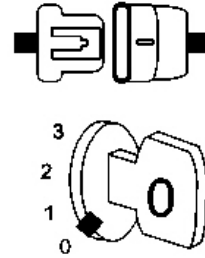
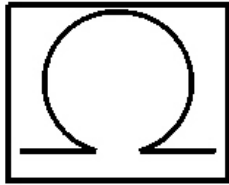
Go To 5.

No

Repair the open in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**

8132bc84

Fig. 17: Checking Manifold Absolute Pressure Sensor Signal Circuit For Short
Courtesy of CHRYSLER LLC

Measure the resistance between the (K900) Sensor ground circuit and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance below 5.0 ohms?

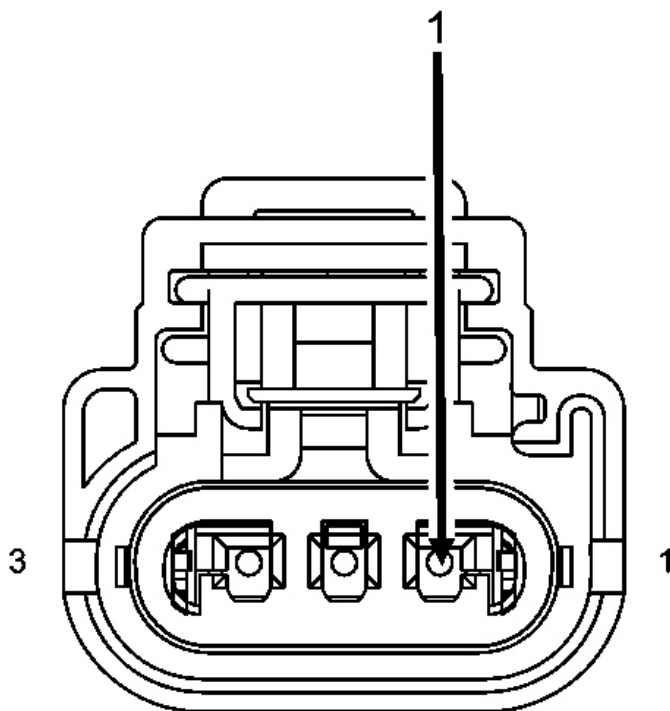
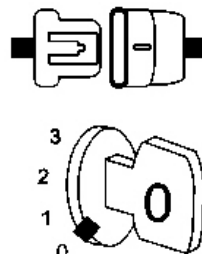
Yes

Repair the short between the (K900) Sensor ground circuit and the (K1) MAP Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



SENSOR-
MAP

8132b323

Fig. 18: Checking MAP Sensor Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

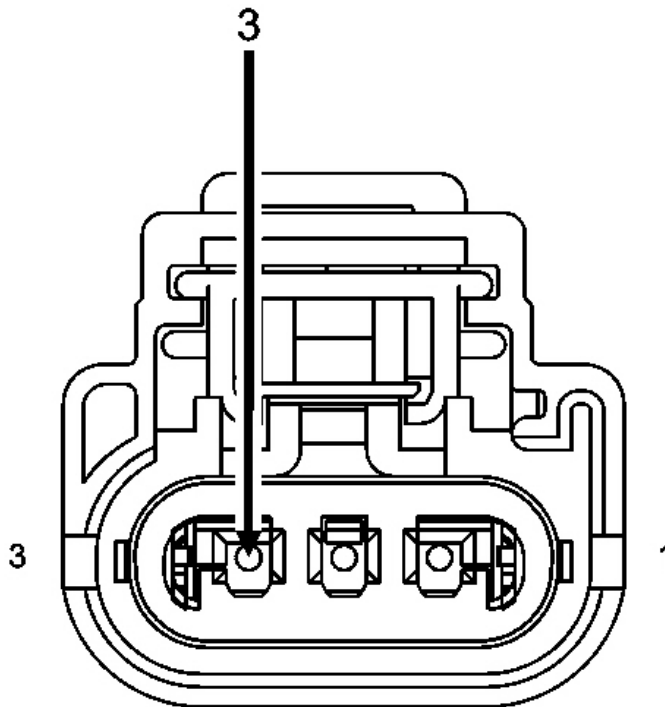
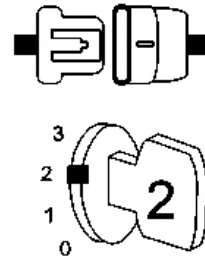
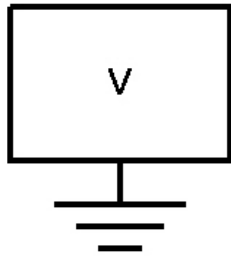
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

7. **(K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**



**SENSOR-
MAP**

8132bc78

Fig. 19: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is there any voltage present?

Yes

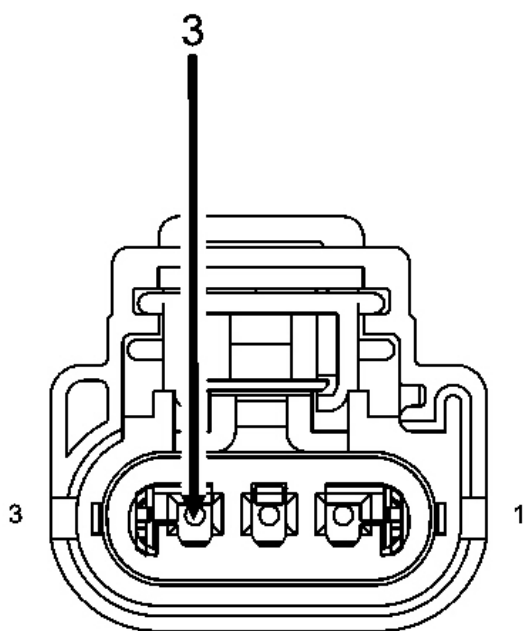
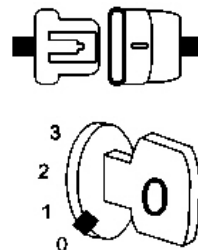
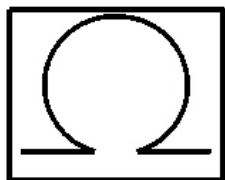
Repair the short to voltage in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

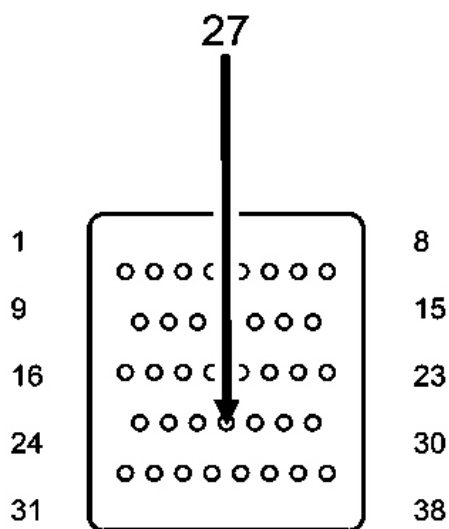
No

Go To 8.

8. (K857) 5-VOLT SUPPLY CIRCUIT OPEN



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 20: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal

to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

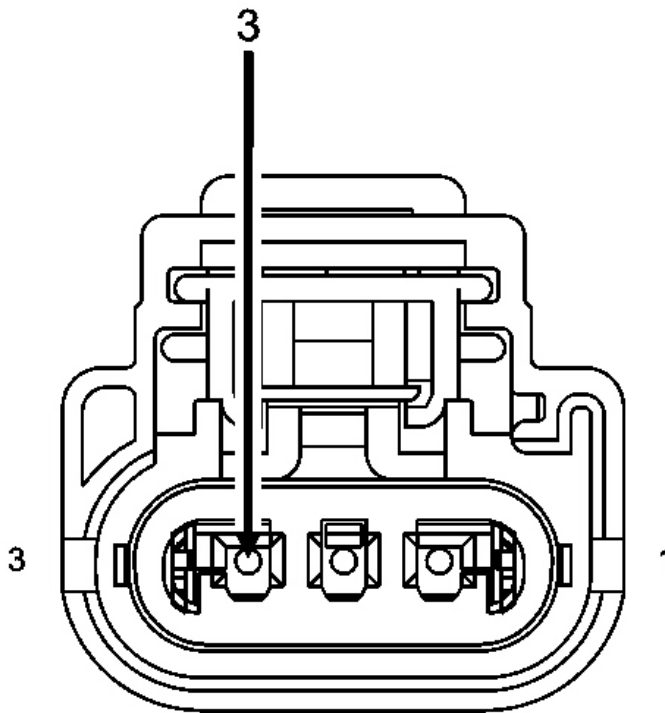
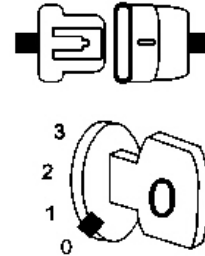
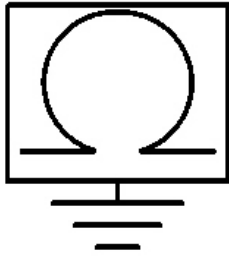
Go To 9.

No

Repair the open in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

9. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 21: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

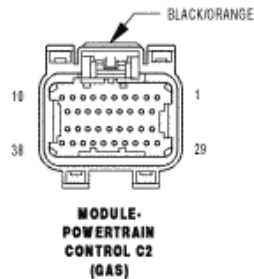
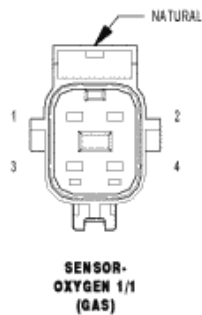
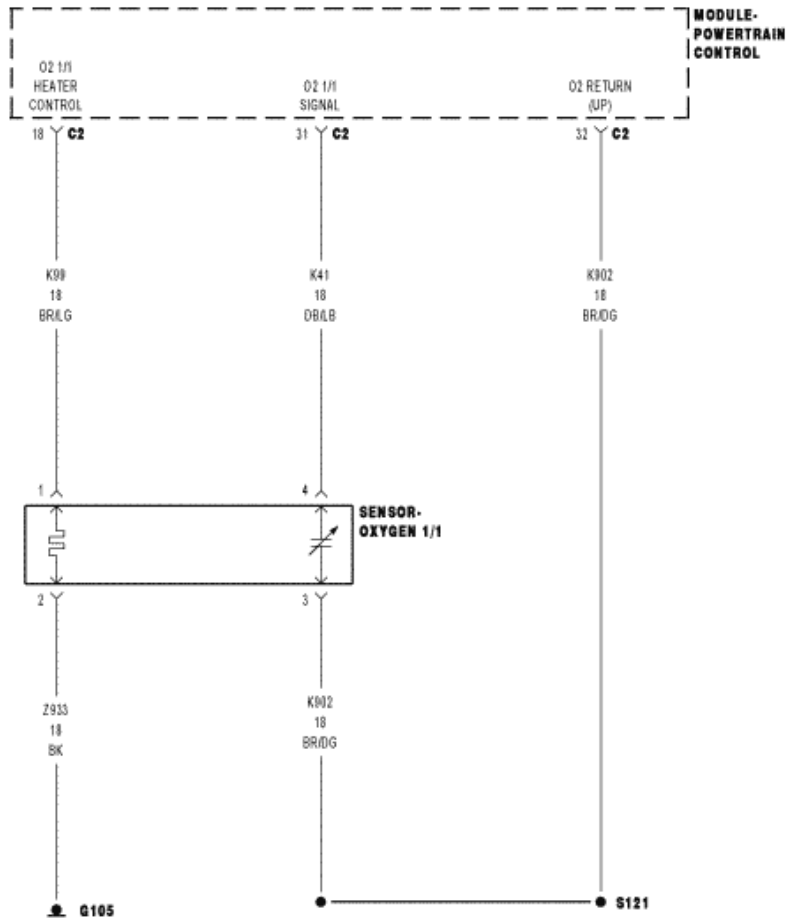
Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0131-O2 SENSOR 1/1 CIRCUIT LOW

CIRCUIT SCHEMATIC



91902414

Fig. 22: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running for less than 30 seconds and the O2 Sensor Heater Temperature is less than 251° C (484° F) with battery voltage greater 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the 1/1 Oxygen Sensor signal voltage is below approximately 1.5 volts for 2.8 seconds after engine startup. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND
(K41) O2 1/1 SIGNAL CIRCUIT SHORTED TO GROUND
(K41) O2 1/1 SIGNAL CIRCUIT SHORTED TO THE (K902) O2 RETURN UPSTREAM CIRCUIT
(K41) O2 1/1 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 1/1 HEATER GROUND CIRCUIT
1/1 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With a scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K41) O2 SENSOR 1/1 SIGNAL CIRCUIT**

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the O2 Sensor voltage.

Is the 1/1 O2 Sensor voltage between 4.1 and 5.0 volts?

Yes

Go To 3.

No

Go To 5.

3. **O2 SENSOR**

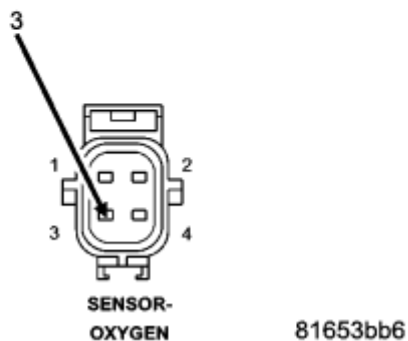


Fig. 23: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

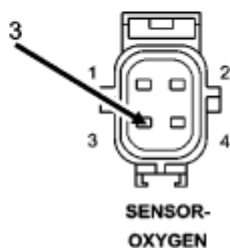
Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the 1/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 24: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Measure the resistance between ground and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

5. **(K41) O2 SENSOR 1/1 SIGNAL CIRCUIT SHORTED TO GROUND**

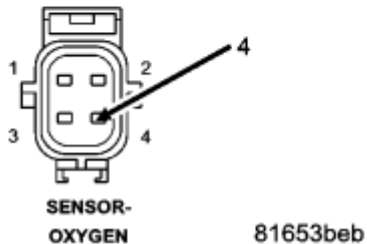


Fig. 25: Checking O2 Sensor 1/1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K41) O2 Sensor 1/1 Signal circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K41) O2 Sensor 1/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K41) O2 SENSOR 1/1 SIGNAL CIRCUIT SHORTED TO THE (K902) O2 RETURN UPSTREAM CIRCUIT**

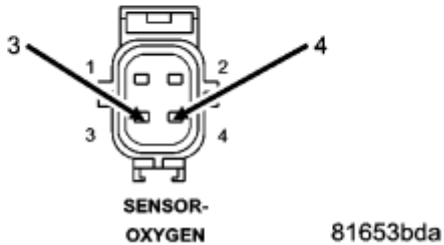


Fig. 26: Checking O2 Sensor 1/1 Signal Circuit For Short To Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K41) O2 Sensor 1/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

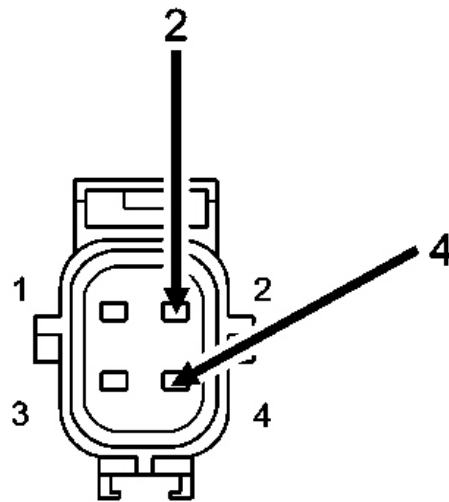
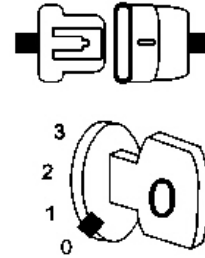
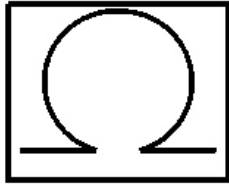
Repair the short between the (K902) O2 Return Upstream circuit and the (K41) O2 Sensor 1/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. **(K41) O2 SENSOR 1/1 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 1/1 HEATER GROUND CIRCUIT**



**SENSOR-
OXYGEN**

81653bca

Fig. 27: Checking O2 Sensor 1/1 Signal Circuit For Short To Heater Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K41) O2 Sensor 1/1 Signal circuit and the (Z933) O2 1/1 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (Z933) O2 1/1 Heater ground circuit and the (K41) O2 Sensor 1/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

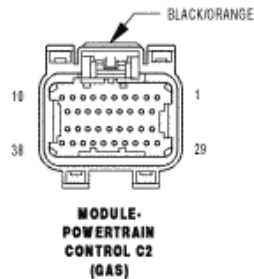
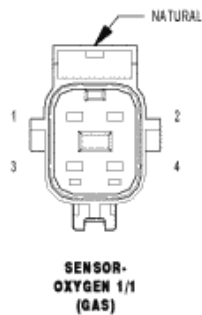
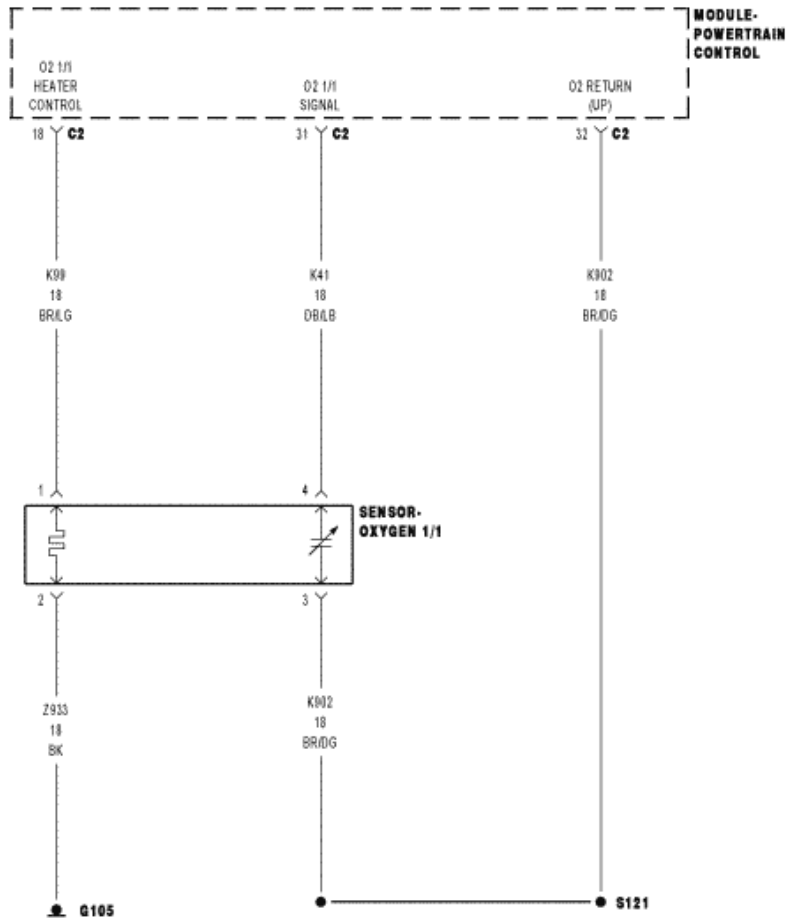
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0132-O2 SENSOR 1/1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



91902414

Fig. 28: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the engine running, no O2 sensor heater DTCs present, 1/1 Oxygen Sensor heater temperature within a specific range, and battery voltage greater than 10.4 volts.

SET CONDITIONS

- Set Condition:

The Oxygen Sensor voltage is above 3.99 volts for 40 seconds. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K41) O2 1/1 SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO VOLTAGE
(K41) O2 1/1 SIGNAL CIRCUIT OPEN
(K902) O2 RETURN UPSTREAM CIRCUIT OPEN
1/1 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If an O2 sensor signal circuit is shorted to voltage, all O2 sensor voltage readings displayed on the scan tool will be approximately 5.0 volts. Diagnose the sensor that set the most current DTC.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

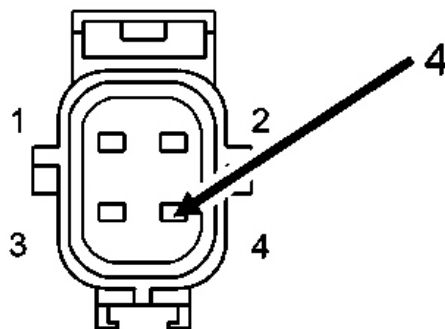
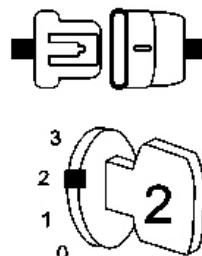
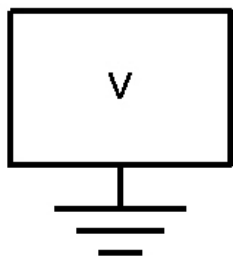
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K41) O2 1/1 SIGNAL CIRCUIT SHORTED TO VOLTAGE**



**SENSOR-
OXYGEN**

81653c72

Fig. 29: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Disconnect the 1/1 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K41) O2 Sensor 1/1 Signal circuit in the 1/1 O2 Sensor harness connector.

NOTE: **Measure the voltage in reference to ground, not the (K902) O2 Return Upstream circuit.**

Is there any voltage present?

Yes

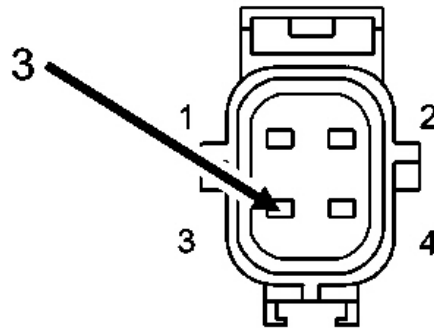
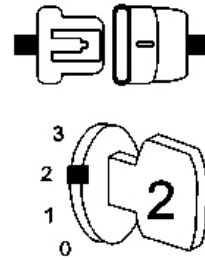
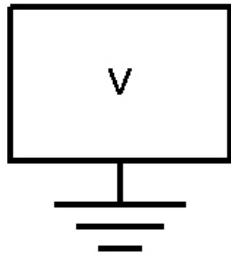
Repair the short to voltage in the (K41) O2 Sensor 1/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c98

Fig. 30: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the 1/1 O2 Sensor harness connector.

Is there any voltage present?

Yes

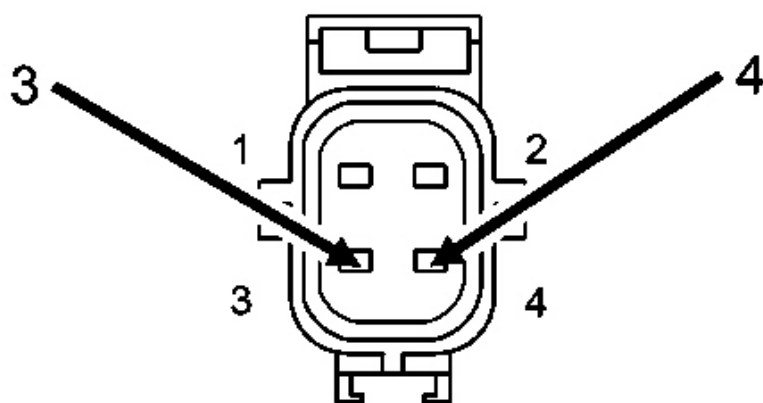
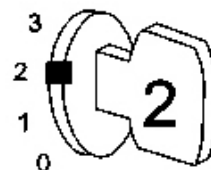
Repair the short to voltage in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. 1/1 O2 SENSOR



**SENSOR-
OXYGEN**

81653cbb

Fig. 31: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C1 and C2 PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the 1/1 O2 Sensor voltage.

Connect a jumper wire between the (K41) O2 1/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage between 2.3 and 2.7 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

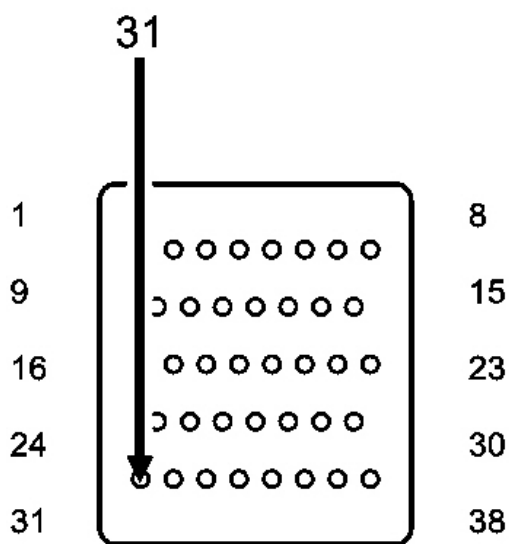
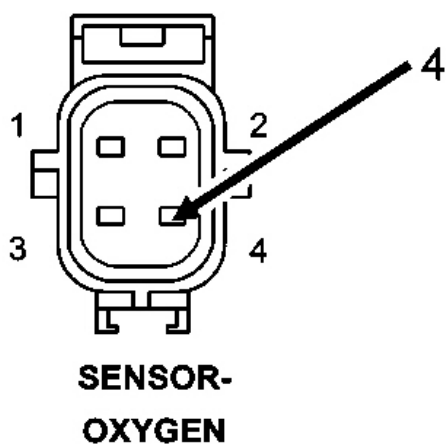
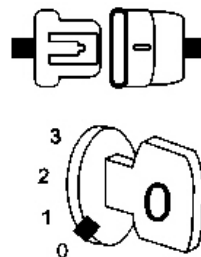
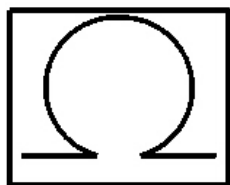
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K41) O2 1/1 SIGNAL CIRCUIT OPEN



**PCM PINOUT
BOX 8815**

81653cf8

Fig. 32: Checking O2 Sensor 1/1 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K41) O2 1/1 Signal circuit from the 1/1 O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

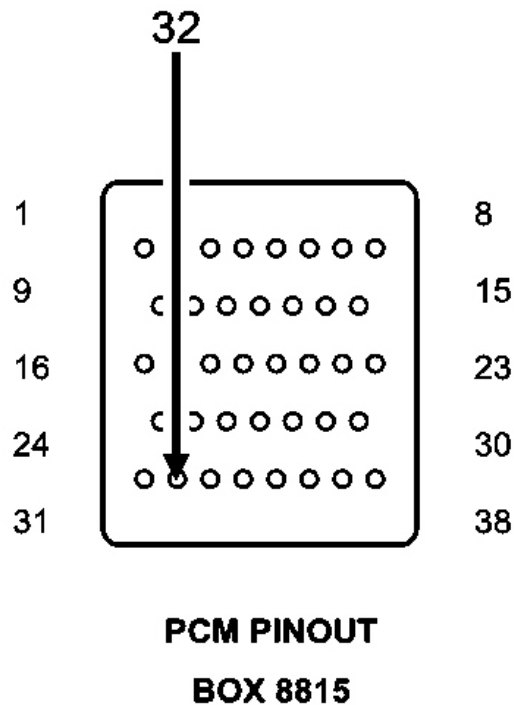
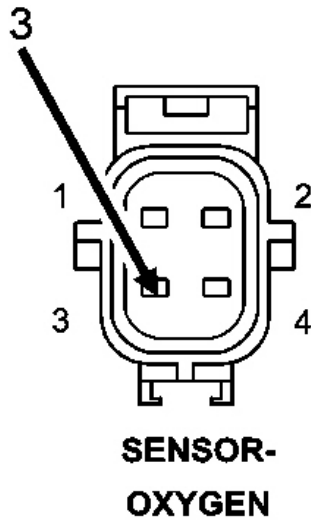
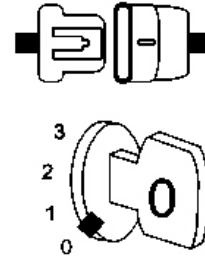
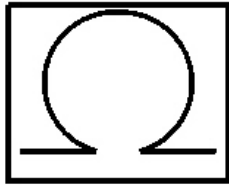
Go To 6.

No

Repair the open in the (K41) O2 1/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K902) O2 RETURN UPSTREAM CIRCUIT OPEN



81653d27

Fig. 33: Checking O2 Sensor Return Upstream Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K902) O2 Return Upstream circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

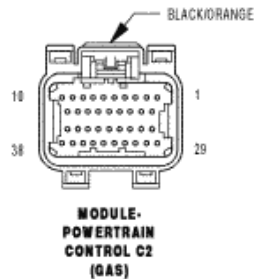
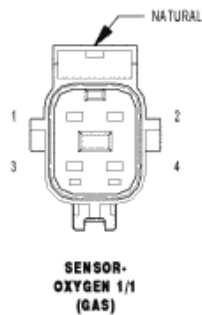
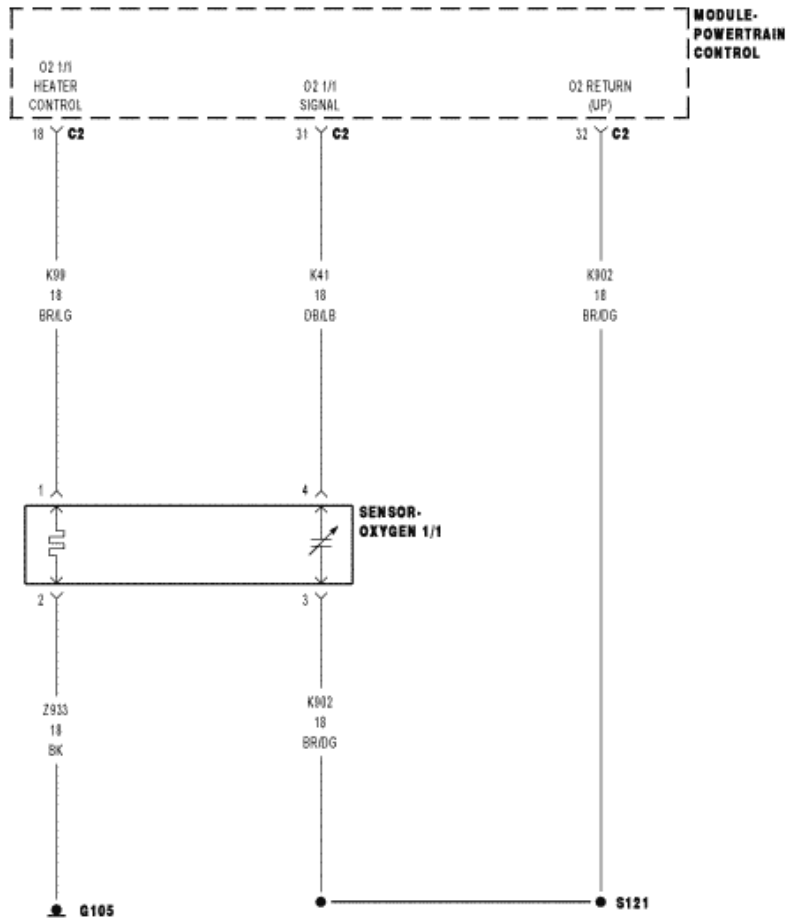
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0133-O2 SENSOR 1/1 SLOW RESPONSE

CIRCUIT SCHEMATIC



91902414

Fig. 34: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

For an aged O2 sensor, the response rate to the air/fuel change is slower than when it was new. The O2 sensor tends to move less with the same air/fuel changes in a given time frame. Therefore by observing the activity of voltage readings from the upstream O2 sensor, the quality of the O2 sensor can be detected.

MONITOR CONDITIONS

When Monitored:

With the ECT above 70° C (158° F), engine RPM between 1400 and 2300, vehicle speed between 64 and 96 kph (40 and 60 mph), and engine run time greater than 3 minutes.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the oxygen sensor signal does not switch adequately during monitoring. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K41) O2 1/1 SIGNAL CIRCUIT (K902) O2 RETURN UPSTREAM CIRCUIT 1/1 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

- NOTE:**

Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.
- NOTE:**

After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear

loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

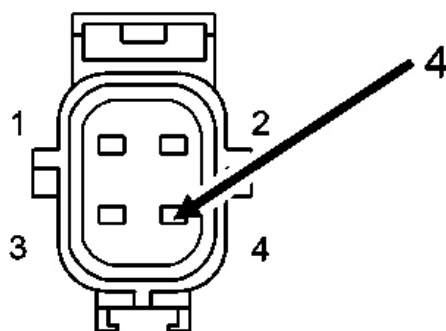
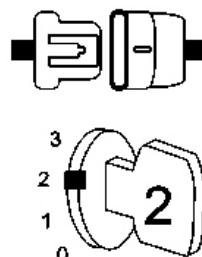
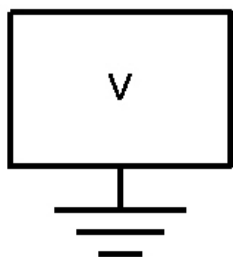
Yes

Repair or replace the leaking exhaust parts as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K41) O2 1/1 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 35: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K41) O2 1/1 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

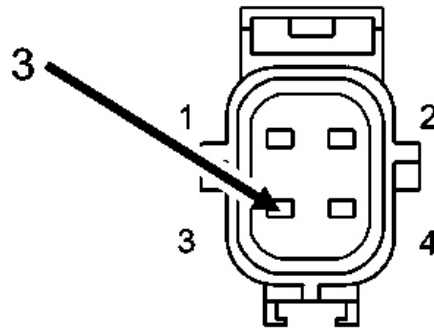
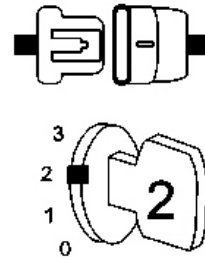
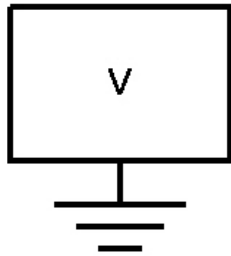
Go To 4.

No

Check the (K41) O2 1/1 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K902) O2 RETURN UPSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 36: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K902) O2 Return Upstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. O2 SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 1/1 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

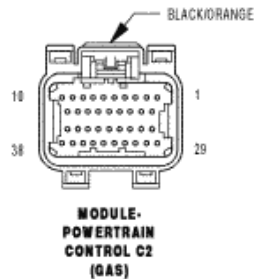
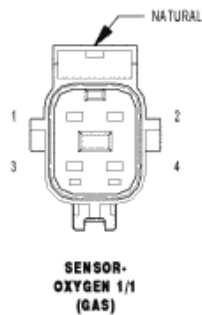
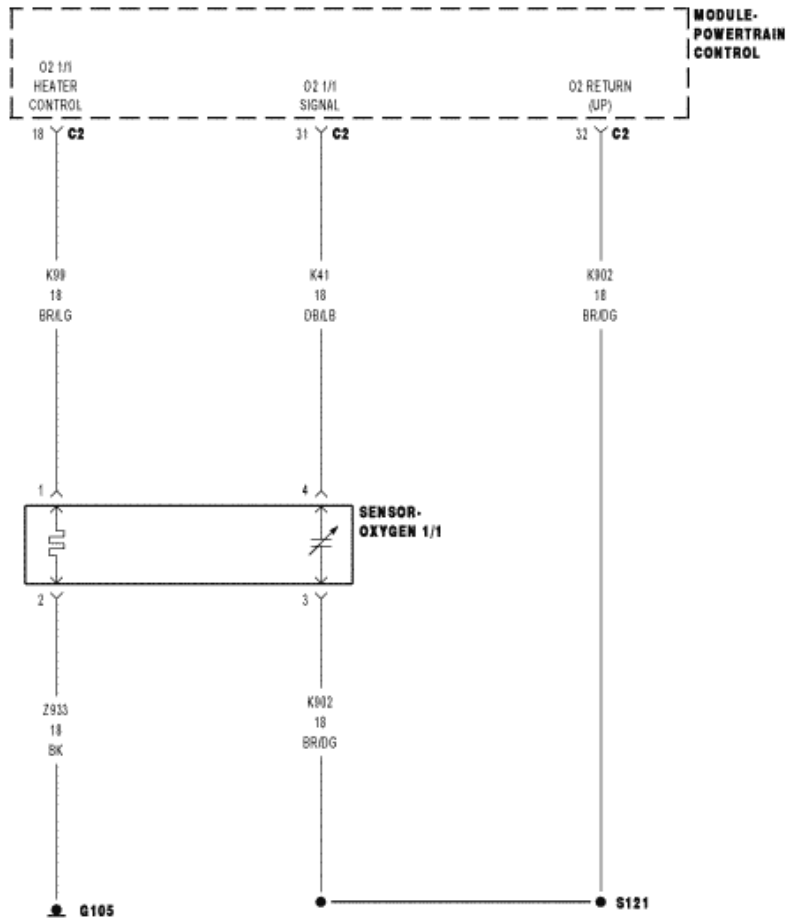
Repair

Replace the O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P0135-O2 SENSOR 1/1 HEATER PERFORMANCE

CIRCUIT SCHEMATIC



91902414

Fig. 37: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This diagnostic provides a continuous check of the O2 heater circuit during operation. The heater circuit is momentarily disabled to allow a resistance measurement to be taken to infer heater temperature. The current delivery to the heater is duty cycled to maintain a specific target temperature. The error from the target temperature is continuously monitored to assess heater performance.

MONITOR CONDITIONS

When Monitored:

Continuously during O2 sensor heater operation with battery voltage between 10.4 and 15.75 volts and no O2 sensor circuit DTCs present.

SET CONDITIONS

- **Set Condition:**

The PCM detects no temperature change in the O2 sensor heater element when the heater circuit is active. The heater temperature is obtained by measuring the heater resistance and calculating the heater temperature. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K99) O2 1/1 HEATER CONTROL CIRCUIT OPEN (Z933) O2 1/1 HEATER GROUND CIRCUIT OPEN 1/1 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: **Wait a minimum of 8 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize between 4.6 and 5.0 volts.**

Ignition on, engine not running.

With a scan tool, perform the 1/1 O2 Sensor Heater Test.

With the scan tool, monitor 1/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 SENSOR HEATER ELEMENT

Turn the ignition off.

NOTE: Allow the O2 sensor to cool down to room temperature.

Disconnect the O2 Sensor harness connector.

Measure the resistance of the O2 Heater Element across the 1/1 O2 Sensor connector between the O2 Heater Control terminal and the Heater ground terminal.

NOTE: O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.

Is the resistance of the O2 Sensor Heater Element between 2.0 and 30.0 ohms?

Yes

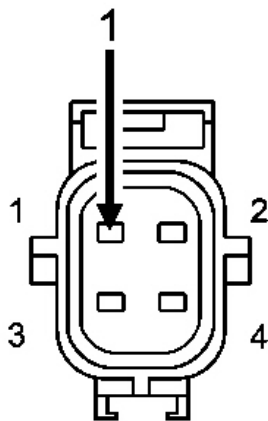
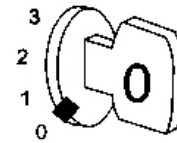
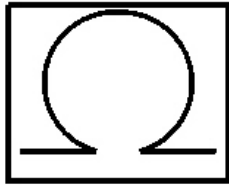
Go To 3.

No

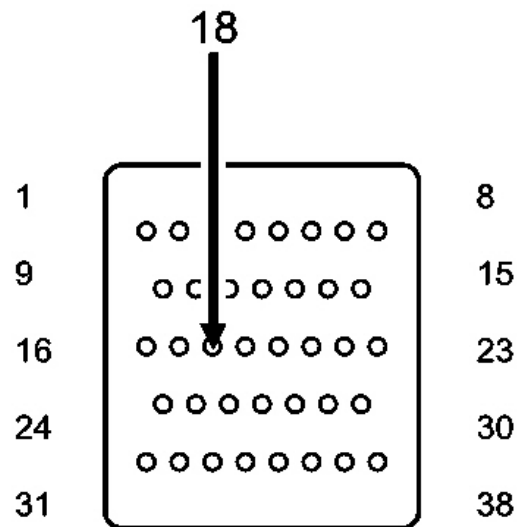
Verify that there is good pin to terminal contact in the Sensor and Control Module connectors. If OK, replace the 1/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K99) O2 1/1 HEATER CONTROL CIRCUIT OPEN



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

816543a2

Fig. 38: Checking O2 Sensor 1/1 Heater Control Circuit For Open
Courtesy of CHRYSLER LLC

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K99) O2 1/1 Heater Control circuit from the O2 harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 0.5 of an ohm?

Yes

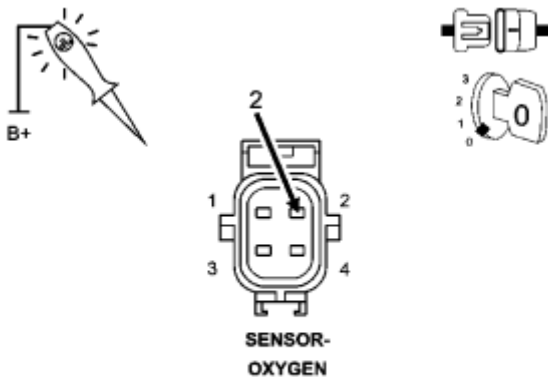
Go To 4.

No

Repair the excessive resistance in the (K99) O2 1/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (Z933) O2 1/1 HEATER GROUND CIRCUIT OPEN



81994b07

Fig. 39: Checking O2 Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12 volt test light connected to 12 volts, probe the (Z933) Ground circuit in the 1/1 Oxygen Sensor harness connector.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Is the test light illuminated and bright?

Yes

Go To 5.

No

Repair the excessive resistance in the (Z933) O2 1/1 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 1/1 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

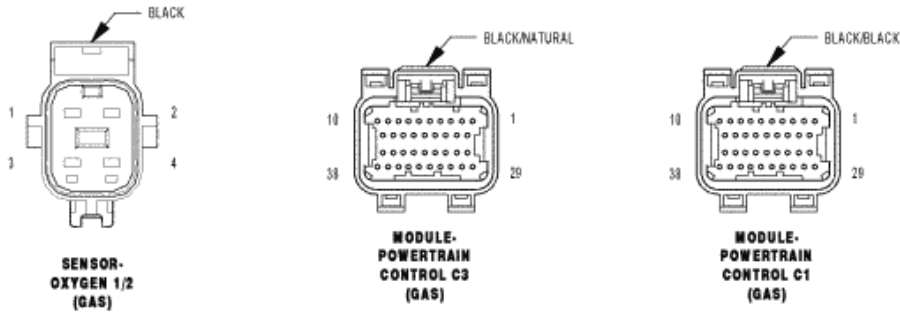
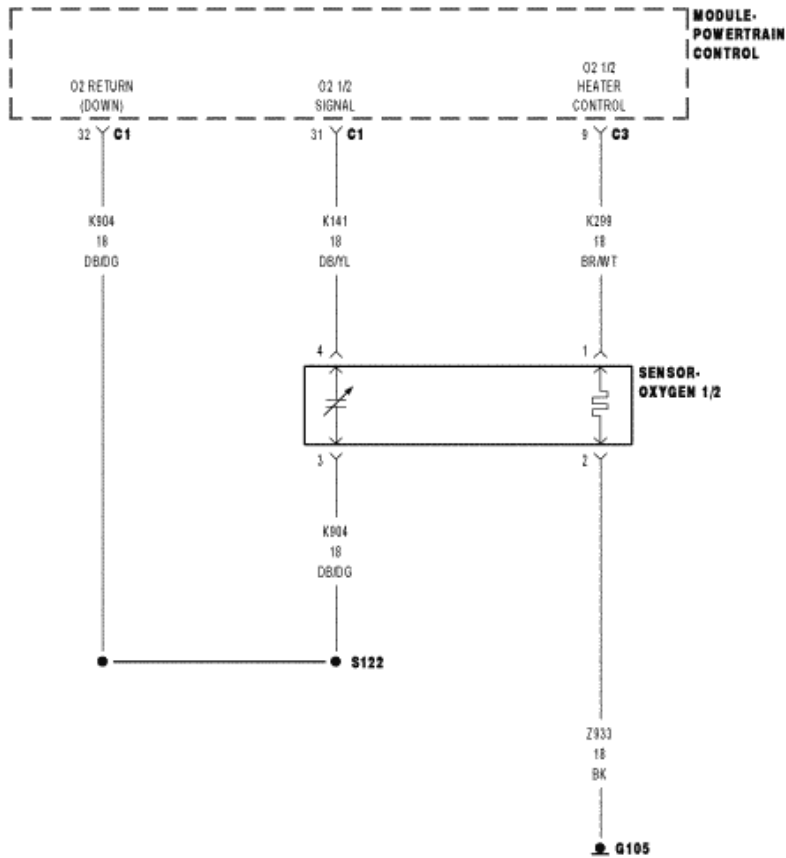
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0137-O2 SENSOR 1/2 CIRCUIT LOW

CIRCUIT SCHEMATIC



01993405

Fig. 40: O2 Sensor 1/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Engine running for less than 30 seconds and the O2 Sensor Heater Temperature is less than 251° C (484° F) with battery voltage greater 10.99 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the 1/2 Oxygen Sensor signal voltage is below approximately 1.5 volts for 2.8 seconds after engine startup. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND
(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO GROUND
(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO THE (K904) O2 RETURN DOWNSTREAM CIRCUIT
(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 1/2 HEATER GROUND CIRCUIT
1/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With a scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K141) O2 1/2 SIGNAL CIRCUIT

Turn the ignition off.

Disconnect the 1/2 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 1/2 O2 Sensor voltage.

Is the O2 Sensor voltage between 4.1 and 5.0 volts?

Yes

Go To 3.

No

Go To 5.

3. O2 SENSOR

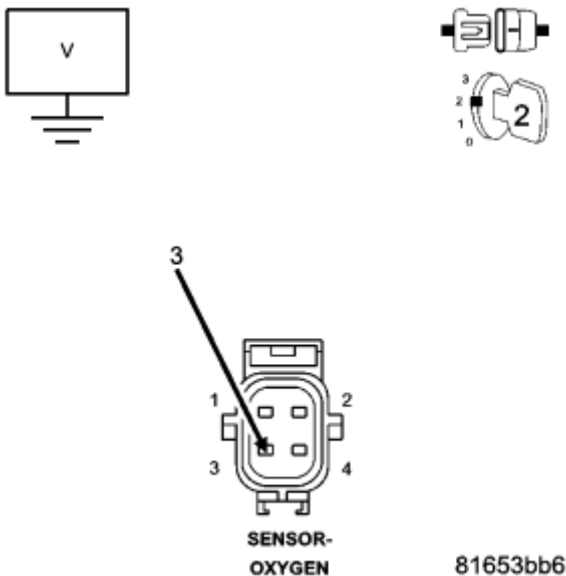


Fig. 41: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

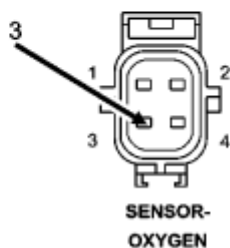
Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. If OK, replace the 1/2 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 42: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

5. **(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO GROUND**

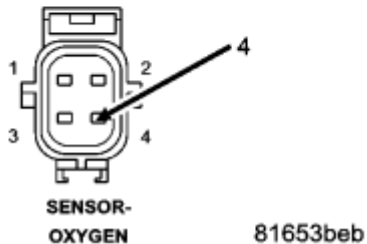


Fig. 43: Checking O2 Sensor 1/1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K141) O2 1/2 Signal circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K141) O2 1/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO THE (K904) O2 RETURN DOWNSTREAM CIRCUIT**

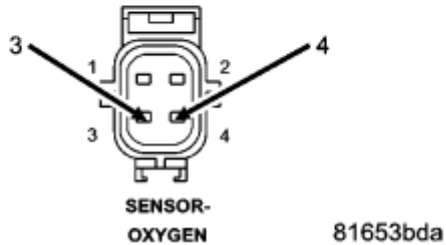


Fig. 44: Checking O2 Sensor 1/1 Signal Circuit For Short To Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K141) O2 1/2 Signal circuit and the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

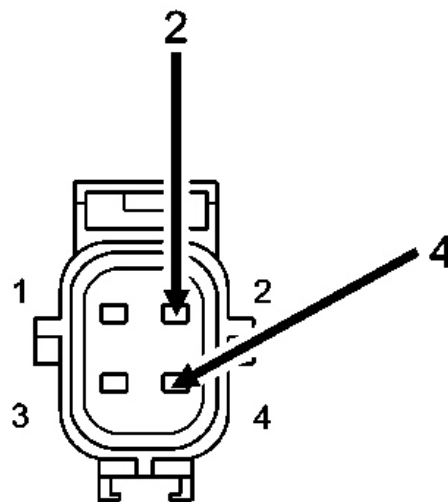
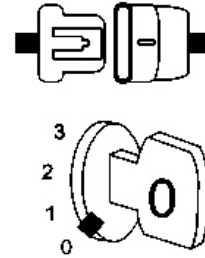
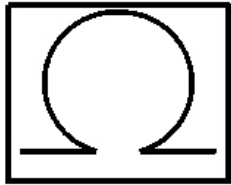
Repair the short between the (K904) O2 Return Downstream circuit and the (K141) O2 1/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. **(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 1/2 HEATER GROUND CIRCUIT**



**SENSOR-
OXYGEN**

81653bca

Fig. 45: Checking O2 Sensor 1/1 Signal Circuit For Short To Heater Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K141) O2 1/2 Signal circuit and the (Z933) O2 1/2 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (Z933) O2 1/2 Heater ground circuit and the (K141) O2 1/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

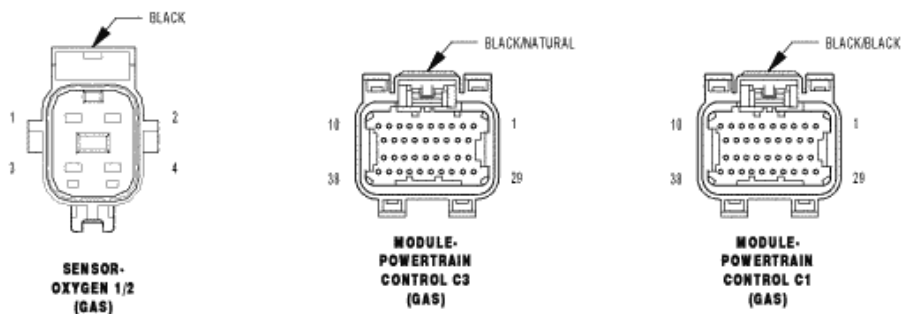
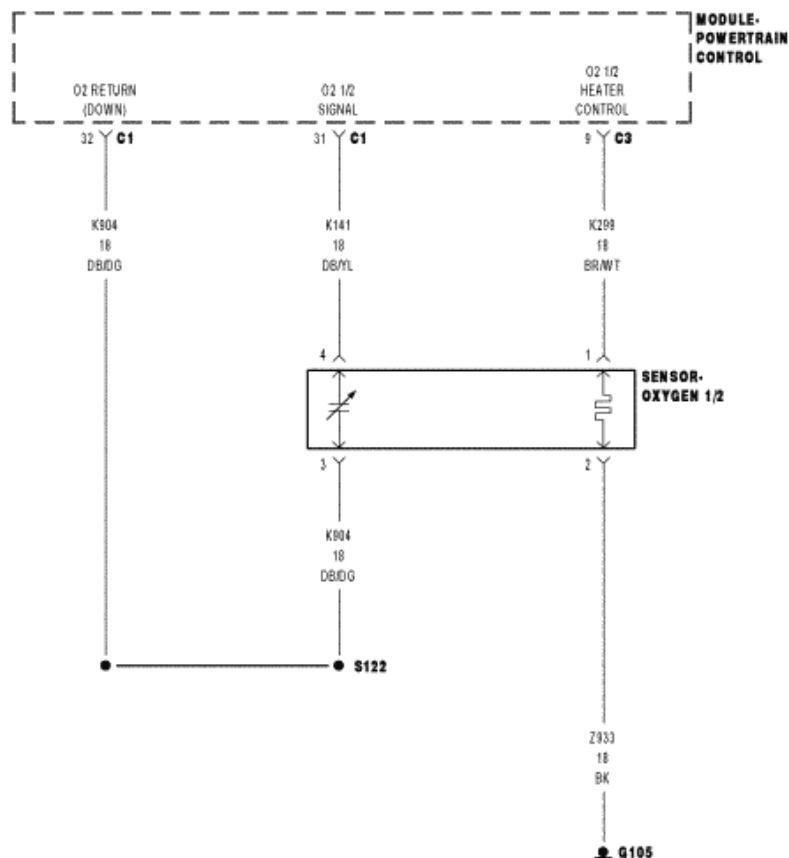
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0138-O2 SENSOR 1/2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01993405

Fig. 46: O2 Sensor 1/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the engine running, no O2 sensor heater DTCs present, 1/2 Oxygen Sensor heater temperature within a specific range, and battery voltage greater than 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the 1/2 Oxygen Sensor voltage is greater than the maximum acceptable value for a specific amount of time, based on O2 sensor heater temperature. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO VOLTAGE
(K141) O2 1/2 SENSOR SIGNAL CIRCUIT OPEN
(K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN
1/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If an O2 sensor signal circuit is shorted to voltage, all O2 sensor voltage readings displayed on the scan tool will be approximately 5.0 volts. Diagnose the sensor that set the most current DTC.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the status Active for this DTC?

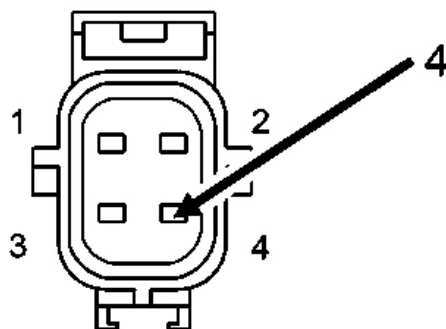
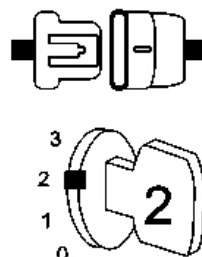
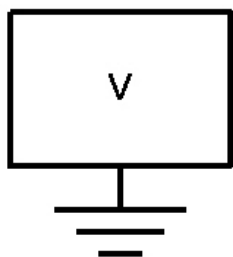
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K141) O2 1/2 SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c72

Fig. 47: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Disconnect the 1/2 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K141) O2 Sensor 1/2 Signal circuit in the O2 Sensor harness connector.

NOTE: Measure the voltage in reference to ground, not the (K904) O2 Return Downstream circuit.

Is there any voltage present?

Yes

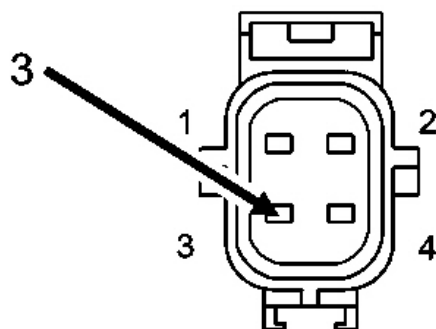
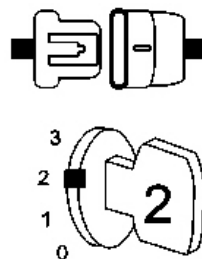
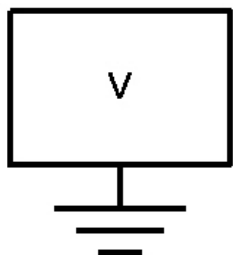
Repair the short to voltage in the (K141) O2 Sensor 1/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c98

Fig. 48: Checking O2 Sensor Return Upstream & Downstream Circuits

Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is there any voltage present?

Yes

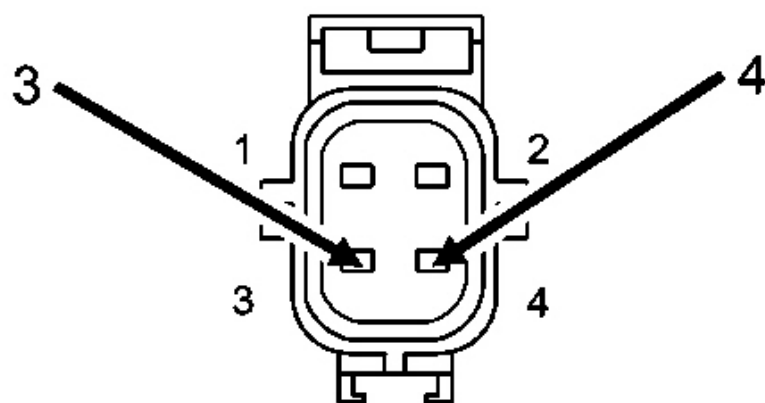
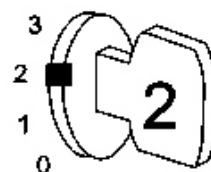
Repair the short to voltage in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. O2 SENSOR



**SENSOR-
OXYGEN**

81653cbb

Fig. 49: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C1 and C2 PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the 1/2 O2 Sensor voltage.

Connect a jumper wire between the (K141) O2 1/2 Signal circuit and the (K904) O2 Return Downstream circuit in the 1/2 O2 Sensor harness connector.

Is the voltage between 2.3 and 2.7 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

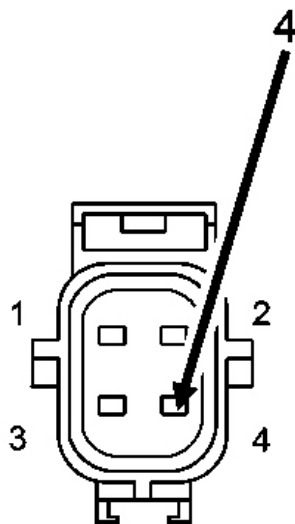
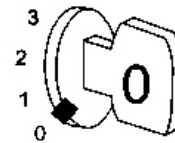
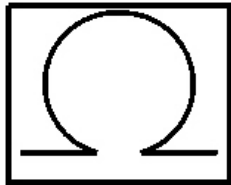
Perform **POWERTRAIN VERIFICATION TEST** .

No

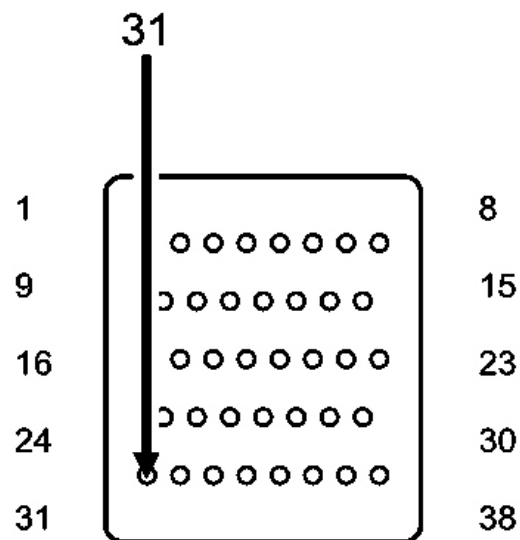
Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K141) O2 1/2 SIGNAL CIRCUIT OPEN



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

816544a1

Fig. 50: Checking O2 1/2 Sensor Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K141) O2 1/2 Signal circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

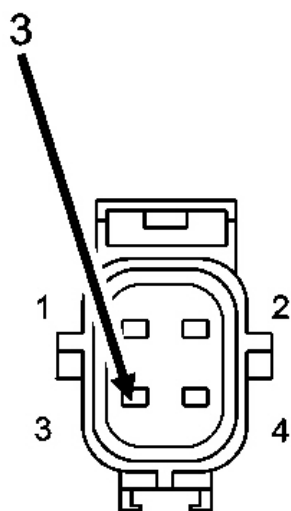
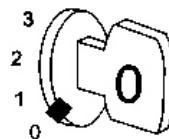
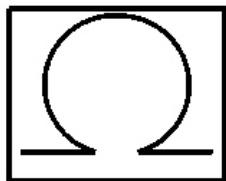
Go To 6.

No

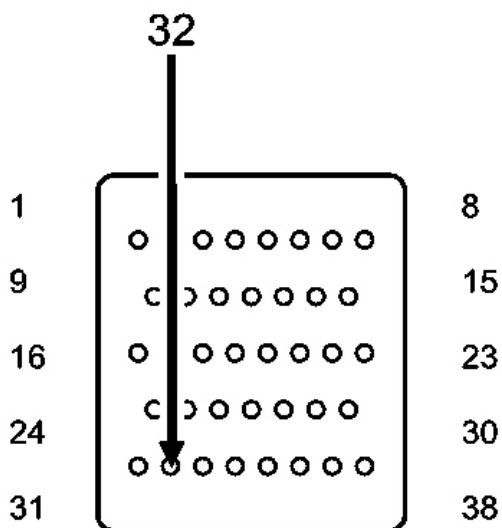
Repair the open in the (K141) O2 1/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

816544d2

Fig. 51: Checking O2 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K904) O2 Return Downstream circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

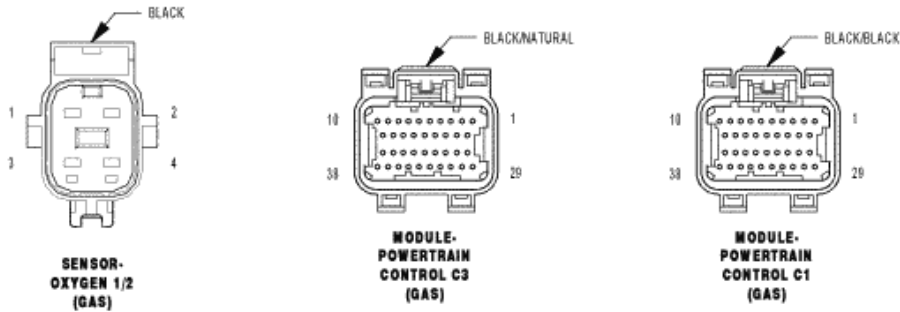
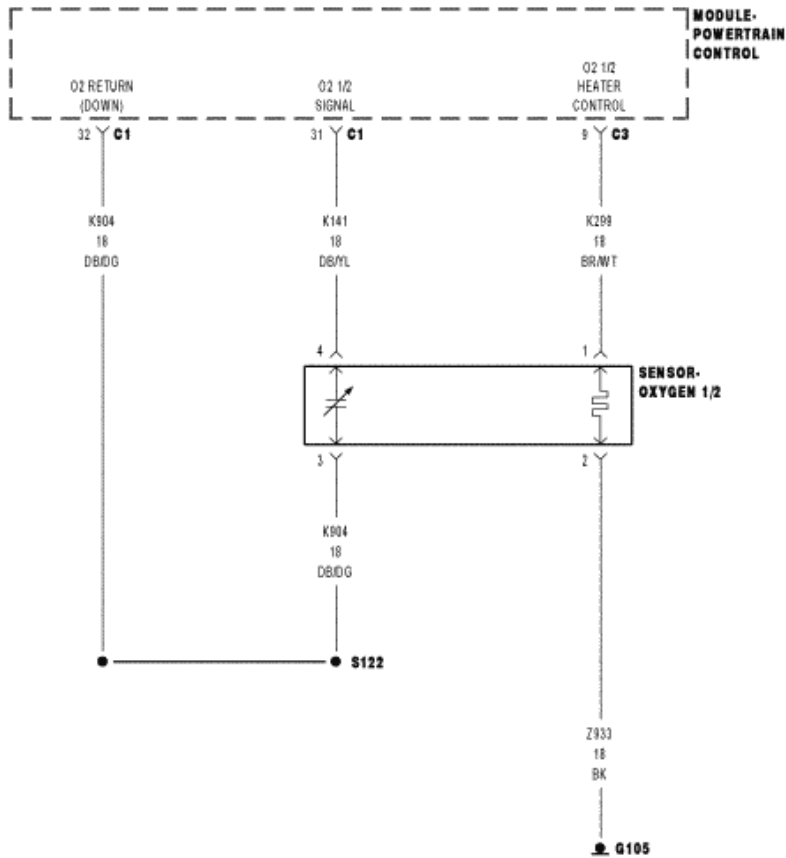
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0139-O2 SENSOR 1/2 SLOW RESPONSE

CIRCUIT SCHEMATIC



01993405

Fig. 52: O2 Sensor 1/2 Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The downstream O2 Sensor is located in the exhaust path behind the catalytic converter, is monitored for proper response to assure optimum catalytic converter efficiency. The downstream O2 response monitor is intended to diagnose a downstream O2 sensor that is not moving or stuck in a voltage window and to insure accurate information for catalyst monitor diagnosis.

MONITOR CONDITIONS

When Monitored:

With the engine running, vehicle speed between 32 and 88 kph (20 and 55 mph), throttle open for a minimum of 120 seconds, ECT greater than 70° C (158° F), Catalytic Converter Temperature greater than 600° C (1112° F) and EVAP Purge active

SET CONDITIONS

- **Set Condition:**

The PCM detects that the oxygen sensor signal switches from lean to rich less than 16 times within 20 seconds during monitoring. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K141) O2 1/2 SIGNAL CIRCUIT (K904) O2 RETURN DOWNSTREAM CIRCUIT 1/2 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

- NOTE:

Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.
- NOTE:

After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor

- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

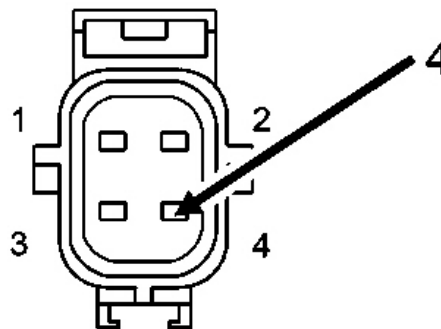
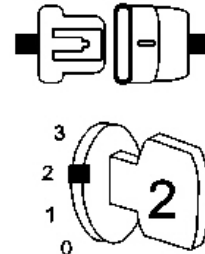
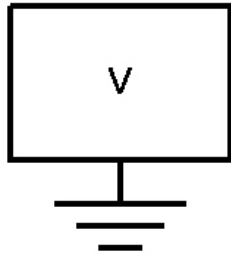
Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K141) O2 1/2 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 53: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off

Disconnect the 1/2 O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K141) O2 1/2 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

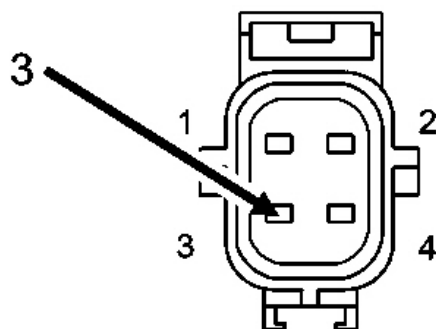
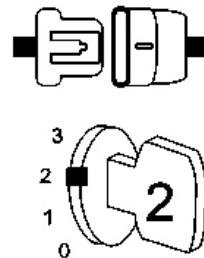
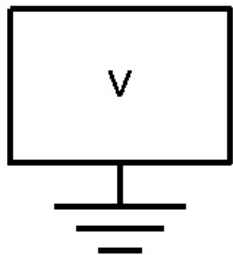
Go To 4.

No

Check the (K141) O2 1/2 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 54: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the 1/2 O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K904) O2 Return Downstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. 1/2 O2 SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 1/2 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

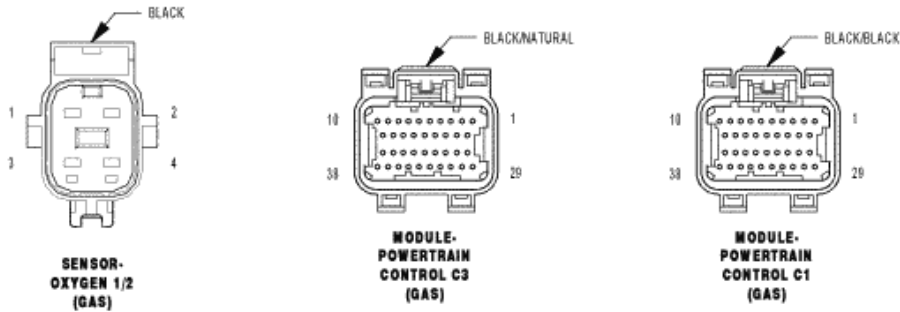
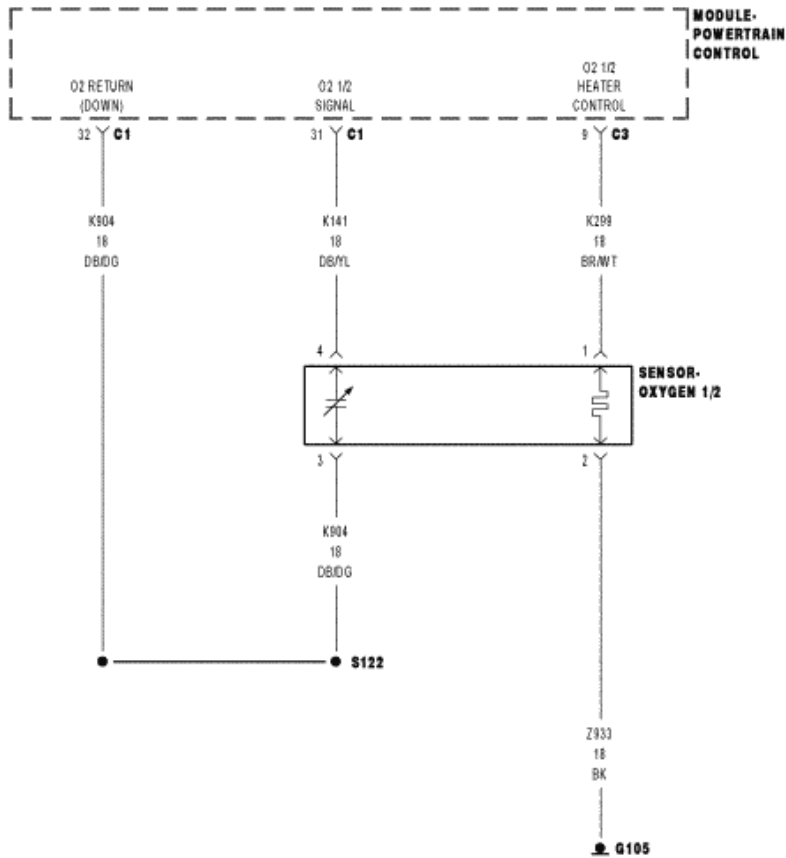
Repair

Replace the 1/2 O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P013A-O2 SENSOR 1/2 SLOW RESPONSE - RICH TO LEAN

CIRCUIT SCHEMATIC



01993405

Fig. 55: O2 Sensor 1/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The downstream O2 Sensor is located in the exhaust path behind the catalytic converter, is monitored for proper response to assure optimum catalytic converter efficiency. The downstream O2 response monitor is intended to diagnose a downstream O2 sensor that is not moving or stuck in a voltage window and to insure accurate information for catalyst monitor diagnosis.

MONITOR CONDITIONS

When Monitored:

With the engine running, vehicle speed above 96 kph (60 mph), throttle open for a minimum of 120 seconds, ECT greater than 70° C (158° F), catalytic converter temperature greater than 600° C (1112° F), and downstream oxygen sensor in a rich state. During a decel fuel shutoff event, the downstream oxygen sensor should switch from rich to lean within a specific time.

SET CONDITIONS

- **Set Condition:**

The PCM monitors the downstream O2 sensor. If the PCM does not detect a rich to lean switch within a specific time during a decel fuel shutoff event, the monitor will fail. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K141) O2 1/2 SIGNAL CIRCUIT (K904) O2 RETURN DOWNSTREAM CIRCUIT 1/2 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

- NOTE:**

Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.
- NOTE:**

After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CHECKING THE EXHAUST SYSTEM FOR LEAKS**

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

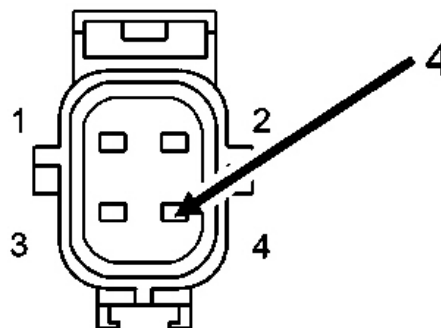
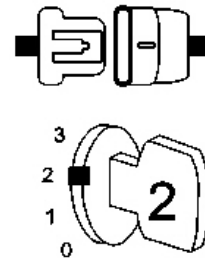
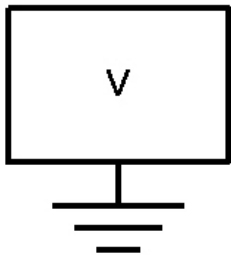
Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K141) O2 1/2 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 56: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off

Disconnect the 1/2 O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K141) O2 1/2 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

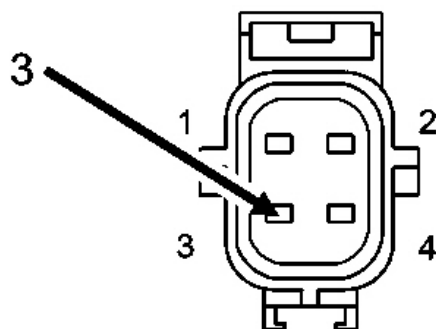
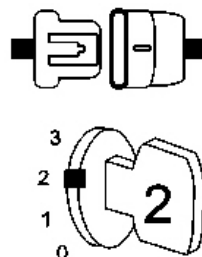
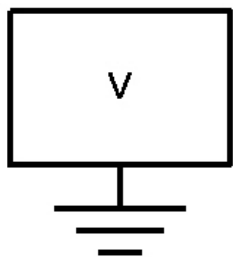
Go To 4.

No

Check the (K141) O2 1/2 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 57: Checking O2 Sensor Return Upstream & Downstream Circuits
 Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the 1/2 O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K904) O2 Return Downstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. 1/2 O2 SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 1/2 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

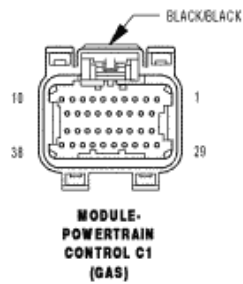
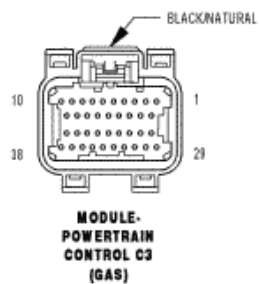
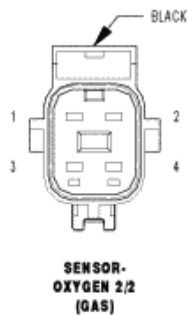
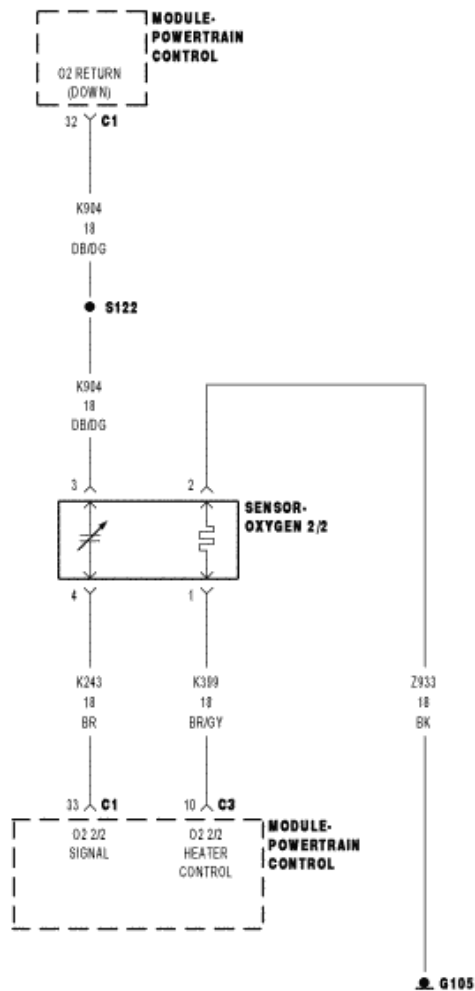
Repair

Replace the 1/2 O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P013C-O2 SENSOR 2/2 SLOW RESPONSE - RICH TO LEAN

CIRCUIT SCHEMATIC



01962075

Fig. 58: O2 Sensor 2/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The downstream O2 Sensor is located in the exhaust path behind the catalytic converter, is monitored for proper response to assure optimum catalytic converter efficiency. The downstream O2 response monitor is intended to diagnose a downstream O2 sensor that is not moving or stuck in a voltage window and to insure accurate information for catalyst monitor diagnosis.

MONITOR CONDITIONS

When Monitored:

With the engine running, vehicle speed above 96 kph (60 mph), throttle open for a minimum of 120 seconds, ECT greater than 70° C (158° F), catalytic converter temperature greater than 600° C (1112° F), and downstream oxygen sensor in a rich state. During a decel fuel shutoff event, the downstream oxygen sensor should switch from rich to lean within a specific time.

SET CONDITIONS

- Set Condition:**

The PCM monitors the downstream O2 sensor. If the PCM does not detect a rich to lean switch within a specific time during a decel fuel shutoff event, the monitor will fail. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K243) O2 2/2 SIGNAL CIRCUIT (K904) O2 RETURN DOWNSTREAM CIRCUIT 2/2 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:**

Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.
- NOTE:**

After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CHECKING THE EXHAUST SYSTEM FOR LEAKS**

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

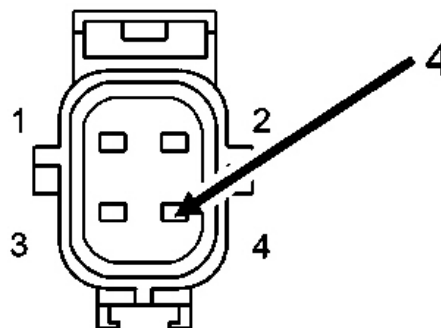
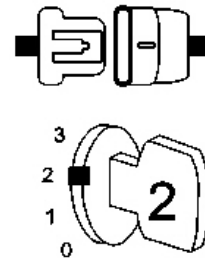
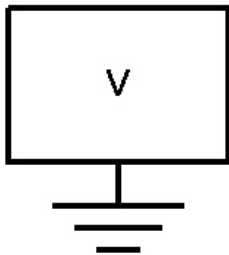
Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K243) O2 2/2 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 59: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off

Disconnect the 2/2 O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K243) O2 2/2 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

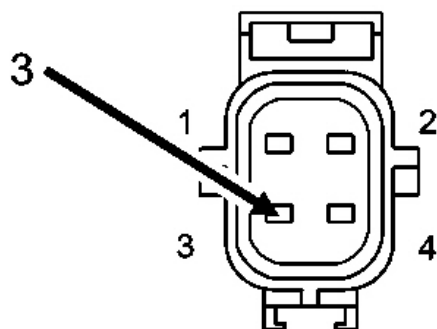
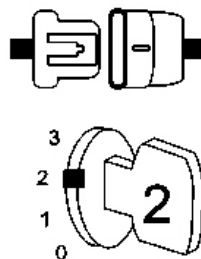
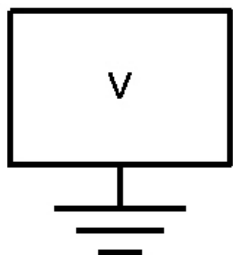
Go To 4.

No

Check the (K243) O2 2/2 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 60: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the 2/2 O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K904) O2 Return Downstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. 2/2 O2 SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 2/2 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

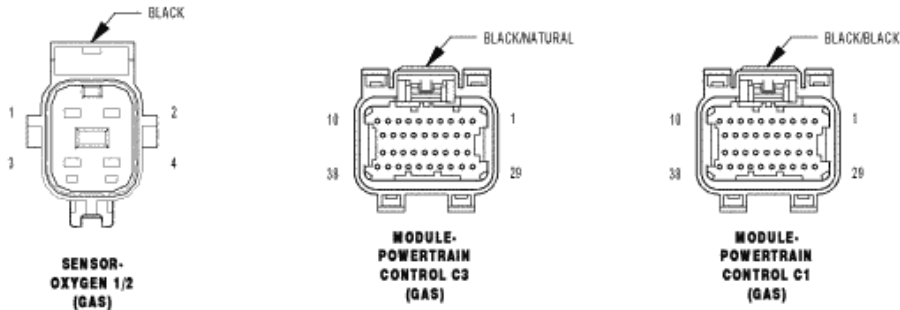
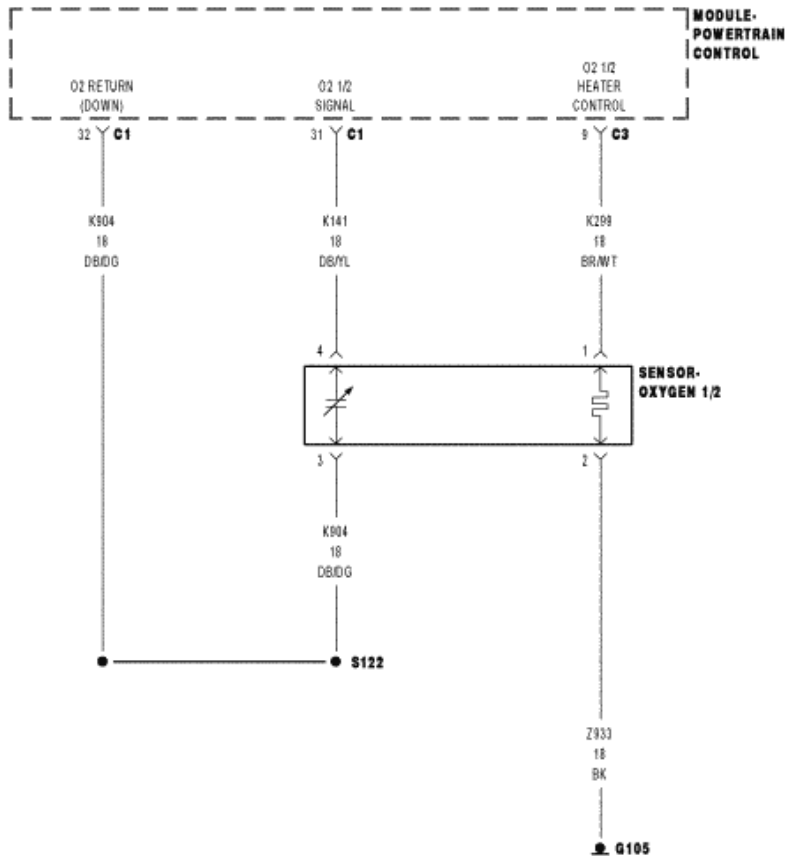
Repair

Replace the 2/2 O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P0141-O2 SENSOR 1/2 HEATER PERFORMANCE

CIRCUIT SCHEMATIC



01903405

Fig. 61: O2 Sensor 1/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This diagnostic provides a continuous check of the O2 heater circuit during operation. The heater circuit is momentarily disabled to allow a resistance measurement to be taken to infer heater temperature. The current delivery to the heater is duty cycled to maintain a specific target temperature. The error from the target temperature is continuously monitored to assess heater performance.

MONITOR CONDITIONS

When Monitored:

Continuously during O2 sensor heater operation with battery voltage between 10.4 and 15.75 volts and no O2 sensor circuit DTCs present.

SET CONDITIONS

- **Set Condition:**

The PCM detects no temperature change in the O2 sensor heater element when the heater circuit is active. The heater temperature is obtained by measuring the heater resistance and calculating the heater temperature. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K299) O2 1/2 HEATER CONTROL CIRCUIT OPEN
(Z933) O2 HEATER GROUND CIRCUIT OPEN
1/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **O2 SENSOR HEATER OPERATION**

Turn the ignition off.

NOTE: **Wait a minimum of 8 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize between 4.6 and 5.0 volts.**

Ignition on, engine not running.

With a scan tool, perform the 1/2 O2 Sensor Heater Test.

With the scan tool, monitor 1/2 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 SENSOR HEATER ELEMENT

Turn the ignition off.

NOTE: Allow the O2 sensor to cool down to room temperature.

Disconnect the O2 Sensor harness connector.

Measure the resistance of the O2 Heater Element across the O2 Sensor connector between the O2 Heater Control terminal and the Heater ground terminal.

NOTE: O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.

Is the resistance of the O2 Sensor Heater Element between 2.0 and 30.0 ohms?

Yes

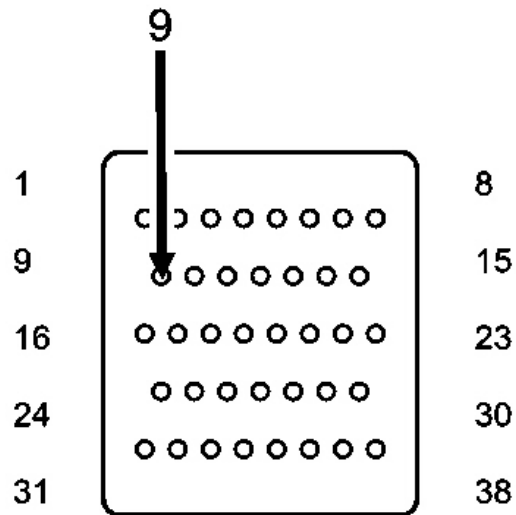
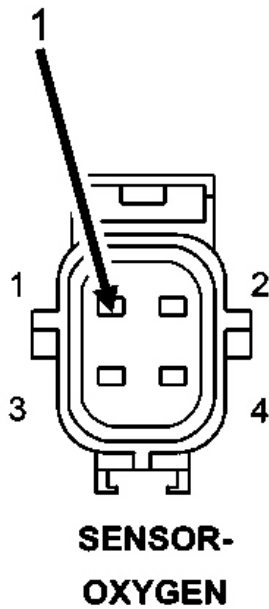
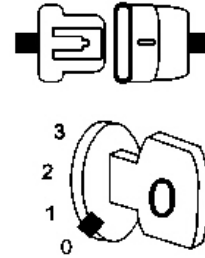
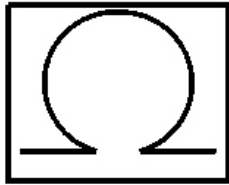
Go To 3.

No

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K299) O2 1/2 HEATER CONTROL CIRCUIT OPEN



**PCM PINOUT
BOX 8815**

81650c66

Fig. 62: Checking 02 Heater Control Circuit For Open
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K299) O2 1/2 Heater Control circuit from the O2 harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 0.5 of an ohm?

Yes

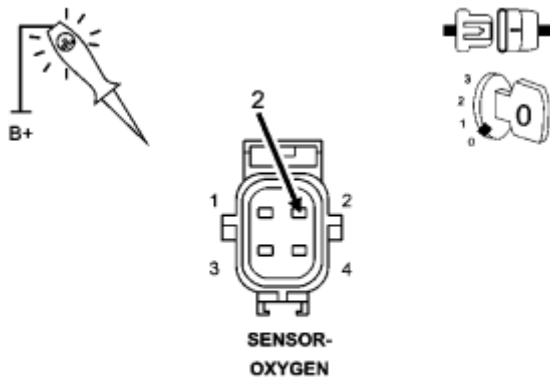
Go To 4.

No

Repair the excessive resistance in the (K299) O2 1/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (Z933) O2 1/2 HEATER GROUND CIRCUIT OPEN



81994b07

Fig. 63: Checking O2 Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12 volt test light connected to 12 volts, check the (Z933) Ground circuit in the 1/2 Oxygen Sensor harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go To 5.

No

Repair the excessive resistance in the (Z933) O2 1/2 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0151-O2 SENSOR 2/1 CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the engine running, battery voltage greater than 10.4 volts, and no O2 sensor heater DTCs present.

SET CONDITIONS

• Set Condition:

The PCM detects that the 2/1 Oxygen Sensor signal voltage is below approximately 1.5 volts for 2.8 seconds after engine startup. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND
(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO GROUND
(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO THE (K902) O2 RETURN UPSTREAM CIRCUIT
(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO THE (Z933) HEATER GROUND CIRCUIT
2/1 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With a scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K43) O2 2/1 SIGNAL CIRCUIT**

Turn the ignition off.

Disconnect the 2/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 2/1 O2 Sensor voltage.

Is the O2 Sensor voltage between 4.1 and 5.0 volts?

Yes

Go To 3.

No

Go To 5.

3. **O2 SENSOR**

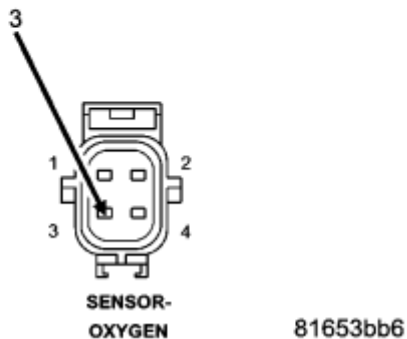


Fig. 65: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

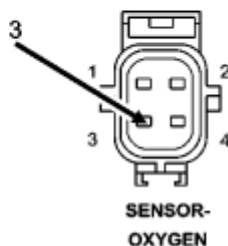
Verify that there is good pin to terminal contact in the Sensor and Control Module connectors. If OK, replace the 2/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 66: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Measure the resistance between ground and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

5. **(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO GROUND**

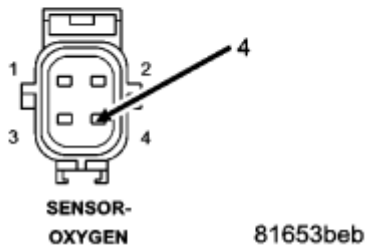


Fig. 67: Checking O2 Sensor 1/1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K43) O2 2/1 Signal circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K43) O2 2/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO THE (K902) O2 RETURN UPSTREAM CIRCUIT**

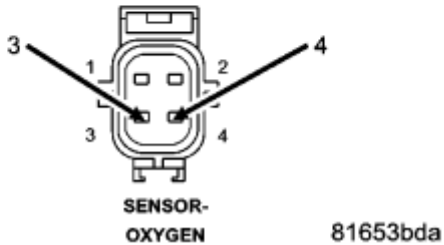


Fig. 68: Checking O2 Sensor 1/1 Signal Circuit For Short To Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K43) O2 2/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

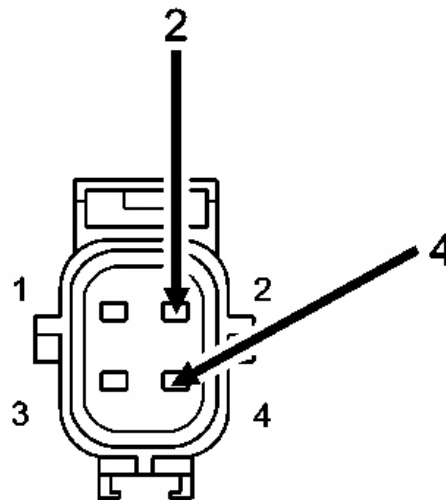
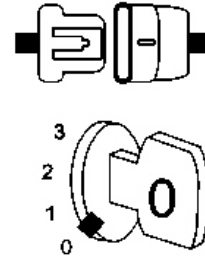
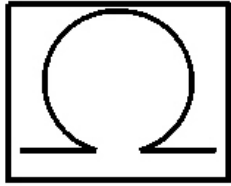
Repair the short between the (K902) O2 Return Upstream circuit and the (K43) O2 2/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. (K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO THE (Z933) HEATER GROUND CIRCUIT



**SENSOR-
OXYGEN**

81653bca

Fig. 69: Checking O2 Sensor 1/1 Signal Circuit For Short To Heater Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K43) O2 2/1 Signal circuit and the (Z933) O2 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (Z933) O2 Heater ground circuit and the (K43) O2 2/1 Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

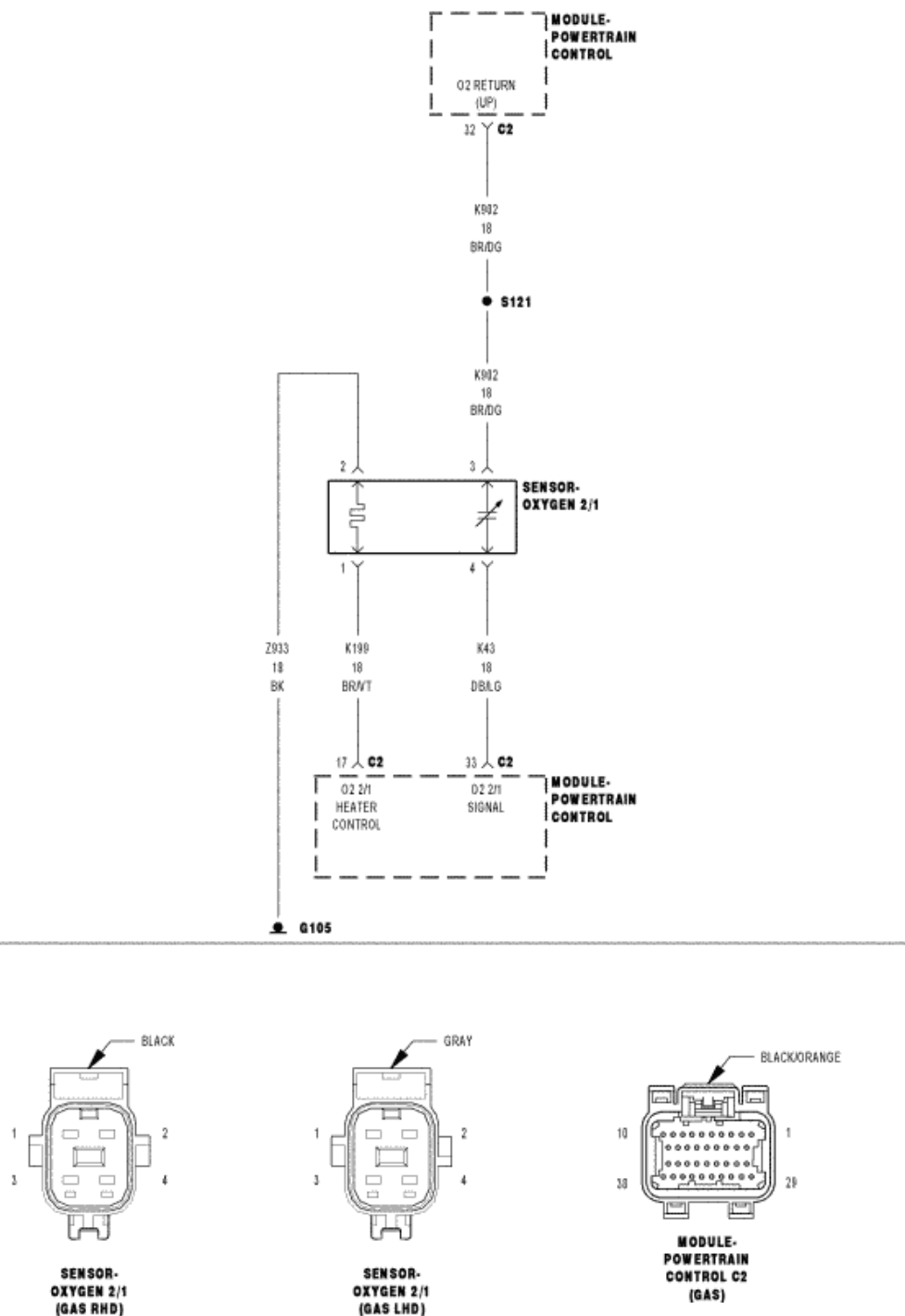
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0152-O2 SENSOR 2/1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01963670

Fig. 70: O2 Sensor 2/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the engine running, no O2 sensor heater DTCs present, 2/1 Oxygen Sensor heater temperature within a specific range, and battery voltage greater than 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the 2/1 Oxygen Sensor voltage is greater than the maximum acceptable value for a specific amount of time, based on O2 sensor heater temperature. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO VOLTAGE (K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO VOLTAGE (K43) O2 2/1 SIGNAL CIRCUIT OPEN (K902) O2 RETURN UPSTREAM CIRCUIT OPEN 2/1 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If an O2 sensor signal circuit is shorted to voltage, all O2 sensor voltage readings displayed on the scan tool will be approximately 5.0 volts. Diagnose the sensor that set the most current DTC.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the status Active for this DTC?

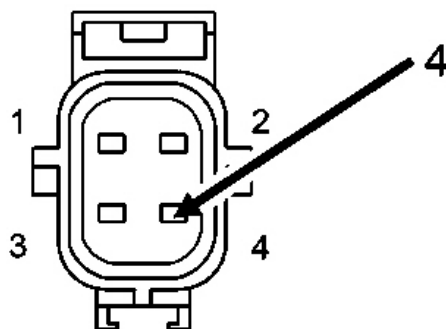
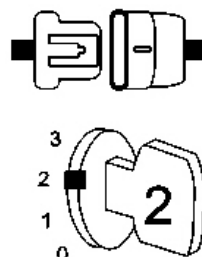
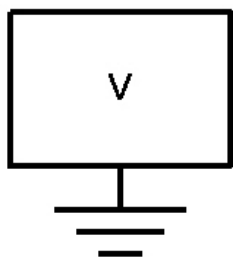
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K43) O2 2/1 SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c72

Fig. 71: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Disconnect the 2/1 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K43) O2 Sensor 2/1 Signal circuit in the 2/1 O2 Sensor harness connector.

NOTE: Measure the voltage in reference to ground, not the (K902) O2 Return Upstream circuit.

Is there any voltage present?

Yes

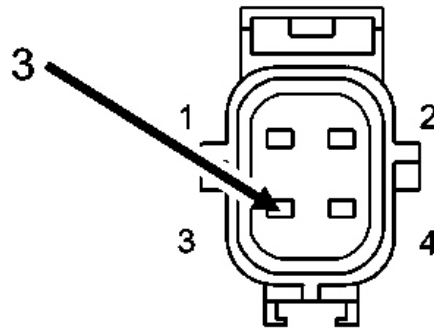
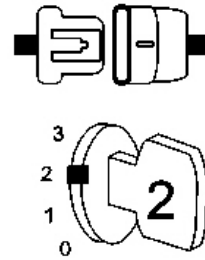
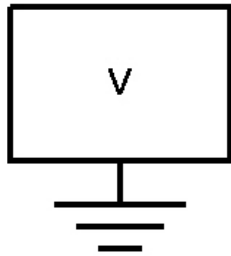
Repair the short to voltage in the (K43) O2 Sensor 2/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K902) O2 RETURN UPSTREAM CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c98

Fig. 72: Checking O2 Sensor Return Upstream & Downstream Circuits
 Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the 2/1 O2 Sensor harness connector.

Is there any voltage present?

Yes

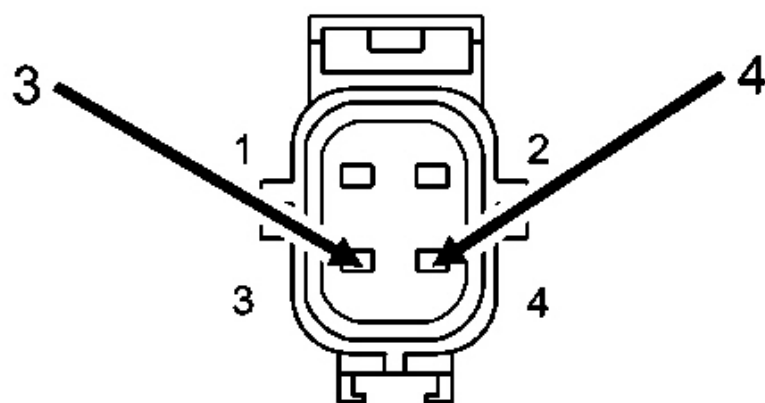
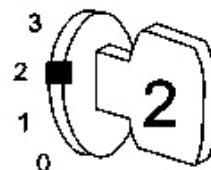
Repair the short to voltage in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. O2 SENSOR



**SENSOR-
OXYGEN**

81653cbb

Fig. 73: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C1 and C2 PCM harness connectors.

Ignition on, engine not running.

With a scan tool, monitor the 2/1 O2 Sensor voltage.

Connect a jumper wire between the (K43) O2 2/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage between 2.3 and 2.7 volts with the jumper wire in place?

Yes

Verify that there is good pin to terminal contact in the Sensor and Control Module connectors. If OK, replace the O2 Sensor.

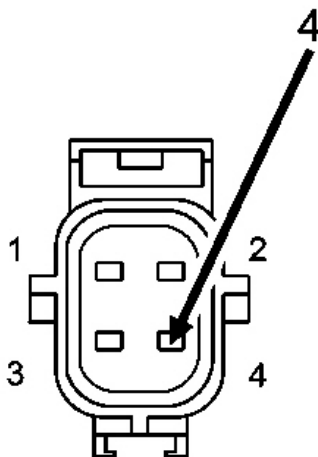
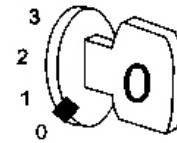
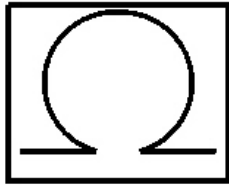
Perform **POWERTRAIN VERIFICATION TEST** .

No

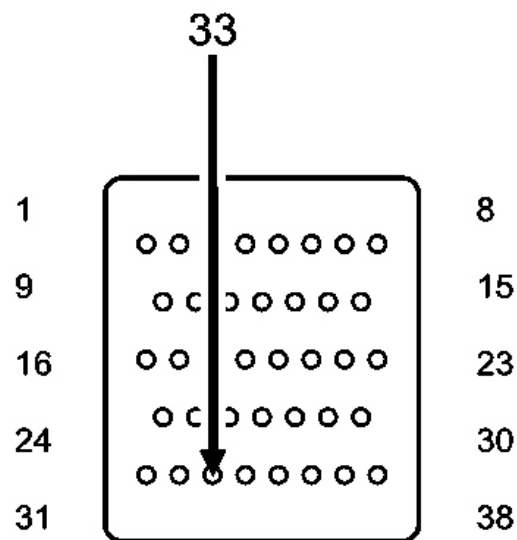
Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K43) O2 2/1 SIGNAL CIRCUIT OPEN



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

816546f2

Fig. 74: Checking O2 2/1 Signal Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K43) O2 2/1 Signal circuit from the 2/1 O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

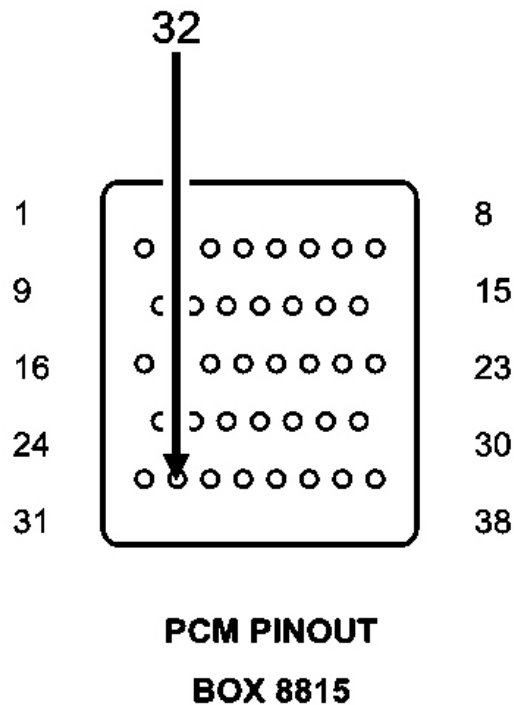
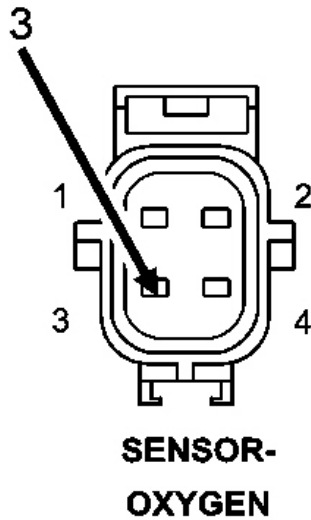
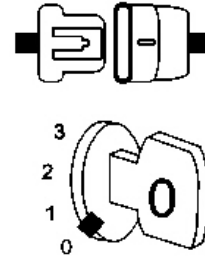
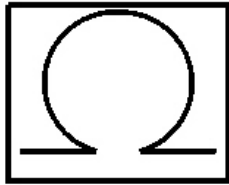
Go To 6.

No

Repair the open in the (K43) O2 2/1 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K902) O2 RETURN UPSTREAM CIRCUIT OPEN



81653d27

Fig. 75: Checking O2 Sensor Return Upstream Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K902) O2 Return Upstream circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K902) O2 Return Upstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

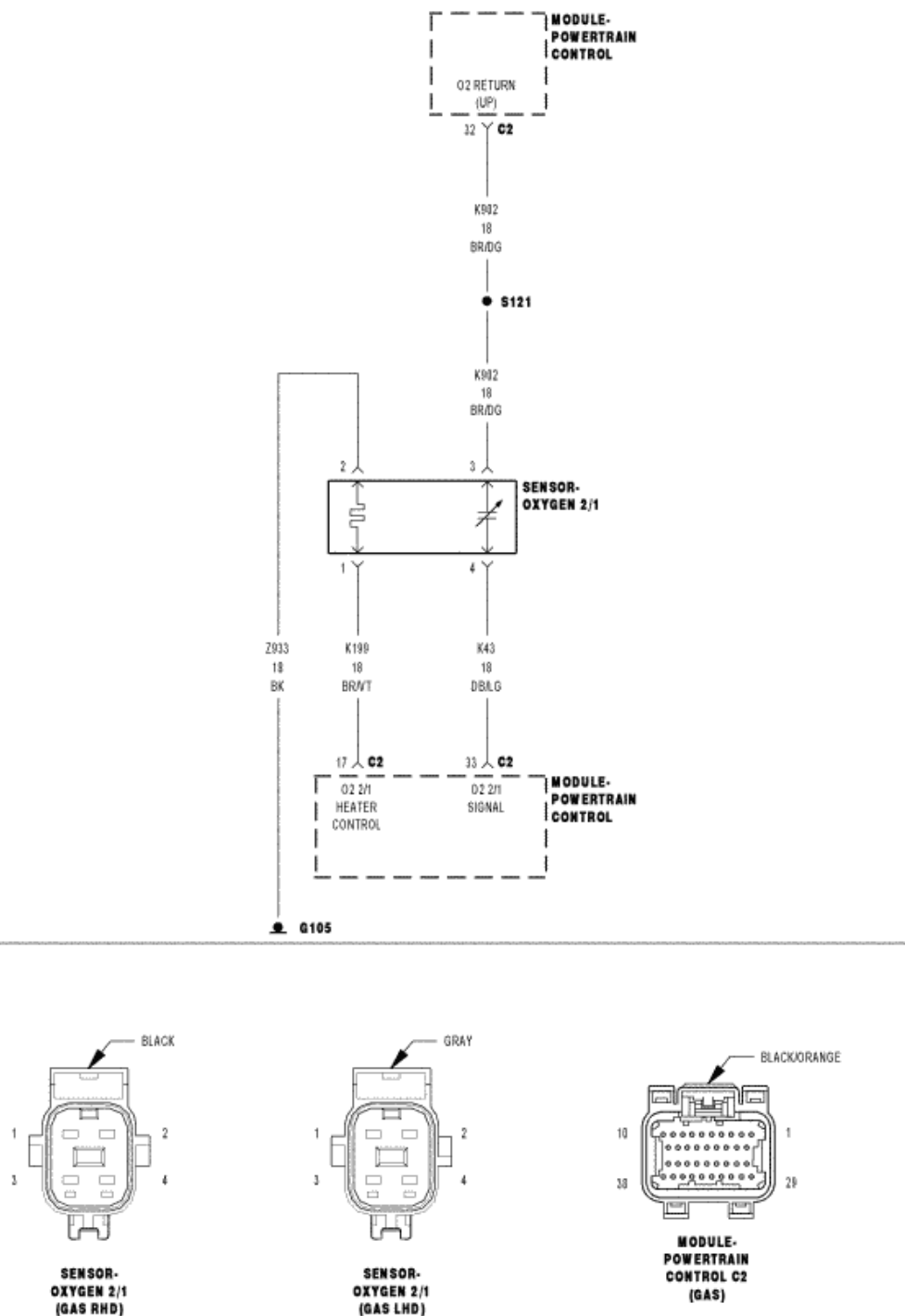
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0153-O2 SENSOR 2/1 SLOW RESPONSE

CIRCUIT SCHEMATIC



01963670

Fig. 76: O2 Sensor 2/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

For an aged O2 sensor, the response rate to the air/fuel change is slower than when it was new. The O2 sensor tends to move less with the same air/fuel changes in a given time frame. Therefore by observing the activity of voltage readings from the upstream O2 sensor, the quality of the O2 sensor can be detected.

MONITOR CONDITIONS

When Monitored:

With the ECT above 70 °C (158 °F), engine RPM between 1400 and 2300, vehicle speed between 64 and 96 kph (40 and 60 mph), and engine run time greater than 3 minutes.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the oxygen sensor signal does not switch adequately during monitoring. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K43) O2 2/1 SIGNAL CIRCUIT (K902) O2 RETURN UPSTREAM CIRCUIT 2/1 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

- NOTE:

Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.
- NOTE:

After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear

loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

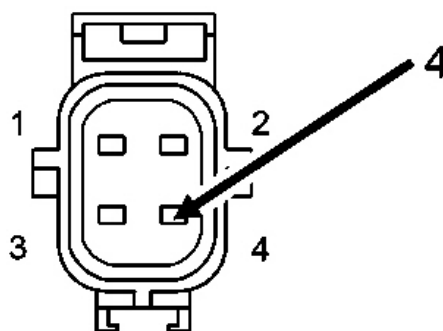
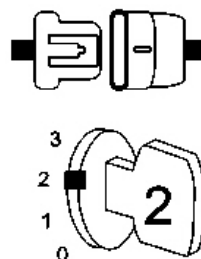
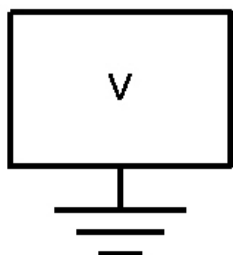
Yes

Repair or replace the leaking exhaust parts as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K43) O2 2/1 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Turn the ignition off

Disconnect the O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K43) O2 2/1 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

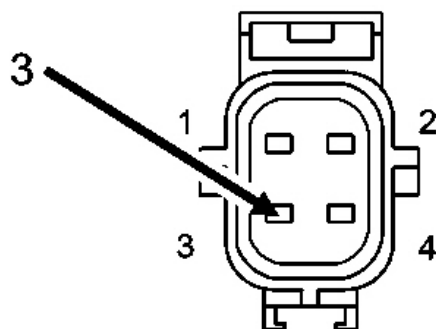
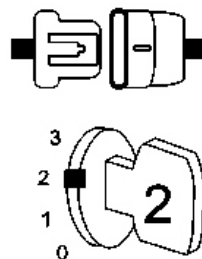
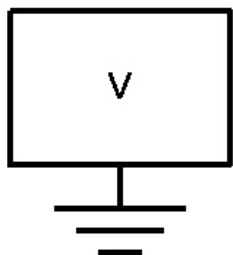
Go To 4.

No

Check the (K43) O2 2/1 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K902) O2 RETURN UPSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 78: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K902) O2 Return Upstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. 2/1 OXYGEN SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 2/1 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

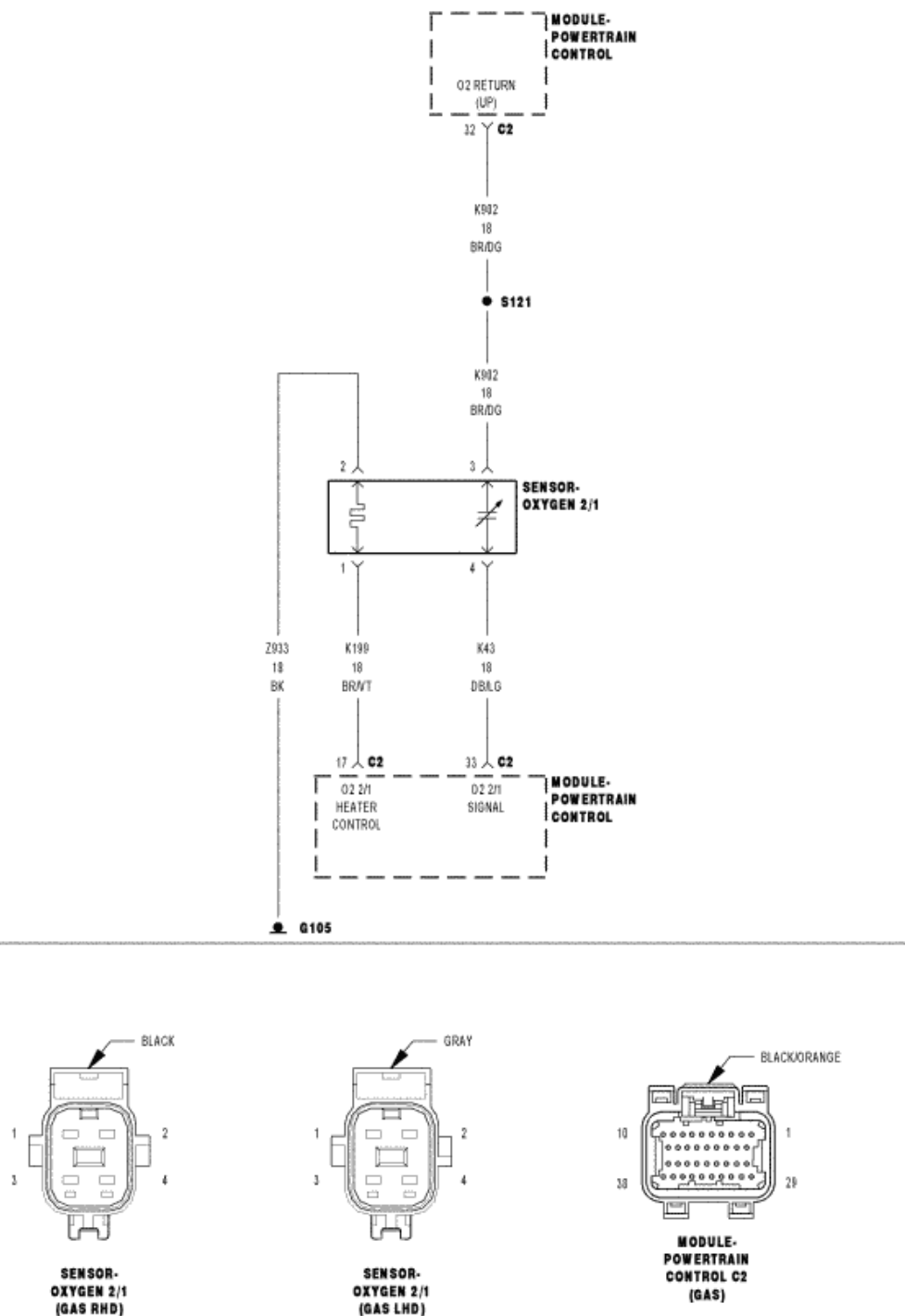
Repair

Replace the 2/1 O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P0155-O2 SENSOR 2/1 HEATER PERFORMANCE

CIRCUIT SCHEMATIC



01963670

Fig. 79: O2 Sensor 2/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This diagnostic provides a continuous check of the O2 heater circuit during operation. The heater circuit is momentarily disabled to allow a resistance measurement to be taken to infer heater temperature. The current delivery to the heater is duty cycled to maintain a specific target temperature. The error from the target temperature is continuously monitored to assess heater performance.

MONITOR CONDITIONS

When Monitored:

Continuously during O2 sensor heater operation with battery voltage between 10.4 and 15.75 volts and no O2 sensor circuit DTCs present.

SET CONDITIONS

- **Set Condition:**

The PCM detects no temperature change in the O2 sensor heater element when the heater circuit is active. The heater temperature is obtained by measuring the heater resistance and calculating the heater temperature. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K199) O2 2/1 HEATER CONTROL CIRCUIT OPEN (Z933) O2 HEATER GROUND CIRCUIT OPEN 2/1 O2 SENSOR HEATER POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: **Wait a minimum of 8 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize between 4.6 and 5.0 volts.**

Ignition on, engine not running.

With a scan tool, perform the 2/1 O2 Sensor Heater Test.

With the scan tool, monitor 2/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 SENSOR HEATER ELEMENT

Turn the ignition off.

NOTE: Allow the O2 sensor to cool down to room temperature.

Disconnect the 2/1 O2 Sensor harness connector.

Measure the resistance of the O2 Heater Element across the O2 Sensor connector between the O2 Heater Control terminal and the O2 Heater ground terminal.

NOTE: O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.

Is the resistance of the O2 Sensor Heater Element between 2.0 and 30.0 ohms?

Yes

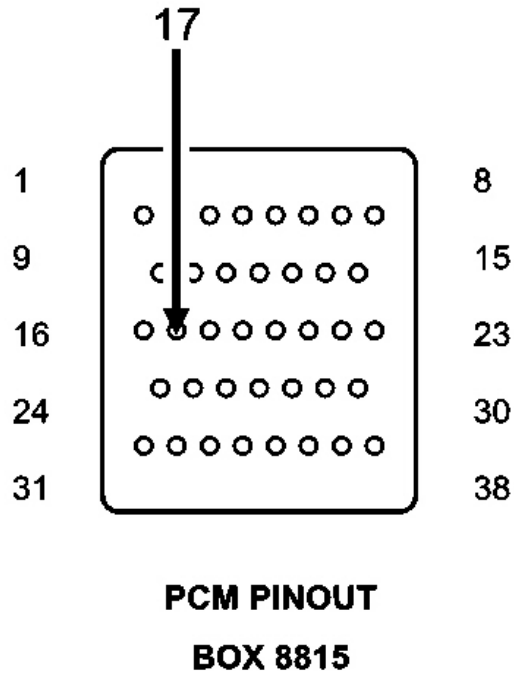
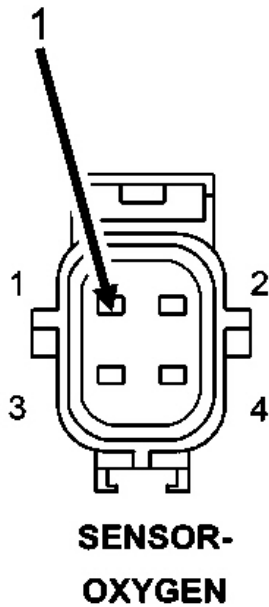
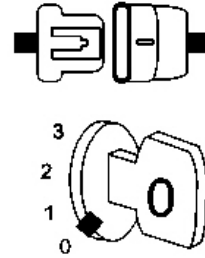
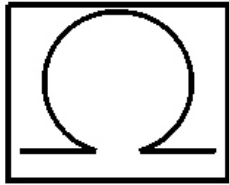
Go To 3.

No

Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the 2/1 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K199) O2 2/1 HEATER CONTROL CIRCUIT OPEN



81650c75

Fig. 80: Checking 02 2/1 Sensor Heater Control Circuit For Open
 Courtesy of CHRYSLER LLC

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K199) O2 2/1 Heater Control circuit from the O2 harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 0.5 of an ohm?

Yes

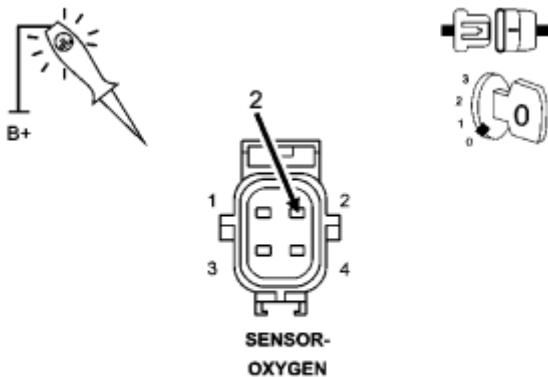
Go To 4.

No

Repair the excessive resistance in the (K199) O2 2/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (Z933) O2 SENSOR HEATER GROUND CIRCUIT OPEN



81994b07

Fig. 81: Checking O2 Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12 volt test light connected to 12 volts, check the (Z933) Ground circuit in the 2/1 Oxygen Sensor harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go To 5.

No

Repair the excessive resistance in the (Z933) O2 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/1 Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

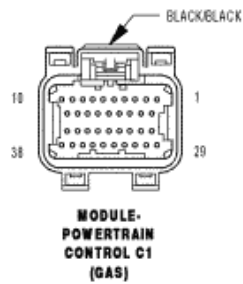
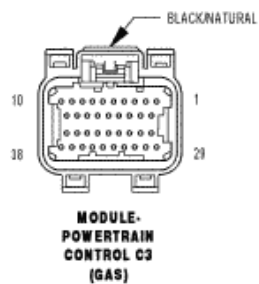
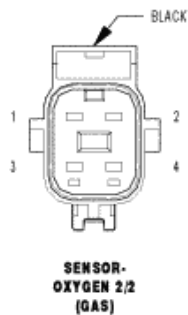
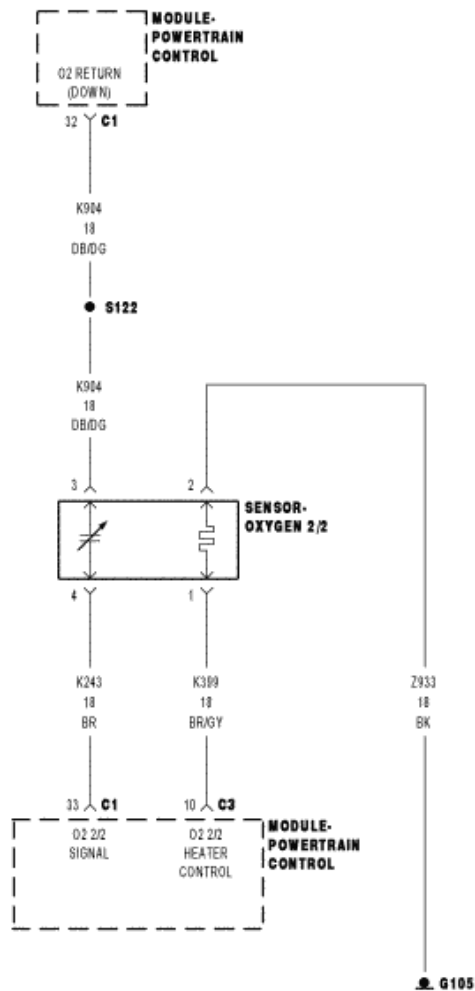
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0157-O2 SENSOR 2/2 CIRCUIT LOW

CIRCUIT SCHEMATIC



01962075

Fig. 82: O2 Sensor 2/2 Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the engine running, battery voltage greater than 10.4 volts, and no O2 sensor heater DTCs present.

SET CONDITIONS

• Set Condition:

The PCM detects that the 2/2 Oxygen Sensor signal voltage is below approximately 1.5 volts for 2.8 seconds after engine startup. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND
(K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO GROUND
(K243) O2 SIGNAL CIRCUIT SHORTED TO THE (K904) O2 RETURN DOWNSTREAM CIRCUIT
(K243) O2 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 2/2 HEATER GROUND CIRCUIT
2/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With a scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K243) O2 2/2 SIGNAL CIRCUIT

Turn the ignition off.

Disconnect the 2/2 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 2/2 O2 Sensor voltage.

Is the O2 Sensor voltage between 4.1 and 5.0 volts?

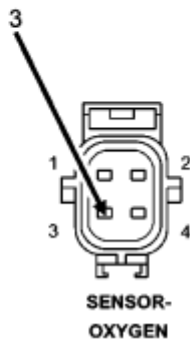
Yes

Go To 3.

No

Go To 5.

3. O2 SENSOR



SENSOR-
OXYGEN

81653bb6

Fig. 83: Checking O2 Sensor Return Downstream/Upstream Circuit Voltage
Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

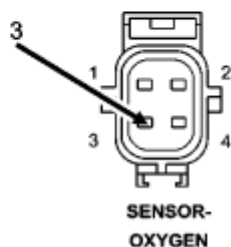
Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the 2/2 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO GROUND



81653c09

Fig. 84: Checking O2 Return Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

5. **(K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO GROUND**

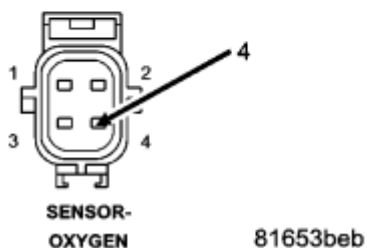


Fig. 85: Checking O2 Sensor 1/1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 and C2 PCM harness connectors.

Measure the resistance between ground and the (K243) O2 2/2 Signal circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K243) O2 2/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO THE (K904) O2 RETURN DOWNSTREAM CIRCUIT**

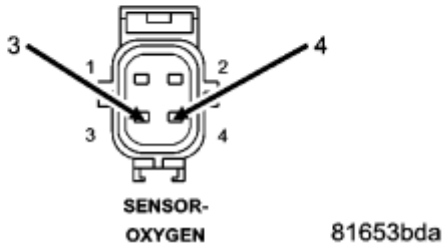


Fig. 86: Checking O2 Sensor 1/1 Signal Circuit For Short To Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K243) O2 2/2 Signal circuit and the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

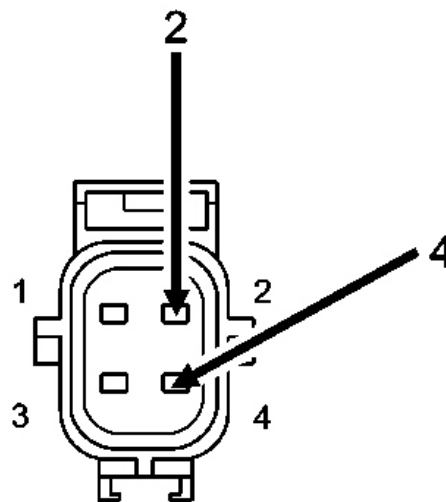
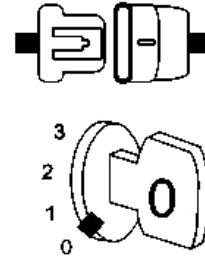
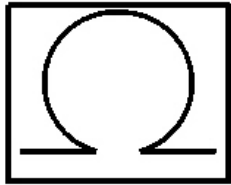
Repair the short between the (K904) O2 Return Downstream circuit and the (K243) O2 2/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. **(K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO THE (Z933) O2 2/2 HEATER GROUND CIRCUIT**



**SENSOR-
OXYGEN**

81653bca

Fig. 87: Checking O2 Sensor 1/1 Signal Circuit For Short To Heater Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K243) O2 2/2 Signal circuit and the (Z933) O2 2/2 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (Z933) O2 2/2 Heater ground circuit and the (K243) O2 2/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/2 Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

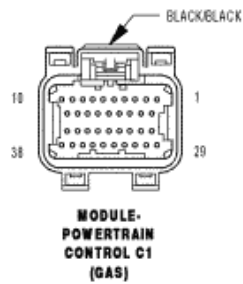
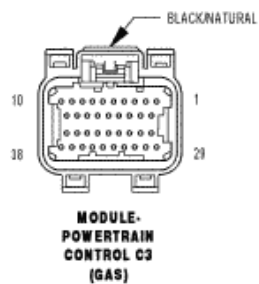
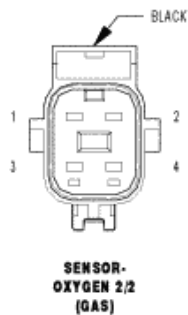
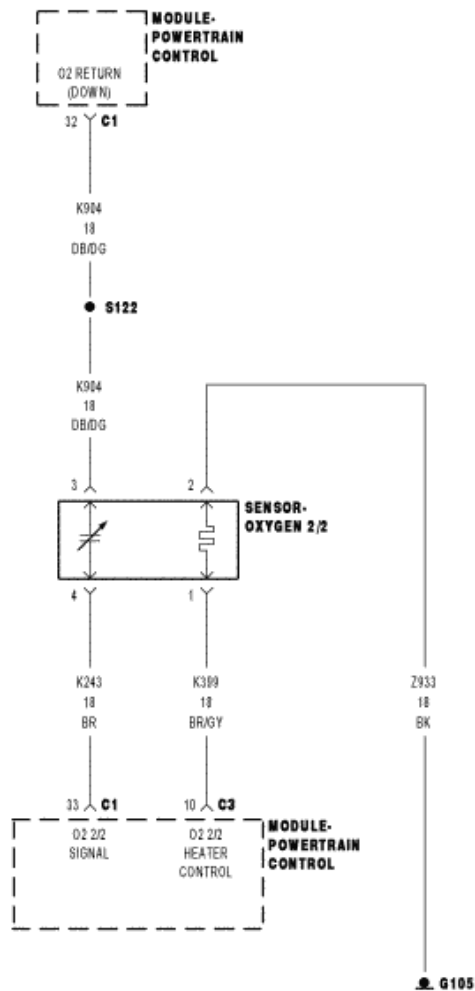
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0158-O2 SENSOR 2/2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01962075

Fig. 88: O2 Sensor 2/2 Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously with the engine running, no O2 sensor heater DTCs present, 2/2 Oxygen Sensor heater temperature within a specific range, and battery voltage greater than 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the 2/2 Oxygen Sensor voltage is greater than the maximum acceptable value for a specific amount of time, based on O2 sensor heater temperature. The DTC will set as Pending after one trip and Active after two trips. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO VOLTAGE
(K243) O2 2/2 SIGNAL CIRCUIT OPEN
(K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN
2/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: If an O2 sensor signal circuit is shorted to voltage, all O2 sensor voltage readings displayed on the scan tool will be approximately 5.0 volts. Diagnose the sensor that set the most current DTC.

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the status Active for this DTC?

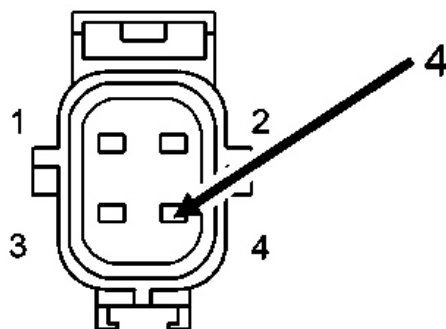
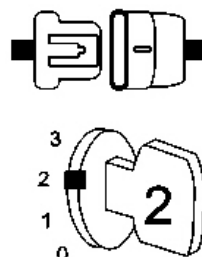
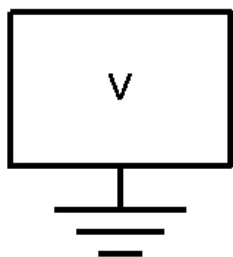
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. (K243) O2 2/2 SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c72

Turn the ignition off.

Disconnect the C1 PCM harness connector.

Disconnect the 2/2 O2 Sensor harness connector.

Turn the ignition on.

Measure the voltage on the (K243) O2 Sensor 2/2 Signal circuit in the O2 Sensor harness connector.

NOTE: Measure the voltage in reference to ground, not the (K904) O2 Return Downstream circuit.

Is there any voltage present?

Yes

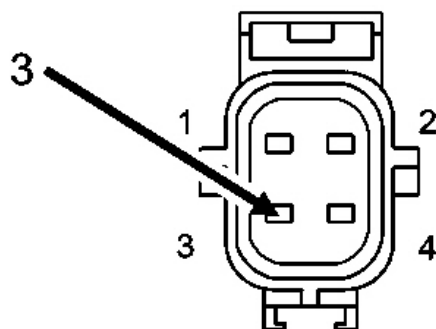
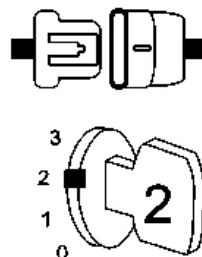
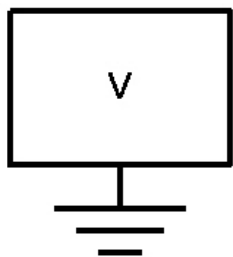
Repair the short to voltage in the (K243) O2 Sensor 2/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K904) O2 RETURN DOWNSTREAM CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
OXYGEN**

81653c98

Fig. 90: Checking O2 Sensor Return Upstream & Downstream Circuits

Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the 2/2 O2 Sensor harness connector.

Is there any voltage present?

Yes

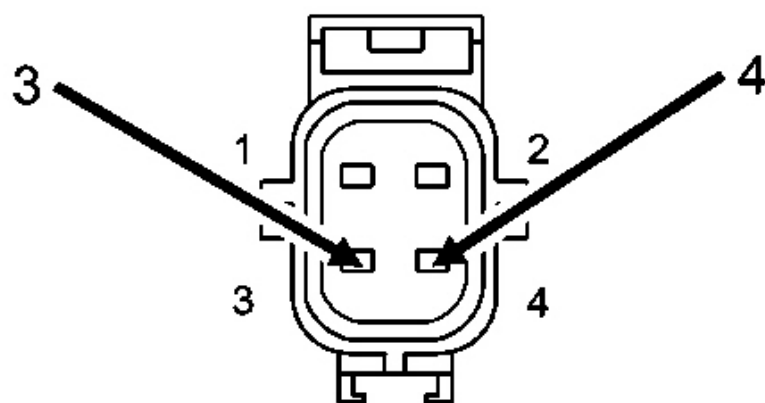
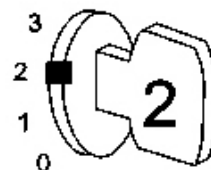
Repair the short to battery voltage in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. O2 SENSOR



**SENSOR-
OXYGEN**

81653cbb

Fig. 91: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C1 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 2/2 O2 Sensor voltage.

Connect a jumper wire between the (K243) O2 2/2 Signal circuit and the (K904) O2 Return Downstream circuit in the 2/2 O2 Sensor harness connector.

Is the voltage between 2.3 and 2.7 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the 2/2 O2 Sensor.

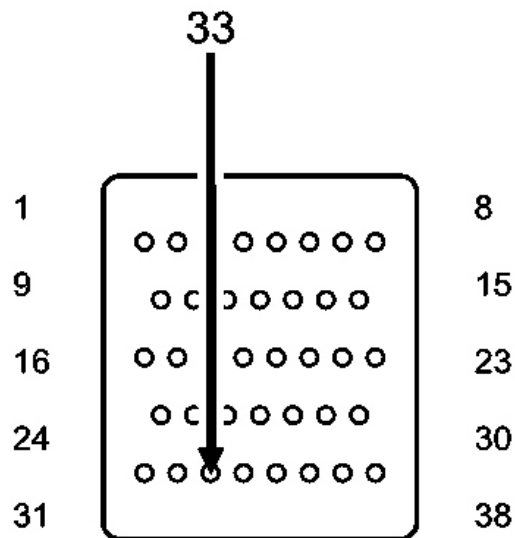
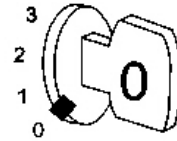
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. (K243) O2 2/2 SIGNAL CIRCUIT OPEN



PCM PINOUT
BOX 8815

Fig. 92: Checking O2 2/2 Sensor Signal Circuit For Open
Courtesy of CHRYSLER LLC

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K243) O2 2/2 Signal circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

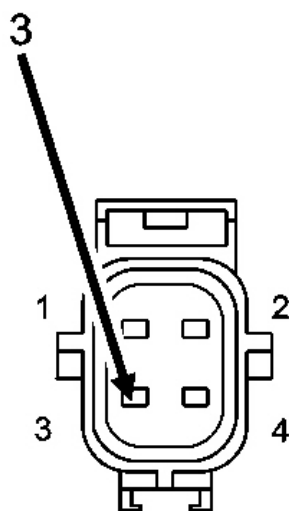
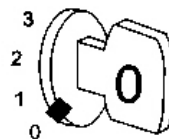
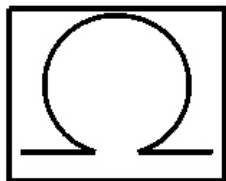
Go To 6.

No

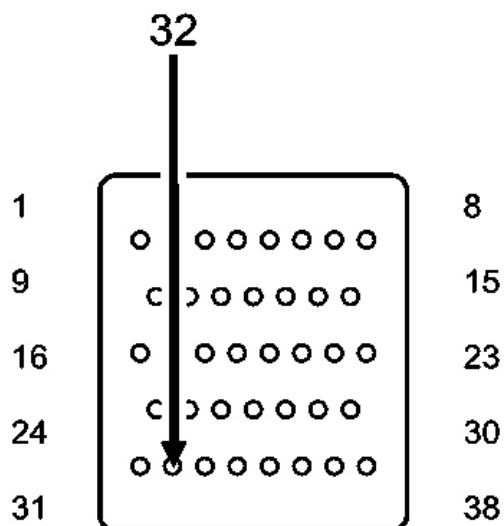
Repair the open in the (K243) O2 2/2 Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K904) O2 RETURN DOWNSTREAM CIRCUIT OPEN



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

816544d2

Fig. 93: Checking O2 Return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K904) O2 Return Downstream circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K904) O2 Return Downstream circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

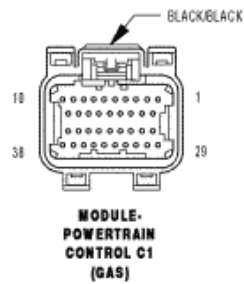
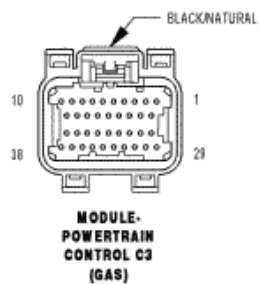
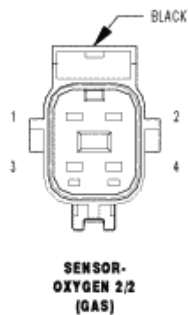
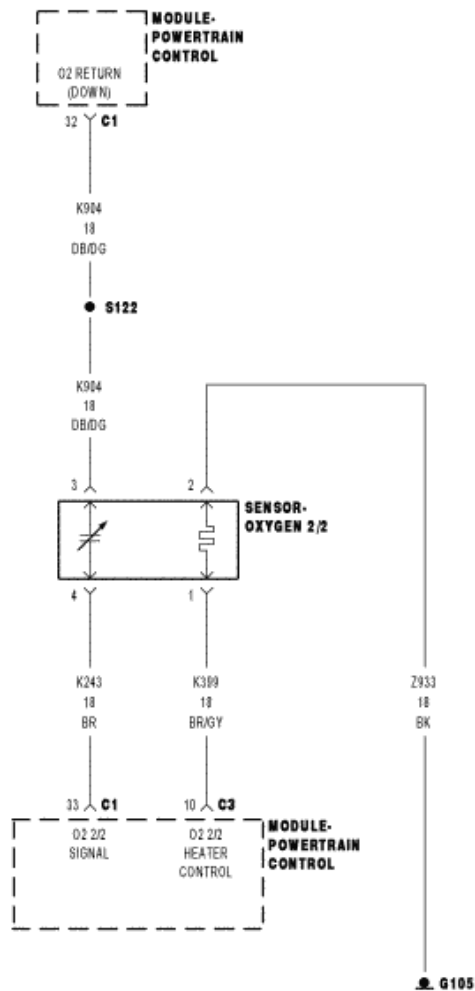
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0159-O2 SENSOR 2/2 SLOW RESPONSE

CIRCUIT SCHEMATIC



01962075

Fig. 94: O2 Sensor 2/2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The downstream O2 Sensor is located in the exhaust path behind the catalytic converter, is monitored for proper response to assure optimum catalytic converter efficiency. The downstream O2 response monitor is intended to diagnose a downstream O2 sensor that is not moving or stuck in a voltage window and to insure accurate information for catalyst monitor diagnosis.

MONITOR CONDITIONS

When Monitored:

Vehicle is started and driven between 32 and 88.5 km/h (20 and 55 mph) with the Throttle open for a minimum of 120 seconds. Coolant greater than 70° C (158° F). Catalytic Converter Temp greater than 600° C (1112° F) and EVAP Purge is active.

SET CONDITIONS

- **Set Condition:**

The oxygen sensor signal voltage switches less than 16 times from lean to rich within 20 seconds during monitoring. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXHAUST LEAK (K243) O2 2/2 SIGNAL CIRCUIT (K904) O2 RETURN DOWNSTREAM CIRCUIT 2/2 O2 SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: Check for contaminants that may have damaged the O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor

- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

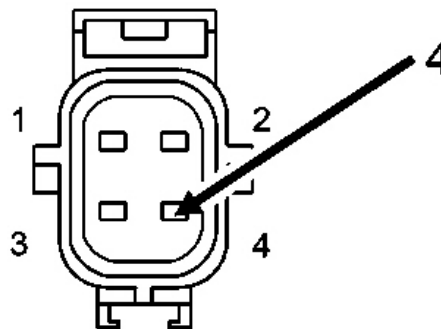
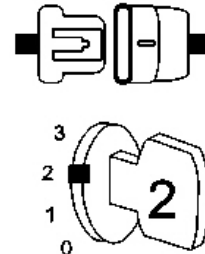
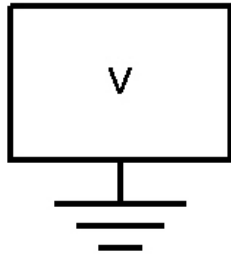
Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K243) O2 2/2 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 95: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off

Disconnect the 2/2 O2 Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K243) O2 2/2 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

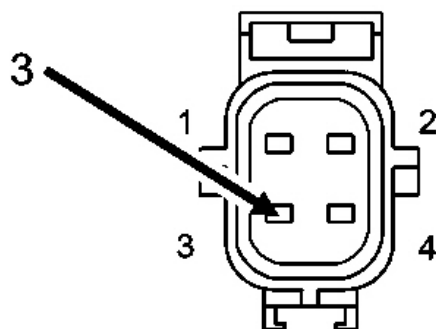
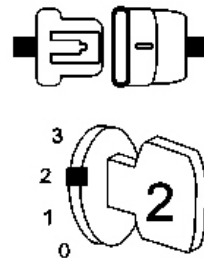
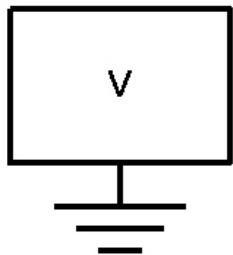
Go To 4.

No

Check the (K243) O2 2/2 Signal circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K904) O2 RETURN DOWNSTREAM CIRCUIT



**SENSOR-
OXYGEN**

81653c98

Fig. 96: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K904) O2 Return Downstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 5.

No

Check the (K904) O2 Return Downstream circuit for a short to ground, open, or short to voltage. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

5. 2/2 OXYGEN SENSOR

NOTE: **Check for signs of contaminants that may have damaged the O2 Sensor, such as contaminated fuel, unapproved silicone, oil and coolant.**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the 2/2 Oxygen Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

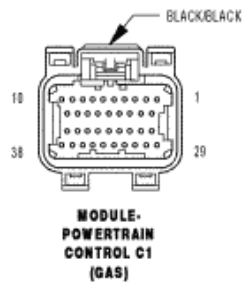
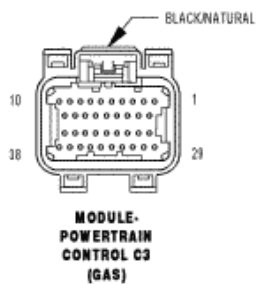
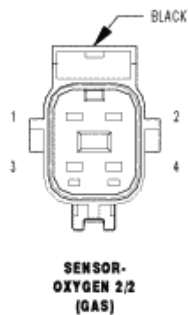
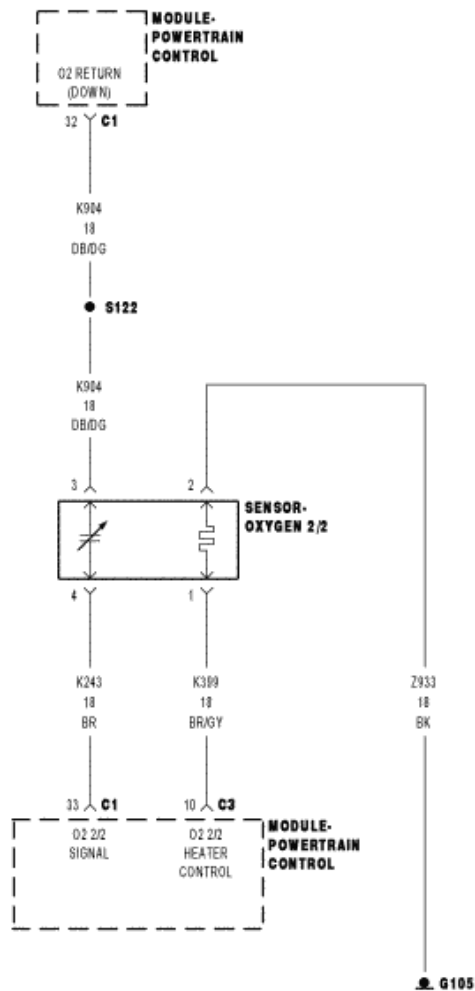
Repair

Replace the 2/2 O2 Sensor

Perform **POWERTRAIN VERIFICATION TEST** .

P0161-O2 SENSOR 2/2 HEATER PERFORMANCE

CIRCUIT SCHEMATIC



01962075

Fig. 97: O2 Sensor 2/2 Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

This diagnostic provides a continuous check of the O2 heater circuit during operation. The heater circuit is momentarily disabled to allow a resistance measurement to be taken to infer heater temperature. The current delivery to the heater is duty cycled to maintain a specific target temperature. The error from the target temperature is continuously monitored to assess heater performance.

MONITOR CONDITIONS

When Monitored:

Continuously during O2 sensor heater operation with battery voltage between 10.4 and 15.75 volts and no O2 sensor circuit DTCs present.

SET CONDITIONS

- **Set Condition:**

The PCM detects no temperature change in the O2 sensor heater element when the heater circuit is active. The heater temperature is obtained by measuring the heater resistance and calculating the heater temperature. Two trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K399) O2 2/2 HEATER CONTROL CIRCUIT OPEN (Z933) O2 2/2 HEATER GROUND CIRCUIT OPEN 2/2 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: **Wait a minimum of 8 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize between 4.6 and 5.0 volts.**

Ignition on, engine not running.

With a scan tool, perform the 2/2 O2 Sensor Heater Test.

With a scan tool, monitor 2/2 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 SENSOR HEATER ELEMENT

Turn the ignition off.

NOTE: Allow the O2 sensor to cool down to room temperature.

Disconnect the 2/2 O2 Sensor harness connector.

Measure the resistance of the 2/2 O2 Heater Element, between the O2 Heater Control terminal and the O2 Heater ground terminal in the O2 Sensor connector.

NOTE: O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.

Is the resistance of the O2 Sensor Heater Element between 2.0 and 30.0 ohms?

Yes

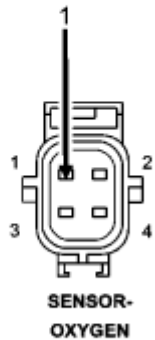
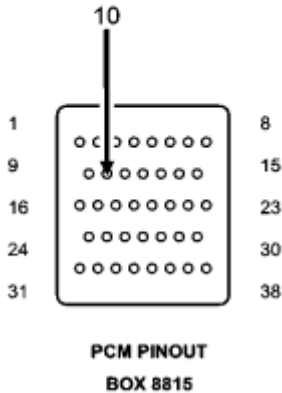
Go To 3.

No

Verify that there is good pin to terminal contact in the Oxygen Sensor and Powertrain Control Module connectors. If OK, replace the 2/2 O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K399) O2 2/2 HEATER CONTROL CIRCUIT OPEN



81a283c4

Fig. 98: Checking O2 2/2 Heater Control Circuit For Open Or Excessive Resistance
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K399) O2 2/2 Heater Control circuit from the O2 harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 0.5 of an ohm?

Yes

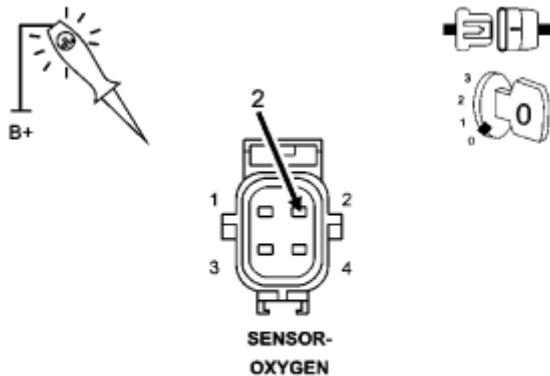
Go To 4.

No

Repair the excessive resistance in the (K399) O2 2/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (Z933) O2 2/2 HEATER GROUND CIRCUIT OPEN



81994b07

Fig. 99: Checking O2 Sensor Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12 volt test light connected to 12 volts, check the (Z933) Ground circuit in the 2/2 Oxygen Sensor harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go To 5.

No

Repair the excessive resistance in the (Z933) O2 2/2 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/2 Oxygen Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

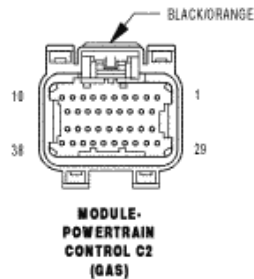
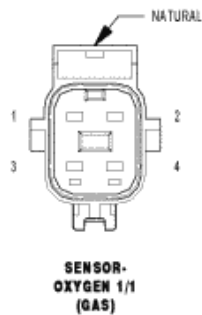
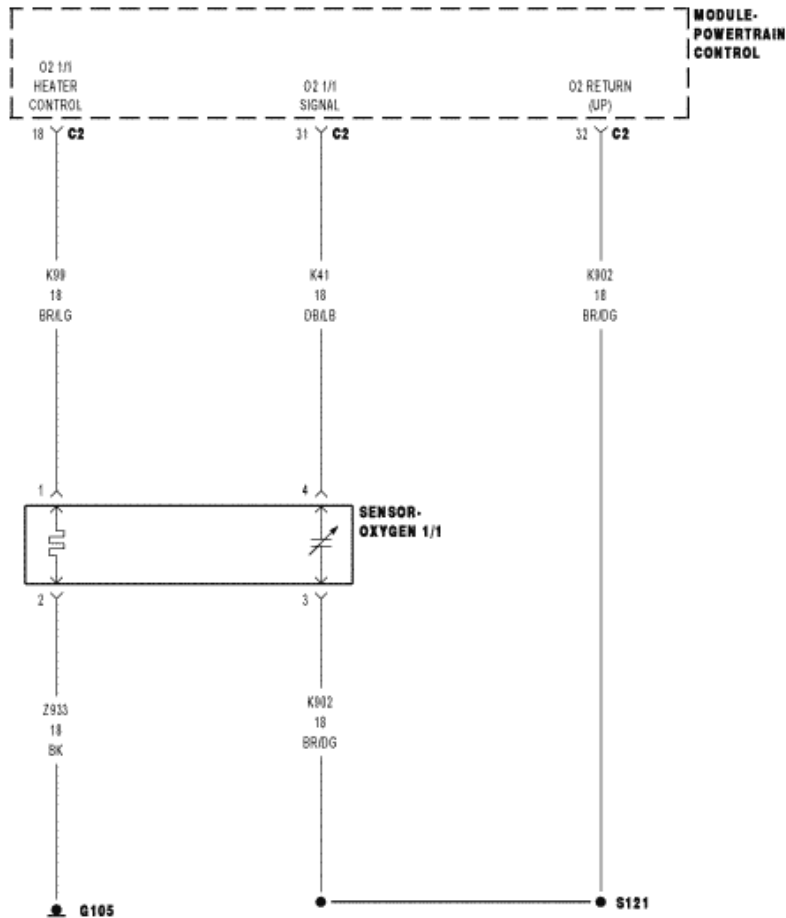
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0171-FUEL SYSTEM 1/1 LEAN

CIRCUIT SCHEMATIC



91902414

Fig. 100: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The fuel feedback system will maintain a stoichiometric fuel/air mixture, 14.7:1, by modifying the injector pulsewidth according to the oxygen content of the exhaust gas. The PCM makes short term and long term fuel corrections to maintain stoichiometric fuel/air ratio for best catalytic converter efficiency. Short term fuel correction is based on upstream O2 sensor output and is designed for quick engine response. The long term fuel correction compensated for variations in the engine specifications, sensor tolerances and component aging and is designed to correct rich and lean conditions over a longer period of time.

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- **Set Condition:**

If the PCM multiplies short term compensation by long term adaptive and a certain percentage is exceeded for two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored. Two Trip Fault. Three good trips to turn off the MIL

POSSIBLE CAUSES

Possible Causes
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL PUMP MODULE
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
O2 SENSOR
MAP SENSOR
ECT SENSOR
ENGINE MECHANICAL PROBLEM
FUEL FILTER/PRESSURE REGULATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Diagnose all other trouble codes before continuing.

NOTE: **Check for contaminants that may have damaged an O2 Sensor:**

contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST**.

Below Specification

Go To 13.

CAUTION: Stop All Actuations.

3. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor

- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground the scan tool will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.

NOTE: If one of the O2 Sensor Signal or Return circuits are shorted to voltage, the scan tool will display all O2 Sensor voltage readings high.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With a scan tool, monitor all of the O2 Sensor voltage readings.

Is the voltage switching between 2.5 and 3.4 volts for all the O2 Sensors?

Yes

Go To 5.

No

Go To 9.

5. 1/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Ignition on, engine not running.

With a scan tool, actuate the 1/1 O2 Heater Test.

With the scan tool, monitor 1/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 1/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. MAP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, read the Barometric Pressure.

NOTE: **The Barometric Pressure should be approximately equal to the actual barometric pressure. If necessary, compare the Barometric Pressure value of this vehicle to the value of a known good vehicle of a similar make and model.**

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: **If engine will not idle, maintain a constant RPM above idle.**

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading for MAP Vacuum within 1 inch of Hg on the Vacuum Gauge and is the Barometric Pressure reading of the vehicle the approximately the same as actual Barometric Pressure?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. Replace the MAP Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

7. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak)

Ignition on, engine not running.

With a scan tool, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and did it reach at least 182° C (180° F)?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. Replace the ECT Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

8. ENGINE MECHANICAL PROBLEM

Turn the ignition off.

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

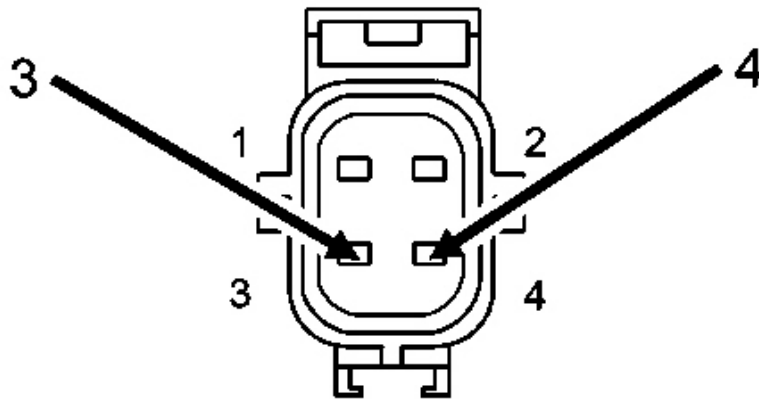
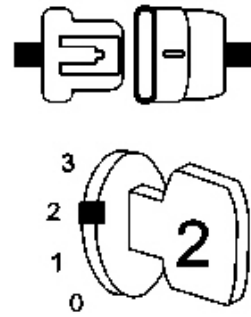
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

9. **1/1 O2 SENSOR**



**SENSOR-
OXYGEN**

81653cbb

Fig. 101: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 1/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K41) Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: The voltage should drop from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire in place.

Did the O2 Sensor voltage change from 5.0 volts to 2.5 volts with the jumper wire installed?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 1/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: Remove the jumper wire before continuing.

10. (K41) O2 SENSOR 1/1 SIGNAL CIRCUIT

With a scan tool, monitor the 1/1 O2 Sensor voltage reading with the jumper wire removed.

NOTE: The scan tool will display all O2 Sensor voltage readings approximately 5.0 volts when only one O2 Sensor's Signal circuit is shorted to voltage.

NOTE: The scan tool will display one O2 Sensor voltage close to zero and the others will read lower than normal when one O2 Sensor Signal circuit contains excessive resistance.

Is the voltage between 4.1 and 5.0 volts?

Yes

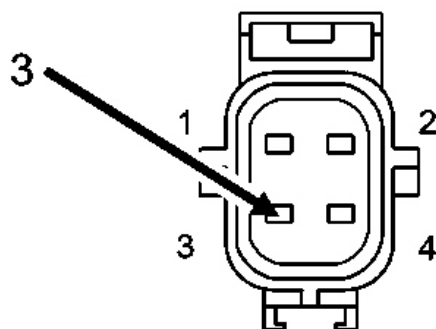
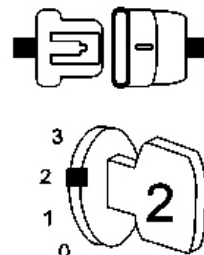
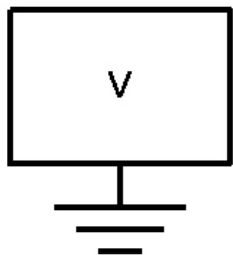
Go To 11.

No

Check the (K41) O2 Sensor 1/1 Signal circuit for a short to ground, open, or short to voltage.
Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K902) O2 RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 102: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Disconnect the 1/1 O2 Sensor harness connector.

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 12.

No

Check the O2 Return Upstream circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESTRICTED FUEL SUPPLY LINE**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special 5/16 fuel line adapter tool #6539 between disconnected fuel line and the fuel pump module.

Attach a fuel pressure test gauge to the T fitting on tool #6539.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

CAUTION: Stop All Actuations.

14. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. FUEL PUMP MODULE

If there are no possible causes remaining, view repair.

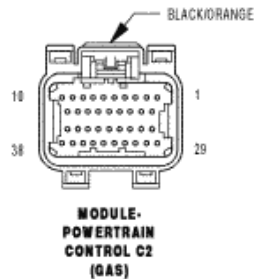
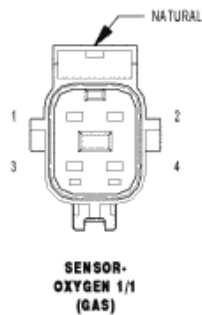
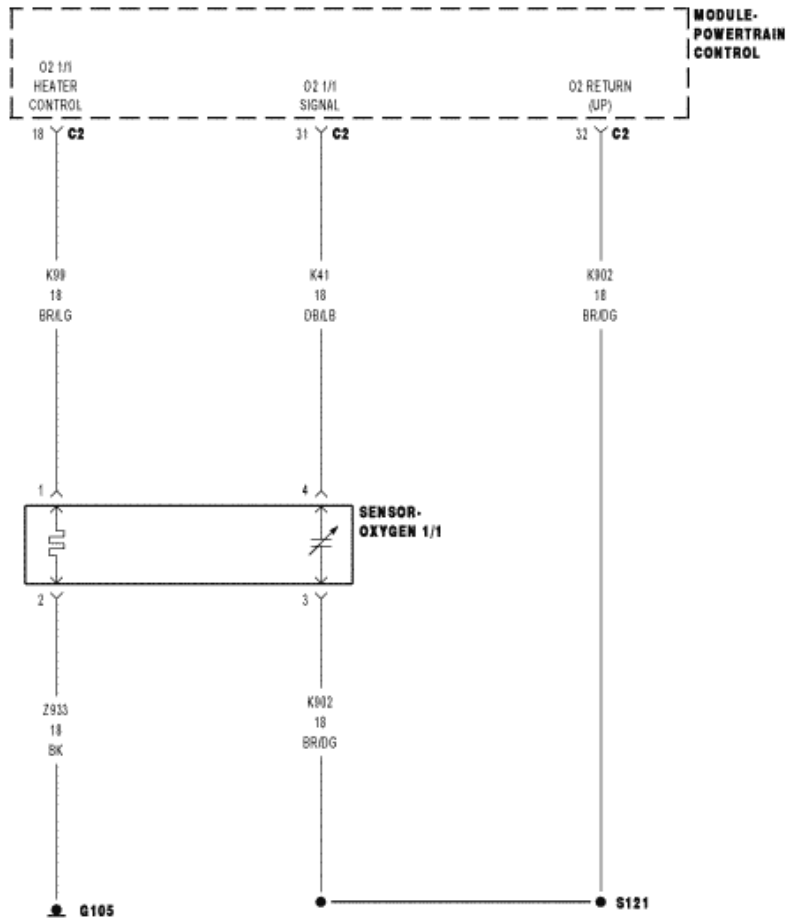
Repair

Verify that there is good pin to terminal contact in the Fuel Pump Module, TIPM, and Powertrain Control Module connectors. Replace the Fuel Pump Module if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

P0172-FUEL SYSTEM 1/1 RICH

CIRCUIT SCHEMATIC



91902414

Fig. 103: O2 Sensor 1/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The fuel feedback system will maintain a stoichiometric fuel/air mixture, 14.7:1, by modifying the injector pulse width according to the oxygen content of the exhaust gas. The PCM makes short term and long term fuel corrections to maintain stoichiometric fuel/air ratio for best catalytic converter efficiency. Short term fuel correction is based on upstream O2 sensor output and is designed for quick engine response. The long term fuel correction compensated for variations in the engine specifications, sensor tolerances and component aging and is designed to correct rich and lean conditions over a longer period of time.

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- **Set Condition:**

If the PCM multiplies short term compensation by long term adaptive and a purge fuel multiplier and the result is below a certain value for 30 seconds over two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
O2 SENSOR HEATER OPERATION
EVAP PURGE SOLENOID OPERATION
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
O2 SENSOR
MAP SENSOR
ECT SENSOR
ENGINE MECHANICAL PROBLEM
FUEL FILTER/PRESSURE REGULATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Diagnose all other trouble codes before continuing.

NOTE: **Check for contaminants that may have damaged an O2 Sensor:**
contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

CAUTION: Stop All Actuations.

3. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With the scan tool, monitor the 1/1 O2 Sensor voltage reading.

Is the voltage switching between 2.5 and 3.4 volts?

Yes

Go To 4.

No

Go To 9.

4. 1/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Ignition on, engine not running.

With the scan tool, perform the 1/1 O2 Heater Test.

With the scan tool, monitor the O2 Sensor voltage while performing the Heater test for at least 2 minutes.

Does the voltage stay above 4.5 volts during the Heater test?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 1/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. MAP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, read the Barometric Pressure.

NOTE: **The Barometric Pressure should be approximately equal to the actual barometric pressure. If necessary, compare the Barometric Pressure value of this vehicle to the value of a known good vehicle of a similar make and model.**

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: **If engine will not idle, maintain a constant RPM above idle.**

With a scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading for MAP Vacuum within 1 inch of Hg on the Vacuum Gauge and is the Barometric Pressure reading of the vehicle the approximately the same as actual Barometric Pressure?

Yes

Go To 6.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. Replace the MAP Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Remove the vacuum gauge before continuing.

6. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak)

Ignition on, engine not running.

With a scan tool, read the Engine Coolant Temperature Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the Engine Coolant Temperature value. The temp value change should be a smooth transition from start up to normal operating temp 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and reach at least 82° C (180° F)?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. Replace the Engine Coolant Temperature Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EVAP PURGE SOLENOID OPERATION

Turn the ignition off.

Disconnect the hoses at the Evap Purge Solenoid.

Using a hand vacuum pump, apply 10 inches of vacuum to the Evap Purge Solenoid vacuum source port on the component side.

Did the Evap Purge Solenoid hold vacuum?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the Solenoid and Powertrain Control Module connectors. Replace the Evap Purge Solenoid if no problems were found with the connectors.
Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Connect the vacuum hoses before continuing.

8. ENGINE MECHANICAL PROBLEM

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from restrictions.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

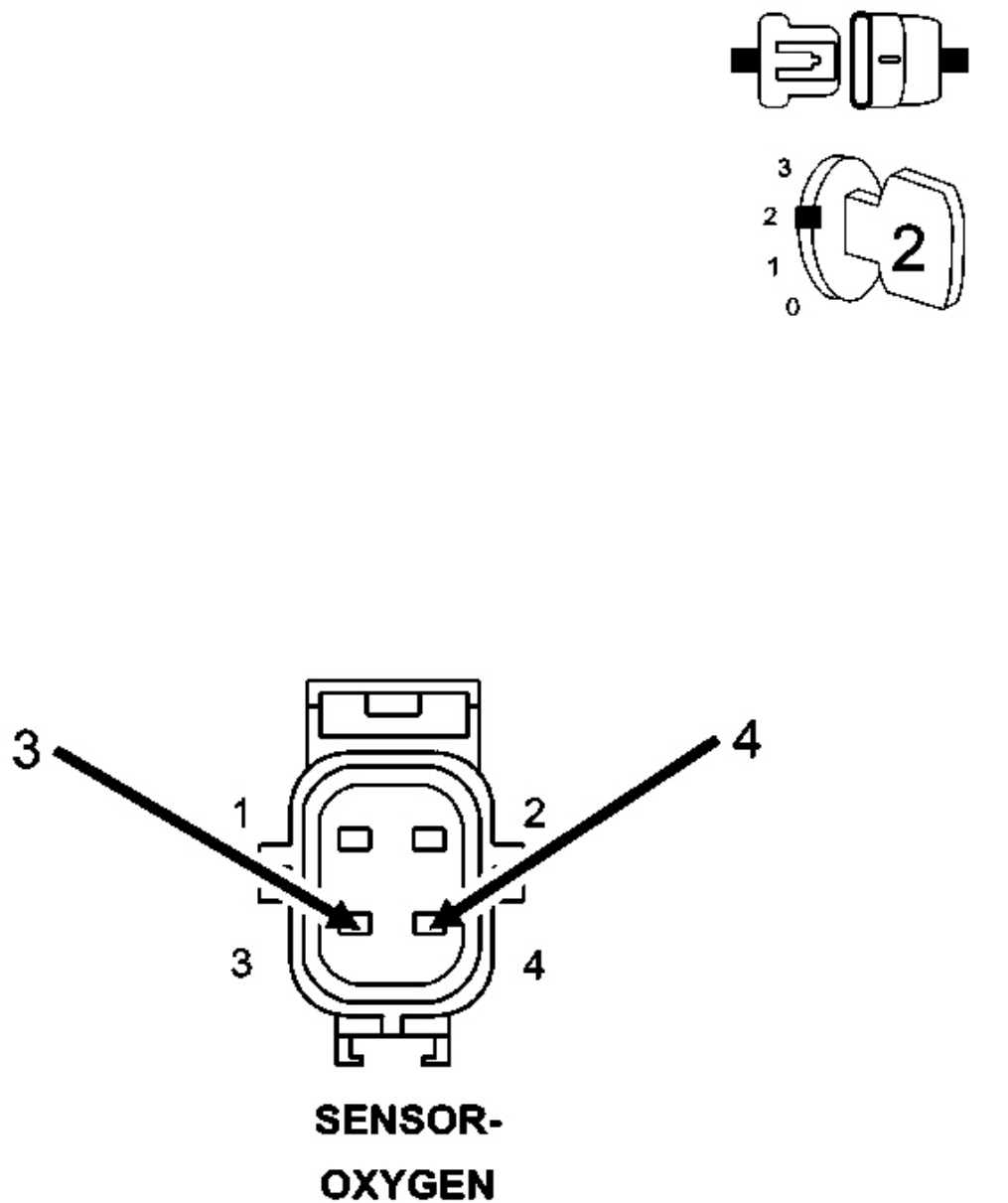
Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

9. 1/1 O2 SENSOR



81653cbb

Fig. 104: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 1/1 O2 Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the 1/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K41) O2 Sensor 1/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: The voltage should drop from between 4.1 and 5.0 volts down to 2.5 volts with the jumper wire connected.

Did the O2 Sensor voltage drop from between 4.1 and 5.0 volts to 2.5 volts when the jumper wire was installed?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 1/1 O2 Sensor if no problems were found with the connectors.

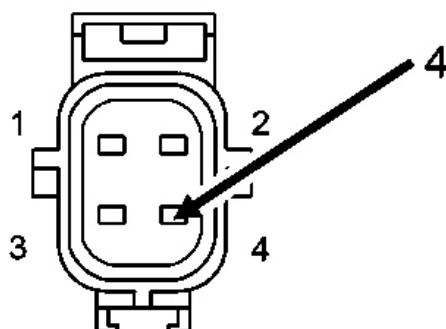
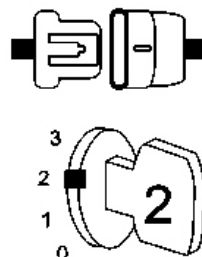
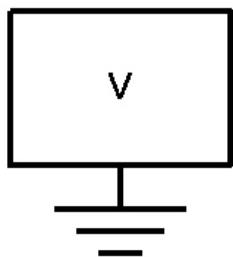
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: Remove the jumper wire before continuing.

10. (K41) O2 SENSOR 1/1 SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 105: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Measure the voltage on the (K41) O2 Sensor 1/1 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

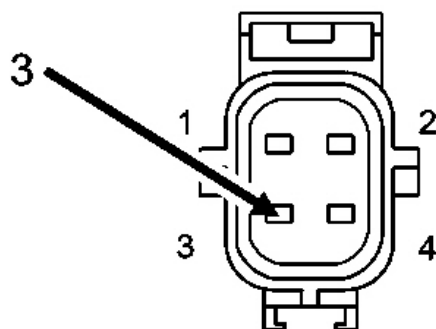
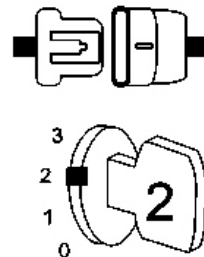
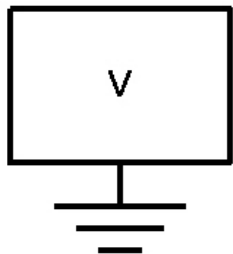
Go To 11.

No

Check the (K41) O2 Sensor 1/1 Signal circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K902) O2 SENSOR RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 106: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Measure the voltage on the (K902) O2 Return Upstream circuit in the 1/1 O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 12.

No

Check the (K902) O2 Return Upstream circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: **Turn the ignition off before continuing.**

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

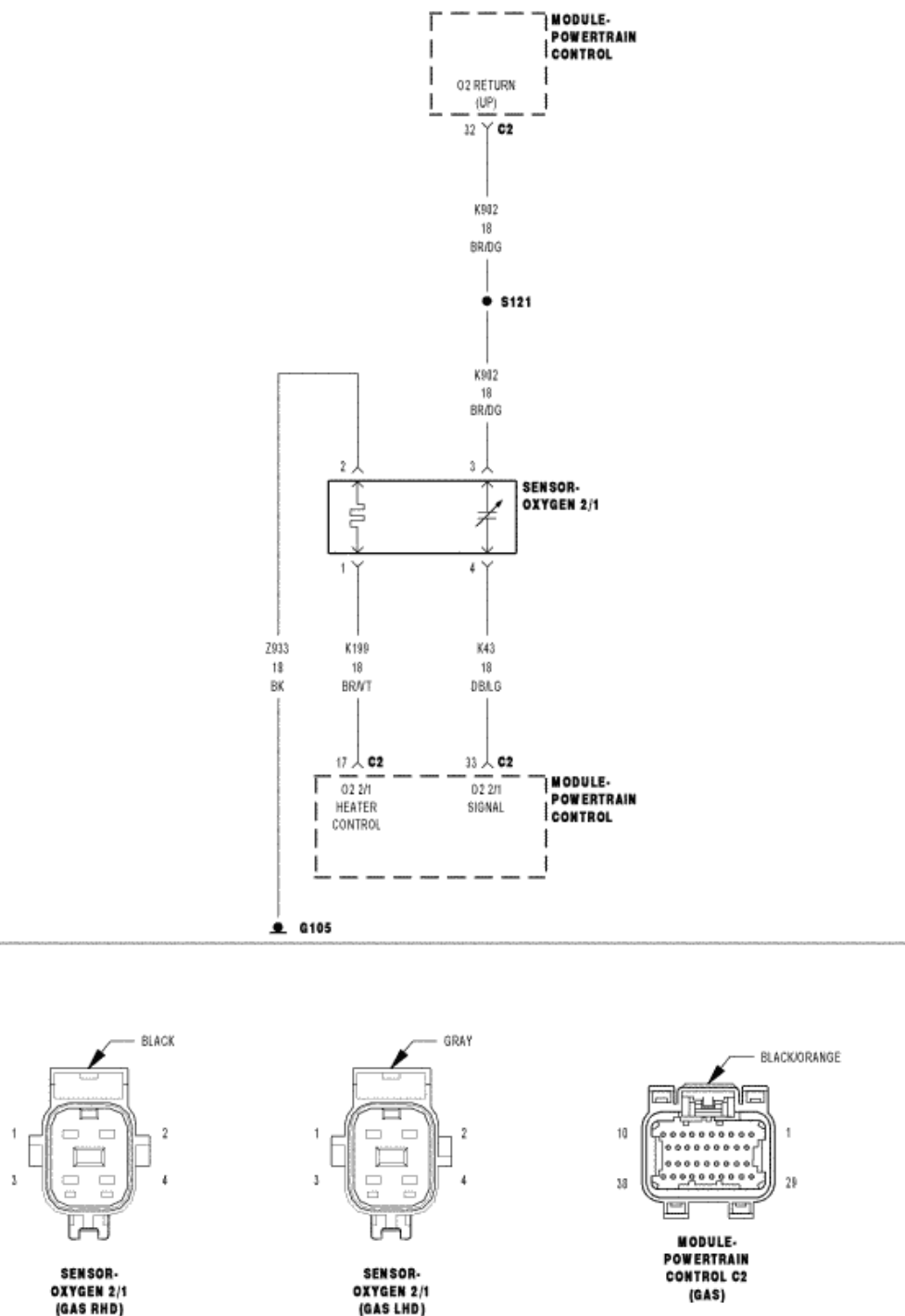
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0174-FUEL SYSTEM 2/1 LEAN

CIRCUIT SCHEMATIC



01963670

Fig. 107: O2 Sensor 2/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The fuel feedback system will maintain a stoichiometric fuel/air mixture, 14.7:1, by modifying the injector pulse width according to the oxygen content of the exhaust gas. The PCM makes short term and long term fuel corrections to maintain stoichiometric fuel/air ratio for best catalytic converter efficiency. Short term fuel correction is based on upstream O2 sensor output and is designed for quick engine response. The long term fuel correction compensated for variations in the engine specifications, sensor tolerances and component aging and is designed to correct rich and lean conditions over a longer period of time.

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- **Set Condition:**

If the PCM multiplies short term compensation by long term adaptive and a certain percentage is exceeded for two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
RESTRICTED FUEL SUPPLY LINE FUEL PUMP INLET STRAINER PLUGGED FUEL PUMP MODULE EXHAUST LEAK O2 SIGNAL CIRCUIT O2 RETURN CIRCUIT O2 SENSOR MAP SENSOR ECT SENSOR ENGINE MECHANICAL PROBLEM FUEL FILTER/PRESSURE REGULATOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Diagnose all other trouble codes before continuing.

NOTE: Check for contaminants that may have damaged an O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST**.

Below Specification

Go To 13.

CAUTION: Stop All Actuations.

3. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor

- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)
- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the liquid/soapy water to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground the scan tool will display all O2 Sensor voltage readings low. The O2 Sensor that is shorted to ground will display a voltage reading near or at 0 volts.

NOTE: If one of the O2 Sensor Signal or Return circuits are shorted to voltage, the scan tool will display all O2 Sensor voltage readings high.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With the scan tool, monitor the 2/1 O2 Sensor voltage reading.

Is the voltage switching between 2.5 and 3.4 volts?

Yes

Go To 5.

No

Go To 9.

5. 2/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

NOTE: Perform the following test on all O2 Sensors.

Ignition on, engine not running.

With a scan tool, actuate the 2/1 O2 Heater Test.

With the scan tool, monitor 2/1 O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 2/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. MAP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, read the Barometric Pressure.

NOTE: **The Barometric Pressure should be approximately equal to the actual barometric pressure. If necessary, compare the Barometric Pressure value of this vehicle to the value of a known good vehicle of a similar make and model.**

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: **If engine will not idle, maintain a constant RPM above idle.**

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading for MAP Vacuum within 1 inch of Hg on the Vacuum Gauge and is the Barometric Pressure reading of the vehicle the approximately the same as actual Barometric Pressure?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. Replace the MAP Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

7. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak).

Ignition on, engine not running.

With the scan tool, read the Engine Coolant Temperature (ECT) Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the ECT Sensor value. The temperature value change should be a smooth transition from start up to normal operating temperature 82° (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and did it reach at least 82° (180° F)?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. Replace the Engine Coolant Temperature Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

8. ENGINE MECHANICAL PROBLEM

Turn the ignition off.

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from leaks.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

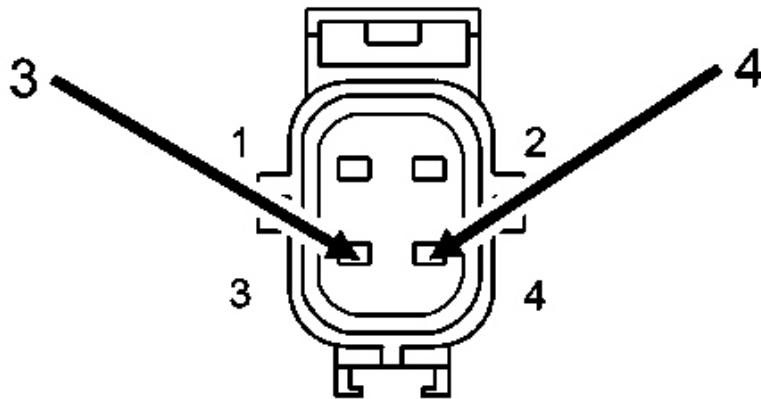
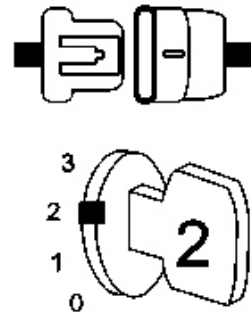
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

9. O2 SENSOR



**SENSOR-
OXYGEN**

81653cbb

Fig. 108: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/1 O2 Sensor harness connector.

Ignition on, engine not running.

With the scan tool, monitor the 2/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K43) O2 Sensor 2/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: **The voltage should drop from between 4.1 and 5.0 volts to 2.5 volts with the jumper wire in place.**

Did the O2 Sensor voltage change from between 4.1 and 5.0 volts to 2.5 volts when the jumper wire was installed?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 2/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: **Remove the jumper wire before continuing.**

10. O2 SENSOR SIGNAL CIRCUIT

With the scan tool, monitor all the O2 Sensor voltage reading with the jumper wire removed.

NOTE: **The scan tool will display all O2 Sensor voltage readings approximately 5.0 volts when only one O2 Sensor's Signal circuit is shorted to voltage.**

NOTE: **The scan tool will display one O2 Sensor voltage close to zero and the others will read lower than normal when one O2 Sensor Signal circuit contains excessive resistance.**

Is the voltage between 4.1 and 5.0 volts?

Yes

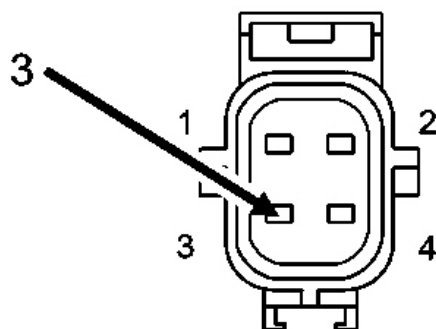
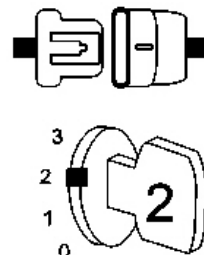
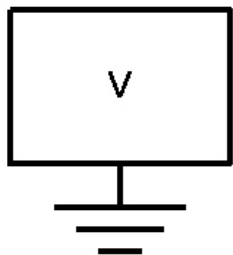
Go To 11.

No

Check all the O2 Signal circuits for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K902) O2 RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 109: Checking O2 Sensor Return Upstream & Downstream Circuits
Courtesy of CHRYSLER LLC

Disconnect the 2/1 O2 Sensor harness connector.

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 12.

No

Check the (K902) O2 Return Upstream circuit for a short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

13. **RESTRICTED FUEL SUPPLY LINE**

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special 5/16 fuel line adapter tool #6539 between disconnected fuel line and the fuel pump module.

Attach a fuel pressure test gauge to the T fitting on tool #6539.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Repair or replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 14.

CAUTION: Stop All Actuations.

14. FUEL PUMP INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 15.

15. FUEL PUMP MODULE

If there are no possible causes remaining, view repair.

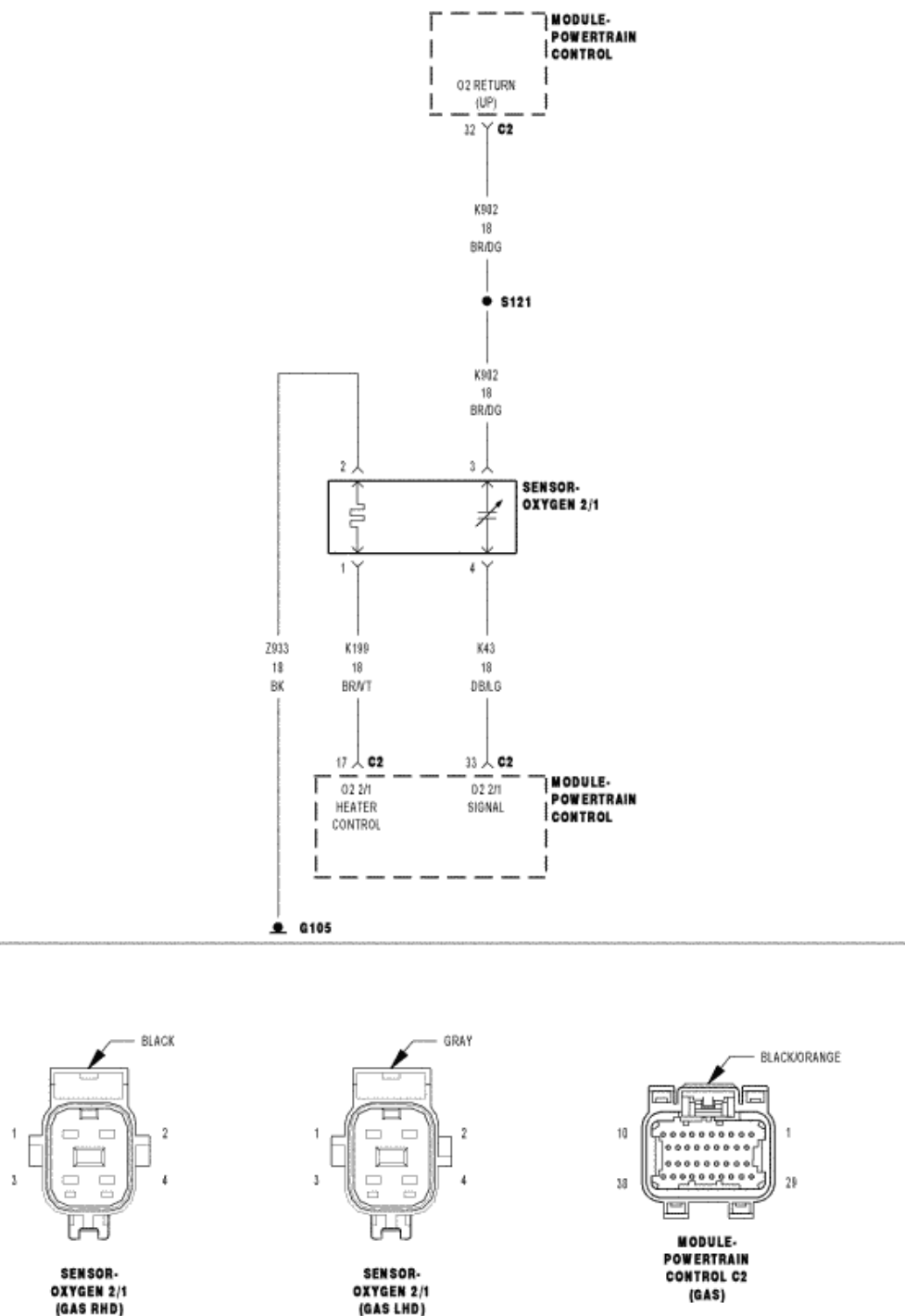
Repair

Verify that there is good pin to terminal contact in the Fuel Pump Module, TIPM, and Powertrain Control Module connectors. Replace the Fuel Pump Module if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

P0175-FUEL SYSTEM 2/1 RICH

CIRCUIT SCHEMATIC



01963670

Fig. 110: O2 Sensor 2/1 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The fuel feedback system will maintain a stoichiometric fuel/air mixture, 14.7:1, by modifying the injector pulse width according to the oxygen content of the exhaust gas. The PCM makes short term and long term fuel corrections to maintain stoichiometric fuel/air ratio for best catalytic converter efficiency. Short term fuel correction is based on upstream O2 sensor output and is designed for quick engine response. The long term fuel correction compensated for variations in the engine specifications, sensor tolerances and component aging and is designed to correct rich and lean conditions over a longer period of time.

MONITOR CONDITIONS

When Monitored:

With the engine running in closed loop mode, the ambient/battery temperature above -6.7° C (20° F) and altitude below 2590.8 m (8500 ft).

SET CONDITIONS

- Set Condition:**

If the PCM multiplies short term compensation by long term adaptive and a purge fuel multiplier and the result is below a certain value for 30 seconds over two trips, a freeze frame is stored, the MIL illuminates and a trouble code is stored. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
O2 SENSOR HEATER OPERATION
EVAP PURGE SOLENOID OPERATION
O2 SIGNAL CIRCUIT
O2 RETURN CIRCUIT
O2 SENSOR
MAP SENSOR
ECT SENSOR
ENGINE MECHANICAL PROBLEM
FUEL FILTER/PRESSURE REGULATOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Diagnose all other trouble codes before continuing.

NOTE: Check for contaminants that may have damaged an O2 Sensor: contaminated fuel, unapproved silicone, oil and coolant.

Start the engine.

Allow the engine to reach normal operating temperature.

With a scan tool, select View DTCs.

NOTE: It may be necessary to drive the vehicle to meet the conditions to set this DTC, try to repeat the conditions in which the fault originally set by reviewing the Freeze Frame data.

Is the DTC Active or Pending at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge to the fuel rail.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Turn the ignition off.

Choose a conclusion that best matches your fuel pressure reading.

Within Specification

Go To 3.

Above Specification

Replace the fuel filter/pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

CAUTION: Stop All Actuations.

3. O2 SENSOR OPERATION

Start the engine.

Allow the engine to reach normal operating temperature.

NOTE: If one of the O2 Sensor's Signal or Return circuit is shorted to ground or voltage, all the other O2 Sensor voltage readings will be affected.

NOTE: After the repairs have been made, verify proper O2 Sensor operation. If all the O2 Sensor voltage readings have not returned to normal, follow the diagnostic procedure for the remaining O2 Sensors.

With the scan tool, monitor the 2/1 O2 Sensor voltage reading.

Is the voltage switching between 2.5 and 3.4 volts?

Yes

Go To 4.

No

Go To 9.

4. 2/1 O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Ignition on, engine not running.

With the scan tool, perform the 2/1 O2 Heater Test for each O2 Sensor.

With the scan tool, monitor the 2/1 O2 Sensor voltage while performing the Heater test for at least 2 minutes.

Does the voltage stay above 4.5 volts for each Sensor?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 2/1 O2 Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. MAP SENSOR OPERATION

Ignition on, engine not running.

With a scan tool, read the Barometric Pressure.

NOTE: **The Barometric Pressure should be approximately equal to the actual barometric pressure. If necessary, compare the Barometric Pressure value of this vehicle to the value of a known good vehicle of a similar make and model.**

Turn the ignition off.

Connect a Vacuum Gauge to a Manifold Vacuum source.

Start the engine.

Allow the engine to idle.

NOTE: **If engine will not idle, maintain a constant RPM above idle.**

With the scan tool, read the MAP Sensor vacuum value.

Is the scan tool reading for MAP Vacuum within 1 inch of Hg on the Vacuum reading and is the Barometric Pressure reading of the vehicle the approximately the same as actual Barometric Pressure?

Yes

Go To 6.

No

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. Replace the MAP Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Remove the vacuum gauge before continuing.

6. ECT SENSOR OPERATION

NOTE: For this test to be valid, the thermostat must be operating correctly.

NOTE: This test works best if performed on a cold engine (cold soak).

Ignition on, engine not running.

With the scan tool, read the Engine Coolant Temperature Sensor value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up, monitor the Engine Coolant Temperature value. The temp value change should be a smooth transition from start up to normal operating temp 82° C (180° F). The value should reach at least 82° C (180° F).

Did the ECT value increase smoothly and reach at least 82° C (180° F)?

Yes

Go To 7.

No

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. Replace the Engine Coolant Temperature Sensor if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EVAP PURGE SOLENOID OPERATION

Turn the ignition off.

Disconnect the hoses at the Evap Purge Solenoid.

Using a hand vacuum pump, apply 10 inches of vacuum to the Evap Purge Solenoid vacuum source port on the component side.

Did the Evap Purge Solenoid hold vacuum?

Yes

Go To 8.

No

Verify that there is good pin to terminal contact in the Evap Purge Solenoid and Powertrain Control Module connectors. Replace the Evap Purge Solenoid if no problems were found with the connectors.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Connect the vacuum hoses before continuing.

8. ENGINE MECHANICAL PROBLEM

Check for any of the following conditions/mechanical problems.

AIR INDUCTION SYSTEM - must be free from restrictions.

ENGINE VACUUM - must be at least 13 inches in neutral

ENGINE VALVE TIMING - must be within specifications

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE PCV SYSTEM - must flow freely

TORQUE CONVERTER STALL SPEED - must be within specifications

POWER BRAKE BOOSTER - no internal vacuum leaks

FUEL - must be free of contamination

FUEL INJECTOR - plugged or restricted injector; control wire not connected to correct injector

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 12.

9. 2/1 O2 SENSOR

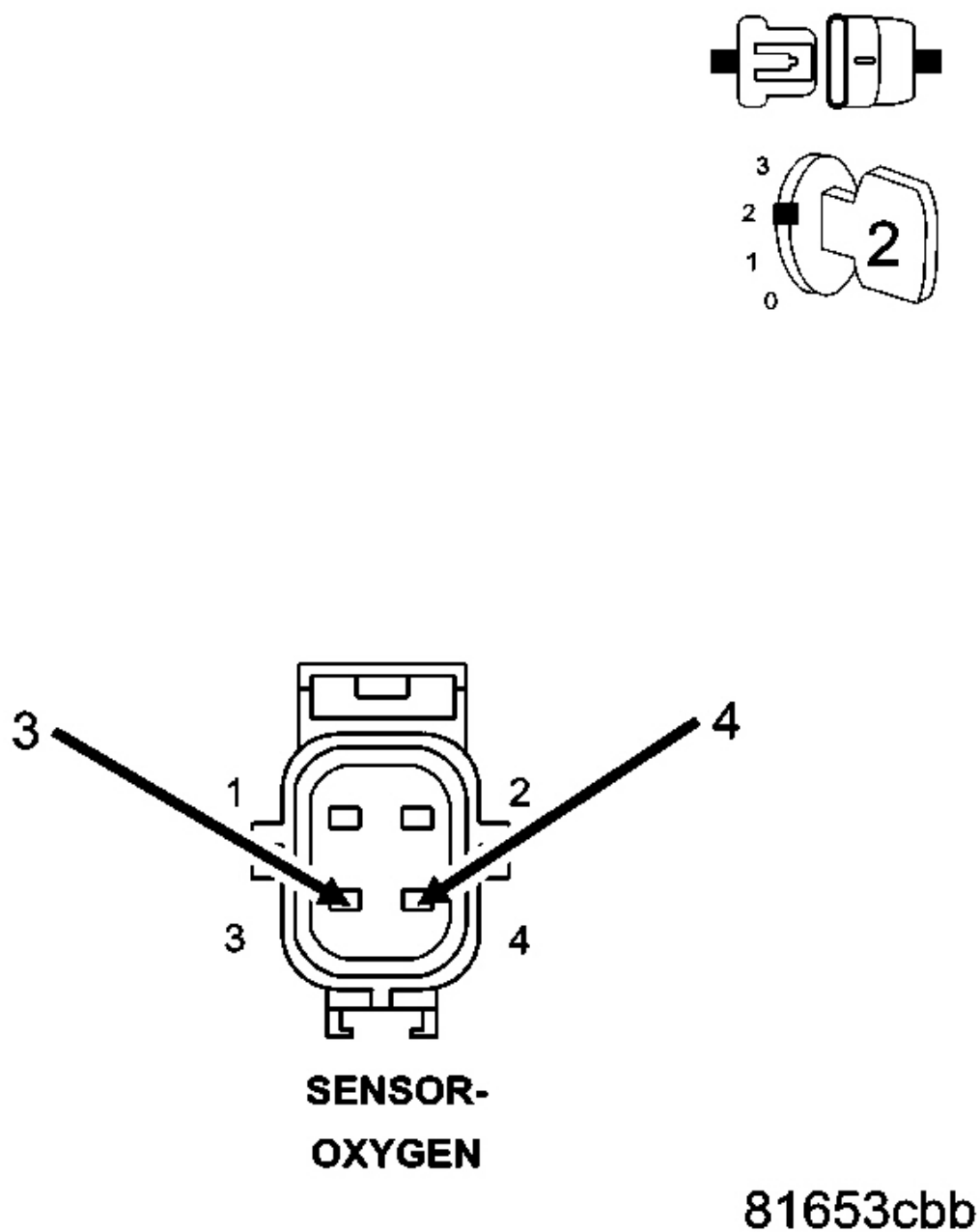


Fig. 111: Checking O2 Sensor Return Upstream & Downstream Circuits

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the 2/1 O2 Sensor harness connector.

Ignition on, engine not running.

With the scan tool, monitor the 2/1 O2 Sensor voltage.

O2 Sensor voltage should read between 4.1 and 5.0 volts on the scan tool with the connector disconnected.

Connect a jumper wire between the (K43) O2 Sensor 2/1 Signal circuit and the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

NOTE: The voltage should drop from between 4.1 and 5.0 volts down to 2.5 volts with the jumper wire connected.

Did the O2 Sensor voltage drop from between 4.1 and 5.0 volts to 2.5 volts when the jumper wire was installed?

Yes

Verify that there is good pin to terminal contact in the O2 Sensor and Powertrain Control Module connectors. Replace the 2/1 O2 Sensor if no problems were found with the connectors.

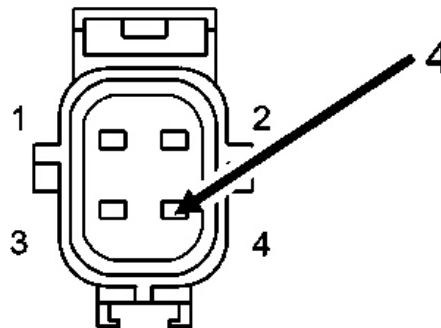
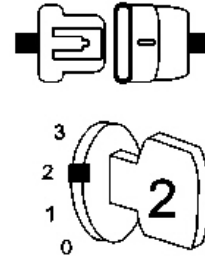
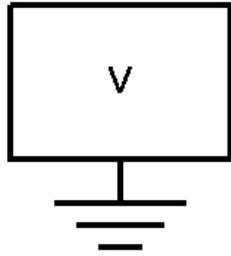
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

NOTE: Remove the jumper wire before continuing.

10. O2 SENSOR SIGNAL CIRCUIT



**SENSOR-
OXYGEN**

81653c72

Fig. 112: Checking O2 Sensor Signal Circuit
Courtesy of CHRYSLER LLC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine.

Measure the voltage on the (K43) O2 Sensor 2/1 Signal circuit in the O2 Sensor harness connector.

Is the voltage between 4.1 and 5.0 volts?

Yes

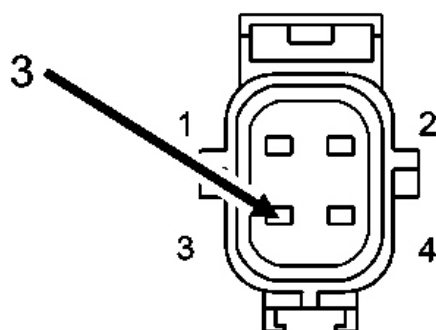
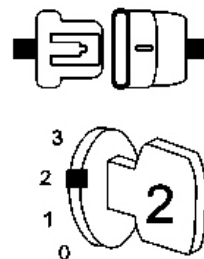
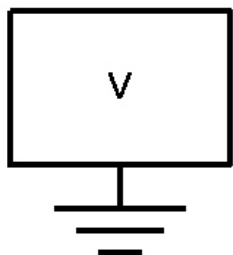
Go To 11.

No

Check the (K43) O2 Sensor 2/1 Signal circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. **(K902) O2 SENSOR RETURN UPSTREAM CIRCUIT**



**SENSOR-
OXYGEN**

81653c98

Fig. 113: Checking O2 Sensor Return Upstream & Downstream Circuits

Courtesy of CHRYSLER LLC

Engine still running.

Measure the voltage on the (K902) O2 Return Upstream circuit in the O2 Sensor harness connector.

Is the voltage at 2.5 volts?

Yes

Go To 12.

No

Check the (K902) O2 Return Upstream circuit for damage, short to ground, open, or short to voltage. Inspect the O2 Sensor connector and the PCM harness connector. If OK, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

NOTE: Turn the ignition off before continuing.

12. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Sensors and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0201-FUEL INJECTOR 1 CIRCUIT

CIRCUIT SCHEMATIC

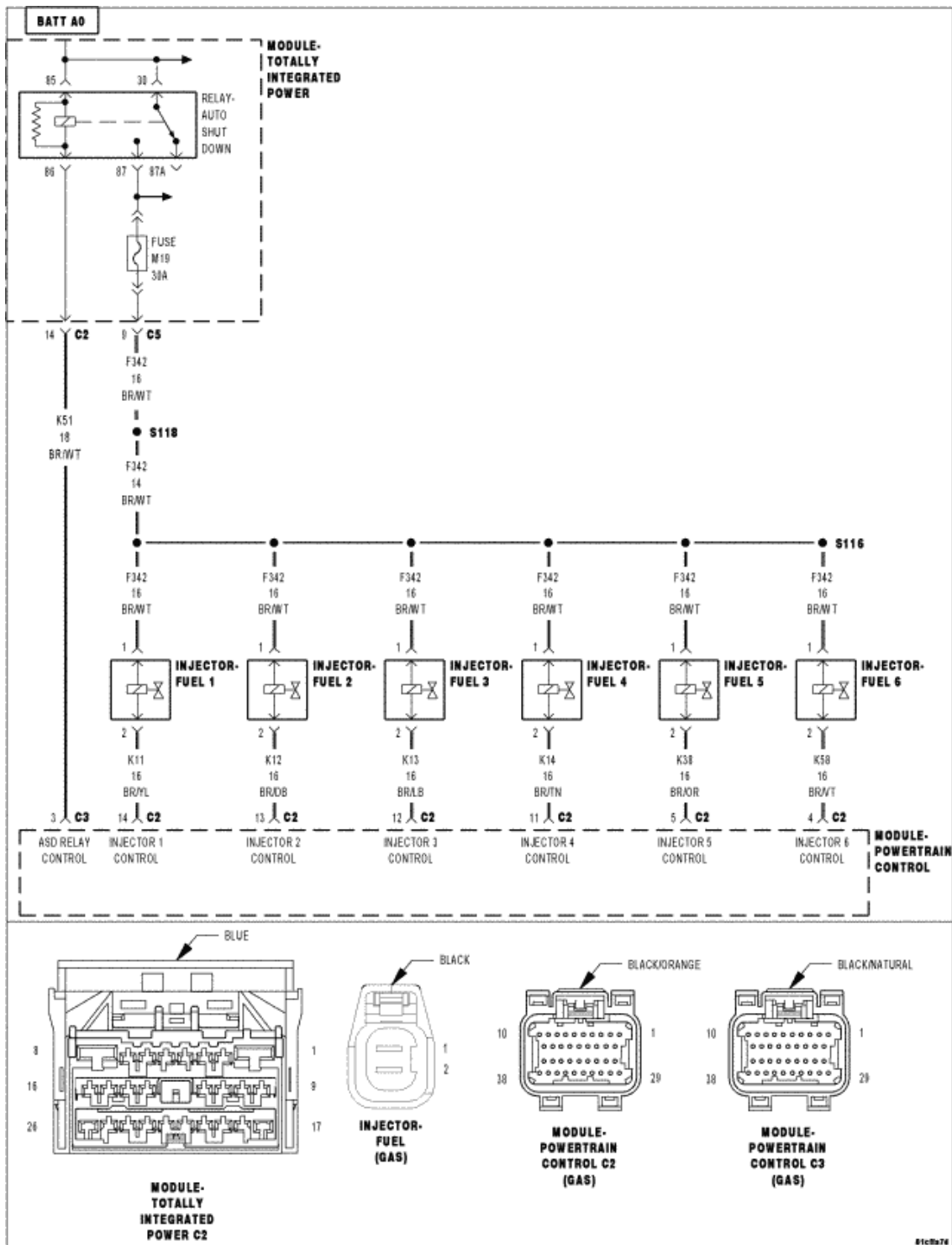


Fig. 114: Fuel Injector Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- **Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD OUTPUT CIRCUIT
(K11) INJECTOR 1 CONTROL CIRCUIT OPEN
(K11) INJECTOR 1 CONTROL CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

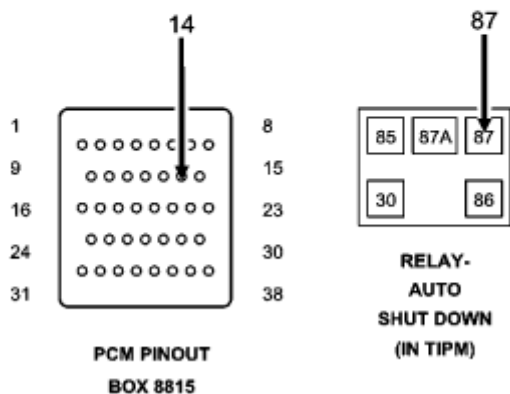
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 1 CIRCUIT RESISTANCE



819be643

Fig. 115: Measuring Resistance Of Fuel Injector 1 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 1 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 1 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 1 is properly connected to the injector. Disconnect the Fuel Injector 1 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 1 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

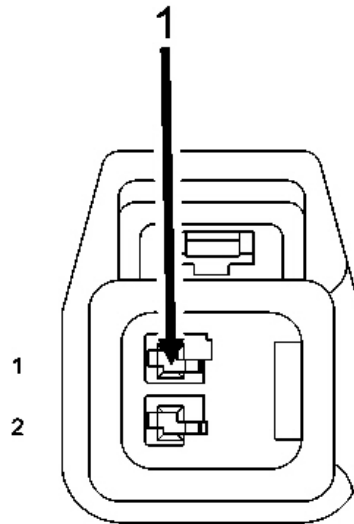
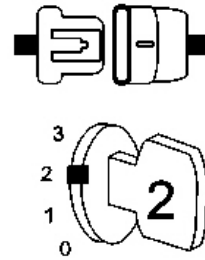
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 116: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 1 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

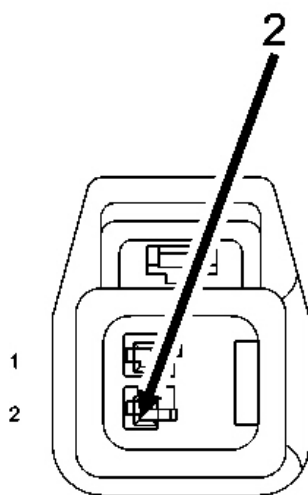
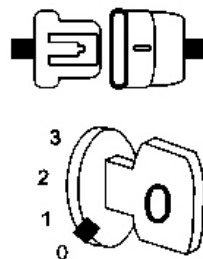
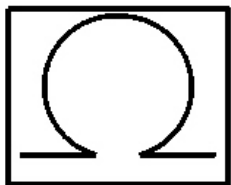
Go To 5.

No

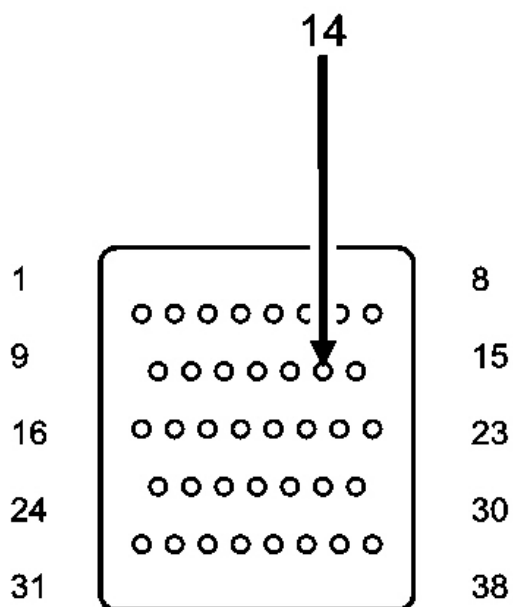
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K11) INJECTOR 1 CONTROL CIRCUIT OPEN



**INJECTOR-
FUEL**



**PCM PINOUT
BOX 8815**

81654d9e

Fig. 117: Checking Injector Control No. 1 Circuit Resistance
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K11) Injector 1 Control circuit between the Fuel Injector 1 harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K11) Injector 1 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 1

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

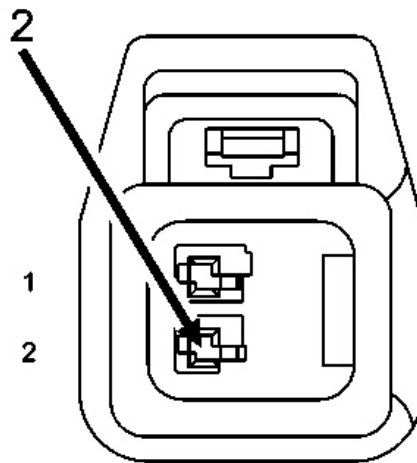
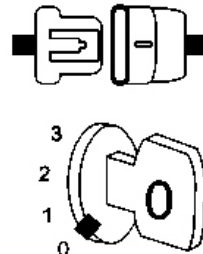
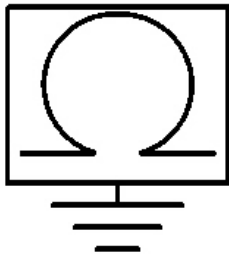
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 1 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K11) INJECTOR 1 CONTROL CIRCUIT SHORTED TO GROUND**



INJECTOR-
FUEL

81654d74

Fig. 118: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K11) Injector 1 Control circuit in the Fuel Injector 1 harness connector.

Is the resistance below 100 ohms?

Yes

Go To 8.

No

Repair the (K11) Injector 1 Control circuit for a short to ground.

Perform **POWERTRAIN VERIFICATION TEST** .

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0202-FUEL INJECTOR 2 CIRCUIT

CIRCUIT SCHEMATIC

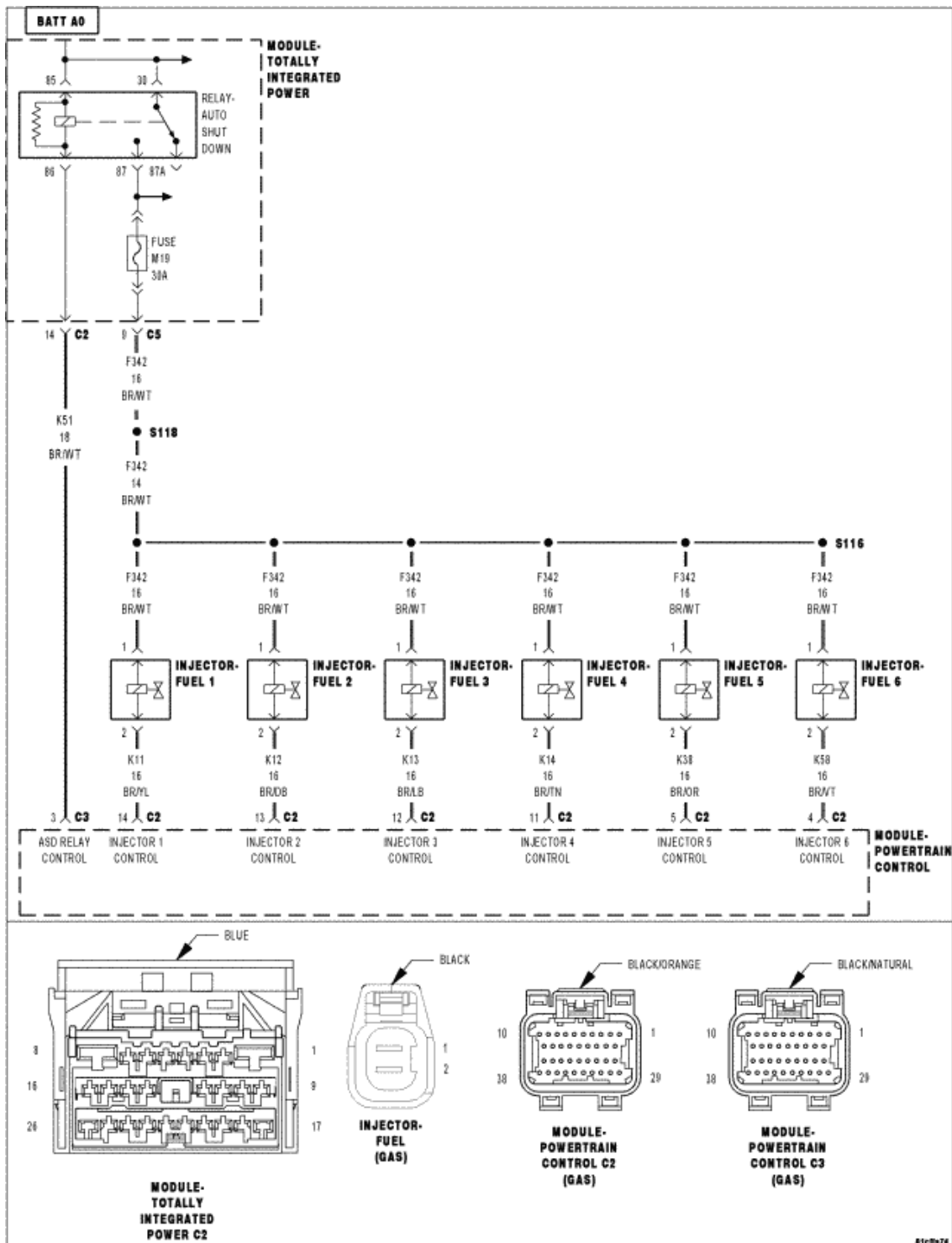


Fig. 119: Fuel Injector Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The fueling strategy for NGC requires potentially three fuel pulses per cylinder per cycle. The first pulse is delivered starting at a programmed angle soon after the intake valve closes, for specified time duration. This is for two reasons, one to prevent any fuel from this pulse being delivered in the previous cycle and second to allow fueling to begin as early as possible in the current cycle. The second pulse is delivered for a specified time and is set to end at a programmed angle. The pulse must not extend past the end angle. There can be a separate value for each cylinder under the same operating conditions. This is done for two reasons, one to prevent any fuel from this pulse being delivered during the intake/exhaust valve overlap period, which tends to cause elevated emission levels. Also, allowing fuel to enter each cylinder at a slightly different angle tends to reduce any fuel pressure standing waves in the fuel rail. If the desired total fuel pulse-width increases, a third fuel pulse must be delivered. The third pulse, if necessary, is delivered for a specified time and must end at a programmed angle before the valve closes again. The third pulse in the cycle is controlled by its ending angle. This is also for two reasons, one to prevent any fuel from this pulse being delivered in the next cycle and second to allow fueling to end as late as possible in the current cycle. At high engine speeds, one or more of the pulses may be dropped from the fueling strategy.

MONITOR CONDITIONS

When Monitored:

With battery voltage greater than 10 volts. Auto Shutdown Relay energized. Engine speed less than 3000 rpm.

SET CONDITIONS

- **Set Condition:**

The PCM monitors the continuity of the injector circuits as well as the voltage spike created by the collapse of the magnetic field in the injector coil. Any condition that reduces the maximum current flow or the magnitude of the voltage spike can cause this DTC to set.

POSSIBLE CAUSES

Possible Causes
(F342) ASD RELAY OUTPUT CIRCUIT
(K12) INJECTOR 2 CONTROL CIRCUIT OPEN
(K12) INJECTOR 2 CONTROL CIRCUIT SHORTED TO GROUND
FUEL INJECTOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool, select View DTCs. Record DTC and Freeze Frame information.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Review Freeze Frame information. Operate the vehicle under conditions similar to which the DTC was set.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

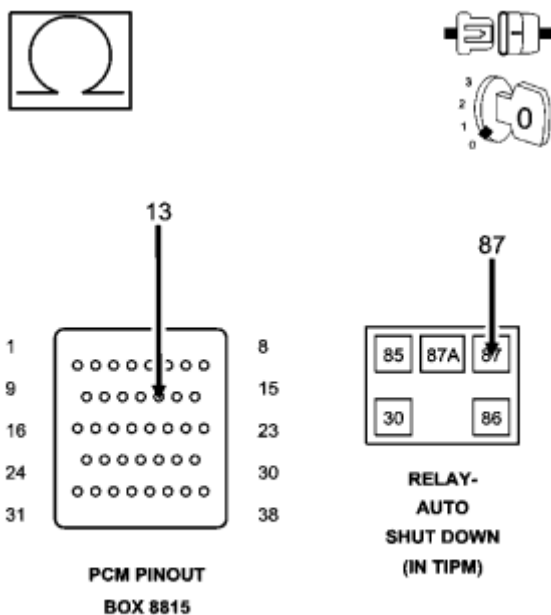
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. FUEL INJECTOR 2 CIRCUIT RESISTANCE



819bec5b

Fig. 120: Measuring Resistance Of Fuel Injector 2 Circuit From Appropriate Terminal Of Special

Tool #8815 And ASD Relay Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Remove the ASD Relay.

NOTE: **The resistance of the circuit will vary according to the temperature of the injector coil. Use the table below to determine the resistance range of the injector.**

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the Fuel Injector 2 circuit from the appropriate terminal of special tool #8815 and the ASD Relay connector.

Fuel Injector Coil Resistance Based on Engine Temperature	
Temperature	Resistance
-20° C (-4° F)	10 ohms (+/-.6 of an ohm)
20° C (68° F)	12 ohms (+/-.6 of an ohm)
60° C (140° F)	14 ohms (+/-.6 of an ohm)
100° C (212° F)	16 ohms (+/-.6 of an ohm)

Is the resistance of the injector within the specified range?

Yes

Go To 7.

No

Go To 3.

3. FUEL INJECTOR 2 WIRING AND CONNECTOR INSPECTION

Turn the ignition off.

Verify that the Fuel Injector 2 is properly connected to the injector. Disconnect the Fuel Injector 2 connector and Inspect the terminals for any condition that would result in a poor connection.

Using the wiring diagram/schematic as a guide, inspect the Fuel Injector 2 wiring and connector.

Look for any chafed, pierced, pinched, or partially broken wires.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

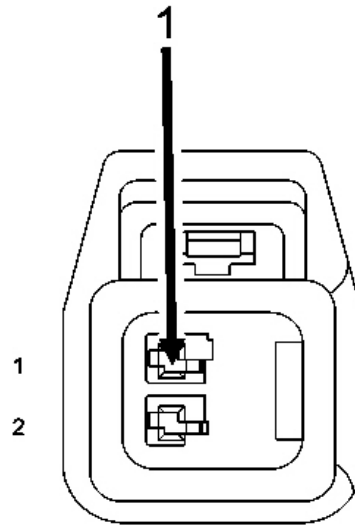
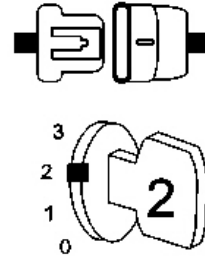
Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (F342) ASD RELAY OUTPUT CIRCUIT



INJECTOR-
FUEL

81654d0c

Fig. 121: Checking ASD Relay Output Circuit
Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Turn the ignition on.

With the scan tool, actuate the Auto Shutdown (ASD) Relay Control State.

Using a 12-volt test light connected to ground, check the (F342) ASD Relay Output circuit in the Fuel Injector 2 harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes.

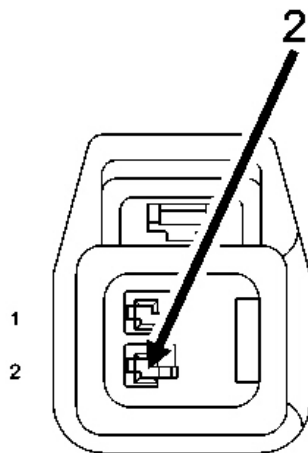
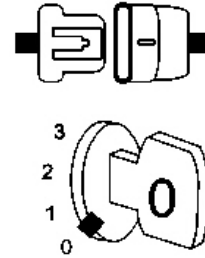
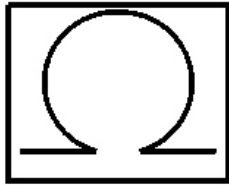
Go To 5.

No.

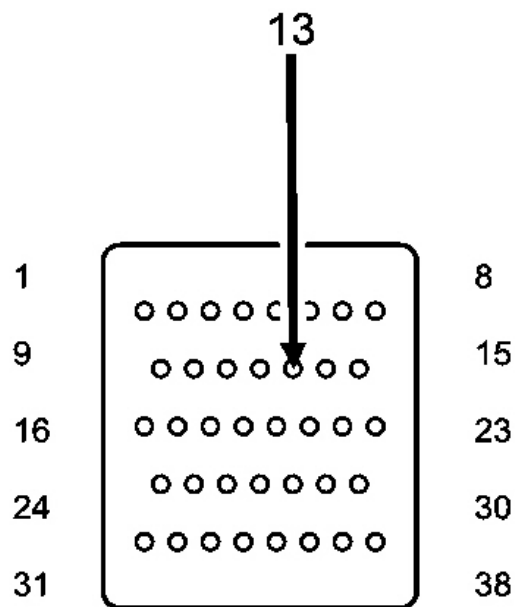
Repair the excessive resistance or short to ground in the (F342) ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K12) INJECTOR 2 CONTROL CIRCUIT OPEN



INJECTOR-
FUEL



PCM PINOUT
BOX 8815

81654e1d

Fig. 122: Checking Injector Control No. 2 Circuit Resistance
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance of the (K12) Injector 2 Control circuit from the Fuel Injector harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K12) Injector 2 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. FUEL INJECTOR 2

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

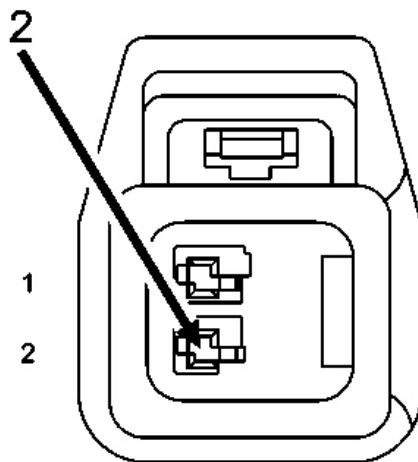
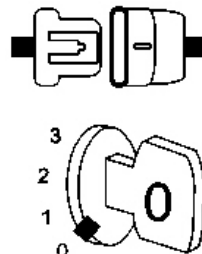
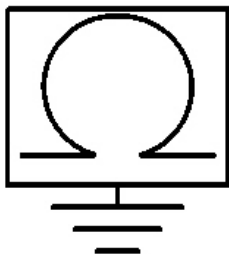
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Injector 2 in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST**.

7. **(K12) INJECTOR 2 CONTROL CIRCUIT SHORTED TO GROUND**



**INJECTOR-
FUEL**

81654d74

Fig. 123: Checking Injector Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K12) Injector 2 Control circuit in the Injector harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K12) Injector 2 Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Fuel Injector 2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Injector and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

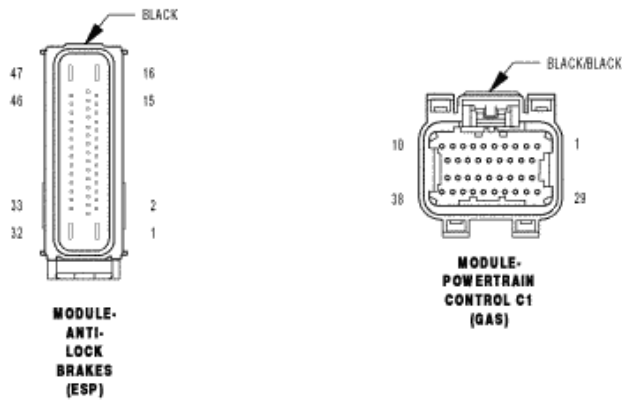
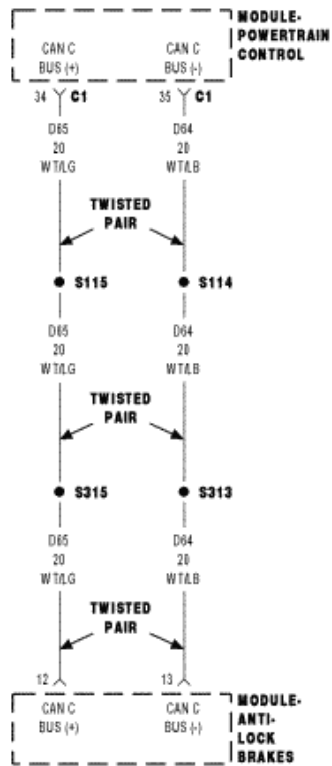
Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

U1110-LOST VEHICLE SPEED MESSAGE

CIRCUIT SCHEMATIC



01948756

Fig. 1: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The PCM receives the vehicle speed signal over the CAN C bus from the Anti-lock Brake Module.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM doesn't receive a vehicle speed signal from the Anti-lock brake Module over the CAN C bus.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT OPEN OR SHORTED
ANTI-LOCK BRAKE MODULE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With the scan tool read Powertrain DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **U0121-LOST COMMUNICATION WITH ABS MODULE ALSO SET**

With the scan tool continue reading DTCs.

Is the U0121-LOST COMMUNICATION WITH ABS MODULE also set?

Yes

Follow the diagnostics for U0121-LOST COMMUNICATION WITH ABS MODULE
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

U1113-LOST A/C PRESSURE MESSAGE

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Pressure Transducer signal is a direct input to the TIPM. The TIPM sends the PCM the A/C Pressure Transducer signal over the CAN C bus.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- Set Condition:**

The PCM doesn't receive the A/C pressure signal over the CAN C bus from the TIPM. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT OPEN OR SHORTED TOTALLY INTEGRATED POWER MODULE (TIPM) POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Ignition on, engine not running.

With the scan tool, view Active Powertrain DTCs.

Is the DTC active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM) ALSO ACTIVE

With the scan tool, View DTCs.

Is the U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM) also set?

Yes

Follow the diagnostics for U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)

Perform **POWERTRAIN VERIFICATION TEST** .

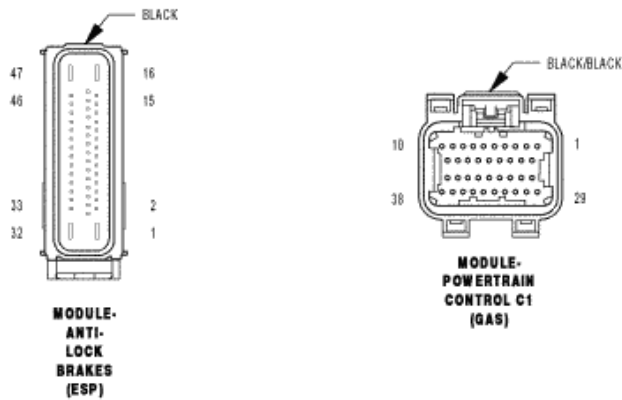
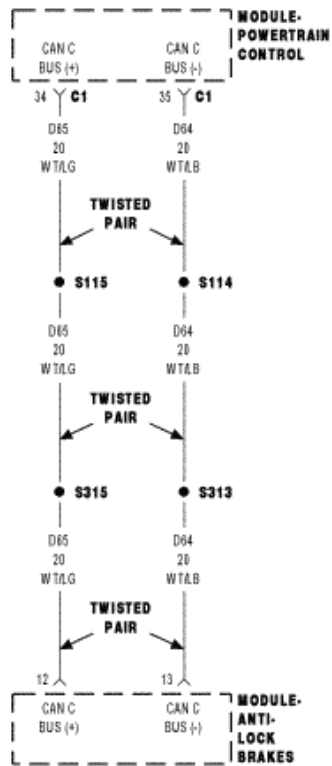
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1120-LOST WHEEL DISTANCE MESSAGE

CIRCUIT SCHEMATIC



01948756

Fig. 2: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The PCM receives the vehicle speed signal over the CAN C bus from the Anti-lock Brake Module.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM doesn't receive a wheel distance message from the Anti-lock brake Module over the CAN C bus.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT OPEN OR SHORTED ANTI-LOCK BRAKE MODULE PCM

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With the scan tool View Powertrain DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **U0121-LOST COMMUNICATION WITH ABS MODULE/P0141-LOST COMMUNICATION WITH FCM (TIPM) ALSO SET**

With the scan tool, read the appropriate module for DTCs.

Is the U0121-LOST COMMUNICATION WITH ABS MODULE/P0141-LOST COMMUNICATION WITH FCM (TIPM) also set?

Yes

Perform the appropriate diagnostic test.

Perform the **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1403-IMPLAUSIBLE FUEL LEVEL SIGNAL RECEIVED

CIRCUIT SCHEMATIC

The TIPM has to send the PCM a fuel level signal over CAN C. The signal the TIPM sends over CAN C is implausible.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The fuel level message the PCM is receiving is implausible. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
CAN C OPEN OR SHORTED
FUEL LEVEL SENSOR
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND
(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO THE (K91) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (N4) FUEL LEVEL SIGNAL CIRCUIT
EXCESSIVE RESISTANCE IN THE (K91) SENSOR GROUND CIRCUIT
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CAN C BUS DTCS ALSO ACTIVE

With a scan tool check for DTCs in the TIPM.

Are any CAN C related DTCs Active at this time?

Yes

(Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article) for the appropriate diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. FUEL LEVEL SENSOR

Disconnect the Fuel Pump Module harness connector.

Ignition on, engine not running.

Using a fused jumper wire, jump the (K91) Sensor Ground circuit to the (N4) Fuel Level Sensor No.1 Signal circuit in the Fuel Pump Motor harness connector.

Did the Fuel gauge level change from empty to full?

Yes

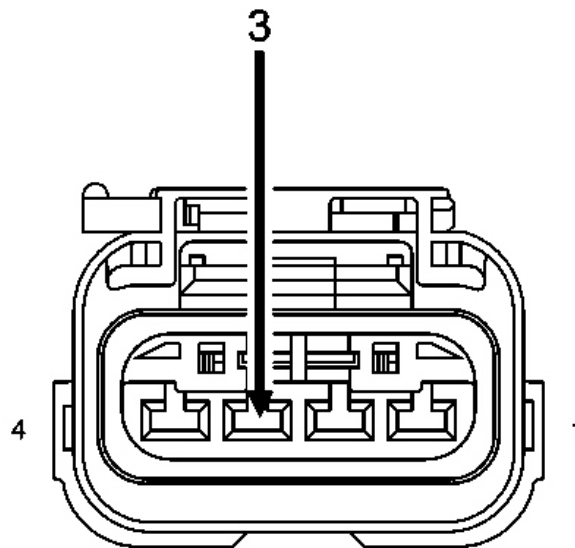
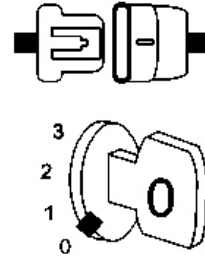
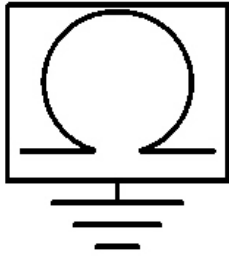
Replace the Fuel Level Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO GROUND



**MODULE-
FUEL
PUMP**

81335b04

Fig. 5: Checking Fuel Level Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C7 TIPM harness connector.

Measure the resistance between ground and the (N4) Fuel Level Signal circuit in the Fuel Pump Module harness connector.

Is the resistance below 100 ohms?

Yes

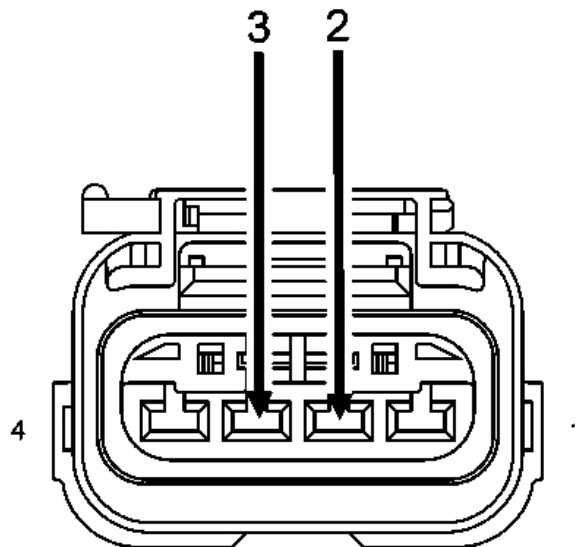
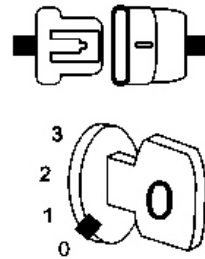
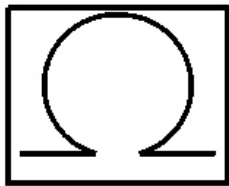
Repair the short to ground in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. **(N4) FUEL LEVEL SIGNAL CIRCUIT SHORTED TO THE (K91) SENSOR GROUND CIRCUIT**



**MODULE-
FUEL
PUMP**

81335b4c

Fig. 6: Checking Fuel Level Sensor Signal Circuit & Ground Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between the (N4) Fuel Level Signal circuit and the (K91) Sensor Ground circuit from the Fuel Pump Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K91) Sensor Ground circuit and the (N4) Fuel Level Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. EXCESSIVE RESISTANCE IN THE (N4) FUEL LEVEL SIGNAL CIRCUIT

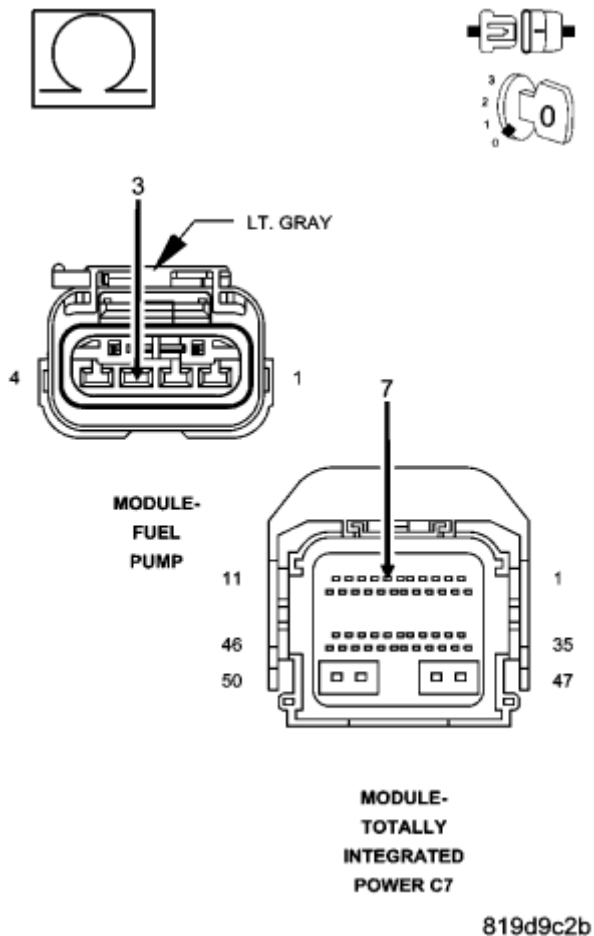


Fig. 7: Measuring Resistance Of (N4) Fuel Level Signal Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (N4) Fuel Level Signal circuit from the Fuel Pump Module harness connector to the C7 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the excessive resistance in the (N4) Fuel Level Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. EXCESSIVE RESISTANCE IN THE (K91) SENSOR GROUND CIRCUIT

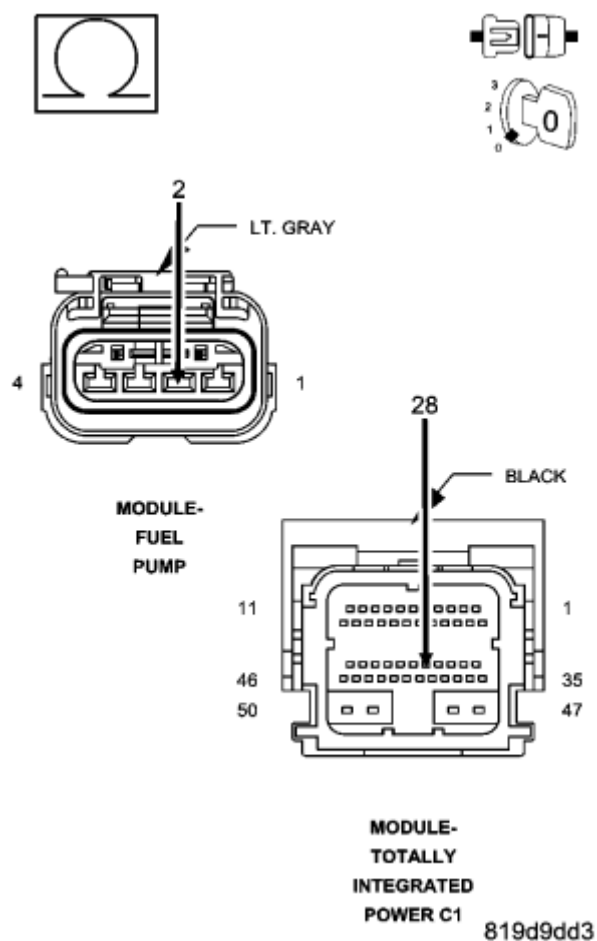


Fig. 8: Measuring Resistance Of (K91) Sensor Ground Circuit From Fuel Pump Module Harness Connector To TIPM Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C1 TIPM harness connector.

Measure the resistance of the (K91) Sensor Ground circuit from the Fuel Pump Module harness connector to the TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 8.

No

Repair the excessive resistance in the (K91) Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connector at the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1411-IMPLAUSIBLE FUEL VOLUME SIGNAL RECEIVED

CIRCUIT SCHEMATIC

The TIPM has to send the PCM a fuel volume signal over CAN C. The signal the TIPM sends over CAN C is implausible.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The fuel volume message the PCM is receiving is implausible. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
CAN C OPEN OR SHORTED TOTALLY INTEGRATED POWER MODULE (TIPM) POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **CAN C BUS DTCS ALSO ACTIVE**

With a scan tool check for DTCs in the TIPM.

Are any CAN C related DTCs Active at this time?

Yes

(Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article) for the appropriate diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

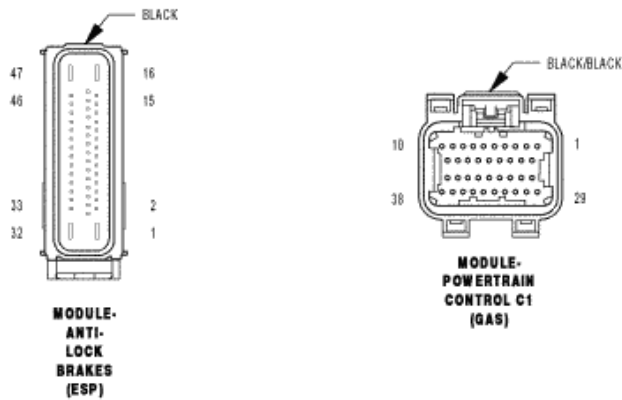
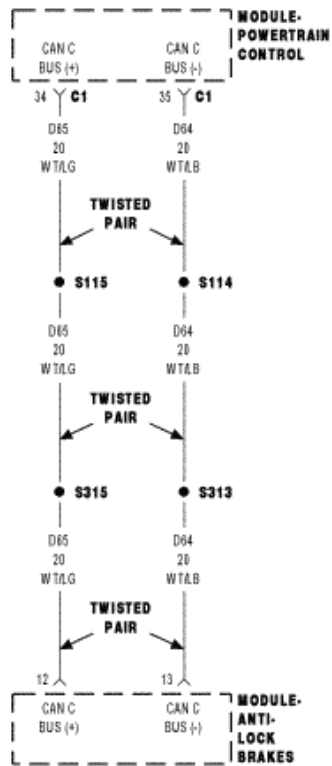
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1412-IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED

CIRCUIT SCHEMATIC



01948756

Fig. 10: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The ABS Module sends vehicle speed information over the CAN C Bus circuit to the PCM.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM gets an implausible signal over the CAN C circuit from the ABS Module. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
CAN C BUS CIRCUIT SHORTED
CAN C BUS CIRCUIT OPEN
ABS MODULE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the U1412-IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **U0001-NO COMMUNICATION ON THE CAN C BUS CIRCUIT IS ACTIVE**

Continue reading DTCs.

Is the U0001-NO COMMUNICATION ON THE CAN C BUS CIRCUIT ACTIVE at this time?

Yes

Refer to the Diagnostic Procedure for the U0001-NO COMMUNICATION ON THE CAN C BUS CIRCUIT. Refer to **DIAGNOSIS AND TESTING** .

No

Go To 3.

3. ABS MODULE IS ACTIVE ON THE CAN C BUS

With the scan tool, select ECU View.

Verify that the ABS Module active on the bus.

Is the ABS Module Active on the bus?

Yes

Go To 4.

No

(Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article) for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

4. ACTIVE DTCS IN THE TIPM

With the scan tool, select ECU View and select TIPM.

With the scan tool, read active DTCs.

Is the U0001-NO COMMUNICATION ON THE CAN C BUS CIRCUIT ACTIVE in the TIPM at this time?

Yes

Replace the ABS Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1417-IMPLAUSIBLE LEFT WHEEL DISTANCE SIGNAL RECEIVED

CIRCUIT SCHEMATIC

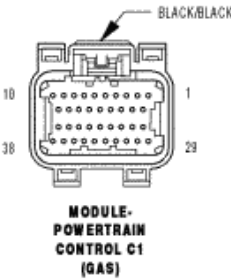
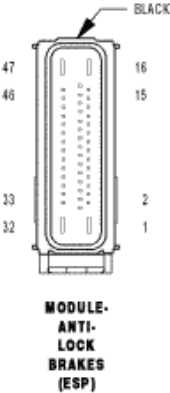
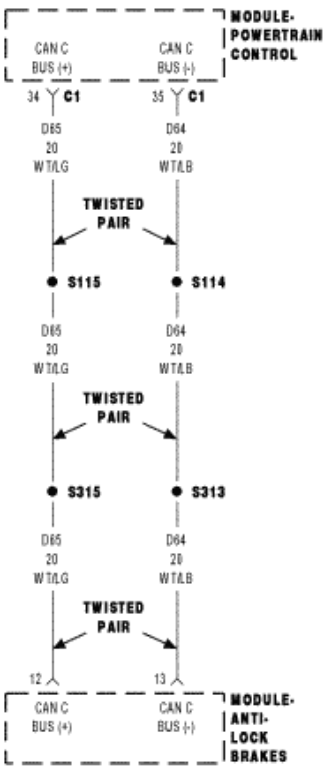


Fig. 11: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The ABS Module sends an implausible distance signal over the CAN C Bus circuit to the PCM.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM gets an implausible signal over the CAN C circuit from the ABS Module. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
VEHICLE SPEED SENSOR FAULT ACTIVE IN ANTI-LOCK BRAKE MODULE
CAN C BUS CIRCUIT SHORTED
CAN C BUS CIRCUIT OPEN
ABS MODULE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the U1417-IMPLAUSIBLE LEFT WHEEL DISTANCE SIGNAL RECEIVED Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **ABS MODULE IS ACTIVE ON THE CAN C BUS**

With the scan tool, select ECU View.

Verify that the ABS Module active on the bus.

Is the ABS Module Active on the bus?

Yes

Go To 3.

No

(Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article) for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **DTCS STORED OR ACTIVE IN THE ABS MODULE**

Check for DTCs in the ABS Module.

Are any DTCs Active or stored in the ABS Module?

Yes

Refer to **ABS - ELECTRICAL DIAGNOSTICS** and perform the diagnostics for the DTCs in the ABS Module.

Perform **ABS VERIFICATION TEST** .

No

Go to 4.

4. **ACTIVE DTCS IN THE TIPM**

With the scan tool, select ECU View and select TIPM.

With the scan tool, view Active DTCs.

Are any Communication DTCs active in the TIPM relating to the ABS System?

Yes

Replace the ABS Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

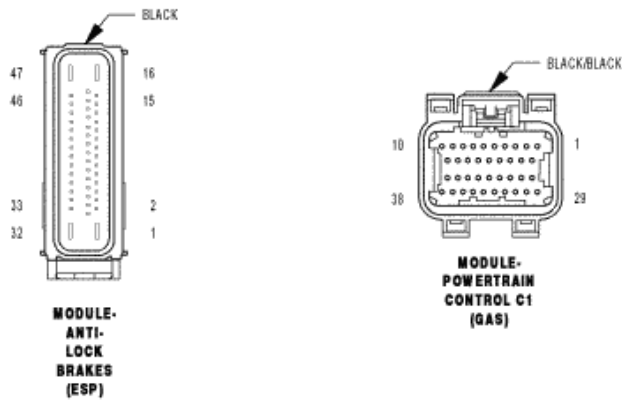
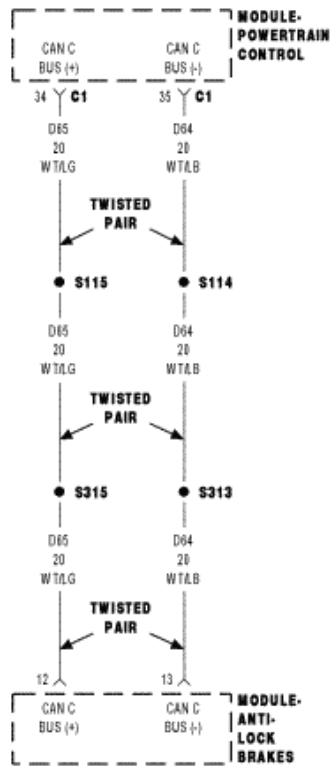
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

U1418-IMPLAUSIBLE RIGHT WHEEL DISTANCE SIGNAL RECEIVED

CIRCUIT SCHEMATIC



01948756

Fig. 12: Anti-Lock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The ABS Module sends an implausible distance signal over the CAN C Bus circuit to the PCM.

MONITOR CONDITIONS

When Monitored:

Ignition on.

SET CONDITIONS

- **Set Condition:**

The PCM gets an implausible signal over the CAN C circuit from the ABS Module. The circuit is continuously monitored.

POSSIBLE CAUSES

Possible Causes
VEHICLE SPEED SENSOR FAULT ACTIVE IN ANTI-LOCK BRAKE MODULE
CAN C BUS CIRCUIT SHORTED
CAN C BUS CIRCUIT OPEN
ABS MODULE
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the U1418-IMPLAUSIBLE RIGHT WHEEL DISTANCE SIGNAL RECEIVED active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **ABS MODULE IS ACTIVE ON THE CAN C BUS**

With the scan tool, select ECU View.

Verify that the ABS Module active on the bus.

Is the ABS Module active on the bus?

Yes

Go To 3.

No

(Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article) for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

3. DTCS STORED OR ACTIVE IN THE ABS MODULE

Check for DTCs in the ABS Module.

Are any DTCs active or stored in the ABS Module?

Yes

Refer to **ABS - ELECTRICAL DIAGNOSTICS** and perform the diagnostics for the DTCs in the ABS Module.

Perform **ABS VERIFICATION TEST** .

No

Go to 4.

4. ACTIVE DTCS IN THE TIPM

With the scan tool, select ECU View and select TIPM.

With the scan tool, view active DTCs.

Are any Communication DTCs active in the TIPM relating to the ABS System?

Yes

Replace the ABS Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

***CHECKING THE EXHAUST SYSTEM FOR LEAKS**

DIAGNOSTIC TEST

1. CHECKING THE EXHAUST SYSTEM FOR LEAKS

Turn the ignition off.

Raise the vehicle in accordance with the Service Information.

WARNING: The normal operating temperature of the exhaust system is very high. Never work around or attempt to service any part of the exhaust system until it has cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operating time

Connect Exhaust Cone #8404-EC or #8404-EC to Air Pressure Regulator (with hose) #W-18-MIL-1146AS.

CAUTION: The air pressure must not exceed 27.6 kPa (4 psi), otherwise engine damage can occur.

Attach shop air to the air pressure regulator.

Adjust the Air Pressure Regulator to 27.6 kPa (4 psi)

Insert the exhaust cone into the vehicle tail pipe.

If the vehicle is equipped with dual exhaust. Use the #8404-ECT with equipped attached plug, plug one side of the dual exhaust pipe. Pressurize the other as described above.

Apply Mopar® Air Leak Detector PN# 05191804AA (or an equivalent leak finder liquid) to the following areas:

- All welded joints from the exhaust manifold to 152.4 mm (6 inches) behind the downstream O2 sensor
- O2 sensor seal points
- O2 sensor boss welds
- Flange/joint connection(s)
- Exhaust manifold to cylinder head connection(s)

- EGR solenoid gasket base and tube seal points (if equipped)

Watch for the Mopar® Air Leak Detector PN# 05191804AA (or the equivalent leak finder liquid) to bubble.

Use the following definitions to help determine if system or component repair/replacement is necessary:

Type 1 Leak is defined as a leak where very small foam like bubbles 1 mm (0.04 of an inch) or less appear.

Any Type 1 or greater leaks found in welded joints, O2 sensor seal points or O2 sensor boss welds must be repaired or the component must be replaced.

Type 2 Leak is defined as a leak where larger bubbles pea size, 8 mm (0.3 of an inch) or greater appear.

Any Type 2 or greater leaks found in flange or joint connections, exhaust manifold to cylinder head connections, or EGR gasket and tube seal points must be repaired or the components must be replaced

Leak Location	Repair required if results at 27.6 kPa (4 psi) reveal bubble size:
Welded joints	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor seal points	Type 1, 1 mm (0.04 of an inch) or greater
O2 Sensor boss welds	Type 1, 1 mm (0.04 of an inch) or greater
Flange / joint connections	Type 2, 8 mm (0.3 of an inch) or greater
Exhaust Manifold to cylinder head connections	Type 2, 8 mm (0.3 of an inch) or greater
EGR gasket and tube seal points	Type 2, 8 mm (0.3 of an inch) or greater

If a leak is found that matches the above definition, repair or replace the component as necessary.

Once the repair is complete, repeat the procedure to verify that all leaks have been repaired.

Were any exhaust leaks found?

Yes

Repair or replace the leaking exhaust parts as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test complete.

***CHECKING THE FUEL DELIVERY SYSTEM**

CIRCUIT SCHEMATIC

POSSIBLE CAUSES

Possible Causes
RESTRICTED FUEL SUPPLY LINE
FUEL PUMP INLET STRAINER PLUGGED
FUEL CONTAMINATION
(K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO BATTERY VOLTAGE
(K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO GROUND
(K31) FUEL PUMP CONTROL CIRCUIT OPEN
(N1) FUSED FUEL PUMP OUTPUT OPEN
(N1) FUSED FUEL PUMP OUTPUT SHORTED TO GROUND
FUEL PUMP MODULE
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. FUEL PUMP OPERATION

Ignition on, engine not running.

With a scan tool, actuate the Fuel System test.

NOTE: **It may be necessary to use a mechanics stethoscope in the next step.**

Listen for fuel pump operation at the fuel tank.

Does the Fuel Pump operate?

Yes

Go To step 2.

No

Go To step 5.

CAUTION: Stop All Actuations.

2. FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line,

the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge at the engine.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 KPa +/- 34 KPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Below Specification

Go To step 3.

Within Specification

Check for contamination/water in the fuel. Make sure the fuel being used in this vehicle meets manufactures Fuel Requirement, refer to the service information.

Above Specification

Replace the fuel filter/fuel pressure regulator.

Perform **POWERTRAIN VERIFICATION TEST** .

CAUTION: Stop All Actuations.

3. RESTRICTED FUEL SUPPLY LINE

WARNING: The fuel system is under a constant pressure even with the engine off. Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel pressure line at the fuel pump module.

Install special tool #6539 (5/16") or #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 KPa +/- 34 KPa (59 psi +/- 5 psi).

Is the fuel pressure within specification now?

Yes

Repair/replace fuel supply line as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To step 4.

CAUTION: Stop All Actuations.

4. CHECKING FUEL INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST**.

5. FUEL PUMP CONTROL OPERATION FROM THE PCM

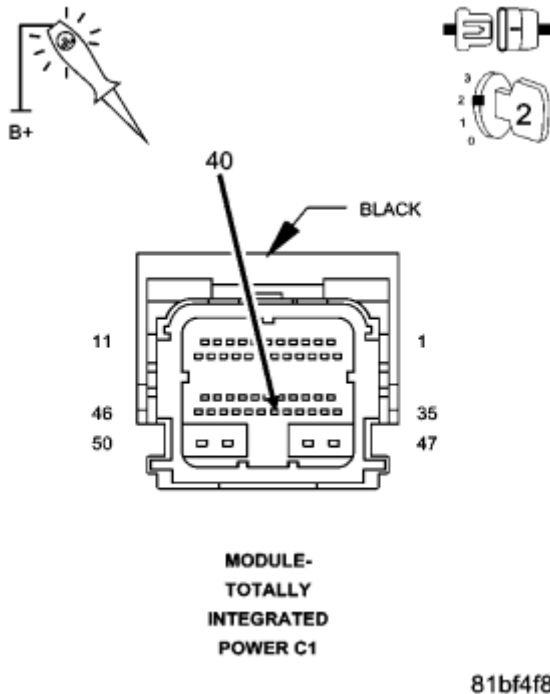


Fig. 14: Using 12-Volt Test Light Connected To B+ To Probe K31 Fuel Pump Control Circuit In C1 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Stop the Fuel Pump actuation.

Turn the ignition off.

Disconnect the C1 TIPM harness connector.

NOTE: Before continuing, check the TIPM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Ignition on, engine not running.

Using a 12-volt test light connected to B+ probe the (K31 Fuel Pump Control circuit in the C1 TIPM harness connector.

Using a scan tool actuate the Fuel Pump under the PCM actuations.

Does the test light illuminate brightly during the actuation?

Yes

Go To step 8.

No

Go To step 6.

6. (K31) FUEL PUMP CONTROL CIRCUIT OPEN

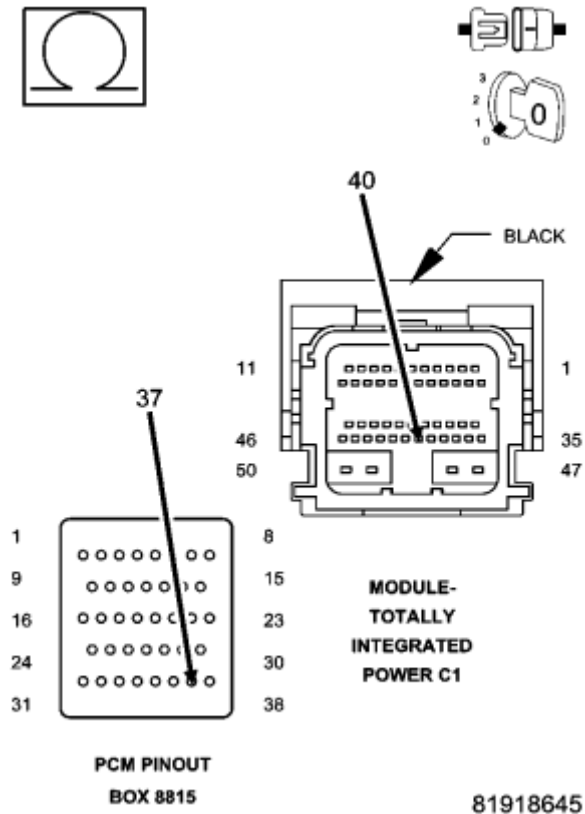


Fig. 15: Measuring Resistance Of (K31) Fuel Pump Control Circuit From C1 TIPM Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K31) Fuel Pump Control circuit from the C1 TIPM harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To step 7.

No

Repair the open in the (K31) Fuel Pump Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K31) FUEL PUMP CONTROL CIRCUIT SHORTED TO GROUND

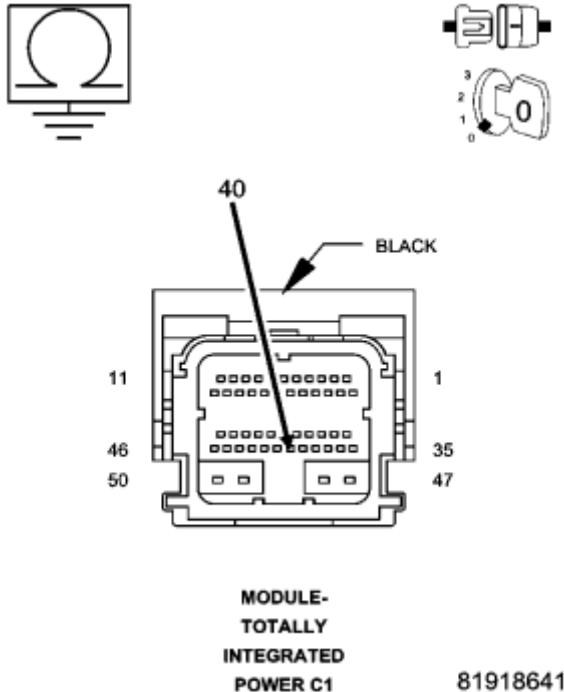


Fig. 16: Measuring Resistance Between Ground And Fuel Pump Control Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K31) Fuel Pump Control circuit in the TIPM C1 harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K31) Fuel Pump Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 11.

8. (N1) FUEL PUMP OUTPUT CIRCUIT OPEN

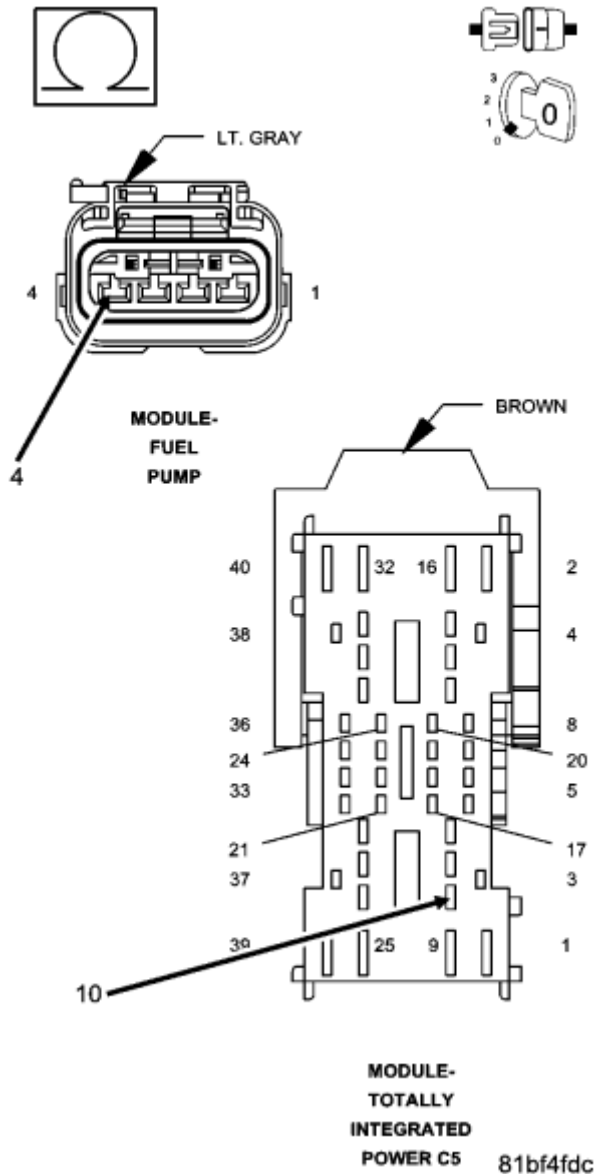


Fig. 17: Measuring Resistance Of (N1) Fused Fuel Pump Output Circuit From C5 TIPM Harness Connector And Fuel Pump Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C5 TIPM harness connector.

Disconnect the Fuel Pump Module harness connector.

Measure the resistance of the (N1) Fused Fuel Pump Output circuit from the C5 TIPM harness connector and the Fuel Pump Module harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the open in the (N1) Fused Fuel Pump Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 9.

9. (N1) FUEL PUMP OUTPUT CIRCUIT SHORTED TO GROUND

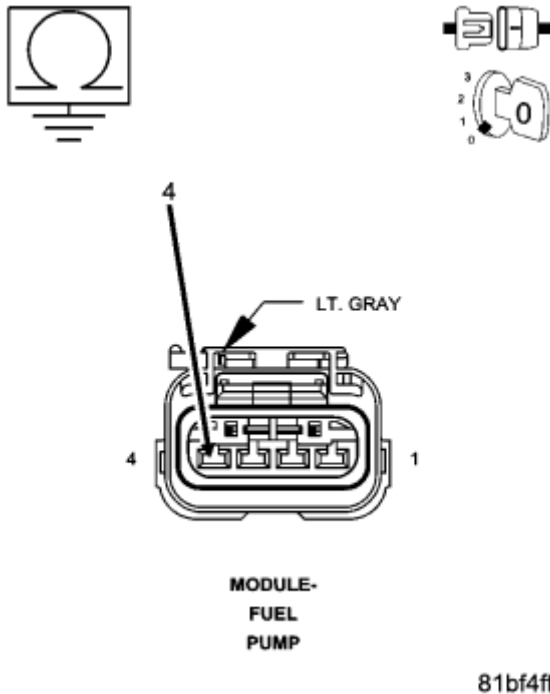


Fig. 18: Measuring Resistance Between Ground And (N1) Fused Fuel Pump Output Circuit At Fuel Pump Module Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (N1) Fused Fuel Pump Output circuit at the Fuel Pump Module harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (N1) Fused Fuel Pump Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 10.

10. FUEL PUMP MODULE/TIPM

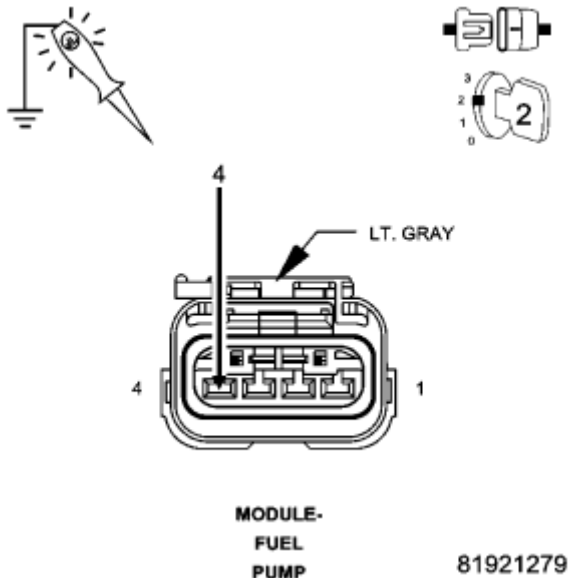


Fig. 19: Using 12-Volt Test Light Connected To Ground To Probe (N1) Fused Fuel Pump Output Circuit At Fuel Pump Module Harness Connector
Courtesy of CHRYSLER LLC

Connect the C3 PCM harness connector.

Connect the C1 and C5 TIPM harness connectors.

Turn the ignition on.

Using a scan tool actuate the Fuel Pump Module.

Using a 12-volt test light connected to ground, probe the (N1) Fused Fuel Pump Output circuit at the Fuel Pump Module harness connector.

Does the test light illuminate?

Yes

Replace the Fuel Pump Module in accordance with the Service Information. Refer to **REMOVAL** .
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module in accordance with the Service Information. Refer to **REMOVAL** .

Perform **POWERTRAIN VERIFICATION TEST** .

11. PCM

NOTE: Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

***CHECKING THE OXYGEN SENSOR OPERATION**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

DIAGNOSTIC TEST

1. OXYGEN SENSOR, WIRING, OR CONNECTORS

NOTE: Diagnose and repair any O2 sensor or rationality DTCs before proceeding with this test.

NOTE: When performing this procedure as part of another diagnostic process, it may be necessary to repeat this test for all of the oxygen sensors on the vehicle.

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen sensor and the PCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Turn the ignition on.

Monitor the scan tool data relative to the sensor and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test. If necessary, check each sensor circuit for high resistance or a shorted condition.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 2.

2. OXYGEN SENSOR VOLTAGE

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, monitor all O2 Sensor voltage readings.

Is the voltage switching between 2.5 and 3.4 volts for all O2 sensors?

Yes

Go to step 3.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 4.

3. O2 SENSOR HEATER OPERATION

Turn the ignition off.

NOTE: Wait a minimum of 10 minutes to allow the O2 Sensor to cool down before

continuing the test. Allow the O2 Sensor voltage to stabilize at 5.0 volts.

Turn the ignition on.

With a scan tool, actuate the O2 Sensor heater.

With the scan tool, monitor O2 Sensor voltage for at least 2 minutes.

Does the voltage stay above 4.5 volts?

Yes

Go to step 4.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test complete.

4. O2 SENSOR

Turn the ignition off.

NOTE: **Check for contaminants that may cause improper O2 Sensor operation, such as contaminated fuel, unapproved silicone, or evidence of oil or coolant.**

Disconnect the O2 Sensor harness connector.

Turn the ignition on.

With a scan tool, monitor the O2 Sensor voltage.

NOTE: **The voltage should be approximately 5.0 volts with the connector disconnected.**

Connect a jumper wire between the signal circuit and the return circuit in the O2 Sensor harness connector.

NOTE: **The voltage should drop from 5.0 volts to 2.5 volts with the jumper wire in place.**

Is the O2 Sensor voltage displayed on the scan tool as described?

Yes

Replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 5.

5. O2 SENSOR SIGNAL CIRCUIT

Using the wiring diagram/schematic as a guide, inspect the O2 Sensor Signal circuit and connectors between the O2 sensor and the PCM.

Check the O2 Sensor signal circuit for a short to ground, open circuit, short to voltage, or high resistance.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 6.

6. O2 SENSOR RETURN CIRCUIT

Using the wiring diagram/schematic as a guide, inspect the O2 Sensor Return circuit and connectors between the O2 sensor and the PCM.

Check the O2 Sensor return circuit for a short to ground, open circuit, short to voltage or high resistance.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 7.

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the O2 sensor and the PCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to the components tested in this procedure and wiggle test the wiring and connectors.

Look for the data to change or for a DTC to set during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

***CHECKING THE PCM POWER AND GROUND CIRCUITS**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

DIAGNOSTIC TEST

1. PCM WIRING OR CONNECTORS

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and each connector at the PCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 2.

2. CHECKING THE PCM GROUND CIRCUITS

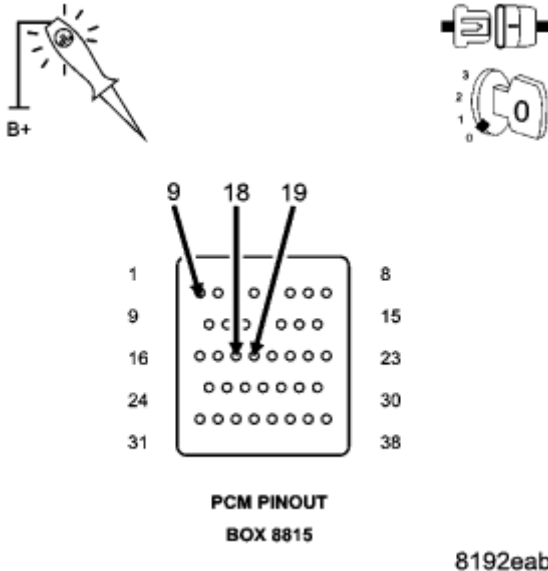


Fig. 20: Using 12 Volt Test Light Connected To 12 Volts To Check PCM Ground Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12 volt test light connected to 12 volts, check the PCM ground circuits.

Wiggle test each circuit during the test to check for an intermittent open in the circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

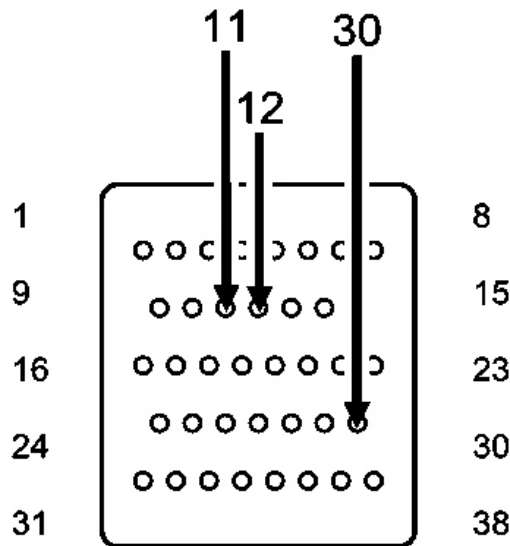
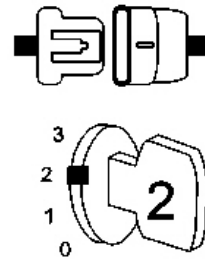
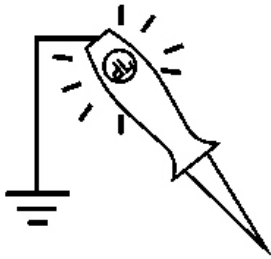
Go To step 3.

No

Repair the PCM ground circuit(s) for an open circuit or high resistance.

Perform **POWERTRAIN VERIFICATION TEST** .

3. CHECKING THE PCM FUSED IGNITION CIRCUITS



**PCM PINOUT
BOX 8815**

81337cf9

Fig. 21: Checking PCM Fused Ignition Switch Circuits
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Turn the ignition on.

Using a 12 volt test light connected to ground, check the PCM Fused Ignition circuits.

Check each circuit with the ignition on, engine running position, and during cranking.

Wiggle test each circuit during the test to check for an intermittent open in the circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go To step 4.

No

Repair the open or short to ground in the PCM Fused Ignition circuits.

Perform **POWERTRAIN VERIFICATION TEST** .

4. CHECKING THE PCM FUSED B+ CIRCUITS

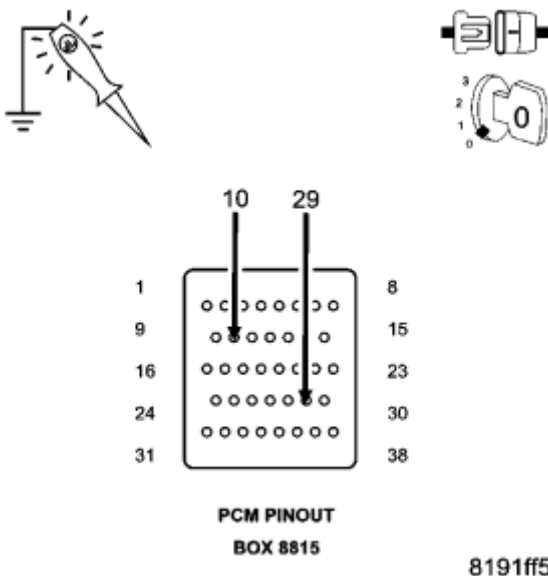


Fig. 22: Checking Fused B+ Circuits For Open Or Short To Ground

Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12 volt test light connected to Ground, check the PCM Fused B+ circuits.

Wiggle test each circuit during the test to check for an intermittent open in the circuit.

NOTE: The test light should be illuminated and bright with the ignition on and not illuminated with the ignition off. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated as described above?

Yes

Test complete.

No

Repair the open or short to ground in the PCM Fused B+ circuit(s) for as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

***ENGINE CRANKS BUT DOES NOT START**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
POWERTRAIN FUSES OPEN
CRANKSHAFT POSITION SENSOR
CAMSHAFT POSITION SENSOR
ASD RELAY
(A209) FUSED B+ CIRCUIT OPEN OR SHORTED TO GROUND
(F342) FUSED ASD RELAY OUTPUT CIRCUIT OPEN
FUEL CONTAMINATION
ENGINE MECHANICAL

DIAGNOSTIC TEST

1. NO START PRE-TEST

NOTE: **Verify no codes are set in the Occupant Restraint Controller. If codes are present, they may be the cause of a No Start condition.**

NOTE: **The following list of items must be checked before continuing with any no start tests.**

The battery must be fully charged and in good condition. A low charged battery may produce invalid test results. If the battery is low, charge the battery and then attempt to start the vehicle by cranking the engine for 15 seconds, 3 consecutive times. This will allow any DTCs to set that may have been erased due to a dead battery.

Try to communicate with PCM using a scan tool. If communication between the scan tool and PCM is not allowed inspect fuses. If the PCM reports a No Response condition, refer to appropriate Engine ELECTRICAL DIAGNOSTICS article.

Make sure the PCM Power and Ground circuits are OK.

Read the PCM DTCs with the scan tool. If any DTCs are present, they must be repaired before continuing with any other No Start diagnostic tests. Refer to **DIAGNOSTIC CODE INDEX** for the related P-code that is reported by the PCM.

Make sure that the Bus is functional. Attempt to communicate with the Instrument Cluster and VTSS, If you are unable to establish communications refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for the proper Diagnostic procedures.

The Sentry Key Immobilizer System must be operating properly. Check for proper communication with the scan tool and check for DTCs that may be stored in the WCM/Sentry Key Immobilizer Module (SKREEM). Repair the DTC(s) before continuing.

If no DTCs are found, using the scan tool, select Clear PCM (BATT Disconnect).

Crank the engine several times. Using the scan tool, View DTCs. If a DTC is present perform the DTC diagnostics before continuing.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 2.

2. OPEN FUSE

Check for any open fuses in the TIPM or Junction Block that may be related to the No Start condition.

Are any of the fuses open?

Yes

Replace the open fuse and check the related circuit(s) for a short to ground.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 3.

3. CRANKSHAFT POSITION SENSOR

Turn the ignition off.

Disconnect the CKP Sensor.

Attempt to start the engine.

Does the engine start?

Yes

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 4.

4. CAMSHAFT POSITION SENSOR

Turn the ignition off.

Connect the CKP Sensor.

Disconnect the CMP Sensor.

Attempt to start the engine.

Does the engine start?

Yes

Replace the Camshaft Position Sensor in accordance with the Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 5.

5. (A209) FUSED B+ CIRCUIT CHECK

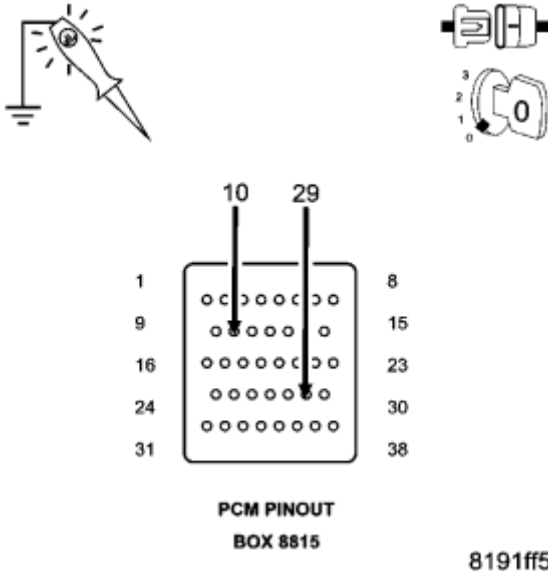


Fig. 23: Checking Fused B+ Circuits For Open Or Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground probe the (A209) Fused B+ circuits.

Does the test light illuminate brightly?

Yes

Go To step 6.

No

Repair the open or short to ground in the (A209) Fused B+ circuit between the TIPM and PCM.
Perform **POWERTRAIN VERIFICATION TEST** .

6. **(F342) FUSED ASD RELAY OUTPUT CIRCUIT OPEN**

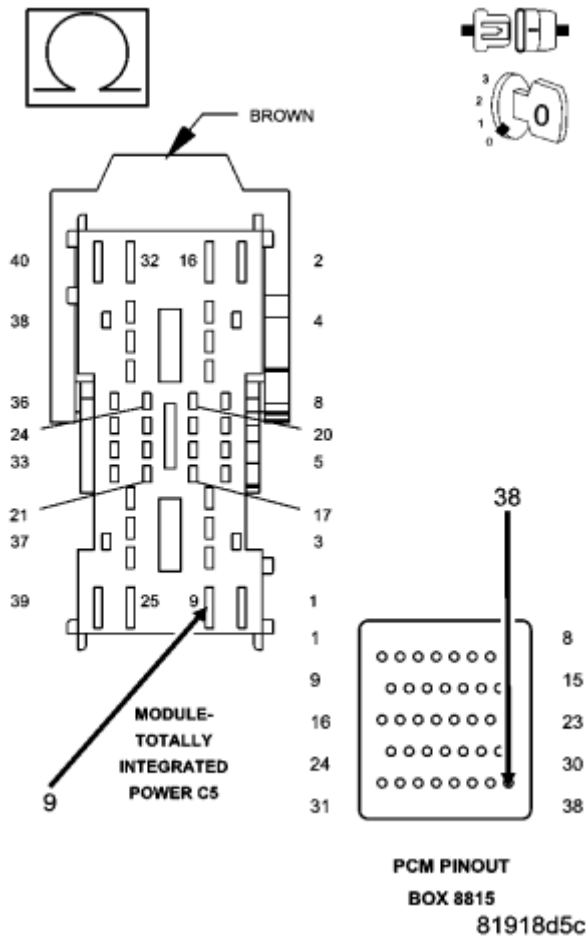


Fig. 24: Measuring Resistance Of (F342) ASD Control Output Circuit From C5 TIPM Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

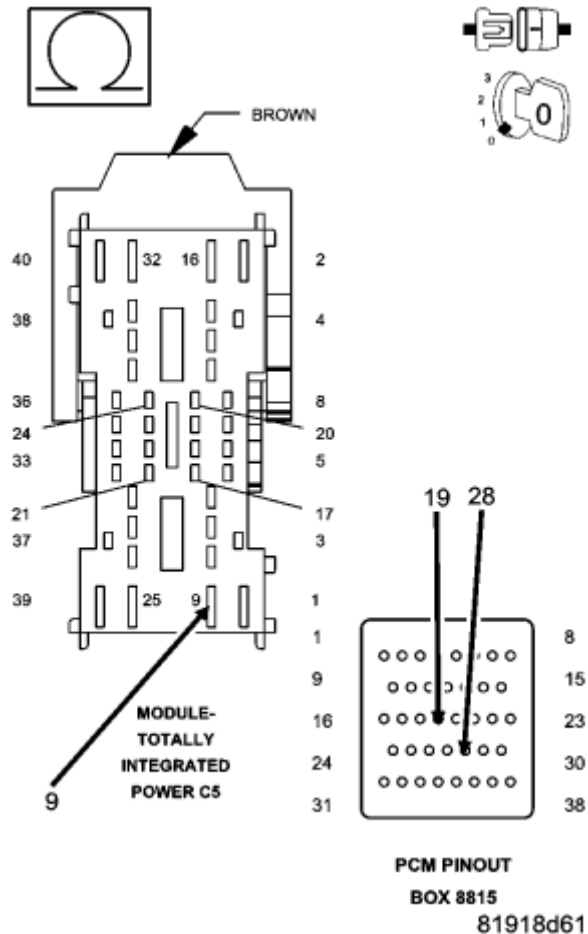


Fig. 25: Measuring Resistance Of (F342) ASD Control Output Circuit From C5 TIPM Harness Connector To Appropriate Terminals Of Special Tool #8815
Courtesy of CHRYSLER LLC

Disconnect the C5 TIPM harness connector

Disconnect the C3 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (F342) ASD Relay Output circuit from the C5 TIPM harness connector to the appropriate terminals of special tool #8815, Ignition coils, and the Fuel injectors.

Is the resistance below 5.0 ohms for each measurement?

Yes

Go To step 7.

No

Repair the open in the (F342) Fused ASD Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **FUEL PUMP DELIVERY**

Verify that the Fuel tank is not empty before continuing.

Follow the diagnostics for Checking the Fuel Delivery System in the appropriate Engine ELECTRICAL DIAGNOSTICS article.

Was the No Start condition solved after following the Checking the Fuel Delivery System diagnostic procedure?

Yes

Test Complete.

No

Go To step 8.

8. **ENGINE MECHANICAL**

Check for any of the following conditions/mechanical problems.

ENGINE COMPRESSION - must be within specifications

ENGINE EXHAUST SYSTEM - must be free of any restrictions or leaks.

ENGINE VALVE TIMING - must be within specifications, check for broken timing components

Are there any engine mechanical problems?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 9.

9. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors at the Powertrain

Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

***ETC INTERMITTENT NO CRANK CONDITION**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
ETC STARTER INHIBIT

DIAGNOSTIC TEST

1. ETC STARTER INHIBIT

NOTE: This ETC equipped engine will try to relearn ETC position when the key is left in the on position for an extended period of time and will not allow the starter to crank during this procedure. This procedure can take up to 2.5 seconds.

To verify the cause of the no crank condition or delayed crank use the scan tool, and read the ETC Starter Inhibit mileage.

The controller will store the mileage at which the no start condition occurred because of the ETC testing procedure.

This is considered normal operation for a vehicle equipped with an Electronic Throttle Control System and no repairs are necessary.

Is a mileage stored under the ETC Starter Inhibit?

Yes

Test Complete.

No

Refer to the appropriate diagnostic procedure for further assistance if any other DTC's are set.
Perform **POWERTRAIN VERIFICATION TEST** .

***FUEL PRESSURE LEAK DOWN**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
FAULTY FUEL PUMP MODULE FUEL INJECTOR(S)

DIAGNOSTIC TEST

1. FUEL PUMP MODULE

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the fuel pressure drop?

Yes

Replace Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To step 2.

2. FUEL INJECTOR(S)

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Remove special tool #C4390.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Move special tool #C4390, Hose Clamp Pliers, from between the fuel pressure gauge and the engine to between the fuel pressure gauge and fuel pump module.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the fuel pressure drop?

Yes

Replace the leaking fuel injectors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

***HARD START (FUEL SYSTEM)**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
FUEL CONTAMINATION RESTRICTED FUEL SUPPLY LINE FUEL PUMP INLET STRAINER PLUGGED FUEL PUMP MODULE FUEL INJECTOR(S)

DIAGNOSTIC TEST

1. CHECKING FUEL PRESSURE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install a fuel pressure gauge at the engine.

Ignition on, engine not running.

With a scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Choose a conclusion that best matches your fuel pressure reading.

Below Specification

Go To step 2.

Within Specification

Go To step 4.

2. RESTRICTED FUEL SUPPLY LINE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Raise vehicle on hoist, and disconnect the fuel supply line at the fuel pump module.

Install special tool #6539 (5/16") #6631(3/8") fuel line adapter and the fuel pressure gauge between the fuel supply line and the fuel pump module.

Ignition on, engine not running.

With the scan tool, actuate the ASD Fuel System test and observe the fuel pressure gauge.

NOTE: Fuel pressure specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Is the fuel pressure within specification?

Yes

Visually and physically inspect the fuel supply lines between the fuel tank and the fuel rail.
Repair/replace as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 3.

3. CHECKING THE FUEL INLET STRAINER

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Remove the Fuel Pump Module and inspect the Fuel Inlet Strainer.

Is the Fuel Inlet Strainer plugged?

Yes

Replace the Fuel Pump Inlet Strainer.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

4. FUEL PUMP MODULE

NOTE: Before continuing visually and physically inspect the fuel delivery system for external leaks or damage. Repair/replace as necessary.

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Turn the ignition off.

Install special tool #6539 (5/16") or #6631 (3/8") fuel line adapter.

Install the fuel pressure gauge.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Using special tool #C4390, Hose Clamp Pliers, pinch the rubber fuel line between the fuel pressure gauge and the engine.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the fuel pressure drop?

Yes

Replace Fuel Pump Module.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 5.

5. FUEL INJECTOR(S)

WARNING: The fuel system is under a constant pressure (even with the engine off). Before testing or servicing any fuel system hose, fitting or line, the fuel system pressure must be released. Failure to follow these instructions can result in personal injury or death.

Remove special tool #C4390.

Start the engine and allow the fuel system to reach maximum pressure.

Turn the ignition off.

NOTE: Fuel specification is 407 kPa +/- 34 kPa (59 psi +/- 5 psi).

Move special tool #C4390, Hose Clamp Pliers, from between the fuel pressure gauge and the engine to between the fuel pressure gauge and fuel pump module.

Monitor the fuel pressure gauge for a minimum of 5 minutes.

NOTE: The pressure should not fall below 241 kPa (35 psi)

Does the fuel pressure drop?

Yes

Replace the leaking fuel injectors.

Perform **POWERTRAIN VERIFICATION TEST** .

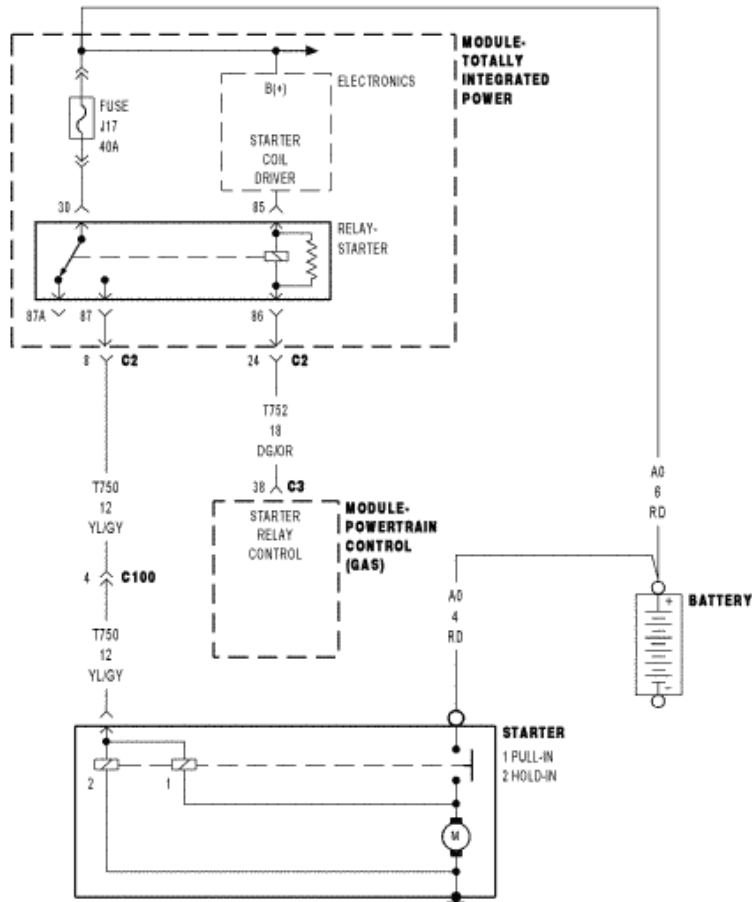
No

Check the fuel for contaminants.

Perform **POWERTRAIN VERIFICATION TEST** .

***NO CRANK CONDITION**

CIRCUIT SCHEMATIC



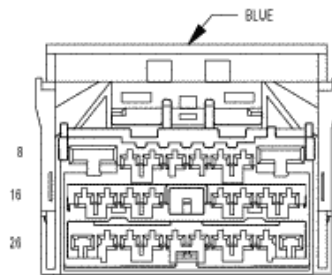
RELAY-STARTER (IN TIPM)



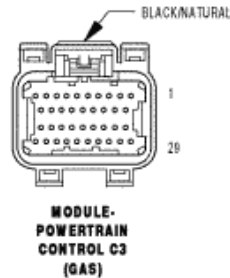
STARTER



STARTER-EYELET (GAS)



MODULE-TOTALLY INTEGRATED POWER C2



MODULE-POWERTRAIN CONTROL C3 (GAS)



BATTERY-POSITIVE (GAS)

01320603

Fig. 26: Starter Relay Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

POSSIBLE CAUSES

Possible Causes
MECHANICAL CONDITION FUSED B+ CIRCUITS OPEN BATTERY CIRCUIT RESISTANCE TOO HIGH (T752) STARTER RELAY CONTROL CIRCUIT SHORTED TO GROUND (T752) STARTER RELAY CONTROL CIRCUIT OPEN (T750) STARTER RELAY OUTPUT CIRCUIT SHORTED TO GROUND (T750) STARTER RELAY OUTPUT CIRCUIT OPEN TRANSMISSION RANGE SENSOR TOTALLY INTEGRATED POWER MODULE (TIPM) POWERTRAIN CONTROL MODULE (PCM) STARTER

DIAGNOSTIC TEST

1. MECHANICAL CONDITION

NOTE: Verify the battery is fully charged and capable of passing a load test before continuing.

WARNING: Make sure the battery is disconnected, then wait two minutes before proceeding. Failure to do so may result in personal injury or possible death.

Turn the engine over by hand to make sure the engine is not seized.

Is the engine able to turn over?

Yes

Go To step 2.

No

Repair the mechanical condition preventing the starter motor from cranking.
Perform **POWERTRAIN VERIFICATION TEST** .

2. PCM FUSED B+ CIRCUITS

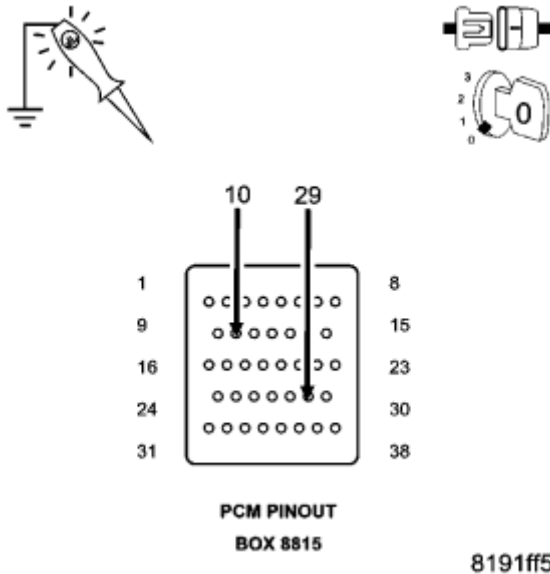


Fig. 27: Checking Fused B+ Circuits For Open Or Short To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground, probe the Fused B+ circuits at the appropriate terminals of special too #8815.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the open or short to ground in the PCM Fused B+ circuits.

Perform **POWERTRAIN VERIFICATION TEST** .

3. TRANSMISSION RANGE SENSOR

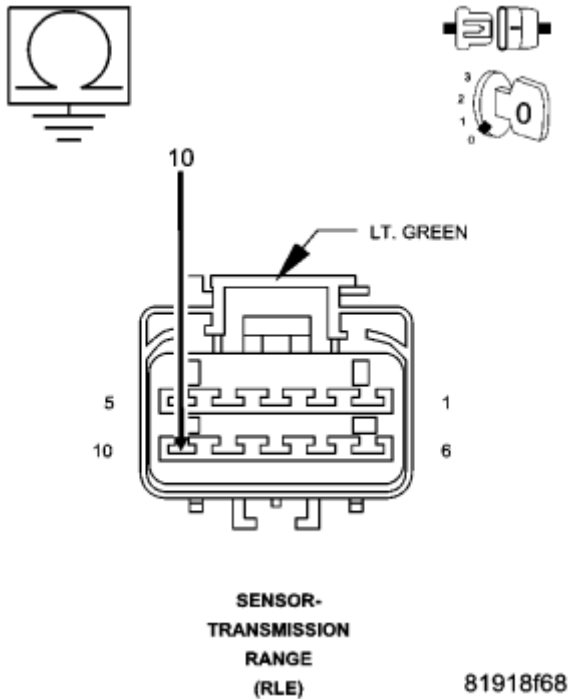


Fig. 28: Measuring Resistance In Transmission Range Sensor Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TRS harness connectors.

Move the Gear selector through all gear positions, from Park to 1st and back.

While moving the gear selector through each gear, measure the resistance between ground and the TRS (T41) Sense (P/N Sense) circuit at the TRS connector.

NOTE: The circuit is grounded in Park and Neutral and open in the other positions.

Did the resistance change from above 100 kohms (open) to below 10.0 ohms (grounded) ?

Yes

Go To step 4.

No

Replace the Transmission Range Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

4. EXCESSIVE RESISTANCE IN THE BATTERY CIRCUIT

Turn the ignition off.

Check the Battery Cables for excessive resistance using the service information procedure.

Did either Battery Cable have a voltage drop greater than 0.2 of a volt?

Yes

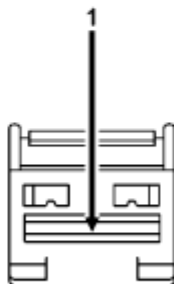
Repair the excessive resistance in the Battery circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 5.

5. STARTER



STARTER

81920faa

Fig. 29: Checking Starter Relay Output Circuit
Courtesy of CHRYSLER LLC

CAUTION: The Parking Brake must be on and the Transmission must be in park for a vehicle equipped with an automatic transmission.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Turn ignition off.

Disconnect the Starter Solenoid harness connector.

NOTE: **The Stater Solenoid harness connector must remain disconnected at this time.**

Have an assistant turn the ignition key to the CRANK position.

Using a 12-volt test light connected ground, probe the (T750) Stater Relay Output circuit in the Starter Solenoid harness connector while the ignition key is in the CRANK position.

Does the test light illuminate brightly?

Yes

Replace the Starter per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 6.

6. (T752) STARTER RELAY CONTROL CIRCUIT CHECK

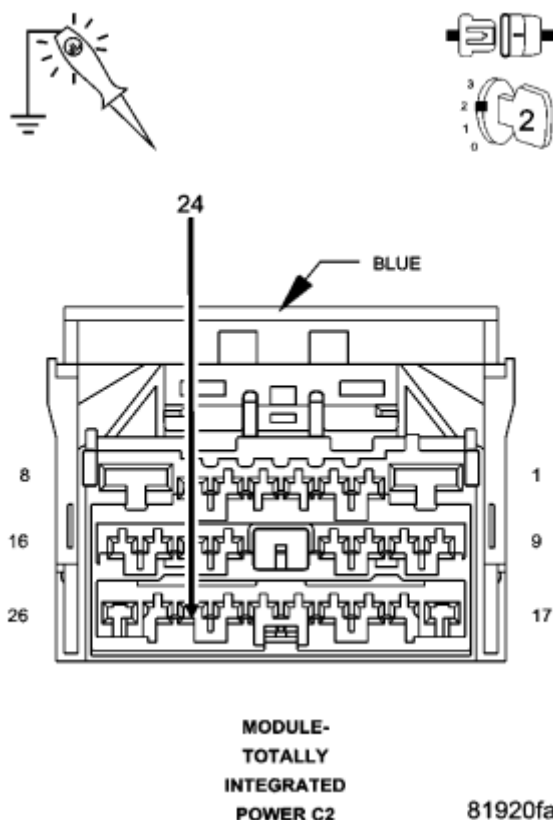


Fig. 30: Checking Starter Relay Control Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 TIPM harness connector.

Use a 12-volt test light connected to ground and probe the (T752) Starter Relay Control circuit in the C2 TIPM harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Have an assistant turn the key to the CRANK position.

Does the test light illuminate brightly when the key is turned to the crank condition?

Yes

Go To step 7.

No

Repair the excessive resistance or short to ground in the (T752) Starter Relay Control circuit between the PCM and TIPM.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (T750) STARTER CONTROL OUTPUT CIRCUIT OPEN

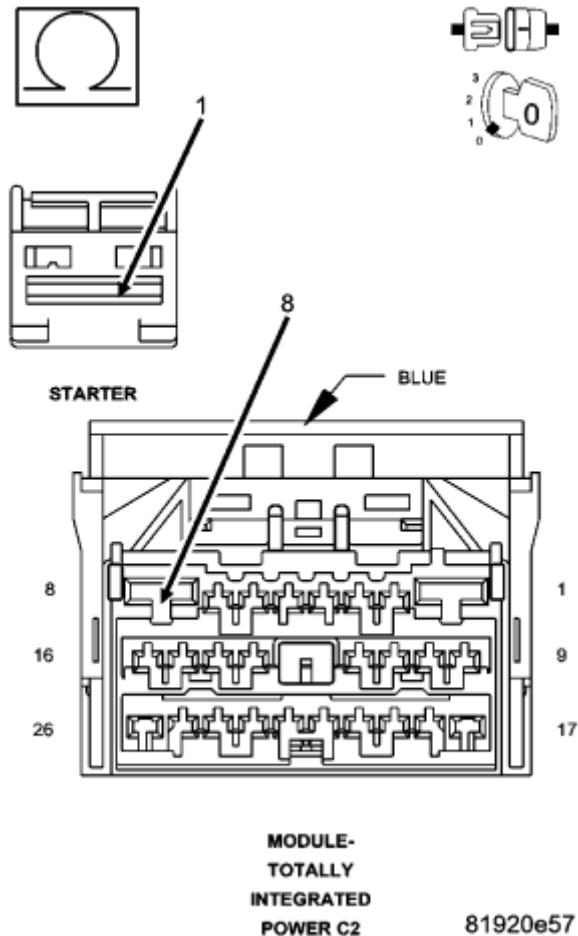


Fig. 31: Measuring Resistance Of Starter Control Output Circuit
 Courtesy of CHRYSLER LLC

Disconnect the Starter Solenoid connector.

Measure the resistance of the (T750) Starter Control Output circuit between the Starter Solenoid harness connector and the C2 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

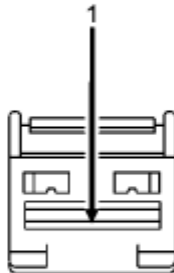
Go To step 8.

No

Repair the open in the (T750) Starter Control Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (T750) STARTER RELAY OUTPUT CIRCUIT SHORTED TO GROUND



STARTER

81920e4e

Fig. 32: Measuring Resistance Between Ground And Starter Relay Output Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T750) Starter Relay Output circuit in the Starter Solenoid harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (T750) Starter Relay Output circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 9.

9. TOTALLY INTEGRATED POWER MODULE (TIPM)

NOTE: Before continuing, check the TIPM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.

Using the schematics as a guide, inspect the wire harness and connectors.

Pay particular attention to all Power and Ground circuits.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

***NO RESPONSE WITH A NO START CONDITION**

ADDITIONAL WIRING

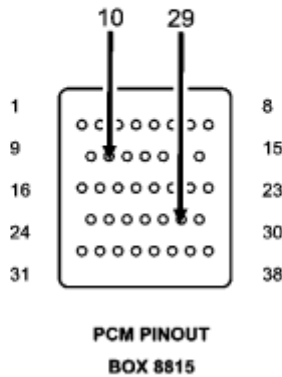
For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
(A209) PCM FUSED B+ CIRCUITS PCM NO RESPONSE (F1) PCM FUSED IGNITION SWITCH OUTPUT CIRCUIT (Z933) PCM GROUND CIRCUIT CRANKSHAFT POSITION SENSOR (K855) 5-VOLT SENSOR OPEN/SHORTED (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND POWERTRAIN CONTROL MODULE (PCM)

DIAGNOSTIC TEST

1. **(A209) PCM FUSED B+ CIRCUIT**



8191ff56

Fig. 33: Checking Fused B+ Circuits For Open Or Short To Ground
Courtesy of CHRYSLER LLC

NOTE: The scan tool and cable must be operating properly for the results of this test to be valid.

NOTE: Make sure the ignition switch was on while trying to communicate with the PCM.

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground probe the appropriate terminal of special tool #8815.

Does the test light illuminate brightly?

Yes

Go To step 2.

No

Repair the open or short to ground in the (A209) Fused B+ circuit. Inspect and replace fuses as

necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

2. (F1) PCM FUSED IGNITION SWITCH CIRCUIT

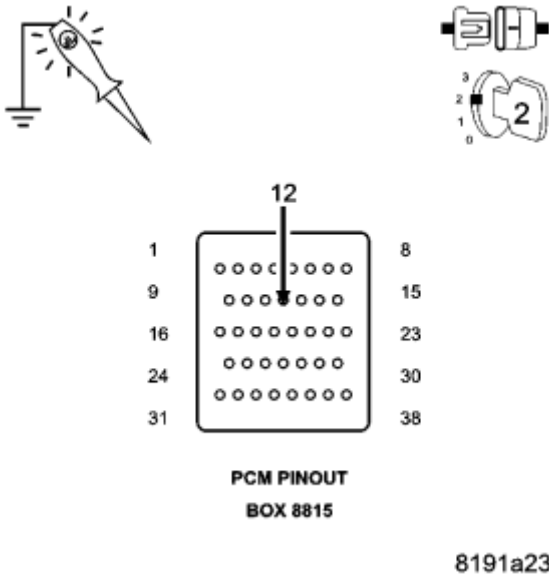


Fig. 34: Probing PCM Ignition Circuits
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to ground, probe the (F1) PCM Fused Ignition Switch Output circuit in the appropriate terminals of special tool #8815.

Does the test light illuminate brightly?

Yes

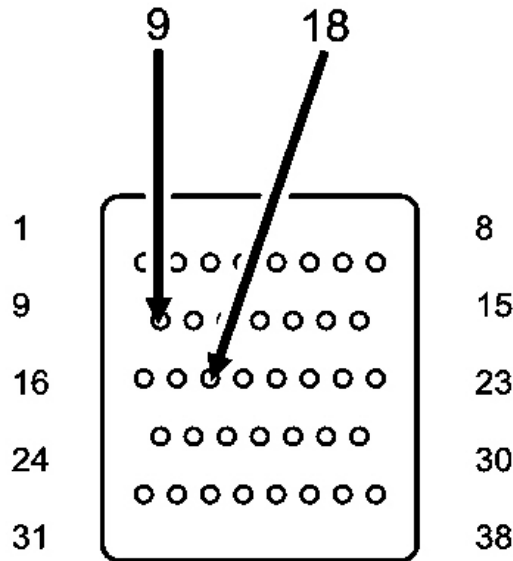
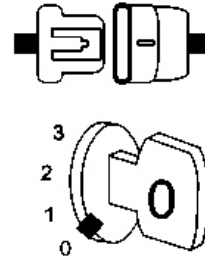
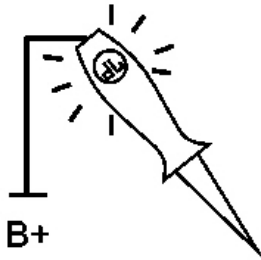
Go To step 3.

No

Repair the (F1) Ignition Switch Output circuit. Inspect and replace fuses as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (Z933) PCM GROUND CIRCUITS



**PCM PINOUT
BOX 8815**

81337cfd

Fig. 35: Checking PCM Ground Circuits
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to battery voltage, probe the (Z933) PCM ground circuits in the appropriate terminals of special tool #8815.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z933) PCM ground circuits.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (K855) 5-VOLT SUPPLY CIRCUIT

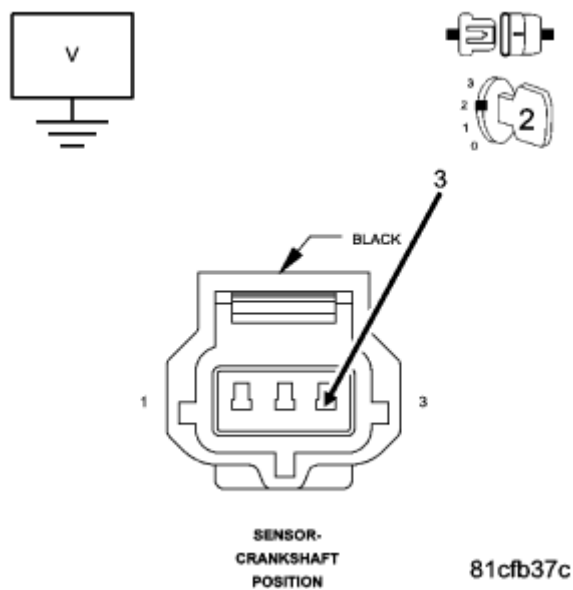


Fig. 36: Measuring The Voltage On The 5-Volt Supply Circuit In The CKP Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Connect the C2 PCM harness connector.

Disconnect the Crankshaft Position Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit.

Is the voltage between 4.5 and 5.2 volts?

Yes

Go To step 5.

No

Go To step 6.

5. CKP SENSOR

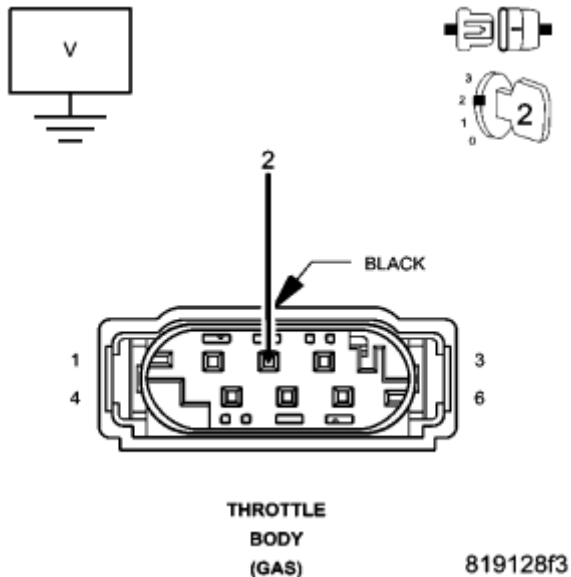


Fig. 37: Checking 5-Volt Sensor Circuit For Open Or Short
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

Is the voltage between 4.5 and 5.2 volts?

Yes

If communication is available with a PCM on a like vehicle, replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Crankshaft Position Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K855) 5-VOLT SENSOR OPEN/SHORTED

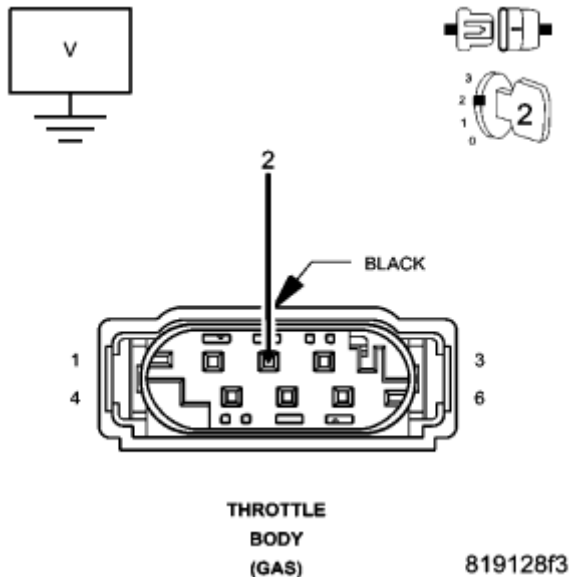


Fig. 38: Checking 5-Volt Sensor Circuit For Open Or Short
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit.

Disconnect all the sensors that use the (K855) 5-volt Supply circuit.

Did the voltage return to 4.5 to 5.2 volts when disconnecting any of the sensors.

Yes

Replace the sensor that is pulling down the (K855) 5-volt supply.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 7.

7. (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect PCM harness connectors.

Disconnect all the sensors that share the (K855) 5-volt Supply circuit.

Measure the resistance between ground and the (K855) 5-volt Supply circuit at one of the sensor harness connectors.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 8.

8. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND

Disconnect all the sensors that share the (K857) 5-volt Supply circuit.

Measure the resistance between ground and the (K857) 5-volt Supply circuit at one of the sensor harness connectors.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 9.

9. POWERTRAIN CONTROL MODULE (PCM)

NOTE: **Before continuing, check the PCM harness connector terminals for corrosion, damage, or terminal push out. Repair as necessary.**

Using the schematics as a guide, inspect the wire harness and connectors. Pay particular attention to all Power and Ground circuits.

Were there any problems found?

Yes

Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

***START AND STALL CONDITION**

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

POSSIBLE CAUSES

Possible Causes
CURRENT PCM DTCS CURRENT SKIM DTCS RESTRICTED EXHAUST ENGINE MECHANICAL VACUUM LEAKS CRACKED SPARK PLUG(S), CARBON TRACKING SPARK PLUG AND COIL CARBON BUILDUP ON THROTTLE BODY FUEL CONTAMINATION FUEL DELIVERY VALVE TIME OUT OF SPECIFICATION 5 VOLT SUPPLY CIRCUIT SENSOR GROUND CIRCUIT CMP SIGNAL CIRCUIT CAMSHAFT POSITION SENSOR CKP SIGNAL CIRCUIT CRANKSHAFT POSITION SENSOR FLEX PLATE (TARGET WHEEL) CMP AIRGAP CKP AIRGAP POWERTRAIN CONTROL MODULE

DIAGNOSTIC TEST

1. CHECKING DTCS

- NOTE:

Before continuing with this procedure, review the TSBs that mat be related to a start and stall condition.
- NOTE:

It may be helpful to review Secondary Indicators, if a two trip DTC(s) is present, drive the vehicle to try and mature the DTC to Active.

Ignition on, engine not running.

With a scan tool, read DTCs.

Are any DTCs present?

Yes

Refer to the appropriate Diagnostic Procedure.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 2.

2. CHECKING VEHICLE THEFT DTCS

NOTE: **If you are unable to communicate with the SKIM/SKREEM, refer to the VEHICLE THEFT SECURITY - ELECTRICAL DIAGNOSTICS and perform the appropriate diagnostics.**

With the scan tool, read the SKIM/SKREEM codes.

Are there any SKIM/SKREEM DTCs?

Yes

Refer to the **SKREEM/SKIM VERIFICATION TEST** .

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 3.

3. CAM/CRANK VERIFICATION

Using a scan tool, under OBDII Monitors, read and record the Cam Crank Synchronization Event Monitors.

CAM EVENT STATUS						
CM1ULTRH	CM1ULTLH	CM1TOL1	CM1LOW	CM1ULZERO	CM1MFS	CM1MFR
CM1IF	CM1ONLY	CM2ULTRH	CM2ULTLH	CM2TOL1	CM2LOW	CM2ULZERO
CM2MFS	CM2MFR	CM2IF	CM2ONLY	CM3ULTRH	CM3ULTLH	CM3TOL1
CM3LOW	CM3ULZERO	CM3MFS	CM3MFR	CM3IF	CM3ONLY	CM4ULTRH
CM4ULTLH	CM4TOL1	CM4LOW	CM4ULZERO	CM4MFS	CM4MFR	CM4IF
CM4ONLY	SYULCAM	-	-	-	-	-
CRANK EVENT STATUS						
CKULTRH	CKULTLH	CKLOW	CKUL60M2	CKMFS	CKMFR	CK1IF

CKULGTRH	CKULGTLH	CKULGTVR	CKULGTVL	CKUL220	CKUL40	SYULCRK
SYNOCLCK	-	-	-	-	-	-
SYNC EVENT STATUS						
SYULTOL	SYTOLF	-	-	-	-	-

Use the table above and determine if any of the values are present in the Cam Crank Synchronization Event Monitor display.

CAM EVENT STATUS ONLY

Go To step 7.

CRANK EVENT STATUS ONLY

Go To step 14.

CAM, CKP and/or SYNC EVENT STATUS

Go To step 21.

None Present

Go To step 4.

4. SPARK PLUG(S)

NOTE: Inspect the ignition coil for damage, carbon tracking on the coil or a damaged spark plug insulator boot. If a problem is found, replace the ignition coil.

Turn the ignition off.

Remove the spark plug.

Inspect the spark plug for any of the following conditions:

- Cracks or damage
- Carbon tracking
- Foreign material
- Gap not within specification
- Loose or broken electrode

NOTE: **Lightly tap the bottom of the spark plug on a solid surface. The electrode in the spark plug should not move.**

Were any problems found?

Yes

Replace the spark plug.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 5.

5. POSSIBLE CAUSES OF START AND STALL CONDITION

The following items should be checked as a possible cause for a start and stall condition.

Refer to any Technical Service Bulletins (TSBs) that may apply to the symptom.

The exhaust system must be free of any restrictions.

The engine compression must be within specifications.

The engine valve timing must be within specifications.

The engine must be free from vacuum leaks.

The throttle body must be free of carbon buildup and dirt.

Cracked spark plugs, carbon track on spark plugs, coil and coil boot.

Do any of the above conditions exist?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To step 6.

6. FUEL PUMP DELIVERY

Verify that the Fuel tank is not empty before continuing.

Follow the diagnostics for Checking Fuel Delivery in this article.

Was the No Start condition solved after following the above diagnostic test?

Yes

Test Complete.

No

Check for contamination/water in the fuel. Ensure the fuel being used in this vehicle meets OEM Fuel Requirement, refer to the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

7. 5 VOLT SUPPLY CIRCUIT VOLTAGE (CMP)

Turn the ignition off.

Disconnect the Camshaft Position Sensor connector.

Turn the ignition on.

Measure the voltage of the 5 Volt Supply circuit in the Camshaft Position Sensor harness connector.

Is the voltage 5.0 volts?

Yes

Go to step 8.

No

Repair the 5 Volt Supply.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

8. SENSOR GROUND CIRCUIT TEST

Turn the ignition off.

Using a 12 volt test light connected to 12 volts, probe the Sensor Ground circuit in the Camshaft Position Sensor harness connector.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Is the test light illuminated and bright?

Yes

Go to step 9.

No

Repair the Ground Circuit

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

9. CMP SIGNAL

Turn the ignition on.

Measure the voltage of the CMP Signal circuit in the Camshaft Position Sensor harness connector.

Is the voltage between 4.7 and 5.0 volts?

Yes

Go to step 13.

No

Go to step 10.

10. CMP SIGNAL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Powertrain Control Module connector.

Turn the ignition on.

Measure the voltage of the CMP Signal circuit in the Camshaft Position Sensor harness connector.

Is there any voltage present?

Yes

Repair the CMP Signal circuit for a short to voltage.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 11.

11. CMP SIGNAL CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the CMP Signal circuit in the Camshaft Position Sensor harness connector.

Is the resistance above 100 ohms?

Yes

Go to step 12.

No

Repair the CMP Signal circuit for a short to ground.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

12. CMP SIGNAL CIRCUIT OPEN OR HIGH RESISTANCE

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the CMP Signal circuit between the Camshaft Position Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go to step 24.

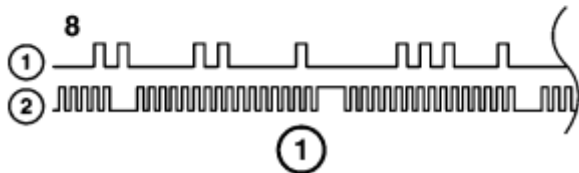
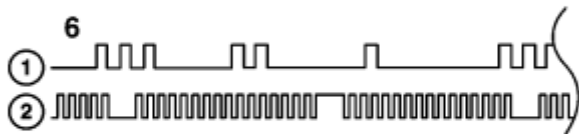
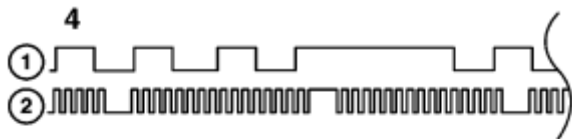
No

Repair the CMP Signal circuit for an open circuit or high resistance.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

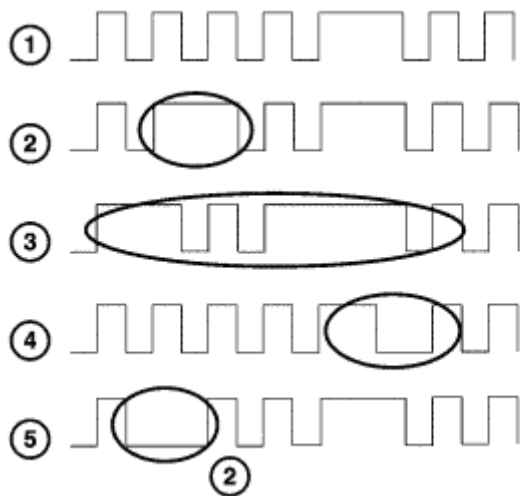
Perform **POWERTRAIN VERIFICATION TEST** .

13. **CAMSHAFT POSITION SENSOR SIGNAL**



81cac0a0

Fig. 39: Typical Scope Patterns Of Cam & Crank Sensors (1 of 2)
Courtesy of CHRYSLER LLC



81cabee3

Fig. 40: Typical Scope Patterns Of Cam & Crank Sensors (2 Of 2)
Courtesy of CHRYSLER LLC

Turn the ignition off.

Fig. 39 is a depiction of typical scope patterns of the Cam (1) and Crank (2) sensors for 4, 6, and 8 cylinder engines. The square wave patterns are uniform and are identical to one another. The patterns must be evenly spread apart and at the same height. The larger gap pattern (signature) after the shorter wave forms are used for cylinder identification (Crank signal) and the distance between the series of slots (trigger) on the camshaft pulley (cam signal). Any variation of the pattern will indicate an issue with the sensor, wiring, or trigger (target) wheel.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

With a lab scope, probe the CMP Signal circuit in the appropriate terminal of the special tool #8815.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start and allow the engine to run.

Observe the lab scope screen.

Compare the scope pattern with the ones in **Fig. 40**.

1. Pattern indicates a clean (good) square wave form that is identical to what the cam and crank should be. The square wave patterns are uniformed and are identical to one another.
2. Two pulses joined together in the same spot on target. Indicates damage to the target (trigger) on the flexplate or broke tooth, runout in the target or large airgap between the sensor and the target wheel.
3. Wide airgap or intermittent connection.
4. Early signature, predominately at high speed. Large airgap between the sensor and the target wheel.
5. Missed pulse. Possible burr or light damage to target or incorrect lateral position of the crank sensor to target (trigger).

NOTE: If any of the above (except pattern 1) is displayed on the lab scope repair as necessary.

Was the square wave found to match any of the above except pattern 1?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Camshaft Position Sensors.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

14. 5 VOLT SUPPLY CIRCUIT VOLTAGE (CKP)

Turn the ignition off.

Disconnect the Crankshaft Position Sensor connector.

Turn the ignition on.

Measure the voltage of the 5 Volt Supply circuit in the Crankshaft Position Sensor harness connector.

Is the voltage 5.0 volts?

Yes

Go to step 15.

No

Repair the 5 Volt Supply.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

15. SENSOR GROUND CIRCUIT TEST

Turn the ignition off.

Using a 12 volt test light connected to 12 volts, check the Sensor Ground circuit in the Crankshaft Position Sensor harness connector.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to step 16.

No

Repair the Ground Circuit.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

16. CKP SIGNAL

Turn the ignition on.

Measure the voltage of the CKP Signal circuit in the Crankshaft Position Sensor harness connector.

Is the voltage between 4.7 and 5.0 volts?

Yes

Go to step 20.

No

Go to step 17.

17. CKP SIGNAL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Powertrain Control Module (PCM) connector.

Turn the ignition on.

Measure the voltage of the CKP Signal circuit in the Crankshaft Position Sensor harness connector.

Is there any voltage present?

Yes

Repair the CKP Signal circuit for a short to voltage.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go to step 18.

18. CKP SIGNAL CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the CKP Signal circuit in the Crankshaft Position Sensor harness connector.

Is the resistance above 100 ohms?

Yes

Go to step 19.

No

Repair the CMP Signal circuit for a short to ground.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

19. CKP SIGNAL CIRCUIT OPEN OR HIGH RESISTANCE

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the CKP Signal circuit between the Camshaft Position Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go to step 24.

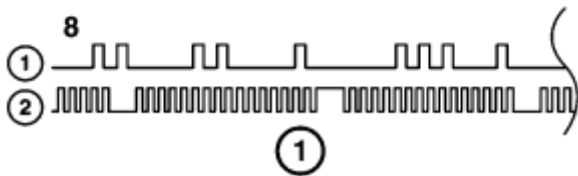
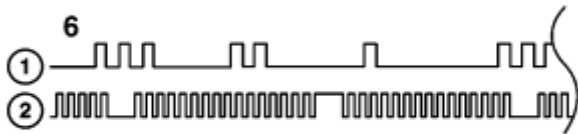
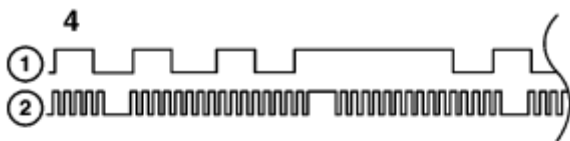
No

Repair the CMP Signal circuit for an open circuit or high resistance.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform POWERTRAIN VERIFICATION TEST .

20. CRANKSHAFT POSITION SENSOR SIGNAL



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Fig. 41: Typical Scope Patterns Of Cam & Crank Sensors (1 of 2)
Courtesy of CHRYSLER LLC

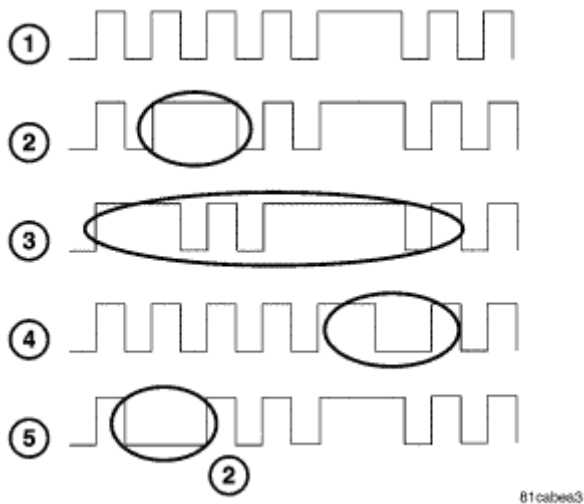


Fig. 42: Typical Scope Patterns Of Cam & Crank Sensors (2 Of 2)
Courtesy of CHRYSLER LLC

Turn the ignition off.

Fig. 41 is a depiction of typical scope patterns of the Cam (1) and Crank (2) sensors for 4, 6, and 8 cylinder engines. The square wave patterns are uniform and are identical to one another. The patterns must be evenly spread apart and at the same height. The larger gap pattern (signature) after the shorter wave forms are used for cylinder identification (Crank signal) and the distance between the series of slots (trigger) on the camshaft pulley (cam signal). Any variation of the pattern will indicate an issue with the sensor, wiring, and trigger (target) wheel.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

With a lab scope, probe the CKP Signal circuit in the appropriate terminal of the special tool #8815.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start and allow the engine to run.

Observe the lab scope screen.

Compare the scope pattern with the ones in **Fig. 42**.

1. Pattern indicates a clean (good) square wave form that is identical to what the cam and crank should be. The square wave patterns are uniform and are identical to one another.

2. Two pulses joined together in the same spot on target. Indicates damage to the target (trigger) on the flexplate or broke tooth, runout in the target or large airgap between the sensor and the target wheel.
3. Wide airgap or intermittent connection.
4. Early signature, predominately at high speed. Large airgap between the sensor and the target wheel.
5. Missed pulse. Possible burr or light damage to target or incorrect lateral position of the crank sensor to target (trigger).

NOTE: **If any of the above (except pattern 1) is displayed on the lab scope repair as necessary.**

Was the square wave found to match any of the above except pattern 1?

Yes

Repair as necessary.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Crankshaft Position Sensor.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

21. **VALVE TIMING**

Ensure the valve timing is within specification. Refer to **VALVE TIMING** .

Was the valve timing within specification?

Yes

Go to step 22.

No

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

22. 5 VOLT SUPPLY CIRCUIT VOLTAGE (CMP/CKP)

NOTE: The 5 Volt Supply circuit must be present at both CMP and CKP Sensors.

Turn the ignition off.

Disconnect the Camshaft Position Sensor connector.

Turn the ignition on.

Measure the voltage of the 5 Volt Supply circuit in the Camshaft Position Sensor harness connector.

Repeat the above test at the Crankshaft Position Sensor (Crankshaft Position Sensor harness connector measure).

Is the voltage 5.0 volts at each sensor?

Yes

Go to step 23.

No

Repair the 5 Volt Supply circuit(s) as necessary.

NOTE: A battery disconnect must be performed to clear the Cam Crank Synchronization Events.

Perform **POWERTRAIN VERIFICATION TEST** .

23. SENSOR GROUND CIRCUIT

NOTE: The Ground circuit must be present at both CMP and CKP Sensors.

Turn the ignition off.

Using a 12 volt test light connected to 12 volts, probe the Sensor Ground circuit in the Camshaft Position Sensor harness connector.

Repeat the above test at the Crankshaft Position Sensor (Crankshaft Position Sensor harness connector measure).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Replace both the Camshaft Position Sensor and Crankshaft Position Sensor in accordance with the Service Information.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the Ground Circuit(s) as necessary.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

24. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Camshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Monitor the scan tool data relative to this circuit and wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

NOTE: **A battery disconnect must be performed to clear the Cam Crank Synchronization Events.**

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE

DIAGNOSTIC TEST

1. NO RESPONSE

Make sure the scan tool will communicate with the appropriate modules.

Are you currently experiencing a NO RESPONSE condition?

Yes

The NO RESPONSE condition must be properly diagnosed before continuing.

Refer to the appropriate BUS Communication test in appropriate Engine ELECTRICAL DIAGNOSTICS article.

No

Go To step 2.

2. NO START

Is the customer complaint a NO START condition?

Yes

Check the vehicle for any NO START related PCM DTCs or Vehicle Theft Security related DTCs.

If no Theft related DTCs are present, refer to the Non DTC Diagnostic Procedures that relate to Fuel and Starting.

No

Go To step 3.

3. VEHICLE HISTORY AND TSB(s)

Continue by reading PCM DTCs and record the related Freeze Frame data if any DTCs are present.

Whether or not any DTCs are present you will want to check the following items which may assist in repairing the customers complaint successfully.

Check the vehicle's repair history.

If the vehicle has a repair history that pertains to the customer's current complaint, review the repair.

Inspect the vehicle for any aftermarket accessories that may have been installed incorrectly.

Check for any TSBs related to the customer's complaint or DTCs.

If a TSB applies, follow the instructions per the TSB.

Choose the following scenario that best applies.

The TSB repaired the customer's complaint.

Testing complete.

A DTC is present, no TSB applies, or the TSB didn't repair the customer's complaint.

Go To step 4.

No DTCs are present.

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

4. **WIRE HARNESS INSPECTION**

Clear the DTCs.

Attempt to duplicate the customer complaint.

Whether the customer complaint can be duplicated or not, make a quick wire harness inspection related to the DTCs that were previously cleared.

Check the Powertrain Control Module connectors, the suspected component connection, in-line connectors, wire harness splices, PCM power and ground circuits, and any related fuses.

If the DTCs are fuel or air related, check the fuel level and quality.

Were any repairs made that fixed the customer's complaint?

Yes

Testing complete.

No

Refer to the diagnostic test procedure related to the DTC.

INTERMITTENT CONDITION

DIAGNOSTIC TEST

1. INTERMITTENT CONDITION

NOTE: The conditions that set the DTC are not present at this time. The following list may help in identifying the intermittent condition.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Refer to any Technical Service Bulletins (TSBs) that may apply.

Review the scan tool Freeze Frame information. If possible, try to duplicate the conditions under which the DTC set.

With the engine running at normal operating temperature, monitor the scan tool parameters related to the DTC while wiggling the wire harness. Look for parameter values to change and/or a DTC to set.

Turn the ignition off.

Visually inspect the related wire harness. Disconnect all the related harness connectors. Look for any chafed, pierced, pinched, partially broken wires and broken, bent, pushed out, or corroded terminals. Verify correct connector pin fit at the related connectors.

Perform a voltage drop test on the related circuits between the suspected inoperative component and the PCM.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Inspect and clean all PCM, engine, and chassis grounds that are related to the most current DTC.

If numerous trouble codes were set, use a wire schematic and look for any common ground or supply circuits.

For any Relay DTCs, actuate the Relay with the scan tool and wiggle the related wire harness to try to interrupt the actuation.

For intermittent Evaporative Emission trouble codes perform a visual and physical inspection of the related parts including hoses and the Fuel Filler cap.

For intermittent Misfire DTCs check for restrictions in the Intake and Exhaust system, proper installation of Sensors, vacuum leaks, and binding components that are run by the accessory drive belt.

Use the scan tool to perform a System Test if one applies to failing component.

A co-pilot, data recorder, and/or lab scope should be used to help diagnose intermittent conditions.

Were any problems found during the above inspections?

Yes

Perform the necessary repairs.

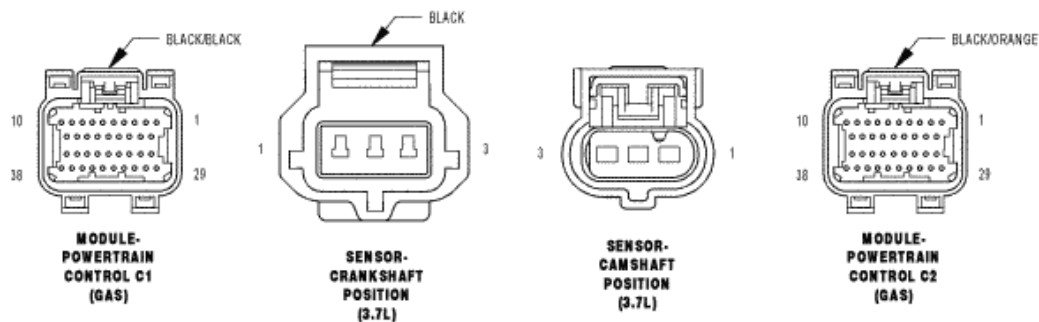
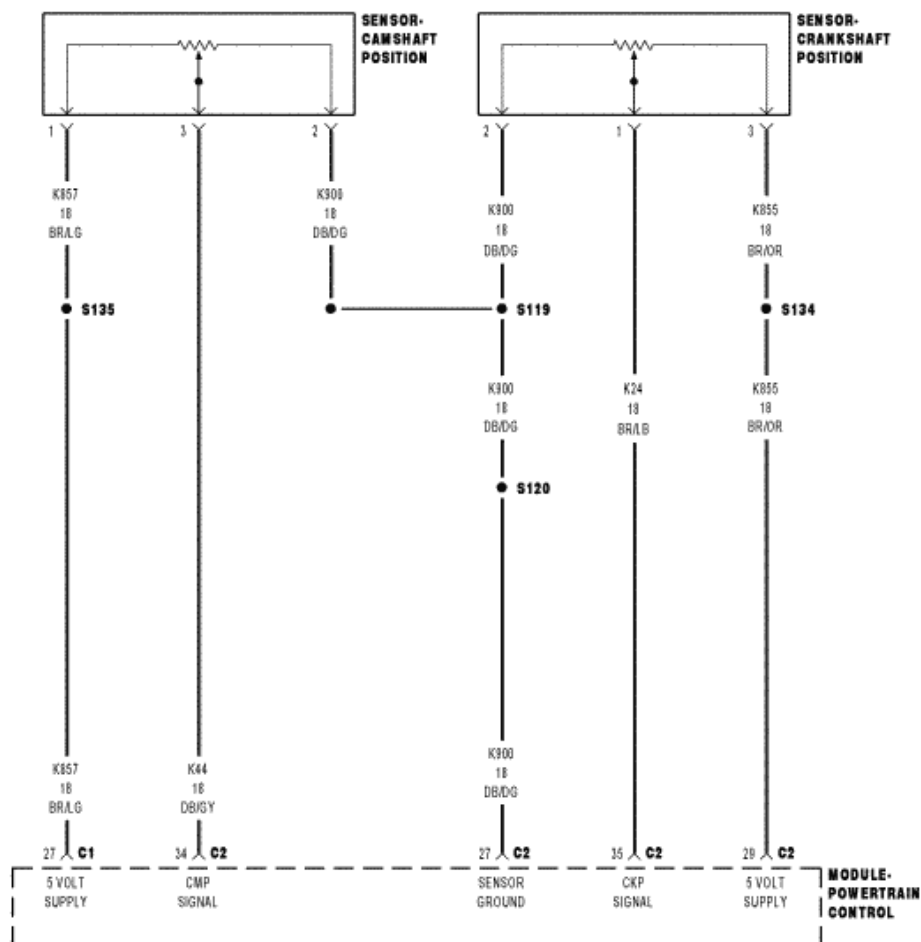
Perform **POWERTRAIN VERIFICATION TEST** .

No

Test Complete.

P0016-CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT

CIRCUIT SCHEMATIC



01c1a8a3

Fig. 1: Crankshaft And Camshaft Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the engine speed between 480 and 6816 RPM and no CMP or CKP sensor DTCs detected.

SET CONDITIONS

- Set Condition:

The PCM detects that the deviation between the camshaft position and the crankshaft position has exceeded the maximum acceptable value. One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
ERRATIC CAM POSITION SENSOR SIGNAL CAMSHAFT POSITION SENSOR TONE WHEEL/PULSE RING ERRATIC CRANKSHAFT POSITION SENSOR SIGNAL CRANKSHAFT POSITION SENSOR TONE WHEEL/PULSE RING TIMING SPROCKET ALIGNMENT CAMSHAFT POSITION SENSOR CRANKSHAFT POSITION SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Turn the ignition on.

With the scan tool select View DTCs.

Record the related Freeze Frame data.

With the scan tool clear DTCs.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CAMSHAFT POSITION SENSOR CIRCUIT WIRING OR CONNECTORS

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Camshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Inspect the Camshaft Position Sensor for conditions such as loose mounting screws, damage, or cracks.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. CRANKSHAFT POSITION SENSOR CIRCUIT WIRING OR CONNECTORS

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Crankshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Inspect the Crankshaft Position Sensor for conditions such as loose mounting screws, damage, or cracks.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. CRANKSHAFT, TONE WHEEL OR FLEX PLATE

Turn the ignition off.

Remove the Crankshaft Position Sensor.

Inspect the Crankshaft Position Sensor and mounting area for any condition that would result in an incorrect signal, such as damage, evidence of foreign material, or excessive movement.

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. CAMSHAFT, TONE WHEEL OR PULSE RING

Remove the Camshaft Position Sensor.

Inspect the Camshaft Position Sensor and mounting area for any condition that would result in an incorrect signal, such as damage, evidence of foreign material, or excessive movement.

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. TIMING SPROCKET ALIGNMENT

Turn the ignition off.

Verify proper timing gear alignment in accordance with the Service Information.

Were any problems found?

Yes

Repair as necessary in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. CAMSHAFT POSITION SENSOR IRREGULAR SIGNAL

Turn the ignition off.

Install any previously removed components. Connect all connectors.

Using a lab scope and the Miller special tool #6801, backprobe the (K44) CMP Signal circuit in the Camshaft Position Sensor harness connector.

Turn the ignition on.

Wiggle the related wire harness and lightly tap on the Camshaft Position Sensor while monitoring the lab scope screen.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Monitor the Camshaft Position Sensor signal on the lab scope screen.

Were any Camshaft Position Sensor signals irregular or missing?

Yes

Go To 9.

No

Go To 8.

8. CRANKSHAFT POSITION SENSOR IRREGULAR SIGNAL

Turn the ignition off.

Using a lab scope and the Miller special tool #6801, backprobe the (K24) CKP Signal circuit in the Crankshaft Position Sensor harness connector.

Turn the ignition on.

Wiggle the related wire harness and lightly tap on the Crankshaft Position Sensor while monitoring the lab scope screen.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Monitor the Crankshaft Position Sensor signal on the lab scope screen.

Were any Crankshaft Position Sensor signals irregular or missing?

Yes

Go To 10.

No

Go To 11.

9. CAMSHAFT POSITION SENSOR

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Camshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Replace the Camshaft Position Sensor in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

10. CRANKSHAFT POSITION SENSOR

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Crankshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Crankshaft Position Sensor in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. POWERTRAIN CONTROL MODULE (PCM)

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Camshaft Position Sensor and the Powertrain Control Module (PCM) and between the Crankshaft Position Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Turn the ignition on.

With the scan tool clear DTCs.

Start the engine.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Monitor the scan tool data relative to this circuit and wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

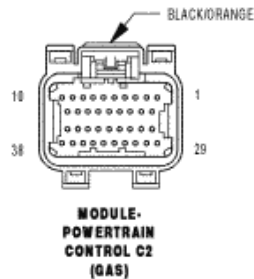
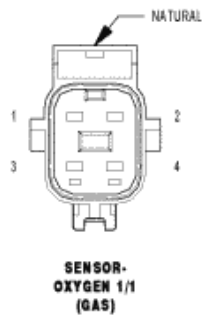
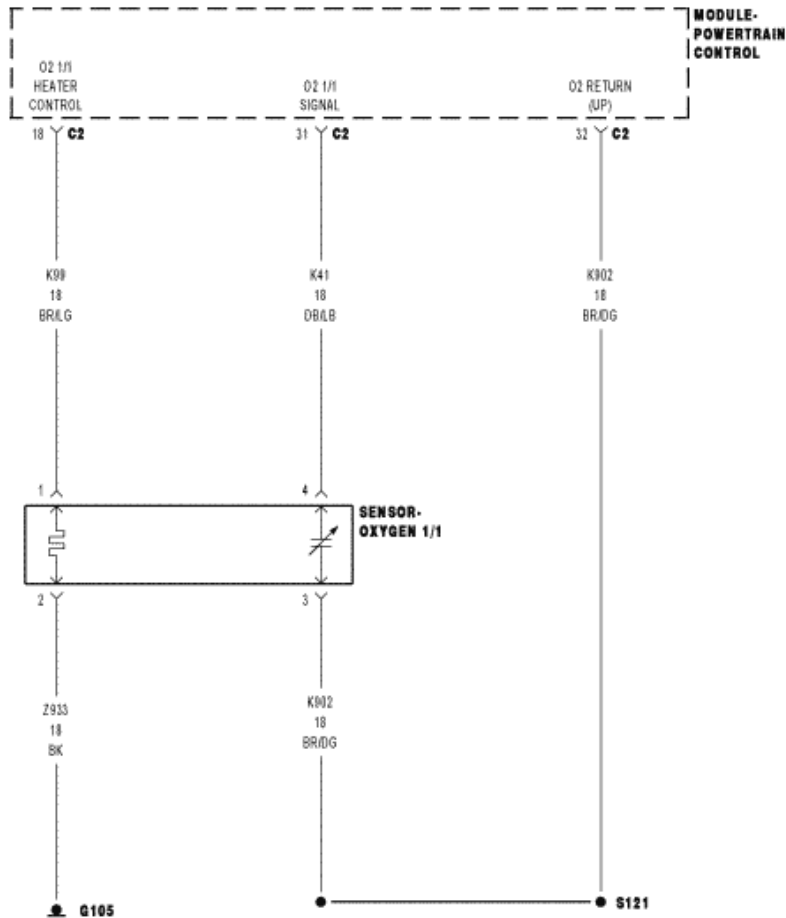
No

Replace and program the Powertrain Control Module (PCM) in accordance with the Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0031-O2 SENSOR 1/1 HEATER CIRCUIT LOW

CIRCUIT SCHEMATIC



91902414

Fig. 2: O2 Sensor 1/1 Heater Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is below the minimum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K99) O2 SENSOR 1/1 HEATER CONTROL CIRCUIT SHORTED TO GROUND EXCESSIVE RESISTANCE IN THE (K99) O2 SENSOR 1/1 HEATER CONTROL CIRCUIT 1/1 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 HEATER ELEMENT

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 1/1 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the Heater Control terminal and the Heater ground terminal at the component.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

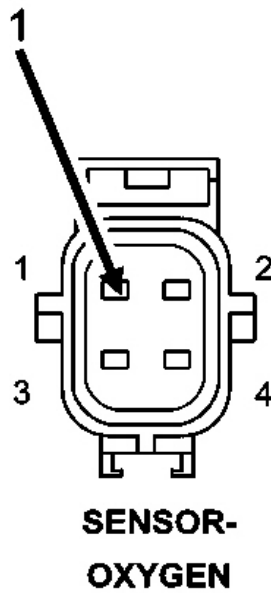
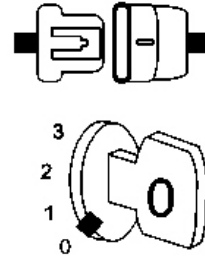
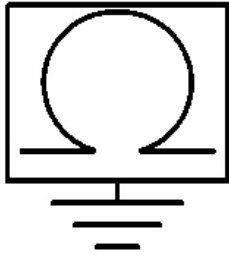
Go To 3.

No

Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K99) O2 1/1 HEATER CONTROL CIRCUIT SHORTED TO GROUND



81650a4c

Fig. 3: Checking O2 Sensor Heater Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K99) O2 1/1 Heater Control circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

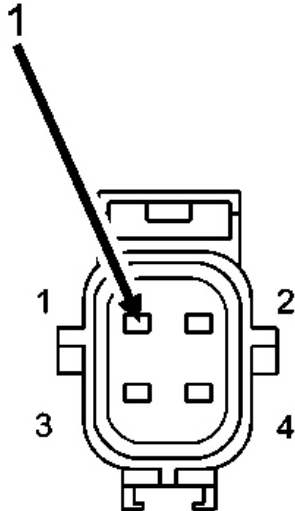
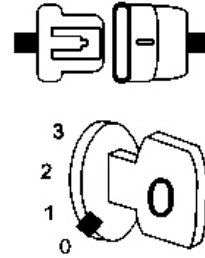
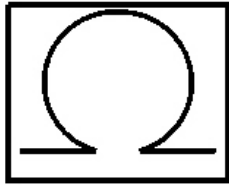
Repair the short to ground in the (K99) O2 1/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

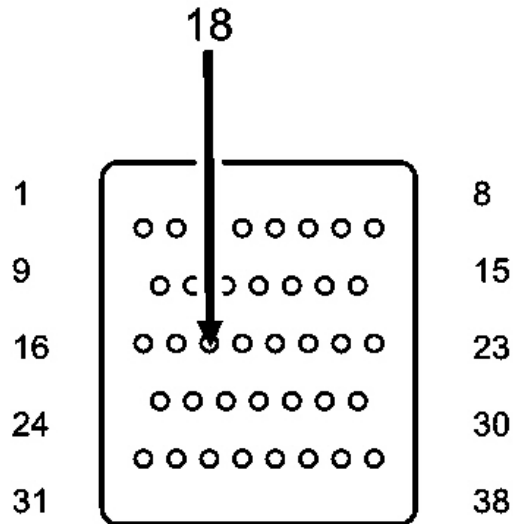
No

Go To 4.

4. EXCESSIVE RESISTANCE IN THE (K99) O2 1/1 HEATER CONTROL CIRCUIT



**SENSOR-
OXYGEN**



**PCM PINOUT
BOX 8815**

81650a85

Fig. 4: Checking O2 1/1 Heater Control Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (K99) O2 1/1 Heater Control circuit between the 1/1 Oxygen Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 0.5 ohms?

Yes

Go To 5.

No

Repair the excessive resistance in the (K99) O2 1/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

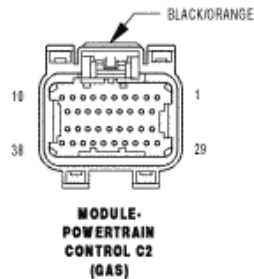
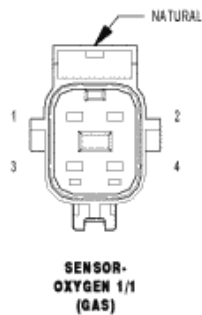
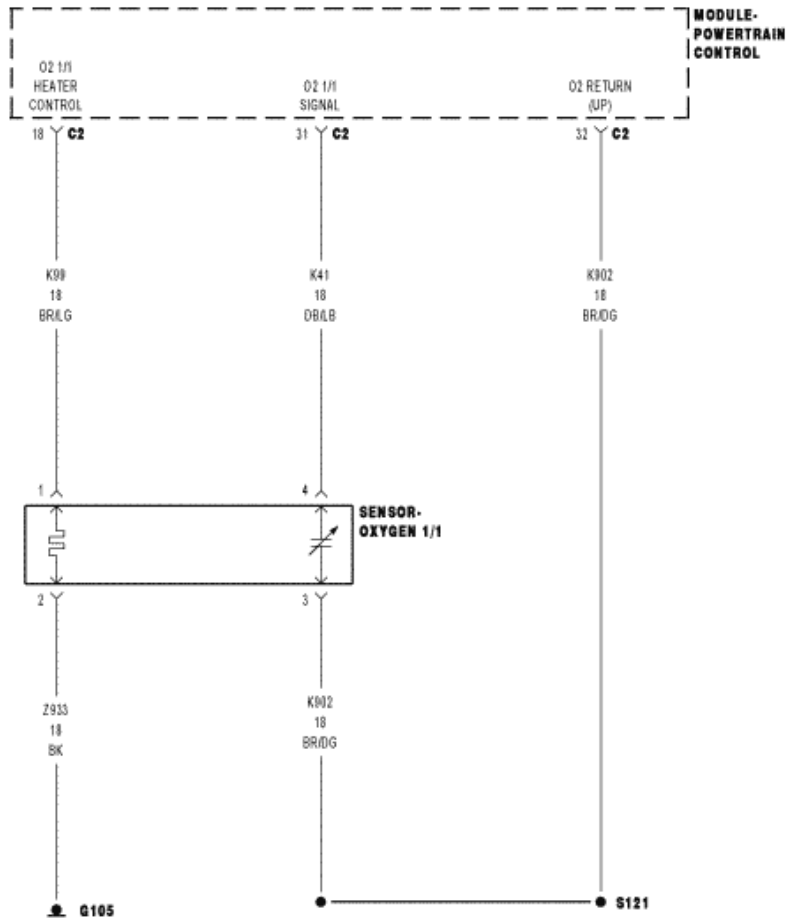
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0032-O2 SENSOR 1/1 HEATER CIRCUIT HIGH

CIRCUIT SCHEMATIC



91902414

Fig. 5: O2 Sensor 1/1 Heater Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is above the maximum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K99) O2 1/1 HEATER CONTROL CIRCUIT OPEN
(Z933) O2 1/1 HEATER GROUND CIRCUIT OPEN
(K99) O2 1/1 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE
1/1 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in possible serious or fatal injury.

NOTE: If P0688-AUTO SHUTDOWN RELAY SENSE CIRCUIT LOW has set along with any of the O2 SENSOR HEATER CIRCUIT HIGH DTCs, all of the O2 Sensor Heater Control circuits need to be checked for a short to battery voltage.

Start the engine and allow it to idle for at least 60 seconds.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **O2 HEATER ELEMENT**

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 1/1 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element between the O2 Heater Control terminal and the O2 Heater ground terminal at the component.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

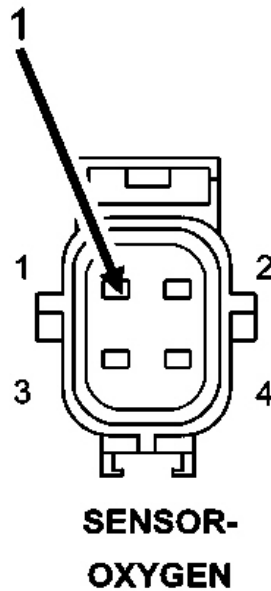
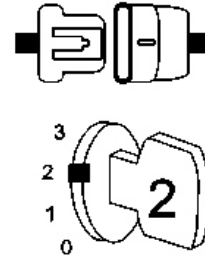
Go To 3.

No

Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(K99) O2 1/1 HEATER CONTROL CIRCUIT**



81650a53

Fig. 6: Checking O2 Sensor Heater Control Circuit
 Courtesy of CHRYSLER LLC

Ignition on, engine not running.

NOTE: Make sure the test light is probing the circuit before actuating the Heater Test or a DTC may set and not allow the actuation.

Using a 12-volt test light connected to ground, probe the (K99) O2 1/1 Heater Control circuit in the O2 Sensor harness connector.

With a scan tool, actuate the O2 1/1 Heater Test with the Sensor harness connector still disconnected.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate brightly and flash on and off during the actuation?

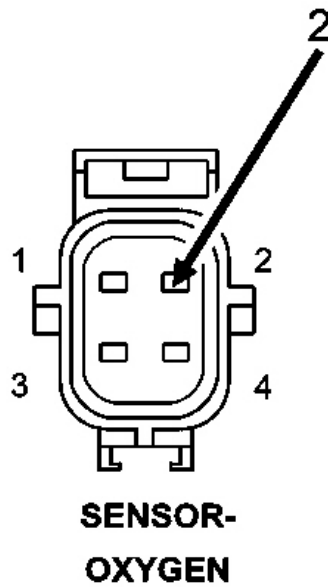
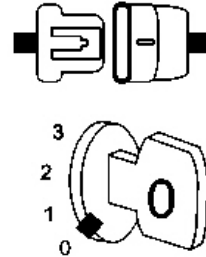
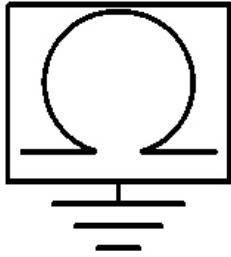
Yes

Go To 4.

No

Go To 5.

4. (Z933) O2 HEATER GROUND CIRCUIT OPEN



81650a81

Fig. 7: Checking O2 Heater Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between an engine ground and the (Z933) O2 1/1 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the O2 Sensor.

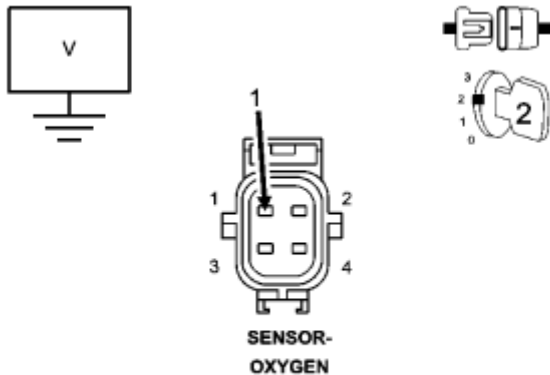
Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the open in the (Z933) O2 1/1 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K99) O2 1/1 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE**



81994b00

Fig. 8: Checking Voltage Of O2 Heater Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage of the (K99) O2 1/1 Heater Control circuit in the 1/1 Oxygen Sensor harness connector.

Is there any voltage present?

Yes

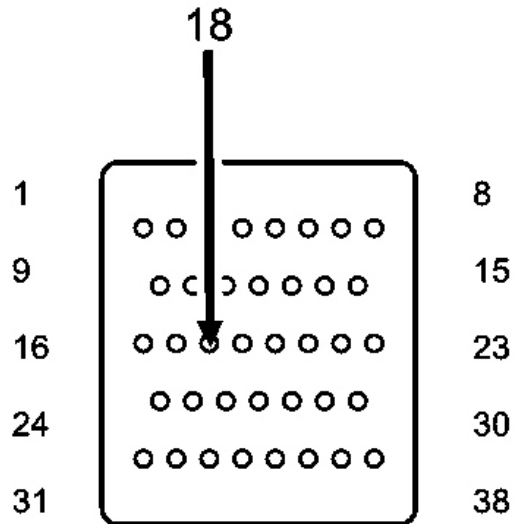
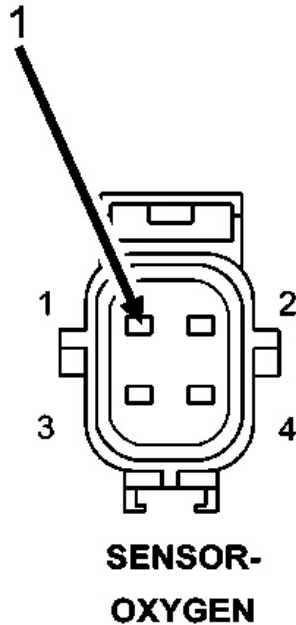
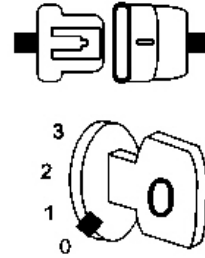
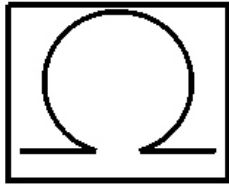
Repair the short to voltage in the (K99) O2 1/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K99) O2 1/1 HEATER CONTROL CIRCUIT OPEN**



**PCM PINOUT
BOX 8815**

81650a85

Fig. 9: Checking O2 1/1 Heater Control Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K99) O2 1/1 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K99) O2 1/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

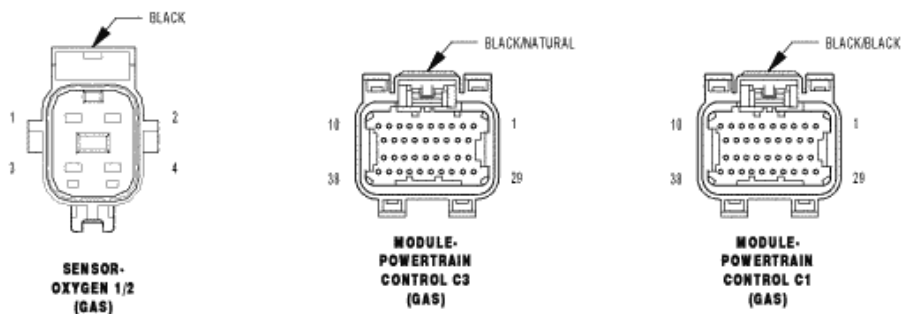
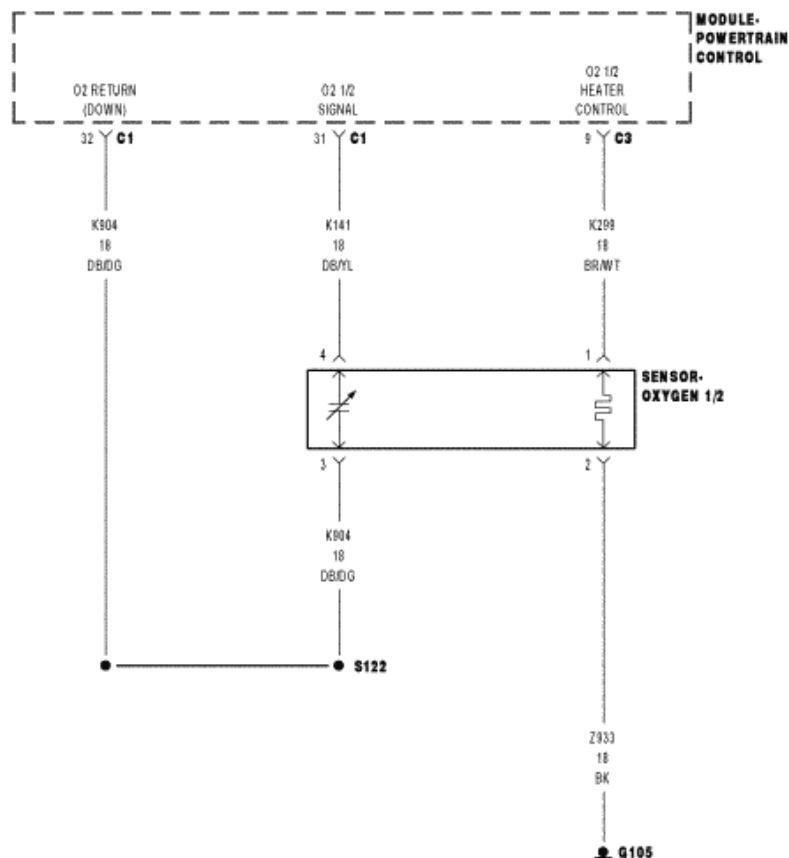
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0037-O2 SENSOR 1/2 HEATER CIRCUIT LOW

CIRCUIT SCHEMATIC



01993405

Fig. 10: Downstream Fuel Trim System Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is below the minimum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K299) O2 1/2 HEATER CONTROL CIRCUIT SHORTED TO GROUND EXCESSIVE RESISTANCE IN THE (K299) O2 SENSOR 1/2 HEATER CONTROL CIRCUIT 1/2 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 HEATER ELEMENT

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 1/2 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the O2 Heater Control terminal and the O2 Heater ground terminal at the component.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

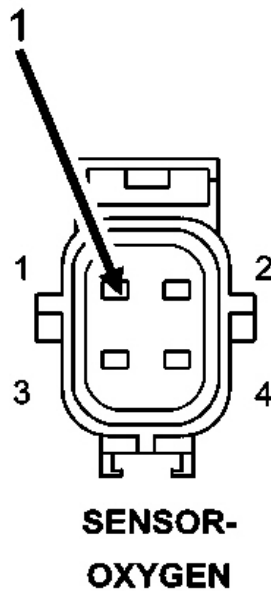
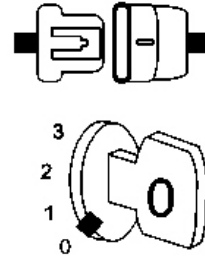
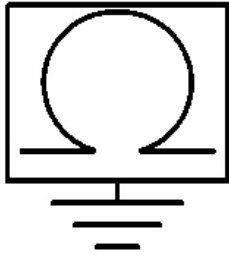
Go To 3.

No

Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K299) O2 1/2 HEATER CONTROL CIRCUIT SHORTED TO GROUND



81650a4c

Fig. 11: Checking O2 Sensor Heater Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (K299) O2 1/2 Heater Control circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

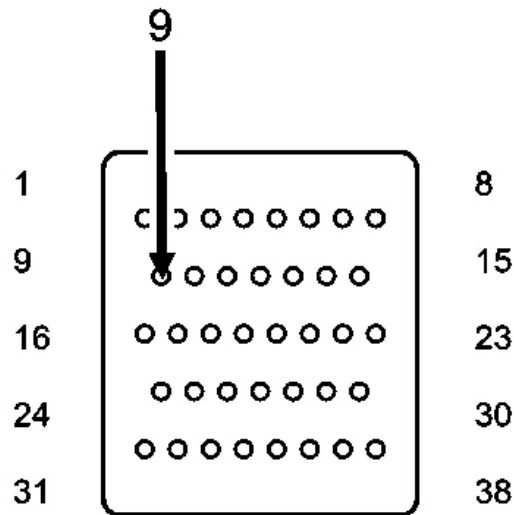
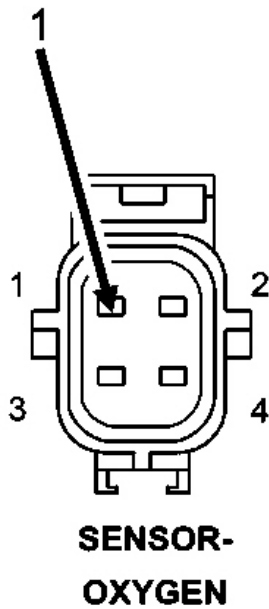
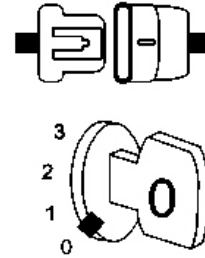
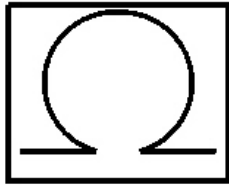
Repair the short to ground in the (K299) O2 1/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. EXCESSIVE RESISTANCE IN THE (K299) O2 1/2 HEATER CONTROL CIRCUIT



**PCM PINOUT
BOX 8815**

81650c66

Fig. 12: Checking 02 Heater Control Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (K299) O2 1/2 Heater Control circuit between the 1/2 Oxygen Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 0.5 ohms?

Yes

Go To 5.

No

Repair the excessive resistance in the (K299) O2 1/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

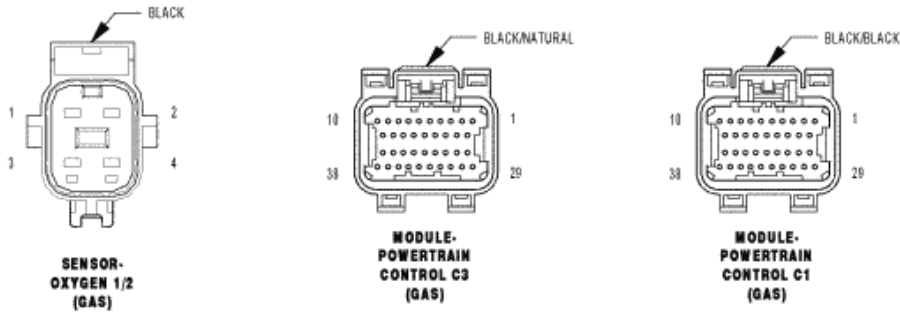
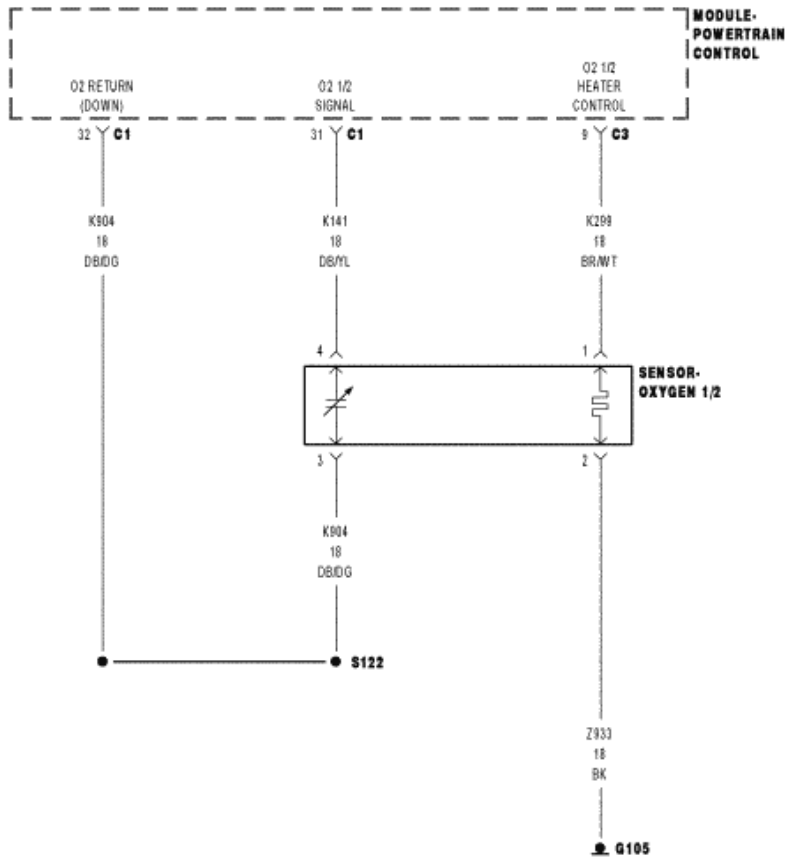
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0038-O2 SENSOR 1/2 HEATER CIRCUIT HIGH

CIRCUIT SCHEMATIC



01993405

Fig. 13: Downstream Fuel Trim System Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is above the maximum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K299) O2 1/2 HEATER CONTROL CIRCUIT OPEN
(Z933) O2 1/2 HEATER GROUND CIRCUIT OPEN
(K299) O2 SENSOR 1/2 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE
1/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in possible serious or fatal injury.

NOTE: If P0688-AUTO SHUTDOWN RELAY SENSE CIRCUIT LOW has set along with any of the O2 SENSOR HEATER CIRCUIT HIGH DTCs, all of the O2 Sensor Heater Control circuits need to be checked for a short to battery voltage.

Start the engine and allow it to idle for at least 60 seconds.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **O2 HEATER ELEMENT**

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 1/2 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the Heater Control terminal and the Heater ground terminal at the component.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

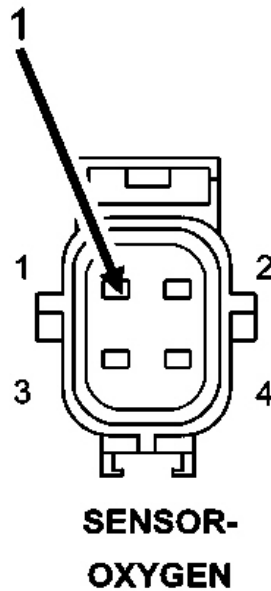
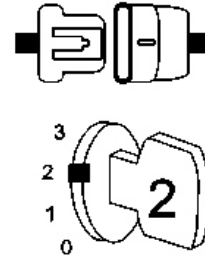
Go To 3.

No

Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(K299) O2 1/2 HEATER CONTROL CIRCUIT**



81650a53

Fig. 14: Checking O2 Sensor Heater Control Circuit
 Courtesy of CHRYSLER LLC

Ignition on, engine not running.

NOTE: Make sure the test light is probing the circuit before actuating the Heater Test or a DTC may set and not allow the actuation.

Using a 12-volt test light connected to ground, probe the (K299) O2 1/2 Heater Control circuit in the O2 Sensor harness connector.

With a scan tool, actuate the O2 1/2 Heater Test with the O2 Sensor harness connector still disconnected.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate brightly and flash on and off during the actuation?

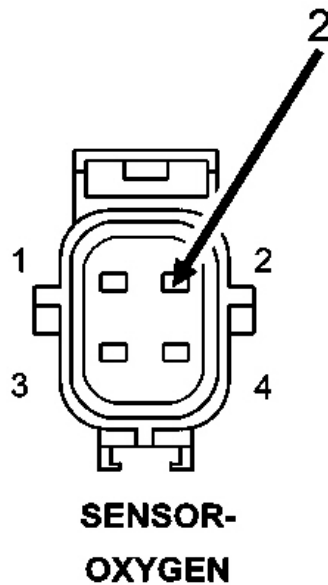
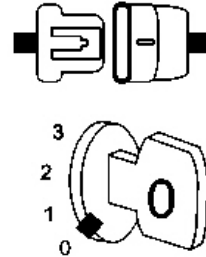
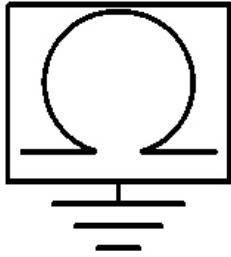
Yes

Go To 4.

No

Go To 5.

4. (Z933) O2 HEATER GROUND CIRCUIT OPEN



81650a81

Fig. 15: Checking O2 Heater Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between an engine ground and the (Z933) O2 1/2 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the O2 Sensor.

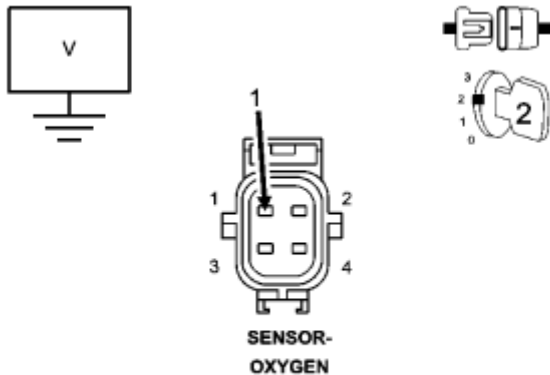
Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the open in the (Z933) O2 1/2 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K299) O2 1/2 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE**



81994b00

Fig. 16: Checking Voltage Of O2 Heater Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage of the (K299) O2 1/2 Heater Control circuit in the 1/2 Oxygen Sensor harness connector.

Is there any voltage present?

Yes

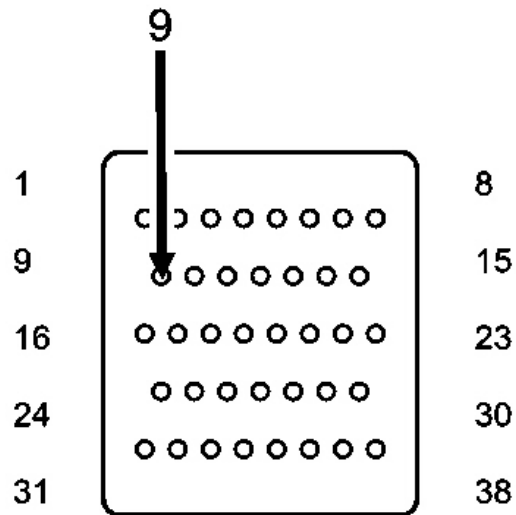
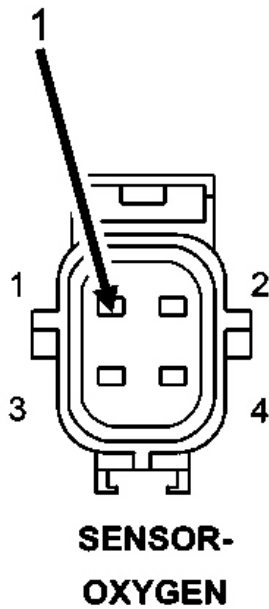
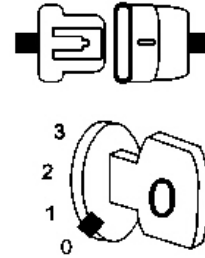
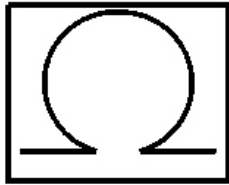
Repair the short to voltage in the (K299) O2 1/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K299) O2 1/2 HEATER CONTROL CIRCUIT OPEN**



81650c66

Fig. 17: Checking 02 Heater Control Circuit For Open
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K299) O2 1/2 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K299) O2 1/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 1/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 1/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0051-O2 SENSOR 2/1 HEATER CIRCUIT LOW

CIRCUIT SCHEMATIC

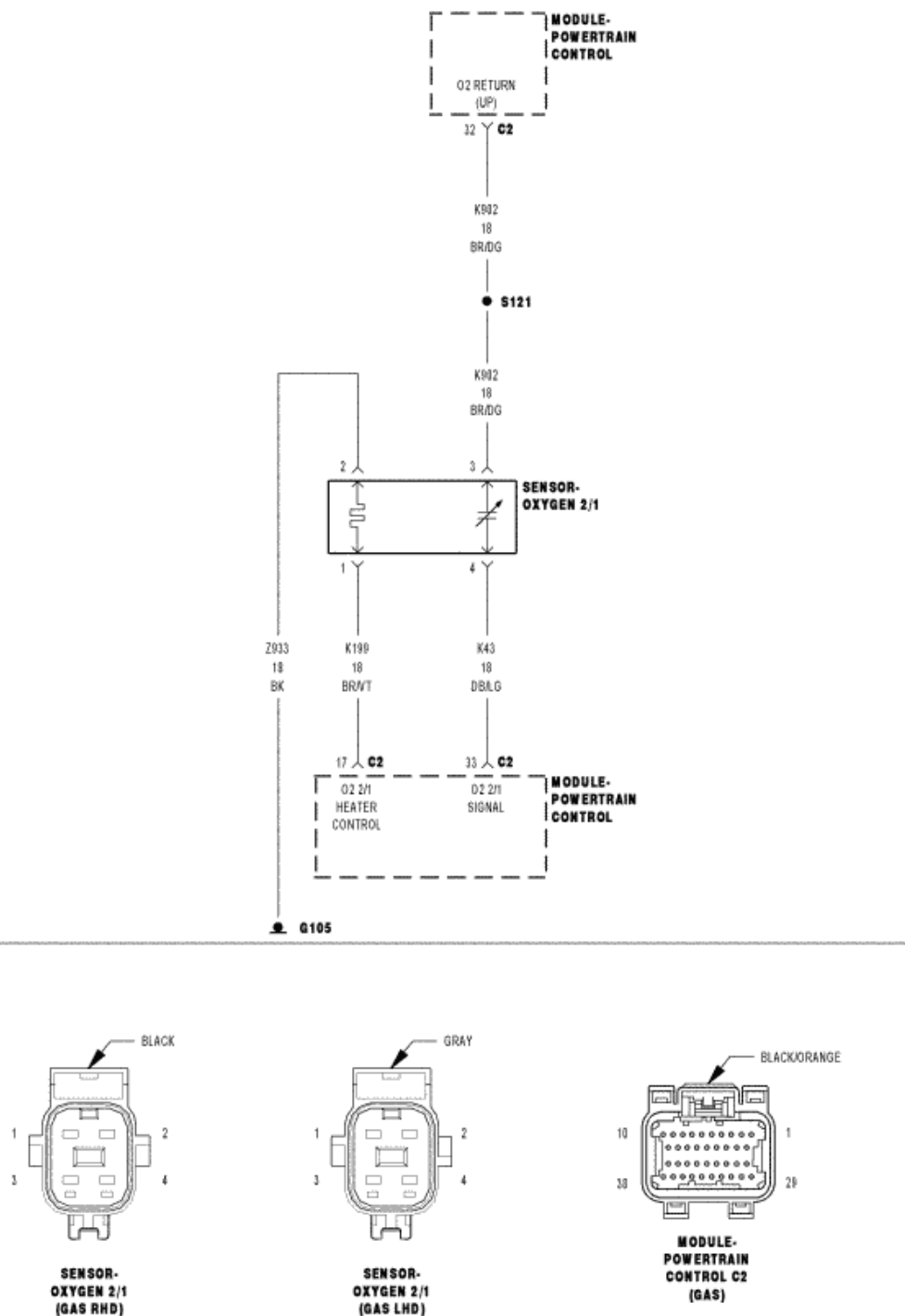


Fig. 18: O2 Sensor 2/1 Heater Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is below the minimum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K199) O2 2/1 HEATER CONTROL CIRCUIT SHORTED TO GROUND EXCESSIVE RESISTANCE IN THE (K199) O2 2/1 HEATER CONTROL CIRCUIT 2/1 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 HEATER ELEMENT

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 2/1 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the Heater Control terminal and the Heater ground terminal at the component.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

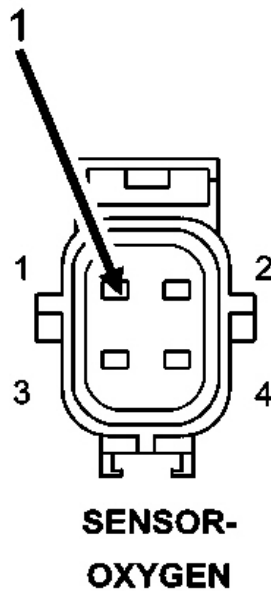
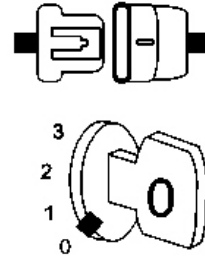
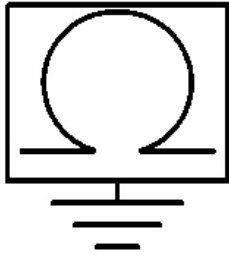
Go To 3.

No

Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K199) O2 2/1 HEATER CONTROL CIRCUIT SHORTED TO GROUND



81650a4c

Fig. 19: Checking O2 Sensor Heater Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K199) O2 2/1 Heater Control circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

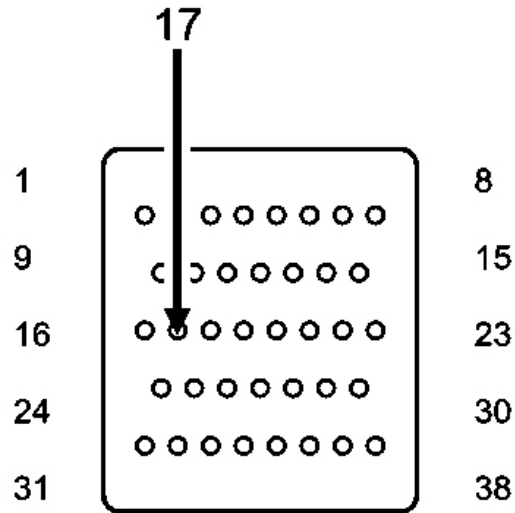
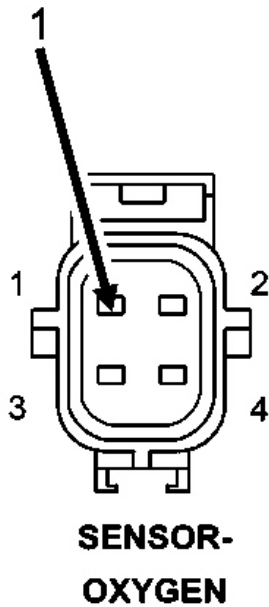
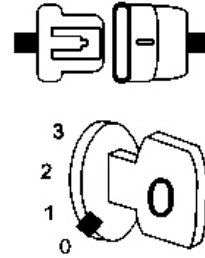
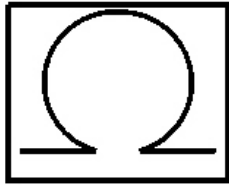
Repair the short to ground in the (K199) O2 2/1 Sensor Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. EXCESSIVE RESISTANCE IN THE (K199) O2 2/1 HEATER CONTROL CIRCUIT



**PCM PINOUT
BOX 8815**

81650c75

Fig. 20: Checking 02 2/1 Sensor Heater Control Circuit For Open
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform

diagnosis.

Measure the resistance of the (K199) O2 2/1 Heater Control circuit between the 2/1 Oxygen Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 0.5 ohms?

Yes

Go To 5.

No

Repair the excessive resistance in the (K199) O2 2/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

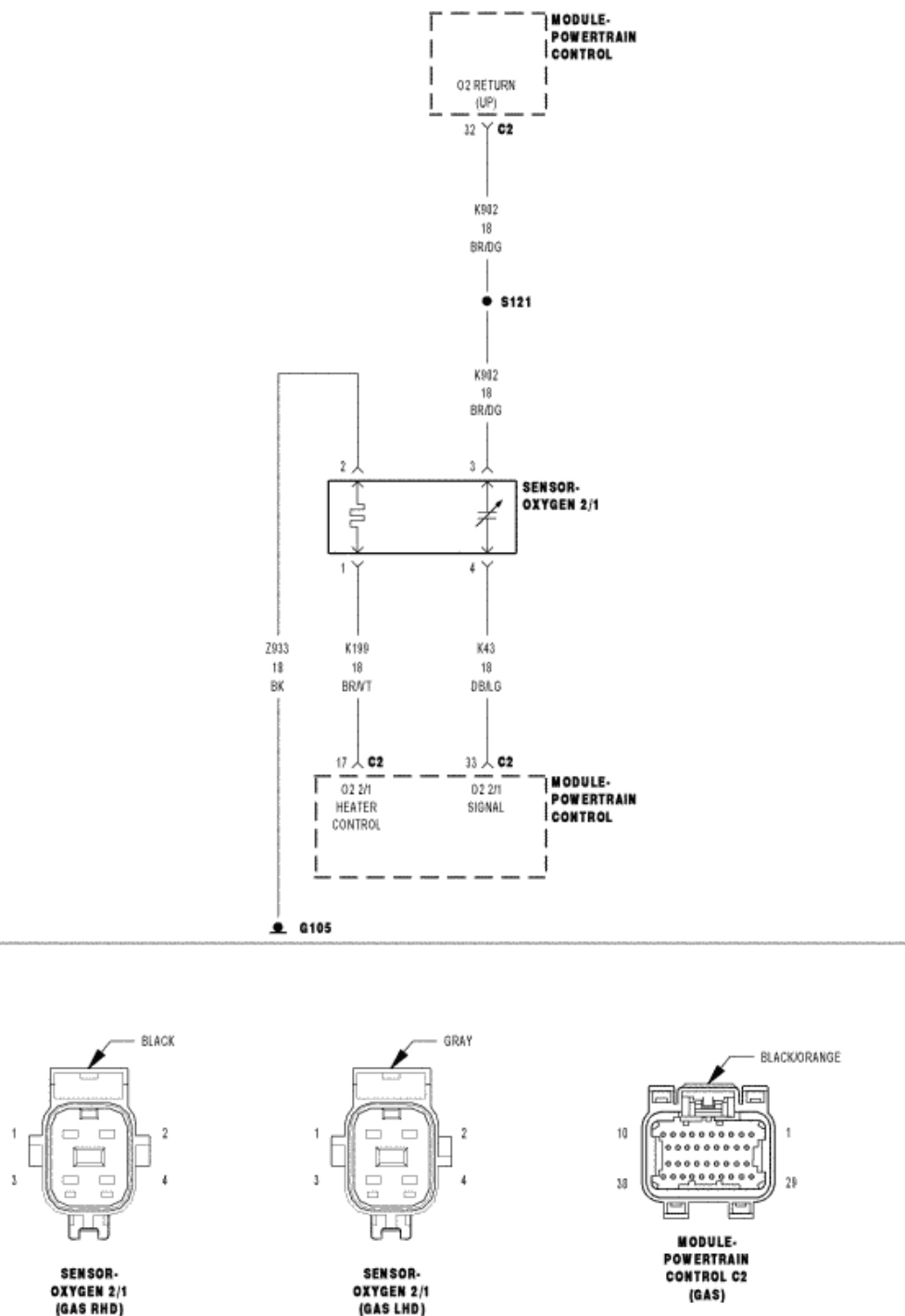
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0052-O2 SENSOR 2/1 HEATER CIRCUIT HIGH

CIRCUIT SCHEMATIC



01963670

Fig. 21: O2 Sensor 2/1 Heater Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

• Set Condition:

The PCM detects that the O2 sensor heater element input is above the maximum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K199) O2 2/1 HEATER CONTROL CIRCUIT OPEN
(Z933) O2 2/1 HEATER GROUND CIRCUIT OPEN
(K199) O2 2/1 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE
2/1 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in possible serious or fatal injury.

NOTE: If P0688-AUTO SHUTDOWN RELAY SENSE CIRCUIT LOW has set along with any of the O2 SENSOR HEATER CIRCUIT HIGH DTCs, all of the O2 Sensor Heater Control circuits need to be checked for a short to battery voltage.

Start the engine and allow it to idle for at least 60 seconds.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **O2 HEATER ELEMENT**

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 2/1 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the O2 Heater Control terminal and the Heater ground terminal at the component connector.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

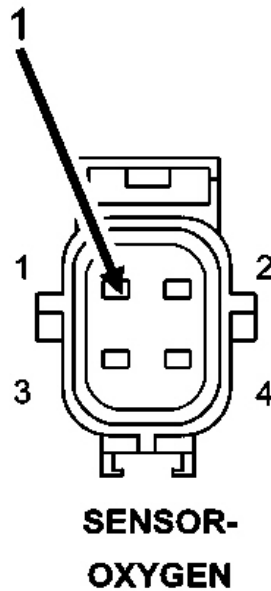
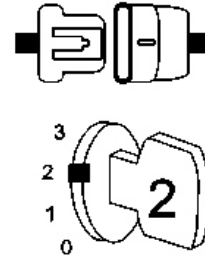
Go To 3.

No

Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(K199) O2 2/1 HEATER CONTROL CIRCUIT**



81650a53

Fig. 22: Checking O2 Sensor Heater Control Circuit
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using a 12-volt test light connected to ground, probe the (K199) O2 2/1 Heater Control circuit in the O2 Sensor harness connector.

NOTE: Make sure the test light is probing the circuit before actuating the Heater Test or a DTC may set and not allow the actuation.

With the scan tool, actuate the O2 Heater Test with the Sensor harness connector still disconnected.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate brightly and flash on and off during the actuation?

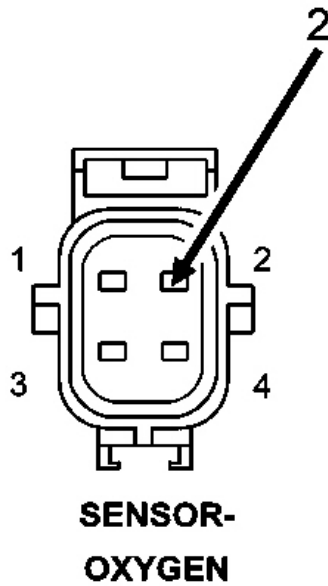
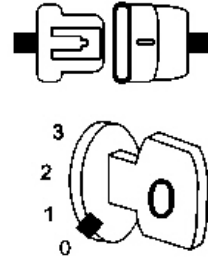
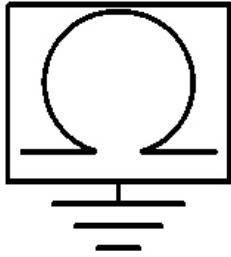
Yes

Go To 4.

No

Go To 5.

4. (Z933) O2 2/1 HEATER GROUND CIRCUIT OPEN



81650a81

Fig. 23: Checking O2 Heater Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between an engine ground and the (Z933) O2 2/1 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the O2 Sensor.

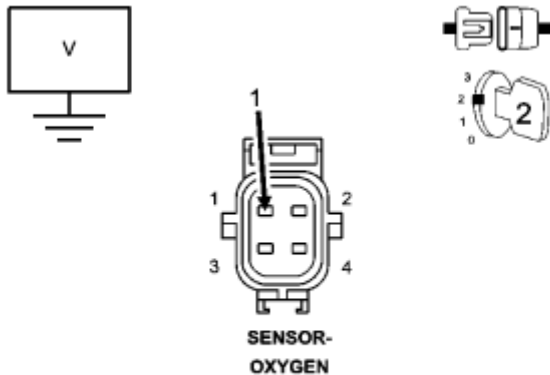
Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the open in the (Z933) O2 2/1 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K199) O2 2/1 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE**



81994b00

Fig. 24: Checking Voltage Of O2 Heater Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K199) O2 2/1 Heater Control circuit at the 2/1 O2 Sensor harness connector.

Is there any voltage present?

Yes

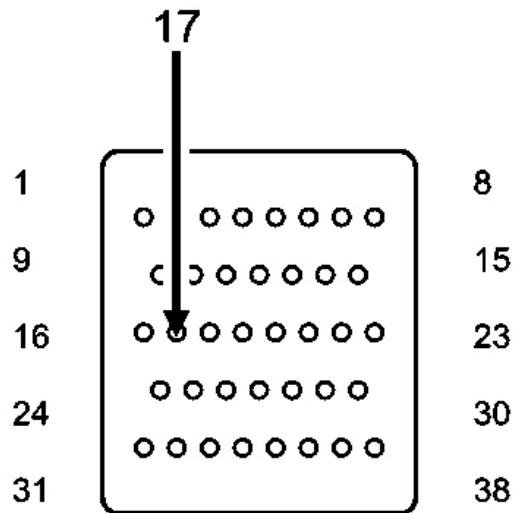
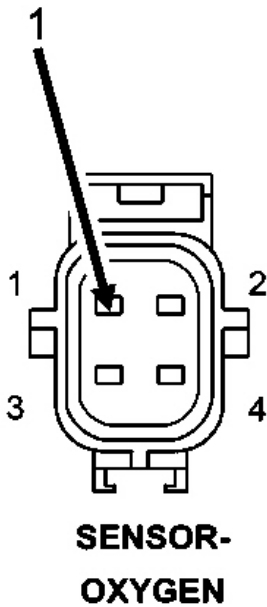
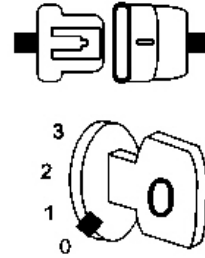
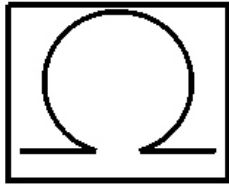
Repair the short to voltage in the (K199) O2 2/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K199) O2 2/1 HEATER CONTROL CIRCUIT OPEN**



81650c75

Fig. 25: Checking 02 2/1 Sensor Heater Control Circuit For Open
 Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness

connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K199) O2 2/1 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K199) O2 2/1 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/1 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/1 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0057-O2 SENSOR 2/2 HEATER CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is below the minimum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K399) O2 SENSOR 2/2 HEATER CONTROL CIRCUIT SHORTED TO GROUND EXCESSIVE RESISTANCE IN THE (K399) O2 SENSOR 2/2 HEATER CONTROL CIRCUIT 2/2 O2 SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Start the engine and allow it to idle for at least 60 seconds.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. O2 HEATER ELEMENT

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 2/2 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the O2 Heater Control terminal and the O2 Heater ground terminal in the component connector.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

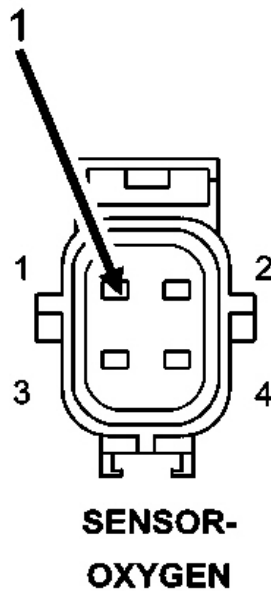
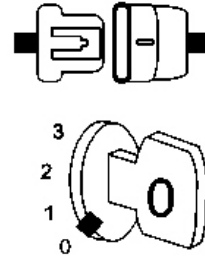
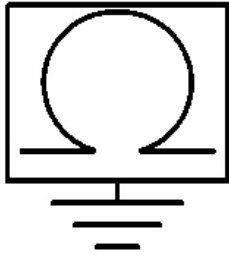
Go To 3.

No

Verify that there is good pin to terminal contact in the 2/2 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. (K399) O2 2/2 HEATER CONTROL CIRCUIT SHORTED TO GROUND



81650a4c

Fig. 27: Checking O2 Sensor Heater Control Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Disconnect the C3 PCM harness connector.

Measure the resistance between ground and the (K399) O2 2/2 Heater Control circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short to ground in the (K399) O2 2/2 Sensor Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. EXCESSIVE RESISTANCE IN THE (K399) O2 2/2 HEATER CONTROL CIRCUIT

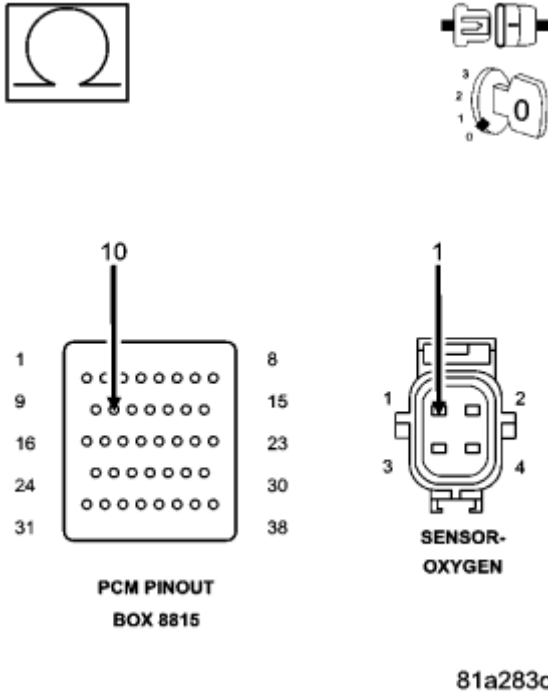


Fig. 28: Checking O2 2/2 Heater Control Circuit For Open Or Excessive Resistance
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K399) O2 2/2 Heater Control circuit between the 2/2 Oxygen Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 0.5 ohms?

Yes

Go To 5.

No

Repair the excessive resistance in the (K399) O2 2/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen Sensor 2/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

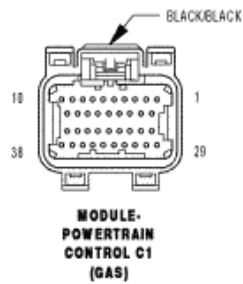
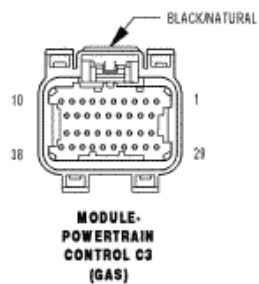
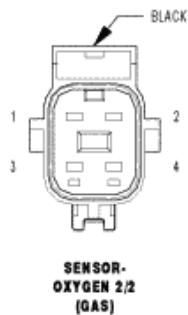
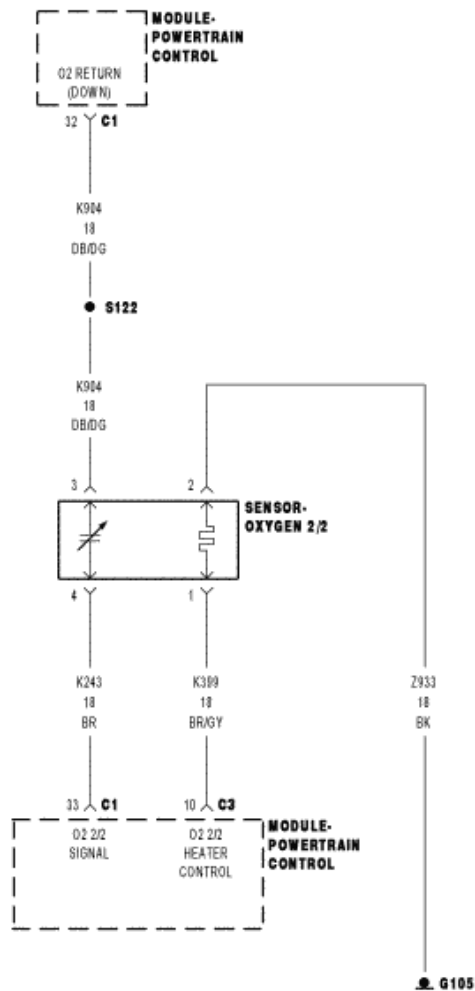
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0058-O2 SENSOR 2/2 HEATER CIRCUIT HIGH

CIRCUIT SCHEMATIC



01962075

Fig. 29: Downstream Fuel Trim System 2 Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Continuously during O2 heater operation with battery voltage between 10.4 and 15.75 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the O2 sensor heater element input is above the maximum acceptable voltage. One trip fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(K399) O2 2/2 HEATER CONTROL CIRCUIT OPEN
(Z933) O2 2/2 HEATER GROUND CIRCUIT OPEN
(K399) O2 2/2 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE
2/2 O2 SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in possible serious or fatal injury.

NOTE: If P0688-AUTO SHUTDOWN RELAY SENSE CIRCUIT LOW has set along with any of the O2 SENSOR HEATER CIRCUIT HIGH DTCs, all of the O2 Sensor Heater Control circuits need to be checked for a short to battery voltage.

Start the engine and allow it to idle for at least 60 seconds.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **O2 HEATER ELEMENT**

Turn the ignition off.

NOTE: **Allow the O2 Sensor to cool down to room temperature.**

Disconnect the 2/2 O2 Sensor harness connector.

Measure the resistance across the O2 Sensor Heater element, between the O2 Heater Control terminal and the O2 Heater ground terminal in the component connector.

NOTE: **O2 Heater Element resistance values should be measured at 21.1° C (70° F). The resistance value will vary with different temperature values.**

Is the O2 Sensor Heater Element resistance between 2.0 and 30.0 ohms?

Yes

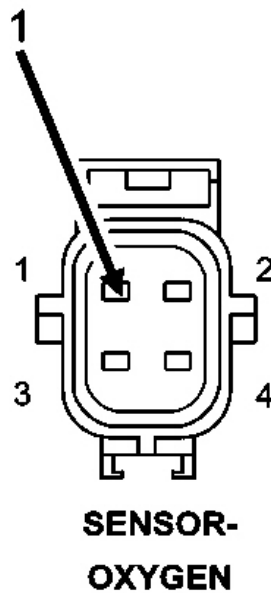
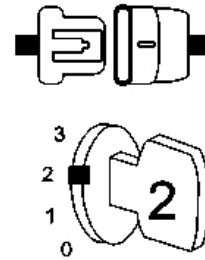
Go To 3.

No

Verify that there is good pin to terminal contact in the 2/2 O2 Sensor and Powertrain Control Module connectors. If OK, replace the O2 Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **(K399) O2 2/2 HEATER CONTROL CIRCUIT**



81650a53

Fig. 30: Checking O2 Sensor Heater Control Circuit
 Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using a 12-volt test light connected to ground, probe the (K399) O2 2/2 Heater Control circuit in the O2 Sensor harness connector.

NOTE: Make sure the test light is probing the circuit before actuating the Heater Test or a DTC may set and not allow the actuation.

With a scan tool, actuate the O2 2/2 Heater Test with the Sensor harness connector still disconnected.

NOTE: The test light should be illuminated and bright proportional to the maximum duty cycle allowed by the scan tool. For example, if the scan tool allows 100% actuation, the brightness should be as bright as a direct connection to the battery. If the scan tool allows a maximum 25% actuation, the brightness should be 25% as bright as a direct connection to the battery.

Does the test light illuminate brightly and flash on and off during the actuation?

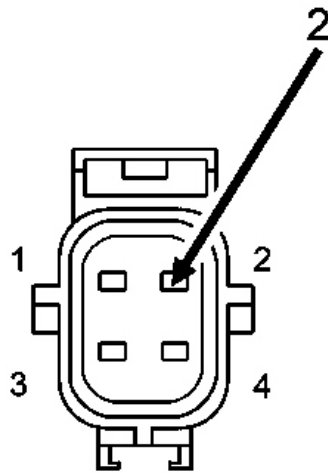
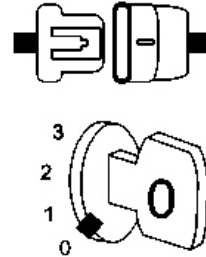
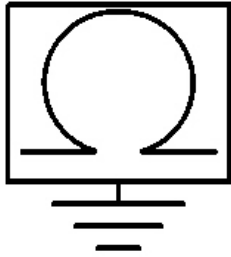
Yes

Go To 4.

No

Go To 5.

4. (Z933) O2 HEATER GROUND CIRCUIT OPEN



**SENSOR-
OXYGEN**

81650a81

Fig. 31: Checking O2 Heater Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between an engine ground and the (Z933) O2 2/2 Heater ground circuit in the O2 Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the O2 Sensor.

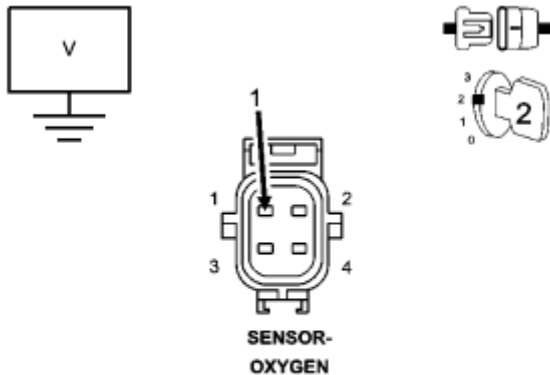
Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the open in the (Z933) O2 2/2 Heater ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K399) O2 2/2 HEATER CONTROL CIRCUIT SHORTED TO VOLTAGE**



81994b00

Fig. 32: Checking Voltage Of O2 Heater Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C3 PCM harness connector.

Ignition on, engine not running.

Measure the voltage of the (K399) O2 2/2 Heater Control circuit in the O2 Sensor harness connector.

Is there any voltage present?

Yes

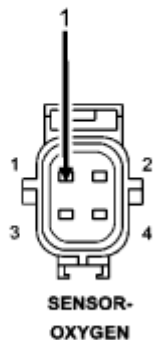
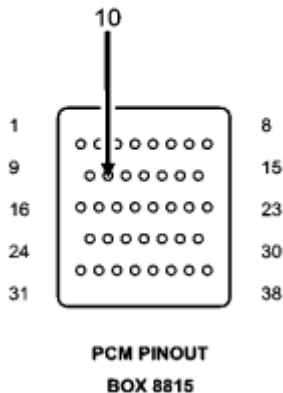
Repair the short to voltage in the (K399) O2 2/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. **(K399) O2 2/2 HEATER CONTROL CIRCUIT OPEN**



81a283c4

Fig. 33: Checking O2 2/2 Heater Control Circuit For Open Or Excessive Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K399) O2 2/2 Heater Control circuit from the O2 Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K399) O2 2/2 Heater Control circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Oxygen

Sensor 2/2 and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the 2/2 O2 Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0071-AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE

CIRCUIT SCHEMATIC

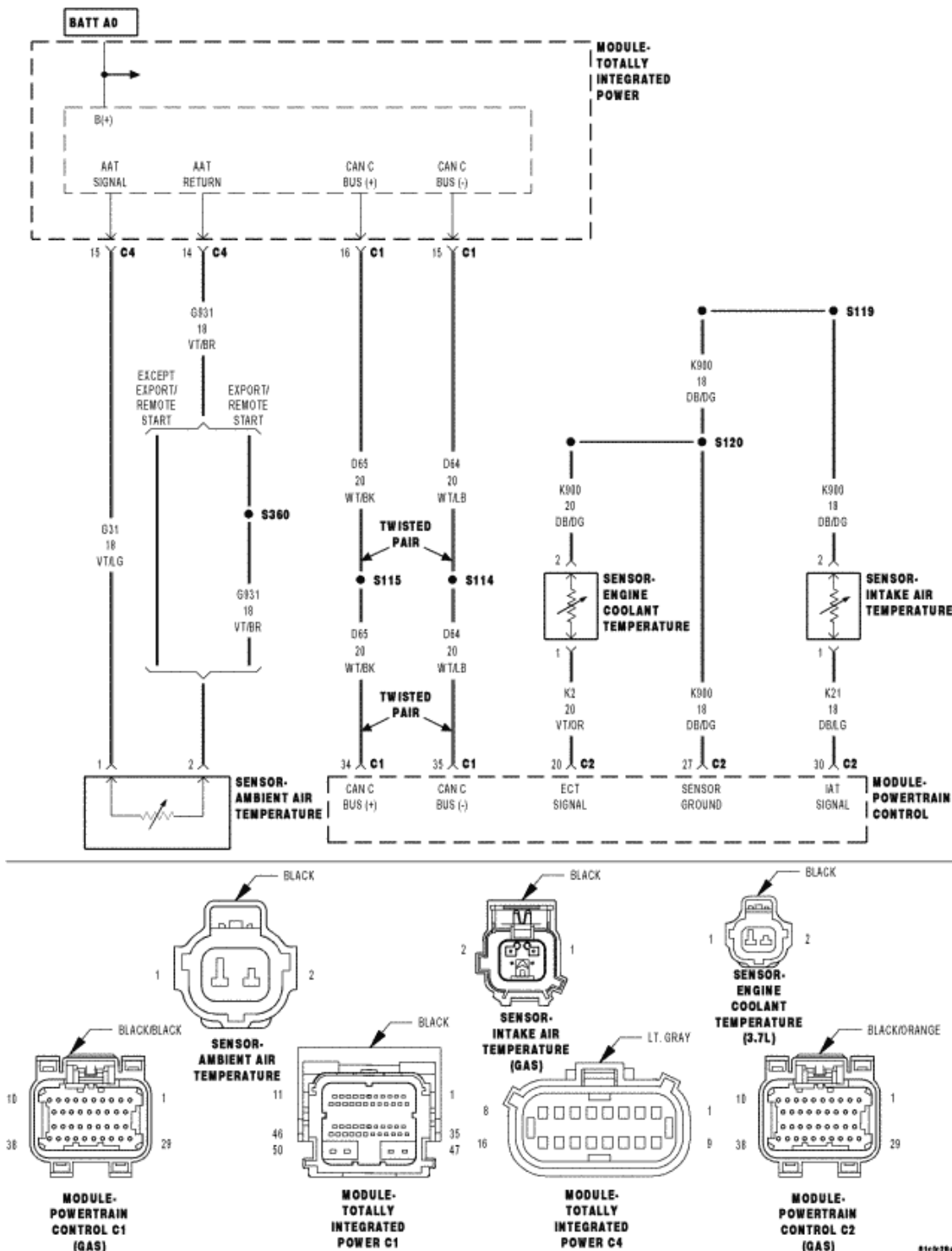


Fig. 34: Thermostat Circuit Schematic
Courtesy of CHRYSLER LLC

THEORY OF OPERATION

Ambient Air Temperature Sensor performance looks at the outputs of three temperature sensors and compares

them under cold start conditions. Following a start to run delay time, the outputs of the ambient, engine coolant, and intake air temperature sensors will be compared. If the engine coolant and intake air temperature sensors agree and the ambient air temperature does not agree, the ambient air temperature sensor is declared as irrational. If declared irrational a second comparison will be done after a short drive cycle.

MONITOR CONDITIONS

When Monitored:

Engine off time is greater than 480 minutes and the vehicle has been driven for one minute over 35 mph.
Ambient temperature is greater than -64° C (-83° F).

SET CONDITIONS

- Set Condition:**

The PCM compares the ambient, engine coolant, and intake air temperature sensor values. If engine coolant and intake air temperature sensors agree with each other but ambient air temperature does not agree with them, the ambient air temperature sensor is declared as irrational. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(G31) AAT SIGNAL CIRCUIT HIGH RESISTANCE
(G31) AAT SIGNAL CIRCUIT SHORTED TO GROUND
(G31) AAT SIGNAL CIRCUIT SHORTED TO THE (G931) SENSOR GROUND CIRCUIT
(G31) AAT SIGNAL CIRCUIT SHORTED TO VOLTAGE
(G931) SENSOR GROUND HIGH RESISTANCE
AMBIENT AIR TEMPERATURE SENSOR
CAN C BUS CIRCUITS
TOTALLY INTEGRATED POWER MODULE (TIPM)
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: **Diagnose any CAN - C Communication DTCs before continuing.**

Turn the ignition off.

If possible, allow the vehicle to sit with the ignition off for more than 480 minutes in an environment where the temperature is consistent and above -7° C (19.4° F).

Test drive the vehicle. The vehicle must exceed 48 km/h (30 mph) during the test drive. Do not cycle the ignition off when the test drive is completed.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Go To 2.

2. AMBIENT AIR TEMPERATURE

Turn the ignition off.

Allow the vehicle to sit with the ignition off in an environment where the temperature is consistent and above -7° C (19.4° F) until the engine coolant temperature is equal to ambient temperature.

Turn the ignition on.

With a scan tool, compare the AAT, ECT, and IAT sensor values.

Is the Ambient Air Temperature Sensor value within 10° C (18° F) of the other two sensor values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. AAT SENSOR VOLTAGE

Turn the ignition off.

Disconnect the AAT sensor harness connector.

Ignition on, engine not running.

With a scan tool, read the AAT voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1**

volt) with the connector disconnected.

Does the scan tool display the voltage as described above?

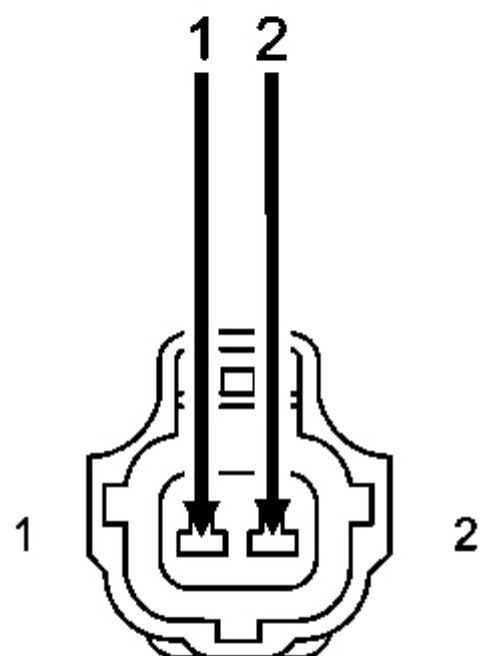
Yes

Go To 4.

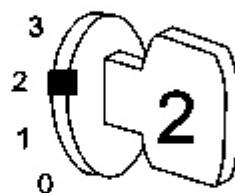
No

Go To 5.

4. AAT SENSOR



**SENSOR-
AMBIENT
AIR
TEMPERATURE**



8132b444

Fig. 35: Identifying Ambient Air Temperature Sensor Connector Terminals
Courtesy of CHRYSLER LLC

Turn the ignition on.

With a scan tool, read the Ambient Air Temperature Sensor voltage.

Connect a jumper wire between the (G31) AAT Signal circuit and the (G931) Sensor Ground circuit in the Ambient Air Temperature Sensor harness connector.

NOTE: **The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.**

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the Ambient Air Temperature Sensor and Control Module connectors. If OK, replace the Ambient Air Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: **Remove the jumper wire before continuing.**

5. (G31) AAT SIGNAL CIRCUIT HIGH RESISTANCE

Turn the ignition off.

Reconnect the AAT sensor harness connector.

Using a voltmeter perform a voltage drop test. Backprobe the (G31) AAT Signal circuit at the AAT sensor harness connector and the C4 TIPM harness connector.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

Go To 6.

No

Repair the excessive resistance in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (G931) SENSOR GROUND CIRCUIT HIGH RESISTANCE

Turn the ignition off.

Using a voltmeter perform a voltage drop test. Backprobe the (G931) Sensor ground circuit at the AAT sensor harness connector and the C4 TIPM harness connector.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

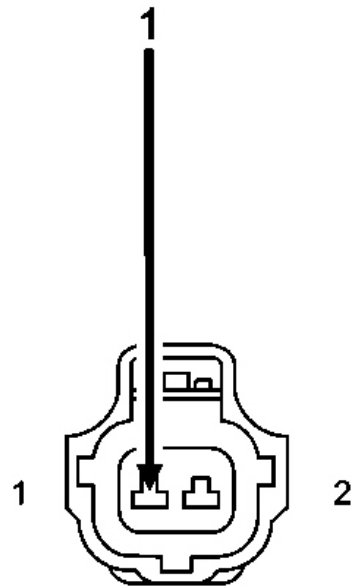
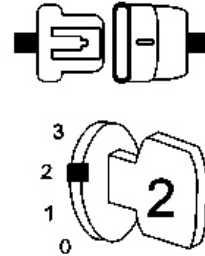
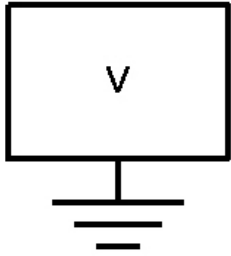
Go To 7.

No

Repair the excessive resistance in the (G931) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (G31) AAT SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b439

Fig. 36: Checking Ambient Air Temperature Sensor Signal Circuit Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C4 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (G31) AAT Signal circuit in the AAT Sensor harness connector.

Is there any voltage present?

Yes

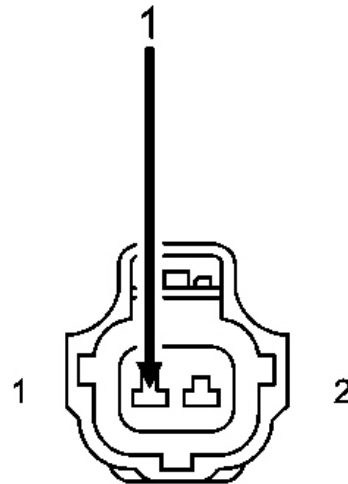
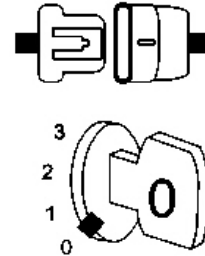
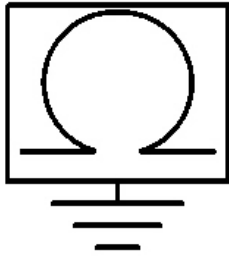
Repair the short to voltage in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (G31) AAT SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b45d

Fig. 37: Checking Ambient Air Temperature Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (G31) AAT Signal circuit in the AAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

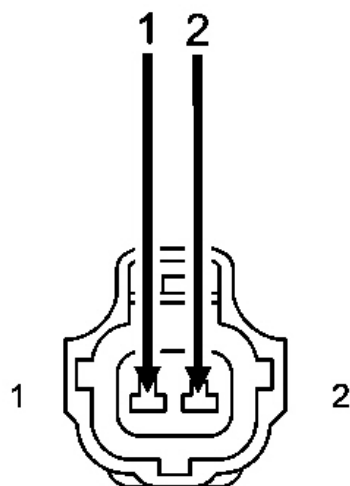
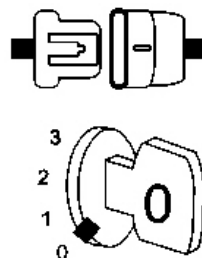
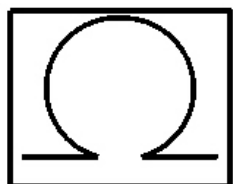
Repair the short to ground in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (G31) AAT SIGNAL CIRCUIT SHORTED TO THE (G931) SENSOR GROUND CIRCUIT



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b459

Fig. 38: Checking AAT Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between the (G931) Sensor ground circuit and the (G31) AAT Signal circuit in the

AAT Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (G931) Sensor ground circuit and the (G31) AAT Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **TOTALLY INTEGRATED POWER MODULE (TIPM)**

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the AAT Sensor and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Ambient Air Temperature Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

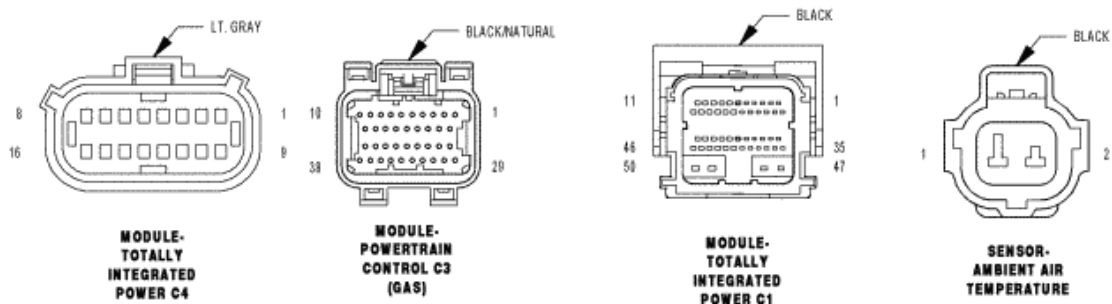
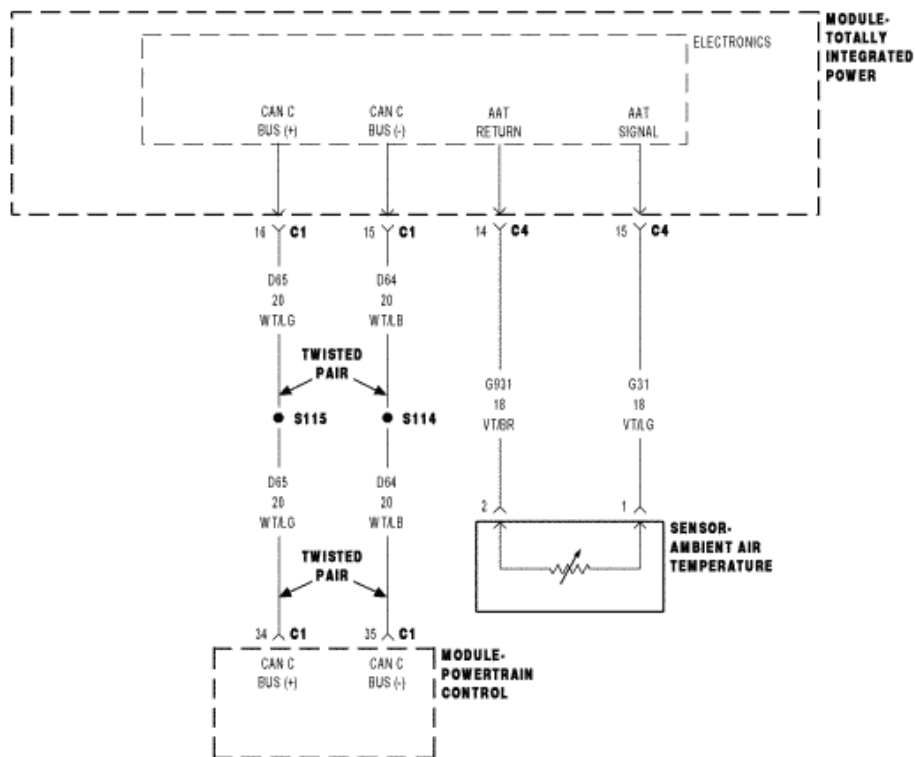
Repair as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module per Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

P0072-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC



019902-00

Fig. 39: Ambient Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

The ignition key on.

SET CONDITIONS

• Set Condition:

Ambient Temperature Sensor is less than the minimum acceptable value at the TIPM for 4.8 seconds.
One Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(G31) AAT SIGNAL CIRCUIT SHORTED TO GROUND (G31) AAT SIGNAL CIRCUIT SHORTED TO THE (G931) SENSOR GROUND CIRCUIT EXCESSIVE RESISTANCE IN THE (G31) AAT SIGNAL CIRCUIT AMBIENT AIR TEMPERATURE SENSOR TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DTC IS ACTIVE

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. CHECKING AAT SENSOR

Turn the ignition off.

Disconnect the Ambient Air Temperature Sensor harness connector.

Ignition on, engine not running.

With a scan tool, read the AAT Sensor voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

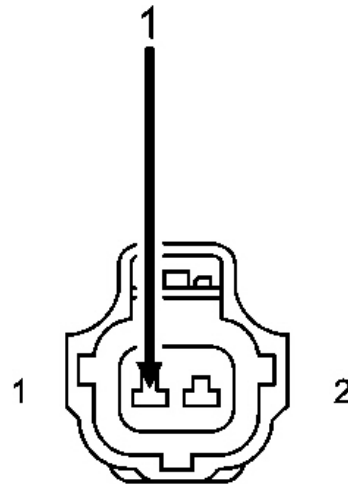
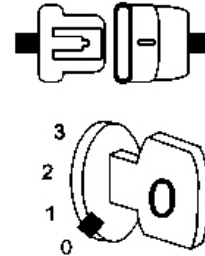
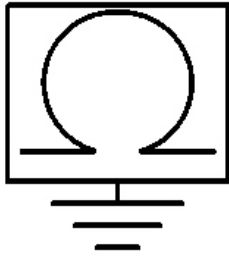
Verify that there is good pin to terminal contact in the Sensor and Control Module connectors. If OK, replace the Ambient Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (G31) AAT SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b45d

Fig. 40: Checking Ambient Air Temperature Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C4 TIPM harness connector.

Measure the resistance between ground and the (G31) AAT Signal circuit in the AAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

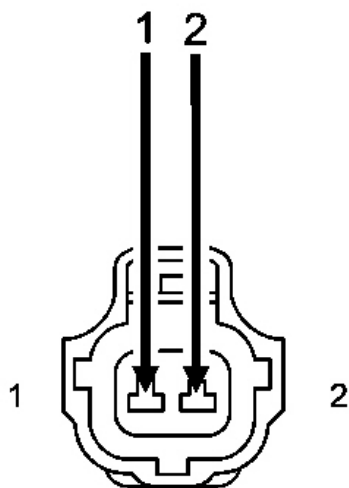
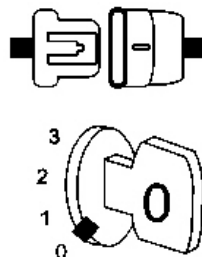
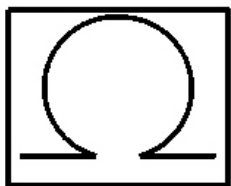
Repair the short to ground in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (G31) AAT SIGNAL CIRCUIT SHORTED TO THE (G931) SENSOR GROUND CIRCUIT



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b459

Fig. 41: Checking AAT Sensor Signal Circuit Shorted To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between the (G931) Sensor ground circuit and the (G31) AAT Signal circuit in the AAT Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (G931) Sensor ground circuit and the (G31) AAT Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (G31) AAT SIGNAL CIRCUIT

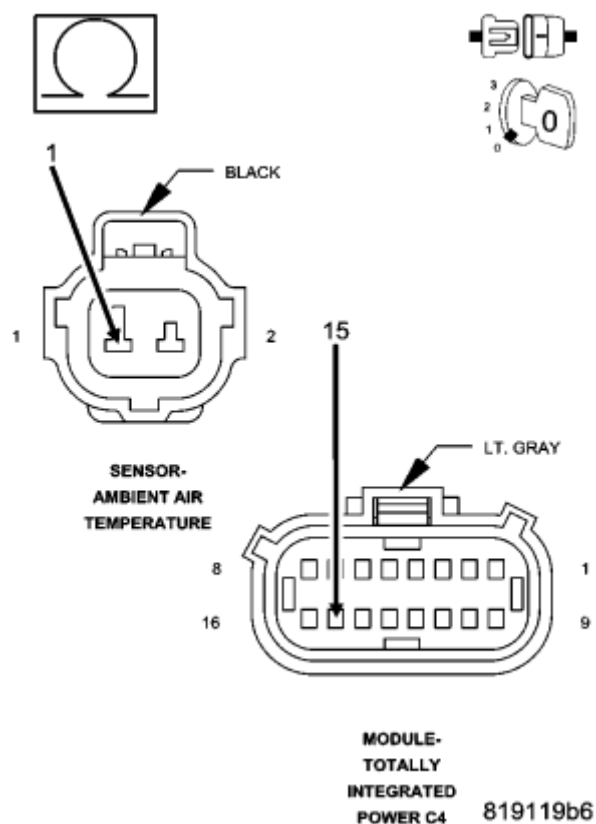


Fig. 42: Measuring Resistance Of (G31) AAT Signal Circuit Between Ambient Air Temperature Sensor Harness Connector And C4 TIPM Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (G31) AAT Signal circuit between the Ambient Air Temperature Sensor harness connector and the C4 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go to 6.

No

Repair the excessive resistance in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the AAT Sensor and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

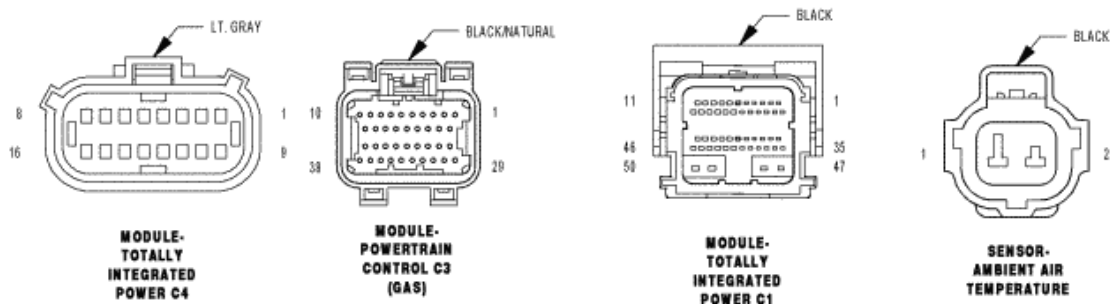
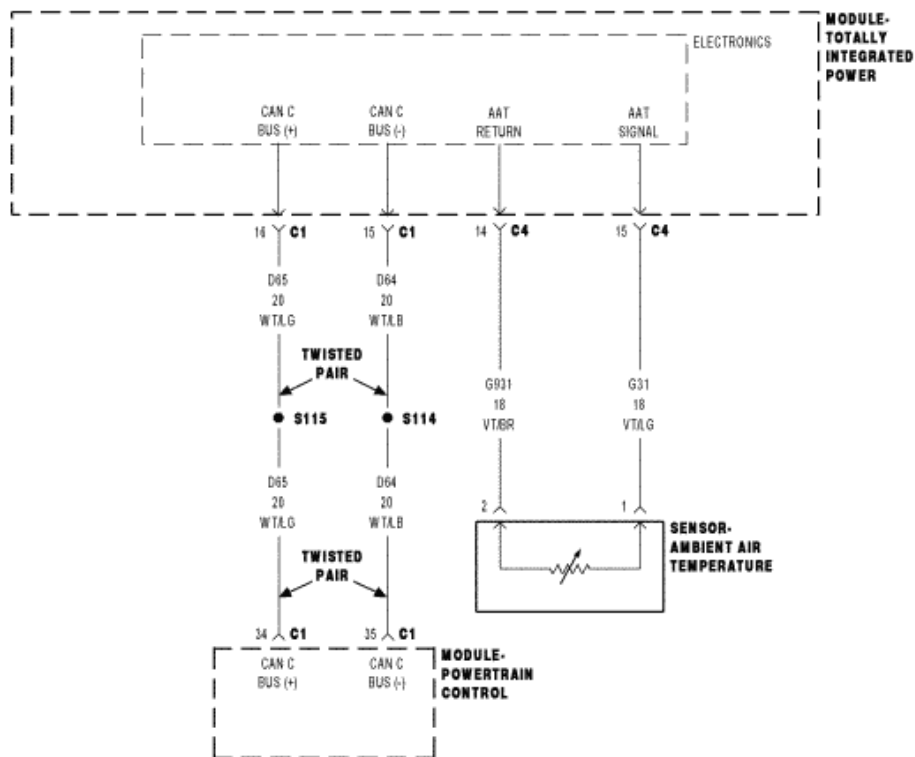
No

Replace and program the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0073-AMBIENT AIR TEMPERATURE SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



019902-00

Fig. 43: Ambient Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

The Ambient Temperature Sensor voltage is greater than the maximum acceptable value. One Trip Fault.
Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
(G31) AAT SIGNAL CIRCUIT SHORTED TO VOLTAGE
(G31) AAT SIGNAL CIRCUIT OPEN
(G931) SENSOR GROUND CIRCUIT OPEN
AMBIENT AIR TEMPERATURE SENSOR
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

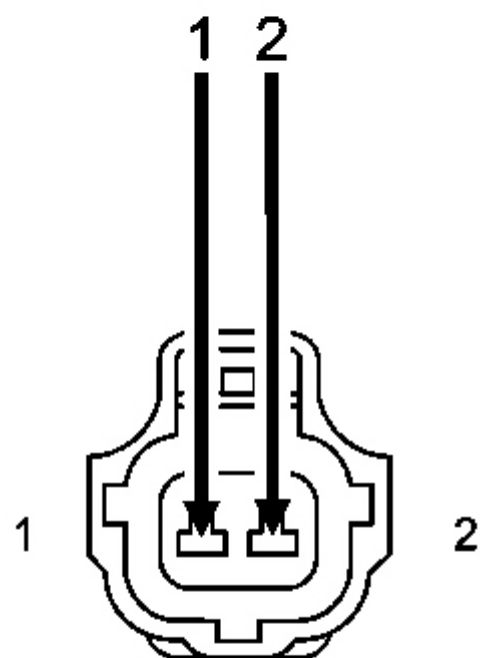
Yes

Go To 2.

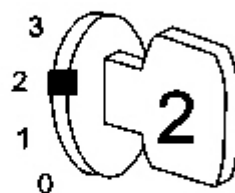
No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. AAT SENSOR



**SENSOR-
AMBIENT
AIR
TEMPERATURE**



8132b444

Fig. 44: Identifying Ambient Air Temperature Sensor Connector Terminals
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Ambient Air Temperature Sensor harness connector.

Ignition on, engine not running.

With a scan tool, read AAT Sensor voltage.

Connect a jumper wire between the (G31) AAT Signal circuit and the (K300) Sensor ground circuit in the AAT Sensor harness connector.

NOTE: **The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.**

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the AAT Sensor and Control Module connectors. If OK, replace the Ambient Air Temperature Sensor.

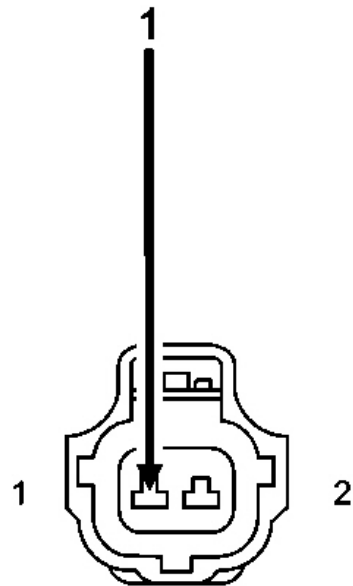
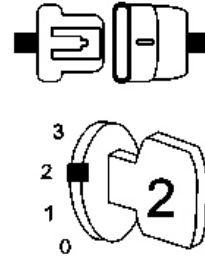
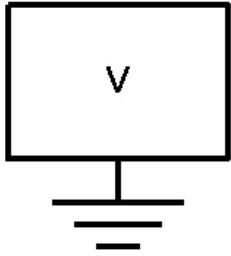
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: **Remove the jumper wire before continuing.**

3. (G31) AAT SIGNAL CIRCUIT SHORTED TO VOLTAGE



**SENSOR-
AMBIENT
AIR
TEMPERATURE**

8132b439

Fig. 45: Checking Ambient Air Temperature Sensor Signal Circuit Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C4 TIPM harness connector.

Ignition on, engine not running.

Measure the voltage on the (G31) AAT Signal circuit in the AAT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (G31) AAT SIGNAL CIRCUIT OPEN

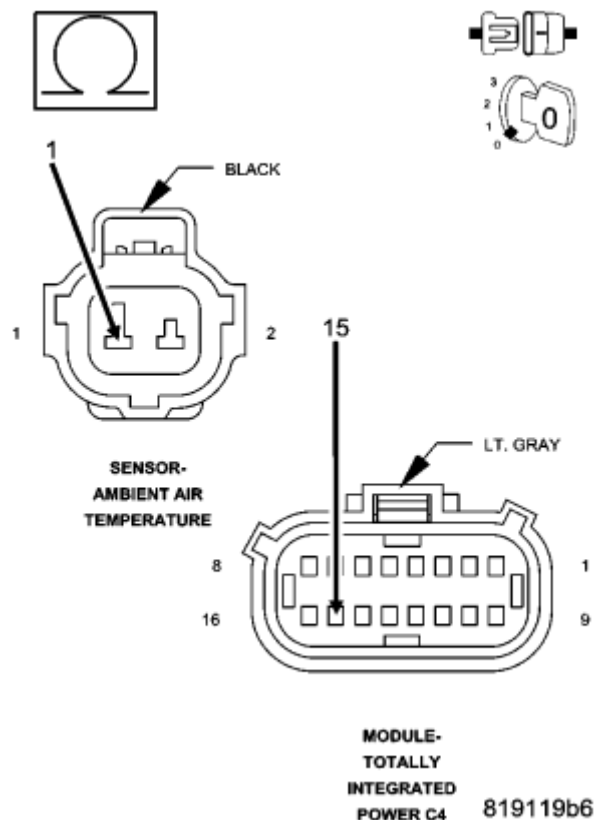


Fig. 46: Measuring Resistance Of (G31) AAT Signal Circuit Between Ambient Air Temperature Sensor Harness Connector And C4 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G31) AAT Signal circuit from the AAT Sensor harness connector to the C4 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (G31) AAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

5. (G931) SENSOR GROUND CIRCUIT OPEN

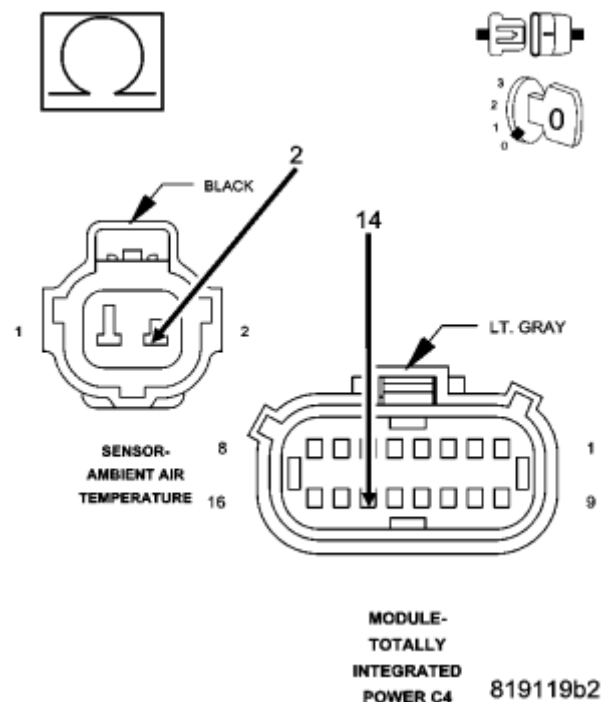


Fig. 47: Measuring Resistance Of (G931) Sensor Ground Circuit From AAT Sensor Harness Connector To C4 TIPM Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G931) Sensor ground circuit from the AAT Sensor harness connector to the C4 TIPM harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (G931) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. TOTALLY INTEGRATED POWER MODULE (TIPM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the AAT Sensor and the Totally Integrated Power Module (TIPM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Sensor and Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

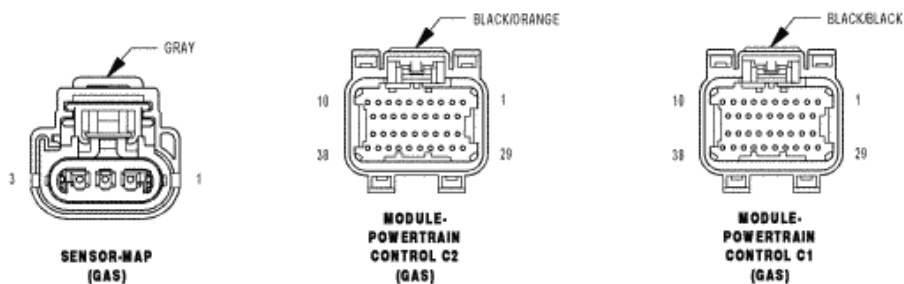
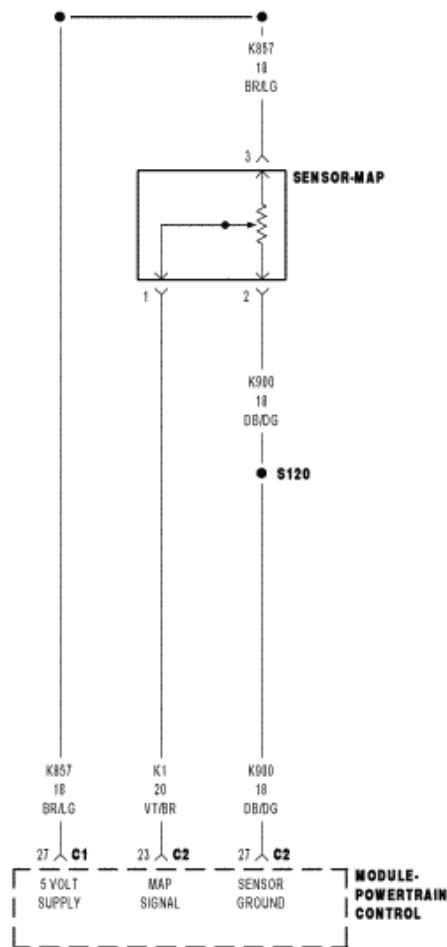
No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

P0107-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC



019805c0

Fig. 48: Manifold Absolute Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine speed between 600 and 3500 RPM. Battery voltage greater than 10.37 volts.

SET CONDITIONS

• Set Condition:

The PCM detects that the MAP Sensor input voltage is below the minimum acceptable value. One Trip Fault. Three good trips to turn off the MIL. The MIL will illuminate and the ETC light will flash if equipped.

POSSIBLE CAUSES

Possible Causes
(K857) 5-VOLT SUPPLY CIRCUIT OPEN (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND (K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT EXCESSIVE RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT MAP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

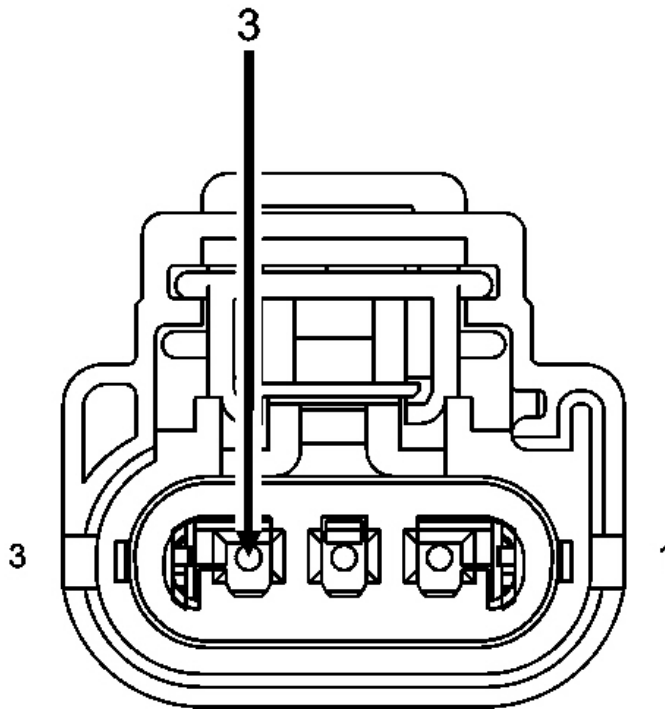
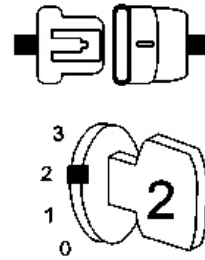
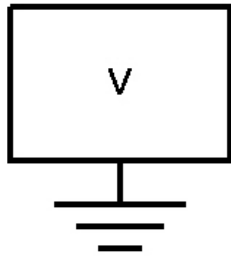
Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **(K857) 5-VOLT SUPPLY CIRCUIT**



**SENSOR-
MAP**

8132bc78

Fig. 49: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Ignition on, engine not running.

Measure the voltage on the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the voltage between 4.5 to 5.2 volts?

Yes

Go To 3.

No

Go To 7.

3. MAP SENSOR

With a scan tool, monitor the MAP Sensor voltage with the Sensor harness connector disconnected.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

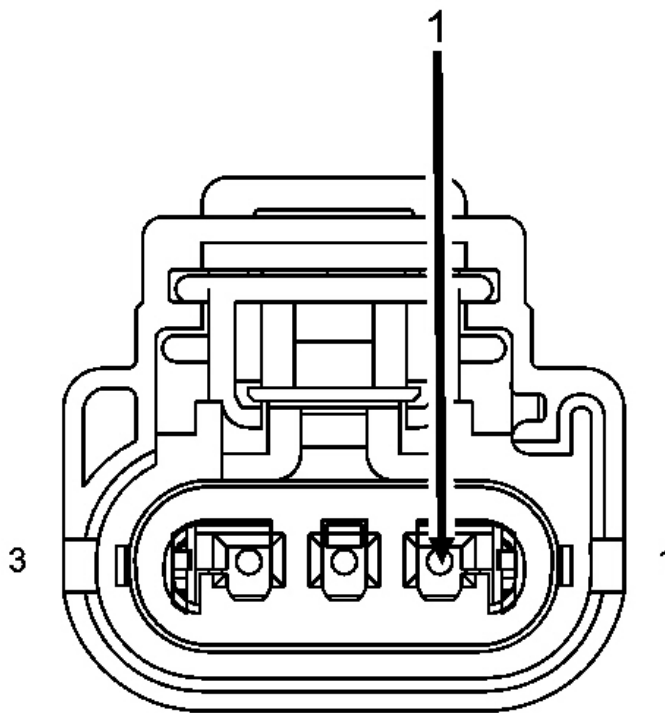
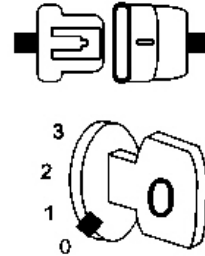
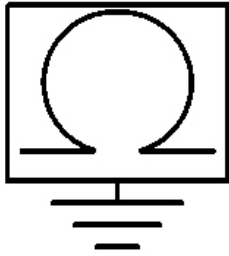
Verify that there is good pin to terminal contact in the Sensor and Powertrain Control Module connectors. If OK, replace the MAP Sensors.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K1) MAP SIGNAL CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b323

Fig. 50: Checking MAP Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

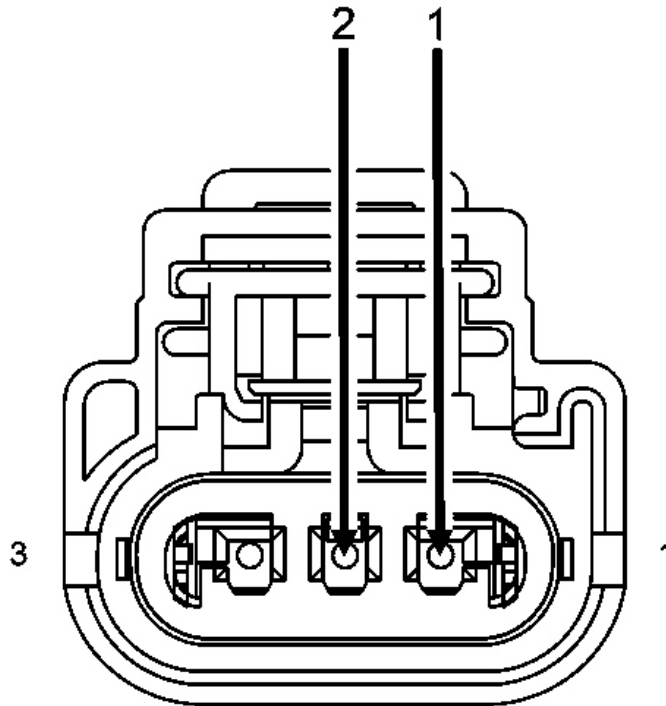
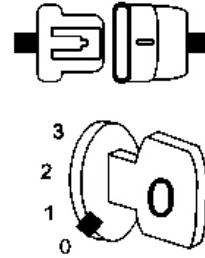
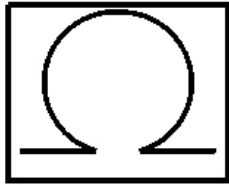
Repair the short to ground in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT



**SENSOR-
MAP**

8132bc84

Fig. 51: Checking Manifold Absolute Pressure Sensor Signal Circuit For Short
Courtesy of CHRYSLER LLC

Measure the resistance between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

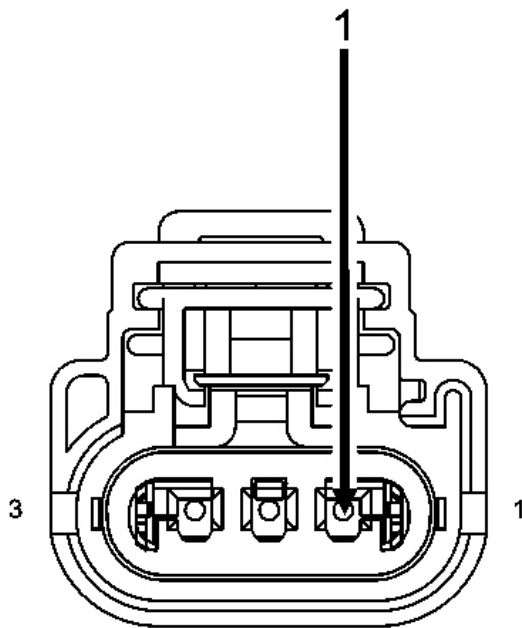
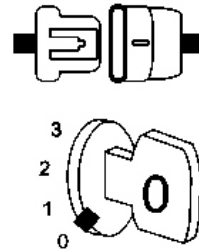
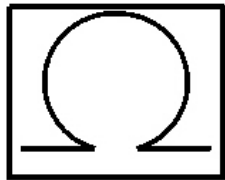
Yes

Repair the short between the (K900) Sensor ground and the (K1) MAP Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

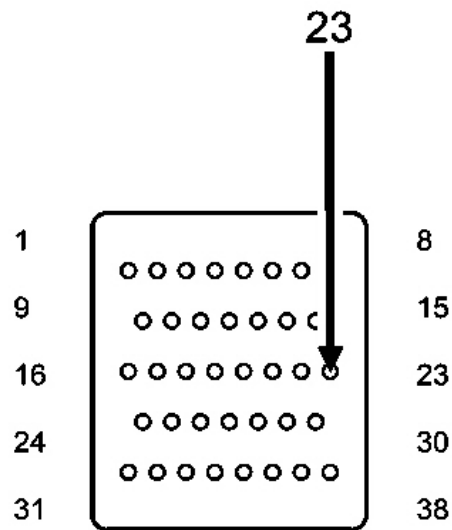
No

Go To 6.

6. EXCESSIVE RESISTANCE IN THE (K1) MAP SIGNAL CIRCUIT



SENSOR-
MAP



PCM PINOUT
BOX 8815

8132b31b

Fig. 52: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K1) MAP Signal circuit between the MAP Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

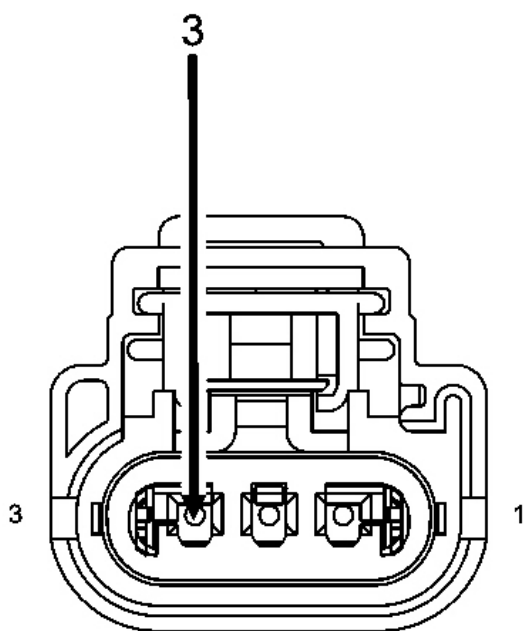
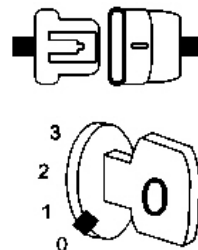
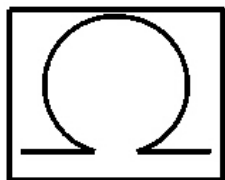
Go To 9.

No

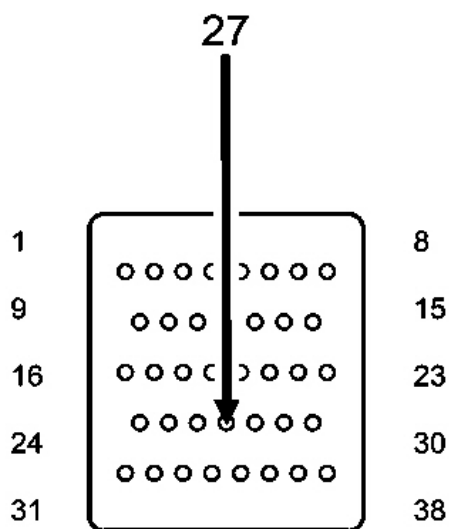
Repair the excessive resistance in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K857) 5-VOLT SUPPLY CIRCUIT OPEN



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b308

Fig. 53: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C1 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K857) 5-volt Supply circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

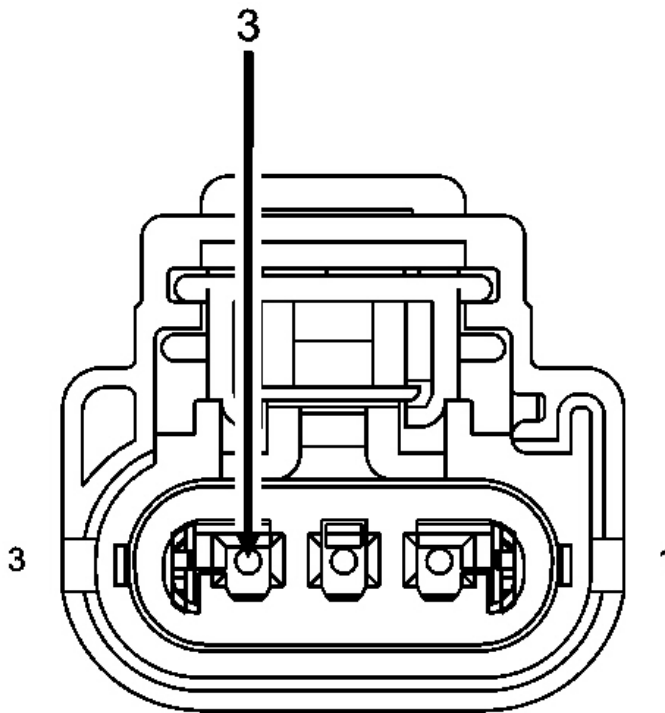
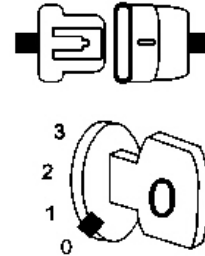
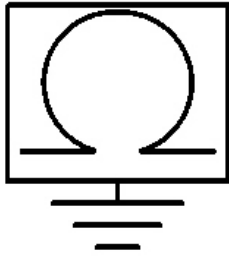
Go To 8.

No

Repair the open in the (K857) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (K857) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND



**SENSOR-
MAP**

8132b312

Fig. 54: Checking MAP Sensor 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K857) 5-volt Supply circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

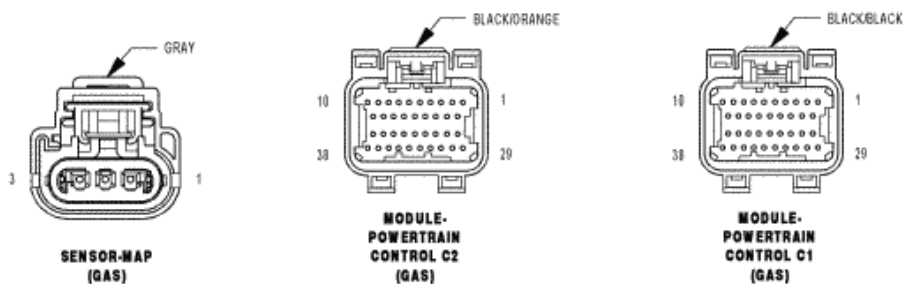
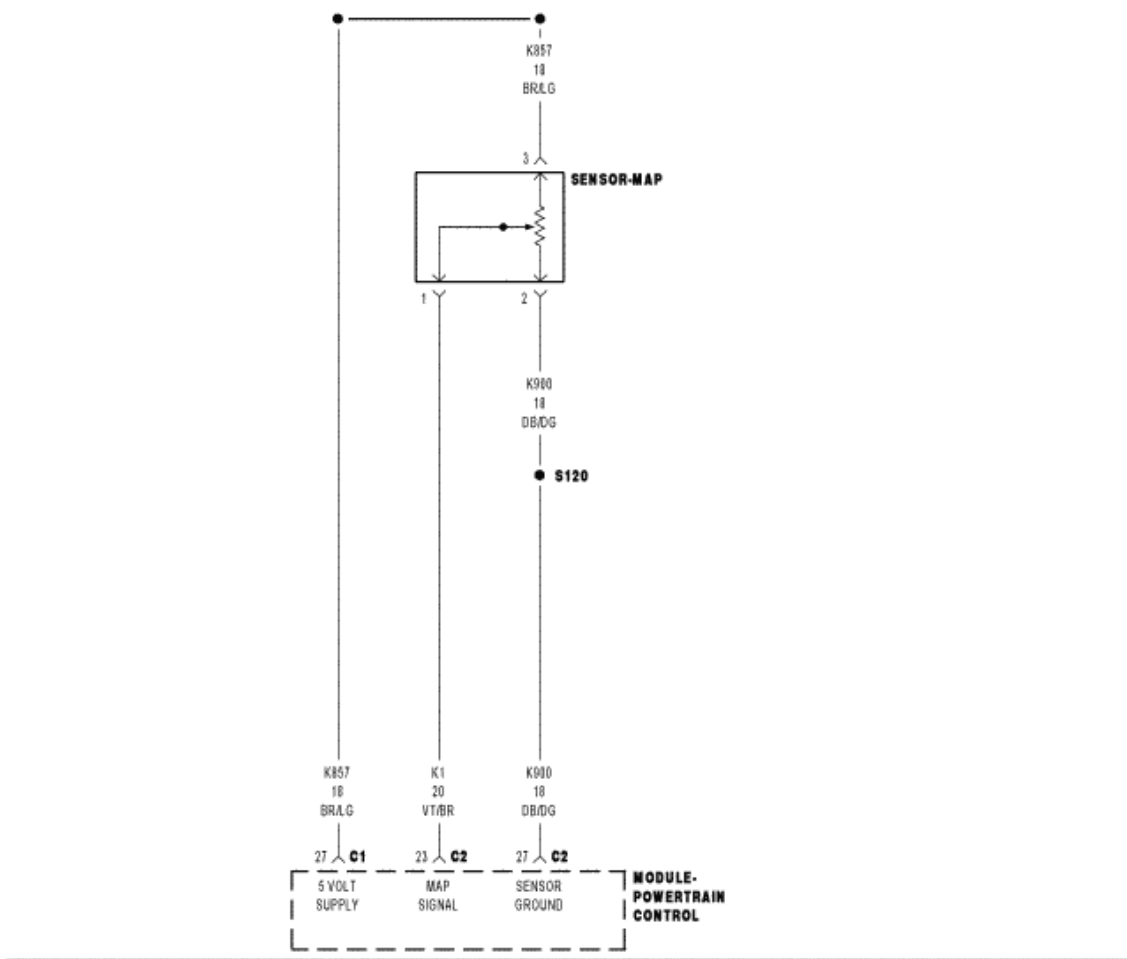
Repair as necessary.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

P0108-MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



019805c9

Fig. 55: Manifold Absolute Pressure Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Engine speed between 600 to 3500 RPM. Battery voltage greater than 10.37 volts.

SET CONDITIONS

• Set Condition:

The MAP sensor signal voltage is greater than the maximum acceptable value. One trip fault. Three good trips to turn off the MIL. The MIL will illuminate and the ETC light will flash if equipped.

POSSIBLE CAUSES

Possible Causes
(K1) MAP SIGNAL CIRCUIT SHORTED TO VOLTAGE (K1) MAP SIGNAL CIRCUIT OPEN (K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT (K900) SENSOR GROUND CIRCUIT OPEN MAP SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage or sensor supply voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

2. MAP SENSOR

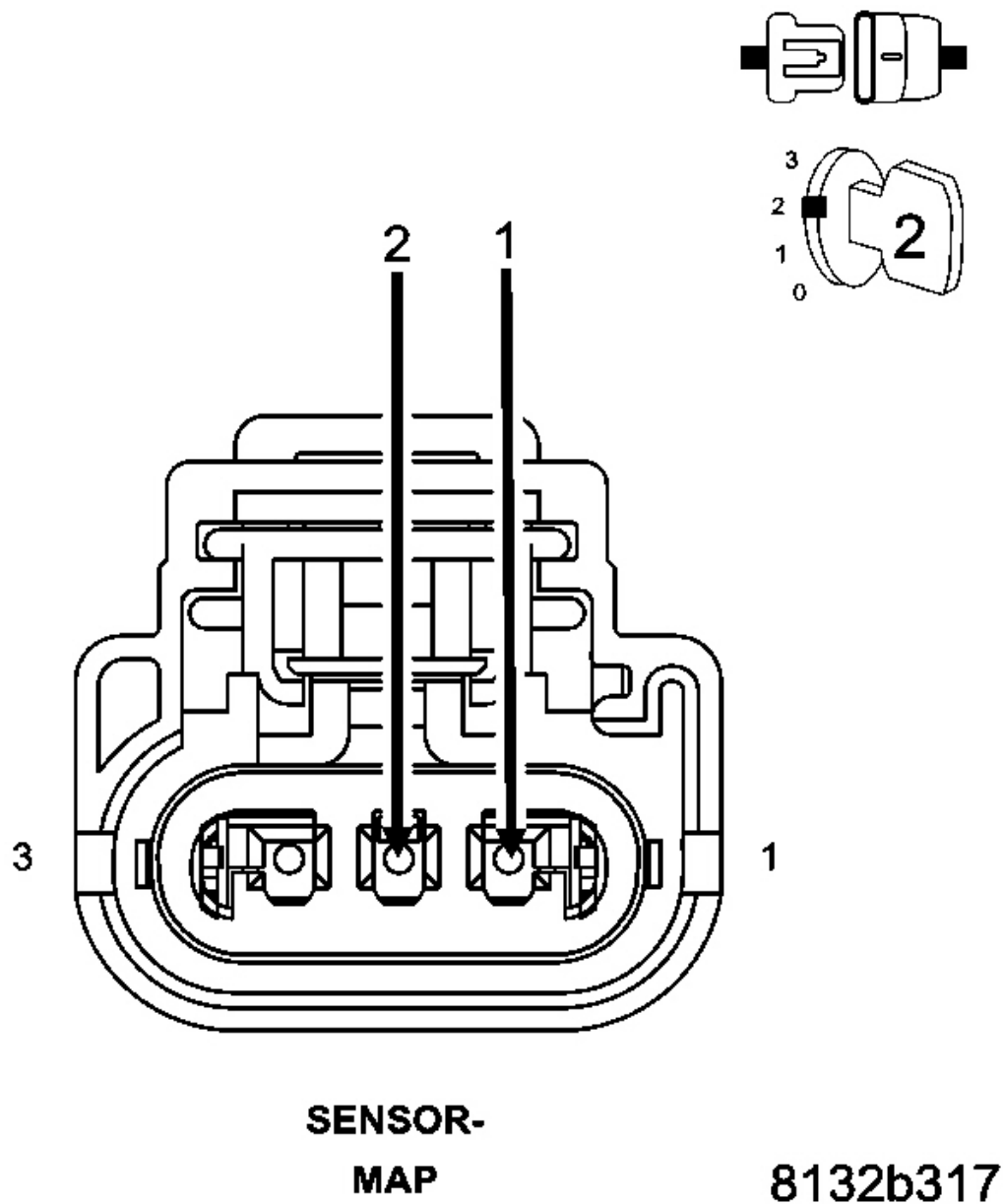


Fig. 56: Identifying MAP Sensor Signal & Ground Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the MAP Sensor harness connector.

Ignition on, engine not running.

With a scan tool, monitor the MAP Sensor voltage.

Connect a jumper wire between the (K1) MAP Signal circuit and the (K900) Sensor ground circuit in the Sensor harness connector.

NOTE: **The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.**

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors. If OK, replace the MAP Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: **Remove the jumper wire before continuing.**

3. (K1) MAP SIGNAL CIRCUIT SHORTED TO VOLTAGE

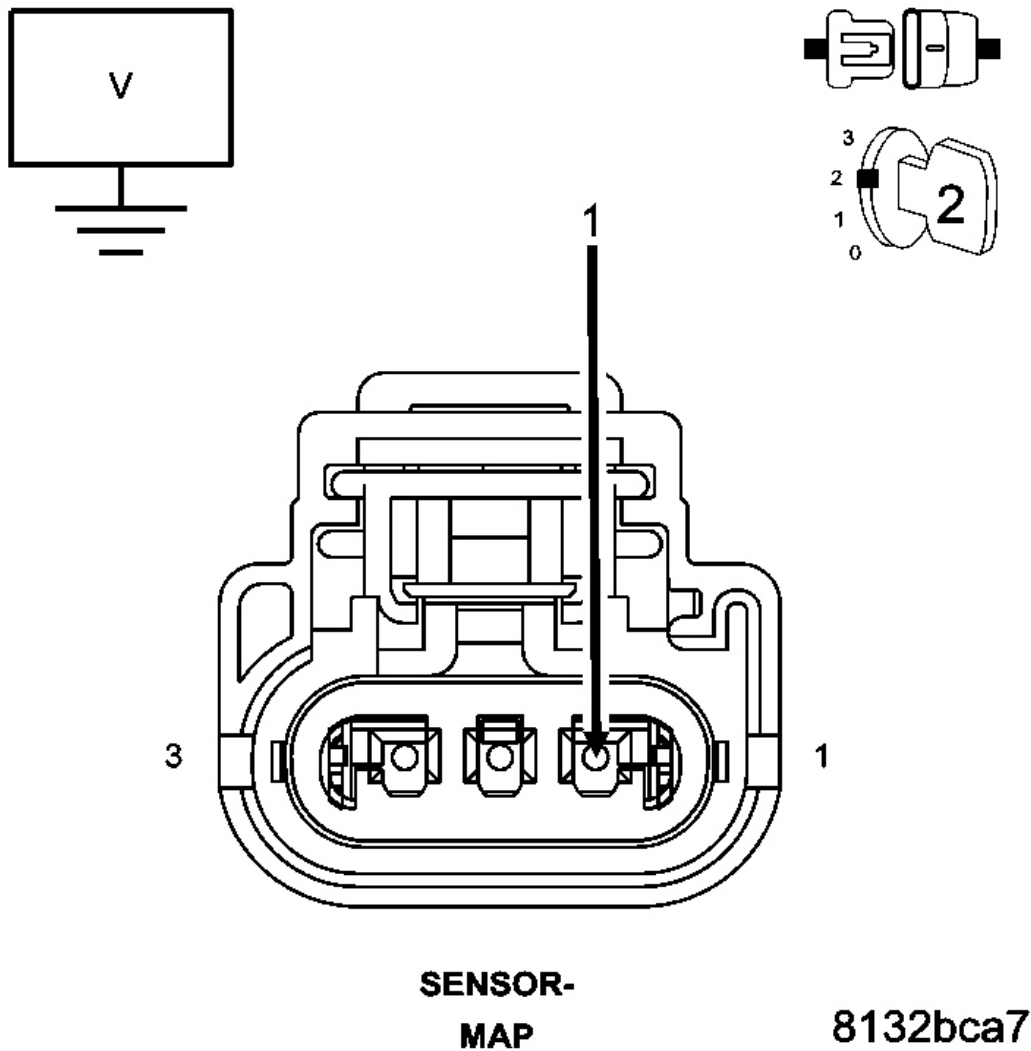


Fig. 57: Checking MAP Signal Circuit For Short To Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K1) MAP Signal circuit in the MAP Sensor harness connector.

Is there any voltage present?

Yes

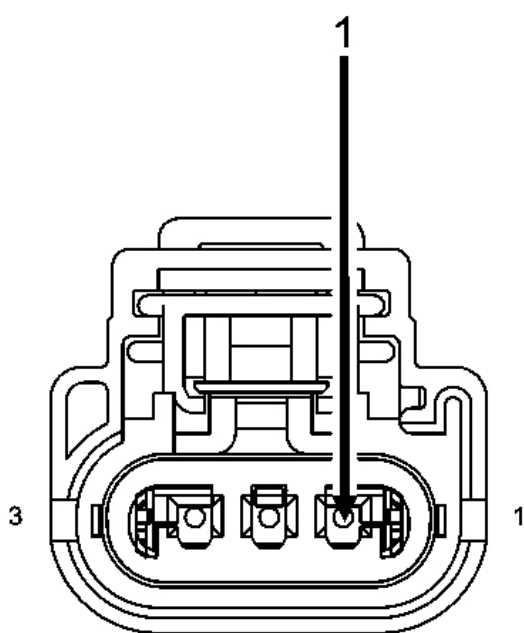
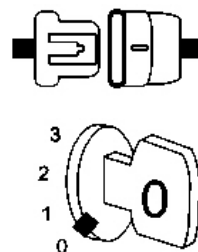
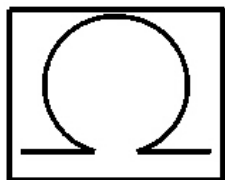
Repair the short to voltage in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

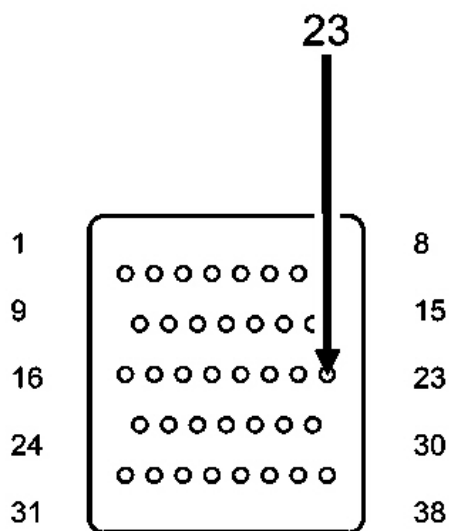
No

Go To 4.

4. **(K1) MAP SIGNAL CIRCUIT OPEN**



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b31b

Fig. 58: Checking MAP Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal

to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K1) MAP Signal circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

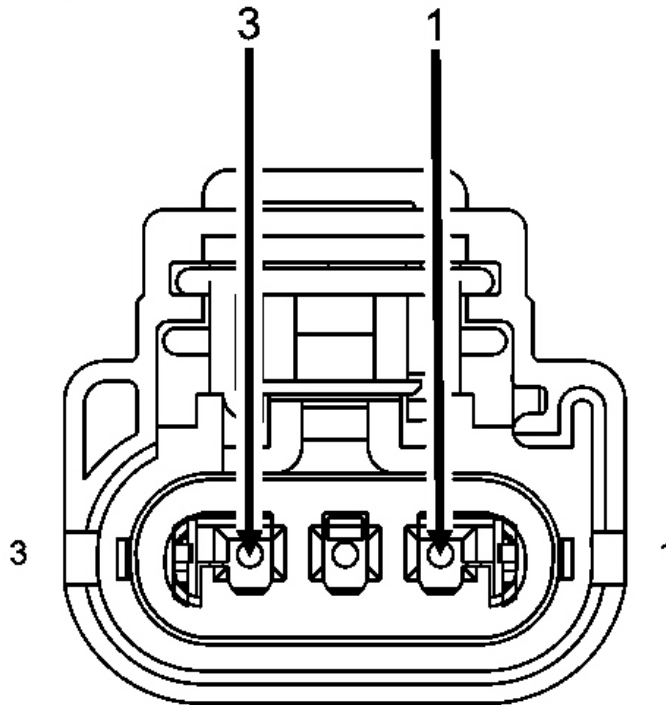
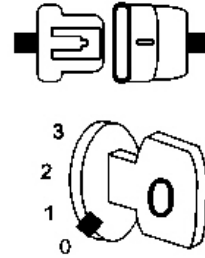
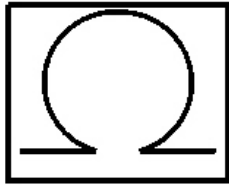
Go To 5.

No

Repair the open in the (K1) MAP Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K1) MAP SIGNAL CIRCUIT SHORTED TO THE (K857) 5-VOLT SUPPLY CIRCUIT



**SENSOR-
MAP**

8132bcae

Fig. 59: Checking MAP Sensor Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Disconnect the C1 PCM harness connector.

Measure the resistance between the (K1) MAP Signal circuit and the (K857) 5-volt Supply circuit in the MAP Sensor harness connector.

Is the resistance below 100 ohms?

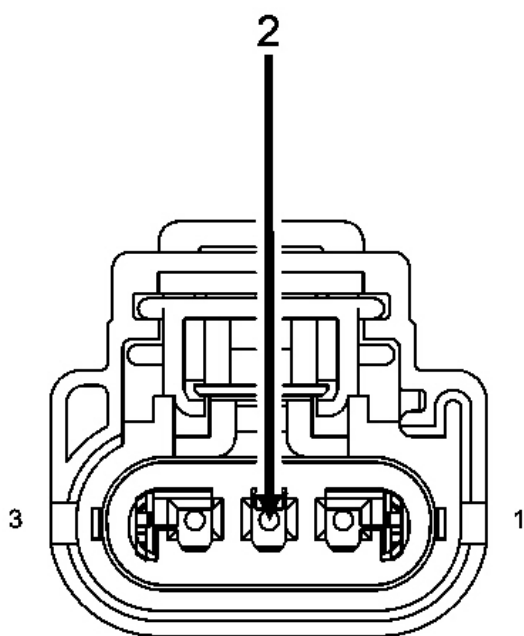
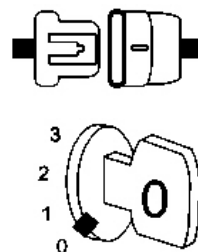
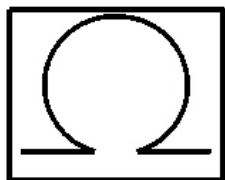
Yes

Repair the short between the (K857) 5-volt Supply circuit and the (K1) MAP Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

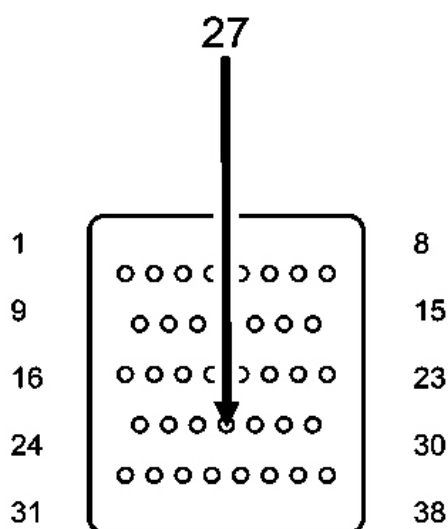
No

Go To 6.

6. (K900) SENSOR GROUND CIRCUIT OPEN



**SENSOR-
MAP**



**PCM PINOUT
BOX 8815**

8132b327

Fig. 60: Checking MAP Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the MAP Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the MAP Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the MAP Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0111-INTAKE AIR TEMPERATURE SENSOR RATIONALITY

CIRCUIT SCHEMATIC

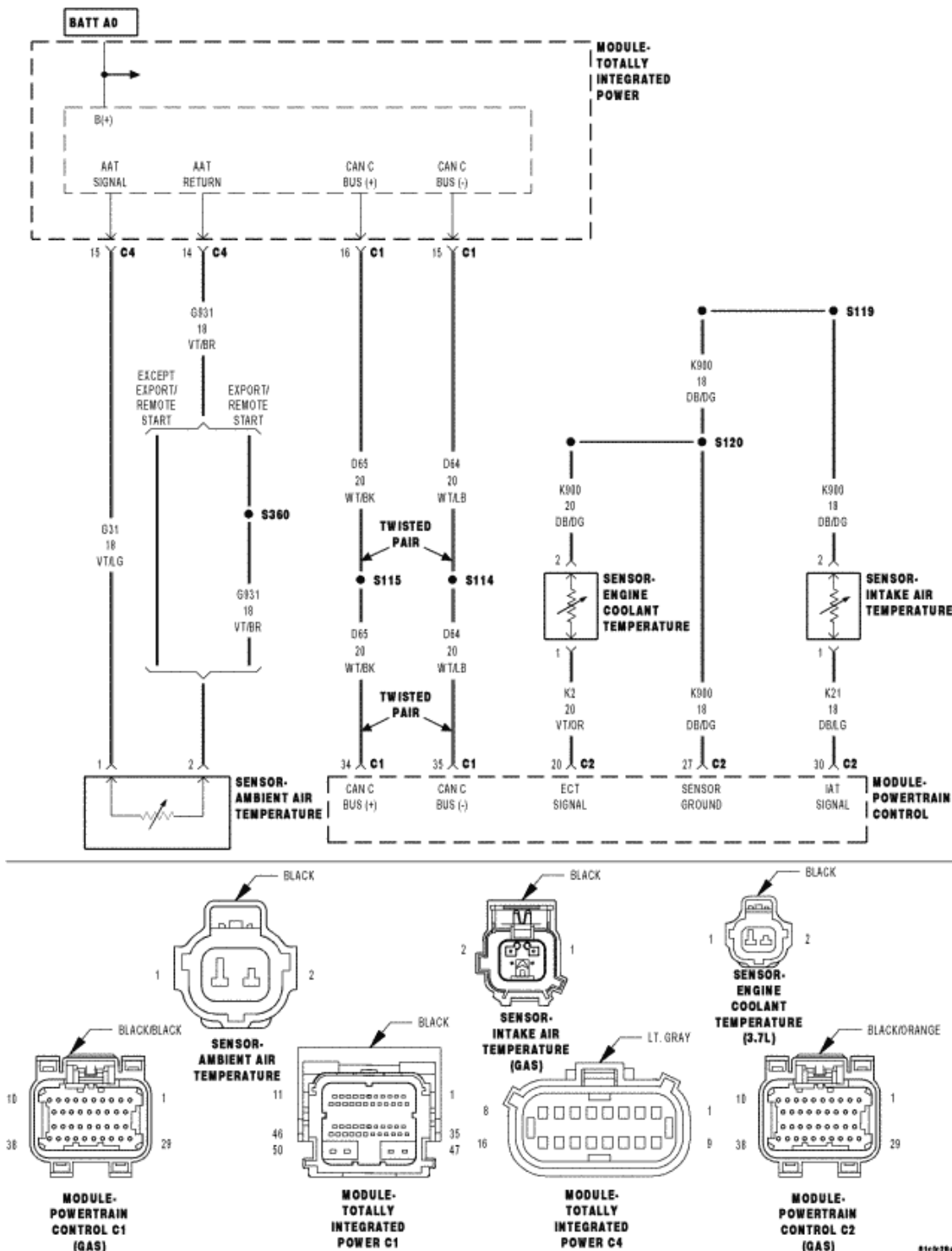


Fig. 61: Thermostat Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Intake Air Temperature Sensor performance looks at the outputs of three temperature sensors and compares them under cold start conditions. Following a start to run delay time, the outputs of the ambient, engine coolant, and intake air temperature sensors will be compared. If the engine coolant and ambient air temperature sensors agree and the intake air temperature does not agree, the intake air temperature sensor is declared as irrational. If declared irrational a second comparison will be done after a short drive cycle.

MONITOR CONDITIONS

When Monitored:

Engine off time is greater than 480 minutes and the vehicle has been driven for one minute over 35 mph.
Ambient temperature is greater than -64° C (-83° F).

SET CONDITIONS

- **Set Condition:**

Once the vehicle is soaked for a calibrated engine off time and then driven over calibrated speed and load conditions for some calibrated time, the PCM compares the ambient, engine coolant, and intake air temperature sensor values. If engine coolant and ambient air temperature sensors agree with each other but intake air temperature does not agree with them, the intake air temperature sensor is declared as irrational. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K21) IAT SIGNAL CIRCUIT
(K21) IAT SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K21) IAT SIGNAL CIRCUIT SHORTED TO GROUND
(K21) IAT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT
INTAKE AIR TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Turn the ignition off.

If possible, allow the vehicle to sit with the ignition off for more than 480 minutes in an environment where the temperature is consistent and above -7° C (19.4° F).

Test drive the vehicle. The vehicle must exceed 48 km/h (30 mph) during the test drive. Do not cycle the

ignition off when the test drive is completed.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Go To 2.

2. INTAKE AIR TEMPERATURE

Turn the ignition off.

Allow the vehicle to sit with the ignition off in an environment where the temperature is consistent and above -7° C (19.4° F) until the engine coolant temperature is equal to ambient temperature.

Turn the ignition on.

With a scan tool, compare the AAT, ECT, and IAT sensor values.

Is the Intake Air Temperature Sensor value within 10° C (18° F) of the other two sensor values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 3.

3. IAT SENSOR VOLTAGE

Turn the ignition off.

Disconnect the Intake Air Temperature Sensor harness connector.

Turn the ignition on.

With a scan tool, read the Intake Air Temperature Sensor voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

Go To 4.

No

Go To 5.

4. IAT SENSOR

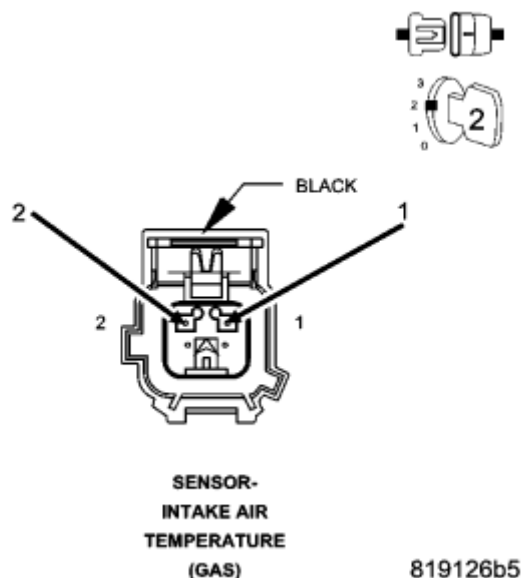


Fig. 62: Checking Intake Air Temperature Sensor
Courtesy of CHRYSLER LLC

Turn the ignition on.

With a scan tool, read the IAT voltage.

Connect a jumper wire between the (K21) IAT Signal circuit and the (K900) Sensor ground circuit in the IAT Sensor harness connector.

NOTE: **The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.**

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors. If OK, replace the Intake Air Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. EXCESSIVE RESISTANCE IN THE (K21) IAT SIGNAL CIRCUIT

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K21) IAT Signal circuit at the IAT Sensor harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 6.

No

Repair the open in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EXCESSIVE RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K900) Sensor Ground circuit at the IAT Sensor harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

Go To 7.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

7. (K21) IAT SIGNAL CIRCUIT SHORTED TO VOLTAGE

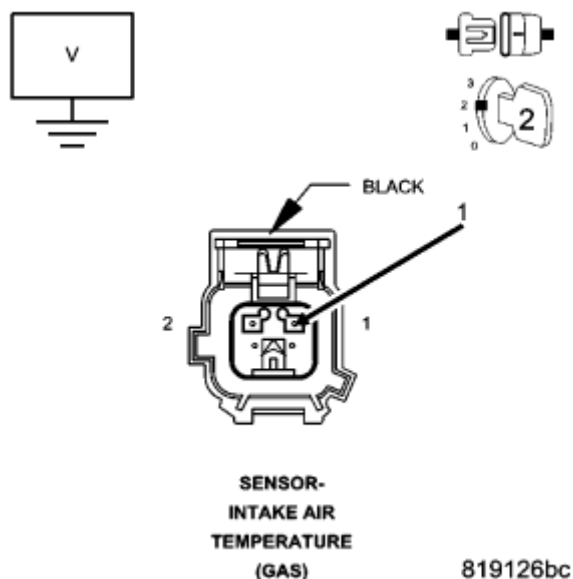


Fig. 63: Measuring Voltage On (K21) IAT Signal Circuit In IAT Sensor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the special tool #8815 from the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K21) IAT Signal circuit in the IAT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

8. (K21) IAT SIGNAL CIRCUIT SHORTED TO GROUND

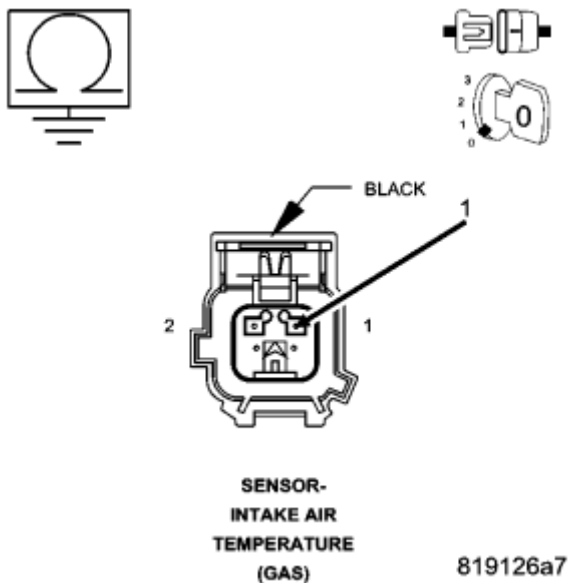


Fig. 64: Measuring Resistance Between Ground And (K21) IAT Signal Circuit In IAT Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (K21) IAT Signal circuit in the IAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (K21) IAT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT

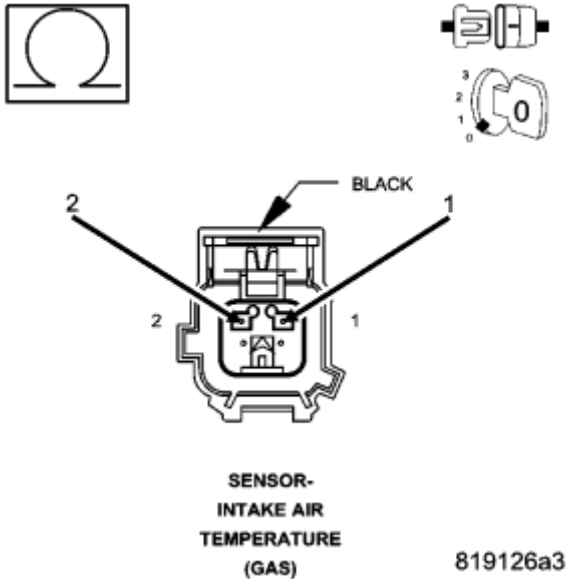


Fig. 65: Measuring Resistance Between (K21) IAT Signal Circuit And (K900) Sensor Ground Circuit In IAT Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (K21) IAT Signal circuit and the (K900) Sensor ground circuit in the IAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K900) Sensor ground circuit and the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the IAT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

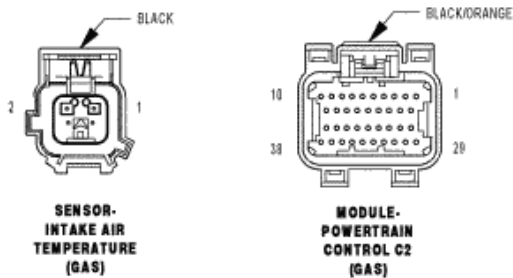
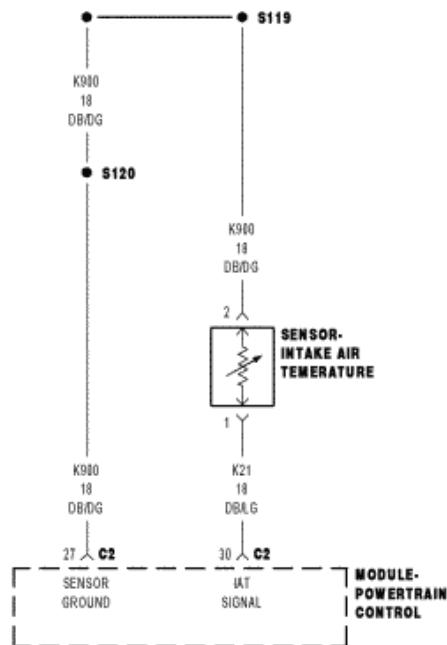
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0112-INTAKE AIR TEMPERATURE SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC



01000506

Fig. 66: Intake Air Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on and battery voltage greater than 10.4 volts.

SET CONDITIONS

• Set Condition:

When the Inlet Air Temp Sensor Signal circuit voltage is less than the minimum acceptable value. One trip failure. Three good trips to clear the MIL.

POSSIBLE CAUSES

Possible Causes
(K21) IAT SIGNAL CIRCUIT SHORTED TO GROUND (K21) IAT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT EXCESSIVE RESISTANCE IN THE (K21) IAT SIGNAL CIRCUIT INTAKE AIR TEMPERATURE SENSOR POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. **IAT SENSOR**

Turn the ignition off.

Disconnect the IAT Sensor harness connector.

Ignition on, engine not running.

With a scan tool, read IAT voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

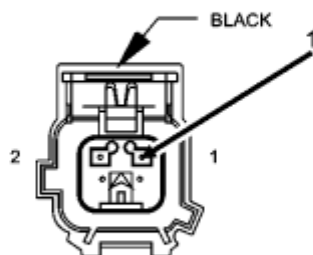
Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors. If OK, replace the Intake Air Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. **(K21) IAT SIGNAL CIRCUIT SHORTED TO GROUND**



**SENSOR-
INTAKE AIR
TEMPERATURE
(GAS)**

819126a7

Fig. 67: Measuring Resistance Between Ground And (K21) IAT Signal Circuit In IAT Sensor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K21) IAT Signal circuit in the IAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K21) IAT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT

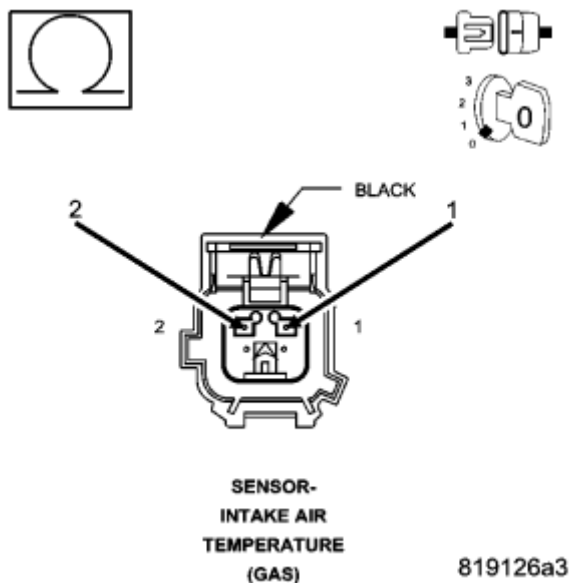


Fig. 68: Measuring Resistance Between (K21) IAT Signal Circuit And (K900) Sensor Ground Circuit In IAT Sensor Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (K21) IAT Signal circuit and the (K900) Sensor ground circuit in the IAT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K900) Sensor ground circuit and the (K21) IAT Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (K21) IAT SIGNAL CIRCUIT

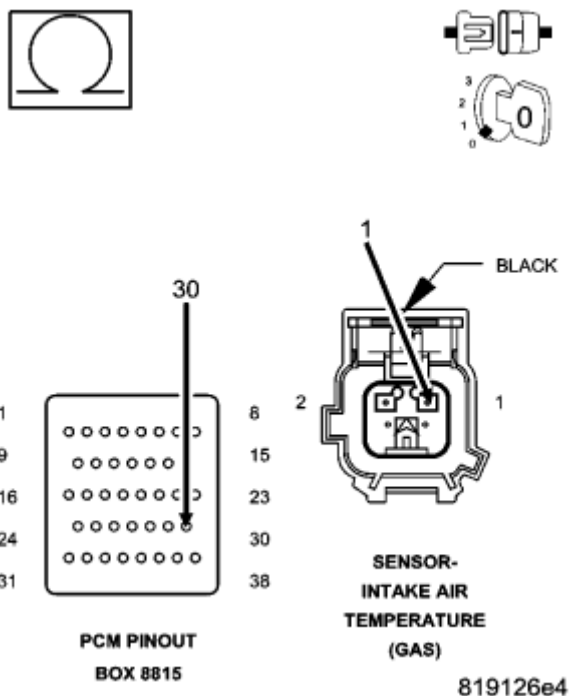


Fig. 69: Measuring Resistance Of (K21) IAT Signal Circuit From IAT Sensor Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K21) IAT Signal circuit between the Intake Air Temperature Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the IAT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

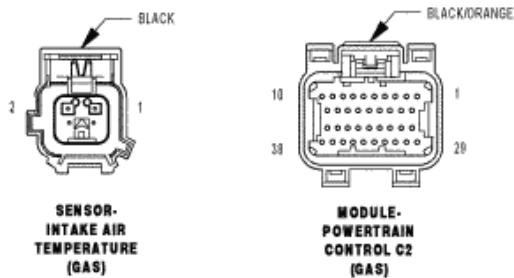
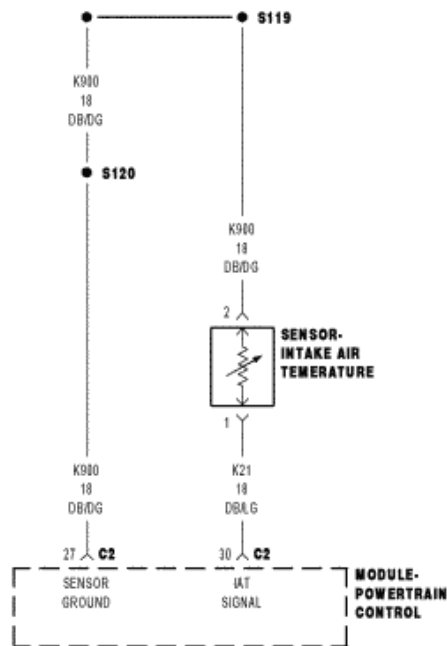
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0113-INTAKE AIR TEMPERATURE SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



01000500

Fig. 70: Intake Air Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts.

SET CONDITIONS

- Set Condition:

The PCM detects that the Intake Air Temperature Sensor input voltage is above the maximum acceptable value.

POSSIBLE CAUSES

Possible Causes
(K21) IAT SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K21) IAT SIGNAL CIRCUIT OPEN
(K900) SENSOR GROUND CIRCUIT OPEN
INTAKE AIR TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the INTERMITTENT CONDITION Diagnostic Procedure.

2. IAT SENSOR

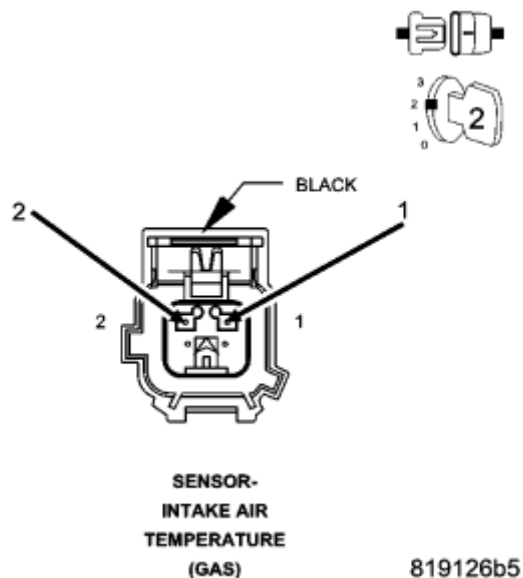


Fig. 71: Checking Intake Air Temperature Sensor
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intake Air Temperature Sensor harness connector.

Ignition on, engine not running.

With a scan tool, read the IAT Sensor voltage.

Connect a jumper wire between the (K21) IAT Signal circuit and the (K900) Sensor ground circuit in the IAT Sensor harness connector.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus .1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors. If OK, replace the Intake Air Temperature Sensor.

Perform POWERTRAIN VERIFICATION TEST.

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. **(K21) IAT SIGNAL CIRCUIT SHORTED TO VOLTAGE**

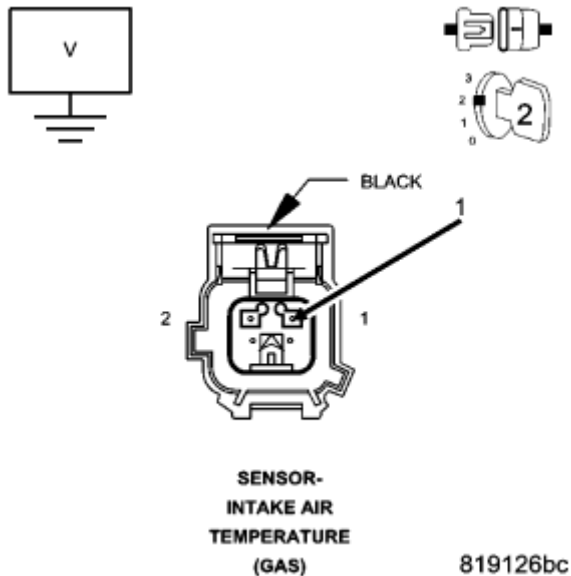


Fig. 72: Measuring Voltage On (K21) IAT Signal Circuit In IAT Sensor Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K21) IAT Signal circuit in the IAT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. **(K21) IAT SIGNAL CIRCUIT OPEN**

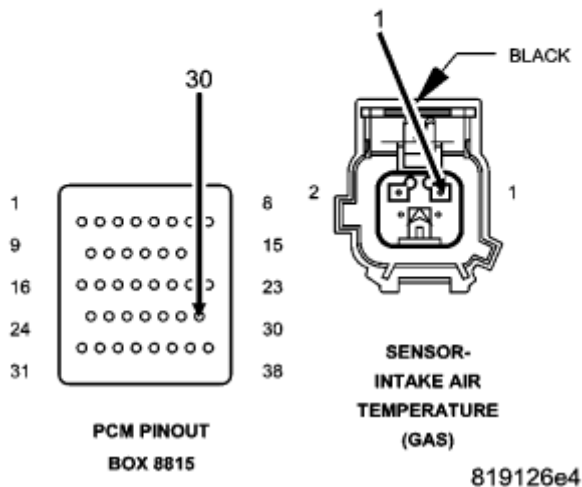


Fig. 73: Measuring Resistance Of (K21) IAT Signal Circuit From IAT Sensor Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K21) IAT Signal circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K21) IAT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K900) SENSOR GROUND CIRCUIT OPEN

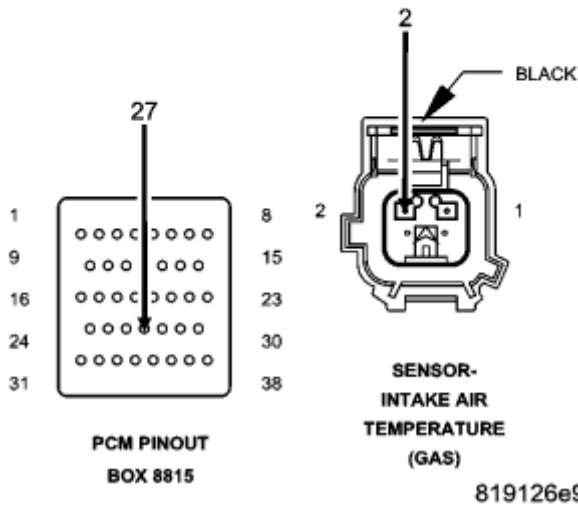


Fig. 74: Measuring Resistance Of (K900) Sensor Ground Circuit From IAT Sensor Harness Connector To Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the IAT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

6. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the IAT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the IAT Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0116-ENGINE COOLANT TEMPERATURE SENSOR PERFORMANCE

CIRCUIT SCHEMATIC

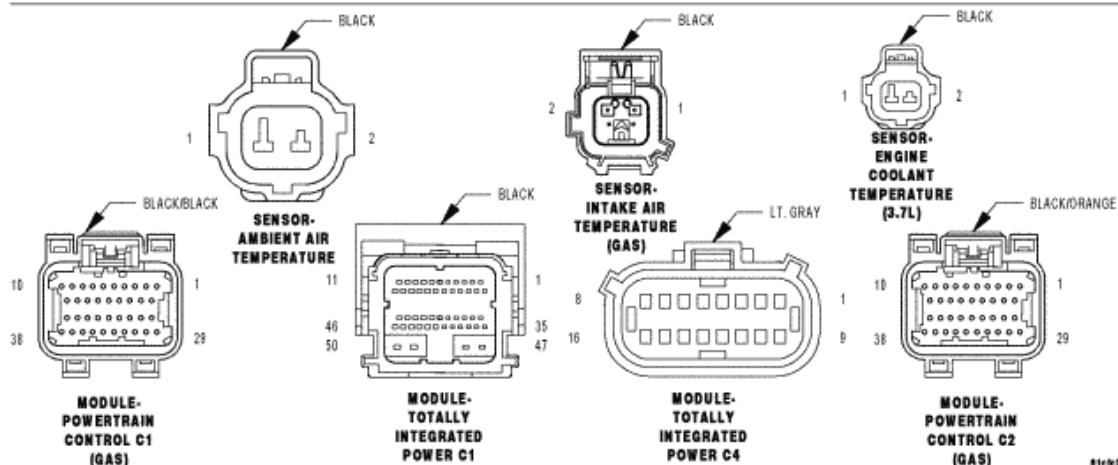
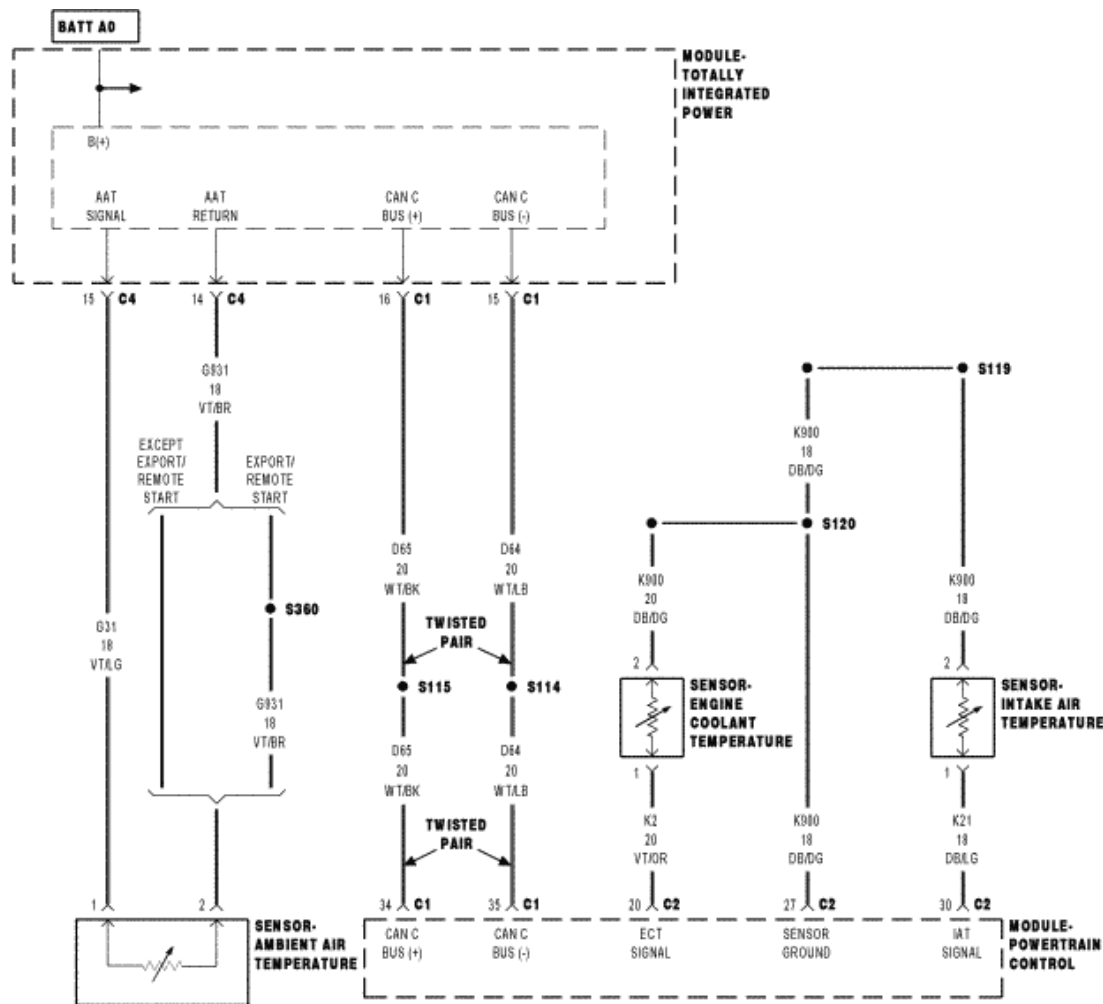


Fig. 75: Thermostat Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Engine Coolant Temperature Sensor performance looks at the outputs of three temperature sensors and compares them under cold start conditions. Following a start to run delay time, the outputs of the ambient, engine coolant, and intake air temperature sensors will be compared. If the intake air and ambient air temperature sensors agree and the intake air temperature does not agree, the engine coolant temperature sensor is declared as irrational.

MONITOR CONDITIONS

When Monitored:

Engine off time is greater than 480 minutes and the vehicle has been driven for one minute over 35 mph.
Ambient temperature is greater than -64° C (-83° F).

SET CONDITIONS

- **Set Condition:**

Once the vehicle is soaked for a calibrated engine off time and then driven over calibrated speed and load conditions for some calibrated time, the PCM compares the ambient, engine coolant, and intake air temperature sensor values. If ambient air and intake air temperature sensors agree with each other but engine coolant temperature does not agree with them, the engine coolant temperature sensor is declared as irrational. Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K2) ECT SIGNAL CIRCUIT
(K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND
(K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
(K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE
EXCESSIVE RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT
ENGINE COOLANT TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

NOTE: **Diagnose any CAN - C Communication DTCs before continuing.**

Turn the ignition off.

If possible, allow the vehicle to sit with the ignition off for more than 480 minutes in an environment where the temperature is consistent and above -7° C (19.4° F).

Test drive the vehicle. The vehicle must exceed 48 km/h (30 mph) during the test drive. Do not cycle the ignition off when the test drive is completed.

With a scan tool, select View DTCs.

Is the DTC Active or Pending at this time?

Yes

Go To 3.

No

Go To 2.

2. ENGINE COOLANT TEMPERATURE

Turn the ignition off.

Allow the vehicle to sit with the ignition off in an environment where the temperature is consistent and above -7° C (19.4° F) until the engine coolant temperature is equal to ambient temperature.

Turn the ignition on.

With a scan tool, compare the AAT, ECT, and IAT sensor values.

Is the Engine Coolant Temperature Sensor value within 10° C (18° F) of the other two sensor values?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Go To 3.

3. ECT SENSOR VOLTAGE

Turn the ignition off.

Disconnect the Engine Coolant Temperature Sensor harness connector.

Turn the ignition on.

With a scan tool, read the Engine Coolant Temperature Sensor voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1**

volt) with the connector disconnected.

Does the scan tool display the voltage as described above?

Yes

Go To 4.

No

Go To 5.

4. ECT SENSOR

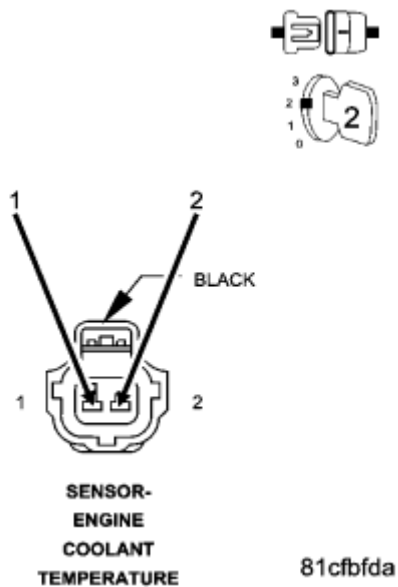


Fig. 76: Checking ECT Sensor
Courtesy of CHRYSLER LLC

With a scan tool, read the Engine Coolant Temperature Sensor voltage.

Connect a jumper wire between the (K2) ECT Signal circuit and the (K900) Sensor Ground circuit in the Engine Coolant Temperature Sensor harness connector.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus .1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module

connectors. If OK, replace the Engine Coolant Temperature Sensor.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

NOTE: Remove the jumper wire before continuing.

5. EXCESSIVE RESISTANCE IN THE (K2) ECT SIGNAL CIRCUIT

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 and #8815-1 to perform diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K2) ECT Signal circuit at the ECT Sensor harness connector and probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 6.

No

Repair the open in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. EXCESSIVE RESISTANCE IN THE (K900) SENSOR GROUND CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K900) Sensor Ground circuit at the ECT Sensor harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is indicated on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

Go To 7.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. (K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE

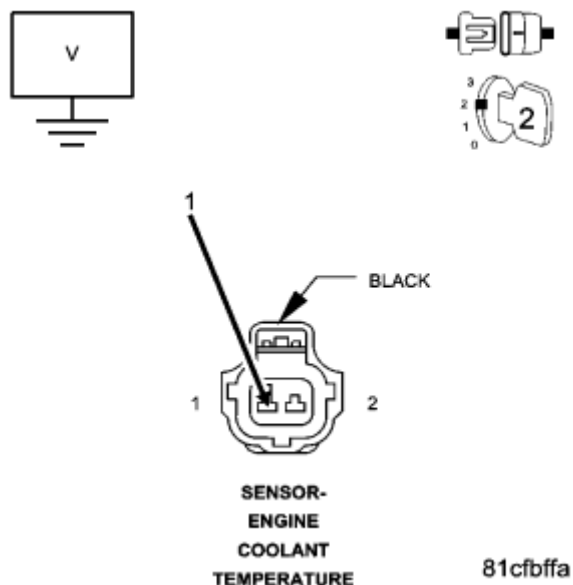


Fig. 77: Checking ECT Sensor Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the special tool #8815 from the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

No

Go To 8.

8. (K2) ECT SIGNAL CIRCUIT SHORTED GROUND

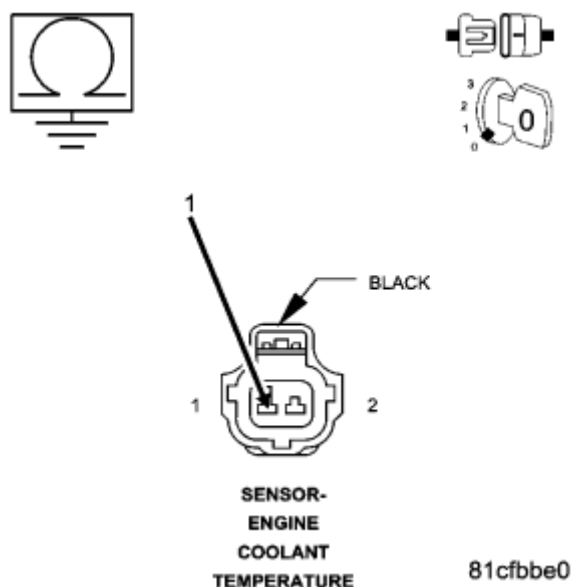


Fig. 78: Checking ECT Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 9.

9. (K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT

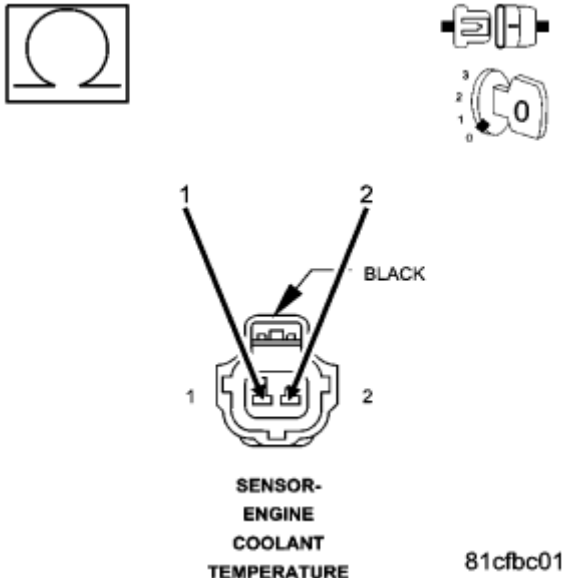


Fig. 79: Checking ECT Sensor Signal Circuit For Short To Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between the (K900) Sensor ground circuit and the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short to between the (K900) Sensor ground circuit and the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the ECT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

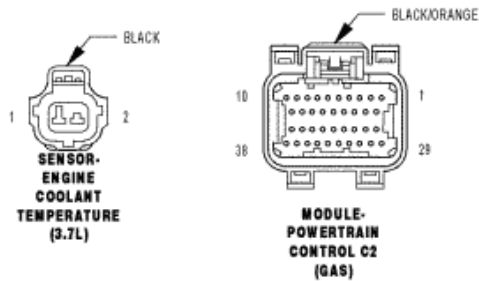
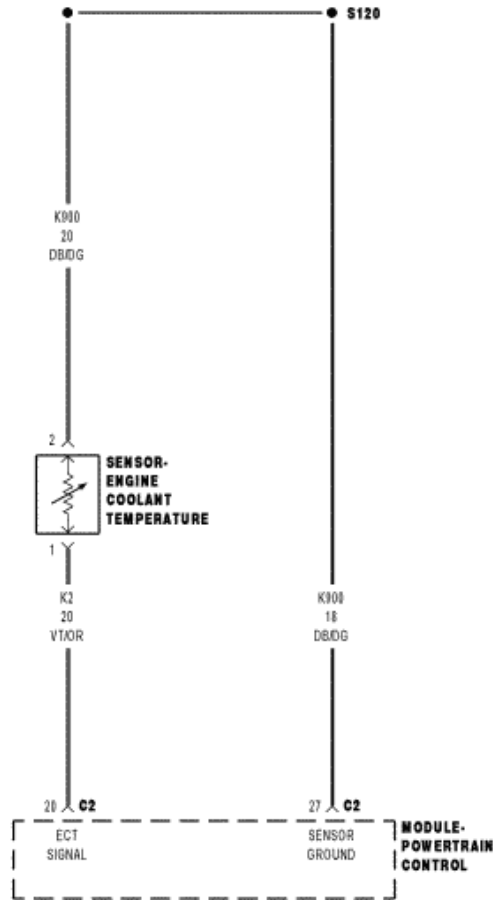
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0117-ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC



8100000

Fig. 80: Engine Coolant Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The engine coolant temperature sensor is a negative temperature coefficient thermistor-type sensor whose resistance varies inversely with temperature. At cold temperatures the sensor resistance is high so the voltage is high. As the coolant temperature increases the resistance decreases and the voltage becomes low.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the Engine Coolant Temperature Sensor input voltage is below the minimum acceptable value. One Trip Fault. Three good trips to clear the MIL. The MIL and ETC light will illuminate if equipped.

POSSIBLE CAUSES

Possible Causes
(K2) ECT SIGNAL CIRCUIT SHORTED TO GROUND
(K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT
EXCESSIVE RESISTANCE IN THE (K2) ECT SIGNAL CIRCUIT
ENGINE COOLANT TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. ECT SENSOR

Turn the ignition off.

Disconnect the ECT harness connector.

Ignition on, engine not running.

With a scan tool, read ECT voltage.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus .1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

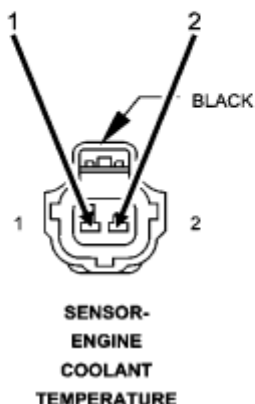
Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. If OK, replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

3. (K2) ECT SIGNAL CIRCUIT SHORTED TO THE (K900) SENSOR GROUND CIRCUIT



81cfbc01

Fig. 81: Checking ECT Sensor Signal Circuit For Short To Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between the (K900) Sensor ground circuit and the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short to between the (K900) Sensor ground circuit and the (K2) ECT Signal circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K2) ECT SIGNAL CIRCUIT SHORTED GROUND

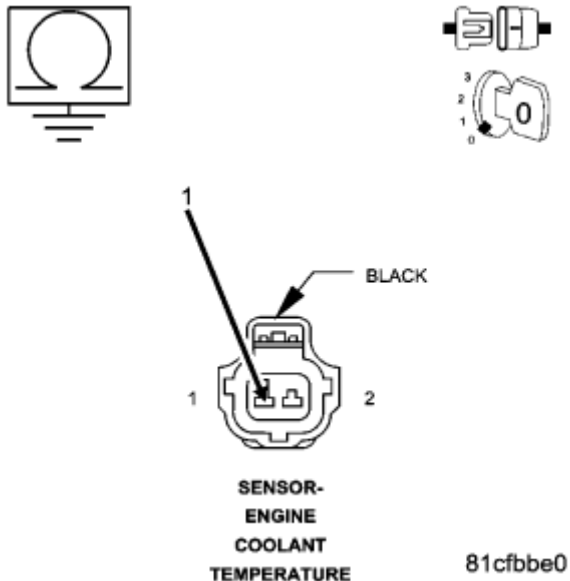


Fig. 82: Checking ECT Sensor Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. EXCESSIVE RESISTANCE IN THE (K2) ECT SIGNAL CIRCUIT

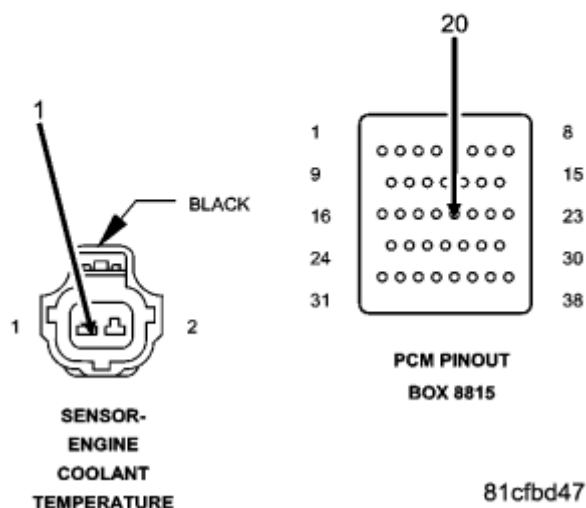
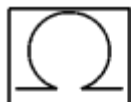


Fig. 83: Checking ECT Sensor Signal Circuit For Excessive Resistance
 Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals, resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K2) ECT Signal circuit between the Engine Coolant Temperature Sensor harness connector and the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the excessive resistance in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the ECT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Engine Coolant Temperature Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

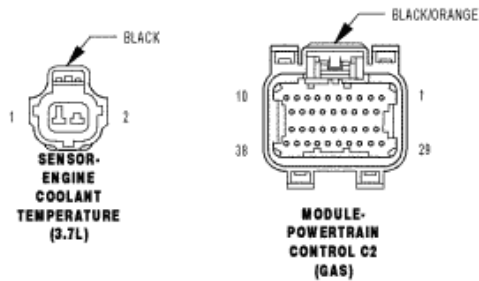
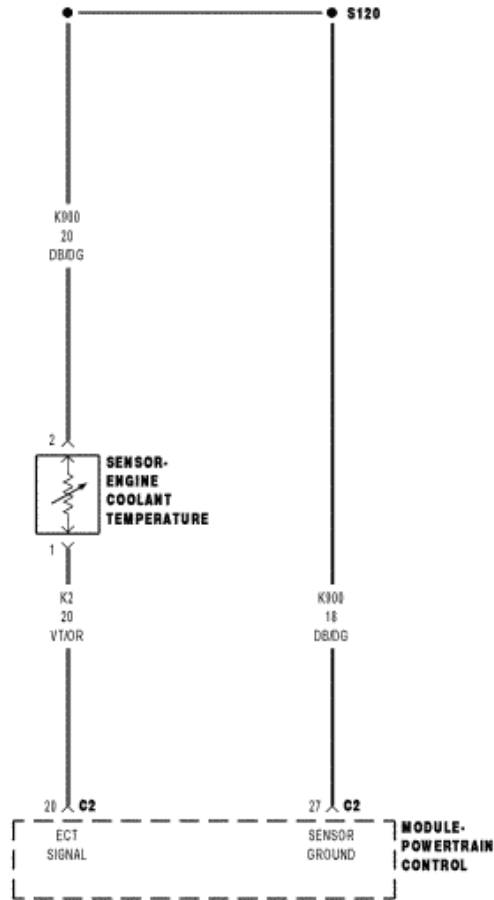
No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

P0118-ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH

CIRCUIT SCHEMATIC



8108a19

Fig. 84: Engine Coolant Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The engine coolant temperature sensor is a negative temperature coefficient thermistor-type sensor whose resistance varies inversely with temperature. At cold temperatures the sensor resistance is high so the voltage is high. As the coolant temperature increases the resistance decreases and the voltage becomes low.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts.

SET CONDITIONS

- **Set Condition:**

The PCM detects that the Engine Coolant Temperature Sensor input voltage is above the maximum acceptable value. One Trip Fault. Three good trips to turn off the MIL. The MIL and ETC light will illuminate if equipped.

POSSIBLE CAUSES

Possible Causes
(K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K2) ECT SIGNAL CIRCUIT OPEN
(K900) SENSOR GROUND CIRCUIT OPEN
ENGINE COOLANT TEMPERATURE SENSOR
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. **ACTIVE DTC**

Start the engine and allow it to reach normal operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

NOTE: Diagnose and repair any system voltage DTCs before continuing with this test.

With the scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2. ECT SENSOR

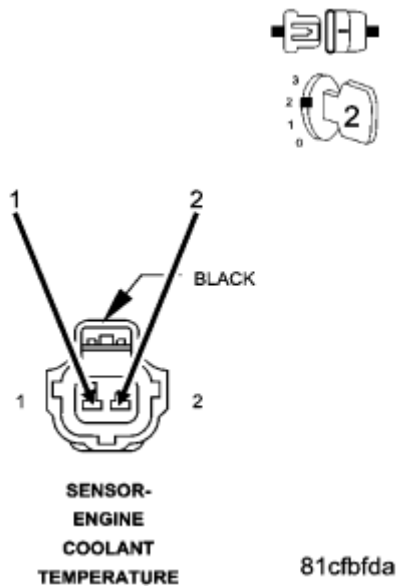


Fig. 85: Checking ECT Sensor
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the ECT harness connector.

Ignition on, engine not running.

With a scan tool, read ECT voltage.

Connect a jumper wire between the (K2) ECT Signal circuit and the (K900) Sensor ground circuit in the ECT harness connector.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the ECT Sensor and Powertrain Control Module connectors. If OK, replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. (K2) ECT SIGNAL CIRCUIT SHORTED TO VOLTAGE

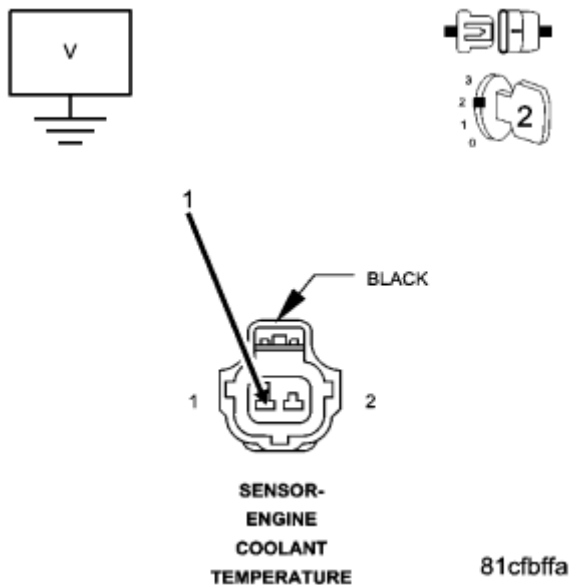


Fig. 86: Checking ECT Sensor Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K2) ECT Signal circuit in the ECT Sensor harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K2) ECT SIGNAL CIRCUIT OPEN

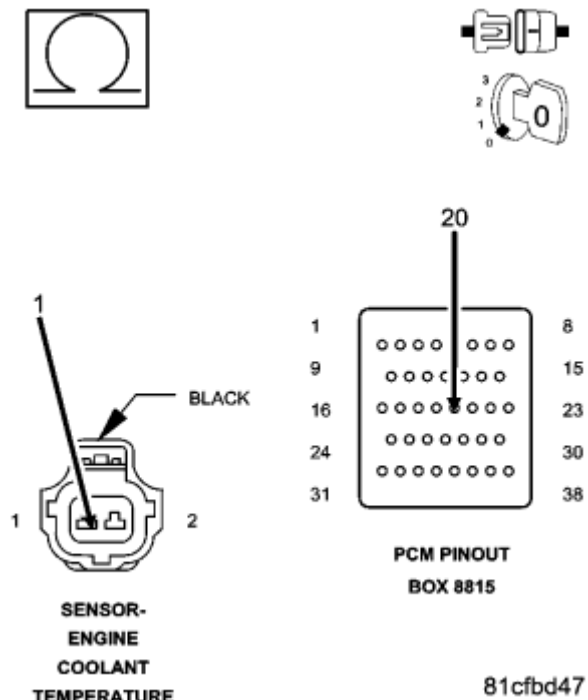


Fig. 87: Checking ECT Sensor Signal Circuit For Excessive Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K2) ECT Signal circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K2) ECT Signal circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. **(K900) SENSOR GROUND CIRCUIT OPEN**

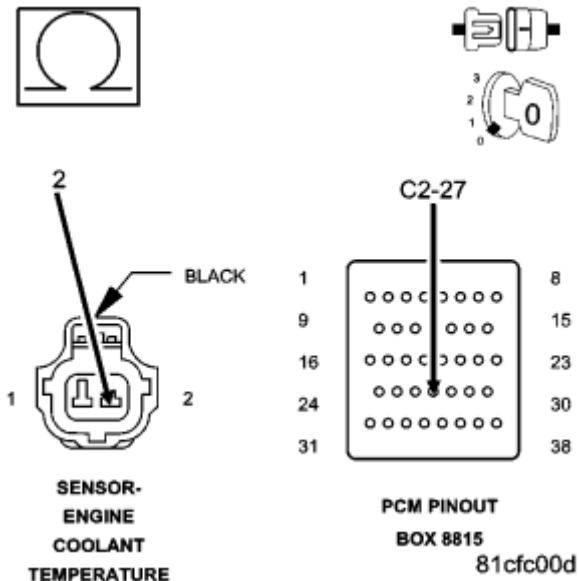


Fig. 88: Checking ECT Sensor Ground Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K900) Sensor ground circuit from the ECT Sensor harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 6.

No

Repair the open in the (K900) Sensor ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the ECT Sensor and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Engine Coolant Temperature Sensor and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

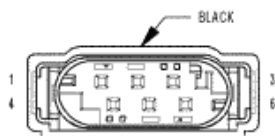
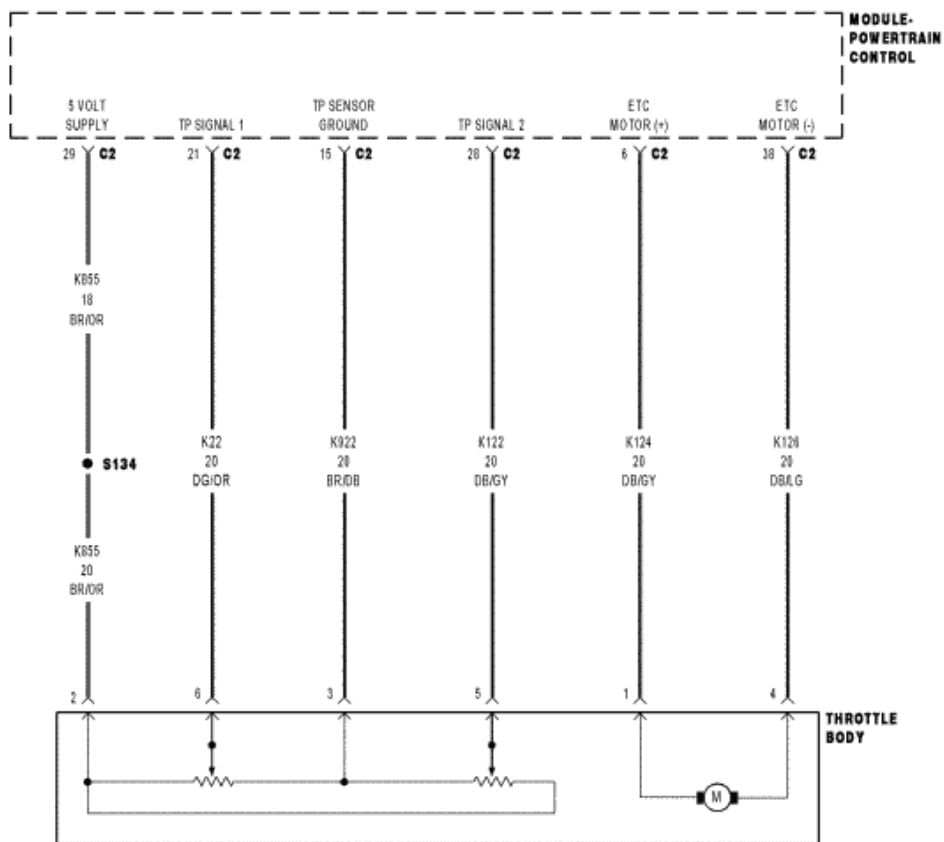
No

Replace and program the Powertrain Control Module per Service Information.

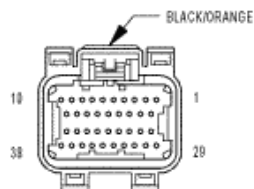
Perform **POWERTRAIN VERIFICATION TEST** .

P0121-THROTTLE POSITION SENSOR 1 PERFORMANCE

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

07101644

Fig. 89: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

Ignition on and No MAP Sensor DTCs set.

SET CONDITIONS

• Set Condition:

The PCM detects that the sensor input voltage does not fall within a valid range based on engine speed and load. Two Trip Fault. ETC light will illuminate. P2135 should set with this code also.

POSSIBLE CAUSES

Possible Causes
EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT
EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT
EXCESSIVE RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT
(K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K122) TP SIGNAL 2 CIRCUIT
THROTTLE POSITION SENSOR/THROTTLE BODY
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose and repair any Throttle Body circuit, system voltage, or sensor supply voltage DTCs before continuing with this test.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 9.

2. EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 along with the #8815-1 to perform the diagnosis.

Using a voltmeter perform a voltage drop test. Backprobe the (K22) TP Signal 1 circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 3.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST**.

3. EXCESSIVE RESISTANCE IN THE (K122) TP SIGNAL 2 CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K122) TP Signal 2 circuit at the Throttle Body harness

connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 of a volt?

Yes

Go To 4.

No

Repair the excessive resistance in the (K122) TP Signal 2 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

4. EXCESSIVE RESISTANCE IN THE (K855) 5-VOLT SUPPLY CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K855) 5-volt Supply circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

Go To 5.

No

Repair the excessive resistance in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. EXCESSIVE RESISTANCE IN THE (K922) TP SENSOR GROUND CIRCUIT

Turn the ignition off.

Move the voltmeter leads to backprobe the (K922) TP Sensor Ground circuit at the Throttle Body harness connector and to probe the appropriate terminal of the special tool #8815. Make sure the voltmeter leads are connected so a positive polarity is displayed on the voltmeter.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

Start the engine and allow it to reach normal operating temperature.

Monitor the voltmeter.

Is the voltage below 0.5 volts?

Yes

Go To 6.

No

Repair the excessive resistance in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

6. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K122) TP SIGNAL 2 CIRCUIT

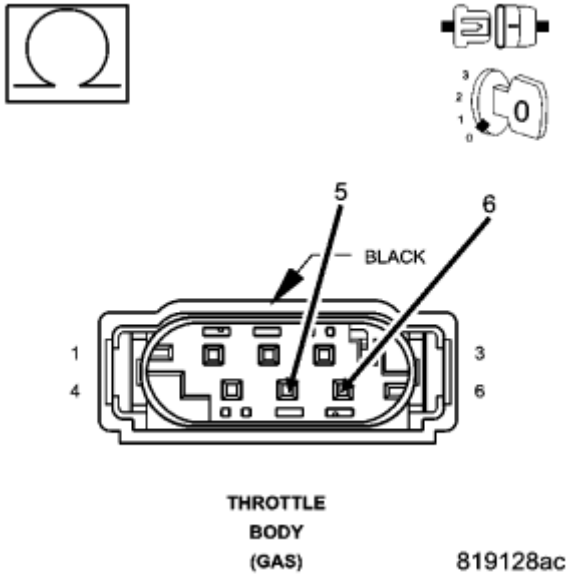


Fig. 90: Measuring Resistance Between TP Sensor No. 1 Signal Circuit & TP Sensor No. 2 Signal Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Remove special tool #8815 and #8815-1 leaving the C2 PCM harness connector disconnected.

Disconnect the Throttle Body harness connector.

Measure the resistance between the (K22) TP Signal 1 circuit and the (K122) TP Signal 2 circuit in the Throttle Body harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the short between the (K122) TP Signal 2 circuit and the (K22) TP Signal 1 circuit.
 Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. THROTTLE POSITION SENSOR

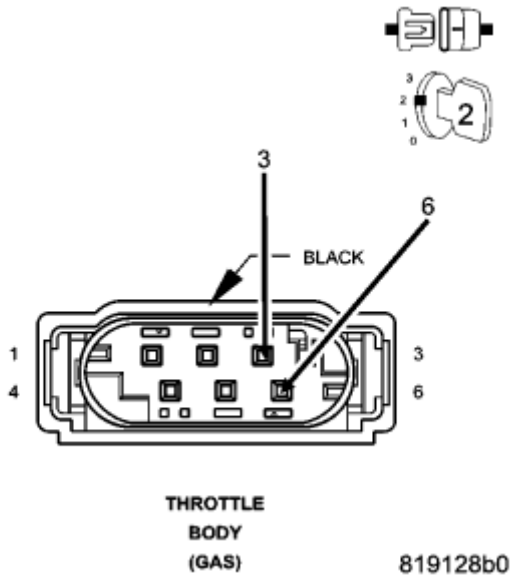


Fig. 91: View Of Throttle Position Sensor Connector
 Courtesy of CHRYSLER LLC

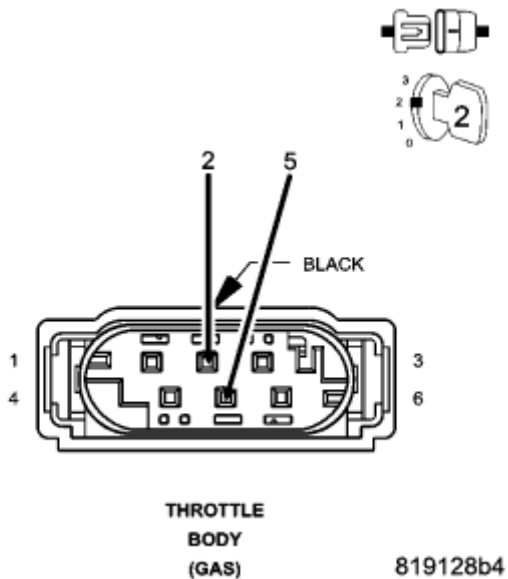


Fig. 92: View Of Throttle Body Connector
 Courtesy of CHRYSLER LLC

Connect the C2 PCM harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor No.1 and No.2 voltage.

Connect a jumper wire between the (K922) TP Sensor Ground circuit and the (K22) TP Signal 1 circuit.

NOTE: TP Sensor No.1 voltage should change from approximately 4.5 volts to less than 0.5 of a volt.

For TP Sensor No.2, connect a jumper wire between (K855) 5-volt supply circuit and the (K122) TP Signal 2 circuit.

NOTE: TP Sensor No.2 voltage should change from approximately 0 volts to 5.0 volts?

Is the voltage reading within the listed specification when the jumper wire is installed?

Yes

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 8.

NOTE: Remove the jumper wire before continuing.

8. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **THROTTLE FOLLOWER TEST**

Ignition on, engine not running.

With a scan tool, perform the ETC Throttle Follower Test and monitor the TP Sensor No.1 or No.2 voltage.

Slowly press the throttle pedal down.

The voltage for TP Sensor No.1 should start at approximately 0.7 of a volt and increase to approximately 4.3 volts.

The voltage for TP Sensor No.2 should start at approximately 4.3 volts and decrease to approximately 0.7 of a volt.

Is the voltage within the range of the listed specification for the appropriate Sensor?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

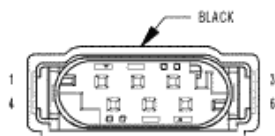
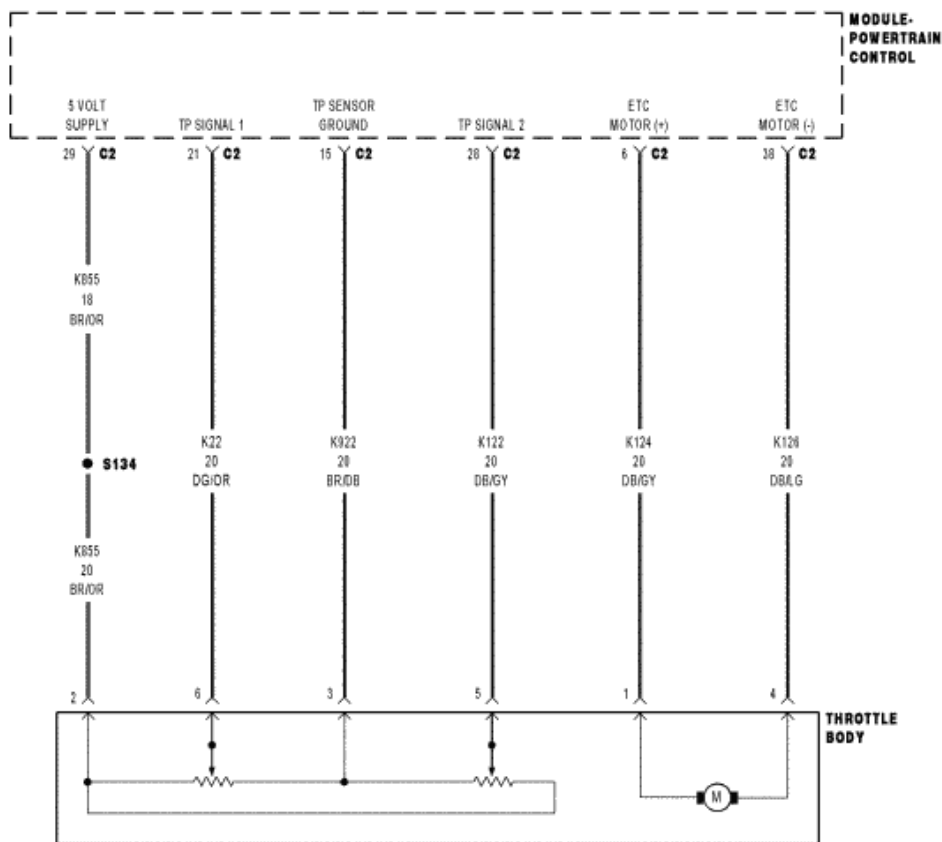
No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, use a scan tool and select the ETC RELEARN function.

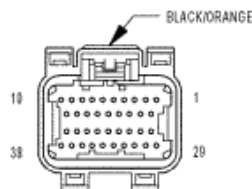
Perform **POWERTRAIN VERIFICATION TEST** .

P0122-THROTTLE POSITION SENSOR 1 CIRCUIT LOW

CIRCUIT SCHEMATIC



THROTTLE BODY (3.7L)



MODULE-POWERTRAIN CONTROL C2 (GAS)

Fig. 93: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

Throttle Position Sensor voltage at the PCM is less than the minimum acceptable value. One Trip Fault.
Three good trips to turn off the MIL. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
(K855) 5-VOLT SUPPLY CIRCUIT OPEN (K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K922) TP SENSOR GROUND CIRCUIT EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT THROTTLE POSITION SENSOR/THROTTLE BODY POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

NOTE: Diagnose and repair any Throttle Body circuit, system voltage, or sensor supply voltage DTCs before continuing with this test.

Start the engine and allow it to reach operating temperature.

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts, or fan. Do not wear loose clothing. Failure to follow these instructions can result in personal injury or death.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

NOTE: If the P2122-APP Sensor 1 Circuit Low DTC is also Active, diagnose the

P2122 before continuing with the P0122 diagnostic procedure.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 11.

2. P0222 ALSO SET

Was the P0222-TP SENSOR NO.2 VOLTAGE LOW DTC set along with the P0122?

Yes

Go To 3.

No

Go To 4.

3. (K855) 5-VOLT SUPPLY CIRCUIT

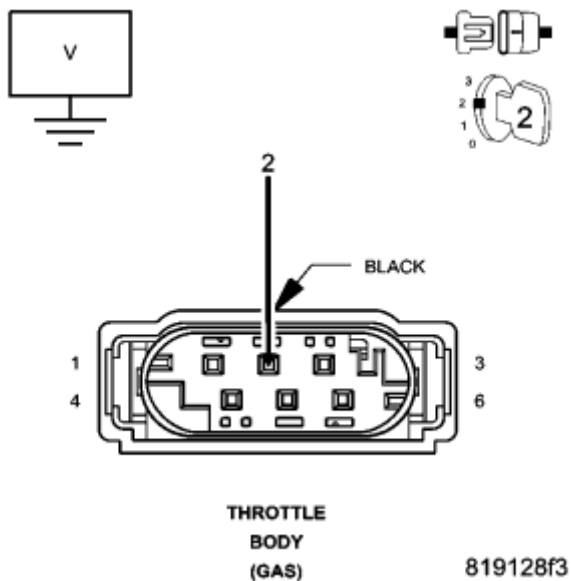


Fig. 94: Checking 5-Volt Sensor Circuit For Open Or Short
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

Measure the voltage on the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

Is the voltage between 4.8 to 5.2 volts?

Yes

Go To 4.

No

Go To 8.

4. THROTTLE POSITION SENSOR

With a scan tool, monitor the TP Sensor No.1 voltage with the Sensor harness connector disconnected.

NOTE: **The sensor voltage should be approximately 5.0 volts (plus or minus.1 volt) with the connector disconnected.**

Does the scan tool display the voltage as described above?

Yes

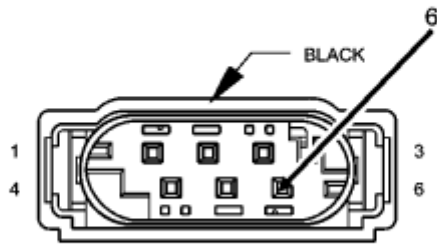
Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 5.

5. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO GROUND



THROTTLE
BODY
(GAS)

819128fd

Fig. 95: Checking TP Sensor No. 1 Signal Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Measure the resistance between ground and the (K22) TP Signal 1 circuit in the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

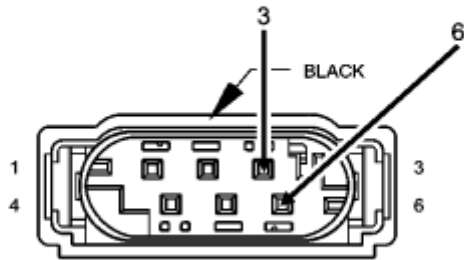
Repair the short to ground in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K922) TP SENSOR GROUND CIRCUIT



THROTTLE
BODY
(GAS)

81912902

Fig. 96: Measuring Resistance Between TP Signal 1 Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K922) TP Sensor Ground circuit and the (K22) TP Signal 1 circuit.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 7.

7. EXCESSIVE RESISTANCE IN THE (K22) TP SIGNAL 1 CIRCUIT

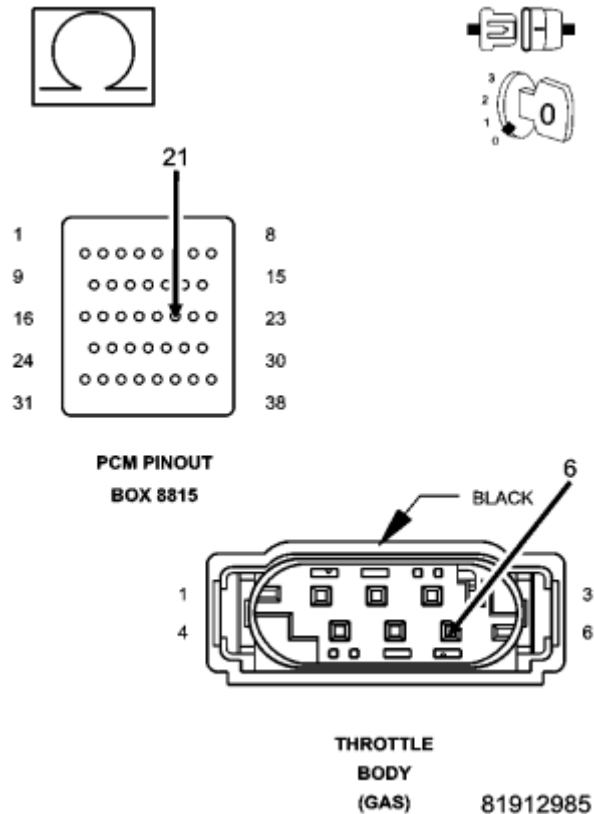


Fig. 97: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 10.

No

Repair the excessive resistance in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (K855) 5-VOLT SUPPLY CIRCUIT OPEN

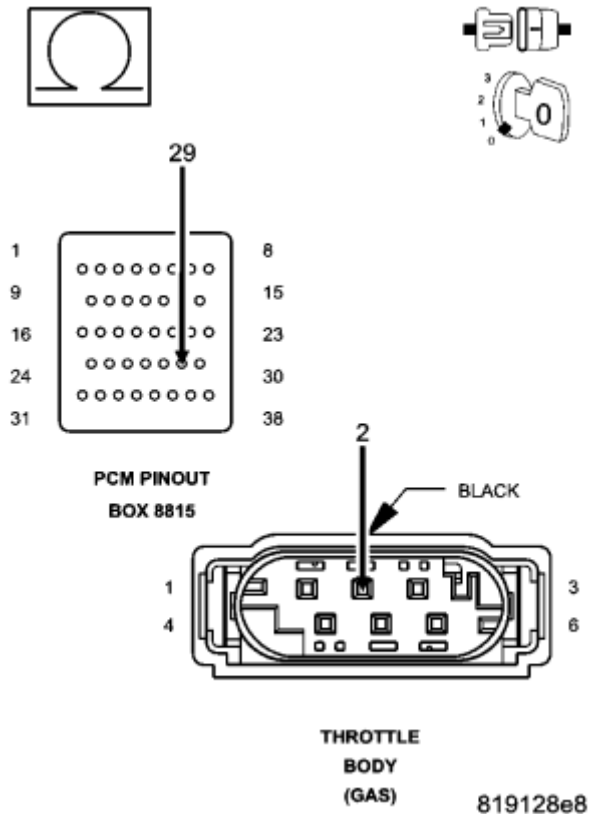


Fig. 98: Checking 5-volt Supply Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnostics.

Measure the resistance of the (K855) 5-volt Supply circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 9.

No

Repair the open in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

9. **(K855) 5-VOLT SUPPLY CIRCUIT SHORTED TO GROUND**

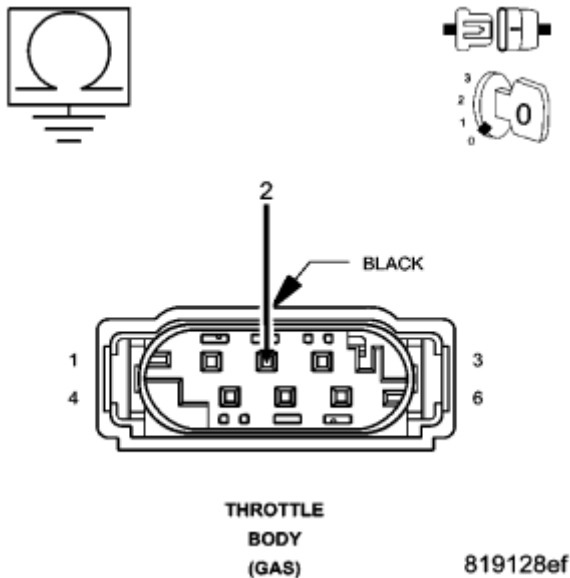


Fig. 99: Checking 5-volt Supply Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short to ground in the (K855) 5-volt Supply circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 10.

10. **POWERTRAIN CONTROL MODULE (PCM)**

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

11. THROTTLE FOLLOWER TEST

With a scan tool, perform the ETC Throttle Follower Test.

Monitor the TP Sensor No.1 voltage.

Does the voltage start at approximately 0.7 of a volt and increase to approximately 4.3 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

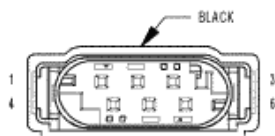
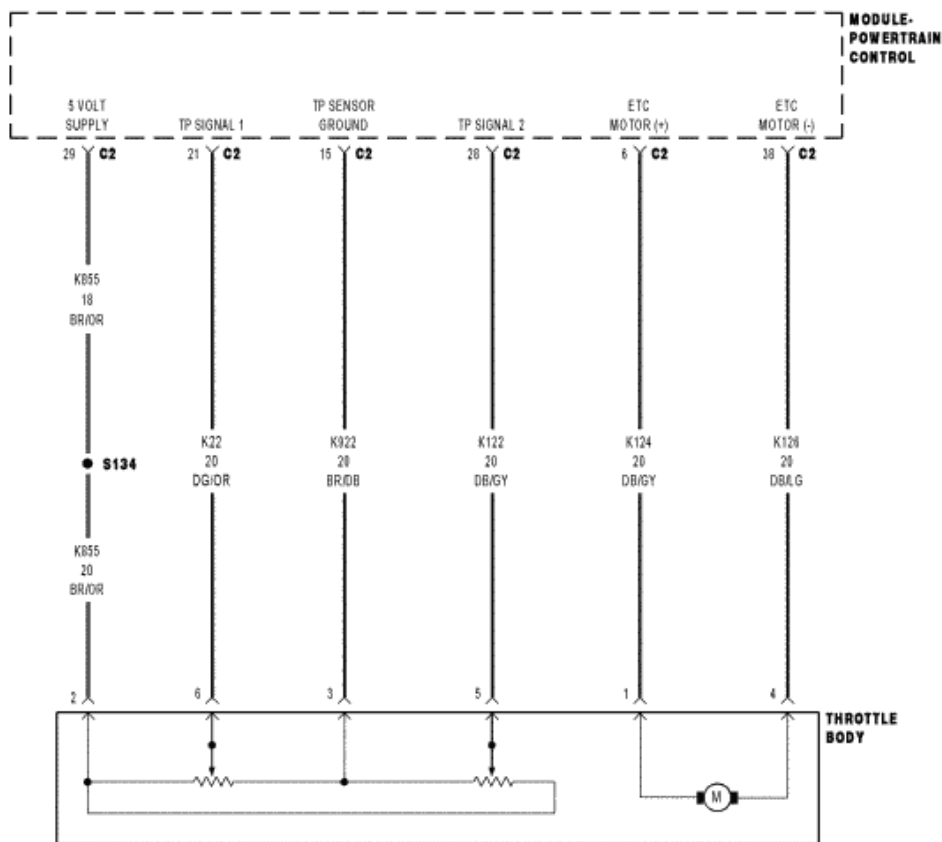
No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

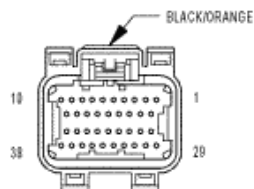
Perform **POWERTRAIN VERIFICATION TEST** .

P0123-THROTTLE POSITION SENSOR 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



**THROTTLE
BODY
(3.7L)**



**MODULE-
POWERTRAIN
CONTROL C2
(GAS)**

01010600

Fig. 100: Throttle Body Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on. Battery voltage greater than 10 volts.

SET CONDITIONS

- Set Condition:

Throttle Position Sensor No.1 voltage is greater than the maximum acceptable value. One Trip Fault. ETC light will illuminate.

POSSIBLE CAUSES

Possible Causes
(K22) TP SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE
(K22) TP SIGNAL 1 CIRCUIT OPEN
(K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT
(K922) TP SENSOR GROUND CIRCUIT OPEN
THROTTLE POSITION SENSOR/THROTTLE BODY
THROTTLE PLATE JAMMED AGAINST THE MAXIMUM STOP
POWERTRAIN CONTROL MODULE (PCM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. ACTIVE DTC

- NOTE:

When this DTC is Active the engine speed, torque, and vehicle speed are limited to a Limp in mode.
- NOTE:

Make sure the throttle is fully closed and free from binding or carbon build up.
- NOTE:

If a 5-Volt Supply DTC has also set, diagnose the 5-Volt DTC before continuing.
- NOTE:

If P2101 is also set, then make sure that the blade moves freely and does not hang up near Wide Open Throttle before trying to repair P0123.

Start the engine and allow it to reach operating temperature.

With the scan tool select View DTCs.

NOTE: If the DTC does not reset it may be necessary to test drive the vehicle.

NOTE: If the P2123-APP Sensor 1 Circuit High DTC is also Active, diagnose the P2123 before continuing with the P0123 diagnostic procedure.

Is the DTC Active at this time?

Yes

Go To 2.

No

Go To 8.

2. THROTTLE POSITION SENSOR

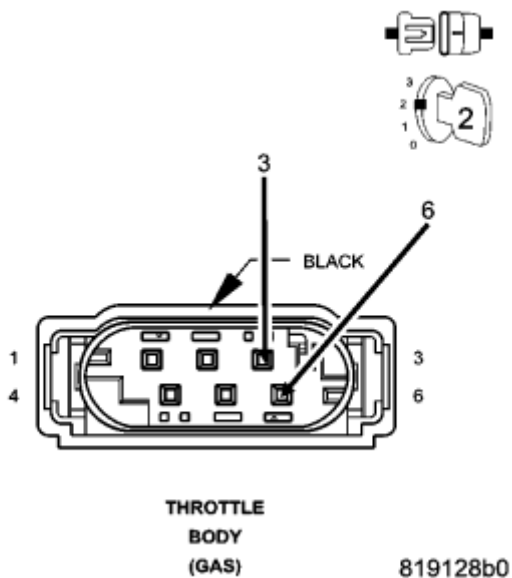


Fig. 101: View Of Throttle Position Sensor Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Throttle Body harness connector.

Ignition on, engine not running.

With a scan tool, monitor the TP Sensor No.1 voltage.

Connect a jumper wire between the (K22) TP Signal 1 circuit and the (K922) TP Sensor Ground circuit in the Throttle Body harness connector.

NOTE: The sensor voltage should be approximately 0.0 volts (plus or minus.1 volt) with the jumper wire in place.

Does the scan tool display the voltage as described above?

Yes

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 3.

NOTE: Remove the jumper wire before continuing.

3. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO VOLTAGE

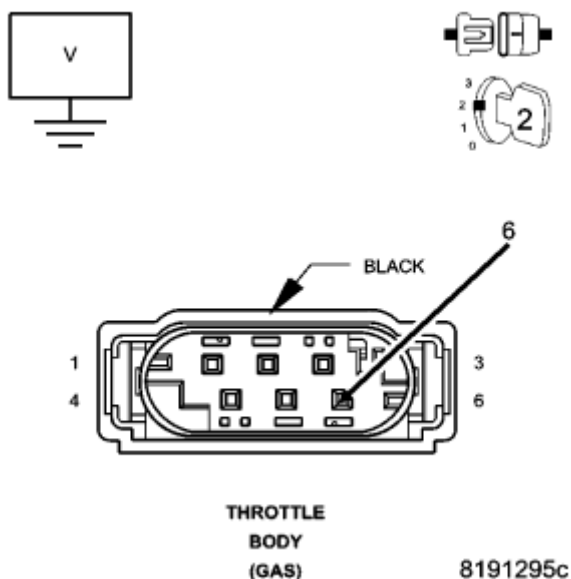


Fig. 102: Checking TP Sensor No.1 Signal Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the C2 PCM harness connector.

Ignition on, engine not running.

Measure the voltage on the (K22) TP Signal 1 circuit in the Throttle Body harness connector.

Is there any voltage present?

Yes

Repair the short to voltage in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4.

4. (K22) TP SIGNAL 1 CIRCUIT OPEN

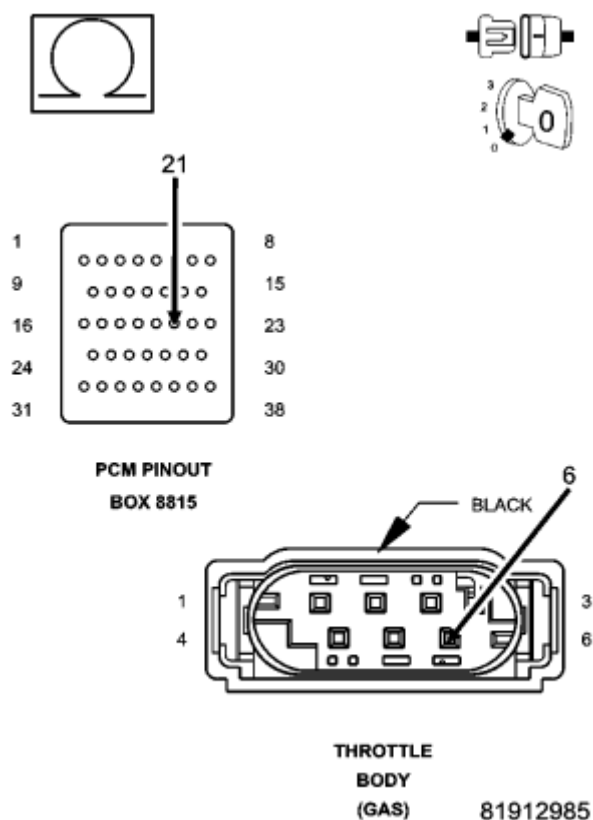


Fig. 103: Checking For Excessive Resistance In TP Sensor No.1 Signal Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Measure the resistance of the (K22) TP Signal 1 circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 5.

No

Repair the open in the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (K22) TP SIGNAL 1 CIRCUIT SHORTED TO THE (K855) 5-VOLT SUPPLY CIRCUIT

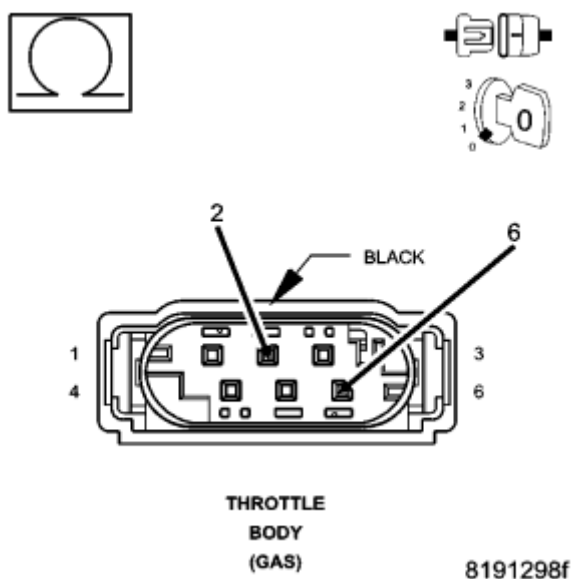


Fig. 104: Checking TP Sensor No. 1 Signal Circuit For Short To 5-Volt Supply Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (K22) TP Signal 1 circuit and the (K855) 5-volt Supply circuit in the Throttle Body harness connector.

Is the resistance below 100 ohms?

Yes

Repair the short between the (K855) 5-volt Supply circuit and the (K22) TP Signal 1 circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 6.

6. (K922) TP SENSOR GROUND CIRCUIT OPEN

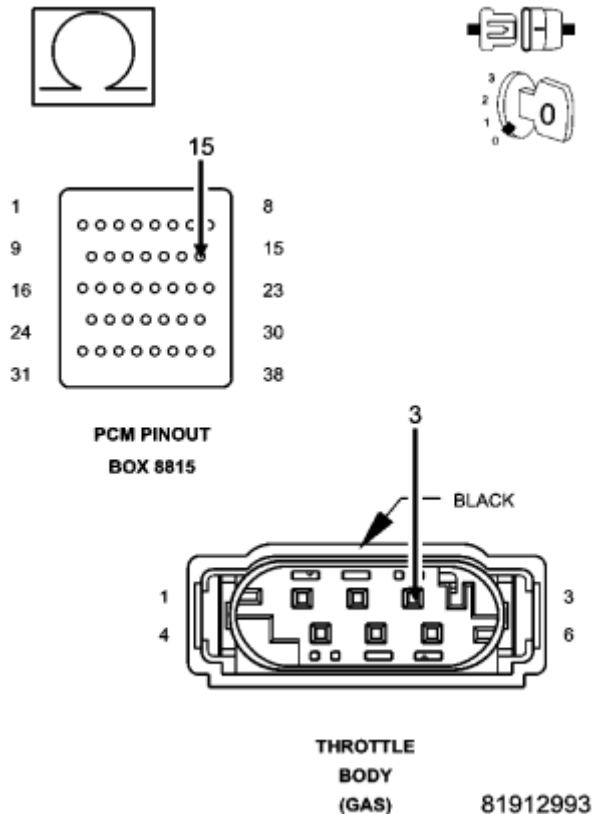


Fig. 105: Checking TP Sensor return Circuit For Open
Courtesy of CHRYSLER LLC

Measure the resistance of the (K922) TP Sensor Ground circuit from the Throttle Body harness connector to the appropriate terminal of special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To 7.

No

Repair the open in the (K922) TP Sensor Ground circuit.

Perform **POWERTRAIN VERIFICATION TEST** .

7. POWERTRAIN CONTROL MODULE (PCM)

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the Throttle Body and the Powertrain Control Module (PCM).

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals. Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors.

Refer to any Technical Service Bulletins that may apply.

Were there any problems found?

Yes

Repair as necessary.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace and program the Powertrain Control Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

8. THROTTLE FOLLOWER TEST

With a scan tool, perform the ETC Throttle Follower Test.

Monitor the TP Sensor No.1 voltage.

Does the voltage start at approximately 0.7 of a volt and increase to approximately 4.3 volts with a smooth transition?

Yes

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

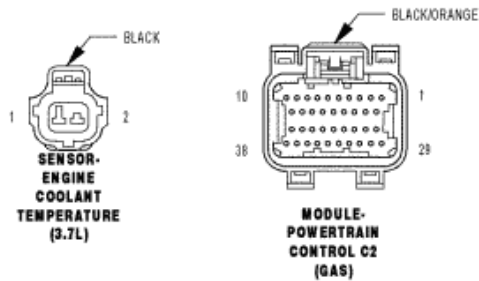
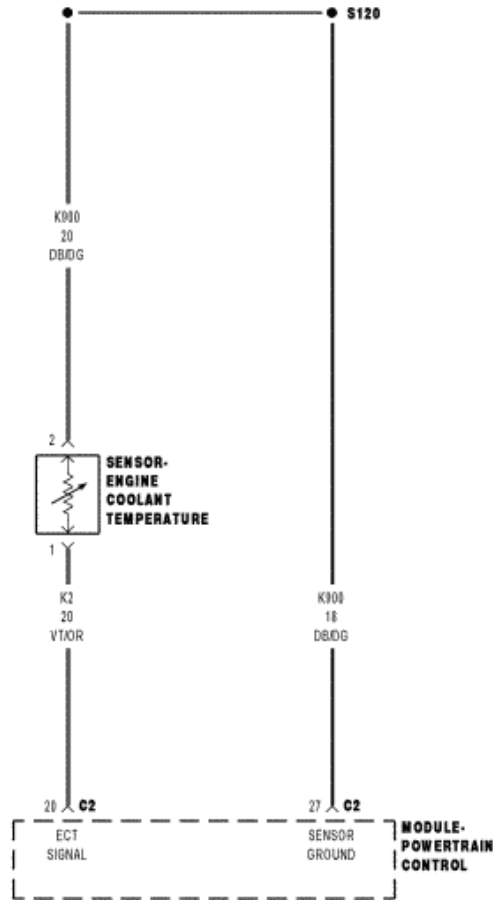
No

Verify that there is good pin to terminal contact in the Throttle Body and Powertrain Control Module connectors. If OK, replace the Throttle Body Assembly. Disconnect the Battery when replacing the Throttle Body Assembly. After installation is complete, using a scan tool select the ETC RELEARN function.

Perform **POWERTRAIN VERIFICATION TEST** .

P0125-INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED-LOOP FUEL CONTROL

CIRCUIT SCHEMATIC



8100000

Fig. 106: Engine Coolant Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The engine coolant temperature sensor is a negative temperature coefficient thermistor-type sensor whose resistance varies inversely with temperature. At cold temperatures the sensor resistance is high so the voltage is high. As the coolant temperature increases the resistance decreases and the voltage becomes low. The INSUFFICIENT COOLANT TEMP FOR CLOSED-LOOP FUEL CONTROL determines if the engine coolant temperature will reach the closed loop fueling control temperature limit in a regulated time after start.

MONITOR CONDITIONS

When Monitored:

With the ignition on, battery voltage greater than 10.4 volts, and no ECT sensor circuit DTCs present.

SET CONDITIONS

- Set Condition:**

The engine temperature does not go above -10° C (15° F). Failure time depends on start-up coolant temperature and ambient temperature. (i.e. 2 minutes for a start temp of -10° C (15° F) or up to 10 minutes for a vehicle with a start-up temp of -28° C (5° F). Two Trip Fault. Three good trips to turn off the MIL.

POSSIBLE CAUSES

Possible Causes
LOW COOLANT LEVEL THERMOSTAT ECT SENSOR

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. CHECKING COOLANT LEVEL AND CONDITION

NOTE: If a Engine Coolant Temperature (ECT) DTC is set along with this code, diagnose the ECT DTC first.

NOTE: Inspect the ECT terminals and related PCM terminals. Make sure the terminals are free from corrosion and damage.

NOTE: The best way to diagnose this DTC is to allow the vehicle to sit overnight outside in order to have a totally cold soaked engine.

NOTE: Extremely cold outside ambient temperatures may have caused this DTC to set.

WARNING: Never open the cooling system when the engine is hot. The system is under pressure. Extreme burns or scalding may result. Failure to follow these instructions can result in personal injury or death. Allow the engine to cool before opening the cooling system.

Inspect the coolant system for proper level and condition.

Is the coolant level and condition OK?

Yes

Go To 2.

No

Inspect the vehicle for a coolant leak, make the appropriate repairs, and add the correct amount of coolant.

Perform **POWERTRAIN VERIFICATION TEST** .

2. THERMOSTAT OPERATION

NOTE: This test works best if performed on a cold engine (cold soak)

Ignition on, engine not running.

With a scan tool, read the Eng Coolant Tmp Deg value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.

Start the Engine.

During engine warm-up monitor the Eng Coolant Tmp Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82° C (180° F). Also monitor the actual coolant temperature with a thermometer.

NOTE: As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the scan tool Eng Coolant Tmp Deg values should stay relatively close to each other.

Using the appropriate service information, determine the proper opening temperature of the thermostat.

Did the thermostat open at the proper temperature?

Yes

Go To 3.

No

Replace the thermostat.

Perform **POWERTRAIN VERIFICATION TEST** .

3. **ECT SENSOR OPERATION**

Ignition on, engine not running.

With a scan tool, read the Eng Coolant Tmp Deg value. If the engine was allowed to sit overnight (cold soak), the temperature value should be a sensible value that is somewhere close to the ambient temperature.

NOTE: **If engine coolant temperature is above 82° C (180° F), allow the engine to cool until 65° C (150° F) is reached.**

Start the Engine.

During engine warm-up monitor the Eng Coolant Tmp Deg value. The temp deg value change should be a smooth transition from start up to normal operating temp 82° C (180° F). Also monitor the actual coolant temperature with a thermometer.

NOTE: **As the engine warms up to operating temperature, the actual coolant temperature (thermometer reading) and the scan tools Eng Coolant Tmp Deg value should stay relatively close to each other.**

Is the thermometer reading relatively close to the scan tool ECT reading?

Yes

The conditions that set this DTC are no longer present. Test Complete. Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

No

Replace the Engine Coolant Temperature Sensor.

Perform **POWERTRAIN VERIFICATION TEST** .

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

STANDARD PROCEDURE

PCM/ECM PROGRAMMING - GAS

PCM / TCM FLASH REPROGRAMMING

This procedure will need to be done when one or more of the following situations are true:

1. A vehicle's Powertrain control module (PCM) has been replaced.
2. A diagnostic trouble code (DTC) is set "P1602 - PCM Not Programmed."
3. An updated calibration or software release is available for either the PCM or TCM ECUs.

This procedure assumes that the StarSCAN® and StarMOBILE® devices are configured to your dealership's network with either a wired or wireless connection. The StarSCAN® and StarMOBILE® must also be running at the latest operating system and software release level. For more help on how to network your StarSCAN® or StarMOBILE® reference the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the Download Center.

Table of contents

1. **SECTION 1 - PCM / TCM FLASH PROCEDURE.**
2. **REQUIRED TOOLS/EQUIPMENT:.**
3. **TECH TIPS and INFORMATION:.**
4. **PARTS REQUIRED.**

SECTION 1 - PCM / TCM FLASH PROCEDURE

If using StarSCAN® or StarMOBILE® Desktop Client. Go to **REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client.**

If using StarMOBILE® Standalone Diagnostic Mode. Go To **REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode.**

REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client

NOTE: If this flash process is interrupted or aborted, the flash should be restarted.

1. Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
2. Connect the StarSCAN® or StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.

3. Power on the StarSCAN® or StarMOBILE®. If the StarMOBILE® is being used, launch the StarMOBILE® Desktop Client and connect to the appropriate StarMOBILE® device.
4. Retrieve the old ECU part number. From the tool's Home screen,
 - a. Select "ECU View"
 - b. Select "PCM"
 - c. Select "More Options"
 - d. Select "ECU Flash"
 - e. Record the part number at the top of the Flash PCM screen for later reference.
5. Program the ECU as follows:
 - Using the StarSCAN® / StarMOBILE® at the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the part number recorded in Step 4e, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

- Select "Download to Scantool"
- Once the download is complete, select "Close" and then "Back"
- Highlight the listed calibration, select "Update Controller" and follow the on screen instructions.
- When the PCM update is complete, select "OK"
- Verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: If this flash process is interrupted or aborted, the flash should be restarted.

6. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to complete the process if the ECU has been replaced.
7. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode

NOTE: StarMOBILE® Standalone Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.

NOTE: StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.

1. Power on the StarMOBILE®. Launch the StarMOBILE® Desktop Client and connect to the tool.
2. At the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the current ECU part number, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

3. From the Flash File List, select the appropriate calibration for the PCM and select "Download to Client"
4. Once the download is complete, hit "OK" and then "Manage Files"

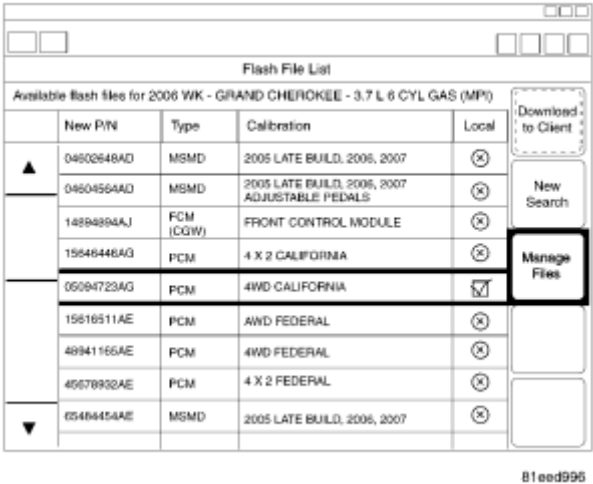


Fig. 1: Identifying StarMOBILE(R) Manage Files Screen (1 Of 2)
Courtesy of CHRYSLER LLC

5. In the Manage Files screen, highlight the downloaded flash file and select "Copy to SM Device". A green checkmark should now appear in the On SM Device column.

Flash File List						View Details	
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						Copy to SM Device	
	Name	Type	Date	On PC	On SM Device	Copy to USB	
▲	04602648AD	PCM	2007-08-20	☒	☐	Delete	
	046040564AD	PCM	2007-09-13	☒	☐	More Options	
	14894894AJ	PCM	2007-09-10	☒	☐		
	15646446AG	PCM	2007-09-13	☒	☐		
	05094723AG	SCCM	2007-09-20	☒	☐		
	15616511AE	SUNR	2007-09-20	☒	☐		
	48941165AE	TCM	2007-08-20	☒	☐		
	45678932AE	TPM	2007-09-20	☒	☐		
▼	65484454AE	TPM	2007-09-05	☒	☐		

Flash File NOT copied to Device

Flash File List						
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						
	Name	Type	Date	On PC	On SM Device	View Details
▲	04602648AD	PCM	2007-08-20	☒	☐	Copy to SM Device
	046040564AD	PCM	2007-09-13	☒	☐	
	14894894AJ	PCM	2007-09-10	☒	☐	Copy to USB
	15646446AG	PCM	2007-09-13	☒	☒	
	05094723AG	SCCM	2007-09-20	☒	☐	Delete
	15616511AE	SUNR	2007-09-20	☒	☐	
	48941165AE	TCM	2007-08-20	☒	☐	More Options
	45678932AE	TPM	2007-09-20	☒	☐	
▼	65484454AE	TPM	2007-09-06	☒	☐	

Flash File copied to Device

81eed99a

Fig. 2: Identifying StarMOBILE(R) Manage Files Screen (2 Of 2)
Courtesy of CHRYSLER LLC

- Exit the StarMOBILE® Desktop Client application.
- Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
- Connect the StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.
- On the StarMOBILE® device, select "Enter Standalone Diagnostic Mode" (use the right function key).

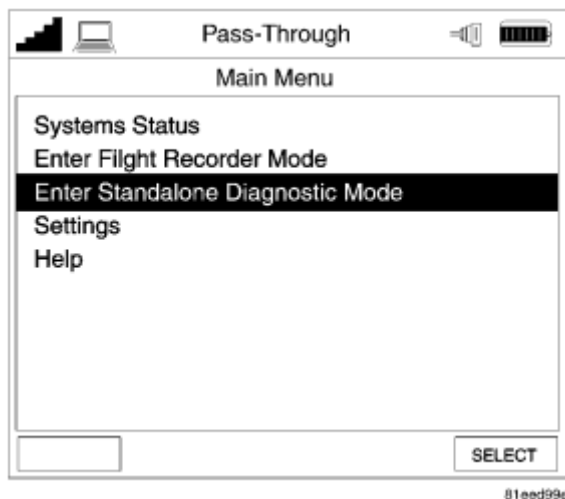
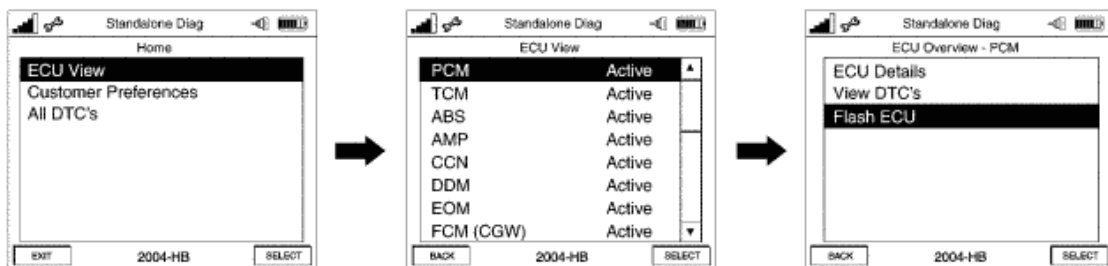


Fig. 3: Identifying StarMOBILE(R) Screen For Enter Standalone Diagnostic Mode
Courtesy of CHRYSLER LLC

NOTE: If a StarMOBILE® Desktop Client is still associated with the device, you will receive the following error: "Your StarMOBILE® device is currently locked by a pc named 'xxxxxxx' on your network. To remove the lock, close its Desktop Client or reboot this device".

10. Program the ECU as follows:

- Select "ECU View"
- Select "PCM"
- Select "Flash ECU"



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Fig. 4: Programming ECU (1 Of 3)
Courtesy of CHRYSLER LLC

- Record the ECU part number at the very top of the screen for later reference.

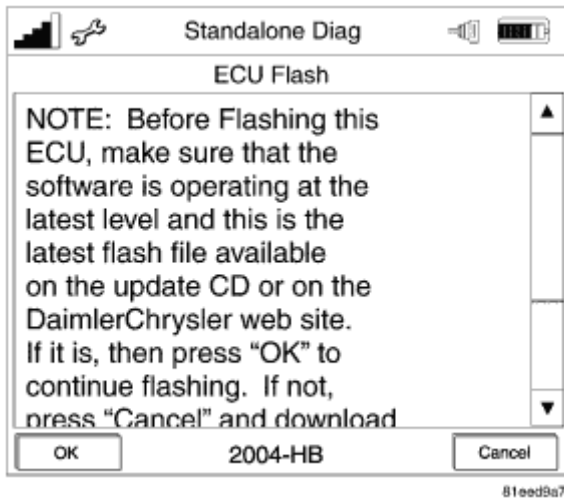


Fig. 5: Programming ECU (2 Of 3)
Courtesy of CHRYSLER LLC

- Highlight the flash file that you want to use. Hit "SELECT" and then "OK". Follow the on screen instructions.

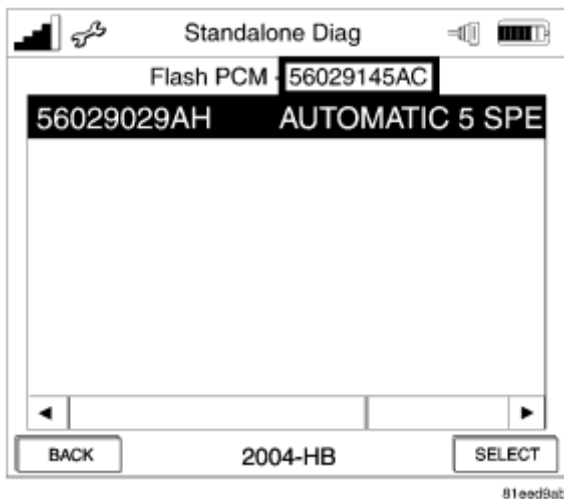


Fig. 6: Programming ECU (3 Of 3)
Courtesy of CHRYSLER LLC

- Once the flash is complete, verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: **If this flash process is interrupted or aborted, the flash should be restarted.**

11. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to complete the process if the ECU has been replaced.
12. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach

near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES

Find the PCM/TCM Type for the vehicle, read and write down the steps, and then go to the step by step instructions for additional information on how to perform these procedures. See STEP-BY-STEP INSTRUCTIONS.

If a NGC3 or NGC4 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Learn ETC - if ETC equipped
3. Check PCM Odometer
4. Check PCM VIN - if NOT WCM equipped
5. Quicklearn - if EATX equipped

If a GPEC PCM was replaced, perform the following additional steps and/or routines:

1. If the vehicle is equipped with a CVT, ensure that the TCM has the latest software calibration available (if the vehicle is not equipped with a CVT, skip to Step 3).
2. PCM Replaced - if WCM equipped
3. Learn ETC
4. Check PCM Odometer
5. Check PCM VIN - if NOT WCM equipped
6. TCM Quicklearn - if EATX equipped

If a CVT TCM was replaced, perform the following additional steps and/or routines:

1. Initialize CVT

If an EGS TCM was replaced, perform the following additional steps and/or routines:

1. Initialize EGS

STEP-BY-STEP INSTRUCTIONS

Check PCM Odometer

From the "Home" screen, select "ECU View".

Select "PCM"

Select "Misc. Functions"

Select "Check PCM Odometer" and follow the on screen instructions.

When complete, select "Finish".

Check PCM VIN

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Check PCM VIN" and follow the on screen instructions.

When complete, select "Finish"

Initialize CVT

From the "Home" screen, select "ECU View"

Select "TCM"

Select "Misc. Functions"

Select "Initialize CVT" and follow the on screen instructions.

When complete, select "Finish"

Initialize EGS

From the "Home" screen, select "ECU View"

Select "TCM"

Select "Misc. Functions"

Select "Initialize EGS" and follow the on screen instructions.

When complete, select "Finish"

Learn ETC

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Learn ETC" and follow the on screen instructions.

When complete, select "Finish"

PCM Replaced

The vehicle pin (Personal Identification Number) will be required to complete the routine. This information may be obtained in three ways:

1. The original selling invoice
2. DealerCONNECT > Parts > Key Codes
3. Contacting the District Manager.

From the "Home" screen, select "ECU View"

Select "WCM"

Select "Misc. Functions"

Select "PCM Replaced" and follow the on screen instructions.

When complete, select "Finish"

Quicklearn

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Quicklearn" and follow the on screen instructions.

When complete, select "Finish"

Update CVT TCM

From the "Home" screen:

Select "ECU View"

Select "TCM"

Select "More Options"

Select "ECU Flash"

Select "Browse for New File" and follow the on screen instructions.

Highlight the appropriate calibration.

Select "Download to Scantool"

Once the download is complete, select "Close" and then "Back"

Highlight the listed calibration, select "Update Controller" and follow the on screen instructions.

When the TCM update is complete, select "OK"

Verify that the part number at the top of the "Flash TCM" screen has updated to the latest level.

SECTION 3 - AUTHORIZED MODIFICATION LABEL

NOTE: The following step is required by law when reprogramming a PCM and/or TCM.

Type the necessary information on the "Authorized Modification Label" and attach near the VECI label.

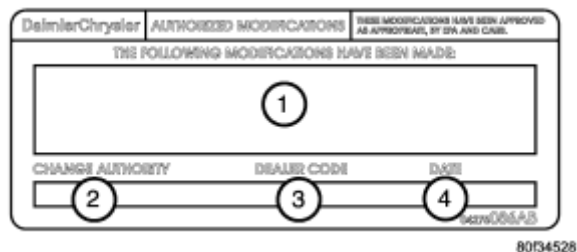


Fig. 7: Authorized Modification Label
Courtesy of CHRYSLER LLC

1. Powertrain Control / Transmission Control Module Part Numbers (Insert P/Ns) Used
2. Change Authority: TSB XX--XX
3. Dealer Code: XXXXX
4. Date: XX-XX-XX

REQUIRED TOOLS/EQUIPMENT:

PART NUMBER	StarSCAN®	PART NUMBER	StarMOBILE®
NPN	Battery Charger	NPN	Battery Charger
CH9401	StarSCAN® Tool Kit	CH9801	StarMOBILE® Tool Kit
CH9404	StarSCAN® Vehicle Cable	CH9804	StarMOBILE® Vehicle Cable
-	-	-	TechCONNECT PC or equivalent

TECH TIPS and INFORMATION:

1. StarMOBILE® Standalone Diagnostic Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.
2. To use the StarMOBILE® in Pass-Through Mode requires that your StarMOBILE® is connected to the dealerships network via a wired or wireless connection. For more information on how to use the StarMOBILE in Pass-Through Mode see the StarMOBILE® training tutorials available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Training Aids' link or at www.dcctools.com, under the 'Training Aids' link.
3. StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.
4. Extreme care must be taken when programming a calibration into a generic PCM. Do not randomly select a calibration. Once a calibration is selected and programmed, the controller cannot be reprogrammed to a different calibration. The ECU can only be reprogrammed to a more recent version of that calibration.
5. If the flash process is interrupted or aborted, the flash should be restarted.
6. Due to the PCM / TCM programming procedure, a DTC may be set in other ECUs within the vehicle. Some DTCs may cause the MIL to illuminate. From the "Home" screen select "System View". Then select "All DTCs". Press "Clear All Stored DTCs" if there are any DTCs shown on the list.

7. When replacing a GPEC PCM for a vehicle that is equipped with a CVT, it is extremely important that the PCM and TCM both have the latest software calibrations.
8. Do not allow the battery charger to time out or the charging rate to climb above 13.5 volts during the flash process.
9. The StarSCAN® and StarMOBILE® diagnostic tools fully support Internet connectivity and must be configured for your dealership's network. For help on setting up your StarSCAN® / StarMOBILE® for the dealership's network, refer to the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.
10. The operating software in the StarSCAN® and StarMOBILE® must be programmed with the latest software release level. The software level is visible in the blue header at the top of the StarSCAN® and StarMOBILE® Desktop Client screens. For instructions on how to update your scan tool, refer to the StarSCAN® / StarMOBILE® Software Update guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.

PARTS REQUIRED

Qty	Part Number	DESCRIPTION
1	04275086AB	Label, Authorized Modification

POWERTRAIN VERIFICATION TEST

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Diagnostic Test

1. SELECTING THE PROPER VERIFICATION TEST

The following verification test are for different repairs. Select the appropriate Verification test for the repair that has been completed.

Speed Control repair

Go To step 2.

Charging System repair

Go To step 3.

EVAP System repair

Go To step 4.

All other repairs

Go To step 5.

2. POWERTRAIN VERIFICATION TEST 1

- NOTE:** 1. If this vehicle is equipped with an Electronic Throttle Control system, and the APP Sensors, PCM, or Throttle Body Assembly have been replaced, use the scan tool to perform the ETC RELEARN function.
- NOTE:** 2. After completing the Powertrain Verification Test the Transmission Verification Test must be performed.
- NOTE:** 3. If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will set in the ABS Module, Airbag Module and the SKIM/SKREEM.
- NOTE:** 4. If the vehicle is equipped with a Sentry Key Remote Entry, Secret Key data must be updated. Refer to the Service Information for the PCM, SENTRY KEY REMOTE ENTRY MODULE and TRANSPONDER KEY for programming information. Using the scan tool, program the Secret Key information into the PCM using the PCM replaced function under the WCM menu.

5. Inspect the vehicle to make sure that all engine components are properly installed and connected.
6. Connect the scan tool to the data link connector and erase all codes.
7. Turn the speed control ON (if equipped, cruise light will be on).
8. Depress and release the SET Switch when the vehicle speed is greater than 56 km/h (35 mph). The speed control should engage and hold the selected speed.
9. Press and hold the RESUME/ACCEL Switch. The vehicle speed should increase by at least 3 km/h (2 mph).
10. Press and hold the COAST switch. The vehicle speed should decrease.
11. Using caution, press and release the brake pedal. The speed control should disengage.
12. Bring the vehicle speed back up to 56 km/h (35 mph).
13. Press the RESUME/ACCEL switch. The speed control should resume the previously set speed.
14. Hold down the SET switch. The vehicle should decelerate.
15. Make sure vehicle speed is greater than 56 km/h (35 mph) and release the SET Switch. The vehicle should adjust and set a new vehicle speed.

16. Press and release the CANCEL switch. The speed control should disengage.
17. Bring the vehicle speed back up above 56 km/h (35 mph) and engage speed control.
18. Turn the Speed Control Off. (Cruise light will be off). The speed control should disengage.

NOTE: OVERSHOOT/UNDERSHOOT FOLLOWING SPEED CONTROL SET.

19. If the vehicle operator repeatedly presses and releases the SET button with their foot off of the accelerator (referred to as "lift foot set"), the vehicle may accelerate and exceed the desired set speed by up to 8 km/h (5 mph).
20. It may also decelerate to less than the desired set speed, before finally achieving the desired set speed.
21. The Speed Control System has an adaptive strategy that compensates for vehicle-to-vehicle variations in speed control cable lengths.
22. When the speed control is set with the vehicles operators foot off of the accelerator pedal, the speed control thinks there is excessive speed control cable slack and adapts accordingly.
23. If the "lift foot sets" are continually used, a speed control overshoot/undershoot condition will develop.
24. To "unlearn" the overshoot/undershoot condition, the vehicle operator has to press and release the set button while maintaining the desired set speed using the accelerator pedal (not decelerating or accelerating).
25. Then turn the cruise control switch to the OFF position (or press the CANCEL button if equipped) after waiting 10 seconds.
26. This procedure must be performed approximately 10-15 times to completely unlearn the overshoot/undershoot condition.

Did the Speed Control pass the above test?

Yes

Repair is complete.

No

Check for any related Technical Service Bulletins and/or refer to the appropriate Diagnostic Procedure.

3. POWERTRAIN VERIFICATION TEST 2

1. If this vehicle is equipped with an Electronic Throttle Control system, and the APP Sensors, PCM, or Throttle Body Assembly has been replaced use a scan tool to perform the ETC RELEARN function.

- NOTE:** 2. After completing the Powertrain Verification Test the Transmission Verification Test must be performed.
- NOTE:** 3. If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will set in the ABS Module, Airbag Module and the SKIM/SKREEM.
- NOTE:** 4. If the vehicle is equipped with a Sentry Key Remote Entry, Secret Key data must be updated. Refer to the Service Information for the PCM, SENTRY KEY REMOTE ENTRY MODULE and TRANSPONDER KEY for programming information. Using the scan tool, program the Secret Key information into the PCM using the PCM replaced function under the WCM menu.

5. Inspect the vehicle to make sure that all components related to the repair are properly installed and connected.
6. With the scan tool, clear DTCs.
7. Perform generator output test. Refer to the appropriate service information as necessary.
8. Start the engine and set engine speed to 2000 RPM for at least thirty seconds.
9. Cycle the ignition key off and on.
10. With the scan tool, read the DTCs.

Are any DTCs or symptoms remaining?

Yes

Check for any Technical Service Bulletins and/or refer to the appropriate Diagnostic Procedure.

No

Repair is complete.

4. POWERTRAIN VERIFICATION TEST 3

1. Install the Miller Tool #8404 Evaporative Emission Leak Detector (EELD) according to the instructions in the previous DTC table.
2. Set the smoke/air control switch to AIR.
3. Insert the tester's AIR supply tip (clear hose) into the appropriate calibration orifice on the tester's control panel (based on DTC leak size).

4. Press the remote smoke/air start button.
5. Position the red flag on the air flow meter so it is aligned with the indicator ball.
6. When the calibration is complete, release the remote button. The EELD flow meter is now calibrated in liters per minute to the size of leak indicated by the DTC set in the PCM.
7. Install the service port adapter #8404-14 on the vehicle's service port.
8. Connect the Air supply hose from the EELD to the vehicle.
9. Press the remote button to activate AIR flow.

NOTE: **10. Larger volume fuel tanks, lower fuel levels or if the vehicle is equipped with a Flow Management Valve may indicate high flow and will require 4 to 5 minutes to fill.**

11. Compare the flow meter indicator ball reading to the red flag.
12. ABOVE the red flag indicates a leak present.
13. BELOW the red flag indicates a sealed system.

NOTE: **If this vehicle is equipped with an Electronic Throttle Control system, and the APP Sensors, PCM, or Throttle Body Assembly have been replaced, use the scan tool to perform the ETC RELEARN function.**

14. If the indicator ball shows a leak present, perform the smoke test indicated in the previous test and identify the leak and repair. Perform this verification test when the repair is complete.

Did the indicator ball indicate the a leak is present?

Yes

Repeat the DTC test to identify the leak and repair.

No

Repair is complete.

5. POWERTRAIN VERIFICATION TEST 4

NOTE: **After completing the Powertrain Verification Test the Transmission Verification Test must be performed.**

NOTE: **If the PCM has been replaced and the correct VIN and mileage have not been programmed, a DTC will set in the ABS Module, Airbag**

1.

1. **Module and the SKIM/SKREEM.**

NOTE: If the vehicle is equipped with a Sentry Key Remote Entry, Secret Key data must be updated. Refer to the Service Information for the PCM, SENTRY KEY REMOTE ENTRY MODULE and TRANSPONDER KEY for programming information. Using the scan tool, program the Secret Key information into the PCM using the PCM replaced function under the WCM menu.

2.

NOTE: If this vehicle is equipped with an Electronic Throttle Control system, and the APP Sensors, PCM, or Throttle Body Assembly have been replaced, use the scan tool to perform the ETC RELEARN function.

3.

NOTE: When replacing an O2 Sensor, the PCM RAM memory must be cleared, either by disconnecting the PCM C1 connector or momentarily disconnecting the Battery negative terminal.

4.

5.

6. The NGC learns the characteristics of each O2 heater element and these old values should be cleared when installing a new O2 sensor. The customer may experience driveability issues if this is not performed.
7. Inspect the vehicle to make sure that all engine components are properly installed and connected. Reassemble and reconnect components as necessary.
8. Connect the scan tool to the data link connector.
9. Make sure the fuel tank has at least a quarter tank of fuel. Turn off all accessories.
10. If the Catalyst was replaced, with the scan tool go to the Miscellaneous Menu Option "Catalyst Replaced" and press enter.
11. If a Comprehensive Component DTC was repaired, perform steps 12 - 14. If a Major OBDII Monitor DTC was repaired skip those steps and continue verification.
12. After the ignition has been off for at least 10 seconds, restart the vehicle and run 2 minutes.
13. With the scan tool, monitor the appropriate pre-test enabling conditions until all conditions have been met. Once the conditions have been met, switch screen to the appropriate OBDII monitor, (Audible beeps when the monitor is running).
14. If the repaired OBDII trouble code has reset or was seen in the monitor while on the road test, the repair is not complete. Check for any related technical service bulletins or flash updates and return to Engine Electrical Diagnostic List.
15. If the conditions cannot be duplicated, erase all DTCs with the Scan tool.
16. If another DTC has set, return to the Engine Electrical Diagnostic List and follow the path specified for that DTC.

Did the OBDII Monitor run successfully and has the Good Trip Counter changed to one or more?

Yes

Repair is complete.

No

Check for any related Technical Service Bulletins and/or refer to the appropriate Diagnostic Procedure.

2008 RESTRAINTS

Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1B00</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT LOW
<u>B1B01</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT HIGH
<u>B1B02</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT OPEN
<u>B1B03</u>	DRIVER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B04</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT LOW
<u>B1B05</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT HIGH
<u>B1B06</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT OPEN
<u>B1B07</u>	DRIVER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER
<u>B1B08</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT LOW
<u>B1B09</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT HIGH
<u>B1B0A</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT OPEN
<u>B1B0B</u>	PASSENGER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B0C</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT LOW
<u>B1B0D</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT HIGH
<u>B1B0E</u>	PASSENGER AIRBAG SQUIB 2 CIRCUIT OPEN
<u>B1B0F</u>	PASSENGER AIRBAG SQUIB 2 CIRCUITS SHORTED TOGETHER
<u>B1B18</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT LOW
<u>B1B19</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH
<u>B1B1A</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN
<u>B1B1B</u>	LEFT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B20</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT LOW
<u>B1B21</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH
<u>B1B22</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN
<u>B1B23</u>	RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER
<u>B1B54</u>	1ST ROW PASSENGER SEAT BELT SENSOR CIRCUIT LOW
<u>B1B55</u>	1st ROW PASSENGER SEAT BELT SENSOR CIRCUIT HIGH
<u>B1B70</u>	UP-FRONT LEFT SATELLITE ACCELERATION SENSOR INTERNAL
<u>B1B71</u>	UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR INTERNAL
<u>B1B72</u>	LEFT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL
<u>B1B73</u>	LEFT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL
<u>B1B75</u>	RIGHT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL
<u>B1B76</u>	RIGHT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL
<u>B1B78</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT PERFORMANCE
<u>B1B79</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT

	LOW
<u>B1B7A</u>	PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH
<u>B1B7D</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT PERFORMANCE
<u>B1B7E</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW
<u>B1B7F</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH
<u>B1B82</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR PERFORMANCE
<u>B1B83</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW
<u>B1B84</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH
<u>B1B87</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR PERFORMANCE
<u>B1B88</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW
<u>B1B89</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH
<u>B1B8D</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT LOW
<u>B1B8E</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH
<u>B1B8F</u>	DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN
<u>B1B93</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT LOW
<u>B1B94</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH
<u>B1B95</u>	PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN
<u>B1B97</u>	PASSENGER SEAT TRACK POSITION SENSOR CONFIGURATION MISMATCH
<u>B1BA5</u>	AIRBAG SQUIB CONFIGURATION MISMATCH
<u>B1BA6</u>	OCCUPANT CLASSIFICATION UNDETERMINED
<u>B1BA7</u>	OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED
<u>B1BA8</u>	OCM SYSTEM OUT OF CALIBRATION/NOT CALIBRATED
<u>B1BAA</u>	OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH
<u>B1BBA</u>	PASSENGER SEAT WEIGHT SENSOR SUPPLY CIRCUIT
<u>B1BBB</u>	PASSENGER SEAT WEIGHT SENSOR INPUTS SHORTED TOGETHER
<u>B1BBC</u>	OCS NEGATIVE SYSTEM WEIGHT
<u>B1BBD</u>	OCM CURRENT CONFIGURATION TABLE UNPROGRAMMED
<u>B1BC7</u>	DEPLOYMENT DATA RECORD FULL
<u>B1BCF</u>	ROLL OVER SENSOR
<u>B1C23</u>	PASSENGER SEAT WEIGHT 3 - LEFT FRONT CONFIGURATION MISMATCH
<u>B1C24</u>	PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT CONFIGURATION MISMATCH
<u>B1C25</u>	PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR CONFIGURATION MISMATCH
<u>B1C26</u>	PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR CONFIGURATION MISMATCH

<u>B1C38</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT LOW
<u>B1C39</u>	1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT HIGH
<u>B1C3A</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT OPEN
<u>B1C3B</u>	1st ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C3D</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW
<u>B1C3E</u>	1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT HIGH
<u>B1C3F</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN
<u>B1C40</u>	1st ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C47</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT LOW
<u>B1C48</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT HIGH
<u>B1C49</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT OPEN
<u>B1C4A</u>	1st ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B1C4C</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW
<u>B1C4D</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT HIGH
<u>B1C4E</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN
<u>B1C4F</u>	1st ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT SHORTED TOGETHER
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B212C</u>	IGNITION RUN/START INPUT CIRCUIT OPEN
<u>B212D</u>	IGNITION RUN ONLY INPUT CIRCUIT OPEN
<u>B2206</u>	CURRENT VIN MISSING / MISMATCH
<u>B2207</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 1
<u>B2208</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 2
<u>B2209</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 3
<u>B220A</u>	OCCUPANT RESTRAINT CONTROLLER INTERNAL 4
<u>B220B</u>	OCCUPANT RESTRAINT CONTROLLER FIRING STORED ENERGY
<u>B220C</u>	OCCUPANT RESTRAINT CONTROLLER ACCELEROMETER 1 INTERNAL
<u>B2212</u>	OCCUPANT CLASSIFICATION MODULE INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B223B</u>	VEHICLE CONFIGURATION MISMATCH
<u>B223D</u>	OCCUPANT CLASSIFICATION MODULE DTC PRESENT
<u>B2255</u>	OCCUPANT RESTRAINT CONTROLLER ROLL OVER FEATURE DISABLE
<u>U0002</u>	CAN C BUS OFF PERFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER

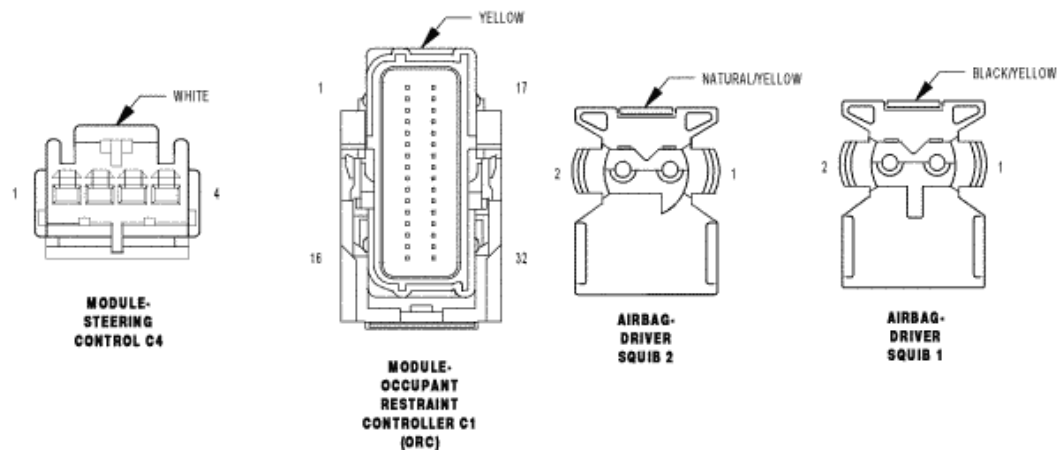
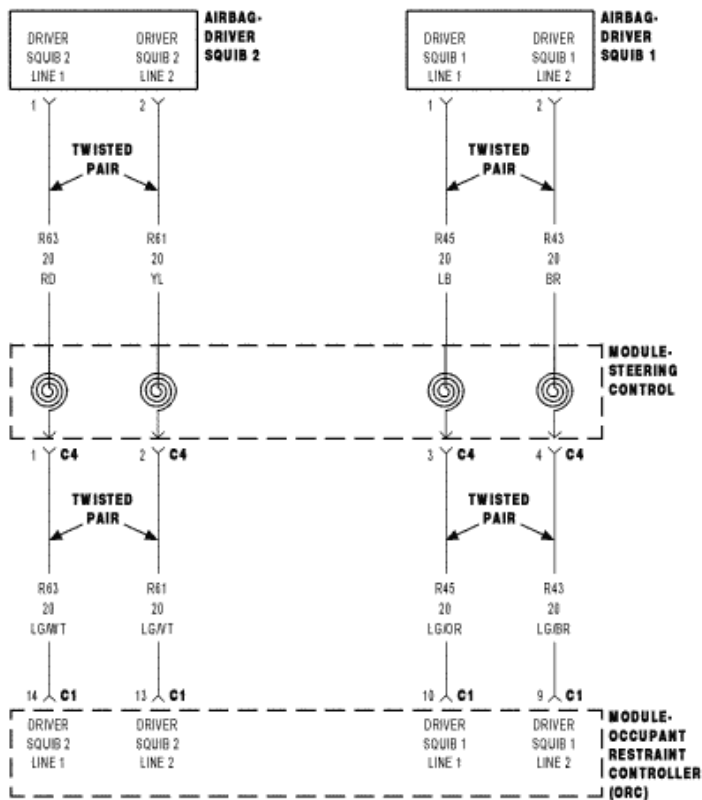
	(ORC)
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0170</u>	LOST COMMUNICATION W/UP-FRONT LEFT SATELLITE ACCELERATION SENSOR
<u>U0171</u>	LOST COMMUNICATION W/UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR
<u>U0172</u>	LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 1
<u>U0173</u>	LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 2
<u>U0175</u>	COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 1
<u>U0176</u>	LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 2
<u>U1414</u>	IMPLAUSIBLE/MISSING ECU NETWORK CONFIGURATION DATA
<u>U1415</u>	IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA
<u>U1419</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 3 - LEFT FRONT
<u>U141A</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 2 - RIGHT FRONT
<u>U141B</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 4 - LEFT REAR
<u>U141C</u>	IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 1 - RIGHT REAR

2008 RESTRAINTS

Electrical Diagnostics - Liberty

B1B00-DRIVER AIRBAG SQUIB 1 CIRCUIT LOW

CIRCUIT SCHEMATIC



0195 1501

Fig. 1: Driver Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 1 circuits. The ORC will set this DTC if it detects low resistance on the Driver Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R43) DRIVER SQUIB 1 LINE 2 CIRCUIT SHORTED TO GROUND
(R45) DRIVER SQUIB 1 LINE 1 CIRCUIT SHORTED TO GROUND
STEERING CONTROL MODULE
DRIVER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

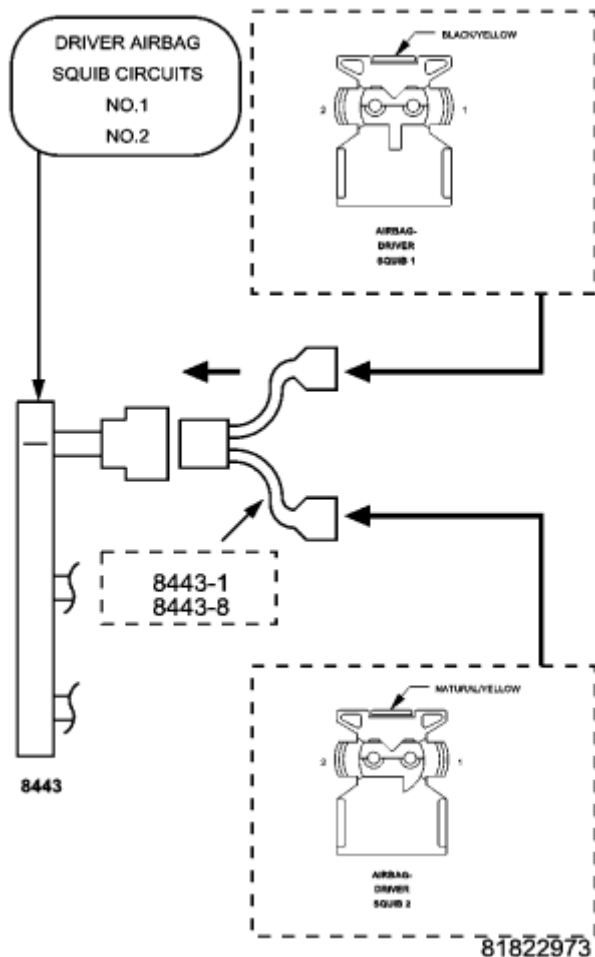


Fig. 2: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B00-DRIVER AIRBAG SQUIB 1 CIRCUIT LOW?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TO GROUND

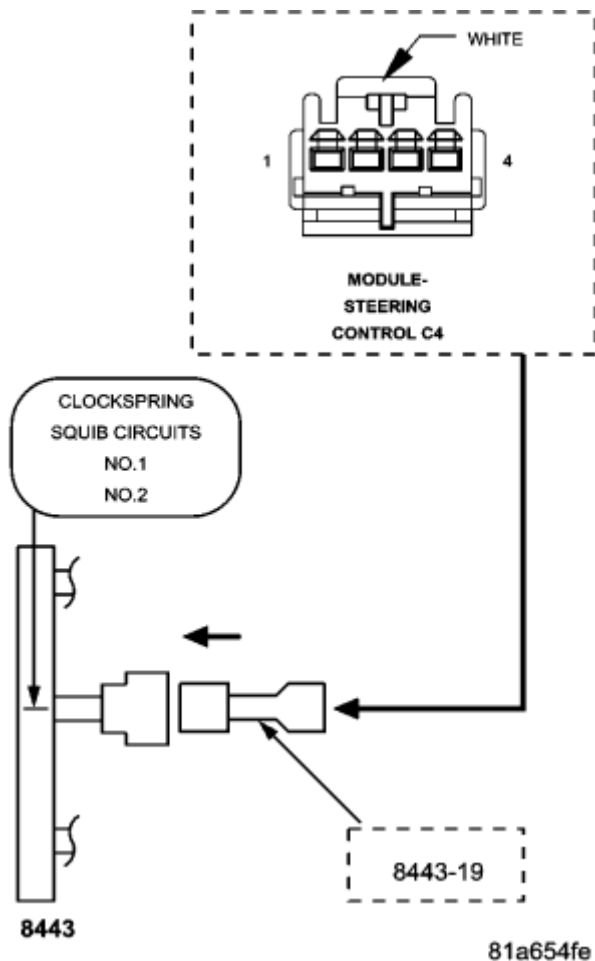


Fig. 3: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Fig. 4: Measuring Resistance Of The (R43/45) Driver Squib 1 Line 2/1 Circuit Between 8443-32-R

Adapter Cavity C1-9/10 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module C4 connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R43) Driver Squib 1 Line 2 circuit between the 8443-32-R Adapter cavity C1-9 and ground.

Measure the resistance of the (R45) Driver Squib 1 Line 1 circuit between 8443-32-R Adapter cavity C1-10 ground.

Is the resistance below 10k ohms for either measurement?

Yes

Repair the Driver Squib 1 circuits with resistance below 10k ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes.

Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B01-DRIVER AIRBAG SQUIB 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC

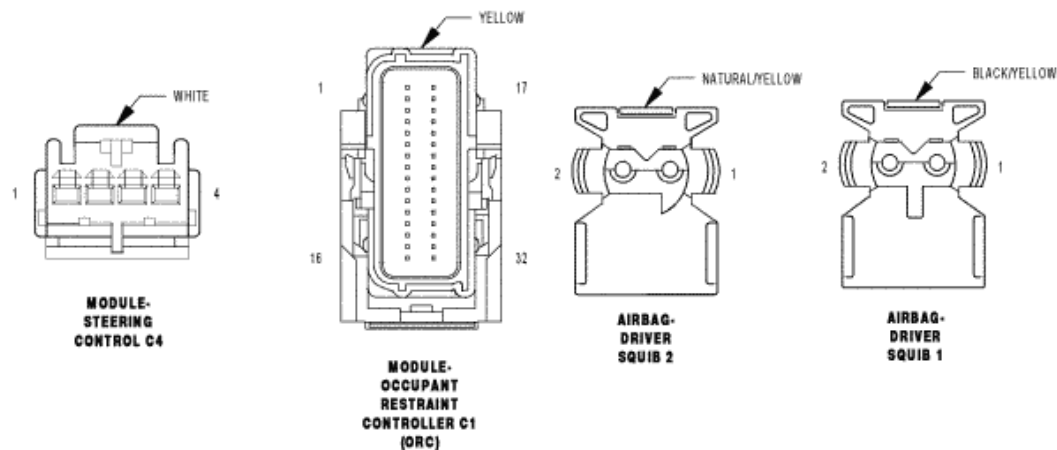
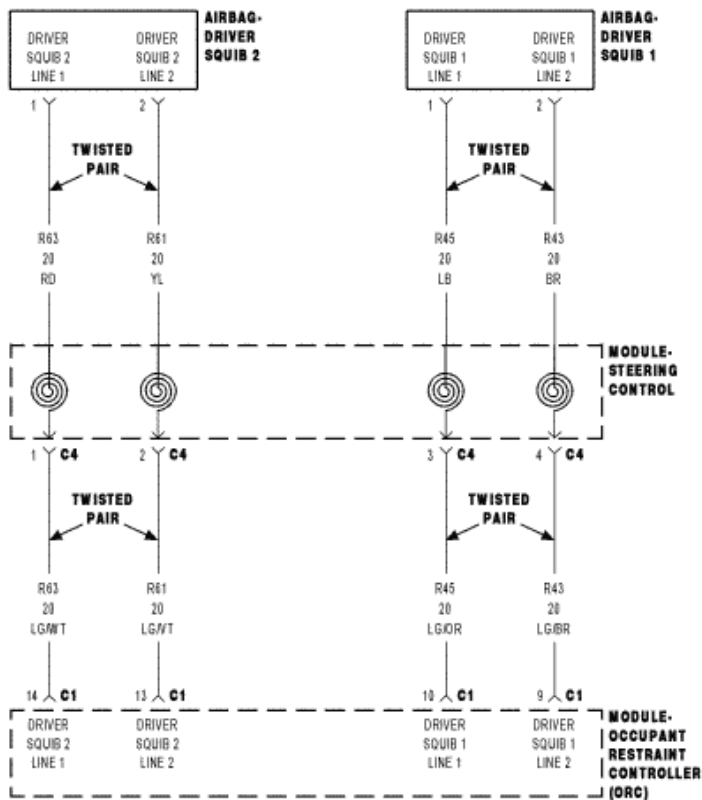


Fig. 5: Driver Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the voltage on the Driver Squib 1 circuits. The ORC will set this DTC if it detects voltage on the Driver Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R43) DRIVER SQUIB 1 LINE 2 CIRCUIT SHORTED TO BATTERY (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT SHORTED TO BATTERY STEERING CONTROL MODULE (SCM) DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

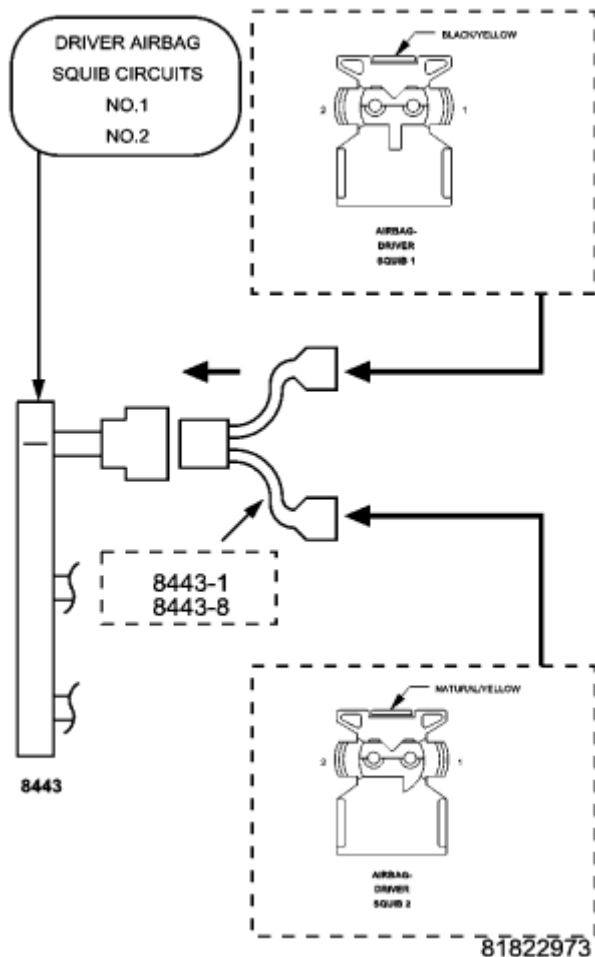


Fig. 6: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B01-DRIVER AIRBAG SQUIB 1 CIRCUIT HIGH?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TO BATTERY

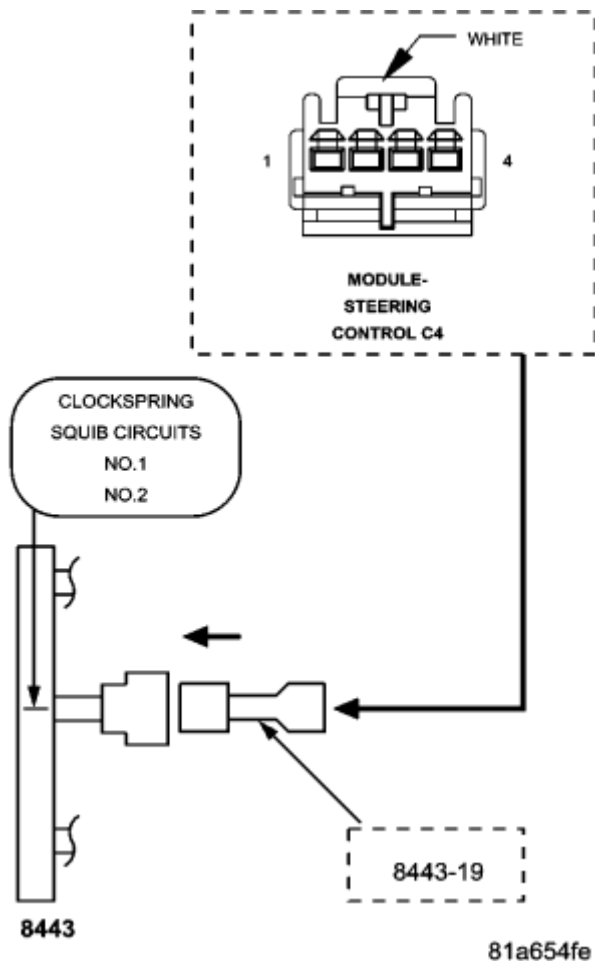


Fig. 7: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B01-DRIVER AIRBAG SQUIB 1 CIRCUIT HIGH?

Yes

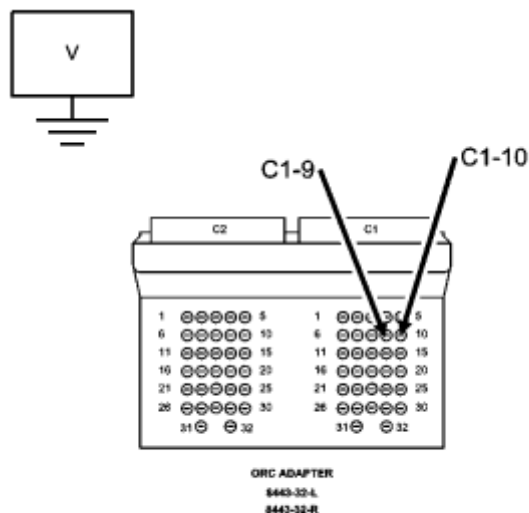
Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. **CHECK (R43) DRIVER SQUIB 1 LINE 2 CIRCUIT AND (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT FOR A SHORT TO BATTERY**



819b33fd

Fig. 8: Measuring Voltage Of (R43) Driver Squib 1 Line 2/1 Circuit Between 8443-32-R Adapter

Cavity C1-9/10 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module C4 connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R43) Driver Squib 1 Line 2 circuit between the 8443-32-R Adapter cavity C1-9 and ground.

Measure the voltage of the (R45) Driver Squib 1 Line 1 circuit between the 8443-32-R Adapter cavity C1-10 and ground.

Is there any voltage present for either measurement?

Yes

Repair the Driver Squib 1 circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

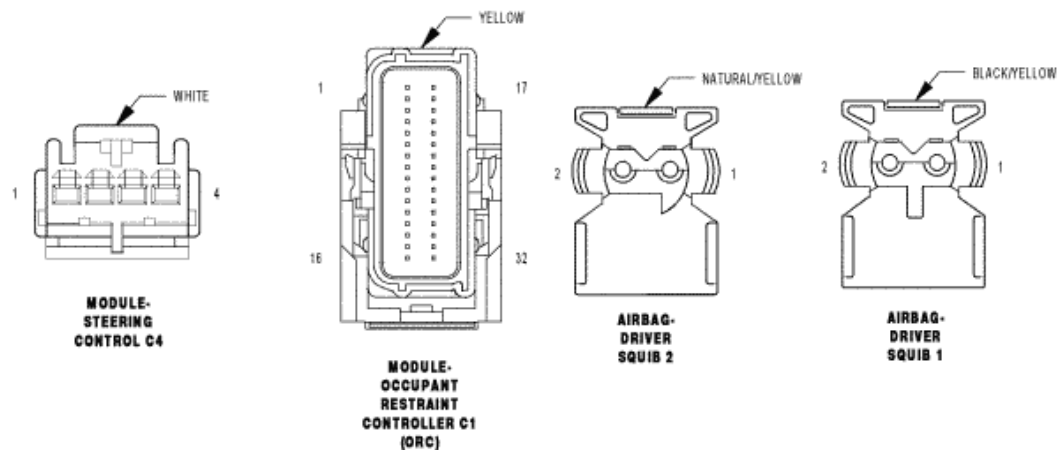
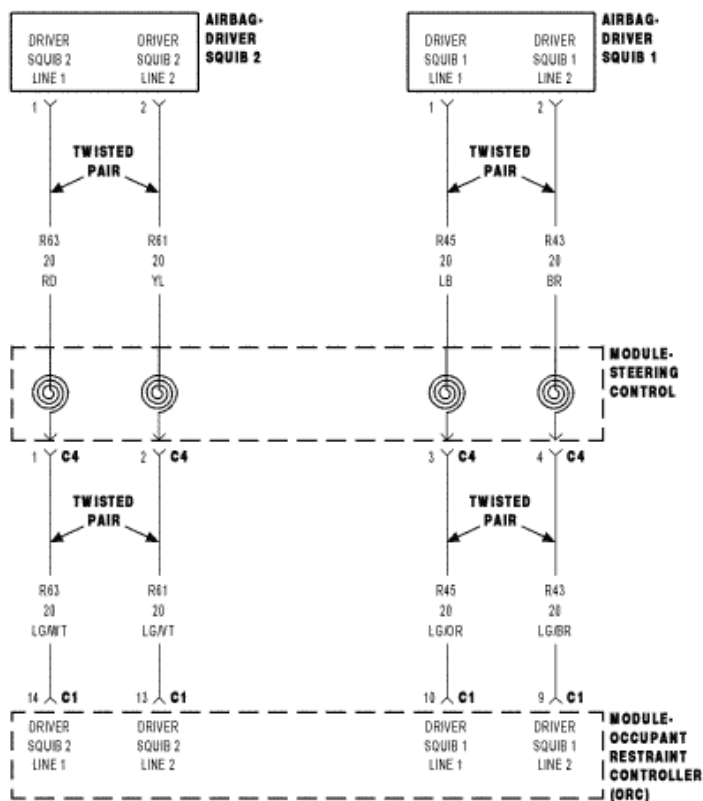
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B02-DRIVER AIRBAG SQUIB 1 CIRCUIT OPEN

CIRCUIT SCHEMATIC



0198 1501

Fig. 9: Driver Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 1 circuits. The ORC will set this DTC if it detects an open or high resistance on the Driver Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R43) DRIVER SQUIB 1 LINE 2 CIRCUIT OPEN (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT OPEN STEERING CONTROL MODULE DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 6.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN DRIVER AIRBAG**

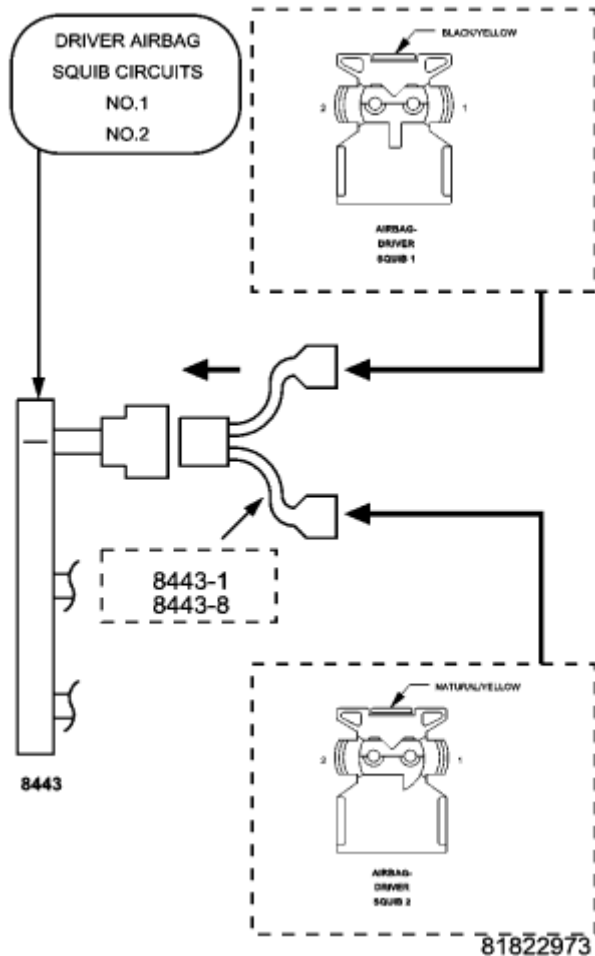


Fig. 10: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B02-DRIVER AIRBAG SQUIB 1 CIRCUIT OPEN?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR AN OPEN

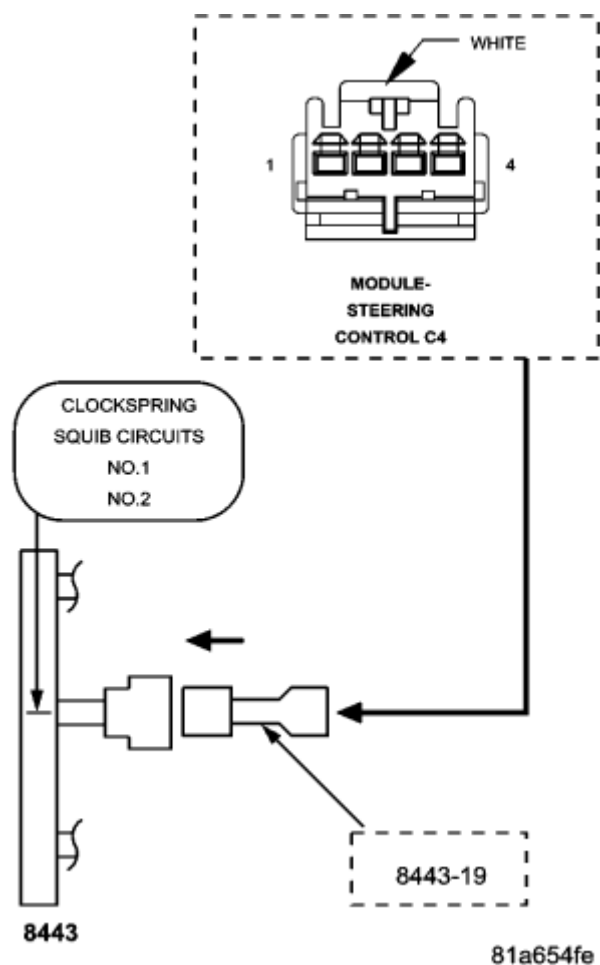


Fig. 11: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: **Check connectors - Clean and repair as necessary.**

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B02-DRIVER AIRBAG SQUIB 1 CIRCUIT OPEN?

Yes

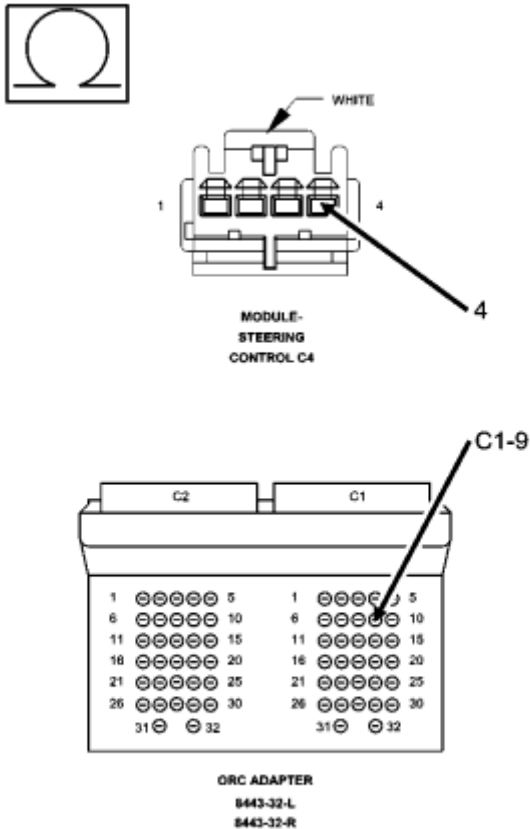
Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. **CHECK (R43) DRIVER SQUIB 1 LINE 2 CIRCUIT FOR AN OPEN**



81a79d5d

Fig. 12: Measuring Resistance Of (R43) Driver Squib 1 Line 2 Circuit Between Steering Control Module C4 Connector Cavity 4 And The 8443-32-R ORC Adapter Cavity C1-9
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module C4 connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R43) Driver Squib 1 Line 2 circuit between the Steering Control Module

C4 connector cavity 4 and the 8443-32-R ORC Adapter cavity C1-9.

Is the resistance below 1.0 ohm?

Yes

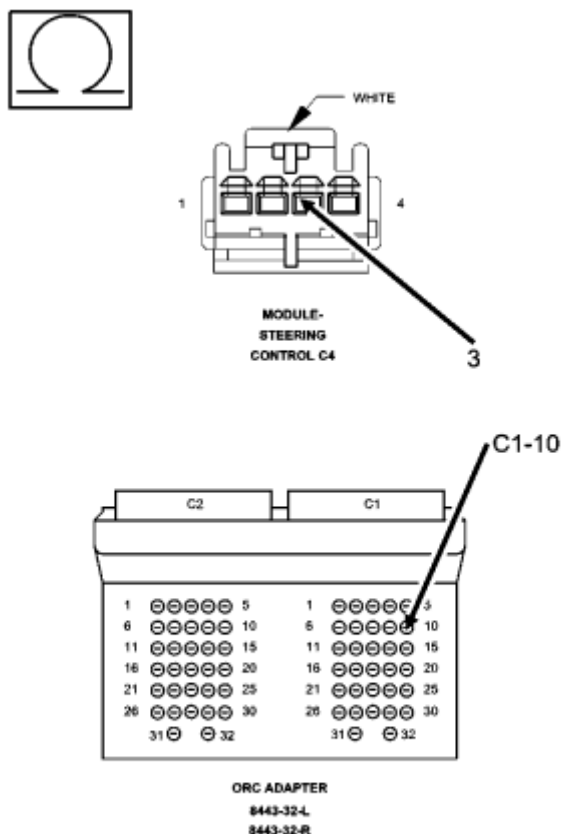
Go To 5.

No

Repair the R43 Driver Squib 1 Line 2 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECK (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT FOR AN OPEN



81a79d79

Fig. 13: Measuring Resistance Of (R45) Driver Squib 1 Line 1 Circuit Between Steering Control Module C4 Connector And 8443-32-R ORC Adapter Cavity C1-10
Courtesy of CHRYSLER LLC

Measure the resistance of the (R45) Driver Squib 1 Line 1 circuit between the Steering Control Module C4 connector and the 8443-32-R ORC Adapter cavity C1-10.

Is the resistance below 1.0 ohm?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Replace the ORC in accordance with Service Information.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1.

No

Repair the (R45) Driver Squib 1 Line 1 circuit for an open.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1.

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

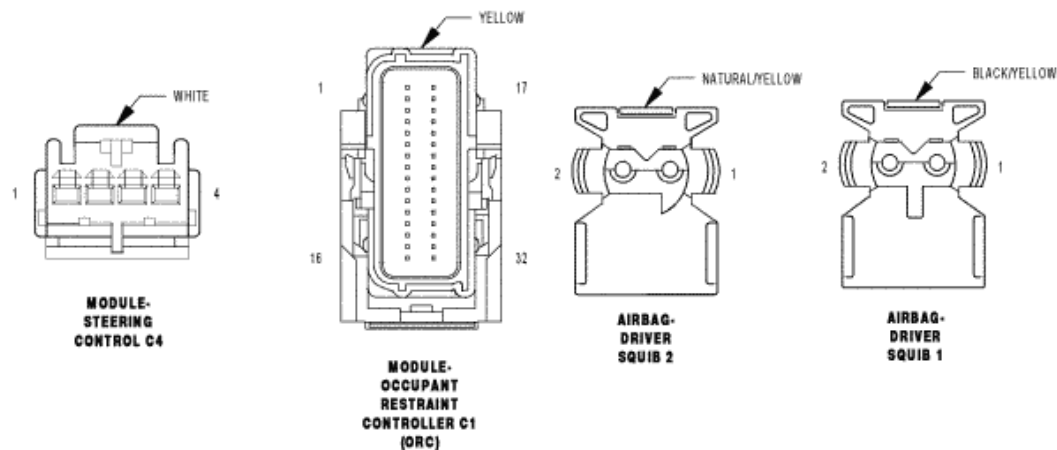
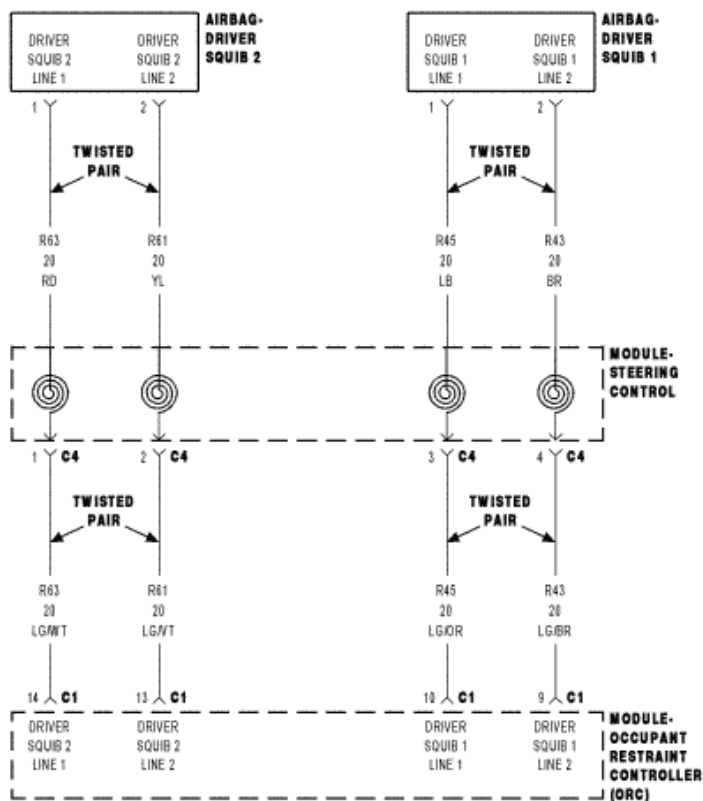
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B03-DRIVER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER

CIRCUIT SCHEMATIC



0195 1501

Fig. 14: Driver Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 1 circuits. The ORC will set this DTC if it detects low resistance between the Driver Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R43) DRIVER SQUIB 1 LINE 2 CIRCUIT SHORTED TO (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT STEERING CONTROL MODULE (SCM) DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

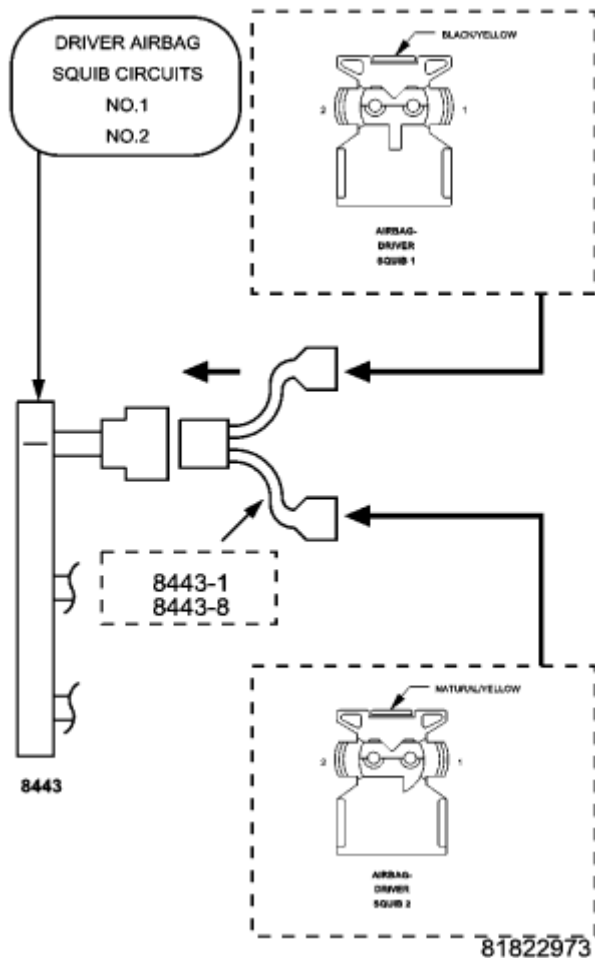


Fig. 15: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

Disconnect the Driver Airbag Squib connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B03-DRIVER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK STEERING CONTROL MODULE C4 (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TOGETHER

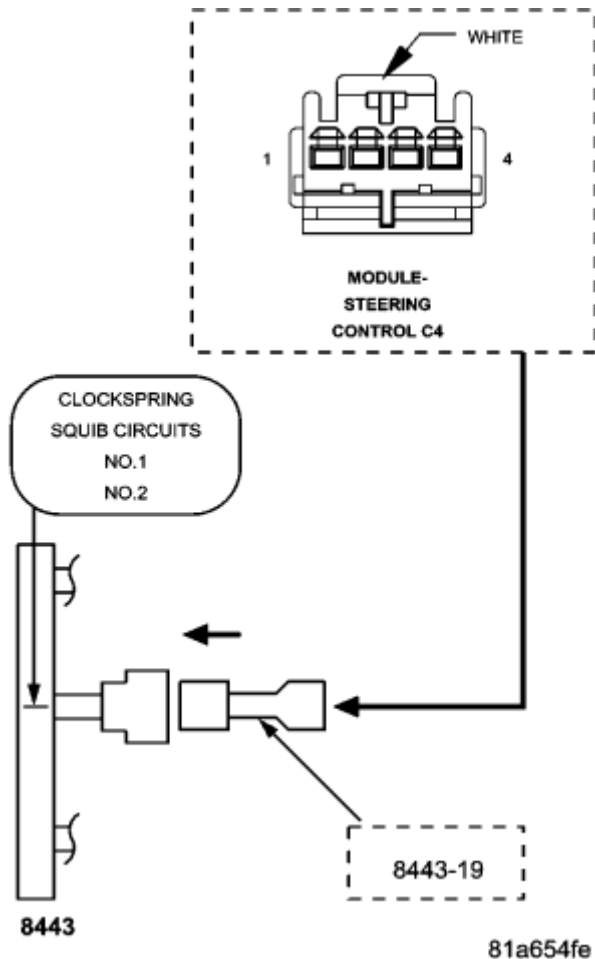


Fig. 16: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the

battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B03-DRIVER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER?

Yes

Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. CHECK (R43) DRIVER SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO (R45) DRIVER SQUIB 1 LINE 1 CIRCUIT

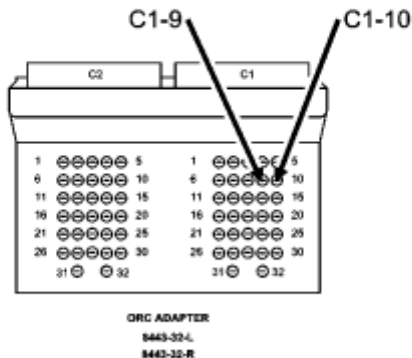


Fig. 17: Measuring Resistance Between (R43) Driver Squib 1 Line 2 Circuit And (R45) Driver Squib 1 Line 1 Circuit At ORC 8443-32-R Adapter Cavities C1-9 And C1-10

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R43) Driver Squib 1 Line 2 circuit and the (R45) Driver Squib 1 Line 1 circuit at the ORC 8443-32-R Adapter cavities C1-9 and C1-10.

Is the resistance below 10k ohms?

Yes

Repair the (R43) Driver Squib 1 Line 2 circuit for a short to the (R45) Driver Squib 1 Line 1 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system

diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

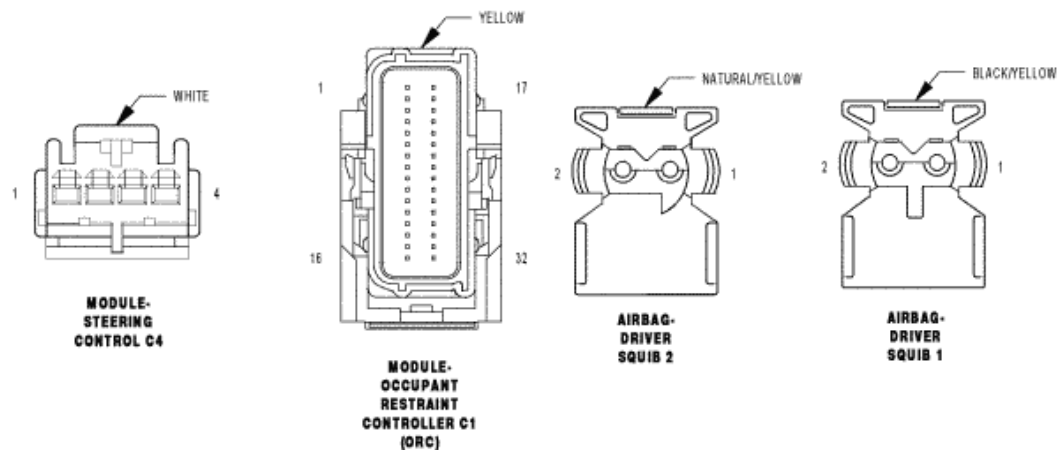
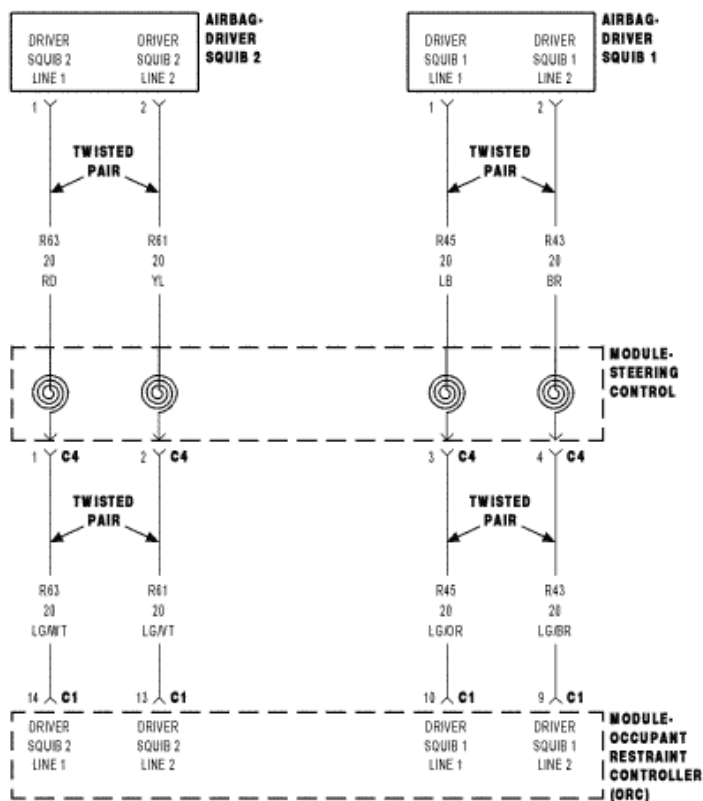
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B04-DRIVER AIRBAG SQUIB 2 CIRCUIT LOW

CIRCUIT SCHEMATIC



0198 1501

Fig. 18: Driver Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 2 circuits. The ORC will set this DTC if it detects low resistance on the Driver Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R63) DRIVER SQUIB 2 LINE 1 CIRCUIT OR (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT SHORTED TO GROUND STEERING CONTROL MODULE (SCM) DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

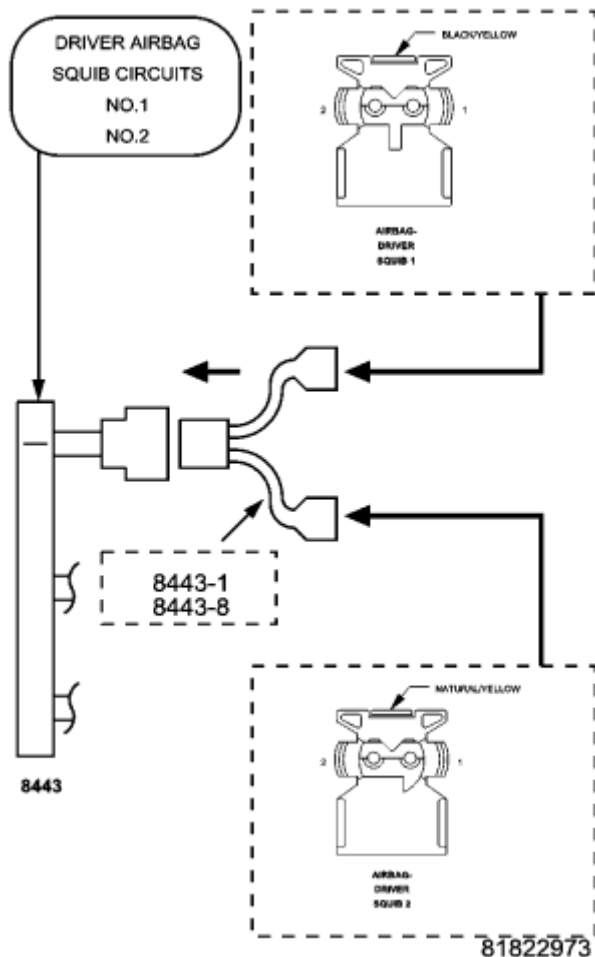


Fig. 19: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B04-DRIVER AIRBAG SQUIB 2 CIRCUIT LOW?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TO GROUND

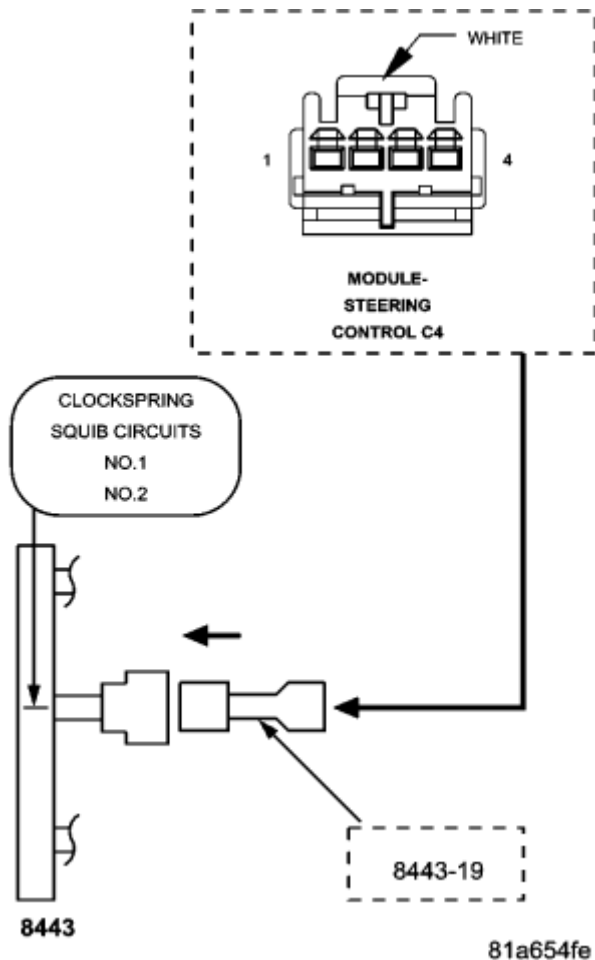


Fig. 20: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B04-DRIVER AIRBAG SQUIB 2 CIRCUIT LOW?

Yes

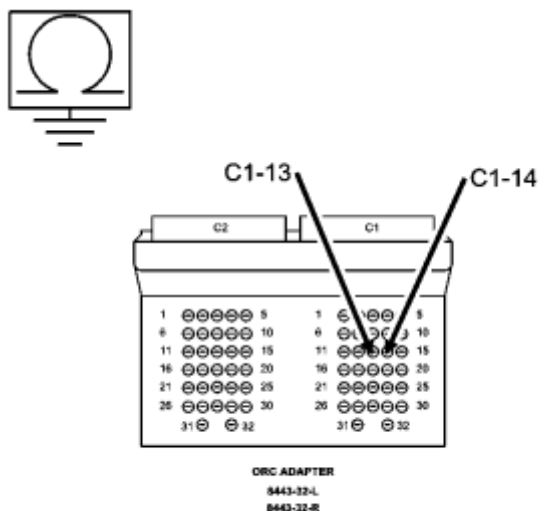
Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. **CHECK (R63) DRIVER SQUIB 2 LINE 1 CIRCUIT AND (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT FOR A SHORT TO GROUND**



819b2193

Fig. 21: Measuring Resistance Of (R63/61) Driver Squib 2 Line 1 Circuit Between Ground And

ORC 8443-32-R Adapter Cavity C1-14/13

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module C4 connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R63) Driver Squib 2 Line 1 circuit between ground and the ORC 8443-32-R Adapter cavity C1-14.

Measure the resistance of the (R61) Driver Squib 2 Line 2 circuit between ground and the ORC 8443-32-R Adapter cavity C1-13.

Is the resistance below 10k ohms for either measurement?

Yes

Repair the Driver Squib 2 circuits with resistance below 10k ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes.

Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

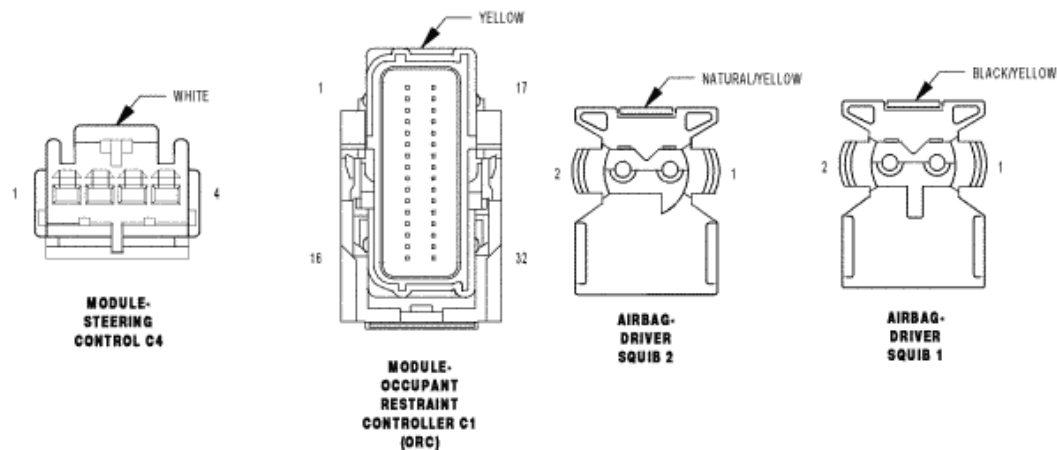
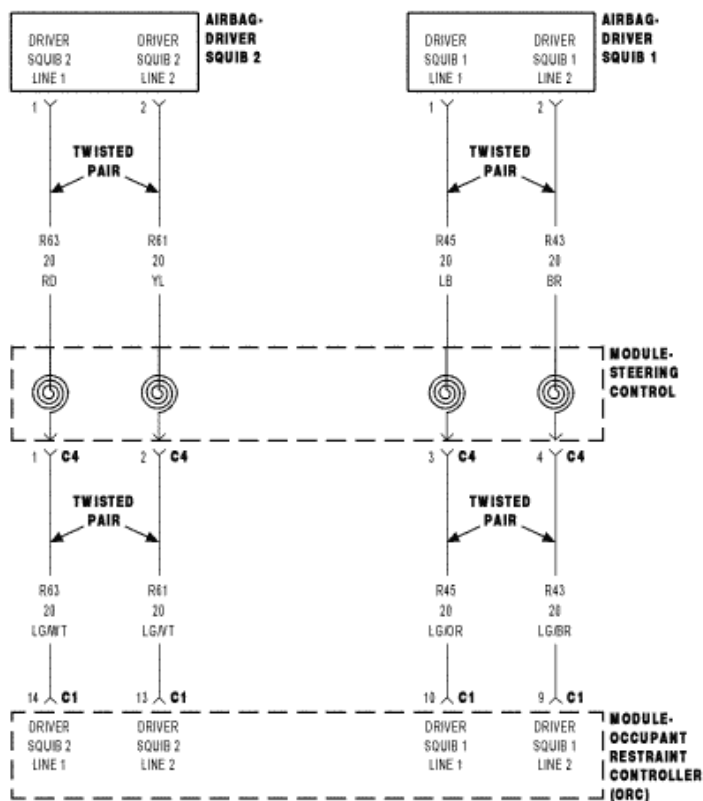
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B05-DRIVER AIRBAG SQUIB 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



0195 1501

Fig. 22: Driver Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the voltage on the Driver Squib 2 circuits. The ORC will set this DTC if it detects voltage on the Driver Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R63) DRIVER SQUIB 2 LINE 1 CIRCUIT SHORTED TO BATTERY (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT SHORTED TO BATTERY STEERING CONTROL MODULE (SCM) DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

- NOTE:** Ensure that the battery is fully charged.
- NOTE:** The Scan Tool, SRS Airbag Load Tool 8443 and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

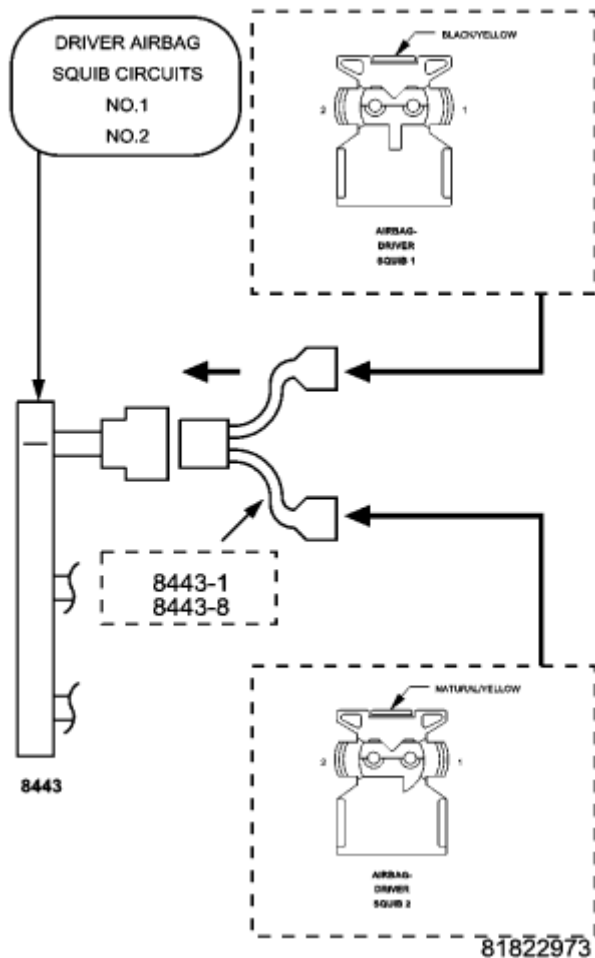


Fig. 23: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B05-DRIVER AIRBAG SQUIB 2 CIRCUIT HIGH?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TO BATTERY

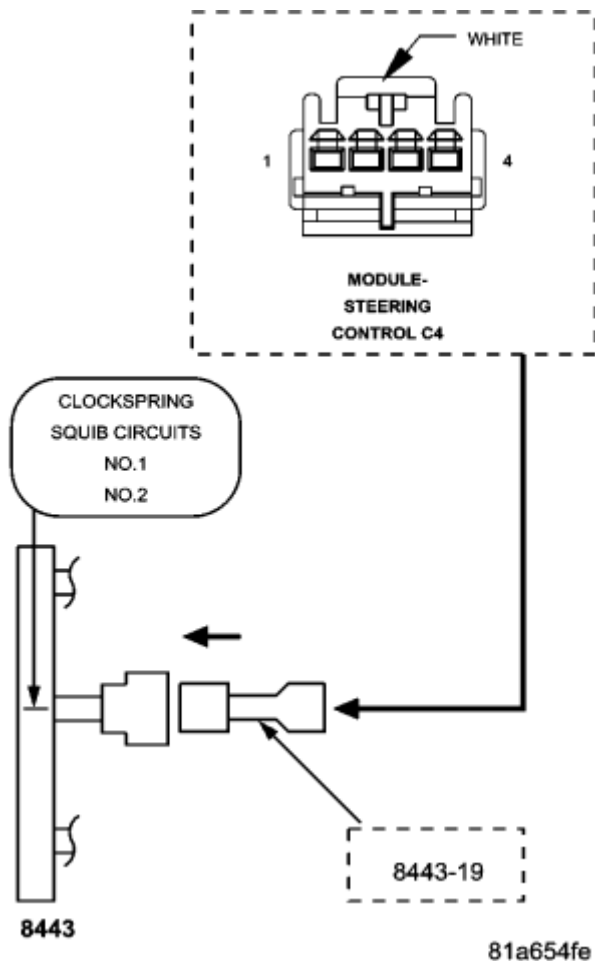


Fig. 24: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B05-DRIVER AIRBAG SQUIB 2 CIRCUIT HIGH?

Yes

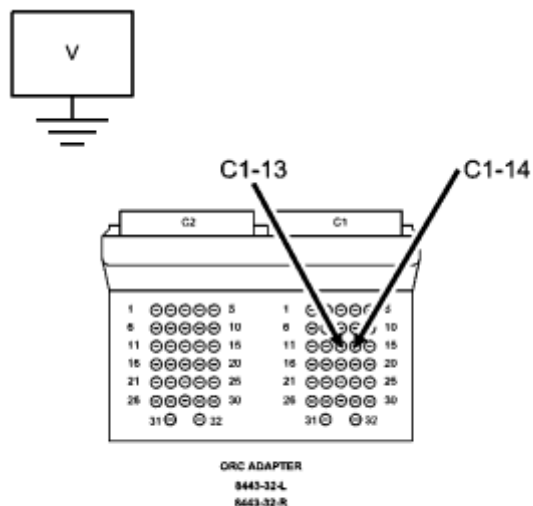
Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. **CHECK (R63) DRIVER SQUIB 2 LINE 1 CIRCUIT AND (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



819b43bd

Fig. 25: Measuring Voltage Of (R63/61) Driver Squib 2 Line 1/2 Circuit Between 8443-32-R

Adapter Cavity C1-14/13 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R63) Driver Squib 2 Line 1 circuit between the 8443-32-R Adapter cavity C1-14 and ground.

Measure the voltage of the (R61) Driver Squib 2 Line 2 circuit between the 8443-32-R Adapter cavity C1-13 and ground.

Is there any voltage present for either measurement?

Yes

Repair the Driver Squib 2 circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

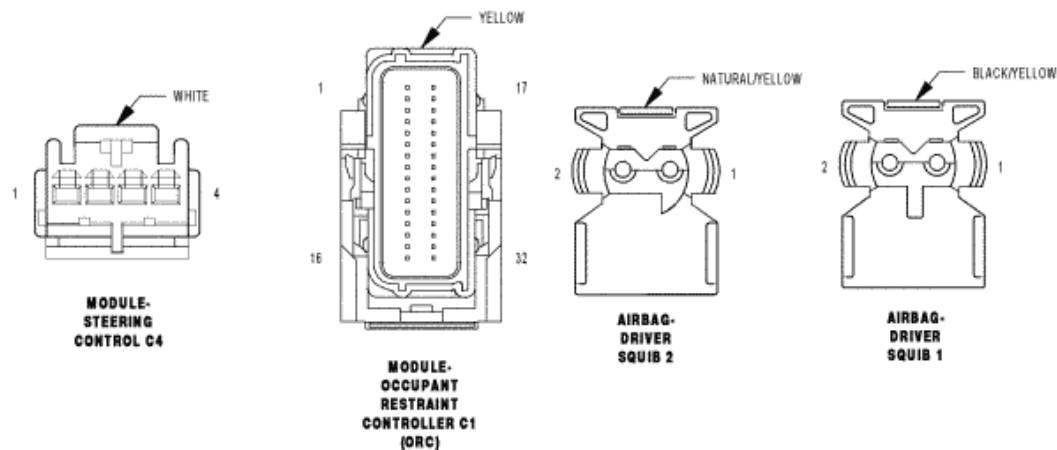
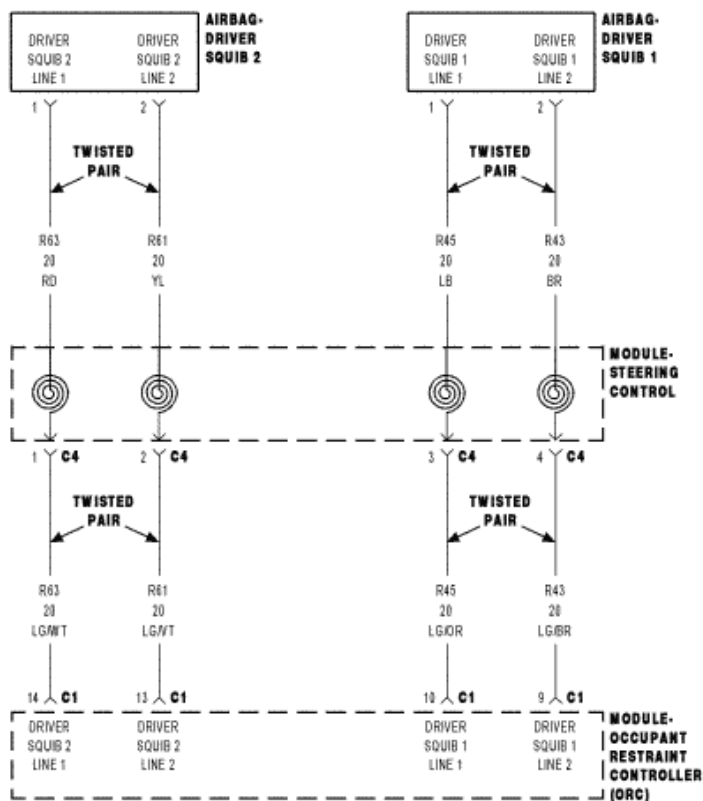
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B06-DRIVER AIRBAG SQUIB 2 CIRCUIT OPEN

CIRCUIT SCHEMATIC



0195 1501

Fig. 26: Driver Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 2 circuits. The ORC will set this DTC if it detects an open or high resistance on the Driver Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R63) DRIVER SQUIB 2 LINE 1 CIRCUIT OPEN (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT OPEN STEERING CONTROL MODULE (SCM) DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 6.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN DRIVER AIRBAG**

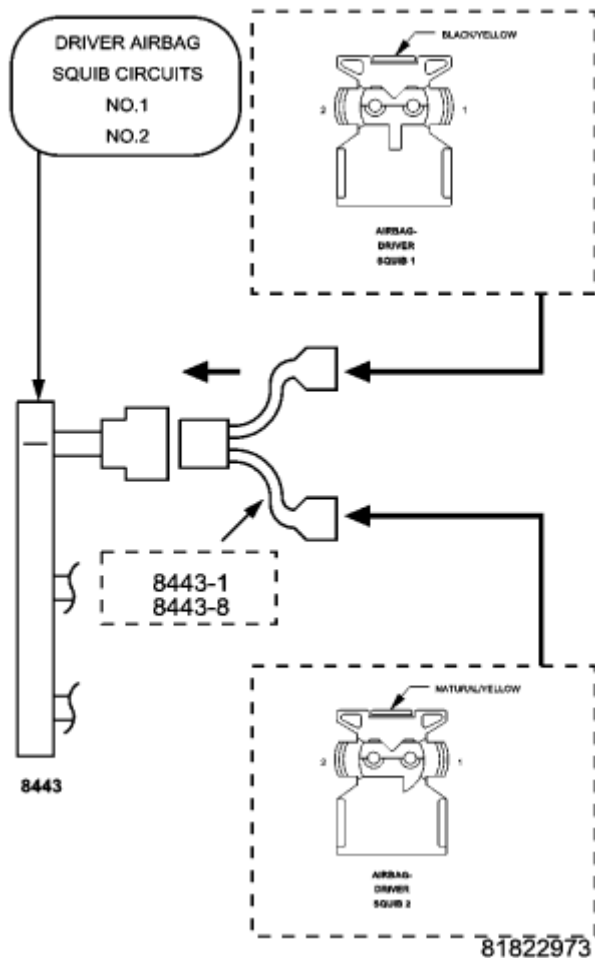


Fig. 27: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B06-DRIVER AIRBAG SQUIB 2 CIRCUIT OPEN?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR AN OPEN

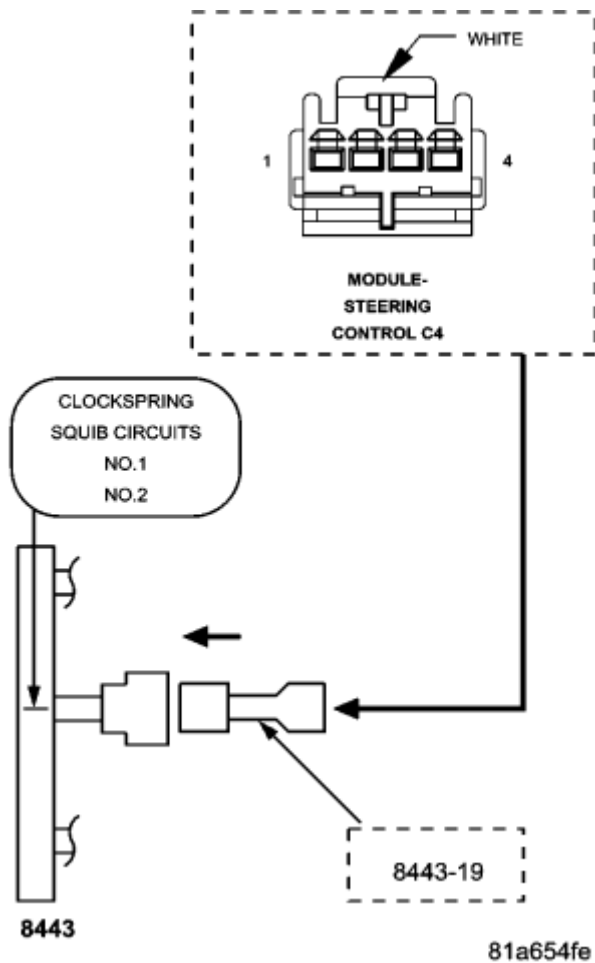


Fig. 28: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: **Check connectors - Clean and repair as necessary.**

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B06-DRIVER AIRBAG SQUIB 2 CIRCUIT OPEN?

Yes

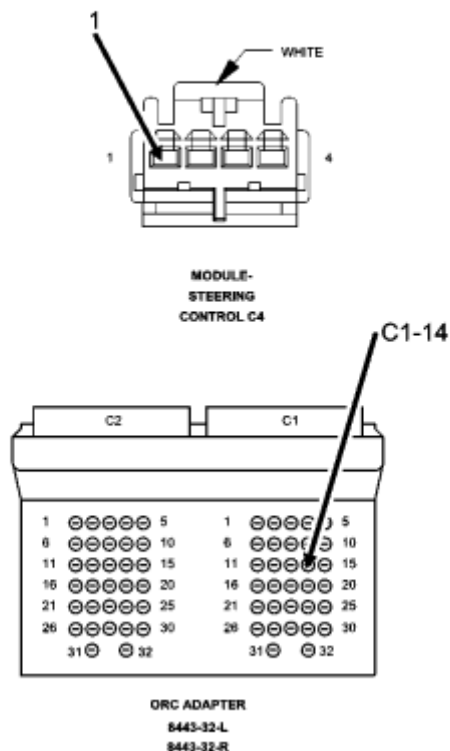
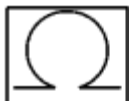
Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. **CHECK (R63) DRIVER SQUIB 2 LINE 1 CIRCUIT FOR AN OPEN**



819b4fea

Fig. 29: Measuring Resistance Of (R63) Driver Squib 2 Line 1 Circuit Between Steering Control Module C4 Connector Cavity 1 And 8443-32-R Adapter Cavity C1-14
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32 ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R63) Driver Squib 2 Line 1 circuit between the Steering Control Module

C4 connector cavity 1 and the 8443-32-R Adapter cavity C1-14.

Is the resistance below 1.0 ohm?

Yes

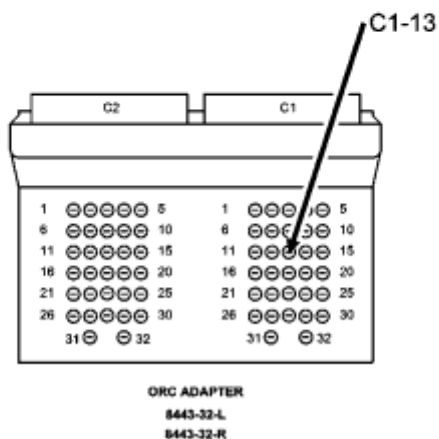
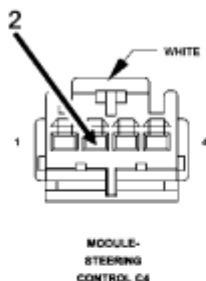
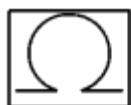
Go To 5.

No

Repair the (R63) Driver Squib 2 Line 1 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECK (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT FOR AN OPEN



819b4f3d

Fig. 30: Measuring Resistance Of (R61) Driver Squib 2 Line 2 Circuit Between Steering Control Module C4 Connector Cavity 2 And ORC 8443-32-R Adapter Cavity C1-13
Courtesy of CHRYSLER LLC

Measure the resistance of the (R61) Driver Squib 2 Line 2 circuit between the Steering Control Module C4 connector cavity 2 and the ORC 8443-32-R Adapter cavity C1-13.

Is the resistance below 1.0 ohm?

Yes

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1.

No

Repair the (R61) Driver Squib 2 Line 2 circuit for an open.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1.

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

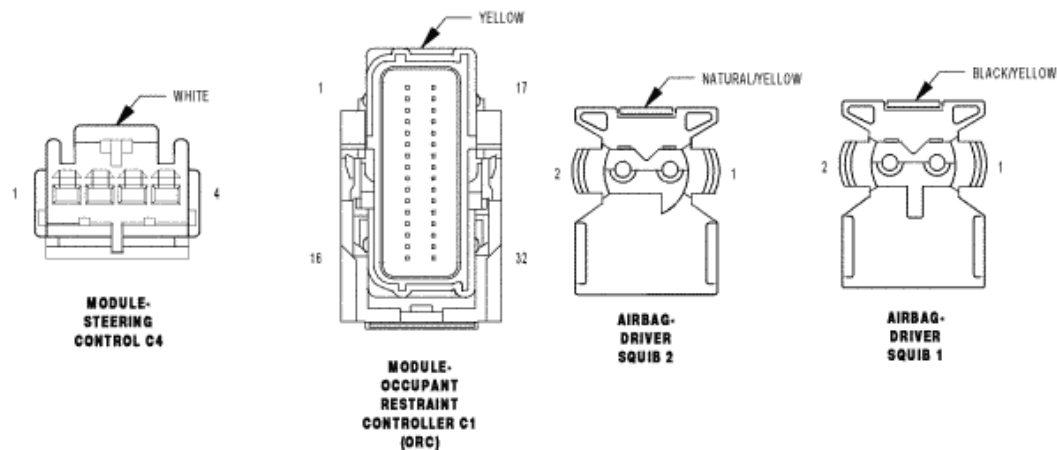
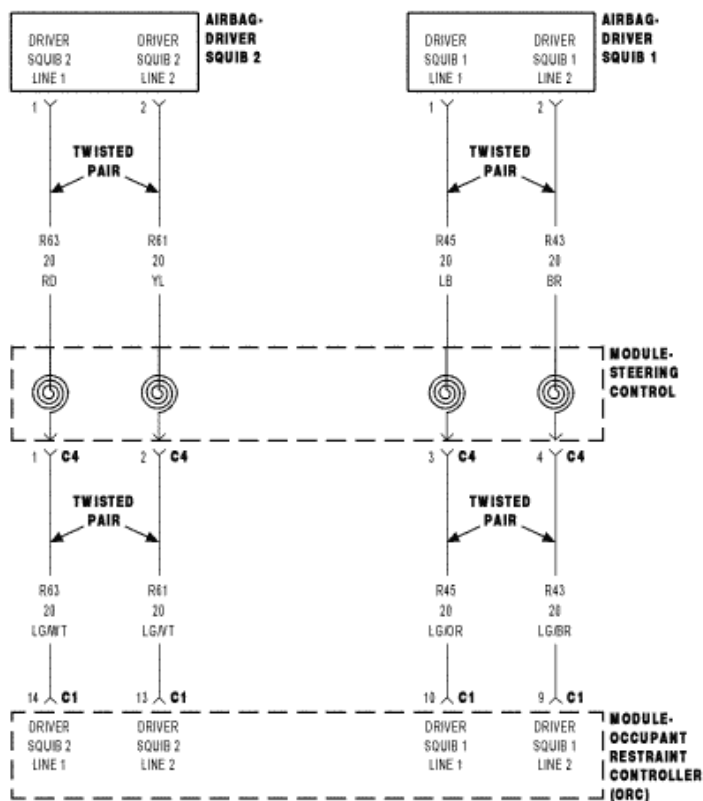
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B07-DRIVER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER

CIRCUIT SCHEMATIC



0195 1501

Fig. 31: Driver Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Driver Squib 2 circuits. The ORC will set this DTC if it detects low resistance between the Driver Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R63) DRIVER SQUIB 2 LINE 1 CIRCUIT SHORTED TO (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT STEERING CONTROL MODULE DRIVER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The Scan Tool, SRS Airbag Load Tool 8443 and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN DRIVER AIRBAG**

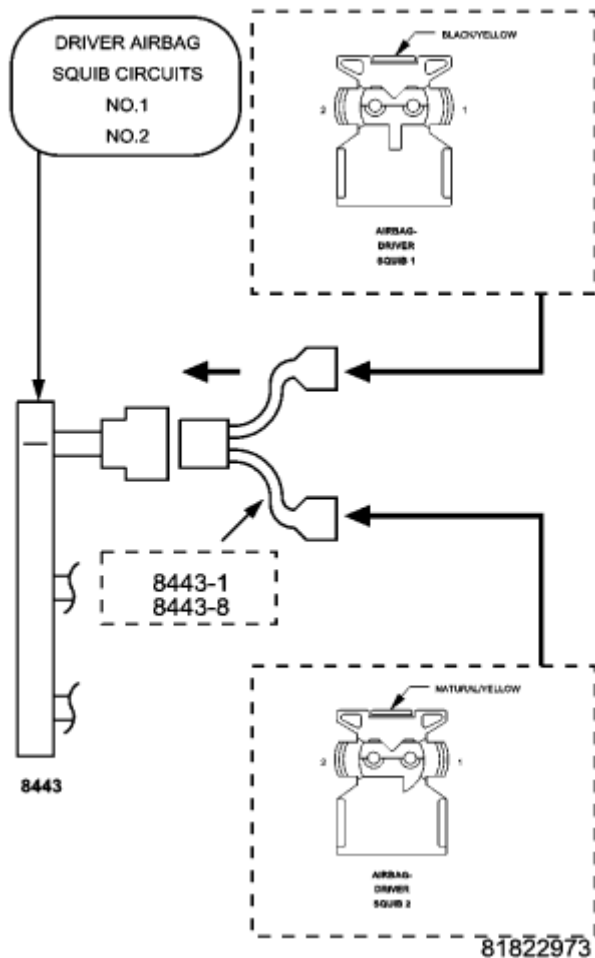


Fig. 32: Checking For Shorted/Open Squib Circuits In Driver Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

Disconnect the Driver Airbag Squib connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-1 Jumper to the Driver Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B07-DRIVER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER?

Yes

Go To 3.

No

Replace the Driver Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK STEERING CONTROL MODULE (CLOCKSPRING) SQUIB CIRCUITS FOR A SHORT TOGETHER

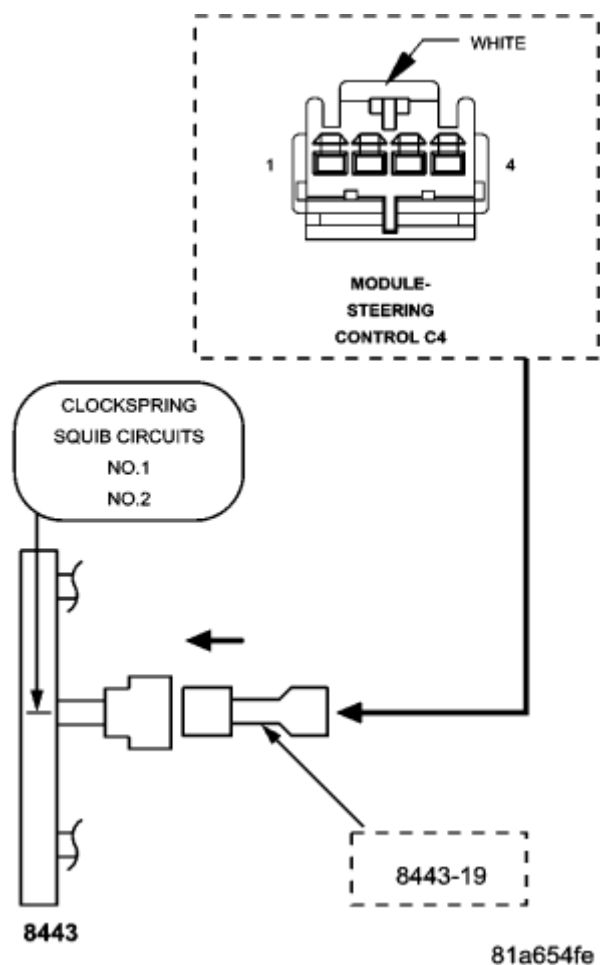


Fig. 33: Checking Steering Control Module (Clockspring) Squib Circuits For Short/Open
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the

battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and jumper from the Driver Airbag Squib connectors.

Disconnect the Steering Control Module C4 connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-19 Jumper to the Steering Control Module C4 connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B07-DRIVER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER?

Yes

Go To 4.

No

Replace the Steering Control Module in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. CHECK (R63) DRIVER SQUIB 2 LINE 1 CIRCUIT FOR A SHORT TO (R61) DRIVER SQUIB 2 LINE 2 CIRCUIT

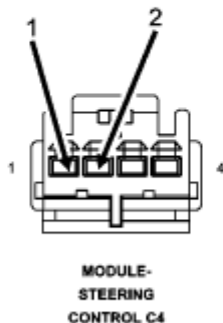


Fig. 34: Checking Driver Squib 2 Line 1 Circuit For Short To Driver Squib 2 Line 2 Circuit
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Steering Control Module connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R63) Driver Squib 2 Line 1 circuit cavity 1 and the (R61) Driver Squib 2 Line 2 circuit cavity 2 in the SCM C4 connector.

Is the resistance below 10k ohms?

Yes

Repair the (R63) Driver Squib 2 Line 1 circuit for a short to the (R61) Driver Squib 2 Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

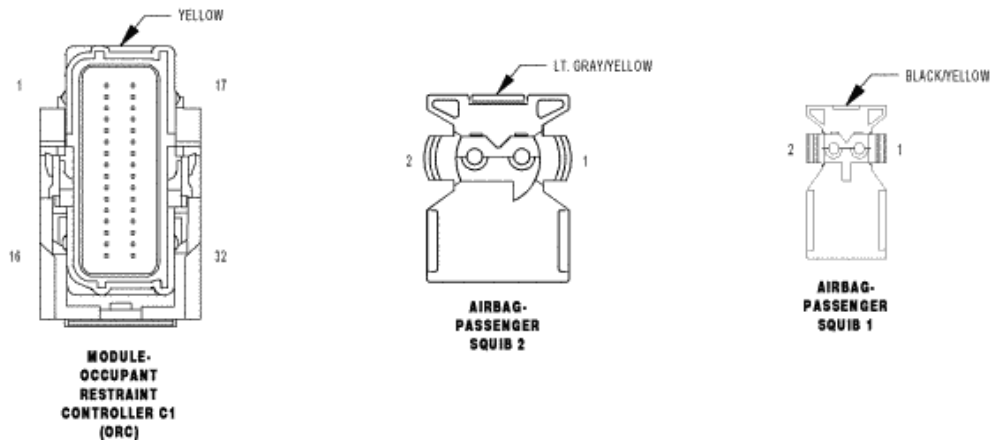
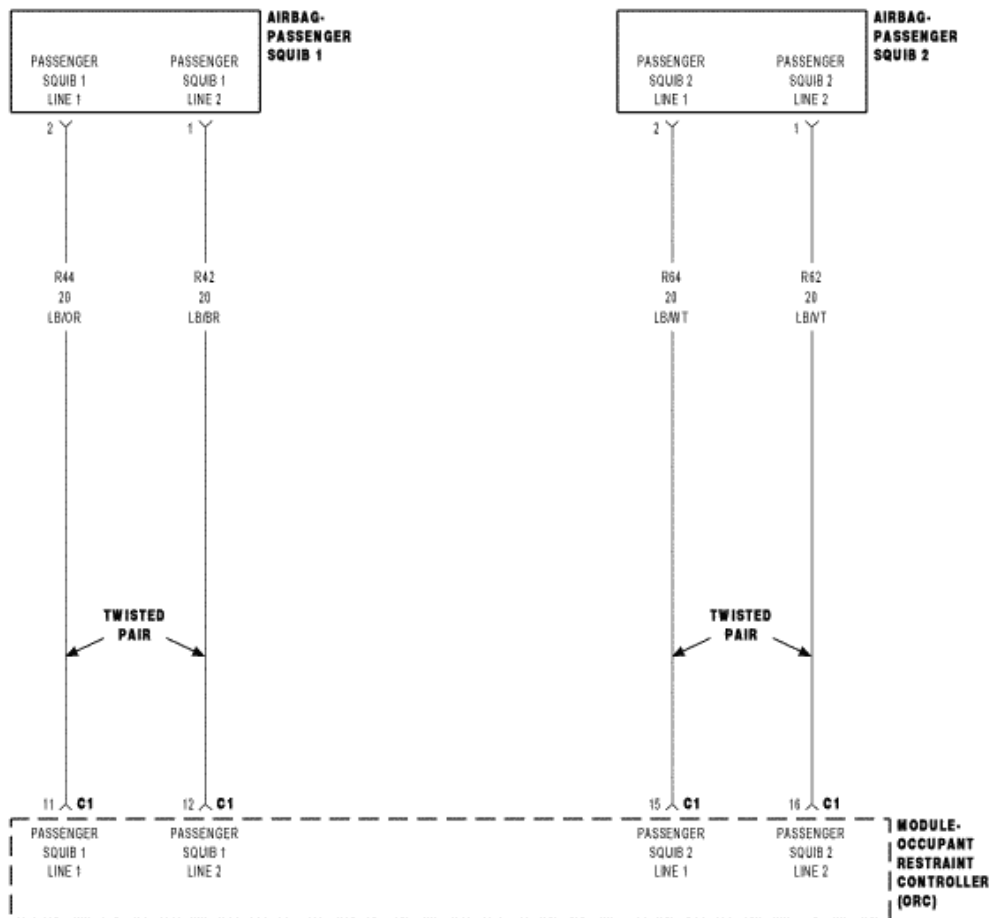
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B08-PASSENGER AIRBAG SQUIB 1 CIRCUIT LOW

CIRCUIT SCHEMATIC



01902000

Fig. 35: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 1 circuits. The ORC will set this DTC if it detects low resistance on the Passenger Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT SHORTED TO GROUND
(R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT SHORTED TO GROUND
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG**

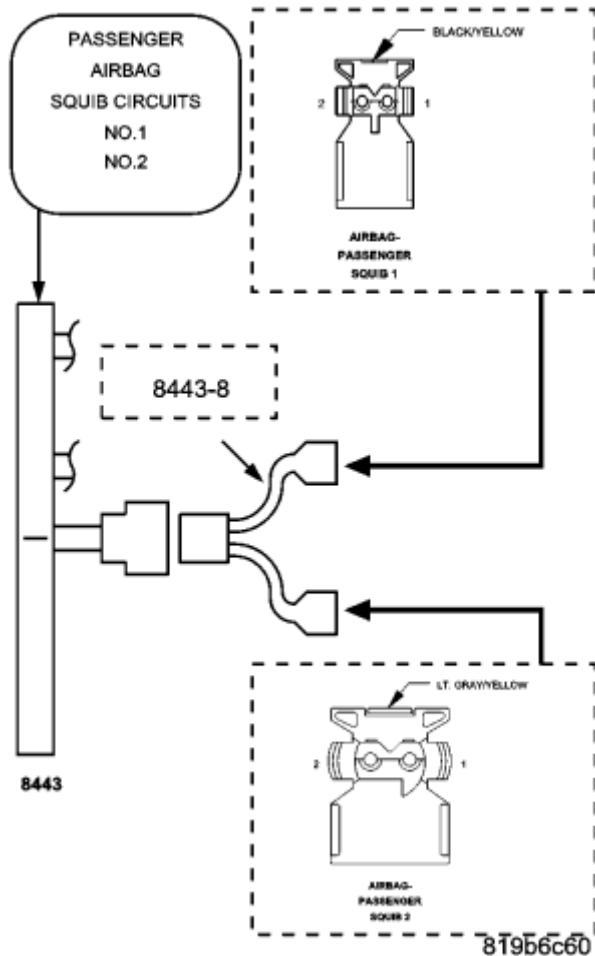


Fig. 36: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B08-PASSENGER AIRBAG SQUIB 1 CIRCUIT LOW?

Yes

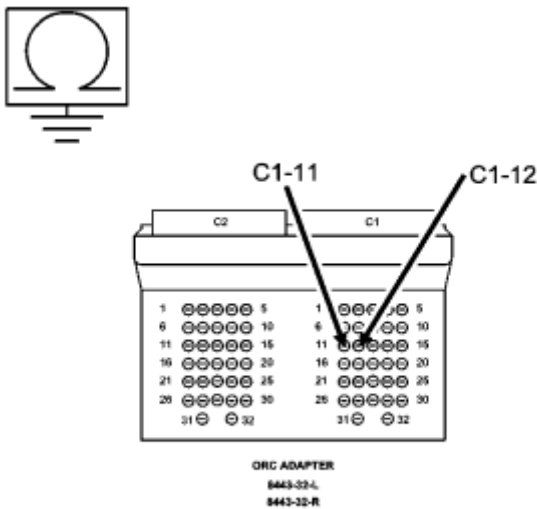
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT AND (R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT FOR A SHORT TO GROUND**



819b20f9

Fig. 37: Measuring Resistance Of (R42/44) Passenger Squib 1 Line 2/1 Circuit Between ORC 8443-32-R Adapter Cavity C1-12/11 And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool from the Passenger Airbag Squib connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the ORC 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R42) Passenger Squib 1 Line 2 circuit between the ORC 8443-32-R Adapter cavity C1-12 and ground.

Measure the resistance of the (R44) Passenger Squib 1 Line 1 circuit between the ORC 8443-32-R Adapter cavity C1-11 and ground.

Is the resistance below 10k ohms on either circuit?

Yes

Repair the Passenger Squib 1 circuits with resistance below 10k ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

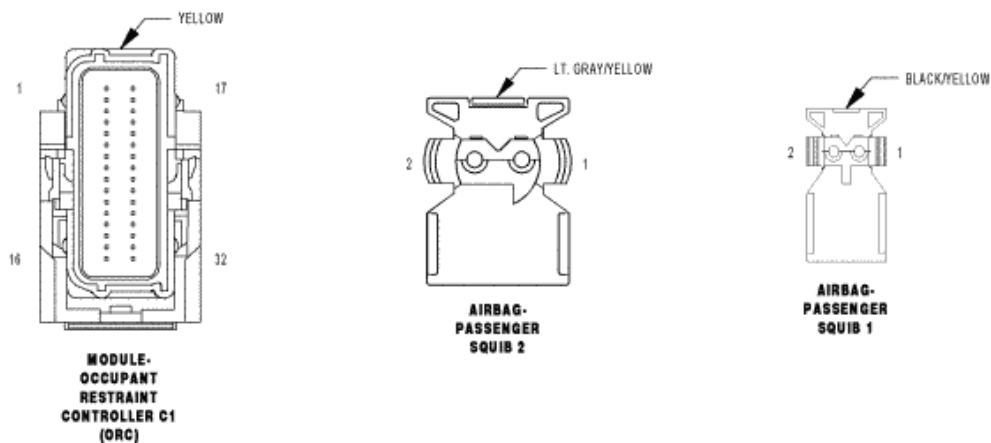
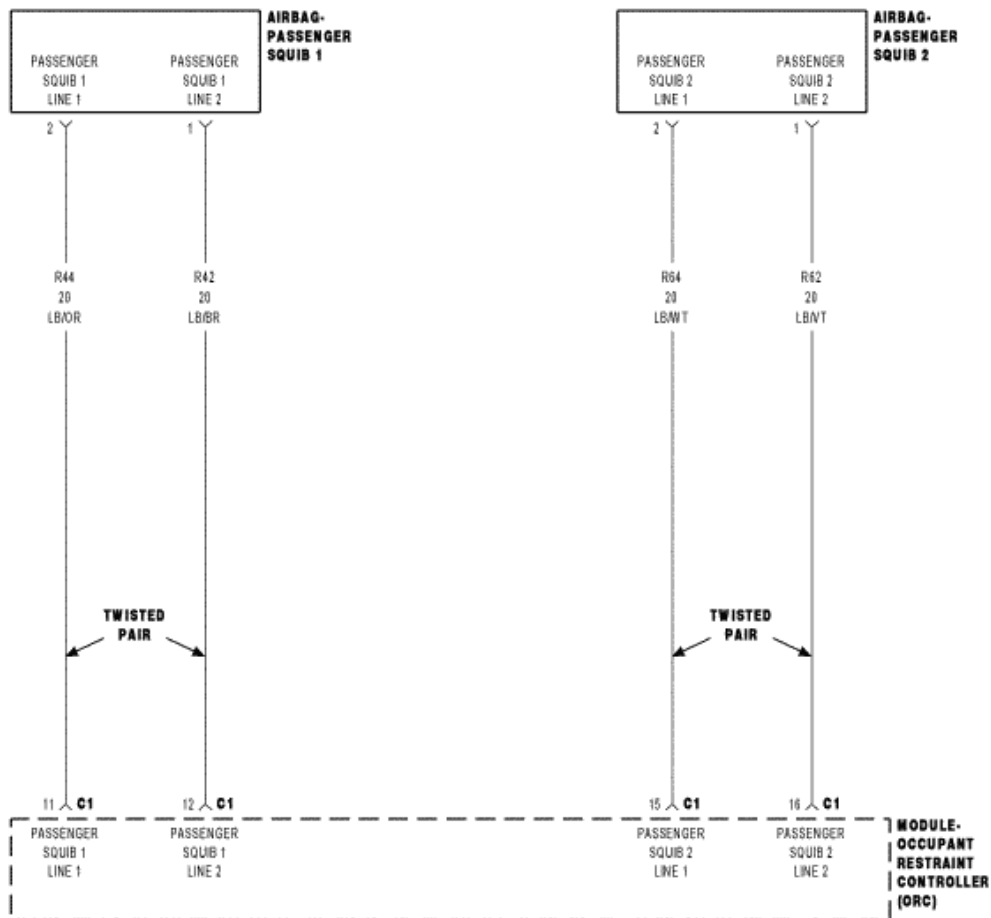
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B09-PASSENGER AIRBAG SQUIB 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01902000

Fig. 38: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the voltage on the Passenger Squib 1 circuits. The ORC will set this DTC if it detects voltage on the Passenger Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT SHORTED TO BATTERY
(R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT SHORTED TO BATTERY
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG**

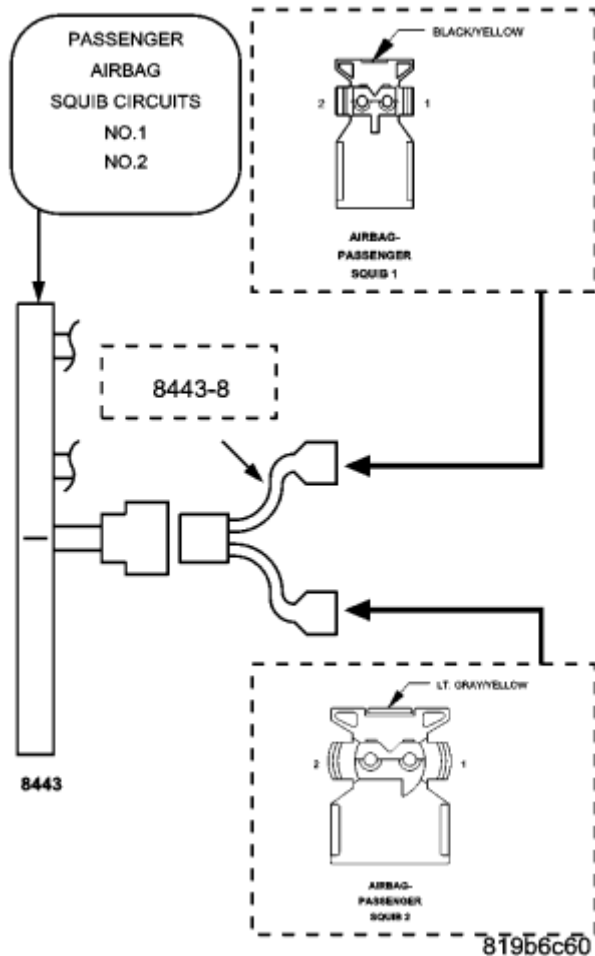


Fig. 39: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B09-PASSENGER AIRBAG SQUIB 1 CIRCUIT HIGH?

Yes

Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT AND (R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT FOR A SHORT TO BATTERY**

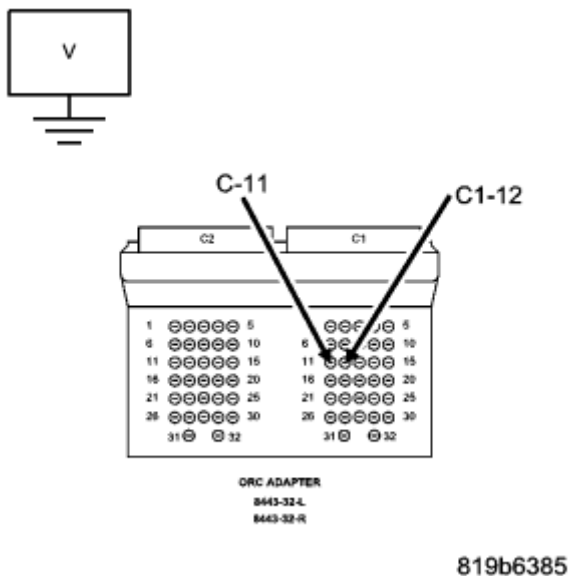


Fig. 40: Measuring Voltage Of (R42/44) Passenger Squib 1 Line 2/1 Circuit Between 8443-32-R Adapter Cavity C1-12/11 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R42) Passenger Squib 1 Line 2 circuit between the 8443-32-R Adapter cavity C1-12 and ground.

Measure the voltage of the (R44) Passenger Squib 1 Line 1 circuit between the 8443-32-R Adapter cavity C1-11 and ground.

Is there any voltage present on either circuit?

Yes

Repair the Passenger Squib 1 circuits with voltage present for short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

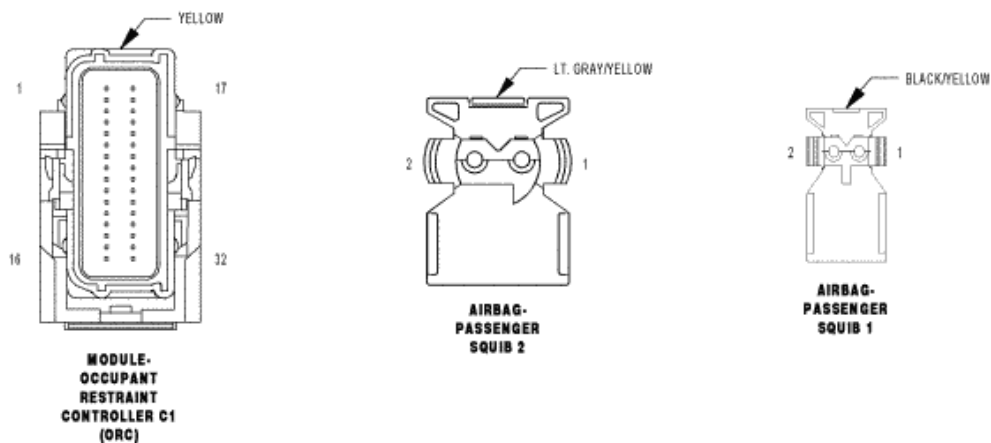
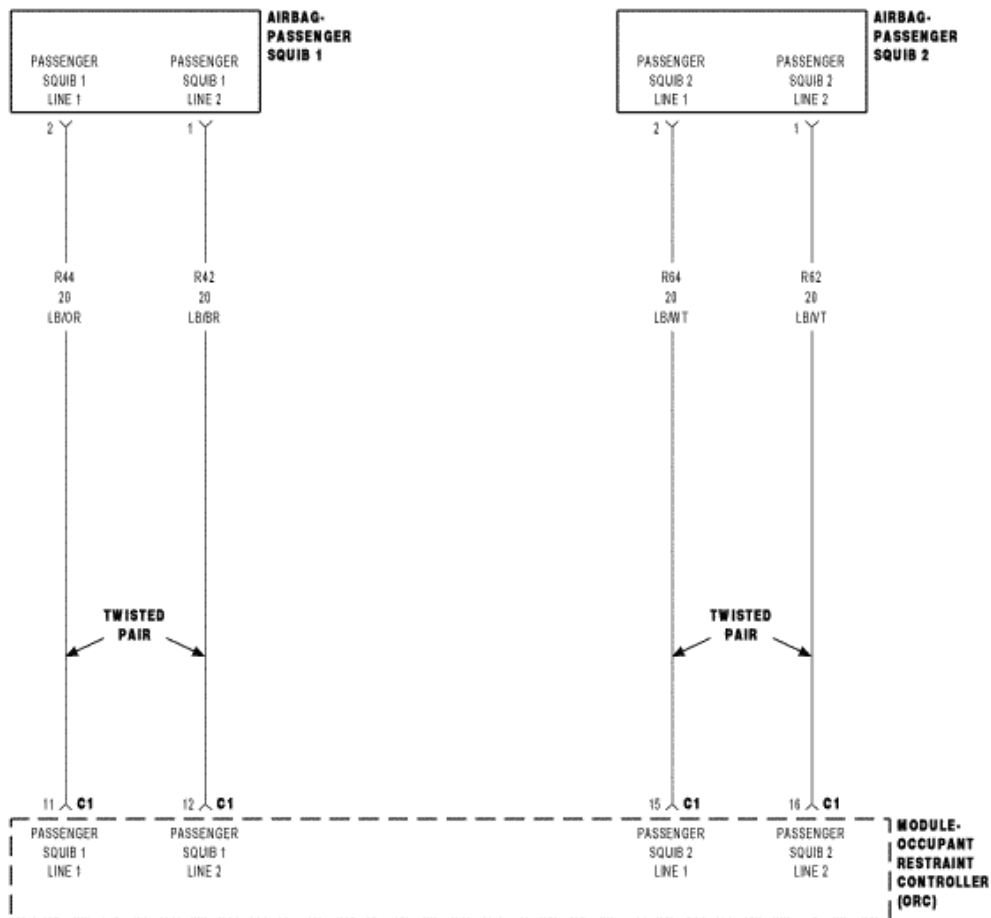
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0A-PASSENGER AIRBAG SQUIB 1 CIRCUIT OPEN

CIRCUIT SCHEMATIC



01902000

Fig. 41: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 1 circuits. The ORC will set this DTC if it detects an open or high resistance on the Passenger Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT OPEN
(R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT OPEN
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN PASSENGER AIRBAG**

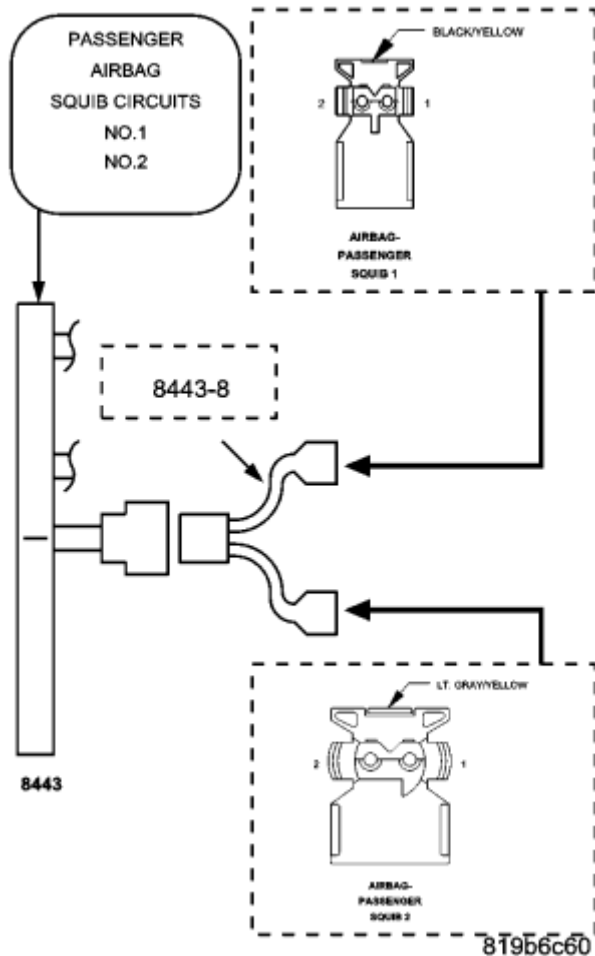


Fig. 42: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0A-PASSENGER AIRBAG SQUIB 1 CIRCUIT OPEN?

Yes

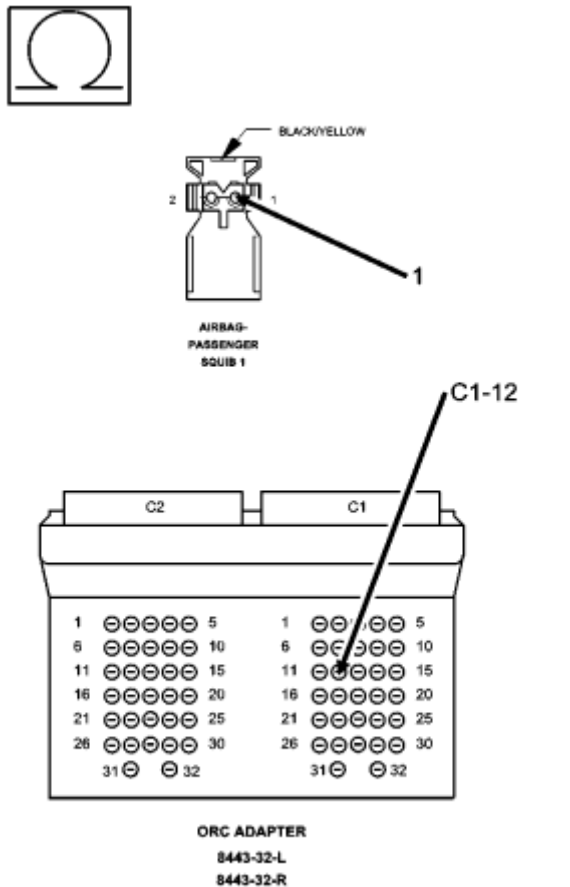
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT FOR AN OPEN**



819b652e

Fig. 43: Measuring Resistance Of (R42) Passenger Squib 1 Line 2 Between Passenger Airbag Squib Connector Circuit Cavity 1 And 8443-32-R Adapter Cavity C1-12
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: **Check connectors - Clean and repair as necessary.**

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R42) Passenger Squib 1 Line 2 between the Passenger Airbag Squib connector circuit cavity 1 and the 8443-32-R Adapter cavity C1-12.

Is the resistance below 1.0 ohm?

Yes

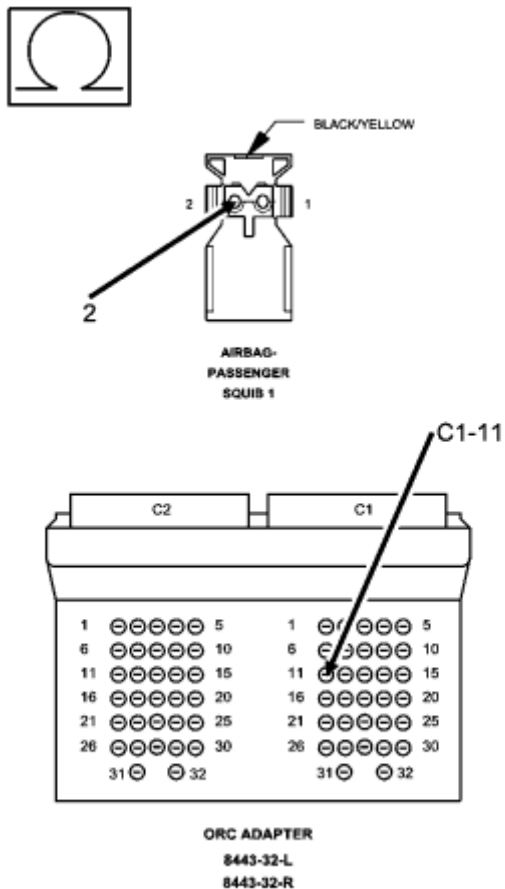
Go To 4.

No

Repair the (R42) Passenger Squib 1 Line 2 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. CHECK (R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT FOR AN OPEN



819b64d9

Fig. 44: Measuring resistance of (R44) Passenger Squib 1 Line 1 circuit between Passenger Airbag Squib connector circuit cavity 2 and 8443-32-R Adapter cavity C1-11
Courtesy of CHRYSLER LLC

Measure the resistance of the (R44) Passenger Squib 1 Line 1 circuit between the Passenger Airbag Squib connector circuit cavity 2 and the 8443-32-R Adapter cavity C1-11.

Is the resistance below 1.0 ohm?

Yes

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Repair the (R44) Passenger Squib 1 Line 1 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. **CHECKING STORED OR INTERMITTENT CODES**

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: **To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.**

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: **To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.**

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

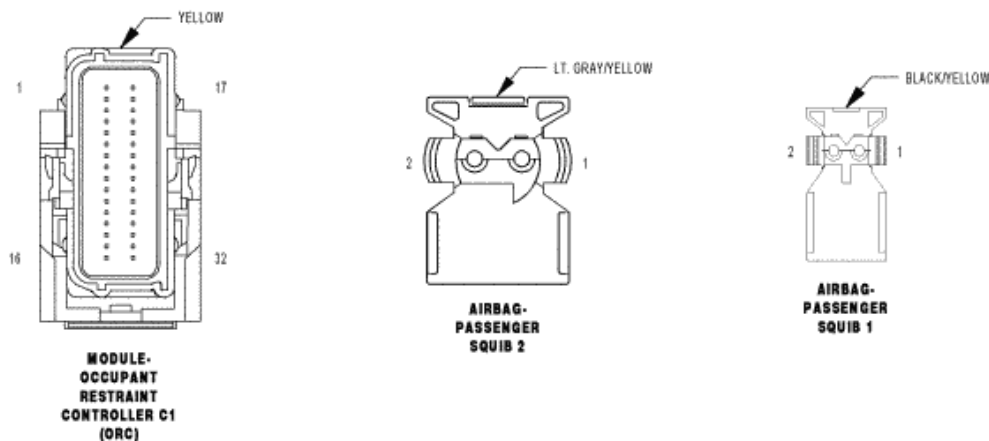
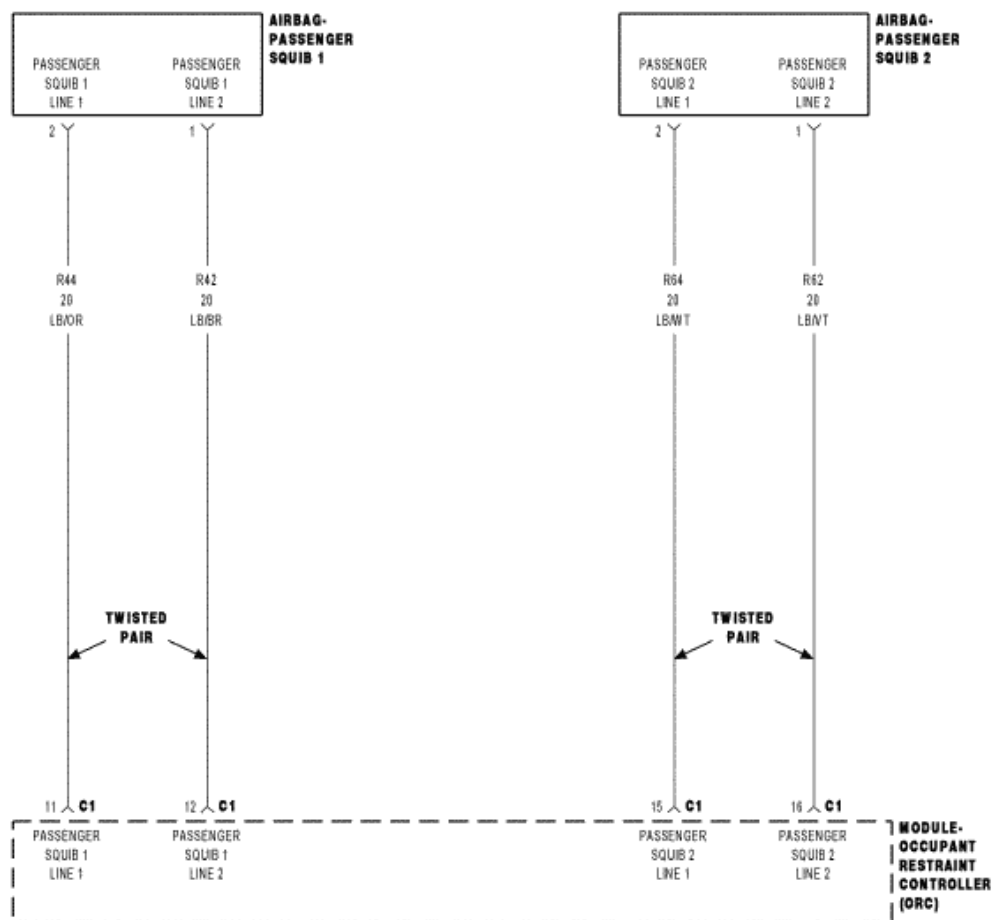
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0B-PASSENGER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER

CIRCUIT SCHEMATIC



01992000

Fig. 45: Passenger Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 1 circuits. The ORC will set this DTC if it detects low resistance between the Passenger Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT SHORTED TO (R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT PASSENGER AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. DETERMINE ACTIVE OR STORED DTC

- NOTE:** Ensure that the battery is fully charged.
- NOTE:** The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG

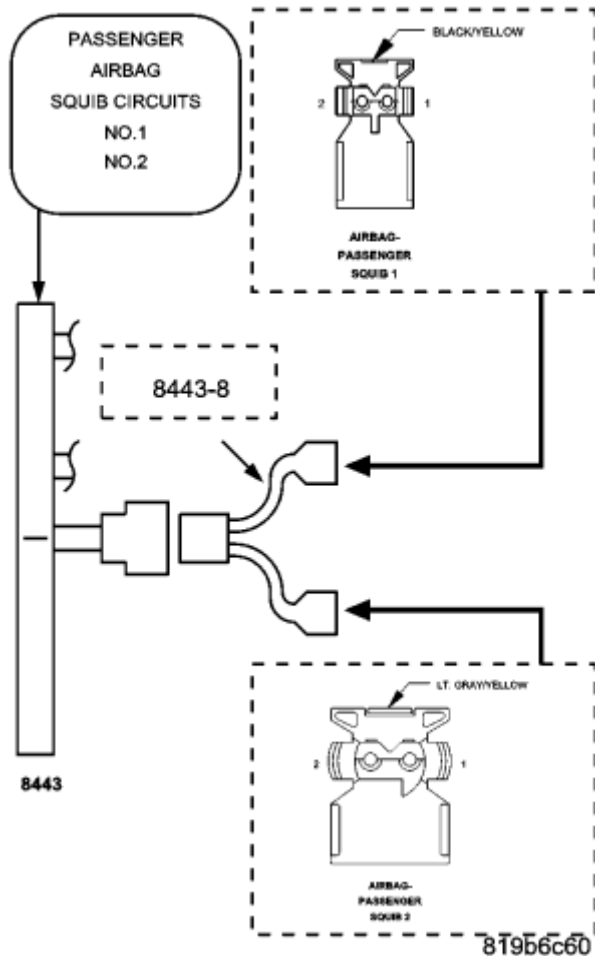


Fig. 46: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0B-PASSENGER AIRBAG SQUIB 1 CIRCUIT SHORTED TOGETHER?

Yes

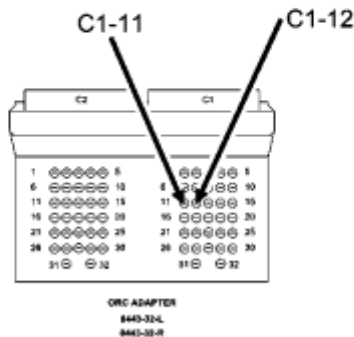
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R42) PASSENGER SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO (R44) PASSENGER SQUIB 1 LINE 1 CIRCUIT**



819b677a

Fig. 47: Measuring Resistance Between (R42) Passenger Squib 1 Line 2 Circuit Cavity C1-12 And (R44) Passenger Squib 1 Line 1 Circuit Cavity C1-11 At ORC 8443-32-R Adapter
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R42) Passenger Squib 1 Line 2 circuit cavity C1-12 and the (R44) Passenger Squib 1 Line 1 circuit cavity C1-11 at the ORC 8443-32-R Adapter.

Is the resistance below 10k ohms?

Yes

Repair the (R42) Passenger Squib 1 Line 2 circuit for a short to the (R44) Passenger Squib 1 Line 1 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

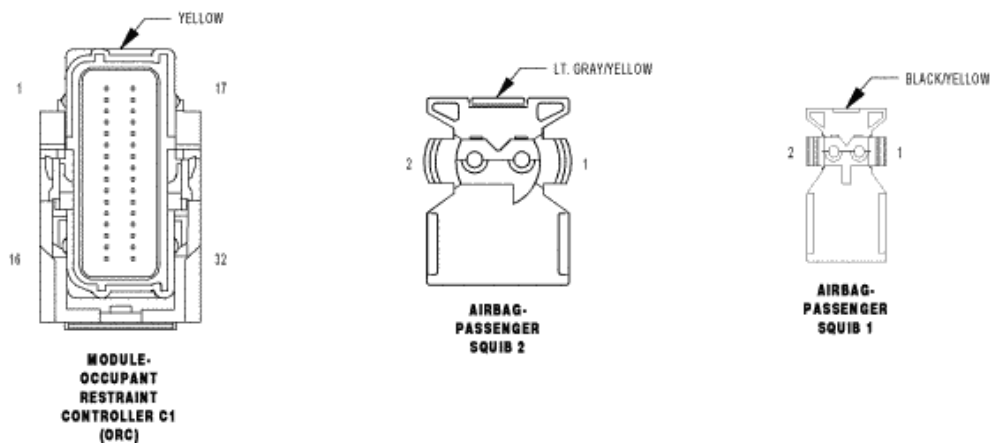
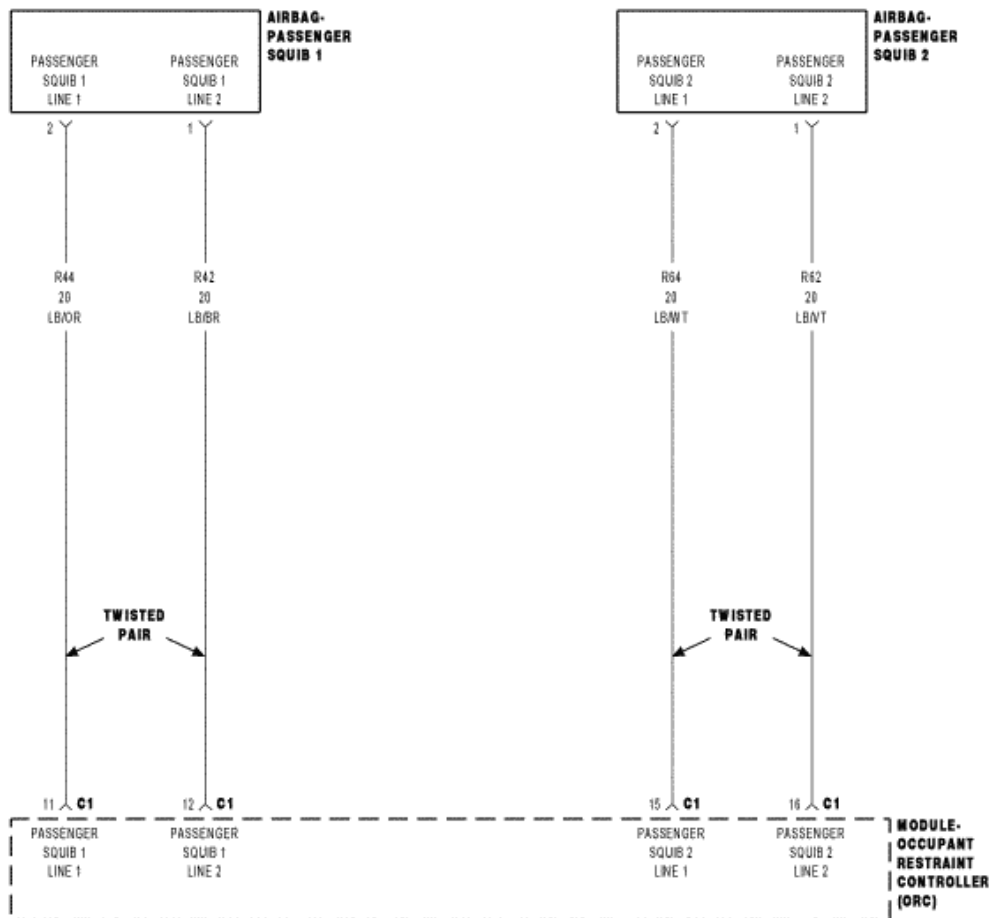
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0C-PASSENGER AIRBAG SQUIB 2 CIRCUIT LOW

CIRCUIT SCHEMATIC



01902000

Fig. 48: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 2 circuits. The ORC will set this DTC if it detects low resistance on the Passenger Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT SHORTED TO GROUND
(R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT SHORTED TO GROUND
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG**

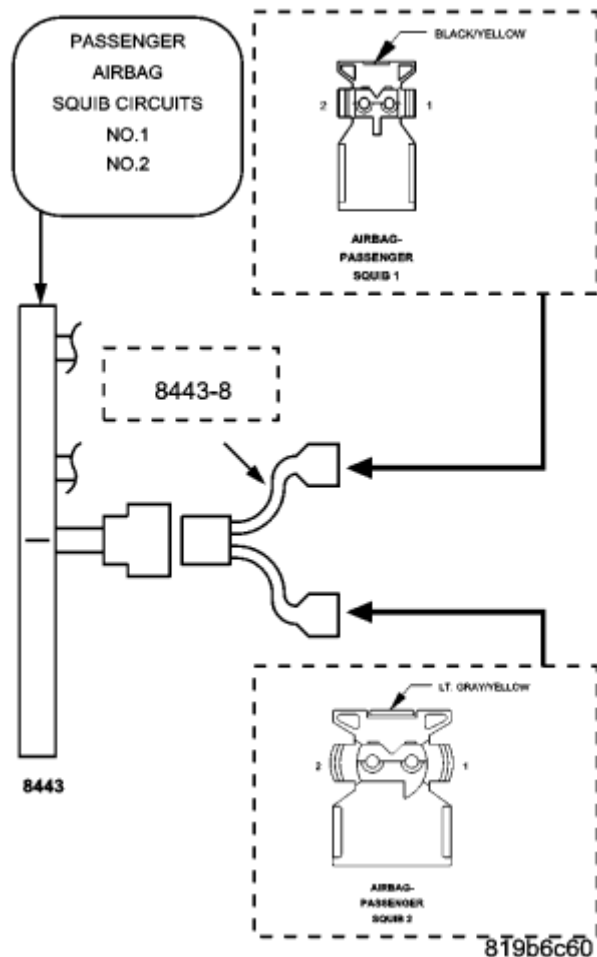


Fig. 49: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0C-PASSENGER AIRBAG SQUIB 2 CIRCUIT LOW?

Yes

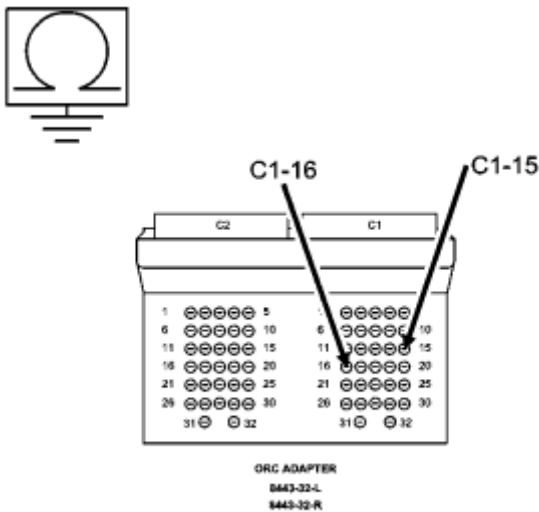
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT AND (R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT FOR A SHORT TO GROUND**



819b281a

Fig. 50: Measuring Resistance Of (R64/62) Passenger Squib 2 Line 1/2 Circuit Between ORC 8443-32-R Adapter Cavity C1-15/16 And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R64) Passenger Squib 2 Line 1 circuit between ORC 8443-32-R Adapter cavity C1-15 and ground.

Measure the resistance of the (R62) Passenger Squib 2 Line 2 circuit between ORC 8443-32-R Adapter cavity C1-16 and ground.

Is the resistance below 10k ohms on either circuit?

Yes

Repair the Passenger Squib 2 circuits with resistance below 10k ohms a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

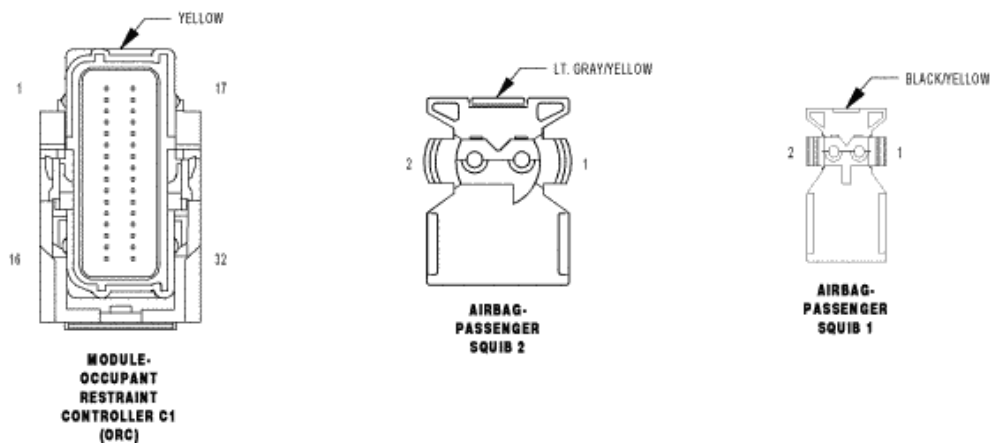
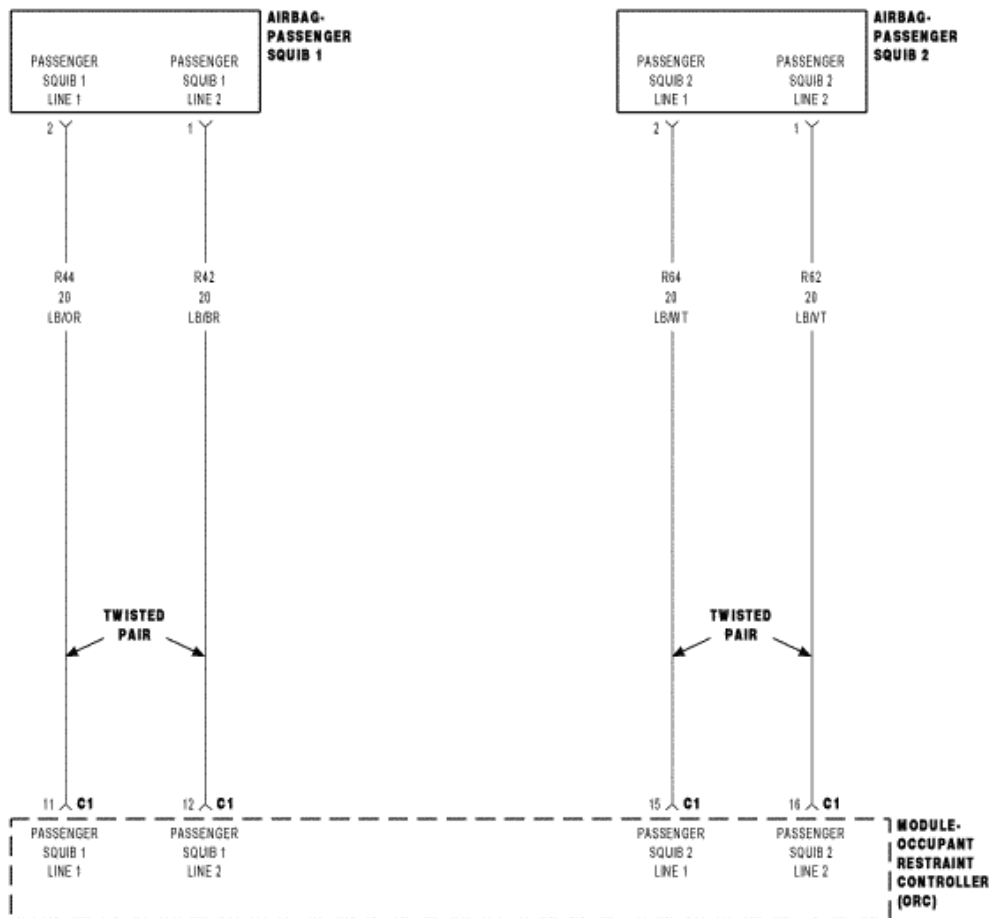
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0D-PASSENGER AIRBAG SQUIB 2 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01902000

Fig. 51: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the voltage of the Passenger Squib 2 circuits. The ORC will set this DTC if it detects voltage on the Passenger Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT SHORTED TO BATTERY
(R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT SHORTED TO BATTERY
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG**

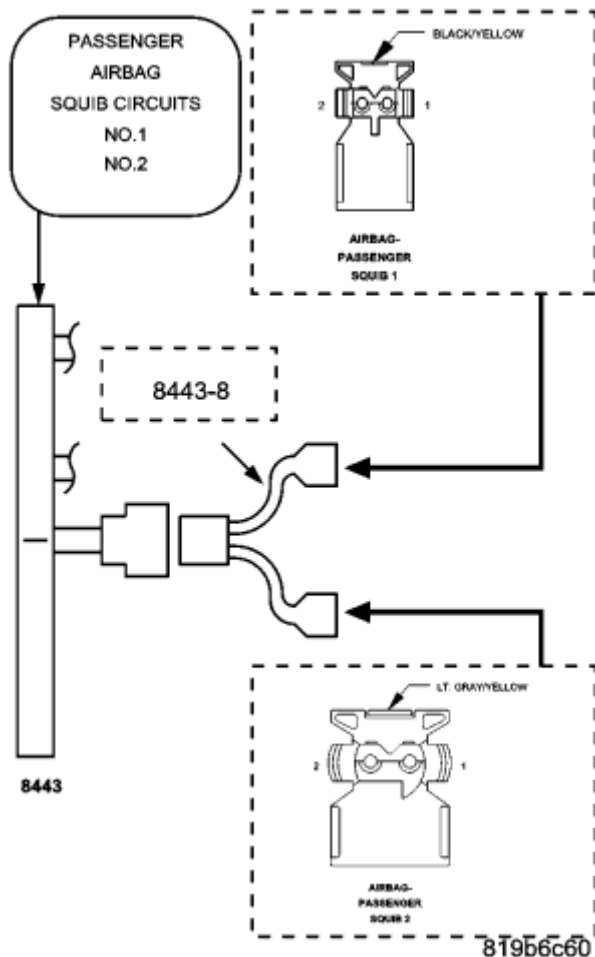


Fig. 52: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0D-PASSENGER AIRBAG SQUIB 2 CIRCUIT HIGH?

Yes

Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT AND (R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT FOR A SHORT TO BATTERY**

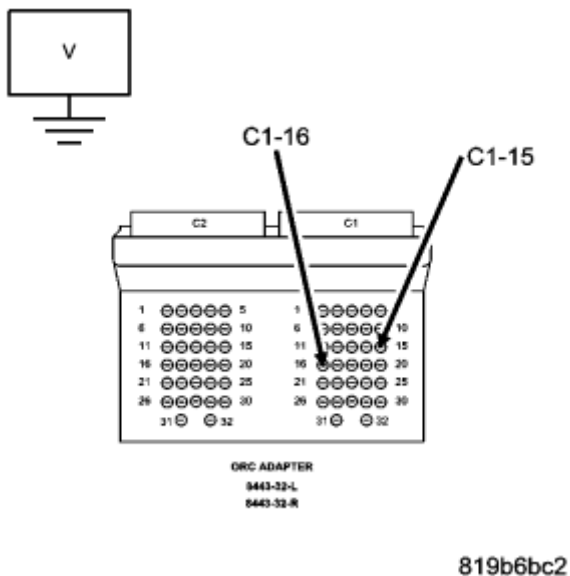


Fig. 53: Measuring Voltage Of (R64/62) Passenger Squib 2 Line 1/2 Circuit Between 8443-32-R Adapter Cavity C1-15/16 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R64) Passenger Squib 2 Line 1 circuit between the 8443-32-R Adapter cavity C1-15 and ground.

Measure the voltage of the (R62) Passenger Squib 2 Line 2 circuit between the 8443-32-R Adapter cavity C1-16 and ground.

Is there any voltage present on either circuit?

Yes

Repair the Passenger Squib 2 circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0E-PASSENGER AIRBAG SQUIB 2 CIRCUIT OPEN

CIRCUIT SCHEMATIC

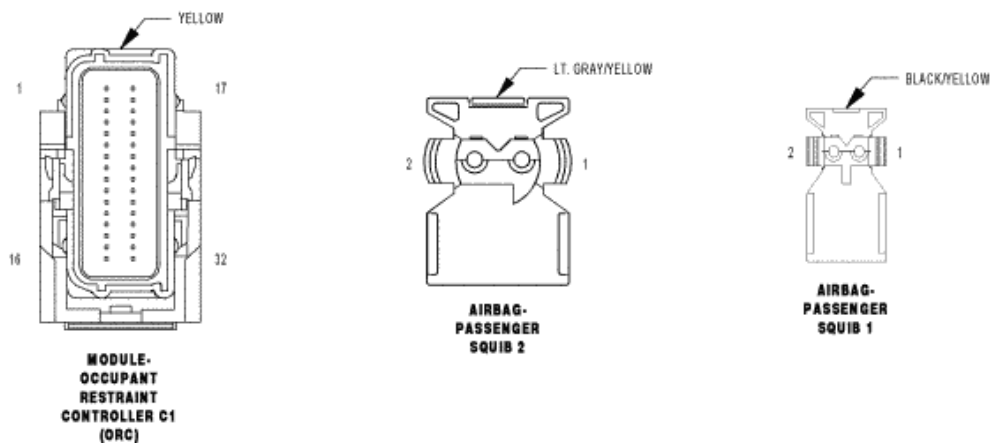
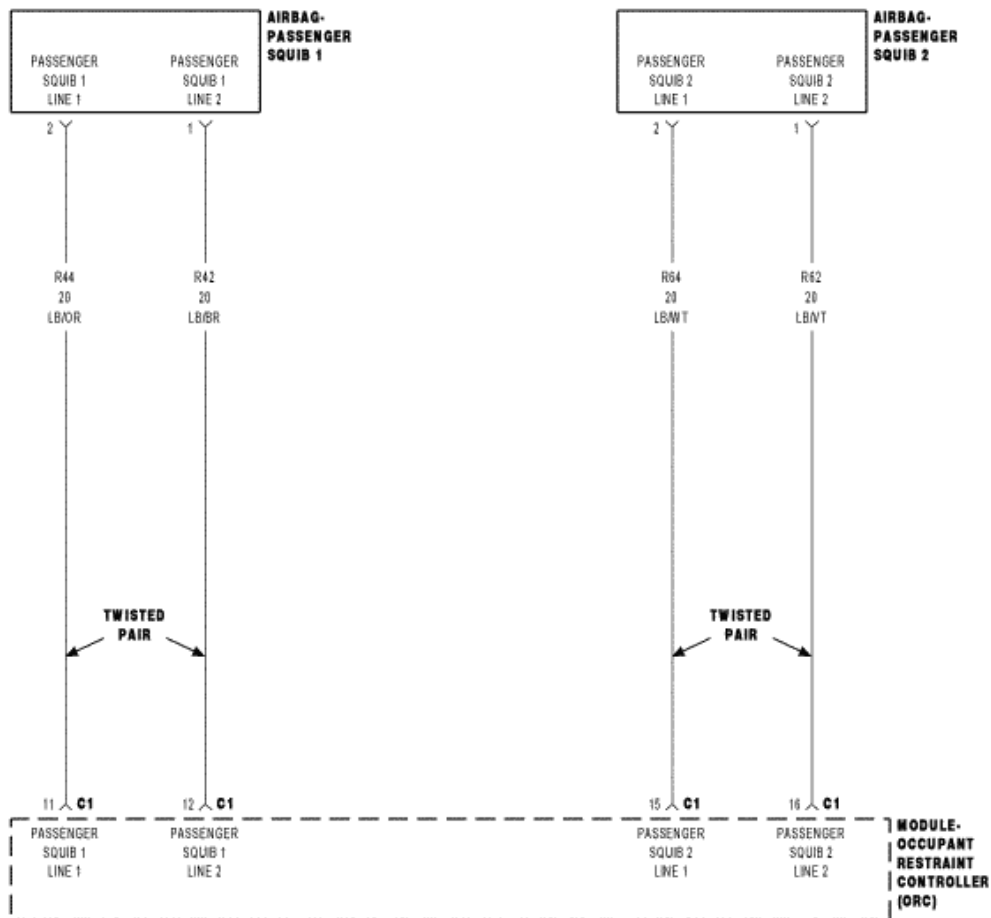


Fig. 54: Passenger Airbag Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 2 circuits. The ORC will set this DTC if it detects an open or high resistance on the Passenger Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT OPEN
(R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT OPEN
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 5.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN PASSENGER AIRBAG**

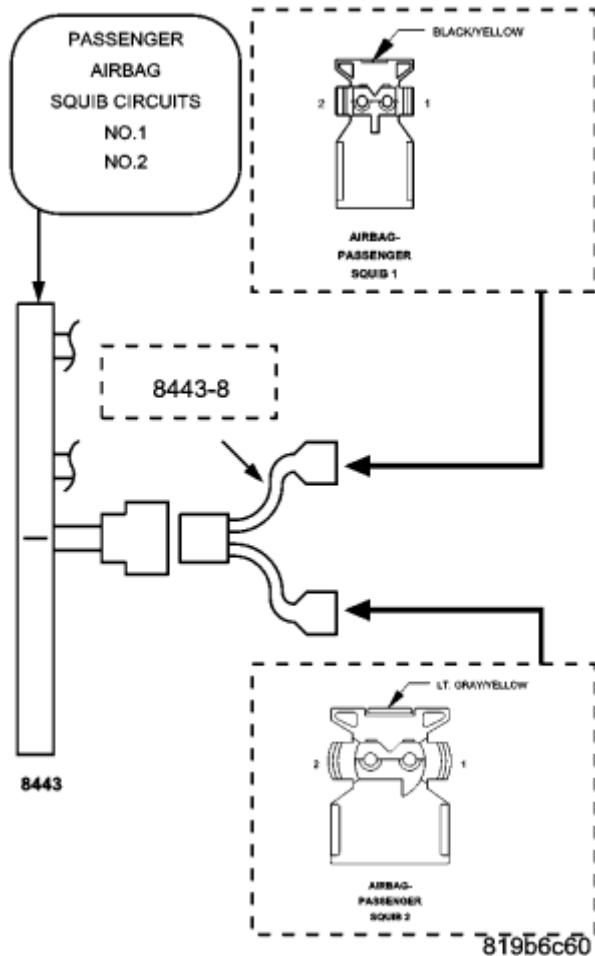


Fig. 55: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0E-PASSENGER AIRBAG SQUIB 2 CIRCUIT OPEN?

Yes

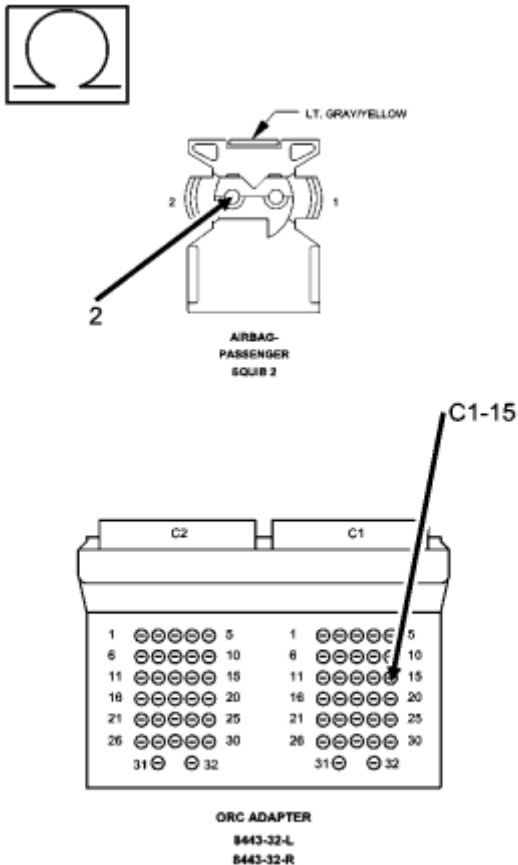
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK (R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT FOR AN OPEN



819b6bd1

Fig. 56: Measuring Resistance Of (R64) Passenger Squib 2 Line 1 Circuit Between Passenger Airbag Squib Connector And 8443-32-R ORC Adapter Cavity C1-15
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R64) Passenger Squib 2 Line 1 circuit between the Passenger Airbag Squib connector and the 8443-32-R ORC Adapter cavity C1-15.

Is the resistance below 1.0 ohm?

Yes

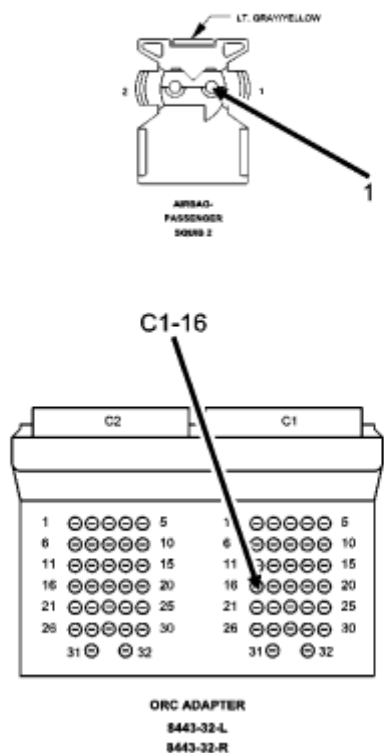
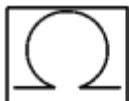
Go to 4.

No

Repair the (R64) Passenger Squib 2 Line 1 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. CHECK (R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT FOR AN OPEN



819b6bd9

Fig. 57: Measuring Resistance Of (R62) Passenger Squib 2 Line 2 Circuit Between Passenger Airbag Squib Connector And 8443-32-R ORC Adapter Cavity C1-16
Courtesy of CHRYSLER LLC

Measure the resistance of the (R62) Passenger Squib 2 Line 2 circuit between the Passenger Airbag Squib connector and the 8443-32-R ORC Adapter cavity C1-16.

Is the resistance below 1.0 ohm?

Yes

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Repair the (R62) Passenger Squib 2 Line 2 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. **CHECKING STORED OR INTERMITTENT CODES**

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: **To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.**

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: **To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.**

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B0F-PASSENGER AIRBAG SQUIB 2 CIRCUITS SHORTED TOGETHER

CIRCUIT SCHEMATIC

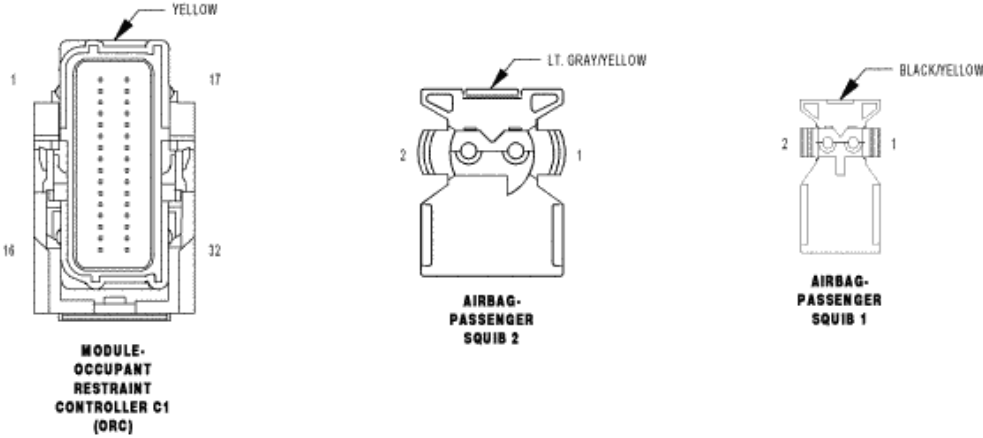
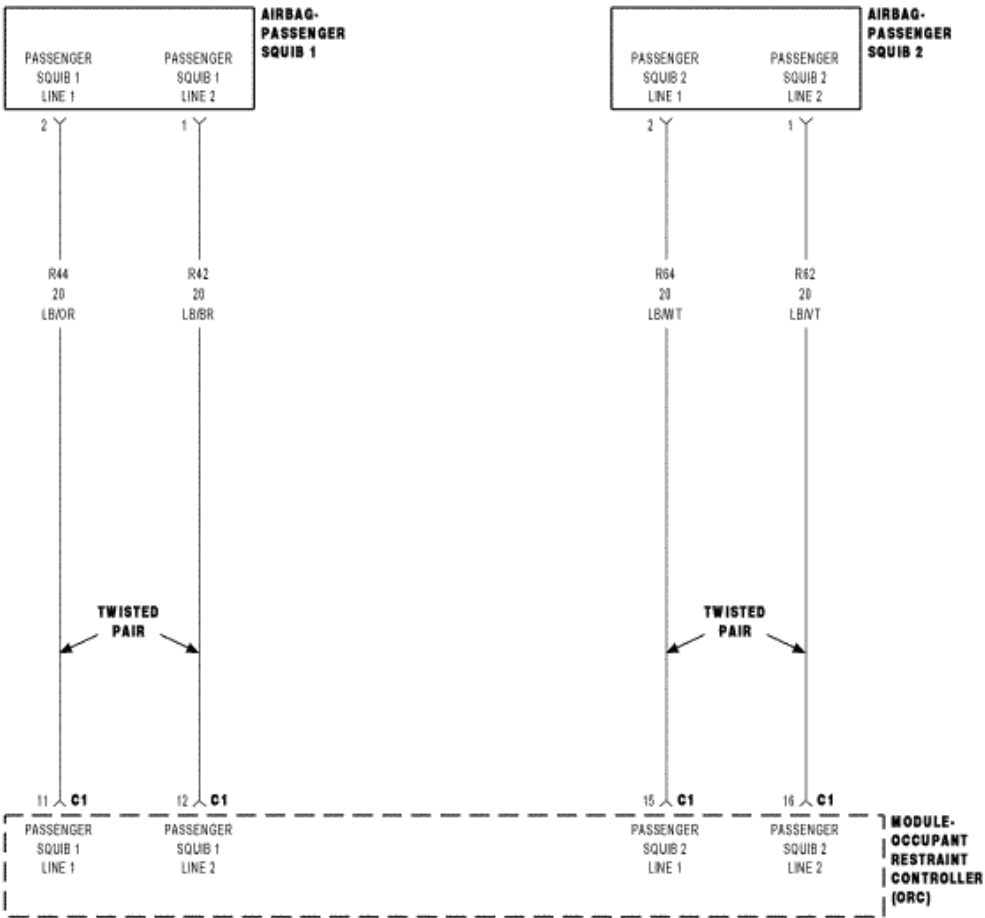


Fig. 58: Passenger Airbag Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:**

The Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Squib 2 circuits. The ORC will set this DTC if it detects low resistance between the Passenger Squib 2 circuits.

POSSIBLE CAUSES

Possible Causes
(R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT SHORTED TO (R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT
PASSENGER AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. DETERMINE ACTIVE OR STORED DTC

NOTE: Ensure that the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Turn the ignition on.

Select ACTIVE or STORED DTC:

ACTIVE DTC

Go To 2.

STORED DTC

Go To 4.

2. CHECK FOR SHORTED SQUIB CIRCUITS IN PASSENGER AIRBAG

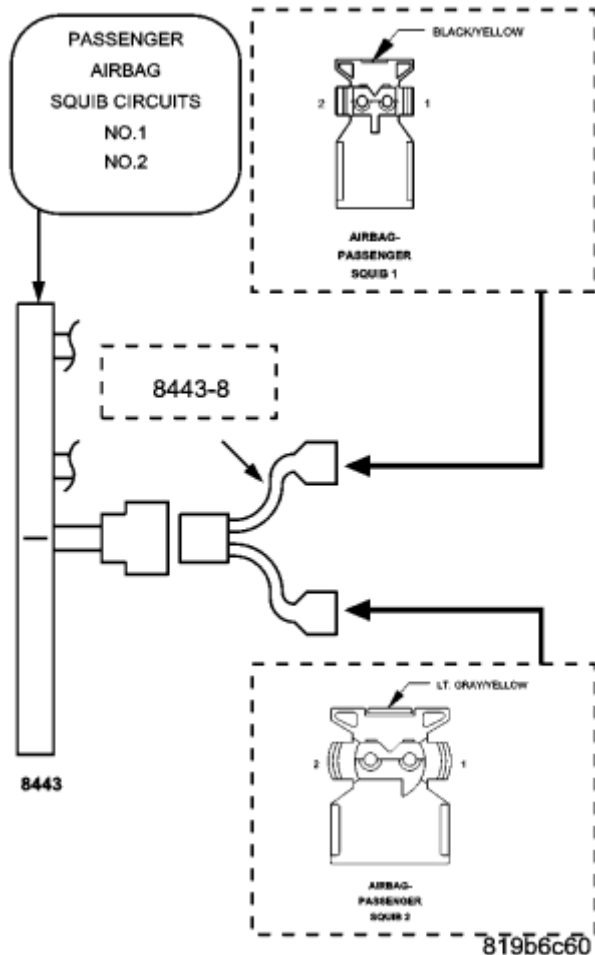


Fig. 59: Checking For Shorted/Open Squib Circuits In Passenger Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-8 Jumper to the Passenger Airbag Squib connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1B0F-PASSENGER AIRBAG SQUIB 2 CIRCUIT SHORTED TOGETHER?

Yes

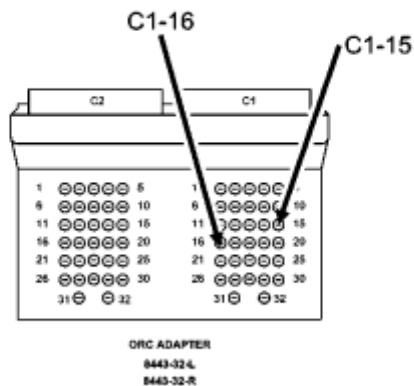
Go To 3.

No

Replace the Passenger Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R64) PASSENGER SQUIB 2 LINE 1 CIRCUIT FOR A SHORT TO (R62) PASSENGER SQUIB 2 LINE 2 CIRCUIT**



819b6bec

Fig. 60: Measuring Resistance Between (R64) Passenger Squib 2 Line 1 Circuit And (R62) Passenger Squib 2 Line 2 Circuit At 8443-32-R Adapter Cavities C1-15 And C1-16
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Airbag Squib connectors.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance between the (R64) Passenger Squib 2 Line 1 circuit and the (R62) Passenger Squib 2 Line 2 circuit at the 8443-32-R Adapter cavities C1-15 and C1-16.

Is the resistance below 10k ohms?

Yes

Repair the (R64) Passenger Squib 2 Line 1 circuit for a short to the (R62) Passenger Squib 2 Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECKING STORED OR INTERMITTENT CODES

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning the vehicle to the customer.

B1B18-LEFT SIDE CURTAIN SQUIB 1 CIRCUIT LOW

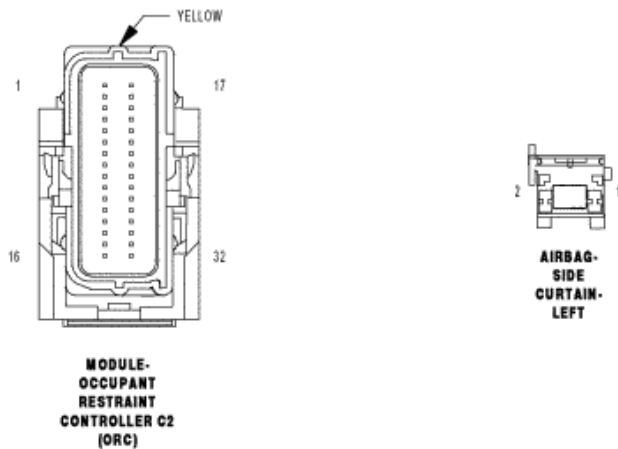
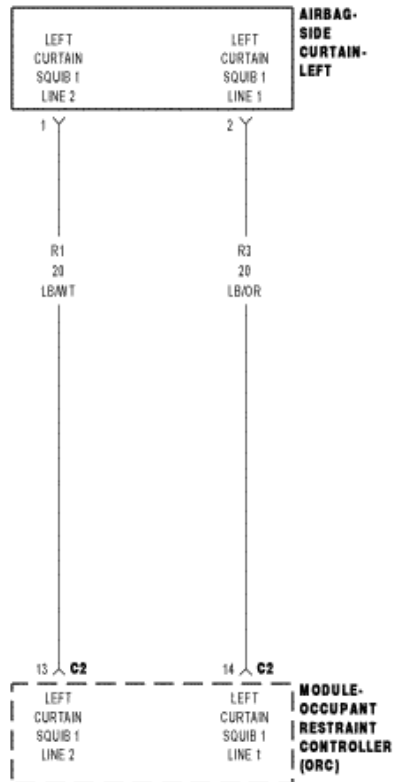


Fig. 61: Left Side Curtain Squib Circuit
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Left Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance of the Left Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO GROUND
(R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT SHORTED TO GROUND
LEFT SIDE CURTAIN AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN LEFT SIDE CURTAIN AIRBAG**

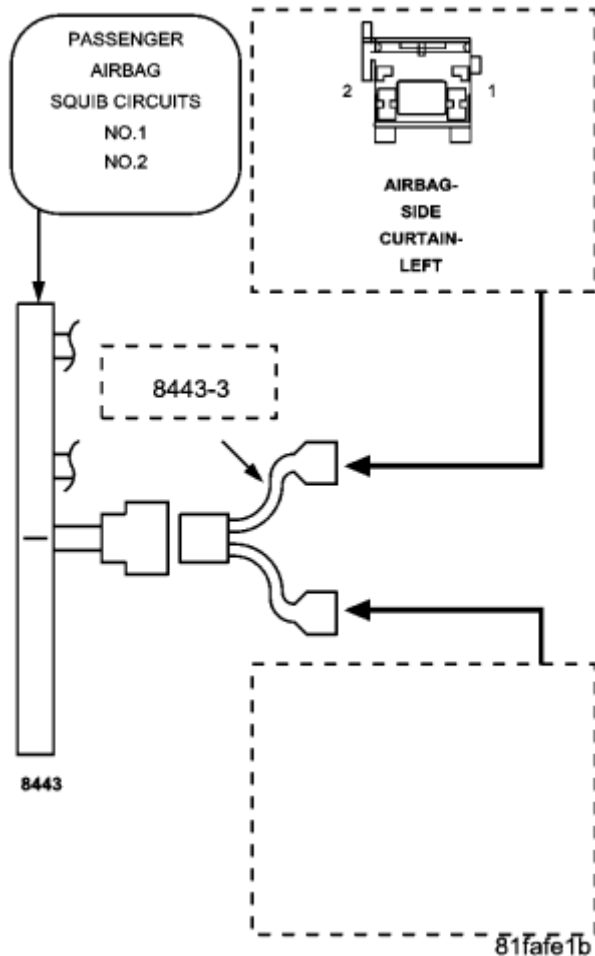


Fig. 62: Checking For Shorted/Open Squib Circuits In Left Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Left Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B18 LEFT SIDE CURTAIN SQUIB 1 CIRCUIT LOW?

Yes

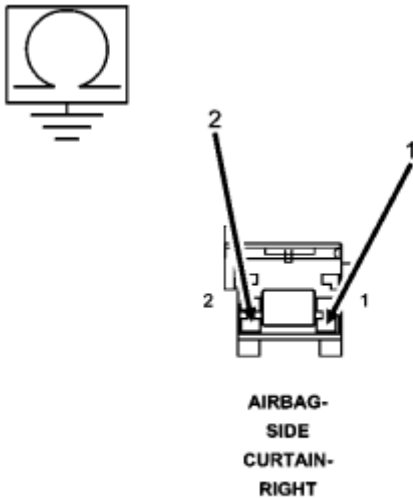
Go To 3.

No

Replace the Left Side Curtain Airbag and pigtail harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT AND (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO GROUND**



81a7aa64

Fig. 63: Measuring Resistance Of (R3/R1) Left Curtain Squib 1 Line 1/2 Circuit Between Ground And Left Side Curtain Airbag Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Left Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R3) Left Curtain Squib 1 Line 1 circuit between ground and the Left Side Curtain Airbag connector.

Measure the resistance of the (R1) Left Curtain Squib 1 Line 2 circuit between ground and the Left Side Curtain Airbag connector.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the Left Curtain Squib 1 circuits with a resistance below 10K ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE OCCUPANT RESTRAINT CONTROLLER (ORC)

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

IF only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

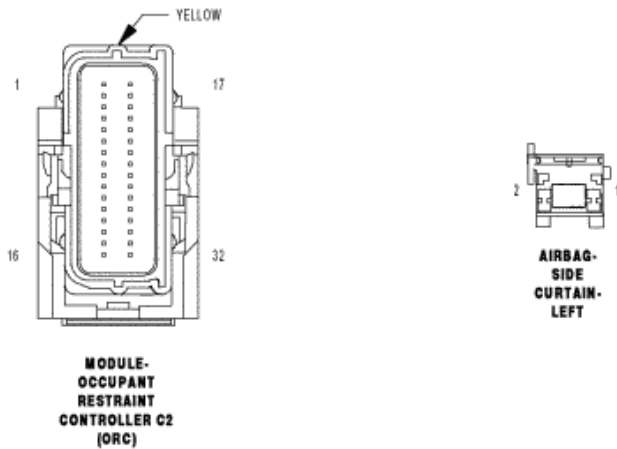
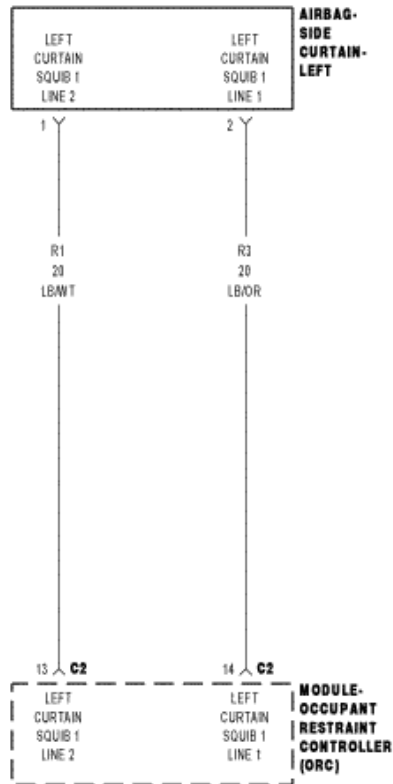
Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B19-LEFT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH



81a7a06

Fig. 64: Left Side Curtain Squib Circuit
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Left Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected voltage on the Left Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO BATTERY (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT SHORTED TO BATTERY LEFT SIDE CURTAIN AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN LEFT SIDE CURTAIN AIRBAG**

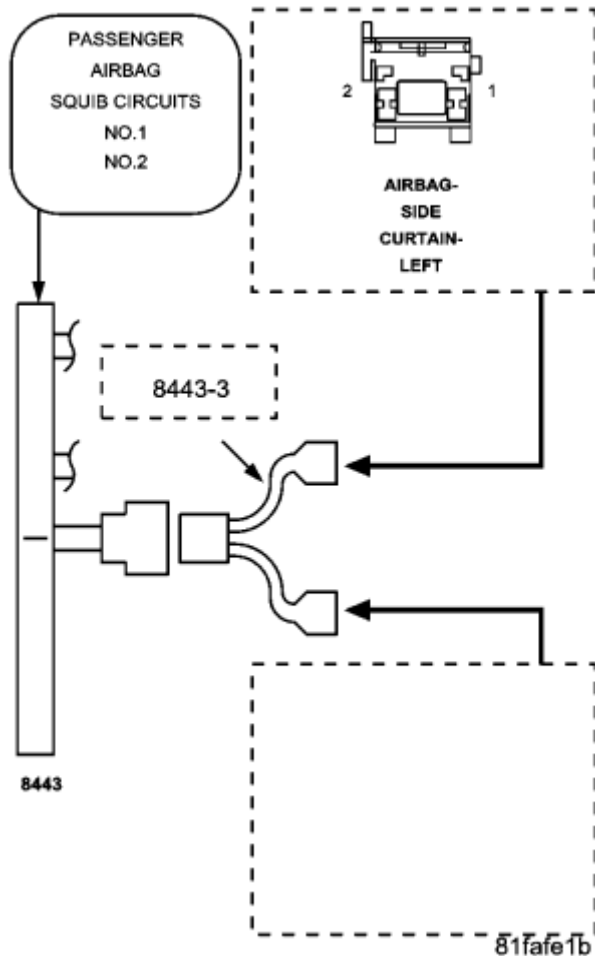


Fig. 65: Checking For Shorted/Open Squib Circuits In Left Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Left Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B19-LEFT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH?

Yes

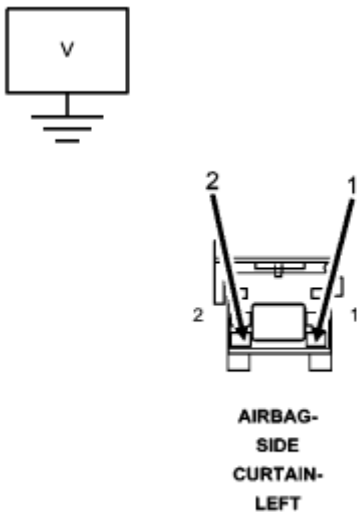
Go To 3.

No

Replace the Left Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT AND (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



81a7aa7a

Fig. 66: Measuring Voltage Of (R3/R1) Left Curtain Squib 1 Line 1/2 Circuit Between Left Side Curtain Airbag Connector And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Left Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R3) Left Curtain Squib 1 Line 1 circuit between the Left Side Curtain Airbag connector and ground.

Measure the voltage of the (R1) Left Curtain Squib 1 Line 2 circuit between the Left Side Curtain Airbag connector and ground.

Is there any voltage present on either circuit?

Yes

Repair the Left Curtain Squib 1 circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off then disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread,

corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B1A-LEFT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN

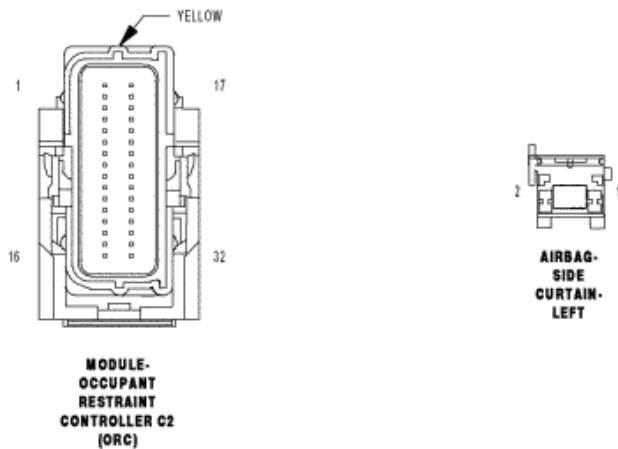
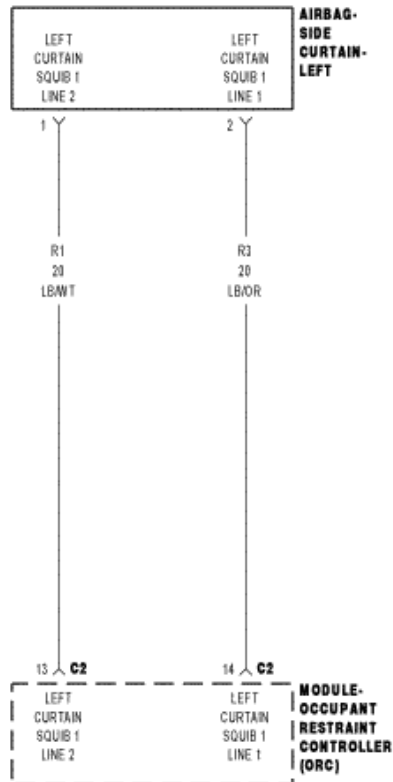


Fig. 67: Left Side Curtain Squib Circuit
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Left Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected an open or high resistance on the Left Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT OPEN (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT OPEN LEFT SIDE CURTAIN AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN LEFT SIDE CURTAIN AIRBAG**

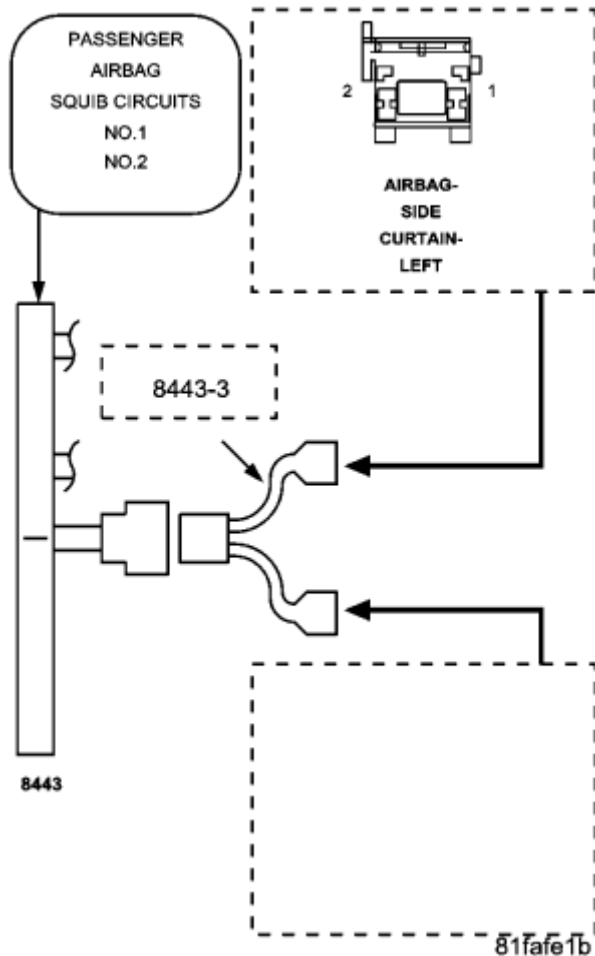


Fig. 68: Checking For Shorted/Open Squib Circuits In Left Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Left Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B1A LEFT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN?

Yes

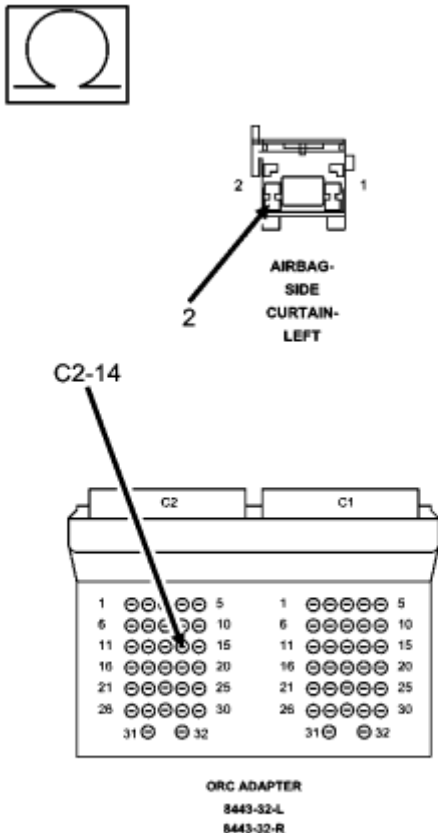
Go To 3.

No

Replace the Left Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK (R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT FOR AN OPEN



81a7ab51

Fig. 69: Measuring Resistance Of (R3) Left Curtain Squib 1 Line 1 Circuit Between Left Side Curtain Airbag Connector And Load Tool ORC 8443-32-R Adapter
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Left Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R3) Left Curtain Squib 1 Line 1 circuit between the Left Side Curtain Airbag connector and the Load Tool ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

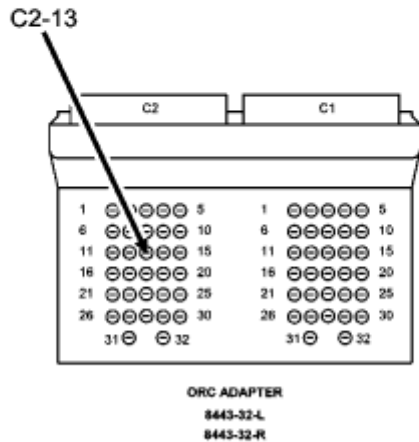
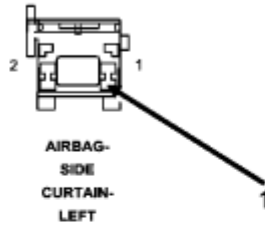
Yes

Go To 4.

No

Repair the (R3) Left Curtain Squib 1 Line 1 circuit for an open. Then, Go To 4.

4. CHECK (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR AN OPEN



81a7aabb

Fig. 70: Measuring Resistance Of (R1) Left Curtain Squib 1 Line 2 Circuit Between Left Side Curtain Airbag Connector And Load Tool ORC 8443-32-R Adapter
Courtesy of CHRYSLER LLC

Measure the resistance of the (R1) Left Curtain Squib 1 Line 2 circuit between the Left Side Curtain Airbag connector and the Load Tool ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R1) Left Curtain Squib 1 Line 2 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it

must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B1B-LEFT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER

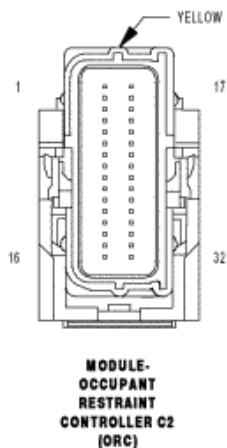
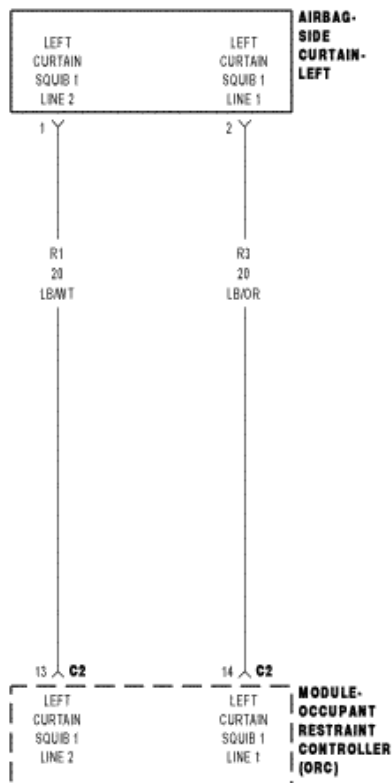


Fig. 71: Left Side Curtain Squib Circuit
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Left Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Left Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT
LEFT SIDE CURTAIN AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: **Ensure the battery is fully charged.**

NOTE: **The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.**

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. CHECK FOR SHORTED SQUIB CIRCUITS IN LEFT SIDE CURTAIN AIRBAG

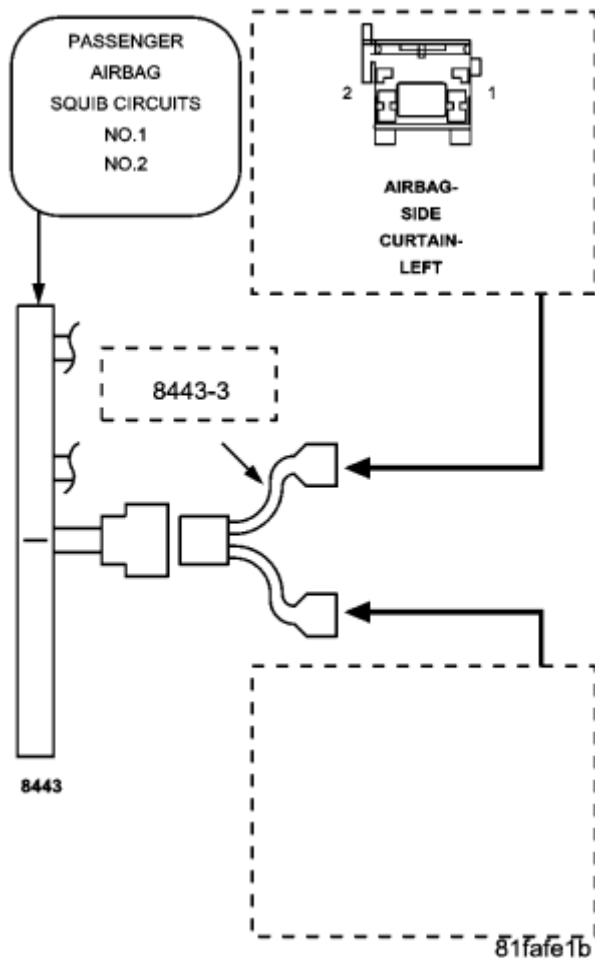


Fig. 72: Checking For Shorted/Open Squib Circuits In Left Side Curtain Airbag
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Left Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B1B LEFT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER?

Yes

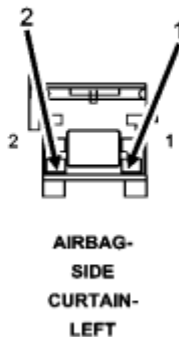
Go To 3.

No

Replace the Left Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R3) LEFT CURTAIN SQUIB 1 LINE 1 CIRCUIT FOR A SHORT TO (R1) LEFT CURTAIN SQUIB 1 LINE 2 CIRCUIT**



81a7abb0

Fig. 73: Measuring Resistance Between (R3) Left Curtain Squib 1 Line 1 Circuit And (R1) Left Curtain Squib 1 Line 2 Circuit At Left Side Curtain Airbag Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Left Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R3) Left Curtain Squib 1 Line 1 circuit and the (R1) Left Curtain Squib 1 Line 2 circuit at the Left Side Curtain Airbag connector.

Is the resistance below 10K ohms?

Yes

Repair the (R3) Left Curtain Squib 1 Line 1 circuit for a short to the (R1) Left Curtain Squib 1 Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

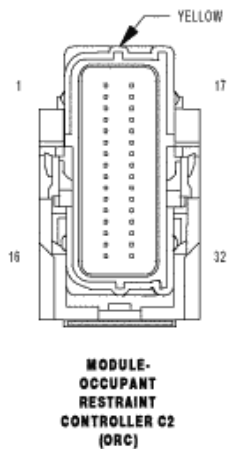
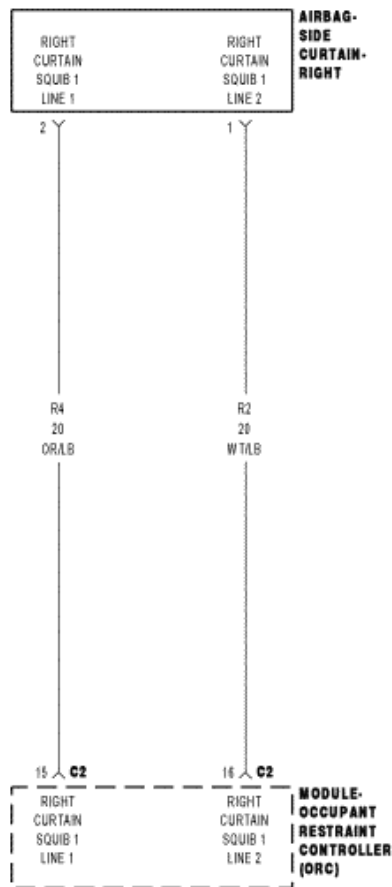
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B20-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT LOW

CIRCUIT SCHEMATIC



81a75a36

Fig. 74: Right Side Curtain Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Right Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance on the Right Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO GROUND
(R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT SHORTED TO GROUND
RIGHT SIDE CURTAIN AIRBAG
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN RIGHT SIDE CURTAIN AIRBAG**

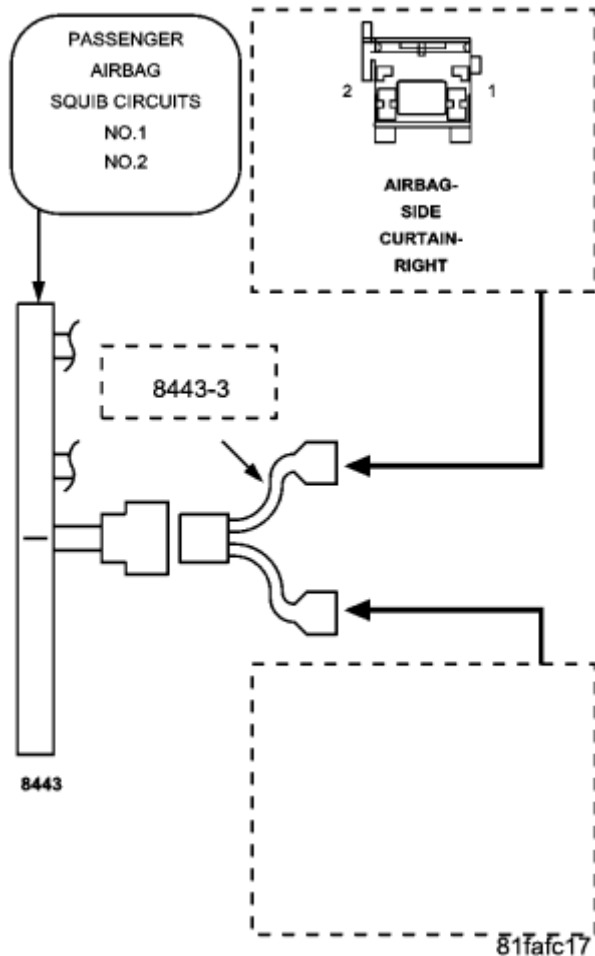


Fig. 75: Checking For Shorted/Open Squib Circuits In Right Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact undeployed curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Right Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B20-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT LOW?

Yes

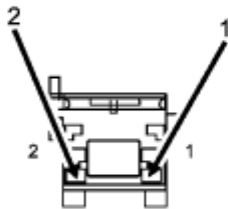
Go To 3.

No

Replace the Right Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT AND (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO GROUND**



**AIRBAG-
SIDE
CURTAIN-
RIGHT**

81a80767

Fig. 76: Measuring Resistance Of (R4) Right Curtain Squib 1 Line 1/2 Circuit Between Ground And Right Side Curtain Airbag Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Right Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R4) Right Curtain Squib 1 Line 1 circuit between ground and the Right Side Curtain Airbag connector.

Measure the resistance of the (R2) Right Curtain Squib 1 Line 2 circuit between ground and the Right Side Curtain Airbag connector.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the Right Curtain Squib 1 circuits with a resistance below 10K ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go to 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

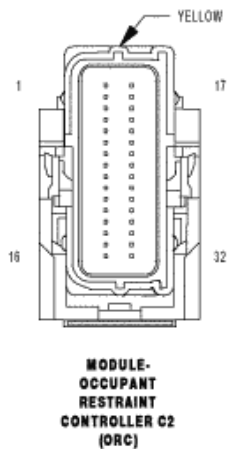
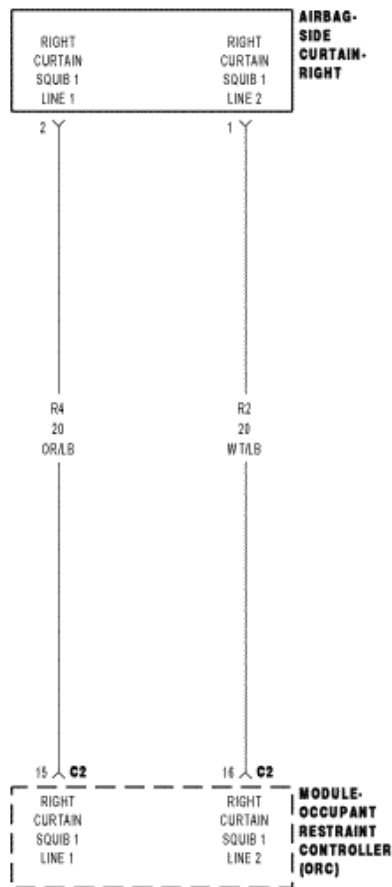
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B21-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH

CIRCUIT SCHEMATIC



01a75a36

Fig. 77: Right Side Curtain Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Right Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

When the ORC detects voltage on the Right Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO BATTERY (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT SHORTED TO BATTERY RIGHT SIDE CURTAIN AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN RIGHT SIDE CURTAIN AIRBAG**

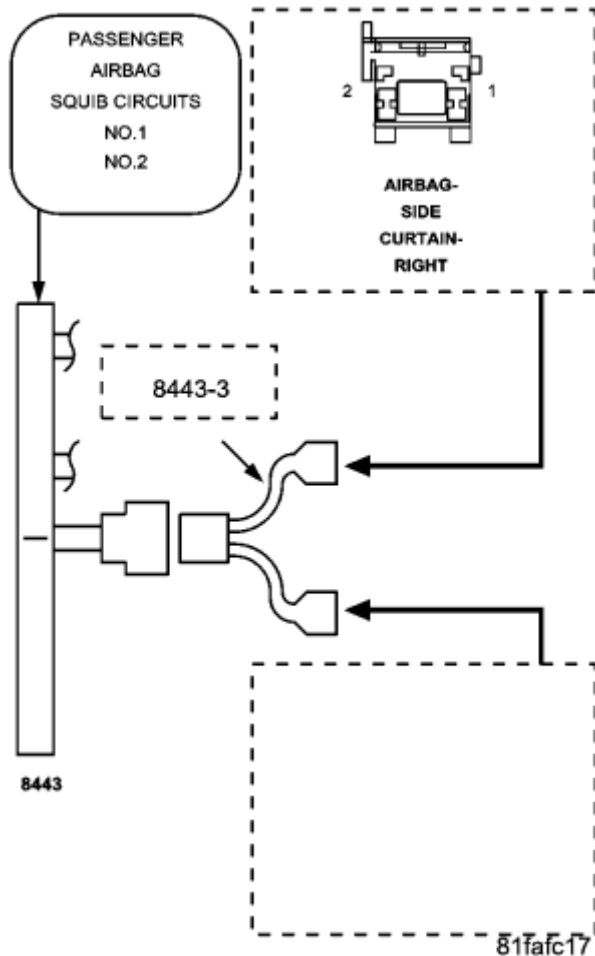


Fig. 78: Checking For Shorted/Open Squib Circuits In Right Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact uncoupled curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Right Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B21 RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT HIGH?

Yes

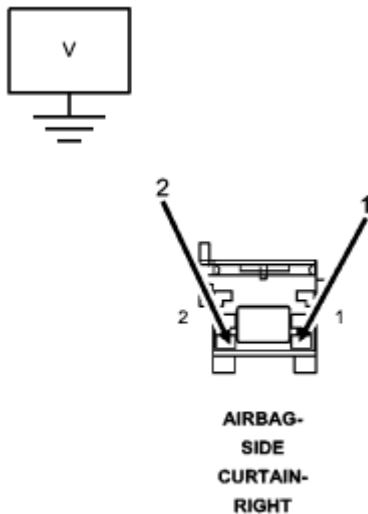
Go To 3.

No

Replace the Right Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT AND (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



81a7ad2a

Fig. 79: Measuring Voltage Of (R4/R2) Right Curtain Squib 1 Line 1/2 Circuit Between Right Side Curtain Airbag Connector And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Right Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R4) Right Curtain Squib 1 Line 1 circuit between the Right Side Curtain Airbag connector and ground.

Measure the voltage of the (R2) Right Curtain Squib 1 Line 2 circuit between the Right Side Curtain Airbag connector and ground.

Is there any voltage present on either circuit?

Yes

Repair the Right Curtain Squib 1 circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go to 4.

4. REPLACE THE ORC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread,

corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

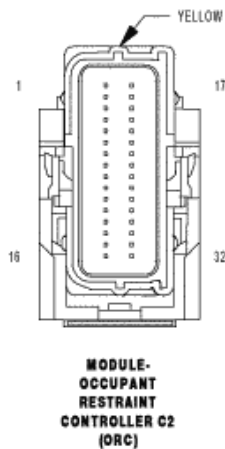
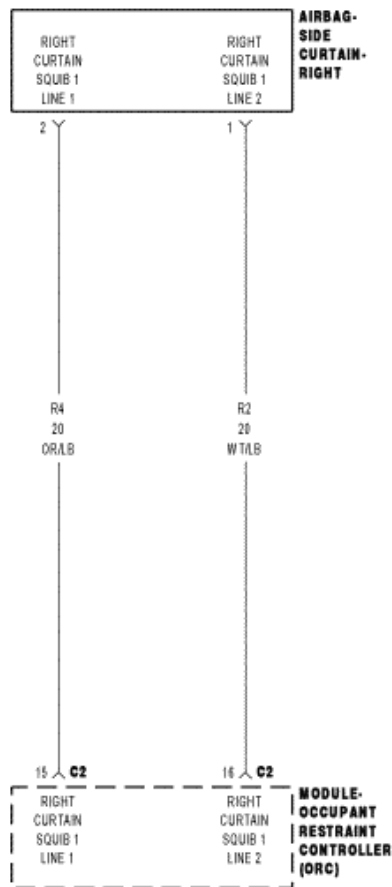
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer

B1B22-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN

CIRCUIT SCHEMATIC



81a75a36

Fig. 80: Right Side Curtain Squib Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Right Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

When the ORC has detects an open or high resistance on the Right Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT OPEN (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT OPEN RIGHT SIDE CURTAIN AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR OPEN SQUIB CIRCUITS IN RIGHT SIDE CURTAIN AIRBAG**

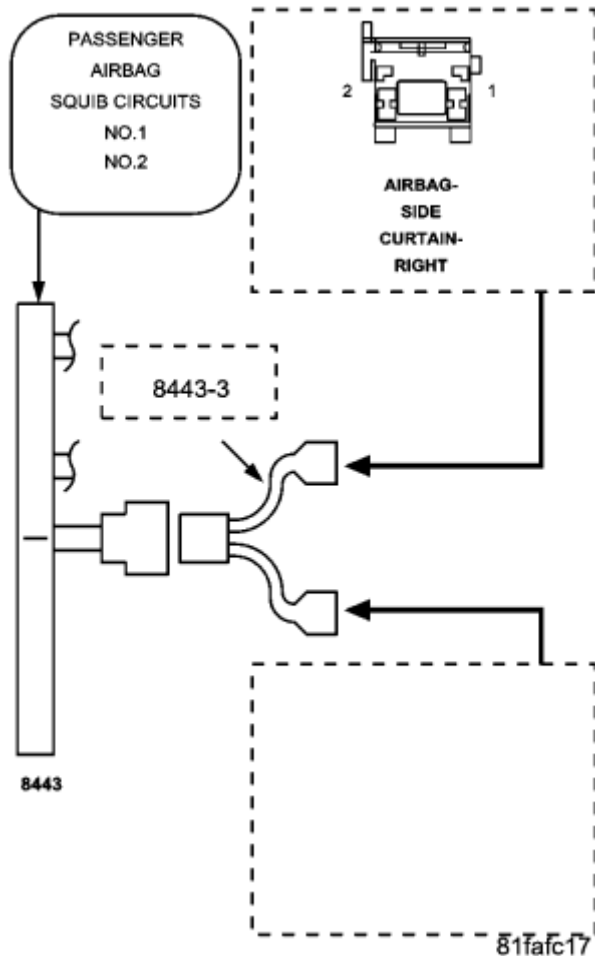


Fig. 81: Checking For Shorted/Open Squib Circuits In Right Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact uncoupled curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Right Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B22 RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT OPEN?

Yes

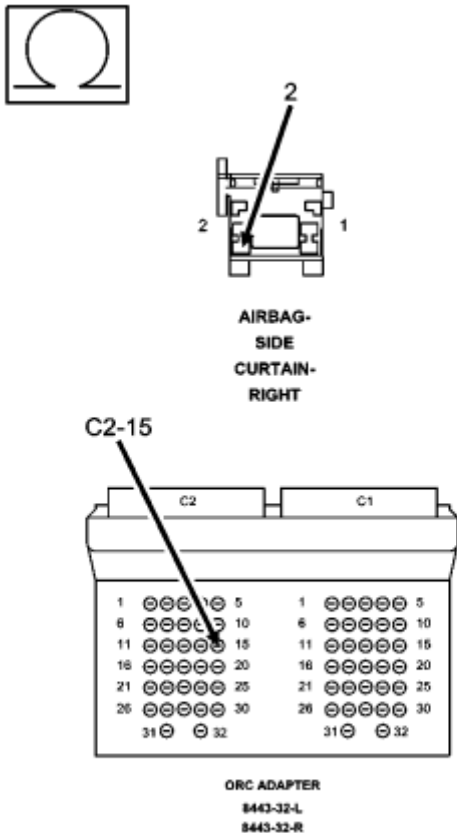
Go to 3.

No

Replace the Right Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. CHECK (R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT FOR AN OPEN



81a7acb4

Fig. 82: Measuring Resistance Of (R4) Right Curtain Squib 1 Line 1 Circuit Between Right Side Curtain Airbag Connector And ORC 8443-32-R Adapter
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Right Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R4) Right Curtain Squib 1 Line 1 circuit between the Right Side Curtain Airbag connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

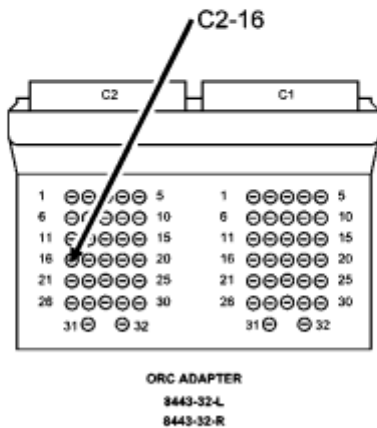
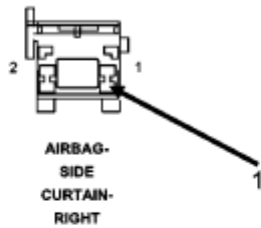
Yes

Go To 4.

No

Repair the (R4) Right Curtain Squib 1 Line 1 circuit for an open. Then, Go To 4.

4. CHECK (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT FOR AN OPEN



81a7ad0b

Fig. 83: Measuring Resistance Of (R2) Right Curtain Squib 1 Line 2 Circuit Between Right Side Curtain Airbag Connector And ORC 8443-32-R Adapter
Courtesy of CHRYSLER LLC

Measure the resistance of the (R2) Right Curtain Squib 1 Line 2 circuit between the Right Side Curtain Airbag connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R2) Right Curtain Squib 1 Line 2 circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it

must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

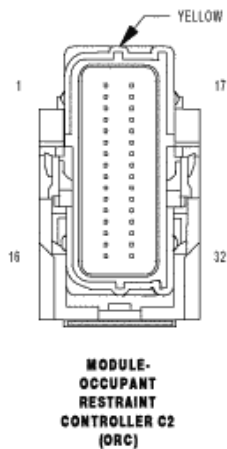
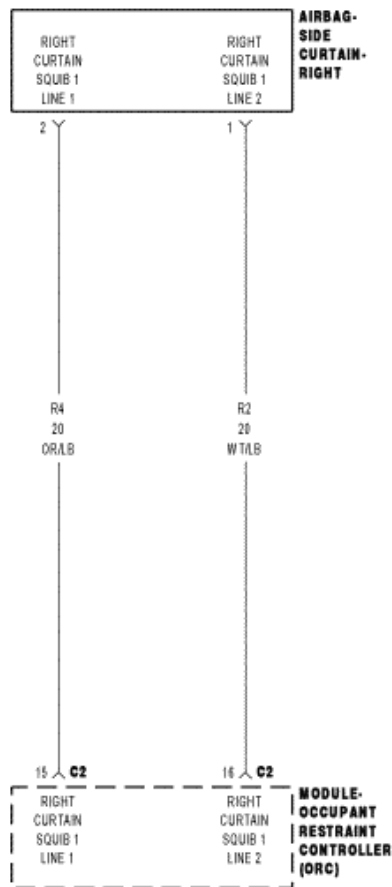
Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B23-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER
CIRCUIT SCHEMATIC



81a75a36

Fig. 84: Right Side Curtain Squib Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Right Curtain Squib 1 circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Right Curtain Squib 1 circuits.

POSSIBLE CAUSES

Possible Causes
(R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT SHORTED TO (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT RIGHT SIDE CURTAIN AIRBAG OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED SQUIB CIRCUITS IN RIGHT SIDE CURTAIN AIRBAG**

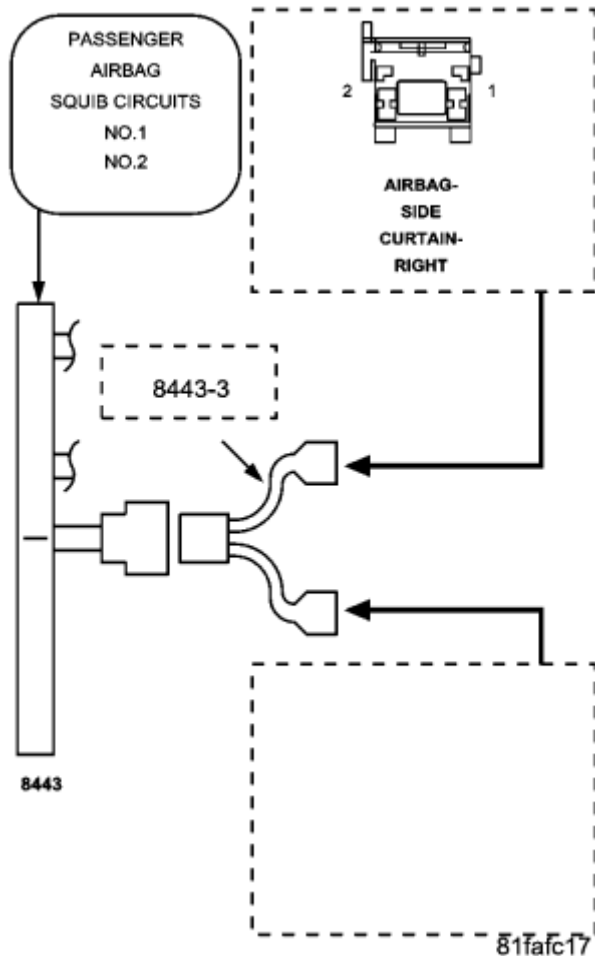


Fig. 85: Checking For Shorted/Open Squib Circuits In Right Side Curtain Airbag
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Curtain Airbag connector located in the "D" post.

WARNING: To avoid serious or fatal injury, do not place an intact uncoupled curtain airbag face down on a hard surface, the airbag will propel into the air if accidentally deployed.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-3 Jumper to the Right Side Curtain Airbag connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1B23-RIGHT SIDE CURTAIN SQUIB 1 CIRCUIT SHORTED TOGETHER?

Yes

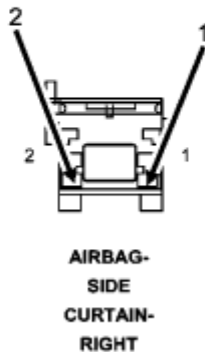
Go to 3.

No

Replace the Right Side Curtain Airbag in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. **CHECK (R4) RIGHT CURTAIN SQUIB 1 LINE 1 CIRCUIT FOR A SHORT TO (R2) RIGHT CURTAIN SQUIB 1 LINE 2 CIRCUIT**



81a7ad12

Fig. 86: Measuring Resistance Between (R4) Right Curtain Squib 1 Line 1 Circuit And (R2) Right Curtain Squib 1 Line 2 Circuit At Right Side Curtain Airbag Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Right Side Curtain Airbag connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R4) Right Curtain Squib 1 Line 1 circuit and the (R2) Right Curtain Squib 1 Line 2 circuit at the Right Side Curtain Airbag connector.

Is the resistance below 10K ohms?

Yes

Repair the (R4) Right Curtain Squib 1 Line 1 circuit for a short to the (R2) Right Curtain Squib 1 Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go to 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B54-1ST ROW PASSENGER SEAT BELT SENSOR CIRCUIT LOW

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

When powered, the Occupant Restraint Controller (ORC) sends a test current to the belt switches to verify the integrity of the switch and wiring. The use of the ORC connector adapter tool in the tests below provides a test point in place of the module.

SET CONDITIONS

- **Set Condition:**

The ORC monitors the status of the seat belt switch circuits at power up and every 60 ms thereafter while the ignition is in on.

This DTC sets when the ORC detects the seat belt switch circuits have become shorted to ground for more than 2.5 seconds. This DTC transitions from active to stored when the module sees a recovery from the shorted to ground condition for greater than 5 seconds.

POSSIBLE CAUSES

Possible Causes
(R58) PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT SHORTED TO GROUND OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. DETERMINE ACTIVE OR STORED DTC

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read all active ORC DTCs.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Perform *RESTRAINTS SYSTEM INTERMITTENT TEST. Refer to **STANDARD PROCEDURE** .

2. PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT SHORTED TO GROUND

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Switch connector.

Disconnect the ORC connector.

NOTE: **Check connectors - Clean and repair as necessary.**

Connect the Load Tool ORC 8443-28 Adapter to the ORC connectors.

Measure the resistance of the (R58) Passenger Seat Belt Switch Signal circuit between the Load Tool ORC 8443-28 Adapter and ground.

Is the resistance below 10.0 Ohms?

Yes

Repair or replace the (R58) Passenger Seat Belt Switch Signal circuit for a short to ground in accordance with the Service Information.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Replace the ORC in accordance with the Service Information.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

B1B55-1ST ROW PASSENGER SEAT BELT SENSOR CIRCUIT HIGH

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

THEORY OF OPERATION

When powered, the Occupant Restraint Controller (ORC) sends a test current to the belt switches to verify the integrity of the switch and wiring. The use of the ORC connector adapter tool in the tests below provides a test point in place of the module.

MONITOR CONDITIONS

When Monitored:

The ORC monitors the status of the seat belt switch circuits at power up and every 60 ms thereafter while the ignition is in on.

SET CONDITIONS

• Set Condition:

This DTC sets when the ORC detects the seat belt switch circuits have become shorted to voltage for more than 2.5 seconds. This DTC transitions from active to stored when the module sees a recovery from the shorted to voltage condition for greater than 5 seconds.

POSSIBLE CAUSES

Possible Causes

(R58) PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT SHORTED TO VOLTAGE
(R60) PASSENGER SEAT BELT SWITCH GROUND CIRCUIT SHORTED TO VOLTAGE
(R58) PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT OPEN
(R60) PASSENGER SEAT BELT SWITCH GROUND CIRCUIT OPEN
PASSENGER SEAT BELT SWITCH
OCCUPANT RESTRAINT CONTROLLER (ORC)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

DIAGNOSTIC TEST

1. DETERMINE ACTIVE OR STORED DTC

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

With the scan tool, read all active ORC DTCs.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Perform *RESTRAINTS SYSTEM INTERMITTENT TEST. Refer to **STANDARD PROCEDURE** .

2. CHECK FOR ADDITIONAL ACTIVE SENSOR DTCS

Turn the ignition on.

With the scan tool, read all active ORC DTCs.

Are DTCs B1B8E-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH and B1B94-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH active?

Yes

Repair the (Z908) Ground circuit for an open.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

No

Go To 3.

3. **(R58) PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT SHORTED TO VOLTAGE**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Switch connector.

Disconnect the ORC connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-28 Adapter to the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R58) Passenger Seat Belt Switch Signal circuit between the Load Tool ORC 8443-28 Adapter and ground.

Is there any voltage present on the circuit?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Repair the (R58) Passenger Seat Belt Switch Signal circuit for a short to battery.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

No

Go To 4.

4. **(R60) PASSENGER SEAT BELT SWITCH GROUND CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage of the (R60) Passenger Seat Belt Switch Ground circuit between the Load Tool ORC 8443-28 Adapter and ground.

Is there any voltage present on the circuit?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect

the battery and wait two minutes before proceeding.

Repair or replace the (R60) Passenger Seat Belt Switch Ground circuit for a short to battery in accordance with the Service Information.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

No

Go To 5.

5. (R58) PASSENGER SEAT BELT SWITCH SIGNAL CIRCUIT FOR AN OPEN

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Switch connector.

Disconnect the ORC connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-28 Adapter to the ORC connectors.

Measure the resistance of the (R58) Passenger Seat Belt Switch Signal circuit between the Passenger Seat Belt Switch connector and the 8443 ORC Adapter.

Is the resistance below 1.0 ohm?

Yes

Go to 6.

No

Repair or replace the (R58) Passenger Seat Belt Switch Signal circuit in accordance with the Service Information. Then, Go to 6.

6. (R60) PASSENGER SEAT BELT SWITCH GROUND CIRCUIT FOR AN OPEN

Measure the resistance of the (R60) Passenger Seat Belt Switch Ground circuit between the Passenger Seat Belt Switch connector and the Load Tool ORC 8443-28 Adapter.

Is the resistance below 1.0 ohm?

Yes

Go to 7.

No

Repair or replace the (R60) Passenger Seat Belt Switch Ground in accordance with the Service Information.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

7. CHECK OPERATION OF THE 1st ROW PASSENGER SEAT BELT SWITCH

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the 1st Row Passenger Seat Belt Switch.

Reconnect the vehicle body harness to the switch.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase all codes in the ORC.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active B1B56-1st ROW PASSENGER SEAT BELT SENSOR CIRCUIT OPEN DTC return?

Yes

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the ORC in accordance with the Service Information.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

No

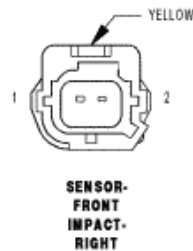
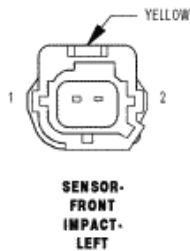
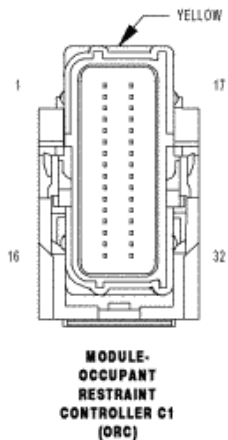
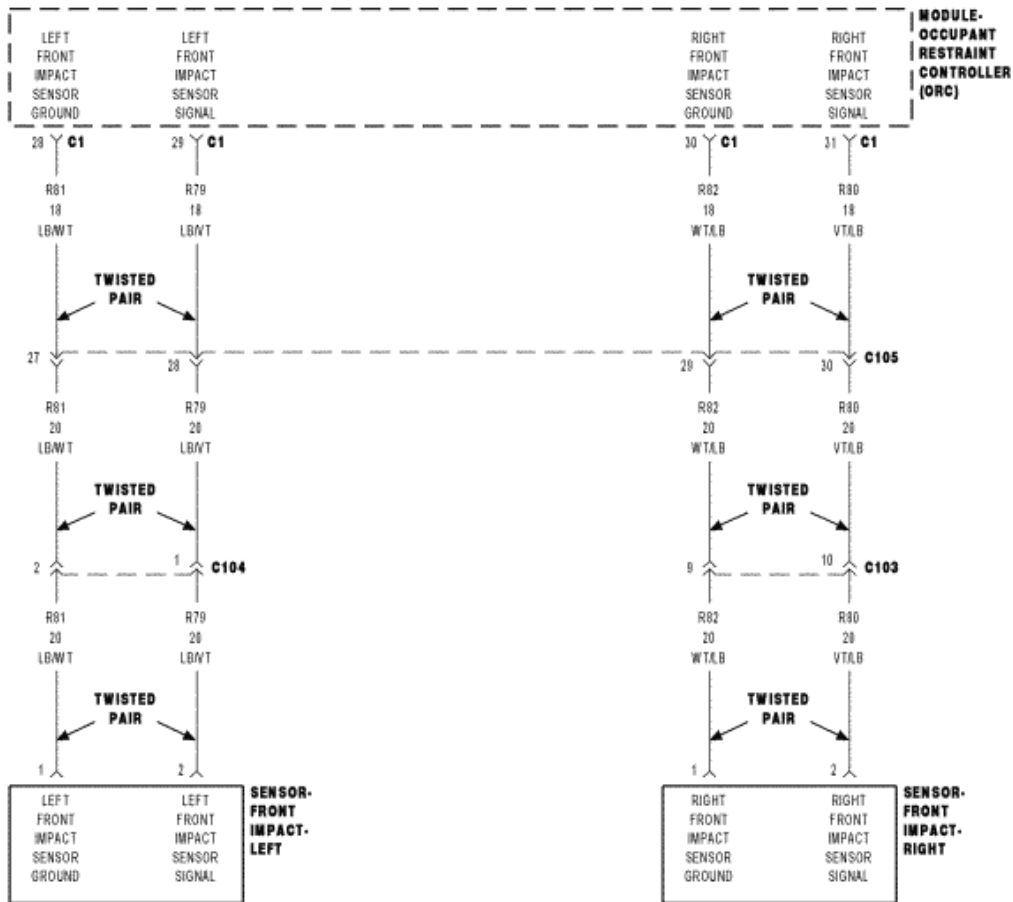
Repair is complete.

Perform **VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM** .

2008 RESTRAINTS

Electrical Diagnostics - Liberty

B1B70-UP-FRONT LEFT SATELLITE ACCELERATION SENSOR INTERNAL CIRCUIT SCHEMATIC



01954000

Fig. 1: Front Left/Right Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Front Left Impact Sensor is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Front Left Impact Sensor Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Front Left Impact Sensor.

POSSIBLE CAUSES

Possible Causes
FRONT LEFT IMPACT SENSOR OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

Wait one minute, and read active codes.

Is the DTC: B1B70-UP-FRONT LEFT SATELLITE ACCELERATION SENSOR INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE FRONT LEFT IMPACT SENSOR**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Front Left Impact Sensor.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B70-UP-FRONT LEFT SATELLITE ACCELERATION SENSOR INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B71-UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR INTERNAL

CIRCUIT SCHEMATIC

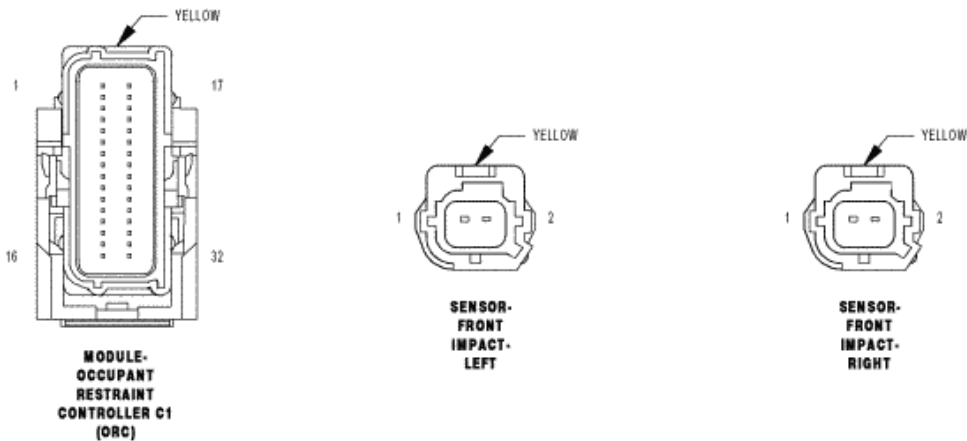
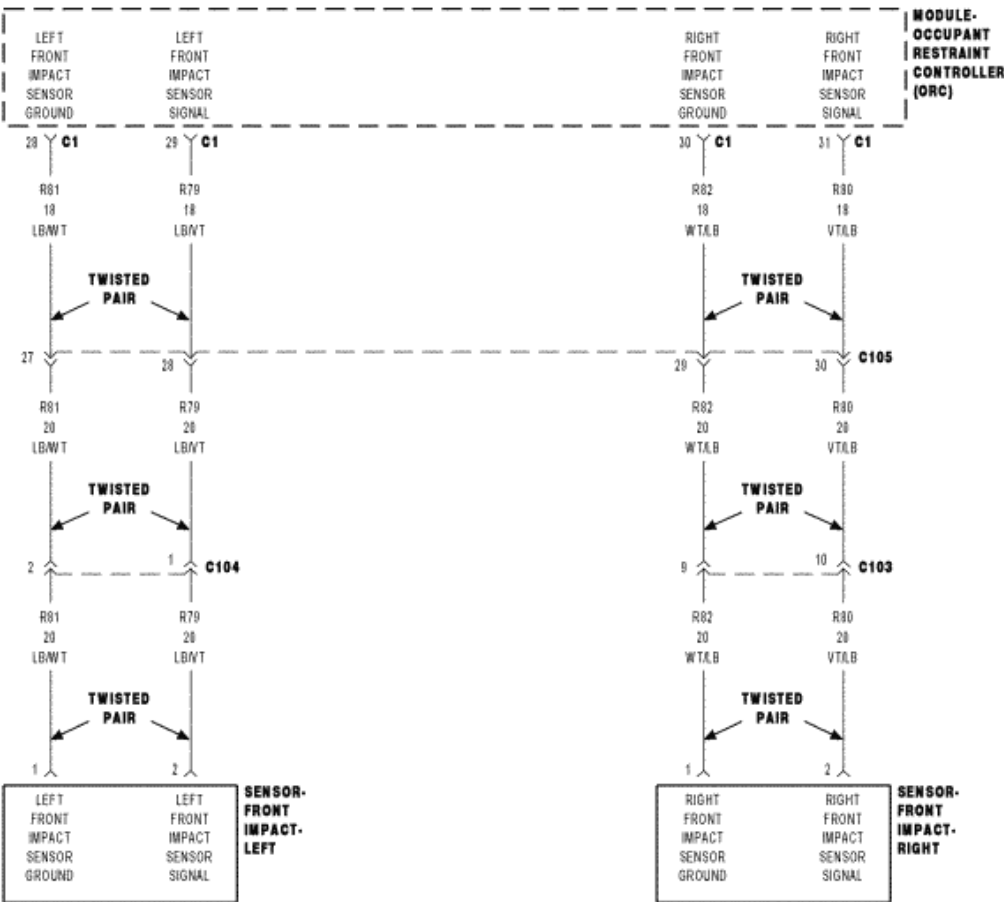


Fig. 2: Front Left/Right Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Front Right Impact Sensor is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Front Right Impact Sensor Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Front Right Impact Sensor.

POSSIBLE CAUSES

Possible Causes
FRONT RIGHT IMPACT SENSOR OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

Is the DTC: B1B71-UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE FRONT RIGHT IMPACT SENSOR**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Front Right Impact Sensor.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B71-UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

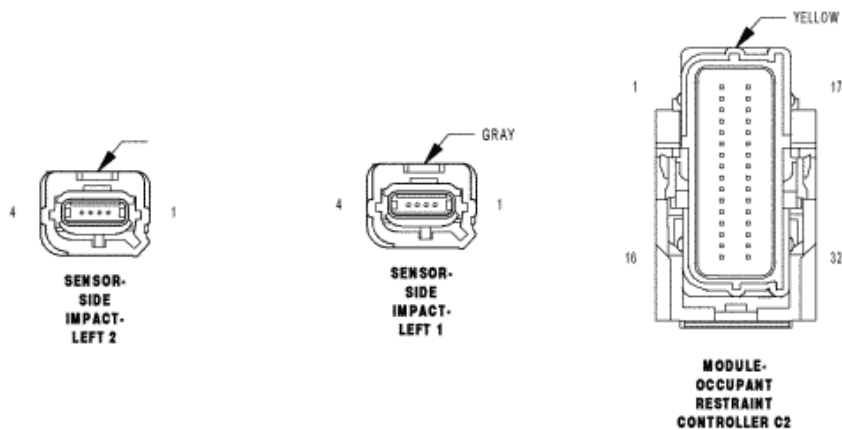
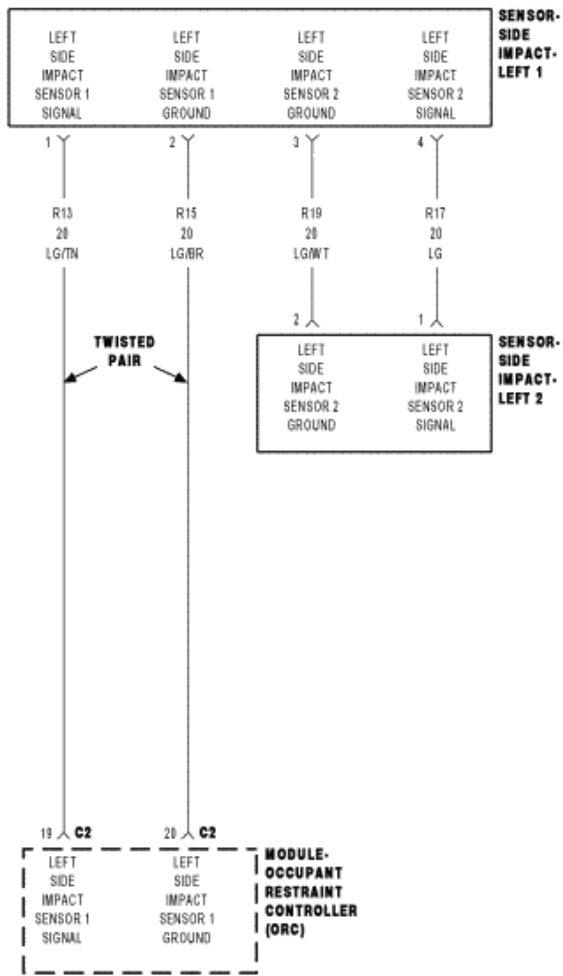
Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B72-LEFT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL

CIRCUIT SCHEMATIC



81a575c2

Fig. 3: Left Side Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Left Side Impact Sensor 1 is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Left Side Impact Sensor 1 Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Left Side Impact Sensor 1.

POSSIBLE CAUSES

Possible Causes
LEFT SIDE IMPACT SENSOR 1 OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

Turn the ignition on.

NOTE: **Ensure the battery is fully charged.**

IS the DTC: B1B72-LEFT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE LEFT SIDE IMPACT SENSOR 1.**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Left Side Impact Sensor 1.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B72-LEFT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B73-LEFT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Left Side Impact Sensor 2 is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Left Side Impact Sensor 2 Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Left Side Impact Sensor 2.

POSSIBLE CAUSES

Possible Causes
LEFT SIDE IMPACT SENSOR 2 OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

Is the DTC: B1B73-LEFT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE LEFT SIDE IMPACT SENSOR**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Left Side Impact Sensor 2.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B73-LEFT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

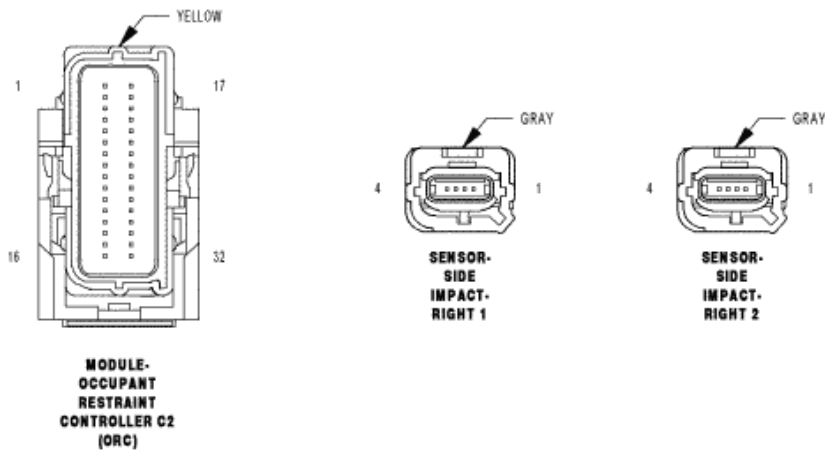
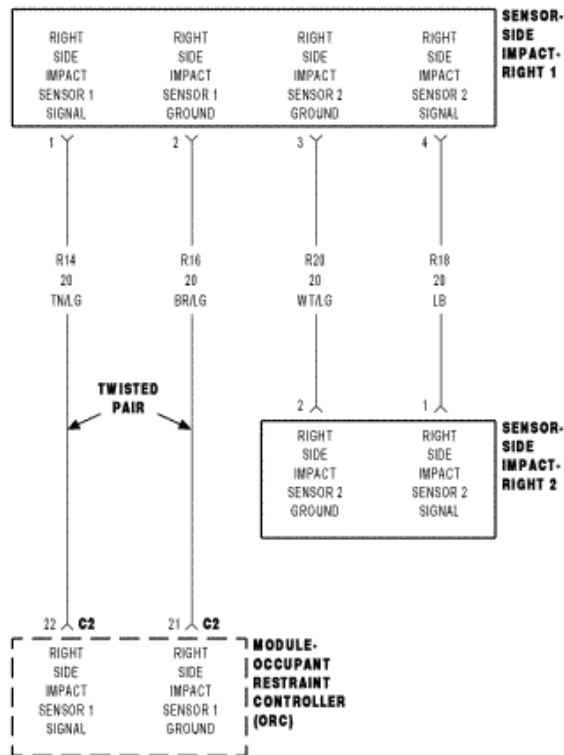
Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B75-RIGHT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL CIRCUIT SCHEMATIC



01a57557

Fig. 4: Right Side Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Right Side Impact Sensor 1 is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Right Side Impact Sensor 1 Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Right Side Impact Sensor 1.

POSSIBLE CAUSES

Possible Causes
RIGHT SIDE IMPACT SENSOR 1 OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

Is the DTC: B1B75-RIGHT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE RIGHT SIDE IMPACT SENSOR**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Right Side Impact Sensor 1.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B75-RIGHT SIDE SATELLITE ACCELERATION SENSOR 1 INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

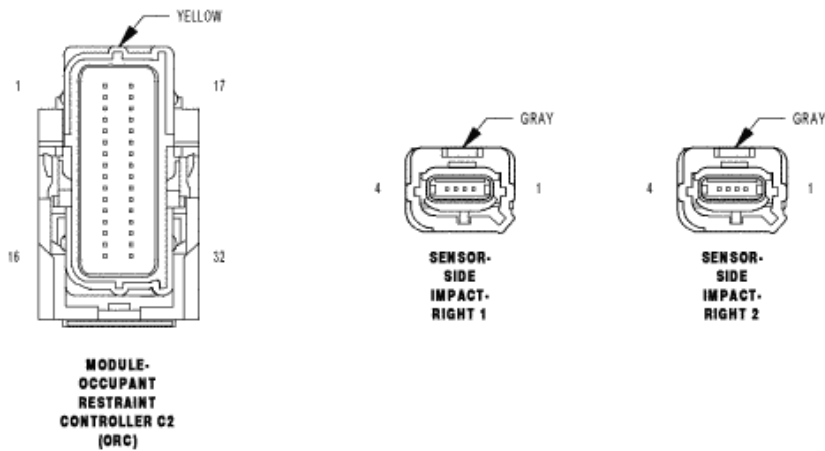
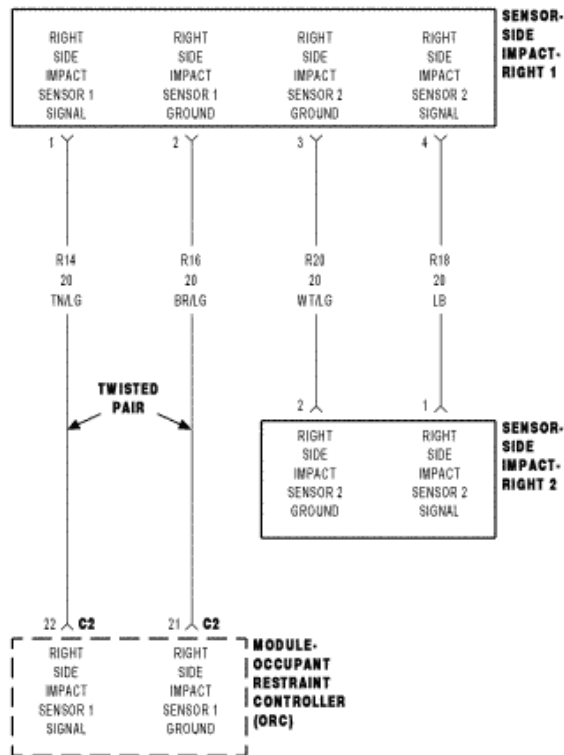
Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B76-RIGHT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL CIRCUIT SCHEMATIC



01a57557

Fig. 5: Right Side Satellite Acceleration Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Right Side Impact Sensor 2 is equipped with on board diagnostics to monitor to sensor's internal circuits. If a problem is identified, the sensor sends the Right Side Impact Sensor 2 Internal message to the Occupant Restraint Controller (ORC).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC receives an internal DTC from the Right Side Impact Sensor 2.

POSSIBLE CAUSES

Possible Causes
RIGHT SIDE IMPACT SENSOR 2 OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED FAULT CODE**

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

Is the DTC: B1B76-RIGHT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL active?

Yes

Go To 2.

No

Go To 4.

2. **VERIFY OPERATION OF THE RIGHT SIDE IMPACT SENSOR 2**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Right Side Impact Sensor 2.

Reconnect the vehicle wire harness to the sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes.

Did the active DTC: B1B76-RIGHT SIDE SATELLITE ACCELERATION SENSOR 2 INTERNAL return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

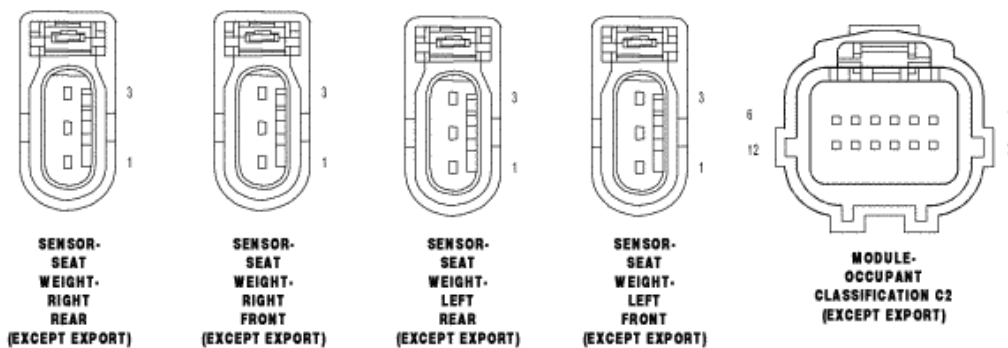
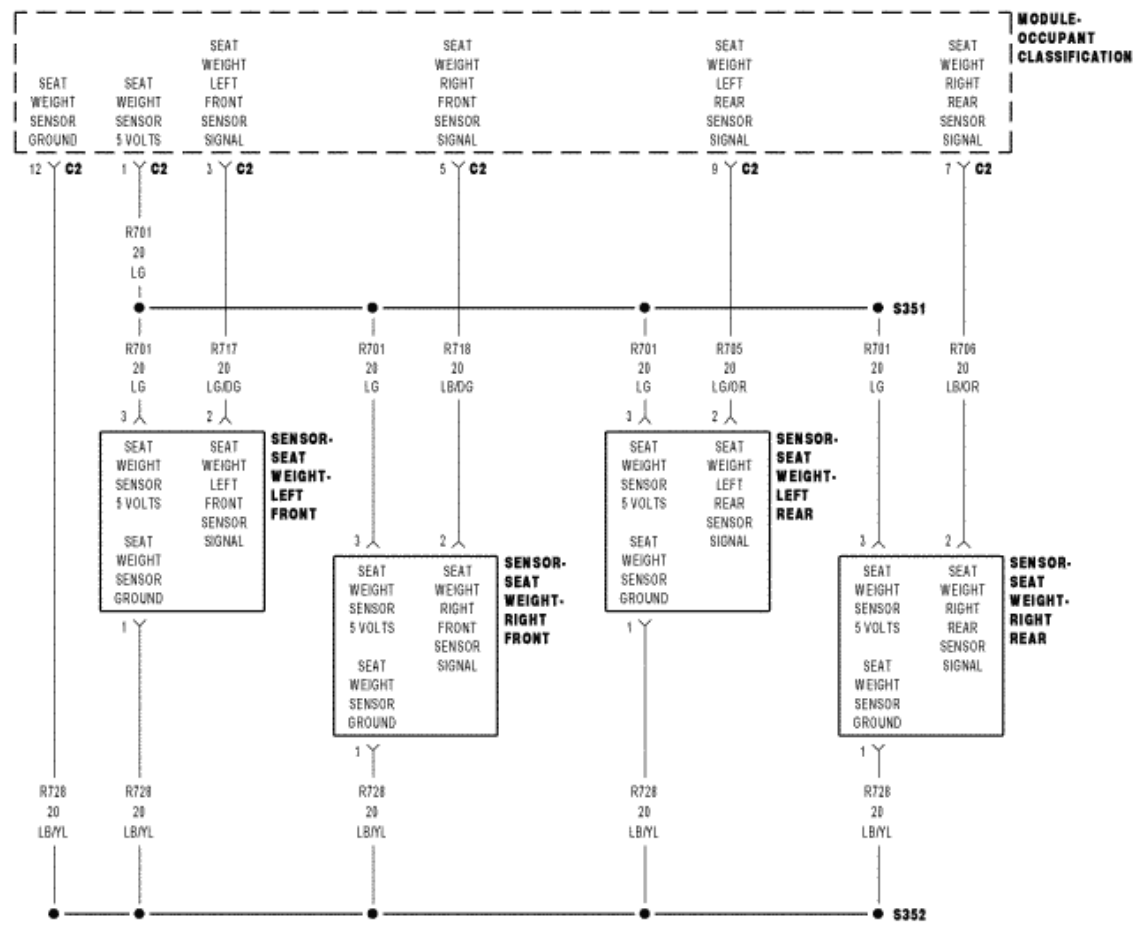
Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B78-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT PERFORMANCE

CIRCUIT SCHEMATIC



8189c07

Fig. 6: Passenger Seat Weight Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

When CAN ignitions status is Run or Signal Not Available (SNA), during auto zero and while performing the Occupant Classification Module System Verification Test.

SET CONDITIONS

- **Set Condition:**

During the Occupant Classification Module system verification test: if the module detects that the sensor input is less than 1.4 volts or greater than 3.6 volts. During auto zero: if the module detects that the sensor input is less than 1 volt or greater than 4 volts.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED LEFT-FRONT PASSENGER SEAT WEIGHT SENSOR DAMAGE TO THE PASSENGER SEAT STRUCTURE, RISER ASSEMBLY, CROSSMEMBERS, SEAT TRACKS, FLOOR PAN OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC B1B78-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT PERFORMANCE IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B78-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT PERFORMANCE?

Yes

Go To 3.

No

Go To 6.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Are any of these conditions present?

Yes

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 4.

4. **PERFORM THE OCM VERIFICATION TEST**

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

5. **PERFORM SEAT WEIGHT SENSOR VERIFICATION TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to SEAT WEIGHT SENSOR for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all

tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR PERFORMANCE?

Yes

Perform ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS** .

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

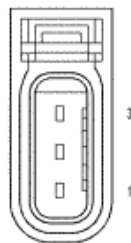
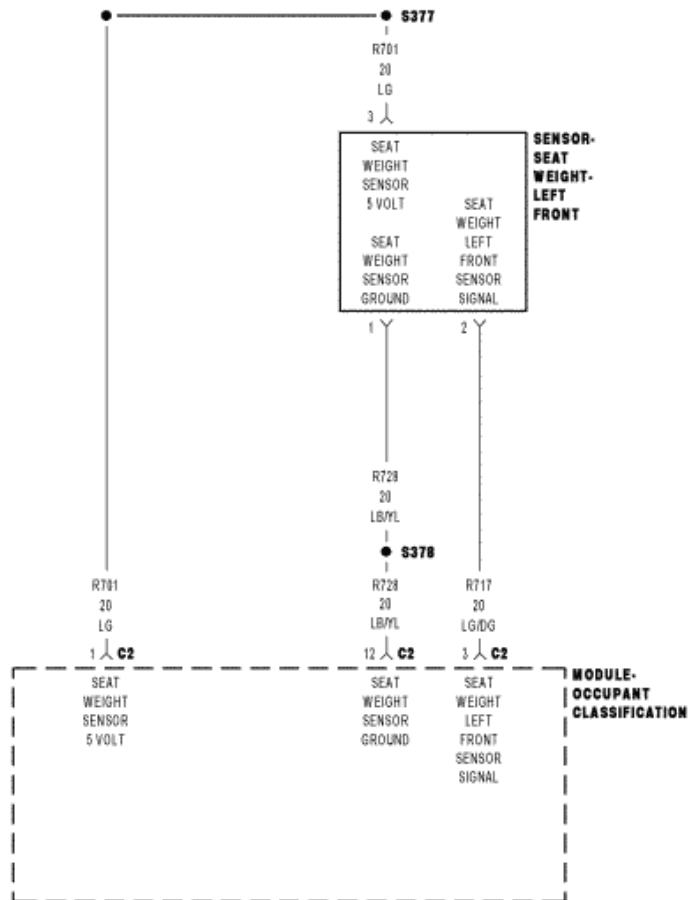
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

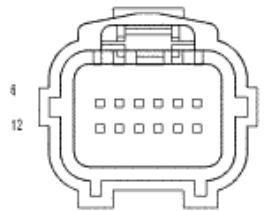
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
LEFT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

01025101

Fig. 7: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects that the sensor input is less than $3.4 \pm 6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. This DTC will also set if the (R701) Seat Weight Sensor 5 Volt circuit is shorted to ground. However, this condition would prevent communication with the OCM and cause a Lost Communication With OCM DTC to set in other modules. Also, this DTC will remain active after the condition that set this fault is no longer present. This condition is referred to as latching the DTC for the ignition cycle. Cycling the ignition key will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
ACTIVE B1B79 DTC AND B1B7A DTC AT THE SAME TIME
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
(R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT OPEN
(R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT OPEN
LEFT-FRONT SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW IS ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW?

Yes

Go To 3.

No

Go To 10.

3. VERIFY THAT B1B7A-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH DTC AND B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW DTC ARE ACTIVE AT THE SAME TIME

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7A-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH AND B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW AT THE SAME TIME?

Yes

Perform B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH diagnostic test.

No

Go To 4.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Are any of these conditions present?

Yes

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

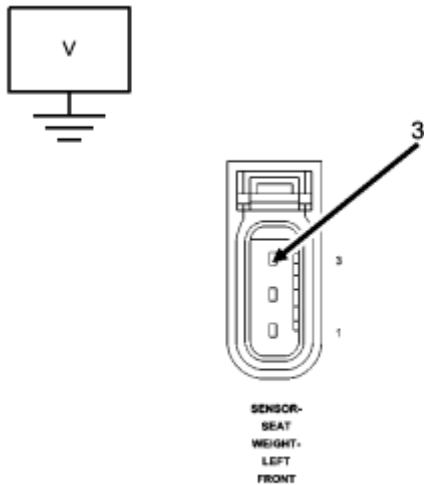
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. CHECK VOLTAGE OF (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT



81825811

Fig. 8: Checking Voltage Of Seat Weight Sensor 5 Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Left-Front Seat Weight Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R701) Seat Weight Sensor 5 Volt circuit.

Is the voltage above 4.8 volts?

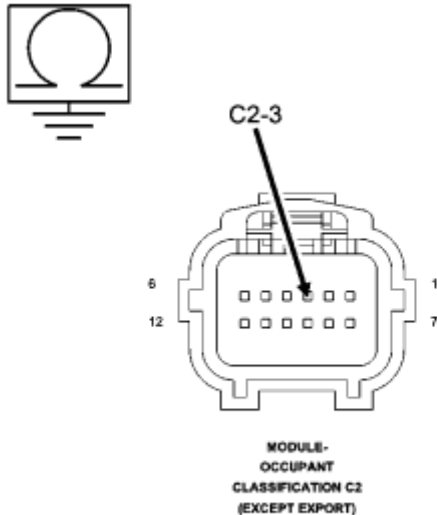
Yes

Go To 7.

No

Go To 9.

7. **CHECK (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND**



81825815

Fig. 9: Measuring Resistance Of The (R717) Left-Front Seat Weight Sensor Signal Circuit Between Ground And OCM C2 Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R717) LT-FT Seat Weight Sensor Signal circuit between ground and the OCM C2 connector.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance below 5.0 ohms?

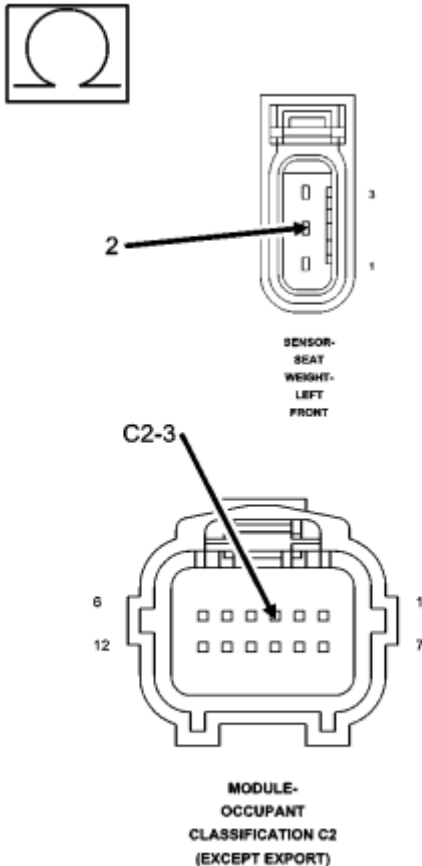
Yes

Replace the Passenger Seat Harness in accordance with the Service Information.
 Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 8.

8. CHECK (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR AN OPEN



81825819

Fig. 10: Measuring Resistance Of (R717) Lt-Ft Seat Weight Sensor Signal Circuit Between OCM C2 Connector And Left-Front Seat Weight Sensor Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R717) LT-FT Seat Weight Sensor Signal circuit between the OCM C2 connector and the Left-Front Seat Weight Sensor connector.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance below 5.0 ohms?

Yes

Replace the Left-Front Seat Weight Sensor in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

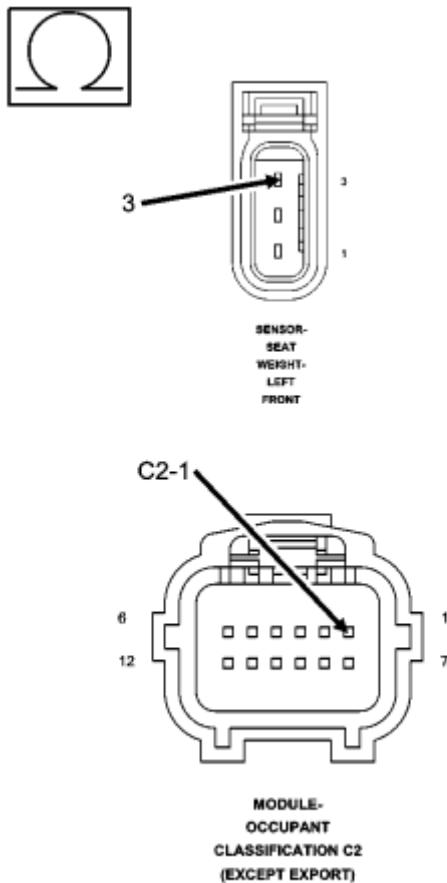
If DTC B1B79-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT LOW returns active, replace the OCM in accordance with the Service Information.

No

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. **CHECK (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT FOR AN OPEN**



8182581e

Fig. 11: Measuring Resistance Of (R701) Seat Weight Sensor 5-Volt Circuit Between OCM C2 Connector And Left-Front Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM connectors.

Measure the resistance of the (R701) Seat Weight Sensor 5 Volt circuit between the OCM C2 connector and the Left-Front Seat Weight Sensor connector.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

10. **CHECKING STORED OR INTERMITTENT CODES**

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

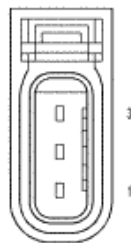
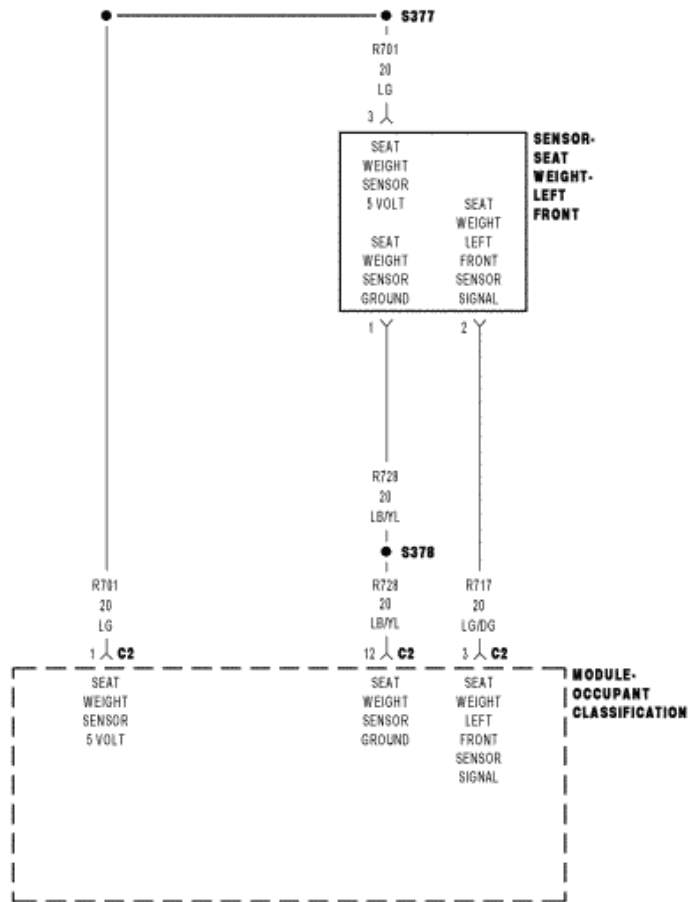
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

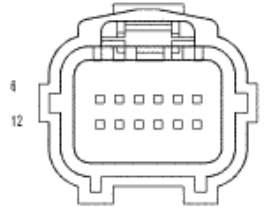
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B7A-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
LEFT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

01025101

Fig. 12: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects that the sensor input is greater than $96 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. Note that this DTC will remain active after the condition that set this fault is no longer present. Performing the Occupant Classification Module System Verification Test will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT (R728) SEAT WEIGHT SENSOR GROUND CIRCUIT OPEN LEFT-FRONT SEAT WEIGHT SENSOR OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, & BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of

symptoms.

No

Go To 2.

2. PREFORM OCM VERIFICATION

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7A-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH?

Yes

Go To 3.

No

Go To 9.

3. VERIFY SENSOR TORQUE

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to SEAT WEIGHT SENSOR for specification.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7A-PASSENGER SEAT WEIGHT SENSOR 3 - LEFT FRONT INPUT CIRCUIT HIGH?

Yes

Go To 4.

No

Go To 9.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

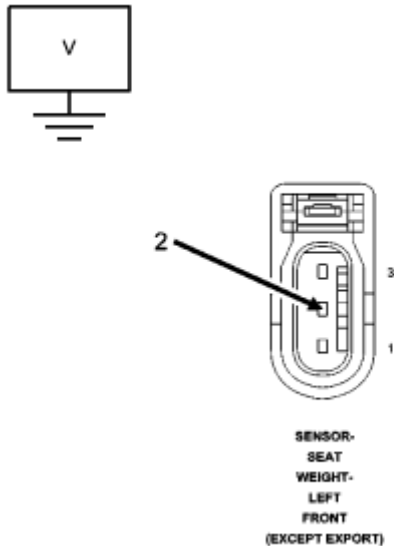
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. **CHECK (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**



81825823

Fig. 13: Measuring Voltage Of (R717) Left-Front Seat Weight Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the OCM C2 connector.

Measure the voltage of the (R717) LT-FT Seat Weight Sensor Signal circuit.

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Is the voltage above 0.2 volt?

Yes

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 7.

7. **CHECK (R717) LT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT**

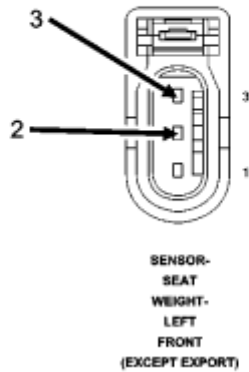


Fig. 14: Measuring Resistance Between (R717) LT-FT Seat Weight Sensor Signal Circuit And (R701) Seat Weight Sensor 5 Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Left-Front Seat Weight Sensor connector.

Measure the resistance between the (R717) LT-FT Seat Weight Sensor Signal circuit and the (R701) Seat Weight Sensor 5 Volt circuit.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance below 5.0 ohms?

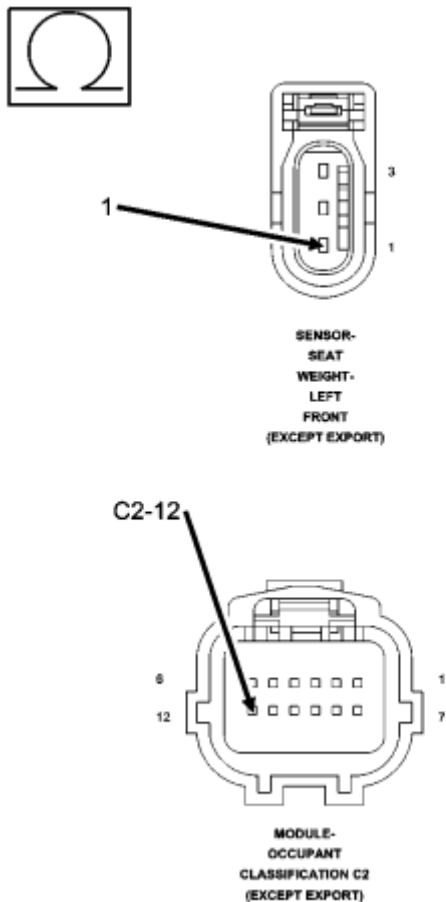
Yes

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 8.

8. **CHECK (R728) SEAT WEIGHT SENSOR GROUND CIRCUIT FOR AN OPEN**



81825918

Fig. 15: Measuring Resistance Of (R728) Seat Weight Sensor Ground Circuit Between OCM C2 Connector And Left-Front Seat Weight Sensor Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R728) Seat Weight Sensor Ground circuit between the OCM C2 connector and the Left-Front Seat Weight Sensor connector.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.
 Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

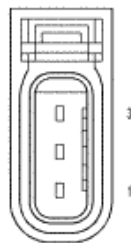
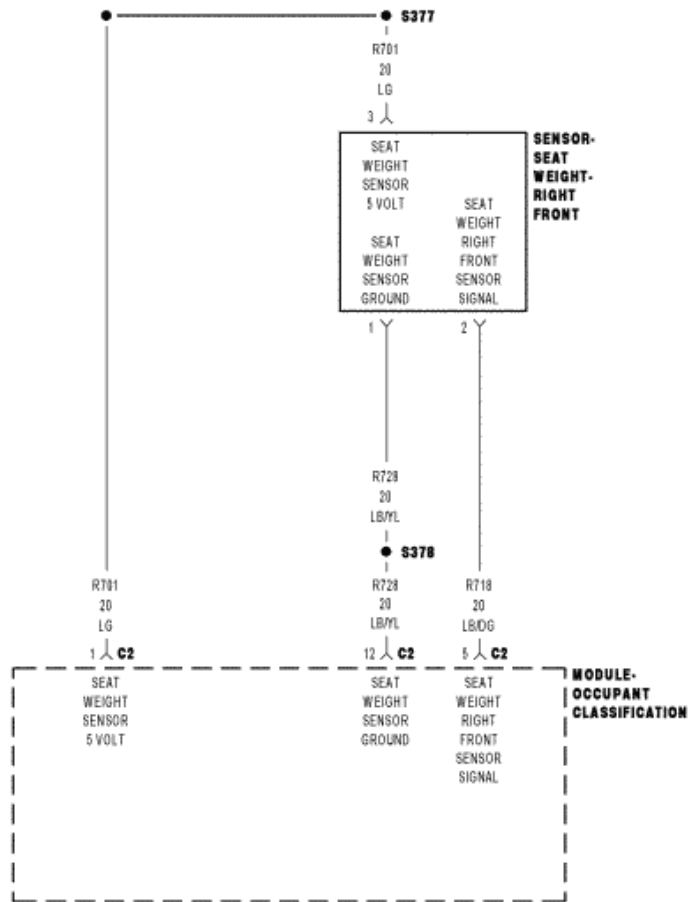
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

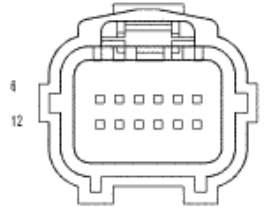
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B7D-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT PERFORMANCE

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
RIGHT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

8102503

Fig. 16: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

When CAN ignitions status is Run or SNA, during auto zero and while performing the Occupant Classification Module System Verification Test.

SET CONDITIONS

- **Set Condition:**

During the occupant classification module system verification test: if the module detects that the sensor input is less than 1.4 volts or greater than 3.6 volts. During auto zero: if the module detects that the sensor input is less than 1 volt or greater than 4 volts.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED RIGHT-FRONT PASSENGER SEAT WEIGHT SENSOR DAMAGE TO THE PASSENGER SEAT STRUCTURE, RISER ASSEMBLY, CROSSMEMBERS, SEAT TRACKS, FLOOR PAN OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC B1B7D-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT PERFORMANCE IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7D-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT PERFORMANCE?

Yes

Go To 3.

No

Go To 6.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 4.

4. **PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

5. PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer to SEAT WEIGHT SENSOR for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all

tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR PERFORMANCE DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS**.

No

But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

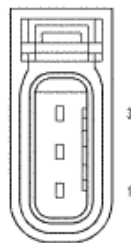
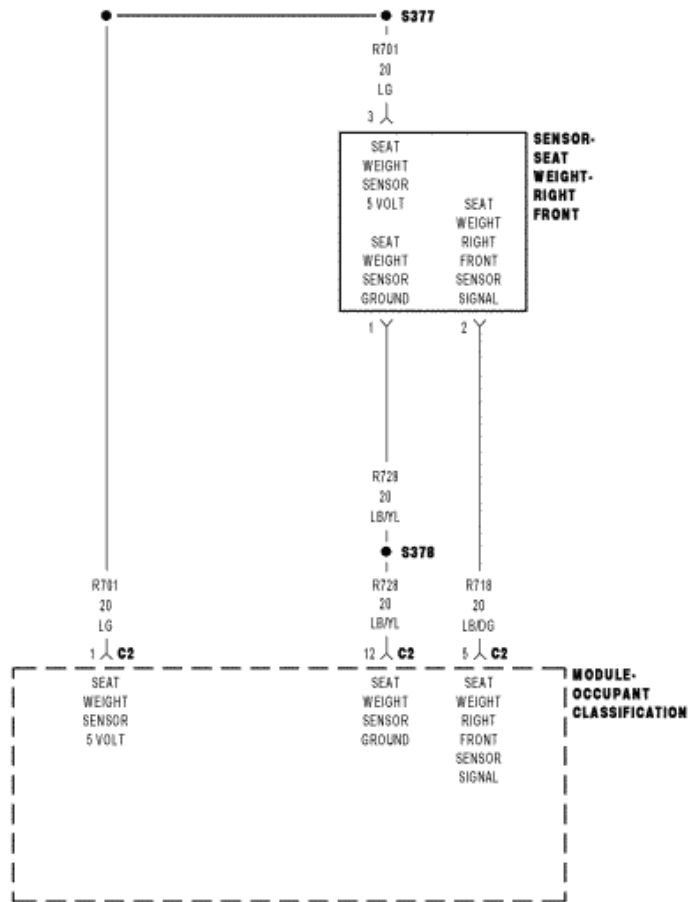
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

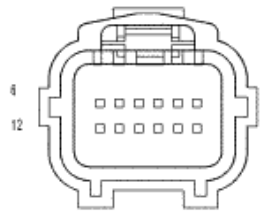
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B7E-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
RIGHT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

8102503

Fig. 17: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

• Set Condition:

If the module detects that the sensor input is less than $3.4 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. This DTC will also set if the (R701) Seat Weight Sensor 5 Volt circuit is shorted to ground. However, this condition would prevent communication with the OCM and cause a Lost Communication With OCM DTC to set in other modules. Also, this DTC will remain active after the condition that set this fault is no longer present. This condition is referred to as latching the DTC for the ignition cycle. Cycling the ignition key will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
ACTIVE B1B7E DTC AND B1B7F DTC AT THE SAME TIME
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
(R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT OPEN
(R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT OPEN
RIGHT-FRONT SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B7E-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW IS ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7E-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW?

Yes

Go To 3.

No

Go To 10.

3. VERIFY THAT DTC B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH AND B1B7E-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW ARE BOTH ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH?

Yes

Perform **B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH** diagnostic test.

No

Go To 4.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and

connectors. Look for chaffed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

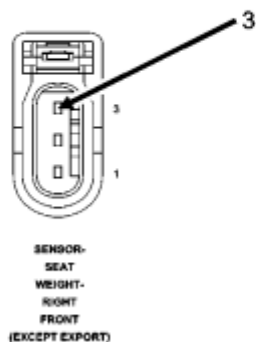
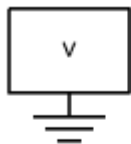
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. CHECK VOLTAGE OF (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT



81825930

Fig. 18: Measuring Voltage Of (R701) Seat Weight Sensor 5 Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Right-Front Seat Weight Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R701) Seat Weight Sensor 5 Volt circuit.

Is the voltage above 4.8 volts?

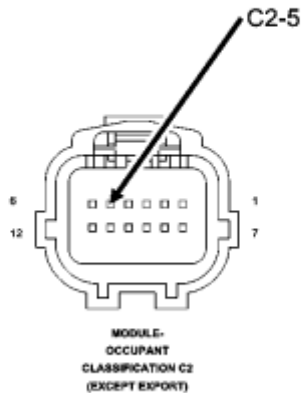
Yes

Go To 7.

No

Go To 9.

7. **CHECK (R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND**



81825934

Fig. 19: Measuring Resistance Of (R718) RT-FT Seat Weight Sensor Signal Circuit Between OCM C2 Connector Cavity 5 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R718) RT-FT Seat Weight Sensor Signal circuit between the OCM C2 connector cavity 5 and ground.

Is the resistance below 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

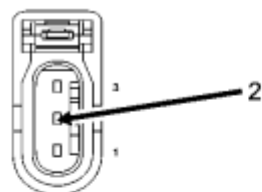
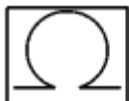
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

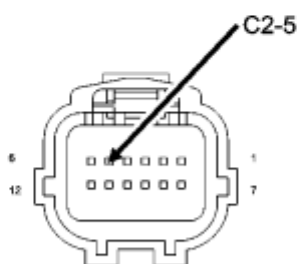
No

Go To 8.

8. CHECK (R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR AN OPEN



SENSOR-
SEAT
WEIGHT-
RIGHT
FRONT
(EXCEPT EXPORT)



MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)

8182593b

Fig. 20: Measuring Resistance Of (R718) RT-FT Seat Weight Sensor Signal Circuit Between OCM C2 Connector Cavity 5 And Right-Front Seat Weight Sensor Connector Cavity 2
Courtesy of CHRYSLER LLC

Measure the resistance of the (R718) RT-FT Seat Weight Sensor Signal circuit between the OCM C2 connector cavity 5 and the Right-Front Seat Weight Sensor connector cavity 2.

Is the resistance below 5.0 ohms?

Yes

Replace the Right-Front Seat Weight Sensor in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

If DTC B1B7E-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT LOW returns active, replace the OCM in accordance with the Service Information.

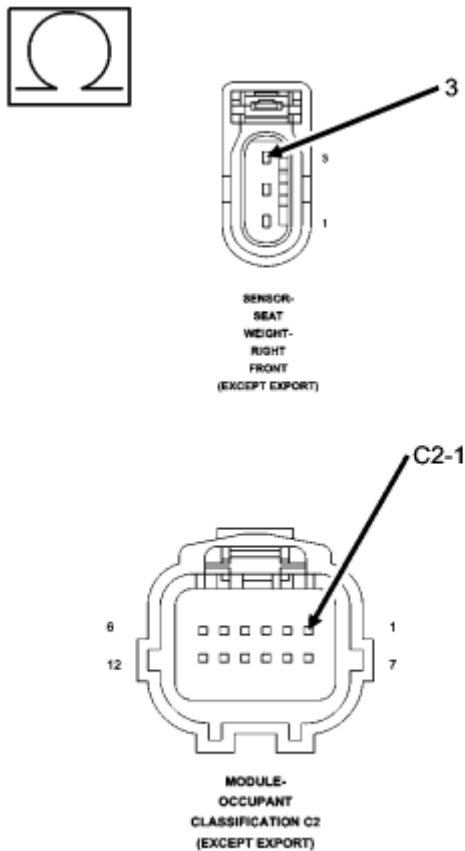
No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. **CHECK (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT FOR AN OPEN**



81825940

Fig. 21: Measuring Resistance Of (R701) Seat Weight Sensor 5 Volt Circuit Between OCM C2 Connector Cavity 1 And Right-Front Seat Weight Sensor Connector Cavity 3
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R701) Seat Weight Sensor 5 Volt circuit between the OCM C2 connector cavity 1 and the Right-Front Seat Weight Sensor connector cavity 3.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

10. **CHECKING STORED OR INTERMITTENT CODES**

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: **To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.**

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chaffed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: **To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.**

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

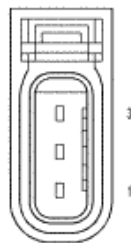
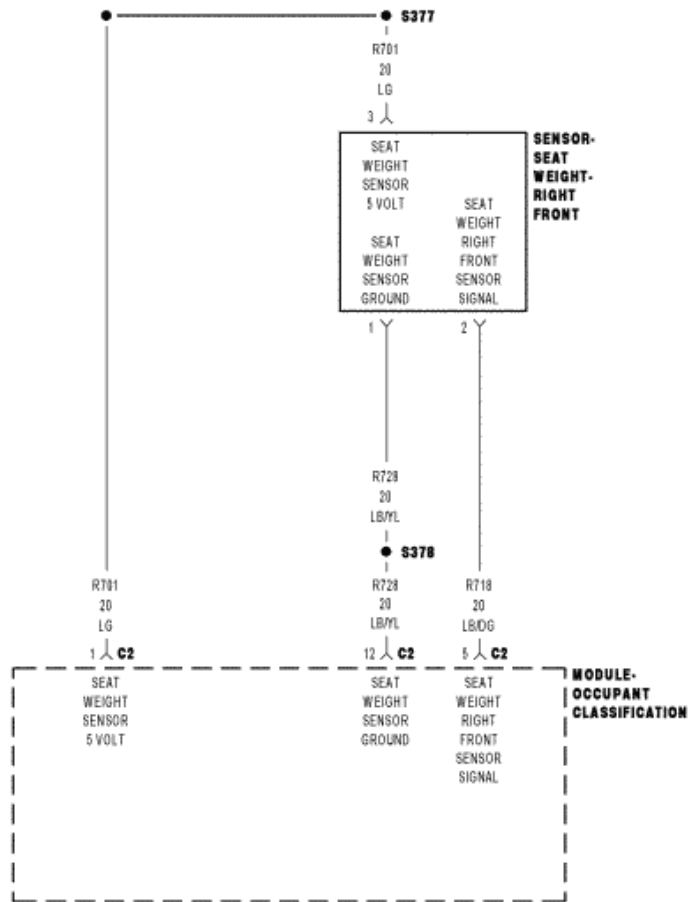
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

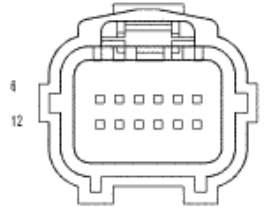
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

**B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT
CIRCUIT HIGH**

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
RIGHT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

8102503

Fig. 22: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

• Set Condition:

If the module detects that the sensor input is greater than $96 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. Note that this DTC will remain active after the condition that set this fault is no longer present. Performing the Occupant Classification Module System Verification Test will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT
(R728) SEAT WEIGHT SENSOR GROUND CIRCUIT OPEN
RIGHT-FRONT SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

- CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)

NOTE: Ensure that the battery is fully charged.

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTC.

Does the scan tool display any active DTC relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of

symptoms.

No

Go To 2.

2. VERIFY OCM

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH?

Yes

Go To 3.

No

Go To 9.

3. VERIFY SENSOR TORQUE

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer SEAT WEIGHT SENSOR .

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1B7F-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT INPUT CIRCUIT HIGH?

Yes

Go To 4.

No

Go To 9.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

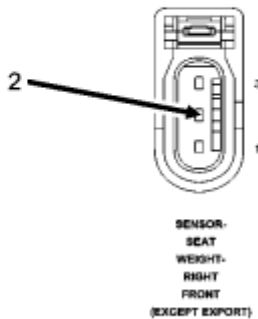
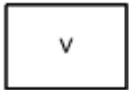
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. **CHECK (R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**



819e6447

Fig. 23: Measuring Voltage Of The (R718) Right-Front Seat Weight Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the OCM C2 connector.

Measure the voltage of the (R718) RT-FT Seat Weight Sensor Signal circuit.

Is the voltage above 0.2 volt?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

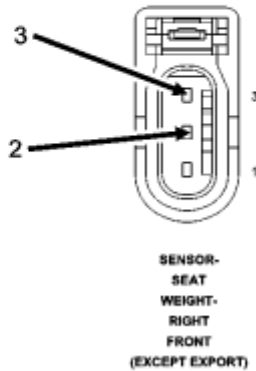
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 7.

7. **CHECK (R718) RT-FT SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT**



81825959

Fig. 24: Measuring Resistance Between (R718) Right-Front Seat Weight Sensor Signal Circuit And (R701) Seat Weight Sensor 5-Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Right-Front Seat Weight Sensor connector.

Measure the resistance between the (R718) RT-FT Seat Weight Sensor Signal circuit and the (R701) Seat Weight Sensor 5 Volt circuit.

Is the resistance below 5.0 ohms?

Yes

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

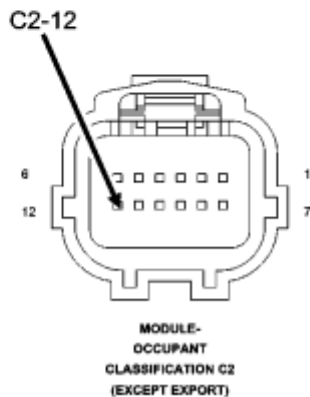
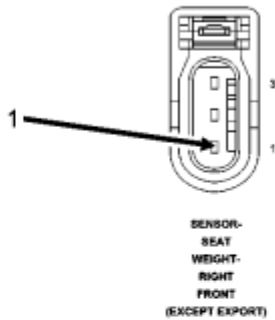
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 8.

8. **CHECK (R728) SEAT WEIGHT SENSOR GROUND CIRCUIT FOR AN OPEN**



8182595d

Fig. 25: Measuring Resistance Of (R728) Seat Weight Sensor Ground Circuit Between OCM C2 Connector And Right-Front Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (R728) Seat Weight Sensor Ground circuit between the OCM C2 connector and the Right-Front Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTC.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTC present?

Yes

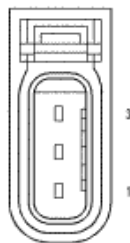
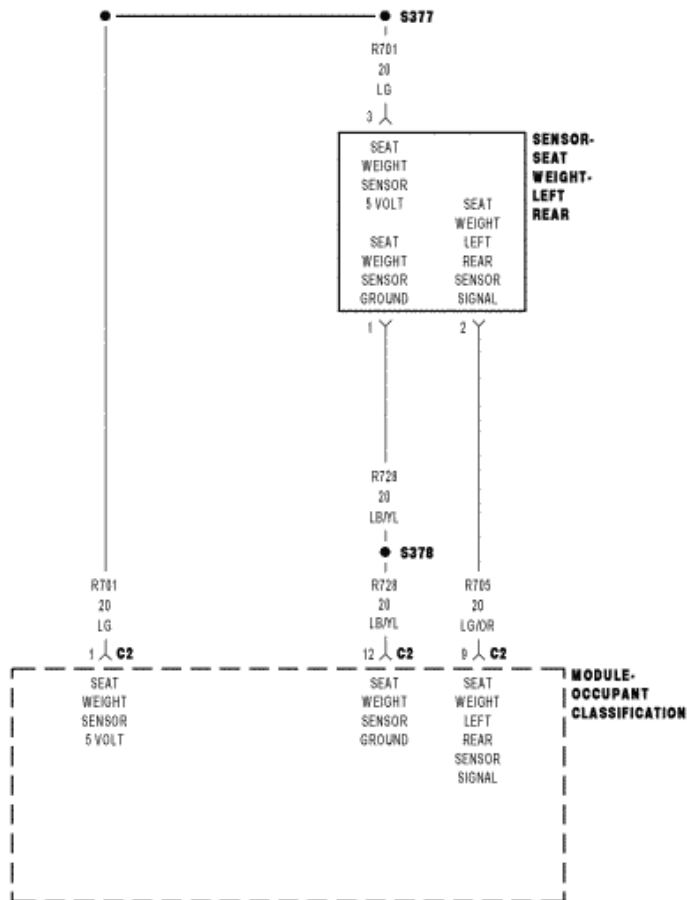
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

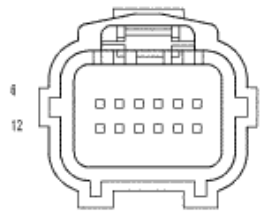
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B82-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR PERFORMANCE

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
LEFT
REAR**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

910350a

Fig. 26: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

When CAN ignitions status is Run or SNA, during auto zero and while performing the Occupant Classification Module System Verification Test.

SET CONDITIONS

• Set Condition:

During the occupant classification module system verification test: if the module detects that the sensor input is less than 1.4 volts or greater than 3.6 volts. During auto zero: if the module detects that the sensor input is less than 1 volt or greater than 4 volts.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
LEFT-REAR PASSENGER SEAT WEIGHT SENSOR
DAMAGE TO THE PASSENGER SEAT STRUCTURE, RISER ASSEMBLY, CROSSMEMBERS, SEAT TRACKS, FLOOR PAN
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)

NOTE: Ensure that the battery is fully charged.

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to DIAGNOSTIC CODE INDEX for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC B1B82-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR PERFORMANCE IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B82- PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR PERFORMANCE?

Yes

Go To 3.

No

Go To 6.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 4.

4. **PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

5. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer to SEAT WEIGHT SENSOR for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all

tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR PERFORMANCE DTCs?

Yes

Perform ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS** .

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: **Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.**

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect

the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

• Set Condition:

If the module detects that the sensor input is less than $3.4 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. This DTC will also set if the (R701) Seat Weight Sensor 5 Volt circuit is shorted to ground. However, this condition would prevent communication with the OCM and cause a Lost Communication With OCM DTC to set in other modules. Also, this DTC will remain active after the condition that set this fault is no longer present. This condition is referred to as latching the DTC for the ignition cycle. Cycling the ignition key will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
(R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT OPEN
(R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT OPEN
LEFT-REAR SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, & BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW IS ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW?

Yes

Go To 3.

No

Go To 10.

3. VERIFY THAT B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW DTC AND B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH DTC ARE ACTIVE AT THE SAME TIME

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW AND B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH AT THE SAME TIME?

Yes

Perform **B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH** diagnostic test.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

Go To 6.

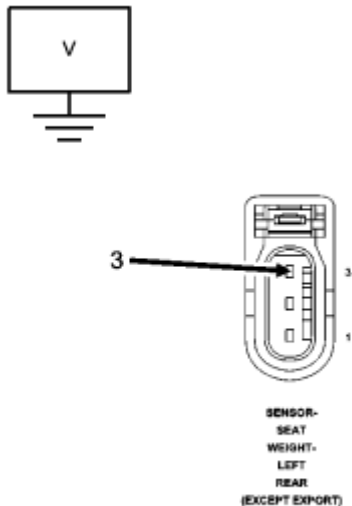
No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. CHECK VOLTAGE OF (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT



81825982

Fig. 28: Measuring Voltage Of (R701) Seat Weight Sensor 5 Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Left-Rear Seat Weight Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R701) Seat Weight Sensor 5 Volt circuit.

Is the voltage above 4.8 volts?

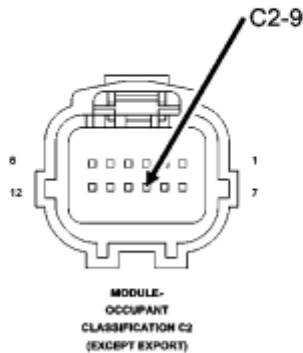
Yes

Go To 7.

No

Go To 9.

7. **CHECK (R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND**



81825989

Fig. 29: Measuring Resistance Of (R705) LT-RR Seat Weight Sensor Signal Circuit Between Ground And OCM C2 Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R705) LT-RR Seat Weight Sensor Signal circuit between ground and the OCM C2 connector.

Is the resistance below 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

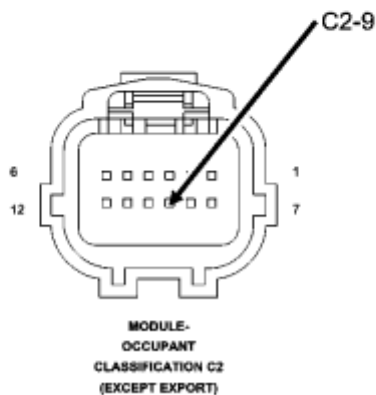
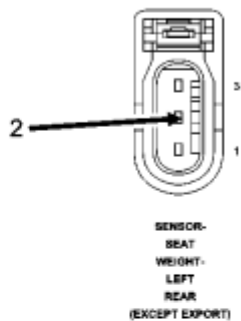
Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 8.

8. CHECK (R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR AN OPEN



8182598d

Fig. 30: Measuring Resistance Of (R705) LT-RR Seat Weight Sensor Signal Circuit Between OCM C2 Connector And Left-Rear Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (R705) LT-RR Seat Weight Sensor Signal circuit between the OCM C2 connector and the Left-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Left-Rear Seat Weight Sensor in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** . If DTC B1B83-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT LOW returns active, replace the OCM in accordance with the Service Information.

No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the

condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

9. CHECK (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT FOR AN OPEN

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R701) Seat Weight Sensor 5 Volt circuit between the OCM C2 connector and the Left-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

10. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to DIAGNOSTIC CODE INDEX for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the related wiring and connectors for chafed,

pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

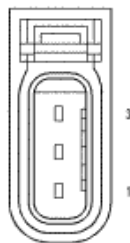
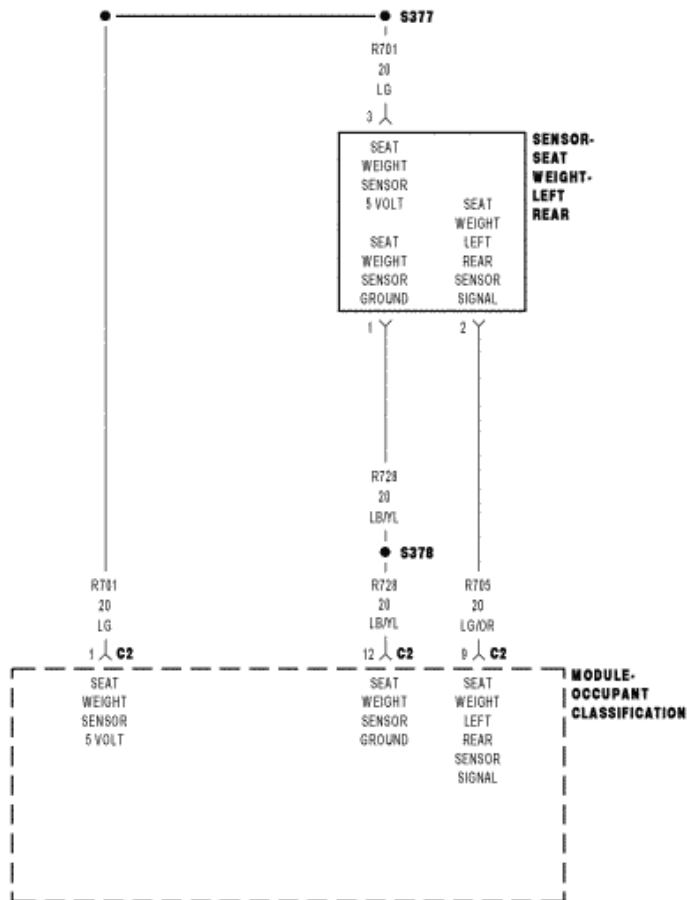
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

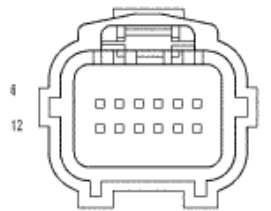
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
LEFT
REAR**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

910350a

Fig. 31: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

• Set Condition:

If the module detects that the sensor input is greater than $96 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. Note that this DTC will remain active after the condition that set this fault is no longer present. Performing the Occupant Classification Module System Verification Test will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT
(R728) SEAT WEIGHT SENSOR GROUND CIRCUIT OPEN
LEFT-REAR SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)

NOTE: Ensure that the battery is fully charged.

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTC.

Does the scan tool display any active DTC relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of

symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH IS ACTIVE

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH?

Yes

Go To 3.

No

Go To 9.

3. VERIFY THAT DTC B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH IS ACTIVE

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to SEAT WEIGHT SENSOR for specification.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION

TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1B84-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR INPUT CIRCUIT HIGH?

Yes

Go To 4.

No

Go To 9.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

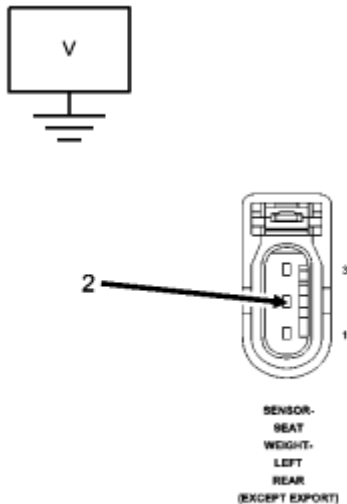
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. **CHECK (R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**



818259ae

Fig. 32: Measuring Voltage Of (R705) Left-Rear Seat Weight Sensor Signal Circuit
Courtesy of CHRYSLER LLC

Disconnect the OCM C2 connector.

Measure the voltage of the (R705) LT-RR Seat Weight Sensor Signal circuit.

Is the voltage above 0.2 volt?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

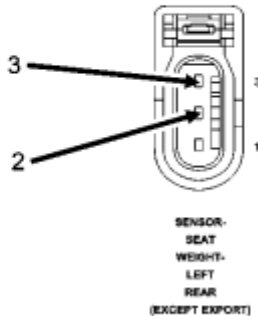
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 7.

7. **CHECK (R705) LT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT**



818259b5

Fig. 33: Measuring Resistance Between (R705) LT-RR Seat Weight Sensor Signal Circuit And (R701) Seat Weight Sensor 5 Volt Circuit

Courtesy of CHRYSLER LLC

Disconnect the Left-Rear Seat Weight Sensor connector.

Measure the resistance between the (R705) LT-RR Seat Weight Sensor Signal circuit and the (R701) Seat Weight Sensor 5 Volt circuit.

Is the resistance below 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

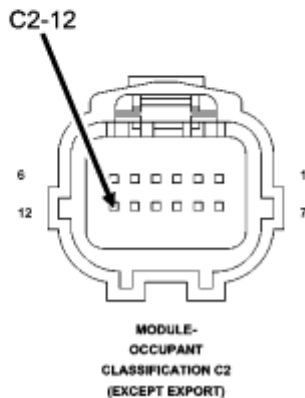
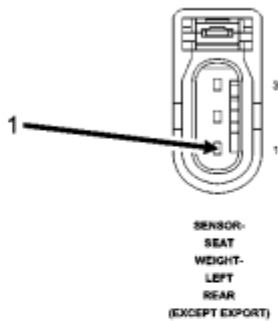
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 8.

8. **CHECK (R728) SEAT WEIGHT SENSOR GROUND CIRCUIT FOR AN OPEN**



819f250c

Fig. 34: Measuring Resistance Of (R728) Seat Weight Sensor Ground Circuit Between OCM C2 Connector And Left-Rear Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (R728) Seat Weight Sensor Ground circuit between the OCM C2 connector and the Left-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTC.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTC present?

Yes

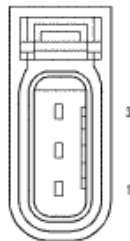
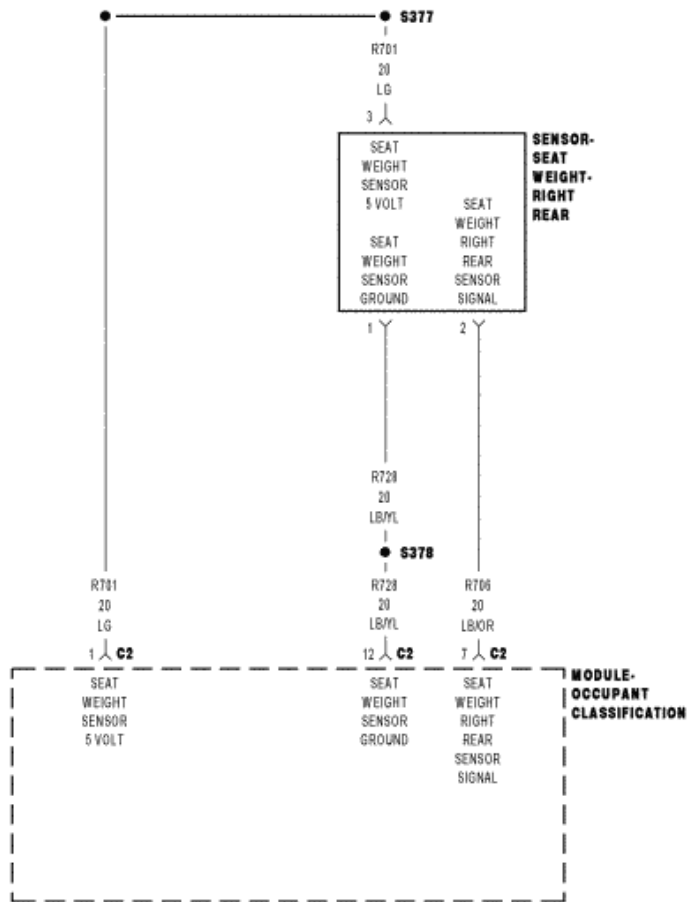
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

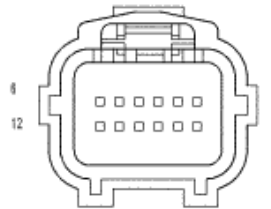
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B87-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR PERFORMANCE

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
RIGHT
REAR**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

010355a2

Fig. 35: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

When CAN ignitions status is Run or SNA, during auto zero and while performing the Occupant Classification Module System Verification Test.

SET CONDITIONS

- **Set Condition:**

During the occupant classification module system verification test: if the module detects that the sensor input is less than 1.4 volts or greater than 3.6 volts. During auto zero: if the module detects that the sensor input is less than 1 volt or greater than 4 volts.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED RIGHT-REAR PASSENGER SEAT WEIGHT SENSOR DAMAGE TO THE PASSENGER SEAT STRUCTURE, RISER ASSEMBLY, CROSSMEMBERS, SEAT TRACKS, FLOOR PAN OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC B1B87-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR PERFORMANCE IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B87-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR PERFORMANCE?

Yes

Go To 3.

No

Go To 6.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 4.

4. **PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the *OCM SYSTEM VERIFICATION TEST to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

5. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer to SEAT WEIGHT SENSOR for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all

tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active: PASSENGER SEAT WEIGHT SENSOR PERFORMANCE DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS**.

No

But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

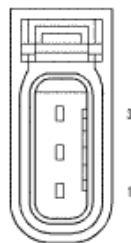
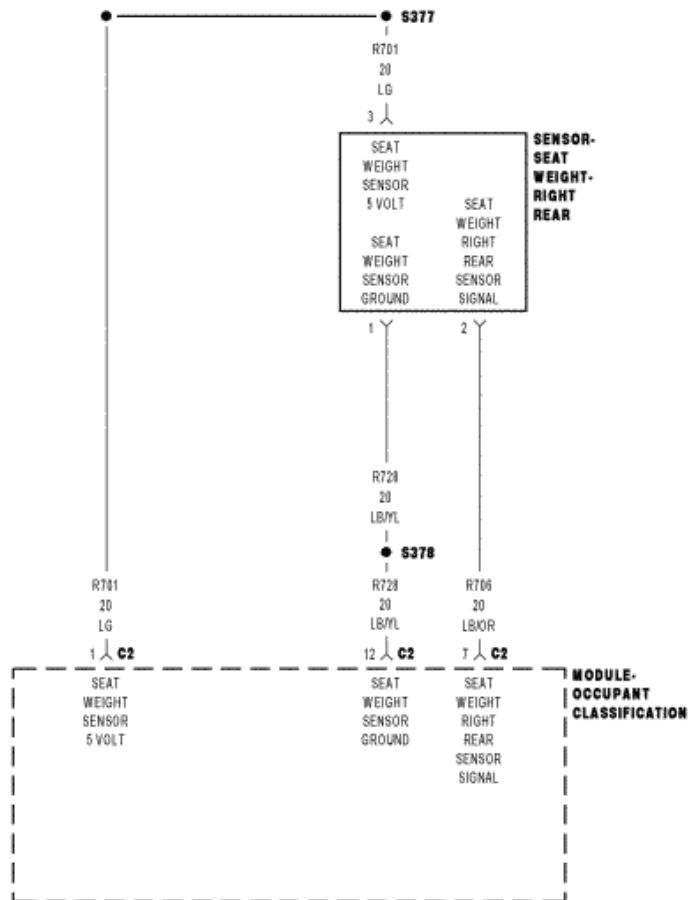
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

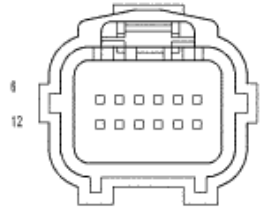
No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
RIGHT
REAR**



**MODULE-
OCCUPANT
CLASSIFICATION C2
(EXCEPT EXPORT)**

010355a2

Fig. 36: Passenger Seat Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

• Set Condition:

If the module detects that the sensor input is less than $3.4 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. This DTC will also set if the (R701) Seat Weight Sensor 5 Volt circuit is shorted to ground. However, this condition would prevent communication with the OCM and cause a Lost Communication With OCM DTC to set in other modules. Also, this DTC will remain active after the condition that set this fault is no longer present. This condition is referred to as latching the DTC for the ignition cycle. Cycling the ignition key will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
ACTIVE B1B88 DTC AND B1B89 DTC AT THE SAME TIME
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO GROUND
(R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT OPEN
(R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT OPEN
RIGHT-REAR SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW IS ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW?

Yes

Go To 3.

No

Go To 10.

3. VERIFY THAT DTC B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW AND B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH ARE ACTIVE AT THE SAME TIME

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW DTC AND B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH DTC AT THE SAME TIME?

Yes

Perform **B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH** diagnostic test.

No

Go To 4.

4. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

Go To 6.

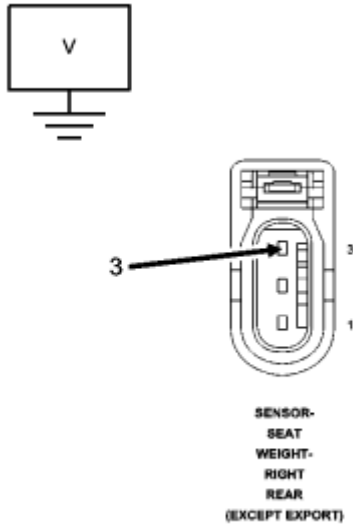
No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. CHECK VOLTAGE OF (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT



81825998

Fig. 37: Measuring Voltage Of (R701) Seat Weight Sensor 5 Volt Circuit
Courtesy of CHRYSLER LLC

Disconnect the Right-Rear Seat Weight Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R701) Seat Weight Sensor 5 Volt circuit.

Is the voltage above 4.8 volts?

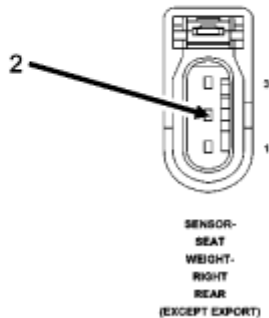
Yes

Go To 7.

No

Go To 9.

7. **CHECK (R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND**



8182599e

Fig. 38: Measuring Resistance Of (R706) RT-RR Seat Weight Sensor Signal Circuit Between Ground And OCM C2 Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R706) RT-RR Seat Weight Sensor Signal circuit between ground and the OCM C2 connector.

Is the resistance below 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

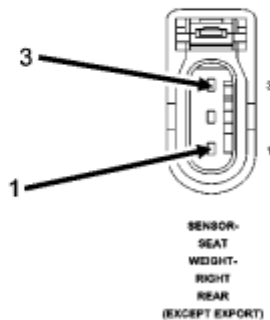
Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 8.

8. CHECK (R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR AN OPEN



818259b9

Fig. 39: Measuring Resistance Of (R706) RT-RR Seat Weight Sensor Signal Circuit Between OCM C2 Connector And Right-Rear Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (R706) RT-RR Seat Weight Sensor Signal circuit between the OCM C2 connector and the Right-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Right-Rear Seat Weight Sensor in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** . If DTC B1B88-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT LOW returns active, replace the OCM in accordance with the Service Information.

No

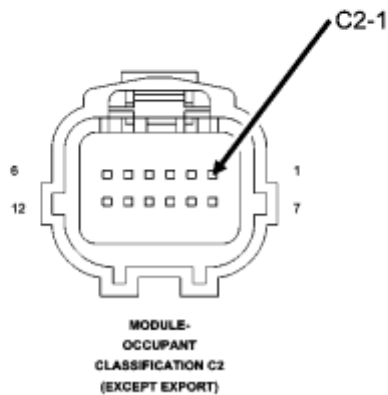
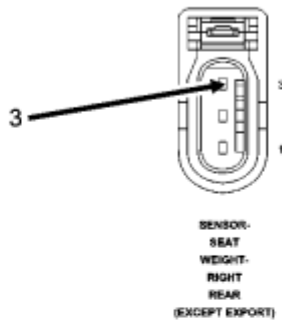
NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

9. CHECK (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT FOR AN OPEN



818259bd

Fig. 40: Measuring Resistance Of (R701) Seat Weight Sensor 5 Volt Circuit Between OCM C2 Connector And Right-Rear Seat Weight Sensor Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM C2 connector.

Measure the resistance of the (R701) Seat Weight Sensor 5 Volt circuit between the OCM C2 connector and the Right-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

10. CHECKING STORED OR INTERMITTENT CODES

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT

CIRCUIT HIGH

CIRCUIT SCHEMATIC

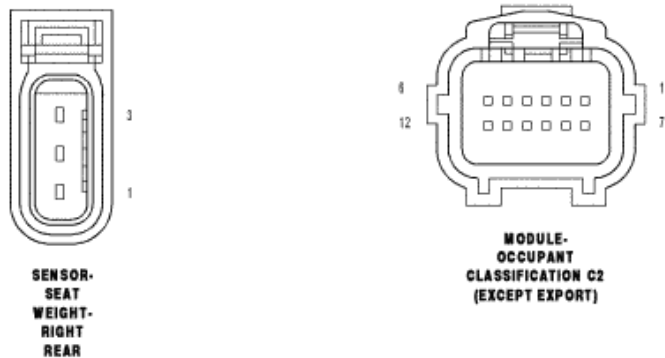
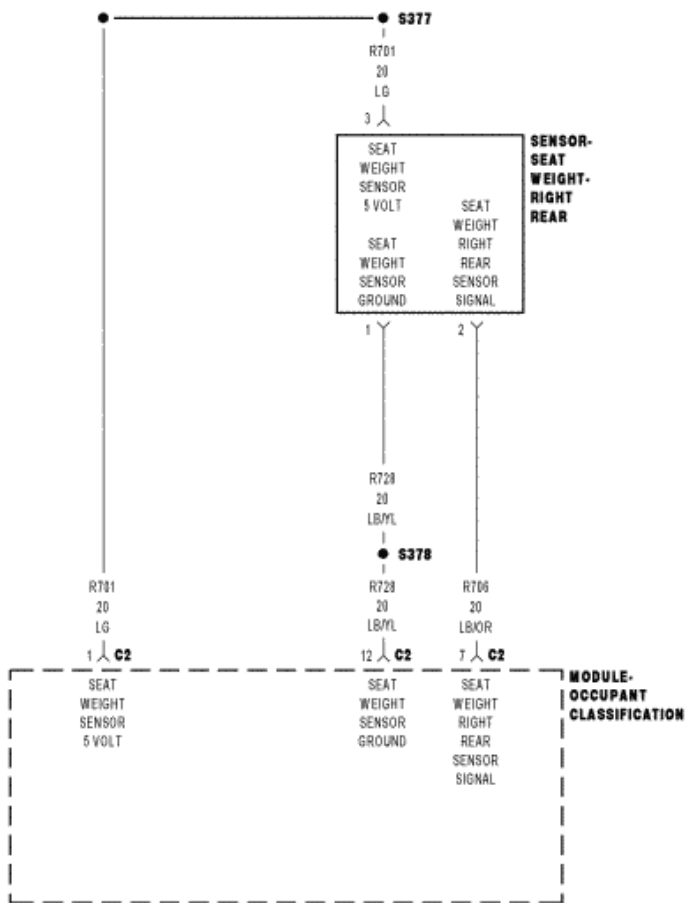


Fig. 41: Passenger Seat Weight Sensor Circuit Schematic

Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

- Set Condition:**

If the module detects that the sensor input is greater than $96 \pm 0.6\%$ of the (R701) Seat Weight Sensor 5 Volt circuit voltage. Note that this DTC will remain active after the condition that set this fault is no longer present. Performing the Occupant Classification Module System Verification Test will change the status from active to stored if the condition that set the fault is no longer present.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT SHORTED TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT
(R728) SEAT WEIGHT SENSOR GROUND CIRCUIT OPEN
RIGHT-REAR SEAT WEIGHT SENSOR
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

- CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 3.

No

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **VERIFY THAT DTC B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH IS ACTIVE**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer to **SEAT WEIGHT SENSOR** for specification.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1B89-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR INPUT CIRCUIT HIGH?

Yes

Go To 4.

No

Go To 9.

4. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chaffed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 5.

5. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

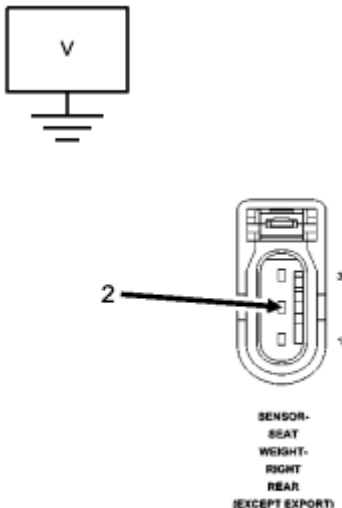
Go To 6.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. CHECK (R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE



818259c2

Fig. 42: Measuring Voltage Of (R706) RT-RR Seat Weight Sensor Signal Circuit

Courtesy of CHRYSLER LLC

Disconnect the OCM C2 connectors.

Measure the voltage of the (R706) RT-RR Seat Weight Sensor Signal circuit.

Is the voltage above 0.2 volt?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 7.

7. CHECK (R706) RT-RR SEAT WEIGHT SENSOR SIGNAL CIRCUIT FOR A SHORT TO (R701) SEAT WEIGHT SENSOR 5 VOLT CIRCUIT

Disconnect the Right-Rear Seat Weight Sensor connector.

Measure the resistance between the (R706) RT-RR Seat Weight Sensor Signal circuit and the (R701) Seat Weight Sensor 5 Volt circuit.

Is the resistance below 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 8.

8. CHECK (R728) SEAT WEIGHT SENSOR GROUND CIRCUIT FOR AN OPEN

Measure the resistance of the (R728) Seat Weight Sensor Ground circuit between the OCM C2 connector and the Right-Rear Seat Weight Sensor connector.

Is the resistance below 5.0 ohms?

Yes

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

9. CHECKING STORED OR INTERMITTENT CODES

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chaffed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question / causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform ***OCM SYSTEM VERIFICATION TEST** . Erase all codes before returning vehicle to customer.

B1B8D-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT LOW

CIRCUIT SCHEMATIC

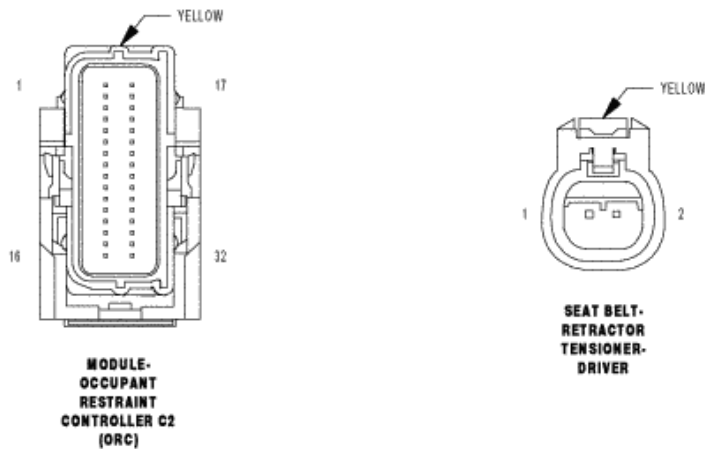
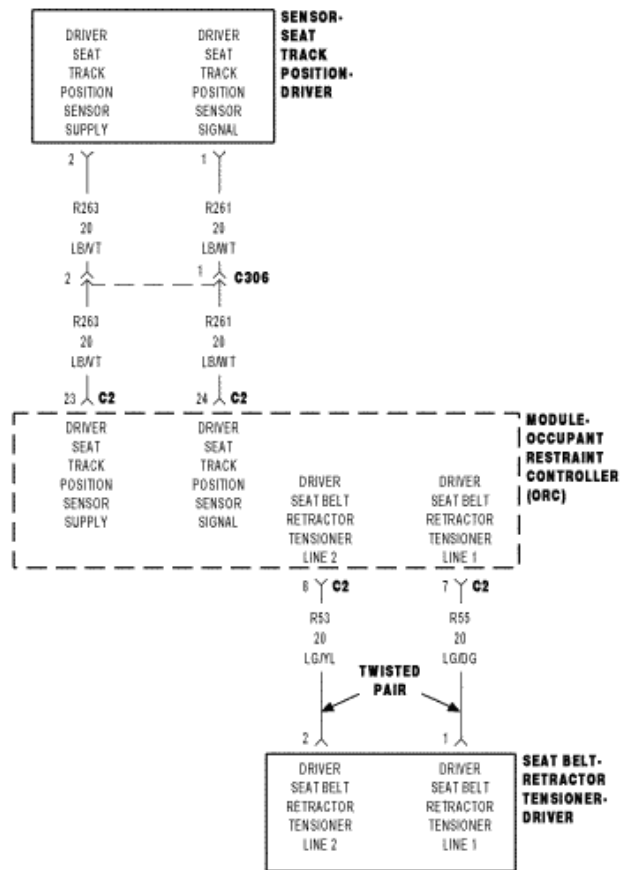


Fig. 43: Driver Seat Track Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Driver Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects that the sensor input is less than or equal to 0.3 ma. This DTC may set when the current is between 0.3 mA and 2.0 mA.

POSSIBLE CAUSES

Possible Causes
DRIVER SEAT HARNESS IMPROPERLY ROUTED
DRIVER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
DRIVER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO GROUND
(R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO GROUND
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT OPEN
(R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT OPEN
DRIVER SEAT TRACK POSITION SENSOR
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. IDENTIFYING VEHICLE EQUIPMENT

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC active DTCs.

Does the scan tool display active DTC: B1B8D-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT LOW?

Yes

Go To 2.

No

Go To 7.

2. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)**

With the scan tool, read Occupant restraint Controller (ORC) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 3.

3. **INSPECT DRIVER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the driver seat harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the driver seat harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **VERIFY THAT DRIVER SEAT HARNESS IS ROUTED CORRECTLY**

Verify that the driver seat harness is routed correctly.

Is the Driver Seat Harness routed correctly?

Yes

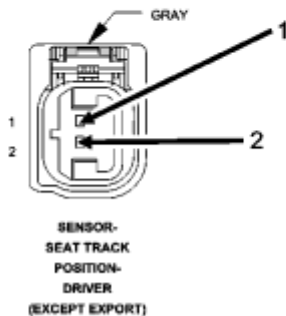
Go To 5.

No

Reroute the driver seat harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. **CHECK (R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT AND (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO GROUND**



819f5b13

Fig. 44: Measuring Resistance Between Ground And (R261/263) Driver Seat Position Sensor Data Circuit Cavity 1/2

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

Connect the 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between ground and the (R261) Driver Seat Position Sensor Data circuit cavity 1.

Measure the resistance between ground and the (R263) Driver Seat Position Sensor Voltage circuit cavity 2.

Is the resistance below 10k ohms on either circuit?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

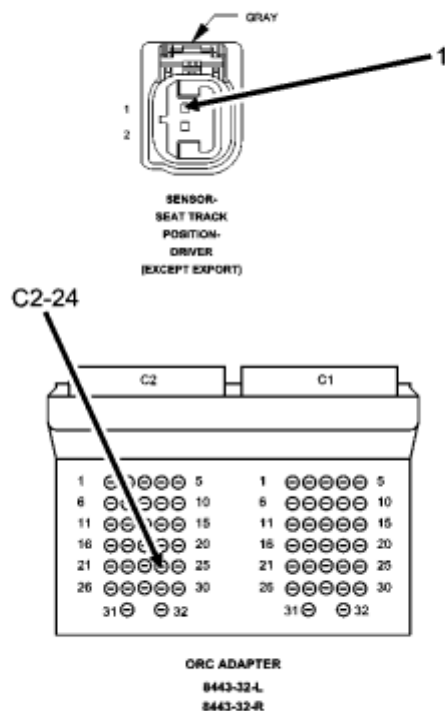
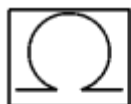
Replace the Driver Seat Harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

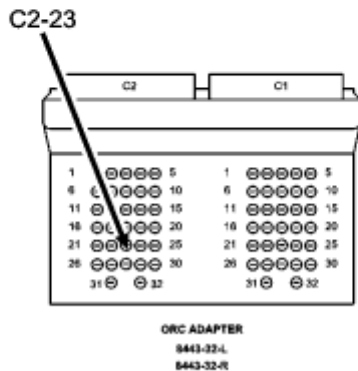
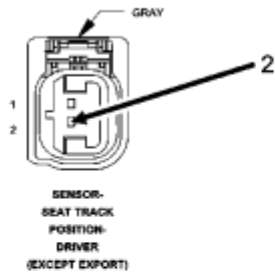
Go To 6.

6. **CHECK (R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT AND (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR AN OPEN**



819f5c3c

Fig. 45: Measuring Resistance Of (R261) Driver Seat Position Sensor Data Circuit Between ORC-C2 Connector Cavity C2-24 And Driver Seat Track Position Sensor Connector Cavity 1
Courtesy of CHRYSLER LLC



819f5c26

Fig. 46: Measuring Resistance Of (R263) Driver Seat Position Sensor Voltage Circuit Between ORC-C2 Connector Cavity C1-23 And Driver Seat Track Position Sensor Connector Cavity 2
Courtesy of CHRYSLER LLC

Measure the resistance of the (R261) Driver Seat Position Sensor Data circuit between the ORC-C2 connector cavity C2-24 and the Driver Seat Track Position Sensor connector cavity 1.

Measure the resistance of the (R263) Driver Seat Position Sensor Voltage circuit between the ORC-C2 connector cavity C1-23 and the Driver Seat Track Position Sensor connector cavity 2.

Is the resistance of either circuit above 5.0 ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Driver Seat Harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Replace the Occupant Restraint Controller (ORC) in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

7. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

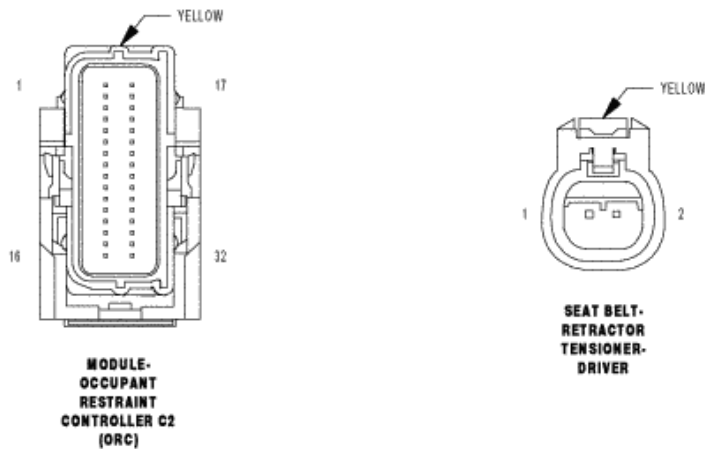
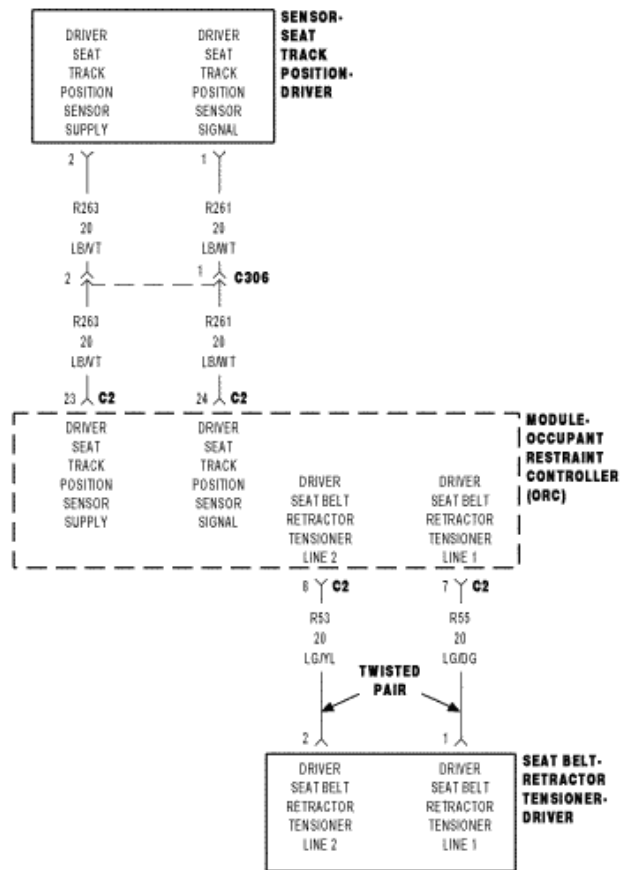
Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B8E-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH CIRCUIT SCHEMATIC



0100003

Fig. 47: Driver Seat Track Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Driver Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects that the sensor input is greater than or equal to 20.5 mA. This DTC may set when the current is between 17 mA and 20.5 mA.

POSSIBLE CAUSES

Possible Causes
DRIVER SEAT HARNESS IMPROPERLY ROUTED
DRIVER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
DRIVER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO VOLTAGE
(R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO VOLTAGE
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT
DRIVER SEAT TRACK POSITION SENSOR
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **IDENTIFYING VEHICLE EQUIPMENT**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC active DTC.

Does the scan tool display active DTC: B1B8E-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH?

Yes

Go To 2.

No

Go To 8.

2. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)**

With the scan tool, read Occupant Restraint Controller (ORC) DTC.

Does the scan tool display any active DTC relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 3.

3. **INSPECT DRIVER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the driver seat harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the driver seat harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **VERIFY THAT DRIVER SEAT HARNESS IS ROUTED CORRECTLY**

Verify that the driver seat harness is routed correctly.

Is the Driver Seat Harness routed correctly?

Yes

Go To 5.

No

Reroute the driver seat harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. **CHECK FOR DTC B1B8E-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH WITH DRIVER SEAT TRACK POSITION SENSOR DISCONNECTED**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Track Position Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Wait two minutes, and then with the scan tool, read ORC DTC.

Does the scan tool display: B1B8E-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT HIGH?

Yes

Go To 6.

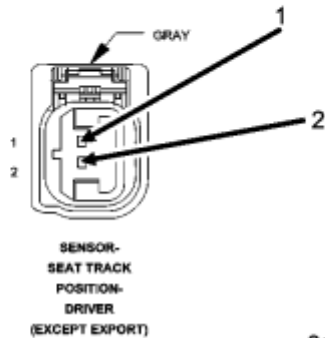
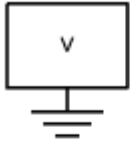
No

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Driver Seat Track Position Sensor in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. **CHECK (R261) DRIVE SEAT POSITION SENSOR DATA CIRCUIT AND (R263) DRIVE SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE**



819f5d13

Fig. 48: Measuring Voltage Of (R261/263) Driver Seat Position Sensor Data/Voltage Circuit Between Driver Seat Track Position Sensor Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R261) Driver Seat Position Sensor Data circuit at the Driver Seat Track Position Sensor connector cavity 1.

Measure the voltage of the (R263) Driver Seat Position Sensor Voltage circuit at the Driver Seat Track Position Sensor connector cavity 2.

Is the voltage above 0.2 volts on either circuit?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

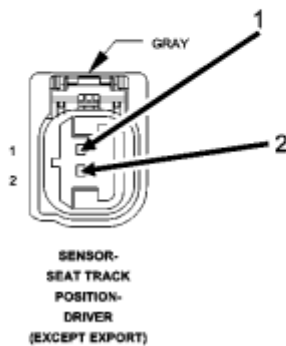
Replace the Driver Seat Harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 7.

7. **CHECK (R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT FOR A SHORT TO (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT**



819f5cf6

Fig. 49: Measuring Resistance Between (R261) Driver Seat Position Sensor Data Circuit And (R263) Driver Seat Position Sensor Voltage Circuit In Driver Seat Track Position Sensor Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance between the (R261) Driver Seat Position Sensor Data circuit cavity 1 and the (R263) Driver Seat Position Sensor Voltage circuit cavity 2 in the Driver Seat Track Position Sensor connector.

Is the resistance below 10k ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Driver Seat Harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Replace the ORC in accordance with the Service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

8. **TEST FOR AN INTERMITTENT CONDITION**

With the scan tool, record and erase all DTC from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC present?

Yes

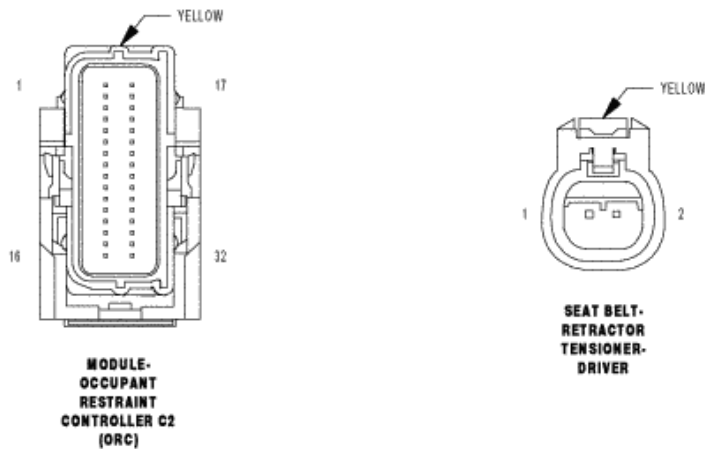
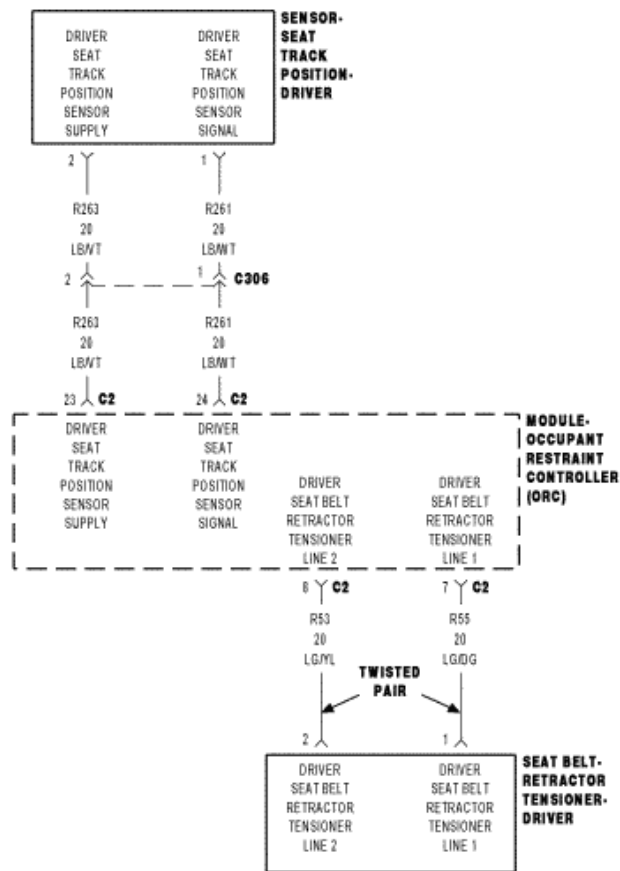
Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B8F-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN

CIRCUIT SCHEMATIC



0100003

Fig. 50: Driver Seat Track Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- Set Condition:

This DTC may set when the module detects that the sensor input current is below 1 mA.

POSSIBLE CAUSES

Possible Causes
DRIVER SEAT HARNESS IMPROPERLY ROUTED
DRIVER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
DRIVER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO VOLTAGE
(R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO VOLTAGE
(R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT
DRIVER SEAT TRACK POSITION SENSOR
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

- CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)

With the scan tool, read Occupant Restraint Controller (ORC) DTC.

Does the scan tool display any active DTC relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

- VERIFY THAT DTC B1B8F-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN IS

ACTIVE

Does the scan tool display active: B1B8F-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN?

Yes

Go To 3.

No

Go To 8.

3. INSPECT DRIVER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Driver Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

Replace the Driver Seat Harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. VERIFY THAT DRIVER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Driver Seat Harness is routed correctly.

Is the Driver Seat Harness routed correctly?

Yes

Go To 5.

No

Reroute the Driver Seat Harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. **CHECK FOR DTC B1B8F-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN WITH DRIVER SEAT TRACK POSITION SENSOR DISCONNECTED**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Track Position Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Wait two minutes, and then with the scan tool, read ORC DTC.

Does the scan tool display: B1B8F-DRIVER SEAT TRACK POSITION SENSOR CIRCUIT OPEN?

Yes

Go To 6.

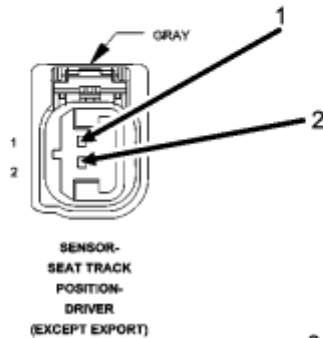
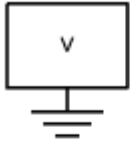
No

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Driver Seat Track Position Sensor in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. **CHECK (R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT AND (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE**



819f5d13

Fig. 51: Measuring Voltage Of (R261/263) Driver Seat Position Sensor Data/Voltage Circuit Between Driver Seat Track Position Sensor Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R261) Driver Seat Position Sensor Data circuit between the Driver Seat Track Position Sensor connector and ground.

Measure the voltage of the (R263) Driver Seat Position Sensor Voltage circuit between the Driver Seat Track Position Sensor connector and ground.

Is the voltage above 0.2 volts on either circuit?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

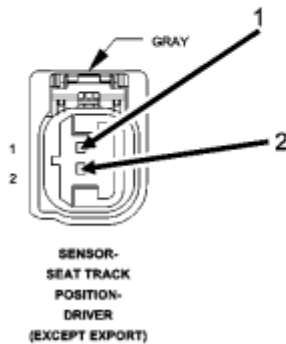
Replace the Driver Seat Harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 7.

7. **CHECK (R261) DRIVER SEAT POSITION SENSOR DATA CIRCUIT FOR A SHORT TO (R263) DRIVER SEAT POSITION SENSOR VOLTAGE CIRCUIT**



819f5cf6

Fig. 52: Measuring Resistance Between (R261) Driver Seat Position Sensor Data Circuit And (R263) Driver Seat Position Sensor Voltage Circuit In Driver Seat Track Position Sensor Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance between the (R261) Driver Seat Position Sensor Data circuit and the (R263) Driver Seat Position Sensor Voltage circuit in the Driver Seat Track Position Sensor connector.

Is the resistance below 10k ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

Replace the Driver Seat Harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Replace the ORC in accordance with the Service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

8. **TEST FOR AN INTERMITTENT CONDITION**

With the scan tool, record and erase all DTC from the ORC.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC present?

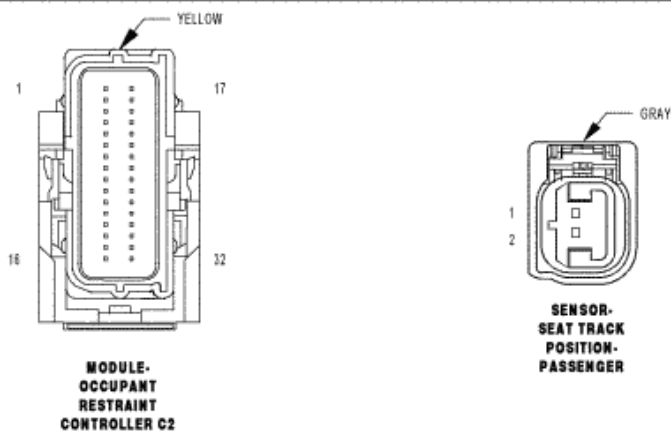
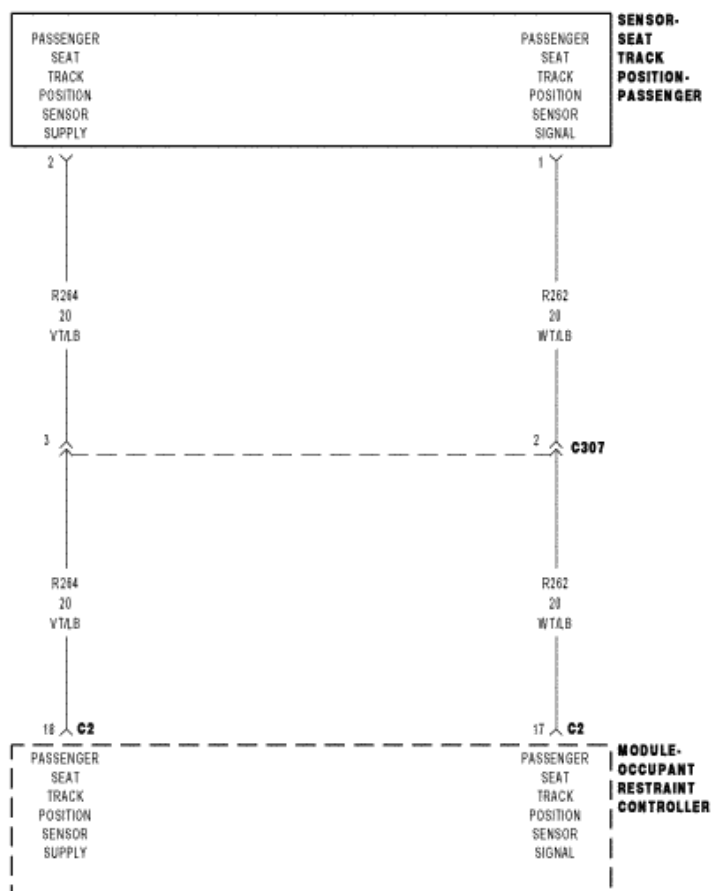
Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B93-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT LOW
CIRCUIT SCHEMATIC



01900005

Fig. 53: Passenger Seat Track Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Passenger Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects that the sensor input is less than or equal to 0.3 ma. This DTC may set when the current is between 0.3 mA and 2.0 mA.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO GROUND (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO GROUND (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT OPEN (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT OPEN PASSENGER SEAT TRACK POSITION SENSOR OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. IDENTIFYING VEHICLE EQUIPMENT

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC active DTCs.

Does the scan tool display active DTC: B1B93-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT LOW?

Yes

Go To 2.

No

Go To 7.

2. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)**

With the scan tool, read Occupant restraint Controller (ORC) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 3.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the passenger seat harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the passenger seat harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY**

Verify that the passenger seat harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

Go To 5.

No

Reroute the passenger seat harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. **CHECK (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT AND (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO GROUND**

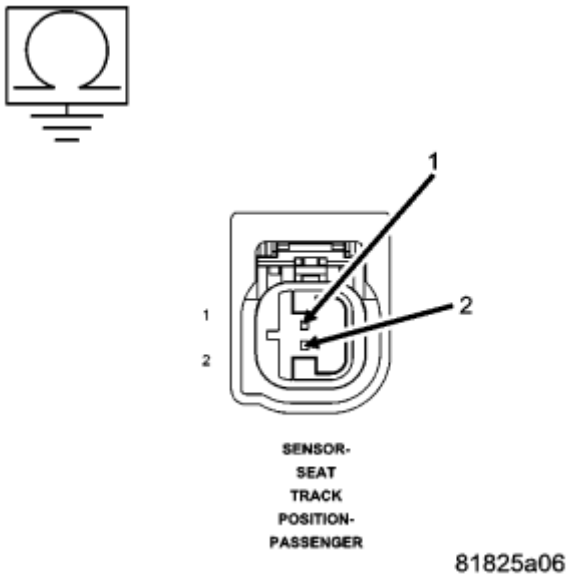


Fig. 54: Checking Seat Position Sensor Data-Passenger Circuit & Seat Position Sensor Voltage-Passenger Circuit For Short To Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

Install the 8443-32-R ORC Adapter to the ORC-C2

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between ground and the (R262) Passenger Seat Position Sensor Data circuit cavity 1.

Measure the resistance between ground and the (R264) Passenger Seat Position Sensor Voltage circuit

cavity 2.

Is the resistance below 10k ohms on either circuit?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

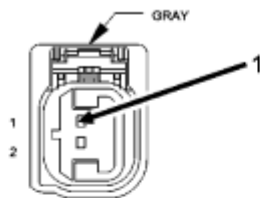
Replace the passenger seat harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

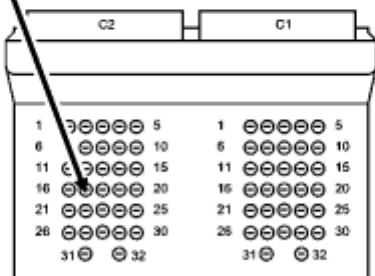
Go To 6.

6. CHECK (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT AND (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR AN OPEN



SENSOR-
SEAT TRACK
POSITION-
PASSENGER
(EXCEPT EXPORT)

C2-17



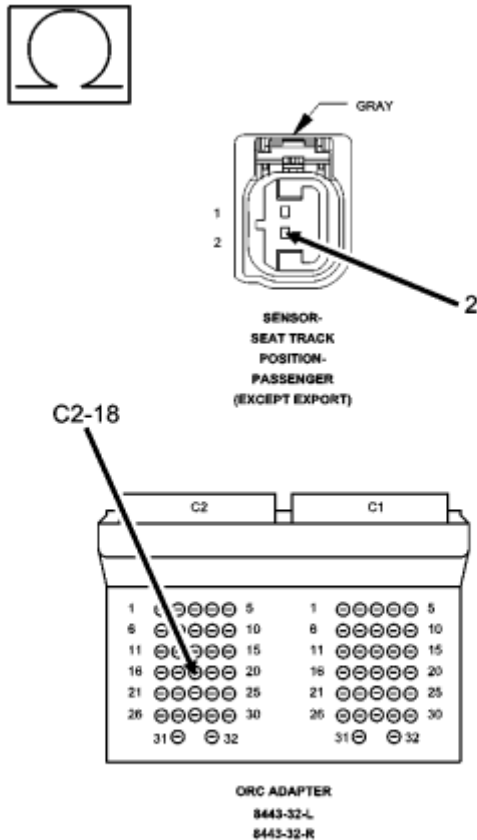
ORC ADAPTER
8443-32-L
8443-32-R

81a8dab9

Fig. 55: Measuring Resistance Of (R262) Passenger Seat Position Sensor Data Circuit Between 8443-32-R ORC Adapter Cavity C2-17 And Passenger Seat Track Position Sensor Connector

Cavity 1

Courtesy of CHRYSLER LLC



81a8dabd

Fig. 56: Measuring Resistance Of (R264) Passenger Seat Position Sensor Voltage Circuit Between 8443-32-R ORC Adapter Cavity C2-18 And Passenger Seat Track Position Sensor Connector

Cavity 2

Courtesy of CHRYSLER LLC

Measure the resistance of the (R262) Passenger Seat Position Sensor Data circuit between the 8443-32-R ORC Adapter cavity C2-17 and the Passenger Seat Track Position Sensor connector cavity 1.

Measure the resistance of the (R264) Passenger Seat Position Sensor Voltage circuit between the 8443-32-R ORC Adapter cavity C2-18 and the Passenger Seat Track Position Sensor connector cavity 2.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Is the resistance of either circuit above 5.0 ohms?

Yes

Replace the passenger seat harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Replace the Occupant Restraint Controller (ORC) in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

7. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

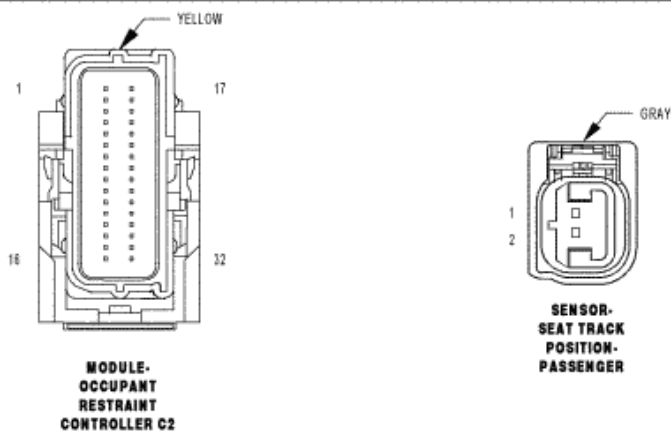
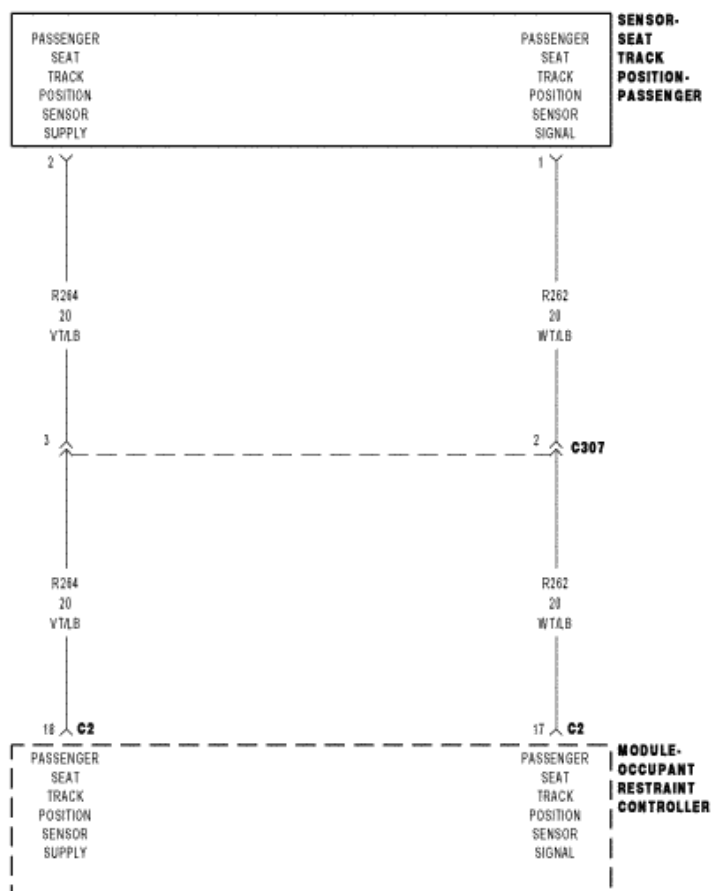
Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B94-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH CIRCUIT SCHEMATIC



01900005

Fig. 57: Passenger Seat Track Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Passenger Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- Set Condition:

If the module detects that the sensor input is greater than or equal to 20.5 mA. This DTC may set when the current is between 17 mA and 20.5 mA.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO VOLTAGE (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO VOLTAGE (R262) SEAT POSITION SENSOR DATA-PASSENGER CIRCUIT SHORTED TO (R264) SEAT POSITION SENSOR VOLTAGE-PASSENGER CIRCUIT PASSENGER SEAT TRACK POSITION SENSOR OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. IDENTIFYING VEHICLE EQUIPMENT

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC active DTCs.

Does the scan tool display active DTC: B1B94-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH?

Yes

Go To 2.

No

Go To 8.

2. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)**

With the scan tool, read Occupant Restraint Controller (ORC) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 3.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the passenger seat harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the passenger seat harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY**

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

Go To 5.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. **CHECK FOR DTC B1B94-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH WITH PASSENGER SEAT TRACK POSITION SENSOR DISCONNECTED**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Track Position Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Wait two minutes, and then with the scan tool, read ORC DTCs.

Does the scan tool display: B1B94-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT HIGH?

Yes

Go To 6.

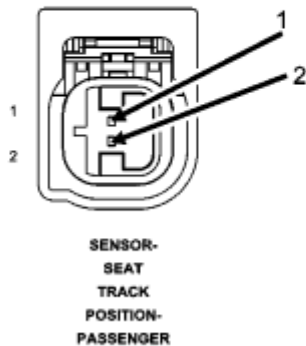
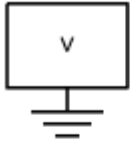
No

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Passenger Seat Track Position Sensor in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. **CHECK (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT AND (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE**



81876d50

Fig. 58: Checking Passenger Seat Position Sensor Data Circuit & Passenger Seat Position Sensor Voltage Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the both ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R262) Passenger Seat Position Sensor Data circuit at the Passenger Seat Track Position Sensor connector.

Measure the voltage of the (R263) Passenger Seat Position Sensor Voltage circuit at the Passenger Seat Track Position Sensor connector.

Is the voltage above 0.2 volts on either circuit?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

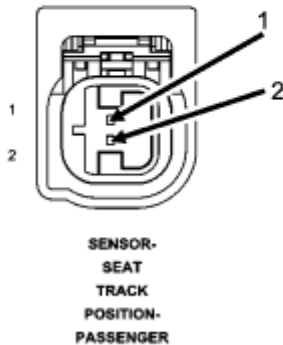
Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 7.

7. **CHECK (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT FOR A SHORT TO (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT**



81876d62

Fig. 59: Checking Passenger Seat Position Sensor Data Circuit

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance between the (R262) Passenger Seat Position Sensor Data circuit and the (R264) Passenger Seat Position Sensor Voltage circuit in the Passenger Seat Track Position Sensor connector.

Is the resistance below 10k ohms?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the passenger seat harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Replace the ORC in accordance with the Service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

8. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B95-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN

CIRCUIT SCHEMATIC

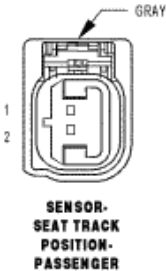
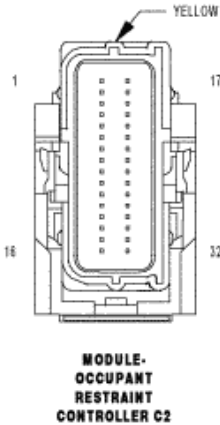
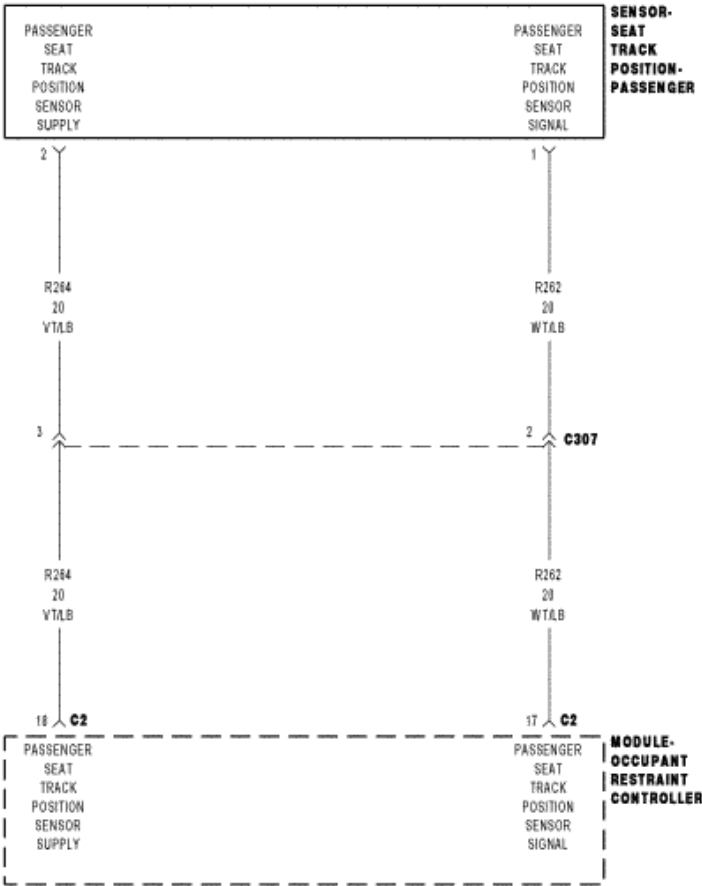


Fig. 60: Passenger Seat Track Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN and the module is configured for a Seat Track Position Sensor, the module checks the sensor input current ranges.

SET CONDITIONS

- **Set Condition:**

This DTC may set when the module detects that the sensor input current is below 1 mA.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS IMPROPERLY ROUTED
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN
PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT, PUSHED OUT, SPREAD, CORRODED, CONTAMINATED
(R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO VOLTAGE
(R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT SHORTED TO VOLTAGE
(R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT SHORTED TO (R264) SEAT POSITION SENSOR VOLTAGE-PASSENGER CIRCUIT
PASSENGER SEAT TRACK POSITION SENSOR
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT RESTRAINT CONTROLLER (ORC)**

With the scan tool, read Occupant Restraint Controller (ORC) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1B95-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN IS ACTIVE

Does the scan tool display active: B1B95-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN?

Yes

Go To 3.

No

Go To 8.

3. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

Replace the Passenger Seat Harness in accordance with the Service Information.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. VERIFY THAT PASSENGER SEAT HARNESS IS ROUTED CORRECTLY

Verify that the Passenger Seat Harness is routed correctly.

Is the Passenger Seat Harness routed correctly?

Yes

Go To 5.

No

Reroute the Passenger Seat Harness as necessary.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. **CHECK FOR DTC B1B95-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN WITH PASSENGER SEAT TRACK POSITION SENSOR DISCONNECTED**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Track Position Sensor connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Wait two minutes, and then with the scan tool, read ORC DTCs.

Does the scan tool display: B1B95-PASSENGER SEAT TRACK POSITION SENSOR CIRCUIT OPEN?

Yes

Go To 6.

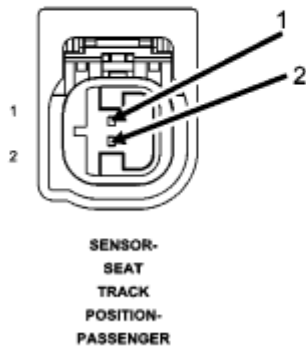
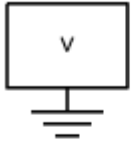
No

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Passenger Seat Track Position Sensor in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. **CHECK (R262) PASSENGER SEAT POSITION SENSOR DATA CIRCUIT AND (R264) PASSENGER SEAT POSITION SENSOR VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE**



81876d50

Fig. 61: Checking Passenger Seat Position Sensor Data Circuit & Passenger Seat Position Sensor Voltage Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R262) Passenger Seat Position Sensor Data circuit between the Passenger Seat Track Position Sensor connector and ground.

Measure the voltage of the (R264) Passenger Seat Position Sensor Voltage circuit between the Passenger Seat Track Position Sensor connector and ground.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

Is the voltage above 0.2 volts on either circuit?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Passenger Seat Harness in accordance with the Service Information.

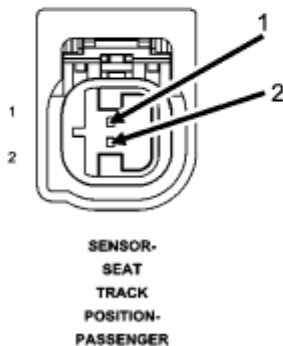
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 7.

7. **CHECK (R262) SEAT POSITION SENSOR DATA-PASSENGER CIRCUIT FOR A SHORT TO (R264) SEAT POSITION SENSOR VOLTAGE-PASSENGER CIRCUIT**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.



81876d62

Fig. 62: Checking Passenger Seat Position Sensor Data Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (R262) Passenger Seat Position Sensor Data circuit and the (R264) Passenger Seat Position Sensor Voltage circuit in the Passenger Seat Track Position Sensor connector.

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist

Is the resistance below 10k ohms?

Yes

Replace the Passenger Seat Harness in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Replace the ORC in accordance with the Service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

8. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from the ORC.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

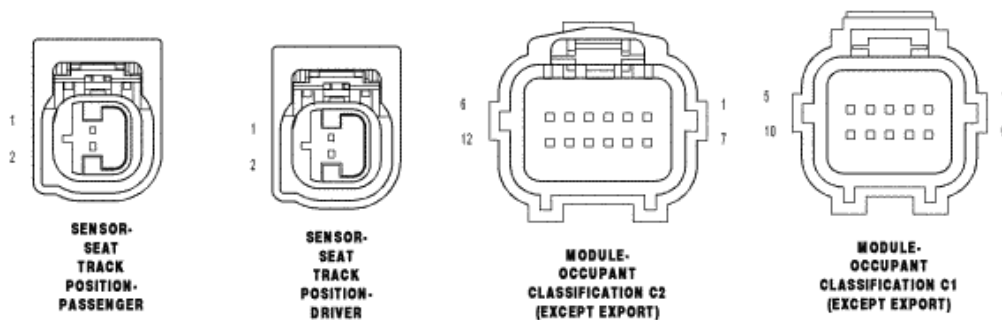
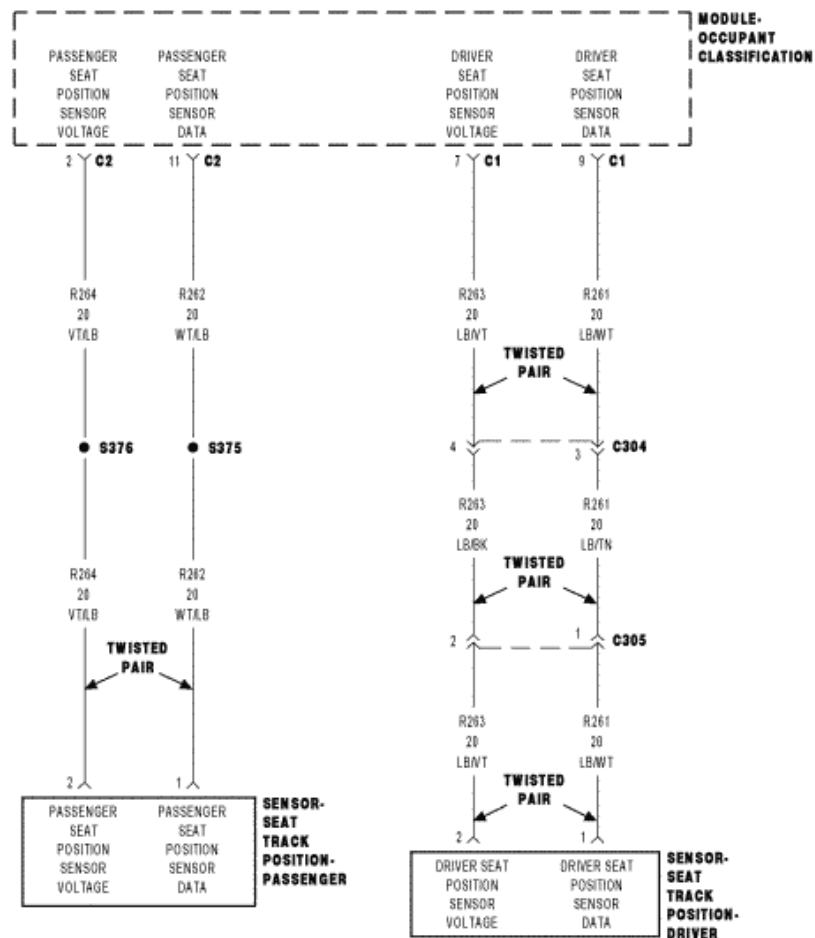
Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1B97-PASSENGER SEAT TRACK POSITION SENSOR CONFIGURATION MISMATCH

CIRCUIT SCHEMATIC



910259M

Fig. 63: Seat Track Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on the OCM monitors the Seat Track Position Sensors (STPS) circuits.

SET CONDITIONS

- Set Condition:

If the module detects current on the Seat Track Position Sensors circuits and the module is not configured for STPS.

POSSIBLE CAUSES

Possible Causes
SEAT TRACK POSITION SENSORS (STPS) WIRING OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

- CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)

NOTE: Ensure the battery is fully charged.

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

- VERIFY THAT B1B97-PASSENGER SEAT TRACK POSITION SENSOR CONFIGURATION MISMATCH IS ACTIVE

With the scan tool, erase OCM DTCs.

Turn the ignition off, wait 10 seconds and then turn the ignition on.

Wait 2 minutes, and then with the scan tool, read OCM DTCs.

Does the scan tool display active: B1B97-PASSENGER SEAT TRACK POSITION SENSOR CONFIGURATION MISMATCH?

Yes

Go To 3.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

3. **VERIFY WIRING**

Turn the ignition off.

Inspect the passenger seat wiring for Seat Position Sensors.

Are Seat Position Sensor(s) present?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

B1BA5-AIRBAG SQUIB CONFIGURATION MISMATCH

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

If an Occupant Restraint Controller (ORC) configured for vehicles without side airbags is installed in a vehicle with side airbags.

POSSIBLE CAUSES

Possible Causes
TOTALLY INTEGRATED POWER MODULE (TIPM)
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. VERIFY THAT DTC B1BA5-AIRBAG SQUIB CONFIGURATION MISMATCH IS ACTIVE

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: B1BA5-AIRBAG SQUIB CONFIGURATION MISMATCH?

Yes

Go To 2.

No

Go To 5.

2. CHECK FOR ACTIVE TIPM DTC

Verify that the vehicle is equipped with a Occupant Classification System (OCS).

With the scan tool, read the active TIPM DTCs.

Is active TIPM DTCs present?

Yes

Diagnose and repair the active TIPM DTCs.

Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 3.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK ORC PART NUMBER WITH SCAN TOOL

With the scan tool, select ECU View, select ORC, select ECU Details, and read the ORC part number.

Is the part number correct for the vehicle?

Yes

Go To 4.

No

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. CHECK VIN WITH SCAN TOOL

With the scan tool, read the VIN.

Is the correct VIN displayed?

Yes

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Replace or reprogram the Totally Integrated Power Module (TIPM) in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase all DTCs from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the

battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return, continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the active DTC in question.

Does the scan tool display any ACTIVE DTCs?

Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

2008 RESTRAINTS

Electrical Diagnostics - Liberty

B1BA6-OCCUPANT CLASSIFICATION UNDETERMINED

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

Because other DTC have made occupant detection impossible. This DTC will set in addition to all sensor and module DTC and will be erased when the repairs are completed.

DIAGNOSTIC TEST

Refer to **B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED** for the diagnostic test procedure.

B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED

OCCUPANT CLASSIFICATION SEAT WEIGHTS

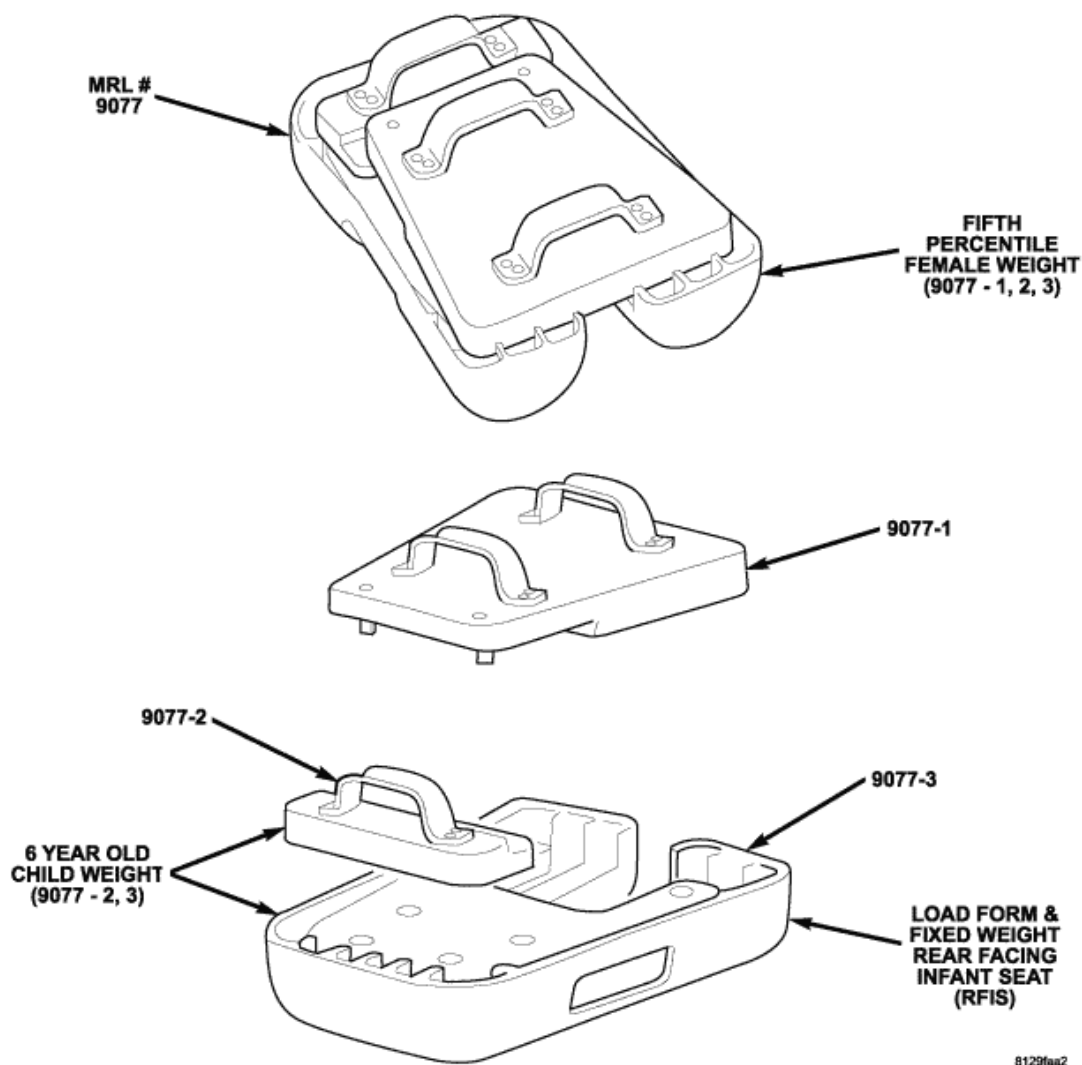


Fig. 1: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

With the CAN ignition status as IGN_RUN, the module tries to detect potentially damaging events and monitors the CAN Bus for the Impact messages (crash event causing one or more airbag or pretensioner

to deploy) or upon detecting an Offset Event (if equipped).

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects a potentially damaging event or the Impact messages from the CAN Bus input.

POSSIBLE CAUSES

Possible Causes
B1BA7-OCS VERIFICATION REQUIRED DTC ACTIVE

DIAGNOSTIC TEST

1. CHECK FOR OCCUPANT CLASSIFICATION MODULE (OCM) ACTIVE DTC:

- ACTIVE INTERNAL FAULTS
- IGNITION FAULTS
- BATTERY FAULT
- SEAT WEIGHT SENSOR DTC

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read Occupant Classification Module (OCM) DTC.

Does the scan tool display any active DTC listed above?

Yes

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED IS ACTIVE

With the scan tool, read OCM DTC.

Does the scan tool display active: B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED?

Yes

Go To 3.

No

Go To 5.

3. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED?

Yes

Go To 4.

No - But Other DTC Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No - No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

4. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No - But Other DTC Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No - Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

5. CHECK FOR ACTIVE DTC B1BA8-OCM SYSTEM OUT OF CALIBRATION/NOT CALIBRATED

With the scan tool, read OCM DTC.

Does the scan tool display active: B1BA8-OCM SYSTEM OUT OF CALIBRATION/NOT CALIBRATED?

Yes

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

B1BA8-OCM SYSTEM OUT OF CALIBRATION/NOT CALIBRATED

OCCUPANT CLASSIFICATION SEAT WEIGHTS

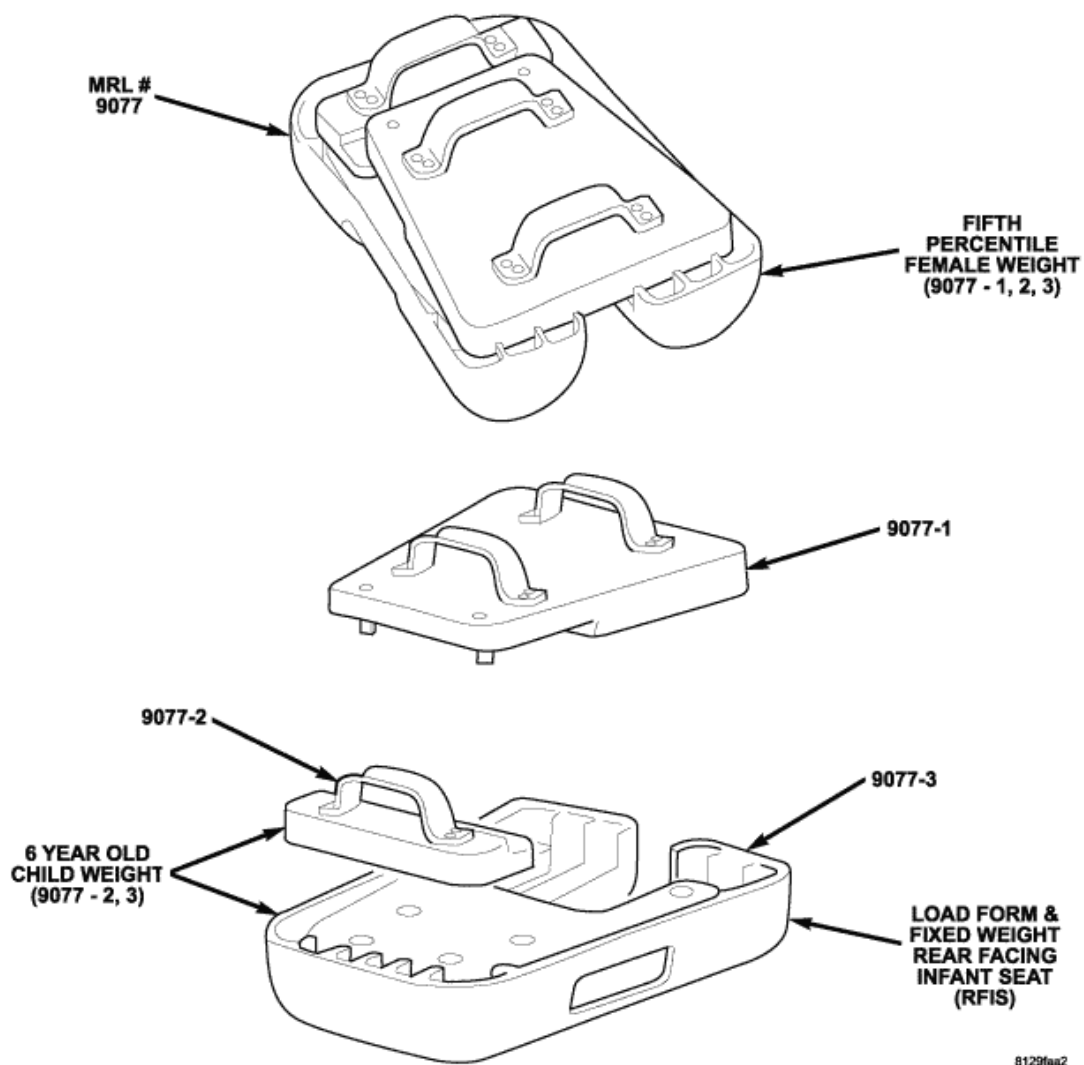


Fig. 2: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is IGN_RUN or signal not available.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module has initiated a re-zero and did not successfully complete the system verification, a system verification routine has been aborted or a update option table from flash routine has been completed.

DIAGNOSTIC TEST

1. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display any active DTC?

Yes

Go To 2.

Yes

But Other DTC Present?
Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present?
Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display any active DTC?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Yes

But Other DTC Present?

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present?

Perform *OCM SYSTEM VERIFICATION TEST .

**B1BAA-OCCUPANT CLASSIFICATION MODULE CONFIGURATION
MISMATCH**

CIRCUIT SCHEMATIC

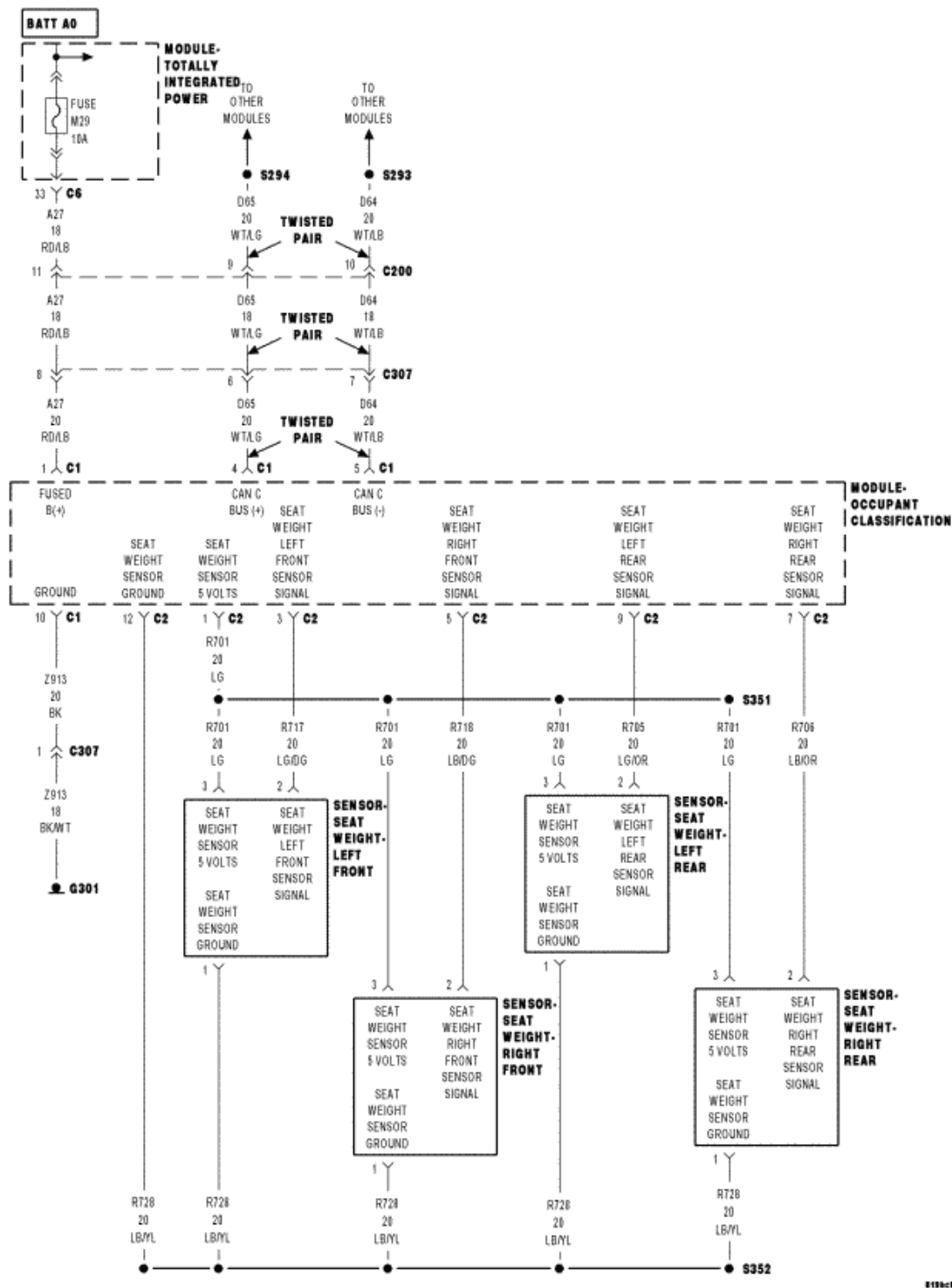


Fig. 3: Occupant Classification Module Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is IGN_RUN.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC is not configured for Occupant Classification Module (OCM) and the OCM is active on the CAN Bus. Note: Because all ORCs are originally configured for the OCM the ORC must learn the not equipped with OCM state from the TIPM.

POSSIBLE CAUSES

Possible Causes
LOSS OF COMMUNICATION BETWEEN ORC AND TIPM
MISSING CAN BUS CONFIGURATION MESSAGE
CORRUPT CONFIGURATION MESSAGE
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE B1BAA-OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH**

With the scan tool, read Occupant Restraints Controller (ORC) DTCs.

Does the scan tool display an active: B1BAA-OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH DTCs?

Yes

Go To 2.

No

Go To 5.

2. **CHECKING FOR CORRUPT CONFIGURATION MESSAGE**

With the scan tool, read Occupant Restraints Controller (ORC) DTCs.

Does the scan tool display an active: U1414-IMPLAUSIBLE/MISSING ECU NETWORK CONFIGURATION DATA DTCs?

Yes

Perform the U1414-IMPLAUSIBLE/MISSING ECU NETWORK CONFIGURATION DATA diagnostic test.

No

Go To 3.

3. CHECKING FOR LOSS OF CAN BUS CONFIGURATION MESSAGE

With the scan tool, read Occupant Restraints Controller (ORC) DTCs.

Does the scan tool display an active U1415-IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA DTCs?

Yes

Perform the U1415-IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA diagnostic test.

No

Go To 4.

4. CHECKING FOR LOSS OF COMMUNICATION WITH THE TIPM

With the scan tool, read Occupant Restraints Controller (ORC) DTCs.

Does the scan tool display an active: U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TOTALLY INTEGRATED POWER MODULE)?

Yes

Perform the U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE. Refer to **DIAGNOSIS AND TESTING** .

No

Go To 6.

5. VERIFYING STORED B1BAA-OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH DTC

With the scan tool, record and erase all DTC's from the Occupant Restraint Controller.

Turn the ignition off, and wait 15 seconds, then turn the ignition on.

Wait one minute, and read active and stored codes.

Does the scan tool display an active or stored B1BAA-OCCUPANT CLASSIFICATION MODULE CONFIGURATION MISMATCH DTCs?

Yes

For active DTC-Go To 2.

Yes

For stored-Go To 6.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

6. REPLACE THE ORC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

B1BBA-PASSENGER SEAT WEIGHT SENSOR SUPPLY CIRCUIT

CIRCUIT SCHEMATIC

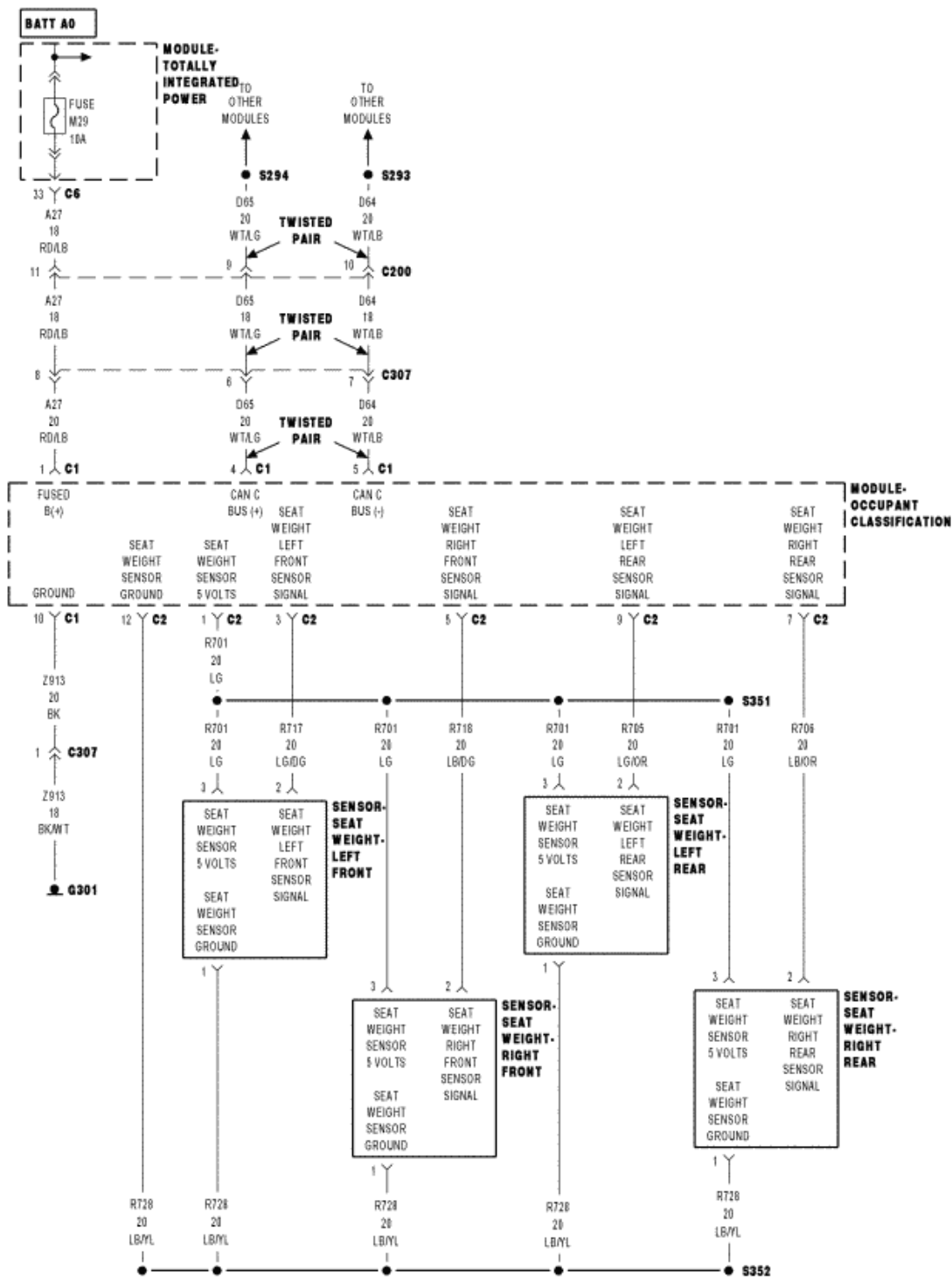


Fig. 4: Occupant Classification Module Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor supply.

SET CONDITIONS

- **Set Condition:**

If the OCM detects that the sensor supply shorted.

NOTE: **A shorted supply circuit will cause a 'NO RESPONSE FROM OCM' condition.**

POSSIBLE CAUSES

Possible Causes
OCS SUPPLY CIRCUIT SHORTED OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **VERIFY THAT B1BBA-PASSENGER SEAT WEIGHT SENSOR SUPPLY CIRCUIT DTC IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1BBA-PASSENGER SEAT WEIGHT SENSOR SUPPLY CIRCUIT?

Yes

Replace the OCM in accordance with the Service Information.
Perform the B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED diagnostic test.

No

Go To 2.

2. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: **Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.**

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 3.

3. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase all DTCs from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Perform the Occupant Classification Module System Verification Test in this Section. Erase all codes before returning vehicle to customer.

B1BBB-PASSENGER SEAT WEIGHT SENSOR INPUTS SHORTED TOGETHER

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN.

SET CONDITIONS

- **Set Condition:**

If the OCM detects any two sensors voltages below 20 mV for 10 minutes while any other sensor is greater than 40 mV. Note: 1 A/D count is equal to 5 mV.

NOTE: **A shorted supply circuit will cause a "NO RESPONSE FROM OCM" condition.**

POSSIBLE CAUSES

Possible Causes
OCS SENSOR CIRCUITS SHORTED TOGETHER OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **VERIFY THAT B1BBB-PASSENGER SEAT WEIGHT SENSOR INPUTS SHORTED TOGETHER DTC IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1BBB-PASSENGER SEAT WEIGHT SENSOR INPUTS SHORTED TOGETHER ?

Yes

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the OCM in accordance with the Service Information.

Perform the B1BA7-OCCUPANT CLASSIFICATION SYSTEM VERIFICATION REQUIRED diagnostic test.

No

Go To 2.

2. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if the condition inspecting or testing for is present in the Seat Harness.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Go To 3.

3. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, record and erase all DTCs from the OCM.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Perform the Occupant Classification Module System Verification Test in this Section. Erase all codes before returning vehicle to customer.

B1BBC-OCS NEGATIVE SYSTEM WEIGHT

OCCUPANT CLASSIFICATION SEAT WEIGHTS

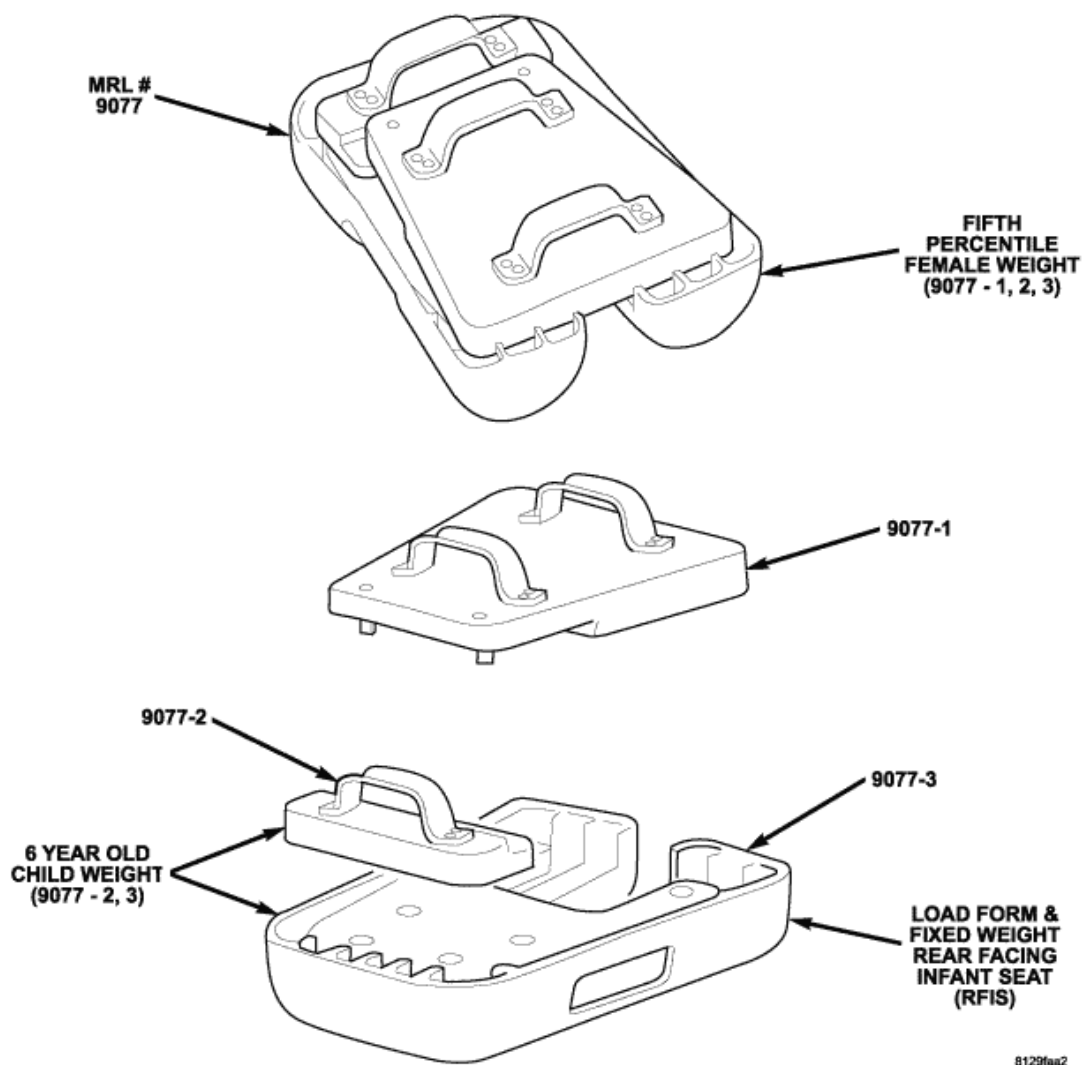


Fig. 5: Identifying OCS Seat Weights
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status is in IGN_RUN, the module checks the sensor input ranges.

SET CONDITIONS

- **Set Condition:**

If the module detects a seat weight sensor input with the total seat weight below -6.5 kg +/- 1kg.

POSSIBLE CAUSES

Possible Causes
DAMAGE TO THE PASSENGER SEAT STRUCTURE, RISER ASSEMBLY, CROSSMEMBERS, SEAT TRACKS, FLOOR PAN OBJECT UNDER SEAT OR REAR SEAT FOLDED DOWN AND RESTING AGAINST PASSENGER SEAT OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE OCM DTCs**

- ACTIVE INTERNAL DTC
- IGNITION DTC
- BATTERY DTC
- SEAT WEIGHT SENSOR DTC

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs listed above?

Yes

Diagnose and repair the DTCs. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

Go To 2.

2. **ACTIVE OR STORED DTC**

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1BBC-OCS NEGATIVE SYSTEM WEIGHT?

Yes

Go To 3.

No

Go To 5.

3. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

Verify that the passenger seat is empty.

NOTE: **Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.**

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1BA8-OCS NOT CALIBRATED DTC?

Yes

Go To 4.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTCs are Present?

Diagnose and repair the DTCs. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTCs Present?

Perform ***OCM SYSTEM VERIFICATION TEST** .

4. VERIFY SEAT WEIGHT SENSOR TORQUE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B1BA8-OCS NOT CALIBRATED DTC?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTCs are Present?

Diagnose and repair the DTCs. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTCs Present?

Perform ***OCM SYSTEM VERIFICATION TEST** .

5. **STORED B1BBC-OCS NEGATIVE SYSTEM WEIGHT DTC**

With the scan tool, record and erase all DTCs from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

Select appropriate symptom from Symptom List.

No

No problem found at this time. Perform the Occupant Classification Module System Verification Test in this Section. Erase all codes before returning vehicle to customer.

B1BBD-OCM CURRENT CONFIGURATION TABLE UNPROGRAMMED

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

If the Configuration Table is not programmed at the supplier or when the checksum is invalid.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the Occupant Classification Module (OCM) was received unprogrammed from the supplier, the vehicle line was not identified correctly or if the flash procedure was not completed successfully

POSSIBLE CAUSES

Possible Causes
NEW OCCUPANT CLASSIFICATION MODULE
INTERNAL CHECKSUM FAILURE

DIAGNOSTIC TEST

1. **MODULE CONFIGURATION**

Does the scan tool display B1BBD-OCM CURRENT CONFIGURATION TABLE UNPROGRAMMED?

Yes

Perform the B1BA7-OCS VERIFICATION REQUIRED diagnostic procedure.

No

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the OCM in accordance with the service information.
With the scan tool, perform *OCM SYSTEM VERIFICATION TEST.

B1BC7-DEPLOYMENT DATA RECORD FULL

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. The Occupant Restraint Controller (ORC) on board diagnostics continuously monitors the deployment register.

The register counts the number of airbag deployment for this vehicle.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC deployment register increments to 3.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **REPLACE THE OCCUPANT RESTRAINT CONTROLLER**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

View repair.

Repair

Replace the Occupant Restraint Controller in accordance with the service information.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

B1BCF-ROLL OVER SENSOR

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range Roll Over Sensor circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions could result in accidental airbag deployment and serious or fatal injury.

When this code is set, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

B1C23-PASSENGER SEAT WEIGHT 3 - LEFT FRONT CONFIGURATION MISMATCH

OCCUPANT CLASSIFICATION SEAT WEIGHTS

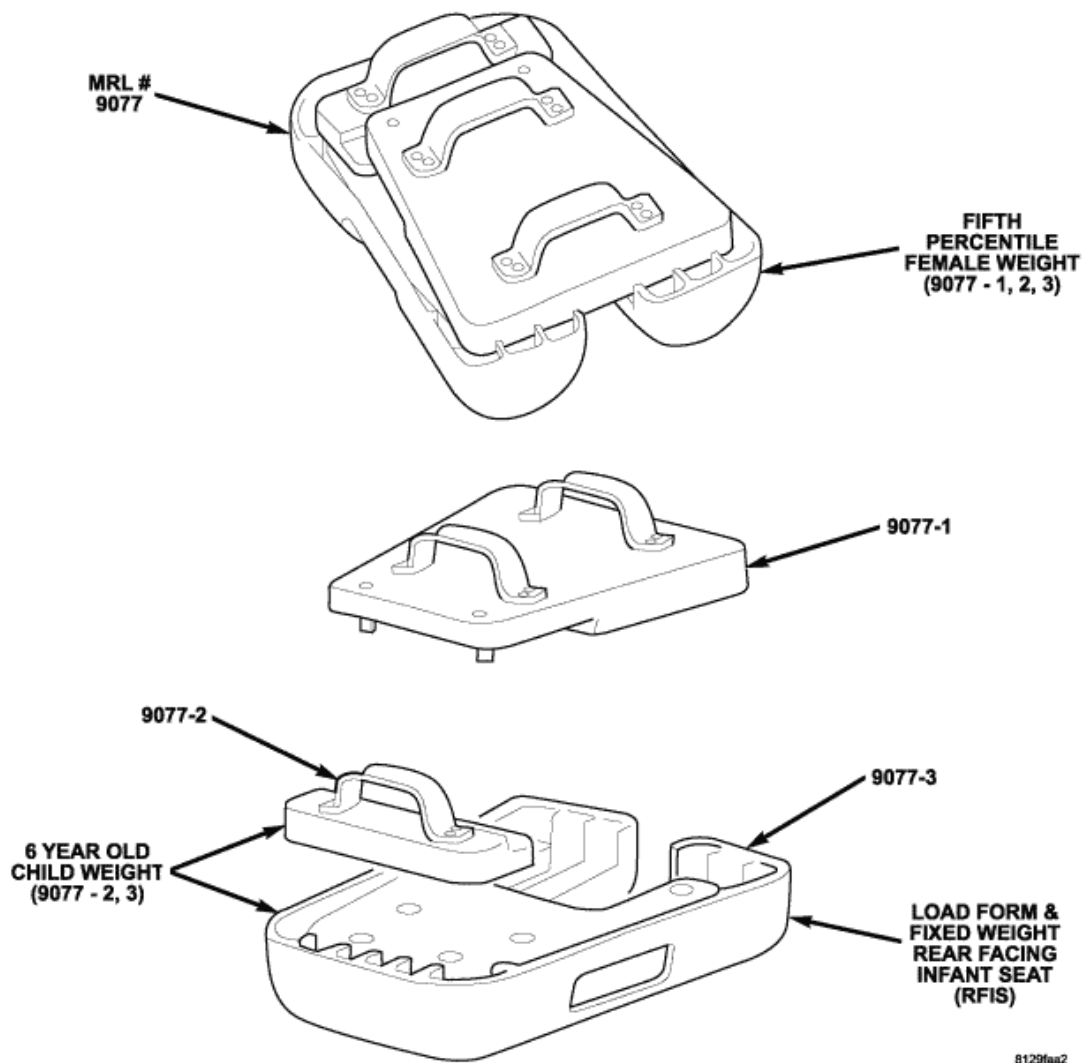


Fig. 6: OCS Seat Weights
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Classification Module (OCM) monitors the position of each Seat Weight Sensor. The sensor identification is mapped to the sensor position during the OCM SYSTEM

VERIFICATION TEST.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects one or more new Seat Weight Sensors or if the existing sensors are moved to a new position.

POSSIBLE CAUSES

Possible Causes
NEW SEAT WEIGHT SENSOR INSTALLED
EXISTING SEAT WEIGHT SENSOR MOVED TO A NEW POSITION

DIAGNOSTIC TEST

1. PERFORM OCM SYSTEM VERIFICATION TEST

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C23-PASSENGER SEAT WEIGHT 3 - LEFT FRONT CONFIGURATION MISMATCH?

Yes

Go To 2.

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C23-PASSENGER SEAT WEIGHT 3 - LEFT FRONT CONFIGURATION MISMATCH?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

**B1C24-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT
CONFIGURATION MISMATCH**

OCCUPANT CLASSIFICATION SEAT WEIGHTS

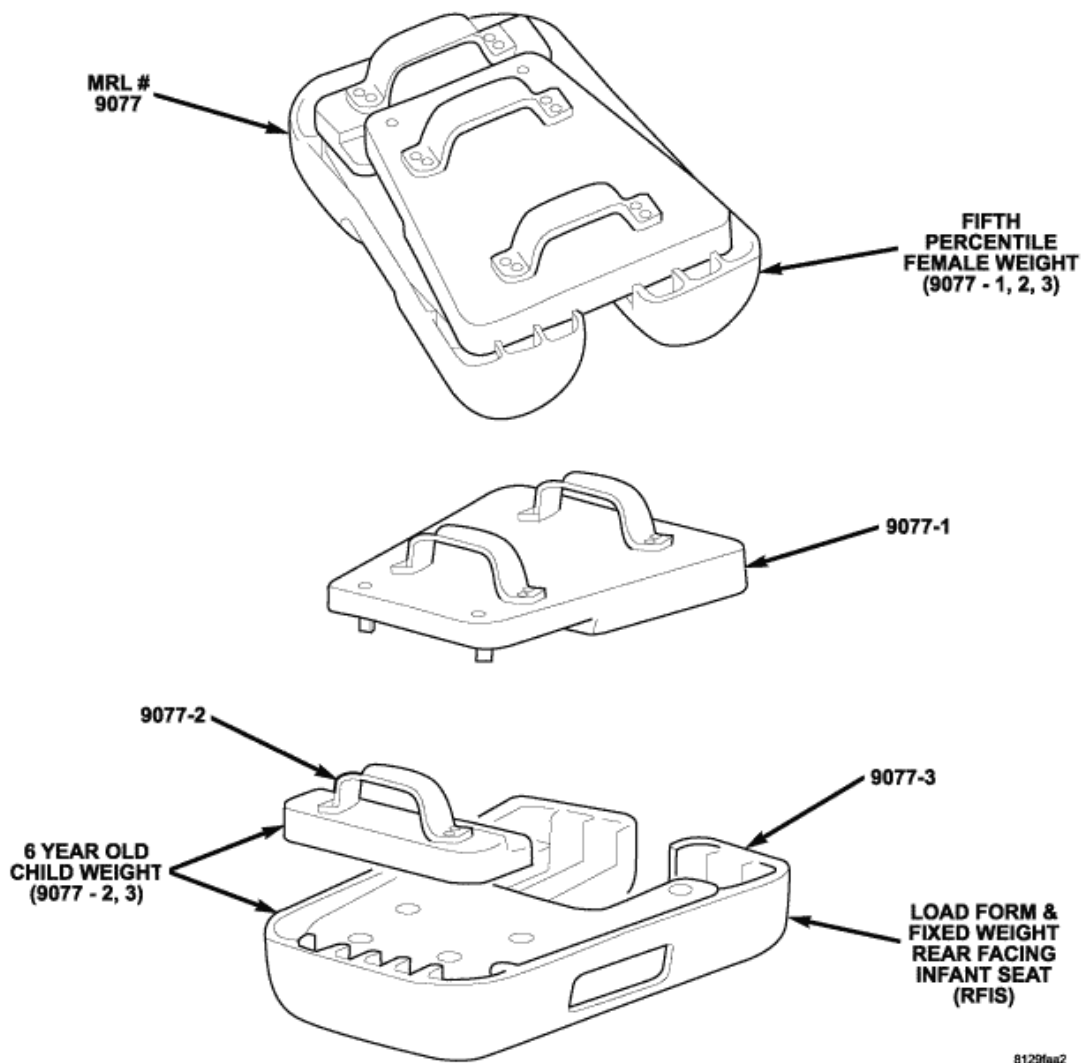


Fig. 7: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Classification Module (OCM) monitors the position of each Seat Weight Sensor. The sensor identification is mapped to the sensor position during the OCM SYSTEM

VERIFICATION TEST.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects one or more new Seat Weight Sensors or if the existing sensors are moved to a new position.

POSSIBLE CAUSES

Possible Causes
NEW SEAT WEIGHT SENSOR INSTALLED
EXISTING SEAT WEIGHT SENSOR MOVED TO A NEW POSITION

DIAGNOSTIC TEST

1. PERFORM OCM SYSTEM VERIFICATION TEST

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C24-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT CONFIGURATION MISMATCH?

Yes

Go To 2.

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C24-PASSENGER SEAT WEIGHT SENSOR 2 - RIGHT FRONT CONFIGURATION MISMATCH?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

**B1C25-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR
CONFIGURATION MISMATCH**

OCCUPANT CLASSIFICATION SEAT WEIGHTS

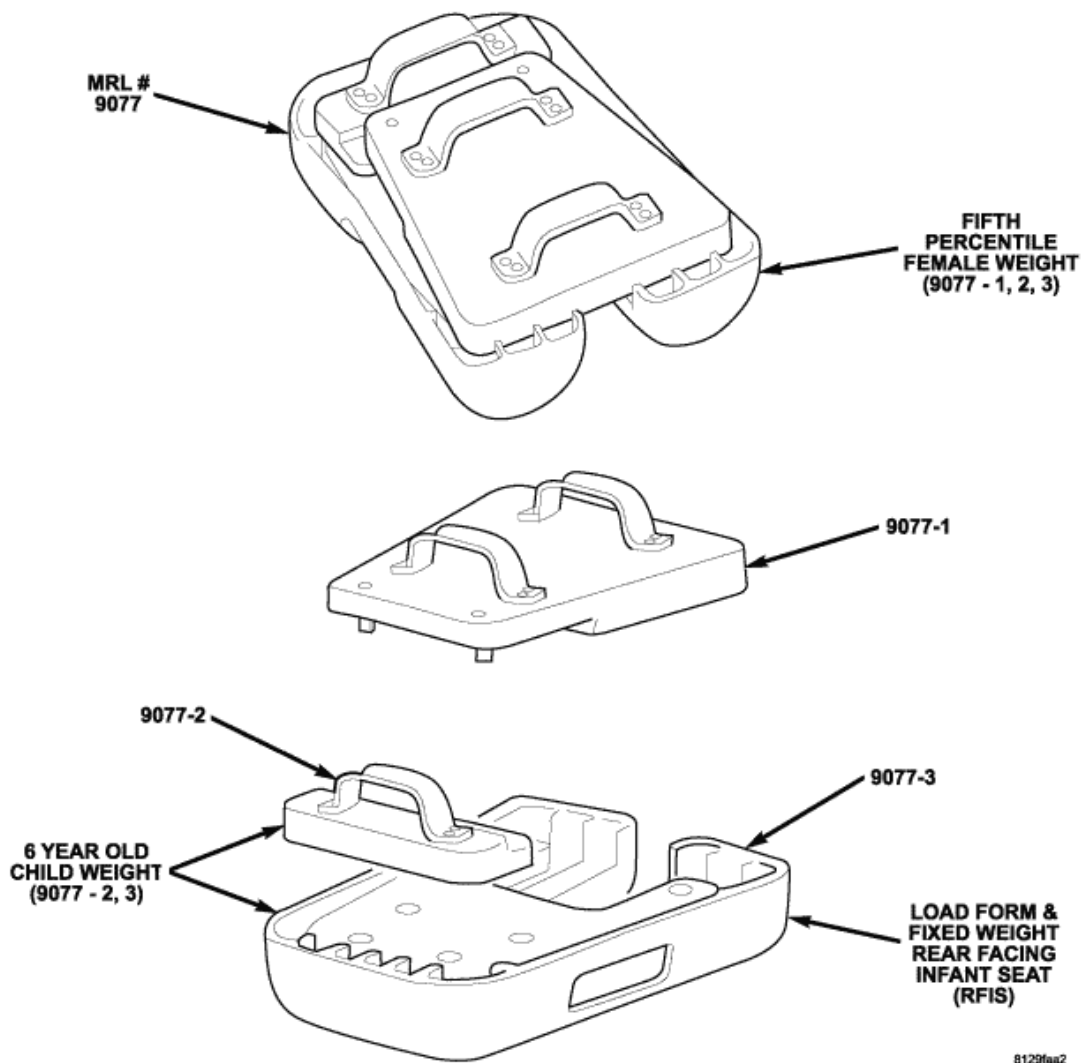


Fig. 8: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Classification Module (OCM) monitors the position of each Seat Weight Sensor. The sensor identification is mapped to the sensor position during the OCM SYSTEM

VERIFICATION TEST.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects one or more new Seat Weight Sensors or if the existing sensors are moved to a new position.

POSSIBLE CAUSES

Possible Causes
NEW SEAT WEIGHT SENSOR INSTALLED
EXISTING SEAT WEIGHT SENSOR MOVED TO A NEW POSITION

DIAGNOSTIC TEST

1. PERFORM OCM SYSTEM VERIFICATION TEST

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C25-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR CONFIGURATION MISMATCH?

Yes

Go To 2.

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C25-PASSENGER SEAT WEIGHT SENSOR 4 - LEFT REAR CONFIGURATION MISMATCH?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

B1C26-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR CONFIGURATION MISMATCH

OCCUPANT CLASSIFICATION SEAT WEIGHTS

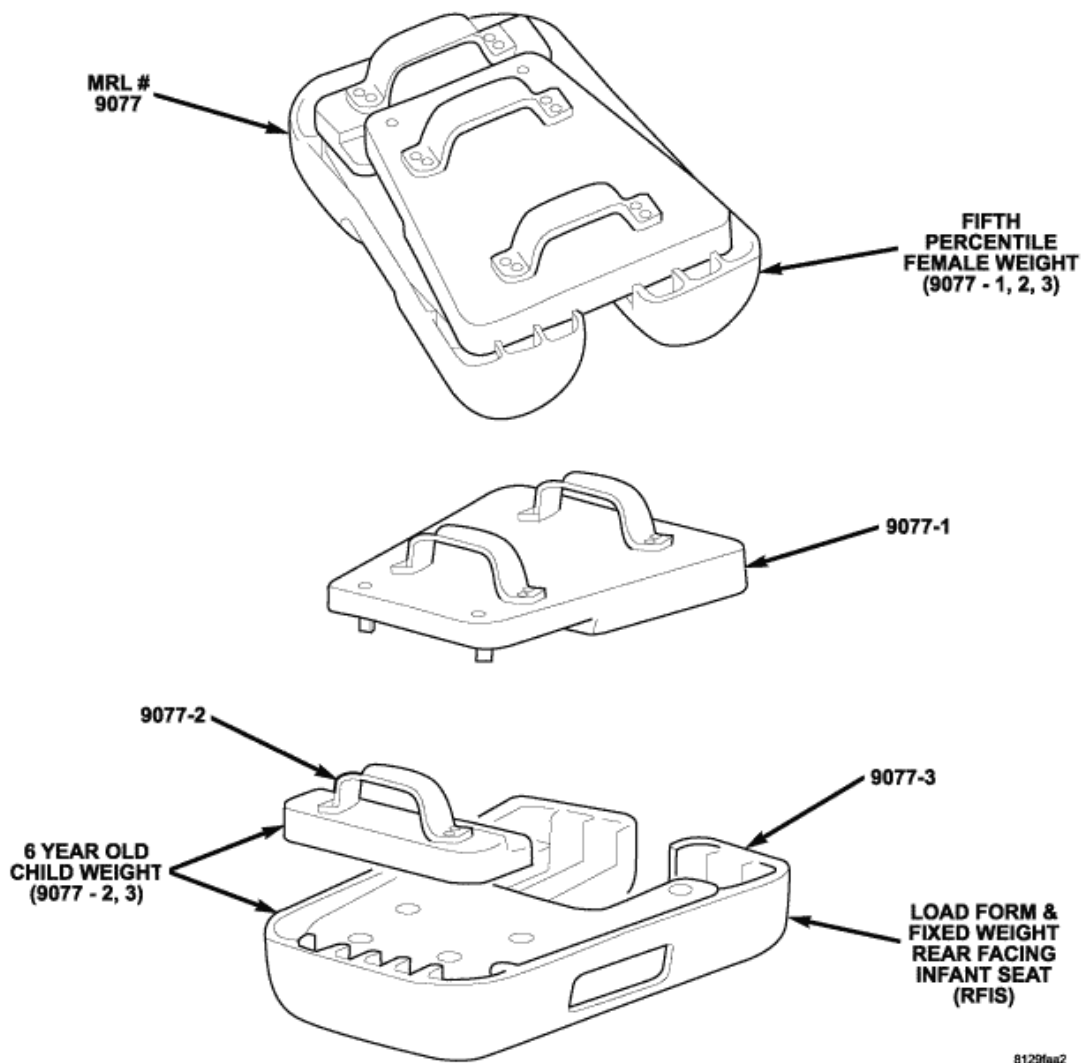


Fig. 9: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Classification Module (OCM) monitors the position of each Seat Weight Sensor. The sensor identification is mapped to the sensor position during the OCM SYSTEM

VERIFICATION TEST.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects one or more new Seat Weight Sensors or if the existing sensors are moved to a new position.

POSSIBLE CAUSES

Possible Causes
NEW SEAT WEIGHT SENSOR INSTALLED
EXISTING SEAT WEIGHT SENSOR MOVED TO A NEW POSITION

DIAGNOSTIC TEST

1. PERFORM OCM SYSTEM VERIFICATION TEST

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C26-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR CONFIGURATION MISMATCH?

Yes

Go To 2.

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM SENSOR TORQUE TEST**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to Group 23 for specification.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B1C26-PASSENGER SEAT WEIGHT SENSOR 1 - RIGHT REAR CONFIGURATION MISMATCH?

Yes

Perform the *Diagnosis/Checkout Procedure For Seat Weight Sensors.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

DTC are Present

Diagnose and repair the DTC. Refer to the Table of Contents in this Section for a complete list of symptoms.

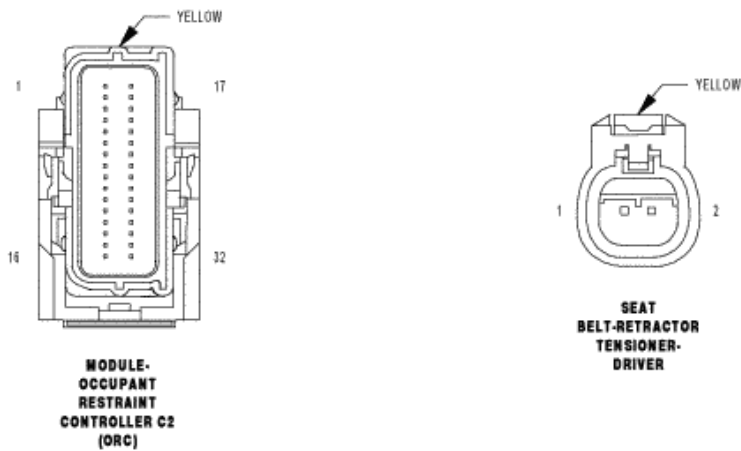
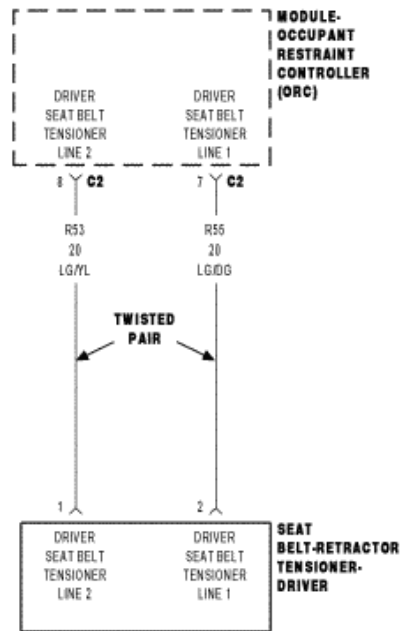
No

No Active DTC Present

Perform ***OCM SYSTEM VERIFICATION TEST** .

B1C38-1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT LOW

CIRCUIT SCHEMATIC



013506000

Fig. 10: Driver Seat Belt Retractor Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance on the Driver Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT SHORTED TO GROUND
(R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT SHORTED TO GROUND
DRIVER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED DRIVER SEAT BELT RETRACTOR TENSIONER**

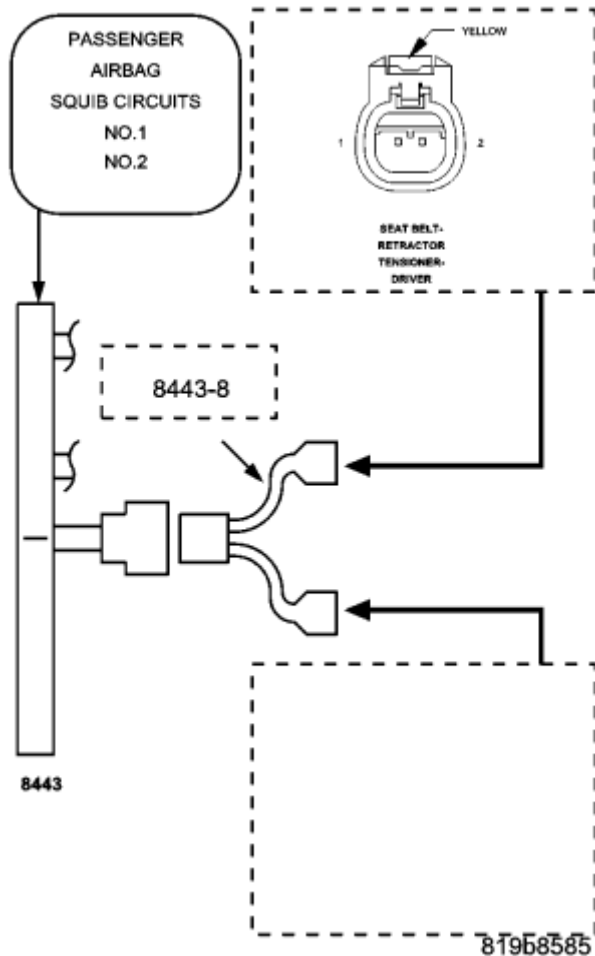


Fig. 11: Connecting 8443 Load Tool And 8443-10 Jumper To Driver Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Retractor Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Driver Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C38-1ST ROW DRIVER RETRACTOR PRETENSIONER

CIRCUIT LOW?

Yes

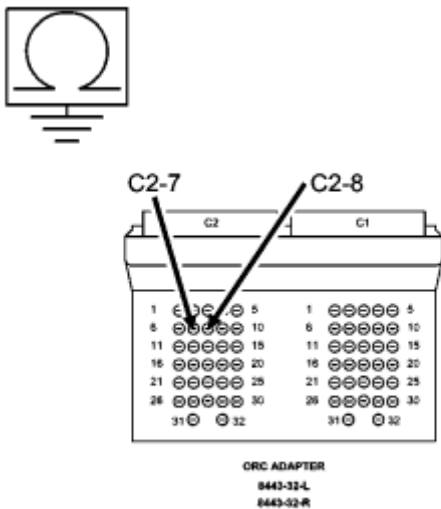
Go To 3.

No

Replace the Driver Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT AND (R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR A SHORT TO GROUND**



819b8507

Fig. 12: Measuring Resistance Of (R55/R53) Driver Seat Belt Retractor Tensioner Line 1 Circuit Between Driver Seat Belt Retractor Tensioner Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connector.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit between the Driver Seat Belt Retractor Tensioner connector and ground.

Measure the resistance of the (R53) Driver Seat Belt Retractor Tensioner Line 1 circuit between the Driver Seat Belt Retractor Tensioner connector and ground.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the Driver Seat Belt Retractor Tensioner circuits for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

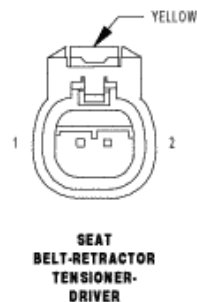
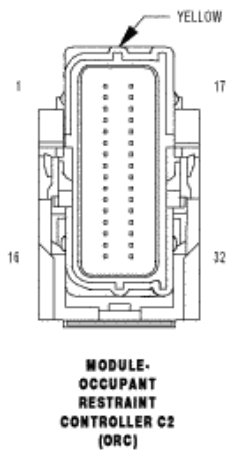
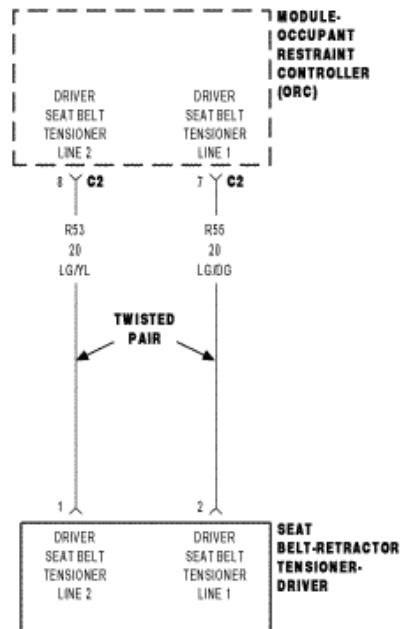
Yes

Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C39-1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT HIGH CIRCUIT SCHEMATIC



013506000

Fig. 13: Driver Seat Belt Retractor Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Driver Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC detects voltage on the Driver Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT SHORTED TO BATTERY
(R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT SHORTED TO BATTERY
DRIVER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED DRIVER SEAT BELT RETRACTOR TENSIONER**

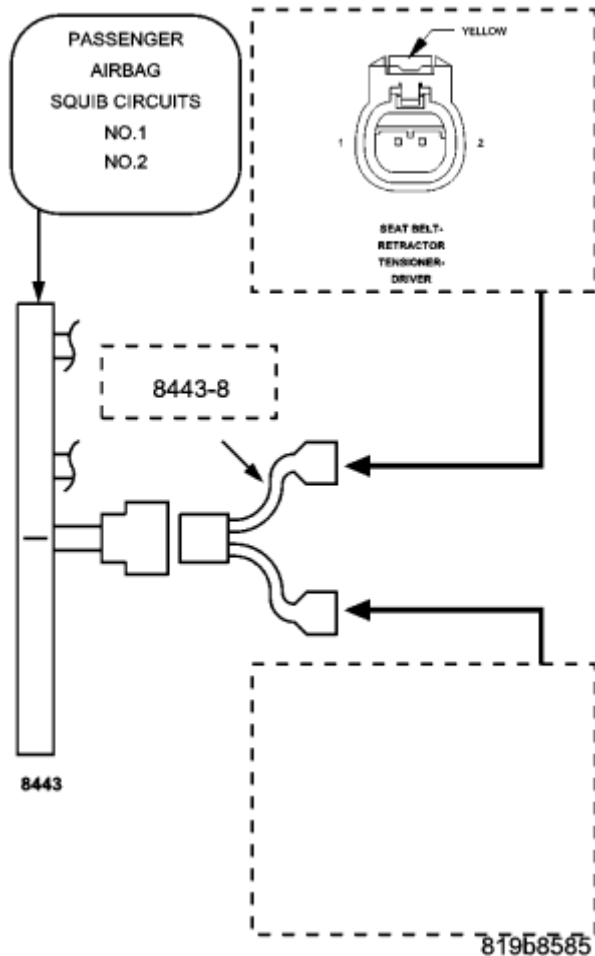


Fig. 14: Connecting 8443 Load Tool And 8443-10 Jumper To Driver Seat Belt Retractor Tensioner Connector

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Driver Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C39-1ST ROW DRIVER RETRACTOR PRETENSIONER

CIRCUIT HIGH?

Yes

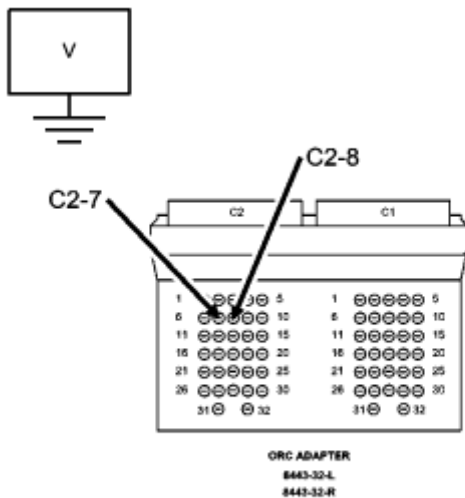
Go To 3.

No

Replace the Driver Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT AND (R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



819b9c4f

Fig. 15: Measuring Voltage Of (R55/53) Driver Seat Belt Retractor Tensioner Line 1/2 Circuit Between Driver Seat Belt Tensioner Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit between the Driver Seat Belt Tensioner connector and ground.

Measure the voltage of the (R53) Driver Seat Belt Retractor Tensioner Line 2 circuit between the Driver Seat Belt Tensioner connector and ground.

Is there any voltage present on either circuit?

Yes

Repair the Driver Seat Belt Retractor Tensioner circuits with voltage present for a short to battery.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

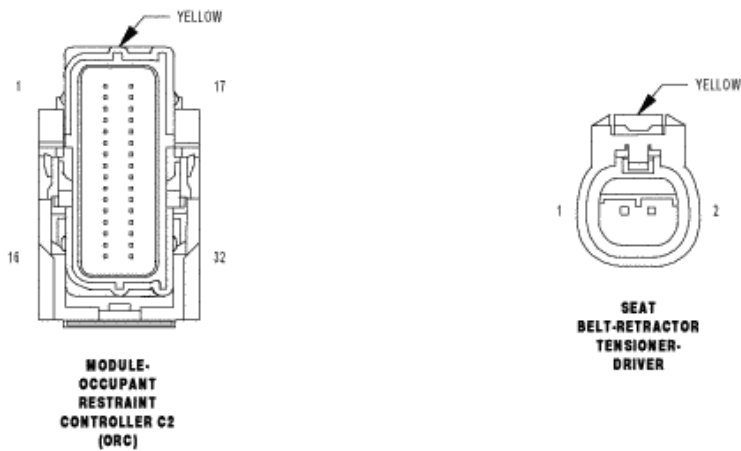
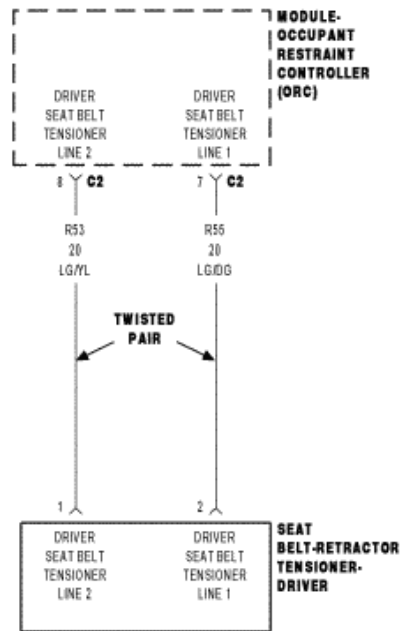
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C3A-1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT OPEN

CIRCUIT SCHEMATIC



013506000

Fig. 16: Driver Seat Belt Retractor Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected an open or high resistance on the Driver Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT OPEN
(R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT OPEN
DRIVER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR DRIVER SEAT BELT RETRACTOR TENSIONER CIRCUIT OPEN**

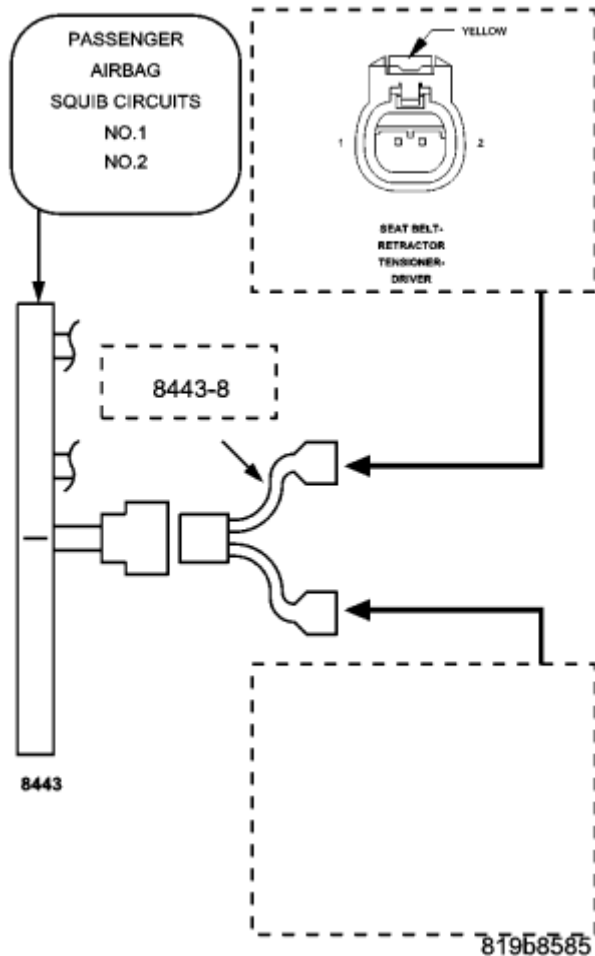


Fig. 17: Connecting 8443 Load Tool And 8443-10 Jumper To Driver Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Retractor Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Driver Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C3A-1ST ROW DRIVER RETRACTOR PRETENSIONER

CIRCUIT OPEN?

Yes

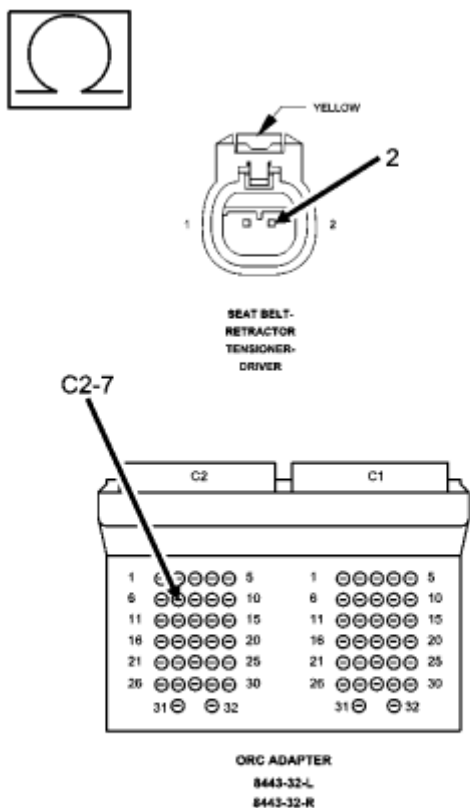
Go To 3.

No

Replace the Driver Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK (R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT FOR AN OPEN



819b9ac2

Fig. 18: Measuring Resistance Of (R55) Driver Seat Belt Retractor Tensioner Line 1 Circuit Between Driver Seat Belt Retractor Tensioner Connector And ORC 8443-32-R Adaptor
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool 8443-32-R ORC Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit between the Driver Seat Belt Retractor Tensioner connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

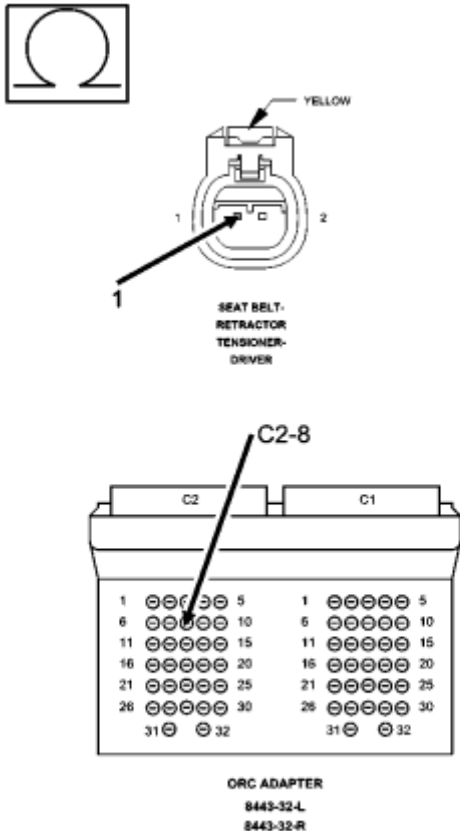
Yes

Go To 4.

No

Repair the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit for and open. Then Go To 4.

4. CHECK (R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR AN OPEN



819b9ad2

Fig. 19: Measuring resistance of (R53) Driver Seat Belt Retractor Tensioner Line 1 circuit between Driver Seat Belt Retractor Tensioner connector and ORC 8443-32-R Adaptor
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R53) Driver Seat Belt Retractor Tensioner Line 1 circuit between the Driver Seat Belt Retractor Tensioner connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R53) Driver Seat Belt Retractor Tensioner Line 1 circuit for and open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it

must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

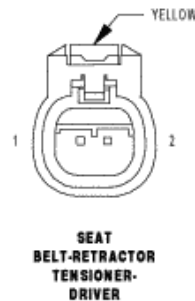
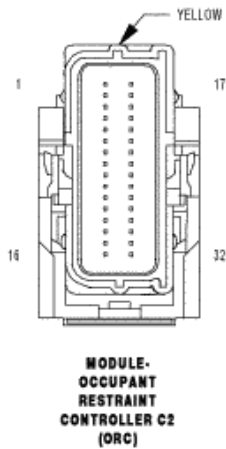
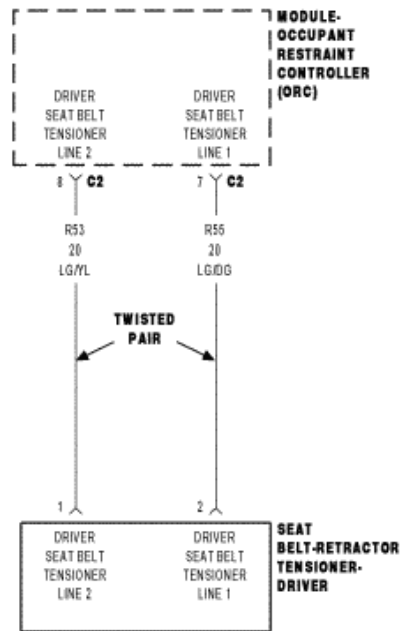
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**B1C3B-1ST ROW DRIVER RETRACTOR PRETENSIONER CIRCUIT
SHORTED TOGETHER**

CIRCUIT SCHEMATIC



013506000

Fig. 20: Driver Seat Belt Retractor Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Driver Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
CIRCUIT (R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 SHORTED TO CIRCUIT (R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT DRIVER SEAT BELT RETRACTOR PRETENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. SELECT ACTIVE OR STORED DTC

- NOTE:** Ensure the battery is fully charged.
- NOTE:** The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. CHECK FOR SHORTED DRIVER SEAT BELT RETRACTOR TENSIONER

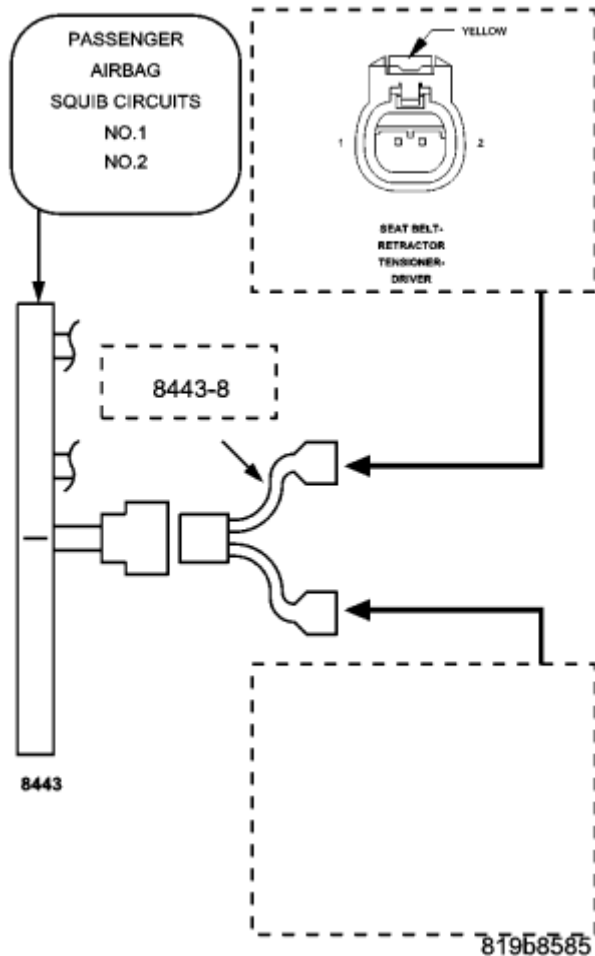


Fig. 21: Connecting 8443 Load Tool And 8443-10 Jumper To Driver Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Retractor Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Driver Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C3B-1ST ROW DRIVER RETRACTOR PRETENSIONER

CIRCUIT SHORTED TOGETHER?

Yes

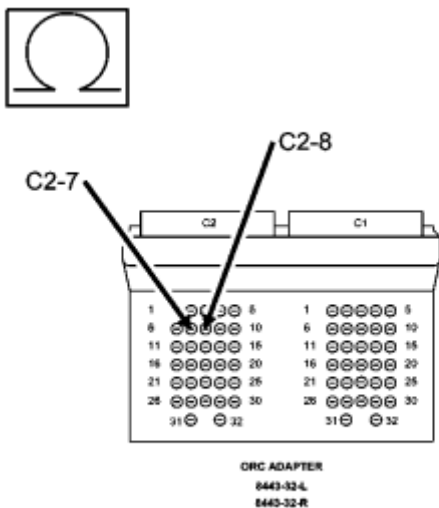
Go To 3.

No

Replace the Driver Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R55) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT FOR A SHORT TO (R53) DRIVER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT**



819b9aa5

Fig. 22: Measuring Resistance Between (R55) Driver Seat Belt Retractor Tensioner Line 1 Circuit And (R53) Driver Seat Belt Retractor Tensioner Line 2 Circuit At Driver Seat Belt Retractor Tensioner Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance between the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit and the (R53) Driver Seat Belt Retractor Tensioner Line 2 circuit at the Driver Seat Belt Retractor Tensioner connector.

Is the resistance below 10K ohms?

Yes

Repair the (R55) Driver Seat Belt Retractor Tensioner Line 1 circuit for a short to the (R53) Driver Seat Belt Retractor Tensioner Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

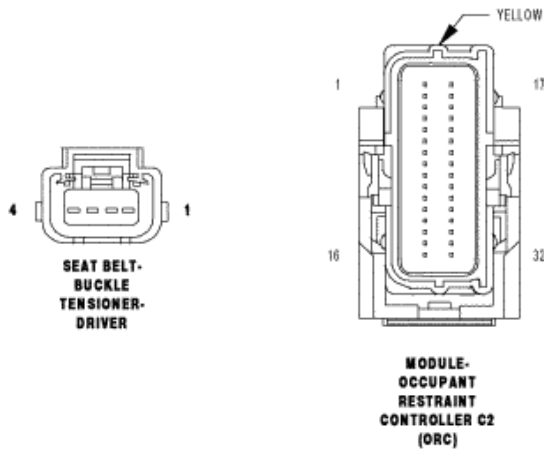
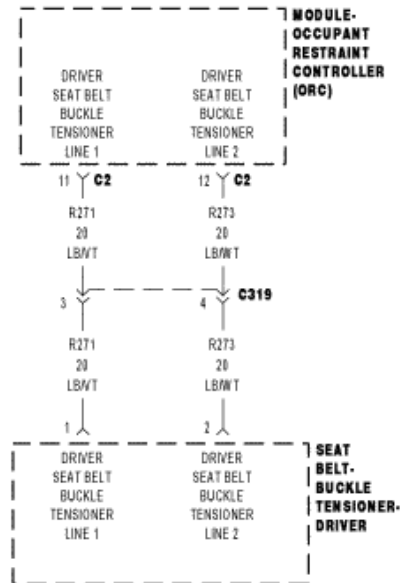
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C3D-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW

CIRCUIT SCHEMATIC



01a0e538

Fig. 23: Driver Seat Belt Buckle Tensioner Circuits Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance on the Driver Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO GROUND (R273) DRIVER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT SHORTED TO GROUND DRIVER SEAT BELT BUCKLE TENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT**

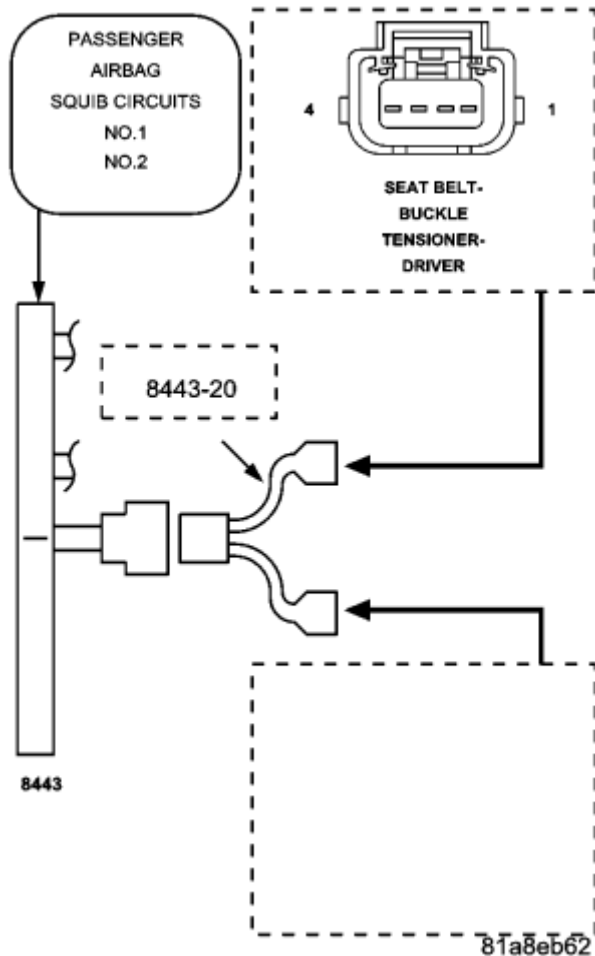


Fig. 24: Connecting 8443 Load Tool And 8443-20 Jumper To Driver Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Driver Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C3D-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER

CIRCUIT LOW

Yes

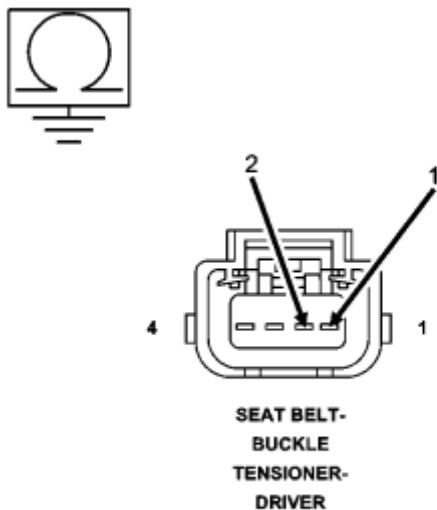
Go To 3.

No

Replace the Driver Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT AND (R273) DRIVER SEAT BELT TENSIONER LINE 2 CIRCUIT FOR A SHORT TO GROUND**



81a8eb69

Fig. 25: Measuring Resistance Of (R271/273) Driver Seat Belt Buckle Tensioner Line 1/2 Circuit Between Driver Seat Belt Buckle Tensioner Connector Cavity 1/2 And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connector.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R271) Driver Seat Belt Buckle Tensioner Line 1 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 1 and ground.

Measure the resistance of the (R273) Driver Seat Belt Buckle Tensioner Line 2 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 2 and ground.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the shorted to ground Driver Seat Belt Buckle Tensioner circuits.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

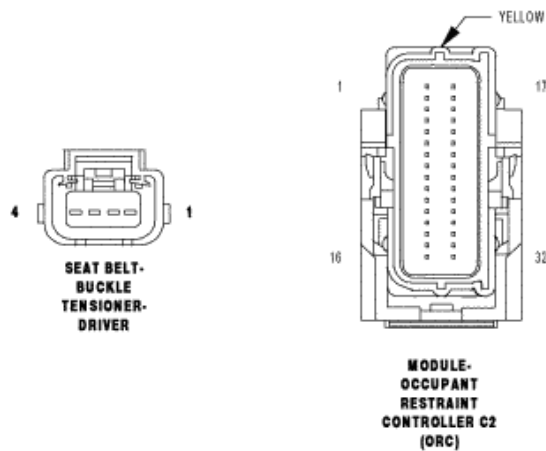
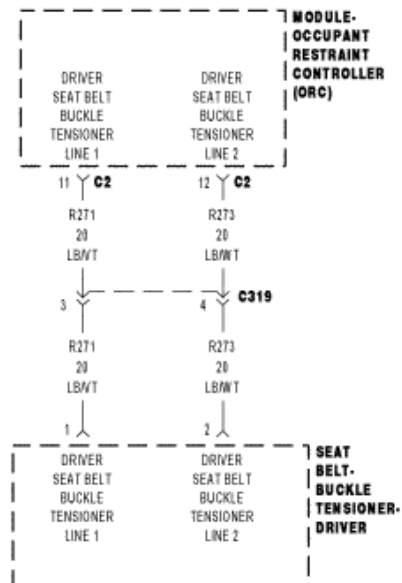
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C3E-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT HIGH

CIRCUIT SCHEMATIC



01a0e538

Fig. 26: Driver Seat Belt Buckle Tensioner Circuits Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Driver Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC detects voltage on the Driver Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO BATTERY (R273) DRIVER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT SHORTED TO BATTERY DRIVER SEAT BELT BUCKLE TENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED DRIVER SEAT BELT TENSIONER**

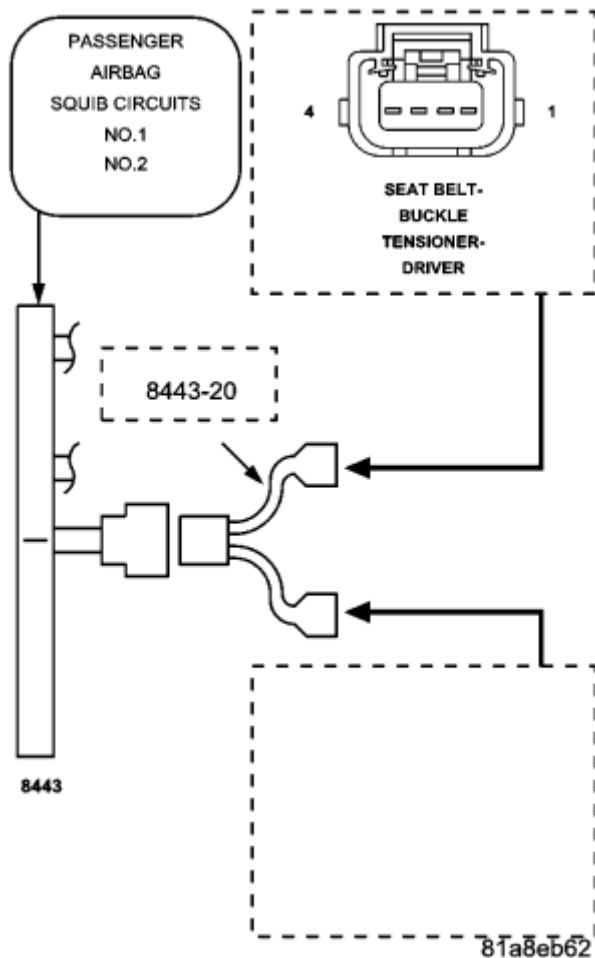


Fig. 27: Connecting 8443 Load Tool And 8443-20 Jumper To Driver Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Driver Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C3E-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER

CIRCUIT HIGH?

Yes

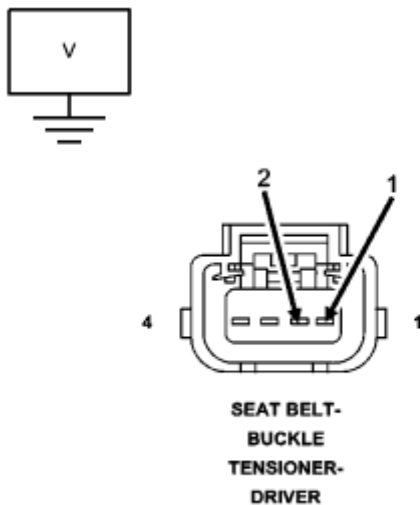
Go To 3.

No

Replace the Driver Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT AND (R273) DRIVER SEAT BELT BUCKLE TENSIONER VOLTAGE CIRCUIT FOR A SHORT TO BATTERY**



81a8eb71

Fig. 28: Measuring Voltage Of (R271/273) Driver Seat Belt Buckle Tensioner Line 1/2 Circuit Between Driver Seat Belt Buckle Tensioner Connector Cavity 1/2 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R271) Driver Seat Belt Buckle Tensioner Line 1 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 1 and ground.

Measure the voltage of the (R273) Driver Seat Belt Buckle Tensioner Line 2 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 2 and ground.

Is there any voltage present on either circuit?

Yes

Repair the Driver Seat Belt Buckle Tensioner circuits with voltage present for a short to battery.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread,

corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

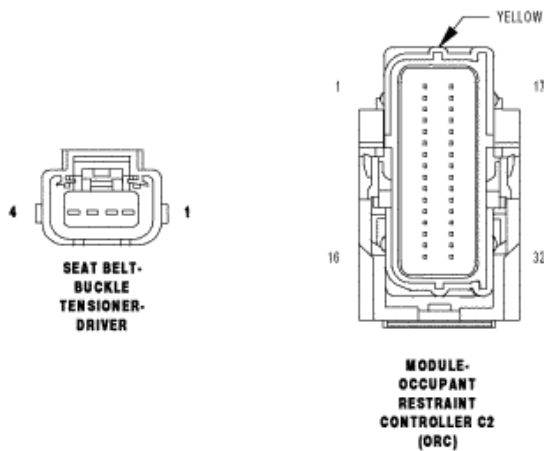
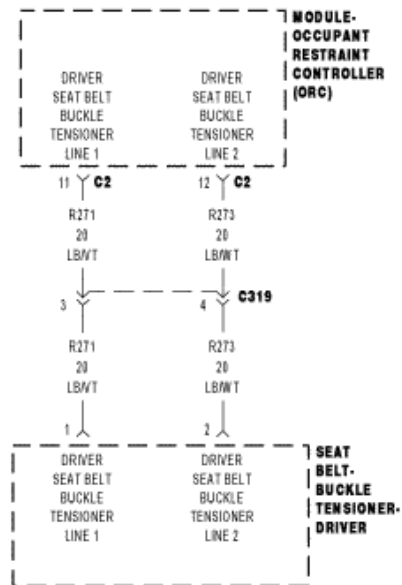
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C3F-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN

CIRCUIT SCHEMATIC



01a0e538

Fig. 29: Driver Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected an open or high resistance on the Driver Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT OPEN
(R273) DRIVER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT OPEN
DRIVER SEAT BELT BUCKLE TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: **Ensure the battery is fully charged.**

NOTE: **The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.**

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR OPEN DRIVER SEAT BELT BUCKLE TENSIONER**

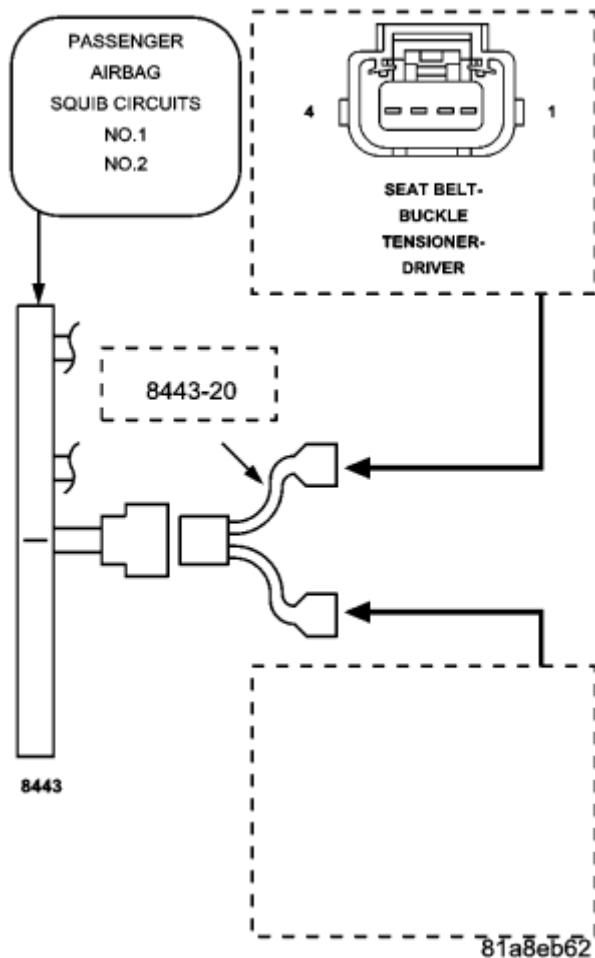


Fig. 30: Connecting 8443 Load Tool And 8443-20 Jumper To Driver Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Driver Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C3F-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER

CIRCUIT OPEN?

Yes

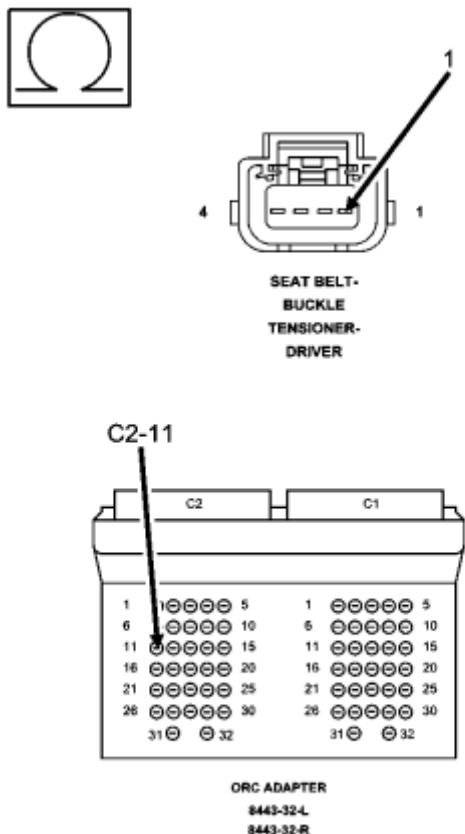
Go To 3.

No

Replace the Driver Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK (R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT FOR AN OPEN



81a8eb75

Fig. 31: Measuring Resistance Of (R271) Driver Seat Belt Buckle Tensioner Line 1 Circuit Between Driver Seat Belt Buckle Tensioner Connector Cavity 1 And ORC 8443-32-R Adaptor Cavity C2-11
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

Measure the resistance of the (R271) Driver Seat Belt Buckle Tensioner Line 1 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 1 and the ORC 8443-32-R Adapter cavity C2-11.

Is the resistance below 1.0 ohm?

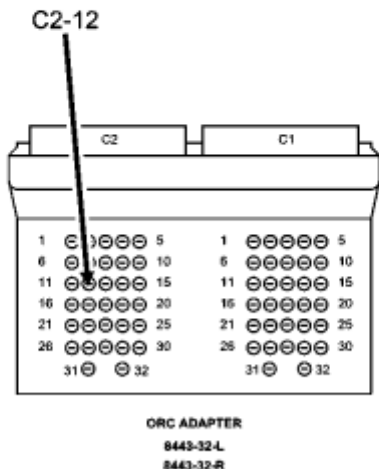
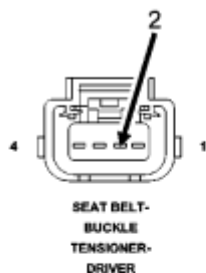
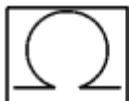
Yes

Go To 4.

No

Repair the (R55) Driver Seat Belt Buckle Tensioner Line 1 circuit for and open. Then Go To 4.

4. CHECK (R53) DRIVER SEAT BELT BUCKLE PRETENSIONER VOLTAGE CIRCUIT FOR AN OPEN



81a8eb79

Fig. 32: Measuring Resistance Of (R273) Driver Seat Belt Buckle Tensioner Line 2 Circuit Between Driver Seat Belt Buckle Tensioner Connector Cavity 2 And ORC 8443-32-R Adaptor Cavity 12
Courtesy of CHRYSLER LLC

Measure the resistance of the (R273) Driver Seat Belt Buckle Tensioner Line 2 circuit between the Driver Seat Belt Buckle Tensioner connector cavity 2 and the ORC 8443-32-R Adapter cavity 12.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R53) Driver Seat Belt Buckle Tensioner Line 2 circuit for and open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it

must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

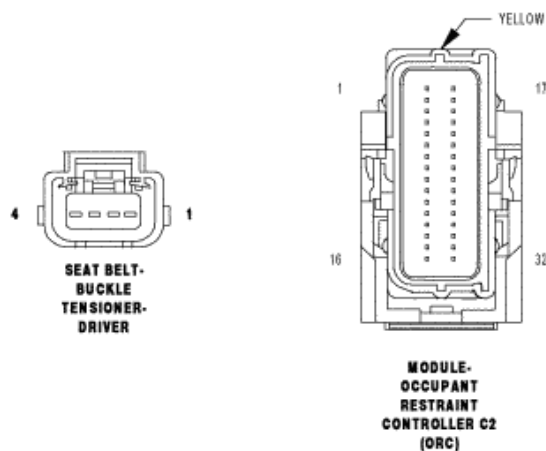
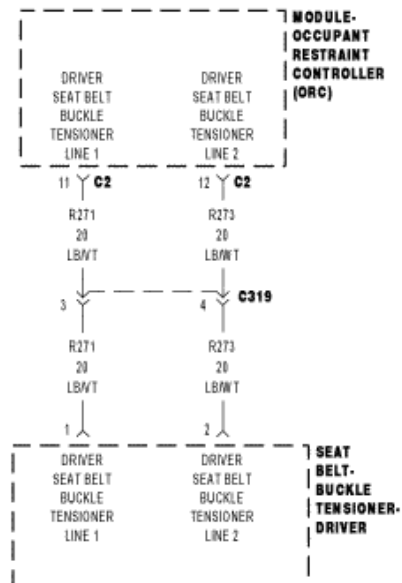
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**B1C40-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER CIRCUIT
SHORTED TOGETHER**

CIRCUIT SCHEMATIC



01a0e538

Fig. 33: Driver Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Driver Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Driver Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO (R273) DRIVER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT DRIVER SEAT BELT BUCKLE TENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. SELECT ACTIVE OR STORED DTC

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. CHECK FOR SHORTED DRIVER SEAT BELT BUCKLE TENSIONER

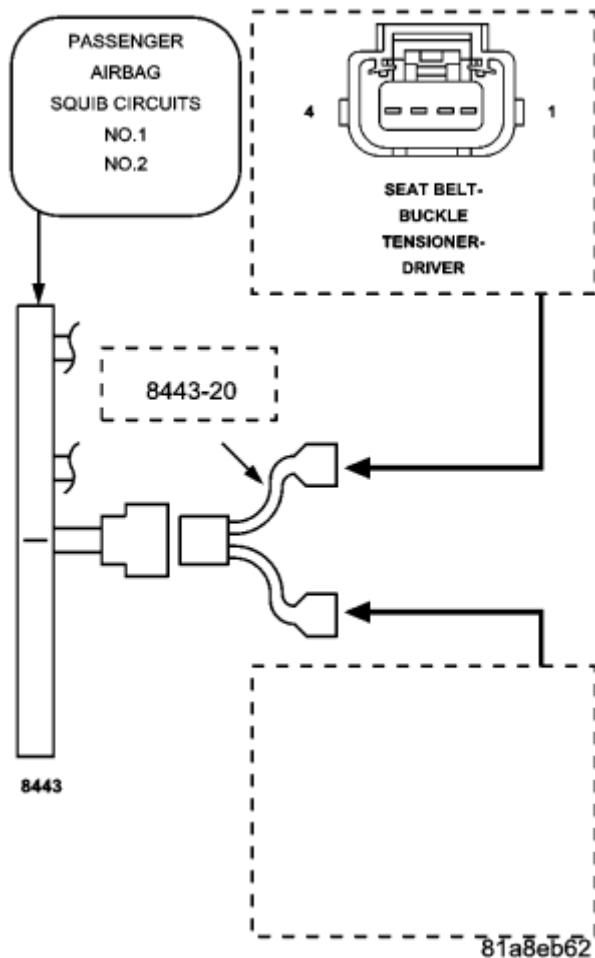


Fig. 34: Connecting 8443 Load Tool And 8443-20 Jumper To Driver Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Driver Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Driver Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C40-1ST ROW DRIVER SEAT BELT BUCKLE PRETENSIONER

CIRCUIT SHORTED TOGETHER?

Yes

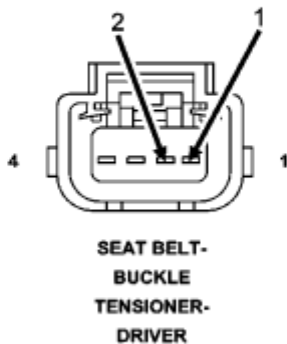
Go To 3.

No

Replace the Driver Seat Belt Buckle Pretensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R271) DRIVER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT FOR A SHORT TO (R273) DRIVER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT**



81a8eb7e

Fig. 35: Measuring Resistance Between (R271) Driver Seat Belt Buckle Tensioner Line 1 Circuit Cavity 1 And (R273) Driver Seat Belt Buckle Tensioner Line 2 Circuit Cavity 2 At Driver Seat Belt Buckle Tensioner Connector

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Driver Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

Measure the resistance between the (R271) Driver Seat Belt Buckle Tensioner Line 1 circuit cavity 1 and the (R273) Driver Seat Belt Buckle Tensioner Line 2 circuit cavity 2 at the Driver Seat Belt Buckle Tensioner connector.

Is the resistance below 10K ohms?

Yes

Repair the (R55) Driver Seat Belt Buckle Tensioner Line 1 circuit for a short to the (R53) Driver Seat Belt Buckle Tensioner Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

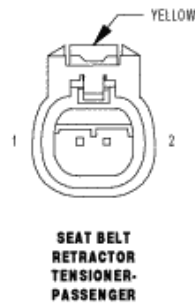
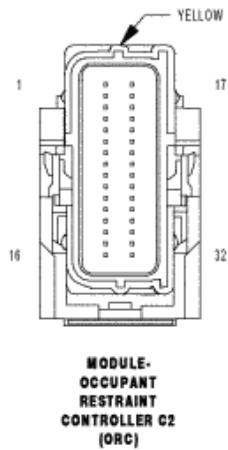
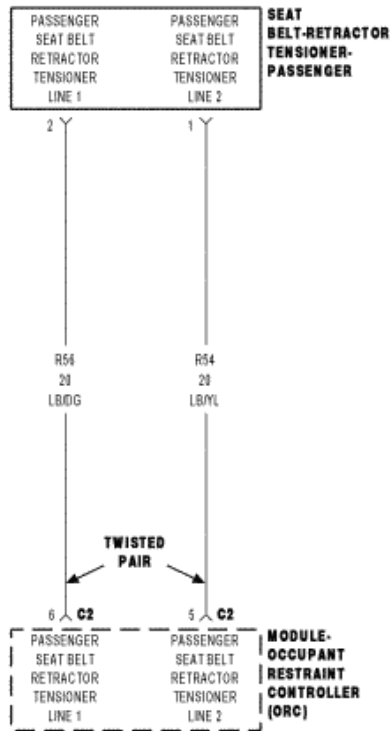
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C47-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT LOW

CIRCUIT SCHEMATIC



01950006

Fig. 36: Passenger Seat Belt Retractor Tensioner Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance on the Passenger Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT SHORTED TO GROUND
(R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT SHORTED TO GROUND
PASSENGER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAIN CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED PASSENGER SEAT BELT RETRACTOR TENSIONER**

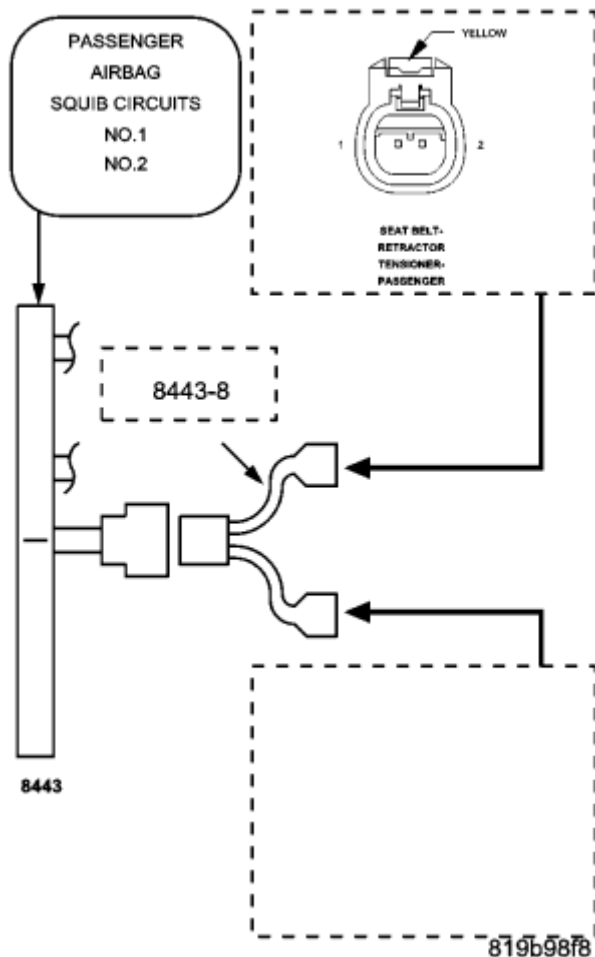


Fig. 37: Connecting 8443 Load Tool And 8443-10 Jumper To Passenger Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Retractor Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Passenger Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C47-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT LOW?

Yes

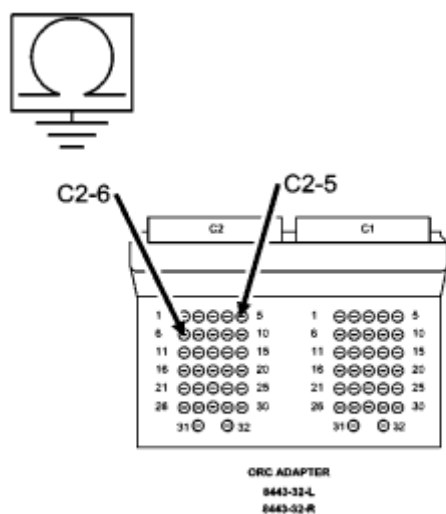
Go To 3.

No

Replace the Passenger Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT AND (R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR A SHORT TO GROUND**



819b9c95

Fig. 38: Measuring Resistance Of (R56/54) Passenger Seat Belt Retractor Tensioner Line 1/2 Circuit Between Passenger Seat Belt Retractor Pretensioner/Tensioner Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance of the (R56) Passenger Seat Belt Retractor Tensioner Line 1 circuit between the Passenger Seat Belt Retractor Pretensioner connector and ground.

Measure the resistance of the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit between the Passenger Seat Belt Retractor Tensioner connector and ground.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the Passenger Seat Belt Retractor Tensioner circuits shorted to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

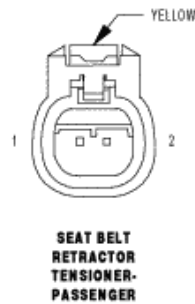
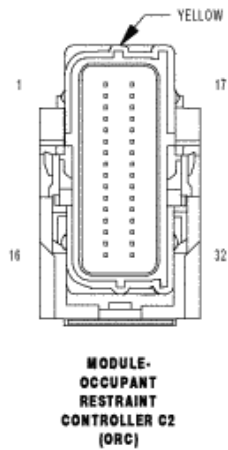
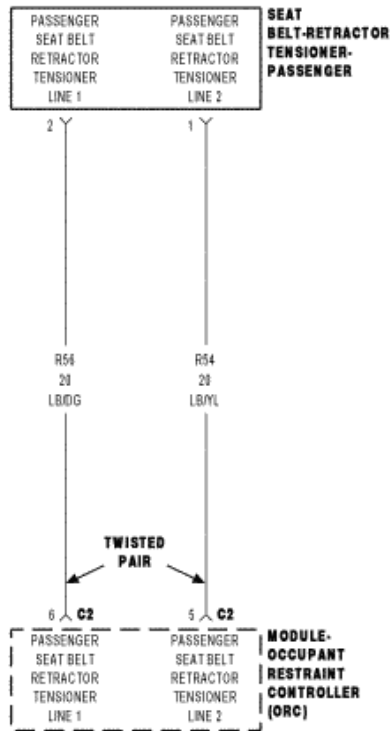
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C48-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT HIGH

CIRCUIT SCHEMATIC



01990006

Fig. 39: Passenger Seat Belt Retractor Tensioner Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Passenger Seat Belt Retractor Pretensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC detects voltage on the Passenger Seat Belt Retractor Pretensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R506) PASSENGER SEAT BELT RETRACTOR PRETENSIONER DATA CIRCUIT SHORTED TO BATTERY
(R504) PASSENGER SEAT BELT RETRACTOR PRETENSIONER VOLTAGE CIRCUIT SHORTED TO BATTERY
PASSENGER SEAT BELT RETRACTOR PRETENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: **Ensure the battery is fully charged.**

NOTE: **The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.**

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED PASSENGER SEAT BELT RETRACTOR PRETENSIONER**

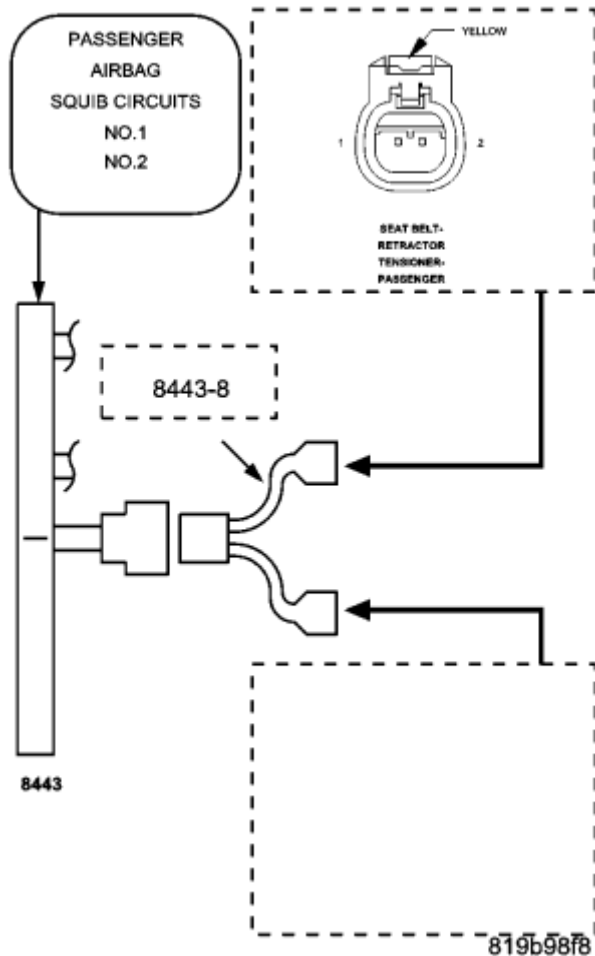


Fig. 40: Connecting 8443 Load Tool And 8443-10 Jumper To Passenger Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Retractor Pretensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Passenger Seat Belt Pretensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C48-1ST ROW PASSENGER RETRACTOR PRETENSIONER

CIRCUIT HIGH?

Yes

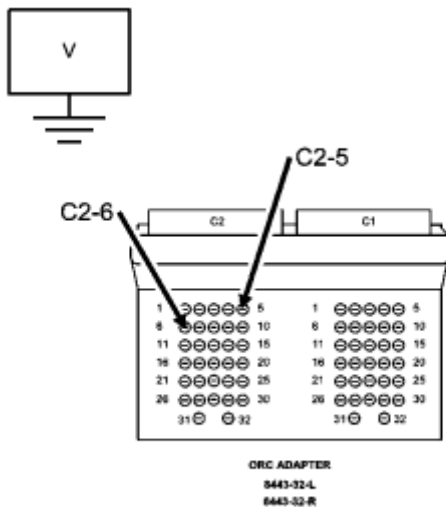
Go To 3.

No

Replace the Passenger Seat Belt Pretensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT AND (R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



819b9a8f

Fig. 41: Measuring Voltage Of (R56/54) Passenger Seat Belt Retractor Tensioner Line 1/2 Circuit Between Passenger Seat Belt Tensioner Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the voltage of the (R56) Passenger Seat Belt Retractor Tensioner Line 1 circuit between the Passenger Seat Belt Tensioner connector and ground.

Measure the voltage of the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit between the Passenger Seat Belt Tensioner connector and ground.

Is there any voltage present on either circuit?

Yes

Repair the Passenger Seat Belt Retractor Tensioner circuits with voltage present for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. REPLACE THE ORC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

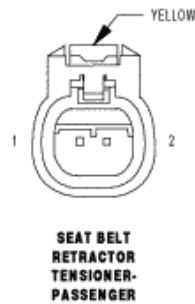
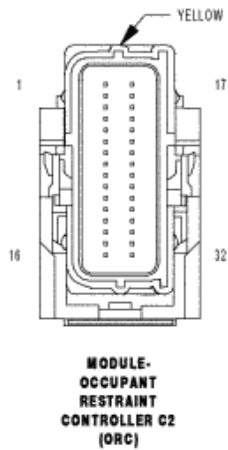
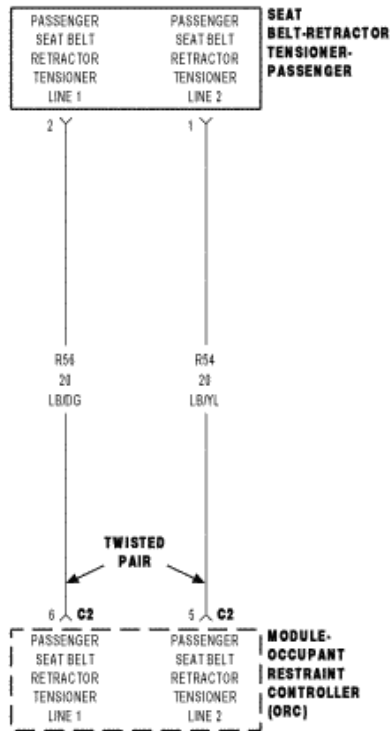
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C49-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT OPEN

CIRCUIT SCHEMATIC



01990006

Fig. 42: Passenger Seat Belt Retractor Tensioner Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected an open or high resistance on the Passenger Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT OPEN
(R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT OPEN
PASSENGER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR PASSENGER SEAT BELT RETRACTOR TENSIONER CIRCUIT OPEN**

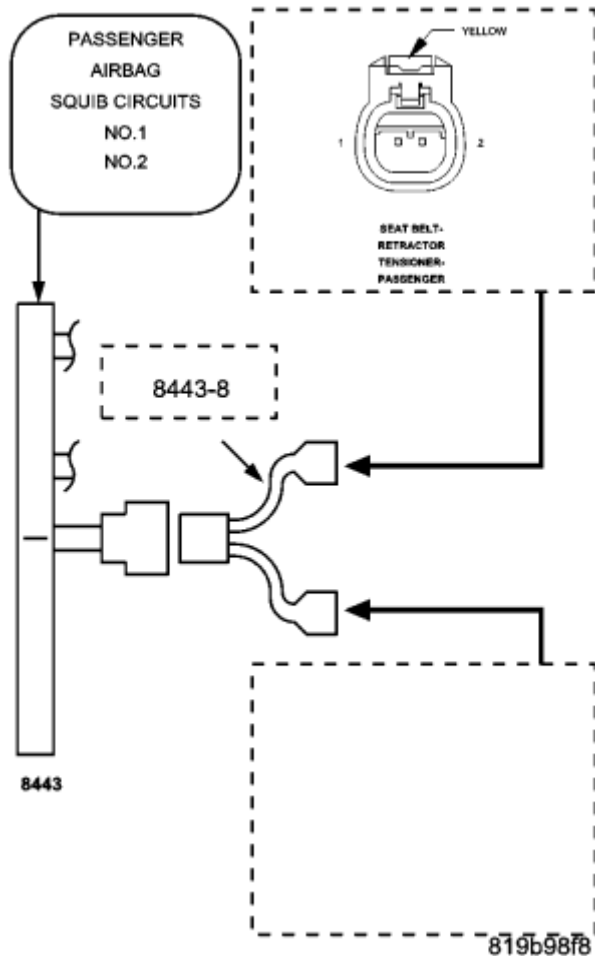


Fig. 43: Connecting 8443 Load Tool And 8443-10 Jumper To Passenger Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Retractor Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Passenger Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C49-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT OPEN?

Yes

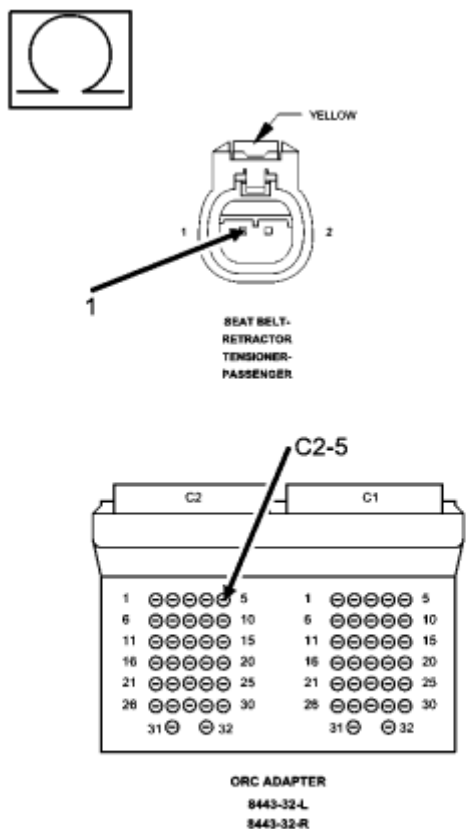
Go To 3.

No

Replace the Passenger Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK (R56) PASSENGER SEAT BELT RETRACTOR TENSIONER DATA CIRCUIT FOR AN OPEN



819b99de

Fig. 44: Measuring Resistance Of (R56) Passenger Seat Belt Retractor Tensioner Line 1 Circuit Between Passenger Seat Belt Retractor Tensioner Connector And ORC 8443-32-R Adaptor
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

Measure the resistance of the (R56) Passenger Seat Belt Retractor Tensioner Line 1 circuit between the Passenger Seat Belt Retractor Tensioner connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

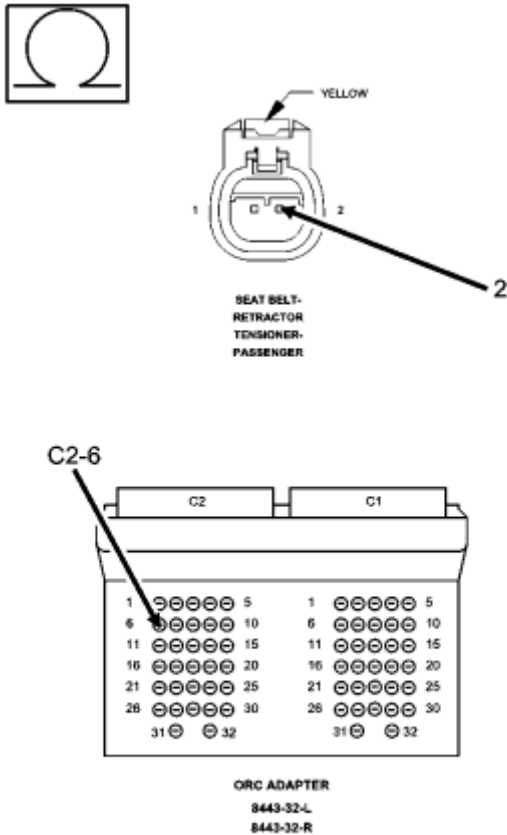
Yes

Go To 4.

No

Repair the (R506) Passenger Seat Belt Retractor Pretensioner Line 1 circuit for and open. Then Go To 4.

4. CHECK (R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT FOR AN OPEN



819b9a62

Fig. 45: Measuring Resistance Of (R54) Passenger Seat Belt Retractor Tensioner Line 2 Circuit Between Passenger Seat Belt Retractor Tensioner Connector And ORC 8443-32-R Adaptor
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit between the Passenger Seat Belt Retractor Tensioner connector and the ORC 8443-32-R Adapter.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit for and open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it

must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: TO AVOID SERIOUS OR FATAL INJURY, TURN THE IGNITION OFF, DISCONNECT THE BATTERY AND WAIT TWO MINUTES BEFORE PROCEEDING.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: TO AVOID SERIOUS OR FATAL INJURY, TURN THE IGNITION ON, THEN RECONNECT THE BATTERY.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

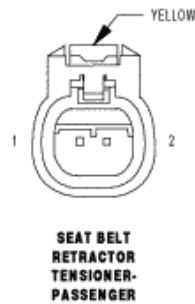
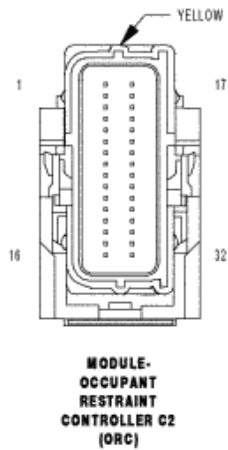
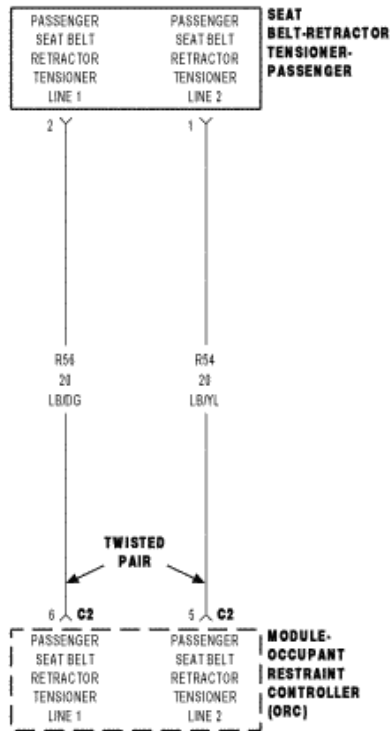
Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**B1C4A-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT
SHORTED TOGETHER**

CIRCUIT SCHEMATIC



01990006

Fig. 46: Passenger Seat Belt Retractor Tensioner Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Retractor Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Passenger Seat Belt Retractor Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT SHORTED TO (R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT
PASSENGER SEAT BELT RETRACTOR TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. SELECT ACTIVE OR STORED DTC

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. CHECK FOR SHORTED PASSENGER SEAT BELT RETRACTOR TENSIONER

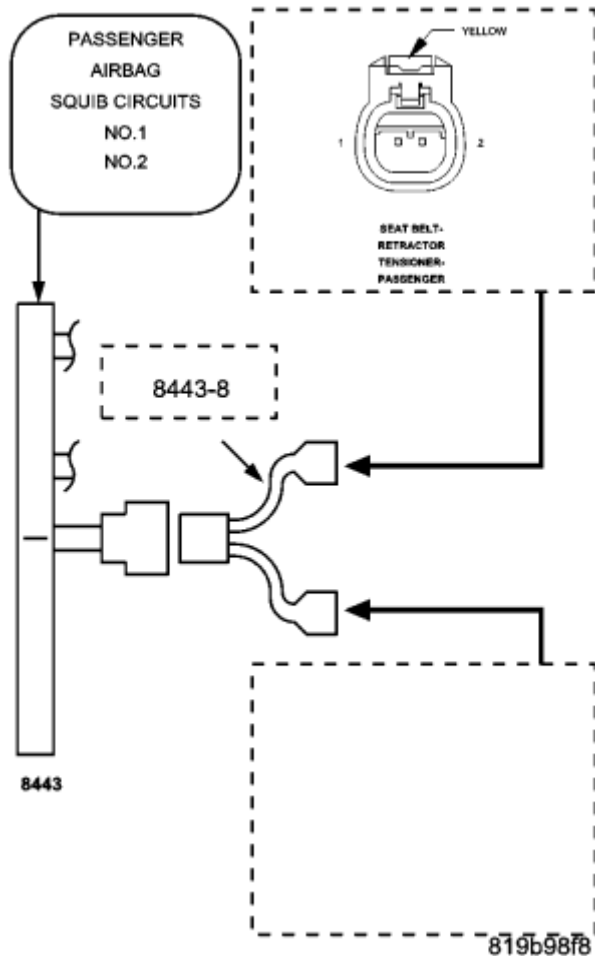


Fig. 47: Connecting 8443 Load Tool And 8443-10 Jumper To Passenger Seat Belt Retractor Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-10 Jumper to the Passenger Seat Belt Retractor Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C4A-1ST ROW PASSENGER RETRACTOR PRETENSIONER CIRCUIT SHORTED TOGETHER?

Yes

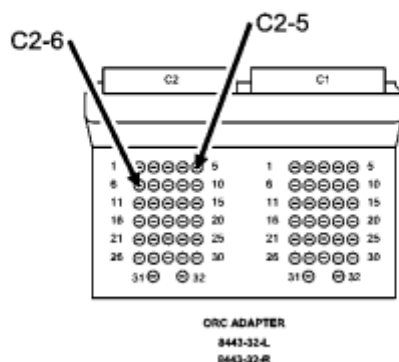
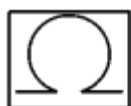
Go To 3.

No

Replace the Passenger Seat Belt Retractor Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R56) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 1 CIRCUIT FOR A SHORT TO (R54) PASSENGER SEAT BELT RETRACTOR TENSIONER LINE 2 CIRCUIT**



819b9a2a

Fig. 48: Measuring Resistance Between (R56) Passenger Seat Belt Retractor Tensioner Line 1 Circuit And (R54) Passenger Seat Belt Retractor Tensioner Line 2 Circuit At Passenger Seat Belt Retractor Tensioner Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Retractor Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: **The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.**

Measure the resistance between the (R56) Passenger Seat Belt Retractor Tensioner Line 1 circuit and the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit at the Passenger Seat Belt Retractor Tensioner connector.

Is the resistance below 10K ohms?

Yes

Repair the (R56) Passenger Seat Belt Retractor Tensioner Line 1 circuit for a short to the (R54) Passenger Seat Belt Retractor Tensioner Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

Select the appropriate diagnostic procedure from the Table of Contents in this section.

No

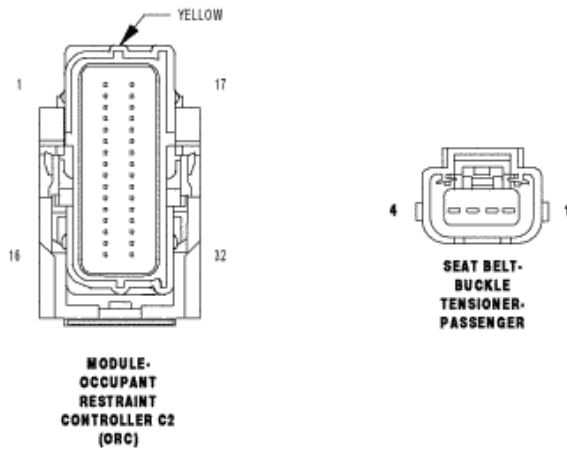
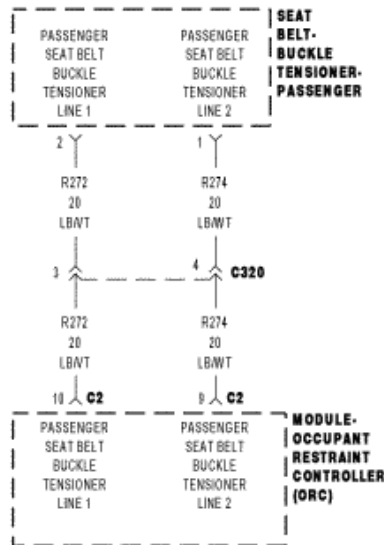
No problem found at this time. Erase all codes before returning vehicle to customer.

2008 RESTRAINTS

Electrical Diagnostics - Liberty

B1C4C-1ST ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT LOW

CIRCUIT SCHEMATIC



01a06506

Fig. 1: Passenger Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance on the Passenger Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO GROUND
(R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT SHORTED TO GROUND
PASSENGER SEAT BELT BUCKLE TENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED PASSENGER SEAT BELT BUCKLE TENSIONER CIRCUIT**

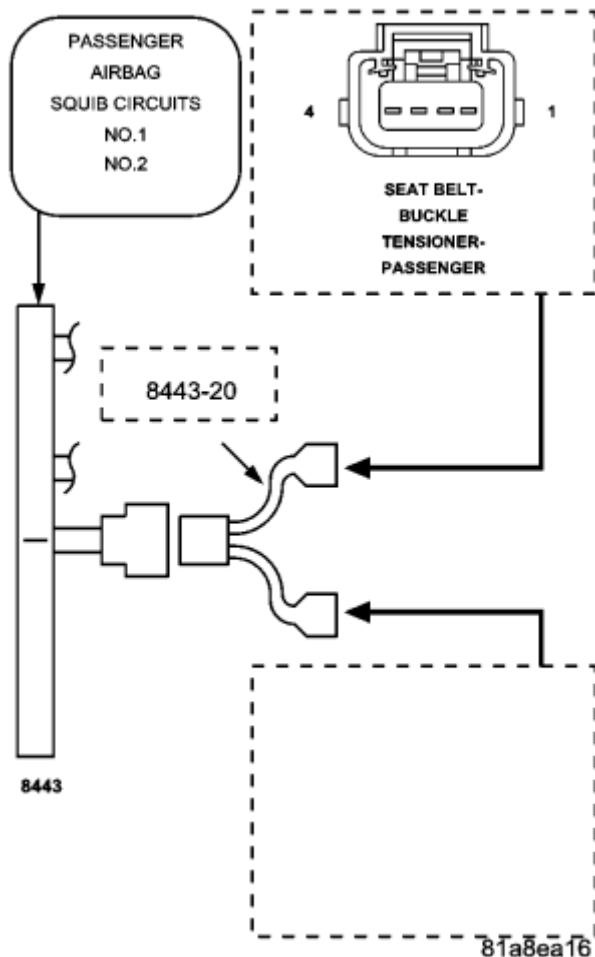


Fig. 2: Connecting 8443 Load Tool And 8443-20 Jumper To Passenger Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Passenger Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTCs.

Does the scan tool display: B1C4C-1ST ROW PASSENGER SEAT BELT BUCKLE

PRETENSIONER CIRCUIT LOW

Yes

Go To 3.

No

Replace the Passenger Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT AND (R274) PASSENGER SEAT BELT TENSIONER LINE 2 CIRCUIT FOR A SHORT TO GROUND**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R272) Passenger Seat Belt Buckle Tensioner Line 1 circuit between the Passenger Seat Belt Buckle Tensioner connector cavity 2 and ground.

Measure the resistance of the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit between the Passenger Seat Belt Buckle Tensioner connector cavity 2 and ground.

Is the resistance below 10K ohms on either circuit?

Yes

Repair the Passenger Seat Belt Buckle Tensioner circuits with a resistance below 10K ohms for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

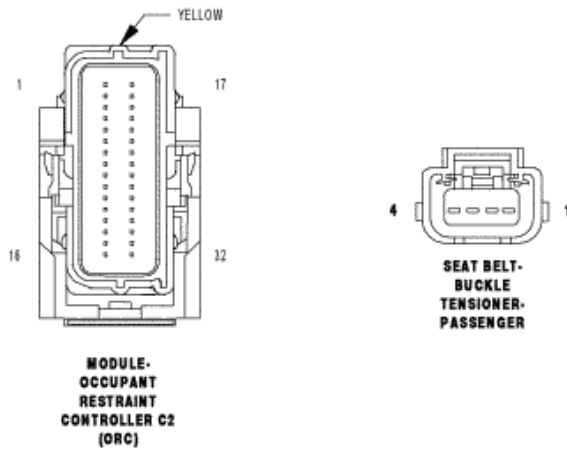
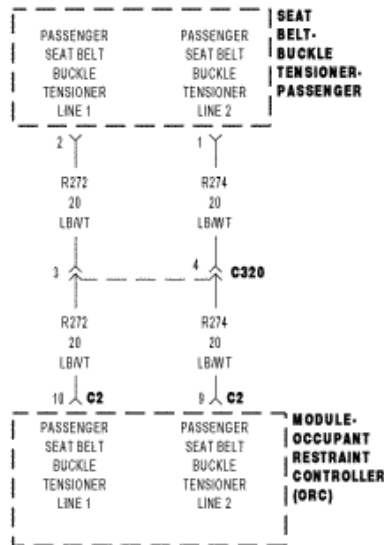
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**B1C4D-1ST ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER
CIRCUIT HIGH**

CIRCUIT SCHEMATIC



01a00500

Fig. 3: Passenger Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the voltage on the Passenger Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC detects voltage on the Passenger Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO BATTERY
(R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT SHORTED TO BATTERY
PASSENGER SEAT BELT BUCKLE TENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. **CHECK FOR SHORTED PASSENGER SEAT BELT BUCKLE TENSIONER**

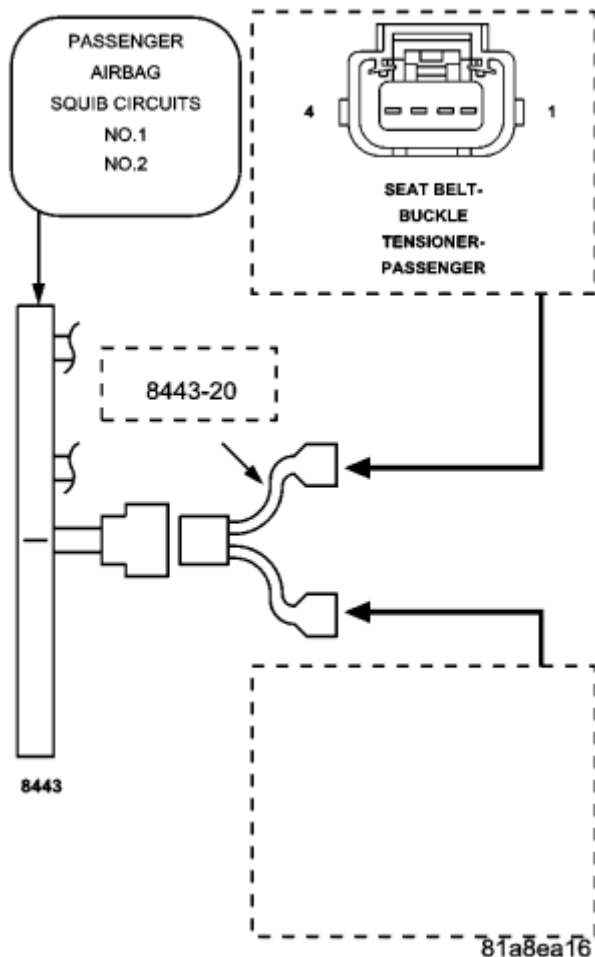


Fig. 4: Connecting 8443 Load Tool And 8443-20 Jumper To Passenger Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Passenger Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C4D-1ST ROW PASSENGER SEAT BELT BUCKLE

PRETENSIONER CIRCUIT HIGH?

Yes

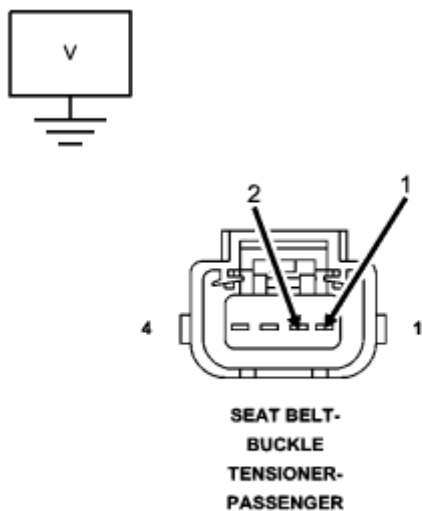
Go To 3.

No

Replace the Passenger Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT AND (R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT FOR A SHORT TO BATTERY**



81a8eb2b

Fig. 5: Measuring Voltage Of (R272/R274) Passenger Seat Belt Buckle Tensioner Line 1/2 Circuit Between Passenger Seat Belt Buckle Tensioner Connector Cavity 2/1 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R272) Passenger Seat Belt Buckle Tensioner Line 1 circuit between the Passenger Seat Belt Buckle Tensioner connector cavity 2 and ground.

Measure the voltage of the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit between the Passenger Seat Belt Buckle Tensioner connector cavity 1 and ground.

Is there any voltage present on either circuit?

Yes

Repair the Passenger Seat Belt Buckle Tensioner circuits with voltage present for a short to battery.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. **REPLACE THE ORC**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. **STORED ORC DTC**

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

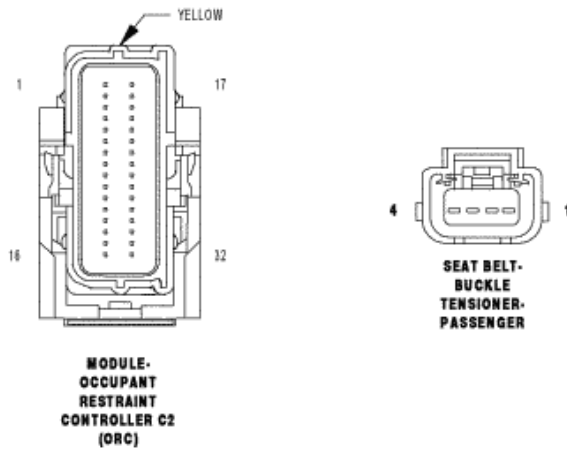
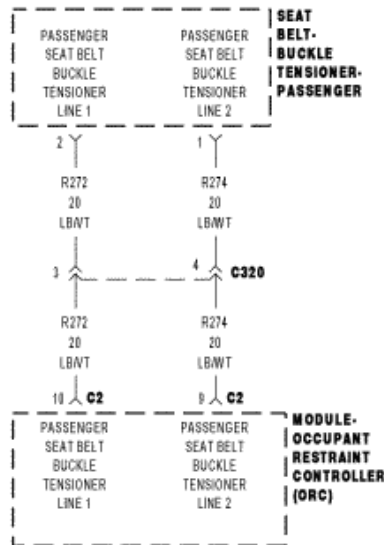
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B1C4E-1ST ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER CIRCUIT OPEN

CIRCUIT SCHEMATIC



01a06506

Fig. 6: Passenger Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected an open or high resistance on the Passenger Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT OPEN
(R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT OPEN
PASSENGER SEAT BELT BUCKLE PRETENSIONER
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **DETERMINE ACTIVE OR STORED DTC**

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 6.

2. **CHECK FOR OPEN PASSENGER SEAT BELT BUCKLE TENSIONER**

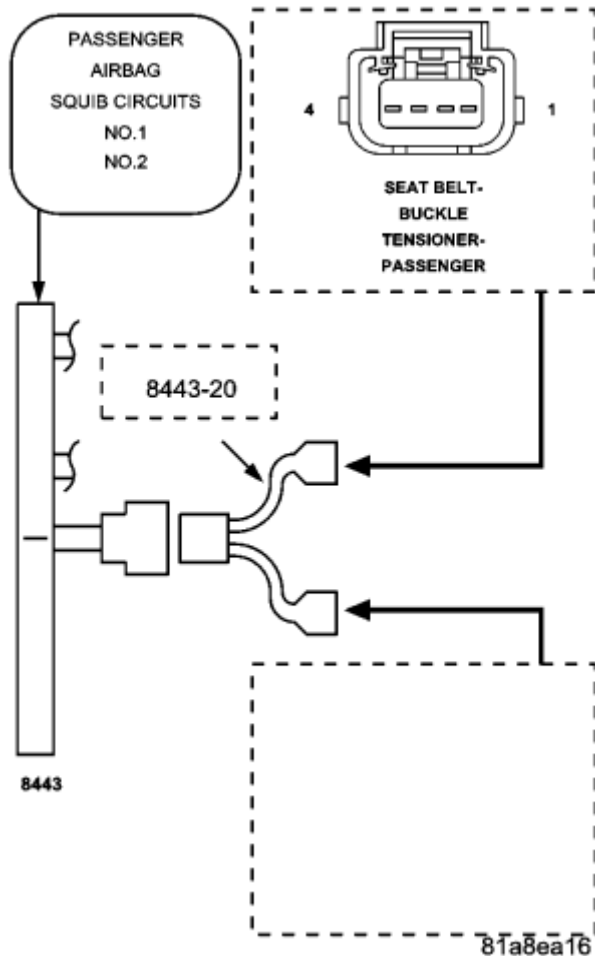


Fig. 7: Connecting 8443 Load Tool And 8443-20 Jumper To Passenger Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Passenger Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C4E-1ST ROW PASSENGER SEAT BELT BUCKLE

PRETENSIONER CIRCUIT OPEN?

Yes

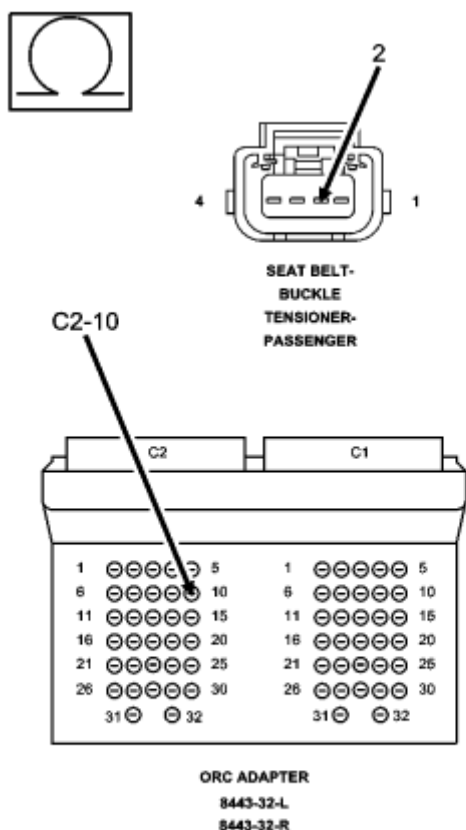
Go To 3.

No

Replace the Passenger Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. CHECK (R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT FOR AN OPEN



81a8eb36

Fig. 8: Measuring Resistance Of (R272) Passenger Seat Belt Buckle Tensioner Line/1 Circuit Between Passenger Seat Belt Buckle Tensioner Connector Cavity 2 And ORC 8443-32-R Adapter Cavity C2-10

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance of the (R272) Passenger Seat Belt Buckle Tensioner Line 1 circuit between the Passenger Seat Belt Buckle Tensioner connector cavity 2 and the ORC 8443-32-R Adapter cavity C2-10.

Is the resistance below 1.0 ohm?

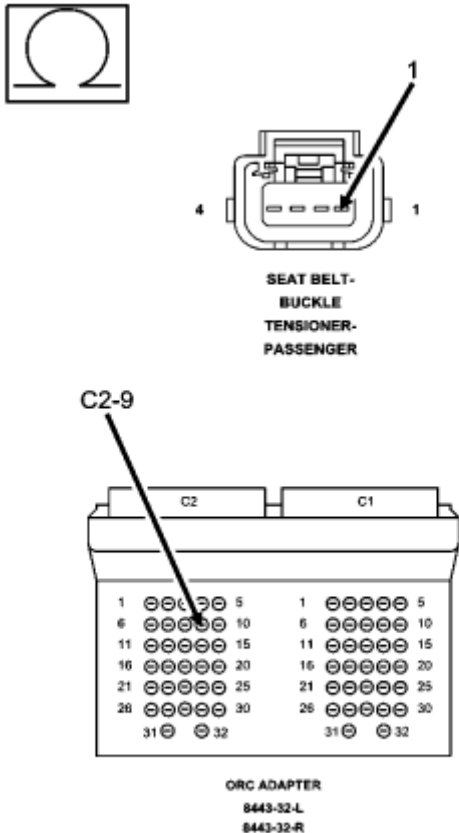
Yes

Go To 4.

No

Repair the (R272) Passenger Seat Belt Buckle Tensioner Line 1 circuit for and open. Then Go To 4.

4. CHECK (R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT FOR AN OPEN



81a8eb2f

Fig. 9: Measuring Resistance Of (R274) Passenger Seat Belt Buckle Tensioner Line 2 Circuit Between Passenger Seat Belt Buckle Tensioner Connector Cavity 1 And ORC 8443-32-R Adapter Cavity C2-9

Courtesy of CHRYSLER LLC

Measure the resistance of the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit between the Passenger Seat Belt Buckle Tensioner connector Cavity 1 and the ORC 8443-32-R Adapter cavity C2-9.

Is the resistance below 1.0 ohm?

Yes

Go To 5.

No

Repair the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit for and open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1 .**

5. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

6. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

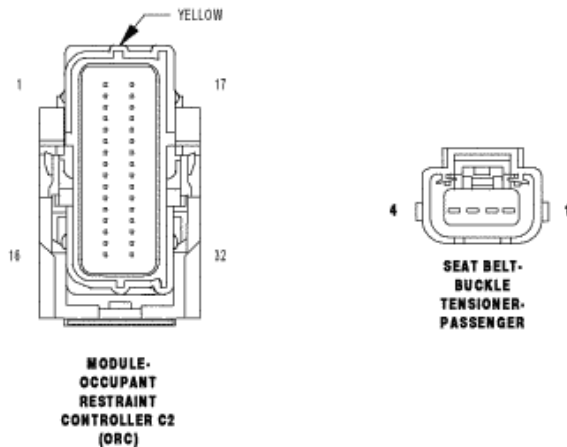
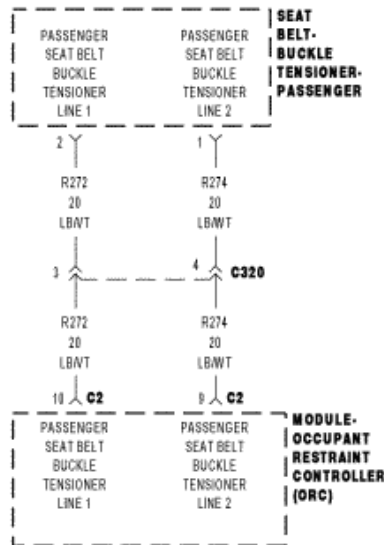
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**B1C4F-1ST ROW PASSENGER SEAT BELT BUCKLE PRETENSIONER
CIRCUIT SHORTED TOGETHER**

CIRCUIT SCHEMATIC



01a06506

Fig. 10: Passenger Seat Belt Buckle Tensioner Circuits Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on, the Occupant Restraint Controller (ORC) monitors the resistance of the Passenger Seat Belt Buckle Tensioner circuits.

SET CONDITIONS

- **Set Condition:**

The ORC has detected low resistance between the Passenger Seat Belt Buckle Tensioner circuits.

POSSIBLE CAUSES

Possible Causes
(R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT SHORTED TO (R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT PASSENGER SEAT BELT BUCKLE TENSIONER OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. SELECT ACTIVE OR STORED DTC

NOTE: Ensure the battery is fully charged.

NOTE: The scan tool, SRS Airbag Load Tool 8443, and DVOM are required to perform the following test.

Select Active or Stored DTC.

Is the DTC active or stored?

ORC - ACTIVE DTC

Go To 2.

ORC - STORED DTC

Go To 5.

2. CHECK FOR SHORTED PASSENGER SEAT BELT BUCKLE TENSIONER

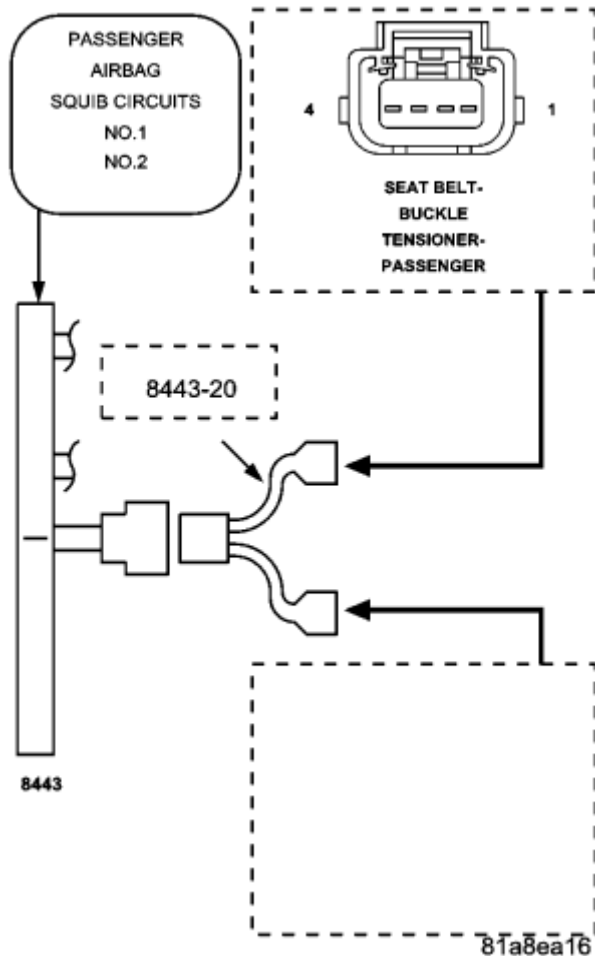


Fig. 11: Connecting 8443 Load Tool And 8443-20 Jumper To Passenger Seat Belt Buckle Tensioner Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Passenger Seat Belt Buckle Tensioner connector.

NOTE: Check connectors - Clean and repair as necessary.

Connect the 8443 Load Tool and 8443-20 Jumper to the Passenger Seat Belt Buckle Tensioner connector.

WARNING: To avoid serious or fatal injury, turn the ignition on then reconnect the battery.

With the scan tool, read the active ORC DTC's.

Does the scan tool display: B1C4F-1ST ROW PASSENGER SEAT BELT BUCKLE

PRETENSIONER CIRCUIT SHORTED TOGETHER?

Yes

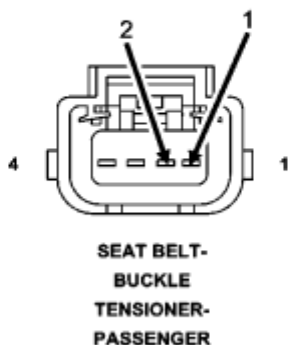
Go To 3.

No

Replace the Passenger Seat Belt Buckle Tensioner in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. **CHECK (R272) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 1 CIRCUIT FOR A SHORT TO (R274) PASSENGER SEAT BELT BUCKLE TENSIONER LINE 2 CIRCUIT**



81a8eb3d

Fig. 12: Measuring Resistance Between (R272) Passenger Seat Belt Buckle Pretensioner Line 1 Circuit Cavity 1 And (R274) Passenger Seat Belt Buckle Tensioner Line 2 Circuit Cavity 1 And 2 At Passenger Seat Belt Buckle Tensioner Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the 8443 Load Tool and Jumper from the Passenger Seat Belt Buckle Tensioner connector.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

Measure the resistance between the (R272) Passenger Seat Belt Buckle Pretensioner Line 1 circuit cavity 1 and the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit cavity 1 and 2 at the Passenger Seat Belt Buckle Tensioner connector.

Is the resistance below 10K ohms?

Yes

Repair the (R272) Passenger Seat Belt Buckle Tensioner Line 1 circuit for a short to the (R274) Passenger Seat Belt Buckle Tensioner Line 2 circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. REPLACE THE ORC

WARNING: If the Occupant Restraint Controller (ORC) is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. STORED ORC DTC

With the scan tool, record and erase all DTC's from all Airbag System Modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTC's present?

Yes

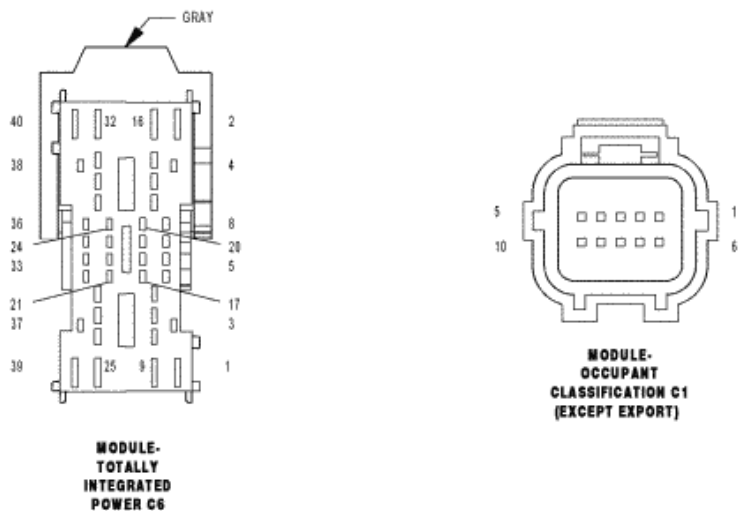
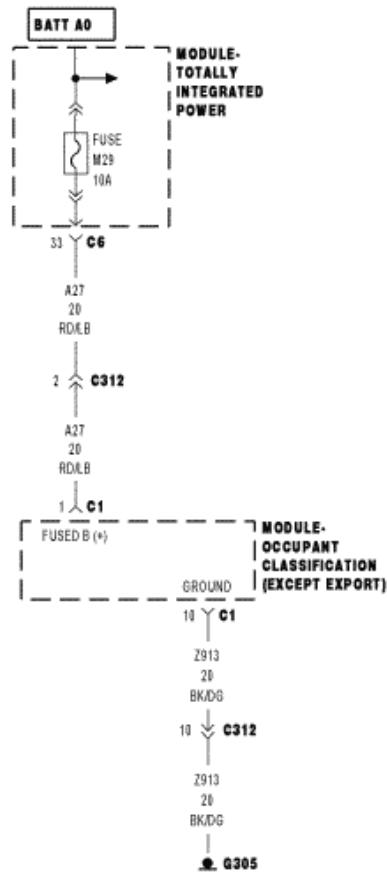
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B210D-BATTERY VOLTAGE LOW

CIRCUIT SCHEMATIC



01a03106

Fig. 13: Occupant Classification Module (OCM) Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

While the Occupant Classification Module (OCM) CAN bus ignition status received is RUN or signal not available, the module checks the (A417) Fused B(+) circuit voltage input range.

SET CONDITIONS

- **Set Condition:**

If the OCM detects that the battery voltage is less than or equal to 6.25 volts $\pm$ 0.25 volt.

POSSIBLE CAUSES

Possible Causes
OCM (A27) FUSED B(+) CIRCUIT OPEN
VEHICLE CHARGING SYSTEM
OCCUPANT CLASSIFICATION MODULE (ORC)

DIAGNOSTIC TEST

1. VERIFY THAT DTC B210D-BATTERY VOLTAGE LOW IS ACTIVE

NOTE: Ensure the battery is fully charged.

NOTE: Troubleshoot any PCM charging/cranking DTCs before proceeding.

Turn the ignition on.

With the scan tool, read the Occupant Classification Module (OCM) DTCs.

Does the scan tool display active: B210D-BATTERY VOLTAGE LOW IS ACTIVE?

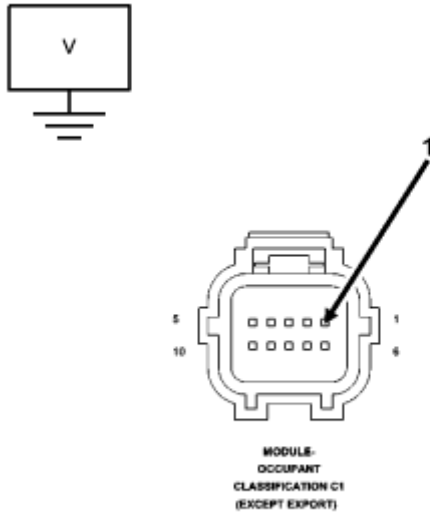
Yes

Go To 2.

No

Go To 3.

2. CHECK VOLTAGE OF OCM (A27) FUSED B(+) CIRCUIT.



81a931f8

Fig. 14: Measuring Voltage Between Ground And (A27) Fused B(+) Circuit Cavity 1 Of OCM C1 Connector
 Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the OCM connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage between Ground and the (A27) Fused B(+) circuit cavity 1 of the OCM C1 connector.

Is the voltage above 6.5 volts circuit?

Yes

Replace the OCM in accordance with the service information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No

Repair the (A27) Fused B(+) circuit for an open or high resistance.

Perform ***OCM SYSTEM VERIFICATION TEST** .

3. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Does the scan tool display any ACTIVE DTCs?

Yes

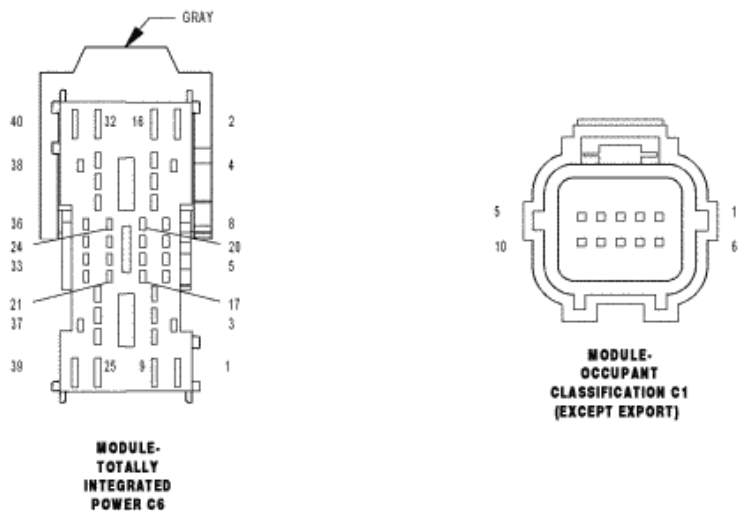
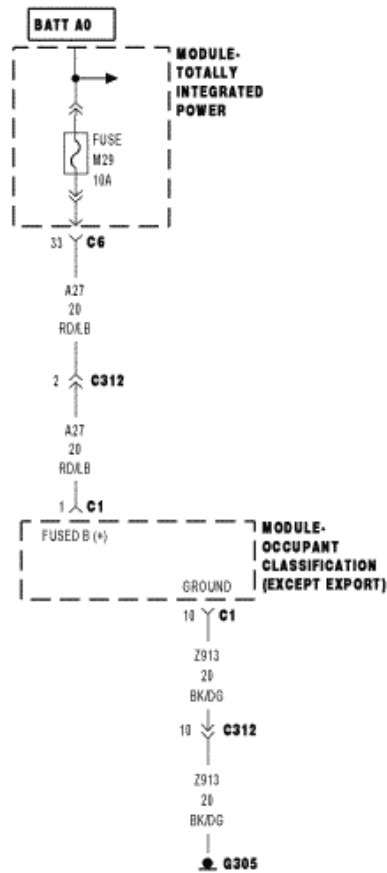
Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Erase all codes before returning vehicle to customer.

B210E-BATTERY VOLTAGE HIGH

CIRCUIT SCHEMATIC



01a03106

Fig. 15: Occupant Classification Module (OCM) Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

While the CAN bus ignition status received is RUN or SNA (Signal Not Available), the module checks the (A27) Fused B(+) circuit voltage input range.

SET CONDITIONS

- **Set Condition:**

If the Occupant Classification Module (OCM) detects battery voltage greater than or equal to 24.25 ± 0.25 volts for 10 seconds.

POSSIBLE CAUSES

Possible Causes
VEHICLE CHARGING SYSTEM
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, read OCM DTCs.

Does the scan tool display active: B210E-BATTERY VOLTAGE HIGH?

Yes

Go To 2.

No

Go To 4.

2. **CHECK THE BATTERY VOLTAGE TO THE OCCUPANT CLASSIFICATION MODULE**

With the scan tool in Data Display, read OCM battery voltage.

Is the battery voltage greater than 24.0 ± 0.25 volts?

Yes

Go To 3.

No

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

3. CHECK FOR CHARGING SYSTEM RELATED DTCs IN THE POWERTRAIN CONTROL MODULE (PCM)

With the scan tool in ECU View, select PCM and check for any Charging System related DTCs.

Does the scan tool display any Charging System related DTCs?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSIS AND TESTING** .

No

Replace the OCM in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

4. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase all DTCs from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

Does the scan tool display any ACTIVE DTCs?

Yes

Select appropriate symptom from Symptom List.

No

No problem found. Erase all codes before returning vehicle to customer.

B212C-IGNITION RUN/START INPUT CIRCUIT OPEN

CIRCUIT SCHEMATIC

MONITOR CONDITIONS

When Monitored:

With the ignition in the Run-Start position.

SET CONDITIONS

- **Set Condition:**

If voltage on the (F201) Fused Run/Start Relay Output circuit drops below 6.0 ± 0.25 volts.

POSSIBLE CAUSES

Possible Causes
(F201) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN
(F201) FUSED RUN/START RELAY OUTPUT CIRCUIT SHORTED TO GROUND
OPEN TIPM FUSE 35
TOTALLY INTEGRATED POWER MODULE (TIPM)
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **VERIFY THAT DTC B212C-IGNITION RUN/START INPUT CIRCUIT OPEN IS ACTIVE IN THE ORC.**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

Wait 10 seconds.

With the scan tool, read Occupant Restraint Controller (ORC) DTCs.

Does the scan tool display active: B212C-IGNITION RUN/START INPUT CIRCUIT OPEN?

Yes

Go To 2.

No

Go To 8.

2. **INSPECT AIRBAG RUN-START FUSE**

Turn the ignition off.

Remove the Airbag Run-Start TIPM Fuse 35 from the TIPM and inspect the fuse.

NOTE: Check connectors - Clean and repair as necessary.

Is the Run/Start fuse open?

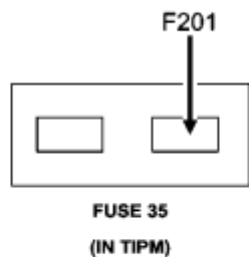
Yes

Go To 3.

No

Go To 5.

3. CHECK (F201) FUSED RUN/START RELAY OUTPUT CIRCUIT RESISTANCE



81a40d47

Fig. 17: Measuring Resistance Of (F201) Fused Run/Start Relay Output Circuit Between TIPM Run-Start Fuse M16 Output Terminal And Ground
Courtesy of CHRYSLER LLC

Measure the resistance of the (F201) Fused Run - Start Relay Output circuit between the Airbag Run-Start TIPM Fuse 35 (output side) terminal and ground.

Is the resistance below 100.0 ohms?

Yes

Go To 4.

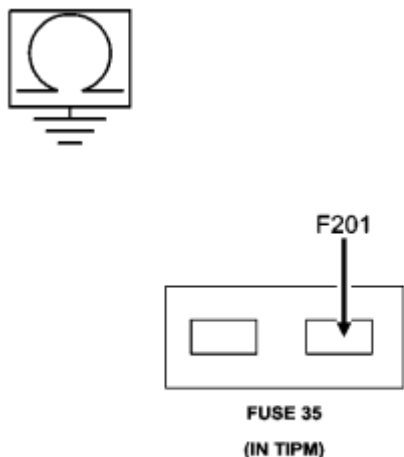
No

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Replace Airbag Run-Start TIPM Fuse 35.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. **CHECK (F201) FUSED RUN/START RELAY OUTPUT CIRCUIT RESISTANCE WITH ORC DISCONNECTED**



81a40d47

Fig. 18: Measuring Resistance Of (F201) Fused Run/Start Relay Output Circuit Between TIPM Run-Start Fuse M16 Output Terminal And Ground

Courtesy of CHRYSLER LLC

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect both ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32-R Adapter to the ORC connectors.

Measure the resistance of the (F201) Fused Run - Start Relay Output circuit between C2-32 of the 8443-32-R Adapter and ground.

Is the resistance below 100.0 ohms?

Yes

Repair the (F201) Fused Run - Start Relay Output circuit for a short to ground.

Replace the Airbag Run-Start TIPM Fuse 35.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

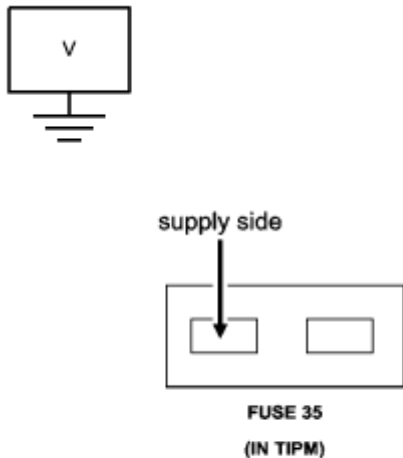
No

Replace the ORC in accordance with the Service Information.

Replace the Airbag Run-Start TIPM Fuse 35.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECK AIRBAG RUN - START TIPM FUSE 35 SUPPLY VOLTAGE



81a40d9a

Fig. 19: Measuring Voltage Of Run/Start Relay Output Circuit Between TIPM Run-Start Fuse M16 Supply Terminal And Ground
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage between the Airbag Run-Start TIPM Fuse 35 (supply side) terminal and ground.

Is the voltage above 6.0 volts?

Yes

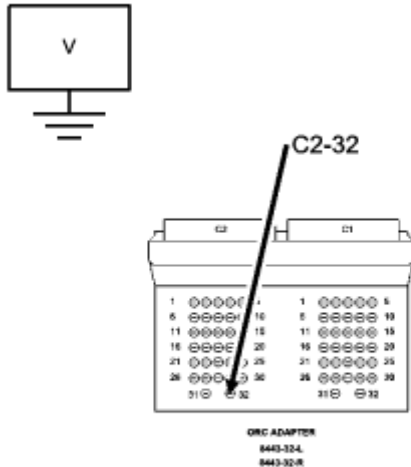
Go To 6.

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1**.

6. **CHECK (F201) FUSED RUN - START RELAY OUTPUT CIRCUIT FOR AN OPEN**



81a40da9

Fig. 20: Measuring Voltage Of (F201) Fused Run Start Relay Output Circuit Between ORC 8443-32-R Adapter Cavity C2-32 And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Reinstall the Airbag Run-Start TIPM Fuse 35.

Disconnect the both ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Install the Airbag Load tool ORC 8443-32-R Adapter to the ORC connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (F201) Fused Run - Start Relay Output circuit between the 8443-32-R connector cavity C2-32 and ground.

Is the voltage above 6.0 volts?

Yes

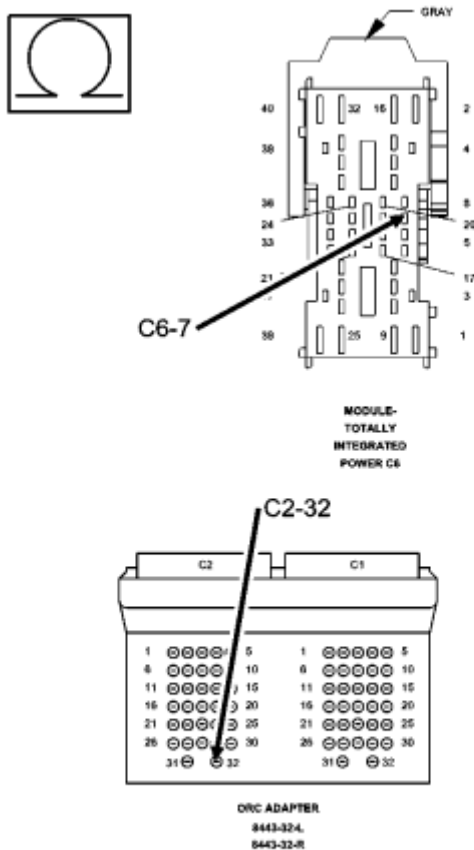
Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 7.

7. **CHECK (F201) FUSED RUN - START RELAY OUTPUT CIRCUIT FOR AN OPEN**



81a40db0

Fig. 21: Measuring Resistance Of (F201) Fused Run - Start Relay Output Circuit Between 8443-32-R Connector Cavity C2-32 And Cavity 7 Of TIPM C6 Connector
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the TIPM C6 connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the resistance of the (F201) Fused Run - Start Relay Output Circuit between the 8443-32-R connector cavity C2-32 and cavity 7 of the TIPM C6 connector.

Is the below 5.0 ohms?

Yes

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the open (F201) Fused Run/Start Relay Output circuit.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

8. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase all DTCs from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return, continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the active DTC in question.

Does the scan tool display any ACTIVE DTCs?

Yes

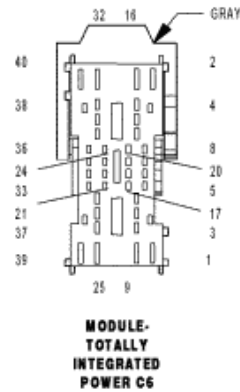
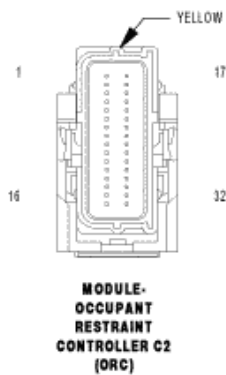
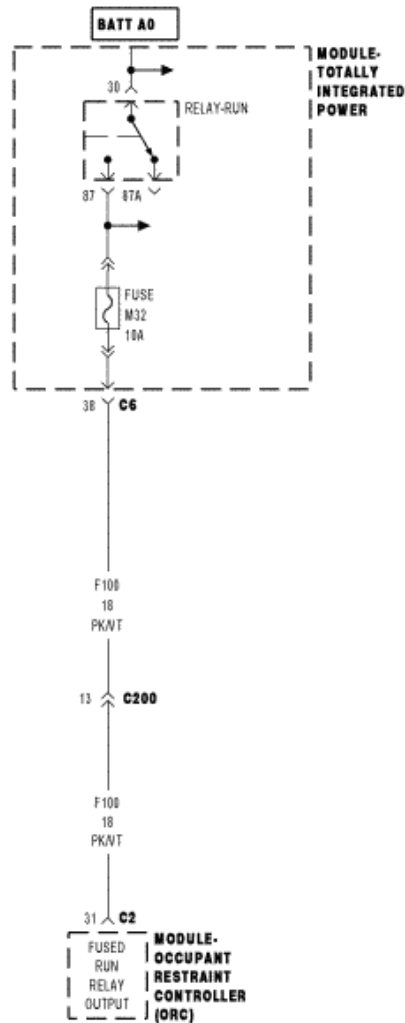
Select appropriate symptom from Symptom List.

No

No problem found. Erase all codes before returning the vehicle to the customer.

B212D-IGNITION RUN ONLY INPUT CIRCUIT OPEN

CIRCUIT SCHEMATIC



0190cc02

Fig. 22: Fused Ignition Switch Output (RUN) Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition in the Run position.

SET CONDITIONS

- **Set Condition:**

If voltage on the (F100) Fused Ignition Switch Output (RUN) circuit drops below 6.0 volts.

POSSIBLE CAUSES

Possible Causes
TIPM FUSE 51 OPEN
TIPM FUSE 51 SUPPLY VOLTAGE LOW
(F100) FUSED RUN RELAY OUTPUT CIRCUIT OPEN
(F100) FUSED RUN RELAY OUTPUT CIRCUIT SHORT TO GROUND
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **VERIFY THAT DTC B212D-IGNITION RUN ONLY INPUT CIRCUIT OPEN IS ACTIVE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

Wait 10 seconds.

With the scan tool, read Occupant Restraint Controller (ORC) and Occupant Classification Module (OCM) DTCs.

Does the scan tool display active: B212D-IGNITION RUN ONLY INPUT CIRCUIT OPEN?

Yes

Go To 2.

No

Go To 8.

2. **INSPECT AIRBAG RUN CIRCUIT FUSE 51**

Turn the ignition off.

Remove the TIPM Fuse 51 and inspect the fuse.

NOTE: Check connectors - Clean and repair as necessary.

Is the fuse open?

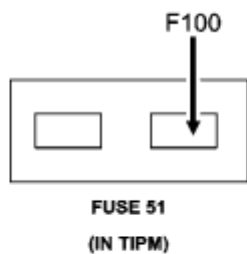
Yes

Go To 3.

No

Go To 5.

3. CHECK (F100) FUSED IGNITION SWITCH OUTPUT CIRCUIT SHORT TO GROUND



81a4084c

Fig. 23: Measuring Resistance Of (F100) Fused Run Relay Output Circuit Between TIPM Fuse 51 (Output Side) Terminal And Ground
Courtesy of CHRYSLER LLC

Measure the resistance of the (F100) Fused Run Relay Output circuit between the TIPM Fuse 51 (output side) terminal and ground.

Is the resistance below 100.0 ohms?

Yes

Go To 4.

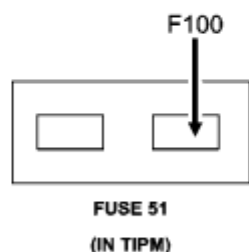
No

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Replace TIPM Fuse 51.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. **CHECK (F100) FUSED IGNITION SWITCH OUTPUT CIRCUIT RESISTANCE WITH ORC DISCONNECTED**



81a4084c

Fig. 24: Measuring Resistance Of (F100) Fused Run Relay Output Circuit Between TIPM Fuse 51 (Output Side) Terminal And Ground

Courtesy of CHRYSLER LLC

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Load Tool ORC 8443-32 Adapter to the ORC connectors.

Measure the resistance of the (F100) Fused Run Relay Output circuit between 8443-32-R Adapter cavity C2-31 and ground.

Is the resistance below 100.0 ohms?

Yes

Repair the (F100) Fused Run Relay Output (Run) circuit for a short to ground.

Replace the TIPM Fuse 51.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

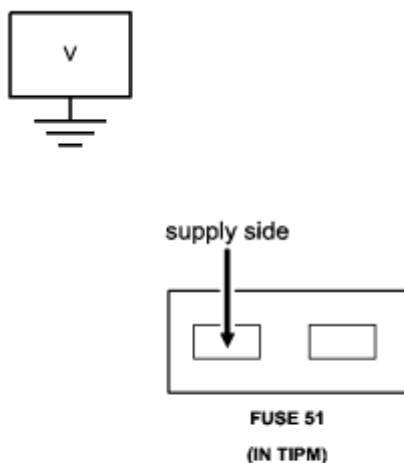
No

Replace the ORC in accordance with the Service Information.

Replace the TIPM Fuse 51.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

5. CHECK TIPM FUSE 51 SUPPLY SIDE CIRCUIT VOLTAGE



81a40853

Fig. 25: Measuring Voltage Of TIPM Fuse 51 (Supply Side) Of Fuse To Ground
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage of the TIPM Fuse 51 (supply side) of the fuse to ground.

Is the voltage above 6.0 volts?

Yes

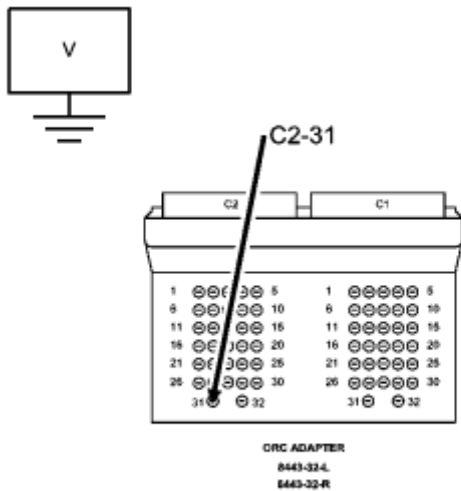
Go To 6.

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1**.

6. **CHECK (F100) FUSED RUN RELAY OUTPUT CIRCUIT FOR AN OPEN CIRCUIT**



81a40857

Fig. 26: Measuring Voltage Of (F100) Fused Run Relay Output (Run) Circuit Between 8443-32-R Adapter Cavity C2-31 And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Reinstall the TIPM Fuse 51.

Disconnect the ORC connectors.

NOTE: Check connectors - Clean and repair as necessary.

Connect the Airbag Load Tool ORC 8443-32-R Adapter to the ORC harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (F100) Fused Run Relay Output (Run) circuit between the 8443-32-R Adapter cavity C2-31 and ground.

Is the voltage above 6.0 volts?

Yes

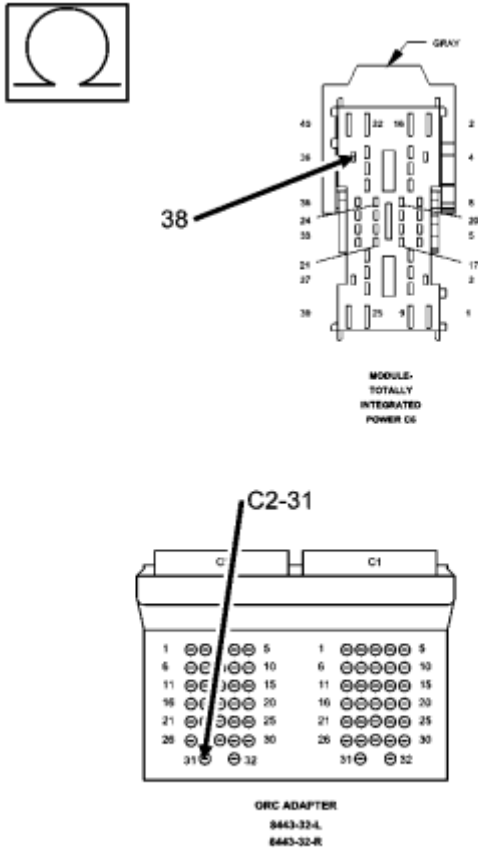
Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 7.

7. **CHECK FUSE 51 OUTPUT TO CAVITY 38 OF THE TIPM C6 CONNECTOR**



81a4085e

Fig. 27: Measuring Resistance Of (F100) Fused Run Relay Output (Run) Circuit Between 8443-32-R Adapter Cavity C2-31 And TIPM C6 Connector Cavity 38

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the TIPM C6 connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the resistance of the (F100) Fused Run Relay Output (Run) circuit between the 8443-32-R Adapter cavity C2-31 and TIPM C6 connector cavity 38.

Is the resistance below 5.0 ohms?

Yes

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

8. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase all DTCs from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If only stored codes return, continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the active DTC in question.

Does the scan tool display any ACTIVE DTCs?

Yes

Select appropriate symptom from Symptom List.

No

No problem found. Erase all codes before returning vehicle to customer.

B2206-CURRENT VIN MISSING / MISMATCH

OCCUPANT CLASSIFICATION SEAT WEIGHTS

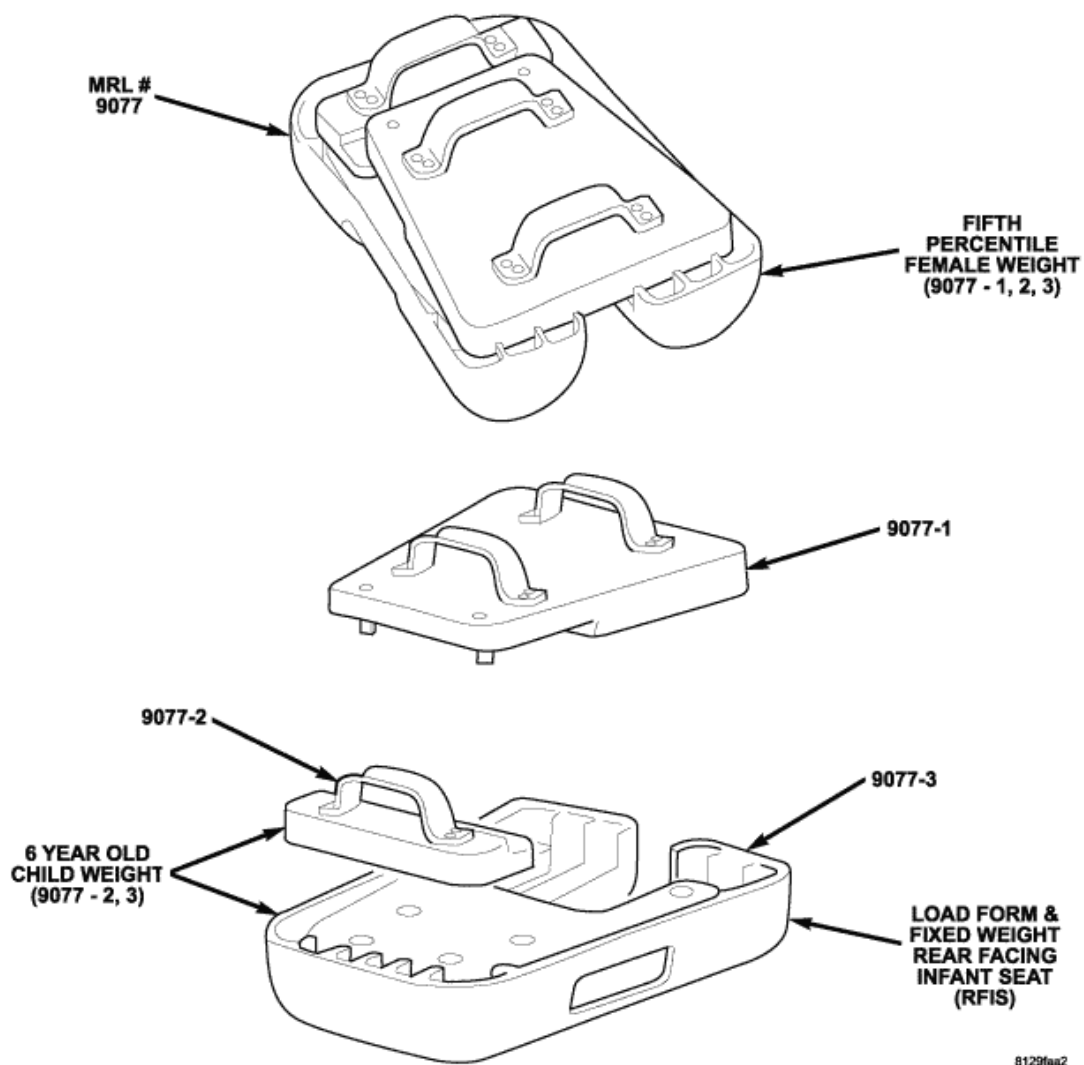


Fig. 28: Identifying OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

During power-up, the Occupant Restraint Controller (ORC) and Occupant Classification Module (OCM) monitors the CAN bus for the VIN message.

SET CONDITIONS

Set Condition:

This DTC will set if the VIN information received from the Powertrain Control Module (PCM) is different from the stored VIN.

POSSIBLE CAUSES

Possible Causes
INCORRECT VIN PROGRAMMED INTO THE PCM OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. CHECK FOR ACTIVE DTC

NOTE: Troubleshoot any Ignition, Battery, Seat Weight Sensor, or OCM Internal DTC BEFORE proceeding

NOTE: Ensure that the battery is fully charged.

NOTE: This DTC cannot be cleared until the *OCM SYSTEM VERIFICATION TEST has been completed successfully.

With the scan tool, read DTC.

Select the module and DTC type.

OCM-Active

Go To 2.

OCM-Stored

Erase code with scan tool, test complete.

2. CHECK THE VIN STORED IN THE PCM

With the scan tool, compare the VIN that is stored in the PCM to the VIN of the vehicle's VIN plate.

Does the VIN stored in the PCM match the vehicle's VIN?

Yes

Go To 3.

No

Replace and Configure the Powertrain Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST**.

3. PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Verify that the passenger seat is empty.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display any active: B2206-CURRENT VIN MISSING/MISMATCH DTC?

Yes

Go To 4.

No

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

4. PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to **SEAT WEIGHT SENSOR** for specification.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display active: B2206-CURRENT VIN MISSING/MISMATCH?

Yes

To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the OCM in accordance with the Service Information.

Replace the Service Kit if a seat from another vehicle was installed.

Perform ***OCM SYSTEM VERIFICATION TEST** .

No - But Other DTC Present

Diagnose and repair the other DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTC Present

Erase all codes before returning vehicle to customer.

B2207-OCCUPANT RESTRAINT CONTROLLER INTERNAL 1

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
INTERMITTENT SQUIB SHORT TO GROUND
INTERMITTENT SQUIB SHORT TO VOLTAGE
INTERMITTENT SQUIB OPEN
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. CHECK FOR SQUIB RELATED DTCS

Turn the ignition on.

With the scan tool, read ORC DTCs.

Is there any squib related DTCs present?

Yes

Diagnose specified squib DTCs according to procedure in article before diagnosing this DTC.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go to 2.

2. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

With the scan tool, erase and read ORC DTC.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions could result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

B2208-OCCUPANT RESTRAINT CONTROLLER INTERNAL 2

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions could result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

B2209-OCCUPANT RESTRAINT CONTROLLER INTERNAL 3

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions could result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

B220A-OCCUPANT RESTRAINT CONTROLLER INTERNAL 4

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions could result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

B220B-OCCUPANT RESTRAINT CONTROLLER FIRING STORED ENERGY

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

B220C-OCCUPANT RESTRAINT CONTROLLER ACCELEROMETER 1 INTERNAL

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module identifies an out of range internal circuit.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. REPLACE OCCUPANT RESTRAINT CONTROLLER

Turn the ignition on.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the Occupant Restraint Controller is dropped at any time, it must be replaced. Failure to take proper precautions can result in accidental airbag deployment and serious or fatal injury.

Repair

Replace the ORC in accordance with the Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

B2212-OCCUPANT CLASSIFICATION MODULE INTERNAL

MONITOR CONDITIONS

When Monitored:

While the IGN status is RUN or signal not available, while the CAN bus system voltage is between 10 and 16 volts, and during the OCS Verification Test.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the module detects an internal failure.

POSSIBLE CAUSES

Possible Causes
OCCUPANT CLASSIFICATION MODULE (OCM)

DIAGNOSTIC TEST

1. **PERFORM THE OCCUPANT CLASSIFICATION MODULE VERIFICATION TEST**

NOTE: **Ensure that the passenger seat is empty.**

Turn the ignition off, wait 10 seconds and turn ignition on.

With the scan tool, read OCM DTC.

Did the DTC: B2212-OCCUPANT CLASSIFICATION MODULE INTERNAL reset?

Yes

Go To 2.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

2. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

OCCUPANT CLASSIFICATION SEAT WEIGHTS

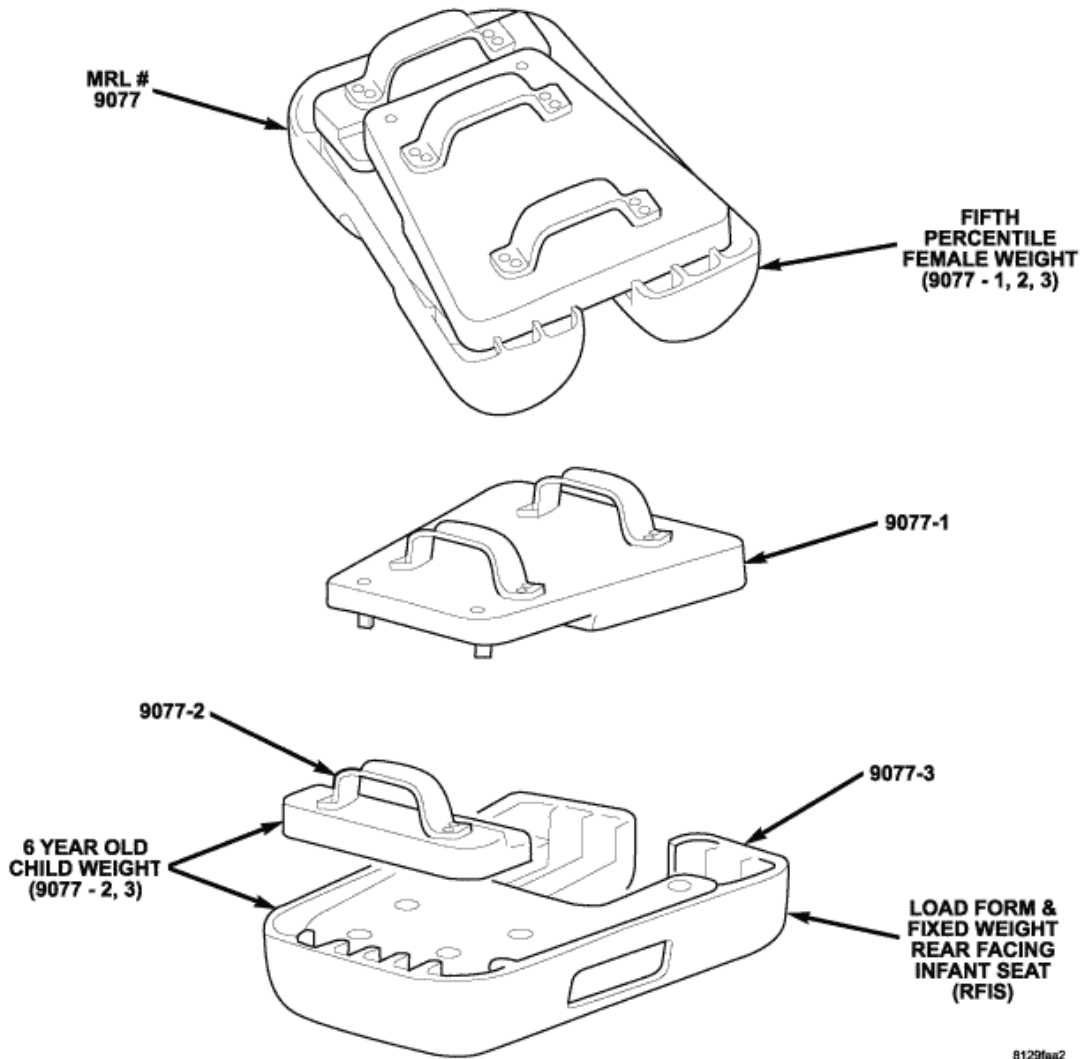


Fig. 29: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

Verify that the passenger seat is empty.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all

tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display any active DTC?

Yes -

B2212-OCCUPANT CLASSIFICATION MODULE INTERNAL DTC is ACTIVE
Go To 3.

Yes -

other DTC ACTIVE
Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

3. **VERIFY SENSOR TORQUE**

OCCUPANT CLASSIFICATION SEAT WEIGHTS

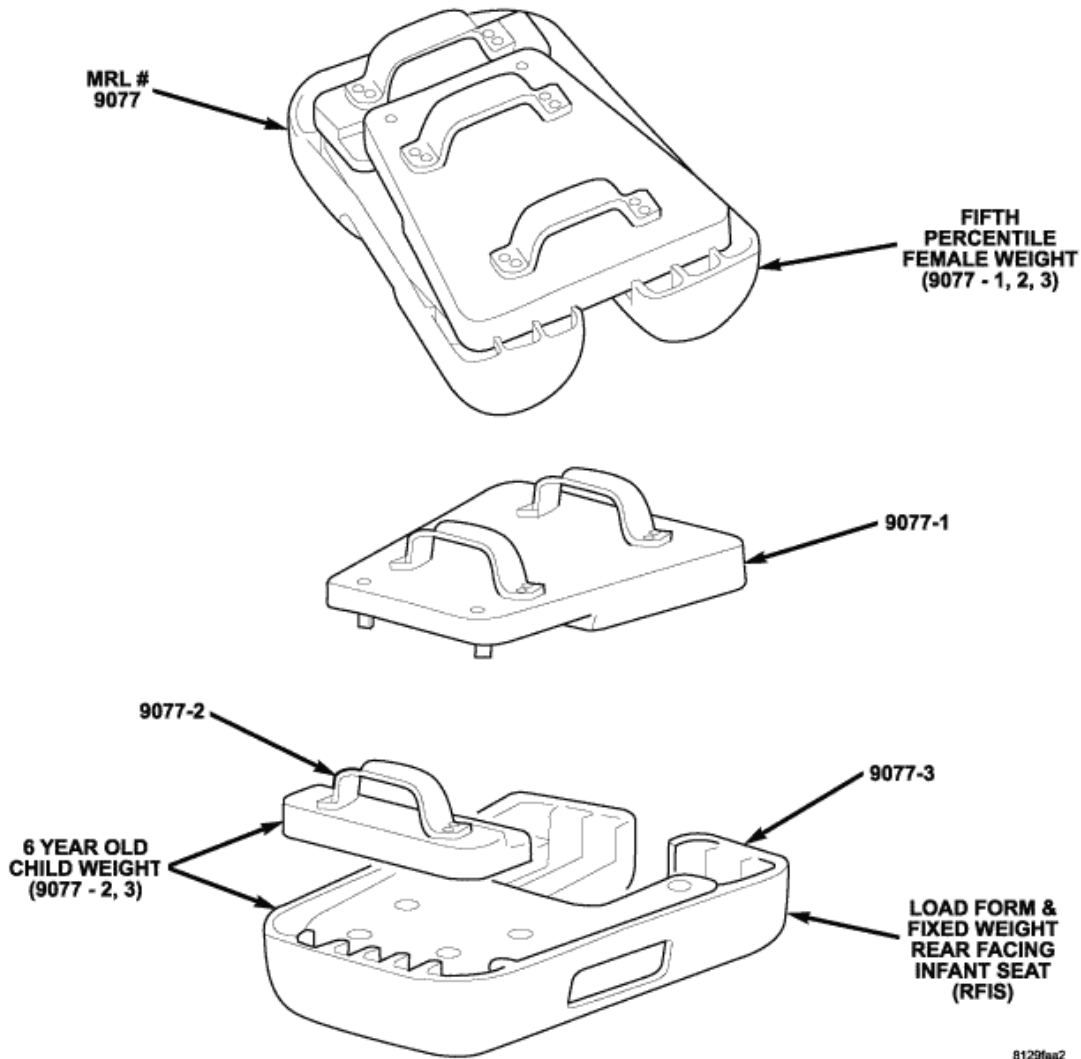


Fig. 30: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that the passenger seat is empty.

To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to torque specification. Refer to **SEAT WEIGHT SENSOR** for specifications.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the ***OCM SYSTEM VERIFICATION TEST** to completion.

To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, proceed as follows.

With the scan tool, read OCM DTC.

Does the scan tool display any active DTC?

Yes -

B2212-OCCUPANT CLASSIFICATION MODULE INTERNAL DTC is ACTIVE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Replace the Occupant Classification Module in accordance with the service information.

Perform ***OCM SYSTEM VERIFICATION TEST** .

Yes -

other DTC ACTIVE

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Perform ***OCM SYSTEM VERIFICATION TEST** .

B222A-VEHICLE LINE MISMATCH

ADDITIONAL WIRING

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:

The Totally Integrated Power Module (TIPM) sends a Bus Message to the Occupant Restraint Controller (ORC) containing the vehicle line but the ORC original VIN does not march the broadcast VIN.

POSSIBLE CAUSES

Possible Causes
TOTALLY INTEGRATED POWER MODULE (TIPM)
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. VERIFY THAT DTC B222A-VEHICLE LINE MISMATCH IS ACTIVE

NOTE: Ensure the battery is fully charged.

Turn the ignition on.

With the scan tool, read ORC DTC.

Does the scan tool display active: B222A-VEHICLE LINE MISMATCH?

Yes

Go To 2.

No

Erase DTC, see if code returns

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

2. COMPARE STORED VIN IN THE TIPM AND ORC

With the scan tool in ORC select More Options select ECU Details, compare Original VIN and current VIN.

With the scan tool, read and record the VIN that is stored in the ORC.

Does the stored VIN match the current VIN?

Yes

Go To 3.

No

Replace or reprogram the TIPM in accordance with the Service Information.

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

View repair

Repair

Replace the ORC in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

B223B-VEHICLE CONFIGURATION MISMATCH

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- **Set Condition:**

The Totally Integrated Power Module (TIPM) sends a message to the Occupant Restraint Controller

(ORC) that the vehicle is not equipped with an Occupant Classification Module (OCM) but the ORC is receiving OCM messages over the Can B bus.

POSSIBLE CAUSES

Possible Causes
TOTALLY INTEGRATED POWER MODULE (TIPM) OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. VERIFY THAT DTC B223B-VEHICLE CONFIGURATION MISMATCH IS ACTIVE

Turn the ignition on.

With the scan tool, read ORC DTC.

NOTE: Ensure the battery is fully charged.

Does the scan tool display active: B223B-VEHICLE CONFIGURATION MISMATCH?

Yes

Go To 2.

No

Erase DTC, see if code returns

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

2. COMPARE STORED VIN IN THE TIPM AND ORC

With the scan tool in ORC select More Options select ECU Details, compare Original VIN and current VIN.

With the scan tool, read and record the VIN that is stored in the ORC.

Does the stored VIN match the current VIN?

Yes

Go To 3.

No

Replace or reprogram the TIPM in accordance with the Service Information.

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

View repair

Repair

Replace the ORC in accordance with the service information.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1.

B223D-OCCUPANT CLASSIFICATION MODULE DTC PRESENT

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

- Set Condition:

This DTC will set if the ORC receives a bus message with the active OCM DTC Present bit set.

POSSIBLE CAUSES

Possible Causes
ACTIVE DTC IN OCCUPANT CLASSIFICATION MODULE (OCM) OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. VERIFY THAT DTC B223D-OCCUPANT CLASSIFICATION MODULE DTC IS ACTIVE

With the scan tool, read the ORC active DTCs.

Does the scan tool display active: B223D-OCCUPANT CLASSIFICATION MODULE?

Yes

Go To 2.

No

With the scan tool, perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

2. ACTIVE DTC IN OCCUPANT CLASSIFICATION MODULE

With the scan tool, read the OCCUPANT CLASSIFICATION MODULE active DTC.

Are there any active DTC present?

Yes

Refer to the symptom list for problems related to the OCM.

No

Go To 3.

3. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions can result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the ORC in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

B2255-OCCUPANT RESTRAINT CONTROLLER ROLL OVER FEATURE DISABLE

MONITOR CONDITIONS

When Monitored:

With the ignition on. The module's on board diagnostics continuously performs internal circuit tests.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the ORC Roll Over Feature has been disabled via the scan tool.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. OCCUPANT RESTRAINT CONTROLLER ROLL OVER FEATURE DISABLED

Turn the ignition on.

With the scan tool read the ORC Roll Over Feature status Enabled or Disabled.

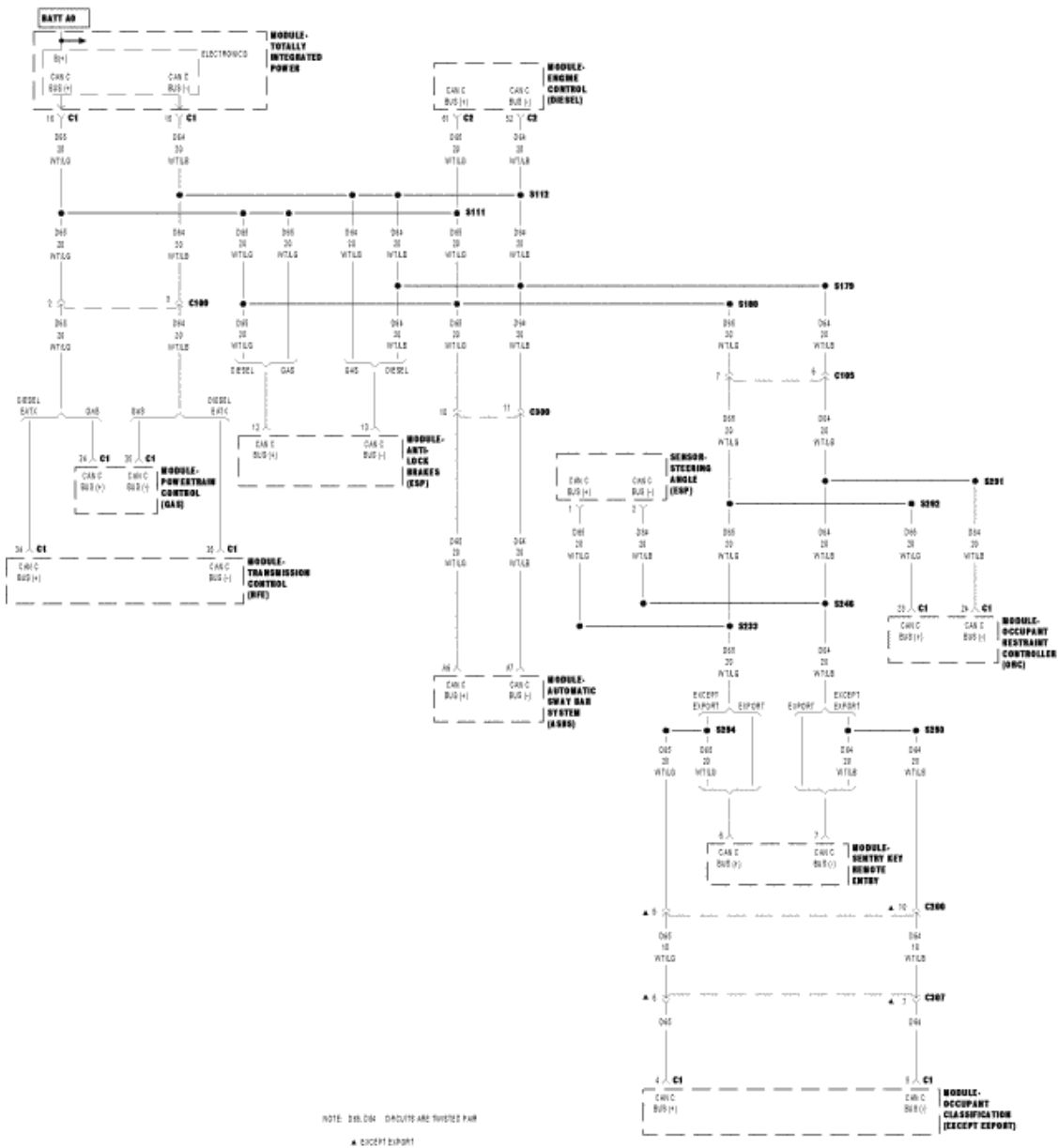
Does the scan tool show Roll Over Feature Disabled?

Repair

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

U0002-CAN C BUS OFF PERFORMANCE

CIRCUIT SCHEMATIC



01300245

Fig. 31: CAN C Bus Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

With the ignition on.

SET CONDITIONS

• Set Condition:

The Occupant Restraint Controller (ORC) or Occupant Classification (OCM) detects a corrupt CAN C Bus messages from the Totally Integrated Power Module (TIPM).

POSSIBLE CAUSES

Possible Causes
(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE (D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT ANTILOCK BRAKE MODULE POWERTRAIN CONTROL MODULE (PCM) ENGINE CONTROL MODULE (DIESEL ONLY) (ECM) TRANSMISSION CONTROL MODULE (TCM) STEERING ANGLE SENSOR AUTOMATIC SWAY BAR SYSTEM MODULE WIRELESS CONTROL MODULE (WCM) OCCUPANT RESTRAINT CONTROLLER MODULE (ORC) OCCUPANT CLASSIFICATION MODULE (OCM) TOTALLY INTEGRATED POWER MODULE (TIPM)

DIAGNOSTIC TEST

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. ANTILOCK BRAKE MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Antilock Brake Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active ORC and OCM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 3.

No

Inspect the wiring and connectors for damage or shorted circuits in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

Perform ***OCM SYSTEM VERIFICATION TEST** .

3. POWERTRAIN CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Powertrain Control Module C1 harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 4.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Powertrain Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. ENGINE CONTROL MODULE (DIESEL ONLY) - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Engine Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 5.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the

Engine Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

5. TRANSMISSION CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Transmission Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 6.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Transmission Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

6. STEERING ANGLE SENSOR - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Steering Angle Sensor harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 7.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Steering Angle Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

7. AUTOMATIC SWAY BAR SYSTEM MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Automatic Sway Bar System Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 8.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Automatic Sway Bar System Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

8. WIRELESS CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Wireless Control Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 9.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Wireless Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

9. **OCCUPANT RESTRAINT CONTROLLER MODULE - INTERNAL SHORT**

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Occupant Restraint Controller Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 10.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Restraint Controller Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

10. OCCUPANT CLASSIFICATION MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Occupant Classification Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display U0002-CAN C BUS OFF PERFORMANCE as active?

Yes

Go To 11.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Classification Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

11. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

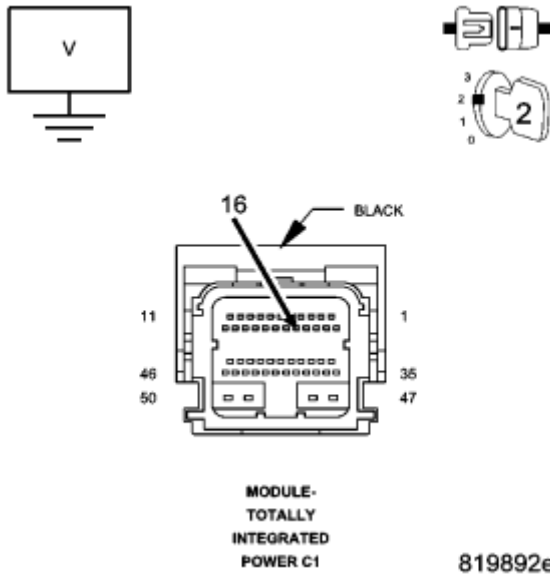


Fig. 32: Checking Voltage Between CAN C Bus (+) Circuit & Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Totally Integrated Power Module C1 harness connector.

Turn the ignition on.

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is there any voltage present?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 12.

12. (D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE

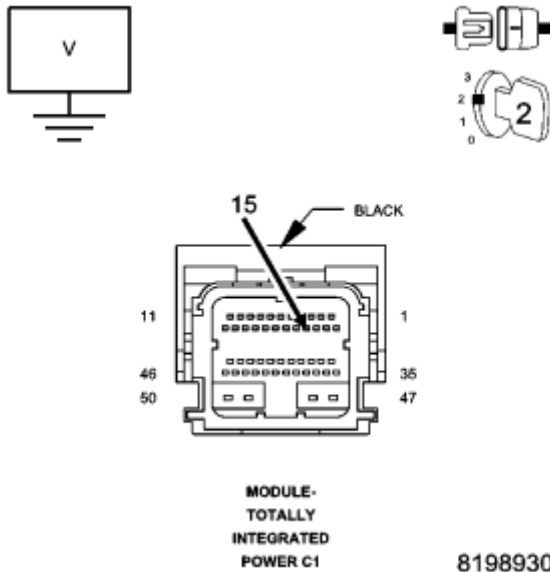


Fig. 33: Measuring Voltage Between CAN C Bus (-) Circuit & Ground
 Courtesy of CHRYSLER LLC

Measure the voltage between the (D64) CAN C Bus (-) circuit and ground.

Is there any voltage present?

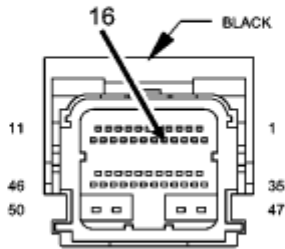
Yes

Repair the (D64) CAN C Bus (-) circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 13.

13. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND**



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198930f

Fig. 34: Checking CAN C Bus (+) Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D65) CAN C Bus (+) circuit.

Is any resistance present?

Yes

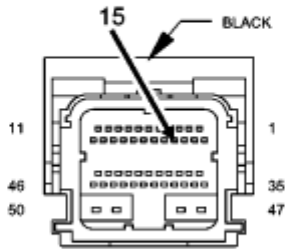
Repair the (D65) CAN C Bus (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 14.

14. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198931a

Fig. 35: Measuring Resistance Between Ground & CAN C Bus (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is any resistance present?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 15.

15. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT**

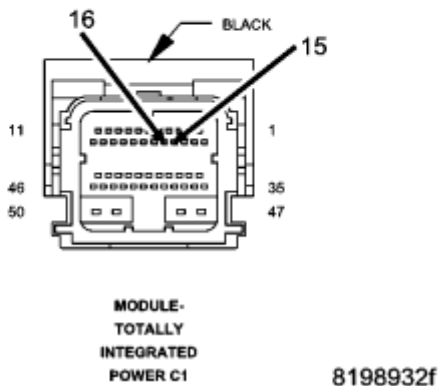


Fig. 36: Checking Resistance Between CAN C Bus (+) Circuit & CAN C Bus (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (D65) CAN C Bus (+) circuit and the (D64) CAN C Bus (-) circuit.

Is any resistance present?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to the (D64) CAN C Bus (-) circuit.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Totally Integrated Power Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

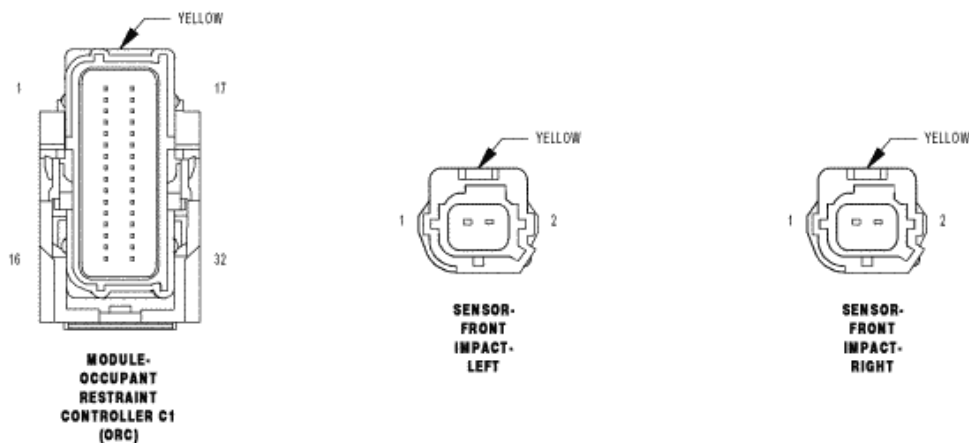
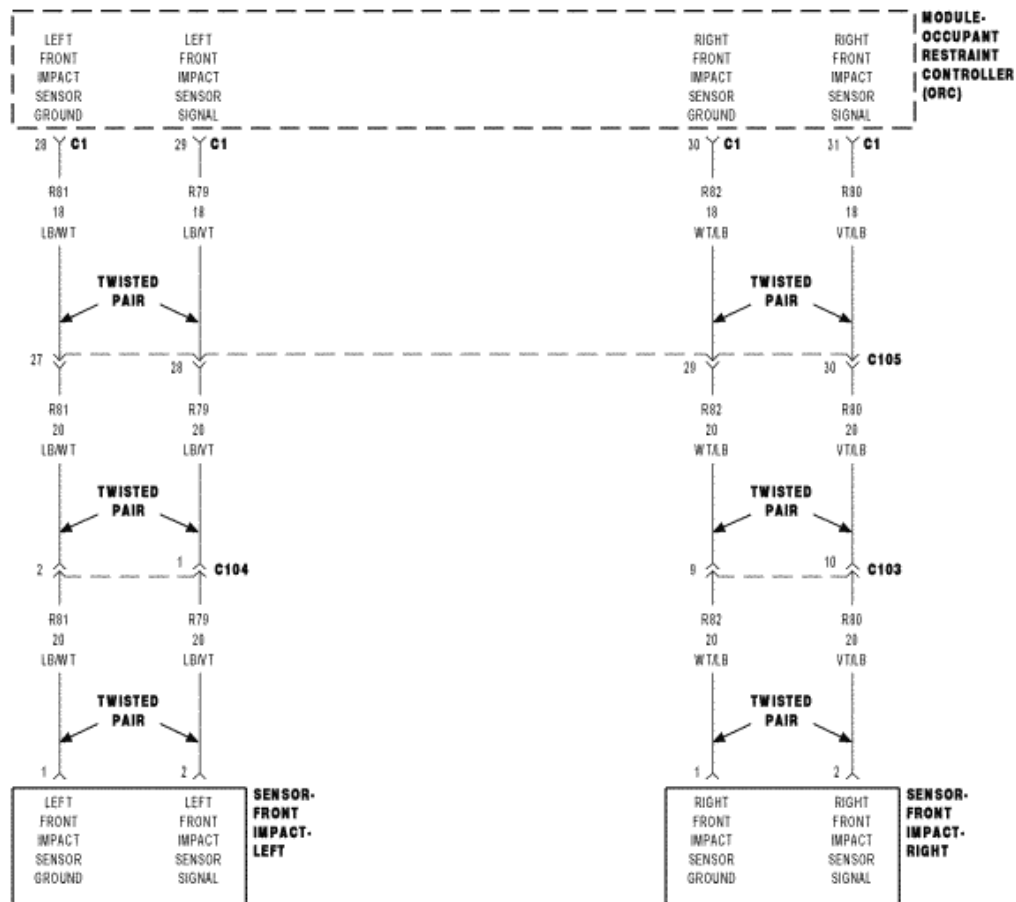
ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0170-LOST COMMUNICATION W/UP-FRONT LEFT SATELLITE ACCELERATION SENSOR

CIRCUIT SCHEMATIC



01954000

Fig. 37: Front Left/Right Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Front Left Impact Sensor over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Front Left Impact Sensor do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R79) SIGNAL CIRCUIT SHORTED TO BATTERY
(R79) SIGNAL CIRCUIT SHORTED TO GROUND
(R79, R81) FRONT LEFT IMPACT SENSOR CIRCUITS SHORTED TOGETHER
(R81) FRONT LEFT IMPACT SENSOR GROUND CIRCUIT OPEN
(R79) FRONT LEFT IMPACT SENSOR SIGNAL CIRCUIT OPEN
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0170-LOST COMMUNICATION W/UP-FRONT LEFT SATELLITE ACCELERATION SENSOR IS ACTIVE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: U0170-LOST COMMUNICATION W/UP-FRONT LEFT SATELLITE ACCELERATION SENSOR?

Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R79) and (R81) FRONT LEFT IMPACT SENSOR SIGNAL AND GROUND CIRCUITS FOR A SHORT TO BATTERY**

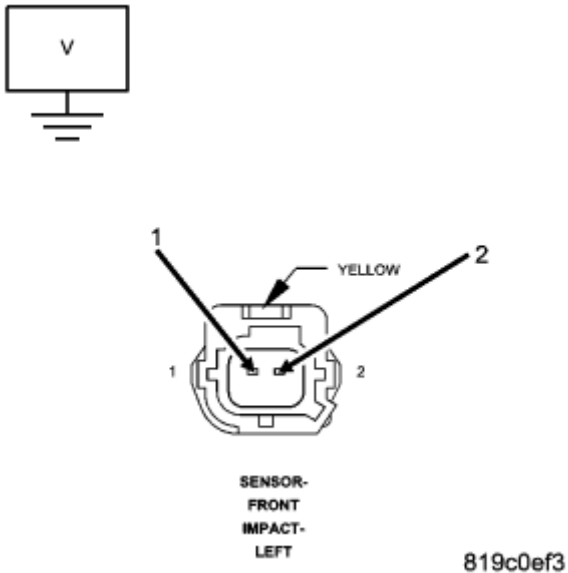


Fig. 38: Measuring (R79) Front Left Impact Sensor Signal Cavity 1 And (R81) Front Left Impact Sensor Ground Cavity 2 Circuit Voltage Between Front Left Impact Sensor Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Front Left Impact Sensor connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the (R79) Front Left Impact Sensor Signal cavity 1 and (R81) Front Left Impact Sensor Ground cavity 2 circuit voltage between the Front Left Impact Sensor connector and ground.

Is there any voltage present?

Yes

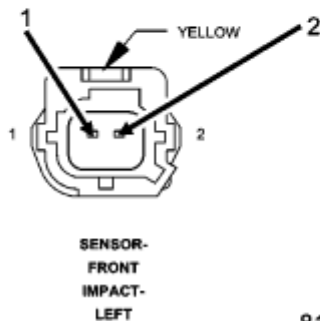
Repair the (R79) and (R81) Front Left Impact Sensor circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (R79) AND (R81) FRONT LEFT IMPACT SENSOR CIRCUITS FOR A SHORT TO GROUND**



819c0f29

Fig. 39: Measuring Resistance Of (R79) Front Left Impact Sensor Signal Circuit Cavity 2 And (R81) Front Left Impact Sensor Ground Circuit Cavity 1 Between Front Left Impact Sensor Connector And Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance of the (R79) Front Left Impact Sensor Signal circuit cavity 2 and (R81) Front Left Impact Sensor Ground circuit cavity 1 between the Front Left Impact Sensor connector and ground.

Is the resistance below 100K ohms?

Yes

Repair the (R79) and (R81) Front Left Impact Sensor circuits for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (R79) AND (R81) FRONT LEFT IMPACT SENSOR CIRCUITS FOR A SHORT TOGETHER**

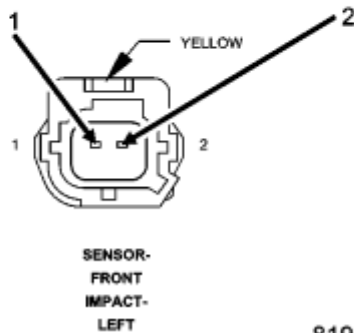


Fig. 40: Measuring Resistance Between (R79) Front Left Impact Sensor Signal And (R81) Front Left Impact Sensor Ground Circuits At Front Left Impact Sensor Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (R79) Front Left Impact Sensor Signal and (R81) Front Left Impact Sensor Ground circuits at the Front Left Impact Sensor connector.

Is the resistance below 100K ohms?

Yes

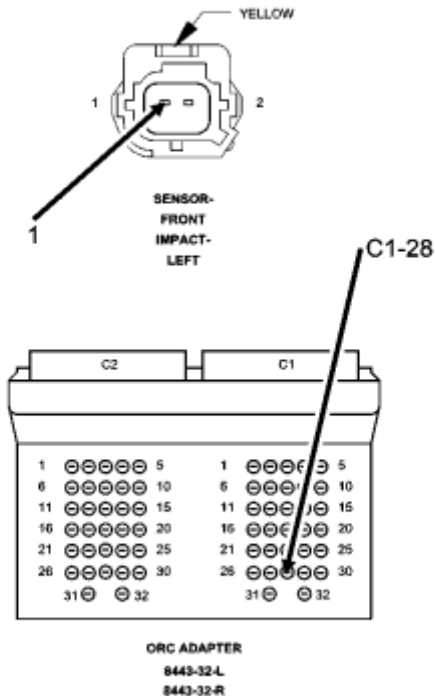
Repair the (R79) and (R81) Front Left Impact Sensor circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (R81) FRONT LEFT IMPACT SENSOR GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



819c1062

Fig. 41: Measuring Resistance Of (R81) Front Left Impact Sensor Ground Circuit Cavity 1 Between Front Left Impact Sensor Connector And ORC 8443-32-R Adapter Cavity C1-28
Courtesy of CHRYSLER LLC

Measure the resistance of the (R81) Front Left Impact Sensor Ground circuit cavity 1 between the Front Left Impact Sensor connector and the ORC 8443-32-R Adapter cavity C1-28.

Is the resistance below 1 ohm?

Yes

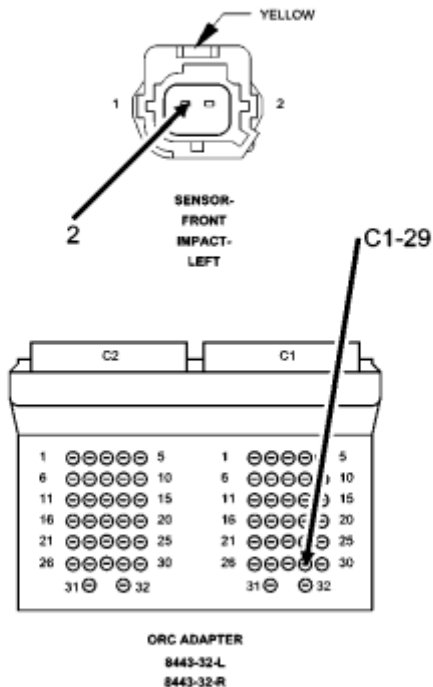
Go To 6.

No

Repair the (R81) Front Left Impact Sensor 1 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. **CHECK THE (R79) FRONT LEFT IMPACT SENSOR CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



819c139a

Fig. 42: Measuring Resistance Of (R79) Front Left Impact Sensor Signal Circuit Cavity 2 Between Front Left Impact Sensor Connector And ORC 8443-32-R Adapter Cavity 29
Courtesy of CHRYSLER LLC

Measure the resistance of the (R79) Front Left Impact Sensor Signal circuit cavity 2 between the Front Left Impact Sensor connector and the ORC 8443-32-R Adapter cavity 29.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R79) Front Left Impact Sensor Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

7. CHECK OPERATION OF THE FRONT LEFT IMPACT SENSOR

Replace the Front Left Impact Sensor.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Front Left Impact Sensor DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

Disconnect the ORC 8443-32-R Adapter.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram / schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

U0171-LOST COMMUNICATION W/UP-FRONT RIGHT SATELLITE

ACCELERATION SENSOR

CIRCUIT SCHEMATIC

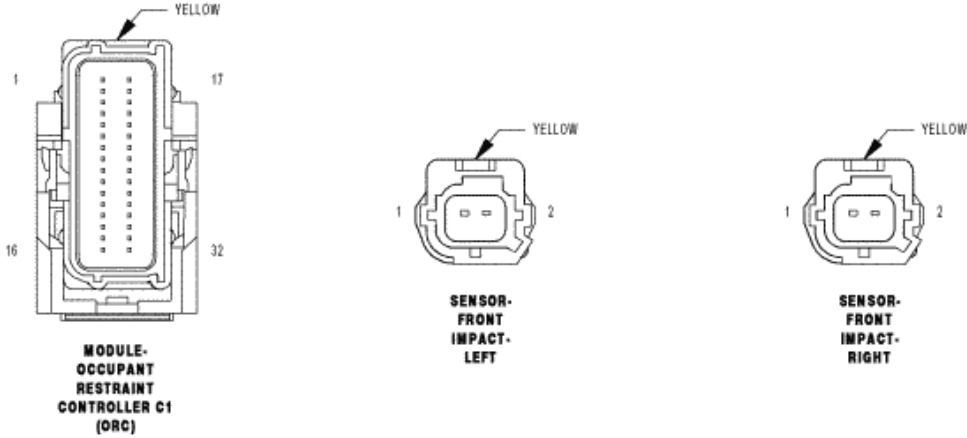
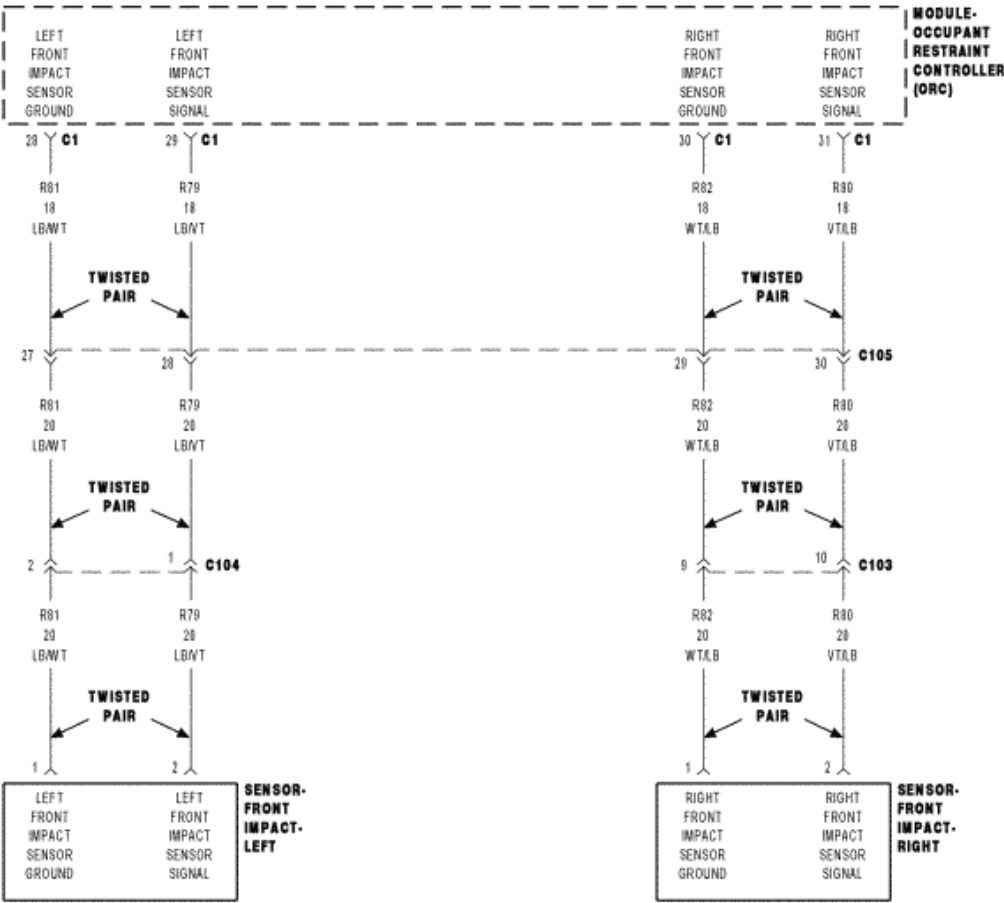


Fig. 43: Front Left/Right Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Front Right Impact Sensor over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Front Right Impact Sensor do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R80) SIGNAL CIRCUIT SHORTED TO BATTERY
(R80) SIGNAL CIRCUIT SHORTED TO GROUND
(R80, R82) FRONT RIGHT IMPACT SENSOR CIRCUITS SHORTED TOGETHER
(R82) FRONT RIGHT IMPACT SENSOR GROUND CIRCUIT OPEN
(R80) FRONT RIGHT IMPACT SENSOR SIGNAL CIRCUIT OPEN
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0171-LOST COMMUNICATION W/UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR IS ACTIVE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: U0171-LOST COMMUNICATION W/UP-FRONT RIGHT SATELLITE ACCELERATION SENSOR?

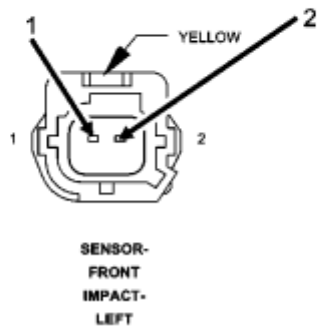
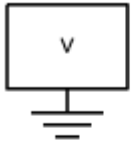
Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R80) and (R82) FRONT RIGHT IMPACT SENSOR CIRCUITS FOR A SHORT TO BATTERY**



819c3eb1

Fig. 44: Measuring (R80) Front Right Impact Sensor Signal Circuit Cavity 2 And (R82) Sensor Ground Circuit At Front Right Impact Sensor Cavity 1 Circuit Voltage Between Front Right Impact Sensor Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Front Right Impact Sensor connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connector.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the (R80) Front Right Impact Sensor Signal circuit cavity 2 and (R82) Sensor Ground circuit at the Front Right Impact Sensor cavity 1 circuit voltage between the Front Right Impact Sensor connector

and ground.

Is there any voltage present?

Yes

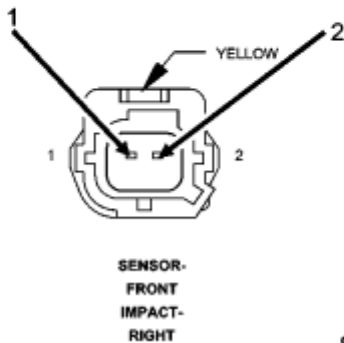
Repair the (R80) and (R82) Front Right Impact Sensor circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (R80) AND (R82) FRONT RIGHT IMPACT SENSOR CIRCUITS FOR A SHORT TO GROUND



819c3f82

Fig. 45: Measuring Resistance Of (R80) Cavity 2 And (R82) Front Right Impact Sensor Circuit Cavity 1 Between Front Right Impact Sensor Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn ignition on, then reconnect the battery.

Measure the resistance of the (R80) cavity 2 and (R82) Front Right Impact Sensor circuit cavity 1 between the Front Right Impact Sensor connector and ground.

Is the resistance below 100K ohms?

Yes

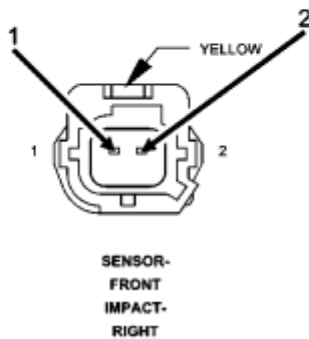
Repair the (R80) and (R82) Front Right Impact Sensor circuits for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK THE (R80) AND (R82) FRONT RIGHT IMPACT SENSOR CIRCUITS FOR A SHORT TOGETHER**



819c3f1a

Fig. 46: Measuring Resistance Between (R80) Front Right Impact Sensor Signal Cavity 2 And (R82) Front Right Impact Sensor Ground Cavity 1 Circuit At Front Right Impact Sensor Connector

Courtesy of CHRYSLER LLC

Measure the resistance between the (R80) Front Right Impact Sensor Signal cavity 2 and (R82) Front Right Impact Sensor Ground cavity 1 circuit at the Front Right Impact Sensor connector.

Is the resistance below 100K ohms?

Yes

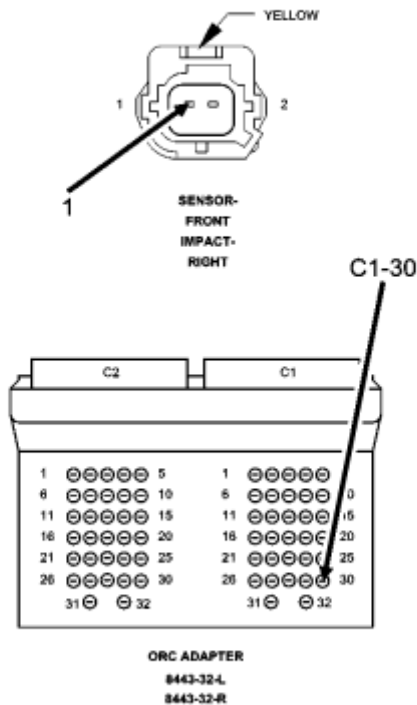
Repair the (R80) and (R82) Front Right Impact Sensor circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE (R82) FRONT RIGHT IMPACT SENSOR GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



819c3f2f

Fig. 47: Measuring Resistance Of (R82) Front Right Impact Sensor Ground Circuit Cavity 1 Between Front Right Impact Sensor Connector And ORC 8443-32-R Adapter C1-30
Courtesy of CHRYSLER LLC

Measure the resistance of the (R82) Front Right Impact Sensor Ground circuit cavity 1 between the Front Right Impact Sensor connector and the ORC 8443-32-R Adapter C1-30.

Is the resistance below 1 ohm?

Yes

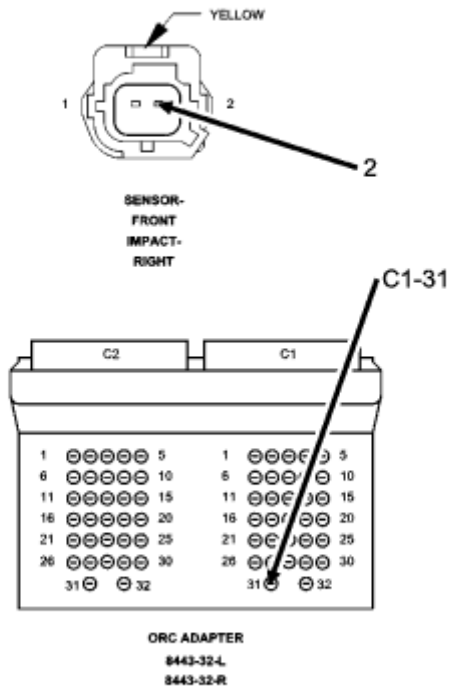
Go To 6.

No

Repair the (R82) Front Right Impact Sensor 2 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. **CHECK THE (R80) FRONT RIGHT IMPACT SENSOR SIGNAL CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



819c3f74

Fig. 48: Measuring Resistance Of (R80) Front Right Impact Sensor Signal Circuit Cavity 1 Between Front Right Impact Sensor Connector And ORC 8443-32-R Adapter Cavity 31
Courtesy of CHRYSLER LLC

Measure the resistance of the (R80) Front Right Impact Sensor Signal circuit cavity 1 between the Front Right Impact Sensor connector and the ORC 8443-32-R Adapter cavity 31.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R80) Front Right Impact Sensor Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

7. CHECK OPERATION OF THE FRONT RIGHT IMPACT SENSOR

Replace the Front Right Impact Sensor.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Front Right Impact Sensor DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

2008 RESTRAINTS

Electrical Diagnostics - Liberty

U0172-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 1

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Left Side Impact Sensor 1 over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Left Side Impact Sensor 1 do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R13) SIGNAL CIRCUIT SHORTED TO BATTERY
(R13) SIGNAL CIRCUIT SHORTED TO GROUND
(R13, R15) LEFT SIDE IMPACT SENSOR 1 CIRCUITS SHORTED TOGETHER
(R15) LEFT SIDE IMPACT SENSOR 1 GROUND CIRCUIT OPEN
(R13) LEFT SIDE IMPACT SENSOR 1 SIGNAL CIRCUIT OPEN
LEFT SIDE IMPACT SENSOR 1

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0172-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 1 IS ACTIVE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: U0172-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 1?

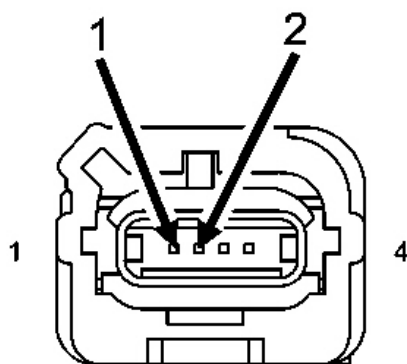
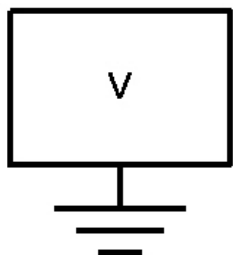
Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R13) and (R15) LEFT SIDE IMPACT SENSOR 1 CIRCUITS FOR A SHORT TO BATTERY**



**SENSOR-
SIDE
IMPACT-
LEFT 1**

81618505

Fig. 1: Checking Left Side Impact Sensor 1 Circuits For Short To Battery
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Impact Sensor 1 connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connectors.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R13) Left Side Impact Sensor 1 Signal circuit and (R15) Sensor Ground circuit between the Left Side Impact Sensor 1 connector and ground.

Is there any voltage present?

Yes

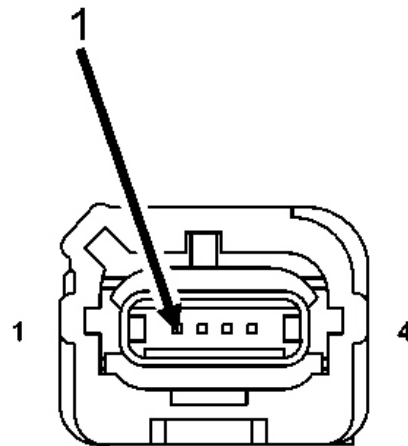
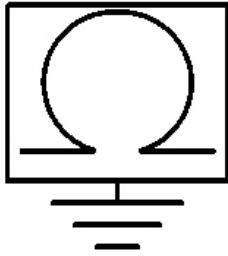
Repair the (R13) and (R15) Left Side Impact Sensor 1 circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (R13) and (R15) LEFT SIDE IMPACT SENSOR 1 CIRCUITS FOR A SHORT TO GROUND**



**SENSOR-
SIDE
IMPACT-
LEFT 1**

81618509

Fig. 2: Checking Left Side Impact Sensor Signal Circuit
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn ignition on, then reconnect the battery.

Measure the resistance of the (R13) Left Side Impact Sensor 1 Signal circuit between the Left Side Impact Sensor 1 connector and ground.

Measure the resistance of the (R15) Left Side Impact Sensor 1 Ground circuit between the Left Side Impact Sensor 1 connector and ground.

Is the resistance below 100K ohms on either circuit?

Yes

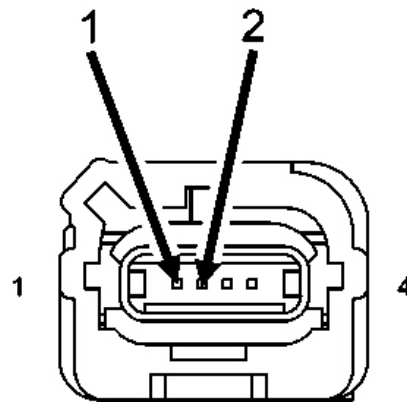
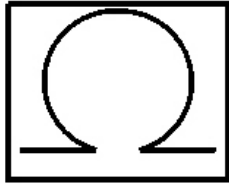
Repair the (R13) and (R15) Left Side Impact Sensor 1 Signal and Ground circuit for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 4.

4. **CHECK THE (R13) and (R15) LEFT SIDE IMPACT SENSOR CIRCUITS FOR A SHORT TOGETHER**



**SENSOR-
SIDE
IMPACT-
LEFT 1**

8161853b

Fig. 3: Checking Left Side Impact Sensor Circuits For Short Together
Courtesy of CHRYSLER LLC

Measure the resistance between the (R13) Left Side Impact Sensor 1 Signal and (R15) Sensor Ground circuits at the Left Side Impact Sensor 1 connector.

Is the resistance below 100K ohms?

Yes

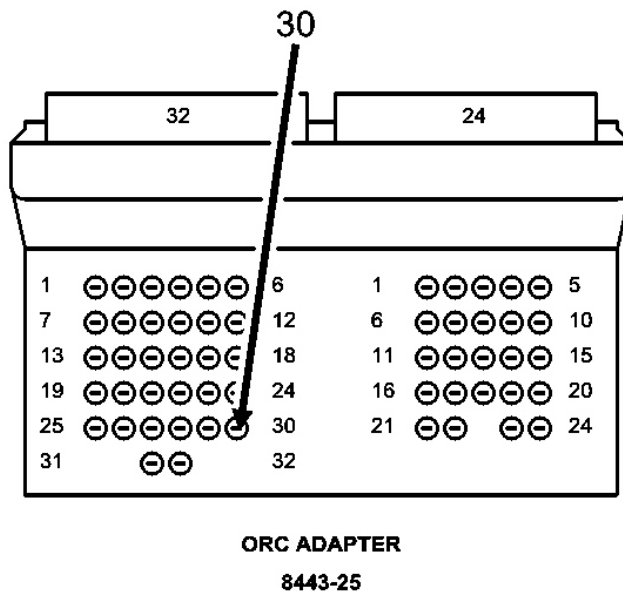
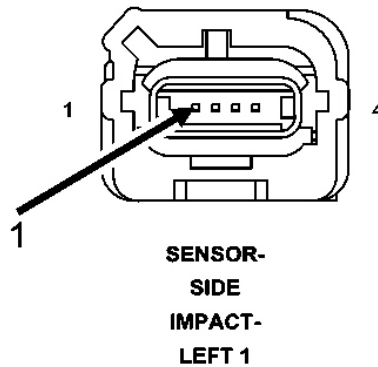
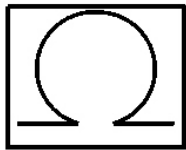
Repair the (R13) and (R15) Left Side Impact Sensor 1 circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 5.

5. **CHECK THE (R15) LEFT SIDE IMPACT SENSOR 1 GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



816180db

Fig. 4: Checking Left Side Impact Sensor 1 Signal Circuit For Open Or High Resistance
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R15) Left Side Impact Sensor 1 Ground circuit between the Left Side Impact Sensor 1 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

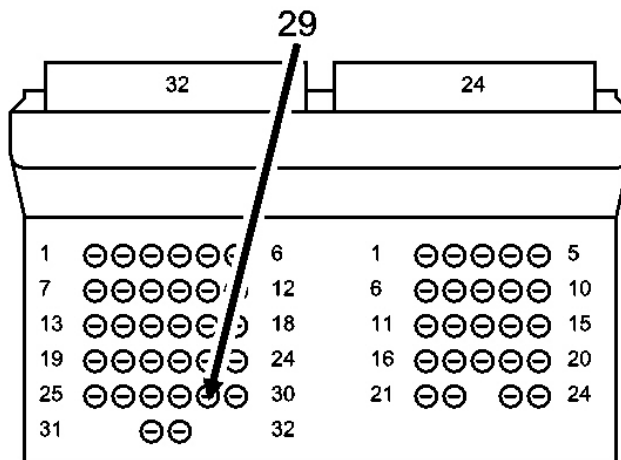
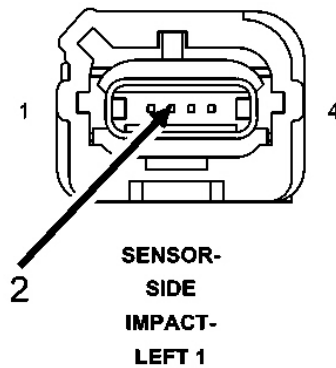
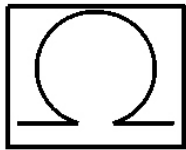
Go To 6.

No

Repair the (R15) Left Side Impact Sensor 1 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (R13) LEFT SIDE IMPACT SENSOR 1 CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



ORC ADAPTER
8443-25

816180d7

Fig. 5: Checking Left Side Impact Sensor 1 Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Measure the resistance of the (R13) Left Side Impact Sensor 1 Signal circuit between the Left Side Impact Sensor 1 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R13) Left Side Impact Sensor 1 Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK OPERATION OF THE LEFT SIDE IMPACT SENSOR 1

Replace the Left Side Impact Sensor 1.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Left Side Impact Sensor 1 DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

U0173-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 2

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Left Side Impact Sensor 2 over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Left Side Impact Sensor 2 do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R17) SIGNAL CIRCUIT SHORTED TO BATTERY
(R17) SIGNAL CIRCUIT SHORTED TO GROUND
(R17, R19) LEFT SIDE IMPACT SENSOR 2 CIRCUITS SHORTED TOGETHER
(R19) LEFT SIDE IMPACT SENSOR 2 GROUND CIRCUIT OPEN
(R17) LEFT SIDE IMPACT SENSOR 2 SIGNAL CIRCUIT OPEN
LEFT SIDE IMPACT SENSOR 2

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0173-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 2 IS ACTIVE**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: U0173-LOST COMMUNICATION W/LEFT SIDE SATELLITE ACCELERATION SENSOR 2?

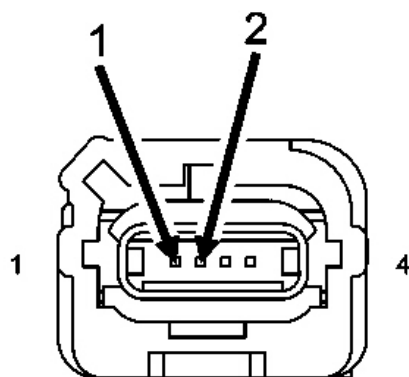
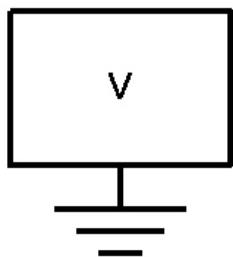
Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R17) and (R19) LEFT SIDE IMPACT SENSOR 2 CIRCUITS FOR A SHORT TO BATTERY**



**SENSOR-
SIDE
IMPACT-
LEFT 2**

81618607

Fig. 6: Measuring Voltage Of Left Side Impact Sensor 2 Signal Circuit And Sensor Ground Circuit
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Left Side Impact Sensor 2 connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connector.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R17) Left Side Impact Sensor 2 Signal circuit and (R19) Sensor Ground circuit at the Left Side Impact Sensor 2 connector and ground.

Is there any voltage present?

Yes

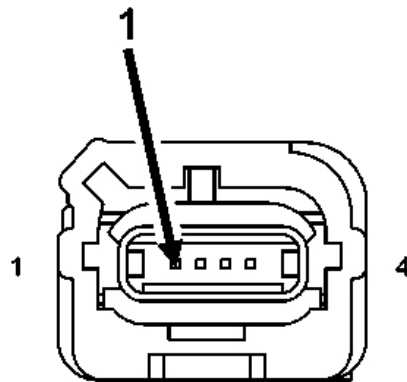
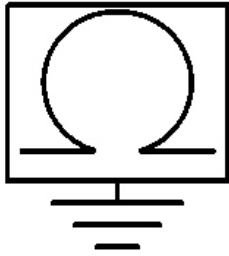
Repair the (R17) and (R19) Left Side Impact Sensor 2 circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (R17) and (R19) LEFT SIDE IMPACT SENSOR 2 CIRCUITS FOR A SHORT TO GROUND**



**SENSOR-
SIDE
IMPACT-
LEFT 2**

8161860b

Fig. 7: Measuring Resistance Of Left Side Impact Sensor 2 Signal Circuit
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance of the (R17) Left Side Impact Sensor 2 Signal circuit between the Left Side Impact Sensor 2 connector and ground.

Is the resistance below 100K ohms?

Yes

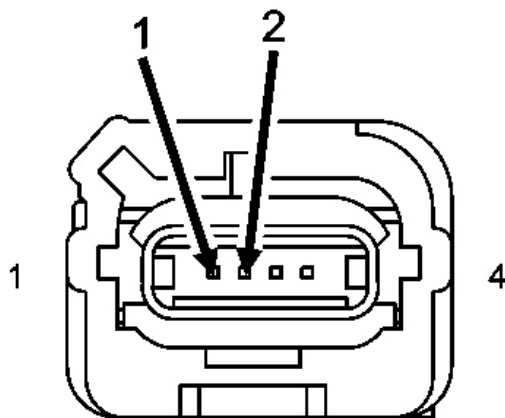
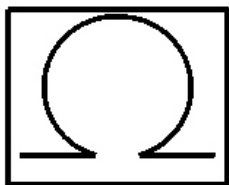
Repair the (R17) and (R19) Left Side Impact Sensor 2 circuits for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 4.

4. **CHECK THE (R17) and (R19) LEFT SIDE IMPACT SENSOR 2 CIRCUITS FOR A SHORT TOGETHER**



**SENSOR-
SIDE
IMPACT-
LEFT 2**

8161860f

Fig. 8: Measuring Resistance Between Left Side Impact Sensor 2 Signal And Sensor Ground Circuits

Courtesy of CHRYSLER LLC

Measure the resistance between the (R17) Left Side Impact Sensor 2 Signal and (R19) Sensor Ground circuits at the Left Side Impact Sensor 2 connector.

Is the resistance below 100K ohms?

Yes

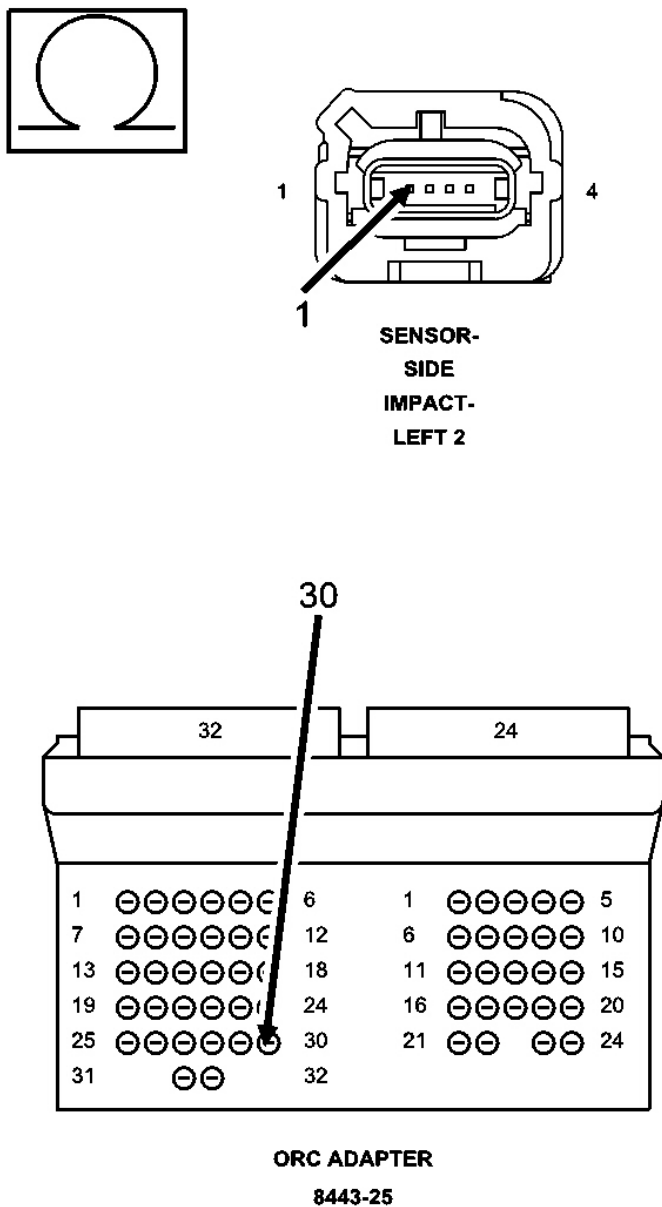
Repair the (R17) and R19) Left Side Impact Sensor 2 circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 5.

5. **CHECK THE (R19) LEFT SIDE IMPACT SENSOR 2 GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



816185fc

Fig. 9: Measuring Resistance Of Left Side Impact Sensor 2 Signal
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R19) Left Side Impact Sensor 2 Ground circuit between the Left Side Impact Sensor 2 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

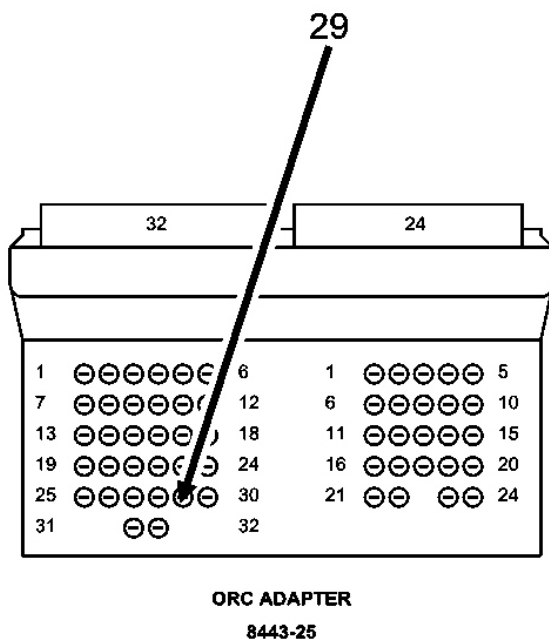
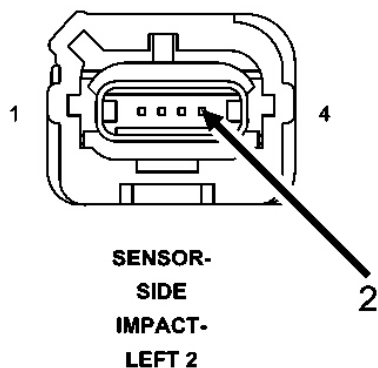
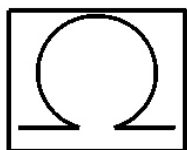
Go To 6.

No

Repair the (R19) Left Side Impact Sensor 2 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (R17) LEFT SIDE IMPACT SENSOR 2 CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



81618619

Fig. 10: Measuring Resistance Of Left Side Impact Sensor 2 Ground Circuit
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R17) Left Side Impact Sensor 2 Signal circuit between the Left Side Impact Sensor 2 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R17) Left Side Impact Sensor 2 Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK OPERATION OF THE LEFT SIDE IMPACT SENSOR 2

Replace the Left Side Impact Sensor 2.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Left Side Impact Sensor 2 DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

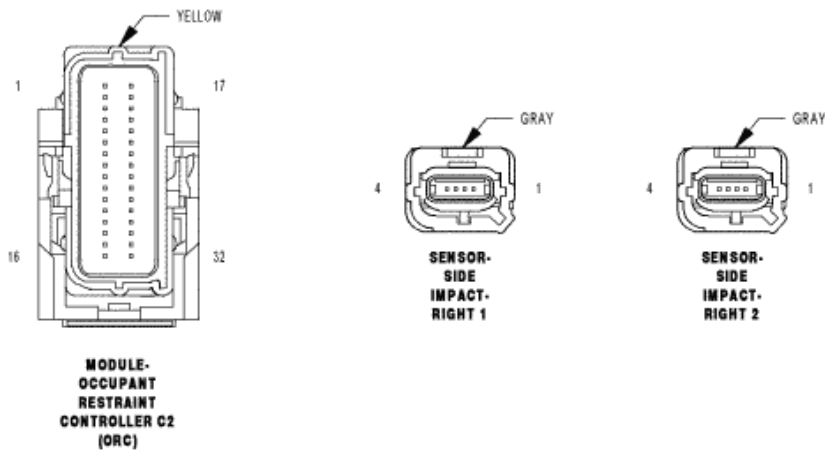
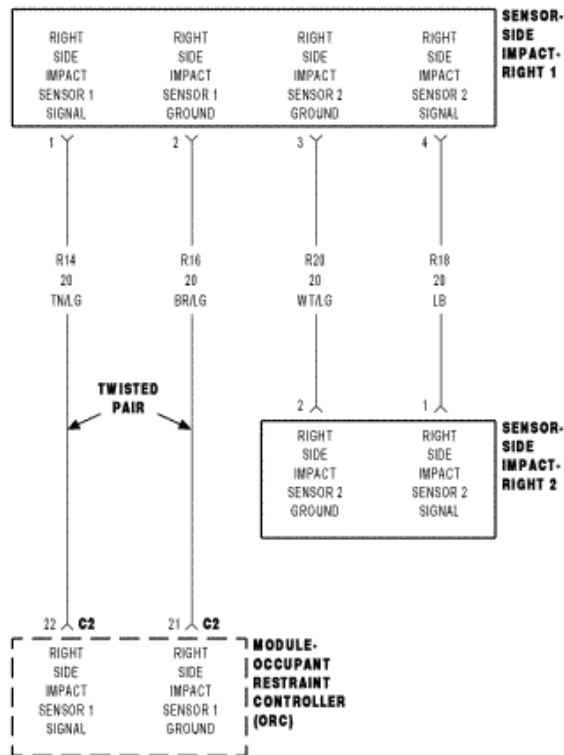
Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

U0175-COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 1

CIRCUIT SCHEMATIC



01a57557

Fig. 11: Right Side Satellite Acceleration Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Right Side Impact Sensor 1 over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Right Side Impact Sensor 1 do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R14) SIGNAL CIRCUIT SHORTED TO BATTERY
(R14) SIGNAL CIRCUIT SHORTED TO GROUND
(R14, R16) RIGHT SIDE IMPACT SENSOR 1 CIRCUITS SHORTED TOGETHER
(R16) RIGHT SIDE IMPACT SENSOR 1 GROUND CIRCUIT OPEN
(R14) RIGHT SIDE IMPACT SENSOR 1 SIGNAL CIRCUIT OPEN
OCCUPANT RESTRAINT CONTROLLER (ORC)

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0175-LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 1**

NOTE: **Ensure the battery is fully charged.**

Turn the ignition on.

With the scan tool, read ORC DTCs.

Does the scan tool display active: U0175-LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 1?

Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R14) and (R16) RIGHT SIDE IMPACT SENSOR 1 CIRCUITS FOR A SHORT TO BATTERY**

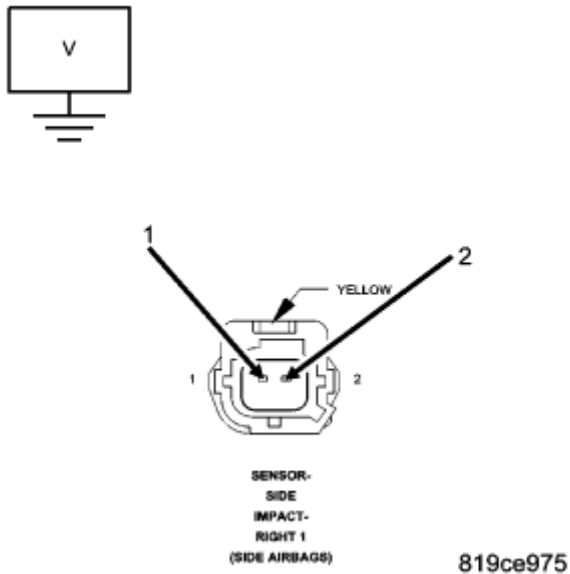


Fig. 12: Measuring Voltage Of (R14) Right Side Impact Sensor 1 Signal Circuit And (R16) Sensor Ground Circuit At Right Side Impact Sensor 1 Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Impact Sensor 1 connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connector.

NOTE: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R14) Right Side Impact Sensor 1 Signal circuit and (R16) Sensor Ground circuit at the Right Side Impact Sensor 1 connector and ground.

Is there any voltage present?

Yes

Repair the (R14) and (R16) Right Side Impact Sensor 1 circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (R14) and (R16) RIGHT SIDE IMPACT SENSOR 1 CIRCUITS FOR A SHORT TO GROUND**

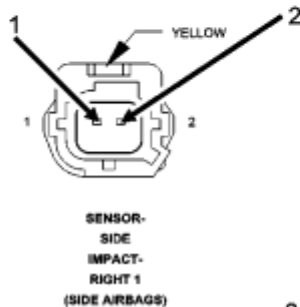


Fig. 13: Measuring Resistance Of (R14/R16) Right Side Impact Sensor Signal/Ground Circuit Between Right Side Impact Sensor 1 Connector And Ground
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance of the (R14) Right Side Impact Sensor 1 Signal circuit between the Right Side Impact Sensor 1 connector and ground.

Measure the resistance of the (R16) Right Side Impact Sensor Ground circuit between the Right Side Impact Sensor 1 connector and ground.

Is the resistance below 100K ohms on either circuit?

Yes

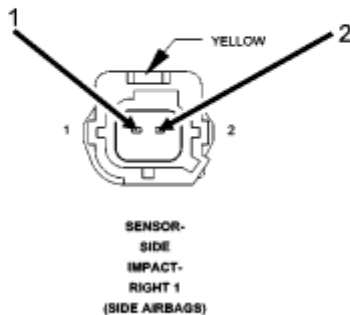
Repair the (R14) Right Side Impact Sensor 1 Signal or (R16) Right Side Impact Sensor 1 Ground circuit for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 4.

4. **CHECK THE (R14) and (R16) RIGHT SIDE IMPACT SENSOR CIRCUITS FOR A SHORT TOGETHER**



819cea1b

Fig. 14: Measuring Resistance Between (R14) Right Side Impact Sensor 1 Signal And (R16) Sensor Ground Circuits At Right Side Impact Sensor 1 Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (R14) Right Side Impact Sensor 1 Signal and (R16) Sensor Ground circuits at the Right Side Impact Sensor 1 connector.

Is the resistance below 100K ohms?

Yes

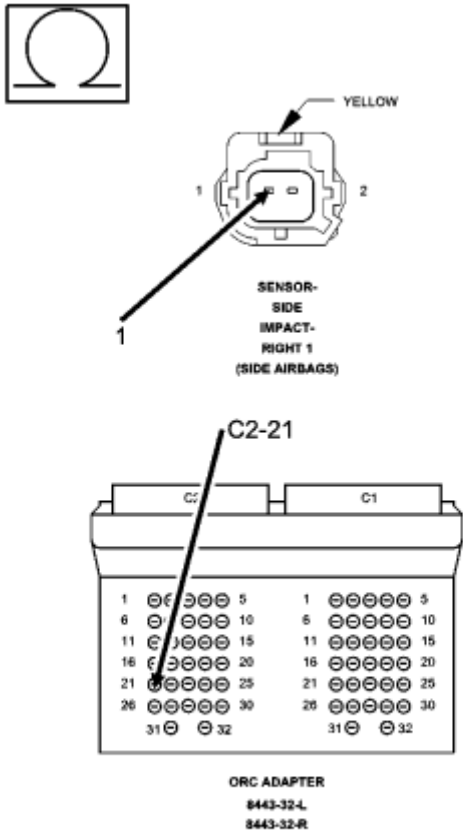
Repair the (R14) and (R16) Right Side Impact Sensor 1 circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 5.

5. **CHECK THE (R16) RIGHT SIDE IMPACT SENSOR 1 GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



819ce9bc

Fig. 15: Measuring Resistance Of (R16) Right Side Impact Sensor 1 Ground Circuit Between Right Side Impact Sensor 1 Connector And ORC 8443-32-R Adapter
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R16) Right Side Impact Sensor 1 Ground circuit between the Right Side Impact Sensor 1 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

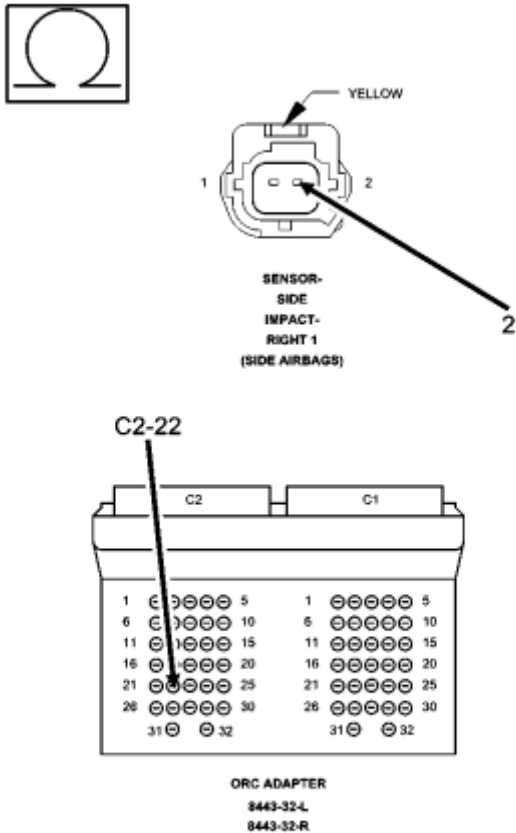
Go To 6.

No

Repair the (R16) Right Side Impact Sensor 1 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. CHECK THE (R14) RIGHT SIDE IMPACT SENSOR 1 CIRCUIT FOR AN OPEN OR HIGH RESISTANCE



819ce9fe

Fig. 16: Measuring Resistance Of (R14) Right Side Impact Sensor 1 Signal Circuit Between Right Side Impact Sensor 1 Connector And ORC 8443-32-R Adapter
 Courtesy of CHRYSLER LLC

Measure the resistance of the (R14) Right Side Impact Sensor 1 Signal circuit between the Right Side Impact Sensor 1 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R14) Right Side Impact Sensor 1 Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK OPERATION OF THE RIGHT SIDE IMPACT SENSOR 1

Replace the Right Side Impact Sensor 1.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Right Side Impact Sensor 1 DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

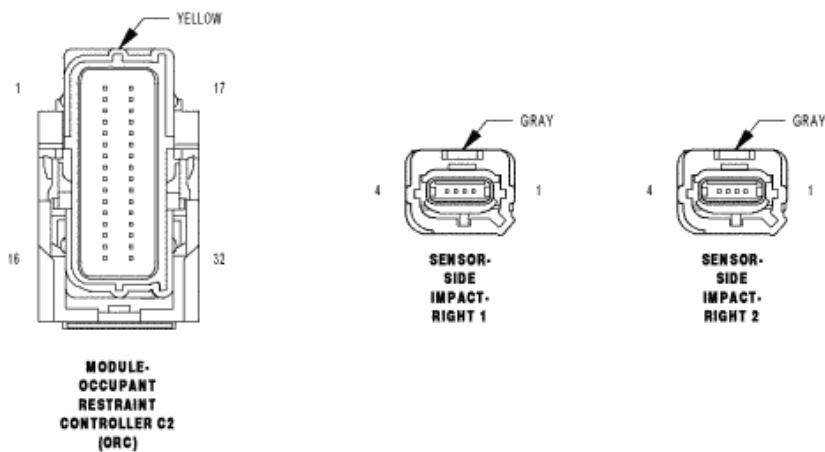
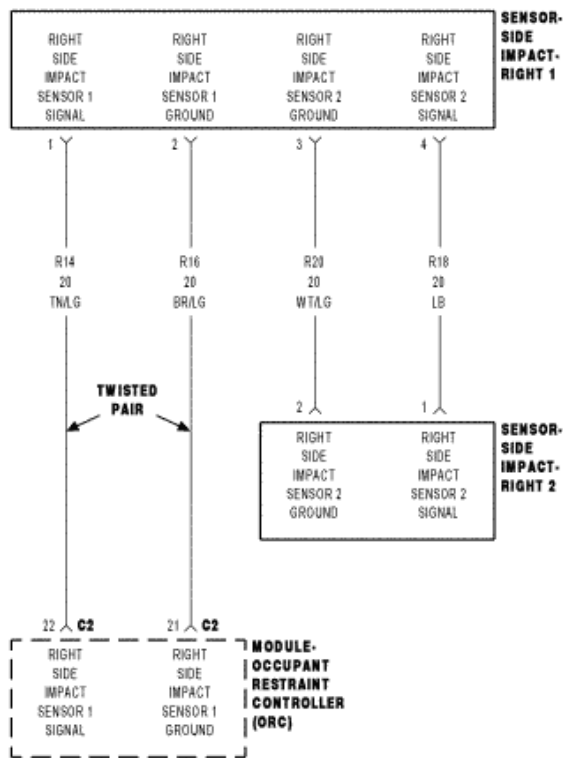
Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

**U0176-LOST COMMUNICATION W/RIGHT SIDE SATELLITE
ACCELERATION SENSOR 2**

CIRCUIT SCHEMATIC



81a57557

Fig. 17: Right Side Satellite Acceleration Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

The Occupant Restraint Controller (ORC) continuously communicates with the Right Side Impact Sensor 2 over the sensor signal circuit. The sensor communication and on board diagnostics are powered by the ORC signal.

SET CONDITIONS

- **Set Condition:**

This code will set, if the ORC and the Right Side Impact Sensor 2 do not establish and maintain valid data communications.

POSSIBLE CAUSES

Possible Causes
(R18) SIGNAL CIRCUIT SHORTED TO BATTERY
(R18) SIGNAL CIRCUIT SHORTED TO GROUND
(R18, R20) RIGHT SIDE IMPACT SENSOR 2 CIRCUITS SHORTED TOGETHER
(R20) RIGHT SIDE IMPACT SENSOR 2 GROUND CIRCUIT OPEN
(R18) RIGHT SIDE IMPACT SENSOR 2 SIGNAL CIRCUIT OPEN
RIGHT SIDE IMPACT SENSOR 2

DIAGNOSTIC TEST

1. **VERIFY THAT DTC U0176-LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 2**

Turn the ignition on.

With the scan tool, read ORC DTCs.

NOTE: **Ensure the battery is fully charged.**

Does the scan tool display active: U0176-LOST COMMUNICATION W/RIGHT SIDE SATELLITE ACCELERATION SENSOR 2?

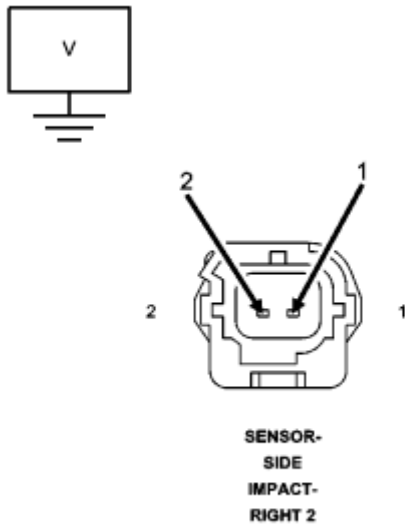
Yes

Go To 2.

No

Go To 9.

2. **CHECK THE (R18) and (R20) RIGHT SIDE IMPACT SENSOR 2 SIGNAL AND GROUND CIRCUITS FOR A SHORT TO BATTERY**



818711b5

Fig. 18: Checking Right Side Impact Sensor 2 Signal And Ground Circuits For Short To Battery
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Right Side Impact Sensor 2 connector.

Disconnect the ORC connectors.

Connect the ORC 8443-32-R Adapter to the ORC connector.

NOTE: The IP Harness is always connected to the right side (C1) of the 8443-32-R Adapter.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Measure the voltage of the (R18) Right Side Impact Sensor 2 Signal circuit and (R20) Sensor Ground circuit at the Right Side Impact Sensor 2 connector and ground.

Is there any voltage present?

Yes

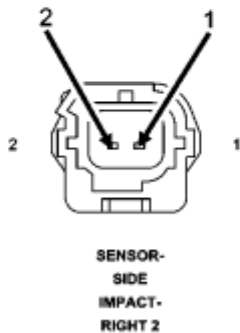
Repair the (R18) and (R20) Right Side Impact Sensor 2 circuits for a short to battery.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (R18) RIGHT SIDE IMPACT SENSOR 2 SIGNAL CIRCUIT FOR A SHORT TO GROUND**



818711b9

Fig. 19: Checking Right Side Impact Sensor 2 Signal Circuit For Short To Ground

Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Measure the resistance of the (R18) Right Side Impact Sensor 2 Signal circuit between the Right Side Impact Sensor 2 connector and ground.

Is the resistance below 100K ohms?

Yes

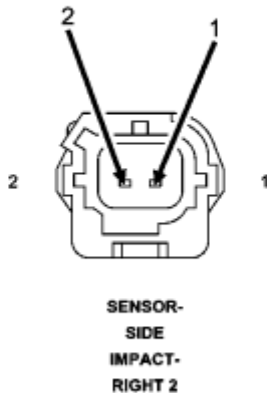
Repair the (R18) Right Side Impact Sensor 2 Signal circuit for a short to ground.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 4.

4. **CHECK THE (R18) AND (R20) RIGHT SIDE IMPACT SENSOR CIRCUITS FOR A SHORT TOGETHER**



818711bd

Fig. 20: Checking Right Side Impact Sensor 2 Circuits For Short Together
Courtesy of CHRYSLER LLC

Measure the resistance between the (R18) Right Side Impact Sensor 2 Signal and (R20) Sensor Ground circuits at the Right Side Impact Sensor 2 connector.

Is the resistance below 100K ohms?

Yes

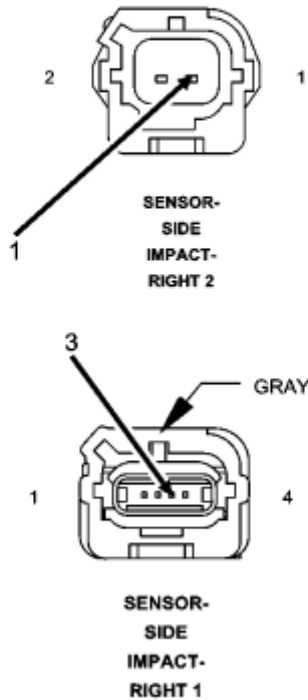
Repair the (R18) and (R20) Right Side Impact Sensor 2 circuits shorted together.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 5.

5. **CHECK THE (R20) RIGHT SIDE IMPACT SENSOR 2 GROUND CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**



818711c2

Fig. 21: Checking Right Side Impact Sensor 2 Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Measure the resistance of the (R20) Right Side Impact Sensor 2 Ground circuit between the Right Side Impact Sensor 2 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

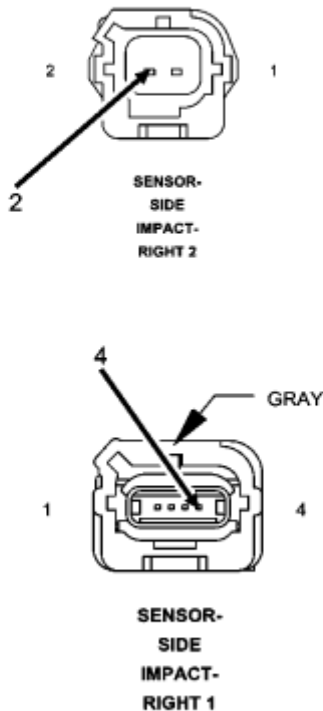
Go To 6.

No

Repair the (R20) Right Side Impact Sensor 2 Ground circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. CHECK THE (R18) RIGHT SIDE IMPACT SENSOR 2 CIRCUIT FOR AN OPEN OR HIGH RESISTANCE



818711c6

Fig. 22: Checking Right Side Impact Sensor 2 Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Measure the resistance of the (R18) Right Side Impact Sensor 2 Signal circuit between the Right Side Impact Sensor 2 connector and the ORC 8443-32-R Adapter.

Is the resistance below 1 ohm?

Yes

Go To 7.

No

Repair the (R18) Right Side Impact Sensor 2 Signal circuit for an open or high resistance.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK OPERATION OF THE RIGHT SIDE IMPACT SENSOR 2

Replace the Right Side Impact Sensor 2.

Reconnect the vehicle body harness to the impact sensor.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Use the scan tool and erase the stored codes in all airbag system modules.

Turn the Ignition Off, and wait 15 seconds before turning the Ignition On.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active Right Side Impact Sensor 2 DTC return?

Yes

Go To 8.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

8. REPLACE THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

If there are no possible causes remaining, view repair.

Repair

Replace the Occupant Restraint Controller in accordance with Service Instructions.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

9. TEST FOR AN INTERMITTENT CONDITION

With the scan tool, record and erase all DTC's from all Airbag modules.

If any ACTIVE codes are present they must be resolved before diagnosing any stored codes.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

The following additional checks may assist you in identifying a possible intermittent problem.

Reconnect any disconnected components and harness connector.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool monitor active codes as you work through the following steps.

WARNING: To avoid serious or fatal injury, maintain a safe distance from all airbags while performing the following steps.

Wiggle the wiring harness and connectors of the related airbag circuit or component.

If codes are related to the Driver Airbag circuits, rotate the steering wheel from stop to stop.

If only stored codes return continue the test until the problem area has been isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting active DTC in question.

Are any ACTIVE DTCs present?

Yes

Select the appropriate symptom from Symptom List.

No

No problem found at this time. Erase all codes before returning vehicle to customer.

U1414-IMPLAUSIBLE/MISSING ECU NETWORK CONFIGURATION DATA

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. The Occupant Restraint Controller (ORC) on board diagnostics continuously monitors the CAN Bus message from the TIPM containing the ORC configuration data.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the data is invalid or missing.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)
TOTALLY INTEGRATED POWER MODULE (TIPM)

DIAGNOSTIC TEST

1. **VERIFY TOTALLY INTEGRATED POWER MODULE (TIPM) OPERATION**

Turn the ignition on.

With the scan tool, read TIPM DTC.

Does the scan tool display any TIPM DTC?

Yes

Select appropriate symptom from Symptom List. Repair all TIPM active DTC or reprogram the TIPM before diagnosing the ORC DTC.

No

Go To 2.

2. **CHECK OPERATION OF THE OCCUPANT RESTRAINT CONTROLLER**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be

replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

Replace the Occupant Restraint Controller in accordance with the service information.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active U1414-IMPLAUSIBLE/MISSING ECU CONFIGURATION DATA DTC return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

3. REPLACE THE TOTALLY INTEGRATED POWER MODULE (TIPM)

View repair.

Repair

Replace the Totally Integrated Power Module (TIPM) in accordance with Service Information.

U1415-IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

With the ignition on. The Occupant Restraint Controller (ORC) on board diagnostics continuously monitors the CAN Bus message from the TIPM containing the ORC configuration data.

SET CONDITIONS

- **Set Condition:**

This DTC will set if the data is invalid or missing.

POSSIBLE CAUSES

Possible Causes
OCCUPANT RESTRAINT CONTROLLER (ORC)
TOTALLY INTEGRATED POWER MODULE (TIPM)

DIAGNOSTIC TEST

1. VERIFY TOTALLY INTEGRATED POWER MODULE (TIPM) OPERATION

Turn the ignition on.

With the scan tool, read TIPM DTCs.

Does the scan tool display any TIPM DTCs?

Yes

Select appropriate symptom from Symptom List. Repair all TIPM active DTCs or reprogram the TIPM before diagnosing the ORC DTCs.

No

Go To 2.

2. CHECK OPERATION OF THE OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

WARNING: If the airbag control module is dropped at any time, it must be replaced. Failure to take the proper precautions could result in accidental airbag deployment and serious or fatal injury.

Replace the Occupant Restraint Controller in accordance with the service information.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

Connect the scan tool to the Data Link Connector - use the most current software available.

Wait one minute, and read active codes and if there are none present read the stored codes.

Did the active U1415-IMPLAUSIBLE/MISSING VEHICLE CONFIGURATION DATA DTC return?

Yes

Go To 3.

No

Repair is complete.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

3. REPLACE THE TOTALLY INTEGRATED POWER MODULE (TIPM)

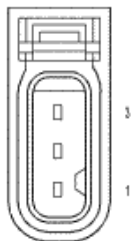
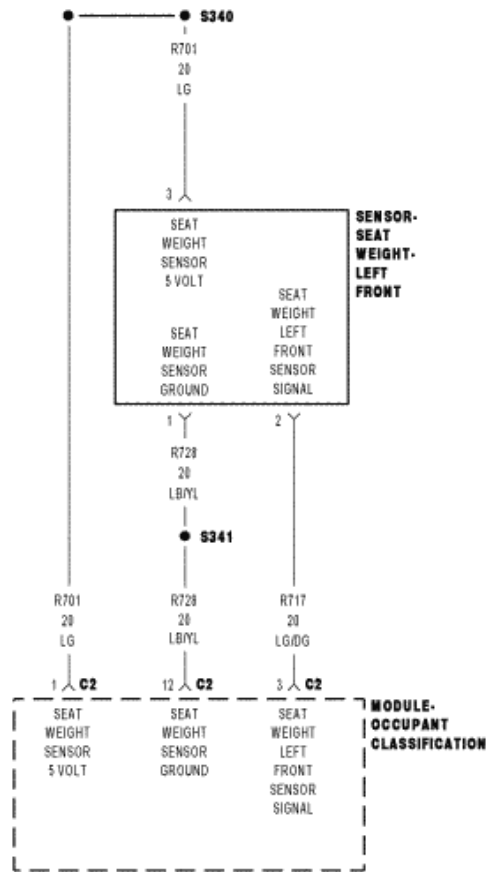
View repair.

Repair

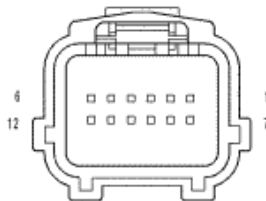
Replace the Totally Integrated Power Module (TIPM) in accordance with Service Information.

U1419-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 3 - LEFT FRONT

CIRCUIT SCHEMATIC



**SENSOR-
SEAT
WEIGHT-
LEFT
FRONT**



**MODULE-
OCCUPANT
CLASSIFICATION C2**

0101007

Fig. 23: Left Front Weight Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

MONITOR CONDITIONS

When Monitored:

At ignition on the Occupant Classification Module (OCM) supplies 5 volts to power up the Left Front Passenger Seat Weight Sensor. Every time the sensor is powered up it sends an initialization message containing the sensor serial number to the OCM.

SET CONDITIONS

- **Set Condition:**

If the Left Front Passenger Seat Weight Sensor 5 volt supply is temporarily interrupted resulting in the sensor powering up more than one time in the same ignition cycle the code will be set.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC U1419-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 3 - LEFT FRONT IS ACTIVE**

With the scan tool, read OCM DTCs.

Does the scan tool display active: U1419-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 3 - LEFT FRONT?

Yes

Go To 3.

No

Go To 6.

3. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST**.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

5. VERIFY SEAT SENSOR TORQUE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are torqued to specification. Refer to **SEATS** .

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS.**

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question/causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform the ***OCM SYSTEM VERIFICATION TEST**. Erase all codes before returning vehicle to customer.

U141A-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 2 - RIGHT FRONT

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

At ignition on the Occupant Classification Module (OCM) supplies 5 volts to power up the Right Front Passenger Seat Weight Sensor. Every time the sensor is powered up it sends an initialization message containing the sensor serial number to the OCM.

SET CONDITIONS

- **Set Condition:**

If the Right Front Passenger Seat Weight Sensor 5 volt supply is temporarily interrupted resulting in the sensor powering up more than one time in the same ignition cycle the code will be set.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC U141A-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 2 - RIGHT FRONT

With the scan tool, read OCM DTCs.

Does the scan tool display active: U141A-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 2 - RIGHT FRONT?

Yes

Go To 3.

No

Go To 6.

3. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST.**

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 4.

4. PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

5. VERIFY SEAT SENSOR TORQUE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are torqued to specification. Refer to **SEATS** .

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect

the battery.

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS.**

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and

contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question/causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform the ***OCM SYSTEM VERIFICATION TEST**. Erase all codes before returning vehicle to customer.

U141B-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 4 - LEFT REAR

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

At ignition on the Occupant Classification Module (OCM) supplies 5 volts to power up the Left Rear Passenger Seat Weight Sensor. Every time the sensor is powered up it sends an initialization message containing the sensor serial number to the OCM.

SET CONDITIONS

- **Set Condition:**

If the Left Rear Passenger Seat Weight Sensor 5 volt supply is temporarily interrupted resulting in the

sensor powering up more than one time in the same ignition cycle the code will be set.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED

DIAGNOSTIC TEST

1. CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)

NOTE: Ensure that the battery is fully charged.

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. VERIFY THAT DTC U141B-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 4 - LEFT REAR IS ACTIVE

With the scan tool, read OCM DTCs.

Does the scan tool display active: U141B-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 4 - LEFT REAR?

Yes

Go To 3.

No

Go To 6.

3. INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST**.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

5. VERIFY SEAT SENSOR TORQUE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are torqued to specification. Refer to **SEATS** .

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS.**

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question/causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform the ***OCM SYSTEM VERIFICATION TEST**. Erase all codes before returning vehicle to customer.

U141C-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 1 - RIGHT REAR

ADDITIONAL WIRING

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

MONITOR CONDITIONS

When Monitored:

At ignition on the Occupant Classification Module (OCM) supplies 5 volts to power up the Right Rear Passenger Seat Weight Sensor. Every time the sensor is powered up it sends an initialization message containing the sensor serial number to the OCM.

SET CONDITIONS

- **Set Condition:**

If the Right Rear Passenger Seat Weight Sensor 5 volt supply is temporarily interrupted resulting in the sensor powering up more than one time in the same ignition cycle the code will be set.

POSSIBLE CAUSES

Possible Causes
PASSENGER SEAT HARNESS WIRES CHAFED, PIERCED, PINCHED, PARTIALLY BROKEN PASSENGER SEAT HARNESS CONNECTOR TERMINALS BROKEN, BENT PUSHED OUT, SPREAD, CORRODED, CONTAMINATED

DIAGNOSTIC TEST

1. **CHECK FOR ACTIVE INTERNAL FAULTS, IGNITION FAULTS, AND BATTERY FAULTS IN THE OCCUPANT CLASSIFICATION MODULE (OCM)**

NOTE: **Ensure that the battery is fully charged.**

Turn the ignition on, then off, and then on again.

With the scan tool, read Occupant Classification Module (OCM) DTCs.

Does the scan tool display any active DTCs relating to internal faults, ignition faults, or battery faults?

Yes

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **VERIFY THAT DTC U141C-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 1 - RIGHT REAR**

With the scan tool, read OCM DTCs.

Does the scan tool display active: U141C-IMPLAUSIBLE DATA RECEIVED FROM OCS SENSOR 1 - RIGHT REAR?

Yes

Go To 3.

No

Go To 6.

3. **INSPECT PASSENGER SEAT HARNESS WIRES AND CONNECTORS**

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the Passenger Seat Harness wiring and connectors. Look for chafed, pierced, pinched, or partially broken wires and broken, bent, pushed out, spread, corroded, or contaminated terminals.

Are any of these conditions present?

Yes

NOTE: Do not attempt to repair the Seat Harness. Replace the Seat Harness if any of these conditions exist.

Replace the Passenger Seat Harness in accordance with the Service Information.

Perform ***OCM SYSTEM VERIFICATION TEST**.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 4.

4. **PERFORM OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST**

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All

Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To 5.

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

5. VERIFY SEAT SENSOR TORQUE

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are torqued to specification. Refer to **SEATS**.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: Verify That All Tests Steps That Led You Here Were Performed As Directed; Verify That The Ignition Is In Run; Wait 30 Seconds After Changing The Seat Weight Before Proceeding To Allow The System To Stabilize; Only Press Scan Tool Buttons When Directed To Do So; and Perform The Occupant Classification Module System Verification Test To Completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Perform the ***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS**.

No - But Other DTCs Present

Diagnose and repair the DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No - No Active DTCs Present

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

6. CHECKING STORED OR INTERMITTENT CODES

NOTE: Diagnose and repair all active codes before diagnosing stored codes. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of airbag system diagnostic procedures.

With the scan tool, record and erase all Airbag System Module DTCs.

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Using the wiring diagram/schematic as a guide, inspect the related wiring and connectors for chafed, pierced, pinched, and partially broken wires, and for broken, bent, pushed out, corroded, and contaminated terminals. Repair as necessary.

Reconnect all disconnected components and harness connectors.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

With the scan tool, monitor for active codes while performing the following:

- Wiggle the wiring harness and connectors of the related airbag circuit.
- Continue the test until either a code becomes active or the problem area is isolated.

In the previous steps you have attempted to recreate the conditions responsible for setting the DTC in question/causing the intermittent condition.

Are any ACTIVE DTCs present?

Yes

Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX** .

No

No problem found at this time. Perform the ***OCM SYSTEM VERIFICATION TEST**. Erase all codes before returning vehicle to customer.

***DIAGNOSIS AND CHECKOUT PROCEDURE FOR SEAT WEIGHT SENSORS**

OCCUPANT CLASSIFICATION SEAT WEIGHTS

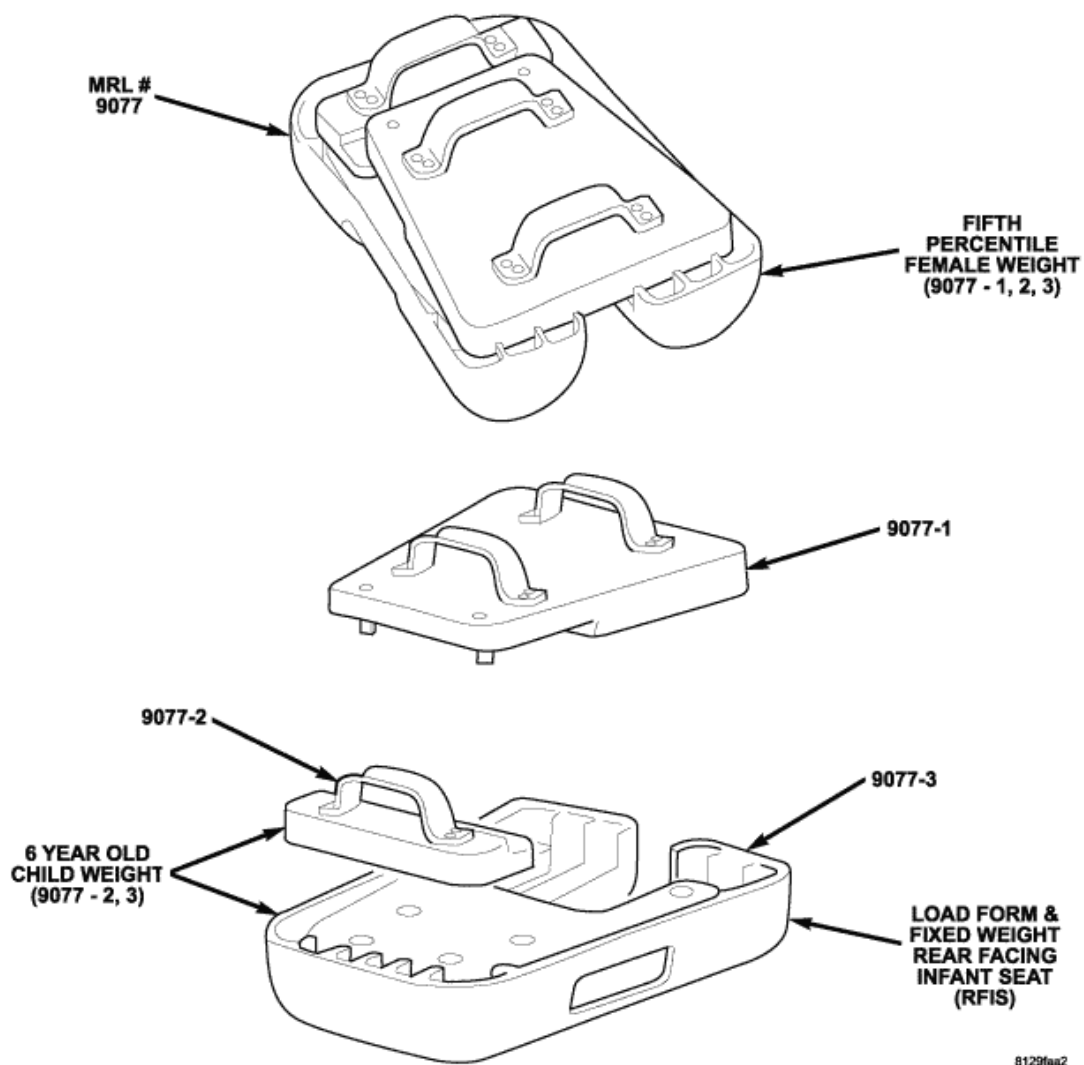


Fig. 24: OCS Seat Weights MRL #9077
Courtesy of CHRYSLER LLC

DIAGNOSTIC TEST

1. VERIFY COMPLAINT

Turn the ignition off.

Move the front passenger seat to the full rear position. Verify that the seat is empty, the seat back is in the normal upright position, and that the seat is not interfering with any interior components.

Verify that all related connectors are properly seated and locked.

Turn the ignition on.

With the scan tool in OCM, select Data Display and note the Passenger Seat Weight Sensor voltage for all four sensors (Left Front, Right Front, Left Rear and Right Rear).

Move the front passenger seat to the mid track position.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors.

Move the front passenger seat to the full forward position.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4

to 3.6 volts for each sensor in each position (full rear, mid track, and full forward).

Is any sensor's voltage reading out of the acceptable range in any position?

Yes

Go To step 2.

No

Perform test B1BA7-Occupant Classification System Verification Required. If the test passes, the seat weight sensing system is working properly. Return to the procedure that directed you to this procedure.

2. CHECKING FOR BENT FLOOR PAN

Turn the ignition off.

Loosen all of the mounting screws retaining the front passenger seat to the vehicle crossmembers, but do not remove them. Verify that the seat is loose and that no binding exists between the seat and the crossmembers.

Move the front passenger seat to the full rear position and then to the full forward position.

Tighten all of the mounting screws to specification. Refer to **SEAT WEIGHT SENSOR** for specification.

Move the front passenger seat to the full rear position.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors.

Move the front passenger seat to the mid track position.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors.

Move the front passenger seat to the full forward position.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4 to 3.6 volts for each sensor in each position.

Is any sensor's voltage reading out of the acceptable range in any position?

Yes

Go To step 3.

No

Perform test B1BA7-Occupant Classification System Verification Required. Return to the procedure that directed you to this procedure.

If the test passes, the seat weight sensing system is working properly.

Return to the procedure that directed you to this procedure.

3. CHECKING SEAT TO RISER STRESS

Turn the ignition off.

Loosen all of the mounting screws retaining the front passenger seat track to the riser, but do not remove them. Verify that the seat track is loose and that no binding exists between the seat track and the risers.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.5 to 3.5 volts for each sensor.

Is any sensor's voltage reading out of the acceptable range?

Yes

Go To step 4.

No

Visually inspect for damaged or bent risers and crossmembers. Also, verify that the riser holes line

up with the seat mounts in the crossmembers.

If riser damage is apparent, replace the risers in accordance with the Service Information. Then, reinstall the Seat Weight Sensors, and Go To step 6.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

If crossmember or floorpan damage is present, repair or replace the components as necessary in accordance with the Service Information. Reinstall the seat in the vehicle in accordance with the Service Information. Turn the ignition on. With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the directions displayed on the scan tool. When the test is complete, Go To step 1.

4. TEST SEAT FRAME

Turn the ignition off.

Remove the front passenger seat from the risers in accordance with the Service Information. Return the risers to their normal mounting position.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4 to 3.6 volts for each sensor.

Is any sensor's voltage reading out of the acceptable range?

Yes

Go To step 5.

No

Visually inspect for damaged or bent risers, a damaged or bent seat and seat structure, and damaged or bent seat tracks. Also, verify that the holes in the center of the sensors line up with the seat track holes and that the seat track position locating tabs are locked in the same parallel slots.

If riser damage is apparent, replace the risers in accordance with the Service Information. Then, reinstall the Seat Weight Sensors, and Go To step 6.

If seat or seat track damage is present, replace the components as necessary in accordance with the

Service Information. Then, Go To step 7.

5. **TEST SENSOR**

Turn the ignition off.

Loosen the mounting screws of all of the Seat Weight Sensors, but do not remove them. Verify that the sensors are loose and that no binding exists between the sensors and the risers.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4 to 3.6 volts for each sensor.

Is any sensor's voltage reading out of the acceptable range?

Yes

Replace any Seat Weight Sensors that have an unacceptable voltage reading in accordance with the Service Information. Then, Go To step 6.

No

Replace the risers in accordance with the Service Information. Then, reinstall the Seat Weight Sensors, and Go To step 6.

6. **CHECKING FOR LOOSE SEAT WEIGHT SENSOR**

Turn the ignition off.

Tighten all of the Seat Weight Sensor mounting screws to specification. Refer to **SEAT WEIGHT SENSOR** for specification.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4 to 3.6 volts for each sensor.

Is any sensor's voltage reading out of the acceptable range?

Yes

Loosen the mounting screws of all Seat Weight Sensors with an unacceptable voltage reading, and repeat Steps 5 and 6.

No

Go To step 7.

7. TEST SEAT TRACKS

Turn the ignition off.

Mount the front passenger seat on the risers in accordance with service information.

Turn the ignition on.

Using the scan tool, note the Passenger Seat Weight Sensor voltage for all four sensors. The voltage should be from 1.4 to 3.6 volts for each sensor.

Is any sensor's voltage reading out of the acceptable range?

Yes

Replace the seat track in accordance with the Service Information. Verify that no binding exists between the seat and risers. Then, repeat Steps 6 and 7.

No

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

Reinstall the seat in the vehicle in accordance with the Service Information. Turn the ignition on. With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed by the scan tool. When the test is complete, Go To step 1.

***AIRBAG SYSTEM VERIFICATION TEST - VER 1**

DIAGNOSTIC TEST

1. *AIRBAG SYSTEM VERIFICATION TEST - VER 1

1. Remove all special tools and jumper wires and reconnect all previously disconnected components - except the Battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

2. Connect the scan tool to the Data Link Connector - use the most current software available.
3. If sent here from an Occupant Classification System (OCS) related diagnostic procedure or if repairs were made to the OCS, perform the ***OCM SYSTEM VERIFICATION TEST** before proceeding.
4. With the scan tool, erase stored DTCs in all Airbag System Modules.
5. Turn the ignition off, and wait 30 seconds, then turn the ignition on.
6. Wait one minute, and read active DTCs in all Airbag System Modules.
7. Read the stored DTCs in all Airbag System Modules.

Are any DTCs present or if the original condition still present?

Yes

Repair is not complete. Select the appropriate diagnostic procedure from **DIAGNOSTIC CODE INDEX**.

No

Repair is complete.

***OCM SYSTEM VERIFICATION TEST**

DIAGNOSTIC TEST

1. PERFORM THE *OCM SYSTEM VERIFICATION TEST

NOTE: Ensure that the battery is fully charged.

NOTE: The Occupant Classification Seat Weights 9077 are required to perform this test.

Remove any special tools or jumper wires and reconnect all previously disconnected components - except the battery.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the

ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active: PASSENGER SEAT WEIGHT SENSOR DTCs?

Yes

Go To step 2.

No

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

2. PERFORM THE OCCUPANT CLASSIFICATION MODULE SYSTEM VERIFICATION TEST

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Verify that all of the Seat Weight Sensor mounting screws are tightened to specification. Refer to **SEAT WEIGHT SENSOR** for specification.

WARNING: To avoid serious or fatal injury, turn the ignition on, then reconnect the battery.

NOTE: Failure to follow the test instructions or aborting the test will cause faults to set when performing the Occupant Classification Module System Verification Test. To prevent faults due to process errors: verify that all tests steps that led you here were performed as directed; verify that the ignition is in run; Wait 30 seconds after changing the seat weight before proceeding to allow the system to stabilize; only press scan tool buttons when directed to do so; and perform the Occupant Classification Module System Verification Test to completion.

With the scan tool in OCM, select More Options, select System Tests, and select Occupant Classification Module System Verification Test. Run the test by following the instructions displayed on the scan tool. When the test is complete, wait two minutes, and then proceed as follows.

With the scan tool, read OCM DTCs.

Does the scan tool display any active DTCs?

Yes

Diagnose and repair the DTCs.

Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1.**

2008 TRANSFER CASE

Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>C1403</u>	TRANSFER CASE RANGE POSITION SENSOR PERFORMANCE
<u>C1404</u>	TRANSFER CASE RANGE POSITION SENSOR CIRCUIT LOW
<u>C1405</u>	TRANSFER CASE RANGE POSITION SENSOR CIRCUIT HIGH
<u>C1406</u>	TRANSFER CASE BRAKE PERFORMANCE
<u>C1407</u>	TRANSFER CASE BRAKE CONTROL CIRCUIT LOW
<u>C1408</u>	TRANSFER CASE BRAKE CONTROL CIRCUIT HIGH
<u>C140A</u>	TRANSFER CASE MOTOR PERFORMANCE
<u>C140D</u>	TRANSFER CASE MOTOR CONTROL CIRCUIT OPEN
<u>C140E</u>	TRANSFER CASE MOTOR BLOCKED
<u>C140F</u>	TRANSFER CASE RANGE POSITION SENSOR ERRATIC PERFORMANCE
<u>C1415</u>	TRANSFER CASE MOTOR "CURRENT" PERFORMANCE
<u>C1438</u>	TRANSFER CASE DIFFERENTIAL CLUTCH WORN
<u>C1444</u>	TRANSFER CASE MOTOR OVERUSE
<u>C1472</u>	TRANSFER CASE CLUTCH CONTROL CIRCUIT PERFORMANCE
<u>C1476</u>	TRANSFER CASE CLUTCH POSITION OUT OF RANGE
<u>C1477</u>	TRANSFER CASE CLUTCH OVERTEMPERATURE
<u>C2100</u>	BATTERY VOLTAGE LOW (FDCM)
<u>C2101</u>	BATTERY VOLTAGE HIGH (FDCM)
<u>C2111</u>	SENSOR SUPPLY 1 VOLTAGE CIRCUIT LOW (FDCM)
<u>C2112</u>	SENSOR SUPPLY 1 VOLTAGE CIRCUIT HIGH (FDCM)
<u>C2201</u>	INTERNAL CONTROLLER (FDCM)
<u>C2206</u>	VEHICLE CONFIGURATION MISMATCH
<u>U0001</u>	CAN C BUS
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0141</u>	LOST COMMUNICATION WITH FCM
<u>U0212</u>	LOST COMMUNICATION WITH SCM (SAS)
<u>U0401</u>	IMPLAUSIBLE DATA RECEIVED FROM ECM (FDCM)
<u>U0402</u>	IMPLAUSIBLE DATA RECEIVED FROM TCM (FDCM)
<u>U0415</u>	IMPLAUSIBLE DATA RECEIVED FROM ABS (FDCM)
<u>U0429</u>	IMPLAUSIBLE DATA RECEIVED FROM SCM (FDCM)
<u>U0431</u>	IMPLAUSIBLE DATA RECEIVED FROM FCM (FDCM)

TRANSFER CASE - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

C1403-TRANSFER CASE RANGE POSITION SENSOR PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

Ignition on. Battery voltage between 9 and 16 volts. No Range Position Sensor low or high voltage conditions present.

Set Conditions

- **Set Condition:**

During a blocked shift attempt, motor current indicates motor movement, but the sensor value change is less than a specified value.

Possible Causes

Possible Causes
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE OR OPEN
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT FOR VOLTAGE
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT FOR VOLTAGE
TRANSFER CASE MOTOR MODE SENSOR
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **DTC IS ACTIVE**

NOTE: If DTCs C1403 and C1407 are both present, refer to the diagnostics for C1407 before continuing with this procedure.

Ignition on, engine not running.

NOTE: Repair any system undervoltage or overvoltage DTCs that are set in this module before proceeding.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 5.

2. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE OR OPEN

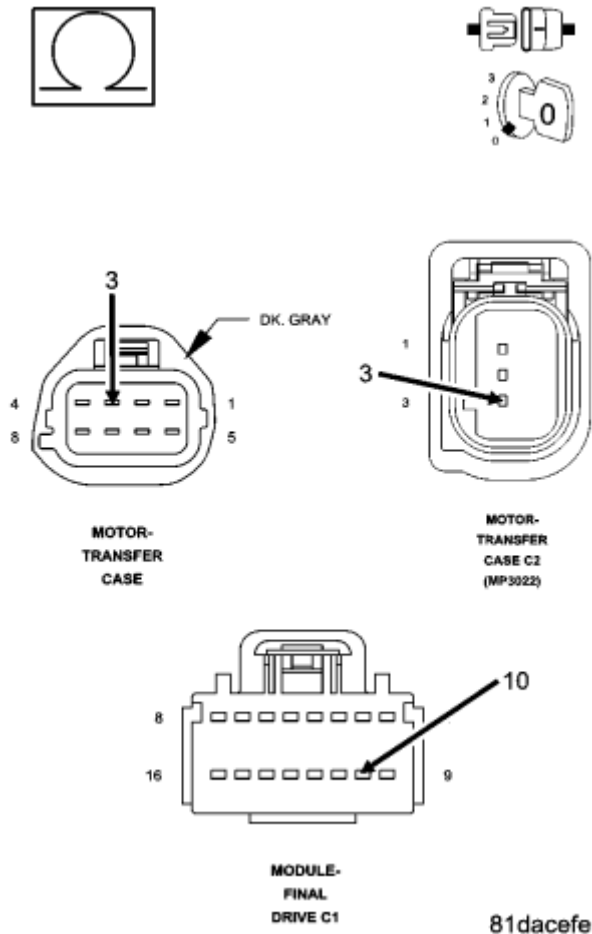


Fig. 2: Measuring The Resistance Of The (K594) Drivetrain Sensor Return Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C1 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the FDCM C1 harness connector.

Measure the resistance of the (K594) Drivetrain Sensor Return circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Is the resistance above 5.0 ohms?

Yes

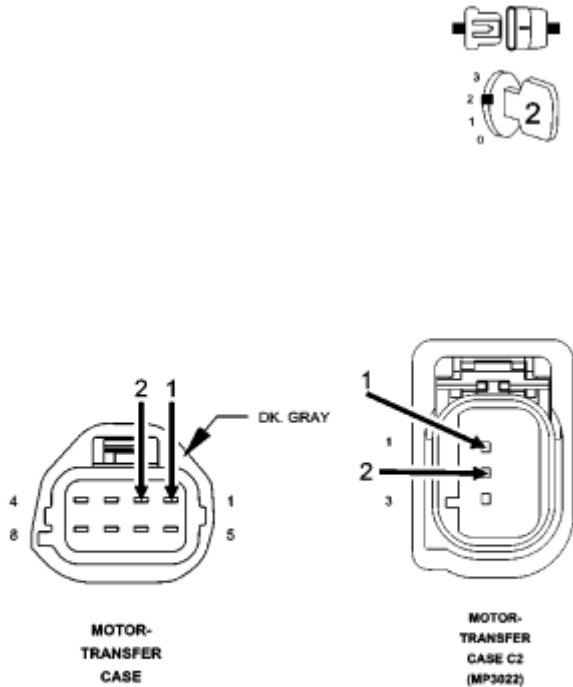
Repair the high resistance or open in the (K594) Drivetrain Sensor Return circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT FOR VOLTAGE



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Fig. 3: Checking Drivetrain 5 Volt Supply Circuit For Voltage
Courtesy of CHRYSLER LLC

Reconnect the FDCM C1 harness connector.

Connect a jumper wire between the (T313) Mode Sensor Signal circuit and the (K504) Drivetrain Sensor Return circuit at the Transfer Case Motor harness connector.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage.

The displayed voltage should be between 4.5 volts and 5.5 volts with the jumper wire in place.

Does the voltage display as described?

Yes

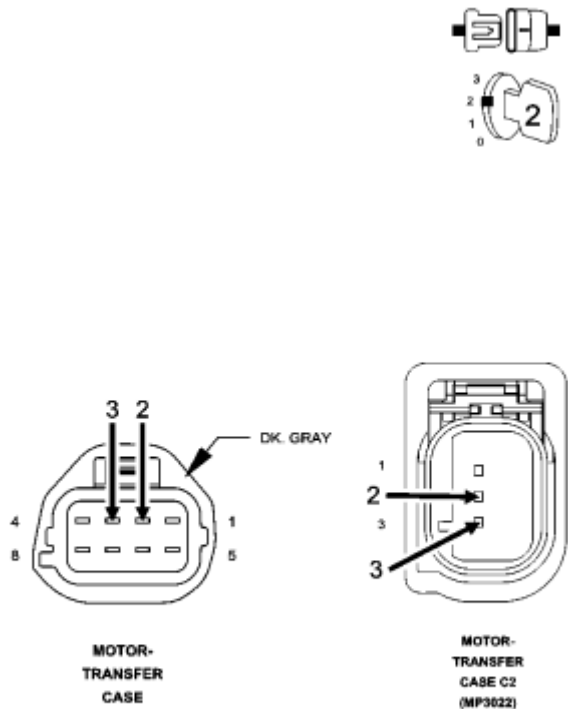
Go to 4.

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT FOR VOLTAGE



81dacf9c

Fig. 4: Checking Drivetrain Sensor Return Circuit For Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Connect a jumper wire between the (T313) Mode Sensor Signal circuit and the (K594) Drivetrain Sensor Return circuit at the Transfer Case Motor harness connector.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage.

The displayed voltage should be between 0.0 volts and 0.4 volts with the jumper wire in place.

Does the voltage display as described?

Yes

Replace the Transfer Case Motor Mode Sensor in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

While monitoring the scan tool data relative to this circuit, move the selector switch to each position several times.

Look for the data to change other than as expected or for the DTC to reset.

Were any problems found?

Yes

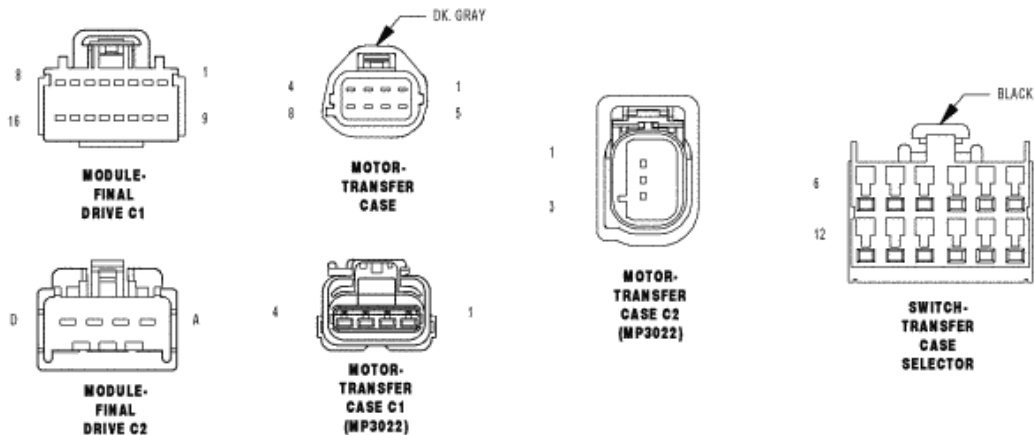
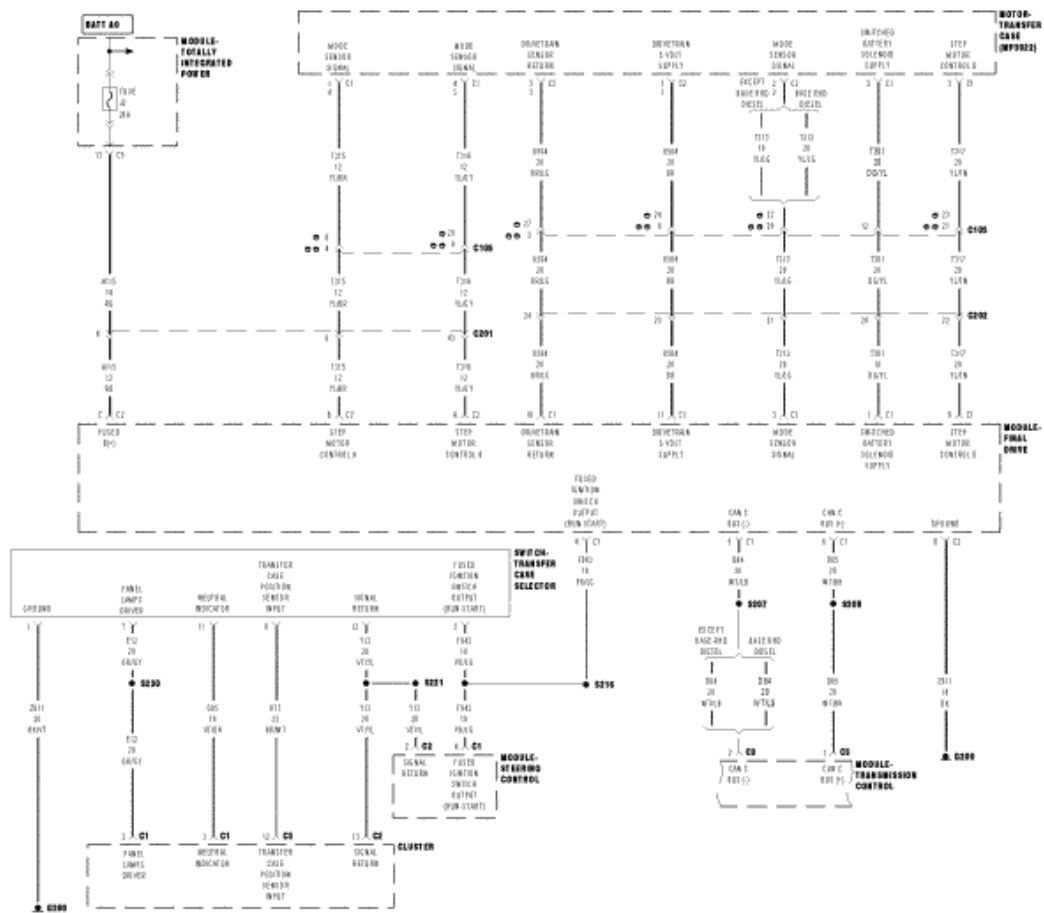
Repair as necessary.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1404-TRANSFER CASE RANGE POSITION SENSOR CIRCUIT LOW

Circuit Schematic



01410000

Fig. 5: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage or supply voltage low conditions present.

Set Conditions

- **Set Condition:**

Sensor input voltage is below a specified value for a calibrated amount of time.

Possible Causes

Possible Causes
INTERMITTENT TRANSFER CASE RANGE POSITION SENSOR CIRCUIT LOW (K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT OPEN (K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE (T313) MODE SENSOR SIGNAL CIRCUIT OPEN (T313) MODE SENSOR SIGNAL CIRCUIT SHORTED TO GROUND TRANSFER CASE MOTOR MODE SENSOR FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **T-CASE POSITION SENSOR VOLTAGE BELOW 0.4 VOLTS**

NOTE: If DTCs C1404 and C2112 are both present, refer to the diagnostics procedure for C2112 before continuing.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage in the Final Drive Control Module.

Is the voltage below 0.4 volts?

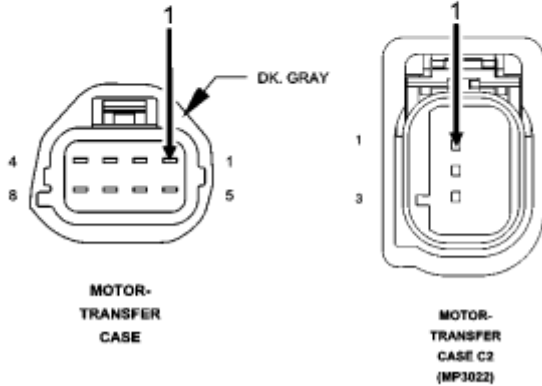
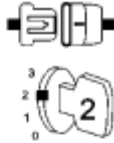
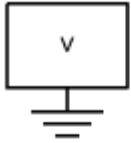
Yes

Go to 2.

No

Go to 8.

2. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT FOR VOLTAGE**



81dad0fe

Fig. 6: Measuring The Voltage Of The (K504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Ignition on, engine not running.

Measure the voltage of the (K504) Drivetrain 5-volt Supply circuit at the Transfer Case Motor harness connector.

Choose an answer that matches the voltage measured?

Below 4.5 volts

Go to 3.

Above 5.5 volts

Go to 4.

Between 4.5 volts and 5.5 volts

Go to 5.

3. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**

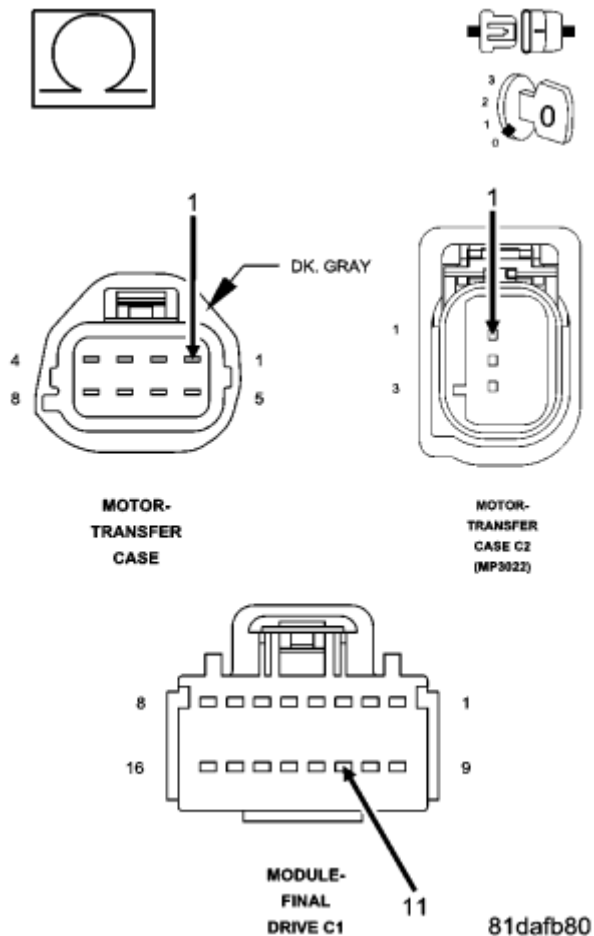


Fig. 7: Measuring The Resistance Of The (K504) Drivetrain 5-Volt Supply Circuit Between The FDCM C1 And The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the FDCM C1 harness connector.

Measure the resistance of the (K504) Drivetrain 5-volt Supply circuit between the FDCM C1 and the Transfer Case Motor harness connector.

Is the resistance above 5.0 ohms?

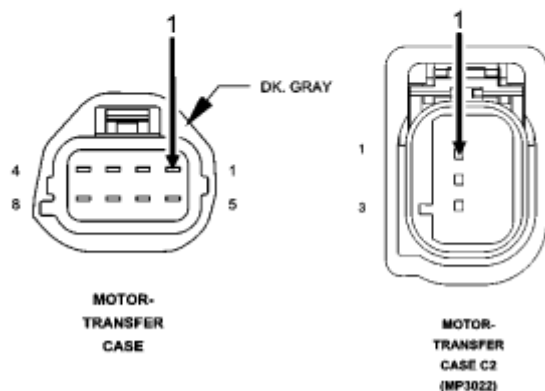
Yes

Repair the (K504) Drivetrain 5-volt Supply circuit for an open or high resistance.

No

Go to 4.

4. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**



81dad0fe

Fig. 8: Measuring The Voltage Of The (K504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the voltage of the (K504) Drivetrain 5-volt Supply circuit at the Transfer Case Motor harness connector.

Is the voltage above 5.5 volts?

Yes

Repair the (K504) Drivetrain 5-volt Supply circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (T313) MODE SENSOR SIGNAL CIRCUIT SHORTED TO GROUND

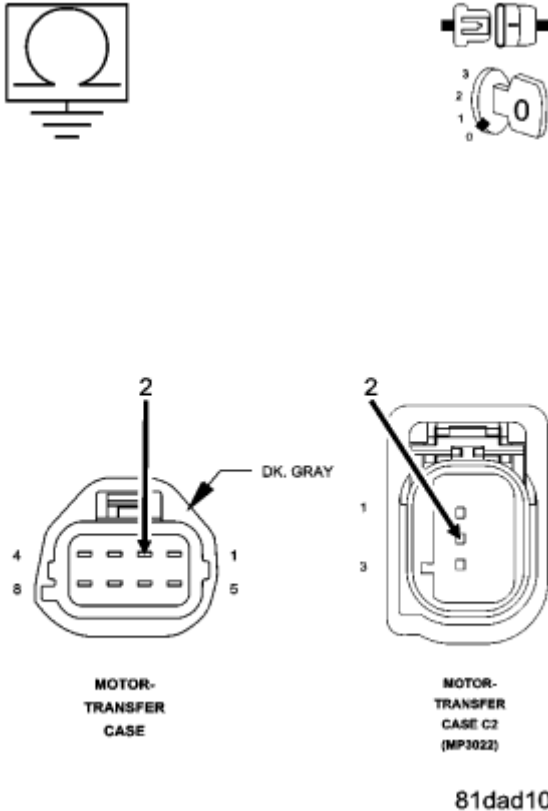


Fig. 9: Measuring The Resistance Between Ground And The (T313) Mode Sensor Signal Circuit At The Transfer Case Motor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance between ground and the (T313) Mode Sensor Signal circuit at the Transfer Case Motor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (T313) Mode Sensor Signal circuit for a short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 6.

6. (T313) MODE SENSOR SIGNAL CIRCUIT OPEN

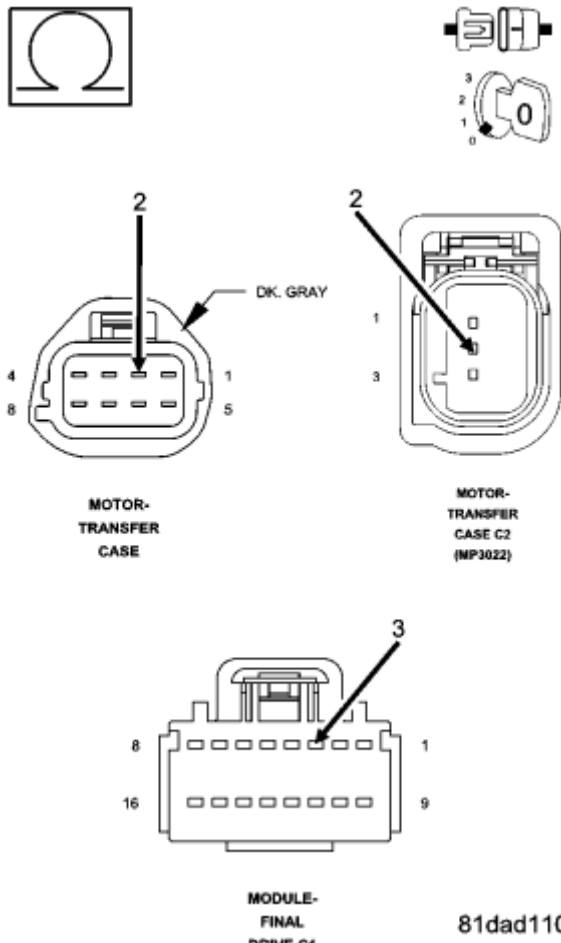


Fig. 10: Measuring The Resistance Of The (T313) Mode Sensor Signal Circuit Between The Final Drive Control Module C1 Harness Connector And The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (T313) Mode Sensor Signal circuit between the Final Drive Control Module C1 harness connector and the Transfer Case Motor harness connector.

Is the resistance above 5.0 ohms?

Yes

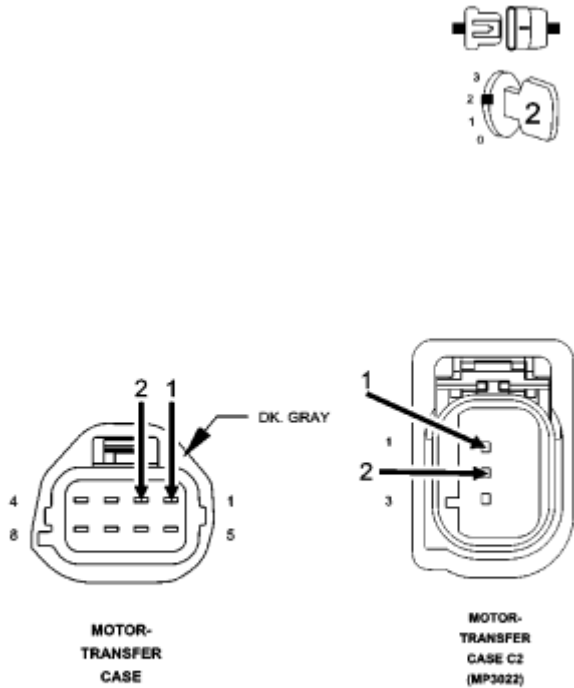
Repair the (T313) Mode Sensor Signal circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 7.

7. TRANSFER CASE MOTOR MODE SENSOR



81dacf97

Fig. 11: Checking Drivetrain 5 Volt Supply Circuit For Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Reconnect the Final Drive Control Module C1 harness connector.

Connect a jumper wire between the (T313) Mode Sensor Signal circuit and the (K504) Drivetrain 5 volt supply circuit at the Transfer Case Motor harness connector.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage in the FDCM.

The displayed voltage should be between 4.5 volts and 5.5 volts with the jumper wire in place.

Does the voltage display as described?

Yes

Replace the Transfer Case Motor Mode Sensor in accordance with the Service Information.
 Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

8. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1405-TRANSFER CASE RANGE POSITION SENSOR CIRCUIT HIGH

Circuit Schematic

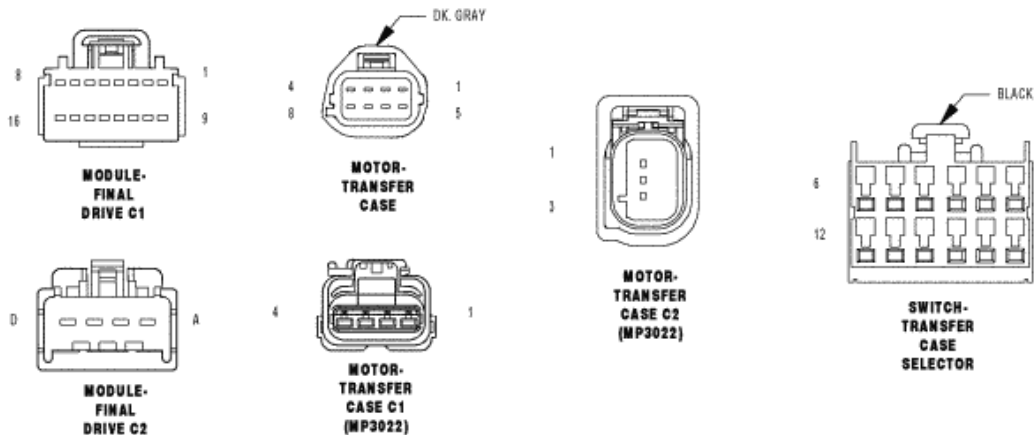
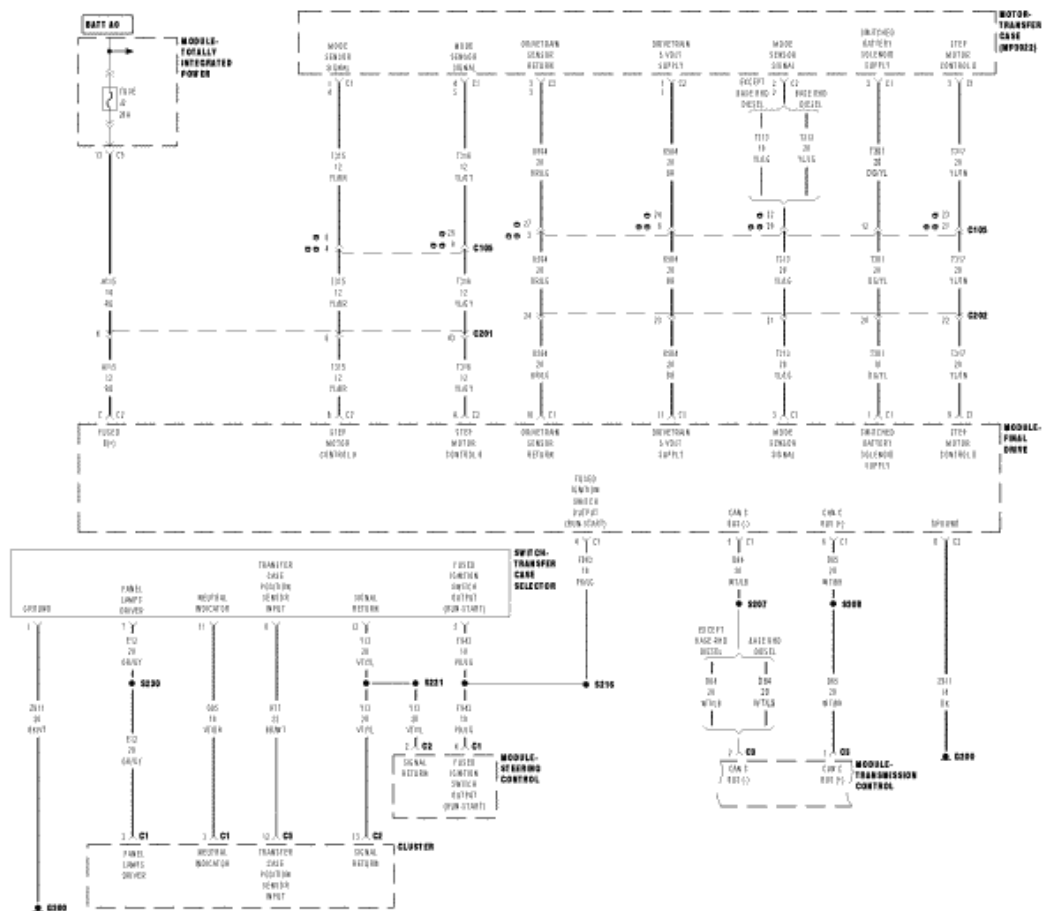


Fig. 12: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The sensor voltage is above a specified value for a calibrated amount of time.

Possible Causes

Possible Causes
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE
(T313) MODE SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT OPEN
TRANSFER CASE MOTOR/ENCODER
FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **T-CASE POSITION SENSOR VOLTAGE ABOVE 4.8 VOLTS**

NOTE: If DTCs C1405 and C2112 are both present, refer to the diagnostics procedure for C2112 before continuing.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage in the Final Drive Control Module.

Is the voltage above 4.8 volts?

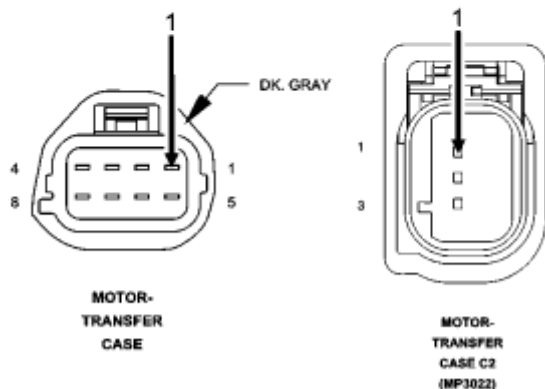
Yes

Go To 2.

No

Go to 6.

2. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**



81dad0fe

Fig. 13: Measuring The Voltage Of The (K504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Ignition on, engine not running.

Measure the voltage of the (K504) Drivetrain 5 Volt Supply circuit at the Transfer Case Motor harness connector.

Is the voltage above 5.5 volts?

Yes

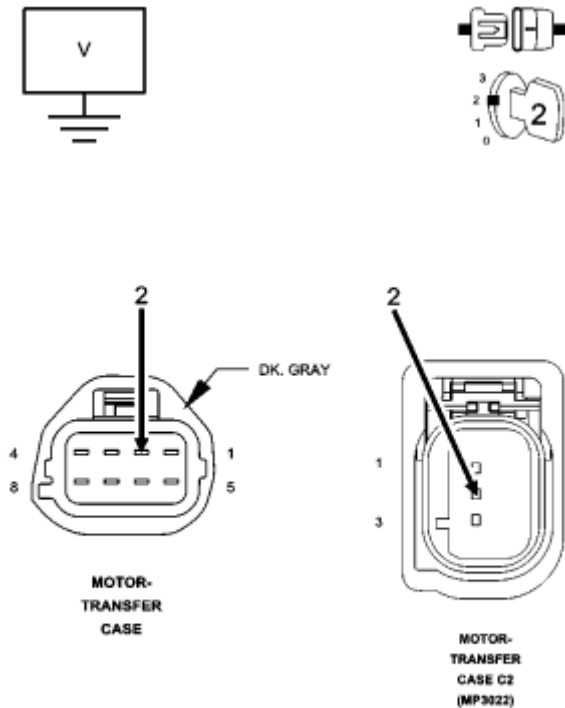
Repair the (K504) Drivetrain 5 Volt Supply circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T313) MODE SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE



81dad2e2

Fig. 14: Measuring The Voltage Of The (T313) Mode Sensor Signal Circuit At The Transfer Case Motor Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage of the (T313) Mode Sensor Signal circuit at the Transfer Case Motor harness connector.

Is the voltage above 5.5 volts?

Yes

Repair the (T313) Mode Sensor Signal circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT OPEN

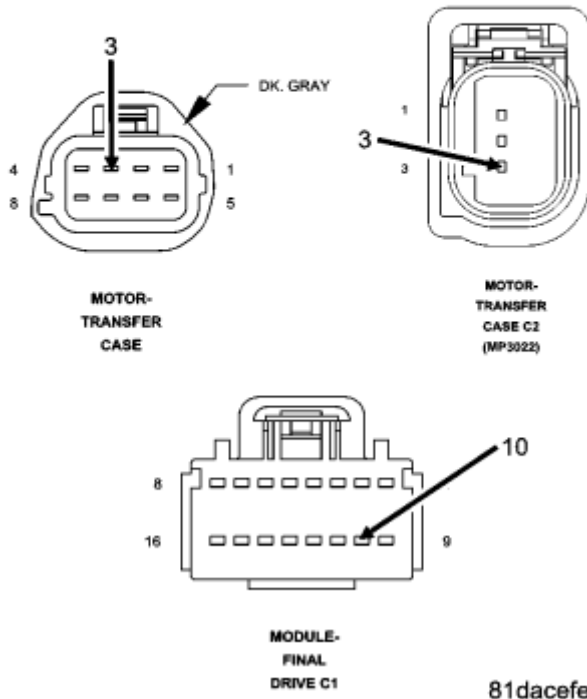


Fig. 15: Measuring The Resistance Of The (K594) Drivetrain Sensor Return Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (K594) Drivetrain Sensor Return circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

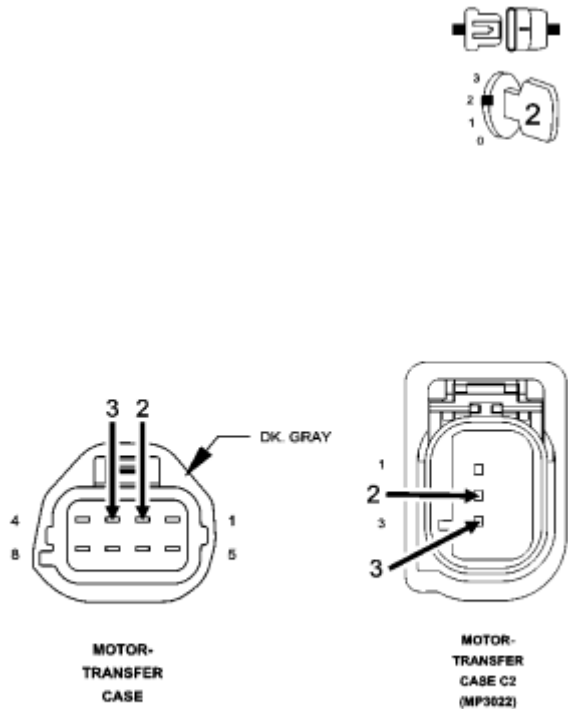
Repair the (K594) Drivetrain Sensor Return circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to step 5.

5. TRANSFER CASE MOTOR/ENCODER



81dacf9c

Fig. 16: Checking Drivetrain Sensor Return Circuit For Voltage
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Connect a jumper wire between the (K594) Drivetrain Sensor Return circuit and the (T313) Mode Sensor Signal circuit in the Transfer Case Motor harness connector.

Ignition on, engine not running.

With the scan tool, read the T-Case Position Sensor voltage in the Final Drive Control Module.

NOTE: Remove the jumper wire before continuing.

Is the voltage below 0.2 volts?

Yes

Replace the Transfer Case Motor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Transfer Case Motor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1406-TRANSFER CASE BRAKE PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**
 1. The Control Module detects an excessive voltage variation on the Mode Sensor Signal circuit.
 2. The Control Module performs an error correction procedure too frequently.

Possible Causes

Possible Causes
(T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT VOLTAGE TRANSFER CASE MOTOR ASSEMBLY FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

Start the engine and allow it to idle.

Move the Transfer Case Selector Switch to each position several times.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

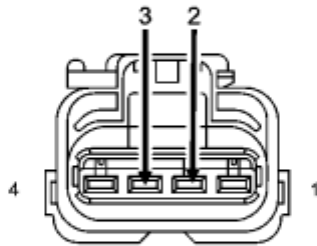
Yes

Go to 2.

No

Go to 3.

2. **(T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT VOLTAGE**



**MOTOR-
TRANSFER
CASE
(MP3022)**

81dad35d

Fig. 18: Checking Switched Battery Solenoid Supply Circuit Voltage
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using a 12-volt test light, jumper the (T301) Switched Battery Solenoid Supply circuit to the (T317) Transfer Case Motor Lock Signal in the Transfer Case Motor harness connector.

NOTE: As a fail-safe precaution when the Transfer Case Motor harness connectors are disconnected, the DTCs must be cleared in the FDCM. Failure to follow this will result in the FDCM detecting this condition and turning OFF the Switched Battery Solenoid Supply circuit.

Using the scan tool, clear the DTCs in the FDCM.

With the scan tool, actuate the T-Case Motor Solenoid Lock in the Final Drive Control Module.

NOTE: Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Replace the Transfer Case Motor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1407-TRANSFER CASE BRAKE CONTROL CIRCUIT LOW

Circuit Schematic

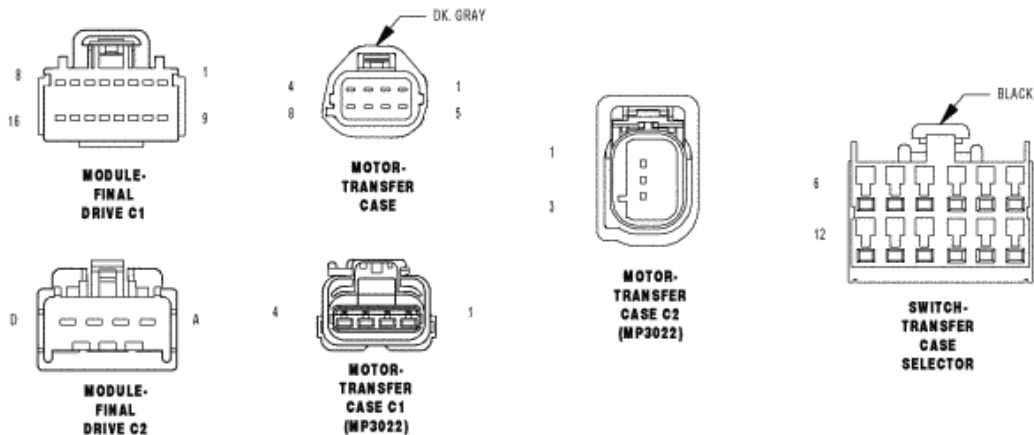
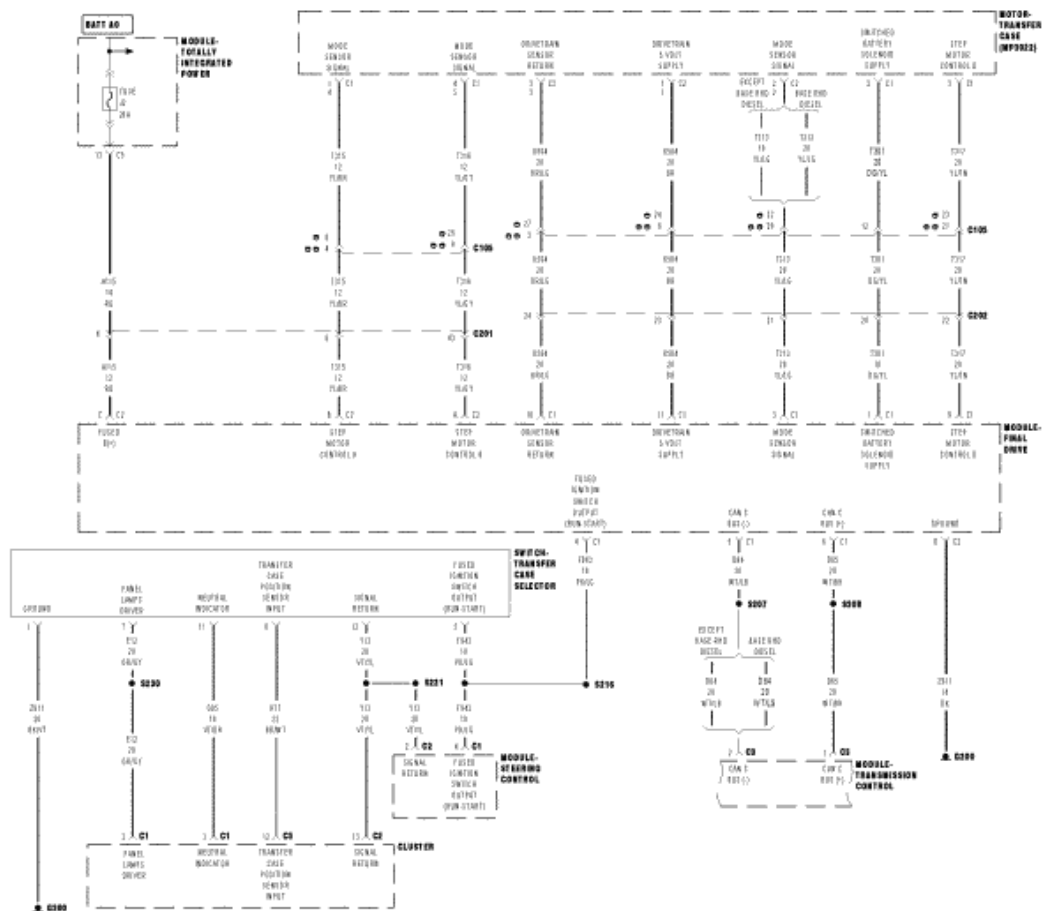


Fig. 19: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that the Transfer Case Motor Lock circuit diagnostic input is low when output is off.

Possible Causes

Possible Causes
(T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT SHORTED TO GROUND (T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT VOLTAGE TRANSFER CASE MOTOR ASSEMBLY FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

Start the engine and allow it to idle.

Move the Transfer Case Selector Switch to each position several times.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

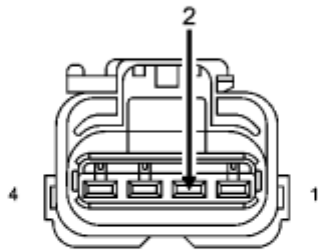
Yes

Go to 2.

No

Go to 4.

2. **(T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT SHORTED TO GROUND**



**MOTOR-
TRANSFER
CASE
(MP3022)**

81dad455

Fig. 20: Measuring The Resistance Between Ground And The (T301) Switched Battery Solenoid Supply Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance between ground and the (T301) Switched Battery Solenoid Supply circuit.

Is the resistance below 5.0 ohms?

Yes

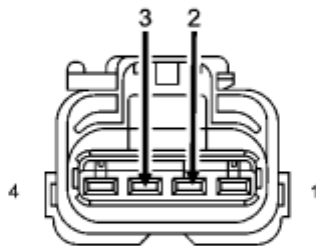
Repair the (T301) Switched Battery Solenoid Supply circuit for a short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T301) SWITCHED BATTERY SOLENOID SUPPLY VOLTAGE



**MOTOR-
TRANSFER
CASE
(MP3022)**

81dad35d

Fig. 21: Checking Switched Battery Solenoid Supply Circuit Voltage
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Using a 12-volt test light, jumper the (T301) Switched Battery Solenoid Supply circuit to the (T317) Transfer Case Motor Lock Signal in the Transfer Case Motor harness connector.

NOTE: As a fail-safe precaution when either the Transfer Case Motor harness connectors are disconnected, the DTCs must be cleared in the FDCM. Failure to follow this will result in the FDCM detecting this condition and turning OFF the Switched Battery Solenoid Supply circuit.

Using the scan tool, clear the DTCs in the FDCM.

With the scan tool, actuate the T-Case Motor Solenoid Lock in the Final Drive Control Module.

NOTE: Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Replace the Transfer Case Motor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1408-TRANSFER CASE BRAKE CONTROL CIRCUIT HIGH

Circuit Schematic

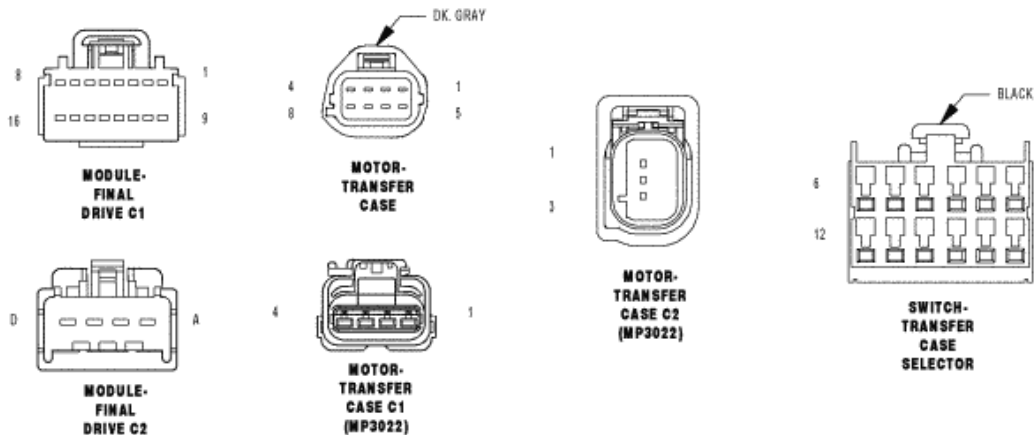
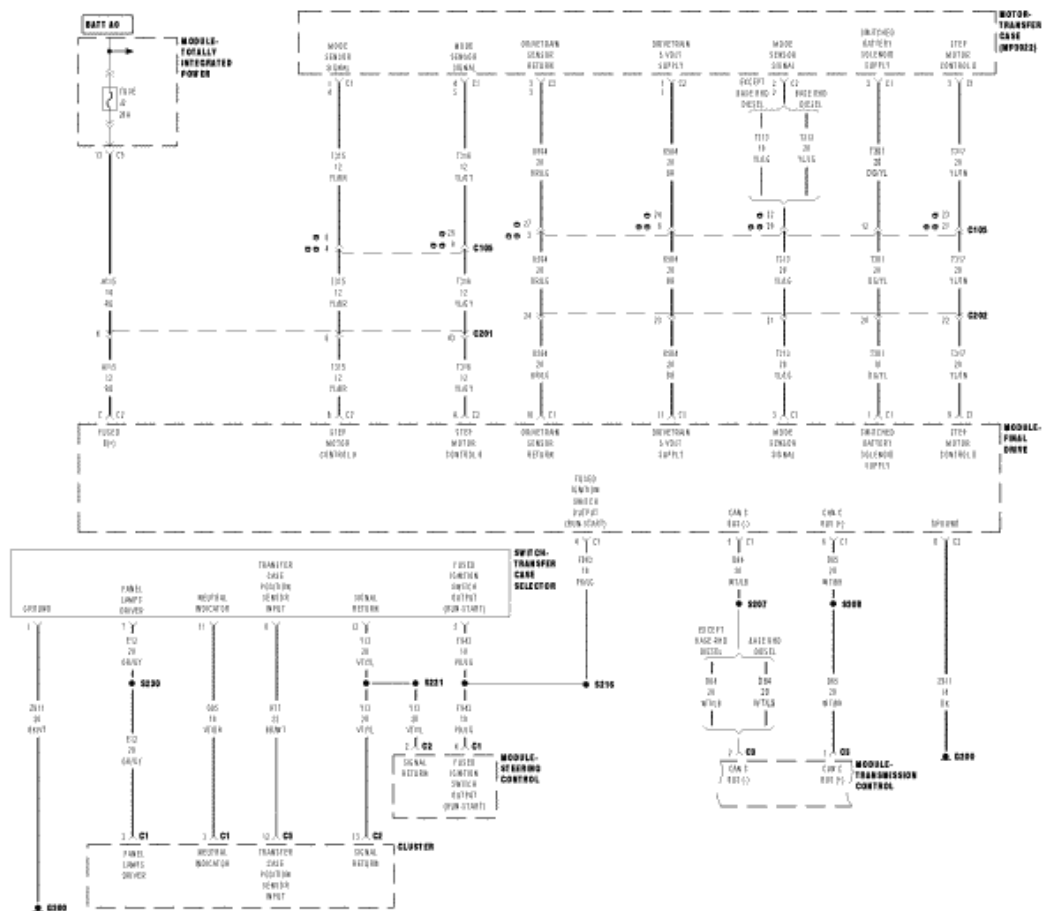


Fig. 22: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that the Transfer Case Motor Lock Circuit diagnostic input is high when the output is on.

Possible Causes

Possible Causes
(T301) TRANSFER CASE MOTOR LOCK SIGNAL CIRCUIT OPEN (T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT SHORT TO VOLTAGE (T317) TRANSFER CASE MOTOR LOCK SIGNAL CIRCUIT OPEN TRANSFER CASE MOTOR ACTUATOR FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, clear DTCs in the Final Drive Control Module.

Move the Shift control to each position.

With the scan tool, read DTCs in the Final Drive Control Module.

Does the DTC reset?

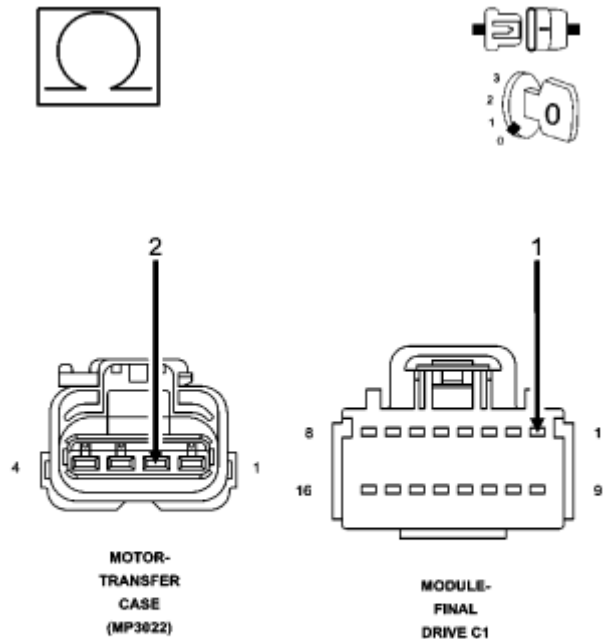
Yes

Go to 2.

No

Go to 7.

2. **(T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT OPEN**



81dad21

Fig. 23: Measuring The Resistance Of The (T301) Switched Battery Solenoid Supply Circuit Between The Transfer Case Motor Harness Connector And The FDCM C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance of the (T301) Switched Battery Solenoid Supply circuit between the Transfer Case Motor harness connector and the FDCM C1 harness connector.

Is the resistance above 5.0 ohms?

Yes

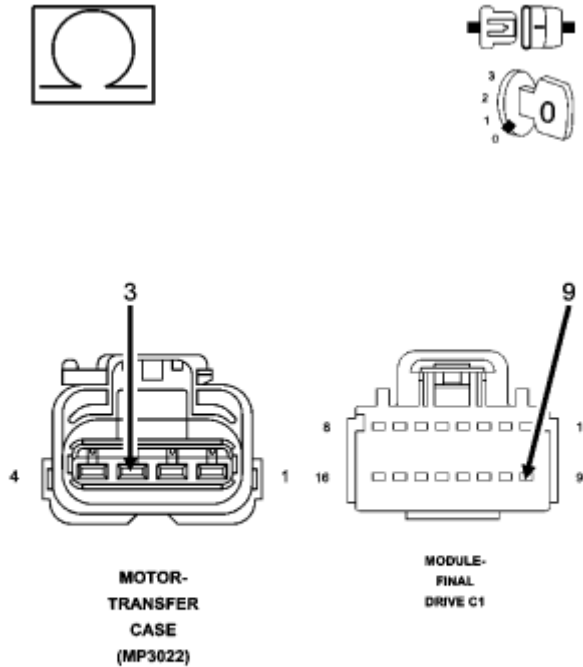
Repair the (T301) Switched Battery Solenoid Supply circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T317) TRANSFER CASE MOTOR LOCK SIGNAL CIRCUIT OPEN



81daddae

Fig. 24: Measuring The Resistance Of The (T317) Transfer Case Motor Lock Signal Circuit Between The Transfer Case Motor Harness Connector And The FDCM C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (T317) Transfer Case Motor Lock Signal circuit between the Transfer Case Motor harness connector and the FDCM C1 harness connector.

Is the resistance below 5.0 ohms?

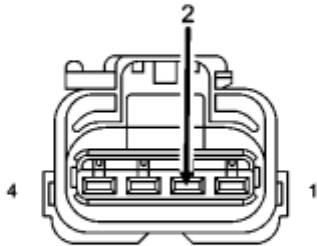
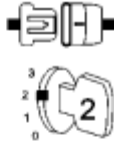
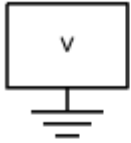
Yes

Repair the (T317) Transfer Case Motor Lock Signal circuit for an open.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (T301) SWITCHED BATTERY SOLENOID SUPPLY CIRCUIT SHORTED TO VOLTAGE



**MOTOR-
TRANSFER
CASE
(MP3022)**

81e2525a

Fig. 25: Measuring The Voltage Of The (T301) Switched Battery Solenoid Supply Circuit In The Transfer Case Motor Harness Connector

Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Measure the voltage of the (T301) Switched Battery Solenoid Supply circuit in the Transfer Case Motor harness connector.

Is any voltage present?

Yes

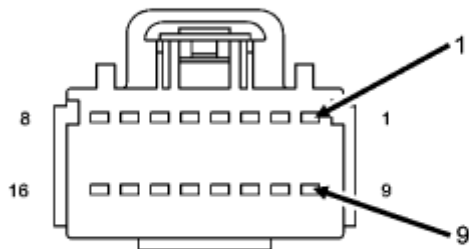
Repair the (T301) Switched Battery Solenoid Supply circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. TRANSFER CASE MOTOR



MODULE-
FINAL
DRIVE C1

81dc5558

Fig. 26: Measuring The Resistance Of The (T317) Transfer Case Motor Lock Signal Circuit And The (T301) Switched Battery Solenoid Supply In The FDCM C1 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Reconnect the Transfer Case Motor harness connector.

Measure the resistance of the (T317) Transfer Case Motor Lock Signal circuit and the (T301) Switched Battery Solenoid Supply in the FDCM C1 harness connector.

Is the resistance above 10.0 ohms?

Yes

Replace the Transfer Case Motor assembly in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to step 6.

6. FINAL DRIVE CONTROL MODULE (FDCM)

Reconnect the Final Drive Control Module C1 harness connector.

Ignition on, engine not running.

With the scan tool, clear the DTCs.

With the scan tool, read the DTCs in the Final Drive Control Module.

Does the DTC P1408-Transfer Case Brake Control Circuit High set?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 7.

7. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C140A-TRANSFER CASE MOTOR PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

A faulted condition is detected in the H-bridge driver.

Possible Causes

Possible Causes
(T315) SHIFT MOTOR CONTROL A CIRCUIT SHORTED TO GROUND
(T316) SHIFT MOTOR CONTROL B CIRCUIT SHORTED TO GROUND
(T315) SHIFT MOTOR CONTROL A CIRCUIT SHORTED TO (T316) SHIFT MOTOR CONTROL B CIRCUIT
TRANSFER CASE MOTOR
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **CHECK DTC CONDITIONS**

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is C140a active?

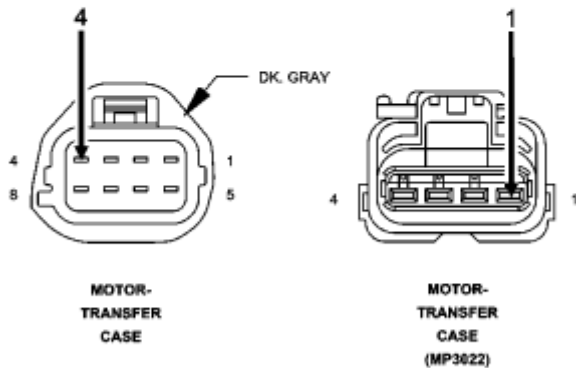
Yes

Go to 2.

No

Go to 5.

2. **(T315) SHIFT MOTOR CONTROL A CIRCUIT SHORTED TO GROUND**



81dae9ef

Fig. 28: Measuring The Resistance Between Ground And The (T315) Shift Motor Control A Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Ignition on, engine not running.

Measure the resistance between ground and the (T315) Shift Motor Control A circuit at the Transfer Case Motor harness connector.

Is the resistance below 5.0 ohms?

Yes

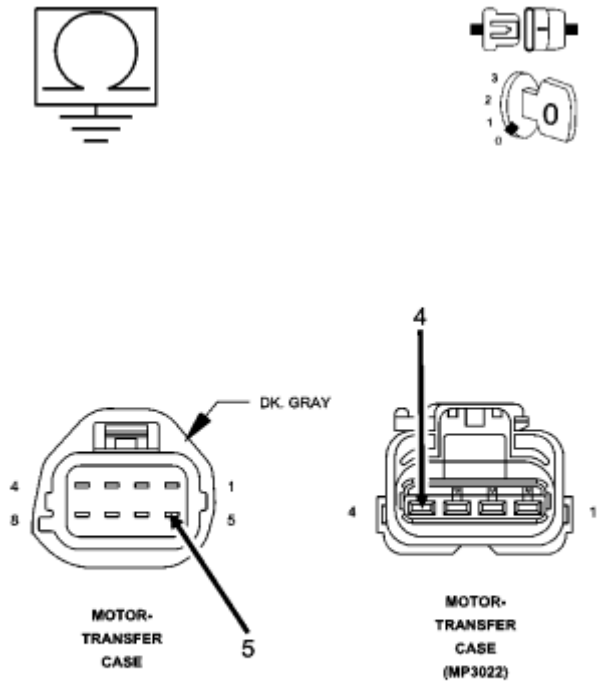
Repair the (T315) Shift Motor Control A circuit for a short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T316) SHIFT MOTOR CONTROL B CIRCUIT SHORTED TO GROUND



81dae9f3

Fig. 29: Measuring The Resistance Between Ground And The (T316) Shift Motor Control B Circuit At The Transfer Case Motor Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T316) Shift Motor Control B circuit at the Transfer Case Motor harness connector.

Is the resistance below 5.0 ohms?

Yes

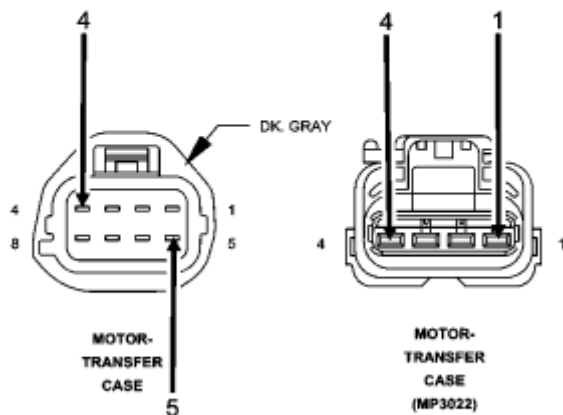
Repair the (T316) Shift Motor Control B circuit for a short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (T315) SHIFT MOTOR CONTROL A CIRCUIT SHORTED TO (T316) SHIFT MOTOR CONTROL B CIRCUIT



81dae9fb

Fig. 30: Measuring The Resistance Between The (T315) Shift Motor Control A Circuit And The (T316) Shift Motor Control B Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (T315) Shift Motor Control A circuit and the (T316) Shift Motor Control B circuit at the Transfer Case Motor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (T315) Shift Motor Control A circuit for a short to the (T316) Shift Motor Control B circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C140D-TRANSFER CASE MOTOR CONTROL CIRCUIT OPEN

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects an open circuit on one of the Transfer Case Shift Motor Control circuits.

Possible Causes

Possible Causes
(T315) SHIFT MOTOR CONTROL A CIRCUIT OPEN (T316) SHIFT MOTOR CONTROL B CIRCUIT OPEN (T315) SHIFT MOTOR CONTROL A CIRCUIT SHORTED TO VOLTAGE (T316) SHIFT MOTOR CONTROL B CIRCUIT SHORTED TO VOLTAGE TRANSFER CASE MOTOR FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Go to 2.

No

Go to 7.

2. **(T315) SHIFT MOTOR CONTROL A CIRCUIT OPEN**

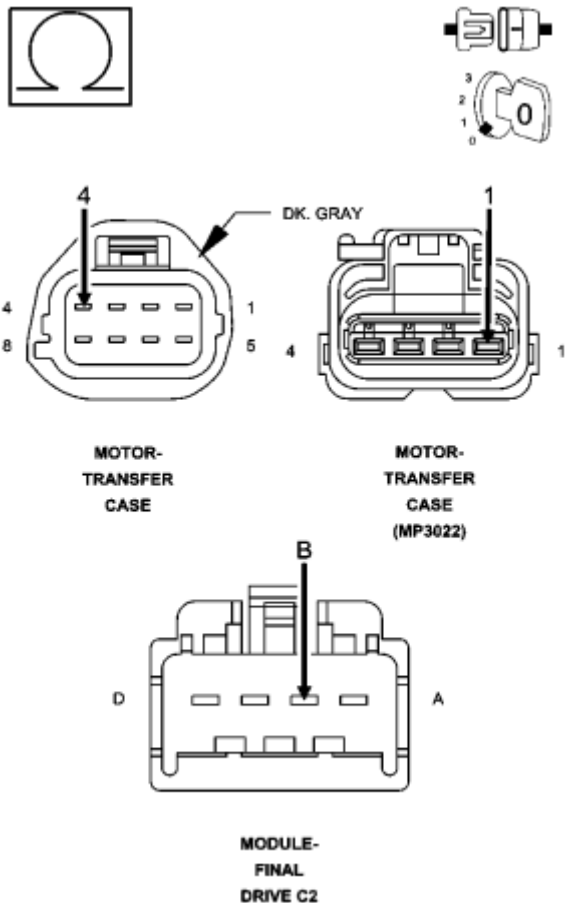


Fig. 32: Measuring The Resistance Of The (T315) Shift Motor Control A Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance of the (T315) Shift Motor Control A circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the (T315) Shift Motor Control A circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T316) SHIFT MOTOR CONTROL B CIRCUIT OPEN

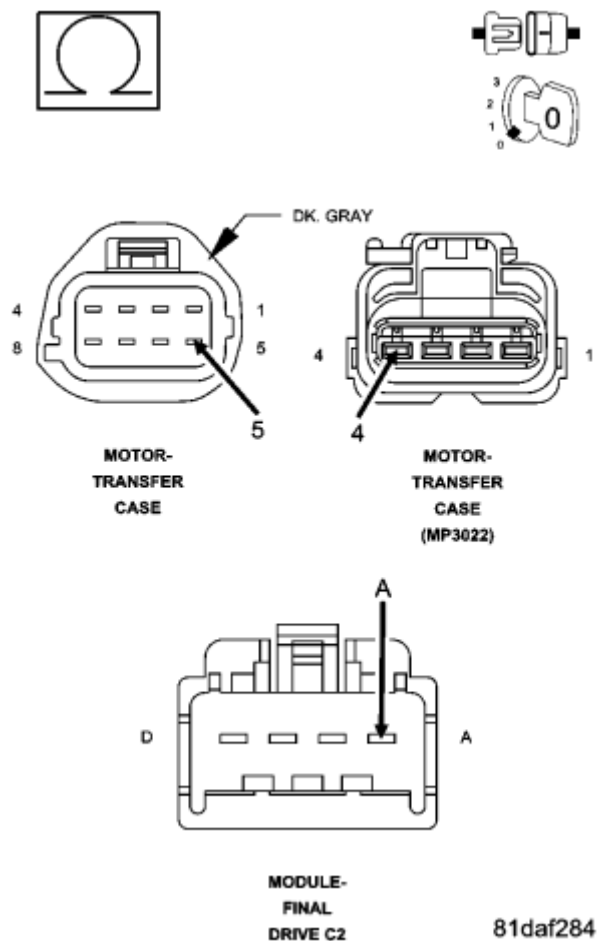


Fig. 33: Measuring The Resistance Of The (T316) Shift Motor Control B Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (T316) Shift Motor Control B circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

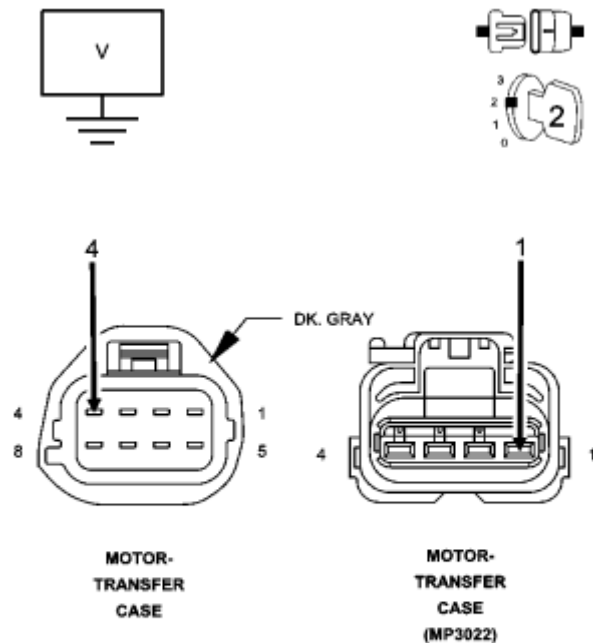
Repair the (T316) Shift Motor Control B circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (T315) SHIFT MOTOR CONTROL A CIRCUIT VOLTAGE



81daf288

Fig. 34: Measuring The Voltage Of The (T315) Shift Motor Control A Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Ignition on, engine not running.

Measure the voltage of the (T315) Shift Motor Control A circuit at the Transfer Case Motor harness connector.

Is the voltage above 0.5 volts?

Yes

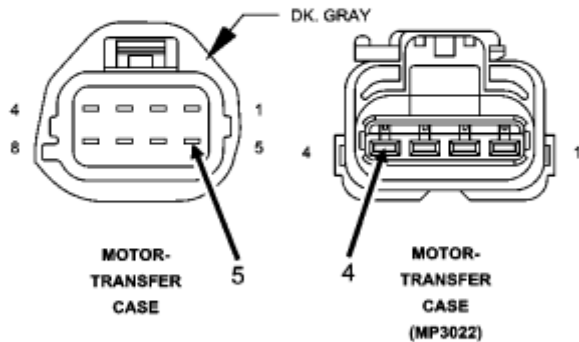
Repair the (T315) Shift Motor Control A circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. **(T316) SHIFT MOTOR CONTROL B CIRCUIT VOLTAGE**



81daf28f

Fig. 35: Measuring The Voltage Of The (T316) Shift Motor Control B Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the voltage of the (T316) Shift Motor Control B circuit at the Transfer Case Motor harness connector.

Is the voltage above 0.5 volts?

Yes

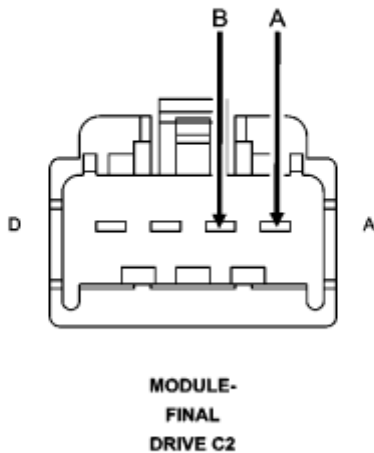
Repair the (T316) Shift Motor Control B circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 6.

6. **TRANSFER CASE MOTOR**



81daea03

Fig. 36: Measuring The Resistance Between The (T315) Shift Motor Control A Circuit And The (T316) Shift Motor Control B Circuit At The Final Drive Control Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Reconnect the Transfer Case Motor harness connector.

Measure the resistance between the (T315) Shift Motor Control A circuit and the (T316) Shift Motor Control B circuit at the Final Drive Control Module C2 harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the shorted Transfer Case Motor in accordance with the Service Information.
Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

7. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C140E-TRANSFER CASE MOTOR BLOCKED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is unable to engage the requested range.

Possible Causes

Possible Causes
TRANSFER CASE INTERNAL CONDITION
TRANSFER CASE MOTOR
FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. DTC IS ACTIVE

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Go to 2.

No

Go to 4.

2. TRANSFER CASE INTERNAL CONDITION

Turn the ignition off to the lock position

Inspect the Transfer Case in accordance with the Service Information to determine if there are any mechanical conditions that are preventing the Shift Motor from engaging the requested range.

Are any mechanical conditions preventing the Shift Motor from engaging the requested range?

Yes

Repair or replace the Transfer Case in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. TRANSFER CASE MOTOR

Turn the ignition off to the lock position

Using the wiring diagram/schematic as a guide, inspect all wiring and connectors that pertain to this circuit.

If any problems are found, repair as necessary and retest.

If no other problems are found, replace the Transfer Case Motor in accordance with the Service Information.

Ignition on, engine not running.

Cycle the Transfer Case Selector Switch to each position several times during a test drive.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the DTC status Active?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C140F-TRANSFER CASE RANGE POSITION SENSOR ERRATIC PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects excessive voltage fluctuation on the Mode Sensor Signal circuit.

Possible Causes

Possible Causes
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORT TO VOLTAGE
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT HIGH RESISTANCE
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORT TO GROUND
(T313) MODE SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE
(T313) MODE SENSOR SIGNAL CIRCUIT HIGH RESISTANCE
(T313) MODE SENSOR SIGNAL CIRCUIT SHORT TO GROUND
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT SHORT TO VOLTAGE
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE
TRANSFER CASE MOTOR/ENCODER
FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

NOTE: This DTC sets when the Final Drive Control Module detects excessive voltage fluctuation on the Mode Sensor Signal circuit. Perform a thorough inspection of all wiring and connectors between the sensor and the control module.

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

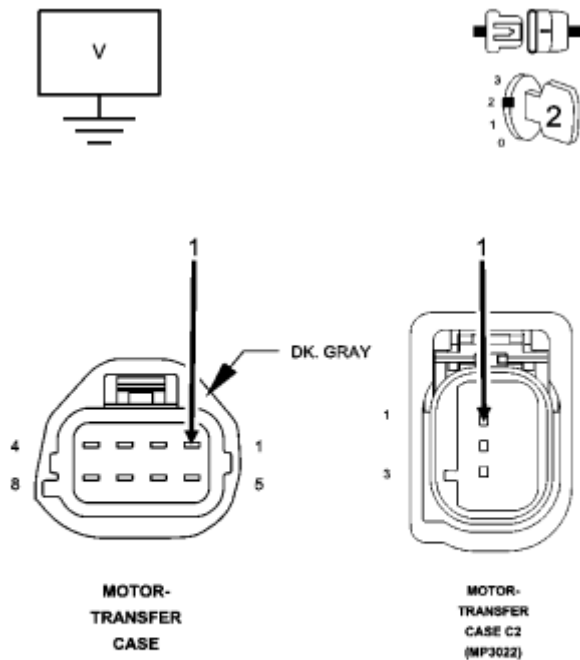
Yes

Go to 2.

No

Go to 14.

2. (T504) DRIVETRAIN 5 VOLT SUPPLY VOLTAGE ERRATIC



81dafb51

Fig. 38: Measuring The Voltage Of The (T504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

NOTE: This DTC sets when the Final Drive Control Module detects excessive voltage fluctuation on the Mode Sensor Signal circuit. Perform a thorough inspection of all wiring and connectors between the sensor and the control module.

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Ignition on, engine not running.

Measure the voltage of the (T504) Drivetrain 5-volt Supply circuit at the Transfer Case Motor harness connector.

NOTE: Voltage should be approximately 5.0 volts and steady. Compare any slight fluctuations found to a known good circuit in order to verify voltmeter

functionality.

Is the voltage approximately 5.0 volts and steady?

Yes

Go to 6.

No

Go to 3.

3. (T504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT INTERMITTENT SHORT TO VOLTAGE

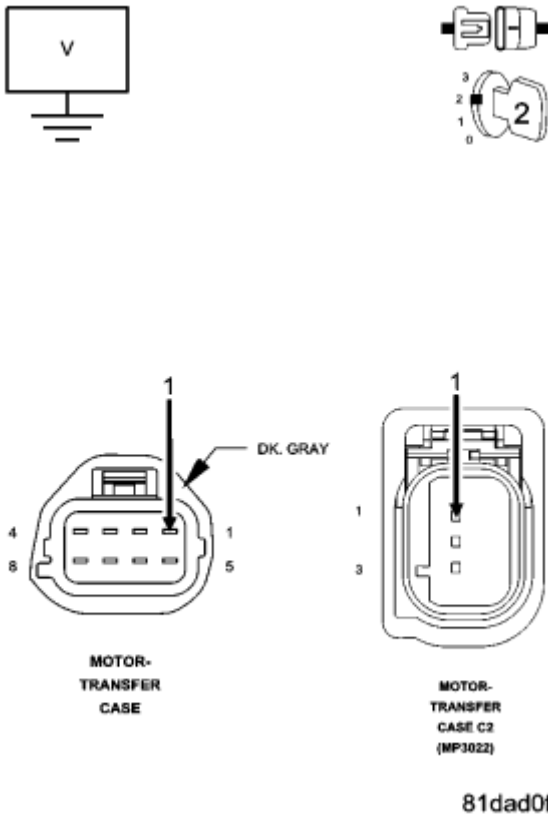


Fig. 39: Measuring The Voltage Of The (K504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Ignition on, engine not running.

Measure the voltage of the (T504) Drivetrain 5-volt Supply circuit at the Transfer Case Motor harness connector.

Monitor the voltmeter while performing a wiggle test on the wiring harness and connectors.

Is any voltage detected on the circuit during the wiggle test?

Yes

Repair the (T504) Drivetrain 5-volt Supply circuit for an intermittent short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (T504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT HIGH RESISTANCE

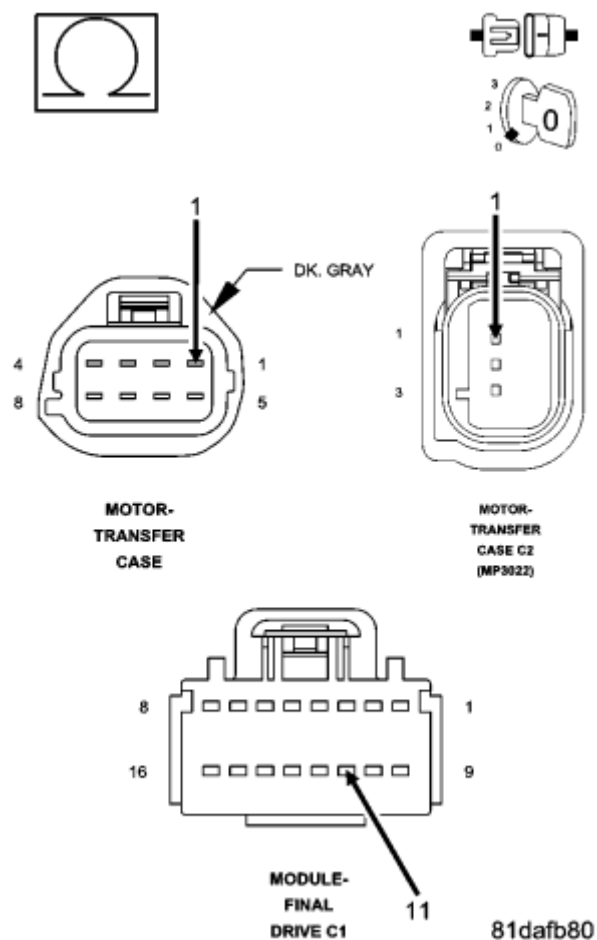


Fig. 40: Measuring The Resistance Of The (K504) Drivetrain 5-Volt Supply Circuit Between The FDCM C1 And The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (T504) Drivetrain 5-volt Supply circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Monitor the ohmmeter while performing a wiggle test on the wiring harness and connectors.

Is the resistance ever above 5.0 ohms during the wiggle test?

Yes

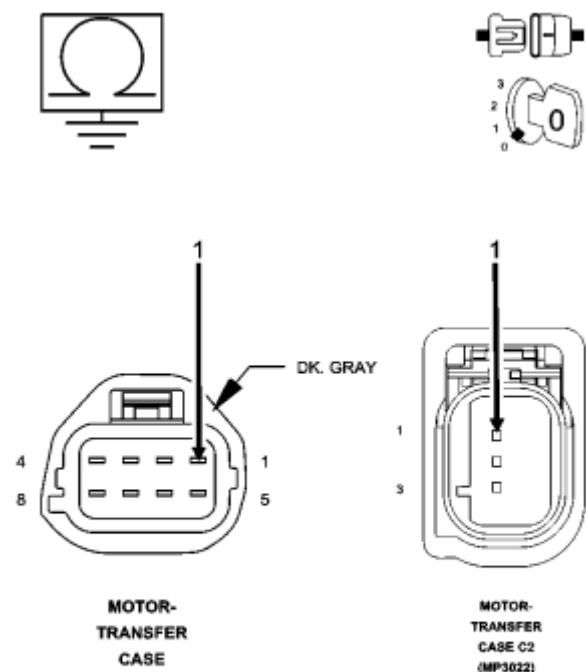
Repair the (T504) Drivetrain 5-volt Supply circuit for an intermittent open circuit or high resistance.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (T504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT INTERMITTENT SHORT TO GROUND



81dafb84

Fig. 41: Measuring The Resistance Between Ground And The (T504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T504) Drivetrain 5-volt Supply circuit at the Transfer

Case Motor harness connector.

Monitor the ohmmeter while performing a wiggle test on the wiring harness and connectors.

Is the resistance ever below 5.0 ohms during the wiggle test?

Yes

Repair the (T504) Drivetrain 5-volt Supply circuit for an intermittent short to ground.

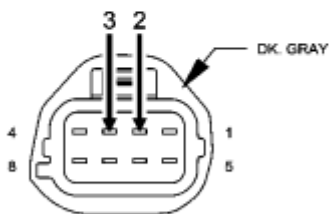
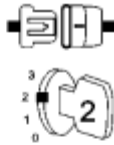
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

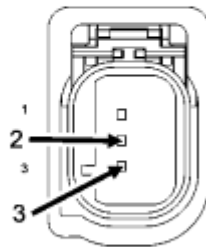
Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

6. T-CASE POSITION SENSOR VOLTAGE



MOTOR-
TRANSFER
CASE



MOTOR-
TRANSFER
CASE C2
(MP3022)

81dacf9c

Fig. 42: Checking Drivetrain Sensor Return Circuit For Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Reconnect the Final Drive Control Module C1 harness connector.

Connect a jumper wire between the (T313) Mode Sensor Signal circuit and the (K594) Drivetrain Sensor Return circuit in the Transfer Case Motor harness connector.

Ignition on, engine not running.

With the scan tool read the T-Case Position Sensor Voltage in the Final Drive Control Module while performing a wiggle test on the wiring and connectors between the sensor and the control module.

NOTE: Voltage should be approximately 0.0 volts and steady.

Is the T-Case Position Sensor Voltage approximately 0.0 volts and steady?

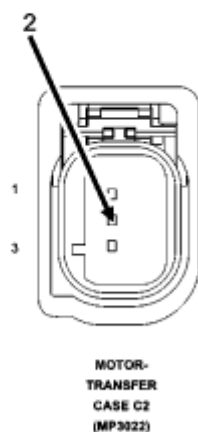
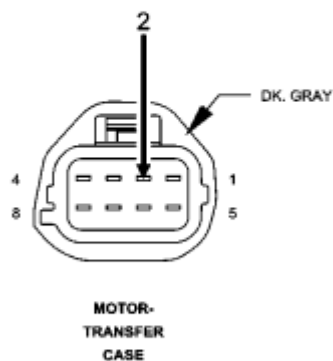
Yes

Go to 12.

No

Go to 7.

7. (T313) MODE SENSOR SIGNAL CIRCUIT INTERMITTENT SHORT TO VOLTAGE



81dad2e2

Fig. 43: Measuring The Voltage Of The (T313) Mode Sensor Signal Circuit At The Transfer Case Motor Harness Connector

Courtesy of CHRYSLER LLC

NOTE: Remove the previously installed jumper wire.

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Ignition on, engine not running.

Measure the voltage of the (T313) Mode Sensor Signal circuit at the Transfer Case Motor harness connector.

Monitor the voltmeter while performing a wiggle test on the wiring harness and connectors.

Is any voltage detected on the circuit during the wiggle test?

Yes

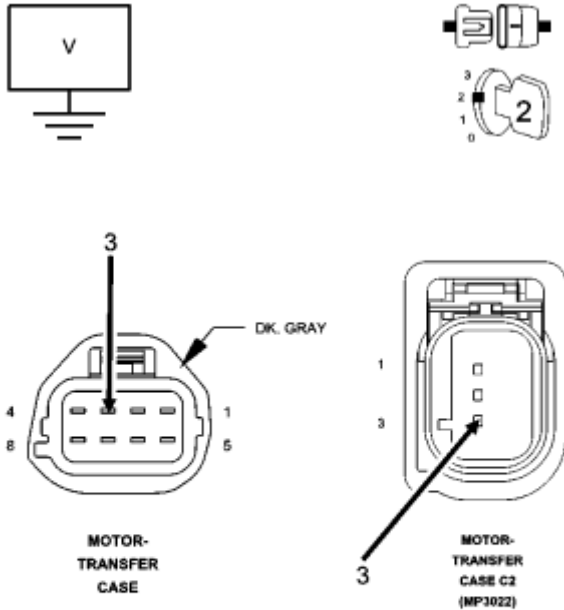
Repair the (T313) Mode Sensor Signal circuit for an intermittent short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 8.

8. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT INTERMITTENT SHORT TO VOLTAGE



81dafc15

Fig. 44: Measuring The Voltage Of The (K594) Drivetrain Sensor Return Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the voltage of the (K594) Drivetrain Sensor Return circuit at the Transfer Case Motor harness connector.

Monitor the voltmeter while performing a wiggle test on the wiring harness and connectors.

Is any voltage detected on the circuit during the wiggle test?

Yes

Repair the (K594) Drivetrain Sensor Return circuit for an intermittent short to voltage.
 Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 9.

9. (T313) MODE SENSOR SIGNAL CIRCUIT HIGH RESISTANCE

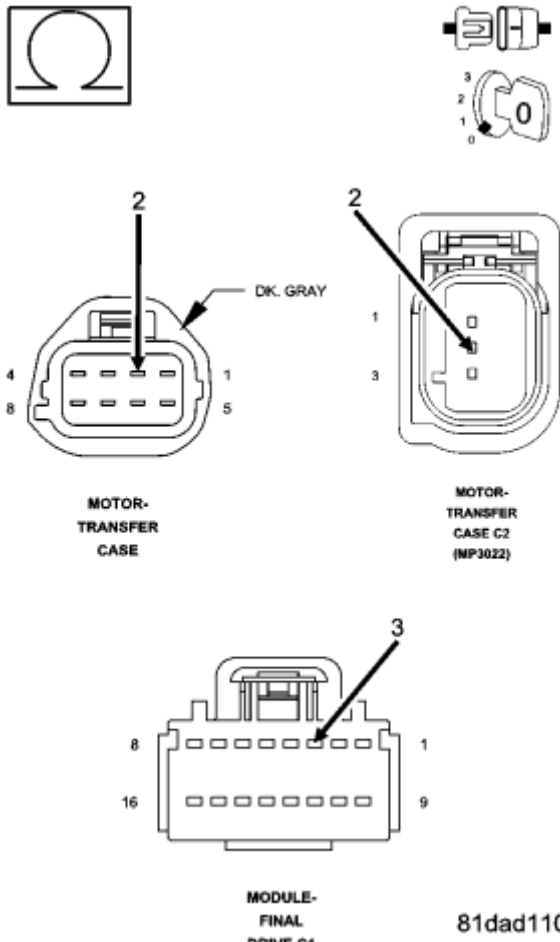


Fig. 45: Measuring The Resistance Of The (T313) Mode Sensor Signal Circuit Between The Final Drive Control Module C1 Harness Connector And The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Measure the resistance of the (T313) Mode Sensor Signal circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C2 harness connector.

Monitor the ohmmeter while performing a wiggle test on the wiring harness and connectors.

Is the resistance ever above 5.0 ohms during the wiggle test?

Yes

Repair the (T313) Mode Sensor Signal circuit for an intermittent open circuit or high resistance.
 Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 10.

10. **(K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE**

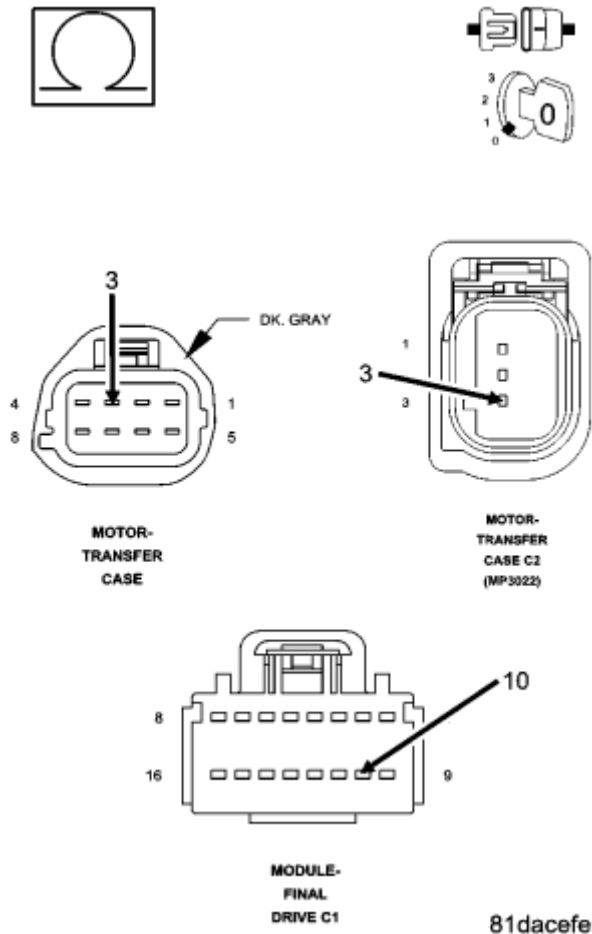


Fig. 46: Measuring The Resistance Of The (K594) Drivetrain Sensor Return Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (K594) Drivetrain Sensor Return circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Monitor the ohmmeter while performing a wiggle test on the wiring harness and connectors.

Is the resistance ever above 5.0 ohms during the wiggle test?

Yes

Repair the (K594) Drivetrain Sensor Return circuit for an intermittent open circuit or high resistance.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 11.

11. **(T313) MODE SENSOR SIGNAL CIRCUIT INTERMITTENT SHORT TO GROUND**

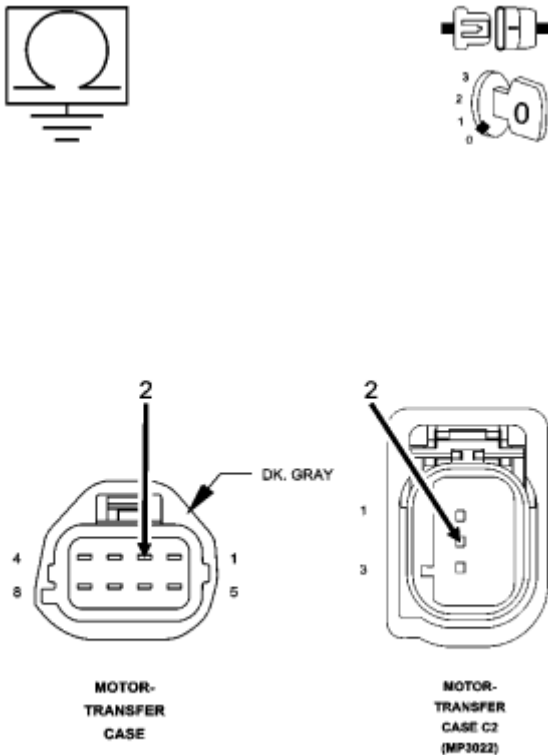


Fig. 47: Measuring The Resistance Between Ground And The (T313) Mode Sensor Signal Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (T313) Mode Sensor Signal circuit at the Transfer Case Motor harness connector.

Monitor the ohmmeter while performing a wiggle test on the wiring harness and connectors.

Is the resistance ever below 5.0 ohms during the wiggle test?

Yes

Repair the (T313) Mode Sensor Signal circuit for an intermittent short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 12.

12. **TRANSFER CASE MOTOR**

NOTE: This DTC sets when the Final Drive Control Module detects excessive voltage fluctuation on the Mode Sensor Signal circuit. Perform a thorough inspection of all wiring and connectors between the sensor and the control module.

Using the schematic as a guide, inspect the Final Drive Control Module power and ground circuits.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to step 13.

13. **TRANSFER CASE MOTOR/ENCODER**

Replace the Transfer Case Motor/ Encoder in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

Test drive the vehicle.

With the scan tool, read the DTCs in the Final Drive Control Module.

Does this DTC reset?

Yes

Replace the FDCM in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

14. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1415-TRANSFER CASE MOTOR "CURRENT" PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**
 1. Current reading greater than 1A for 200 msec with no motor activation.
 2. Current reading never greater than 1A during a completed range or neutral shift.

Possible Causes

Possible Causes
(T315) SHIFT MOTOR CONTROL A CIRCUIT OPEN OR HIGH RESISTANCE
(T316) SHIFT MOTOR CONTROL B CIRCUIT OPEN OR HIGH RESISTANCE
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **DTC IS ACTIVE**

NOTE: If both DTCs C1415 and C140A are present, check the FDCM fuse and the B(+) supply to the Integrated Power Module (IPM).

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Pick the answer that best describes the DTC set conditions?

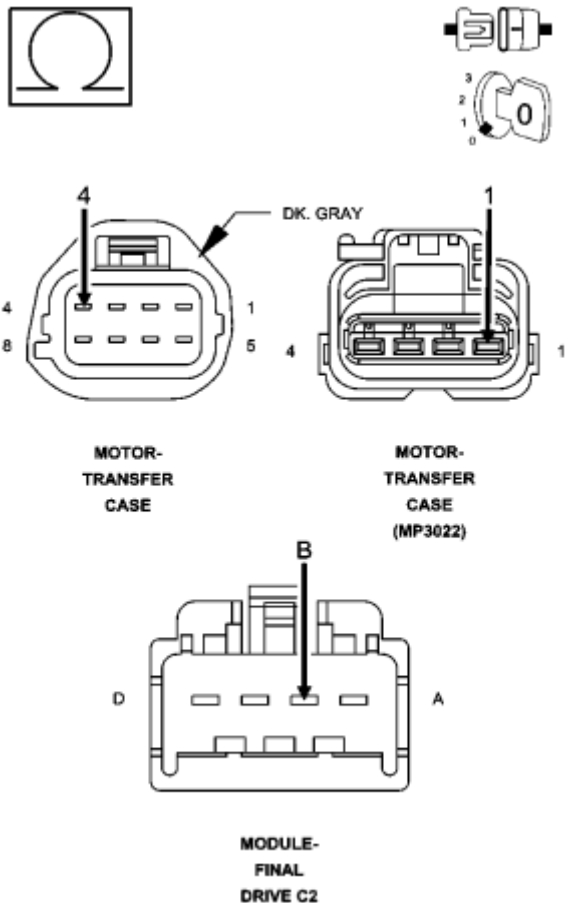
Yes

Go to 2.

No

Go to 4.

2. **(T315) SHIFT MOTOR CONTROL A CIRCUIT OPEN OR HIGH RESISTANCE**



81daf250

Fig. 49: Measuring The Resistance Of The (T315) Shift Motor Control A Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance of the (T315) Shift Motor Control A circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the (T315) Shift Motor Control A circuit for an open or high resistance.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T316) SHIFT MOTOR CONTROL B CIRCUIT OPEN OR HIGH RESISTANCE

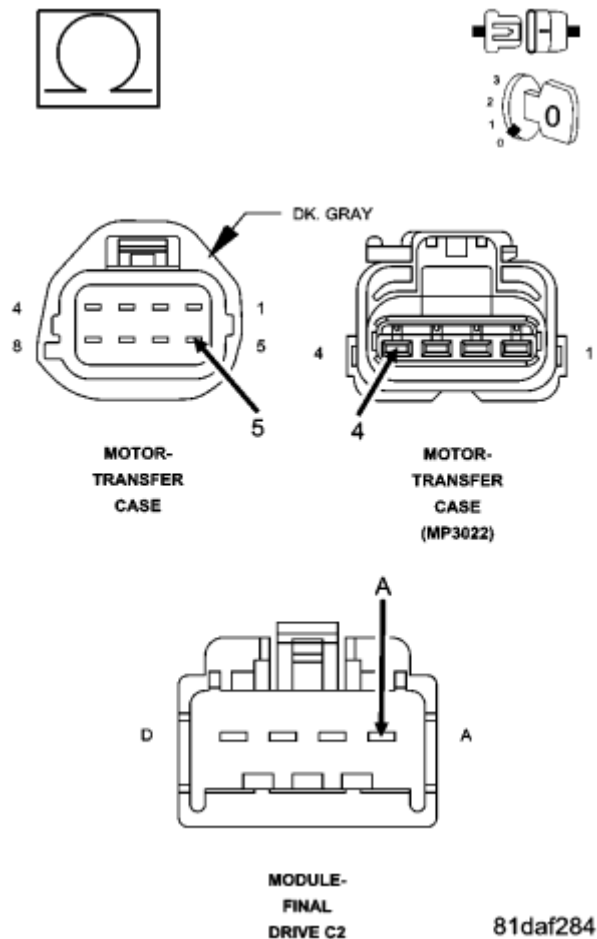


Fig. 50: Measuring The Resistance Of The (T316) Shift Motor Control B Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (T316) Shift Motor Control B circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the (T316) Shift Motor Control B circuit for an open or high resistance.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1438-TRANSFER CASE DIFFERENTIAL CLUTCH WORN

Circuit Schematic

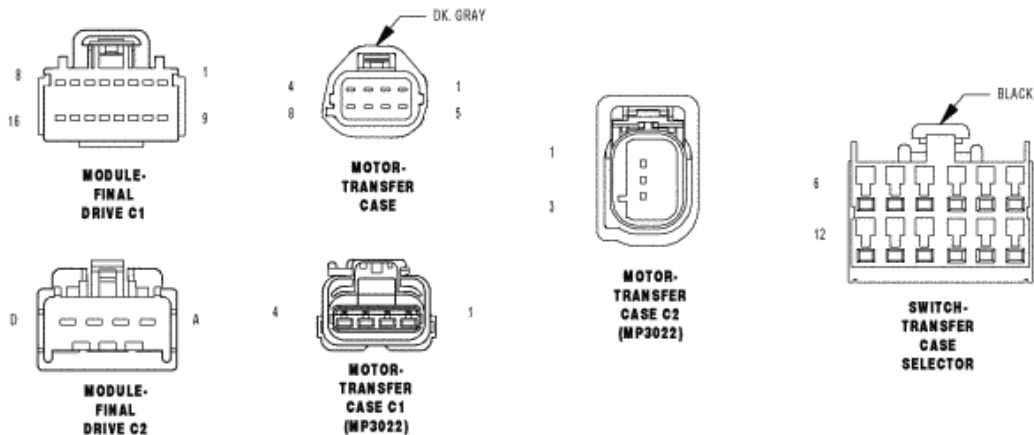
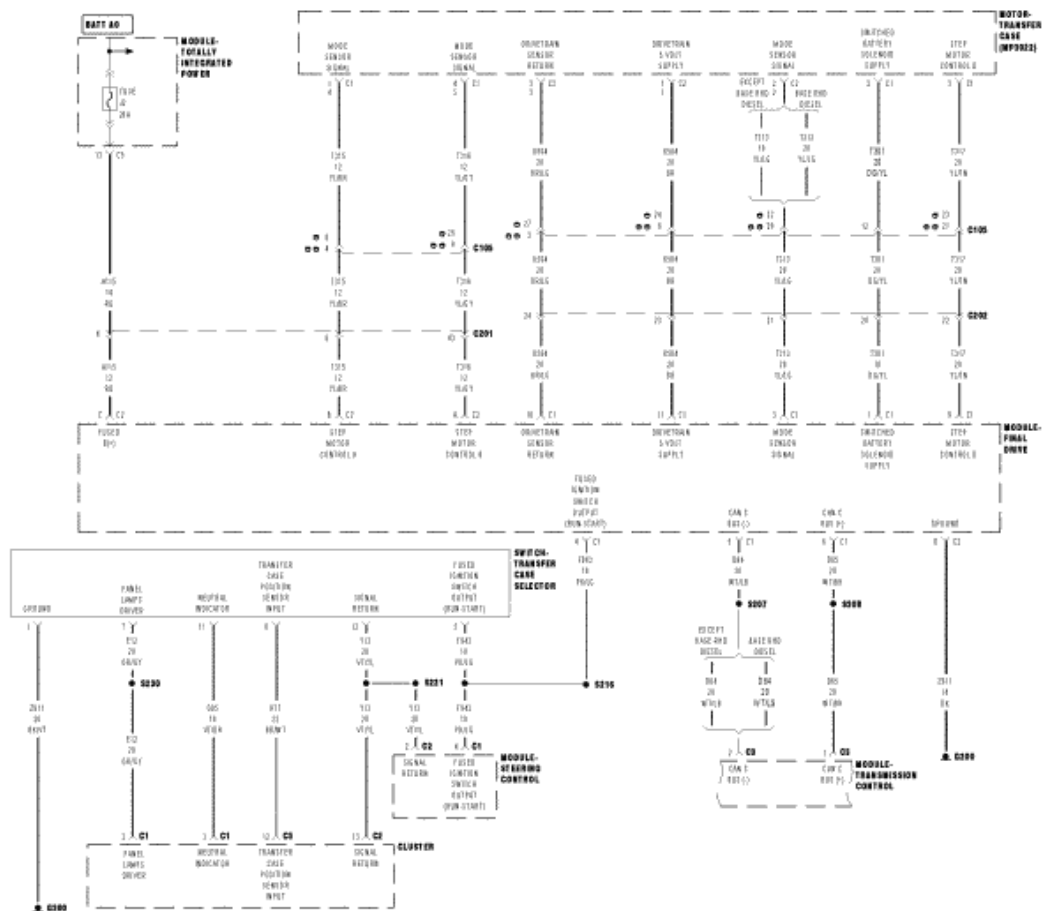


Fig. 51: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

The ignition on, engine running. No Under/Overvoltage, and/or encoder error DTCs present. When shifted into 4-Low or in 4-high.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is unable to fully lock the T-Case (in Either High or Low) because the T-Case clutch is worn.

Possible Causes

Possible Causes
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT OPEN OR HIGH RESISTANCE
(T313) MODE SENSOR SIGNAL CIRCUIT OPEN OR HIGH RESISTANCE
(K594) DRIVETRAIN SENSOR RETURN CIRCUIT OPEN OR HIGH RESISTANCE
TRANSFER CASE CLUTCH WORN
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **DTC IS ACTIVE**

NOTE: **Diagnose and repair any system voltage or Transfer Case related DTCs in the FDCM before continuing with this test.**

Ignition on, engine running.

With the scan tool, clear stored DTCs in the Final Drive Control Module.

Test drive the vehicle.

During the test drive, move the Transfer Case Selector Switch to each position several times in accordance with the Service Information.

With the scan tool, read DTCs in the Final Drive Control Module.

Does this DTC reset?

Yes

Go to 2.

No

Go to 6.

2. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT HIGH RESISTANCE**

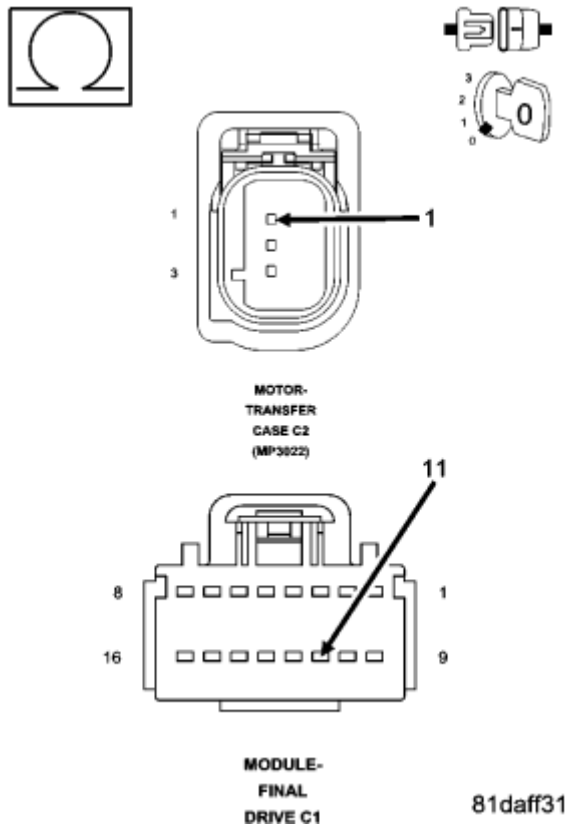


Fig. 52: Measuring The Resistance Of The (K504) Drivetrain 5 Volt Supply Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Disconnect the Transfer Case Motor harness connector.

Measure the resistance of the (K504) Drivetrain 5 Volt Supply circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the high resistance in the (K504) Drivetrain 5 Volt Supply circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (T313) MODE SENSOR SIGNAL CIRCUIT HIGH RESISTANCE

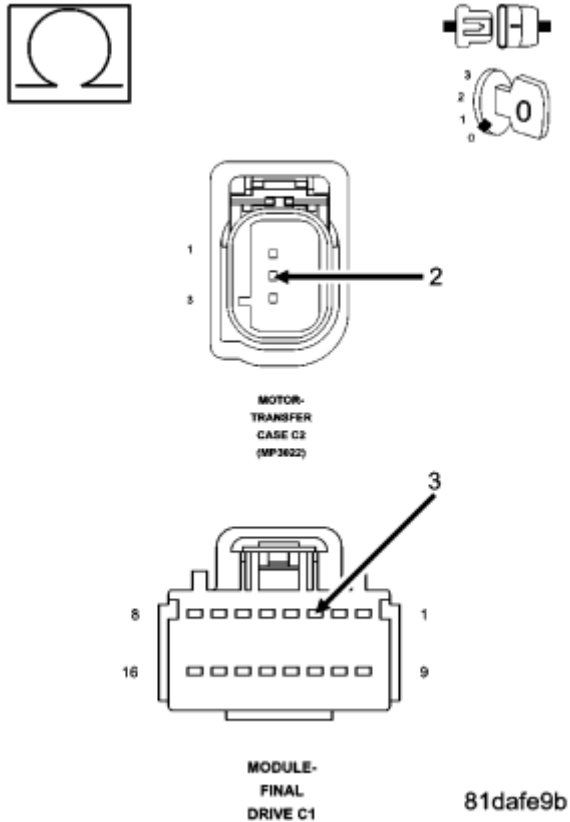


Fig. 53: Measuring The Resistance Of The (T313) Mode Sensor Signal Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance of the (T313) Mode Sensor Signal circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the high resistance in the (T313) Mode Sensor Signal circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE

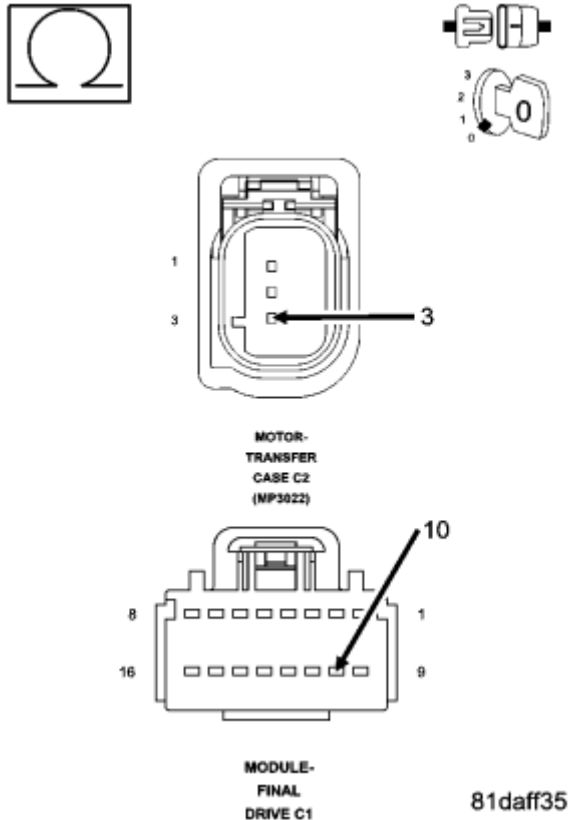


Fig. 54: Measuring The Resistance Of The (K594) Drivetrain Sensor Return Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (K594) Drivetrain Sensor Return circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C1 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the high resistance in the (K594) Drivetrain Sensor Return circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. TRANSFER CLUTCH WORN

Ignition on, engine not running.

Shift the Transfer case into 4-LOW.

With the scan tool, monitor the encoder voltage in the Final Drive Control Module.

Shift the Transfer case into AWD.

Is the encoder voltage between 4.625 volts and 4.750?

Yes

Replace the worn clutch pack assembly in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

6. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

Circuit Schematic

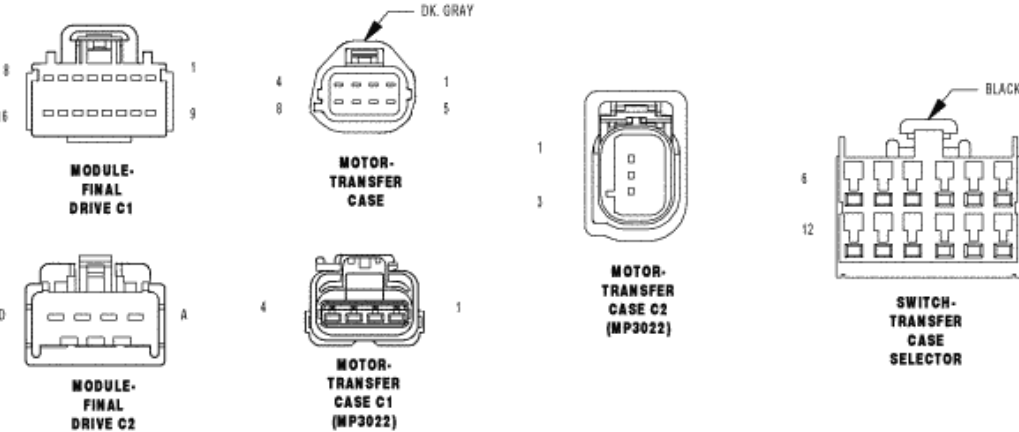
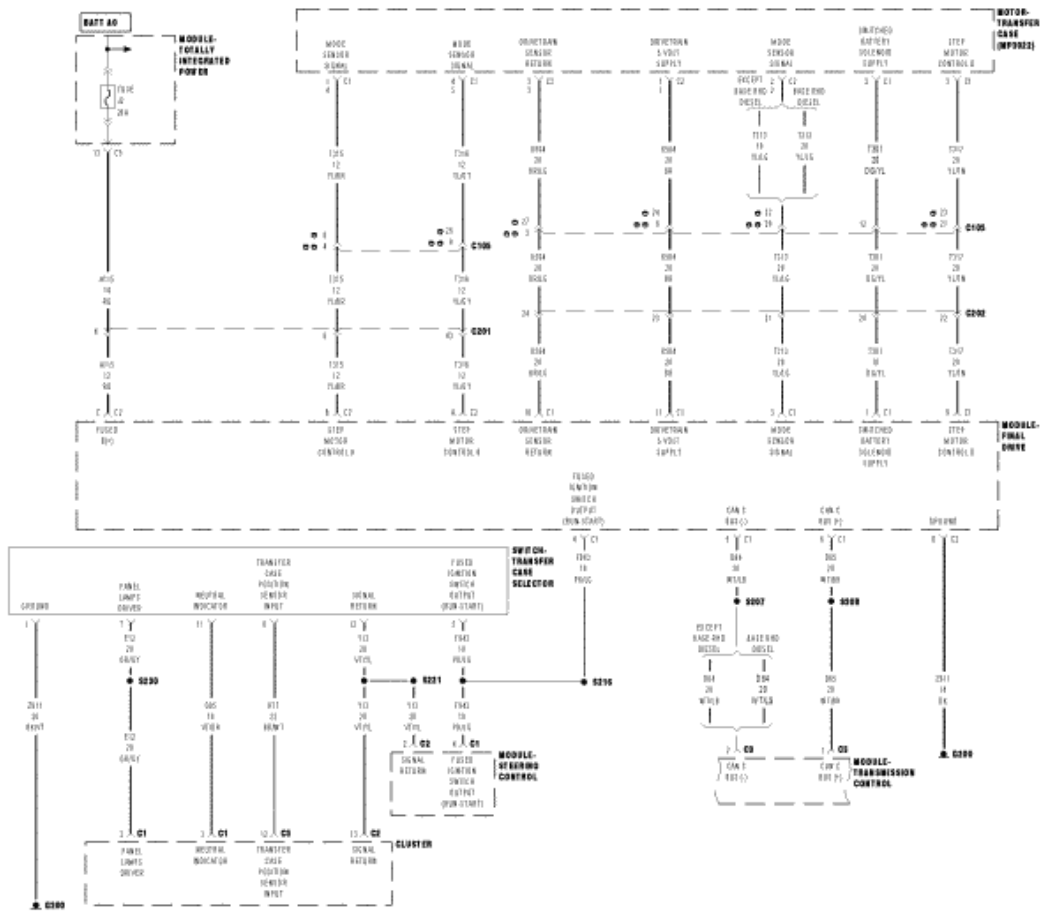


Fig. 55: Transfer Case Sensors Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

A calibrated motor abuse temperature limit has been achieved. The Final Drive Control Module monitors the motor use and has determined that excessive motor activations have occurred. This DTC will be stored after Transfer Case Motor has cooled down.

Possible Causes

Possible Causes
TRANSFER CASE SELECTOR SWITCH AMBIENT TEMPERATURE SENSOR CLUSTER CONTROL NODE (CCN) FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **DTC IS ACTIVE**

NOTE: **Diagnose and repair any system voltage or Transfer Case related DTCs in the Final Drive Control Module before continuing with this test.**

Ignition on, engine not running.

With the scan tool, clear Stored DTCs in the FDCM and the CCN.

Test drive the vehicle.

During the test drive, move the Transfer Case Selector Switch to each position several times in accordance with the Service Information.

With the scan tool, read DTCs in the FDCM and the CCN.

Does this DTC reset?

Yes

Go to 2.

No

Go to 5.

2. AMBIENT TEMPERATURE SENSOR

With the scan tool, monitor the ambient temperature in the Totally Integrated Power Module (TIPM).

Is the ambient temperature at room temperature?

Yes

Go to 3.

No

Replace the Ambient Temperature Sensor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

3. TRANSFER CASE SELECTOR SWITCH

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors relative to this circuit.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. CLUSTER CONTROL NODE

Turn the ignition off to the lock position

Replace the Transfer Case Selector Switch in accordance with the Service Information.

Ignition on, engine not running.

With the scan tool, clear Stored DTCs in the CCN and the FDCM.

Test drive the vehicle.

During the test drive, move the Transfer Case Selector Switch to each position several times in

accordance with the Service Information.

With the scan tool, read DTCs in the CCN and the FDCM.

Does this DTC reset?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1472-TRANSFER CASE CLUTCH CONTROL CIRCUIT PERFORMANCE

Circuit Schematic

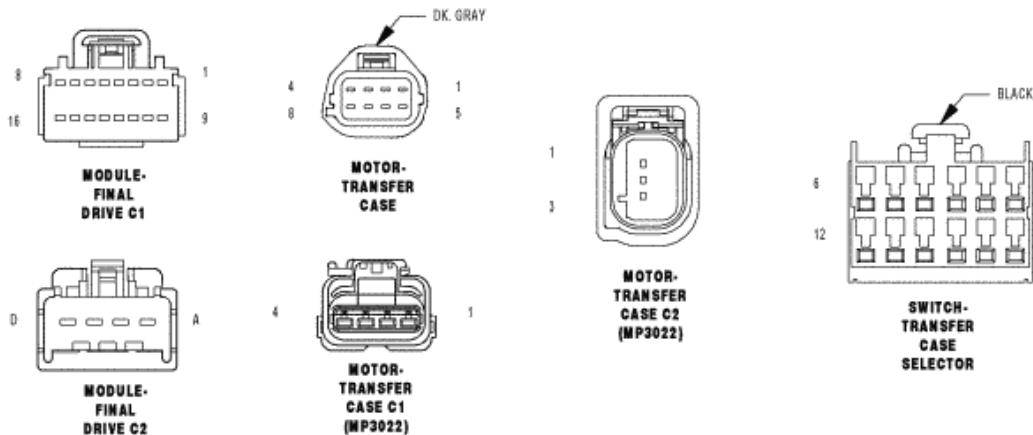
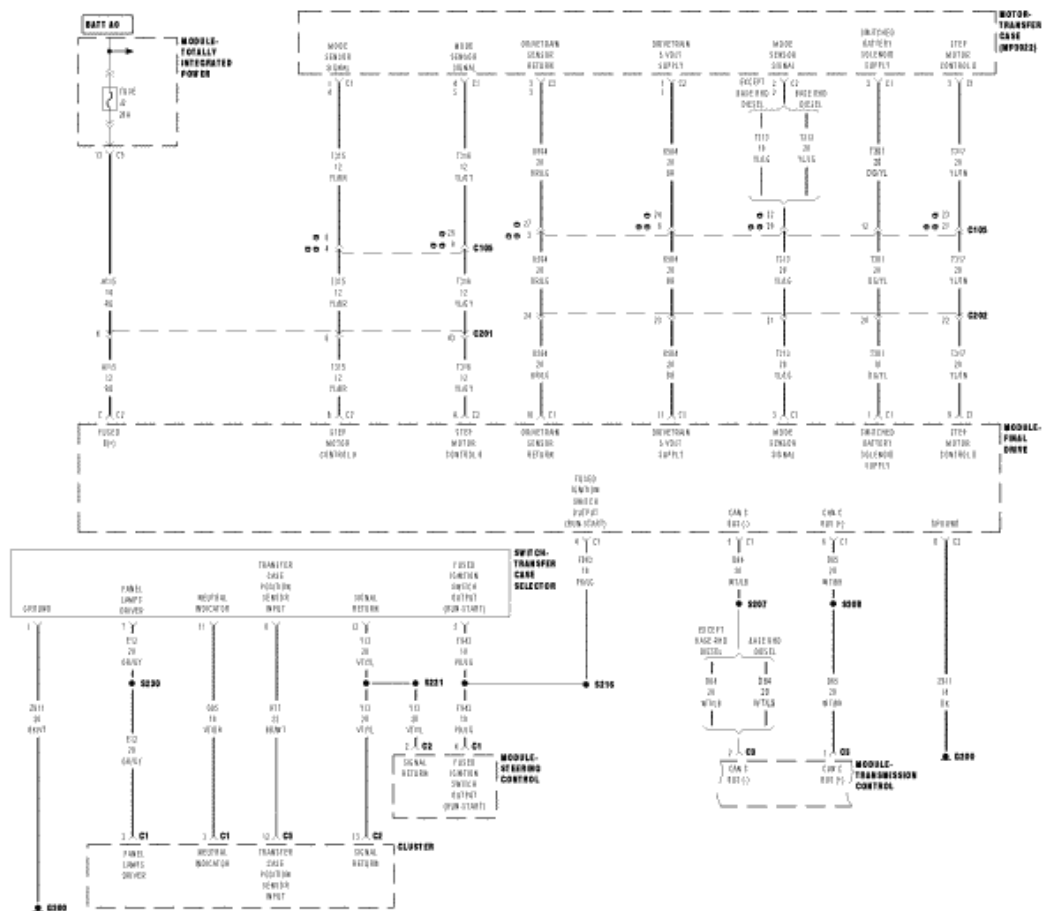


Fig. 56: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Ignition on.

Set Conditions

- **Set Condition:**

The FDCM detects an overheat condition due to excessive difference in speed across the Transfer Case from hard driving conditions (Mud, Sand, Snow, 2WD Chassis dynamometer etc.).

Possible Causes

Possible Causes
DRIVING CONDITIONS FINAL DRIVE CONTROL MODULE (FDCM) TRANSFER CASE

Diagnostic Test

1. **ANTI-LOCK BRAKE SYSTEM (ABS) MODULE DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, select View DTCs in the ABS Module.

Are there any ABS DTCs present?

Yes

Refer to the symptom list and perform any ABS DTC diagnostic procedures before continuing with this test.

No

Go to 2.

2. **POWER CONTROL MODULE (PCM) DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, select View DTCs in the PCM.

Are there any PCM DTCs present?

Yes

Refer to the symptom list and perform any PCM DTC diagnostic procedures before continuing with this test.

No

Go to 3.

3. **DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, select View DTCs.

Is the status Active for this DTC?

Yes

Go To 4.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go To 5.

4. **VERIFY SET CONDITION**

NOTE: **Check with customer on driving terrain (e.g. mud, sand, snow) for set condition.**

With the scan tool, erase DTC's.

Test drive vehicle on dry paved road.

With the scan tool, read DTC's.

Is the status Active for this DTC?

Yes

Replace the Transfer Case Clutch Pack in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test Complete.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the scan tool, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

Yes

Repair as necessary.

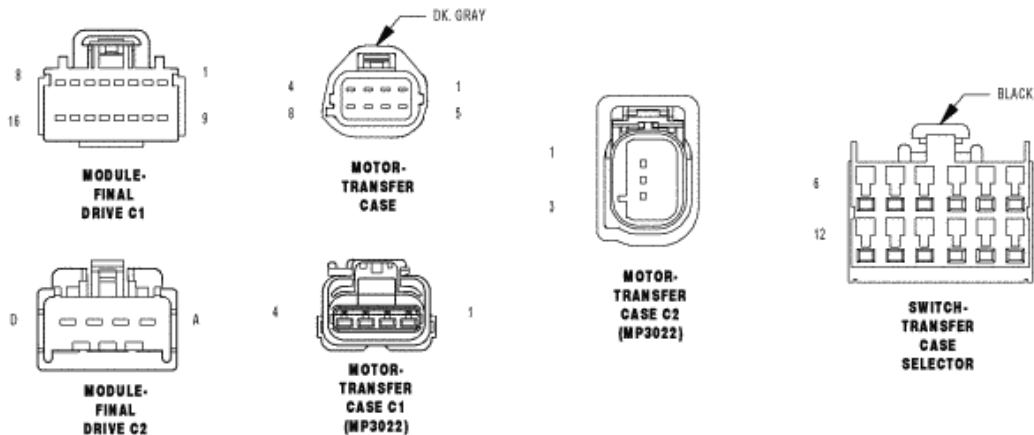
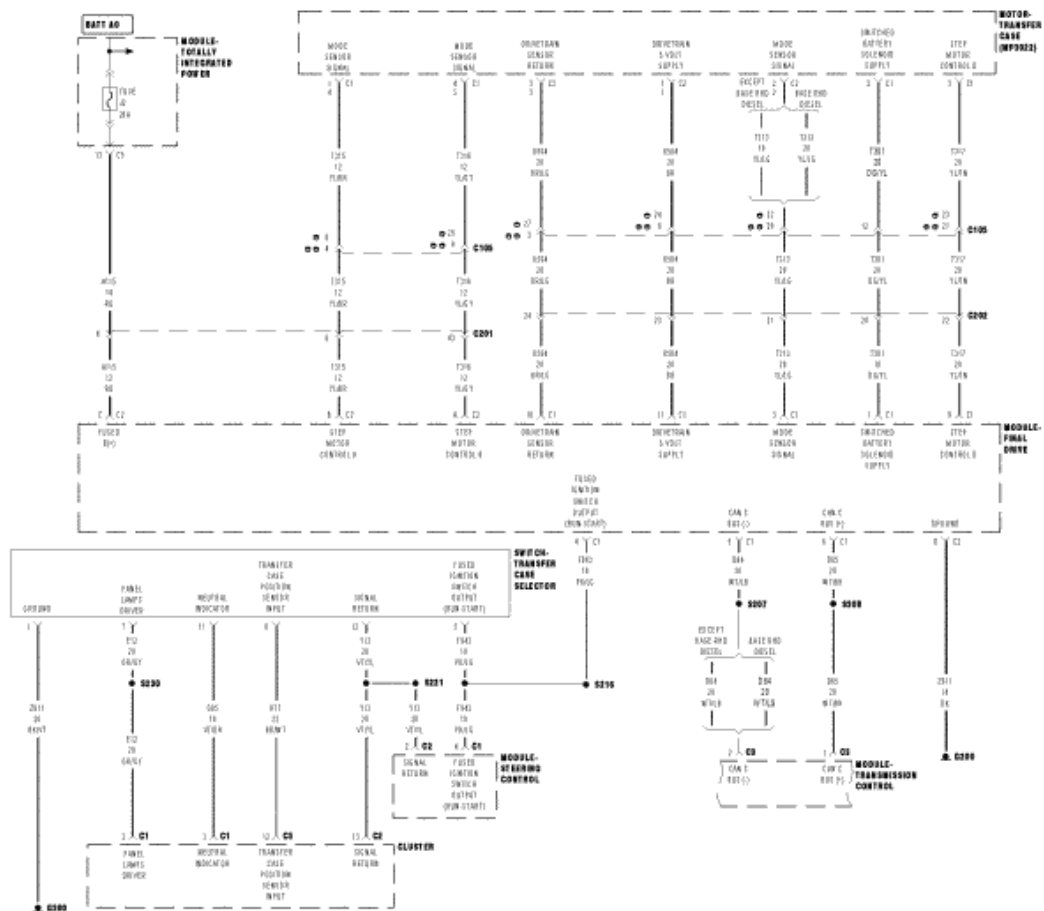
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test Complete.

C1476-TRANSFER CASE CLUTCH POSITION OUT OF RANGE

Circuit Schematic



01410000

Fig. 57: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is unable to engage the requested range.

Possible Causes

Possible Causes
TRANSFER CASE KISSPOINT NOT LEARNED (T315) MOTOR A CIRCUIT OPEN OR HIGH RESISTANCE (T316) MOTOR B CIRCUIT OPEN OR HIGH RESISTANCE (K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT OPEN OR HIGH RESISTANCE (T313) MODE SENSOR SIGNAL CIRCUIT OPEN OR HIGH RESISTANCE (K594) DRIVETRAIN SENSOR RETURN CIRCUIT OPEN OR HIGH RESISTANCE TRANSFER CASE INTERNAL CONDITION TRANSFER CASE FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. **DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Go to 2.

No

Go to 9.

2. **RELEARN KISS POINT**

Ignition on, engine running.

Place the Transmission in neutral and apply the brakes firmly.

Place the Transfer Case Motor Selector Switch in AWD.

With the scan tool, run the Final Drive Control Module non-volatile reset command.

Place the Transmission in park.

Wait for 10 seconds and turn Ignition switch back to Ignition on, engine not running.

With the scan tool, clear stored DTCs in the Final Drive Control Module.

Switch the Transfer Case Motor Selector Switch to 4-Low and back to AWD.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the DTC status Active?

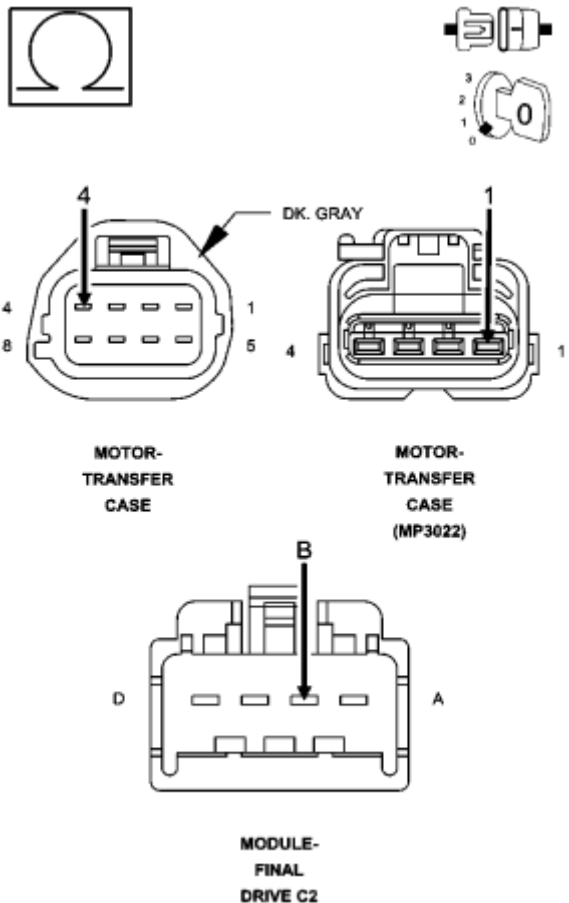
Yes

Go to 3.

No

Go to 9.

3. (T315) SHIFT MOTOR CONTROL A CIRCUIT OPEN



81daf250

Fig. 58: Measuring The Resistance Of The (T315) Shift Motor Control A Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Measure the resistance of the (T315) Shift Motor Control A circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the (T315) Shift Motor Control A circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (T316) SHIFT MOTOR CONTROL B CIRCUIT OPEN

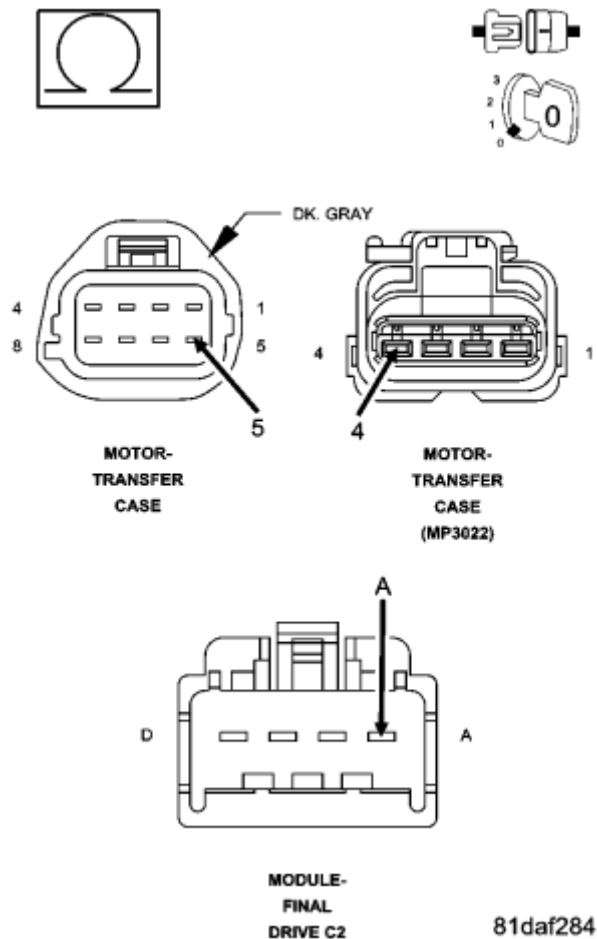


Fig. 59: Measuring The Resistance Of The (T316) Shift Motor Control B Circuit From The Transfer Case Motor Harness Connector To The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (T316) Shift Motor Control B circuit from the Transfer Case Motor harness connector to the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the (T316) Shift Motor Control B circuit for an open.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 5.

5. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT OPEN**

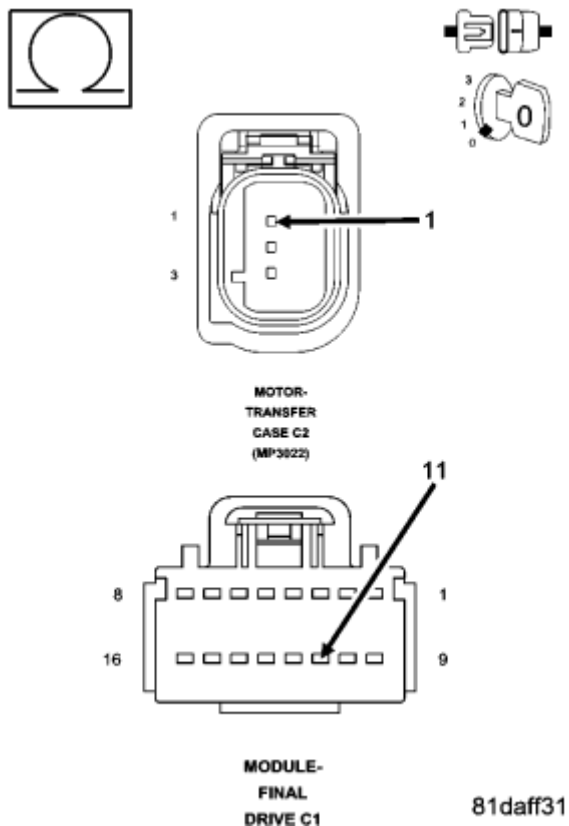


Fig. 60: Measuring The Resistance Of The (K504) Drivetrain 5 Volt Supply Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (K504) Drivetrain 5 Volt Supply circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the open in the (K504) Drivetrain 5 Volt Supply circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 6.

6. (T313) MODE SENSOR SIGNAL CIRCUIT HIGH RESISTANCE

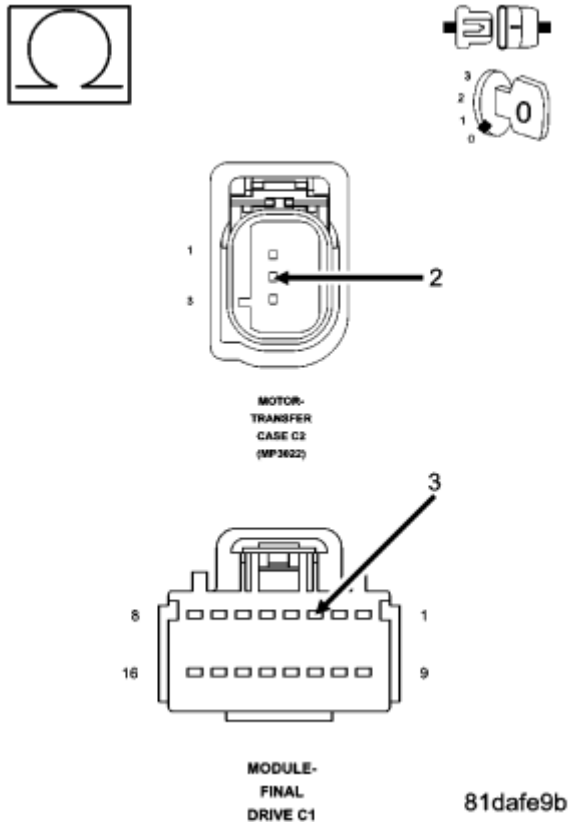


Fig. 61: Measuring The Resistance Of The (T313) Mode Sensor Signal Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (T313) Mode Sensor Signal circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C2 harness connector.

Is the resistance above 5.0 ohms?

Yes

Repair the high resistance in the (T313) Mode Sensor Signal circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 7.

7. (K594) DRIVETRAIN SENSOR RETURN CIRCUIT HIGH RESISTANCE

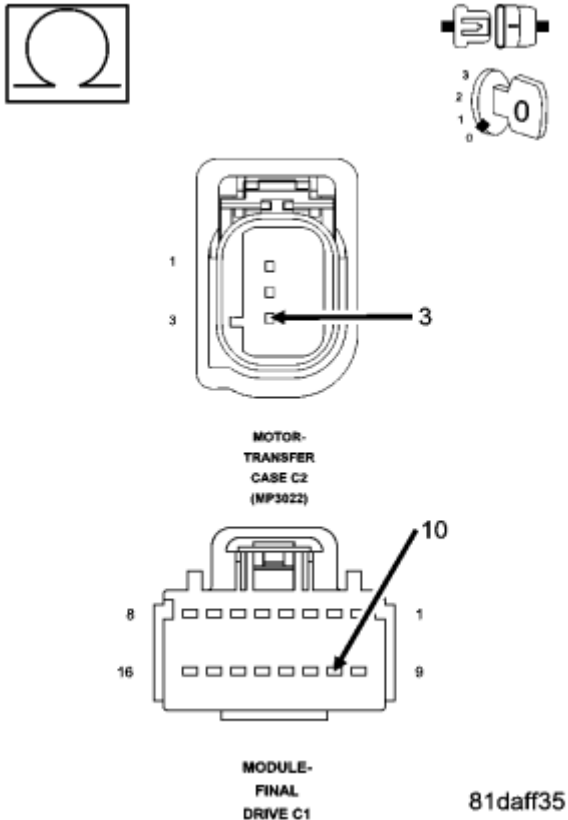


Fig. 62: Measuring The Resistance Of The (K594) Drivetrain Sensor Return Circuit Between The Transfer Case Motor Harness Connector And The Final Drive Control Module C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (K594) Drivetrain Sensor Return circuit between the Transfer Case Motor harness connector and the Final Drive Control Module C2 harness connector.

Is the resistance below 5.0 ohms?

Yes

Go to 8.

No

Repair the high resistance in the (K594) Drivetrain Sensor Return circuit.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

8. TRANSFER CASE

Turn the ignition off to the lock position

Inspect the Transfer Case to determine if there are any mechanical conditions preventing the shift motor

from engaging in the position selected.

Are any mechanical conditions preventing the shift motor from engaging in the position selected?

Yes

Replace the Transfer Case in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

9. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C1477-TRANSFER CASE CLUTCH OVERTEMPERATURE

Circuit Schematic

Monitor Conditions

When Monitored:

Ignition on.

Set Conditions

- **Set Condition:**

The FDCM detects an overheat condition due to excessive difference in speed across the Transfer Case from hard driving conditions (Mud, Sand, Snow, 2WD Chassis dynamometer etc.).

Possible Causes

Possible Causes
DRIVING CONDITIONS AMBIENT TEMPERATURE SENSOR FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **ANTI-LOCK BRAKE SYSTEM (ABS) MODULE DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, select View DTCs in the ABS Module.

Are there any ABS DTCs present?

Yes

Refer to the symptom list and perform any ABS DTC diagnostic procedures before continuing with this test.

No

Go to 2.

2. **DTC IS ACTIVE**

Ignition on, engine not running.

With the scan tool, select View DTCs.

Is the status Active for this DTC?

Yes

Go To 3.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go To 5.

3. **AMBIENT TEMPERATURE SENSOR**

With the scan tool, monitor the ambient temperature in the Totally Integrated Power Module (TIPM).

Is the ambient temperature at room temperature?

Yes

Go To 4.

No

Replace the Ambient Temperature Sensor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. **VERIFY SET CONDITION**

NOTE: Check with customer on driving terrain (e.g. mud, sand, snow) for set condition.

With the scan tool, erase DTC's.

Allow the Transfer Case to cool down.

Test drive vehicle on dry paved road.

With the scan tool, read DTC's.

Is the status Active for this DTC?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test Complete.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the schematics as a guide, inspect the wiring and connectors specific to this circuit.

Wiggle test the wiring harness and connectors while checking for shorted and open circuits.

Using the scan tool, monitor the data related to this circuit while performing the wiggle test. Look for the data to change or for the DTC to reset.

Were there any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test Complete.

C2100-BATTERY VOLTAGE LOW (FDCM)

Circuit Schematic

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that system voltage is below 8.5 volts for 60 seconds with engine RPM greater than 1500.

Possible Causes

Possible Causes
CHARGING SYSTEM DTCS PRESENT FINAL DRIVE CONTROL MODULE (Z910) GROUND CIRCUIT OPEN OR HIGH RESISTANCE FINAL DRIVE CONTROL MODULE POWER CIRCUITS OPEN OR HIGH RESISTANCE FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **CHARGING SYSTEM DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, read DTCs in the Powertrain Control Module.

Are there any Charging System or related voltage DTCs present?

Yes

Refer to the symptom list and perform any Charging System DTC diagnostic procedures before continuing with this test.

No

Go to 2.

2. **DTC IS ACTIVE**

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

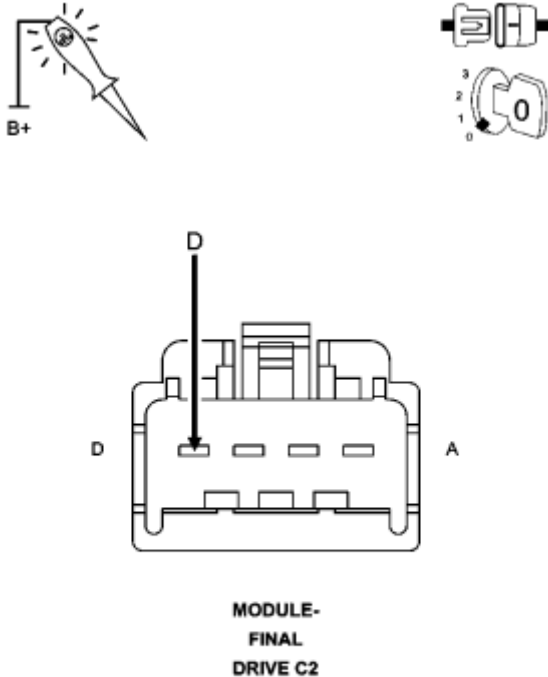
Yes

Go to 3.

No

Go to 5.

3. FINAL DRIVE CONTROL MODULE (Z910) GROUND CIRCUIT OPEN OR HIGH RESISTANCE



81db01b8

Fig. 65: Checking Final Drive Control Module (Z910) Ground Circuit Open Or High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module C1 harness connector.

Disconnect the Final Drive Control Module C2 harness connector.

Ignition on, engine not running.

With a 12-volt test light connected to B+, check the (Z910) Ground circuit in the Final Drive Control Module C2 harness connector.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a

direct connection to the battery.

Does the test light illuminate brightly for each of the Ground circuits?

Yes

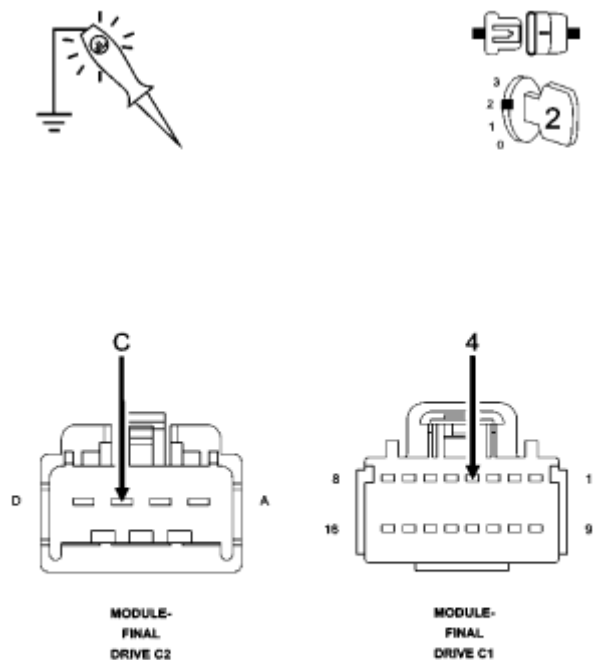
Go to 4.

No

Repair the (Z910) Ground circuit for an open circuit or high resistance.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. **FINAL DRIVE CONTROL MODULE POWER CIRCUITS OPEN OR HIGH RESISTANCE**



81db019e

Fig. 66: Checking Final Drive Control Module Power Circuits Open Or High Resistance
Courtesy of CHRYSLER LLC

With a 12-volt test light connected to ground, check the (F943) Fused Ignition Switch Output circuit in the Final Drive Control Module C1 harness connector and the (A115) Fused B+ circuit in the Final Drive Control Module C2 harness connector.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly for each of the circuits?

Yes

Replace the Final Drive Control Module in accordance with the Service information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Repair the Fused B+ circuit(s) for an open circuit or high resistance.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C2101-BATTERY VOLTAGE HIGH (FDCM)

Circuit Schematic

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that system voltage is above 16.0 volts for 60 seconds with engine RPM greater than 1500.

Possible Causes

Possible Causes
INTERMITTENT BATTERY VOLTAGE HIGH CHARGING SYSTEM DTCS PRESENT FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **CHARGING SYSTEM DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, read DTCs in the Powertrain Control Module.

Are there any Charging System or related voltage DTCs present?

Yes

Refer to the symptom list and perform any Charging System DTC diagnostic procedures before continuing with this test.

No

Go to 2.

2. **DTC IS ACTIVE**

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Replace the Final Drive Control Module in accordance with the Service information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

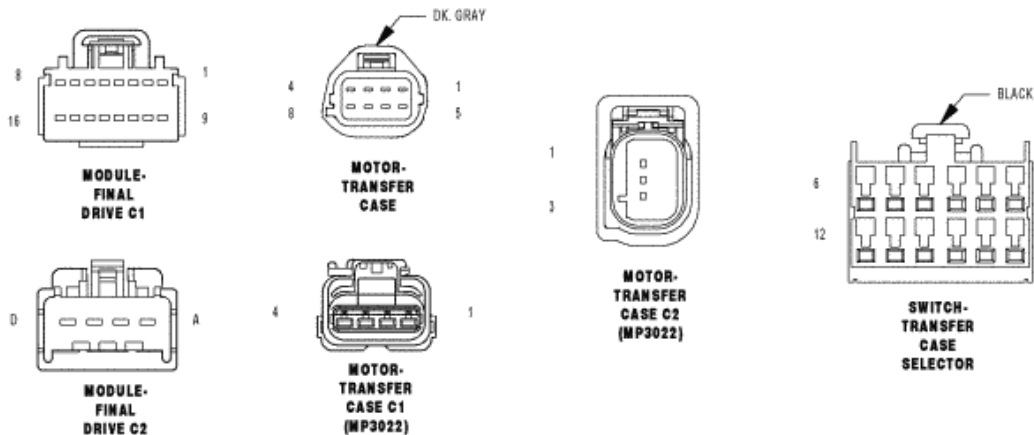
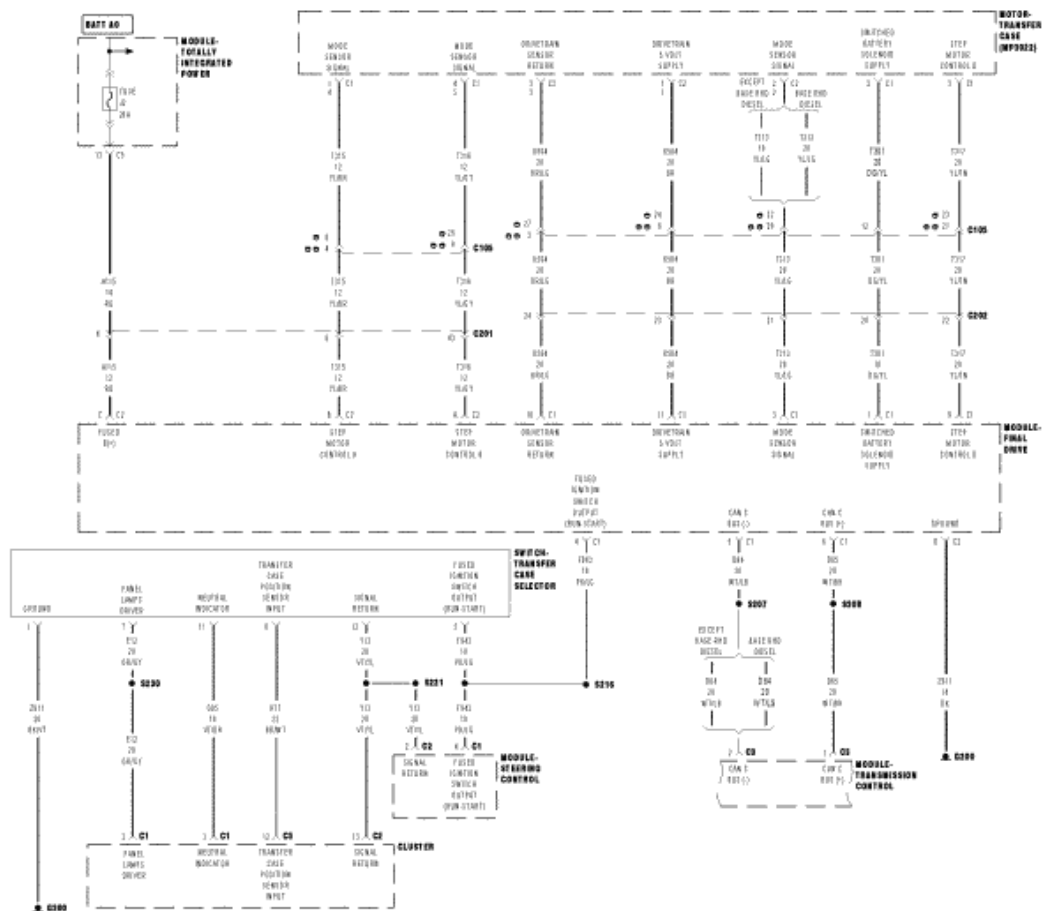
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C2111-SENSOR SUPPLY 1 VOLTAGE CIRCUIT LOW (FDCM)

Circuit Schematic



01410000

Fig. 68: Transfer Case Sensors Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that the Drivetrain Sensor Supply voltage is below 2.5 volts for 300 mS.

Possible Causes

Possible Causes
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORT TO GROUND TRANSFER CASE MOTOR/ENCODER FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **DRIVETRAIN 5 VOLT SUPPLY (REFERENCE) VOLTAGE BELOW 4.8 VOLTS**

Ignition on, engine not running.

With the scan tool, read the Drivetrain 5-volt Supply (Reference) Voltage in the FDCM.

Is the voltage below 4.8 volts?

Yes

Go to 2.

No

Go to 4.

2. **TRANSFER CASE MOTOR/ENCODER**

Turn the ignition off to the lock position

Disconnect the Transfer Case Motor/Encoder harness connector.

Ignition on, engine not running.

With the scan tool, read the 5-volt Supply (Reference) Voltage.

Is the voltage above 4.75 volts with the Transfer Case Motor harness disconnected?

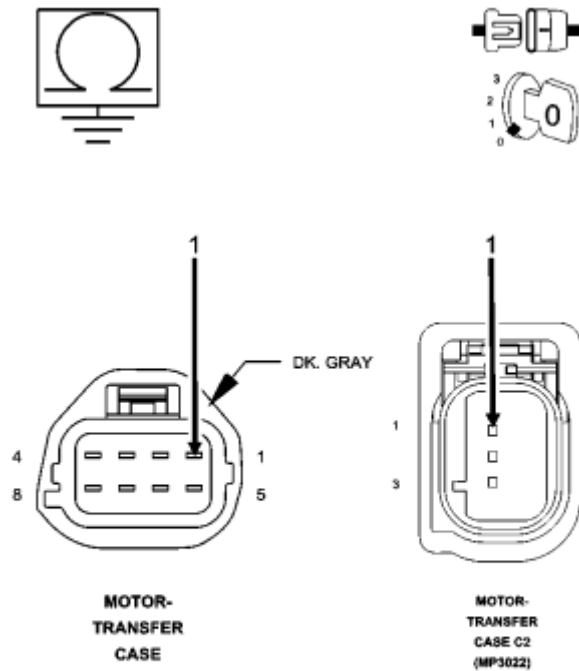
Yes

Replace the Transfer Case Encoder/Sensor in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. (K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORT TO GROUND



81dafb84

Fig. 69: Measuring The Resistance Between Ground And The (T504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Final Drive Control Module harness connector.

Measure the resistance between ground and the (K504) Drivetrain 5- volt Supply circuit at the Transfer Case Motor harness connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (K504) Drivetrain 5 Volt Supply circuit for a short to ground.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C2112-SENSOR SUPPLY 1 VOLTAGE CIRCUIT HIGH (FDCM)

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module detects that the Drivetrain Sensor Supply voltage is above 7.5 volts for 300 mS

Possible Causes

Possible Causes
(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORT TO VOLTAGE FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **5 VOLT SUPPLY (REFERENCE) VOLTAGE IS ABOVE 5.2 VOLTS**

Ignition on, engine not running.

With the scan tool, read the Drivetrain 5-volt Supply (Reference) Voltage in the FDCM.

Is the voltage above 5.2 volts?

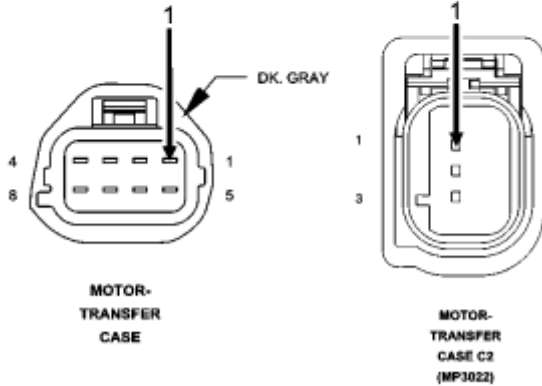
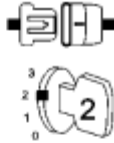
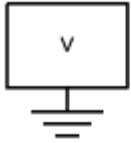
Yes

Go to 2.

No

Go to 3.

2. **(K504) DRIVETRAIN 5 VOLT SUPPLY CIRCUIT SHORTED TO VOLTAGE**



81dad0fe

Fig. 71: Measuring The Voltage Of The (K504) Drivetrain 5-Volt Supply Circuit At The Transfer Case Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off to the lock position

Disconnect the Transfer Case Encoder/Sensor harness connector.

Disconnect the Final Drive Control Module C1 harness connector.

Ignition on, engine not running.

Measure the voltage of the (K504) Drivetrain 5 Volt Supply circuit at Transfer Case Encoder/Sensor harness connector.

Is there any voltage present?

Yes

Repair the (K504) Drivetrain 5 Volt Supply circuit for a short to voltage.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

3. **INTERMITTENT WIRING AND CONNECTORS**

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

C2201-INTERNAL CONTROLLER (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Final Drive Control Module has detected a failure internal to the controller.

Possible Causes

Possible Causes
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. DTC IS ACTIVE

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test Complete

C2206-VEHICLE CONFIGURATION MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• Set Condition:

When the Final Drive Control Module (FDCM) detects the signal from the gateway module relevant for vehicle characteristic is missing or does not match for a period greater than the specified fault duration.

Possible Causes

Possible Causes
INCORRECT TRANSFER CASE SWITCH INCORRECT TRANSFER CASE TOTALLY INTEGRATED POWER MODULE (TIPM) NOT CONFIGURED CORRECTLY FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. CHECK FOR A DTC C2206-VEHICLE CONFIGURATION MISMATCH

NOTE: This DTC must be active for the results of this test to be valid and this DTC will be active when a new module is installed until initialization is performed.

Turn the ignition on.

With the scan tool, read and record DTCs.

With the scan tool, erase DTCs.

Perform ECU initialization with drive test on FDCM.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

Cycle the ignition switch from off to on.

With the scan tool, read and record DTCs.

Does the scan tool display: C2206-VEHICLE CONFIGURATION MISMATCH?

Yes

Go To 2.

No

FDCM is now configured.

2. VERIFY THAT THE CORRECT TRANSFER CASE SWITCH IS INSTALLED

NOTE: Verify the correct Transfer Case Switch part number is installed for the correct for the correct Transfer Case.

Turn the ignition to the lock position.

The correct Transfer Case Switch for the MP 1522 Transfer Case will read 4WD LOCK in the center position.

The correct Transfer Case Switch for the MP 3022 Transfer Case will read 4WD AUTO in the center position.

Is the correct Transfer Case Switch installed for the correct Transfer Case?

Yes

Go To 3.

No

Replace the Transfer Case Switch in accordance with the Service Information.

Perform the **TRANSFER CASE VERIFICATION TEST - VER 1.**

3. VERIFY THAT THE TIPM IS CONFIGURED CORRECTLY

Turn the ignition on.

Check the following data to ensure the TIPM is configured correctly. Engine Displacement (PCM), 2WD 4WD or AWD, Axle ratio N/A, Vehicle Line (BCM), Brake type 1=ESP, Suspension 1, 2 or 3.

NOTE: **The DTC will be active when a new controller is installed until initialization is performed.**

Was the TIPM configured correctly?

Yes

Replace the FDCM in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Reprogram the appropriate module.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

U0001-CAN C BUS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Theory Of Operation

The FDCM communicates with other controllers over the CAN C bus. The FDCM continuously monitors the bus activity and receives the messages it needs. The CAN C bus is also used to communicate FDCM MIL status to the Engine Controller, therefore if the Engine Controller is unable to communicate with the FDCM, the Engine Controller will light the MIL.

Monitor Conditions

When Monitored:

Ignition run time is greater than 1 second. Battery voltage between 10 and 16 volts. Engine run time greater than 3 seconds.

Set Conditions

- **Set Condition:**

The PCM loses communication over the CAN C Bus circuit. The circuit is continuously monitored. One Trip fault.

Possible Causes

Possible Causes
CAN C BUS OPEN OR SHORTED CONDITION ANTI-LOCK BRAKE SYSTEM (ABS) MODULE FINAL DRIVE CONTROL MODULE (FDCM) POWERTRAIN CONTROL MODULE (PCM) TOTALLY INTEGRATED POWER MODULE (TIPM)

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

U0100-LOST COMMUNICATION WITH ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed
- TIPM is configured correctly

Set Conditions

- **Set Condition:**

Bus messages not received from the ECM/PCM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
CAN C+ OR CAN C- BUS CIRCUITS OPEN OR SHORTED DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY ECM/PCM POWER AND GROUND ECM/PCM IPM

MODULE THAT SET THIS DTC

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

U0101-LOST COMMUNICATION WITH TCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed
- TIPM is configured correctly

Set Conditions

- Set Condition:**

Bus messages not received from the TCM for approximately 500ms.

Possible Causes

Possible Causes
CAN C BUS CIRCUITS OPEN OR SHORTED
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
TIPM NOT CONFIGURED CORRECTLY
TCM
TCM POWER AND GROUND
MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to the ***STORED LOST COMMUNICATION DTCS** test procedure. Refer to **DIAGNOSTIC CODE INDEX**.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN B or C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. VERIFY THAT THE TCM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the TCM is active on the bus.

Is the TCM active on the bus?

Yes

Go To 4.

No

Refer to **DIAGNOSIS AND TESTING** for No Response diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the TCM?

Yes

Replace/update the TCM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0121-LOST COMMUNICATION WITH ABS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The ABS communicates with other controllers over the CAN C bus. The FDCM Module continuously monitors the bus activity and receives the messages it needs. If the FDCM does not receive messages from the ABS Module , then this fault will set and the service 4WD is illuminated.

Monitor Conditions

When Monitored:

Every 7 msec. Conditions: Battery voltage greater than 10v but less than 16v.

Set Conditions

- **Set Condition:**

CAN C bus messages not received for 10 seconds.

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

U0141-LOST COMMUNICATION WITH FCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The TIPM communicates with other controllers over the CAN C bus. The FDCM Module continuously monitors the bus activity and receives the messages it needs. If the FDCM does not receive messages from the TIPM Module , then this fault will set and the service 4WD is illuminated.

Monitor Conditions

When Monitored:

Every 7 msec. Conditions: Battery voltage greater than 10v but less than 16v.

Set Conditions

- **Set Condition:**

CAN C bus messages not received for 10 seconds.

Refer to **DIAGNOSIS AND TESTING** for diagnostic procedures and for further possible causes.

U0212-LOST COMMUNICATION WITH SCM (SAS)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- **Set Condition:**

If the Final Drive Control Module fails to receive bus messages from the Steering Angle Sensor for approximately 500 ms.

Possible Causes

Possible Causes
DTCs RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
CAN C BUS CIRCUITS OPEN OR SHORTED
STEERING ANGLE SENSOR POWER AND GROUND
STEERING ANGLE SENSOR
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

Turn the ignition on.

With the scan tool, read and record FDCM DTCs.

With the scan tool, read and record Environmental Data (EV Data).

With the scan tool, erase FDCM DTCs.

Cycle the ignition switch.

With the scan tool, read FDCM DTCs.

Does this DTC reset?

Yes

Go To 2.

No

The condition that caused the symptom is currently not present. Inspect the related wiring for a possible intermittent condition. Look for any chafed, pierced, pinched, or partially broken wires.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCs

With the scan tool, read all active DTCs from all CAN C Bus modules.

NOTE: Check for CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs related to the conditions listed above?

Yes

Diagnose and repair the DTC(s). Refer to the DIAGNOSTIC CODE INDEX in the applicable article.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **VERIFY THAT THE STEERING ANGLE SENSOR IS ACTIVE ON THE BUS**

With the scan tool, select ECU View.

Verify that the Steering Angle Sensor is active on the bus.

Is the Steering Angle Sensor active on the bus?

Yes

Refer to the ***STORED LOST COMMUNICATION DTCS** test procedure. Refer to **DIAGNOSTIC CODE INDEX**.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCS "Logged Against" the STEERING ANGLE SENSOR?

Yes

Replace/update the Steering Angle Sensor in accordance with the service information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1**.

No

Replace the Final Drive Control Module in accordance with the service information.

Replace/update the module that set this DTC in accordance with the service information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1**.

U0401-IMPLAUSIBLE DATA RECEIVED FROM ECM (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on for 4 seconds, no CAN BUS circuit error condition present, no lost communication with PCM condition present, and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is receiving implausible data for pedal position, engine RPM, torque, or engine coolant temperature from the PCM.

Possible Causes

Possible Causes
POWERTRAIN DTCS PRESENT FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **POWERTRAIN DTCS PRESENT**

Ignition on.

With the scan tool, read DTCs in the Powertrain Control Module.

Are there any active DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the applicable diagnostic procedure.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

U0402-IMPLAUSIBLE DATA RECEIVED FROM TCM (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on for 4 seconds, no CAN BUS circuit error condition present, no lost communication

with TCM condition present, and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is receiving implausible data for gear or PRNDL position from the TCM.

Possible Causes

Possible Causes
TRANSMISSION DTCS PRESENT FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **TRANSMISSION DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, read DTCs in the Transmission Control Module.

Are there any DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the applicable diagnostic procedure.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

U0415-IMPLAUSIBLE DATA RECEIVED FROM ABS (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on for 4 seconds, no CAN BUS circuit error condition present, no lost communication with ABS condition present, and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is receiving implausible data for vehicle speed, wheel speeds, brake switch status, longitudinal acceleration, yaw rate, or lateral acceleration from the ABS controller.

Possible Causes

Possible Causes
ANTILOCK BRAKE SYSTEM DTCS PRESENT FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **ABS DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, read DTCs in the Antilock Brake Controller.

Are there any DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the applicable diagnostic procedure.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

U0429-IMPLAUSIBLE DATA RECEIVED FROM SCM (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on for 4 seconds, no CAN BUS circuit error condition present, no lost communication with SCM condition present, and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is receiving implausible data for sensor status from the SCM.

Possible Causes

Possible Causes
STEERING COLUMN CONTROL MODULE DTCS PRESENT FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. **STEERING COLUMN CONTROL MODULE DTCS PRESENT**

Ignition on, engine not running.

With the scan tool, read DTCs in the Steering Column Control Module.

Are there any DTCs present?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the applicable diagnostic procedure.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Final Drive Control Module in accordance with the Service Information.
Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

U0431-IMPLAUSIBLE DATA RECEIVED FROM FCM (FDCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on for 4 seconds, no CAN BUS circuit error condition present, no lost communication with FCM condition present, and no system undervoltage or overvoltage condition present.

Set Conditions

- **Set Condition:**

The Final Drive Control Module is receiving no message or implausible data for ambient temperature or the transfer case selector switch.

Possible Causes

Possible Causes
CLUSTER CONTROL NODE (CCN) DTCS PRESENT
TOTALLY INTEGRATED POWER MODULE (TIPM) DTCS PRESENT
TOTALLY INTEGRATED POWER MODULE (TIPM) CONFIGURED INCORRECTLY
TRANSFER CASE SELECTOR SWITCH
AMBIENT TEMPERATURE SENSOR
FINAL DRIVE CONTROL MODULE (FDCM)

Diagnostic Test

1. DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

Ignition on, engine not running.

With the scan tool, read DTCs in the Final Drive Control Module.

Is the status Active for this DTC?

Yes

Go to 2.

No

Go to 5.

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

With the scan tool, read all active DTCs from the TIPM and CCN.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Refer to **DIAGNOSTIC CODE INDEX** and perform the applicable diagnostic procedure.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Go to 3.

3. AMBIENT TEMPERATURE SENSOR

With the scan tool, monitor the ambient temperature in the Totally Integrated Power Module (TIPM).

Is the ambient temperature at room temperature?

Yes

Go to 4.

No

Replace the Ambient Temperature Sensor in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

4. TRANSFER CASE SELECTOR SWITCH

With the scan tool, monitor the voltages of the transfer case selector switch positions in the CCN.

Transfer Case Selector Switch Position Voltage	
Transfer Case Selector Switch Position	Voltage Range
Neutral	0.67 volts - 0.95 volts
2WD	1.98 volts - 2.22 volts
4WD AWD (MP3022)	2.62 volts - 2.88 volts
4WD LOCK (MP1522)	3.39 volts - 3.65 volts
4WD LOW	4.05 volts - 4.30 volts

Are the voltages of the transfer case selector switch within the specified ranges?

Yes

Replace the Final Drive Control Module in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Replace the Transfer Case Selector Switch in accordance with the Service Information.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

5. INTERMITTENT WIRING AND CONNECTORS

The conditions necessary to set this DTC are not present at this time.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

While monitoring the scan tool data relative to this circuit, wiggle test the wiring and connectors.

Look for the data to change or for the DTC to reset during the wiggle test.

Were any problems found?

Yes

Repair as necessary.

Perform **TRANSFER CASE VERIFICATION TEST - VER 1.**

No

Test complete.

STANDARD PROCEDURE

TRANSFER CASE VERIFICATION TEST - VER 1

Disconnect all jumper wires and reconnect all previously disconnected components and connectors.

With the scan tool, select clear Stored DTCs.

Make sure that all accessories are turned off and that the battery is fully charged.

Test drive the vehicle in each Transfer Case range and verify proper operation in each range.

To select or deselect 2WD, AWD or 4HI mode, vehicle speed must be below 88 Km/h (55 mph) with all wheels at vehicle speed.

Shifts will not take place with a wheel speed difference of greater than 21 Km/h (13 mph) between the front and rear wheels.

To select or deselect 4LO (if equipped), vehicle speed must be below 5 Km/h (3 mph) with the ignition ON and the transmission in neutral (auto trans) or the clutch pedal pressed (man trans).

To select or deselect Transfer Case Neutral, vehicle speed must be 0 Km/h (0 mph) with the ignition ON, engine OFF, the brake pedal applied, and the transmission in neutral (auto trans) or the clutch pedal pressed (man trans). Press the Neutral button (if equipped) on the Transfer Case Selector Switch until the Neutral Indicator is illuminated.

WARNING: Apply the parking brake. The vehicle may roll with the Transfer Case in neutral.

To verify that the Transfer Case is in Neutral, shift the automatic transmission into reverse and release the

brake pedal for three seconds or shift the manual transmission into gear and slowly release the clutch pedal. There should be no vehicle movement if the Transfer Case is in Neutral.

With the scan tool, select View DTCs in the Totally Integrated Power Module (TIPM) and in the Instrument Cluster (CCN).

Are there any DTCs present in the Totally Integrated Power Module (TIPM) or in the Instrument Cluster (CCN)?

Yes

Return to the symptom list and perform the appropriate diagnostic test.

No

Repair is complete.

2008 JEEP

Liberty

BUZZERS, RELAYS & TIMERS

BUZZERS, RELAYS & TIMERS LOCATION

Component	Location
Auto Shut Down Relay	In totally integrated power module. See Fig. 1 .
Brake Lamp Activation Relay	Base of left "D" pillar. See Fig. 31 .
Radiator Fan Control Relay	In totally integrated power module. See Fig. 1 .
Radiator Fan High Relay	Right front of engine compartment. See Fig. 2 .
Rear Window Defogger Relay	In totally integrated power module. See Fig. 1 .
Run/Accessory Relay	In totally integrated power module. See Fig. 1 .
Run Relay	In totally integrated power module. See Fig. 1 .
Run/Start Relay	In totally integrated power module. See Fig. 1 .
Secondary Door Lock Relay	Under right end of dash. See Fig. 19 .
Secondary Door Unlock Relay	Under right end of dash. See Fig. 19 .
Starter Relay	In totally integrated power module. See Fig. 1 .
Trailer Tow Relay (Left/Right)	Base of left "D" pillar. See Fig. 31 .
Transmission Control Relay	In totally integrated power module. See Fig. 1 .

CIRCUIT PROTECTION DEVICES

CIRCUIT PROTECTION DEVICES LOCATION

Component	Location
Circuit Breaker 1	In totally integrated power module. See Fig. 1 .
Power Seat Circuit Breaker	Under driver's seat. See Fig. 26 .
Totally Integrated Power Module	Left front of engine compartment. See Fig. 13 .

CONTROL UNITS

CONTROL UNITS LOCATION

Component	Location
Anti-Lock Brakes (EPS) Module	Left rear of engine compartment. See Fig. 12 .
Compass Module	Right rear of headliner.
Door Module (Driver)	Front of driver's door. See Fig. 24 .
Door Module (Passenger)	Front of front passenger's door.
Final Drive Module	Behind left side of dash. See Fig. 20 .
Fuel Pump Module	In fuel tank. See Fig. 30 .
Hands Free Module	Behind right quarterpanel. See Fig. 32 .
Heated Seats Module	Under front passenger's seat. See Fig. 26 .

Inverter Module	Under right rear seat. See Fig. 28.
Memory Seat Module	Under driver's seat.
Occupant Classification Module	Under front passenger's seat. See Fig. 26.
Occupant Restraint Controller Module	Under center console. See Fig. 21.
Park Assist Module	Behind right quarterpanel. See Fig. 32.
Powertrain Control Module	Right rear of engine compartment. See Fig. 14.
Radiator Cooling Fan Module	Right front of engine compartment. See Fig. 2.
Sentry Key Remote Entry/WCM	Behind left side of dash. See Fig. 20.
Steering Control Module	Under left side of dash. See Fig. 21.
Sunroof Module	Front of roof. See Fig. 17.
Totally Integrated Power Module	Left front of engine compartment. See Fig. 13.
Transmission Control Module	Below steering column.

MOTORS

MOTORS LOCATION

Component	Location
Blend Door Actuator	Behind left side of dash, on HVAC assembly. See Fig. 20.
Blower Motor	Behind right side of dash, on HVAC assembly. See Fig. 20.
Door Latch (Driver)	Rear of driver's door. See Fig. 24.
Door Latch (Left Rear)	Rear of left rear door. See Fig. 25.
Door Latch (Passenger)	Rear of front passenger's door.
Door Latch (Right Rear)	Rear of right rear door.
Flip-Up Glass Latch	Inside upper center of tailgate. See Fig. 34.
Liftgate Door Latch	In liftgate. See Fig. 35.
Mode Door Actuator	Behind left side of dash, on HVAC assembly. See Fig. 20.
Outside Rearview Mirror (Driver)	At mirror. See Fig. 24.
Outside Rearview Mirror (Passenger)	At mirror.
Seat Horizontal Adjuster Motor (Driver)	Under driver's seat. See Fig. 26.
Seat Horizontal Adjuster Motor (Passenger)	Under front passenger's seat.
Seat Vertical Adjuster Motor (Driver Front/Rear)	Under driver's seat. See Fig. 26.
Starter	Lower left rear of engine. See Fig. 6.
Throttle Body	Top center of engine. See Fig. 7.
Transfer Case Motor	Rear of transfer case. See Fig. 11.
Window Motor (Driver)	Lower center of driver's door. See Fig. 24.
Window Motor (Left Rear)	In left rear door. See Fig. 25.
Window Motor (Passenger)	Lower center of front passenger's door.
Window Motor (Right Rear)	In right rear door.
Windshield Washer Pump	Washer fluid reservoir.

Wiper Motor (Front)	Left rear of engine compartment. See Fig. 15 .
Wiper Motor (Rear)	In liftgate. See Fig. 35 .

SENDING UNITS & SENSORS

SENDING UNITS & SENSORS LOCATION

Component	Location
ABS Wheel Speed Sensor (Left Front)	Left side of engine compartment. See Fig. 12 .
ABS Wheel Speed Sensor (Left Rear)	At left rear wheel. See Fig. 29 .
ABS Wheel Speed Sensor (Right Front)	Right side of engine compartment. See Fig. 16 .
ABS Wheel Speed Sensor (Right Rear)	At right rear wheel. See Fig. 29 .
A/C Pressure Transducer	Right rear of engine compartment. See Fig. 14 .
Ambient Air Temperature Sensor	Right front of engine compartment.
Brake Fluid Level Sensor	On brake fluid reservoir. See Fig. 12 .
Camshaft Position Sensor	Lower right front of engine. See Fig. 10 .
Crankshaft Position Sensor	Lower right side of engine. See Fig. 10 .
Dynamics (ESP) Sensor	Under front passenger's seat. See Fig. 23 .
Engine Coolant Temperature Sensor	Top front of engine. See Fig. 7 .
Evaporator Temperature Sensor	Behind right side of dash, on HVAC assembly. See Fig. 20 .
Front Impact Sensor (Left)	Left front of engine compartment. See Fig. 3 .
Front Impact Sensor (Right)	Right front of engine compartment. See Fig. 2 .
Infrared Sensor	In headliner.
Intake Air Temperature Sensor	Top of engine. See Fig. 9 .
Knock Sensor No. 1	Left side of engine. See Fig. 9 .
Knock Sensor No. 2	Right side of engine. See Fig. 9 .
MAP Sensor	Top front of engine. See Fig. 7 .
Oxygen Sensor 1/1	Lower left side of engine. See Fig. 11 .
Oxygen Sensor 1/2	Left side of transmission. See Fig. 11 .
Oxygen Sensor 2/1	Lower right side of engine. See Fig. 11 .
Oxygen Sensor 2/2	Right side of transmission. See Fig. 9 .
Park Assist Sensors No. 8 -11 (Parktronics)	Behind rear fascia.
Rain Sensor	In overhead harness.
Seat Track Position Sensor (Driver)	Under driver's seat. See Fig. 26 .
Seat Track Position Sensor (Passenger)	Under front passenger's seat. See Fig. 26 .
Seat Weight Sensor (Left/Right Front)	Under front passenger's seat. See Fig. 26 .
Seat Weight Sensor (Left/Right Rear)	Under front passenger's seat. See Fig. 26 .
Side Impact Sensor 1 (Left)	In left "B" pillar. See Fig. 27 .
Side Impact Sensor 1 (Right)	In right "B" pillar. See Fig. 28 .
Side Impact Sensor 2 (Left)	Base of left "C" pillar. See Fig. 31 .
Side Impact Sensor 2 (Right)	Base of right "C" pillar. See Fig. 32 .

Steering Angle Sensor	Under left side of dash. See Fig. 21.
Sunload Sensor	In overhead harness.
Tire Pressure Transponder (Left Front)	Left front of engine compartment. See Fig. 3.
Tire Pressure Transponder (Left Rear)	Under left rear of body. See Fig. 33.
Tire Pressure Transponder (Right Front)	Right front of engine compartment. See Fig. 3.
Tire Pressure Transponder (Right Rear)	Under right rear of body.

SOLENOIDS & SOLENOID VALVES

SOLENOIDS & SOLENOID VALVES LOCATION

Component	Location
A/C Compressor Clutch	Top front of engine. See Fig. 7.
EGR Valve Assembly	Left rear of engine. See Fig. 9.
Evap/Purge Solenoid	Left front of engine. See Fig. 7.
Fuel Injectors No. 1, 3 & 5	Top left side of engine. See Fig. 7.
Fuel Injectors No. 2, 4 & 6	Top right side of engine. See Fig. 8.

SWITCHES

SWITCHES LOCATION

Component	Location
Backup Lamp Switch	Left side of transmission. See Fig. 11.
EVAP Systems Monitor Switch	At front of fuel tank. See Fig. 33.
Hood Ajar Switch	Left front of engine compartment. See Fig. 3.
Oil Pressure Switch	Lower left front of engine. See Fig. 7.
Parking Brake Switch	At base of parking brake lever. See Fig. 23.
Transmission Solenoid/Pressure Switch Assembly	Right side of transmission. See Fig. 9.

MISCELLANEOUS

MISCELLANEOUS LOCATION

Component	Location
Blower Motor Resistor Block	Behind right side of dash. See Fig. 20.
Clockspring	Behind steering wheel.
Data Link Connector	Under left side of dash. See Fig. 21.
Driver Airbag Squib 1 & 2	In steering wheel. See Fig. 22.
Generator	Top left front of engine. See Fig. 8.
Horn 1 & 2	Left front of engine compartment. See Fig. 3.
Ignition Coils No. 1, 3 & 5	Top of left side of engine. See Fig. 7.
Ignition Coils No. 2, 4 & 6	Top of right side of engine. See Fig. 8.
Passenger Airbag Squib 1 & 2	Behind right end of instrument panel. See Fig. 20.

Radio Amplifier	Behind right quarterpanel. See Fig. 32.
Seat Belt Buckle Tensioner (Driver)	Under driver's seat.
Seat Belt Buckle Tensioner (Passenger)	Under front passenger's seat. See Fig. 26.
Seat Belt Retractor/Tensioner (Driver)	Base of left "B" pillar. See Fig. 27.
Seat Belt Retractor/Tensioner (Passenger)	Base of right "B" pillar. See Fig. 28.
Side Curtain Airbag (Left)	In left "D" pillar. See Fig. 31.
Side Curtain Airbag (Right)	In right "D" pillar.
Trailer Tow Wiring (7-Way Connector)	Below center of rear bumper. See Fig. 33.

CONNECTORS

CONNECTORS LOCATION

Component	Location
C105 (734 Pin)	Left rear of engine compartment. See Fig. 12.
C127 (14 Pin)	Lower right side of engine compartment. See Fig. 16.
C201 (43 Pin)	Behind left kick panel. See Fig. 18.
C202 (43 Pin)	Behind left kick panel. See Fig. 18.
C231 (2 Pin)	Behind right end of instrument panel. See Fig. 20.
C232 (4 Pin)	Right front of engine compartment. See Fig. 2.
C304 (14 Pin)	Left side of engine compartment. See Fig. 13.
C306 (24 Pin)	In right "D" pillar. See Fig. 32.
C307 (24 Pin)	Behind left kick panel. See Fig. 18.
C308 (24 Pin)	Behind right kick panel. See Fig. 18.
C309 (14 Pin)	In left "B" pillar. See Fig. 25.
C310 (14 Pin)	In right "B" pillar. See Fig. 25.
C311 (14 Pin)	Under driver's seat. See Fig. 26.
C312 (14 Pin)	Under front passenger's seat. See Fig. 23.
C313 (13 or 24 Pin)	In right "D" pillar. See Fig. 32.
C314 (8 Pin)	Under right rear seat. See Fig. 28.
C315 (16 Pin)	In left "D" pillar. See Fig. 31.
C316 (13 Pin)	Behind right kick panel. See Fig. 18.
C317 (13 or 16 Pin)	Behind left kick panel. See Fig. 18.
C318 (16 Pin)	In left "D" pillar. See Fig. 31.
C319 (4 Pin)	Under driver's seat. See Fig. 26.
C320 (4 Pin)	Under front passenger's seat. See Fig. 26.
C321 (8 Pin)	Under left rear of vehicle. See Fig. 33.
C322 (24 Pin)	In right "D" pillar. See Fig. 32.
C323 (11 Pin)	Top of liftgate. See Fig. 34.
C324 (4 Pin)	Left front of engine compartment. See Fig. 3.
C326 (8 Pin)	Top of liftgate. See Fig. 34.

C329 (3 Pin)	Behind left end of instrument panel. See Fig. 20.
--------------	--

GROUNDINGS

GROUNDINGS LOCATION

Component	Location
G100	Lower left side of engine. See Fig. 6.
G101	Lower right front of engine. See Fig. 10.
G102	Left rear of engine compartment. See Fig. 14.
G103	Left side of engine compartment. See Fig. 5.
G106	Left rear of engine compartment. See Fig. 12.
G107	Left side of engine compartment. See Fig. 12.
G108	Left front of engine compartment. See Fig. 3.
G200	Under left end of dash. See Fig. 21.
G201	Under left end of dash. See Fig. 21.
G300	Base of left "D" pillar. See Fig. 31.
G301	Base of right "D" pillar. See Fig. 32.
G302	Under right rear seat. See Fig. 28.
G303	Under right rear seat. See Fig. 28.
G304	Under driver's seat. See Fig. 23.
G305	Under driver's seat. See Fig. 23.
G306	Under lower left side of center console. See Fig. 21.
G307	Under front passenger's seat. See Fig. 23.

SPLICES

SPLICES LOCATION

Component	Location
S101	Left front engine of compartment. See Fig. 3.
S102	Left front engine of compartment. See Fig. 3.
S103	Near breakout for left headlight. See Fig. 4.
S104	Near totally integrated power module C3 & C4. See Fig. 4.
S108	Left front engine of compartment. See Fig. 3.
S109	Left front engine of compartment. See Fig. 3.
S114	Right rear of engine compartment. See Fig. 14.
S115	Right rear of engine compartment. See Fig. 14.
S116	Rear of engine. See Fig. 9.
S117	Rear of engine. See Fig. 9.
S118	Right rear of engine compartment. See Fig. 14.
S119	Left rear of engine. See Fig. 7.

S120	Rear of engine. See <u>Fig. 9.</u>
S121	Right rear of engine. See <u>Fig. 9.</u>
S122	Left side of transmission. See <u>Fig. 11.</u>
S125	Right rear of engine compartment. See <u>Fig. 14.</u>
S126	Rear of engine. See <u>Fig. 9.</u>
S131	Right rear of engine compartment. See <u>Fig. 14.</u>
S134	Left rear of engine. See <u>Fig. 7.</u>
S135	Rear of engine. See <u>Fig. 9.</u>
S137	In breakout for battery-negative.
S138	In breakout for battery-positive. See <u>Fig. 5.</u>
S143	In cooling jumper harness.
S144	In battery harness.
S201	Behind left side of instrument panel. See <u>Fig. 21.</u>
S202	Behind center of instrument panel. See <u>Fig. 20.</u>
S203	Behind left side of instrument panel. See <u>Fig. 20.</u>
S204	Behind right side of instrument panel, near blower motor resistor block. See <u>Fig. 20.</u>
S205	Behind right center of instrument panel. See <u>Fig. 20.</u>
S206	Behind center of instrument panel. See <u>Fig. 20.</u>
S207	Behind left side of instrument panel. See <u>Fig. 20.</u>
S208	Behind left kick panel, near C202.
S209	Behind right center of instrument panel. See <u>Fig. 20.</u>
S211	Behind right center of instrument panel. See <u>Fig. 20.</u>
S213	Behind left kick panel, near C202.
S216	Behind left side of instrument panel. See <u>Fig. 20.</u>
S220	Behind left side of instrument panel. See <u>Fig. 20.</u>
S221	Near breakout for instrument cluster. See <u>Fig. 21.</u>
S222	Behind right side of instrument panel. See <u>Fig. 20.</u>
S223	Behind right side of instrument panel. See <u>Fig. 20.</u>
S230	Behind lower center of instrument panel. See <u>Fig. 21.</u>
S231	In steering wheel harness.
S232	In steering wheel harness.
S300	In body harness, at C311 breakout. See <u>Fig. 23.</u>
S301	Right rear body.
S302	Right rear body.
S303	In body harness, at C311 breakout. See <u>Fig. 23.</u>
S304	Left rear body. See <u>Fig. 27.</u>
S305	Left front of engine compartment. See <u>Fig. 4.</u>
S306	In driver's seat.
S307	Near base of left "B" pillar. See <u>Fig. 27.</u>

S308	Left rear body. See <u>Fig. 27.</u>
S309	Left center body. See <u>Fig. 27.</u>
S310	Near base of left "B" pillar. See <u>Fig. 27.</u>
S311	Left side of body, at breakout for C202. See <u>Fig. 18.</u>
S312	Left side of body, at breakout for G305. See <u>Fig. 23.</u>
S313	Left rear of engine compartment. See <u>Fig. 12.</u>
S314	Near base of left "B" pillar. See <u>Fig. 27.</u>
S315	In breakout for ABS module. See <u>Fig. 12.</u>
S316	Floor, near left front door. See <u>Fig. 18.</u>
S317	Front left floor, near left kick panel. See <u>Fig. 18.</u>
S318	Left rear body. See <u>Fig. 31.</u>
S319	Front left floor, near left kick panel. See <u>Fig. 18.</u>
S320	Left rear body. See <u>Fig. 31.</u>
S321	Left rear body. See <u>Fig. 31.</u>
S322	In front passenger seat. See <u>Fig. 26.</u>
S323	In front passenger seat. See <u>Fig. 26.</u>
S324	In front passenger seat.
S325	Front left floor, near left kick panel. See <u>Fig. 18.</u>
S326	Behind left kick panel, near C202. See <u>Fig. 18.</u>
S328	Floor, near left front door. See <u>Fig. 18.</u>
S329	Left floor pan, near front door. See <u>Fig. 18.</u>
S330	Left rear of engine compartment. See <u>Fig. 12.</u>
S332	Left rear of engine compartment. See <u>Fig. 12.</u>
S333	Behind right kick panel. See <u>Fig. 18.</u>
S334	Floor, near right front door. See <u>Fig. 18.</u>
S335	In front passenger's door.
S341	Behind left kick panel. See <u>Fig. 18.</u>
S345	Right side of liftgate. See <u>Fig. 34.</u>
S346	Left rear door, near breakout for rear speaker. See <u>Fig. 25.</u>
S347	Left rear door, near breakout for rear speaker. See <u>Fig. 25.</u>
S348	Left rear door, near breakout for rear speaker. See <u>Fig. 25.</u>
S349	Left rear door, near breakout for rear speaker. See <u>Fig. 25.</u>
S351	In liftgate.
S353	In front passenger's seat. See <u>Fig. 26.</u>
S354	In front passenger's seat. See <u>Fig. 26.</u>
S357	Left side of body, at breakout for C202. See <u>Fig. 18.</u>
S358	In driver's door. See <u>Fig. 24.</u>
S359	Right rear of headliner.

S360	Right front of engine compartment. See <u>Fig. 2.</u>
S362	Behind right kick panel. See <u>Fig. 18.</u>
S363	In body harness.
S365	Behind right kick panel. See <u>Fig. 18.</u>
S366	Left rear body. See <u>Fig. 27.</u>
S367	Right rear of headliner.
S368	Left rear body. See <u>Fig. 27.</u>
S369	Behind rear fascia, between park assist sensors 9 & 10.
S370	Behind rear fascia, between park assist sensors 10 & 11.
S371	Behind left kick panel. See <u>Fig. 18.</u>
S372	In liftgate.
S374	In driver's door. See <u>Fig. 24.</u>
S375	Behind rear fascia, between park assist sensors 10 & 11.
S376	At DVD.

COMPONENT LOCATION GRAPHICS

NOTE: Figures may show multiple component locations. Refer to appropriate table for proper figure references.

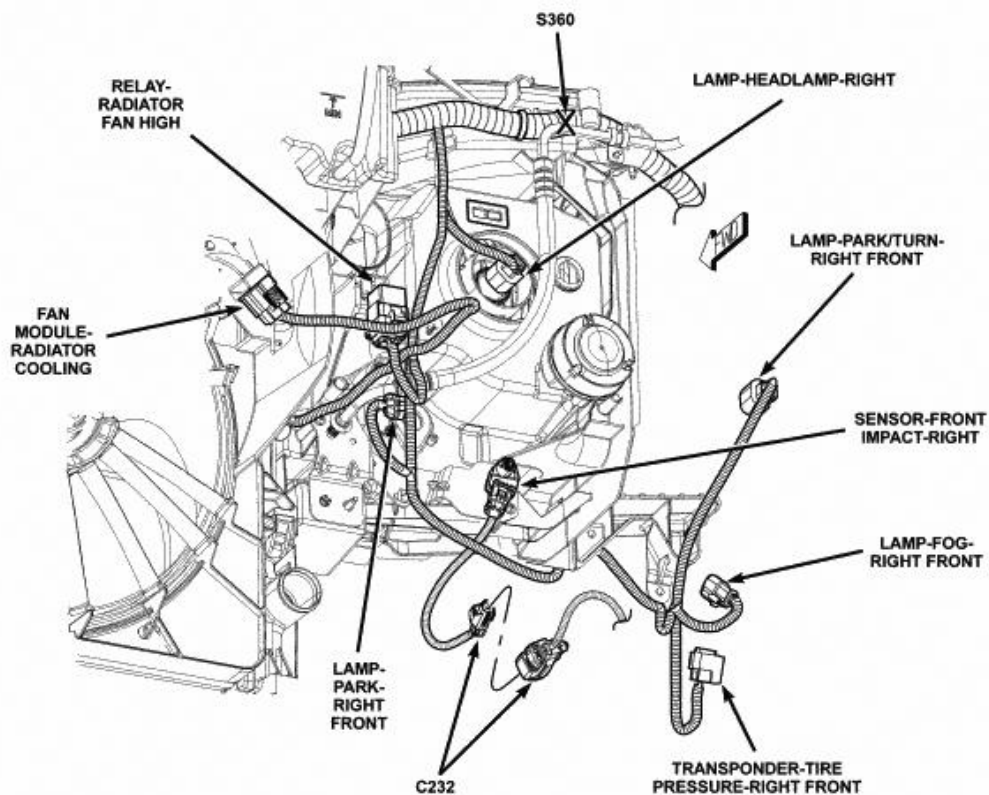


Fig. 2: Right Front Of Engine Compartment
 Courtesy of CHRYSLER LLC

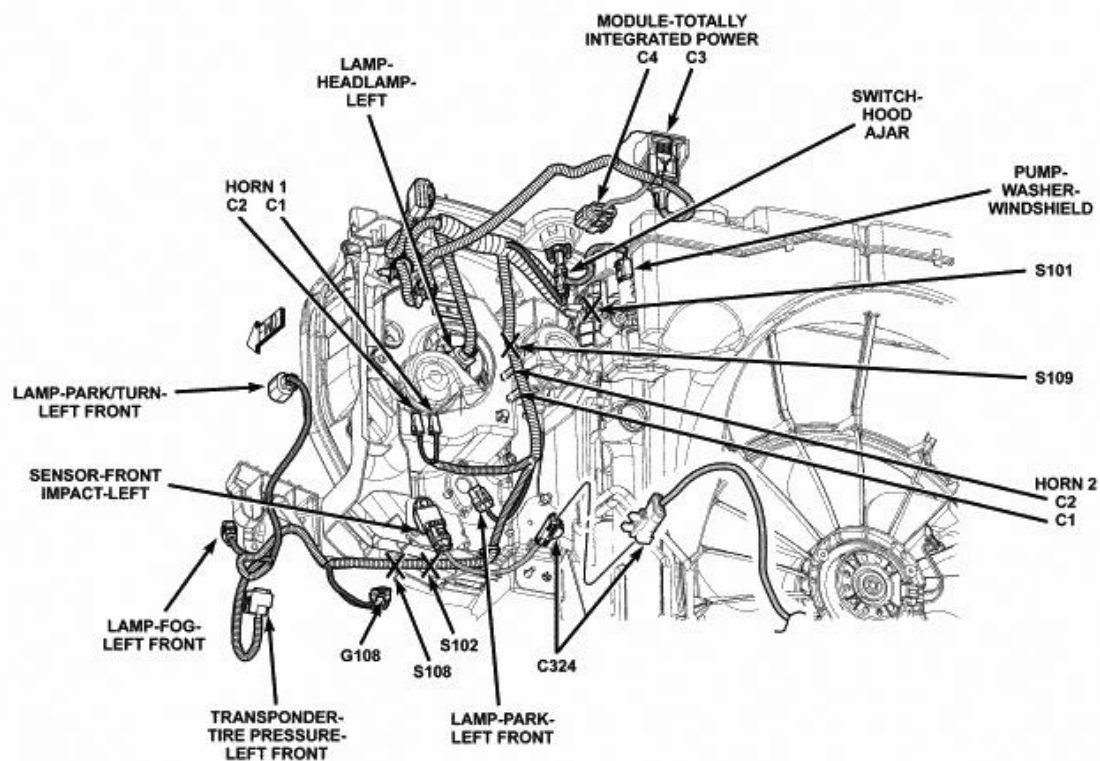


Fig. 3: Left Front Of Engine Compartment
Courtesy of CHRYSLER LLC

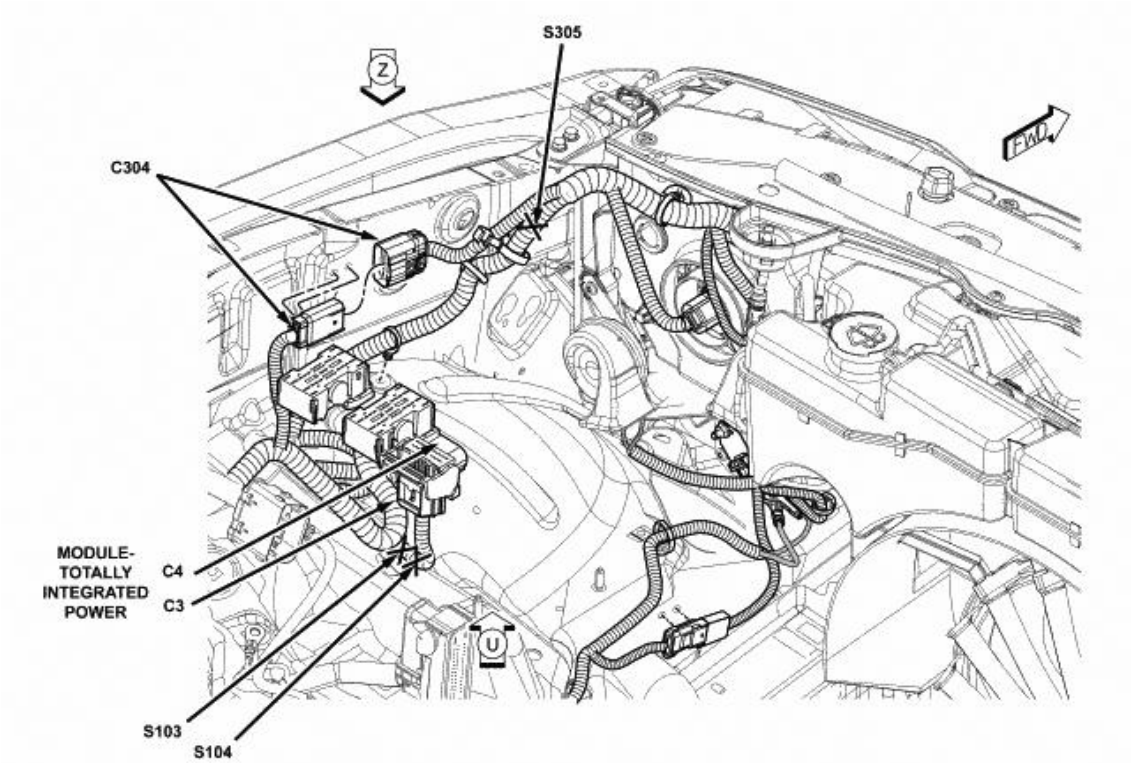


Fig. 4: Left Side Of Engine Compartment
Courtesy of CHRYSLER LLC

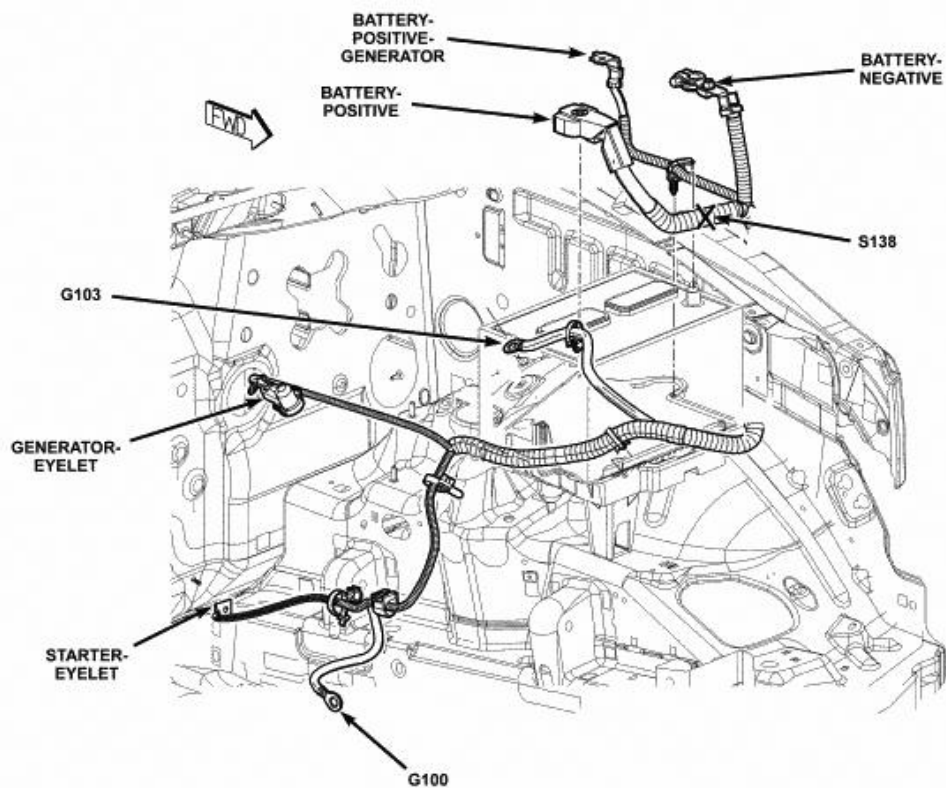


Fig. 5: Left Side Of Engine Compartment
 Courtesy of CHRYSLER LLC

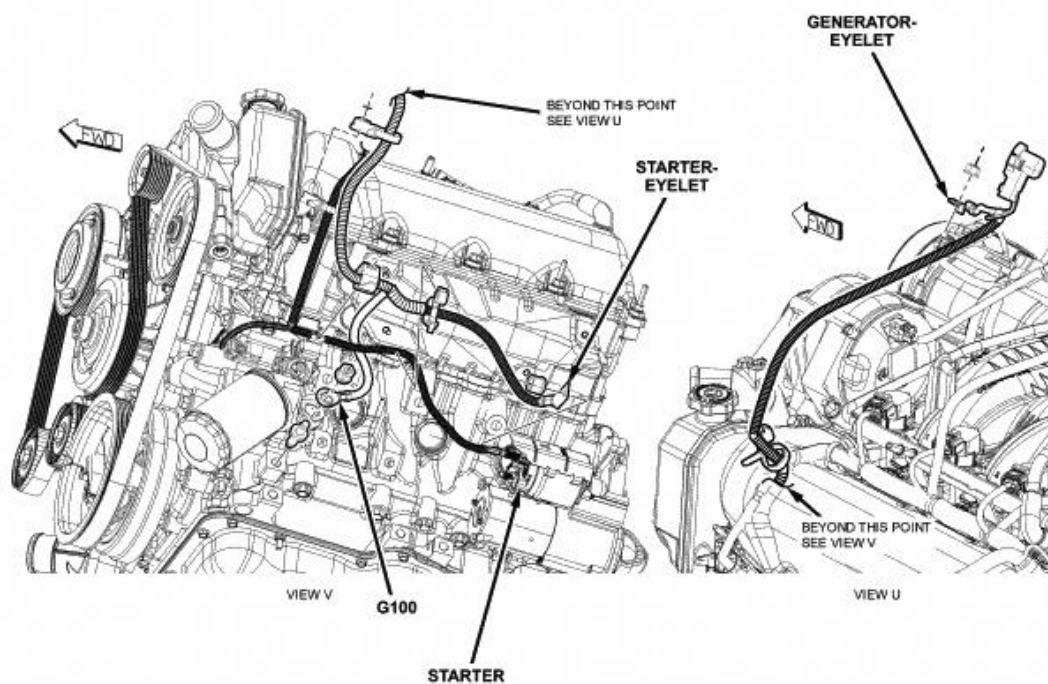


Fig. 6: Left Side Of Engine
Courtesy of CHRYSLER LLC

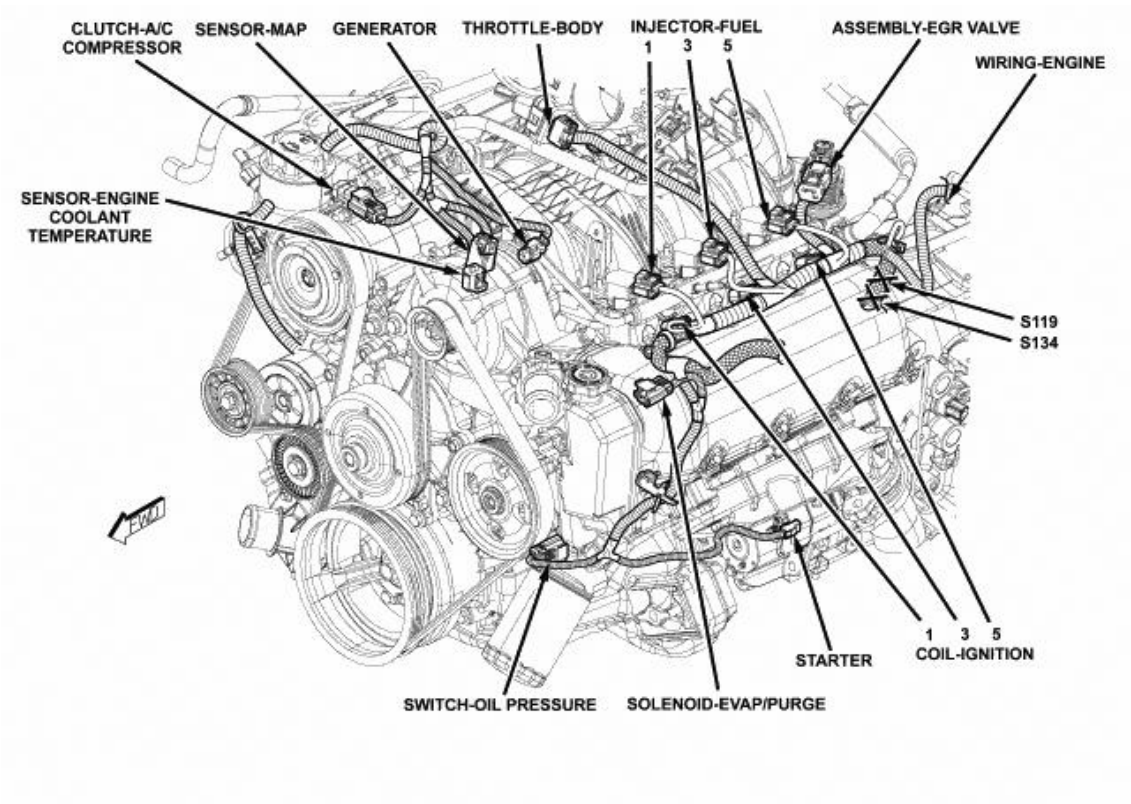


Fig. 7: Left Side Of Engine
Courtesy of CHRYSLER LLC

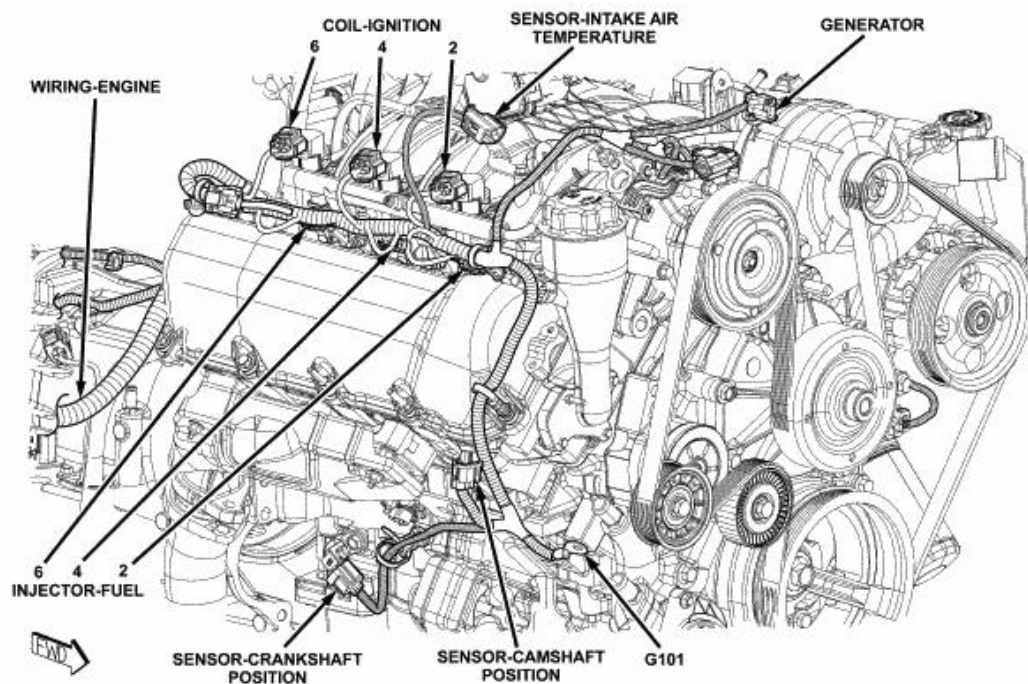


Fig. 8: Right Side Of Engine
 Courtesy of CHRYSLER LLC

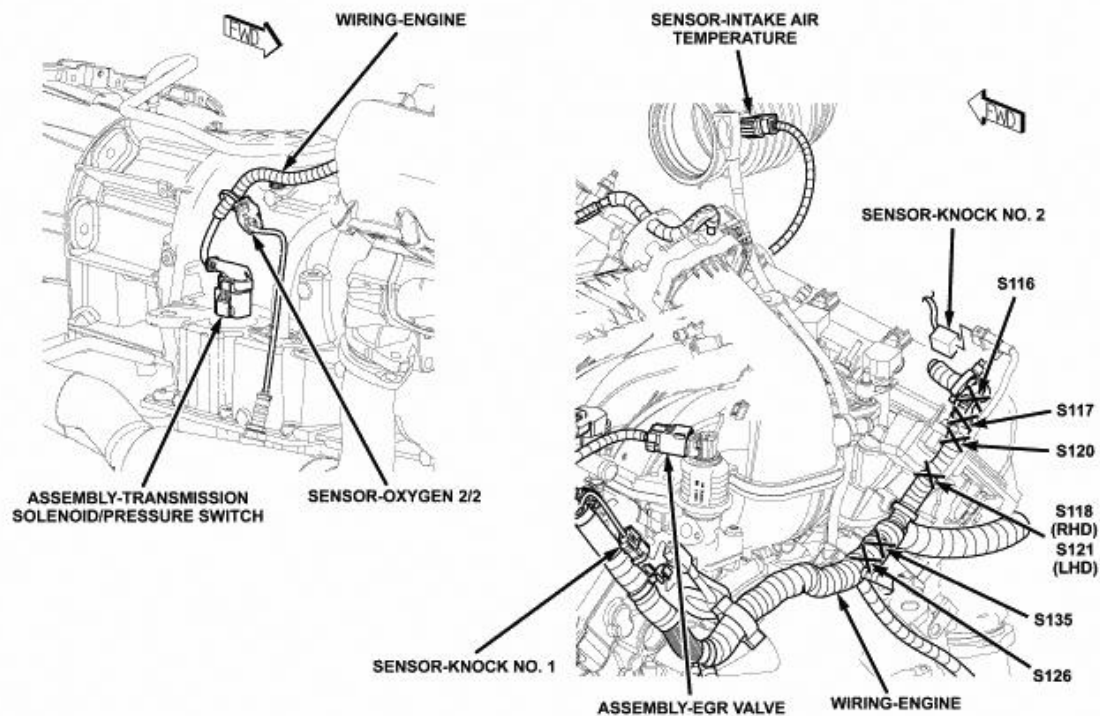


Fig. 9: Rear Of Engine
Courtesy of CHRYSLER LLC

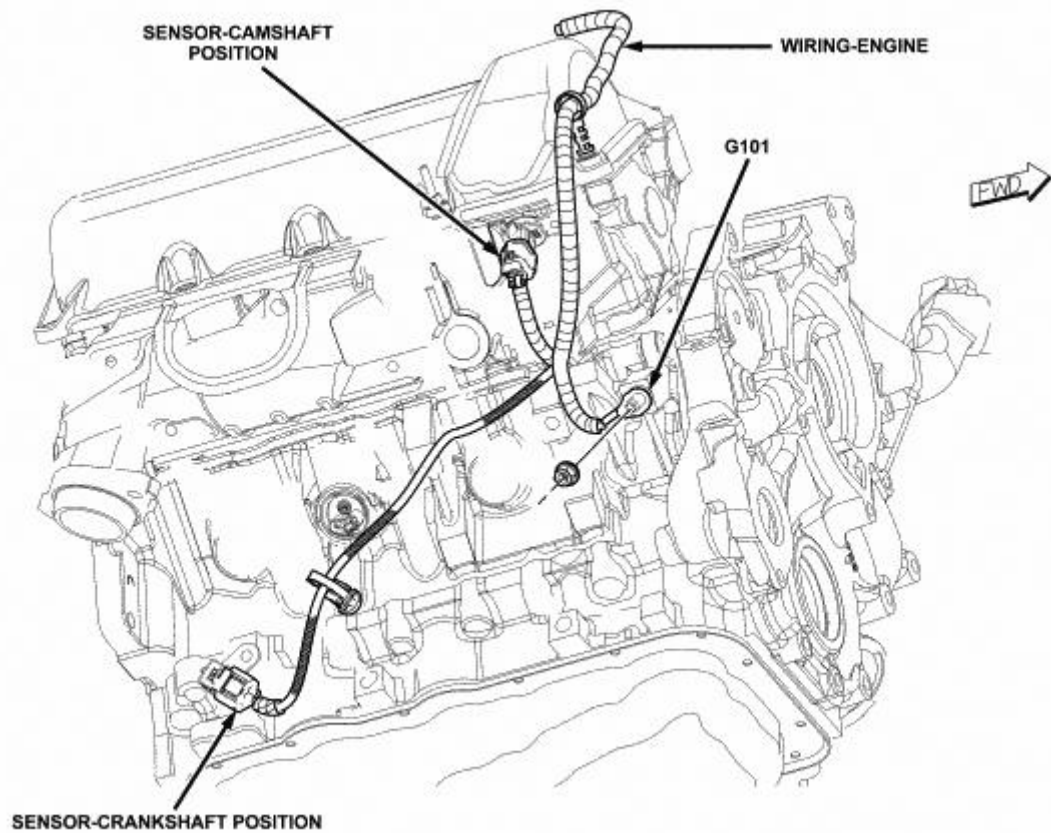


Fig. 10: Lower Right Side Of Engine
Courtesy of CHRYSLER LLC

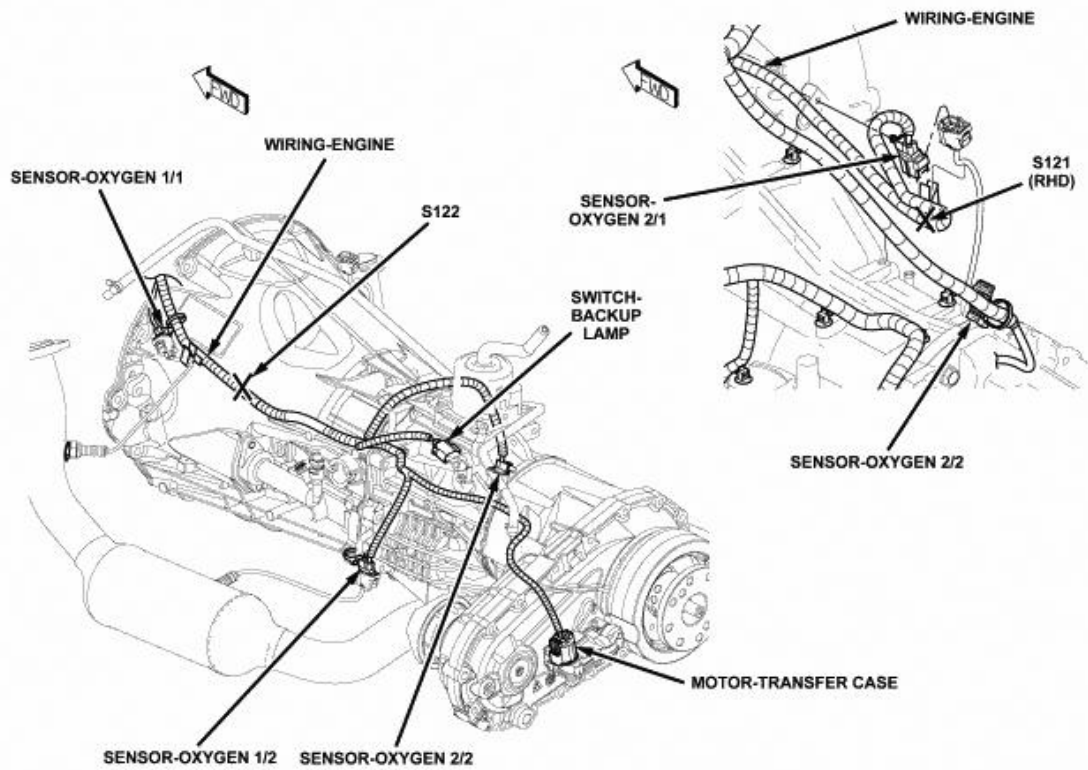


Fig. 11: Left Side Of Transmission
 Courtesy of CHRYSLER LLC

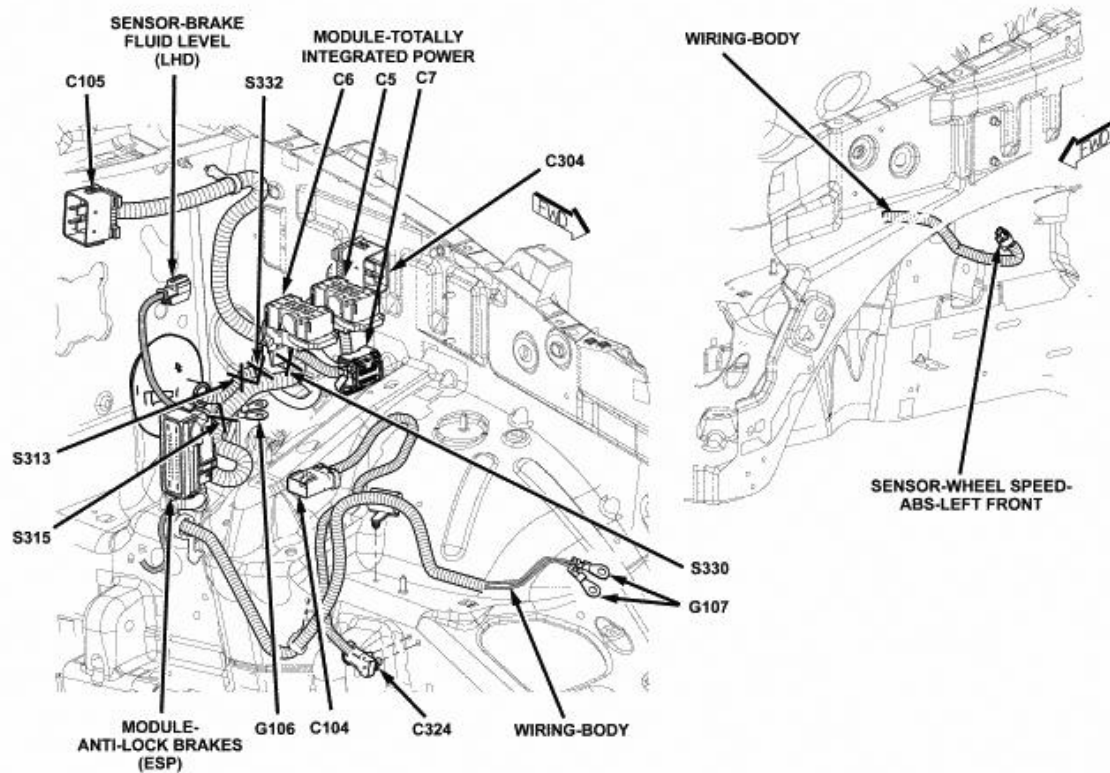


Fig. 12: Left Rear Of Engine Compartment
Courtesy of CHRYSLER LLC

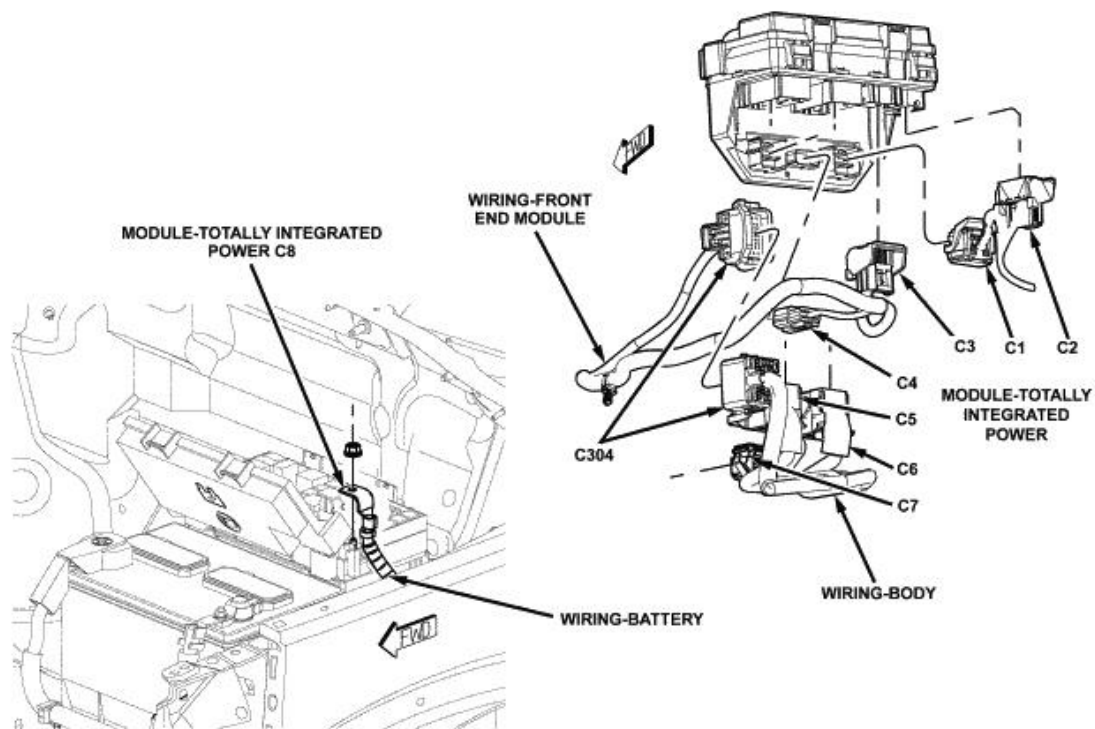


Fig. 13: Left Side Of Engine Compartment
Courtesy of CHRYSLER LLC

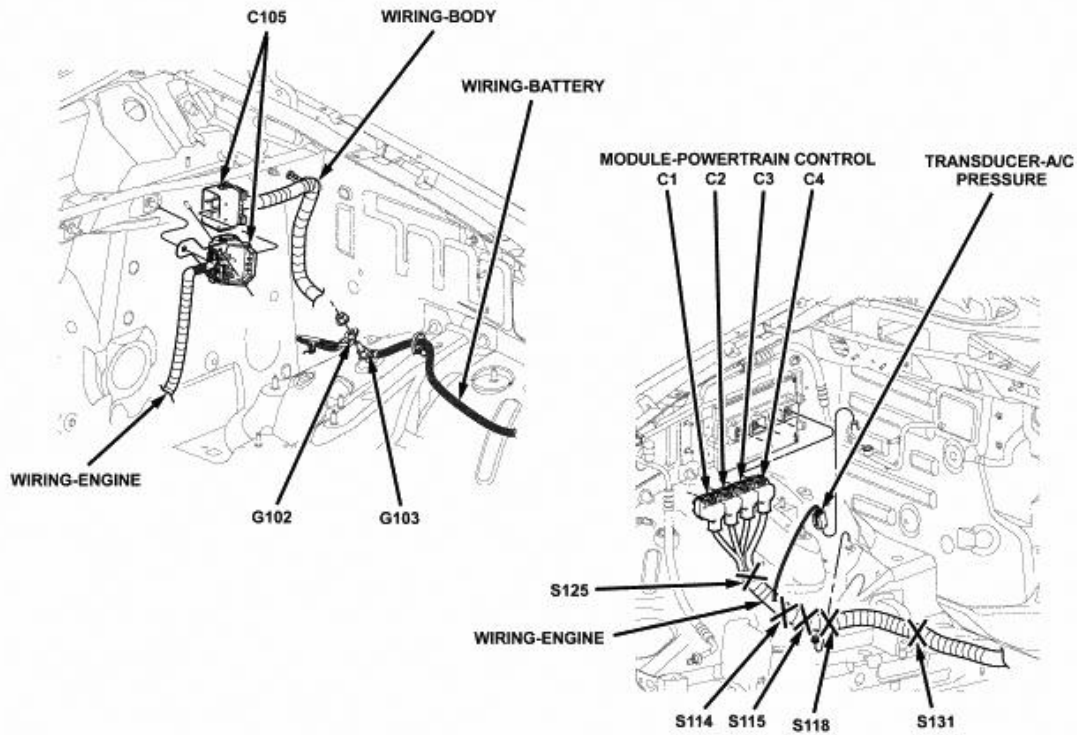


Fig. 14: Rear Of Engine Compartment
Courtesy of CHRYSLER LLC

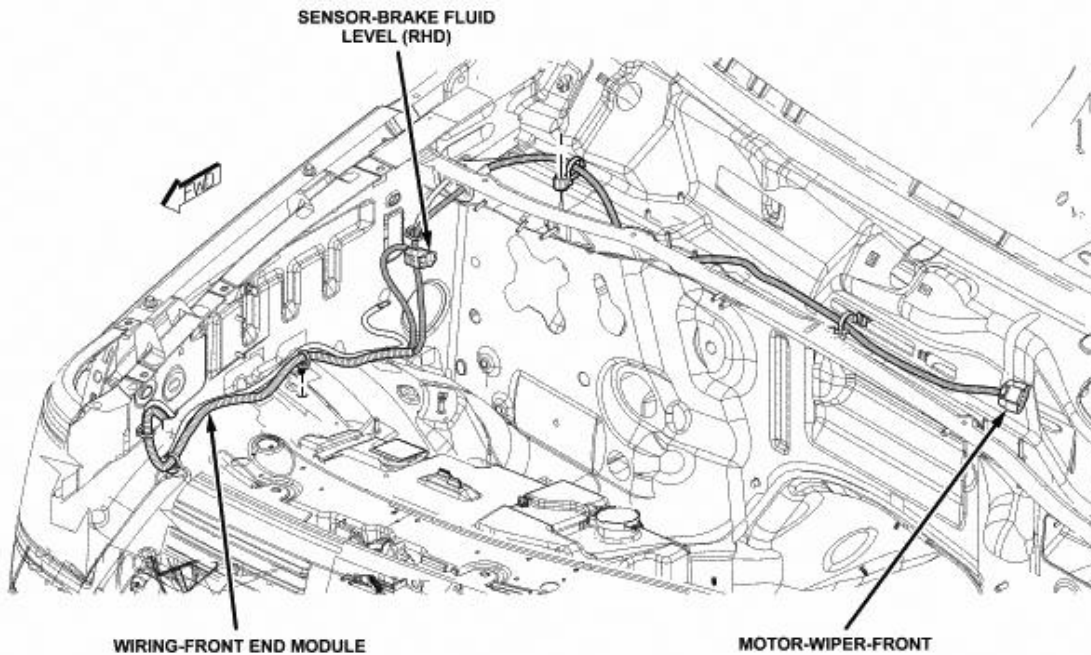


Fig. 15: Rear Of Engine Compartment
Courtesy of CHRYSLER LLC

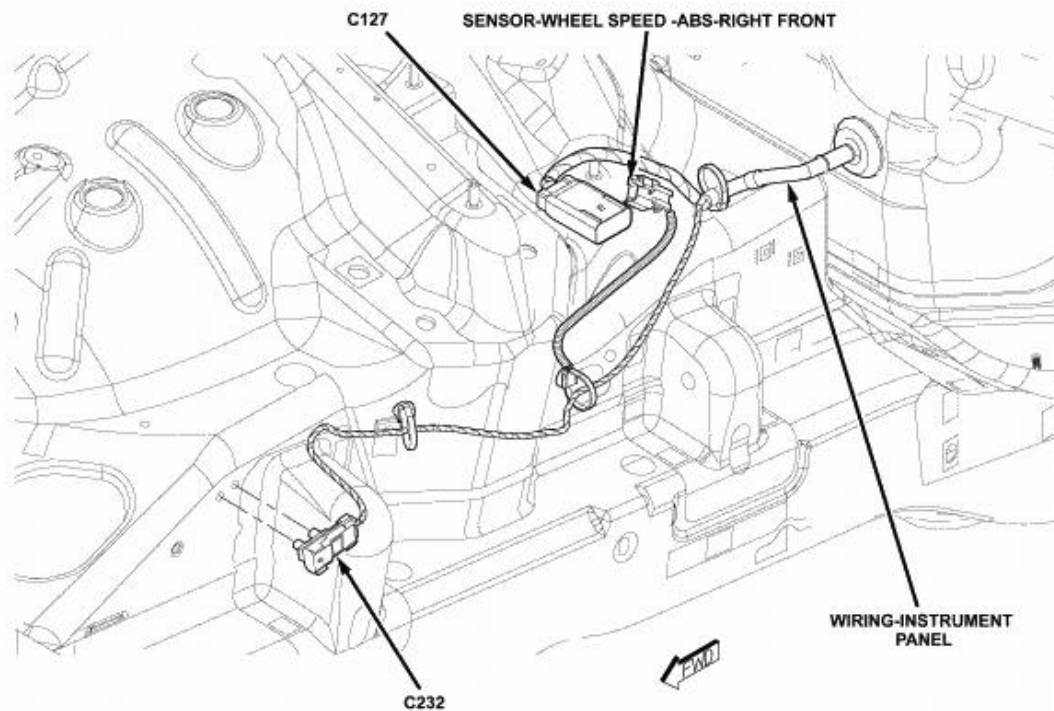


Fig. 16: Lower Right Side Of Engine Compartment
 Courtesy of CHRYSLER LLC

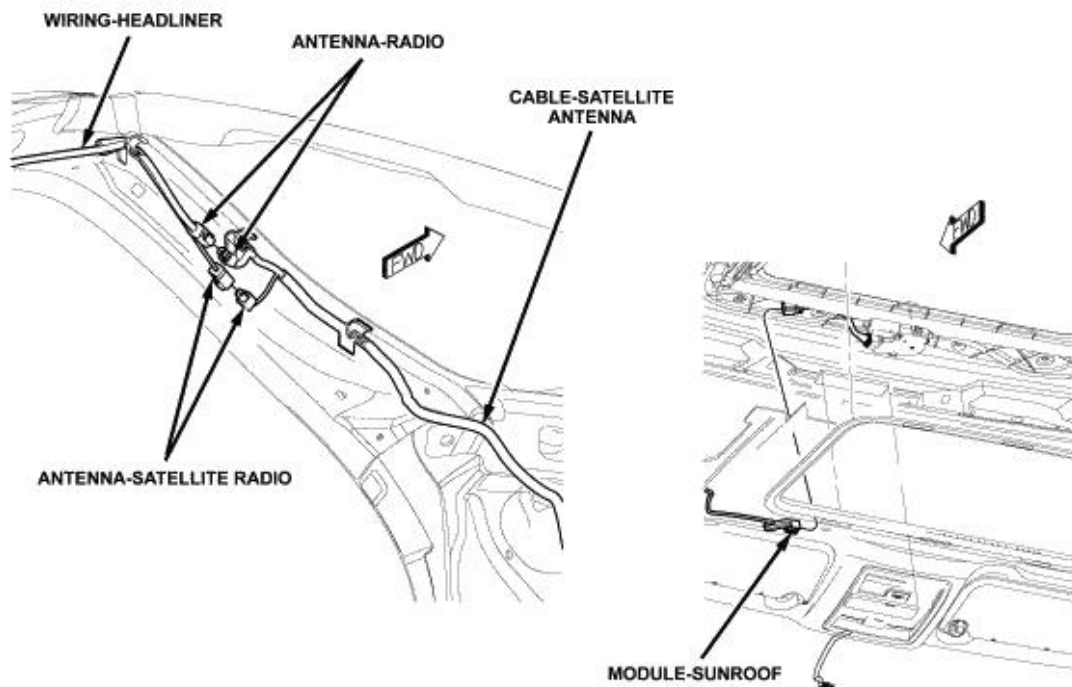


Fig. 17: Front Of Roof
 Courtesy of CHRYSLER LLC

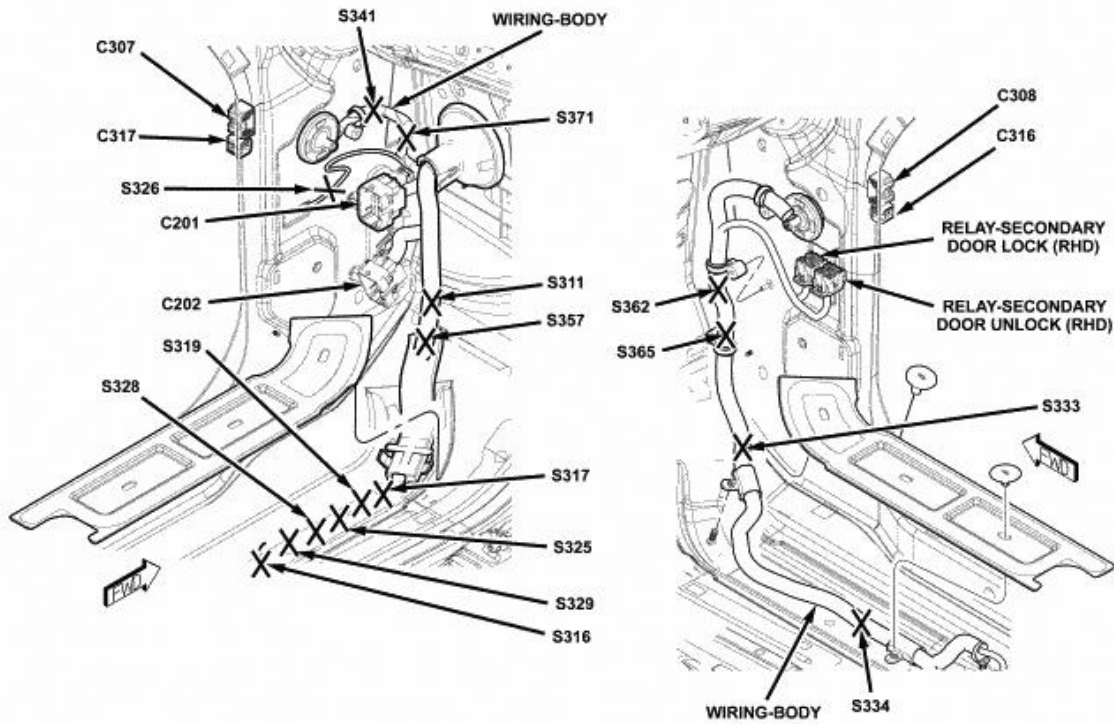


Fig. 18: Left & Right Kick Panels
Courtesy of CHRYSLER LLC

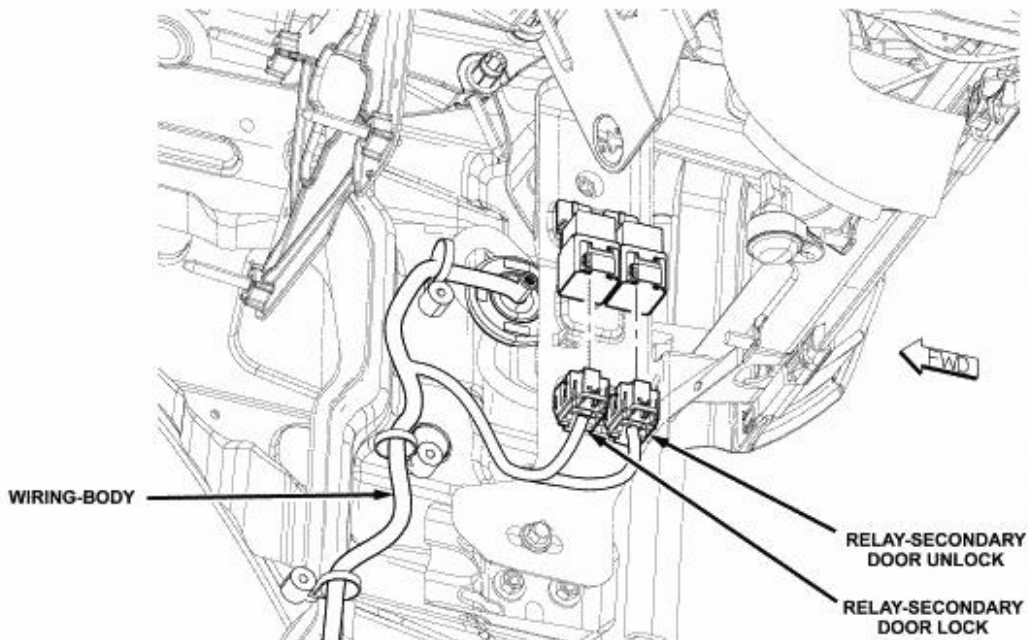


Fig. 19: Behind Right End Of Dash
Courtesy of CHRYSLER LLC

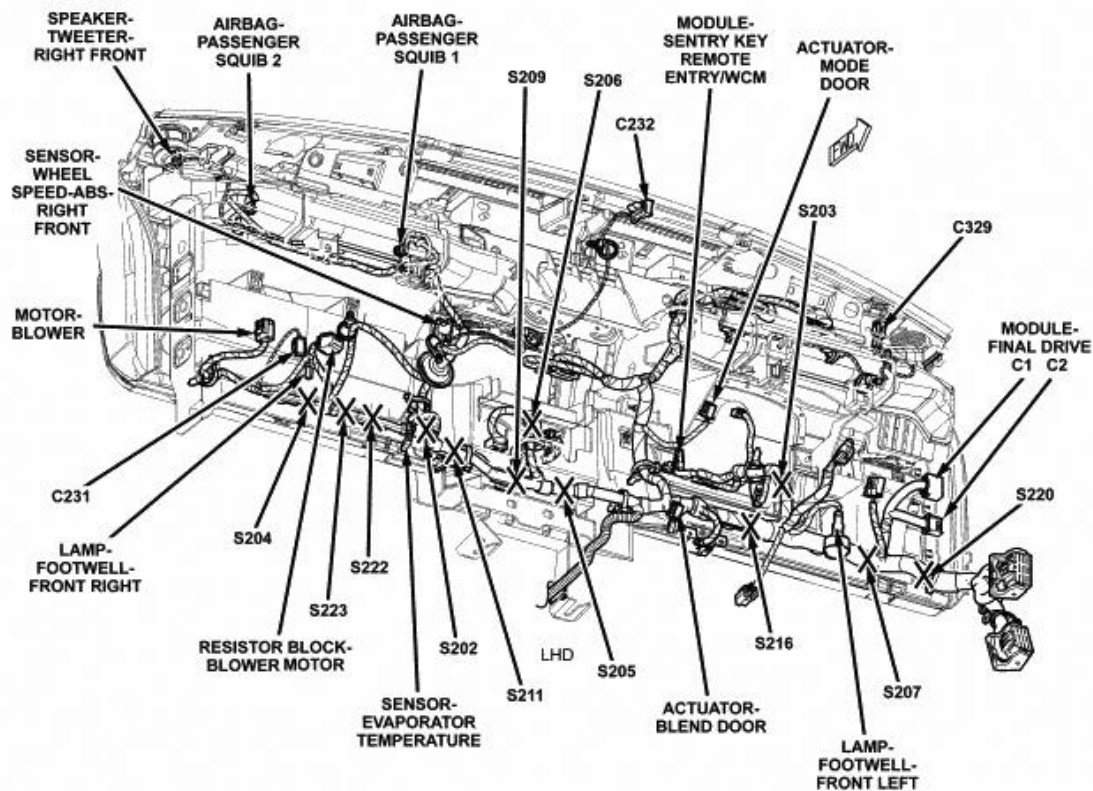


Fig. 20: Dash
Courtesy of CHRYSLER LLC

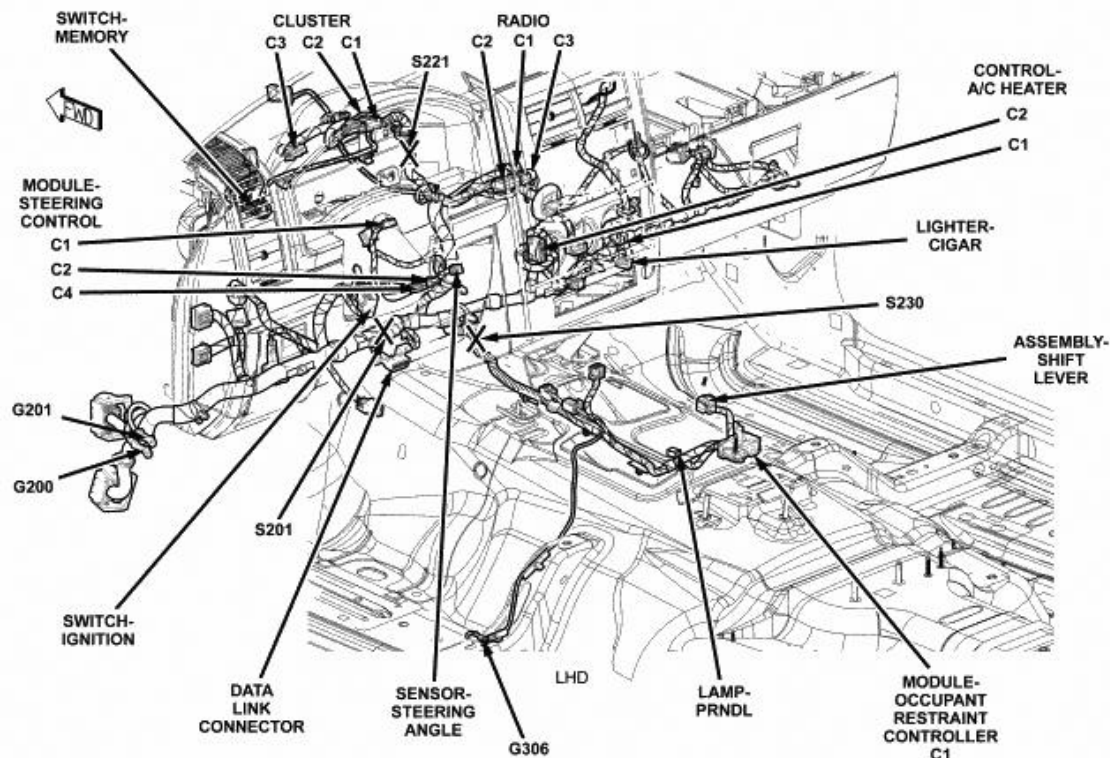


Fig. 21: Left Side Of Dash & Center Console
Courtesy of CHRYSLER LLC

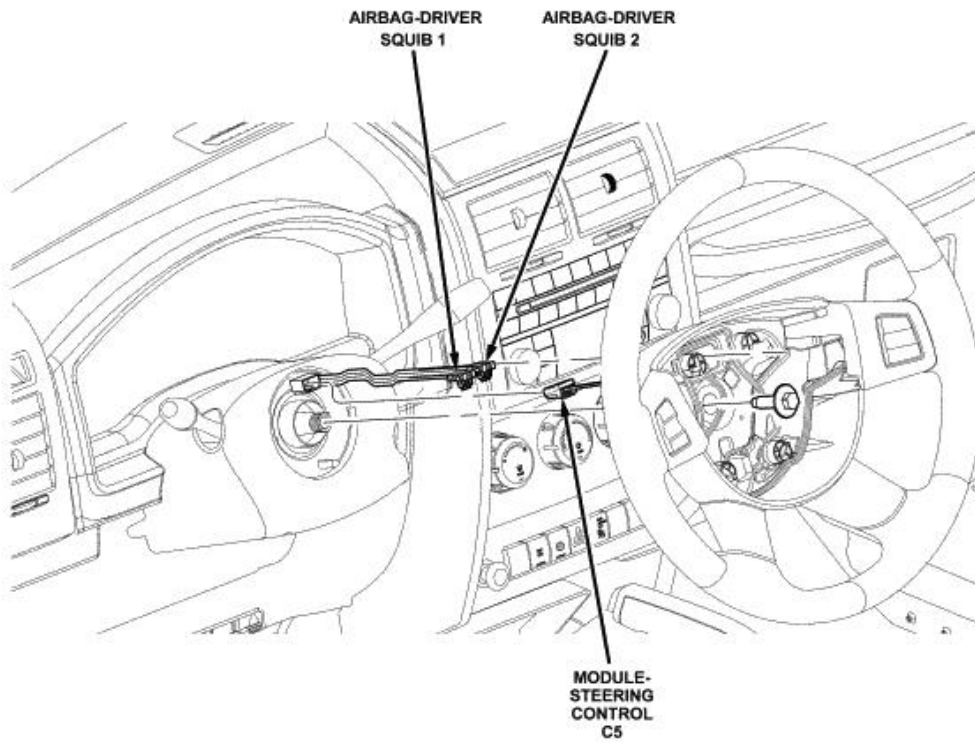


Fig. 22: Top Of Steering Column
Courtesy of CHRYSLER LLC

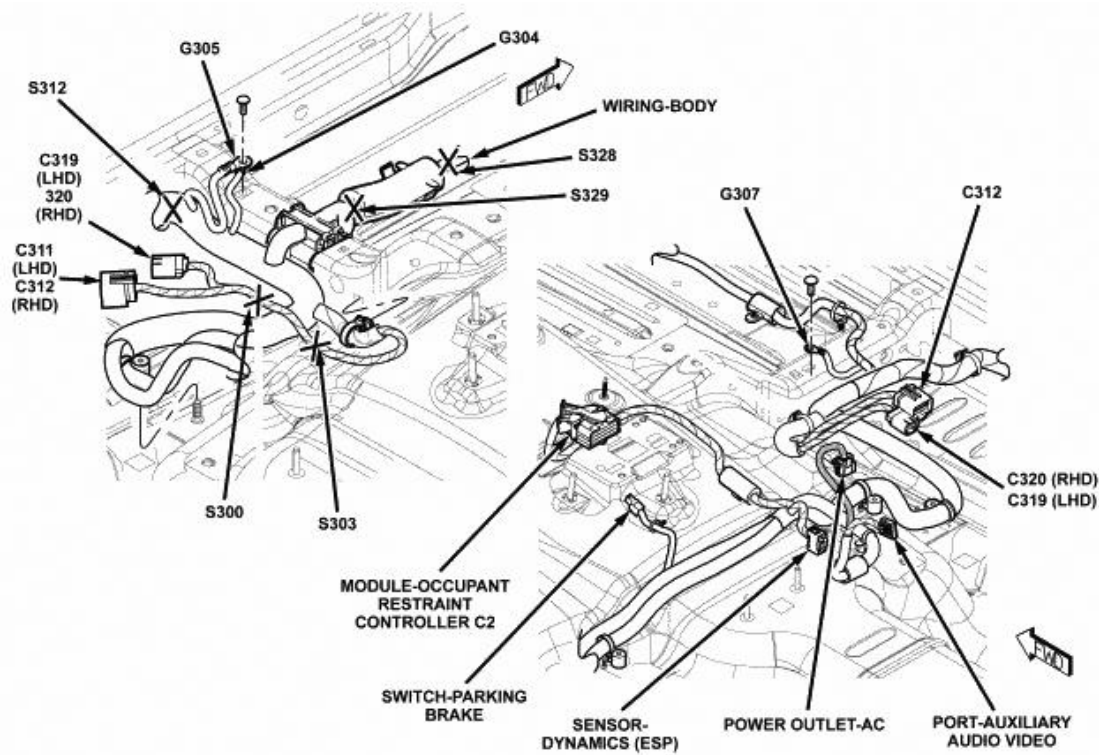


Fig. 23: Under Front Seats
 Courtesy of CHRYSLER LLC

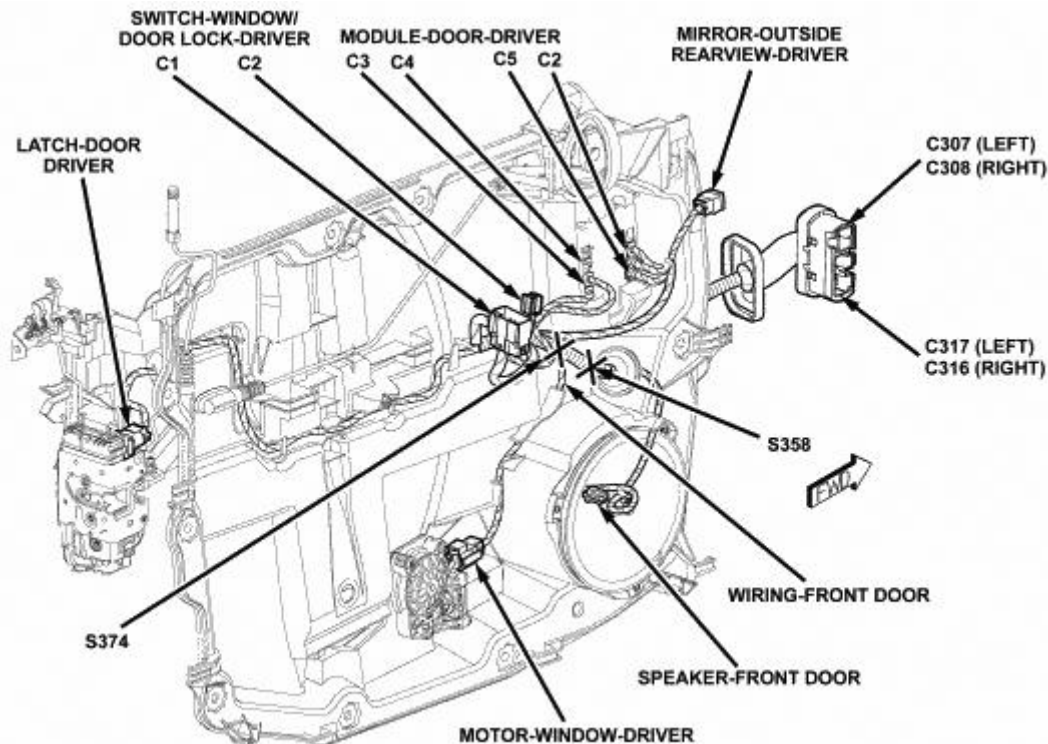


Fig. 24: Driver's Door (Front Passenger's Similar)

Courtesy of CHRYSLER LLC

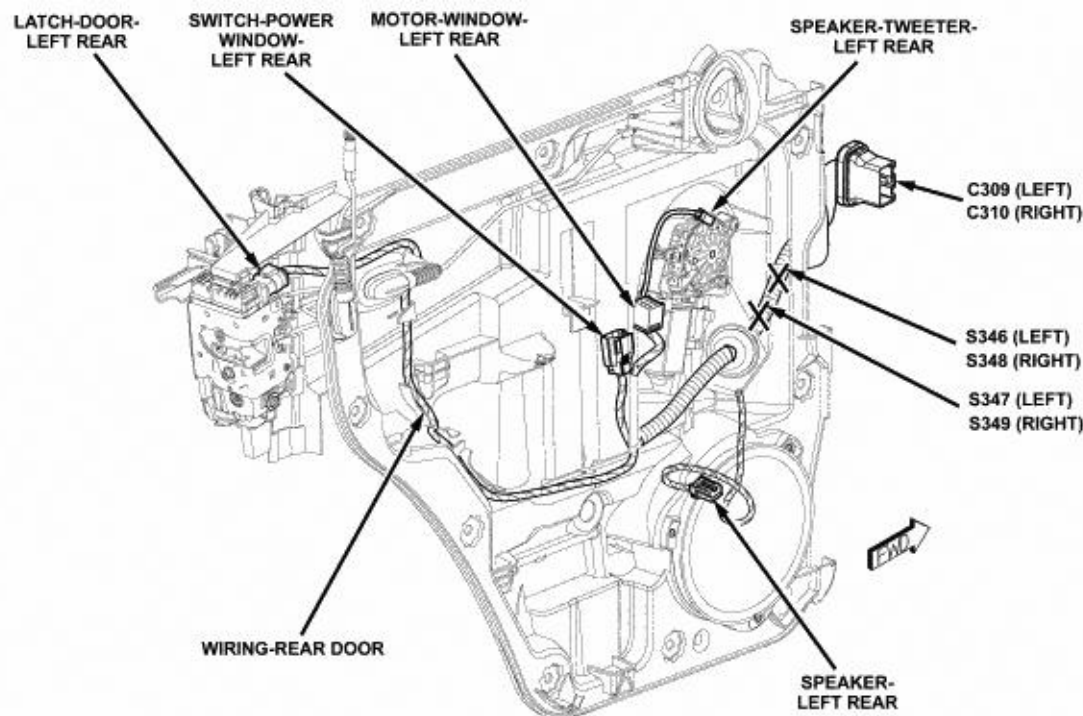


Fig. 25: Left Rear Door (Right Rear Similar)
Courtesy of CHRYSLER LLC

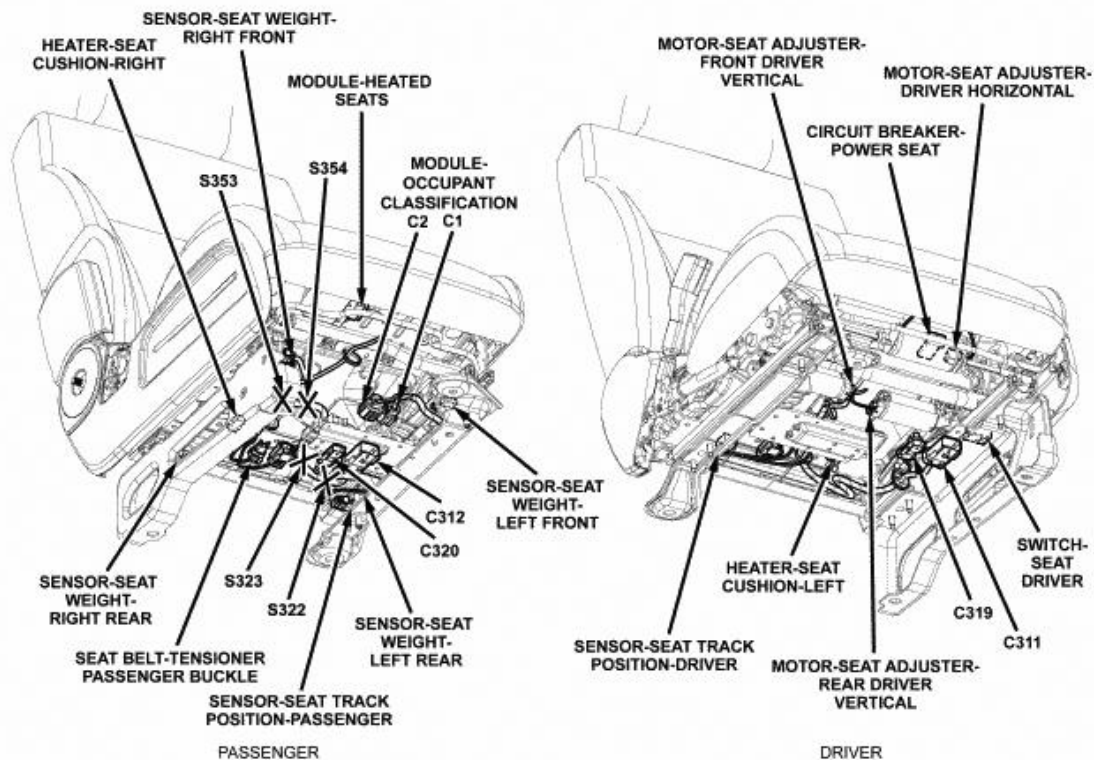


Fig. 26: Front Seats
Courtesy of CHRYSLER LLC

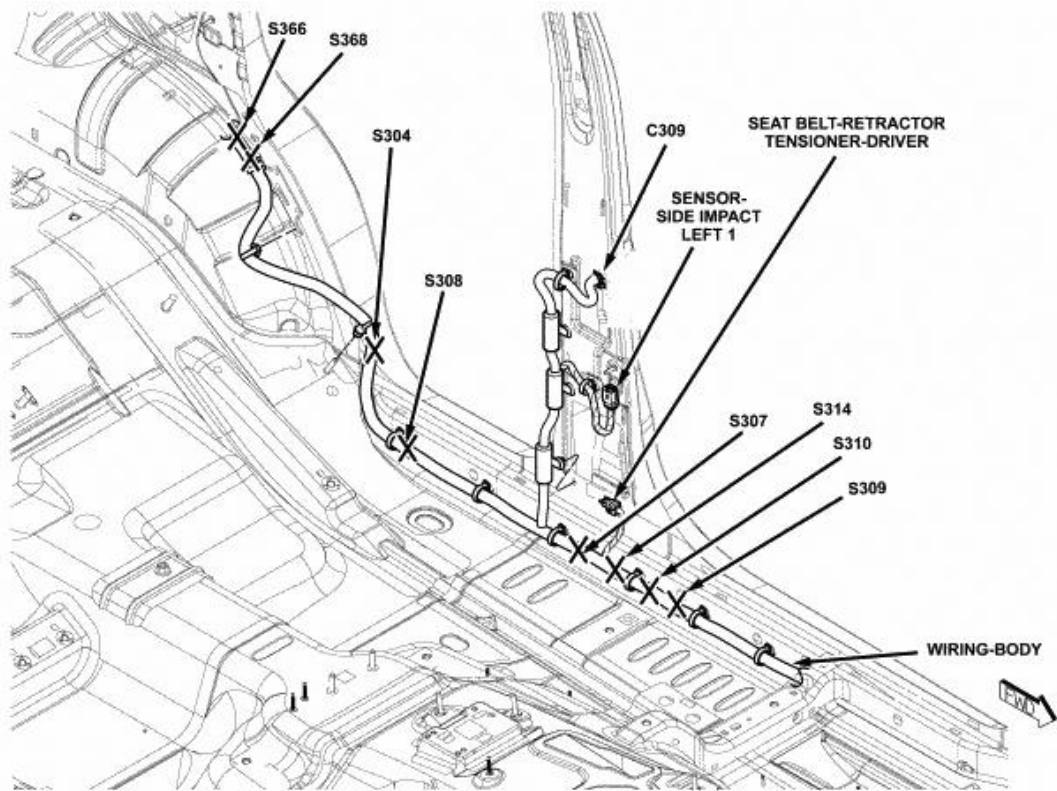


Fig. 27: Left "B" & "C" Pillars
Courtesy of CHRYSLER LLC

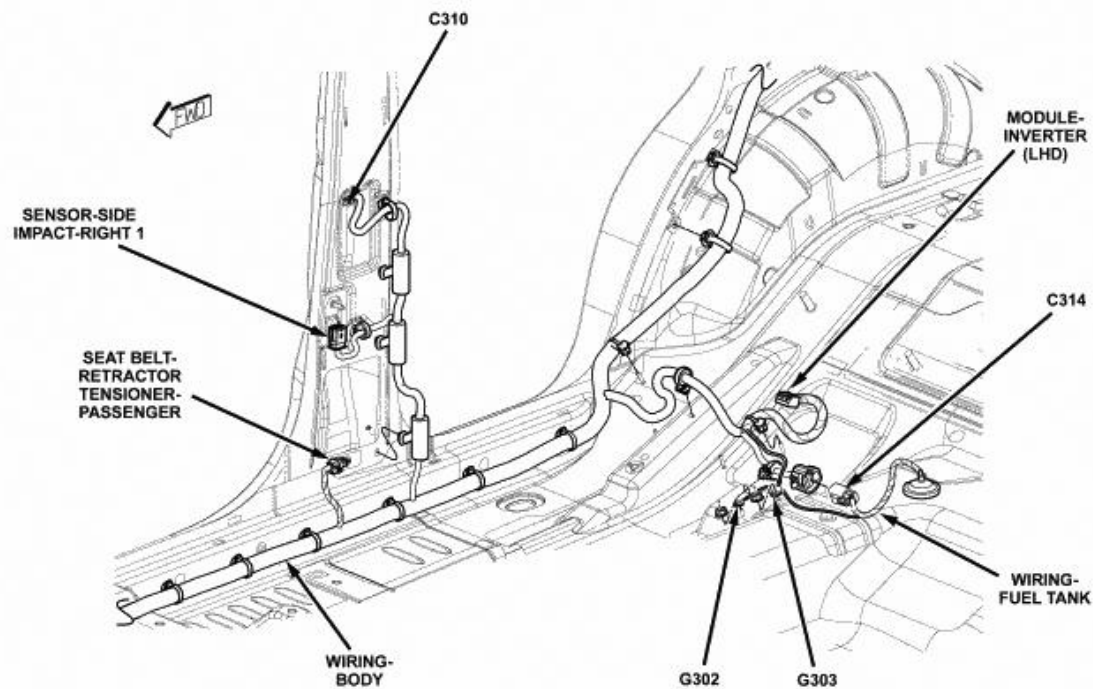


Fig. 28: Right "B" & "C" Pillars
 Courtesy of CHRYSLER LLC

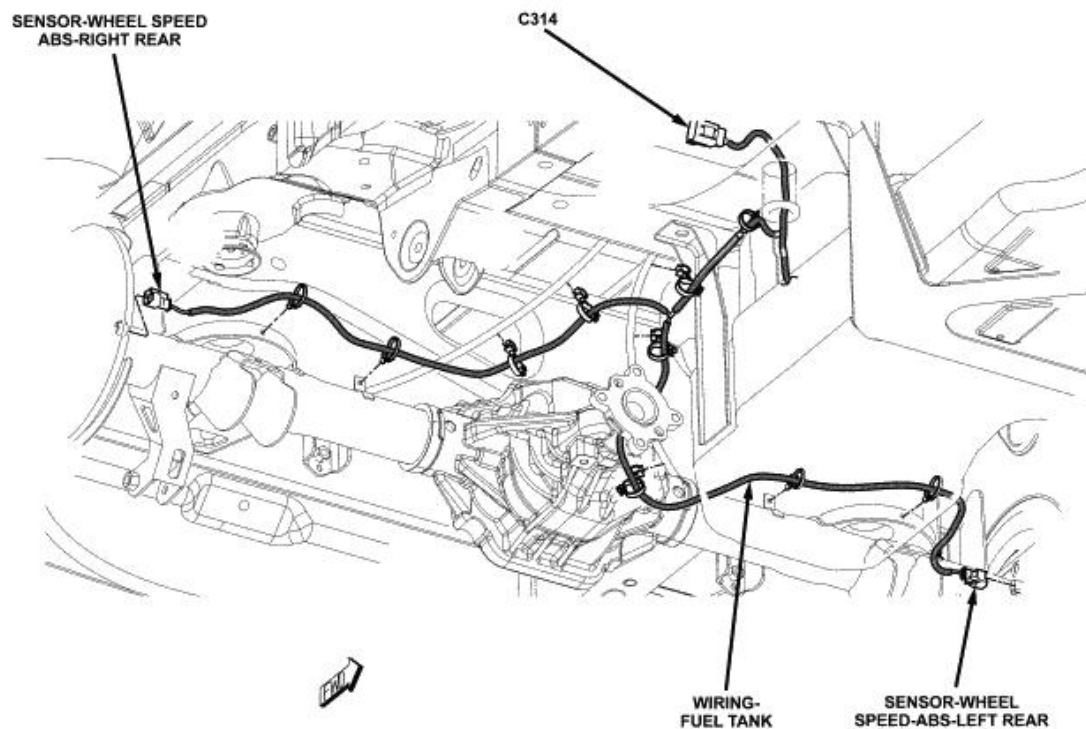


Fig. 29: Under Rear Of Vehicle
Courtesy of CHRYSLER LLC

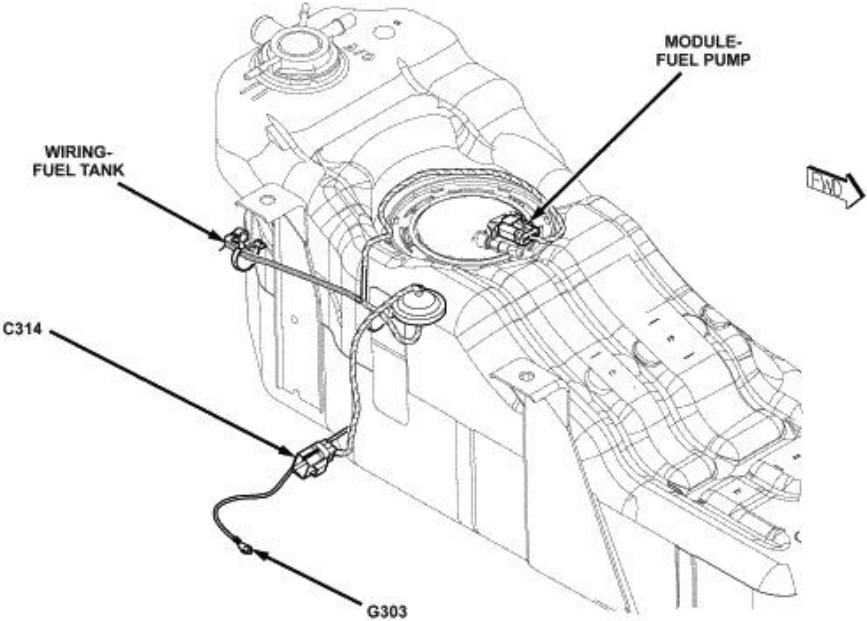


Fig. 30: Fuel Tank
Courtesy of CHRYSLER LLC

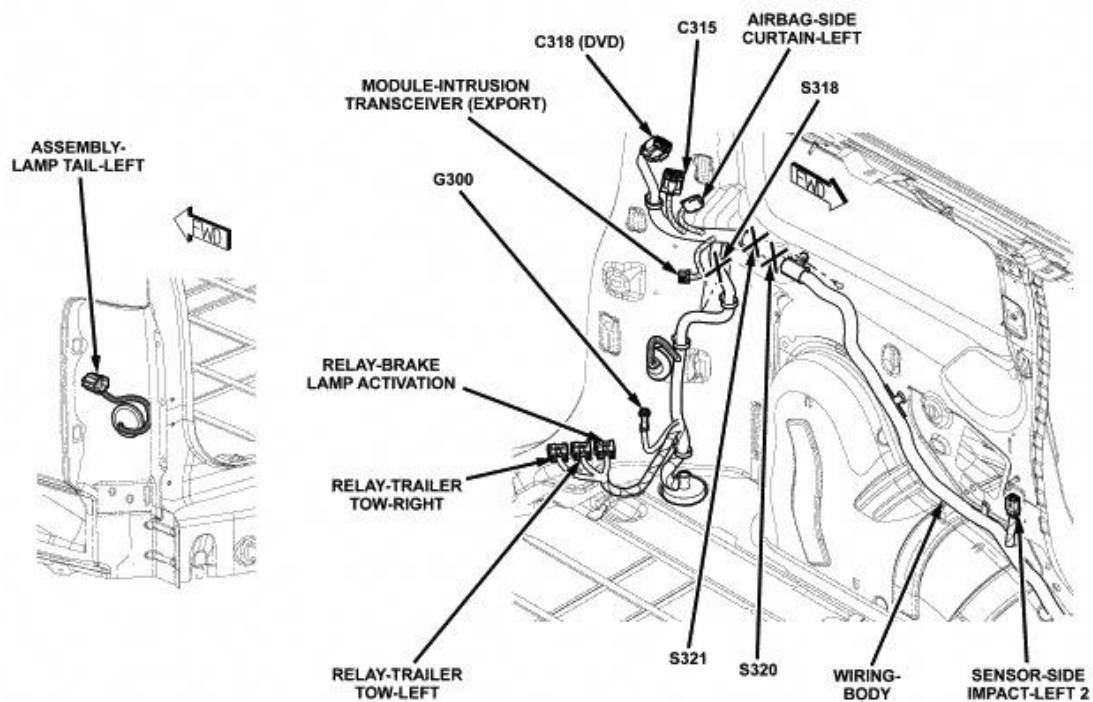


Fig. 31: Left Quarterpanel
 Courtesy of CHRYSLER LLC

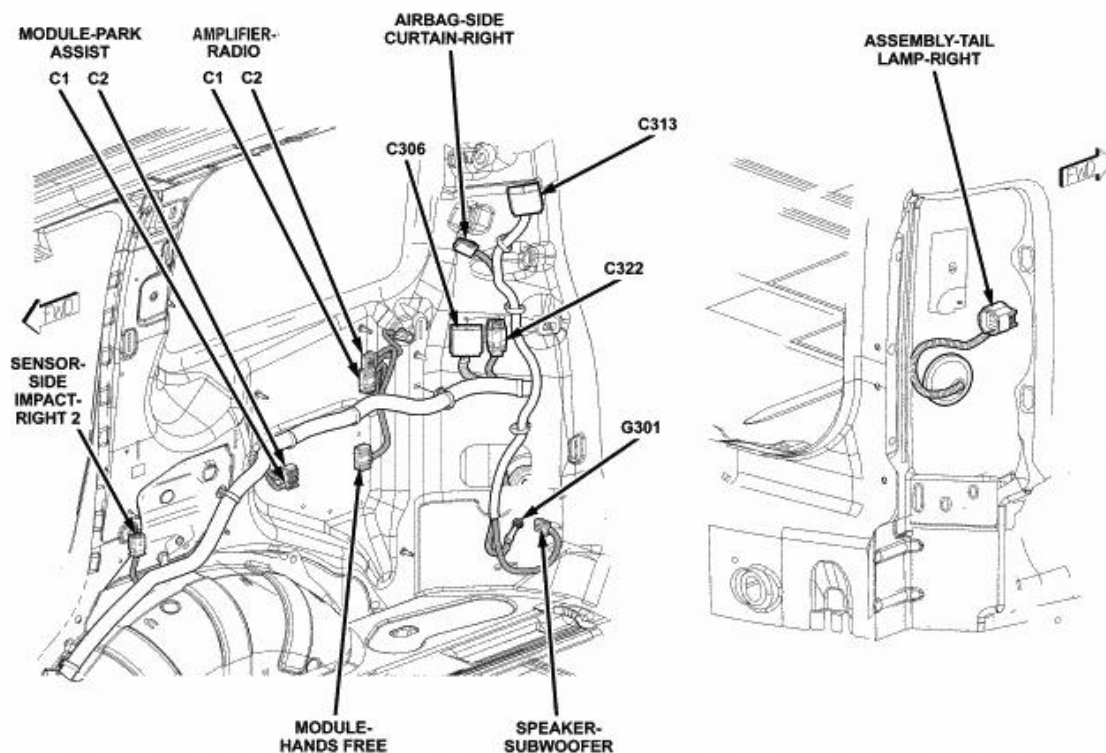


Fig. 32: Right Quarterpanel
Courtesy of CHRYSLER LLC

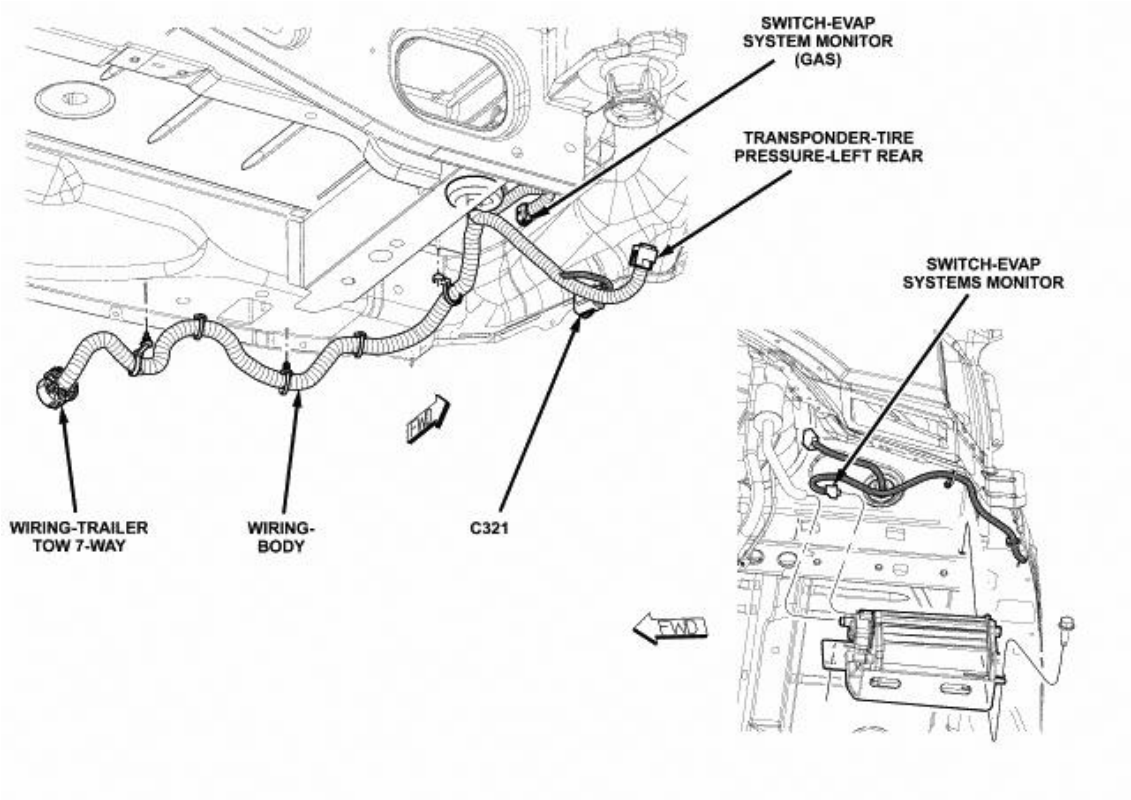


Fig. 33: Under Rear Of Vehicle
Courtesy of CHRYSLER LLC

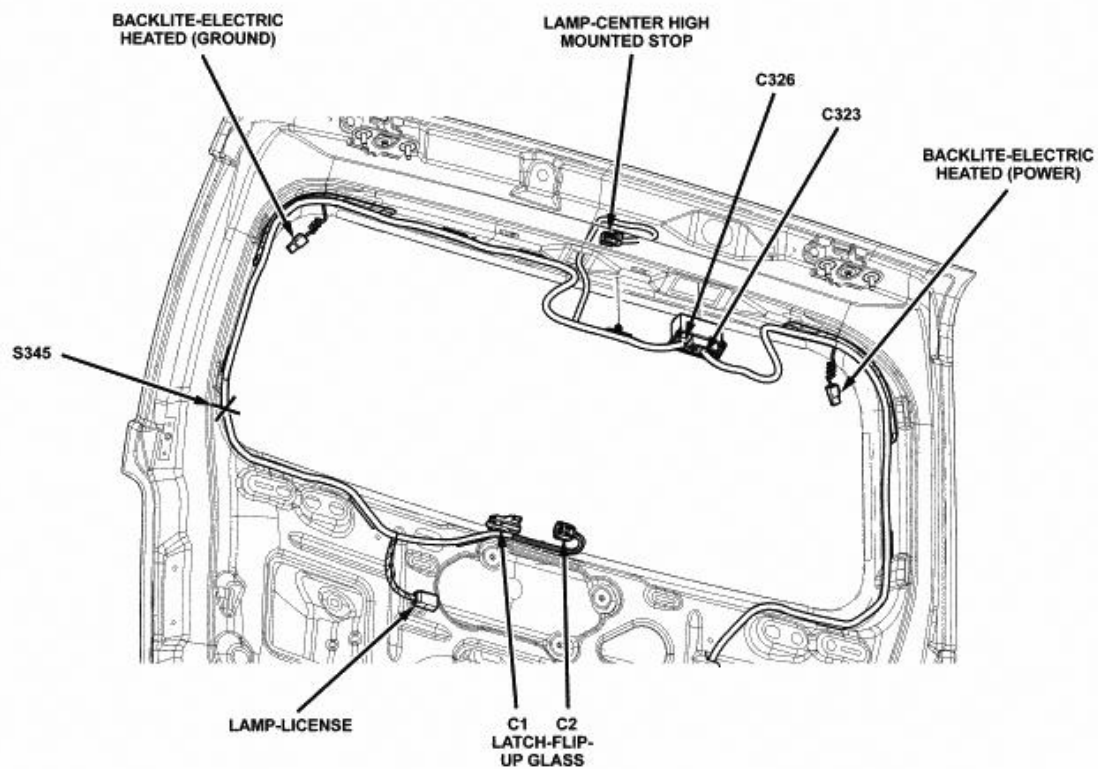


Fig. 34: Top Of Liftgate
 Courtesy of CHRYSLER LLC

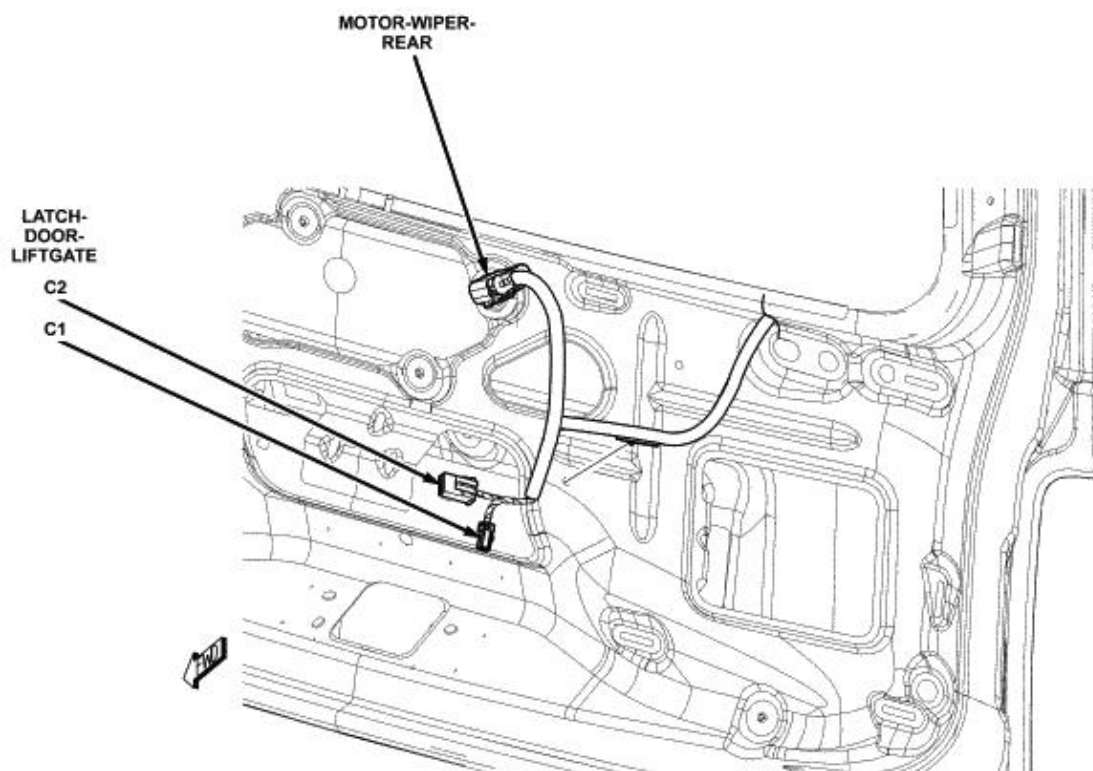


Fig. 35: Bottom Of Liftgate
Courtesy of CHRYSLER LLC

2008 ACCESSORIES AND EQUIPMENT

Electronic Control Modules - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

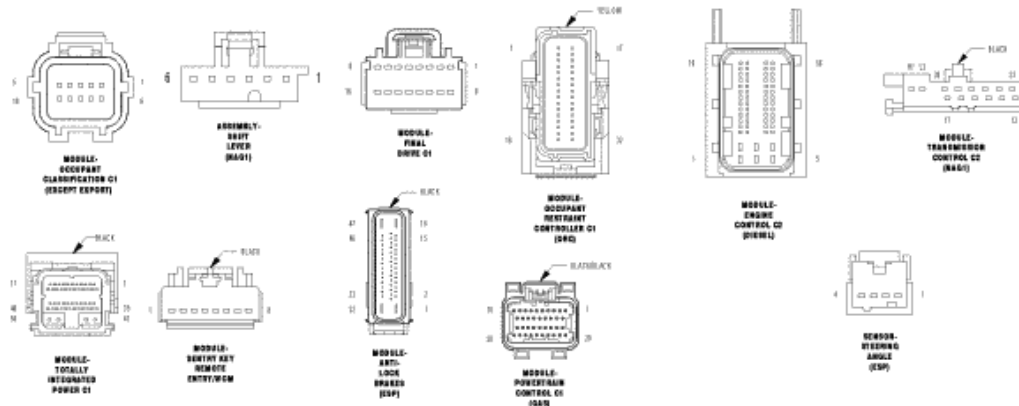
DTC	Description
<u>U0001</u>	CAN C BUS CIRCUIT
<u>U0010</u>	CAN INTERIOR BUS
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0100</u>	LOST COMMUNICATION WITH TCM
<u>U0103</u>	LOST COMMUNICATION WITH ESM
<u>U0114</u>	LOST COMMUNICATION WITH FDCM
<u>U0121</u>	LOST COMMUNICATION WITH ABS
<u>U0126</u>	LOST COMMUNICATION WITH SAS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0151</u>	LOST COMMUNICATION WITH ORC
<u>U0154</u>	LOST COMMUNICATION WITH OCM
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARK ASSIST MODULE
<u>U0164</u>	LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER MODULE (ITM)
<u>U0168</u>	LOST COMMUNICATION WITH WCM
<u>U0169</u>	LOST COMMUNICATION WITH SUNROOF CONTROL MODULE (SUNR)
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE MODULE (HFM)
<u>U0203</u>	LOST COMMUNICATION WITH DRIVER DOOR MODULE (DDM)
<u>U0204</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE (PDM)
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE (MSMD)
<u>U1147</u>	ADDITIONAL CAN INTERIOR BUS ECU DETECTED
<u>U1148</u>	ADDITIONAL CAN C BUS ECU DETECTED

ELECTRONIC CONTROL MODULES - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

U0001-CAN C BUS CIRCUIT

Additional Wiring



01d3540c

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

The Totally Integrated Power Module (TIPM) detects a corrupt CAN C Bus message.

Possible Causes

Possible Causes
(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND
(D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE
(D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT
ANTILOCK BRAKE MODULE
POWERTRAIN CONTROL MODULE
ENGINE CONTROL MODULE (DIESEL ONLY)
TRANSMISSION CONTROL MODULE
STEERING ANGLE SENSOR
ELECTRIC GEAR SHIFT MODULE
SENTRY KEY REMOTE ENTRY (SKREEM/WCM) MODULE
OCCUPANT RESTRAINT CONTROLLER MODULE
OCCUPANT CLASSIFICATION MODULE
TOTALLY INTEGRATED POWER MODULE
ANY CAN C BUS MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. ANTILOCK BRAKE MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Antilock Brake Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Inspect the wiring and connectors for damage or shorted circuits in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. POWERTRAIN CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

Disconnect the Powertrain Control Module C1 harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 4.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Powertrain Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

4. ENGINE CONTROL MODULE (DIESEL ONLY) - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Engine Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 5.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Engine Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

5. TRANSMISSION CONTROL MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Transmission Control Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 6.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Transmission Control Module in accordance with the service information.

Perform **POWERTRAIN VERIFICATION TEST** .

6. STEERING ANGLE SENSOR - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Steering Angle Sensor harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 7.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Steering Angle Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

7. ELECTRIC GEAR SHIFT MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Electric Gear Shift Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 8.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Automatic Sway Bar System Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. SENTRY KEY REMOTE ENTRY (SKREEM/WCM) MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Sentry Key Remote Entry (SKREEM/WCM) Module harness connector.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 9.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Sentry Key Remote Entry (SKREEM/WCM) Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

9. **OCCUPANT RESTRAINT CONTROLLER MODULE - INTERNAL SHORT**

Turn the ignition off.

NOTE: If vehicle is not equipped with this module, answer yes to the question.

Disconnect the Occupant Restraint Controller Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 10.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Restraint Controller Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

10. OCCUPANT CLASSIFICATION MODULE - INTERNAL SHORT

Turn the ignition off.

NOTE: **If vehicle is not equipped with this module, answer yes to the question.**

Disconnect the Occupant Classification Module harness connectors.

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 11.

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Occupant Classification Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

11. (D64) CAN C BUS (-) CIRCUIT SHORTED TO VOLTAGE

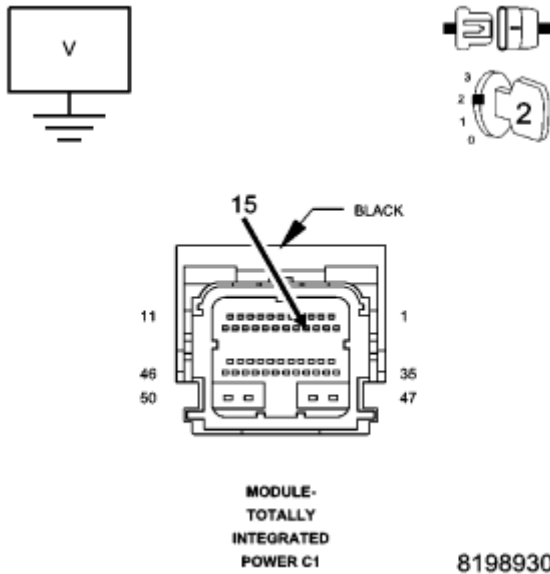


Fig. 2: Measuring Voltage Between CAN C Bus (-) Circuit & Ground
 Courtesy of CHRYSLER LLC

Measure the voltage between the (D64) CAN C Bus (-) circuit and ground.

Is there any voltage present?

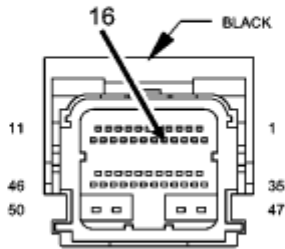
Yes

Repair the (D64) CAN C Bus (-) circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 12.

12. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO GROUND**



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198930f

Fig. 3: Checking CAN C Bus (+) Circuit For Short To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D65) CAN C Bus (+) circuit.

Is any resistance present?

Yes

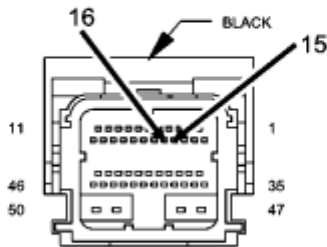
Repair the (D65) CAN C Bus (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 13.

13. (D65) CAN C BUS (+) CIRCUIT SHORTED TO (D64) CAN C BUS (-) CIRCUIT



MODULE-
TOTALLY
INTEGRATED
POWER C1

8198932f

Fig. 4: Checking Resistance Between CAN C Bus (+) Circuit & CAN C Bus (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (D65) CAN C Bus (+) circuit and the (D64) CAN C Bus (-) circuit.

Is any resistance present?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to the (D64) CAN C Bus (-) circuit.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Totally Integrated Power Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

U0010-CAN INTERIOR BUS

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The TIPM detects the CAN Interior Bus (125K) circuits shorted together.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS (125K)(+) CIRCUIT SHORTED TO THE (D264) CAN INTERIOR BUS (125K)(-) CIRCUIT ANY CAN INTERIOR BUS MODULE TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase TIPM DTC's.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. **ANY CAN INTERIOR BUS (125K) MODULE- INTERNAL SHORT**

NOTE: When performing this step, turn the ignition off (wait one minute) before

disconnecting any module. When the module is disconnected turn the ignition on.

NOTE: This step is to determine if the fault is internal within a module.

While monitoring the scan tool, disconnect each CAN Interior Bus (125K) module one at a time.

Check for this DTC to become active after disconnecting each CAN Interior Bus (125K) module the vehicle is equipped with.

NOTE: If the DTC becomes stored when a particular module is disconnected, that module is causing the DTC to set.

With all the CAN Interior Bus modules disconnected does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the module that when disconnected caused this DTC to become stored in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

3. **(D265) CAN INTERIOR BUS (125K)(+) CIRCUIT SHORTED TO (D264) CAN INTERIOR BUS (125K)(-) CIRCUIT**

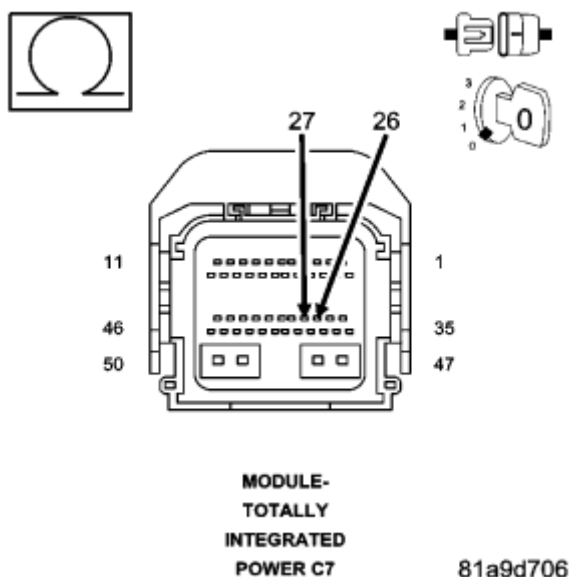


Fig. 6: Measuring Resistance Between (D265) CAN Interior Bus (125K)(+) Circuit And (D264) CAN Interior Bus (125K)(-) Circuit At TIPM C7 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (D265) CAN Interior Bus (125K)(+) circuit and the (D264) CAN Interior Bus (125K)(-) circuit at the TIPM C7 harness connector.

Is the resistance below 10K ohms?

Yes

Repair the (D265) CAN Interior Bus (125K)(+) circuit for a short to the (D264) CAN Interior Bus (125K)(-) circuit.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0011-CAN INTERIOR BUS OFF PERFORMANCE

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

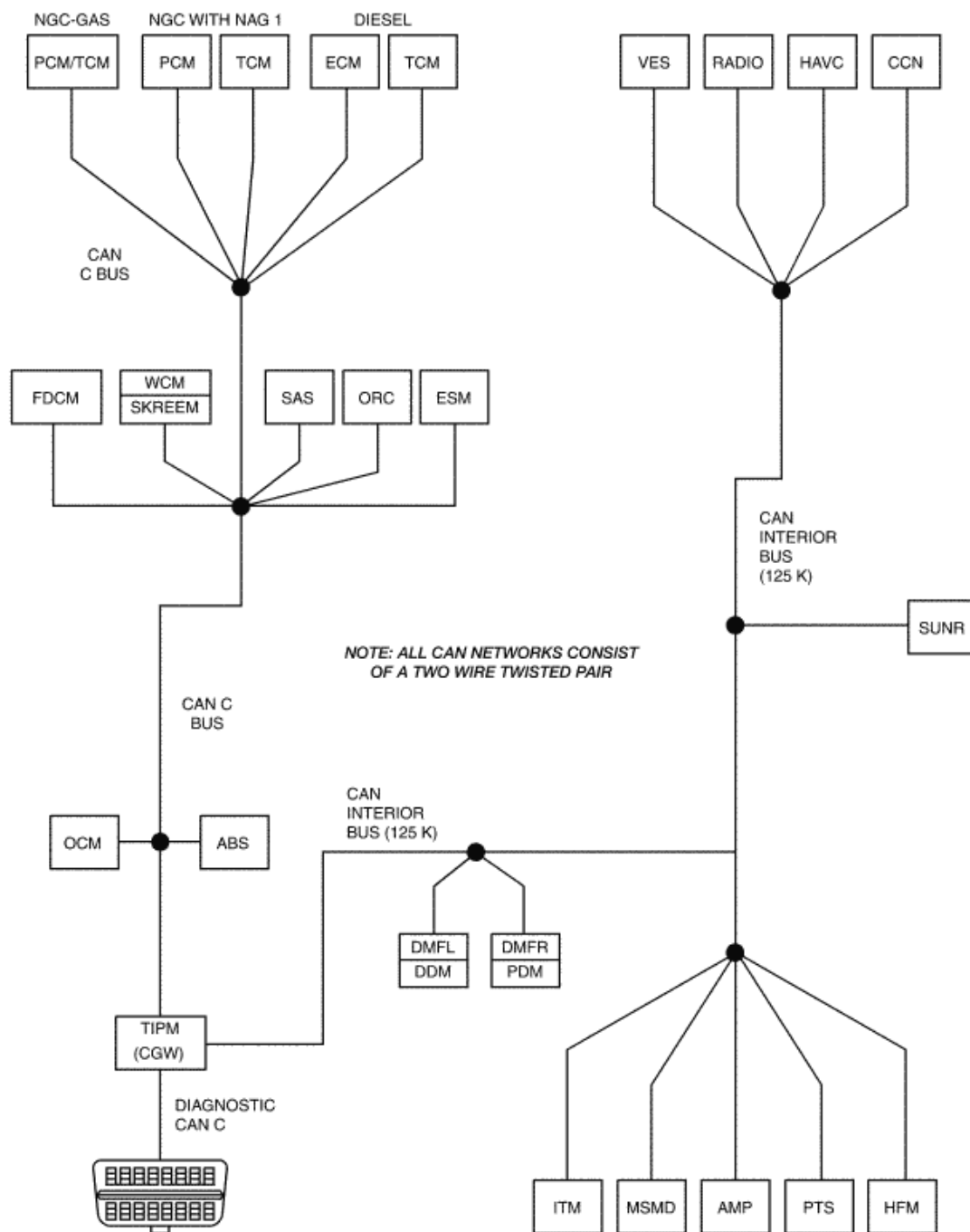
- **Set Condition:**

A module detects a short in either CAN Interior Bus circuit.

Perform the CAN Interior Bus Communication Failure diagnostic test procedure. See **DIAGNOSIS AND TESTING** .

U0100-LOST COMMUNICATION WITH ECM/PCM

Circuit Schematic



81d344d1

Fig. 8: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the ECM/PCM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY ECM/PCM POWER AND GROUND ECM/PCM MODULE THAT SET THIS DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCS from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

Does the scan tool display any active DTCS to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE ECM/PCM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the ECM/PCM is active on the bus.

Is the ECM/PCM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the ECM/PCM?

Yes

Replace/update the ECM/PCM in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the ECM/PCM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

8. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

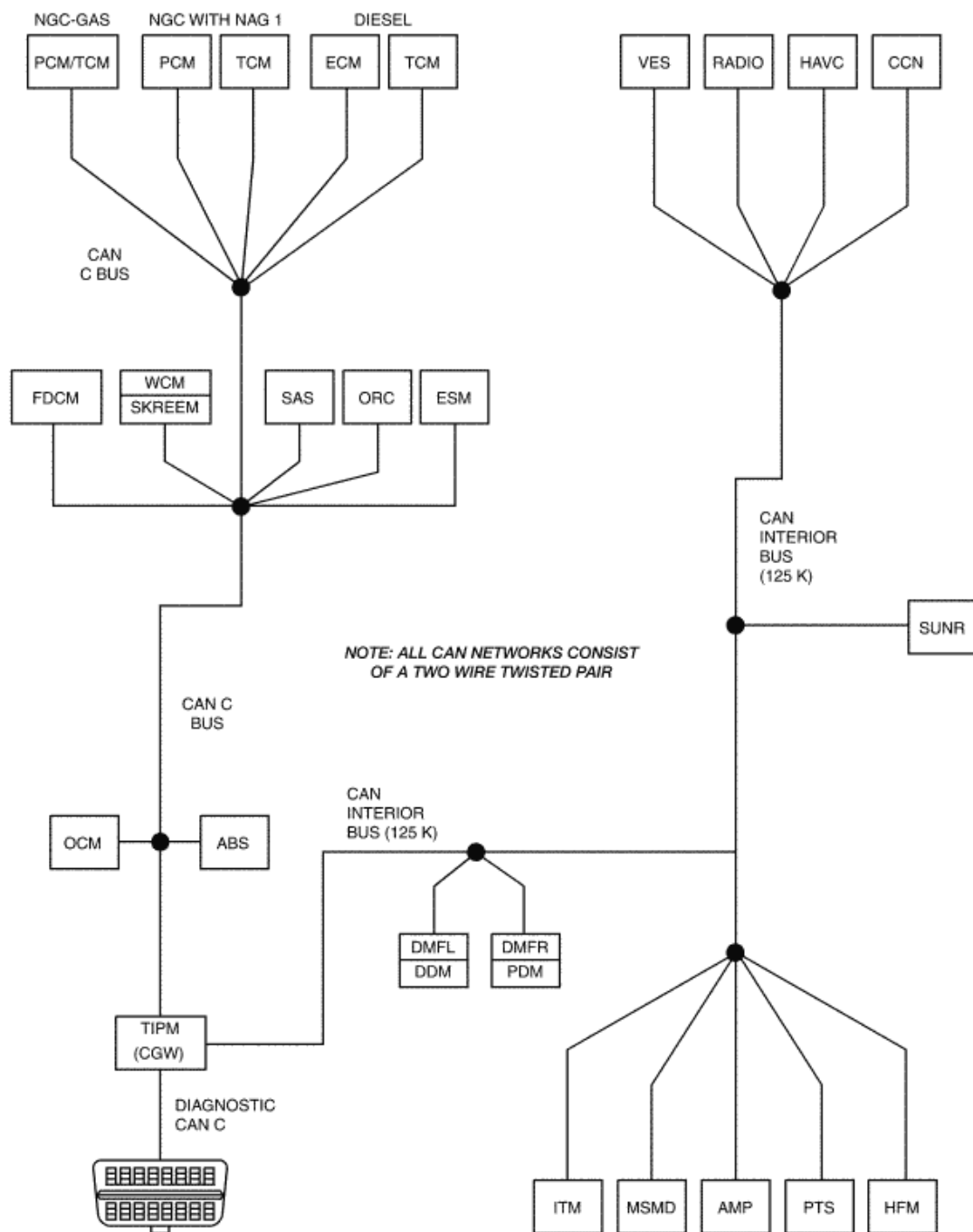
Repair the (D64) CAN C Bus (-) circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Replace/update the module that set this DTC in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

U0100-LOST COMMUNICATION WITH TCM

Circuit Schematic



81d344d1

Fig. 9: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the TCM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND TCM POWER AND GROUND TCM MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE TCM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the TCM is active on the bus.

Is the TCM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the TCM?

Yes

Replace/update the TCM in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the TCM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.
Perform the appropriate VERIFICATION TEST.

8. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

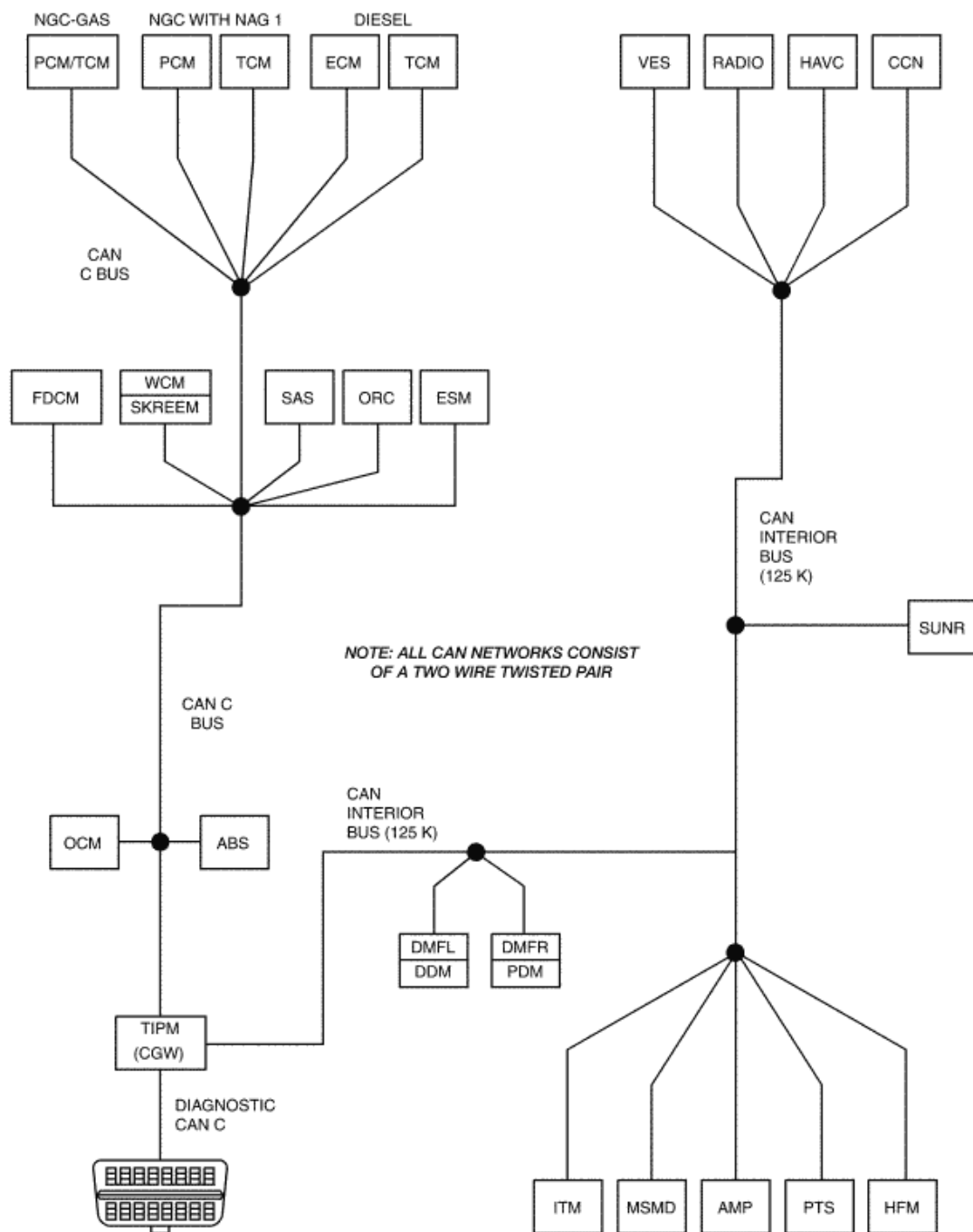
No

Replace/update the module that set this DTC in accordance with the service information.

Perform the appropriate VERIFICATION TEST.

U0103-LOST COMMUNICATION WITH ESM

Circuit Schematic



81d344d1

Fig. 10: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the ESM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND ESM POWER AND GROUND ESM MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE ESM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the ESM is active on the bus.

Is the ESM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the ESM?

Yes

Replace/update the ESM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 5.

5. **CLEAR DTC IN MODULE SETTING FAULT**

With the scan tool, select the module setting the DTC against the ESM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 6.

6. **CYCLE IGNITION**

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. **CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS**

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. **(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

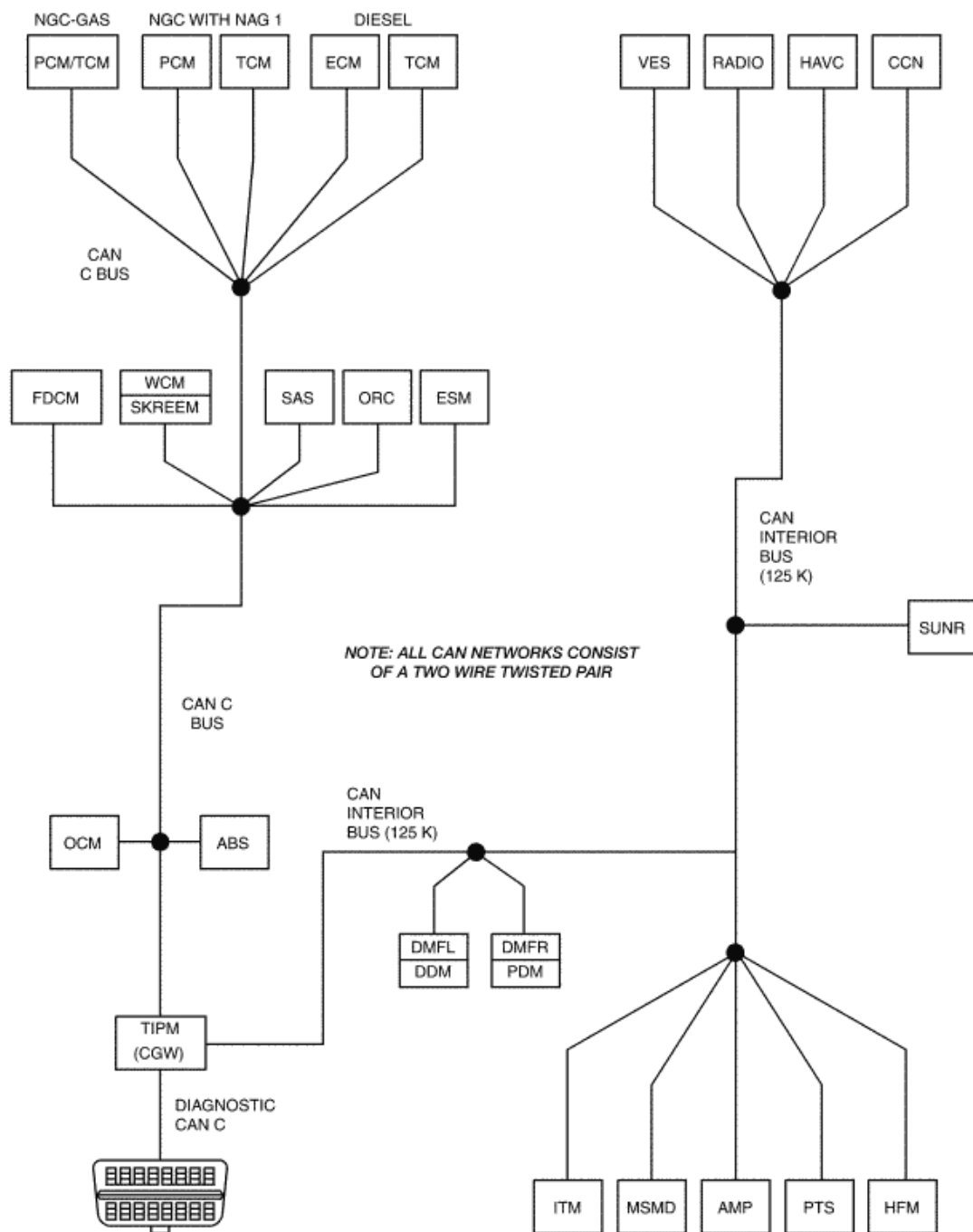
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0114-LOST COMMUNICATION WITH FDCM

Circuit Schematic



81d344d1

Fig. 11: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the FDCM (ASBS) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY FDCM (ASBS) POWER AND GROUND FDCM (ASBS) MODULE THAT SET THIS DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCS from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

Does the scan tool display any active DTCS to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE FDCM (ASBS) IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the FDCM (ASBS) is active on the bus.

Is the FDCM (ASBS) active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the FDCM (ASBS)?

Yes

Replace/update the FDCM (ASBS) in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the FDCM (ASBS).

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

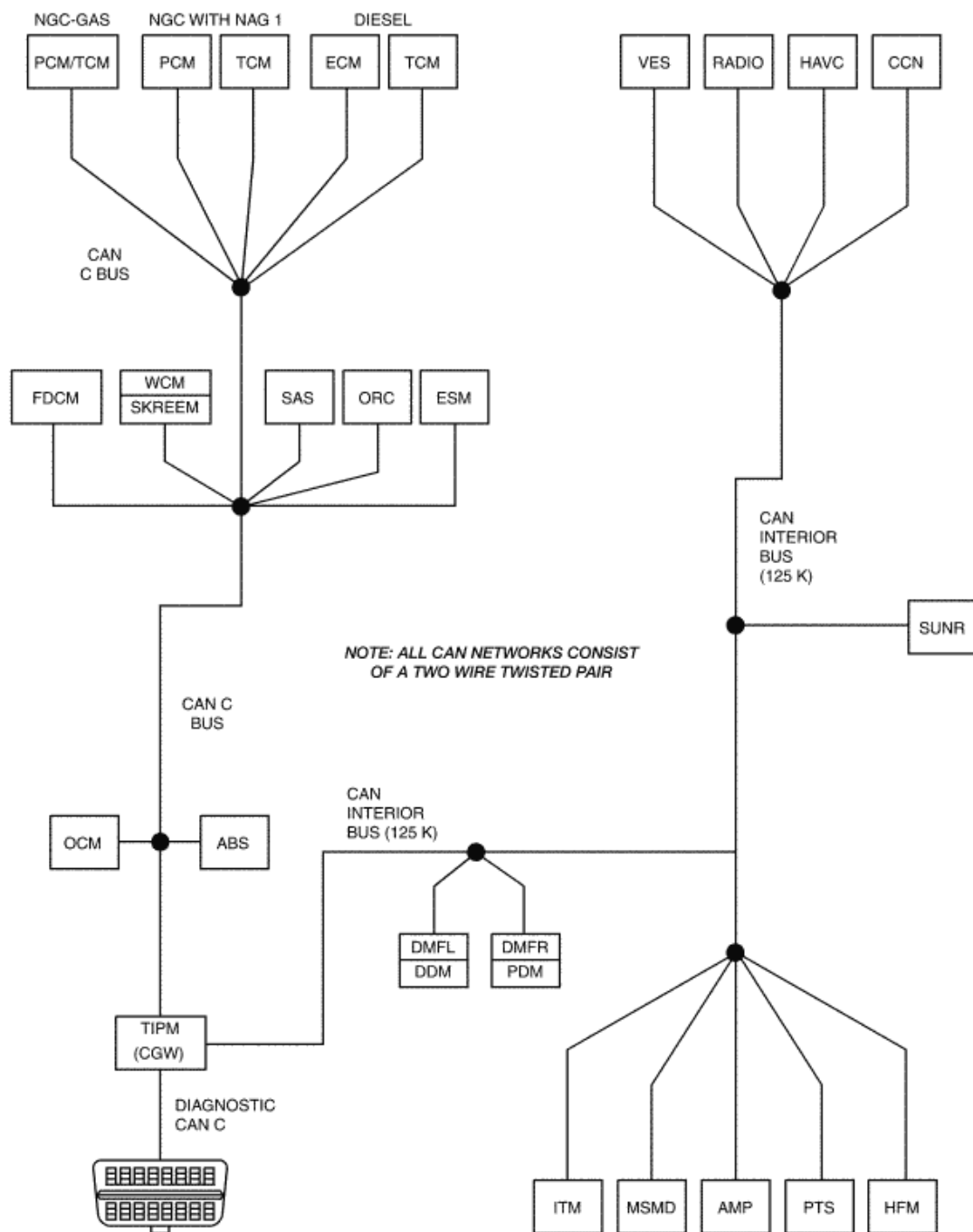
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0121-LOST COMMUNICATION WITH ABS

Circuit Schematic



81d344d1

Fig. 12: Electronic Control Modules Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the ABS for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND ABS POWER AND GROUND ABS MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE ABS IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the ABS is active on the bus.

Is the ABS active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the ABS?

Yes

Replace/update the ABS in accordance with the service information.
Perform **ABS VERIFICATION TEST** .

No

Go To 5.

5. **CLEAR DTC IN MODULE SETTING FAULT**

With the scan tool, select the module setting the DTC against the ABS.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 6.

6. **CYCLE IGNITION**

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. **CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS**

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. **(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

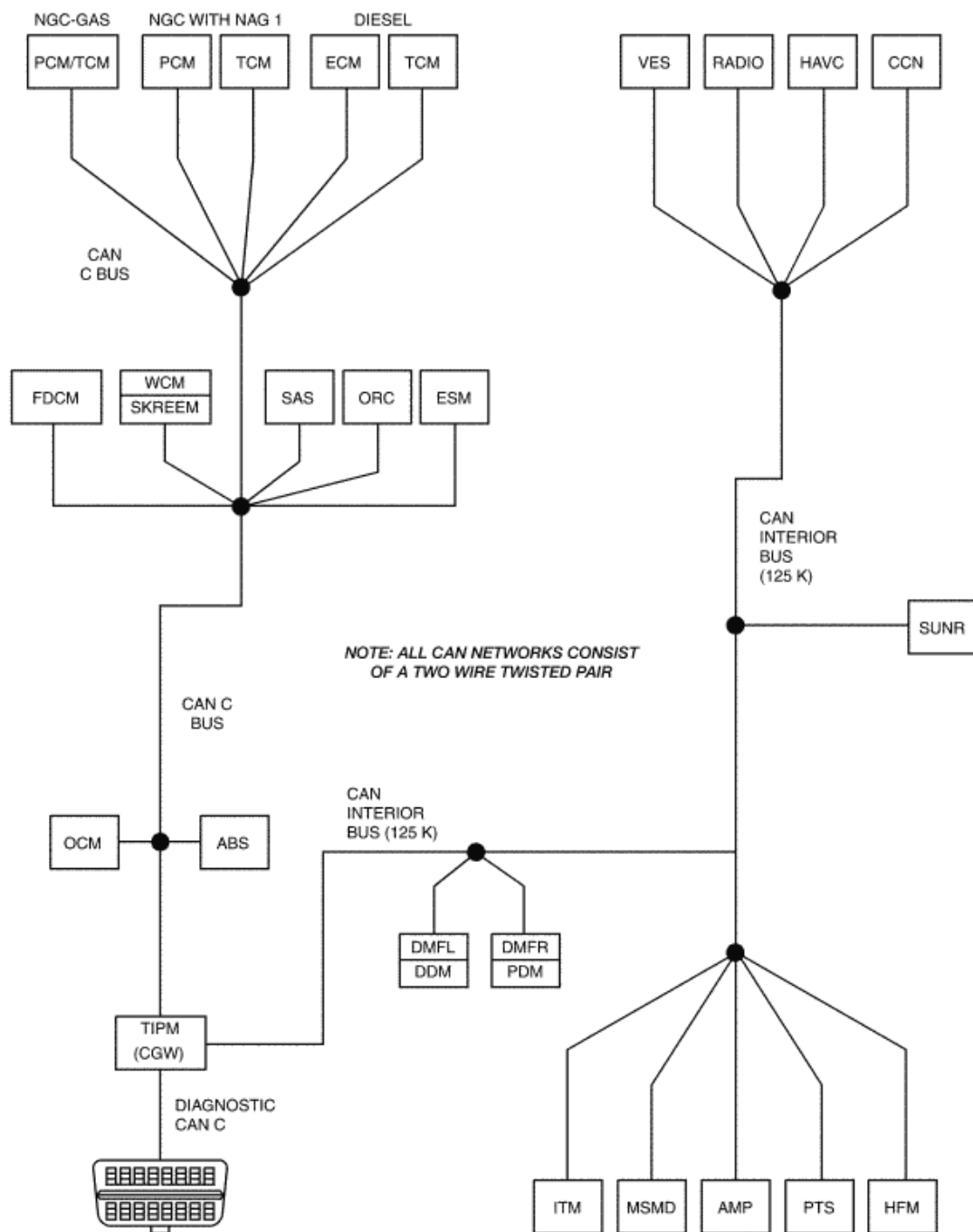
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0126-LOST COMMUNICATION WITH SAS

Circuit Schematic



81d344d1

Fig. 13: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the SAS for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND SAS POWER AND GROUND SAS MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE SAS IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the SAS is active on the bus.

Is the SAS active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the SAS?

Yes

Replace/update the SAS in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 5.

5. **CLEAR DTC IN MODULE SETTING FAULT**

With the scan tool, select the module setting the DTC against the SAS.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 6.

6. **CYCLE IGNITION**

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. **CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS**

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. **(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

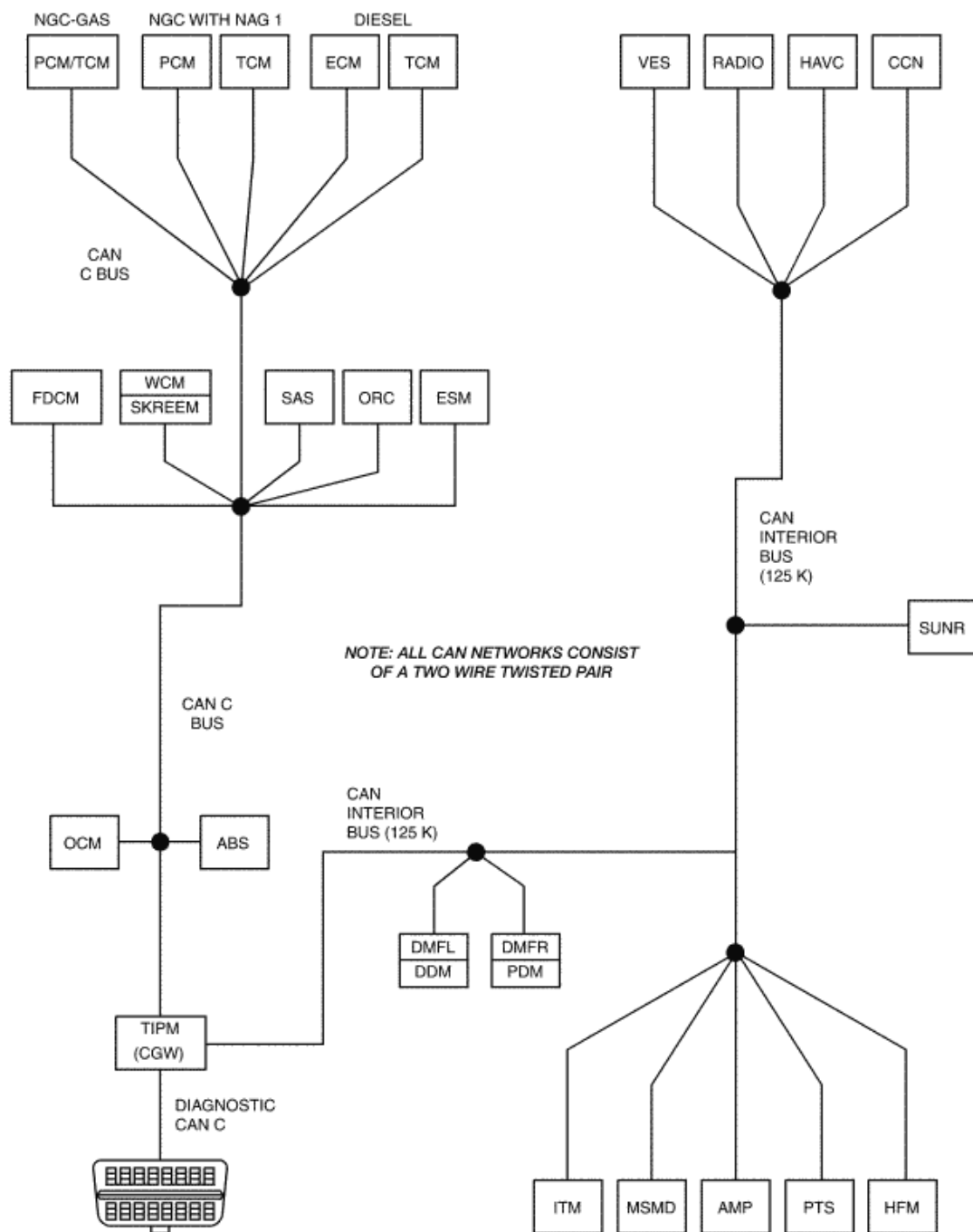
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)

Circuit Schematic



81d344d1

Fig. 14: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- **Set Condition:**

Bus messages not received from the Totally Integrated Power Module (TIPM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
DIAGNOSTIC CAN C BUS CIRCUITS OPEN OR SHORTED DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY TOTALLY INTEGRATED POWER MODULE POWER AND GROUND TOTALLY INTEGRATED POWER MODULE MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE TIPM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the TIPM is active on the bus.

Is the TIPM active on the bus?

Yes

Go To 4.

No

Refer to ***NO RESPONSE FROM TIPM (TOTALLY INTEGRATED POWER MODULE)***.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the TIPM?

Yes

Replace/update the Totally Integrated Power Module (TIPM) in accordance with the service information.

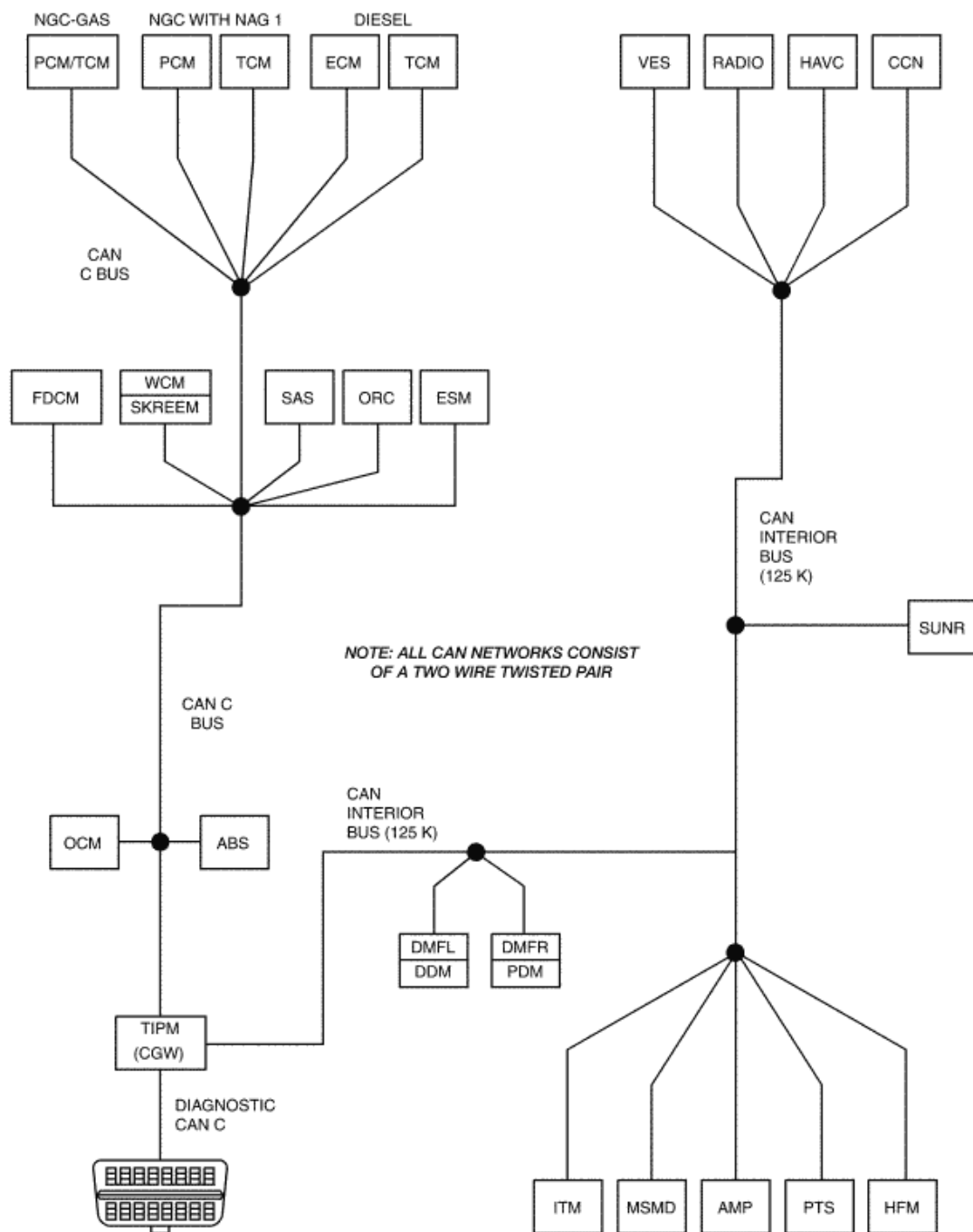
Perform **BODY VERIFICATION TEST - VER 1**.

No

Replace/update the module that set this DTC in accordance with the service information
Perform the appropriate VERIFICATION TEST.

U0151-LOST COMMUNICATION WITH ORC

Circuit Schematic



81d344d1

Fig. 15: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- Airbag fuse (35) and (51) installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the ORC for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND ORC POWER AND GROUND OCCUPANT RESTRAINT CONTROLLER MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the Airbag fuses (35) and (51) are installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE ORC IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the ORC is active on the bus.

Is the ORC active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the ORC?

Yes

Replace/update the Occupant Restraint Controller in accordance with the service information.
Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

No

Go To 5.

5. **CLEAR DTC IN MODULE SETTING FAULT**

With the scan tool, select the module setting the DTC against the ORC.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 6.

6. **CYCLE IGNITION**

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform the appropriate VERIFICATION TEST.

7. **CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS**

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. **(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

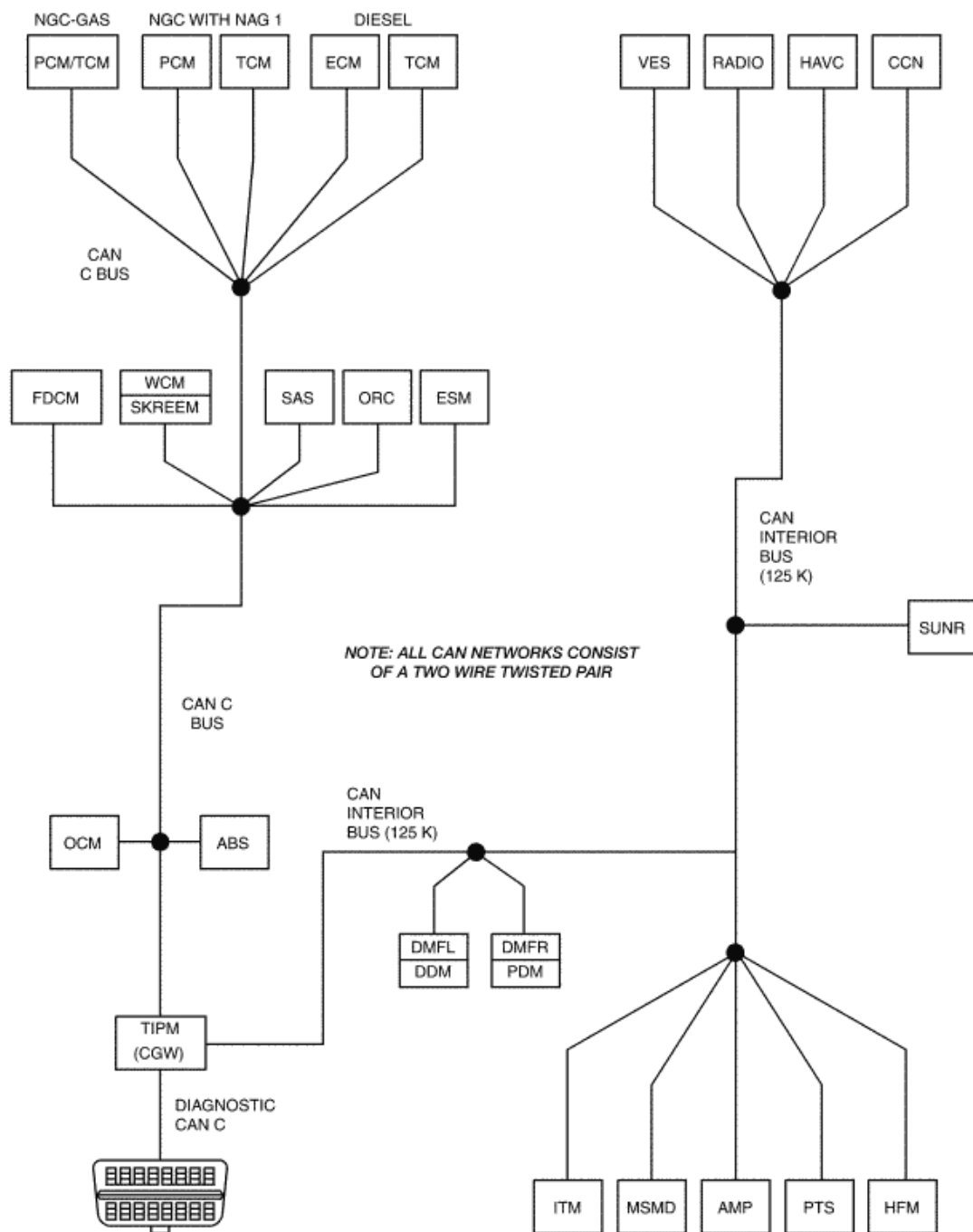
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0154-LOST COMMUNICATION WITH OCM

Circuit Schematic



81d344d1

Fig. 16: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- Airbag fuse (48) installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the OCM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND OCM POWER AND GROUND OCCUPANT CLASSIFICATION MODULE MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the Airbag fuse (48) is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. VERIFY THAT THE OCM IS ACTIVE ON THE BUS

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the OCM is active on the bus.

Is the OCM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING**.

4. CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the OCM?

Yes

Replace/update the Occupant Classification Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the OCM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. **(D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE**

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. **(D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

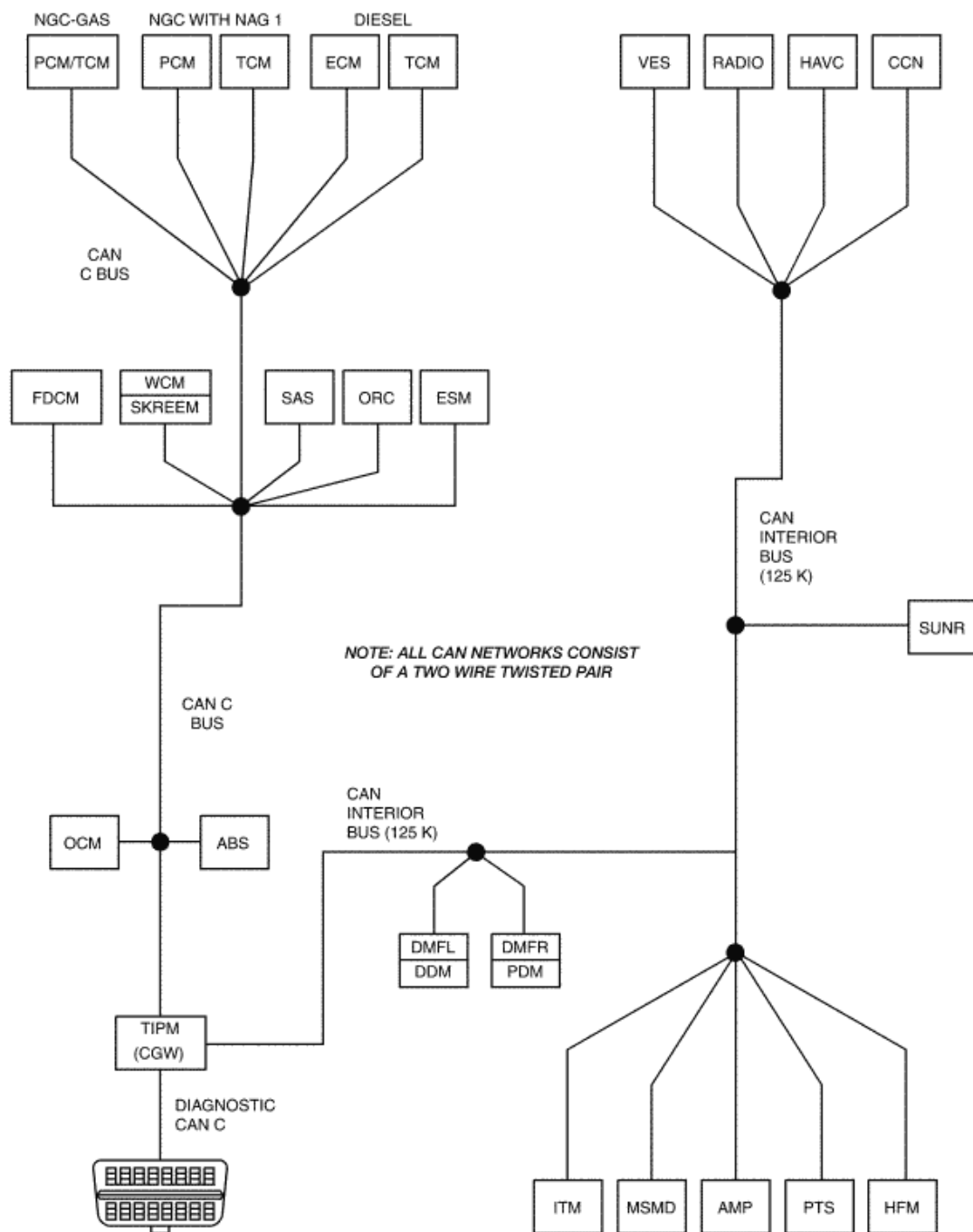
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Circuit Schematic



81d344d1

Fig. 17: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Cluster/CCN for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY CLUSTER/CCN POWER AND GROUND CLUSTER/CCN MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE CCN IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the CCN is active on the bus.

Is the CCN active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the CCN?

Yes

Replace/update the Cluster (CCN) in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the Cluster/CCN.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

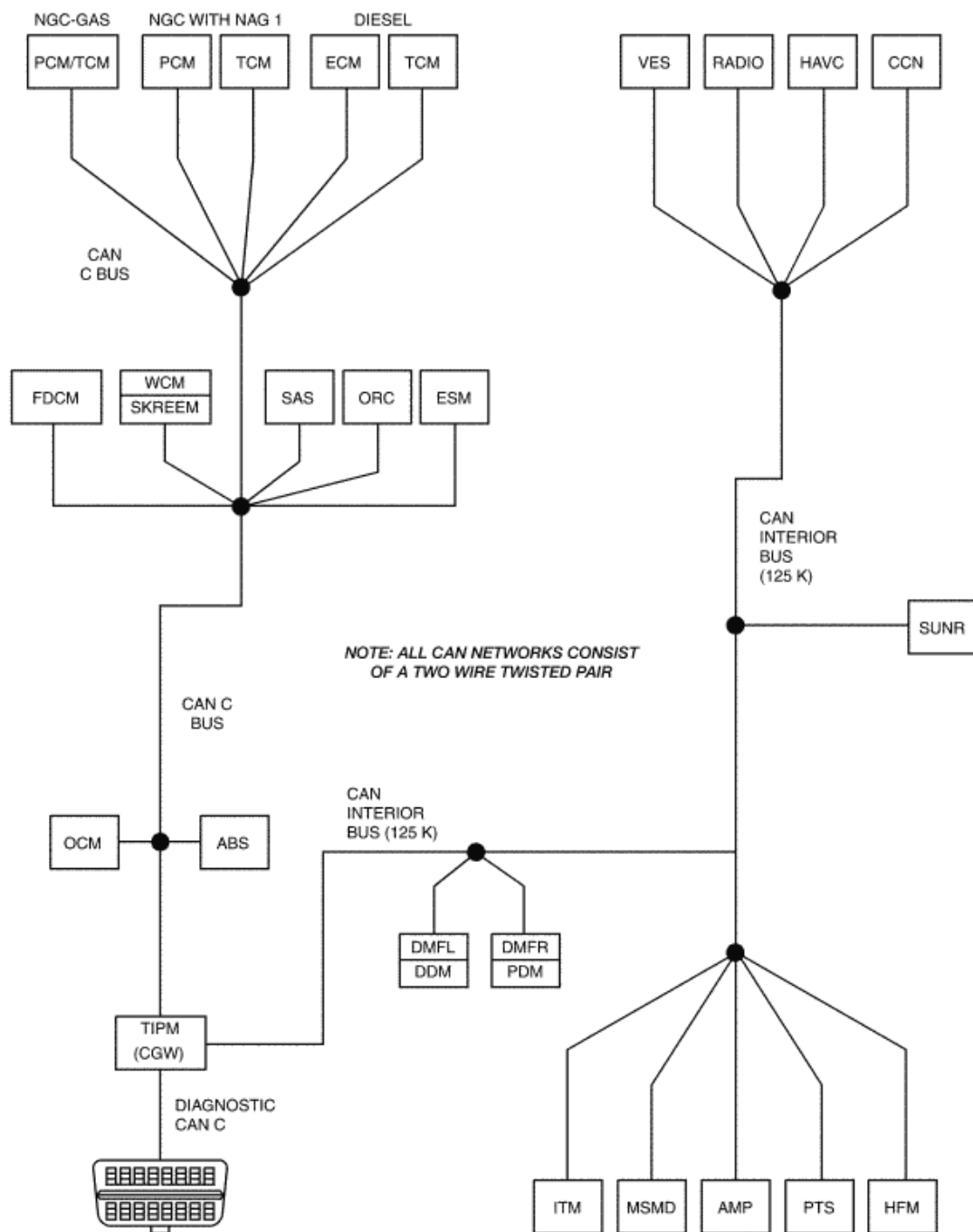
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0159-LOST COMMUNICATION WITH PARK ASSIST MODULE

Circuit Schematic



81d344d1

Fig. 18: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Park Assist (PTS) Module for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY PARK ASSIST MODULE POWER AND GROUND PARK ASSIST MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCS from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

Does the scan tool display any active DTCS to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE PTS IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the PTS is active on the bus.

Is the PTS active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the PTS?

Yes

Replace/update the Park Assist (PTS) Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the Park Assist (PTS) Module.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

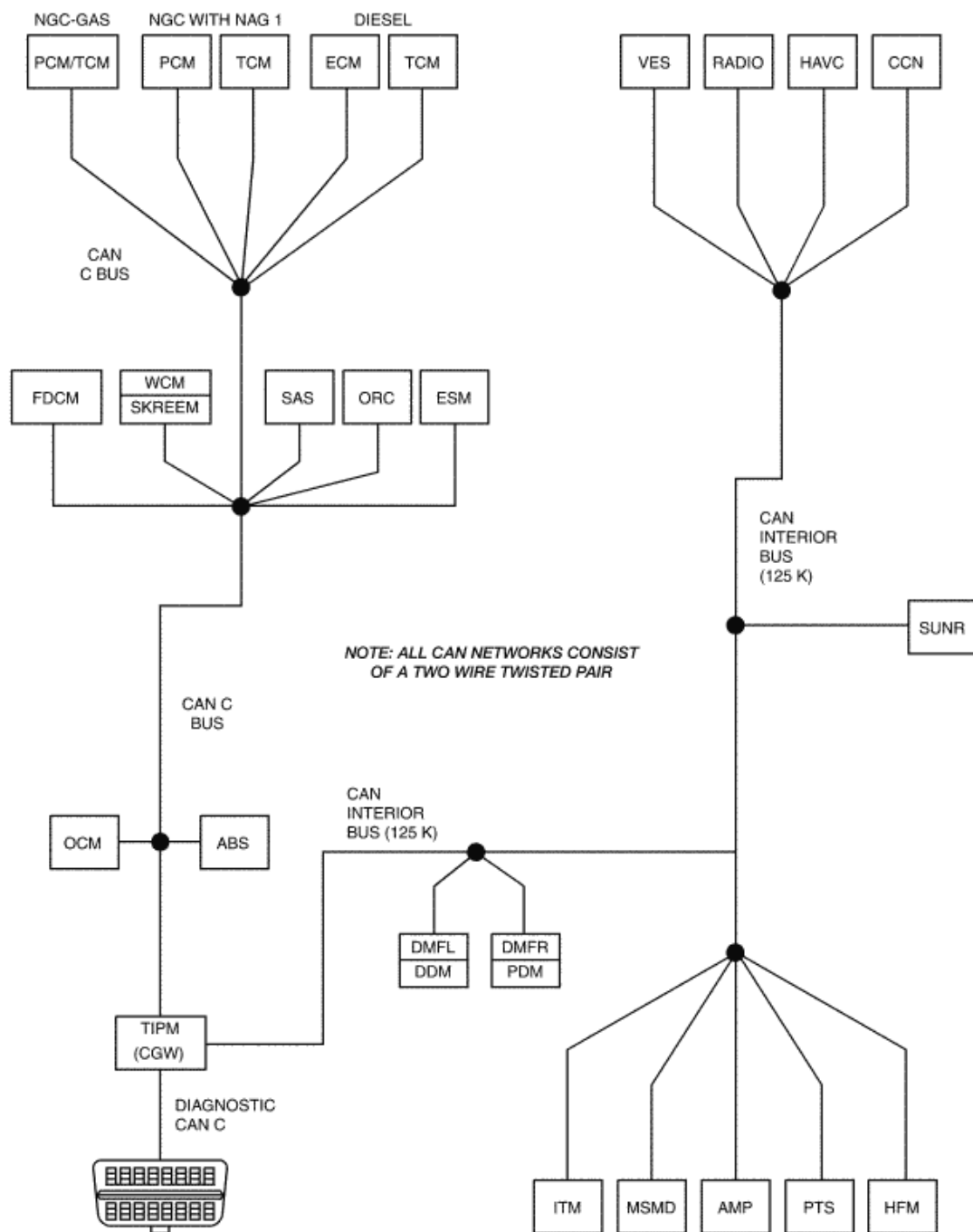
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0164-LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)

Circuit Schematic



81d344d1

Fig. 19: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the A/C Heater Control (HVAC) Module for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE
(D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
TIPM NOT CONFIGURED CORRECTLY
A/C HEATER CONTROL MODULE POWER AND GROUND
A/C HEATER CONTROL MODULE
MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE HVAC IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the HVAC is active on the bus.

Is the HVAC active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the HVAC?

Yes

Replace/update the A/C Heater Control (HVAC) Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the A/C Heater Control (HVAC) Module.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

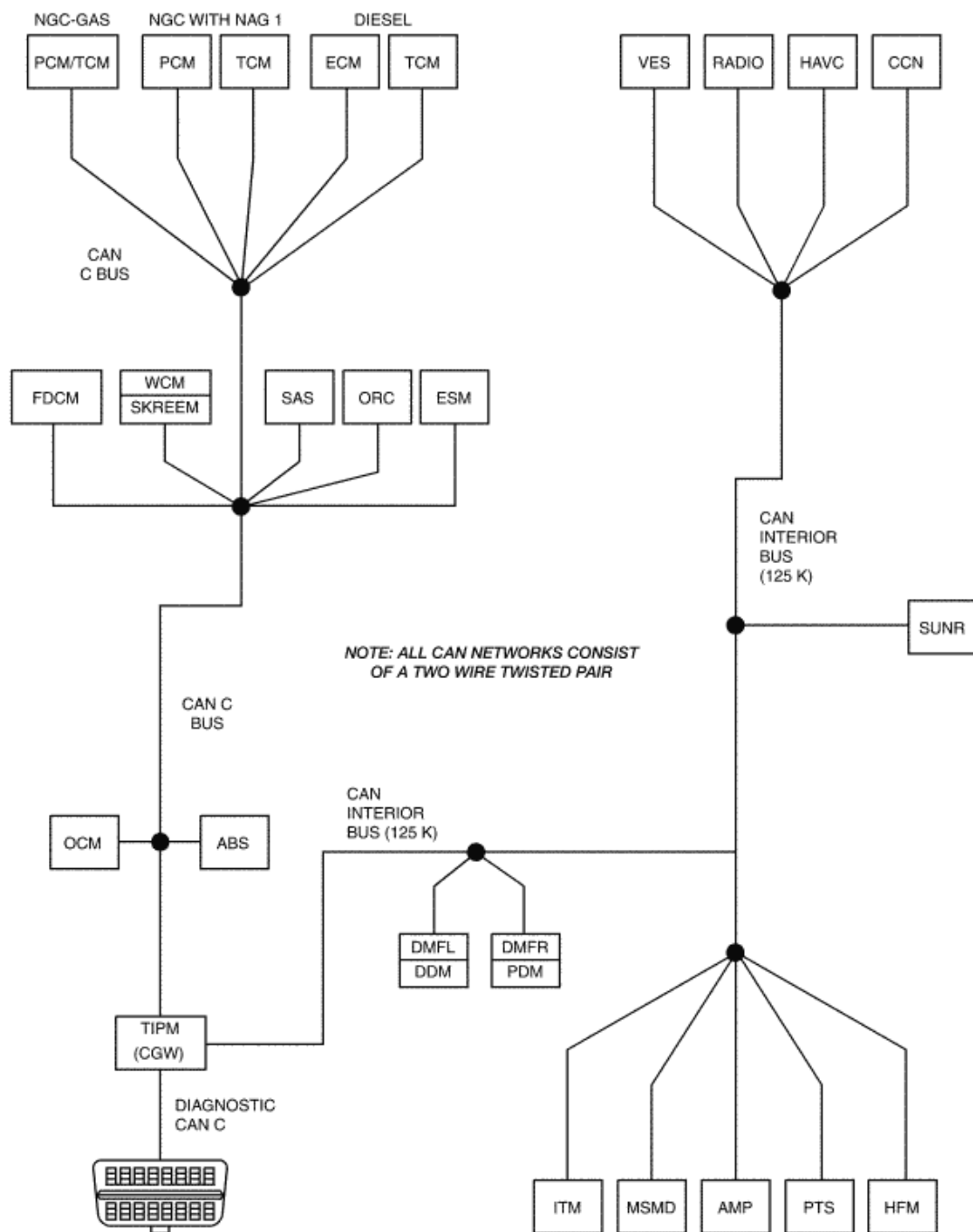
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0167-LOST COMMUNICATION WITH INTRUSION TRANSCEIVER MODULE (ITM)

Circuit Schematic



81d344d1

Fig. 20: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Intrusion Transceiver Module (ITM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY INTRUSION TRANSCIEVER MODULE POWER AND GROUND INTRUSION TRANSCIEVER MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE ITM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the ITM is active on the bus.

Is the ITM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the ITM?

Yes

Replace/update the Intrusion Transceiver Module (ITM) in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the Intrusion Transceiver Module (ITM).

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

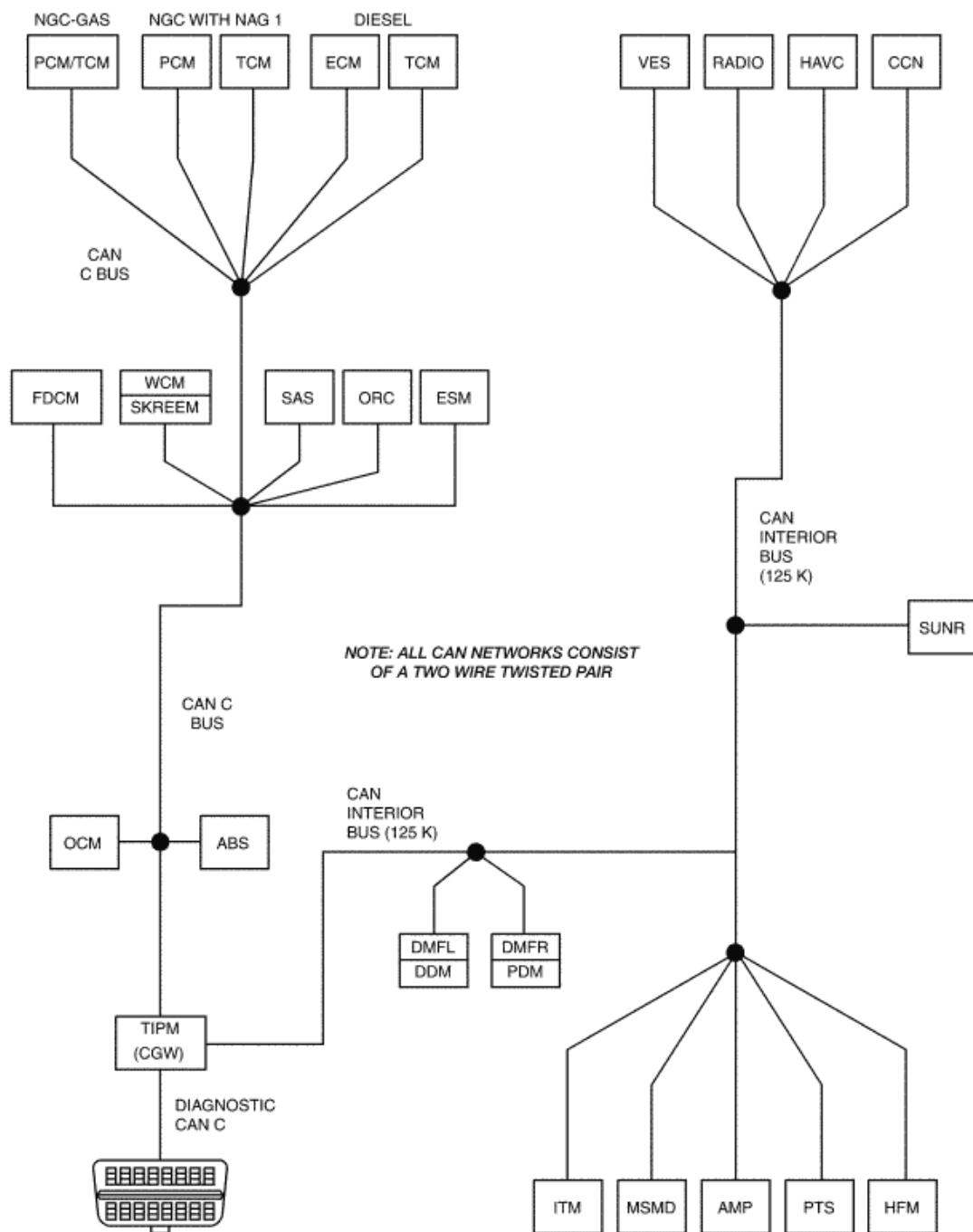
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0168-LOST COMMUNICATION WITH WCM

Circuit Schematic



81d344d1

Fig. 21: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- **Set Condition:**

Bus messages not received from the WCM for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D65) CAN C BUS(+) CIRCUIT SHORTED TO VOLTAGE (D64) CAN C BUS(-) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY WCM POWER AND GROUND VEHICLE SECURITY CONTROL MODULE (WCM/SKREEM) MODULE THAT SET THIS DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read all active DTCS from all modules.

NOTE: Check for TIPM configuration, CAN C hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

Does the scan tool display any active DTCS to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE WCM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the WCM is active on the bus.

Is the WCM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCS "Logged Against" the WCM?

Yes

Replace/update the Occupant Classification Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the WCM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three time ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN C BUS modules show Lost Communication with the remaining CAN C BUS modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D65) CAN C BUS (+) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D65) CAN C Bus (+) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D65) CAN C Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D64) CAN C BUS (-) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D64) CAN C Bus (-) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D64) CAN C Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

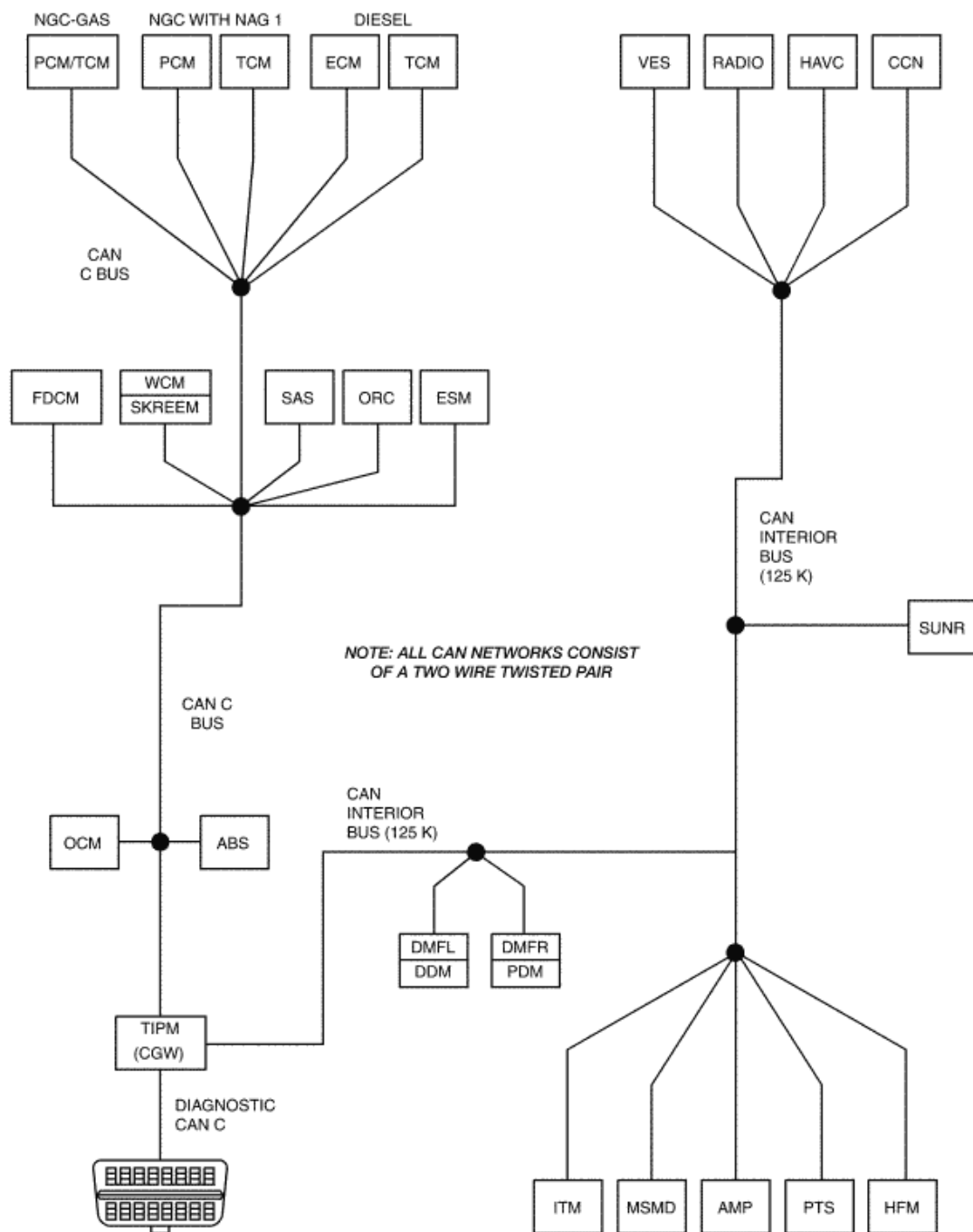
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0169-LOST COMMUNICATION WITH SUNROOF CONTROL MODULE (SUNR)

Circuit Schematic



81d344d1

Fig. 22: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Sunroof Control Module (SUNR) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY SUNR POWER AND GROUND SUNROOF CONTROL MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE SUNR IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the SUNR is active on the bus.

Is the SUNR active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the SUNR?

Yes

Replace/update the Sunroof Control Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the SUNR.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

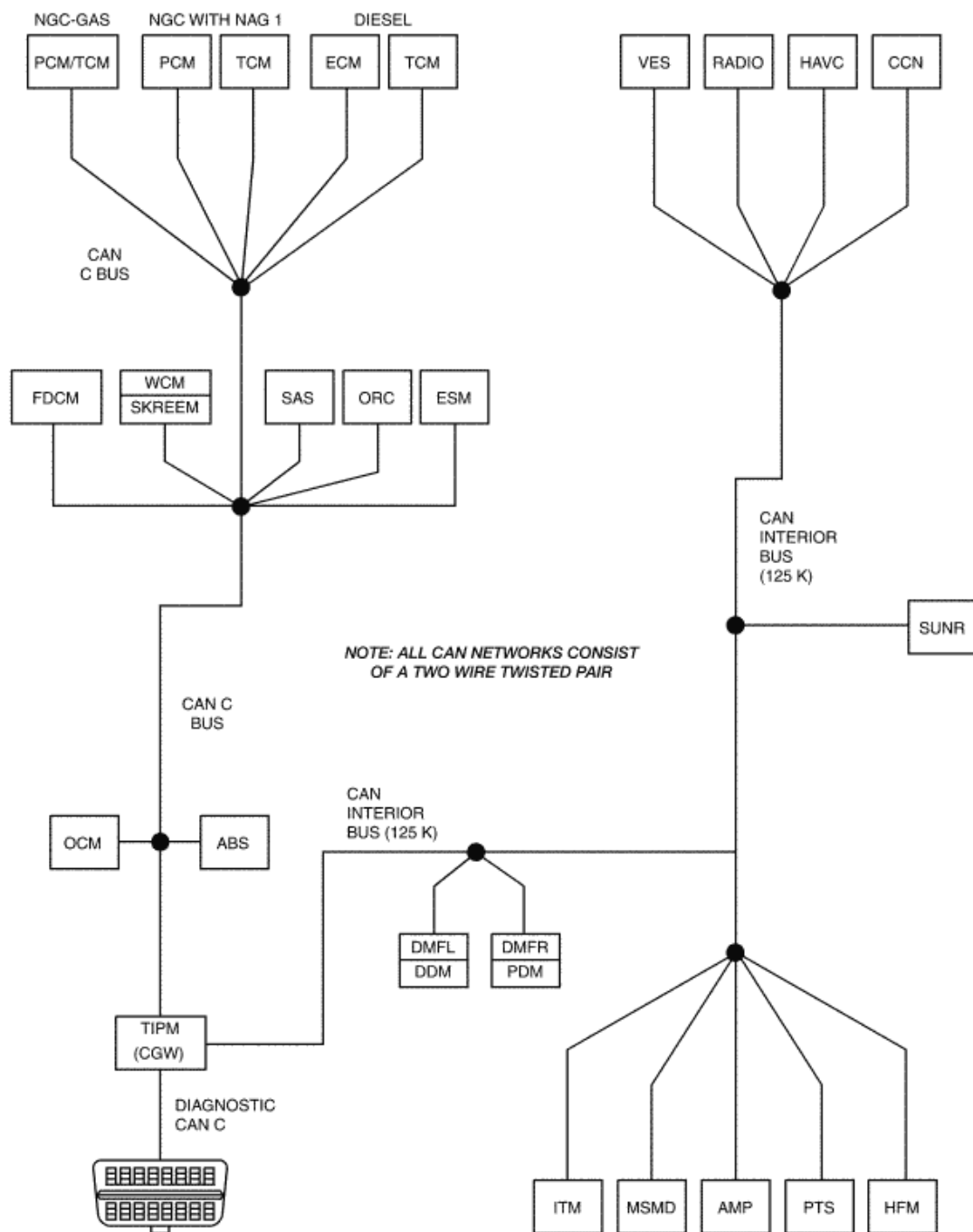
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0184-LOST COMMUNICATION WITH RADIO

Circuit Schematic



81d344d1

Fig. 23: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Radio for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY RADIO POWER AND GROUND RADIO MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE RADIO IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the RADIO is active on the bus.

Is the RADIO active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the RADIO?

Yes

Replace/update the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the Radio.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

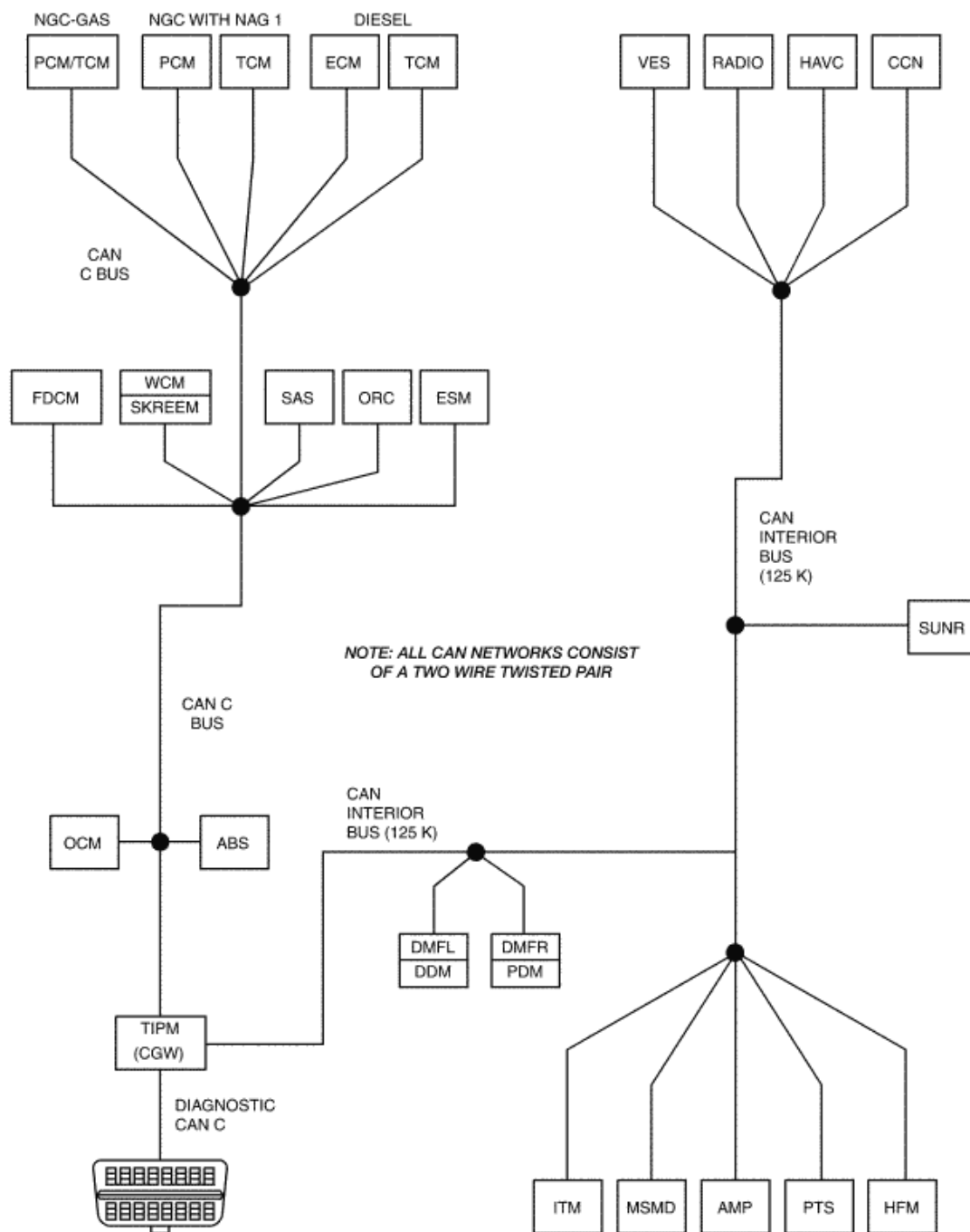
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Circuit Schematic



81d344d1

Fig. 24: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Amplifier for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY AMPLIFIER POWER AND GROUND AMPLIFIER MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCS.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE AMP IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the AMP is active on the bus.

Is the AMP active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the AMP?

Yes

Replace/update the Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the Amp.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

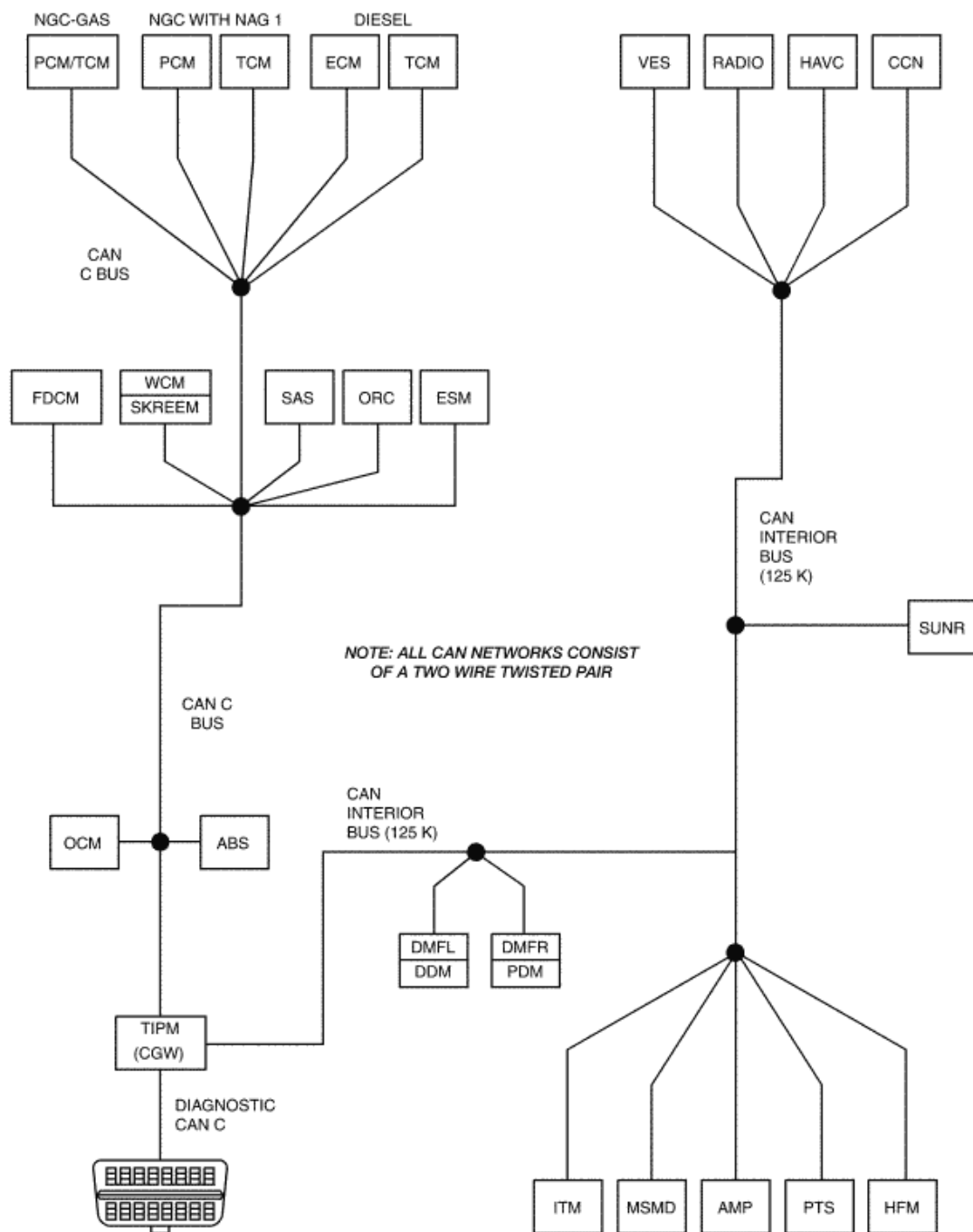
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0187-LOST COMMUNICATION WITH DVD PLAYER

Circuit Schematic



81d344d1

Fig. 25: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- **Set Condition:**

Bus messages not received from the DVD Player (VES) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY DVD PLAYER (VES) POWER AND GROUND DVD PLAYER (VES) MODULE THAT SET THE DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE VES IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the VES is active on the bus.

Is the VES active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the VES?

Yes

Replace/update the DVD Player (VES) in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the VES.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

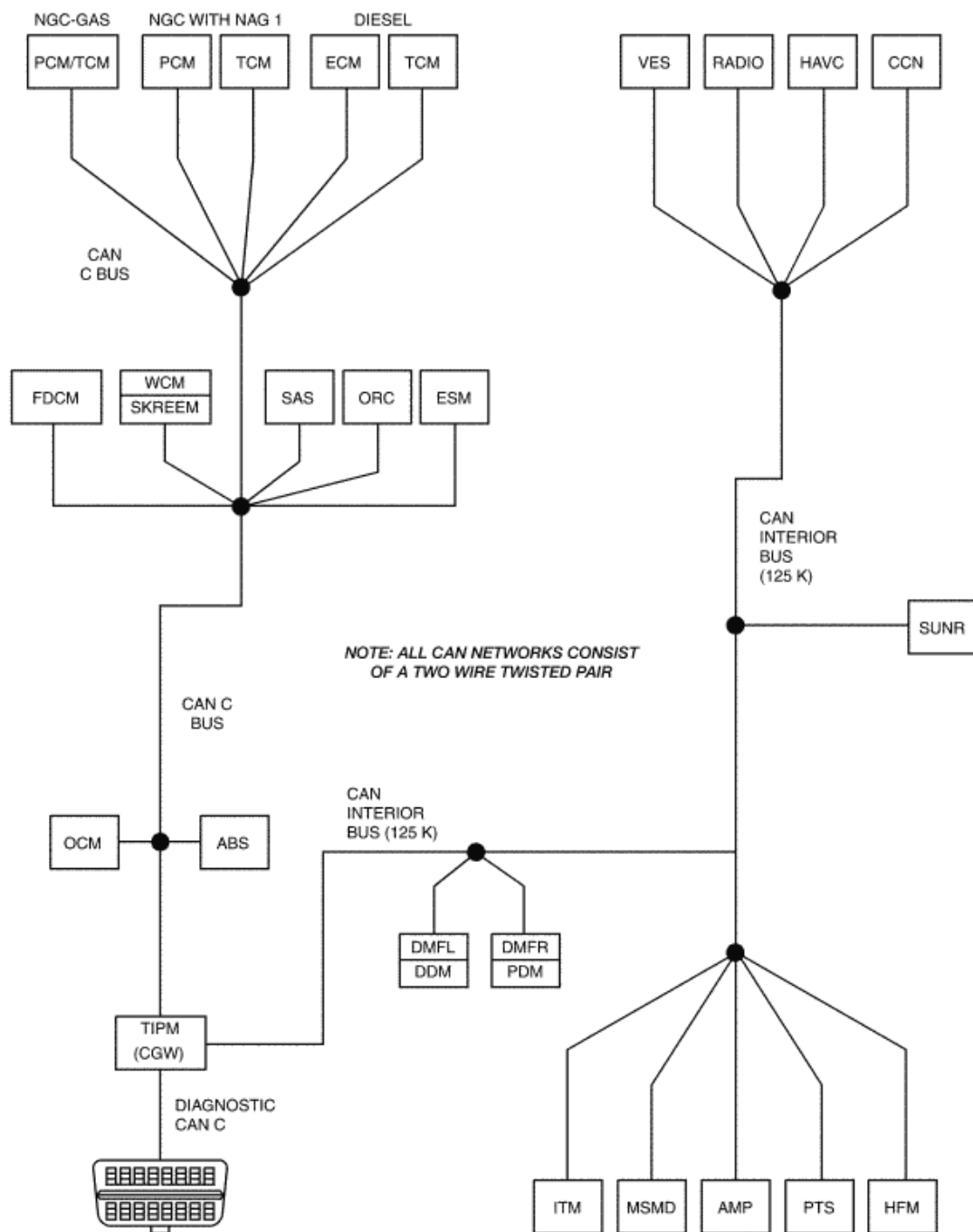
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0197-LOST COMMUNICATION WITH HANDS FREE MODULE (HFM)

Circuit Schematic



81d344d1

Fig. 26: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Hands Free Module (HFM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY HANDS FREE MODULE POWER AND GROUND HANDS FREE MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE HFM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the HFM is active on the bus.

Is the HFM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the HFM?

Yes

Replace/update the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the HFM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

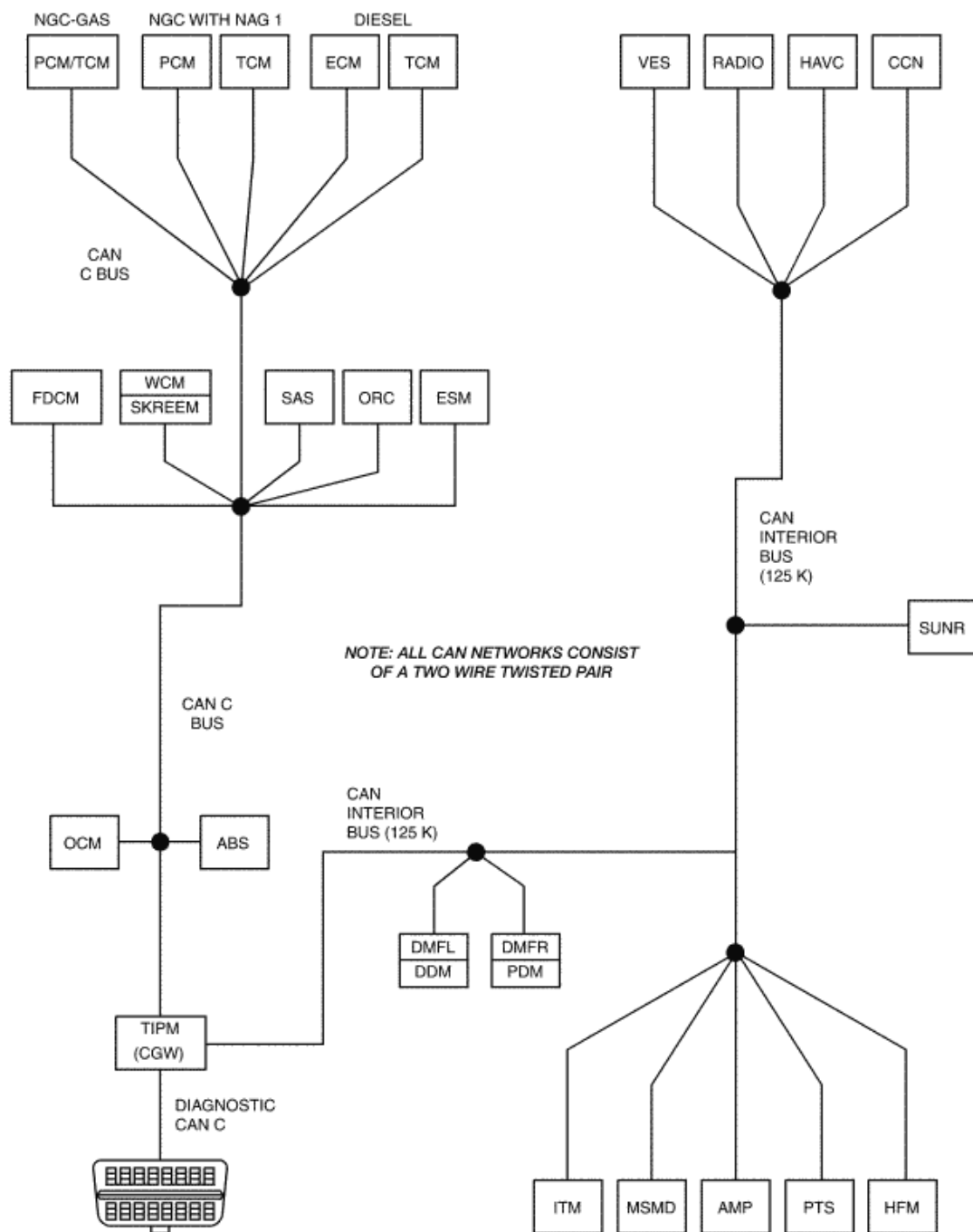
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0203-LOST COMMUNICATION WITH DRIVER DOOR MODULE (DDM)

Circuit Schematic



81d344d1

Fig. 27: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Driver Door Module (DDM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY DRIVER DOOR MODULE POWER AND GROUND DRIVER DOOR MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE DDM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the DDM is active on the bus.

Is the DDM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the DDM?

Yes

Replace/update the Driver Door Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the DDM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

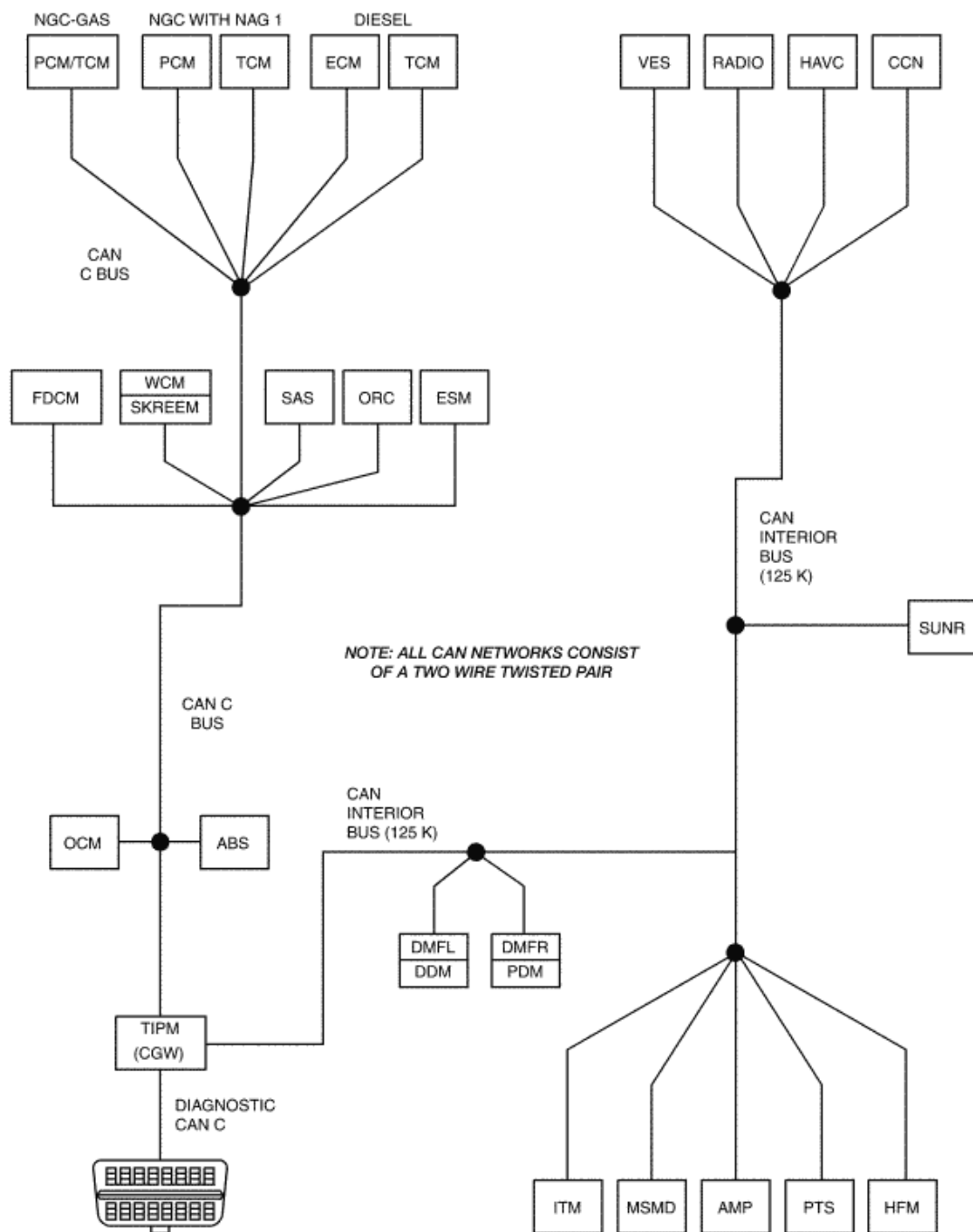
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0204-LOST COMMUNICATION WITH PASSENGER DOOR MODULE (PDM)

Circuit Schematic



81d344d1

Fig. 28: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Passenger Door Module (PDM) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY PASSENGER DOOR MODULE POWER AND GROUND PASSENGER DOOR MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE PDM IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the PDM is active on the bus.

Is the PDM active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the PDM?

Yes

Replace/update the Passenger Door Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the PDM.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

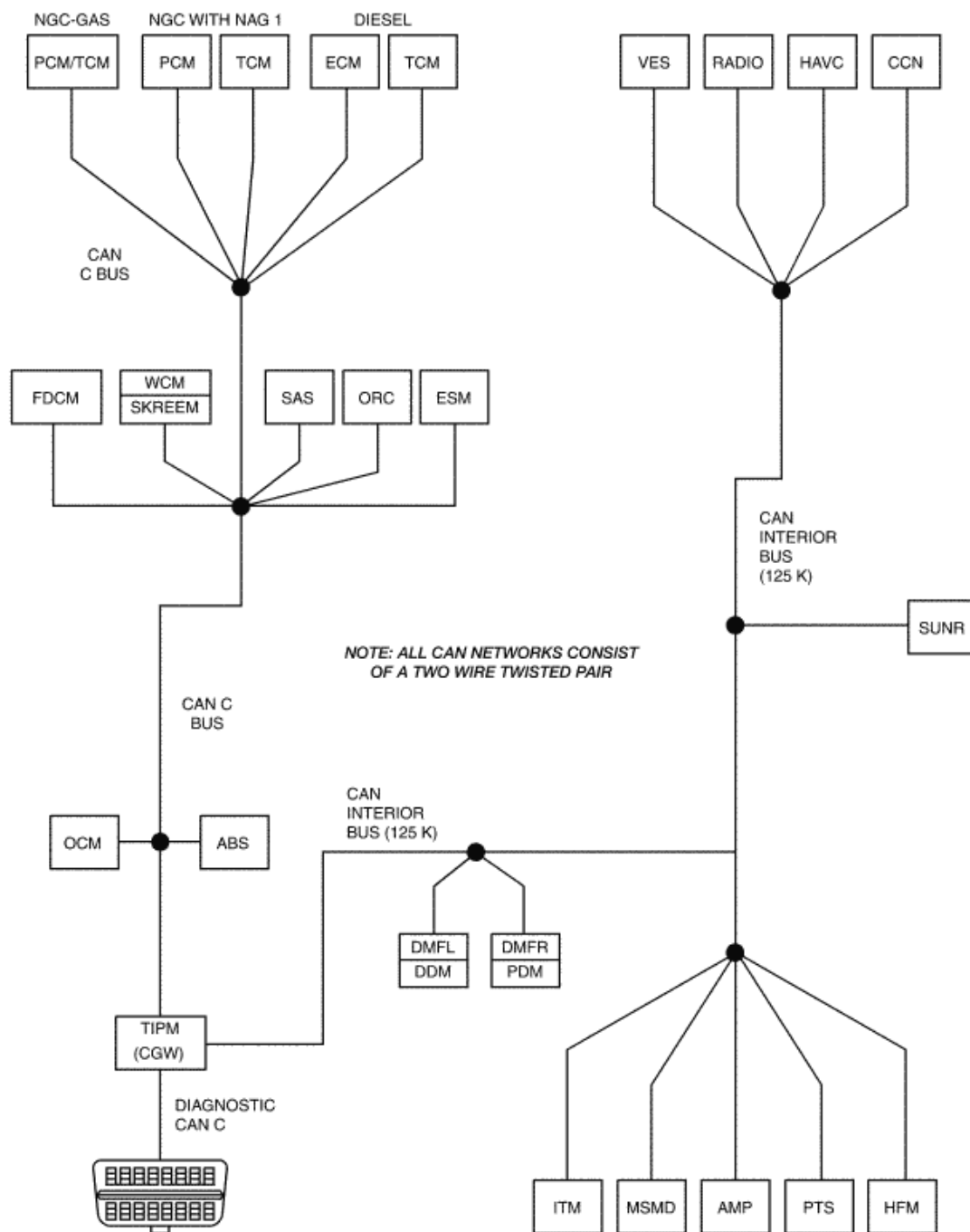
No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U0209-LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE (MSMD)

Circuit Schematic



81d344d1

Fig. 29: Electronic Control Modules Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.
- TIPM is configured correctly.

Set Conditions

- Set Condition:**

Bus messages not received from the Memory Seat Control Module (MSMD) for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
(D265) CAN INTERIOR BUS(+) (125k) CIRCUIT SHORTED TO VOLTAGE (D264) CAN INTERIOR BUS(-) (125k) CIRCUIT SHORTED TO GROUND DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY MSMD POWER AND GROUND MEMORY SEAT CONTROL MODULE MODULE THAT SET THE DTC

Diagnostic Test

1. VERIFY DTC IS ACTIVE

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

With the scan tool, read active DTCs.

Is this DTC active?

Yes

Go To 2.

No

Refer to ***STORED LOST COMMUNICATION DTCS.**

2. **CHECK FOR ANY OF THE FOLLOWING ACTIVE DTCS**

With the scan tool, read active DTCs from all modules.

NOTE: Check for TIPM configuration, CAN Interior Bus hardware electrical, VIN Missing/Mismatch, battery or ignition related DTCs.

Does the scan tool display any active DTCs to the conditions listed above?

Yes

Diagnose and repair the DTC. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of the symptoms.

No

Go To 3.

3. **VERIFY THAT THE MSMD IS ACTIVE ON THE BUS**

Turn the ignition on.

With the scan tool, select Network Diagnostics.

Verify that the MSMD is active on the bus.

Is the MSMD active on the bus?

Yes

Go To 4.

No

Perform the No Response diagnostic procedure. See **DIAGNOSIS AND TESTING.**

4. **CHECK FOR ADDITIONAL COMMUNICATION RELATED DTCS**

With the scan tool, select Network Diagnostics.

Is there more than one module with active DTCs "Logged Against" the MSMD?

Yes

Replace/update the Memory Seat Control Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 5.

5. CLEAR DTC IN MODULE SETTING FAULT

With the scan tool, select the module setting the DTC against the MSMD.

Clear active DTCs.

Is this DTC still active?

Yes

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 6.

6. CYCLE IGNITION

Cycle the ignition from RUN to OFF three times ending with the key in the RUN position.

Does this DTC become active?

Yes

Go To 7.

No

The condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1.**

7. CHECK FOR ADDITIONAL LOST COMMUNICATION FAULTS

With the scan tool, select Network Diagnostics.

Does the TIPM and other CAN Interior BUS (125K) modules show Lost Communication with the remaining CAN Interior BUS (125K) modules?

Yes

Go To 8.

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

8. (D265) CAN INTERIOR BUS(+) (125K) CIRCUIT SHORTED TO VOLTAGE

Measure the voltage between the (D265) CAN Interior Bus(+) (125K) circuit and ground.

Is the voltage above 5 volts?

Yes

Repair the (D265) CAN Interior Bus(+) (125K) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To 9.

9. (D264) CAN INTERIOR BUS(-) (125K) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus(-) (125K) circuit.

Is the resistance below 10K Ohms?

Yes

Repair the (D264) CAN Interior Bus(-) (125K) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Replace/update the module that set this DTC in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

U1147-ADDITIONAL CAN INTERIOR BUS ECU DETECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) detects an additional CAN Interior Bus module and requires reprogramming.

Possible Causes

Possible Causes
ADDITIONAL MODULE ADDED/REMOVED FROM THE CAN INTERIOR BUS NETWORK

Diagnostic Test

1. **REPROGRAM THE TOTALLY INTEGRATED POWER MODULE (TIPM)**

Turn the ignition on.

With the scan tool, select network view and select the CAN Interior Bus. This will list the CAN Interior Bus modules on the vehicle. Read and record the listed modules.

With the scan tool, select TIPM, miscellaneous functions then add/remove ECUs.

With the scan tool, add or remove the module that was not configured in the TIPM.

With the scan tool, erase DTC's.

Cycle the ignition from on to off 3 times and read the active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Retest system and attempt to reprogram the TIPM.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair is complete.

Perform **BODY VERIFICATION TEST - VER 1.**

U1148-ADDITIONAL CAN C BUS ECU DETECTED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) detects an additional CAN C Bus module and requires reprogramming.

Possible Causes

Possible Causes
ADDITIONAL MODULE ADDED/REMOVED FROM THE CAN C BUS NETWORK

Diagnostic Test

1. **REPROGRAM THE TOTALLY INTEGRATED POWER MODULE (TIPM)**

Turn the ignition on.

With the scan tool, select network view and select the CAN C Bus network. This will list the CAN C Bus modules on the vehicle. Read and record the listed modules.

With the scan tool, select TIPM, miscellaneous functions then add/remove ECUs.

With the scan tool, add or remove the module that was not configured in the TIPM.

With the scan tool, erase DTC's.

Cycle the ignition from on to off 3 times and read the active TIPM DTC's.

Does the scan tool display this DTC as active?

Yes

Retest system and attempt to reprogram the TIPM.
Perform **BODY VERIFICATION TEST - VER 1.**

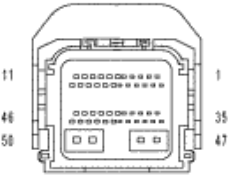
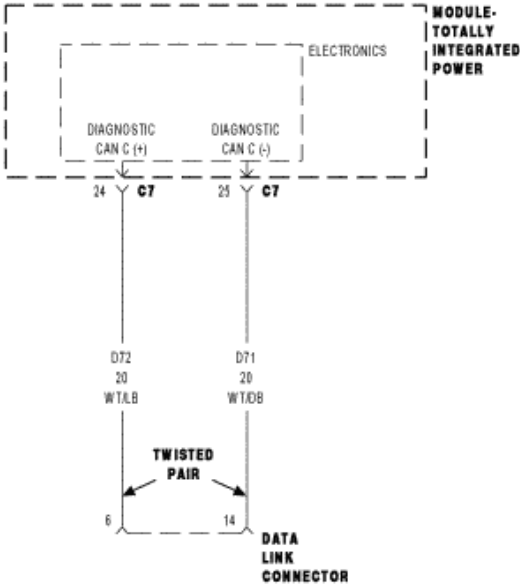
No

Repair is complete.

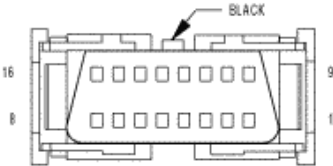
Perform **BODY VERIFICATION TEST - VER 1.**

***BOTH DIAGNOSTIC CAN C (+) AND DIAGNOSTIC CAN C (-) CIRCUITS OPEN**

Circuit Schematic



MODULE-TOTALLY INTEGRATED POWER C7



DATA LINK CONNECTOR

Fig. 30: Diagnostic CAN C Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected an open condition on both Diagnostic CAN C circuits.

Possible Causes

Possible Causes
(D72) DIAGNOSTIC CAN C (+) CIRCUIT OPEN
(D71) DIAGNOSTIC CAN C (-) CIRCUIT OPEN
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

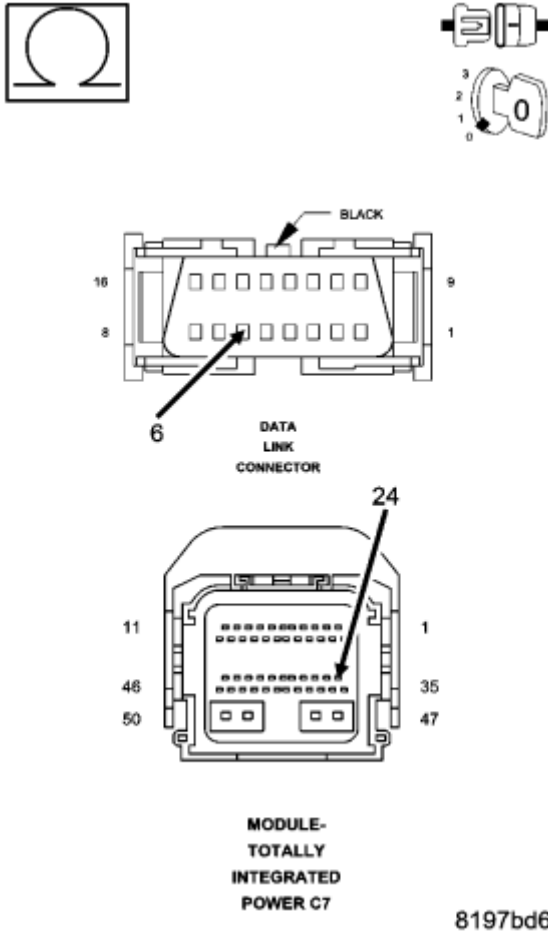
Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. (D72) DIAGNOSTIC CAN C (+) CIRCUIT OPEN



8197bd61

Fig. 31: Measuring Resistance Of (D72) Diagnostic CAN C (+) Circuit Between TIPM C7 Harness Connector And DLC

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

NOTE: Check the connectors at both the DLC and the TIPM.

Measure the resistance of the (D72) Diagnostic CAN C (+) circuit between the TIPM C7 harness connector and the DLC.

Is the resistance below 5.0 ohms?

Yes

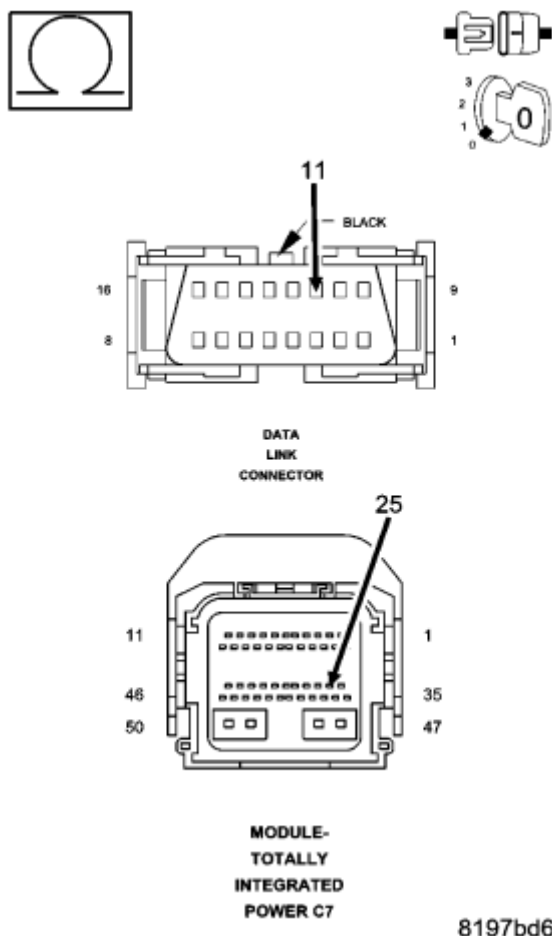
Go To step 3.

No

Repair the (D72) Diagnostic CAN C (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (D71) DIAGNOSTIC CAN C (-) CIRCUIT OPEN



8197bd65

Fig. 32: Measuring Resistance Of (D71) Diagnostic CAN C (-) Circuit Between TIPM C7 Harness Connector And DLC
Courtesy of CHRYSLER LLC

Measure the resistance of the (D71) Diagnostic CAN C (-) circuit between the TIPM C7 harness

connector and the DLC.

Is the resistance below 5.0 ohms?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

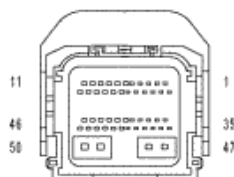
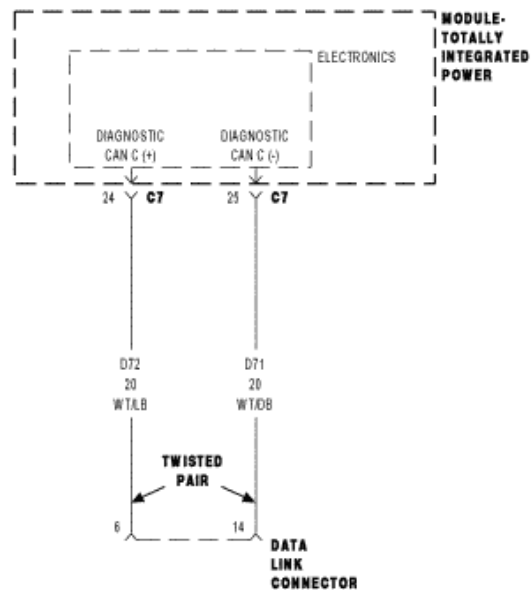
No

Repair the (D71) Diagnostic CAN C (-) circuit for an open.

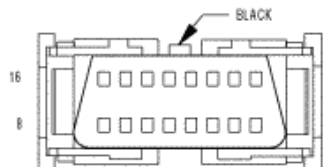
Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (+) AND/OR DIAGNOSTIC CAN C (-) CIRCUITS HIGH**

Circuit Schematic



MODULE-TOTALLY INTEGRATED POWER C7



DATA LINK CONNECTOR

01978cc09

Fig. 33: Diagnostic CAN C Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected a shorted high condition on either or both Diagnostic CAN C circuits.

Possible Causes

Possible Causes
(D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO VOLTAGE
(D71) DIAGNOSTIC CAN C (-) CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the Data Link Connector (DLC).

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. DIAGNOSTIC CAN C CIRCUITS SHORTED TO VOLTAGE

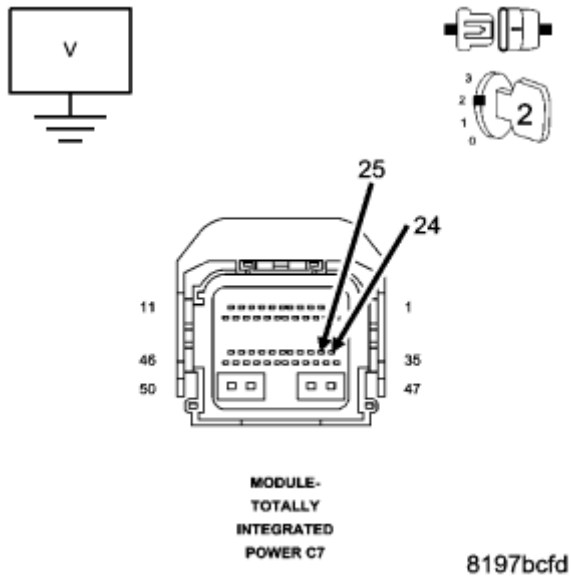


Fig. 34: Measuring Voltage Of Diagnostic CAN C Circuits
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Turn the ignition on.

Measure the voltage of the Diagnostic CAN C circuits.

Is the voltage above 6.0 volts for either circuit?

Yes

Repair the Diagnostic CAN C circuits for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (+) CIRCUIT LOW**

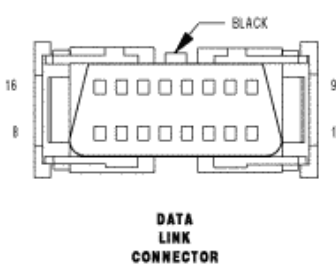
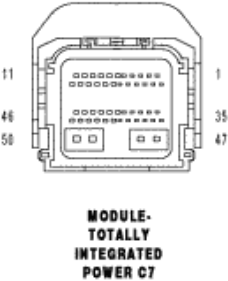
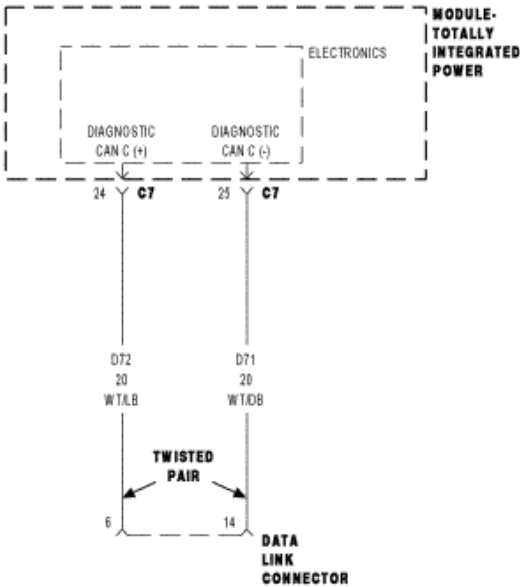


Fig. 35: Diagnostic CAN C Circuit Schematic
Courtesy of CHRYSLER LLC

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected a shorted low condition on the (D72) Diagnostic CAN C (+) circuit.

Possible Causes

Possible Causes
(D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO GROUND TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. (D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO GROUND

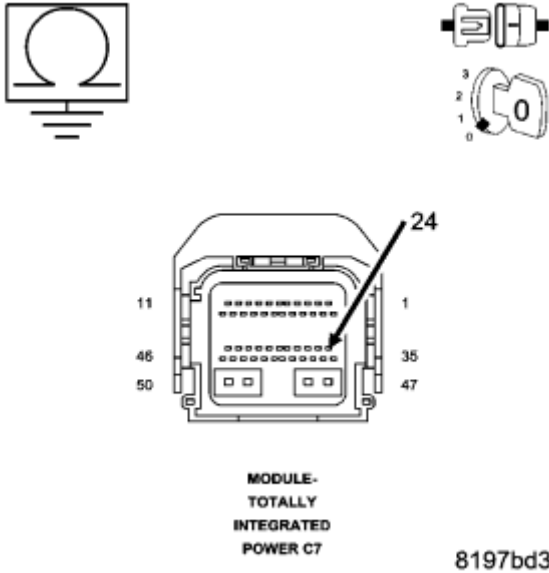


Fig. 36: Measuring The Resistance Between Ground And The Diagnostic Can C (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance between ground and the (D72) Diagnostic CAN C (+) circuit.

Is the resistance below 100.0 ohms?

Yes

Repair the (D72) Diagnostic CAN C (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

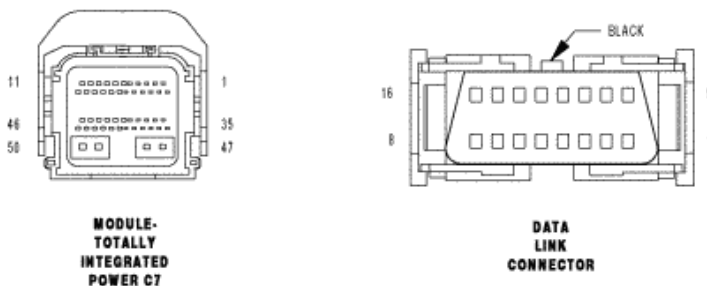
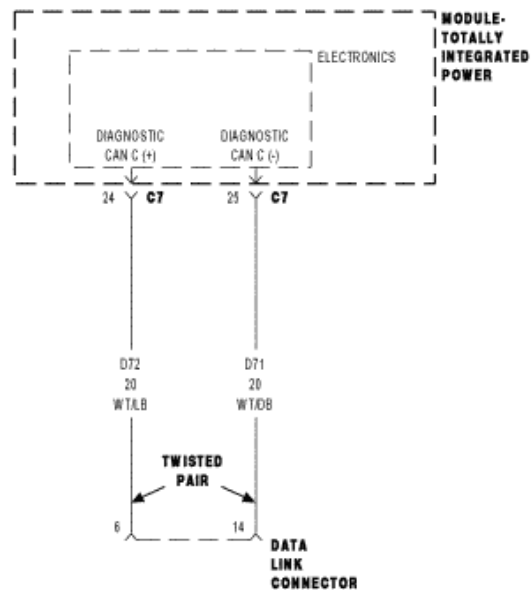
No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (+) CIRCUIT OPEN**

Circuit Schematic



01978cc09

Fig. 37: Diagnostic CAN C Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- Set Condition:

The scan tool has detected an open condition on the (D72) Diagnostic CAN C (+) circuit.

Possible Causes

Possible Causes
(D72) DIAGNOSTIC CAN C (+) CIRCUIT OPEN TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. CHECK THE STATUS OF THE ERROR MESSAGE

NOTE: Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.

NOTE: Ensure the scan tool is updated to the latest software.

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

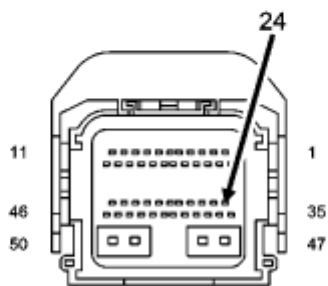
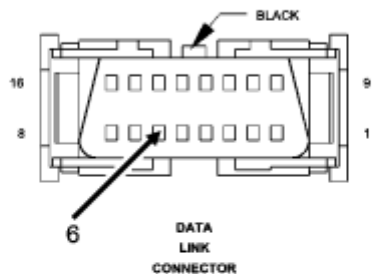
Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. (D72) DIAGNOSTIC CAN C (+) CIRCUIT OPEN



MODULE-
TOTALLY
INTEGRATED
POWER C7

8197bd61

Fig. 38: Measuring Resistance Of (D72) Diagnostic CAN C (+) Circuit Between TIPM C7 Harness Connector And DLC
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance of the (D72) Diagnostic CAN C (+) circuit between the TIPM C7 harness connector and the DLC.

Is the resistance below 5.0 ohms?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

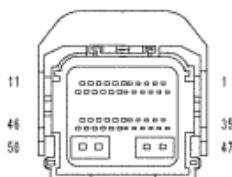
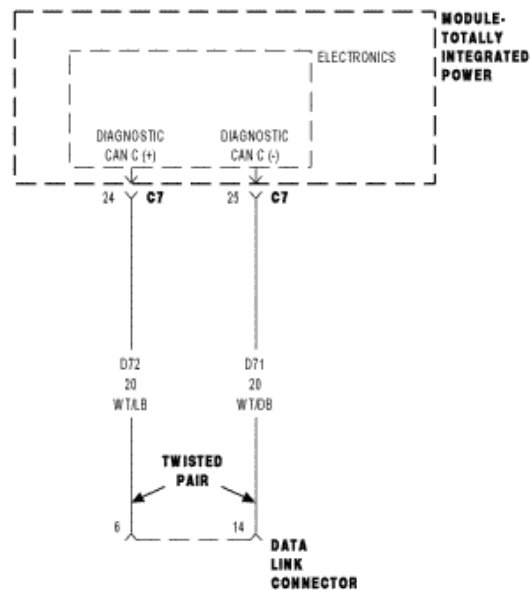
No

Repair the (D72) Diagnostic CAN C (+) circuit for an open.

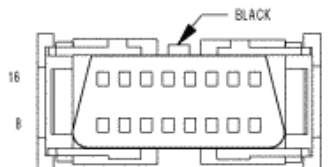
Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (+) SHORTED TO DIAGNOSTIC CAN C (-)**

Circuit Schematic



MODULE-TOTALLY INTEGRATED POWER C7



DATA LINK CONNECTOR

01978cc09

Fig. 39: Diagnostic CAN C Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected a shorted together condition on the Diagnostic CAN C circuits.

Possible Causes

Possible Causes
(D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO (D71) DIAGNOSTIC CAN C (-) CIRCUIT TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. **(D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO (D71) DIAGNOSTIC CAN C (-)**

CIRCUIT

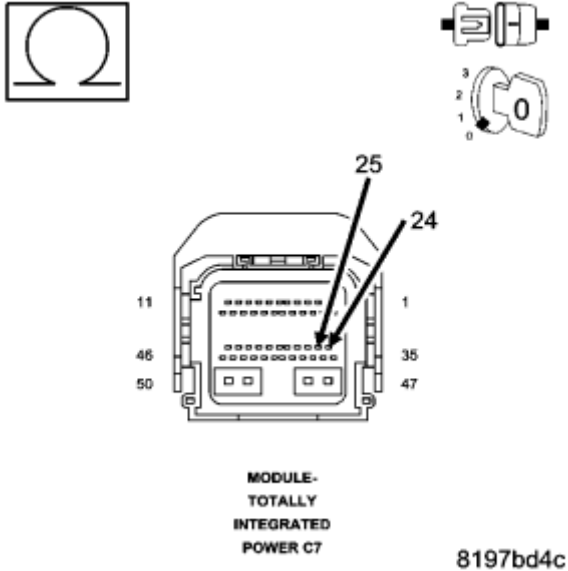


Fig. 40: Measuring Resistance Between (D72/52) Diagnostic CAN C (+) Circuit And (D71) Diagnostic CAN C (-) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance between the (D72) Diagnostic CAN C (+) circuit and the (D71) Diagnostic CAN C (-) circuit.

Is the resistance below 100.0 ohms?

Yes

Repair the (D72) Diagnostic CAN C (+) circuit for a short to the (D71) Diagnostic CAN C (-) circuit.

Perform **BODY VERIFICATION TEST - VER 1.**

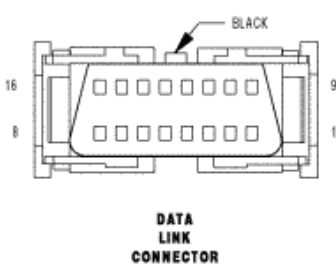
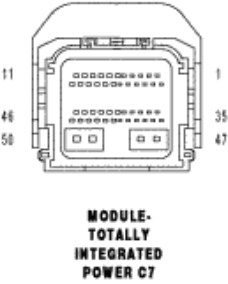
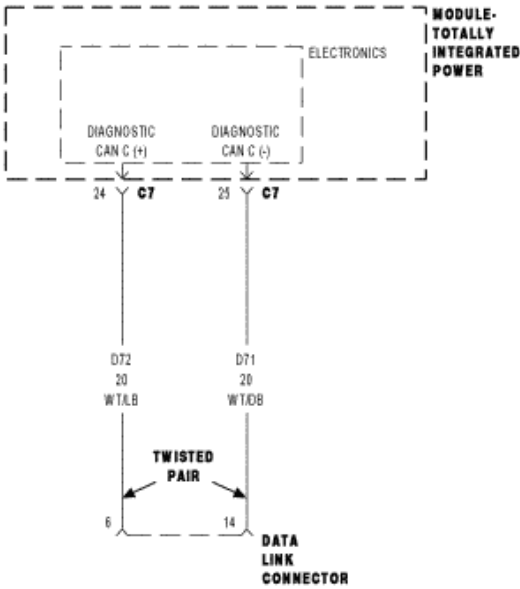
No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (-) CIRCUIT LOW**

Circuit Schematic



01070009

Fig. 41: Diagnostic CAN C Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected a shorted low condition on the (D71) Diagnostic CAN C (-) circuit.

Possible Causes

Possible Causes
(D71) DIAGNOSTIC CAN C (-) CIRCUIT SHORTED TO GROUND TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. (D71) DIAGNOSTIC CAN C (-) CIRCUIT SHORTED TO GROUND

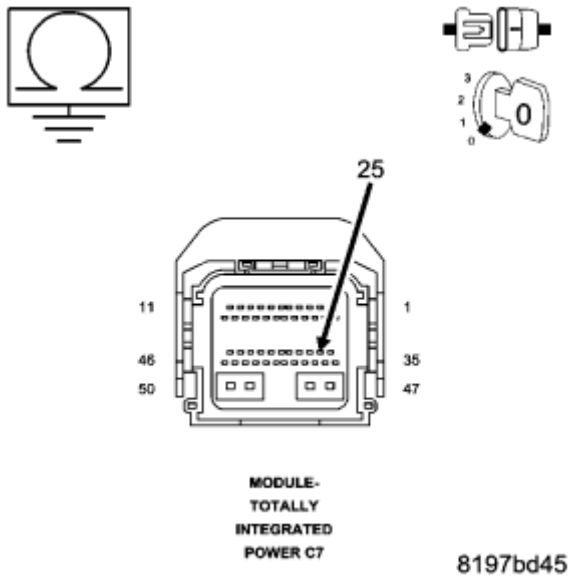


Fig. 42: Measuring Resistance Between Ground And (D71) Diagnostic CAN C (-) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance between ground and the (D71) Diagnostic CAN C (-) circuit.

Is the resistance below 100.0 ohms?

Yes

Repair the (D71) Diagnostic CAN C (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

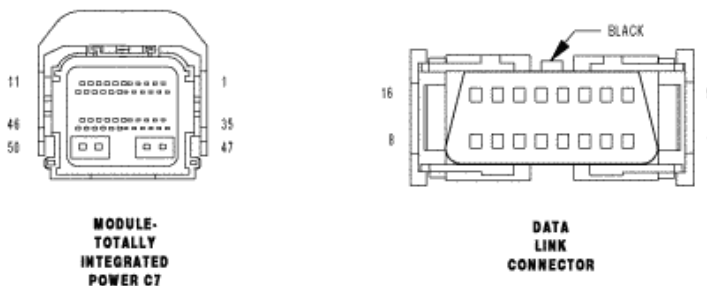
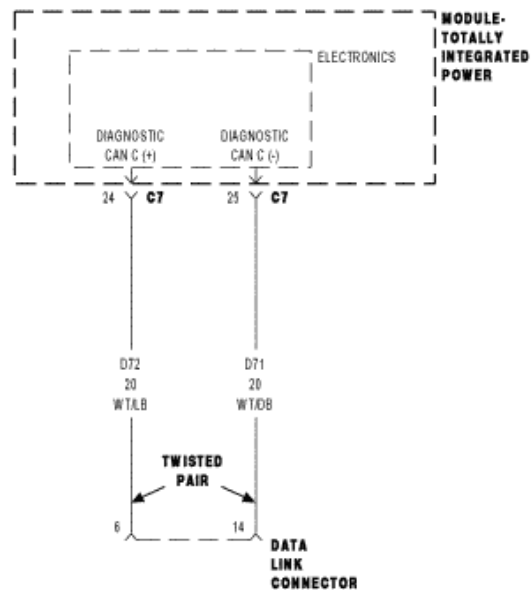
No

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

***DIAGNOSTIC CAN C (-) CIRCUIT OPEN**

Circuit Schematic



01978cc09

Fig. 43: Diagnostic CAN C Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the scan tool queries the TIPM.

Set Conditions

- **Set Condition:**

The scan tool has detected an open condition on the (D71) Diagnostic CAN C (-) circuit.

Possible Causes

Possible Causes
(D71) DIAGNOSTIC CAN C (-) CIRCUIT OPEN TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **CHECK THE STATUS OF THE ERROR MESSAGE**

NOTE: **Ensure the vehicle being tested is a CAN BUS VEHICLE. If not, false error messages may be displayed.**

NOTE: **Ensure the scan tool is updated to the latest software.**

With the scan tool, record the error message.

Disconnect the scan tool from the DLC.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

Does the scan tool display this same error message?

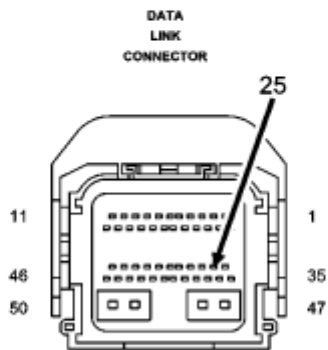
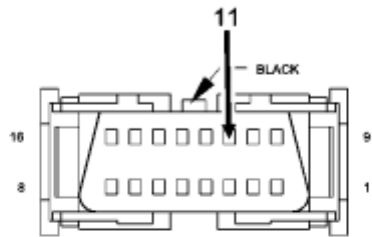
Yes

Go To step 2.

No

The conditions that caused this error message to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

2. **(D71) DIAGNOSTIC CAN C (-) CIRCUIT OPEN**



MODULE-
TOTALLY
INTEGRATED
POWER C7

8197bd65

Fig. 44: Measuring Resistance Of (D71) Diagnostic CAN C (-) Circuit Between TIPM C7 Harness Connector And DLC
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance of the (D71) Diagnostic CAN C (-) circuit between the TIPM C7 harness connector and the DLC.

Is the resistance below 5.0 ohms?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D71) Diagnostic CAN C (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM A/C HEATER CONTROL MODULE (HVAC - ATC)**

Circuit Schematic

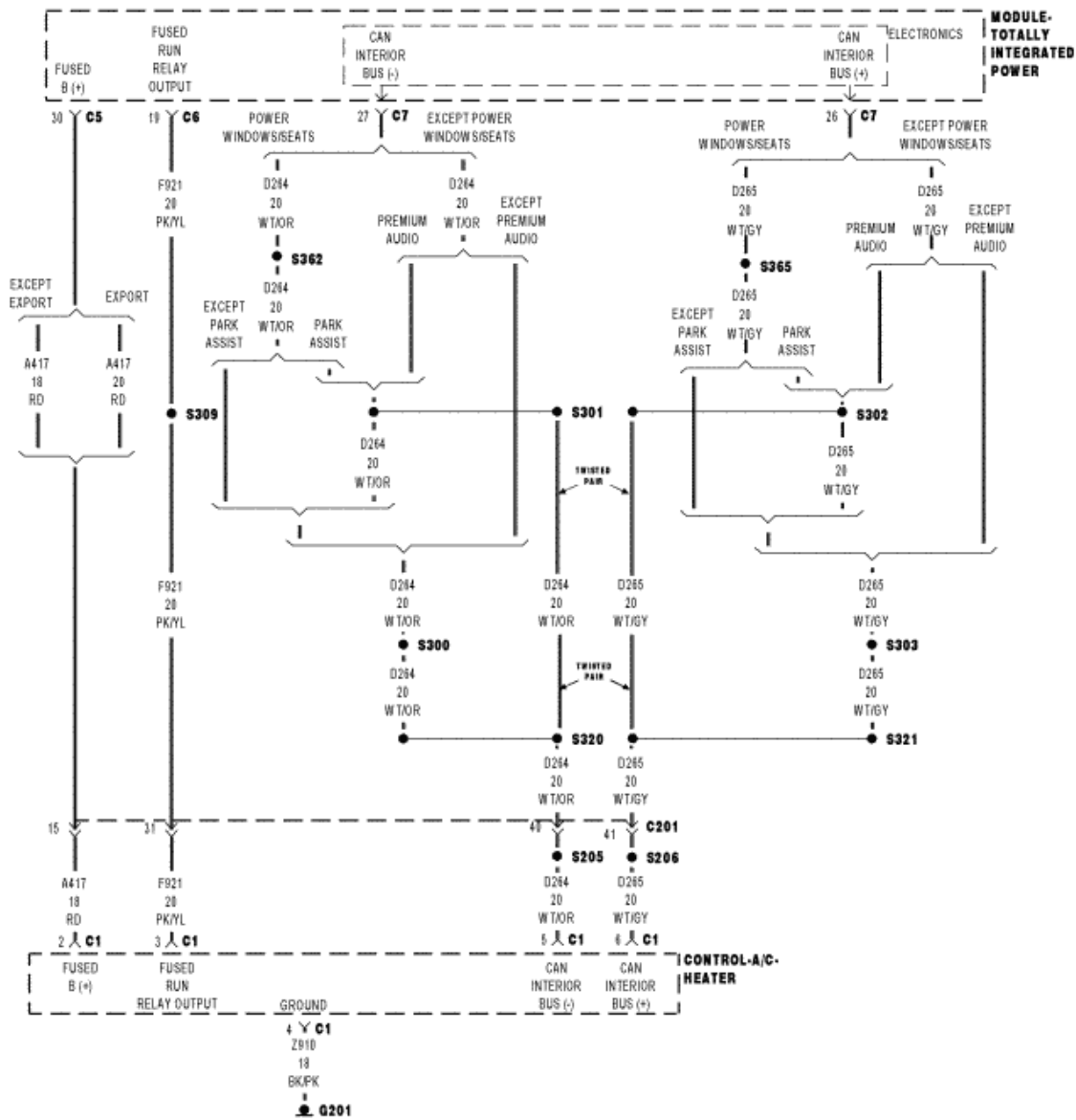


Fig. 45: A/C Heater Control Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A417) FUSED B+ CIRCUIT OPEN OR SHORTED
(F921) FUSED RUN RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(Z910) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
A/C HEATER CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A417) FUSED B+ CIRCUIT OPEN OR SHORTED

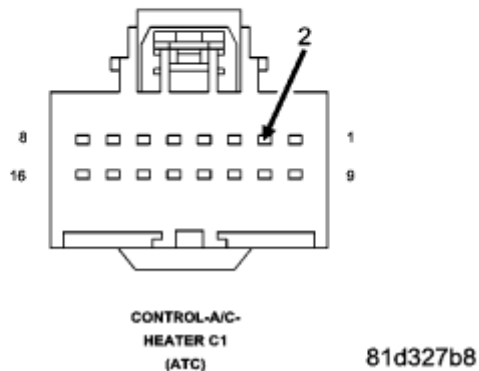


Fig. 46: Checking The Fused B+ Circuit Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control Module C1 harness connector.

Using a 12-volt test light connected to ground, check the (A417) Fused B+ circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (A417) Fused B+ circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (F921) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED

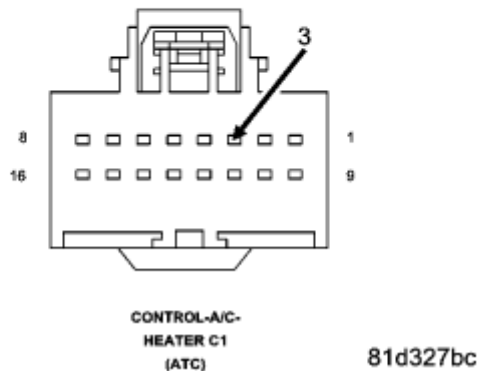
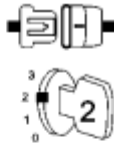


Fig. 47: Checking The Fused Run/Start Relay Output Circuit Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F921) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (F921) Fused Run/Start Relay Output circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(Z910) GROUND CIRCUIT OPEN**

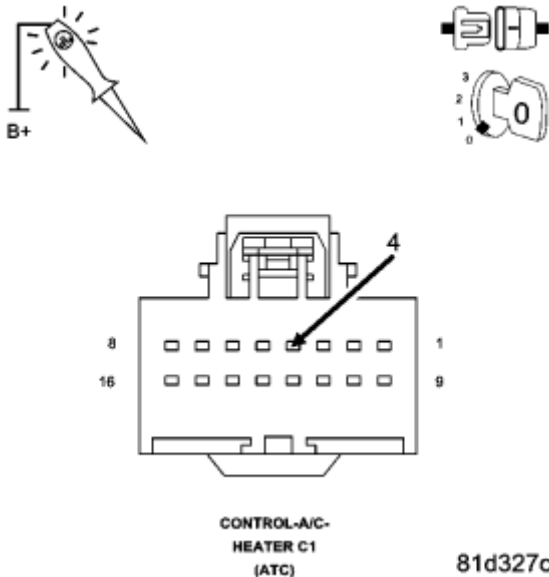


Fig. 48: Checking The Ground Circuit Using A 12-Volt Test Light Connected To 12-Volts
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 5.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

5. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**

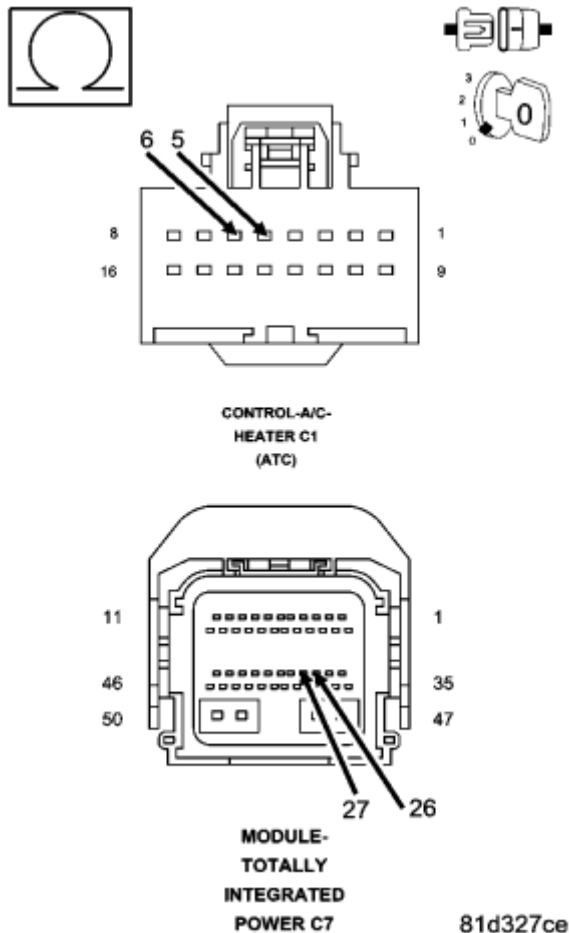


Fig. 49: Measuring The Resistance Of The Can Interior Bus Circuit Between The TIPM C7 Harness Connector And The A/C Heater Control Module C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the A/C Heater Control Module C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the A/C Heater Control Module C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the A/C Heater Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM A/C HEATER CONTROL MODULE (HVAC - MTC)**

Circuit Schematic

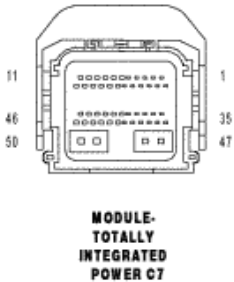
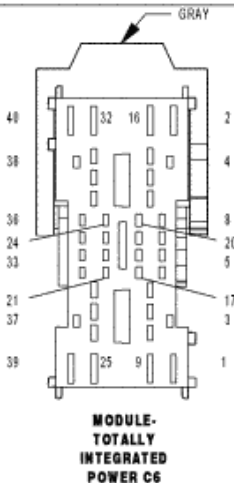
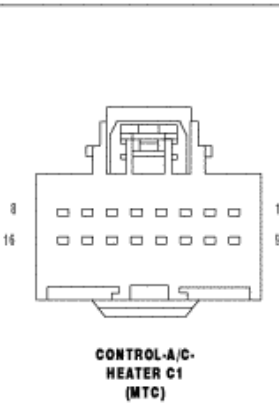
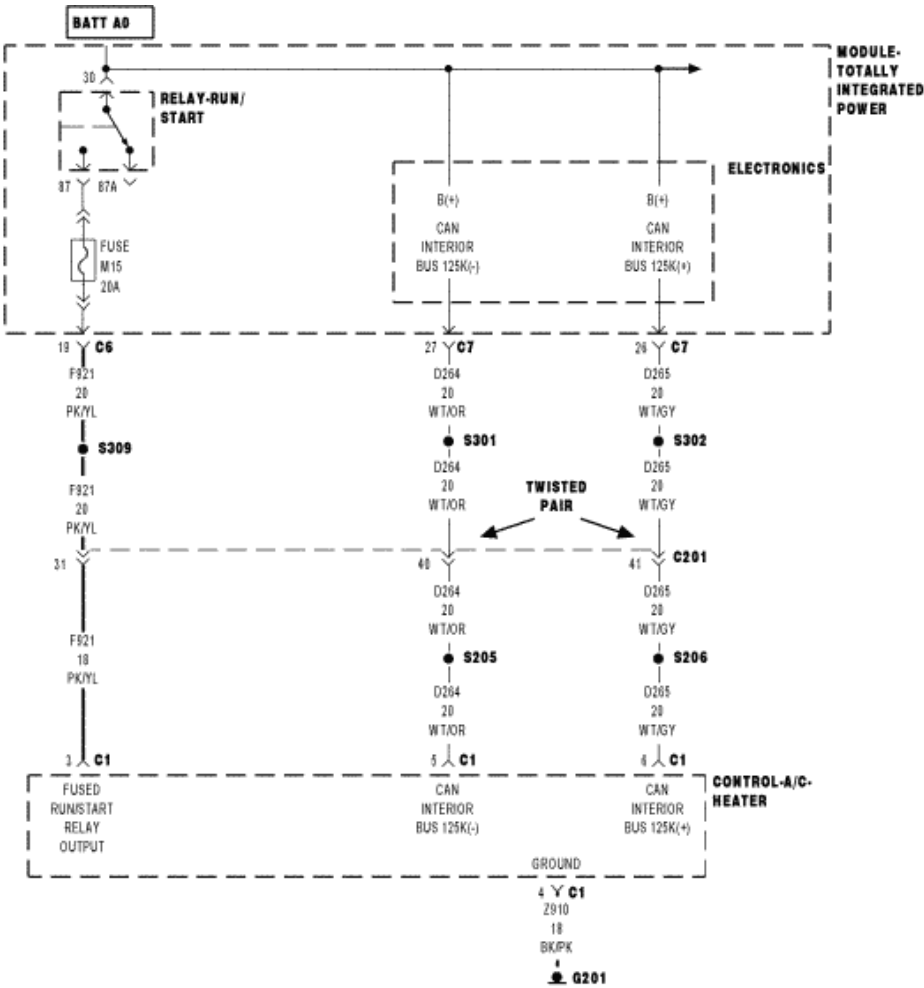


Fig. 50: A/C Heater Control Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(F921) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(Z910) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
A/C HEATER CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (F921) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED

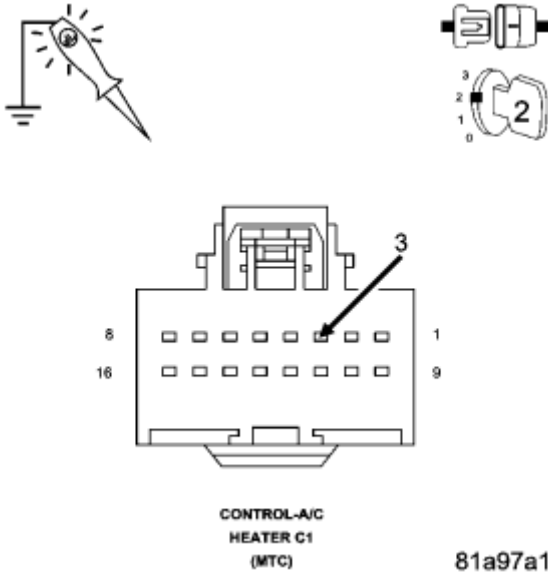


Fig. 51: Using 12-Volt Test Light Connected To Ground To Check (F943) Fused Run/Start Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control Module C1 harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F921) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (F921) Fused Run/Start Relay Output circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z910) GROUND CIRCUIT OPEN

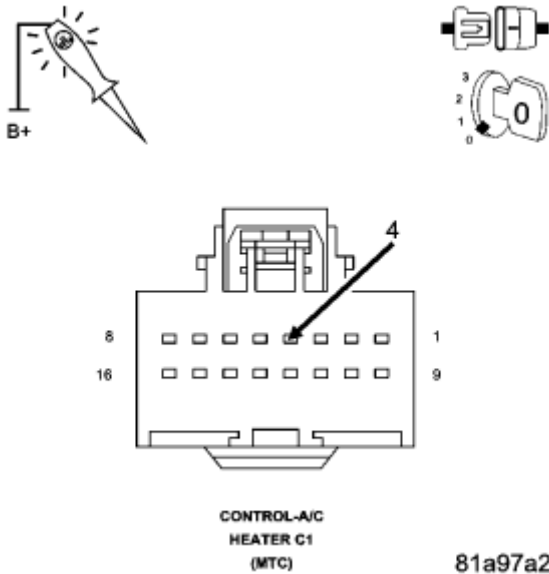


Fig. 52: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN

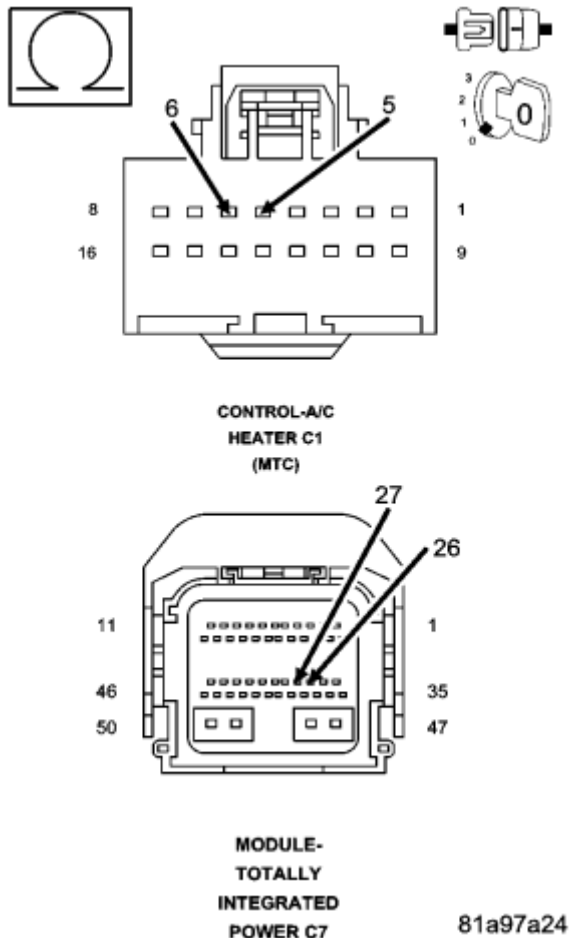


Fig. 53: Measuring Resistance Of (D264/5) CAN Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And A/C Heater Control Module C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the A/C Heater Control Module C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the A/C Heater Control Module C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the A/C Heater Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

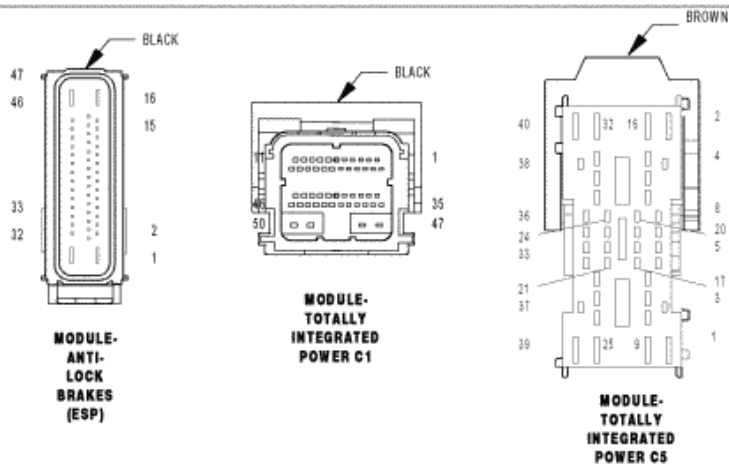
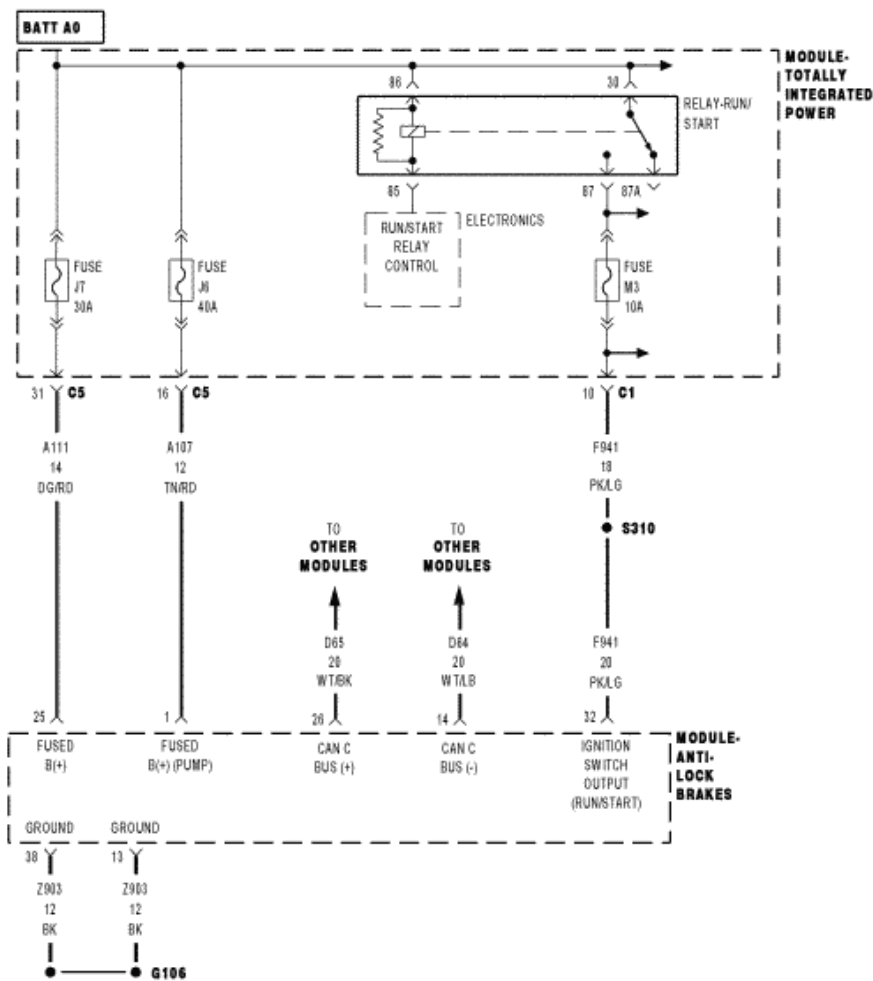
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM ABS (ANTILOCK BRAKE MODULE)**

Circuit Schematic



BT433680

Fig. 54: Antilock Brake Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(A107) (A111) FUSED B(+) CIRCUIT OPEN OR SHORTED
(Z909) (Z917) GROUND CIRCUIT OPEN
(F941) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
ANTILOCK BRAKE MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware DTCs, perform DTC before proceeding.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A107) (A111) FUSED B(+) CIRCUIT OPEN OR SHORTED

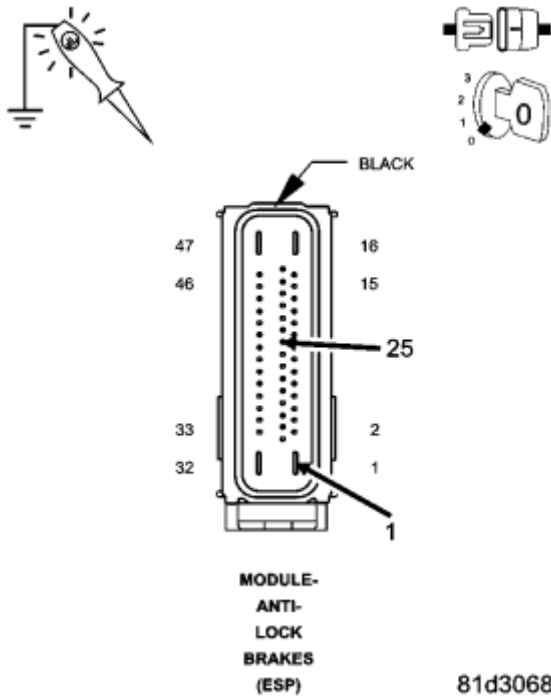


Fig. 55: Checking Each And Fused Circuit Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Antilock Brake Module harness connector.

Using a 12-volt test light connected to ground, check each (A107) and (A111) Fused B(+) circuit.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 3.

No

Repair the Fused B(+) circuit for an open or short.

Perform **ABS VERIFICATION TEST** .

3. (Z909) (Z917) GROUND CIRCUITS OPEN

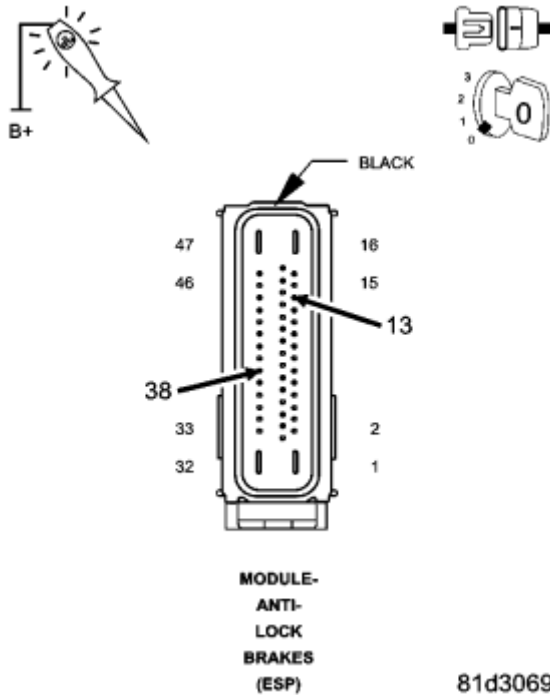


Fig. 56: Checking (Z909) And (Z917) Ground Circuit Using A 12-Volt Test Light Connected To 12-Volts

Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check each (Z909) and (Z917) ground circuit.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 4.

No

Repair the (Z909) or (Z917) ground circuit for an open.

Perform **ABS VERIFICATION TEST** .

4. (F941) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED

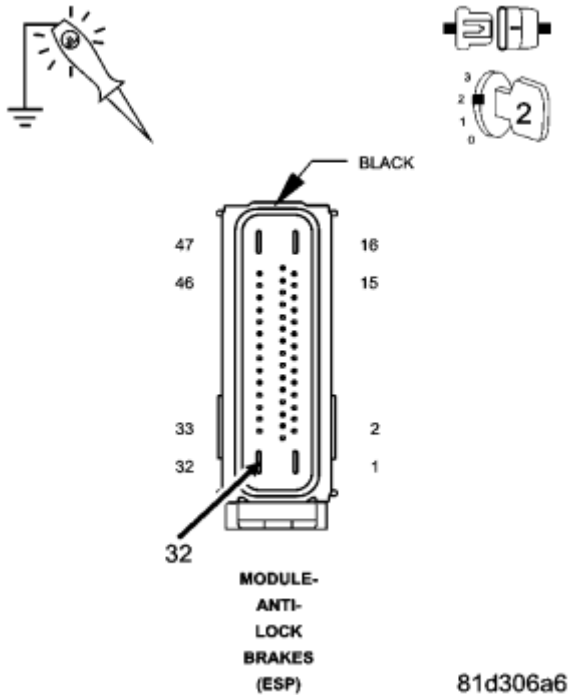


Fig. 57: Checking The Fused Run/Relay Output Circuit Using A 12-Volt Test Light Connected To Ground

Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F941) Fused Run/Relay Output circuit.

Does the test light illuminate brightly?

Yes

Go To step 5.

No

Repair the (F941) Fused Run/Relay Output circuit for an open or short.

Perform **ABS VERIFICATION TEST** .

5. (D65) CAN C BUS (+) CIRCUIT OPEN

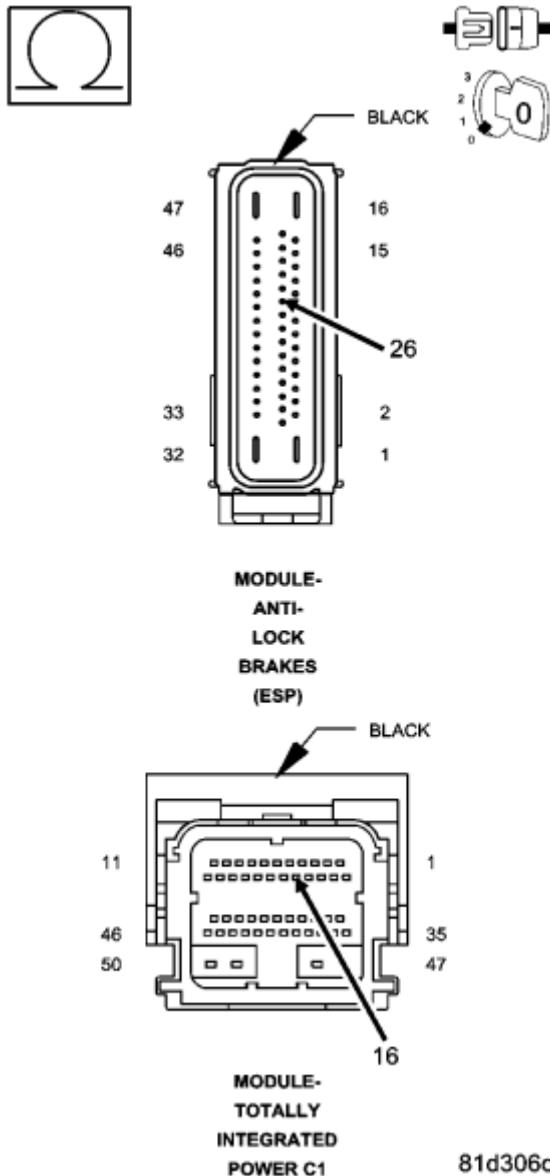


Fig. 58: Measuring The Resistance Of The CAN C Bus Circuit Between The TIPM C1 Harness Connector And The Antilock Brake Module Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM C1 harness connector and the Antilock Brake Module connector.

Is resistance below 5.0 ohms?

Yes

Go To step 6.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **ABS VERIFICATION TEST** .

6. (D64) Can C Bus (-) Circuit Open

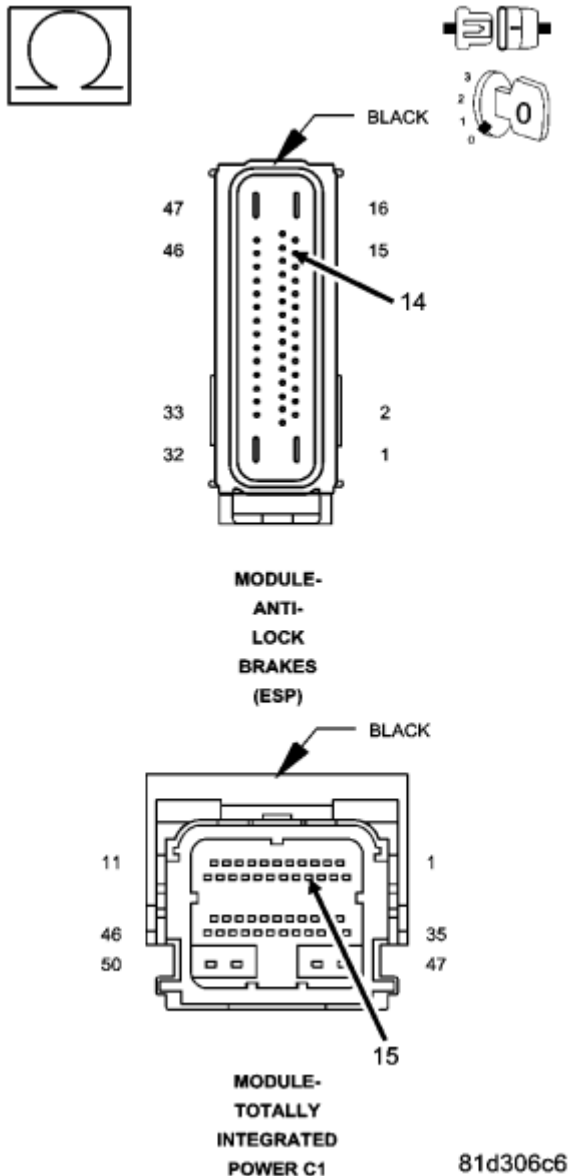


Fig. 59: Measuring The Resistance Of The CAN C Bus Circuit Between The TIPM C1 Harness Connector And The Antilock Brake Module Connector
Courtesy of CHRYSLER LLC

Measure The Resistance Of The (D64) Can C Bus (-) Circuit Between The TIPM C1 Harness Connector

And The Antilock Brake Module Connector.

Is Resistance Below 5.0 Ohms?

Yes

Replace The Antilock Brake Module In Accordance With The Service Information.
Perform **ABS Verification Test** .

No

Repair The (D64) Can C Bus (-) Circuit For An Open.
Perform **ABS Verification Test** .

***NO RESPONSE FROM AMP (AMPLIFIER)**

Circuit Schematic

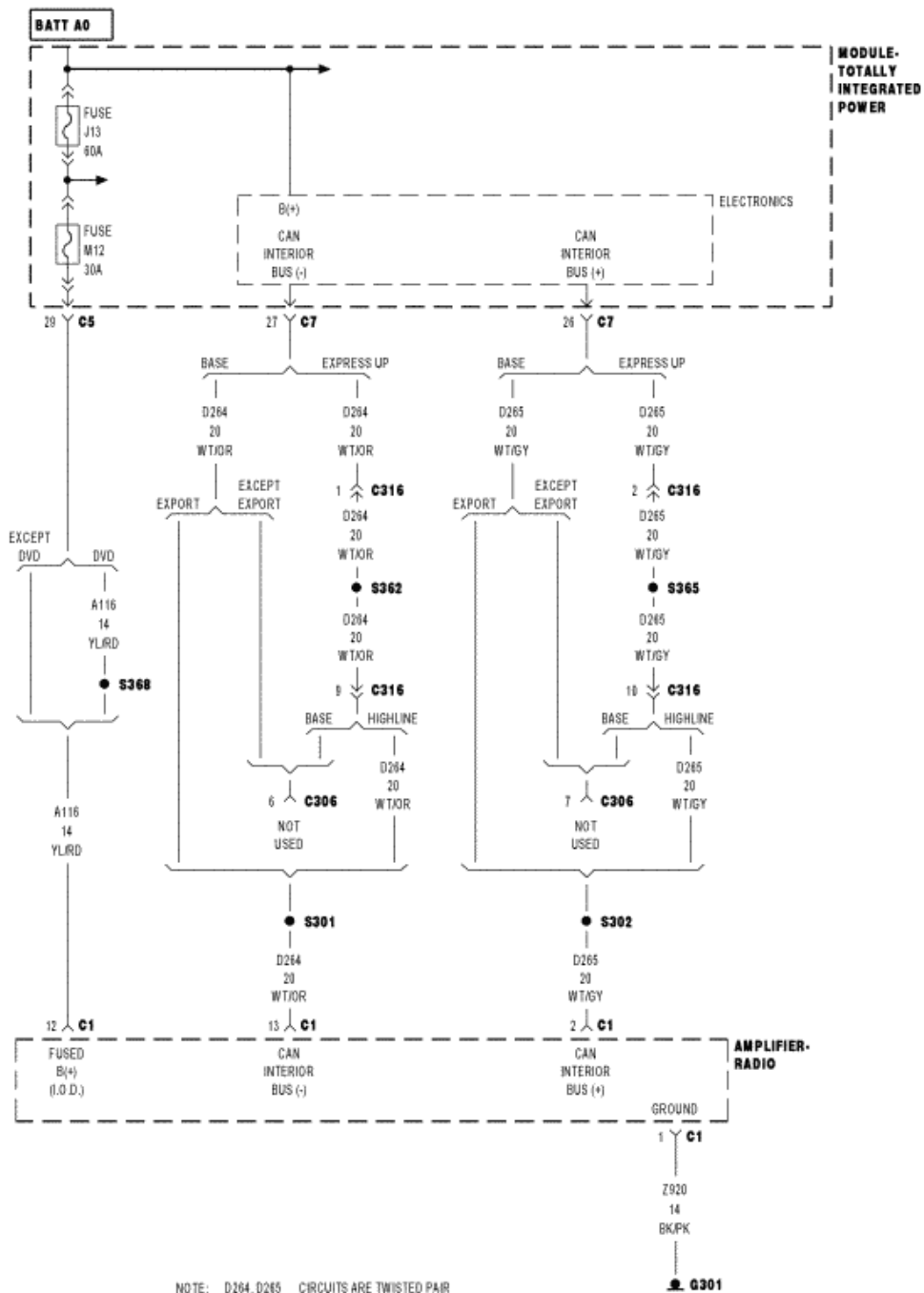


Fig. 60: Amplifier Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A116) FUSED B (+) (I.O.D.) CIRCUIT OPEN OR SHORTED
(Z920) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
AMPLIFIER

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

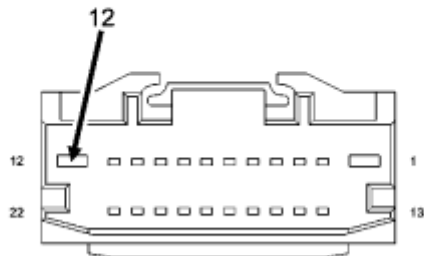
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A116) FUSED B(+) (I.O.D.) CIRCUIT OPEN OR SHORTED



AMPLIFIER-
RADIO C1

81996ba2

Fig. 61: Using 12-Volt Test Light Connected To Ground To Check (A116) Fused B(+) (I.O.D.) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio Amplifier C1 harness connector.

Using a 12-volt test light connected to ground, check the (A116) Fused B(+) (I.O.D.) circuit.

Does the test light illuminate brightly?

Yes

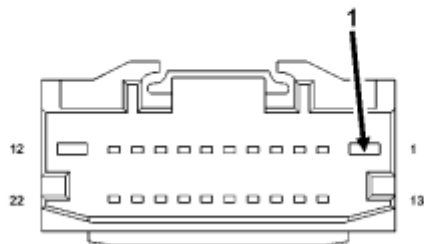
Go To step 3.

No

Repair the (A116) Fused B(+) (I.O.D.) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z920) GROUND CIRCUIT OPEN



AMPLIFIER-
RADIO C1

81996bbc

Fig. 62: Using 12-Volt Test Light Connected To 12-Volts To Check (Z920) Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z920) ground circuit.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 4.

No

Repair the (Z920) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**

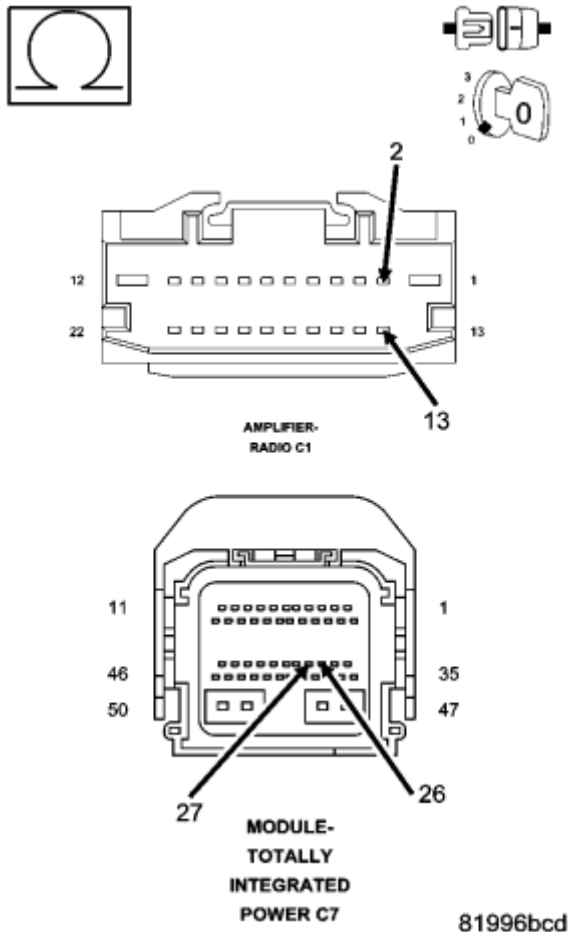


Fig. 63: Measuring Resistance Of (D264/5) CAN Interior Bus (-) (125K) Circuit Between TIPM C7 Harness Connector And Radio Amplifier C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Radio Amplifier C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Radio Amplifier C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Radio Amplifier in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

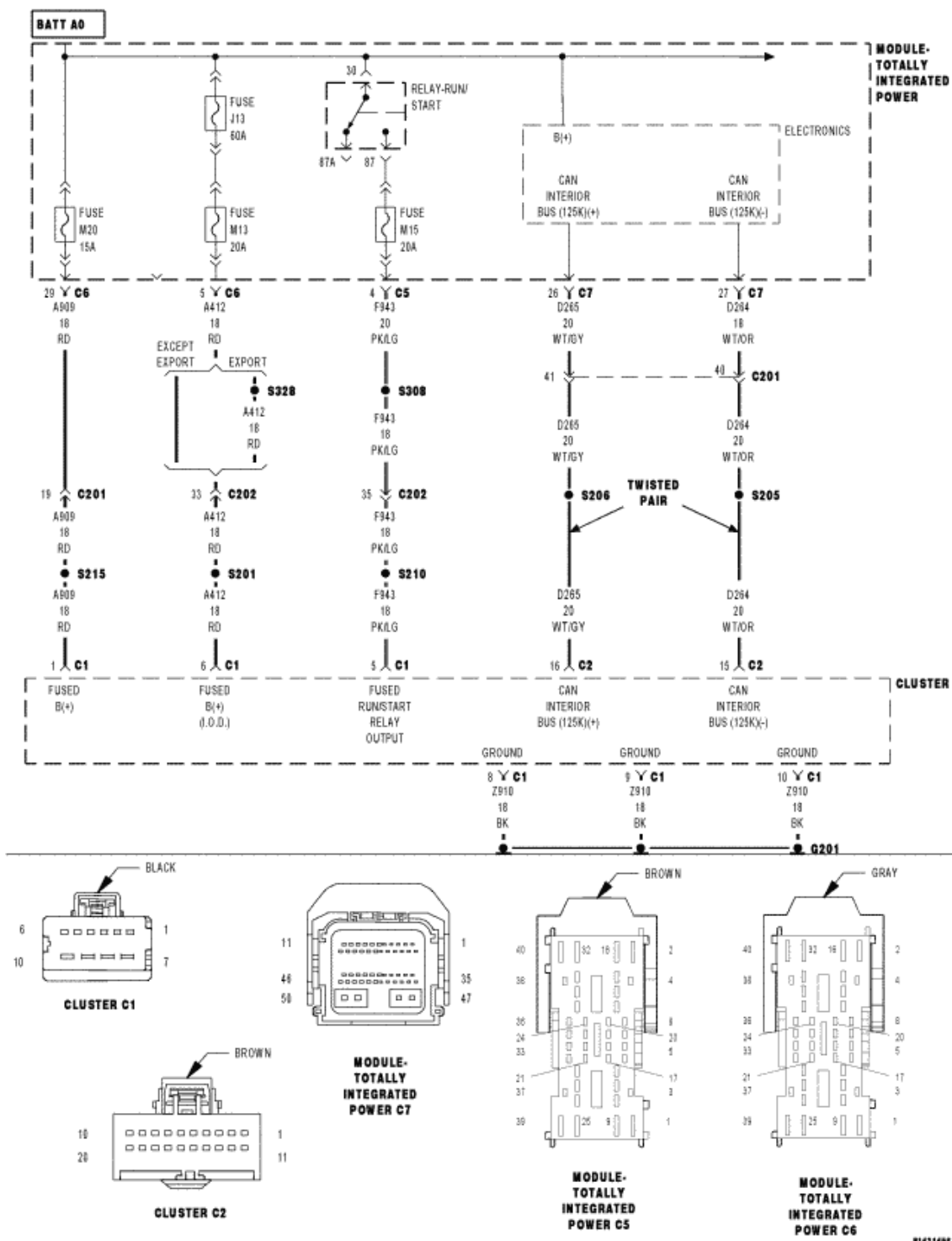
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM CCN (CLUSTER)**

Circuit Schematic



Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A909) (A412) FUSED B(+) CIRCUITS OPEN OR SHORTED
(Z910) GROUND CIRCUITS OPEN
(F943) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
CLUSTER (CCN)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

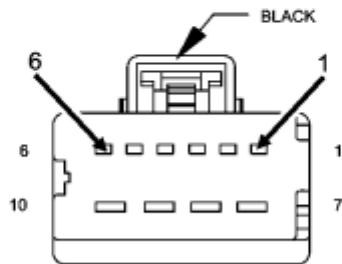
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A909) (A412) FUSED B(+) CIRCUIT OPEN OR SHORTED



CLUSTER C1

81997187

Fig. 65: Checking Each (A909) And (A412) Fused B(+) Circuit Using A 12-Volt Test Light Connected To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C1 and C2 harness connectors.

Using a 12-volt test light connected to ground, check each (A909) and (A412) Fused B(+) circuit.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 3.

No

Repair the Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z910) GROUND CIRCUIT OPEN

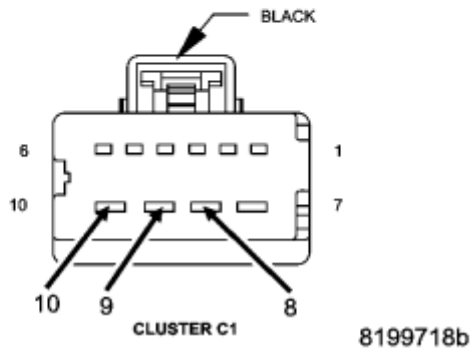


Fig. 66: Using 12-Volt Test Light Connected To 12-Volts To Check Each (Z910) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check each (Z910) ground circuit.

Does the test light illuminate brightly for each circuit?

Yes

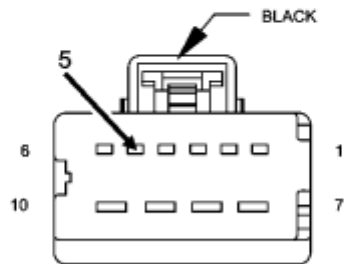
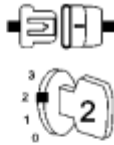
Go To step 4.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (F943) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED



CLUSTER C1

8199718f

Fig. 67: Using 12-Volt Test Light Connected To Ground To Check (F202) Fused Run/Start Relay Output Circuit

Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F943) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

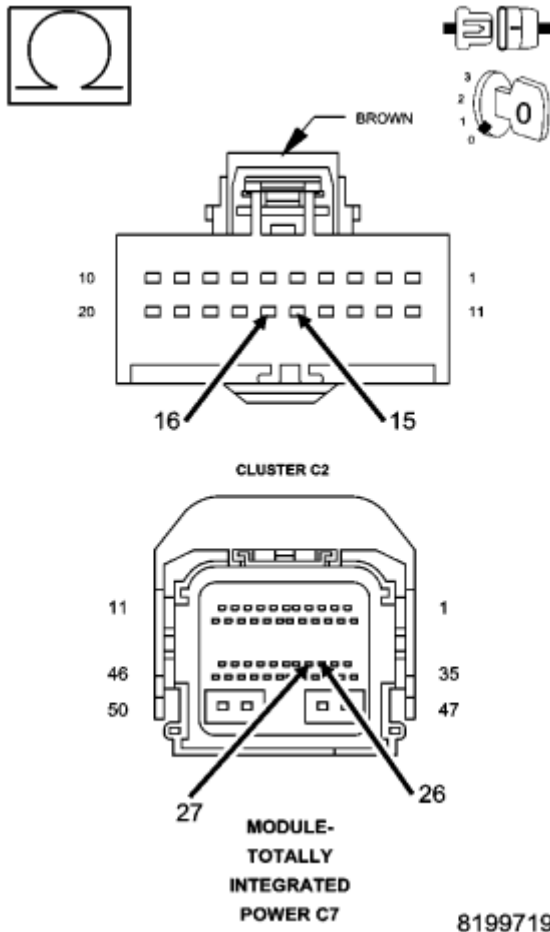
Go To step 5.

No

Repair the (F943) Fused Run/Start Relay Output circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

5. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



81997193

Fig. 68: Measuring Resistance Of (D264/5) CAN Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And Cluster C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Cluster C2 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Cluster C2 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

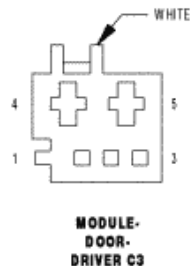
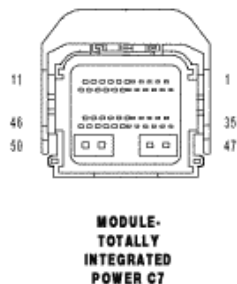
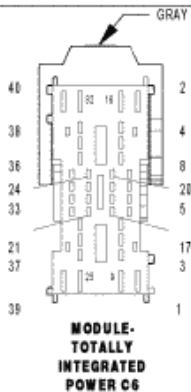
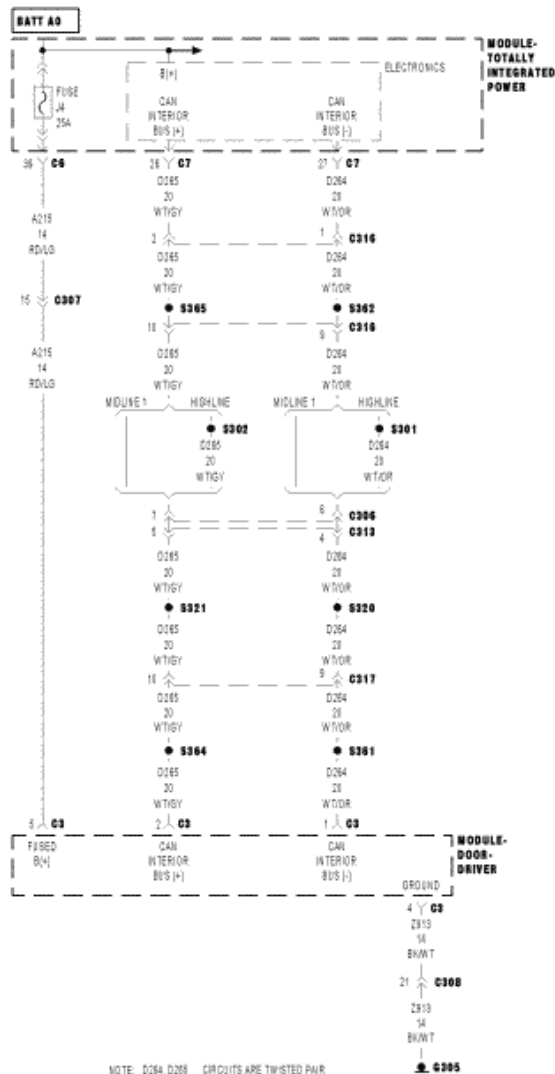
Repair the (D265) or (D264) CAN C Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM DRIVER DOOR MODULE (DDM)**

Circuit Schematic



91423400a

Fig. 69: Driver Door Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A215) FUSED B (+) CIRCUIT OPEN OR SHORTED
(Z913) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN C INTERIOR BUS (125K) CIRCUITS OPEN
DRIVER DOOR MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

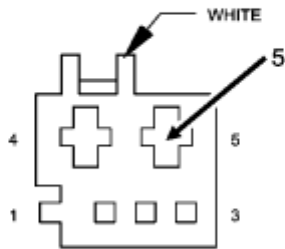
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A215) FUSED B(+) CIRCUIT OPEN OR SHORTED



MODULE-
DOOR-
DRIVER C3

81a2f491

Fig. 70: Using 12-Volt Test Light Connected To Ground To Check (A215) Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C3 harness connector.

Using a 12-volt test light connected to ground, check the (A215) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

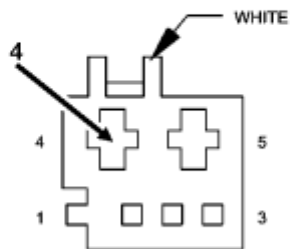
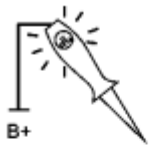
Go To step 3.

No

Repair the (A215) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z913) GROUND CIRCUIT OPEN



MODULE-
DOOR-
DRIVER C3

81a2f495

Fig. 71: Using 12-Volt Test Light Connected To 12-Volts To Check (Z913) Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z913) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z913) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN C INTERIOR BUS (125K) CIRCUIT OPEN**

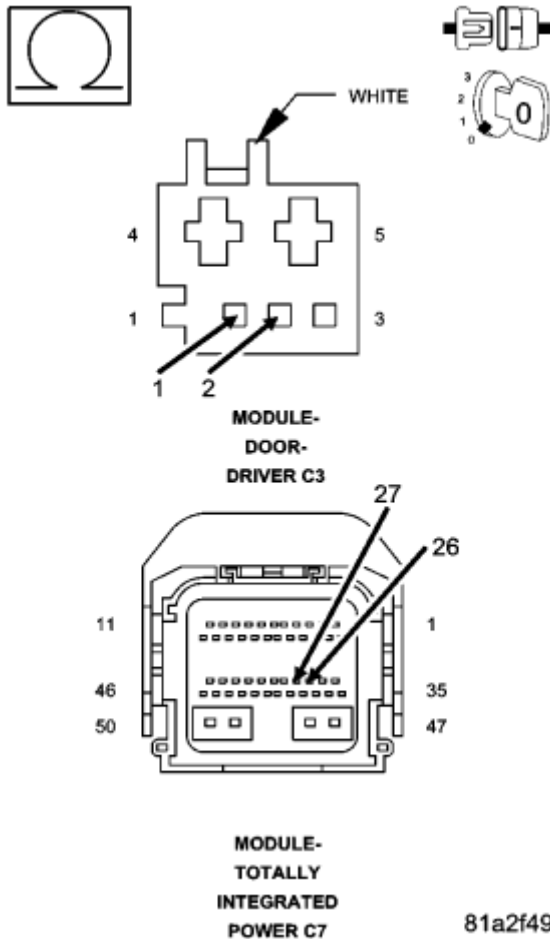


Fig. 72: Measuring Resistance Of (D264/5) CAN C Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And Driver Door Module C3 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN C Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Driver Door Module C3 harness connector.

Measure the resistance of the (D265) CAN C Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Driver Door Module C3 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Driver Door Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D265) or (D264) CAN C Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM ECM (ENGINE CONTROL MODULE) - DIESEL**

Circuit Schematic

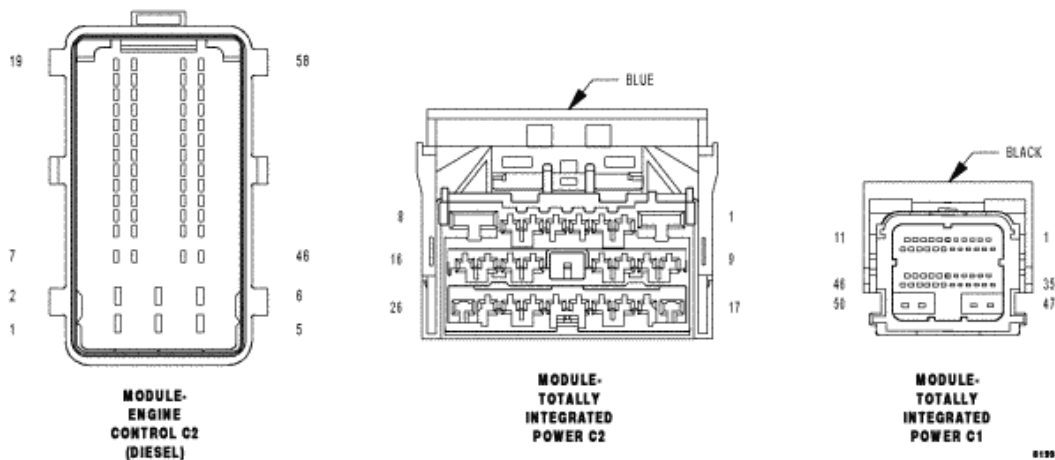
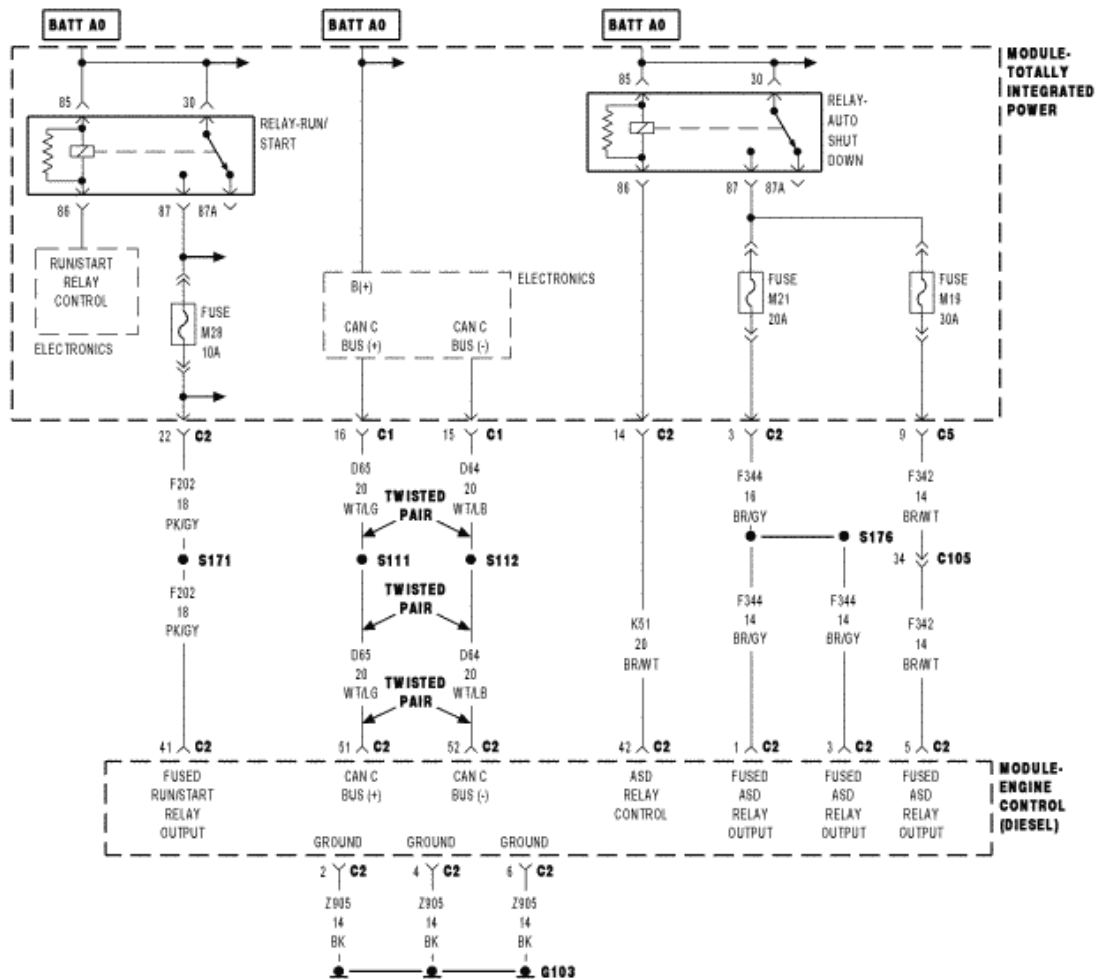


Fig. 73: Engine Control Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
ENGINE CONTROL MODULE POWER AND GROUND (D65) CAN C BUS (+) CIRCUIT OPEN (D64) CAN C BUS (-) CIRCUIT OPEN ENGINE CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware and any ignition related DTCs, perform DTCs before proceeding.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. CHECK ECM POWER AND GROUND

Check the ECM power and ground circuits. Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for the diagnostic test procedure.

Were any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To step 3.

3. (D65) CAN C BUS (+) CIRCUIT OPEN

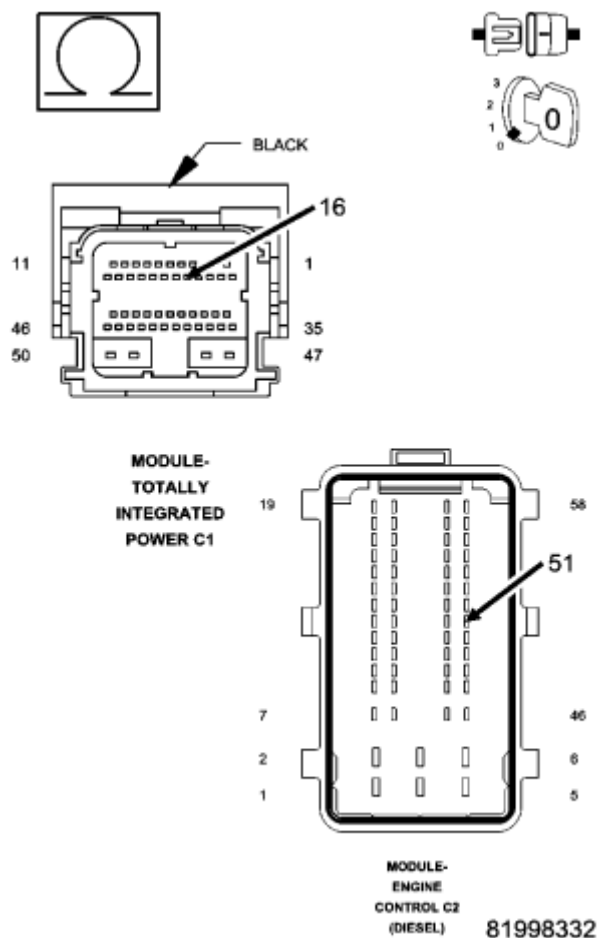


Fig. 74: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM Connector And ECM Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Disconnect the ECM C2 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM connector and the ECM connector.

Is resistance below 5.0 ohms?

Yes

Go To step 4.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D64) CAN C BUS (-) CIRCUIT OPEN

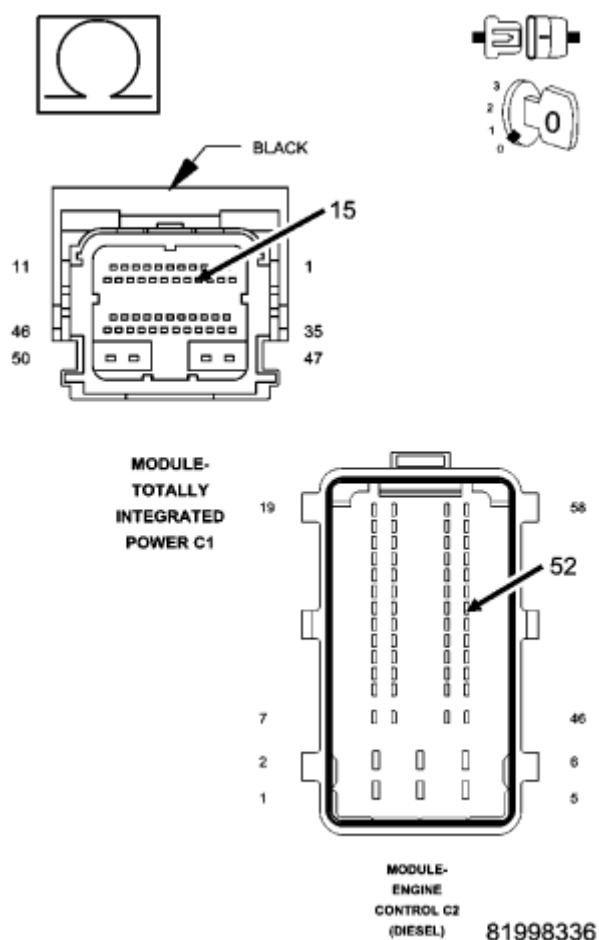


Fig. 75: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM Connector And ECM Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM connector and the ECM connector.

Is resistance below 5.0 ohms?

Yes

Replace and program the Engine Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D64) CAN C Bus (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM ESM (ELECTRIC GEAR SHIFT MODULE)**

Circuit Schematic

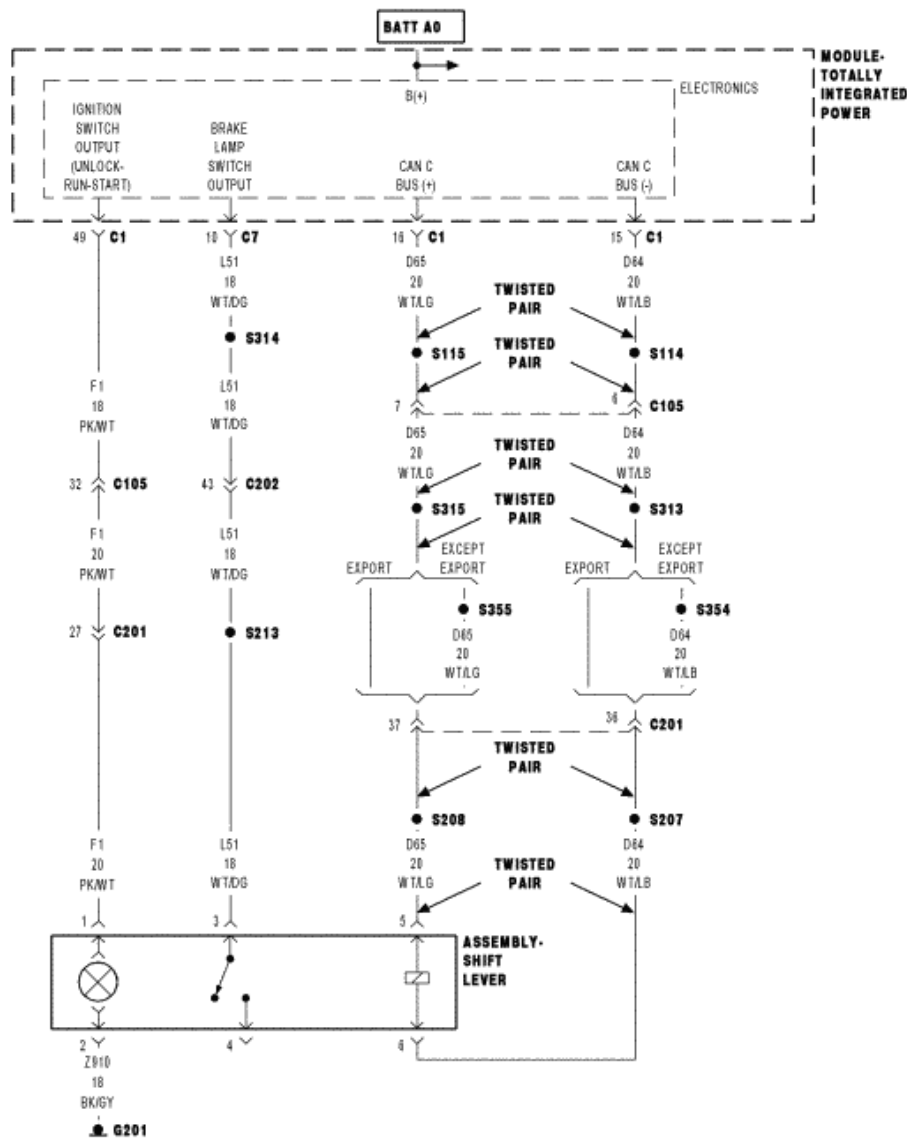


Fig. 76: Electric Gear Shift Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(Z910) GROUND CIRCUIT OPEN (F1) IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) CIRCUIT OPEN OR SHORTED (D65) CAN C BUS (+) CIRCUIT OPEN (D64) CAN C BUS (-) CIRCUIT OPEN ELECTRIC GEAR SHIFT MODULE (SHIFTER LEVER (NAG1) ASSEMBLY)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware DTCs, perform DTC before proceeding.

Does the scan tool display a red X next to the module?

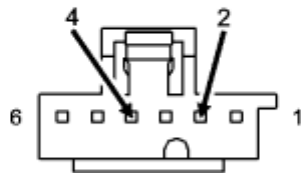
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (Z910) GROUND CIRCUIT OPEN



**ASSEMBLY-
SHIFTER
LEVER
(NAG1)**

81a24f54

Fig. 77: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Shifter Lever (NAG1) Assembly connector

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

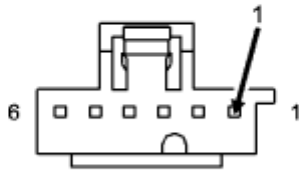
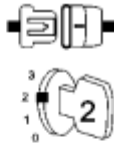
Go To step 3.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

3. **(F1) IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) CIRCUIT OPEN OR SHORTED**



ASSEMBLY-
SHIFTER
LEVER
(NAG1)

81a24f5e

Fig. 78: Using 12-Volt Test Light Connected To Ground To Check (F1) Ignition Switch Output (Unlock-Run-Start) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F1) Ignition Switch Output (Unlock-Run-Start) circuit.

Does the test light illuminate brightly?

Yes

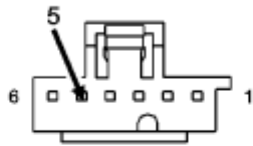
Go To step 4.

No

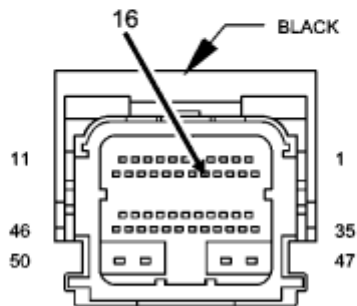
Repair the (F1) Ignition Switch Output (Unlock-Run-Start) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D65) CAN C BUS (+) CIRCUIT OPEN



ASSEMBLY-
SHIFTER
LEVER
(NAG1)



MODULE-
TOTALLY
INTEGRATED
POWER C1

81a24f70

Fig. 79: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM C1 Harness Connector And Shifter Lever (NAG1) Assembly Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM C1 harness connector and the Shifter Lever (NAG1) Assembly connector.

Is resistance below 5.0 ohms?

Yes

Go To step 5.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

5. (D64) CAN C BUS (-) CIRCUIT OPEN

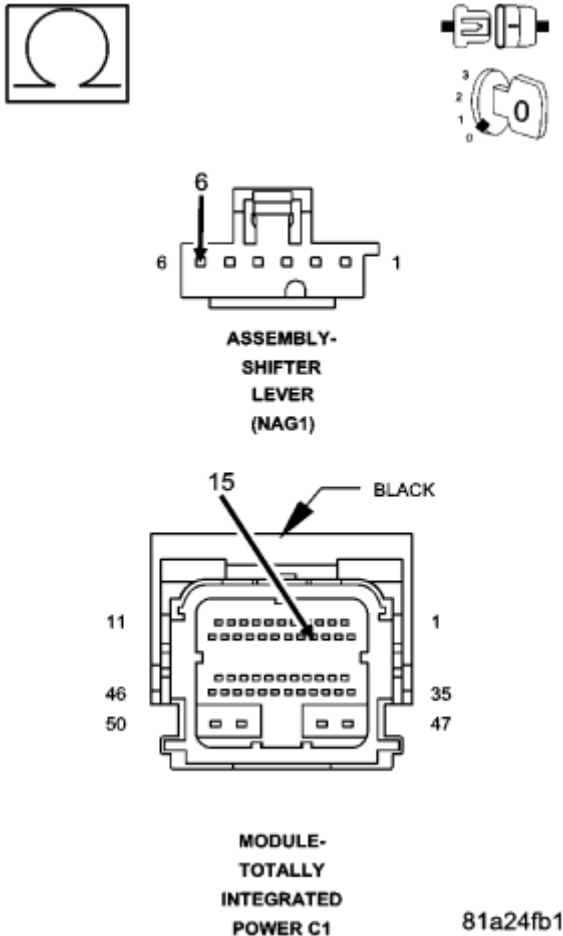


Fig. 80: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM C1 Harness Connector And Shifter Lever (NAG1) Assembly Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Shifter Lever (NAG1) Assembly connector.

Is resistance below 5.0 ohms?

Yes

Replace the Shifter Lever (NAG1) Assembly in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D64) CAN C Bus (-) circuit for an open.

***NO RESPONSE FROM FINAL DRIVE CONTROL MODULE**

Circuit Schematic

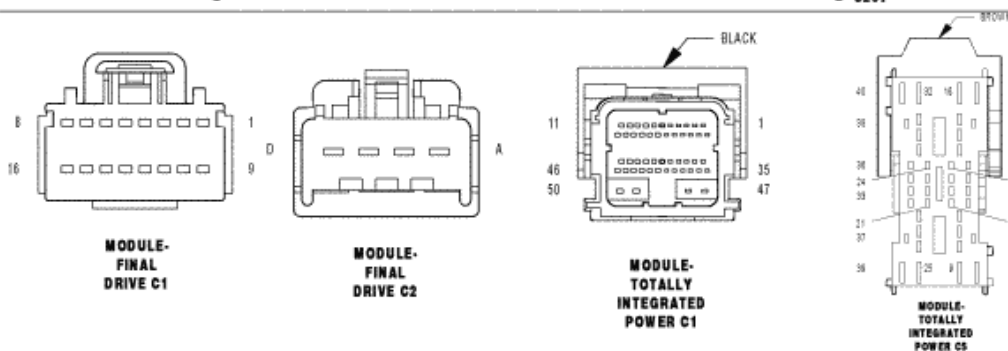
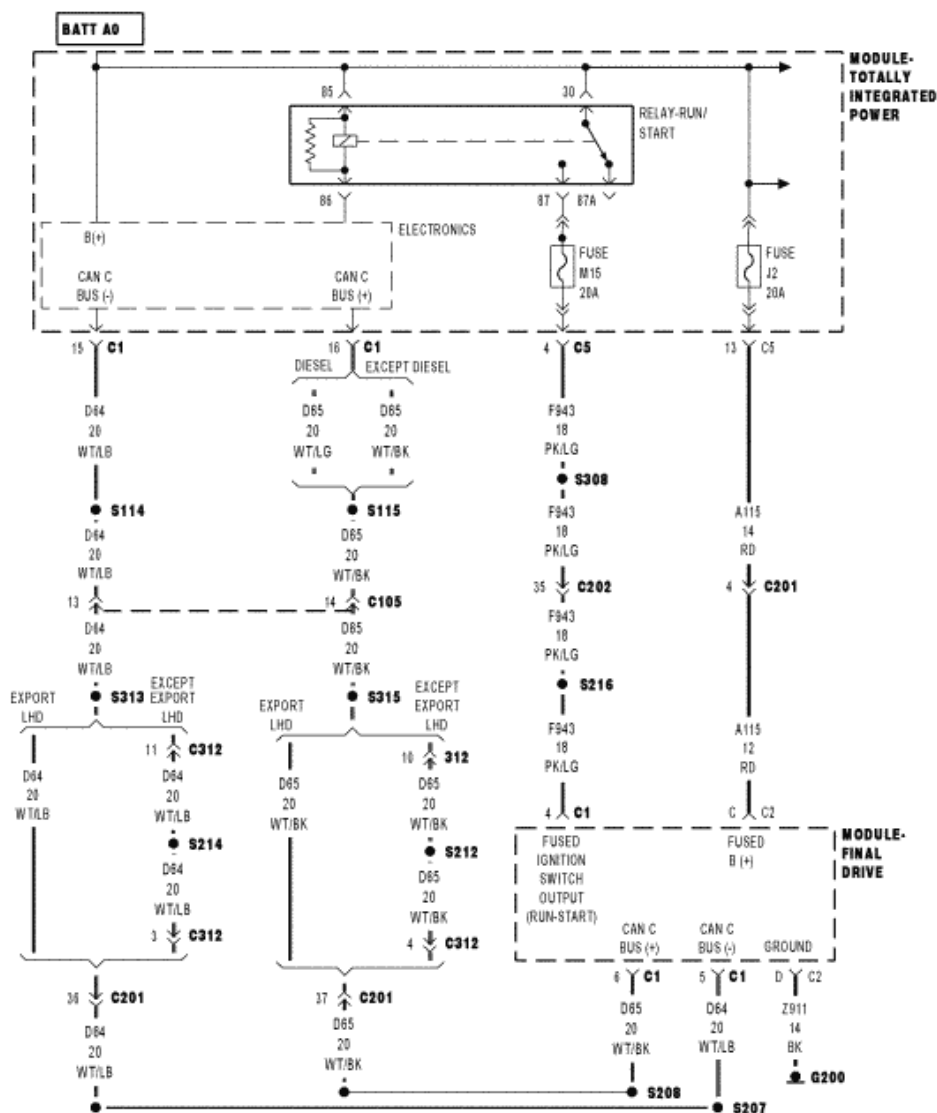


Fig. 81: Final Drive Control Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A115) FUSED B(+) CIRCUIT OPEN OR SHORTED
(Z911) GROUND CIRCUIT OPEN
(F943) FUSED IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
FINAL DRIVE CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

NOTE: **Check the TIPM for any active CAN C hardware DTCs, perform DTC before proceeding.**

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A115) FUSED B(+) CIRCUIT OPEN OR SHORTED

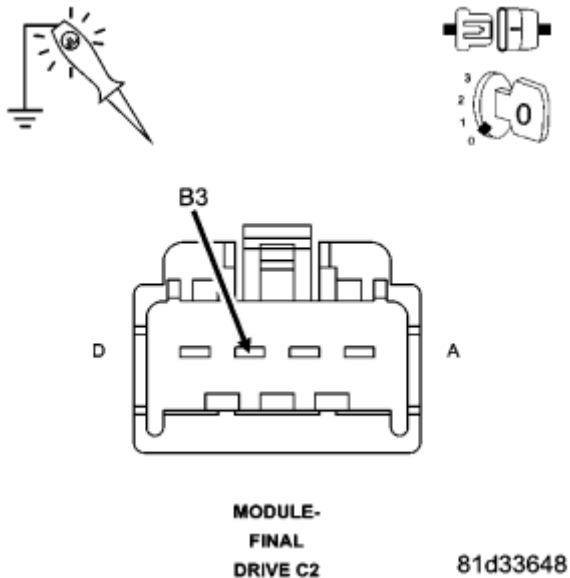


Fig. 82: Checking The (A115) Fused B(+) Circuit Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Final Drive Control Module harness connectors.

Using a 12-volt test light connected to ground, check the (A115) Fused B(+) circuit.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 3.

No

Repair the (A115) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z911) GROUND CIRCUIT OPEN

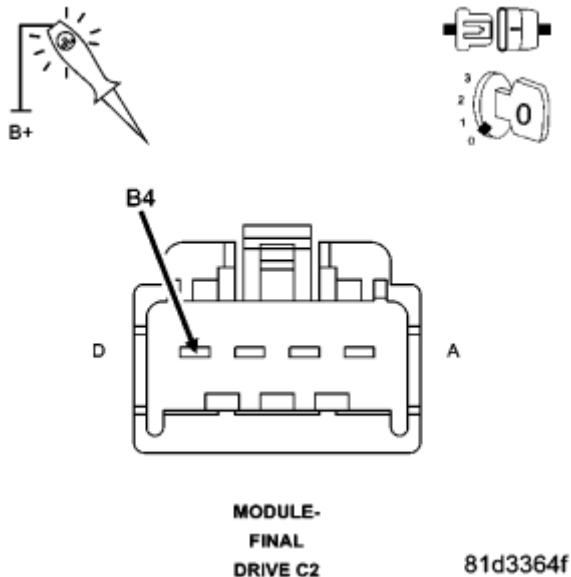


Fig. 83: Checking The (Z911) Ground Circuit Using A 12-Volt Test Light Connected To 12-Volts
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z911) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z911) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (F943) FUSED IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN OR SHORTED

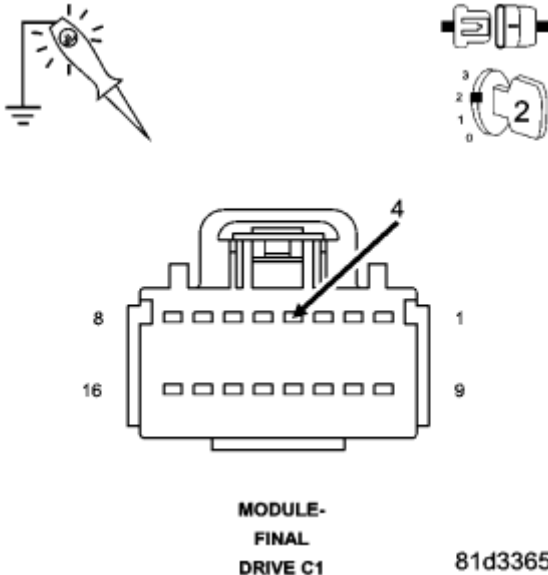


Fig. 84: Checking The (F943) Fused Ignition Switch Output (Run/Start) Circuit Using A 12-Volt Test Light Connected To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F943) Fused Ignition Switch Output (Run/Start) circuit.

Does the test light illuminate brightly?

Yes

Go To step 5.

No

Repair the (F943) Fused Ignition Switch Output (Run/Start) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

5. (D65) CAN C BUS (+) CIRCUIT OPEN

Perform **BODY VERIFICATION TEST - VER 1.**

6. (D64) CAN C BUS (-) CIRCUIT OPEN

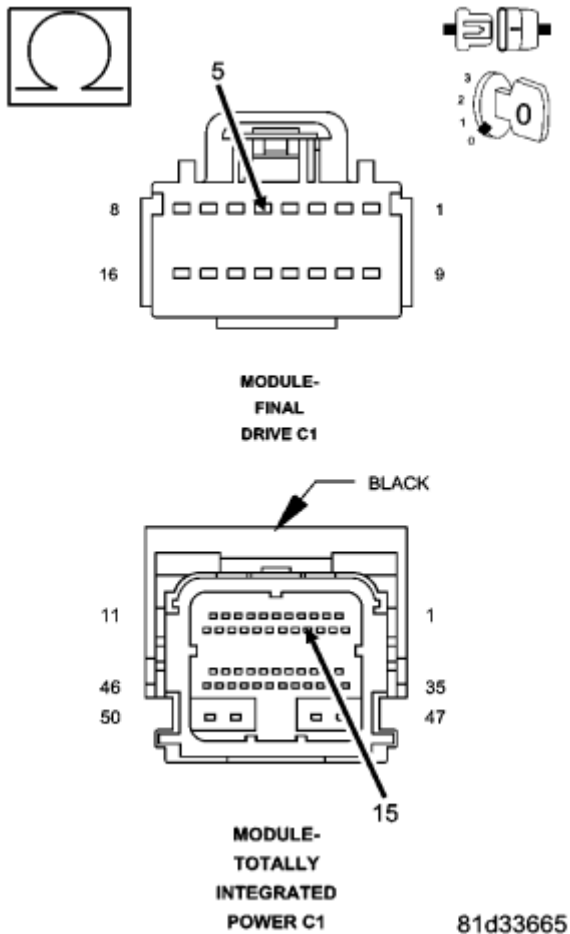


Fig. 86: Measuring The Resistance Of The (D64) Can C Bus (-) Circuit Between The TIPM C1 Harness Connector And The Final Drive Control Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Final Drive Control Module harness connector.

Is resistance below 5.0 ohms?

Yes

Replace the Final Drive Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D64) CAN C Bus (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM HANDS FREE MODULE (HFM)**

Circuit Schematic

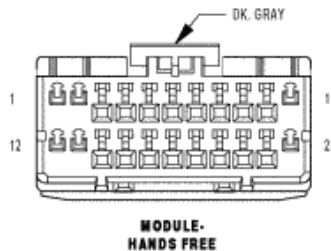
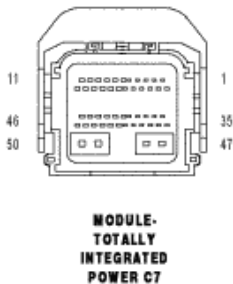
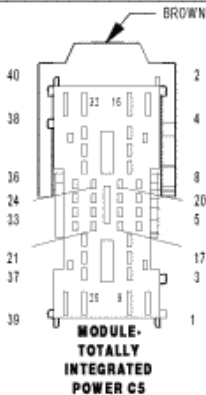
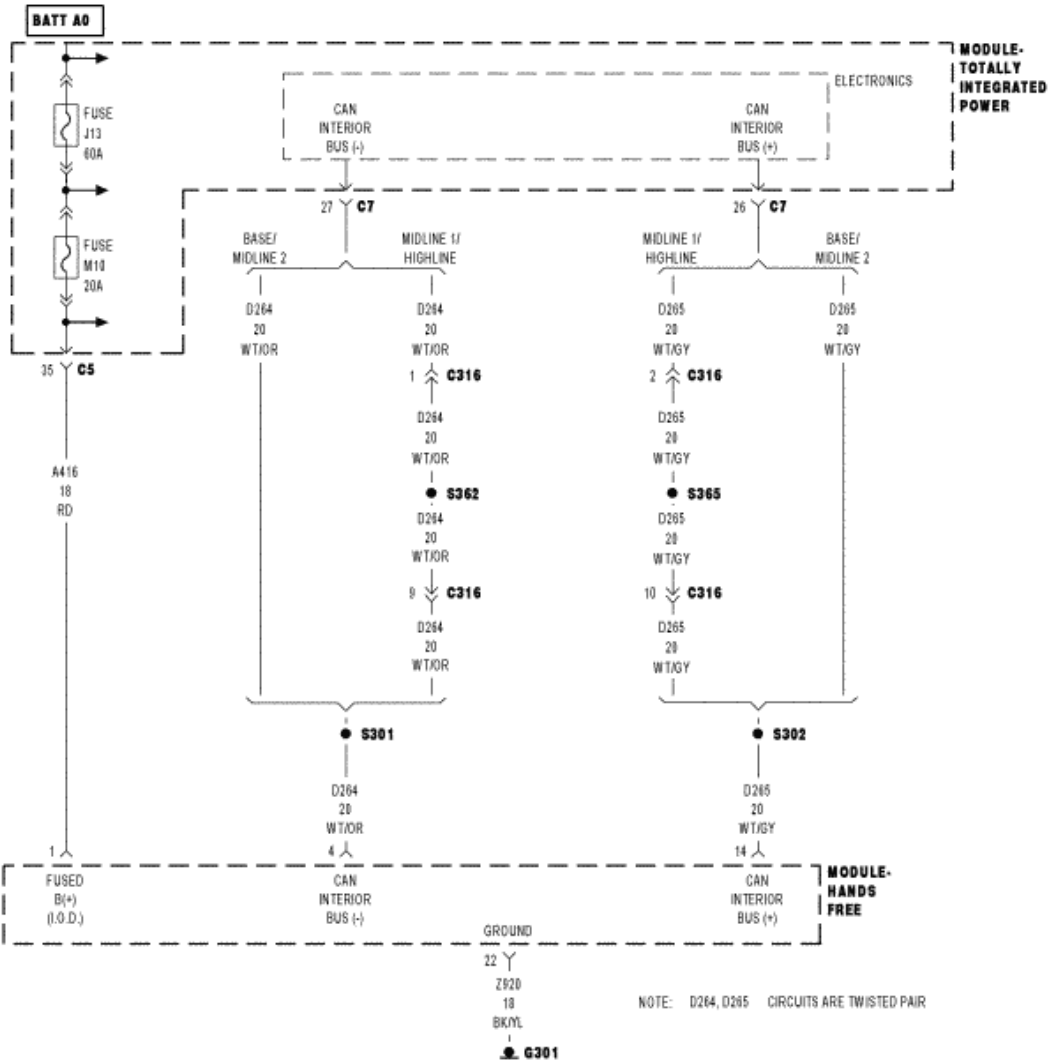


Fig. 87: Hands Free Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A416) FUSED B (+) (I.O.D.) CIRCUIT OPEN OR SHORTED (Z909) GROUND CIRCUIT OPEN (D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN HANDS FREE MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A416) FUSED B(+) (I.O.D.) CIRCUIT OPEN OR SHORTED

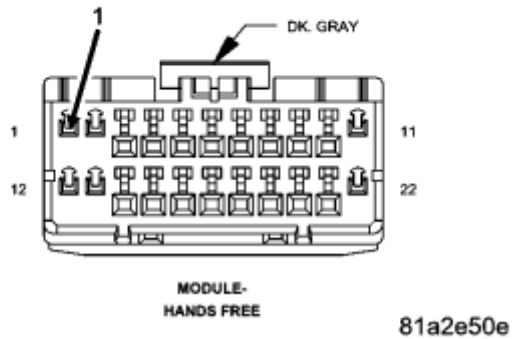


Fig. 88: Using 12-Volt Test Light Connected To Ground To Check (A416) Fused B(+) (I.O.D.) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Using a 12-volt test light connected to ground, check the (A416) Fused B(+) (I.O.D.) circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (A416) Fused B(+) (I.O.D.) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z909) GROUND CIRCUIT OPEN

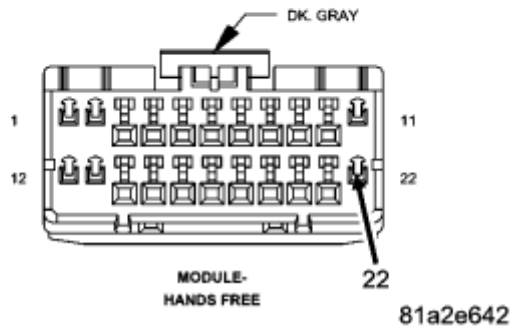


Fig. 89: Using 12-Volt Test Light Connected To 12-Volts To Check (Z909) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z909) ground circuit.

Does the test light illuminate brightly?

Yes

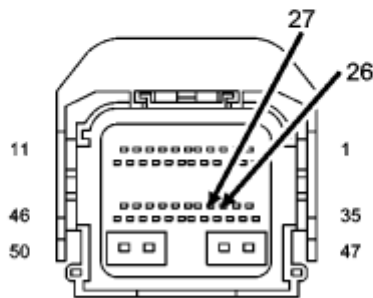
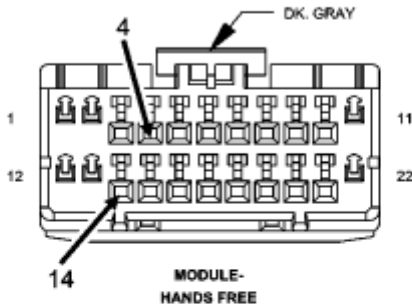
Go To step 4.

No

Repair the (Z909) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



81a2e64d

Fig. 90: Measuring Resistance Of (D264/5) CAN C Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And HFM Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN C Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the HFM harness connector.

Measure the resistance of the (D265) CAN C Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the HFM harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

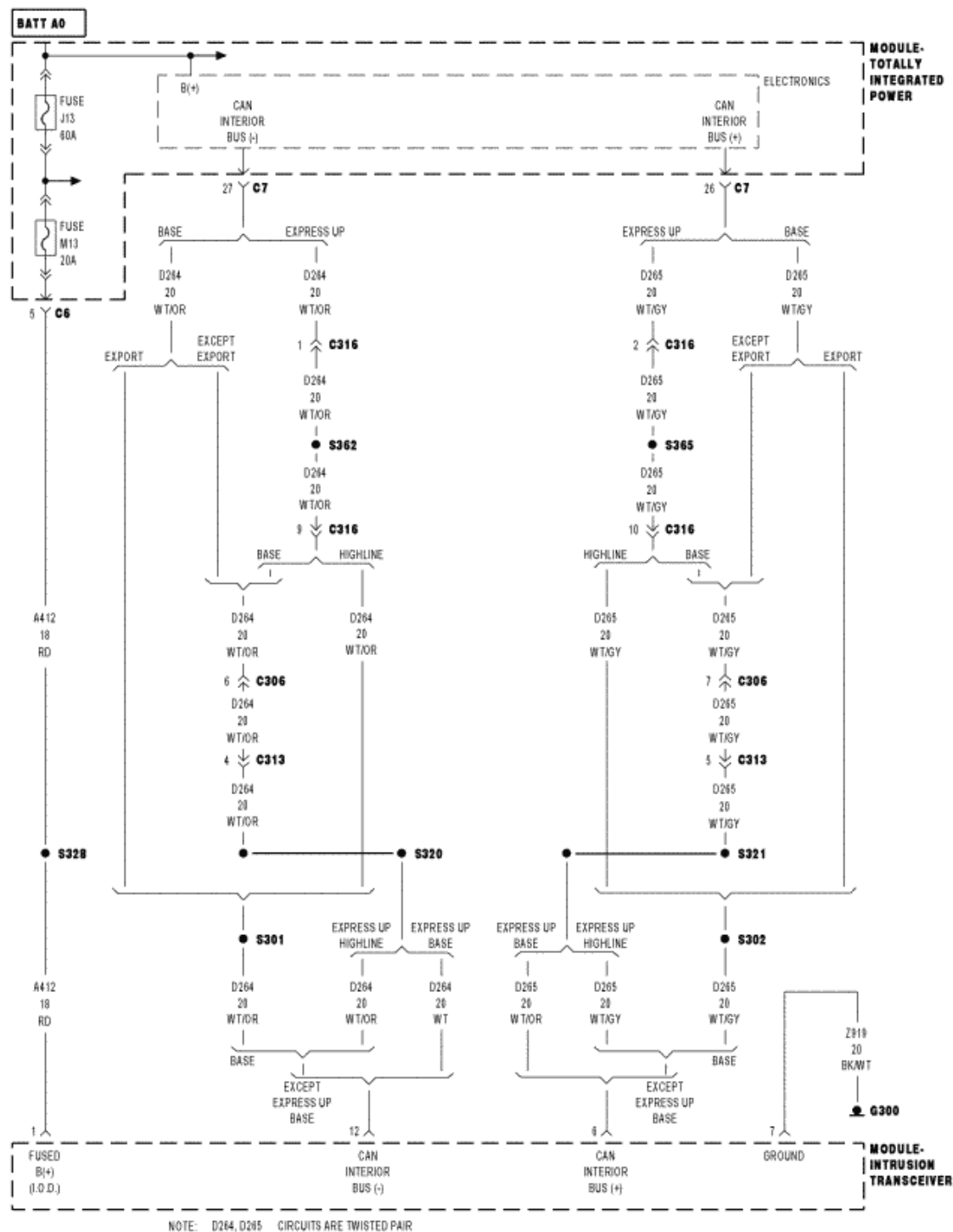
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM ITM (INTRUSION TRANSCIEVER MODULE)**

Circuit Schematic



01ss003c

Fig. 91: Intrusion Transceiver Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A412) FUSED B (+) (I.O.D.) CIRCUIT OPEN OR SHORTED
(Z919) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
INTRUSION TRANSCIEVER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A412) FUSED B(+) (I.O.D.) CIRCUIT OPEN OR SHORTED

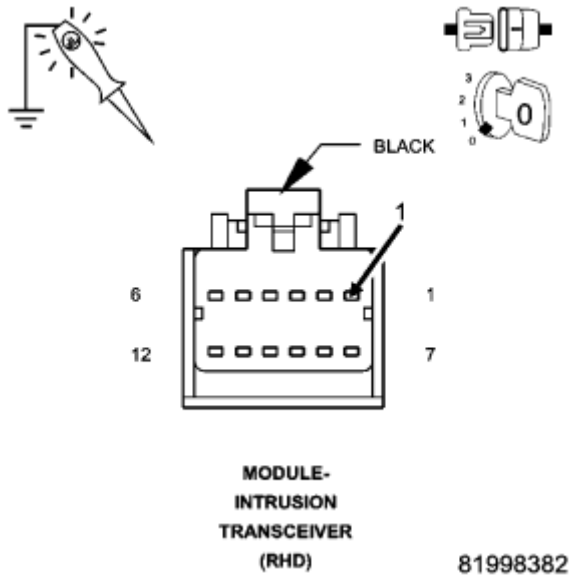


Fig. 92: Using 12-Volt Test Light Connected To Ground To Check (A412) Fused B(+) (I.O.D.) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Transceiver Module harness connector.

Using a 12-volt test light connected to ground, check the (A412) Fused B(+) (I.O.D.) circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (A412) Fused B(+) (I.O.D.) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z919) GROUND CIRCUIT OPEN

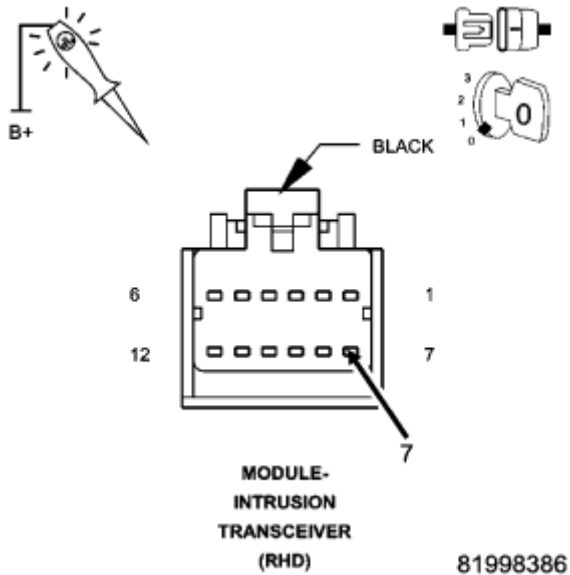


Fig. 93: Using 12-Volt Test Light Connected To 12-Volts To Check (Z919) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z919) ground circuit.

Does the test light illuminate brightly?

Yes

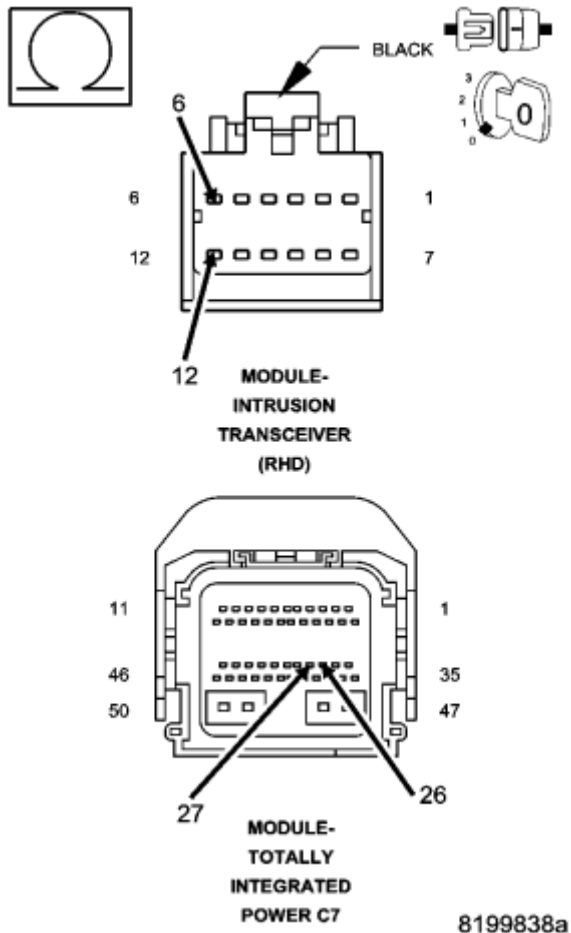
Go To step 4.

No

Repair the (Z919) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



8199838a

Fig. 94: Measuring Resistance Of (D264/5) CAN Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And Intrusion Transceiver Module Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Intrusion Transceiver Module harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Intrusion Transceiver Module harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Intrusion Transceiver Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

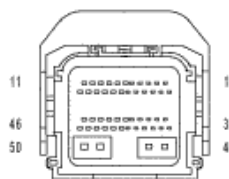
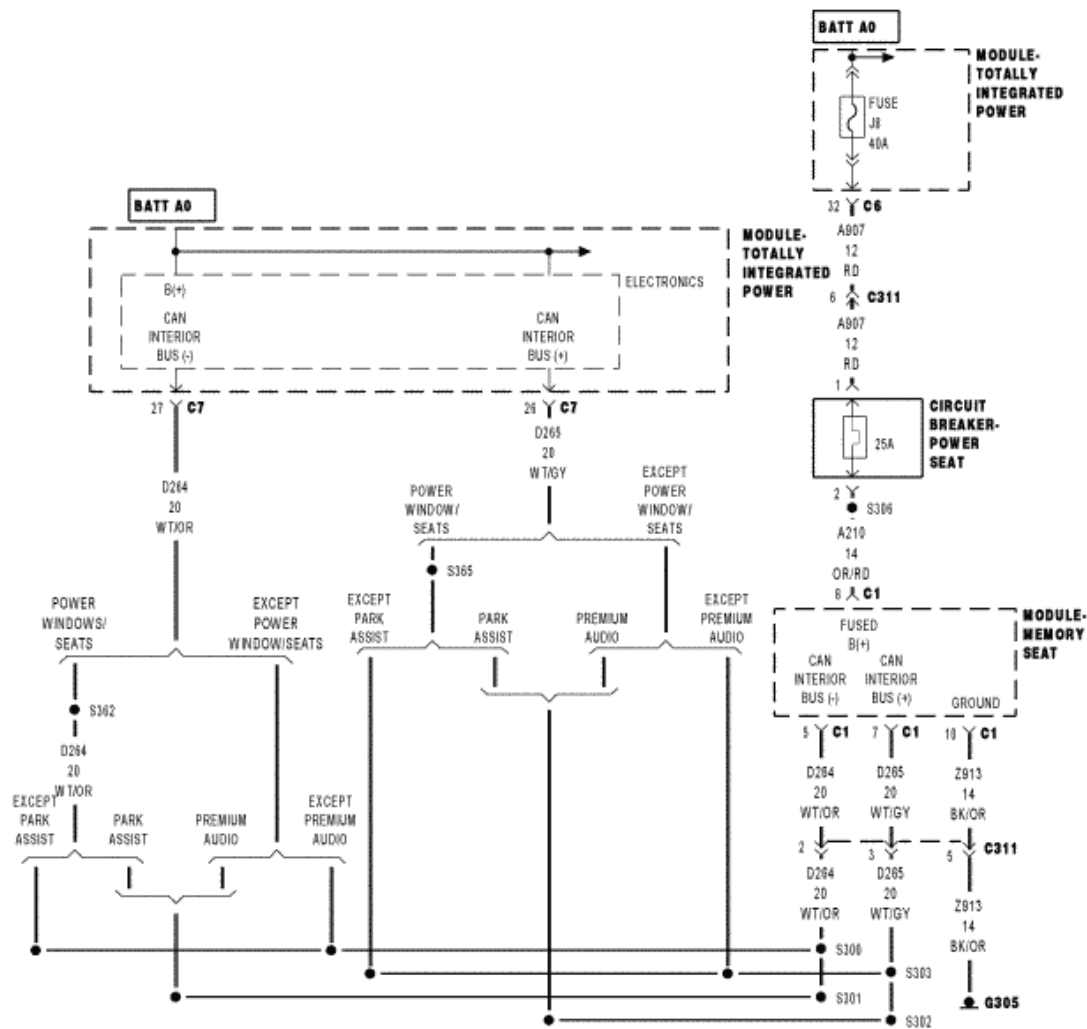
Repair the (D265) or (D264) CAN C Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM MSMD (MEMORY SEAT MODULE)**

Circuit Schematic



01426017

Fig. 95: Memory Seat Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(A210) FUSED B (+) CIRCUIT OPEN OR SHORTED
(Z913) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A210) FUSED B(+) CIRCUIT OPEN OR SHORTED

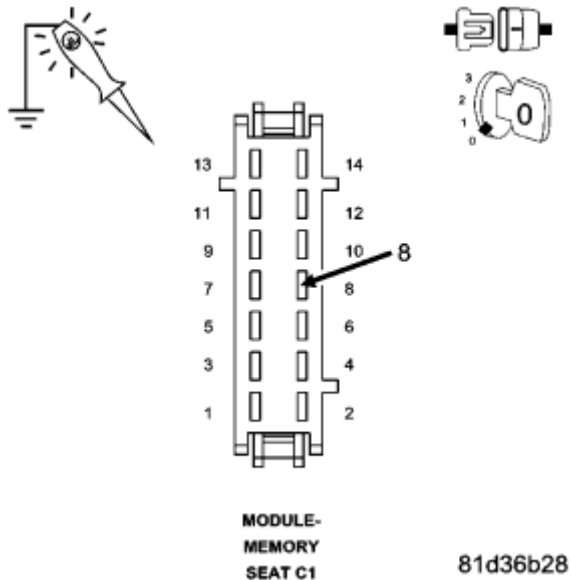


Fig. 96: Checking The (A210) Fused B(+) Circuit Using A 12-Volt Test Light Connected To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C1 harness connector.

Using a 12-volt test light connected to ground, check the (A210) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (A210) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z913) GROUND CIRCUIT OPEN

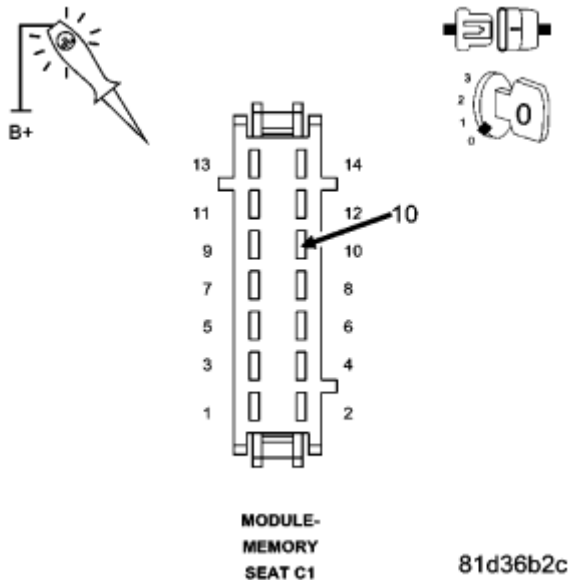


Fig. 97: Checking The (Z913) Ground Circuit Using A 12-Volt Test Light Connected To 12-Volts
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z913) ground circuit.

Does the test light illuminate brightly for each circuit?

Yes

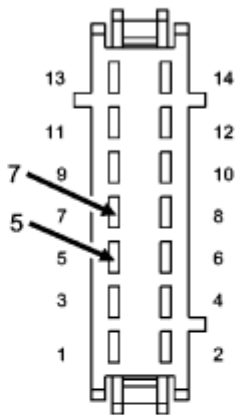
Go To step 4.

No

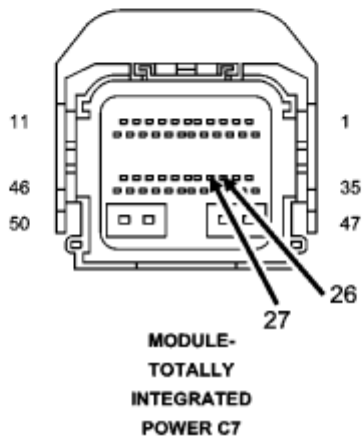
Repair the (Z913) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



MODULE-
MEMORY
SEAT C1



MODULE-
TOTALLY
INTEGRATED
POWER C7

81d36b33

Fig. 98: Measuring The Resistance Of The CAN Interior Bus (125K) Circuits Between The TIPM C7 Harness Connector And The Memory Seat Module C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Memory Seat Module C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Memory Seat Module C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Memory Seat Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM OCM (OCCUPANT CLASSIFICATION MODULE)**

Circuit Schematic

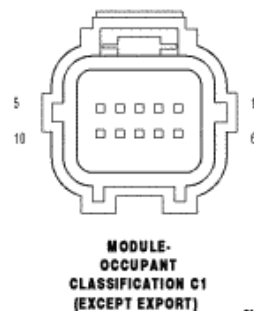
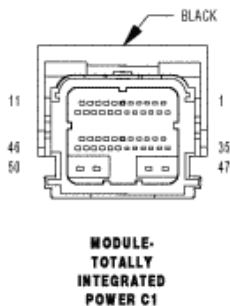
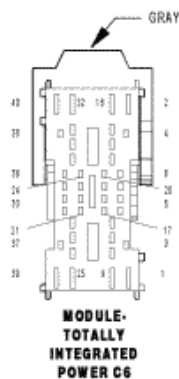
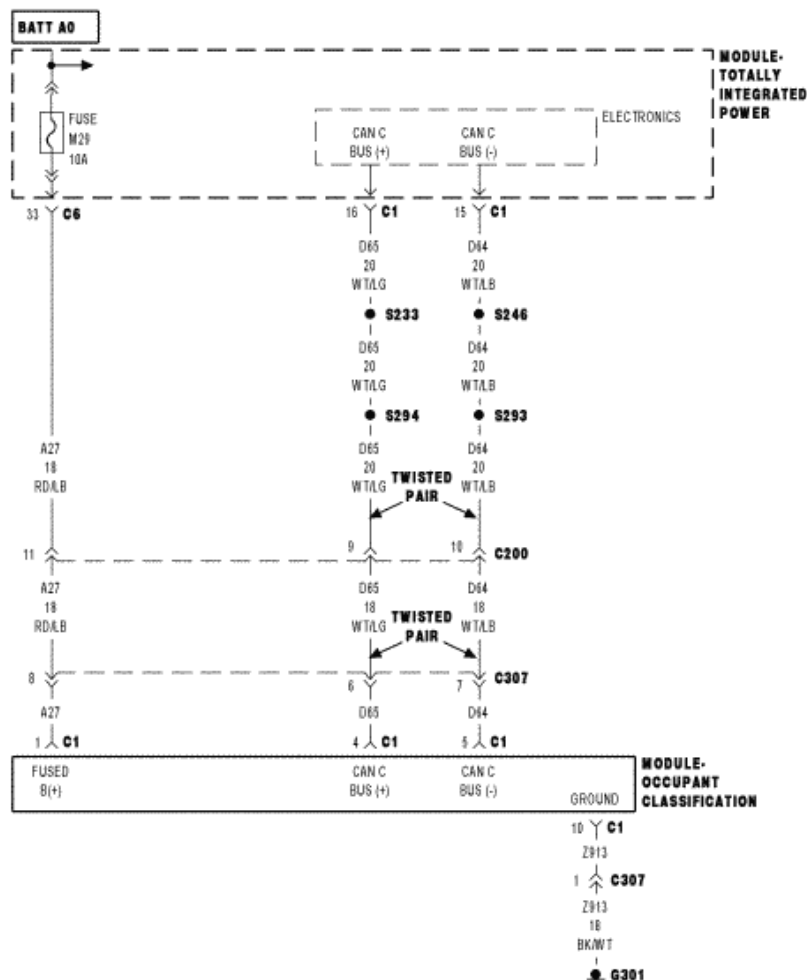


Fig. 99: Occupant Classification Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(Z913) GROUND CIRCUIT OPEN
(A27) FUSED B+ CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
OCCUPANT CLASSIFICATION MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (Z913) GROUND CIRCUIT OPEN

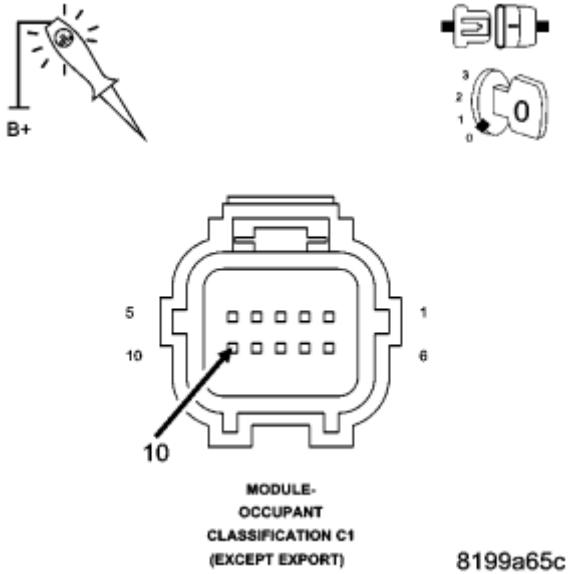


Fig. 100: Using 12-Volt Test Light Connected To 12-Volts To Check (Z913) Ground Circuit
Courtesy of CHRYSLER LLC

Disconnect the Occupant Classification Module harness connectors.

Using a 12-volt test light connected to 12-volts, check the (Z913) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (Z913) ground circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1** .

3. (A27) FUSED B+ CIRCUIT OPEN OR SHORTED

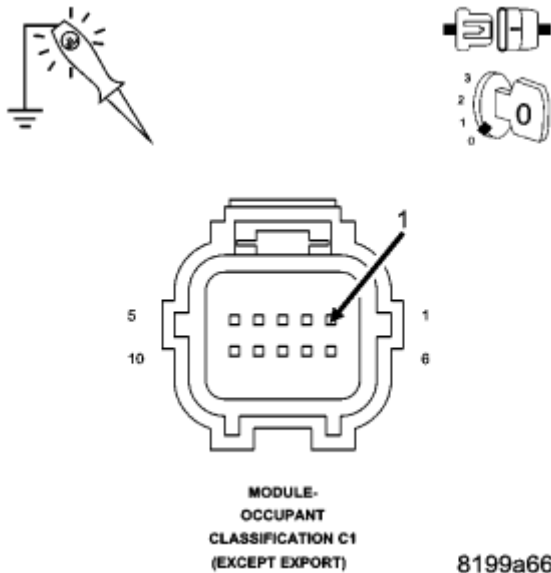


Fig. 101: Using 12-Volt Test Light Connected To Ground To Check (A27) Fused B+ Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to ground, check the (A27) Fused B+ circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

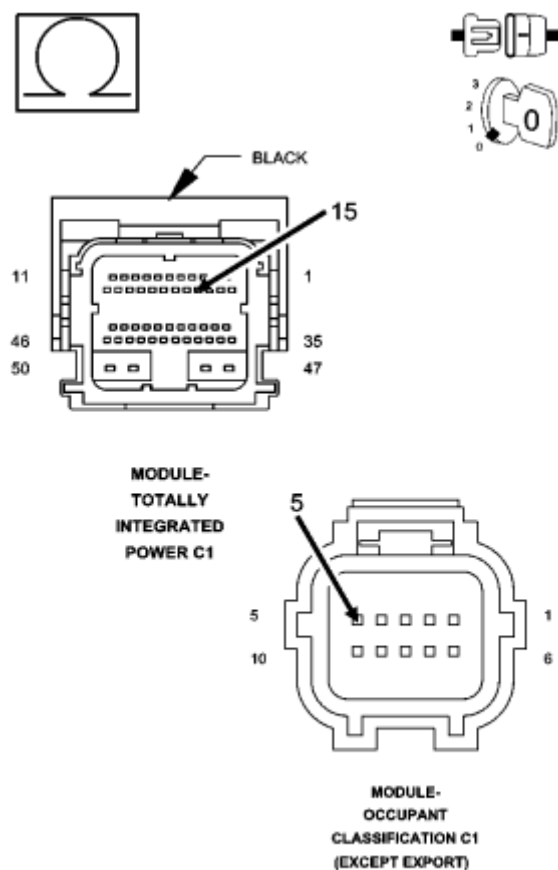
Repair the (A27) Fused B+ circuit for an open or short.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

4. (D65) CAN C BUS (+) CIRCUIT OPEN

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1 .**

5. (D64) CAN C BUS (-) CIRCUIT OPEN



8199a672

Fig. 103: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM C1 Harness Connector And Occupant Classification Module Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Occupant Classification Module connector.

Is resistance below 5.0 ohms?

Yes

Replace the Occupant Classification Module in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1 .**

No

Repair the (D64) CAN C Bus (-) circuit for an open.

***NO RESPONSE FROM ORC (OCCUPANT RESTRAINT CONTROLLER)**

Circuit Schematic

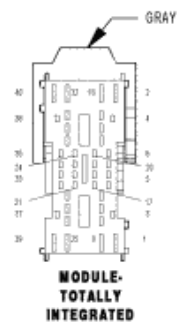
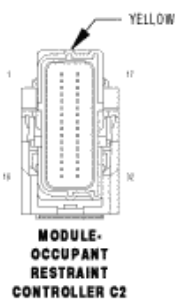
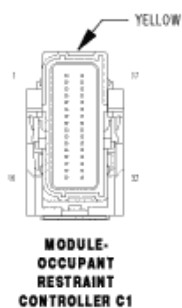
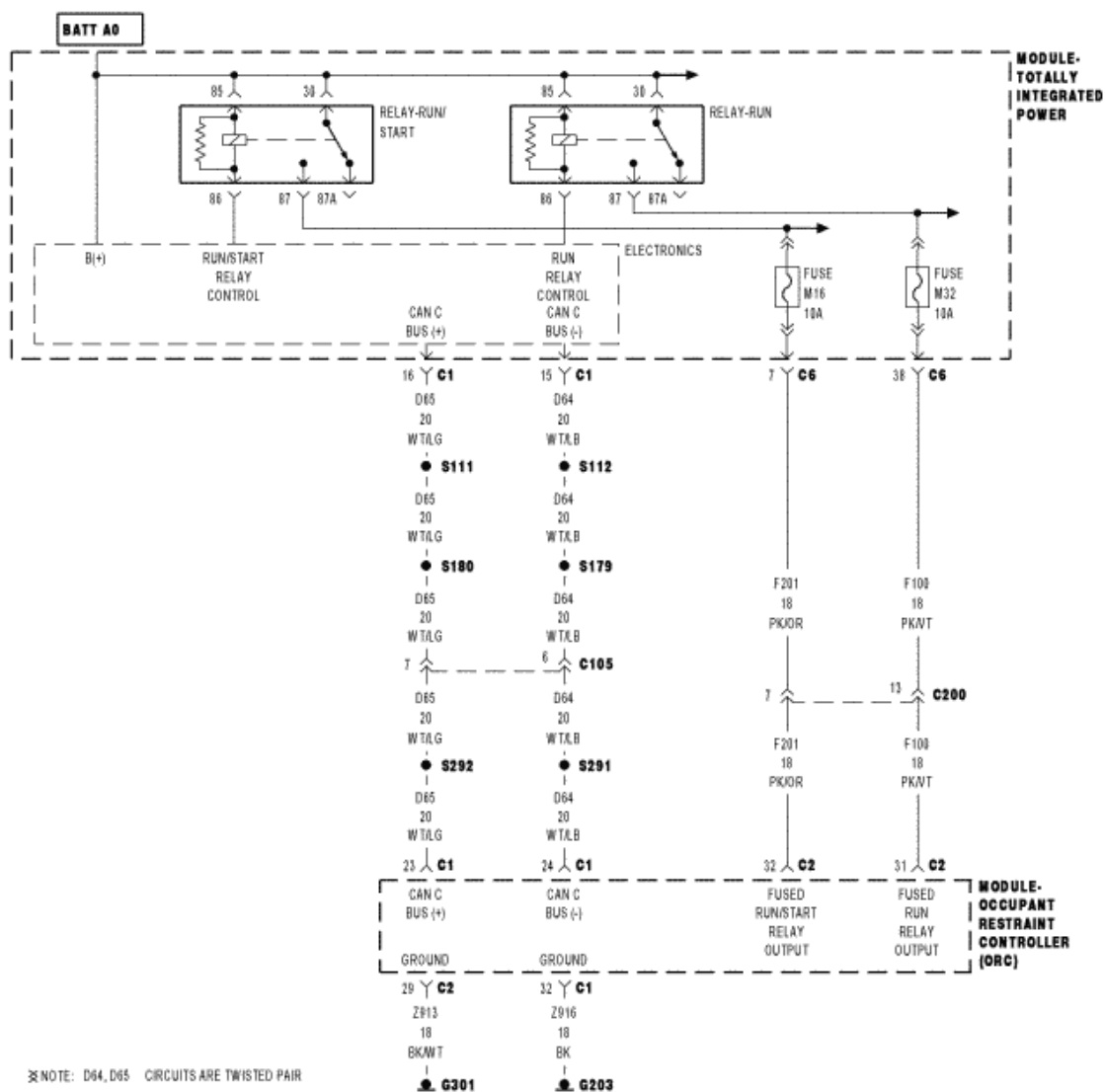


Fig. 104: Occupant Restraint Controller Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(Z912) (Z915) GROUND CIRCUITS OPEN
(F100) FUSED RUN RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(F201) FUSED RUN/START RELAY OUTPUT (RUN/START) CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
OCCUPANT RESTRAINT CONTROLLER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: **Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.**

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (Z912) (Z915) GROUND CIRCUITS OPEN

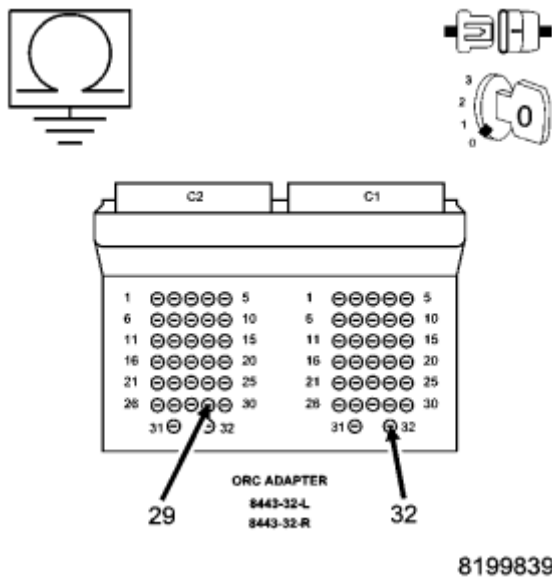


Fig. 105: Measuring Resistance Between Ground And (Z912) And (Z915) Ground Circuits
Courtesy of CHRYSLER LLC

WARNING: To avoid personal injury or death, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Occupant Restraint Controller Module harness connectors.

Connect the appropriate Load Tool ACM Adapter to the ORC connectors.

Measure the resistance between ground and the (Z912) and (Z915) ground circuits.

Is the resistance below 10k ohms?

Yes

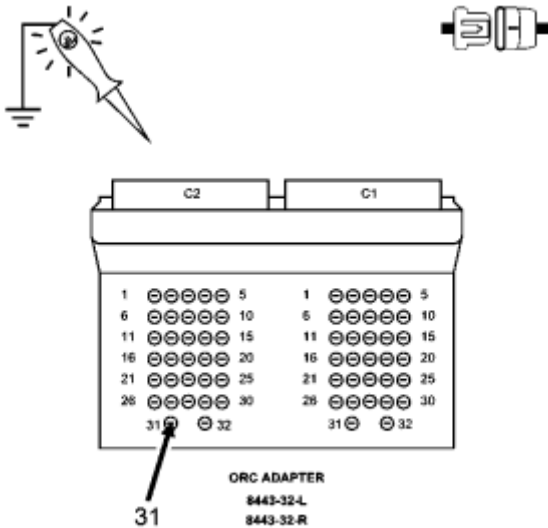
Go To step 3.

No

Repair the (Z912) or (Z915) ground circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

3. (F100) FUSED RUN RELAY OUTPUT CIRCUIT OPEN OR SHORTED



81998399

Fig. 106: Using 12-Volt Test Light Connected To Ground To Check (F100) Fused Run Relay Output Circuit
 Courtesy of CHRYSLER LLC

NOTE: Check the TIPM for any ignition related DTCs before proceeding. If set. Refer to DIAGNOSIS AND TESTING .

WARNING: To avoid personal injury or death, turn the ignition on, then reconnect the battery.

Using a 12-volt test light connected to ground, check the (F100) Fused Run Relay Output circuit.

Does the test light illuminate brightly?

Yes

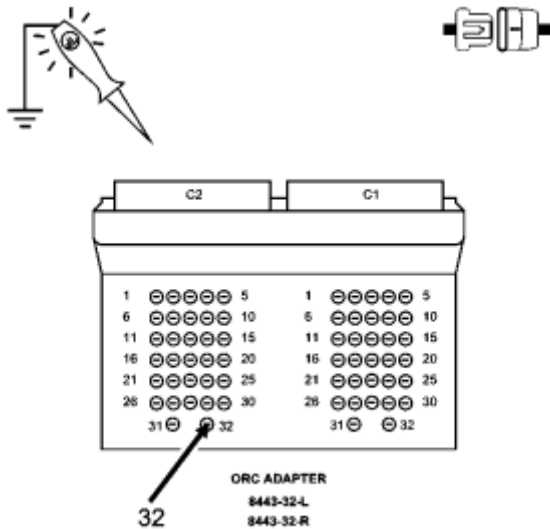
Go To step 4.

No

Repair the (F100) Fused Run Relay Output circuit for an open or short.

Perform *AIRBAG SYSTEM VERIFICATION TEST - VER 1 .

4. (F201) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED



8199839d

Fig. 107: Using 12-Volt Test Light Connected To Ground To Check (F201) Fused Run/Start Relay Output Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to ground, check the (F201) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

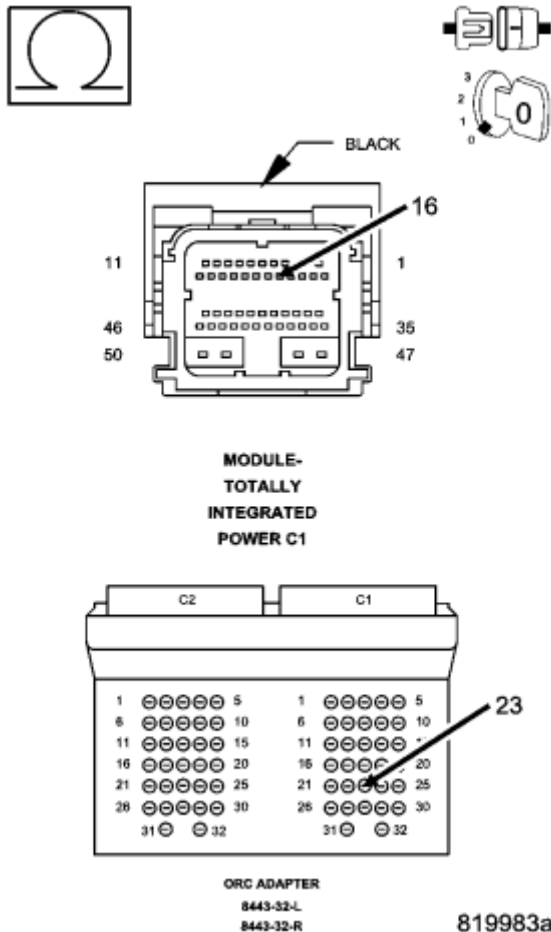
Go To step 5.

No

Repair the (F201) Fused Run/Start Relay Output circuit for an open or short.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1**.

5. (D65) CAN C BUS (+) CIRCUIT OPEN



819983a2

Fig. 108: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM C1 Harness Connector And Occupant Restraint Controller Module Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM C1 harness connector and the Occupant Restraint Controller Module connector.

Is resistance below 5.0 ohms?

Yes

Go To step 6.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1 .**

6. (D64) CAN C BUS (-) CIRCUIT OPEN

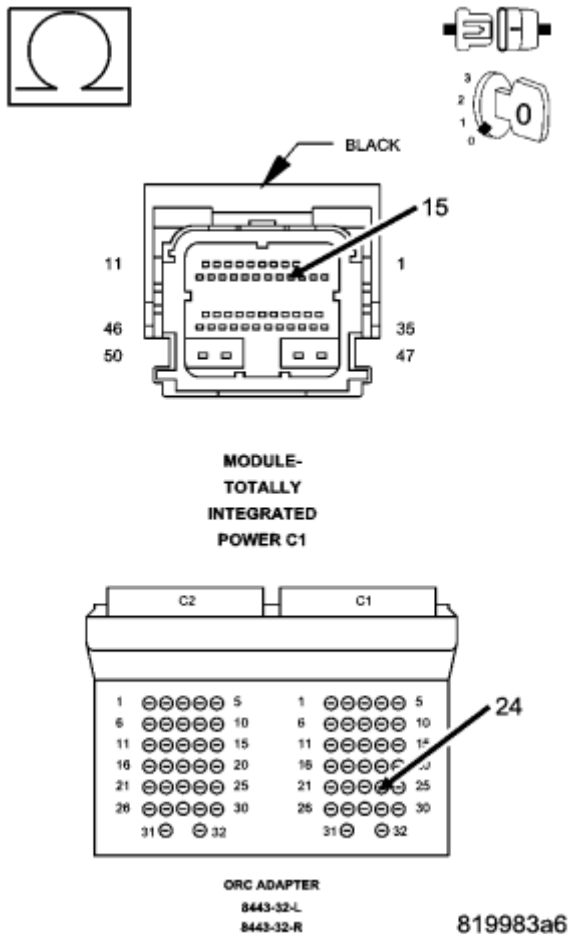


Fig. 109: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM C1 Harness Connector And Occupant Restraint Controller Module Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Occupant Restraint Controller Module connector.

Is resistance below 5.0 ohms?

Yes

Replace the Occupant Restraint Controller Module in accordance with the service information.

Perform ***AIRBAG SYSTEM VERIFICATION TEST - VER 1 .**

No

Repair the (D64) CAN C Bus (-) circuit for an open.



Fig. 110: Park Assist (Parktronics) Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(F921) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR SHORTED
(Z920) GROUND CIRCUIT OPEN
(D265) AND (D264) CAN INTERIOR BUS (125K) CIRCUITS OPEN
PARK ASSIST (PARKTRONICS) (PTS) MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (F921) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR SHORTED

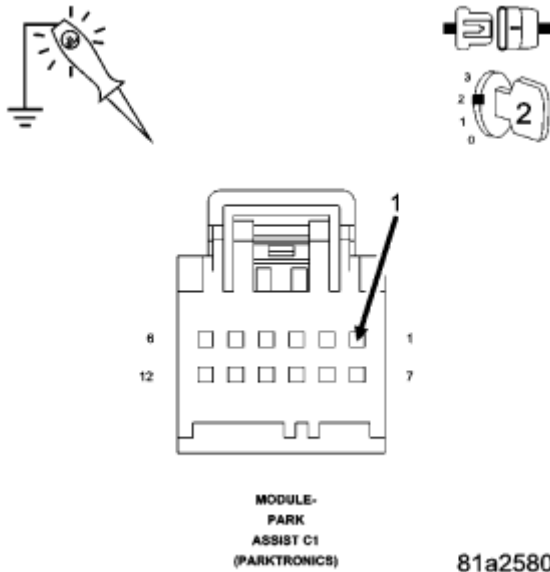


Fig. 111: Using 12-Volt Test Light Connected To Ground To Check (F921) Fused Ignition Switch Output (Run) Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the PTS C1 harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F921) Fused Ignition Switch Output (Run) circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (F921) Fused Ignition Switch Output (Run) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z920) GROUND CIRCUIT OPEN

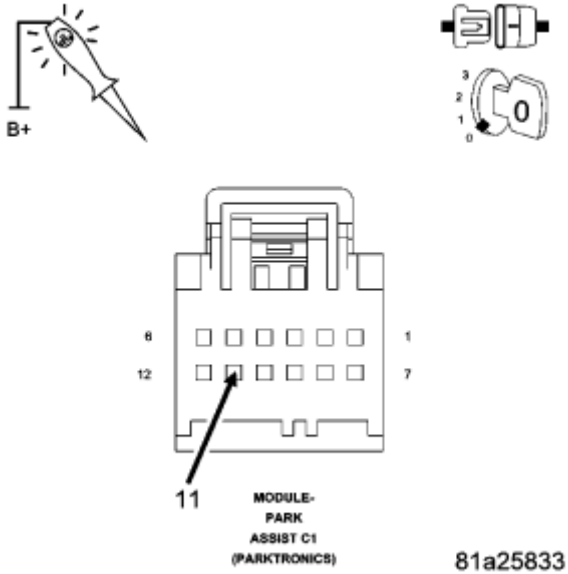


Fig. 112: Using 12-Volt Test Light Connected To 12-Volts To Check (Z920) Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z920) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z920) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN

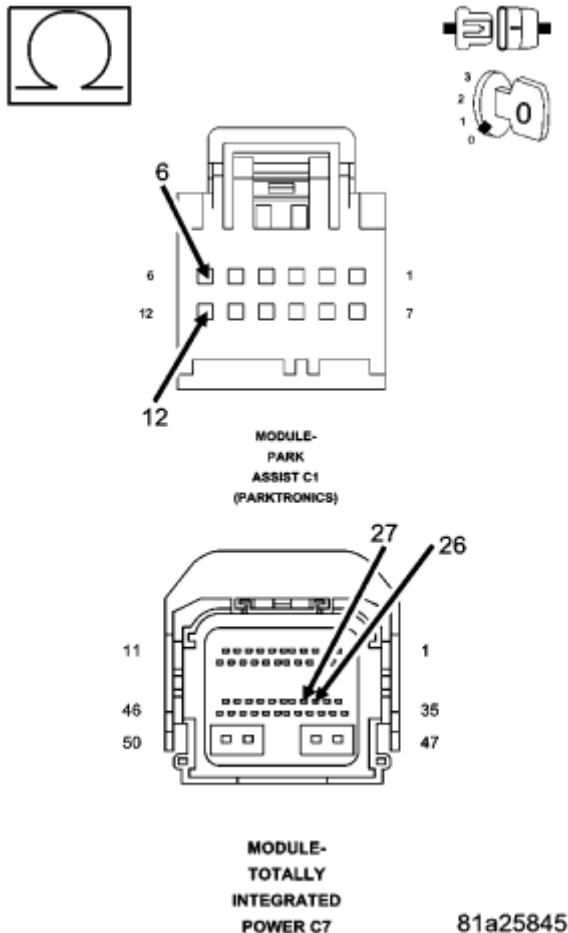


Fig. 113: Measuring Resistance Of (D264/5) CAN Interior Bus (-) (125K) Circuit Between TIPM C7 Harness Connector And PTS C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the PTS C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the PTS C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Park Assist (Parktronic) Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

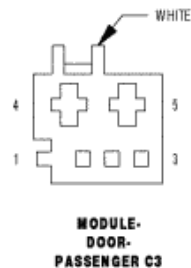
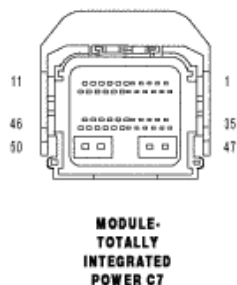
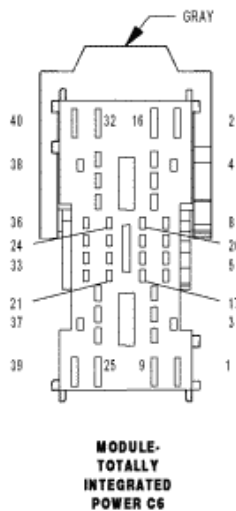
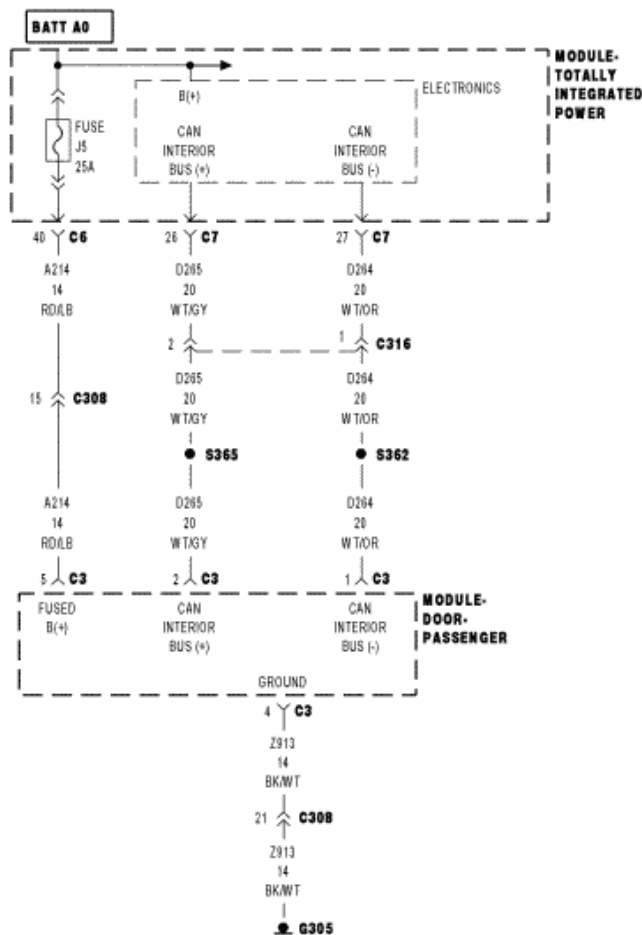
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM PASSENGER DOOR MODULE (PDM)**

Circuit Schematic



8142801

Fig. 114: Passenger Door Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(A214) FUSED B (+) CIRCUIT OPEN OR SHORTED
(Z913) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
PASSENGER DOOR MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

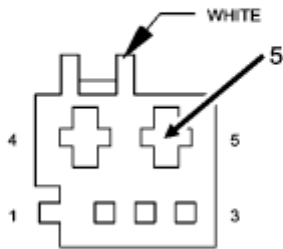
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A214) FUSED B(+) CIRCUIT OPEN OR SHORTED



MODULE-
DOOR-
PASSENGER C3

81a2f6c9

Fig. 115: Using 12-Volt Test Light Connected To Ground To Check (A214) Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C3 harness connector.

Using a 12-volt test light connected to ground, check the (A214) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

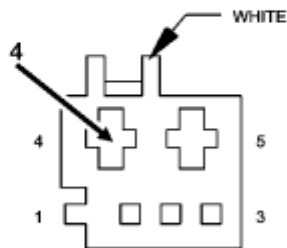
Go To step 3.

No

Repair the (A214) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z913) GROUND CIRCUIT OPEN



MODULE-
DOOR-
PASSENGER C3

81a2f6cd

Fig. 116: Using 12-Volt Test Light Connected To 12-Volts To Check (Z913) Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z913) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z913) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**

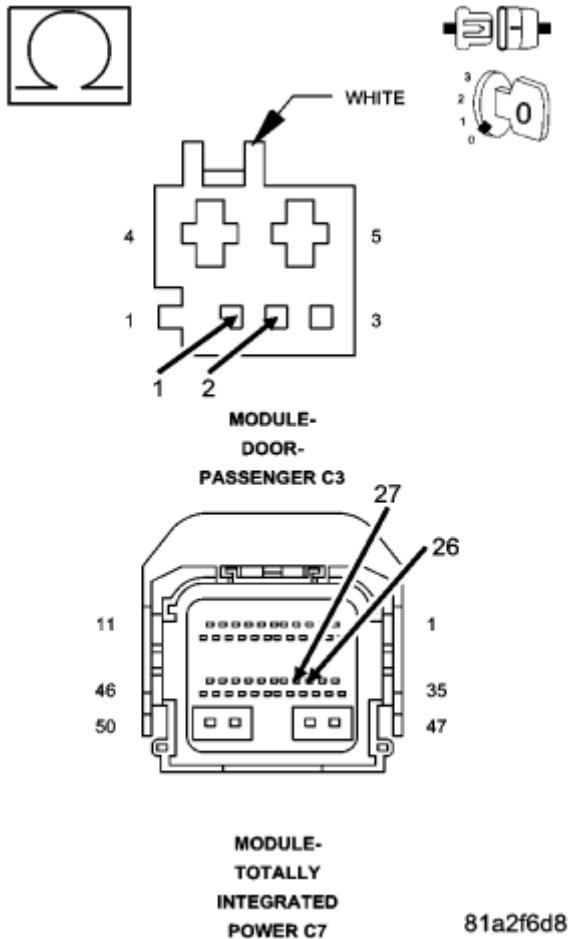


Fig. 117: Measuring Resistance Of (D264/5) CAN Interior Bus (-)/(+) (125K) Circuit Between TIPM C7 Harness Connector And Passenger Door Module C3 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Passenger Door Module C3 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Passenger Door Module C3 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Passenger Door Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

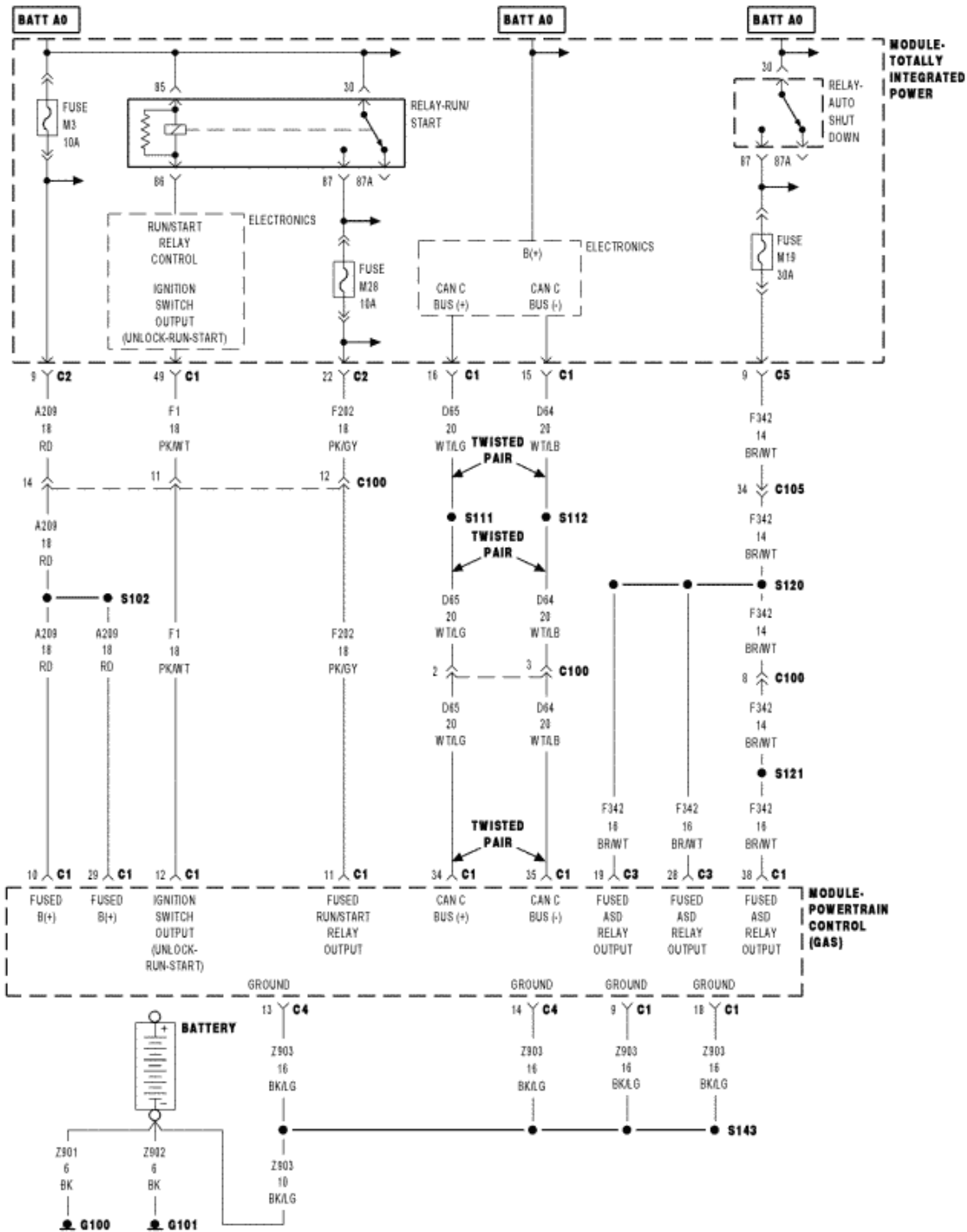
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM PCM (POWERTRAIN CONTROL MODULE) (NGC)**

Circuit Schematic



01990399

Fig. 118: Powertrain Control Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A209) FUSED B(+) CIRCUITS OPEN OR SHORTED
(Z933) GROUND CIRCUITS OPEN
(F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(F1) IGNITION SWITCH OUTPUT (UNLOCK/RUN/START) CIRCUIT OPEN OR SHORTED
(F342) FUSED ASD RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
POWERTRAIN CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware DTCs, perform DTC before proceeding.

Does the scan tool display a red X next to the module?

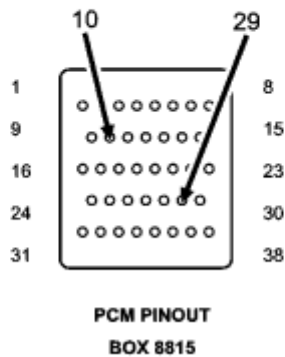
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A209) FUSED B(+) CIRCUITS OPEN OR SHORTED



8199840d

Fig. 119: Using 12-Volt Test Light Connected To Ground To Check (A209) Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the PCM C1 harness connector.

CAUTION: Do not probe the PCM harness connectors. Probing the PCM harness connectors will damage the PCM terminals resulting in poor terminal to pin connection. Install Miller Special Tool #8815 to perform diagnosis.

Using a 12-volt test light connected to ground, check the (A209) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

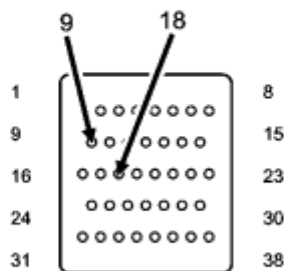
Go To step 3.

No

Repair the (A209) Fused B(+) circuit for an open or short.

Perform **POWERTRAIN VERIFICATION TEST**.

3. (Z933) GROUND CIRCUITS OPEN



PCM PINOUT
BOX 8815

81998415

Fig. 120: Using 12-Volt Test Light Connected To 12-Volts To Check Each (Z933) Ground Circuits
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check each (Z933) ground circuits.

Does the test light illuminate brightly for each circuit?

Yes

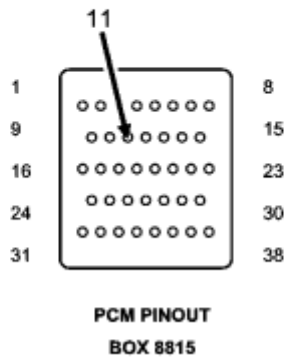
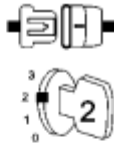
Go To step 4.

No

Repair the ground circuit for an open.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED



8199841d

Fig. 121: Using 12-Volt Test Light Connected To Ground To Check (F941) Fused Run/Start Relay Output Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F202) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

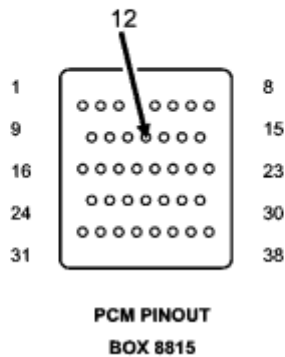
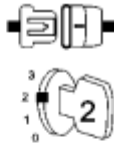
Go To step 5.

No

Repair the (F202) Fused Run/Start Relay Output circuit for an open or short.

Perform **POWERTRAIN VERIFICATION TEST** .

5. (F1) IGNITION SWITCH OUTPUT (UNLOCK/RUN/START) CIRCUIT OPEN OR SHORTED



81998428

Fig. 122: Using 12-Volt Test Light Connected To Ground To Check (F1) Ignition Switch Output (Unlock/Run/Start) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F1) Ignition Switch Output (Unlock/Run/Start) circuit.

Does the test light illuminate brightly?

Yes

Go To step 6.

No

Repair the (F1) Ignition Switch Output (Unlock/Run/Start) circuit for an open or short.
Perform **POWERTRAIN VERIFICATION TEST**.

6. (F342) FUSED ASD RELAY OUTPUT CIRCUIT OPEN OR SHORTED

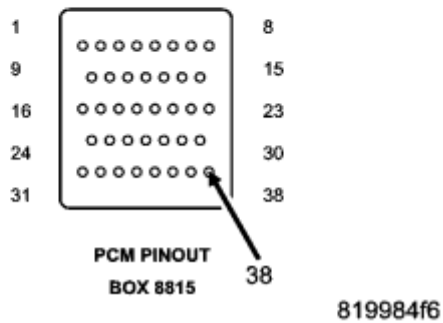
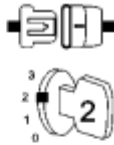


Fig. 123: Using 12-Volt Test Light Connected To Ground To Check (F342) Fused ASD Relay Output Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F342) Fused ASD Relay Output circuit.

Does the test light illuminate brightly?

Yes

Go To step 7.

No

Repair the (F342) Fused ASD Relay Output circuit for an open or short.

Perform **POWERTRAIN VERIFICATION TEST** .

7. **(D65) CAN C BUS (+) CIRCUIT OPEN**

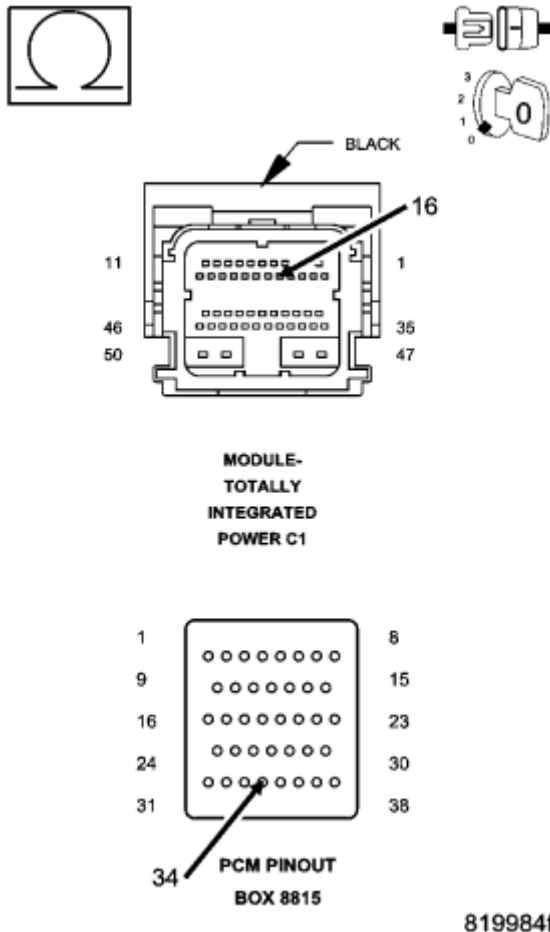


Fig. 124: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM Connector And Appropriate Terminal Of Special Tool #8815
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM connector and the appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To step 8.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **POWERTRAIN VERIFICATION TEST** .

8. (D64) CAN C BUS (-) CIRCUIT OPEN

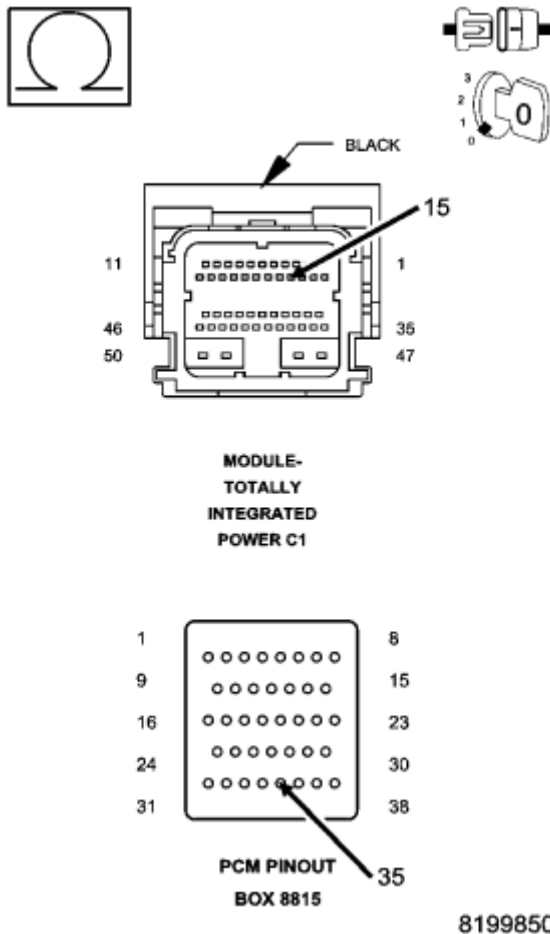


Fig. 125: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM Connector And Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM connector and the appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Replace and program the Powertrain Control Module in accordance with the service information.
Perform **POWERTRAIN VERIFICATION TEST** .

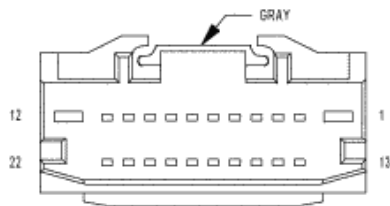
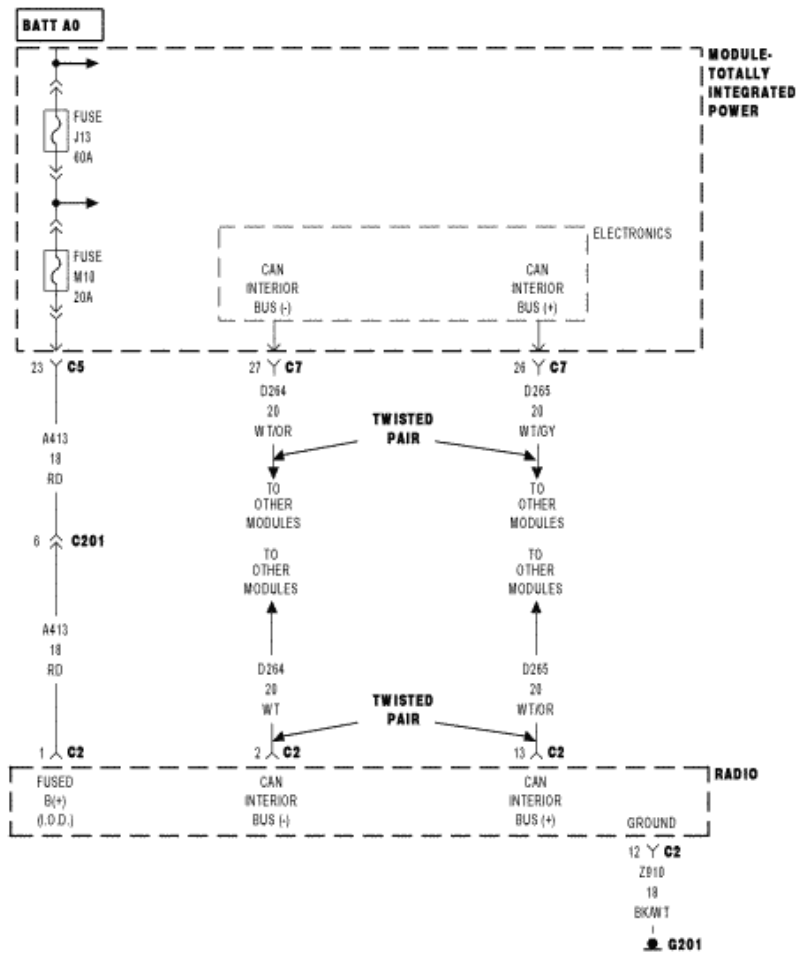
No

Repair the (D64) CAN C Bus (-) circuit for an open.

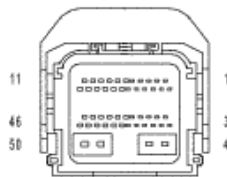
Perform **POWERTRAIN VERIFICATION TEST** .

***NO RESPONSE FROM RADIO**

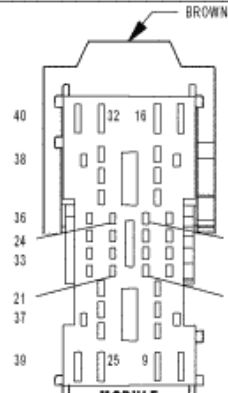
Circuit Schematic



RADIO C2



MODULE-TOTALLY INTEGRATED POWER C7



MODULE-TOTALLY INTEGRATED POWER C5

Fig. 126: Radio Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A413) FUSED B(+) CIRCUIT OPEN OR SHORTED (Z910) GROUND CIRCUIT OPEN (D265) AND (D264) CAN INTERIOR BUS (125K) CIRCUITS OPEN RADIO

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

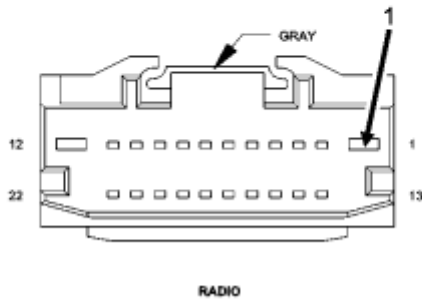
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A413) FUSED B(+) CIRCUIT OPEN OR SHORTED



81999260

Fig. 127: Using 12-Volt Test Light Connected To Ground To Check (A413) Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Radio harness connector.

Using a 12-volt test light connected to ground, check the (A413) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

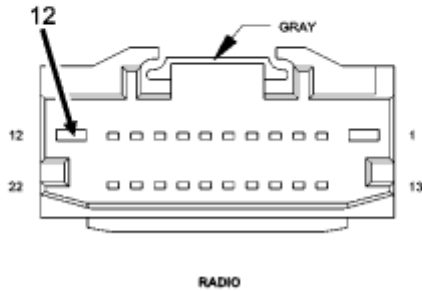
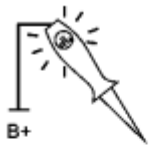
Go To step 3.

No

Repair the (A413) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z910) GROUND CIRCUIT OPEN



8199926b

Fig. 128: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

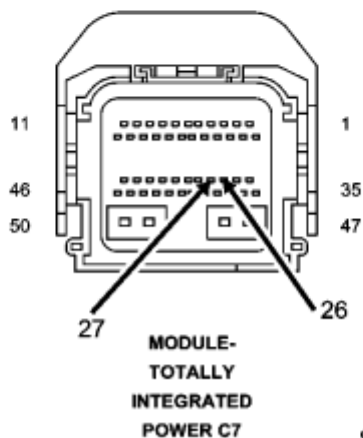
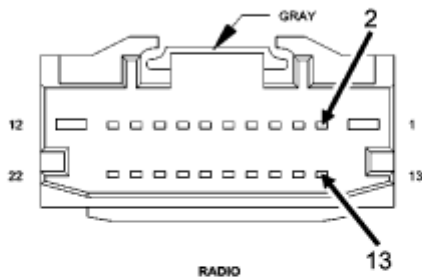
Go To step 4.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



8199927e

Fig. 129: Measuring Resistance Of (D264/5) CAN Interior Bus (-) (125K) Circuit Between TIPM C7 Harness Connector And Radio Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Radio harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Radio harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Radio in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM STEERING ANGLE SENSOR (SAS)**

Circuit Schematic

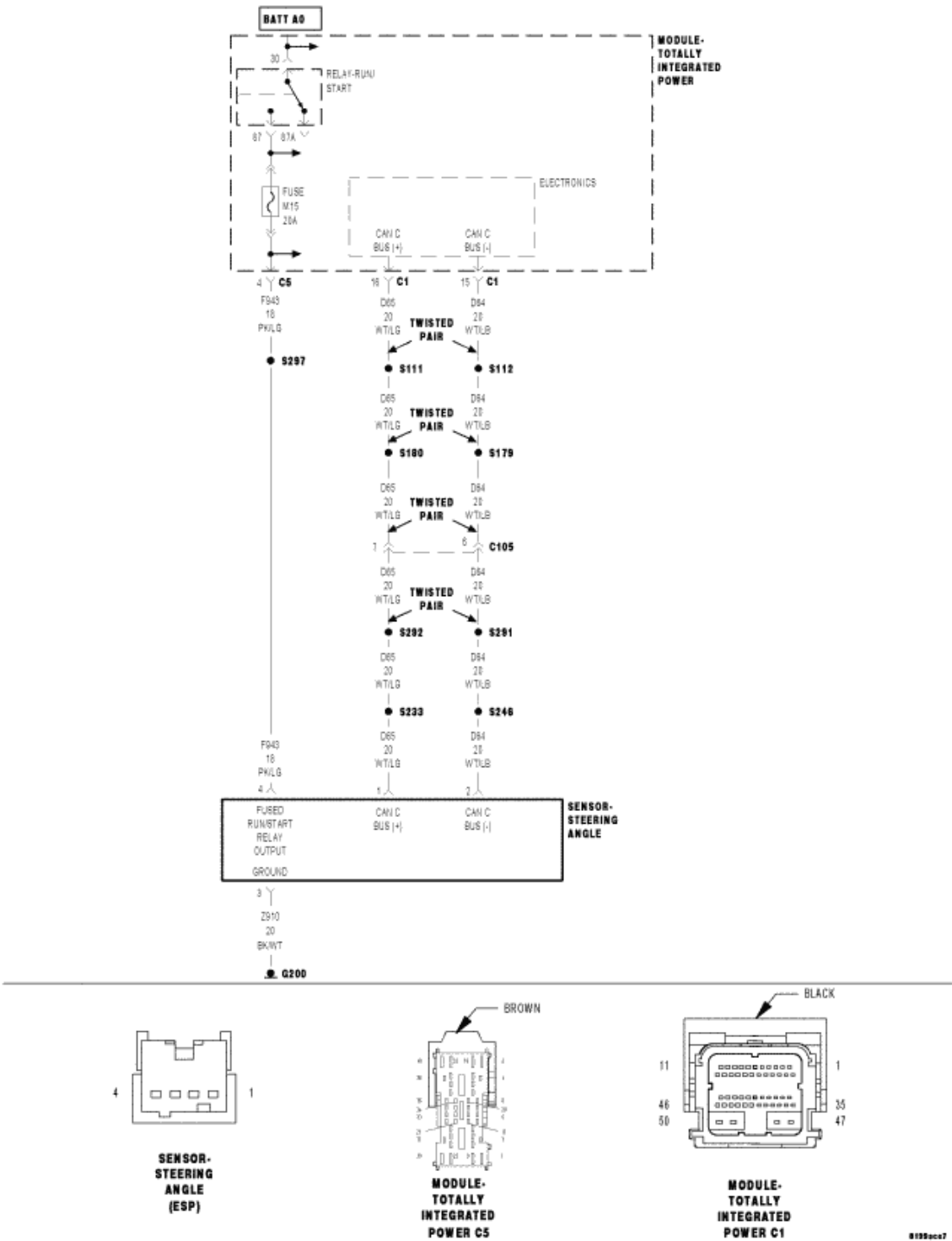


Fig. 130: Steering Angle Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED
(Z910) GROUND CIRCUIT OPEN
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
STEERING ANGLE SENSOR

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the sensor?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN OR SHORTED

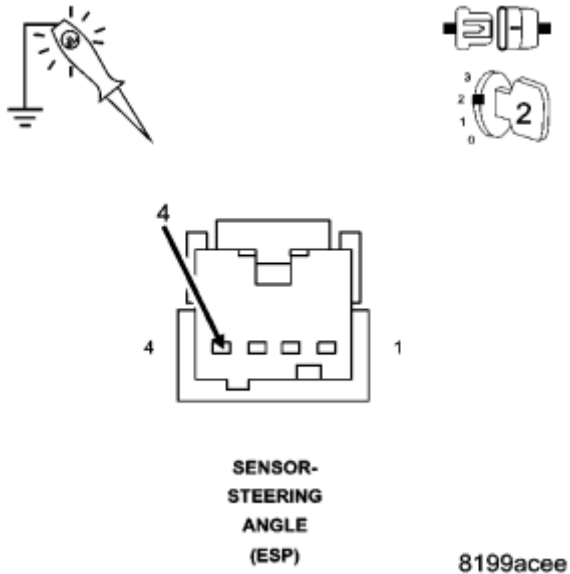


Fig. 131: Using 12-Volt Test Light Connected To Ground To Check (F202) Fused Run/Start Relay Output Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Steering Angle Sensor harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F202) Fused Run/Start Relay Output circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (F202) Fused Run/Start Relay Output circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z910) GROUND CIRCUIT OPEN

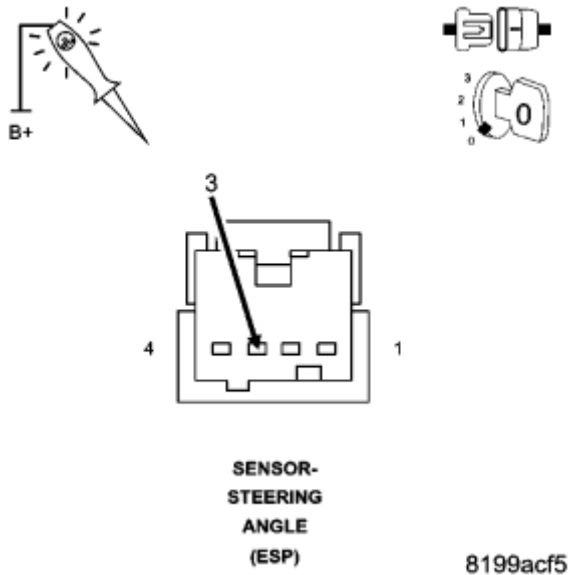


Fig. 132: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D65) CAN C BUS (+) CIRCUIT OPEN

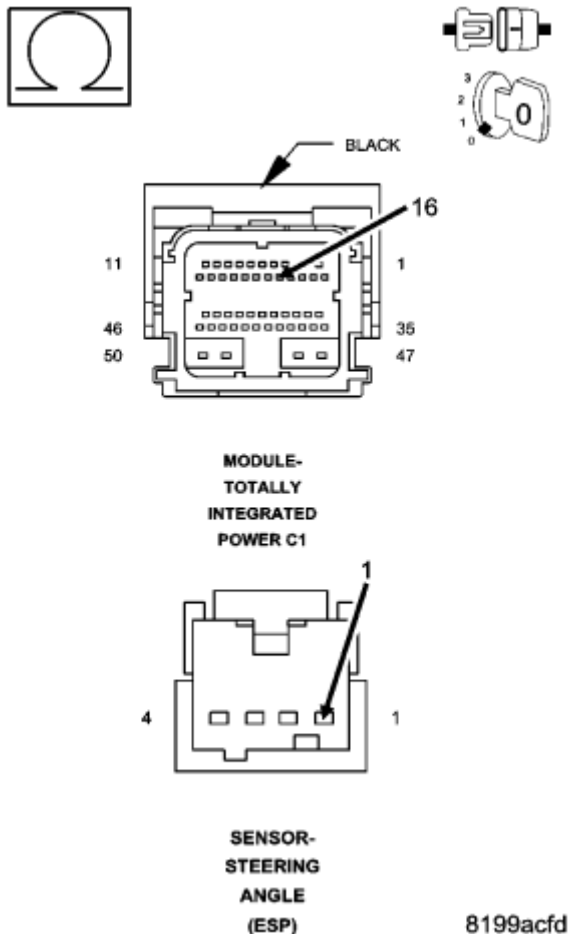


Fig. 133: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM C1 Harness Connector And Steering Angle Sensor Connector
 Courtesy of CHRYSLER LLC

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM C1 harness connector and the Steering Angle Sensor connector.

Is resistance below 5.0 ohms?

Yes

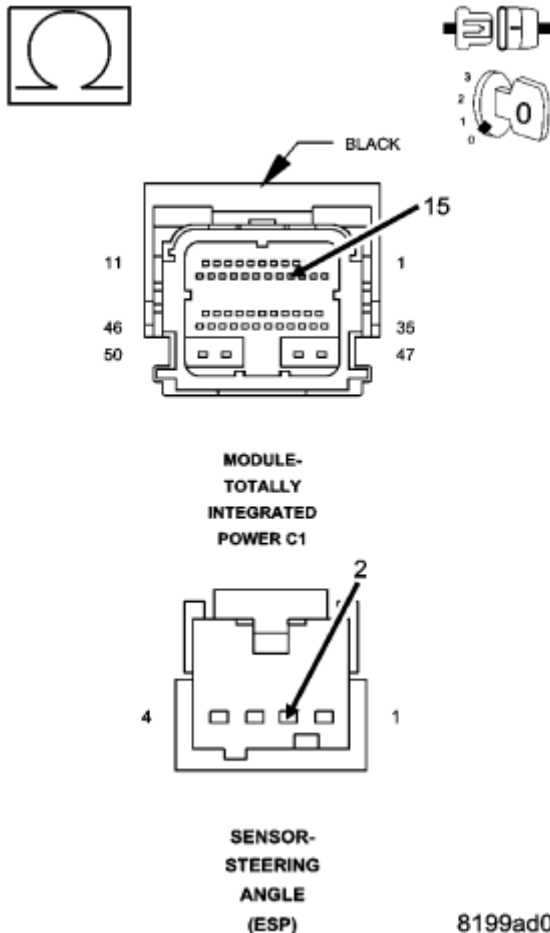
Go To step 5.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

5. (D64) CAN C BUS (-) CIRCUIT OPEN



8199ad02

Fig. 134: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM C1 Harness Connector And Steering Angle Sensor Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Steering Angle Sensor connector.

Is resistance below 5.0 ohms?

Yes

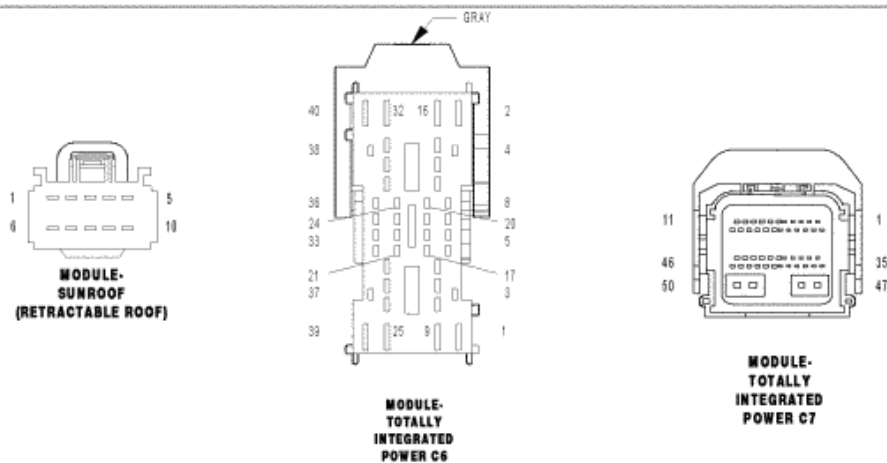
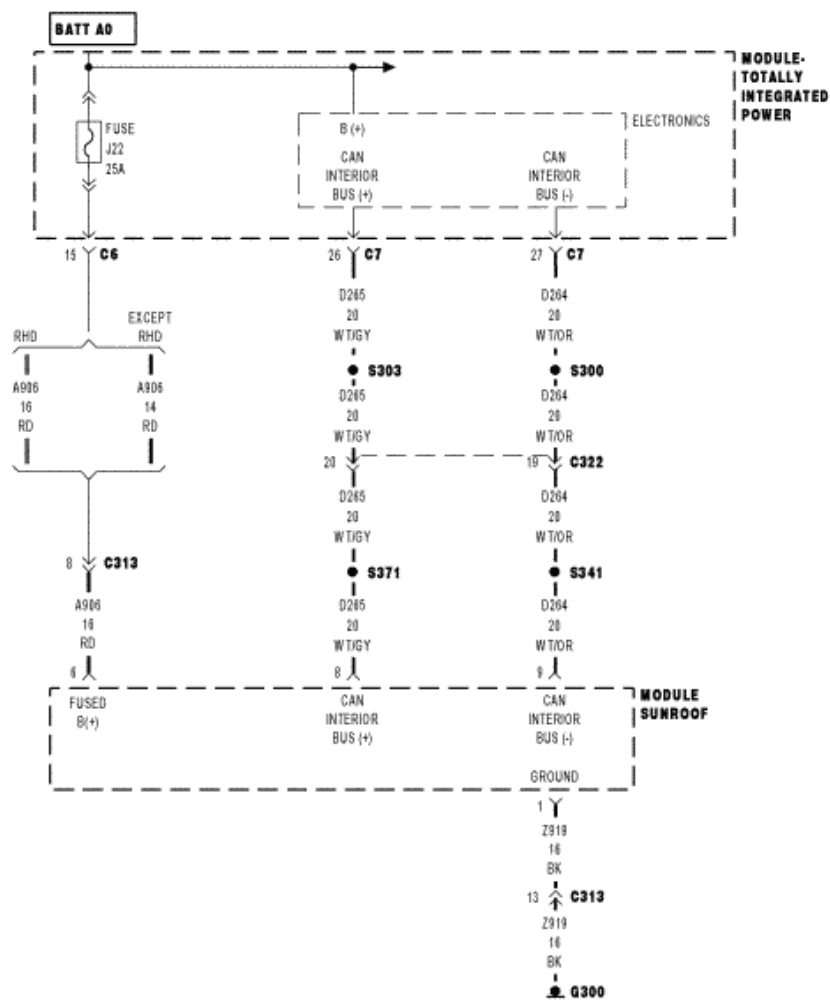
Replace the Steering Angle Sensor in accordance with the service information.
 Perform **BODY VERIFICATION TEST - VER 1.**

No

Repair the (D264) CAN C Bus (-) circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM SUNROOF MODULE (SUNR)**

Circuit Schematic



01030005

Fig. 135: Sunroof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A906) FUSED B (+) CIRCUIT OPEN OR SHORTED
(Z919) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
SUNROOF MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.**

With the scan tool, select ECU View.

NOTE: **A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.**

Does the scan tool display a red X next to the module?

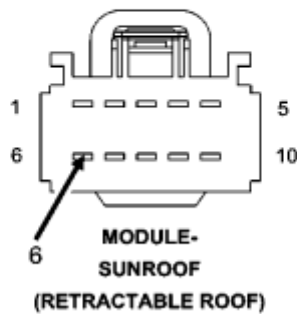
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A906) FUSED B(+) CIRCUIT OPEN OR SHORTED



81d3be4b

Fig. 136: Checking The (A906) Fused B(+) Circuit Using A 12-Volt Test Light Connected To Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Sunroof Module harness connector.

Using a 12-volt test light connected to ground, check the (A906) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

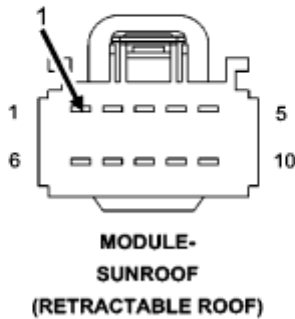
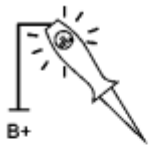
Go To step 3.

No

Repair the (A906) Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z919) GROUND CIRCUIT OPEN



81d3be4f

Fig. 137: Checking The (Z919) Ground Circuit Using A 12-Volt Test Light Connected To 12-Volts
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z919) ground circuit.

Does the test light illuminate brightly?

Yes

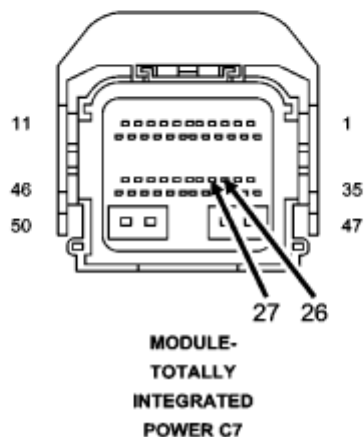
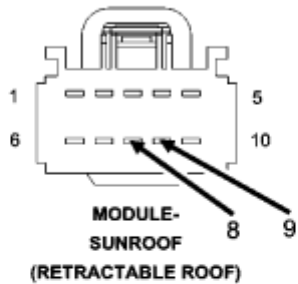
Go To step 4.

No

Repair the (Z919) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**



81d3be53

Fig. 138: Measuring The Resistance Of The CAN C Interior Bus (125K) Circuits Between The TIPM C7 Harness Connector And The Sunroof Module Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN C Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the Sunroof Module harness connector.

Measure the resistance of the (D265) CAN C Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the Sunroof Module harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the Sunroof Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

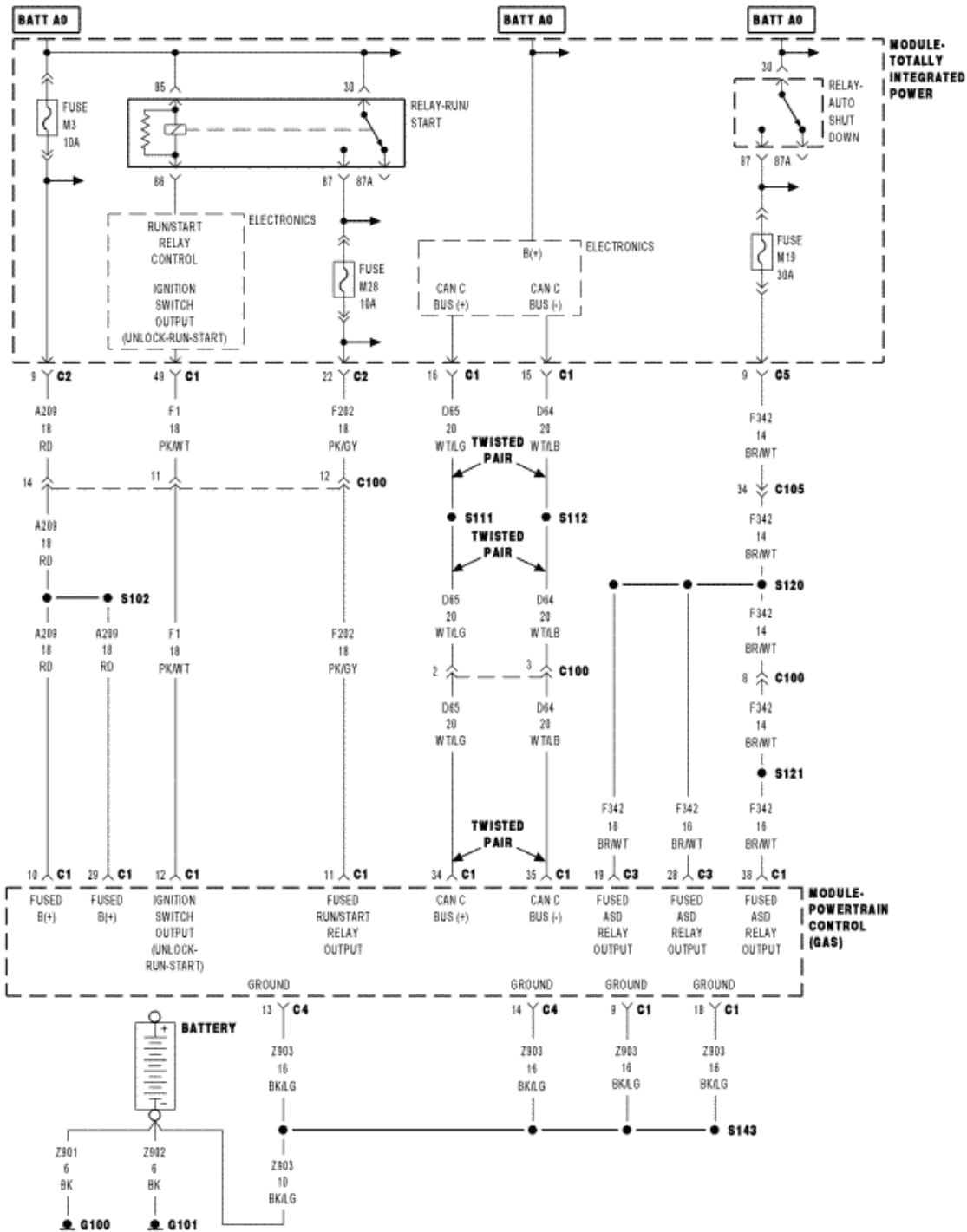
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM TCM (POWERTRAIN CONTROL MODULE) - NGC**

Circuit Schematic



01990399

Fig. 139: Powertrain Control Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
POWERTRAIN CONTROL MODULE POWERS AND GROUNDS (D65) CAN C BUS (+) CIRCUIT OPEN (D64) CAN C BUS (-) CIRCUIT OPEN POWERTRAIN CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU view.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware DTCs, perform DTC before proceeding.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. ATTEMPT TO COMMUNICATE WITH THE PCM

With the scan tool in ECU View, observe the status of the PCM.

Does the scan tool display a red X next to the PCM?

Yes

Perform the No Response From PCM diagnostic procedure. See **DIAGNOSIS AND TESTING.**

No

Go To step 3.

3. (D65) CAN C BUS (+) CIRCUIT OPEN

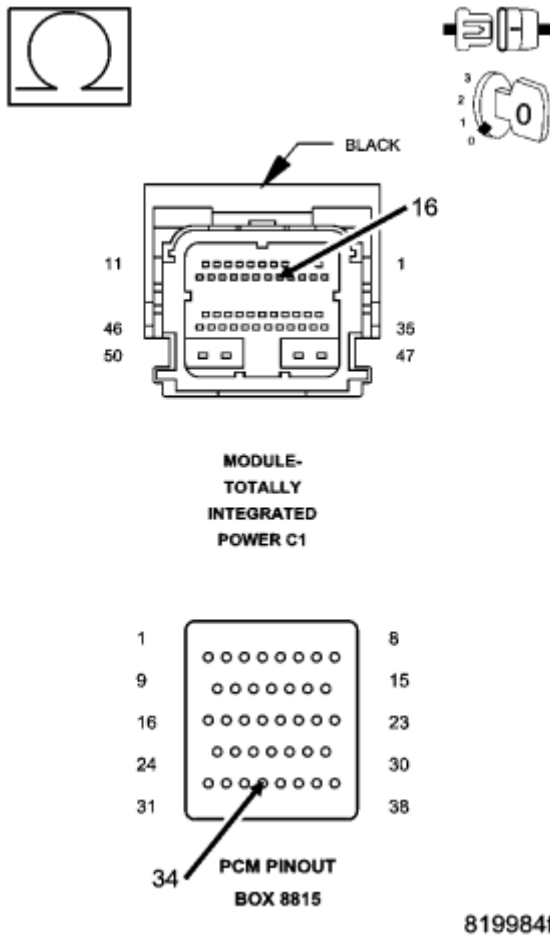


Fig. 140: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM Connector And Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM connector and the appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Go To step 4.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **POWERTRAIN VERIFICATION TEST** .

4. (D64) CAN C BUS (-) CIRCUIT OPEN

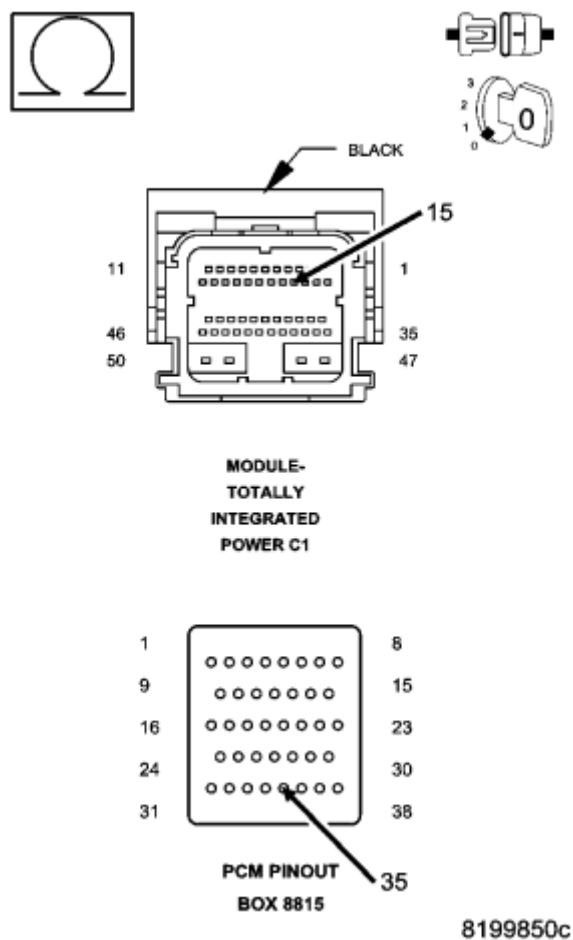


Fig. 141: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM Connector And Appropriate Terminal Of Special Tool #8815
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM connector and the appropriate terminal of the special tool #8815.

Is the resistance below 5.0 ohms?

Yes

Replace and program the Powertrain Control Module in accordance with the service information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Repair the (D64) CAN C Bus (-) circuit for an open.
Perform **POWERTRAIN VERIFICATION TEST** .

***NO RESPONSE FROM TCM - NAG1/DIESEL**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(Z910) GROUND CIRCUIT OPEN (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN OR SHORTED (D65) CAN C BUS (+) CIRCUIT OPEN (D64) CAN C BUS (-) CIRCUIT OPEN TRANSMISSION CONTROL MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

NOTE: Check the TIPM for any active CAN C hardware and any ignition related DTCs, perform DTCs before proceeding.

Does the scan tool display a red X next to the module?

Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (Z910) GROUND CIRCUIT OPEN

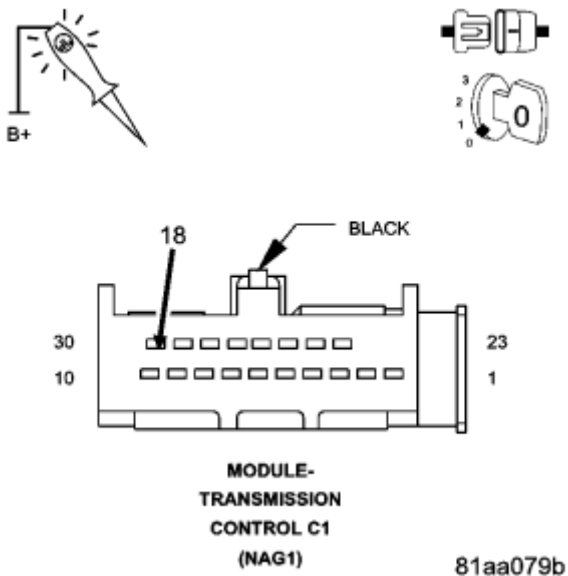


Fig. 142: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TCM C1 harness connector.

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (T16) TRANSMISSION CONTROL OUTPUT CIRCUIT OPEN OR SHORTED

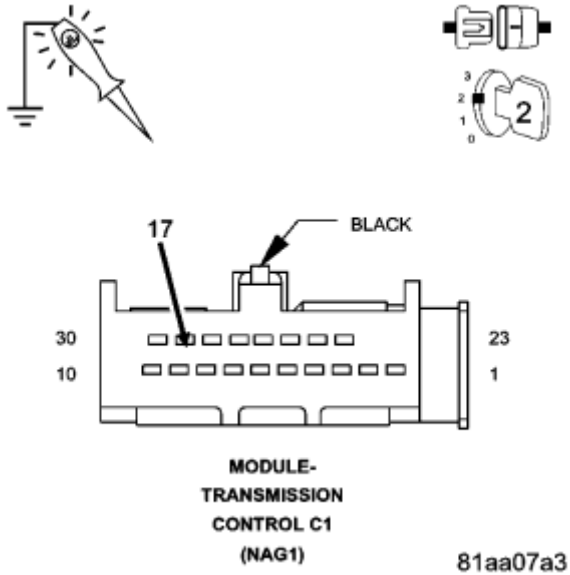


Fig. 143: Using 12-Volt Test Light Connected To Ground To Check (T16) Transmission Control Output Circuit

Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (T16) Transmission Control Output circuit.

Does the test light illuminate brightly?

Yes

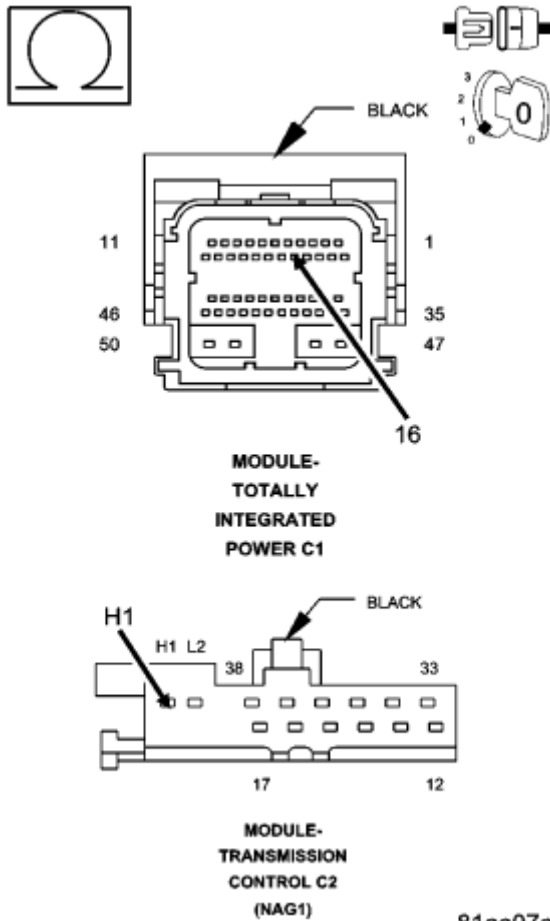
Go To step 4.

No

Repair the (T16) Transmission Control Output circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

4. (D65) CAN C BUS (+) CIRCUIT OPEN



81aa07a7

Fig. 144: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM Connector And TCM Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Disconnect the TCM C2 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM connector and the TCM connector.

Is resistance below 5.0 ohms?

Yes

Go To step 5.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform NAG1 TRANSMISSION VERIFICATION TEST.

5. **(D64) CAN C BUS (-) CIRCUIT OPEN**

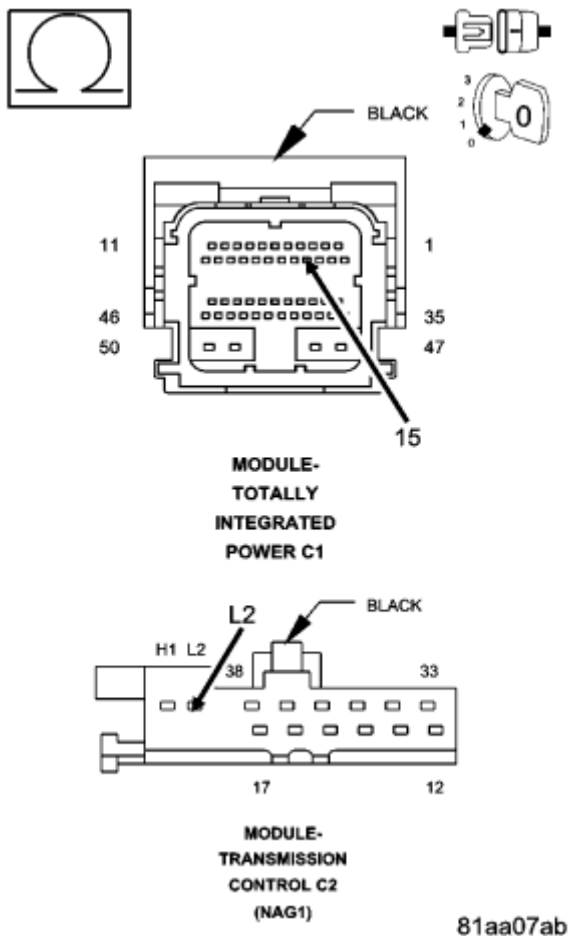


Fig. 145: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM Connector And TCM Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM connector and the TCM connector.

Is resistance below 5.0 ohms?

Yes

Replace the Transmission Control Module in accordance with the service information.

Perform NAG1 TRANSMISSION VERIFICATION TEST.

No

Repair the (D64) CAN C Bus (-) circuit for an open.
Perform NAG1 TRANSMISSION VERIFICATION TEST.

***NO RESPONSE FROM TIPM (TOTALLY INTEGRATED POWER MODULE)**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
FUSED B (+) CIRCUITS OPEN
FUSED IGNITION SWITCH OUTPUT CIRCUITS OPEN
GROUND CIRCUITS OPEN
DIAGNOSTIC CAN C CIRCUITS OPEN
DIAGNOSTIC CAN C CIRCUITS SHORTED TO GROUND
DIAGNOSTIC CAN C CIRCUITS SHORTED TOGETHER
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

NOTE: Ensure the scan tool is updated to the latest software.

NOTE: If the scan tool displays any error messages involving the Diagnostic CAN C circuits, diagnose and repair the error message before proceeding. Refer to **DIAGNOSTIC CODE INDEX** .

NOTE: A loss of communication with the TIPM can cause the ECU View button on the scan tool to be inoperative (not highlighted).

With the scan tool, attempt to select ECU View.

Can the scan tool communicate with the TIPM?

Yes

The no response condition is not present at this time. Using the wiring diagram/schematic as a

guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

No

Go To step 2.

2. **FUSED B (+) CIRCUITS OPEN AT TIPM**

Disconnect the scan tool from the DLC.

Using a 12-volt test light connected to ground, and using the wiring diagram as a guide, check all Fused B (+) circuits at the TIPM.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 3.

No

Repair the Fused B(+) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. **FUSED IGNITION SWITCH OUTPUT CIRCUITS OPEN AT TIPM**

Turn the ignition on.

Using a 12-volt test light connected to ground, and using the wiring diagram as a guide, check each Fused Ignition Switch Output circuit at the TIPM.

Does the test light illuminate brightly for each circuit?

Yes

Go To step 4.

No

Repair the Fused Ignition Switch Output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **GROUND CIRCUITS OPEN AT TIPM**

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, and using the wiring diagram as a guide, check all ground circuits at the TIPM.

Does the test light illuminate brightly on each circuit?

Yes

Go To step 5.

No

Repair the ground circuit that did not light the test light for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

5. **CHECK FOR (D72) DIAGNOSTIC CAN C (+) CIRCUIT OPEN AT DLC**

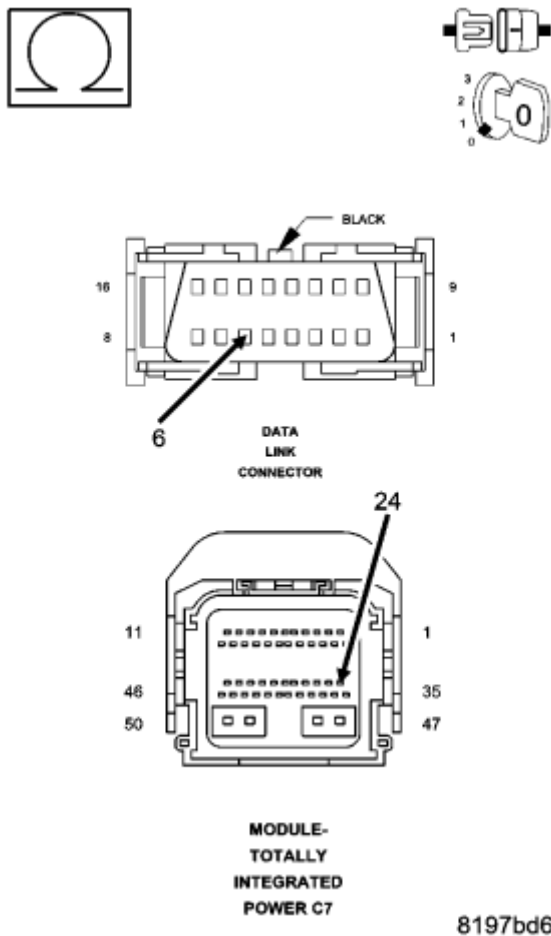


Fig. 146: Measuring Resistance Of (D72) Diagnostic CAN C (+) Circuit Between TIPM C7 Harness Connector And DLC

Courtesy of CHRYSLER LLC

Disconnect the TIPM C7 harness connector.

Measure the resistance on the (D72) Diagnostic CAN C (+) circuit between the TIPM C7 harness connector and the DLC.

Is the resistance above 10.0 ohms?

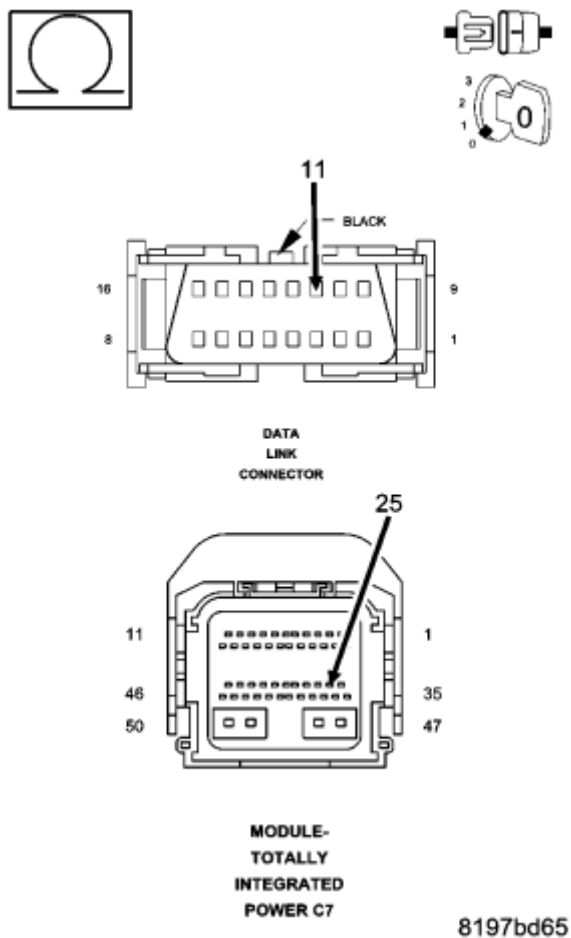
Yes

Repair the (D72) Diagnostic CAN C (+) circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To step 6.

6. CHECK FOR (D71) DIAGNOSTIC CAN C (-) CIRCUIT OPEN AT DLC



8197bd65

Fig. 147: Measuring Resistance Of (D71) Diagnostic CAN C (-) Circuit Between TIPM C7 Harness Connector And DLC
Courtesy of CHRYSLER LLC

Measure the resistance on the (D71) Diagnostic CAN C (-) circuit between the TIPM C7 harness connector and the DLC.

Is the resistance above 10.0 ohms?

Yes

Repair the (D71) Diagnostic CAN C (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To step 7.

7. (D72) DIAGNOSTIC CAN C (+) CIRCUIT SHORTED TO GROUND

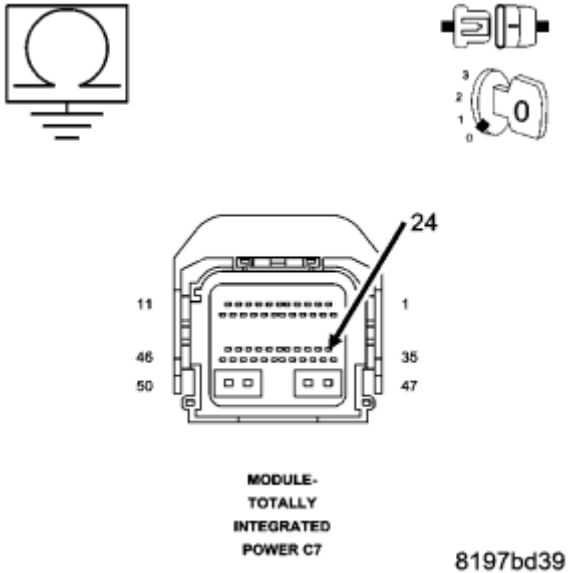


Fig. 148: Measuring The Resistance Between Ground And The Diagnostic Can C (+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance between ground and the (D72) Diagnostic CAN C (+) circuit.

Is the resistance below 100.0 ohms?

Yes

Repair the (D72) Diagnostic CAN C (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To step 8.

8. **(D71) DIAGNOSTIC CAN C (-) CIRCUIT SHORTED TO GROUND**

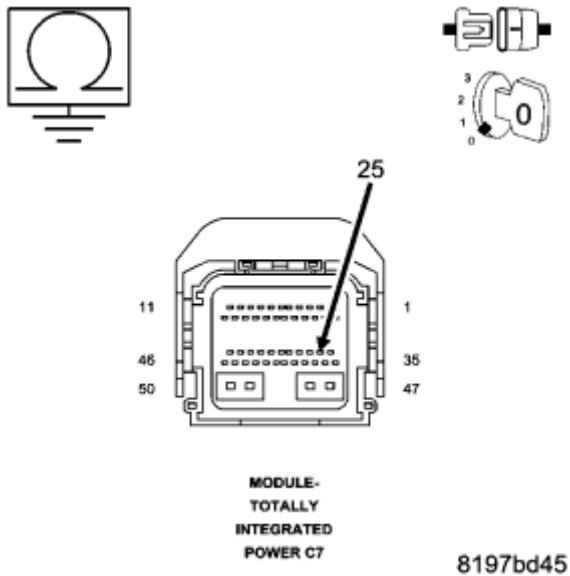


Fig. 149: Measuring Resistance Between Ground And (D71) Diagnostic CAN C (-) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the scan tool from the DLC.

Measure the resistance between ground and the (D71) Diagnostic CAN C (-) circuit.

Is the resistance below 100.0 ohms?

Yes

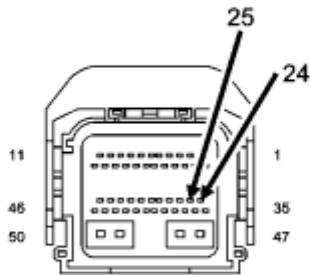
Repair the (D71) Diagnostic CAN C (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Go To step 9.

9. **CHECK FOR DIAGNOSTIC CAN C CIRCUITS SHORTED TOGETHER**



MODULE-
TOTALLY
INTEGRATED
POWER C7

8197bd4c

Fig. 150: Measuring Resistance Between (D72/52) Diagnostic CAN C (+) Circuit And (D71) Diagnostic CAN C (-) Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (D52) Diagnostic CAN C (+) circuit and the (D71) Diagnostic CAN C (-) circuit at the TIPM C7 harness connector.

Is the resistance below 100.0 ohms?

Yes

Repair the (D72) Diagnostic CAN C (+) circuit for a short to the (D71) Diagnostic CAN C (-) circuit.

Perform **BODY VERIFICATION TEST - VER 1.**

No

Replace the Totally Integrated Power Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM VEHICLE ENTERTAINMENT SYSTEM (VES)(DVD MONITOR)**

Circuit Schematic

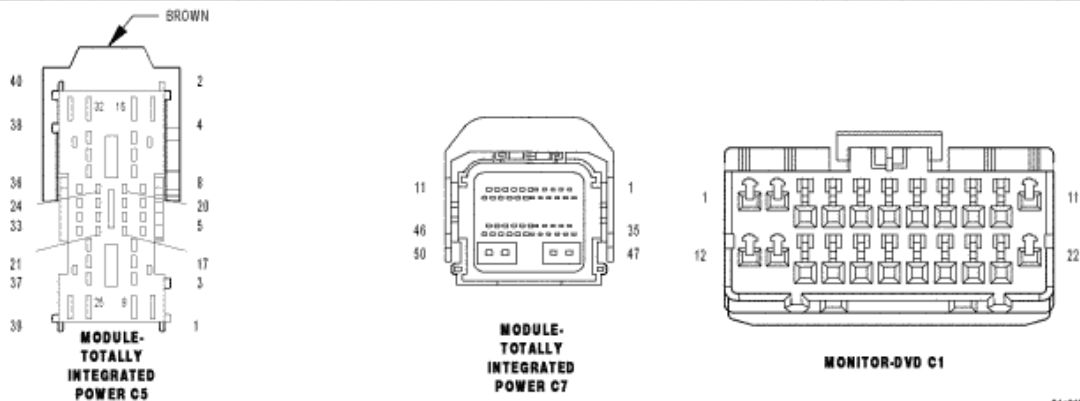
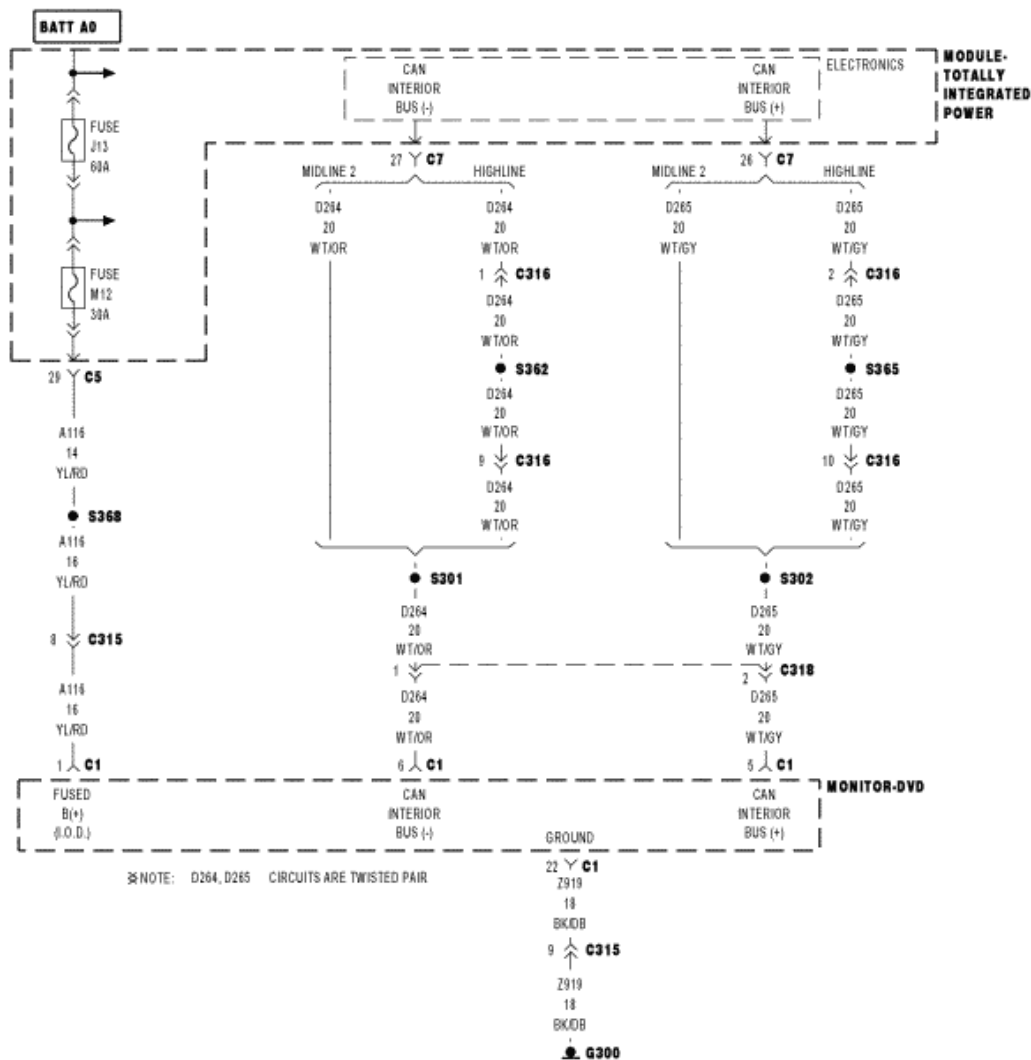


Fig. 151: Vehicle Entertainment System Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(A116) FUSED B (+) (I.O.D.) CIRCUIT OPEN OR SHORTED
(Z919) GROUND CIRCUIT OPEN
(D264) AND (D265) CAN INTERIOR BUS (125K) CIRCUITS OPEN
VEHICLE ENTERTAINMENT SYSTEM (DVD MONITOR)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

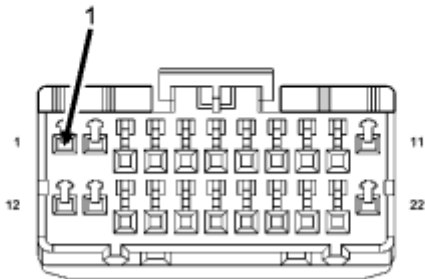
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A116) FUSED B(+) (I.O.D.) CIRCUIT OPEN OR SHORTED



MONITOR-DVD C1

81a2f40a

Fig. 152: Using 12-Volt Test Light Connected To Ground To Check (A116) Fused B(+) (I.O.D.) Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the DVD Monitor C1 harness connector.

Using a 12-volt test light connected to ground, check the (A116) Fused B(+) (I.O.D.) circuit.

Does the test light illuminate brightly?

Yes

Go To step 3.

No

Repair the (A116) Fused B(+) (I.O.D.) circuit for an open or short.

Perform **BODY VERIFICATION TEST - VER 1.**

3. (Z919) GROUND CIRCUIT OPEN

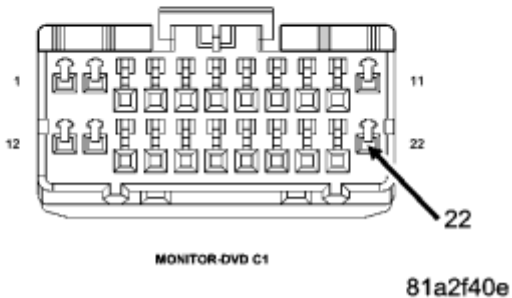


Fig. 153: Using 12-Volt Test Light Connected To 12-Volts To Check (Z919) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z919) ground circuit.

Does the test light illuminate brightly?

Yes

Go To step 4.

No

Repair the (Z919) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1.**

4. **(D265) OR (D264) CAN INTERIOR BUS (125K) CIRCUIT OPEN**

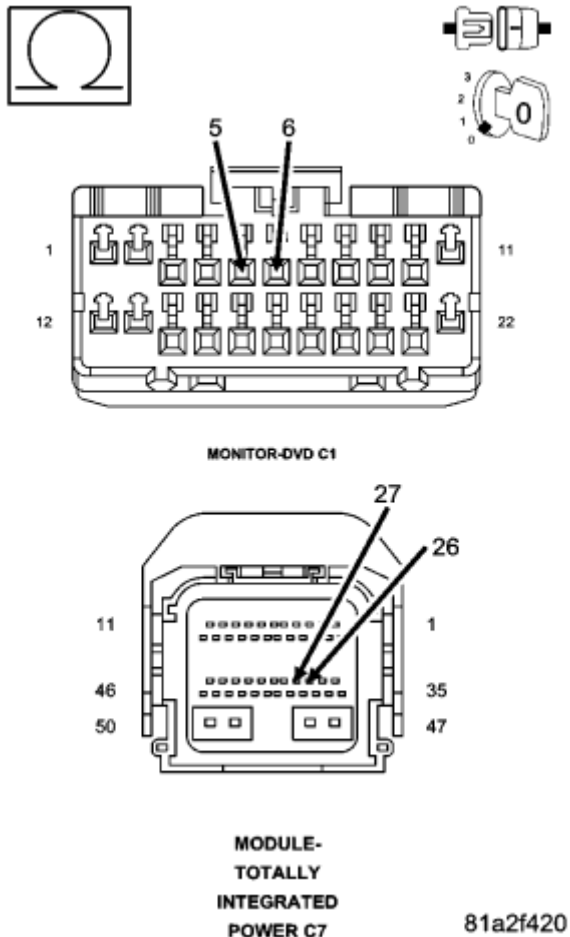


Fig. 154: Measuring Resistance Of CAN Interior Bus (125K) Circuits Between TIPM C7 Harness Connector And DVD Monitor C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) (125K) circuit between the TIPM C7 harness connector and the DVD Monitor C1 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) (125K) circuit between the TIPM C7 harness connector and the DVD Monitor C1 harness connector.

Is resistance below 5.0 ohms on both circuits?

Yes

Replace the DVD Monitor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1.**

No

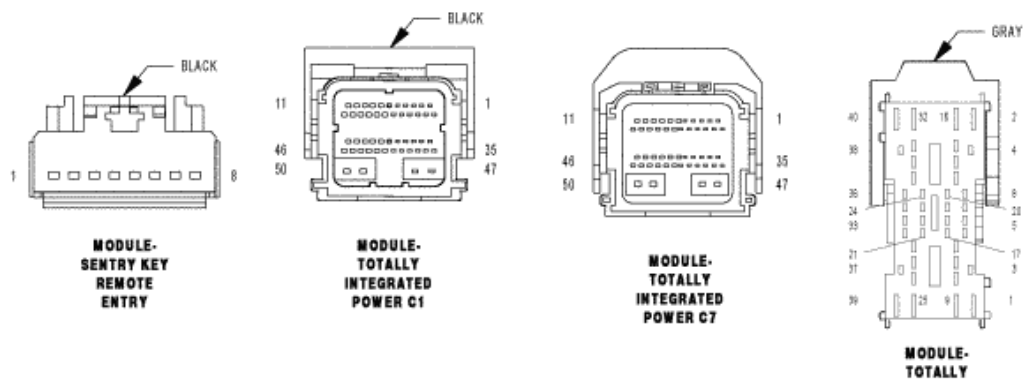
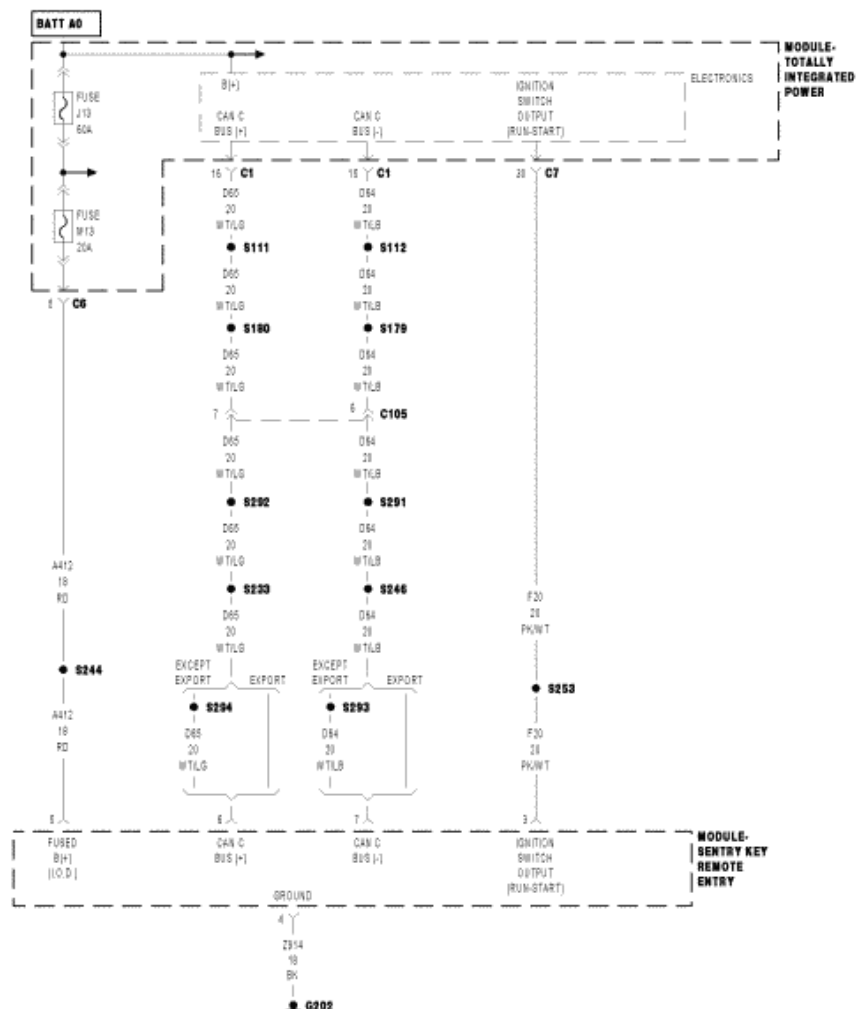
Repair the (D265) or (D264) CAN Interior Bus (125K) circuit for an open. Inspect the connector

for damage.

Perform **BODY VERIFICATION TEST - VER 1.**

***NO RESPONSE FROM WCM (SENTRY KEY REMOTE ENTRY MODULE)**

Circuit Schematic



01000001

Fig. 155: Sentry Key Remote Entry Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Possible Causes

Possible Causes
(A412) FUSED B(+) CIRCUIT OPEN OR SHORTED
(Z910) GROUND CIRCUIT OPEN
(F20) IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN OR SHORTED
(D65) CAN C BUS (+) CIRCUIT OPEN
(D64) CAN C BUS (-) CIRCUIT OPEN
SENTRY KEY REMOTE ENTRY MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10.0 and 16.0 volts.

With the scan tool, select ECU View.

NOTE: A red X will be next to the module that is not communicating, indicating that the module is not active on the Bus network. A green check indicates that the module is active on the Bus network.

Does the scan tool display a red X next to the module?

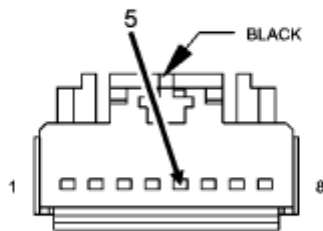
Yes

Go To step 2.

No

The no response condition is not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals.

2. (A412) FUSED B(+) CIRCUIT OPEN OR SHORTED



MODULE-
SENTRY KEY
REMOTE
ENTRY

81999043

Fig. 156: Using 12-Volt Test Light Connected To Ground To Check (A412) Fused B(+) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Sentry Key Remote Entry Module harness connector.

Using a 12-volt test light connected to ground, check the (A412) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

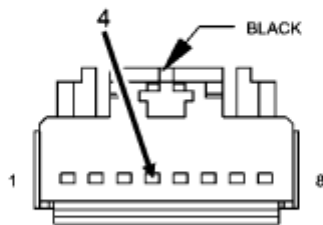
Go To step 3.

No

Repair the (A412) Fused B(+) circuit for an open or short.

Perform **SKREEM/SKIM VERIFICATION TEST** .

3. (Z910) GROUND CIRCUIT OPEN



MODULE-
SENTRY KEY
REMOTE
ENTRY

8199904d

Fig. 157: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z910) ground circuit.

Does the test light illuminate brightly?

Yes

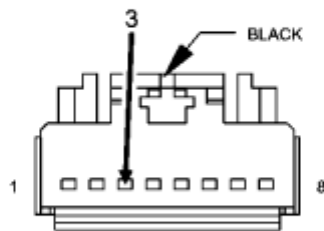
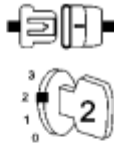
Go To step 4.

No

Repair the (Z910) ground circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST** .

4. (F20) IGNITION SWITCH OUTPUT (RUN/START) CIRCUIT OPEN OR SHORTED



MODULE-
SENTRY KEY
REMOTE
ENTRY

81999057

Fig. 158: Using 12-Volt Test Light Connected To Ground To Check (F20) Ignition Switch Output (Run/Start) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F20) Ignition Switch Output (Run/Start) circuit.

Does the test light illuminate brightly?

Yes

Go To step 5.

No

Repair the (F20) Ignition Switch Output (Run/Start) circuit for an open or short.

Perform **SKREEM/SKIM VERIFICATION TEST** .

5. **(D65) CAN C BUS (+) CIRCUIT OPEN**

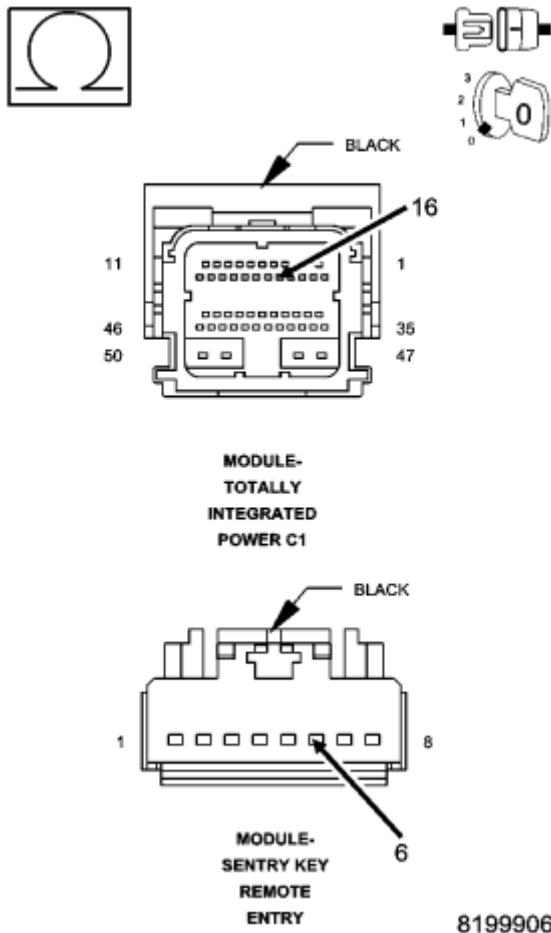


Fig. 159: Measuring Resistance Of (D65) CAN C Bus (+) Circuit Between TIPM C1 Harness Connector And Sentry Key Remote Entry Module Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Measure the resistance of the (D65) CAN C Bus (+) circuit between the TIPM C1 harness connector and the Sentry Key Remote Entry Module connector.

Is resistance below 5.0 ohms?

Yes

Go To step 6.

No

Repair the (D65) CAN C Bus (+) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST** .

6. (D64) CAN C BUS (-) CIRCUIT OPEN

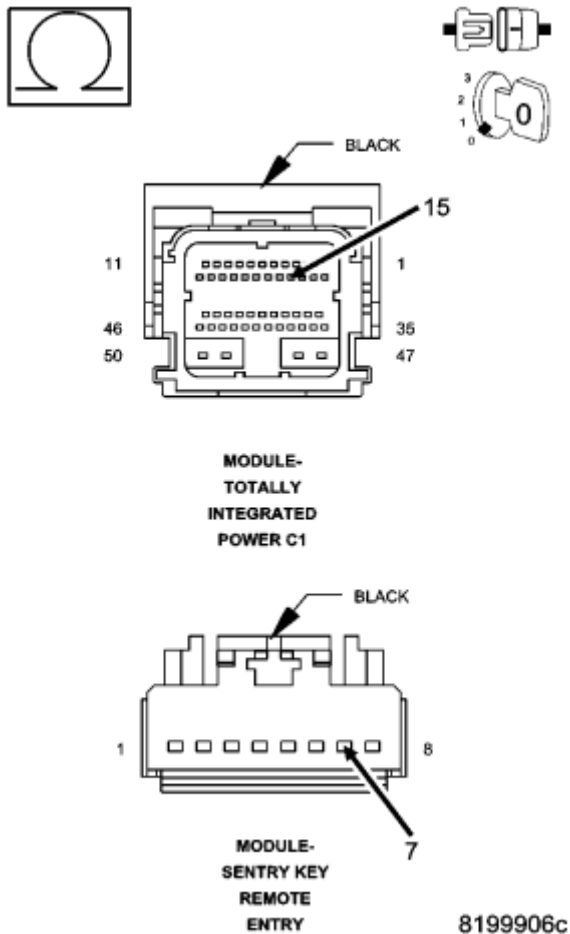


Fig. 160: Measuring Resistance Of (D64) CAN C Bus (-) Circuit Between TIPM C1 Harness Connector And Sentry Key Remote Entry Module Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D64) CAN C Bus (-) circuit between the TIPM C1 harness connector and the Sentry Key Remote Entry Module connector.

Is resistance below 5.0 ohms?

Yes

Replace the Sentry Key Remote Entry Module in accordance with the service information.

Perform **SKREEM/SKIM VERIFICATION TEST** .

No

Repair the (D64) CAN C Bus (-) circuit for an open.

Perform SKREEM/SKIM VERIFICATION TEST .

***STORED LOST COMMUNICATION DTCS**

Circuit Schematic

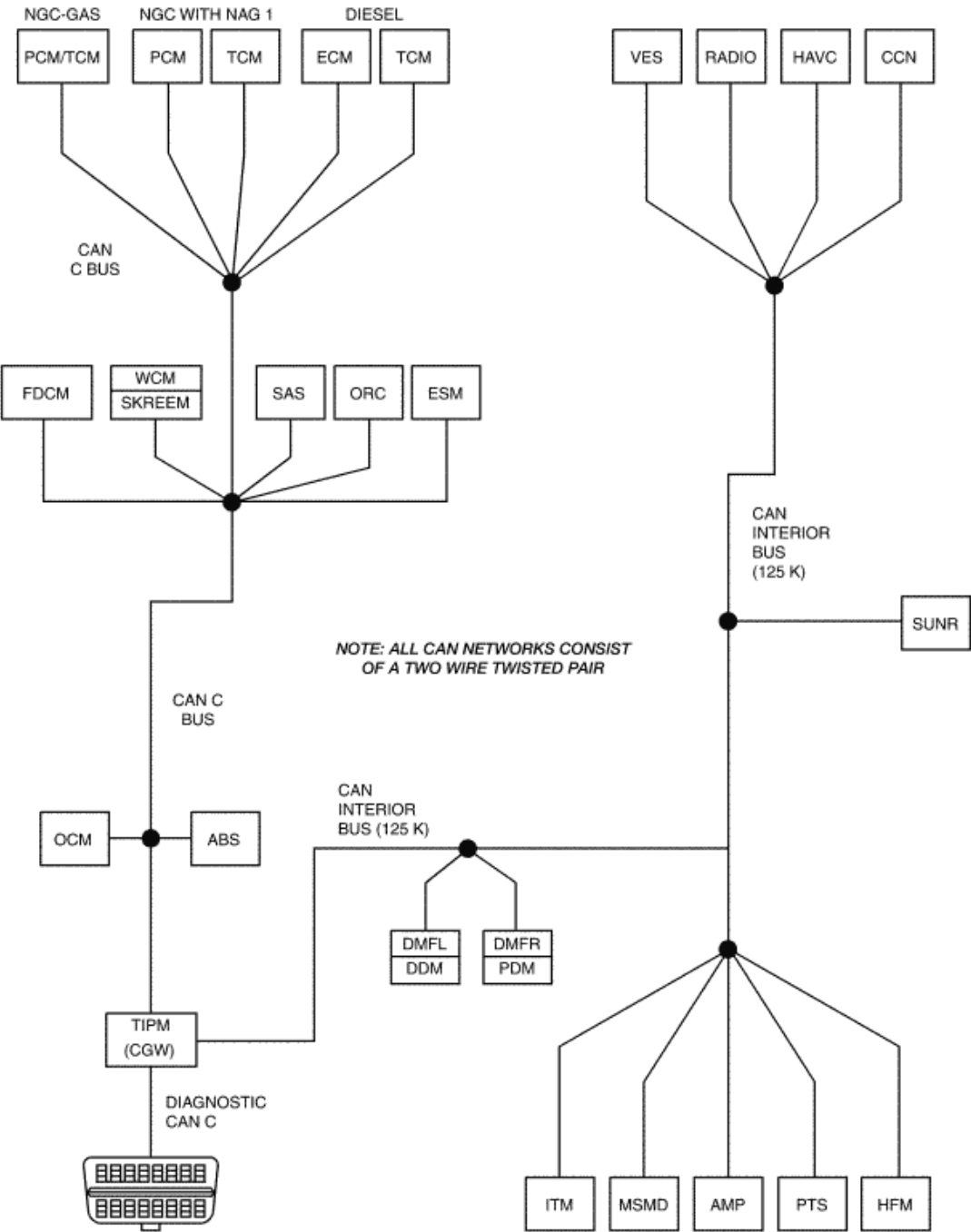


Fig. 161: Electronic Control Modules Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on.
- Battery voltage between 10 and 16 volts.
- IOD fuse installed.

Set Conditions

- Set Condition:**
 - Bus messages not received for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
CAN C BUS CIRCUITS OPEN OR SHORTED
CAN INTERIOR BUS CIRCUITS OPEN OR SHORTED
DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES
POWER OR GROUND FROM THE REPORTING MODULE
MODULE THAT SET THIS DTC
PREVIOUS SERVICE PERFORMED WITHIN THE LAST 100 KEY CYCLES (FUSE/RELAYS REMOVED, WIRING SERVICE, BATTERY DISCONNECT)
LOW BATTERY/JUMP START CONDITION
IOD FUSE WAS REMOVED DURING SHIPPING
CHECK FOR RELATED TSBS

Diagnostic Test

1. VERIFY DTC IS STORED

- NOTE:** **Stored faults may indicate a customer perceived intermittent condition.**
- NOTE:** **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

Turn the ignition on.

With the scan tool, read stored DTCs.

Is this DTC stored?

Yes

Go To step 2.

No

Diagnose the active DTC. Refer to **DIAGNOSTIC CODE INDEX** for a list of the symptoms.

2. CHECK THE ENVIRONMENTAL DATA

With the scan tool, read the loss of communication environmental data.

Does the loss of communication environmental odometer data match up to any of the previous service procedures listed in the possible causes or are there any stored CAN C hardware electrical, battery, ignition voltage, VIN missing/mismatch DTCs present which match environmental data?

Yes

These DTCs may have been the result of other service procedures performed. Clear DTCs.
Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To step 3.

3. VERIFY INTERMITTENT LOST COMMUNICATION DTC-WIRING CONCERNS

With the scan tool, select Network View and select Advanced.

Is there more than one ECU with stored DTCs "Logged Against" the module and one or more lost communication DTCs stored in the offending module?

Yes

Verify if the vehicle was recently in for this type of service. Otherwise, visually inspect the related wiring harness for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals. Repair as necessary.

No

Go To step 4.

4. **VERIFY INTERMITTENT LOST COMMUNICATION DTC-OFFENDING MODULE**

With the scan tool, select Network View and select Advanced.

Is there more than one ECU with stored DTCs "Logged Against" the module and NO lost communication DTCs stored in the offending module?

Yes

Check for a TSB related to this offending module.

No

Go To step 5.

5. **VERIFY INTERMITTENT LOST COMMUNICATION DTC-REPORTING MODULE**

With the scan tool, select Network View and select Advanced.

Is there ONLY ONE ECU with stored DTCs "Logged Against" the module?

Yes

Check for a TSB related to the module that set this DTC.

No

Verify if the vehicle was recently in for this type of service. Otherwise, visually inspect the related wiring harness for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals. Repair as necessary.

STANDARD PROCEDURE

BODY VERIFICATION TEST - VER 1

Diagnostic Test

1. Perform Body Verification Test

NOTE: If the SKREEM or PCM/ECM was replaced, refer to the service information for proper programming procedures.

1. Disconnect all jumper wires and reconnect all previously disconnected components and connectors.
2. Ensure that all accessories are turned off.
3. Ensure that the battery is fully charged.
4. Turn the ignition on.

5. With the scan tool, record and erase DTC's from all modules.
6. If an electronic control module was replaced, select the applicable module from the scan tool menu and press "Misc. Functions". If the module has programmable features, program as necessary.
7. (Export only) If the Intrusion Transceiver Module (ITM) and/or Siren was replaced, select ITM from the scan tool ECU View menu then "Misc. Functions" and perform the applicable replacement procedure.
8. If this vehicle is equipped with Express Up Power Windows and the battery or a door module was disconnected for any reason, the front windows will have to be calibrated. To calibrate, start by moving the window to the middle position. Next, hold the window express up switch one second after fully up. Next, hold the express down switch one second after fully down.
9. Turn the ignition off, wait 10 seconds, and then turn the ignition on.
10. Operate all functions of the system that caused the original concern.
11. With the scan tool, select ECU View and check for DTC's in the modules.

Are DTCs present in any of the modules or is the original condition still present?

Yes

The repair is not complete. Refer to the related article for the DTC or symptom that is still present.

No

The repair is complete.

2008 ACCESSORIES AND EQUIPMENT

Electronic Control Modules - Service Information - Liberty

ELECTRONIC CONTROL MODULES - SERVICE INFORMATION

STANDARD PROCEDURE

SKREEM PROGRAMMING

When a Powertrain Control Module (PCM) for a gasoline engine, or an Engine Control Module (ECM) for a diesel engine and the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM) on vehicles equipped with the Sentry Key Immobilizer System (SKIS) are replaced at the same time, perform the following steps in order:

NOTE: If the PCM and the SKREEM are replaced at the same time, program the PCM VIN into the PCM first.

1. If applicable first replace the PCM/ECM with the original WCM still connected to the vehicle.
2. Using the appropriate service information program the new PCM/ECM. (This will ensure the Secret Key Transfer from the original WCM into the new PCM/ECM).
3. Now replace and program the WCM. This will retain the Secret Key from the PCM/ECM back into the new WCM.
4. With the scan tool, select Miscellaneous Functions, WCM/Wireless Control Module. Then select the desired procedure and follow the display on the scan tool.
5. If the vehicle is equipped with Tire Pressure Monitoring System program the Placard Pressure Values into the WCM/SKREEM.
6. Ensure all the customer's keys have been programmed into the new module if necessary.

NOTE: If the original keys do not successfully program to the new SKREEM after the proper procedures are followed correctly, programming new keys will be necessary.

PROGRAMMING THE SKREEM

The SKIS Secret Key is an ID code that is unique to each SKREEM/WCM. This code is programmed and stored in the SKREEM/WCM, the PCM/ECM, and each ignition key transponder chip. When the PCM/ECM or SKREEM/WCM is replaced, it is necessary to program the Secret Key into the new module using a diagnostic scan tool. Follow the programming steps outlined in the diagnostic scan tool for **PCM REPLACED**, **ECM REPLACED**, **WCM REPLACED**, or **GATEWAY REPLACED** under **MISCELLANEOUS FUNCTIONS** for the **WIRELESS CONTROL MODULE/WCM** menu item as appropriate.

NOTE: Programming the PCM/ECM or SKREEM is done using a diagnostic scan tool and a PIN to enter secure access mode. If three attempts are made to enter secure access mode using an incorrect PIN, secure access mode will be locked

out for one hour. To exit this lockout mode, turn the ignition to the RUN position for one hour then enter the correct PIN. Be certain that all accessories are turned OFF. Also monitor the battery state and connect a battery charger if necessary.

NOTE: Before replacing the ECU for a failed driver, control circuit or ground circuit, be sure to check the related component/circuit integrity for failures not detected due to a double fault in the circuit. Most ECM driver/control circuit failures are caused by internal component failures (i.e. relay and solenoids) and shorted circuits (i.e. pull-ups, drivers and switched circuits). These failures are difficult to detect when a double fault has occurred and only one DTC has set.

ECM/SKIM/WCM PROGRAMMING

When a ECM and the SKIM are replaced at the same time perform the following steps in order:

1. Program the new SKIM
2. Program the new ECM
3. Replace all ignition keys and program them to the new SKIM.

When an ECM (Bosch) and the SKIM are replaced at the same time perform the following steps in order:

1. Program the new SKIM
2. Program the new ECM (Bosch)
3. Replace all ignition keys and program them to the new SKIM.

PROGRAMMING THE SKIM

CAUTION: Read all notes and cautions for programming procedures.

1. Connect a battery charger to the vehicle.
2. Connect the StarSCAN®.

CAUTION: If the ECM/PCM and SKREEM/WCM are replaced at the same time, the ECM/PCM MUST be programmed before the SKREEM/WCM.

3. Select "ECU View".
4. Select "WCM Wireless Control Module".
5. Select "Miscellaneous Functions".
6. Select WCM replaced.
7. Enter the PIN when prompted.
8. Verify the correct information.

NOTE: If the ECM and the SKIM are replaced at the same time, all vehicle keys will need to be replaced and programmed to the new SKIM.

PROGRAMMING IGNITION KEYS TO THE SKREEM

Each ignition key transponder also has a unique ID code that is assigned at the time the key is manufactured. When a key is programmed into the SKREEM/WCM, the transponder ID code is learned by the module and the transponder acquires the unique Secret Key ID code from the SKREEM/WCM. To program ignition keys into the SKREEM/WCM, follow the programming steps outlined in the diagnostic scan tool for **PROGRAM IGNITION KEYS OR KEY FOBS** under **MISCELLANEOUS FUNCTIONS** for the **WIRELESS CONTROL MODULE/WCM** menu item.

NOTE: If the original keys do not successfully program to the new SKREEM after the proper procedures are followed correctly, programming new keys will be necessary.

NOTE: A maximum of eight keys can be learned to each SKREEM. Once a key is learned to a SKREEM, that key has acquired the Secret Key for that SKREEM and cannot be transferred to any other SKREEM or vehicle.

If ignition key programming is unsuccessful, the scan tool will display one of the following error messages:

- **PROGRAMMING NOT ATTEMPTED** - The scan tool attempts to read the programmed key status and there are no keys programmed into SKREEM memory.
- **PROGRAMMING KEY FAILED (POSSIBLE USED KEY FROM WRONG VEHICLE)** - SKREEM is unable to program an ignition key transponder due to one of the following:
 - The ignition key transponder is ineffective.
 - The ignition key transponder is or has been already programmed to another vehicle.
- **8 KEYS ALREADY LEARNED, PROGRAMMING NOT DONE** - The SKREEM transponder ID memory is full.
- **LEARNED KEY IN IGNITION** - The ID for the ignition key transponder currently in the ignition lock cylinder is already programmed into SKREEM memory.

COMMUNICATION

DESCRIPTION

CAN-IHS-LIN BUS

The primary on-board communication network between microprocessor-based electronic control modules in this vehicle is the Controller Area Network (CAN) data bus system. A data bus network minimizes redundant wiring connections; and, at the same time, reduces wire harness complexity, sensor current loads and controller hardware by allowing each sensing device to be connected to only one module (also referred to as a node). Each node reads, then broadcasts its sensor data over the bus for use by all other nodes requiring that data. Each node ignores the messages on the bus that it cannot use.

The CAN bus is a two-wire multiplex system. Multiplexing is any system that enables the transmission of multiple messages over a single channel or circuit. The CAN bus is used for communication between most vehicle nodes. However, in addition to the CAN bus network, certain nodes may also be equipped with a Local Interface Network (LIN) data bus. The LIN data bus is a single wire low-speed (9.6 Kbps) serial link bus used to provide direct communication between a LIN master module and certain switch or sensor inputs.

There are actually three separate CAN bus systems used in the vehicle. They are designated: the CAN-Interior (also known as CAN Interior High Speed/IHS), the CAN-C and the Diagnostic CAN-C. The CAN-Interior and CAN-C systems provide on-board communication between all nodes in the vehicle. The CAN-C is the faster of the two systems providing near real-time communication (500 Kbps). The CAN-C is used typically for communications between more critical nodes, while the slower (125 Kbps) CAN-Interior system is used for communications between less critical nodes.

The added speed of the CAN data bus is many times faster than previous data bus systems. This added speed facilitates the addition of more electronic control modules or nodes and the incorporation of many new electrical and electronic features in the vehicle.

The Diagnostic CAN-C bus is also capable of 500 Kbps communication, and is sometimes informally referred to as the CAN-D system to differentiate it from the other high speed CAN-C bus. The Diagnostic CAN-C is used exclusively for the transmission of diagnostic information between the Totally Integrated Power Module/Central GateWay (TIPM or TIPMCGW) and a diagnostic scan tool connected to the industry-standard 16-way Data Link Connector (DLC) located beneath the instrument panel on the driver side of the vehicle.

The TIPM is located in the engine compartment near the battery. The central CAN gateway or hub module integral to the TIPM is connected to all three CAN buses. This gateway physically and electrically isolates the CAN buses from each other and coordinates the bi-directional transfer of messages between them.

OPERATION

CAN-IHS-LIN BUS

The Controller Area Network (CAN) data bus allows all electronic modules or nodes connected to the bus to share information with each other. Regardless of whether a message originates from a module on the lower speed CAN-Interior (also known as CAN Interior High Speed/IHS) bus or on the higher speed CAN-C or CAN-D bus, the message structure and layout is similar, which allows the Totally Integrated Power Module/Central GateWay (TIPM or TIPMCGW) to process and transfer messages between the CAN buses. The TIPM also stores a Diagnostic Trouble Code (DTC) for certain bus network faults.

All modules (also referred to as nodes) transmit and receive messages over one of these buses. Data exchange between nodes is achieved by serial transmission of encoded data messages. Each node can both send and receive serial data simultaneously. Each digital bit of a CAN bus message is carried over the bus as a voltage differential between the two bus circuits which, when strung together, form a message. Each node uses arbitration to sort the message priority if two competing messages are attempting to be broadcast at the same time.

The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is the Local Interface Network (LIN) master module in this vehicle and it gathers information from the compass module, the instrument panel switch bank, the Steering Control Module (SCM), and the Heated Seat Module

(HSM) through the LIN data bus. There is also LIN bus communication between the individual Tire Pressure Monitor (TPM) transponders and the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM). Both the EMIC and the SKREEM either act directly upon the information received through the LIN data bus, relay the information to other nodes in the vehicle using electronic messages placed on the CAN bus, or both.

The voltage network used to transmit messages requires biasing and termination. Each module on the CAN bus network provides its own biasing and termination. There are two types of nodes used in the CAN bus network. On the CAN-C or the IHS bus, a dominant node has a 120 ohm termination resistance while a non-dominant (or recessive) node has about a 2500 to 3000 ohm (2.5 to 3.0 kilohm) termination resistance. The dominant nodes on the CAN-C bus are the TIPM and the Powertrain Control Module (PCM). The dominant nodes on the IHS bus are the EMIC and the TIPM.

The termination resistance of two dominant nodes is combined in parallel to provide a total of about 60 ohms. This resistance value may vary somewhat by application, depending upon the number of non-dominant nodes on the bus. On the CAN-D bus (or Diagnostic CAN-C) all of the 60 ohm termination resistance is present in the Central GateWay (TIPMCGW).

NOTE: All measurement of termination resistance is done with the vehicle battery disconnected.

The communication protocol being used for the CAN data bus is a non-proprietary, open standard adopted from the Bosch CAN Specification 2.0b. The CAN-C is the faster of the two primary buses in the CAN bus system, providing near real-time communication (500 Kbps).

The CAN bus nodes are connected in parallel to the two-wire bus using a twisted pair, where the wires are wrapped around each other to provide shielding from unwanted electromagnetic induction, thus preventing interference with the relatively low voltage signals being carried through them. The twisted pairs have between 33 and 50 twists per meter (yard). While the CAN bus is operating (active), one of the bus wires will carry a higher voltage and is referred to as the CAN High or CAN bus (+) wire, while the other bus wire will carry a lower voltage and is referred to as the CAN Low or CAN bus (-) wire. Refer to the CAN BUS VOLTAGES table.

CAN Bus Voltages (Normal Operation)								
CAN-C Bus Circuits	Sleep	Recessive (Bus Idle)	Dominant (Bus Active)	CAN-L Short to Ground	CAN-H Short to Ground	CAN-L Short to Battery	CAN-H Short to Battery	CAN-H Short to CAN-L
CAN-L (-)	0 V	2.4 - 2.5 V	1.3 - 2.3 V	0 V	0.3 - 0.5V	Battery Voltage	Battery Voltage Less 0.75 V	2.45 V
CAN-H (+)	0 V	2.4 - 2.5 V	2.6 - 3.5 V	0.02 V	0 V	Battery Voltage Less 0.75 V	Battery Voltage	2.45 V
CAN-Interior Bus	Key-Off (Bus		Key-On (Bus	CAN-L Short to	CAN-H Short to	CAN-L Short to	CAN-H Short to	CAN-H Short to

Circuits	Asleep)	Active)	Ground	Ground	Battery	Battery	CAN-L
CAN-L (-)	0.0 V	1.3 - 2.3 V	0 V	0.3 - 0.5 V	Battery Voltage	Battery Voltage Less 0.75 V	2.45 V
CAN-H (+)	0.0 V	2.6 - 3.5 V	0.02 V	0 V	Battery Voltage Less 0.75 V	Battery Voltage	2.45 V
Notes							
All measurements taken between node ground and CAN terminal with a standard DVOM. DVOM will display average network voltage. Total resistance of CAN-C network can also be measured (60 ohms). Total resistance of CAN-Interior network varies, depending upon the number of optional non-dominant nodes on the bus. CAN-Interior total resistance should range between about 60 ohms with the minimal number of nodes, to about 42 ohms with the maximum number of nodes.							

In order to minimize the potential effects of Ignition-OFF Draw (IOD), the CAN-Interior network employs a sleep strategy. However, a network sleep strategy should not be confused with the sleep strategy of the individual nodes on that network, as they may differ. For example: The CAN-C bus network is awake only when the ignition switch is in the ON or START positions; however, the TIPM, which is on the CAN-C bus, may still be awake with the ignition switch in the ACCESSORY or UNLOCK positions. The integrated circuitry of an individual node may be capable of processing certain sensor inputs and outputs without the need to utilize network resources.

The CAN-Interior bus network remains active until all nodes on that network are ready for sleep. This is determined by the network using tokens in a manner similar to polling. When the last node that is active on the network is ready for sleep, and it has already received a token indicating that all other nodes on the bus are ready for sleep, it broadcasts a **bus sleep acknowledgment** message that causes the network to sleep. Once the CAN-Interior bus network is asleep, any node on the bus can awaken it by transmitting a message on the network. The TIPM will keep either the CAN-Interior or the CAN-C bus awake for a timed interval after it receives a diagnostic message for that bus over the Diagnostic CAN-C bus.

In the CAN system, available options are configured into the TIPM at the assembly plant, but additional options can be added in the field using the diagnostic scan tool. The configuration settings are stored in non-volatile memory. The TIPM also has two 64-bit registers, which track each of the **as-built** and **currently responding** nodes on the CAN-Interior and CAN-C buses. The TIPM stores a Diagnostic Trouble Code (DTC) in one of two caches for any detected active or stored faults in the order in which they occur. One cache stores powertrain (P-Code), chassis (C-Code) and body (B-Code) DTCs, while the second cache is dedicated to storing network (U-Code) DTCs.

If there are intermittent or active faults in the CAN network, a diagnostic scan tool connected to the Diagnostic CAN-C bus through the 16-way Data Link Connector (DLC) may only be able to communicate with the TIPM. To aid in CAN network diagnosis, the TIPM will provide CAN-Interior and CAN-C network status information to the scan tool using certain diagnostic signals. In addition, the transceiver in each node on the CAN-C bus will identify a **bus off hardware failure**, while the transceiver in each node on the CAN-Interior bus will identify a **general bus hardware failure**. The transceivers for some CAN-Interior nodes will also identify certain

failures for both CAN-Interior bus signal wires.

DATA LINK CONNECTOR

DESCRIPTION

DATA LINK CONNECTOR

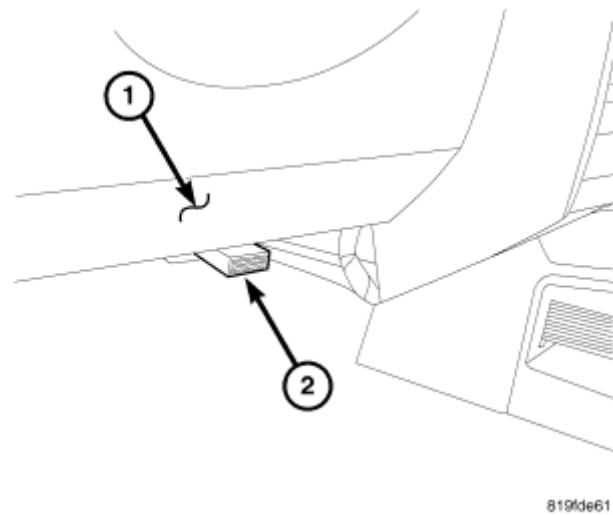


Fig. 1: Identifying Data Link Connector (DLC) & Steering Column Opening Cover
Courtesy of CHRYSLER LLC

The Data Link Connector (DLC) (2) is a 16-way molded plastic connector insulator on a dedicated take out of the instrument panel wire harness. This connector is located at the lower edge of the steering column opening cover (1) on the instrument panel, inboard of the steering column. The connector insulator is retained by two screws to an integral mounting tab on the lower instrument panel reinforcement, just below the lower edge of the steering column opening cover.

OPERATION

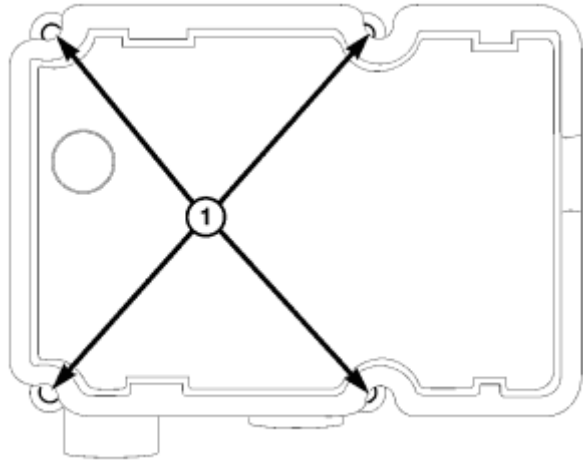
DATA LINK CONNECTOR

The Data Link Connector (DLC) is an industry-standard 16-way connector that permits the connection of a diagnostic scan tool to the Controller Area Network (CAN) data bus for interfacing with, configuring, and retrieving Diagnostic Trouble Code (DTC) data from the electronic modules that reside on the data bus network of the vehicle.

MODULE-ANTILOCK BRAKE

DESCRIPTION

CONTROLLER ANTILOCK BRAKES



818ba6f7

Fig. 2: ABM MODULE
Courtesy of CHRYSLER LLC

The Antilock Brake Module (ABM) is mounted to the Hydraulic Control Unit (HCU) and operates the ABS system.

OPERATION

CONTROLLER ANTILOCK BRAKES

The ABM voltage source is through the ignition switch in the RUN position. The ABM contains dual microprocessors. A logic block in each microprocessor receives identical sensor signals. These signals are processed and compared simultaneously. The ABM contains a self check program that illuminates the ABS warning light when a system fault is detected. Faults are stored in a diagnostic program memory and are accessible with the scan tool. ABS faults remain in memory until cleared, or until after the vehicle is started approximately 50 times. Stored faults are **not** erased if the battery is disconnected.

REMOVAL

ANTILOCK BRAKE MODULE

1. Disconnect negative (-) battery cable from battery post and isolate.

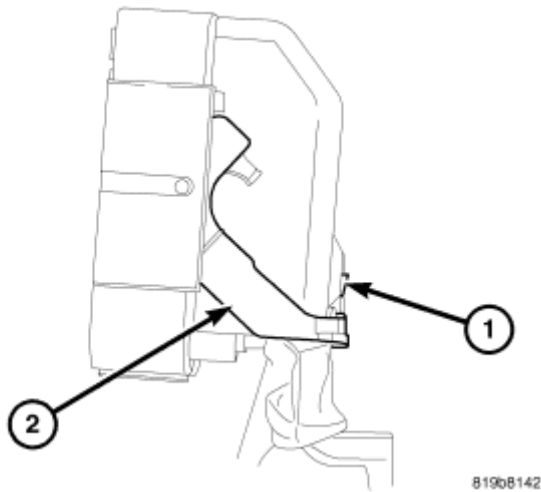


Fig. 3: ABM CONNECTOR LEVER
 Courtesy of CHRYSLER LLC

NOTE: To disconnect the ABM wiring connector in the following step, depress the tab (1) in the center of the connector and lift the release lever (2), rotating it upward to the top of the connector, or until the connector is fully released from the module socket.

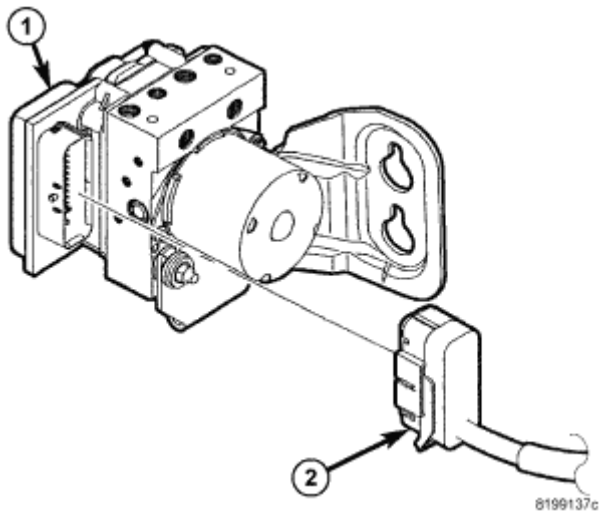
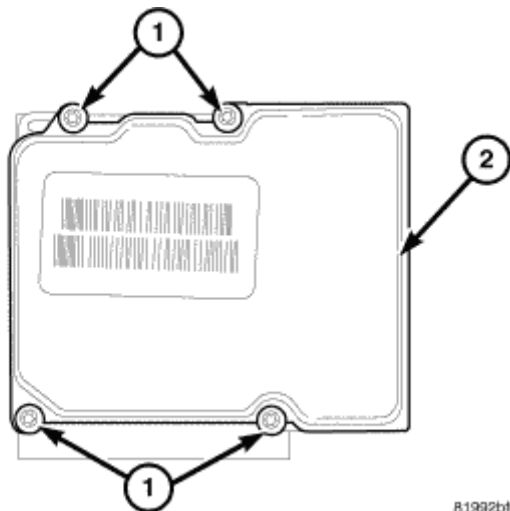


Fig. 4: ABM WIRING CONNECTOR
 Courtesy of CHRYSLER LLC

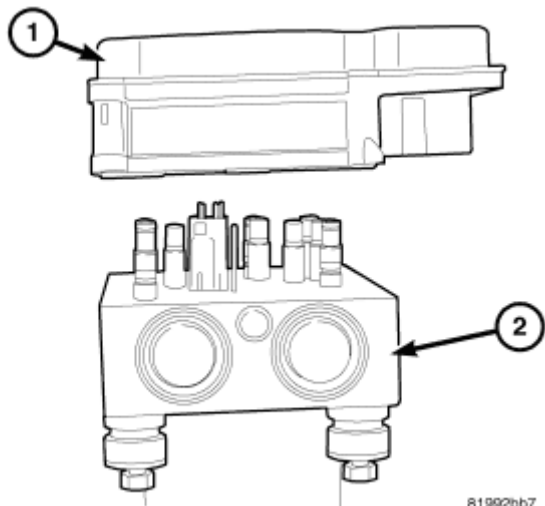
2. Disconnect the wiring connector from the ABM.



81992b16

Fig. 5: ABM MOUNTING SCREWS (W/ESP)
 Courtesy of CHRYSLER LLC

3. Remove four screws (1) attaching antilock brake module (ABM) (2) to hydraulic control unit (HCU).



81992b7

Fig. 6: REMOVE/INSTALL ABM
 Courtesy of CHRYSLER LLC

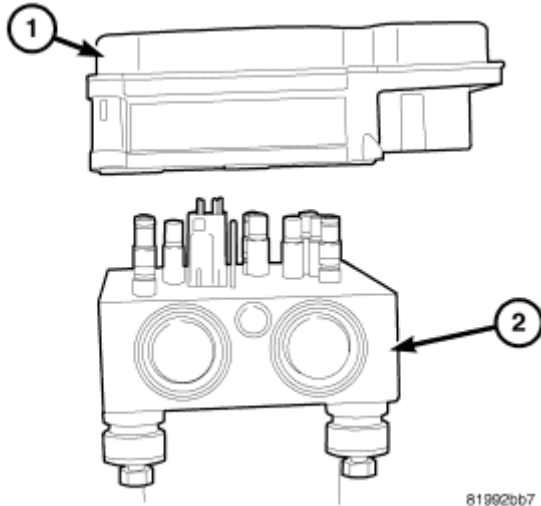
CAUTION: When removing ABM from HCU, be sure to completely separate the two components (approximately 38 mm (1.5 inches)) before removing ABM. Otherwise, damage to the pressure sensor will result requiring HCU replacement.

4. Slide ABM (1) off HCU (2).
5. Remove ABM from vehicle.

INSTALLATION

CAUTION: Inspect seal around mating edge of ABM to ensure seal is in good shape.

1. Clean any debris off the mating surfaces of the antilock brake module (ABM) and hydraulic control unit (HCU).

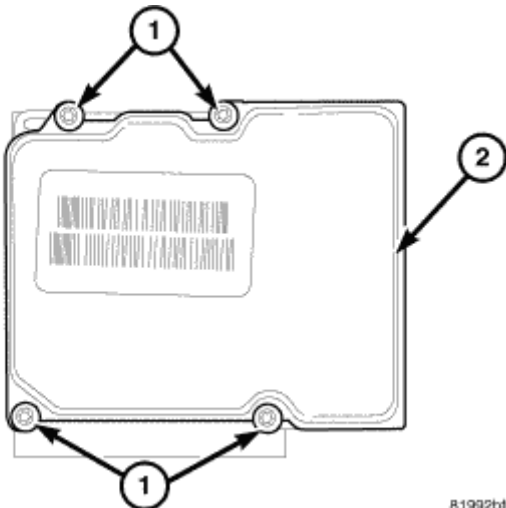


81992bb7

Fig. 7: REMOVE/INSTALL ABM
Courtesy of CHRYSLER LLC

CAUTION: When installing ABM to HCU, care must be taken not to damage the pressure sensor. If damaged, HCU replacement is necessary.

2. Align ABM (1) solenoids and pump/motor wiring with HCU (2) valves and wiring passage. Slide ABM onto HCU.



81992b16

Fig. 8: ABM MOUNTING SCREWS (W/ESP)

Courtesy of CHRYSLER LLC

3. Install four screws (1) attaching ABM to HCU. Tighten mounting screws to 6 N.m (53 in. lbs.).

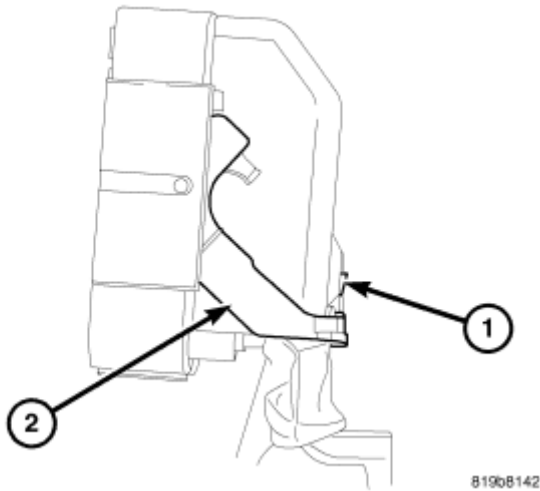


Fig. 9: ABM CONNECTOR LEVER

Courtesy of CHRYSLER LLC

NOTE: To connect the ABM wiring connector to the ABM in the following step, begin with the release lever in the full upward (released) position. Push the connector onto the ABM socket and rotate the release lever (2) downward until it snaps into place in the locked position below the release tab (1).

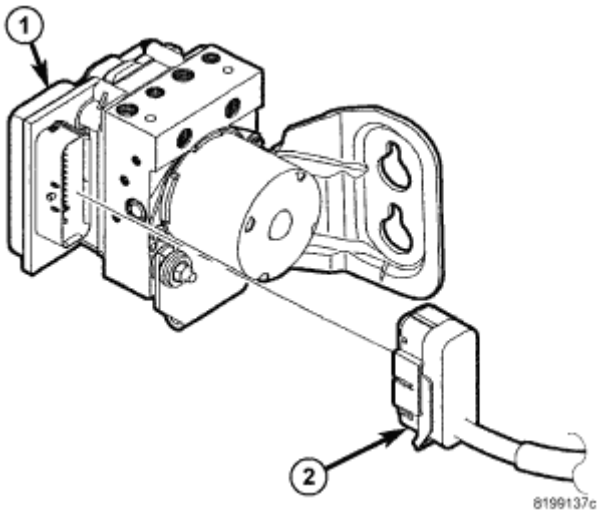


Fig. 10: ABM WIRING CONNECTOR

Courtesy of CHRYSLER LLC

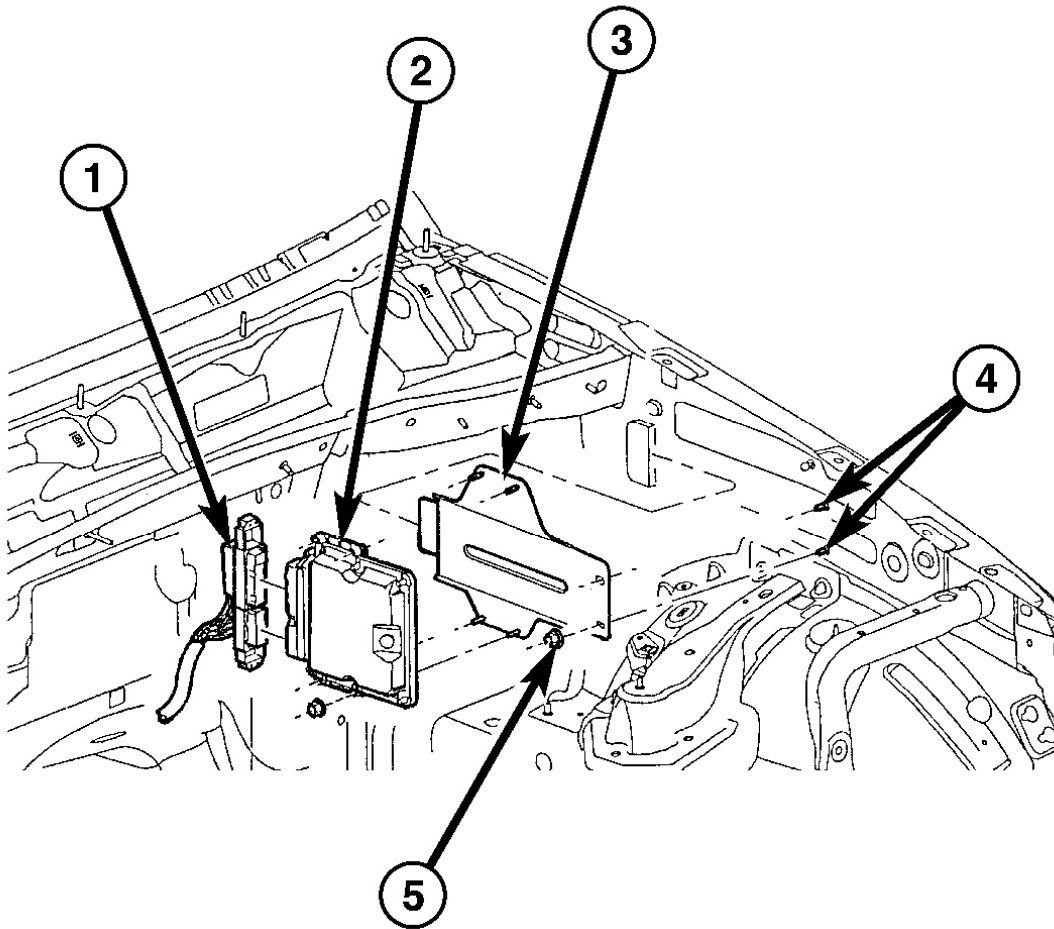
4. Install ABM wiring connector (2) into socket of ABM.
5. Connect negative battery cable to battery post.

6. Hook up the scan tool to initialize the ABM and perform the following:
 - Clear any faults.
 - Perform **ABS VERIFICATION TEST** and road test the vehicle.

MODULE-DIESEL ENGINE CONTROL

DESCRIPTION

ENGINE CONTROL MODULE (ECM)



80cc7aa6

Fig. 11: Removing/Installing Engine Control Module (ECM)
Courtesy of CHRYSLER LLC

- 1 - ECM ELECTRICAL CONNECTORS
- 2 - ENGINE CONTROL MODULE (ECM)
- 3 - ECM MOUNTING BRACKET
- 4 - ECM MOUNTING BRACKET MOUNTING STUDS
- 5 - MOUNTING BRACKET RETAINING NUTS

The Engine Control Module (ECM) (2) is located in the left side of engine compartment attached to the left inner fender behind the battery. The ECM also incorporates the barometric pressure sensor in it's housing. See **Fig. 11.**

OPERATION

ENGINE CONTROL MODULE (ECM)

The ECM has been programmed to monitor different circuits of the diesel fuel injection system. This monitoring is called on-board diagnostics. Certain criteria must be met for a diagnostic trouble code to be entered into the ECM memory. The criteria may be a range of engine rpm, engine temperature, time or other input signals to the ECM. If all of the criteria for monitoring a system or circuit are met, and a problem is sensed, then a DTC will be stored in the ECM memory. It is possible that a DTC for a monitored circuit may not be entered into the ECM memory, even though a malfunction has occurred. This may happen when the monitoring criteria have not been met. The ECM compares input signal voltages from each input device with specifications (the established high and low limits of the input range) that are programmed into it for that device. If the input voltage is not within the specifications and other trouble code criteria are met, a DTC will be stored in the ECM memory.

ECM OPERATING MODES

As input signals to the ECM change, the ECM adjusts its response to the output devices. For example, the ECM must calculate a different fuel quantity and fuel timing for engine idle condition than it would for a wide open throttle condition. There are several different modes of operation that determine how the ECM responds to the various input signals.

Ignition Switch On (Engine Off)

When the ignition is turned on, the ECM activates the glow plug relay for a time period that is determined by engine coolant temperature, atmospheric temperature and battery voltage.

Engine Start-Up Mode

The ECM uses the engine temperature sensor and the crankshaft position sensor (engine speed) inputs to determine fuel injection quantity.

Normal Driving Modes

Engine idle, warm-up, acceleration, deceleration and wide open throttle modes are controlled based on all of the sensor inputs to the ECM. The ECM uses these sensor inputs to adjust fuel quantity and fuel injector timing.

Limp-In Mode

If there is a fault detected with the accelerator pedal position sensor, the ECM will set the engine speed at 1100 rpm.

Overspeed Detection Mode

If the ECM detects engine rpm that exceeds 5200 rpm, the ECM will set a DTC in memory and illuminate the MIL until the DTC is cleared.

After-Run Mode

The ECM transfers RAM information to ROM and performs an Input/Output state check.

MONITORED CIRCUITS

The ECM is able to monitor and identify most driveability related trouble conditions. Some circuits are directly monitored through ECM feedback circuitry. In addition, the ECM monitors the voltage state of some circuits and compares those states with expected values. Other systems are monitored indirectly when the ECM conducts a rationality test to identify problems. Although most subsystems of the engine control module are either directly or indirectly monitored, there may be occasions when diagnostic trouble codes are not immediately identified. For a trouble code to set, a specific set of conditions must occur and unless these conditions occur, a DTC will not set.

DIAGNOSTIC TROUBLE CODES

Each Diagnostic Trouble Code (DTC) is diagnosed by following a specific procedure. The diagnostic test procedure contains step-by-step instruction for determining the cause of the DTC as well as no trouble code problems. Refer to the appropriate diagnostic service information.

HARD CODE

A DTC that comes back within one cycle of the ignition key is a hard code. This means that the problem is current every time the ECM/SKIM checks that circuit or function. Procedures in this service information, verify if the DTC is a hard code at the beginning of each test. When the fault is not a hard code, an intermittent test must be performed. **NOTE:** If the scan tool displays faults for multiple components (i.e. ECT, VSS, IAT sensors) identify and check the shared circuits for possible problems before continuing (i.e. sensor grounds or 5-volt supply circuits). Refer to the appropriate schematic to identify shared circuits. Refer to the appropriate diagnostic service information.

INTERMITTENT CODE

A DTC that is not current every time the ECM/SKIM checks the circuit or function is an intermittent code. Most intermittent DTCs are caused by wiring or connector problems. Problems that come and go like this are the most difficult to diagnose; they must be looked for under specific conditions that cause them. **NOTE: Electromagnetic (radio) interference can cause an intermittent system malfunction.** This interference can interrupt communication between the ignition key transponder and the SKIM.

The following checks may assist you in identifying a possible intermittent problem:

- Visually inspect the related wire harness connectors. Look for broken, bent, pushed out, loose fitting or

corroded terminals.

- Visually inspect the related wire harness. Look for chafed, pierced or partially broken wire.
- Refer to hotlines or technical service bulletins that may apply.

Refer to the appropriate diagnostic service information.

ECM DIAGNOSTIC TROUBLE CODES

IMPORTANT NOTE: Before replacing the ECM for a failed driver, control circuit or ground circuit, be sure to check the related component/circuit integrity for failures not detected due to a double fault in the circuit. Most ECM driver/control circuit failures are caused by internal failures to components (i.e. relays and solenoids) and shorted circuits (i.e. sensor pull-ups, drivers and ground circuits). These faults are difficult to detect when a double fault has occurred and only one DTC has set. If the scan tool displays faults for multiple components (i.e. VSS, ECT, Batt Temp, etc.) identify and check the shared circuits for possible problems before continuing (i.e. sensor grounds or 5-volt supply circuits). Refer to the appropriate wiring diagrams to identify shared circuits. Refer to the appropriate diagnostic service information.

STANDARD PROCEDURE

PCM/ECM PROGRAMMING - DIESEL

PCM / TCM FLASH REPROGRAMING

This procedure will need to be done when one or more of the following situations are true:

1. A vehicle's Powertrain control module (PCM) has been replaced.
2. A diagnostic trouble code (DTC) is set P1602 - PCM Not Programmed.
3. An updated calibration or software release is available for either the PCM or TCM ECUs.

This procedure assumes that the StarSCAN® and StarMOBILE® devices are configured to your dealership's network with either a wired or wireless connection. The StarSCAN® and StarMOBILE® must also be running at the latest operating system and software release level. For more help on how to network your StarSCAN® or StarMOBILE® reference the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the Download Center.

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1. **SECTION 1 - PCM / TCM FLASH PROCEDURE.**
2. **REQUIRED TOOLS/EQUIPMENT:.**
3. **TECH TIPS and INFORMATION:.**
4. **PARTS REQUIRED.**

SECTION 1 - PCM / TCM FLASH PROCEDURE

If using StarSCAN® or StarMOBILE® Desktop Client. Go to **REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client.**

If using StarMOBILE® Standalone Diagnostic Mode. Go To **REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode.**

REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client

NOTE: If this flash process is interrupted or aborted, the flash should be restarted.

1. Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
2. Connect the StarSCAN® or StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.
3. Power on the StarSCAN® or StarMOBILE®. If the StarMOBILE® is being used, launch the StarMOBILE® Desktop Client and connect to the appropriate StarMOBILE® device.
4. Retrieve the old ECU part number. From the tool's Home screen,
 - a. Select "ECU View"
 - b. Select "PCM"
 - c. Select "More Options"
 - d. Select "ECU Flash"
 - e. Record the part number at the top of the Flash PCM screen for later reference.
5. Program the ECU as follows:
 - Using the StarSCAN® / StarMOBILE® at the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the part number recorded in Step 4e, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

- Select "Download to Scantool"
- Once the download is complete, select "Close" and then "Back"
- Highlight the listed calibration, select "Update Controller" and follow the on screen instructions.
- When the PCM update is complete, select "OK"
- Verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: If this flash process is interrupted or aborted, the flash should be restarted.

6. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to

complete the process if the ECU has been replaced.

7. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode

NOTE: StarMOBILE® Standalone Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.

NOTE: StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.

1. Power on the StarMOBILE®, Launch the StarMOBILE® Desktop Client and connect to the tool.
2. At the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the current ECU part number, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

3. From the Flash File List, select the appropriate calibration for the PCM and select "Download to Client"
4. Once the download is complete, hit "OK" and then "Manage Files"

Flash File List					Download to Client
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MP)					
	New P/N	Type	Calibration	Local	New Search
▲	04802648AD	MSMD	2005 LATE BUILD, 2006, 2007	⊗	
	04804564AD	MSMD	2005 LATE BUILD, 2006, 2007 ADJUSTABLE PEDALS	⊗	Manage Files
	14894894AJ	PCM (CGW)	FRONT CONTROL MODULE	⊗	
	15846446AG	PCM	4 X 2 CALIFORNIA	⊗	
	05094723AG	PCM	4WD CALIFORNIA	☑	
	15816511AE	PCM	AWD FEDERAL	⊗	
	48941166AE	PCM	4WD FEDERAL	⊗	
	405678932AE	PCM	4 X 2 FEDERAL	⊗	
▼	05484545AE	MSMD	2005 LATE BUILD, 2006, 2007	⊗	

Fig. 12: Identifying StarMOBILE(R) Manage Files Screen (1 Of 2)
Courtesy of CHRYSLER LLC

5. In the Manage Files screen, highlight the downloaded flash file and select "Copy to SM Device". A green checkmark should now appear in the On SM Device column.

Flash File List						
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						
	Name	Type	Date	On PC	On SM Device	View Details
▲	04602648AD	PCM	2007-08-20	☒	☐	Copy to SM Device
	04604554AD	PCM	2007-09-13	☒	☐	
	14894894AJ	PCM	2007-09-10	☒	☐	
	15646446AG	PCM	2007-09-13	☒	☐	
	06084723AG	SCCM	2007-08-20	☒	☐	
	15616511AE	SUNR	2007-08-20	☒	☐	Copy to USB
	48941165AE	TCM	2007-08-20	☒	☐	Delete
	45678932AE	TPM	2007-08-20	☒	☐	
	65464454AE	TPM	2007-09-05	☒	☐	
▼						More Options

Flash File NOT copied to Device

Flash File List						
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						
	Name	Type	Date	On PC	On SM Device	View Details
▲	04602648AD	PCM	2007-08-20	☒	☐	Copy to SM Device
	04604554AD	PCM	2007-09-13	☒	☐	
	14894894AJ	PCM	2007-09-10	☒	☐	
	15646446AG	PCM	2007-09-13	☒	☒	
	06084723AG	SCCM	2007-08-20	☒	☐	
	15616511AE	SUNR	2007-08-20	☒	☐	Copy to USB
	48941165AE	TCM	2007-08-20	☒	☐	Delete
	45678932AE	TPM	2007-08-20	☒	☐	
	65464454AE	TPM	2007-09-05	☒	☐	
▼						More Options

Flash File copied to Device

81eed99a

Fig. 13: Identifying StarMOBILE(R) Manage Files Screen (2 Of 2)
Courtesy of CHRYSLER LLC

6. Exit the StarMOBILE® Desktop Client application.
7. Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
8. Connect the StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.
9. On the StarMOBILE® device, select "Enter Standalone Diagnostic Mode" (use the right function key).

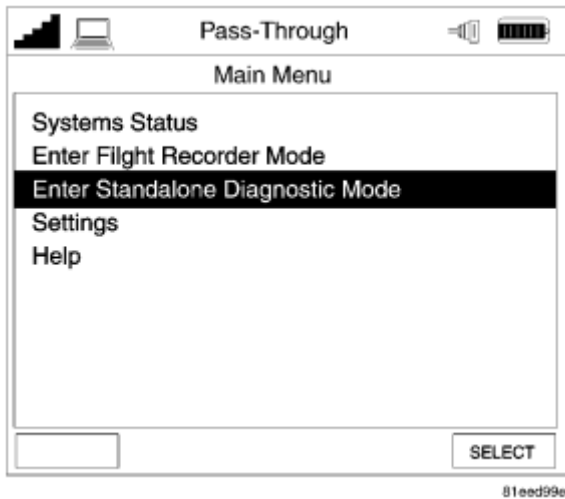
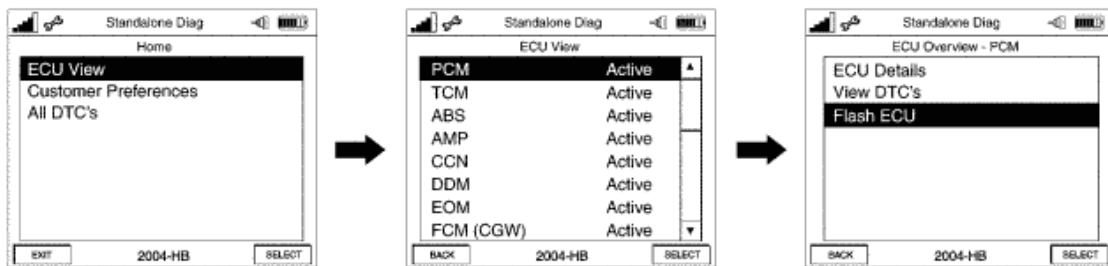


Fig. 14: Identifying StarMOBILE(R) Screen For Enter Standalone Diagnostic Mode
Courtesy of CHRYSLER LLC

NOTE: If a StarMOBILE® Desktop Client is still associated with the device, you will receive the following error: "Your StarMOBILE® device is currently locked by a pc named 'xxxxxxx' on your network. To remove the lock, close its Desktop Client or reboot this device".

10. Program the ECU as follows:

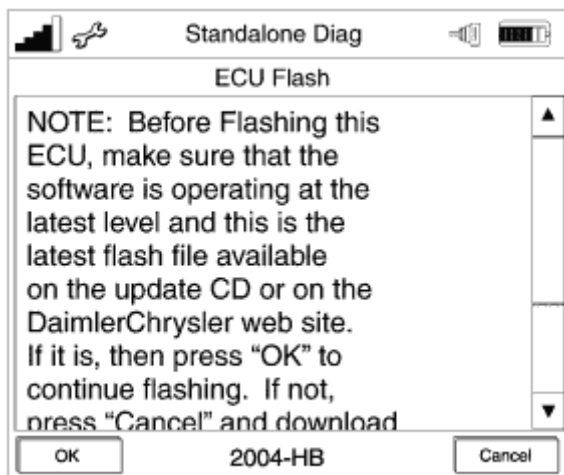
- Select "ECU View"
- Select "PCM"
- Select "Flash ECU"



81eed9a3

Fig. 15: Programming ECU (1 Of 3)
Courtesy of CHRYSLER LLC

- Record the ECU part number at the very top of the screen for later reference.



81eed9a7

Fig. 16: Programming ECU (2 Of 3)
Courtesy of CHRYSLER LLC

- Highlight the flash file that you want to use. Hit "SELECT" and then "OK". Follow the on screen instructions.

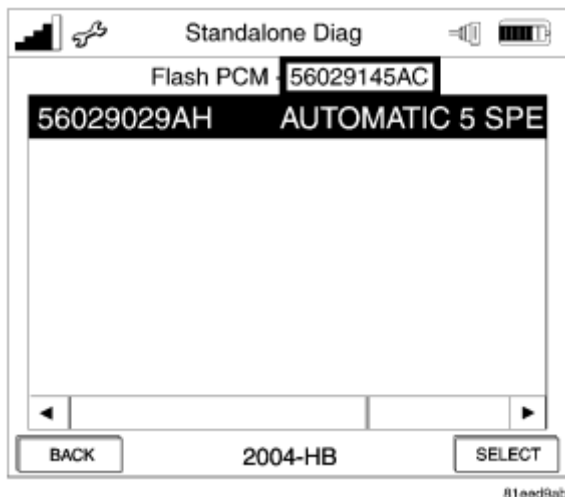


Fig. 17: Programming ECU (3 Of 3)
Courtesy of CHRYSLER LLC

- Once the flash is complete, verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: **If this flash process is interrupted or aborted, the flash should be restarted.**

11. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to complete the process if the ECU has been replaced.
12. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES

NOTE: **Find the PCM/TCM Type for the vehicle, read and write down the steps, and then go to the step by step instructions for additional information on how to perform these procedures. See STEP-BY-STEP INSTRUCTIONS.**

If an EDC16-U31 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM equipped
3. Program Variant Code

If an EDC16-C2 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM / SKREEM equipped
3. IMA Rapid Calibration Test - Only on 06 PT & up

4. Injector Quantity Adjustment - Only on 06 PT & up

If an EDC16-CP31 was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM equipped
3. Diesel Particulate Filter (Used) Learning
4. NOx Catalyst (New) Initialization
5. Injector Quantity Adjustment
6. IMA Rapid Calibration Test
7. Fuel Mean Value Adaptation Initialization
8. Exhaust Throttle Plate Adaptive Learn Position

If an EDC16-CP31-2 was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM equipped
3. Injector Quantity Adjustment
4. Program Variant Code
5. ECU Replacement With Value Transfer - if the ECU to be replaced is still responsive
6. ECU Replacement Without Value Transfer - if the ECU to be replaced is NOT responsive
7. Fuel Mean Value Adaptation Initialization
8. IMA Rapid Calibration Test
9. Set Oil Dilution Mass Value

If a CM849 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM equipped

If a CM2100 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Check PCM VIN - if NOT WCM equipped
3. Enable / Disable Vehicle Features - need to enable features
4. Injector Quantity Adjustment
5. Reset Regenerative Filter Timers
6. Mobile DeSoot - NO Minimum Required Soot Load

If an Aisin TCM was replaced, perform the following additional steps and/or routines:

1. Quicklearn

If an EGS TCM was replaced, perform the following additional steps and/or routines:

1. Initialize EGS

If an NGC4 TCM ONLY was replaced, perform the following additional steps and/or routines:

1. Quicklearn

If an NGC3 TCM ONLY was replaced, perform the following additional steps and/or routines:

1. Quicklearn

If an EATX TCM was replaced, perform the following additional steps and/or routines:

1. Quicklearn

STEP-BY-STEP INSTRUCTIONS

Check PCM VIN

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Check PCM VIN" and follow the on screen instructions.

When complete, select "Finish"

Diesel Particulate Filter (Used) Learning

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Diesel Particulate Filter (Used) Learning" and follow the on screen instructions.

When complete, select "Finish"

ECU Replacement with Value Transfer

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "ECU Replacement with Value Transfer" and follow the on screen instructions.

When complete, select "Finish"

ECU Replacement without Value Transfer

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "ECU Replacement without Value Transfer" and follow the on screen instructions.

When complete, select "Finish"

Enable / Disable Vehicle Features

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Enable / Disable Vehicle Features" and follow the on screen instructions.

When complete, select "Finish"

Exhaust Throttle Plate Adaptive Learn Position

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Exhaust Throttle Plate Adaptive Learn Position" and follow the on screen instructions.

When complete, select "Finish"

Fuel Mean Value Adaptation Initialization

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Fuel Mean Value Adaptation Initialization" and follow the on screen instructions.

When complete, select "Finish"

IMA Rapid Calibration

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "IMA Rapid Calibration Test" and follow the on screen instructions.

When complete, select "Finish"

Initialize EGS

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Initialize EGS" and follow the on screen instructions.

When complete, select "Finish"

Injector Quantity Adjustment

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Injector Quantity Adjustment" and follow the on screen instructions.

When complete, select "Finish"

Mobile DeSoot - NO Minimum Required Soot Load

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Mobile DeSoot - NO Minimum Required Soot Load" and follow the on screen instructions.

When complete, select "Finish"

NOx Catalyst (New) Initialization

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "NOx Catalyst (New) Initialization" and follow the on screen instructions.

When complete, select "Finish"

PCM Replaced

The vehicle pin (Personal Identification Number) will be required to complete the routine. This information may be obtained in three ways:

1. The original selling invoice

2. DealerCONNECT > Parts > Key Codes
3. Contacting the District Manager.

From the "Home" screen, select "ECU View"

Select "WCM"

Select "Misc. Functions"

Select "PCM Replaced" and follow the on screen instructions.

When complete, select "Finish"

Program Variant Code

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Program Variant Code" and follow the on screen instructions.

When complete, select "Finish"

Quicklearn

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Quicklearn" and follow the on screen instructions.

When complete, select "Finish"

Reset Regenerative Filter Timers

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Reset Regenerative Filter Times" and follow the on screen instructions.

When complete, select "Finish"

Set Oil Dilution Mass Value

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Set Oil Dilution Mass Value" and follow the on screen instructions.
When complete, select "Finish"

SECTION 3 - AUTHORIZED MODIFICATION LABEL

NOTE: The following step is required by law when reprogramming a PCM and/or TCM.

Type the necessary information on the "Authorized Modification Label" and attach near the VECI label.

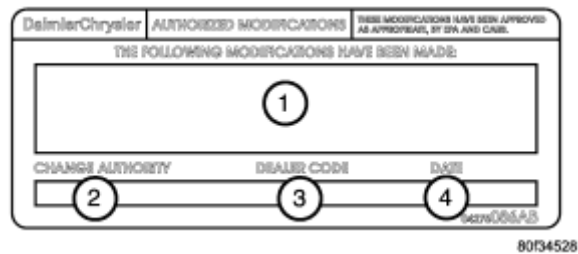


Fig. 18: Authorized Modification Label
Courtesy of CHRYSLER LLC

1. Powertrain Control / Transmission Control Module Part Numbers (Insert P/Ns) Used
2. Change Authority: TSB XX--XX
3. Dealer Code: XXXXX
4. Date: XX-XX-XX

REQUIRED TOOLS/EQUIPMENT:

PART NUMBER	StarSCAN®	PART NUMBER	StarMOBILE®
NPN	Battery Charger	NPN	Battery Charger
CH9401	StarSCAN® Tool Kit	CH9801	StarMOBILE® Tool Kit
CH9404	StarSCAN® Vehicle Cable	CH9804	StarMOBILE® Vehicle Cable
-	-	-	TechCONNECT PC or equivalent

TECH TIPS and INFORMATION:

1. StarMOBILE® Standalone Diagnostic Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.
2. To use the StarMOBILE® in Pass-Through Mode requires that your StarMOBILE® is connected to the dealerships network via a wired or wireless connection. For more information on how to use the StarMOBILE in Pass-Through Mode see the StarMOBILE® training tutorials available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Training Aids' link or at www.dcctools.com, under the 'Training Aids' link.

- 3. StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.
- 4. Extreme care must be taken when programming a calibration into a generic PCM. Do not randomly select a calibration. Once a calibration is selected and programmed, the controller cannot be reprogrammed to a different calibration. The ECU can only be reprogrammed to a more recent version of that calibration.
- 5. If the flash process is interrupted or aborted, the flash should be restarted.
- 6. Due to the PCM / TCM programming procedure, a DTC may be set in other ECUs within the vehicle. Some DTCs may cause the MIL to illuminate. From the "Home" screen select "System View". Then select "All DTCs". Press "Clear All Stored DTCs" if there are any DTCs shown on the list.
- 7. Do not allow the battery charger to time out or the charging rate to climb above 13.5 volts during the flash process.
- 8. The StarSCAN® and StarMOBILE® diagnostic tools fully support Internet connectivity and must be configured for your dealership's network. For help on setting up your StarSCAN® / StarMOBILE® for the dealership's network, refer to the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.
- 9. The operating software in the StarSCAN® and StarMOBILE® must be programmed with the latest software release level. The software level is visible in the blue header at the top of the StarSCAN® and StarMOBILE® Desktop Client screens. For instructions on how to update your scan tool, refer to the StarSCAN® / StarMOBILE® Software Update guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.

PARTS REQUIRED

Qty	Part Number	DESCRIPTION
1	04275086AB	Label, Authorized Modification

REMOVAL

REMOVAL

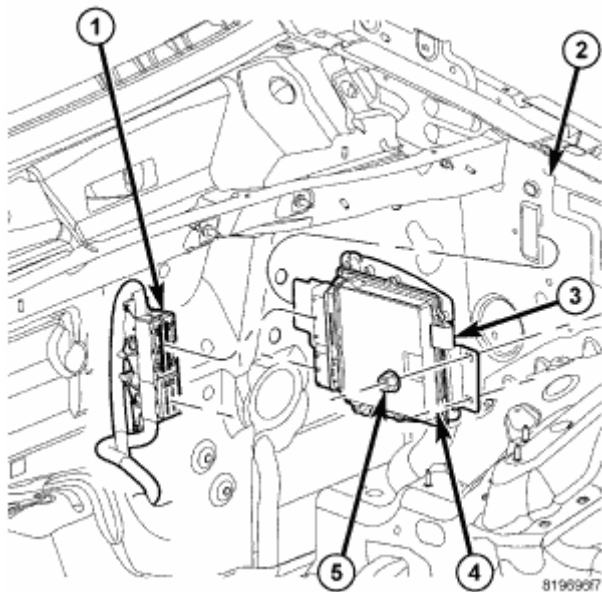


Fig. 19: ENGINE CONTROL MODULE - DIESEL
Courtesy of CHRYSLER LLC

1. The ECM (Engine Control Module-Diesel) (4) is located in the engine compartment.
2. Disconnect negative battery cable.
3. Disconnect ECM electrical connectors (1).
4. Remove ECM mounting nuts (5).
5. Remove ECM (4) and bracket assembly (3) from vehicle.
6. Separate ECM (4) from bracket (3).

INSTALLATION

INSTALLATION

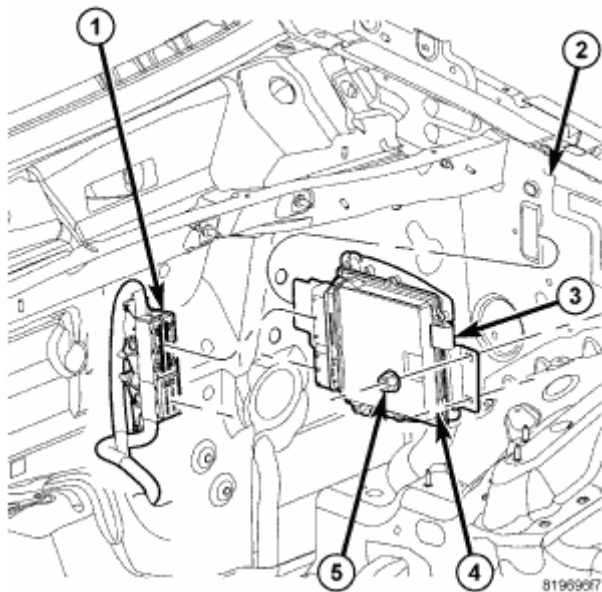


Fig. 20: ENGINE CONTROL MODULE - DIESEL
Courtesy of CHRYSLER LLC

1. Install ECM (4) to bracket (3).
2. Position ECM and bracket assembly to inner fender.
3. Install ECM mounting nuts (5). Tighten nuts to 20 N.m (177 in. lbs.) torque.
4. Check pin connectors in both the ECM and its electrical connectors for corrosion or damage. Also, the pin heights in connectors should all be same. Repair as necessary before installing connectors.
5. Connect ECM electrical connectors (1).
6. Connect negative battery cable.

CAUTION: Refer to PCM/ECM REPROGRAMMING for reprogramming procedures. If this step is not performed, a Diagnostic Trouble Code (DTC) will be set.

CAUTION: Use the scan tool to reprogram the new ECM with the vehicles original identification number (VIN) and the vehicles original mileage. If this step is not performed, a Diagnostic Trouble Code (DTC) will be set.

MODULE-FINAL DRIVE CONTROL

DESCRIPTION

FINAL DRIVE CONTROL MODULE

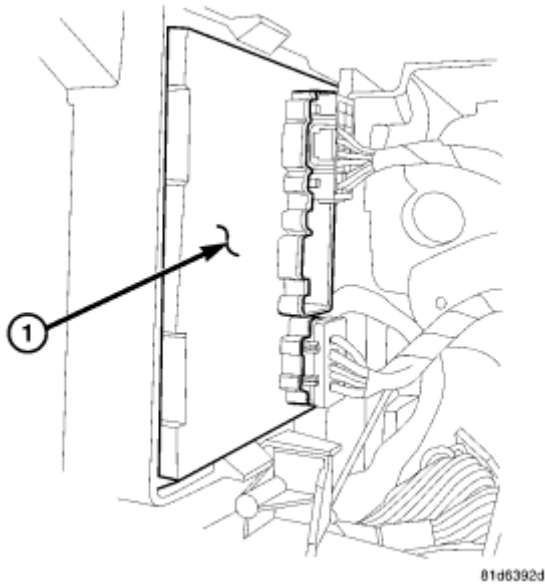


Fig. 21: FINAL DRIVE CONTROL MODULE
Courtesy of CHRYSLER LLC

The Final Drive Control Module (FDCM) is a microprocessor-based assembly controlling the Transfer Case. Communication is via the CAN serial bus. Inputs include user selectable 2WD and 4WD modes that include 2WD, 4WD AUTO, 4WD LOW and Neutral.

The FDCM has two electrical connectors and is installed inside the passenger compartment behind the driver side knee bolster and is mounted to the left kick panel. On RHD vehicles the FDCM is located in a mirrored position on the right side.

OPERATION

FINAL DRIVE CONTROL MODULE

During normal operation of an active transfer case the FDCM control module learns and remembers the Clutch Engagement Point (Kiss Point), the position in the motor actuator's travel where torque begins to be transferred to the front wheels. The position is read out using the encoder as a 0 to 5 volt signal. This information is written into the module's EEPROM area at Ignition OFF. Over time the clutch pack wears and the Kiss Point changes in one direction (going from a lower voltage to a higher value).

POWER UP/DOWN

The Final Drive Control Module (FDCM) will power up with an OFF/ON transition of the hard wired ignition switch input.

The FDCM will power down when the vehicle ignition switch transitions from ON to OFF or there are no system requirements that dictate the controller to remain active

START-UP DIAGNOSTICS

When the FDCM is activated, the internal circuitry will undergo a diagnostic procedure. The controller will examine all inputs and outputs for short circuits to ground, short circuits to battery and open circuits and will also verify proper CPU and memory operation. If a fault is detected, a message will be sent out over the CAN C bus to the Cluster indicating that service is recommended.

After passing all diagnostic tests, the controller will receive and process inputs and produce the appropriate outputs. Proper monitoring of the controller inputs and outputs performance will continue.

INPUTS/OUTPUTS

The following are inputs to the FDCM:

- Transfer Case Mode Sensor Signal
- 1 Direct Battery Feeds
- Ignition RUN Sense
- Sensor Ground
- Module Ground
- CAN C Bus

The following are outputs of the FDCM:

- Transfer Case Motor Brake Control (3022 only)
- 5V Sensor Supply
- Transfer Case Bi-directional Motor Control (A & B)
- Switched B+ Solenoid Supply
- Transfer Case Motor Brake Control

TRANSFER CASE RANGE SELECT SWITCH INPUT (NEUTRAL, 2WD, 4WD AUTO and 4WD LOW SELECT SWITCH)

The transfer case range select switch is hardwired directly to the Cluster (CCN). The switch position is read by the CCN and is communicated to the TIPM (Gateway) via the CAN-I bus. The TIPM then rebroadcasts this information onto the CAN-C bus where the FDCM is a receiver.

The Cluster (CCN) will support circuitry which interfaces to the system's Transfer Case Range Select Switch, including a Transfer Case Range Select Switch voltage supply and a Transfer Case Range Select Switch input. The purpose of this circuitry is to determine the mode currently being requested by the operator via the resistance ladder network in the shifter assembly, where the Transfer Case Range Select Switch is packaged.

The NEUTRAL Select Switch Input will provide the operator with the ability to place the Transfer Case in Neutral. The Select Switch Input will provide the operator with the ability to place the transfer case in 2WD, 4WD AUTO and 4WD LOW. The NEUTRAL Select Switch is a momentary pushpin switch and the 2WD, 4WD AUTO and 4WD LOW Select Switch is a 3-position toggle or a contact switch and both these switches are provided through a resistor network for diagnostic purposes. The input will have an internal 1.0K +/- 1% pull-up resistor to 5V.

As the selected position in the switch varies and/or the NEUTRAL Switch is depressed or not, the resistance

between the Cluster (CCN) voltage supply and Transfer Case Range Select Switches input will vary. Hardware, software, and calibrations within the Cluster will be provided that interpret the external resistance between the module's Transfer Case Range Select Switches voltage supply and Transfer Case Range Select Switches inputs as given in the table below:

NOTE: **There is no requirement for the FDCM to distinguish between a neutral request from the 4WD AUTO or the 4WD LOW position. Resistances in these ranges will be represented as a Neutral Switch Activation.**

TRANSFER CASE MODE SENSOR SIGNAL

The Transfer Case Mode Sensor Signal Input will provide the FDCM feedback about the position of the transfer case. The mode sensor will be a linear analog position sensor with a 1.4K +/- 20% potentiometer and a 1 K +/- 20% wiper resistor that converts the motor shaft position into a multiplexed voltage. The mode sensor (on the 3022 transfer case) is an active device where the sensor's current changes as the motor shaft position changes

TRANSFER CASE BI-DIRECTIONAL MOTOR CONTROL (A & B)

This output will control a Bi-directional DC motor that controls a clutch pack in the Transfer Case that varies the torque transfer between the front and rear axles.

MODES OF OPERATION

Normal Operation

This mode is achieved by the ignition being switched in the RUN position, which powers up the 5V regulator and generates the appropriate RESET for the microprocessor. This mode also includes any required power-up system checks.

Shut Down Mode

This mode is activated when the ignition switch turned to the off position. The FDCM will perform any required Shut Down tasks prior to turning off the 5V regulator.

Limp-In Mode

This mode is entered when the FDCM has detected an error condition that prevents the system from performing its' required task. The FDCM operation will vary depending from modified operation to total system shut down based on the failure that has occurred.

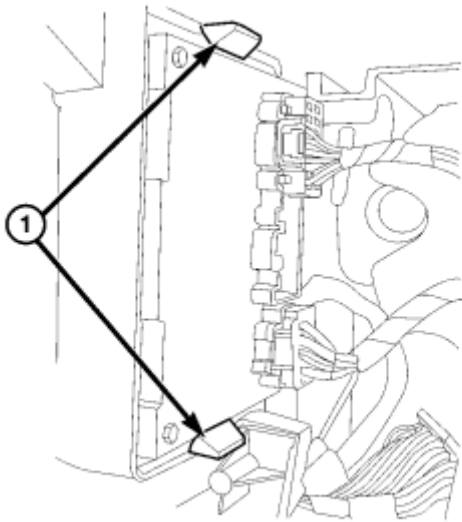
REMOVAL

REMOVAL

NOTE: **If the FDCM is being replaced it is necessary to perform the Quick Learn Procedure using the Scan Tool.**

NOTE: **The FDCM has two electrical connectors and is installed inside the passenger**

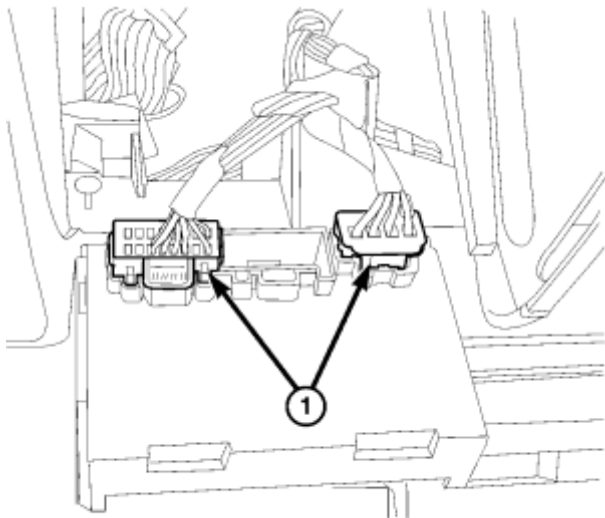
compartment behind the driver side knee bolster and is mounted to the left kick panel. On RHD vehicles the FDCM is located in a mirrored position on the right side.



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Fig. 22: FINAL DRIVE CONTROL MODULE
Courtesy of CHRYSLER LLC

1. Lower the drivers side knee bolster.
2. Push out on the two locking tabs (1) and remove the FDCM.



81d6111b

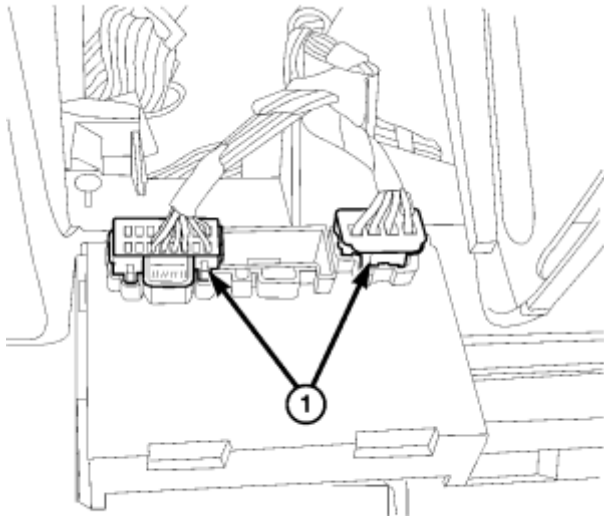
Fig. 23: FDCM ELECTRICAL CONNECTORS
Courtesy of CHRYSLER LLC

3. Disconnect the two electrical connectors (1) from the FDCM.

INSTALLATION

INSTALLATION

NOTE: If the FDCM is being replaced it is necessary to perform the Quick Learn Procedure using the Scan Tool.

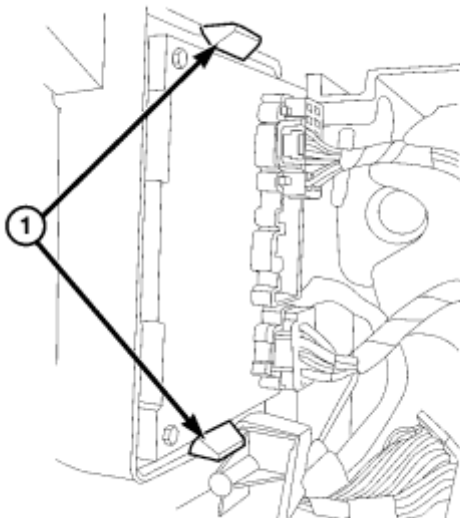


81d6111b

Fig. 24: FDCM ELECTRICAL CONNECTORS

Courtesy of CHRYSLER LLC

1. Connect the two electrical connectors (1) into the FDCM.



81d6110a

Fig. 25: FINAL DRIVE CONTROL MODULE
Courtesy of CHRYSLER LLC

2. Install the FDCM being certain the locking tabs (1) are secure.
3. Raise the drivers side knee bolster.

MODULE-HEATED SEAT

DESCRIPTION

MODULE, HEATED SEAT

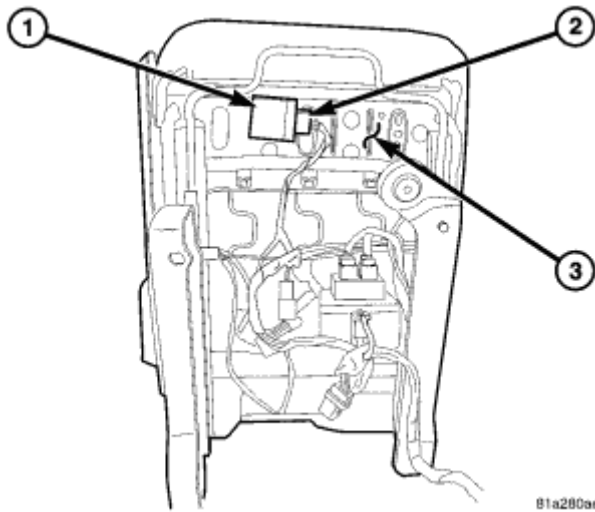


Fig. 26: Identifying Heated Seat Module, Single Electrical Connector & Seat Pan
Courtesy of CHRYSLER LLC

The heated seat module (1) is located under the left front seat. It has a single electrical connector (2) and a push pin style retainer that secures it to the seat pan (3). The module can be accessed from under the front left seat with the seat in the full back and up position.

The heated seat module is a microprocessor designed to use the Local Interface Network (LIN) data bus messages from the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN). The CCN receives inputs from the heated seat switches and in turn signals the heated seat module to operate the heated seat elements for both front seats.

OPERATION

MODULE-HEATED SEAT

The heated seat module operates on fused battery current received from the ignition switch. The module is grounded to the body at all times through the electrical connector. Inputs to the module include Local Interface Network (LIN) data bus messages and standard hardwired 12 volt power and ground. In response to the LIN inputs the heated seat module will control the battery current to the appropriate heated seat elements.

When a heated seat switch LIN data bus signal is received by the heated seat module, the module energizes the selected heated seat element. The Low heat set point is about 38° C (100.4° F), and the High heat set point is about 42° C (107.6° F).

In addition to operating the heated seat elements, the heated seat module sends LED illumination messages to the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN) via the LIN data bus. The CCN then sends the LED illumination message to the accessory switch bank so that the appropriate LEDs are illuminated for any given heating level. Pressing the switch once will select high-level heating. Pressing the switch a second time will select low-level heating. Pressing the switch a third time will shut the heating elements off.

If the heated seat module detects a heated seat element OPEN or SHORT circuit, it will record and store the appropriate Diagnostic Trouble Code (DTC).

DIAGNOSIS AND TESTING

HEATED SEAT MODULE

In order to obtain conclusive testing, the heated seat system and the Local Interface Network (LIN) data bus circuit must be checked. **Any diagnosis of the heated seat system should begin with, the use of a scan tool and the appropriate diagnostic service information.**

Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the heated seat option utilize a low voltage cut-off feature. This feature turns off power to the heated seat system anytime vehicle voltage is below 11.7v or above 15.5v. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the heated seat system is attempted, the battery should be fully-charged.

REMOVAL

HEATED SEAT MODULE

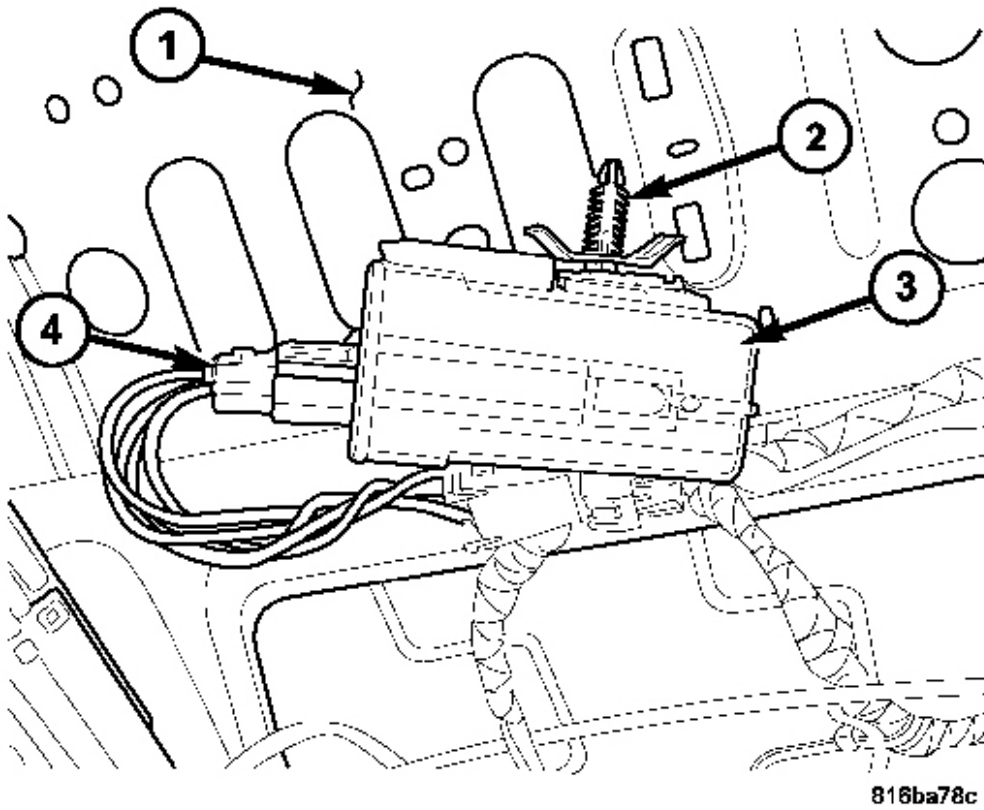


Fig. 27: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

1. Position the right front seat to the full rearward position.
2. Disconnect and isolate the battery negative cable.
3. Disconnect the wire harness connector (4) from the heated seat module (3).
4. Unsnap the heated seat module retaining tab (2) from the seat pan (1).
5. Remove the heated seat module (3) from the vehicle.

INSTALLATION

HEATED SEAT MODULE

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

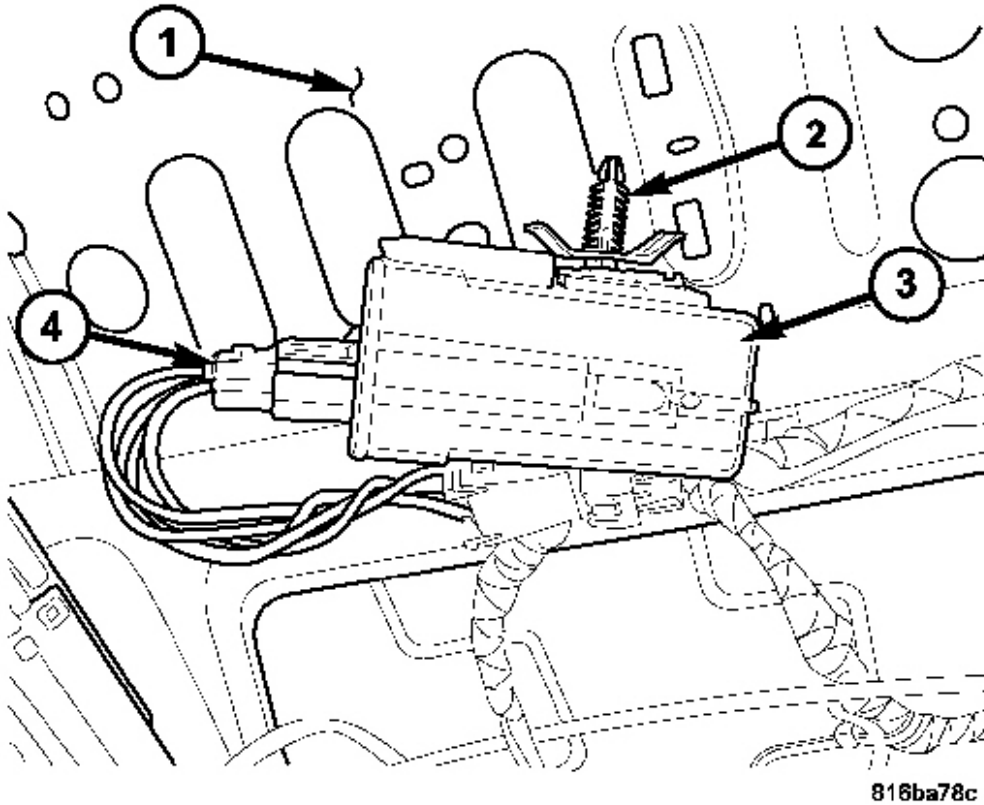


Fig. 28: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

1. Install the heated seat module (3) into the vehicle.
2. Position the retaining tab (2) with the mounting hole in the seat pan (1). Firmly apply even pressure to the module (3) until the mounting tab is fully seated.
3. Connect the wire harness connector (4) to the heated seat module (3).
4. Connect the battery negative cable.
5. Check for proper heated seat system operation.

MODULE-POWERTRAIN CONTROL

STANDARD PROCEDURE

PCM/ECM PROGRAMMING - GAS

PCM / TCM FLASH REPROGRAMING

This procedure will need to be done when one or more of the following situations are true:

1. A vehicle's Powertrain control module (PCM) has been replaced.
2. A diagnostic trouble code (DTC) is set "P1602 - PCM Not Programmed."
3. An updated calibration or software release is available for either the PCM or TCM ECUs.

This procedure assumes that the StarSCAN® and StarMOBILE® devices are configured to your dealership's network with either a wired or wireless connection. The StarSCAN® and StarMOBILE® must also be running at the latest operating system and software release level. For more help on how to network your StarSCAN® or StarMOBILE® reference the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the Download Center.

TABLE OF CONTENTS

1. **SECTION 1 - PCM / TCM FLASH PROCEDURE.**
2. **REQUIRED TOOLS/EQUIPMENT:.**
3. **TECH TIPS and INFORMATION:.**
4. **PARTS REQUIRED.**

SECTION 1 - PCM / TCM FLASH PROCEDURE

If using StarSCAN® or StarMOBILE® Desktop Client. Go to **REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client.**

If using StarMOBILE® Standalone Diagnostic Mode. Go to **REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode.**

REPAIR PROCEDURE - Using StarSCAN® or StarMOBILE® Desktop Client

NOTE: **If this flash process is interrupted or aborted, the flash should be restarted.**

1. Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
2. Connect the StarSCAN® or StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.
3. Power on the StarSCAN® or StarMOBILE®. If the StarMOBILE® is being used, launch the StarMOBILE® Desktop Client and connect to the appropriate StarMOBILE® device.
4. Retrieve the old ECU part number. From the tool's Home screen,
 - a. Select "ECU View"

- b. Select "PCM"
 - c. Select "More Options"
 - d. Select "ECU Flash"
 - e. Record the part number at the top of the Flash PCM screen for later reference.
5. Program the ECU as follows:
- Using the StarSCAN® / StarMOBILE® at the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the part number recorded in Step 4e, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

- Select "Download to Scantool"
- Once the download is complete, select "Close" and then "Back"
- Highlight the listed calibration, select "Update Controller" and follow the on screen instructions.
- When the PCM update is complete, select "OK"
- Verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: If this flash process is interrupted or aborted, the flash should be restarted.

6. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to complete the process if the ECU has been replaced.
7. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

REPAIR PROCEDURE - Using StarMOBILE® Standalone Diagnostic Mode

NOTE: StarMOBILE® Standalone Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.

NOTE: StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.

1. Power on the StarMOBILE®. Launch the StarMOBILE® Desktop Client and connect to the tool.
2. At the Home screen, select "ECU View"
 - Select "PCM"
 - Select "More Options"
 - Select "ECU Flash"
 - Select "Browse for New File" and follow the on screen instructions.
 - Highlight the appropriate calibration based on the current ECU part number, or by using Year/Model/Engine and appropriate emissions selection for the vehicle being worked on.

NOTE: If you are not connected to the vehicle, you may also search for flash files by selecting the "Flash Download" button from the Home screen.

3. From the Flash File List, select the appropriate calibration for the PCM and select "Download to Client"
4. Once the download is complete, hit "OK" and then "Manage Files"

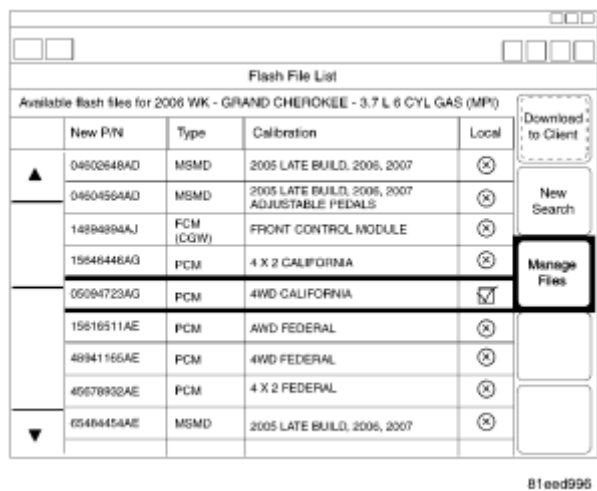


Fig. 29: Identifying StarMOBILE(R) Manage Files Screen (1 Of 2)
Courtesy of CHRYSLER LLC

5. In the Manage Files screen, highlight the downloaded flash file and select "Copy to SM Device". A green checkmark should now appear in the On SM Device column.

Flash File List						View Details	
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						Copy to SM Device	
	Name	Type	Date	On PC	On SM Device	Copy to USB	
▲	04602648AD	PCM	2007-08-20	☒	☐	Delete	
	046040564AD	PCM	2007-09-13	☒	☐	More Options	
	14894894AJ	PCM	2007-09-10	☒	☐		
	15646446AG	PCM	2007-09-13	☒	☐		
	05094723AG	SCCM	2007-09-20	☒	☐		
	15616511AE	SUNR	2007-09-20	☒	☐		
	48941165AE	TCM	2007-08-20	☒	☐		
	45678932AE	TPM	2007-09-20	☒	☐		
▼	65484454AE	TPM	2007-09-05	☒	☐		

Flash File NOT copied to Device

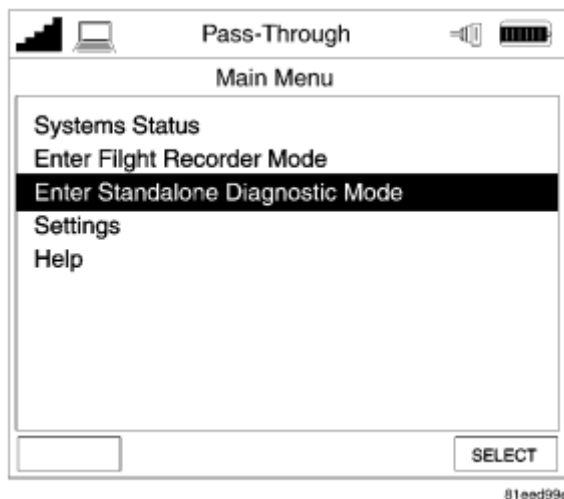
Flash File List						
Available flash files for 2006 WK - GRAND CHEROKEE - 3.7 L 6 CYL GAS (MPI)						
	Name	Type	Date	On PC	On SM Device	View Details
▲	04602648AD	PCM	2007-08-20	☒	☐	Copy to SM Device
	046040564AD	PCM	2007-09-13	☒	☐	
	14894894AJ	PCM	2007-09-10	☒	☐	Copy to USB
	15646446AG	PCM	2007-09-13	☒	☒	
	05094723AG	SCCM	2007-09-20	☒	☐	Delete
	15616511AE	SUNR	2007-09-20	☒	☐	
	48941165AE	TCM	2007-08-20	☒	☐	More Options
	45678932AE	TPM	2007-09-20	☒	☐	
▼	65484454AE	TPM	2007-09-06	☒	☐	

Flash File copied to Device

81eed99a

Fig. 30: Identifying StarMOBILE(R) Manage Files Screen (2 Of 2)
Courtesy of CHRYSLER LLC

- Exit the StarMOBILE® Desktop Client application.
- Open the hood of the vehicle and install a battery charger. Verify that the charging rate provides a continuous charge of 13.2 - 13.5 volts.
- Connect the StarMOBILE® to the vehicle data link connector located under the steering column and turn the ignition key to the "RUN" position.
- On the StarMOBILE® device, select "Enter Standalone Diagnostic Mode" (use the right function key).



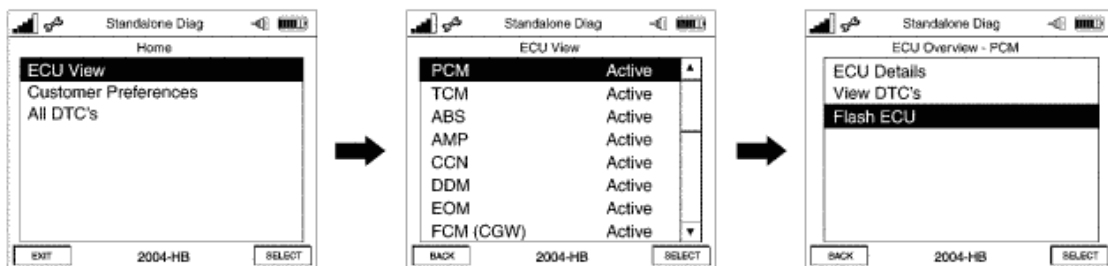
81eed99e

Fig. 31: Identifying StarMOBILE(R) Screen For Enter Standalone Diagnostic Mode
Courtesy of CHRYSLER LLC

NOTE: If a StarMOBILE® Desktop Client is still associated with the device, you will receive the following error: "Your StarMOBILE® device is currently locked by a pc named 'xxxxxxx' on your network. To remove the lock, close its Desktop Client or reboot this device".

10. Program the ECU as follows:

- Select "ECU View"
- Select "PCM"
- Select "Flash ECU"



81eed9a3

Fig. 32: Programming ECU (1 Of 3)
Courtesy of CHRYSLER LLC

- Record the ECU part number at the very top of the screen for later reference.

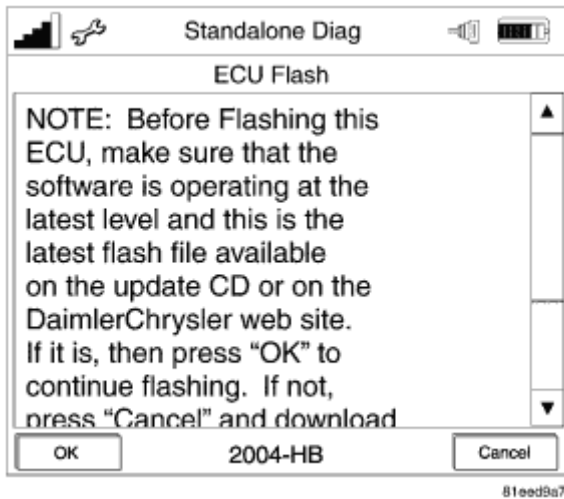


Fig. 33: Programming ECU (2 Of 3)
Courtesy of CHRYSLER LLC

- Highlight the flash file that you want to use. Hit "SELECT" and then "OK". Follow the on screen instructions.

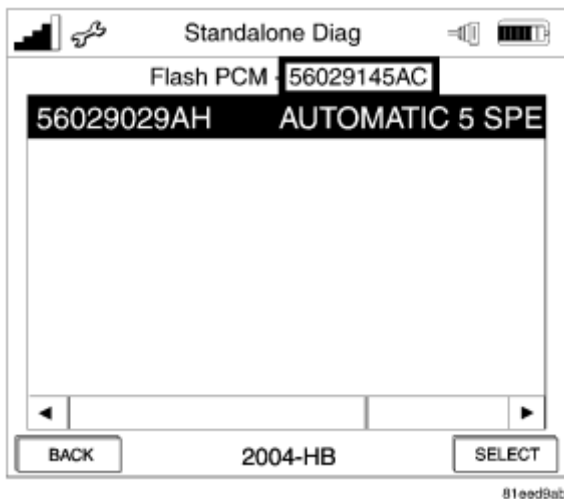


Fig. 34: Programming ECU (3 Of 3)
Courtesy of CHRYSLER LLC

- Once the flash is complete, verify that the part number at the top of the Flash PCM screen has updated to the new part number.

NOTE: **If this flash process is interrupted or aborted, the flash should be restarted.**

11. Continue to **SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES** to complete the process if the ECU has been replaced.
12. Type the necessary information on the "Authorized Modification Label" (p/n 04275086AB) and attach

near the VECI label (See **SECTION 3 - AUTHORIZED MODIFICATION LABEL** for details).

SECTION 2 - ADDITIONAL PCM / TCM REPLACEMENT PROCEDURES

Find the PCM/TCM Type for the vehicle, read and write down the steps, and then go to the step by step instructions for additional information on how to perform these procedures. See **STEP-BY-STEP INSTRUCTIONS**.

If a NGC3 or NGC4 PCM was replaced, perform the following additional steps and/or routines:

1. PCM Replaced - if WCM equipped
2. Learn ETC - if ETC equipped
3. Check PCM Odometer
4. Check PCM VIN - if NOT WCM equipped
5. Quicklearn - if EATX equipped

If a GPEC PCM was replaced, perform the following additional steps and/or routines:

1. If the vehicle is equipped with a CVT, ensure that the TCM has the latest software calibration available (if the vehicle is not equipped with a CVT, skip to Step 3).
2. PCM Replaced - if WCM equipped
3. Learn ETC
4. Check PCM Odometer
5. Check PCM VIN - if NOT WCM equipped
6. TCM Quicklearn - if EATX equipped

If a CVT TCM was replaced, perform the following additional steps and/or routines:

1. Initialize CVT

If an EGS TCM was replaced, perform the following additional steps and/or routines:

1. Initialize EGS

STEP-BY-STEP INSTRUCTIONS

Check PCM Odometer

From the "Home" screen, select "ECU View".

Select "PCM"

Select "Misc. Functions"

Select "Check PCM Odometer" and follow the on screen instructions.

When complete, select "Finish".

Check PCM VIN

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Check PCM VIN" and follow the on screen instructions.

When complete, select "Finish"

Initialize CVT

From the "Home" screen, select "ECU View"

Select "TCM"

Select "Misc. Functions"

Select "Initialize CVT" and follow the on screen instructions.

When complete, select "Finish"

Initialize EGS

From the "Home" screen, select "ECU View"

Select "TCM"

Select "Misc. Functions"

Select "Initialize EGS" and follow the on screen instructions.

When complete, select "Finish"

Learn ETC

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Learn ETC" and follow the on screen instructions.

When complete, select "Finish"

PCM Replaced

The vehicle pin (Personal Identification Number) will be required to complete the routine. This information may be obtained in three ways:

1. The original selling invoice
2. DealerCONNECT > Parts > Key Codes
3. Contacting the District Manager.

From the "Home" screen, select "ECU View"

Select "WCM"

Select "Misc. Functions"

Select "PCM Replaced" and follow the on screen instructions.

When complete, select "Finish"

Quicklearn

From the "Home" screen, select "ECU View"

Select "PCM"

Select "Misc. Functions"

Select "Quicklearn" and follow the on screen instructions.

When complete, select "Finish"

Update CVT TCM

From the "Home" screen:

Select "ECU View"

Select "TCM"

Select "More Options"

Select "ECU Flash"

Select "Browse for New File" and follow the on screen instructions.

Highlight the appropriate calibration.

Select "Download to Scantool"

Once the download is complete, select "Close" and then "Back"

Highlight the listed calibration, select "Update Controller" and follow the on screen instructions.

When the TCM update is complete, select "OK"

Verify that the part number at the top of the "Flash TCM" screen has updated to the latest level.

SECTION 3 - AUTHORIZED MODIFICATION LABEL

NOTE: **The following step is required by law when reprogramming a PCM and/or TCM.**

Type the necessary information on the "Authorized Modification Label" and attach near the VECI label.

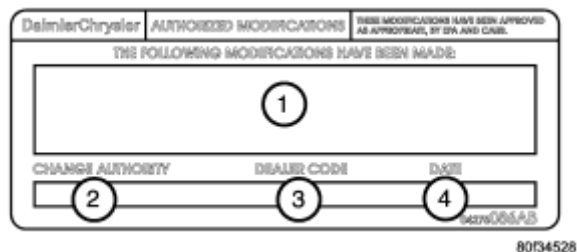


Fig. 35: Authorized Modification Label
Courtesy of CHRYSLER LLC

1. Powertrain Control / Transmission Control Module Part Numbers (Insert P/Ns) Used
2. Change Authority: TSB XX--XX
3. Dealer Code: XXXXX
4. Date: XX-XX-XX

REQUIRED TOOLS/EQUIPMENT:

PART NUMBER	StarSCAN®	PART NUMBER	StarMOBILE®
NPN	Battery Charger	NPN	Battery Charger
CH9401	StarSCAN® Tool Kit	CH9801	StarMOBILE® Tool Kit
CH9404	StarSCAN® Vehicle Cable	CH9804	StarMOBILE® Vehicle Cable
-	-	-	TechCONNECT PC or equivalent

TECH TIPS and INFORMATION:

1. StarMOBILE® Standalone Diagnostic Mode is an efficient way to flash ECUs without having direct access to a network connection. It involves first copying the flash file to the StarMOBILE® device which DOES require a network connection. Once the file has been copied to the StarMOBILE® device, it can be used in a Standalone mode to flash the ECU WITHOUT a network connection.
2. To use the StarMOBILE® in Pass-Through Mode requires that your StarMOBILE® is connected to the dealerships network via a wired or wireless connection. For more information on how to use the StarMOBILE in Pass-Through Mode see the StarMOBILE® training tutorials available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Training Aids' link or at www.dcctools.com, under the 'Training Aids' link.
3. StarMOBILE® does not need to be connected to a vehicle when retrieving a flash file for Standalone Mode.
4. Extreme care must be taken when programming a calibration into a generic PCM. Do not randomly select a calibration. Once a calibration is selected and programmed, the controller cannot be reprogrammed to a different calibration. The ECU can only be reprogrammed to a more recent version of that calibration.
5. If the flash process is interrupted or aborted, the flash should be restarted.
6. Due to the PCM / TCM programming procedure, a DTC may be set in other ECUs within the vehicle. Some DTCs may cause the MIL to illuminate. From the "Home" screen select "System View". Then select "All DTCs". Press "Clear All Stored DTCs" if there are any DTCs shown on the list.

7. When replacing a GPEC PCM for a vehicle that is equipped with a CVT, it is extremely important that the PCM and TCM both have the latest software calibrations.
8. Do not allow the battery charger to time out or the charging rate to climb above 13.5 volts during the flash process.
9. The StarSCAN® and StarMOBILE® diagnostic tools fully support Internet connectivity and must be configured for your dealership's network. For help on setting up your StarSCAN® / StarMOBILE® for the dealership's network, refer to the StarSCAN® / StarMOBILE® Quick Start Networking Guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.
10. The operating software in the StarSCAN® and StarMOBILE® must be programmed with the latest software release level. The software level is visible in the blue header at the top of the StarSCAN® and StarMOBILE® Desktop Client screens. For instructions on how to update your scan tool, refer to the StarSCAN® / StarMOBILE® Software Update guide available on 'DealerCONNECT > Service > StarSCAN® and StarMOBILE® Tools > Online Documentation' or at www.dcctools.com, under the download center.

PARTS REQUIRED

Qty	Part Number	DESCRIPTION
1	04275086AB	Label, Authorized Modification

REMOVAL

REMOVAL

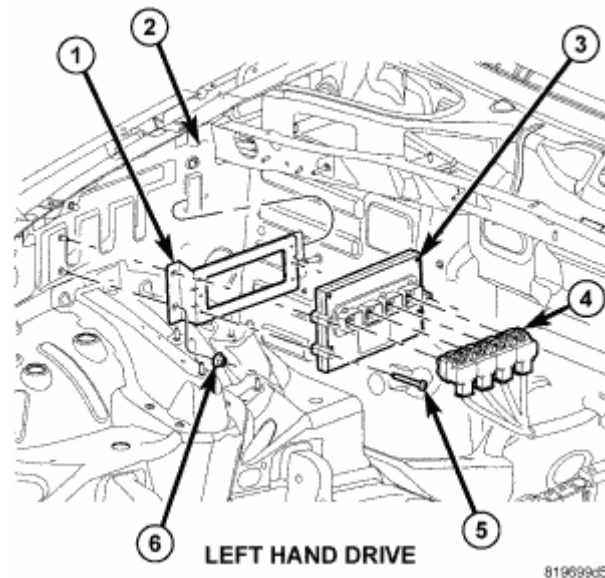


Fig. 36: PCM LOCATION - LEFT HAND DRIVE
 Courtesy of CHRYSLER LLC

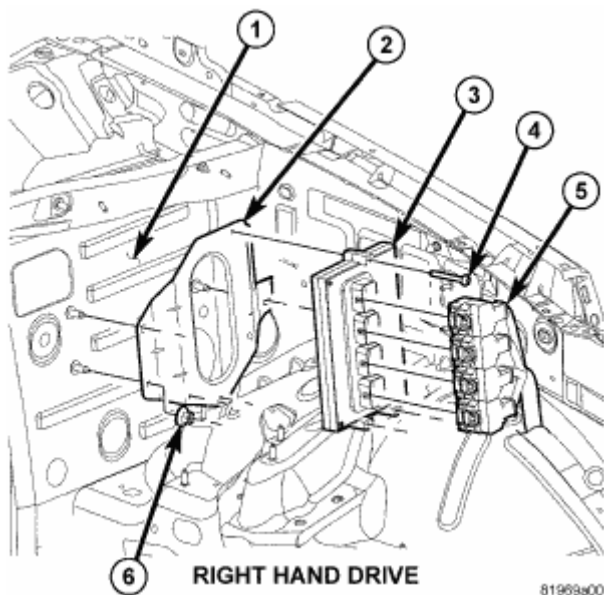


Fig. 37: PCM LOCATION - RIGHT HAND DRIVE
Courtesy of CHRYSLER LLC

1. The PCM (Powertrain Control Module) (3-Right Hand Drive), or (3-Left Hand Drive) is located in the engine compartment.
2. Disconnect negative battery cable.
3. Disconnect PCM electrical connectors (5-Right Hand Drive), or (4-Left Hand Drive).
4. Remove PCM mounting screws (4-Right Hand Drive), or (5-Left Hand Drive).
5. Remove PCM (3-Right Hand Drive), or (3-Left Hand Drive) from vehicle.

INSTALLATION

INSTALLATION

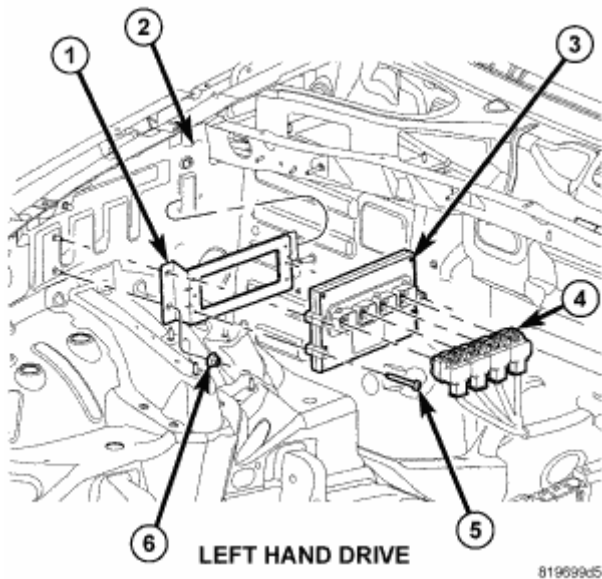


Fig. 38: PCM LOCATION - LEFT HAND DRIVE
 Courtesy of CHRYSLER LLC

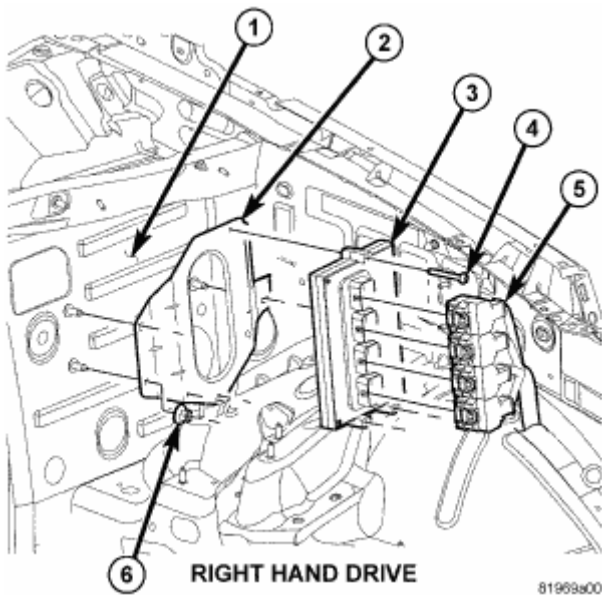


Fig. 39: PCM LOCATION - RIGHT HAND DRIVE
 Courtesy of CHRYSLER LLC

1. The PCM (Powertrain Control Module) (3-Right Hand Drive), or (3-Left Hand Drive) is located in the engine compartment.
2. Position PCM (3-Right Hand Drive), or (3-Left Hand Drive) to vehicle.
3. Install PCM mounting screws (4-Right Hand Drive), or (5-Left Hand Drive). Tighten screws to 8 N.m (71 in. lbs.) torque.
4. Connect PCM electrical connectors (5-Right Hand Drive), or (4-Left Hand Drive).
5. Connect negative battery cable.

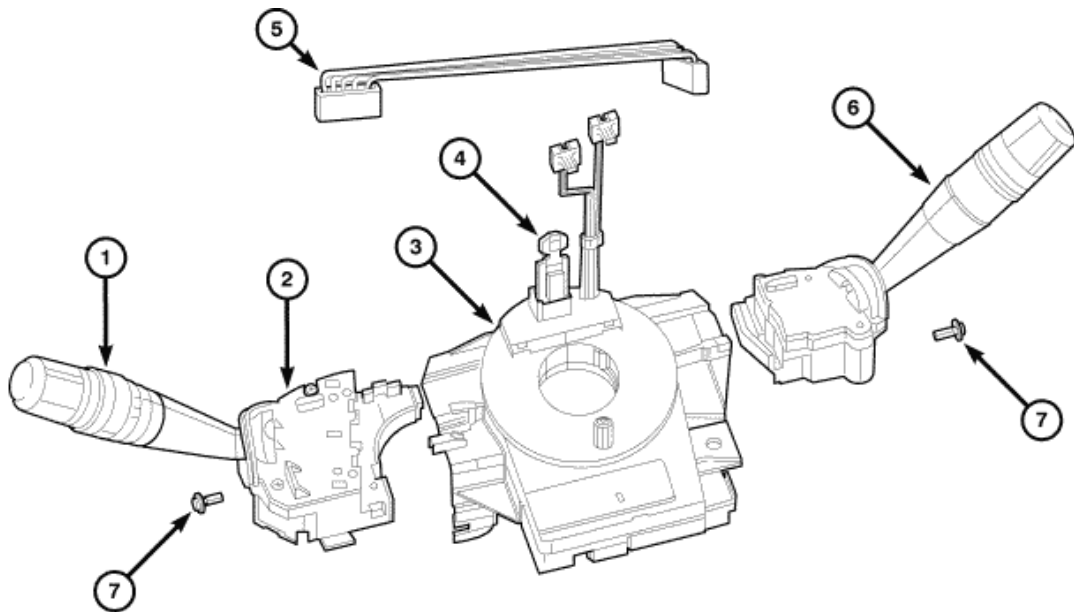
CAUTION: Refer to PCM/ECM REPROGRAMMING for reprogramming procedures. If this step is not performed, a Diagnostic Trouble Code (DTC) will be set.

CAUTION: Use the scan tool to reprogram the new PCM with the vehicles original identification number (VIN) and the vehicles original mileage. If this step is not performed, a Diagnostic Trouble Code (DTC) will be set.

MODULE-STEERING CONTROL

DESCRIPTION

STEERING CONTROL MODULE



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Fig. 40: Steering Control Module
Courtesy of CHRYSLER LLC

This vehicle is equipped with a Steering Control Module (SCM) that is internal to the left multi-function switch housing (2). The left (lighting) multi-function switch is located on the left side of the steering column, just below the steering wheel. This switch is the primary control for the interior and exterior lighting systems. The only visible components of the switch are the control stalk (1), control knob and control sleeve that extend through the steering column shrouds on the left side of the column. The remainder of the switch including its mounting provisions and electrical connections are concealed beneath the shrouds.

The switch housing and controls are constructed of molded black plastic. A single screw (7) through a mounting tab integral to the back of the switch housing, and a slide tab integral to the bottom of the switch housing secure the switch to the mounting bracket integral to the clockspring (3). A connector receptacle containing seven terminal pins is integral to the inboard end of the switch housing and connects the SCM through a jumper wire harness (5) directly to the right (wiper) multi-function switch (6). A second connector receptacle containing four terminal pins is integral to the back of the switch housing and connects the SCM to the vehicle electrical system.

through a dedicated takeout and connector of the instrument panel wire harness.

The SCM cannot be adjusted or repaired. If ineffective or damaged the entire left multi-function switch must be replaced. Refer to **REMOVAL** . The clockspring (with the multi-function switch mounting bracket), the left multi-function switch (with the SCM), the right multi-function switch and the jumper wire harness are each available for separate service replacement.

OPERATION

STEERING CONTROL MODULE

The microprocessor-based Steering Control Module (SCM) utilizes integrated circuitry to monitor hard wired analog and multiplexed inputs from both the right and left multi-function switches. In response to those inputs, the internal circuitry of the SCM allow it to transmit electronic message outputs to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the Local Interface Network (LIN) data bus.

In response to those inputs the internal circuitry and programming of the EMIC, which is also the LIN master module in the vehicle, allow it to control and integrate many electronic functions and features of the vehicle through both hard wired outputs and the transmission of electronic message outputs to other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. See **DESCRIPTION**.

The SCM is connected to both a fused B(+) circuit and a fused ignition switch output (run-start) circuit. It receives a path to ground at all times. These connections allow it to remain functional regardless of the ignition switch position. Any input to the SCM that controls a vehicle system function that does not require that the ignition switch be in the ON position such as turning on the lights, prompts the SCM to wake up and transmit on the LIN data bus.

The hard wired circuits between components related to the SCM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SCM or the electronic controls or communication between modules and other devices that provide some features of the SCM. The most reliable, efficient, and accurate means to diagnose the SCM or the electronic controls and communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

DIAGNOSIS AND TESTING

STEERING CONTROL MODULE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground)

cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between components related to the Steering Control Module (SCM) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SCM or the electronic controls or communication between modules and other devices that provide some features of the SCM. The most reliable, efficient, and accurate means to diagnose the SCM or the electronic controls and communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

MODULE-TRANSMISSION CONTROL

DESCRIPTION

TRANSMISSION CONTROL MODULE - DIESEL ENGINE

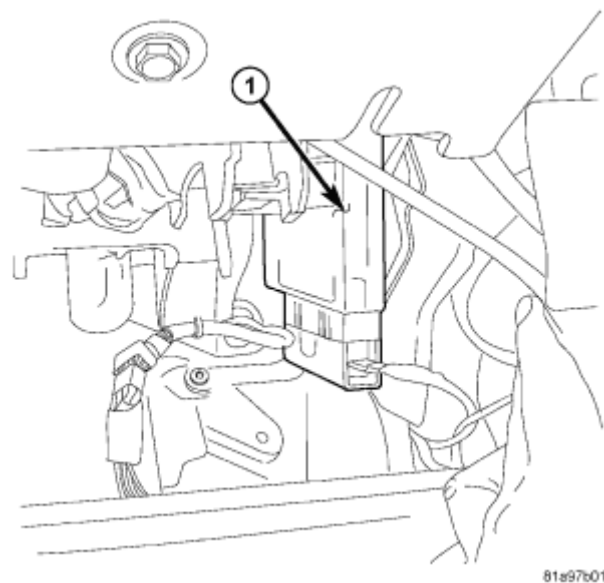


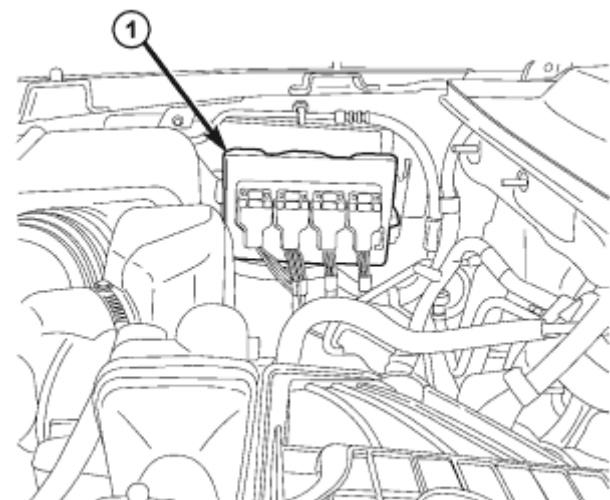
Fig. 41: NAG1 TCM
Courtesy of CHRYSLER LLC

1 - TCM

If the vehicle is equipped with a NAG1 transmission the TCM (1) is a separate module located behind the drivers knee bolster to the right of the steering column. The TCM uses the Controller Area Network (CAN) C

high-speed intra-vehicle communications network to deliver commands to the transmission and monitor operations. A module on the automatic transmission shifter communicates range selection data to the transmission, also using the CAN-C network. This information is also displayed in the instrument cluster.

TRANSMISSION CONTROL MODULE - GASOLINE ENGINES



81a9792e

Fig. 42: PCM (NGC4)
Courtesy of CHRYSLER LLC

1 - PCM

The Transmission Control Module (TCM) is a sub-module within the Powertrain Control Module (PCM) (1). The PCM is located on the right inner fender. The NGC IV (fourth-generation) Powertrain Control Module (PCM) provides integrated electronic control of all transmission functions.

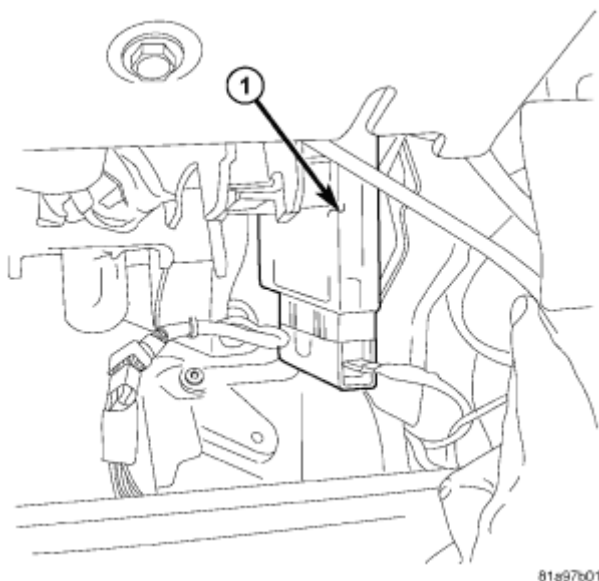


Fig. 43: NAG1 TCM
Courtesy of CHRYSLER LLC

1 - TCM

If the vehicle is equipped with a NAG1 transmission the TCM (1) is a separate module located behind the drivers knee bolster to the right of the steering column.

OPERATION

OPERATION-TCM- DIESEL ENGINE

The transmission control module (TCM) determines the current operating conditions of the vehicle and controls the shifting process for shift comfort and driving situations. It receives this operating data from sensors and broadcast messages from other modules.

The TCM uses inputs from several sensors that are directly hardwired to the controller and it uses several indirect inputs that are used to control shifts. This information is used to actuate the proper solenoids in the valve body to achieve the desired gear.

The shift lever sensor assembly (SLSA) has sensors that are monitored by the TCM to calculate shift lever position. The reverse light switch, an integral part of the SLSA, controls the reverse light relay control circuit. The Brake/Transmission Shift Interlock (BTSI) solenoid and the park lockout solenoid (also part of the SLSA) are controlled by the TCM.

The ECM and ABS broadcast messages over the controller area network (CAN C) bus for use by the TCM. The TCM uses this information, with other inputs, to determine the transmission operating conditions.

The TCM:

- determines the momentary operating conditions of the vehicle.

controls all shift processes.

considers shift comfort and the driving situation.

The TCM controls the solenoid valves for modulating shift pressures and gear changes. Relative to the torque being transmitted, the required pressures are calculated from load conditions, engine rpm, vehicle speed, and ATF temperature.

The following functions are contained in the TCM:

Shift Program.

Downshift Safety.

Torque Converter Lock-Up Clutch.

Adaptation.

This transmission does not have a TCM relay. Power is supplied to the SLSA and the TCM directly from the ignition.

The TCM continuously checks for electrical problems, mechanical problems, and some hydraulic problems. When a problem is sensed, the TCM stores a diagnostic trouble code (DTC). Some of these codes cause the transmission to go into "Limp-In" or "default" mode. Some DTCs cause permanent Limp-In and others cause temporary Limp-In. The NAG1 defaults in the current gear position if a DTC is detected, then after a key cycle the transmission will go into Limp-in, which is mechanical 2nd gear. Some DTCs may allow the transmission to resume normal operation (recover) if the detected problem goes away. A permanent Limp-In DTC will recover when the key is cycled, but if the same DTC is detected for three key cycles the system will not recover and the DTC must be cleared from the TCM with the scan tool.

TCM SIGNALS

The TCM registers one part of the input signals by direct inputs, the other part by CAN C bus. In addition to the direct control of the actuators, the TCM sends various output signals by CAN C bus to other control modules.

Selector Lever Position

A series of 12 Hall-effect switches in the SLSA inform the TCM of the position of the selector lever.

The TCM monitors the SLSA for all shift lever positions through five position circuits. The SLSA provides a low-current 12-volt signal to the TCM. The TCM compares the on/off signals to programmed combinations to determine the exact position of the shift lever.

ATF Temperature Sensor

The ATF temperature sensor is a positive temperature co-efficient (PTC) thermistor. It measures the temperature of the transmission fluid and is a direct input signal for the TCM. The temperature of the ATF has an influence on the shift time and resulting shift quality. As the temperature rises, resistance rises, and therefore, the probing voltage is decreasing. Because of its registration, the shifting process can be optimized in all temperature ranges.

The ATF temperature sensor is wired in series with the park/neutral contact. The temperature signal is transmitted to the TCM only when the reed contact of the park/neutral contact is closed because the TCM only reads ATF temperature while in any forward gear, or REVERSE. When the transmission is in PARK or NEUTRAL, the TCM will substitute the engine temperature for the ATF temperature.

Starter Interlock

The TCM monitors a contact switch wired in series with the transmission temperature sensor to determine PARK and NEUTRAL positions. The contact switch is open in PARK and NEUTRAL. The TCM senses transmission temperature as high (switch supply voltage), confirming switch status as open. The TCM then broadcasts a message over CAN bus to confirm switch status. The PCM receives this information and allows operation of the starter circuit.

N2 and N3 Speed Sensors

The N2 and N3 Input Speed Sensors are two Hall-effect speed sensors that are mounted internally in the transmission and are used by the TCM to calculate the transmission's input speed. Since the input speed cannot be measured directly, two of the drive elements are measured. Two input speed sensors were required because both drive elements are not active in all gears.

CAN C Bus Indirect Input Signals

A 2.5-volt bias (operating voltage) is present on the CAN C bus any time the ignition switch is in the RUN position. Both the TCM and the ABS apply this bias. On this vehicle, the CAN C bus is used for module data exchange only. The indirect inputs used on the NAG1 electronic control system are:

- Wheel Speed Sensors.

- Transfer Case Switch Status.

- Brake Switch.

- Engine RPM.

- Engine Temperature.

- Cruise Control Status.

- Gear Limit Request.

- Throttle Position - 0% at idle, 100% at WOT. If open, TCM assumes idle (0% throttle opening).

- Odometer Mileage

- Maximum Effective Torque.

- Engine in Limp-In Mode/Mileage Where DTC Was Set.

SHIFT SCHEDULES

The basic shift schedule includes up and downshifts for all five gears. The TCM adapts the shift program according to driving style, accelerator pedal position and deviation of vehicle speed. Influencing factors are:

- Road Conditions.

- Incline, Decline and Altitude.

Trailer Operation, Loading.
Engine Coolant Temperature.
Cruise Control Operation.
Sporty Driving Style.
Low and High ATF Temperature.

Upshift To:	1-2	2-3	3-4	4-5
Activated By Solenoid:	1-2/4-5	2-3	3-4	1-2/4-5
Shift Point (at 35.2% of throttle)	17.8 km/h (11.6 mph)	32.1 km/h (19.95 mph)	67.5 km/h (41.94 mph)	73.8 km/h (45.86 mph)

Downshift From:	5-4	4-3	3-2	2-1
Activated By Solenoid:	1-2/4-5	3-4	2-3	1-2/4-5
Shift Point	55.7 km/h (34.61 mph)	40.5 km/h (25.17 mph)	24.4 km/h (15.16 mph)	15.1 km/h (9.38 mph)

DOWNSHIFT SAFETY

Selector lever downshifts are not performed if inadmissible high engine RPM is sensed.

ADAPTATION

To equalize tolerances and wear, an automatic adaptation takes place for:

Shift Time.
Clutch Filling Time.
Clutch Filling Pressure.
Torque Converter Lock-Up Control.

Adaptation data may be stored permanently and to some extent, can be diagnosed.

Driving Style Adaptation

The shift point is modified in steps based on the information from the inputs. The control module looks at inputs such as:

vehicle acceleration and deceleration (calculated by the TCM).
rate of change as well as the position of the throttle pedal (fuel injection information from the ECM).
lateral acceleration (calculated by the TCM).
gear change frequency (how often the shift occurs).

Based on how aggressive the driver is, the TCM moves up the shift so that the present gear is held a little longer

before the next upshift. If the driving style is still aggressive, the shift point is modified up to ten steps. If the driving returns to normal, then the shift point modification also returns to the base position.

This adaptation has no memory. The adaptation to driving style is nothing more than a shift point modification meant to assist an aggressive driver. The shift points are adjusted for the moment and return to base position as soon as the inputs are controlled in a more rational manner.

Shift Time Adaptation (Shift Overlap Adaptation, Working Pressure)

Shift time adaptation is the ability of the TCM to electronically alter the time it takes to go from one gear to another. Shift time is defined as the time it takes to disengage one shift member while another is being applied. Shift time adaptation is divided into four categories:

Accelerating upshift, which is an upshift under a load. For shift time adaptation for the 1-2 upshift to take place, the transmission must shift from 1st to 2nd in six different engine load ranges vs. transmission output speed ranges.

Decelerating upshift, which is an upshift under no load. This shift is a rolling upshift and is accomplished by letting the vehicle roll into the next gear.

Accelerating downshift, which is a downshift under load. This shift can be initiated by the throttle, with or without kickdown. The shift selector can also be used.

Decelerating downshift, which is accomplished by coasting down. As the speed of the vehicle decreases, the transmission downshifts.

Fill Pressure Adaptation (Apply Pressure Adaptation, Modulating Pressure)

Fill pressure adaptation is the ability of the TCM to modify the pressure used to engage a shift member. The value of this pressure determines how firm the shift will be.

If too much pressure is used, the shift will be hard.

If too little pressure is used, the transmission may slip.

The pressure adjustment is needed to compensate for the tolerances of the shift pressure solenoid valve. The amount the solenoid valve opens as well as how quickly the valve can move, has an effect on the pressure. The return spring for the shift member provides a resistance that must be overcome by the pressure in order for shift member to apply. These return springs have slightly different values. This also affects the application pressure and is compensated for by fill pressure adaptation.

Fill Time Adaptation (Engagement Time Adaptation)

Fill time is the time it takes to fill the piston cavity and take up any clearances for a friction element (clutch or brake). Fill time adaptation is the ability of the TCM to modify the time it takes to fill the shift member by applying a preload pressure.

CONTROLLER MODES OF OPERATION

Permanent Limp-In Mode

When the TCM determines there is a non-recoverable condition present that does not allow proper transmission operation, it places the transmission in permanent Limp-In Mode. When the condition occurs the TCM turns off all solenoids as well as the solenoid supply output circuit. If this occurs while the vehicle is moving, the transmission remains in the current gear position until the ignition is turned off or the shifter is placed in the "P" position. When the shifter has been placed in "P," the transmission only allows 2nd gear operation. If this occurs while the vehicle is not moving, the transmission only allows operation in 2nd gear.

Temporary Limp-In Mode

This mode is the same as the permanent Limp-In Mode except if the condition is no longer present, the system resumes normal operation.

Under Voltage Limp-In Mode

When the TCM detects that system voltage has dropped below 8.5 volts, it disables voltage-dependant diagnostics and places the transmission in the temporary Limp-In Mode. When the TCM senses that the voltage has risen above 9.0 volts, normal transmission operation is resumed.

Hardware Error Mode

When the TCM detects a major internal error, the transmission is placed in the permanent Limp-In Mode and ceases all communication over the CAN bus. When the TCM has entered this mode normal transmission operation does not resume until all DTCs are cleared from the TCM.

Loss of Drive

If the TCM detects a situation that has resulted or may result in a catastrophic engine or transmission problem, the transmission is placed in the neutral position. Improper Ratio, Input Sensor Overspeed or Engine Overspeed DTCs cause the loss of drive.

Controlled Limp-in Mode

When a failure does not require the TCM to shut down the solenoid supply, but the failure is severe enough that the TCM places the transmission into a predefined gear, there are several shift performance concerns. For instance, if the transmission is slipping, the controller tries to place the transmission into 3rd gear and maintain 3rd gear for all forward drive conditions.

TRANSMISSION CONTROL MODULE - GASOLINE ENGINES

The TCM is the controlling unit for all electronic operations of the transmission. The TCM receives information regarding vehicle operation from both direct and indirect inputs, and selects the operational mode of the transmission. Direct inputs are hard-wired to, and used specifically by the TCM. Indirect inputs originate from other components/modules, and are shared with the TCM via the CAN bus.

Some examples of **direct inputs** to the TCM are:

- Battery (B+) voltage
- Ignition "ON" voltage

Transmission Control Relay (Switched B+)
Throttle Position Sensor
Crankshaft Position sensor (CKP)
Transmission Range Sensor (TRS)
Pressure Switches (L/R, 2/4, OD)
Transmission Temperature Sensor (TTS) (Integral to TRS)
Input Shaft Speed Sensor
Output Shaft Speed Sensor

Some examples of **indirect inputs** to the TCM are:

Engine/Body Identification
Manifold Pressure
Target Idle
Torque Reduction Confirmation
Speed Control ON/OFF Switch
Engine Coolant Temperature
Ambient/Battery Temperature
Brake Switch Status
Scan Tool Communication

Based on the information received from these various inputs, the TCM determines the appropriate shift schedule and shift points, depending on the present operating conditions and driver demand. This is possible through the control of various direct and indirect outputs.

Some examples of TCM **direct outputs** are:

Transmission Control Relay
Solenoids (L/R, 2/4, OD and UD)
Vehicle Speed (to PCM)
Torque Reduction Request (to PCM)

Some examples of TCM **indirect outputs** are:

Transmission Temperature (to PCM)
PRNDL Position (to CCN)

In addition to monitoring inputs and controlling outputs, the TCM has other important responsibilities and functions:

Storing and maintaining Clutch Volume Indices (CVI)
Storing and selecting appropriate Shift Schedules

System self-diagnostics

Diagnostic capabilities (with scan tool)

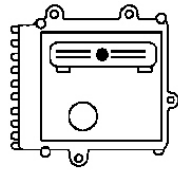
NOTE: **If the TCM has been replaced, the "Quick Learn Procedure" must be performed. See STANDARD PROCEDURE.**

CLUTCH VOLUME INDEX (CVI)

An important function of the TCM is to monitor Clutch Volume Index (CVI). CVIs represent the volume of fluid needed to compress a clutch pack.

The TCM monitors gear ratio changes by monitoring the Input and Output Speed Sensors. The Input, or Turbine Speed Sensor sends an electrical signal to the TCM that represents input shaft rpm. The Output Speed Sensor provides the TCM with output shaft speed information.

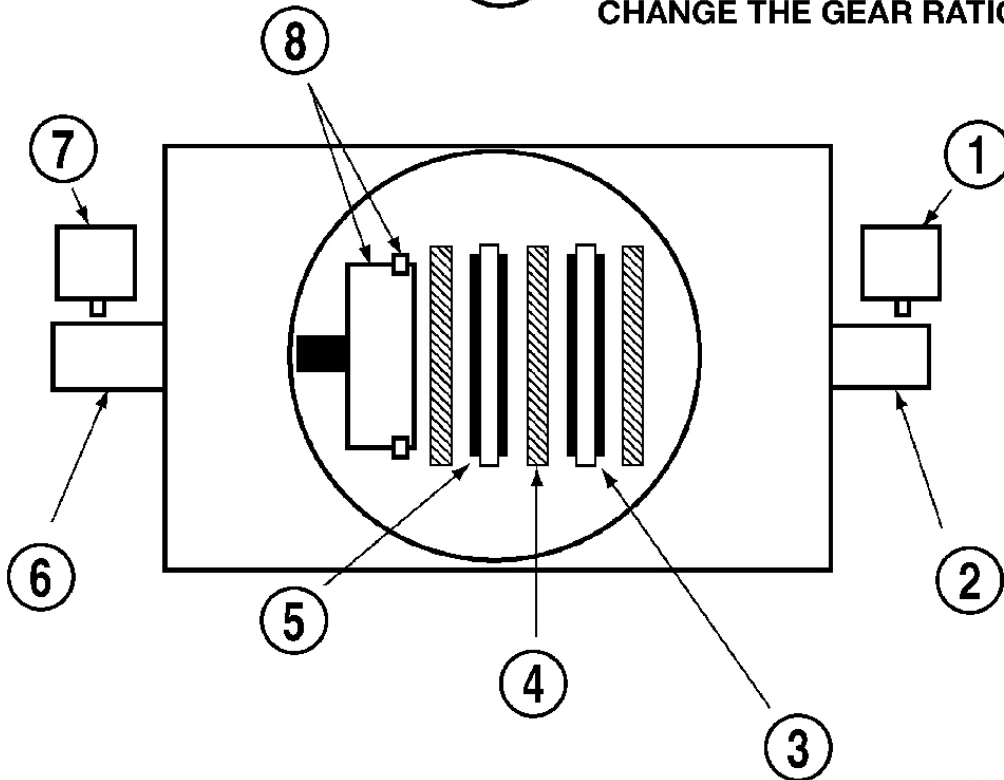
By comparing the two inputs, the TCM can determine transmission gear position. This is important to the CVI calculation because the TCM determines CVIs by monitoring how long it takes for a gear change to occur. See **Fig. 44**.



TCM



THE TCM TIMES HOW LONG
IT TAKES TO COMPRESS
THE CLUTCH PACK TO
CHANGE THE GEAR RATIO



80b89925

Fig. 44: Example of Clutch Volume Indexes (CVI) Calculation
Courtesy of CHRYSLER LLC

- 1 - OUTPUT SPEED SENSOR
- 2 - OUTPUT SHAFT
- 3 - CLUTCH PACK
- 4 - SEPARATOR PLATE
- 5 - FRICTION DISCS
- 6 - INPUT SHAFT
- 7 - INPUT SPEED SENSOR
- 8 - PISTON AND SEAL

Gear ratios can be determined by using the scan tool and reading the Input/Output Speed Sensor values in the "Monitors" display. Gear ratio can be obtained by dividing the Input Speed Sensor value by the Output Speed Sensor value.

For example, if the input shaft is rotating at 1000 rpm and the output shaft is rotating at 500 rpm, then the TCM can determine that the gear ratio is 2:1. In direct drive (3rd gear), the gear ratio changes to 1:1. The gear ratio changes as clutches are applied and released. By monitoring the length of time it takes for the gear ratio to change following a shift request, the TCM can determine the volume of fluid used to apply or release a friction element.

The volume of transmission fluid needed to apply the friction elements are continuously updated for adaptive controls. As friction material wears, the volume of fluid need to apply the element increases.

Certain mechanical problems within the input clutch assembly (broken return springs, out of position snap rings, excessive clutch pack clearance, improper assembly, etc.) can cause inadequate or out-of-range element volumes. Also, defective Input/Output Speed Sensors and wiring can cause these conditions. The following chart identifies the appropriate clutch volumes and when they are monitored/updated:

CLUTCH VOLUMES				
Clutch	When Updated			Proper Clutch Volume
	Shift Sequence	Oil Temperature	Throttle Angle	
L/R	2-1 or 3-1 coast downshift	> 21° C (70° F)	< 5°	35 to 83
2/4	1-2 shift	> 43° C (110° F)	5 - 54°	20 to 77
OD	2-3 shift			48 to 150
UD	4-3 or 4-2 shift		> 5°	24 to 70

SHIFT SCHEDULES

As mentioned earlier, the TCM has programming that allows it to select a variety of shift schedules. Shift schedule selection is dependent on the following:

- Shift lever position
- Throttle position
- Engine load
- Fluid temperature
- Software level

As driving conditions change, the TCM appropriately adjusts the shift schedule. Refer to the **42RLE SHIFT SCHEDULE** table to determine the appropriate operation expected, depending on driving conditions.

42RLE SHIFT SCHEDULE

Schedule	Condition	Expected Operation
Extreme Cold	Oil temperature at start-up below -27° C (-16° F)	Park, Reverse, Neutral and 2nd gear only (prevents shifting which

		may fail a clutch with frequent shifts)
Cold	Oil temperature at start-up above -25° C (-12° F) and below 2° C (36° F)	- Delayed 2-3 upshift (approximately 22-31 mph) - Delayed 3-4 upshift (45-53 mph) - Early 4-3 coastdown shift (approximately 30 mph) - Early 3-2 coastdown shift (approximately 17 mph) - High speed 4-2, 3-2, 2-1 kickdown shifts are prevented - No EMCC
Warm	Oil temperature at start-up above 2° C (36° F) and below 27° C (80° F)	- Normal operation (upshift, kickdowns, and coastdowns) - No EMCC
Hot	Oil temperature at start-up above 27° C (80° F)	- Normal operation (upshift, kickdowns, and coastdowns) - Full EMCC, no PEMCC except to engage FEMCC (except at closed throttle at speeds above 70-83 mph)
Overheat	Oil temperature above 115° C (240° F) or engine coolant temperature above 118° C (244° F)	- Delayed 2-3 upshift (25-32 mph) - Delayed 3-4 upshift (41-48 mph) - 3rd gear FEMCC from 30-48 mph - 3rd gear PEMCC from 27-31 mph
Super Overheat	Oil temperature above 127° C (260° F)	- All "Overheat" shift schedule features apply - 2nd gear PEMCC above 22 mph - Above 22 mph the torque converter will not unlock unless the throttle is closed or if a wide open throttle 2nd PEMCC to 1 kickdown is made

STANDARD PROCEDURE

DRIVE LEARN - RFE

When a transmission is repaired and a Quick Learn procedure has been performed on the Transmission Control Module (TCM), the following Drive Learn procedure can be performed to fine tune any shifts which are particularly objectionable.

NOTE: It is not necessary to perform the complete Drive Learn procedure every time

the TCM is Quick Learned. Perform only the portions which target the objectionable shift.

LEARN A SMOOTH 1ST NEUTRAL TO DRIVE SHIFT

Perform this procedure only if the complaint is for a delayed or harsh shift the first time the transmission is put into gear after the vehicle is allowed to set with the engine not running for at least 10 minutes. Use the following steps to have the TCM learn the 1st N-D UD CVI.

NOTE: The transmission oil temperature must be between 27-43° C (80-110° F).

1. Start the engine only when the engine and ignition have been off for at least ten (10) minutes.
2. With the vehicle at a stop and the service brake applied, record the 1st N-D UD CVI while performing a Neutral to Drive shift. The 1st N-D UD CVI accounts for air entrapment in the UD clutch that may occur after the engine has been off for a period of time.
3. Repeat step 1 and step 2 until the recorded 1st N-D UD CVI value stabilizes.

NOTE: It is important that this procedure be performed when the transmission temperature is between 27-43° C (80-110° F). If this procedure takes too long to complete fully for the allowed transmission oil temperature, the vehicle may be returned to the customer with an explanation that the shift will improve daily during normal vehicle usage. The TCM also learns at higher oil temperatures, but these values (line pressure correction values) are not available for viewing on the scan tool.

LEARN A SMOOTH NEUTRAL TO DRIVE GARAGE SHIFT

Perform this procedure if the complaint is for a delayed or harsh shift when the transmission is put into gear after the vehicle has had its first shift. Use the following steps to have the TCM learn the Norm N-D UD CVI.

NOTE: The transmission oil temperature must be between 27-43° C (80-110° F) to learn the UD CVI. Additional learning occurs at temperatures as low as -18° C (0° F) and as high as 93° C (200° F). This procedure may be performed at any temperature that experiences poor shift quality. Although the UD CVI may not change, shift quality should improve.

1. Start the vehicle engine and shift to drive.
2. Move the vehicle forward to a speed of at least 16 km/h (10 MPH) and come to a stop. This ensures no air is present in the UD hydraulic circuit.
3. Perform repeated N-D shifts at a stop while pausing in Neutral for at least 2-3 seconds and monitor Norm N-D UD CVI volume until the value stabilizes. The value will change during the N-D shift. This is normal since the UD value is different for the N-D shift then the normal value shown which is used for 4-3 coastdown and kickdowns. Perform repeated shifts in this temperature range until the Norm N-D UD CVI value stabilizes and the N-D shifts become smooth.

LEARN THE 1ST 2-3 SHIFT AFTER A RESTART OR SHIFT TO REVERSE

Use the following steps to have the TCM learn the 1st 2-3 shift OD CVI.

NOTE: The transmission oil temperature must be above 27° C (80° F).

1. With the vehicle engine running, select reverse gear for over 2 seconds.
2. Shift the transmission to Drive and accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform a 2-3 shift while noting the 1st 2-3 OD CVI.
3. Repeat step 1 and step 2 until the 1st 2-3 upshift becomes smooth and the 1st 2-3 OD CVI stabilizes.

LEARN A SMOOTH 2-3 AND 3-4 UPSHIFT

NOTE: The transmission oil temperature must be above 43° C (110° F).

Use the following steps to have the TCM learn the OD and 4C CVI's.

1. Accelerate the vehicle from a stop at a steady 15 degree throttle opening and perform multiple 1-2, 2-3, and 3-4 upshifts. The 2nd 2-3 shift following a restart or shift to reverse will be shown during the shift as a value between the 1st 2-3 OD CVI and the normal OD CVI. Updates to the normal OD CVI will occur after the 2nd shift into 3rd gear, following a restart or shift to reverse.
2. Repeat step 1 until the 2-3 and 3-4 shifts become smooth and the OD and 4C CVI become stable.

LEARN A SMOOTH 4-3 COASTDOWN AND PART THROTTLE 4-3 KICKDOWN

NOTE: The transmission oil temperature must be above 43° C (110° F).

Use the following steps to have the TCM learn the UD shift volume.

1. At a vehicle speed between 64-97 km/h (40-60 mph), perform repeated 4-3 kickdown shifts.
2. Repeat step 1 until the UD volume becomes somewhat stable and the shift becomes smooth.

LEARN A SMOOTH 1-2 UPSHIFT AND 3-2 KICKDOWN

Use the following steps to have the TCM learn the 2C shift volume.

NOTE: The transmission oil temperature must be above 43° C (110° F).

1. With a vehicle speed below 48 km/h (30 mph) and the transmission in 3rd gear, perform multiple 3-2 kickdowns.
2. Repeat step 1 until the 3-2 kickdowns become smooth and the 2C CVI becomes stable.

LEARN A SMOOTH MANUAL 2-1 PULLDOWN SHIFT AS WELL AS A NEUTRAL TO REVERSE SHIFT

NOTE: The transmission oil temperature must be above 43° C (110° F).

Use the following steps to have the TCM learn the LR volume.

1. With the vehicle speed around 40-48 km/h (25-30 mph) in Manual 2nd, perform manual pulldowns to Low or 1st gear at closed throttle.
2. Repeat step 1 until the LR CVI becomes stable and the manual 2-1 becomes smooth.

LEARN A SMOOTH NEUTRAL TO REVERSE SHIFT

NOTE: The transmission oil temperature must be above 43° C (110° F).

1. With the vehicle at a stop, perform Neutral to Reverse shifts until the shift is smooth. An unlearned Neutral to Reverse shift may be harsh or exhibit a double bump.
2. If any of the shifts are still not smooth after the clutch volume stabilizes, an internal transmission problem may be present.

LEARN A SMOOTH 4-5 UPSHIFT

NOTE: The transmission oil temperature must be above 43° C (110° F).

Use the following steps to have the TCM learn the Alt 2C CVI.

1. Accelerate the vehicle through 88 km/h (55 mph) at a steady 10-15 degree throttle opening and perform multiple 4-5 upshifts.
2. Repeat step 1 until the 4-5 shift become smooth and the Alt 2C CVI become stable. There is a separate 2C volume used and learned for 4-5 shifts, 2CA. It is independent of the 2C CVI learned on 3-2 kickdowns.

TCM QUICK LEARN

The quick learn procedure requires the use of the scan tool.

This program allows the electronic transmission system to recalibrate itself. This will provide the proper transmission operation. The quick learn procedure should be performed if any of the following procedures are performed:

Transmission Assembly Replacement
Transmission Control Module Replacement
Solenoid Pack Replacement
Clutch Plate and/or Seal Replacement
Valve Body Replacement or Recondition

To perform the Quick Learn Procedure, the following conditions must be met:

The brakes must be applied
The engine speed must be above 500 rpm
The throttle angle (TPS) must be less than three degrees

The shift lever position must stay in PARK until prompted to shift to overdrive

The shift lever position must stay in overdrive after the Shift to Overdrive prompt until the scan tool indicates the procedure is complete.

The calculated oil temperature must be above 16° C (60° F) and below 93° C (200° F).

2008 ENGINE PERFORMANCE

Emission Applications - Jeep Liberty

EMISSION APPLICATIONS

LIBERTY

Engine & Fuel System	(1) Emission Control Systems & Devices
2008	
3.7L (225") V6 SFI	(2) CCV, EVAP, TWC, FR, EGR, SPK, (3) HO2S, CEC, MIL, EVAP-CPCS, EVAP-LDP, EVAP-VC
(1) Major emission control systems and devices are listed in bold type; components and other related devices are listed in light type. (2) System uses a vacuum controlled (PCV) valve. (3) Equipped with 4.	

ABBREVIATIONS

CCV

Closed Crankcase Ventilation

CEC

Computerized Engine Control

EGR

Exhaust Gas Recirculation System

EVAP

Evaporative Emission Control

EVAP-CPCS

EVAP Canister Purge Control Solenoid

EVAP-LDP

EVAP Leak Detection Pump

EVAP-VC

EVAP System Vapor Canister

FR

Fill Pipe Restrictor

HO2S

Heated Oxygen Sensor

MIL

Malfunction Indicator Light

PCV

Positive Crankcase Ventilation

SFI

Sequential Fuel Injection

SPK

Spark Controls

SPK-CC

SPK Computer Controlled

TWC

Three-Way Catalytic Converter

2008 ENGINE PERFORMANCE

Emissions Control - Liberty

SPECIFICATIONS

SPECS - TORQUE

DESCRIPTION	N.m	Ft. Lbs.	Inch Lbs.
EVAP Canister Mounting Nut/Bolt	11	-	95
PCV Valve	12	-	106
EGR Valve-to-Cyl. Head Bolts - 3.7L	28	21	248
ERG Tube-to-EGR Valve Bolts	13	9.6-	115
EGR Tube-to-Intake Manifold Bolts	4	-	35

EVAPORATIVE EMISSIONS

SOLENOID-EVAP/PURGE

REMOVAL

DUTY CYCLE EVAP CANISTER PURGE SOLENOID

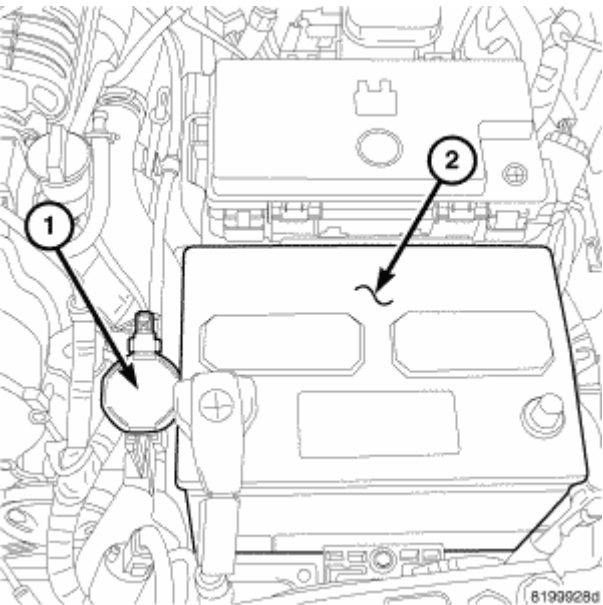


Fig. 1: Identifying EVAP Canister Purge Solenoid & Battery
Courtesy of CHRYSLER LLC

The EVAP canister purge solenoid (1) is located near the battery (2).

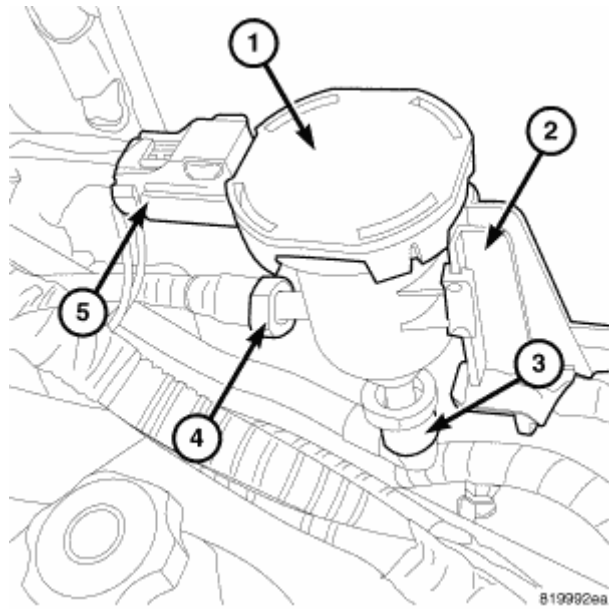


Fig. 2: Identifying Solenoid Assembly, Tongue-Type Bracket, Quick-Connect Fittings & Electrical Connector

Courtesy of CHRYSLER LLC

1. Lift the solenoid assembly (1) from the tongue-type bracket (2).
2. Disconnect electrical connector (5).
3. Disconnect quick-connect fittings (3) and (4) from solenoid.

INSTALLATION

DUTY CYCLE EVAP CANISTER PURGE SOLENOID

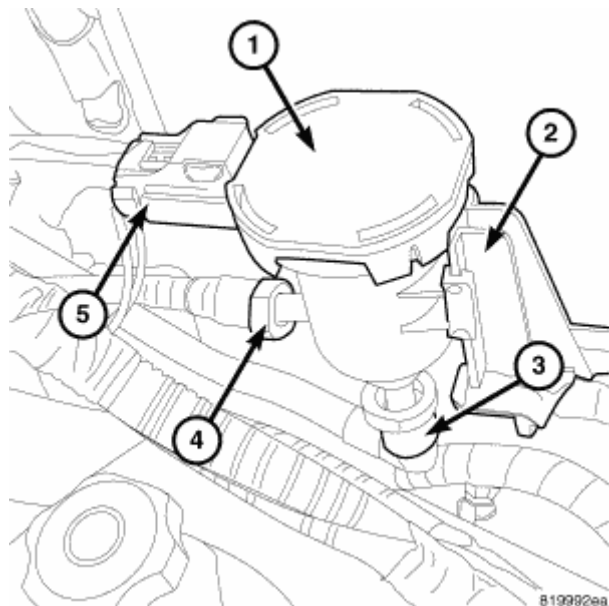


Fig. 3: Identifying Solenoid Assembly, Tongue-Type Bracket, Quick-Connect Fittings & Electrical Connector

Courtesy of CHRYSLER LLC

1. Connect quick-connect fittings (3) and (4) to solenoid.
2. Connect electrical connector (5).
3. Push solenoid assembly (1) onto the tongue-type bracket (2).
4. **The vapor/vacuum lines and hoses must be firmly connected. Also check the vapor/vacuum lines at the ESIM switch and filter for damage or leaks. If a leak is present, a Diagnostic Trouble Code (DTC) may be set.**

CAP-FUEL FILLER

DESCRIPTION

FUEL TANK FILLER TUBE CAP

The plastic fuel tank filler tube cap is threaded onto the end of the fuel fill tube. All models are equipped with a 1/4 turn cap.

OPERATION

FUEL TANK FILLER TUBE CAP

The loss of any fuel or vapor out of fuel filler tube is prevented by the use of a pressure-vacuum fuel fill cap. Relief valves inside the cap will release fuel tank pressure at predetermined pressures. Fuel tank vacuum will also be released at predetermined values. This cap must be replaced by a similar unit if replacement is necessary. This is in order for the system to remain effective.

CAUTION: Remove fill cap before servicing any fuel system component to relieve tank pressure. If equipped with an ORVR system and an ESIM switch, the cap must be tightened securely. If cap is left loose, a Diagnostic Trouble Code (DTC) may be set.

ORVR

DESCRIPTION

ORVR

The ORVR (On-Board Refueling Vapor Recovery) system consists of a unique fuel tank, flow management valve, fluid control valve, one-way check valve and vapor canister.

OPERATION

ORVR

The ORVR (On-Board Refueling Vapor Recovery) system is used to remove excess fuel tank vapors. This is done while the vehicle is being refueled.

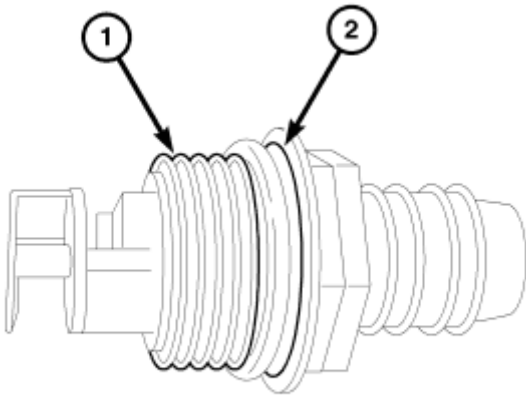
Fuel flowing into the fuel filler tube (approx. 1" I.D.) creates an aspiration effect drawing air into the fuel fill tube. During refueling, the fuel tank is vented to the EVAP canister to capture escaping vapors. With air flowing into the filler tube, there are no fuel vapors escaping to the atmosphere. Once the refueling vapors are captured by the EVAP canister, the vehicle's computer controlled purge system draws vapor out of the canister for the engine to burn. The vapor flow is metered by the purge solenoid so that there is no, or minimal impact on driveability or tailpipe emissions.

As fuel starts to flow through the fuel fill tube, it opens the normally closed check valve and enters the fuel tank. Vapor or air is expelled from the tank through the control valve and on to the vapor canister. Vapor is absorbed in the EVAP canister until vapor flow in the lines stops. This stoppage occurs following fuel shut-off, or by having the fuel level in the tank rise high enough to close the control valve. This control valve contains a float that rises to seal the large diameter vent path to the EVAP canister. At this point in the refueling process, fuel tank pressure increases, the check valve closes (preventing liquid fuel from spiting back at the operator), and fuel then rises up the fuel filler tube to shut off the dispensing nozzle.

VALVE-PCV-3.7L

DESCRIPTION

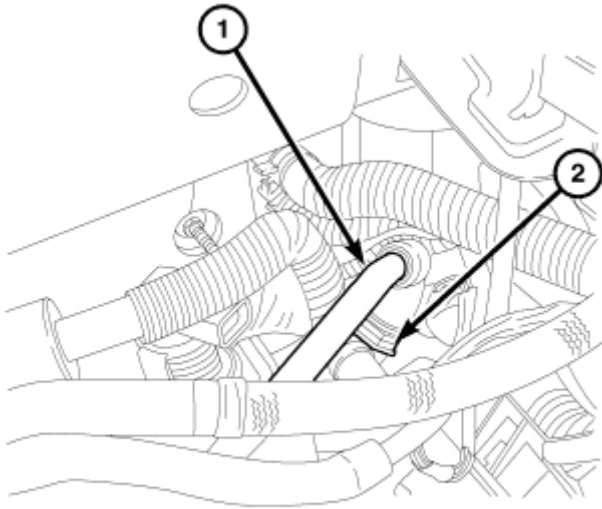
DESCRIPTION



81903415

Fig. 4: Identifying PCV Valve & Rubber Sealing O-Ring
Courtesy of CHRYSLER LLC

A PCV valve (1) using a rubber sealing O-ring (2) is used.



6190341e

Fig. 5: Identifying PCV Line & Valve
Courtesy of CHRYSLER LLC

The PCV valve is threaded into a metal fitting. The valve (2) is located at the rear of the left cylinder head.

OPERATION

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM

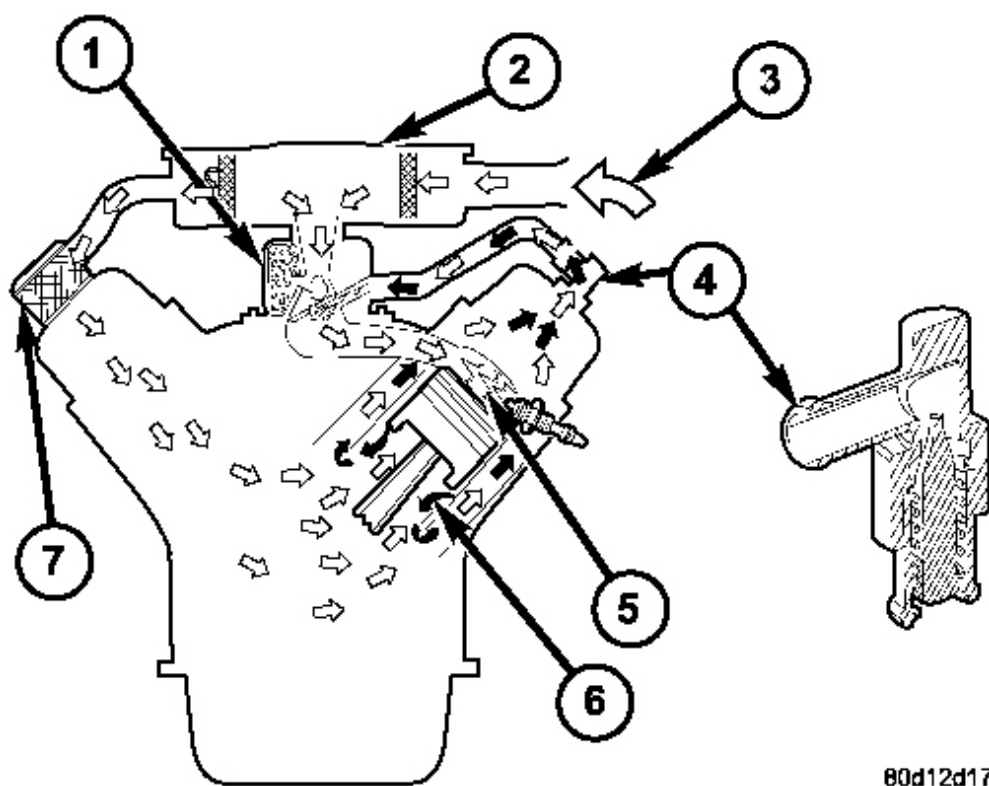


Fig. 6: Typical Closed Crankcase Ventilation System
 Courtesy of CHRYSLER LLC

A typical enclosed crankcase ventilation system is shown in the graphic.

The PCV system operates by engine intake manifold vacuum. Filtered air is routed into the crankcase through the air cleaner hose. The metered air, along with crankcase vapors, are drawn through the PCV valve (4) and into a passage in the intake manifold. The PCV system manages crankcase pressure and meters blow by gases to the intake system, reducing engine sludge formation.

The PCV valve contains a spring loaded plunger. This plunger meters the amount of crankcase vapors routed into the combustion chamber based on intake manifold vacuum.

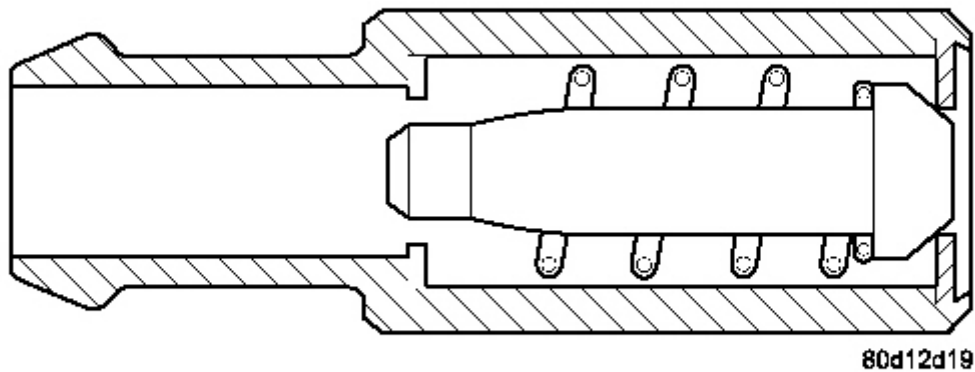


Fig. 7: Plunger Position During Engine Off Or Engine Backfire-No Vapor Flow
 Courtesy of CHRYSLER LLC

When the engine is not operating or during an engine pop-back, the spring forces the plunger back against the seat. This will prevent vapors from flowing through the valve.

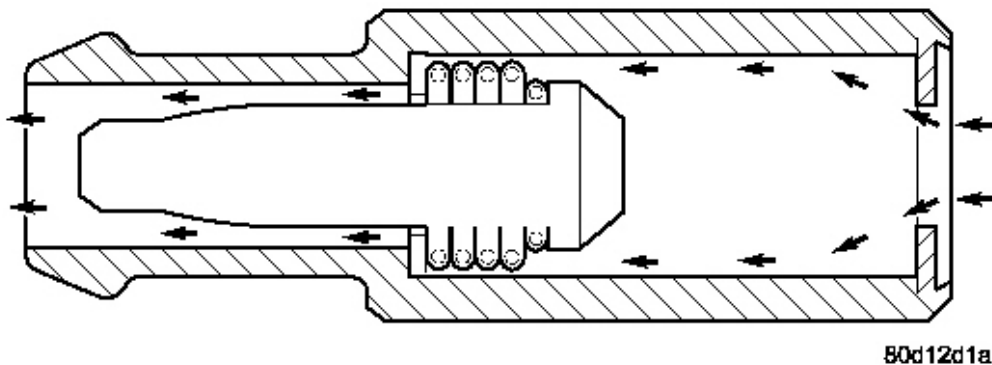


Fig. 8: Plunger Position During High Intake Manifold Vacuum-Minimal Vapor Flow
 Courtesy of CHRYSLER LLC

During periods of high manifold vacuum, such as idle or cruising speeds, vacuum is sufficient to completely compress spring. It will then pull the plunger to the top of the valve. In this position there is minimal vapor flow

through the valve.

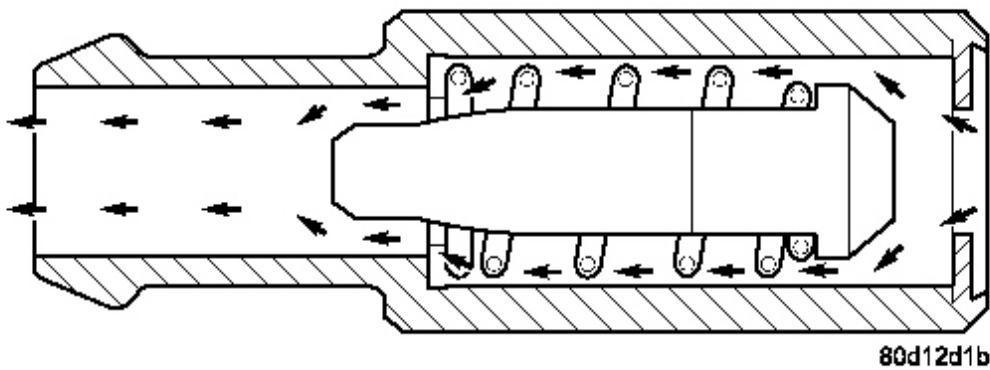


Fig. 9: Plunger Position During Moderate Intake Manifold Vacuum-Maximum Vapor Flow
Courtesy of CHRYSLER LLC

During periods of moderate manifold vacuum, the plunger is only pulled part way back from inlet. This results in maximum vapor flow through the valve.

REMOVAL

REMOVAL - 3.7L

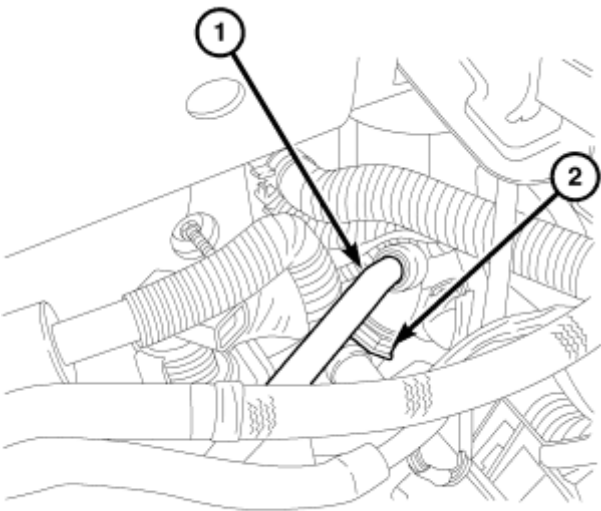
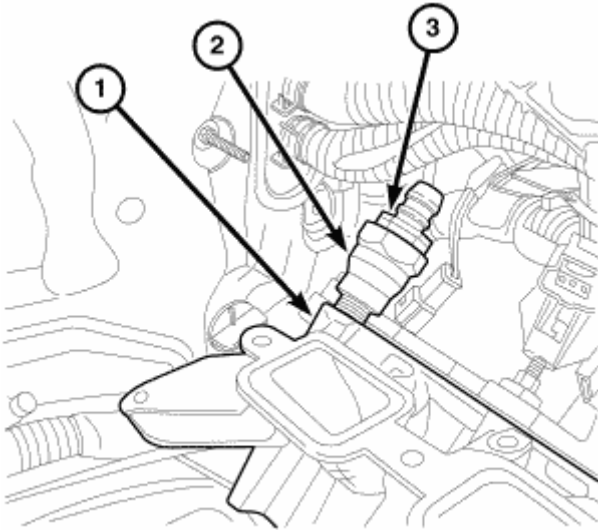


Fig. 10: Identifying PCV Line & Valve
Courtesy of CHRYSLER LLC

The PCV valve is located at the rear of the left cylinder head.

1. Remove line (1) and rubber connector hose from PCV valve.



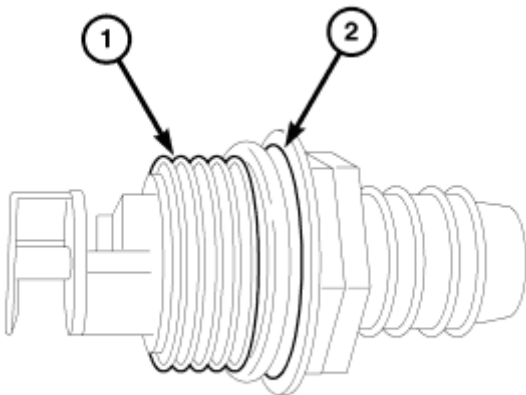
81903491

Fig. 11: Identifying PCV Valve & Metal Fitting
Courtesy of CHRYSLER LLC

2. Unthread PCV valve (3) from metal fitting (2).

INSTALLATION

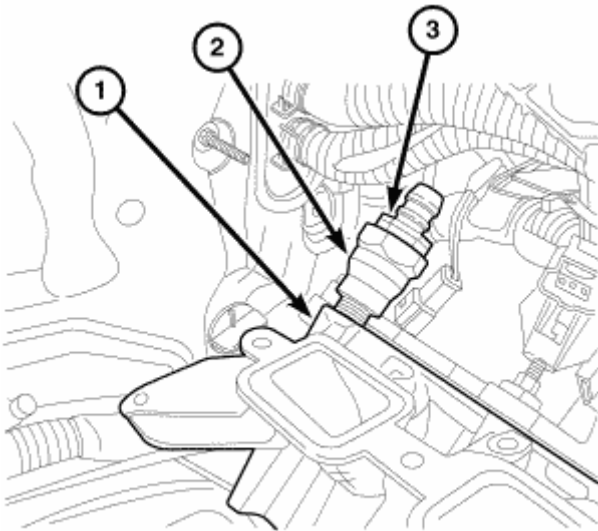
INSTALLATION - 3.7L



81903415

Fig. 12: Identifying PCV Valve & Rubber Sealing O-Ring
Courtesy of CHRYSLER LLC

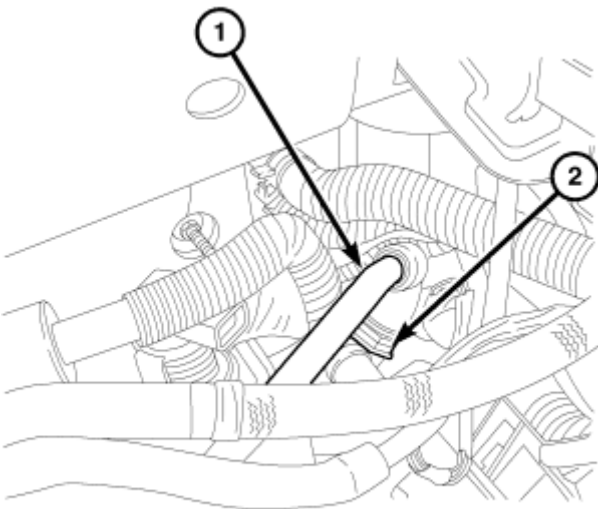
1. Check condition of PCV valve rubber O-ring (2).



81903491

Fig. 13: Identifying PCV Valve & Metal Fitting
Courtesy of CHRYSLER LLC

2. Clean fitting (2).
3. Install PCV valve (3) into fitting (2).



8190341e

Fig. 14: Identifying PCV Line & Valve
Courtesy of CHRYSLER LLC

4. Install PCV line (1) and rubber connector to valve.

LINES-VACUUM

DESCRIPTION

VACUUM LINES

A vacuum schematic for emission related items can be found on the VECI label. Refer to Vehicle Emission Control Information (VECI) Label for schematic location.

SWITCH-EVAP SYSTEM MONITOR

OPERATION

SWITCH-EVAP SYSTEM MONITOR

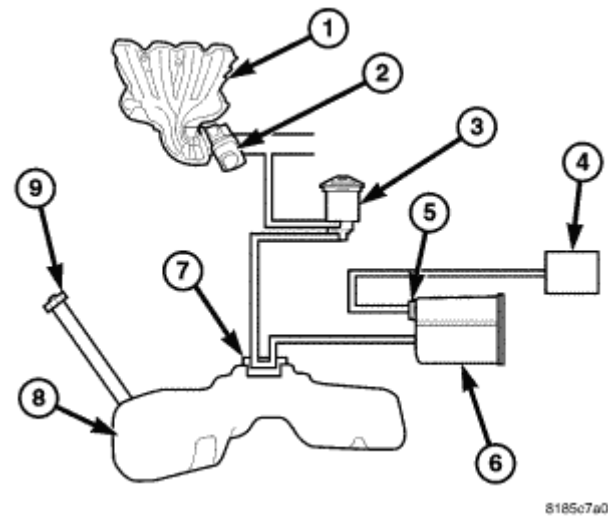


Fig. 15: Identifying Switch-EVAP System
Courtesy of CHRYSLER LLC

- 1 - Intake Manifold
- 2 - Throttle Body
- 3 - Purge Solenoid
- 4 - Filter
- 5 - ESIM
- 6 - Vapor Canister
- 7 - Control Valve
- 8 - Fuel Tank
- 9 - Gas Cap

The ESIM (Evaporative System Integrity Monitor) is very similar to the NVLD. However, the design of the ESIM has been simplified and unlike the NVLD the ESIM does not require a solenoid. The ESIM mounts

directly to the canister, eliminating the need for a mounting bracket. It is critical that the ESIM is mounted vertically. On vehicles where the canister is mounted on an angle, the ESIM requires an adapter to maintain a vertical position. When the ESIM is installed vertically, the electrical connector is in the 3 o'clock position.

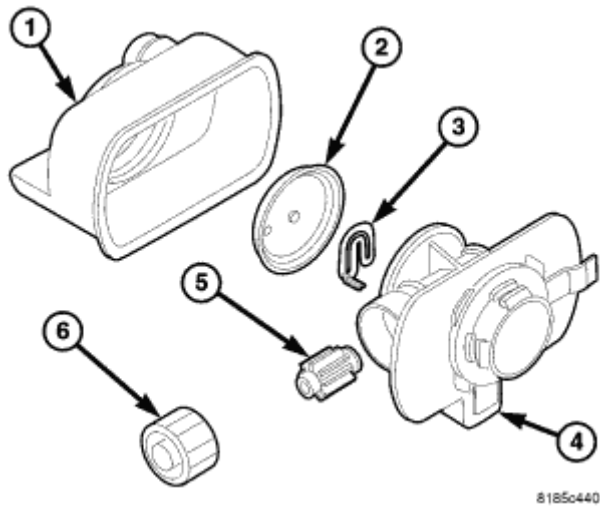


Fig. 16: Identifying ESIM Housing, Diaphragm, Switch, Cover & Small/Large Check Valve
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - ESIM Housing2 - Diaphragm3 - Switch4 - Cover5 - Small Check Valve6 - Large Check Valve |
|---|

The ESIM assembly consists of a housing, a small weight and a large weight that serve as check valves, a diaphragm, a switch and a cover. There is one large weight and one small weight check valve in the ESIM assembly. A seal is attached at the end of each weighted check valve. The large weight check valve seals for pressure. The small weight check valve seals for vacuum. The weighted check valves are contained within the ESIM housing.

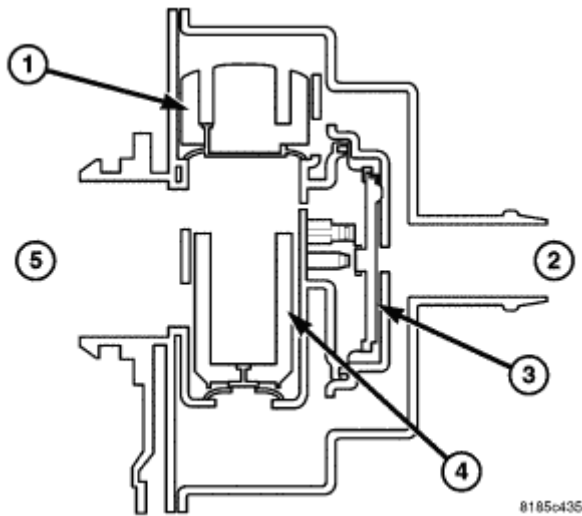


Fig. 17: Identifying Large/Small Check Valve, Fresh Air Inlet, Diaphragm & Vapor Canister
Courtesy of CHRYSLER LLC

- 1 - Large Check Valve
- 2 - Fresh Air Inlet
- 3 - Diaphragm
- 4 - Small Check Valve
- 5 - Vapor Canister

The ESIM (Evaporative System Integrity Monitor), while physically different than the NVLD system, performs the same basic function as the NVLD does - controlling evaporative emissions. The ESIM has been simplified because the solenoid used on the NVLD is not used on the ESIM.

The ESIM consists of housing, two check valves (sometimes referred to as weights), a diaphragm, a switch and a cover. The larger check valve seals for pressure and the smaller one seals for vacuum.

During refueling, pressure is built up in the evaporative system. When pressure reaches approximately .5 inches of water, the large check valve unseats and pressure vents to the fresh air filter.

Conversely, when the system cools, and the resulting vacuum lifts the small check valve from its seat and allows fresh air to enter the system and relieves the vacuum condition. When a calibrated amount of vacuum is achieved in the evaporative system, the diaphragm is pulled inward, pushing on the spring and closing the contacts.

The ESIM conducts test on the evaporative system as follows: An engine off, non-intrusive test for small leaks and an engine running, intrusive test for medium/large leaks.

The ESIM weights seal the EVAP. system during engine off conditions. If the EVAP. system is sealed, it will be pulled into a vacuum, either due to the cool down from operating temperature or diurnal ambient temperature cycling. When the vacuum in the system exceeds about 1" H₂O, the vacuum switch closes. The switch closure sends a signal to the PCM. In order to pass the non-intrusive small leak test, the ESIM switch must close within a calculated amount of time and within a specified amount of key-off events.

If the ESIM switch does not close as specified, the test is considered inconclusive and the intrusive engine running test will be run during the next key-on cycle. This intrusive test will run on the next cold engine running condition.

Conditions for running the intrusive test are:

After the vehicle is started, the engine coolant temperature must be within 50°F (10°C) of ambient to indicate a cold start.

The fuel level must be between 12% and 88%.

The engine must be in closed loop.

Manifold vacuum must be greater than a minimum specified value.

Ambient temperature must be between 39°F and 98°F (4°C and 37°C) and the elevation level must be below 8500 feet (2591 meters).

The test is accomplished by the PCM activating the purge solenoid to create a vacuum in the evaporative system. The PCM then measures the amount of time it takes for the vacuum to dissipate. This is known as the vacuum decay method. If the switch opens quickly a large leak is recorded. If the switch opens after a predetermined amount of time, then the small leak matures. If the switch does not close, then a general evaporative failure is recorded. The purge monitor tests the integrity of the hose attached between the purge valve and throttle body/intake. The purge monitor is a two stage test and it runs only after the evaporative system passes the small leak test.

Even when all of the thresholds are met, a small leak won't be recorded until after the medium/large leak monitor has been run. This is accomplished by the PCM activating the purge solenoid to create a vacuum in the evaporative system. The PCM then measures the amount of time it takes for the vacuum to dissipate. This is known as the vacuum decay method. If the switch opens quickly a large leak is recorded. If the switch opens after a predetermined amount of time, then the small leak matures. If the medium/large leak test runs and the ESIM switch doesn't close, a general evaporative test is run. The purge solenoid is activated for approximately 10 seconds, increasing the amount of vacuum in the system. If the ESIM switch closes after the extended purge activation, a large leak fault is generated. If the switch doesn't close, a general evaporative system fault is generated.

The purge monitor tests the integrity of the hose attached between the purge valve and throttle body/intake. The purge monitor is a two stage test and it runs only after the evaporative system passes the small leak test.

Stage one of the purge monitor is non-intrusive. The PCM monitors the purge vapor ratio. If the ratio is above a calibrated specification, the monitor passes. Stage two is an intrusive test and it runs only if stage one fails. During the stage two test, the PCM commands the purge solenoid to flow at a specified rate to force the purge vapor ratio to update. The vapor ratio is compared to a calibrated specification and if it is less than specified, a one-trip failure is recorded.

The ESIM switch stuck closed monitor checks to see if the switch is stuck closed. This is a power down test that runs at key-off; when the PCM sees 0 rpm's, the purge solenoid is energized for a maximum of 30 seconds, venting any vacuum trapped in the evaporative system. If the switch opens or was open before the test began, the monitor passes. If the switch doesn't open, the monitor fails. This is a two-trip MIL. The star scan tool can be used to force the ESIM switch stick closed monitor to run.

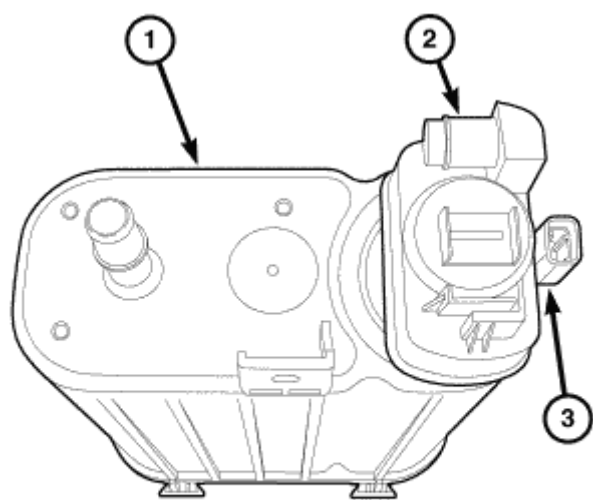
The PCM also uses the ESIM to detect a loose or missing gas cap. The PCM controller looks for a change in the fuel level (25% minimum) and then gas cap is loose or missing. If a medium/large leak is detected, a loose gas cap light illuminates and a pending one-trip fault code is set. On the PCM, this is a three-trip fault before the code matures

REMOVAL

REMOVAL

The ESIM (EVAP System Integrity Monitor) switch is attached to the EVAP canister and is usually not serviceable. Replace the switch by replacing the EVAP canister. Refer to **REMOVAL**.

If servicing separately, refer to the following:



618fa833

Fig. 18: Identifying EVAP Canister, ESIM Switch & Electrical Connector
Courtesy of CHRYSLER LLC

1 - EVAP Canister
2 - ESIM Switch
3 - Electrical Connector

The ESIM switch (2) is located on the EVAP canister (1) **The picture displays a typical EVAP Canister and a typical ESIM switch.**

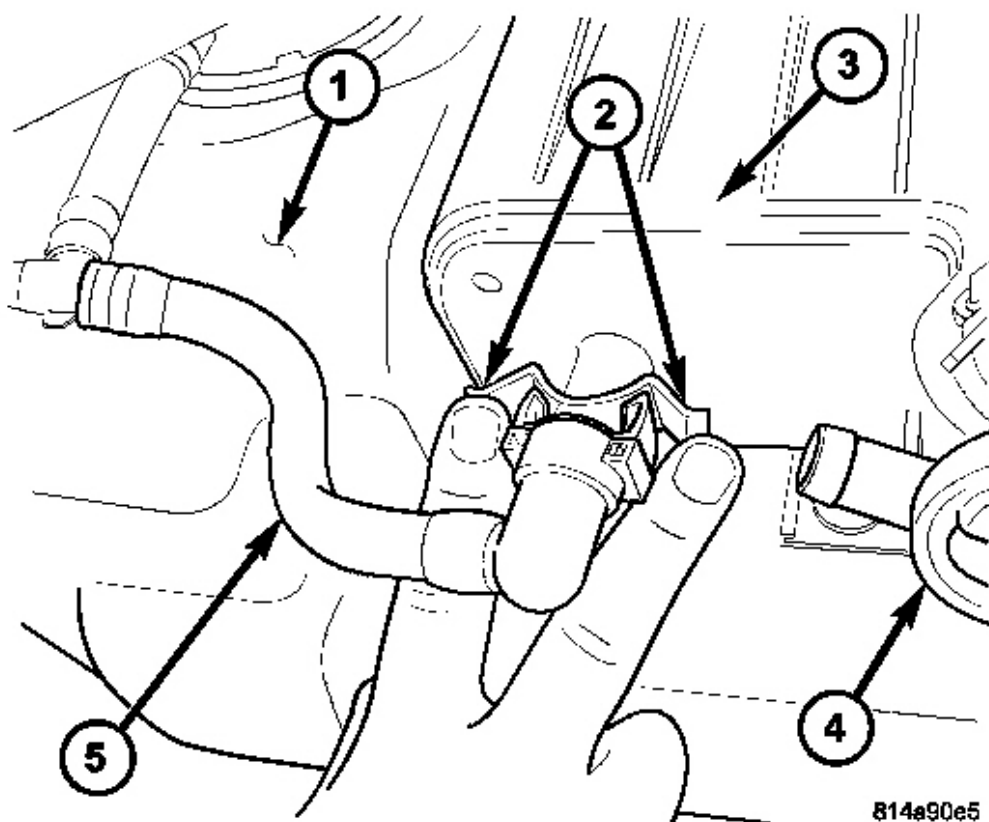


Fig. 19: EVAP Canister Vapor Hose
Courtesy of CHRYSLER LLC

1. Remove both plastic lines from switch by folding line tabs (2).

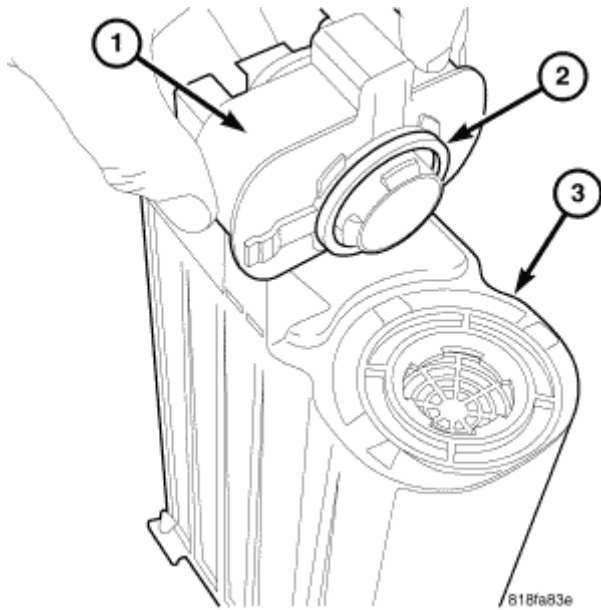


Fig. 20: Identifying ESIM Switch, O-Ring And EVAP Canister Opening
Courtesy of CHRYSLER LLC

2. Disconnect electrical connector at switch.
3. Clean any dirt from ESIM switch and its lines.

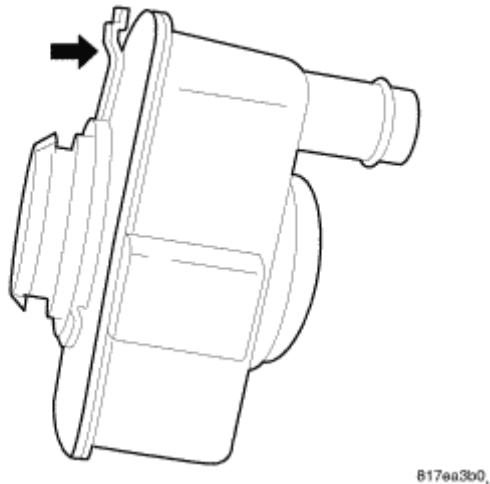


Fig. 21: Identifying Locking Tab
Courtesy of CHRYSLER LLC

4. A lock tab (see arrow) is used on the back of the switch. Push lock tab towards switch while rotating switch counterclockwise 1/4 turn for removal.
5. The fresh air lines and hoses from the ESIM must have a clear opening to the atmosphere. Check the fresh air lines, including the fresh air filter, for obstructions or restrictions at the ESIM. Also check the routing to the exit to atmosphere. If a restriction is present, the system will not allow free flow passage of clean air, and an early shut off of the fuel fill nozzle may occur during fuel fill.

INSTALLATION

INSTALLATION

The following pictures display a TYPICAL EVAP Canister and a typical ESIM switch. After installing any ESIM switch, the electrical connector on the switch must be in the 3 O'clock position. This step must be done for proper ESIM switch operation.

1. The fresh air lines and hoses from the ESIM must have a clear opening to the atmosphere. Check the fresh air lines, including the fresh air filter, for obstructions or restrictions at the ESIM. Also check the routing to the exit to atmosphere. If a restriction is present, the system will not allow free flow passage of clean air, and an early shut off of the fuel fill nozzle may occur during fuel fill.

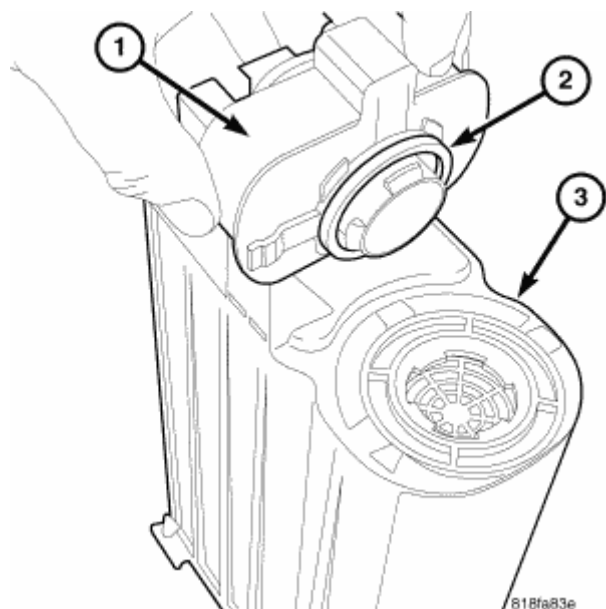
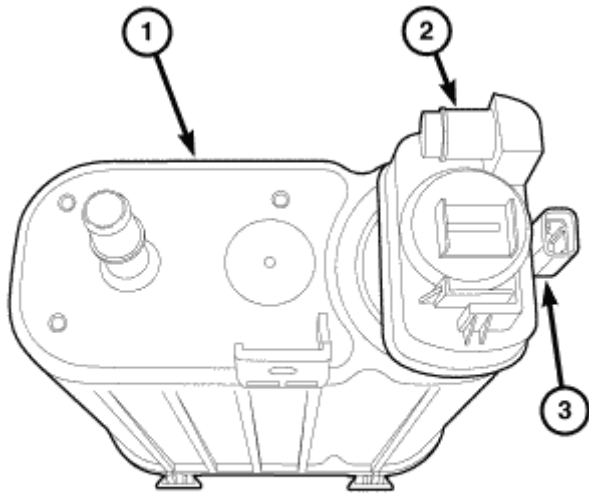


Fig. 22: Identifying ESIM Switch, O-Ring And EVAP Canister Opening
Courtesy of CHRYSLER LLC

2. Be sure O-ring (2) and EVAP canister opening are clean.



618fa833

Fig. 23: Identifying EVAP Canister, ESIM Switch & Electrical Connector
Courtesy of CHRYSLER LLC

1 - EVAP Canister
2 - ESIM Switch
3 - Electrical Connector

CAUTION: The electrical connector (3) on the ESIM switch must be in 3 O'clock position after installation. This step must be done for proper switch operation.

3. Position ESIM switch (2) into EVAP canister (1) and rotate until electrical connector is in 3 O'clock position (3).
4. Connect electrical connector.
5. Connect plastic lines to ESIM switch.

CANISTER - VAPOR

OPERATION

EVAP CANISTER

A maintenance free, EVAP canister is used on all vehicles. The EVAP canister is filled with granules of an activated carbon mixture. Fuel vapors entering the EVAP canister are absorbed by the charcoal granules.

Fuel tank pressure vents into the EVAP canister. Fuel vapors are temporarily held in the canister until they can be drawn into the intake manifold. The duty cycle EVAP canister purge solenoid allows the EVAP canister to be purged at predetermined times and at certain engine operating conditions.

The EVAP canister is also to be considered as part of the ORVR system.

REMOVAL

REMOVAL

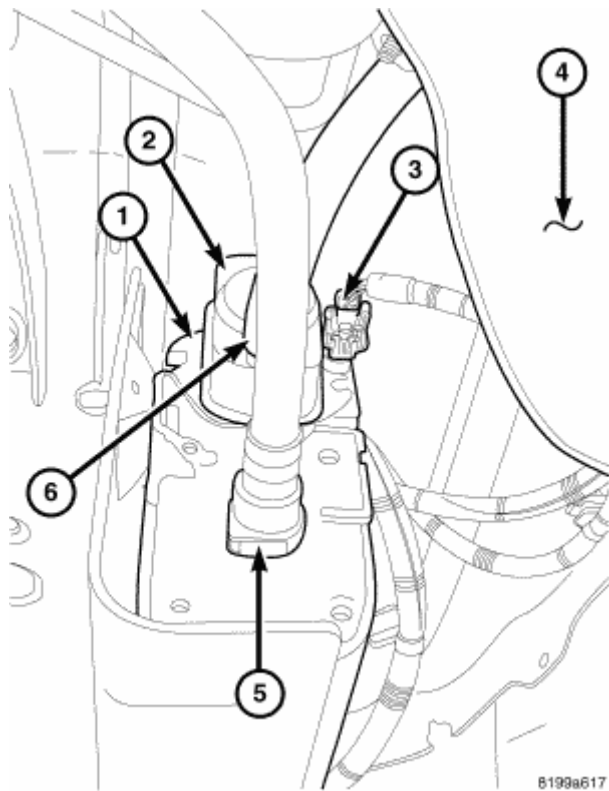


Fig. 24: Identifying EVAP Canister, ESIM Switch, Electrical Connector, Plastic Splash Shield, Quick-Connect Fitting & Rubber Hose
Courtesy of CHRYSLER LLC

The EVAP canister (1) is located under the vehicle behind the plastic splash shield (4) used for the left/rear tire. The ESIM switch (2) is attached to the EVAP canister.

1. Raise and support vehicle.
2. Clean dirt or debris from canister vacuum lines.
3. Disconnect electrical connector (3) at ESIM switch (2).
4. Disconnect rubber hose (6) from ESIM switch (2).
5. Disconnect quick-connect fitting (5) at EVAP canister.

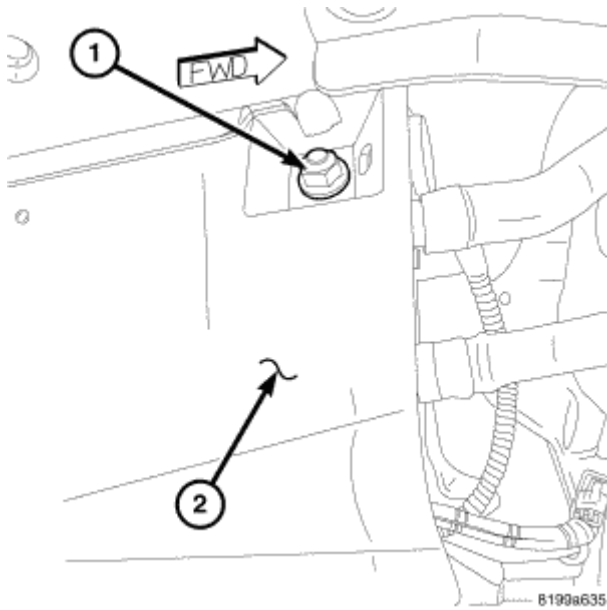


Fig. 25: Identifying Nut/Bolt & Mounting Bracket
 Courtesy of CHRYSLER LLC

6. Remove nut/bolt (1) at front of canister mounting bracket (2).

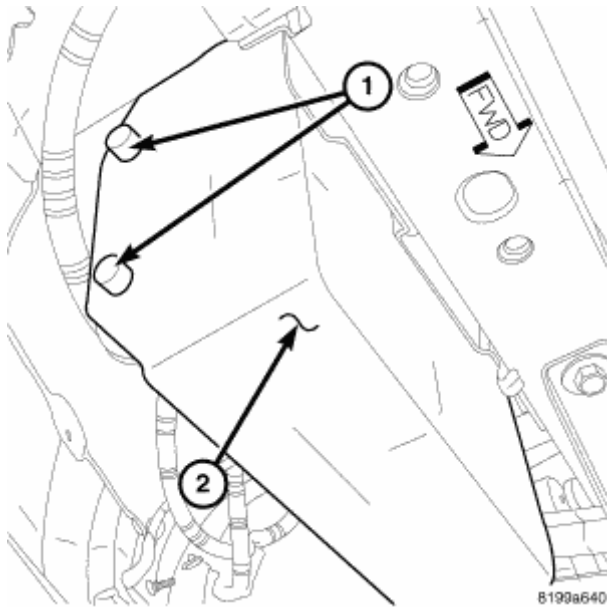


Fig. 26: Identifying Pins & Bracket
 Courtesy of CHRYSLER LLC

7. To remove canister, pull straight forward until pins (1) have cleared bracket (2).

INSTALLATION

INSTALLATION

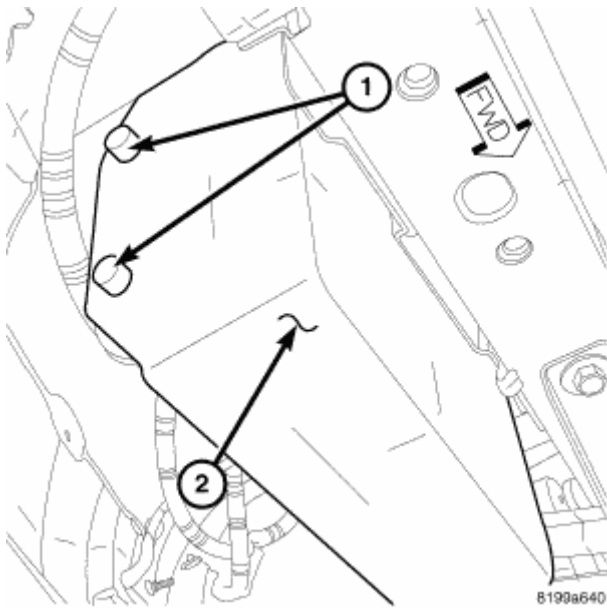


Fig. 27: Identifying Pins & Bracket
 Courtesy of CHRYSLER LLC

1. Position canister locating pins (1) into bracket (2).

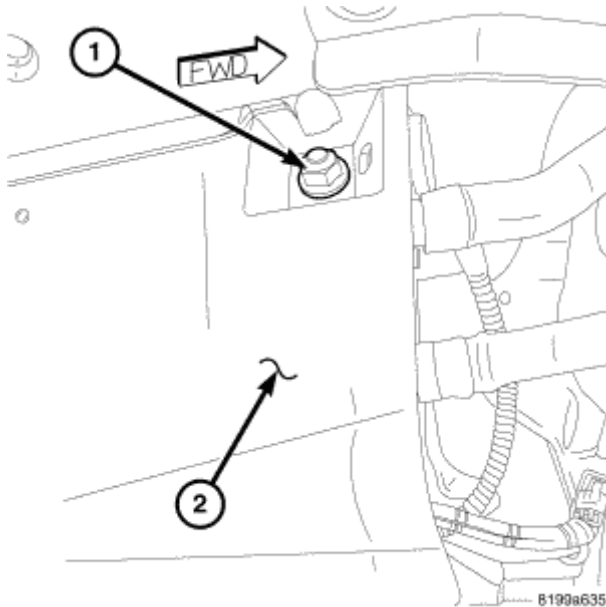


Fig. 28: Identifying Nut/Bolt & Mounting Bracket
 Courtesy of CHRYSLER LLC

2. Install nut/bolt (1) at front of canister mounting bracket (2).

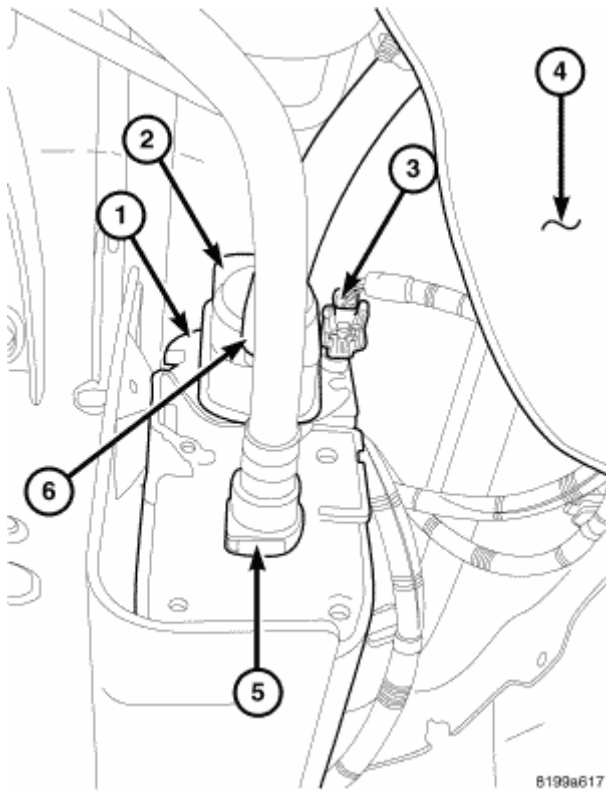


Fig. 29: Identifying EVAP Canister, ESIM Switch, Electrical Connector, Plastic Splash Shield, Quick-Connect Fitting & Rubber Hose
 Courtesy of CHRYSLER LLC

3. Clean dirt or debris from canister vacuum lines.
4. Connect electrical connector (3) to ESIM switch (2).
5. Connect rubber hose (6) to ESIM switch (2).
6. Connect quick-connect fitting (5) to EVAP canister.
7. Lower vehicle.

HEATER-CRANKCASE 2.8L DIESEL

REMOVAL

REMOVAL

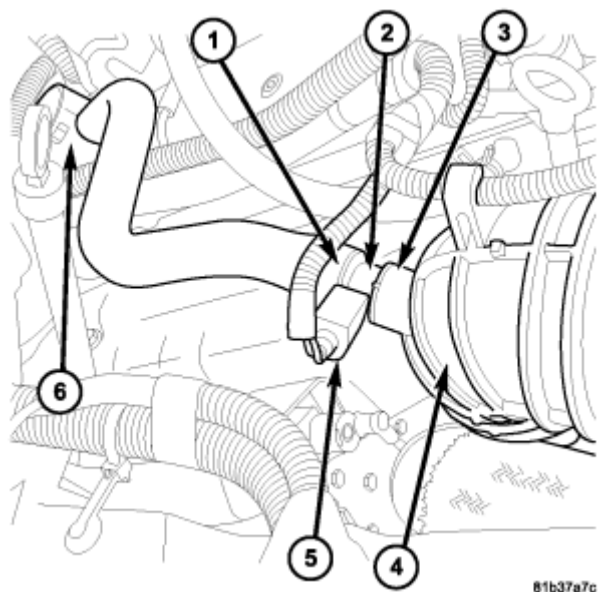


Fig. 30: Identifying Hoses, Crankcase Heater, Crankcase Breather & Electrical Connector
 Courtesy of CHRYSLER LLC

The crankcase heater (2) is located in the hose (1) leading to the crankcase breather (6).

1. Disconnect electrical connector (5).
2. Separate hose (1) from heater.
3. Separate heater from hose (3).

INSTALLATION

INSTALLATION

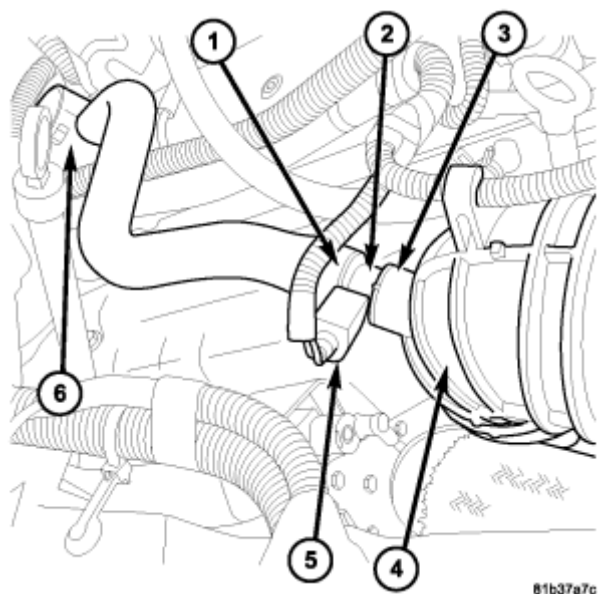


Fig. 31: Identifying Hoses, Crankcase Heater, Crankcase Breather & Electrical Connector
Courtesy of CHRYSLER LLC

The crankcase heater (2) is located in the hose (1) leading to the crankcase breather (6).

1. Twist heater (2) into hose (3).
2. Twist hose (1) into heater.
3. Connect electrical connector (5).

EXHAUST GAS RECIRCULATION - EXCEPT DIESEL

VALVE - EGR 3.7L

REMOVAL

VALVE - EGR - 3.7L

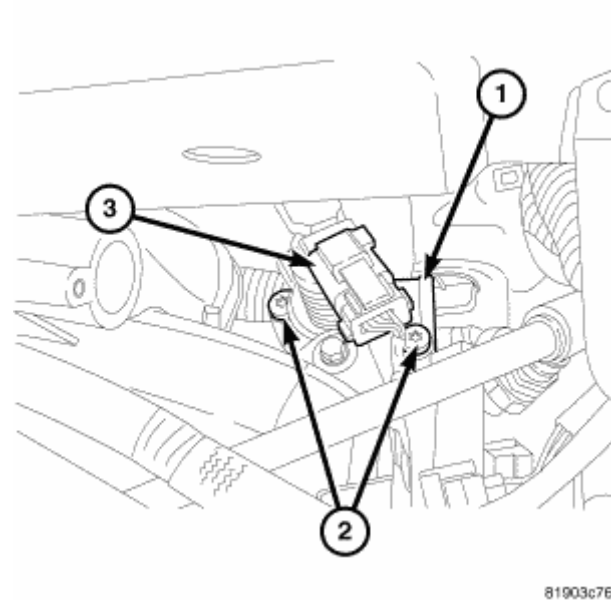


Fig. 32: EGR Valve Solenoid Location
Courtesy of CHRYSLER LLC

The electronic EGR valve and solenoid assembly (1) is attached to the rear of the left cylinder head.

1. Use a diagnostic scan tool to record any DTC's (Diagnostic Trouble Codes).
2. Disconnect and isolate the negative battery cable.

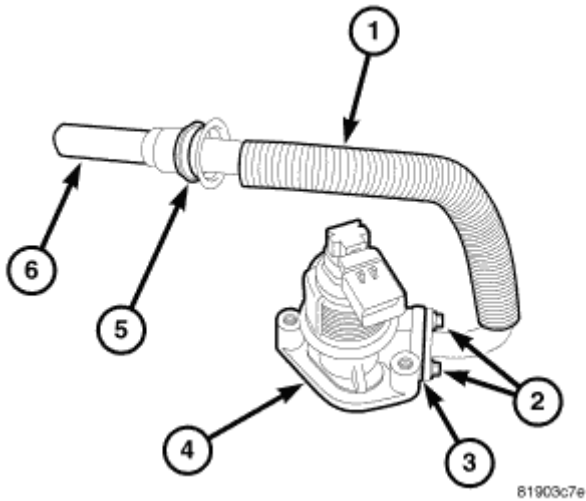


Fig. 33: Removing/Installing EGR Solenoid/Tube Assembly
 Courtesy of CHRYSLER LLC

An exhaust gas routing tube (1) connects the EGR valve (4) to the intake manifold.

3. Remove two tube mounting bolts (2).
4. Remove tube (1) from solenoid (4). Slip opposite end of tube (6) from intake manifold.
5. Remove gasket (3) located between EGR valve solenoid and tube flange.

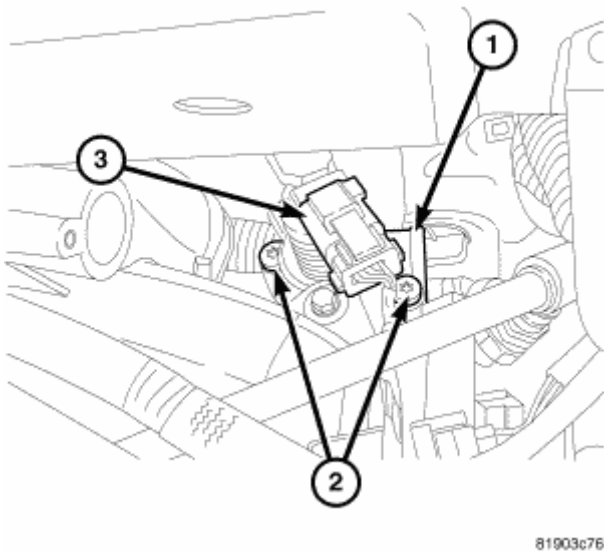


Fig. 34: EGR Valve Solenoid Location
 Courtesy of CHRYSLER LLC

6. Disconnect electrical connector (3) at solenoid (1).
7. Remove two EGR valve solenoid mounting bolts (2).
8. Remove solenoid (1) from engine.

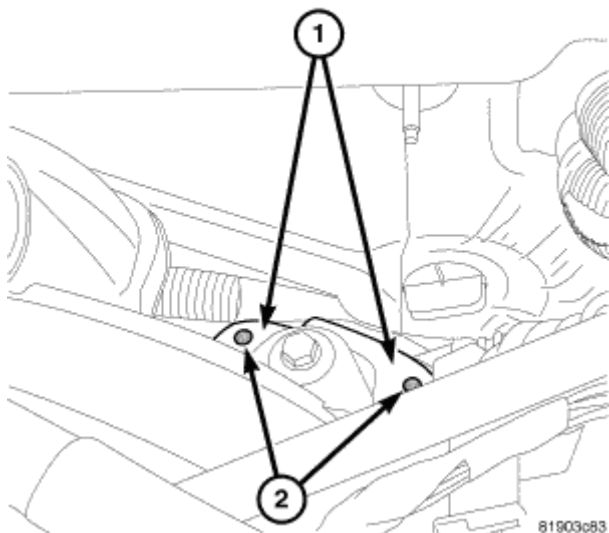


Fig. 35: EGR Valve Solenoid Gasket
 Courtesy of CHRYSLER LLC

9. Remove and discard gasket (1) located under EGR solenoid.

INSTALLATION

VALVE - EGR - 3.7L

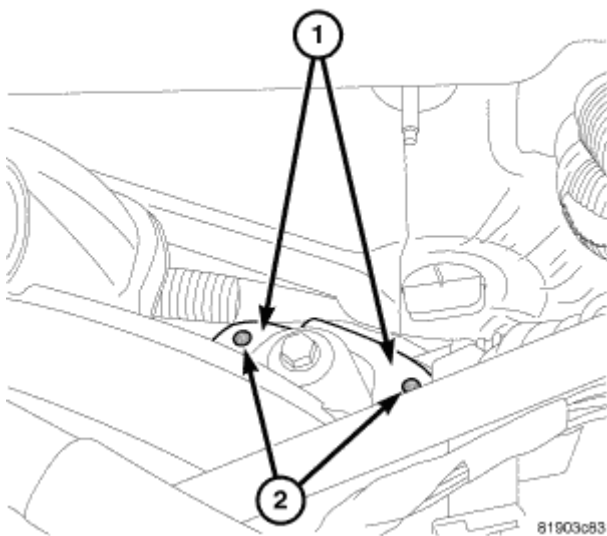
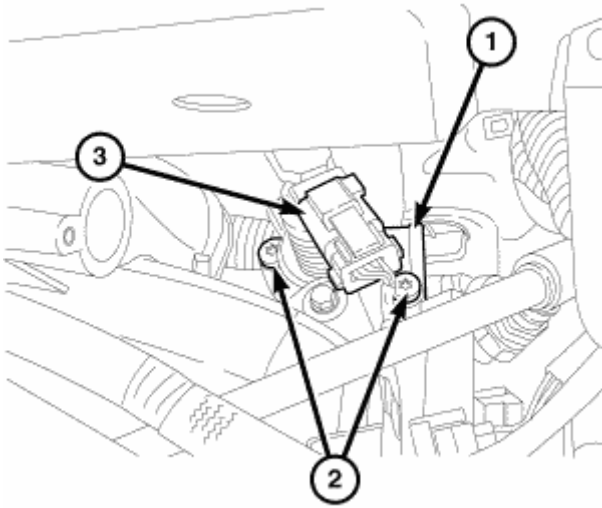


Fig. 36: EGR Valve Solenoid Gasket
 Courtesy of CHRYSLER LLC

1. Clean gasket area (1) at rear of left cylinder head where it joins base of EGR valve.
2. Clean EGR tube where it joins EGR valve.

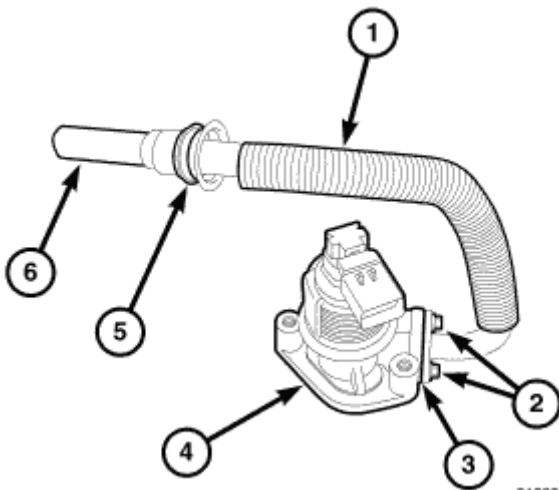
3. Position new gasket between EGR valve and cylinder head.



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Fig. 37: EGR Valve Solenoid Location
Courtesy of CHRYSLER LLC

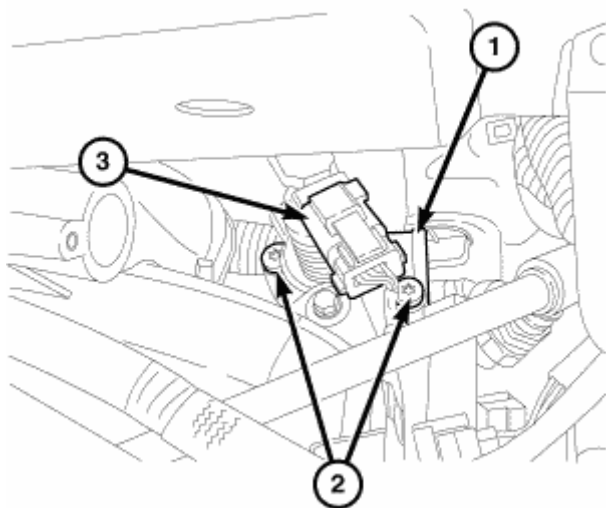
4. Position EGR valve to cylinder head. Install and tighten two bolts (2). Tighten to 9 N.m (80 in. lbs.).



81903c7e

Fig. 38: Removing/Installing EGR Solenoid/Tube Assembly
Courtesy of CHRYSLER LLC

5. Position new gasket (3) between EGR tube flange and EGR valve assembly.
6. Position EGR tube (1) to side of EGR valve. Position end of tube (6) into intake manifold. Install two bolts (2). Tighten to 11 N.m (97 in. lbs.).



81903c76

Fig. 39: EGR Valve Solenoid Location
Courtesy of CHRYSLER LLC

7. Connect electrical connector (3) to top of EGR valve solenoid (1).
8. Connect negative battery cable.
9. Using a diagnostic scan tool, erase any previously recorded DTC's (Diagnostic Trouble Codes).

EXHAUST GAS RECIRCULATION - 2.8L DIESEL

SPECIFICATIONS

TORQUE

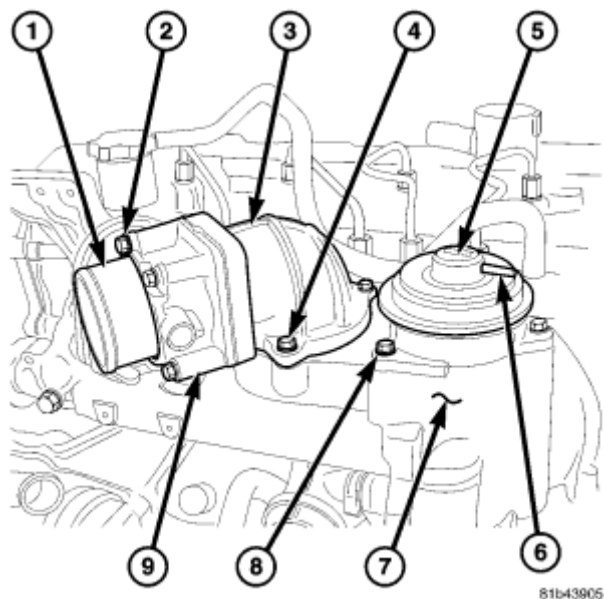
TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
EGR Mounting Bolts - 2.8L Diesel	15	11	-
EGR Airflow Control Valve - 2.8L Diesel	11	8	-

VALVE - EGR 2.8L

REMOVAL

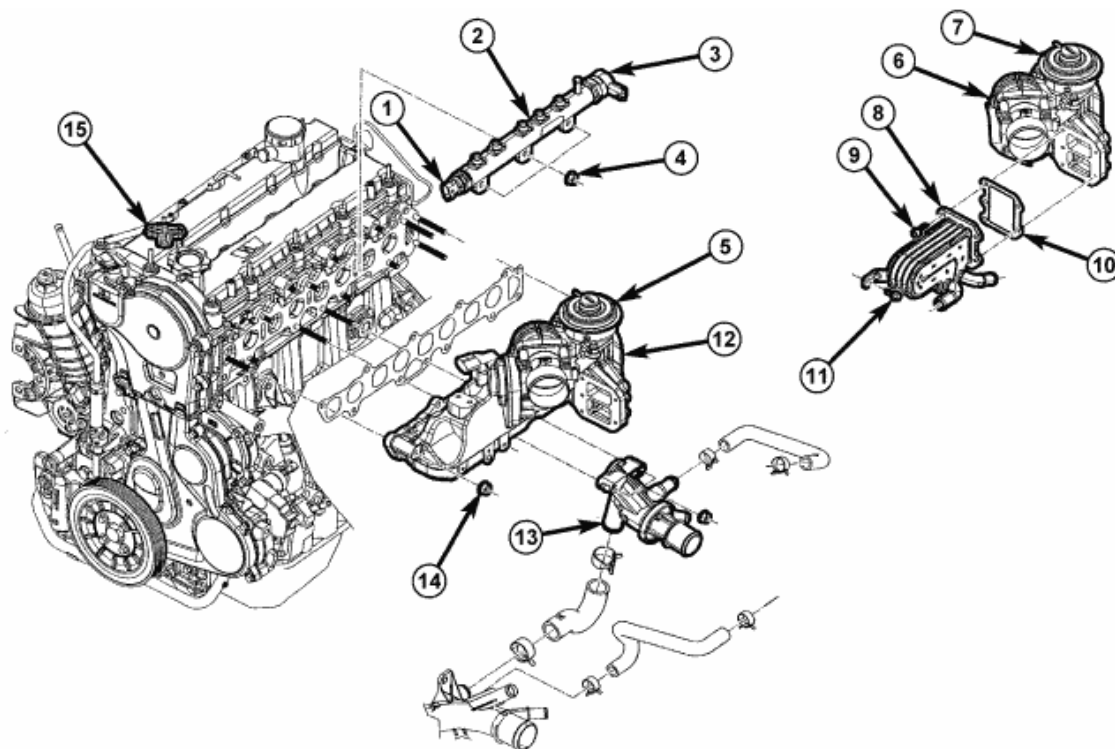
REMOVAL



81b43905

Fig. 40: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

The EGR valve (5) is located at the rear of the intake manifold (7).



81b2ac70

Fig. 41: Exploded View Of Fuel Rail - 2.8L Diesel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate negative battery cable at battery.

2. Remove plastic engine cover.
3. Relieve cooling system pressure and remove EGR cooler (8). Refer to **COOLING** for removal procedures.

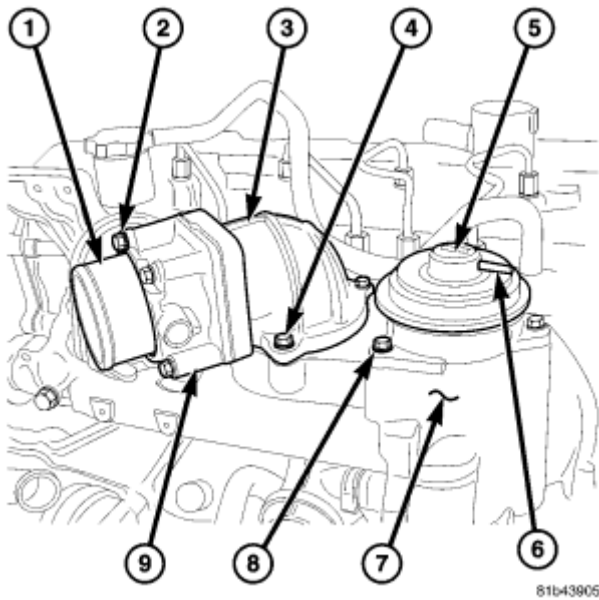


Fig. 42: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

4. Remove vacuum line from fitting (6).
5. Remove EGR valve mounting bolts (8) and remove EGR valve (5) from intake manifold.
6. Remove and discard old mounting gasket located between EGR valve and intake manifold.
7. Clean mounting areas at bottom of valve and at top of intake manifold.

INSTALLATION

INSTALLATION

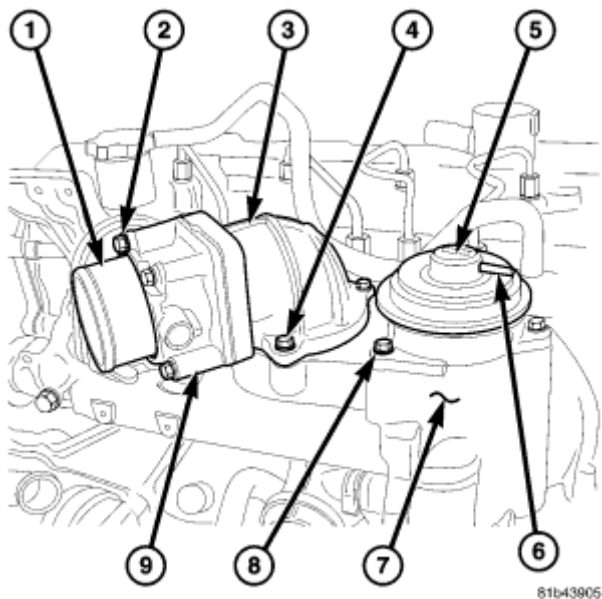
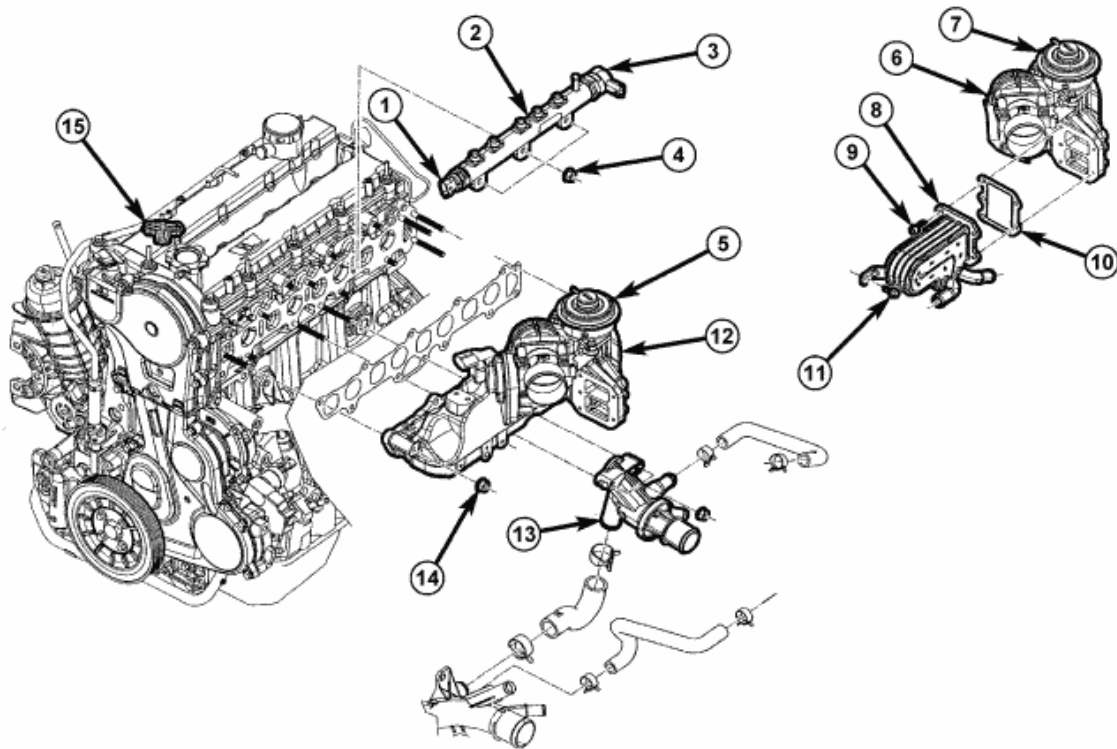


Fig. 43: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

The EGR valve (5) is located at the rear of the intake manifold (7).

1. Clean mounting areas at bottom of EGR valve and at top of intake manifold.
2. Place new mounting gasket between EGR valve and intake manifold.
3. Install EGR valve (5) and mounting bolts (8) to intake manifold. Tighten bolts to 15 N.m (11 ft. lbs.) torque.
4. Connect vacuum line to fitting (6).



81b2ac70

Fig. 44: Exploded View Of Fuel Rail - 2.8L Diesel
Courtesy of CHRYSLER LLC

5. Install EGR cooler (8). Refer to **COOLING** for removal procedures.
6. Install plastic engine cover.
7. Connect and negative battery cable to battery.

SOLENOID-EGR

REMOVAL

REMOVAL

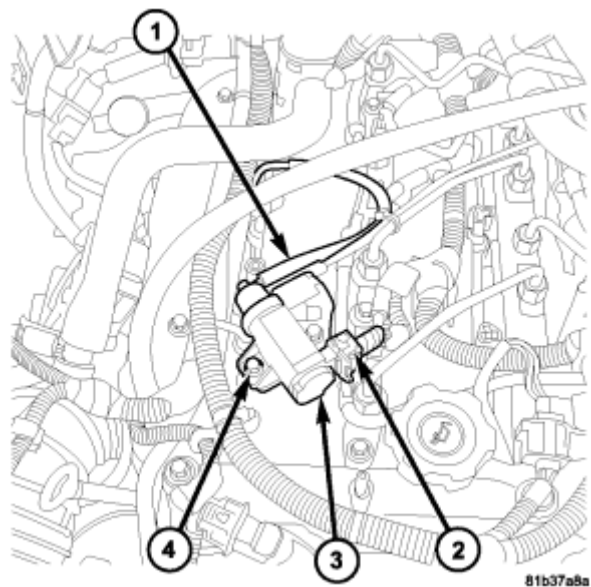


Fig. 45: Identifying Vacuum/Pressure Lines, Electrical Connector, EGR Solenoid & Mounting Bolts
Courtesy of CHRYSLER LLC

The EGR Solenoid (3) is located on the top of valve cover.

1. Remove plastic engine cover.
2. Disconnect electrical connector (2).
3. Disconnect vacuum/pressure lines (1).
4. Remove two mounting bolts (4) and remove solenoid.

INSTALLATION

INSTALLATION

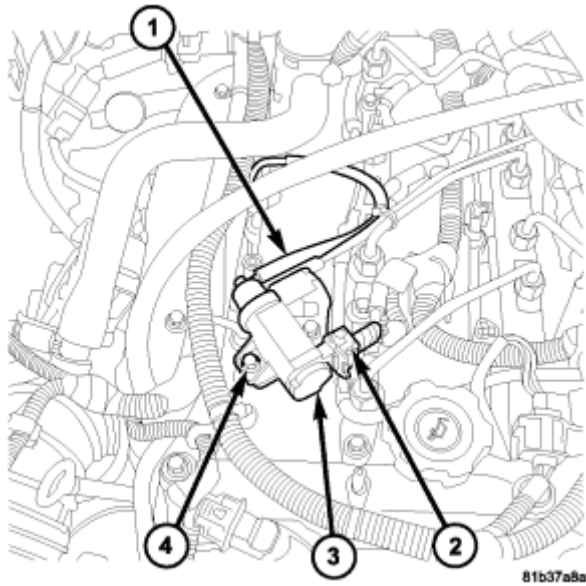


Fig. 46: Identifying Vacuum/Pressure Lines, Electrical Connector, EGR Solenoid & Mounting Bolts
Courtesy of CHRYSLER LLC

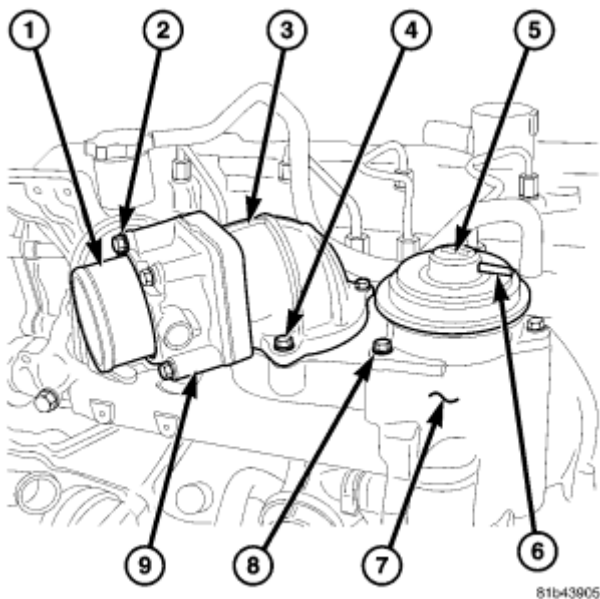
The EGR Solenoid (3) is located on the top of valve cover.

1. Position solenoid (3) to valve cover and install two mounting bolts (4).
2. Connect electrical connector (2).
3. Connect vacuum/pressure lines (1).
4. Install plastic engine cover.

VALVE-EGR AIR FLOW CONTROL

REMOVAL

REMOVAL

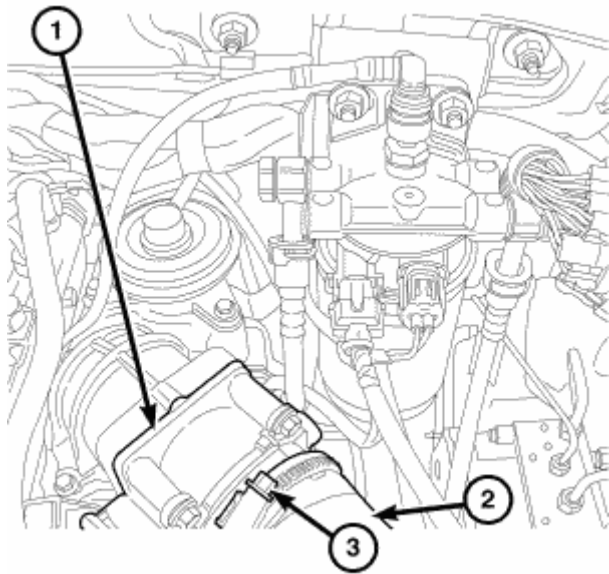


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Fig. 47: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

The EGR air control valve (9) is located near the center of the intake manifold (7). A cast intake housing (3) connects the control valve to the intake manifold.

1. Disconnect and isolate negative battery cable at battery.
2. Remove plastic engine cover.

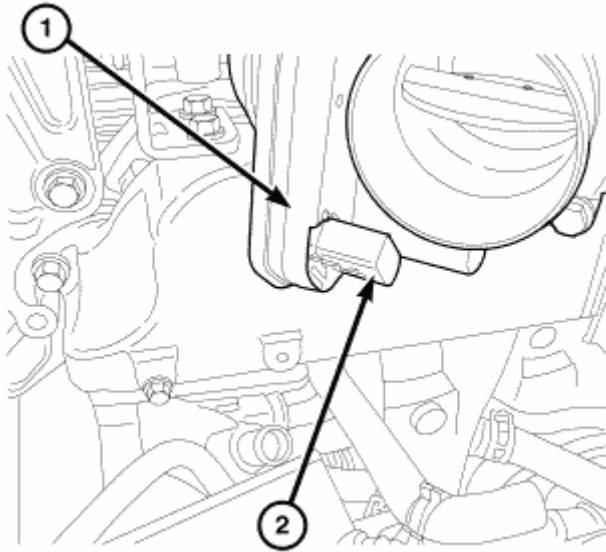


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Fig. 48: Identifying Air Control Valve, Rubber Tube & Rubber Intake Tube Clamp
Courtesy of CHRYSLER LLC

3. Remove rubber intake tube clamp (3).

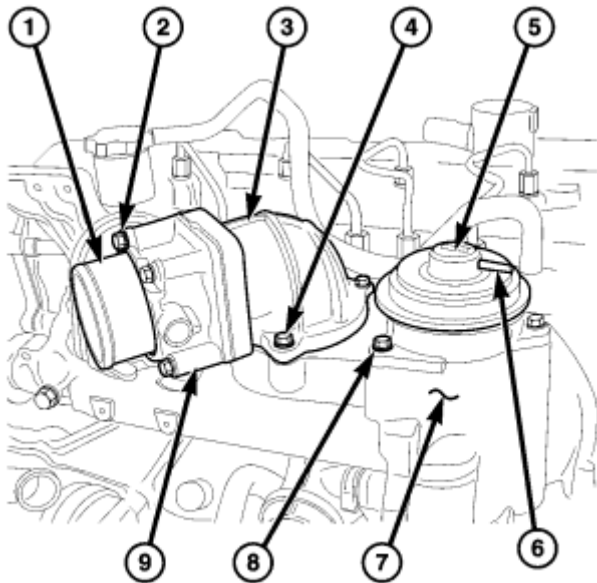
4. Disconnect rubber tube (2) from air control valve (1).



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Fig. 49: Disconnecting/Connecting Air Control Valve Electrical Connector From/To Control Valve At Point
Courtesy of CHRYSLER LLC

5. Disconnect air control valve electrical connector from control valve at point (2).



81b43805

Fig. 50: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

6. Remove EGR air control valve mounting bolts (2) and remove valve (9).
7. Remove and discard old mounting gasket located between EGR air control valve (9) and intake manifold

connecting housing (3).

8. Clean mounting areas at bottom of air control valve and at intake manifold connecting housing (3).

INSTALLATION

INSTALLATION

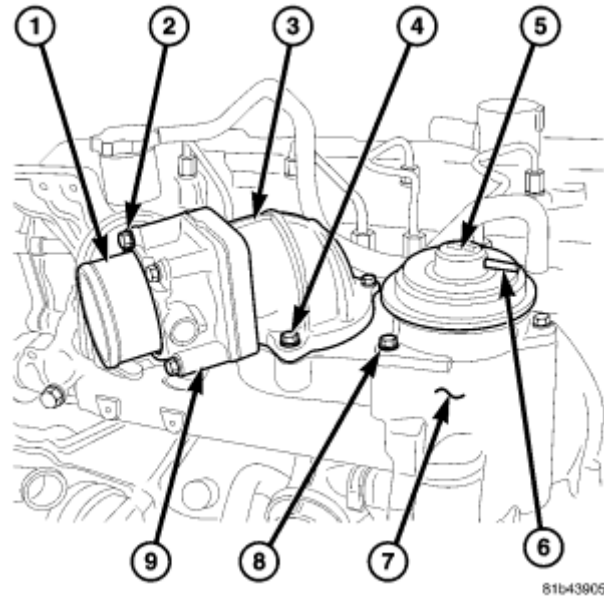
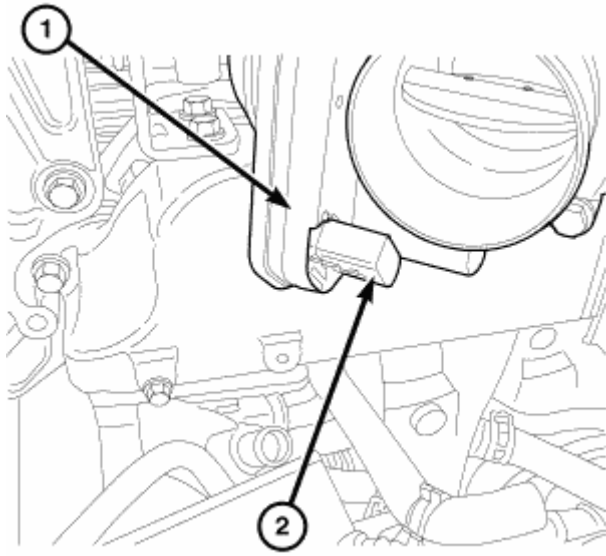


Fig. 51: Identifying EGR Valve/EGR Airflow Control Valve
Courtesy of CHRYSLER LLC

The EGR air control valve (9) is located near the center of the intake manifold (7). A cast intake housing (3) connects the control valve to the intake manifold.

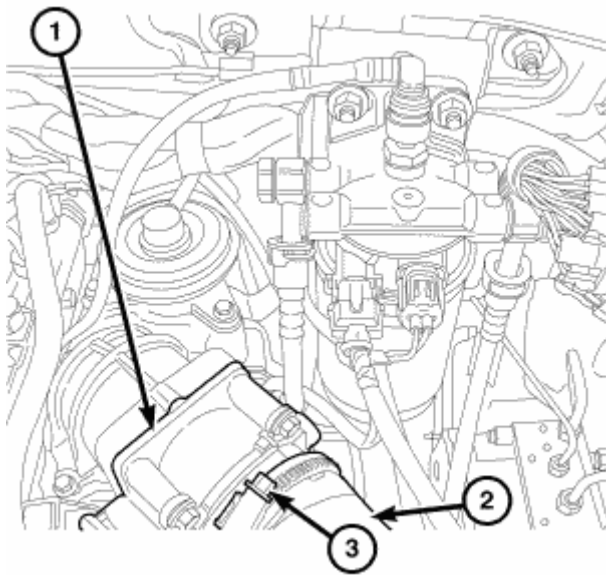
1. Clean mounting areas at bottom of air control valve and at intake manifold connecting housing (3).
2. Install new mounting gasket between EGR air control valve (9) and intake manifold connecting housing (3).
3. Install EGR air control valve and mounting bolts (2). Tighten bolts to 13 N.m (10 ft. lbs.) torque.



81b467c2

Fig. 52: Disconnecting/Connecting Air Control Valve Electrical Connector From/To Control Valve At Point
 Courtesy of CHRYSLER LLC

4. Connect air control valve electrical connector to control valve at point (2).



81b467c8

Fig. 53: Identifying Air Control Valve, Rubber Tube & Rubber Intake Tube Clamp
 Courtesy of CHRYSLER LLC

5. Connect rubber tube (2) to air control valve (1).
6. Install and tighten rubber intake tube clamp (3).
7. Install plastic engine cover.
8. Connect negative battery cable to battery.

ON-BOARD DIAGNOSTICS

DESCRIPTION

GLOSSARY OF TERMS

APPS	Accelerator Pedal Position Sensor
AAT	Ambient Air Temperature
ABS	Anti-Lock Brake System
ASD	Auto Shut Down
BARO	Barometric
CGW	Central Gateway
CKP	Crankshaft Position Sensor
CMP	Camshaft Position Sensor
CMTC	Compass/Mini-Trip Computer
DCHA	Diesel Cabin Heater Assist
DLC	Data Link Connector
DTC	Diagnostic Trouble Code
EATX	Electronic Automatic Transaxle
ECT	Engine Coolant Temperature
ECM	Engine Control Module
EGR	Exhaust Gas Recirculation
ETC	Electronic Throttle Control
GEN	Generator
GPEC	Global Powertrain Engine Controller
FCM	Front Control Module
FDCM	Final Drive Control Module
IAT	Intake/Inlet Air Temperature
IAC	Idle Air Control
IOD	Ignition Off-Draw
IPM	Integrated Power Module
JTEC	Jeep Truck Engine Controller
KS	Knock Sensor
LDP	Leak Detection Pump
MAP	Manifold Air Pressure
MDS	Multi Displacement System
MIC	Mechanical Instrument Cluster
MIL	Malfunction Indicator Lamp
MTV	Manifold Tuning Valve
NGC	Next Generation Controller
NVLD	Natural Vacuum Leak Detection
O2S	Oxygen Sensor

OBD	On Board Diagnostic
PDC	Power Distribution Center
PCI	Programmable Communication Interface
PCM	Powertrain Control Module
PCV	Positive Crankcase Ventilation
PEP	Peripheral Expansion Port
SBEC	Single Board Engine Controller
SCM	Steering Control Module
S/C	Speed Control
SKIM	Sentry Key Immobilizer Module
SKIS	Sentry Key Immobilizer System
SKREEM	Sentry Key Remote Entry Module
SKREES	Sentry Key Remote Entry System
SOL	Solenoid
SRV	Short Runner Valve
TCM	Transmission Control Module
TCC	Torque Converter Clutch
TIP	Throttle Inlet Pressure
TIPM	Totally Integrated Power Module
TP	Throttle Position
TPMS	Tire Pressure Monitor System
TRS	Transmission Range Sensor
VSS	Vehicle Speed Sensor/Signal
WCM	Wireless Control Module

OPERATION

OBDII MONITOR RUN PROCESS

The following procedure has been established to assist technicians in the field with enabling and running OBD II Monitors. The order listed in the following procedure is intended to allow the technician to effectively complete each monitor and to set the CARB Readiness Status in the least time possible.

NOTE: Once the monitor run process has begun, do not turn off the ignition. By turning the ignition key off, monitor enabling conditions will be lost. EVAP Monitor runs after key off. By performing a Battery Disconnect, or Selecting Erase DTCs, the CARB Readiness and all additional OBD II information will be cleared.

Monitor Preliminary Checks:

1. Plug a scan tool into the vehicle's Data Link Connector (DLC).
2. Turn the ignition, KEY ON - ENGINE OFF. Watch for MIL lamp illumination during the bulb check.

MIL lamp must have illuminated, if not, repair MIL lamp.

3. Using a scan tool check for Powertrain related DTCs.

Verify that No Emissions Related DTCs are Present. If an Emissions DTC is Present, the OBD II Monitors may not run and the CARB Readiness will not update.

The Emissions related DTC, will need to be repaired, then cleared. By clearing DTCs, the OBD Monitors will need to be run and completed to set the CARB Readiness Status.

Using the scan tool check the CARB Readiness Status.

Do all the CARB Readiness Status Locations read YES?

YES - all monitors have been completed and this vehicle is ready to be I/M or Emission Tested.

NO - then the following procedure needs to be followed to run/complete all available monitors.

NOTE: Only the monitors, which are not YES in the CARB Readiness Status, need to be completed. Specific criteria need to be met for each monitor. The most efficient order to run the monitors has been outlined below, including suggestions to aid the process.

Evaporative Emission System Leak Detection with Purge Monitor

This monitor requires a cool down cycle, usually an overnight soak for at least 8 hours without the engine running. The ambient temperature must decrease overnight - parking the vehicle outside is advised. To run this test the fuel level must be between 15-85% full. Criteria for EVAP monitor:

Engine off time greater than one hour.

Fuel Level between 15% and 85%.

Start Up ECT and IAT within 10°C (18°F).

Vehicle started and run until Purge Monitor reports a result.

NOTE: If the vehicle does not report a result and the conditions where correct. It may take up to two weeks to fail the small leak monitor. DO NOT use this test to attempt to determine a fault. Use the appropriate service information procedure for finding a small leak. If there are no faults and the conditions are correct this test will run and report a pass. Note the Small leak test can find leaks less than 10 thousands of an inch. If a small leak is present it takes approximately one week of normal driving to report a failure.

Catalyst / O2 Monitor

The Catalyst and O2 Monitor information are acquired and processed at the same time. Most vehicles will need to be driven at highway speed (less than 50 mph) (73km/h) for a few minutes. Some vehicles run the monitor at idle in drive. If the vehicle is equipped with a manual transmission, using 4th gear may assist in meeting the monitor running criteria.

Engine RPM between 1200 to 3000.

Engine temperature greater than 70°C (158°F)

Engine run time greater than 92 seconds

MAP between 10 - 20 kPa (7.5 - 15 Hg)

Vehicle speed between 20 - 70 mph (29-103 km/h)

EGR Monitor

After the vehicle has reached the below conditions and during a throttle decel the EGR monitor will run.

Engine RPM between 1375 - 2500

Engine temperature greater than 70°C (158°F)

Engine run time greater than 125 seconds

Vehicle speed between 25 - 70 mph (37-103 km/h)

O2 Sensor Heater Monitor

This monitor is now continuously running once the heaters are energized. Pass information will be processed at power down.

Mis-Fire Monitor

The Misfire Monitor is a continuous two-trip monitor. The monitor uses two different tests/counters:

NOTE: **The Adaptive Numerator must be learned before the PCM will run the Mis-Fire Monitor. The PCM updates the Adaptive Numerator at every key-ON, and is relearned after battery disconnect. The Misfire Monitor will not run until the Adaptive Numerator has updated since the last battery disconnect. If the Adaptive Numerator is equal to the default value then the PCM knows that the Adaptive Numerator has not been learned and does not permit the Misfire Monitor to run. If the Adaptive Numerator exceeds a calibrated percentage, the PCM sets a DTC for CKP NOT LEARNED and illuminates the MIL.**

200 Revolution Counter - Looks for misfire that can cause immediate catalyst damage.

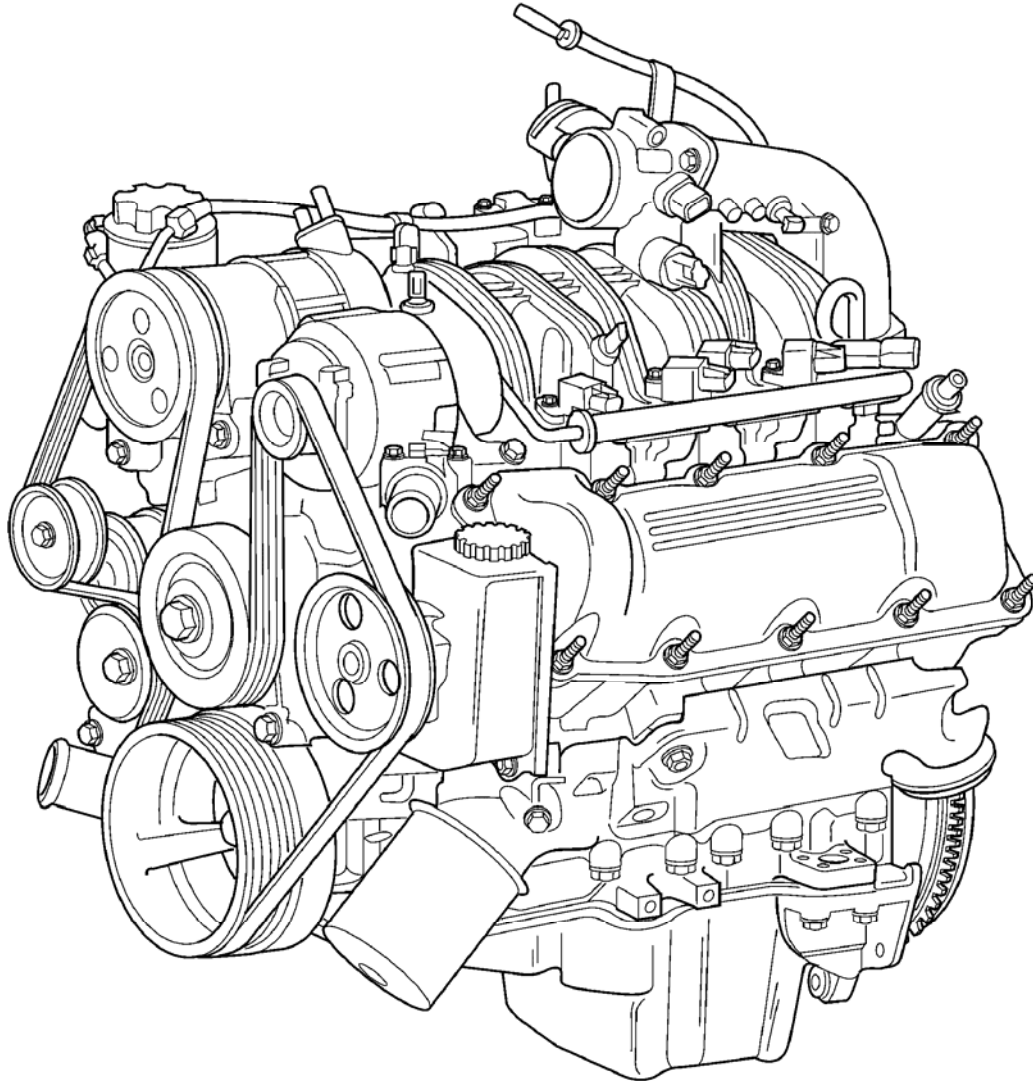
1000 Revolution Counter - Looks for misfire that can cause emissions to increase 1.5 times the Federal Test Procedure (FTP) standards. This test must also identify misfire percentages that might cause a "durability demonstration vehicle" to fail an Inspection and Maintenance Program tailpipe emissions test.

2008 ENGINE

3.7L - Service Information - Liberty

DESCRIPTION

3.7L ENGINE DESCRIPTION



80ccc15e

Fig. 1: 3.7L Engine
Courtesy of CHRYSLER LLC

The 3.7 liter (226 CID) six-cylinder engine is an 90° single overhead camshaft engine. The cast iron cylinder block is made up of two different components; the first component is the cylinder bore and upper block, the second component is the bedplate that comprises the lower portion of the cylinder block and houses the lower

half of the crankshaft main bearings. The cylinders are numbered from front to rear with the left bank being numbered 1,3, and 5 and the right bank being numbered 2,4, and 6. The firing order is 1-6-5-4-3-2. The engine serial number is located at the right front side of the engine block. See **Fig. 1**.

DIAGNOSIS AND TESTING

CYLINDER COMBUSTION PRESSURE LEAKAGE

The combustion pressure leakage test provides an accurate means for determining engine condition.

Combustion pressure leakage testing will detect:

- Exhaust and intake valve leaks (improper seating).
- Leaks between adjacent cylinders or into water jacket.
- Any causes for combustion/compression pressure loss.

1. Check the coolant level and fill as required. DO NOT install the radiator cap.
2. Start and operate the engine until it attains normal operating temperature, then turn the engine OFF.
3. Remove the spark plugs.
4. Remove the oil filler cap.
5. Remove the air cleaner.
6. Calibrate the tester according to the manufacturer's instructions. The shop air source for testing should maintain 483 kPa (70 psi) minimum, 1,379 kPa (200 psi) maximum and 552 kPa (80 psi) recommended.
7. Perform the test procedures on each cylinder according to the tester manufacturer's instructions. Set piston of cylinder to be tested at TDC compression. While testing, listen for pressurized air escaping through the throttle body, tailpipe and oil filler cap opening. Check for bubbles in the radiator coolant.

All gauge pressure indications should be equal, with no more than 25% leakage.

FOR EXAMPLE: At 552 kPa (80 psi) input pressure, a minimum of 414 kPa (60 psi) should be maintained in the cylinder.

Refer to **CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART**.

CYLINDER COMBUSTION PRESSURE LEAKAGE DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
AIR ESCAPES THROUGH THROTTLE BODY	Intake valve bent, burnt, or not seated properly	Inspect valve and valve seat. Reface or replace, as necessary. Inspect valve springs. Replace as necessary.
AIR ESCAPES THROUGH TAILPIPE	Exhaust valve bent, burnt, or not seated properly	Inspect valve and valve seat. Reface or replace, as necessary. Inspect valve springs. Replace as necessary.

AIR ESCAPES THROUGH RADIATOR	Head gasket leaking or cracked cylinder head or block	Remove cylinder head and inspect. Replace defective part
MORE THAN 50% LEAKAGE FROM ADJACENT CYLINDERS	Head gasket leaking or crack in cylinder head or block between adjacent cylinders	Remove cylinder head and inspect. Replace gasket, head, or block as necessary
MORE THAN 25% LEAKAGE AND AIR ESCAPES THROUGH OIL FILLER CAP OPENING ONLY	Stuck or broken piston rings; cracked piston; worn rings and/or cylinder wall	Inspect for broken rings or piston. Measure ring gap and cylinder diameter, taper and out-of-round. Replace defective part as necessary

CYLINDER COMPRESSION PRESSURE

The results of a cylinder compression pressure test can be utilized to diagnose several engine malfunctions.

Ensure the battery is completely charged and the engine starter motor is in good operating condition. Otherwise the indicated compression pressures may not be valid for diagnosis purposes.

1. Clean the spark plug recesses with compressed air.
2. Remove the spark plugs.
3. Secure the throttle in the wide-open position.
4. Disable the fuel system Refer to **OPERATION** .
5. Remove the ASD relay. Refer to **REMOVAL** .
6. Insert a compression pressure gauge and rotate the engine with the engine starter motor for three revolutions.
7. Record the compression pressure on the 3rd revolution. Continue the test for the remaining cylinders.
8. See **SPECIFICATIONS** for the correct engine compression pressures.

ENGINE DIAGNOSIS - INTRODUCTION

Engine diagnosis is helpful in determining the causes of malfunctions not detected and remedied by routine maintenance.

These malfunctions may be classified as either performance (e.g, engine idles rough and stalls) or mechanical (e.g, a strange noise).

See **ENGINE PERFORMANCE DIAGNOSTIC TABLE** and **ENGINE MECHANICAL DIAGNOSTIC TABLE**. For possible causes and corrections of malfunctions, refer to **DIAGNOSIS AND TESTING** .

Additional tests and diagnostic procedures may be necessary for specific engine malfunctions that can not be isolated with the Service Diagnosis charts. Information concerning additional tests and diagnosis is provided within the following diagnosis:

Cylinder Compression Pressure Test. See **CYLINDER COMPRESSION PRESSURE**.

Cylinder Combustion Pressure Leakage Test. See **CYLINDER COMBUSTION PRESSURE**

LEAKAGE.

Engine Cylinder Head Gasket Failure Diagnosis. See **CYLINDER HEAD GASKET.**

Intake Manifold Leakage Diagnosis. See **INTAKE MANIFOLD LEAKS.**

ENGINE LUBRICATION DIAGNOSTIC TABLE

CONDITION	POSSIBLE CAUSES	CORRECTION
OIL LEAKS	1. Gaskets and O-Rings. (a) Misaligned or damaged. (b) Loose fasteners, broken or porous metal parts. 2. Crankshaft rear seal 3. Crankshaft seal flange. Scratched, nicked or grooved. 4. Oil pan flange cracked. 5. Timing chain cover seal damaged. 6. Scratched or damaged vibration damper hub.	- (a) Replace as necessary. (b) Tighten fasteners, Repair or replace metal parts. 2. Replace as necessary. See <u>REMOVAL.</u> 3. Polish or replace crankshaft. 4. Replace oil pan. See <u>REMOVAL.</u> 5. Reseal timing cover. 6. Polish or replace damper.
OIL PRESSURE DROP	1. Low oil level. 2. Faulty oil pressure sending unit. 3. Low oil pressure. 4. Clogged oil filter. 5. Worn oil pump. 6. Thin or diluted oil. 7. Excessive bearing clearance. 8. Oil pump relief valve stuck. 9. Oil pick up tube loose, damaged or clogged.	1. Check and correct oil level. 2. Replace sending unit. See <u>REMOVAL.</u> 3. Check oil pump and bearing clearance. 4. Replace oil filter. See <u>REMOVAL.</u> 5. Replace oil pump. See <u>REMOVAL.</u> 6. Change oil and filter. 7. Replace as necessary. 8. Replace oil pump. See <u>REMOVAL.</u> 9. Replace as necessary.
OIL PUMPING AT RINGS; SPARK PLUGS FOULING	1. Worn or damaged rings. 2. Carbon in oil ring slots. 3. Incorrect ring size installed. 4. Worn valve guides.	1. Hone cylinder bores and replace rings. 2. Replace rings. See <u>STANDARD PROCEDURE.</u> 3. Replace rings. See <u>STANDARD PROCEDURE.</u> 4. Ream guides and replace valves. See <u>STANDARD PROCEDURE.</u>

5. Leaking valve guide seals.

5. Replace valve guide seals.

ENGINE MECHANICAL DIAGNOSTIC TABLE

CONDITION	POSSIBLE CAUSES	CORRECTIONS
NOISY VALVES	1. High or low oil level in crankcase. 2. Thin or diluted oil. 3. Low oil pressure. 4. Dirt in lash adjusters. 5. Worn rocker arms. 6. Worn valve guides. 7. Excessive runout of valve seats.	1. Refer to <u>SPECIFICATIONS</u> . 2. Change oil and filter. 3. Check oil pump, if OK, check rod and main bearings for excessive wear. 4. Clean or replace as necessary. 5. Replace as necessary. 6. See <u>STANDARD PROCEDURE</u> . 7. Service valves and valve seats. See <u>STANDARD PROCEDURE</u> .
ENGINE VIBRATION	1. Counter Balance Shaft not timed properly	1. Refer to <u>VALVE TIMING</u>
CONNECTING ROD NOISE	1. Insufficient oil supply. 2. Low oil pressure. 3. Thin or diluted oil. 4. Excessive bearing clearance. 5. Connecting rod journal out-of-round. 6. Misaligned connecting rods.	1. Refer to <u>SPECIFICATIONS</u> . 2. Check oil pump, if OK, check rod and main bearings for excessive wear. 3. Change oil and filter. 4. Replace as necessary. 5. Service or replace crankshaft. 6. Replace bent connecting rods.
MAIN BEARING NOISE	1. Insufficient oil supply. 2. Low oil pressure. 3. Thin or diluted oil. 4. Excessive bearing clearance. 5. Excessive end play. 6. Crankshaft journal out-of-round. 7. Loose flywheel or torque converter.	1. Refer to <u>SPECIFICATIONS</u> . 2. Check oil pump, if OK, check rod and main bearings for excessive wear. 3. Change oil and filter. 4. Replace as necessary. 5. Check thrust washers for wear. 6. Service or replace crankshaft. 7. Tighten to correct torque

ENGINE PERFORMANCE DIAGNOSTIC TABLE

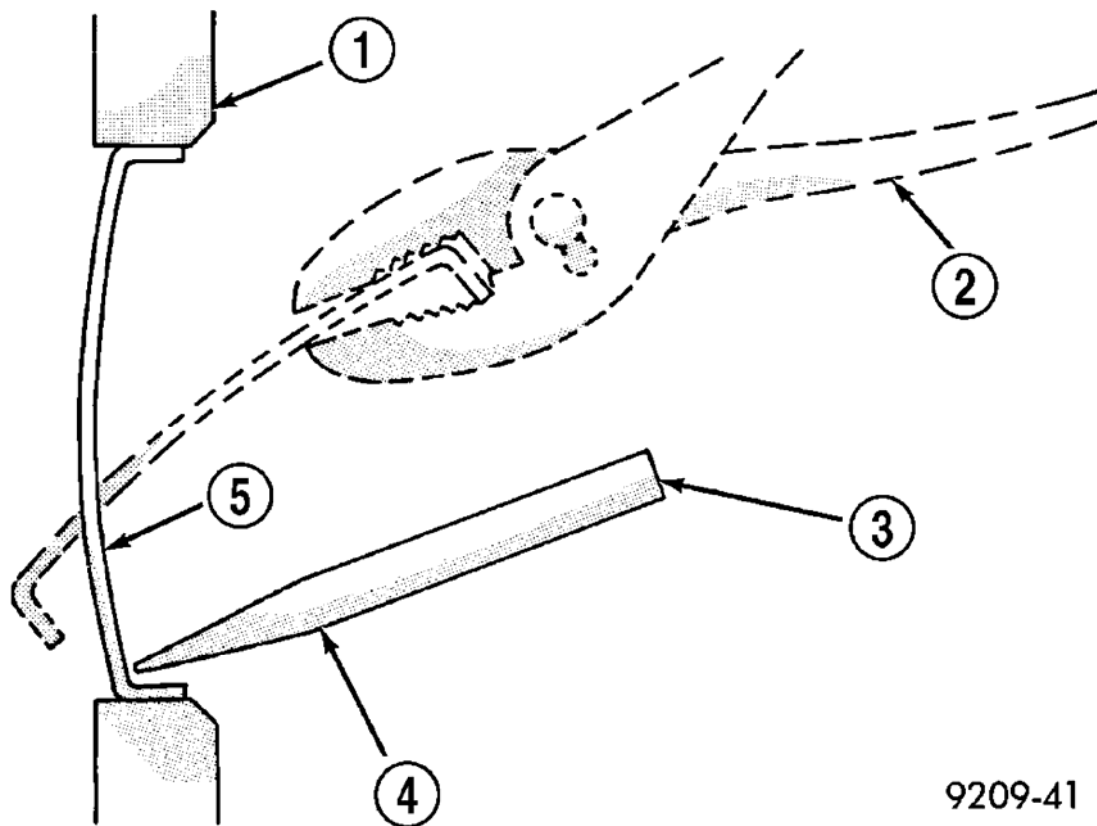
CONDITION	POSSIBLE CAUSE	CORRECTION

ENGINE WILL NOT START	1. Weak battery 2. Corroded or loose battery connections. 3. Faulty starter. 4. Faulty coil or control unit. 5. Incorrect spark plug gap. 6. Incorrect right bank cam timing. 7. Dirt or water in fuel system. 8. Faulty fuel pump, relay or wiring. 9. Faulty cam or crank sensor	1. Charge or replace as necessary. 2. Clean and tighten battery connections. Apply a coat of light mineral grease to the terminals. 3. Refer to <u>DIAGNOSIS AND TESTING</u> . 4. Refer to <u>REMOVAL</u> . 5. (Refer to <u>SPARK PLUG</u> . 6. Refer to <u>VALVE TIMING</u>. 7. Clean system and replace fuel filter. 8. Repair or replace as necessary. 9. Refer to <u>IGNITION CONTROL - SERVICE INFORMATION</u> .
ENGINE STALLS OR ROUGH IDLE	1. Vacuum leak. 2. Faulty crank position sensor 3. Faulty coil. 4. Incorrect cam timing.	1. Inspect intake manifold and vacuum hoses, repair or replace as necessary. 2. Replace crank position sensor. 3. Refer to <u>REMOVAL</u> . 4. See <u>STANDARD PROCEDURE</u>.
ENGINE LOSS OF POWER	1. Dirty or incorrectly gapped spark plugs. 2. Dirt or water in fuel system. 3. Faulty fuel pump. 4. Blown cylinder head gasket. 5. Low	1. Refer to <u>SPARK PLUG</u> . 2. Clean system and replace fuel filter. 3. Refer to <u>PUMP-FUEL</u> . 4. Replace cylinder head gasket. 5. See

	compression. 6. Burned, warped or pitted valves. 7. Plugged or restricted exhaust system. 8. Faulty coil. 9. Incorrect cam timing.	<u>DIAGNOSIS AND TESTING</u>, repair as necessary. 6. Replace as necessary. 7. Inspect and replace as necessary. 8. Refer to <u>REMOVAL</u> . 9. Refer to <u>VALVE TIMING</u>.
ENGINE MISSES ON ACCELERATION	1. Spark plugs dirty or incorrectly gapped. 2. Dirt in fuel system. 3. Burned, warped or pitted valves. 4. Refer to <u>REMOVAL</u> .	1. Refer to <u>SPARK PLUG</u> . 2. Clean fuel system. 3. Replace as necessary.
ENGINE MISSES AT HIGH SPEED	1. Spark plugs dirty or incorrectly gapped. 2. Faulty coil.	1. Refer to <u>SPARK PLUG</u> . 2. Refer to <u>REMOVAL</u> .
3. Dirt or water in fuel system.	3. Clean system and replace fuel filter.	

STANDARD PROCEDURE

ENGINE CORE AND OIL GALLERY PLUGS



9209-41

Fig. 2: Core Hole Plug Removal
Courtesy of CHRYSLER LLC

- 1 - CYLINDER BLOCK
- 2 - REMOVE PLUG WITH PLIERS
- 3 - STRIKE HERE WITH HAMMER
- 4 - DRIFT PUNCH
- 5 - CUP PLUG

Using a blunt tool such as a drift and a hammer, strike the bottom edge of the cup plug (5). With the cup plug rotated, grasp firmly with pliers or other suitable tool and remove plug. See **Fig. 2**.

CAUTION: Do not drive cup plug into the casting as restricted cooling can result and cause serious engine problems.

Thoroughly clean inside of cup plug hole in cylinder block or head. Be sure to remove old sealer. Lightly coat inside of cup plug hole with Mopar® Stud and Bearing Mount. Make certain the new plug is cleaned of all oil or grease. Using proper drive plug, drive plug into hole so that the sharp edge of the plug is at least 0.5 mm (0.020 in.) inside the lead-in chamfer.

It is not necessary to wait for curing of the sealant. The cooling system can be refilled and the vehicle placed in service immediately.

ENGINE GASKET SURFACE PREPARATION

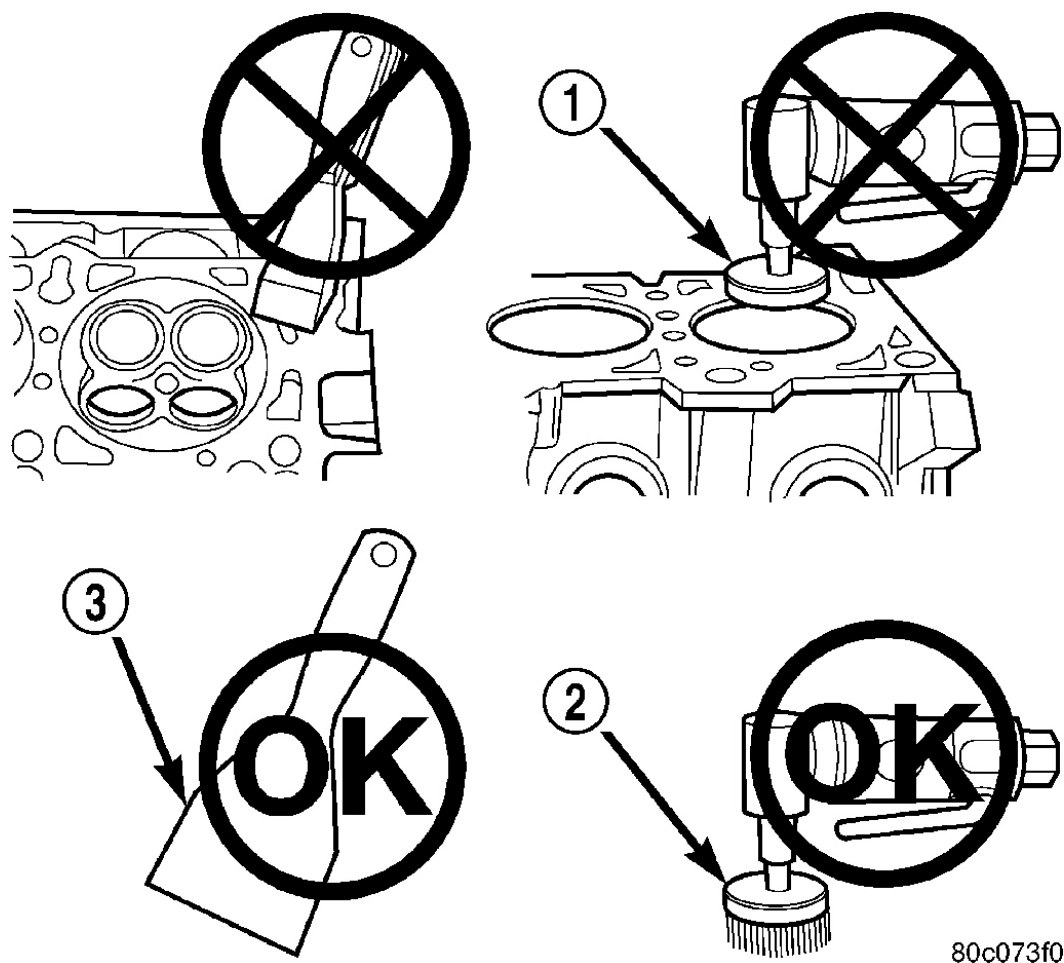


Fig. 3: Proper Tool Usage for Surface Preparation
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - ABRASIVE PAD
2 - 3M ROLOC™ BRISTLE DISC
3 - PLASTIC/WOOD SCRAPER |
|--|

To ensure engine gasket sealing, proper surface preparation must be performed, especially with the use of aluminum engine components and multi-layer steel cylinder head gaskets.

Never use the following to clean gasket surfaces:

Metal scraper (3).

Abrasive pad (1) or paper to clean cylinder block and head.

High speed power tool (1) with an abrasive pad or a wire brush.

NOTE: Multi-Layer Steel (MLS) head gaskets require a scratch free sealing surface.

Only use the following for cleaning gasket surfaces:

Solvent or a commercially available gasket remover

Plastic or wood scraper.

Drill motor with 3M Roloc™ Bristle Disc (white or yellow).

CAUTION: Excessive pressure or high RPM (beyond the recommended speed), can damage the sealing surfaces. The mild (white, 120 grit) bristle disc is recommended. If necessary, the medium (yellow, 80 grit) bristle disc may be used on cast iron surfaces with care.

REPAIR DAMAGED OR WORN THREADS

CAUTION: Be sure that the tapped holes maintain the original center line.

Damaged or worn threads can be repaired. Essentially, this repair consists of:

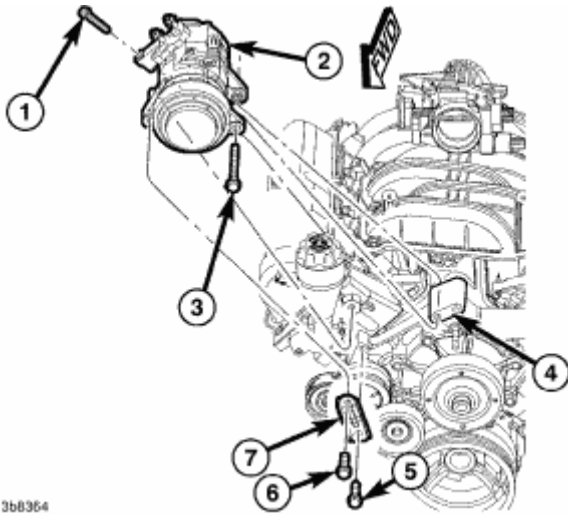
Drilling out worn or damaged threads.

Tapping the hole with a special Heli-Coil Tap, or equivalent.

Installing an insert into the tapped hole to bring the hole back to its original thread size.

REMOVAL

REMOVAL



613b6364

Fig. 4: Removal/Installation A/C Compressor
Courtesy of CHRYSLER LLC

1. Disconnect the battery negative cable.
2. Remove hood. Mark hood hinge location for reinstallation.
3. Remove air cleaner assembly.
4. Remove radiator core support bracket.
5. Remove fan shroud with electric fan assembly.
6. Remove mechanical cooling fan.
7. Remove drive belt.

NOTE: **It is NOT necessary to discharge the A/C system to remove the engine.**

8. Remove A/C compressor (2) and secure away from engine with lines attached.

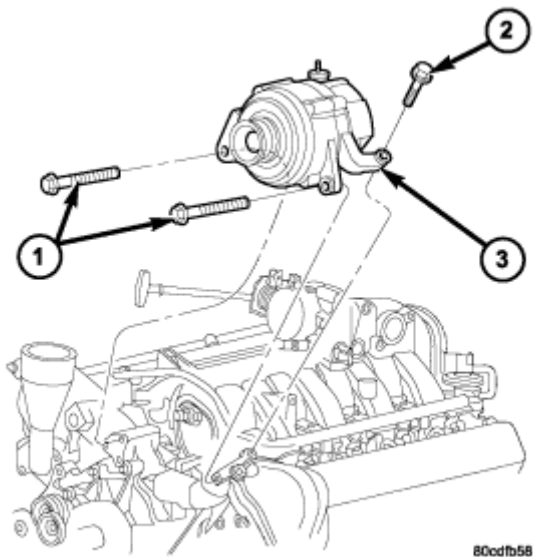
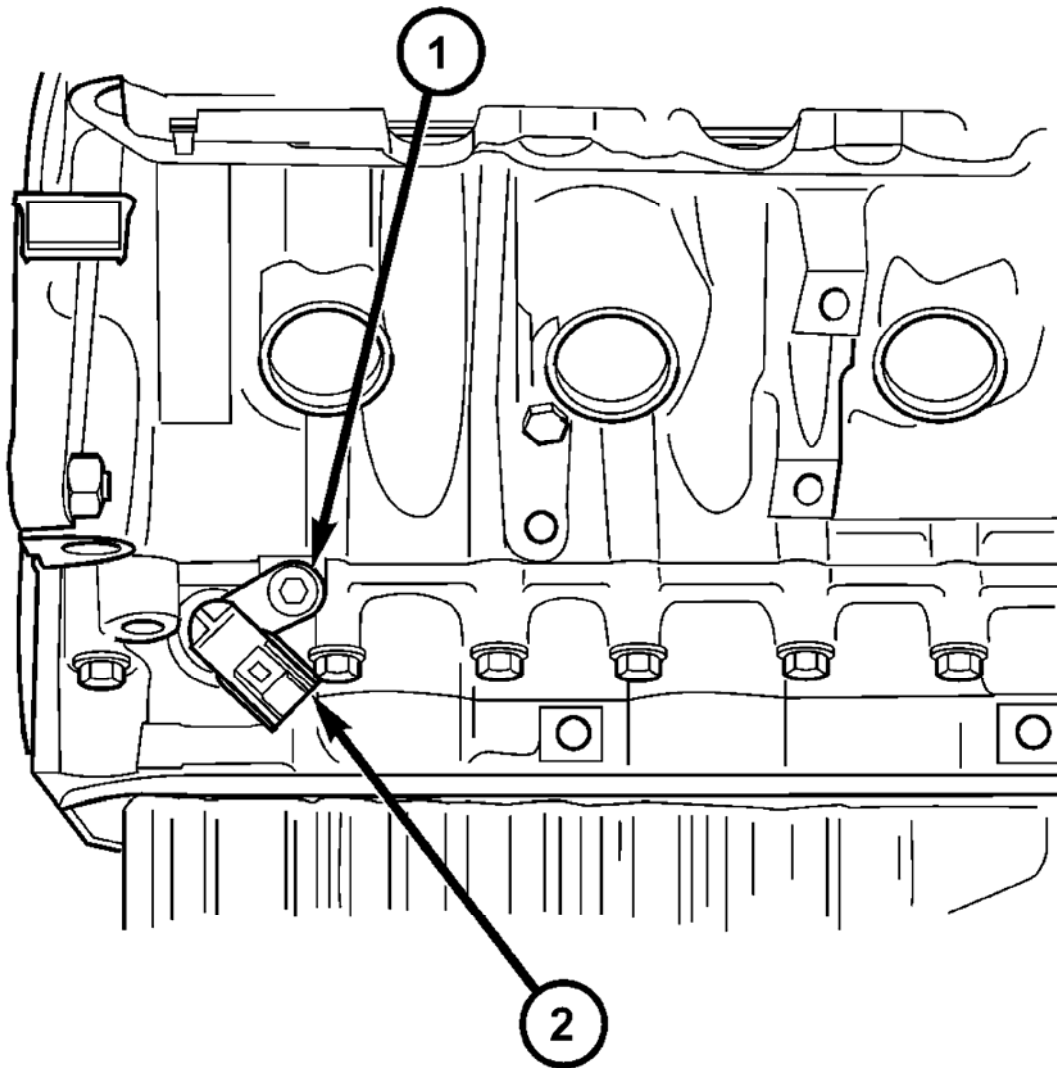


Fig. 5: Removal/Installation Generator - 3.7L/4.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - LOWER BOLTS
2 - REAR BOLT
3 - GENERATOR |
|---|

NOTE: **Do NOT remove the phenolic pulley from the P/S pump. It is not required for P/S pump removal.**

9. Remove power steering pump with lines attached and secure away from engine.
10. Drain cooling system.
11. Remove coolant bottle.
12. Disconnect the heater hoses from the engine.
13. Disconnect heater hoses from heater core and remove hose assembly.
14. Remove generator (3) and secure away from engine.
15. Disconnect throttle and speed control cables.
16. Remove upper radiator hose from engine.
17. Remove lower radiator hose from engine.



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Fig. 6: Crankshaft Position Sensor
Courtesy of CHRYSLER LLC

1 - CRANKSHAFT POSITION SENSOR
2 - CYLINDER HEAD COVER
3 - CAMSHAFT POSITION SENSOR
4 - RIGHT

SIDE CYLINDER BLOCK

18. Disconnect the engine wiring harness at the following points:

- Intake air temperature (IAT) sensor
- Fuel Injectors
- Electronic Throttle Control (ETC)
- Idle Air Control (IAC) Motor
- Engine Oil Pressure Switch
- Engine Coolant Temperature (ECT) Sensor
- Manifold Absolute Pressure (MAP) Sensor
- Camshaft Position (CMP) Sensor
- Coil Over Plugs
- Crankshaft Position Sensor (2)

19. Remove coil over plugs.

20. Release fuel rail pressure.

21. Remove fuel rail and secure away from engine.

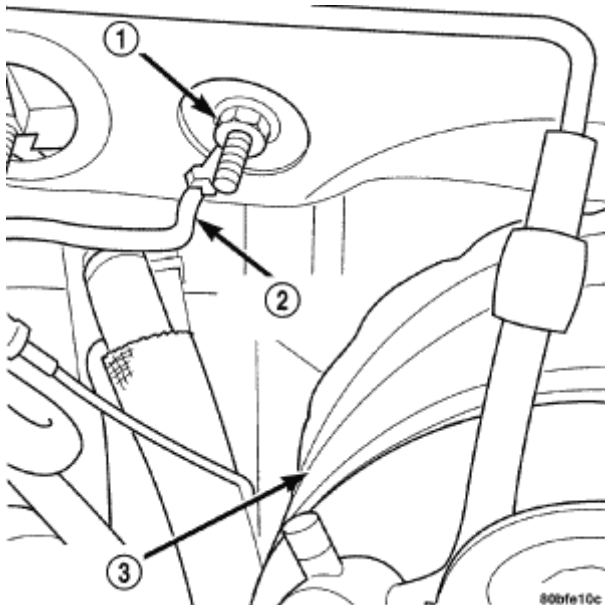


Fig. 7: Body Ground Strap-Left Side Removal/Installation
Courtesy of CHRYSLER LLC

1 - NUT
2 - GROUND STRAP

3 - BRAKE BOOSTER

NOTE: It is not necessary to release the quick connect fitting from the fuel supply line for engine removal.

22. Remove the PCV hose.
23. Remove the breather hoses.
24. Remove the vacuum hose for the power brake booster.
25. Disconnect knock sensors.
26. Disconnect the engine to body ground straps (2) at the cowl.

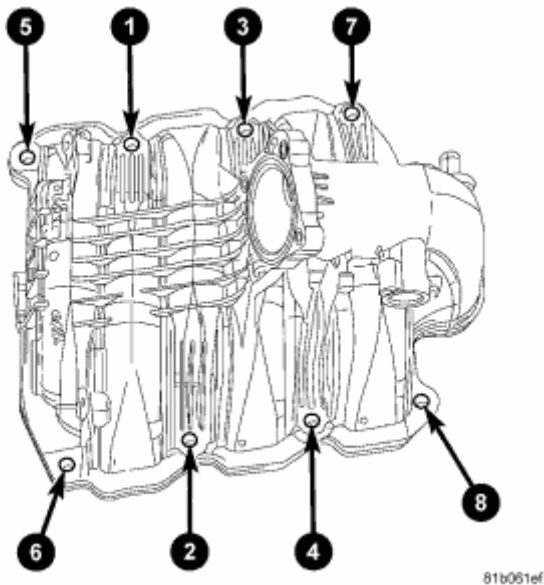
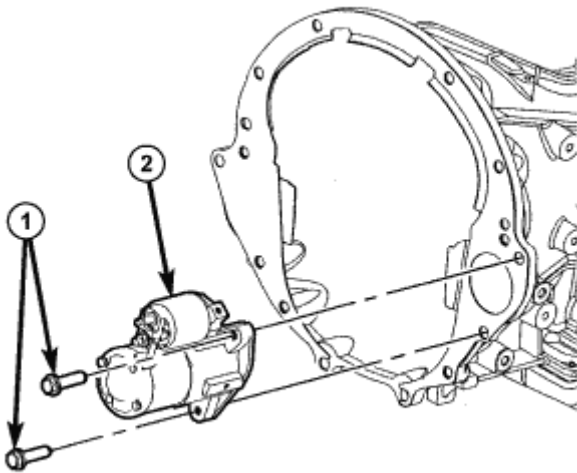


Fig. 8: 3.7L Intake Torque Sequence
Courtesy of CHRYSLER LLC

27. Remove intake manifold.
28. Remove engine oil dipstick tube.
29. Install Engine Lifting Fixture 8427.

NOTE: Recheck bolt torque for engine lift plate before removing engine.

30. Secure the left and right engine wiring harnesses away from engine.
31. Raise vehicle.



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Fig. 9: Locating Starter Motor - 3.7L
Courtesy of CHRYSLER LLC

32. Disconnect oxygen sensor wiring.
33. Disconnect the engine block heater power cable, if equipped.
34. Disconnect the front propshaft at the front differential and secure out of way.

NOTE: **It is necessary to disconnect the front propshaft for access to the starter and left side exhaust flange.**

35. Remove the ground straps from the left and right side of the block.
36. Disconnect the right and left exhaust pipes at the manifolds and from the crossover, and remove from the vehicle.

NOTE: **The exhaust clamps at the manifolds cannot be reused. New clamps must be used or leaks may occur.**

NOTE: **For manual transmission vehicles, the transmission must be removed from the vehicle, before the engine can be removed. The manual transmission will contact the floorpan before the engine clears the motor mounts, so it must be removed.**

37. Remove the starter. Refer to **REMOVAL** .

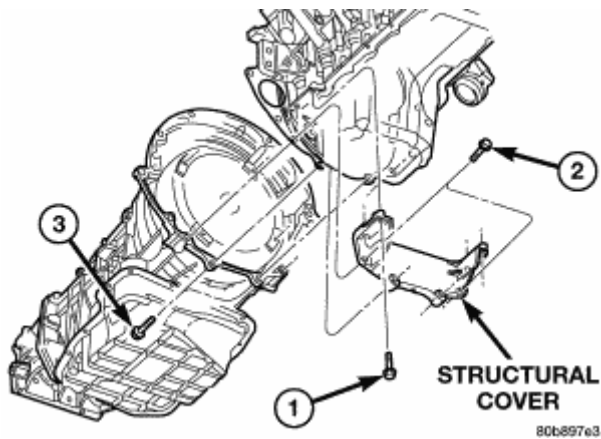


Fig. 10: Structural Cover
 Courtesy of CHRYSLER LLC

1 - BOLT 2 - BOLT 3 - BOLT

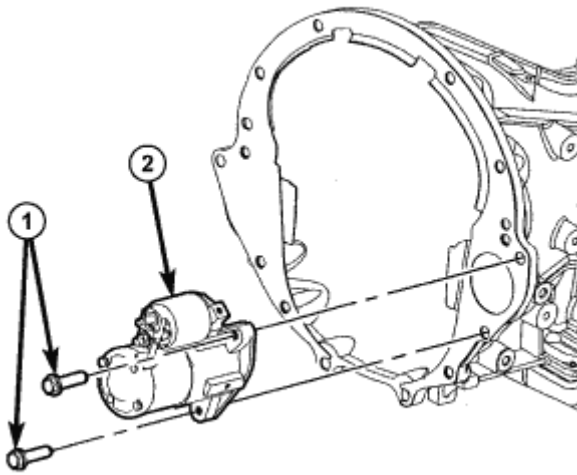
38. Remove the structural cover retaining bolts (1), and cover. See **REMOVAL**.
39. Remove torque converter bolts, and mark location for reassembly.
40. Remove transmission bellhousing to engine bolts.
41. Loosen left and right engine mount thru bolts.

NOTE: **It is not necessary to completely remove engine mount thru bolts, for engine removal.**

42. Lower the vehicle.
43. Support the transmission with a suitable jack.
44. Connect a suitable engine hoist to the engine lift plate.
45. Remove engine from vehicle.

INSTALLATION

INSTALLATION



819688cs

Fig. 11: Starter Motor Removal/Installation - 3.7L
 Courtesy of CHRYSLER LLC

1. Position the engine in the vehicle.
2. Install both left and right side engine mounts onto engine.
3. Raise the vehicle.
4. Install the transmission bellhousing to engine mounting bolts. Tighten the bolts to 41 N.m (30 ft. lbs.).
5. Tighten the engine mount thru bolts.
6. Install the torque convertor bolts.
7. Connect the ground straps on the left and right side of the engine.
8. Install the starter (2). Refer to **INSTALLATION** .

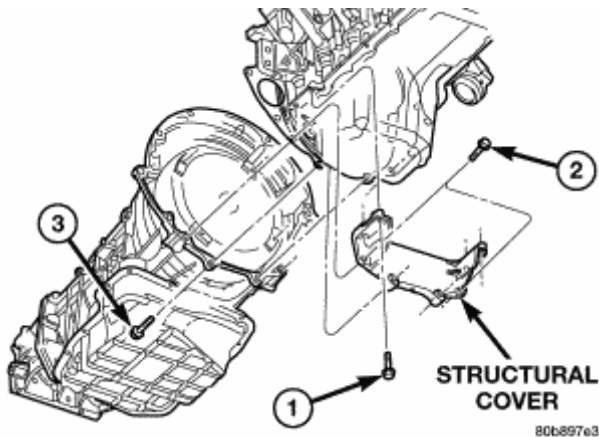


Fig. 12: Structural Cover
 Courtesy of CHRYSLER LLC

1 - BOLT

- | |
|----------|
| 2 - BOLT |
| 3 - BOLT |

9. Install the engine block heater power cable, if equipped.

CAUTION: The structural cover requires a specific torque sequence. Failure to follow this sequence may cause severe damage to the cover.

10. Install the structural cover, and torque bolts (1). See INSTALLATION.

NOTE: New clamps must be used on exhaust manifold flanges. Failure to use new clamps may result in exhaust leaks.

11. Install the left and right exhaust pipes.
12. Connect the left and right oxygen sensors.
13. Lower vehicle.

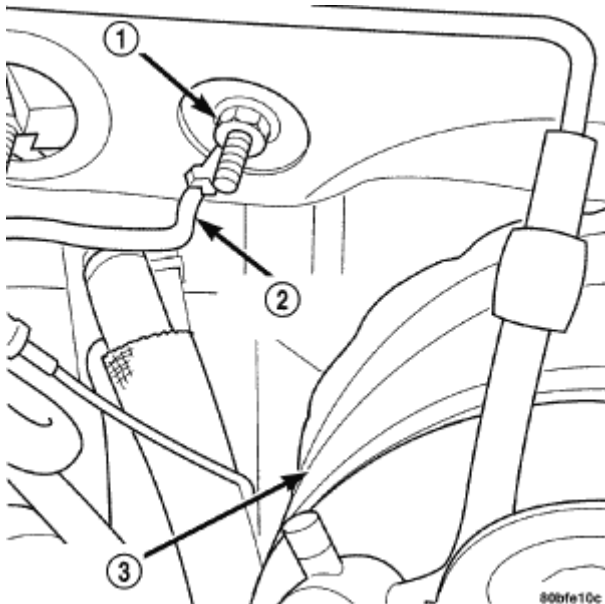


Fig. 13: Body Ground Strap Removal/Installation - Left Side
Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - NUT |
| 2 -
GROUND
STRAP |
| 3 -
BRAKE
BOOSTER |

14. Connect the engine to body ground straps at the cowl.
15. Remove the engine lift plate.
16. Connect the knock sensors.

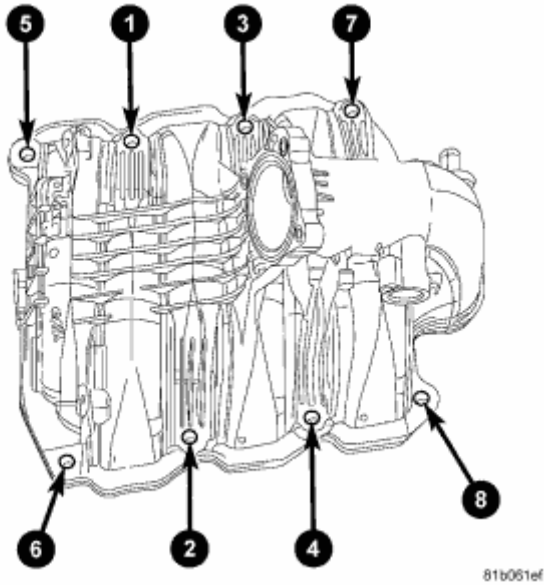
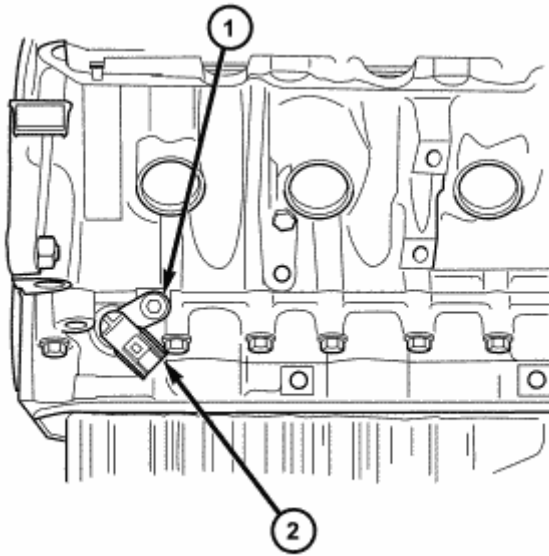


Fig. 14: 3.7L Intake Torque Sequence
Courtesy of CHRYSLER LLC

17. Install the intake manifold. See **INSTALLATION**.
18. Install the engine oil dipstick tube.
19. Install the power brake booster vacuum hose.
20. Install the breather hoses.
21. Install the PCV hose.
22. Install the fuel rail.
23. Install the coil over plugs.



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Fig. 15: Crankshaft Position Sensor
Courtesy of CHRYSLER LLC

1 - CRANKSHAFT POSITION SENSOR
2 - CYLINDER HEAD COVER
3 - CAMSHAFT POSITION SENSOR
4 - RIGHT SIDE CYLINDER BLOCK

24. Connect the engine wiring harness at the following points:

- Intake air temperature (IAT) sensor
- Fuel Injectors
- Electronic Throttle Control (ETC)
- Idle Air Control (IAC) Motor
- Engine Oil Pressure Switch
- Engine Coolant Temperature (ECT) Sensor
- Manifold Absolute Pressure (MAP) Sensor
- Camshaft Position (CMP) Sensor
- Coil Over Plugs

- Crankshaft Position Sensor (2)

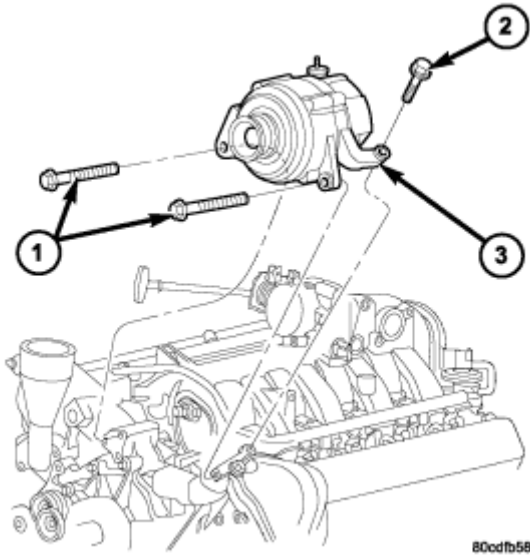


Fig. 16: Removing/Installing Generator - 3.7L/4.7L
Courtesy of CHRYSLER LLC

- | |
|-----------------|
| 1 - LOWER BOLTS |
| 2 - REAR BOLT |
| 3 - GENERATOR |

25. Connect lower radiator hose.
26. Connect upper radiator hose.
27. Connect throttle and speed control cables.
28. Install the heater hose assembly.
29. Install coolant recovery bottle.
30. Install the power steering pump.
31. Install the generator (3). Refer to **INSTALLATION**.

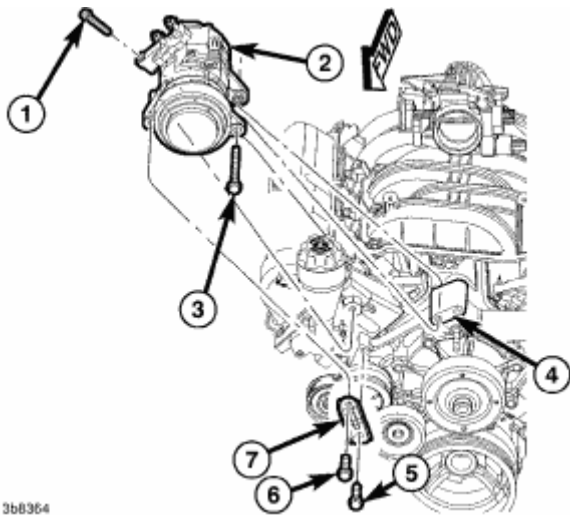


Fig. 17: Removing/Installing A/C Compressor
Courtesy of CHRYSLER LLC

32. Install the A/C compressor (2).
33. Install the drive belt. Refer to **INSTALLATION** .
34. Install the fan shroud with the electric fan assembly. Refer to **INSTALLATION** .
35. Install the radiator core support bracket.
36. Install the air cleaner assembly.
37. Refill the engine cooling system.
38. Install the hood.
39. Check and fill engine oil.
40. Connect the battery negative cable.
41. Start the engine and check for leaks.

SPECIFICATIONS

3.7L ENGINE

GENERAL SPECIFICATIONS

DESCRIPTION	SPECIFICATION	
Type	90° SOHC V6 12 Valve	
Number of Cylinders	6	
Firing Order	1-6-5-4-3-2	
Lead Cylinder	No. 1 Left Bank	
Compression Ratio	9.6:1	
Max. Variation Between Cylinders	25%	
	Metric	Standard
Displacement	3.7 Liters	226 Cubic Inches
Bore	93.0 mm	3.66 in.

Stroke	90.8 mm	3.40 in.
Horsepower	211 @ 5200 RPM	
Torque	236 ft. lbs. @ 4000 RPM	
Compression Pressure	1172-1551 kPa	170-225 psi

CYLINDER BLOCK

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Bore Diameter	93.013 ± 0.0075 mm	3.6619 ± 0.0003 in.
Out of Round (MAX)	0.076 mm	0.003 in.
Taper (MAX)	0.051 mm	0.002 in.

PISTONS

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Diameter	92.975 mm	3.6605 in.
Weight	365.0 grams	12.87 oz
Ring Groove Diameter	No. 1 85.37 - 83.13 mm	3.282 - 3.273 in
	No. 2 82.833 - 83.033 mm	3.261 - 3.310 in.
	No. 3 83.88 - 84.08 mm	3.302 - 3.310 in.

PISTON PINS

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Clearance In Piston	0.006 - 0.015 mm	0.0002 - 0.0005 in.
Diameter	24.017 - 24.020 mm	0.9455 - 0.9456 in.

PISTON RINGS

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Ring Gap	Top Compression Ring 0.20 - 0.36 mm	0.0079 - 0.0142 in.
	Second Compression Ring 0.37 - 0.63 mm	0.0146 - 0.0249 in.
	Oil Control (Steel Rails) 0.25 - 0.76 mm	0.0099 - 0.30 in.
Side Clearance	-	
	Top Compression Ring 0.051 - 0.094 mm	0.0020 - 0.0037 in.
	Second Compression Ring 0.040 - 0.080 mm	0.0016 - 0.0031 in.
	Oil Ring (Steel Ring) 0.019 - 0.229 mm	0.0007 - 0.0091 in.
Ring Width	Top Compression Ring 1.472 - 1.490 mm	0.057 - 0.058 in.
	Second Compression Ring 1.472 - 1.490 mm	0.057 - 0.058 in.

Oil Ring (Steel Rails)	0.445 - 0.470 mm	0.017 - 0.018 in.
------------------------	------------------	-------------------

CONNECTING RODS

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Bearing Clearance	0.006 - 0.044 mm	0.0002 - 0.0017 in.
Side Clearance	0.10 - 0.35 mm	0.004 - 0.0138 in.
Piston Pin Clearance	0.015 - 0.028 mm	0.0006 - 0.0011 in.
Bearing Bore Out of Round (MAX)	0.004 mm	0.0002 in.
Total Weight (Less Bearing)	612 grams	21.588 ounces

CRANKSHAFT

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Main Bearing Journal Diameter	63.488 - 63.512 mm	2.4996 - 2.5005 in.
Bearing Clearance	0.002 - 0.046 mm	0.00008 - 0.0018 in.
Out of Round (MAX)	0.005 mm	0.0002 in.
Taper (MAX)	0.006 mm	0.0004 in.
End Play	0.052 - 0.282 mm	0.0021 - 0.0112 in.
End Play (MAX)	0.282 mm	0.0112 in.
Connecting Rod Journal Diameter	57.908 - 57.892 mm	2.2798 - 2.2792 in.
Bearing Clearance	0.006 - 0.044	0.0002 - 0.0011 in.
Out of Round (MAX)	0.005 mm	0.0002 in.
Taper (MAX)	0.006 mm	0.0002 in.

CAMSHAFT

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Bore Diameter	26.02 - 26.04 mm	1.0245 - 1.0252 in.
Bearing Journal Diameter	25.975 - 25.995 mm	1.0227 - 1.0235 in.
Bearing Clearance	0.025 - 0.065 mm	0.001 - 0.0026 in.
Bearing Clearance (MAX)	0.065 mm	0.0026 in.
End Play	0.075 -0.200 mm	0.003 - 0.0079 in.
End Play (MAX)	0.200 mm	0.0079 in.

VALVE TIMING

DESCRIPTION		SPECIFICATION
Intake	Opens (BTDC)	5.6°
	Closes (ATDC)	240.1°
	Duration	245.7°

Exhaust	Opens (BTDC)	241.5°
	Closes (ATDC)	20.1°
	Duration	261.6°
Valve Overlap		25.7°

VALVES

DESCRIPTION	SPECIFICATION		
	Metric	Standard	
Face Angle	45° - 45.5°		
Head Diameter	Intake	48.52 - 48.78 mm	1.9103 - 1.9205 in.
	Exhaust	36.87 - 37.13 mm	1.4516 - 1.4618 in.
Length (Overall)	Intake	113.45 - 114.21 mm	4.4666 - 4.4965 in.
	Exhaust	114.92 - 115.68 mm	4.5244 - 4.5543 in.
Stem Diameter	Intake	6.931 - 6.957 mm	0.2729 - 0.2739 in.
	Exhaust	6.902 - 6.928 mm	0.2717 - 0.2728 in.
Stem-to-Guide Clearance	Intake	0.018 - 0.069 mm	0.0008 - 0.0028 in.
	Exhaust	0.047 - 0.098 mm	0.0019 - 0.0039 in.
Max. Allowable Stem-to-Guide Clearance (Rocking Method)	Intake	0.069 mm	0.0028 in.
	Exhaust	0.098 mm	0.0039 in.
Valve Lift (Zero Lash)	Intake	12.00 mm	0.472 in.
	Exhaust	12.00 mm	0.472 in.

VALVE SPRING

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Free Length (Approx)		
Intake	48.18 mm	1.896 in.
Exhaust - w/damper	49.2 mm	1.973 in.
Spring Force (Valve Closed)		
Intake	332.0 - 368.0 N @ 40.12 mm	74.63 - 82.72 lbs. @ 1.5795 in.
Exhaust - (without damper)	356 - 394 N @ 39.12 mm	80.031 - 88.57 lbs. @ 1.54 in.
Spring Force (Valve Open)		
Intake	948.0 - 1038.0 N @ 28.12 mm	213.2 - 233.8 lbs. @ 1.107 in.
Exhaust - without damper	874 - 956 N @ 27.12 mm	196.5 - 214.9 lbs. @ 1.067 in.
Number of Coils	-	-

	Intake	7.30	
	Exhaust	7.15	
Wire Diameter	-	-	
	Intake	4.77 x 3.80 mm	0.1878 x 0.1496 in.
	Exhaust	4.66 x 3.72 mm	0.1843 x.1464 in.
Installed Height (Spring Seat to Bottom of Retainer)			
Nominal			
	Intake	40.12 mm	1.579 in.
	Exhaust - w/damper	40.12 mm	1.579 in.

CYLINDER HEAD

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Gasket Thickness (Compressed)	0.7 mm	(0.0276 in.)
Valve Seat Angle	44.5° - 45.0°	
Valve Seat Runout (MAX)	0.051 mm	0.002 in.
Valve Seat Width		
Intake	1.75 - 2.36 mm	0.0698 - 0.0928 in.
Exhaust	1.71 - 2.32 mm	0.0673 - 0.0911 in.
Guide Bore Diameter (Std.)	6.975 - 7.00 mm	0.2747 - 0.2756 in.
Cylinder Head Warpage (Flatness)	0.0508 mm	0.002 in.

OIL PUMP

DESCRIPTION	SPECIFICATION	
	Metric	Standard
Clearance Over Rotors/End Face (MAX)	0.095 mm	0.0038 in.
Cover Out - of -Flat (MAX)	0.025 mm	0.001 in.
Inner and Outer Rotor Thickness	12.02 mm	0.4731 in.
Outer Rotor to pocket (Diametral) clearance (MAX)	.235 mm	0.0093 in.
Outer Rotor Diameter (MIN)	85.925 mm	0.400 in.
Tip Clearance Between Rotors (MAX)	0.150 mm	0.006 in.

OIL PRESSURE

SPECIFICATION	SPECIFICATION	
	Metric	Standard
At Curb Idle Speed (MIN)*	25 kPa	4 psi
@ 3000 RPM	170 - 758 kPa	25 - 110 psi
* CAUTION: If pressure is zero at curb idle, DO NOT run engine at 3000 RPM.		

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
	-		
Camshaft	-	-	-
Non - Oiled Sprocket Bolt	122	90	-
Bearing Cap Bolts	11	-	100
Counterbalance shaft retaining bolt	28	-	250
Timing Chain Cover Bolts	58	43	-
Connecting Rod Cap Bolts	27	20	-
PLUS 90° TURN			
Bed Plate-Bolts	Refer to Procedure		
Crankshaft Damper Bolt	175	130	-
Cylinder Head Bolts	M11 Bolts M8 Bolts	Refer To Procedure Refer To Procedure	
Cylinder Head Cover Bolts	12	-	105
Exhaust Manifold Bolts	25	18	-
Exhaust Manifold Heat Shield Nuts	8	-	72
Then loosen 45°			
Flexplate Bolts	95	70	-
Engine Mount Bracket to Block Bolts	61	45	-
Rear Mount to Transmission Bolts	46	34	-
Generator Mounting Bolts	M10 Bolts M8 Bolts	54 28	40 - 250
Intake Manifold Bolts	12	-	105
Refer to Procedure Tightening Sequence			
Oil Pan Bolts	15	-	130
Oil Pan-Drain Plug	34	25	-
Oil Pump Bolts	28	-	250
Oil Pump Cover Bolts	12	-	105
Oil Pickup Tube Bolt and Nut	28	-	250
Oil Dipstick Tube to Engine Block Bolt	- 15	- -	- 130
Oil Fill Tube Bolts	12	-	105
Timing Chain Guide Bolts	28	-	250
Timing Chain Tensioner Arm Bolt	28	-	250
Hydraulic Tensioner Bolts	28	-	250
Timing Chain Primary Tensioner Bolts	28	-	250
Timing Drive Idler Sprocket Bolt	34	25	-

Thermostat Housing Bolts	12	-	105
Water Pump Bolts	58	43	-

SPECIAL TOOLS

3.7L ENGINE

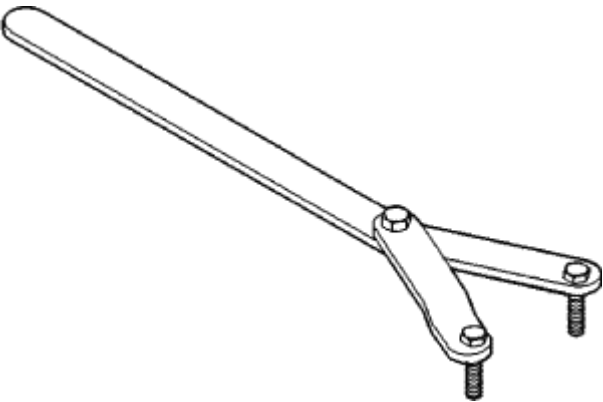


Fig. 18: Spanner Wrench - 6958
Courtesy of CHRYSLER LLC

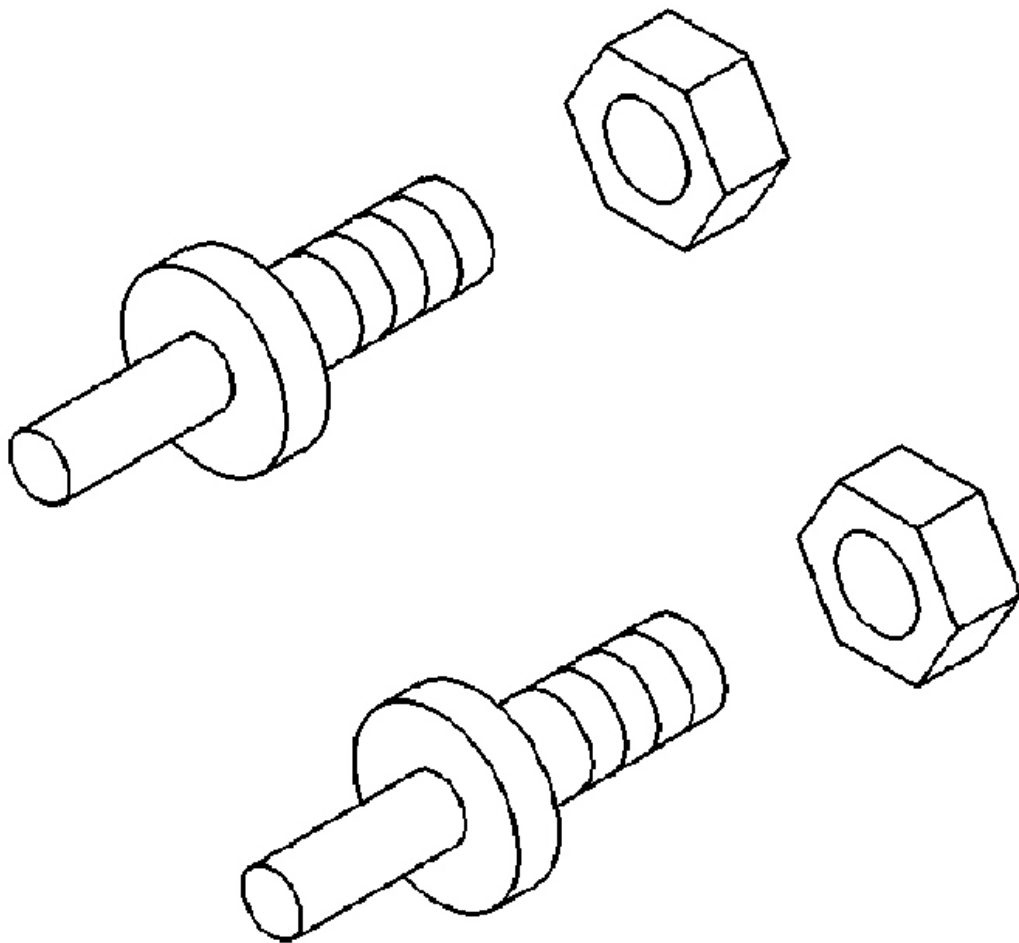


Fig. 19: Adapter Pins 8346
Courtesy of CHRYSLER LLC

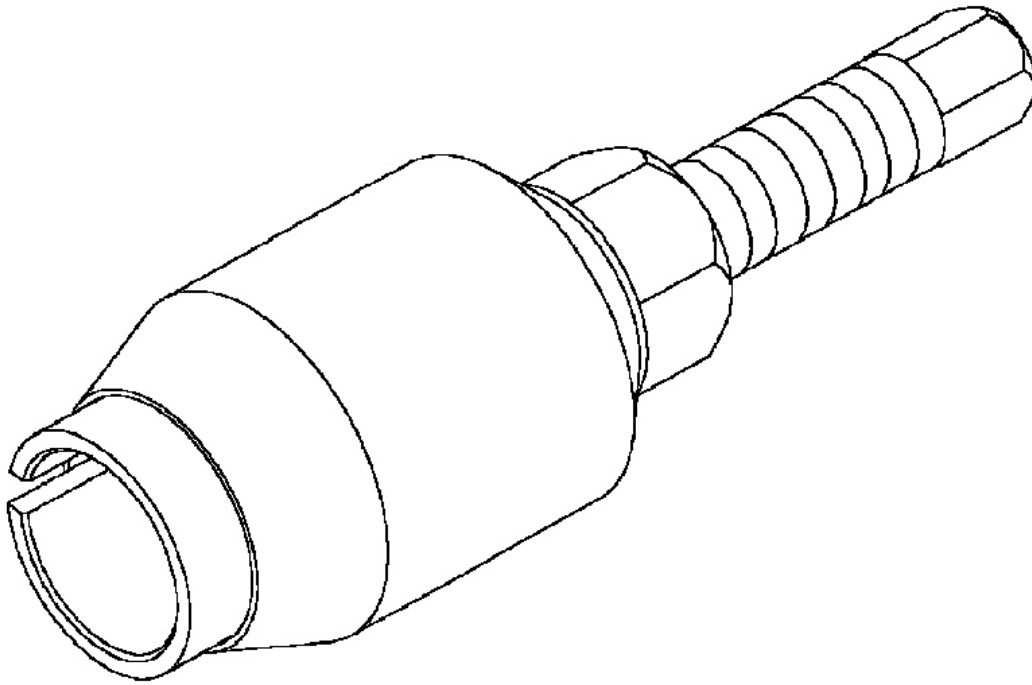


Fig. 20: Front Crankshaft Seal Remover 8511
Courtesy of CHRYSLER LLC

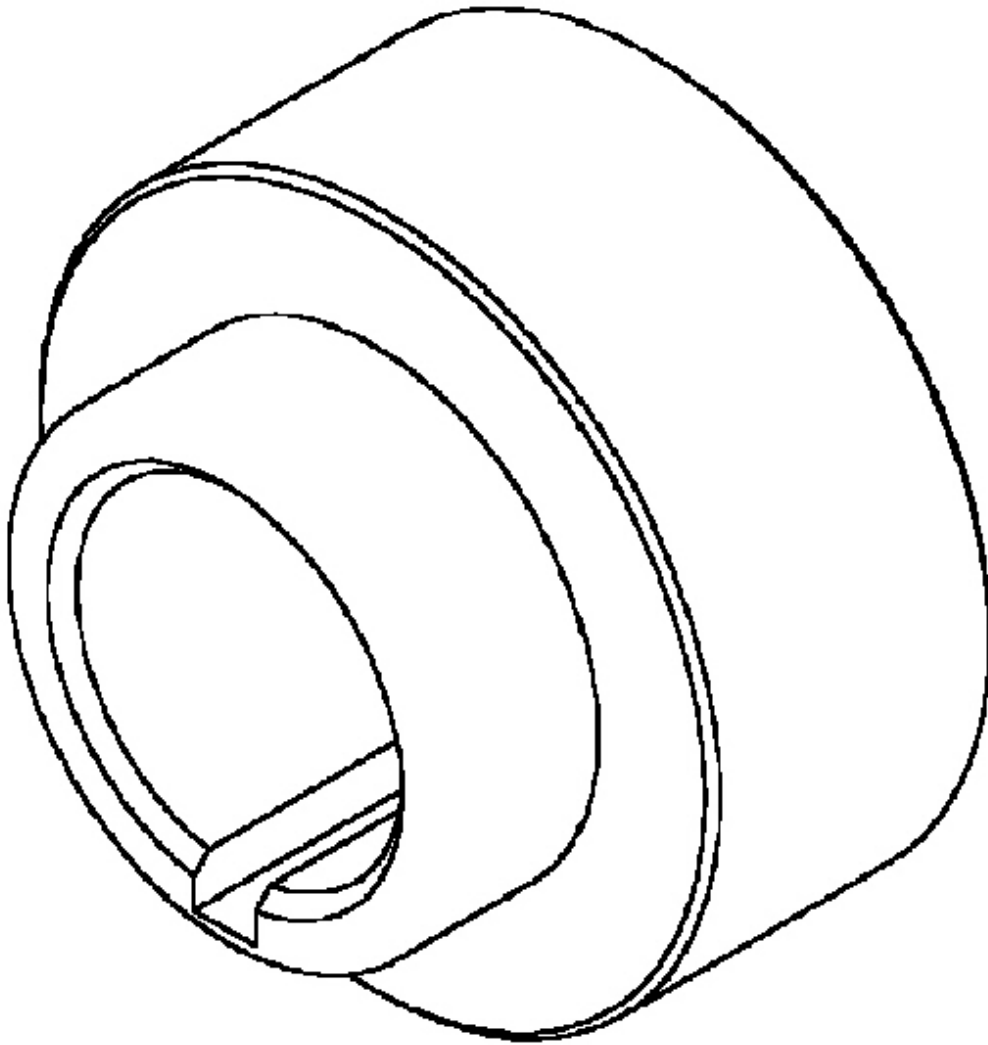


Fig. 21: Front Crankshaft Seal Installer 8348
Courtesy of CHRYSLER LLC

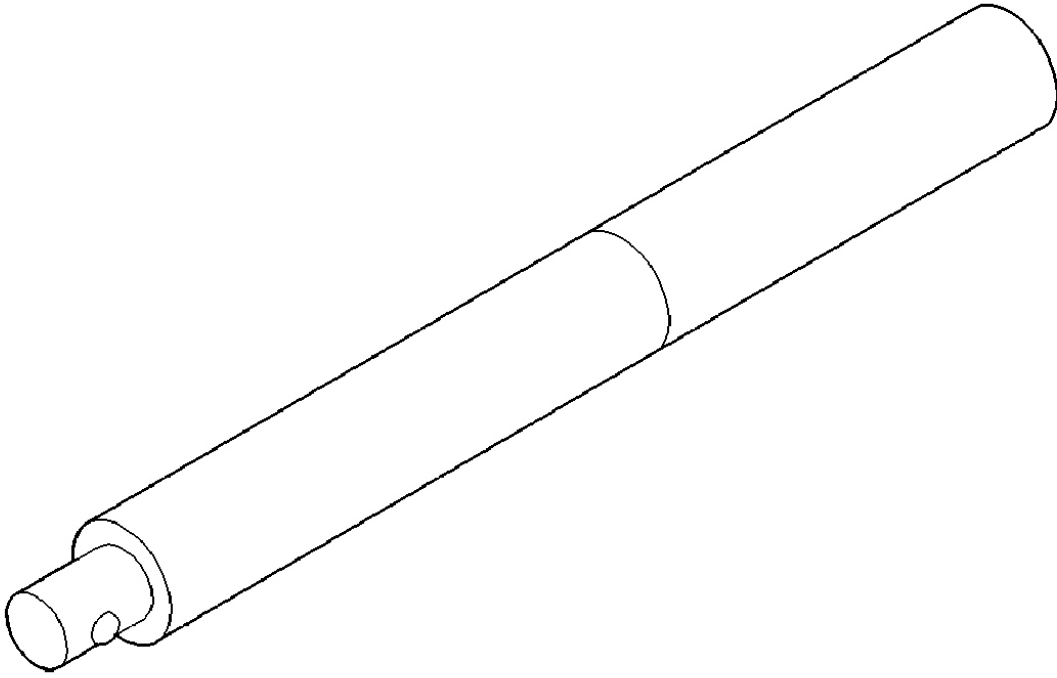


Fig. 22: Universal Driver Handle - C4171
Courtesy of CHRYSLER LLC

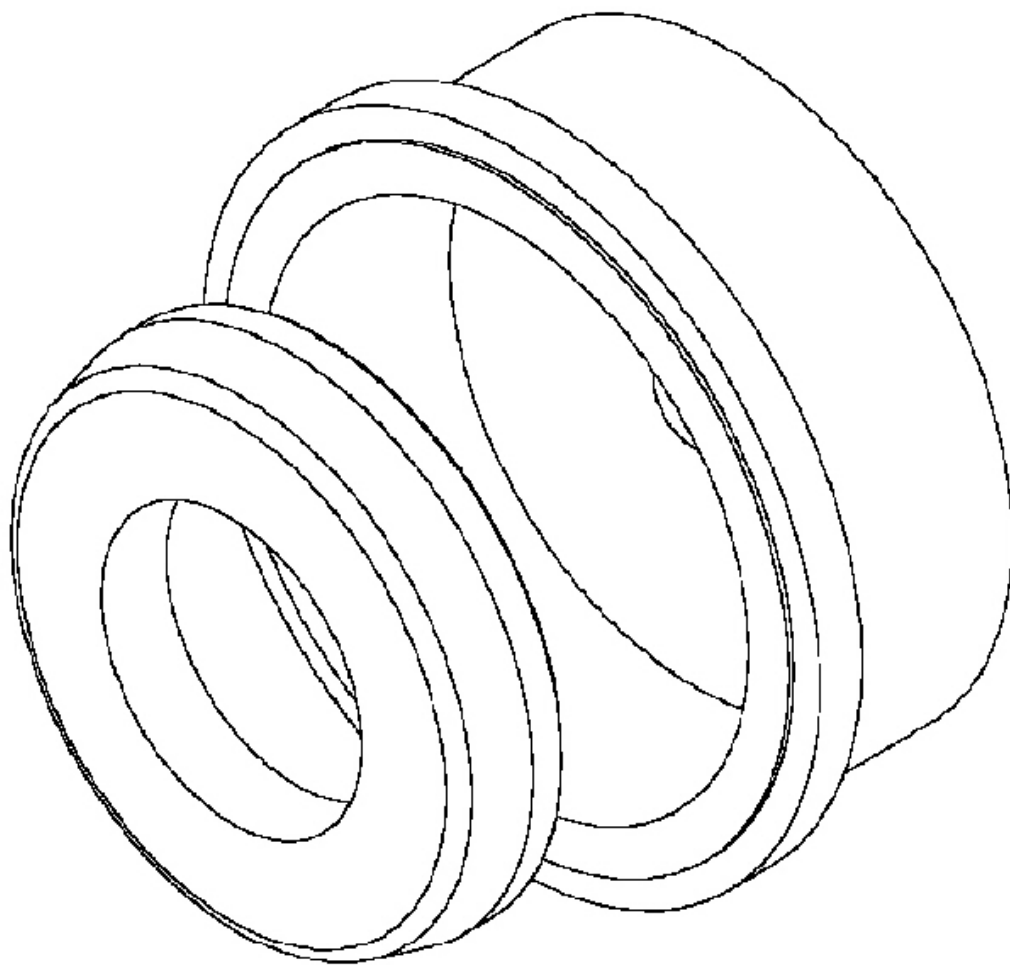


Fig. 23: Rear Crankshaft Seal Installer 8349
Courtesy of CHRYSLER LLC

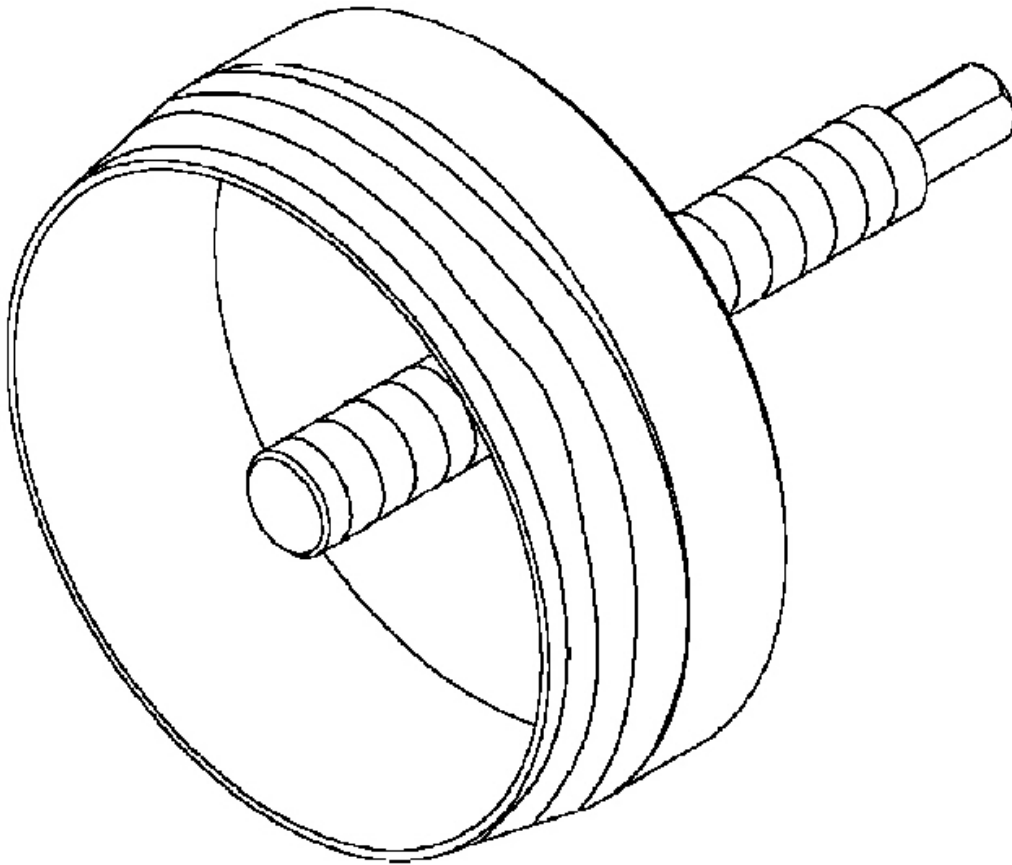


Fig. 24: Rear Crankshaft Seal Remover 8506
Courtesy of CHRYSLER LLC

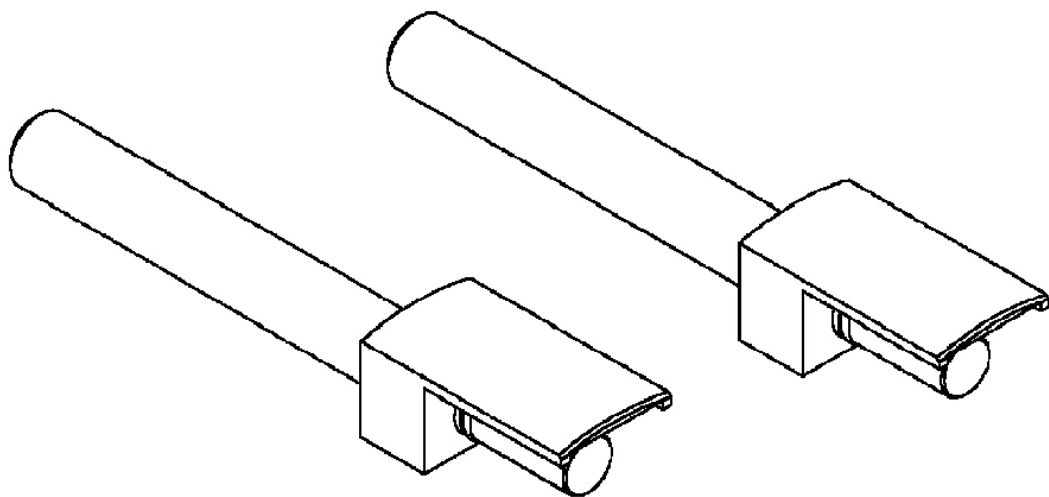


Fig. 25: Connecting Rod Guides 8507
Courtesy of CHRYSLER LLC

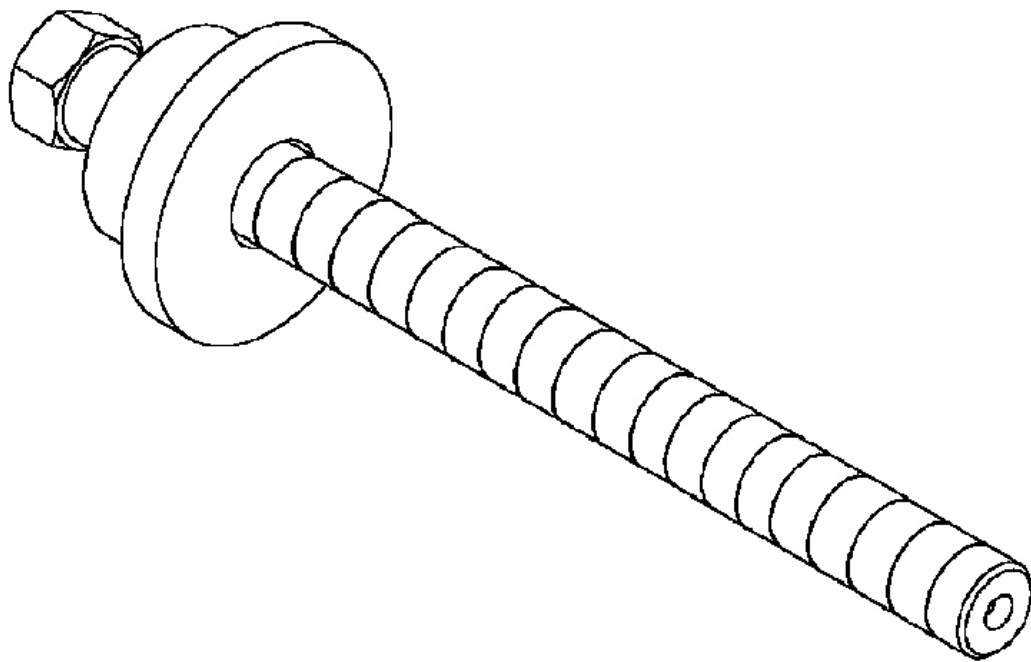


Fig. 26: Crankshaft Damper Installer 8512
Courtesy of CHRYSLER LLC

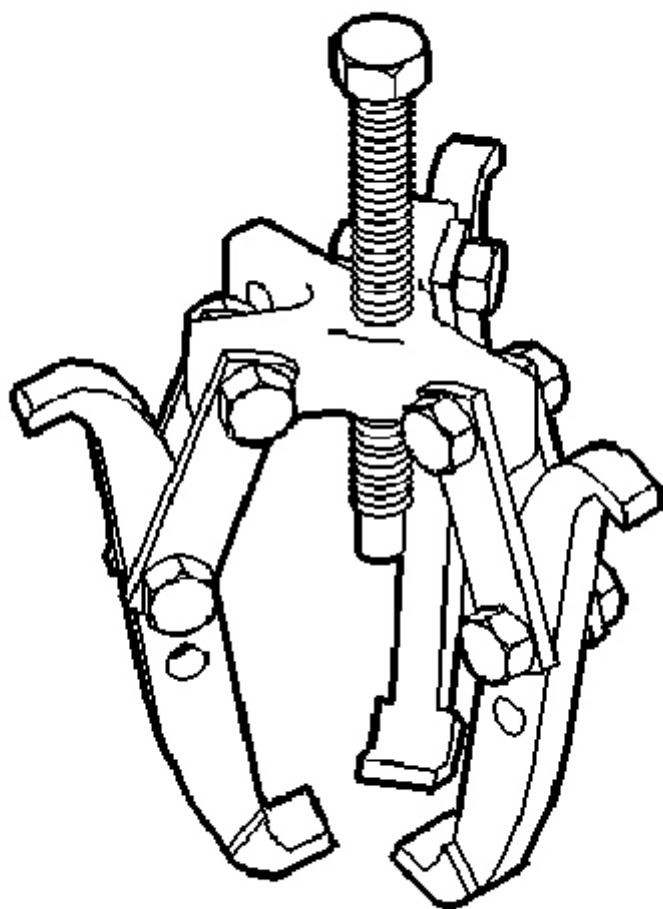


Fig. 27: Puller
Courtesy of CHRYSLER LLC

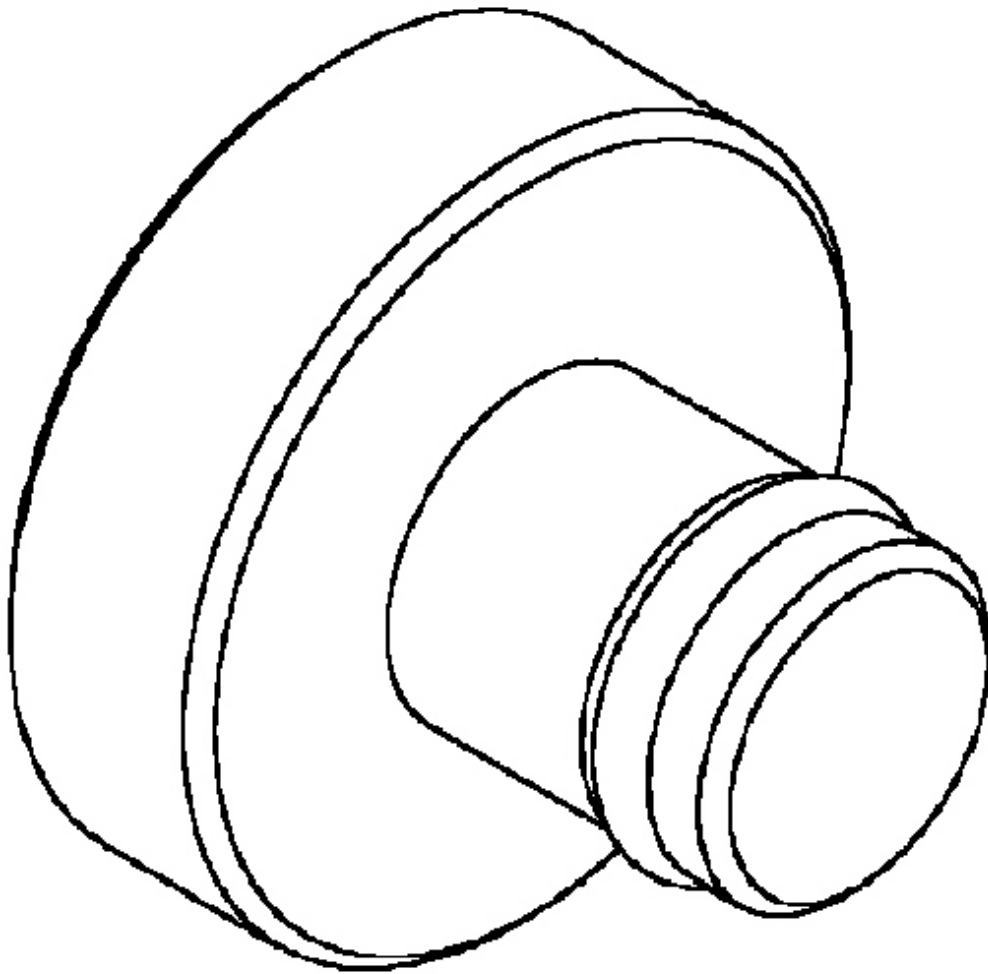


Fig. 28: Crankshaft Damper Removal Insert 8513
Courtesy of CHRYSLER LLC

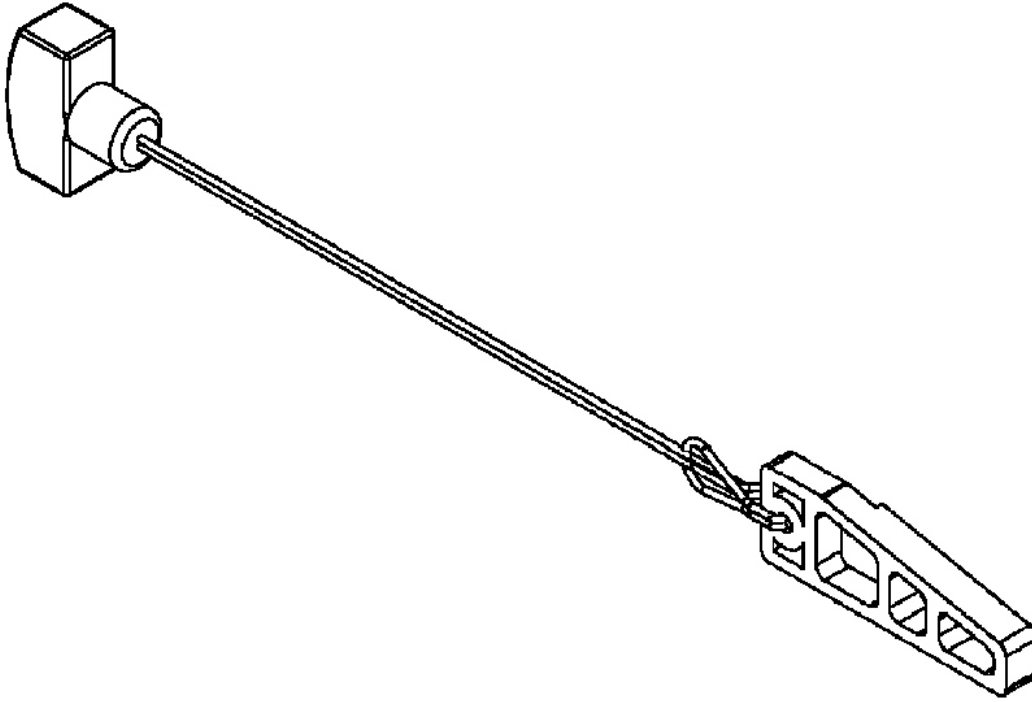


Fig. 29: Chain Tensioner Wedge 8379
Courtesy of CHRYSLER LLC

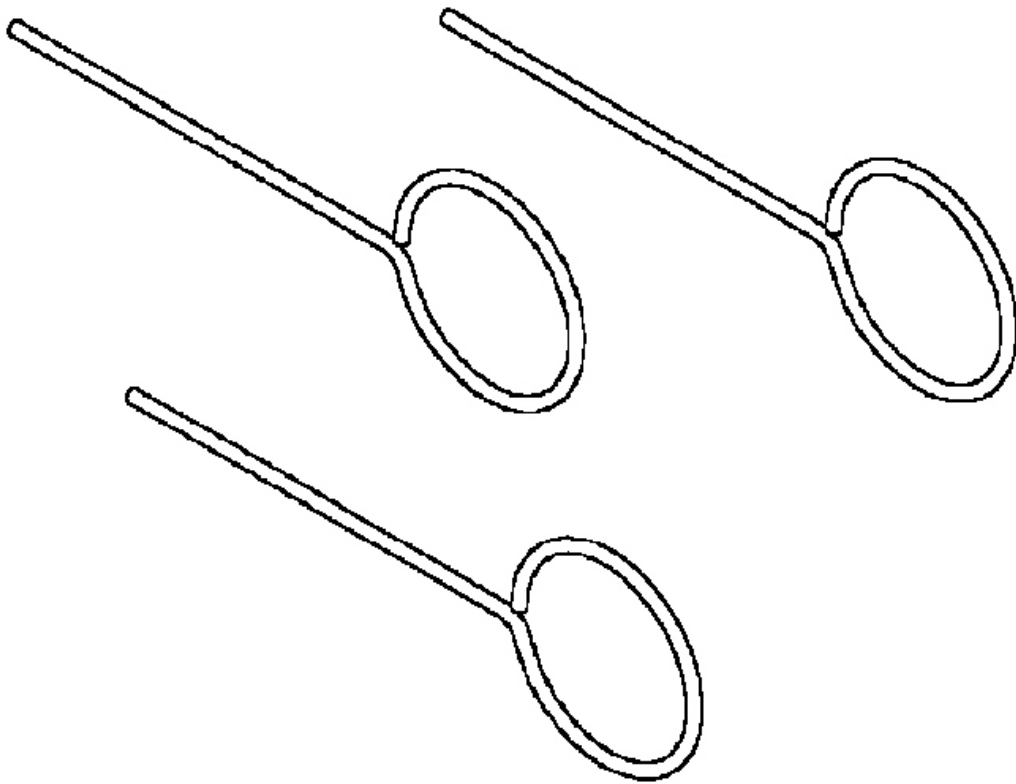


Fig. 30: Chain Tensioner Pins 8514
Courtesy of CHRYSLER LLC

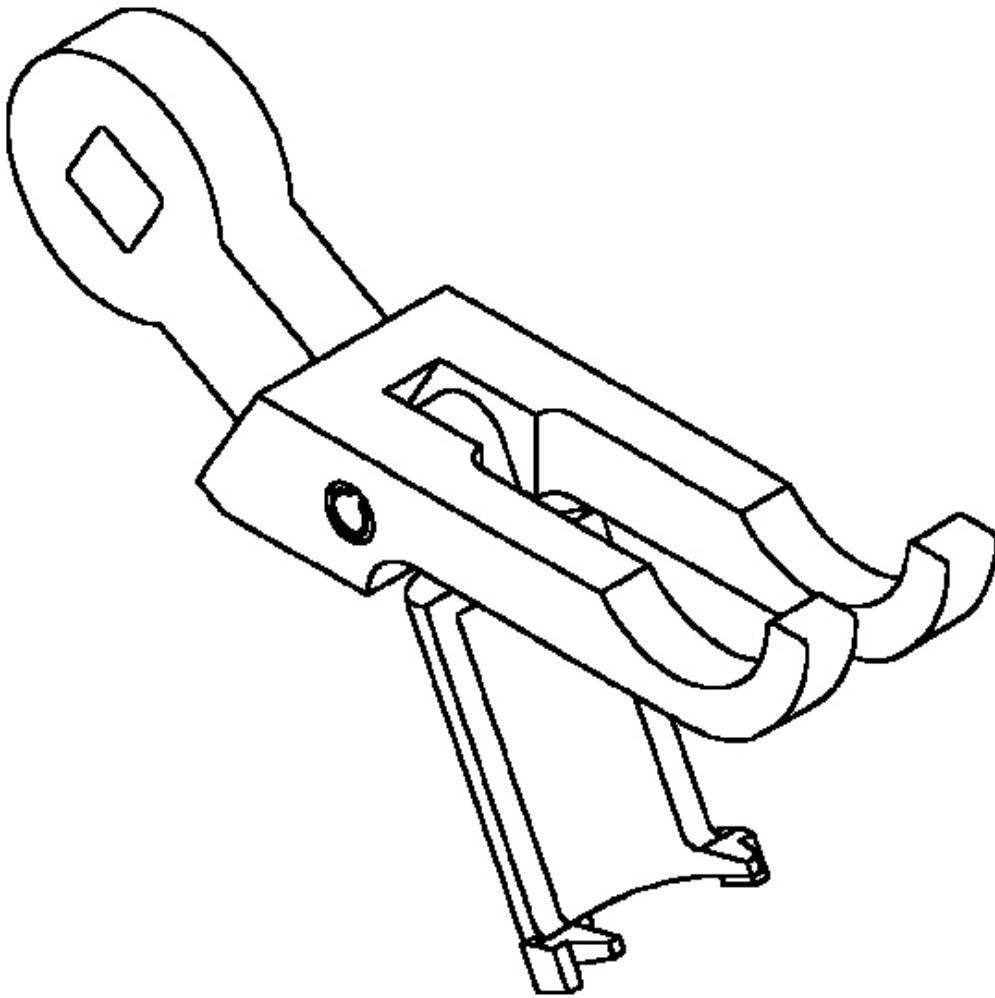


Fig. 31: Valve Spring Compressor 8426
Courtesy of CHRYSLER LLC

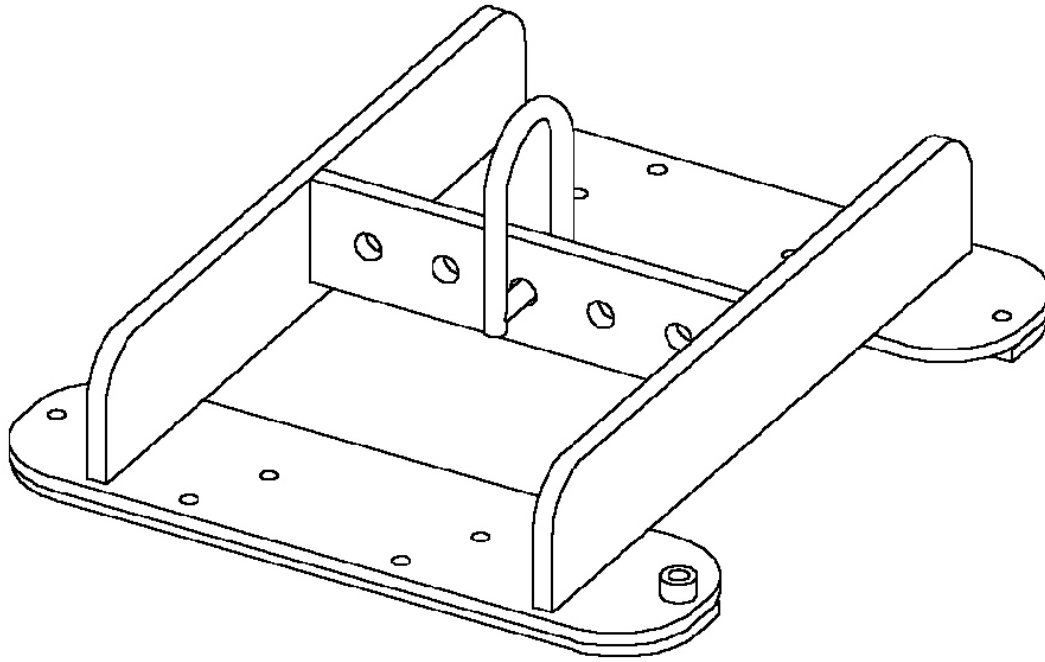


Fig. 32: Engine Lifting Fixture 8427
Courtesy of CHRYSLER LLC

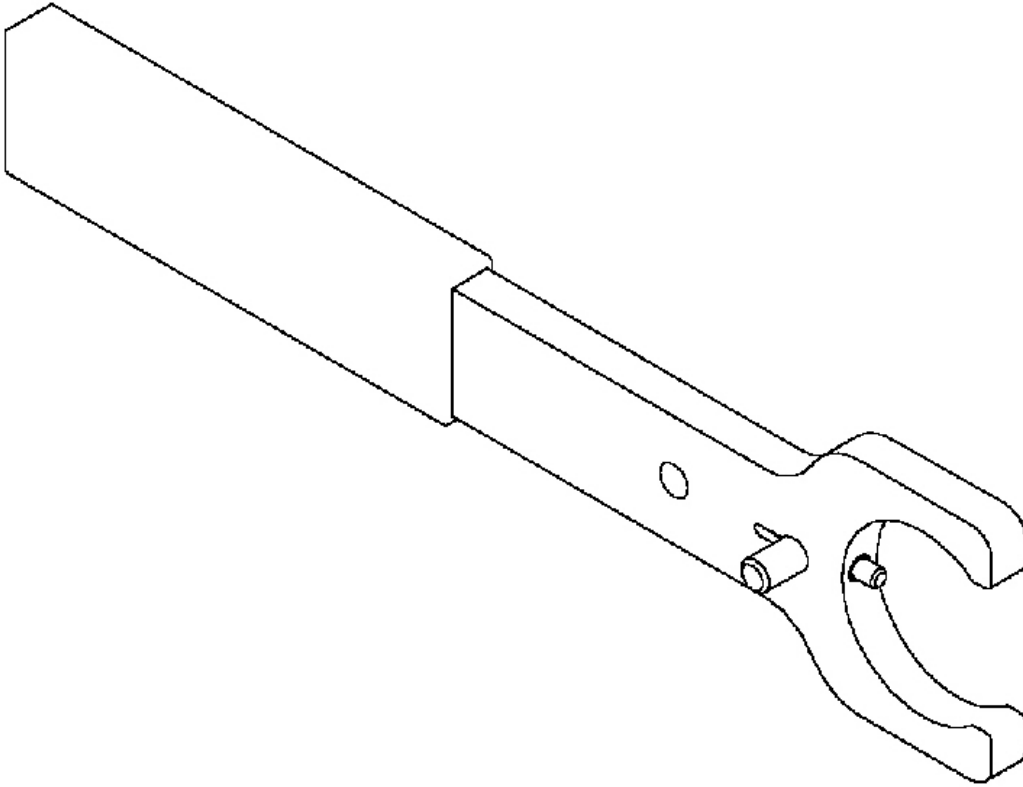


Fig. 33: Camshaft Holder 8428
Courtesy of CHRYSLER LLC

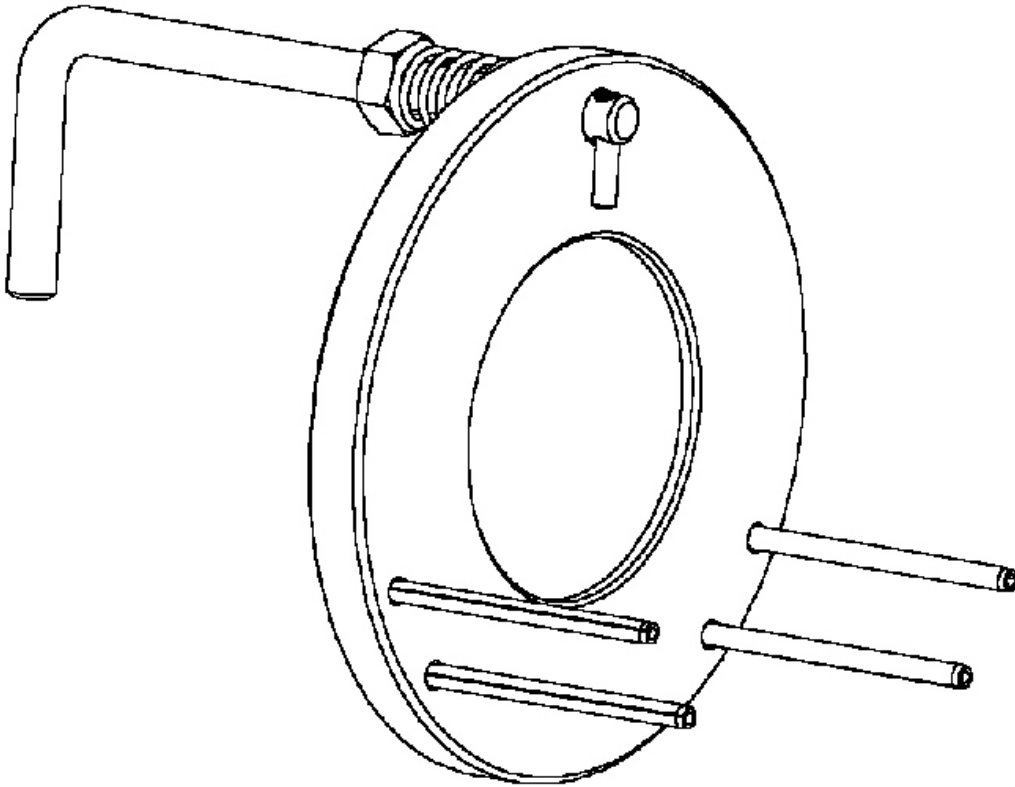


Fig. 34: Holder Secondary Camshaft Chain 8429
Courtesy of CHRYSLER LLC

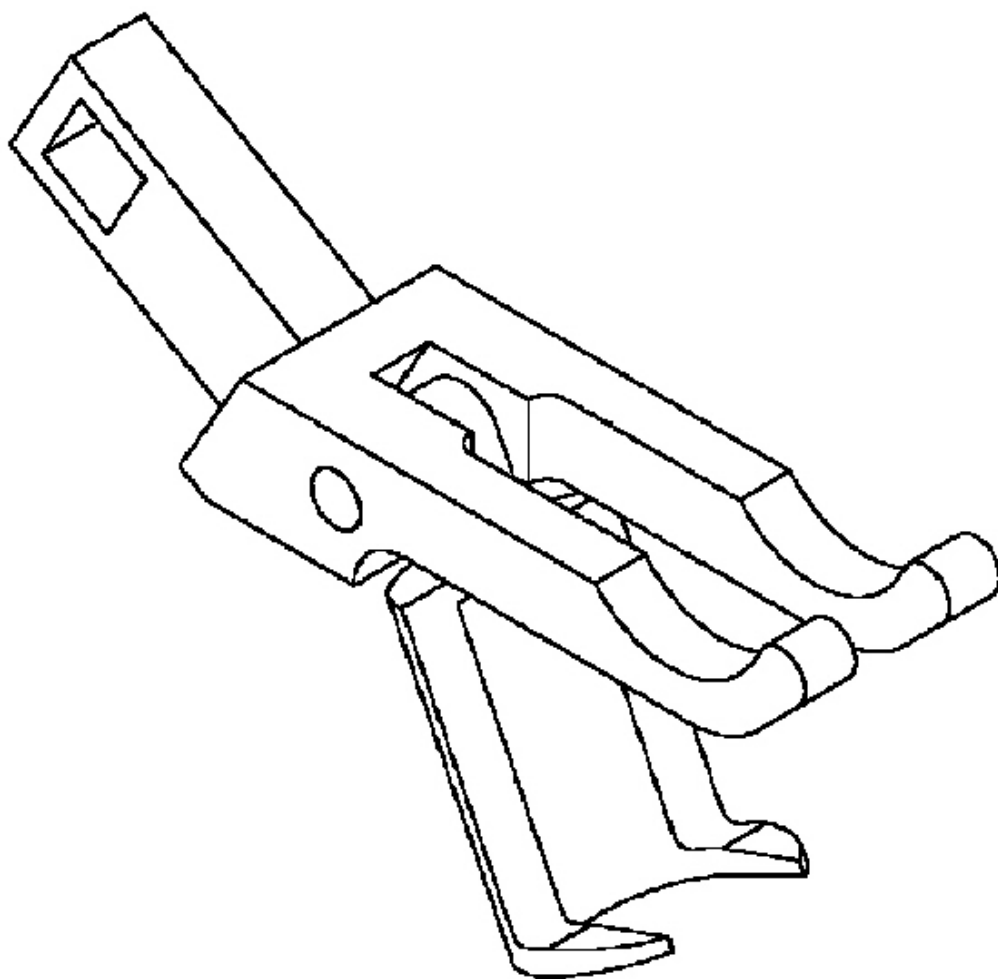


Fig. 35: Remover, Rocker Arm 8516
Courtesy of CHRYSLER LLC

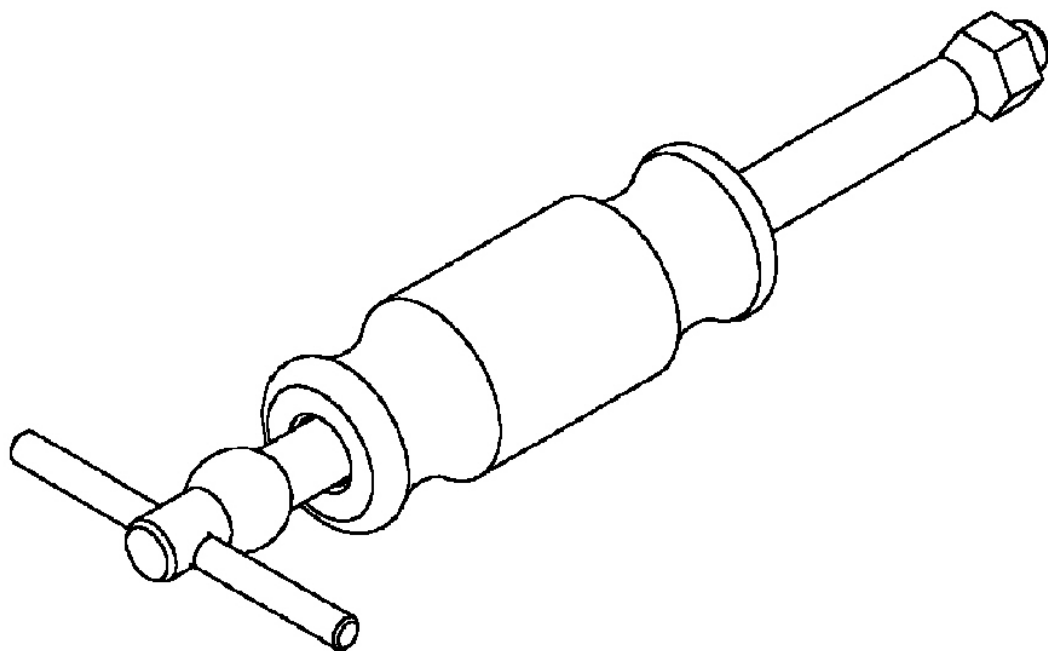


Fig. 36: Idler Shaft Remover 8517
Courtesy of CHRYSLER LLC

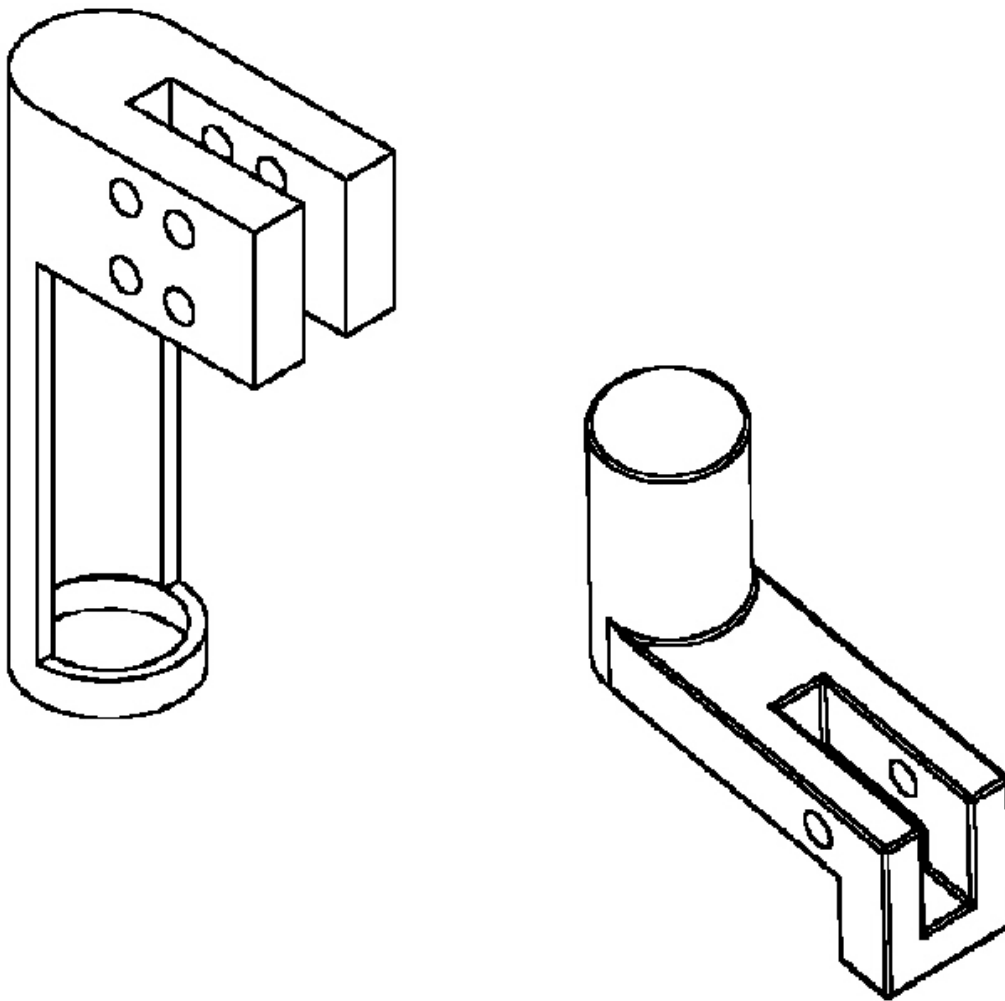


Fig. 37: Valve Spring Compressor Adapters 8519
Courtesy of CHRYSLER LLC

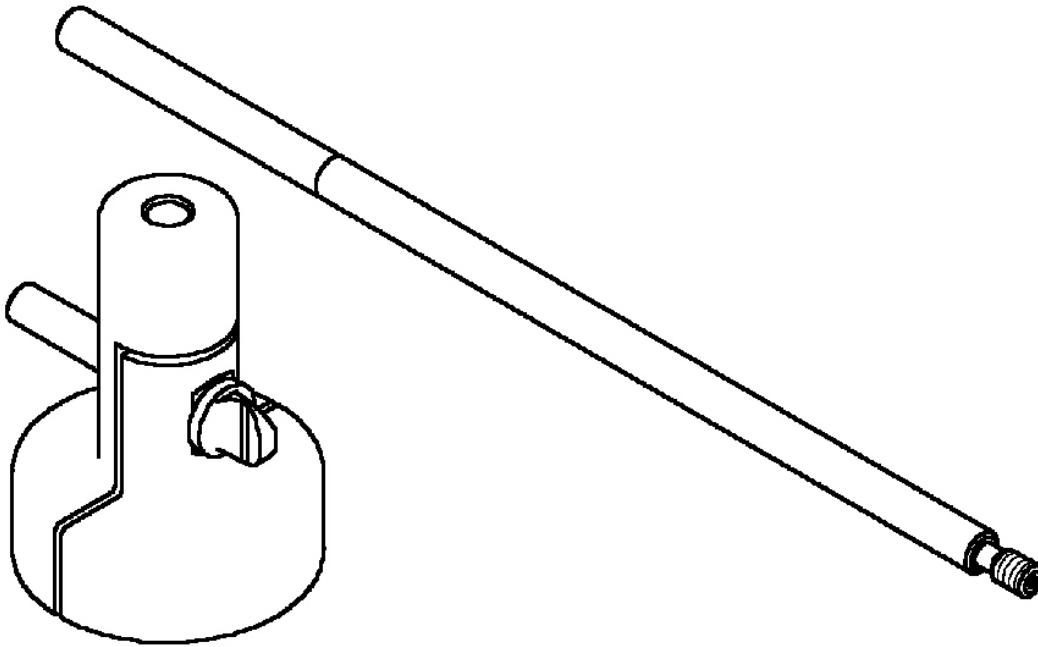
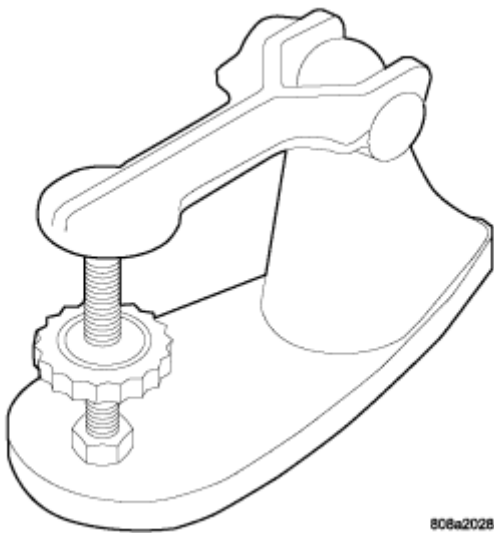
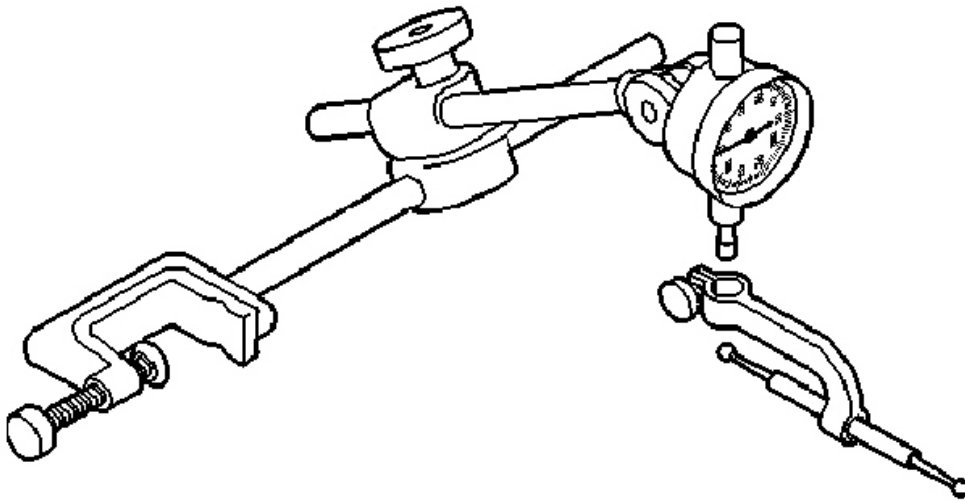


Fig. 38: Installer - Remover - Counter Balance Shaft 8641
Courtesy of CHRYSLER LLC



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Fig. 39: Valve Spring Tester C-647
Courtesy of CHRYSLER LLC



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Fig. 40: Dial Indicator C-3339
Courtesy of CHRYSLER LLC

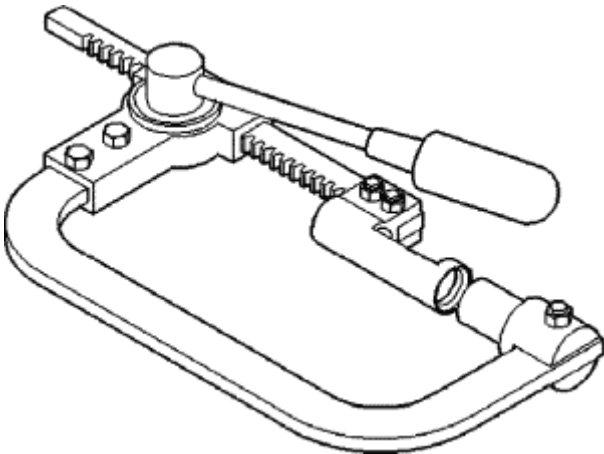
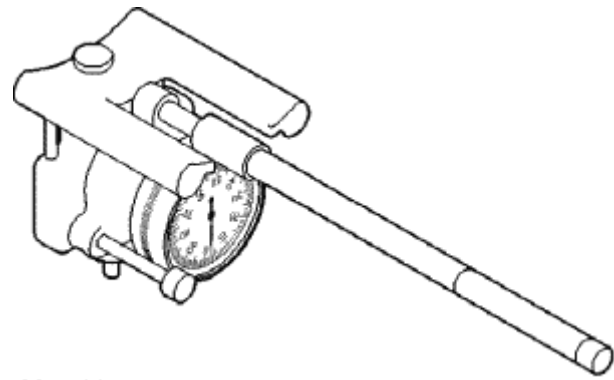


Fig. 41: Valve Spring Compressor
Courtesy of CHRYSLER LLC



8011c9fa

Fig. 42: Bore Size Indicator C-119

Courtesy of CHRYSLER LLC

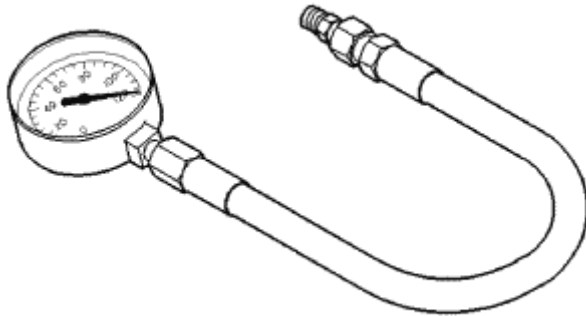


Fig. 43: Oil Pressure Gauge C-3292

Courtesy of CHRYSLER LLC

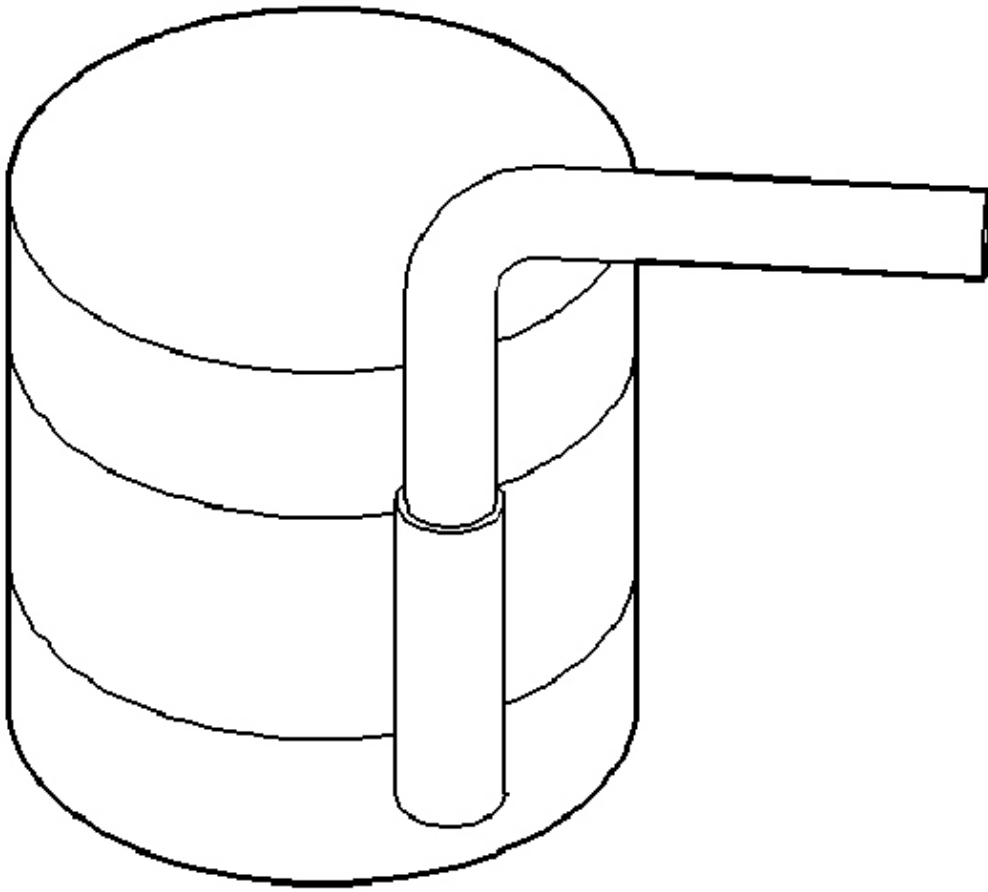


Fig. 44: Piston Ring Compressor C-385
Courtesy of CHRYSLER LLC

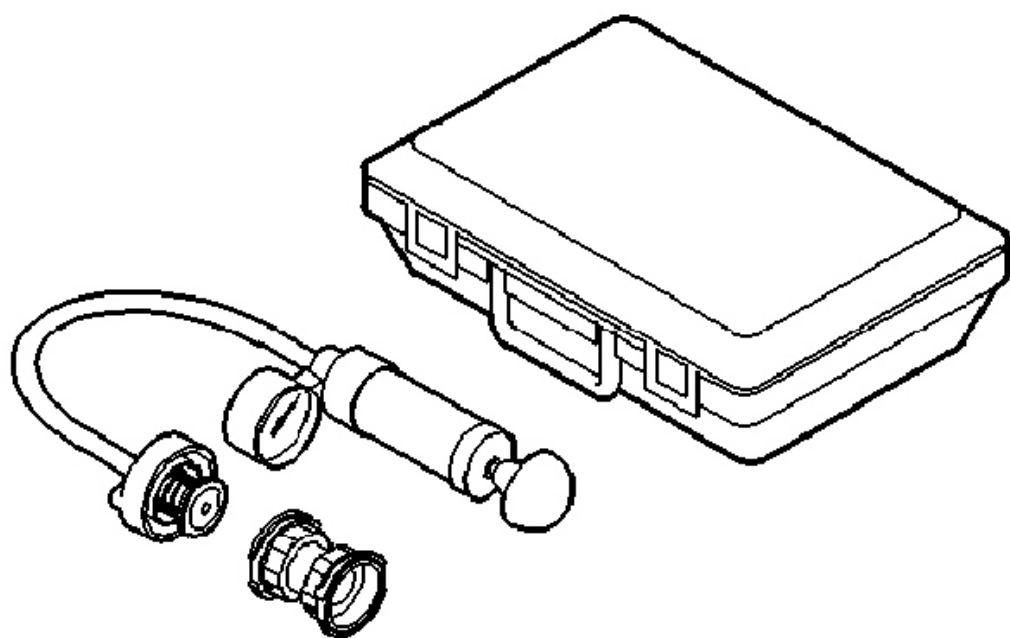
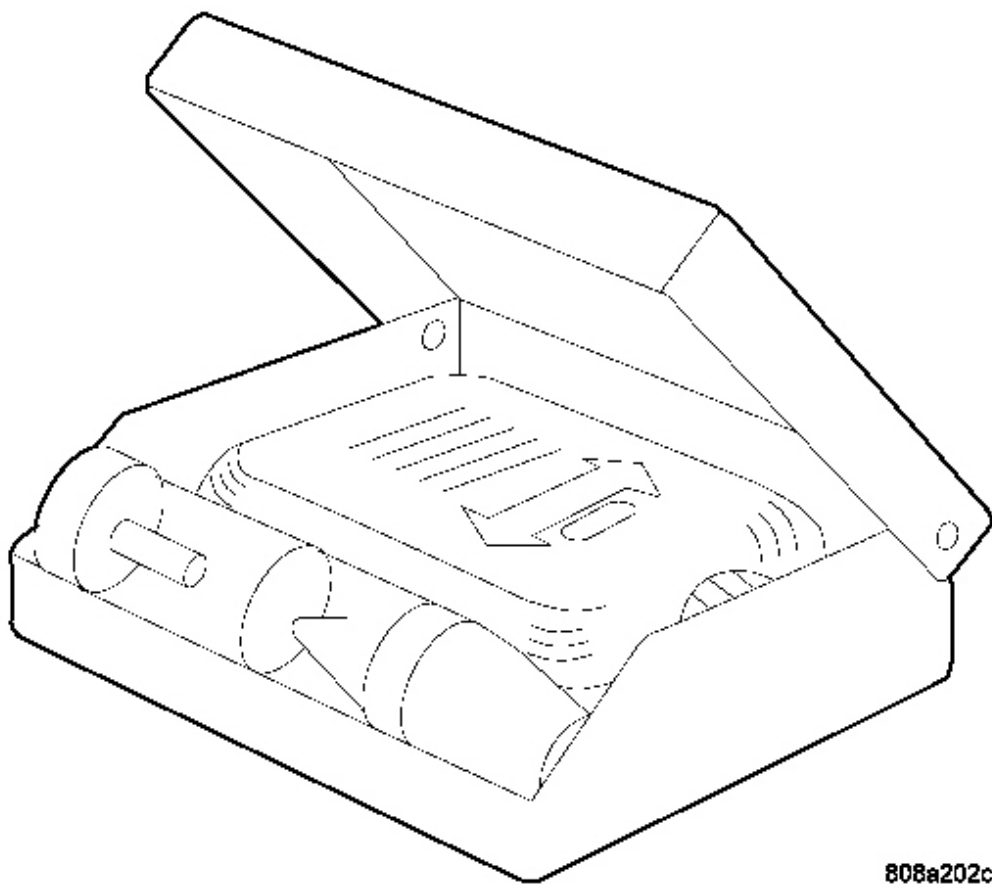


Fig. 45: Cooling System Tester 7700
Courtesy of CHRYSLER LLC



808a202c

Fig. 46: Bloc-Chek Kit C-3685
Courtesy of CHRYSLER LLC

AIR INTAKE SYSTEM

CLEANER-AIR ELEMENT

REMOVAL

REMOVAL

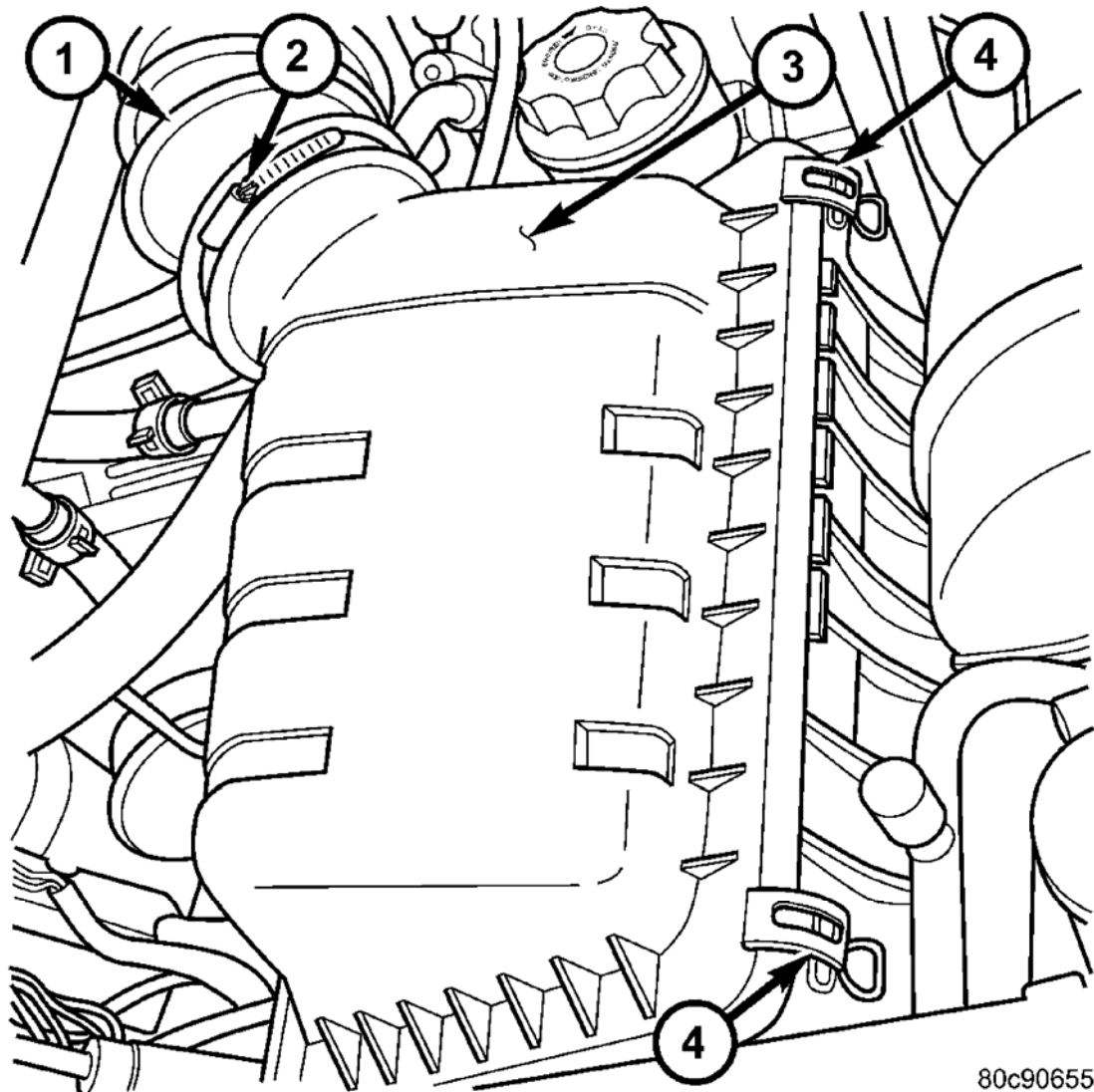


Fig. 47: Air Cleaner Element - 3.7L
Courtesy of CHRYSLER LLC

- 1 - AIR INTAKE HOSE
- 2 - HOSE CLAMP
- 3 - COVER
- 4 - CLIPS (2)

Housing removal is not necessary for element (filter) replacement.

1. Pry up spring clips (4) from front of housing cover (spring clips retain cover to housing). See **Fig. 47**.
2. Release housing cover from 4 locating tabs located on rear of housing, and remove cover.
3. Remove air cleaner element (filter) from housing.

4. Clean inside of housing before replacing element.

INSTALLATION

INSTALLATION

1. Install element into housing.
2. Position housing cover into housing locating tabs.
3. Pry up spring clips and lock cover to housing.

If any air filter, air resonator, air intake tubes or air filter housing clamps had been loosened or removed, tighten them to 5 N.m (40 in. lbs.)

CYLINDER HEAD - LEFT

DESCRIPTION

VALVE GUIDES

The valve guides are made of powdered metal and are pressed into the cylinder head. The guides are not replaceable or serviceable, and valve guide reaming is not recommended. If the guides are worn beyond acceptable limits, replace the cylinder heads.

DIAGNOSIS AND TESTING

CYLINDER HEAD GASKET

A cylinder head gasket leak can be located between adjacent cylinders or between a cylinder and the adjacent water jacket.

Possible indications of the cylinder head gasket leaking between adjacent cylinders are:

- Loss of engine power
- Engine misfiring
- Poor fuel economy

Possible indications of the cylinder head gasket leaking between a cylinder and an adjacent water jacket are:

- Engine overheating
- Loss of coolant
- Excessive steam (white smoke) emitting from exhaust
- Coolant foaming

CYLINDER-TO-CYLINDER LEAKAGE TEST

To determine if an engine cylinder head gasket is leaking between adjacent cylinders, follow the procedures in

Cylinder Compression Pressure Test. See **CYLINDER COMPRESSION PRESSURE**. An engine cylinder head gasket leaking between adjacent cylinders will result in approximately a 50 - 70% reduction in compression pressure.

CYLINDER-TO-WATER JACKET LEAKAGE TEST

WARNING: USE EXTREME CAUTION WHEN THE ENGINE IS OPERATING WITH COOLANT PRESSURE CAP REMOVED.

VISUAL TEST METHOD

With the engine cool, remove the coolant pressure cap. Start the engine and allow it to warm up until thermostat opens.

If a large combustion/compression pressure leak exists, bubbles will be visible in the coolant.

COOLING SYSTEM TESTER METHOD

WARNING: WITH COOLING SYSTEM TESTER IN PLACE, PRESSURE WILL BUILD UP FAST. EXCESSIVE PRESSURE BUILT UP, BY CONTINUOUS ENGINE OPERATION, MUST BE RELEASED TO A SAFE PRESSURE POINT. NEVER PERMIT PRESSURE TO EXCEED 138 kPa (20 psi).

Install Cooling System Tester 7700 or equivalent to pressure cap neck. Start the engine and observe the tester's pressure gauge. If gauge pulsates with every power stroke of a cylinder a combustion pressure leak is evident.

CHEMICAL TEST METHOD

Combustion leaks into the cooling system can also be checked by using Bloc-Chek Kit C-3685-A or equivalent. Perform test following the procedures supplied with the tool kit.

HYDRAULIC LASH ADJUSTER

A tappet-like noise may be produced from several items. Check the following items.

1. Engine oil level too high or too low. This may cause aerated oil to enter the adjusters and cause them to be spongy.
2. Insufficient running time after rebuilding cylinder head. Low speed running up to 1 hour may be required.
3. Turn engine off and let set for a few minutes before restarting. Repeat this several times after engine has reached normal operating temperature.
4. Low oil pressure.
5. The oil restrictor in cylinder head gasket or the oil passage to the cylinder head is plugged with debris.
6. Air ingested into oil due to broken or cracked oil pump pick up.
7. Worn valve guides.
8. Rocker arm ears contacting valve spring retainer.

9. Rocker arm loose, adjuster stuck or at maximum extension and still leaves lash in the system.
10. Oil leak or excessive cam bore wear in cylinder head.
11. Faulty lash adjuster.

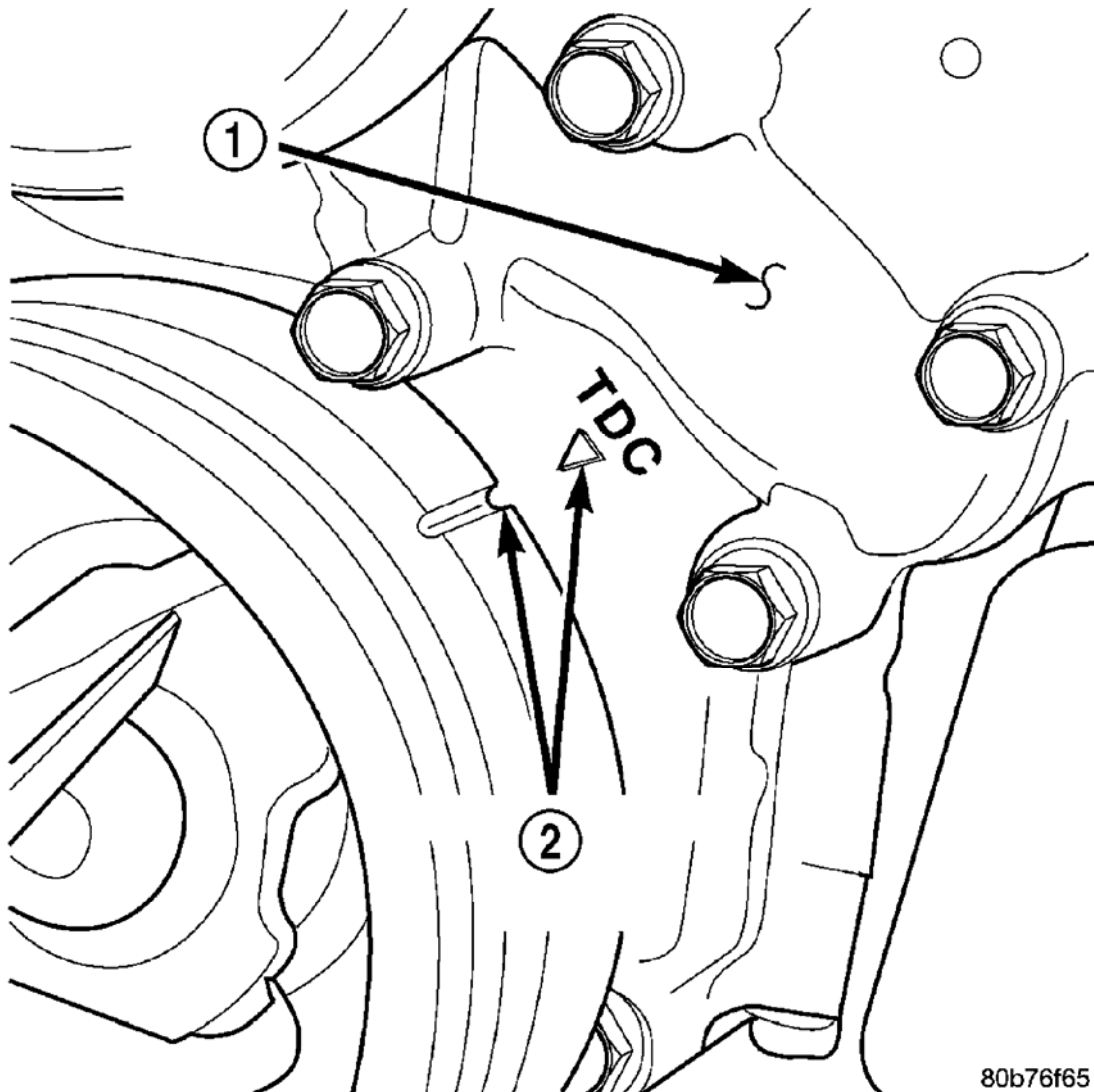
Check lash adjusters for sponginess while installed in cylinder head and cam on camshaft at base circle. Depress part of rocker arm over adjuster. Normal adjusters should feel firm when pressed quickly. When pressed very slowly, lash adjusters should collapse.

Remove suspected lash adjusters, and replace.

Before installation, make sure adjusters are full of oil. This can be verified by little plunger travel when lash adjuster is depressed quickly.

REMOVAL

REMOVAL



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Fig. 48: Engine Top Dead Center (TDC) Indicator Marks

Courtesy of CHRYSLER LLC

- | |
|-----------------------------|
| 1 - TIMING CHAIN COVER |
| 2 - CRANKSHAFT TIMING MARKS |

1. Disconnect the negative cable from the battery.
2. Raise the vehicle on a hoist.
3. Disconnect the exhaust pipe at the left side exhaust manifold.
4. Drain the engine coolant. Refer to **COOLING** .
5. Lower the vehicle.
6. Remove the intake manifold. Refer to appropriate procedure.
7. Remove the cylinder head cover. Refer to appropriate procedure.
8. Remove the fan shroud and fan blade assembly. Refer to **COOLING** .
9. Remove accessory drive belt. Refer to **COOLING** .
10. Remove the power steering pump and set aside.
11. Rotate the crankshaft until the damper timing mark is aligned with TDC indicator mark (2). See **Fig. 48**.

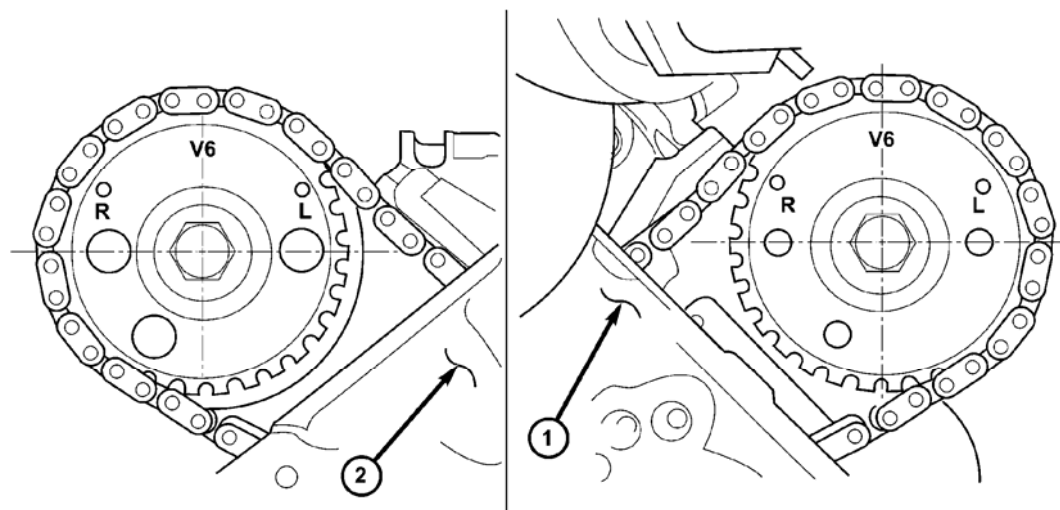


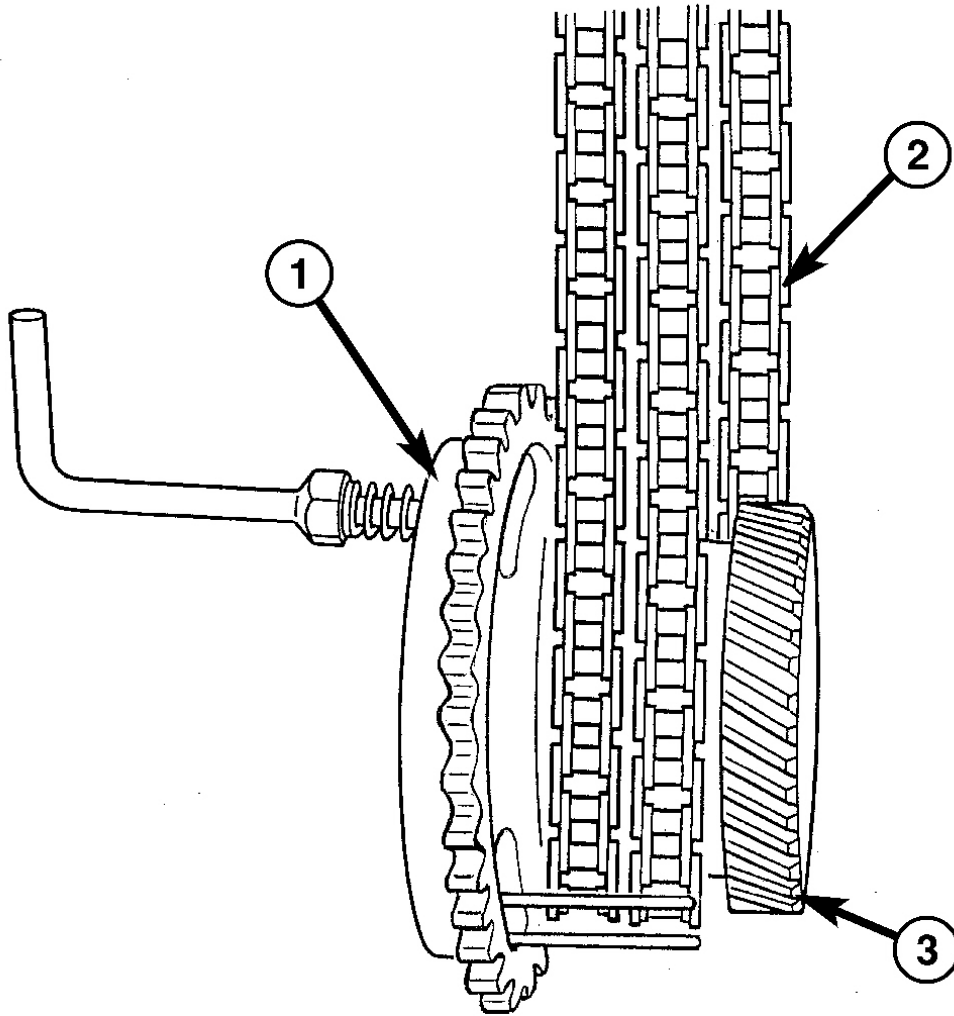
Fig. 49: Camshaft Sprocket V6 Marks (#1 TDC, Exhaust Stroke)

Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - LEFT CYLINDER HEAD |
| 2 - RIGHT CYLINDER HEAD |

12. Verify the V6 mark on the camshaft sprocket is at the 12 o'clock position. See **Fig. 49**. Rotate the crankshaft one turn if necessary.
13. Remove the crankshaft damper. See **REMOVAL**.

14. Remove the timing chain cover. See **REMOVAL**.



80cb5655

Fig. 50: Locking Secondary Timing Chains
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - SPECIAL TOOL 8429 |
| 2 - CAMSHAFT CHAIN |
| 3 - CRANKSHAFT TIMING GEAR |

15. Lock the secondary timing chains to the idler sprocket using Secondary Camshaft Chain Holder 8429 (1). See **Fig. 50**.

NOTE: Mark the secondary timing chain prior to removal to aid in installation.

16. Mark the secondary timing chain, one link on each side of the V6 mark on the camshaft drive gear.
17. Remove the left side secondary chain tensioner.

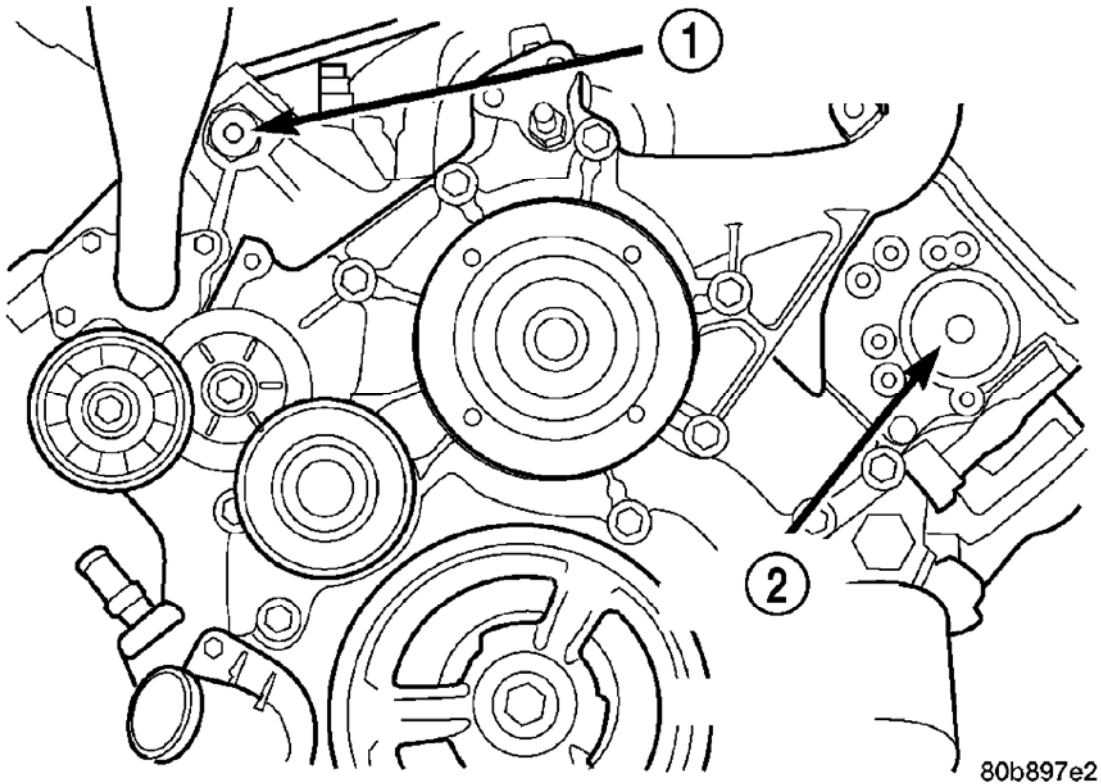


Fig. 51: Cylinder Head Access Plug Location
Courtesy of CHRYSLER LLC

1 - RIGHT CYLINDER HEAD ACCESS PLUG 2 - LEFT CYLINDER HEAD ACCESS PLUG

18. Remove the cylinder head access plug (1) (2). See **Fig. 51**.
19. Remove the left side secondary chain guide.
20. Remove the retaining bolt and the camshaft drive gear.

CAUTION: Do not allow the engine to rotate. Severe damage to the valve train can occur.

CAUTION: Do not overlook the four smaller bolts at the front of the cylinder head. Do not attempt to remove the cylinder head without removing these four bolts.

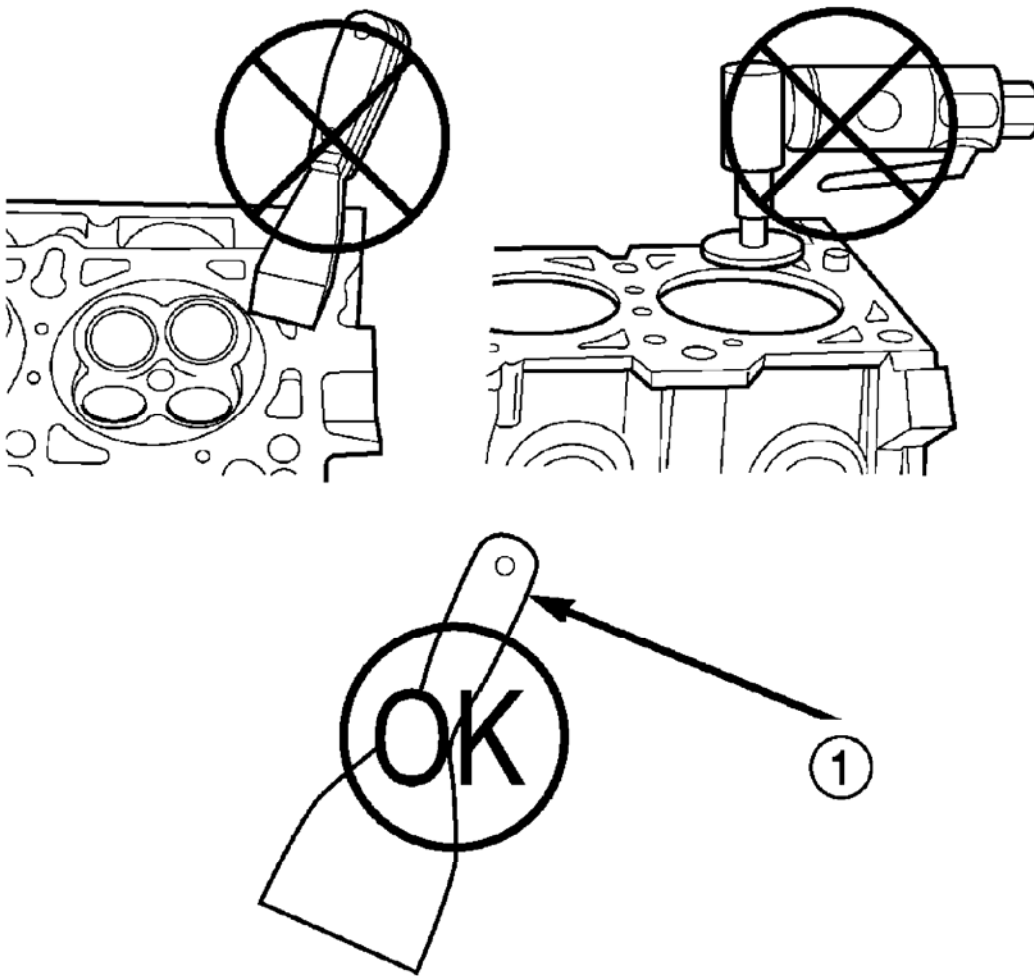
NOTE: The cylinder head is attached to the cylinder block with twelve bolts.

21. Remove the cylinder head retaining bolts.
22. Remove the cylinder head and gasket. Discard the gasket.

CAUTION: Do not lay the cylinder head on its gasket sealing surface, due to the design of the cylinder head gasket any distortion to the cylinder head sealing surface may prevent the gasket from properly sealing resulting in leaks.

CLEANING

CYLINDER HEADS



80b76eba

Fig. 52: Proper Tool Usage for Surface Preparation

1 - PLASTIC/WOOD SCRAPER

To ensure engine gasket sealing, proper surface preparation must be performed, especially with the use of aluminum engine components. See **Fig. 52**. See **STANDARD PROCEDURE**.

INSTALLATION

INSTALLATION

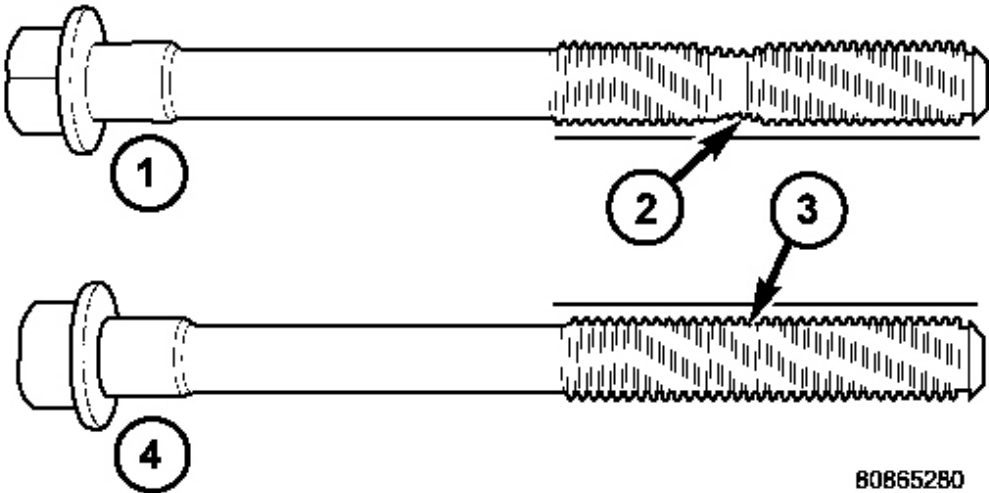


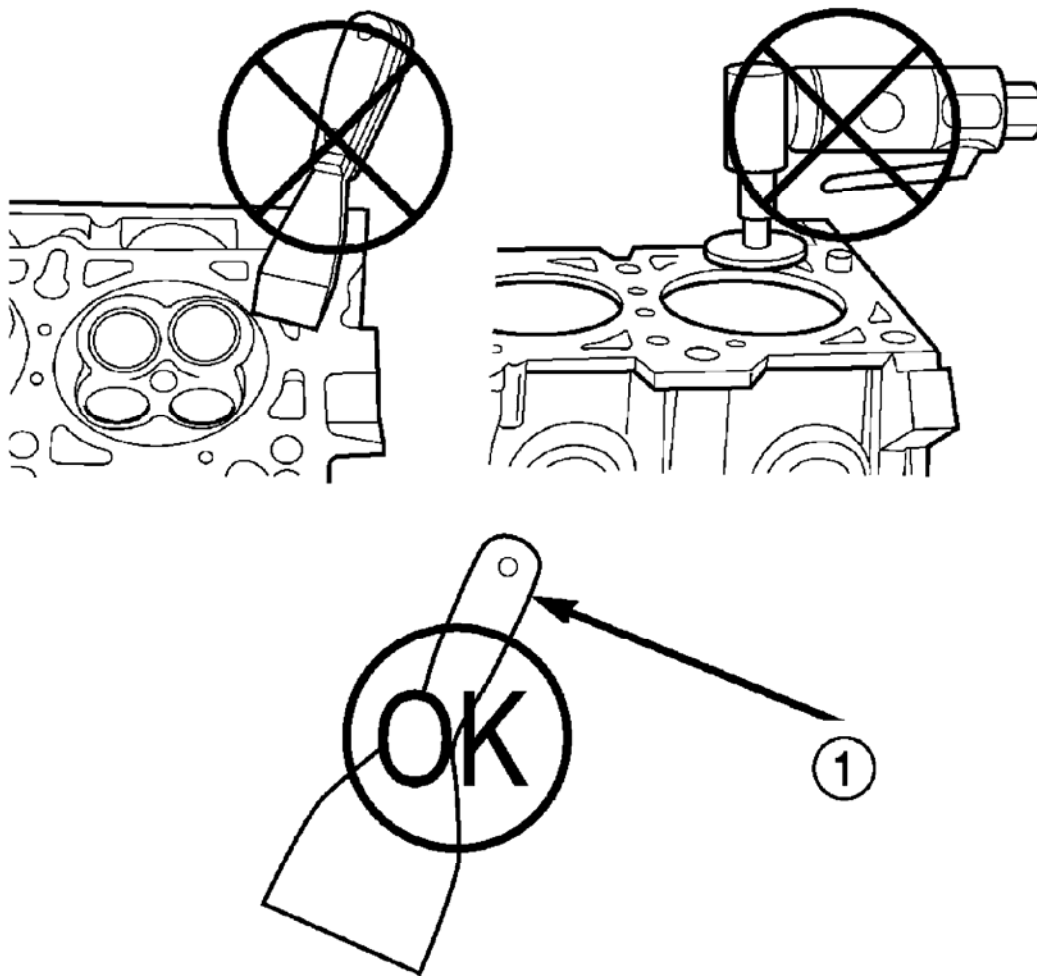
Fig. 53: Checking Cylinder Head Bolts for Stretching (Necking)
Courtesy of CHRYSLER LLC

- 1 - STRETCHED BOLT
- 2 - THREADS ARE NOT STRAIGHT ON LINE
- 3 - THREADS ARE STRAIGHT ON LINE
- 4 - UNSTRETCHED BOLT

NOTE: The cylinder head bolts are tightened using a torque plus angle procedure. The bolts must be examined **BEFORE** reuse. If the threads are necked down the bolts should be replaced.

Necking can be checked by holding a straight edge against the threads. If all the threads do not contact the scale

(1), the bolt should be replaced. See **Fig. 53**.



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Fig. 54: Proper Tool Usage for Surface Preparation
Courtesy of CHRYSLER LLC

1 - PLASTIC/WOOD SCRAPER

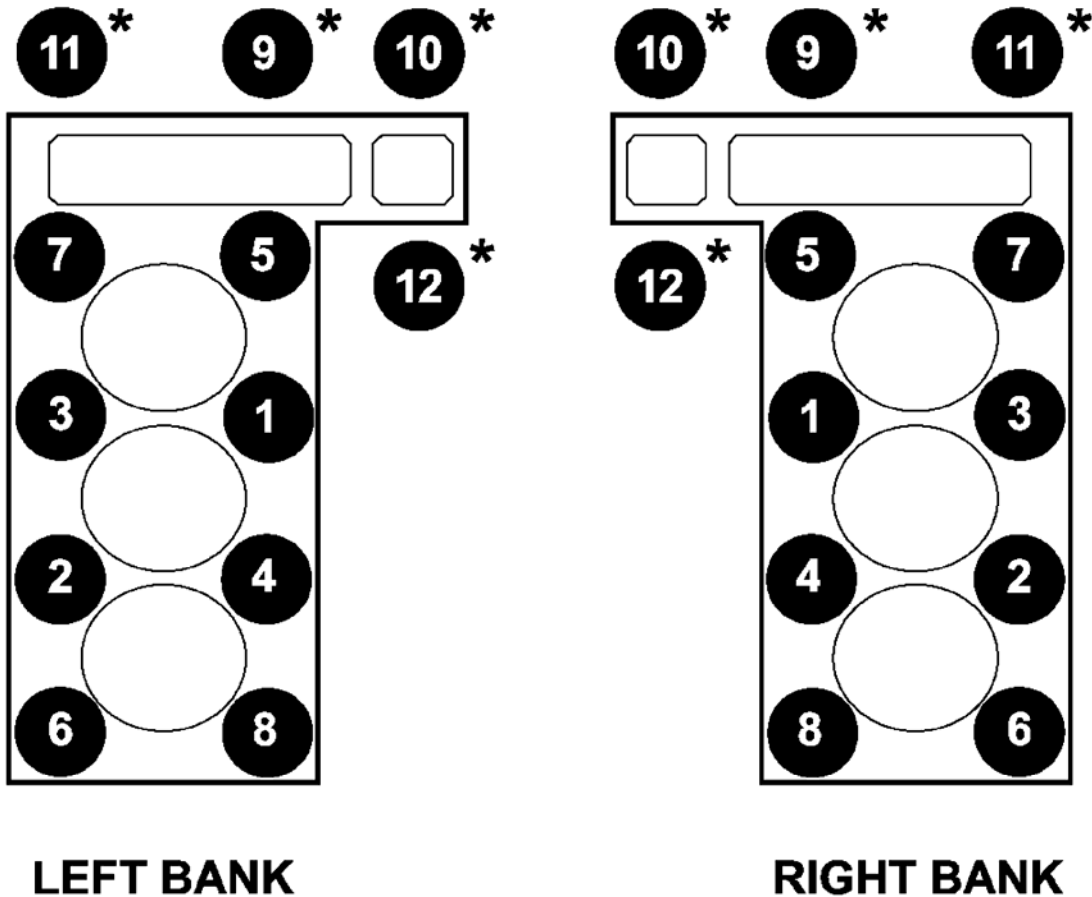
CAUTION: When cleaning cylinder head and cylinder block surfaces, DO NOT use a metal scraper because the surfaces could be cut or ground. Use only a wooden or plastic scraper.

1. Clean the cylinder head and cylinder block mating surfaces. See **Fig. 54**.
2. Position the new cylinder head gasket on the locating dowels.

CAUTION: When installing cylinder head, use care not damage the tensioner

arm or the guide arm.

3. Position the cylinder head onto the cylinder block. Make sure the cylinder head seats fully over the locating dowels.



80cb8871

Fig. 55: Cylinder Head Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

* - INDICATES SEALANT ON THREADS

NOTE: The four smaller cylinder head mounting bolts require sealant to be added to them before installing. Failure to do so may cause leaks.

4. Lubricate the cylinder head bolt threads with clean engine oil and install the eight M11 bolts.
5. Coat the four M8 cylinder head bolts with **Mopar® Lock and Seal Adhesive** then install the bolts.

NOTE: The cylinder head bolts are tightened using an angle torque procedure, however, the bolts are not a torque-to-yield design.

6. Tighten the bolts in sequence using the following steps and torque values:
 - Step 1: Tighten bolts 1-8, 27 N.m (20 ft. lbs.).
 - Step 2: Verify that bolts 1-8, all reached 27 N.m (20 ft. lbs.), by repeating step-1 without loosening the bolts. Tighten bolts 9 through 12 to 14 N.m (10 ft. lbs.).
 - Step 3: Tighten bolts 1-8, 90 degrees. See **Fig. 55**.
 - Step 4: Tighten bolts 1-8, 90 degrees, again. Tighten bolts 9-12, 26 N.m (19 ft. lbs.)
7. Position the secondary chain onto the camshaft drive gear, making sure one marked chain link is on either side of the V6 mark on the gear then using Camshaft Holder 8428, position the gear onto the camshaft.

CAUTION: Remove excess oil from camshaft sprocket retaining bolt before reinstalling bolt. Failure to do so may cause over-torquing of bolt resulting in bolt failure.

8. Install the camshaft drive gear retaining bolt.
9. Install the left side secondary chain guide.
10. Install the cylinder head access plug.
11. Reset and Install the left side secondary chain tensioner.
12. Remove Secondary Camshaft Chain Holder 8429.
13. Install the timing chain cover.
14. Install the crankshaft damper. Tighten damper bolt 175 N.m (130 Ft. Lbs.)
15. Install the power steering pump.
16. Install the fan blade assembly and fan shroud.
17. Install the cylinder head cover.
18. Install the intake manifold.
19. Refill the cooling system
20. Raise the vehicle.
21. Install the exhaust pipe onto the left exhaust manifold.
22. Lower the vehicle.
23. Connect the negative cable to the battery.
24. Start the engine and check for leaks.

CAMSHAFT

DESCRIPTION

CAMSHAFT - LEFT

The camshafts consist of powdered metal steel lobes which are sinter-bonded to a steel tube. Four bearing journals are machined into the camshaft. Camshaft end play is controlled by two thrust walls that border the

nose piece journal.

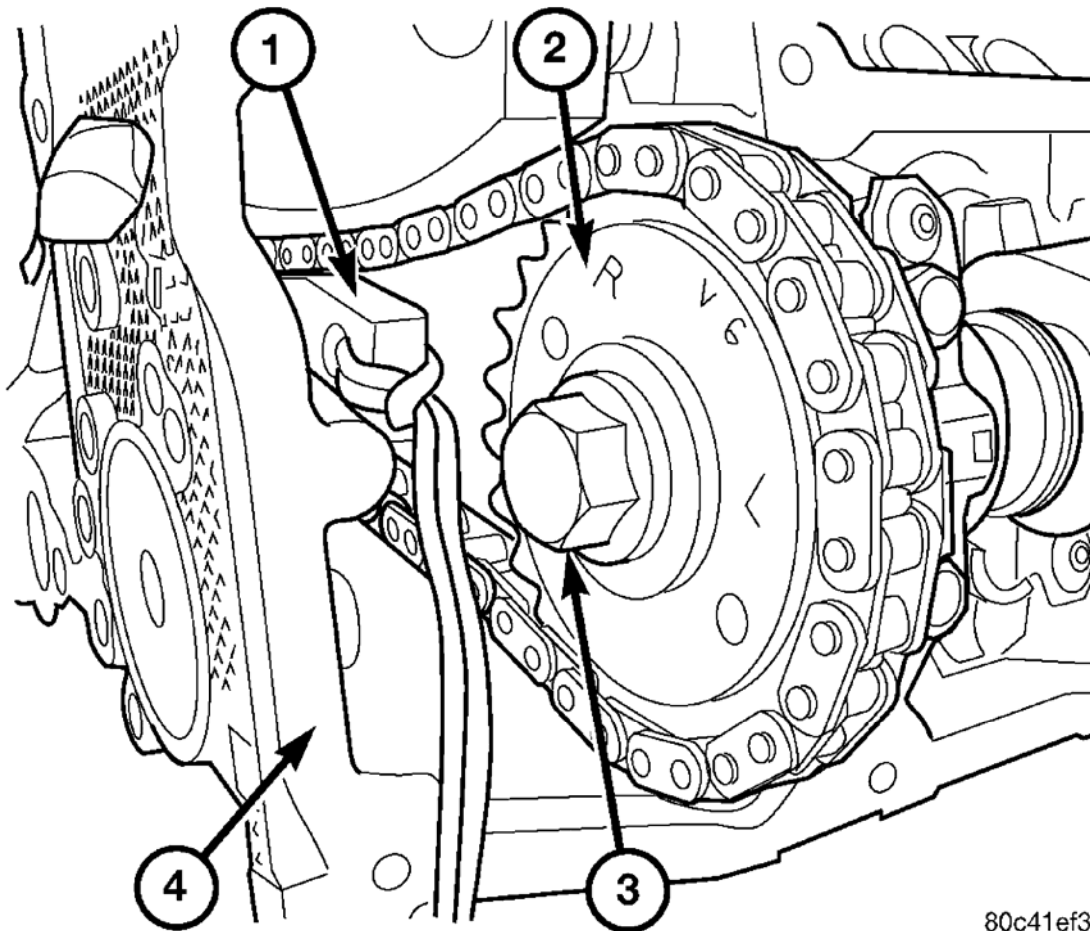
REMOVAL

CAMSHAFT - LEFT

CAUTION: When the timing chain is removed and the cylinder heads are still installed, DO NOT forcefully rotate the camshafts or crankshaft independently of each other. Severe valve and/or piston damage can occur.

CAUTION: When removing the cam sprocket, timing chains or camshaft, Failure to use the Wedge Locking Tool 8379 will result in hydraulic tensioner ratchet over extension, requiring timing chain cover removal to reset the tensioner ratchet.

1. Remove cylinder head cover. See REMOVAL.



80c41ef3

Fig. 56: Securing Timing Chain Tensioners Using Timing Chain Wedge - Typical

1 - SPECIAL TOOL 8379 2 - CAMSHAFT SPROCKET 3 - CAMSHAFT SPROCKET BOLT 4 - CYLINDER HEAD

2. Set engine to TDC cylinder #1, camshaft sprocket V6 marks at the 12 o'clock position.
3. Mark one link on the secondary timing chain on both sides of the V6 mark on the camshaft sprocket to aid in installation.

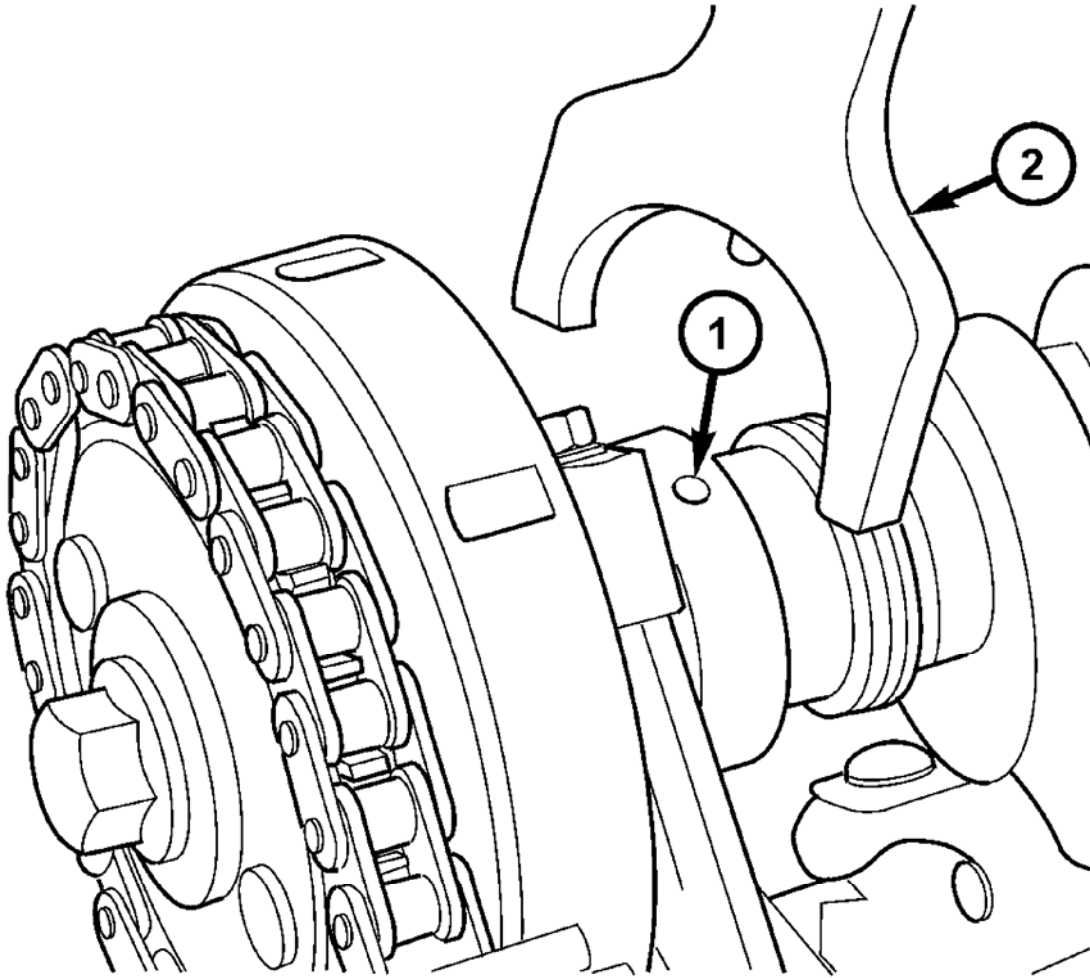
CAUTION: Do not hold or pry on the camshaft target wheel (Located on the right side camshaft sprocket) for any reason, Severe damage will occur to the target wheel resulting in a vehicle no start condition.

4. Loosen but **DO NOT** remove the camshaft sprocket retaining bolt. Leave the bolt snug against the sprocket.

NOTE: The timing chain tensioners must be secured prior to removing the camshaft sprockets. Failure to secure tensioners will allow the tensioners to extend, requiring timing chain cover removal in order to reset tensioners.

CAUTION: Do not force wedge past the narrowest point between the chain strands. Damage to the tensioners may occur.

5. Position the Wedge Locking Tool 8379. See **Fig. 56** between the timing chain strands, tap the tool to securely wedge the timing chain against the tensioner arm and guide.



80ccc0a4

Fig. 57: Special Tool 8428
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - Camshaft hole
2 - Special Tool 8428 |
|--|

6. Hold the camshaft with Camshaft Holder 8428 while removing the camshaft sprocket bolt and sprocket. See **Fig. 57**.
7. Using the Camshaft Holder 8428, gently allow the camshaft to rotate 5° clockwise until the camshaft is in the neutral position (no valve load).
8. Starting at the outside working inward, loosen the camshaft bearing cap retaining bolts 1/2 turn at a time. Repeat until all load is off the bearing caps.

CAUTION: DO NOT STAMP OR STRIKE THE CAMSHAFT BEARING CAPS.

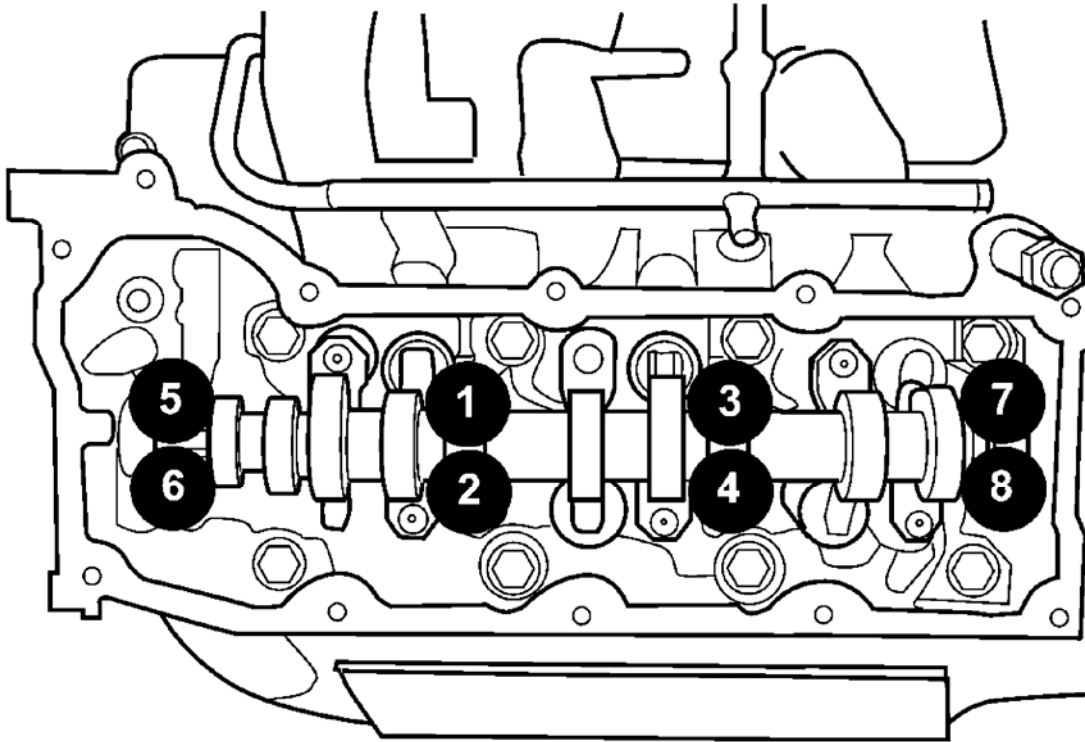
SEVERE DAMAGE WILL OCCUR TO THE BEARING CAPS.

NOTE: When the camshaft is removed the rocker arms may slide downward, mark the rocker arms before removing camshaft.

9. Remove the camshaft bearing caps and the camshaft.

INSTALLATION

CAMSHAFT - LEFT



808a1e9b

Fig. 58: Camshaft Bearing Cap Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

1. Lubricate camshaft journals with clean engine oil.

NOTE: Position the left side camshaft so that the camshaft sprocket dowel is near

the 1 o'clock position, This will place the camshaft at the neutral position easing the installation of the camshaft bearing caps.

2. Position the camshaft into the cylinder head.
3. Install the camshaft bearing caps, hand tighten the retaining bolts.

NOTE: Caps should be installed so that the stamped numbers on the caps are in numerical order, (1 through 4) from the front to the rear of the engine. All caps should be installed so that the stamped arrows on the caps point toward the front of the engine.

4. Working in 1/2 turn increments, tighten the bearing cap retaining bolts starting with the middle cap working outward.
5. Tighten the camshaft bearing cap retaining bolts to 11 N.m (100 in. lbs.). See **Fig. 58**.
6. Position the camshaft drive gear into the timing chain aligning the V6 mark between the two marked chain links (Two links marked during removal).
7. Using the Camshaft Holder 8428, rotate the camshaft until the camshaft sprocket dowel is aligned with the slot in the camshaft sprocket. Install the sprocket onto the camshaft.

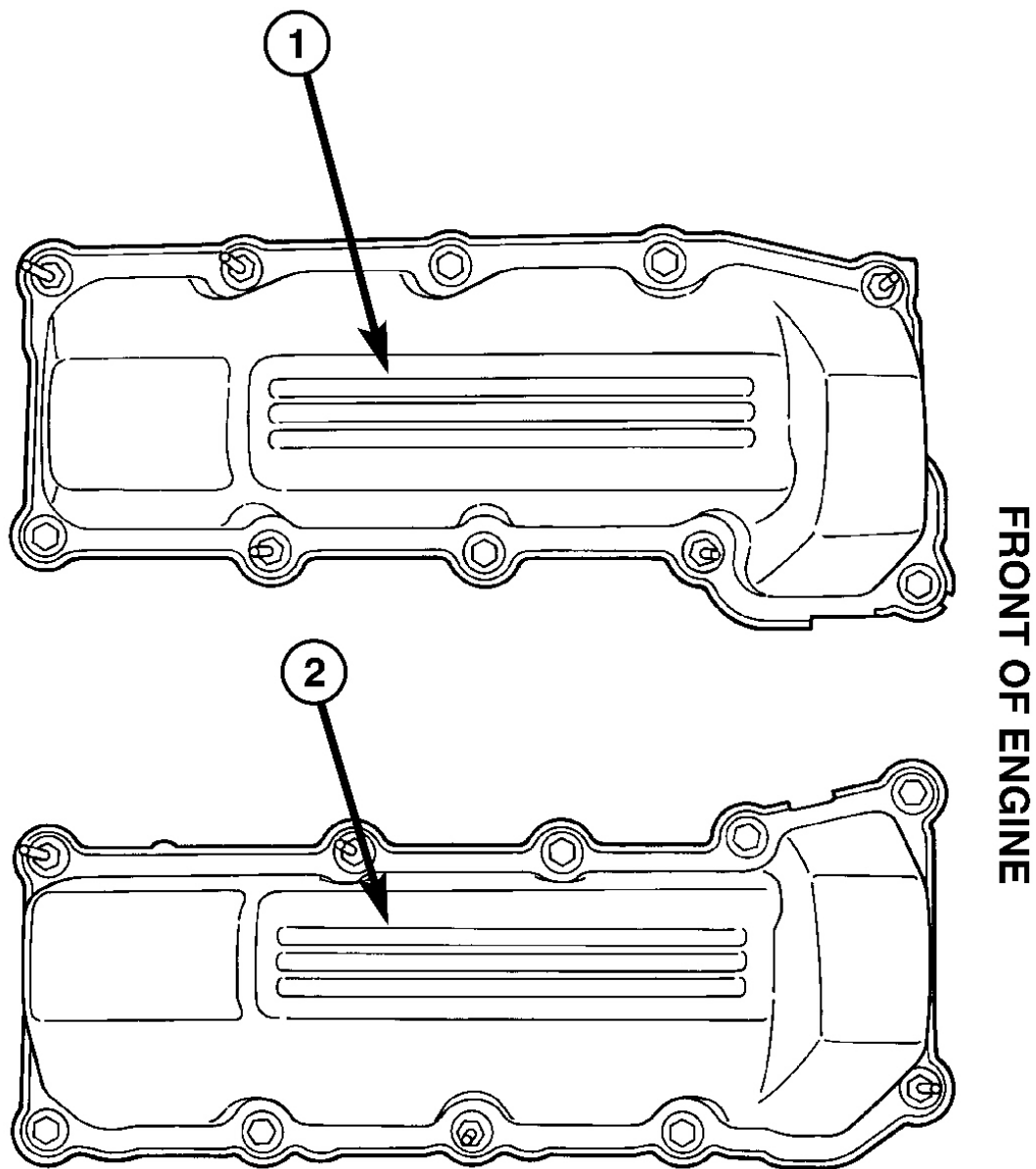
CAUTION: Remove excess oil from camshaft sprocket bolt. Failure to do so can cause bolt over-torque resulting in bolt failure.

8. Remove excess oil from bolt, then install the camshaft sprocket retaining bolt and hand tighten.
9. Remove Wedge Locking Tool 8379.
10. Using the Spanner Wrench 6958 with adapter pins 8346, tighten the camshaft sprocket retaining bolt to 122 N.m (90 ft. lbs.).
11. Install the cylinder head cover. See **INSTALLATION**.

COVER-CYLINDER HEAD

DESCRIPTION

CYLINDER HEAD COVER



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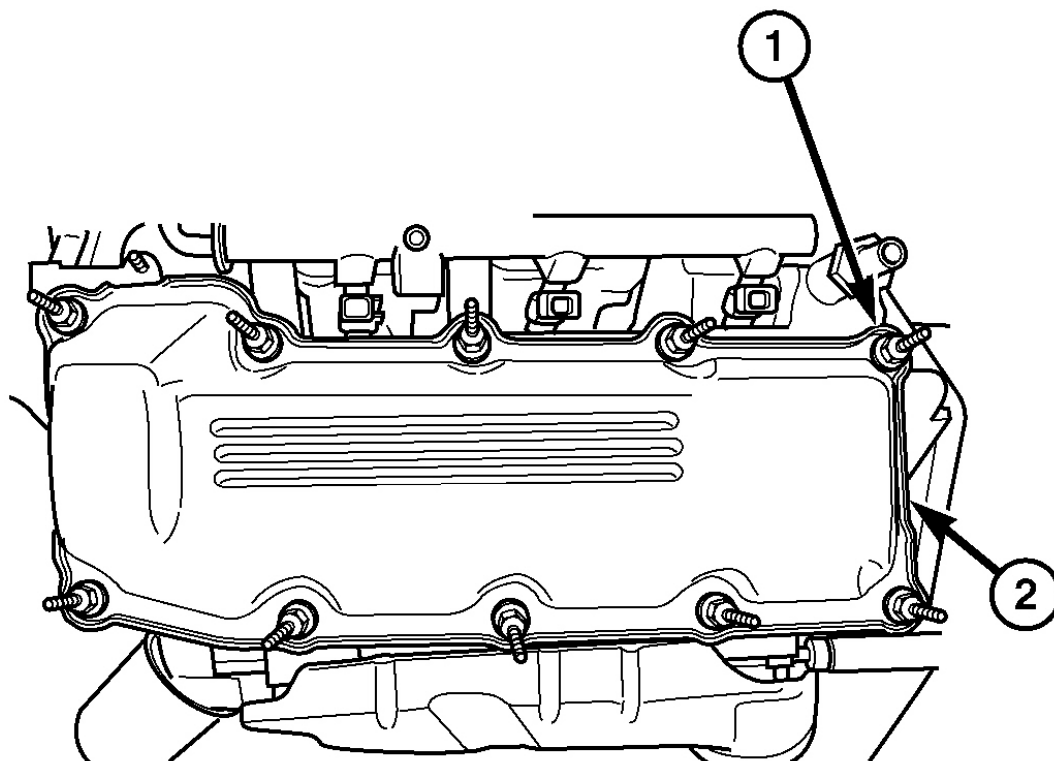
Fig. 59: Identifying Cylinder Head Covers
Courtesy of CHRYSLER LLC

- 1 - LEFT SIDE CYLINDER HEAD COVER
- 2 - RIGHT SIDE CYLINDER HEAD COVER

The cylinder head covers (1,2) are made of glass re-enforced thermoset plastic, and are not interchangeable from side-to-side. See **Fig. 59**.

REMOVAL

CYLINDER HEAD COVER



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Fig. 60: Cylinder Head Cover - Typical
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - SCREWS
2 - CYLINDER HEAD COVER |
|---------------------------------------|

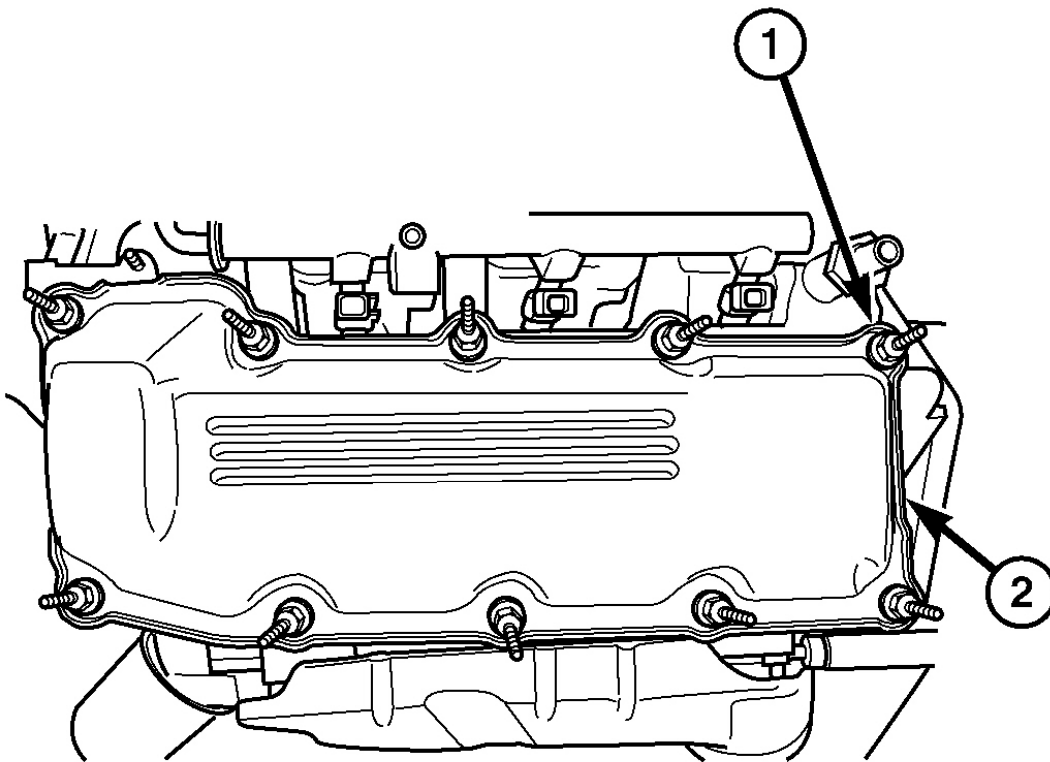
1. Disconnect negative cable from battery.
2. Remove the resonator assemble and air inlet hose.
3. Disconnect injector connectors and unclip the injector harness.

4. Route injector harness in front of cylinder head cover.
5. Disconnect the left side breather tube and remove the breather tube.
6. Remove the cylinder head cover mounting bolts (1).
7. Remove cylinder head cover (1) and gasket. See **Fig. 60**.

NOTE: The gasket may be used again, providing no cuts, tears, or deformation has occurred.

INSTALLATION

CYLINDER HEAD COVER



80cb41a5

Fig. 61: Cylinder Head Cover - Typical
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - SCREWS
2 - CYLINDER HEAD COVER |
|---------------------------------------|

CAUTION: Do not use harsh cleaners to clean the cylinder head covers. Severe damage to covers may occur.

NOTE: The gasket may be used again, provided no cuts, tears, or deformation has occurred.

1. Clean cylinder head cover and both sealing surfaces. Inspect and replace gasket as necessary.
2. Install cylinder head cover (2). See **Fig. 61**.
3. Tighten cylinder head cover bolts (1) and double ended studs to 12 N.m (105 in. lbs.).
4. Install left side breather and connect breather tube.
5. Connect injector electrical connectors and injector harness retaining clips.
6. Install the resonator and air inlet hose.
7. Connect negative cable to battery.

VALVES & SEATS - INTAKE/EXHAUST

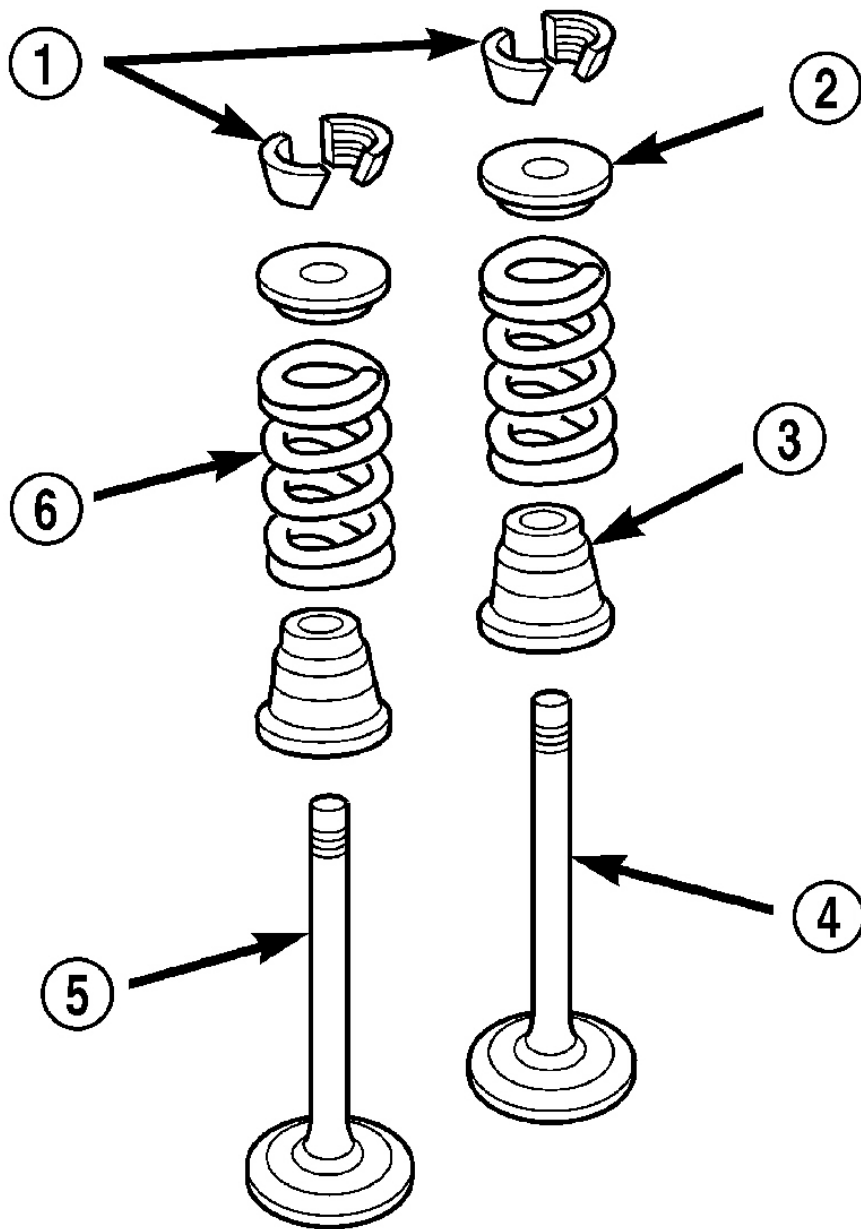
DESCRIPTION

VALVES

The valves are made of heat resistant steel and have chrome plated stems to prevent scuffing. Each valve is actuated by a roller rocker arm which pivots on a stationary lash adjuster. All valves use three bead lock keepers to retain the springs and promote valve rotation.

STANDARD PROCEDURE

REFACING



80b8983f

Fig. 62: Valve Assembly Configuration
 Courtesy of CHRYSLER LLC

- 1 - VALVE LOCKS (3-BEAD)
- 2 - RETAINER
- 3 - VALVE STEM OIL SEAL
- 4 - INTAKE VALVE
- 5 - EXHAUST VALVE

NOTE: Valve seats that are worn or burned can be reworked, provided that correct angle and seat width are maintained. Otherwise the cylinder head must be replaced.

NOTE: When refacing valves (4) and valve seats, it is important that the correct size valve guide pilot be used for reseating stones. A true and complete surface must be obtained.

1. Using a suitable dial indicator measure the center of the valve seat. Total run out must not exceed 0.051 mm (0.002 in).
2. Apply a small amount of Prussian blue to the valve seat, insert the valve into the cylinder head, while applying light pressure on the valve rotate the valve. Remove the valve and examine the valve face. If the blue is transferred below the top edge of the valve face, lower the valve seat using a 15 degree stone. If the blue is transferred to the bottom edge of the valve face, raise the valve seat using a 65 degree stone.
3. When the seat is properly positioned the width of the intake seat must be 1.75 - 2.36 mm (0.0689 - 0.0928 in.) and the exhaust seat must be 1.71 - 2.32 mm (0.0673 - 0.0911 in.).
4. Check the valve spring (6) installed height after refacing the valve and seat. The installed height for both intake and exhaust valve springs must not exceed 40.74 mm (1.6039 in.)
5. The valve seat and valve face must maintain a face angle of 44.5 - 45° angle.

REMOVAL

VALVES AND VALVE SPRINGS

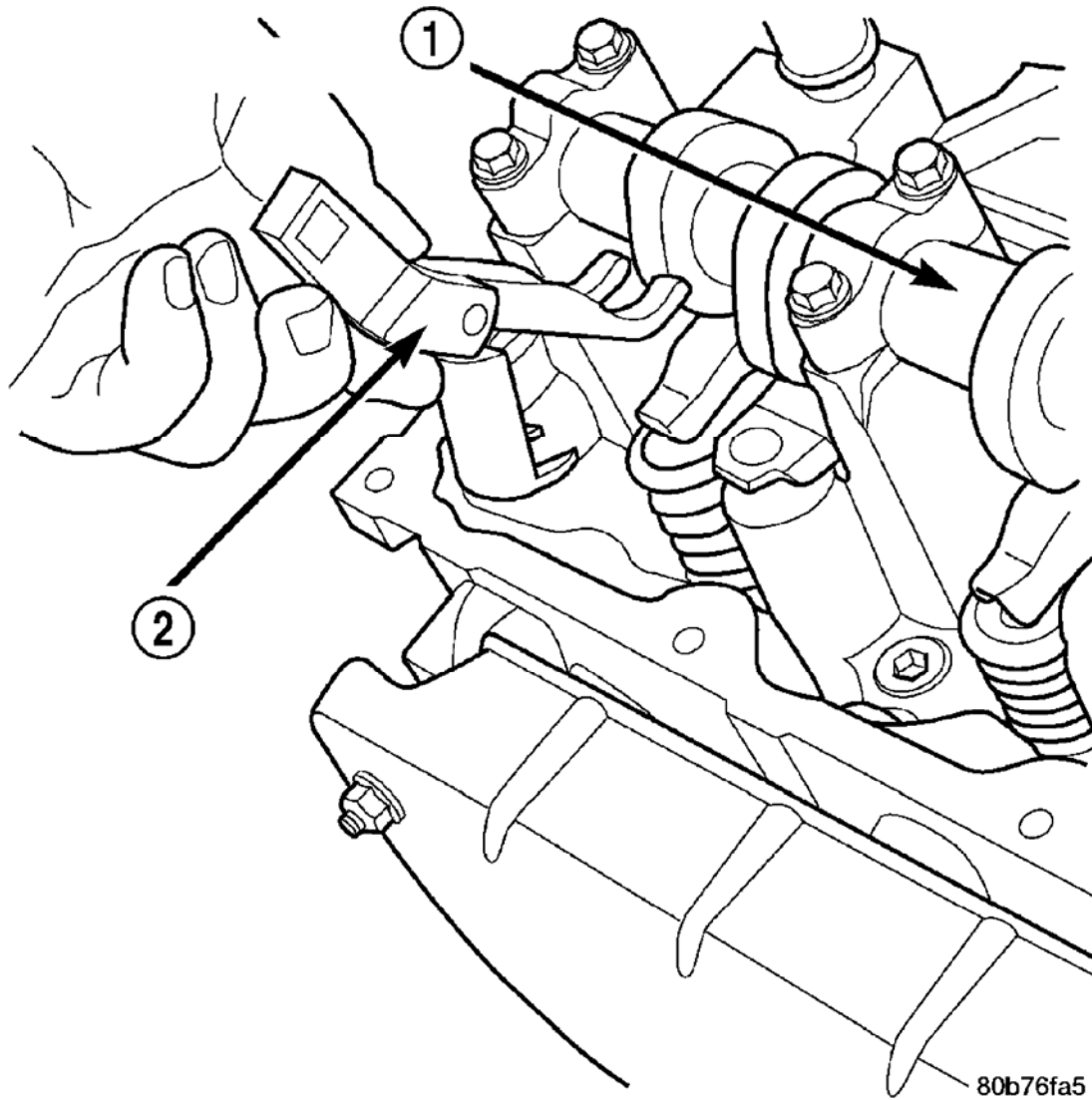


Fig. 63: Removing/Installing Rocker Arm
Courtesy of CHRYSLER LLC

- | |
|-----------------------------------|
| 1 - CAMSHAFT |
| 2 - VALVE SPRING COMPRESSOR 10102 |

NOTE: The cylinder heads must be removed in order to perform this procedure.

1. Remove rocker arms and lash adjusters. See **REMOVAL**.
2. Remove the camshaft bearing caps and the camshaft.

NOTE: All valve springs and valves are removed in the same manner; this procedure only covers one valve and valve spring.

3. Using Valve Spring Compressor C-3422-B or C-3422-C and Adapter 8519, compress the valve spring.

NOTE: It may be necessary to tap the top of the valve spring to loosen the spring retainers locks enough to be removed.

4. Remove the two spring retainer lock halves.

NOTE: the valve spring is under tension use care when releasing the valve spring compressor.

5. Remove the valve spring compressor.

6. Remove the spring retainer, and the spring.

NOTE: Check for sharp edges on the keeper grooves. Remove any burrs from the valve stem before removing the valve from the cylinder head.

7. Remove the valve from the cylinder head.

NOTE: The valve stem seals are common between intake and exhaust.

8. Remove the valve stem seal. Mark the valve for proper installation.

TESTING VALVE SPRINGS

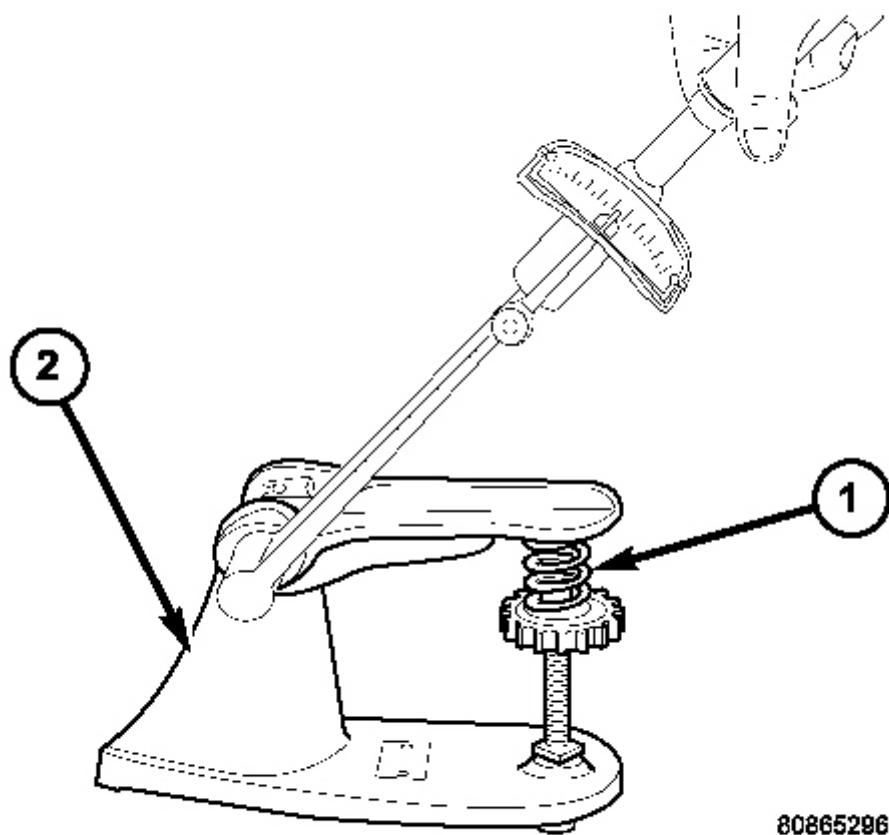


Fig. 64: Testing Valve Spring
Courtesy of CHRYSLER LLC

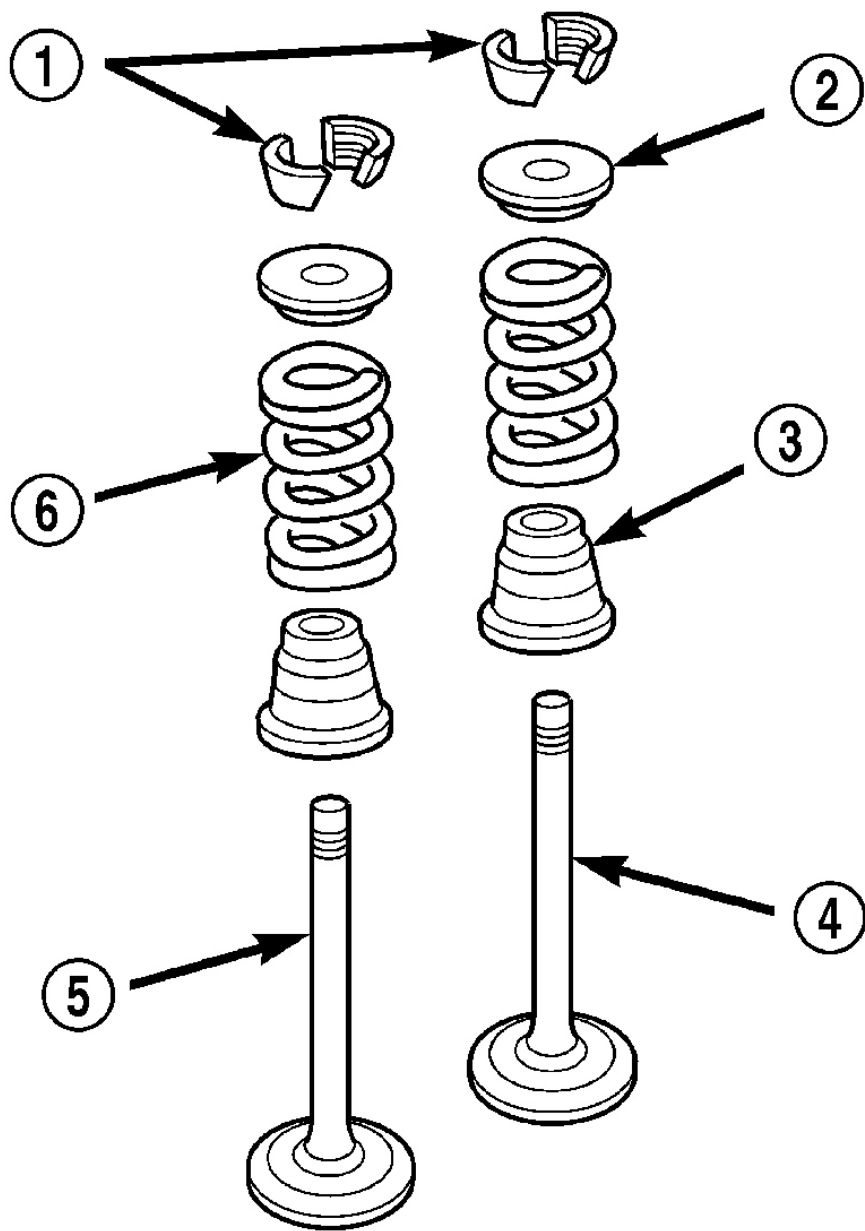
1 - SPECIAL TOOL C-647

NOTE: Whenever the valves are removed from the cylinder head it is recommended that the valve springs be inspected and tested for reuse.

Inspect the valve springs for physical signs of wear or damage. Turn table of tool C-647 (1) until surface is in line with the 40.12 mm (1.579 in.) mark on the threaded stud and the zero mark on the front. Place spring over the stud on the table and lift compressing lever to set tone device. Pull on torque wrench until a Ping is heard. Take reading on torque wrench at this instant. Multiply this reading by two. This will give the spring load at test length. Fractional measurements are indicated on the table for finer adjustments. Refer to **SPECIFICATIONS** to obtain specified height and allowable tensions. Replace any springs that do not meet specifications.

INSTALLATION

VALVES AND VALVE SPRINGS



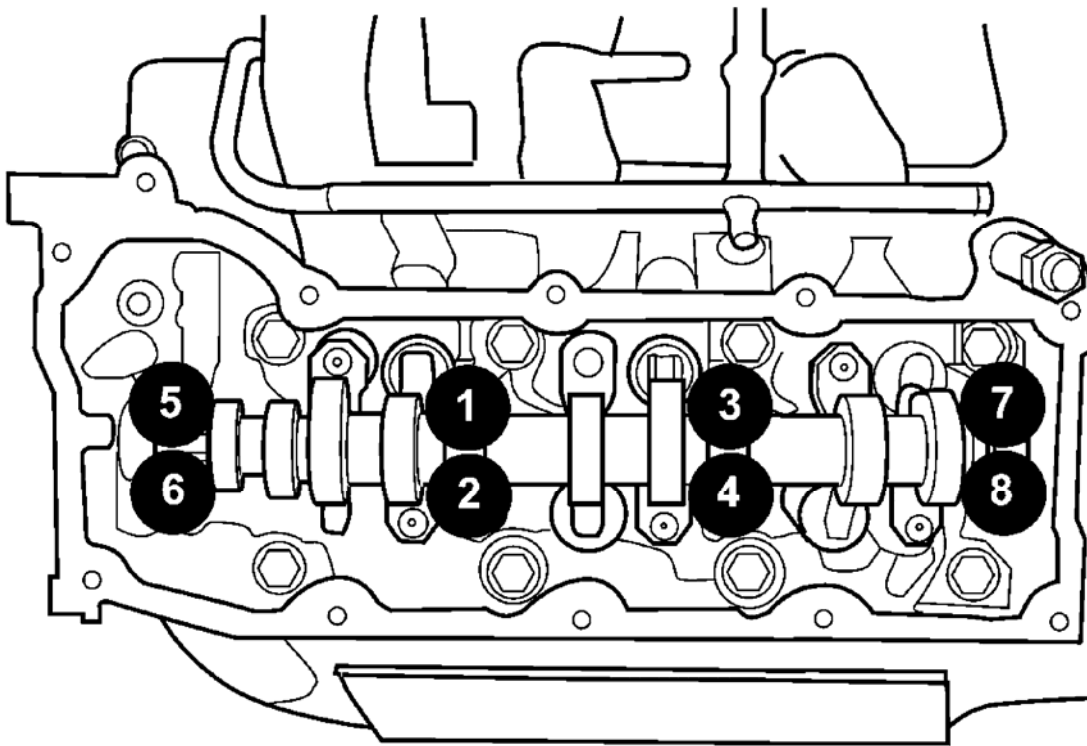
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Fig. 65: Valve Assembly Configuration
Courtesy of CHRYSLER LLC

- 1 - VALVE LOCKS (3-BEAD)
- 2 - RETAINER
- 3 - VALVE STEM OIL SEAL

- 4 - INTAKE VALVE
- 5 - EXHAUST VALVE
- 6 - VALVE SPRING

1. coat the valve stem with clean engine oil and insert it into the cylinder head.
2. Install the valve stem seal. make sure the seal is fully seated and that the garter spring at the top of the seal is intact.
3. Install the spring and the spring retainer.
4. Using the valve spring compressor, compress the spring and install the two valve spring retainer halves.
5. Release the valve spring compressor and make sure the two spring retainer halves and the spring retainer are fully seated. See **Fig. 65**.



808a1e9b

Fig. 66: Camshaft Bearing Caps Tightening Sequence
Courtesy of CHRYSLER LLC

6. Lubricate the camshaft journal with clean engine oil then Position the camshaft (with the sprocket dowel on the left camshaft at 11 o'clock and the right camshaft at 12 o'clock), then position the camshaft bearing

caps.

7. Install the camshaft bearing cap retaining bolts. Tighten the bolts 9-13 N.m (100 in. lbs.) in 1/2 turn increments in the sequence shown in illustration. See **Fig. 66**.
8. Position the hydraulic lash adjusters and rocker arms. See **INSTALLATION**.

ARM-VALVE ROCKER

DESCRIPTION

VALVE ROCKER ARM

The rocker arms are steel stampings with an integral roller bearing. The rocker arms incorporate a 2.8 mm (0.5 inch) oil jet hole in the lash adjuster socket for roller and camshaft lubrication.

REMOVAL

VALVE ROCKER ARM

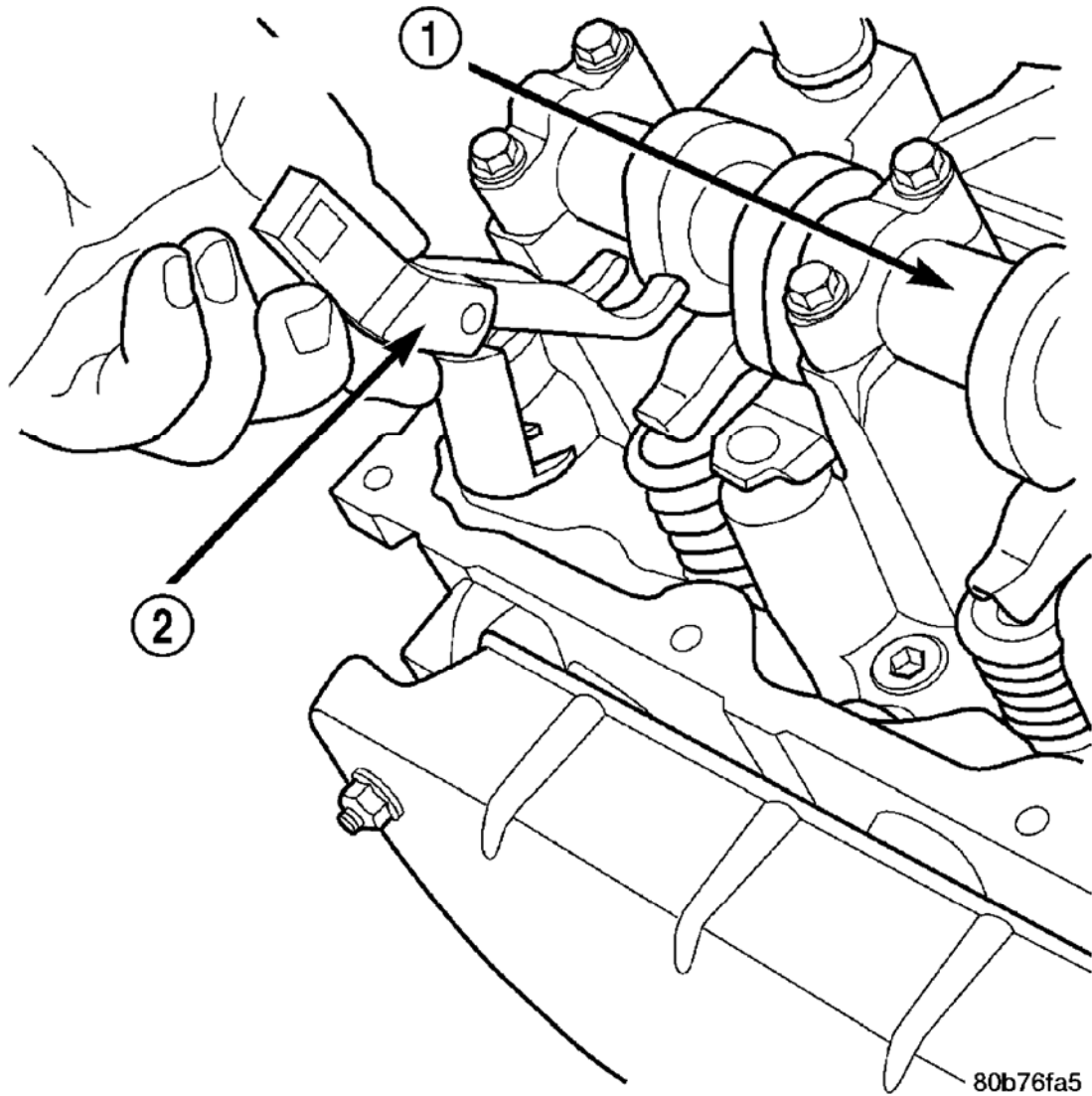


Fig. 67: Removing/Installing Rocker Arm
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - CAMSHAFT
2 - SPECIAL TOOL 8516 |
|---------------------------------------|

NOTE: **Disconnect the battery negative cable to prevent accidental starter engagement.**

1. Remove the cylinder head cover. See **REMOVAL**.
2. For rocker arm removal on cylinder No. 4, Rotate the crankshaft until cylinder No. 1 is at BDC intake stroke.
3. For rocker arm removal on cylinder No. 1, Rotate the crankshaft until cylinder No. 1 is at BDC combustion stroke.

4. For rocker arm removal on cylinders No. 3 and No. 5, Rotate the crankshaft until cylinder No. 1 is at TDC exhaust stroke.
5. For rocker arm removal on cylinders No. 2 and No. 6, Rotate the crankshaft until cylinder No. 1 is at TDC ignition stroke.
6. Using the Rocker Arm Remover/Installer 8516A (2) , press downward on the valve spring, remove rocker arm. See **Fig. 67**.

SEALS-VALVE GUIDE

DESCRIPTION

VALVE GUIDE SEAL

The valve guide seals are made of rubber and incorporate an integral steel valve spring seat. The integral garter spring maintains consistent lubrication control to the valve stems.

SPRINGS-VALVE

DESCRIPTION

VALVE SPRINGS

The valve springs are made from high strength chrome silicon steel. The springs are NOT common for intake and exhaust applications. The exhaust spring has an external damper. The valve spring seat is integral with the valve stem seal, which is a positive type seal to control lubrication.

REMOVAL

VALVE SPRINGS

1. Remove the cylinder head cover. See **REMOVAL**.
2. Using the Valve Spring Remover/Installer 8516A, remove the rocker arms and the hydraulic lash adjusters.
3. Remove the spark plug for the cylinder the valve spring and seal are to be removed from.
4. Apply shop air to the cylinder to hold the valves in place when the spring is removed.

NOTE: **All six valve springs and seals are removed in the same manner; this procedure only covers one valve seal and valve spring.**

5. Using the Valve Spring Compressor 8387, compress the valve spring.

NOTE: **It may be necessary to tap the top of the valve spring to loosen the spring retainers locks enough to be removed.**

6. Remove the two spring retainer lock halves.

NOTE: **the valve spring is under tension use care when releasing the valve spring compressor.**

7. Remove the valve spring compressor.

NOTE: **The valve springs are NOT common between intake and exhaust.**

8. Remove the spring retainer, and the spring.
9. Remove the valve stem seal.

NOTE: **The valve stem seals are common between intake and exhaust.**

INSTALLATION

VALVE SPRINGS

NOTE: **All six valve springs and seals are removed in the same manner; this procedure only covers one valve seal and valve spring.**

1. Apply shop air to the cylinder to hold the valves in place while the spring is installed.

NOTE: **The valve stem seals are common between intake and exhaust.**

2. Install the valve stem seal.

NOTE: **The valve springs are NOT common between intake and exhaust.**

3. Install the spring retainer, and the spring.
4. Using the Valve Spring Compressor 8387, compress the valve spring.
5. Install the two spring retainer lock halves.

NOTE: **the valve spring is under tension use care when releasing the valve spring compressor.**

6. Remove the valve spring compressor.
7. Disconnect the shop air to the cylinder.
8. Install the spark plug for the cylinder the valve spring and seal was installed on.
9. Using Valve Spring Remover/Installer 8516, install the rocker arms and the hydraulic lash adjusters.
10. Install the cylinder head cover. See **INSTALLATION**.

CYLINDER HEAD - RIGHT

DESCRIPTION

CYLINDER HEAD

The cylinder heads are made of an aluminum alloy. The cylinder head features two valves per cylinder with pressed in powdered metal valve guides. The cylinder heads also provide enclosures for the timing chain drain, necessitating unique left and right cylinder heads.

VALVE GUIDES

The valve guides are made of powdered metal and are pressed into the cylinder head. The guides are not replaceable or serviceable, and valve guide reaming is not recommended. If the guides are worn beyond acceptable limits, replace the cylinder heads.

VALVES

The valves are made of heat resistant steel and have chrome plated stems to prevent scuffing. Each valve is actuated by a roller rocker arm which pivots on a stationary lash adjuster. All valves use three bead lock keepers to retain the springs and promote valve rotation.

DIAGNOSIS AND TESTING

CYLINDER HEAD GASKET

A cylinder head gasket leak can be located between adjacent cylinders or between a cylinder and the adjacent water jacket.

Possible indications of the cylinder head gasket leaking between adjacent cylinders are:

- Loss of engine power
- Engine misfiring
- Poor fuel economy

Possible indications of the cylinder head gasket leaking between a cylinder and an adjacent water jacket are:

- Engine overheating
- Loss of coolant
- Excessive steam (white smoke) emitting from exhaust
- Coolant foaming

CYLINDER-TO-CYLINDER LEAKAGE TEST

To determine if an engine cylinder head gasket is leaking between adjacent cylinders, follow the procedures in Cylinder Compression Pressure Test. See **CYLINDER COMPRESSION PRESSURE**. An engine cylinder head gasket leaking between adjacent cylinders will result in approximately a 50 - 70% reduction in compression pressure.

CYLINDER-TO-WATER JACKET LEAKAGE TEST

WARNING: USE EXTREME CAUTION WHEN THE ENGINE IS OPERATING WITH COOLANT PRESSURE CAP REMOVED.

VISUAL TEST METHOD

With the engine cool, remove the coolant pressure cap. Start the engine and allow it to warm up until thermostat opens.

If a large combustion/compression pressure leak exists, bubbles will be visible in the coolant.

COOLING SYSTEM TESTER METHOD

WARNING: WITH COOLING SYSTEM TESTER IN PLACE, PRESSURE WILL BUILD UP FAST. EXCESSIVE PRESSURE BUILT UP, BY CONTINUOUS ENGINE OPERATION, MUST BE RELEASED TO A SAFE PRESSURE POINT. NEVER PERMIT PRESSURE TO EXCEED 138 kPa (20 psi).

Install Cooling System Tester 7700 or equivalent to pressure cap neck. Start the engine and observe the tester's pressure gauge. If gauge pulsates with every power stroke of a cylinder a combustion pressure leak is evident.

CHEMICAL TEST METHOD

Combustion leaks into the cooling system can also be checked by using Bloc-Chek Kit C-3685-A or equivalent. Perform test following the procedures supplied with the tool kit.

HYDRAULIC LASH ADJUSTER

A tappet-like noise may be produced from several items. Check the following items.

1. Engine oil level too high or too low. This may cause aerated oil to enter the adjusters and cause them to be spongy.
2. Insufficient running time after rebuilding cylinder head. Low speed running up to 1 hour may be required.
3. Turn engine off and let set for a few minutes before restarting. Repeat this several times after engine has reached normal operating temperature.
4. Low oil pressure.
5. The oil restrictor in cylinder head gasket or the oil passage to the cylinder head is plugged with debris.
6. Air ingested into oil due to broken or cracked oil pump pick up.
7. Worn valve guides.
8. Rocker arm ears contacting valve spring retainer.
9. Rocker arm loose, adjuster stuck or at maximum extension and still leaves lash in the system.
10. Oil leak or excessive cam bore wear in cylinder head.
11. Faulty lash adjuster.

Check lash adjusters for sponginess while installed in cylinder head and cam on camshaft at base circle. Depress part of rocker arm over adjuster. Normal adjusters should feel very firm. Spongy

adjusters can be bottomed out easily.

Remove suspected lash adjusters, and replace.

Before installation, make sure adjusters are at least partially full of oil. This can be verified by little or no plunger travel when lash adjuster is depressed.

REMOVAL

CYLINDER HEAD - RIGHT

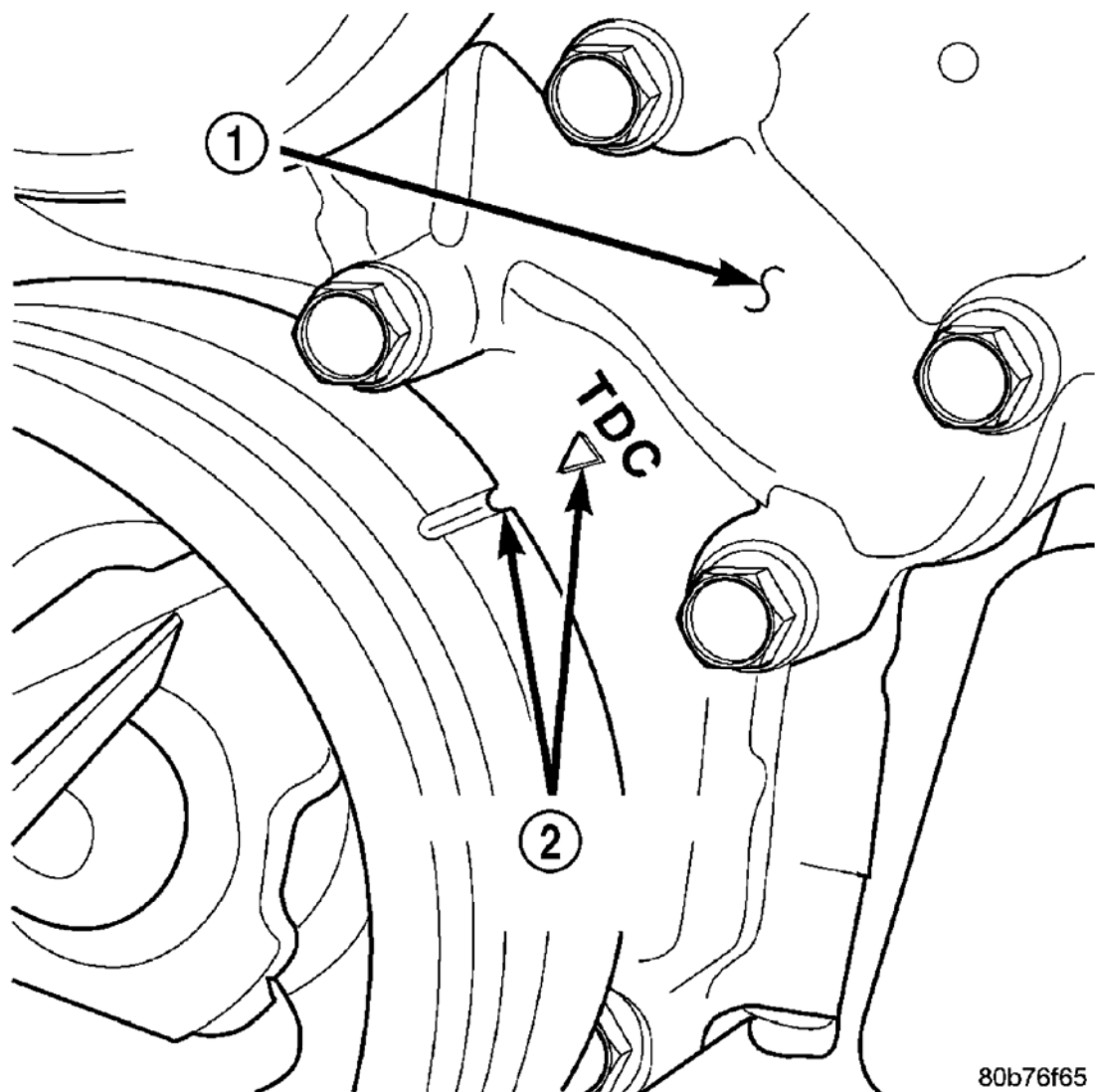


Fig. 68: Engine Top Dead Center (TDC) Indicator Mark
Courtesy of CHRYSLER LLC

1 - TIMING CHAIN COVER

2 - CRANKSHAFT TIMING MARKS

1. Disconnect battery negative cable.
2. Raise the vehicle on a hoist.
3. Disconnect the exhaust pipe at the right side exhaust manifold.
4. Drain the engine coolant. Refer to **STANDARD PROCEDURE** .
5. Lower the vehicle.
6. Remove the intake manifold. See **REMOVAL**.
7. Remove the cylinder head cover. See **REMOVAL**.
8. Remove the fan shroud. Refer to **REMOVAL** .
9. Remove oil fill housing from cylinder head.
10. Remove accessory drive belt. Refer to **REMOVAL** .
11. Rotate the crankshaft until the damper timing mark is aligned with TDC indicator mark (2). See **Fig. 68**.

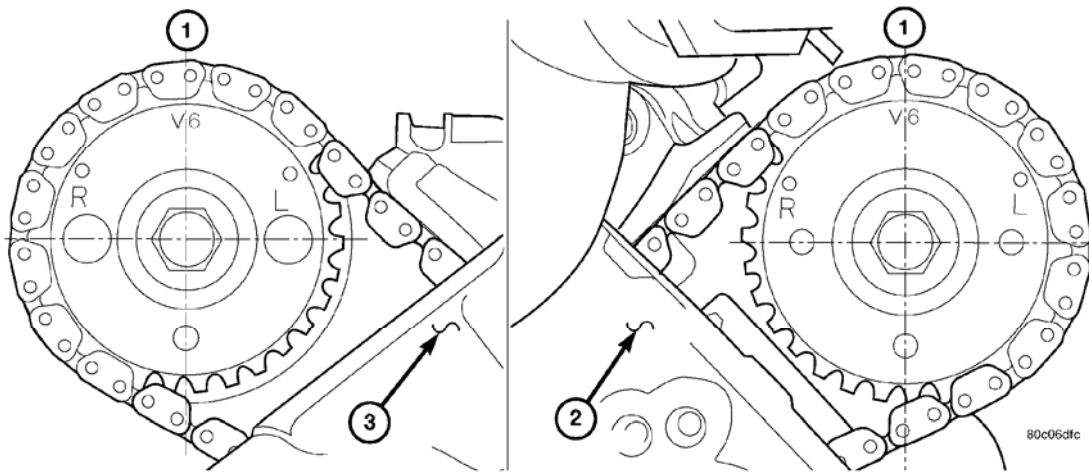
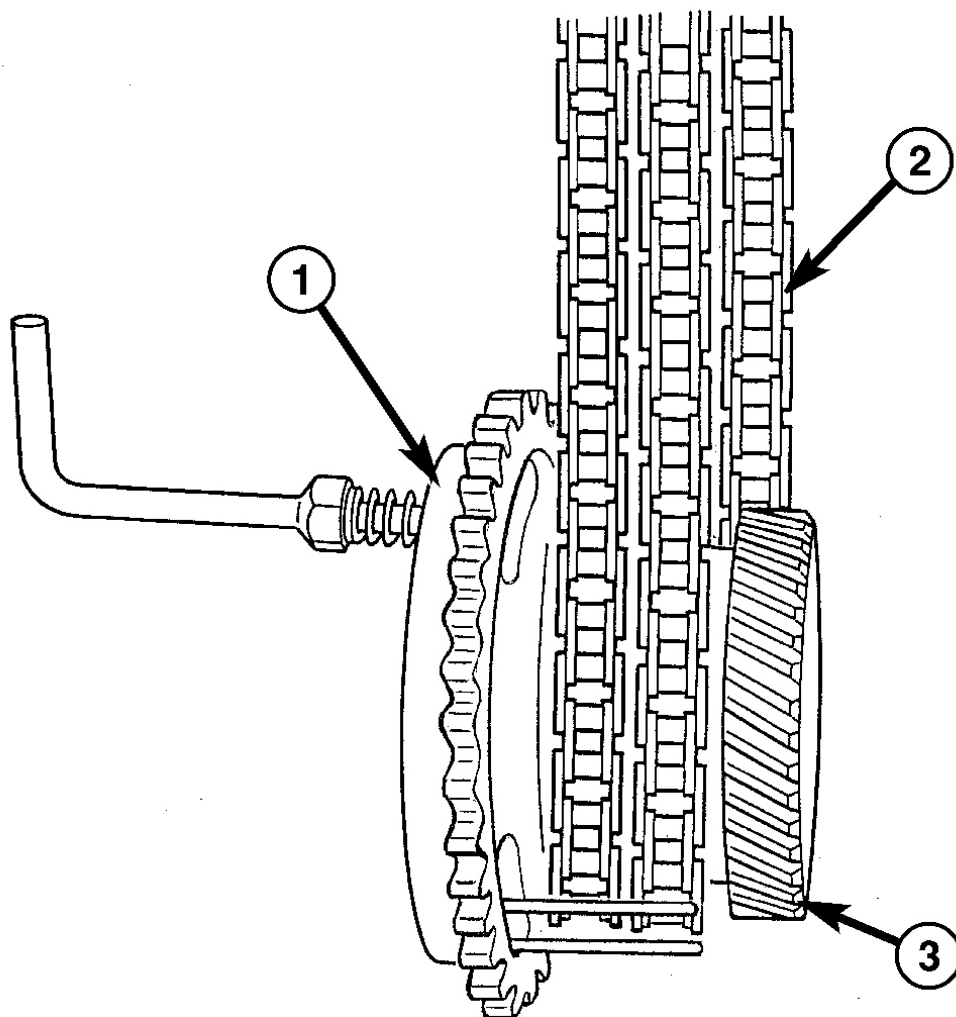


Fig. 69: Camshaft Sprocket V6 Marks
Courtesy of CHRYSLER LLC

12. Verify the V6 mark on the camshaft sprocket is at the 12 o'clock position. See **Fig. 69**. Rotate the crankshaft one turn if necessary.
13. Remove the crankshaft damper. See **REMOVAL**.
14. Remove the timing chain cover. See **REMOVAL**.



80cb5655

Fig. 70: Locking Secondary Timing Chains
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SPECIAL TOOL 8429
2 - CAMSHAFT CHAIN
3 - CRANKSHAFT TIMING GEAR |
|---|

15. Lock the secondary timing chains to the idler sprocket using the Secondary Camshaft Chain Holder 8429 (1). See **Fig. 70**.

NOTE: Mark the secondary timing chain prior to removal to aid in installation.

16. Mark the secondary timing chain, one link on each side of the V6 mark on the camshaft drive gear.

17. Remove the right side secondary chain tensioner. See **REMOVAL**.

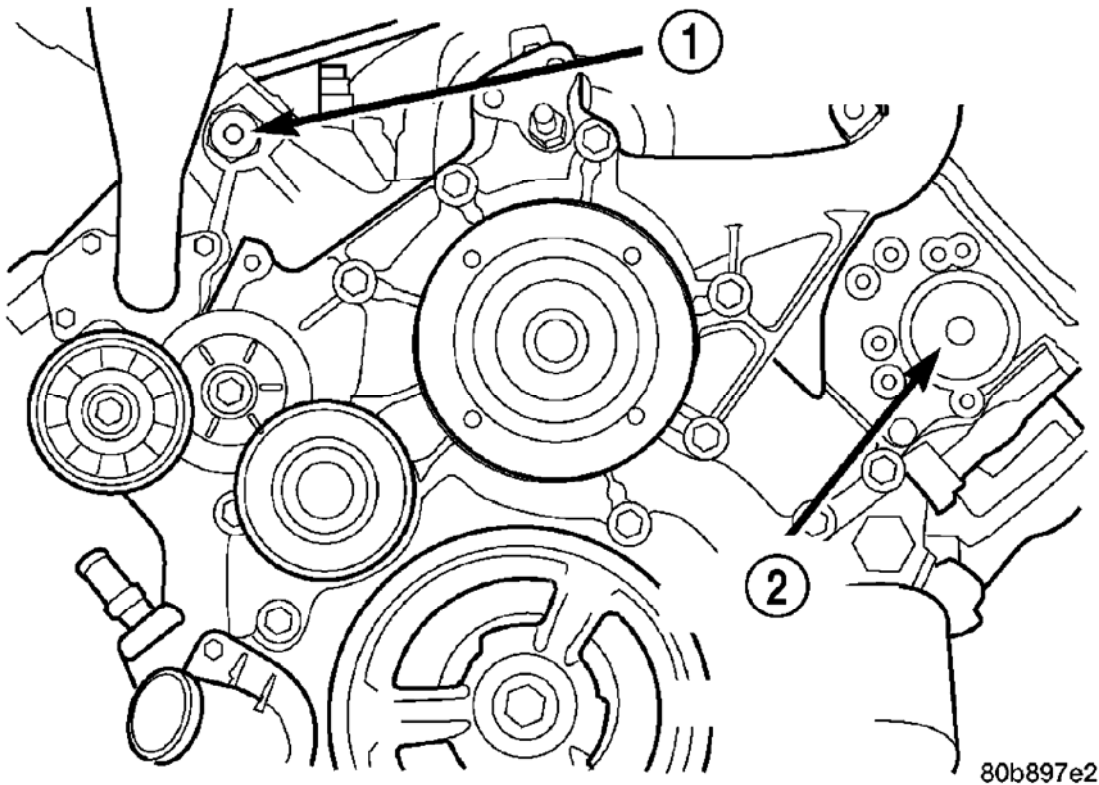


Fig. 71: Locating Cylinder Head Access Plugs

Courtesy of CHRYSLER LLC

1 - RIGHT CYLINDER HEAD ACCESS PLUG

2 - LEFT CYLINDER HEAD ACCESS PLUG

18. Remove the cylinder head access plug (1,2). See **Fig. 71**.
19. Remove the right side secondary chain guide. See **REMOVAL**.

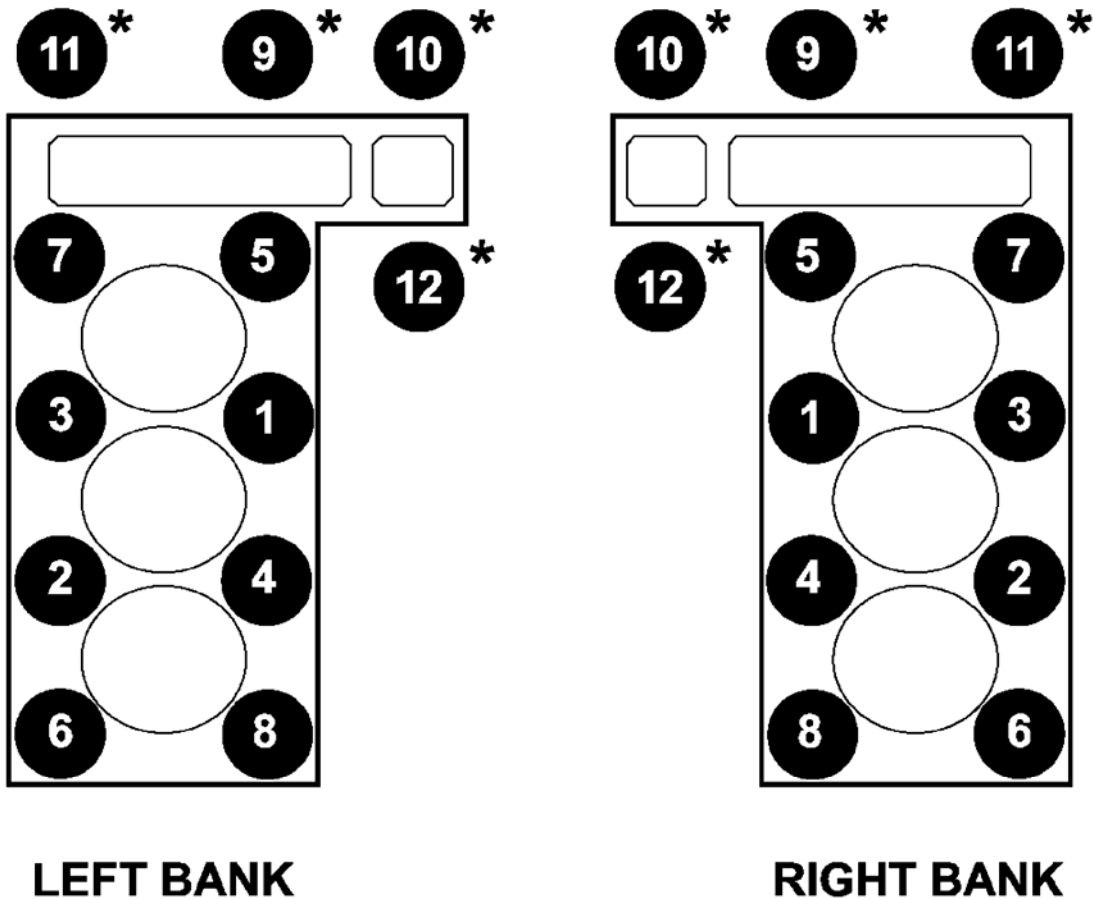
CAUTION: The nut on the right side camshaft sprocket should not be removed for any reason, as the sprocket and camshaft sensor target wheel is serviced as an assembly. If the nut was removed, tighten nut to 5 N.m (44 in. lbs.).

20. Remove the retaining bolt and the camshaft drive gear.

CAUTION: Do not allow the engine to rotate. severe damage to the valve train can occur.

CAUTION: Do not overlook the four smaller bolts at the front of the cylinder head. Do not attempt to remove the cylinder head without removing these four bolts.

CAUTION: Do not hold or pry on the camshaft target wheel for any reason. A damaged target wheel can result in a vehicle no start condition.



80cb8871

Fig. 72: Cylinder Head Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

* - INDICATES SEALANT ON THREADS

NOTE: The cylinder head is attached to the cylinder block with twelve bolts.

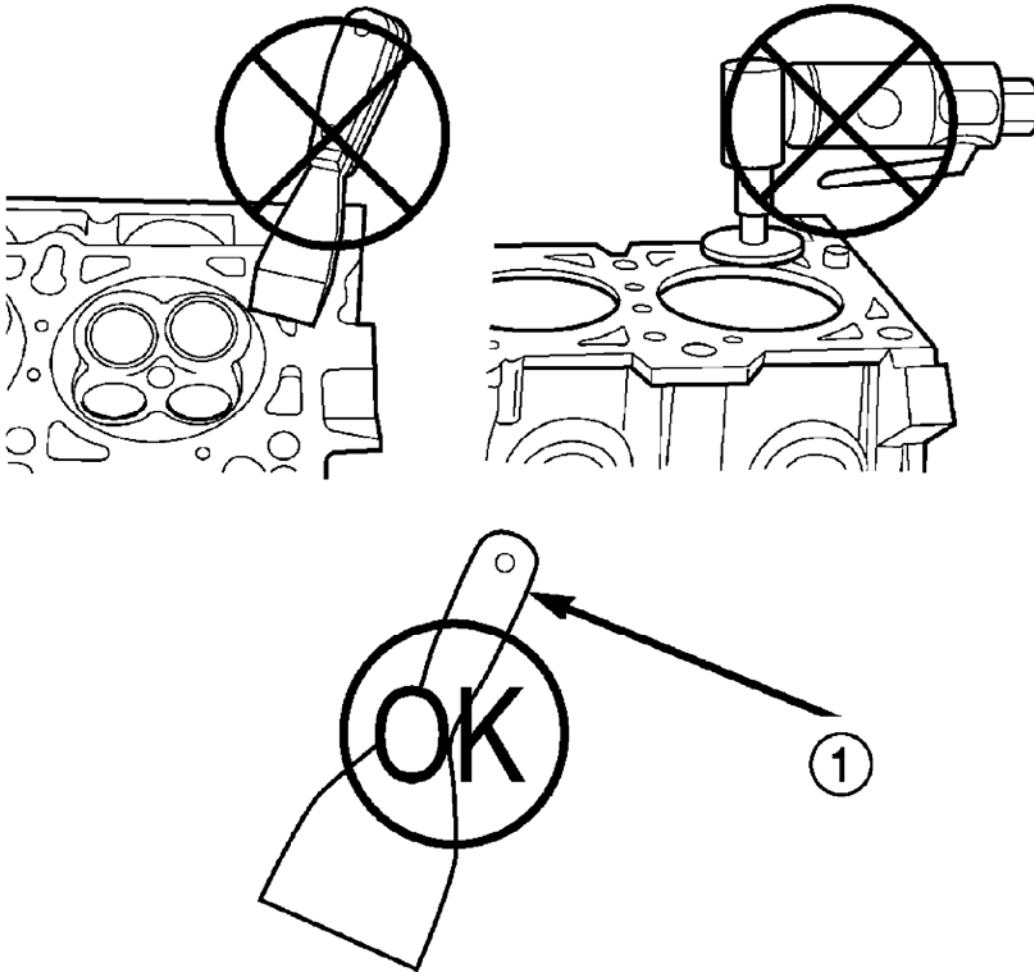
21. Remove the cylinder head retaining bolts. See **Fig. 72**.

22. Remove the cylinder head and gasket. Discard the gasket.

CAUTION: Do not lay the cylinder head on its gasket sealing surface, do to the design of the cylinder head gasket any distortion to the cylinder head sealing surface may prevent the gasket from properly sealing resulting in leaks.

CLEANING

CYLINDER HEADS



80b76eba

Fig. 73: Proper Tool Usage for Surface Preparation
Courtesy of CHRYSLER LLC

1 - PLASTIC/WOOD SCRAPER

To ensure engine gasket sealing, proper surface preparation must be performed, especially with the use of aluminum engine components. See **Fig. 73**. See **STANDARD PROCEDURE**.

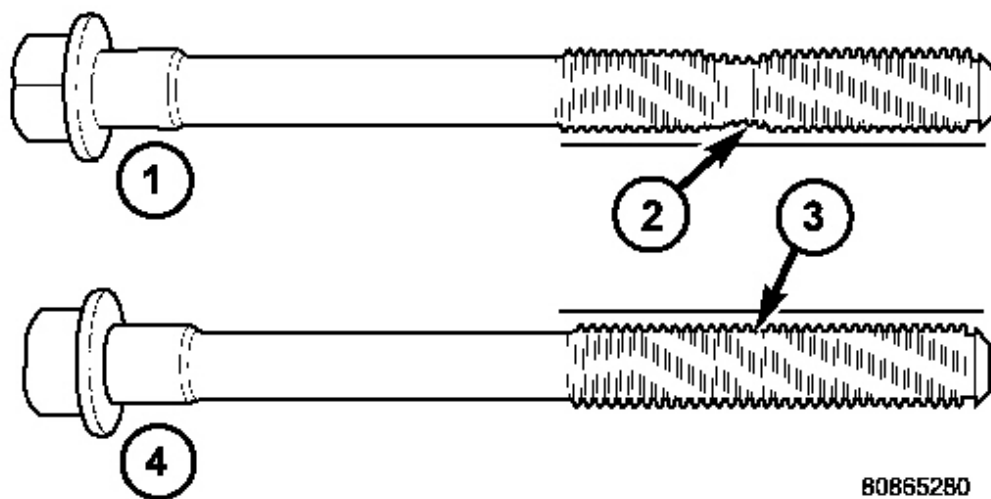
INSPECTION

CYLINDER HEADS

1. Inspect the cylinder head for out-of-flatness, using a straightedge and a feeler gauge. If measurements exceed 0.0508 mm (0.002 in.) replace the cylinder head.
2. Inspect the valve seats for damage. Service the valve seats as necessary.
3. Inspect the valve guides for wear, cracks or looseness. If either condition exist, replace the cylinder head.

INSTALLATION

CYLINDER HEAD - RIGHT



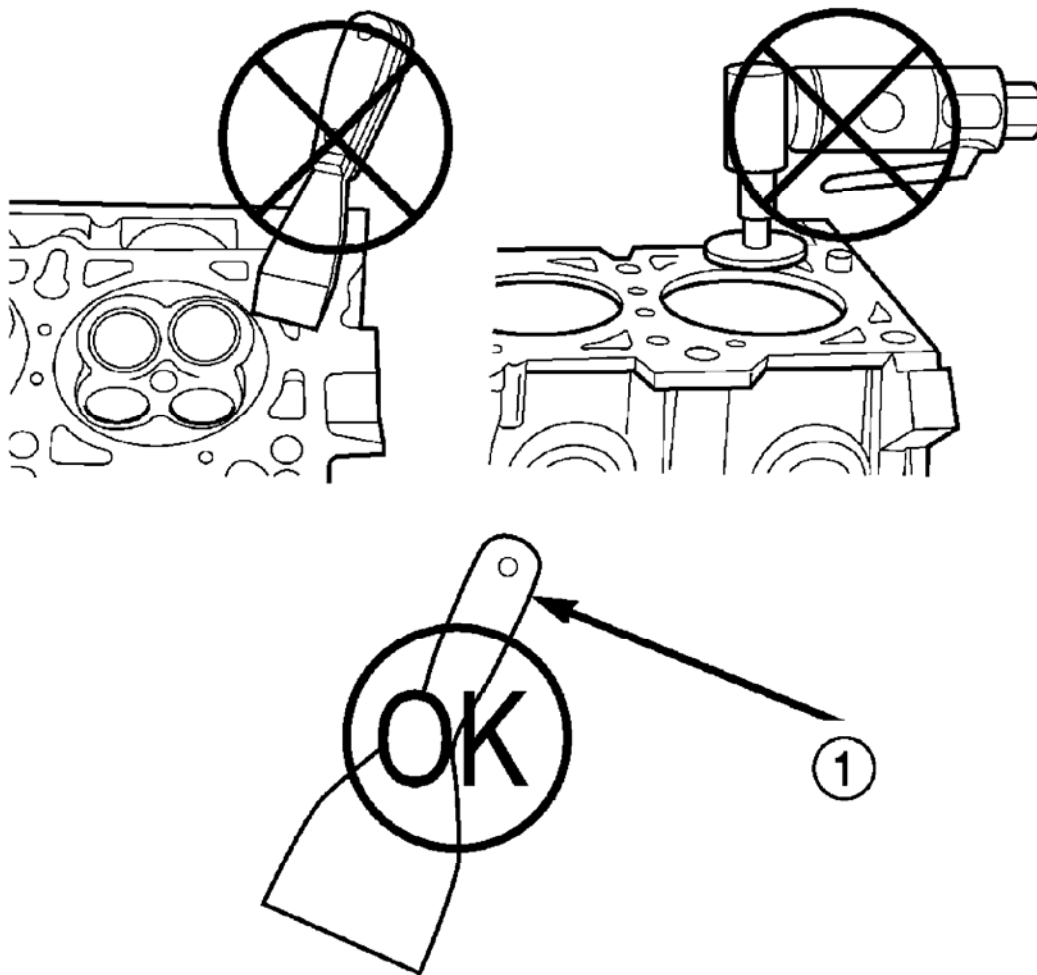
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Fig. 74: Checking Cylinder Head Bolts for Stretching (Necking)

Courtesy of CHRYSLER LLC

NOTE: The cylinder head bolts are tightened using a torque plus angle procedure. The bolts must be examined **BEFORE** reuse. If the threads are necked down (2) the bolts should be replaced.

Necking can be checked by holding a straight edge against the threads. If all the threads do not contact the scale, the bolt should be replaced. See **Fig. 74**.



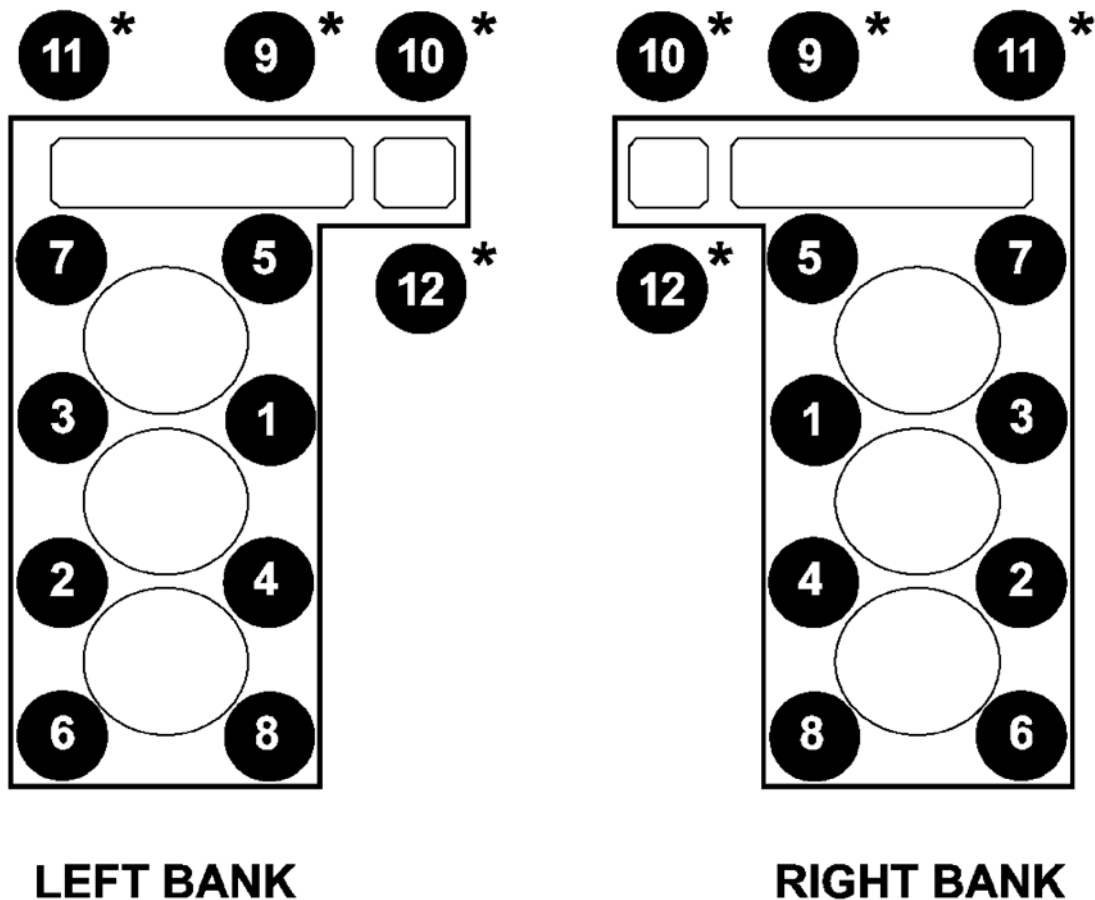
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Fig. 75: Proper Tool Usage for Surface Preparation
Courtesy of CHRYSLER LLC

1 - PLASTIC/WOOD SCRAPER

CAUTION: When cleaning cylinder head and cylinder block surfaces, DO NOT use a metal scraper because the surfaces could be cut or ground. Use only a wooden or plastic scraper (1).

1. Clean the cylinder head and cylinder block mating surfaces. See **Fig. 75**.



80cb8871

Fig. 76: Cylinder Head Bolt Tightening Sequence
 Courtesy of CHRYSLER LLC

* - INDICATES SEALANT ON THREADS

2. Position the new cylinder head gasket on the locating dowels.

CAUTION: When installing cylinder head, use care not damage the tensioner arm or the guide arm.

3. Position the cylinder head onto the cylinder block. Make sure the cylinder head seats fully over the locating dowels.

NOTE: The four M8 cylinder head mounting bolts (1) require sealant to be added to them before installing. Failure to do so may cause leaks.

4. Lubricate the cylinder head bolt threads with clean engine oil and install the eight M10 bolts.
5. Coat the four M8 cylinder head bolts with **Mopar Lock and Seal Adhesive** then install the bolts.

NOTE: The cylinder head bolts are tightened using an angle torque procedure, however, the bolts are not a torque-to-yeild design.

6. Tighten the bolts in sequence using the following steps and torque values. See **Fig. 76**:

Step 1: Tighten bolts 1-8, 27 N.m (20 ft. lbs.).

Step 2: Verify that bolts 1-8, all reached 27 N.m (20 ft. lbs.), by repeating step 1 without loosening the bolts. Tighten bolts 9 thru 12 to 14 N.m (10 ft. lbs.).

Step 3: Tighten bolts 1-8, 90 °.

Step 4: Tighten bolts 1-8, 90 °, again. Tighten bolts 9-12, 26 N.m (19 ft. lbs.)

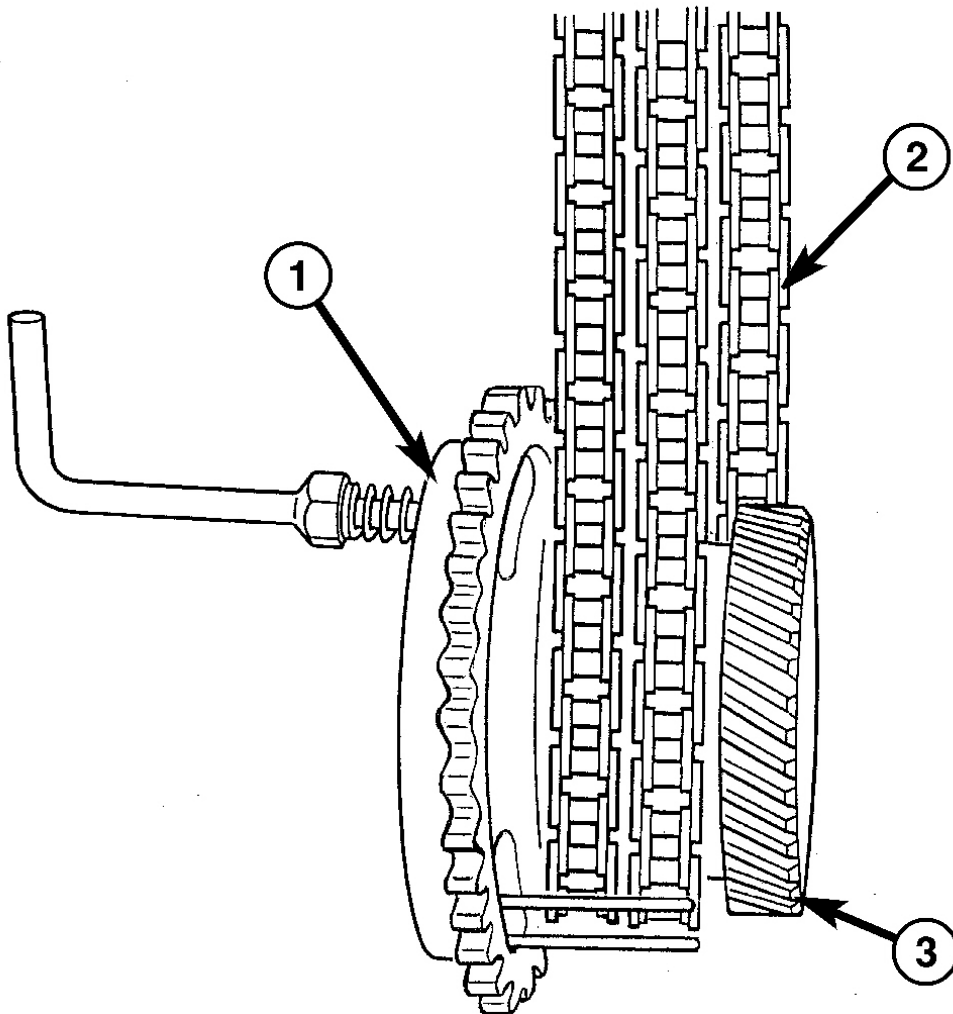


Fig. 77: Locking Secondary Timing Chains
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - SPECIAL TOOL 8429 |
| 2 - CAMSHAFT CHAIN |
| 3 - CRANKSHAFT TIMING GEAR |

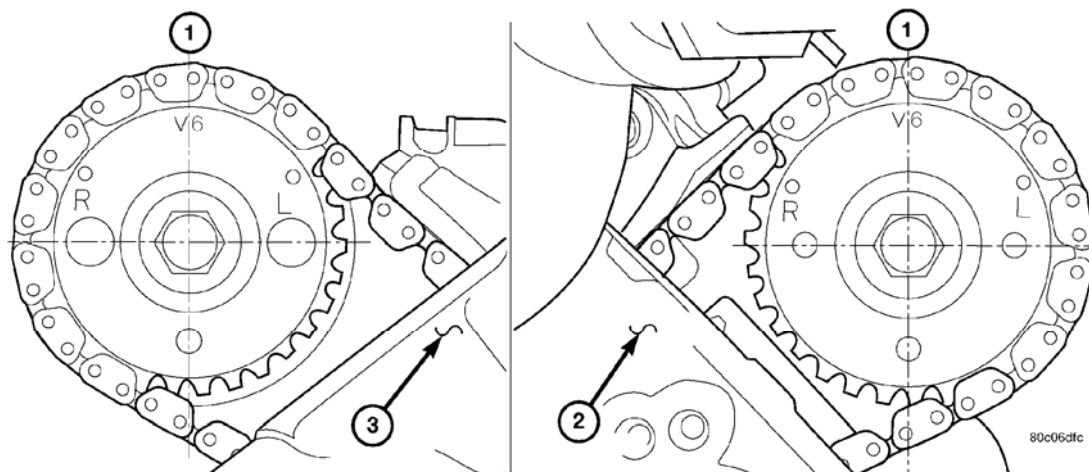


Fig. 78: Camshaft Sprocket V6 Marks
Courtesy of CHRYSLER LLC

7. Position the secondary chain (2) onto the camshaft drive gear, making sure one marked chain link is on either side of the V6 mark (1) on the gear, then using the Camshaft Holder 8428, position the gear onto the camshaft. See **Fig. 77** and **Fig. 78**.

CAUTION: Remove excess oil from camshaft sprocket retaining bolt before reinstalling bolt. Failure to do so may cause over-torquing of bolt resulting in bolt failure.

8. Install the camshaft drive gear retaining bolt.
9. Install the right side secondary chain guide. See **INSTALLATION**.

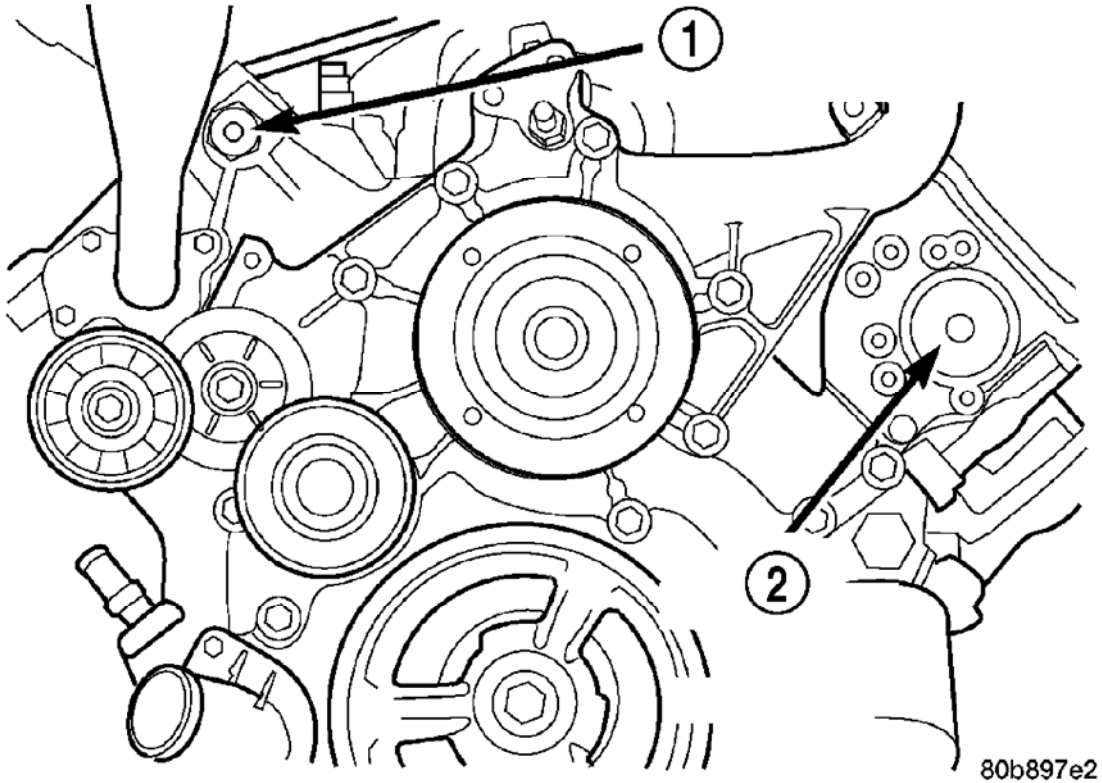
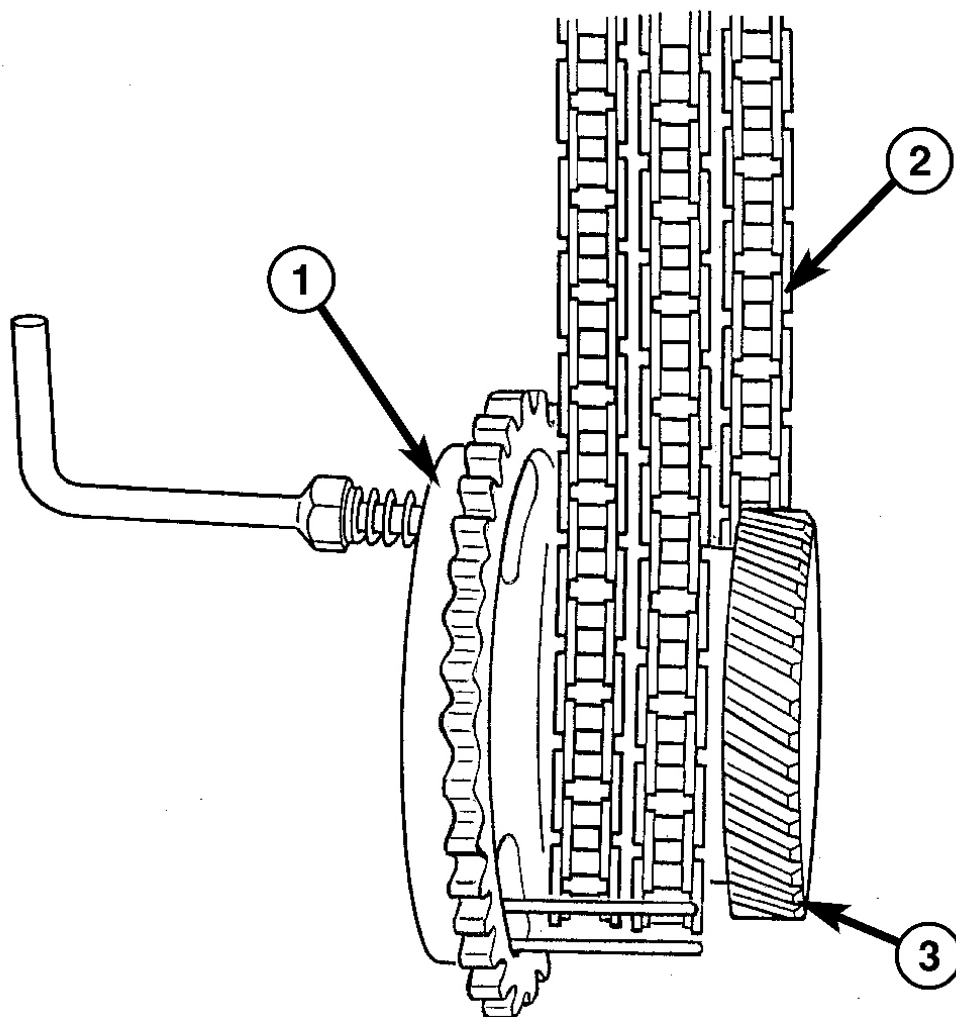


Fig. 79: Locating Cylinder Head Access Plugs
Courtesy of CHRYSLER LLC

1 - RIGHT CYLINDER HEAD ACCESS PLUG
2 - LEFT CYLINDER HEAD ACCESS PLUG

10. Install the cylinder head access plug (1,2). See **Fig. 79**.
11. Reset and install the right side secondary chain tensioner. See **INSTALLATION**.



80cb5655

Fig. 80: Locking Secondary Timing Chains
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SPECIAL TOOL 8429
2 - CAMSHAFT CHAIN
3 - CRANKSHAFT TIMING GEAR |
|---|

12. Remove the Camshaft Holder 8429 (1). See **Fig. 80**.
13. Install the timing chain cover. See **REMOVAL**.
14. Install the crankshaft damper. See **INSTALLATION**. Tighten damper bolt 175 N.m (130 ft. lbs.).
15. Install accessory drive belt. Refer to **INSTALLATION**.
16. Install the fan shroud. Refer to **INSTALLATION**.

17. Install the cylinder head cover. See **INSTALLATION**.
18. Install the intake manifold. See **INSTALLATION**.
19. Install oil fill housing onto cylinder head.
20. Refill the cooling system. Refer to **STANDARD PROCEDURE**.
21. Raise the vehicle.
22. Install the exhaust pipe onto the right exhaust manifold.
23. Lower the vehicle.
24. Reconnect battery negative cable.
25. Start the engine and check for leaks.

CAMSHAFT

DESCRIPTION

CAMSHAFT - RIGHT

The camshafts consist of powdered metal steel lobes which are sinter-bonded to a steel tube. Four bearing journals are machined into the camshaft. Camshaft end play is controlled by two thrust walls that border the nose piece journal.

REMOVAL

CAMSHAFT - RIGHT

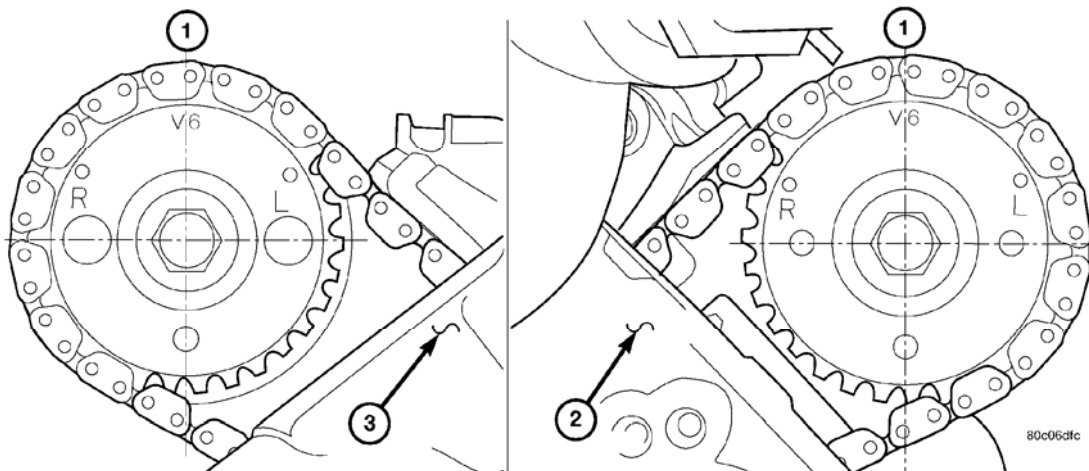


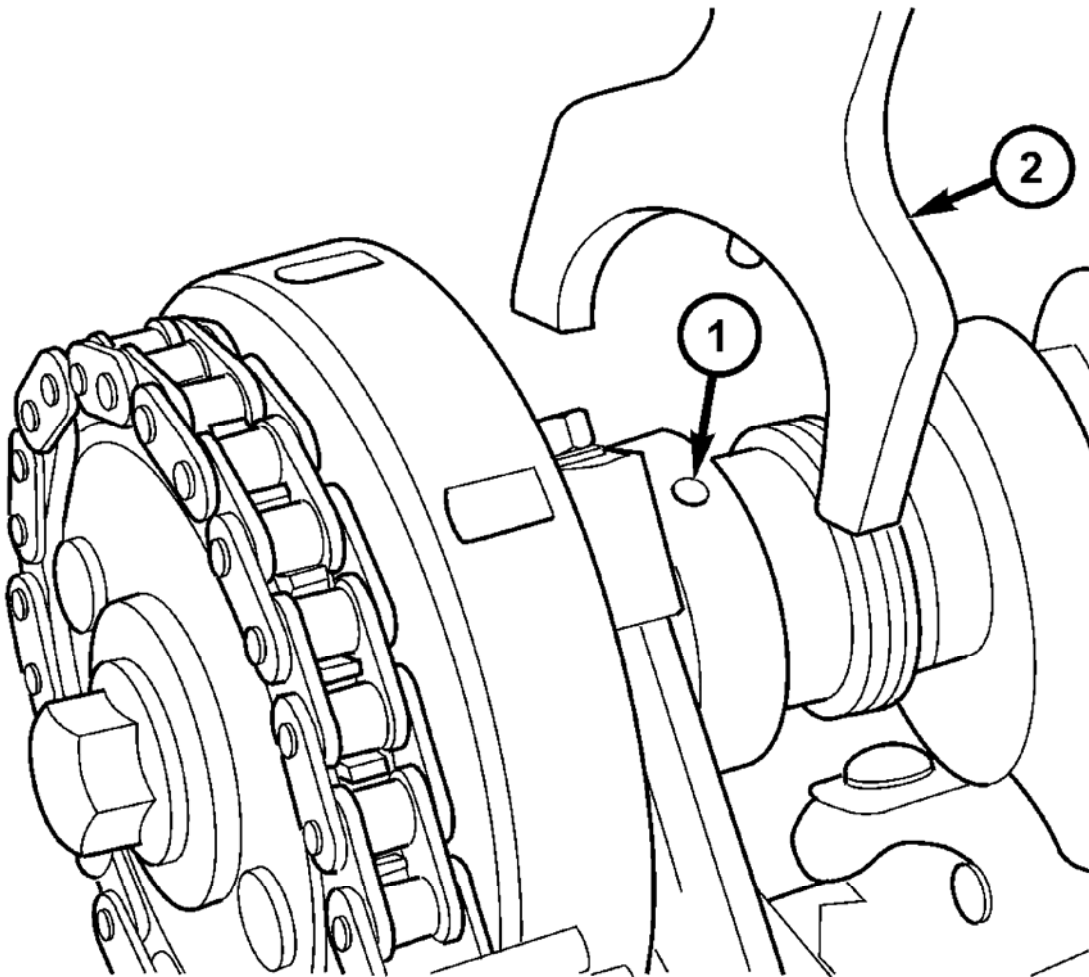
Fig. 81: Camshaft Sprocket V6 Marks
 Courtesy of CHRYSLER LLC

CAUTION: When the timing chain is removed and the cylinder heads are still installed, **DO NOT** forcefully rotate the camshafts or crankshaft independently of each other. Severe valve and/or piston damage can

occur.

CAUTION: When removing the cam sprocket, timing chains or camshaft, Failure to use Wedge Locking Tool 8379 will result in hydraulic tensioner ratchet over extension, Requiring timing chain cover removal to reset the tensioner ratchet.

1. Remove the cylinder head cover. See **REMOVAL**.
2. Set engine to TDC cylinder No. 1, camshaft sprocket V6 marks at the 12 o'clock position (1). See **Fig. 81**.
3. Mark one link on the secondary timing chain on both sides of the V6 mark on the camshaft sprocket to aid in installation.



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Fig. 82: Special Tool 8428
Courtesy of CHRYSLER LLC

- 1 - Camshaft hole
- 2 - Special Tool 8428

CAUTION: Do not hold or pry on the camshaft target wheel for any reason, Severe damage will occur to the target wheel. A damaged target wheel could cause a vehicle no start condition.

4. Loosen but **DO NOT** remove the camshaft sprocket retaining bolt. See **Fig. 83**. Leave bolt snug against sprocket.

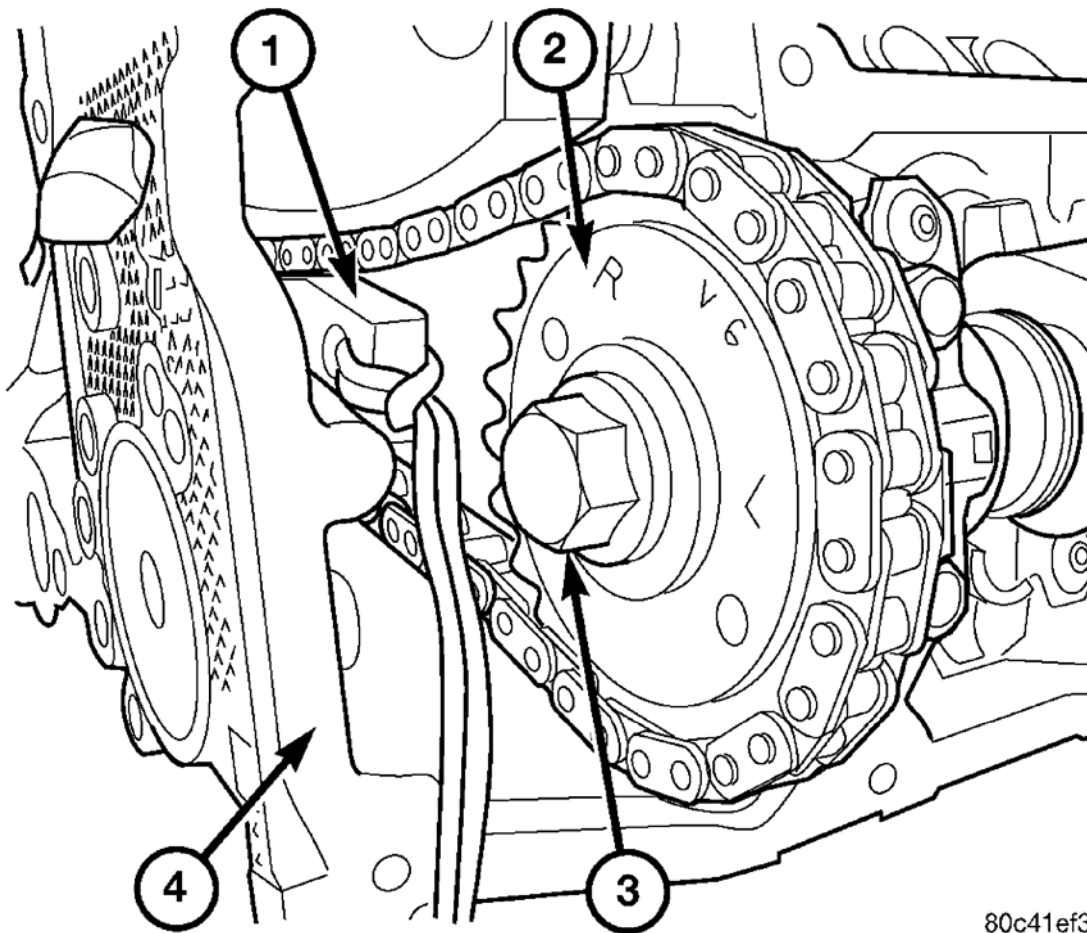


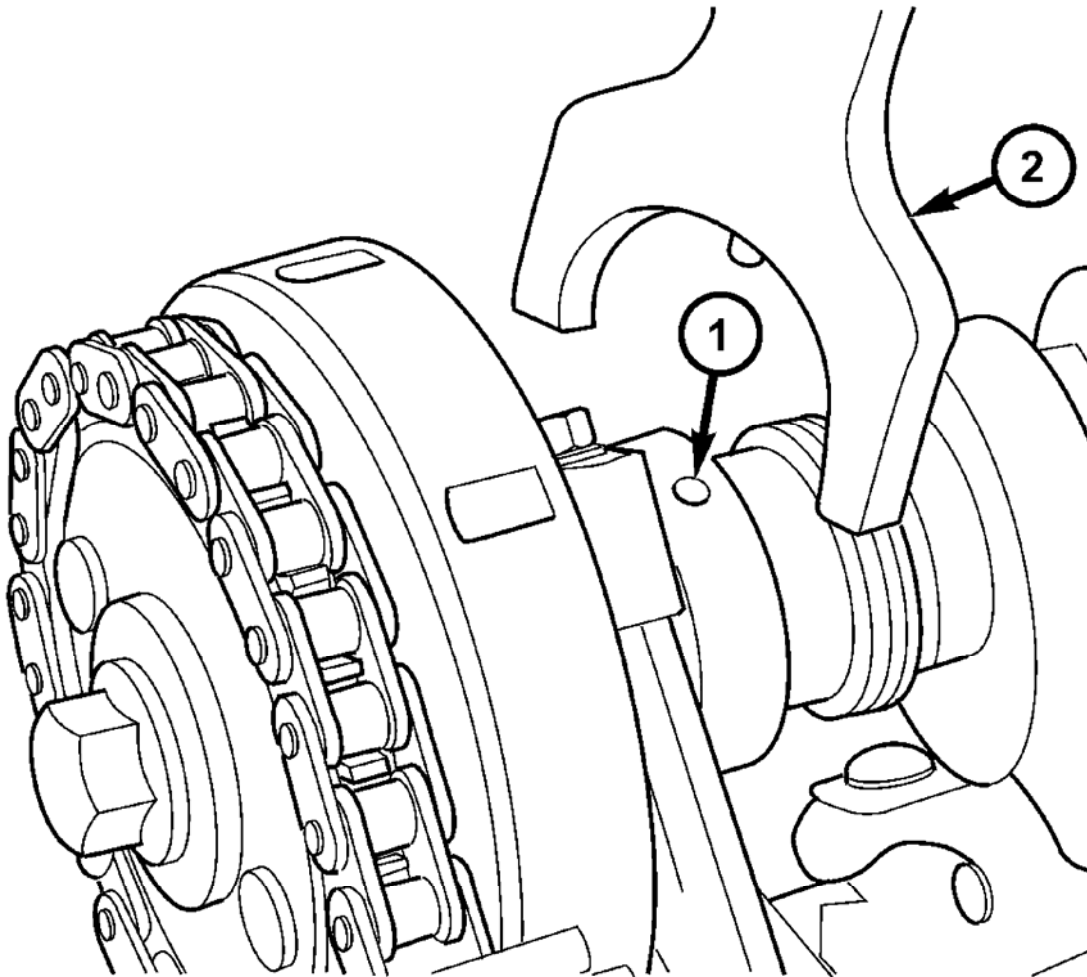
Fig. 83: Securing Timing Chain Tensioners Using Timing Chain Wedge - Typical
Courtesy of CHRYSLER LLC

- 1 - SPECIAL TOOL 8379
- 2 - CAMSHAFT SPROCKET
- 3 - CAMSHAFT SPROCKET BOLT
- 4 - CYLINDER HEAD

NOTE: The timing chain tensioners must be secured prior to removing the camshaft sprockets. Failure to secure tensioners will allow the tensioners to extend, requiring timing chain cover removal in order to reset tensioners.

CAUTION: Do not force wedge past the narrowest point between the chain strands. Damage to the tensioners may occur.

5. Position the Wedge Locking Tool 8379 (1) between the timing chain strands. Tap the tool to securely wedge the timing chain against the tensioner arm and guide. See **Fig. 83**.

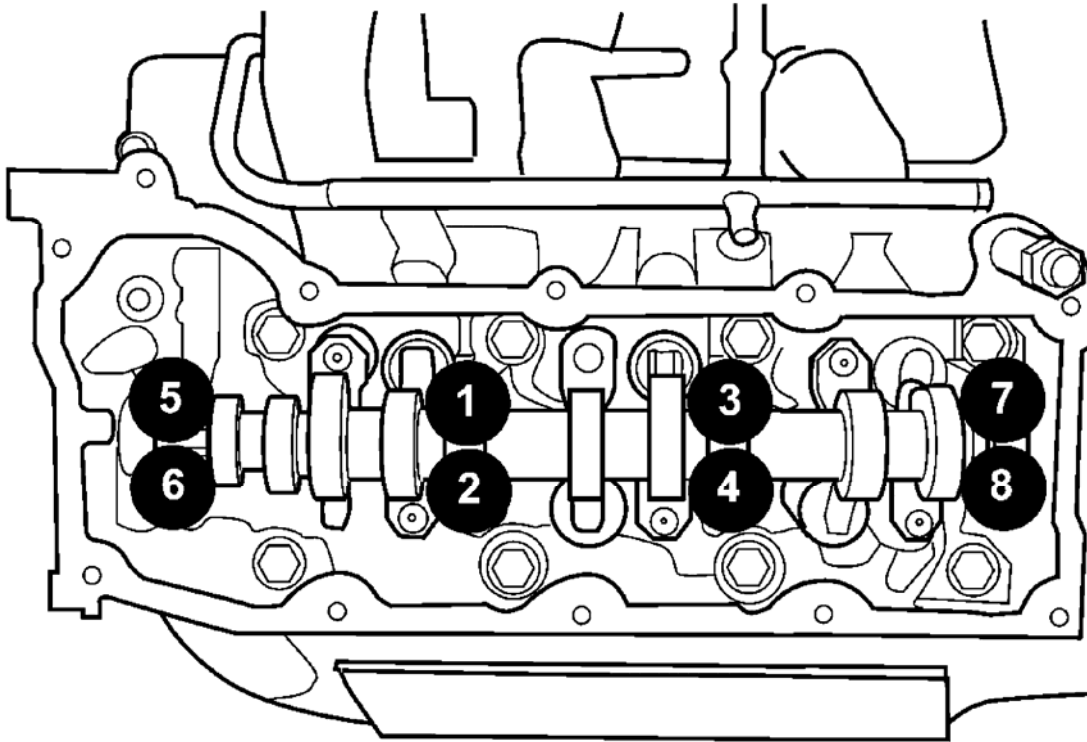


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Fig. 84: Special Tool 8428
Courtesy of CHRYSLER LLC

- 1 - Camshaft hole
- 2 - Special Tool 8428

6. Remove the camshaft position sensor.
7. Hold the camshaft with Camshaft Holder 8428 (2), while removing the camshaft sprocket bolt and sprocket. See **Fig. 84**.



808a1e9b

Fig. 85: Camshaft Bearing Cap Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

8. Starting at the outside working inward, loosen the camshaft bearing cap retaining bolts 1/2 turn at a time. Repeat until all load is off the bearing caps. See **Fig. 85**.

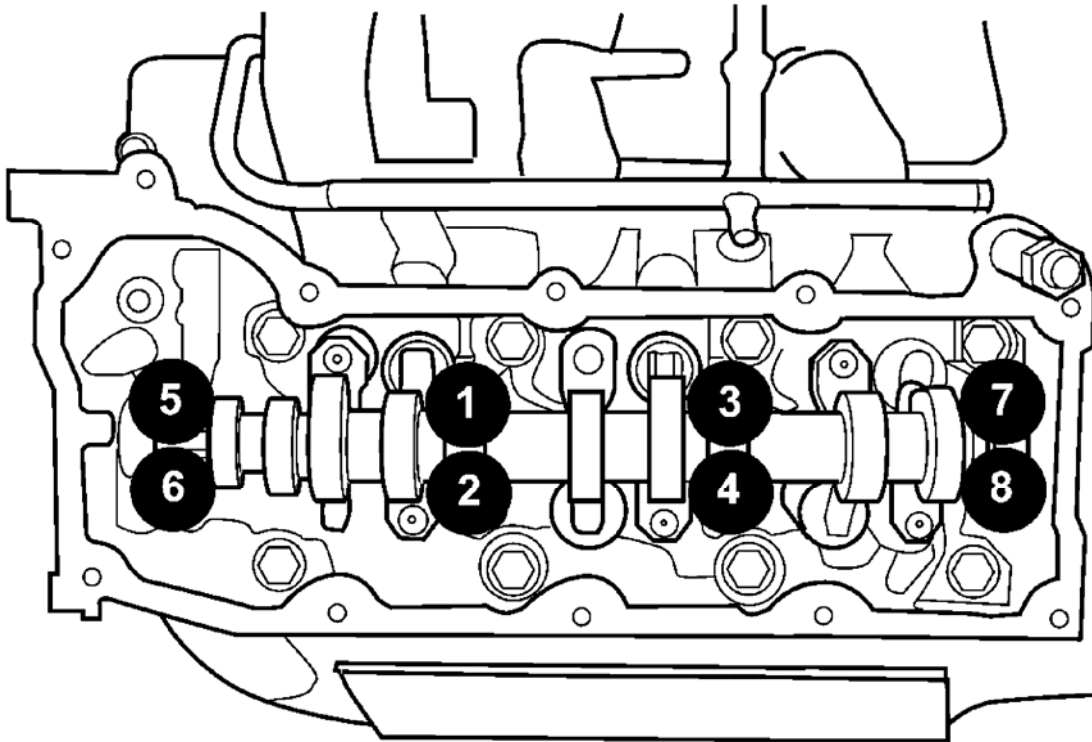
**CAUTION: DO NOT STAMP OR STRIKE THE CAMSHAFT BEARING CAPS.
SEVERE DAMAGE WILL OCCUR TO THE BEARING CAPS.**

NOTE: When the camshaft is removed the rocker arms may slide downward, mark the rocker arms before removing camshaft.

9. Remove the camshaft bearing caps and the camshaft.

INSTALLATION

CAMSHAFT - RIGHT



808a1e9b

Fig. 86: Camshaft Bearing Cap Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

1. Lubricate camshaft journals with clean engine oil.

NOTE: Position the right side camshaft so that the camshaft sprocket dowel is near the 10 o'clock position, This will place the camshaft at the neutral position easing the installation of the camshaft bearing caps.

2. Position the camshaft into the cylinder head.
3. Install the camshaft bearing caps, hand tighten the retaining bolts.

NOTE: Caps should be installed so that the stamped numbers on the caps are in numerical order, (1 through 4) from the front to the rear of the engine. All caps should be installed so that the stamped arrows on the caps point toward the front of the engine.

4. Working in 1/2 turn increments, tighten the bearing cap retaining bolts starting with the middle cap working outward.
5. Tighten the camshaft bearing cap retaining bolts to 11 N.m (100 in. lbs.). See **Fig. 86**.

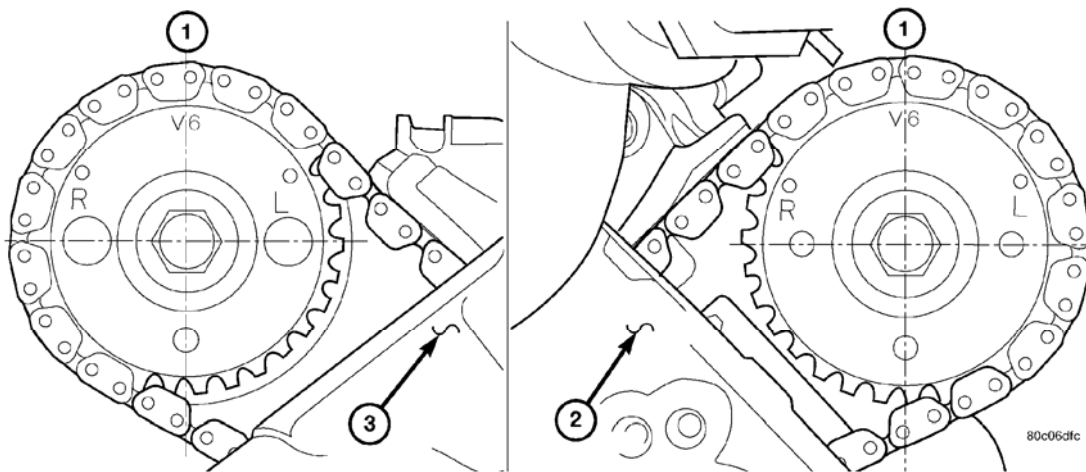
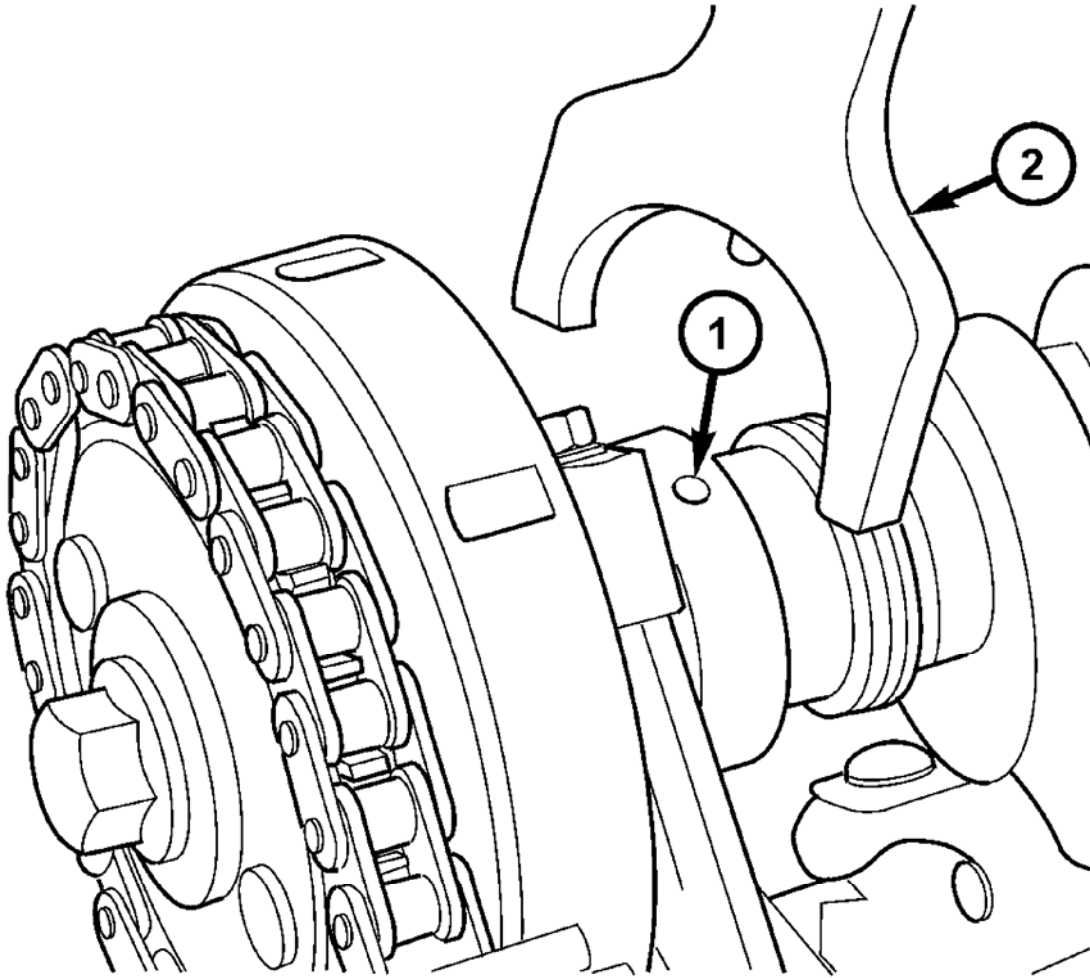


Fig. 87: Camshaft Sprocket V6 Marks
Courtesy of CHRYSLER LLC

6. Position the camshaft drive gear into the timing chain aligning the V6 mark between the two marked chain links (Two links marked during removal). See **Fig. 87**.



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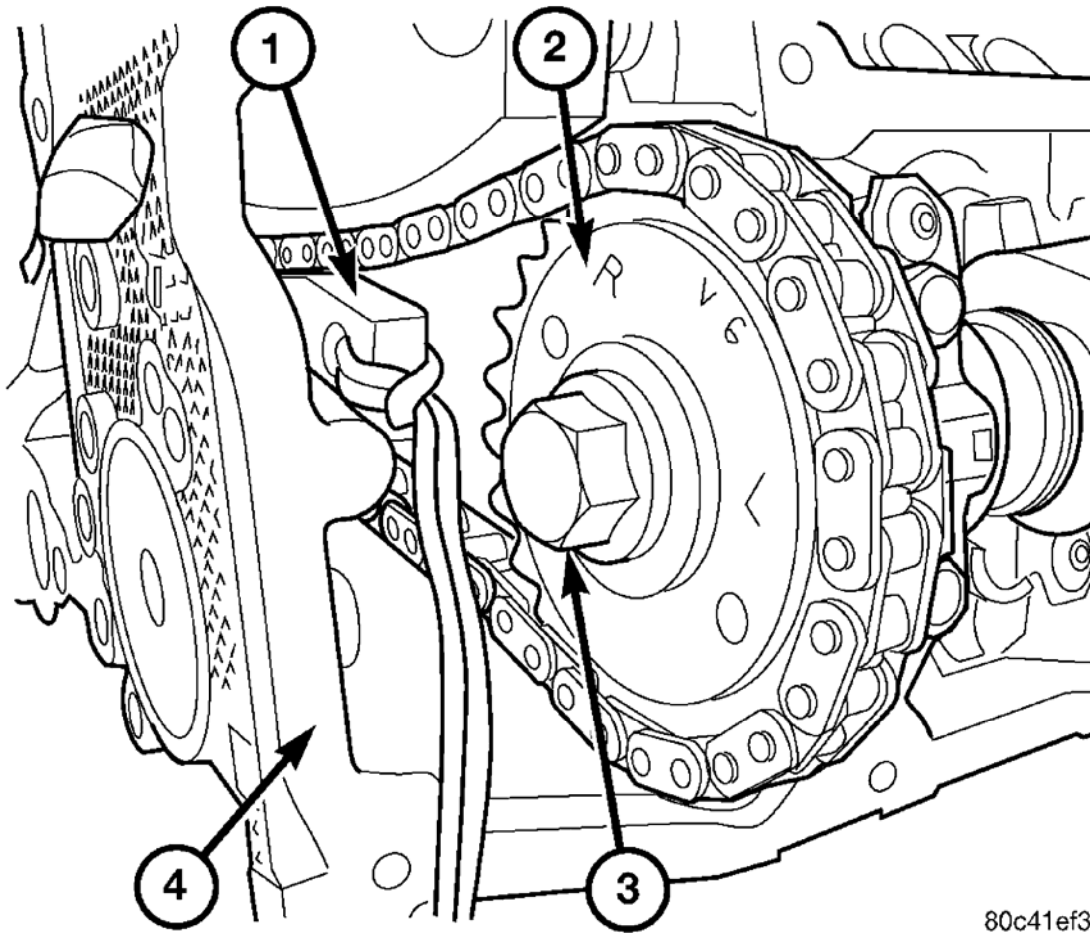
Fig. 88: Special Tool 8428
Courtesy of CHRYSLER LLC

1 - Camshaft hole 2 - Special Tool 8428
--

7. Using the Camshaft Holder 8428 (2), rotate the camshaft until the camshaft sprocket dowel is aligned with the slot in the camshaft sprocket . Install the sprocket onto the camshaft. See **Fig. 88**.

CAUTION: Remove excess oil from camshaft sprocket bolt. Failure to do so can cause bolt over-torque resulting in bolt failure.

8. Remove excess oil from camshaft sprocket bolt, then install the camshaft sprocket retaining bolt and hand tighten.



80c41ef3

Fig. 89: Securing Timing Chain Tensioners Using Timing Chain Wedge - Typical
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SPECIAL TOOL 8379
2 - CAMSHAFT SPROCKET
3 - CAMSHAFT SPROCKET BOLT
4 - CYLINDER HEAD |
|---|

9. Remove timing chain wedge special tool 8379 (1). See **Fig. 89**.
10. Using Spanner Wrench 6958 with adapter pins 8346, tighten the camshaft sprocket retaining bolt to 122 N.m (90 ft. lbs.)
11. Install the camshaft position sensor.
12. Install the cylinder head cover. See **INSTALLATION**.

COVER-CYLINDER HEAD

REMOVAL

CYLINDER HEAD COVER

1. Disconnect battery negative cable.
2. Remove air cleaner assembly, resonator assembly and air inlet hose.
3. Drain cooling system, below the level of the heater hoses. Refer to **STANDARD PROCEDURE** .
4. Remove accessory drive belt. Refer to **REMOVAL** .
5. Remove air conditioning compressor retaining bolts and move compressor to the left.
6. Remove heater hoses.
7. Disconnect injector and ignition coil connectors.
8. Disconnect and remove positive crankcase ventilation (PCV) hose.
9. Remove oil fill tube.
10. Unclip injector and ignition coil harness and move away from cylinder head cover.
11. Remove right rear breather tube and filter assembly.
12. Remove cylinder head cover retaining bolts.
13. Remove cylinder head cover.

INSTALLATION

CYLINDER HEAD COVER

CAUTION: Do not use harsh cleaners to clean the cylinder head covers. Severe damage to covers may occur.

NOTE: The gasket may be used again, provided no cuts, tears, or deformation has occurred.

1. Clean cylinder head cover and both sealing surfaces. Inspect and replace gasket as necessary.
2. Tighten cylinder head cover bolts and double ended studs to 12 N.m (105 in. lbs).
3. Install right rear breather tube and filter assembly.
4. Connect injector, ignition coil electrical connectors and harness retaining clips.
5. Install the oil fill tube.
6. Install PCV hose.
7. Install heater hoses.
8. Install air conditioning compressor retaining bolts.
9. Install accessory drive belt. Refer to **INSTALLATION** .
10. Fill Cooling system. Refer to **STANDARD PROCEDURE** .
11. Install air cleaner assembly, resonator assembly and air inlet hose.
12. Connect battery negative cable.

VALVES AND SEATS - INTAKE/EXHAUST

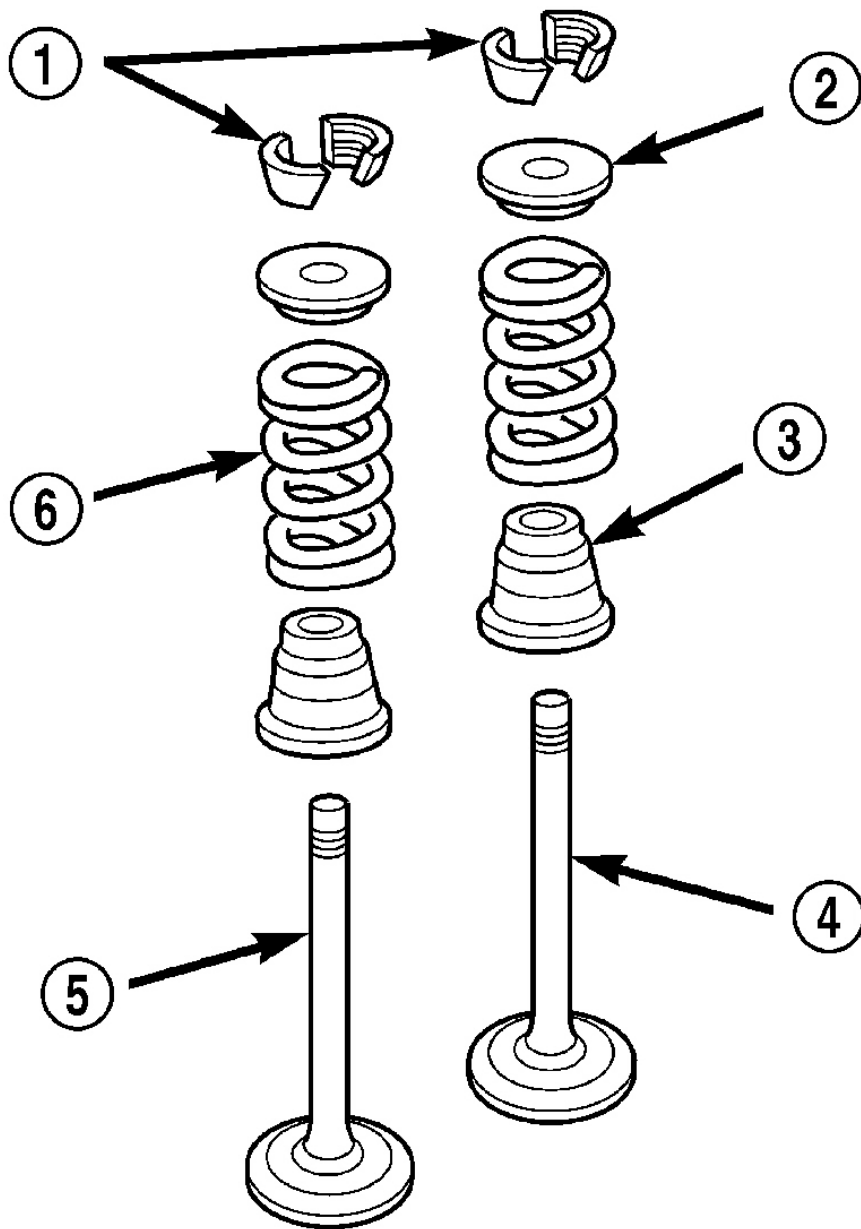
DESCRIPTION

VALVES

The valves are made of heat resistant steel and have chrome plated stems to prevent scuffing. Each valve is actuated by a roller rocker arm which pivots on a stationary lash adjuster. All valves use three bead lock keepers to retain the springs and promote valve rotation.

STANDARD PROCEDURE

REFACING



80b8983f

Fig. 90: Valve Assembly Configuration
Courtesy of CHRYSLER LLC

- 1 - VALVE LOCKS (3-BEAD)
- 2 - RETAINER
- 3 - VALVE STEM OIL SEAL
- 4 - INTAKE VALVE
- 5 - EXHAUST VALVE

NOTE: Valve seats that are worn or burned can be reworked, provided that correct angle and seat width are maintained. Otherwise the cylinder head must be replaced.

NOTE: When refacing valves (4) and valve seats, it is important that the correct size valve guide pilot be used for reseating stones. A true and complete surface must be obtained.

1. Using a suitable dial indicator measure the center of the valve seat. Total run out must not exceed 0.051 mm (0.002 in).
2. Apply a small amount of Prussian blue to the valve seat, insert the valve into the cylinder head, while applying light pressure on the valve rotate the valve. Remove the valve and examine the valve face. If the blue is transferred below the top edge of the valve face, lower the valve seat using a 15 degree stone. If the blue is transferred to the bottom edge of the valve face, raise the valve seat using a 65 degree stone.
3. When the seat is properly positioned the width of the intake seat must be 1.75 - 2.36 mm (0.0689 - 0.0928 in.) and the exhaust seat must be 1.71 - 2.32 mm (0.0673 - 0.0911 in.).
4. Check the valve spring (6) installed height after refacing the valve and seat. The installed height for both intake and exhaust valve springs must not exceed 40.74 mm (1.6039 in.)
5. The valve seat and valve face must maintain a face angle of 44.5 - 45 ° angle.

REMOVAL

VALVES AND VALVE SPRINGS

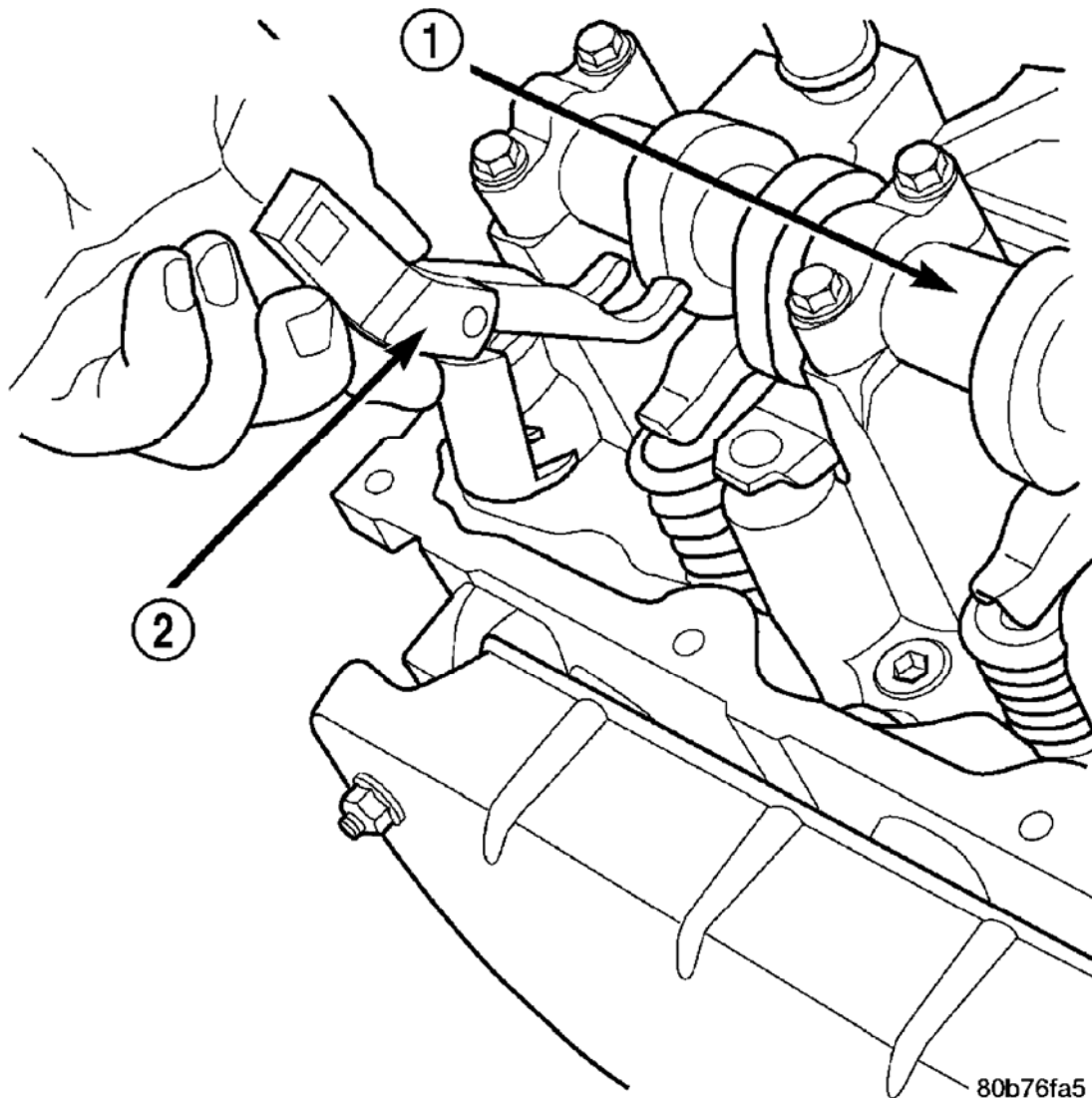


Fig. 91: Removing/Installing Rocker Arm
Courtesy of CHRYSLER LLC

1 - CAMSHAFT

2 - VALVE SPRING COMPRESSOR 10102

NOTE: The cylinder heads must be removed in order to perform this procedure.

1. Remove rocker arms and lash adjusters. See **REMOVAL**.
2. Remove the camshaft bearing caps and the camshaft.

NOTE: All valve springs and valves are removed in the same manner; this procedure only covers one valve and valve spring.

3. Using Valve Spring Compressor C-3422-B or C-3422-C and Adapter 8519, compress the valve spring.

NOTE: **It may be necessary to tap the top of the valve spring to loosen the spring retainers locks enough to be removed.**

4. Remove the two spring retainer lock halves.

NOTE: **the valve spring is under tension use care when releasing the valve spring compressor.**

5. Remove the valve spring compressor.

6. Remove the spring retainer, and the spring.

NOTE: **Check for sharp edges on the keeper grooves. Remove any burrs from the valve stem before removing the valve from the cylinder head.**

7. Remove the valve from the cylinder head.

NOTE: **The valve stem seals are common between intake and exhaust.**

8. Remove the valve stem seal. Mark the valve for proper installation.

TESTING VALVE SPRINGS

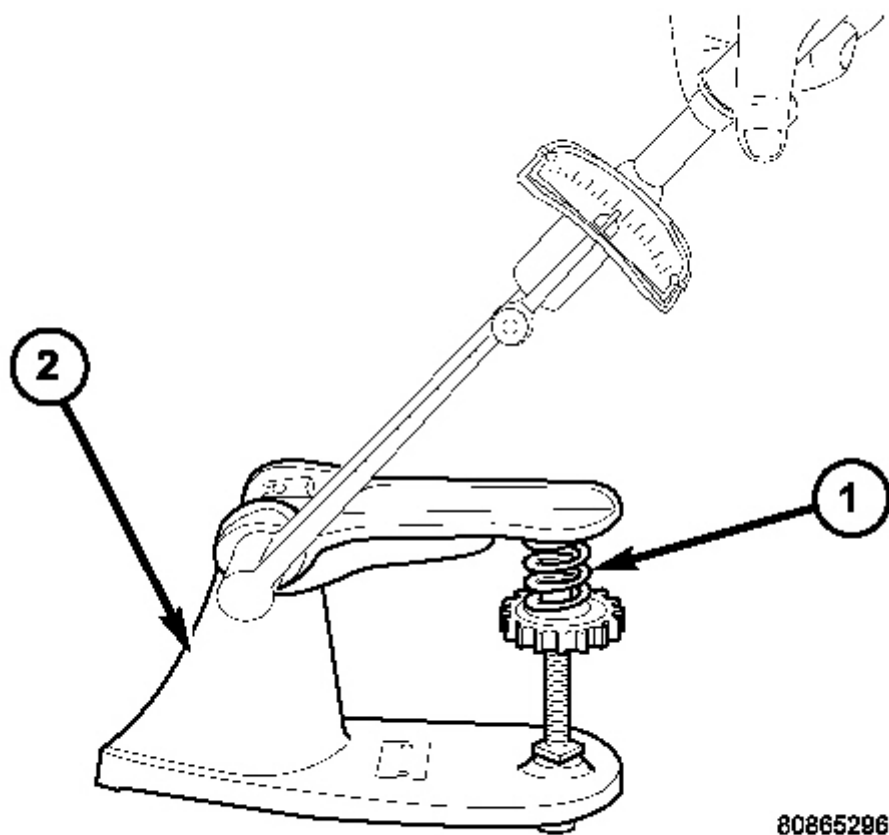


Fig. 92: Testing Valve Spring
Courtesy of CHRYSLER LLC

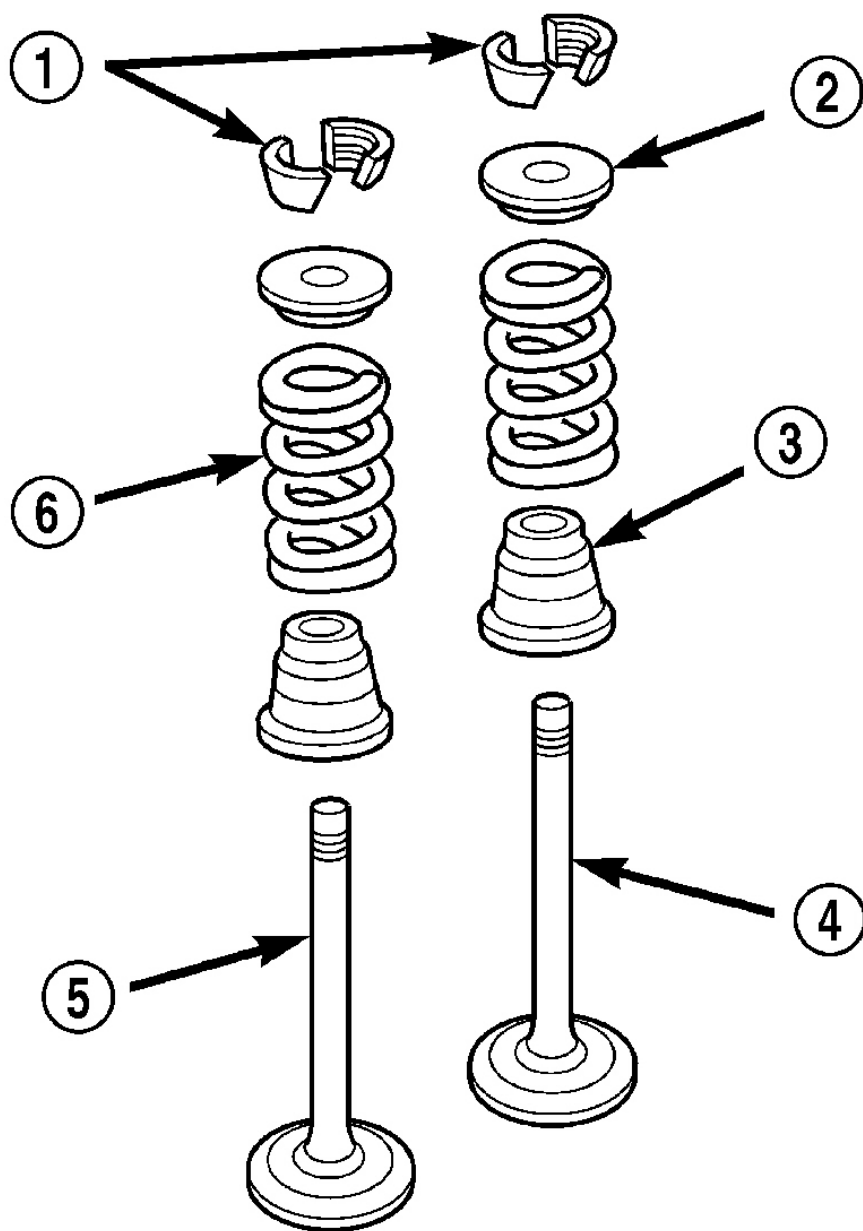
1 - SPECIAL TOOL C-647

NOTE: Whenever the valves are removed from the cylinder head it is recommended that the valve springs be inspected and tested for reuse.

Inspect the valve springs for physical signs of wear or damage. Turn table of tool C-647 (1) until surface is in line with the 40.12 mm (1.579 in.) mark on the threaded stud and the zero mark on the front. Place spring over the stud on the table and lift compressing lever to set tone device. Pull on torque wrench until a Ping is heard. Take reading on torque wrench at this instant. Multiply this reading by two. This will give the spring load at test length. Fractional measurements are indicated on the table for finer adjustments. Refer to **SPECIFICATIONS** to obtain specified height and allowable tensions. Replace any springs that do not meet specifications.

INSTALLATION

VALVES AND VALVE SPRINGS



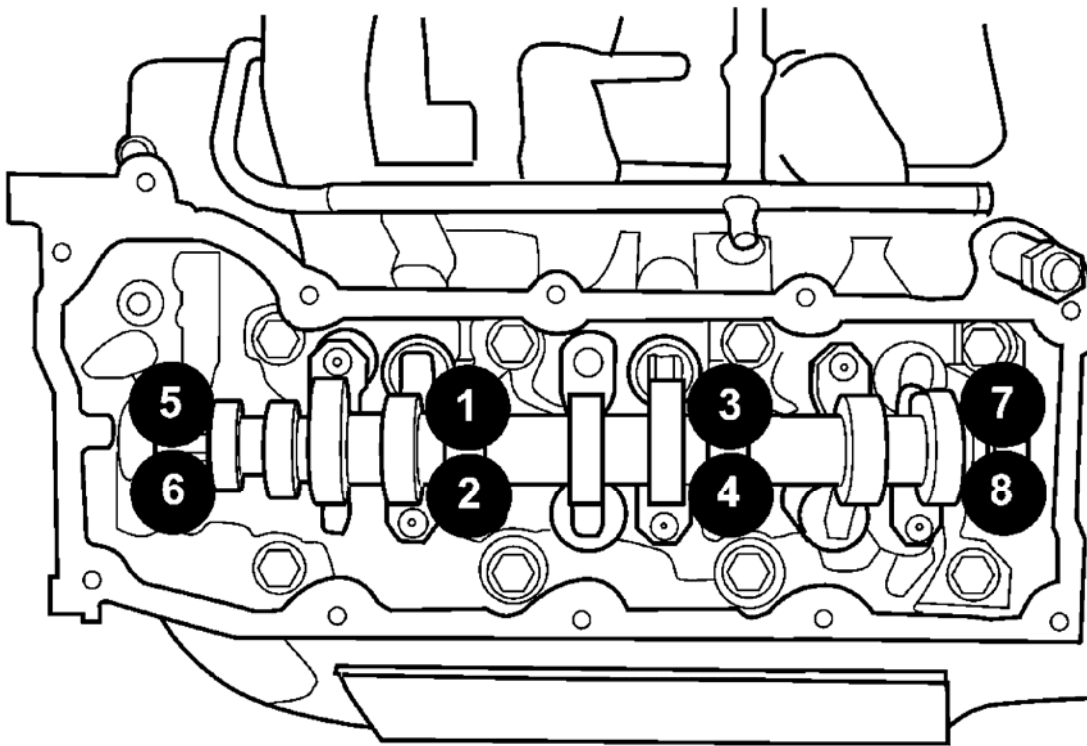
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Fig. 93: Valve Assembly Configuration
Courtesy of CHRYSLER LLC

- 1 - VALVE LOCKS (3-BEAD)
- 2 - RETAINER
- 3 - VALVE STEM OIL SEAL

- 4 - INTAKE VALVE
- 5 - EXHAUST VALVE
- 6 - VALVE SPRING

1. coat the valve stem with clean engine oil and insert it into the cylinder head.
2. Install the valve stem seal. make sure the seal is fully seated and that the garter spring at the top of the seal is intact.
3. Install the spring and the spring retainer.
4. Using the valve spring compressor, compress the spring and install the two valve spring retainer halves.
5. Release the valve spring compressor and make sure the two spring retainer halves and the spring retainer are fully seated. See **Fig. 65**.



808a1e9b

Fig. 94: Camshaft Bearing Caps Tightening Sequence
Courtesy of CHRYSLER LLC

6. Lubricate the camshaft journal with clean engine oil then Position the camshaft (with the sprocket dowel on the left camshaft at 11 o'clock and the right camshaft at 12 o'clock), then position the camshaft bearing

caps.

7. Install the camshaft bearing cap retaining bolts. Tighten the bolts 9-13 N.m (100 in. lbs.) in 1/2 turn increments in the sequence shown in illustration. See **Fig. 66**.
8. Position the hydraulic lash adjusters and rocker arms. See **INSTALLATION**.

ROCKER ARM - VALVE

DESCRIPTION

VALVE ROCKER ARM

The rocker arms are steel stampings with an integral roller bearing. The rocker arms incorporate a 0.5 mm oil jet hole in the lash adjuster socket for roller and camshaft lubrication.

REMOVAL

VALVE ROCKER ARM

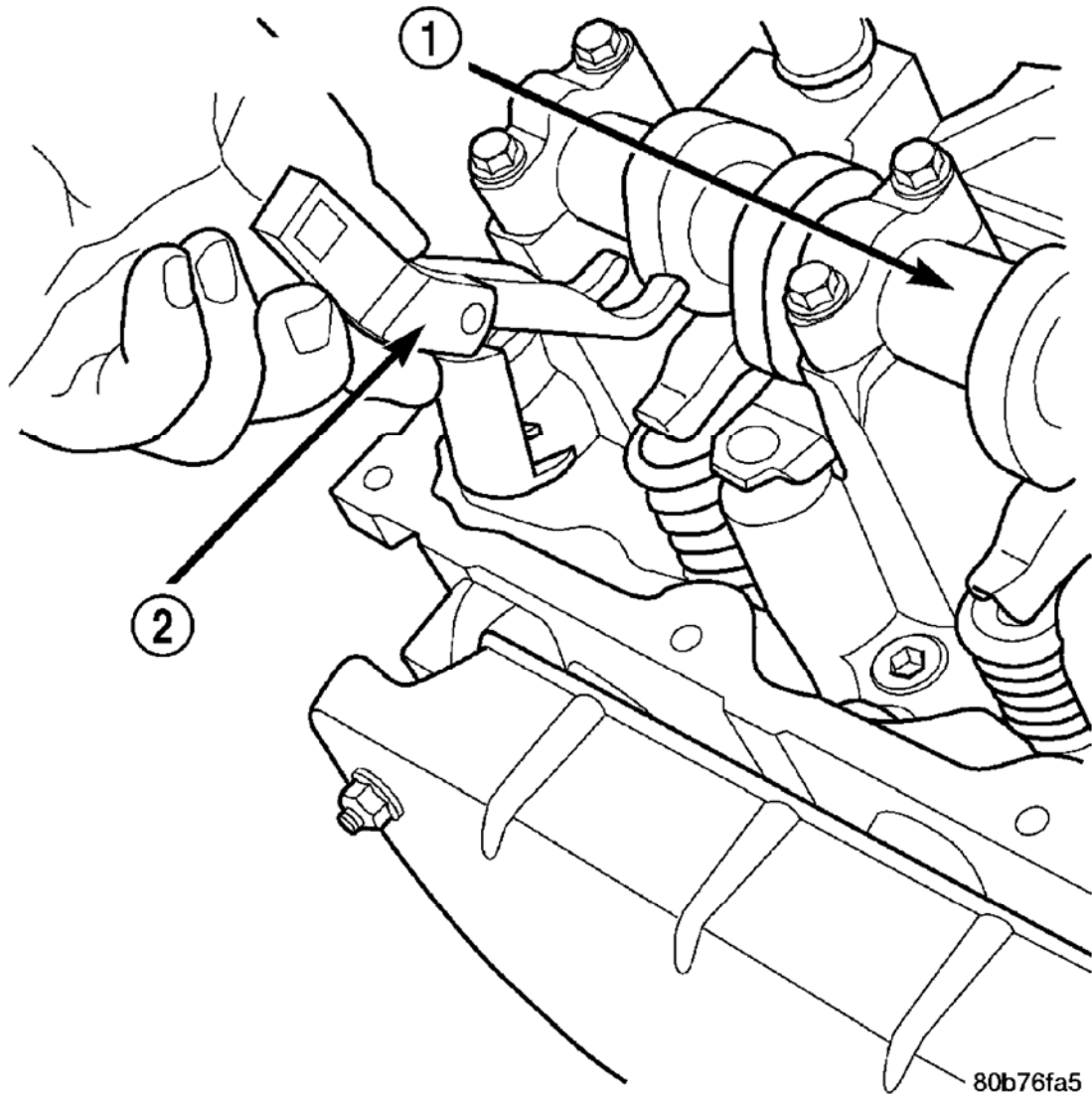


Fig. 95: Removing/Installing Rocker Arm
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - CAMSHAFT
2 - SPECIAL TOOL 8516 |
|---------------------------------------|

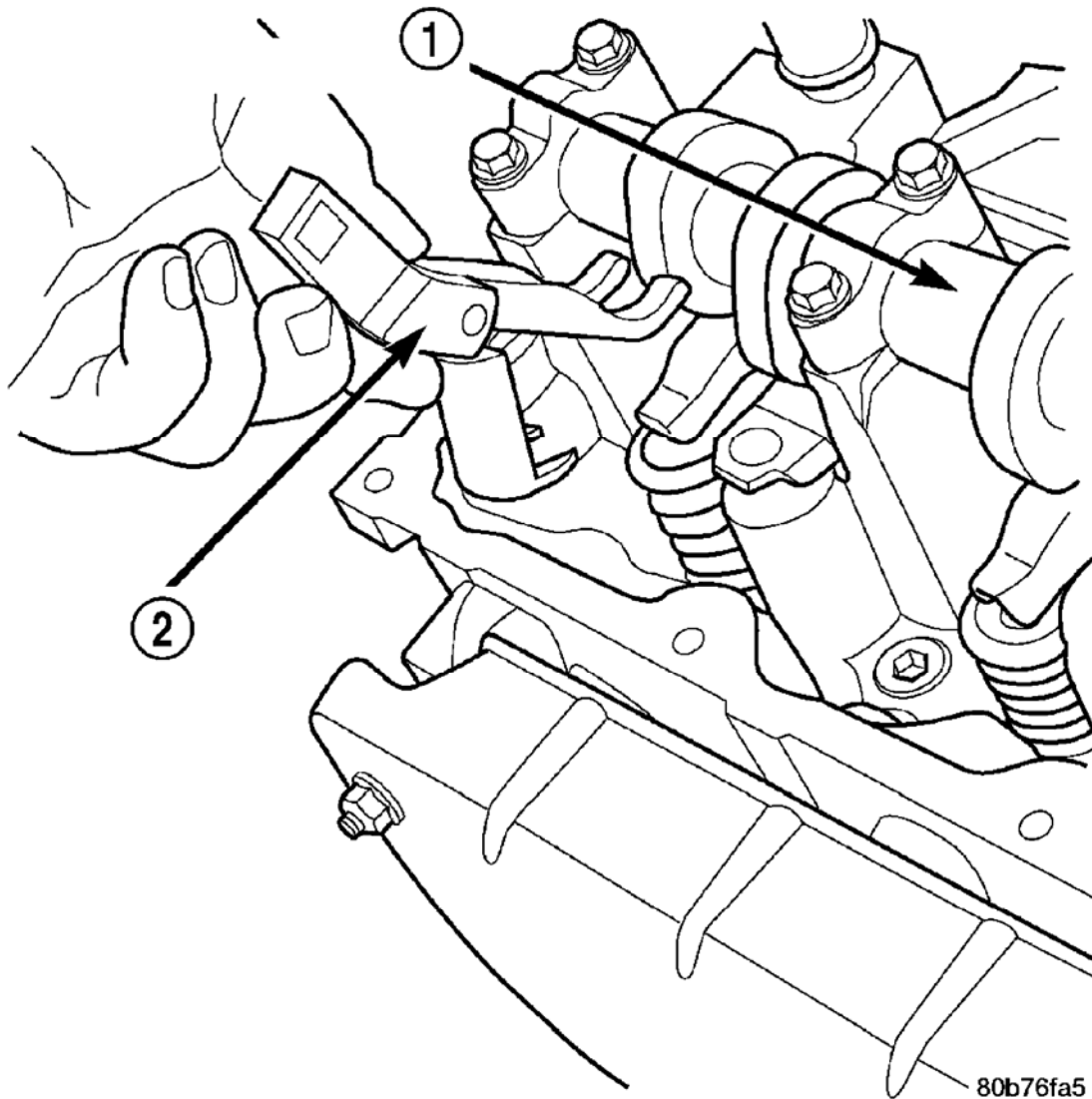
NOTE: **Disconnect the battery negative cable to prevent accidental starter engagement.**

1. Remove the cylinder head cover. See **REMOVAL**.
2. For rocker arm removal on cylinder No. 4, Rotate the crankshaft until cylinder No. 1 is at BDC intake stroke.
3. For rocker arm removal on cylinder No. 1, Rotate the crankshaft until cylinder No. 1 is at BDC combustion stroke.

4. For rocker arm removal on cylinders No. 3 and No. 5, Rotate the crankshaft until cylinder No. 1 is at TDC exhaust stroke.
5. For rocker arm removal on cylinders No. 2 and No. 6, Rotate the crankshaft until cylinder No. 1 is at TDC ignition stroke.
6. Using the Rocker Arm Remover/Installer 8516A (2), press downward on the valve spring, remove rocker arm. See **Fig. 67**.

INSTALLATION

VALVE ROCKER ARM



80b76fa5

Fig. 96: Removing/Installing Rocker Arm
Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - CAMSHAFT
2 - SPECIAL TOOL 8516 |
|---------------------------------------|

CAUTION: Make sure the rocker arms are installed with the concave pocket over the lash adjusters. Failure to do so may cause severe damage to the rocker arms and/or lash adjusters.

NOTE: Coat the rocker arms with clean engine oil prior to installation.

1. For rocker arm installation on cylinders No. 4, Rotate the crankshaft until cylinder No. 1 is at BDC intake stroke.
2. For rocker arm installation on cylinder No. 1, Rotate the crankshaft until cylinder No. 1 is at BDC combustion stroke.
3. For rocker arm installation on cylinders No. 3 and No. 5, Rotate the crankshaft until cylinder No. 1 is at TDC exhaust stroke.
4. For rocker arm installation on cylinders No. 2 and No. 6, Rotate the crankshaft until cylinder No. 1 is at TDC ignition stroke.
5. Using the Rocker Arm Remover/Installer 8516A (2), press downward on the valve spring, install rocker arm. See **Fig. 96**.
6. Install the cylinder head cover. See **INSTALLATION**.

SEALS-VALVE GUIDE

DESCRIPTION

VALVE GUIDE SEALS

The valve guide seals are made of rubber and incorporate an integral steel valve spring seat. The integral garter spring maintains consistent lubrication control to the valve stems.

SPRINGS-VALVE

DESCRIPTION

VALVE SPRINGS

The valve springs are made from high strength chrome silicon steel. There are different springs for intake and exhaust applications. The exhaust spring has an external damper. The valve spring seat is integral with the valve stem seal, which is a positive type seal to control lubrication.

REMOVAL

VALVE SPRINGS

1. Remove the cylinder head cover. See **REMOVAL**.
2. Using the Valve Spring Remover/Installer 8516A, remove the rocker arms and the hydraulic lash

adjusters.

3. Remove the spark plug for the cylinder the valve spring and seal are to be removed from.
4. Apply shop air to the cylinder to hold the valves in place when the spring is removed.

NOTE: All six valve springs and seals are removed in the same manner; this procedure only covers one valve seal and valve spring.

5. Using the Valve Spring Compressor 8387, compress the valve spring.

NOTE: It may be necessary to tap the top of the valve spring to loosen the spring retainers locks enough to be removed.

6. Remove the two spring retainer lock halves.

NOTE: the valve spring is under tension use care when releasing the valve spring compressor.

7. Remove the valve spring compressor.

NOTE: The valve springs are NOT common between intake and exhaust.

8. Remove the spring retainer, and the spring.

9. Remove the valve stem seal.

NOTE: The valve stem seals are common between intake and exhaust.

INSTALLATION

VALVE SPRINGS

NOTE: All six valve springs and seals are removed in the same manner; this procedure only covers one valve seal and valve spring.

1. Apply shop air to the cylinder to hold the valves in place while the spring is installed.

NOTE: The valve stem seals are common between intake and exhaust.

2. Install the valve stem seal.

NOTE: The valve springs are NOT common between intake and exhaust.

3. Install the spring retainer, and the spring.
4. Using Valve Spring Compressor 8387, compress the valve spring.

5. Install the two spring retainer lock halves.

NOTE: **the valve spring is under tension use care when releasing the valve spring compressor.**

6. Remove the valve spring compressor.
7. Disconnect the shop air to the cylinder.
8. Install the spark plug for the cylinder the valve spring and seal was installed on.
9. Using the Valve Spring Remover/Installer Special Tool 8516A, install the rocker arms and the hydraulic lash adjusters.
10. Install the cylinder head cover. See **INSTALLATION**.

ENGINE BLOCK

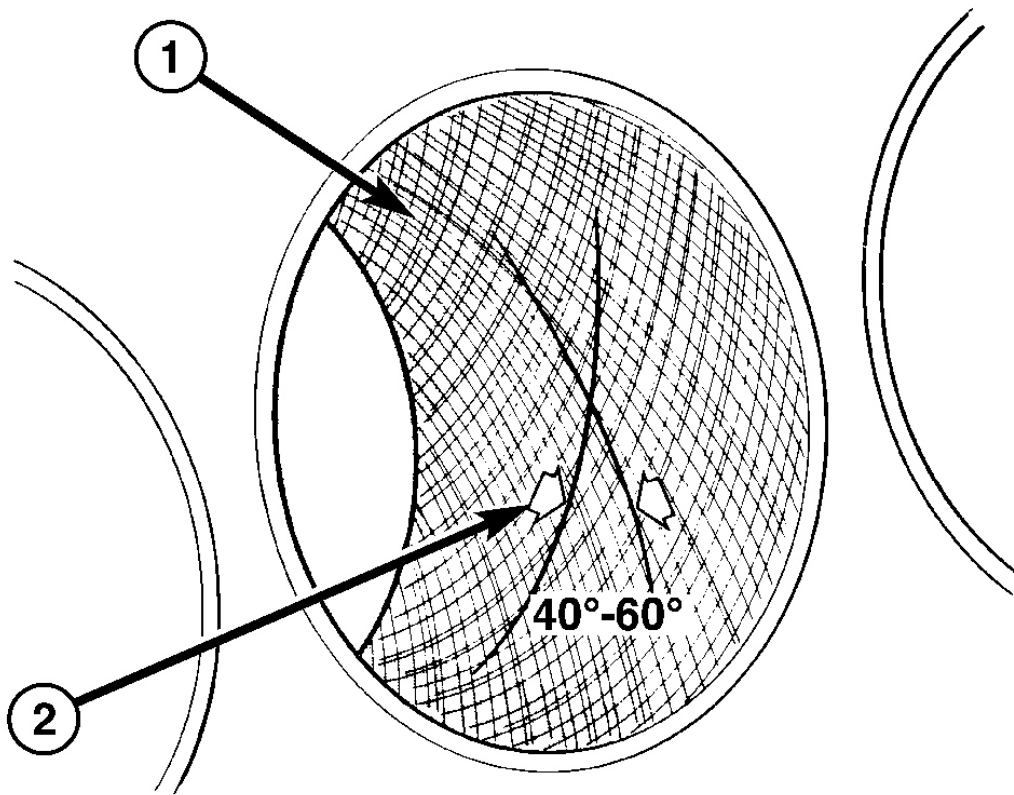
DESCRIPTION

ENGINE BLOCK

The cylinder block is made of cast iron. The block is a closed deck design with the left bank forward. To provide high rigidity and improved NVH an enhanced compacted graphite bedplate is bolted to the block. The block design allows coolant flow between the cylinders bores, and an internal coolant bypass to a single poppet inlet thermostat is included in the cast aluminum front cover.

STANDARD PROCEDURE

CYLINDER BORE HONING



8086fd41

Fig. 97: Cylinder Bore Crosshatch Pattern
Courtesy of CHRYSLER LLC

1 - CROSSHATCH PATTERN 2 - INTERSECT ANGLE

Before honing, stuff plenty of clean shop towels under the bores and over the crankshaft to keep abrasive materials from entering the crankshaft area.

1. Used carefully, the Cylinder Bore Sizing Hone C-823, equipped with 220 grit stones, is the best tool for this job. In addition to deglazing, it will reduce taper and out-of-round, as well as removing light scuffing, scoring and scratches. Usually, a few strokes will clean up a bore and maintain the required limits.

CAUTION: DO NOT use rigid type hones to remove cylinder wall glaze.

2. Deglazing of the cylinder walls may be done if the cylinder bore is straight and round. Use a cylinder surfacing hone, Honing Tool C-3501, equipped with 280 grit stones (C-3501-3810). about 20-60 strokes, depending on the bore condition, will be sufficient to provide a satisfactory surface. Using honing oil C-3501-3880, or a light honing oil, available from major oil distributors.

CAUTION: DO NOT use engine or transmission oil, mineral spirits, or kerosene.

3. Honing should be done by moving the hone up and down fast enough to get a crosshatch pattern (1). The hone marks should INTERSECT at 50° to 60° for proper seating of rings (2).
4. A controlled hone motor speed between 200 and 300 RPM is necessary to obtain the proper crosshatch angle. The number of up and down strokes per minute can be regulated to get the desired 50° to 60° angle. Faster up and down strokes increase the crosshatch angle.
5. After honing, it is necessary that the block be cleaned to remove all traces of abrasive. Use a brush to wash parts with a solution of hot water and detergent. Dry parts thoroughly. Use a clean, white, lint-free cloth to check that the bore is clean. Oil the bores after cleaning to prevent rusting.

CLEANING

CYLINDER BLOCK

Thoroughly clean the oil pan and engine block gasket surfaces.

Use compressed air to clean out:

The galley at the oil filter Adapter hole.

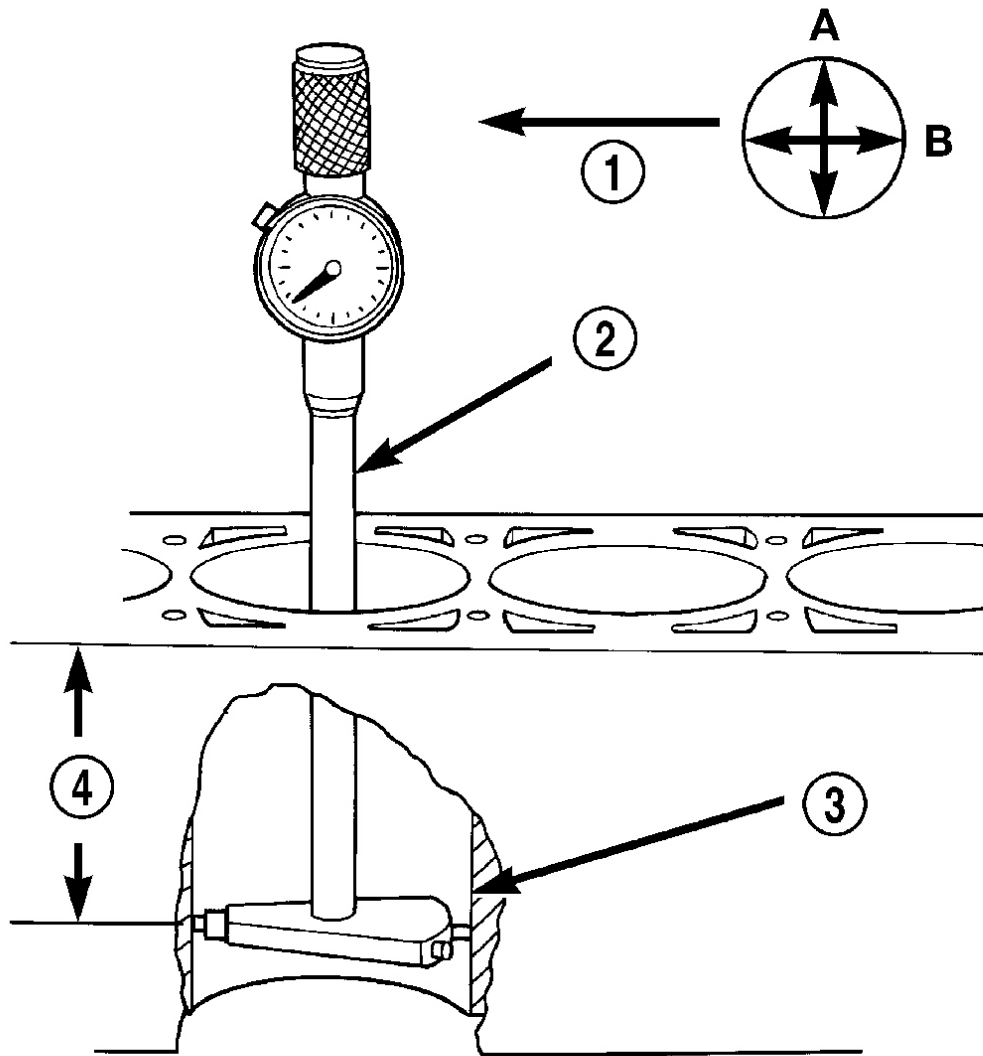
The front and rear oil galley holes.

The feed holes for the crankshaft main bearings.

Once the block has been completely cleaned, apply Loctite PST pipe sealant with Teflon 592 to the threads of the front and rear oil galley plugs. Tighten the plugs to 34 N.m (25 ft. lbs.)

INSPECTION

ENGINE BLOCK



805dd884

Fig. 98: Measuring Cylinder Bore With Gauge - Typical
 Courtesy of CHRYSLER LLC

- 1 - FRONT
- 2 - BORE GAUGE
- 3 - CYLINDER BORE
- 4 - 38 MM (1.5 in)

1. It is mandatory to use a dial bore gauge to measure each cylinder bore diameter. To correctly select the proper size piston, a cylinder bore gauge, capable of reading in 0.003 mm (.0001 in.) INCREMENTS is required. If a bore gauge is not available, do not use an inside micrometer.
2. Measure the inside diameter of the cylinder bore at three levels below top of bore. Start perpendicular

(across or at 90 degrees) to the axis of the crankshaft and then take two additional reading.

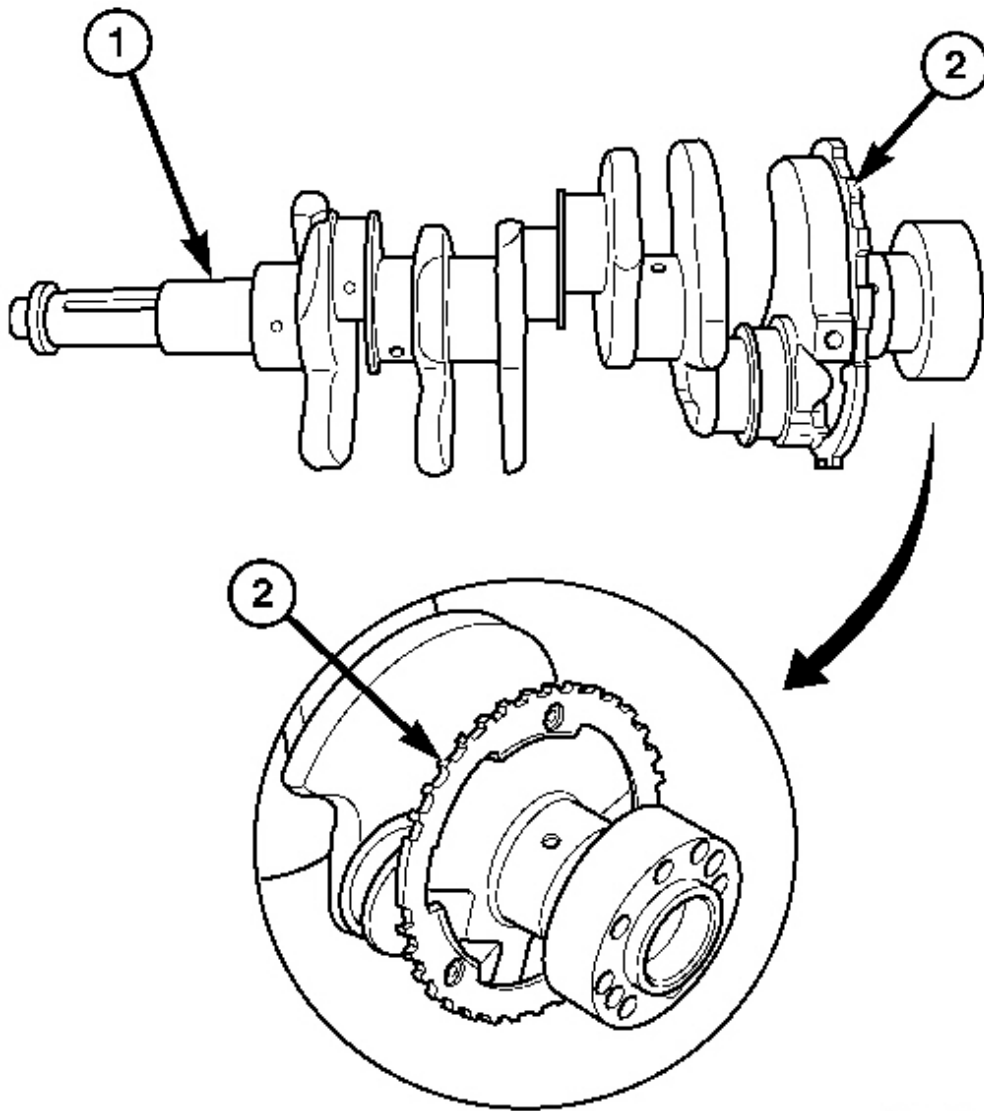
3. Measure the cylinder bore diameter crosswise to the cylinder block near the top of the bore. Repeat the measurement near the middle of the bore, then repeat the measurement near the bottom of the bore.
4. Determine taper by subtracting the smaller diameter from the larger diameter.
5. Rotate measuring device 90° and repeat steps above.
6. Determine out-of-roundness by comparing the difference between each measurement.
7. If cylinder bore taper does not exceed 0.025 mm (0.001 inch) and out-of-roundness does not exceed 0.015 mm (0.0006 inch), the cylinder bore can be honed. If the cylinder bore taper or out- of-round condition exceeds these maximum limits, the cylinder block must be replaced. A slight amount of taper always exists in the cylinder bore after the engine has been in use for a period of time.

CRANKSHAFT

DESCRIPTION

CRANKSHAFT

The crankshaft is constructed of nodular cast iron. The crankshaft is a three throw split pin design with six counterweights for balancing purposes. The crankshaft is supported by four select fit main bearings with the number two serving as the thrust washer location. The main journals of the crankshaft are cross drilled to improve rod bearing lubrication. The number six counterweight has provisions for crankshaft position sensor target wheel mounting. The select fit main bearing markings are located on the rear side of the target wheel. The crankshaft oil seals are one piece design. The front oil seal is retained in the timing chain cover, and the rear seal is pressed in to a bore formed by the cylinder block and the bedplate assembly. See **Fig. 99**.



80bbb3ce

Fig. 99: Crankshaft & Target Ring
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - CRANKSHAFT
2 - CRANKSHAFT POSITION SENSOR TARGET RING |
|--|

REMOVAL

CRANKSHAFT

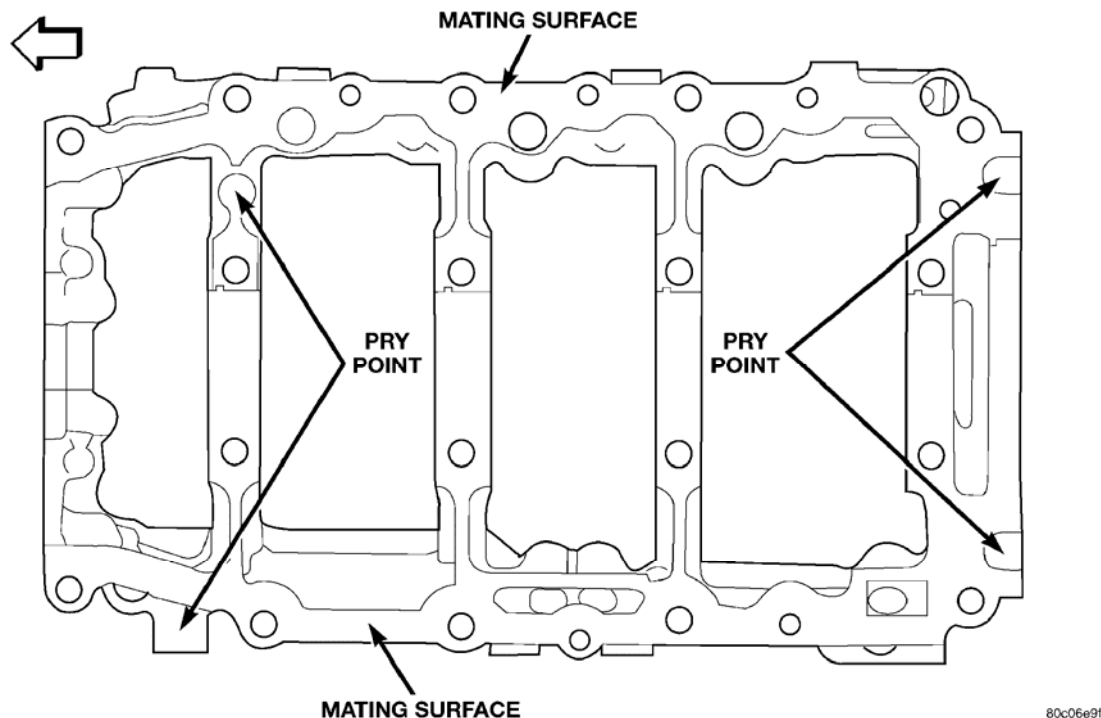


Fig. 100: Bedplate Pry Point Location
Courtesy of CHRYSLER LLC

NOTE: To remove the crankshaft from the engine, the engine must be removed from the vehicle.

1. Remove the engine. See REMOVAL.
2. Remove the engine oil pump. See REMOVAL.

CAUTION: DO NOT pry on the oil pan gasket when removing the oil pan, The oil pan gasket is mounted to the cylinder block in three locations and will remain attached to block when removing oil pan. Gasket can not be removed with oil pan.

3. Remove the bedplate mounting bolts. Note the location of the two stud bolts for installation.
4. Remove the connecting rods from the crankshaft.

CAUTION: The bedplate to cylinder block mating surface is a critical sealing surface. Do not pry on or damage this surface in anyway.

NOTE: The bedplate contains the lower main bearing halves. Use care when

handling bedplate as not to drop or damage bearing halves. Installing main bearing halves in the wrong position will cause severe damage to the crankshaft.

NOTE: The bedplate has pry points cast into it. Use these points only. The pry points are shown in illustration.

5. Carefully pry on the pry points to loosen the bedplate then remove the bedplate. See **Fig. 100**.

CAUTION: When removing the crankshaft, use care not to damage bearing surfaces on the crankshaft.

6. Remove the crankshaft.
7. Remove the crankshaft tone wheel.

INSPECTION

CRANKSHAFT

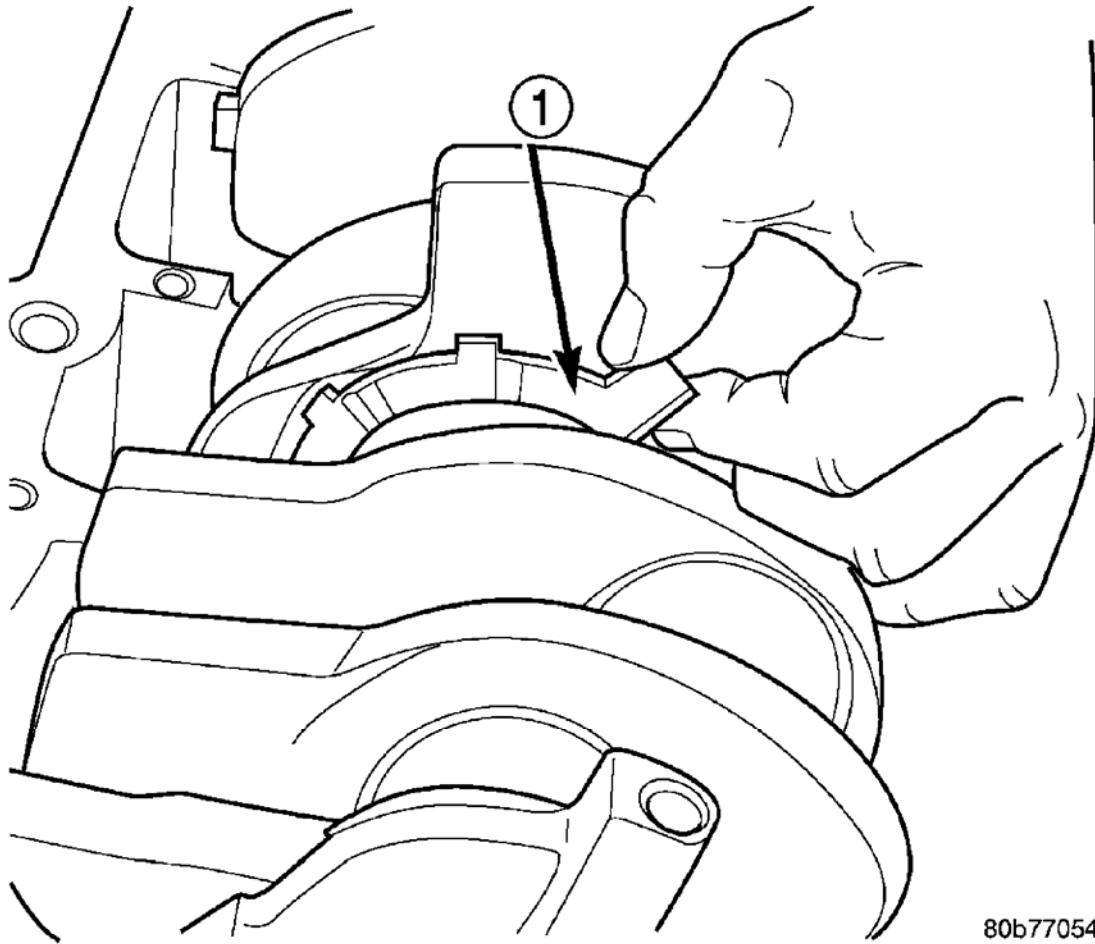
NOTE: Thoroughly inspect the connecting rod bearing bores and main bearing bores for scoring, blueing or severe scratches. Further disassembly may be required.

If connecting rod bearing bores show damage, the cylinder heads must be removed to service the piston and rod assemblies. If the bedplate or the cylinder block main bearing bores show damage the engine must be replaced.

1. If required, remove the main bearing halves from the cylinder block and bedplate.
2. Thoroughly clean the bedplate to cylinder block sealing surfaces and main bearing bores. Remove all oil and sealant residue.
3. Inspect the bedplate main bearing bores for cracks, scoring or severe blueing. If either condition exists the engine must be replaced.
4. Inspect the crankshaft thrust washers for scoring, scratches, wear or blueing. If either condition exist replace the thrust washers.
5. Inspect the oil pan gasket/windage tray for splits, tears or cracks in the gasket sealing surfaces. Replace gasket as necessary.

INSTALLATION

CRANKSHAFT



80b77054

Fig. 101: Identifying Crankshaft Thrust Washer
Courtesy of CHRYSLER LLC

1 - CRANKSHAFT THRUST WASHER

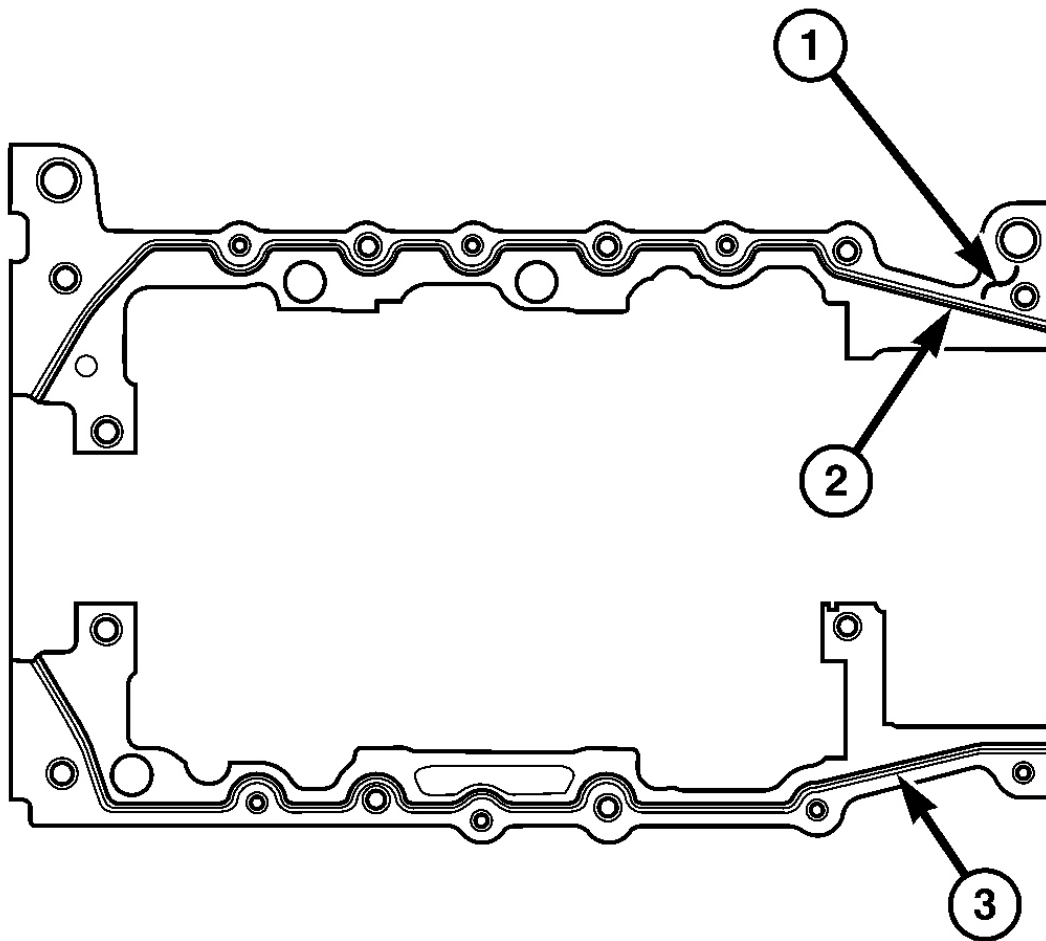
CAUTION: Main bearings are select fit. Refer to CRANKSHAFT MAIN BEARINGS for proper bearing selections.

CAUTION: When installing crankshaft, use care not to damage bearing surfaces on the crankshaft.

NOTE: Apply sealant to the tone wheel retaining screws prior to installation.

1. Lubricate upper main bearing halves with clean engine oil.
2. Install the crankshaft tone wheel. Tighten the mounting screws to 15 N.m (11 ft. lbs.)
3. Position crankshaft in cylinder block.

4. Install the thrust washers (1).



80e534f6

Fig. 102: Bedplate Sealant
Courtesy of CHRYSLER LLC

- | |
|--------------------|
| 1 - CYLINDER BLOCK |
| 2 - SEALANT |
| 3 - SEALANT |

CAUTION: The bedplate to cylinder block mating surface must be coated with Mopar® Engine RTV sealant prior to installation. Failure to do so will cause severe oil leaks.

NOTE: Make sure that the bedplate and cylinder block sealing surfaces are clean and free of oil or other contaminants. Contaminants on the sealing surfaces may cause main bearing distortion and/or oil leaks.

5. Apply a 2.5 mm (0.100 inch) bead of Mopar® Engine RTV sealant to the cylinder block-to-bedplate mating surface (2,3) as shown in illustration.

★ = STUDS

■ = DOWEL LOCATIONS

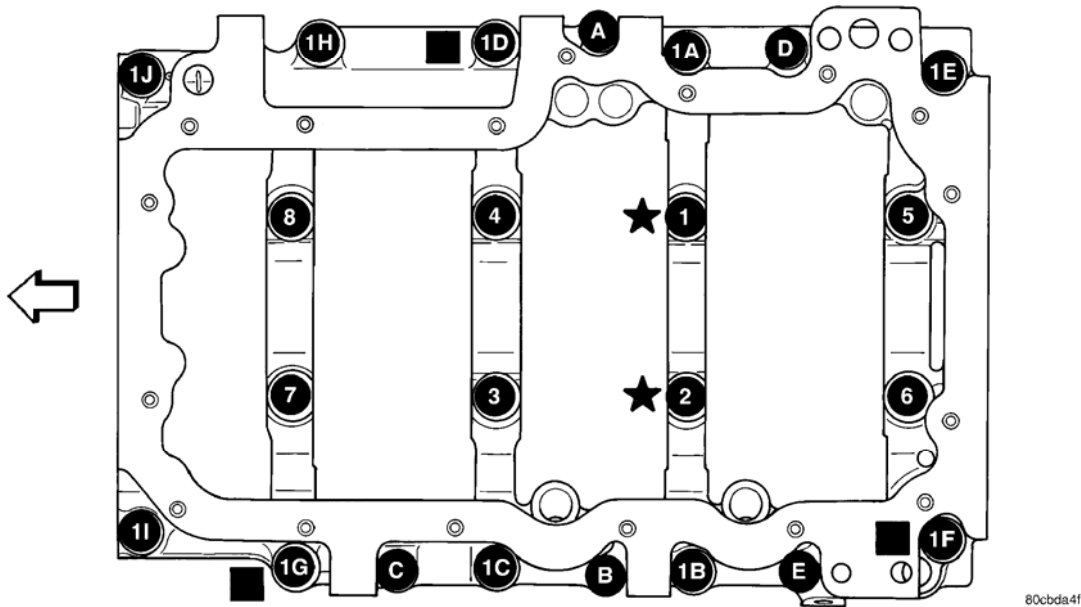


Fig. 103: Bedplate Tightening Sequence
Courtesy of CHRYSLER LLC

6. Coat the crankshaft main bearing journals with clean engine oil and position the bedplate onto the cylinder block.

NOTE: Lubricate the bedplate retaining bolts with clean engine oil prior to installation.

7. Install the bedplate retaining bolts, making sure to place the stud bolts in the correct location, Tighten the bolts in the sequence shown in illustration.

Hand tighten bolts **1D, 1G and 1F** until the bedplate contacts the block.

Tighten bolts **1A - 1J** to 54 N.m (40 ft. lbs.)

Tighten bolts **1 - 8** to 7 N.m (5 ft. lbs.)

Turn bolts **1 - 8** an additional 90°.

Tighten bolts **A - E** 27 N.m (20 ft. lbs.).

8. Measure crankshaft end play.
9. Install the connecting rods and measure side clearance. See **STANDARD PROCEDURE**.
10. Install oil pump. See **INSTALLATION**.
11. Install the engine. See **INSTALLATION**.

BEARINGS-CRANKSHAFT MAIN

STANDARD PROCEDURE

CRANKSHAFT MAIN BEARINGS

SELECT FIT IDENTIFICATION

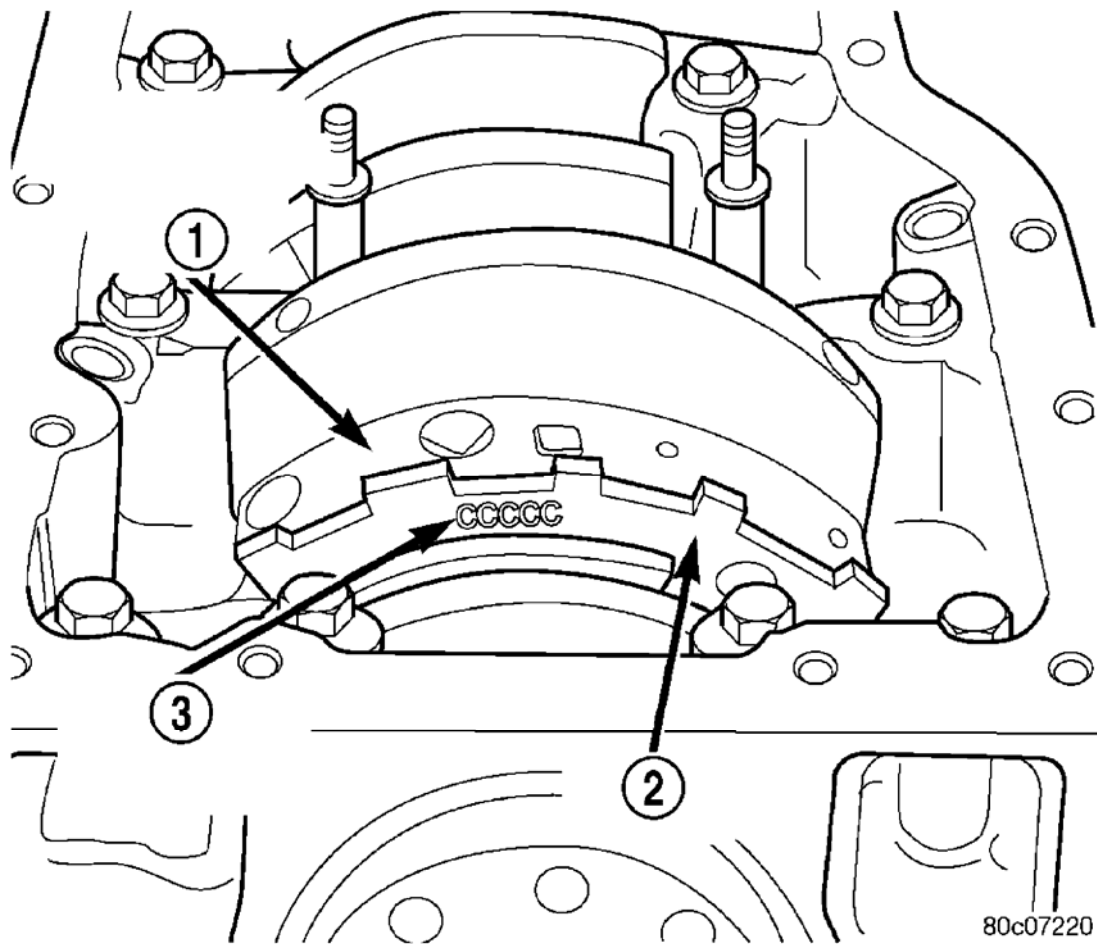


Fig. 104: Markings on Target Wheel
Courtesy of CHRYSLER LLC

1 - REARMOST CRANKSHAFT COUNTER WEIGHT
2 - TARGET WHEEL

3 - MAIN BEARING SELECT FIT MARKINGS

The main bearings are "select fit" to achieve proper oil clearances. For main bearing selection, the crankshaft position sensor target wheel (2) has grade identification marks stamped into it. These marks are read from left to right, corresponding with journal number 1, 2, 3, 4. The crankshaft position sensor target wheel is mounted to the number 6 counter weight (1) on the crankshaft. See **Fig. 104**.

INSPECTION

Wipe the inserts clean and inspect for abnormal wear patterns and for metal or other foreign material imbedded in the lining. Normal main bearing insert wear patterns are illustrated.

Inspect the back of the inserts for fractures, scrapings or irregular wear patterns.

Inspect the upper insert locking tabs for damage.

Replace all damaged or worn bearing inserts.

MAIN BEARING JOURNAL DIAMETER (CRANKSHAFT REMOVED)

Remove the crankshaft from the cylinder block. See **REMOVAL**.

Clean the oil off the main bearing journal.

Determine the maximum diameter of the journal with a micrometer. Measure at two locations 90° apart at each end of the journal.

The maximum allowable taper is 0.008 mm (0.0004 inch.) and maximum out of round is 0.005mm (0.002 inch). Compare the measured diameter with the journal diameter specification (MAIN BEARING FITTING CHART). Select inserts required to obtain the specified bearing-to-journal clearance.

Install the crankshaft into the cylinder block. See **INSPECTION**.

Check crankshaft end play.

CRANKSHAFT MAIN BEARING SELECTION

Crankshaft Marking	JOURNAL SIZE SIZE mm (in.)	
"R" Size	63.488 - 63.496 mm (2.4995 - 2.4998 in.)	
"S" Size	63.496 - 63.500 mm (2.4998 - 2.4999 in.)	
"T" Size	63.500 - 63.504 mm (2.4999 - 2.501 in.)	
"U" Size	63.504 - 63.512 mm (2.5001 - 2.5004 in.)	
Bearing size		
Bearing Code	Size	Application

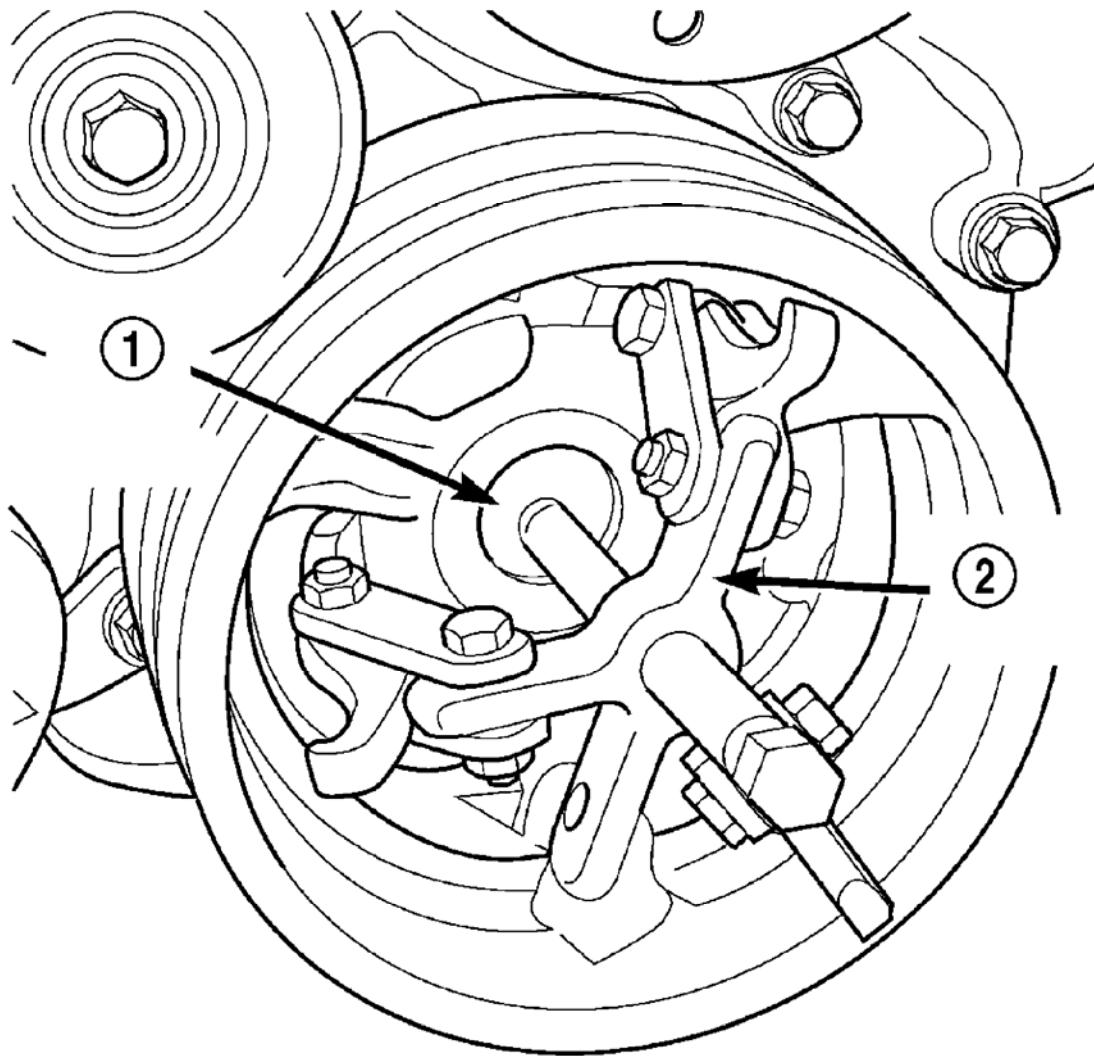
Upper Bearing		
A	2.443 - 2.447 mm (.0961 -.0963 in.)	Use with crankshaft size "R" -
B	2.439 - 2.443 mm (0.960 -.0961 in.)	Use with crankshaft "S, T" -
C	2.435 - 2.439 mm (.0958 -.0960 in.)	Use with crankshaft "U" -
Lower Bearing Main "1" and "4"		
"1" -	2.441 - 2.447 mm (.0961 -.0963 in.)	Use with crankshaft "R, S" Use with crankshaft "T, U"
"2" -	2.435 - 2.441 mm (.0958 -.0962 in.)	
Lower Main Bearing "2" and "3"		
"3" -	2.429 - 2.435 mm (.0956 -.0958 in.)	Use with crankshaft "R, S" Use with crankshaft "T, U"
"4" -	2.423 - 2.429 mm (.0953 -.0956 in.)	
Bearing Clearances		
Main "1, 4"		
Crankshaft "R"	.004 -.034 mm (.00015 - .0013 in.)	
Crankshaft "S"	.004 -.030 mm (.00015 - .0011 in.)	
Crankshaft "T"	.006 -.032 mm (.0002 - .0012 in.)	
Crankshaft "U"	.002 -.032 mm (.00007 - .0012 in.)	
Main "2, 3"		
Crankshaft "R"	.016 -.046 mm (.0006 - .0018 in.)	
Crankshaft "S"	.016 -.042 mm (.00062 - .016 in.)	
Crankshaft "T"	.018 -.044 mm (.0007 - .0017 in.)	
Crankshaft "U"	.014 -.044 mm (.0005 - .0017 in.)	

1. Service main bearings are available in four grades. The chart identifies the four service grades available.

SEAL-CRANKSHAFT OIL-FRONT

REMOVAL

CRANKSHAFT OIL SEAL - FRONT



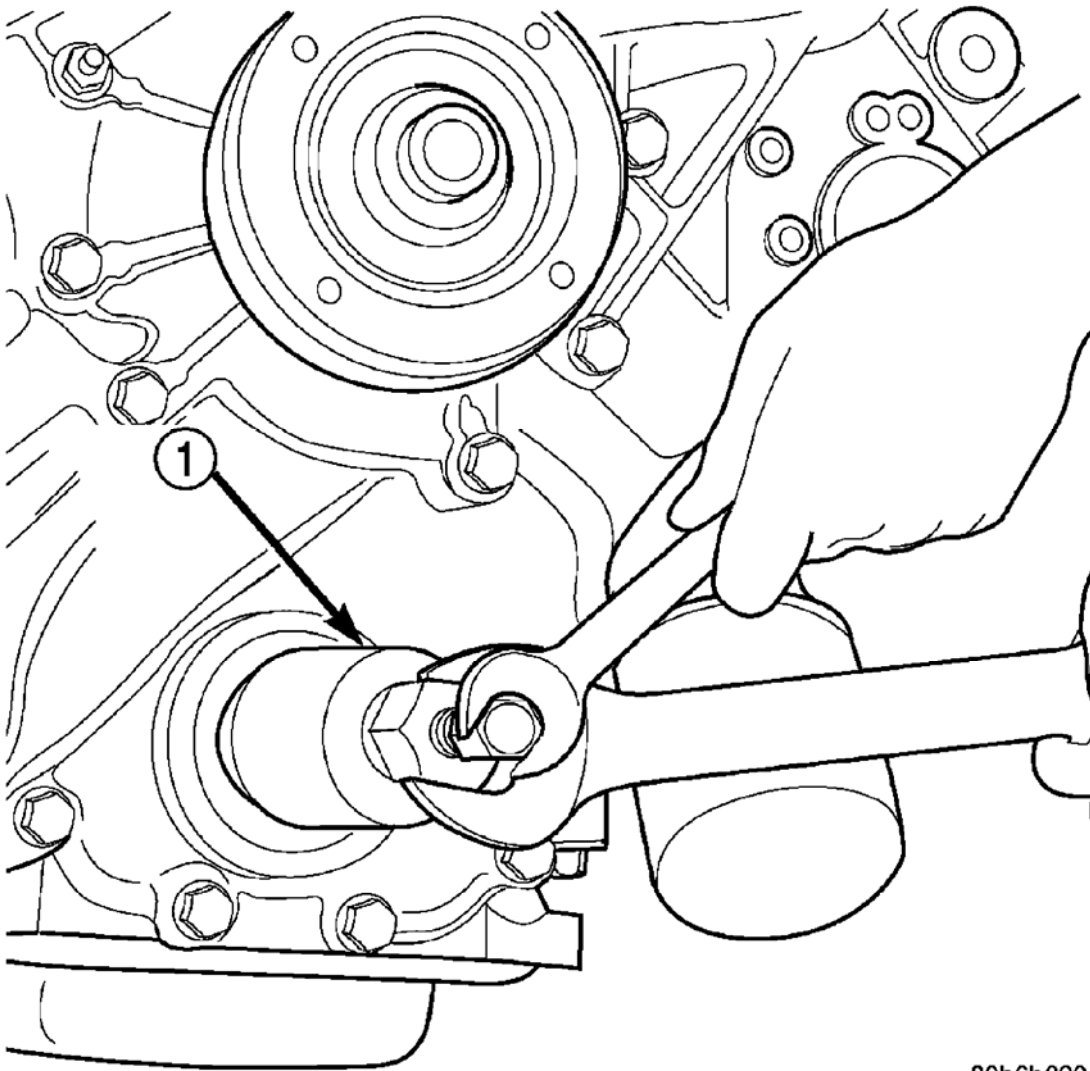
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Fig. 105: Crankshaft Damper - Removal
Courtesy of CHRYSLER LLC

- | |
|--|
| <p>1 - SPECIAL TOOL 8513 I INSERT</p> <p>2 - SPECIAL TOOL 1026</p> |
|--|

1. Disconnect negative cable from battery.
2. Remove accessory drive belt. Refer to **REMOVAL** .
3. Remove A/C compressor mounting fasteners and set aside.
4. Drain cooling system. Refer to **STANDARD PROCEDURE** .
5. Remove upper radiator hose.
6. Disconnect electrical connector for fan mounted inside radiator shroud.
7. Remove radiator shroud attaching fasteners.

8. Remove radiator cooling fan and shroud. Refer to **REMOVAL** .
9. Remove crankshaft damper bolt.
10. Remove damper using the Crankshaft Insert 8513A (1) and the Three Jaw Puller 1026 (2). See **Fig. 105**.



80b6b290

Fig. 106: Crankshaft Front Seal Removal
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 8511

11. Using Seal Remover 8511, remove crankshaft front seal (1). See **Fig. 106**.

INSTALLATION

CRANKSHAFT OIL SEAL - FRONT

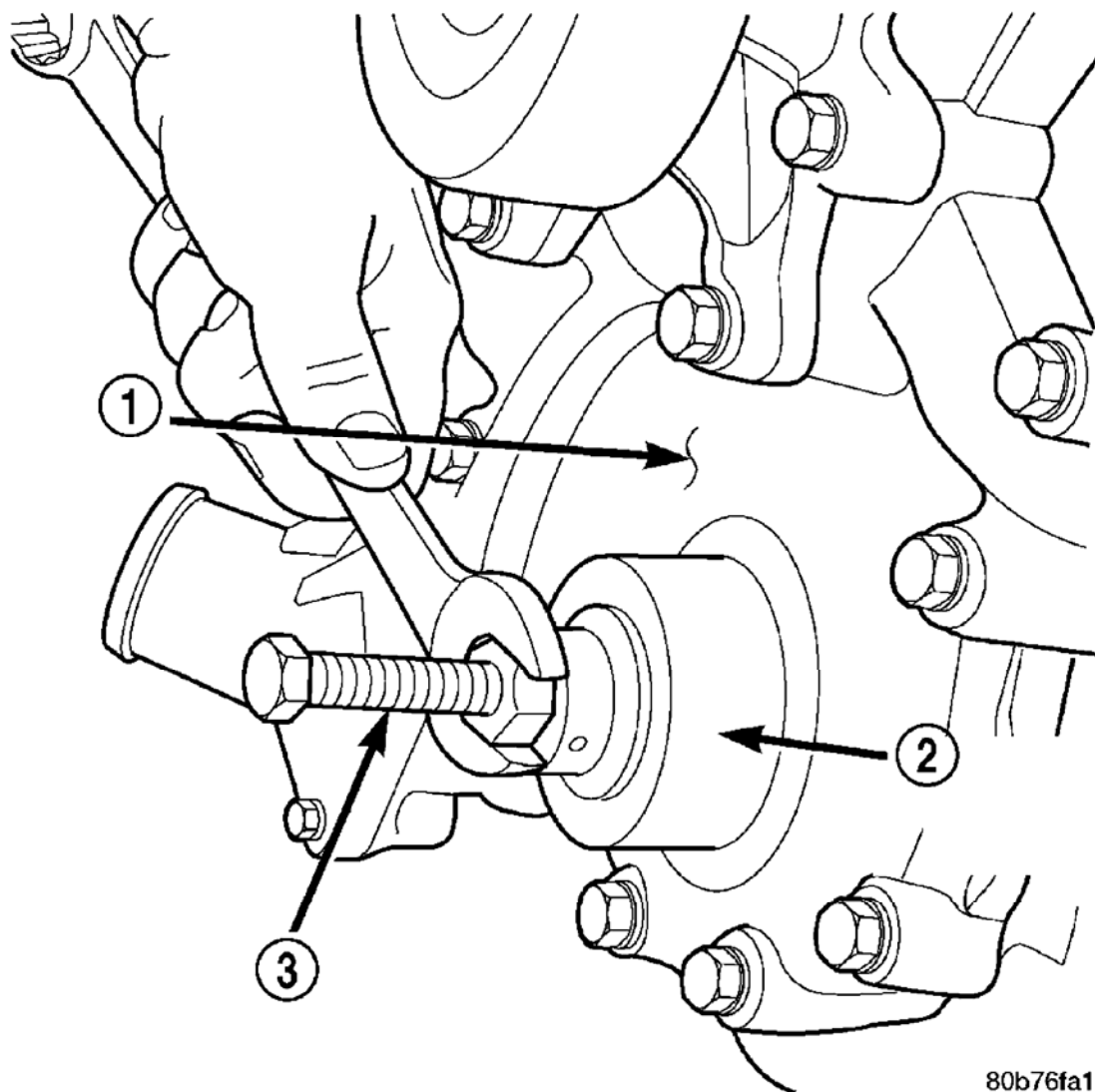


Fig. 107: Crankshaft Front Seal Installation
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - TIMING CHAIN COVER
2 - SPECIAL TOOL 8348
3 - SPECIAL TOOL 8512 |
|--|

CAUTION: To prevent severe damage to the Crankshaft, Damper or Special Tool 8512, thoroughly clean the damper bore and the crankshaft nose before installing Damper.

1. Using the Seal Installer 8348 (2) and Damper Installer 8512 (3), install crankshaft front seal. See **Fig. 107.**
2. Install vibration damper. See **INSTALLATION.**
3. Install radiator cooling fan and shroud. Refer to **INSTALLATION** .
4. Install upper radiator hose.
5. Install A/C compressor and tighten fasteners to 54 N.m (40 ft. lbs.).
6. Install accessory drive belt refer. Refer to **INSTALLATION** .
7. Refill cooling system. Refer to **STANDARD PROCEDURE** .
8. Connect negative cable to battery.

SEAL-CRANKSHAFT OIL-REAR

DIAGNOSIS AND TESTING

REAR CRANKSHAFT OIL SEAL AREA LEAKS

Since it is sometimes difficult to determine the source of an oil leak in the rear seal area of the engine, a more involved inspection is necessary. The following steps should be followed to help pinpoint the source of the leak.

If the leakage occurs at the crankshaft rear oil seal area:

1. Disconnect the battery.
2. Raise the vehicle.
3. Remove torque converter or clutch housing cover and inspect rear of block for evidence of oil. Use a black light to check for the oil leak:
 - Circular spray pattern generally indicates seal leakage or crankshaft damage.
 - Where leakage tends to run straight down, possible causes are a porous block, oil galley pipe plugs, oil filter runoff, and main bearing cap to cylinder block mating surfaces.
4. If no leaks are detected, pressurize the crankcase as outlined in **AIR LEAK DETECTION TEST METHOD**

CAUTION: Do not exceed 20.6 kPa (3 psi).

5. If the leak is not detected, very slowly turn the crankshaft and watch for leakage. If a leak is detected between the crankshaft and seal while slowly turning the crankshaft, it is possible the crankshaft seal surface is damaged. The seal area on the crankshaft could have minor nicks or scratches that can be polished out with emery cloth.

CAUTION: Use extreme caution when crankshaft polishing is necessary to remove minor nicks or scratches. The crankshaft seal flange is specially machined to complement the function of the rear oil seal.

6. For bubbles that remain steady with shaft rotation, no further inspection can be done until disassembled. See OIL LEAKS row under **ENGINE LUBRICATION DIAGNOSTIC TABLE** for components inspections on possible causes and corrections.
7. After the oil leak root cause and appropriate corrective action have been identified, see **REMOVAL**.

REMOVAL

CRANKSHAFT OIL SEAL - REAR

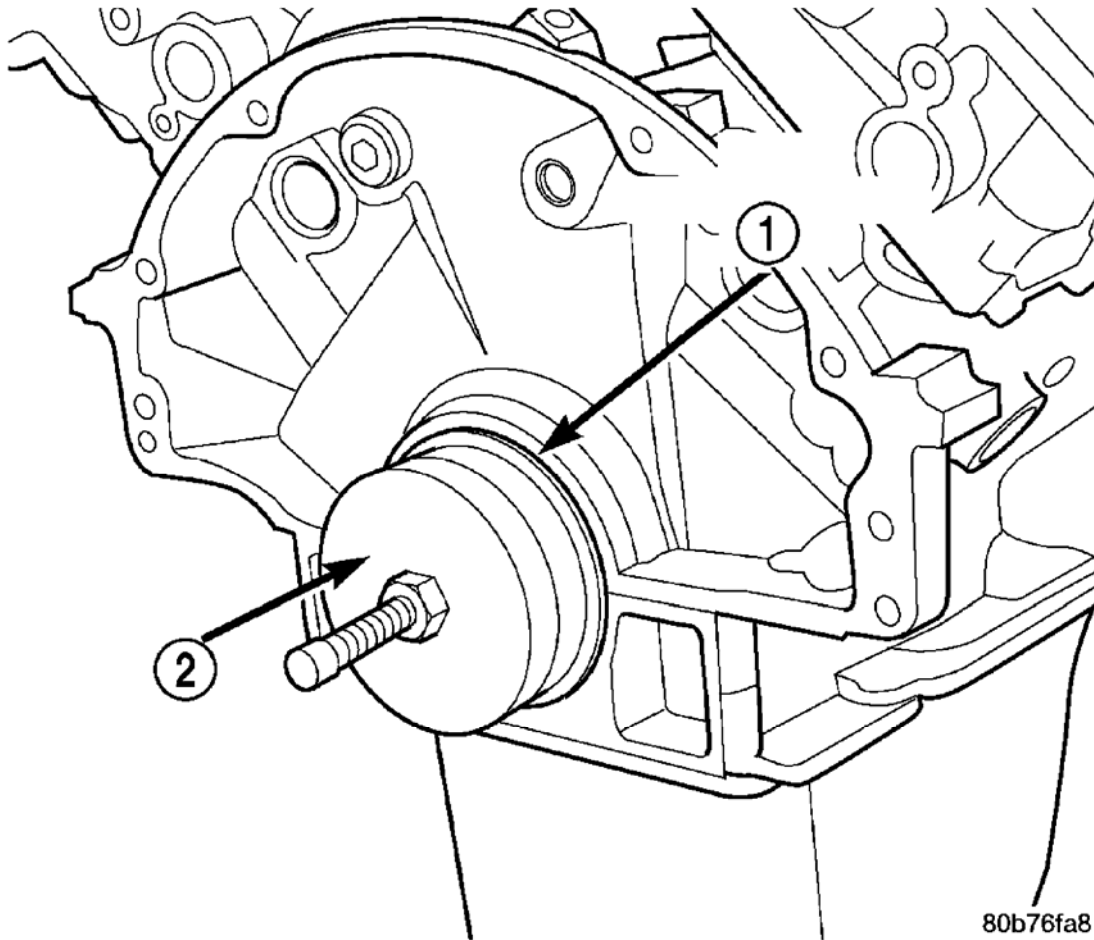


Fig. 108: Crankshaft Rear Oil Seal Removal
Courtesy of CHRYSLER LLC

NOTE: This procedure can be performed in vehicle.

1. If being performed in vehicle, remove the transmission.
2. Remove the flexplate. See **REMOVAL**.

NOTE: The crankshaft oil seal CAN NOT be reused after removal.

NOTE: The crankshaft rear oil seal remover 8506 must be installed deeply into the seal. Continue to tighten the removal tool into the seal until the tool can not be turned farther. Failure to install tool correctly the first time will cause tool to pull free of seal without removing seal from engine.

3. Using Seal Remover 8506 (2), remove the crankshaft rear oil seal (1).

INSTALLATION

CRANKSHAFT OIL SEAL - REAR

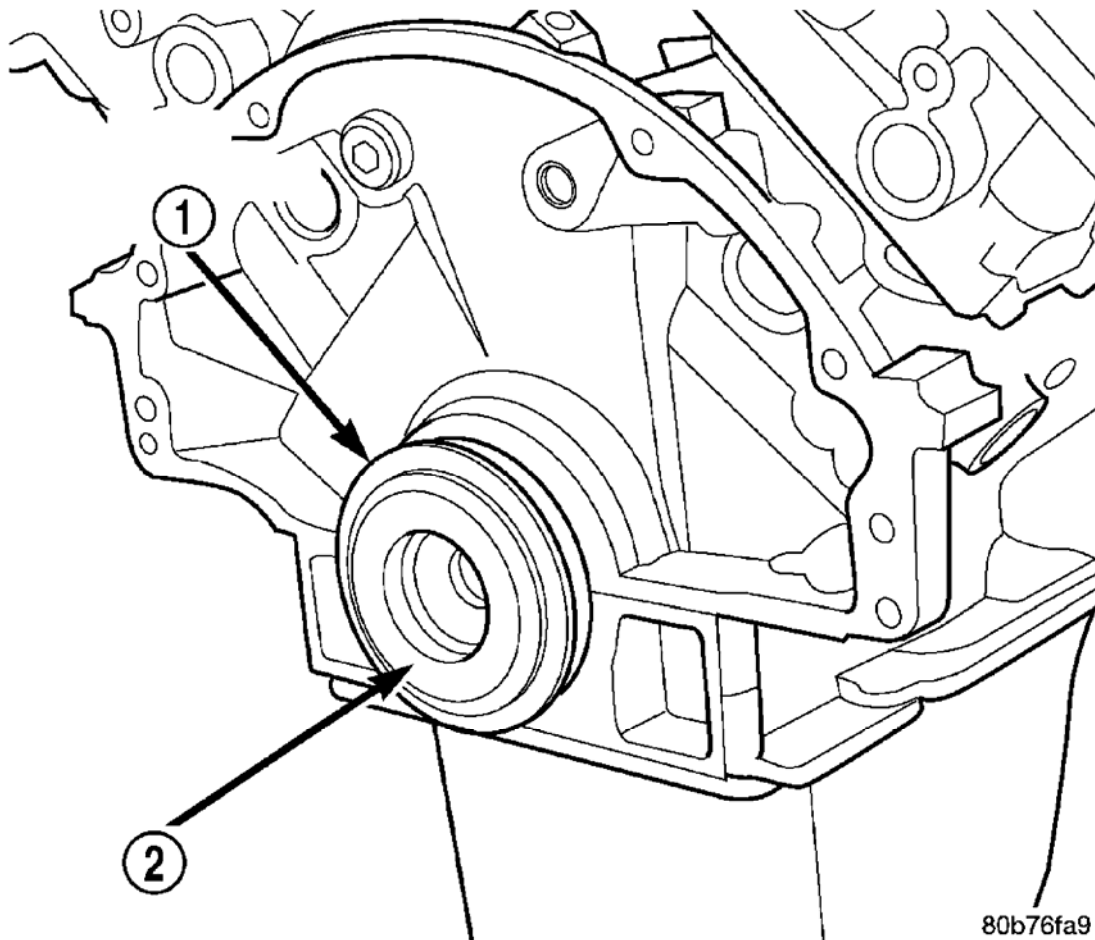


Fig. 109: Positioning Seal Guide Special Tool 8349-2 Onto Crankshaft Rear Face
Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - REAR CRANKSHAFT SEAL |
| 2 - SPECIAL TOOL 8349-2 GUIDE |

1. Lubricate the crankshaft flange with engine oil.

2. Position the magnetic seal guide 8349-2 onto the crankshaft rear face. Then position the crankshaft rear oil seal (1) onto the guide (2).

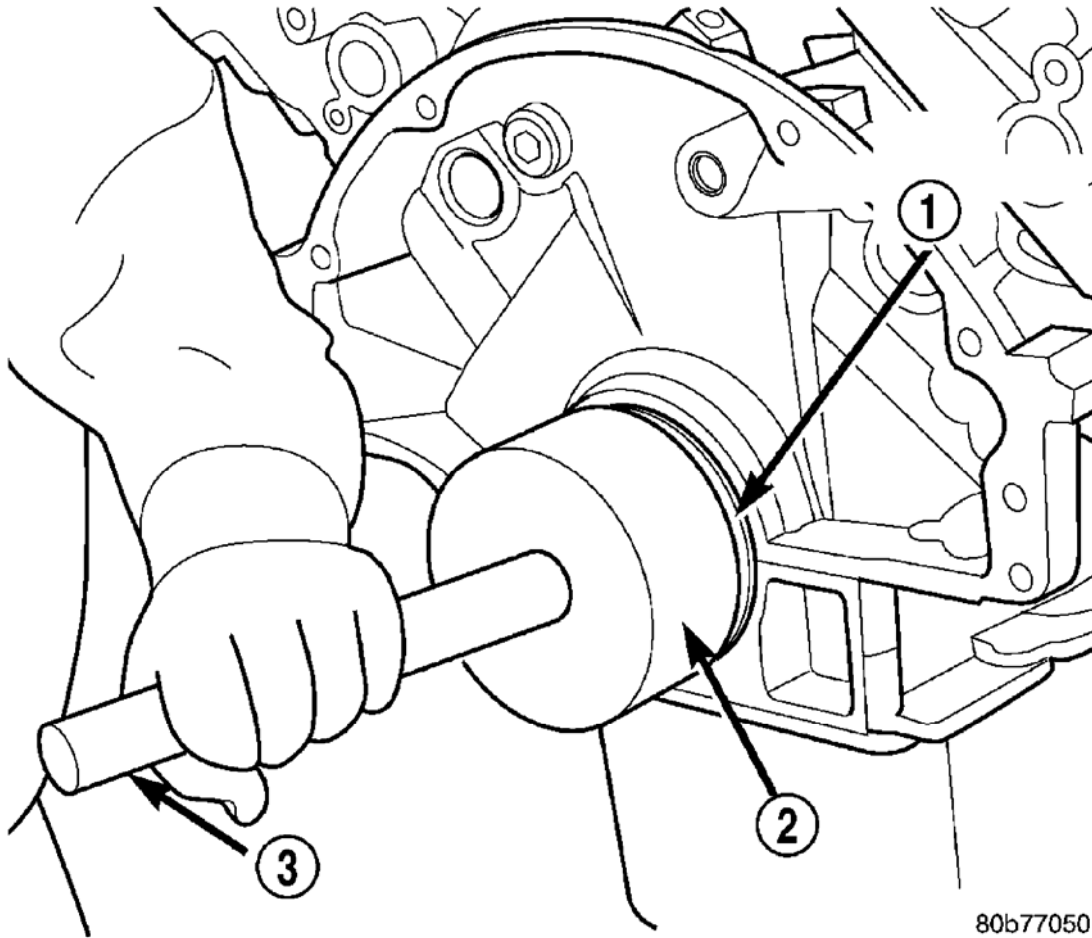


Fig. 110: Crankshaft Rear Oil Seal Installation
Courtesy of CHRYSLER LLC

1 - REAR CRANKSHAFT SEAL
2 - SPECIAL TOOL 8349-1 INSTALLER
3 - SPECIAL TOOL C-4171 HANDLE

3. Using Crankshaft Rear Oil Seal Installer 8349 (2) and Driver Handle C-4171 (3), with a hammer, tap the seal (1) into place. Continue to tap on the driver handle until the seal installer seats against the cylinder block crankshaft bore.
4. Install the flexplate.
5. Install the transmission.

REMOVAL

FLEXPLATE

1. Remove the transmission.
2. Remove the bolts and flexplate.

INSTALLATION

FLEXPLATE

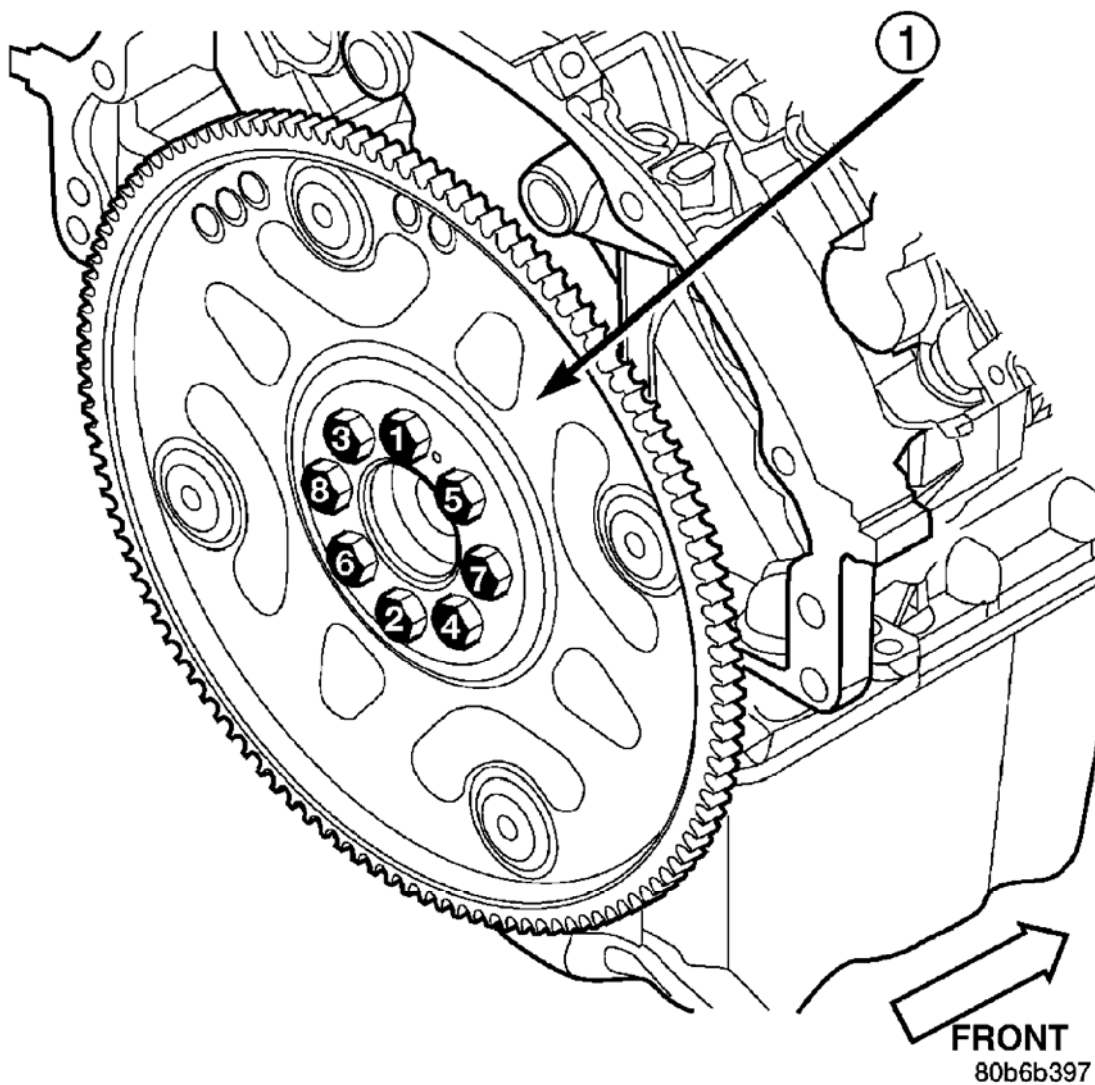


Fig. 111: Flexplate Loosening/Tightening Sequence
Courtesy of CHRYSLER LLC

1. Position the flexplate (1) onto the crankshaft and install the bolts hand tight.
2. Tighten the flexplate retaining bolts to 95 N.m (70 ft. lbs.) in the sequence shown in illustration. See **Fig. 111**.
3. Install the transmission.

ROD-PISTON AND CONNECTING

DESCRIPTION

DESCRIPTION PISTON AND CONNECTING ROD

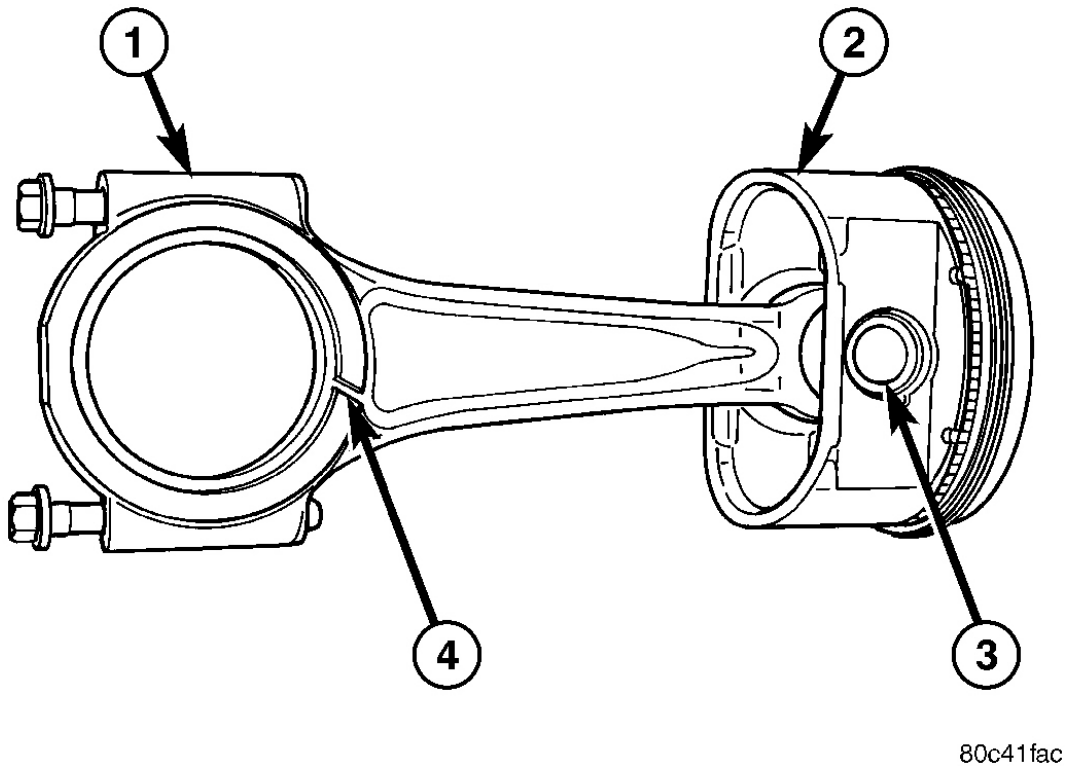


Fig. 112: Piston & Rod Assembly
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - CONNECTING ROD |
| 2 - PISTON |
| 3 - PISTON PIN |
| 4 - OIL SLINGER SLOT |

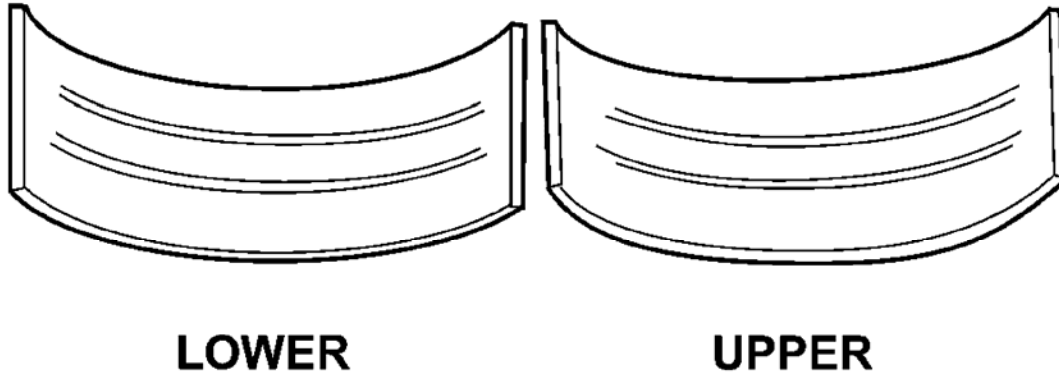
CAUTION: Do not use a metal stamp to mark connecting rods as damage may result,

instead use ink or a scratch awl.

The pistons (2) are made of a high strength aluminum alloy. The connecting rods (1) are made of forged powdered metal, with a "fractured cap" design. A full floating piston pin is used to attach the piston to the connecting rod. See **Fig. 112**.

STANDARD PROCEDURE

CONNECTING ROD BEARING FITTING



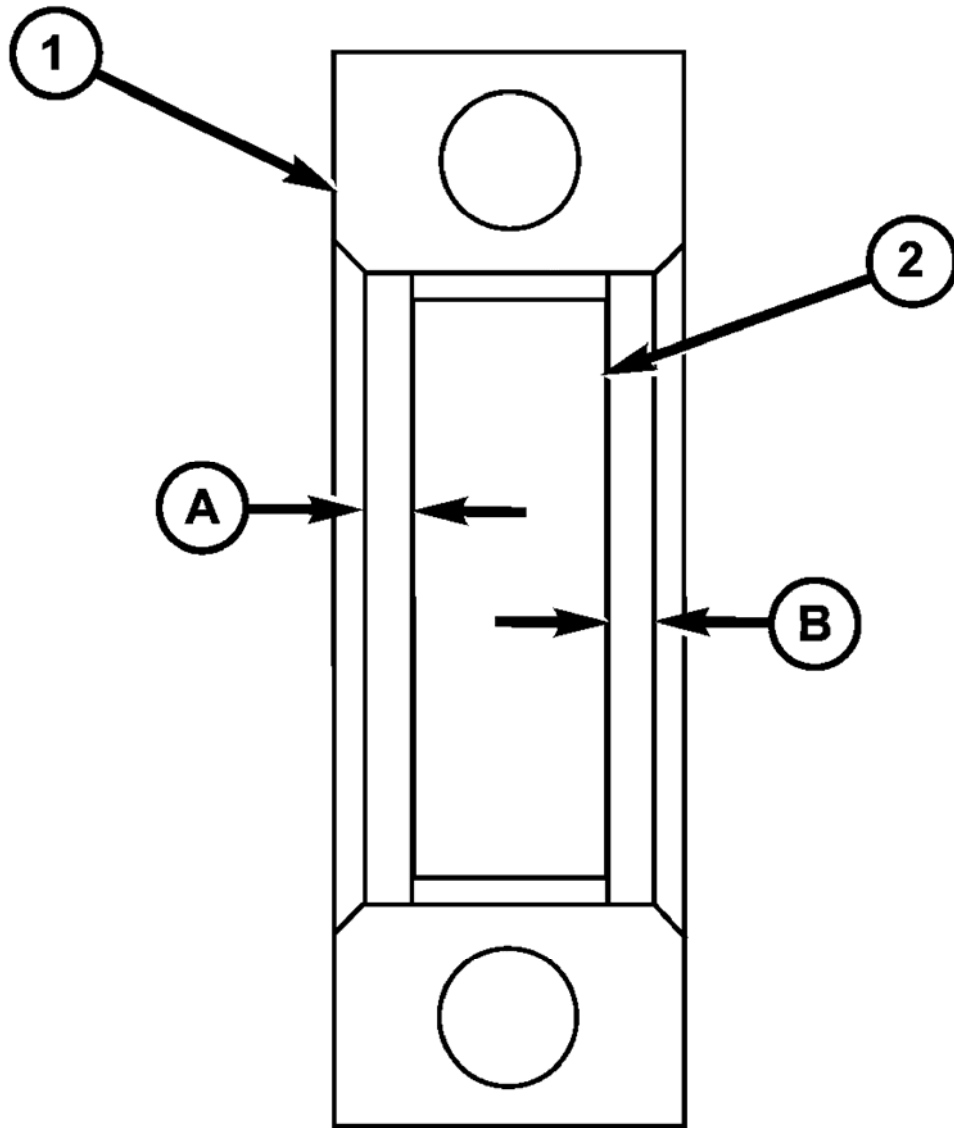
80f77803

Fig. 113: Scoring Caused By Insufficient Lubrication or Damaged Crankshaft Journal
Courtesy of CHRYSLER LLC

Inspect the connecting rod bearings for scoring. Check the bearings for normal wear patterns, scoring, grooving, fatigue and pitting. See **Fig. 113**. Replace any bearing that shows abnormal wear.

Inspect the connecting rod journals for signs of scoring, nicks and burrs.

Misaligned or bent connecting rods can cause abnormal wear on pistons, piston rings, cylinder walls, connecting rod bearings and crankshaft connecting rod journals. If wear patterns or damage to any of these components indicate the probability of a misaligned connecting rod, inspect it for correct rod alignment. Replace misaligned, bent or twisted connecting rods.

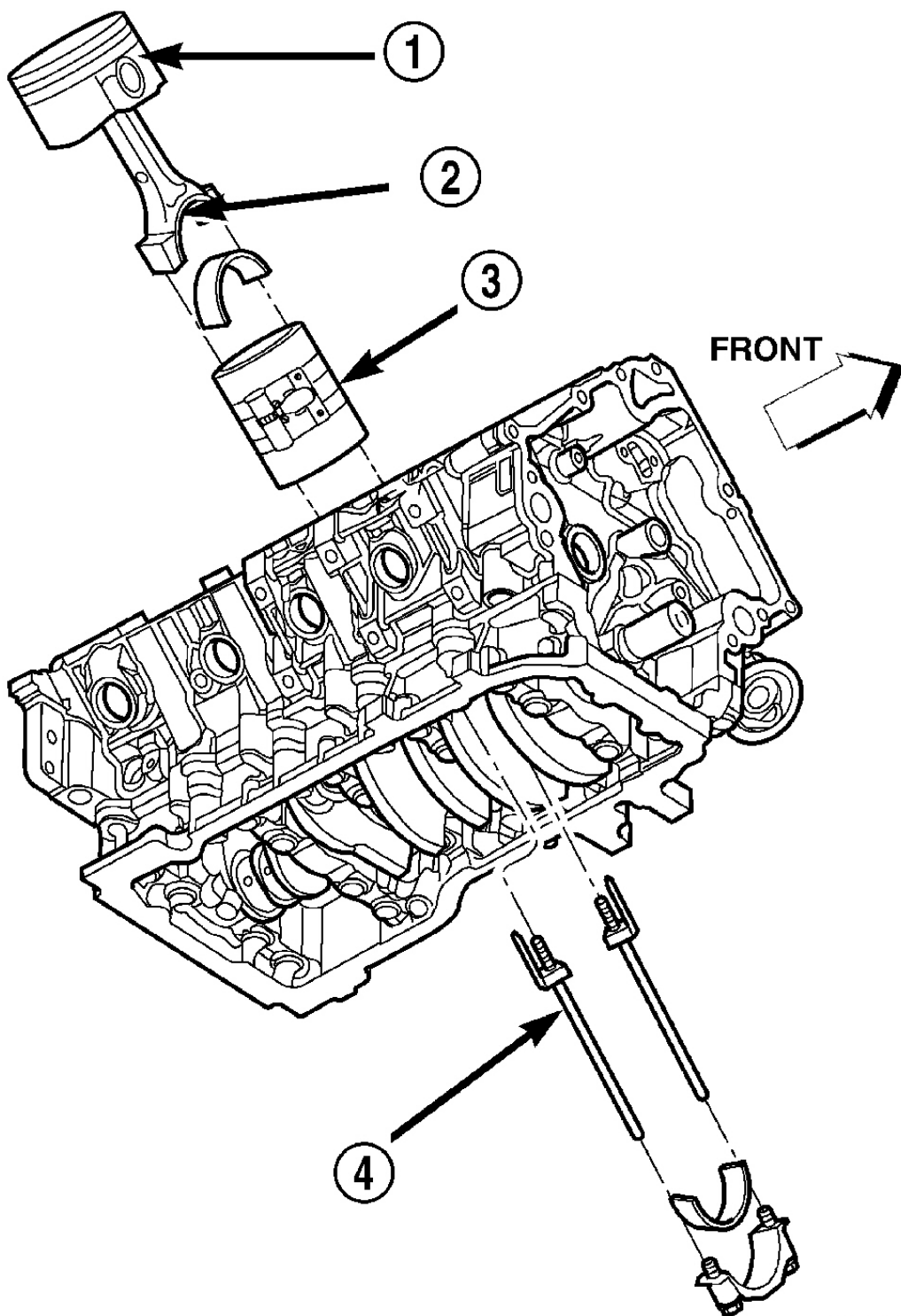


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Fig. 114: Bearing Insert Location
Courtesy of CHRYSLER LLC

1 - Connecting Rod
2 - Bearing Insert
- A, B less then .50 mm (.0196 in.)

1. Wipe the oil from the connecting rod journal.
2. Lubricate the upper bearing insert and position in connecting rod. **Center bearing insert (2) in connecting rod (1).** See **Fig. 114**.



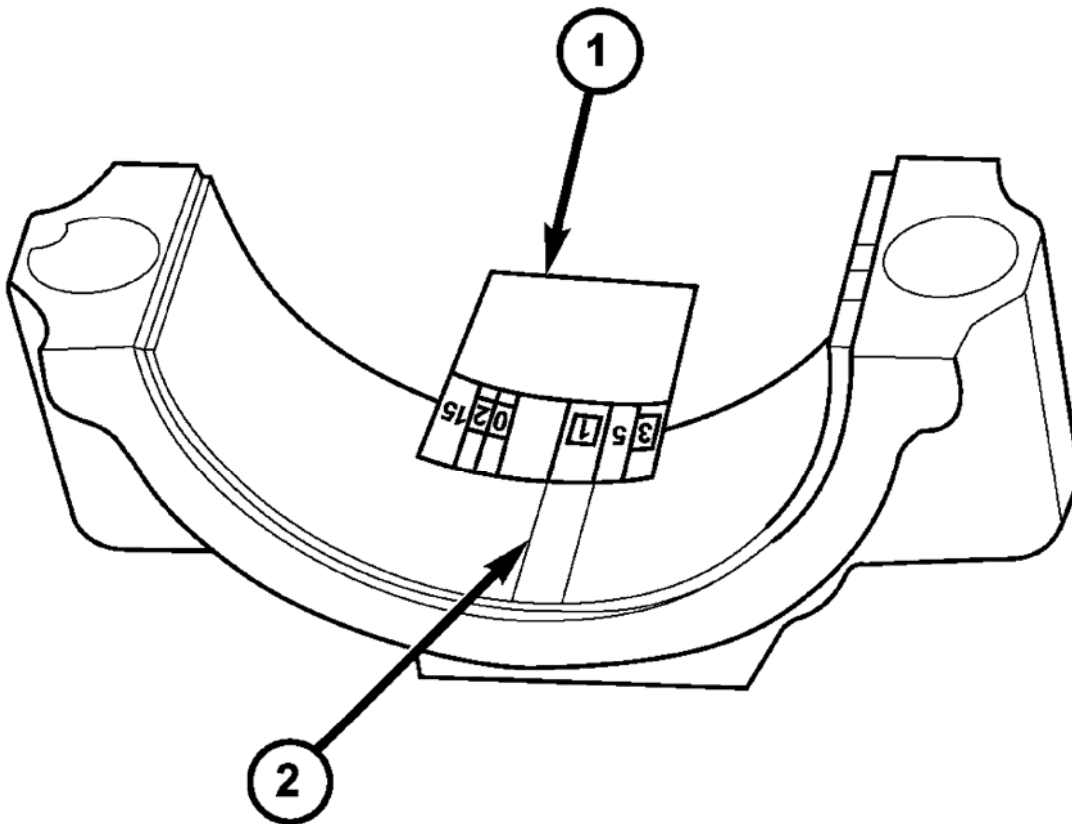
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Fig. 115: Piston & Connecting Rod - Installation - Typical

Courtesy of CHRYSLER LLC

- | |
|--------------------------------|
| 1 - "F" TOWARD FRONT OF ENGINE |
| 2 - OIL SLINGER SLOT |
| 3 - RING COMPRESSOR |
| 4 - SPECIAL TOOL 8507 |

3. Use piston ring compressor (3) and Connecting Rod Guides 8507 to install the rod and piston assemblies. The oil slinger slots in the rods must face front of the engine. The "F"'s near the piston wrist pin bore (1) should point to the front of the engine. See **Fig. 115**.



80f777cc

Fig. 116: Measuring Bearing Clearance With Plastigage
Courtesy of CHRYSLER LLC

- | |
|---------------------------|
| 1 - PLASTIGAGE SCALE |
| 2 - COMPRESSED PLASTIGAGE |

4. Install the lower bearing insert in the bearing cap. **Center bearing insert in connecting rod.** . The lower

insert must be dry. Place strip of Plastigage across full width of the lower insert at the center of bearing cap. See **Fig. 116**. Plastigage must not crumble in use. If brittle, obtain fresh stock.

5. Install bearing cap and connecting rod on the journal and tighten bolts to 27 N.m (20 ft. lbs.) plus a 90° turn. DO NOT rotate crankshaft. Plastigage will smear, resulting in inaccurate indication.
6. Remove the bearing cap and determine amount of bearing-to-journal clearance by measuring the width of compressed Plastigage (2). Refer to **SPECIFICATIONS** for the proper clearance. **Plastigage should indicate the same clearance across the entire width of the insert. If the clearance varies, it may be caused by either a tapered journal, bent connecting rod or foreign material trapped between the insert and cap or rod.**
7. If the correct clearance is indicated, replacement of the bearing inserts is not necessary. Remove the Plastigage from crankshaft journal and bearing insert. Proceed with installation.

Bearing Mark	SIZE	USED WITH JOURNAL SIZE
.025 US	.025 mm (.001 in.)	57.883 - 57.867 mm (2.2788 - 2.2783 in.)
Std.	STANDARD	57.908 - 57.892 mm (2.2798 - 2.2792 in.)
.250 US -	.250 mm (.010 in.)	57.658 - 57.646 mm (2.2700 - 2.2695 in.)

8. If bearing-to-journal clearance exceeds the specification, determine which services bearing set to use the bearing sizes are as follows:

CAUTION: Connecting Rod Bolts are Torque to Yield Bolts and Must Not Be Reused. Always replace the Rod Bolts whenever they are loosened or removed.

9. Repeat the Plastigage measurement to verify your bearing selection prior to final assembly.
10. Once you have selected the proper insert, install the insert and cap. Tighten the connecting rod bolts to 27 N.m (20 ft. lbs.) plus a 90° turn.

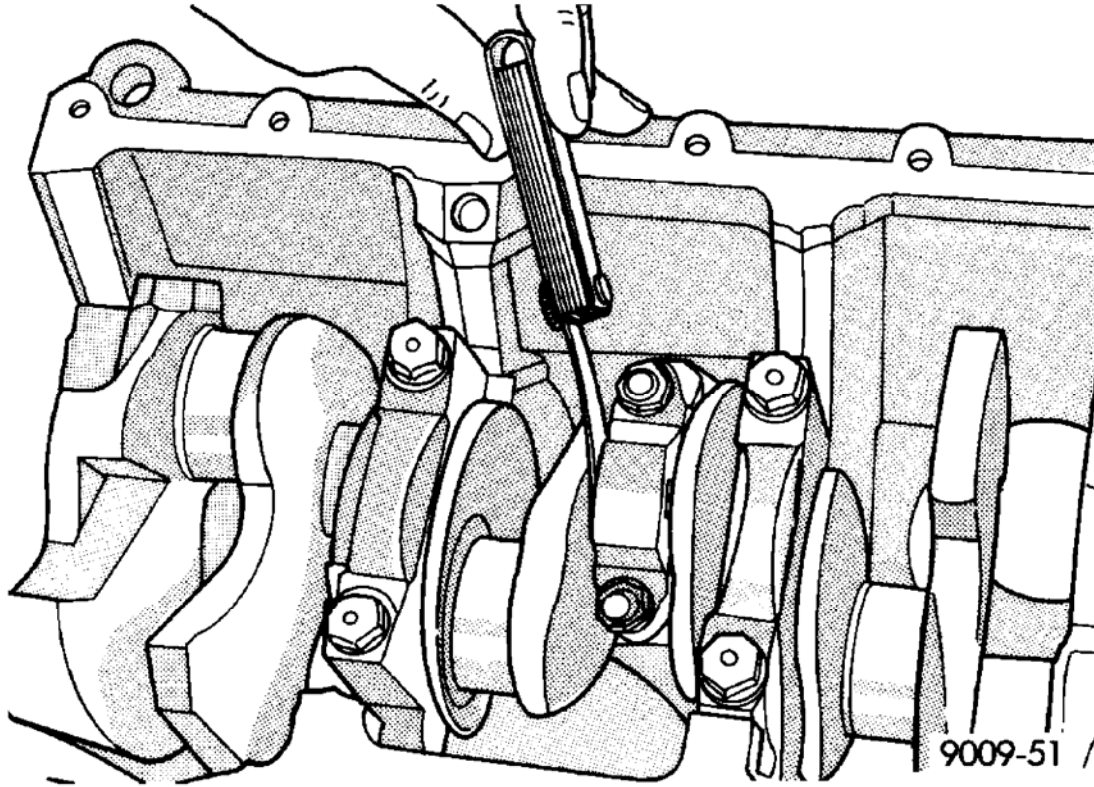
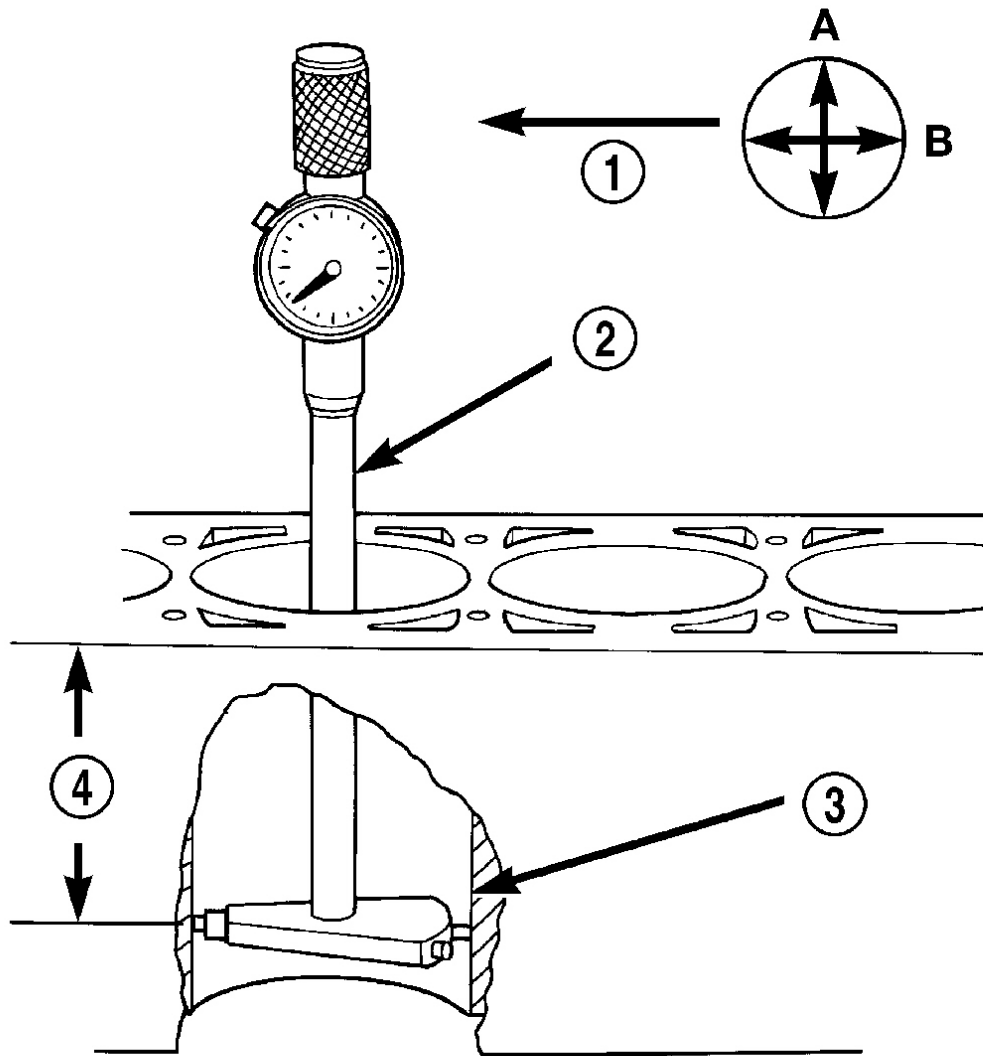


Fig. 117: Checking Connecting Rod Side Clearance - Typical
Courtesy of CHRYSLER LLC

Slide snug-fitting feeler gauge between the connecting rod and crankshaft journal flange. See **Fig. 117**. Refer to **SPECIFICATIONS** for the proper clearance. Replace the connecting rod if the side clearance is not within specification.

PISTON FITTING



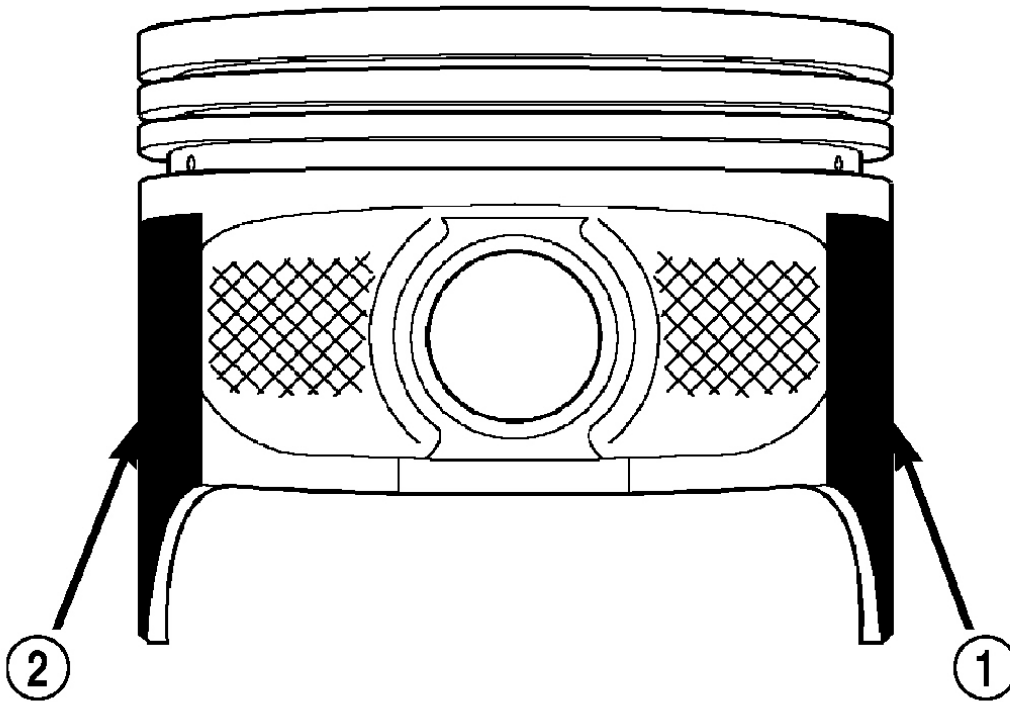
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Fig. 118: Measuring Cylinder Diameter With Bore Gauge - Typical
 Courtesy of CHRYSLER LLC

- 1 - FRONT
- 2 - BORE GAUGE
- 3 - CYLINDER BORE
- 4 - 38 MM
(1.5 in)

1. To correctly select the proper size piston, a cylinder bore gauge (2), capable of reading in 0.003 mm (.0001 in.) INCREMENTS is required. If a bore gauge is not available, do not use an inside micrometer. See **Fig. 118**.

2. Measure the inside diameter of the cylinder bore (3) at a point 38.0 mm (1.5 inches) below top of bore. Start perpendicular (across or at 90 degrees) to the axis of the crankshaft at point A and then take an additional bore reading 90 degrees to that at point B.



80aac2ao

Fig. 119: Typical Moly Coated Piston
Courtesy of CHRYSLER LLC

1 - MOLY COATED
2 - MOLY COATED

3. The coated pistons (1,2) will be serviced with the piston pin and connecting rod pre-assembled. See **Fig. 119**.
4. The coating material is applied to the piston after the final piston machining process. Measuring the outside diameter of a coated piston (1,2) will not provide accurate results. Therefore measuring the inside diameter of the cylinder bore with a dial Bore Gauge is **MANDATORY**. To correctly select the proper size piston, a cylinder bore gauge capable of reading in 0.003 mm (.0001 in.) increments is required.
5. Piston installation into the cylinder bore requires slightly more pressure than that required for non-coated pistons. The bonded coating on the piston will give the appearance of a line-to-line fit with the cylinder bore.

REMOVAL

REMOVAL PISTON AND CONNECTING ROD

1. Disconnect negative cable from battery.
2. Remove the following components:
 - Oil pan and gasket/windage tray. See **REMOVAL**.
 - Cylinder head covers. See **REMOVAL**.
 - Timing chain cover. See **REMOVAL**.
 - Cylinder head(s). See **REMOVAL**.
3. If necessary, remove top ridge of cylinder bores with a reliable ridge reamer before removing pistons from cylinder block. **Be sure to keep tops of pistons covered during this operation.** Pistons and connecting rods must be removed from top of cylinder block. When removing piston and connecting rod assemblies from the engine, rotate crankshaft so the each connecting rod is centered in cylinder bore.

CAUTION: DO NOT use a number stamp or a punch to mark connecting rods or caps, as damage to connecting rods could occur

NOTE: Connecting rods and bearing caps are not interchangeable and should be marked before removing to ensure correct reassembly.

4. Mark connecting rod and bearing cap positions using a permanent ink marker or scribe tool.

CAUTION: Care must be taken not to damage the fractured rod and cap joint face surfaces, as engine damage may occur.

5. Remove connecting rod cap. Install the Connecting Rod Guides 8507 into the connecting rod being removed. Remove piston from cylinder bore. Repeat this procedure for each piston being removed.

CAUTION: Care must be taken not to nick crankshaft journals, as engine damage may occur

6. Immediately after piston and connecting rod removal, install bearing cap on the mating connecting rod to prevent damage to the fractured cap and rod surfaces.

CLEANING

PISTON AND CONNECTING ROD

CAUTION: DO NOT use a wire wheel or other abrasive cleaning devise to clean the pistons or connecting rods. The pistons have a Moly coating, this coating must not be damaged.

1. Using a suitable cleaning solvent clean the pistons in warm water and towel dry.
2. Use a wood or plastic scraper to clean the ring land grooves.

CAUTION: DO NOT remove the piston pin from the piston and connecting rod assembly.

INSPECTION

PISTON AND CONNECTING ROD

Check the connecting rod journal for excessive wear, taper and scoring.

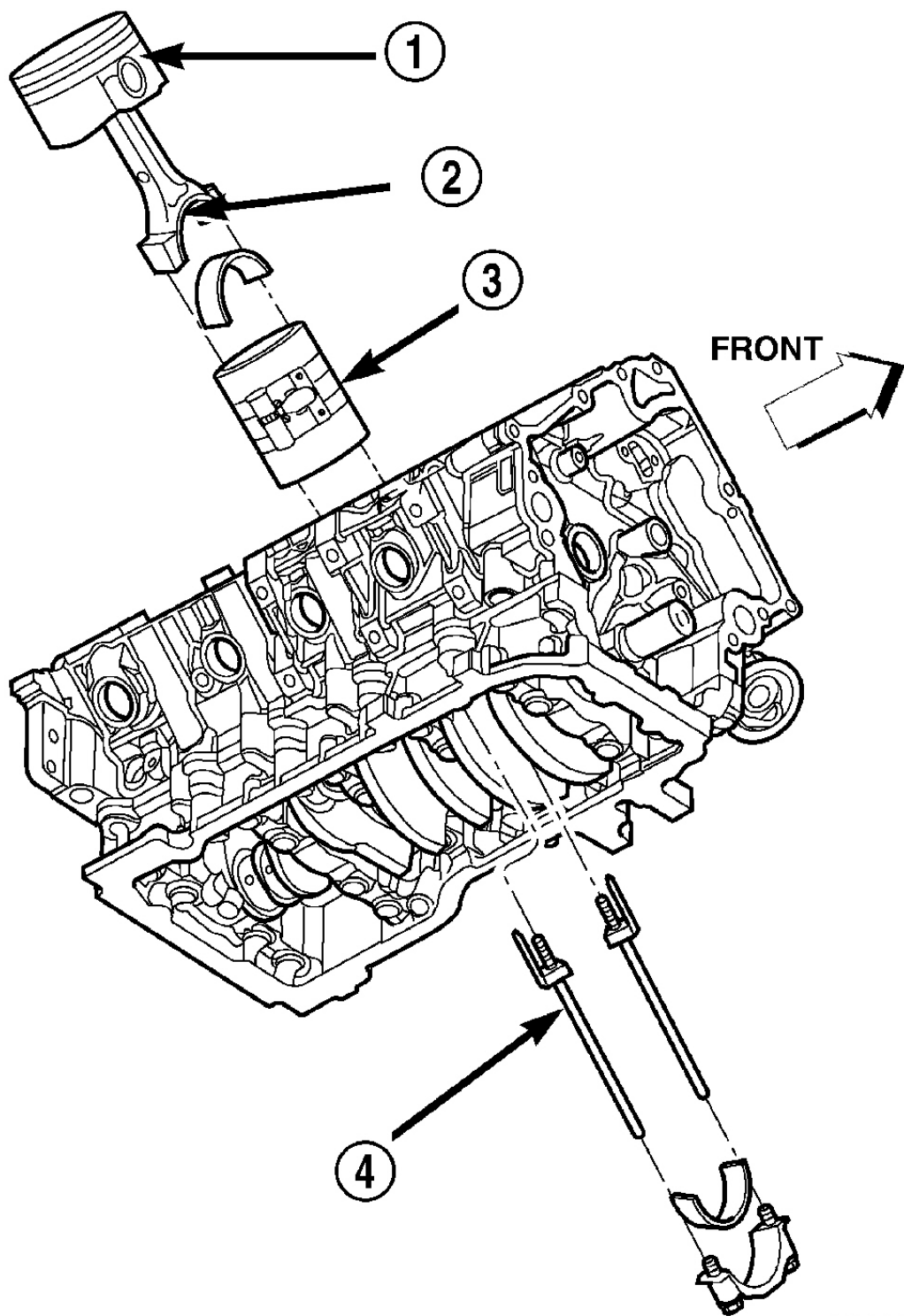
Check the connecting rod for signs of twist or bending.

Check the piston for taper and elliptical shape before it is fitted into the cylinder bore.

Check the piston for scoring, or scraping marks in the piston skirts. Check the ring lands for cracks and/or deterioration.

INSTALLATION

PISTON AND CONNECTING ROD

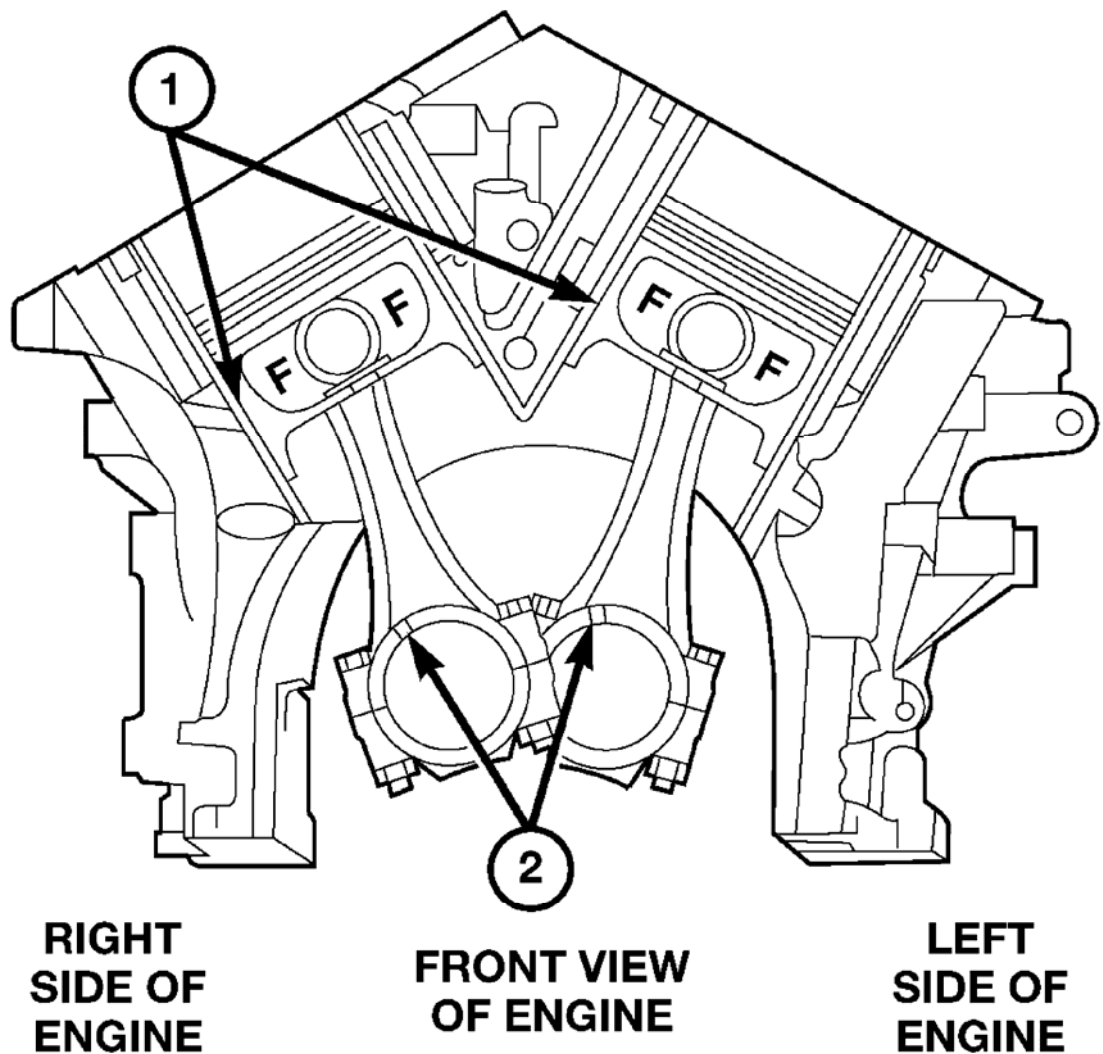


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Fig. 120: Installing Piston & Connecting Rod

1 - "F" TOWARD FRONT OF ENGINE 2 - OIL SLINGER SLOT 3 - RING COMPRESSOR 4 - SPECIAL TOOL 8507
--

1. Before installing piston and connecting rod assemblies into the bore, install the piston rings.
2. Immerse the piston head and rings in clean engine oil. Position a ring compressor over the piston and rings. Tighten ring compressor. **Ensure position of rings do not change during this operation.**
3. Position bearing onto connecting rod. Ensure that tabs in bearing shell aligns with slots in connecting rod. Verify that parting line of bearing is aligned with parting line of connecting rod.
4. Lubricate bearing surface with clean engine oil.
5. Install Connecting Rod Guides 8507 (4) onto connecting rod bolt threads. See **Fig. 120**.



808a1f06

Fig. 121: Identifying Proper Connecting Rod Installation
Courtesy of CHRYSLER LLC

1 - MAJOR THRUST SIDE OF PISTON 2 - OIL SLINGER SLOT

6. The pistons are marked on the piston pin bore surface with an raised "F" indicating installation position. This mark must be pointing toward the front of engine on both cylinder banks. The connecting rod oil slinger slot (2) faces the front of the engine. See **Fig. 121**.
7. Wipe cylinder bore clean and lubricate with engine oil.
8. Rotate crankshaft until connecting rod journal is on the center of cylinder bore. Insert rod and piston into cylinder bore and carefully position connecting rod guides over crankshaft journal.
9. Tap piston down in cylinder bore using a hammer handle. While at the same time, guide connecting rod into position on rod journal.

CAUTION: Connecting Rod Bolts are Torque to Yield Bolts and Must Not Be Reused. Always replace the Rod Bolts whenever they are loosened or removed.

10. Lubricate rod bolts and bearing surfaces with engine oil. Install connecting rod cap and bearing. Tighten bolts to 27 N.m (20 ft. lbs.) plus 90°.
11. Install the following components:
 - Cylinder head(s). See **INSTALLATION**.
 - Timing chain and cover. See **INSTALLATION**.
 - Cylinder head covers. See **INSTALLATION**.
 - Oil pan and gasket/windage tray. See **INSTALLATION**.
12. Fill crankcase with proper engine oil to correct level.
13. Connect negative cable to battery.

RINGS-PISTON

STANDARD PROCEDURE

PISTON RING FITTING

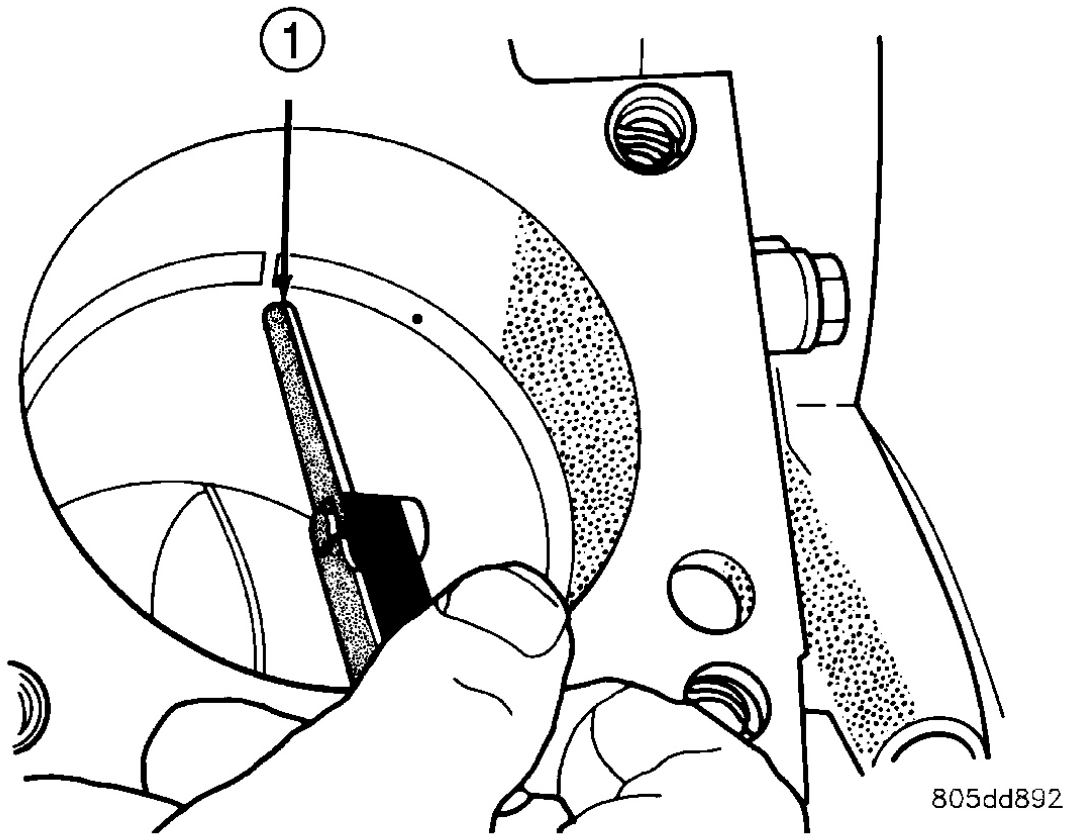


Fig. 122: Ring End Gap Measurement - Typical
Courtesy of CHRYSLER LLC

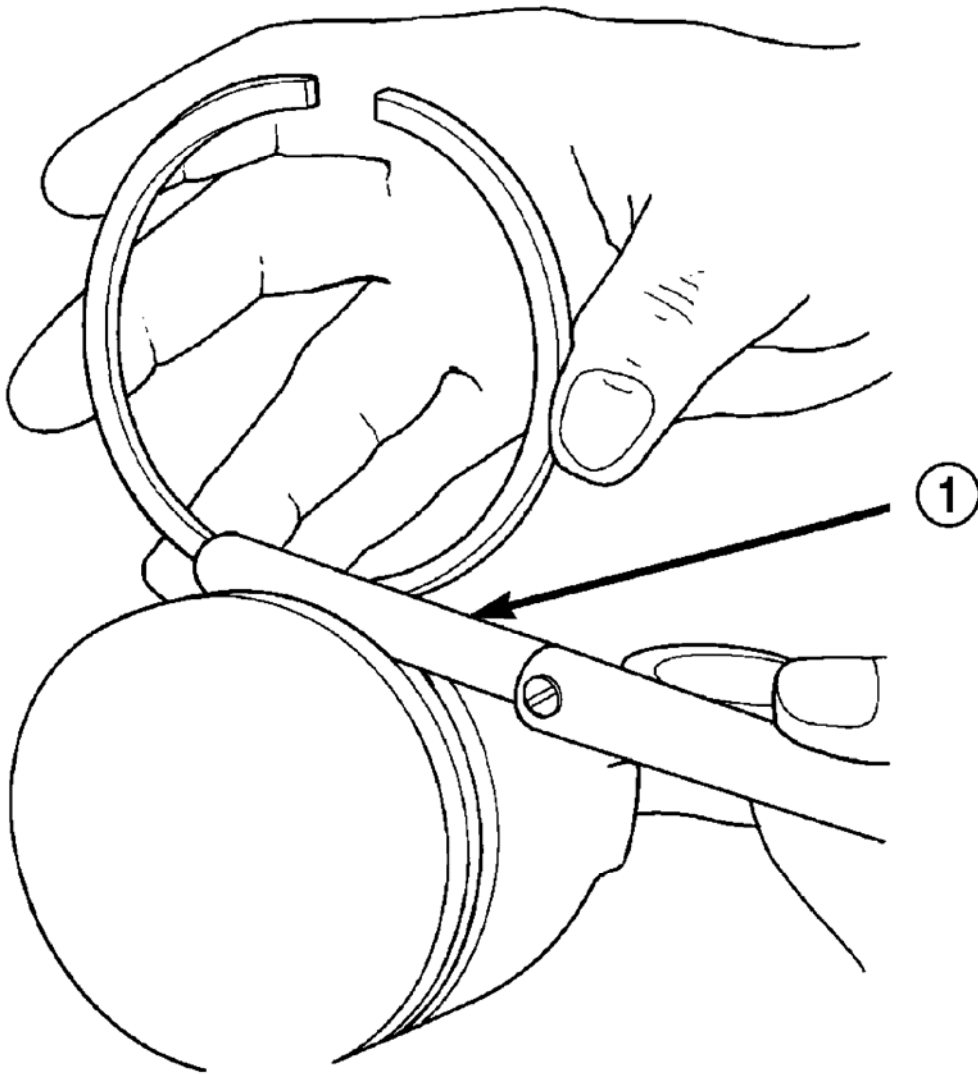
1 - FEELER GAUGE

Before reinstalling used rings or installing new rings, the ring clearances must be checked.

1. Wipe the cylinder bore clean.
2. Insert the ring in the cylinder bore.

NOTE: The ring gap measurement must be made with the ring positioned at least 12 mm (0.50 inch.) from bottom of cylinder bore.

3. Using a piston, to ensure that the ring is squared in the cylinder bore, slide the ring downward into the cylinder.
4. Using a feeler gauge (1) check the ring end gap. Replace any rings not within specification.



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Fig. 123: Measuring Piston Ring Side Clearance
Courtesy of CHRYSLER LLC

1 - FEELER GAUGE

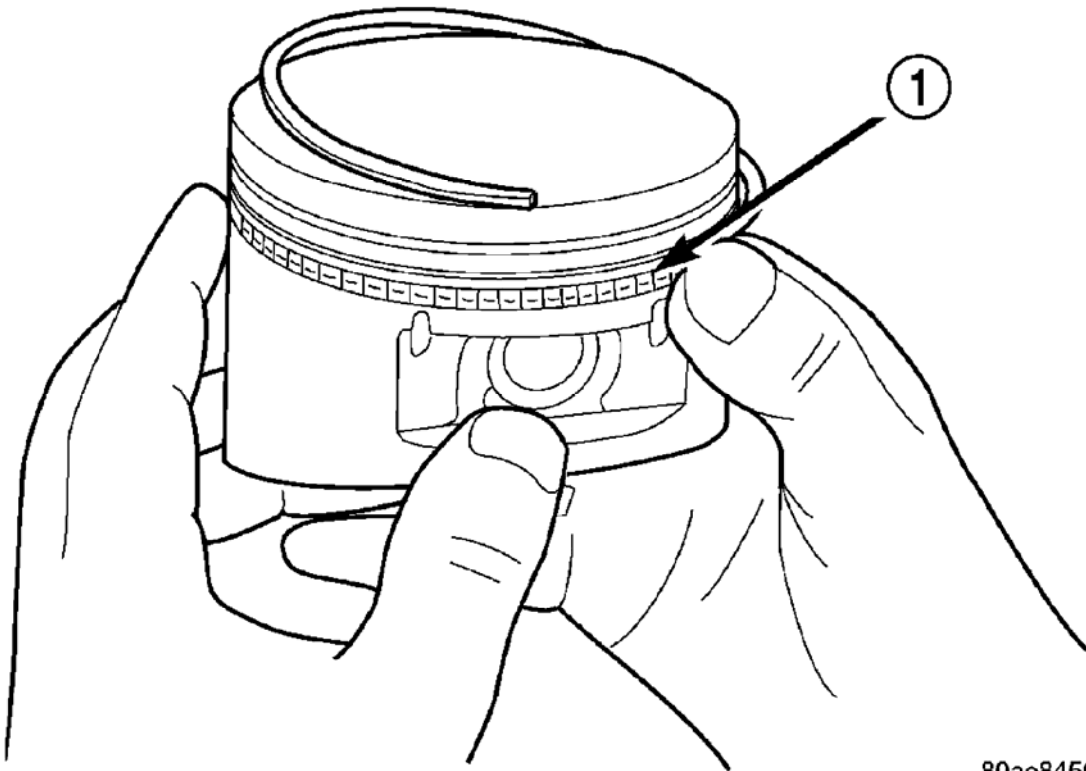
PISTON RING SIDE CLEARANCE

NOTE: Make sure the piston ring grooves are clean and free of nicks and burrs.

5. Measure the ring side clearance as shown in illustration make sure the feeler gauge (1) fits snugly between the ring land and the ring. Replace any ring not within specification.
6. Rotate the ring around the piston, the ring must rotate in the groove with out binding.

PISTON RING SPECIFICATION CHART

Ring Position	Groove Clearance	Maximum Clearance
Upper Ring	0.051 - 0.094 mm (0.0020 - 0.0037 in.)	0.11 mm (0.004 in.)
Intermediate Ring	0.04 - 0.08 mm (0.0016 - 0.0031 in.)	0.10 mm (0.004 in.)
Oil Control Ring (Steel Rails)	0.019 - 0.229 mm (0.0007 - 0.0090 in.)	0.25 mm (0.010 in.)
Ring Position	Ring Gap	Wear Limit
Upper Ring -	0.20 - 0.36 mm (0.0079 - 0.0142 in.)	0.43 mm (0.0017 in.)
Intermediate Ring -	0.37 - 0.63 mm (0.0146 - 0.0249 in.)	0.74 mm (0.029 in.)
Oil Control Ring (Steel Rail)	0.025 - 0.76 mm (0.0099 - 0.03 in.)	1.55 mm (0.061 in.)



80ae8450

Fig. 124: Side Rail - Installation

1 - SIDE RAIL END

7. The No. 1 and No. 2 piston rings have a different cross section. Ensure No. 2 ring is installed with manufacturers I.D. mark (Dot) facing up, towards top of the piston.

NOTE: Piston rings are installed in the following order:

Oil ring expander.

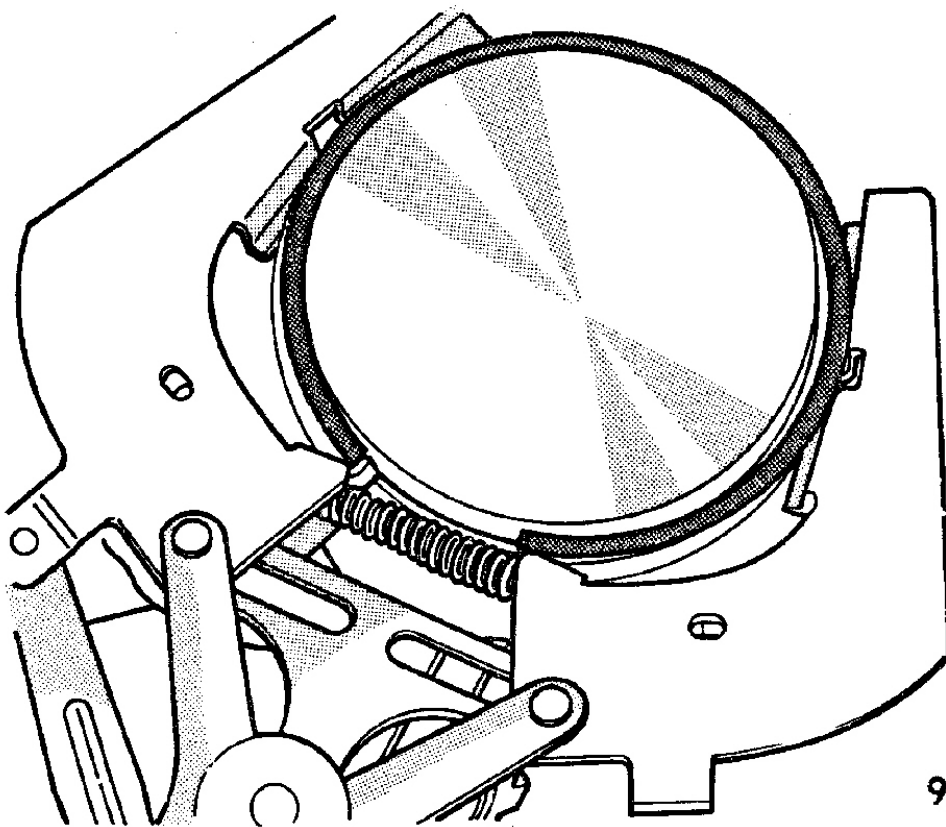
Upper oil ring side rail.

Lower oil ring side rail.

No. 2 Intermediate piston ring.

No. 1 Upper piston ring.

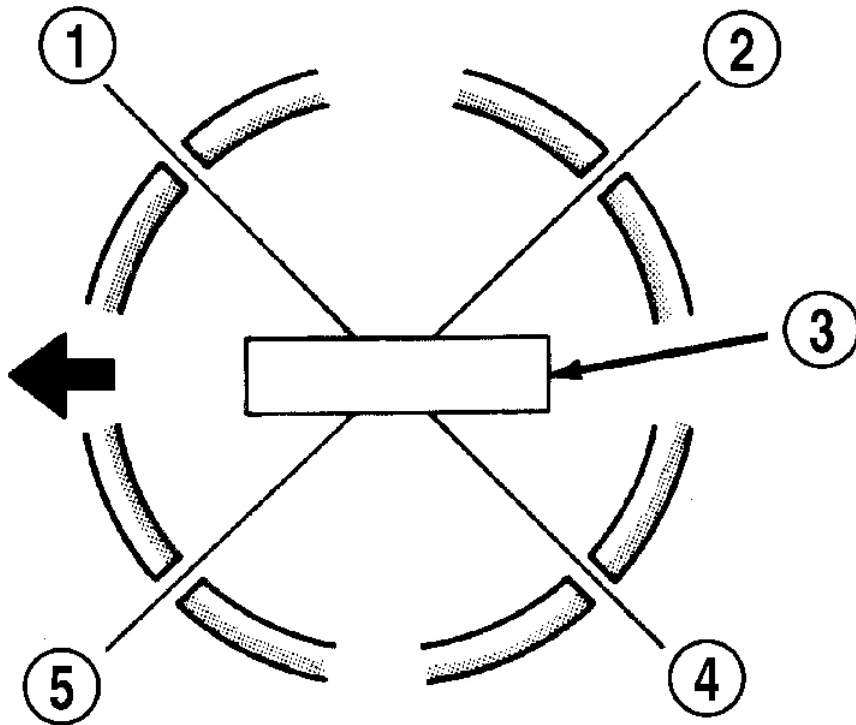
8. Install the oil ring expander.
9. Install upper side rail (1) by placing one end between the piston ring groove and the expander ring. Hold end firmly and press down the portion to be installed until side rail is in position. Repeat this step for the lower side rail.



9309-47

Fig. 125: Piston Ring Remover/Installer
Courtesy of CHRYSLER LLC

10. Install No. 2 intermediate piston ring using a piston ring installer.
11. Install No. 1 upper piston ring using a piston ring installer.



RR09B48

Fig. 126: Piston Ring End Gap Positions
Courtesy of CHRYSLER LLC

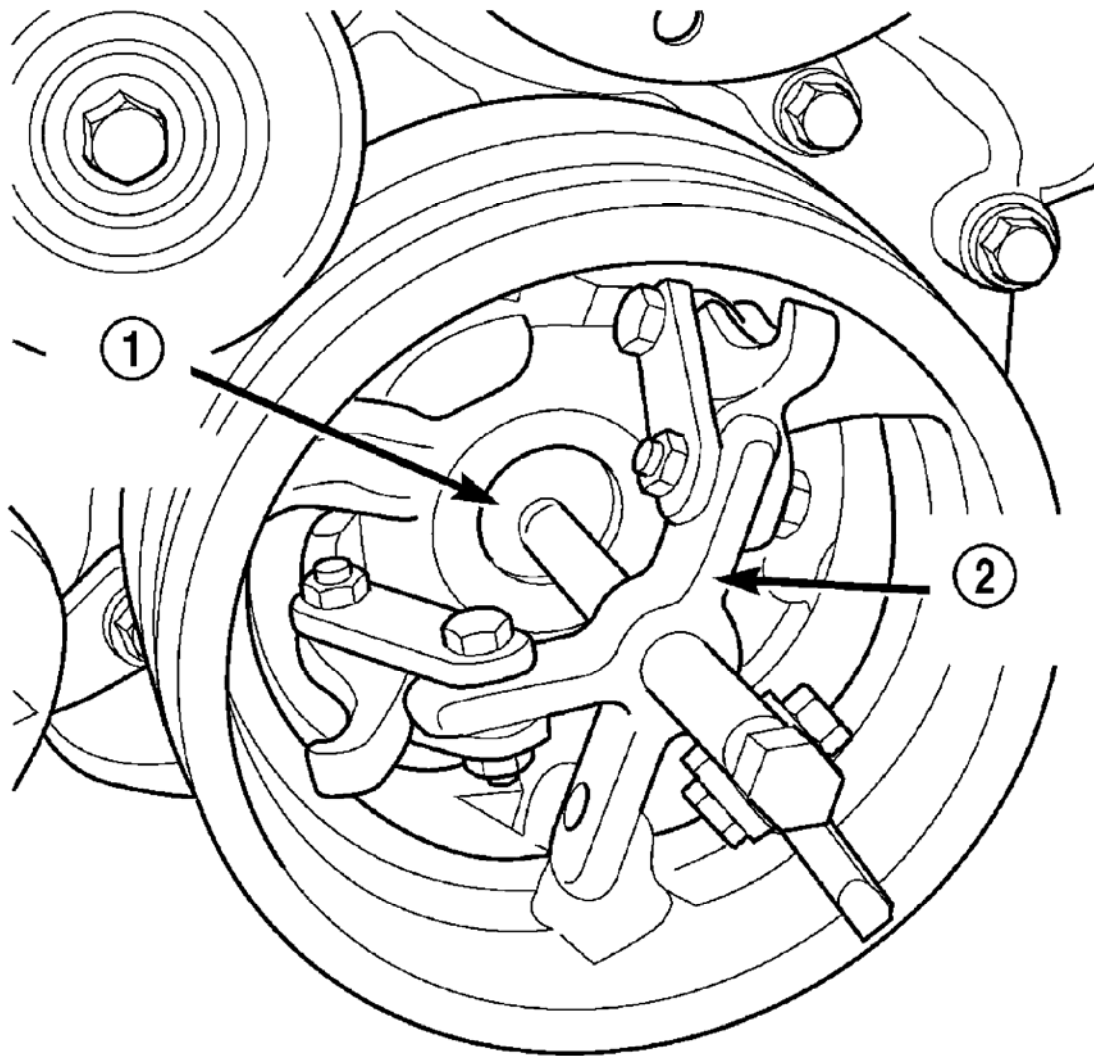
- | |
|--|
| 1 - SIDE RAIL UPPER
2 - NO. 1 RING GAP
3 - PISTON PIN
4 - SIDE RAIL LOWER
5 - NO. 2 RING GAP AND SPACER EXPANDER GAP |
|--|

12. Position piston ring end gaps as shown in illustration. It is important that expander ring gap (5) is at least 45° from the side rail gaps, but not on the piston pin center or on the thrust direction.

DAMPER-CRANKSHAFT

REMOVAL

CRANKSHAFT DAMPER



80b6b292

Fig. 127: Crankshaft Damper - Removal
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SPECIAL TOOL 8513 I INSERT
2 - SPECIAL TOOL 1026 |
|---|

1. Disconnect negative cable from battery.
2. Remove accessory drive belt. Refer to **REMOVAL** .

NOTE: **Transmission cooler line snaps into shroud lower right hand corner.**

3. Remove crankshaft damper bolt.
4. Remove damper using Crankshaft Insert 8513A (1) and Three Jaw Puller 1026(2).

INSTALLATION

CRANKSHAFT DAMPER

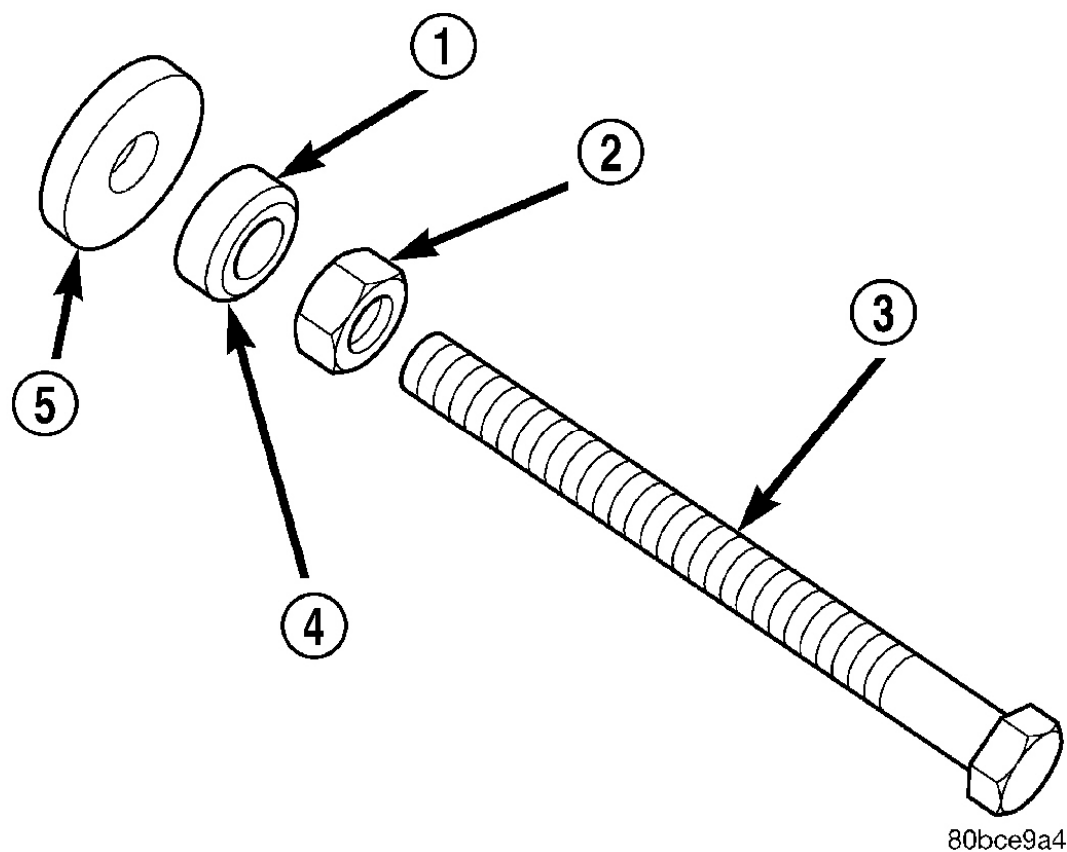


Fig. 128: Proper Assembly Method for Special Tool 8512-A
Courtesy of CHRYSLER LLC

- 1 - BEARING
- 2 - NUT
- 3 - THREADED ROD
- 4 - BEARING HARDENED SURFACE (FACING NUT)
- 5 - HARDENED WASHER

CAUTION: To prevent severe damage to the Crankshaft, Damper or Special Tool 8512, thoroughly clean the damper bore and the crankshaft nose before installing Damper.

1. Align crankshaft damper slot with key in crankshaft. Slide damper onto crankshaft slightly.

CAUTION: Damper Installer 8512A, is assembled in a specific sequence. Failure to assemble this tool in this sequence can result in tool failure and severe damage to either the tool or the crankshaft.

2. Assemble the Damper Installer 8512A as follows, The nut is threaded onto the shaft first. Then the roller bearing (1) is placed onto the threaded rod (3) (The hardened bearing surface of the bearing **MUST** face the nut). Then the hardened washer slides onto the threaded rod. See **Fig. 128**. Once assembled coat the threaded rod's threads with Mopar® Nickel Anti-Seize or (Loctite No. 771).

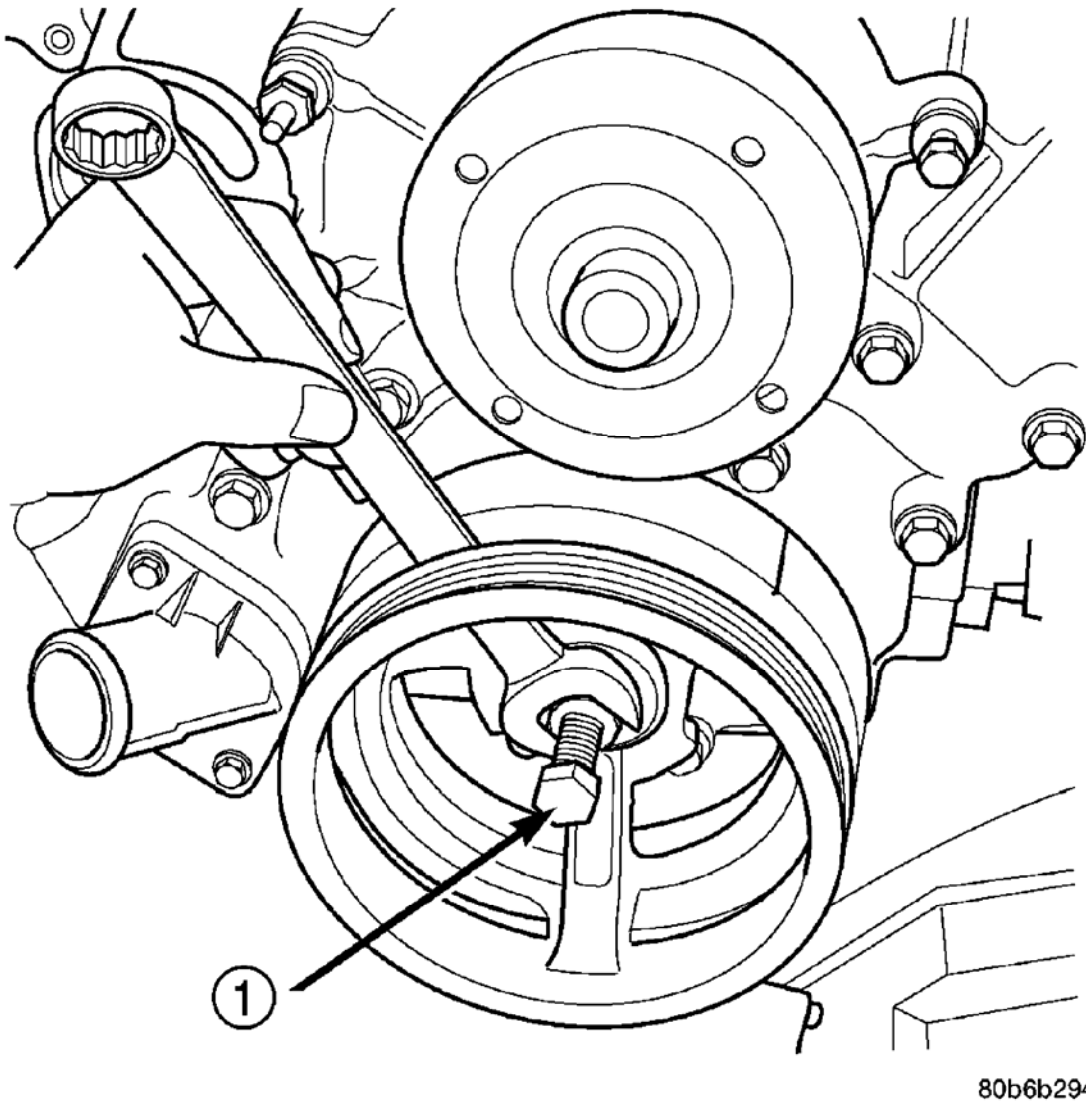


Fig. 129: Crankshaft Damper Installation
Courtesy of CHRYSLER LLC

1 - SPECIAL TOOL 8512A

3. Using the Damper Installer 8512A (1), press damper onto the crankshaft. See **Fig. 129**.
4. Install then tighten crankshaft damper bolt to 175 N.m (130 ft. lbs.).
5. Install accessory drive belt. Refer to **INSTALLATION** .
6. Connect negative cable to battery.

COVER-STRUCTURAL

DESCRIPTION

STRUCTURAL DUST COVER

The structural dust cover is made of die cast aluminum and joins the lower half of the transmission bell housing to the engine bedplate.

OPERATION

STRUCTURAL DUST COVER

The structural cover provides additional powertrain stiffness and reduces noise and vibration.

REMOVAL

STRUCTURAL COVER

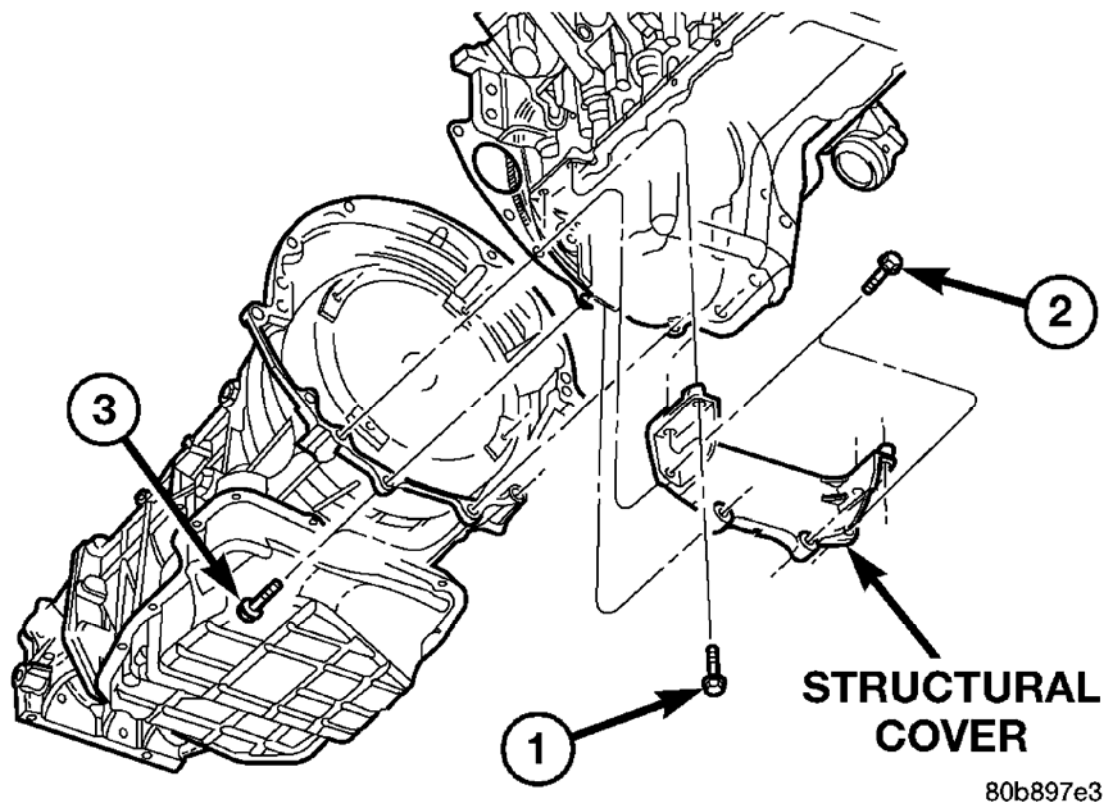


Fig. 130: Removing/Installing Structural Cover
Courtesy of CHRYSLER LLC

1 - BOLT
2 - BOLT
3 - BOLT

1. Raise vehicle on hoist.
2. Remove the bolts (1) retaining structural cover. See **Fig. 130**.
3. Remove the structural cover.

INSTALLATION

STRUCTURAL COVER

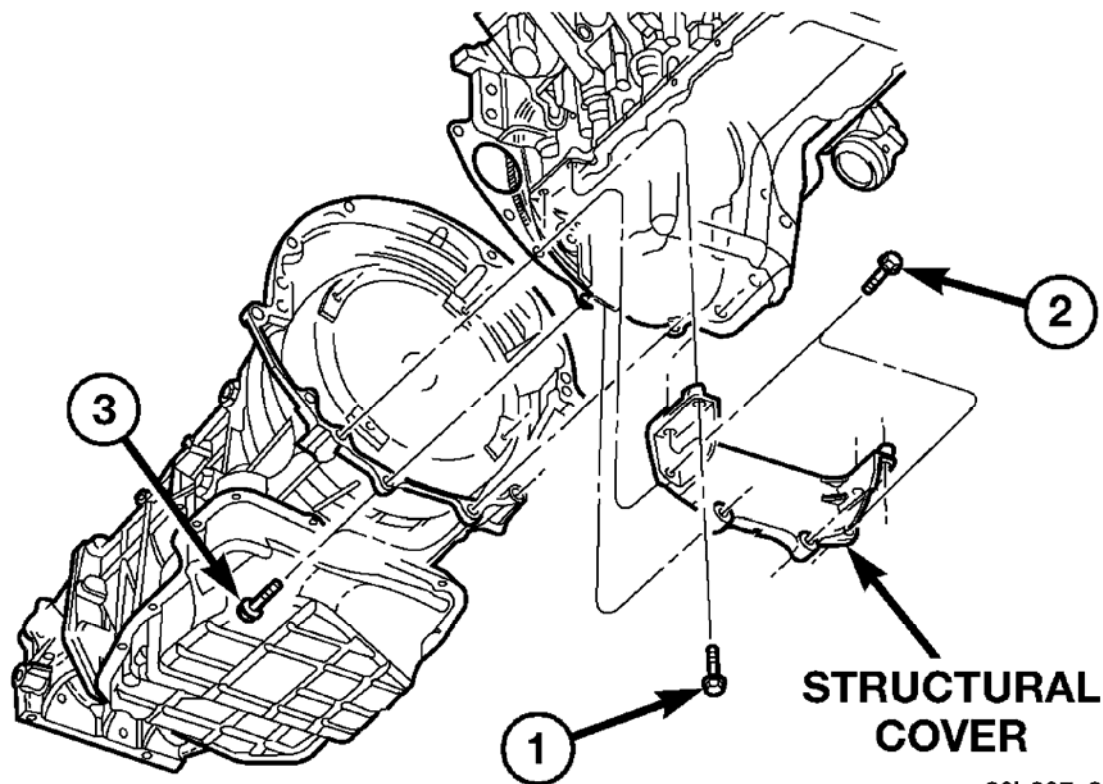


Fig. 131: Removing/Installing Structural Cover
Courtesy of CHRYSLER LLC

1 - BOLT
2 - BOLT
3 - BOLT

CAUTION: The structural cover must be installed as described in the following steps. Failure to do so will cause severe damage to the cover.

1. Position the structural cover in the vehicle.
2. Install all bolts (1) retaining the cover-to-engine. DO NOT tighten the bolts at this time.
3. Install the cover-to-transmission bolts. Do NOT tighten at this time.

CAUTION: The structural cover must be held tightly against both the engine and the transmission bell housing during tightening sequence. Failure to do so may cause damage to the cover.

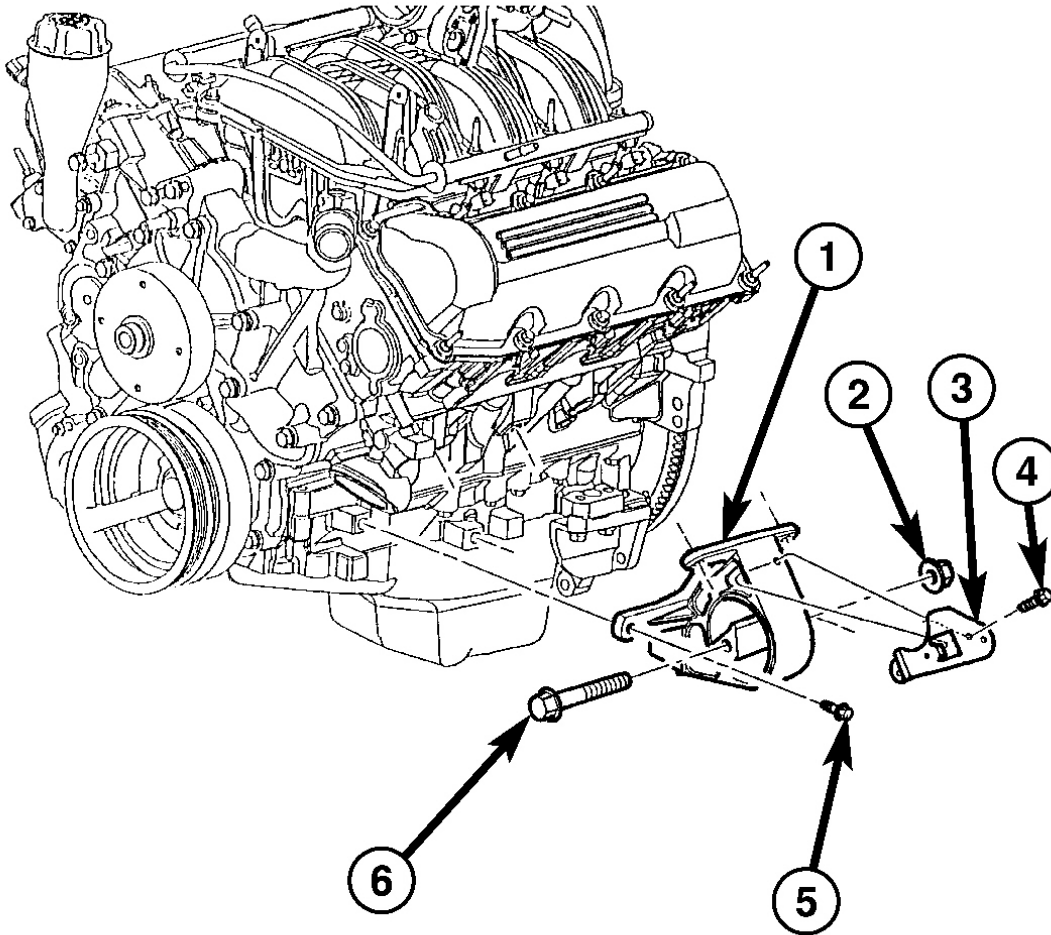
4. Starting with the two rear cover-to-engine bolts, tighten bolts (1) to 54 N.m (40 ft. lbs.), then tighten bolts (2) and (3) to 54 N.m (40 ft. lbs.) in the sequence shown in illustration. See **Fig. 131**.

ENGINE MOUNTING

MOUNT - ENGINE FRONT

REMOVAL

REMOVAL FRONT ENGINE MOUNT



808c2c9d

Fig. 132: Engine Insulator Mount 3.7 Left
Courtesy of CHRYSLER LLC

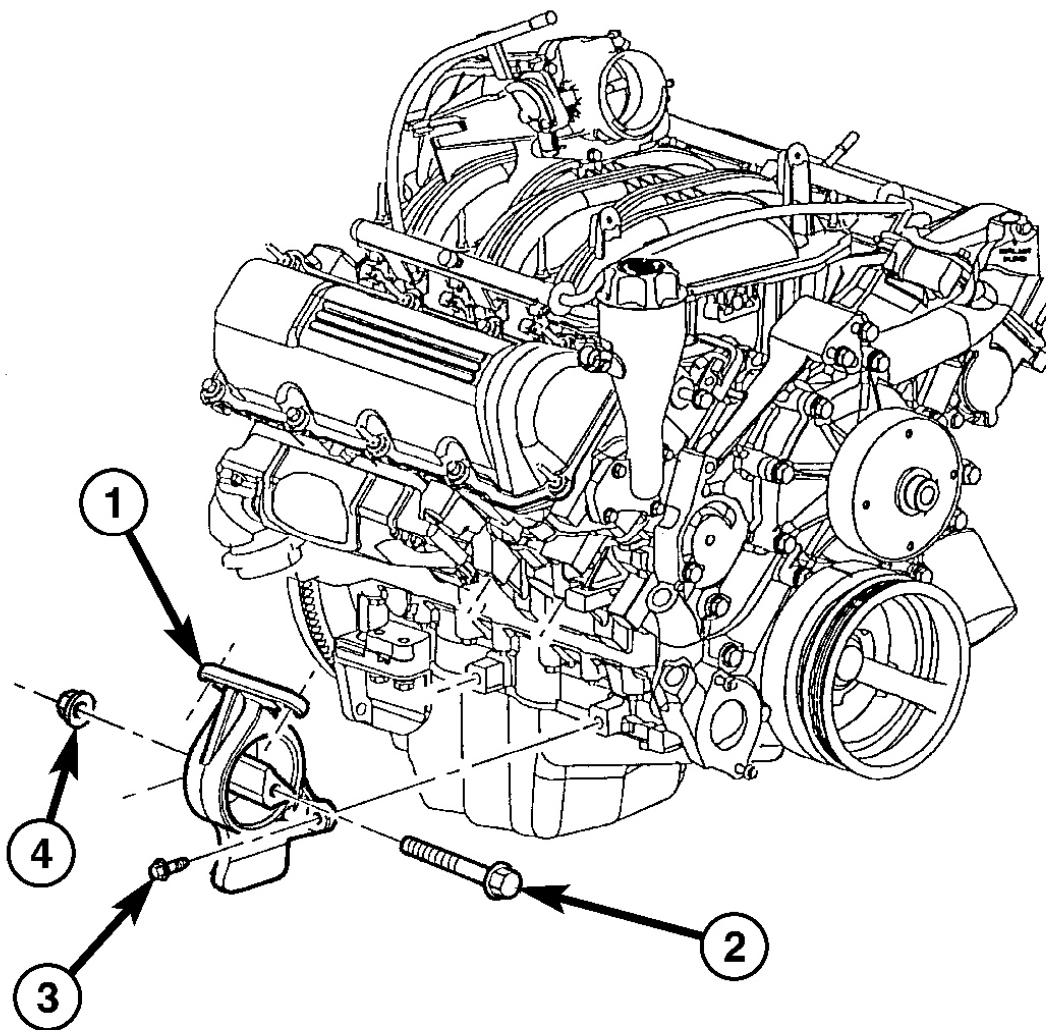
- 1 - MOUNT
- 2 - NUT

3 - SHIELD
4 - FASTENER
5 - BOLT
6 - THRU BOLT

1. Disconnect the negative cable from the battery.

CAUTION: Remove the fan blade, fan clutch and fan shroud before raising engine. Failure to do so may cause damage to the fan blade, fan clutch and fan shroud.

2. Remove the fan blade, fan clutch and fan shroud. Refer to **COOLING** for procedure.
3. Remove the engine oil filter.
4. Support the engine with a suitable jack and a block of wood across the full width of the engine oil pan.
5. Remove the four cylinder block-to-insulator mount bolts (5) and the nut from the engine insulator mount through bolt.



808c2ca2

Fig. 133: Engine Insulator Mount 3.7 Right
Courtesy of CHRYSLER LLC

- | |
|---------------|
| 1 - MOUNT |
| 2 - THRU BOLT |
| 3 - BOLT |
| 4 - NUT |

6. Using the jack, raise the engine high enough to remove the engine insulator mount thru bolt (2) and the insulator mount and. See **Fig. 132**. See **Fig. 133**.

INSTALLATION

INSTALLATION FRONT ENGINE MOUNT

1. Position the insulator mount and install the insulator mount through bolt.
2. Lower the engine until the cylinder block-to-insulator mount bolts can be installed.
3. Remove the jack and block of wood.
4. Tighten the cylinder block-to-insulator mount bolts to 61 N.m (45 ft. lbs.).
5. Install and tighten the through bolt retaining nut to 61 N.m (45 ft. lbs.).
6. Install the fan blade, fan clutch and fan shroud.

MOUNT - ENGINE REAR

REMOVAL

ENGINE MOUNT - REAR

NOTE: **A resilient rubber cushion supports the transmission at the rear between the transmission extension housing and the rear support crossmember or skid plate.**

1. Disconnect negative cable from battery.
2. Raise the vehicle and support the transmission.
3. Remove the nuts holding the support cushion to the crossmember. Remove the crossmember.

MANUAL TRANSMISSION

Remove the support cushion nuts and remove the cushion.

Remove the transmission support bracket bolts and remove the bracket from the transmission.

AUTOMATIC TRANSMISSION

Remove the support cushion bolts and remove the cushion and the support bracket from the transmission (4WD) or from the Adapter bracket (2WD).

On 2WD vehicles, remove the bolts holding the transmission support Adapter bracket to the transmission. Remove the Adapter bracket.

INSTALLATION

ENGINE MOUNT - REAR

MANUAL TRANSMISSION:

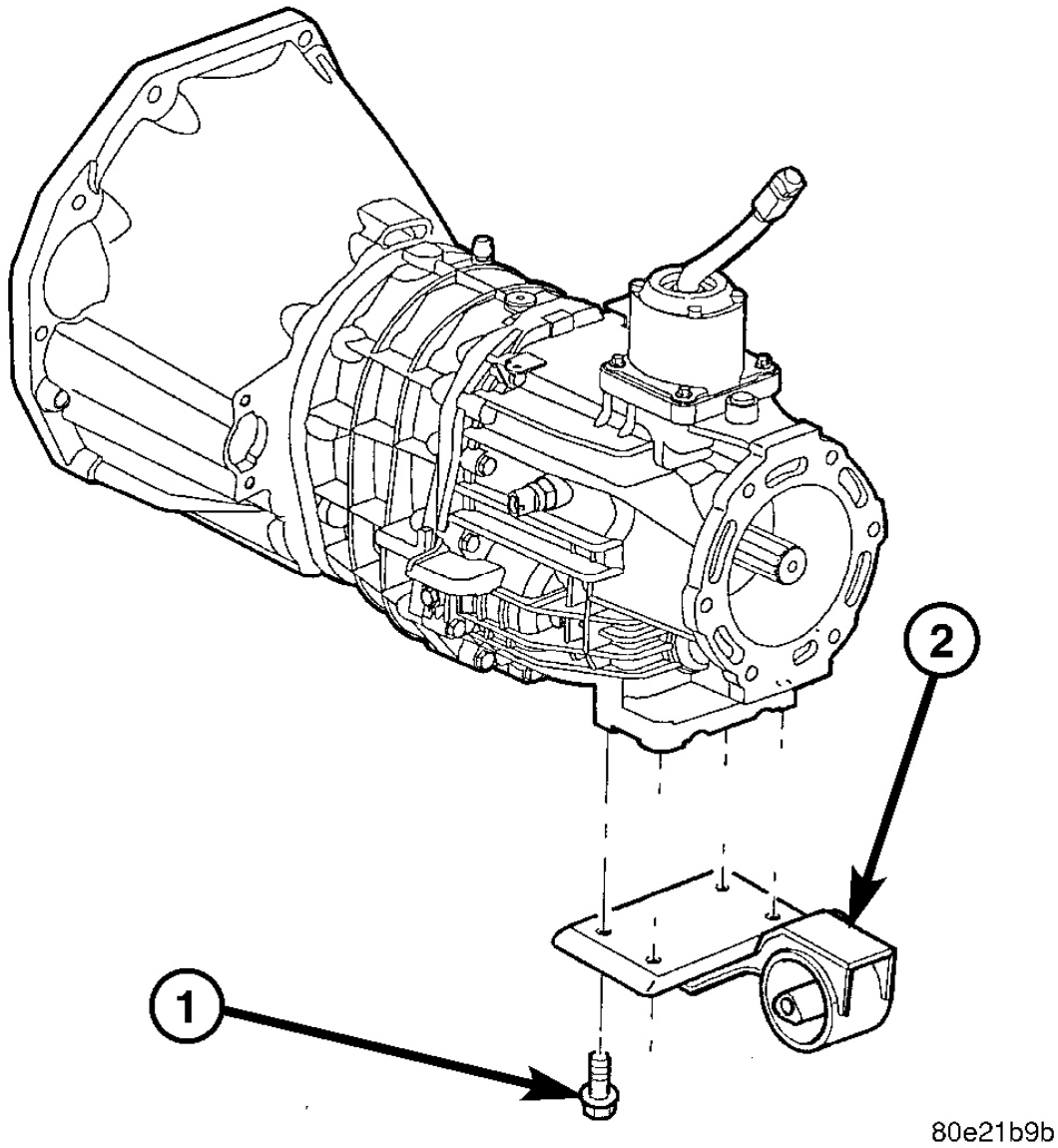
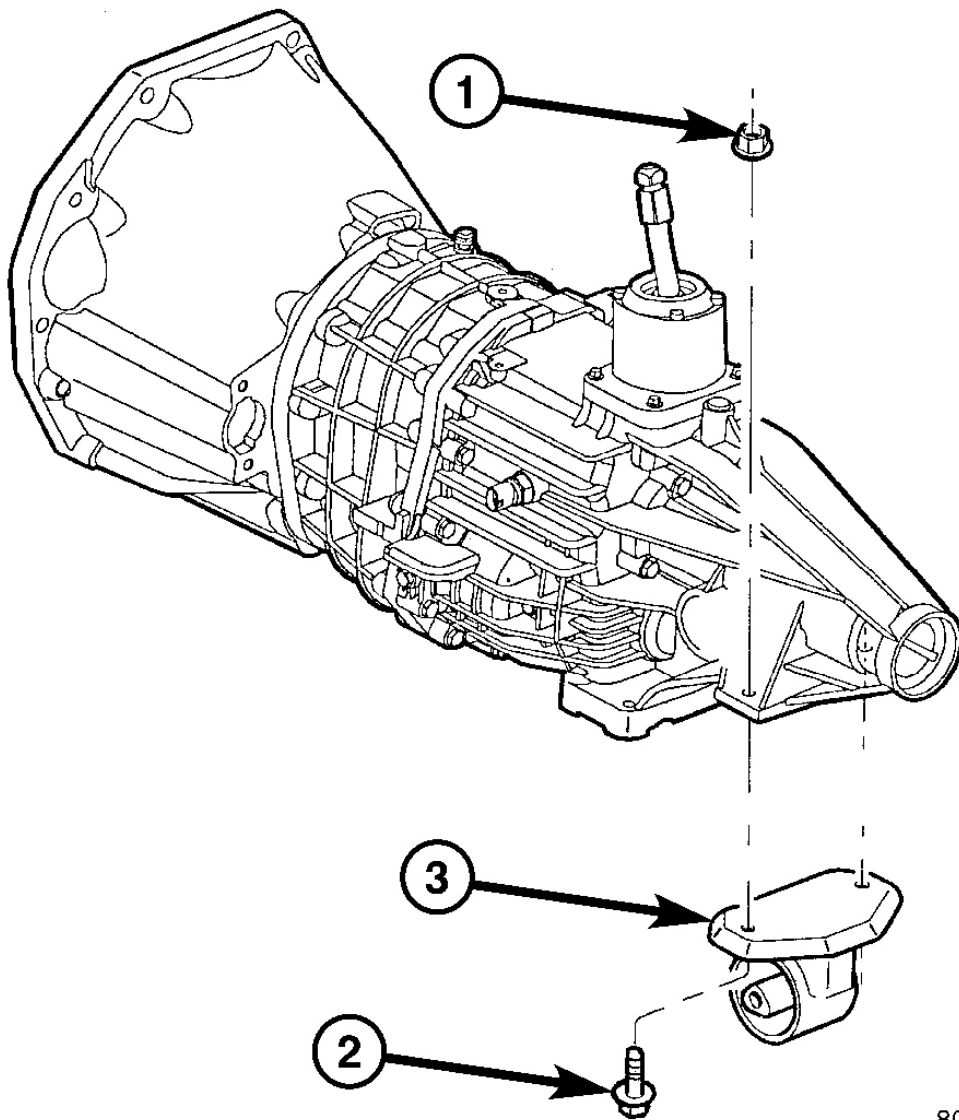


Fig. 134: Transmission Mount - 2.4L Manual Trans
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - TRANSMISSION MOUNT
2 - MOUNTING BOLT |
|---|



80e22e13

Fig. 135: Transmission Mount - 3.7L Manual Trans 2WD
Courtesy of CHRYSLER LLC

- | |
|-----------------|
| 1 - NUT |
| 2 - BOLT |
| 3 - TRANS MOUNT |

1. Install the transmission mount (1) to the transmission. Install the bolts (2) and tighten.
2. Position the crossmember in the vehicle. Install the crossmember to mount through bolt and nut.
3. Install crossmember-to-sill bolts and tighten to 41 N.m (30 ft. lbs.)

4. Remove the transmission support.
5. Lower the vehicle.
6. Connect negative cable to battery.

AUTOMATIC TRANSMISSION:

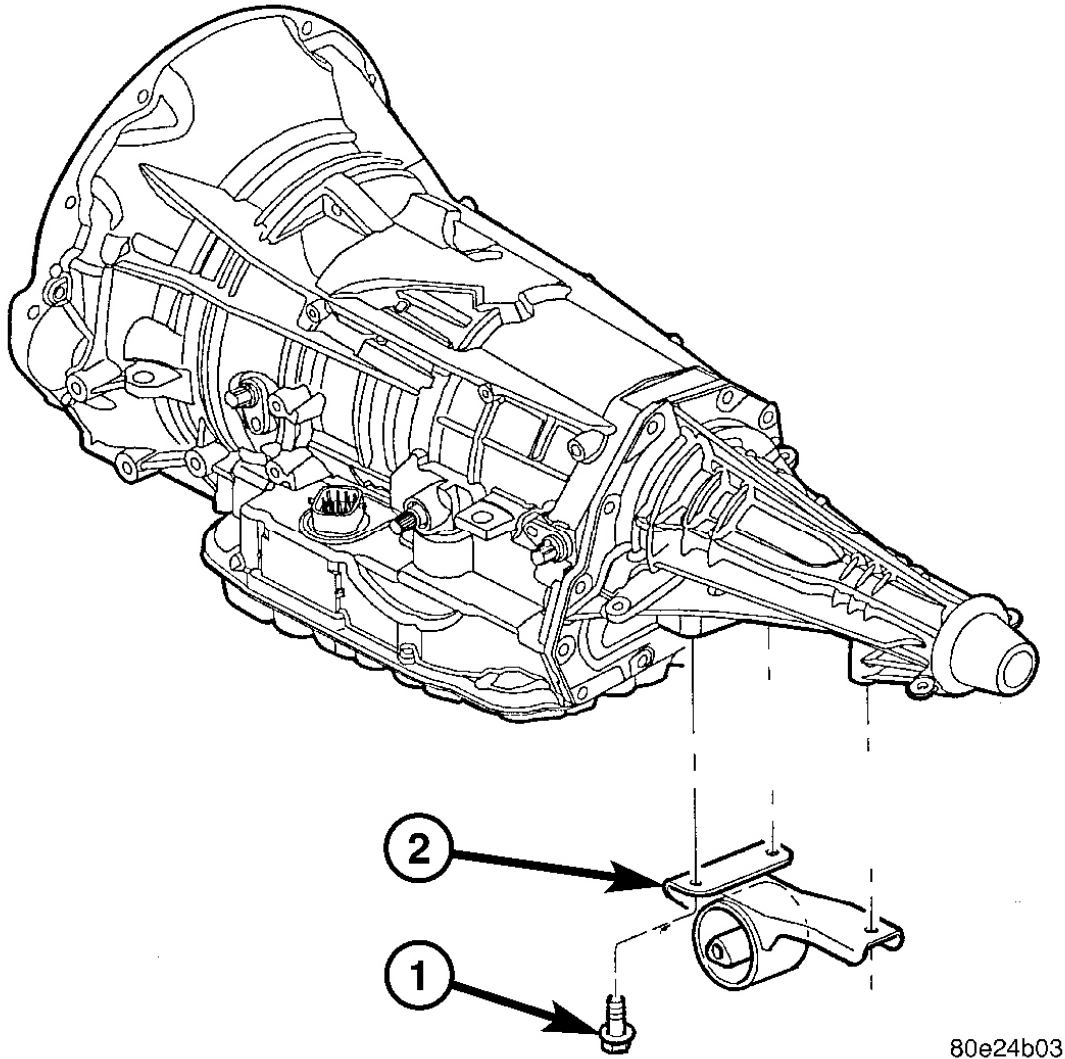


Fig. 136: Transmission Mount - 3.7L 2WD Auto Trans
Courtesy of CHRYSLER LLC

1 - BOLT
2 - MOUNT

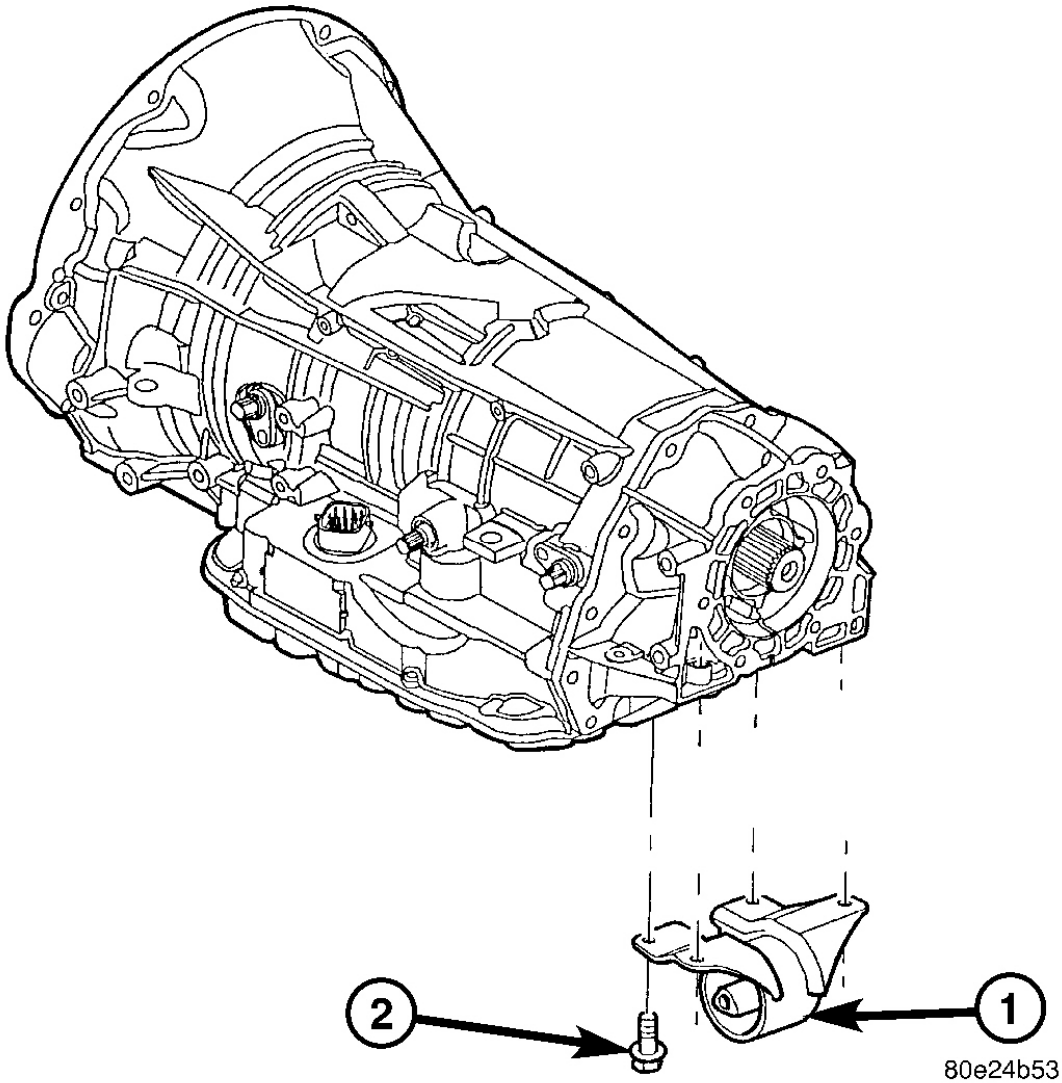


Fig. 137: Transmission Mount - 3.7L 4WD Auto Trans
Courtesy of CHRYSLER LLC

1 - MOUNT
2 - BOLT

1. Install the transmission mount to transmission. See **Fig. 136** and **Fig. 137**. Install the bolts.
2. Position the crossmember in the vehicle. Install the crossmember to mount through bolt and nut.
3. Remove the transmission support.
4. Lower the vehicle.
5. Connect negative cable to battery.

LUBRICATION

DESCRIPTION

LUBRICATION

The lubrication system is a full flow filtration pressure feed type.

OPERATION

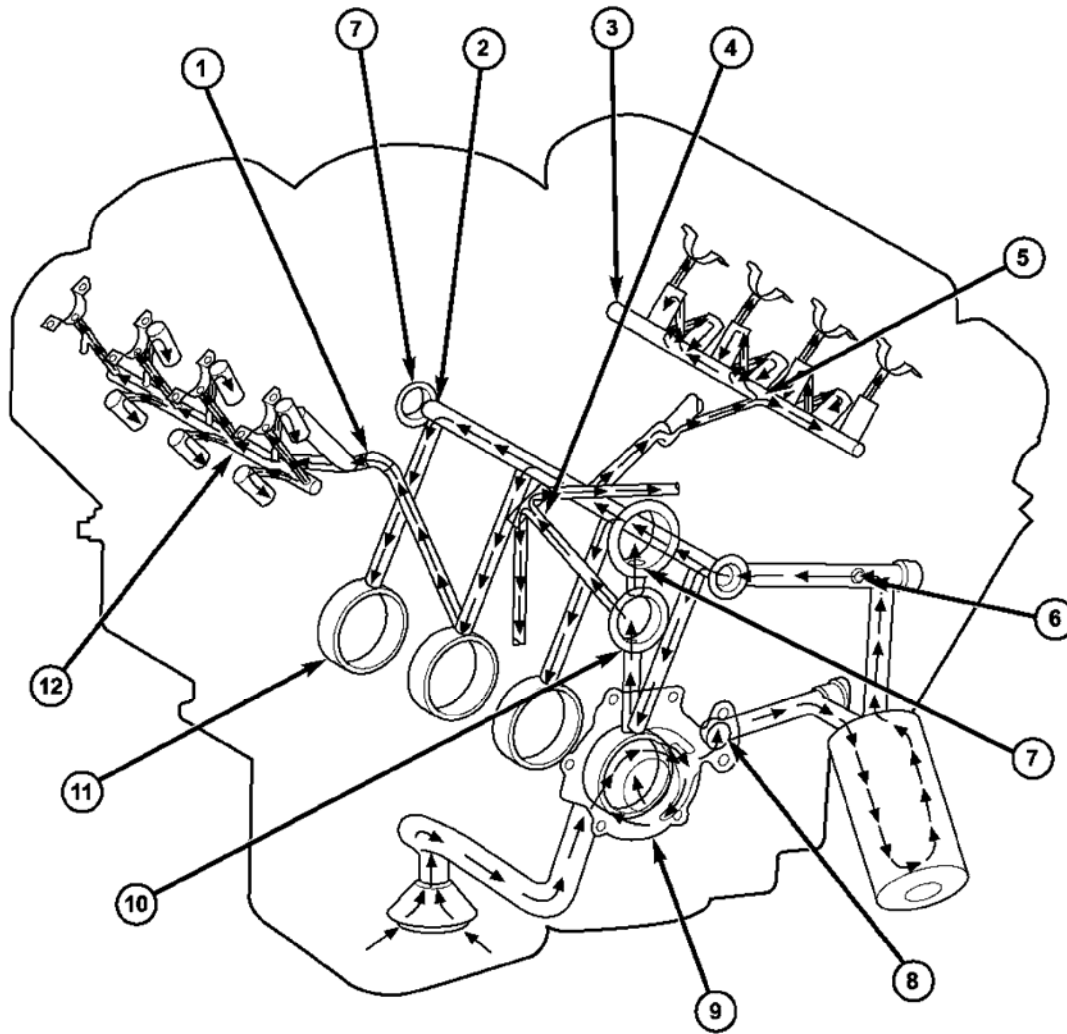
LUBRICATION

ENGINE LUBRICATION FLOW CHART - BLOCK: TABLE 1

FROM	TO
Oil Pickup Tube	Oil Pump
Oil Pump	Oil Filter
Oil Filter	Block Main Oil Gallery
Block Main Oil Gallery	1. Crankshaft Main Journal
-	2. Left Cylinder Head*
-	3. Right Cylinder Head*
-	4. Counterbalance Shaft Rear Journal
Crankshaft Main Journals	Crankshaft Rod Journals
Crankshaft Number One Main Journal	1. Front Timing Chain Idler Shaft
-	2. Counterbalance Shaft - Front Journal
-	3. Both Secondary Chain Tensioners
Left Cylinder Head	Refer to ENGINE LUBRICATION FLOW CHART - CYLINDER HEADS: TABLE 2
Right Cylinder Head	Refer to ENGINE LUBRICATION FLOW CHART - CYLINDER HEADS: TABLE 2
* The cylinder head gaskets have an oil restricter to control oil flow to the cylinder heads	

ENGINE LUBRICATION FLOW CHART - CYLINDER HEADS: TABLE 2

FROM	TO
Cylinder Head Oil Port (in bolt hole)	Diagonal Cross Drilling to Main Oil Gallery
Main Oil Gallery (drilled through head from rear to front)	1. Base of Camshaft Towers
-	2. Lash Adjuster Towers
Base of Camshaft Towers	Vertical Drilling Through Tower to Camshaft Bearings**
Lash Adjuster Towers	Diagonal Drillings to Hydraulic Lash Adjuster Pockets
** The number three camshaft bearing journal feeds oil into the hollow camshaft tubes. Oil is routed to the intake lobes, which have oil passages drilled into them to lubricate the rocker arms.	



80bbb21e

Fig. 138: Lubrication Oil Flow
 Courtesy of CHRYSLER LLC

- 1 - OIL FLOW TO RIGHT CYLINDER HEAD
- 2 - CYLINDER BLOCK MAIN OIL GALLERY
- 3 - LEFT CYLINDER HEAD OIL GALLERY
- 4 - OIL FLOW TO BOTH SECONDARY TENSIONERS
- 5 - OIL FLOW TO LEFT CYLINDER HEAD
- 6 - OIL PRESSURE SENSOR LOCATION
- 7 - OIL FLOW TO COUNTER BALANCE SHAFT
- 8 - OIL PUMP OUTLET TO CYLINDER BLOCK
- 9 - OIL PUMP

- 10 - OIL FLOW TO CRANKSHAFT MAIN JOURNALS
- 11 - CRANKSHAFT MAIN BEARING JOURNALS
- 12 - RIGHT CYLINDER HEAD OIL GALLERY

Oil from the oil pan is pumped by a gerotor type oil pump (9) directly mounted to the crankshaft nose. Oil pressure is controlled by a relief valve mounted inside the oil pump housing.

The camshaft exhaust valve lobes and rocker arms are lubricated through a small hole in the rocker arm; oil flows through the lash adjuster then through the rocker arm and onto the camshaft lobe. Due to the orientation of the rocker arm, the camshaft intake lobes are not lubed in the same manner as the exhaust lobes. The intake lobes are lubed through internal passages in the camshaft. Oil flows through a bore in the No. 3 camshaft bearing bore, and as the camshaft turns, a hole in the camshaft aligns with the hole in the camshaft bore allowing engine oil to enter the camshaft tube. See **Fig. 138**. The oil then exits through 1.6 mm (0.063 in.) holes drilled into the intake lobes, lubricating the lobes and the rocker arms.

DIAGNOSIS AND TESTING

CHECKING ENGINE OIL PRESSURE

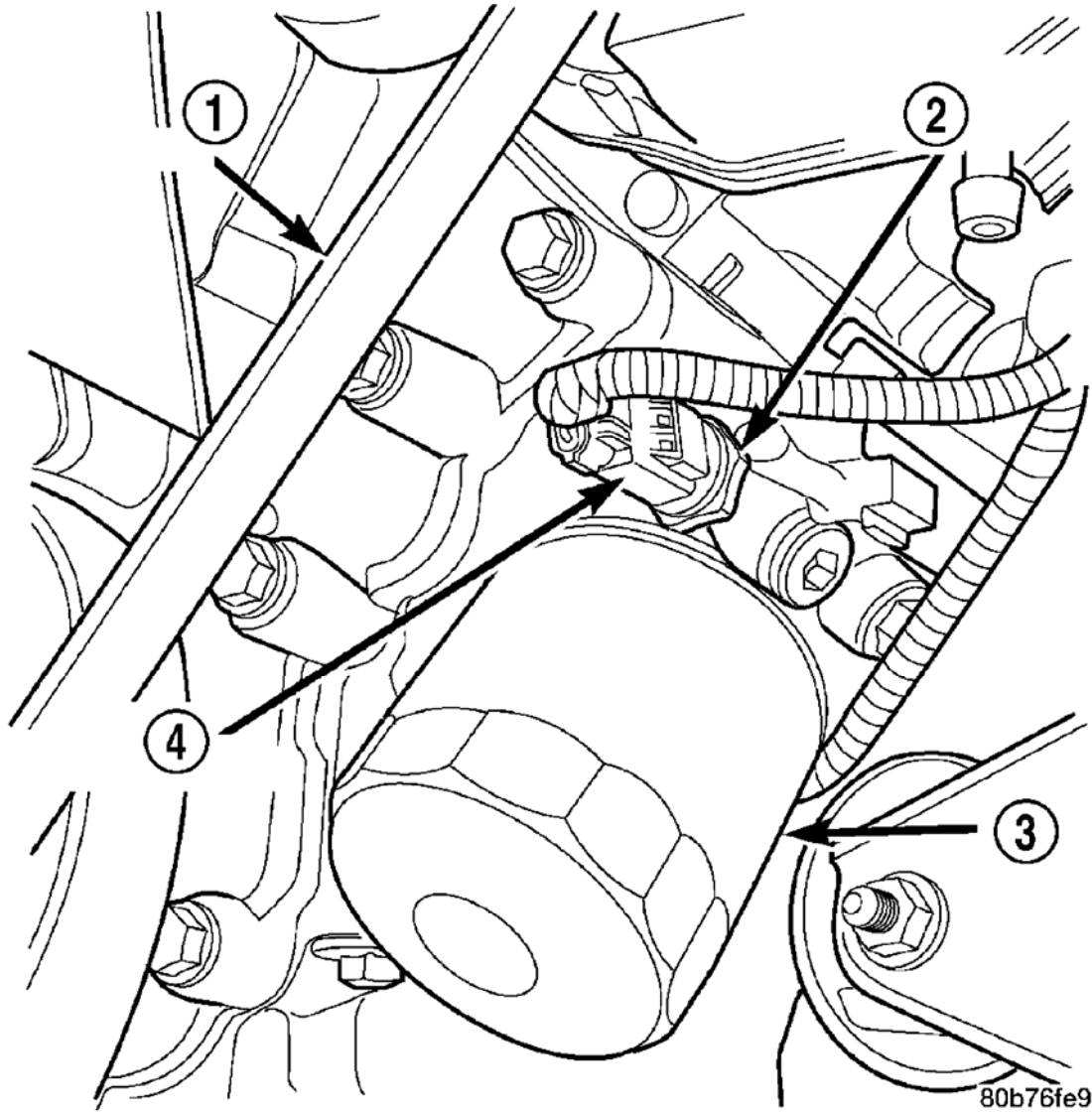


Fig. 139: Locating Oil Pressure Sending Unit, Connector & Oil Filter
Courtesy of CHRYSLER LLC

- 1 - BELT
- 2 - OIL PRESSURE SENSOR
- 3 - OIL FILTER
- 4 - ELEC. CONNECTOR

1. Remove oil pressure sending unit (2) and install gauge assembly C-3292. See **Fig. 139**.
2. Run engine until thermostat opens.
3. Oil Pressure:
 - Curb Idle - 25 kPa (4 psi) minimum

3000 RPM - 170 - 758 kPa (25 - 110 psi)

4. If oil pressure is 0 at idle, shut off engine. Check for a clogged oil pick-up screen or a pressure relief valve stuck open.

ENGINE OIL LEAK

Begin with a thorough visual inspection of the engine, particularly at the area of the suspected leak. If an oil leak source is not readily identifiable, the following steps should be followed:

1. Do not clean or degrease the engine at this time because some solvents may cause rubber to swell, temporarily stopping the leak.
2. Add an oil soluble dye (use as recommended by manufacturer). Start the engine and let idle for approximately 15 minutes. Check the oil dipstick to make sure the dye is thoroughly mixed as indicated with a bright yellow color under a black light.
3. Using a black light, inspect the entire engine for fluorescent dye, particularly at the suspected area of oil leak. If the oil leak is found and identified, repair per service information instructions.
4. If dye is not observed, drive the vehicle at various speeds for approximately 24 km (15 miles), and repeat inspection.

If the oil leak source is not positively identified at this time, proceed with the AIR LEAK DETECTION TEST METHOD.

AIR LEAK DETECTION TEST METHOD

1. Disconnect the breather cap to air cleaner hose at the breather cap end. Cap or plug breather cap nipple.
2. Remove the PCV valve from the cylinder head cover. Cap or plug the PCV valve grommet.
3. Attach an air hose with pressure gauge and regulator to the dipstick tube.

CAUTION: Do not subject the engine assembly to more than 20.6 kPa (3 PSI) of test pressure.

4. Gradually apply air pressure from 1 psi to 2.5 psi maximum while applying soapy water at the suspected source. Adjust the regulator to the suitable test pressure that provide the best bubbles which will pinpoint the leak source. If the oil leak is detected and identified, repair per service information procedures.
5. If the leakage occurs at the rear oil seal area, refer to INSPECTION FOR REAR SEAL AREA LEAK.
6. If no leaks are detected, turn off the air supply and remove the air hose and all plugs and caps. Install the PCV valve and breather cap hose.
7. Clean the oil off the suspect oil leak area using a suitable solvent. Drive the vehicle at various speeds approximately 24 km (15 miles). Inspect the engine for signs of an oil leak by using a black light.

INSPECTION FOR REAR SEAL AREA LEAKS

Since it is sometimes difficult to determine the source of an oil leak in the rear seal area of the engine, a more involved inspection is necessary. The following steps should be followed to help pinpoint the source of the leak.

If the leakage occurs at the crankshaft rear oil seal area:

1. Disconnect the battery.
2. Raise the vehicle.
3. Remove torque converter or clutch housing cover and inspect rear of block for evidence of oil. Use a black light to check for the oil leak:
 - Circular spray pattern generally indicates seal leakage or crankshaft damage.
 - Where leakage tends to run straight down, possible causes are a porous block, camshaft bore cup plugs oil galley pipe plugs, oil filter runoff, and main bearing cap to cylinder block mating surfaces.
4. If no leaks are detected, pressurize the crankcase as outlined in **AIR LEAK DETECTION TEST METHOD**

CAUTION: Do not exceed 20.6 kPa (3 psi).

5. If the leak is not detected, very slowly turn the crankshaft and watch for leakage. If a leak is detected between the crankshaft and seal while slowly turning the crankshaft, it is possible the crankshaft seal surface is damaged. The seal area on the crankshaft could have minor nicks or scratches that can be polished out with emery cloth.

CAUTION: Use extreme caution when crankshaft polishing is necessary to remove minor nicks and scratches. The crankshaft seal flange is especially machined to complement the function of the rear oil seal.

6. For bubbles that remain steady with shaft rotation, no further inspection can be done until disassembled.

REAR CRANKSHAFT OIL SEAL AREA LEAKS

Since it is sometimes difficult to determine the source of an oil leak in the rear seal area of the engine, a more involved inspection is necessary. The following steps should be followed to help pinpoint the source of the leak.

If the leakage occurs at the crankshaft rear oil seal area:

1. Disconnect the battery.
2. Raise the vehicle.
3. Remove torque converter or clutch housing cover and inspect rear of block for evidence of oil. Use a black light to check for the oil leak:
 - Circular spray pattern generally indicates seal leakage or crankshaft damage.
 - Where leakage tends to run straight down, possible causes are a porous block, oil galley pipe plugs, oil filter runoff, and main bearing cap to cylinder block mating surfaces.
4. If no leaks are detected, pressurize the crankcase as outlined in **AIR LEAK DETECTION TEST METHOD**

CAUTION: Do not exceed 20.6 kPa (3 psi).

5. If the leak is not detected, very slowly turn the crankshaft and watch for leakage. If a leak is detected between the crankshaft and seal while slowly turning the crankshaft, it is possible the crankshaft seal surface is damaged. The seal area on the crankshaft could have minor nicks or scratches that can be polished out with emery cloth.

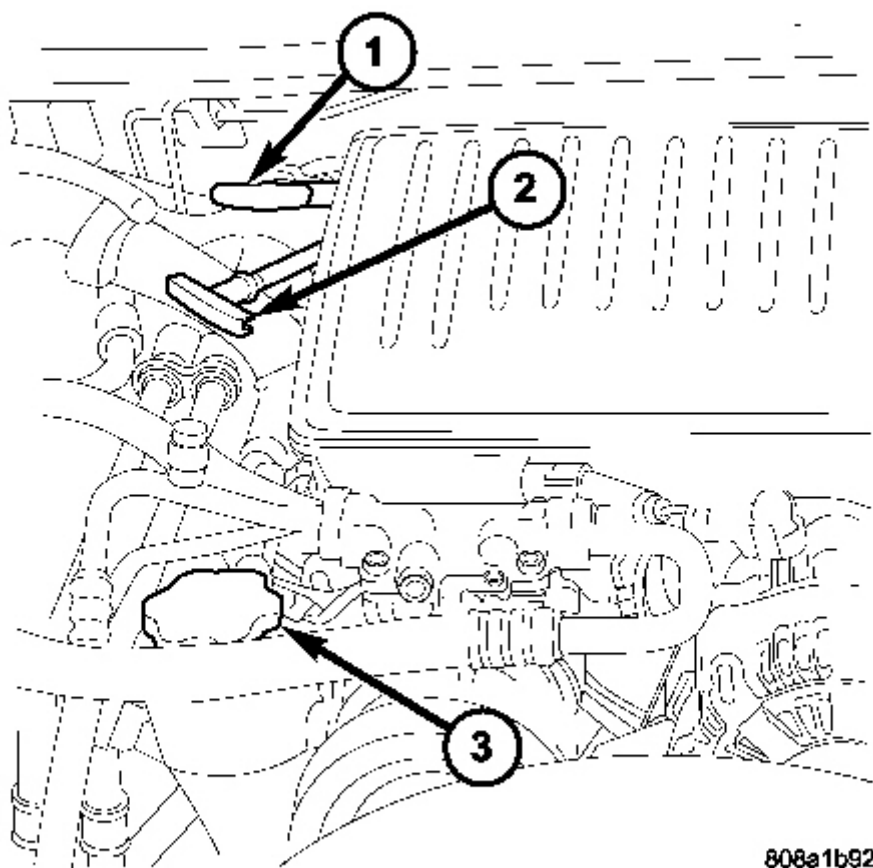
CAUTION: Use extreme caution when crankshaft polishing is necessary to remove minor nicks or scratches. The crankshaft seal flange is specially machined to complement the function of the rear oil seal.

6. For bubbles that remain steady with shaft rotation, no further inspection can be done until disassembled. See OIL LEAKS row under **ENGINE LUBRICATION DIAGNOSTIC TABLE** for components inspections on possible causes and corrections.
7. After the oil leak root cause and appropriate corrective action have been identified, see **REMOVAL**.

OIL

STANDARD PROCEDURE

ENGINE OIL SERVICE



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Fig. 140: Identifying Engine Oil & Transmission Dipsticks & Engine Oil Fill Cap
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - TRANSMISSION DIPSTICK
2 - ENGINE OIL DIPSTICK
3 - ENGINE OIL FILL CAP |
|---|

The engine oil level indicator (1) is located at the right rear of the engine on the 3.7L/4.7L engines. See **Fig. 140**.

CRANKCASE OIL LEVEL INSPECTION

CAUTION: Do not overfill crankcase with engine oil, pressure loss or oil foaming can result.

Inspect engine oil level approximately every 800 kilometers (500 miles). Unless the engine has exhibited loss of oil pressure, run the engine for about five minutes before checking oil level. Checking engine oil level on a cold engine is not accurate.

To ensure proper lubrication of an engine, the engine oil must be maintained at an acceptable level. The acceptable levels are indicated between the ADD and SAFE marks on the engine oil dipstick.

1. Position vehicle on level surface.
2. With engine OFF, allow approximately ten minutes for oil to settle to bottom of crankcase, remove engine oil dipstick.
3. Wipe dipstick clean.
4. Install dipstick and verify it is seated in the tube.
5. Remove dipstick, with handle held above the tip, take oil level reading.
6. Add oil only if level is below the ADD mark on dipstick.

ENGINE OIL CHANGE

Change engine oil at mileage and time intervals described in Maintenance Schedules.

Run engine until achieving normal operating temperature.

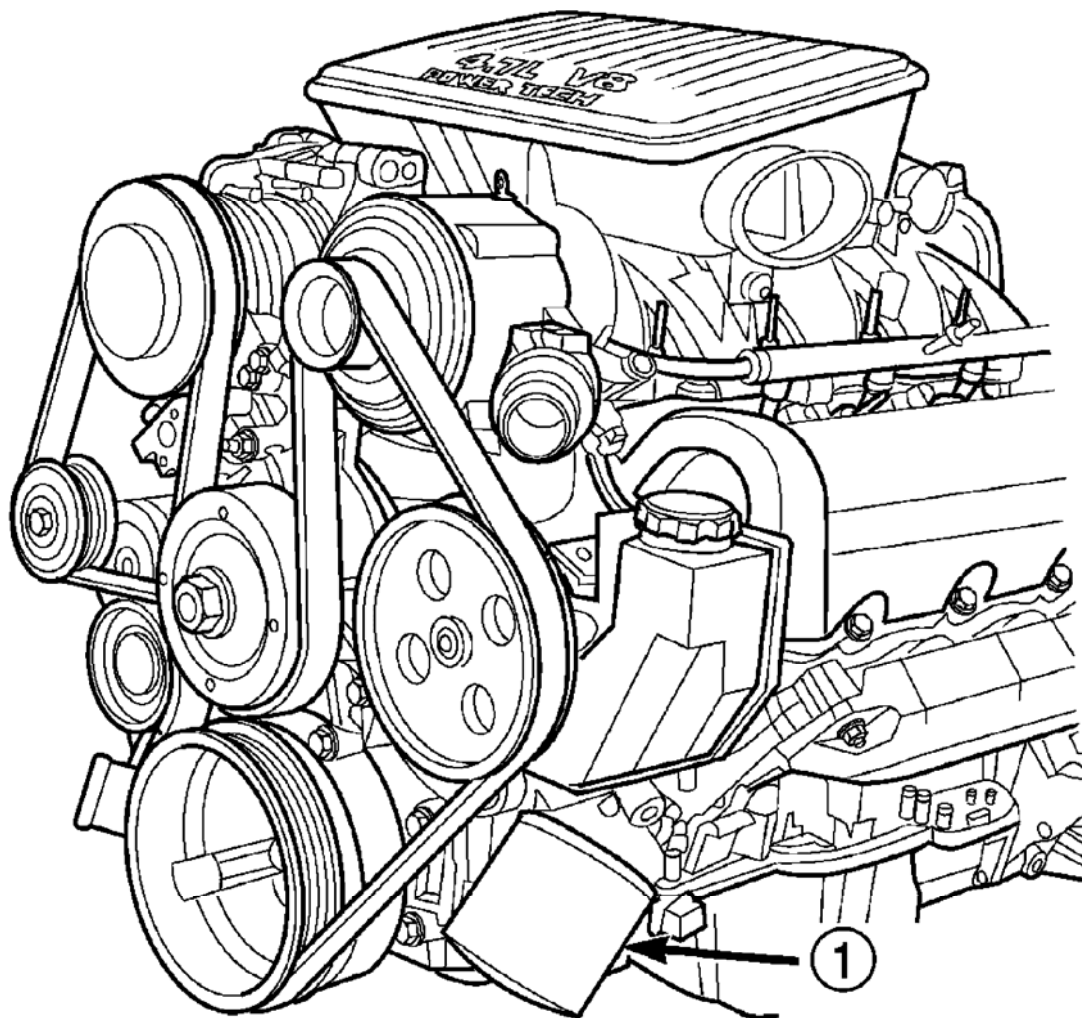
1. Position the vehicle on a level surface and turn engine off.
2. Hoist and support vehicle on safety stands.
3. Remove oil fill cap.
4. Place a suitable drain pan under crankcase drain.
5. Remove drain plug from crankcase and allow oil to drain into pan. Inspect drain plug threads for stretching or other damage. Replace drain plug if damaged.
6. Install drain plug in crankcase.
7. Lower vehicle and fill crankcase with specified type and amount of engine oil.
8. Install oil fill cap.
9. Start engine and inspect for leaks.
10. Stop engine and inspect oil level.

NOTE: Care should be exercised when disposing used engine oil after it has been drained from a vehicle engine.

FILTER-ENGINE OIL

REMOVAL

ENGINE OIL FILTER



80b76f81

Fig. 141: Oil Filter - 4.7L Engine
Courtesy of CHRYSLER LLC

1 - ENGINE OIL FILTER

All engines are equipped with a high quality full-flow, disposable type oil filter. DaimlerChrysler Corporation recommends a Mopar® or equivalent oil filter be used.

1. Position a drain pan under the oil filter (1).
2. Using a suitable oil filter wrench loosen filter.
3. Rotate the oil filter counterclockwise to remove it from the cylinder block oil filter boss. See **Fig. 141**.
4. When filter separates from cylinder block oil filter boss, tip gasket end upward to minimize oil spill. Remove filter from vehicle.

NOTE: **Make sure filter gasket was removed with filter.**

5. With a wiping cloth, clean the gasket sealing surface of oil and grime.

INSTALLATION

ENGINE OIL FILTER

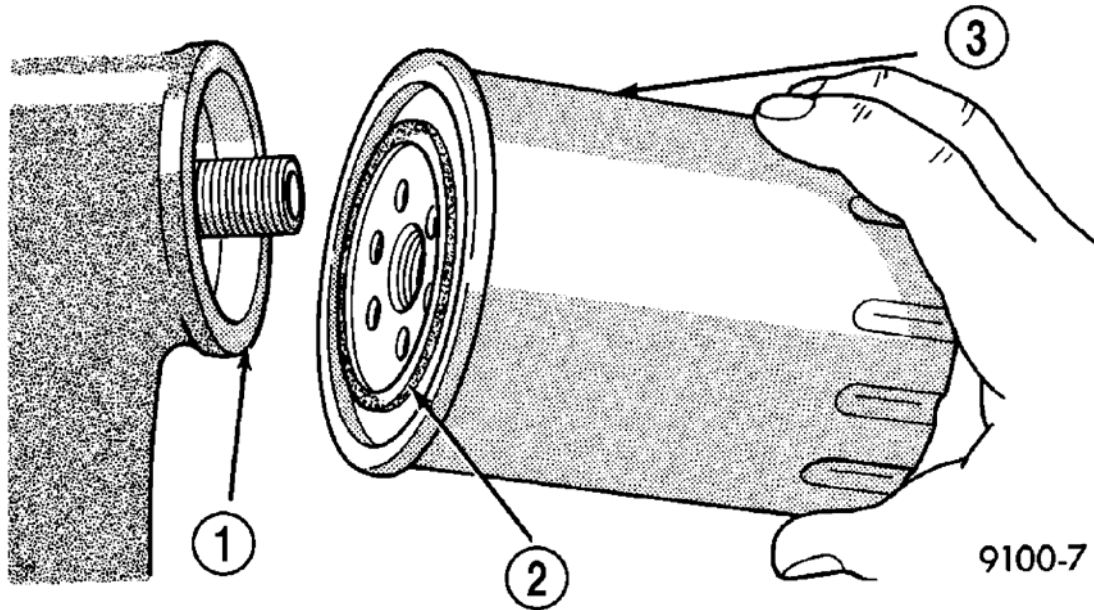


Fig. 142: Oil Filter Sealing Surface - Typical
Courtesy of CHRYSLER LLC

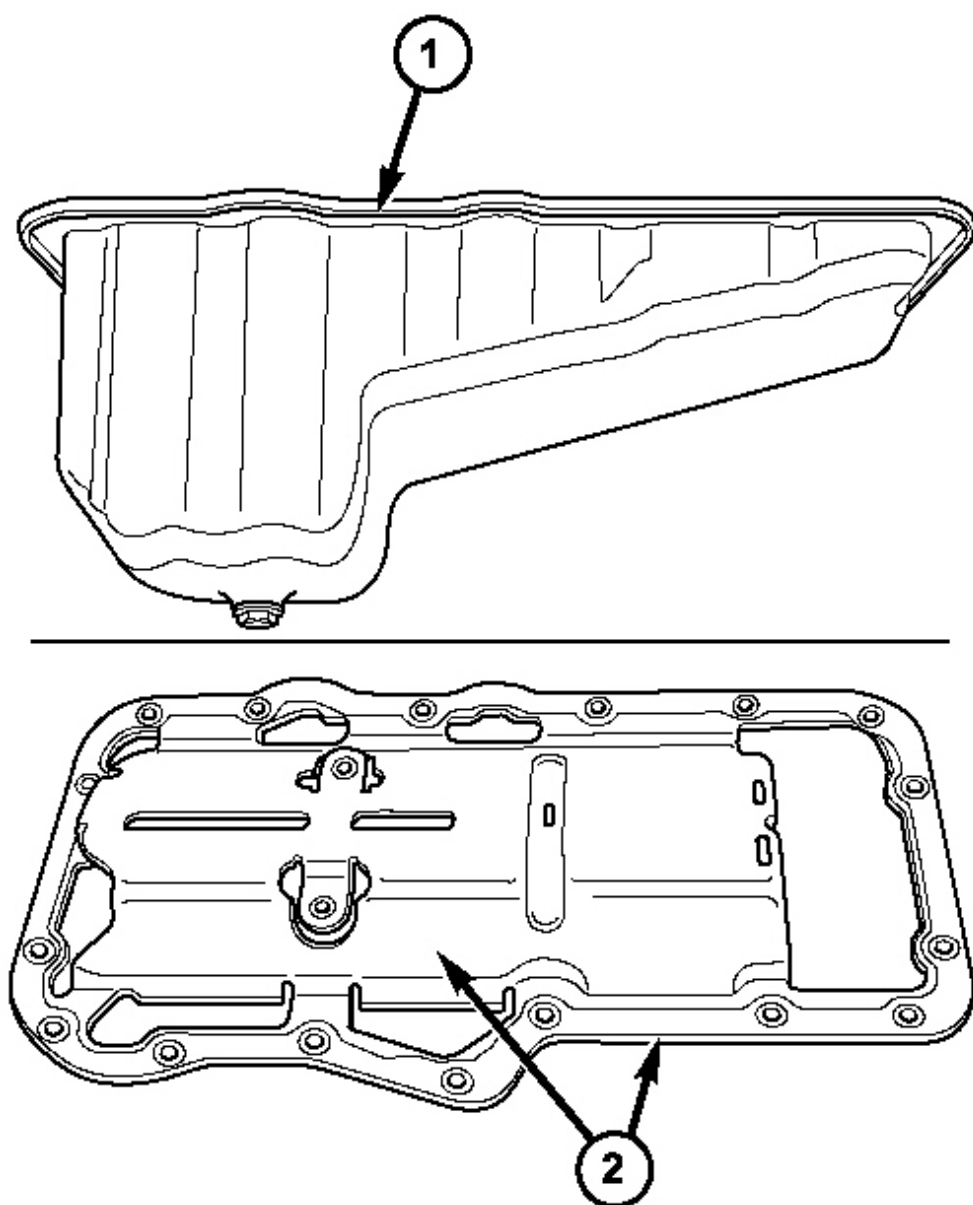
- | |
|--|
| 1 - SEALING SURFACE
2 - RUBBER GASKET
3 - OIL FILTER |
|--|

1. Lightly lubricate oil filter gasket (2) with engine oil. See **Fig. 142**.
2. Thread filter (3) onto adapter nipple. When gasket makes contact with sealing surface, hand tighten filter one full turn, do not over tighten.
3. Add oil, verify crankcase oil level and start engine. Inspect for oil leaks.

PAN-ENGINE OIL

DESCRIPTION

OIL PAN



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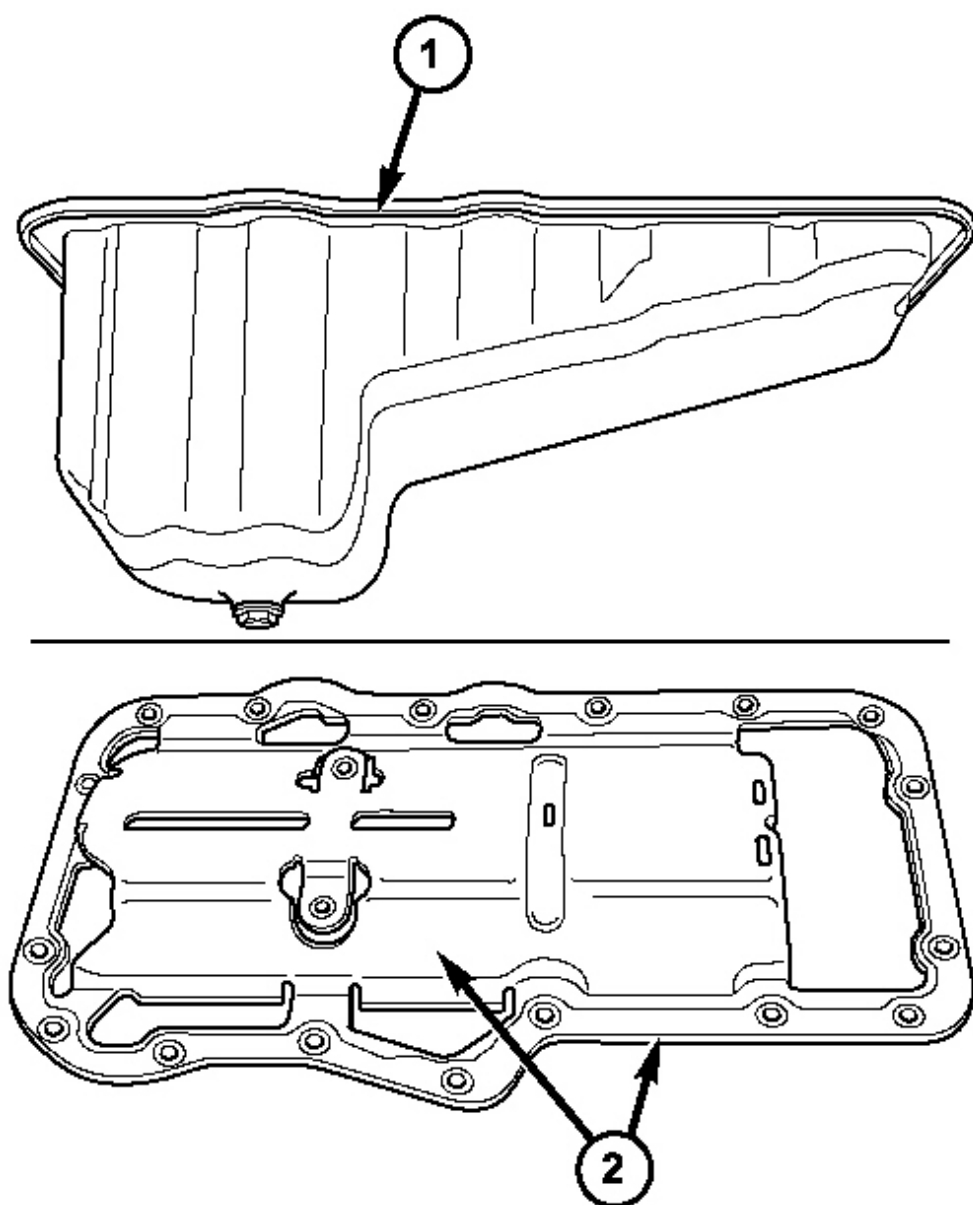
Fig. 143: Oil Pan & Gasket
Courtesy of CHRYSLER LLC

2 - WINDAGE TRAY AND INTEGRATED OIL PAN GASKET

The engine oil pan (1) is made of laminated steel and has a single plane sealing surface. The sandwich style oil pan gasket has an integrated windage tray (2) and steel carrier. The sealing area of the gasket is molded with rubber and is designed to be reused as long as the gasket is not cut, torn or ripped. See **Fig. 143**.

REMOVAL

REMOVAL OIL PAN - 4X2



80ca56ed

Fig. 144: Oil Pan & Gasket
Courtesy of CHRYSLER LLC

2 - WINDAGE TRAY AND INTEGRATED OIL PAN GASKET

1. Disconnect and isolate negative battery cable.
2. Install engine support fixture.
3. Raise and support vehicle.
4. Remove front wheel assemblies.
5. Remove skid plate (if equipped). Refer to **REMOVAL** .
6. Drain engine oil.
7. Mark adjustment cam position of front lower control arm bolts.
8. Remove front lower control arm bolts. Refer to **REMOVAL** .
9. Disconnect LH tie rod. Refer to **REMOVAL** .
10. Disconnect LH lower ball joint. Refer to **REMOVAL** .
11. Disconnect LH strut clevis. Refer to **REMOVAL** .
12. Remove LH front axle. Refer to **REMOVAL** .
13. Remove front axle brace bolts.
14. Remove front prop shaft. Refer to **REMOVAL** .
15. Drain front axle.
16. Using a transmission jack, support front axle.
17. Remove axle bracket bolts.
18. With RH axle still in place, remove front differential.
19. Remove transmission oil cooler line bracket.
20. Remove engine to transmission stiffening bracket.
21. Position Engine Support 8534 on the fender lip and align the slots in the brackets with the fender mounting holes.
22. Secure brackets to the fender using four M6 X 1.0 X 25 MM flanged cap screws.
23. Tighten the thumbscrews to secure the sleeves to the support tube.
24. Secure the support tube in an upright position.
25. Assemble the flat washer, thrust bearing, hook and T handle.
26. Using the M10 X 1.75 mm flanged nut supplied with the support fixture, secure the chain to the front engine lifting stud.
27. Loosen engine mounts.
28. Remove oil pan bolts.
29. Separate oil pan (1) from engine.
30. Move oil pan to one side, remove oils sump bolt and windage tray bolts,

NOTE: **Do not pry on oil pan or oil pan gasket. Gasket is integral to engine windage tray and does not come out with oil pan. See Fig. 144.**

31. Move the oil pan and windage tray (2) toward front of vehicle and remove from vehicle.

REMOVAL - 4X4

1. Disconnect Battery.
2. Install Engine Support Fixture 8534.
3. Raise and support vehicle.
4. Remove front wheel and tire assemblies.
5. Remove skid plate (if equipped).
6. Drain engine oil.
7. Remove engine to transmission structural cover, (if equipped).
8. Remove transmission oil cooler line bracket.
9. Remove the front axle assembly from the vehicle.
10. Loosen both engine mount through bolts.
11. Lower the vehicle.

NOTE: It is not necessary to remove the viscous fan , or fan shroud, for oil pan removal.

12. Raise the engine using Engine Support Fixture 8534, until the viscous fan almost touches the fan shroud.
13. Raise the vehicle.
14. Remove the oil pan bolts.
15. Separate the oil pan from the engine.
16. Remove the (2) nuts and (1) bolt holding the oil pump pick-up tube, and windage tray in place.

NOTE: It will be necessary to move the oil pan from side to side to gain access to these fasteners.

17. Drop the oil pump pick-up tube into the oil pan, and remove the oil pan, pick-up tube, and the windage tray, as an assembly, from the front of the vehicle.

CLEANING

OIL PAN

1. Clean oil pan in solvent and wipe dry with a clean cloth.
2. Clean the oil pan gasket surface. **DO NOT** use a grinder wheel or other abrasive tool to clean sealing surface.
3. Clean oil screen and tube thoroughly in clean solvent.

INSPECTION

OIL PAN

1. Inspect oil drain plug and plug hole for stripped or damaged threads. Repair as necessary.

2. Inspect the oil pan mounting flange for bends or distortion. Straighten flange, if necessary.

INSTALLATION

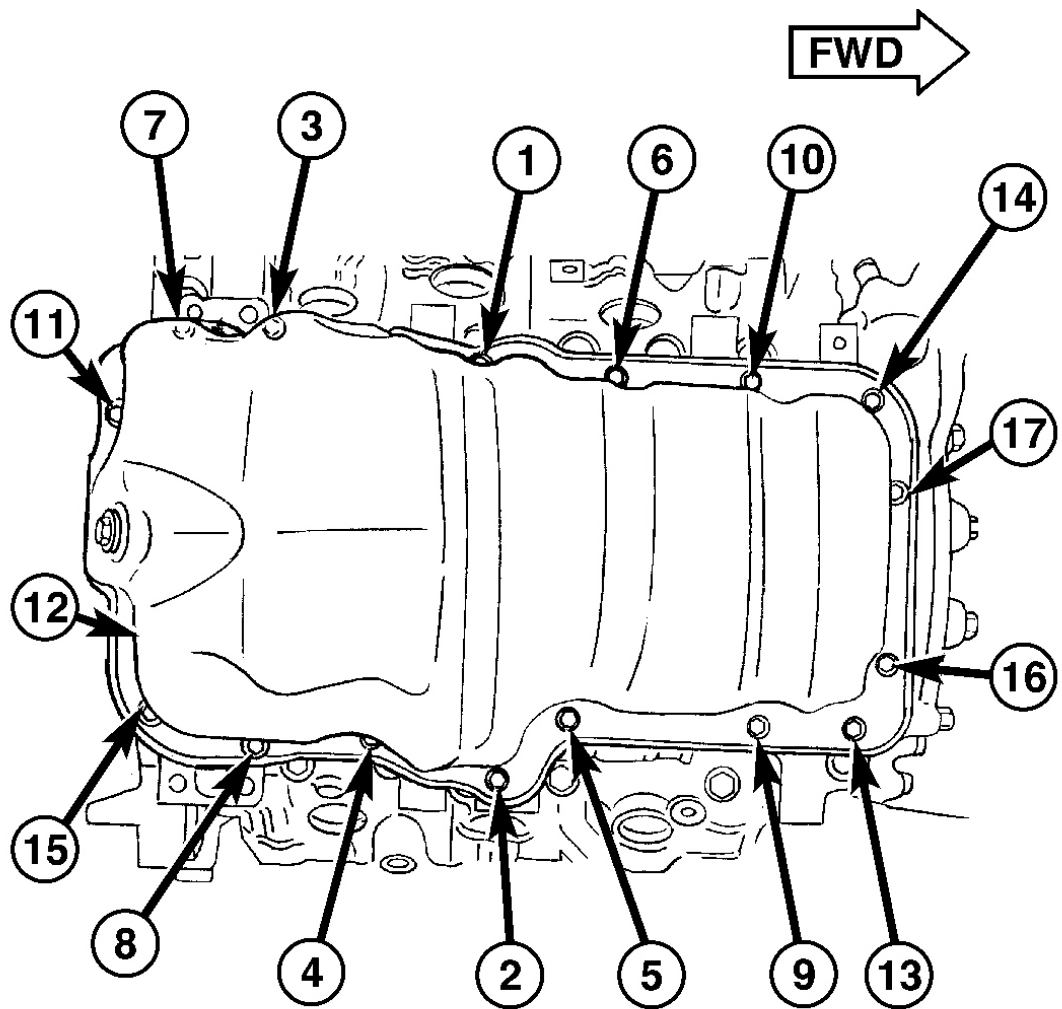
INSTALLATION - 4X4

1. Inspect oil pan gasket for defects, and replace if necessary.
2. Clean the oil pan and block gasket mating surfaces.
3. Drop the oil pump pick-up tube into the oil pan, and install the oil pan, pick-up tube, and the windage tray, as an assembly, from the front of the vehicle.
4. Install the windage tray, then the oil pump pick-up tube, and the (2) nuts and (1) bolt holding the oil pump pick-up tube, in place.

NOTE: **It will be necessary to move the oil pan from side to side to gain access to these fasteners.**

5. Torque the pick-up tube fasteners.
6. Install the oil pan.
7. Install and torque the oil pan bolts.
8. Install the engine to transmission structural cover, (if equipped).
9. Lower the vehicle.
10. Lower the engine using Engine Support Fixture 8534.
11. Remove the Engine Support Fixture 8534.
12. Raise the vehicle.
13. Tighten both engine mount through bolts.
14. Install the transmission oil cooler line bracket.
15. Install the front axle assembly to the vehicle.
16. Install the skid plate (if equipped).
17. Install the front wheel and tire assemblies.
18. Lower the vehicle.
19. Refill engine oil.
20. Reconnect battery.
21. Start engine, and check for leaks.

INSTALLATION OIL PAN - 4X2



80cc65e7

Fig. 145: Oil Pan Bolt Torque Sequence - 3.7L

Courtesy of CHRYSLER LLC

1. Clean the oil pan gasket mating surface of the bedplate and oil pan.
2. Clean the oil pan and block gasket mating surfaces.
3. Inspect integrated oil pan gasket, and replace as necessary.
4. Drop the oil pump pick-up tube into the oil pan, and install the oil pan, pick-up tube, and the windage tray, as an assembly, from the front of the vehicle.
5. Install the windage tray, then the oil pump pick-up tube, and the (2) nuts and (1) bolt holding the oil pump pick-up tube, in place.

NOTE: It will be necessary to move the oil pan from side to side to gain access to these fasteners.

6. Tighten the pick-up tube fasteners.
7. Install the oil pan.
8. Install and tighten the oil pan bolts. See **Fig. 145**.
9. Install the engine to transmission structural cover, (if equipped).
10. Lower engine, and remove Engine Support 8534.
11. Lower the vehicle.
12. Lower the engine using Engine Support Fixture 8534.
13. Remove the Engine Support Fixture 8534.
14. Raise the vehicle.
15. Tighten both engine mount through bolts.
16. Install the transmission oil cooler line bracket.
17. Lower the vehicle.
18. Refill engine oil.
19. Reconnect battery.
20. Start engine and check for leaks.

SWITCH-OIL PRESSURE

DESCRIPTION

OIL PRESSURE SENSOR

The oil pressure switch is a pressure sensitive switch that is activated by the engine's oil pressure (in the main oil gallery). The switch is a two terminal device (one terminal is provided to the wiring harness and the other terminal is the switch's metal housing that screws into the engine block).

OPERATION

OIL PRESSURE SWITCH

The oil pressure switch is normally "Closed." The switch changes from a "Closed" circuit to an "Open" circuit, on increasing pressure of 7 psig. The oil pressure switch changes from an "Open" circuit to a "Closed" circuit, on decreasing pressure, between 2 psig and 4 psig.

REMOVAL

OIL PRESSURE SWITCH

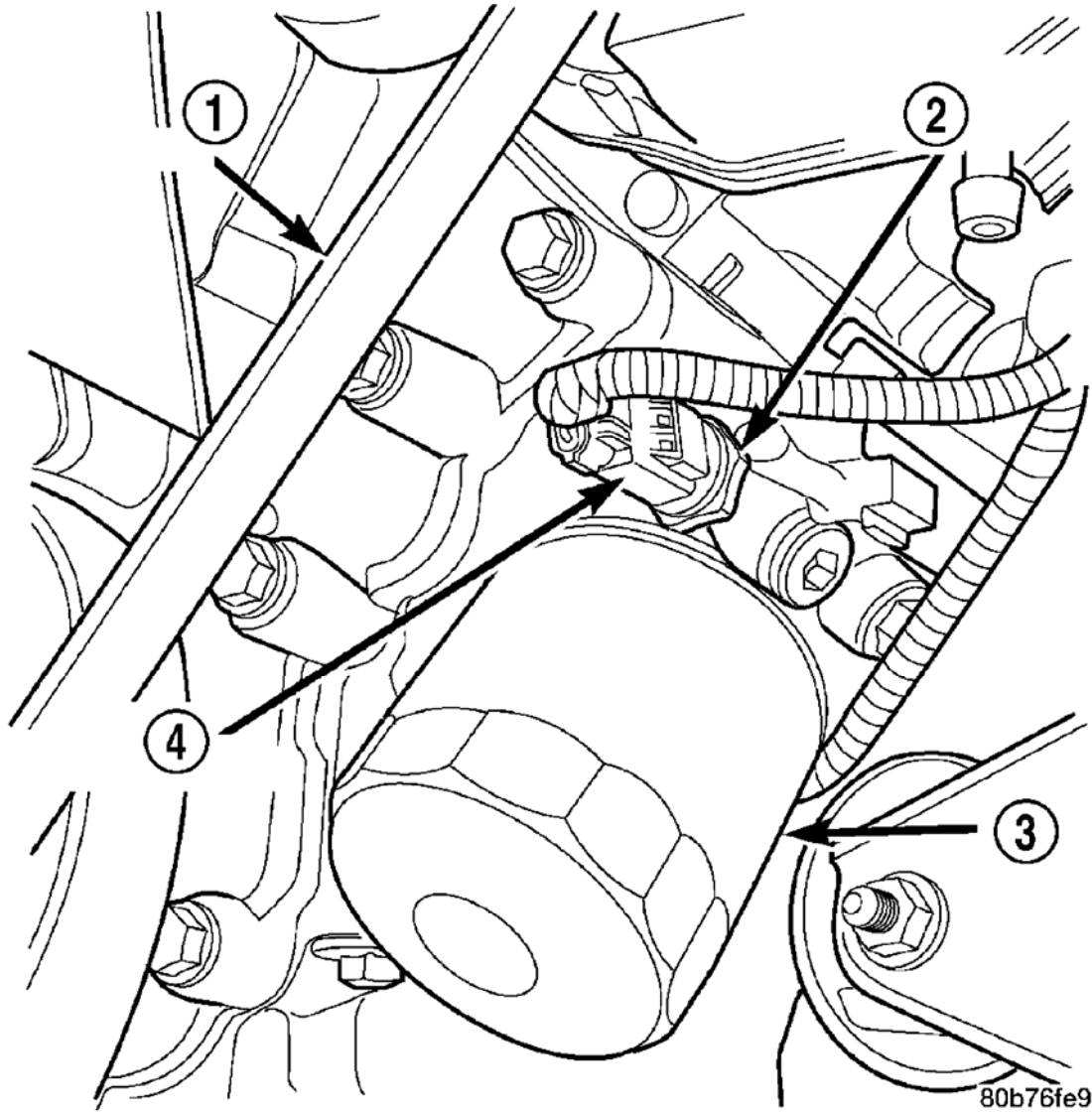


Fig. 146: Locating Oil Pressure Sending Unit, Connector & Oil Filter
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - BELT2 - OIL PRESSURE SENSOR3 - OIL FILTER4 - ELEC. CONNECTOR |
|---|

1. Disconnect the negative cable from the battery.
2. Raise vehicle on hoist.
3. Remove front splash shield.
4. Disconnect oil pressure sender wire (4).

5. Remove the pressure sender (2). See **Fig. 146**.

INSTALLATION

OIL PRESSURE SWITCH

1. Install oil pressure sender.
2. Connect oil pressure sender wire.
3. Install front splash shield.
4. Lower vehicle.
5. Connect the negative battery cable.

PUMP-ENGINE OIL

REMOVAL

OIL PUMP

1. Remove the oil pan and pick-up tube. See **REMOVAL**.
2. Remove the timing chain cover. See **REMOVAL**.
3. Remove the timing chains and tensioners. See **REMOVAL**.
4. Remove the four bolts, primary timing chain tensioner and the oil pump.

DISASSEMBLY

OIL PUMP

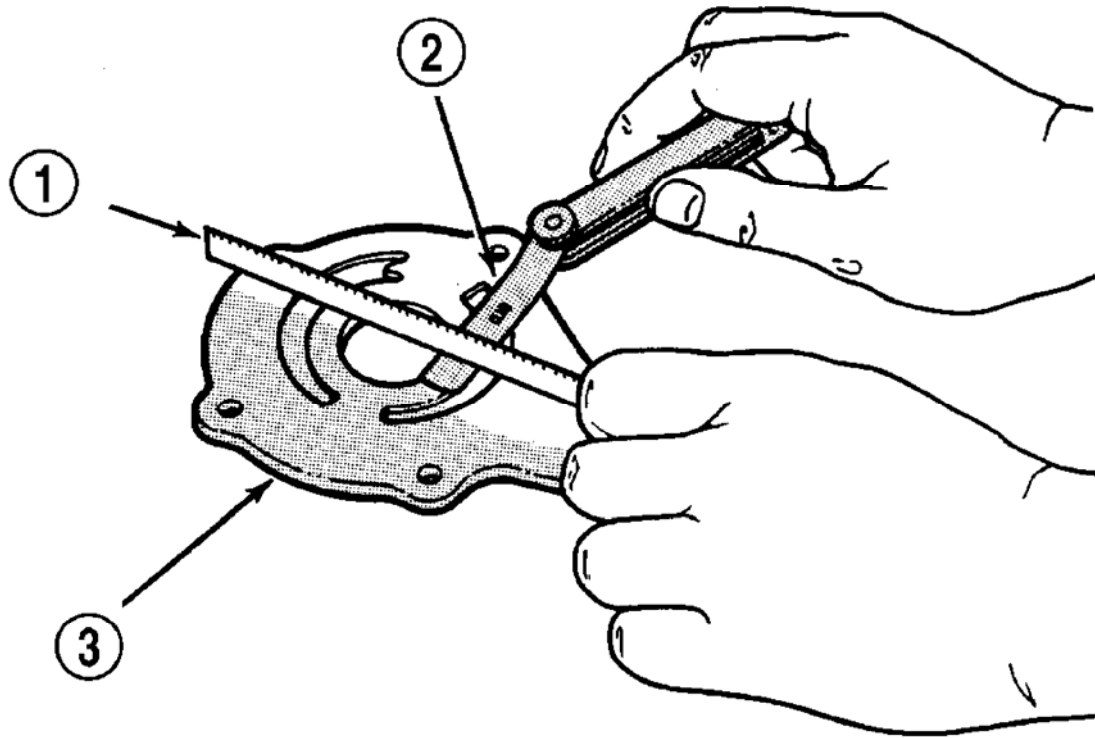
1. Remove oil pump cover screws and lift off cover plate.
2. Remove pump inner and outer rotors.

NOTE: **Once the oil pressure relief valve, cup plug, and pin are removed, the pump assembly must be replaced.**

3. If it is necessary to remove the pressure relief valve, drive the roll pin from pump housing and remove cup plug, spring and valve.

INSPECTION

OIL PUMP



9309-184

Fig. 147: Checking Oil Pump Cover Flatness
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - STRAIGHT EDGE
2 - FEELER GAUGE
3 - OIL PUMP COVER |
|---|

CAUTION: Oil pump pressure relief valve and spring should not be removed from the oil pump. If these components are disassembled and or removed from the pump the entire oil pump assembly must be replaced.

1. Clean all parts thoroughly. Mating surface of the oil pump housing should be smooth. If the pump cover is scratched or grooved the oil pump assembly should be replaced.
2. Lay a straight edge across the pump cover surface (3). If a 0.025 mm (0.001 in.) feeler gauge (2) can be inserted between the cover and the straight edge the oil pump assembly should be replaced.

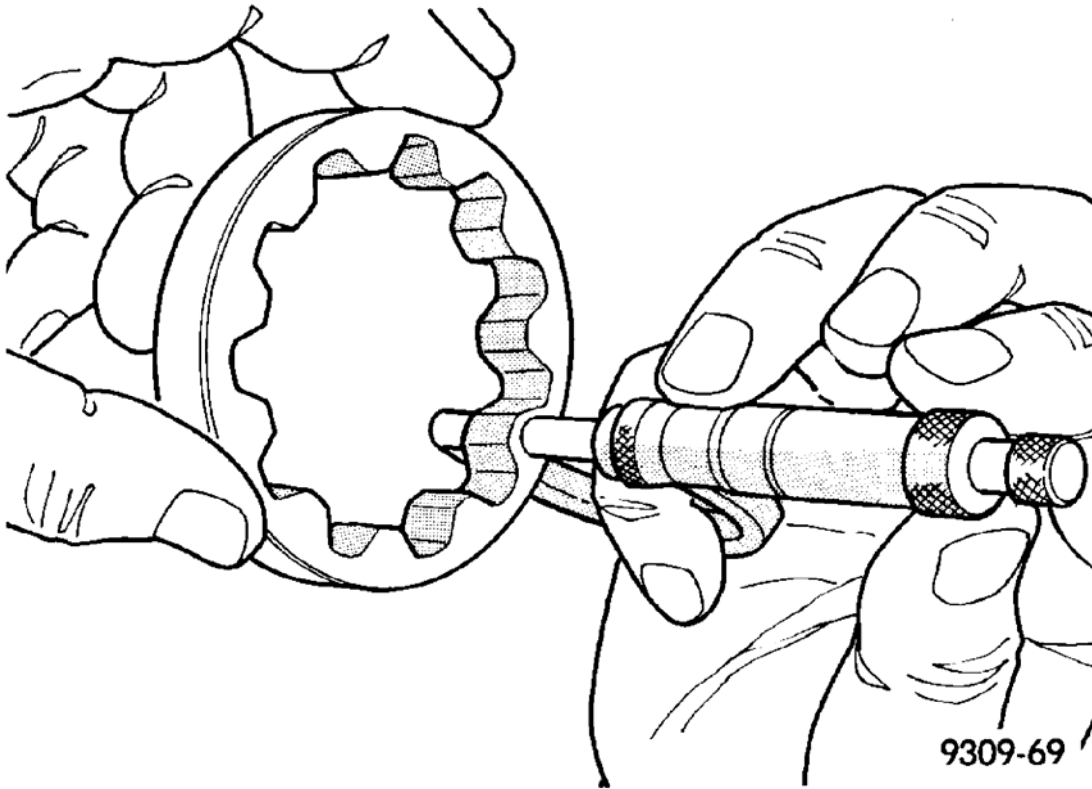
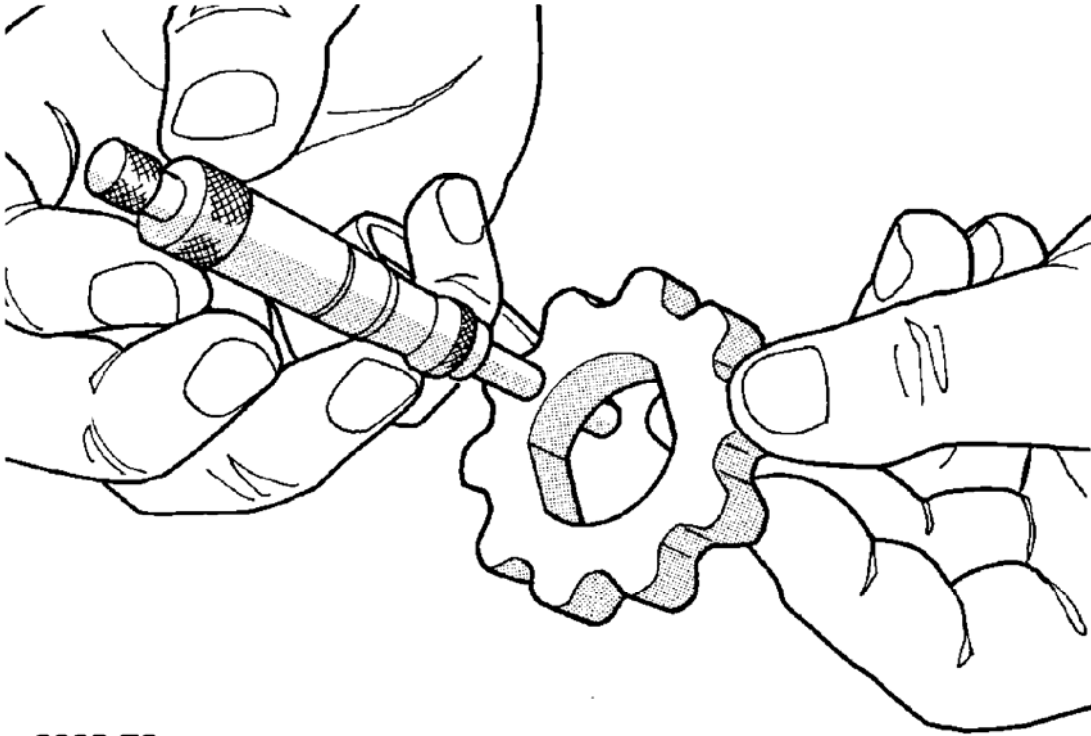


Fig. 148: Measuring Outer Rotor Thickness
Courtesy of CHRYSLER LLC

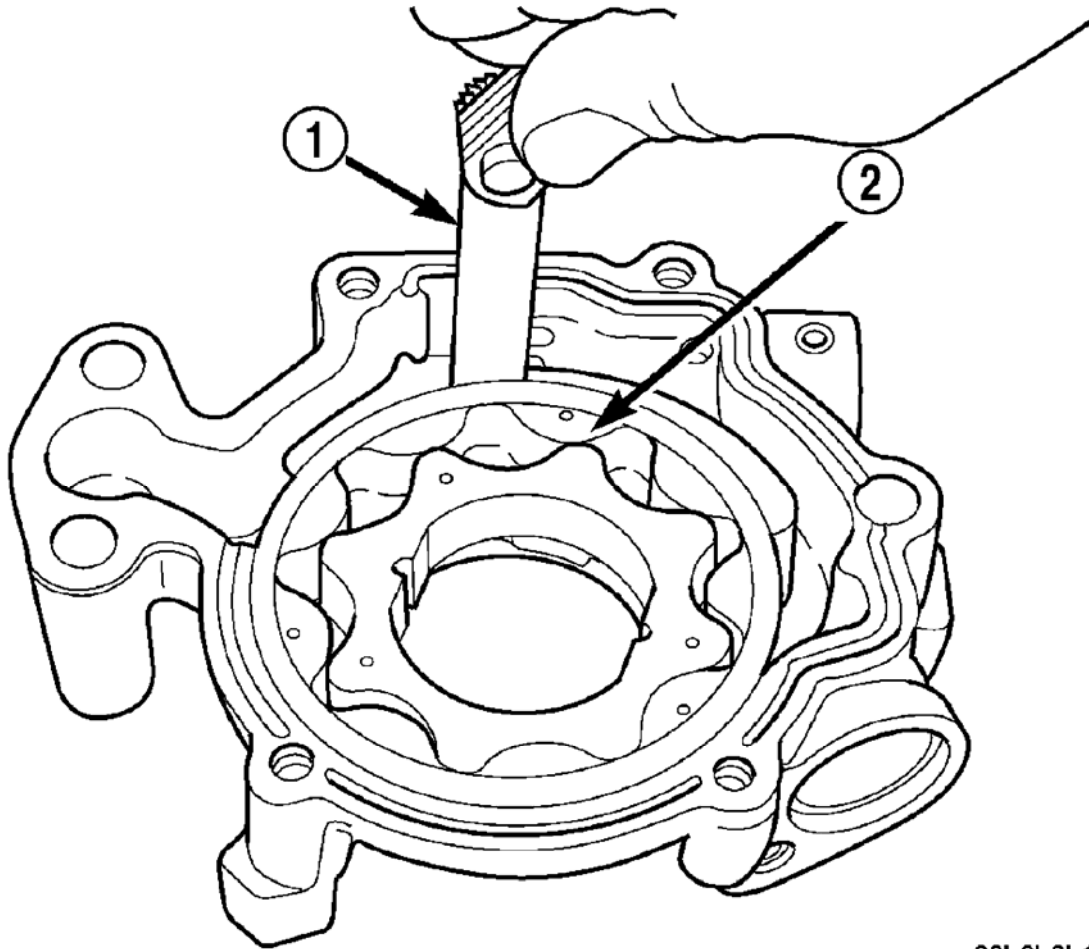
3. Measure the thickness of the outer rotor. If the outer rotor thickness measures at 12.005 mm (0.472 in.) or less the oil pump assembly must be replaced.
4. Measure the diameter of the outer rotor. If the outer rotor diameter measures at 85.925 mm (3.382 in.) or less the oil pump assembly must be replaced.



9309-70

Fig. 149: Measuring Inner Rotor Thickness
Courtesy of CHRYSLER LLC

5. Measure the thickness of the inner rotor. If the inner rotor thickness measures at 12.005 mm (0.472 in.) or less then the oil pump assembly must be replaced.



80b6b3b1

Fig. 150: Measuring Outer Rotor Clearance
Courtesy of CHRYSLER LLC

1 - FEELER GAUGE
2 - OUTER ROTOR

6. Slide outer rotor (2) into the body of the oil pump. Press the outer rotor to one side of the oil pump body and measure clearance between the outer rotor and the body. If the measurement is 0.235 mm (0.009 in.) or more the oil pump assembly must be replaced.

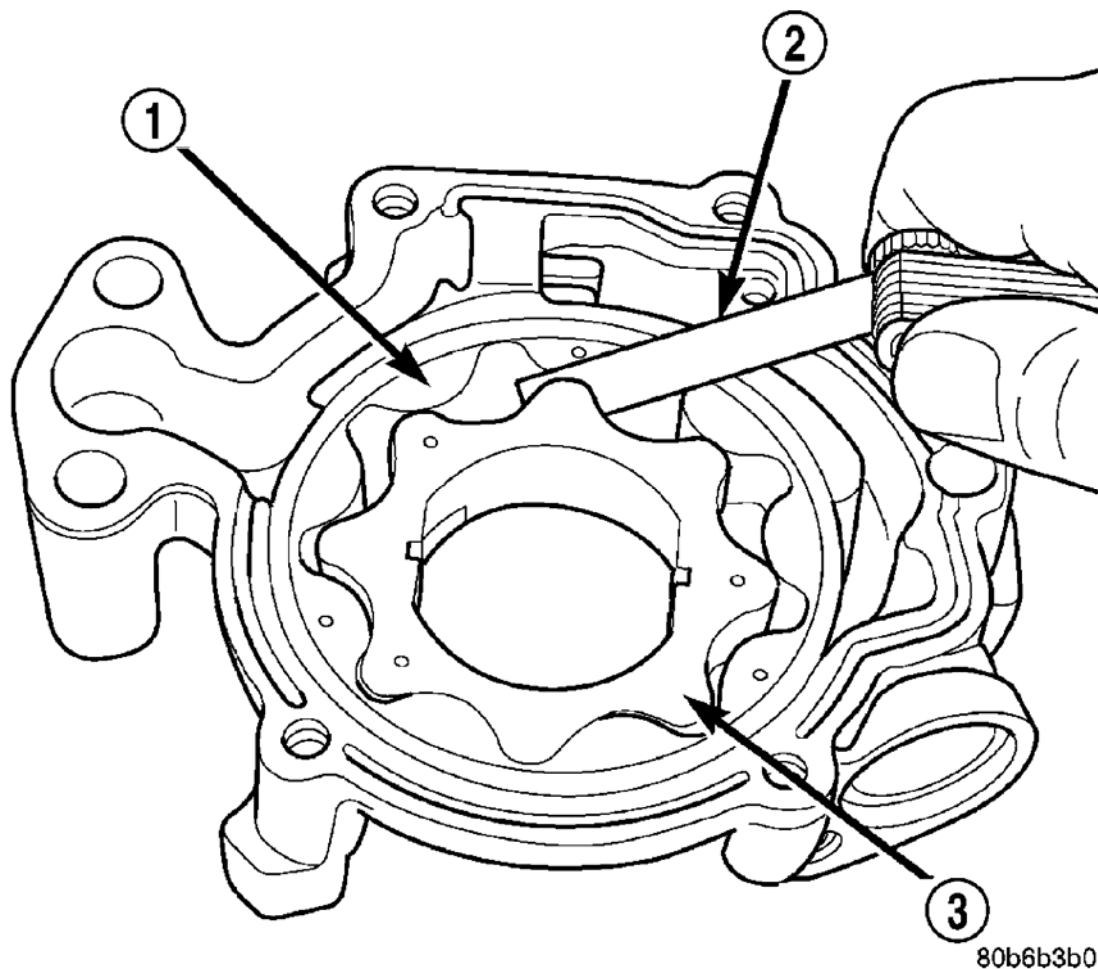
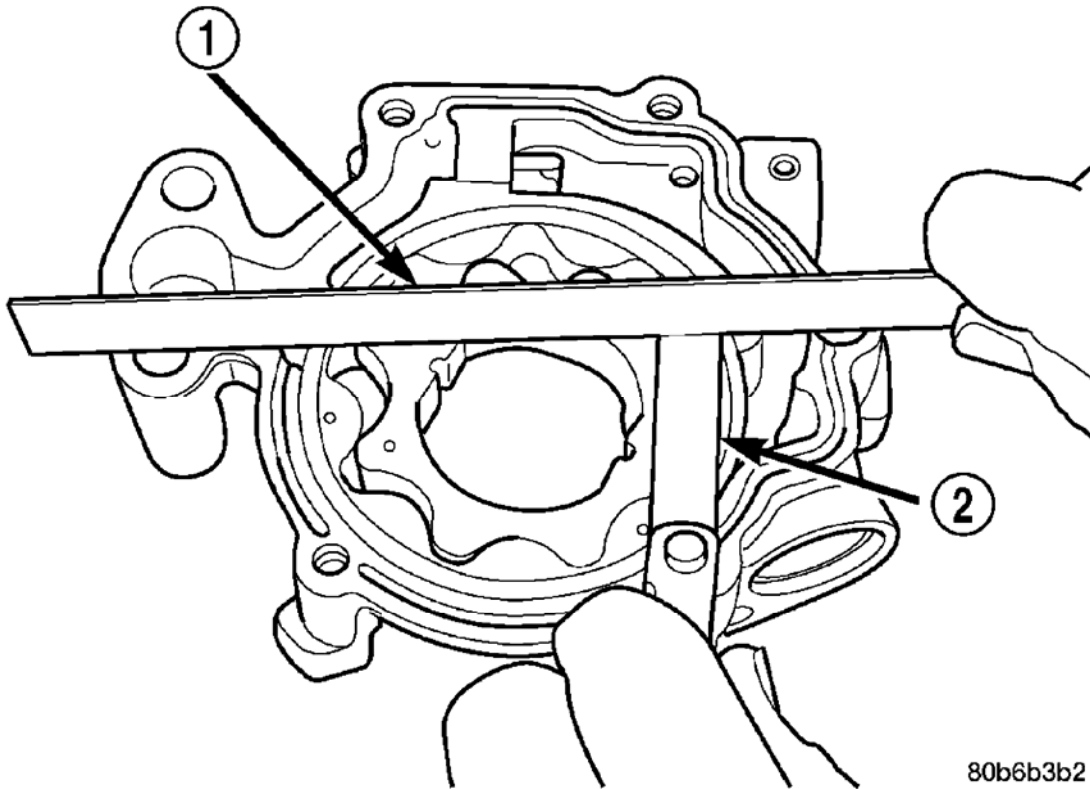


Fig. 151: Measuring Clearance Between Rotors
Courtesy of CHRYSLER LLC

1 -
OUTER
ROTOR
2 -
FEELER
GAUGE
3 -
INNER
ROTOR

7. Install the inner rotor into the oil pump body. Measure the clearance between the inner (3) and outer (1) rotors. If the clearance between the rotors is .150 mm (0.006 in.) or more the oil pump assembly must be replaced.



80b6b3b2

Fig. 152: Measuring Flatness Of Rotors
Courtesy of CHRYSLER LLC

1 - STRAIGHT EDGE
2 - FEELER GAUGE

8. Place a straight edge (1) across the body of the oil pump (between the bolt holes), if a feeler gauge (2) of .095 mm (0.0038 in.) or greater can be inserted between the straightedge and the rotors, the pump must be replaced.

NOTE: The 3.7L/4.7L Oil pump is released as an assembly. There are no DaimlerChrysler part numbers for Sub-Assembly components. In the event the oil pump is not functioning or out of specification it must be replaced as an assembly.

ASSEMBLY

OIL PUMP

1. Wash all parts in a suitable solvent and inspect carefully for damage or wear.
2. Install inner and outer rotors
3. Install oil pump cover plate and install cover bolts and tighten them to 12 N.m (105 in. lbs.).
4. Prime oil pump before installation by filling rotor cavity with engine oil.
5. If oil pressure is low and pump is within specifications, inspect for worn engine bearings or other causes for oil pressure loss.

INSTALLATION

OIL PUMP

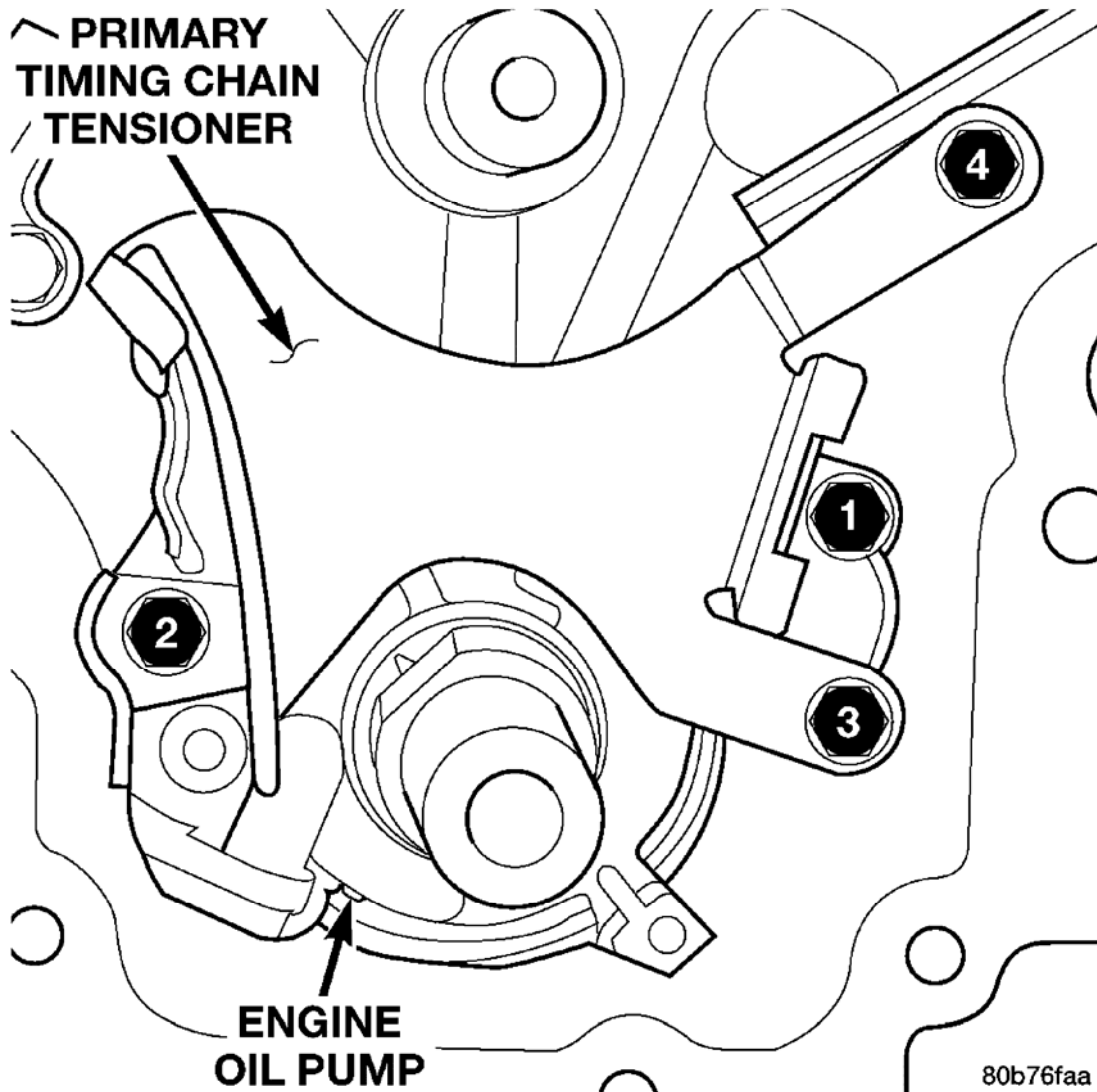


Fig. 153: Primary Timing Chain Tensioner Bolt Tightening Sequence
Courtesy of CHRYSLER LLC

1. Position the oil pump onto the crankshaft and install two oil pump retaining bolts.
2. Position the primary timing chain tensioner and install the two retaining bolts.
3. Tighten the oil pump and primary timing chain tensioner retaining bolts to 28 N.m (250 in. lbs.) in the sequence shown in illustration. See **Fig. 153**.
4. Install the secondary timing chain tensioners and timing chains. See **INSTALLATION**.
5. Install the timing chain cover. See **INSTALLATION**.
6. Install the pick-up tube and oil pan. See **INSTALLATION**.

MANIFOLDS

MANIFOLD-INTAKE

DESCRIPTION

INTAKE MANIFOLD

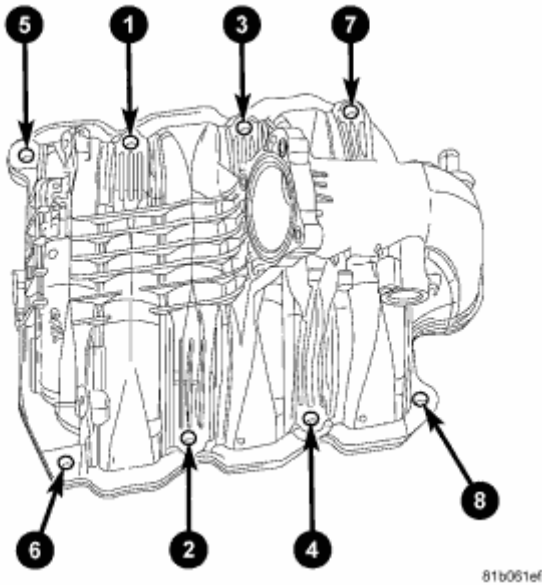
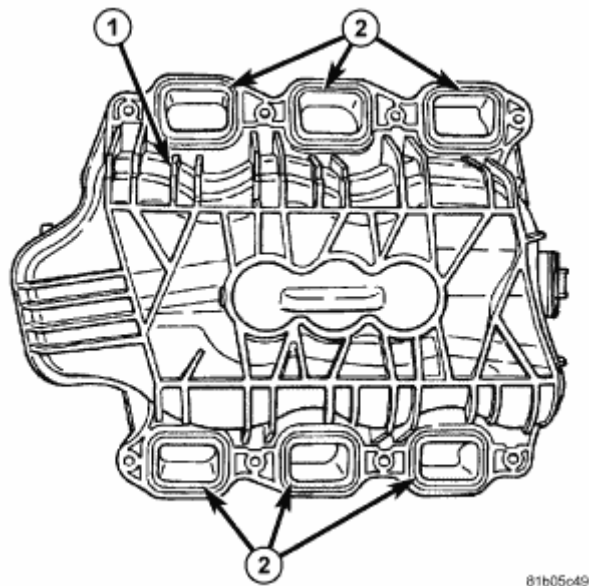


Fig. 154: 3.7L Intake Torque Sequence
Courtesy of CHRYSLER LLC

The intake manifold is made of a composite material and features 300 mm (11.811 in.) long runners which maximizes low end torque. See **Fig. 154**.



81b05c49

Fig. 155: Intake Manifold Seals
Courtesy of CHRYSLER LLC

The intake manifold uses single plane sealing which consist of six individual press in place port gaskets (2) to prevent leaks. The throttle body attaches directly to the intake manifold.

DIAGNOSIS AND TESTING

INTAKE MANIFOLD LEAKS

An intake manifold air leak is characterized by lower than normal manifold vacuum. Also, one or more cylinders may not be functioning.

WARNING: USE EXTREME CAUTION WHEN THE ENGINE IS OPERATING. DO NOT STAND IN A DIRECT LINE WITH THE FAN. DO NOT PUT YOUR HANDS NEAR THE PULLEYS, BELTS OR THE FAN. DO NOT WEAR LOOSE CLOTHING.

1. Start the engine.
2. Spray a small stream of water (spray bottle) at the suspected leak area.
3. If engine RPM'S change, the area of the suspected leak has been found.
4. Repair as required.

REMOVAL

INTAKE MANIFOLD

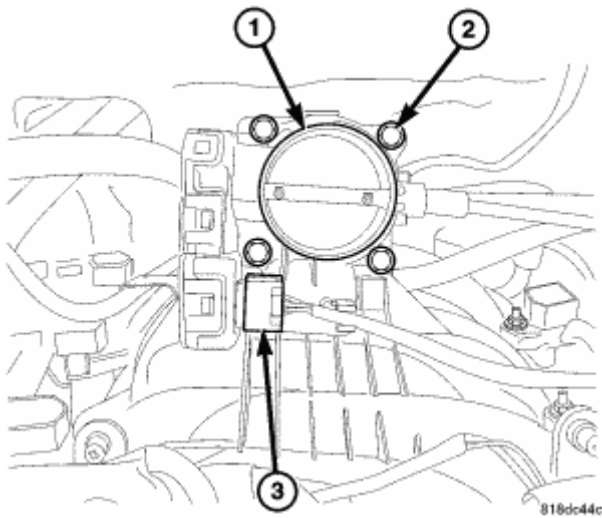


Fig. 156: View Of Throttle Body - 3.7L
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - THROTTLE BODY
2 - MOUNTING BOLTS
3 - ELEC. CONNECTOR |
|--|

1. Bleed the fuel system. Refer to **STANDARD PROCEDURE** .
2. Disconnect the negative cable from battery.
3. Remove the resonator assembly and air inlet hose.
4. Drain the cooling system below coolant temperature sensor level.
5. Disconnect the electronic throttle control (ETC) connector (3).

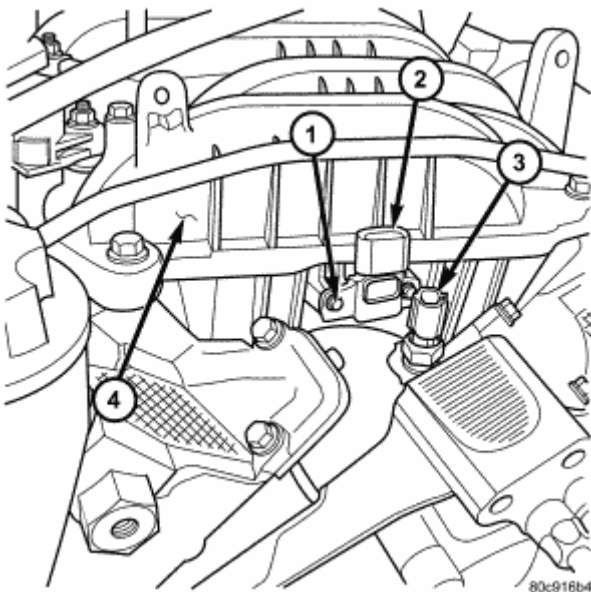


Fig. 157: MAP Sensor - 3.7L V-6
Courtesy of CHRYSLER LLC

- | |
|------------------------------|
| 1 - MOUNTING SCREWS |
| 2 - MAP SENSOR |
| 3 - ECT SENSOR |
| 4 - FRONT OF INTAKE MANIFOLD |

6. Disconnect electrical connectors for the following components:

Coolant Temperature Sensor

Manifold Absolute Pressure (MAP) Sensor (2)

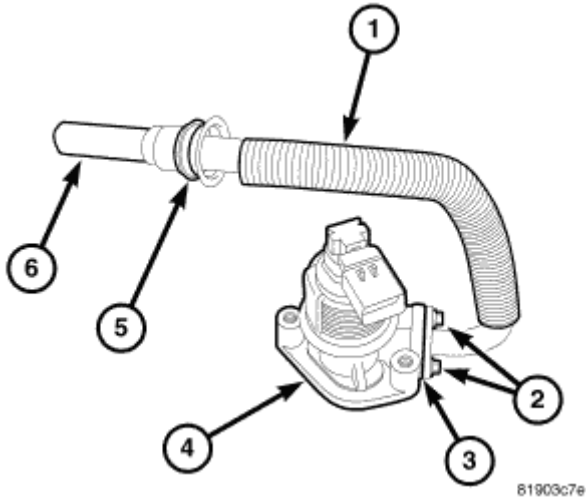


Fig. 158: EGR Solenoid/Tube Assembly

Courtesy of CHRYSLER LLC

7. Disconnect vapor purge hose, brake booster hose, and positive crankcase ventilation (PCV) hose.
8. Disconnect and remove ignition coil towers.
9. Remove the top oil dipstick tube retaining bolt.
10. Remove the EGR tube (1). Refer to **REMOVAL** .
11. Remove fuel rail. Refer to **REMOVAL** .

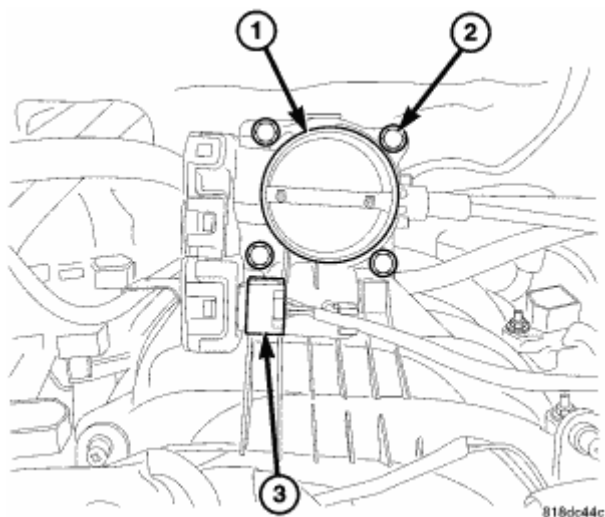


Fig. 159: View Of Throttle Body - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---------------------|
| 1 - THROTTLE BODY |
| 2 - MOUNTING BOLTS |
| 3 - ELEC. CONNECTOR |

12. Remove throttle body assembly (1).

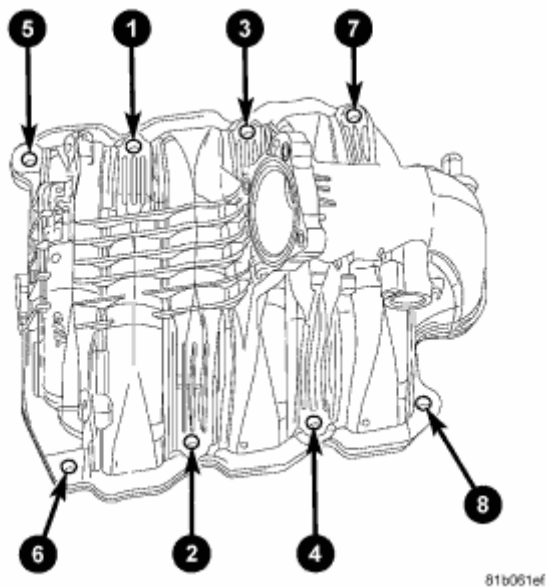


Fig. 160: 3.7L Intake Torque Sequence
Courtesy of CHRYSLER LLC

13. Remove the intake manifold retaining fasteners in reverse order of tightening sequence.

14. Remove the intake manifold.

INSTALLATION

INTAKE MANIFOLD

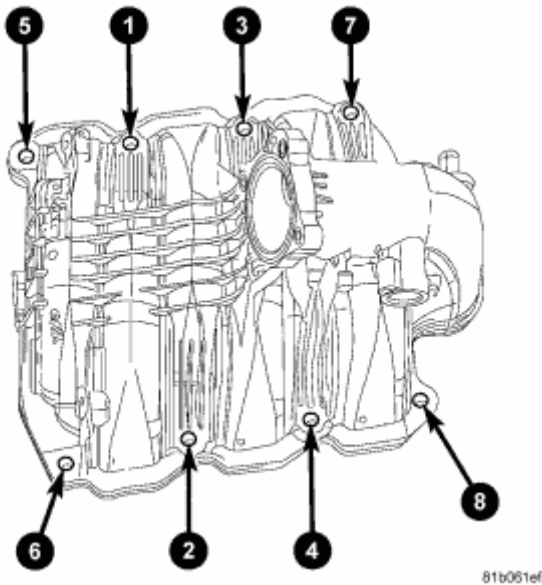


Fig. 161: 3.7L Intake Torque Sequence
Courtesy of CHRYSLER LLC

1. Install the intake manifold seals.
2. Install the intake manifold.
3. Install the intake manifold retaining bolts and tighten in sequence shown in illustration to 12 N.m (105 in. lbs.).

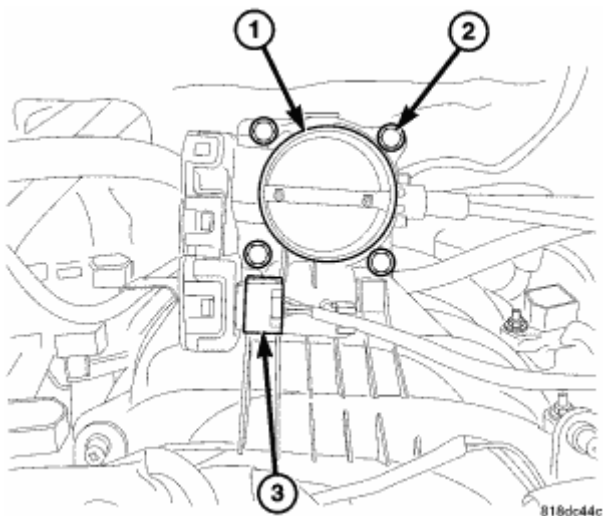


Fig. 162: View Of Throttle Body - 3.7L
Courtesy of CHRYSLER LLC

1 - THROTTLE BODY
2 - MOUNTING BOLTS

CAUTION: Proper torque of the throttle body is critical to normal operation. If the throttle body is over-torqued, damage to the throttle body can occur resulting in throttle plate malfunction.

4. Install the throttle body-to-intake manifold O-ring.
5. Install the throttle body (1) to intake manifold.
6. Install the four mounting bolts (2). Tighten bolts to 7 N.m (60 in. lbs.).
7. Install electrical connector (3).

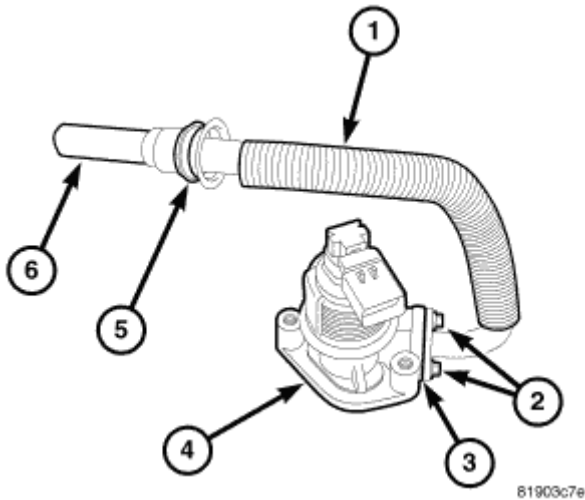


Fig. 163: View Of EGR Solenoid/Tube Assembly
Courtesy of CHRYSLER LLC

8. Install the fuel rail.
9. Install the EGR tube (1). Refer to **INSTALLATION**.
10. Install ignition coil towers.

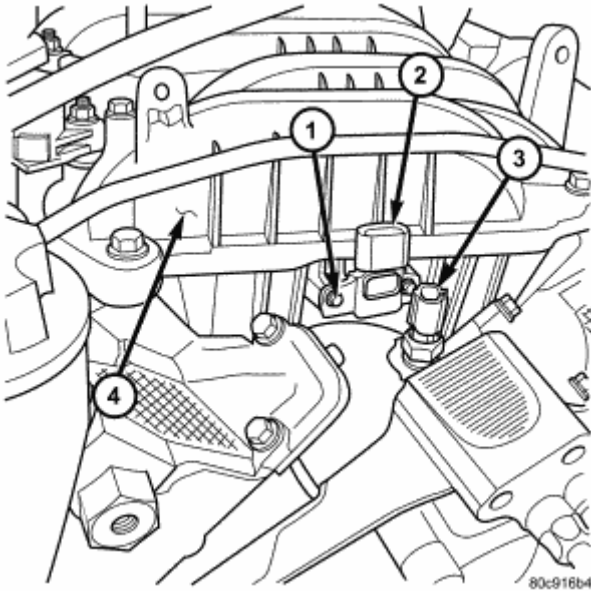


Fig. 164: Identifying MAP Sensor - 3.7L V-6
Courtesy of CHRYSLER LLC

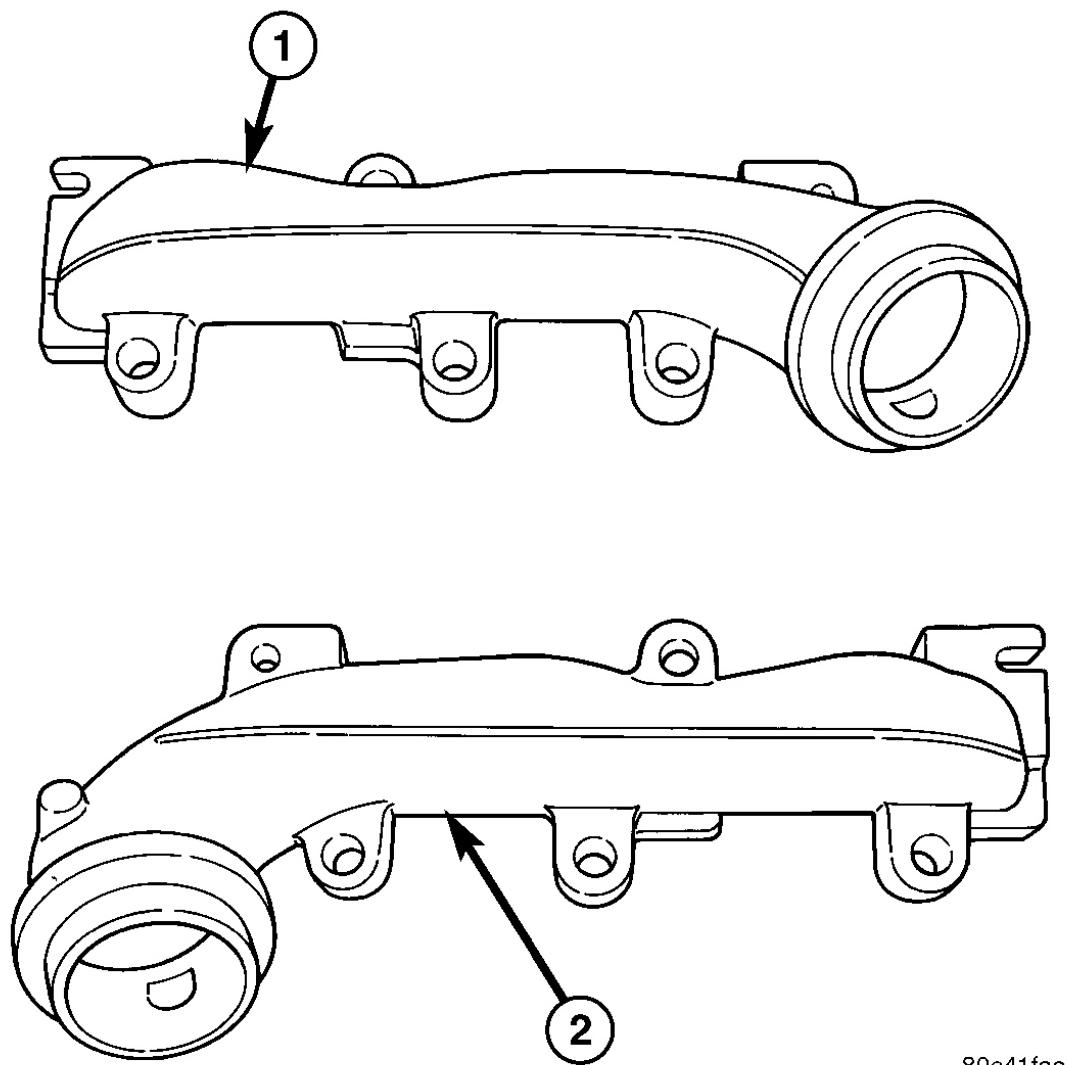
- 1 - MOUNTING SCREWS
- 2 - MAP SENSOR
- 3 - ECT SENSOR
- 4 - FRONT OF INTAKE MANIFOLD

11. Connect electrical connectors for the following components:
 Manifold Absolute Pressure (MAP) Sensor (2)
 Coolant Temperature (CTS) Sensor
 Ignition coil towers
12. Install top oil dipstick tube retaining bolt.
13. Connect Vapor purge hose, Brake booster hose, Positive crankcase ventilation (PCV) hose.
14. Fill the cooling system.
15. Install the resonator assembly and air inlet hose.
16. Connect the negative cable to battery.
17. Using the scan tool, perform the ETC Relearn function.

MANIFOLD-EXHAUST

DESCRIPTION

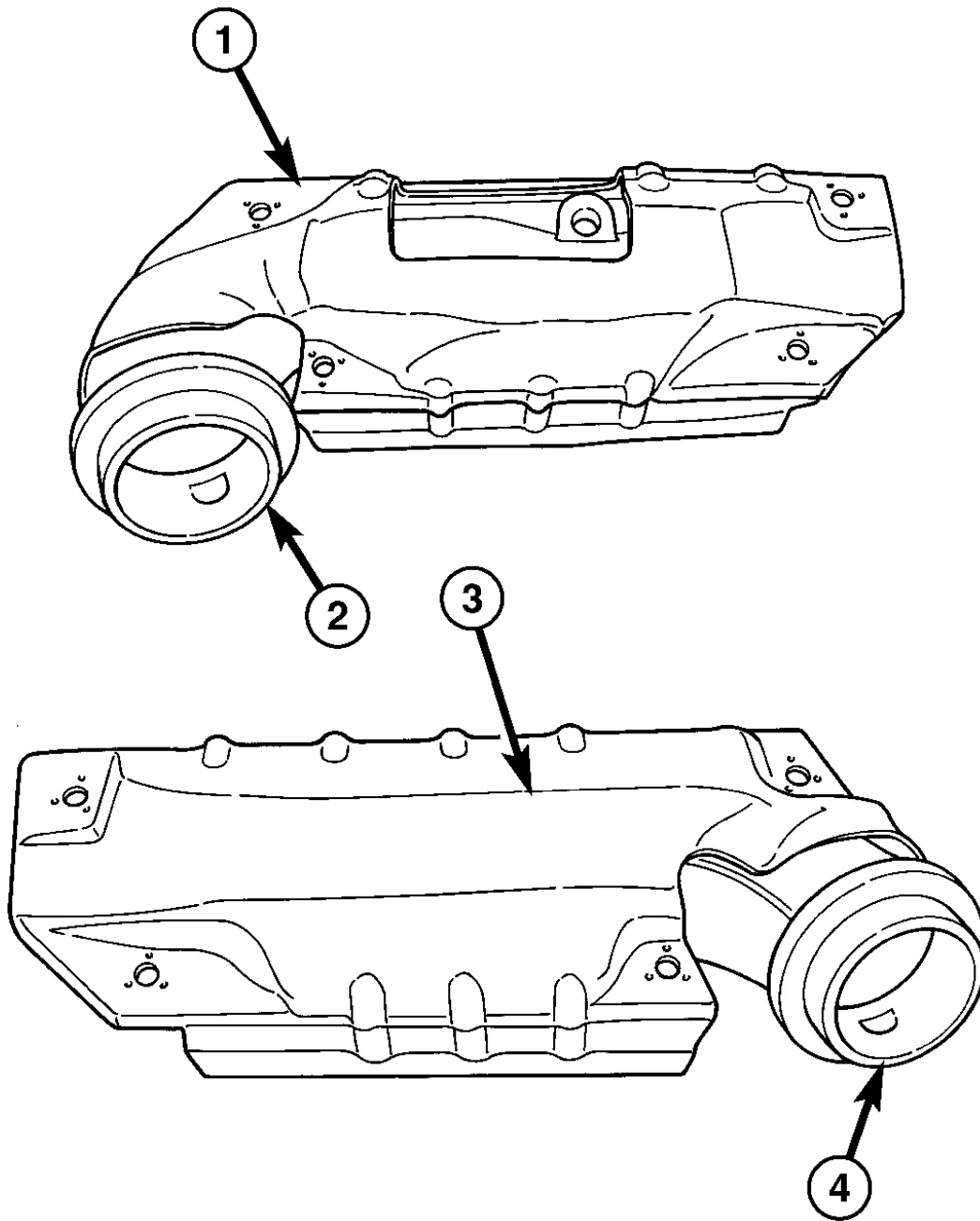
EXHAUST MANIFOLD



80c41fae

Fig. 165: Exhaust Manifolds
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - LEFT SIDE EXHAUST MANIFOLD
2 - RIGHT SIDE EXHAUST MANIFOLD |
|---|



80c41faf

Fig. 166: Exhaust Manifold Heat Shields
Courtesy of CHRYSLER LLC

1 - RIGHT SIDE EXHAUST MANIFOLD HEAT SHIELD

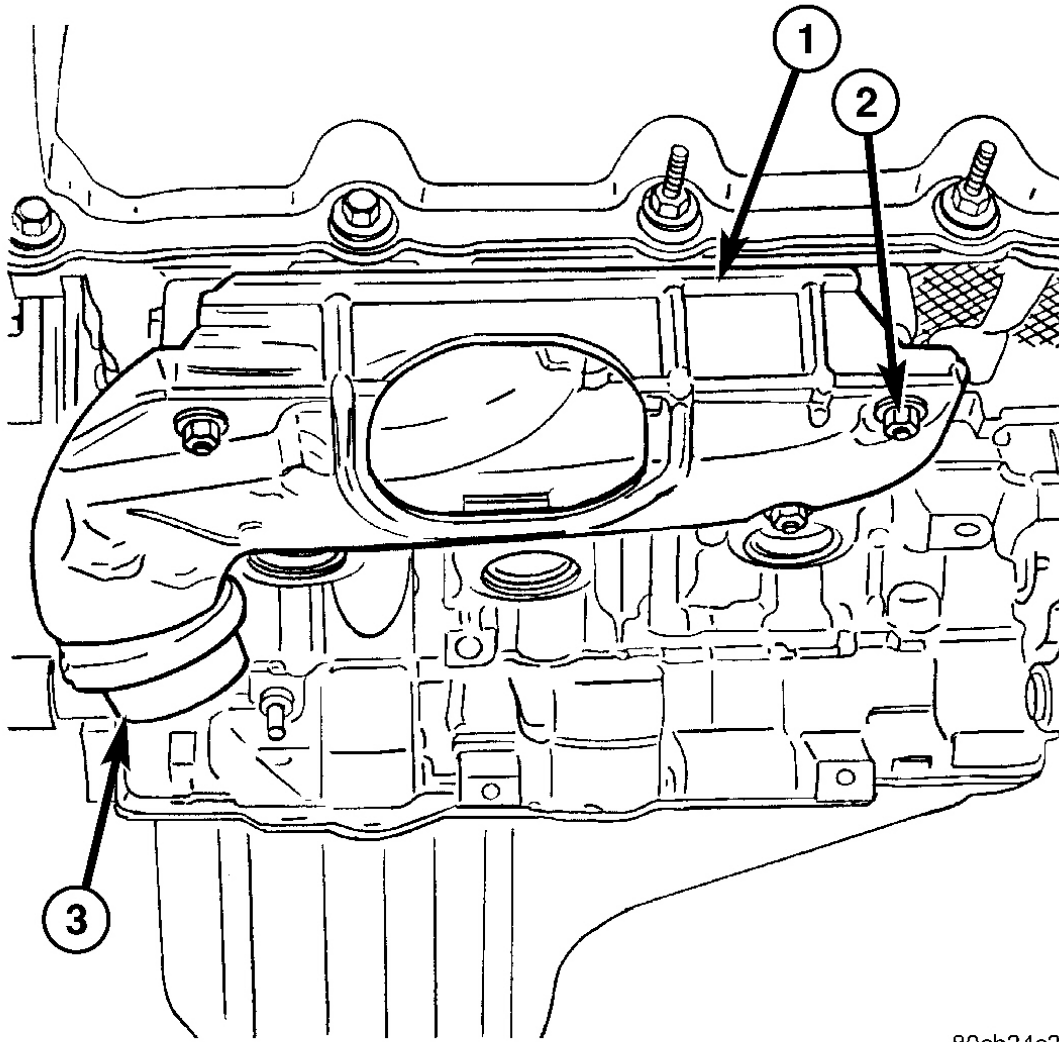
- 2 - RIGHT SIDE EXHAUST MANIFOLD FLANGE
- 3 - LEFT SIDE EXHAUST MANIFOLD HEAT SHIELD
- 4 - LEFT SIDE EXHAUST MANIFOLD FLANGE

The exhaust manifolds (1,2) are log style with a patented flow enhancing design to maximize performance. The exhaust manifolds are made of high silicon molybdenum cast iron. A perforated core graphite exhaust manifold gasket is used to improve sealing to the cylinder head. The exhaust manifolds are covered by a three layer laminated heat shield (3) for thermal protection and noise reduction. The heat shields are fastened with a torque prevailing nut that is backed off slightly to allow for the thermal expansion of the exhaust manifold. See **Fig. 166**.

REMOVAL

EXHAUST MANIFOLD

RIGHT EXHAUST MANIFOLD



80cb34c3

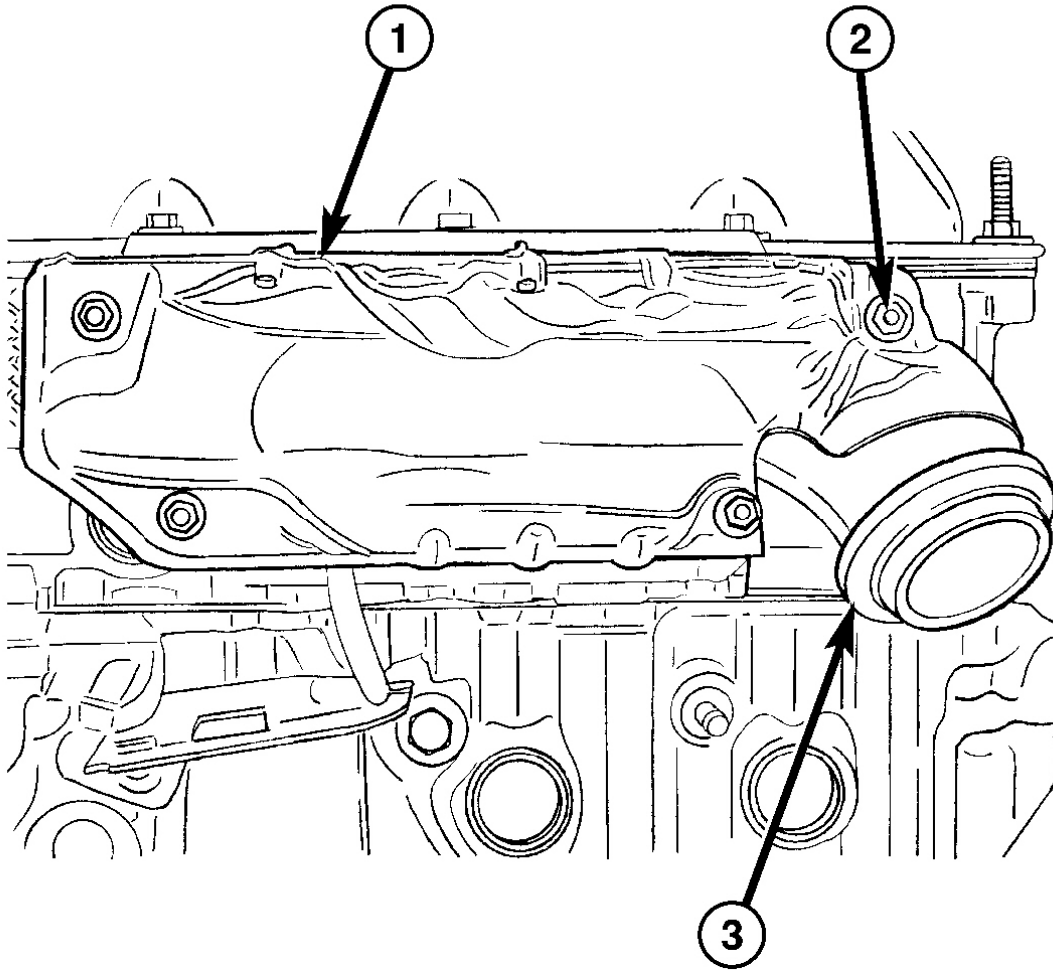
Fig. 167: Exhaust Manifold - Right
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - HEAT SHIELD
2 - NUTS
3 - MANIFOLD FLANGE |
|--|

1. Disconnect the negative cable from the battery.
2. Raise and support the vehicle.
3. Remove the bolts and nuts attaching the exhaust pipe to the engine exhaust manifold.
4. Lower the vehicle.
5. Remove the exhaust heat shield (1).

6. Remove bolts, nuts and washers attaching manifold to cylinder head.
7. Remove manifold and gasket from the cylinder head. See **Fig. 167**.

LEFT EXHAUST MANIFOLD



80cb34c1

Fig. 168: Exhaust Manifold - Left
Courtesy of CHRYSLER LLC

- 1 - HEAT SHIELD
- 2 - NUTS
- 3 - MANIFOLD FLANGE

1. Disconnect the negative cable from the battery.

2. Raise and support the vehicle.
3. Remove the bolts and nuts attaching the exhaust pipe to the engine exhaust manifold.
4. Lower the vehicle.
5. Remove the exhaust heat shields (1).
6. Remove bolts, nuts and washers attaching manifold to cylinder head.
7. Remove manifold and gasket from the cylinder head. See **Fig. 168**.

INSTALLATION

EXHAUST MANIFOLD

RIGHT EXHAUST MANIFOLD

CAUTION: If the studs came out with the nuts when removing the engine exhaust manifold, install new studs. Apply sealer on the coarse thread ends. Water leaks may develop at the studs if this precaution is not taken.

1. Position the engine exhaust manifold and gasket on the two studs located on the cylinder head. Install conical washers and nuts on these studs.
2. Install remaining conical washers. Starting at the center arm and working outward, tighten the bolts and nuts to 25 N.m (18 ft. lbs.)
3. Install the exhaust heat shields.
4. Raise and support the vehicle.

CAUTION: Over tightening heat shield fasteners, may cause shield to distort and/or crack.

5. Assemble exhaust pipe to manifold and secure with bolts, nuts and retainers. Tighten the bolts and nuts to 34 N.m (25 ft. lbs.)

LEFT EXHAUST MANIFOLD

CAUTION: If the studs came out with the nuts when removing the engine exhaust manifold, install new studs. Apply sealer on the coarse thread ends. Water leaks may develop at the studs if this precaution is not taken.

1. Position the engine exhaust manifold and gasket on the two studs located on the cylinder head. Install conical washers and nuts on these studs.
2. Install remaining conical washers. Starting at the center arm and working outward, tighten the bolts and nuts to 25 N.m (18 ft. lbs.)
3. Install the exhaust heat shields.
4. Raise and support the vehicle.

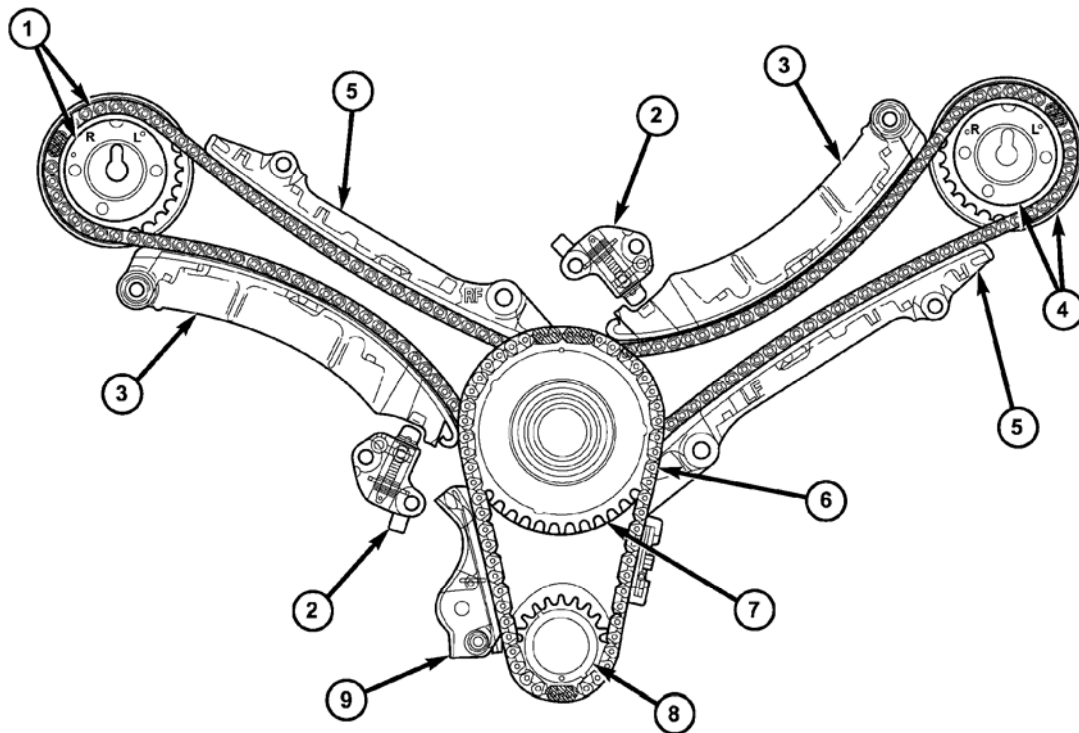
CAUTION: Over tightening heat shield fasteners, may cause shield to distort and/or crack.

5. Assemble exhaust pipe to manifold and secure with bolts, nuts and retainers. Tighten the bolts and nuts to 34 N.m (25 ft. lbs.)

VALVE TIMING

DESCRIPTION

TIMING DRIVE



80d72b71

Fig. 169: Timing Drive System
Courtesy of CHRYSLER LLC

- 1 - RIGHT CAMSHAFT SPROCKET AND SECONDARY CHAIN
- 2 - SECONDARY TIMING CHAIN TENSIONER (LEFT AND RIGHT SIDE NOT INTERCHANGEABLE)
- 3 - SECONDARY TENSIONER ARM
- 4 - LEFT CAMSHAFT SPROCKET AND SECONDARY CHAIN
- 5 - CHAIN GUIDE (LEFT AND RIGHT SIDE ARE NOT INTERCHANGEABLE)
- 6 - PRIMARY CHAIN
- 7 - IDLER SPROCKET

The timing drive system has been designed to provide quiet performance and reliability to support a **non-free wheeling** engine. Specifically the intake valves are non-free wheeling and can be easily damaged with forceful engine rotation if camshaft-to-crankshaft timing is incorrect. The timing drive system consists of a primary chain (6), two secondary timing chain drives (1,4) and a counterbalance shaft drive. See **Fig. 169**.

OPERATION

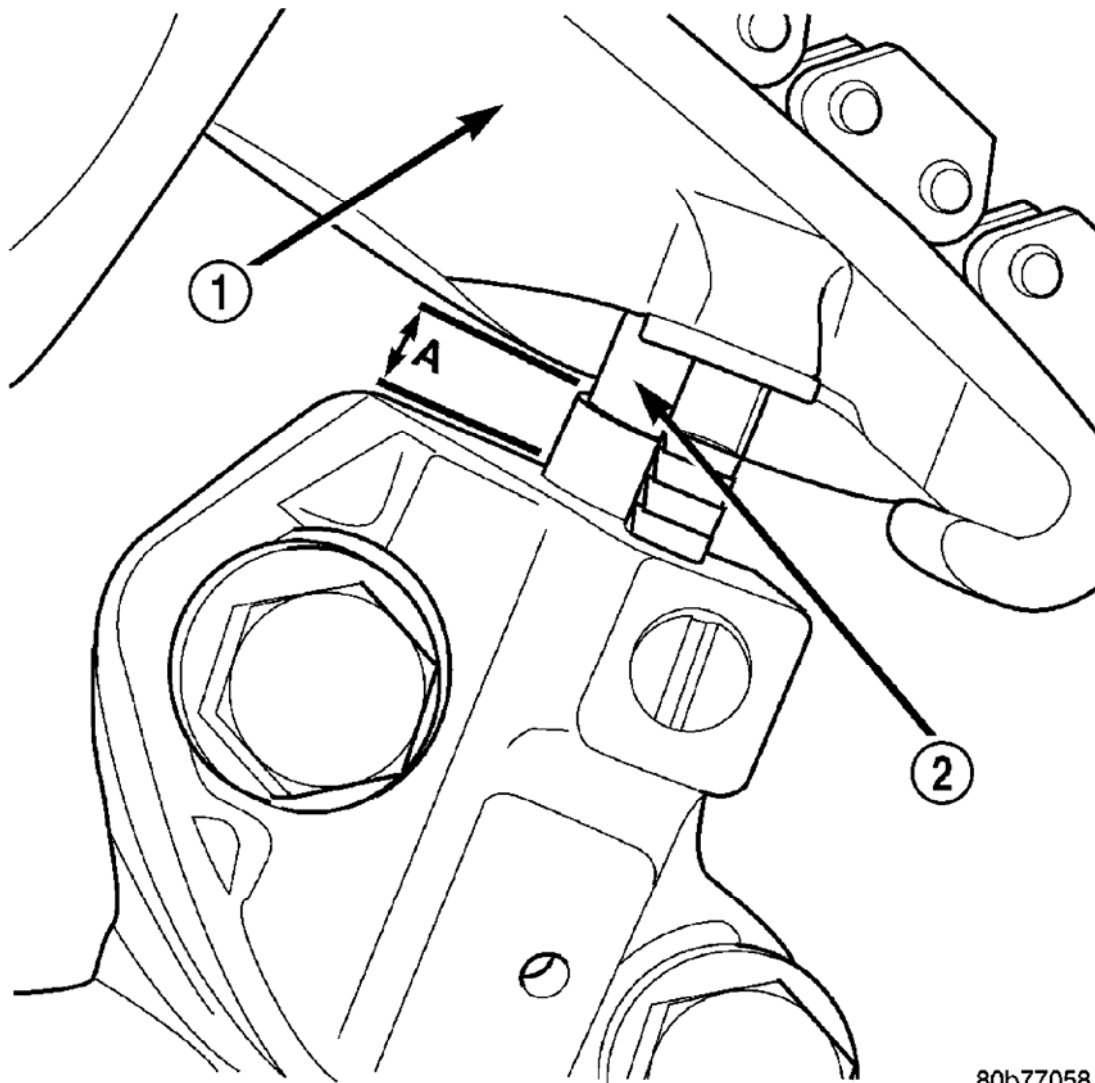
TIMING DRIVE

The primary timing chain is a single inverted tooth chain type. The primary chain drives the large 50 tooth idler sprocket directly from a 25 tooth crankshaft sprocket. Primary chain motion is controlled by a pivoting leaf spring tensioner arm and a fixed guide. The arm and the guide both use nylon plastic wear faces for low friction and long wear. The primary chain receives oil splash lubrication from the secondary chain drive and designed oil pump leakage. The idler sprocket assembly connects the primary chain drive, secondary chain drives, and the counterbalance shaft. The idler sprocket assembly consists of two integral 26 tooth sprockets a 50 tooth sprocket and a helical gear that is press-fit to the assembly. The spline joint for the 50 tooth sprocket is a non serviceable press fit anti rattle type. The idler sprocket assembly spins on a stationary idler shaft. The idler shaft is a light press-fit into the cylinder block. A large washer on the idler shaft bolt and the rear flange of the idler shaft are used to control sprocket thrust movement. Pressurized oil is routed through the center of the idler shaft to provide lubrication for the two bushings used in the idler sprocket assembly.

There are two secondary drive chains, both are roller type, one to drive the camshaft in each SOHC cylinder head. There are no shaft speed changes in the secondary chain drive system. Each secondary chain drives a 26 tooth cam sprocket directly from the 26 tooth sprocket on the idler sprocket assembly. A fixed chain guide and a hydraulic oil damped tensioner are used to maintain tension in each secondary chain system. The hydraulic tensioners for the secondary chain systems are fed pressurized oil from oil reservoir pockets in the block. Each tensioner incorporates a controlled leak path through a device known as a vent disc located in the nose of the piston to manage chain loads. Each tensioner also has a mechanical ratchet system that limits chain slack if the tensioner piston bleeds down after engine shut down. The tensioner arms and guides also utilize nylon wear faces for low friction and long wear. The secondary timing chains receive lubrication from a small orifice in the tensioners. This orifice is protected from clogging by a fine mesh screen which is located on the back of the hydraulic tensioners.

STANDARD PROCEDURE

MEASURING TIMING CHAIN WEAR



80b77058

Fig. 170: Checking Secondary Timing Chains for Wear
 Courtesy of CHRYSLER LLC

- | |
|--------------------------------------|
| 1 - SECONDARY TENSIONER ARM |
| 2 - SECONDARY CHAIN TENSIONER PISTON |

NOTE: This procedure must be performed with the timing chain cover removed.

1. Remove the timing chain cover. See **REMOVAL**.
2. To determine if the secondary timing chains are worn, rotate the engine clockwise until maximum tensioner piston (2) extension is obtained. Measure the distance between the secondary timing chain tensioner housing and the step ledge on the piston. The measurement at point (A) must be less than 15 mm (.5906 inches). See **Fig. 170**.
3. If the measurement exceeds the specification the secondary timing chains are worn and require

replacement. See **REMOVAL**.

TIMING VERIFICATION

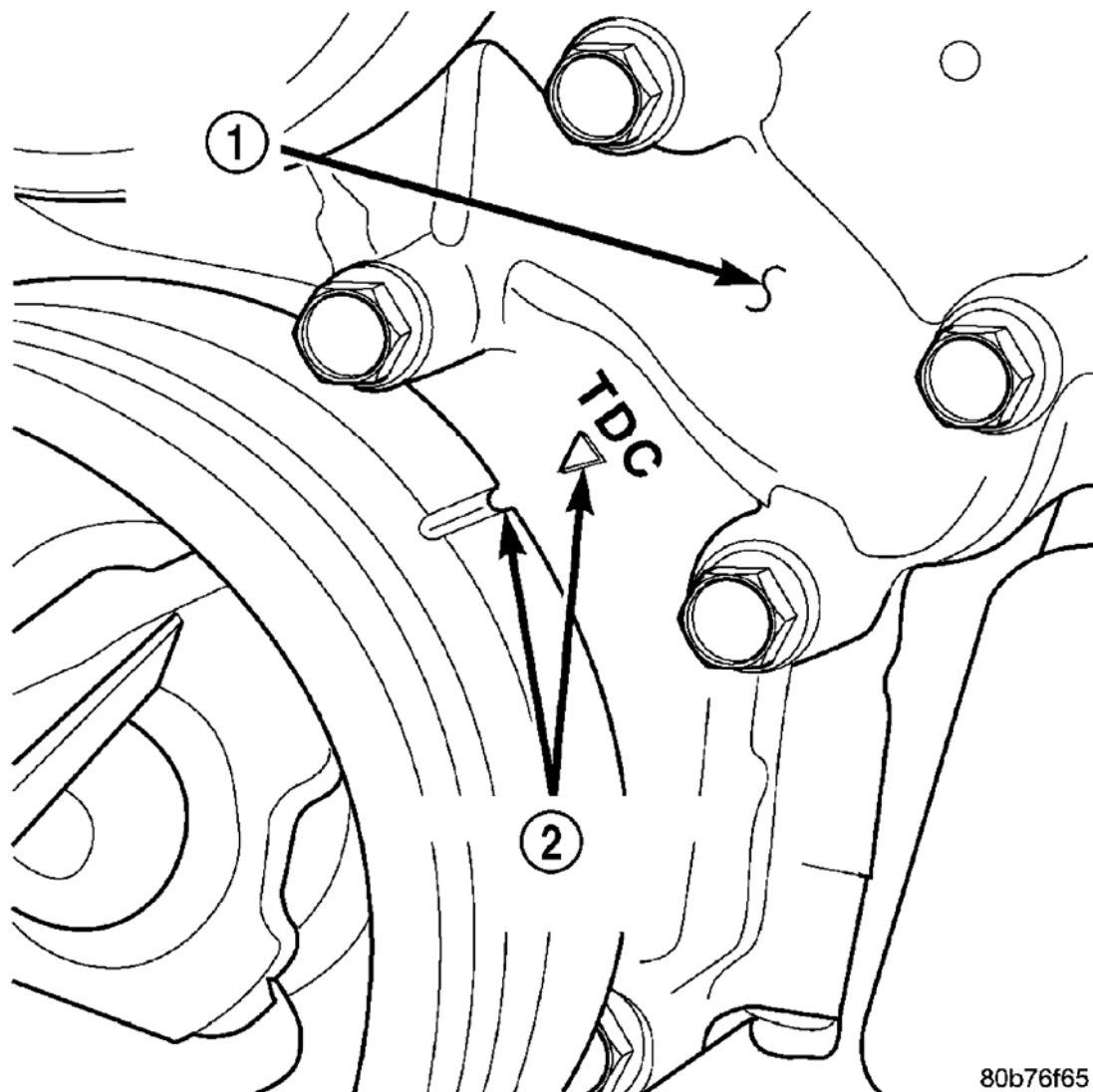


Fig. 171: Engine Top Dead Center (TDC) Indicator Marks
Courtesy of CHRYSLER LLC

- | |
|-----------------------------|
| 1 - TIMING CHAIN COVER |
| 2 - CRANKSHAFT TIMING MARKS |

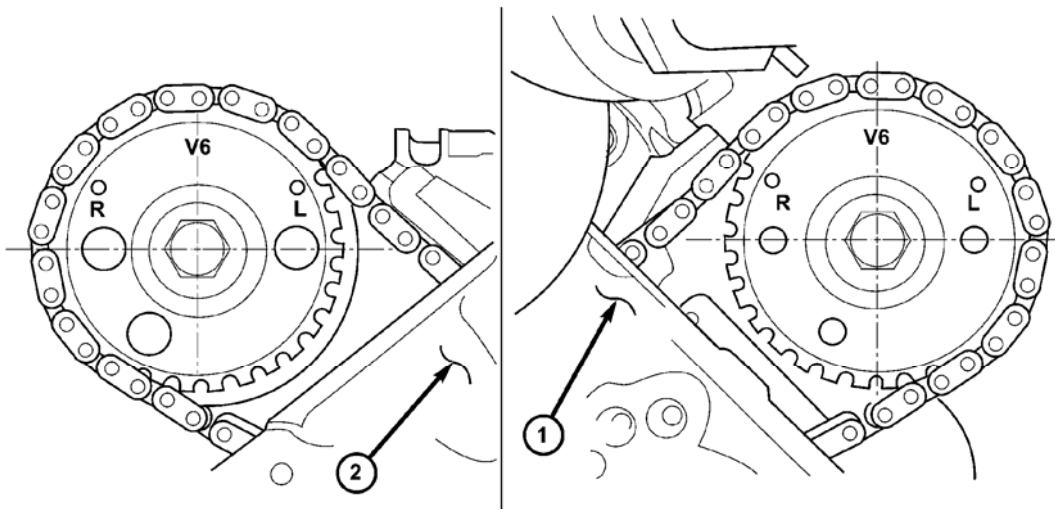
CAUTION: The 3.7L is a non free-wheeling design engine. Therefore, correct engine timing is critical.

NOTE: Components referred to as left hand or right hand are as viewed from the drivers position inside the vehicle.

NOTE: The blue link plates on the chains and the dots on the camshaft drive sprockets may not line up during the timing verification procedure. The blue link plates are lined up with the sprocket dots only when re-timing the complete timing drive. Once the timing drive is rotated blue link-to-dot alignment is no longer valid.

Engine base timing can be verified by the following procedure:

1. Remove the cylinder head covers.
2. Using a mirror, locate the TDC arrow on the front cover. Rotate the crankshaft until the mark on the crankshaft damper (2) is aligned with the TDC arrow on the front cover (2). The engine is now at TDC. See **Fig. 171**.



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Fig. 172: Camshaft Sprocket V6 Marks (#1 TDC, Exhaust Stroke)
Courtesy of CHRYSLER LLC

1 - LEFT CYLINDER HEAD 2 - RIGHT CYLINDER HEAD

3. Note the location of the V6 mark stamped into the camshaft drive gears (1,2). If the V6 mark on each camshaft drive gear is at the twelve o'clock position, the engine is at TDC on the exhaust stroke. If the V6 mark on each gear is at the six o'clock position, the engine is at TDC on the compression stroke. See **Fig. 172**.
4. If both of the camshaft drive gears are off in the same or opposite directions, the primary chain or both secondary chains are at fault. Refer to **CHAIN AND SPROCKETS-TIMING**.
5. If only one of the camshaft drive gears is off and the other is correct, the problem is confined to one

secondary chain.

6. If both camshaft drive gear V6 marks are at the twelve o'clock or the six o'clock position the engine base timing is correct. Reinstall the cylinder head covers.

COUNTER BALANCE SHAFT TIMING

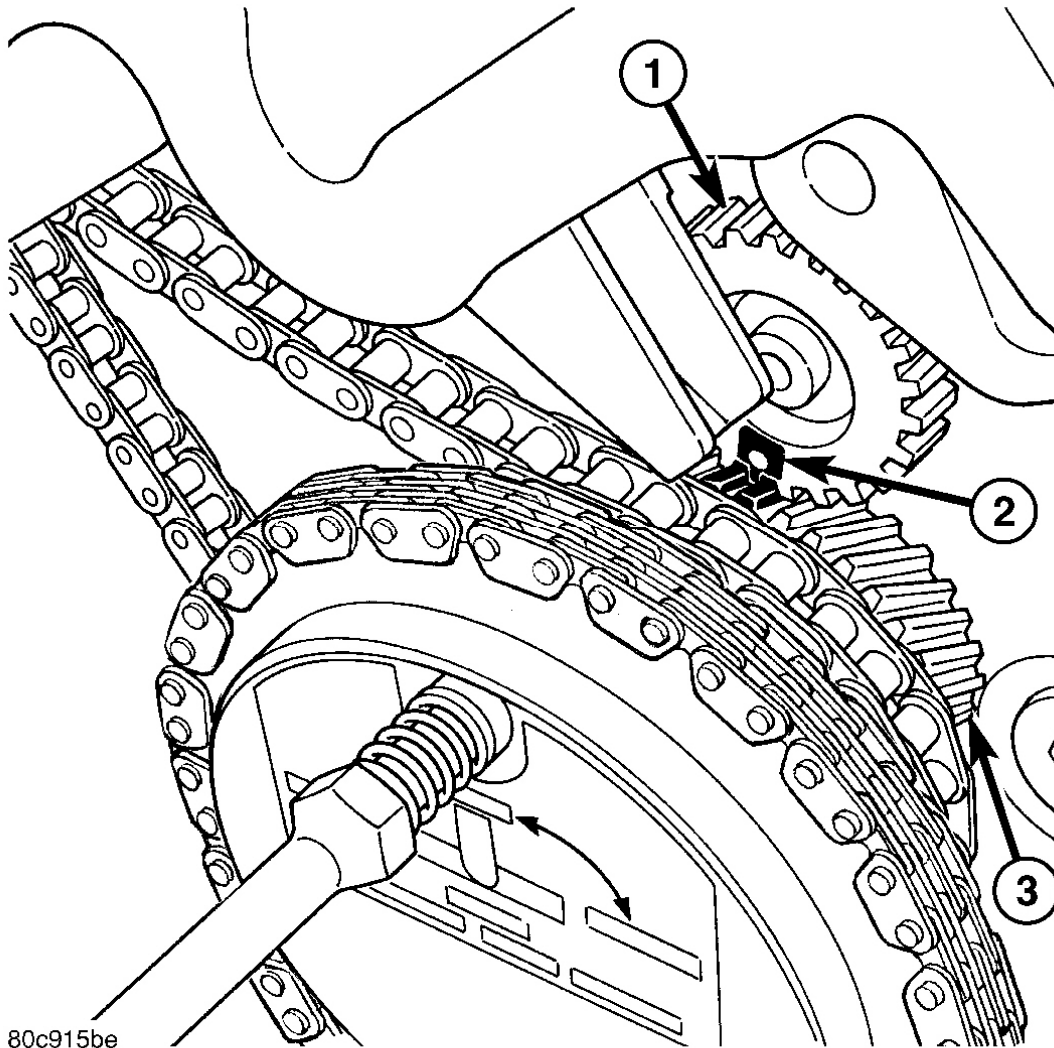


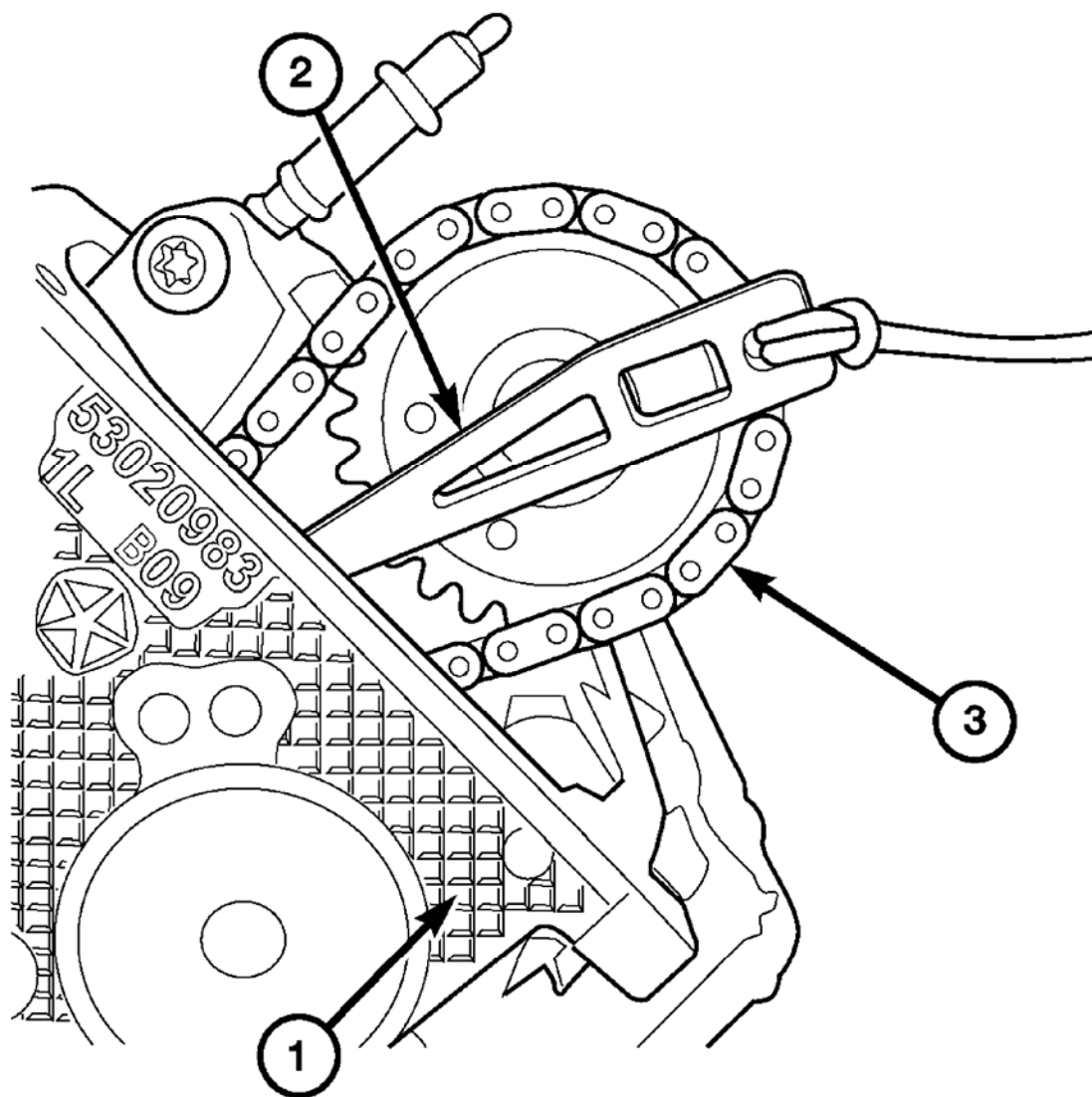
Fig. 173: Counterbalance Shaft Alignment Marks
Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - COUNTERBALANCE SHAFT GEAR |
| 2 - TIMING MARK |
| 3 - IDLER SPROCKET GEAR |

1. Ensure that the engine is at TDC with both camshaft sprocket V6 marks in the 12 o'clock position.

2. Look down the left cylinder head chain cavity. The timing dot (2) on the counter balance shaft drive gear should be in the 6 o'clock position. See **Fig. 173**.

TIMING - SINGLE CAMSHAFT



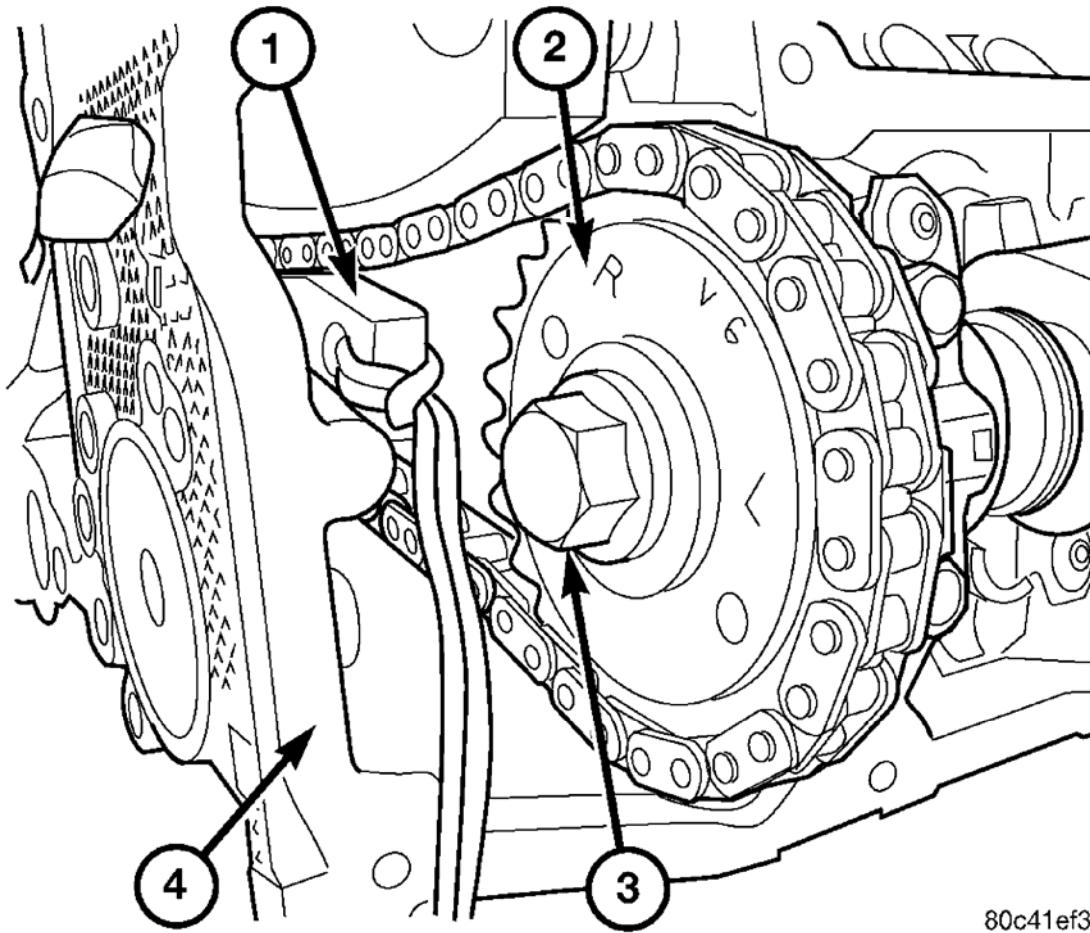
80c41ef2

Fig. 174: Securing Timing Chain Tensioner Using Timing Chain Wedge
Courtesy of CHRYSLER LLC

- 1 - CYLINDER HEAD
- 2 - SPECIAL TOOL 8379
- 3 - TIMING CHAIN

NOTE: to adjust the timing on one camshaft, preform the following procedure.

1. Using the Wedge Locking Tool 8379 (2), stabilize the secondary chain drive. For reference purposes, mark the chain-to-sprocket position. See **Fig. 174**.

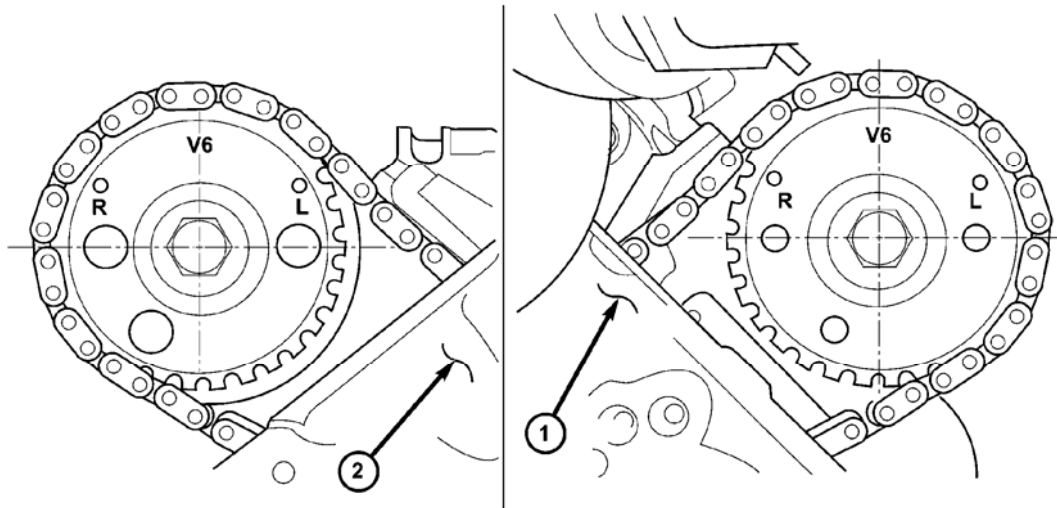


80c41ef3

Fig. 175: Removing/Installing Camshaft Drive Gear
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - SPECIAL TOOL 8379 TIMING CHAIN WEDGE |
| 2 - CAMSHAFT DRIVE GEAR |
| 3 - RETAINING BOLT |
| 4 - CYLINDER HEAD |

2. Remove the camshaft drive gear retaining bolt (3). See **Fig. 175**.
3. Carefully remove the camshaft drive gear from the camshaft.



80cae8813

Fig. 176: Camshaft Sprocket V6 Marks (#1 TDC, Exhaust Stroke)
Courtesy of CHRYSLER LLC

1 - LEFT CYLINDER HEAD 2 - RIGHT CYLINDER HEAD

4. Re-index the camshaft drive gear in the chain until the V6 mark is at the same position as the V6 mark on the opposite camshaft drive gear (1,2). See **Fig. 176**.
5. Using the Camshaft Holder 8428, rotate the camshaft until the alignment dowel on the camshaft is aligned with the slot in the camshaft drive gear.

CAUTION: Remove excess oil from camshaft sprocket retaining bolt before reinstalling bolt. Failure to do so may cause over-torqueing of bolt resulting in bolt failure.

6. Position the camshaft drive gear onto the camshaft, remove oil from bolt then install the retaining bolt. Using Special Tools, Spanner Wrench 6958 with Adapter Pins 8346 and a suitable torque wrench, Tighten the retaining bolt to 122 N.m (90 ft. lbs.)
7. Remove the Wedge Locking Tool 8379.
8. Rotate the crankshaft two full revolutions, then verify that the camshaft drive gear V6 marks are in fact aligned.
9. Install the cylinder head covers.

SHAFT-BALANCE

REMOVAL

BALANCE SHAFT

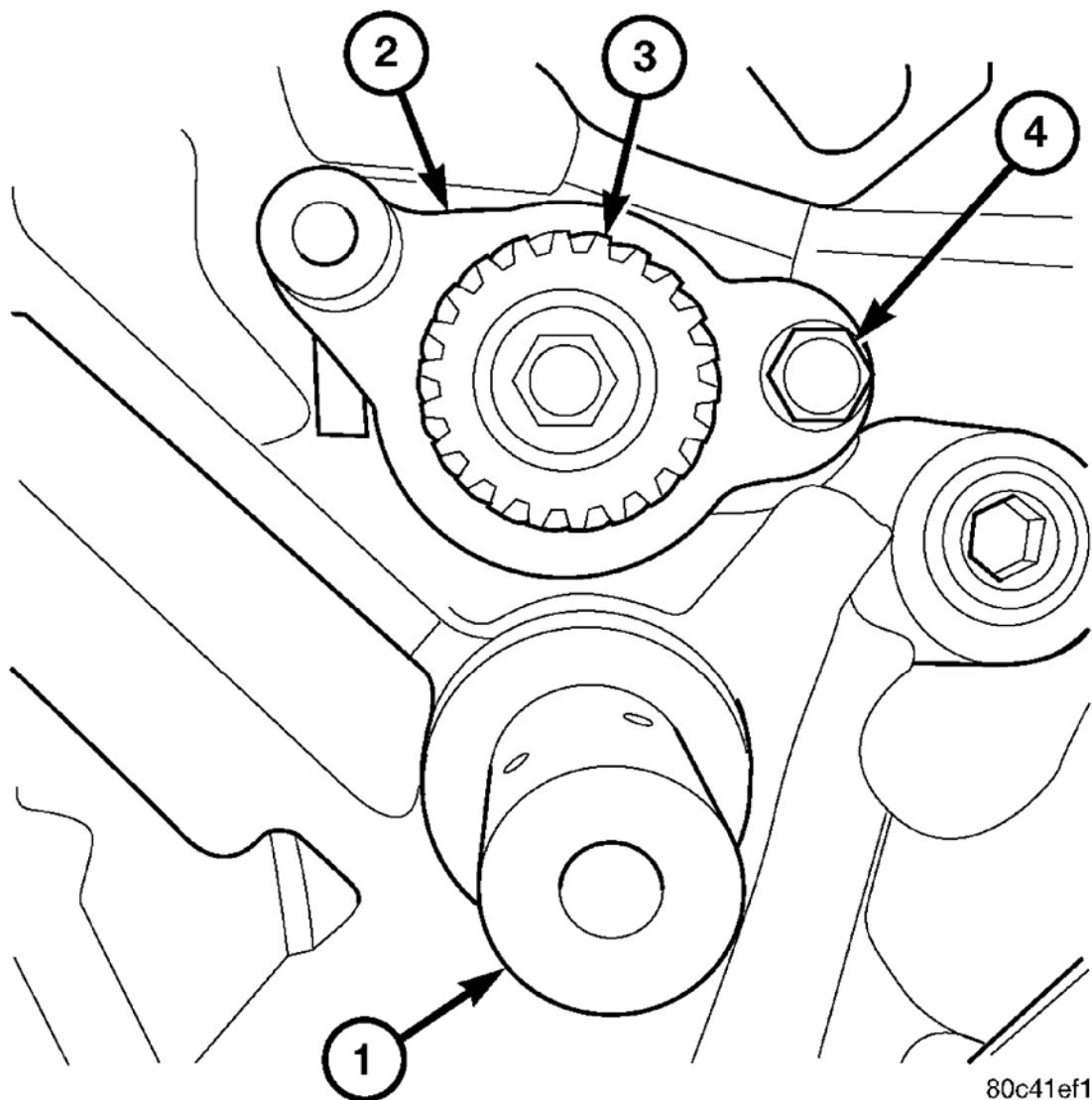


Fig. 177: Counterbalance Shaft Retaining Plate
Courtesy of CHRYSLER LLC

- | |
|---|
| <p>1 - IDLER SHAFT
2 - COUNTERBALANCE SHAFT THRUST PLATE
3 - COUNTERBALANCE SHAFT DRIVE GEAR
4 - RETAINING BOLT</p> |
|---|

1. Remove the primary and secondary timing chains.

NOTE: The balance shaft and gear are serviced as an assembly. Do not attempt to remove the gear from the balance shaft.

Remove the retaining bolt (4) from the counterbalance shaft thrust plate (2). See **Fig. 177**.

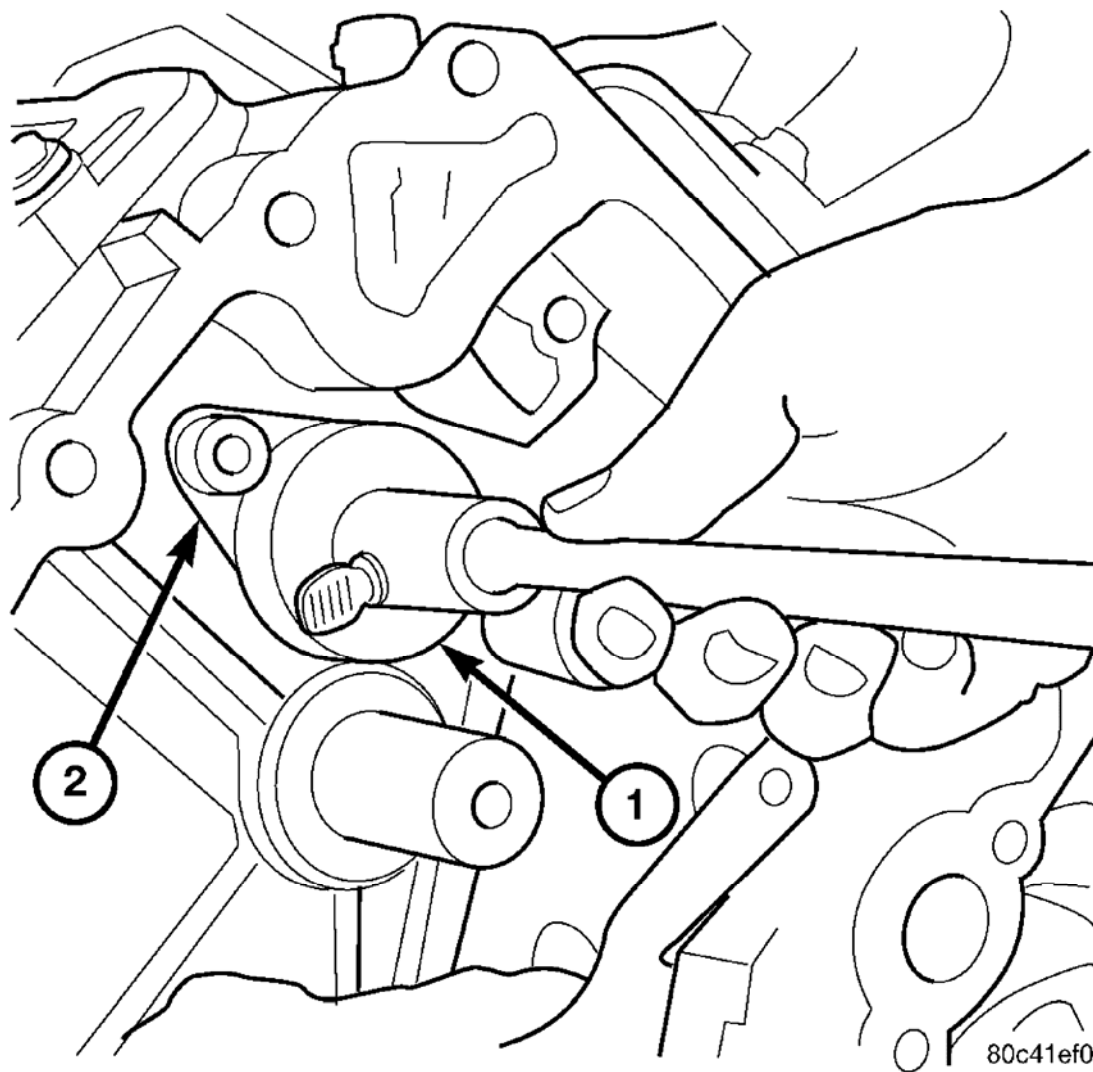


Fig. 178: Counterbalance Shaft Removal/Installation Tool
Courtesy of CHRYSLER LLC

1 - COUNTERBALANCE SHAFT REMOVAL AND INSTALLATION TOOL 2 - COUNTERBALANCE SHAFT THRUST PLATE
--

2. Using the Counterbalance Shaft Remover/Installer tool 8641 (1), remove the counterbalance shaft from the engine. See **Fig. 178**.

INSTALLATION

BALANCE SHAFT

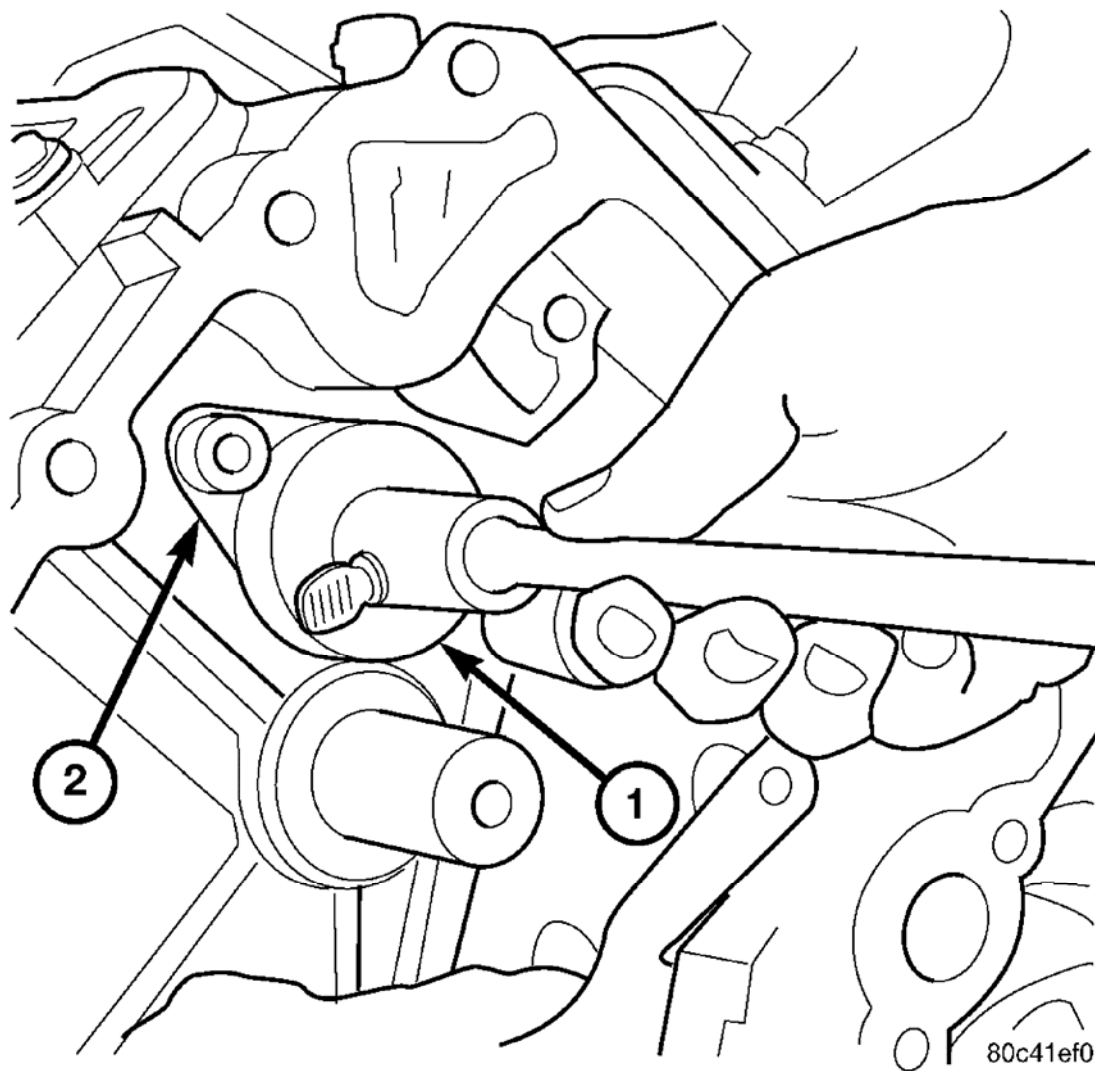


Fig. 179: Counterbalance Shaft Removal/Installation Tool

Courtesy of CHRYSLER LLC

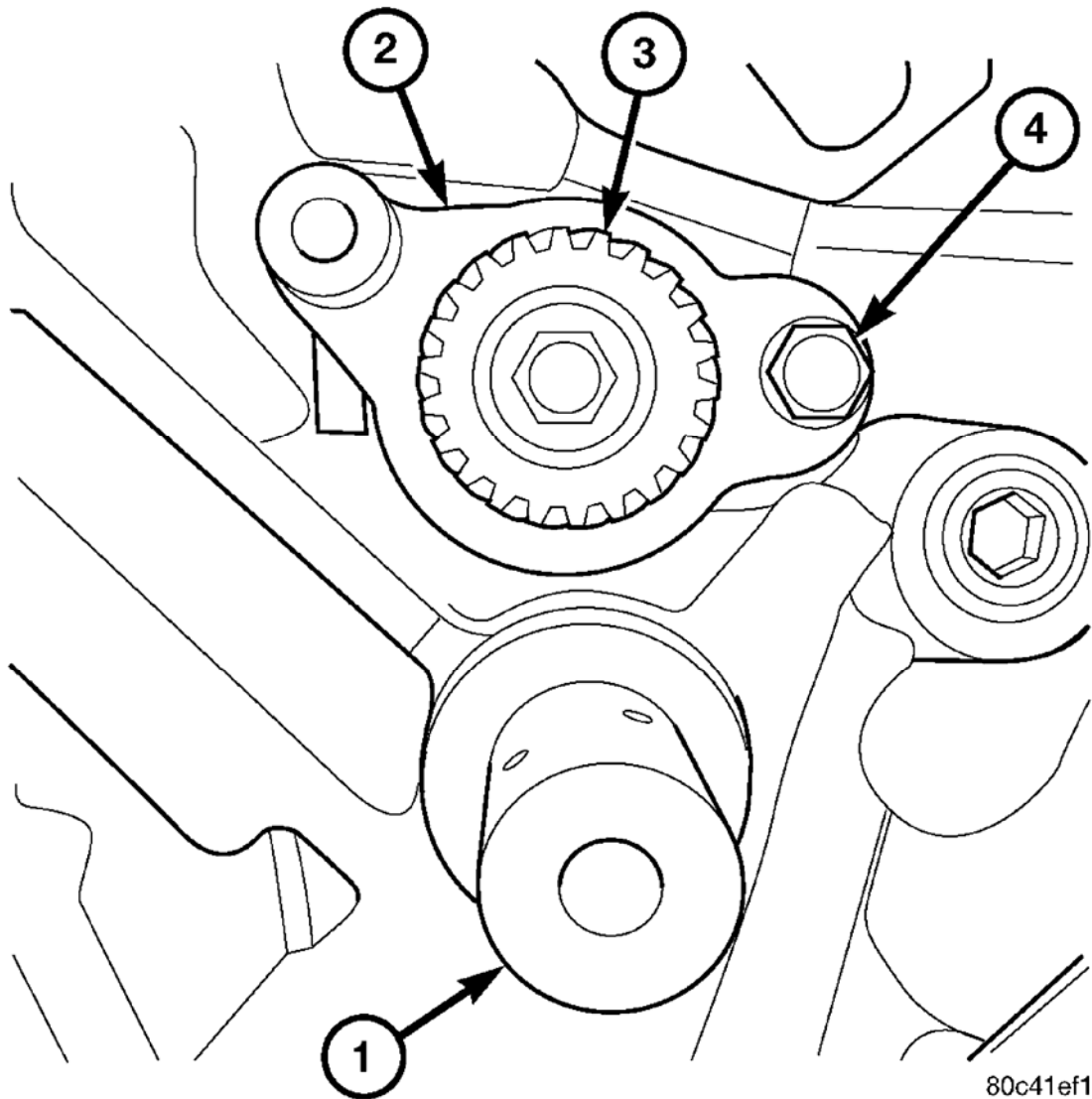
- | |
|--|
| 1 - COUNTERBALANCE SHAFT REMOVAL AND INSTALLATION TOOL |
| 2 - COUNTERBALANCE SHAFT THRUST PLATE |

NOTE: The balance shaft and gear are serviced as an assembly. Do not attempt to remove the gear from the balance shaft.

1. Coat counterbalance shaft bearing journals with clean engine oil.

NOTE: The balance shaft is heavy, and care should be used when installing shaft, so bearings are not damaged.

2. Using the Counterbalance Shaft Remover/Installer 8641 (1), carefully install counterbalance shaft into engine. See **Fig. 179**.



80c41ef1

Fig. 180: Counterbalance Shaft Retaining Plate
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - IDLER SHAFT |
| 2 - COUNTERBALANCE
SHAFT THRUST PLATE |
| 3 - COUNTERBALANCE
SHAFT DRIVE GEAR |
| 4 - RETAINING BOLT |

3. Install Counterbalance shaft thrust plate retaining bolt (4) finger tight. Do not tighten bolt at this time.

4. Position the right side of the thrust plate with the right chain guide bolt, install bolt finger tight.
5. Tighten the thrust plate retaining bolt (4) to 28 N.m (250 in. lbs.) See **Fig. 180**.
6. Remove the chain guide bolt so that guide can be installed.

COVER-TIMING

REMOVAL

TIMING CHAIN COVER

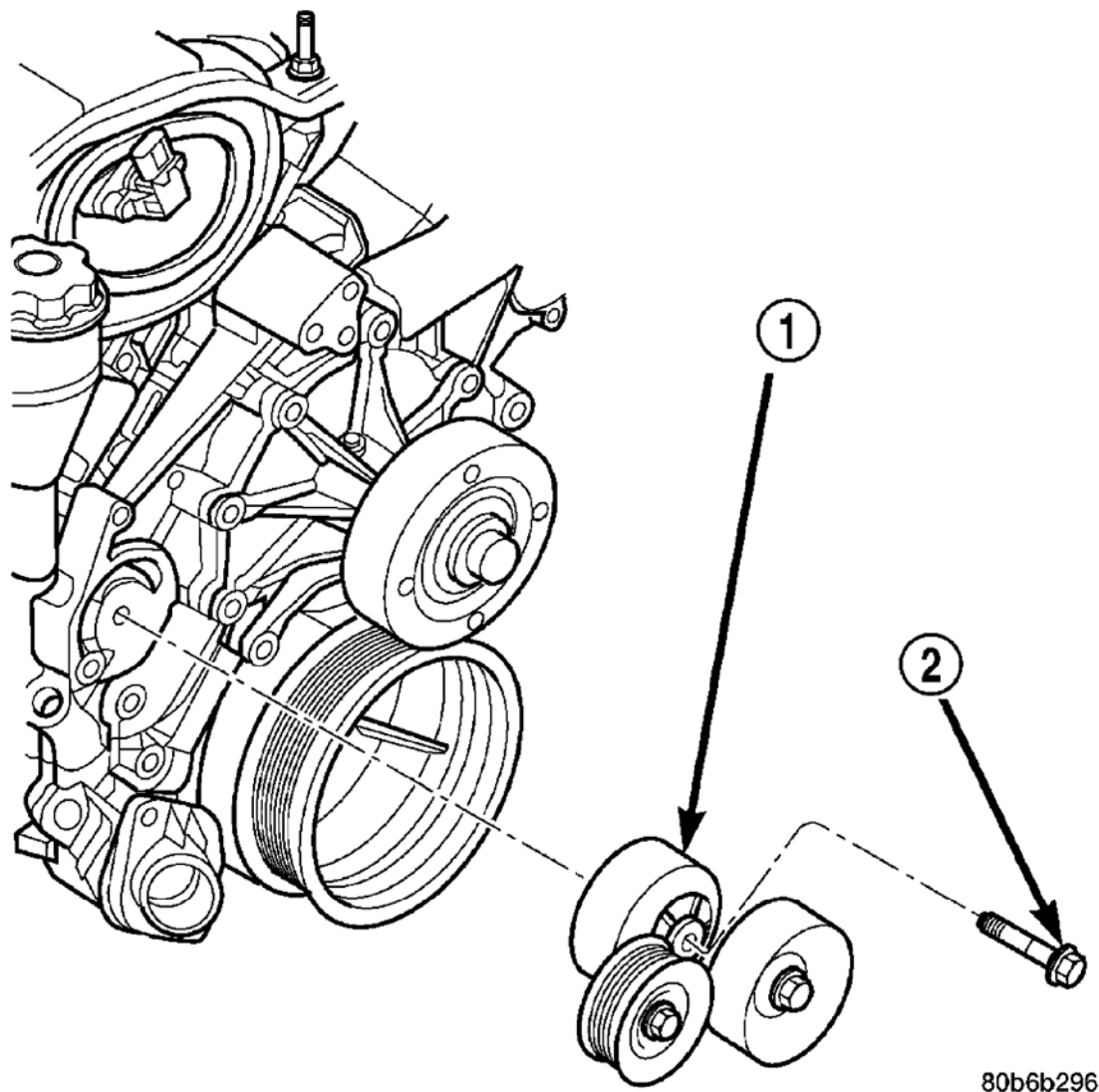


Fig. 181: Accessory Drive Belt Tensioner
Courtesy of CHRYSLER LLC

2 - FASTENER TENSIONER TO FRONT COVER

1. Disconnect the battery negative cable.
2. Drain cooling system. Refer to **STANDARD PROCEDURE** .
3. Remove electric cooling fan and fan shroud assembly.
4. Remove fan and fan drive assembly.
5. Disconnect both heater hoses at timing cover.
6. Disconnect lower radiator hose at engine.
7. Remove accessory drive belt tensioner assembly (1). See **Fig. 181**.

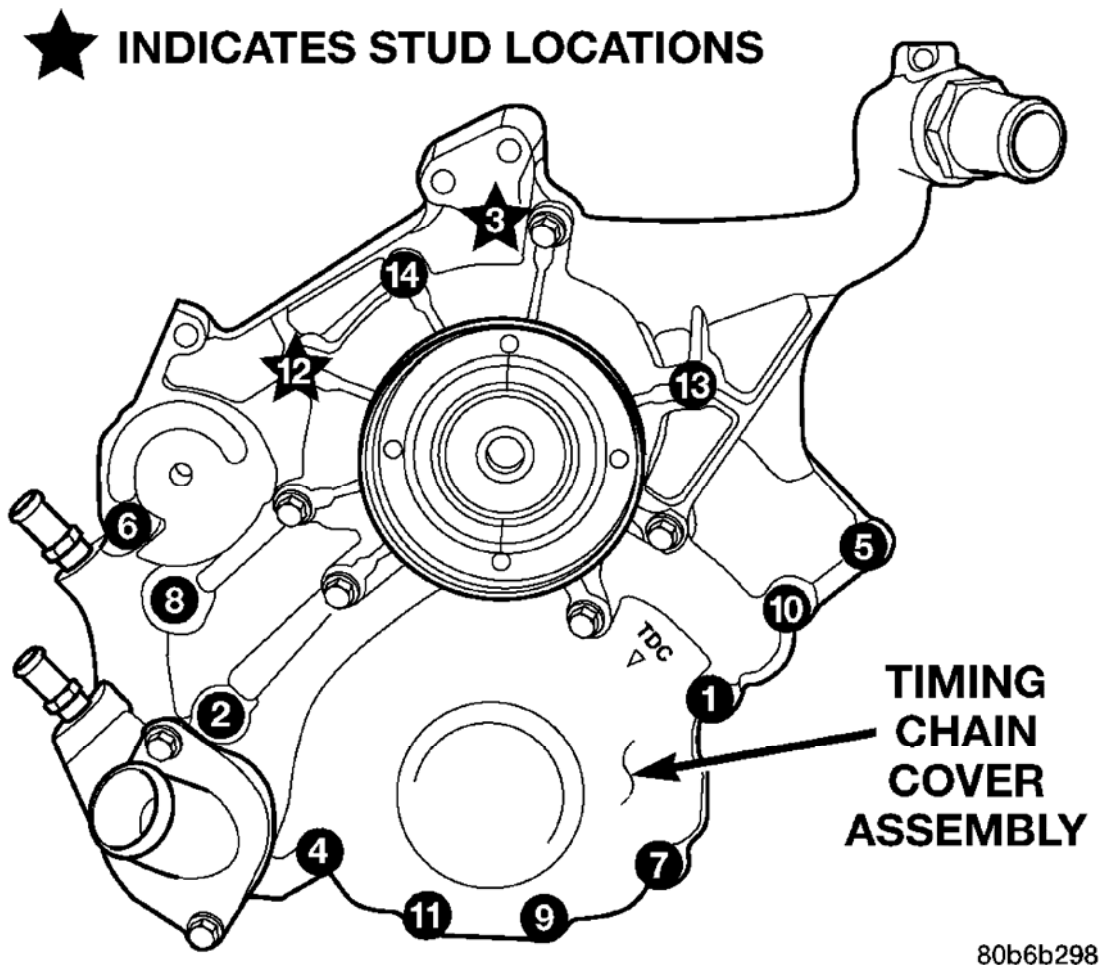


Fig. 182: Timing Chain Cover Fastener Tightening Sequence
Courtesy of CHRYSLER LLC

8. Remove crankshaft damper. See **REMOVAL**.
9. Remove the generator. Refer to **REMOVAL** .
10. Remove the A/C compressor. Refer to **REMOVAL** .

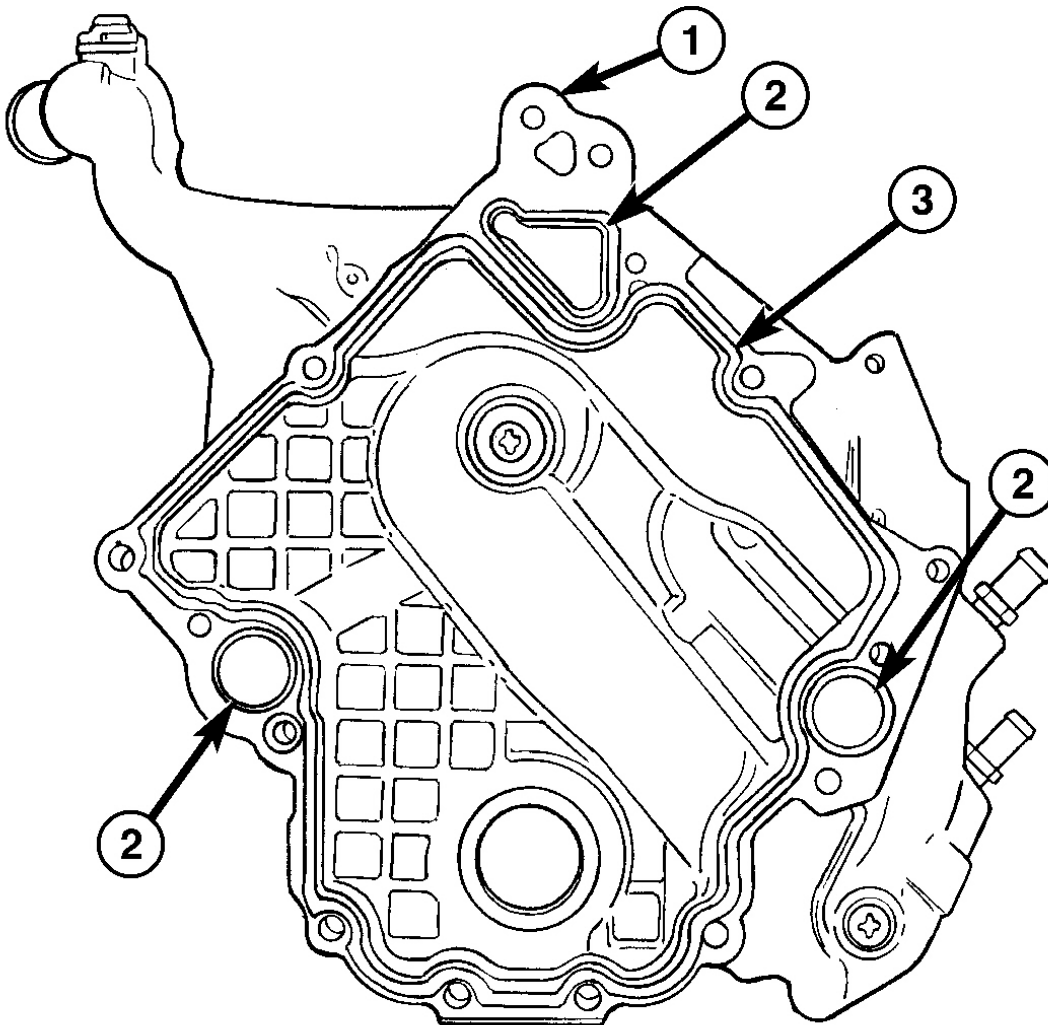
CAUTION: The 3.7L engine uses an anaerobic sealer instead of a gasket to seal the front cover to the engine block, from the factory. For service, Mopar® Grey Engine RTV sealant must be substituted.

NOTE: It is not necessary to remove the water pump for timing cover removal.

11. Remove the bolts holding the timing cover to engine block. See **Fig. 182**.
12. Remove the timing cover.

INSTALLATION

TIMING CHAIN COVER



80cca006

Fig. 183: Installing Timing Cover
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - TIMING CHAIN COVER
2 - WATER PASSAGE O-RING
3 - MOPAR® ENGINE RTV SEALER |
|--|

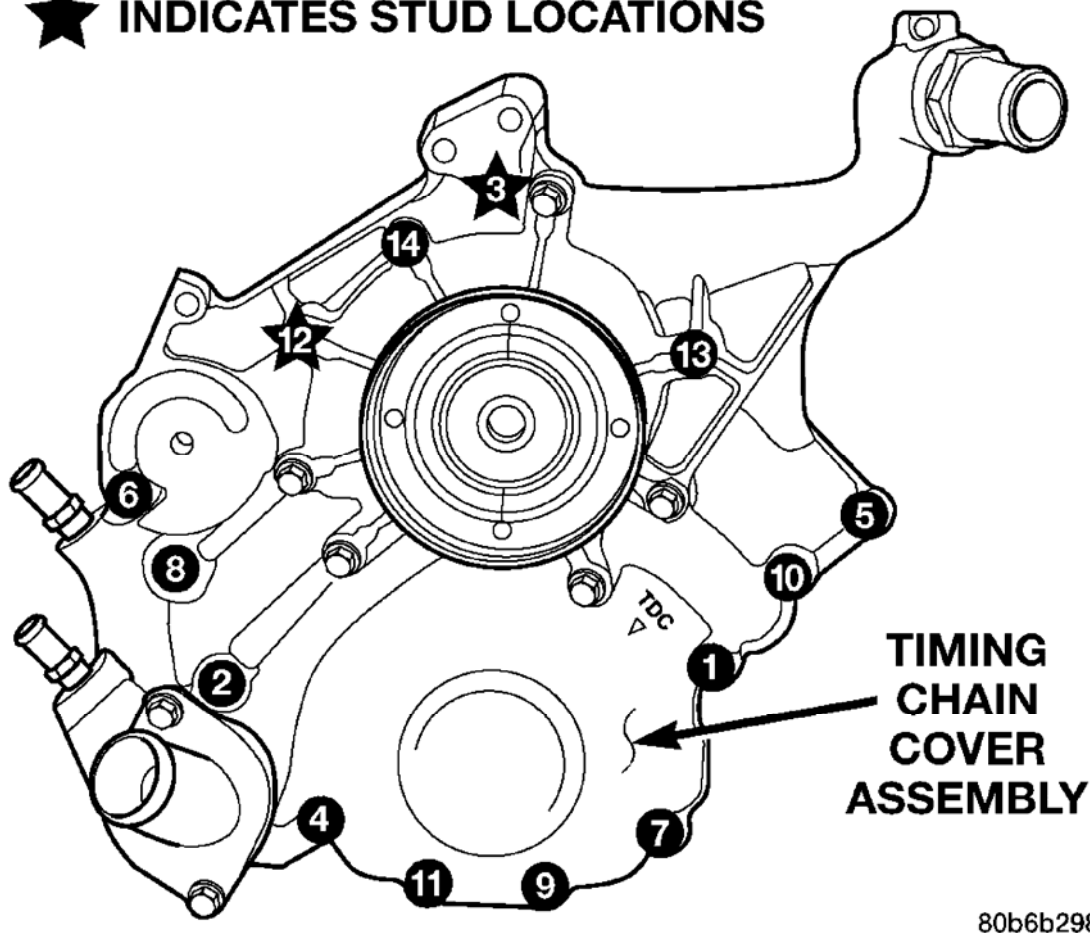
CAUTION: Do not use oil based liquids to clean timing cover or block surfaces. Use only rubbing alcohol, along with plastic or wooden scrapers. Use no wire brushes or abrasive wheels or metal scrapers, or damage to surfaces could result.

1. Clean timing chain cover and block surface using rubbing alcohol.

CAUTION: The 3.7L uses a special anaerobic sealer instead of a gasket to seal the timing cover to the engine block, from the factory. For service repairs, Mopar® Grey Engine RTV must be used as a substitute.

2. Inspect the water passage o-rings for any damage, and replace as necessary.
3. Apply Mopar® Grey Engine RTV sealer (3) to the front cover following the path below, using a 3 to 4 mm thick bead. See **Fig. 183**.

★ INDICATES STUD LOCATIONS



80b6b298

Fig. 184: Timing Chain Cover Fastener Tightening Sequence
 Courtesy of CHRYSLER LLC

4. Install cover. Tighten flange head fasteners in sequence shown in illustration to 58 N.m (43 ft. lbs.). See **Fig. 184**.
5. Install crankshaft damper. See **INSTALLATION**.
6. Install the A/C compressor. Refer to **INSTALLATION**.
7. Install the generator. Refer to **INSTALLATION**.
8. Install accessory drive belt tensioner assembly. Refer to **INSTALLATION**.
9. Install radiator upper and lower hoses.
10. Install both heater hoses.
11. Install electric fan shroud and viscous fan drive assembly.
12. Fill cooling system. Refer to **STANDARD PROCEDURE**.
13. Connect the battery negative cable.

SHAFT-IDLER

REMOVAL

IDLER SHAFT

1. Remove the primary and secondary timing chains and sprockets. Refer to **CHAIN AND SPROCKETS-TIMING**.

NOTE: To remove the idler shaft, it is necessary to tap threads into the shaft, to install the removal tool.

2. Using a 12 mm X 1.75 tap, cut threads in the idler shaft center bore.
3. Cover the radiator core with a suitable cover.

CAUTION: Use care when removing the idler shaft, Do not strike the radiator cooling fins with the slide hammer.

4. Using Slide Hammer 8517 remove the idler shaft.

INSTALLATION

IDLER SHAFT

1. Thoroughly clean the idler shaft bore.
2. Position the idler shaft in the bore.

NOTE: The two lubrication holes in the idler shaft do not require any special alignment.

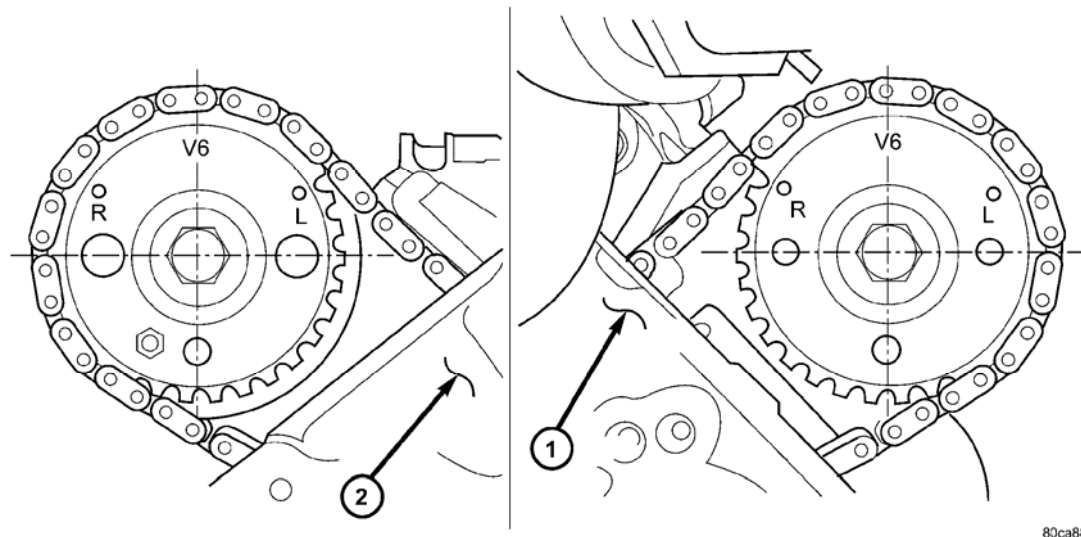
NOTE: Before using the retaining bolt to install the idler shaft, coat the threads and the pilot on the idler shaft, with clean engine oil.

3. Using the primary idler sprocket retaining bolt and washer, carefully draw the idler shaft into the bore until fully seated.
4. Coat the idler shaft with clean engine oil.
5. Install the timing chains and sprockets. Refer to CHAIN AND SPROCKETS-TIMING.

CHAIN AND SPROCKETS-TIMING

REMOVAL

TIMING CHAIN AND SPROCKETS



80ca8813

Fig. 185: Camshaft Sprocket V6 Marks, (#1 TDC Exhaust Stroke)
Courtesy of CHRYSLER LLC

1 - LEFT CYLINDER HEAD
2 - RIGHT CYLINDER HEAD

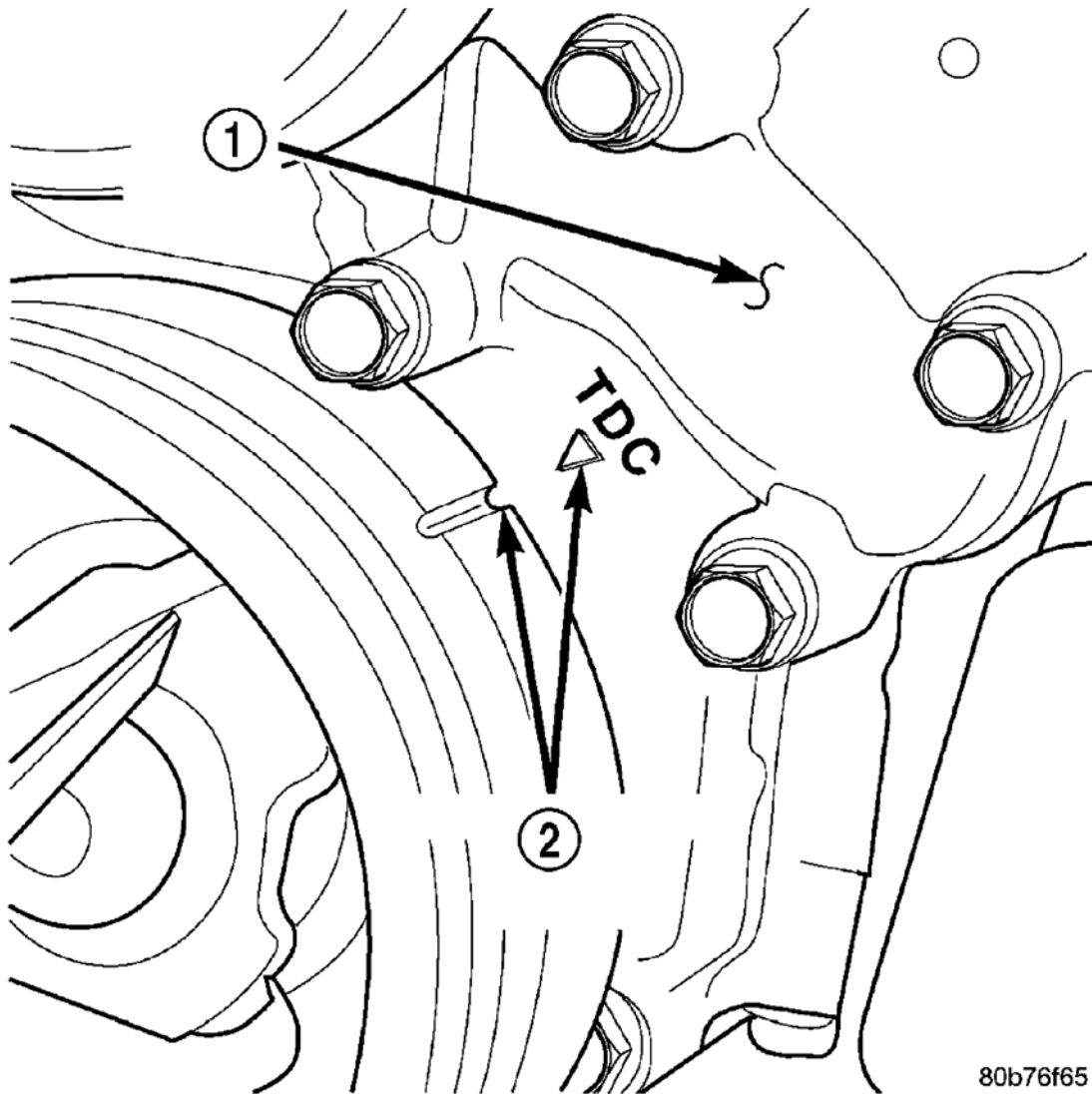


Fig. 186: Engine Top Dead Center
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - TIMING CHAIN COVER
2 - CRANKSHAFT TIMING MARKS |
|---|

1. Disconnect negative cable from battery.
2. Drain cooling system. Refer to **STANDARD PROCEDURE** .
3. Remove right and left cylinder head covers. See **REMOVAL**.
4. Remove radiator fan shroud. Refer to **REMOVAL** .
5. Rotate engine until timing mark on crankshaft damper (2) aligns with TDC mark on timing chain cover (2) and the camshaft sprocket "V6" marks are at the 12 o'clock position (No. 1 TDC exhaust stroke). See **Fig. 185** and **Fig. 186**.

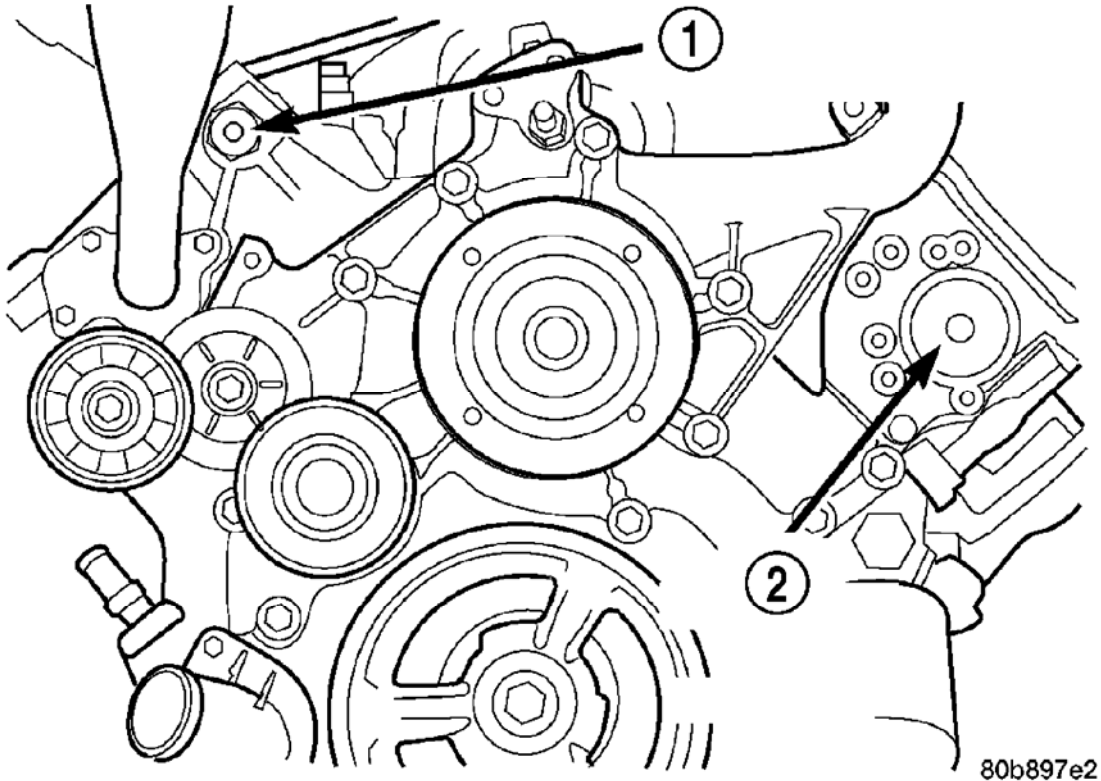


Fig. 187: Cylinder Head Access Plugs
Courtesy of CHRYSLER LLC

1 - RIGHT CYLINDER HEAD ACCESS PLUG 2 - LEFT CYLINDER HEAD ACCESS PLUG

6. Remove power steering pump. Refer to **REMOVAL** .
7. Remove access plug from left and right cylinder heads for access to chain guide fasteners. See **Fig. 187**.
8. Remove the oil fill housing to gain access to the right side tensioner arm fastener.
9. Remove crankshaft damper and timing chain cover. See **REMOVAL** for damper and **REMOVAL** for chain cover.

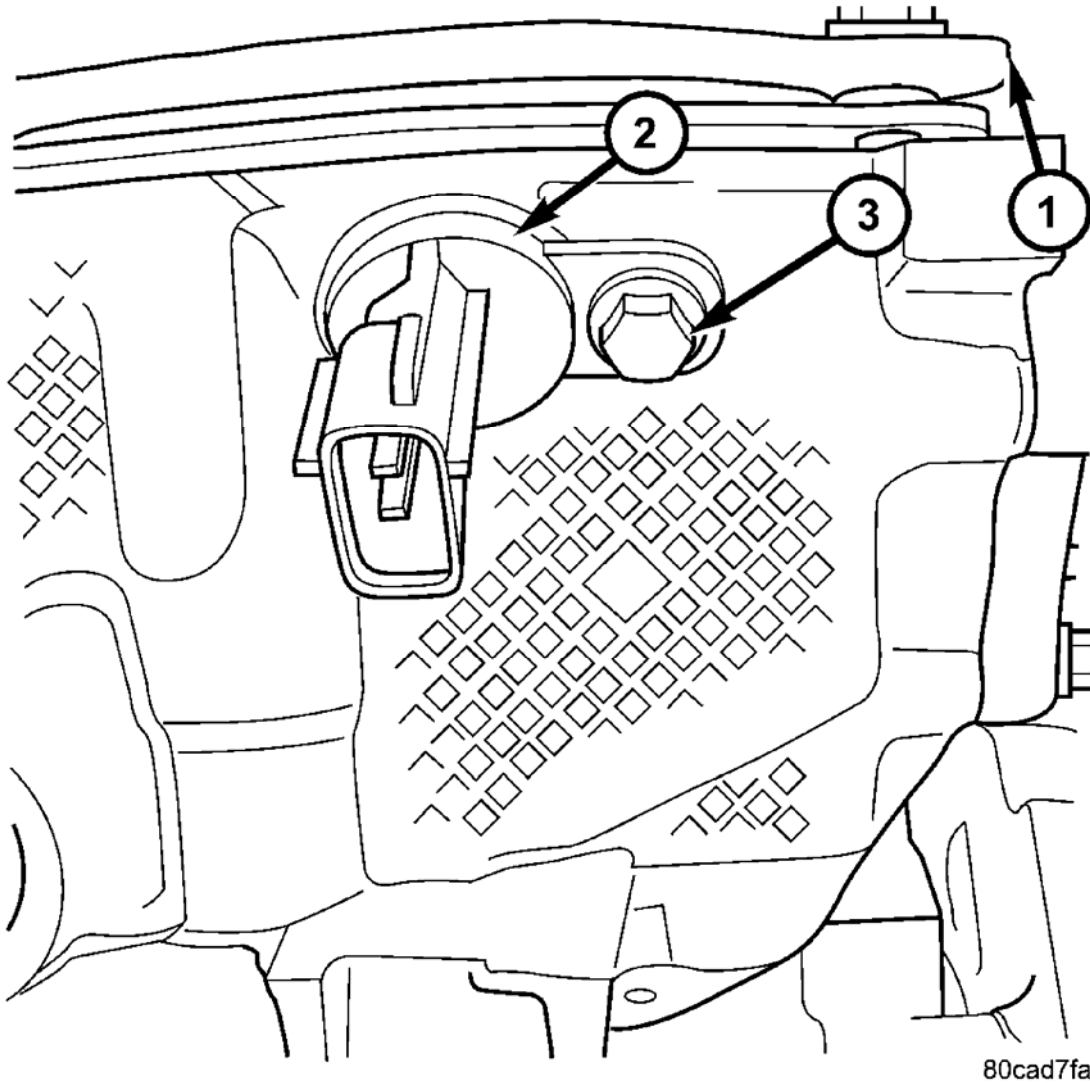


Fig. 188: Camshaft Position Sensor
Courtesy of CHRYSLER LLC

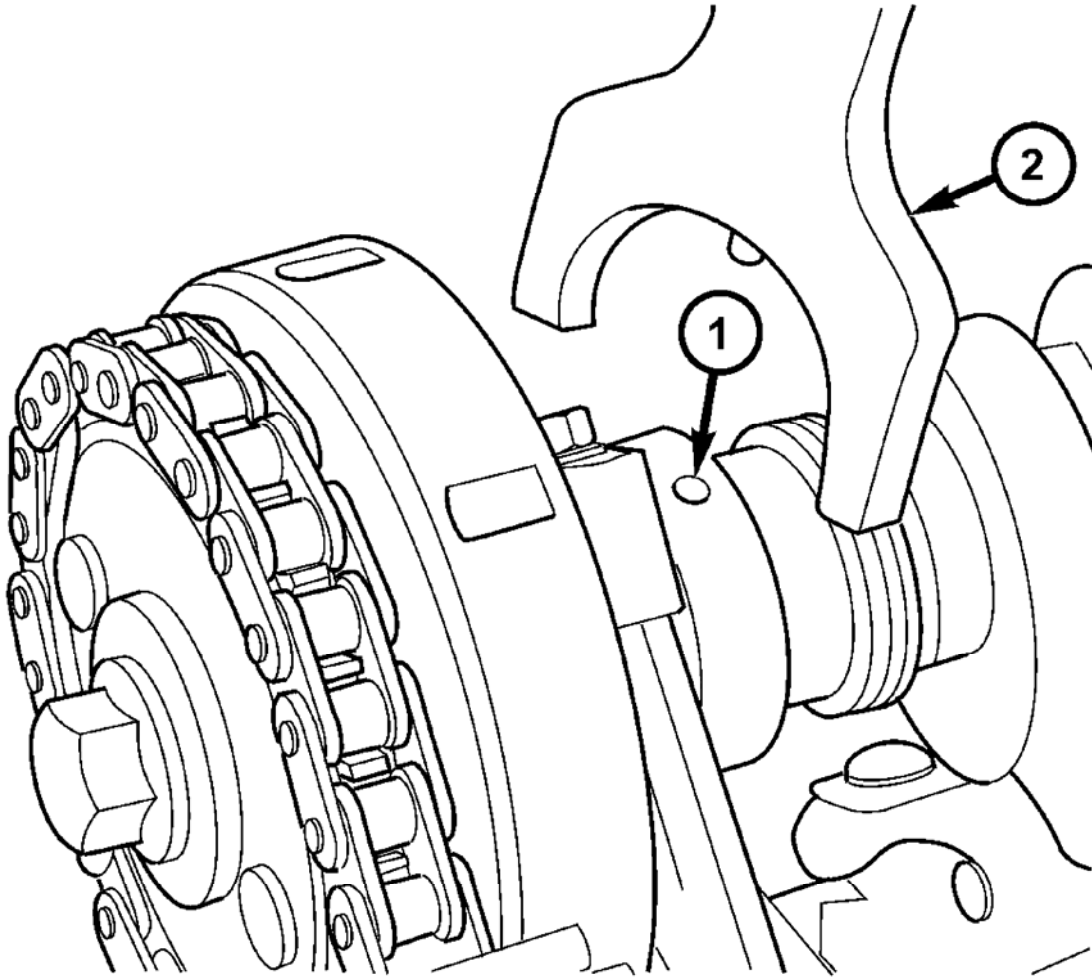
- | |
|--|
| 1 - CYLINDER HEAD
2 - CAMSHAFT POSITION SENSOR
3 - SCREW |
|--|

10. Collapse and pin primary chain tensioner.

CAUTION: Plate behind left secondary chain tensioner could fall into oil pan.
Therefore, cover pan opening.

11. Remove secondary chain tensioners.

12. Remove camshaft position sensor (2). See **Fig. 188**.



80ccc0a4

Fig. 189: Special Tool 8428
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - Camshaft hole
2 - Special Tool 8428 |
|--|

CAUTION: Care should be taken not to damage camshaft target wheel. Do not hold target wheel while loosening or tightening camshaft sprocket. Do not place the target wheel near a magnetic source of any kind. A damaged or magnetized target wheel could cause a vehicle no start condition.

CAUTION: Do not forcefully rotate the camshafts or crankshaft independently of each other. Damaging intake valve to piston contact will occur.

Ensure negative battery cable is disconnected to guard against accidental starter engagement.

13. Remove left and right camshaft sprocket bolts.
14. While holding the left camshaft steel tube with Camshaft Holder 8428 (2), remove the left camshaft sprocket. Slowly rotate the camshaft approximately 5 degrees clockwise to a neutral position. See **Fig. 189**.
15. While holding the right camshaft steel tube with Camshaft Holder 8428 (2), remove the right camshaft sprocket.
16. Remove idler sprocket assembly bolt.
17. Slide the idler sprocket assembly and crank sprocket forward simultaneously to remove the primary and secondary chains.
18. Remove both pivoting tensioner arms and chain guides.
19. Remove primary chain tensioner.

INSPECTION

TIMING CHAIN AND SPROCKETS

Inspect the following components:

Sprockets for excessive tooth wear. Some tooth markings are normal and not a cause for sprocket replacement.

Idler sprocket assembly bushing and shaft for excessive wear.

Idler sprocket assembly spline joint. The joint should be tight with no backlash or axial movement.

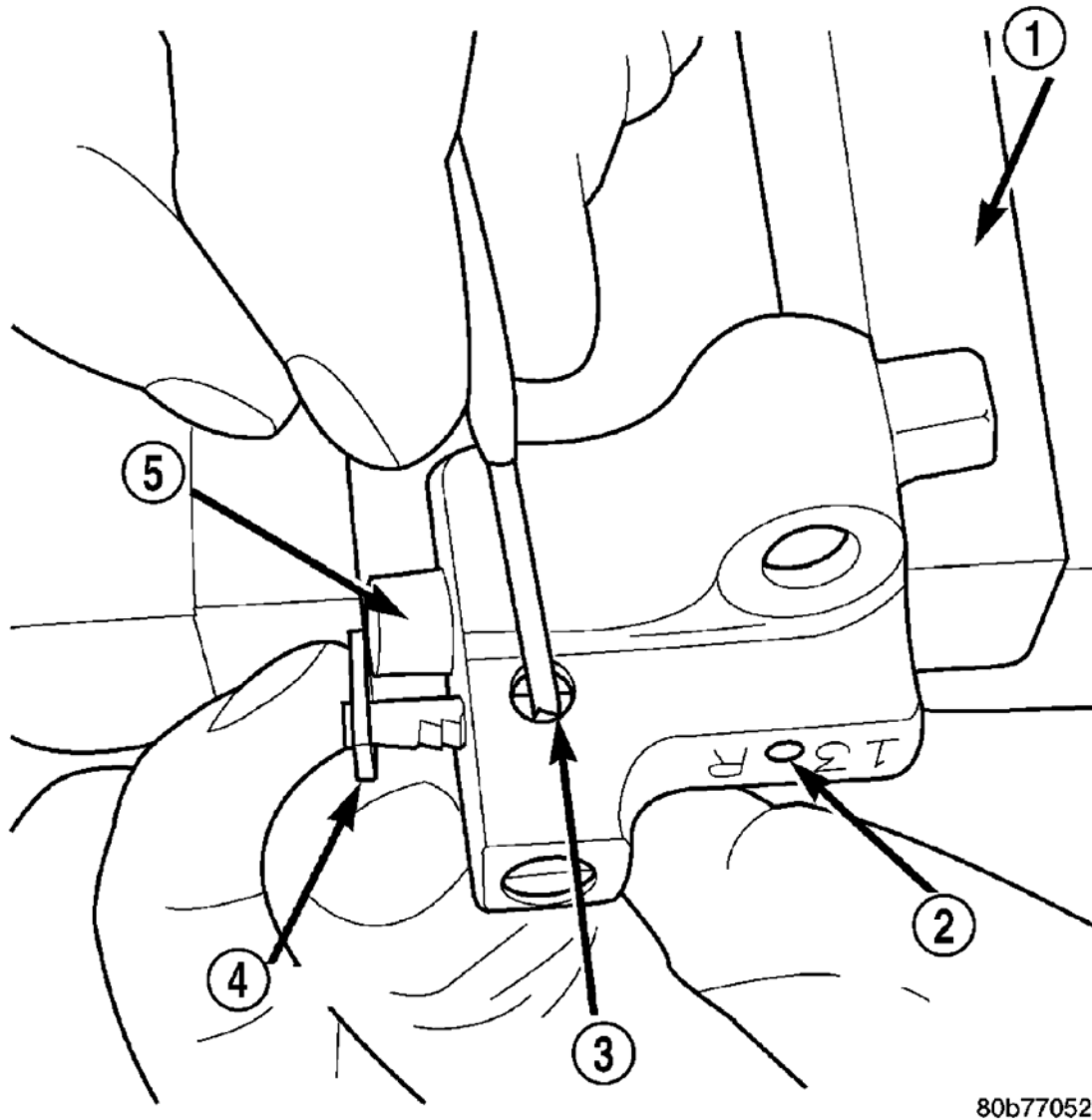
Chain guides and tensioner arms. Replace these parts if grooving in plastic face is more than 1 mm (0.039 in.) deep. If plastic face is severely grooved or melted, the tensioner lube jet may be clogged. The tensioner should be replaced.

Secondary chain tensioner piston and ratcheting device. Inspect for evidence of heavy contact between tensioner piston and tensioner arm. If this condition exist, the tensioner arm and chain should be replaced.

Primary chain tensioner plastic faces. Replace as required.

INSTALLATION

TIMING CHAIN AND SPROCKETS



80b77052

Fig. 190: Resetting Secondary Chain Tensioners
Courtesy of CHRYSLER LLC

- 1 - VISE
- 2 - TENSIONER BODY
- 3 - INSERT LOCK PIN
- 4 - RATCHET
- 5 - PISTON

1. Using a vise, lightly compress the secondary chain tensioner piston (5) until the piston step is flush with the tensioner body. Using a pin or suitable tool, release ratchet pawl by pulling pawl back against spring force through access hole on side of tensioner. While continuing to hold pawl back, Push ratchet device to approximately 2 mm from the tensioner body. Install Tensioner pin 8514 (3) into hole on front of

tensioner. Slowly open vise (1) to transfer piston spring force to lock pin. See **Fig. 190**.

2. Position primary chain tensioner over oil pump and insert bolts into lower two holes on tensioner bracket. Tighten bolts to 28 N.m (250 in. lbs.).

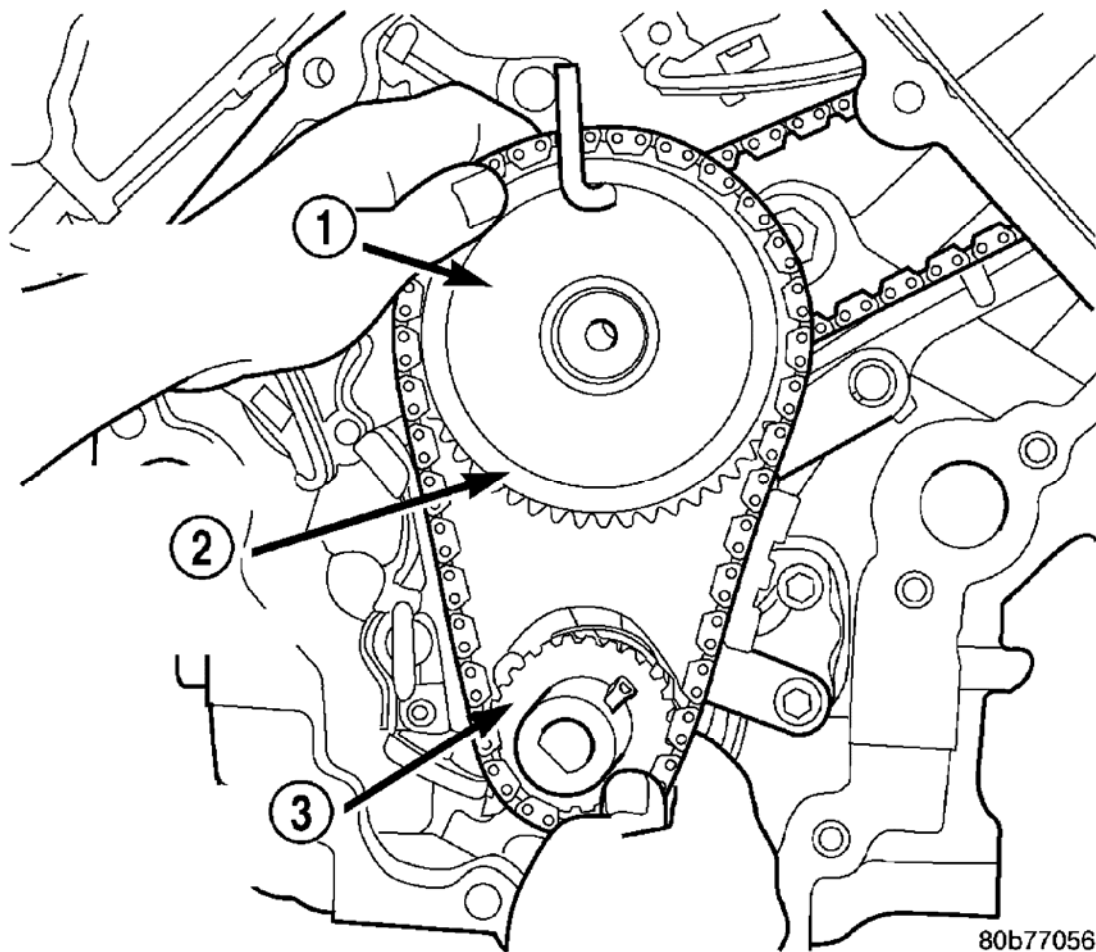


Fig. 191: Identifying Crankshaft Gear, Primary Chain Idler Sprocket & Special Tool
Courtesy of CHRYSLER LLC

- | |
|----------------------------------|
| 1 - SPECIAL TOOL 8429 |
| 2 - PRIMARY CHAIN IDLER SPROCKET |
| 3 - CRANKSHAFT SPROCKET |

3. Install right side chain tensioner arm. Install Torx® bolt. Tighten Torx® bolt to 28 N.m (250 in. lbs.).

CAUTION: The silver bolts retain the guides to the cylinder heads and the black bolts retain the guides to the engine block.

4. Install the left side chain guide. Tighten the bolts to 28 N.m (250 in. lbs.).

5. Install left side chain tensioner arm, and Torx® bolt. Tighten Torx® bolt to 28 N.m (250 in. lbs.).
6. Install the right side chain guide. Tighten the bolts to 28 N.m (250 in. lbs.).
7. Install both secondary chains onto the idler sprocket. Align two plated links on the secondary chains to be visible through the two lower openings on the idler sprocket (4 o'clock and 8 o'clock). Once the secondary timing chains are installed, position the Secondary Camshaft Chain Holder 8429 (1) to hold chains in place for installation. See **Fig. 191**.
8. Align primary chain double plated links with the timing mark at 12 o'clock on the idler sprocket. Align the primary chain single plated link with the timing mark at 6 o'clock on the crankshaft sprocket.
9. Lubricate idler shaft and bushings with clean engine oil.

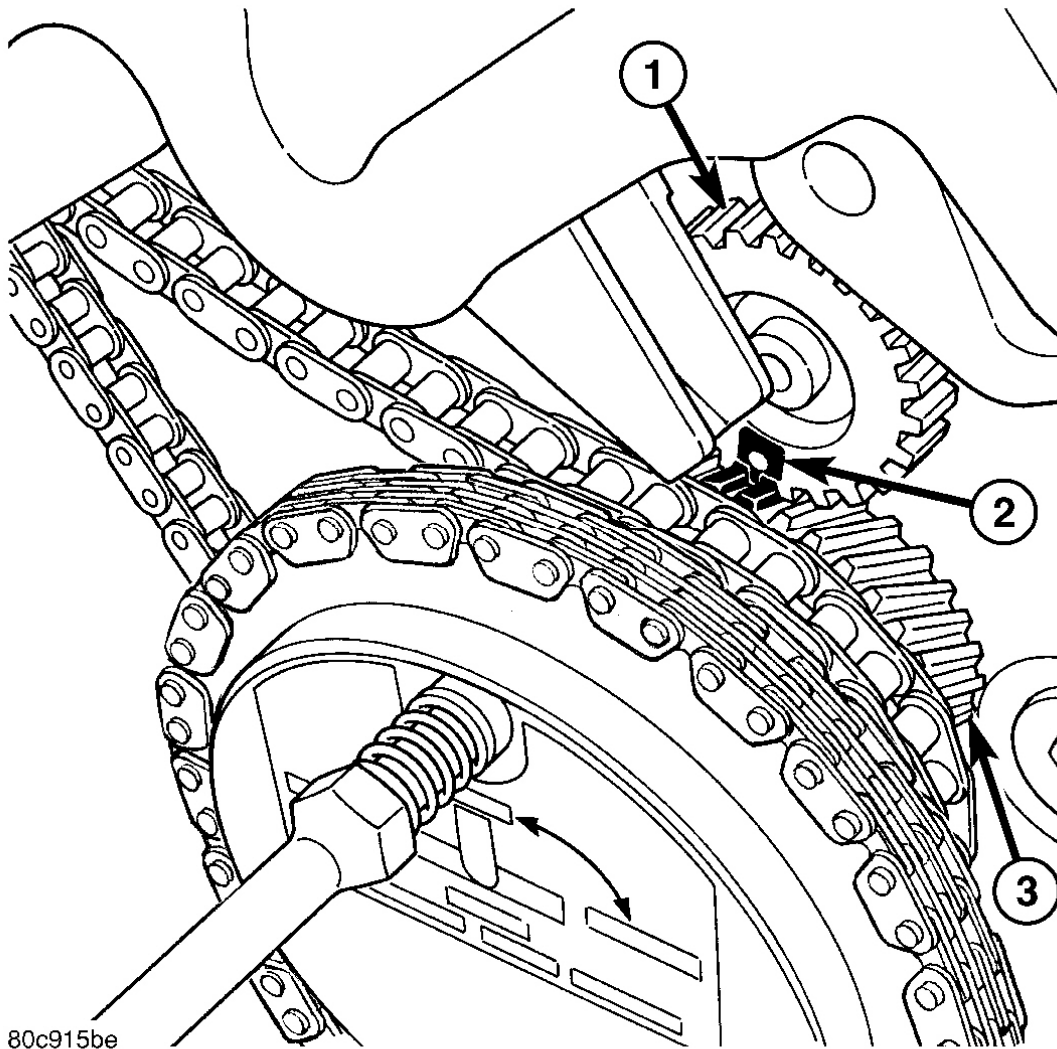


Fig. 192: Counterbalance Shaft Alignment Marks
Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - COUNTERBALANCE SHAFT GEAR |
| 2 - TIMING MARK |
| 3 - IDLER SPROCKET GEAR |

NOTE: **The idler sprocket must be timed to the counterbalance shaft drive gear before the idler sprocket is fully seated.**

10. Install all chains, crankshaft sprocket, and idler sprocket as an assembly. After guiding both secondary chains through the block and cylinder head openings, affix chains with a elastic strap or equivalent. This will maintain tension on chains to aid in installation. Align the timing mark (2) on the idler sprocket gear (3) to the timing mark on the counterbalance shaft drive gear (1), then seat idler sprocket fully. Before installing idler sprocket bolt, lubricate washer with oil, and tighten idler sprocket assembly retaining bolt to 34 N.m (25 ft. lbs.). See **Fig. 192**.

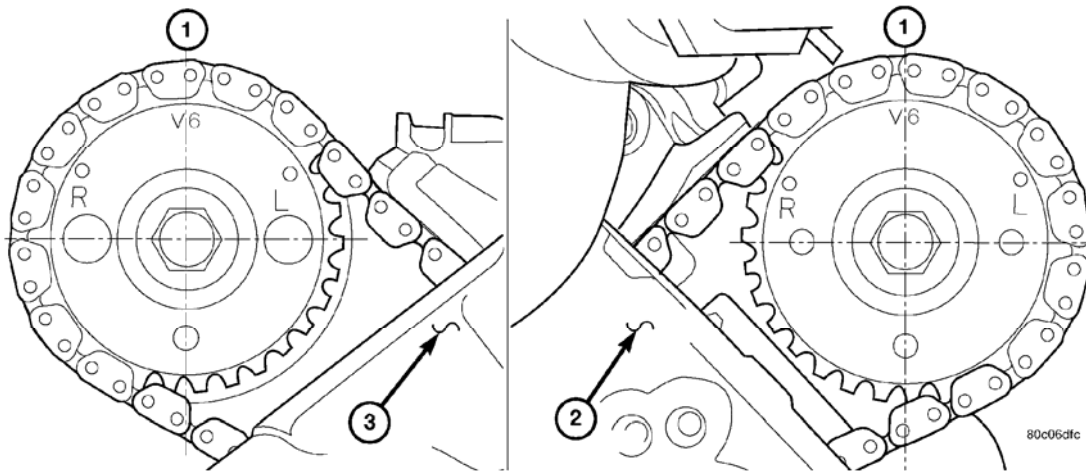


Fig. 193: Camshaft Sprocket V6 Marks
Courtesy of CHRYSLER LLC

NOTE: **It will be necessary to slightly rotate camshafts for sprocket installation.**

11. Align left camshaft sprocket "L" dot to plated link on chain.
12. Align right camshaft sprocket "R" dot to plated link on chain. See **Fig. 193**.

CAUTION: Remove excess oil from the camshaft sprocket bolt. Failure to do so can result in over-torque of bolt resulting in bolt failure.

13. Remove Secondary Camshaft Chain Holder 8429, then attach both sprockets to camshafts. Remove excess oil from bolts, then Install sprocket bolts, but do not tighten at this time.
14. Verify that all plated links are aligned with the marks on all sprockets and the "V6" marks on camshaft sprockets are at the 12 o'clock position.

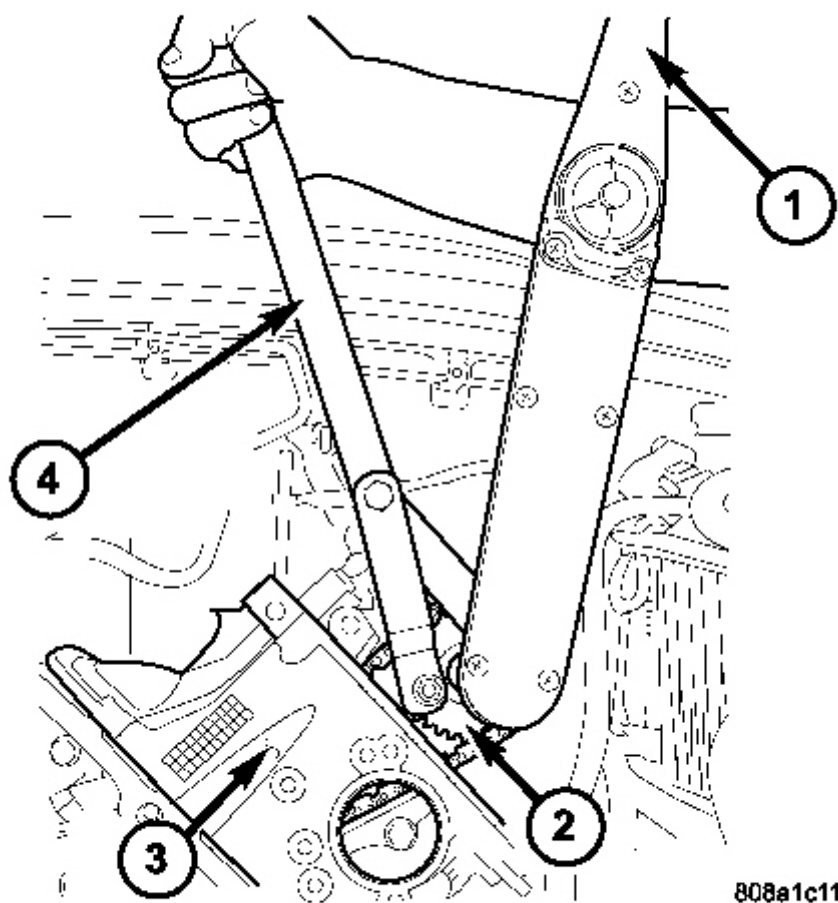


Fig. 194: Tightening Left Side Camshaft Sprocket Bolt
Courtesy of CHRYSLER LLC

- | |
|--|
| <p>1 - TORQUE WRENCH
2 - CAMSHAFT SPROCKET
3 - LEFT CYLINDER HEAD
4 - SPECIAL TOOL 6958 SPANNER WITH ADAPTER
PINS 8346</p> |
|--|

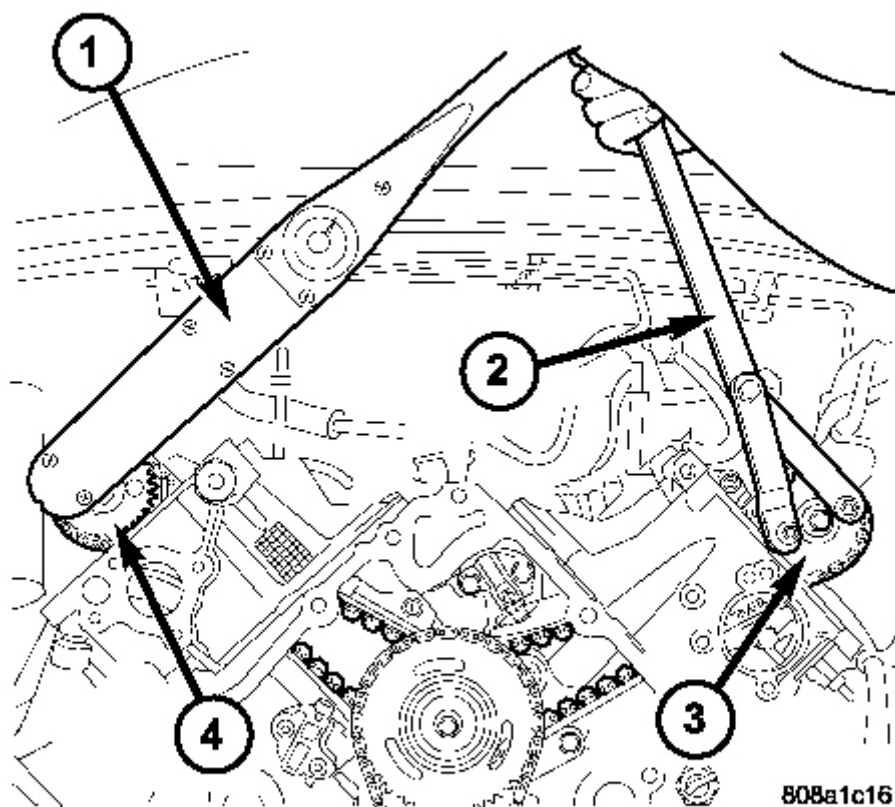


Fig. 195: Tightening Right Side Camshaft Sprocket Bolt
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - TORQUE WRENCH |
| 2 - SPECIAL TOOL 6958 WITH ADAPTER PINS 8346 |
| 3 - LEFT CAMSHAFT SPROCKET |
| 4 - RIGHT CAMSHAFT SPROCKET |

CAUTION: Ensure the plate between the left secondary chain tensioner and block is correctly installed.

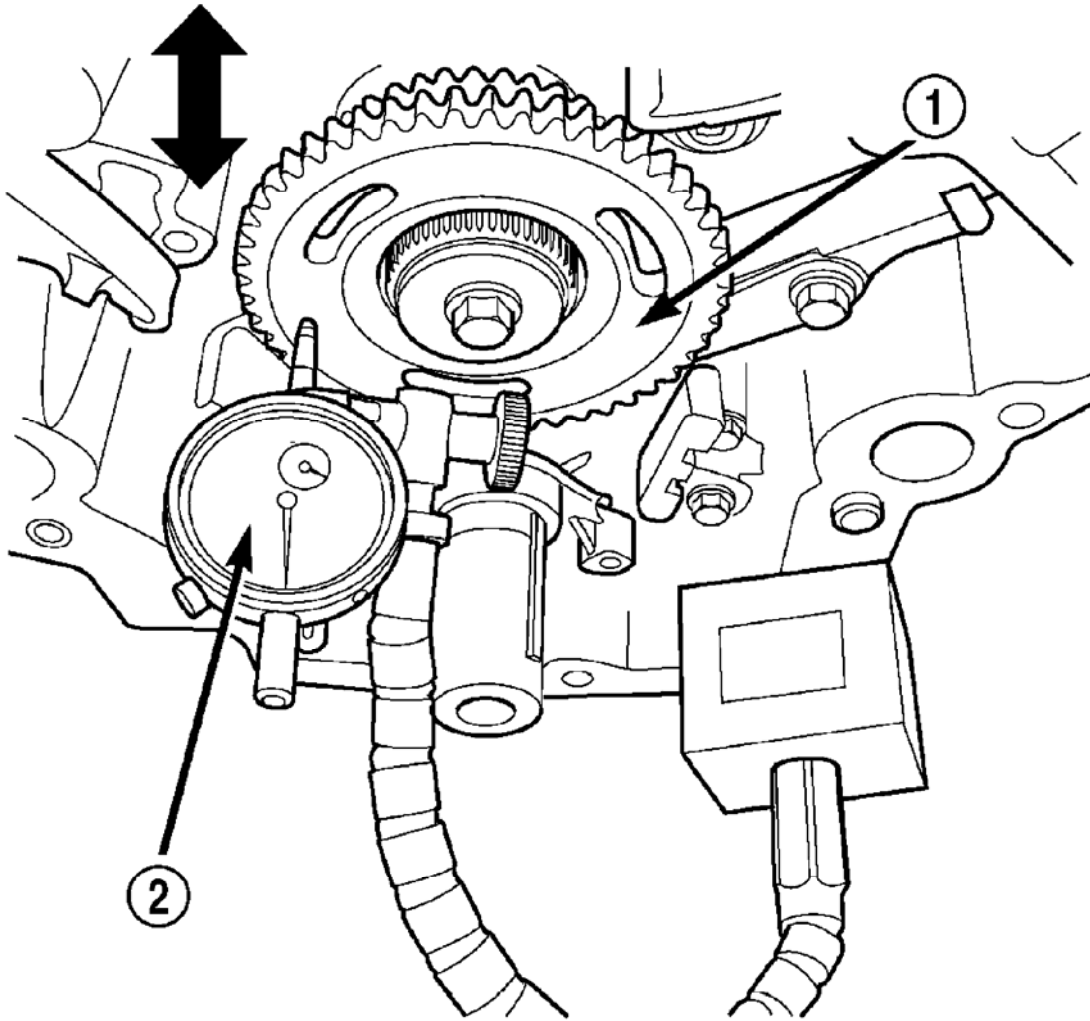
15. Install both secondary chain tensioners. Tighten bolts to 28 N.m (250 in. lbs.).

NOTE: Left and right secondary chain tensioners are not common.

16. Remove all 3 locking pins from tensioners.

CAUTION: After pulling locking pins out of each tensioner, DO NOT manually extend the tensioner(s) ratchet. Doing so will over tension the chains, resulting in noise and/or high timing chain loads.

17. Using Spanner Wrench 6958 with Adapter Pins 8346, (4) tighten left and right camshaft sprocket bolts to 122 N.m (90 ft. lbs.). See **Fig. 194** and **Fig. 195**.
18. Rotate engine two full revolutions. Verify timing marks are at the follow locations:
 - primary chain idler sprocket dot is at 12 o'clock
 - primary chain crankshaft sprocket dot is at 6 o'clock
 - secondary chain camshaft sprockets "V6" marks are at 12 o'clock
 - counterbalancer shaft drive gear dot is aligned to the idler sprocket gear dot
19. Lubricate all three chains with engine oil.

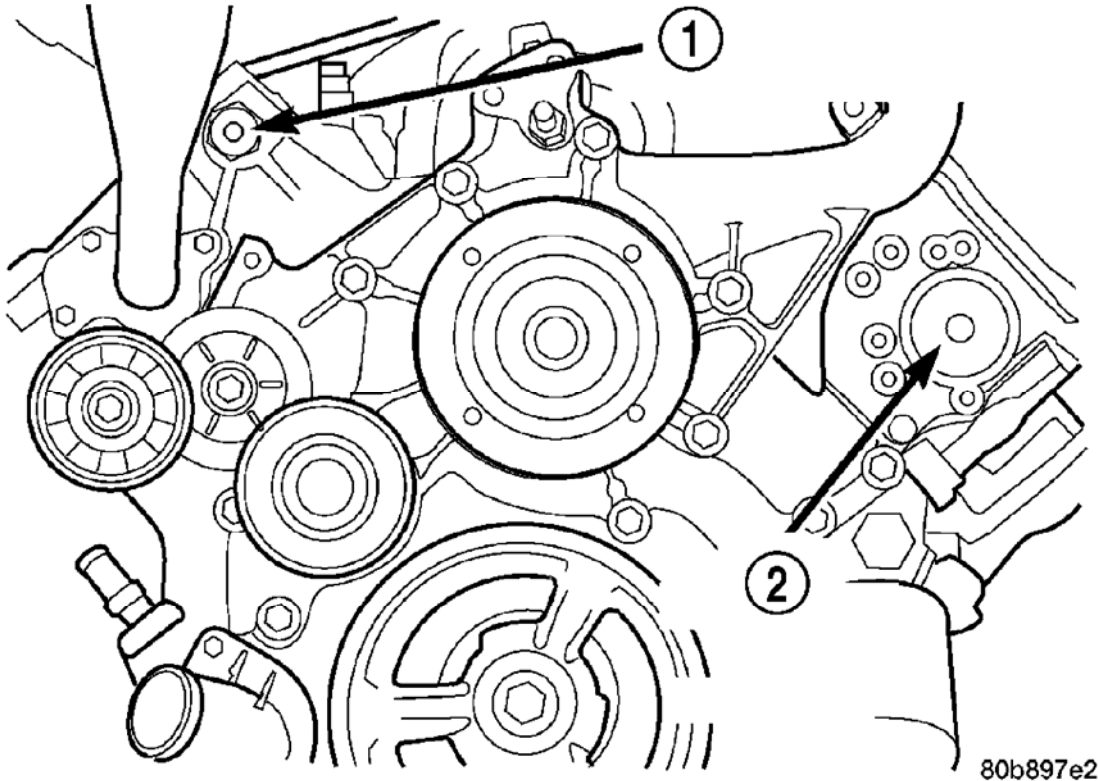


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Fig. 196: Measuring Idler Gear End Play
Courtesy of CHRYSLER LLC

1 - IDLER SPROCKET ASSEMBLY 2 - DIAL INDICATOR

20. After installing all chains, it is recommended that the idler gear end play be checked. The end play must be within 0.10 - 0.25 mm (0.004 - 0.010 in.). If not within specification, the idler gear must be replaced. See **Fig. 196**.
21. Install timing chain cover and crankshaft damper.
22. Install cylinder head covers. See **INSTALLATION**.



80b897e2

Fig. 197: Locating Cylinder Head Access Plugs
Courtesy of CHRYSLER LLC

1 - RIGHT CYLINDER HEAD ACCESS PLUG
2 - LEFT CYLINDER HEAD ACCESS PLUG

NOTE: Before installing threaded plug in right cylinder head, the plug must be coated with sealant to prevent leaks.

23. Coat the large threaded access plug with **Mopar® Thread Sealant with Teflon** , then install into the right cylinder head (1) and tighten to 81 N.m (60 ft. lbs.). See **Fig. 197**.
24. Install the oil fill housing.
25. Install access plug in left cylinder head (2).
26. Install power steering pump. Refer to **INSTALLATION** .
27. Fill cooling system. Refer to **STANDARD PROCEDURE** .
28. Connect negative cable to battery.

2008 ENGINE PERFORMANCE

Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>P0016</u>	CRANKSHAFT/CAMSHAFT TIMING MISALIGNMENT
<u>P0031</u>	O2 SENSOR 1/1 HEATER CIRCUIT LOW
<u>P0032</u>	O2 SENSOR 1/1 HEATER CIRCUIT HIGH
<u>P0037</u>	O2 SENSOR 1/2 HEATER CIRCUIT LOW
<u>P0038</u>	O2 SENSOR 1/2 HEATER CIRCUIT HIGH
<u>P0051</u>	O2 SENSOR 2/1 HEATER CIRCUIT LOW
<u>P0052</u>	O2 SENSOR 2/1 HEATER CIRCUIT HIGH
<u>P0057</u>	O2 SENSOR 2/2 HEATER CIRCUIT LOW
<u>P0058</u>	O2 SENSOR 2/2 HEATER CIRCUIT HIGH
<u>P0071</u>	AMBIENT AIR TEMPERATURE SENSOR PERFORMANCE
<u>P0072</u>	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT LOW
<u>P0073</u>	AMBIENT AIR TEMPERATURE SENSOR CIRCUIT HIGH
<u>P0107</u>	MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT LOW
<u>P0108</u>	MANIFOLD ABSOLUTE PRESSURE SENSOR CIRCUIT HIGH
<u>P0111</u>	INTAKE AIR TEMPERATURE SENSOR RATIONALITY
<u>P0112</u>	INTAKE AIR TEMPERATURE SENSOR CIRCUIT LOW
<u>P0113</u>	INTAKE AIR TEMPERATURE SENSOR CIRCUIT HIGH
<u>P0116</u>	ENGINE COOLANT TEMPERATURE SENSOR PERFORMANCE
<u>P0117</u>	ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT LOW
<u>P0118</u>	ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT HIGH
<u>P0121</u>	THROTTLE POSITION SENSOR 1 PERFORMANCE
<u>P0122</u>	THROTTLE POSITION SENSOR 1 CIRCUIT LOW
<u>P0123</u>	THROTTLE POSITION SENSOR 1 CIRCUIT HIGH
<u>P0125</u>	INSUFFICIENT COOLANT TEMPERATURE FOR CLOSED-LOOP FUEL CONTROL
<u>P0128</u>	THERMOSTAT RATIONALITY
<u>P0129</u>	BAROMETRIC PRESSURE OUT-OF-RANGE LOW
<u>P0131</u>	O2 SENSOR 1/1 CIRCUIT LOW
<u>P0132</u>	O2 SENSOR 1/1 CIRCUIT HIGH
<u>P0133</u>	O2 SENSOR 1/1 SLOW RESPONSE
<u>P0135</u>	O2 SENSOR 1/1 HEATER PERFORMANCE
<u>P0137</u>	O2 SENSOR 1/2 CIRCUIT LOW
<u>P0138</u>	O2 SENSOR 1/2 CIRCUIT HIGH
<u>P0139</u>	O2 SENSOR 1/2 SLOW RESPONSE

<u>P013A</u>	O2 SENSOR 1/2 SLOW RESPONSE - RICH TO LEAN
<u>P013C</u>	O2 SENSOR 2/2 SLOW RESPONSE - RICH TO LEAN
<u>P0141</u>	O2 SENSOR 1/2 HEATER PERFORMANCE
<u>P0151</u>	O2 SENSOR 2/1 CIRCUIT LOW
<u>P0152</u>	O2 SENSOR 2/1 CIRCUIT HIGH
<u>P0153</u>	O2 SENSOR 2/1 SLOW RESPONSE
<u>P0155</u>	O2 SENSOR 2/1 HEATER PERFORMANCE
<u>P0157</u>	O2 SENSOR 2/2 CIRCUIT LOW
<u>P0158</u>	O2 SENSOR 2/2 CIRCUIT HIGH
<u>P0159</u>	O2 SENSOR 2/2 SLOW RESPONSE
<u>P0161</u>	O2 SENSOR 2/2 HEATER PERFORMANCE
<u>P0171</u>	FUEL SYSTEM 1/1 LEAN
<u>P0172</u>	FUEL SYSTEM 1/1 RICH
<u>P0174</u>	FUEL SYSTEM 2/1 LEAN
<u>P0175</u>	FUEL SYSTEM 2/1 RICH
<u>P0201</u>	FUEL INJECTOR 1 CIRCUIT
<u>P0202</u>	FUEL INJECTOR 2 CIRCUIT
<u>P0203</u>	FUEL INJECTOR 3 CIRCUIT
<u>P0204</u>	FUEL INJECTOR 4 CIRCUIT
<u>P0205</u>	FUEL INJECTOR 5 CIRCUIT
<u>P0206</u>	FUEL INJECTOR 6 CIRCUIT
<u>P0221</u>	THROTTLE POSITION SENSOR 2 PERFORMANCE
<u>P0222</u>	THROTTLE POSITION SENSOR 2 CIRCUIT LOW
<u>P0223</u>	THROTTLE POSITION SENSOR 2 CIRCUIT HIGH
<u>P0300</u>	MULTIPLE CYLINDER MISFIRE
<u>P0301</u>	CYLINDER 1 MISFIRE
<u>P0302</u>	CYLINDER 2 MISFIRE
<u>P0303</u>	CYLINDER 3 MISFIRE
<u>P0304</u>	CYLINDER 4 MISFIRE
<u>P0305</u>	CYLINDER 5 MISFIRE
<u>P0306</u>	CYLINDER 6 MISFIRE
<u>P0315</u>	NO CRANK SENSOR LEARNED
<u>P0325</u>	KNOCK SENSOR 1 CIRCUIT
<u>P0330</u>	KNOCK SENSOR 2 CIRCUIT
<u>P0335</u>	CRANKSHAFT POSITION SENSOR CIRCUIT
<u>P0339</u>	CRANKSHAFT POSITION SENSOR INTERMITTENT
<u>P0340</u>	CAMSHAFT POSITION SENSOR CIRCUIT
<u>P0344</u>	CAMSHAFT POSITION SENSOR INTERMITTENT
<u>P0401</u>	EGR SYSTEM PERFORMANCE
<u>P0403</u>	EGR SOLENOID CIRCUIT
<u>P0404</u>	EGR POSITION SENSOR RATIONALITY OPEN
<u>P0405</u>	

	EGR POSITION SENSOR CIRCUIT LOW
<u>P0406</u>	EGR POSITION SENSOR CIRCUIT HIGH
<u>P0420</u>	CATALYST EFFICIENCY (BANK 1)
<u>P0430</u>	CATALYST EFFICIENCY (BANK 2)
<u>P0440</u>	GENERAL EVAP SYSTEM FAILURE
<u>P0441</u>	EVAP PURGE SYSTEM PERFORMANCE
<u>P0443</u>	EVAP PURGE SOLENOID CIRCUIT
<u>P0452</u>	EVAP PRESSURE SWITCH STUCK CLOSED
<u>P0455</u>	EVAP PURGE SYSTEM LARGE LEAK
<u>P0456</u>	EVAP PURGE SYSTEM SMALL LEAK
<u>P0457</u>	LOOSE FUEL CAP
<u>P0461</u>	FUEL LEVEL SENSOR 1 PERFORMANCE
<u>P0462</u>	FUEL LEVEL SENSOR 1 CIRCUIT LOW
<u>P0463</u>	FUEL LEVEL SENSOR 1 CIRCUIT HIGH
<u>P0480</u>	COOLING FAN 1 CONTROL CIRCUIT
<u>P0481</u>	COOLING FAN 2 CONTROL CIRCUIT
<u>P0501</u>	VEHICLE SPEED SENSOR 1 PERFORMANCE
<u>P0503</u>	VEHICLE SPEED SENSOR 1 ERRATIC
<u>P0506</u>	IDLE SPEED PERFORMANCE LOWER THAN EXPECTED
<u>P0507</u>	IDLE SPEED PERFORMANCE HIGHER THAN EXPECTED
<u>P050B</u>	COLD START IGNITION TIMING PERFORMANCE
<u>P050D</u>	COLD START ROUGH IDLE
<u>P0513</u>	INVALID SKIM KEY
<u>P0522</u>	ENGINE OIL PRESSURE TOO LOW
<u>P0532</u>	A/C PRESSURE SENSOR CIRCUIT LOW
<u>P0533</u>	A/C PRESSURE SENSOR CIRCUIT HIGH
<u>P0562</u>	BATTERY VOLTAGE LOW
<u>P0563</u>	BATTERY VOLTAGE HIGH
<u>P0571</u>	BRAKE SWITCH 1 PERFORMANCE
<u>P0572</u>	BRAKE SWITCH 1 STUCK ON
<u>P0573</u>	BRAKE SWITCH 1 STUCK OFF
<u>P0579</u>	SPEED CONTROL SWITCH 1 PERFORMANCE
<u>P0580</u>	SPEED CONTROL SWITCH 1 CIRCUIT LOW
<u>P0581</u>	SPEED CONTROL SWITCH 1 CIRCUIT HIGH
<u>P0585</u>	SPEED CONTROL SWITCH 1/2 CORRELATION
<u>P0591</u>	SPEED CONTROL SWITCH 2 PERFORMANCE
<u>P0592</u>	SPEED CONTROL SWITCH 2 CIRCUIT LOW
<u>P0593</u>	SPEED CONTROL SWITCH 2 CIRCUIT HIGH
<u>P0600</u>	SERIAL COMMUNICATION LINK
<u>P0601</u>	INTERNAL MEMORY CHECKSUM INVALID
<u>P0606</u>	INTERNAL ECM PROCESSOR
<u>P060B</u>	

	ETC A/D GROUND PERFORMANCE
<u>P060D</u>	ETC LEVEL 2 APP PERFORMANCE
<u>P060E</u>	ETC LEVEL 2 TPS PERFORMANCE
<u>P060F</u>	ETC LEVEL 2 ECT PERFORMANCE
<u>P061A</u>	ETC LEVEL 2 TORQUE PERFORMANCE
<u>P061C</u>	ETC LEVEL 2 RPM PERFORMANCE
<u>P0622</u>	GENERATOR FIELD CONTROL CIRCUIT
<u>P0627</u>	FUEL PUMP CONTROL CIRCUIT
<u>P062C</u>	ETC LEVEL 2 MPH PERFORMANCE
<u>P0630</u>	VIN NOT PROGRAMMED IN PCM
<u>P0632</u>	ODOMETER NOT PROGRAMMED IN PCM
<u>P0633</u>	SKIM KEY NOT PROGRAMMED IN PCM
<u>P063A</u>	GENERATOR VOLTAGE SENSE CIRCUIT
<u>P0642</u>	SENSOR REFERENCE VOLTAGE 1 CIRCUIT LOW
<u>P0643</u>	SENSOR REFERENCE VOLTAGE 1 CIRCUIT HIGH
<u>P0645</u>	A/C CLUTCH CONTROL CIRCUIT
<u>P0652</u>	SENSOR REFERENCE VOLTAGE 2 CIRCUIT LOW
<u>P0653</u>	SENSOR REFERENCE VOLTAGE 2 CIRCUIT HIGH
<u>P0685</u>	AUTO SHUTDOWN CONTROL CIRCUIT
<u>P0688</u>	AUTO SHUTDOWN SENSE CIRCUIT LOW
<u>P0691</u>	COOLING FAN 1 CONTROL CIRCUIT LOW
<u>P0692</u>	COOLING FAN 1 CONTROL CIRCUIT HIGH
<u>P0693</u>	COOLING FAN 2 CONTROL CIRCUIT LOW
<u>P0694</u>	COOLING FAN 2 CONTROL CIRCUIT HIGH
<u>P0700</u>	TRANSMISSION CONTROL SYSTEM (MIL REQUEST)
<u>P0703</u>	BRAKE SWITCH 2 PERFORMANCE
<u>P0850</u>	PARK/NEUTRAL SWITCH PERFORMANCE
<u>P1115</u>	GENERAL TEMPERATURE RATIONALITY
<u>P1128</u>	CLOSED LOOP FUELING NOT ACHIEVED - BANK 1
<u>P1129</u>	CLOSED LOOP FUELING NOT ACHIEVED - BANK 2
<u>P1273</u>	A/C CLUTCH CONTROL CIRCUIT 2 HIGH (TIPM)
<u>P1275</u>	A/C CLUTCH CONTROL CIRCUIT 2 OVERCURRENT (TIPM)
<u>P129C</u>	INVERTER CONTROL CIRCUIT HIGH (TIPM)
<u>P129E</u>	INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)
<u>P1404</u>	EGR POSITION SENSOR RATIONALITY CLOSED
<u>P1501</u>	VEHICLE SPEED SENSOR 1/2 CORRELATION - DRIVE WHEELS
<u>P1502</u>	VEHICLE SPEED SENSOR 1/2 CORRELATION - NON DRIVE WHEELS
<u>P1572</u>	BRAKE PEDAL STUCK ON
<u>P1573</u>	BRAKE PEDAL STUCK OFF
<u>P1593</u>	SPEED CONTROL SWITCH 1/2 STUCK
<u>P1607</u>	PCM INTERNAL SHUTDOWN TIMER RATIONALITY
<u>D1618</u>	

	SENSOR REFERENCE VOLTAGE 1 CIRCUIT ERRATIC
<u>P1628</u>	SENSOR REFERENCE VOLTAGE 2 CIRCUIT ERRATIC
<u>P1696</u>	EEPROM MEMORY WRITE DENIED/INVALID
<u>P1697</u>	EMR (SRI) MILEAGE NOT STORED
<u>P1897</u>	LEVEL 1 RPM BUS UNLOCK
<u>P2072</u>	ELECTRONIC THROTTLE CONTROL SYSTEM - ICE BLOCKAGE
<u>P2096</u>	DOWNSTREAM FUEL TRIM SYSTEM 1 LEAN
<u>P2097</u>	DOWNSTREAM FUEL TRIM SYSTEM 1 RICH
<u>P2098</u>	DOWNSTREAM FUEL TRIM SYSTEM 2 LEAN
<u>P2099</u>	DOWNSTREAM FUEL TRIM SYSTEM 2 RICH
<u>P2100</u>	ELECTRONIC THROTTLE CONTROL MOTOR CIRCUIT
<u>P2101</u>	ELECTRONIC THROTTLE CONTROL MOTOR PERFORMANCE
<u>P2107</u>	ELECTRONIC THROTTLE CONTROL MODULE PROCESSOR
<u>P2110</u>	ELECTRONIC THROTTLE CONTROL - FORCED LIMITED RPM
<u>P2111</u>	ELECTRONIC THROTTLE CONTROL - UNABLE TO CLOSE
<u>P2112</u>	ELECTRONIC THROTTLE CONTROL - UNABLE TO OPEN
<u>P2115</u>	ACCELERATOR PEDAL POSITION SENSOR 1 MINIMUM STOP PERFORMANCE
<u>P2116</u>	ACCELERATOR PEDAL POSITION SENSOR 2 MINIMUM STOP PERFORMANCE
<u>P2118</u>	ELECTRONIC THROTTLE CONTROL MOTOR CURRENT PERFORMANCE
<u>P2122</u>	ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT LOW
<u>P2123</u>	ACCELERATOR PEDAL POSITION SENSOR 1 CIRCUIT HIGH
<u>P2127</u>	ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT LOW
<u>P2128</u>	ACCELERATOR PEDAL POSITION SENSOR 2 CIRCUIT HIGH
<u>P2135</u>	THROTTLE POSITION SENSOR 1/2 CORRELATION
<u>P2138</u>	ACCELERATOR PEDAL POSITION SENSOR 1/2 CORRELATION
<u>P2166</u>	ACCELERATOR PEDAL POSITION SENSOR 1 MAXIMUM STOP PERFORMANCE
<u>P2167</u>	ACCELERATOR PEDAL POSITION SENSOR 2 MAXIMUM STOP PERFORMANCE
<u>P2172</u>	HIGH AIRFLOW / VACUUM LEAK DETECTED (INSTANTANEOUS ACCUMULATION)
<u>P2173</u>	HIGH AIRFLOW / VACUUM LEAK DETECTED (SLOW ACCUMULATION)
<u>P2174</u>	LOW AIRFLOW / RESTRICTION DETECTED (INSTANTANEOUS ACCUMULATION)
<u>P2175</u>	LOW AIRFLOW / RESTRICTION DETECTED (SLOW ACCUMULATION)
<u>P2181</u>	COOLING SYSTEM PERFORMANCE
<u>P2299</u>	BRAKE PEDAL POSITION / ACCELERATOR PEDAL POSITION INCOMPATIBLE
<u>P2302</u>	IGNITION COIL 1 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2305</u>	IGNITION COIL 2 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION

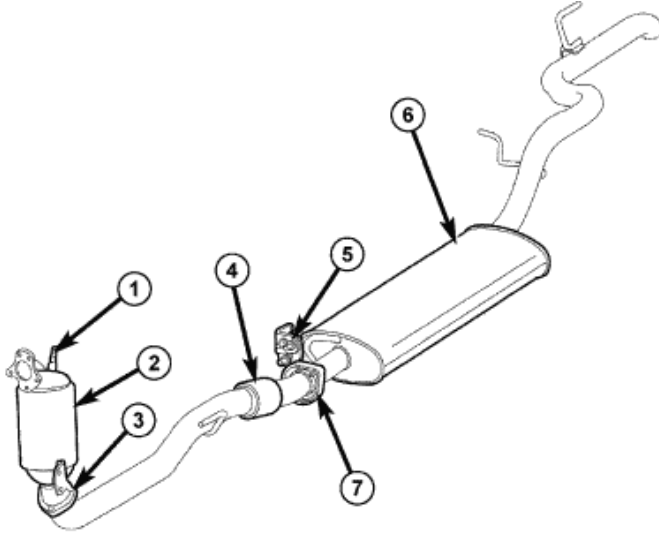
<u>P2308</u>	IGNITION COIL 3 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2311</u>	IGNITION COIL 4 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2314</u>	IGNITION COIL 5 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2317</u>	IGNITION COIL 6 SECONDARY CIRCUIT- INSUFFICIENT IONIZATION
<u>P2503</u>	CHARGING SYSTEM OUTPUT LOW
<u>P2504</u>	CHARGING SYSTEM OUTPUT HIGH
<u>P2610</u>	PCM INTERNAL SHUTDOWN TIMER RATIONALITY TOO FAST
<u>U0001</u>	CAN C BUS
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0121</u>	LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE (TIPM)
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM-WCM)
<u>U110C</u>	LOST FUEL LEVEL MESSAGE
<u>U110E</u>	LOST AMBIENT TEMPERATURE MESSAGE
<u>U1110</u>	LOST VEHICLE SPEED MESSAGE
<u>U1113</u>	LOST A/C PRESSURE MESSAGE
<u>U1120</u>	LOST WHEEL DISTANCE MESSAGE
<u>U1403</u>	IMPLAUSIBLE FUEL LEVEL SIGNAL RECEIVED
<u>U1411</u>	IMPLAUSIBLE FUEL VOLUME SIGNAL RECEIVED
<u>U1412</u>	IMPLAUSIBLE VEHICLE SPEED SIGNAL RECEIVED
<u>U1417</u>	IMPLAUSIBLE LEFT WHEEL DISTANCE SIGNAL RECEIVED
<u>U1418</u>	IMPLAUSIBLE RIGHT WHEEL DISTANCE SIGNAL RECEIVED

2008 ENGINE

Exhaust System And Turbocharger - Liberty

DESCRIPTION

DESCRIPTION-2.8L DIESEL



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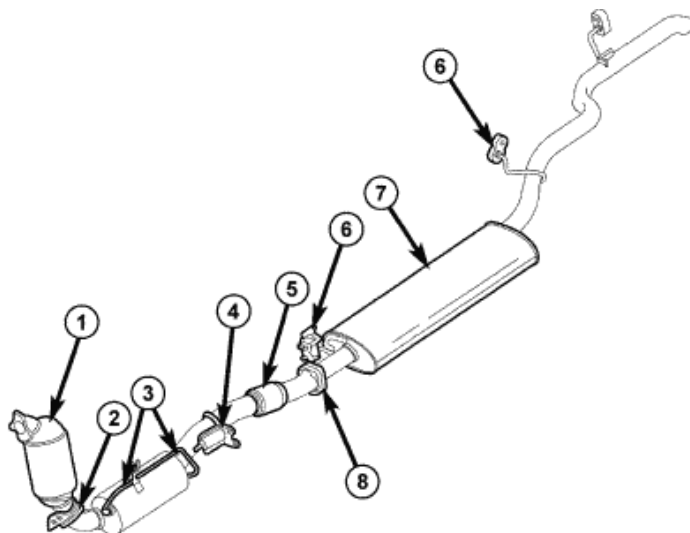
Fig. 1: Exhaust System - 2.8L Diesel - w/out DPF

Courtesy of CHRYSLER LLC

1 - OXYGEN SENSOR
2 - MANIVERTER
3 - MANIVERTER TO EXHAUST PIPE FLANGE
4 - FLEXIBLE BELLOWS
5 - ISOLATORS
6 - MUFFLER/TAILPIPE ASSEMBLY
7 - EXHAUST PIPE TO MUFFLER FLANGE

CAUTION: Avoid application of rust prevention compounds or undercoating materials to exhaust system floor pan exhaust heat shields. Light overspray near the edges is permitted. Application of coating will result in excessive floor pan temperatures and objectionable fumes.

The diesel engine exhaust system consists of an engine exhaust manifold, turbocharger, EGR valve with intercooler, front exhaust pipe with catalytic converter, muffler and tailpipe assembly.



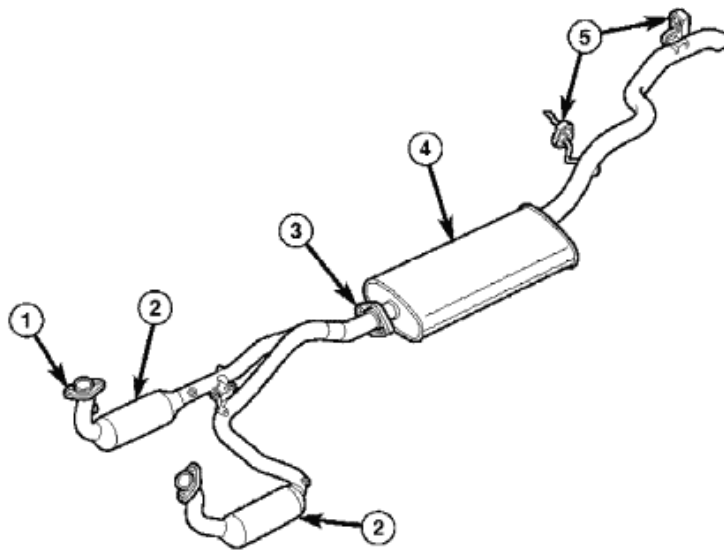
81a592db

Fig. 2: Exhaust System - 2.8L Diesel - w/DPF
Courtesy of CHRYSLER LLC

1 - MANIFVERTER
2 - MANIVERTER TO DFP FLANGE
3 - PRESSURE SENSOR TUBING
4 - STEADY MOUNT
5 - FLEXIBLE BELLOWS
6 - ISOLATOR
7 - MUFFLER/TAIL PIPE ASSEMBLY
8 - DPF TO MUFFLER FLANGE

The exhaust system must be properly aligned to prevent stress, leakage and body contact. The exhaust components should be kept a minimum of 25.4 mm (1.0 in.) away from the body and frame. If the system contacts any body panel, it may amplify objectionable noises from the engine or body.

DESCRIPTION-GAS ENGINE



81471506

Fig. 3: Exhaust System - Typical - Gas Engines
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - EXHAUST FLANGE
2 - CATALYTIC CONVERTER
3 - FRONT EXHAUST PIPE ASSEMBLY-TO-MUFFLER CLAMP
4 - MUFFLER
5 - INSULATOR
6 - RESONATOR |
|--|

The basic exhaust system consists of an exhaust pipe assembly with catalytic converters (2), muffler (4) and tailpipe assembly and heat shields

The exhaust system must be properly aligned to prevent stress, leakage and body contact. Minimum clearance between any exhaust component and the body or frame is 25 mm (1.0 in.). If the system contacts any body panel, it may amplify objectionable noises from the engine or body.

When inspecting an exhaust system, critically inspect for cracked or loose joints, stripped screw or bolt threads, corrosion damage and worn, cracked or broken hangers. Replace all components that are badly corroded or damaged. DO NOT attempt to repair.

When replacement is required, use original equipment parts (or equivalent). This will assure proper engine function and system alignment.

CAUTION: Avoid application of rust prevention compounds or undercoating materials to exhaust system floor pan exhaust heat shields. Light overspray near the edges is permitted. Application of coating will result in excessive floor pan temperatures and objectionable fumes.

DIAGNOSIS AND TESTING

EXHAUST SYSTEM-DIESEL ENGINE

CAUTION: On high mileage vehicles it is normal to see some exhaust staining around the turbocharger control rod area. This is not a sign of turbocharger failure.

EXHAUST SYSTEM DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
EXCESSIVE EXHAUST NOISE OR LEAKING EXHAUST GASES	1. Leaks at pipe joints. 2. Rusted or blown out muffler. 3. Broken or rusted out exhaust pipe. 4. Exhaust pipe leaking at manifold flange. 5. Exhaust manifold cracked or broken. 6. Leak between exhaust manifold and cylinder head. 7. Turbocharger mounting flange cracked. 8. Restriction in exhaust system. 9. EGR pipe(s) leak. 10. EGR assembly leak.	1. Tighten clamps/bolts at leaking joints. 2. Replace muffler. Inspect exhaust system. 3. Replace exhaust pipe. 4. Tighten/replace flange attaching nuts/bolts. 5. Replace exhaust manifold. 6. Tighten exhaust manifold to cylinder head bolts. Replace gasket if necessary. 7. Remove turbocharger and inspect. (Refer to REMOVAL . 8. Remove restriction, if possible. Replace restricted part if necessary. 9. Tighten bolts. Replace gasket. 10. Tighten bolts. Replace gaskets.
Driveability Concern - Turbo	1. Vacuum hose disconnected. 2. Vacuum system leaks. 3. Boost pressure solenoid filter clogged.	1. Check connections, replace as necessary. 2. Inspect for damage. Check for leaks, replace as necessary. 3. Replace the filter.

EXHAUST SYSTEM-GAS ENGINES

CONDITION	POSSIBLE CAUSE	CORRECTION
EXCESSIVE EXHAUST NOISE OR LEAKING EXHAUST GASES	1. Leaks at pipe joints. 2. Rusted or blown out muffler. 3. Broken or rusted out exhaust pipe. 4. Exhaust pipe leaking at	1. Tighten clamps/bolts to specified torque at leaking joints. 2. Replace muffler. Inspect exhaust system. 3. Replace exhaust pipe. 4. Tighten/replace flange attaching

	manifold flange. 5. Exhaust manifold cracked or broken. 6. Leak between exhaust manifold and cylinder head. 7. Catalytic converter rusted or blown out. 8. Restriction in exhaust system.	nuts/bolts. 5. Replace exhaust manifold. 6. Tighten exhaust manifold to cylinder head bolts. 7. Replace catalytic converter assy. 8. Remove restriction, if possible. Replace restricted part if necessary.
CAUTION: When servicing and replacing exhaust system components, disconnect the oxygen sensor connector(s). Allowing the exhaust to hang by the oxygen sensor wires will damage the harness and/or sensor.		

SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
EGR Pipe to EGR Inlet	32	24	-
Front Exhaust Pipe Flange-to-Exhaust Manifold Bolts	36	28	-
Front Exhaust pipe-to- Muffler Flange Nuts	36	28	-
Turbocharger Support Bracket Bolts	24	18	-
Turbocharger Downpipe Nuts	32	24	-
Turbocharger Oil Supply Line Fitting	24	18	215
Turbocharger Oil Return Line bolts	11	-	96
Turbocharger to Exhaust Manifold Nuts	32	24	-

SPECIAL TOOLS

SPECIAL TOOLS



Fig. 4: Turbocharger Tester 9022
Courtesy of CHRYSLER LLC

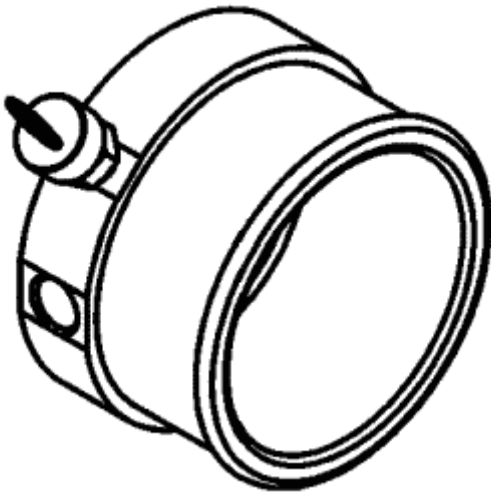


Fig. 5: Adapter 8442
Courtesy of CHRYSLER LLC

CONVERTER-CATALYTIC

DESCRIPTION

DESCRIPTION

WARNING: The normal operating temperature of the exhaust system is very high. Therefore, never work around or attempt to service any part of the exhaust system until it is cooled. Special care should be taken when working near the catalytic converter. The temperature of the converter rises to a high level after a short period of engine operation time.

CAUTION: DO NOT remove spark plug wires from plugs or by any other means short out cylinders. Failure of the catalytic converter can occur due to a temperature increase caused by unburned fuel passing through the

converter.

The stainless steel catalytic converter body is designed to last the life of the vehicle. Excessive heat can result in bulging or other distortion, but excessive heat will not be the fault of the converter. If unburned fuel enters the converter, overheating may occur. If a converter is heat-damaged, correct the cause of the damage at the same time the converter is replaced. Also, inspect all other components of the exhaust system for heat damage.

Unleaded gasoline must be used to avoid contaminating the catalyst core.

50 State emission vehicles incorporate two catalytic converters located after the exhaust manifolds and before the muffler.

REMOVAL

REMOVAL-2.8L DIESEL

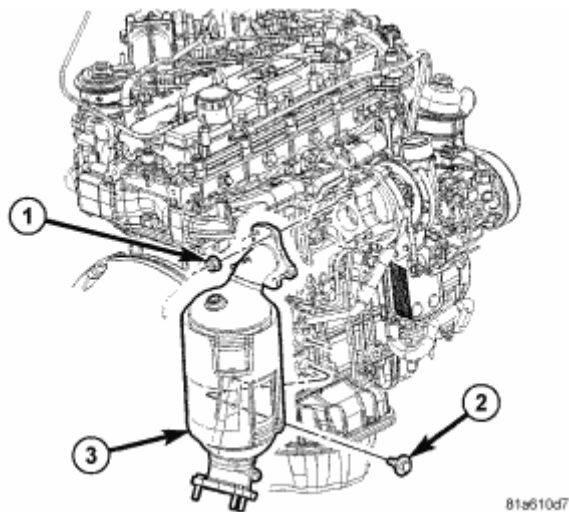


Fig. 6: CATALYTIC CONVERTER - 2.8L DIESEL
Courtesy of CHRYSLER LLC

1 - NUT
2 - MOUNTING BOLT
3 - CATALYTIC CONVERTER

WARNING: If torches are used when working on the exhaust system, do not allow the flame near the fuel lines.

1. Raise and support the vehicle.
2. Saturate the bolts and nuts with heat valve lubricant. Allow 5 minutes for penetration.
3. Remove diesel particulate filter (DPF), if equipped.
4. Remove two bracket bolts (2).

5. Remove the nuts (1) from the front catalytic converter to turbocharger flange.
6. Lower the catalyst assembly (2) and slide out of the mount at the transmission (if equipped).
7. Remove the front exhaust pipe/catalytic converter assembly from the vehicle.

REMOVAL-3.7L ENGINE

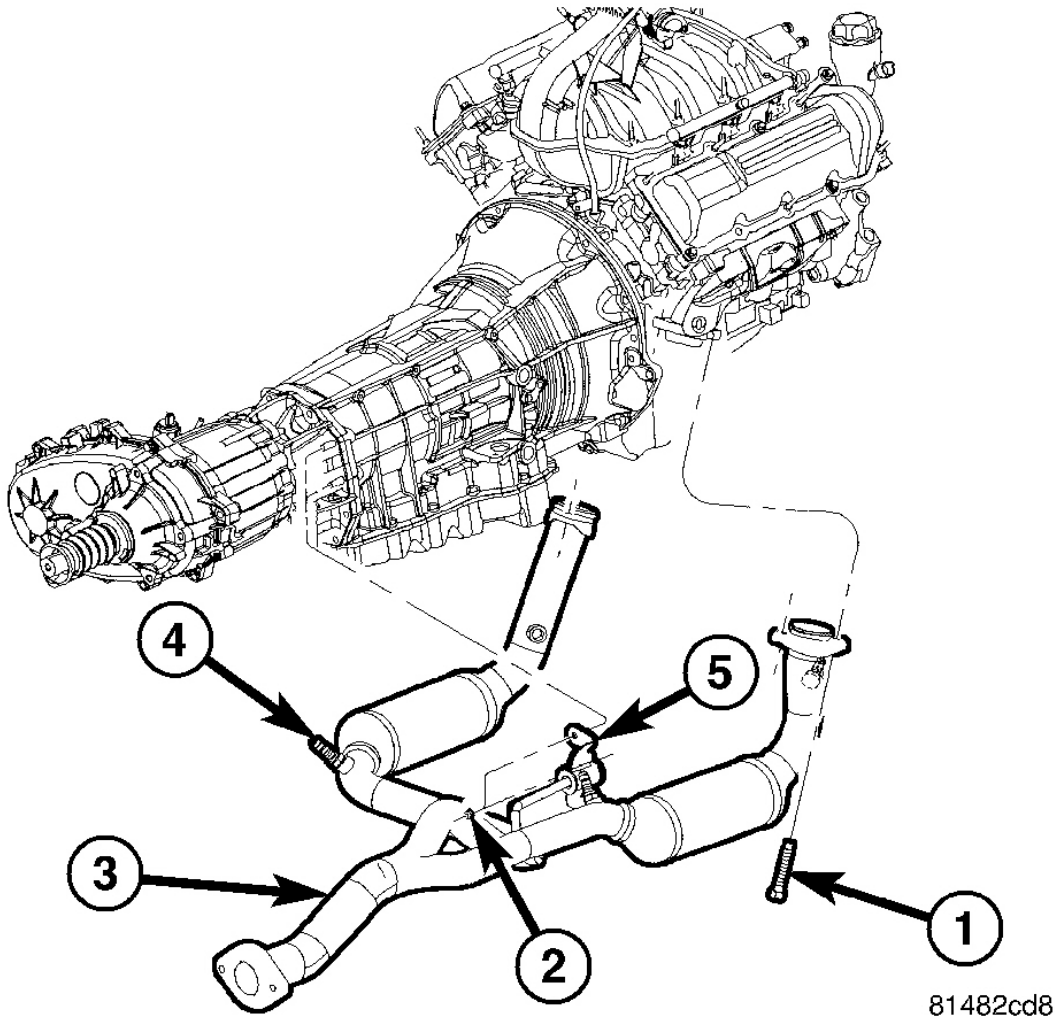


Fig. 7: 3.7L Catalytic Converter - Typical
Courtesy of CHRYSLER LLC

WARNING: If torches are used when working on the exhaust system, do not allow the flame near the fuel lines.

1. Raise and support the vehicle.

2. Saturate the bolts (1) and nuts with heat valve lubricant. Allow 5 minutes for penetration.
3. Disconnect oxygen sensor electrical connectors.
4. Remove the nuts from the front exhaust pipe and catalytic converter assembly to muffler flange.
5. Remove bolts (1) and flanged nuts at the manifold.
6. Lower the front exhaust pipe/catalytic converter assembly (3) and slide out of the mount at the transmission (if equipped).
7. Remove the front exhaust pipe/catalytic converter assembly from the vehicle.

INSPECTION

INSPECTION

Look at the stainless steel body of the converter, inspect for bulging or other distortion that could be a result of overheating. If the converter has a heat shield attached make sure it is not bent or loose.

If you suspect internal damage to the catalyst, tapping the bottom of the catalyst with a rubber mallet may indicate a damaged core.

INSTALLATION

INSTALLATION-2.8L DIESEL

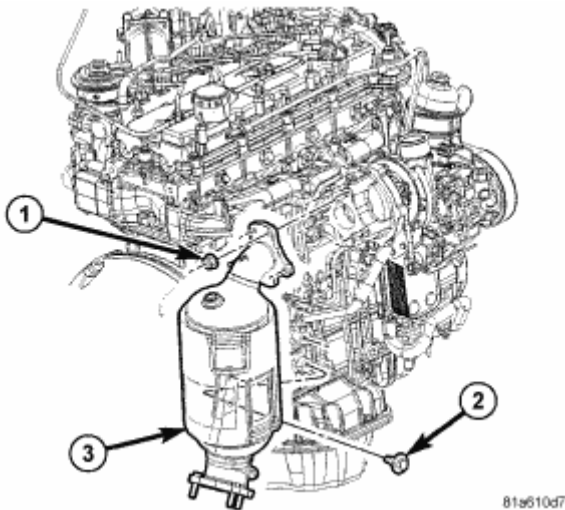


Fig. 8: CATALYTIC CONVERTER - 2.8L DIESEL
Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - NUT |
| 2 - MOUNTING BOLT |
| 3 - CATALYTIC CONVERTER |

1. Position the front catalytic converter assembly (3) onto the turbocharger.
2. Install two catalytic converter mounting bolts. Tighten bolts to 27 N.m (19 ft. lbs.) torque.

3. Install DPF, if equipped. See **REMOVAL**.
4. Position the exhaust pipe for proper clearance with the frame and underbody parts. A minimum clearance of 25.4 mm (1.0 in.) is required.
5. Lower the vehicle.
6. Start the vehicle and inspect for exhaust leaks. Repair exhaust leaks as necessary.
7. Check the exhaust system for contact with the body panels. Make adjustments, if necessary.

INSTALLATION-3.7L ENGINE

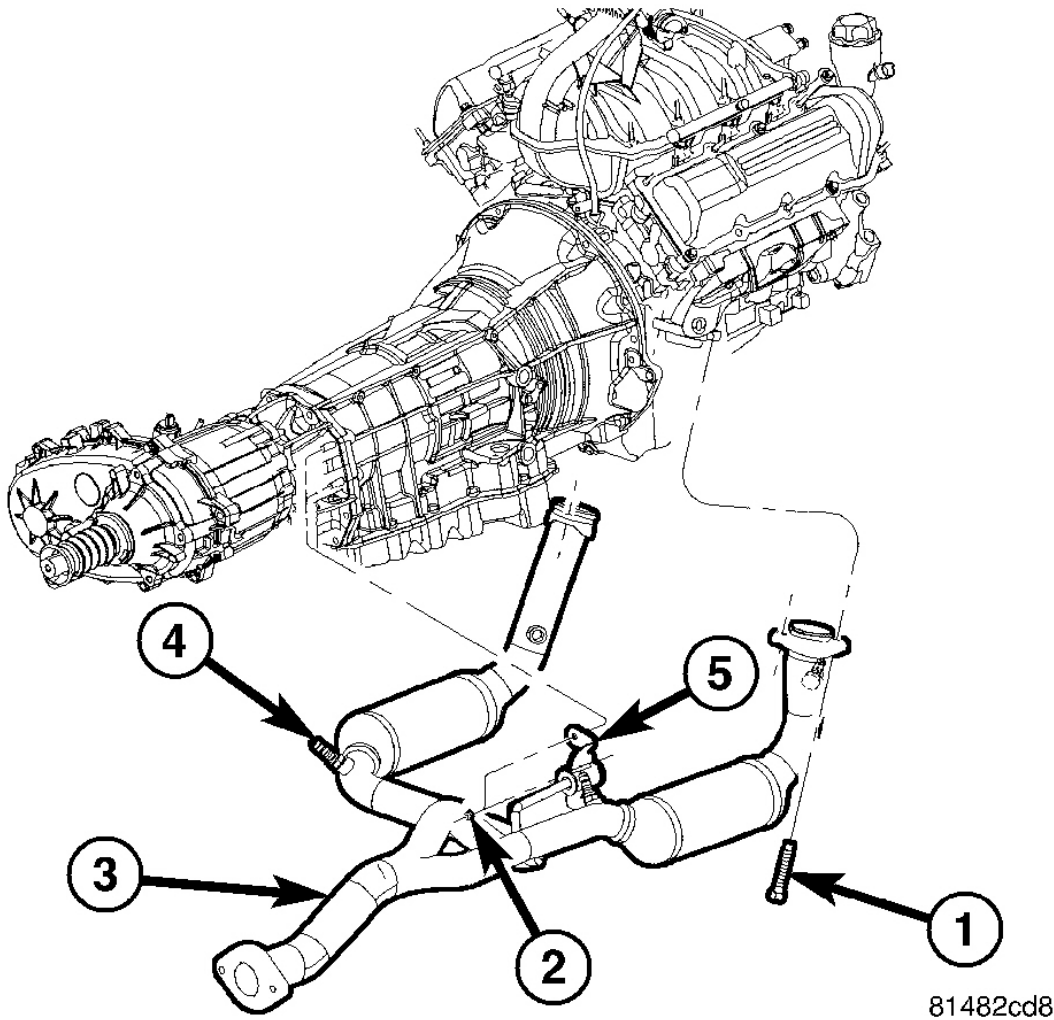


Fig. 9: 3.7L Catalytic Converter - Typical
Courtesy of CHRYSLER LLC

1. Position the front exhaust pipe and catalytic converter assembly (3) into the mount at the transmission (if

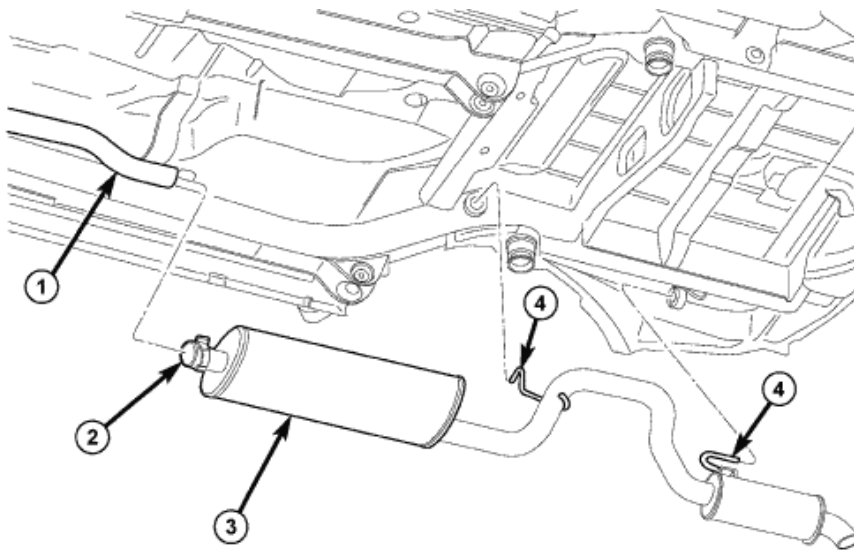
equipped) and onto the exhaust manifold flange connection.

2. Install the nuts at the front exhaust pipe and catalytic converter assembly to muffler flange. Do not tighten.
3. Position the exhaust pipe for proper clearance with the frame and underbody parts. A minimum clearance of 25.4 mm (1.0 in.) is required.
4. Tighten the bolt (1) at exhaust manifold to 27 N.m (19 in. lbs.) torque.
5. Tighten the front exhaust pipe and catalytic converter assembly to muffler flange nuts to 27 N.m (19 ft. lbs.) torque.
6. Position the front pipe onto the exhaust manifold flange connection. Tighten the clamp to 10 N.m (95 in. lbs.) torque.
7. Connect oxygen sensor electrical connectors.
8. Lower the vehicle.
9. Start the vehicle and inspect for exhaust leaks. Repair exhaust leaks as necessary.
10. Check the exhaust system for contact with the body panels. Make adjustments, if necessary.

MUFFLER

REMOVAL

REMOVAL



81a78a90

Fig. 10: MUFFLER/RESONATOR ASSEMBLY

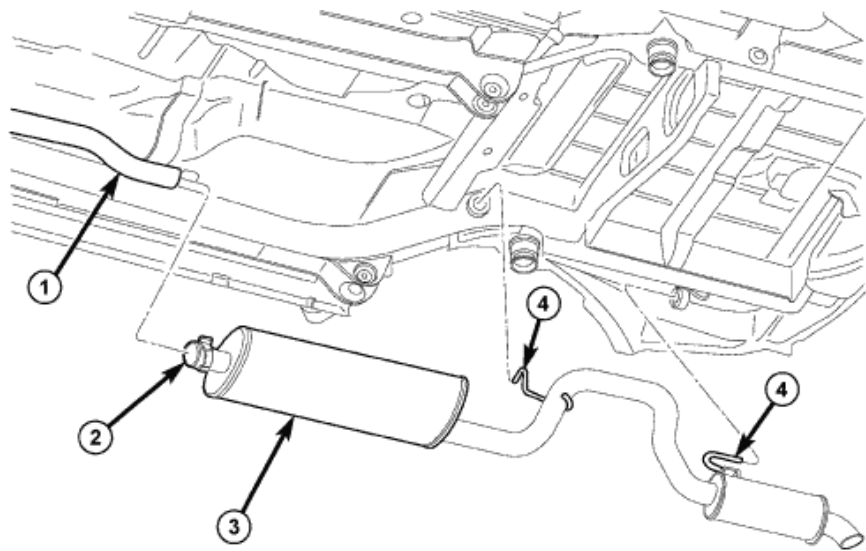
Courtesy of CHRYSLER LLC

1 - CATALYTIC CONVERTER PIPE
2 - CLAMP
3 - MUFFLER/RESONATOR/TAILOPIPE ASSEMBLY
4 - HANGER ROD

1. Raise vehicle on hoist.
2. Remove exhaust pipe to muffler and tailpipe assembly clamp nuts (2).
3. Using a suitable pry bar, pry muffler and tailpipe assembly out of exhaust hanger.
4. Remove muffler and tailpipe assembly (3) from vehicle.

INSTALLATION

INSTALLATION



81a78a90

Fig. 11: MUFFLER/RESONATOR ASSEMBLY
Courtesy of CHRYSLER LLC

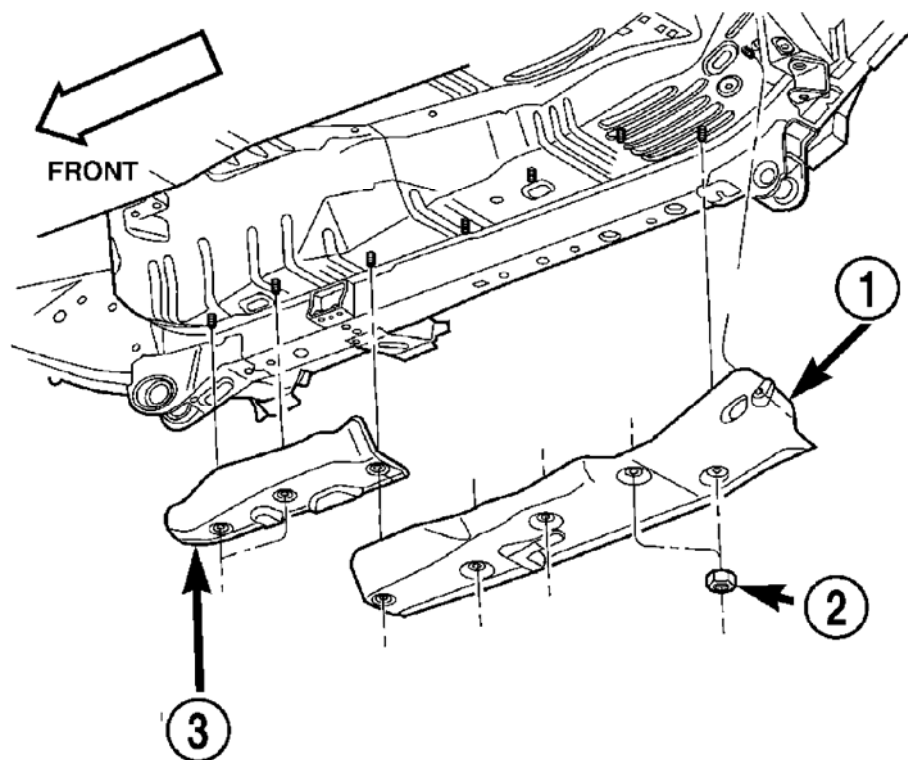
1 - CATALYTIC CONVERTER PIPE
2 - CLAMP
3 - MUFFLER/RESONATOR/TAILOPIPE ASSEMBLY
4 - HANGER ROD

1. Install muffler and tailpipe assembly in vehicle and attach to exhaust hangers.
2. Install muffler and tailpipe assembly to exhaust pipe.
3. Install clamp. Tighten nut to 32 N.m (24 ft. lbs.).
4. Lower vehicle from hoist.

SHIELDS-HEAT

DESCRIPTION

DESCRIPTION



80b89850

Fig. 12: Front & Rear Floor Pan Heat Shields Typical
 Courtesy of CHRYSLER LLC

1 - REAR FLOOR PAN HEAT SHIELD
2 - HEAT SHIELD RETAINING NUTS
3 - FRONT FLOOR PAN HEAT SHIELD

Heat shields (1) (3) are needed to protect both the vehicle and the environment from the high temperatures developed by the catalytic converter. The catalytic converter releases additional heat into the exhaust system. Under severe operating conditions, the temperature increases in the area of the converter. Such conditions can exist when the engine misfires or otherwise does not operate at peak efficiency. See **Fig. 12**.

FILTER-DIESEL PARTICULATE

DESCRIPTION

DESCRIPTION

A diesel particulate filter DPF is installed for exhaust gas after-treatment. The DPF is located downstream of the main oxidation catalyst. The DPF filters, stores and burns particulate matter (soot) that is generated during the combustion process. The soot is oxidized to carbon dioxide CO₂ at exhaust temperatures over 600° C (1,112° F).

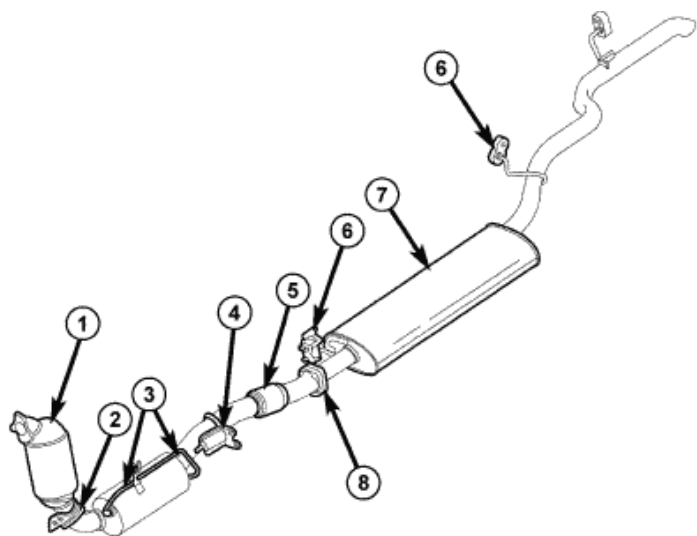
OPERATION

OPERATION

The oxidation catalysts raise the exhaust gas temperatures to regenerate the DPF , which is passive regeneration. If the passive regeneration cannot keep up with the build up of soot in the DPF, the ECM will actively regenerate the DPF to burn off the soot. Residue remains inside the DPF in the form of non burnable ash. Ash comes from the oils and other materials that are trapped in the oils and are present in the soot. Ash is not eliminated by the regeneration cycle. Excessive ash accumulation requires the replacement of the DPF. The DPF uses a silicon carbide wall-flow monolith with a platinum coating to trap particulates. The monolith contains a large number of square parallel channels, which run in the axial direction and are separated by thin porous walls. The channels are alternatively open at one end, but plugged at the other. The exhaust gases flow through the walls and escape through the pores in the wall material. Particulates, however, are too large to escape and are trapped in the monolith walls. The ECM starts the regeneration of the DPF if the soot load exceeds a performance map value. The ECM determines the load condition of the DPF based upon the exhaust gas pressure upstream and downstream of the DPF. A pressure differential sensor provides the pressure input to the ECM. During the regeneration process, the ECM raises the temperature in the DPF to burn off the soot accumulated. Under normal operation, the engine does not produce enough heat to oxidize the soot inside the DPF. This process requires temperatures above 550 °C (1,022 °F). After regeneration, the ECM reads the actual pressure difference at the DPF and compares it with a reference value. From this comparison, the ECM determines the ash quantity inside the DPF.

REMOVAL

REMOVAL



81a592db

Fig. 13: Exhaust System - 2.8L Diesel - w/DPF
Courtesy of CHRYSLER LLC

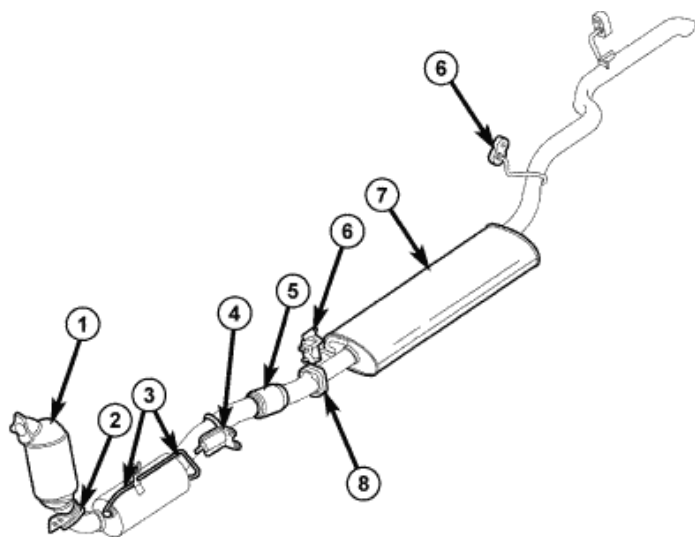
1 - MANIVERTER
2 - MANIVERTER TO DFP FLANGE
3 - PRESSURE SENSOR TUBING

4 - STEADY MOUNT
5 - FLEXIBLE BELLOWS
6 - ISOLATOR
7 - MUFFLER/TAIL PIPE ASSEMBLY
8 - DPF TO MUFFLER FLANGE

1. Disconnect negative battery cable.
2. Raise and support vehicle.
3. Disconnect differential pressure hoses from pressure sensor tubing (3).
4. Disconnect oxygen sensor electrical connector.
5. Remove muffler and tail pipe to DFP flange nuts.
6. Remove the DFP to exhaust manifold nuts.
7. Remove steady rest mounting bolts (4).
8. Remove the diesel particulate filter assembly.

INSTALLATION

INSTALLATION



81a562db

Fig. 14: Exhaust System - 2.8L Diesel - w/DPF
Courtesy of CHRYSLER LLC

1 - MANIVERTER
2 - MANIVERTER TO DFP FLANGE
3 - PRESSURE SENSOR TUBING
4 - STEADY MOUNT
5 - FLEXIBLE BELLOWS
6 - ISOLATOR

7 - MUFFLER/TAIL PIPE ASSEMBLY
8 - DPF TO MUFFLER FLANGE

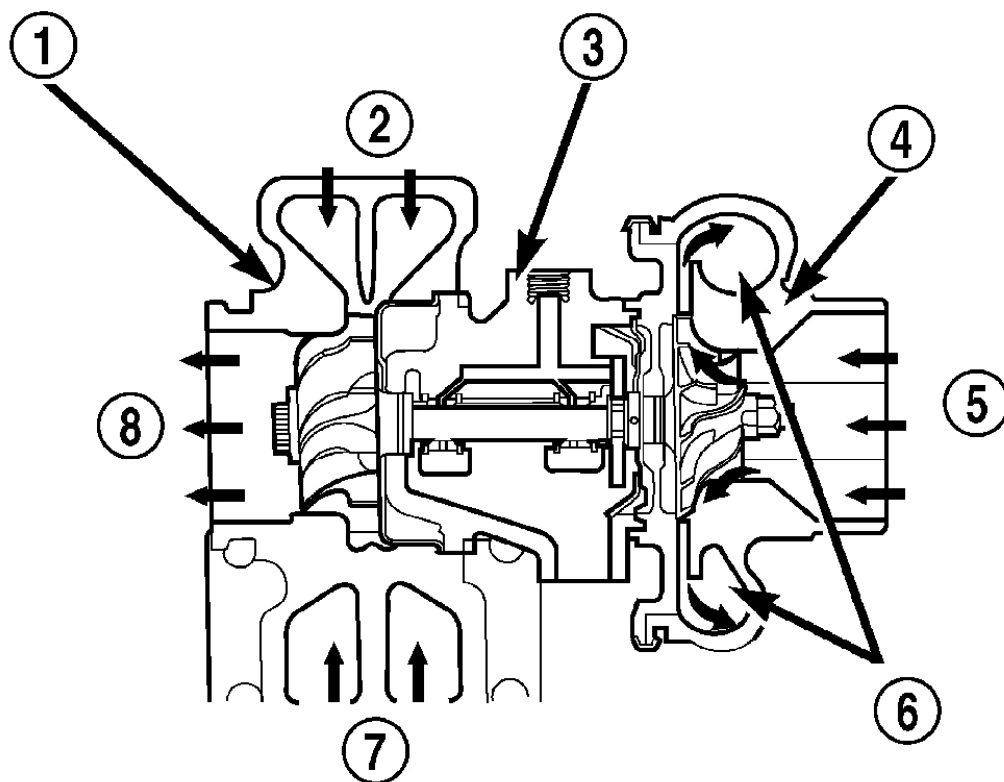
1. Position diesel particulate filter assembly in vehicle.
2. Install DPF to exhaust manifold bolts. Do not tighten at this time.
3. Install muffler/tailpipe to DPF flange nuts. Tighten nut to 32 N.m (24 ft. lbs.).
4. Tighten DPF to exhaust manifold bolts to 32 N.m (24 ft. lbs.) Tighten muffler/tailpipe to DPF flange nuts to 34 N.m (24 ft. lbs.).
5. Lower vehicle.
6. Using scan tool, under ENGINE MISC. FUNCTIONS, perform DIESEL PARTICULATE FILTER REPLACEMENT function.

TURBOCHARGER

TURBOCHARGER

DESCRIPTION

TURBOCHARGER-DESCRIPTION



80b5cc50

Fig. 15: Identifying Turbocharger Components

Courtesy of CHRYSLER LLC

- 1 - TURBINE SECTION
- 2 - EXHAUST GAS
- 3 - BEARING HOUSING
- 4 - COMPRESSOR SECTION
- 5 - INLET AIR
- 6 - COMPRESSED AIR TO ENGINE
- 7 - EXHAUST GAS
- 8 - EXHAUST GAS TO EXHAUST PIPE

CAUTION: The turbocharger is a performance part and must not be tampered with. The wastegate bracket is an integral part of the turbocharger. Tampering with the wastegate components can reduce durability by increasing cylinder pressure and thermal loading due to incorrect inlet and exhaust manifold pressure. Poor fuel economy and failure to meet regulatory

emissions laws may result. Increasing the turbocharger boost WILL NOT increase engine power.

The turbocharger is an exhaust-driven supercharger which increases the pressure and density of the air entering the engine through the charge air cooler. With the increase of air entering the engine, more fuel can be injected into the cylinders, which creates more power during combustion.

The turbocharger assembly consists of four (5) major component systems. See **Fig. 15**.

Turbine section

Compressor section

Bearing housing

Variable veins

Actuator

OPERATION

OPERATION

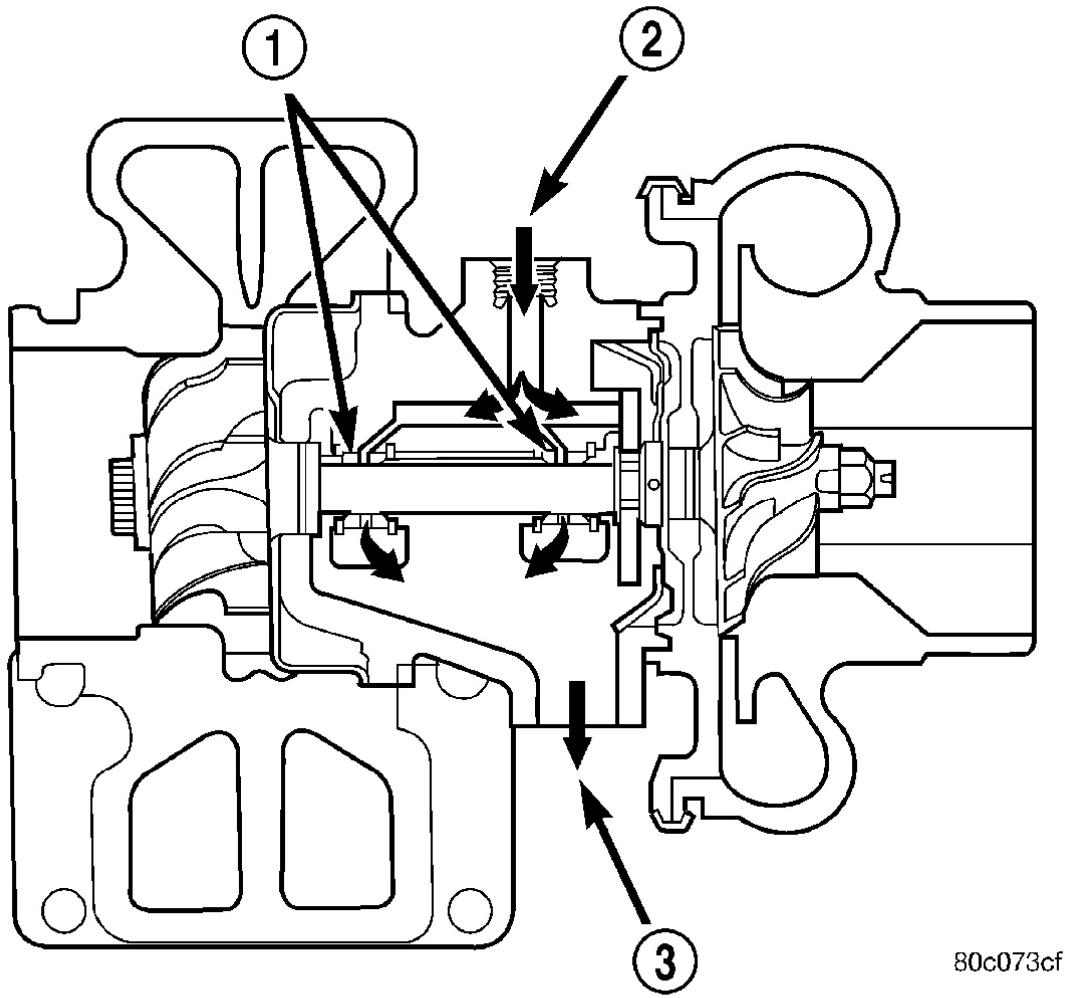


Fig. 16: Turbocharger Oil Supply & Drain
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - BEARINGS2 - OIL SUPPLY (FROM ENGINE BLOCK)3 - OIL RETURN (TO OIL PAN) |
|---|

Exhaust gas pressure and energy drive the turbine, which in turn drives a centrifugal compressor that compresses the inlet air, and forces the air into the engine through the charge air cooler and plumbing. Since heat is a by-product of this compression, the air must pass through a charge air cooler to cool the incoming air and maintain power and efficiency.

Increasing air flow to the engine provides:

Improved engine performance

- Lower exhaust smoke density
- Improved operating economy
- Altitude compensation
- Noise reduction.

The turbocharger is lubricated by engine oil that is pressurized, cooled, and filtered. The oil is delivered to the turbocharger by a supply line (2) that is tapped into the engine block. The oil travels into the bearing housing, where it lubricates the shaft (1) and bearings. See **Fig. 16**. A return pipe (3) at the bottom of the bearing housing, routes the engine oil back to the crankcase.

The most common turbocharger failure is bearing failure related to repeated hot shutdowns with inadequate "cool-down" periods. A sudden engine shut down after prolonged operation will result in the transfer of heat from the turbine section of the turbocharger to the bearing housing. This causes the oil to overheat and break down, which causes bearing and shaft damage the next time the vehicle is started.

Letting the engine idle after extended operation allows the turbine housing to cool to normal operating temperature. The following chart should be used as a guide in determining the amount of engine idle time required to sufficiently cool down the turbocharger before shut down, depending upon the type of driving and the amount of cargo.

TURBOCHARGER "COOL DOWN" CHART			
Driving Condition	Load -	Turbocharger Temperature	Idle Time (in minutes) Before Shut Down
Stop & Go	Empty	Cool	Less than 1
Stop & Go	Medium	Warm	1
Highway Speeds	Medium	Warm	2
City Traffic	Max. GCWR	Warm	3
Highway Speeds	Max. GCWR	Warm	4
Uphill Grade	Max. GCWR	Hot	5

DIAGNOSIS AND TESTING

TURBOCHARGER-BOOST PRESSURE

Low turbocharger boost pressure can cause poor engine performance and driveability concerns. The following procedure will test the turbocharger boost pressure.

Causes of low boost pressure include the following:

- Restricted air inlet system
- Leak in charge air cooler system
- Restricted/high pressure drop across charge air cooler
- Damaged turbocharger compressor wheel housing
- Turbocharger wastegate stuck open

Excessive exhaust restriction

Causes of excessively high boost pressure include:

Turbocharger wastegate stuck closed

Turbocharger wastegate signal line leaking or damaged

Damaged wastegate command valve O-rings

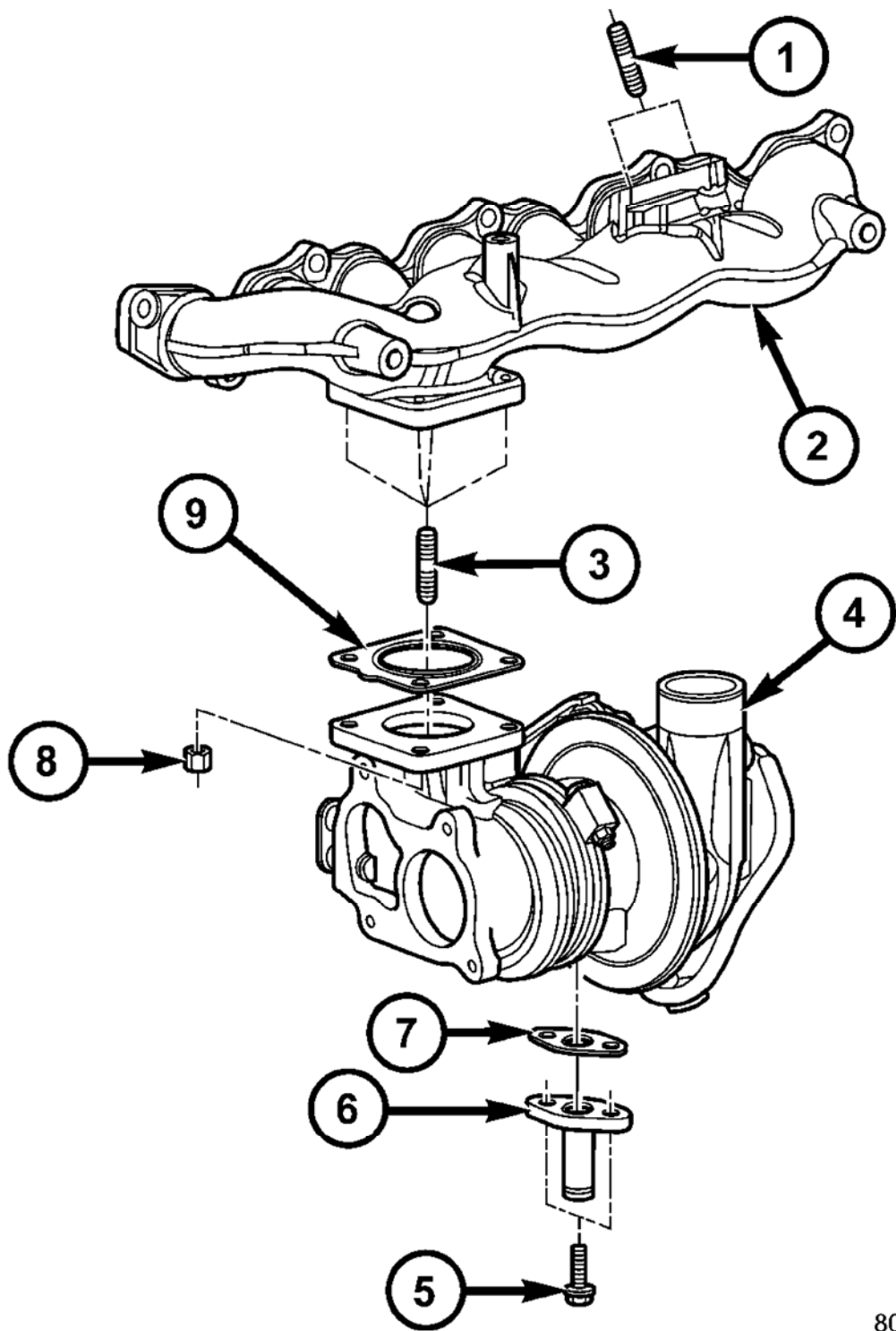
Wastegate command valve mechanically stuck in actuated position

Several Diagnostic Trouble Codes (DTCs) can be set that will indicate high or low system boost levels. There is a DTC for circuit faults relating to the electronically controlled wastegate command valve.

See **DIAGNOSIS AND TESTING** for diagnosing of low or high boost pressure due to leaks.

REMOVAL

REMOVAL



80cb4415

Fig. 17: EXHAUST MANIFOLD AND TURBOCHARGER ASSEMBLY
Courtesy of CHRYSLER LLC

- 2 - EXHAUST MANIFOLD
- 3 - TURBOCHARGER TO EXHAUST MANIFOLD MOUNTING STUDS
- 4 - TURBOCHARGER ASSEMBLY
- 5 - TURBOCHARGER OIL RETURN FITTING ATTACHING BOLT
- 6 - TURBOCHARGER OIL RETURN FITTING
- 7 - OIL RETURN FITTING GASKET
- 8 - RETAINING NUT
- 9 - TURBOCHARGER TO EXHAUST MANIFOLD GASKET

1. Disconnect negative battery cable.
2. Disconnect the MAF and Inlet air pressure sensors wiring harness connectors, disconnect the air outlet duct from the turbocharger, and remove air cleaner assembly.
3. Remove charge air cooler inlet hose from turbocharger. See **REMOVAL**.
4. Drain cooling system.
5. Remove coolant recovery pressure container. Refer to **REMOVAL**.
6. Disconnect the turbocharger actuator vacuum hose and position aside.
7. Remove turbocharger upper heat shield.
8. Raise and support the vehicle.
9. Remove the lower splash shield.
10. Disconnect the front exhaust pipe from the turbocharger.
11. Remove the turbocharger support bracket.
12. Disconnect turbocharger oil return line at turbocharger.
13. Lower the vehicle.
14. Remove the turbocharger oil supply line.
15. Remove turbocharger to exhaust manifold retaining nuts and separate turbocharger from exhaust manifold.

CLEANING

CLEANING

All old gaskets should be inspected for any tears or signs of prior leakage. If any gaskets show such indications, they should be replaced with new gaskets. All gasket mating surfaces must be cleaned of old gasket material to produce a smooth and dirt free sealing surface for the new gasket.

INSTALLATION

INSTALLATION

1. Connect turbocharger to exhaust manifold with new gasket. Torque retaining nuts to 32 N.m.

NOTE: After tightening the exhaust manifold to specification using a diagonal-cross pattern, retrace the pattern checking the correct torque value again.

2. Install exhaust manifold and turbocharger assembly with new gasket in position on studs in cylinder head. Install retaining nuts and tighten to 36 N.m.
3. Install thermostat housing. Refer to **INSTALLATION** .
4. Install accessory drive belt. Refer to **INSTALLATION** .
5. Raise vehicle on hoist.
6. Connect turbocharger oil return line at turbocharger.
7. Connect exhaust pipe at turbocharger downpipe.
8. Lower vehicle from hoist.
9. Connect oil supply line at turbocharger. Tighten banjo fitting to 24 N.m (18 ft. lbs.).
10. Install exhaust manifold heat shield. Tighten retaining bolts to 24 N.m (18 ft. lbs.).
11. Reposition EGR cooler and or EGR valve assembly on exhaust manifold. Tighten retaining nuts and bolt to 32.4 N.m.
12. Connect EGR pipe to EGR valve. Torque bolts to 32 N.m (24 ft. lbs.).
13. Connect EGR cooler coolant hoses at cooler.
14. Install coolant recovery pressure container. Refer to **INSTALLATION** .
15. Refill cooling system. Refer to **STANDARD PROCEDURE** .
16. Connect charge air cooler inlet hose at turbocharger.
17. Install air cleaner assembly.
18. Connect air inlet hose to turbocharger.
19. Connect negative battery cable.

CHARGE AIR COOLER AND PLUMBING

DIAGNOSIS AND TESTING

LEAKS

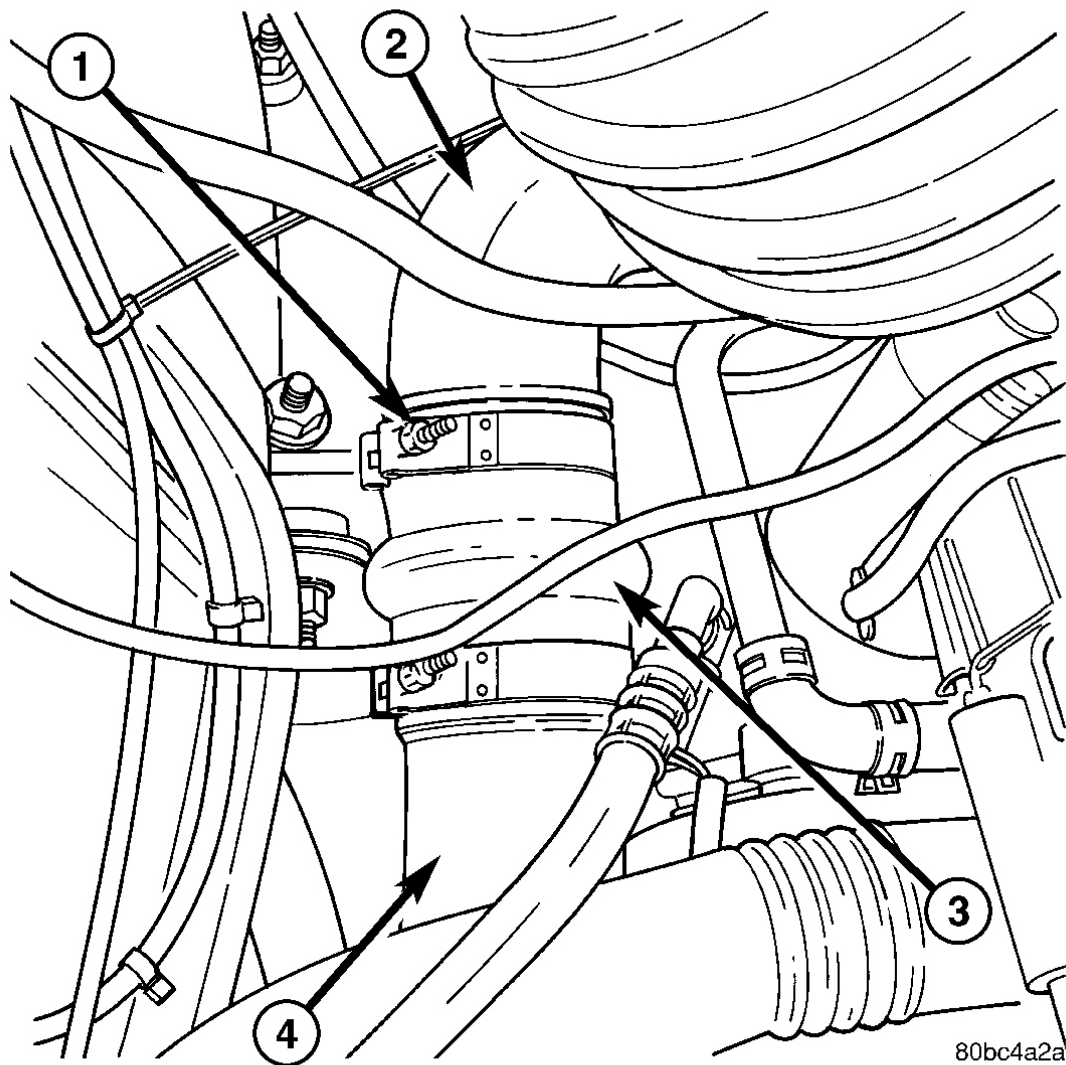


Fig. 18: AIR INLET DUCT RUBBER SLEEVE
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - CLAMP |
| 2 - TURBOCHARGER |
| 3 - AIR DUCT RUBBER SLEEVE |
| 4 - AIR INLET DUCT |

Low turbocharger boost pressure and low engine performance can be caused by leaks in the charge air cooler or plumbing. Fuel staining on the exhaust manifold can also be an indication that there are leaks in the air system. The following procedure outlines how to check for leaks in the charge air cooler system.

This procedure can also be used to check for leaks in the wastegate signal line or the wastegate canister.

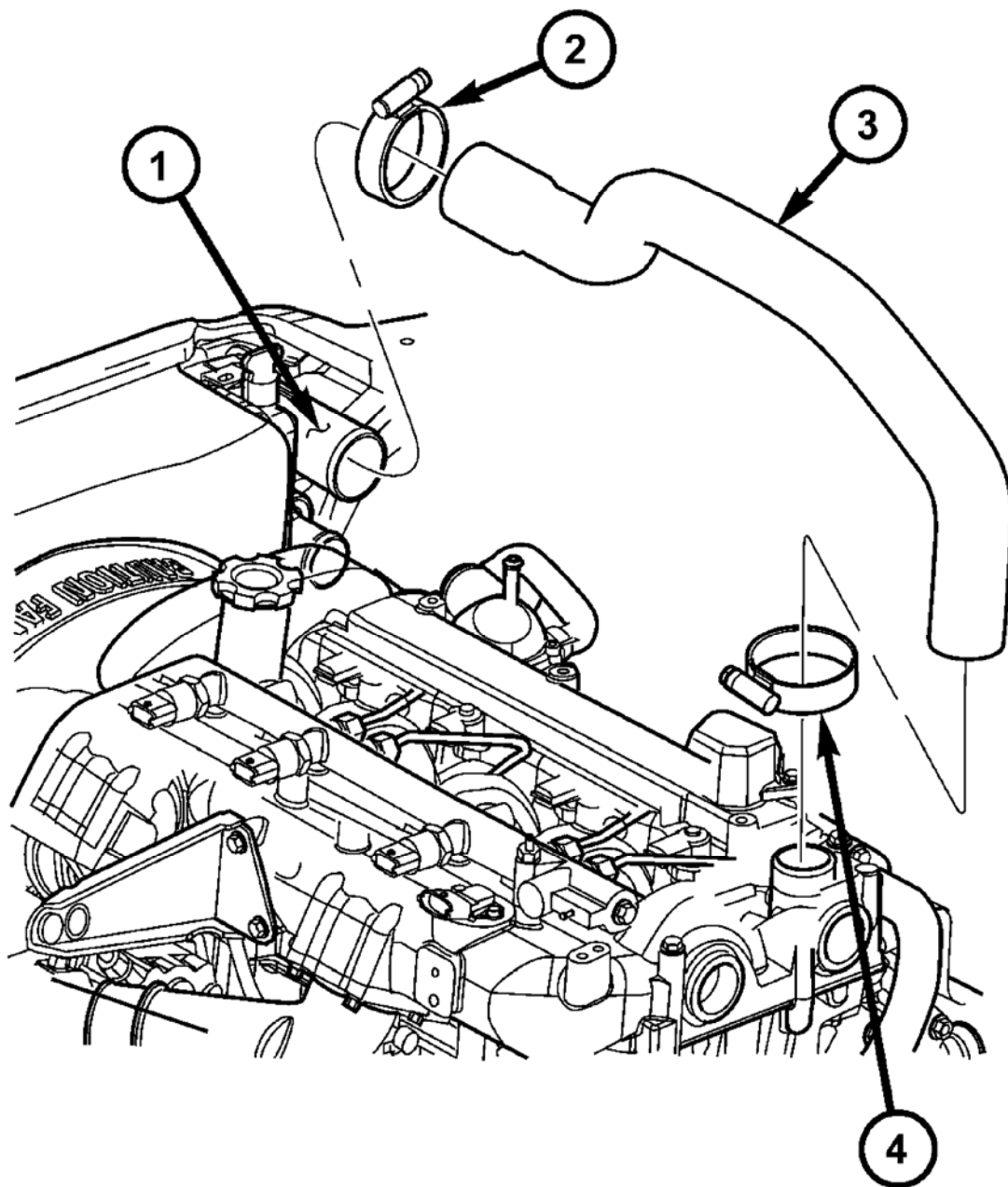
1. Loosen clamp (1) and remove air inlet hose (3) from turbocharger.
2. Insert Special Tool 9022 Adapter into the turbocharger inlet. Tighten tool clamp to 8 N.m (72 in. lbs.).

CAUTION: Do not apply more than 138 kPa (20 psi) air pressure to the charge air cooler system; severe damage to the charge air cooler system may occur.

3. Connect a regulated air supply to air fitting on Tool 9022 Adapter. Set air pressure to a maximum of 138 kPa (20 psi).
4. Using soapy water check the rubber sleeves, charge air cooler and intake manifold for leaks.
5. Using soapy water check for leaks at the wastegate signal line, wastegate canister and wastegate command valve.

REMOVAL

REMOVAL-INLET HOSE



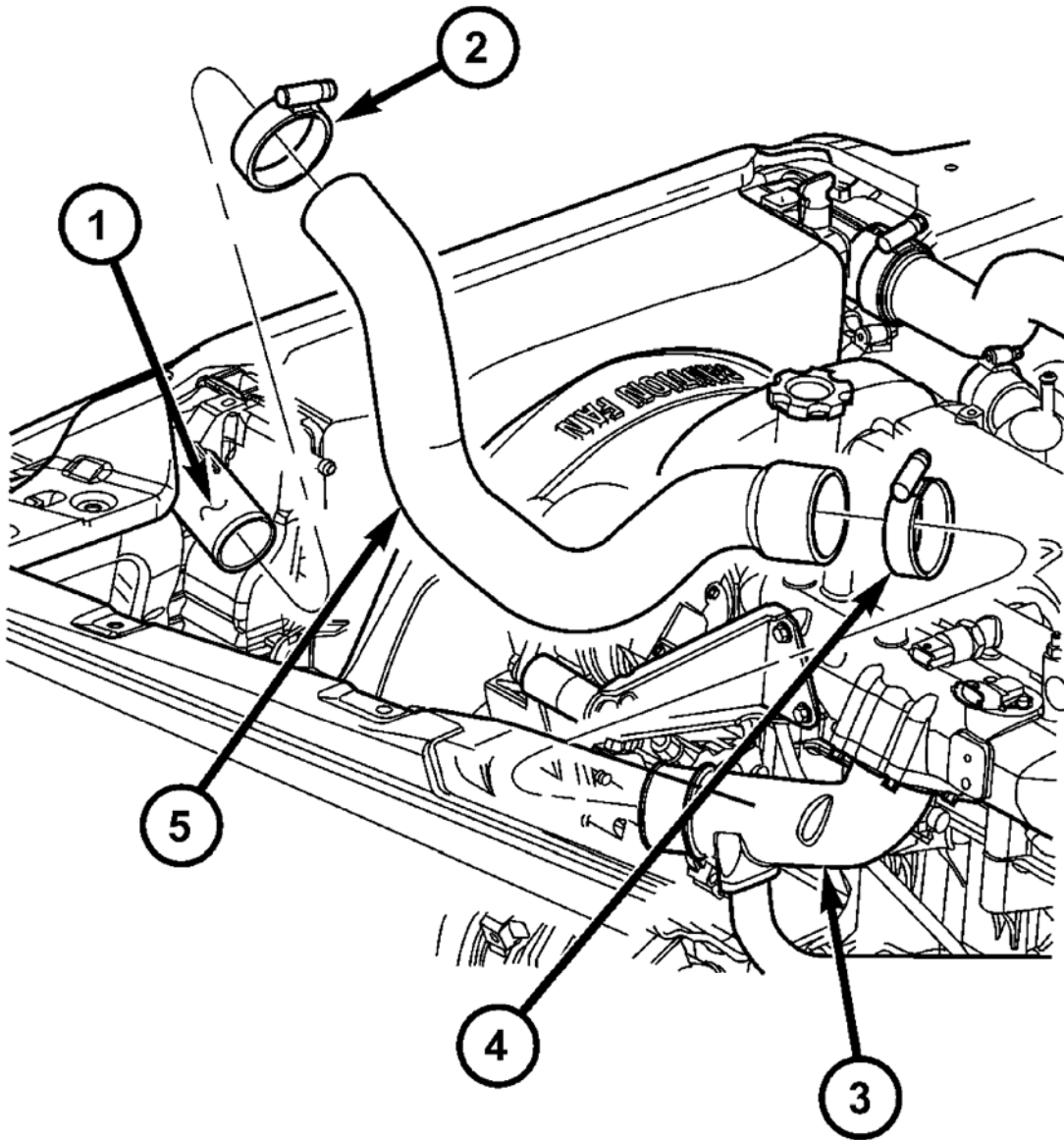
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Fig. 19: Charge Air Cooler Inlet Hose
Courtesy of CHRYSLER LLC

- 1 - CHARGE AIR COOLER
- 2 - HOSE CLAMP
- 3 - CHARGE AIR COOLER INLET HOSE
- 4 - HOSE CLAMP

1. Open and support hood of vehicle.
2. Loosen hose clamps at both ends of charge air cooler (CAC) inlet hose. See **Fig. 19**.
3. Remove CAC inlet hose (3) from turbocharger and CAC.

REMOVAL-OUTLET HOSE



80cdb957

Fig. 20: Charge Air Cooler Outlet Hose
Courtesy of CHRYSLER LLC

- | |
|-----------------------|
| 1 - CHARGE AIR COOLER |
| 2 - HOSE CLAMP |

- 3 - INTAKE MANIFOLD INLET
- 4 - HOSE CLAMP
- 5 - CHARGE AIR COOLER OUTLET HOSE

1. Raise and support hood on vehicle.
2. Loosen hose clamps at both ends of charge air cooler (CAC) outlet hose (5). See **Fig. 20**.
3. Remove hose (5) from CAC and intake manifold inlet. See **Fig. 20**.

INSTALLATION

INSTALLATION-INLET HOSE

1. Install charge air cooler (CAC) inlet hose on turbocharger and CAC.
2. Tighten hose clamps.
3. Close hood.

INSTALLATION-OUTLET HOSE

1. Install charge air cooler (CAC) outlet hose on CAC and intake manifold inlet.
2. Tighten both hose clamp on CAC outlet hose.
3. Close hood.

2008 ACCESSORIES AND EQUIPMENT

Frames & Bumpers - Liberty

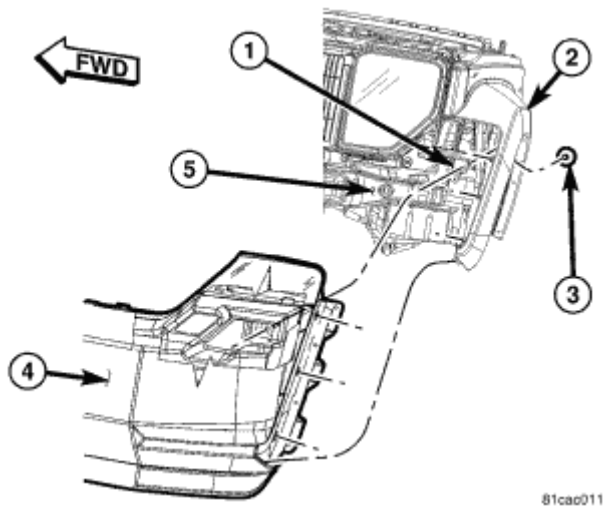
BUMPERS

FASCIA - FRONT

REMOVAL

FASCIA - FRONT

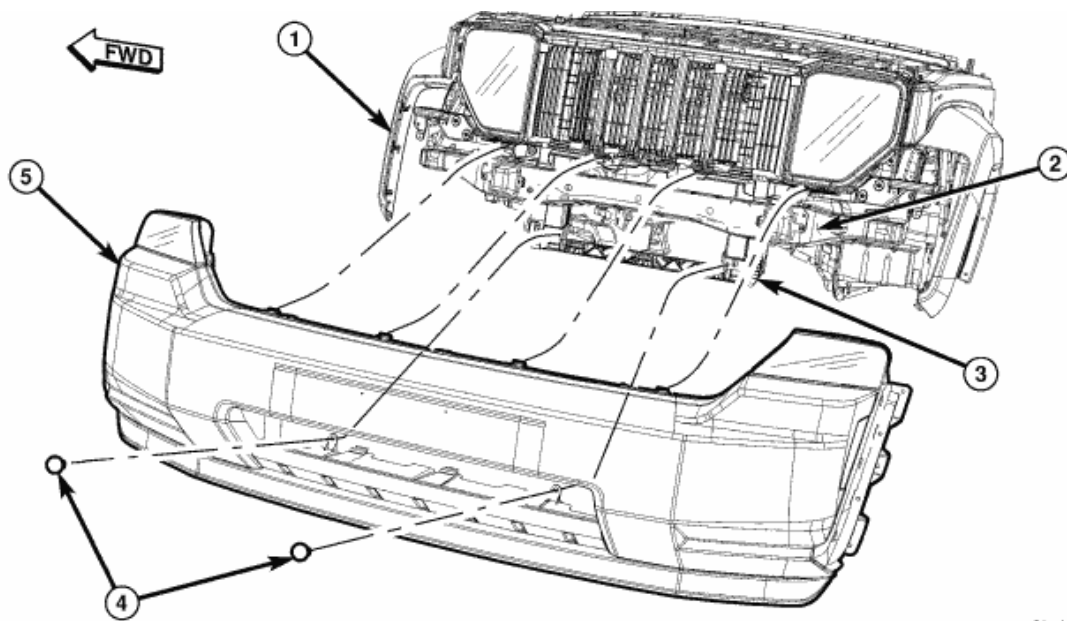
1. Remove both of the front wheel liners only enough to gain access to the bolts. Refer to **REMOVAL**.



81cao011

Fig. 1: Front Fascia
Courtesy of CHRYSLER LLC

2. Remove the side screws (3) attaching the fascia to the wheel moldings.



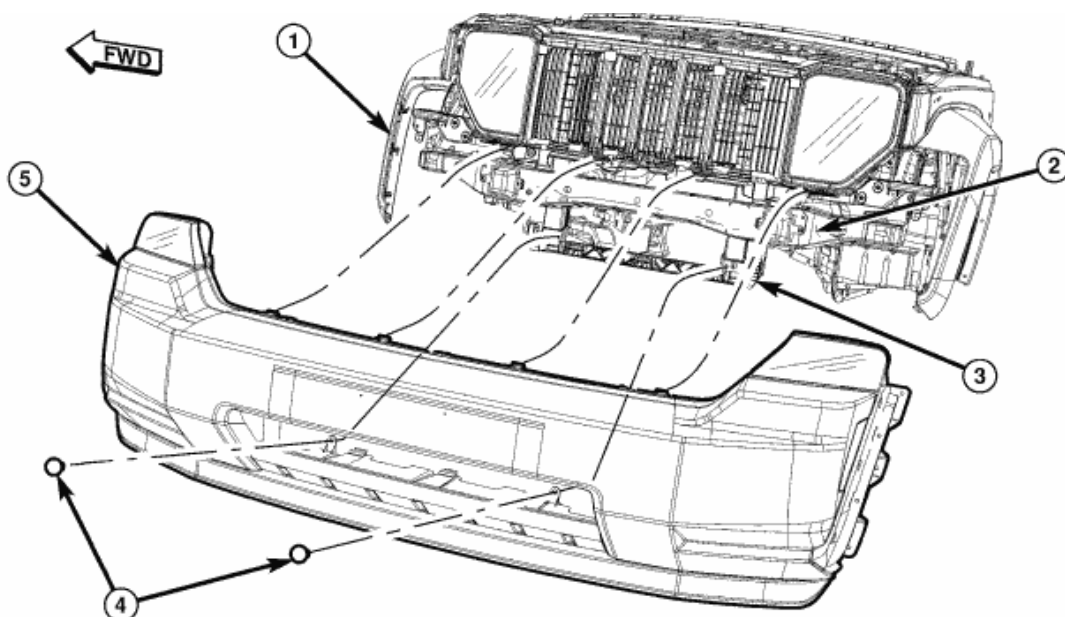
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Fig. 2: Front Fascia Components
Courtesy of CHRYSLER LLC

3. Remove the push pins (4) securing fascia (5) to radiator support (3).
4. Release the tabs securing the fascia to the grille opening reinforcement.
5. If equipped, disconnect the electrical connectors from both of the fog lamp assemblies.

INSTALLATION

FASCIA - FRONT



81cabf6e

Fig. 3: Front Fascia Components

Courtesy of CHRYSLER LLC

1. Install fascia (5) to radiator support (3).
2. Connect the tabs securing the fascia (5) to the grille opening reinforcement and seat fully.
3. If equipped, connect the electrical connectors (4) for the fog lamp assemblies on both sides of the vehicle.
4. Install the push pins (4).

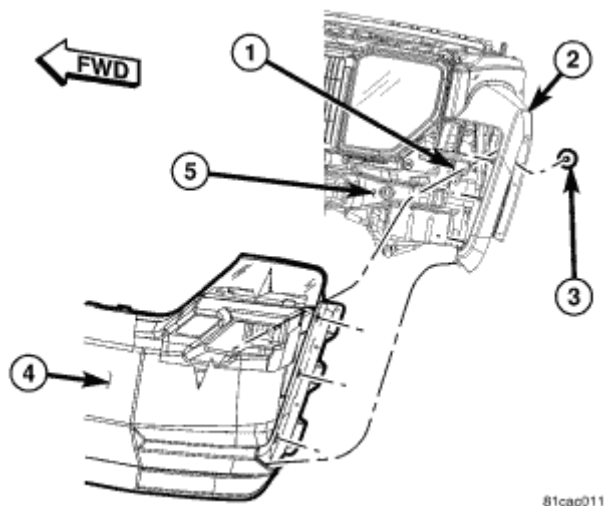


Fig. 4: Front Fascia Components
Courtesy of CHRYSLER LLC

5. Install two screws (3) to the fascia bracket and tighten to 3 N.m (30 in. lbs.).
6. Install splash shields. Refer to **INSTALLATION**.

FASCIA - REAR

REMOVAL

FASCIA - REAR

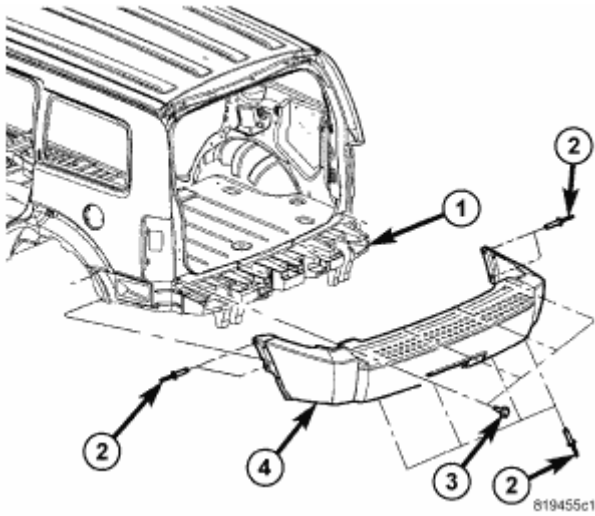


Fig. 5: Rear Fascia Components
Courtesy of CHRYSLER LLC

- | |
|---------------------|
| 1 - Energy Absorber |
| 2 - Rivets |
| 3 - Screws |
| 4 - Rear Fascia |

NOTE: Only remove the rear portion of the right and left rear wheel opening flare moldings, do not remove the door flare moldings.

1. Remove the right and left side rear wheel opening flare moldings. Refer to **REMOVAL** .
2. Remove the six rivets (2) from the rear fascia (4).
3. Remove the four screws (3) from the rear fascia (4).
4. Separate the rear fascia (4) from the rear absorber (1) and remove the fascia from the vehicle.

INSTALLATION

FASCIA - REAR

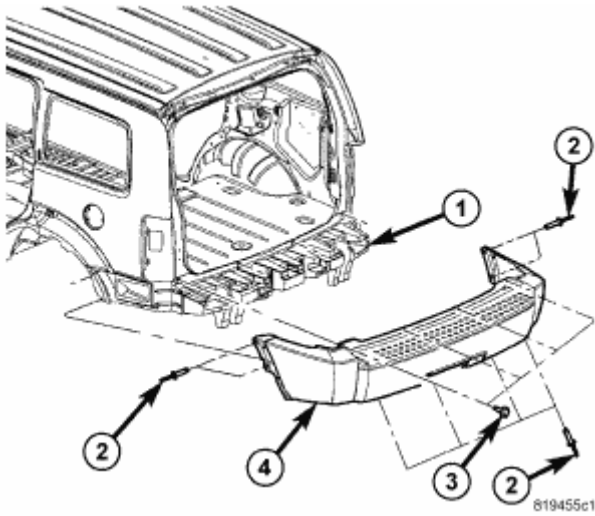


Fig. 6: Rear Fascia Components
 Courtesy of CHRYSLER LLC

1 - Energy Absorber
2 - Rivets
3 - Screws
4 - Rear Fascia

1. Install into position the rear fascia (4) to the rear absorber (1).
2. Install the screws (3) located at the top of the rear fascia (4) and tighten to 8 N.m (70 in. lbs.).
3. Install the six rivets (2) through the rear fascia (4), and the rear absorber (1) to the body.
4. Install both or the rear wheel opening flare moldings. Refer to **INSTALLATION** .

FOAM - REAR BUMPER FASCIA

REMOVAL

FOAM - REAR BUMPER FASCIA

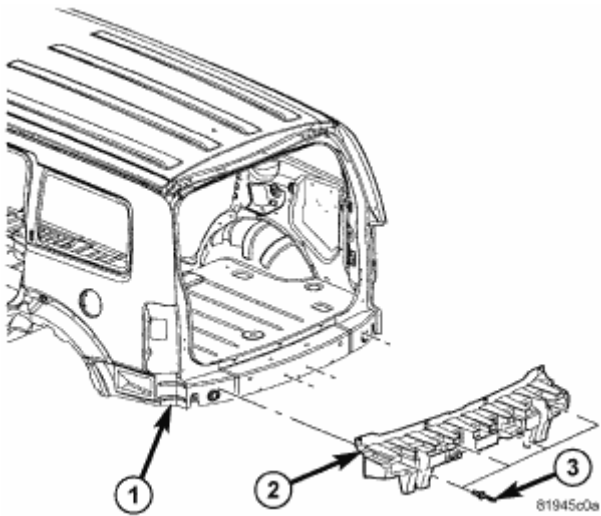


Fig. 7: Rear Absorber, Body & Rivet
 Courtesy of CHRYSLER LLC

1 - Body
2 - Rear Absorber
3 - Rivet

1. Remove the rear fascia. See **REMOVAL**.
2. Remove the four rivets (3) from the rear absorber (2).
3. Unsnap and remove the rear absorber (2) from the body (1).

INSTALLATION

FOAM - REAR BUMPER FASCIA

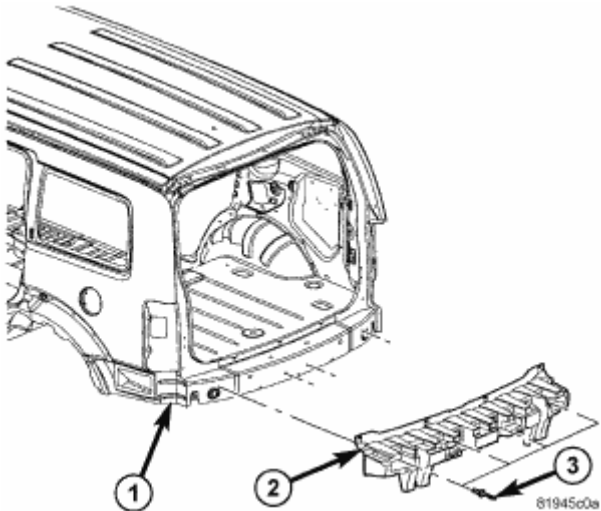


Fig. 8: Rear Absorber, Body & Rivet
 Courtesy of CHRYSLER LLC

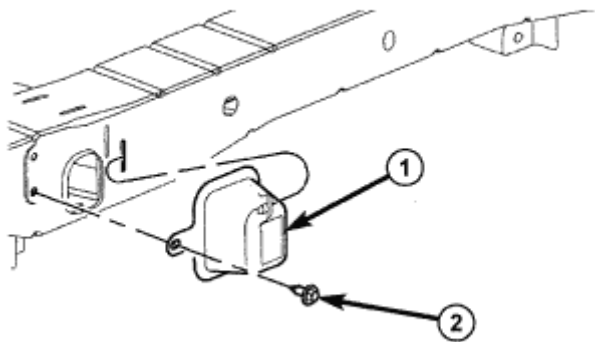
- | |
|-------------------|
| 1 - Body |
| 2 - Rear Absorber |
| 3 - Rivet |

1. Position the rear absorber (2) to the body (1) then use hand pressure on the rear absorber until the plastic clips snap into place securing the rear absorber to the body.
2. Install the four rivets (3) through the rear absorber (2) and into body (1).
3. Install the rear fascia. See **INSTALLATION**.

REINFORCEMENT - FRONT BUMPER

REMOVAL

REINFORCEMENT - FRONT BUMPER



8194c386

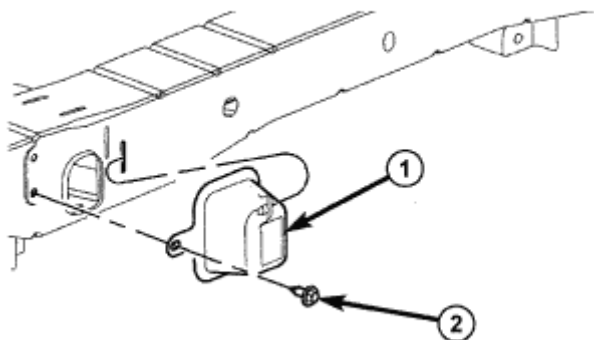
Fig. 9: Identifying Crush Can & Crush Can Bolts
Courtesy of CHRYSLER LLC

- | |
|--------------------|
| 1 - Crush Can |
| 2 - Crush Can Bolt |

1. Remove the front fascia. See **REMOVAL**.
2. Remove the bolt (2) and remove the jounce bumper spacer (1) from the crossmember.

INSTALLATION

REINFORCEMENT - FRONT BUMPER



8194c396

Fig. 10: Identifying Crush Can & Crush Can Bolts
 Courtesy of CHRYSLER LLC

- | |
|-------------------------------------|
| 1 - Crush Can
2 - Crush Can Bolt |
|-------------------------------------|

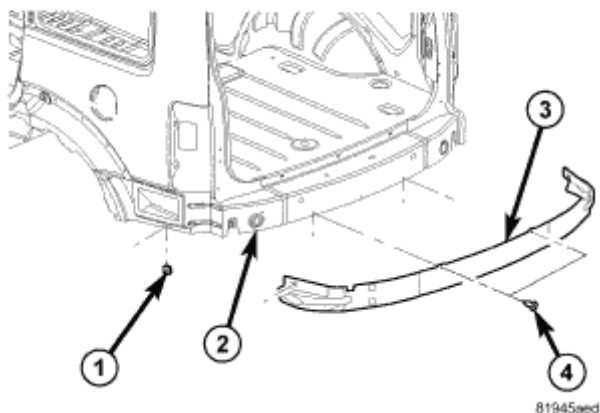
1. Install the jounce bumper spacer (1) to the slot in the crossmember.
2. Install the bolt (2) and tighten to 8 N.m (75 in. lbs.).
3. Install the front fascia. See **INSTALLATION**.

REINFORCEMENT - REAR BUMPER

REMOVAL

REINFORCEMENT - REAR BUMPER

1. Remove the rear bumper fascia foam. See **REMOVAL**.



81945aed

Fig. 11: Identifying U-Nut, Body, Crossmember Support & Screw
Courtesy of CHRYSLER LLC

1 - U - Nut
2 - Body
3 - Crossmember Support
4 - Screw

- 2. Remove the four screws (4) from the crossmember support (3).
- 3. Remove the crossmember (3) from the body (2).
- 4. Remove the U - Nuts (1) from the body (2).

INSTALLATION

REINFORCEMENT - REAR BUMPER

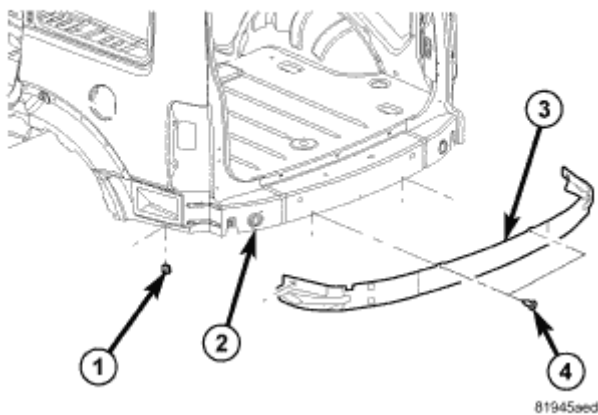


Fig. 12: Identifying U-Nut, Body, Crossmember Support & Screw
Courtesy of CHRYSLER LLC

1 - U - Nut
2 - Body
3 - Crossmember Support
4 - Screw

- 1. Install the U - nuts (1) to the body (2).
- 2. Install the crossmember support (3) to the body (2).
- 3. Install the four screws (4) to the crossmember support (3) and tighten to 7 N.m (5 ft. lbs.).
- 4. Install the rear bumper fascia foam. See **INSTALLATION**.

FRAME

WARNING

WARNING - USE OF HEAT DURING REPAIR

WARNING: Chrysler Group engineering's position on the use of heat during collision repair is as follows:

Any body panel or frame component damaged which is to be repaired and reused, must be repaired using the "cold straightening" method. No heat may be used during the straightening process.

During rough straightening prior to panel replacement, damaged panels or frame components may be heated to assist in body/frame realignment. The application of heat must be constrained to the parts which will be replaced and not allowed to affect any other components.

This "no heat" recommendation is due to the extensive use of high strength and advanced high strength steels in Chrysler Group products. High-strength materials can be substantially and negatively affected from heat input which will not be obviously known to the repairer or consumer.

Ignoring these recommendations may lead to serious compromises in the ability to protect occupants in a future collision event, reduce the engineered qualities and attributes, or decrease the durability and reliability of the vehicle.

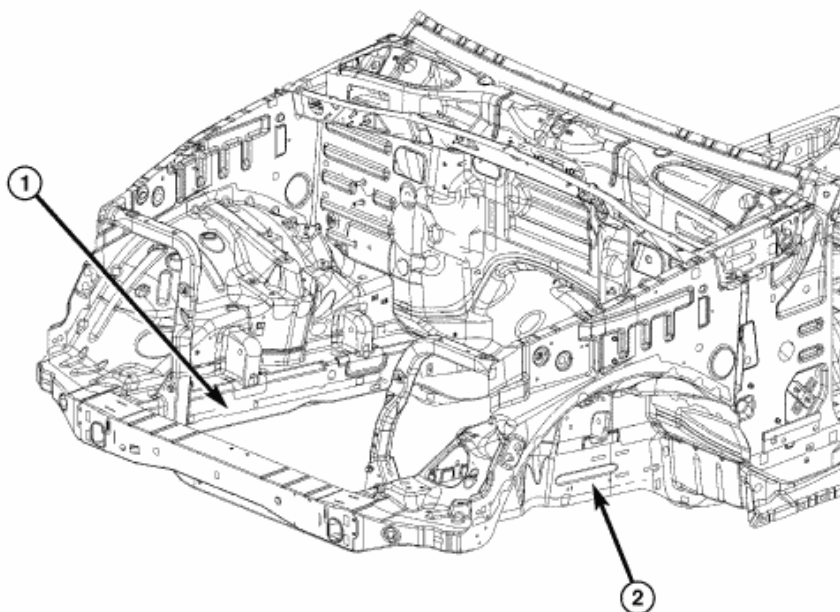
Failure to follow these instructions may result in serious or fatal injury.

This statement supersedes any previously released information by the Chrysler Group.

STANDARD PROCEDURE

FRONT FRAME TIP REPLACEMENT

CAUTION: Damage to the frame rail, rearward of the area covered by this procedure, which is not eliminated during preliminary structural corrections and pulls, necessitates complete rail replacement to restore the vehicle to pre-loss condition.

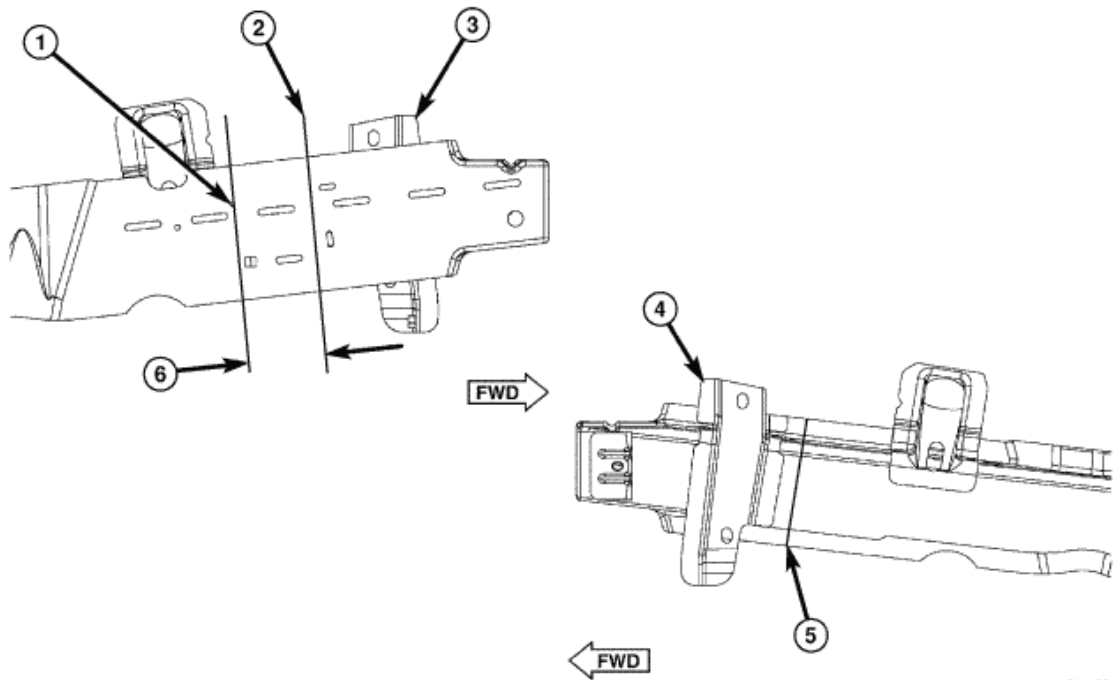


81de8b1e

Fig. 13: Identifying Right Frame Rail & Left Frame Rail
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - RIGHT FRAME RAIL
2 - LEFT FRAME RAIL |
|---|

1. With vehicle mounted to appropriate pulling and 3-dimensional measuring equipment, complete the following procedure paying particular attention to body dimensions while fitting and welding panels.
2. Remove bumper components, cooling module, headlamps, and all other components for clear access to repair area.

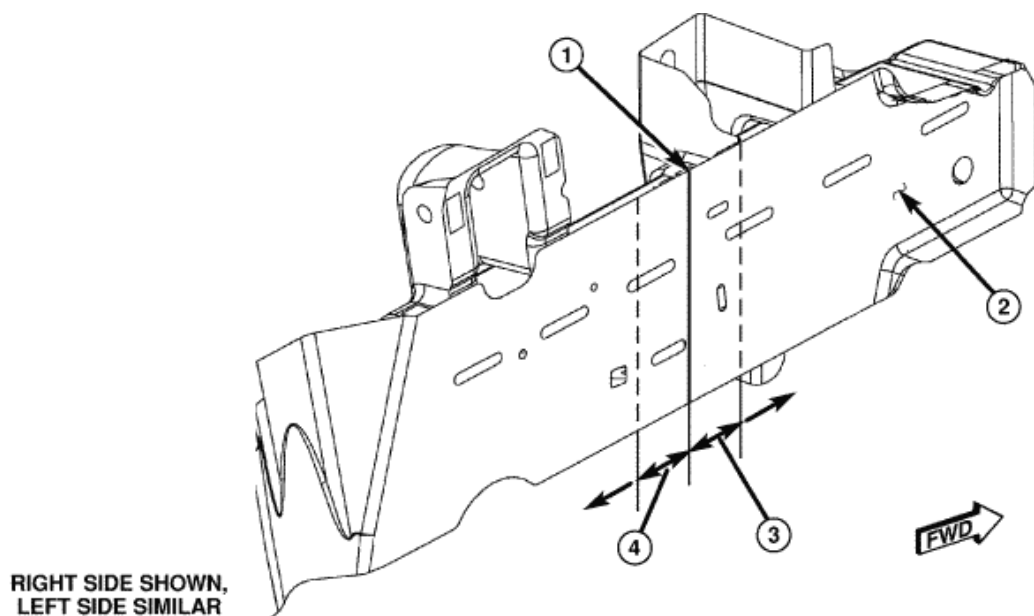


81ds98c4

Fig. 14: Small Hole, Scribe Mark, Radiator Support Bracket
Courtesy of CHRYSLER LLC

- | |
|--|
| <p>1 - SMALL HOLE
 2 - SCRIBE MARK
 3 - RADIATOR SUPPORT BRACKET
 4 - RADIATOR SUPPORT BRACKET
 5 - SCRIBE MARK (TRANSFER FROM OUTER FRAME RAIL) - INNER FRAME RAIL
 6 - DISTANCE 93 mm (3.5 in.) - OUTER FRAME RAIL</p> |
|--|

- Using the center of the small PLP hole on the outer side member as reference, mark outer rail at top and bottom then create vertical scribe mark 93 mm (3.5 in.) forward of the PLP on outer frame rail.

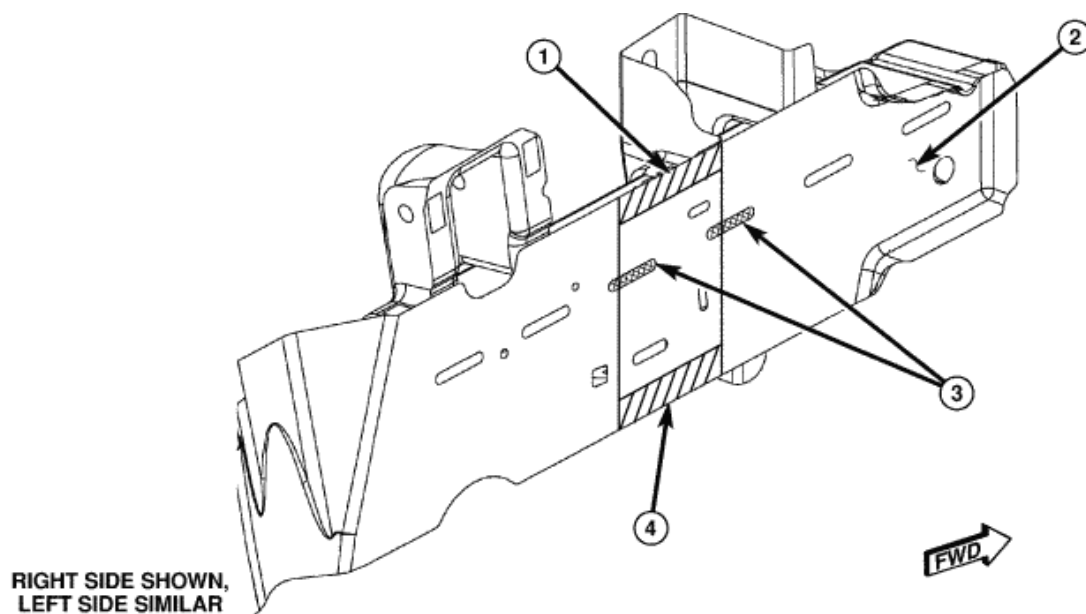


81de98c8

Fig. 15: Identifying Vertical Scribe Mark, Outer Frame Rail, Forward Measure & Rear Measure
Courtesy of CHRYSLER LLC

- | |
|--------------------------------------|
| 1 - VERTICAL SCRIBE MARK |
| 2 - OUTER FRAME RAIL |
| 3 - MEASURE FORWARD 38 mm (1.5 in.) |
| 4 - MEASURE REARWARD 38 mm (1.5 in.) |

- Using the scribe mark on the outer side member as reference, measure rearward 38 mm (1.5 in.) and forward 38 mm (1.5 in.) and mark outer rail at top and bottom then create vertical scribe mark on outer frame rail.



81de98b4

Fig. 16: Identifying Welds & Outer Frame Rail
Courtesy of CHRYSLER LLC

- | |
|------------------------------------|
| 1 - REMOVE WELDS |
| 2 - OUTER FRAME RAIL |
| 3 - REMOVE WELDS (Z-REINFORCEMENT) |
| 4 - REMOVE WELDS |

5. Remove welds holding the inner and outer side members together between the two scribe lines on the outer rail.
6. Remove the welds holding the internal Z-reinforcement to the outer rail between the two scribe lines.

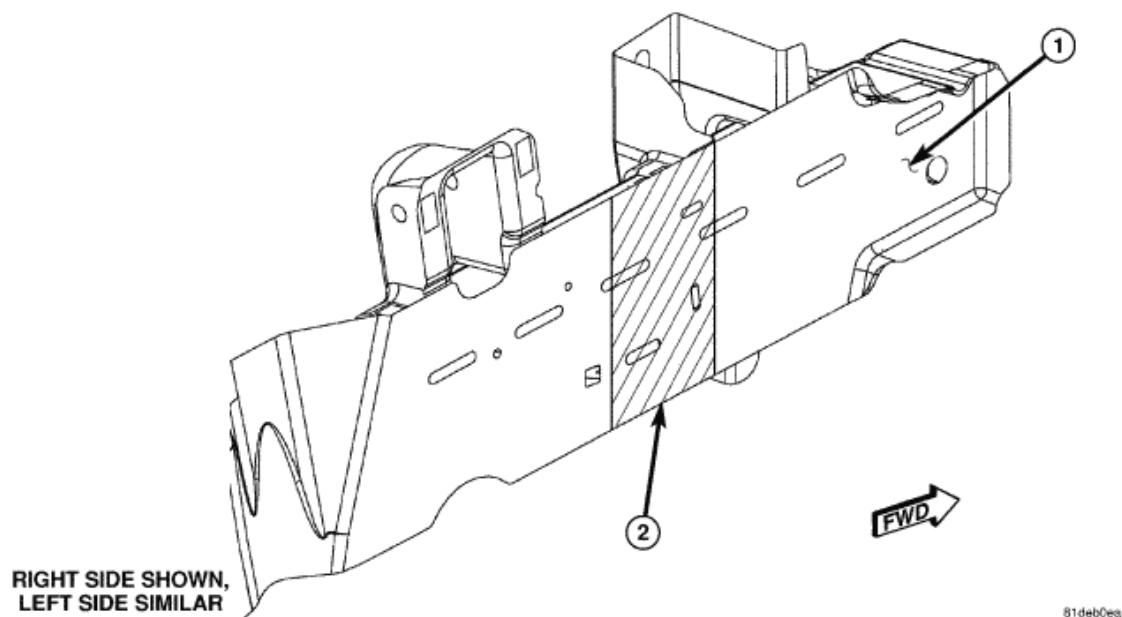


Fig. 17: Identifying Outer Frame Rail & Removal Section
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - OUTER FRAME RAIL |
| 2 - CUT AND REMOVE |

7. Carefully cut the outer side member top to bottom at the scribe lines without damaging the inner side member or the Z-reinforcement inside the rail and remove the access panel or "window".

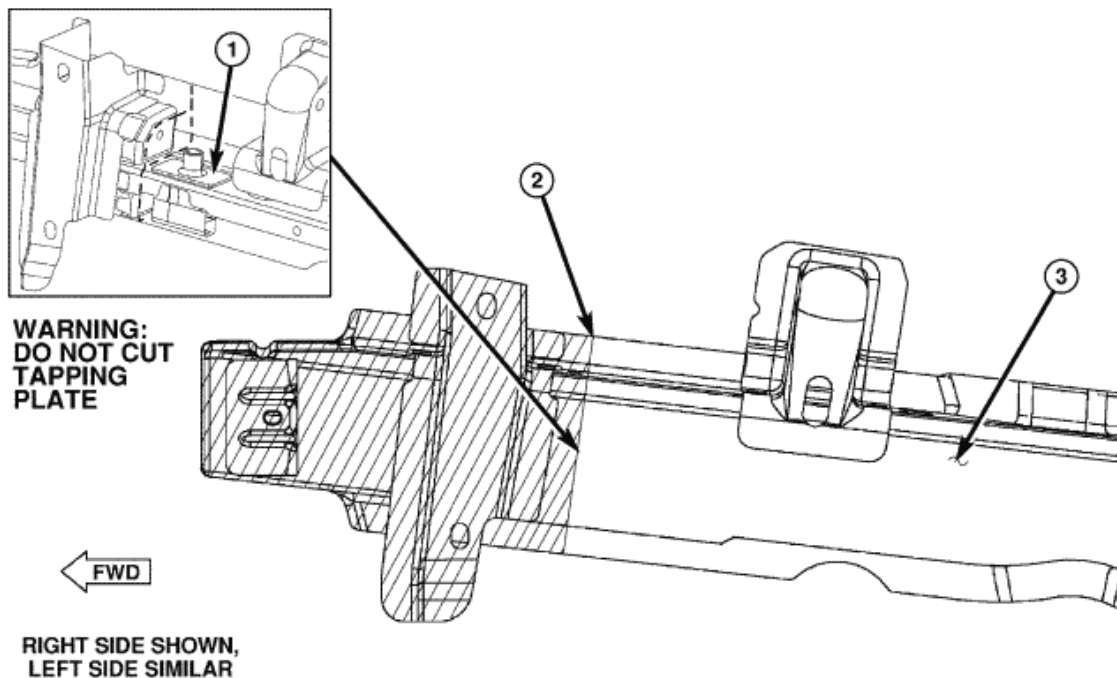
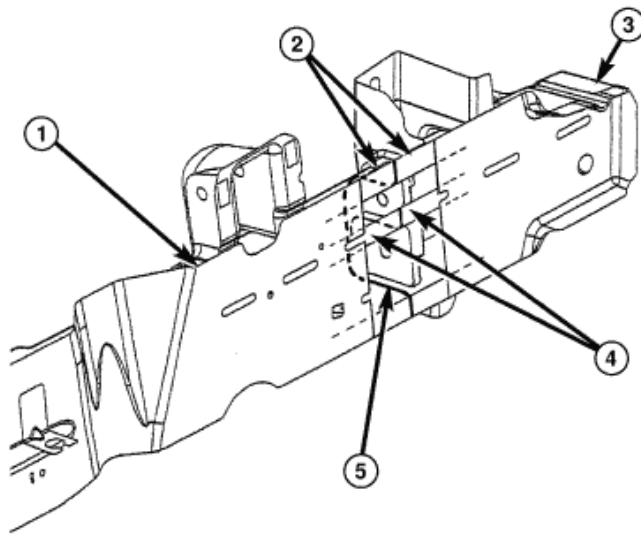


Fig. 18: Identifying Tapping Plate, Inner Frame Rail & Removal Section
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - TAPPING PLATE |
| 2 - CUT AND REMOVE |
| 3 - INNER FRAME RAIL |

WARNING: Do not cut tapping plate (1).

8. Using a reciprocating saw, cut vertically down through the inner frame rail and Z reinforcement at the scribe location on the inner rail.



RIGHT SIDE SHOWN,
LEFT SIDE SIMILAR

81deb8e6

Fig. 19: Identifying Existing Frame Rail, Inner Frame Rail, Replacement Frame Tip, Z-Reinforcement & Access Window
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - EXISTING FRAME RAIL
2 - INNER FRAME RAIL
3 - REPLACEMENT FRAME TIP
4 - Z-REINFORCEMENT
5 - ACCESS WINDOW |
|--|

9. Carefully clean and de-burr all cut edges and prepare for welding.
10. Remove any paint, e-coat, or other coatings within 25 mm (1 in.) of any weld area.
11. Using the same procedures previously described, prepare the service rail tip for installation.
12. Fit and position the new rail tip to the vehicle using XYZ dimensions and measuring equipment.
13. Confirm good joint fit-up with inner frame rail and Z-reinforcement and root gap equal to width of saw cut.
14. Tack weld the new tip into position using the weld chart located at the end of repair procedure section.
15. Reconfirm proper tip location.

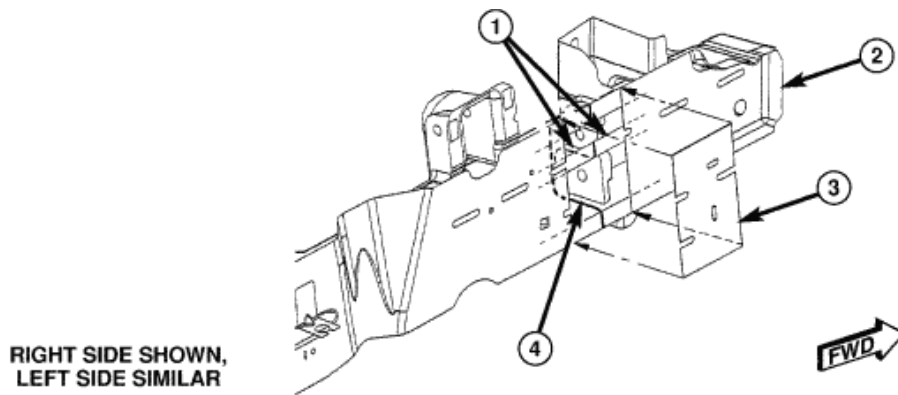
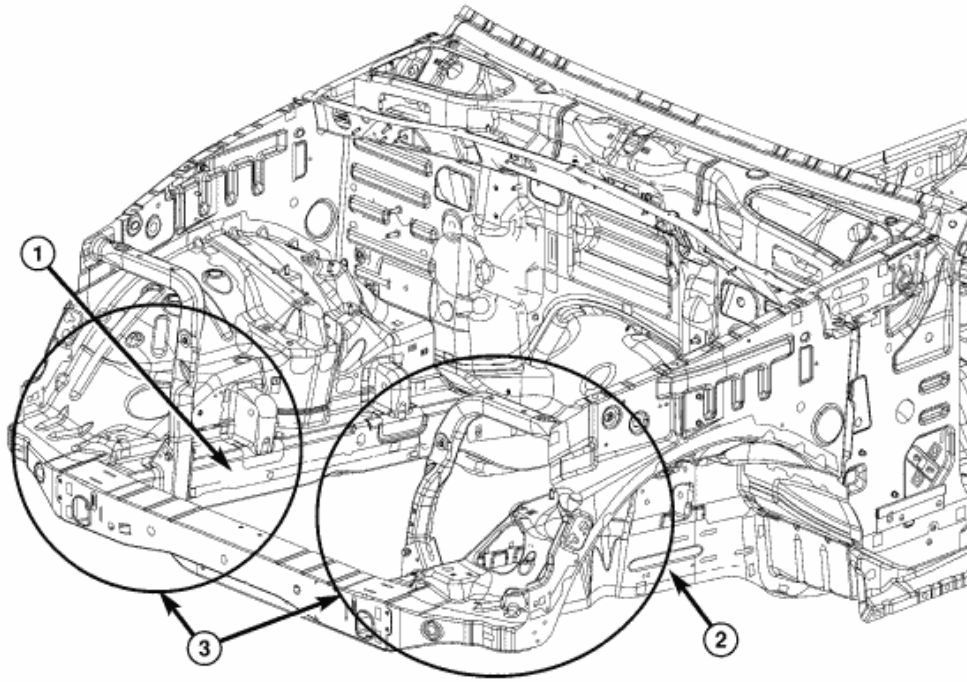


Fig. 20: Identifying Z-Reinforcement, Replacement Frame Tip, Access Panel & Access Window
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - Z-REINFORCEMENT
2 - REPLACEMENT FRAME TIP
3 - ACCESS PANEL
4 - ACCESS WINDOW |
|---|

16. Weld inner frame rail in the following sequence.
 - Upper half from the access window.
 - Lower half from exterior of rail.
 - Clean backside of above two welds in preparation for welding.
 - Upper half from exterior.
 - Lower half from access window.
17. Weld Z-reinforcement from top and from bottom, from inner side rail to outer side rail.
18. Prepare access panel for reinstallation.
19. Clamp the access panel back to rail assembly.
20. Weld the butt-joints completely using a skip/stitch method to reduce the heat affected zone and distortion.
21. Weld the access window at the top and bottom to the inner frame rail using ring file or Squeeze Type Resistance Spot Welding (STRSW) (puddle) welds.
22. Install clamp to snug gap between outer rail and inner Z-reinforcements and MIG weld the outer rail back to the Z-reinforcement through the slots in the outer rail.



81deb961

Fig. 21: Identifying Right/Left Frame Rail & Repaired Area(S)
Courtesy of CHRYSLER LLC

- 1 - RIGHT FRAME RAIL
- 2 - LEFT FRAME RAIL
- 3 - CLEAN AND REFINISH REPAIRED AREA(S)

23. Clean all repaired areas and apply appropriate refinish and corrosion protection material.
 - Apply rust protection into the repaired frame rail.

SPECIFICATIONS

SPECIFICATION - FRAME DIMENSIONS

Frame dimensions are listed in metric scale. All dimensions are from center to center of Principal Locating Point (PLP), or from center to center of PLP and fastener location.

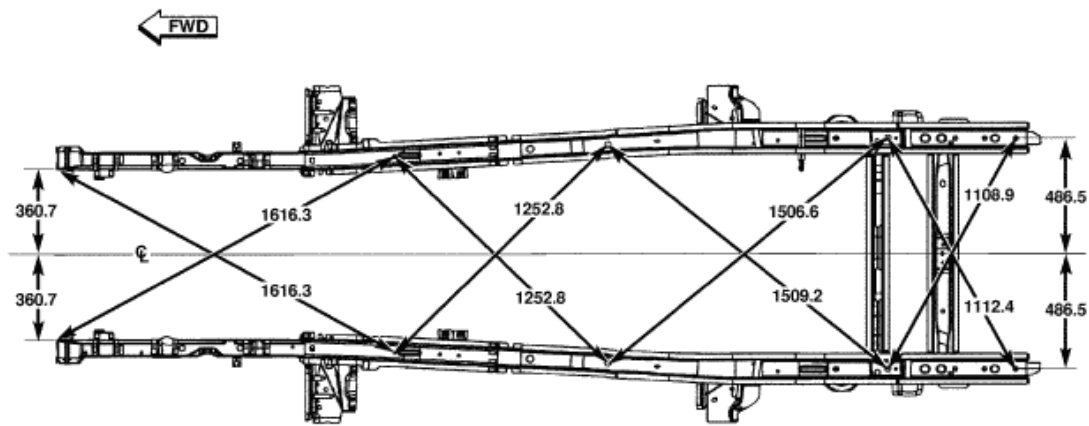
VEHICLE PREPARATION

Position the vehicle on a level work surface. Using screw or bottle jacks, adjust the vehicle PLP heights to the specified dimension above a level work surface. Vertical dimensions can be taken from the work surface to the locations indicated were applicable.

DIMENSION ILLUSTRATIONS

NOTE: All measurements are in MM.

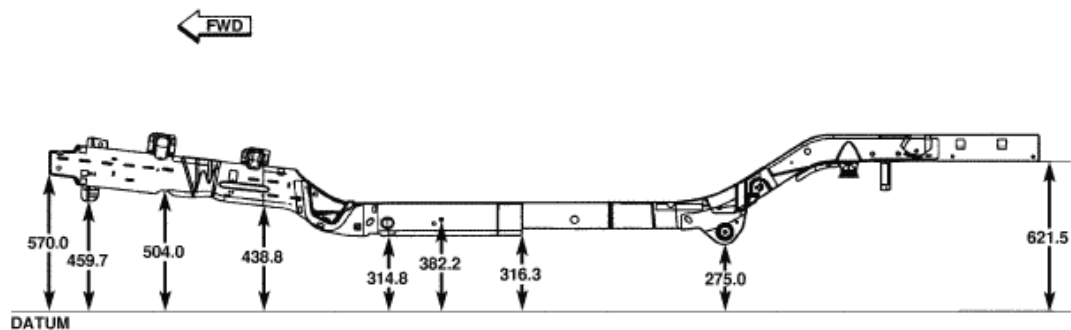
DESCRIPTION	FIGURE
FRAME DIMENSIONS - PLAN VIEW	<u>Fig. 22.</u>
FRAME DIMENSIONS - SIDE VIEW	<u>Fig. 23.</u>



ALL DIMENSIONS
ARE IN MILLIMETERS

8169629

Fig. 22: Frame Dimensions - Plan View
Courtesy of CHRYSLER LLC



ALL DIMENSIONS
ARE IN MILLIMETERS

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Fig. 23: Frame Dimensions - Side View
Courtesy of CHRYSLER LLC

SPECIFICATION - TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Engine cradle crossmember front mounting bolts	122	90	-
Engine cradle crossmember rear mounting bolts	115	85	-
Engine mount through bolts/nuts	88	65	-
Front skid plate bolts	61	45	-
Front tow hook nuts/bolt	61	45	-
Rear crossmember bolts	47	35	-
Rear tow hook bolts	88	65	-
Trailer hitch bolts	95	70	-
Trailer tow connector bolts	4	-	35
Transfer case skid plate bolts	34	25	-
Transmission mount through bolt/nut	88	65	-
Transmission skid plate bolts	27	20	-

CROSSMEMBER - FRONT SUSPENSION

REMOVAL

CROSSMEMBER - FRONT SUSPENSION

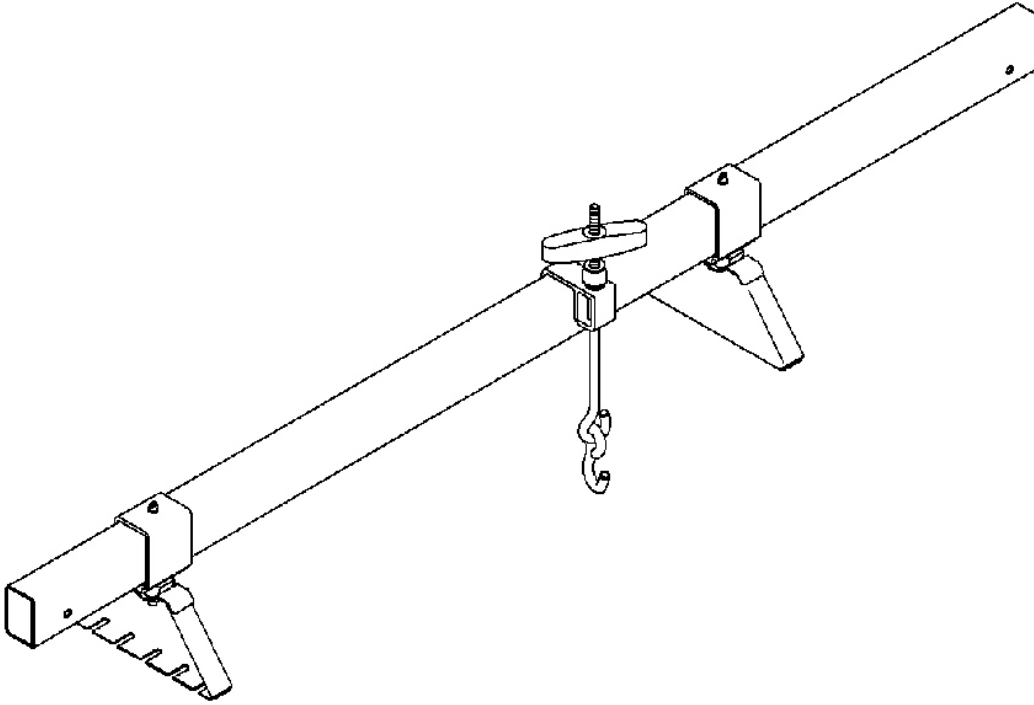


Fig. 24: Driveline Support Fixture
Courtesy of CHRYSLER LLC

1. Install engine support tool 8534 or equivalent.

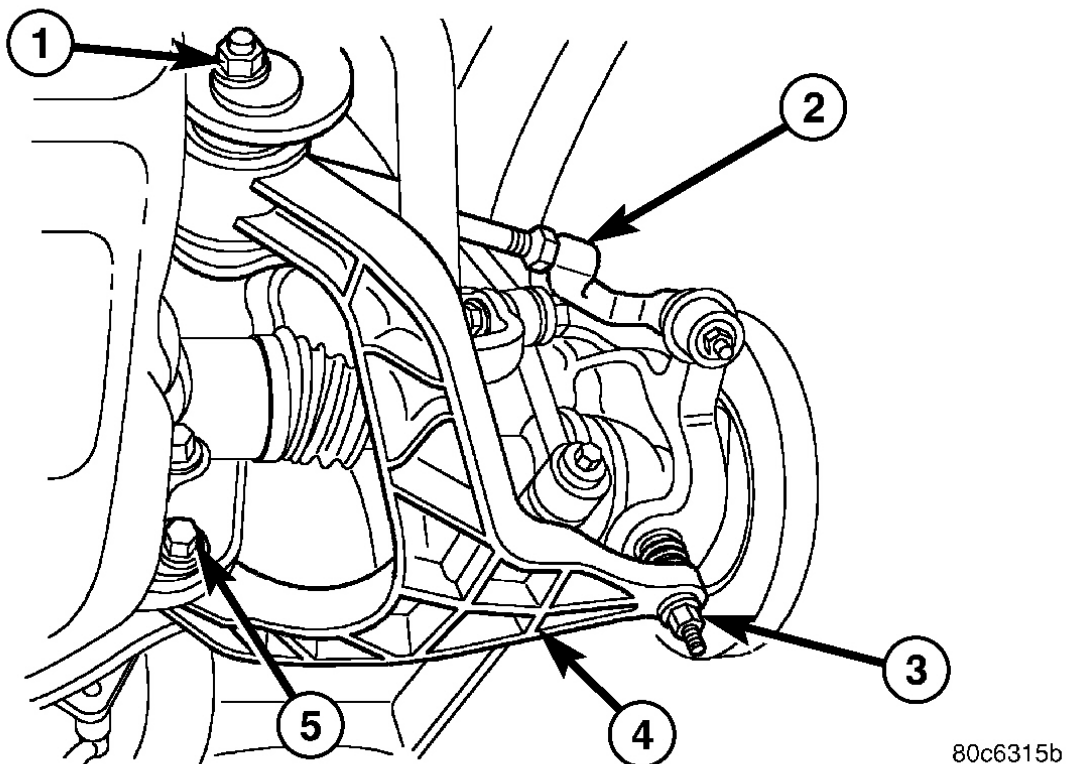
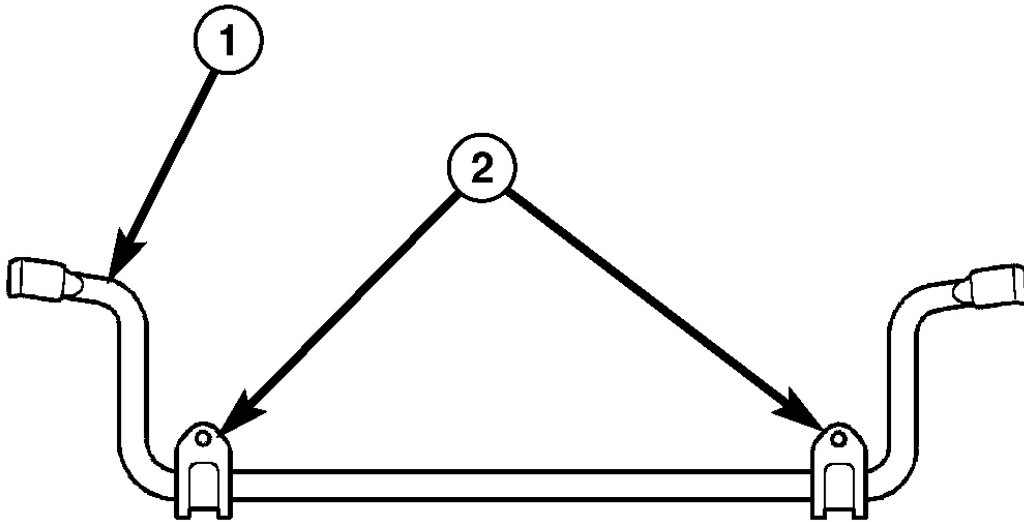


Fig. 25: Removing/Installing Lower Control Arm
Courtesy of CHRYSLER LLC

2. Raise and support the vehicle.

NOTE: Use a grease marker to mark the lower control arm cam bolts with reference points to ease with the wheel alignment.

3. Remove the lower control arms. Refer to **REMOVAL** .

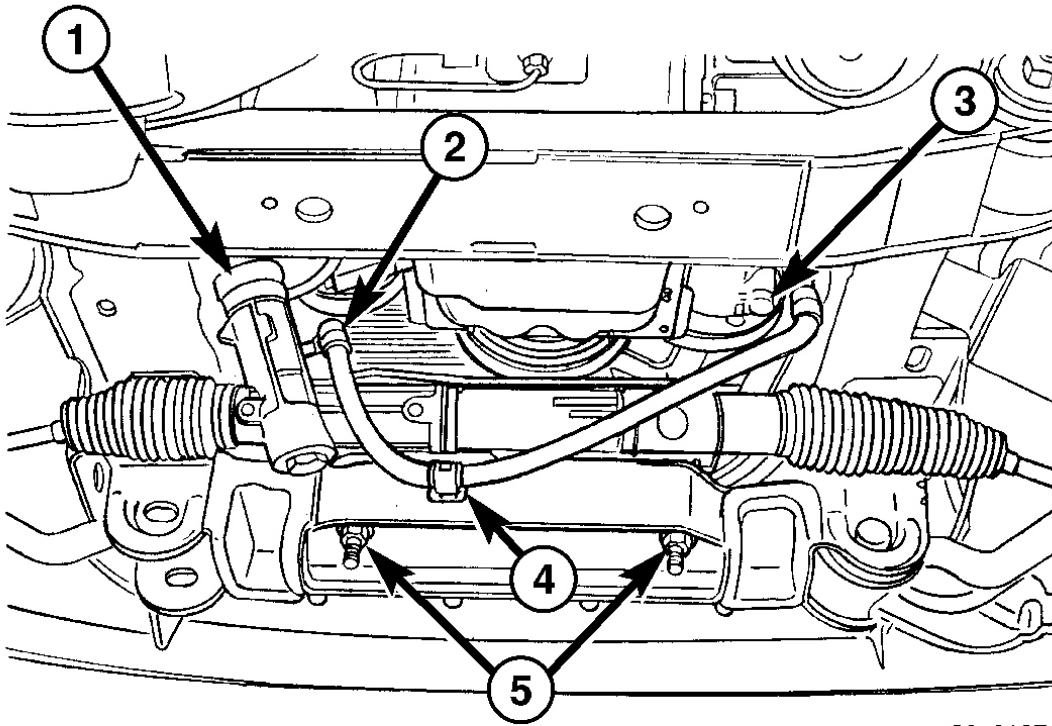


80c62dd2

Fig. 26: Identifying Stabilizer Bar & Stabilizer Bar Bushing/Clamps
Courtesy of CHRYSLER LLC

- | |
|-----------------------------------|
| 1 - STABILIZER BAR |
| 2 - STABILIZER BAR BUSHING/CLAMPS |

4. Remove the stabilizer bar. Refer to **REMOVAL** .



80c6197e

Fig. 27: Removing/Installing Rack & Pinion
Courtesy of CHRYSLER LLC

- | |
|--|
| <ul style="list-style-type: none">1 - RACK & PINION2 - HIGH PRESSURE HOSE3 - POWER STEERING PUMP4 - HIGH PRESSURE HOSE BRACKET5 - RACK & PINION MOUNTING BOLTS |
|--|

- 5. Remove the front axle, if equipped. Refer to **REMOVAL** .
- 6. Remove the power steering rack. Refer to **REMOVAL** .

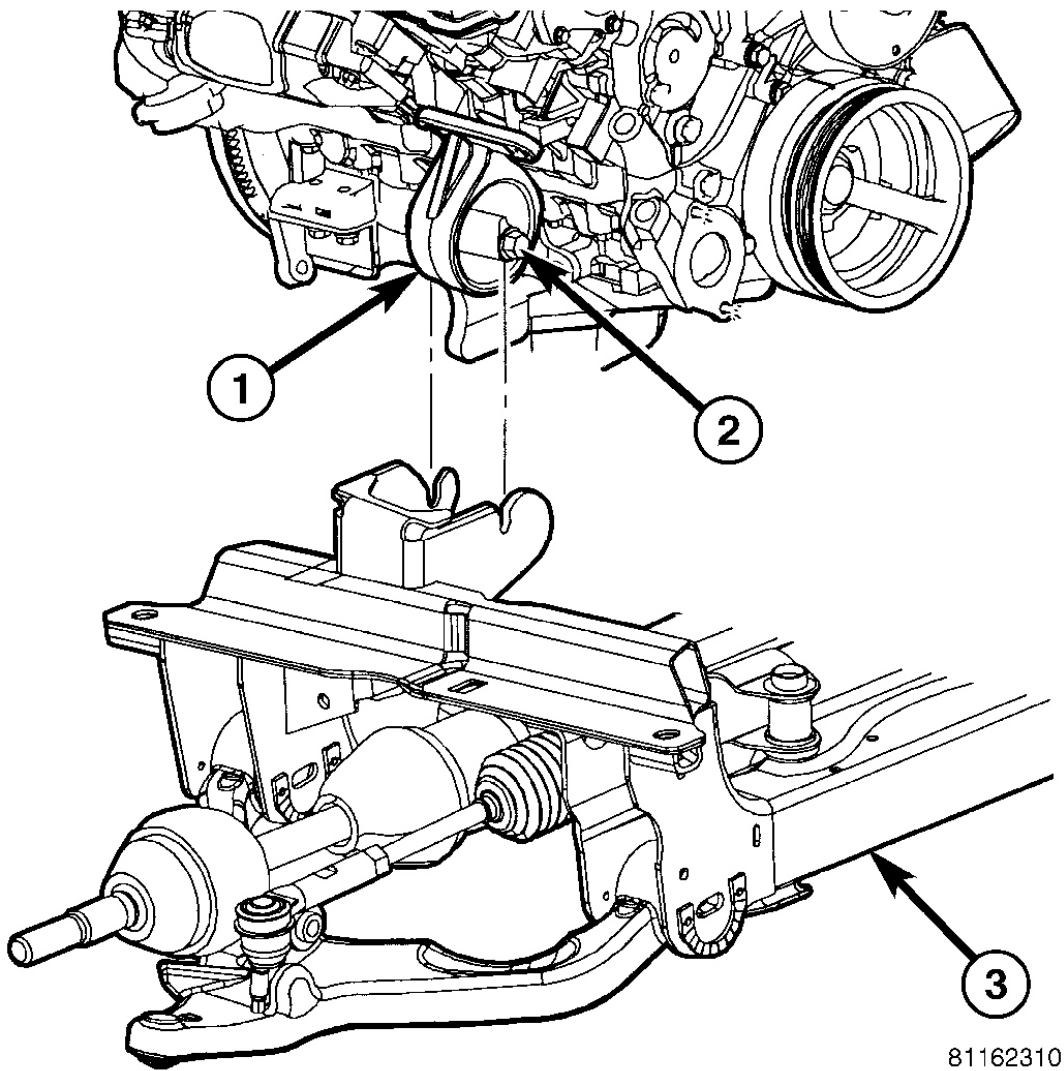
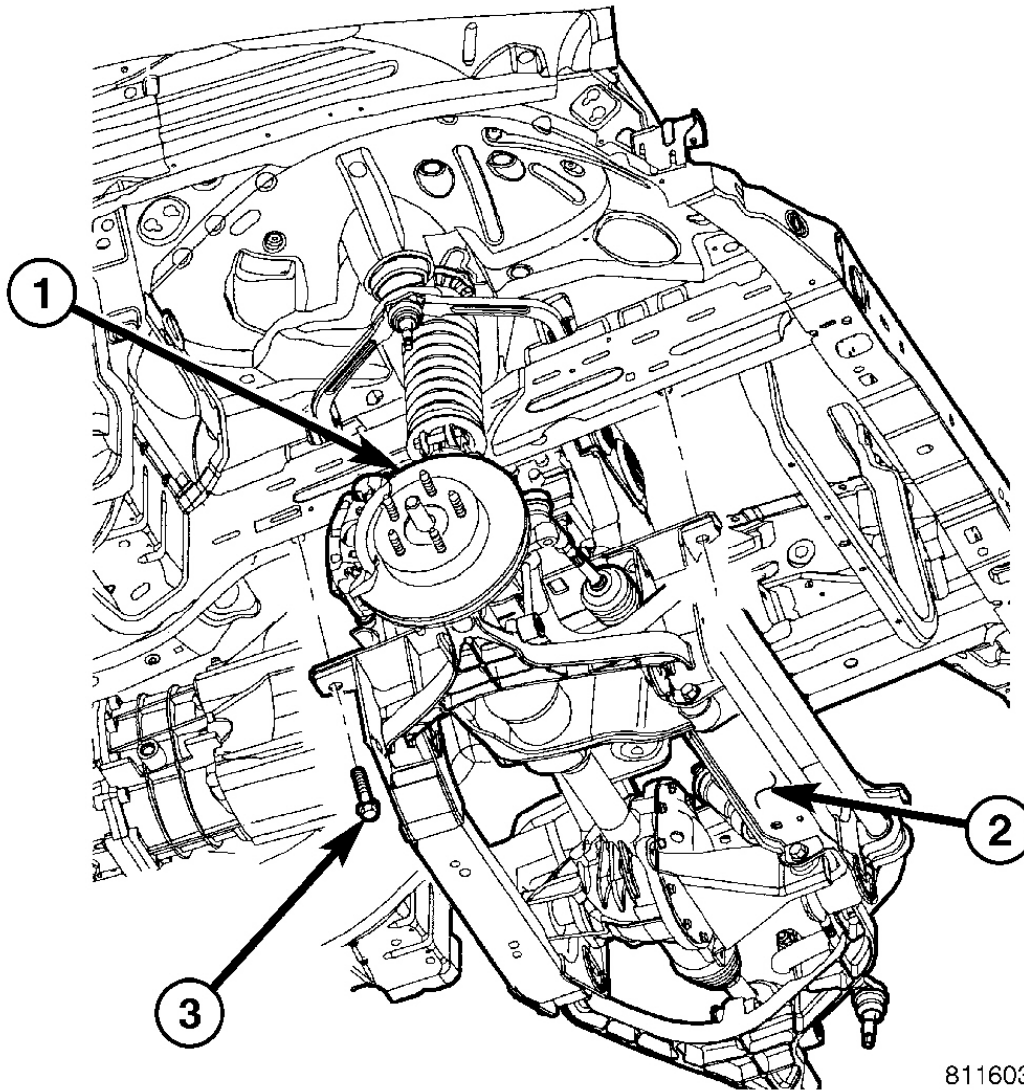


Fig. 28: Engine Mount, Trough Bolt & Engine Cradle Crossmembers
Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - ENGINE MOUNT |
| 2 - THROUGH BOLT |
| 3 - ENGINE CRADLE CROSSMEMBER |

7. Loosen the engine mount through bolts.



81160347

Fig. 29: Identifying Engine Cradle Crossmember & Engine Cradle Support Bolts
Courtesy of CHRYSLER LLC

2 - ENGINE CRADLE CROSSMEMBER
3 - ENGINE CRADLE SUPPORT BOLTS (4)

NOTE: Using a grease pencil or equivalent, mark the location of the engine support cradle.

8. Support the engine cradle with a suitable lifting device.
9. Remove the engine cradle support bolts and remove the engine cradle.

INSTALLATION

CROSSMEMBER - FRONT SUSPENSION

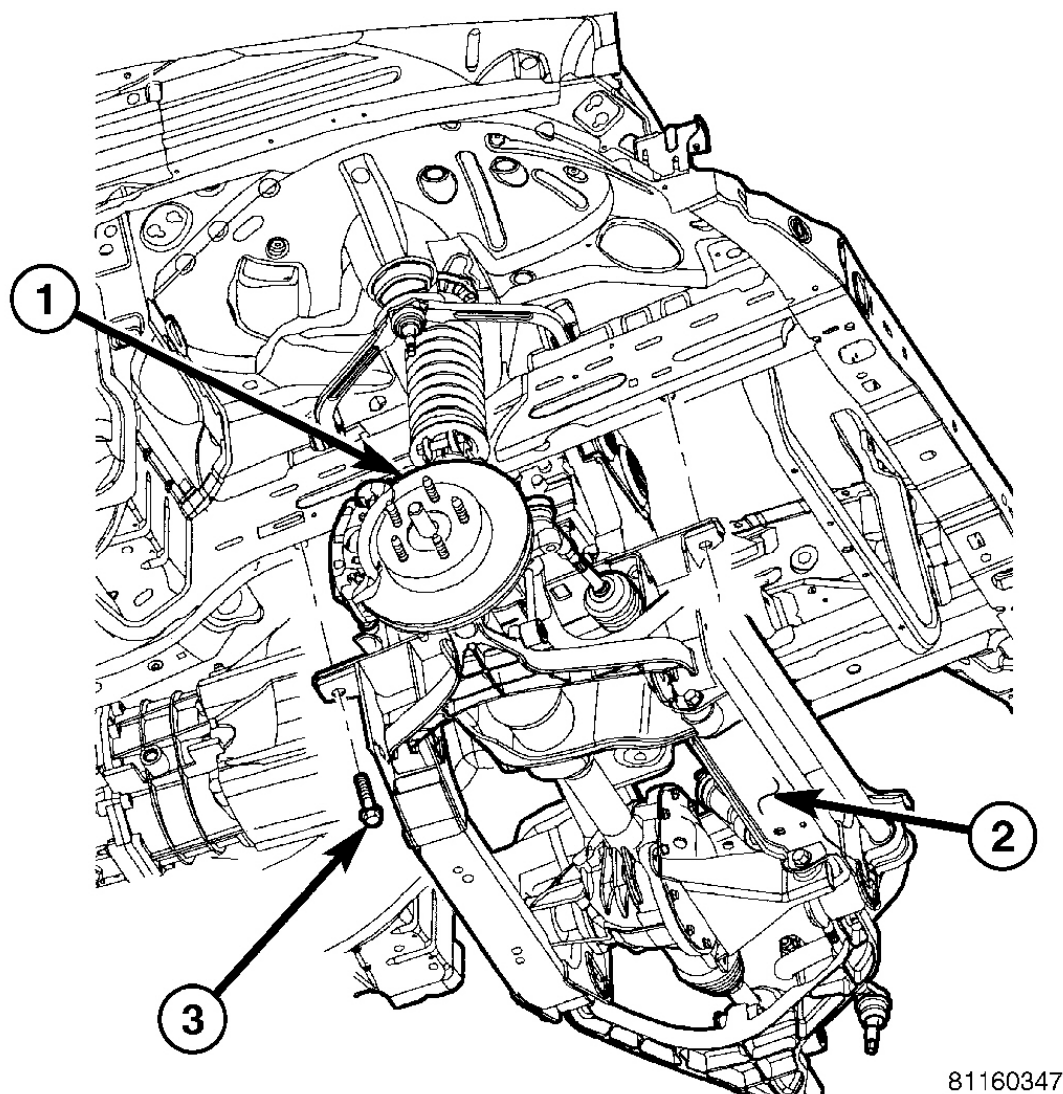


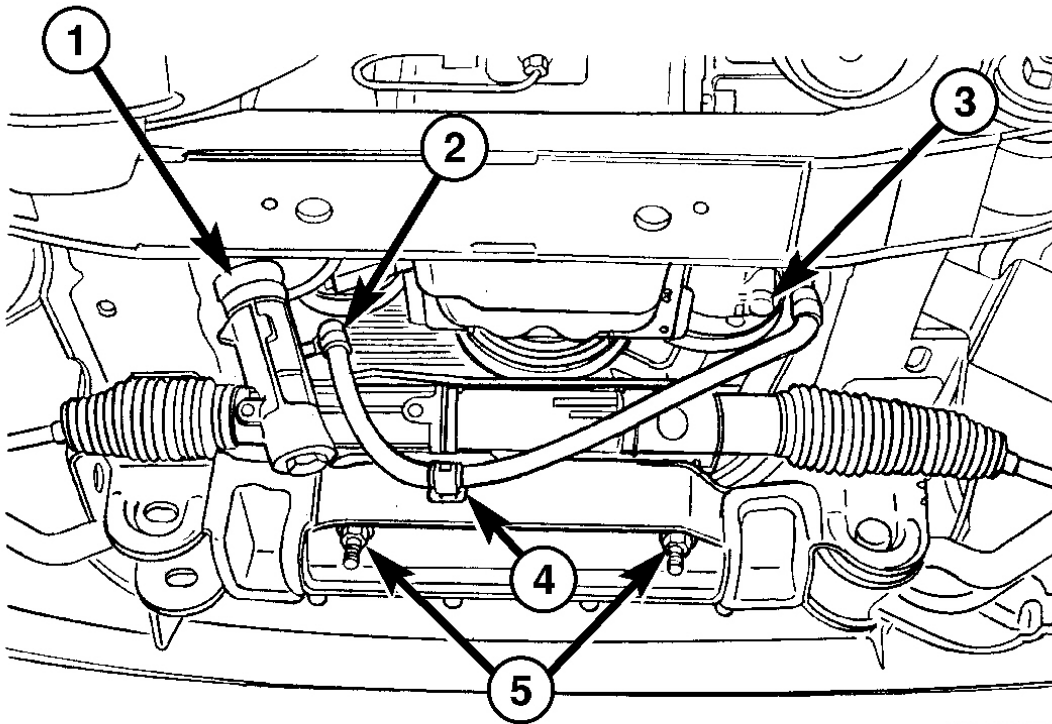
Fig. 30: Identifying Engine Cradle Crossmember & Engine Cradle Support Bolts
Courtesy of CHRYSLER LLC

- | |
|-------------------------------------|
| 2 - ENGINE CRADLE CROSSMEMBER |
| 3 - ENGINE CRADLE SUPPORT BOLTS (4) |

1. Place the cradle on a suitable lifting device, then raise the engine cradle into the vehicle while lining up the engine mount through bolts.

NOTE: Refer to the reference marks made during cradle removal procedure and align the cradle to those marks.

2. Install the cradle mounting bolts and tighten the front bolts to 122 N.m (90 ft. lbs.) and tighten the rear bolts to 115 N.m (85 ft. lbs.).
3. Tighten the engine mount through bolts to 88 N.m (65 ft. lbs.).

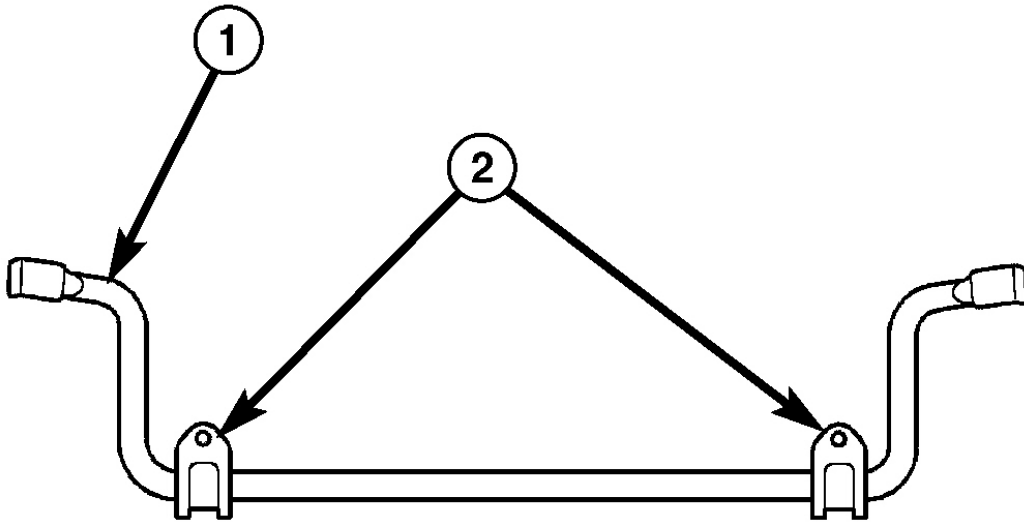


80c6197e

Fig. 31: Removing/Installing Rack & Pinion
Courtesy of CHRYSLER LLC

- | |
|----------------------------------|
| 1 - RACK & PINION |
| 2 - HIGH PRESSURE HOSE |
| 3 - POWER STEERING PUMP |
| 4 - HIGH PRESSURE HOSE BRACKET |
| 5 - RACK & PINION MOUNTING BOLTS |

4. Install the steering gear. Refer to **INSTALLATION**.



80c62dd2

Fig. 32: Identifying Stabilizer Bar & Stabilizer Bar Bushing/Clamps
Courtesy of CHRYSLER LLC

- | |
|-----------------------------------|
| 1 - STABILIZER BAR |
| 2 - STABILIZER BAR BUSHING/CLAMPS |

5. Install the front axle, if equipped. Refer to **INSTALLATION** .
6. Install the stabilizer bar. Refer to **INSTALLATION** .

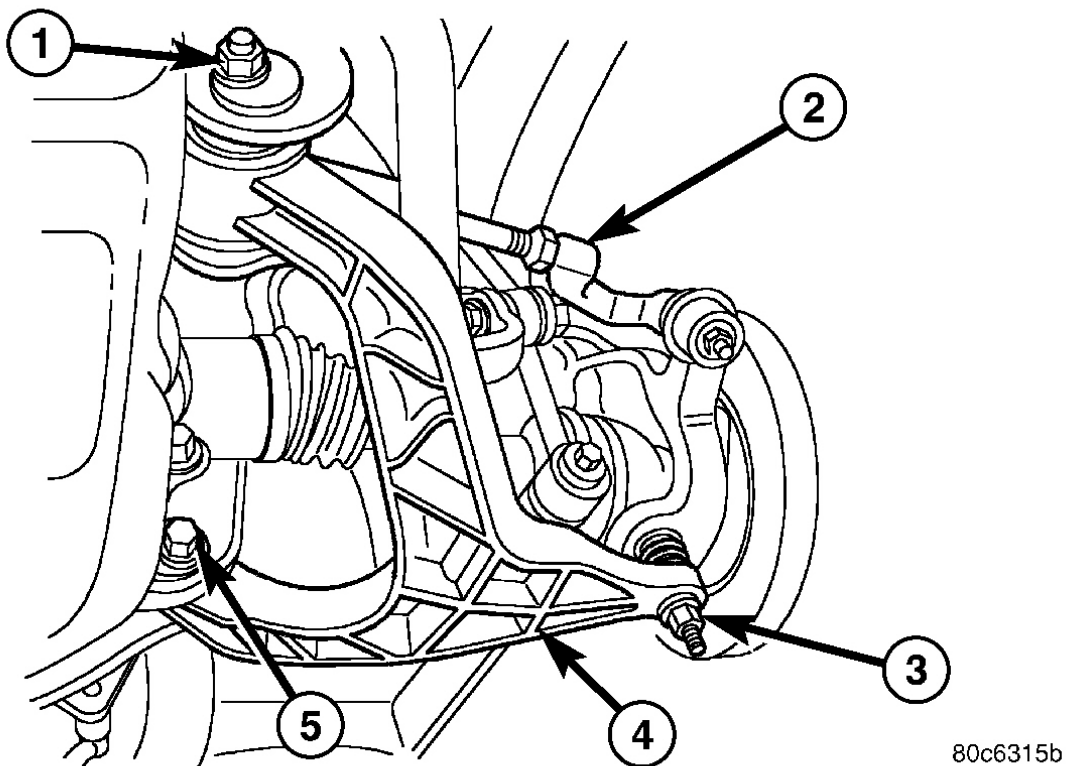


Fig. 33: Removing/Installing Lower Control Arm
Courtesy of CHRYSLER LLC

7. Install the lower control arms. Refer to **INSTALLATION** .

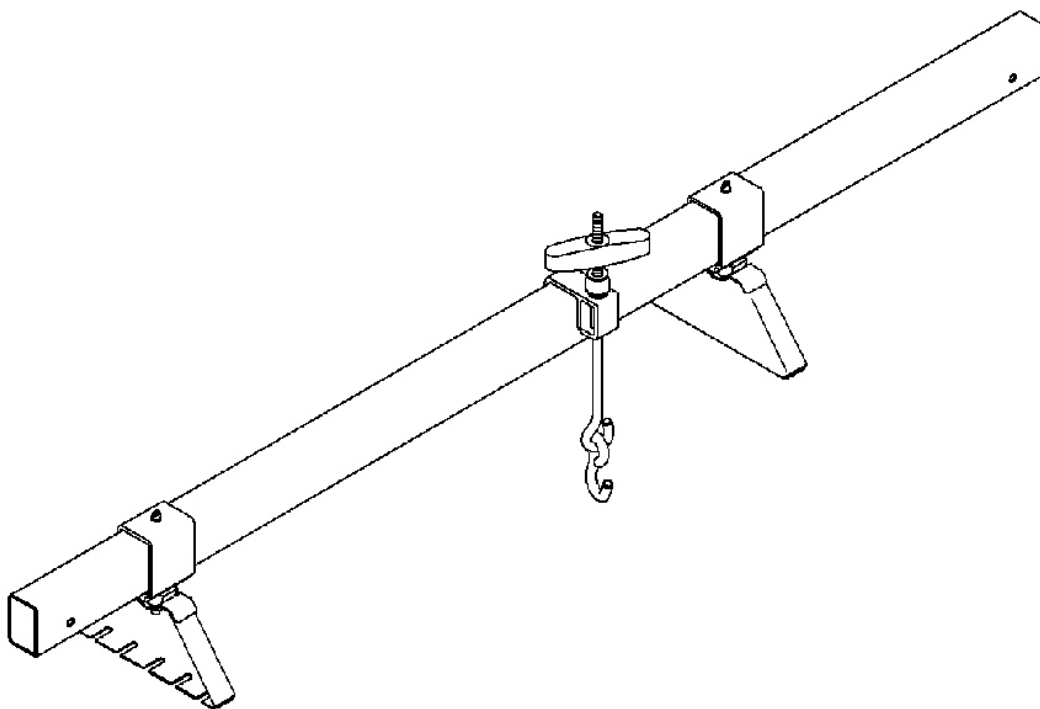


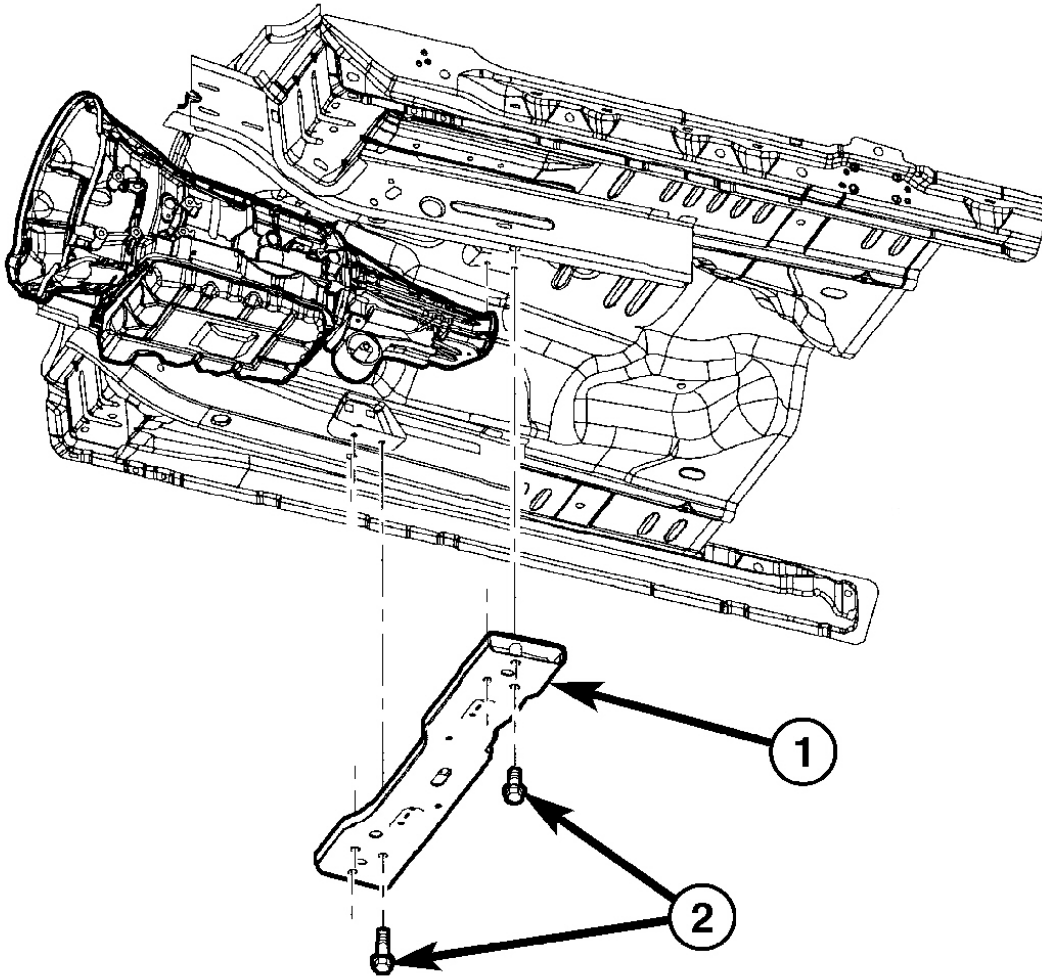
Fig. 34: Driveline Support Fixture
Courtesy of CHRYSLER LLC

8. Lower the vehicle and remove the engine support tool.

CROSSMEMBER - TRANSMISSION

REMOVAL

CROSSMEMBER - TRANSMISSION



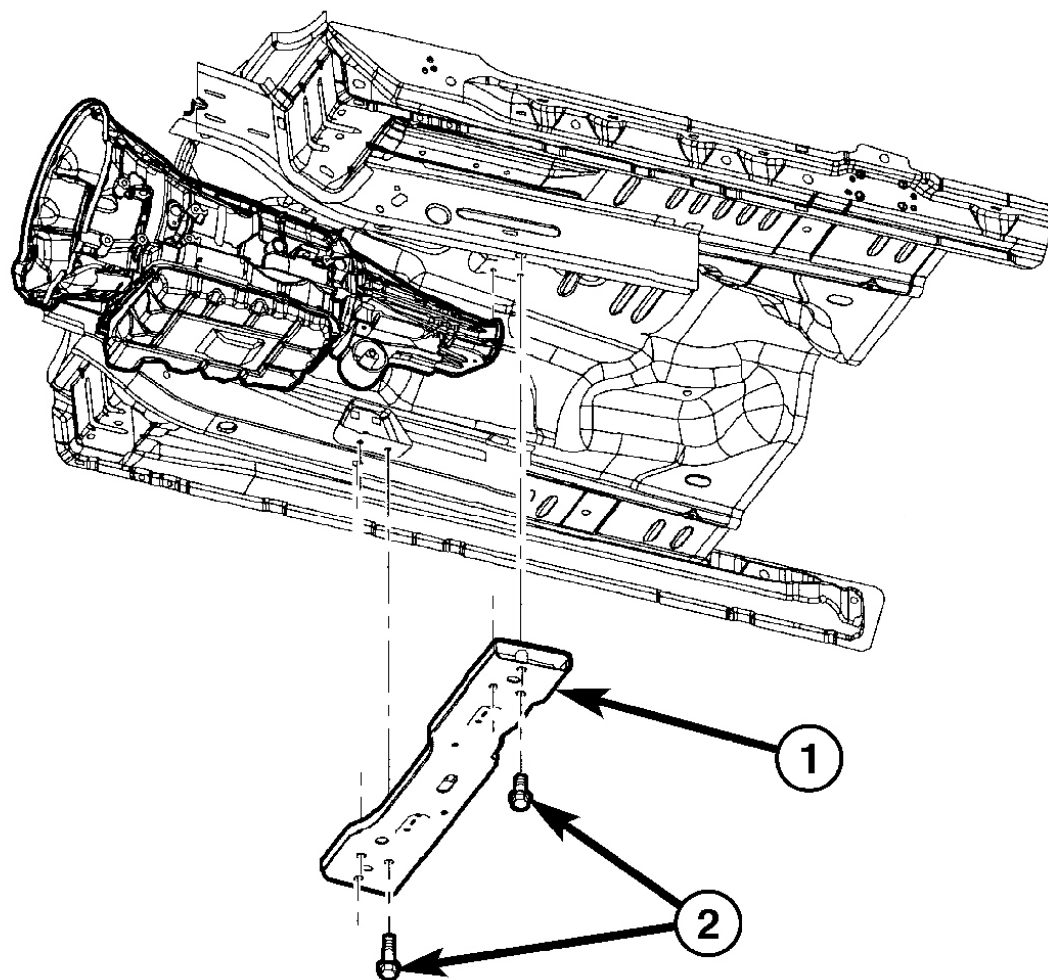
8115f907

Fig. 35: Identifying Crossmember & Bolts
Courtesy of CHRYSLER LLC

- | |
|----------------------------------|
| 1 - CROSSMEMBER
2 - BOLTS (6) |
|----------------------------------|

1. Remove the transmission skid plate. See **REMOVAL**.
2. Remove the transfer case skid plate. See **REMOVAL**.
3. Support the transmission with a suitable lifting device.
4. Remove the four transmission mount nuts from the crossmember.
5. Remove the six bolts (2) and remove the crossmember (1).

INSTALLATION



8115f907

Fig. 36: Identifying Crossmember & Bolts
Courtesy of CHRYSLER LLC

1 - CROSSMEMBER
2 - BOLTS (6)

1. Install the crossmember and six bolts and tighten the bolts to 47 N.m (35 ft. lbs.).
2. Install four transmission mount nuts and tighten to 88 N.m (65 ft. lbs.).
3. Remove the transmission lifting device.
4. Install the transfer case skid plate. See **INSTALLATION**.
5. Install the transmission skid plate. See **INSTALLATION**.

HOOK - FRONT TOW

REMOVAL

HOOK - FRONT TOW

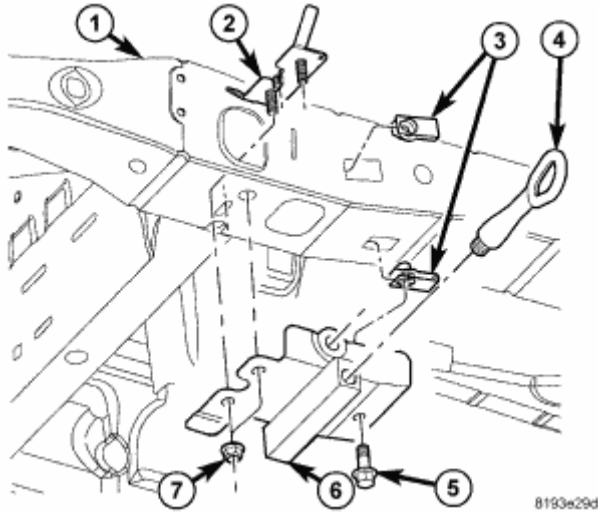


Fig. 37: Front Tow Hook Components
Courtesy of CHRYSLER LLC

- 1 - Front Bumper Crossmember
- 2 - Stud Plate
- 3 - Body Fasteners
- 4 - Tow Hook
- 5 - Bolt
- 6 - Eye Assembly
- 7 - Nuts

1. Remove the jounce bumper spacer. See **REMOVAL**.
2. Remove the tow hook (4) from the eye assembly (6).
3. Remove the bolts (5) from the eye assembly (6).
4. Remove the nuts (7) from the eye assembly (6).
5. Remove the eye assembly (6) from the front bumper crossmember (1).
6. Remove the stud plate (2) and body fasteners (3) from the front bumper crossmember (1).

INSTALLATION

HOOK - FRONT TOW

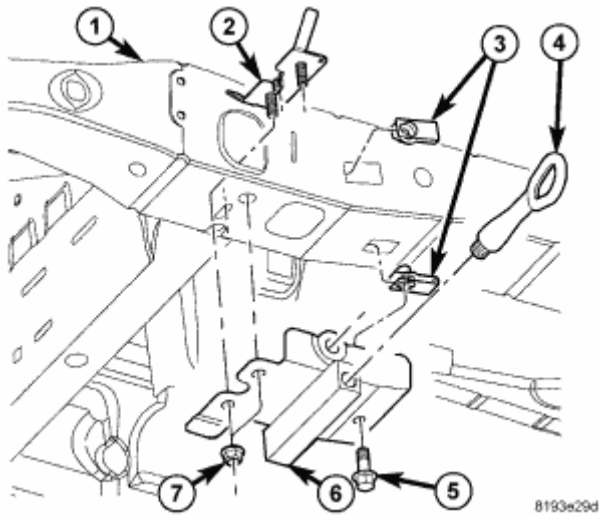


Fig. 38: Front Tow Hook Components
Courtesy of CHRYSLER LLC

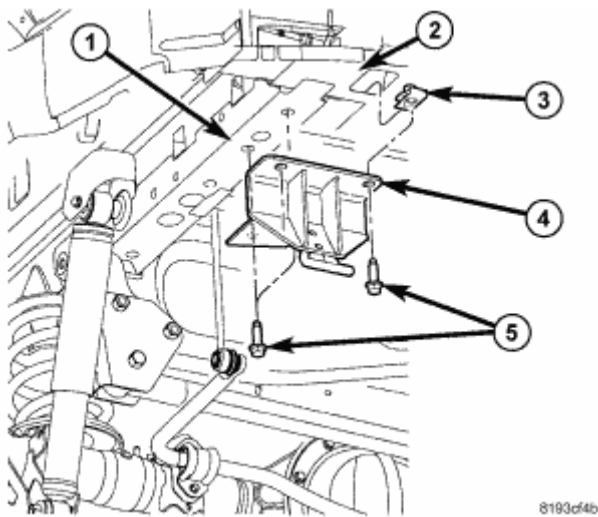
- 1 - Front Bumper Crossmember
- 2 - Stud Plate
- 3 - Body Fasteners
- 4 - Tow Hook
- 5 - Bolt
- 6 - Eye Assembly
- 7 - Nuts

1. Install the stud plate (2) and body fasteners (3) to the front bumper crossmember (1).
2. Install the eye assembly (6) to the front bumper crossmember (1).
3. Install the nuts (7) and bolts (5) to the eye assembly (6) and tighten to 61 N.m (45 ft. lbs.).
4. Install the tow hook (4) to the eye assembly (6).
5. Install the jounce bumper spacer. See **INSTALLATION**.

HOOK - REAR TOW

REMOVAL

HOOK - REAR TOW



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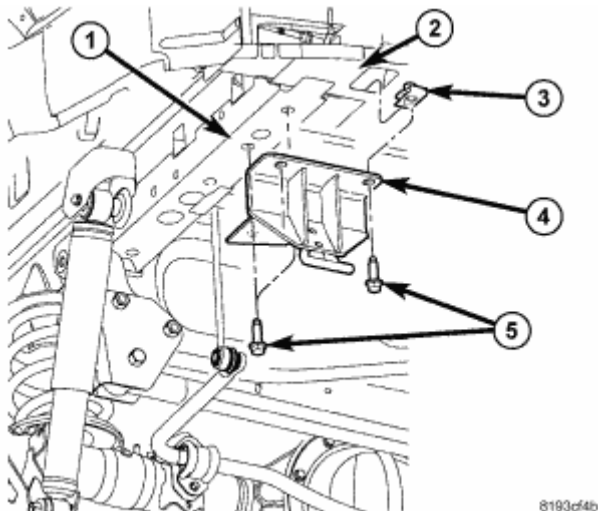
Fig. 39: Rear Tow Hook Components
Courtesy of CHRYSLER LLC

- | |
|-------------------|
| 1 - Body |
| 2 - Crossmember |
| 3 - Body Fastener |
| 4 - Tow Hook/Eye |
| 5 - Bolts |

1. Remove four bolts (5) from the tow hook/eye (4).
2. Remove the tow hook/eye (4) from the body (1).
3. Remove the body fastener (3) from the rear crossmember (2).

INSTALLATION

HOOK - REAR TOW



8193cf4b

Fig. 40: Rear Tow Hook Components
Courtesy of CHRYSLER LLC

1 - Body
2 - Crossmember
3 - Body Fastener
4 - Tow Hook/Eye
5 - Bolts

1. Install the body fastener (3) to the rear crossmember (2).
2. Install the tow hook/eye (4) to the body (1).
3. Install four bolts (5) to the tow hook/eye (4) and tighten to 88 N.m (65 ft. lbs.).

RECEIVER - TRAILER TOW

REMOVAL

RECEIVER - TRAILER TOW

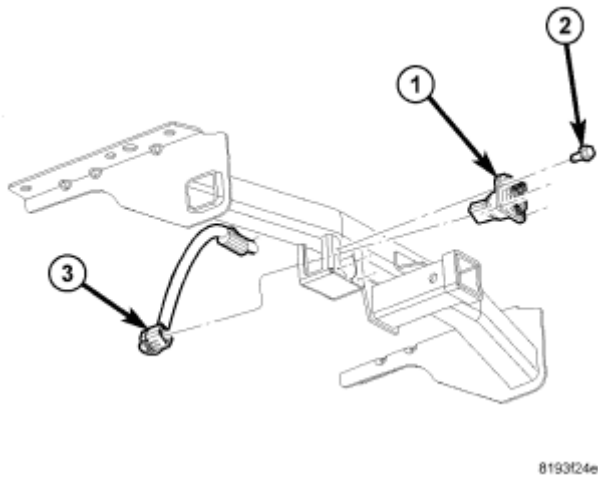


Fig. 41: Identifying Trailer Tow Connector, Bolts & Trailer Tow Harness Connector
Courtesy of CHRYSLER LLC

1 - Trailer Tow Connector
2 - Bolts
3 - Trailer Tow Harness Connector

1. Disconnect the trailer tow harness connector (3) from the trailer tow connector (1).
2. Remove four bolts (2) from the trailer tow connector (1).

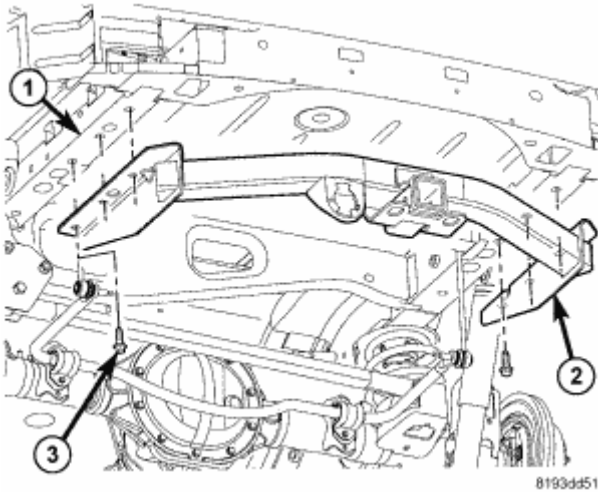


Fig. 42: Identifying Rear Rail Assembly, Trailer Hitch & Bolts
 Courtesy of CHRYSLER LLC

3. If equipped, remove the tow hooks. See **REMOVAL**.
4. Support the trailer hitch (2) with a suitable lifting device.
5. Remove the bolts (3) from the trailer hitch (2).
6. Remove the trailer hitch (2) from the rear rail assembly (1).

INSTALLATION

RECEIVER - TRAILER TOW

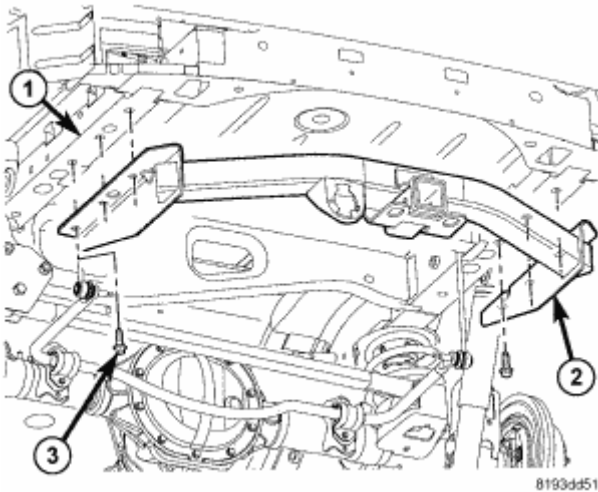


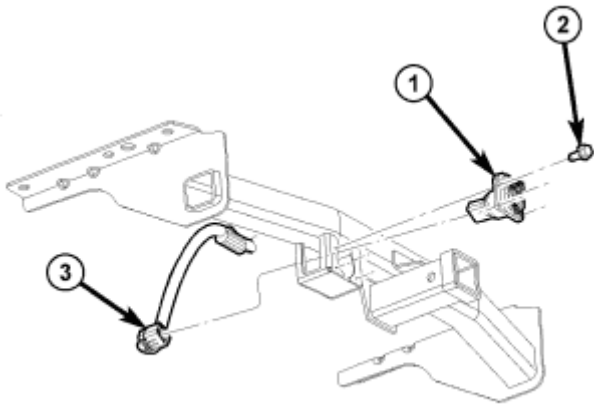
Fig. 43: Identifying Rear Rail Assembly, Trailer Hitch & Bolts
 Courtesy of CHRYSLER LLC

1. Support the trailer hitch (2) with a suitable lifting device and install to the rear rail assembly (1).

NOTE: If equipped with rear tow hooks, support the trailer hitch assembly and

install two front bolts to the trailer hitch, then install the rear tow hooks and remaining bolts.

2. Install the bolts (3) and tighten to 95 N.m (70 ft. lbs.).
3. If equipped, install the tow hooks. See **INSTALLATION**.



8193124e

Fig. 44: Identifying Trailer Tow Connector, Bolts & Trailer Tow Harness Connector
Courtesy of CHRYSLER LLC

- | |
|-----------------------------------|
| 1 - Trailer Tow Connector |
| 2 - Bolts |
| 3 - Trailer Tow Harness Connector |

4. Install the trailer tow connector (1) and the bolts (2) to the trailer hitch. Tighten the bolts to 4 N.m (35 in. lbs.).
5. Connect trailer tow harness connector (3) to the trailer tow connector (1).

SHIELD - FUEL TANK

REMOVAL

SHIELD - FUEL TANK

WARNING: The fuel tank skid plate must be removed as an assembly with the fuel tank. Do not attempt to remove the fuel tank skid plate without removing the fuel tank.

1. Remove the fuel tank. Refer to **REMOVAL** .
2. Remove the fuel tank skid plate from the fuel tank.

INSTALLATION

SHIELD - FUEL TANK

1. Install the fuel tank skid plate to the fuel tank.
2. Install the fuel tank. Refer to **INSTALLATION** .

SKID PLATE - FRONT ENGINE

REMOVAL

SKID PLATE - FRONT ENGINE

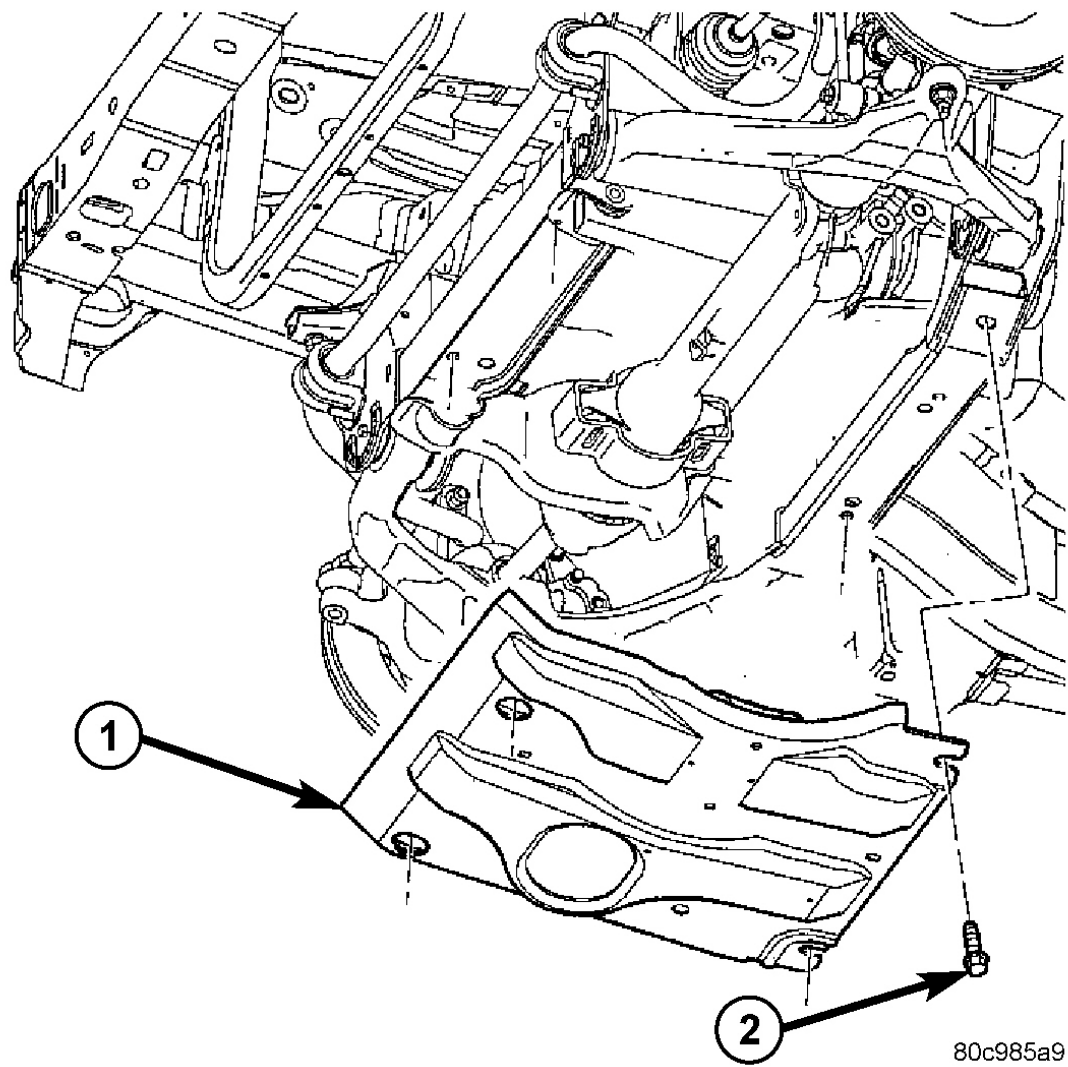


Fig. 45: Skid Plate & Bolts
Courtesy of CHRYSLER LLC

1 - SKID PLATE

2 - BOLTS (4)

1. Remove the skid plate bolts (2) and remove the skid plate (1).

INSTALLATION

SKID PLATE - FRONT ENGINE

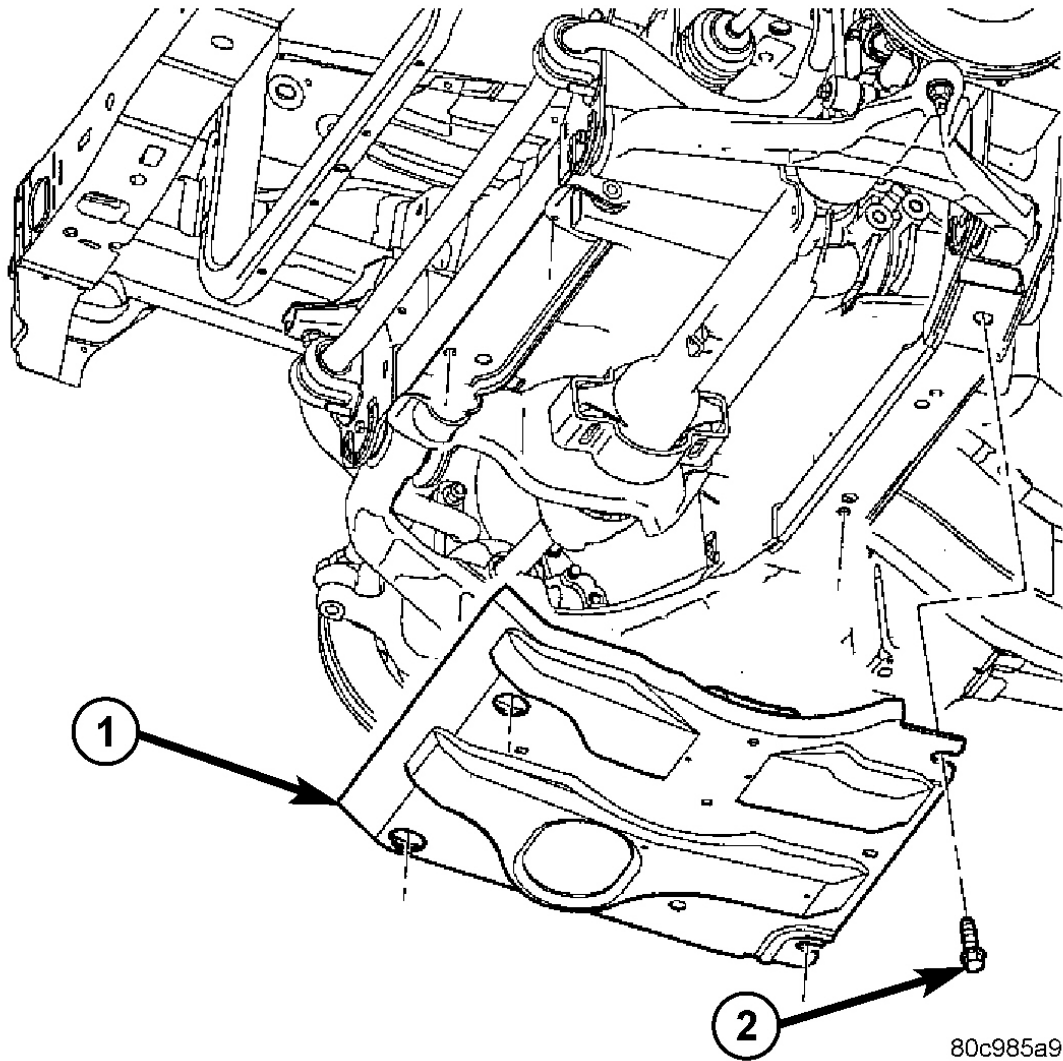


Fig. 46: Skid Plate & Bolts
Courtesy of CHRYSLER LLC

1 - SKID PLATE

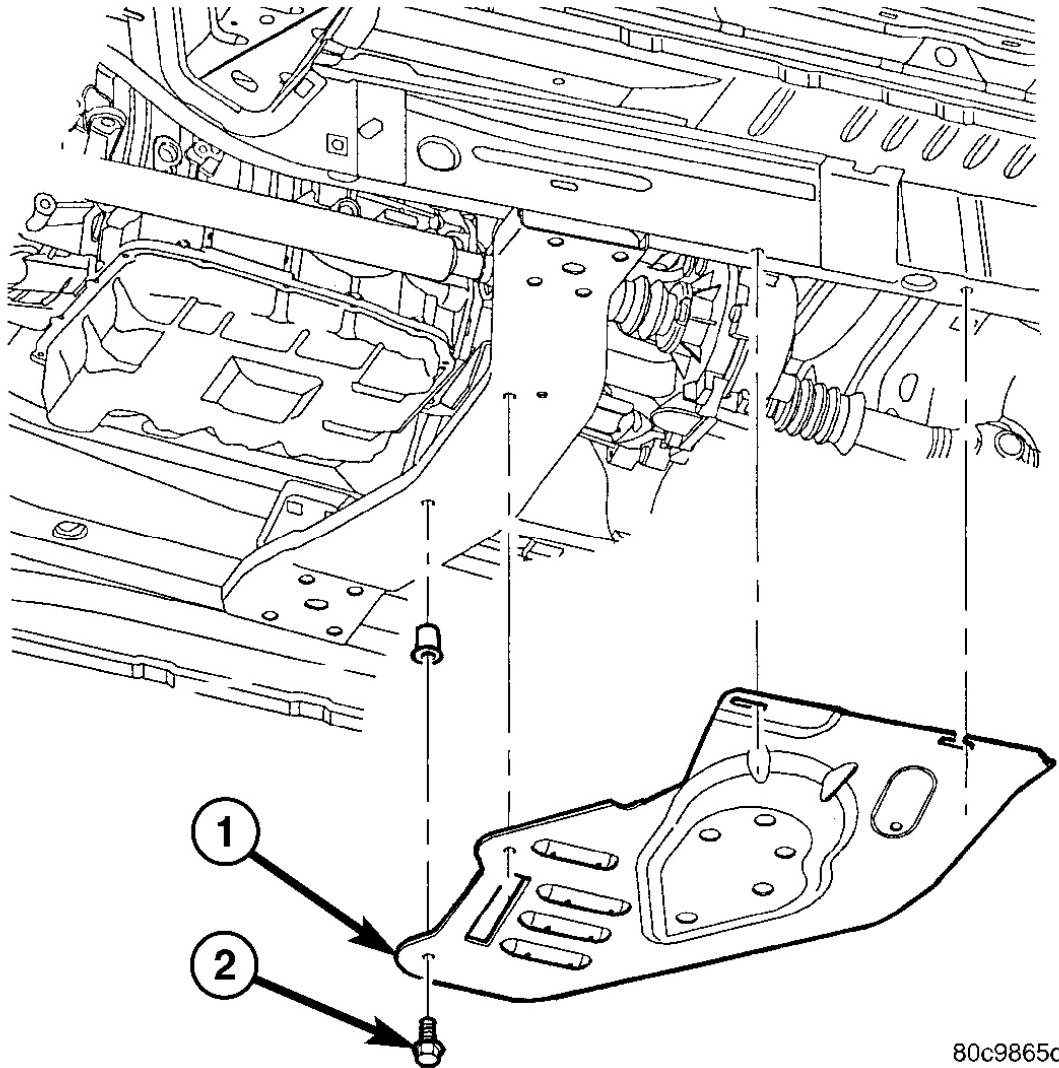
2 - BOLTS (4)

1. Install the skid plate (1).
2. Install the bolts (2) and tighten to 61 N.m (45 ft. lbs.).

SKID PLATE - TRANSFER CASE

REMOVAL

SKID PLATE - TRANSFER CASE



80c9865d

Fig. 47: Skid Plate & Bolts
Courtesy of CHRYSLER LLC

1 - SKID PLATE

2 - BOLTS

1. Remove the bolts (2) and remove the skid plate (1).

INSTALLATION

SKID PLATE - TRANSFER CASE

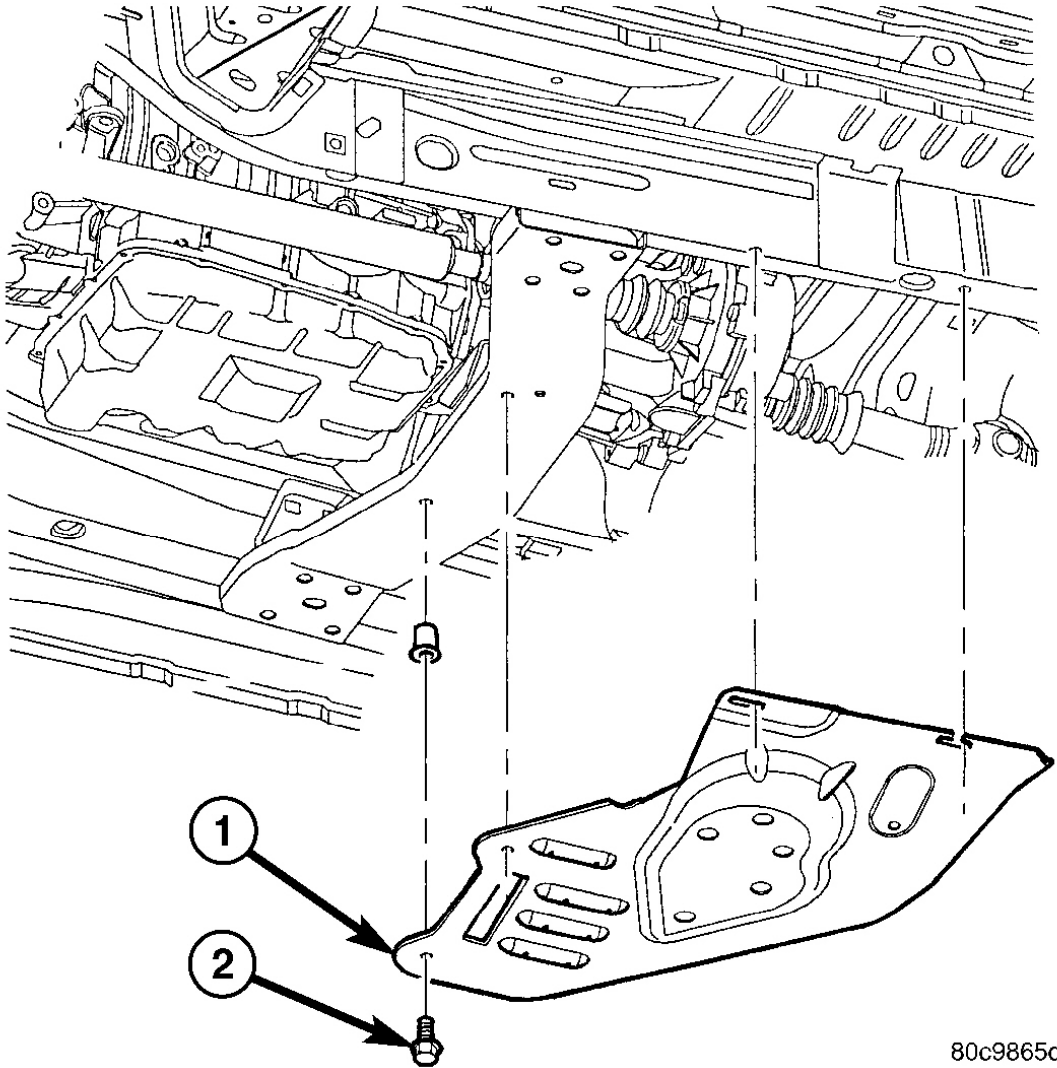


Fig. 48: Skid Plate & Bolts
Courtesy of CHRYSLER LLC

1 - SKID PLATE

2 - BOLTS

1. Install the skid plate (1) and bolts (2) and tighten to 34 N.m (25 ft. lbs.).

SKID PLATE - TRANSMISSION

REMOVAL

SKID PLATE - TRANSMISSION

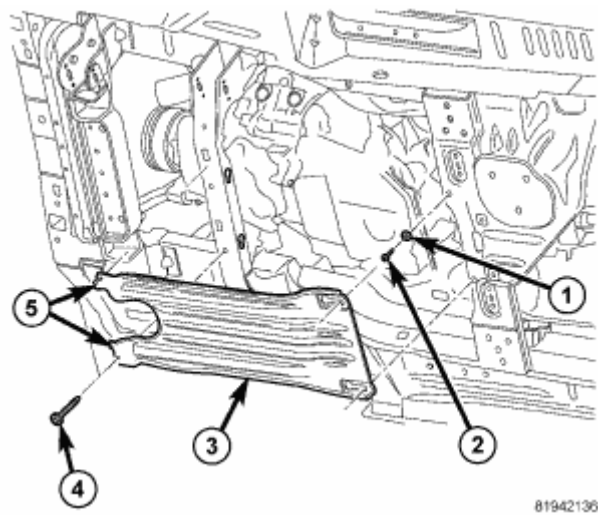


Fig. 49: Identifying Nut/Rivet, Bolt, Skid Plate, Bolt & Tabs
Courtesy of CHRYSLER LLC

1 - Nut/Rivet
2 - Bolt
3 - Skid Plate
4 - Bolt
5 - Location Tabs

1. Loosen bolts (2) but do not remove.
2. Remove the two front bolts (4) and slide the skid plate (3) towards the rear of the vehicle to remove.

NOTE: **Inspect the Nut/Rivets (1) for signs of damage or wear and replace as necessary.**

3. If necessary, remove the nut/rivets.

INSTALLATION

SKID PLATE - TRANSMISSION

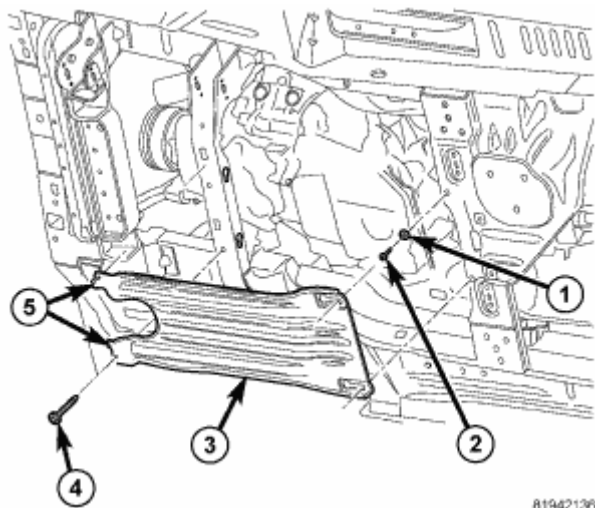


Fig. 50: Identifying Nut/Rivet, Bolt, Skid Plate, Bolt & Tabs
Courtesy of CHRYSLER LLC

1 - Nut/Rivet
2 - Bolt
3 - Skid Plate
4 - Bolt
5 - Location Tabs

NOTE: **Inspect the Nut/Rivets (1) for signs of damage or wear and replace as necessary.**

1. If necessary replace the nut/rivets (1).
2. Position the skid plate (3) onto the bolts (2) on the crossmember.
3. Slide the skid plate forward so that the location tabs on the front of the skid plate (5) engage the slots on the engine cradle.
4. Install the two bolts (4) to the front of the skid plate.
5. Tighten all bolts to 27 N.m (20 ft. lbs.).

2008 ENGINE

Fuel System - Liberty

SPECIFICATIONS

TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Accelerator Pedal Bracket Mounting Nuts	12	-	105
Crankshaft Position Sensor - 3.7L	28	21	-
Fuel Filler Hose Clamp at Tank	3	-	30
Fuel Filler Housing-to- Body Screws	2	-	17
Fuel Filler Tube Clamp	3.5	-	30
Fuel Rail Mounting Bolts - 3.7L	11	-	100
Fuel Tank Mounting Strap Bolts	61	45	-
Map Sensor Mounting Screws	3	-	25
Throttle Body Mounting Bolts - 3.7L	7.5	-	65
Oxygen Sensors	41	30	-

FUEL DELIVERY - GAS

OPERATION

FUEL DELIVERY SYSTEM

Fuel is picked up in the fuel tank by the fuel pump module. This module is located on the bottom of the fuel tank.

A fuel return system is provided within the fuel pump module using check valves. A separate fuel return line from the engine to the tank is not used.

The fuel pressure regulator and the main fuel filter are combined within the fuel pump module.

The fuel tank assembly consists of: the fuel tank, fuel pump module assembly, fuel pump module lock ring/gasket, ORVR components. Refer to **DESCRIPTION** .

A fuel filler/vent tube assembly using a pressure/vacuum, 1/4 turn fuel filler cap is used. A one-way check valve is installed into the tanks fuel fill fitting.

Also to be considered part of the fuel system is the evaporation control system and ORVR system. This is designed to reduce the emission of fuel vapors into the atmosphere.

Both fuel filters are designed for extended service. They do not require normal scheduled maintenance.

STANDARD PROCEDURE

DRAINING FUEL TANK - GAS

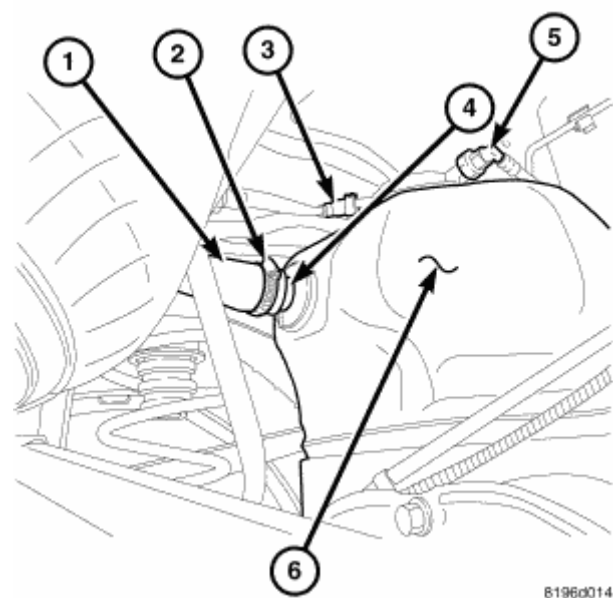


Fig. 1: FUEL TANK REAR
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove fuel fill cap.
3. Raise and support vehicle.
4. Remove fuel fill hose clamp (2) at rear of tank (6).
5. Remove fuel fill hose (1) from fuel tank fitting (4).
6. Position a drain hose into the fuel fill hose opening. Note that a small flapper valve is installed into the opening.
7. Drain fuel tank using an approved gasoline, or diesel fuel draining station.

FUEL SYSTEM PRESSURE RELEASE

1. Remove fuel fill cap.
2. Remove fuel pump fuse from Totally Integrated Power Module (TIPM). For location of fuse, refer to label on underside of TIPM cover.

3. Start and run engine until it stalls.
4. Attempt restarting engine until it will no longer run.
5. Turn ignition key to OFF position.
6. Place a rag or towel below fuel line quick-connect fitting at fuel rail.
7. Disconnect quick-connect fitting at fuel rail. See **STANDARD PROCEDURE**.
8. When the repair is complete, return fuel pump fuse to TIPM.
9. One or more Diagnostic Trouble Codes (DTC's) may have been stored in PCM memory due to fuel pump fuse removal. A diagnostic scan tool must be used to erase a DTC.

SPECIFICATIONS

FUEL SYSTEM PRESSURE

400 kPa +/- 34 kPa (58 psi +/- 5 psi).

SPECIAL TOOLS

FUEL SYSTEM

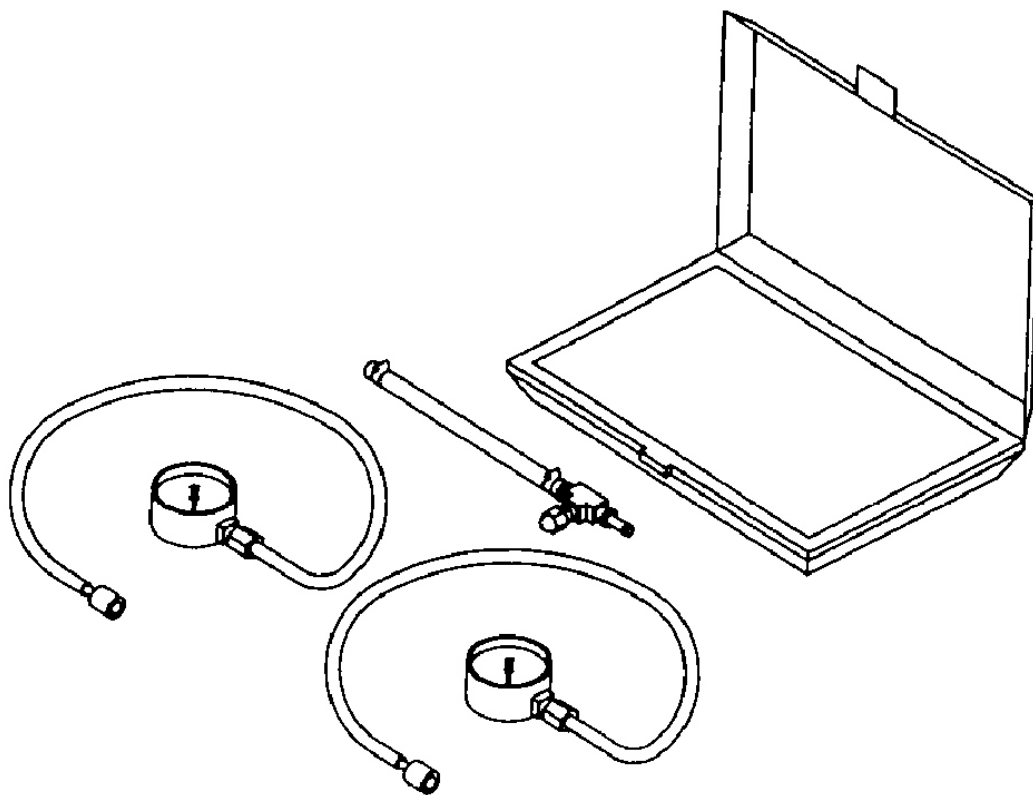


Fig. 2: Test Kit, Fuel Pressure - 5069
Courtesy of CHRYSLER LLC

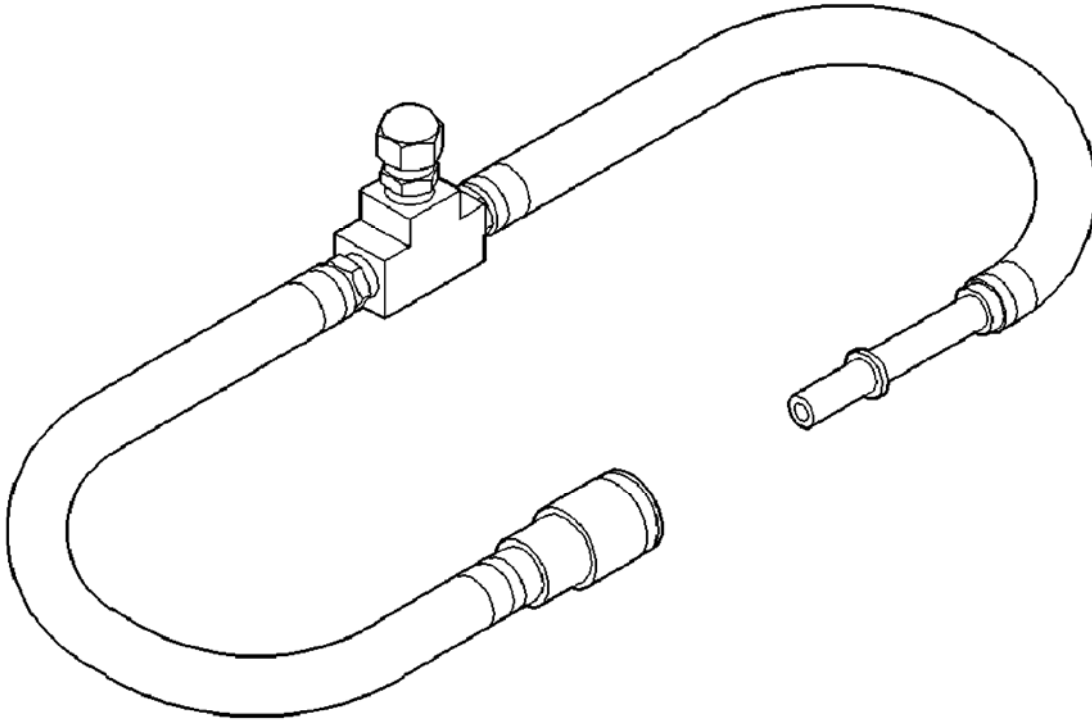


Fig. 3: Adapters, Fuel Pressure Test
Courtesy of CHRYSLER LLC

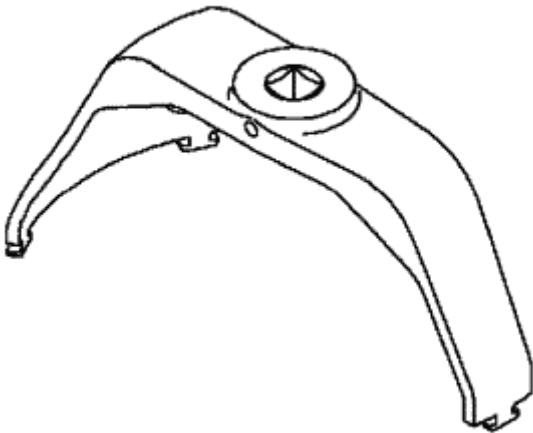


Fig. 4: Lockring Remover/Installer - 9340
Courtesy of CHRYSLER LLC

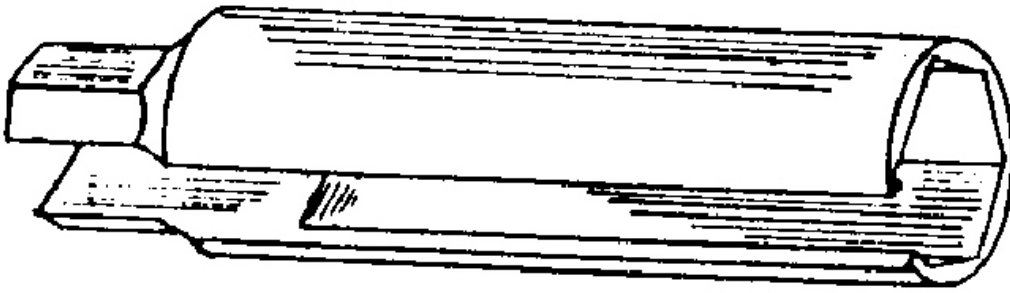


Fig. 5: O2S (Oxygen Sensor) Remover/Installer
Courtesy of CHRYSLER LLC

FILTER-FUEL

DESCRIPTION

DESCRIPTION

The fuel filter and fuel pressure regulator are combined within the fuel pump module assembly. They are not serviceable.

SENSOR-FUEL LEVEL SENDING UNIT

DESCRIPTION

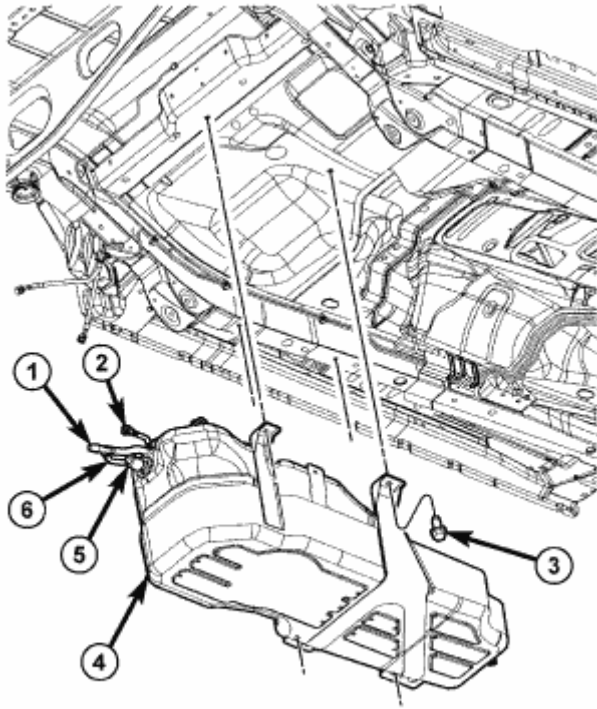
FUEL LEVEL SENDING UNIT SENSOR

The fuel gauge sending unit (fuel level sensor) is attached to the fuel pump module. The sending unit consists of a float, an arm, and a variable resistor track (card).

The sensor is serviceable.

REMOVAL

SENSOR-FUEL LEVEL SENDING UNIT



81971740

Fig. 6: FUEL TANK MOUNTING

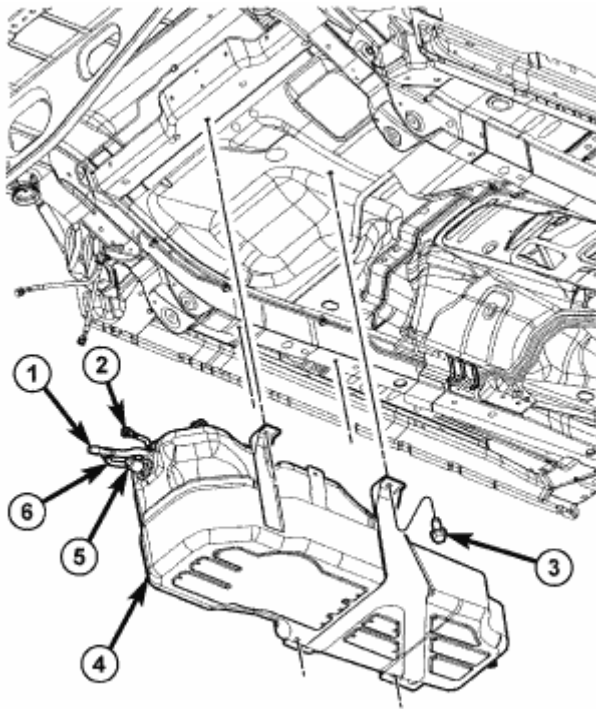
Courtesy of CHRYSLER LLC

1. Drain and remove fuel tank (4). (Refer to **REMOVAL**).
2. Remove the fuel pump module. See **REMOVAL**.
3. Remove the fuel level sending unit.

INSTALLATION

SENSOR-FUEL LEVEL SENDING UNIT

1. Install the fuel level sending unit to the module.
2. Install the fuel pump module in the tank. See **INSTALLATION**.



81971740

Fig. 7: FUEL TANK MOUNTING
Courtesy of CHRYSLER LLC

3. Install fuel tank (4). See **INSTALLATION**.

LINES-FUEL

DESCRIPTION

FUEL LINES

See **STANDARD PROCEDURE**.

WARNING: The fuel system may be under a constant pressure (even with the engine off). Before servicing any fuel system hoses, fittings, lines, or most components, fuel system pressure must be released. Refer to the **FUEL SYSTEM PRESSURE RELEASE** procedure.

The lines/tubes/hoses used on fuel injected vehicles are of a special construction. This is due to the higher fuel pressures and the possibility of contaminated fuel in this system. If it is necessary to replace these lines/tubes/hoses, only those marked EFM/EFI may be used.

If equipped: The hose clamps used to secure rubber hoses on fuel injected vehicles are of a special rolled edge construction. This construction is used to prevent the edge of the clamp from cutting into the hose. Only these rolled edge type clamps may be used in this system. All other types of clamps may cut into the hoses and cause high-pressure fuel leaks.

Use new original equipment type hose clamps.

FITTING-QUICK CONNECT

DESCRIPTION

FITTING-QUICK CONNECT

Different types of quick-connect fittings are used to attach the various fuel system components, lines and tubes. These are: a single-button type, a two-button type, a pinch type, a single-tab type, a two-tab type or a plastic retainer ring type. Some are equipped with safety latch clips. Some may require the use of a special tool for disconnection and removal. See **STANDARD PROCEDURE**.

CAUTION: Before separating a quick-connect fitting, pay attention to what type of fitting is being used by referring to Quick-Connect Fitting Removal. This will prevent unnecessary fitting or fitting latch breakage.

CAUTION: The interior components (O-rings, clips) of quick-connect fittings are not serviced separately, but new plastic spacers and latches are available for some types. If service parts are not available, do not attempt to repair the damaged fitting or fuel line (tube). If repair is necessary, replace the complete fuel line (tube) assembly.

STANDARD PROCEDURE

FITTING-QUICK CONNECT

Different types of quick-connect fittings are used to attach the various fuel system components, lines and tubes. These are: a single-button type, a two-button type, a pinch type, a single-tab type, a two-tab type or a plastic retainer ring type. Some are equipped with safety latch clips. Some may require the use of a special tool for disconnection and removal.

DISCONNECTING

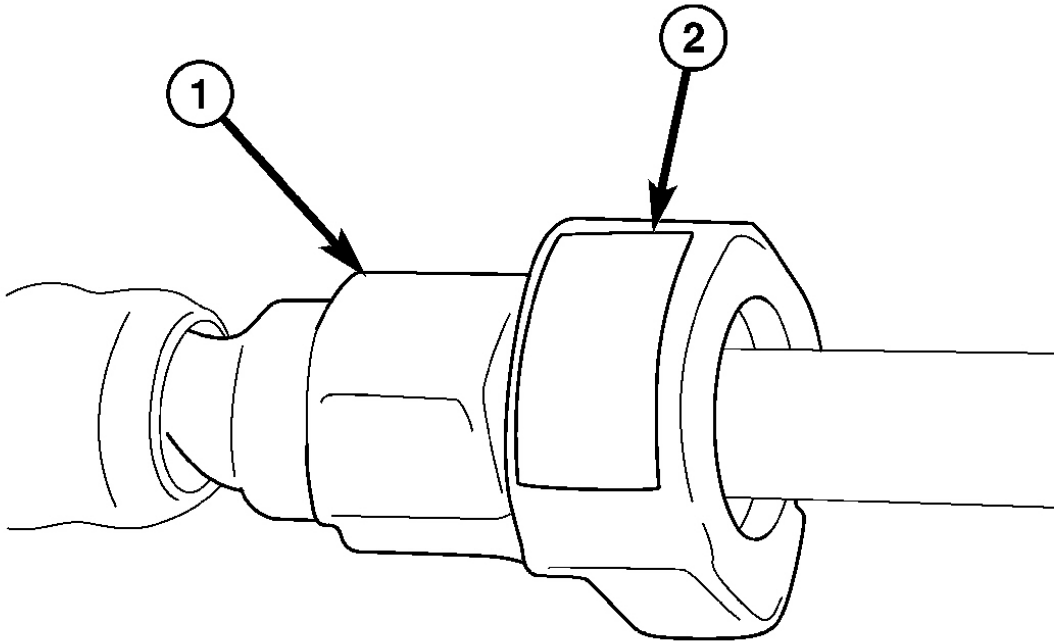
WARNING: The fuel system is under a constant pressure (even with engine off). Before servicing any fuel system hose, fitting or line, fuel system pressure must be released. Refer to **FUEL SYSTEM PRESSURE RELEASE** procedure .

CAUTION: Before separating a quick-connect fitting, pay attention to what type of fitting is being used by referring to Quick-Connect Fitting Removal. This will prevent unnecessary fitting or fitting latch breakage.

CAUTION: The interior components (O-rings, clips) of quick-connect fittings are not serviced separately, but new plastic spacers and latches are available for some types. If service parts are not available, do not attempt to repair the damaged fitting or fuel line (tube). If repair is necessary, replace the

complete fuel line (tube) assembly.

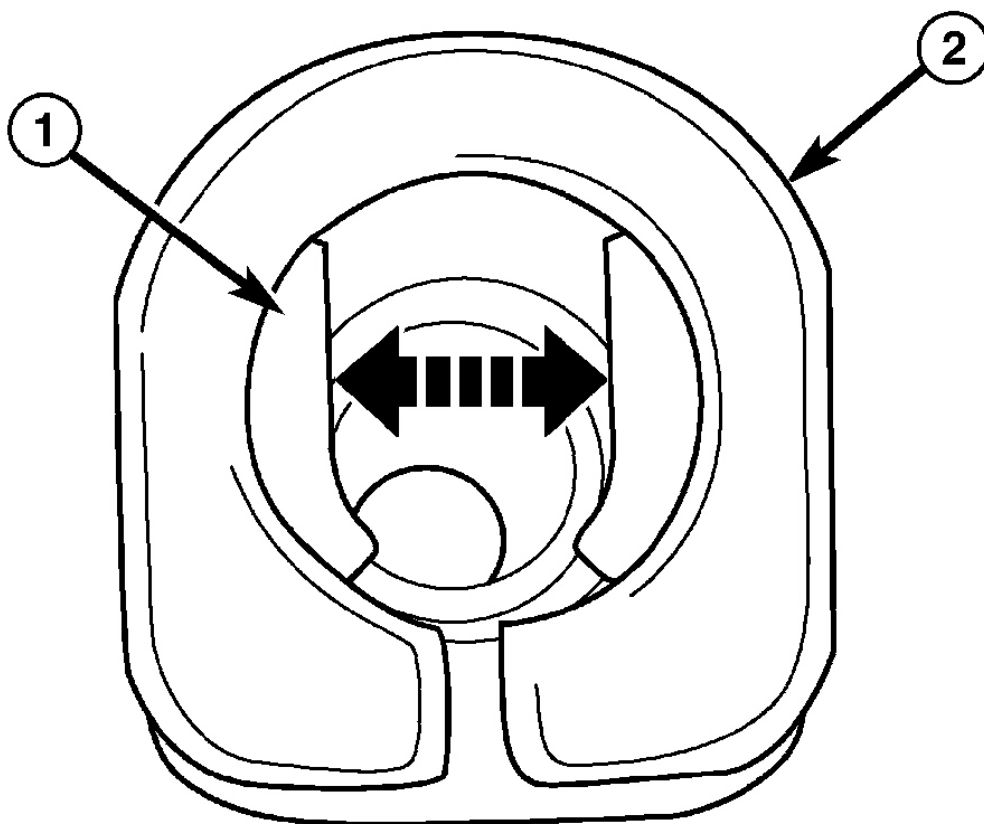
1. Perform fuel pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** Procedure.
2. Disconnect negative battery cable from battery.
3. Clean fitting of any foreign material before disassembly.



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Fig. 8: Single Button Fitting
Courtesy of CHRYSLER LLC

4. **Single-Button Type Fitting:** This type of fitting is equipped with a single push-button (2) located on the quick-connect fitting.

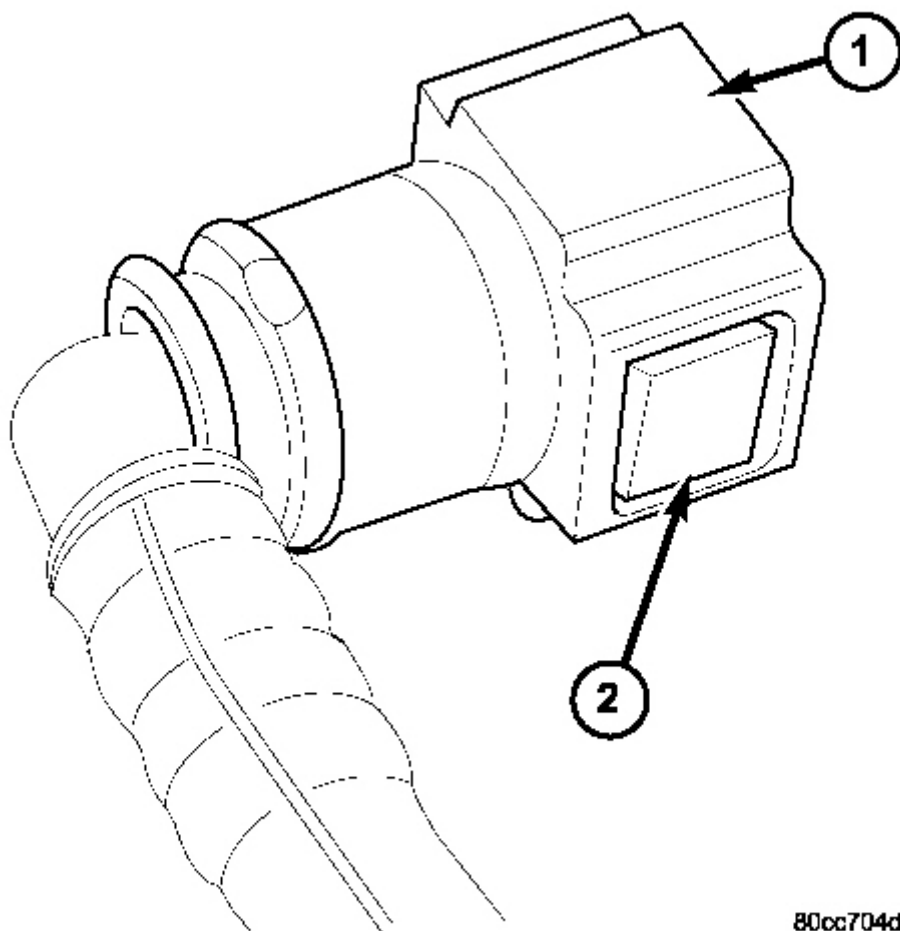


812bc655

Fig. 9: Fitting Latches

Courtesy of CHRYSLER LLC

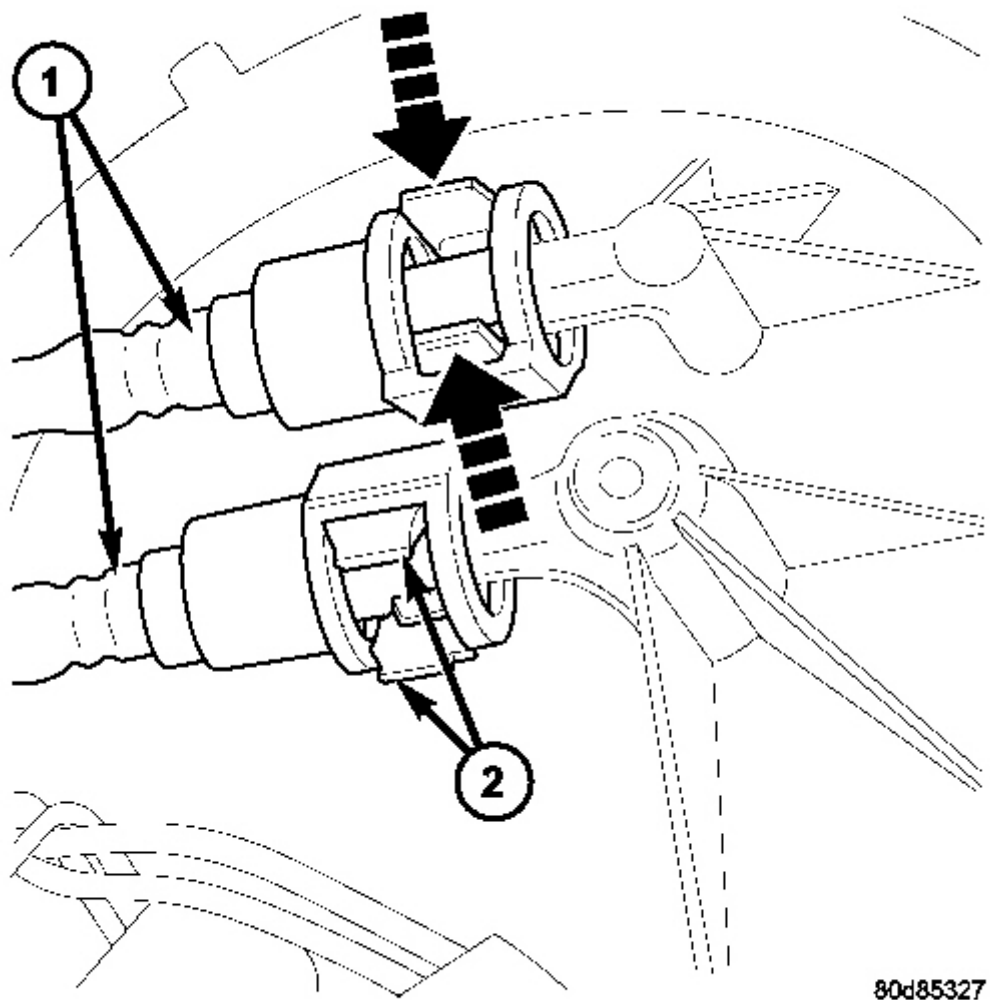
5. The push-button is attached to two internal latches (1). To disconnect, press on push-button with your thumb and unlatch fitting from fuel line. Special tools are not required for disconnection. **DO NOT ATTEMPT TO PRY OR PULL UP ON PUSH-BUTTON. LATCHES WILL BE BROKEN.**



80cc704d

Fig. 10: 2-Button Type Fitting
Courtesy of CHRYSLER LLC

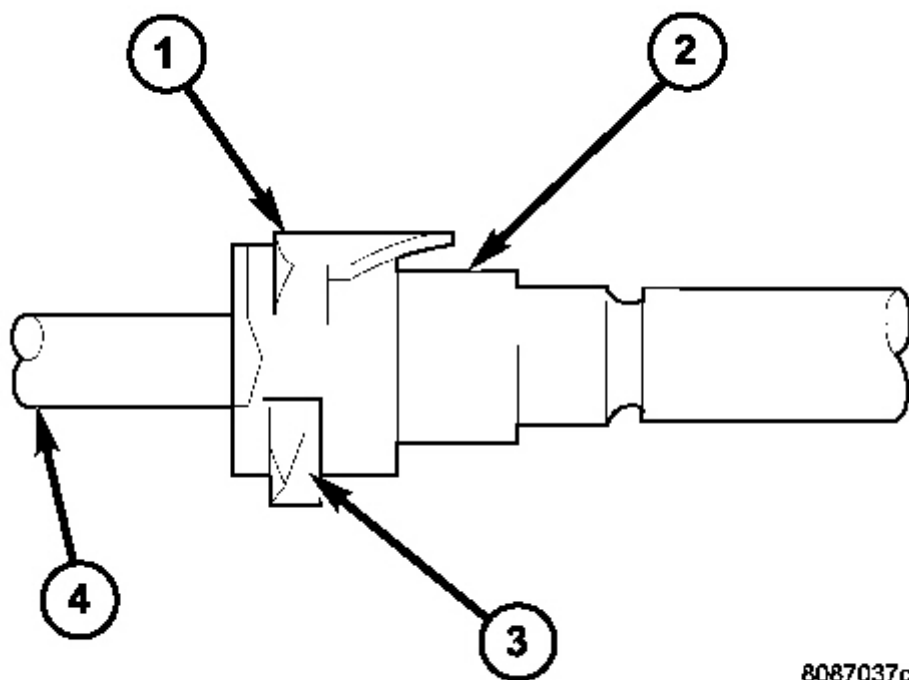
6. Perform fuel pressure release procedure. Refer to **FUEL SYSTEM PRESSURE RELEASE** Procedure.
7. Disconnect negative battery cable from battery.
8. Clean fitting of any foreign material before disassembly.
9. **2-Button Type Fitting:** This type of fitting (1) is equipped with a push-button located on each side of quick-connect fitting (2). Press on both buttons simultaneously for removal. Special tools are not required for disconnection.



80d85327

Fig. 11: Pinch Type Quick-Connect Fitting
Courtesy of CHRYSLER LLC

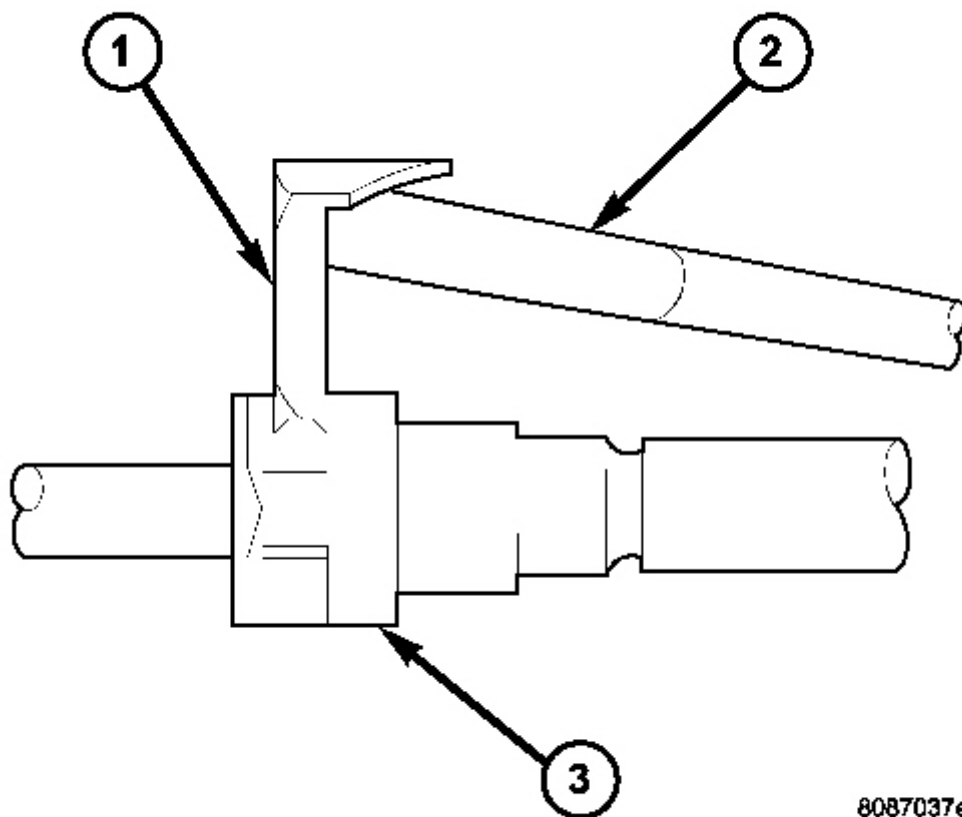
10. **Pinch-Type Fitting:** This fitting (1) is equipped with two finger tabs (2). Pinch both tabs together while removing fitting. Special tools are not required for disconnection.



8087037c

Fig. 12: Single-Tab Type Fitting
Courtesy of CHRYSLER LLC

11. **Single-Tab Type Fitting:** This type of fitting (3) is equipped with a single pull tab (1). The tab is removable. After tab is removed, quick-connect fitting can be separated from fuel system component. Special tools are not required for disconnection.



8087037e

Fig. 13: Disconnecting Single-Tab Type Fitting
Courtesy of CHRYSLER LLC

12. Press release tab on side of fitting to release pull tab (1). **If release tab is not pressed prior to releasing pull tab, pull tab will be damaged.**
13. While pressing release tab on side of fitting, use screwdriver (2) to pry up pull tab.
14. Raise pull tab until it separates from quick-connect fitting.

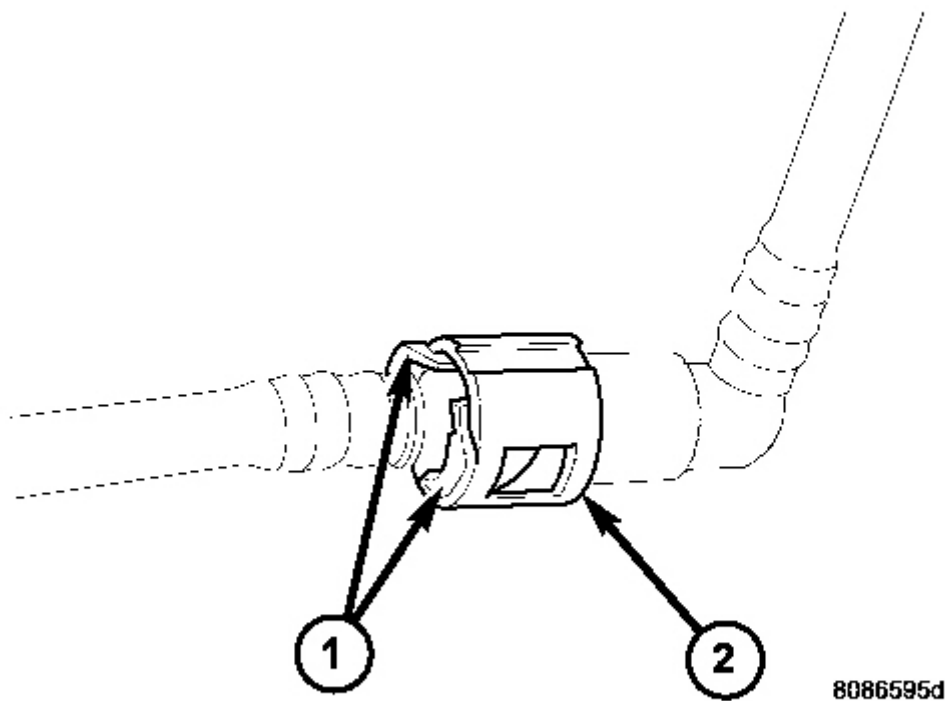
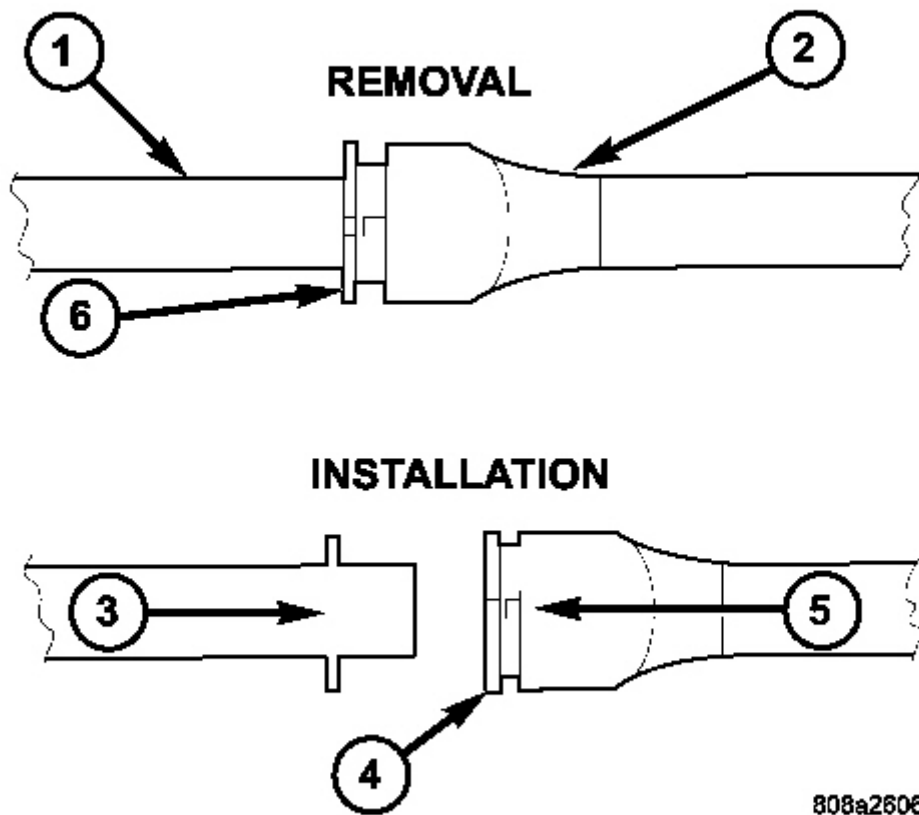


Fig. 14: Typical Two-Tab Type Quick-Connect Fitting
Courtesy of CHRYSLER LLC

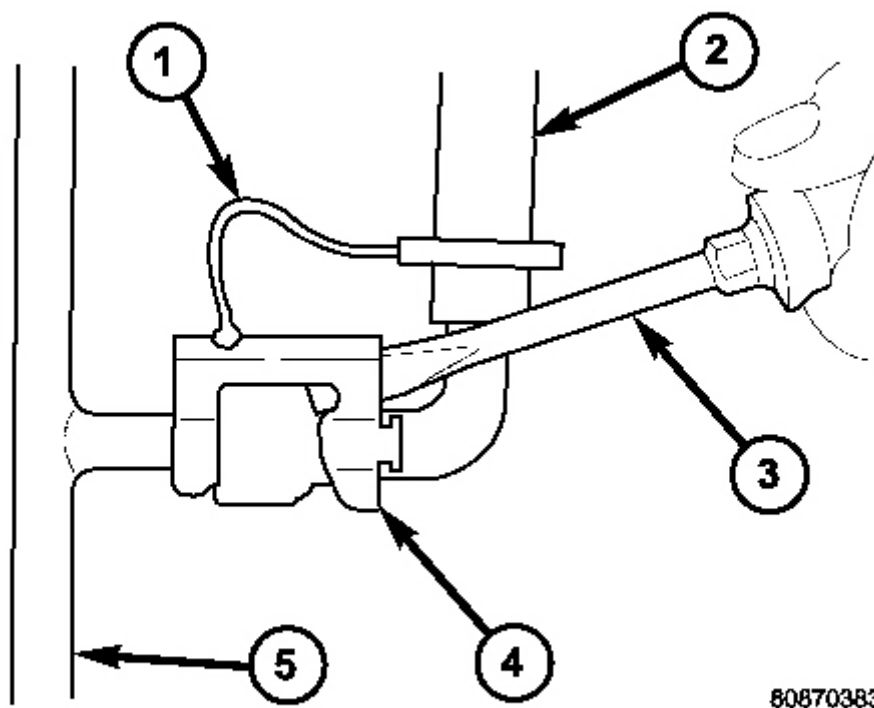
15. **Two-Tab Type Fitting:** This type of fitting (2) is equipped with tabs located on both sides of fitting (1). The tabs are supplied for disconnecting quick-connect fitting from component being serviced.
- To disconnect quick-connect fitting, squeeze plastic retainer tabs (1) against sides of quick-connect fitting with your fingers. Tool use is not required for removal and may damage plastic retainer.
 - Pull fitting from fuel system component being serviced.
 - The plastic retainer will remain on component being serviced after fitting is disconnected. The O-rings and spacer will remain in quick-connect fitting connector body.



808a2606

Fig. 15: Plastic Retainer Ring Type Fitting
 Courtesy of CHRYSLER LLC

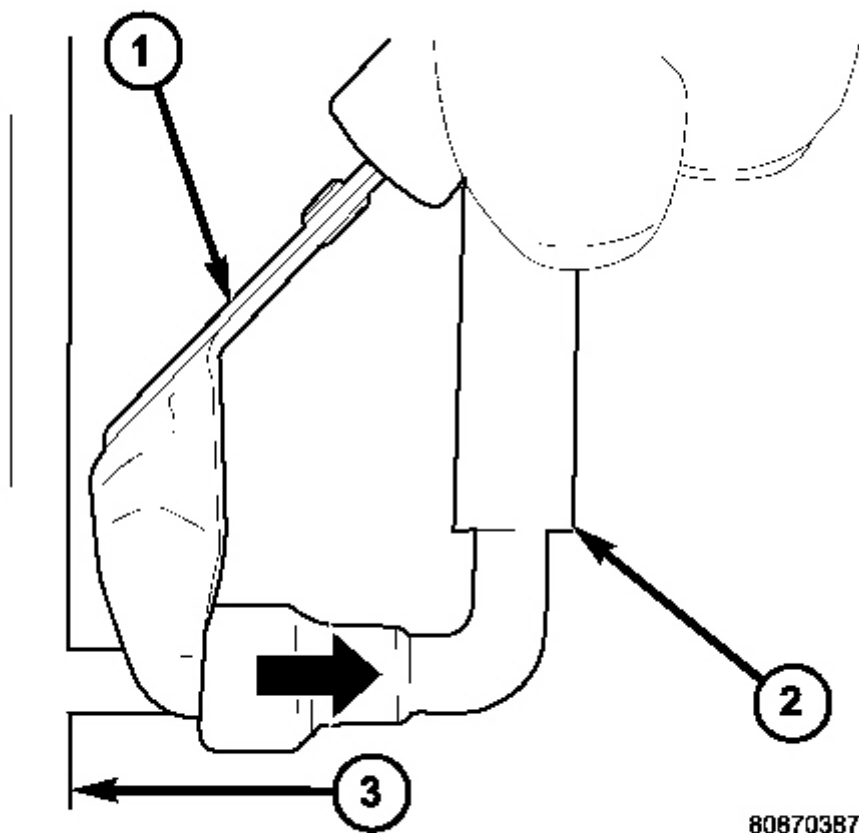
16. **Plastic Retainer Ring Type Fitting:** This type of fitting can be identified by the use of a full-round plastic retainer ring (4) usually black in color.
 - To release fuel system component from quick-connect fitting, firmly push fitting towards component being serviced while firmly pushing plastic retainer ring into fitting (6). With plastic ring depressed, pull fitting from component. **The plastic retainer ring must be pressed squarely into fitting body. If this retainer is cocked during removal, it may be difficult to disconnect fitting. Use an open-end wrench on shoulder of plastic retainer ring to aid in disconnection.**
 - After disconnection, plastic retainer ring will remain with quick-connect fitting connector body.
 - Inspect fitting connector body, plastic retainer ring and fuel system component for damage. Replace as necessary.



80870383

Fig. 16: Latch Clip-Type 1
Courtesy of CHRYSLER LLC

17. **Latch Clips - Type 1:** Depending on vehicle model and engine, 2 different types of safety latch clips are used. Type-1 (4) is tethered to fuel line and type-2 is not. A special tool will be necessary to disconnect fuel line after latch clip is removed. The latch clip may be used on certain fuel line/fuel rail connection, or to join fuel lines together.
18. Pry up on latch clip with a screwdriver (3).
19. Slide latch clip toward fuel rail while lifting with screwdriver.



80870387

Fig. 17: Fuel Line Disconnection Using Special Tool
Courtesy of CHRYSLER LLC

20. Insert special fuel line removal tool (Snap-On number FIH 9055-1 or equivalent) into fuel line (1). Use tool to release locking fingers in end of line.
21. With special tool still inserted, pull fuel line from fuel rail.
22. After disconnection, locking fingers will remain within quick-connect fitting at end of fuel line.
23. Disconnect quick-connect fitting from fuel system component being serviced.

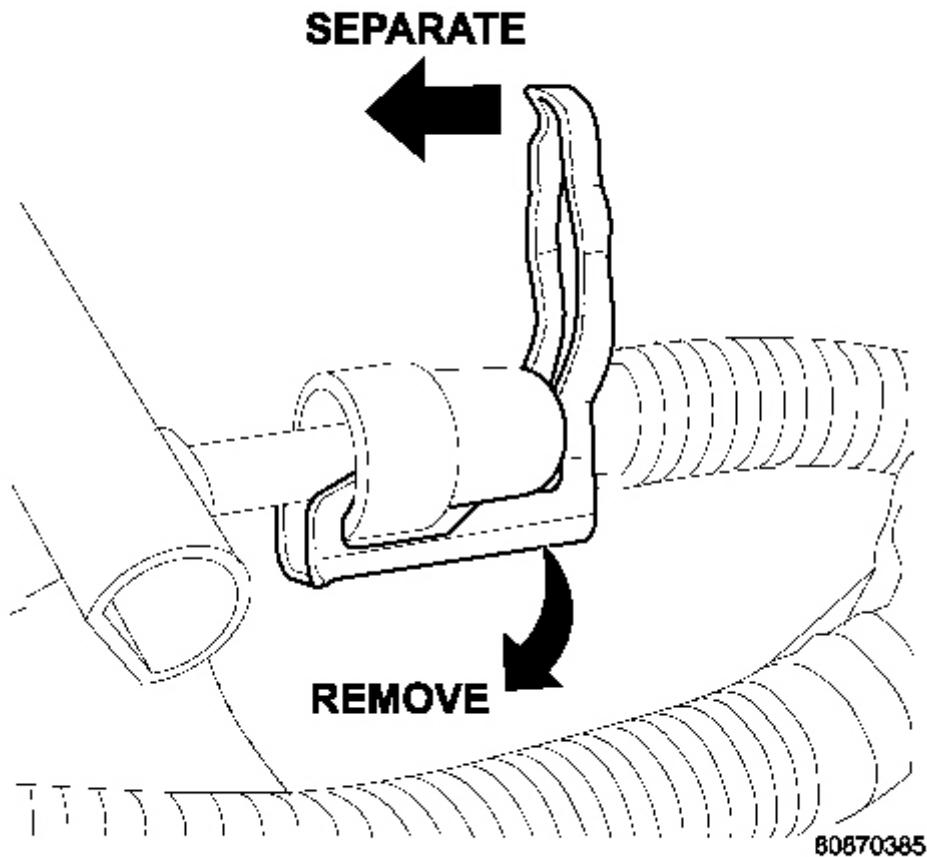
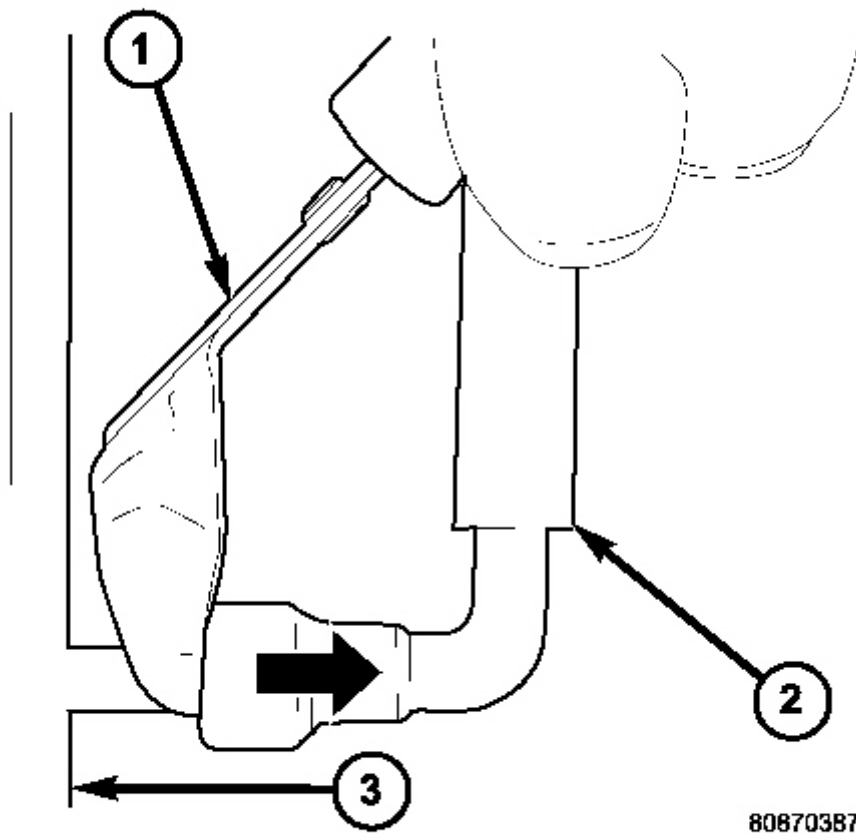


Fig. 18: Latch Clip-Type 2
Courtesy of CHRYSLER LLC

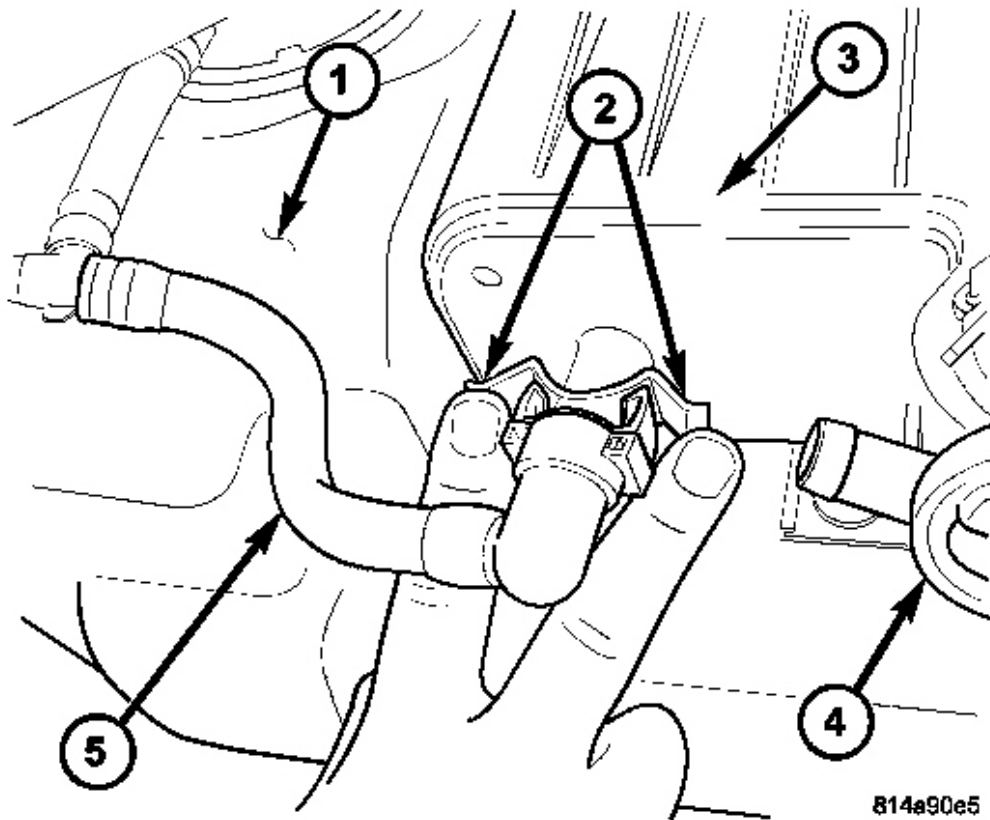
24. **Latch Clips - Type 2:** Depending on vehicle model and engine, 2 different types of safety latch clips are used. Type-1 is tethered to fuel line and type-2 is not. A special tool will be necessary to disconnect fuel line after latch clip is removed. The latch clip may be used on certain fuel line/fuel rail connection, or to join fuel lines together.
25. Type 2: Separate and unlatch small arms on end of clip and swing away from fuel line.
26. Slide latch clip toward fuel rail while lifting with screwdriver.



80870387

Fig. 19: Fuel Line Disconnection Using Special Tool
Courtesy of CHRYSLER LLC

27. Insert special fuel line removal tool (Snap-On number FIH 9055-1 or equivalent) into fuel line (1). Use tool to release locking fingers in end of line.
28. With special tool still inserted, pull fuel line from fuel rail.
29. After disconnection, locking fingers will remain within quick-connect fitting at end of fuel line.
30. Disconnect quick-connect fitting from fuel system component being serviced.



814a90e5

Fig. 20: EVAP Can. Vapor Hose
Courtesy of CHRYSLER LLC

31. **Wing Type:** A special tool will not be necessary to disconnect this type of fitting (2). This line is used on different fuel and emission components. The graphic shows the fitting used on an EVAP canister.
32. Use two fingers to push on fitting wings (2)
33. Pull and disconnect fitting while holding wings.
34. After disconnection, locking fingers will remain within quick-connect fitting.

CONNECTING

1. Inspect quick-connect fitting body and fuel system component for damage. Replace as necessary.
2. Prior to connecting quick-connect fitting to component being serviced, check condition of fitting and component. Clean parts with a lint-free cloth. Lubricate with clean engine oil.
3. Insert quick-connect fitting into fuel tube or fuel system component until built-on stop on fuel tube or component rests against back of fitting.

4. Continue pushing until a click is felt.
5. Single-tab type fitting: Push new tab down until it locks into place in quick-connect fitting.
6. Verify a locked condition by firmly pulling on fuel tube and fitting (15-30 lbs.).
7. Latch Clip Equipped: Install latch clip (snaps into position). **If latch clip will not fit, this indicates fuel line is not properly installed to fuel rail (or other fuel line). Recheck fuel line connection.**
8. Connect negative cable to battery.
9. Start engine and check for leaks.

REGULATOR-FUEL PRESSURE

DESCRIPTION

FUEL PRESSURE REGULATOR

The fuel pressure regulator is located within the fuel pump module. It is serviced by replacing the fuel pump module assembly.

PUMP-FUEL

DESCRIPTION

FUEL PUMP

The electric fuel pump is located inside of the fuel pump module. A 12 volt, permanent magnet, electric motor powers the fuel pump. The electric fuel pump is not a separate, serviceable component.

OPERATION

FUEL PUMP

Voltage to operate the electric pump is supplied through the fuel pump relay.

Fuel is drawn in through a filter at the bottom of the module and pushed through the electric motor gearset to the pump outlet.

Check Valve Operation: The fuel pump module contains a one-way check valve to prevent fuel flow back into the tank and to maintain fuel supply line pressure (engine warm) when pump is not operational. It is also used to keep the fuel supply line full of gasoline when pump is not operational. After the vehicle has cooled down, fuel pressure may drop to 0 psi (cold fluid contracts), but liquid gasoline will remain in fuel supply line between the check valve and fuel injectors. **Fuel pressure that has dropped to 0 psi on a cooled down vehicle (engine off) is a normal condition.**

The electric fuel pump is not a separate, serviceable component.

MODULE-FUEL PUMP

REMOVAL

FUEL PUMP MODULE

WARNING: The fuel system is under a constant pressure (even with the engine off). Before servicing the fuel pump module, the fuel system pressure must be released. (Refer to FUEL SYSTEM PRESSURE RELEASE procedure)

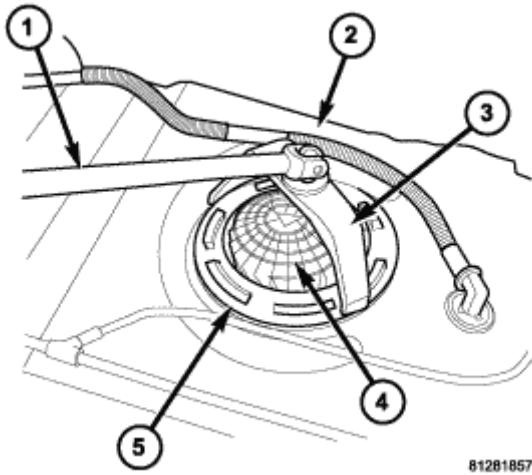


Fig. 21: FUEL PUMP MODULE LOCATION
Courtesy of CHRYSLER LLC

1. Drain and remove fuel tank. (Refer to REMOVAL).
2. Note rotational position of module before attempting removal. An indexing arrow is located on top of module for this purpose.
3. Position special Lockring Remover/Installer tool 9340 (3) into notches on outside edge of lock ring (5).
4. Install 1/2 inch drive breaker bar (1) to special Lockring Remover/Installer tool 9340 (3).
5. Rotate breaker bar counterclockwise to remove lockring.
6. Remove lockring. The module will spring up slightly when lockring is removed.
7. Remove module from fuel tank. Be careful not to bend float arm while removing.

INSTALLATION

FUEL PUMP MODULE

CAUTION: Whenever the fuel pump module is serviced, the rubber seal (gasket) must be replaced.

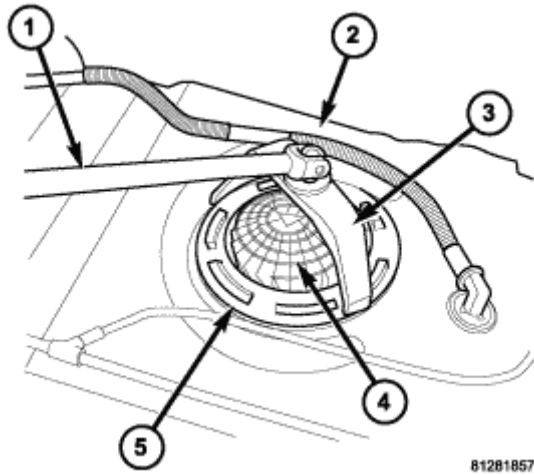


Fig. 22: FUEL PUMP MODULE LOCATION
Courtesy of CHRYSLER LLC

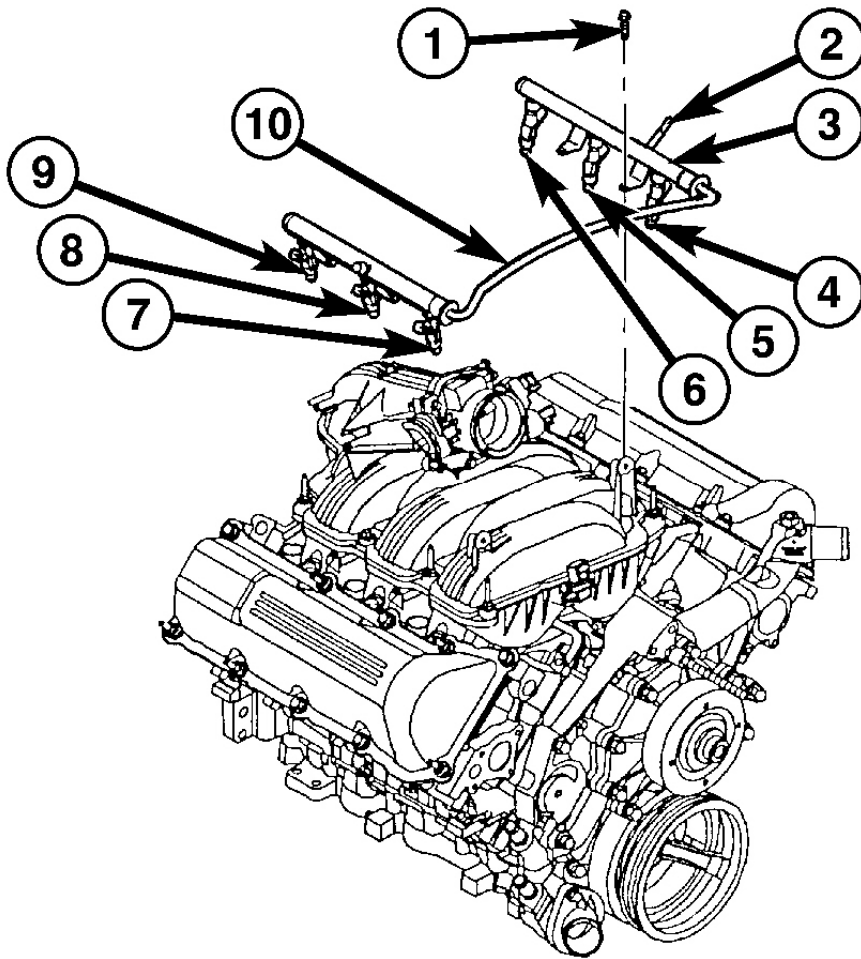
1. Using a new seal (gasket), position fuel pump module into opening in fuel tank.
2. Position lockring (5) over top of fuel pump module.
3. Rotate module until embossed alignment arrow points to center alignment mark. This step must be performed to prevent float from contacting side of fuel tank.
4. Install Lockring Remover/Installer 9340 (3) to lockring.
5. Install 1/2 inch drive breaker (1) into Lockring Remover/Installer 9340 (3).
6. Tighten lockring (clockwise) until all seven notches have engaged.
7. Install fuel tank.

RAIL-FUEL

REMOVAL

REMOVAL - 3.7L

WARNING: The fuel system is under constant pressure even with engine off. Before servicing fuel rail, fuel system pressure must be released.



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Fig. 23: Removing/Installing Fuel Rail - 3.7L
Courtesy of CHRYSLER LLC

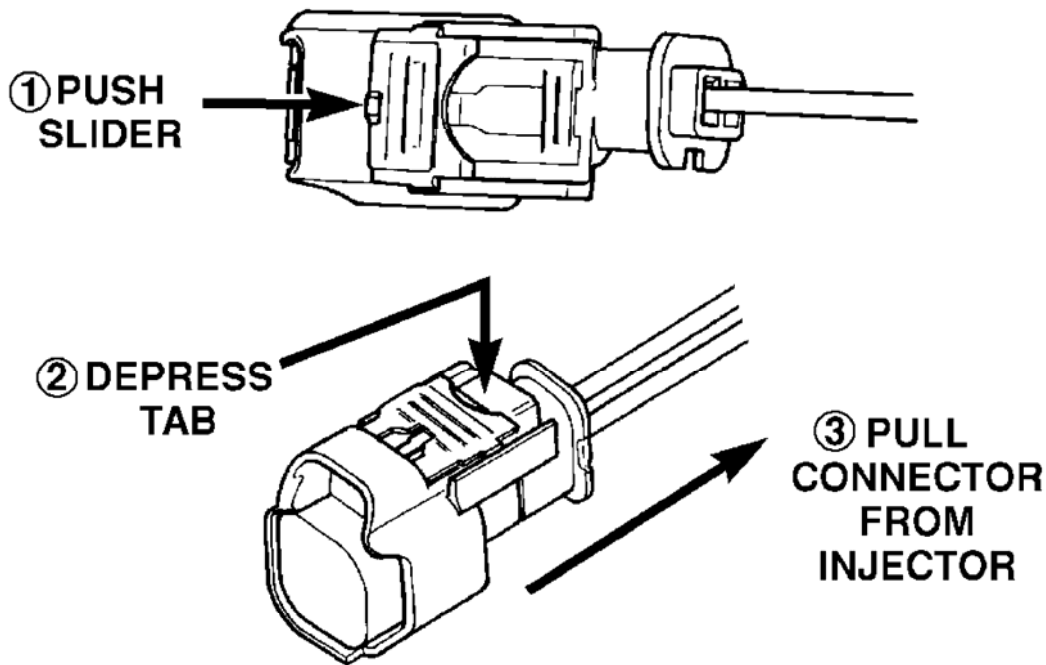
- 1 - MOUNTING BOLTS (4)
- 2 - QUICK-CONNECT FITTING
- 3 - FUEL RAIL
- 4 - INJ. #1
- 5 - INJ. #3
- 6 - INJ. #5
- 7 - INJ. #2
- 8 - INJ. #4
- 9 - INJ. #6
- 10 - CONNECTOR TUBE

CAUTION: The left and right fuel rails are replaced as an assembly. Do not attempt to

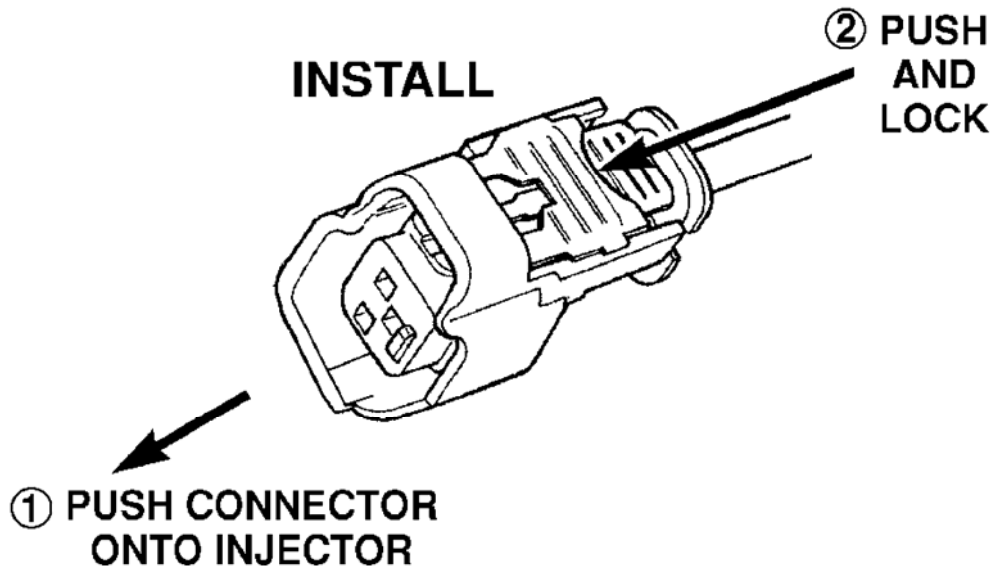
separate rail halves at connector tube (10). Due to design of tube, it does not use any clamps. Never attempt to install a clamping device of any kind to tube. When removing fuel rail assembly for any reason, be careful not to bend or kink tube.

1. Remove fuel tank filler tube cap.
2. Perform Fuel System Pressure Release Procedure. See **FUEL SYSTEM PRESSURE RELEASE**.
3. Remove negative battery cable at battery.
4. Remove air duct at throttle body air box.
5. Remove air box at throttle body.
6. Disconnect fuel line latch clip and fuel line at fuel rail. A special tool will be necessary for fuel line disconnection. See **STANDARD PROCEDURE**.
7. Remove necessary vacuum/vapor lines at throttle body.

REMOVE



INSTALL

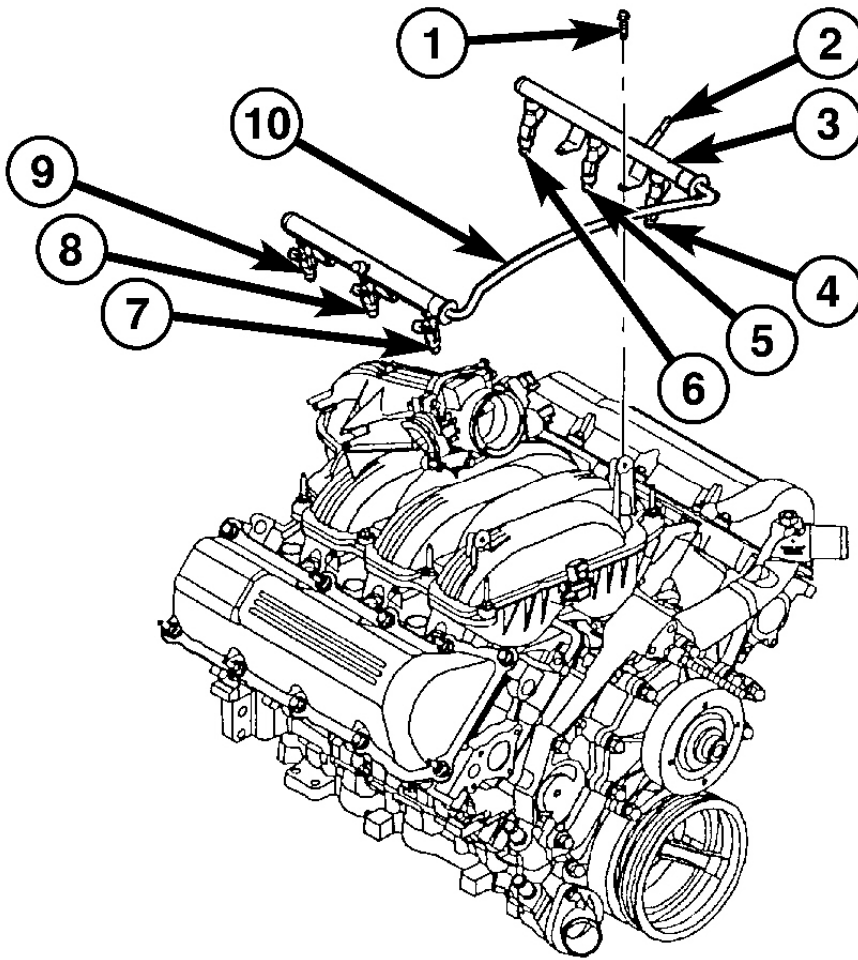


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Fig. 24: Remove/Install Injector Connector
Courtesy of CHRYSLER LLC

8. Disconnect electrical connectors at all 6 fuel injectors. Push red colored slider away from injector (1). While pushing slider, depress tab (2) and remove connector (3) from injector. The factory fuel injection wiring harness is numerically tagged (INJ 1, INJ 2, etc.) for injector position identification. If harness is not tagged, note wiring location before removal.

9. Disconnect electrical connectors at throttle body sensors.
10. Remove 6 ignition coils. Refer to **REMOVAL** .



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Fig. 25: Removing/Installing Fuel Rail - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---------------------------|
| 1 - MOUNTING BOLTS (4) |
| 2 - QUICK-CONNECT FITTING |
| 3 - FUEL RAIL |
| 4 - INJ. #1 |
| 5 - INJ. #3 |
| 6 - INJ. #5 |
| 7 - INJ. #2 |
| 8 - INJ. #4 |
| 9 - INJ. #6 |

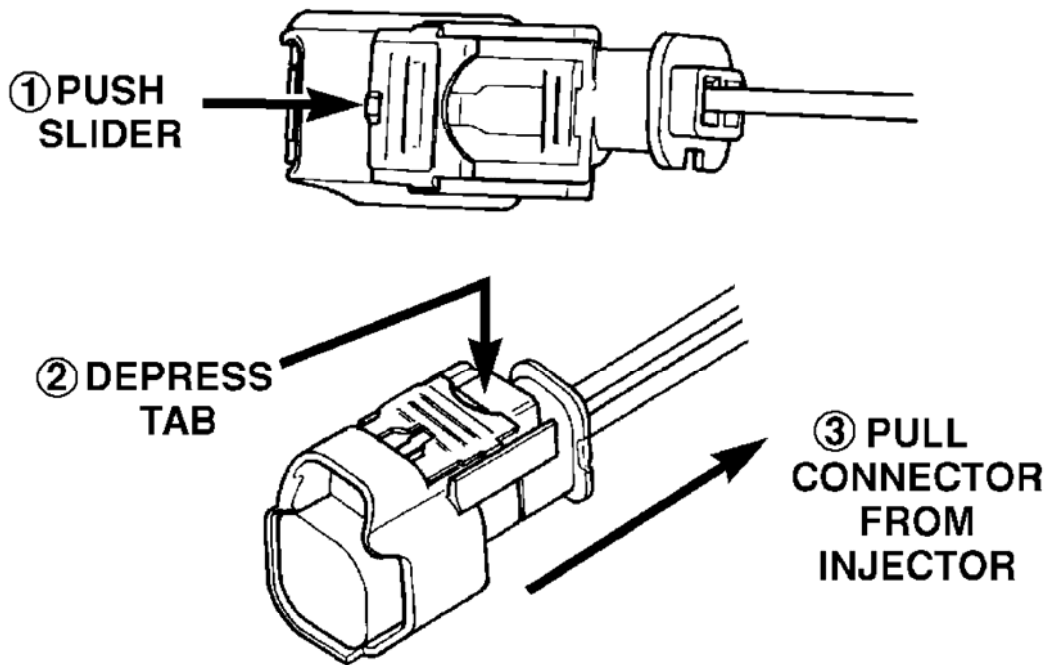
11. Remove four fuel rail mounting bolts (1).
12. Gently rock and pull **left** side of fuel rail until fuel injectors just start to clear machined holes in cylinder head. Gently rock and pull **right** side of rail until injectors just start to clear cylinder head holes. Repeat this procedure (left/right) until all injectors have cleared cylinder head holes.
13. Remove fuel rail (with injectors attached) from engine.
14. If fuel injectors are to be removed, see **REMOVAL**.

INSTALLATION

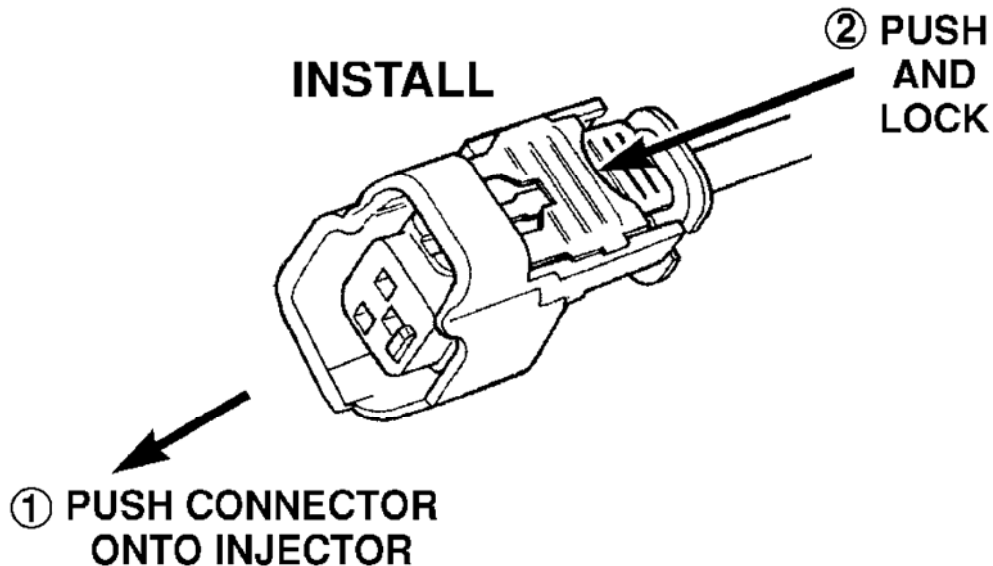
FUEL RAIL

1. If fuel injectors are to be installed, refer to **INSTALLATION** .
2. Clean out fuel injector machined bores in intake manifold.
3. Apply a small amount of engine oil to each fuel injector O-ring. This will help in fuel rail installation.
4. Position fuel rail/fuel injector assembly to machined injector openings in cylinder head.
5. Guide each injector into cylinder head. Be careful not to tear injector O-rings.
6. Push **right** side of fuel rail down until fuel injectors have bottomed on cylinder head shoulder. Push **left** fuel rail down until injectors have bottomed on cylinder head shoulder.
7. Install four fuel rail mounting bolts and tighten to 11 N.m (100 in. lbs.).
8. Install six ignition coils. Refer to **INSTALLATION** .
9. Connect electrical connectors to throttle body.

REMOVE



INSTALL



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Fig. 26: Remove/Install Injector Connector
Courtesy of CHRYSLER LLC

10. Connect electrical connectors at all fuel injectors. Push connector onto injector (1) and then push and lock red colored slider (2). Verify connector is locked to injector by lightly tugging on connector.
11. Connect necessary vacuum/vapor lines to throttle body.

12. Connect fuel line latch clip and fuel line to fuel rail.
13. Install air box to throttle body.
14. Install air duct to air box.
15. Connect battery cable to battery.
16. Start engine and check for leaks.

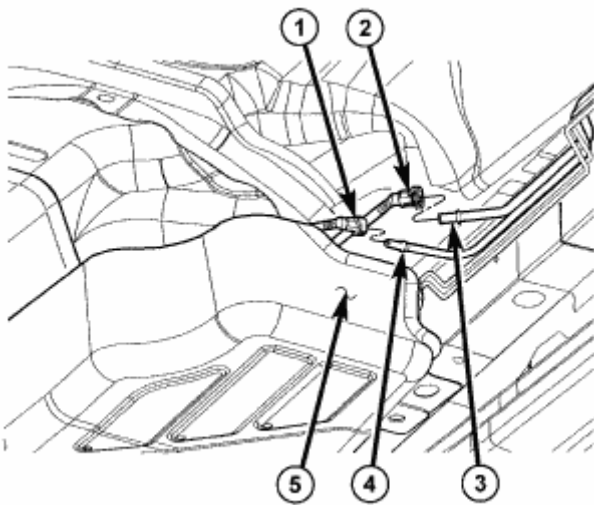
TANK - FUEL

REMOVAL

REMOVAL

WARNING: The fuel system is under constant pressure even with engine off. Before servicing fuel rail, fuel system pressure must be released.

1. Remove fuel tank filler tube cap.
2. Perform **FUEL SYSTEM PRESSURE RELEASE** Procedure.
3. Raise and support vehicle.



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Fig. 27: FUEL LINES FRONT OF TANK
Courtesy of CHRYSLER LLC

4. Disconnect fuel line quick connect fittings (1) and (2) at front of fuel tank (5).

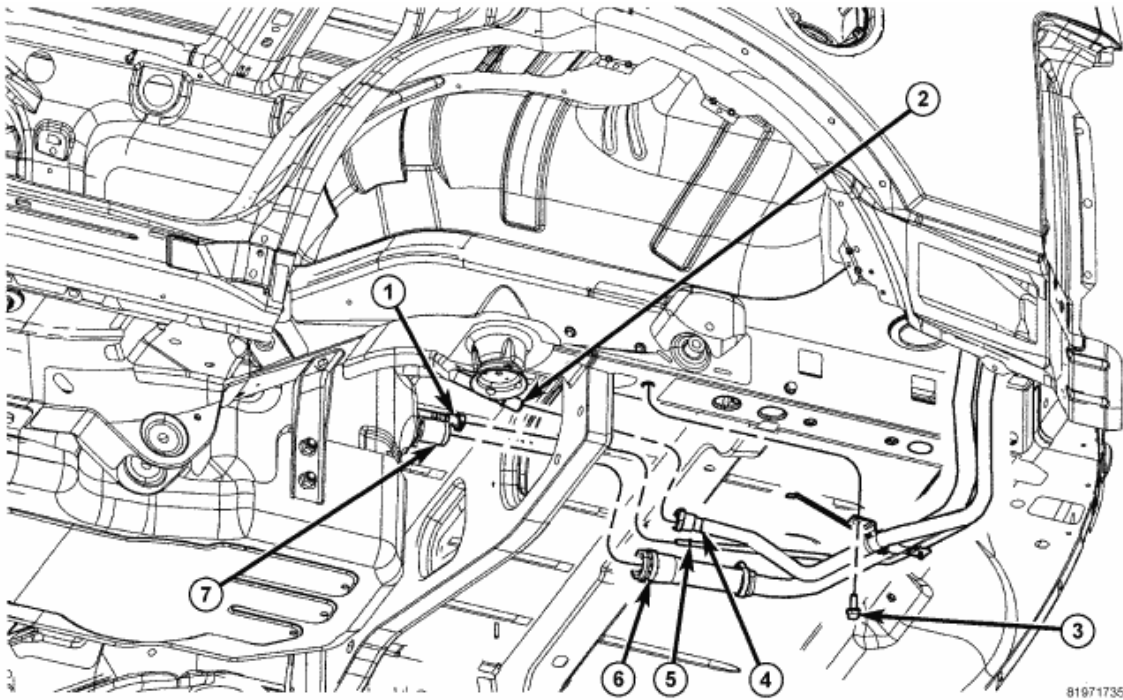


Fig. 28: FUEL TANK LINES - REAR
Courtesy of CHRYSLER LLC

5. Remove fuel fill hose and clamp (6) at rear of tank.
6. Position a drain hose into the fuel fill hose opening. Note that a small flapper valve is installed into the opening.
7. Disconnect vapor lines (4) and (5) at rear of tank.
8. Remove rear propshaft.
9. Support tank with a hydraulic jack.

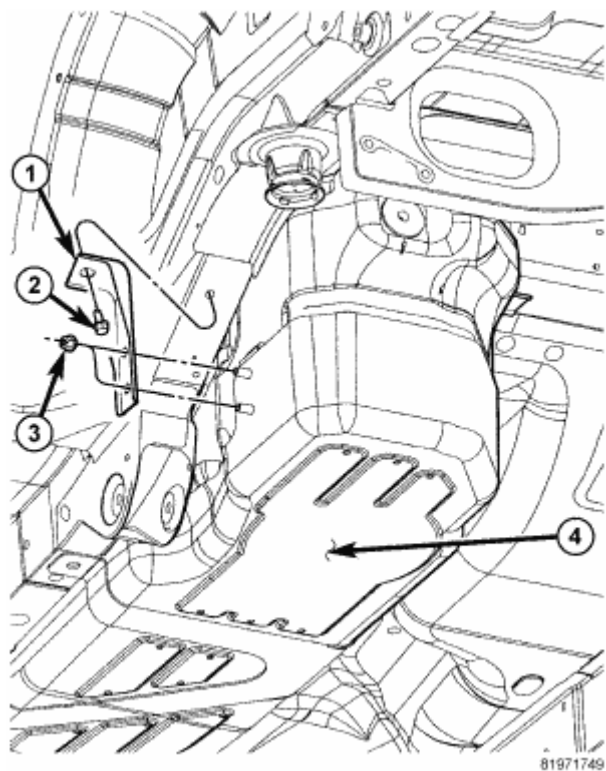
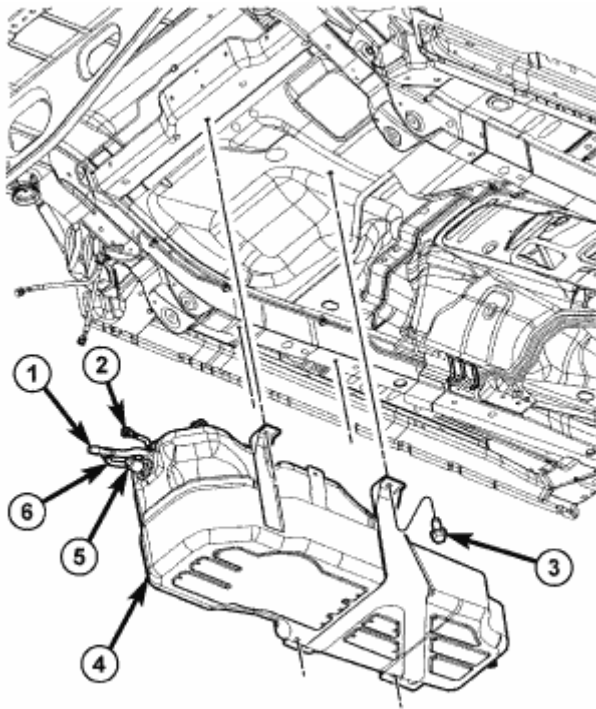


Fig. 29: FUEL TANK SIDE BRACKET

Courtesy of CHRYSLER LLC

10. Loosen two nuts (3) at tank support bracket (1).
11. Remove bolt (2) from tank support bracket (1).



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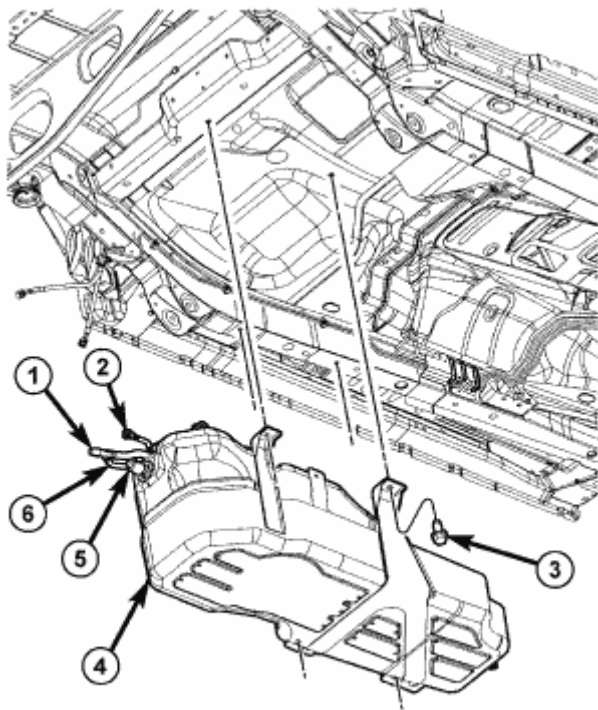
Fig. 30: FUEL TANK MOUNTING
Courtesy of CHRYSLER LLC

12. Remove tank mounting bolts (3) at both sides of tank.
13. Partially lower tank to gain access to pump module electrical connector.
14. Disconnect electrical connector at fuel pump module.
15. Continue lowering tank for removal.
16. If fuel tank is to be replaced, remove fuel pump module from tank.

INSTALLATION

INSTALLATION

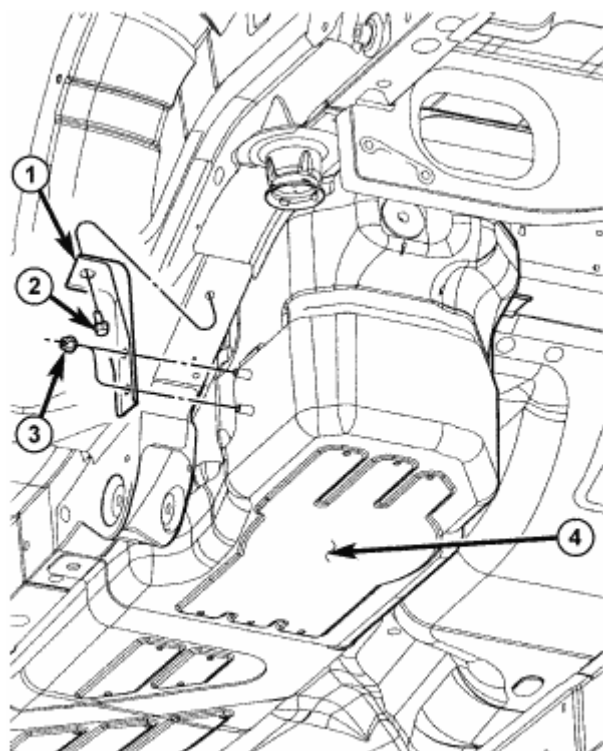
1. If fuel pump module is to be installed, install module to tank.
2. Place tank to a hydraulic jack and raise just enough to connect fuel pump module electrical connector.
3. Continue raising tank until snug to body.



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Fig. 31: FUEL TANK MOUNTING
 Courtesy of CHRYSLER LLC

4. Install tank mounting bolts (3) at both sides of tank. Tighten to 61 N.m (45 ft. lbs.).



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Fig. 32: FUEL TANK SIDE BRACKET

Courtesy of CHRYSLER LLC

5. Tighten two nuts (3) at tank support bracket (1) to 61 N.m (45 ft. lbs.).
6. Install bolt (2). Tighten to 61 N.m (45 ft. lbs.).
7. Install rear propshaft.

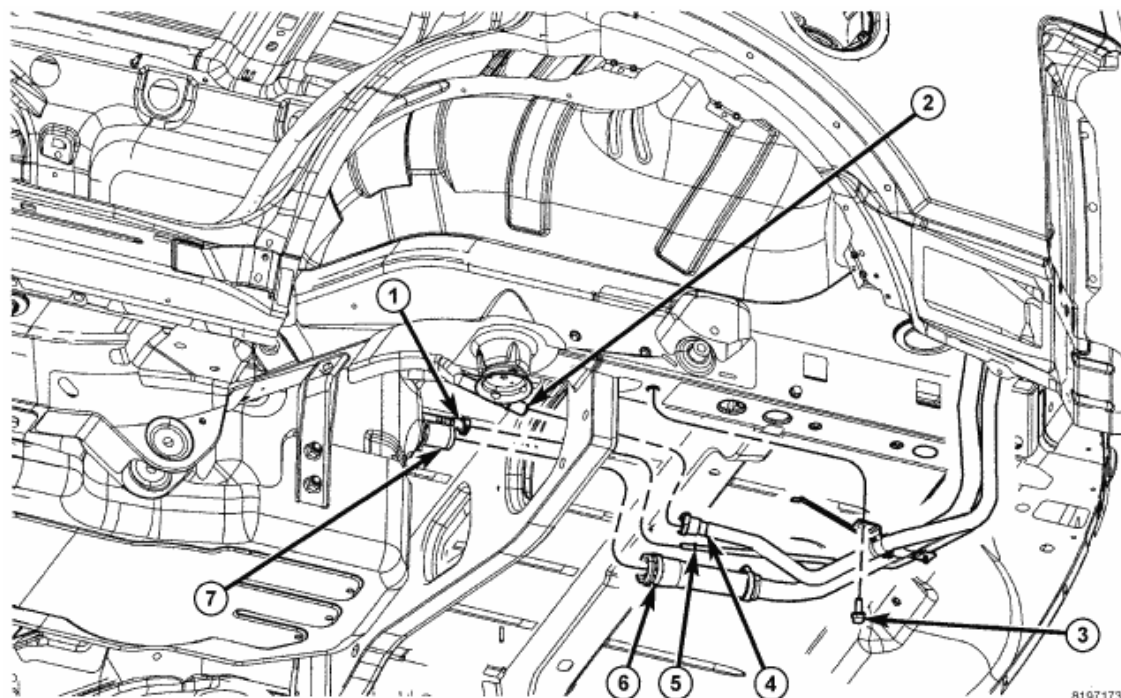
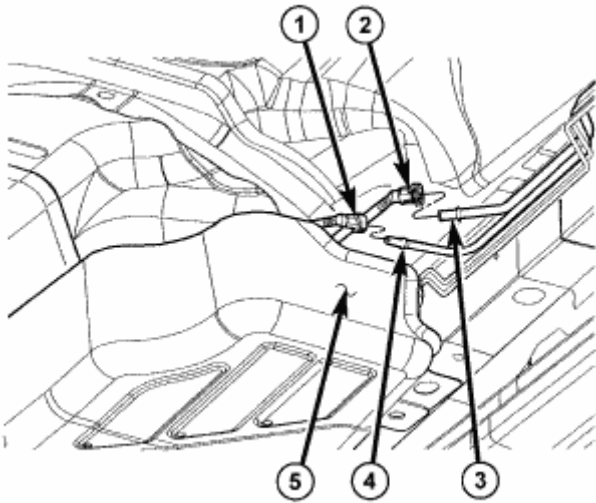


Fig. 33: FUEL TANK LINES - REAR

Courtesy of CHRYSLER LLC

8. Connect vapor lines (4) and (5) at rear of tank.
9. Connect fuel fill hose and clamp (6) at rear of tank.



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Fig. 34: FUEL LINES FRONT OF TANK
Courtesy of CHRYSLER LLC

10. Connect fuel line quick connect fittings (1) and (2) at front of fuel tank (5).
11. Lower vehicle, fill tank with fuel and install fuel fill cap.
12. Check for fuel leaks.

FUEL DELIVERY - 2.8L DIESEL

WARNING

HIGH FUEL SYSTEM PRESSURE

WARNING: High-pressure fuel lines deliver fuel under extreme pressure from the injection pump to the injectors. This may be as high as 1600 bar (23,200 psi). Use extreme caution when inspecting for high-pressure fuel leaks. Fuel under this amount of pressure can penetrate skin causing personal injury or death. Inspect high-pressure fuel leaks with a sheet of cardboard. Wear safety goggles and adequate protective clothing when servicing fuel system.

DIAGNOSIS AND TESTING

D & T HIGH PRESSURE LEAKS

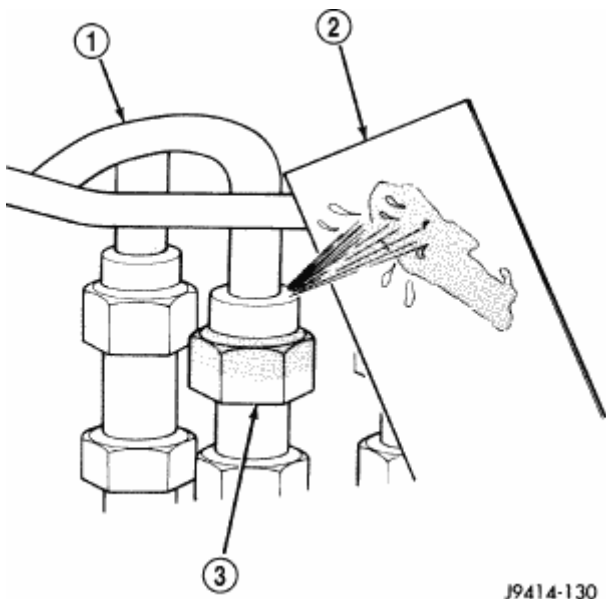


Fig. 35: TYPICAL TEST FOR FUEL LEAK
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - HIGH-PRESSURE LINE
2 - CARDBOARD
3 - FITTING |
|--|

WARNING: High-pressure lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 160,000 kPa (23,206 psi). Use extreme caution when inspecting for high-pressure fuel leaks. Fuel under this amount of pressure can penetrate skin causing personal injury or death. Inspect for high-pressure fuel leaks with a sheet of cardboard. Wear safety goggles and adequate protective clothing when servicing fuel system.

High-pressure fuel leaks can cause starting problems and poor engine performance.

Carefully place a piece of cardboard (2) over the high-pressure fuel lines or suspected area. Move your body and hands away from the area. Start the engine and run till warm. **TURN THE ENGINE OFF** . Inspect the piece of cardboard for witness marks. If a high-pressure line connection is leaking, replace damaged, restricted or leaking high-pressure fuel lines with the correct replacement line.

CAUTION: The high-pressure fuel lines cannot contact each other or other components. Do not attempt to weld high-pressure fuel lines or to repair lines that are damaged. Only use the recommended lines when replacement of high-pressure fuel line is necessary.

FUEL SUPPLY RESTRICTIONS

LOW-PRESSURE LINES

Fuel supply line restrictions or a restricted fuel filter can cause starting problems and prevent engine from accelerating. The starting problems include; no start, longer cranking times, low power and/or white fog like exhaust.

Inspect all fuel supply lines for restrictions or blockage, including the fuel filter. Flush or replace as necessary.

HIGH-PRESSURE LINES

CAUTION: High-pressure lines cannot contact each other or other components. Do not attempt to weld high-pressure fuel lines or to repair lines that are damaged. High-pressure lines can be reused only after close inspection for cracks or deformation around the sealing cone. Corroded pipes must be replaced. Use only recommended lines when replacement of high-pressure fuel line is necessary.

NOTE: High-pressure fuel lines must be replaced at each disassembly.

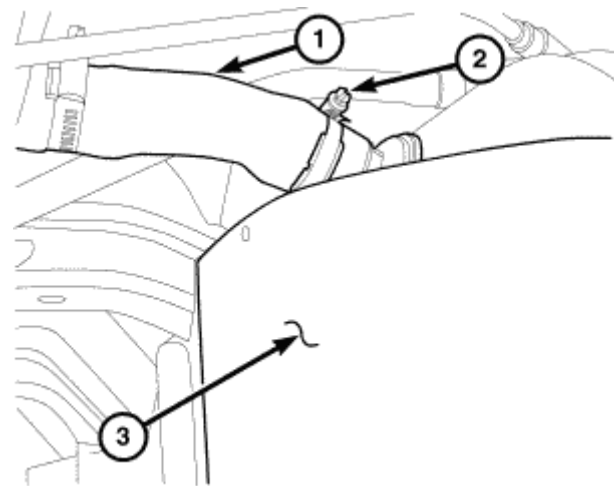
Restricted (kinked or bent) high-pressure lines can cause starting problems, poor engine performance, engine misfire and white smoke from exhaust.

STANDARD PROCEDURE

CLEANING FUEL SYSTEM COMPONENTS

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines, fuel rail, and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. DO NOT wire brush injector nozzles when cleaning. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

STANDARD PROCEDURE - DRAINING FUEL TANK



618d3t33

Fig. 36: FUEL TANK REAR
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove fuel fill cap.
3. Raise and support vehicle.
4. Remove fuel fill hose clamp (2) at rear of tank (3).
5. Remove fuel fill hose (1) from fuel tank.
6. Position a drain hose into the fuel fill hose opening. Note that a small flapper valve is installed into the opening.
7. Drain fuel tank using an approved gasoline, or diesel fuel draining station.

SPECIFICATIONS

TORQUE-2.8L DIESEL

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Fuel Filter Housing Bleeder Screw	10	-	89
Crankshaft Position Sensor Bolt	11	-	97
Crankshaft Position Sensor Shield Bolt	11.8	-	104
Boost Pressure/Intake Air Temperature Sensor Bolts	11.8	-	104
Return Fuel Junction Block at Intake Manifold	10.8	-	96
Fuel Filter	18	-	159
Fuel Filter Screw to Housing	30	22	-

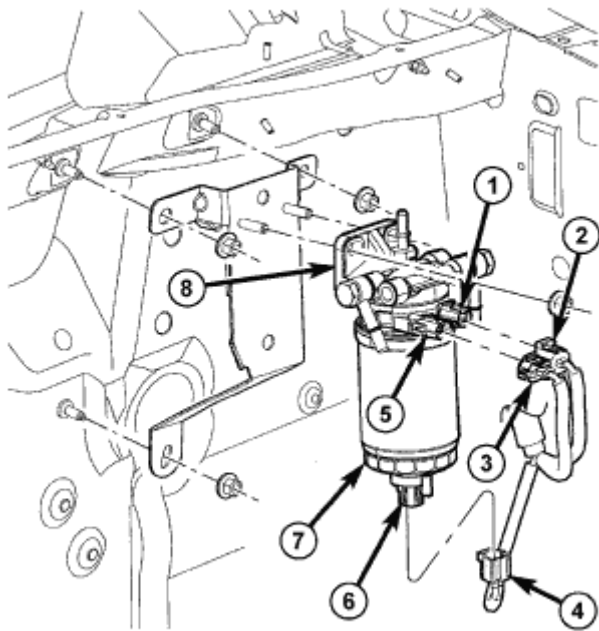
High Pressure Injection Pump Nuts	24.5	18	-
Fuel Line Fittings at Pump	24	17	-
Fuel Rail Sensor	35	25	-
Fuel Line Fittings at Filter Housing	35	25	-
High Pressure Injection Pump Sprocket Nut	88.3	65	-
Fuel Injector Retaining Bolts	32.4	24	-
High Pressure Fuel Lines at High Pressure Pump	28	20	247
Fuel Injector Fuel Lines at Fuel Rail	5	-	44
	PLUS 75° TURN		
High Pressure Fuel Feed Line at Fuel Rail	5	-	44
	PLUS 75° TURN		
Fuel Injector Lines at the Fuel Injectors	28	20	247
Fuel Rail Bolts	24.5	18	-
Fuel Pressure Sensor	35	26	-
Water In Fuel Sensor	1.2	-	10
Fuel Water/Separator Mounting Nuts	24.5	24	-
Fuel Line Hose Clamp	14.7	11	62
Fuel Quantity Solenoid	11	-	97
Fuel Tank Bolts	61	45	-
Fuel Filler Tube Clamp	3.5	-	30
APP Sensor	11	-	97
Fuel Pressure Solenoid Mounting Nut	Refer to the installation Procedure.		

SEPARATOR-FUEL FILTER/WATER

DESCRIPTION

FUEL FILTER/WATER SEPARATOR

The fuel filter/water separator assembly (8) is located on the left-rear side of the engine compartment. The assembly includes the fuel filter (7), fuel heater (1), fuel temperature sensor (5), combination water drain valve/Water-In-Fuel (WIF) sensor (6), and a quick-connect fittings attached at the side of the fuel filter canister.



81b8dodd

Fig. 37: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

OPERATION

FUEL FILTER/WATER SEPARATOR

The fuel filter/water separator protects the fuel injection pump by removing water and contaminants from the fuel. The construction of the filter/separator allows fuel to pass through it, but helps prevent moisture (water) from doing so. Moisture collects at the bottom of the filter.

Refer to the maintenance schedules in the owners manual for the recommended fuel filter replacement intervals.

For draining of water from canister, refer to **REMOVAL** .

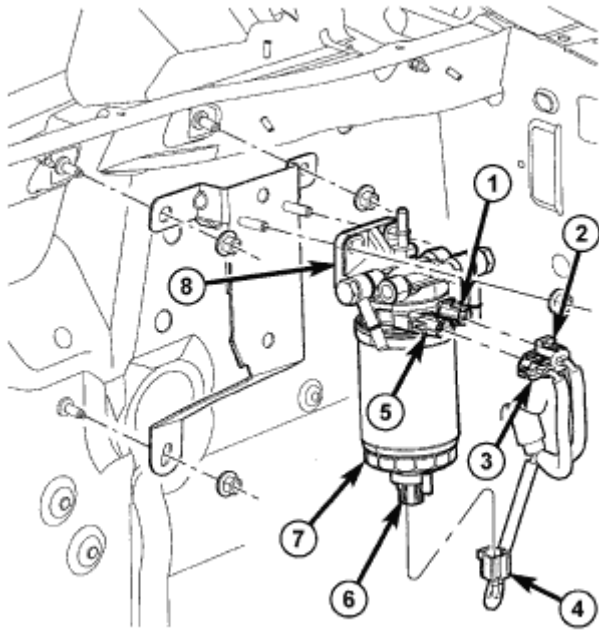
A Water-In-Fuel (WIF) sensor is attached to the bottom of fuel filter element.

The fuel heater and fuel temperature sensor are installed into the side of the filter/separator housing.

REMOVAL

FUEL FILTER/WATER SEPARATOR

Refer to maintenance schedules, or the Owner's Manual for recommended fuel filter replacement intervals.



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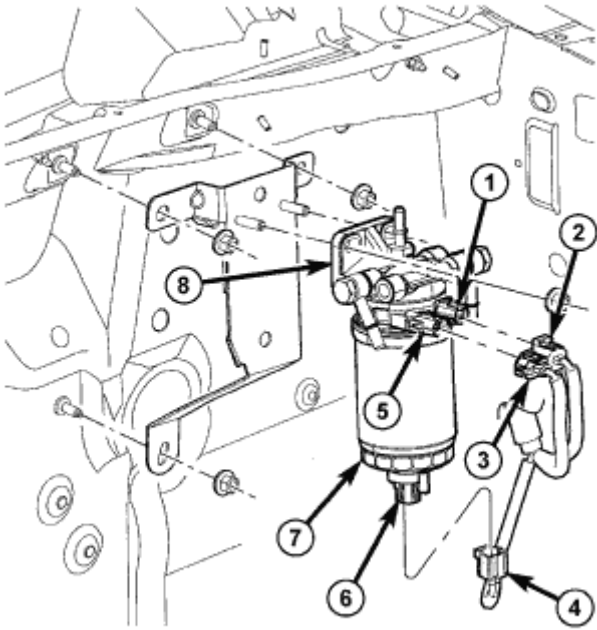
Fig. 38: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

DRAINING WATER FROM FUEL FILTER CANISTER:

The combination housing drain valve/WIF sensor (6) serves two purposes. One is to **partially** drain the filter housing of excess water. The other is to **partially** drain the housing for fuel temperature sensor, fuel filter or fuel heater element replacement.

The filter housing should be partially drained whenever the water-in-fuel warning lamp remains illuminated. (Note that lamp will be illuminated for approximately two seconds when ignition key is initially placed in ON position for a bulb check).

1. A nipple is located at the bottom of drain valve (6). Attach a drain hose to this nipple. Place drain pan under drain hose.
2. **With engine not running**, Disconnect WIF sensor electrical connector (4) then rotate drain valve (6) approximately two revolutions to open it. Leave open until all water and contaminants have been removed and clean fuel exits. Hand tighten drain valve after tightening.
3. If fuel heater element is being replaced, drain housing completely. Dispose of mixture in drain pan according to applicable regulations.
4. After draining operation, close and tighten drain valve (6).



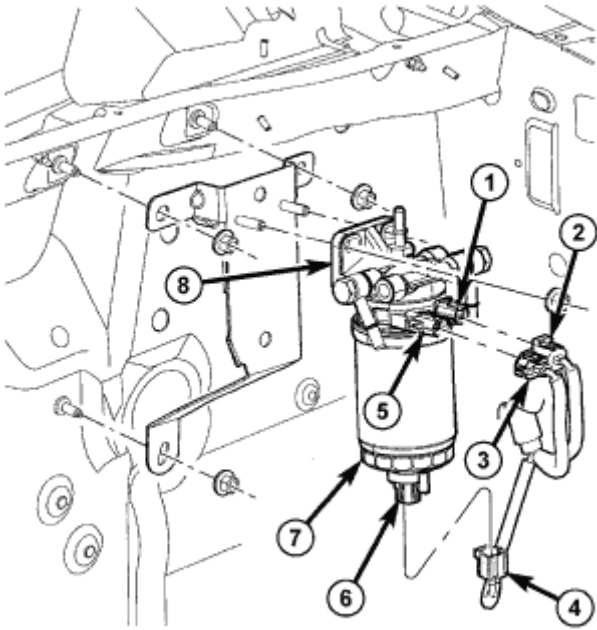
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Fig. 39: FUEL FILTER/WATER SEPARATOR

Courtesy of CHRYSLER LLC

5. FUEL FILTER REPLACEMENT:

6. Clean all debris from around filter canister (7) and canister head.
7. Open drain valve (6) two complete revolutions. Drain approximately 1 cup of fuel into a waste canister. Dispose of fuel according to environmental regulations.
8. Remove drain hose from drain valve (6).
9. Use an oil filter type wrench to loosen filter (7). Continue removing filter by hand.



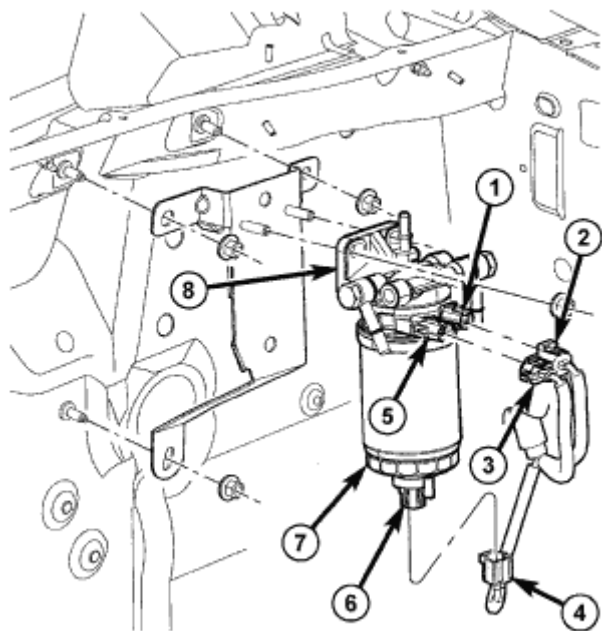
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Fig. 40: FUEL FILTER/WATER SEPARATOR

Courtesy of CHRYSLER LLC

10. **WATER-IN-FUEL (WIF) SENSOR REPLACEMENT:** The combination fuel drain valve/WIF sensor (6) is located on the bottom of the fuel filter housing.

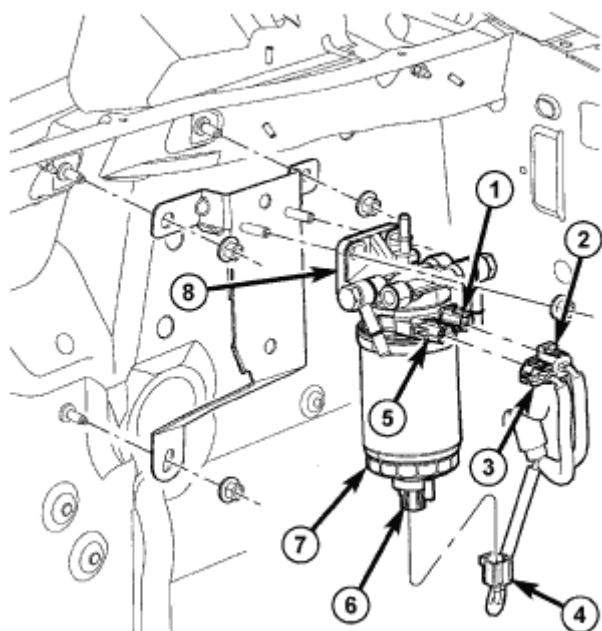
The WIF sensor is not a separately serviceable item. If diagnostics have led you to replace this sensor, then the whole fuel filter assembly needs to be changed.



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Fig. 41: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

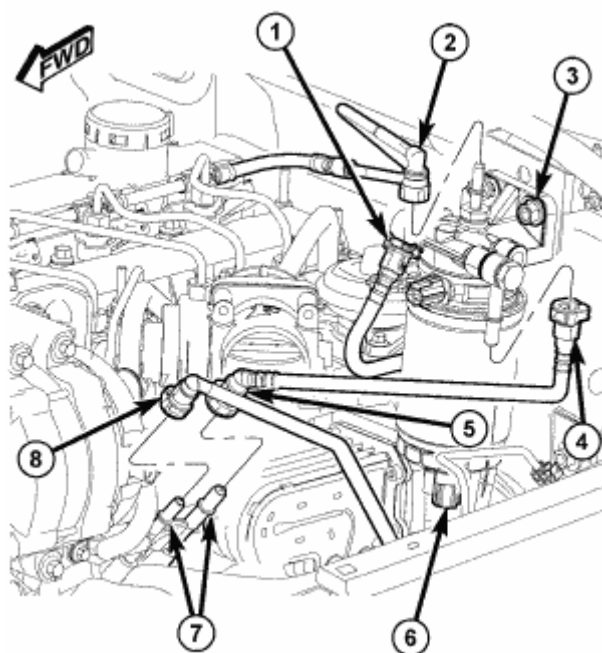
11. **FUEL HEATER ELEMENT REPLACEMENT:** The fuel heater element (1) is located in the fuel filter housing (8). To replace heater, the entire housing assembly must be replaced.
12. Drain fuel filter. See previous steps.



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Fig. 42: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

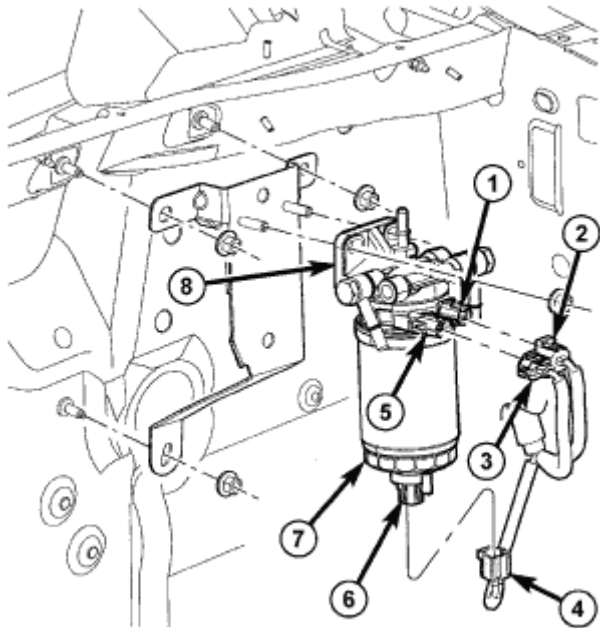
13. Disconnect electrical connectors (2), (3) and (4).



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Fig. 43: FITTINGS/NUTS FUEL FILTER
Courtesy of CHRYSLER LLC

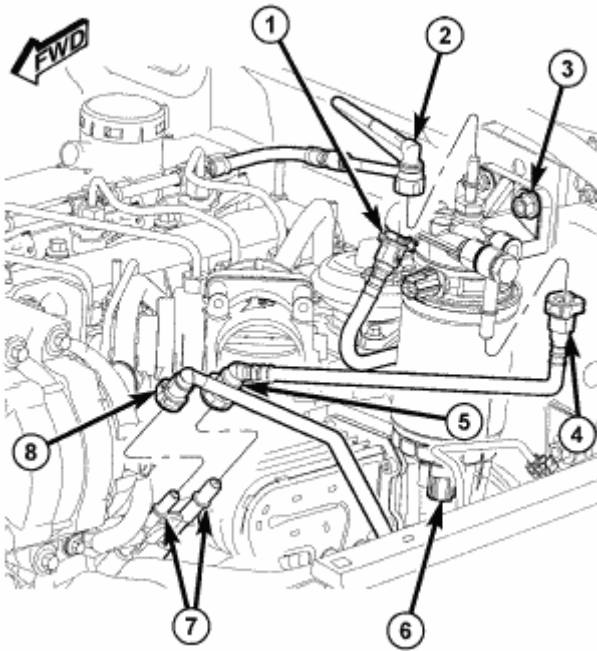
14. Disconnect quick-connect fittings (1), (2) and (4) at housing.
15. Remove housing mounting nuts (3).
16. Remove housing assembly.



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Fig. 44: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

17. **FUEL TEMPERATURE SENSOR REPLACEMENT:** The fuel temperature sensor (5) is located in the fuel filter housing (8). To replace sensor, the entire housing assembly must be replaced.
18. Drain fuel filter. See previous steps.
19. Disconnect electrical connectors (2), (3) and (4).



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Fig. 45: FITTINGS/NUTS FUEL FILTER

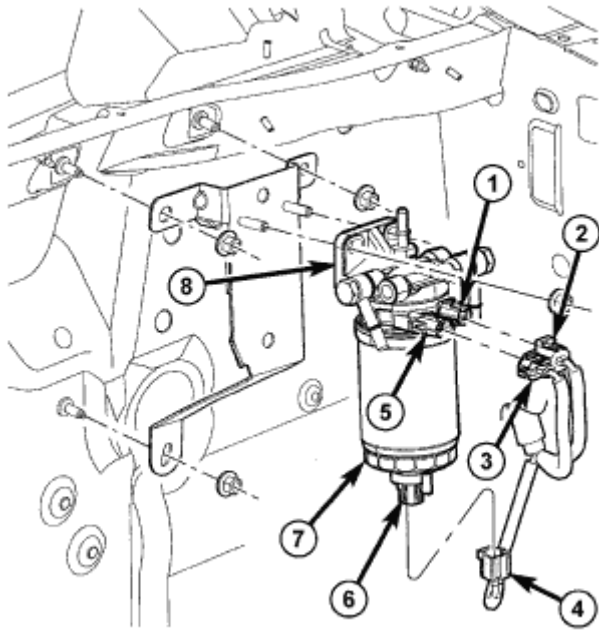
Courtesy of CHRYSLER LLC

20. Disconnect quick-connect fittings (1), (2) and (4) at housing.
21. Remove housing mounting nuts (3).
22. Remove housing assembly.
23. **DRAIN VALVE REPLACEMENT:** The Drain Valve is located on the bottom of the fuel filter. This is not a separately serviceable item. If replacement is necessary, replace the entire filter/filter canister assembly.

INSTALLATION

FUEL FILTER/WATER SEPARATOR

Refer to maintenance schedules for recommended fuel filter replacement intervals.



81b8dadd

Fig. 46: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

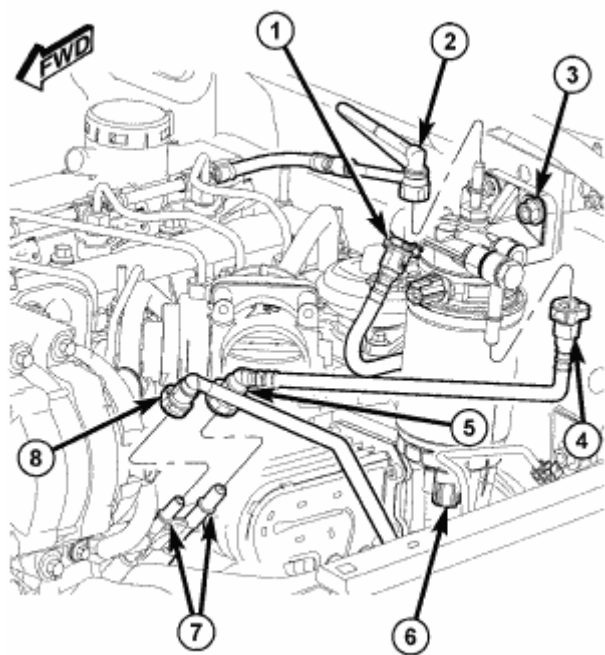
1. FUEL FILTER:

2. Lubricate new fuel filter O-ring with clean engine oil.
3. Position new fuel filter/canister assembly (7) to housing.
4. Rotate fuel filter/canister assembly until it comes to a hard stop.
5. Tighten the filter element an additional half-inch of rotation.
6. Connect WIF sensor electrical connector (4).
7. Be sure drain valve (6) is tight.

8. FUEL HEATER ELEMENT OR FUEL TEMPERATURE SENSOR:

Both the fuel heater element and fuel temperature sensor are attached to the fuel filter housing. To replace either of these components, the entire housing assembly must be replaced.

9. Position housing/canister assembly to body.

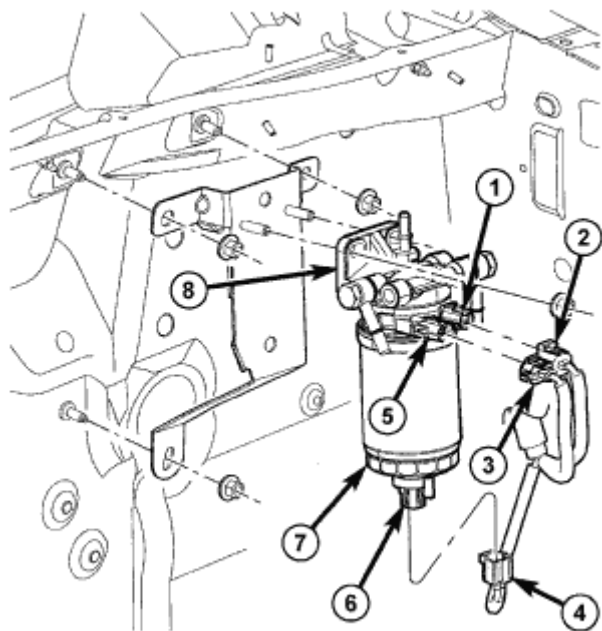


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Fig. 47: FITTINGS/NUTS FUEL FILTER

Courtesy of CHRYSLER LLC

10. Install housing mounting nuts (3).
11. Connect quick-connect fittings (1), (2) and (4) to housing fittings.



81b8dadd

Fig. 48: FUEL FILTER/WATER SEPARATOR

Courtesy of CHRYSLER LLC

12. Connect electrical connectors (2), (3) and (4).
13. **WATER-IN-FUEL (WIF) SENSOR REPLACEMENT:** The combination fuel drain valve/WIF sensor is located on the bottom of the fuel filter housing.

The WIF sensor is not a separately serviceable item. If diagnostics have led you to replace this sensor, then the whole fuel filter assembly needs to be changed.

SENSOR-WATER IN FUEL

DESCRIPTION

WATER-IN-FUEL (WIF) SENSOR - ECM INPUT

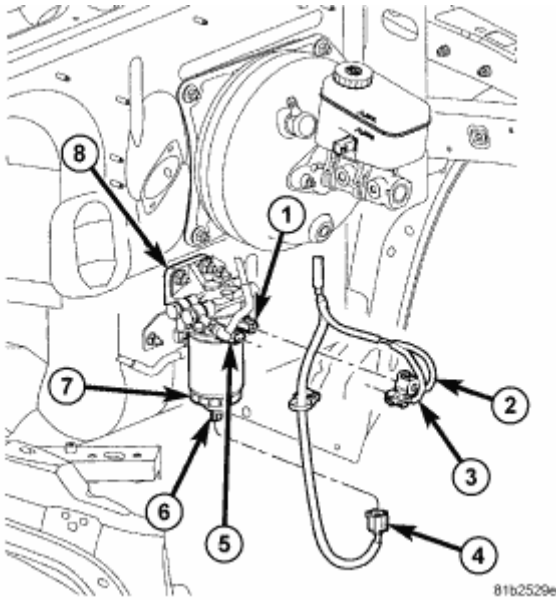


Fig. 49: FUEL FILTER/WATER SEPARATOR
Courtesy of CHRYSLER LLC

The combination drain valve/Water-In-Fuel (WIF) sensor (6) is located on the bottom of the fuel filter/water separator filter canister.

OPERATION

WATER-IN-FUEL (WIF) SENSOR - ECM INPUT

The sensor sends an input to the Engine Control Module (ECM) when it senses water in the fuel filter/water separator. As the water level in the filter/separator increases, the resistance across the WIF sensor decreases. This decrease in resistance is sent as a signal to the ECM and compared to a high water standard value. Once the value reaches 30 to 40 kilohms, the ECM will activate the water-in-fuel warning lamp through CAN bus circuits. This all takes place when the ignition key is initially put in the ON position. The ECM continues to monitor the input while the engine is running.

REMOVAL

WATER-IN-FUEL (WIF) SENSOR

The Water-In-Fuel (WIF) sensor is located at the bottom of fuel filter/water separator canister. Refer to **SEPARATOR-FUEL FILTER/WATER** for removal and installation procedures.

HEATER - FUEL

REMOVAL

WATER-IN-FUEL (WIF) SENSOR

The fuel heater is located in the fuel filter/water separator canister housing. Refer to **SEPARATOR-FUEL FILTER/WATER** for removal and installation procedures.

RELAY - FUEL HEATER

REMOVAL

REMOVAL

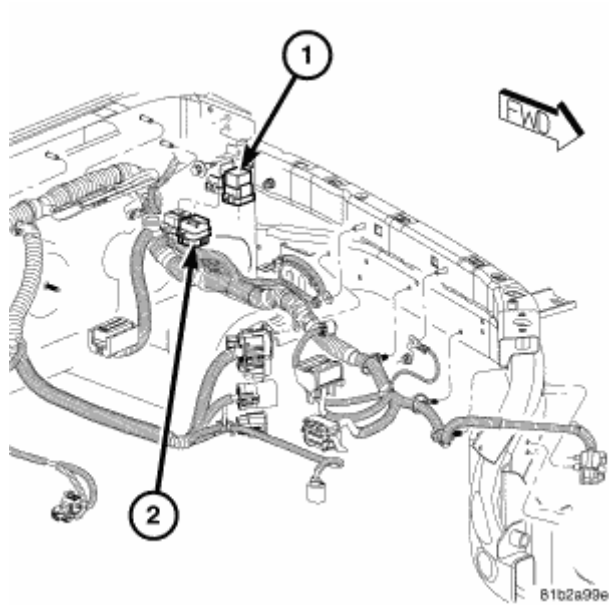


Fig. 50: FUEL HEATER RELAY

Courtesy of CHRYSLER LLC

The fuel heater relay (1) is located in the left/rear of the engine compartment.

1. Disconnect negative battery cable.
2. Disconnect electrical connector (2) from relay.
3. Remove relay mounting bolt and remove relay.
4. Check condition of relay connector pins for corrosion, etc.

INSTALLATION

INSTALLATION

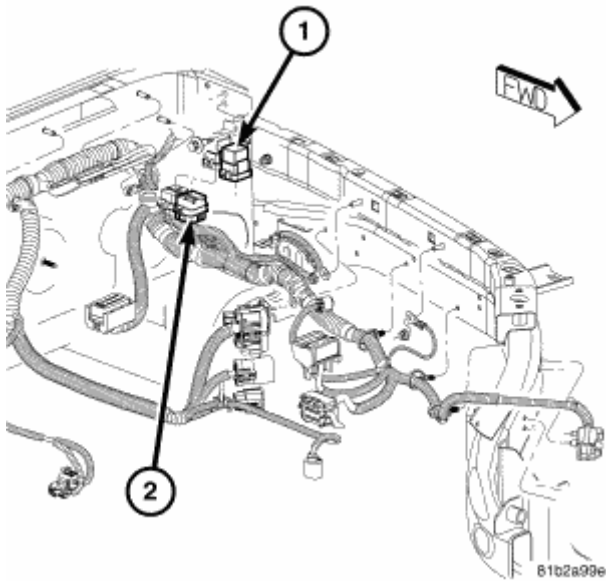


Fig. 51: FUEL HEATER RELAY
 Courtesy of CHRYSLER LLC

The fuel heater relay (1) is located in the left/rear of the engine compartment.

1. Check condition of relay connector pins for corrosion, etc.
2. Position relay and install mounting bolt.
3. Connect electrical connector (2) to relay.
4. Connect negative battery cable to battery.

SENSOR - FUEL TEMPERATURE

REMOVAL

WATER-IN-FUEL (WIF) SENSOR

The fuel temperature sensor is located in the fuel filter/water separator canister housing. Refer to **SEPARATOR-FUEL FILTER/WATER** for removal and installation procedures.

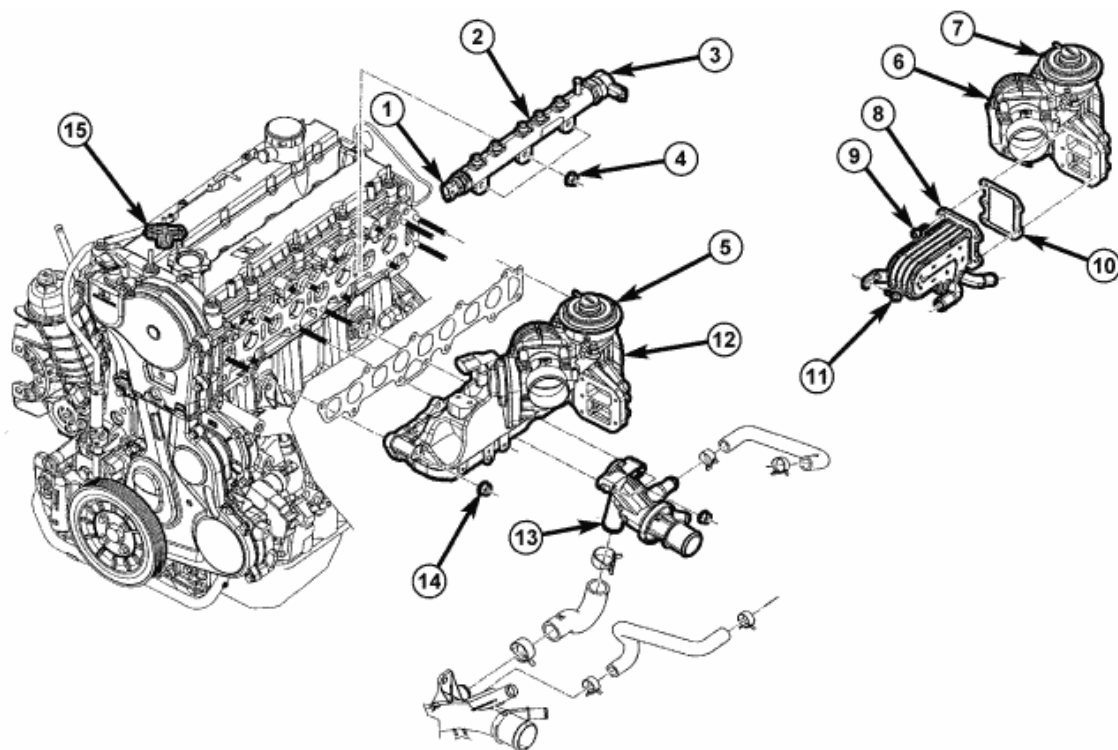
RAIL - FUEL

REMOVAL

REMOVAL

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead

to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.



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Fig. 52: FUEL RAIL - 2.8L DIESEL
Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable at battery. Isolate end of cable.
2. Remove dress-up cover from top of engine.
3. Disconnect electrical connector at fuel pressure sensor (1).
4. Disconnect electrical connector at fuel pressure solenoid (3).

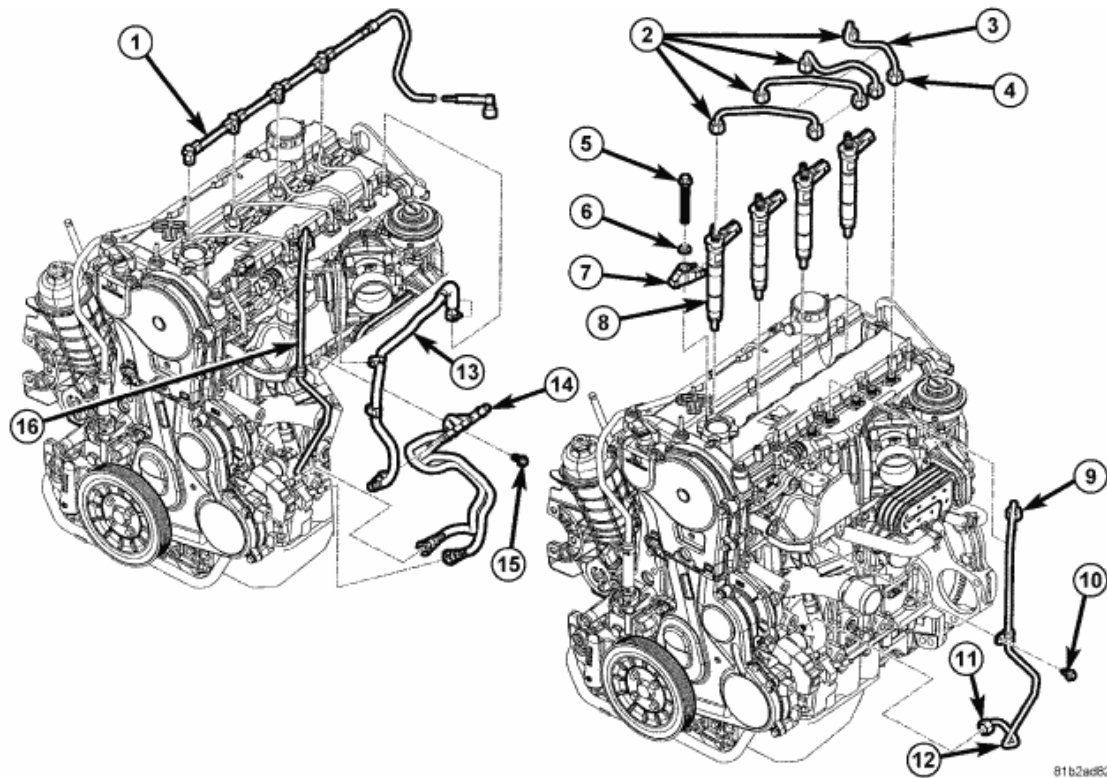
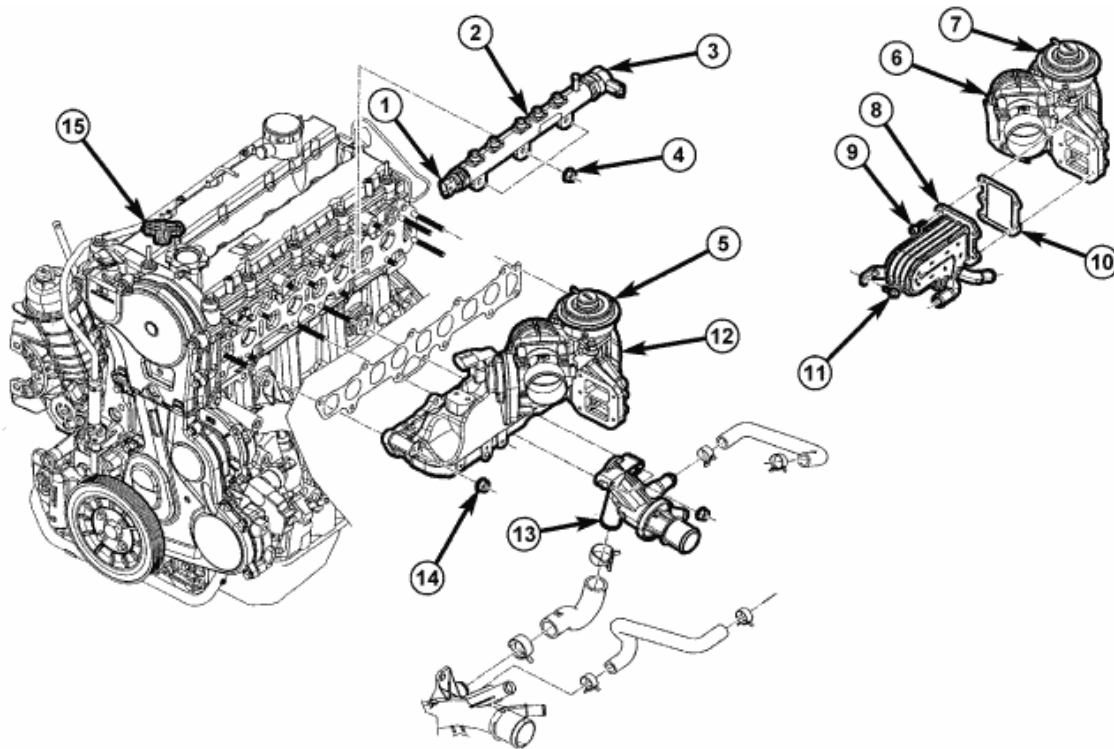


Fig. 53: FUEL INJECTORS - 2.8L DIESEL
 Courtesy of CHRYSLER LLC

CAUTION: WHEN LOOSENING OR TIGHTENING HIGH-PRESSURE LINE FITTINGS ATTACHED TO A SEPARATE FITTING, USE A BACK-UP WRENCH ON FITTING. DO NOT ALLOW FITTING TO ROTATE. DAMAGE TO BOTH FUEL LINE AND FITTING WILL RESULT.

5. Disconnect fuel line fittings (2) and (4) and remove four fuel lines (3). Note and mark position of each fuel line while removing.
6. Remove fuel line clamp bolt (10).
7. Disconnect rail-to-injection pump high-pressure fuel line fittings (9) and (11) and remove fuel line (12). Note and mark position of fuel line while removing.



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Fig. 54: FUEL RAIL - 2.8L DIESEL
Courtesy of CHRYSLER LLC

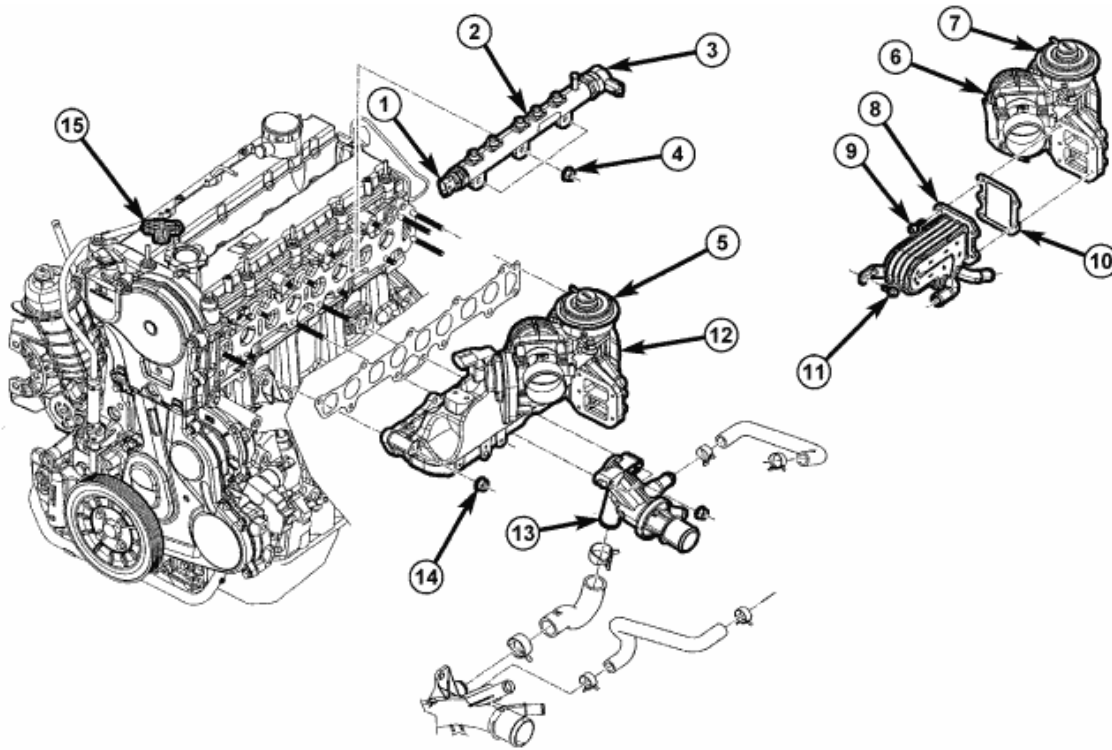
8. Remove three fuel rail mounting nuts (4).
9. Remove rail (2) from cylinder head.

INSTALLATION

INSTALLATION

NOTE: New High Pressure Fuel Line must be used any time the High Pressure Fuel Lines have been removed.

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.



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Fig. 55: FUEL RAIL - 2.8L DIESEL

Courtesy of CHRYSLER LLC

1. Position fuel rail (2) to cylinder head.
2. Install three fuel rail mounting nuts (4). Tighten nuts (alternately) to 24 N.m (18 ft. lbs.) torque.

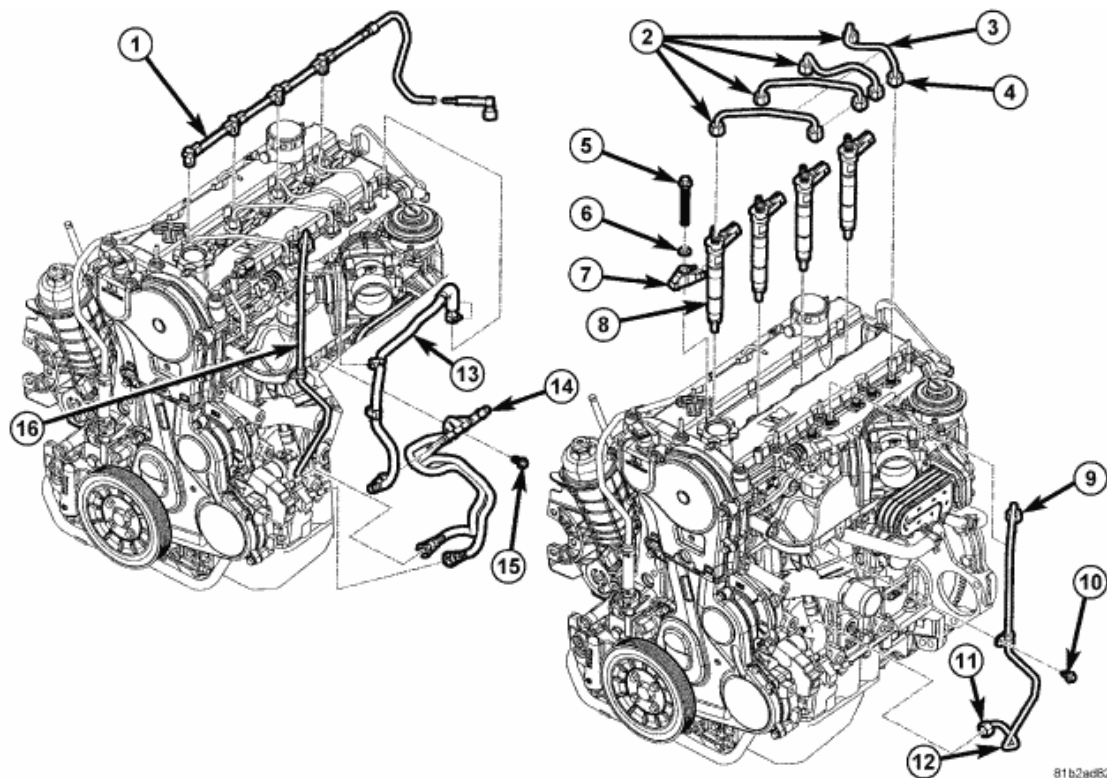
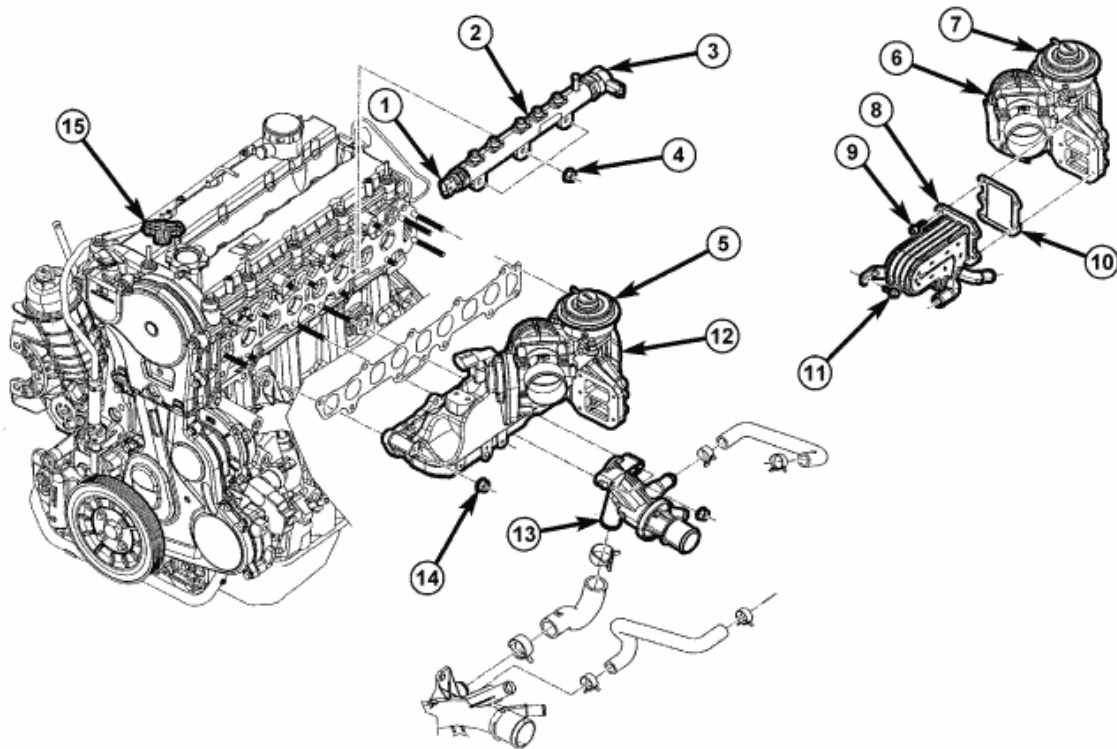


Fig. 56: FUEL INJECTORS - 2.8L DIESEL
 Courtesy of CHRYSLER LLC

CAUTION: WHEN LOOSENING OR TIGHTENING HIGH-PRESSURE LINE FITTINGS ATTACHED TO A SEPARATE FITTING, USE A BACK-UP WRENCH ON FITTING. DO NOT ALLOW FITTING TO ROTATE. DAMAGE TO BOTH FUEL LINE AND FITTING WILL RESULT.

3. Install the injectors (8), the injector clamps (7) and washers (6).
4. Install the injector bolts (5). Do not tighten at this time.
5. Position and connect the high pressure line (12) between the high pressure injection pump and the fuel rail. Do not tighten at this time.
6. Torque injector clamp bolts to 32.4 Nm (23 ft. lbs.).
7. Torque the rail side (4) of the high pressure lines between the injectors and the fuel rail to 5 Nm (44 in. lbs.) plus an additional 75°.
8. Torque the injector side (2) of the high pressure lines between the injectors and the fuel rail to 28 Nm (20 ft. lbs.).
9. Torque the rail side (9) of the high pressure fuel line between the high pressure injection pump and the fuel rail to 5 Nm (44 in. lbs.) plus an additional 75°.
10. Torque the high pressure pump side (11) of the high pressure fuel line between the high pressure injection pump and the fuel rail to 28 Nm (20 ft. lbs.).
11. Install fuel line clamp bolt (10). Tighten bolt to 15 N.m (11 ft. lbs.) torque.



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Fig. 57: FUEL RAIL - 2.8L DIESEL
Courtesy of CHRYSLER LLC

12. Connect electrical connectors to fuel injectors.
13. Connect electrical connector to fuel pressure solenoid (3).
14. Connect electrical connector to fuel pressure sensor (1).
15. Install the engine cover.
16. Connect negative battery cable to battery.

LINES-FUEL

DESCRIPTION

DESCRIPTION

Low-Pressure Lines Are:

- the fuel supply line from fuel tank to fuel filter housing.
- the fuel return line back to fuel tank.
- the fuel drain line from each fuel injector.
- the fuel supply line from fuel filter to fuel injection pump.
- the fuel injection pump return line.

High-Pressure Lines Are:

the fuel line from fuel injection pump to fuel rail.

the four fuel lines from fuel rail up to the fuel injectors

WARNING: High-pressure fuel lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 160,000 kPa (23,206 psi). Use extreme caution when inspecting for high-pressure fuel leaks. Inspect for high-pressure fuel leaks with a sheet of cardboard. High fuel injection pressure can cause personal injury if contact is made with the skin.

OPERATION

HIGH-PRESSURE FUEL LINES

High-Pressure Lines

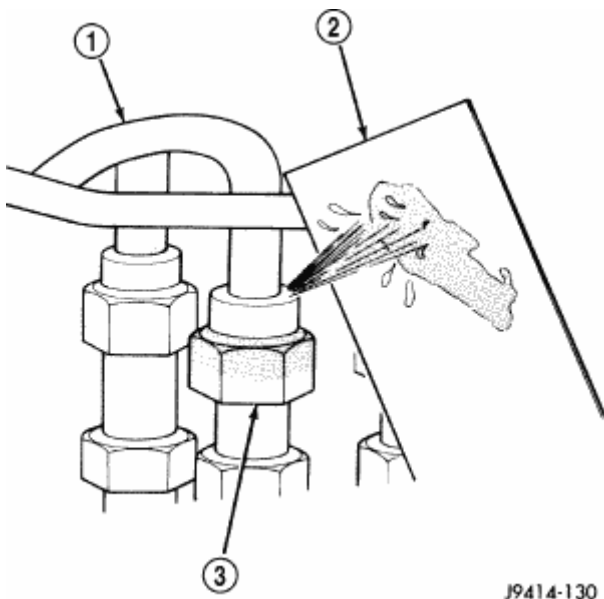
CAUTION: The high-pressure fuel lines cannot contact each other or other components. Do not attempt to weld high-pressure fuel lines or to repair lines that are damaged. If lines are ever kinked or bent, they must be replaced. Use only the recommended lines when replacement of high-pressure fuel line is necessary.

High-pressure fuel lines deliver fuel (under pressure) of up to approximately 160,000 kPa (23,206 psi) from the injection pump to the fuel injectors. The lines expand and contract from the high-pressure fuel pulses generated during the injection process. All high-pressure fuel lines are of the same length and inside diameter. Correct high-pressure fuel line usage and installation is critical to smooth engine operation.

WARNING: Use extreme caution when inspecting for high-pressure fuel leaks. Inspect for high-pressure fuel leaks with a sheet of cardboard. High fuel injection pressure can cause personal injury if contact is made with the skin.

DIAGNOSIS AND TESTING

HIGH-PRESSURE FUEL LINE LEAK TEST



J9414-130

Fig. 58: TYPICAL TEST FOR LEAKS USING CARDBOARD

Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - HIGH-PRESSURE LINE
2 - CARDBOARD
3 - TYPICAL HIGH-PRESSURE FITTING |
|--|

High-pressure fuel line leaks can cause starting problems and poor engine performance.

WARNING: Due to extreme fuel pressures of up to 160,000 kPa (23,207 psi), use extreme caution when inspecting for high-pressure fuel leaks. Do not get your hand or a finger near a suspected leak. Inspect for high-pressure fuel leaks with a sheet of cardboard (2) (typical picture). High fuel injection pressure can cause personal injury if contact is made with the skin.

Start the engine. Move the cardboard (2) over the suspected high-pressure fuel line leak, and check for fuel spray onto the cardboard. If line is leaking, retorque line while engine is shutdown. Replace damaged, restricted or leaking high-pressure fuel lines with the correct replacement line.

CAUTION: The high-pressure fuel lines cannot contact each other or other components. Do not attempt to weld high-pressure fuel lines or to repair lines that are damaged. Only use the recommended lines when replacement of high-pressure fuel line is necessary.

REMOVAL

HIGH-PRESSURE FUEL LINES

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel

fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

1. Disconnect negative battery cable at battery. Isolate end of cable.
2. Remove dress-up cover from top of engine.

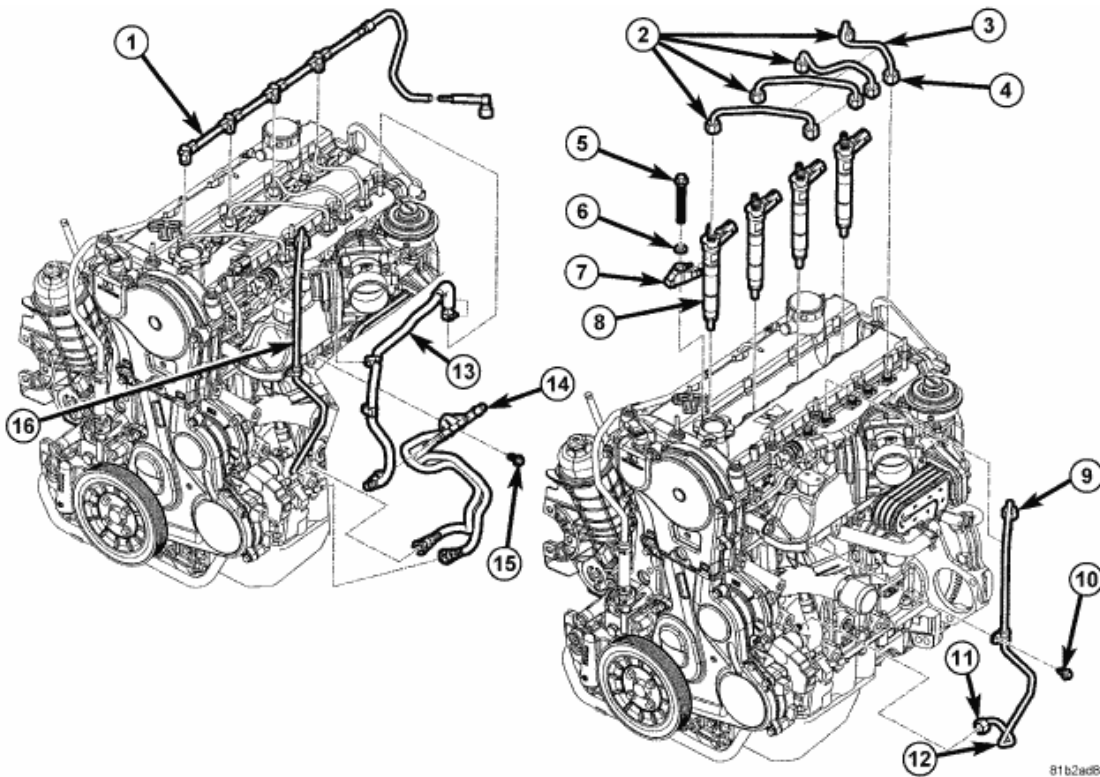


Fig. 59: FUEL INJECTORS - 2.8L DIESEL
 Courtesy of CHRYSLER LLC

CAUTION: WHEN LOOSENING OR TIGHTENING HIGH-PRESSURE LINE FITTINGS ATTACHED TO A SEPARATE FITTING, USE A BACK-UP WRENCH ON FITTING. DO NOT ALLOW FITTING TO ROTATE. DAMAGE TO BOTH FUEL LINE AND FITTING WILL RESULT.

3. Disconnect fuel line fittings (2) and (4) and remove four fuel lines (3). Note and mark position of each fuel line while removing.
4. Remove fuel line clamp bolt (10).

5. Disconnect rail-to-injection pump high-pressure fuel line fittings (9) and (11) and remove fuel line (12). Note and mark position of fuel line while removing.

INSTALLATION

HIGH-PRESSURE FUEL LINES

All high-pressure fuel lines are of the same length and inside diameter. Correct high-pressure fuel line usage and installation is critical to smooth engine operation.

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

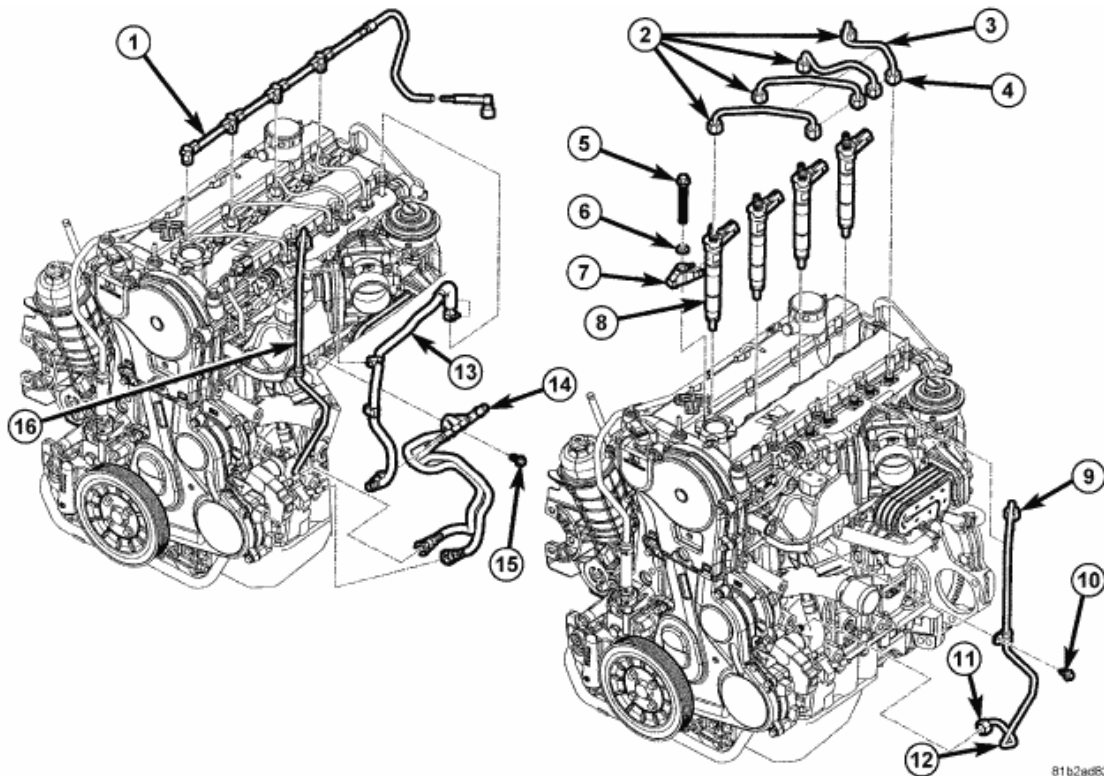


Fig. 60: FUEL INJECTORS - 2.8L DIESEL
Courtesy of CHRYSLER LLC

CAUTION: WHEN LOOSENING OR TIGHTENING HIGH-PRESSURE LINE FITTINGS

ATTACHED TO A SEPARATE FITTING, USE A BACK-UP WRENCH ON FITTING. DO NOT ALLOW FITTING TO ROTATE. DAMAGE TO BOTH FUEL LINE AND FITTING WILL RESULT.

1. Position the injectors with the clamp and washer into the cylinder head seat.
2. Hand tighten the injector clamp bolts.
3. Install the high pressure fuel line.
4. Hand tighten the high pressure fuel line.
5. Torque the fuel injector clamp bolts to 32 Nm (23 ft. lbs.).
6. Torque the high pressure fuel rail nuts to 25 Nm (221 in. lbs.).
7. Torque the high pressure fuel line on the fuel injector to 28 Nm (247 in. lbs.).
8. Torque the high pressure fuel line on the fuel rail to 5 Nm (44 in. lbs) +75 degrees.

MOTOR - FUEL PUMP

DESCRIPTION

DESCRIPTION

An engine mounted, low-pressure mechanical fuel pump is **not used** with the 2.8L diesel engine.

An electric fuel pump is mounted to the fuel pump module. The pump supplies a low-pressure fuel supply to the engine.

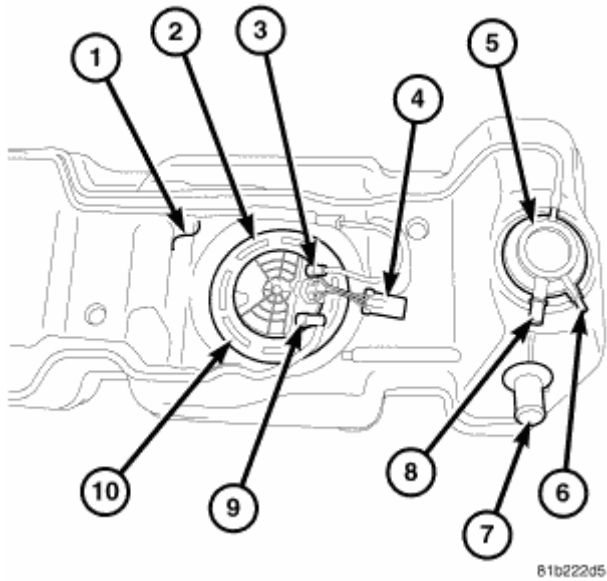
Fuel is drawn in through a filter at the bottom of the module and pushed through the electric motor gearset to the pump outlet.

The electric fuel pump is not a separate, serviceable component. The entire fuel pump module must be replaced.

MODULE - FUEL PUMP

REMOVAL

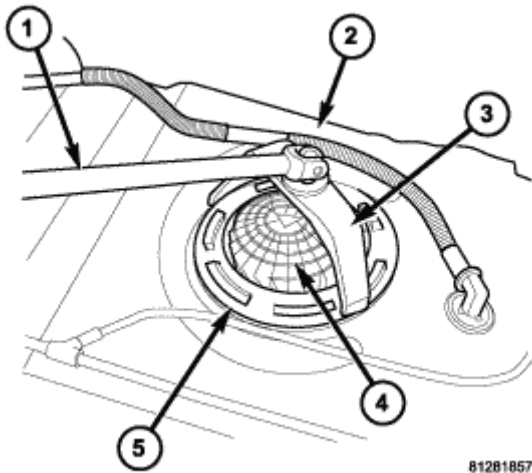
REMOVAL



81b222d5

Fig. 61: FUEL TANK TOP
 Courtesy of CHRYSLER LLC

1. The 2.8L diesel fuel pump module (2) is located on the top of fuel tank.



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Fig. 62: FUEL PUMP MODULE LOCATION
 Courtesy of CHRYSLER LLC

2. Drain and remove fuel tank.
3. Note rotational position of module before attempting removal. An indexing arrow is located on top of module for this purpose.
4. Position special Lockring Remover/Installer tool 9340 (3) into notches on outside edge of lockring (5).
5. Install 1/2 inch drive breaker bar (1) to special Lockring Remover/Installer tool 9340 (3).
6. Rotate breaker bar counterclockwise to remove lockring.
7. Remove lockring. The module will spring up slightly when lockring is removed.

8. Remove module from fuel tank. Be careful not to bend float arm while removing.

INSTALLATION

INSTALLATION

CAUTION: Whenever the fuel pump module is serviced, the rubber seal (gasket) must be replaced.

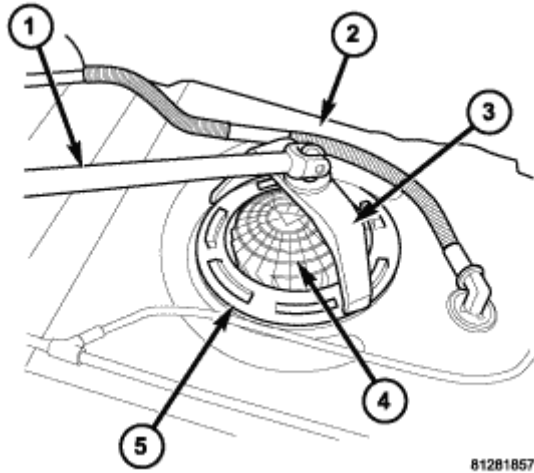


Fig. 63:
Courtesy of CHRYSLER LLC

1. Using a new seal (gasket), position fuel pump module into opening in fuel tank.
2. Position lockring (5) over top of fuel pump module.
3. Rotate module until embossed alignment arrow points to center alignment mark. This step must be performed to prevent float from contacting side of fuel tank.
4. Install Lockring Remover/Installer 9340 (3) to lockring.
5. Install 1/2 inch drive breaker (1) into Lockring Remover/Installer 9340 (3).
6. Tighten lockring (clockwise) until all seven notches have engaged.
7. Install fuel tank.

PUMP-FUEL INJECTION

DESCRIPTION

FUEL INJECTION PUMP

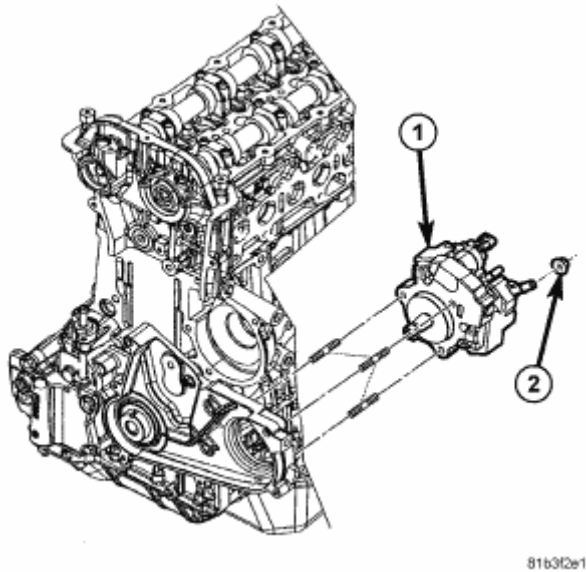


Fig. 64: Fuel Injection Pump
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FUEL INJECTION PUMP
2 - FUEL QUANTITY SOLENOID |
|---|

A radial, 3 piston pump (1) mounted to the timing belt cover, is used to deliver fuel under high pressure to the fuel rail. See **WARNING**.

The pump is driven by the timing belt. Pressure is generated independently of the injection process. The pump is lubricated with diesel fuel and is not responsible for fuel injection timing. However, there is a mark on the high pressure fuel pump sprocket that must be aligned with a mark on the timing belt cover whenever the high pressure pump, sprocket, or timing belt have been removed.

OPERATION

FUEL INJECTION PUMP

High Pressure Pumping Plungers

The fuel quantity solenoid supplies three high pressure pumping chambers. The pumping chambers have one way inlet valves that allow fuel to flow into the chambers. The valves then close during compression of the fuel and cause the high pressure fuel to overcome a ball and angled seat outlet valve.

All three pumping chambers are tied together in one circuit internal to the pump and provide high pressure fuel up to 1600 bar (23,000 psi) through a steel line, to the fuel rail.

The pump is driven at 1:1 engine speed and is not responsible for injection timing. The pump is only responsible for providing high pressure fuel while the ECM controls the injection timing.

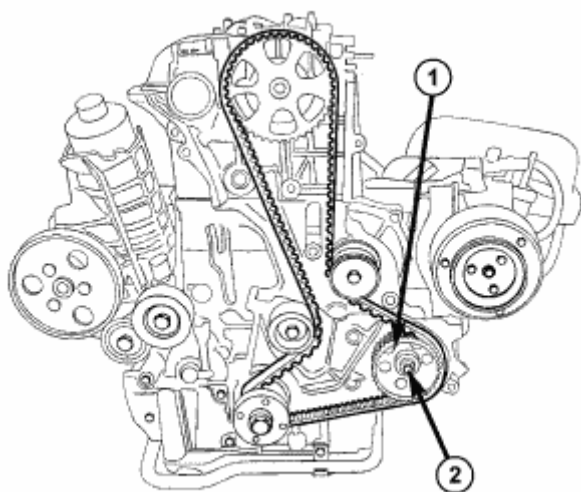
REMOVAL

FUEL INJECTION PUMP

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

WARNING: High-pressure lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. Use extreme caution when inspecting for high-pressure fuel leaks. Fuel under this amount of pressure can penetrate skin causing personal injury or death. Inspect for high-pressure fuel leaks with a sheet of cardboard. Wear safety goggles and adequate protective clothing when servicing fuel system.

1. Disconnect negative battery cable.
2. Drain engine coolant.
3. Raise and support vehicle.
4. Disconnect and reposition engine coolant hose near rear of injection pump.
5. Remove timing belt.



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Fig. 65: FUEL INJECTION PUMP SPROCKET
Courtesy of CHRYSLER LLC

6. Remove injection pump sprocket mounting nut (2). Attach a typical 3-jaw gear/sprocket puller such as special tool 1023 and remove sprocket (1) from pump.

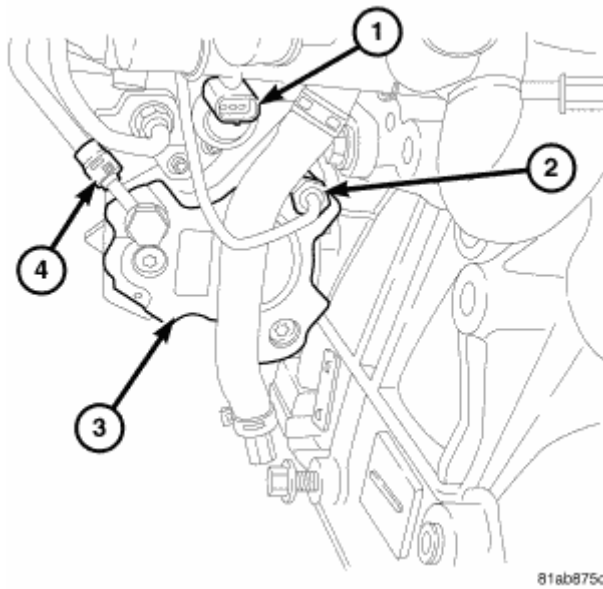


Fig. 66: HIGH PRESSURE FUEL LINE AT PUMP
Courtesy of CHRYSLER LLC

7. Disconnect high-pressure fuel line (4) at rear of pump by removing banjo bolt.
8. Disconnect high-pressure fuel line (2) at rear of pump by removing fitting at end of line.
9. Disconnect electrical connector at high-pressure fuel sensor (1).

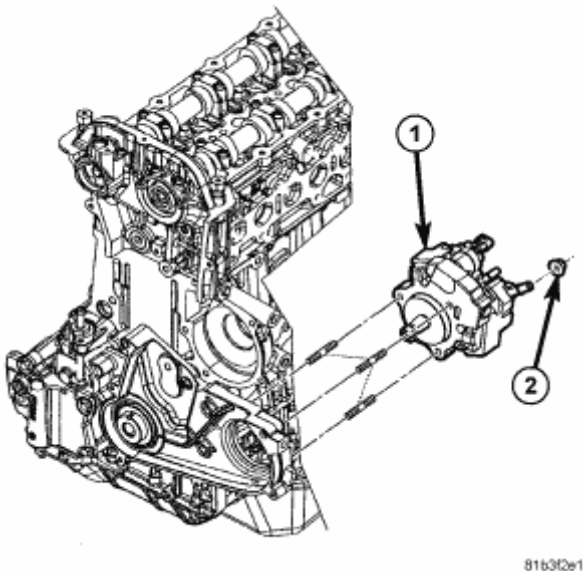


Fig. 67: Fuel Injection Pump
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FUEL INJECTION PUMP
2 - FUEL QUANTITY SOLENOID |
|---|

10. Remove fuel injection pump mounting nuts (2).
11. Slide pump rearward from mounting studs.

INSTALLATION

FUEL INJECTION PUMP

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

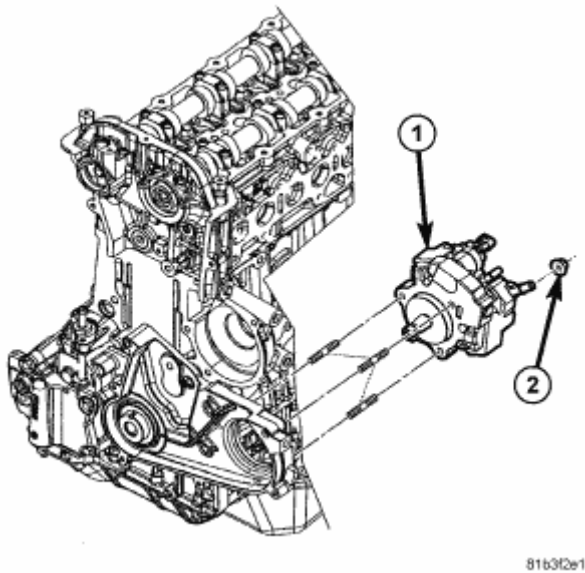


Fig. 68: Fuel Injection Pump
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FUEL INJECTION PUMP
2 - FUEL QUANTITY SOLENOID |
|---|

1. Slip pump (1) over mounting studs.
2. **Be sure pump is fully seated before tightening mounting nuts.** Tighten injection pump mounting nuts

(2) to 24 N.m (18 ft. lbs.) torque.

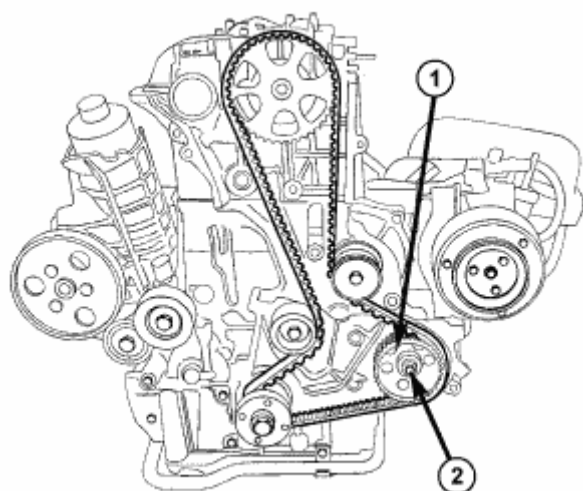


Fig. 69: FUEL INJECTION PUMP SPROCKET
Courtesy of CHRYSLER LLC

3. Position sprocket (1) to pump shaft and install nut (2) finger tight.

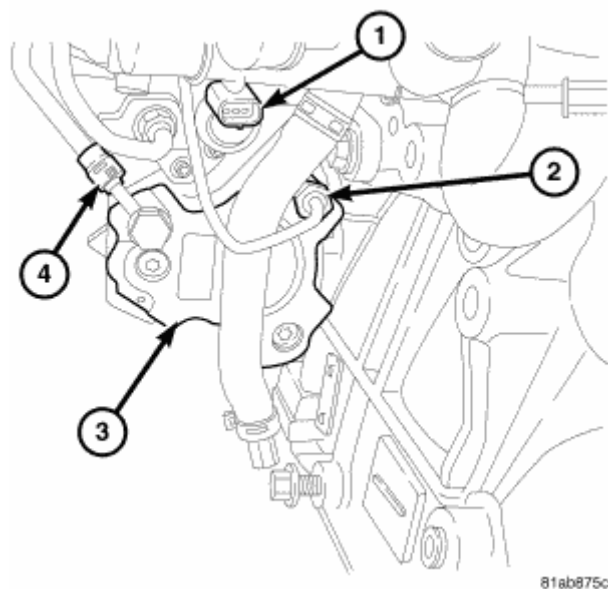


Fig. 70: HIGH PRESSURE FUEL LINE AT PUMP
Courtesy of CHRYSLER LLC

4. Install banjo bolt for fuel line (4) at rear of injection pump. Tighten bolt to 28 N.m (20 ft. lbs.) torque.
5. Install fuel line (2) and fitting to rear of injection pump. Tighten fitting to 28 N.m (20 ft. lbs.) torque.
6. Connect electrical connector to high-pressure fuel sensor (1).

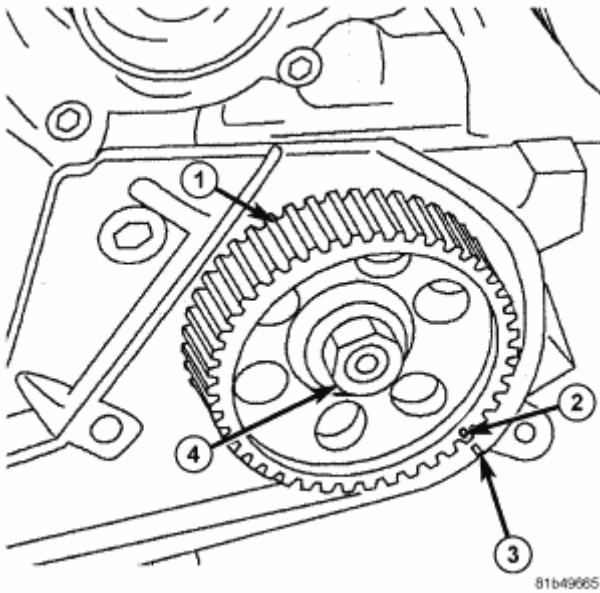


Fig. 71: FUEL INJECTION PUMP TIMING MARKS
Courtesy of CHRYSLER LLC

7. Tighten injection pump sprocket nut (4) to 88 N.m (65 ft. lbs.) torque.
8. **PUMP ALIGNMENT MARKS:** Rotate pump gear (1) until marks (2) and (3) are aligned.
9. Install timing belt.
10. Connect engine coolant hose near rear of injection pump.
11. Fill engine cooling system.
12. Lower vehicle.
13. Connect negative battery cable.
14. Start engine and check for fuel leaks.

PUMP-FUEL TRANSFER

DESCRIPTION

FUEL TRANSFER (LIFT) PUMP

The fuel transfer pump (fuel lift pump) is part of the fuel pump module. The fuel pump module is located in the fuel tank. The 12-volt electric pump is operated and controlled by the Engine Control Module (ECM).

REMOVAL

FUEL TRANSFER PUMP

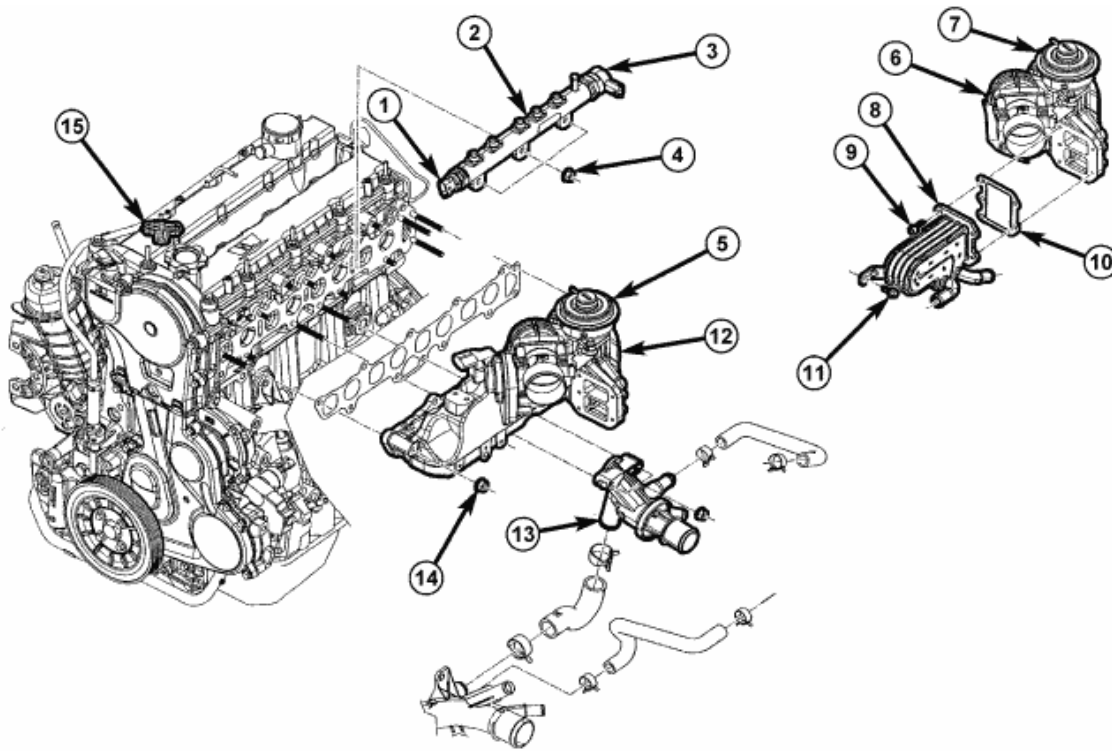
The fuel transfer pump (fuel lift pump) is a part of the fuel tank module. It is not serviced separately.

SENSOR-FUEL PRESSURE

DESCRIPTION

FUEL PRESSURE SENSOR

WARNING: High - pressure fuel line deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 bar (23,200 psi). Use extreme caution when inspecting for high - pressure fuel leaks. Fuel under this amount of pressure can penetrate skin causing personal injury or death. Inspect for high - pressure leaks with a sheet of cardboard. Wear safety goggles and adequate protective clothing when servicing fuel system.



81b2ac70

Fig. 72: SENSOR LOCATIONS
Courtesy of CHRYSLER LLC

The fuel rail pressure sensor (1) screws into the fuel rail (2) at the top of the engine. The ECM uses this sensor to monitor the fuel rail pressure.

OPERATION

FUEL PRESSURE SENSOR

Review the high pressure fuel system warning. See **WARNING**.

The fuel flows to the fuel pressure sensor through an opening in the rail, the end of which is sealed off by the sensor diaphragm. Pressurized fuel reaches the sensor's diaphragm through a blind hole. The sensor element

(semiconductor device) converts the pressure to an electric signal is mounted on this diaphragm. The signal generated by the sensor is monitored by the ECM.

REMOVAL

FUEL PRESSURE SENSOR

1. Disconnect negative battery cable.
2. Remove engine cover.

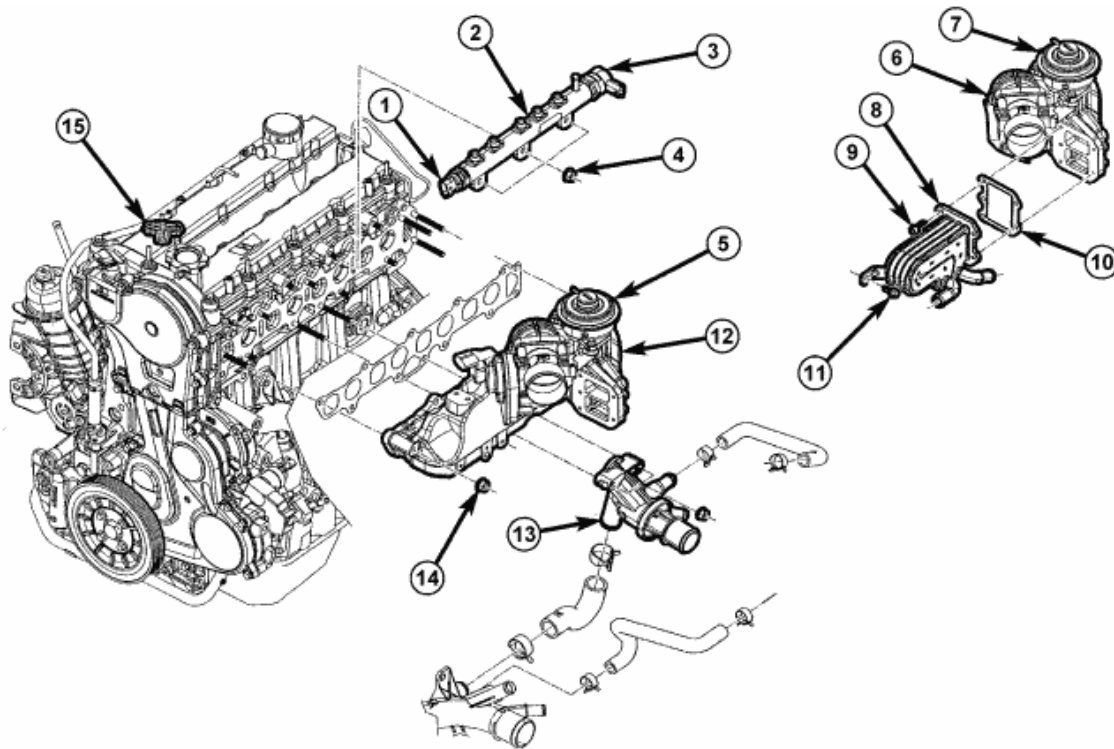
WARNING: High pressure fuel spray can cause severe cuts, and is extremely flammable. Before opening any part of the high pressure fuel system, wait for a minimum of 30 seconds after turning off the engine to allow pressure to bleed down from the high pressure side of the fuel system. Otherwise severe personal injury can result when the high pressure fuel system is opened.

WARNING: No sparks, open flames or smoking. Risk of poisoning from inhaling and swallowing fuel. Risk of injury to eyes and skin from contact with fuel. Pour fuels only into suitable and appropriately marked containers. Wear protective clothing.

NOTE: Do allow cleaning solvent or debris to enter the fuel pressure sensor harness connector.

3. Clean the area around the fuel pressure sensor with Mopar® Throttle Body Cleaner P/N 04897156AA or equivalent degreasing solvent and compressed air.
4. Disconnect fuel pressure sensor electrical connector.

WARNING: When working with parts on the high side of the fuel injection system such as the fuel rail and high pressure injector lines, slowly loosen the part to allow any residual pressure to bleed down from the high pressure side of the system.



81b2ac70

Fig. 73: FUEL RAIL - 2.8L DIESEL
 Courtesy of CHRYSLER LLC

NOTE: Do not touch the connector terminals of the fuel rail pressure sensor. The internal electronic components of the sensor can be damaged.

5. Remove fuel pressure sensor (1) from fuel rail.
6. If the sensor is to be reused, remove the fuel rail pressure sensor sealing ring. Do not damage or gouge the fuel rail pressure sensor threads. If any gouges or cuts are present in the fuel rail pressure sensor threads, the sensor must be replaced. Otherwise, fuel leaks can occur.

NOTE: Do not allow dirt or debris to enter the fuel rail and fuel rail solenoid threads after the fuel pressure solenoid has been removed from the fuel rail.

7. Clean the thread and fuel pressure sensor sealing surface of the fuel rail.
8. Use a clean plug to close off the fuel rail pressure sensor opening if the fuel pressure solenoid will not be immediately reinstalled.

INSTALLATION

FUEL PRESSURE SENSOR

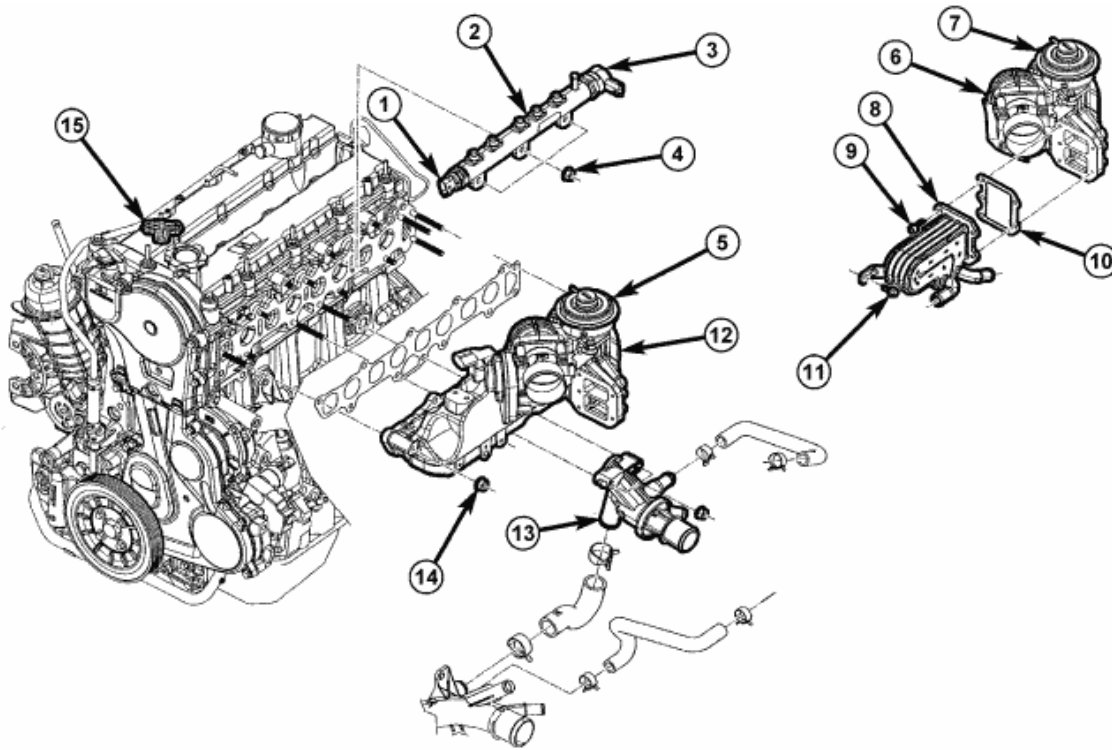
WARNING: Diesel fuel is under extreme pressure in the high pressure side of the fuel

This exploded view diagram illustrates the assembly of a 1.6L engine. The main engine block is shown on the left, with various components numbered for identification. The components include:

- 1: Intake manifold
- 2: Intake manifold gasket
- 3: Intake manifold bolt
- 4: Intake manifold nut
- 5: Water pump
- 6: Water pump gasket
- 7: Water pump housing
- 8: Water pump pulley
- 9: Water pump bracket
- 10: Water pump bracket gasket
- 11: Water pump bracket bolt
- 12: Water pump housing gasket
- 13: Water pump pulley bolt
- 14: Water pump pulley nut
- 15: Water pump pulley

1. If reusing an existing fuel pressure sensor, install a new fuel pressure sensor sealing ring.
2. Lubricate the fuel pressure sensor threads and sealing ring with clean diesel fuel.
3. Install fuel pressure sensor (1) in fuel rail (2). Position the fuel rail pressure sensor so the harness connector is not stretched or under tension. Tighten sensor to 100 N.m (73 ft. lbs.).
4. Connect fuel pressure sensor electrical connector.
5. Install engine cover.
6. Connect negative battery cable.

FUEL PRESSURE SOLENOID



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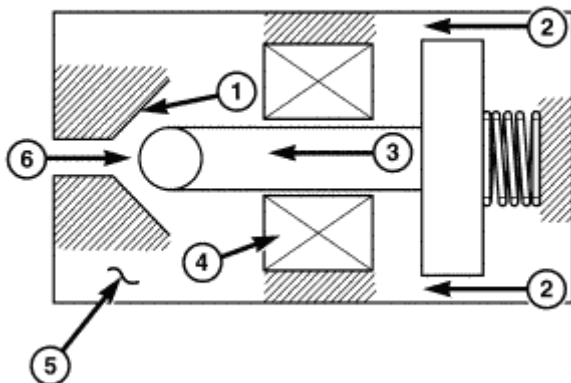
Fig. 75: FUEL RAIL PRESSURE SOLENOID

Courtesy of CHRYSLER LLC

The fuel pressure solenoid (3) is attached to the rear of the fuel rail (2). The tip of the fuel pressure solenoid (3) uses a knife edge, for metal to metal sealing. The knife edge actually deforms the metal in the fuel rail in order to seal the surfaces. The solenoid must be replaced when ever it is removed from the rail. The solenoid controls and maintains constant rail pressure with a control current transmitted by the engine control module (ECM).

OPERATION

FUEL PRESSURE SOLENOID



80a1a220

Fig. 76: FUEL PRESSURE SOLENOID OPERATION
Courtesy of CHRYSLER LLC

- 1 - BALL SEAT
 - 2 - SPRING FORCE
 - 3 - MAGNETIC FORCE
 - 4 - COIL
 - 5 - FUEL PRESSURE SOLENOID
 - 6 - HIGH PRESSURE SUPPLY

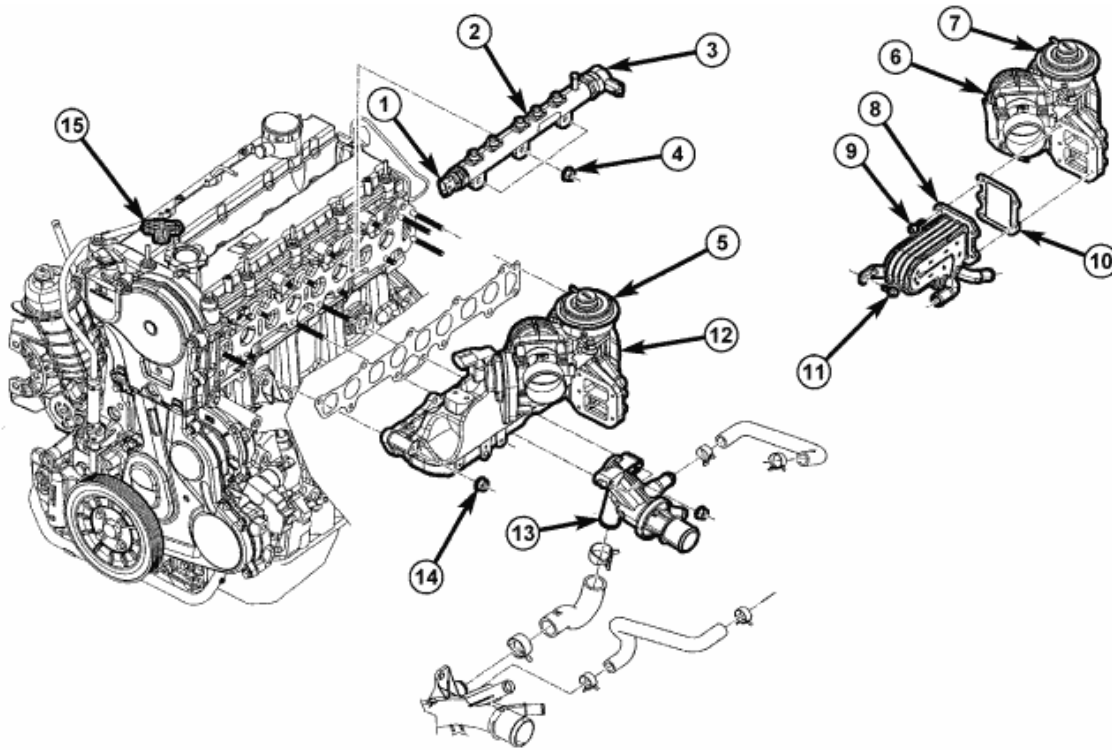
High pressure which is present in the fuel rail flows to the ball seat (1) of the pressure solenoid. The specified pressure required by the system is built up in the rail by the fuel pressure solenoid building up a magnetic force which corresponds to this specific pressure by means of a control current from the Electronic Control Module (ECM). This magnetic force equals a certain outlet cross section at the ball seat of the valve. The rail pressure is altered as a result of the quantity of fuel which flows off. The current fuel pressure is signaled by the fuel rail pressure sensor to the engine control module (ECM). The controlled fuel flows back along the return fuel line, into the tank.

In a de-energized state, the fuel pressure solenoid is closed as the spring force (2) presses the ball into the ball seat. When driving, the fuel pressure solenoid is constantly open. When engine is started, the fuel pressure solenoid is held closed by magnetic force. When driving, the pressure of the fluid counteracts the magnetic force of the coil and the slight spring force.

REMOVAL

FUEL PRESSURE SOLENOID

Review the high pressure fuel system warning before beginning repair. See **WARNING**.



81b2ac70

Fig. 77: FUEL RAIL PRESSURE SOLENOID

Courtesy of CHRYSLER LLC

WARNING: High pressure fuel spray can cause severe cuts, and is extremely flammable. Before opening any part of the high pressure fuel system, wait for a minimum of 30 seconds after turning off the engine to allow pressure to bleed down from the high pressure side of the fuel system. Otherwise severe personal injury can result when the high pressure fuel system is opened.

WARNING: No sparks, open flames or smoking. Risk of poisoning from inhaling and swallowing fuel. Risk of injury to eyes and skin from contact with fuel. Pour fuels only into suitable and appropriately marked containers. Wear protective clothing.

1. Disconnect negative battery cable.

NOTE: Do allow cleaning solvent or debris to enter the fuel pressure solenoid harness connector.

2. Clean the area around the fuel pressure solenoid with Mopar® Throttle Body Cleaner P/N 04897156AA or equivalent degreasing solvent and compressed air.
3. Disconnect the fuel pressure solenoid harness connector.

WARNING: When working with parts on the high side of the fuel injection system such as the fuel rail and high pressure injector lines, slowly loosen the part to allow any residual pressure to bleed down from the high pressure side of the system.

4. Remove fuel rail. See **REMOVAL**.
5. Clamp fuel rail (2) securely in vise with protective jaws.

CAUTION: Once removed, the solenoid must always be replaced. Do not reuse a fuel pressure solenoid that has been installed in the fuel rail.

6. Counterhold the fuel rail and unscrew the fuel pressure solenoid (3).

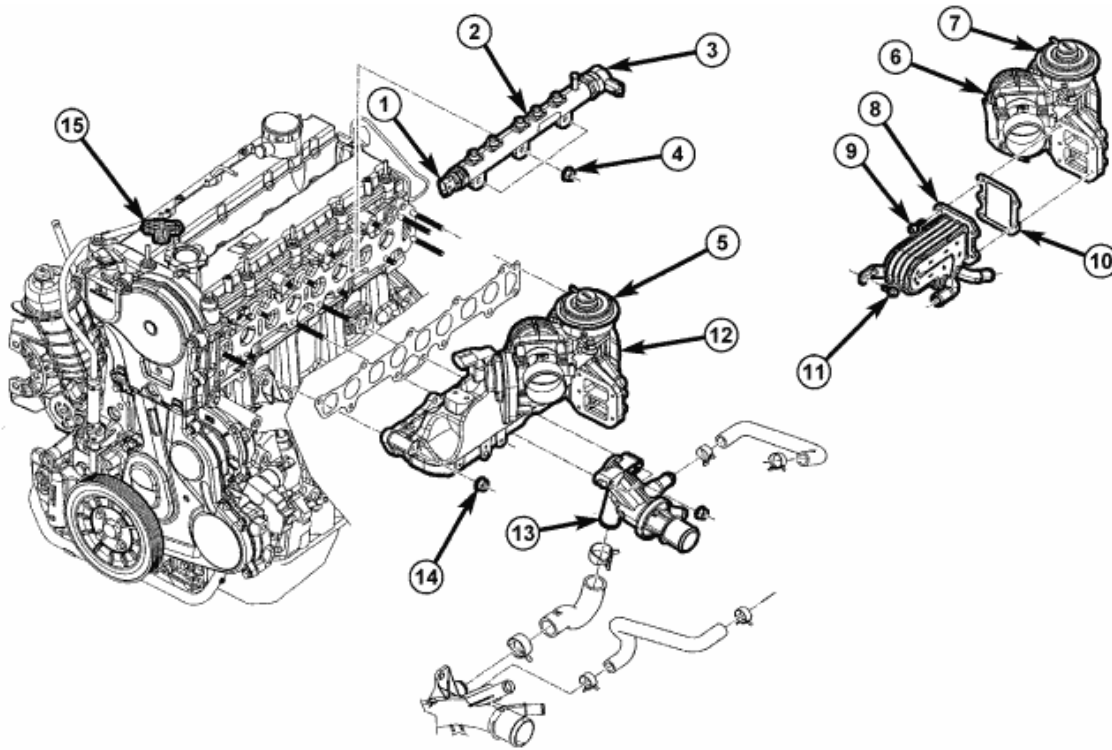
NOTE: Do not allow dirt or debris to enter the fuel rail and fuel rail solenoid threads after the fuel pressure solenoid has been removed from the fuel rail.

7. Use a clean plug to close off the fuel rail pressure solenoid opening if the fuel pressure solenoid will not be immediately reinstalled.

INSTALLATION

FUEL PRESSURE SOLENOID

Review the high pressure fuel system warning before beginning repair. See **WARNING**.



81b2ac70

Fig. 78: FUEL RAIL PRESSURE SOLENOID

Courtesy of CHRYSLER LLC

WARNING: Before working on an open fuel system, eliminate any source of sparks or open flames near the work area, and do not smoke. Wash diesel fuel off skin as soon as possible to avoid the risk of poisoning from inhaling and swallowing fuel. Do not allow diesel fuel to come in contact with eyes, otherwise, severe injury can result from contact with fuel. Pour fuels only into suitable and appropriately marked containers. Wear protective clothing whenever possible to avoid injury.

CAUTION: There is a special tightening procedure for the fuel rail solenoid that must be followed along with the proper use of a torque wrench. Therefore the fuel rail must be removed before installing the fuel pressure solenoid.

CAUTION: Do not reuse an existing fuel pressure solenoid. A new fuel pressure solenoid must be installed any time the existing solenoid has been removed from the fuel rail.

1. Position the fuel rail (2) into a soft jawed vise.
2. Inspect the sealing surfaces of the fuel pressure solenoid opening in the fuel rail. If any cuts or gouges are present in the fuel rail pressure solenoid opening, replace the fuel rail.
3. Lubricate the fuel pressure solenoid sealing rings with clean diesel fuel. Do not allow dirt or debris to come in contact with the fuel rail solenoid or the threads in the fuel rail.

4. Manually thread the fuel pressure solenoid (3) into the fuel rail until hand tight.
5. Position the fuel pressure solenoid electrical socket so the fuel pressure solenoid harness connector is not under stress. Otherwise, the connector or harness can be damaged.
6. Counterhold the fuel rail, and tighten the fuel rail solenoid (3) as follows:
 - Tighten the fuel pressure solenoid to 60 N.m (44 ft. lbs.)
 - Loosen the fuel pressure solenoid 90 degrees.
 - Retighten the fuel pressure solenoid to 85 N.m (62 ft. lbs.).
7. Install fuel rail. See **INSTALLATION**.
8. Connect negative battery cable.
9. Start engine, allow to warm, turn engine off and inspect for leaks. See **DIAGNOSIS AND TESTING**.

SOLENOID - FUEL QUANTITY

DESCRIPTION

FUEL QUANTITY SOLENOID

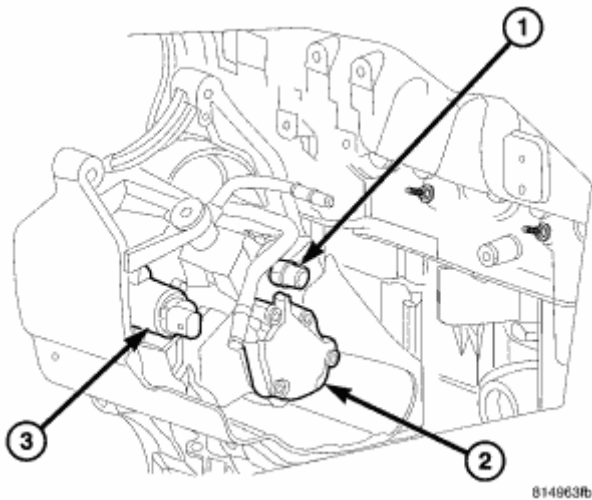


Fig. 79: Fuel Quantity Solenoid
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FUEL SUPPLY TO FUEL RAIL
2 - HIGH PRESSURE FUEL PUMP
3 - FUEL QUANTITY SOLENOID |
|---|

The fuel quantity solenoid is located in the back of the high pressure pump. The solenoid is pulse width modulated by the ECM and meters the amount of fuel that flows into the high pressure elements inside of the high pressure pump. The solenoid is also inactive during the first 30 seconds to allow maximum fuel pressure to the fuel rail during start up. See **Fig. 79**.

OPERATION

FUEL QUANTITY SOLENOID

The fuel quantity solenoid is a pulse width modulated valve that controls the amount of fuel sent or delayed to the high pressure pump elements inside of the high pressure pump. The ECM determines the fuel pressure set point based on engine sensor inputs. If the actual fuel rail pressure is too low, the ECM commands the solenoid to allow more fuel to flow to the high pressure pump. This minimizes the difference between the actual fuel rail pressure reading and the set point. The ECM will also operate the solenoid, delaying fuel if the fuel rail pressure becomes too high.

The fuel quantity solenoid is commanded open by the ECM to allow the high pressure pump to build maximum pressure (1600 BAR, 23,200 PSI). See **WARNING**. The solenoid also has fuel tank heat protection function that meters the exact amount of fuel to prevent excess heated fuel from returning to the fuel tank

REMOVAL

FUEL QUANTITY SOLENOID

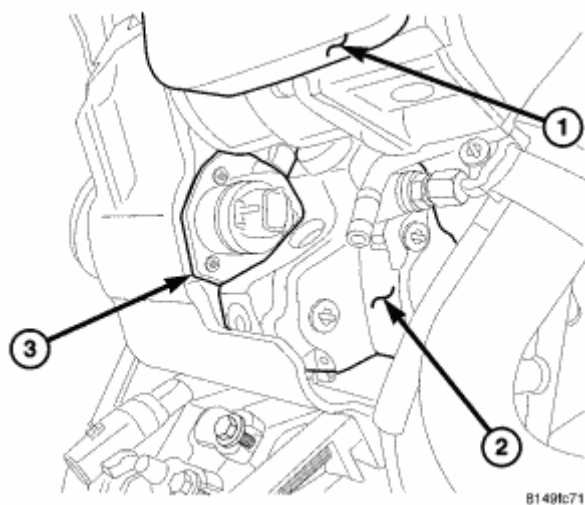


Fig. 80: Fuel Quantity Solenoid, Air Control Valve & Supply Pump
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - EGR AIR CONTROL VALVE2 - GEAR SUPPLY PUMP3 - FUEL QUANTITY SOLENOID |
|---|

1. Disconnect the negative battery cable
2. Remove the charge air inlet hose.
3. Disconnect the fuel quantity solenoid wiring harness connector.
4. Remove the solenoid from the back of the high pressure pump. See **Fig. 80**.

NOTE: **Inspect the fuel quantity solenoid and high pressure pump passage for contamination or corrosion. If contamination or corrosion is present replace the high pressure pump.**

5. Inspect solenoid and pump for corrosion.

INSTALLATION

FUEL QUANTITY SOLENOID

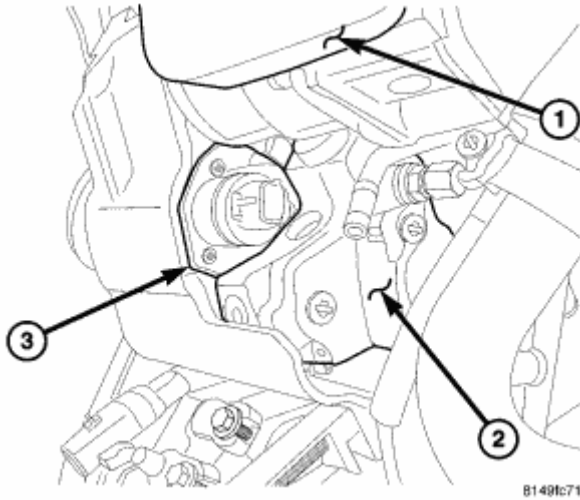


Fig. 81: Fuel Quantity Solenoid, Air Control Valve & Supply Pump
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - EGR AIR CONTROL VALVE2 - GEAR SUPPLY PUMP3 - FUEL QUANTITY SOLENOID |
|---|

1. Review the high pressure fuel system warning. See **WARNING**.
2. Lubricate the fuel quantity solenoid and seal with clean diesel fuel.
3. Install the solenoid into the high pressure pump, hand tighten the fasteners. See **Fig. 81**.
4. Torque the solenoid fasteners to 10.8 N.m (96 in. lbs.).
5. Connect the wiring harness connector.
6. Install the charge air inlet hose.
7. Start engine, allow to warm, shut engine off and inspect for leaks.

FUEL INJECTION - GAS

PEDAL - ACCELERATOR

REMOVAL

ACCELERATOR PEDAL - WITHOUT ACCELERATOR PEDAL POSITION SENSOR

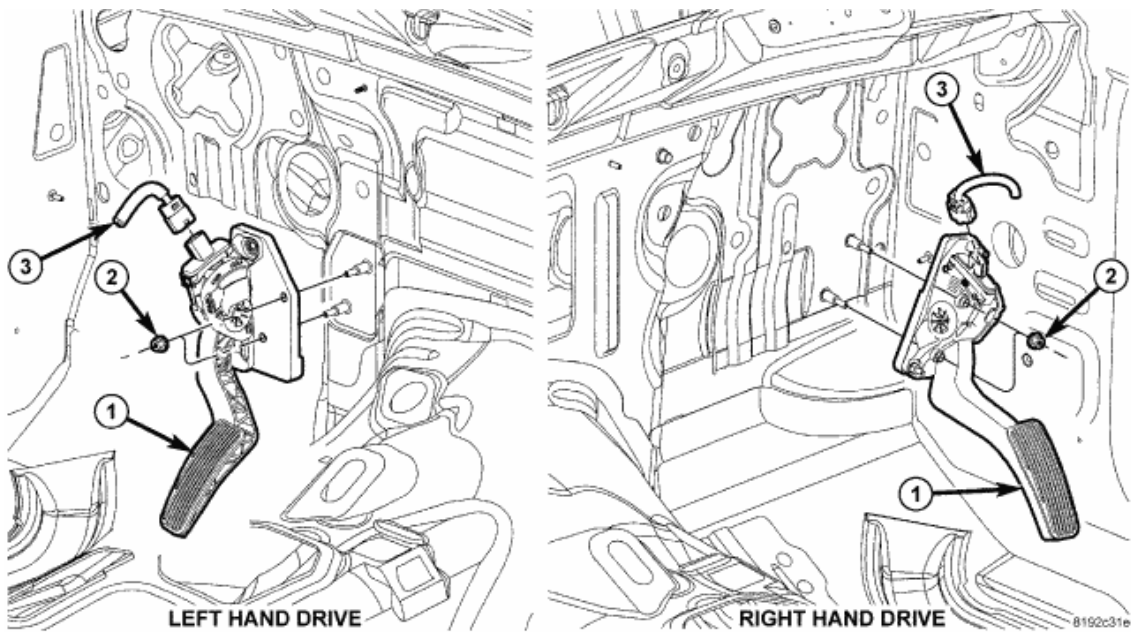


Fig. 82: ACCELERATOR PEDAL/APPS

Courtesy of CHRYSLER LLC

The accelerator pedal and APPS (Accelerator Pedal Position Sensor) are serviced as a complete assembly including the bracket.

1. Disconnect electrical connector (3) at APPS.
2. Remove two accelerator pedal mounting bracket nuts (2).
3. Remove accelerator pedal/APPS assembly (1) from vehicle.

INSTALLATION

ACCELERATOR PEDAL - WITHOUT ACCELERATOR PEDAL POSITION SENSOR

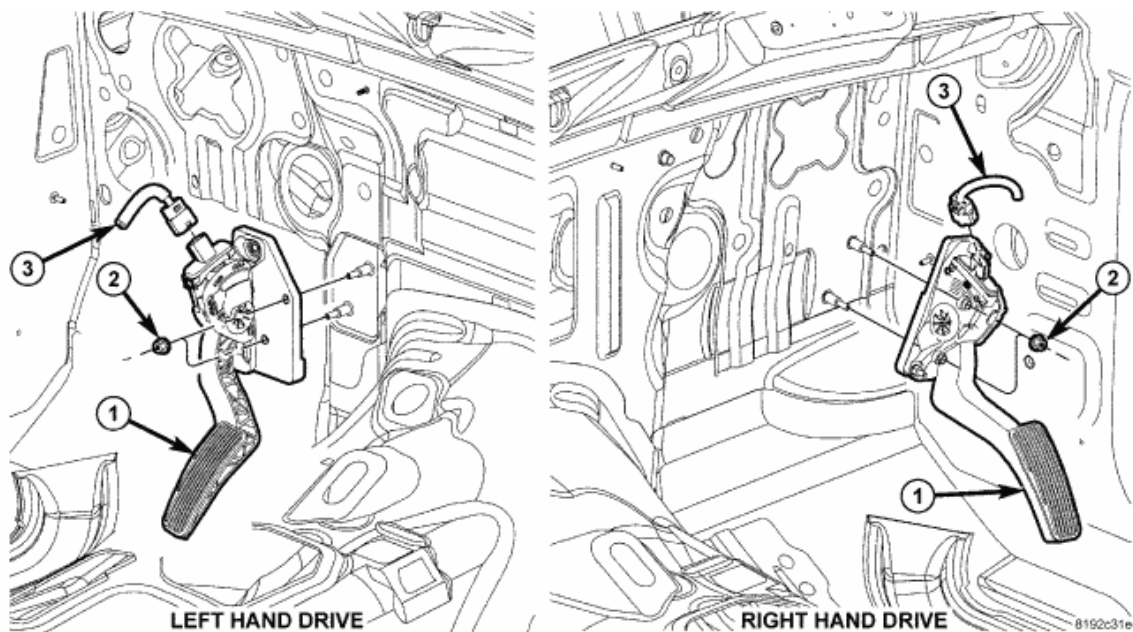


Fig. 83: ACCELERATOR PEDAL/APPS

Courtesy of CHRYSLER LLC

The accelerator pedal and APPS (Accelerator Pedal Position Sensor) are serviced as a complete assembly including the bracket.

1. Position accelerator pedal/APPS assembly over two mounting studs.
2. Install two accelerator pedal mounting bracket nuts (2).
3. Connect electrical connector (3) at APPS.
4. Before starting engine, operate accelerator pedal to check for any binding.

SENSOR - ACCELERATOR PEDAL POSITION

DESCRIPTION

DESCRIPTION

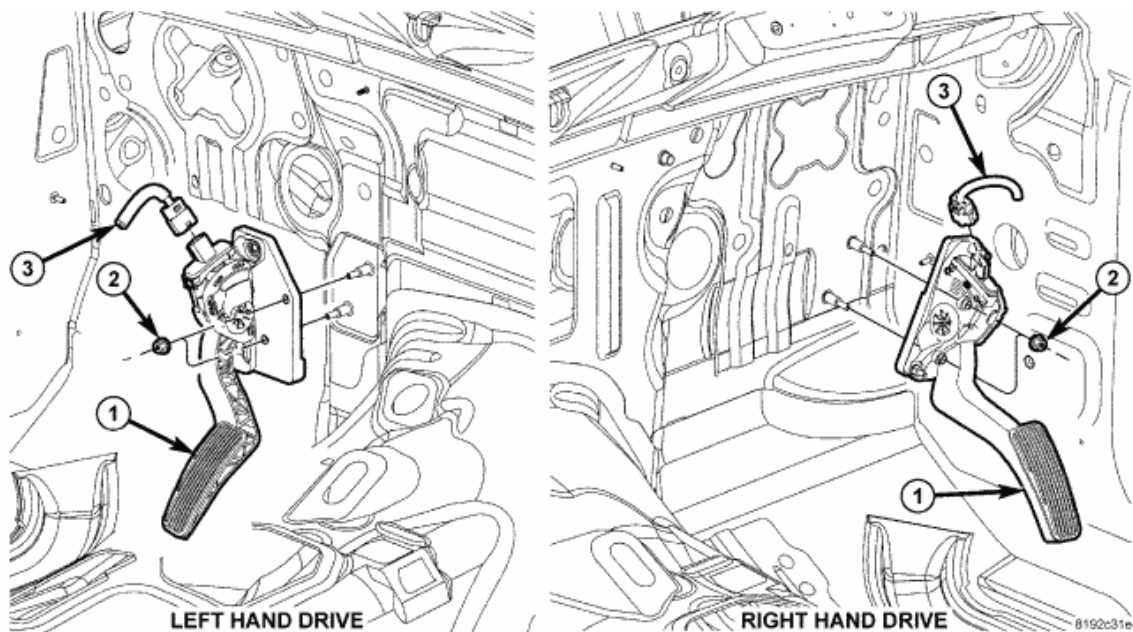


Fig. 84: ACCELERATOR PEDAL/APPS

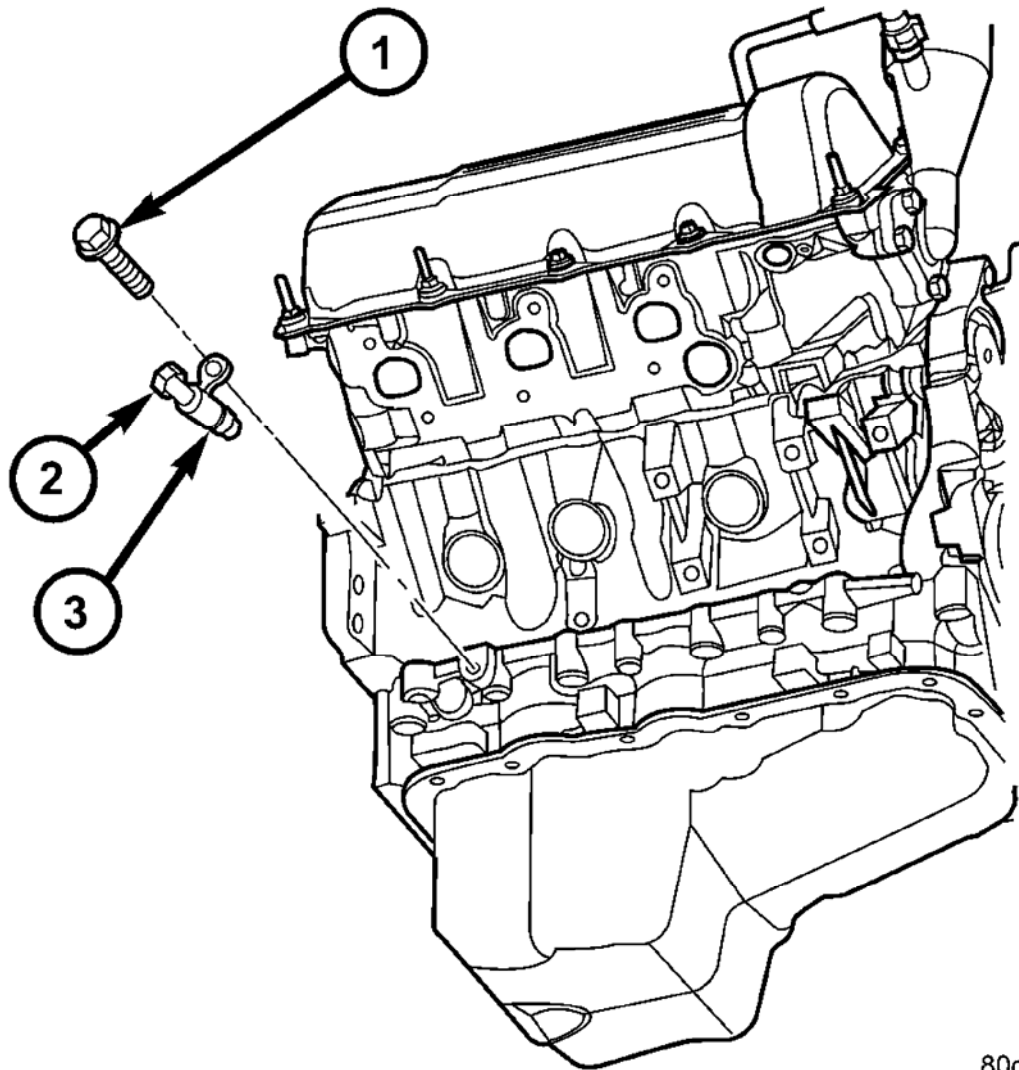
Courtesy of CHRYSLER LLC

The accelerator pedal and APPS (Accelerator Pedal Position Sensor) are serviced as a complete assembly including the bracket. Refer to **SENSOR - ACCELERATOR PEDAL POSITION** .

SENSOR-CRANKSHAFT POSITION

REMOVAL

CRANKSHAFT POSITION (CKP) SENSOR-3.7L



80cea91d

Fig. 85: Locating CKP Sensor - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - MOUNTING BOLT2 - CKP SENSOR3 - O-RING |
|---|

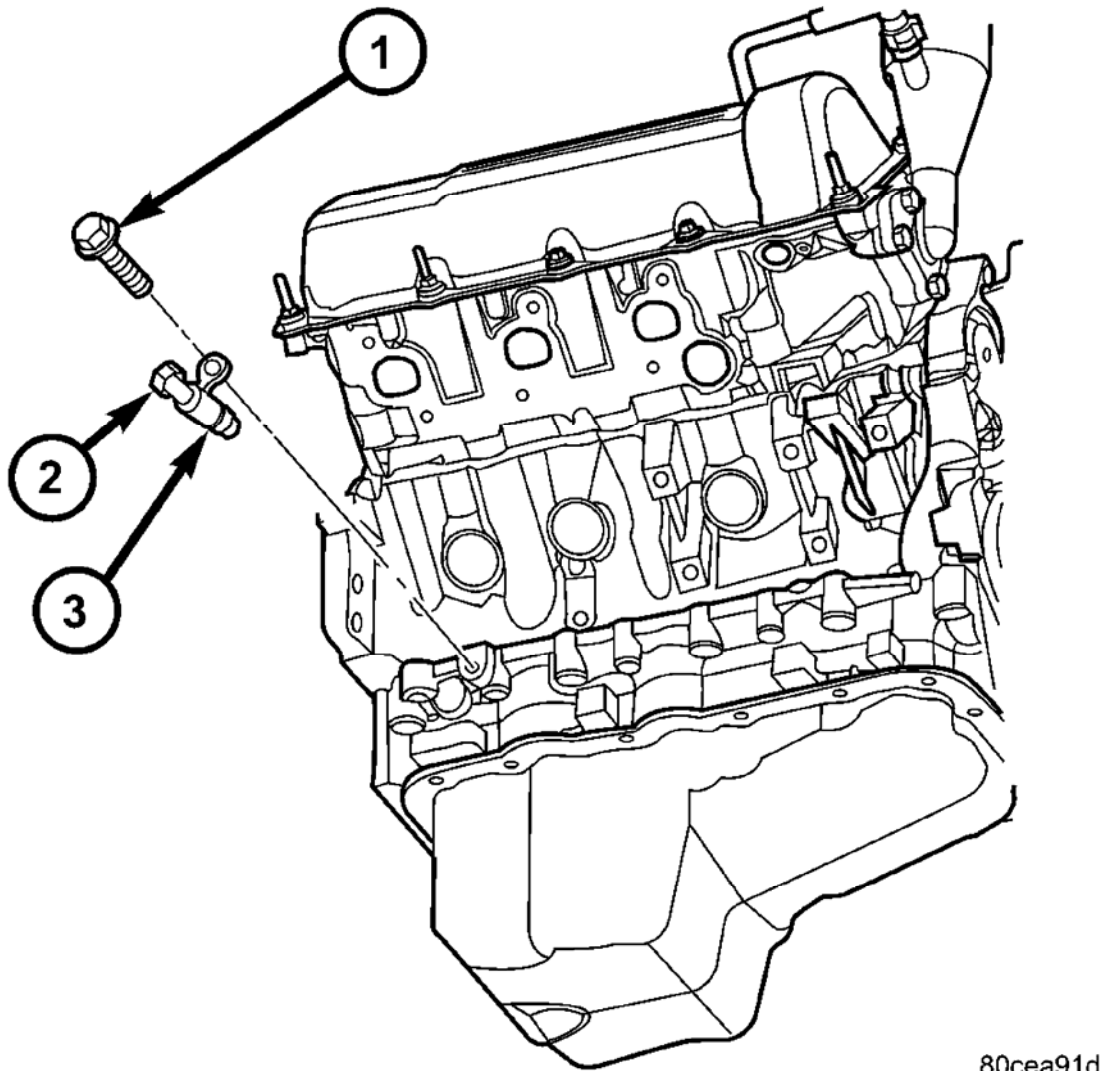
The Crankshaft Position (CKP) sensor (2) is mounted into the right rear side of the cylinder block. It is positioned and bolted into a machined hole.

1. Raise vehicle.
2. Disconnect sensor electrical connector.
3. Remove sensor mounting bolt (1).
4. Carefully twist sensor from cylinder block.

5. Check condition of sensor o-ring (3).

INSTALLATION

CRANKSHAFT POSITION (CKP) SENSOR-3.7L



80cea91d

Fig. 86: Locating CKP Sensor - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - MOUNTING BOLT
2 - CKP SENSOR
3 - O-RING |
|---|

1. Clean out machined hole in engine block.

2. Apply a small amount of engine oil to sensor o-ring (3).
3. Install sensor (2) into engine block with a slight rocking and twisting action.

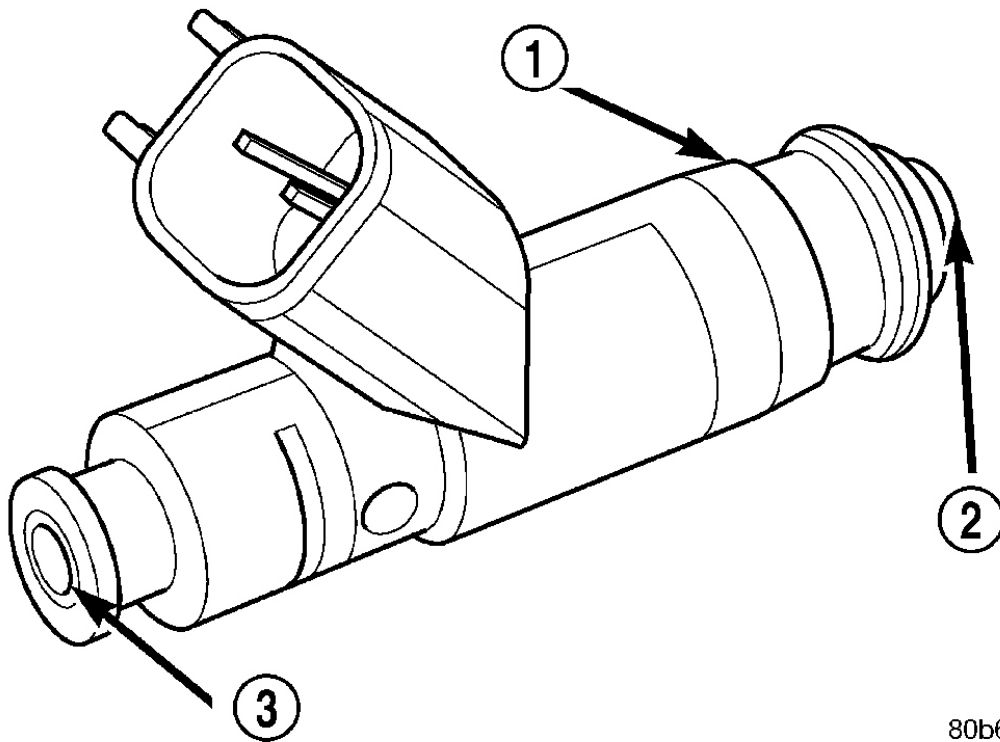
CAUTION: Before tightening sensor mounting bolt (1), be sure sensor is completely flush to cylinder block. If sensor is not flush, damage to sensor mounting tang may result.

4. Install mounting bolt (1).
5. Connect electrical connector to sensor.
6. Lower vehicle.

INJECTOR-FUEL

DESCRIPTION

FUEL INJECTORS



80b6f035

Fig. 87: Fuel Injector - Typical
Courtesy of CHRYSLER LLC

- | |
|---|
| 2 - FUEL OUTLET NOZZLE
3 - FUEL INLET NOZZLE |
|---|

An individual fuel injector (1) is used for each individual cylinder. See **Fig. 87**.

OPERATION

FUEL INJECTORS

The top (fuel entry) end of the injector is attached into an opening on the fuel rail. See **Fig. 87**.

The fuel injectors are electrical solenoids. The injector contains a pintle that closes off an orifice at the nozzle end. When electric current is supplied to the injector, the armature and needle move a short distance against a spring, allowing fuel to flow out the orifice. Because the fuel is under high pressure, a fine spray is developed in the shape of a pencil stream. The spraying action atomizes the fuel, adding it to the air entering the combustion chamber.

The nozzle (outlet) ends of the injectors are positioned into openings in the intake manifold just above the intake valve ports of the cylinder head. The engine wiring harness connector for each fuel injector is equipped with an attached numerical tag (INJ 1, INJ 2 etc.). This is used to identify each fuel injector.

The injectors are energized individually in a sequential order by the Powertrain Control Module (PCM). The PCM will adjust injector pulse width by switching the ground path to each individual injector on and off. Injector pulse width is the period of time that the injector is energized. The PCM will adjust injector pulse width based on various inputs it receives.

Battery voltage is supplied to the injectors through the ASD relay.

The PCM determines injector pulse width based on various inputs.

FUEL INJECTORS - PCM OUTPUT

The nozzle ends of the injectors are positioned into openings in the intake manifold just above the intake valve ports of the cylinder head. The engine wiring harness connector for each fuel injector is equipped with an attached numerical tag (INJ 1, INJ 2 etc.). This is used to identify each fuel injector with its respective cylinder number.

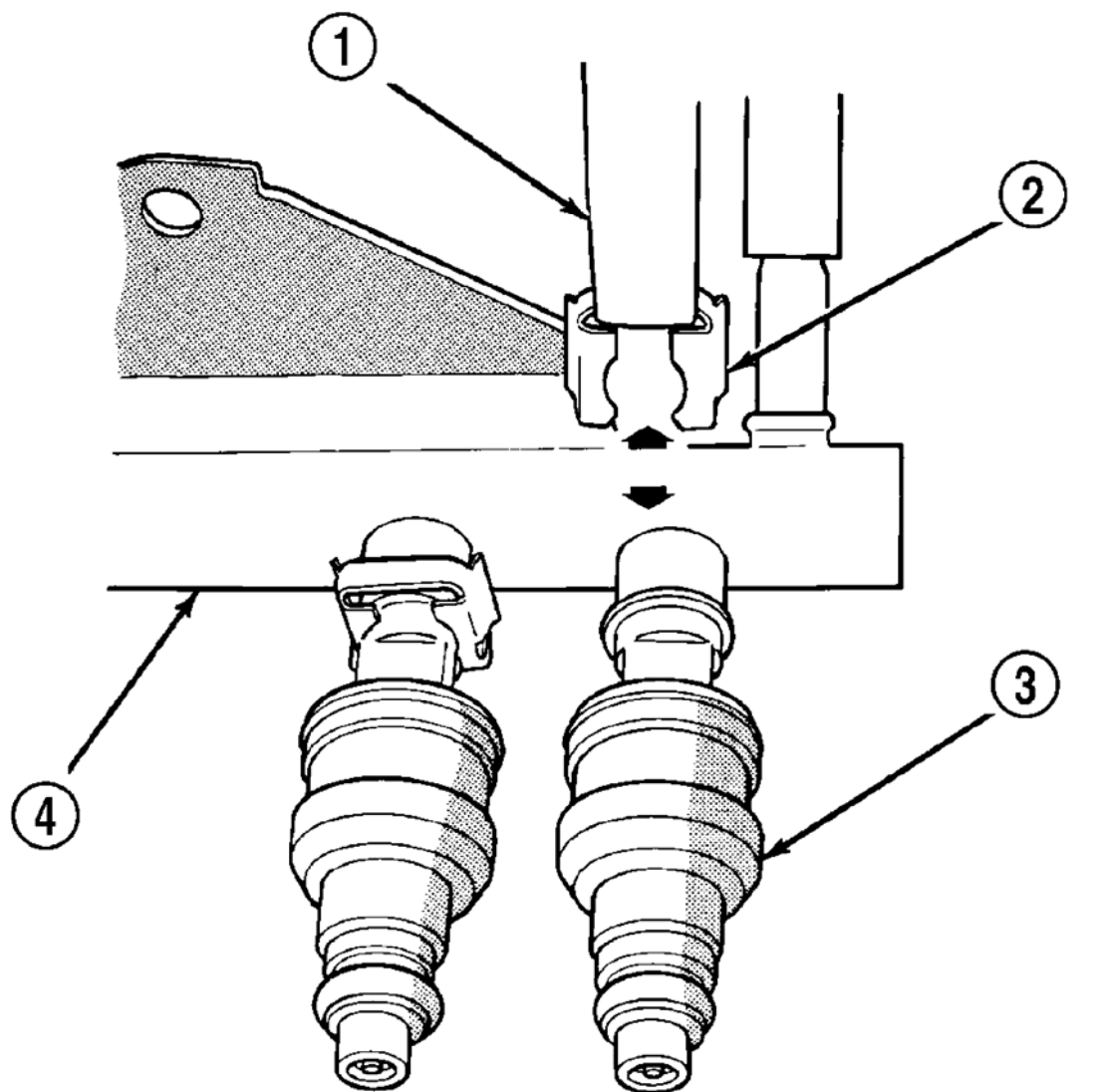
The injectors are energized individually in a sequential order by the Powertrain Control Module (PCM). The PCM will adjust injector pulse width by switching the ground path to each individual injector on and off. Injector pulse width is the period of time that the injector is energized. The PCM will adjust injector pulse width based on various inputs it receives.

Battery voltage (12 volts +) is supplied to the injectors through the ASD relay. The ASD relay will shut-down the 12 volt power source to the fuel injectors if the PCM senses the ignition is on, but the engine is not running. This occurs after the engine has not been running for approximately 1.8 seconds.

The PCM determines injector on-time (pulse width) based on various inputs.

REMOVAL

FUEL INJECTORS



J9414-156

Fig. 88: Locating Injector Retaining Clip
Courtesy of CHRYSLER LLC

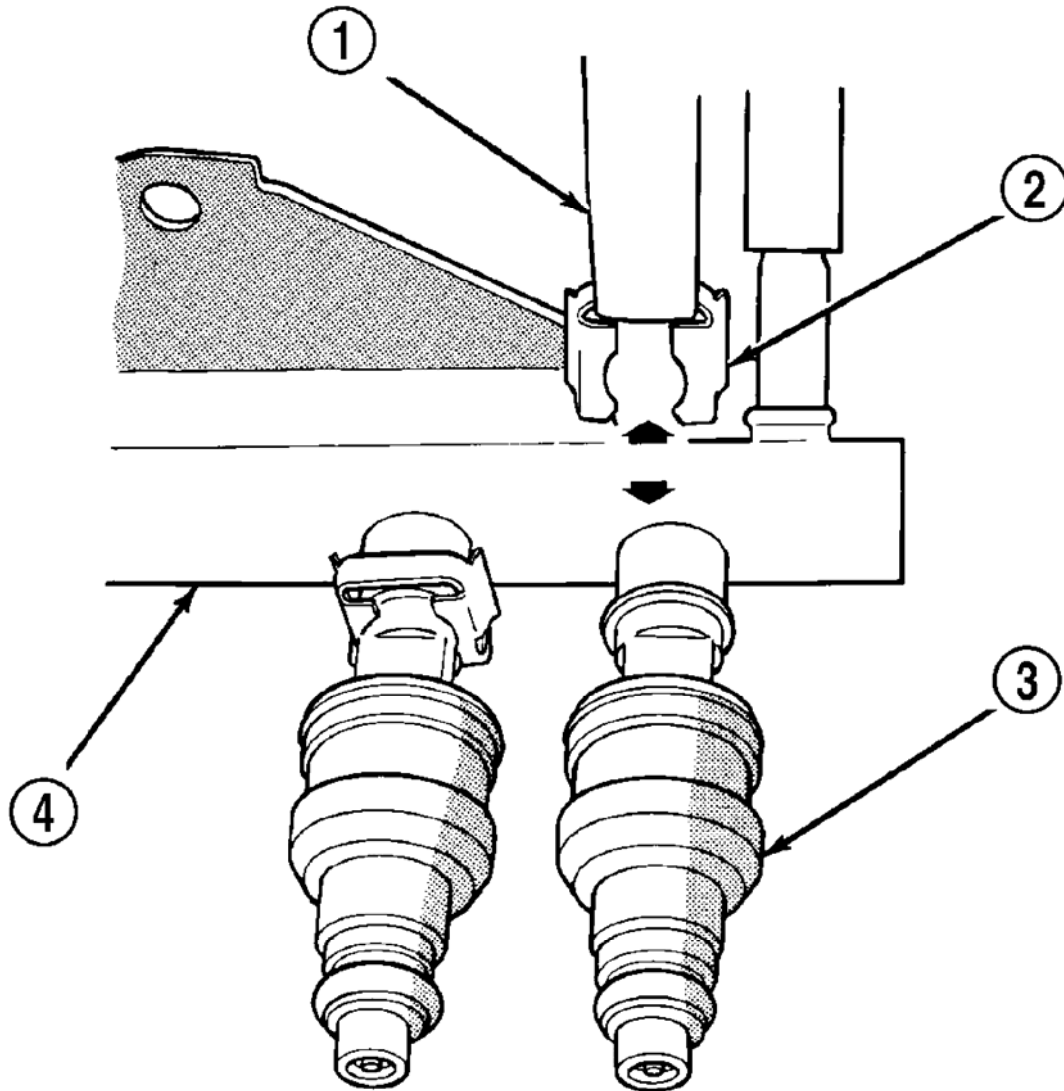
- 1 - PLIERS
- 2 - INJECTOR CLIP
- 3 - FUEL INJECTOR
- 4 - FUEL RAIL - TYPICAL

1. Remove fuel rail. See **REMOVAL**.

2. Disconnect clip(s) (2) that retain fuel injector(s) (3) to fuel rail (4). See **Fig. 88**.

INSTALLATION

FUEL INJECTORS



J9414-156

Fig. 89: Locating Injector Retaining Clip
Courtesy of CHRYSLER LLC

- 1 - PLIERS
- 2 - INJECTOR CLIP
- 3 - FUEL INJECTOR
- 4 - FUEL RAIL - TYPICAL

1. Install fuel injector(s) (3) into fuel rail assembly (4) and install retaining clip(s) (2).
2. If same injector(s) is being reinstalled, install new O-ring(s). Two different O-rings are being used. These can be easily identified by color. Install black O-ring at intake manifold end of injector. Install red/rust colored O-ring at fuel rail end of injector.
3. Apply a small amount of clean engine oil to each injector O-ring. This will aid in installation.
4. Install fuel rail. See **INSTALLATION**.
5. Start engine and check for fuel leaks.

RELAY-FUEL PUMP

DESCRIPTION

FUEL PUMP RELAY

This vehicle is not equipped with a fuel pump relay. The fuel pump control is done through the TIPM. The TIPM receives an input signal from the PCM. Once the TIPM receives the signal, it will output a 12 volt supply to the fuel pump module turning the pump on.

SENSOR-INTAKE AIR TEMPERATURE

REMOVAL

REMOVAL - 3.7L

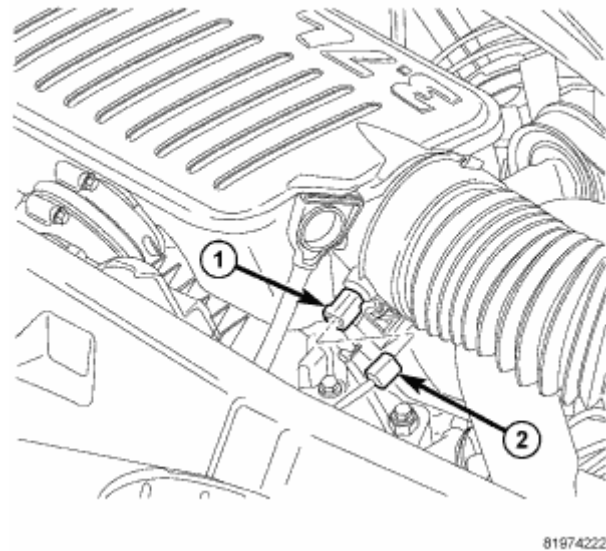


Fig. 90: IAT SENSOR - 3.7L
Courtesy of CHRYSLER LLC

The intake manifold air temperature (IAT) sensor (1) is installed into the rubber air intake tube near the throttle body.

1. Disconnect electrical connector (2) from IAT sensor.
2. Clean dirt from IAT sensor base.
3. Pull out on IAT sensor (1) while rotating for removal.
4. Check condition of sensor O-ring.

INSTALLATION

INSTALLATION - 3.7L

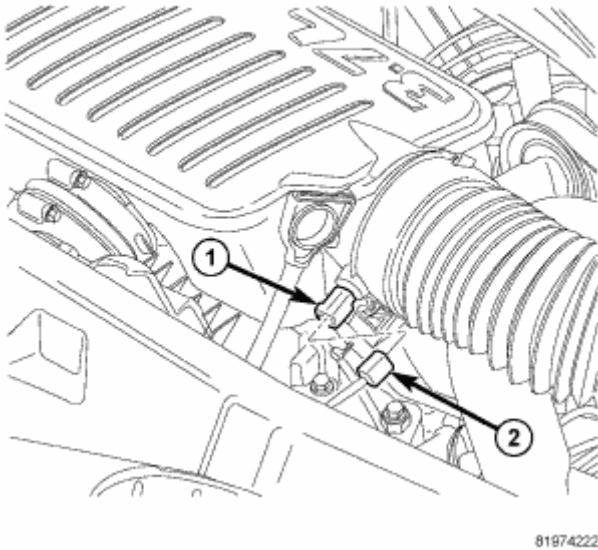


Fig. 91: IAT SENSOR - 3.7L
Courtesy of CHRYSLER LLC

The intake manifold air temperature (IAT) sensor (1) is installed into the rubber air intake tube near the throttle body.

1. Clean mounting hole.
2. Check condition of sensor O-ring.
3. Push IAT sensor (1) into rubber intake tube while rotating for installation.
4. Connect electrical connector (2) to IAT sensor.

SENSOR-MANIFOLD AIR PRESSURE

OPERATION

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR - PCM INPUT

The MAP sensor is used as an input to the Powertrain Control Module (PCM). It contains a silicon based sensing unit to provide data on the manifold vacuum that draws the air/fuel mixture into the combustion chamber. The PCM requires this information to determine injector pulse width and spark advance. When

manifold absolute pressure (MAP) equals Barometric pressure, the pulse width will be at maximum.

A 5 volt reference is supplied from the PCM and returns a voltage signal to the PCM that reflects manifold pressure. The zero pressure reading is 0.5V and full scale is 4.5V. For a pressure swing of 0-15 psi, the voltage changes 4.0V. To operate the sensor, it is supplied a regulated 4.8 to 5.1 volts. Ground is provided through the low-noise, sensor return circuit at the PCM.

The MAP sensor input is the number one contributor to fuel injector pulse width. The most important function of the MAP sensor is to determine barometric pressure. The PCM needs to know if the vehicle is at sea level or at a higher altitude, because the air density changes with altitude. It will also help to correct for varying barometric pressure. Barometric pressure and altitude have a direct inverse correlation; as altitude goes up, barometric goes down. At key-on, the PCM powers up and looks at MAP voltage, and based upon the voltage it sees, it knows the current barometric pressure (relative to altitude). Once the engine starts, the PCM looks at the voltage again, continuously every 12 milliseconds, and compares the current voltage to what it was at key-on. The difference between current voltage and what it was at key-on, is manifold vacuum.

During key-on (engine not running) the sensor reads (updates) barometric pressure. A normal range can be obtained by monitoring a known good sensor.

As the altitude increases, the air becomes thinner (less oxygen). If a vehicle is started and driven to a very different altitude than where it was at key-on, the barometric pressure needs to be updated. Any time the PCM sees Wide Open Throttle (WOT), and RPM, it will update barometric pressure in the MAP memory cell. With periodic updates, the PCM can make its calculations more effectively.

The PCM uses the MAP sensor input to aid in calculating the following:

- Manifold pressure
- Barometric pressure
- Engine load
- Injector pulse-width
- Spark-advance programs
- Shift-point strategies (certain automatic transmissions only)
- Idle speed
- Decel fuel shutoff

The MAP sensor signal is provided from a single piezoresistive element located in the center of a diaphragm. The element and diaphragm are both made of silicone. As manifold pressure changes, the diaphragm moves causing the element to deflect, which stresses the silicone. When silicone is exposed to stress, its resistance changes. As manifold vacuum increases, the MAP sensor input voltage decreases proportionally. The sensor also contains electronics that condition the signal and provide temperature compensation.

The PCM recognizes a decrease in manifold pressure by monitoring a decrease in voltage from the reading stored in the barometric pressure memory cell. The MAP sensor is a linear sensor; meaning as pressure changes, voltage changes proportionately. The range of voltage output from the sensor is usually between 4.6 volts at sea level to as low as 0.3 volts at 26 in. of Hg. Barometric pressure is the pressure exerted by the atmosphere upon an object. At sea level on a standard day, no storm, barometric pressure is approximately 29.92 in Hg. For every

100 feet of altitude, barometric pressure drops 0.10 in. Hg. If a storm goes through, it can change barometric pressure from what should be present for that altitude. You should know what the average pressure and corresponding barometric pressure is for your area.

REMOVAL

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR

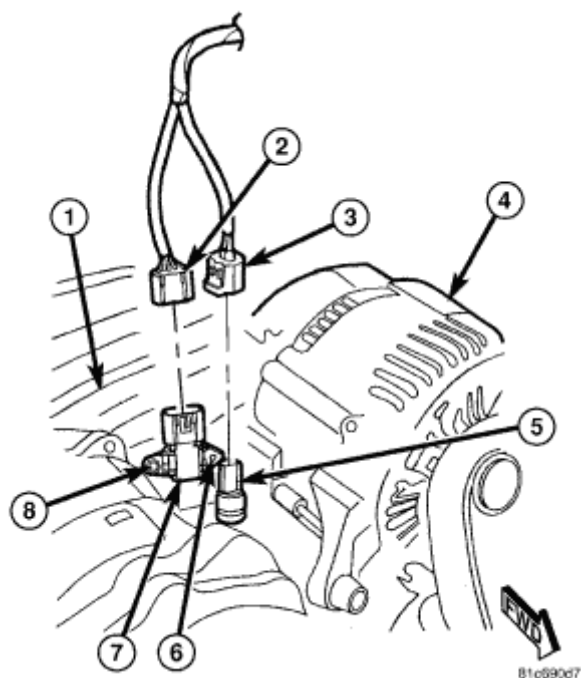
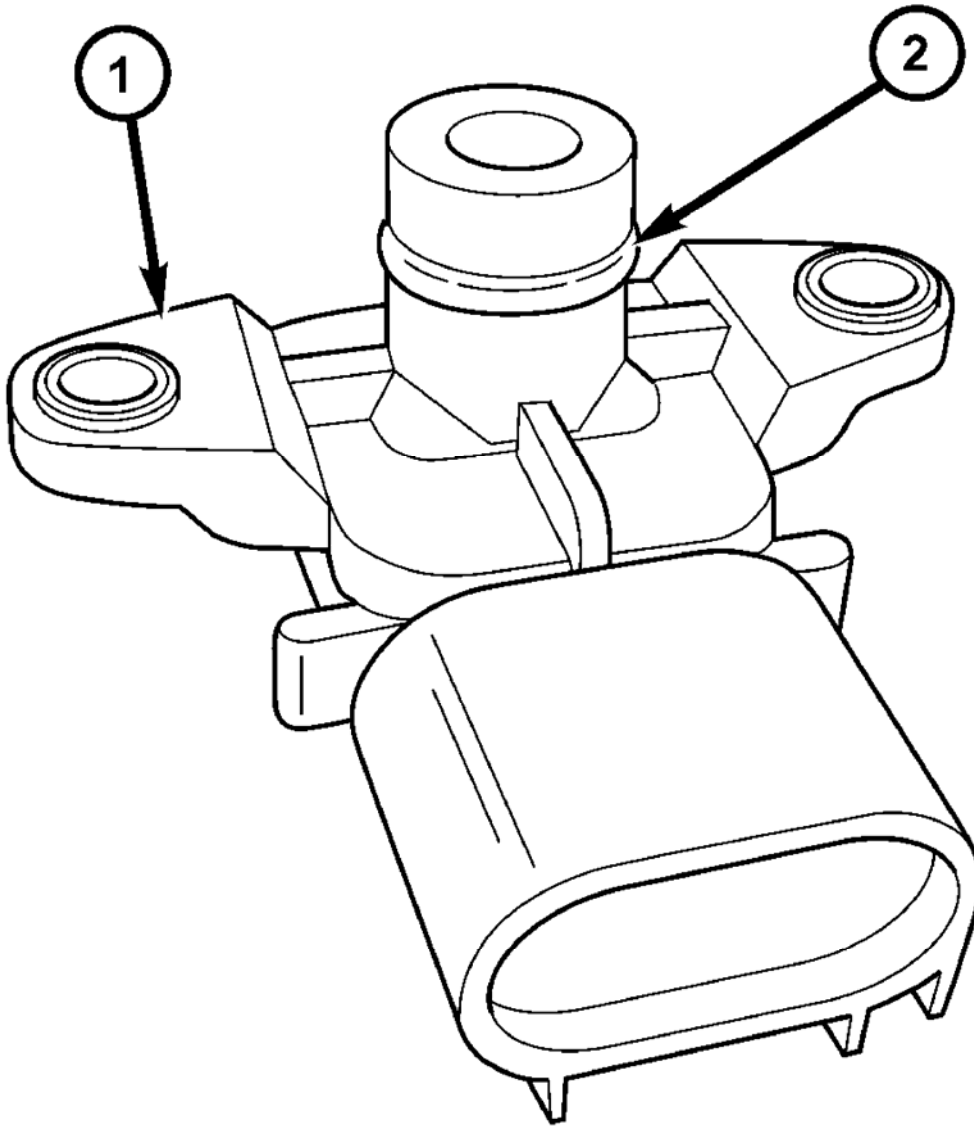


Fig. 92: MAP SENSOR LOCATION 3.7L
Courtesy of CHRYSLER LLC

The Manifold Absolute Pressure (MAP) sensor (7) is mounted into the front of the intake manifold (1).

1. Disconnect electrical connector (2) at sensor.
2. Clean area around MAP sensor.
3. Remove one sensor mounting screw (8).
4. Remove MAP sensor from intake manifold by slipping it from locating pin (6).



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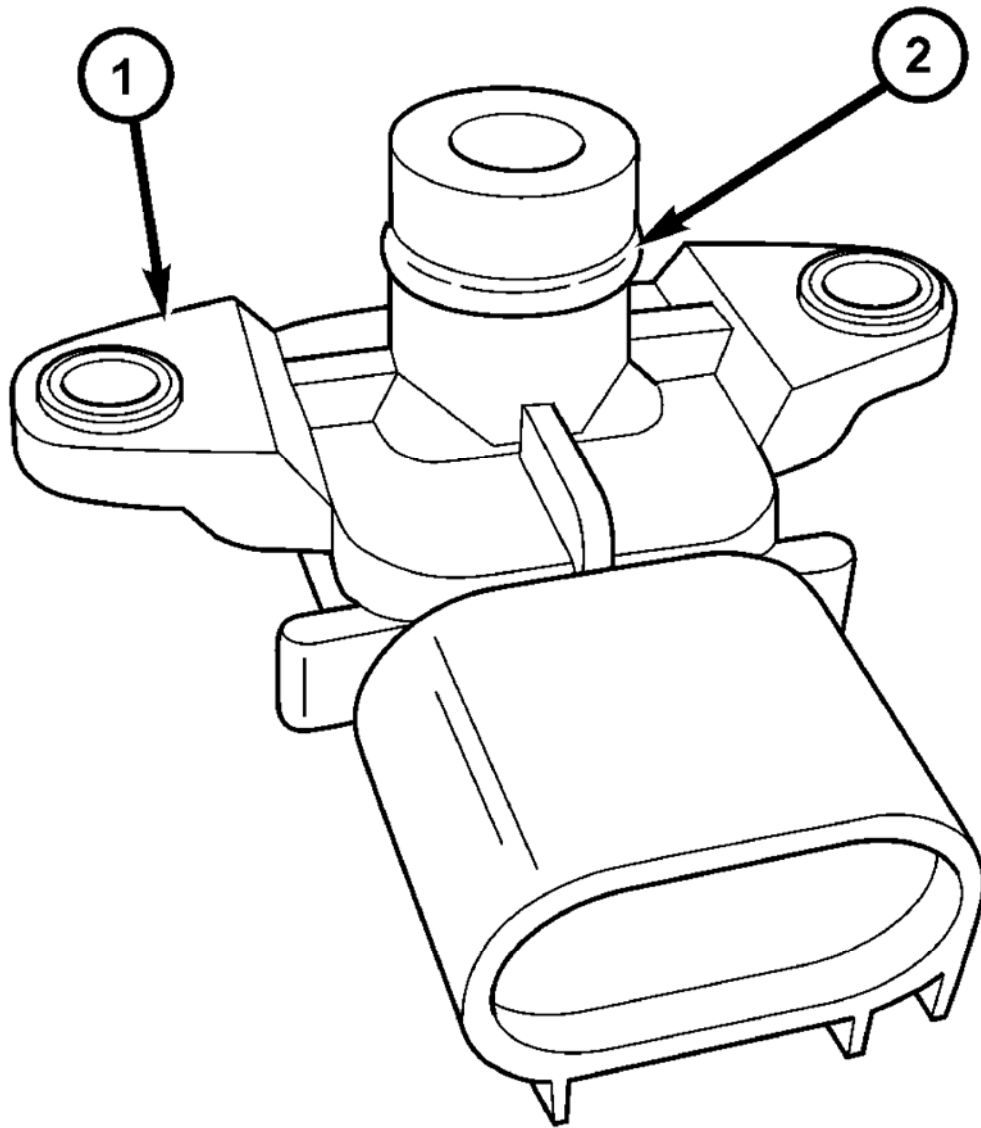
Fig. 93: Locating MAP Sensor O-Ring - 3.7L/4.7L
Courtesy of CHRYSLER LLC

1 - MAP SENSOR 2 - O-RING

5. Check condition of sensor o-ring (2)

INSTALLATION

MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR



80c91461

Fig. 94: Locating MAP Sensor O-Ring - 3.7L/4.7L
Courtesy of CHRYSLER LLC

1 - MAP SENSOR
2 - O-RING

1. Clean MAP sensor mounting hole at intake manifold.
2. Check MAP sensor o-ring seal (2) for cuts or tears.

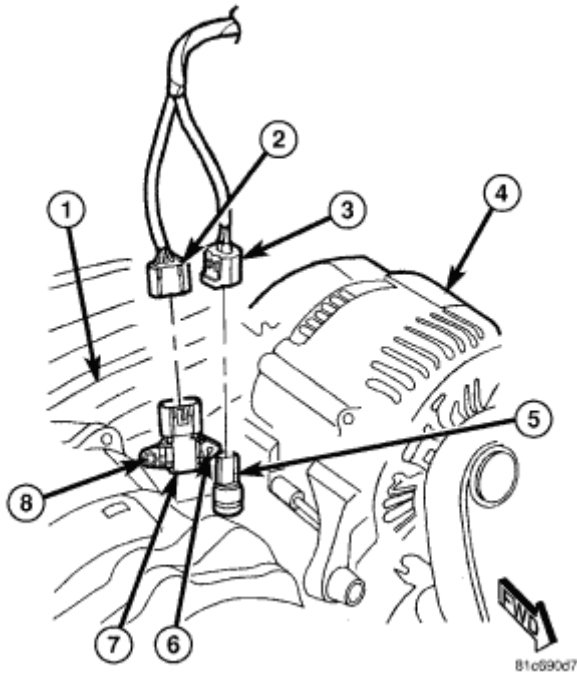


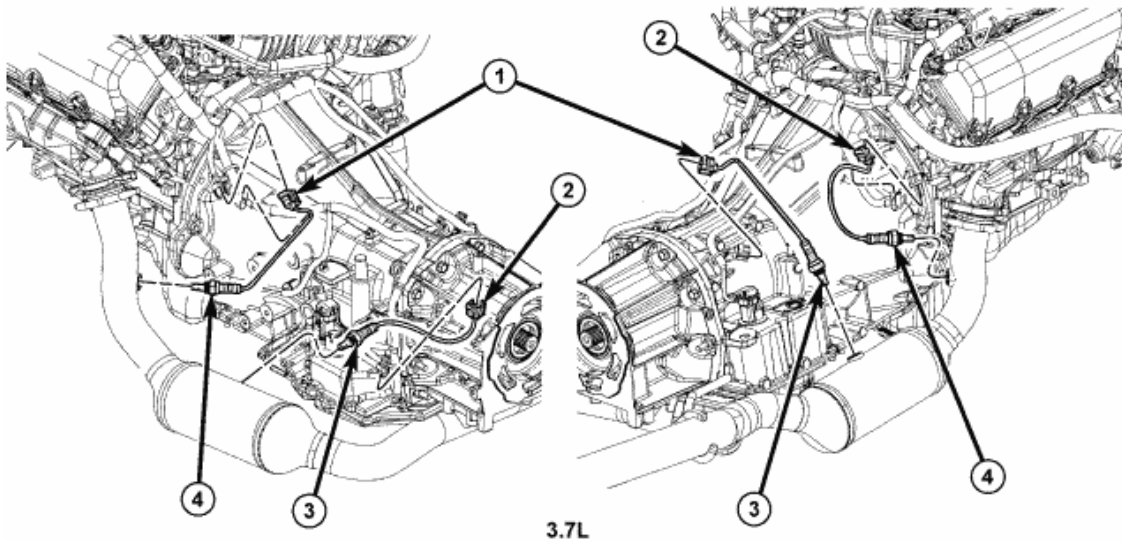
Fig. 95: MAP SENSOR LOCATION 3.7L/4.7L
Courtesy of CHRYSLER LLC

3. Position MAP sensor into manifold by sliding sensor over locating pin (6).
4. Install mounting bolt (8). Tighten to 3 N.m (25 in. lbs.) torque.
5. Connect electrical connector (2).

SENSOR - OXYGEN

REMOVAL

REMOVAL - 3.7L



819736fe

Fig. 96: OXYGEN SENSORS - 3.7L
Courtesy of CHRYSLER LLC

CAUTION: Never apply any type of grease to the oxygen sensor electrical connector, or attempt any soldering of the sensor wiring harness.

WARNING: The exhaust manifold, exhaust pipes and catalytic converter become very hot during engine operation. Allow engine to cool before removing oxygen sensor.

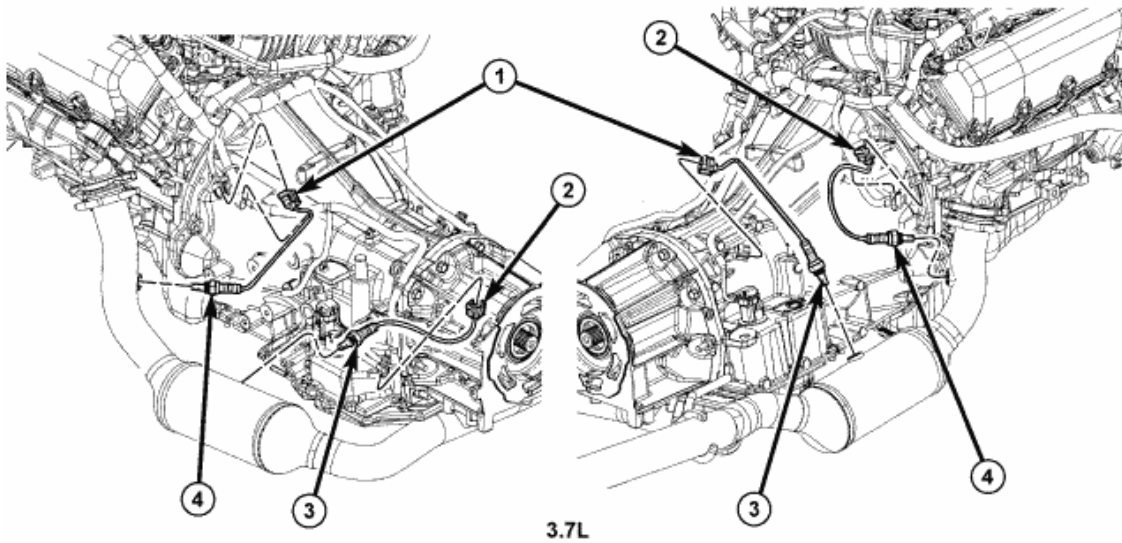
1. Raise and support vehicle.
2. Disconnect wire connector from O2S sensor.

CAUTION: When disconnecting sensor electrical connector, do not pull directly on wire going into sensor.

3. Remove O2S sensor (3) or (4) with an oxygen sensor removal and installation tool.
4. Clean threads in exhaust pipe using appropriate tap.

INSTALLATION

INSTALLATION - 3.7L



819736fe

Fig. 97: OXYGEN SENSORS - 3.7L
Courtesy of CHRYSLER LLC

Threads of new oxygen sensors are factory coated with anti-seize compound to aid in removal. **DO NOT add any additional anti-seize compound to threads of a new oxygen sensor.**

1. Install O2S sensor (3) or (4). Tighten to 41 N.m (30 ft. lbs.).
2. Connect O2S sensor wire connector.
3. Lower vehicle.

BODY-THROTTLE

REMOVAL

THROTTLE BODY - 3.7L

CAUTION: Using a diagnostic scan tool, record any previous DTC's (Diagnostic Trouble Codes).

CAUTION: Never have the ignition key in the ON position when/if checking the throttle body shaft for a binding condition. This may set DTC's.

A (factory adjusted) set screw is used to mechanically limit the position of the throttle body throttle plate. **Never attempt to adjust the engine idle speed using this screw.** All idle speed functions are controlled by the Powertrain Control Module (PCM).

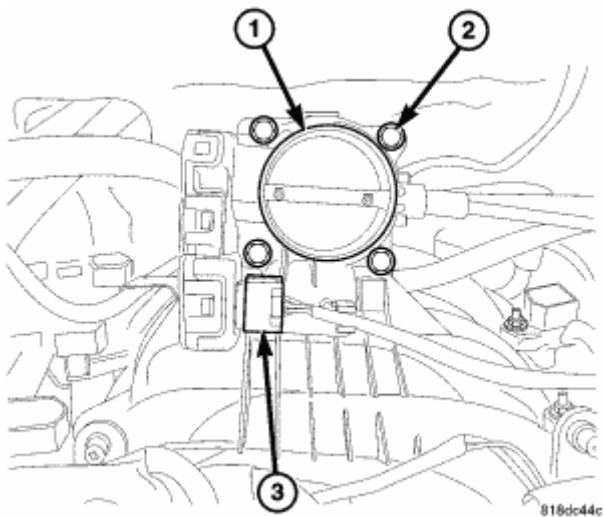


Fig. 98: Throttle Body 3.7L
Courtesy of CHRYSLER LLC

1. Disconnect and isolate negative battery cable at battery.
2. Remove air intake tube at throttle body flange (1).
3. Disconnect throttle body electrical connector (3).
4. Disconnect necessary vacuum lines at throttle body.
5. Remove four throttle body mounting bolts (2).
6. Remove throttle body from intake manifold.
7. Check condition of old throttle body-to-intake manifold o-ring.

INSTALLATION

THROTTLE BODY - 3.7L

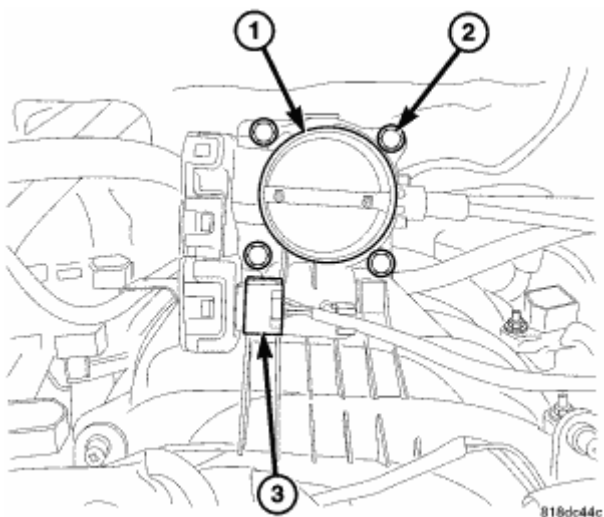


Fig. 99: Throttle Body 3.7L
Courtesy of CHRYSLER LLC

1. Check condition of throttle body-to-intake manifold O-ring. Replace as necessary.
2. Clean mating surfaces of throttle body and intake manifold.
3. Install O-ring between throttle body and intake manifold.
4. Position throttle body (1) to intake manifold.
5. Install all throttle body mounting bolts (2) finger tight.

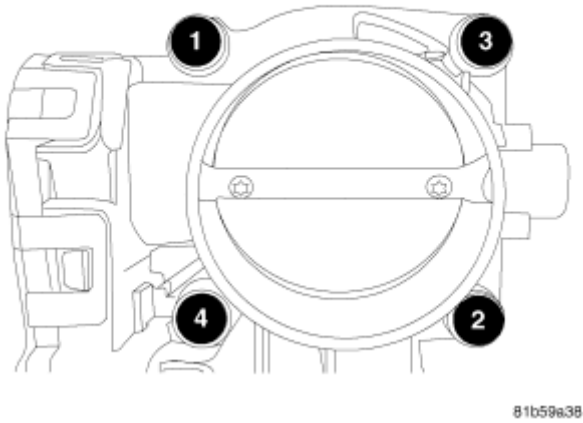


Fig. 100: Throttle Body Mandatory Torque
Courtesy of CHRYSLER LLC

CAUTION: The throttle body mounting bolts **MUST** be torqued to specifications. **DO NOT OVER TIGHTEN MOUNTING BOLTS.** Over tightening can cause damage to the throttle body, throttle plate, gaskets, bolts and/or the intake manifold. Proper torque of the mounting bolts is critical to normal operation.

6. Obtain a torque wrench. Tighten mounting bolts (as shown in graphic) in a mandatory torque crisscross pattern sequence to 7.5 N.m (65 in. lbs.).

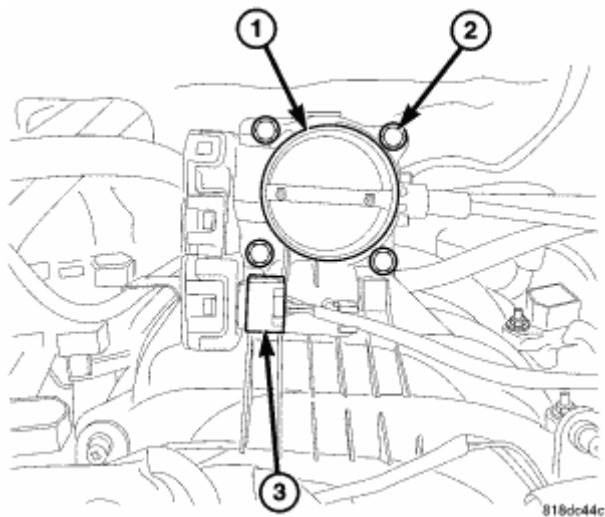


Fig. 101: Throttle Body 3.7L
Courtesy of CHRYSLER LLC

7. Install electrical connector (3).
8. Install necessary vacuum lines.
9. Install air cleaner duct at throttle body.
10. Connect negative battery cable.
11. Using the diagnostic scan tool, erase all previous DTC's and perform the ETC Relearn function.

FUEL INJECTION - 2.8L DIESEL

OPERATION

SYSTEM DIAGNOSIS

OPERATION

A leaking fuel injector can cause excessive preignition knock, poor engine performance, excessive black smoke in the exhaust, poor fuel economy and rough engine idle. If the fuel injector needle valve does not operate properly, the engine may misfire and produce low power.

The Fuel Injection System is controlled by the Engine Control Module (ECM). If the ECM senses a fault in a monitored fuel system circuit, the ECM will store a Diagnostic Trouble Code (DTC), which can be retrieved with a Scan Tool. The On-Board Diagnostic functions of the ECM must be used to test the system when diagnosing mechanical or electrical problems with the Fuel Injection System. In addition to diagnosing electrical faults, the Scan Tool has the following functions to test the mechanical operation of the injectors:

- Compression Test
- Fuel Correction Test
- Balance Test
- Kill Test

SENSOR-ACCELERATOR PEDAL POSITION

REMOVAL

ACCELERATOR PEDAL - WITHOUT ACCELERATOR PEDAL POSITION SENSOR

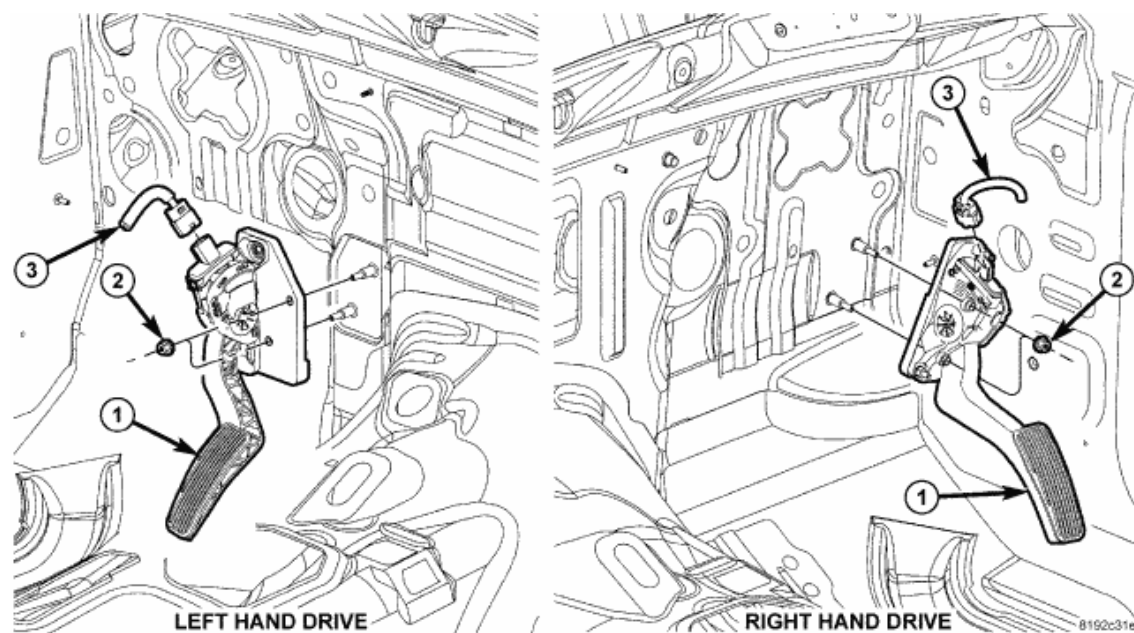


Fig. 102: ACCELERATOR PEDAL/APPS

Courtesy of CHRYSLER LLC

The accelerator pedal and APPS (Accelerator Pedal Position Sensor) are serviced as a complete assembly including the bracket.

1. Disconnect electrical connector (3) at APPS.
2. Remove two accelerator pedal mounting bracket nuts (2).
3. Remove accelerator pedal/APPS assembly (1) from vehicle.

INSTALLATION

ACCELERATOR PEDAL - WITHOUT ACCELERATOR PEDAL POSITION SENSOR

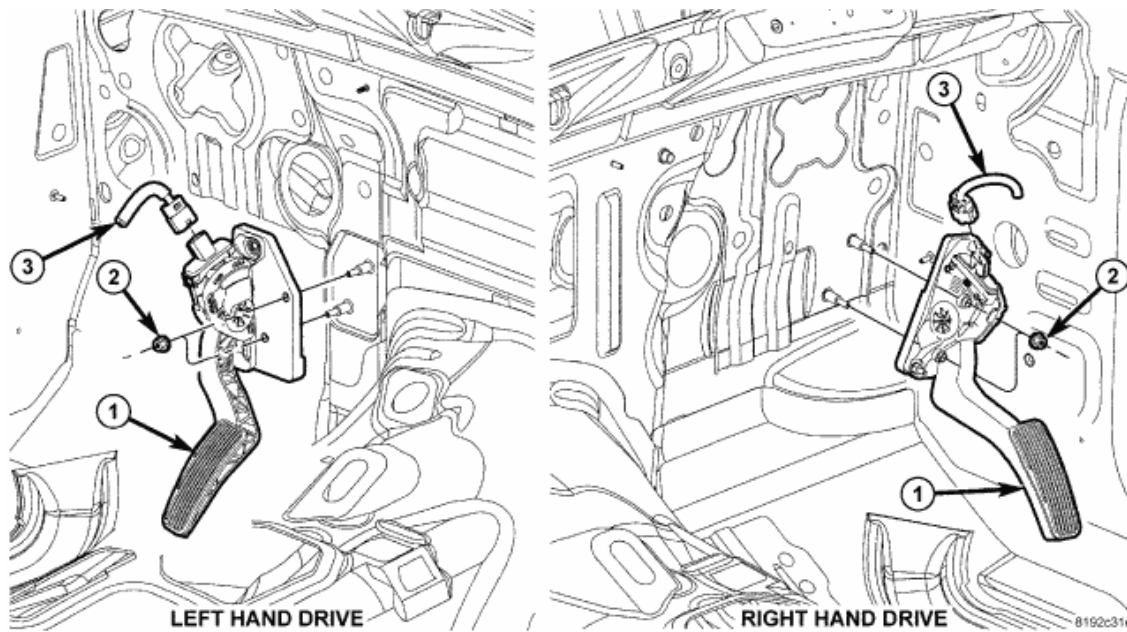


Fig. 103: ACCELERATOR PEDAL/APPS

Courtesy of CHRYSLER LLC

The accelerator pedal and APPS (Accelerator Pedal Position Sensor) are serviced as a complete assembly including the bracket.

1. Position accelerator pedal/APPS assembly over two mounting studs.
2. Install two accelerator pedal mounting bracket nuts (2).
3. Connect electrical connector (3) at APPS.
4. Before starting engine, operate accelerator pedal to check for any binding.

INJECTOR-FUEL

DESCRIPTION

FUEL INJECTOR

To control the injection valves, the new Common-Rail injectors use a rapid-action actuator made of piezo crystals, which opens and closes the injection valve. The piezo crystals expand when electrical current is applied to them, and contract when electrical current is turned off. The piezo actuator can switch up to five times faster than a standard solenoid, because the movement of the piezo crystals does not rely on mechanical components to transmit motion to the injection valve. This doubles the piezo injector's switching speed, and enables fuel to be delivered with greater precision, which leads to lower emissions and better engine performance.

STANDARD PROCEDURE

INJECTOR CLASSIFICATION

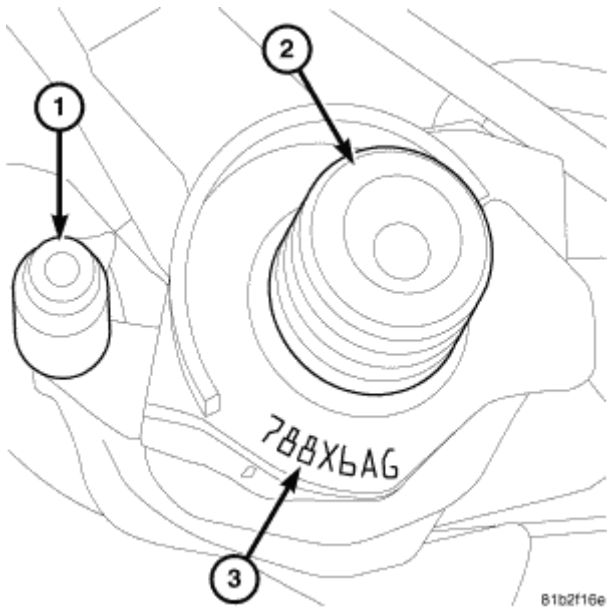


Fig. 104: FUEL INJECTOR ID NUMBER
Courtesy of CHRYSLER LLC

Each fuel injector has a alphanumeric correction code number. This correction code is printed on the upper part of the fuel injector (3) and is used to identify injector calibration. When replacing any fuel injectors, this code must be entered into the vehicles Engine Control Module (ECM) using a diagnostic scan tool. In addition, if a new ECM is installed, use a diagnostic scan tool to program all of the injector codes from the original fuel injectors into the new ECM.

The classification of injectors describes the fuel flow quantity characteristic of the injector. This will make it possible in the future to match the engine software to the tolerances of the injector within a more narrowly graduated range. Classification can be clearly recognized, and assigned only by means of a scan tool.

These general conditions equally apply if, as a result of replacing an engine, carrying out repairs to the cylinder head etc, the cylinder selective assignment of the injectors or the engine control module assignment may have changed. If proper attention is not paid to the classification on these vehicles, driveability and smoking concerns could result.

If an injector is replaced, it is then necessary to assign the classification code to the corresponding cylinder in the ECM (Engine Control Module) with the appropriate scan tool.

INJECTOR CLASSIFICATION PROCEDURE

1. Turn ignition switch "ON".
2. Using the diagnostic scan tool, select ENGINE then MISCELLANEOUS.
3. Select LEARN INJECTORS.
4. Using the up and down arrows, scroll to the appropriate injector.
5. Using the right and left arrows, set injector to proper classification code.
6. Once injectors are classified, cycle ignition key to complete.

REMOVAL

REMOVAL

CAUTION: Due to the complexity of the fuel injection system used on this engine, service any fuel system DTCs prior to replacing any fuel injectors. If no DTCs are present, refer to the appropriate Diesel Engine Diagnostic Test for Lack of Engine Power, and perform all steps as directed prior to replacing any fuel injectors.

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new parts, lubricate them with clean engine oil or clean diesel fuel only.

1. Disconnect negative battery cable at battery. Isolate end of cable.
2. Remove dress-up cover from top of engine.
3. Remove the high-pressure fuel lines from fuel rail to fuel injectors. Refer to **REMOVAL** .

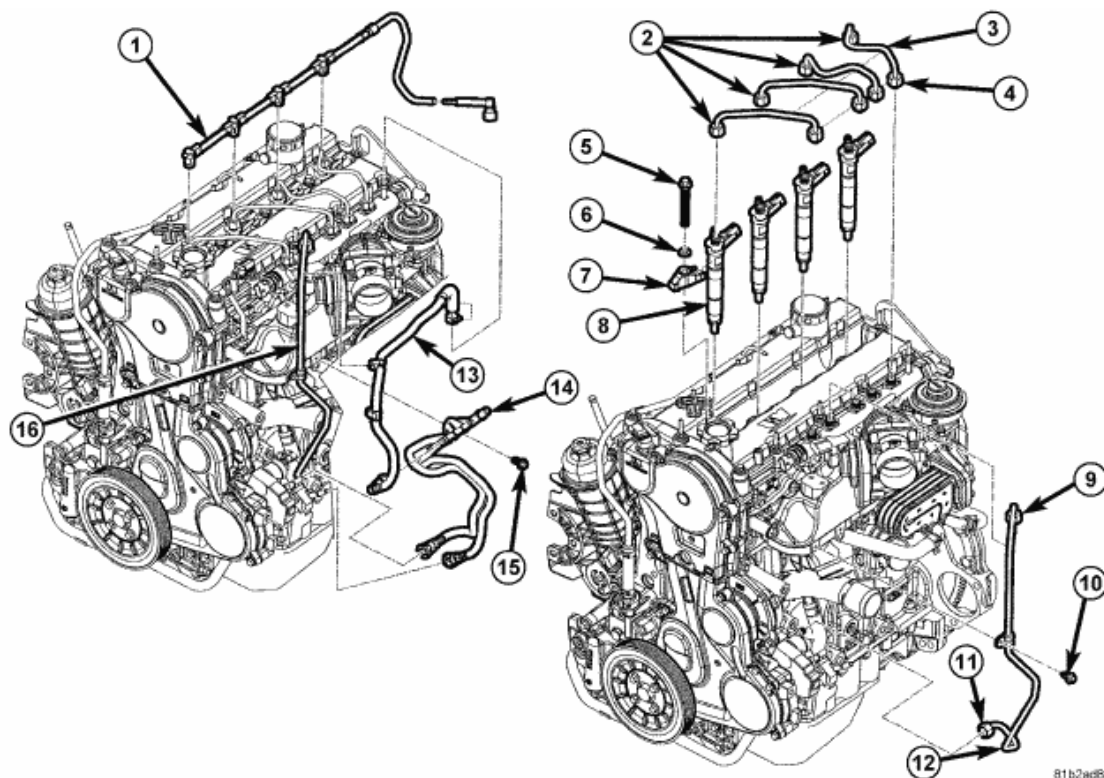


Fig. 105: FUEL INJECTORS - 2.8L DIESEL
Courtesy of CHRYSLER LLC

4. Locate common fuel return line (1).

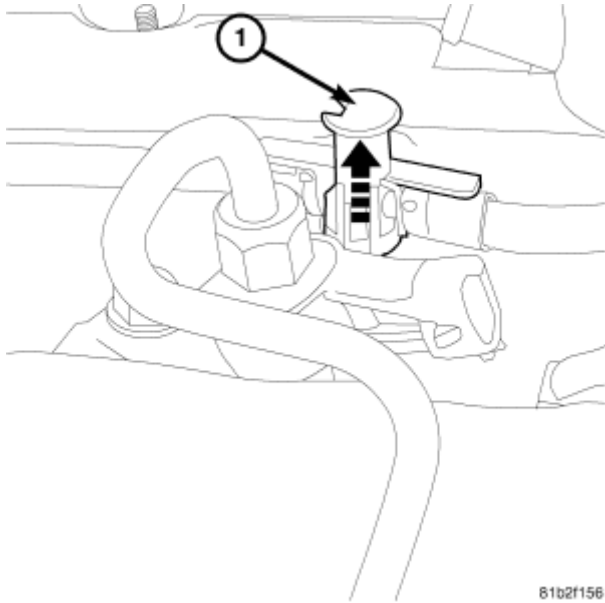
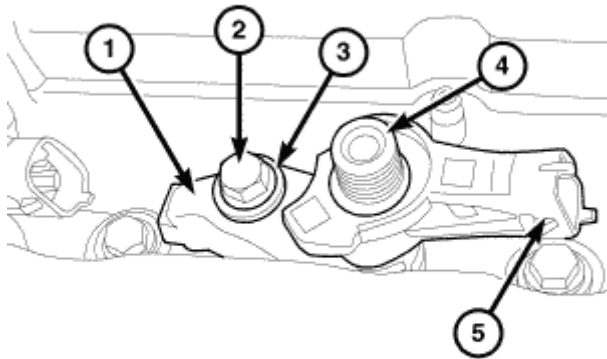


Fig. 106: RETURN LINE LOCK BUTTON UP
Courtesy of CHRYSLER LLC

5. Disconnect electrical connector at top of injector(s).

NOTE: The injector common fuel return line is connected to the low pressure fuel circuit (5 bar/72 psi).

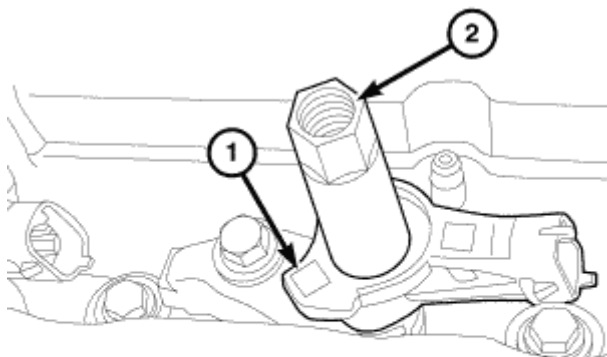
6. A lock button (1) is used to secure the common fuel return line to each fuel injector. Use your fingers to lift all four lock buttons (1) up. After unlocking all four buttons, lift fuel return line assembly up for removal.



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Fig. 107: TOP OF FUEL INJECTOR
Courtesy of CHRYSLER LLC

7. Remove injector mounting bolt (2) and washer (3).
8. Remove injector mounting clamp (1).
9. Using compressed air, thoroughly clean surface area in and around injector bore to prevent foreign material from falling into the injector bore after injector removal.
10. Using your hand, pull fuel injector straight up from cylinder head for removal.



81b2f15e

Fig. 108: SPECIAL TOOL #9552
Courtesy of CHRYSLER LLC

11. If injector can't be removed by hand, install special fuel injector removal tool #9552 (2) to top of fuel

injector.

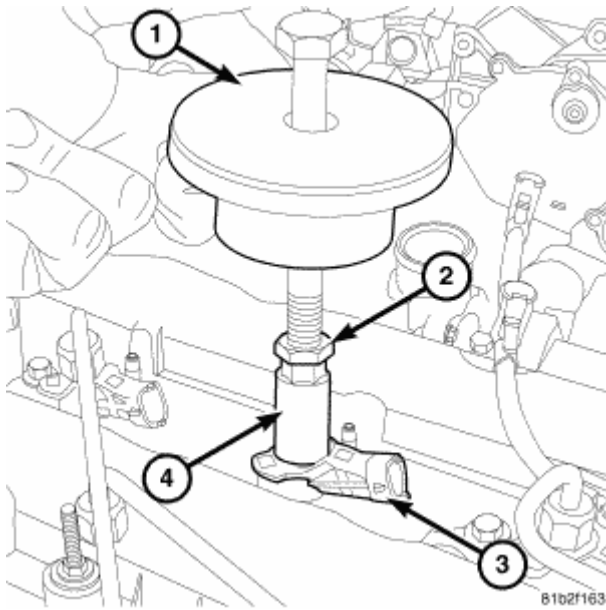


Fig. 109: SPECIAL SLIDE HAMMER TOOL #8941
Courtesy of CHRYSLER LLC

12. Install special slide hammer tool #8941 (1) onto special tool #9552 (4). Tighten lock nut (2). Remove injector from cylinder head.

NOTE: **DO NOT** use a wire brush to clean the fuel injector or nozzle. Possible restriction of the injector needle may result.

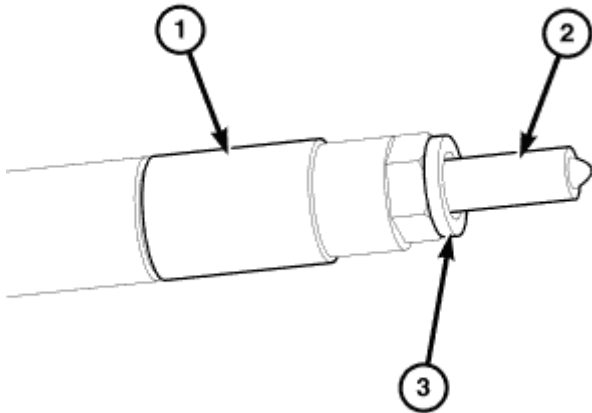
INSTALLATION

INSTALLATION

CAUTION: Due to the complexity of the fuel injection system used on this engine, service any fuel system DTCs prior to replacing any fuel injectors. If no DTCs are present, refer to the appropriate Diesel Engine Diagnostic Test for Lack of Engine Power, and perform all steps as directed prior to replacing any fuel injectors.

CAUTION: Cleanliness cannot be overemphasized when handling or replacing diesel fuel system components. This especially includes the fuel injectors, high-pressure fuel lines and fuel injection pump. Very tight tolerances are used with these parts. Dirt contamination could cause rapid part wear and possible plugging of fuel injector nozzle tip holes. This in turn could lead to possible engine misfire. Always wash/clean any fuel system component thoroughly before disassembly and then air dry. Cap or cover any open part after disassembly. Before assembly, examine each part for dirt, grease or other contaminants and clean if necessary. When installing new

parts, lubricate them with clean engine oil or clean diesel fuel only.



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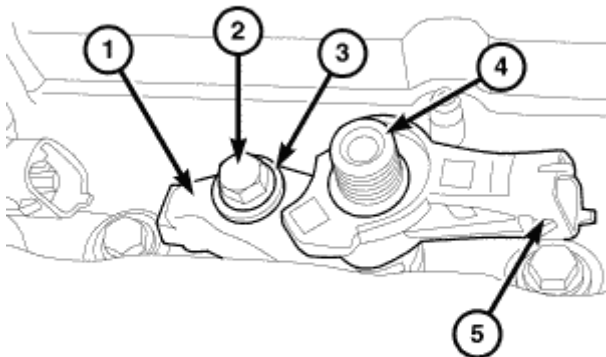
Fig. 110: FUEL INJECTOR GASKET

Courtesy of CHRYSLER LLC

NOTE: DO NOT use a brush to clean around the injector nozzle (2). DO NOT lubricate area around injector nozzle. The injector may become restricted with debris.

NOTE: Be sure a new copper washer/seal (3) is installed on end of injector and the old seal is removed, before installing in cylinder head.

1. Install fuel injector into cylinder head with new seal.



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Fig. 111: TOP OF FUEL INJECTOR

Courtesy of CHRYSLER LLC

2. Install fuel injector retainer clamp (1), washer (3) and bolt (2). Tighten clamp bolt (2) to 33 N.m (24 ft. lbs.) torque.
3. Connect electrical connector to fuel injector.
4. Install fuel injector high-pressure lines. Refer to **INSTALLATION** .

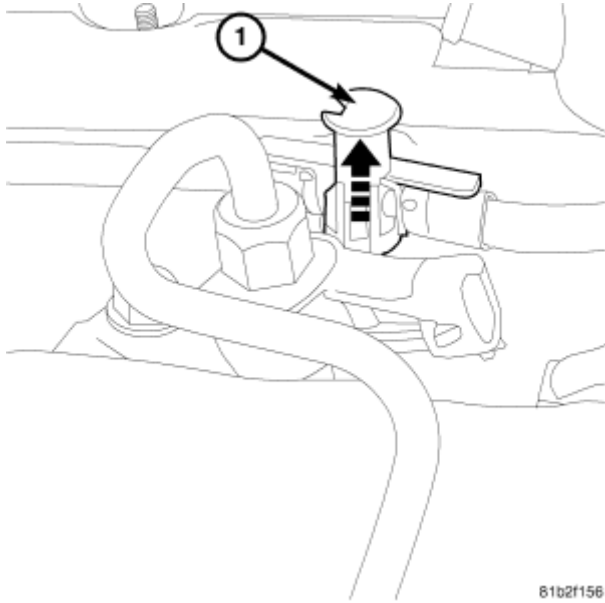


Fig. 112: RETURN LINE LOCK BUTTON UP

Courtesy of CHRYSLER LLC

5. Position female fittings on fuel return line to male fittings at each fuel injector. **Be sure lock buttons (1) are in up position before positioning.**

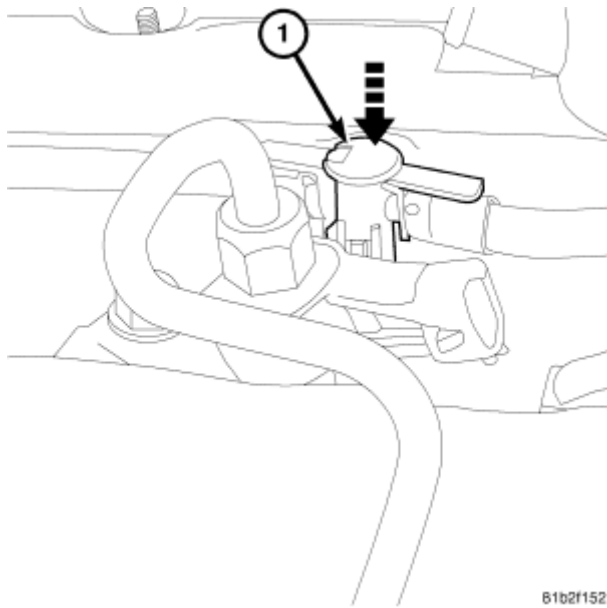


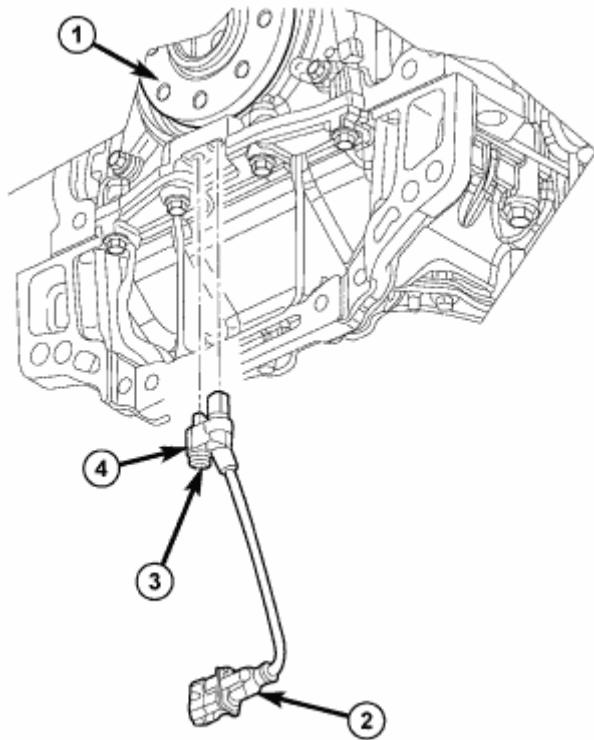
Fig. 113: RETURN LINE LOCK BUTTON DOWN
Courtesy of CHRYSLER LLC

6. After positioning, push each lock button (1) down to secure fuel return line to each fuel injector.
7. Connect each fuel injector electrical connector.
8. Connect negative battery cable.
9. Perform the injector classification procedure with a diagnostic scan tool.
10. Start the engine and allow to warm. **Turn off the ignition switch** and inspect for fuel leaks.
11. Install engine dress-up cover.

SENSOR-CRANKSHAFT POSITION

REMOVAL

REMOVAL



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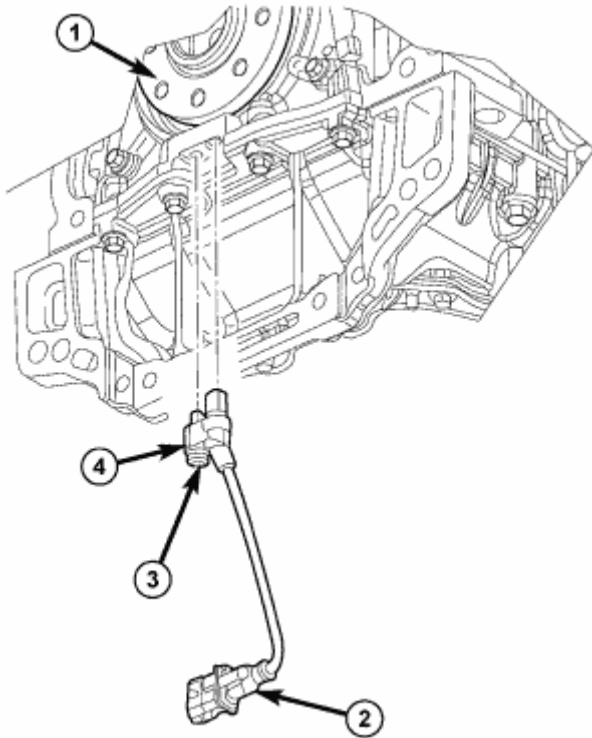
Fig. 114: CRANKSHAFT POSITION SENSOR
Courtesy of CHRYSLER LLC

The Crankshaft Position Sensor (CKP) (4) is located between the transmission and the rear of the engine block. It is bolted to the engine block below the crankshaft hub (1).

1. Raise and support vehicle.
2. Remove access cover.
3. Disconnect CKP electrical connector (2).
4. Remove CKP mounting bolt (3).
5. Remove CKP sensor (4).

INSTALLATION

INSTALLATION



81b31297

Fig. 115: CRANKSHAFT POSITION SENSOR
Courtesy of CHRYSLER LLC

The Crankshaft Position Sensor (CKP) (4) is located between the transmission and the rear of the engine block. It is bolted to the engine block below the crankshaft hub (1).

1. Position CKP sensor (4) into mounting hole.

CAUTION: Before tightening sensor mounting bolt, be sure sensor is completely flush to cylinder block. If sensor is not flush, damage to sensor mounting tang may result.

2. Install CKP mounting bolt (3). Tighten bolt to 11 N.m (8 ft. lbs.) torque.
3. Connect CKP electrical connector (2).
4. Position CKP access cover. Install bolts and tighten to 15 N.m (11 ft. lbs.) torque.
5. Lower vehicle.

SENSOR-INTAKE AIR PRESSURE

REMOVAL

REMOVAL

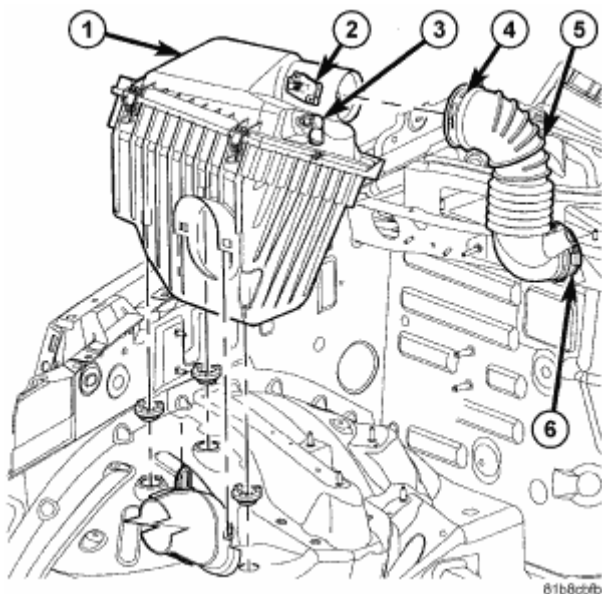


Fig. 116: MAF AND INLET PRESSURE SENSORS
Courtesy of CHRYSLER LLC

The Inlet Pressure Sensor (3) is located on the air cleaner cover (1).

1. Disconnect electrical connector at sensor.
2. Remove mounting screws.
3. Remove sensor from air cleaner cover.

INSTALLATION

INSTALLATION

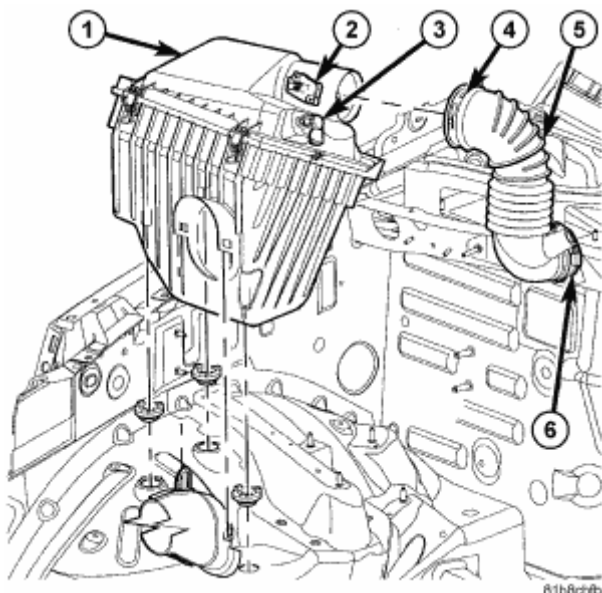


Fig. 117: MAF AND INLET PRESSURE SENSORS

Courtesy of CHRYSLER LLC

1. Check condition of sensor O-ring.
2. Position Inlet Pressure Sensor (3) into top of air cleaner cover (1) with a slight twisting action.
3. Install mounting screws.
4. Install Inlet Pressure Sensor electrical connector.

SENSOR-MASS AIR FLOW

REMOVAL

REMOVAL

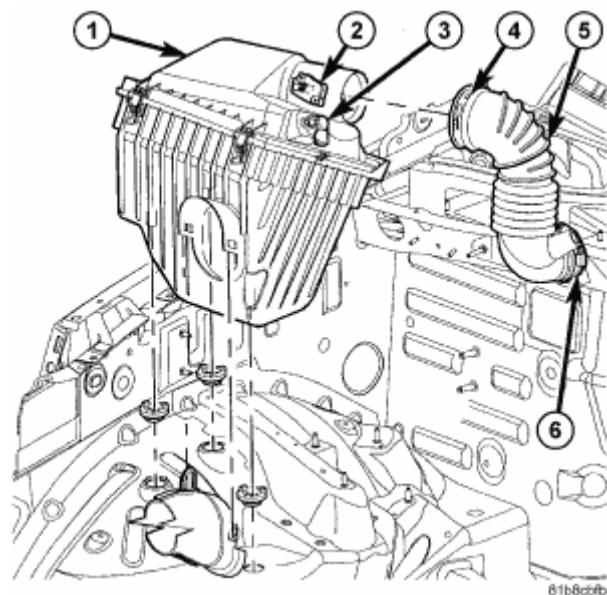


Fig. 118: MAF AND INLET PRESSURE SENSORS

Courtesy of CHRYSLER LLC

The Mass Airflow Sensor (2) is located on the air cleaner cover (1).

1. Disconnect electrical connector at sensor.
2. Remove mounting screws.
3. Remove sensor from air cleaner cover.

INSTALLATION

INSTALLATION

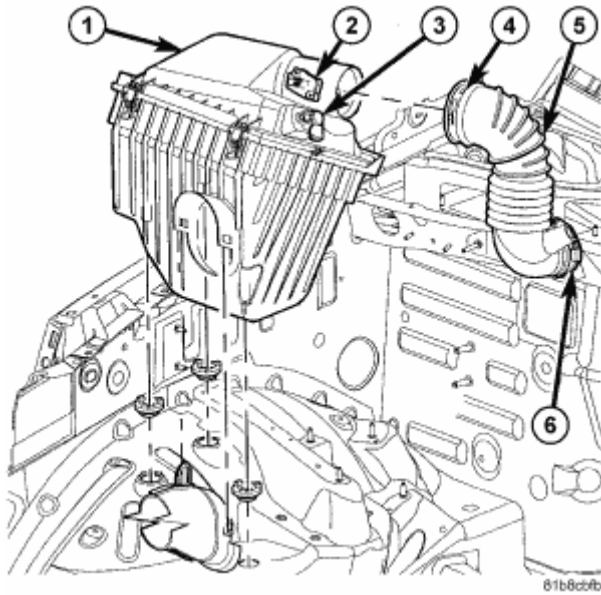


Fig. 119: MAF AND INLET PRESSURE SENSORS
Courtesy of CHRYSLER LLC

1. Check condition of sensor O-ring.
2. Position MAF sensor (2) into top of air cleaner cover (1) with a slight twisting action.
3. Install mounting screws.
4. Install MAF electrical connector.

SENSOR-TEMPERATURE/PRESSURE-MAP

OPERATION

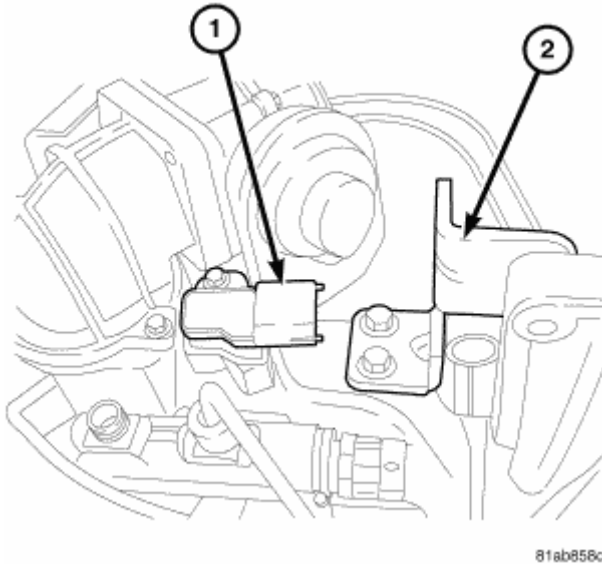
INTAKE MANIFOLD AIR TEMPERATURE (IAT) SENSOR - ECM INPUT

The combination, dual function Intake Manifold Air Temperature Sensor/MAP Sensor is installed into the top of the intake manifold with the sensor element extending into the air stream.

The IAT portion of the sensor provides an input voltage to the Engine Control Module (ECM) indicating intake manifold air temperature. The MAP portion of the sensor provides an input voltage to the ECM indicating turbocharger boost pressure.

REMOVAL

INTAKE MANIFOLD AIR TEMPERATURE (IAT) SENSOR



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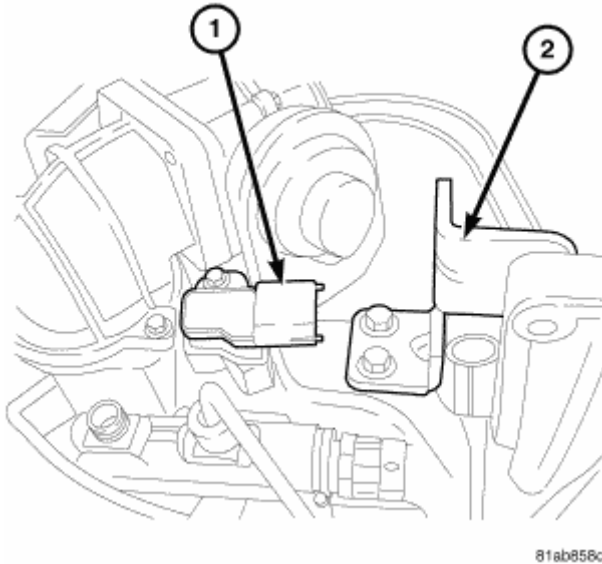
Fig. 120: INTAKE MANIFOLD AIR TEMPERATURE SENSOR/MAP SENSOR
Courtesy of CHRYSLER LLC

The combination, dual function Intake Manifold Air Temperature Sensor/MAP (IAT/MAP) sensor (1) is installed into the top of the intake manifold near the fuel rail.

1. Clean area around sensor.
2. Disconnect electrical connector from IAT/MAP sensor.
3. Remove mounting screw.
4. Remove sensor from intake manifold by twisting.
5. Check condition of sensor O-ring.

INSTALLATION

INTAKE MANIFOLD AIR TEMPERATURE (IAT) SENSOR



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Fig. 121: INTAKE MANIFOLD AIR TEMPERATURE SENSOR/MAP SENSOR
Courtesy of CHRYSLER LLC

1. Check condition of sensor O-ring.
2. Clean sensor mounting area at intake manifold.
3. Lubricate sensor O-ring and sensor mounting hole in intake manifold cover with clean engine or diesel oil.
4. Position sensor (1) into intake manifold.
5. Install and tighten sensor mounting screw to 1 N.m (9 in. lbs.) torque.
6. Connect electrical connector to sensor.

2008 ACCESSORIES AND EQUIPMENT

Full Open Retractable Roof - Service Information - Liberty

SERVICE INFORMATION

DESCRIPTION

FULL OPEN RETRACTABLE ROOF

This vehicle is available with the Full Open Retractable Roof (FORR) option. Marketed as Sky Slider™, the unit is made of reinforced acrylic cloth, similar to a convertible top. The material can be collected to the rear of the vehicle or over the front occupant.

Features

Sky Slider™ offers a convenient express one-touch switch for opening and closing, allowing for operator interruption for infinite positioning

The fabric roof can be gathered fully forward, or fully rearward, or partially opened to any position in-between

The top panel nests into the weather-strip seal to minimize wind noise. Factory installation ensures optimum fit, finish and function

A color-keyed, decorative molding joins the FORR assembly to the headliner

The FORR assembly is equipped with a matching headliner

The full-length open roof assembly is attached to the vehicle through a unique roof structure to facilitate similar performance in noise, wind and crash safety as the standard vehicle. This structure is then bonded to the body side reinforcement system.

OPERATION

FULL OPEN RETRACTABLE ROOF

Automatic Roof Operation (Auto Mode)

Automatic Operation is movement of the roof to either the full open or full closed position without the vehicle operator continually pressing one of the three roof switch buttons. Anti-pinch detection is active in auto mode.

Pressing one of the three roof switch buttons for less than 500 milliseconds will result in the roof moving automatically. The roof will continue movement until either the full open or full closed position is reached or the vehicle operator interrupts movement by pressing any roof switch button.

Manual Roof Operation (Manual Mode)

Manual Operation is movement of the roof while the vehicle operator is continually pressing one of the three roof switch buttons. Roof movement is stopped as soon as the button is released. Anti-pinch detection is not active in manual mode.

Pressing one of the three roof switch buttons for more than 500 milliseconds will result in the roof moving manually. While in manual mode, the roof will move in the desired direction until either the full open or full closed position is reached or the roof switch button is released.

Front Open

To open the Front of the roof from the closed position press the vehicle **most rearward** roof switch button. Once the roof is in the **front open mode** , only the front of the roof can be controlled by the vehicle operator. Use the vehicle **most rearward** roof switch button to further open the roof, or the vehicle **most forward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **front open mode** .

Rear Open

To open the Rear of the roof from the closed position press the vehicle **most forward** roof switch button. Once the roof is in the **rear open mode** , only the rear of the roof can be controlled by the vehicle operator. Use the vehicle **most forward** roof switch button to further open the roof, or the vehicle **most rearward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **rear open mode** .

Global Close

Pressing the roof switch center button with the roof in any position other than closed position, will result in the roof closing. A short press for less than 500 milliseconds will result in automatic mode closing, and a long press for more than 500 milliseconds will result in manual mode closing.

Power Modes Of Operation

The Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module) will function as follows in respect to Country Code Configuration:

- Key out door open - (No Function all Markets)

- Remote Start active - (No Function all Markets)

- Accessory Delay, Front Doors closed, key out - (Manual & Automatic Function for North American Markets) (Manual Function Only for Non-North American Markets)

- Key in Accessory Mode - (Manual & Automatic Function for North American Markets) (Manual Function Only for Non-North American Markets)

- Ignition On (Engine Off) - (Manual & Automatic Function all Markets)

- Ignition On (Engine Running) - (Manual & Automatic Function all Markets)

DIAGNOSIS AND TESTING

FULL OPEN RETRACTABLE ROOF

Any diagnosis of the FULL OPEN RETRACTABLE ROOF (FORR) system should begin with a scan tool and proper Diagnostic Procedures. The scan tool can provide confirmation that the FORR Electronic Control Unit (ECU), (sometimes referred to as the Power Top Control Module) is functional, that all of the electronic modules are sending and receiving the proper messages on the Controller Area Network (CAN) Data Bus, and that the power to the FORR is being sent the proper hard wired output by the FORR switch.

Check the condition of the circuit protection and inspect all wiring connector pins for proper engagement and continuity. For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** . The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views wire harness connectors, splices and grounds.

NOTE: Roof limits:

Motor Thermal Protection: The ECU Calculates the internal motor temperature. When the calculated temperature exceeds 365F (185C), the ECU allows the roof to only close. At 392F (200C) The ECU prevents motor movement.

System Low Temperature Operation: (Via the Vehicle Ambient Temp Sensor) At 14F (-10C) the ECU does not allow the system to vent without stopping the other motor. At -4F (-20C) the motors are allowed to close only.

Speed Thresholds: At 86 m.p.h. (138 km/h) we stop operation and at 81 m.p.h. (129 km/h) we resume operation.

NOTE: For the FORR initialization procedure, see STANDARD PROCEDURE.

SYMPTOM	POSSIBLE CAUSES	CORRECTION
Roof Completely Inoperative	Inoperative control switch	Perform sunroof switch diagnostics
	Inoperative circuit between FORR motor/ECU, control switch, and body harness.	Check the condition of the circuit protection and inspect all wiring. Repair as necessary.
	Inoperative FORR motor/ECU	Replace as necessary Motor/ECU
Audible Whine When Switch Is Depressed, Roof Does Not Operate	Inoperative drive motor gear	Replace drive motor Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Audible Clicking Or Ratcheting When Switch Is Pressed, FORR Does Not Operate.	Cables out of calibration	Left & right hand cables need to be timed Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Cable retainer clip worn or broken	Replace cable retainer clip Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand Refer to <u>REMOVAL</u> .

		Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Inoperative drive motor gear	Replace drive motor Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Front Header Bow Misaligned To Frame	Debris in drive track	Remove debris from track, check cables for wear replace if necessary and reset timing. Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace Drive Cables Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Cables out of time	Left & right hand cables need to be timed Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken cap extension	Replace the front drive assembly. Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Rear Header Bow Misaligned To Frame	Debris in drive track	Remove Debris from Track, check cables for wear replace if necessary and reset Timing. Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken or worn drive cable	Replace cables left & right hand Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Cables out of time	Left & right hand cables need to be timed Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken cap extension	Replace the rear drive assembly. Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Front Lift Arm Not Lifting	Spring disengaged from lift arm	Repair or replace spring if necessary Refer to <u>REMOVAL</u> .

		Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Pin disengaged or broken	Repair or replace nylon pin if necessary Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u>
	Lift arm disengaged from cap extension or broken	Repair or replace front lift arm assembly if necessary Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Floating Bows Not Lifting	Spring disengaged	Repair or replace spring if necessary Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Broken lift arm assembly	Replace lift arm assembly if necessary Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Top Cover Loose In Side View To Seal	Tension cable not attach at front header	Attach tension cable to front header Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Tension cable not attach at rear header	Attach tension cable to rear header Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	Tension cable broken	Replace tension cable Refer to <u>REMOVAL</u> . Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Top Stops Moving Prior To Full Close, Or Full Open	Debris in track	Clean track Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
	ECU lost normed "home" position	Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .
Slider Chatter	Debris in track	Clean track Re-initialize ECU: See <u>STANDARD PROCEDURE</u> .

STANDARD PROCEDURE

FULL OPEN RETRACTABLE ROOF INITIALIZATION

Limits

Temperature

The temperature must be between 5°C (41°F) to 45°C (113°F) for initialization to be performed, Outside of this temperature range an initialization will not start and if requested by a diagnostics scan tool, the Electronic Control Unit (ECU), (sometimes referred to as the Power Top Control Module) will send the proper reject code.

Voltage

Vehicle voltage must be maintained between 11V - 15V.

Roof Initialization Procedure

1. Ensure the Vehicle is in the RUN power mode with the engine running.
2. If roof is in a position other than fully closed; press roof switch center button for less than 1 second and wait for the roof to close.
3. With roof fully closed: Push and hold the roof switch center button for more than 20 seconds and do not release until the following roof cycle is complete:
 - Front of Roof will Close (Then Stall)
 - Rear of Roof will Close (Then Stall)
 - Rear of Roof will Open
 - Rear of Roof will Close
 - Rear of Roof Vents (approx two inches)
 - Front of Roof will Open
 - Front of Roof will Close
 - Rear of Roof Closes from Vent
4. Once all movement has stopped, release the roof switch center button. Roof system initialization is now complete.

MANUAL ROOF OPERATION

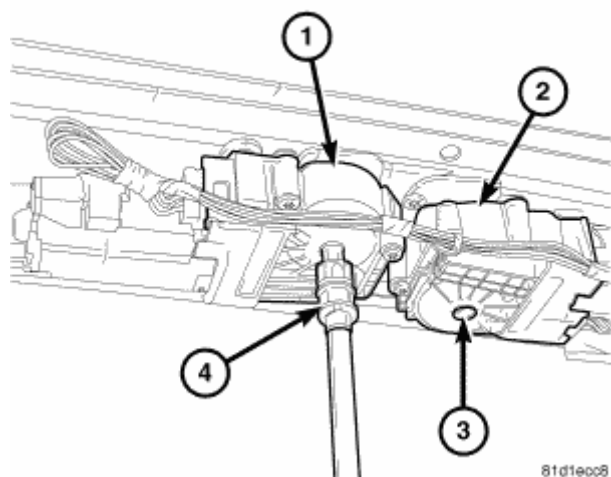


Fig. 1: MOTOR MANUAL OPEN

- 1 - REAR DRIVE MOTOR
 - 2 - FRONT DRIVE MOTOR
 - 3 - DRIVE AXLE LOCATION
 - 4 - 6 mm HEX SOCKET

- 1. Remove the rear dome light. Refer to **REMOVAL** .
- 2. Disconnect the green Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module) electrical connector.
- 3. Locate the motor drive axle hole (3) and using a 6 mm hex socket or equivalent (4), open or close the desired drive assembly as required.

POWER FULL OPEN RETRACTABLE ROOF MODULE

DESCRIPTION

POWER FULL OPEN RETRACTABLE ROOF MODULE

The Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module) is located at the rear of the vehicle roof next to the Full Open Retractable Roof (FORR) motors. The ECU is mounted to the FORR frame assembly with two screws. Three wire harness connectors are used to supply inputs to the ECU and send outputs to the FORR motors.

The ECU communicates via the Controller Area Network (CAN) data bus circuit and can be diagnosed and receive software updates with the use of a diagnostic scan tool.

OPERATION

POWER FULL OPEN RETRACTABLE ROOF MODULE

This vehicle is available with the Full Open Retractable Roof (FORR) option. Marketed as Sky Slider™, the unit is made of reinforced acrylic cloth, similar to a convertible top. The FORR system receives battery feed through the "sunroof" relay and a 25 amp mini fuse located in the Totally Integrated Power Module (TIPM). The FORR system power is supplied when the ignition switch is in the RUN and ACCESSORY positions. The sunroof will operate normally with the key in any position while the Accessory Delay system is active.

The FORR utilizes a single Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module) to control the movement of the power top. The ECU sends a reference voltage to and receives inputs back from the power top switch via a hardwired connection. The ECU responds to the switch input by controlling one or both of the power top motors via a hardwired connection.

The ECU communicates via the Controller Area Network (CAN) data bus circuit and can be diagnosed and receive software updates with the use of a diagnostic scan tool. The ECU continually monitors ambient temperature and vehicle speed inputs from the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN). The ECU also receives vehicle configuration data from the Totally Integrated Power Module (TIPM) to ensure proper operation related to geographical location (i.e. North American markets

versus Export markets).

REMOVAL

POWER FULL OPEN RETRACTABLE ROOF MODULE

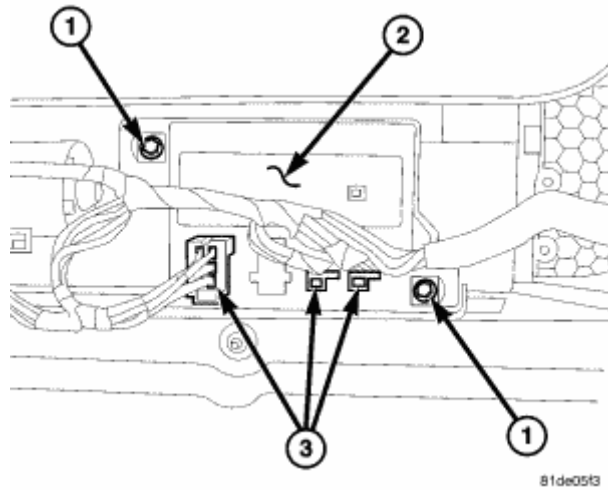


Fig. 2: Electrical Connectors
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Drop rear of headliner down as needed to gain access to the module. Refer to **REMOVAL** .
3. Disconnect the electrical connectors (3) from the module.
4. Remove the two screws (1) and separate the module (2) from the roof system.

INSTALLATION

POWER FULL OPEN RETRACTABLE ROOF MODULE

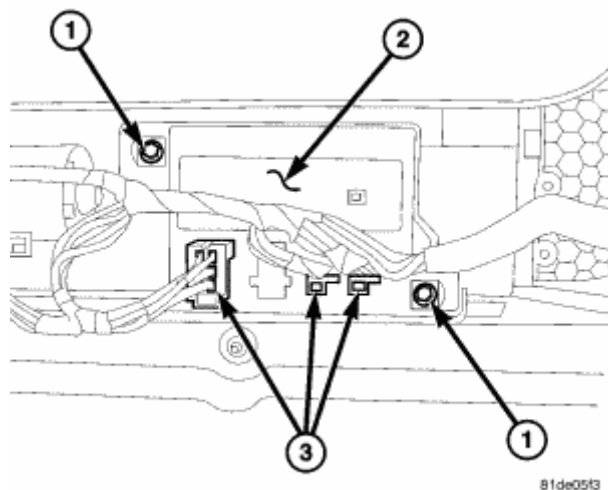


Fig. 3: Electrical Connectors
Courtesy of CHRYSLER LLC

1. Position the module (2) onto the power full open retractable roof assembly.
2. Install the two mounting screws (1).
3. Connect the electrical connectors (3).
4. Install the headliner. Refer to **INSTALLATION**.
5. Connect the battery negative cable.
6. Re-initialize roof assembly. See **STANDARD PROCEDURE**.

POWER FULL OPEN RETRACTABLE ROOF MOTOR

REMOVAL

POWER FULL OPEN RETRACTABLE ROOF MOTOR

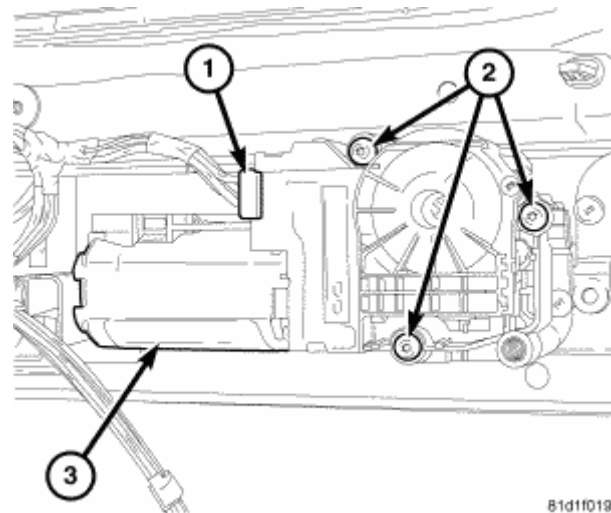


Fig. 4: MOTOR
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Drop rear of headliner down as needed to gain access to the motor. Refer to **REMOVAL**.
3. Remove the three screws (2) and separate the motor (3) from the roof system.
4. Disconnect the electrical connector (1) and remove the motor.

INSTALLATION

POWER FULL OPEN RETRACTABLE ROOF MOTOR

CAUTION: When moving the drive assemblies without the motors attached make sure that the assemblies are moved straight forward or rearward.

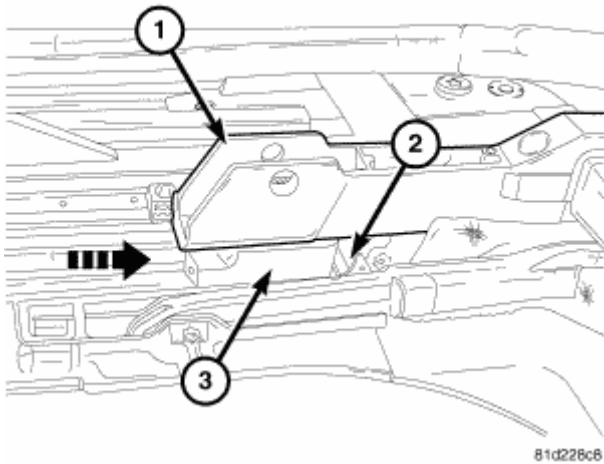


Fig. 5: FRONT DRIVE CABLE TIMING
 Courtesy of CHRYSLER LLC

1. Manually move drive assembly to the fully closed position.
 - For front motor installation, manually push the front drive assembly (1) fully forward.
 - Using a small screwdriver or equivalent, make sure the cable ends (3) are in contact with the frame (2).

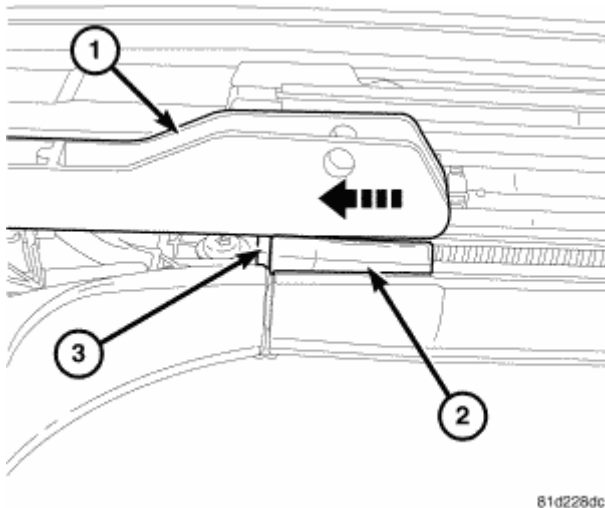


Fig. 6: REAR DRIVE CABLE TIMING
 Courtesy of CHRYSLER LLC

2. Manually move drive assembly to the fully closed position.
 - For rear motor installation, manually push the rear drive assembly (1) fully rearward.
 - Using a small screwdriver or equivalent, make sure the cable ends (2) are in contact with the frame (3).

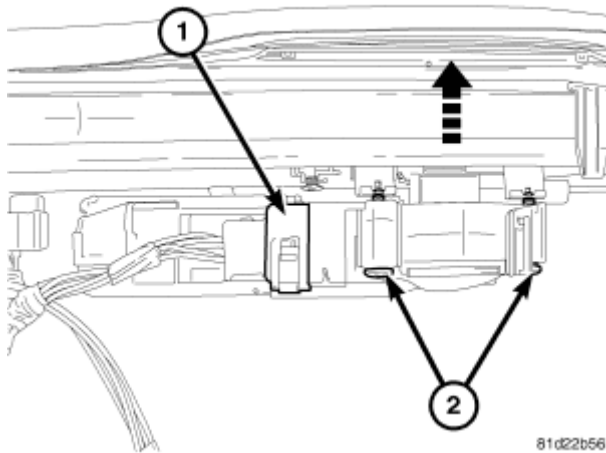


Fig. 7: MOTOR INSTALL
Courtesy of CHRYSLER LLC

3. Position the drive motor (1) up onto the motor mounting plate.

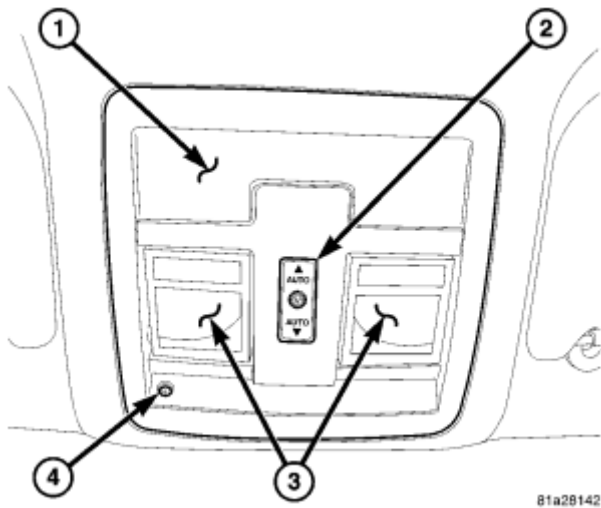
CAUTION: Do not install the motor using any twisting motion. Always install the motor straight and use the screws to draw the drive gear into the drive cables.

4. Install the motor screws (2) and draw the motor up evenly using the motor screws.
5. Connect the electrical connector.
6. Install the headliner. Refer to **INSTALLATION** .
7. Connect battery negative cable.
8. Re-initialize roof assembly. See **STANDARD PROCEDURE**.

POWER FULL OPEN RETRACTABLE ROOF SWITCH

DESCRIPTION

POWER FULL OPEN RETRACTABLE ROOF SWITCH



81a28142

Fig. 8: Identifying Overhead Console, Sunroof Switch, Courtesy Lamps & Infrared Temperature Sensor
Courtesy of CHRYSLER LLC

The full open retractable roof switch (2) is a combination push-button and rocker switch module mounted in the overhead console assembly (1). The power roof switch is a direct contact unit that is directly wired to the roof Electronic Control Unit (ECU) (sometimes referred to as the Power Top Control Module).

The power roof switch is part of the overhead console assembly and cannot be serviced separately. If the switch is damaged or inoperative the overhead console assembly must be replaced. Refer to **REMOVAL** .

OPERATION

POWER FULL OPEN RETRACTABLE ROOF SWITCH

The full open retractable roof switch is grounded at one terminal and receives a 5 volt signal from the Electronic Control Unit (ECU), (sometimes referred to as the Power Top Control Module) on the remaining three terminals. The switch pulls down the 5 volt reference voltage from the module signaling it to perform the desired function.

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

Front Open

To open the Front of the roof from the closed position press the vehicle **most rearward** roof switch button. Once the roof is in the **front open mode** , only the front of the roof can be controlled by the vehicle operator. Use the vehicle **most rearward** roof switch button to further open the roof, or the vehicle **most forward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **front open mode** .

Rear Open

To open the Rear of the roof from the closed position press the vehicle **most forward** roof switch button. Once

the roof is in the **rear open mode** , only the rear of the roof can be controlled by the vehicle operator. Use the vehicle **most forward** roof switch button to further open the roof, or the vehicle **most rearward** roof switch button to close the roof. Once the roof is fully closed the roof will exit the **rear open mode** .

Global Close

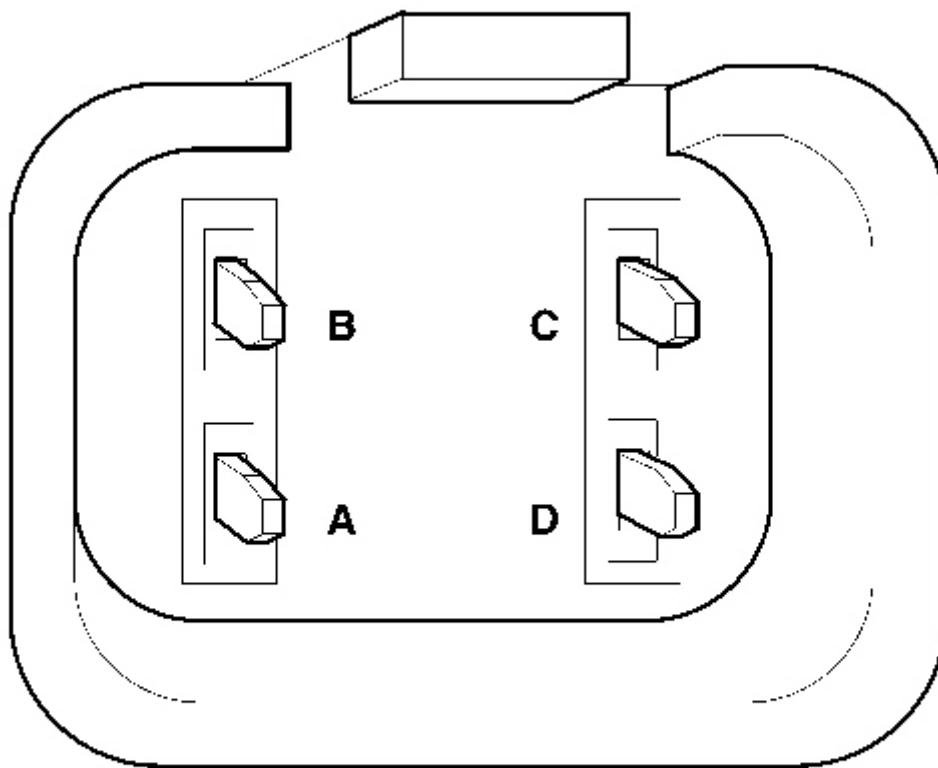
Pressing the roof switch center button with the roof in any position other than closed position, will result in the roof closing. A short press for less than 500 milliseconds will result in automatic mode closing, and a long press for more than 500 milliseconds will result in manual mode closing.

DIAGNOSIS AND TESTING

POWER FULL OPEN RETRACTABLE ROOF SWITCH

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

1. Remove the overhead console. Refer to **REMOVAL** .
2. Disconnect the full open retractable roof switch wire harness connector.
3. With the ignition key in the "RUN" position check for 5 volts on the "FRONT OPEN", "REAR OPEN" and "CLOSE" circuits of the switch harness connector. If OK, go to step 4. If not OK, inspect the wiring harness and connectors for damage and repair as necessary.
4. With the ignition key in the "OFF" position check for continuity between the ground circuit of the switch harness connector and a known good ground. Continuity should be present. If OK, go to step 5. If not OK, inspect the wiring harness and connector and repair the ground circuit as necessary.



813794bc

Fig. 9: Identifying Power Sunroof Switch Terminal Connectors

Courtesy of CHRYSLER LLC

5. Using an ohmmeter, test the continuity of the full open retractable roof switch in each switch position. Refer to **FULL OPEN RETRACTABLE ROOF SWITCH CONTINUITY TABLE**. If OK, inspect the wiring harness and connectors for damage and repair as necessary. If not OK, replace the overhead console assembly. Refer to **REMOVAL** .

FULL OPEN RETRACTABLE ROOF SWITCH CONTINUITY TABLE

SWITCH POSITION	CONTINUITY BETWEEN PINS
OFF	NO CONTINUITY
FRONT of ROOF OPEN (REARWARD MOST BUTTON)	B & D
REAR of ROOF OPEN (FORWARD MOST BUTTON)	B & C

SUNROOF CLOSED (CENTER BUTTON)

B & A

2008 ELECTRICAL

Fuses & Circuit Breakers - Liberty

IDENTIFICATION

CAUTION: When battery is disconnected, vehicle computer and memory systems may lose memory data. Driveability problems may exist until computer systems have completed a relearn cycle.

TOTALLY INTEGRATED POWER MODULE

NOTE: Power distribution center is located on driver's side of engine compartment, between battery and grille. See Fig. 1.

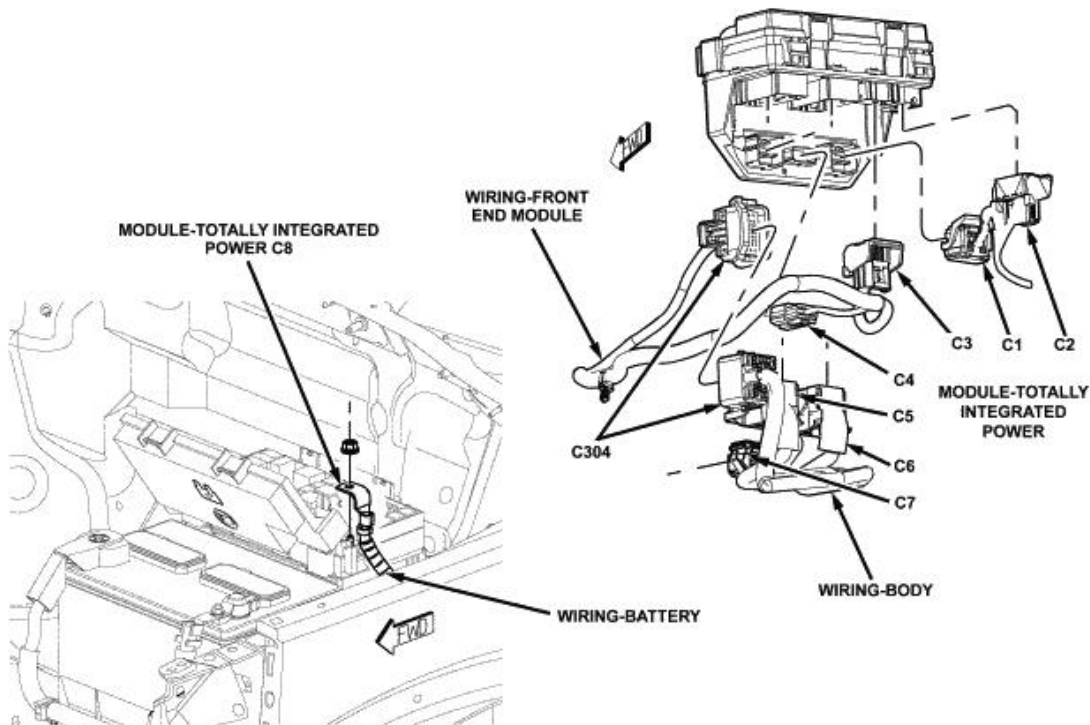


Fig. 1: Locating Totally Integrated Power Module
Courtesy of DAIMLERCHRYSLER CORPORATION

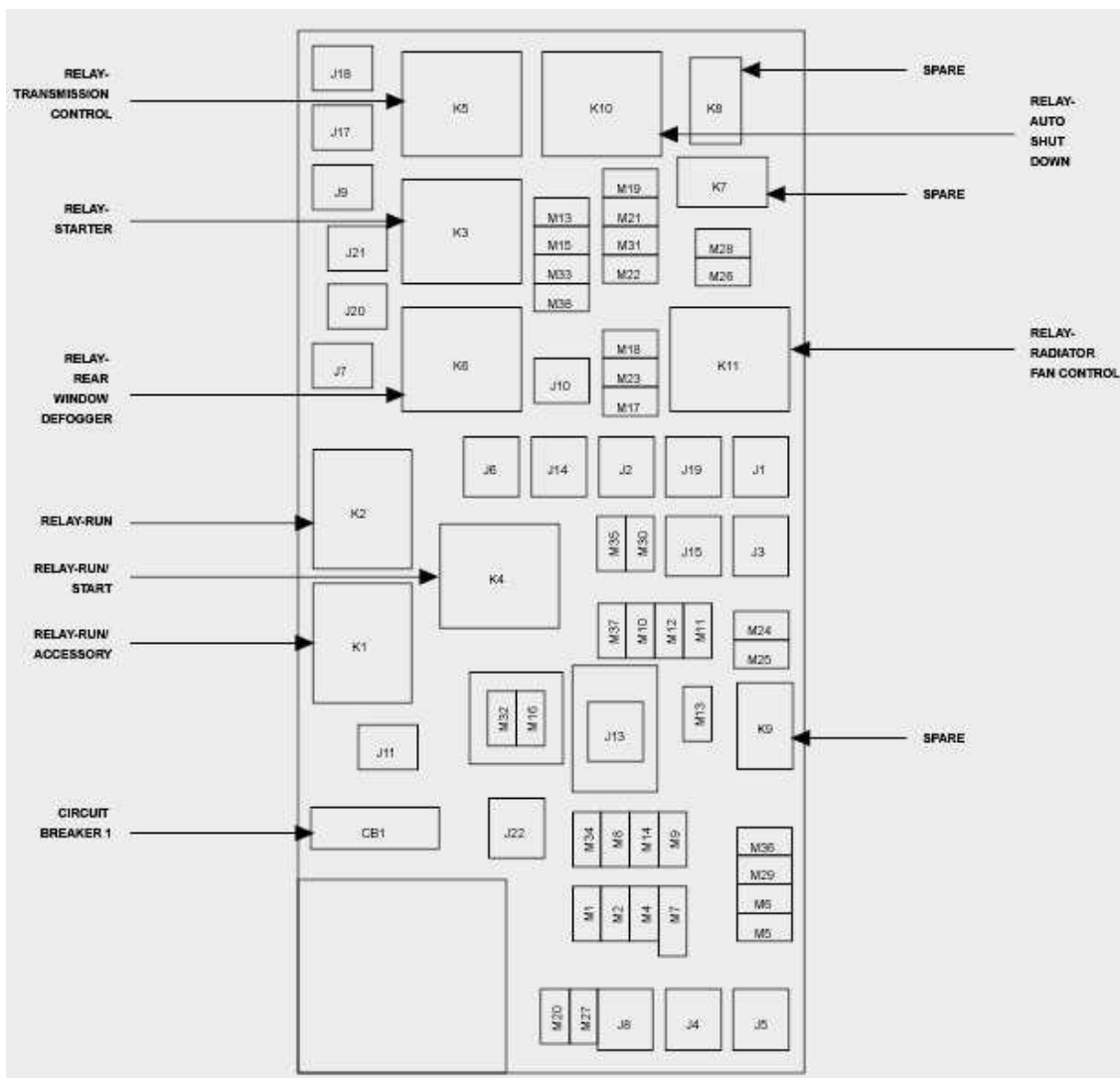


Fig. 2: Identifying Totally Integrated Power Module Components
 Courtesy of DAIMLERCHRYSLER CORPORATION

Power Distribution Center Components (Gas)

FUSE NO.	AMPS	FUNCTION
J1	-	-
J2	30A	Transfer Case Module - If Equipped
J3	40A	Rear Door Modules
J4	25A	Driver Door Node
J5	25A	Passenger Door Node
J6	40A	Anti-Lock Brake System (ABS) Pump/ESP - If Equipped
J7	30A	Anti-Lock Brake System (ABS) Valve/ESP - If Equipped
J8	40A	Power Seats - If Equipped
J9	40A	PZEV/Flex Fuel - If Equipped
J10	-	-

J11	-	-
J13	60A	Ignition Off Draw (IOD)
J14	40A	EBL (Rear Window Defogger) - If Equipped
J15	-	-
J17	40A	Starter Solenoid
J18	20A	Powertrain Control Module (PCM) Transmission Relay
J19	60A	Radiator Fan
J20	30A	Front Wiper
J21	20A	Front Washer/Rear Washer - If Equipped
J22	25A	Sunroof Module - If Equipped
M1	15A	Stop Light Switch Feed - Center High Mounted Stop Light (CHMSL)
M2	20A	Trailer Lighting - If Equipped
M3	-	-
M4	10A	Trailer Tow - If Equipped
M5	25A	Power Inverter - If Equipped
M6	20A	Power Outlet #1 (Cigar Lighter)/Rain Sensor - If Equipped/Trailer Tow - If Equipped
M7	20A	Power Outlet #2 (BATT/ACC SELECT)
M8	20A	Front Heated Seats - If Equipped
M9	-	-
M10	15A	Hands Free Module (HFM) - If Equipped/Universal Garage Door Opener (UGDO) - If Equipped/Vanity Light
M11	10A	Automatic Temperature Control (ATC) - If Equipped
M12	30A	Radio/Amplifier - If Equipped
M13	20A	Cabin Compartment Node (CCN)/Wireless Control Module (WCM)/Multi-function Control Switch
M14	-	-
M15	20A	Multi-function Control Switch/Cabin Compartment Node (CCN)/Steering Column Control Module (SCM)/Rear View Mirror/Tire Pressure Monitor (TPM) - If Equipped/IR Sensor - If Equipped/Transfer Case Module - If Equipped
M16	10A	Occupant Restraint Controller (ORC)
M17	15A	Exterior Lighting - Left Front Park & Side Marker, Left Tail & Running, License Lights
M18	15A	Exterior Lighting - Right Front Park & Side Marker, Right Tail & Running Lights
M19	25A	Auto Shut Down (ASD) #1 & #2
M20	15A	Interior Lighting/Steering Wheel Switches - If Equipped/Switch Bank/Electronic Vehicle Information Center (EVIC) - If Equipped
M21	20A	Auto Shut Down (ASD) #3
M22	10A	Right Horn (Hi/Low)
M23	10A	Left Horn (Hi/Low)

M25	20A	Fuel Pump
M26	10A	Power Mirror Switch/Driver Window Switch
M27	10A	Ignition Switch/Wireless Control Module (WCM)/Steering Column Lock - If Equipped
M28	10A	Powertrain Control Module (PCM)
M29	10A	Occupant Classification Module (OCM)
M30	15A	Rear Wiper Module - If Equipped/Diagnostic Link
M31	20A	Back-Up Lights
M32	10A	Occupant Restraint Controller (ORC)
M33	10A	Powertrain Control Module (PCM)
M34	10A	Park Assist Module - If Equipped/Heating, Ventilation & Air Conditioning (HVAC) Module - If Equipped/Compass Module - If Equipped
M35	10A	Heated Mirrors - If Equipped
M36	-	-
M37	10A	Anti-Lock Brake System (ABS)/Electronic Stability Program (ESP) Module/Stop Light Switch
M38	25A	Door & Liftgate Lock/Unlock Motors

2008 ACCESSORIES AND EQUIPMENT

Heated Glass - Service Information - Liberty

HEATED GLASS - SERVICE INFORMATION

DESCRIPTION

REAR WINDOW DEFOGGER (EBL) SYSTEM

CAUTION: Grid lines can be damaged or scraped off with sharp instruments. Care should be taken in cleaning glass or removing foreign materials, decals or stickers. Normal glass cleaning solvents or hot water used with rags or toweling is recommended.

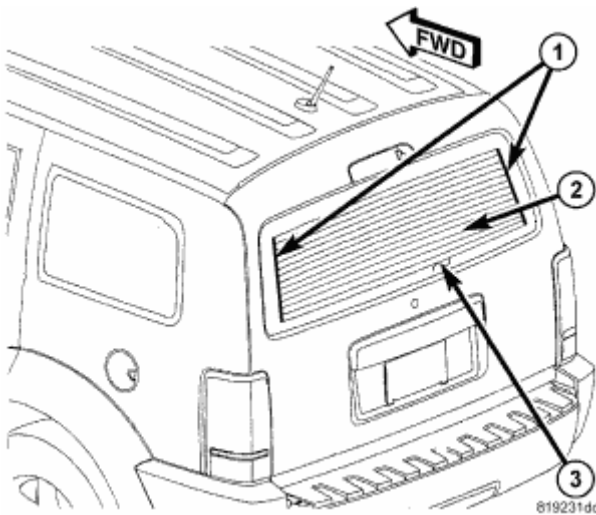


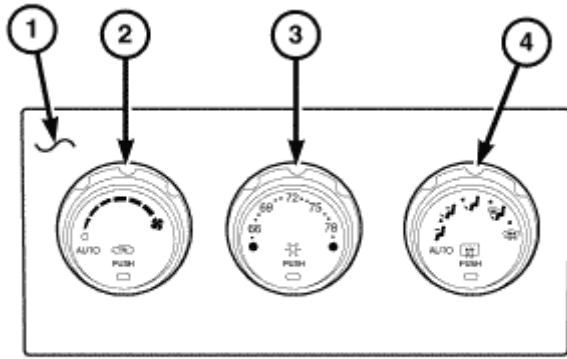
Fig. 1: Identifying Vertical Bus Bars, Grid Lines & Rear Window
Courtesy of CHRYSLER LLC

The rear window defogger system, also known as electric backlight (EBL), consists of two vertical bus bars (1) and a series of grid lines (2) fired onto the inside surface of the rear window (3).

The EBL system is turned on or off by a push-button switch located in the A/C-heater control. Refer to **DESCRIPTION**.

OPERATION

REAR WINDOW DEFOGGER (EBL) SYSTEM



81d5f1be

Fig. 2: A/C-Heater Control Assembly
Courtesy of CHRYSLER LLC

NOTE: ATC control shown. MTC control similar.

The electric backlight (EBL) system is controlled by a momentary push-button switch inside the mode control knob (4) on the A/C-heater control (1) located in the instrument panel center bezel. When the rear window defogger switch is pressed to the On position with the ignition switch in RUN, the switch sends a request signal over the CAN-IHS bus to the totally integrated power module (TIPM), which provides a ground path to energize the coil in the EBL relay. When energized, the EBL relay provides battery current through a fuse to the rear window defogger grid lines and to the heated side view mirrors, when equipped. The grid lines heat the glass to help clear the rear window and side mirror surfaces of fog or frost.

An amber indicator in the mode control knob will illuminate to indicate when the EBL system is operating.

NOTE: The EBL system turns off automatically after 10 minutes of initial operation. Each following activation cycle of the EBL system will last 5 minutes.

The EBL system will be automatically turned off after an initial programmed time interval of about 10 minutes as long as the ignition switch is in RUN. After the initial time interval has expired, if the rear window defogger switch is pressed to the On position again during the same ignition cycle, the EBL system will automatically turn off after about 5 minutes. The EBL system will also turn off if the ignition switch is turned to any position other than RUN or by manually pressing the rear window defogger switch a second time.

Repair of the rear window defogger grid lines, bus bars, terminals or pigtail wires can be accomplished using the Mopar® Rear Window Defogger Repair Kit (Part Number 04549275) or equivalent. See **STANDARD PROCEDURE**.

Circuit protection for the EBL system is provided by fuse 13 located in the TIPM.

DIAGNOSIS AND TESTING

REAR WINDOW DEFOGGER (EBL) SYSTEM

NOTE: Illumination of the defogger switch indicator lamp does not necessarily mean that electrical current is reaching the rear window glass and/or the outside rear view mirror heating grids (when equipped).

NOTE: For circuit descriptions and diagrams of the rear window defogger (EBL) and heated mirror systems, refer to SYSTEM WIRING DIAGRAMS article.

Operation of the electric backlight (EBL) system can be confirmed by the following:

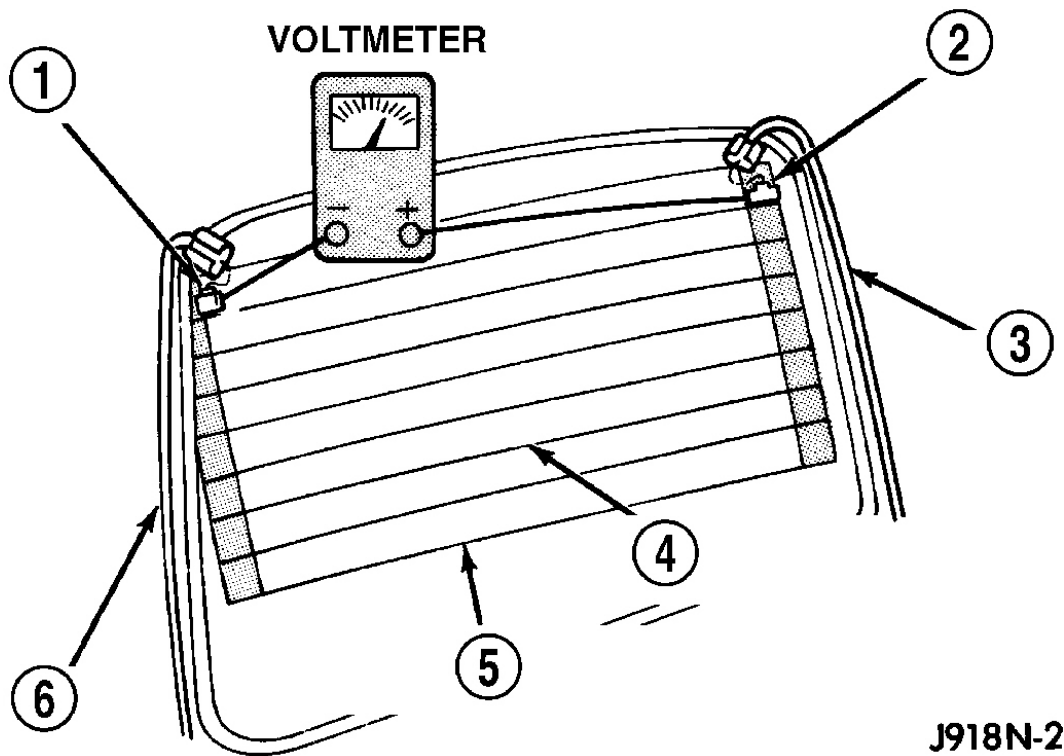


Fig. 3: Rear Window Glass Defogger Grid Test
Courtesy of CHRYSLER LLC

NOTE: Typical heated rear window glass shown.

1. Use a scan tool and check for diagnostic trouble codes (DTCs) related to the A/C-heater control and the totally integrated power module (TIPM). If no DTCs are found, go to step 2. If any DTCs are found, repair as required, then proceed to step 2.
2. Turn the ignition switch to RUN. Press the rear window defogger switch to the On position. Rear window defogger operation can be checked by feeling the surfaces of the rear window glass, or the heated outside rear view mirror glass when equipped with heated mirrors. A distinct difference in temperature between the grid lines (5) and the adjacent clear glass or the heated mirror glass should be detected within three to

four minutes of operation.

3. If a temperature difference is not detected, use a 12-volt DC voltmeter and contact the rear glass heating grid terminal A (1) with the negative lead, and terminal B (2) with the positive lead. The voltmeter should read battery voltage. If the voltmeter does not read battery voltage, check the following:
 - Confirm the ignition switch is in RUN.
 - Confirm the rear window defogger switch is pressed to the On position.
 - Confirm the EBL feed wire (3) is connected to the heating grid positive terminal and that there is continuity between the EBL relay terminal and the heating grid.
 - Confirm the EBL ground wire (6) is connected to the heating grid negative terminal and that there is continuity to ground.
 - Check fuse 13 and fuse 34 located in the TIPM. The fuses must be tight in the receptacles and the electrical connections must be secure.
 - Check the EBL relay located in the TIPM. The relay must be tight in the receptacle and the electrical connections must be secure.
 - When diagnosing a heater mirror concern, check fuse 54 located in the TIPM. The fuse must be tight in the receptacle and the electrical connections must be secure.
4. If broken defogger grid lines or bus bars are suspected, use a 12-volt DC voltmeter and contact terminal A with the negative lead and each rear glass heating grid line at its mid-point C (4) with the positive lead. The voltmeter should read approximately 6 volts at each grid line mid-point. If the voltmeter does not read approximately 6 volts, repair the open grid line(s) or bus bar(s). See **STANDARD PROCEDURE**.
5. If the EBL system operation has been verified but the rear window defogger indicator does not illuminate, replace the A/C-heater control. Refer to **REMOVAL**.

GRID-REAR WINDOW DEFOGGER

STANDARD PROCEDURE

GRID LINE AND TERMINAL REPAIR

WARNING: Materials contained in the Repair Kit (Part Number 04549275) may cause skin or eye irritation. The kit contains epoxy resin and amine type hardener, which are harmful if swallowed. Avoid contact with the skin and eyes. For skin contact, wash the affected areas with soap and water. For contact with the eyes, flush with plenty of water. Do not take internally. If taken internally, induce vomiting and call a physician immediately. Use with adequate ventilation. Do not use near fire or flame. Contains flammable solvents. Keep out of the reach of children. Failure to follow the warnings may result in serious or fatal injury.

Repair of the rear glass heating grid lines, bus bars, terminals or pigtail wires can be accomplished using the Mopar® Rear Window Defogger Repair Kit (Part Number 04549275) or equivalent.

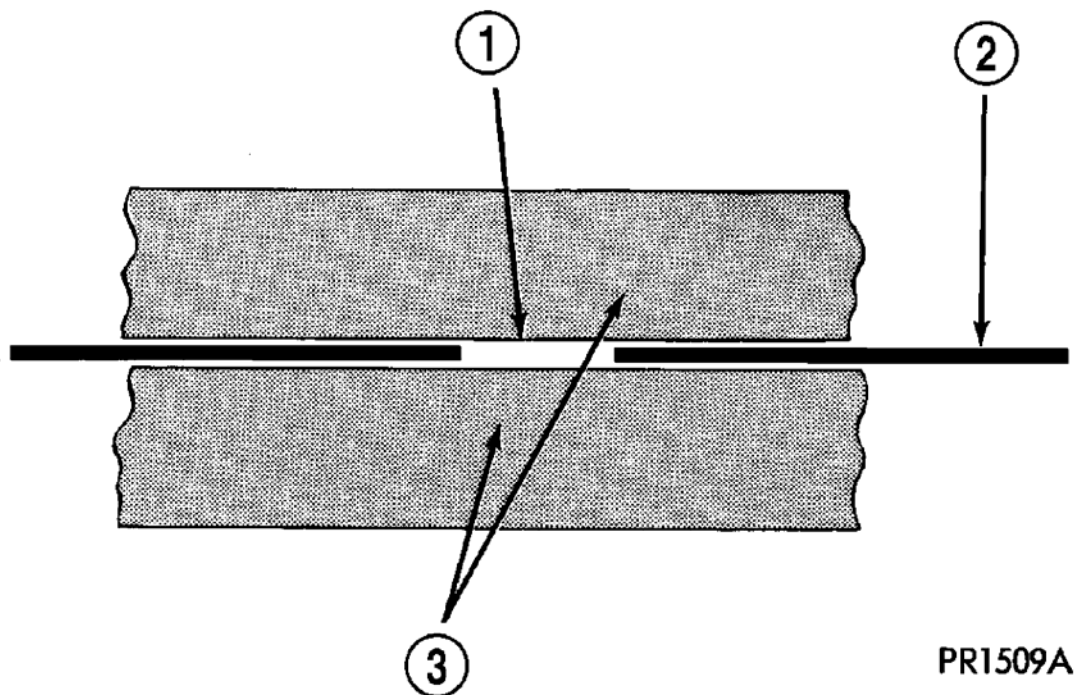


Fig. 4: Grid Line Repair - Typical
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - BREAK
2 - GRID LINE
3 - MASKING TAPE |
|--|

1. Mask the repair area with masking tape (3) so that the conductive epoxy can be applied neatly. Extend the epoxy application onto the grid line (2) or the bus bar on each side of the break (1).
2. Follow the instructions in the repair kit for preparing the damaged area.
3. Remove the package separator clamp and mix the two conductive epoxy components thoroughly within the packaging. Fold the package in half and cut the center corner to dispense the epoxy.
4. Apply the epoxy through the slit in the masking tape or template. Overlap both ends of the break by at least 19 millimeters (0.75 inch).
5. For a terminal or pigtail wire replacement, mask the adjacent areas so the epoxy can be extended onto the adjacent grid line as well as the bus bar. Apply a thin layer of epoxy to the area where the terminal or pigtail wire was fastened and onto the adjacent grid line.
6. Apply a thin layer of conductive epoxy to the terminal or bare wire end of the pigtail and place it in the proper location on the bus bar. To prevent the terminal or pigtail wire from moving while the epoxy is curing, it must be wedged or clamped.
7. Carefully remove the masking tape or template.

CAUTION: Do not allow the glass surface to exceed 204° C (400° F) when using a heat gun, or the glass may fracture.

8. Allow the epoxy to cure 24 hours at room temperature, or carefully use a heat gun for 15 minutes. When using a heat gun, hold it approximately 25.4 centimeters (10 inches) from the repair and do not allow the glass surface to exceed 204° C (400° F).
9. After the conductive epoxy is properly cured, remove the wedge or clamp from the terminal or pigtail wire.
10. Connect the wire harness leads to the grid terminals or pigtail wires and verify EBL operation.

RELAY-REAR WINDOW DEFOGGER

DESCRIPTION

RELAY-REAR WINDOW DEFOGGER

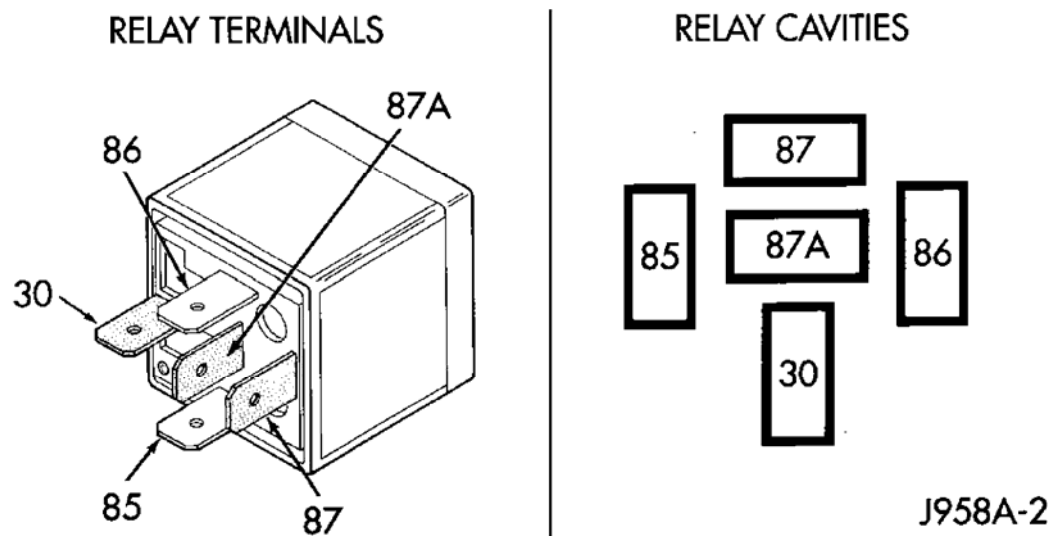


Fig. 5: Identifying Relay Terminals
Courtesy of CHRYSLER LLC

The rear window defogger (EBL) relay (1) is an International Standards Organization (ISO)-type relay. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns (2). The EBL relay is a electromechanical device that switches fused battery current to the rear window defogger grid and to the outside rear view mirror heating grids, when equipped. The EBL relay is energized when the relay coil is provided a ground path by the control circuitry within the totally integrated power module (TIPM).

The EBL relay is located in the TIPM inside the engine compartment.

OPERATION

RELAY-REAR WINDOW DEFOGGER

The rear window defogger (EBL) relay is an electromechanical switch that uses a low current input controlled by the totally integrated power module (TIPM) to control the high current output to the rear window defogger grid lines and to the heated outside mirrors, when equipped. The movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to the rear window defogger grid lines.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of the relay coil collapses.

The EBL relay terminals are connected to the vehicle electrical system through a receptacle in the TIPM located in the engine compartment. The inputs and outputs of the EBL relay include:

Terminal (30) receives battery current at all times.

Terminal (85) receives a ground through the EBL control circuit of the TIPM only when the module electronically pulls the circuit to ground.

Terminal (86) receives battery current at all times.

Terminal (87) provides battery current to the rear window defogger grid and to the heated outside mirrors, only when the EBL relay coil is energized.

Terminal (87A) is not connected to any circuit in this application, but provides a battery current output only when the EBL relay coil is de-energized.

The EBL relay cannot be repaired and must be replaced if inoperative or damaged. Refer to the appropriate wiring information for diagnosis and testing of the ISO relay and for complete rear window defogger (EBL) wiring diagrams.

REMOVAL

RELAY-REAR WINDOW DEFOGGER

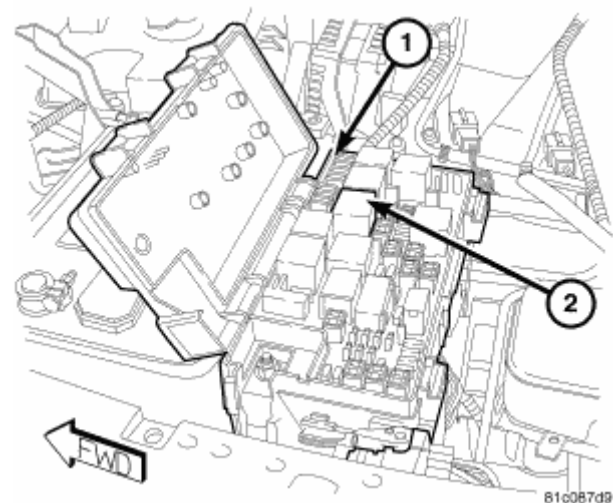


Fig. 6: Identifying Power Module (TIPM) & EBL Relay
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Open the cover on the totally integrated power module (TIPM) (1) located in the engine compartment.

NOTE: Refer to the fuse and relay map on the inside of the TIPM cover for EBL relay location.

3. Remove the EBL relay (2) from the TIPM.

INSTALLATION

RELAY-REAR WINDOW DEFOGGER

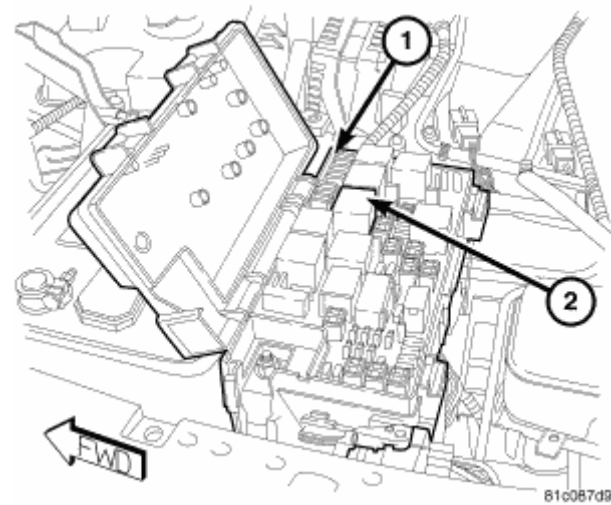


Fig. 7: Identifying Power Module (TIPM) & EBL Relay
Courtesy of CHRYSLER LLC

NOTE: Refer to the fuse and relay map on the inside of the totally integrated power module (TIPM) cover for EBL relay location.

1. Position the EBL relay (2) to the TIPM (1).
2. Align the EBL relay terminals with the terminal cavities in the TIPM receptacle and push down firmly on the relay until the terminals are fully seated.
3. Close the TIPM cover.
4. Reconnect the negative battery cable.

SWITCH-REAR WINDOW DEFOGGER

DESCRIPTION

SWITCH-REAR WINDOW DEFOGGER

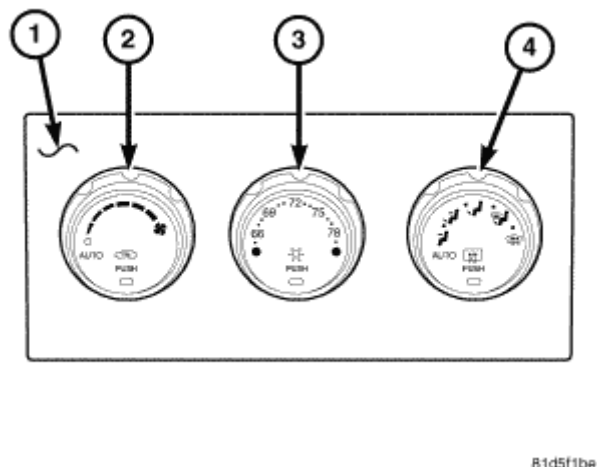


Fig. 8: A/C-Heater Control Assembly
 Courtesy of CHRYSLER LLC

NOTE: ATC control shown in illustration. MTC control similar.

The switch for the rear window defogger (EBL) system is integral to the mode control knob (4) located on the A/C-heater control (1) in the instrument panel. When the rear window defogger switch is pressed to the On position, a request signal is sent over the CAN-IHS bus to the totally integrated power module (TIPM) to operate the EBL system and the amber indicator illuminates within the mode control knob.

When the EBL relay is energized, current is directed to the rear defogger grid lines and to the heated side view mirrors, when equipped. The grid lines heat the glass to help clear the rear window and side mirror surfaces of fog or frost.

OPERATION

SWITCH-REAR WINDOW DEFOGGER

The amber indicator located in the mode control knob in the A/C-heater control will illuminate when the EBL system is operating. When the rear window defogger switch is pressed to the On position with the ignition switch in RUN, the switch sends a request signal to the totally integrated power module (TIPM), which then provides a ground path to energize the coil in the EBL relay. When energized, the EBL relay provides fused battery current to the rear window defogger grid lines and to the heated side view mirrors, when equipped.

NOTE: The EBL system turns off automatically after 10 minutes of initial operation. Each following activation cycle of the EBL system will last 5 minutes.

The EBL system will be automatically turned off after an initial programmed time interval of about 10 minutes as long as the ignition switch is in RUN. After the initial time interval has expired, if the rear window defogger switch is pressed to the On position again during the same ignition cycle, the EBL system will automatically turn off after about 5 minutes. The EBL system will automatically shut off if the ignition switch is turned to any position other than RUN, or it can be turned off manually by pressing the rear window defogger switch a second time.

The rear window defogger switch is diagnosed using a scan tool (refer to **HEATED MIRRORS - ELECTRICAL DIAGNOSTICS** for more information).

The rear window defogger switch and indicator cannot be adjusted or repaired and the A/C-heater control must be replaced if inoperative or damaged. Refer to **REMOVAL** .

2008 ACCESSORIES AND EQUIPMENT

Heated Mirrors - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

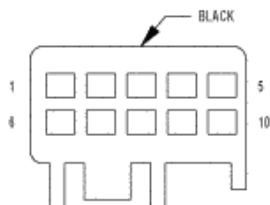
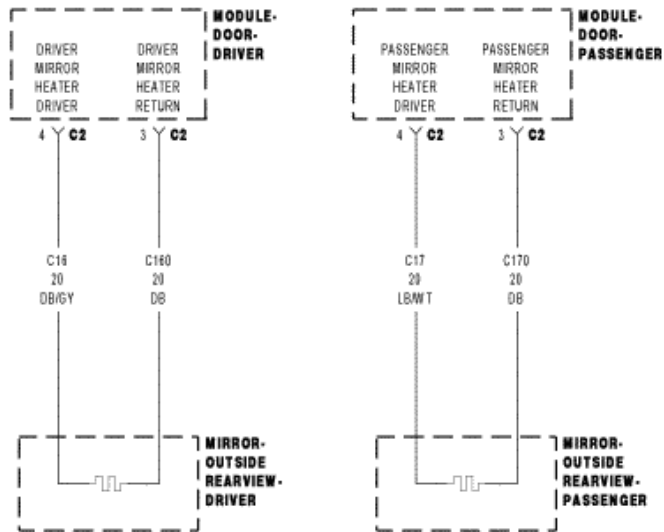
DTC	Description
<u>B1D33, B1D37</u>	MIRROR HEATER CONTROL CIRCUIT LOW - DDM/PDM
<u>B1D34, B1D38</u>	MIRROR HEATER CONTROL CIRCUIT HIGH - DDM/PDM

HEATED MIRRORS - ELECTRICAL DIAGNOSTICS

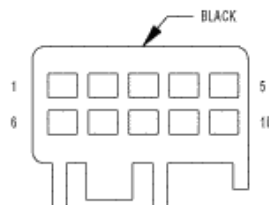
DIAGNOSIS AND TESTING

B1D33, B1D37-MIRROR HEATER CONTROL CIRCUIT LOW - DDM/PDM

Circuit Schematic



**MODULE-
DOOR-
DRIVER C2
(EXPRESS UP)**



**MODULE-
DOOR-
PASSENGER C2
(EXPRESS UP)**

W1a78708

Fig. 1: Mirror Heater Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

NOTE: This test covers both the Driver and Passenger code depending on the side the code appeared in.

- Set Condition:

When the Door Module senses a low value on the mirror heater driver for over 10ms, this code will set.

Possible Causes

Possible Causes
(C16) OR (C17) MIRROR HEATER DRIVER CIRCUIT SHORT TO GROUND
MIRROR SHORTED
DOOR MODULE

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Turn the rear defogger ON.

Operate the Mirror Switch in all directions several times.

With the scan tool, read DTC's.

Does the scan tool display B1D33, B1D37-MIRROR HEATER CONTROL CIRCUIT LOW?

Yes

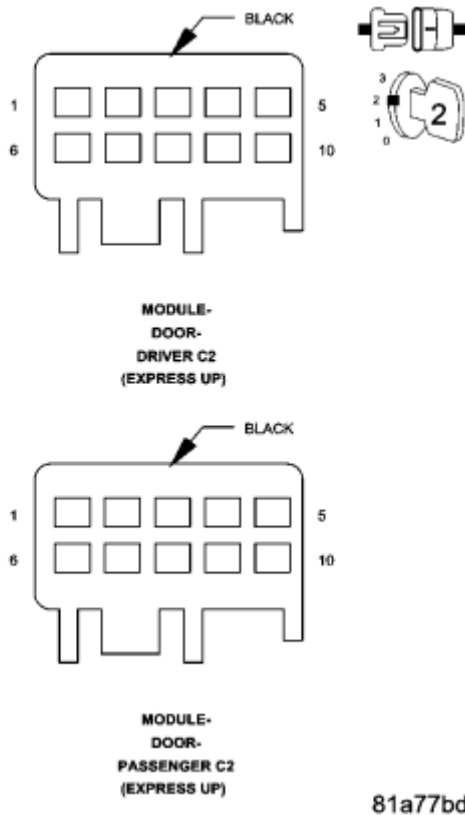
Go To 2) TEST FOR A SHORTED MIRROR.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) TEST FOR A SHORTED MIRROR



81a77bd4

Fig. 2: Driver/Passenger Door Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the appropriate door module C2 connector.

Turn the ignition on.

With the scan tool, erase DTC's

Turn the rear defogger ON.

Operate the Mirror Switch in all directions several times.

With the scan tool, read DTC's.

Does the scan tool display B1D33,B1D37-MIRROR HEATER CONTROL CIRCUIT LOW?

Yes

Replace the appropriate Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

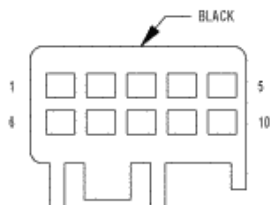
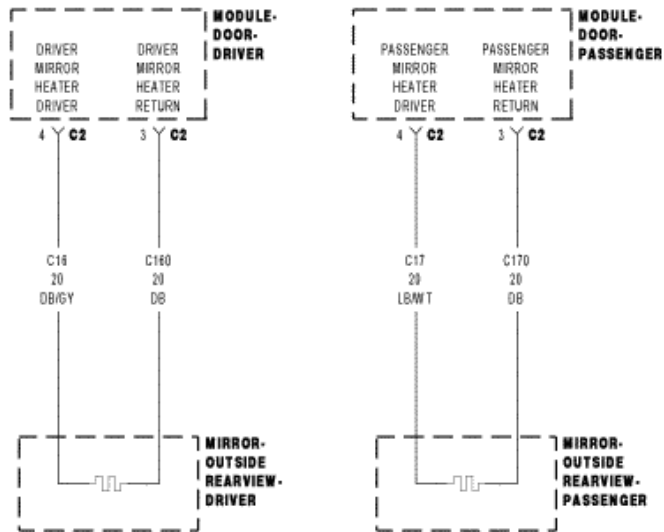
No

Inspect the mirror harness wires for shorted condition and repair as necessary. If the mirror wiring is OK, replace the Mirror.

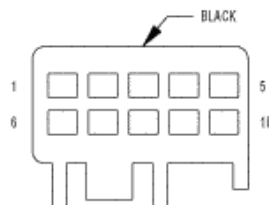
Perform **BODY VERIFICATION TEST - VER 1** .

B1D34, B1D38-MIRROR HEATER CONTROL CIRCUIT HIGH - DDM/PDM

Circuit Schematic



MODULE-DOOR-DRIVER C2 (EXPRESS UP)



MODULE-DOOR-PASSENGER C2 (EXPRESS UP)

W1a78708

Fig. 3: Mirror Heater Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:

When the Door Module senses a high value on the mirror heater driver for over 10ms, this code will set.

NOTE: This test covers both the Driver and Passenger code depending on the side the code appeared in.

Possible Causes

Possible Causes
(C16) OR (C17) MIRROR HEATER DRIVER CIRCUIT SHORT TO VOLTAGE
MIRROR SHORTED
DOOR MODULE

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Turn the rear defogger ON.

Operate the Mirror Switch in all directions several times.

With the scan tool, read DTC's.

Does the scan tool display B1D34, B1D38-MIRROR HEATER CONTROL CIRCUIT HIGH?

Yes

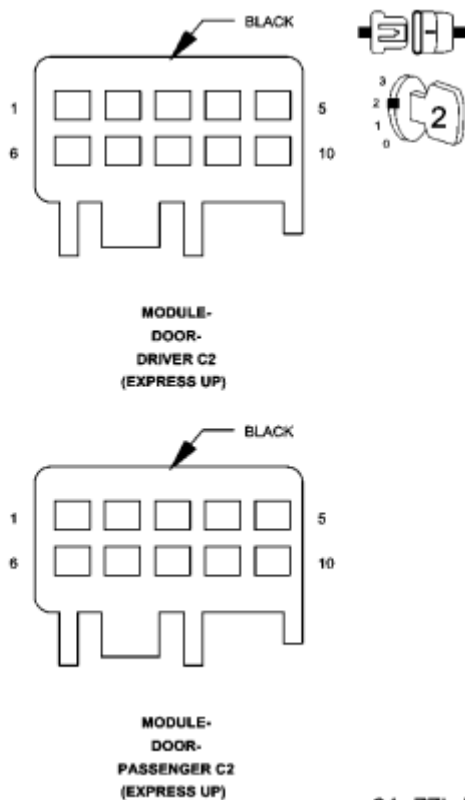
Go To 2).

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) TEST FOR A SHORTED MIRROR



81a77bd4

Fig. 4: Driver/Passenger Door Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the appropriate door module C2 connector.

Turn the ignition on.

With the scan tool, erase DTC's

Turn the rear defogger ON.

Operate the Mirror Switch in all directions several times.

With the scan tool, read DTC's.

Does the scan tool display B1D34,B1D38-MIRROR HEATER CONTROL CIRCUIT HIGH?

Yes

Replace the appropriate Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Inspect the mirror harness wires for shorted condition and repair as necessary. If the mirror wiring is OK, replace the Mirror.

Perform **BODY VERIFICATION TEST - VER 1** .

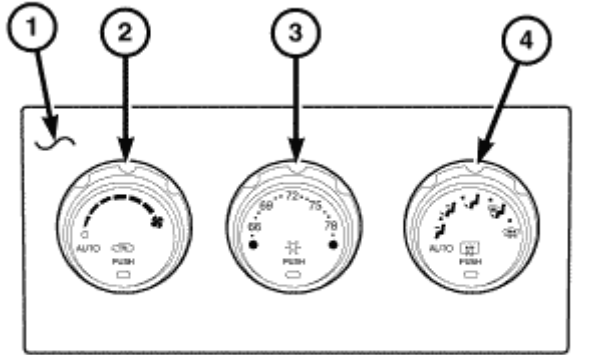
2008 ACCESSORIES AND EQUIPMENT

Heated Mirrors - Service Information - Liberty

HEATED MIRRORS - SERVICE INFORMATION

DESCRIPTION

HEATED MIRROR SYSTEM



81d5f1be

Fig. 1: A/C-Heater Control Assembly
Courtesy of CHRYSLER LLC

When equipped, the heated mirror system operates in concert with the rear window defogger (EBL) system. The EBL system is controlled by a momentary push-button switch integral to the mode control knob located on the A/C-heater control (1) in the instrument panel. When the rear window defogger switch is pressed to the On position with the ignition switch in RUN, the switch sends a request signal over the CAN-IHS bus to the totally integrated power module (TIPM) to energize the EBL relay. When energized, the EBL relay provides battery current to the rear window defogger grid lines and to the heated side view mirrors. The heated side view mirrors help clear the mirror surfaces of fog or frost.

An amber indicator in the mode control knob will illuminate to indicate when the heated mirror system is turned on.

NOTE: **The heated mirror system turns off automatically after 10 minutes of initial operation. Each following activation cycle of the heated mirror system will last 5 minutes.**

The heated mirror system will be automatically turned off after an initial programmed time interval of about 10 minutes as long as the ignition switch is in RUN. After the initial time interval has expired, if the rear window defogger switch is pressed to the on position again during the same ignition cycle, the heated mirror system will automatically turn off after about 5 minutes. The heated mirror system will also turn off if the ignition switch is turned to any position other than RUN or by manually pressing the rear window defogger switch a second time.

Circuit protection for the heated mirror system is provided by fuse 54 located in the TIPM.

OPERATION

HEATED MIRRORS

When equipped, the heated mirror system is activated when the rear window defogger (EBL) system is turned on. Refer to **OPERATION** . When the heated mirror system is activated, an electric heater grid located behind the glass of each of the outside rear view mirror becomes energized and produces heat to help clear the mirror of ice, snow, or fog.

If the outside mirror heating grids are both inoperative, refer to **DIAGNOSIS AND TESTING** . If only one of the outside mirror heating grid is inoperative, refer to **DIAGNOSIS AND TESTING** .

The heating grid behind each outside mirror glass cannot be repaired and the mirror glass must be replaced if the heating grid is found inoperative or damaged. Refer to **REMOVAL** .

2008 ACCESSORIES AND EQUIPMENT

Heated Seats - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1092</u>	FRONT LEFT SEAT HEATER CONTROL CIRCUIT LOW
<u>B1094</u>	FRONT LEFT SEAT HEATER CONTROL CIRCUIT OPEN
<u>B1096</u>	FRONT RIGHT SEAT HEATER CONTROL CIRCUIT LOW
<u>B1098</u>	FRONT RIGHT SEAT HEATER CONTROL CIRCUIT OPEN
<u>B10BB</u>	LEFT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER
<u>B10BC</u>	RIGHT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER
<u>B2181</u>	HEATED SEAT MODULE POWER SUPPLY LOW
<u>B2182</u>	HEATED SEAT MODULE POWER SUPPLY HIGH

HEATED SEATS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1092-FRONT LEFT SEAT HEATER CONTROL CIRCUIT LOW

Circuit Schematic

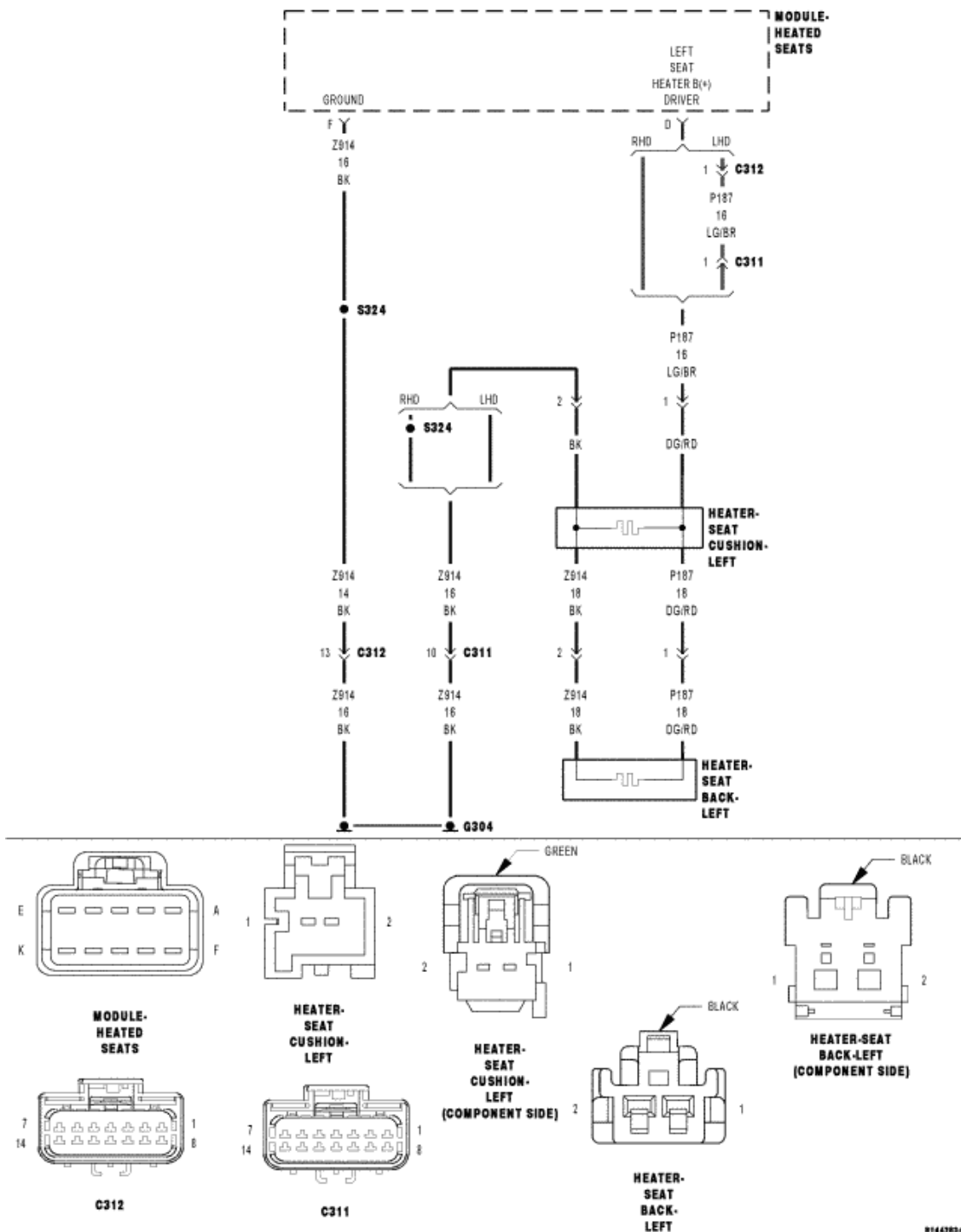


Fig. 1: Front Left Seat Heater Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on, during the heated seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Heated Seat Module detects the control circuit shorted to ground.

Possible Causes

Possible Causes
(P187) LEFT SEAT HEATER B(+) DRIVER SHORTED TO GROUND SEAT CUSHION HEATER ELEMENT SHORTED SEAT BACK HEATER ELEMENT SHORTED HEATED SEAT MODULE

Diagnostic Test

1. **VERIFY THAT DTC B1092-FRONT LEFT SEAT HEATER CONTROL CIRCUIT LOW IS ACTIVE**

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the DTC B1092 - FRONT LEFT SEAT HEATER CONTROL CIRCUIT LOW reset?

Yes

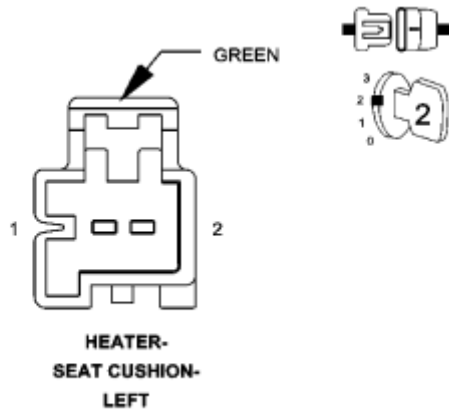
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **DISCONNECT LEFT CUSHION HEATER 2-WAY CONNECTOR AND READ DTC'S**



819f506e

Fig. 2: Left Seat Cushion Heater 2- Way Connector
Courtesy of CHRYSLER LLC

Disconnect the Left Seat Cushion Heater 2- way connector.

NOTE: Check connectors - Clean and repair as necessary.

With the scan tool, erase DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the scan tool display the same DTC?

Yes

Go To 5.

No

Go To 3.

3. **CHECK THE (P187) LEFT SEAT HEATER B(+) DRIVER FOR A SHORT TO GROUND AT THE SEAT**

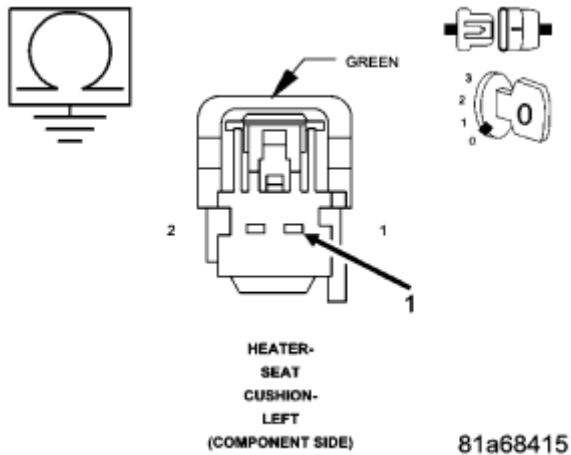


Fig. 3: Measuring Between (P187) Left Seat Heater B(+) Driver Circuit At Left Seat Heater Connector (Component Side) And Seat Frame For Short To Ground
Courtesy of CHRYSLER LLC

Measure between the (P187) Left Seat Heater B(+) Driver circuit at the Left Seat Heater connector (component side) and the seat frame for a short to ground.

Is the resistance below 1000 ohms?

No

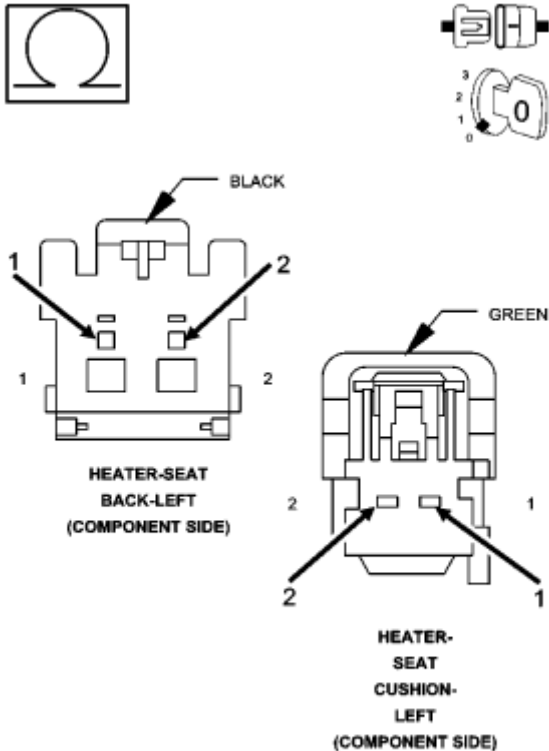
Go To 4.

Yes

Repair/replace the pigtail/heating element as necessary for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1**.

4. CHECK THE LEFT HEATER ELEMENT SEAT CUSHION AND SEAT BACK RESISTANCE



819f50e7

Fig. 4: Measuring Between (P187) Left Seat Heater B(+) Driver And Ground Circuit At Seat Cushion And Seat Back Heater Connectors
 Courtesy of CHRYSLER LLC

Gain access to the seat cushion and seat back heater connectors.

Check the resistance of each of the heater elements by measuring between the (P187) Left Seat Heater B (+) Driver and the Ground circuit at the seat cushion and seat back heater connectors.

For the seat cushion element the resistance value is 3 to 5.5 ohms.

For the seat back element the resistance value is 4 to 6 ohms.

Is the resistance correct for each heater element?

Yes

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors for an intermittent short to ground.

No

Replace the heater element as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

5. Check the (P187) Left Seat Heater B(+) Driver circuit for a short to ground

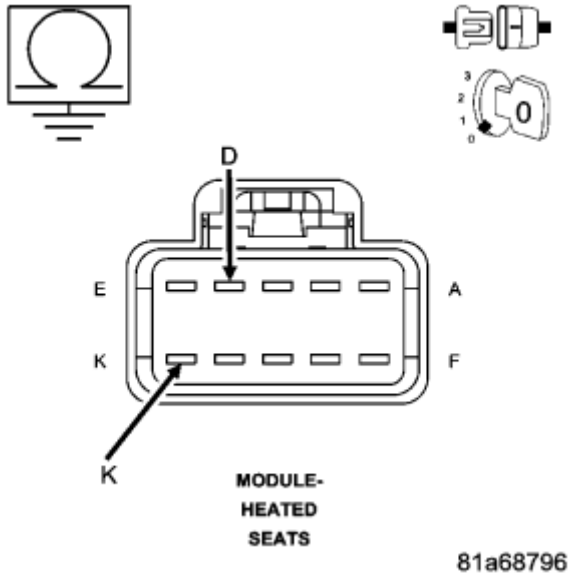


Fig. 5: Checking The Seat Heater B(+) Driver Circuit For A Short To Ground
Courtesy of CHRYSLER LLC

Ensure the Left Seat Cushion Heater 2- way connector is still disconnected.

Disconnect the Heated Seat Module connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the (P187) Left Seat Heater B(+) Driver circuit cavity D at the HSM connector to ground.

Is the resistance below 5.0 ohms?

Yes

Repair the (P187) Left Seat Heater B(+) Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Heated Seat Module.

Perform **BODY VERIFICATION TEST - VER 1** .

B1094-FRONT LEFT SEAT HEATER CONTROL CIRCUIT OPEN

Circuit Schematic

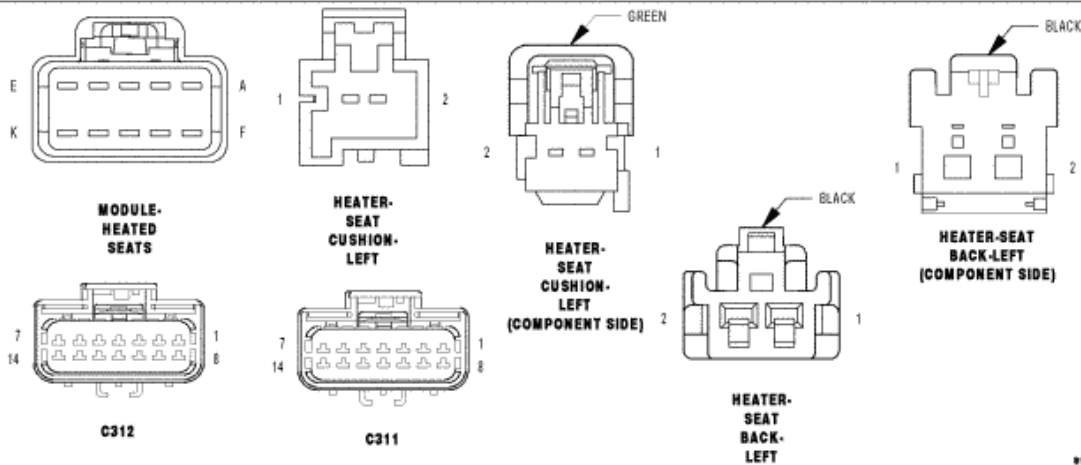
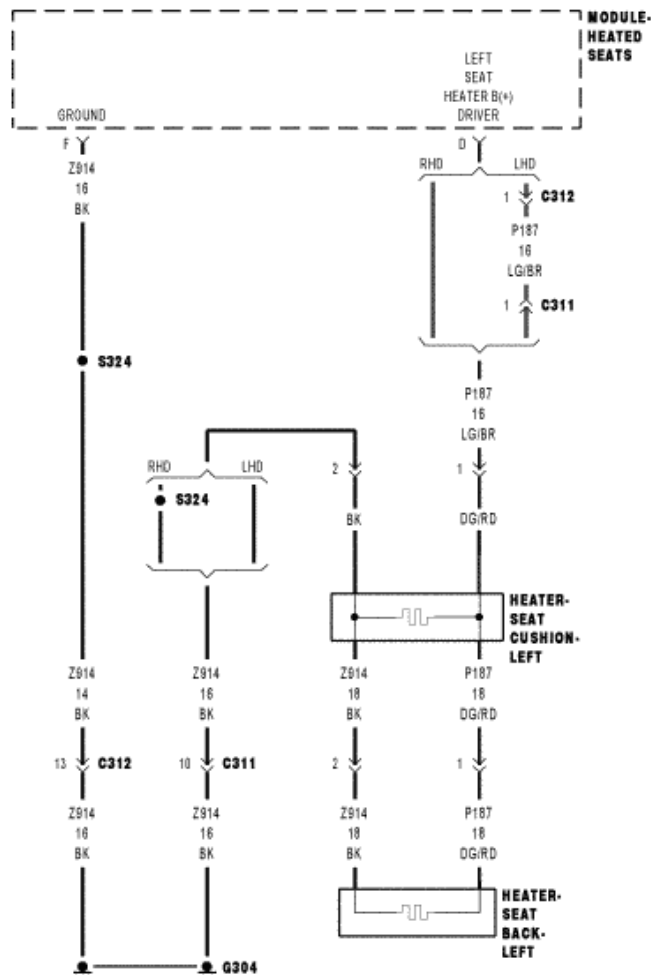


Fig. 6: Front Left Seat Heater Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on, during the heated seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Heated Seat Module detects an open in the seat heater B(+) driver circuit.

Possible Causes

Possible Causes
(P187) LEFT SEAT HEATER B(+) DRIVER WIRE OPEN (Z914) GROUND WIRE OPEN SEAT CUSHION HEATER ELEMENT OPEN SEAT BACK HEATER ELEMENT OPEN HEATED SEAT MODULE

Diagnostic Test

1. **VERIFY THAT DTC B1094-FRONT LEFT SEAT HEATER CONTROL CIRCUIT OPEN IS ACTIVE**

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the DTC B1094 FRONT LEFT SEAT HEATER CONTROL CIRCUIT OPEN reset?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR AN OPEN SEAT HEATER ELEMENT CIRCUIT**

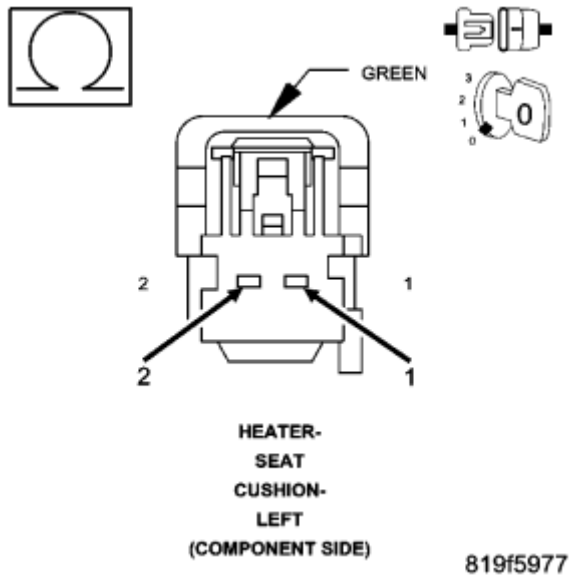


Fig. 7: Measuring Total Resistance Of Cushion And Seat Back Heater Elements At Left Seat Cushion 2- Way Connector (Component Side)
Courtesy of CHRYSLER LLC

Disconnect the Left Seat Cushion Heater 2- way connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the total resistance of the cushion and seat back heater elements at the Left Seat Cushion 2- way connector (component side).

Is the total resistance 2.5 to 3.5 ohms + or -.5 ohms?

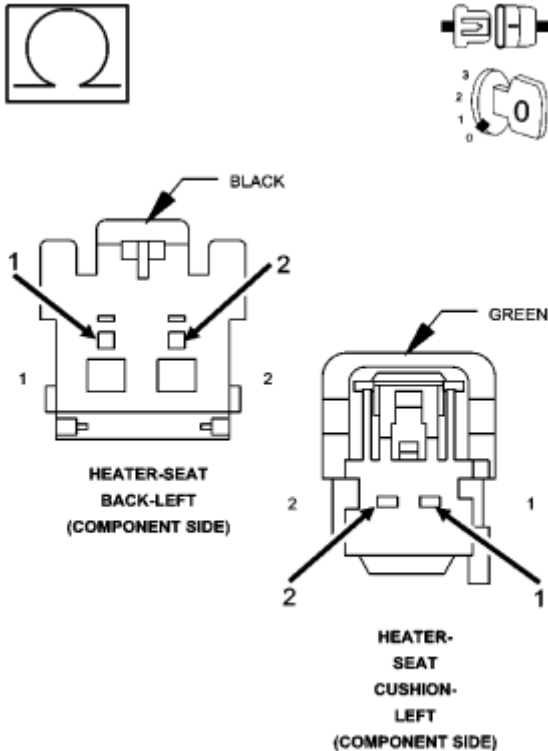
Yes

Go To 4.

No

Go To 3.

3. CHECK THE LEFT SEAT HEATER ELEMENT RESISTANCE



819f50e7

Fig. 8: Measuring Between (P187) Left Seat Heater B(+) Driver And Ground Circuit At Seat Cushion And Seat Back Heater Connectors

Courtesy of CHRYSLER LLC

Gain access to and disconnect the seat cushion and seat back heater connectors.

NOTE: Check connectors - Clean and repair as necessary.

Measure each of the heater elements by measuring between the (P187) Left Seat Heater B(+) Driver and the Ground circuit at the seat cushion and seat back heater connectors.

For the seat cushion element the resistance value is 3 to 5.5 ohms.

For the seat back element the resistance value is 4 to 6 ohms.

Is the resistance correct for each heater element?

Yes

Check for an open in the pigtail harness and repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the heater element as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE LEFT SEAT HEATER GROUND CIRCUIT**

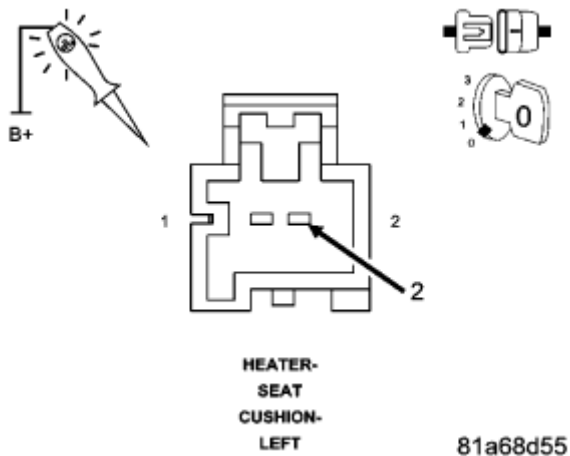


Fig. 9: Using 12-Volt Test Light Connected To 12-Volts To Check (Z914) Ground Circuit At Left Seat Cushion Heater 2- Way Connector (Harness Side)

Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z914) Ground circuit at the Left Seat Cushion Heater 2- way connector (harness side).

Does the test light illuminate brightly?

Yes

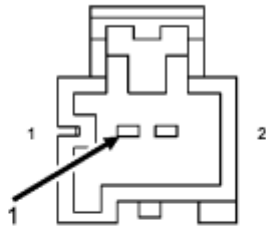
Go To 5.

No

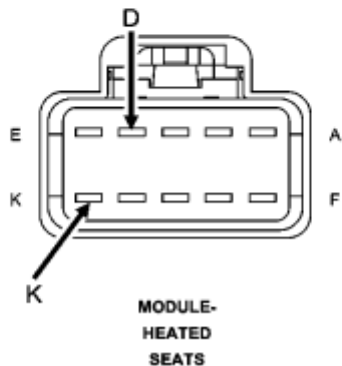
Repair the (Z914) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK THE (P187) LEFT SEAT HEATER B(+) DRIVER CIRCUIT FOR AN OPEN**



HEATER-
SEAT
CUSHION-
LEFT



81a68d9c

Fig. 10: Measuring (P187) Left Seat Heater B(+) Driver Circuit Cavity D From HSM Connector To Left Seat Cushion Heater 2- Way Connector (Harness Side)
Courtesy of CHRYSLER LLC

Disconnect the Heated Seat Module connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the (P187) Left Seat Heater B(+) Driver circuit cavity D from the HSM connector to the Left Seat Cushion Heater 2- way connector (harness side).

Is the resistance below 5.0 ohms?

Yes

Replace the Heated Seat Module.

Perform **BODY VERIFICATION TEST - VER 1** .

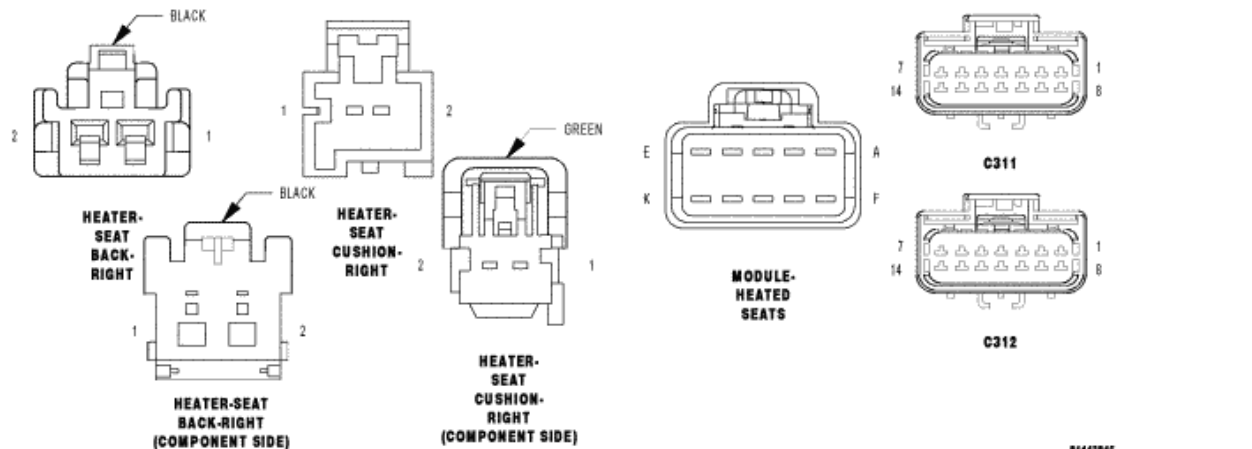
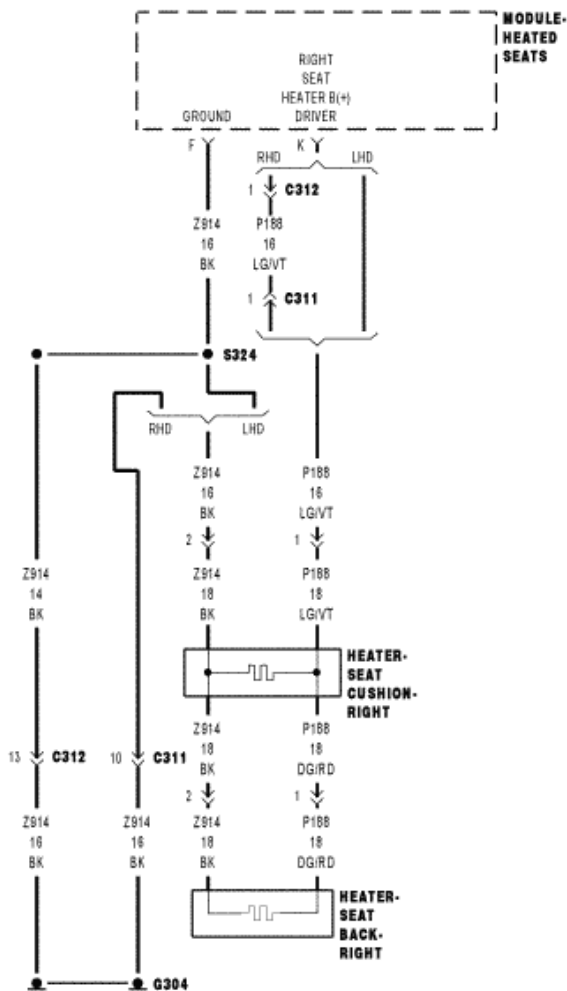
No

Repair the (P187) Left Seat Heater B(+) Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1096-FRONT RIGHT SEAT HEATER CONTROL CIRCUIT LOW

Circuit Schematic



014-02005

Fig. 11: Front Right Seat Heater Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Ignition on, during the heated seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Heated Seat Module detects the control circuit shorted to ground.

Possible Causes

Possible Causes
(P188) RIGHT SEAT HEATER B(+) DRIVER SHORTED TO GROUND SEAT CUSHION HEATER ELEMENT SHORTED SEAT BACK HEATER ELEMENT SHORTED HEATED SEAT MODULE

Diagnostic Test

1. **VERIFY THAT DTC B1096-FRONT RIGHT SEAT HEATER CONTROL CIRCUIT LOW IS ACTIVE**

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the DTC B1096 - FRONT RIGHT SEAT HEATER CONTROL CIRCUIT LOW reset?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **DISCONNECT RIGHT CUSHION HEATER 2-WAY CONNECTOR AND READ DTC'S**

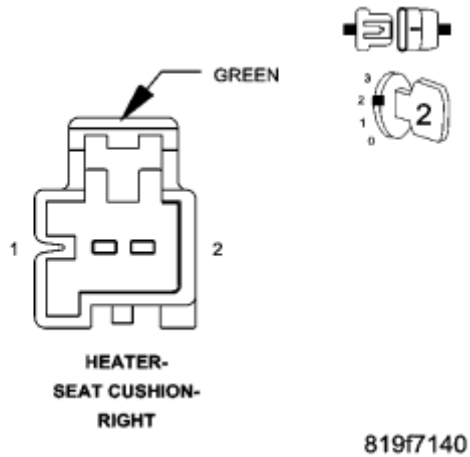


Fig. 12: Left Seat Cushion Heater 2- Way Connector
Courtesy of CHRYSLER LLC

Disconnect the Left Seat Cushion Heater 2- way connector.

NOTE: Check connectors - Clean and repair as necessary.

With the scan tool, erase DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the scan tool display the same DTC?

Yes

Go To 5.

No

Go To 3.

3. **CHECK THE (P188) RIGHT SEAT HEATER B(+) DRIVER FOR A SHORT TO GROUND AT THE SEAT**

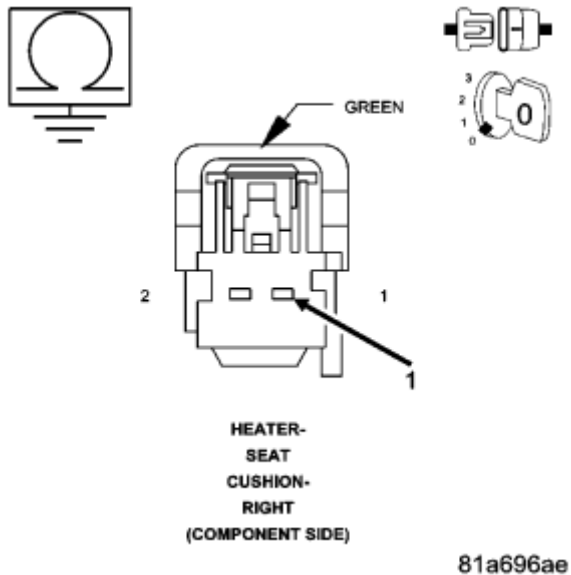


Fig. 13: Measuring Between (P188) Right Seat Heater B(+) Driver Circuit At Right Seat Heater Connector (Component Side) And Seat Frame For Short To Ground
Courtesy of CHRYSLER LLC

Measure between the (P188) Right Seat Heater B(+) Driver circuit at the Right Seat Heater connector (component side) and the seat frame for a short to ground.

Is the resistance below 1000 ohms?

No

Go To 4.

Yes

Repair/replace the pigtail/heating element as necessary for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE RIGHT HEATER ELEMENT SEAT CUSHION AND SEAT BACK RESISTANCE

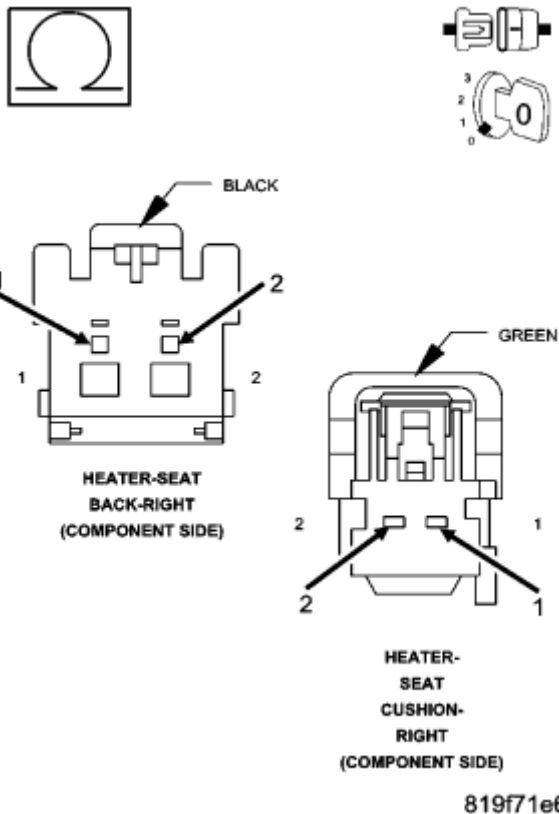


Fig. 14: Measuring Between (P188) Right Seat Heater B(+) Driver And Ground Circuit At Seat Cushion And Seat Back Heater Connectors
 Courtesy of CHRYSLER LLC

Gain access to the seat cushion and seat back heater connectors.

Check the resistance of each of the heater elements by measuring between the (P188) Right Seat Heater B (+) Driver and the Ground circuit at the seat cushion and seat back heater connectors.

For the seat cushion element the resistance value is 3 to 5.5 ohms.

For the seat back element the resistance value is 4 to 6 ohms.

Is the resistance correct for each heater element?

Yes

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors for an intermittent short to ground.

No

Replace the heater element as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK THE (P188) RIGHT SEAT HEATER B(+) DRIVER CIRCUIT FOR A SHORT TO GROUND**

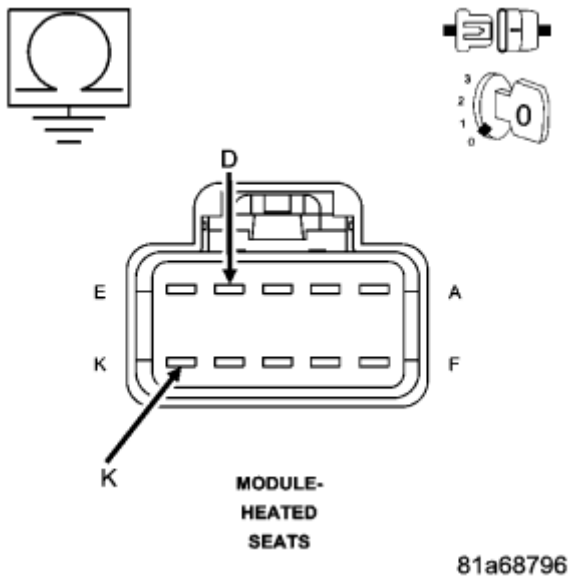


Fig. 15: Checking The Seat Heater B(+) Driver Circuit For A Short To Ground
Courtesy of CHRYSLER LLC

Ensure the Right Seat Cushion Heater 2 - way connector is still disconnected.

Disconnect the Heated Seat Module connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the (P188) Right Seat Heater B(+) Driver circuit cavity K at the HSM connector to ground.

Is the resistance below 5.0 ohms?

Yes

Repair the (P188) Right Seat Heater B(+) Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

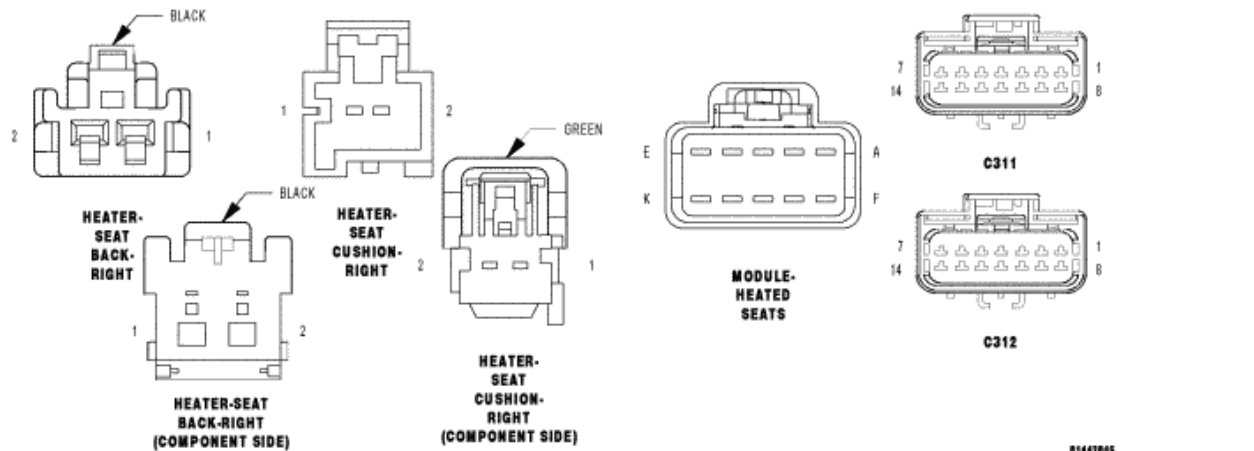
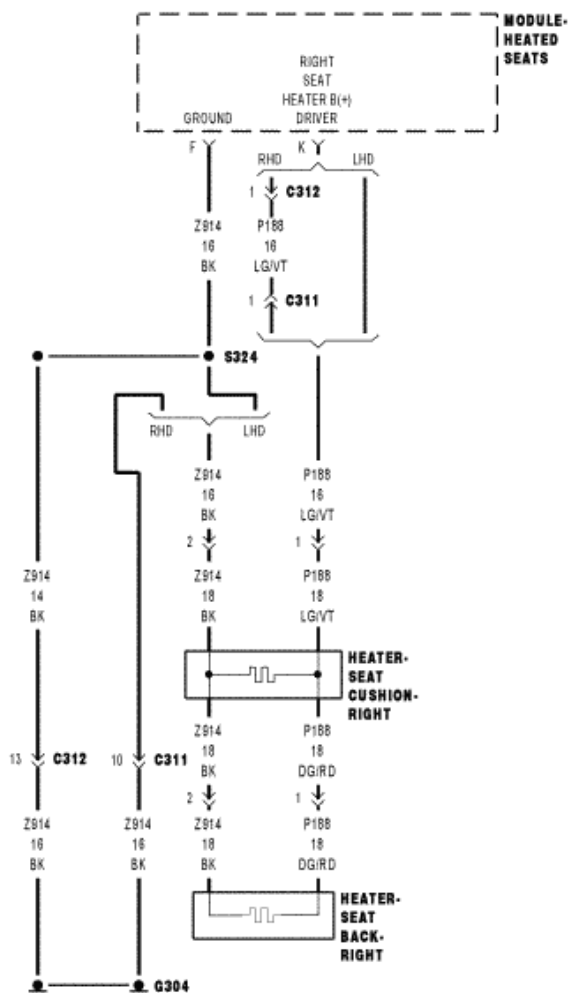
No

Replace the Heated Seat Module.

Perform **BODY VERIFICATION TEST - VER 1** .

B1098-FRONT RIGHT SEAT HEATER CONTROL CIRCUIT OPEN

Circuit Schematic



014-02005

Fig. 16: Front Right Seat Heater Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on, during the heated seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Heated Seat Module detects an open in the seat heater B(+) driver circuit.

Possible Causes

Possible Causes
(P188) RIGHT SEAT HEATER B(+) DRIVER WIRE OPEN (Z914) GROUND WIRE OPEN SEAT CUSHION HEATER ELEMENT OPEN SEAT BACK HEATER ELEMENT OPEN HEATED SEAT MODULE

Diagnostic Test

1. **VERIFY THAT DTC B1098-FRONT RIGHT SEAT HEATER CONTROL CIRCUIT OPEN IS ACTIVE**

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch in both positions several times.

With the scan tool, read DTC's.

Does the DTC B1098 FRONT RIGHT SEAT HEATER CONTROL CIRCUIT OPEN reset?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR AN OPEN SEAT HEATER ELEMENT**

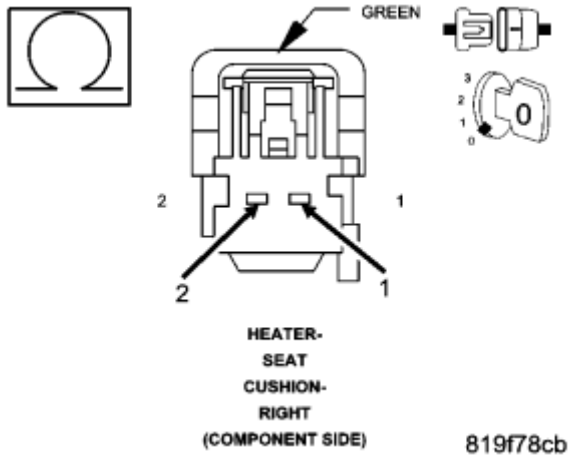


Fig. 17: Measuring Total Resistance Of Cushion And Seat Back Heater Elements At Right Seat Cushion 2 - Way Connector (Component Side)
Courtesy of CHRYSLER LLC

Disconnect the Right Seat Cushion Heater 2 - way connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the total resistance of the cushion and seat back heater elements at the Right Seat Cushion 2 - way connector (component side).

Is the total resistance 2.5 to 3.5 ohms + or -.5 ohms?

Yes

Go To 4.

No

Go To 3.

3. CHECK THE RIGHT SEAT HEATER ELEMENT RESISTANCE

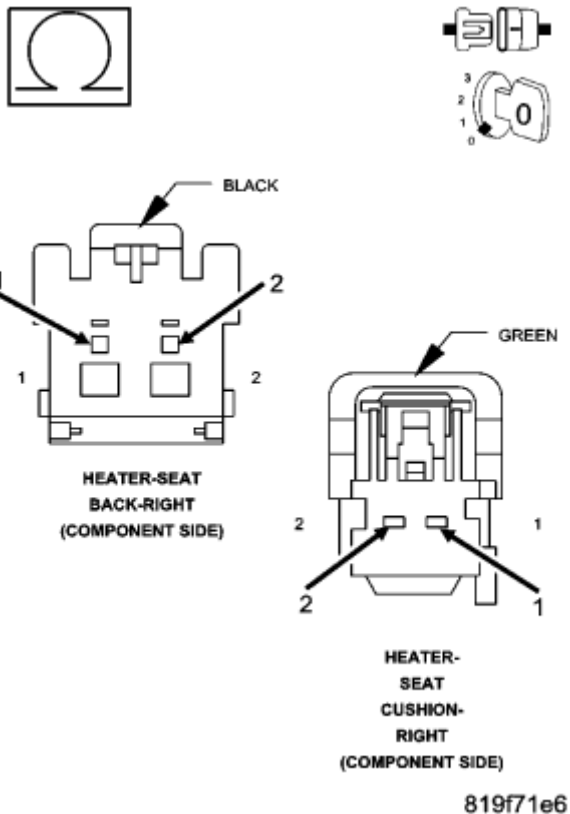


Fig. 18: Measuring Between (P188) Right Seat Heater B(+) Driver And Ground Circuit At Seat Cushion And Seat Back Heater Connectors
 Courtesy of CHRYSLER LLC

Gain access to and disconnect the seat cushion and seat back heater connectors.

NOTE: Check connectors - Clean and repair as necessary.

Measure each of the heater elements by measuring between the (P188) Right Seat Heater B(+) Driver and the Ground circuit at the seat cushion and seat back heater connectors.

For the seat cushion element the resistance value is 3 to 5.5 ohms.

For the seat back element the resistance value is 4 to 6 ohms.

Is the resistance correct for each heater element?

Yes

Check for an open in the pigtail harness and repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the heater element as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE SEAT HEATER GROUND CIRCUIT**

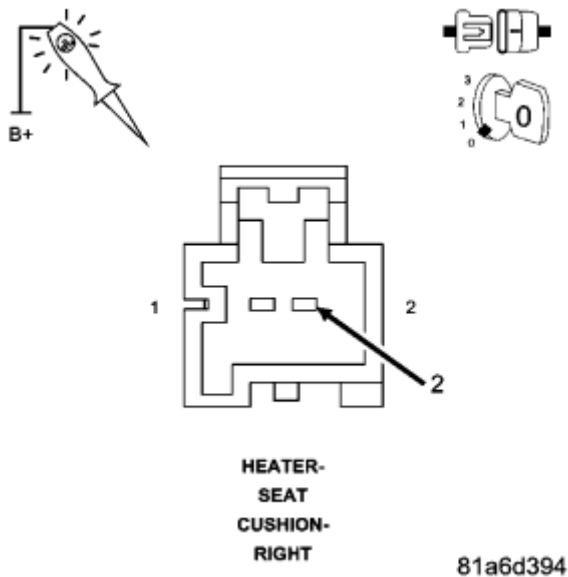


Fig. 19: Using 12-Volt Test Light Connected To 12-Volts To Check (Z914) Ground Circuit At Right Seat Cushion Heater 2 - Way Connector (Harness Side)
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z914) Ground circuit at the Right Seat Cushion Heater 2 - way connector (harness side).

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (Z914) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK THE (P188) RIGHT SEAT HEATER B(+) DRIVER CIRCUIT FOR AN OPEN.**

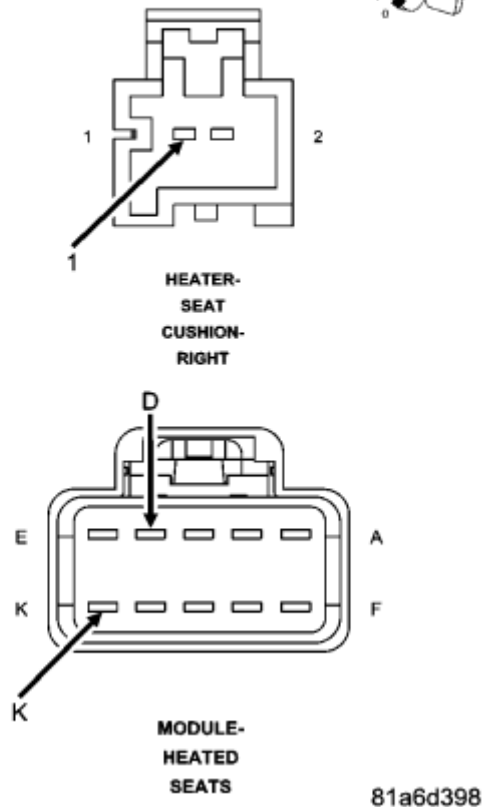


Fig. 20: Measuring (P188) Right Seat Heater B(+) Driver Circuit Cavity K From HSM Connector To Right Seat Cushion Heater 2 - Way Connector (Harness Side)
Courtesy of CHRYSLER LLC

Disconnect the Heated Seat Module connector.

NOTE: Check connectors - Clean and repair as necessary.

Measure the (P188) Right Seat Heater B(+) Driver circuit cavity K from the HSM connector to the Right Seat Cushion Heater 2 - way connector (harness side).

Is the resistance below 5.0 ohms?

Yes

Replace the Heated Seat Module.

Perform **BODY VERIFICATION TEST - VER 1** .

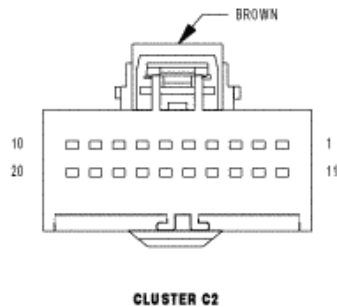
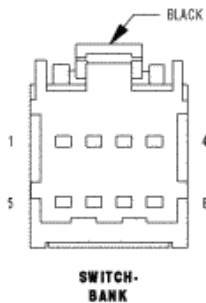
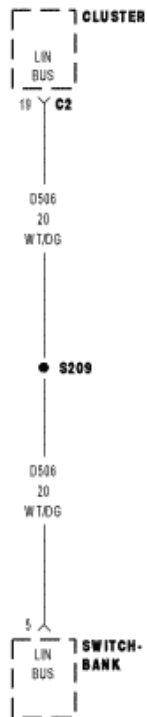
No

Repair the (P188) Right Seat Heater B(+) Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B10BB-LEFT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER

Circuit Schematic



01a063a5

Fig. 21: Left Heated Seat Switch Input Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- Set Condition:**

When the Heated Seat Switch in the Switch Bank is held in the on position for over 10 seconds, this code will set.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT PARTIAL SHORT TO GROUND SWITCH BANK STUCK INSTRUMENT CLUSTER

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch several times.

Cycle the ignition from on to off.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display B10BB LEFT HEATED SEAT SWITCH INPUT CIRCUIT STUCK?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. SWITCH SHORTED

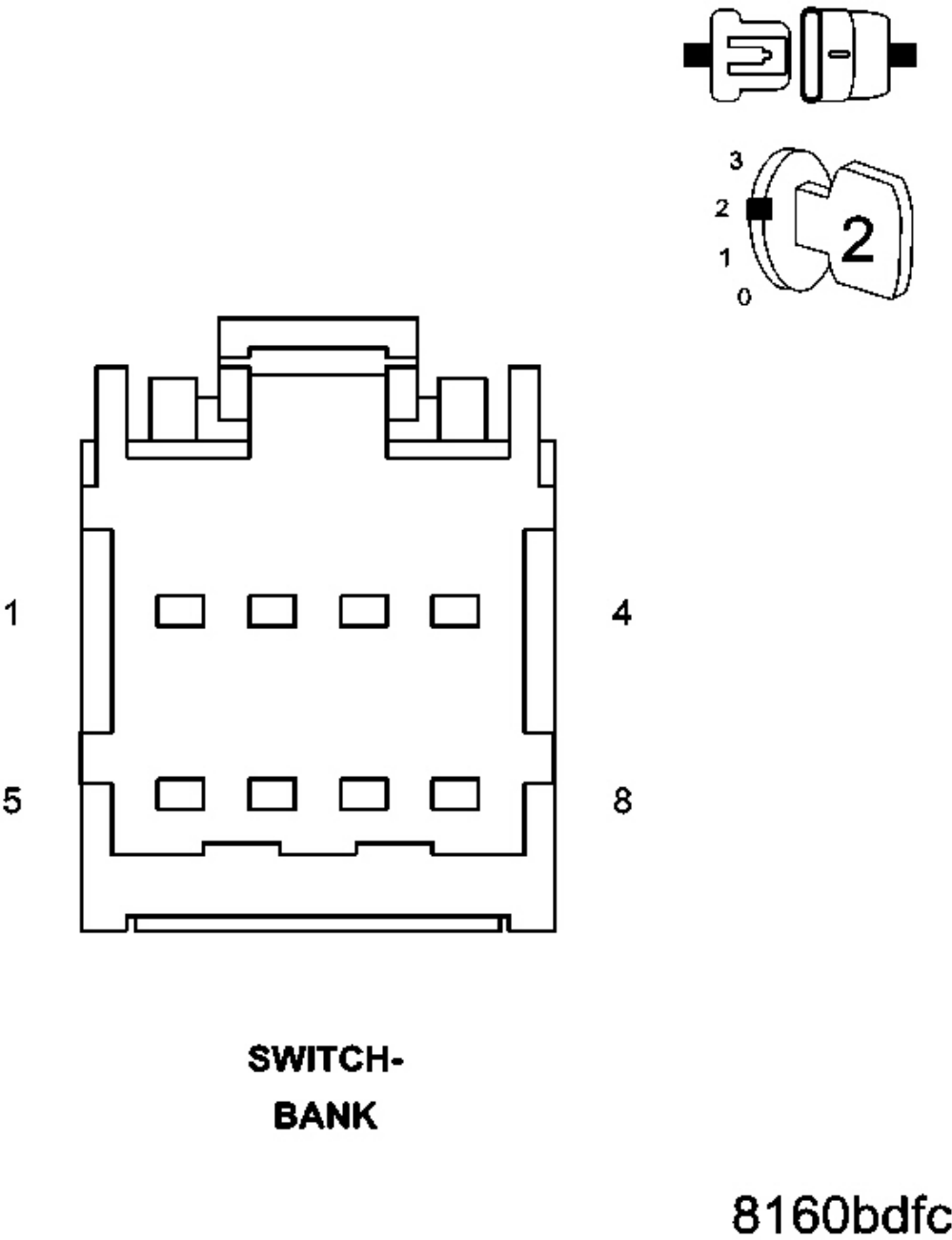


Fig. 22: Identifying Switch Bank Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Disconnect the Switch Bank connector.

With the scan tool, read DTC's.

Does the scan tool display B10BB - LEFT HEATED SEAT SWITCH INPUT CIRCUIT STUCK?

No

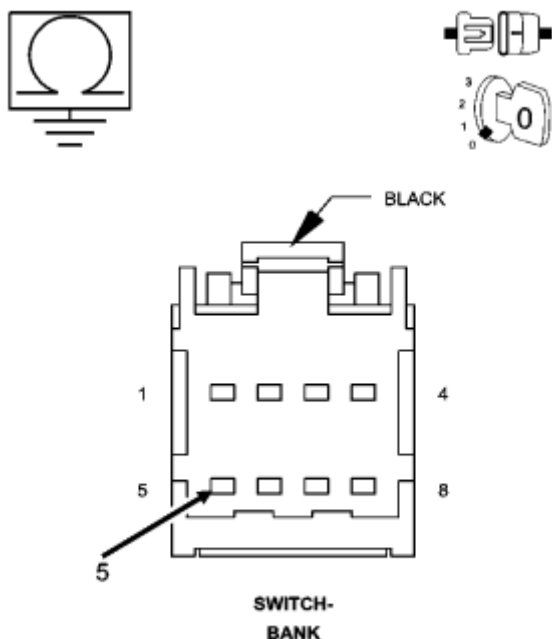
Replace the Switch Bank.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (D506) LIN BUS CIRCUIT PARTIAL SHORT TO GROUND



81aa127d

Fig. 23: Measuring Resistance Between Ground And (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 connector.

Measure the resistance between ground and the (D506) LIN Bus circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (D506) LIN Bus circuit for a partial short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

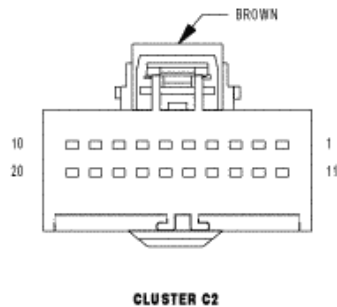
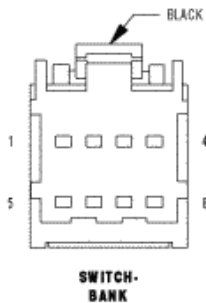
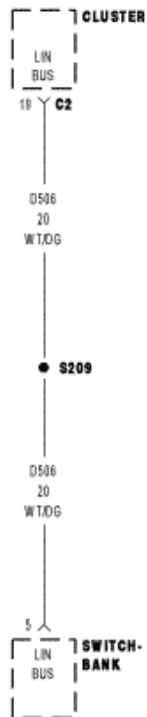
No

Replace the Instrument Cluster in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B10BC-RIGHT HEATED SEAT SWITCH INPUT CIRCUIT STUCK - CLUSTER

Circuit Schematic



01a063a5

Fig. 24: Left Heated Seat Switch Input Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- **Set Condition:**

When the Heated Seat Switch in the Switch Bank is held in the on position for over 10 seconds, this code will set.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT PARTIAL SHORT TO GROUND SWITCH BANK STUCK INSTRUMENT CLUSTER

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase CCN DTC's

Operate the Heated Seat Switch several times.

Cycle the ignition from on to off.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display B10BC RIGHT HEATED SEAT SWITCH INPUT CIRCUIT STUCK?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. SWITCH SHORTED

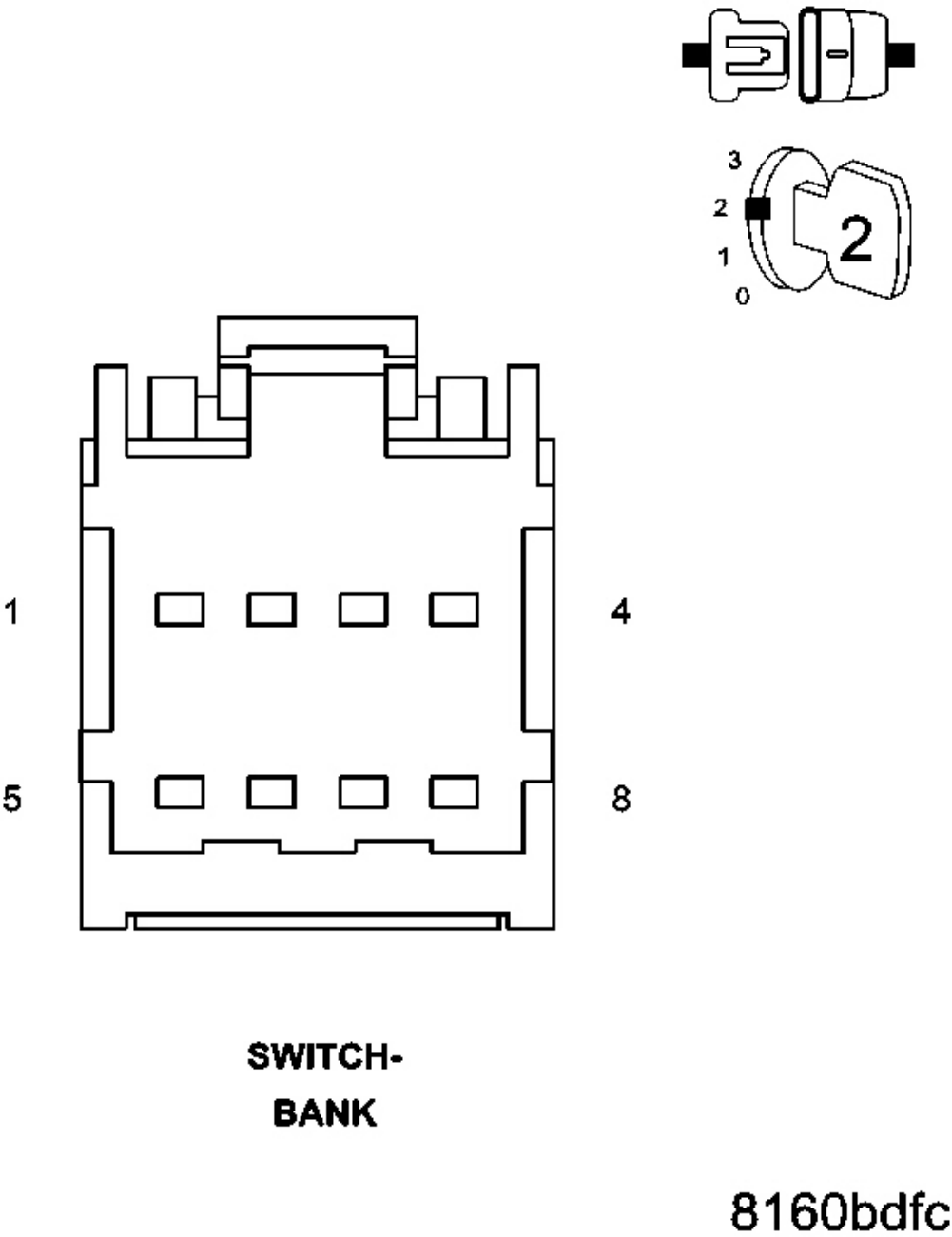


Fig. 25: Identifying Switch Bank Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Disconnect the Switch Bank connector.

With the scan tool, read DTC's.

Does the scan tool display B10BC - RIGHT HEATED SEAT SWITCH INPUT CIRCUIT STUCK?

No

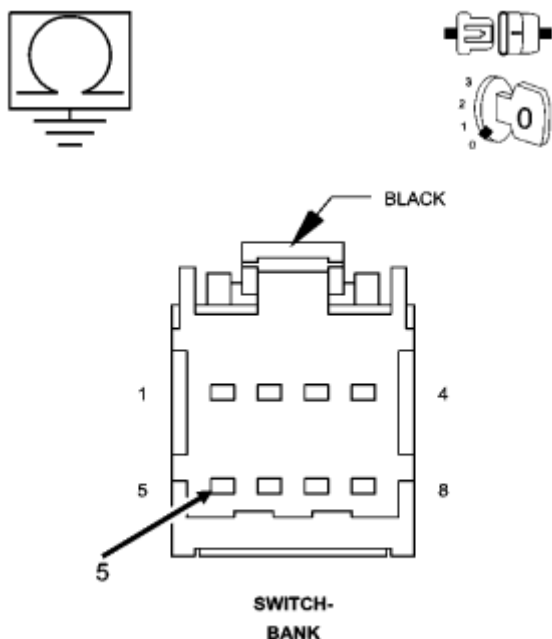
Replace the Switch Bank.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (D506) LIN BUS CIRCUIT PARTIAL SHORT TO GROUND



81aa127d

Fig. 26: Measuring Resistance Between Ground And (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 connector.

Measure the resistance between ground and the (D506) LIN Bus circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (D506) LIN Bus circuit for a partial short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

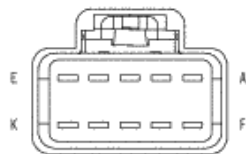
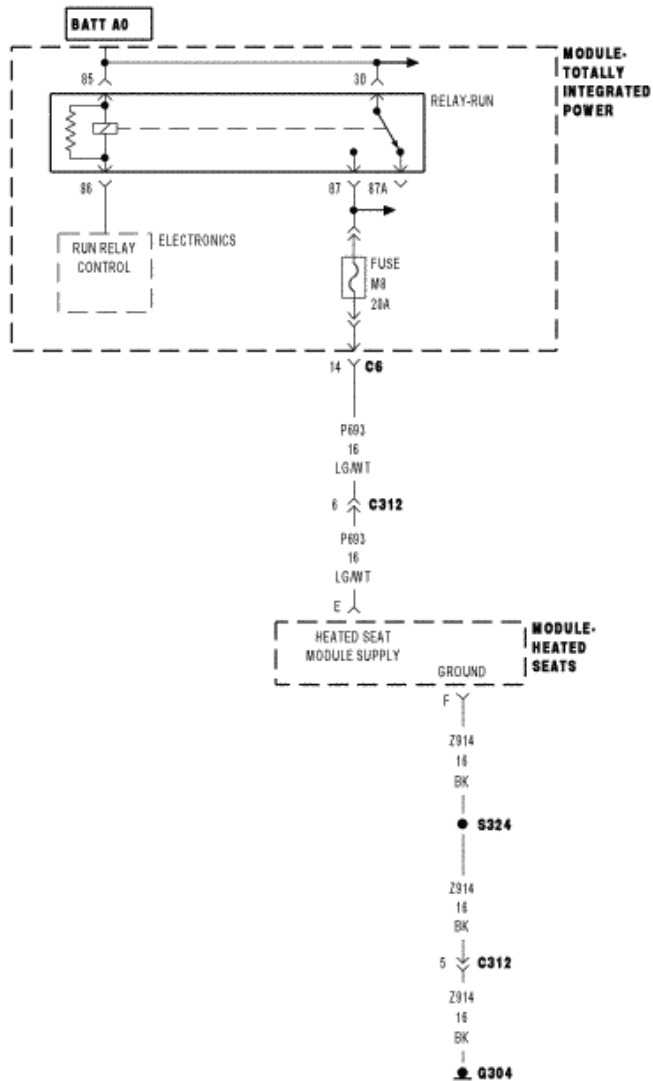
No

Replace the Instrument Cluster in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2181-HEATED SEAT MODULE POWER SUPPLY LOW

Circuit Schematic



MODULE-HEATED SEATS

01a77965

Fig. 27: Heated Seat Module Supply Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During heated seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately if the Heated Seat Module detects voltage under 10 volts on the (P693) Heated Seat Module Supply circuit.

Possible Causes

Possible Causes
(P693) HEATED SEAT MODULE SUPPLY CIRCUIT HIGH RESISTANCE HEATED SEAT MODULE

Diagnostic Test

1. **CHECK PCM FOR CHARGING SYSTEM DTC**

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

No

Go To 2.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **VERIFY THAT DTC B2181 - HEATED SEAT MODULE POWER SUPPLY LOW IS ACTIVE**

With the scan tool, record and erase DTC's

Turn the ignition switch to the Off position then start the engine and operate the heated seats for one minute.

With the scan tool, read DTC's.

Does the DTC B2181 - HEATED SEAT MODULE POWER SUPPLY LOW reset?

Yes

Go To 3.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(P693) HEATED SEAT MODULE SUPPLY CIRCUIT HIGH RESISTANCE**

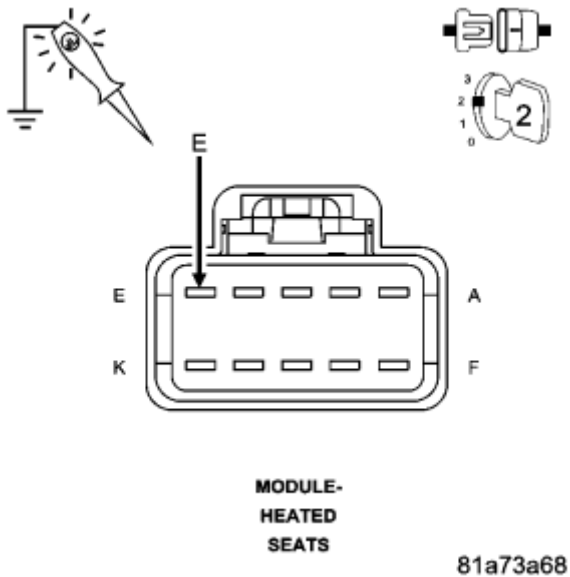


Fig. 28: Using 12-Volt Test Light Connected To Ground To Check (P693) Heated Seat Module Supply Circuit At HSM Connector
Courtesy of CHRYSLER LLC

Disconnect the Heated Seat Module connector.

NOTE: Check connectors - Clean and repair as necessary.

Start the engine and let idle.

Using a 12-volt test light connected to ground, check the (P693) Heated Seat Module Supply circuit at the HSM connector.

NOTE: The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Replace the Heated Seat Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (P693) Heated Seat Module Supply circuit as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

B2182-HEATED SEAT MODULE POWER SUPPLY HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During heated seat operation.

Set Conditions

• **Set Condition:**

This code is set immediately if the Heated Seat Module detects voltage over 16.0 volts on the (F937) Fused Ignition Switch Output (Run) circuit.

Possible Causes

Possible Causes
TROUBLE CODE PRESENT CHARGING SYSTEM HIGH

Diagnostic Test

1. **CHECK PCM FOR CHARGING SYSTEM DTC**

With the scan tool, record and erase DTC's.

Cycle the ignition switch from On to Off.

Start the engine.

Run the engine at approximately 1500 RPM for 1 minute.

With the scan tool, read DTCs.

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using Service Information, check the charging system.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Heated Seats - Service Information - Liberty

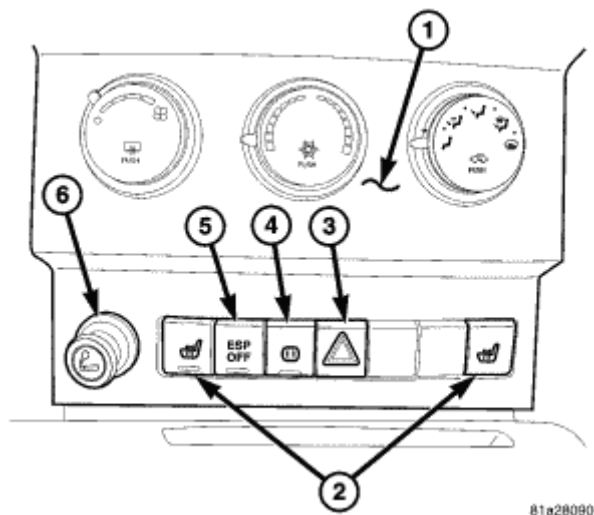
HEATED SEATS - SERVICE INFORMATION

DESCRIPTION

HEATED SEATS

WARNING: The front passenger seat assembly contains critical components that affect the front passenger airbag deployment. Correctly functioning front passenger seat components are critical for the Occupant Classification System (OCS) to properly classify the front passenger and calculate the proper airbag deployment. Unapproved modifications or service procedures to the front passenger seat assembly, its related components, or trim cover may inadvertently change the airbag deployment in case of a frontal crash. This could result in death or serious injury to the front seat passenger if the vehicle is involved in an accident. The following requirements must be strictly adhered to:

- Do not modify the front passenger seat assembly or components in any way.
- Do not modify the front seat center console or center position seat in any way.
- Do not use prior or future model year seat trim covers not designated for the specific model being repaired. Always use the correct seat trim cover specified for the vehicle.
- Do not replace the seat trim cover with an aftermarket trim cover.
- Do not add a secondary trim cover other than those approved by DaimlerChrysler/Mopar.
- At no time should any Supplemental Restraint System (SRS) component or SRS related component or fastener be modified or replaced with any part except those which are approved by DaimlerChrysler/Mopar.



81a28090

Fig. 1: Heated Seat System Components
Courtesy of CHRYSLER LLC

Vehicles with the heated seat option can be visually identified by the two heated seat switches (2) located in the center stack (1) of the instrument panel. The switches are located on the outer edges of the accessory switch bank. The heated seat system allows the driver and front seat passenger to select from two different levels of electrical seat heating (HI/LO). The heated seat system includes the following major components:

- **Heated Seat Elements** - Four heated seat elements are used per vehicle. Two heated seat elements are integral to each seat, one in the seat back and the other in the seat cushion.
- **Heated Seat Module** - One heated seat module is used per vehicle. The Heated Seat Module is mounted under the left front seat. This module contains the control logic and software for the front heated seat system. The module communicates on the Local Interface Network (LIN) data bus.
- **Heated Seat Switches** - Two heated seat switches are used per vehicle, one for each heated seat. Both switches are mounted in the instrument panel center stack.
- **Instrument Cluster (CCN)** - The instrument cluster, sometimes referred to as the Cab Compartment Node (CCN) utilizes integrated software and information carried on the LIN data bus. The CCN serves as the link between the heated seat switches and the heated seat module.

OPERATION

HEATED SEATS

The heated seat system operates on battery current received through a fuse in the Totally Integrated Power Module (TIPM). Fused ignition switch output (Run) circuits are used, so that the heated seat system will only operate when the ignition switch is in the ON position. The heated seat system will turn Off automatically whenever the ignition switch is turned to any position except ON.

A Heated Seat Module is used to control the heated seat system. The module responds to heated seat switch messages and ignition switch status inputs by controlling the 12v output to the front seat heating elements through integral solid-state relays.

When either of the heated seat switches are depressed a switch status message is sent to the Cab Compartment Node (CCN) or instrument cluster via the Local Interface Network (LIN) data bus. The CCN then sends a message via the LIN data bus to the heated seat module, signaling the module to energize the heating element for the selected seat. Amber Light Emitting Diodes (LEDs) in the top portion of each switch indicate the level of heat in use: Two LEDs are illuminated for high, one for low, and none for off. The heated seat module sends the LED illumination message to the CNN via the LIN data bus. The CNN then sends the LED illumination message to the accessory switch bank so that the appropriate LEDs are illuminated for any given heating level. Pressing the switch once will select high-level heating. Pressing the switch a second time will select low-level heating. Pressing the switch a third time will shut the heating elements off.

The heated seat module energizes an integral solid-state relay, which supplies battery current to the heating elements. When high-temperature heating is selected, the heaters provide a boosted heat level during the first four minutes of operation after heating is activated. The heat output then drops to the normal high-temperature level. If high-level heating is selected, the control system will automatically switch to the low level after two hours of continuous operation. At that time, the number of illuminated LEDs changes from two to one, indicating the change. Operation on the low setting also turns off automatically after two hours.

The module will automatically turn off the heating elements if it detects an OPEN or LOW short in the heating element circuit.

DIAGNOSIS AND TESTING

HEATED SEATS

In order to obtain conclusive testing, the heated seat system and the Local Interface Network (LIN) data bus circuit must be checked. **Any diagnosis of the heated seat system should begin with, the use of a scan tool and the appropriate diagnostic service information.**

Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the heated seat option utilize a low voltage cut-off feature. This feature turns off power to the heated seat system anytime vehicle voltage is below 11.7v or above 15.5v. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the heated seat system is attempted, the battery should be fully-charged.

HEATER-CUSHION PAD

DESCRIPTION

HEATED SEAT ELEMENT

Vehicles equipped with the optional heated seat system have two carbon fiber heated seat elements located in each front seat. One heating element is used for each seat cushion and another for each seat back.

Each of the heated seat elements consist of multiple heating circuits operating in parallel throughout the carbon

fiber element. The heated seat elements are captured between the leather trim cover and the seat cushion assembly. If a malfunction occurs in one or more of the individual carbon fiber circuits, the others will continue to provide heat.

The heated seat elements cannot be repaired. If found to be damaged or inoperative, a new heating element assembly must be installed.

OPERATION

HEATED SEAT ELEMENT

One end of the heated seat element is connected to ground at all times through a splice under the seat. Battery current is directed to the other end of the heated seat element by the heated seat module. The heated seat module will energize the heated seat element when the heated seat switch is depressed in the LOW or HIGH position.

As electrical current passes through the heated seat element, the resistance of the wire used in the element disperses some of the electrical current in the form of heat. The heat produced by the heated seat element then radiates through the underside of the seat cushion and seat back trim covers, warming the seat cover and its occupant.

DIAGNOSIS AND TESTING

HEATER-CUSHION PAD

Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

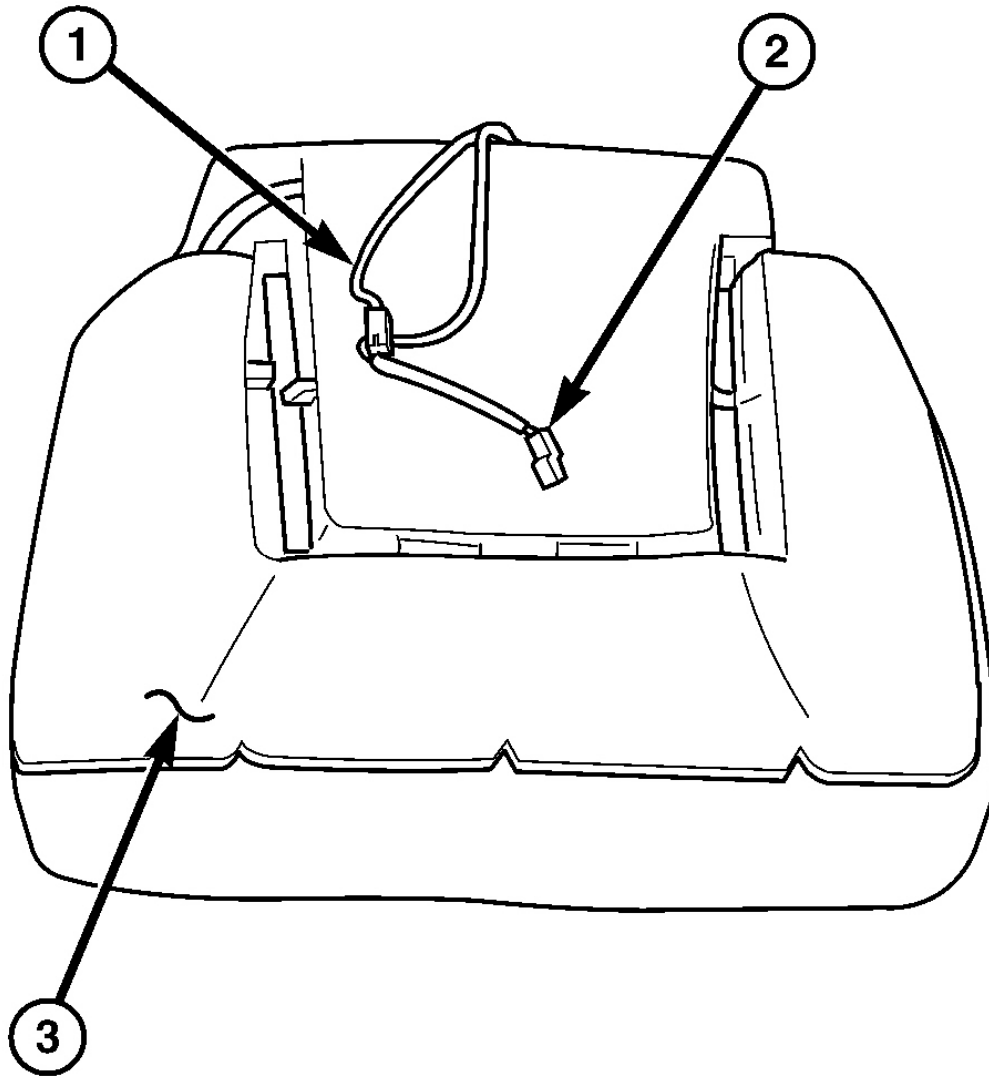
The wire harness connectors for the heating elements are located under the seat.

NOTE: When checking heated seat elements for continuity, be certain to move the heating element being checked. Moving the element, such as sitting in the seat will eliminate the possibility of an intermittent open in the element which would only be evident if the element was in a certain position. Failure to check the element in various positions could result in an incomplete test.

1. Locate and disconnect the seat element electrical connector.
2. Check the resistance between the circuit leading in and out of the suspect heated seat element. The resistance should be between 3.0 - 5.5 ohms for a seat cushion element and 4.0 - 6.0 ohms for a seat back element. If OK, see [DIAGNOSIS AND TESTING](#). If not OK, replace the inoperative heated seat element.

REMOVAL

HEATED SEAT ELEMENT



80c91d10

Fig. 2: Identifying Seat & Back Cushion Element Connectors
Courtesy of CHRYSLER LLC

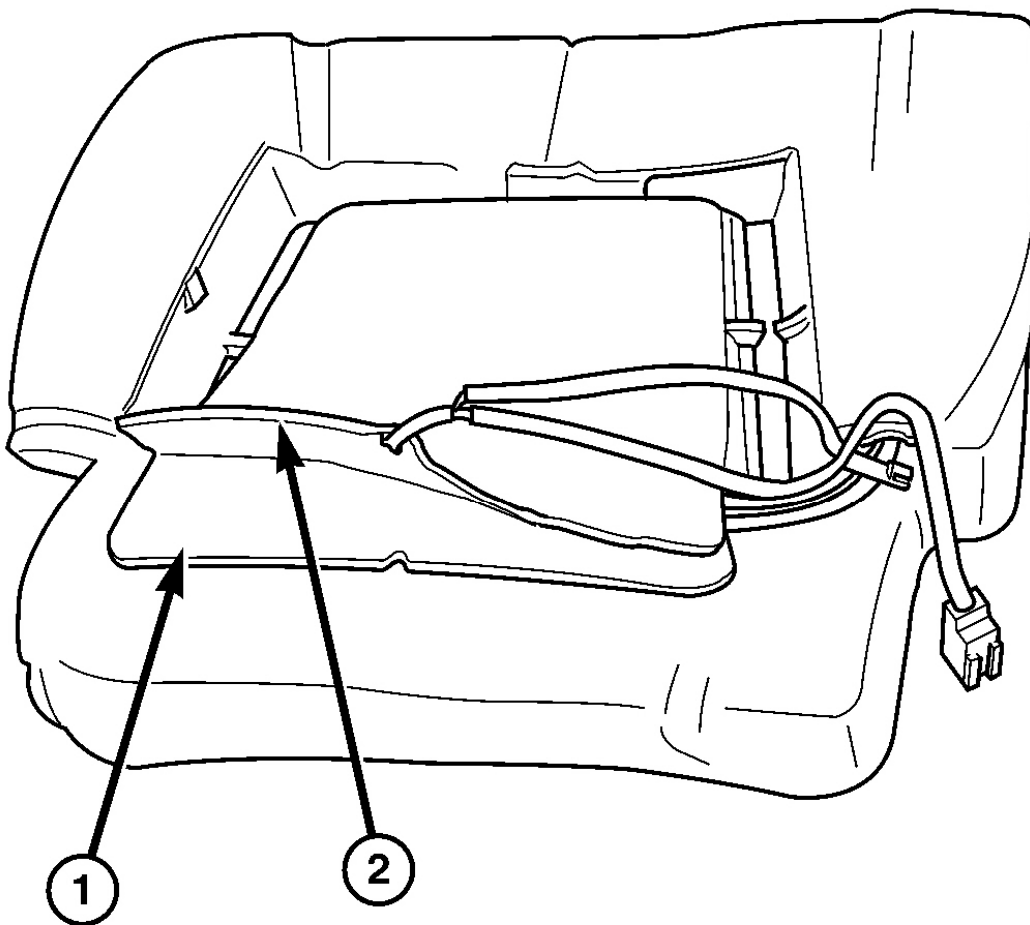
NOTE: Do not remove the factory installed heating elements from the seat cushion (3) or seat back foam. The original element is permanently attached and cannot be removed without permanent damage. The replacement heating element is designed to be applied directly on top of the inoperative factory installed heating element.

NOTE: Heated seat cushion shown in illustration, heated seat back similar.

1. Disconnect and isolate the battery negative cable.
2. Remove the appropriate seat cushion trim cover or seat back trim cover. Refer to **DISASSEMBLY** for seat cushion or refer to **DISASSEMBLY** for trim cover.
3. Disconnect the inoperative heated seat cushion or seat back element electrical connectors (2).
4. Locate the wires leading from the inoperative heating element and cut them off flush with the edge of the original heating element.

INSTALLATION

HEATED SEAT ELEMENT



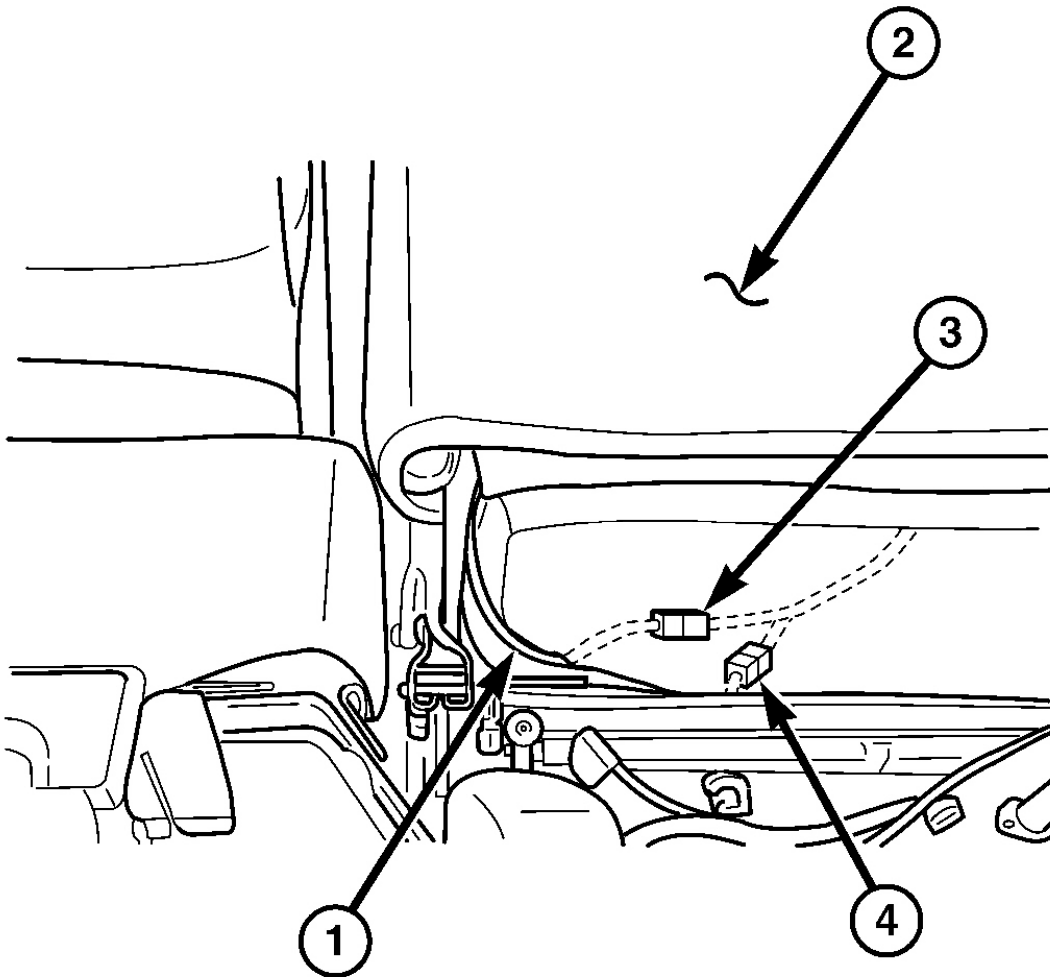
80c91cf2

Fig. 3: Identifying Replacement Heating Element
Courtesy of CHRYSLER LLC

CAUTION: During the installation of the replacement heating element, be careful not to fold or crease the element assembly. Folds or creases will cause premature failure.

NOTE: Heated seat cushion shown in illustration, heated seat back similar.

1. Peel off the adhesive backing on the back of the replacement heating element (2) and stick directly on top of the factory installed heating element (1).



80c91d46

Fig. 4: Identifying Heating Element Electrical Connectors
Courtesy of CHRYSLER LLC

2. Connect the new heating element electrical connectors (3 & 4).

3. Connect the battery negative cable.
4. Verify heated seat system operation.
5. Install the appropriate seat cushion trim cover or seat back trim cover. Refer to **ASSEMBLY** for seat cushion or refer to **ASSEMBLY** for trim cover.

NOTE: Make certain the seat wire harness is correctly routed through the seat and seat back. The excess wire between the cushion and back elements should be securely tucked between the rear of the cushion foam and the rear carpet flap of the trim cover.

MODULE-HEATED SEATS

DESCRIPTION

MODULE, HEATED SEAT

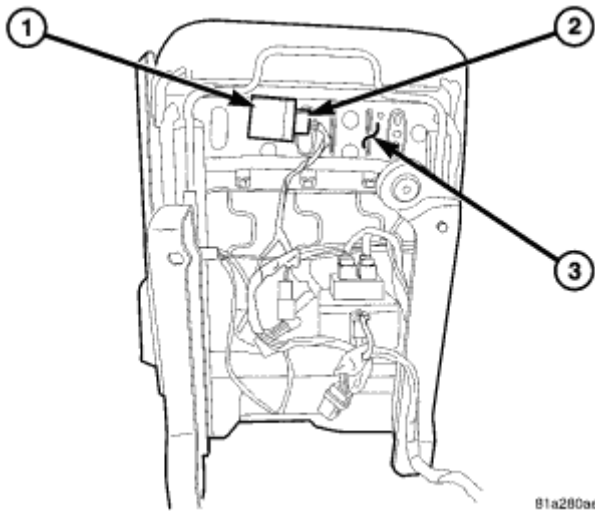


Fig. 5: Identifying Heated Seat Module, Single Electrical Connector & Seat Pan
Courtesy of CHRYSLER LLC

The heated seat module (1) is located under the left front seat. It has a single electrical connector (2) and a push pin style retainer that secures it to the seat pan (3). The module can be accessed from under the front left seat with the seat in the full back and up position.

The heated seat module is a microprocessor designed to use the Local Interface Network (LIN) data bus messages from the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN). The CCN receives inputs from the heated seat switches and in turn signals the heated seat module to operate the heated seat elements for both front seats.

OPERATION

MODULE-HEATED SEAT

The heated seat module operates on fused battery current received from the ignition switch. The module is grounded to the body at all times through the electrical connector. Inputs to the module include Local Interface Network (LIN) data bus messages and standard hardwired 12 volt power and ground. In response to the LIN inputs the heated seat module will control the battery current to the appropriate heated seat elements.

When a heated seat switch LIN data bus signal is received by the heated seat module, the module energizes the selected heated seat element. The Low heat set point is about 38° C (100.4° F), and the High heat set point is about 42° C (107.6° F).

In addition to operating the heated seat elements, the heated seat module sends LED illumination messages to the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN) via the LIN data bus. The CCN then sends the LED illumination message to the accessory switch bank so that the appropriate LEDs are illuminated for any given heating level. Pressing the switch once will select high-level heating. Pressing the switch a second time will select low-level heating. Pressing the switch a third time will shut the heating elements off.

If the heated seat module detects a heated seat element OPEN or SHORT circuit, it will record and store the appropriate Diagnostic Trouble Code (DTC).

DIAGNOSIS AND TESTING

HEATED SEAT MODULE

In order to obtain conclusive testing, the heated seat system and the Local Interface Network (LIN) data bus circuit must be checked. **Any diagnosis of the heated seat system should begin with, the use of a scan tool and the appropriate diagnostic service information.**

Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the heated seat option utilize a low voltage cut-off feature. This feature turns off power to the heated seat system anytime vehicle voltage is below 11.7v or above 15.5v. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the heated seat system is attempted, the battery should be fully-charged.

REMOVAL

HEATED SEAT MODULE

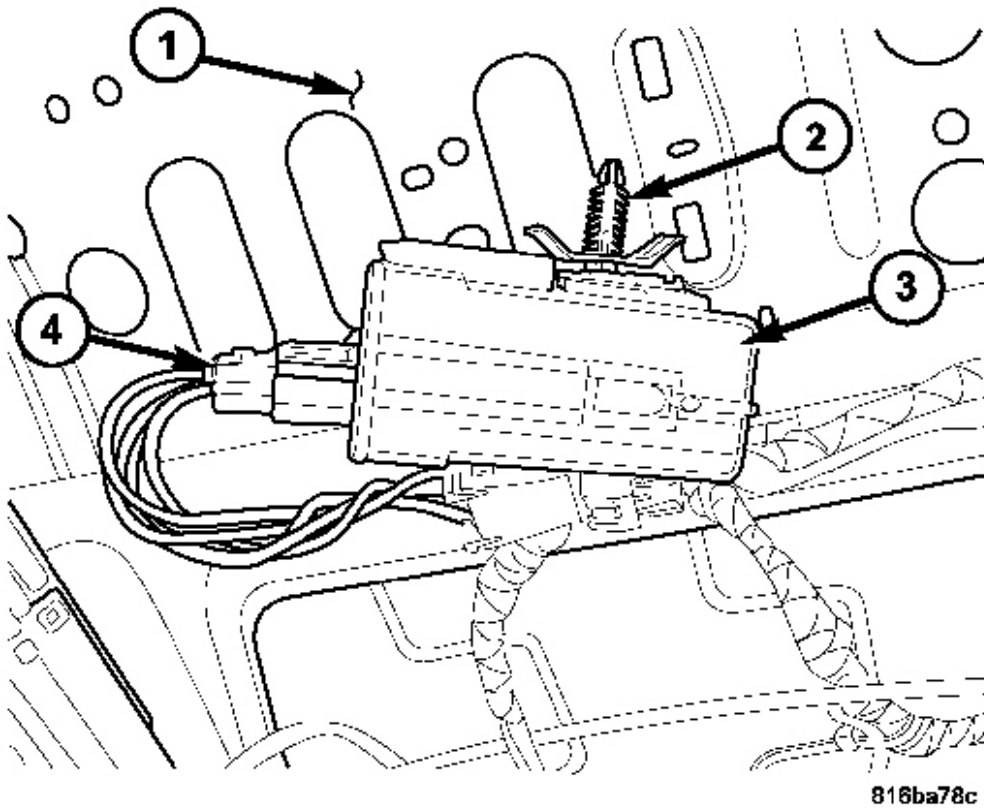


Fig. 6: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

1. Position the right front seat to the full rearward position.
2. Disconnect and isolate the battery negative cable.
3. Disconnect the wire harness connector (4) from the heated seat module (3).
4. Unsnap the heated seat module retaining tab (2) from the seat pan (1).
5. Remove the heated seat module (3) from the vehicle.

INSTALLATION

HEATED SEAT MODULE

CAUTION: The Heated Seat Module mounting tab can be damaged during module removal and installation. Use care to properly align tab to prevent binding that could result in tab breakage.

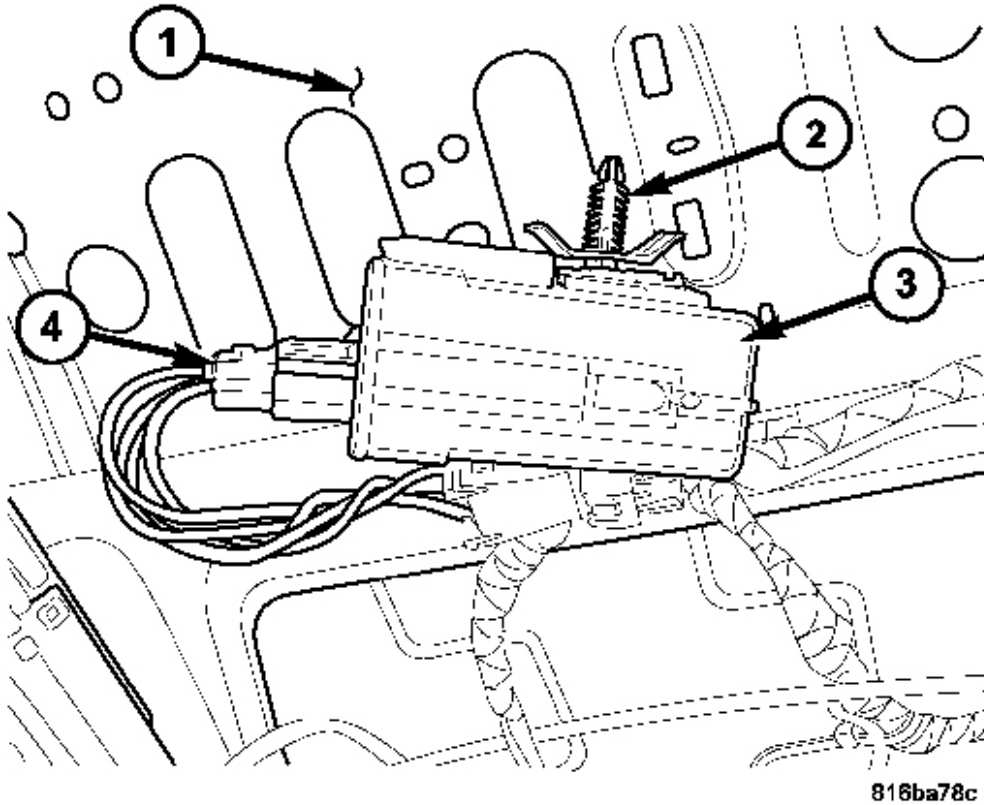


Fig. 7: Locating Heated Seat Module
Courtesy of CHRYSLER LLC

1. Install the heated seat module (3) into the vehicle.
2. Position the retaining tab (2) with the mounting hole in the seat pan (1). Firmly apply even pressure to the module (3) until the mounting tab is fully seated.
3. Connect the wire harness connector (4) to the heated seat module (3).
4. Connect the battery negative cable.
5. Check for proper heated seat system operation.

SWITCH-HEATED SEAT

DESCRIPTION

SEAT SWITCH

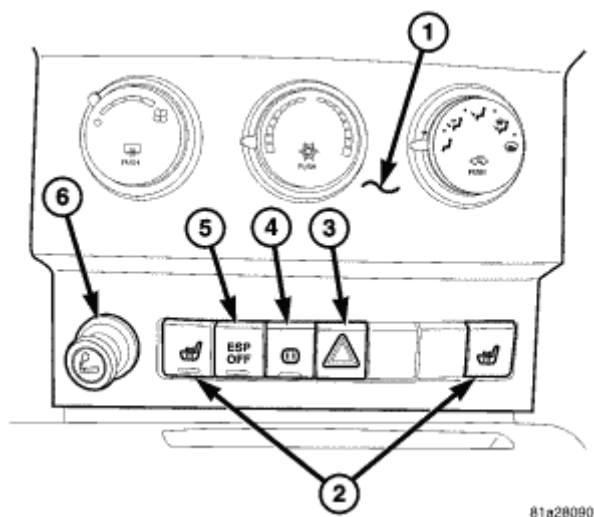


Fig. 8: Heated Seat System Components
Courtesy of CHRYSLER LLC

The heated seat switches (2) are located in the center stack (1) of the instrument panel. The switches are located on the outer edges of the accessory switch bank. If either of the switches is damaged or inoperative the complete accessory switch bank assembly must be replaced.

Each heated seat switch provides a resistor-multiplexed signal to the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN). Amber Light Emitting Diodes (LEDs) in the top portion of each switch indicate the level of heat in use: Two LEDs are illuminated for high, one for low, and none for off. Pressing the switch once will select high-level heating. Pressing the switch a second time will select low-level heating. Pressing the switch a third time will shut the heating elements off.

The LED indicator lamps in each heated seat switch cannot be repaired. If the LED lamps are inoperative or damaged, or the switch is inoperative or damaged, the complete switch pod assembly must be replaced. See **REMOVAL**.

OPERATION

SEAT SWITCH

The heated seat switches are active any time the Local Interface Network (LIN) data bus is active. Depressing the heated seat switch provides a switch status message to the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN), via the LIN data bus. The CCN is responsible for supplying the LIN data bus message to the heated seat module, signaling the module to power the heated seat element of the selected seat and maintain the temperature setting. If the heated seat switch is depressed to a different position (Low or High) than the currently selected state, the CCN will go through the process again to change the temperature setting.

DIAGNOSIS AND TESTING

SEAT SWITCH

In order to obtain conclusive testing, the heated seat system and the Local Interface Network (LIN) data bus circuit must be checked. **Any diagnosis of the heated seat system should begin with, the use of a scan tool and the appropriate diagnostic service information.**

Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the heated seat option utilize a low voltage cut-off feature. This feature turns off power to the heated seat system anytime vehicle voltage is below 11.7v or above 15.5v. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the heated seat system is attempted, the battery should be fully-charged.

REMOVAL

SEAT SWITCH

WARNING: On vehicles equipped with airbags, disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The heated seat switches are integral to the accessory switch bank and cannot be serviced separately. The complete accessory switch bank assembly must be replaced.

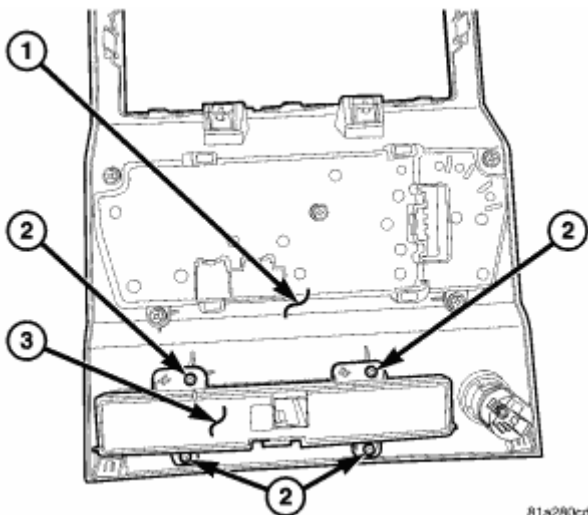


Fig. 9: Identifying Center Bezel, Screws & Accessory Switch Bank
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the center bezel from the instrument panel. Refer to **REMOVAL** .
3. Remove the four screws (2) that secure the accessory switch bank (3) to the back of the center bezel (1) and remove the switch bank.

INSTALLATION

SEAT SWITCH

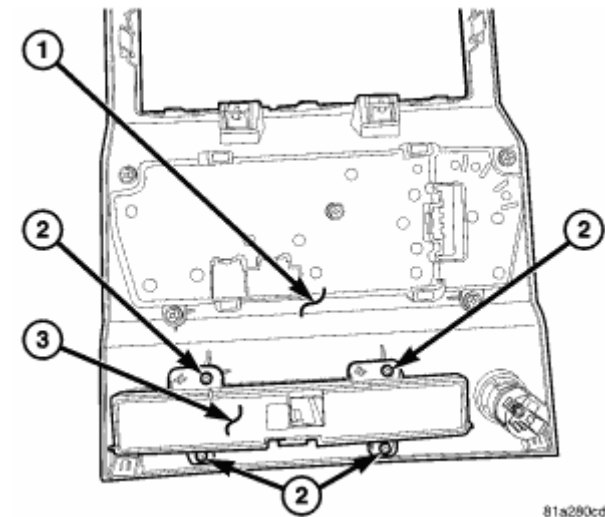


Fig. 10: Identifying Center Bezel, Screws & Accessory Switch Bank
Courtesy of CHRYSLER LLC

NOTE: There are different accessory switch banks available based on the option content of the vehicle. Ensure the switch pod being installed matches the vehicle options.

1. Position the accessory switch bank (3) onto the back of the instrument panel center bezel (1).
2. Install the four screws (2) that secure the accessory switch bank to the center bezel. Tighten the screws to 2 N.m (17 in. lbs.).
3. Install the center bezel onto the instrument panel. Refer to **INSTALLATION** .
4. Connect the battery negative cable.
5. Verify heated seat system operation.

2008 HVAC

Heating & Air Conditioning - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>1006</u>	BI-LEVEL SWITCH REQUEST INPUT CIRCUIT PERFORMANCE
<u>B1000</u>	A/C SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1003</u>	A/C PANEL MODE SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1009</u>	RECIRCULATION SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B100C</u>	FLOOR MODE SWITCH REQUEST INPUT CIRCUIT PER
<u>B100F</u>	MIX SWITCH REQUEST INPUT CIRCUIT PER
<u>B1012</u>	DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1015</u>	REAR DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE
<u>B1031</u>	EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT LOW
<u>B1032</u>	EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT HIGH
<u>B1034</u>	INFRARED TEMPERATURE SENSOR INPUT CIRCUIT LOW
<u>B1034</u>	INFRARED TEMPERATURE SENSOR THERMISTOR CIRCUIT LOW
<u>B1035</u>	INFRARED TEMPERATURE SENSOR INPUT CIRCUIT HIGH
<u>B1040</u>	PANEL MODE DOOR 1 CONTROL CIRCUIT/PERFORMANCE
<u>B1043</u>	PANEL MODE DOOR 1 CONTROL CIRCUIT OPEN
<u>B1044</u>	PANEL MODE DOOR 1 TRAVEL RANGE TOO SMALL
<u>B1045</u>	PANEL MODE DOOR 1 TRAVEL RANGE TOO LARGE
<u>B1058</u>	RECIRCULATION DOOR CONTROL CIRCUIT/PERFORMANCE
<u>B105B</u>	RECIRCULATION DOOR CONTROL CIRCUIT OPEN
<u>B105B</u>	RECIRCULATION DOOR CONTROL CIRCUIT OPEN (TIPM)
<u>B105C</u>	RECIRCULATION DOOR TRAVEL RANGE TOO SMALL
<u>B105D</u>	RECIRCULATION DOOR TRAVEL RANGE TOO LARGE
<u>B10A2</u>	LEFT BLEND DOOR CONTROL CIRCUIT/PERFORMANCE
<u>B10A5</u>	LEFT BLEND DOOR CONTROL CIRCUIT OPEN
<u>B10B1</u>	INFRARED SENSOR THERMISTOR CIRCUIT HIGH
<u>B10B4</u>	CABIN HEATER 1 CONTROL CIRCUIT LOW (TIPM)
<u>B10B8</u>	CABIN HEATER 2 CONTROL CIRCUIT LOW (TIPM)
<u>B10B9</u>	CABIN HEATER 2 CONTROL CIRCUIT HIGH (TIPM)
<u>B10EA</u>	BLOWER MOTOR CONTROL CIRCUIT HIGH
<u>B10EC</u>	BLOWER MOTOR CONTROL CIRCUIT OVERCURRENT (TIPM)
<u>B1138</u>	CABIN HEATER 3 CONTROL CIRCUIT LOW (TIPM)
<u>B1139</u>	CABIN HEATER 3 CONTROL CIRCUIT HIGH (TIPM)
<u>B1610</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT LOW
<u>B1610</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT PERFORMANCE

<u>B1611</u>	AMBIENT LIGHT SENSOR INPUT CIRCUIT HIGH
<u>B210A</u>	SYSTEM VOLTAGE LOW
<u>B210B</u>	SYSTEM VOLTAGE HIGH
<u>B2214</u>	(HVAC) CLIMATE CONTROL INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>U0010</u>	CAN INTERIOR BUS
<u>U0141</u>	LOST COMM W/INTEGRATED POWER MODULE/FRONT CONTROL MODULE/TIPM
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE
<u>U0168</u>	LOST COM WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
<u>U0169</u>	LOST COMMUNICATION WITH SUNROOF CONTROL MODULE
<u>U0181</u>	LOST COMMUNICATION WITH HEADLAMP LEVELING TRANSLATOR
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE PHONE MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE
<u>U0201</u>	LOST COMMUNICATION WITH LEFT REAR DOOR MODULE
<u>U0202</u>	LOST COMMUNICATION WITH RIGHT REAR DOOR MODULE
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

HVAC - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

HEATING AND AIR CONDITIONING SYSTEM

ON-BOARD DIAGNOSTICS

CAUTION: Do not exchange A/C Heater Controls from vehicle to vehicle. Software versions differ between models and model years. Installing an A/C Heater Control with software that is incompatible for a given vehicle can result in

either improper or failed HVAC system operation.

NOTE: Always inspect the IOD fuse prior to diagnosing any heating-A/C system concerns. Make sure the fuse is functional and fully seated into the terminals of the totally integrated power module (TIPM) located in the engine compartment.

The A/C-heater control communicates on the controller area network (CAN) IHS bus and is fully addressable with a scan tool.

The A/C-heater control's primary means of fault detection is through active and stored diagnostic trouble codes (DTCs). Active DTCs are those which currently exist in the system. The condition causing the fault must be repaired in order to clear this type of DTC. Stored DTCs are those which occurred in the system since the A/C-heater control received the last clear diagnostic info message. All DTCs must be read with a scan tool.

The A/C-heater control's secondary means of fault detection is through system tests. These tests include the HVAC System Test, the A/C Cool down Test, the Actuator Calibration Function, and for MTC Systems, the Actuator DTC Detection Test. Refer to **SYSTEM TESTS** for a detailed description of each test.

SYSTEM TESTS

HVAC System Test

The HVAC System Test provides a starting point in the diagnostic process by identifying the appropriate system test to perform when diagnosing a given condition or DTC. It also provides a means for testing the entire HVAC system by utilizing the A/C-heater control's On-Board System Tests. The On-Board System Tests can also assist in diagnosing stored DTCs.

A/C Cool down Test

The A/C Cool down Test:

- is actuated with a scan tool.

- tests A/C system performance based on evaporator temperature sensor input.

- will fail if evaporator starting temperature is below 18° C (65° F) when initiating the test.

- will pass if the evaporator temperature drops 11° C (20° F).

- indicates test outcome by displaying one or more test status messages on the scan tool. These messages will clear after paging back out of this test function. Therefore, is it important to note all of the messages before doing so.

- will cause the A/C status indicator to flash while the test is running.

Actuator Calibration Function

The Actuator Calibration function:

- is actuated with a scan tool.

- homes and repositions door actuators.

monitors for door span faults. Door span faults (XXX Door Travel Range Too Large or XXX Door Travel Range Too Small) will only display after calibration.

will cause the electric backlight (EBL) status indicator to flash while the test is running.

Actuator DTC Detection Test

The Actuator DTC Detection Test:

is actuated with a scan tool.

supplements the continuous diagnostics on the actuator drive system.

monitors for shorted actuator circuits allowing service to easily diagnose and troubleshoot up to three simultaneous shorts. Shorted actuator circuit faults (XXX Control Circuit High or XXX Control Circuit Low) will only display after running the Actuator DTC Detection Test.

After repairing each DTC, cycle the ignition switch, and then rerun the Actuator DTC Detection test to ensure that no new DTCs exist. If multiple DTCs are present, beginning with the common circuits, diagnose and repair all short high faults and then short low faults. When the test returns passed, proceed with troubleshooting by clearing faults and running the Actuator Calibration function as a final check of proper system operation.

1006-BI-LEVEL SWITCH REQUEST INPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Theory Of Operation

The Bi-Level mode switch input changes when the switch is pushed down. An active DTC indicates that the switch is stuck in a pushed position. A stored DTC indicates that the switch was stuck in a pushed position for more than two minutes, but has since returned to its normal state.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Bi-Level mode switch is stuck in a pushed position for more than two minutes. This DTC has a maturing time of two minutes and a de-maturing time of two seconds. If the DTC's status changes from active to stored it will stay in memory for 100 ignition cycles.

Possible Causes

Possible Causes
OBJECT HOLDING SWITCH IN A PUSHED POSITION A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS STILL ACTIVE

Inspect the A/C Heater Control for an object holding the switch in a pushed position. If present, remove the object.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 2 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B1000-A/C SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The switch input changes when the switch is pushed down. A stored DTC indicates that the A/C request switch was stuck in a pushed position for more than 10 minutes, but has since returned to its normal state. An active DTC indicates that the A/C request switch is stuck in a pushed position. When active, this DTC will prevent proper A/C request switch and status indicator function.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C request switch is detected in a pushed position for more than 10 minutes.

Possible Causes

Possible Causes
OBJECT HOLDING A/C MODE SWITCH IN A PUSHED POSITION
SUBSTANCE CAUSING A/C MODE SWITCH TO GET STUCK IN A PUSHED POSITION
A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS STILL ACTIVE

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 10 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR NORMAL A/C REQUEST SWITCH & STATUS INDICATOR FUNCTION

Set the Blower control to any position except Off.

Set the Mode control to any position except Auto.

Press the A/C request switch on and off several times while observing the A/C status indicator.

Does the A/C status indicator turn on and off?

Yes

Go To 4.

No

Go To 3.

3. INSPECT FOR OBJECT OR SUBSTANCE CAUSING THE A/C REQUEST SWITCH TO STAY OR STICK IN A PUSHED POSITION

Inspect the A/C Heater Control for anything that would cause the A/C request switch to stay or stick in a pushed position.

Is anything present that would cause the A/C request switch to stay or stick in a pushed position?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. INSPECT THE A/C HEATER CONTROL FOR DAMAGE

Inspect the A/C Heater Control for damage.

Is the A/C Heater Control damaged?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The switch input changes when the switch is pushed down. A stored DTC indicates that the panel mode switch was stuck in a pushed position for more than 10 minutes, but has since returned to its normal state. An active DTC indicates that the panel mode switch is stuck in a pushed position. An active DTC will prevent proper A/C mode switch and status indicator function.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

If the panel mode switch is detected in a pushed position for more than 10 minutes.

Possible Causes

Possible Causes
OBJECT HOLDING PANEL MODE SWITCH IN A PUSHED POSITION
SUBSTANCE CAUSING PANEL MODE SWITCH TO GET STUCK IN A PUSHED POSITION
A/C HEATER CONTROL

Diagnostic Test

1. **VERIFY THE DTC IS STILL ACTIVE**

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 10 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR NORMAL PANEL MODE SWITCH & STATUS INDICATOR FUNCTION

Set the Blower control to any position except Off.

Set the Mode control to any position except Auto.

Press the Panel mode switch on and off several times while observing the Panel mode status indicator.

Does the Panel mode status indicator turn on and off?

Yes

Go To 4.

No

Go To 3.

3. INSPECT FOR OBJECT OR SUBSTANCE CAUSING THE PANEL MODE SWITCH TO STAY OR STICK IN A PUSHED POSITION

Inspect the A/C Heater Control for anything that would cause the Panel mode switch to stay or stick in a pushed position.

Is anything present that would cause the Panel mode switch to stay or stick in a pushed position?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. INSPECT THE A/C HEATER CONTROL FOR DAMAGE

Inspect the A/C Heater Control for damage.

Is the A/C Heater Control damaged?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B1009-RECIRCULATION SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The switch input changes when the switch is pushed down. A stored DTC indicates that the recirculation switch was stuck in a pushed position for more than 10 minutes, but has since returned to its normal state. An active DTC indicates that the recirculation switch is stuck in a pushed position.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the recirculation switch is detected in a pushed position for more than 10 minutes.

Possible Causes

Possible Causes
OBJECT HOLDING RECIRCULATION SWITCH IN A PUSHED POSITION
SUBSTANCE CAUSING RECIRCULATION SWITCH TO GET STUCK IN A PUSHED POSITION
A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS STILL ACTIVE

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 10 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR NORMAL RECIRCULATION SWITCH & STATUS INDICATOR FUNCTION

Set the Blower control to any position except Off.

Set the Mode control to any position except Auto.

Press the Recirculation switch on and off several times while observing the Recirculation status indicator.

Does the Recirculation status indicator turn on and off?

Yes

Go To 4.

No

Go To 3.

3. INSPECT FOR OBJECT OR SUBSTANCE CAUSING THE RECIRCULATION SWITCH TO STAY OR STICK IN A PUSHED POSITION

Inspect the A/C Heater Control for anything that would cause the Recirculation switch to stay or stick in a pushed position.

Is anything present that would cause the Recirculation switch to stay or stick in a pushed position?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **INSPECT THE A/C HEATER CONTROL FOR DAMAGE**

Inspect the A/C Heater Control for damage.

Is the A/C Heater Control damaged?

Yes

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B100C-FLOOR MODE SWITCH REQUEST INPUT CIRCUIT PER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Floor mode switch input changes when the switch is pushed down. An active DTC indicates that the switch is stuck in a pushed position. A stored DTC indicates that the switch was stuck in a pushed position for more than two minutes, but has since returned to its normal state.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Floor mode switch is stuck in a pushed position for more than two minutes. This DTC has a maturing time of two minutes and a de-maturing time of two seconds. If the DTC's status changes from active to stored it will stay in memory for 100 ignition cycles.

Possible Causes

Possible Causes
OBJECT HOLDING SWITCH IN A PUSHED POSITION
A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS STILL ACTIVE

Inspect the A/C Heater Control for an object holding the switch in a pushed position. If present, remove the object.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 2 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B100F-MIX SWITCH REQUEST INPUT CIRCUIT PER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The mix switch input changes when the switch is pushed down. An active DTC indicates that the switch is stuck in a pushed position. A stored DTC indicates that the switch was stuck in a pushed position for more than two minutes, but has since returned to its normal state.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the mix switch is stuck in a pushed position for more than two minutes. This DTC has a maturing time of two minutes and a de-maturing time of two seconds. If the DTC's status changes from active to stored it will stay in memory for 100 ignition cycles.

Possible Causes

Possible Causes
OBJECT HOLDING SWITCH IN A PUSHED POSITION A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS STILL ACTIVE

Inspect the A/C Heater Control for an object holding the switch in a pushed position. If present, remove the object.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 2 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B1012-DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The switch input changes when the switch is pushed down. A stored DTC indicates that the defrost switch was

stuck in a pushed position for more than 10 minutes, but has since returned to its normal state. An active DTC indicates that the defrost switch is stuck in a pushed position.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the defrost switch is detected in a pushed position for more than 10 minutes.

Possible Causes

Possible Causes
OBJECT HOLDING DEFROST SWITCH IN A PUSHED POSITION SUBSTANCE CAUSING DEFROST SWITCH TO GET STUCK IN A PUSHED POSITION A/C HEATER CONTROL

Diagnostic Test

1. **VERIFY THE DTC IS STILL ACTIVE**

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 10 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR NORMAL DEFROST SWITCH & STATUS INDICATOR FUNCTION

Set the Blower control to any position except Off.

Set the Mode control to any position except Auto.

Press the Defrost switch on and off several times while observing the Defrost status indicator.

Does the Defrost status indicator turn on and off?

Yes

Go To 4.

No

Go To 3.

3. INSPECT FOR OBJECT OR SUBSTANCE CAUSING THE DEFROST SWITCH TO STAY OR STICK IN A PUSHED POSITION

Inspect the A/C Heater Control for anything that would cause the Defrost switch to stay or stick in a pushed position.

Is anything present that would cause the Defrost switch to stay or stick in a pushed position?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 4.

4. INSPECT THE A/C HEATER CONTROL FOR DAMAGE

Inspect the A/C Heater Control for damage.

Is the A/C Heater Control damaged?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Perform **BODY VERIFICATION TEST - VER 1** .

B1015-REAR DEFROST SWITCH REQUEST INPUT CIRCUIT/PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The switch input changes when the switch is pushed down. A stored DTC indicates that the rear defrost switch was stuck in a pushed position for more than 10 minutes, but has since returned to its normal state. An active DTC indicates that the rear defrost switch is stuck in a pushed position.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the rear defrost switch is detected in a pushed position for more than 10 minutes.

Possible Causes

Possible Causes
OBJECT HOLDING REAR DEFROST SWITCH IN A PUSHED POSITION SUBSTANCE CAUSING REAR DEFROST SWITCH TO GET STUCK IN A PUSHED POSITION A/C HEATER CONTROL

Diagnostic Test

1. **VERIFY THE DTC IS STILL ACTIVE**

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on. Wait 10 minutes before proceeding.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR NORMAL REAR DEFROST SWITCH & STATUS INDICATOR FUNCTION

Set the Blower control to any position except Off.

Set the Mode control to any position except Auto.

Press the Rear Defrost switch on and off several times while observing the Rear Defrost status indicator.

Does the Rear Defrost status indicator turn on and off?

Yes

Go To 4.

No

Go To 3.

3. INSPECT FOR OBJECT OR SUBSTANCE CAUSING THE REAR DEFROST SWITCH TO STAY OR STICK IN A PUSHED POSITION

Inspect the A/C Heater Control for anything that would cause the Rear Defrost switch to stay or stick in a pushed position.

Is anything present that would cause the Rear Defrost switch to stay or stick in a pushed position?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. INSPECT THE A/C HEATER CONTROL FOR DAMAGE

Inspect the A/C Heater Control for damage.

Is the A/C Heater Control damaged?

Yes

Replace the A/C Heater Control in accordance with the service information.

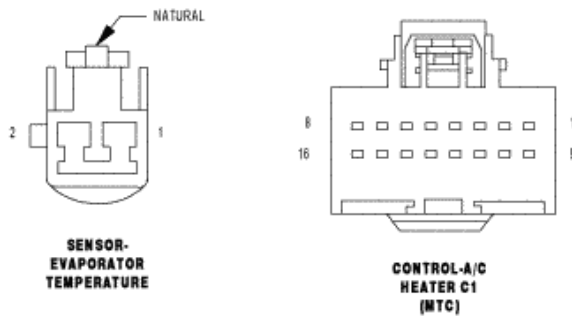
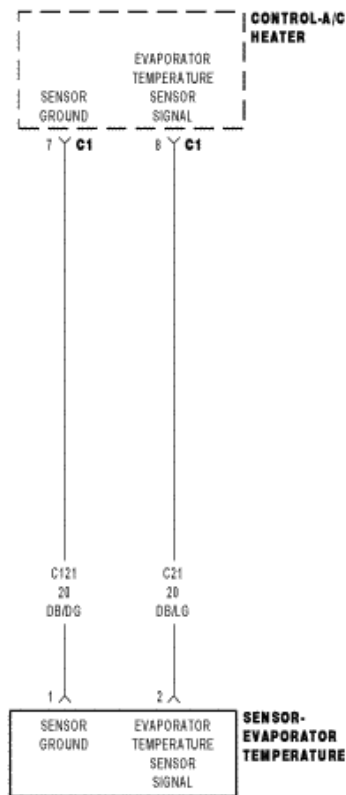
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B1031-EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT LOW

Circuit Schematic



01000010

Fig. 1: Evaporator Fin Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Evaporator Temperature Sensor input is out of range toward the low voltage threshold.

Possible Causes

Possible Causes
(C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT SHORTED TO GROUND EVAPORATOR TEMPERATURE SENSOR A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, turn the heater on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR DTC WITH THE EVAPORATOR TEMPERATURE SENSOR HARNESS CONNECTOR DISCONNECTED**

Turn the ignition off.

Disconnect the Evaporator Temperature Sensor Harness Connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Evaporator Temperature Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK (C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND**

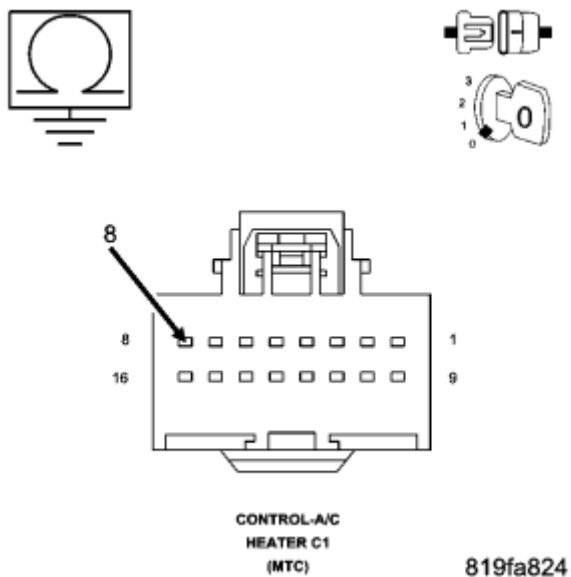


Fig. 2: Measuring Resistance Between Ground And (C21) Evaporator Temperature Sensor Signal Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Measure the resistance between ground and the (C21) Evaporator Temperature Sensor Signal circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

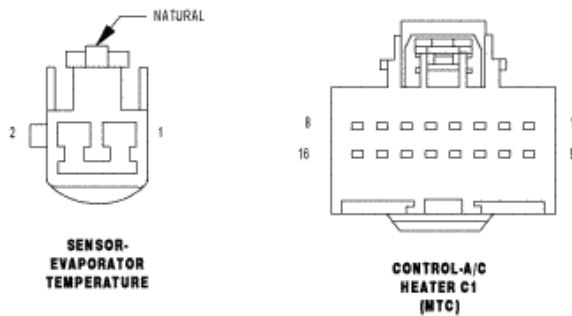
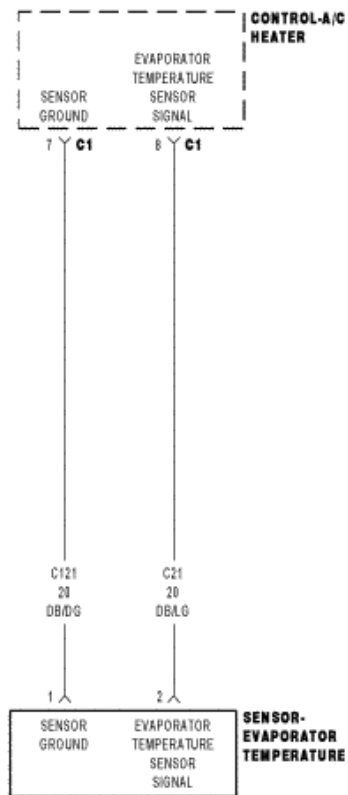
No

Repair the (C21) Evaporator Temperature Sensor Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B1032-EVAPORATOR FIN TEMPERATURE SENSOR CIRCUIT HIGH

Circuit Schematic



01000010

Fig. 3: Evaporator Fin Temperature Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Evaporator Temperature Sensor input is out of range toward the high voltage threshold.

Possible Causes

Possible Causes
(C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE
(C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT OPEN
(C121) SENSOR GROUND CIRCUIT OPEN
EVAPORATOR TEMPERATURE SENSOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, turn the heater on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**

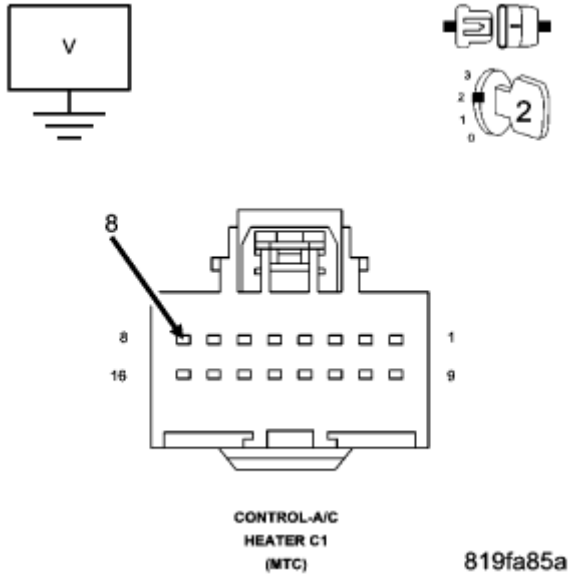


Fig. 4: Measuring Voltage Of (C21) Evaporator Temperature Sensor Signal Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Measure the voltage of the (C21) Evaporator Temperature Sensor Signal circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C21) Evaporator Temperature Sensor Signal circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK (C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT, (C121) SENSOR GROUND CIRCUIT, & EVAPORATOR TEMPERATURE SENSOR**

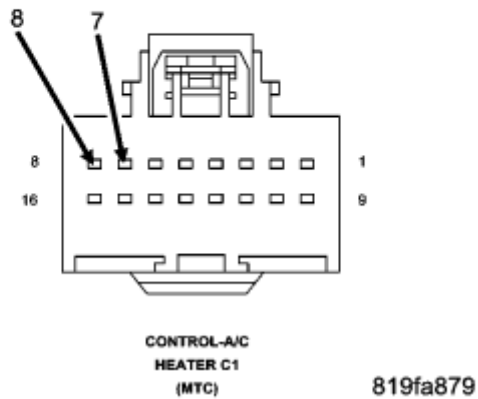


Fig. 5: Measuring Resistance Between (C21) Evaporator Temperature Sensor Signal Circuit And (C121) Sensor Ground Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between the (C21) Evaporator Temperature Sensor Signal circuit and the (C121) Sensor Ground circuit in the A/C Heater Control C1 harness connector. The approximate circuit resistance should be as follows:

- 1468 ohms @ 40°C (104°F)
- 1800 ohms @ 35°C (95°F)
- 2221 ohms @ 30°C (86°F)
- 2757 ohms @ 25°C (77°F)
- 3443 ohms @ 20°C (68°F)
- 4330 ohms @ 15°C (59°F)
- 5485 ohms @ 10°C (50°F)
- 6998 ohms @ 5°C (41°F)
- 7354 ohms @ 4°C (39°F)
- 7731 ohms @ 3°C (37°F)
- 8130 ohms @ 2°C (36°F)
- 8553 ohms @ 1°C (34°F)
- 9000 ohms @ 0°C (32°F)

Is the resistance within the specifications?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (C21) EVAPORATOR TEMPERATURE SENSOR SIGNAL CIRCUIT FOR AN OPEN

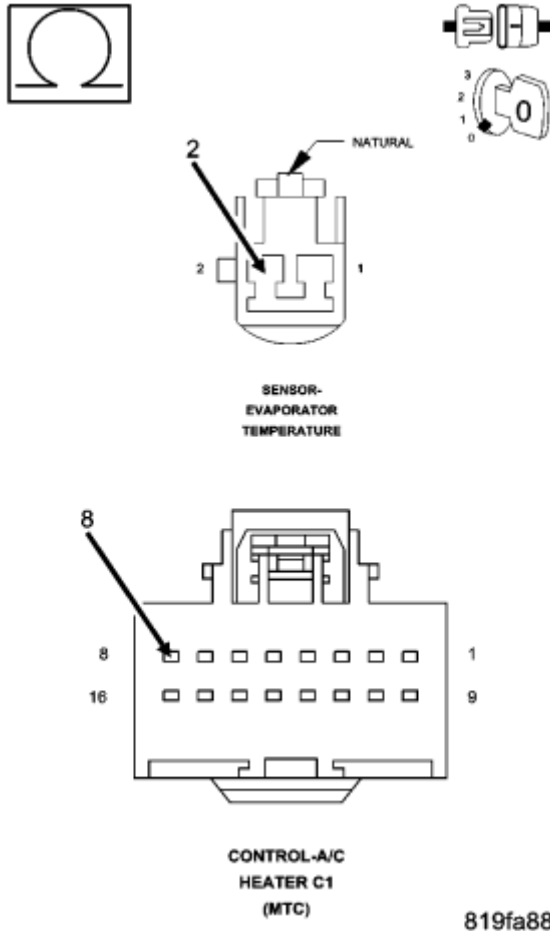


Fig. 6: Measuring Resistance Of (C21) Evaporator Temperature Sensor Signal Circuit Between A/C Heater Control C1 Harness Connector And Evaporator Temperature Sensor Harness Connector

Courtesy of CHRYSLER LLC

Disconnect the Evaporator Temperature Sensor harness connector.

Measure the resistance of the (C21) Evaporator Temperature Sensor Signal circuit between the A/C Heater Control C1 harness connector and the Evaporator Temperature Sensor harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C21) Evaporator Temperature Sensor Signal circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK (C121) SENSOR GROUND CIRCUIT FOR AN OPEN**

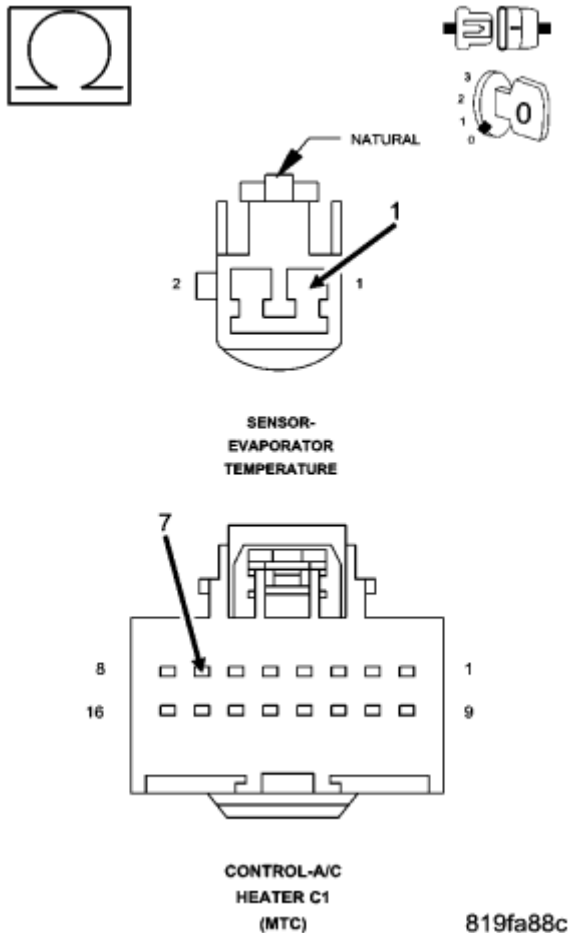


Fig. 7: Measuring Resistance Of (C121) Sensor Ground Circuit Between A/C Heater Control C1 Harness Connector And Evaporator Temperature Sensor Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (C121) Sensor Ground circuit between the A/C Heater Control C1 harness connector and the Evaporator Temperature Sensor harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C121) Sensor Ground circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Evaporator Temperature Sensor in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1034-INFRARED TEMPERATURE SENSOR INPUT CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the IR Sensor fails the internal self test.

Possible Causes

Possible Causes
A/C HEATER CONTROL

NOTE: This DTC must be active for the results of this test to be valid. Do not perform this test if this DTC is stored. Refer to ***HVAC SYSTEM TEST** for stored DTC test procedures.

Diagnostic Test

1. **REPLACE THE A/C HEATER CONTROL**

Repair

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1034-INFRARED TEMPERATURE SENSOR THERMISTOR CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the IR Sensor fails the internal self test.

Possible Causes

Possible Causes
A/C HEATER CONTROL

NOTE: This DTC must be active for the results of this test to be valid. Do not perform this test if this DTC is stored. Refer to ***HVAC SYSTEM TEST** for stored DTC test procedures.

Diagnostic Test

1. **REPLACE THE A/C HEATER CONTROL**

Repair

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1035-INFRARED TEMPERATURE SENSOR INPUT CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the IR Sensor fails the internal self test.

Possible Causes

Possible Causes
A/C HEATER CONTROL

NOTE: This DTC must be active for the results of this test to be valid. Do not perform this test if this DTC is stored. Refer to *HVAC SYSTEM TEST for stored DTC test procedures.

Diagnostic Test

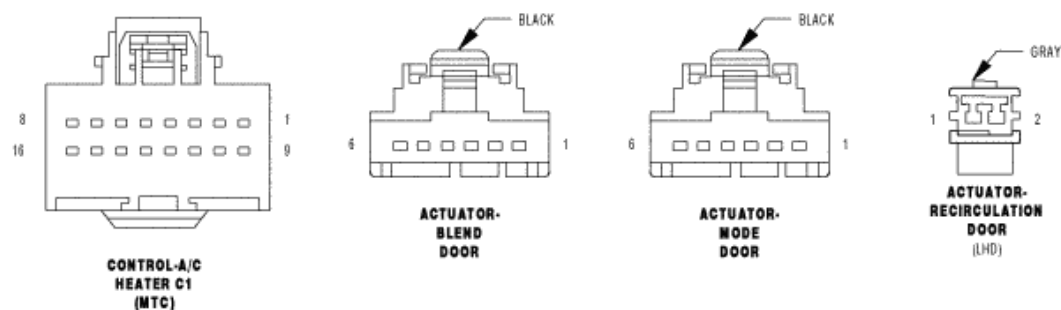
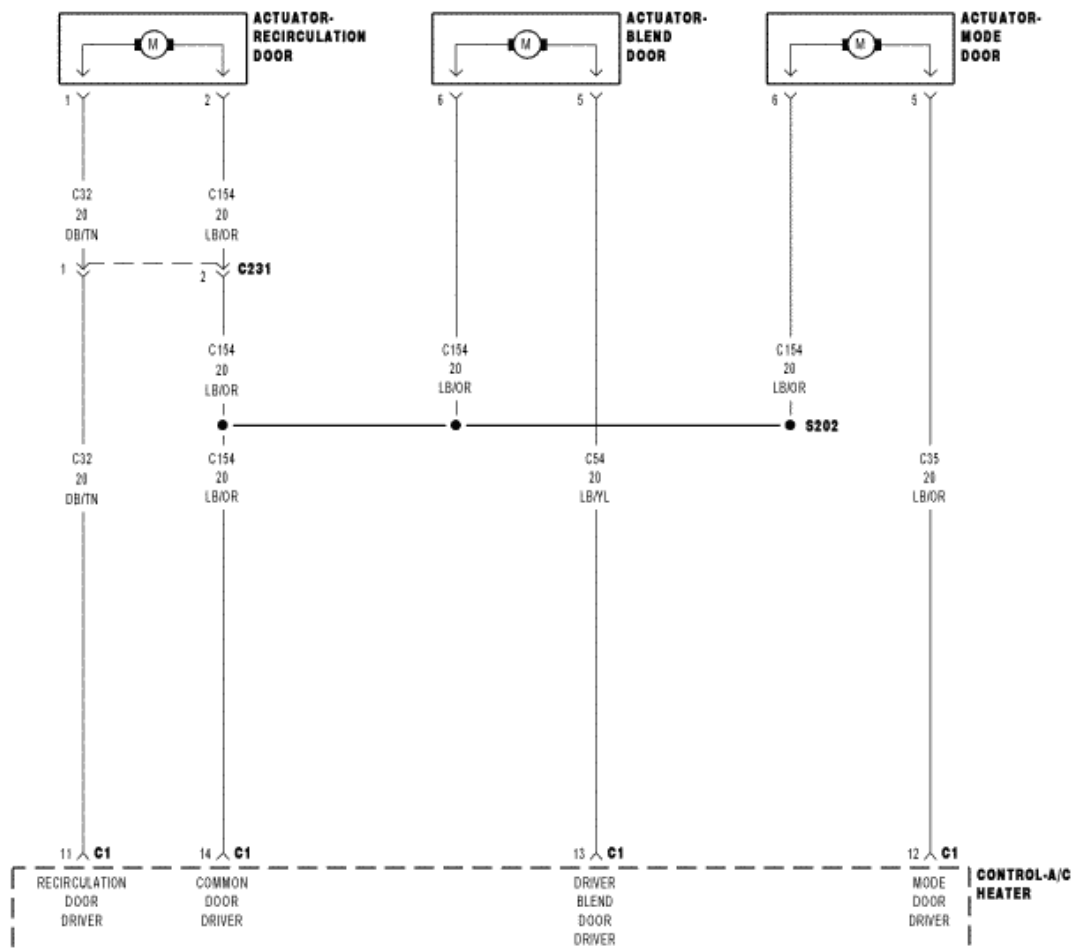
- 1. REPLACE THE A/C HEATER CONTROL

Repair

Replace the A/C Heater Control in accordance with the service information.
Perform BODY VERIFICATION TEST - VER 1 .

B1040-PANEL MODE DOOR 1 CONTROL CIRCUIT/PERFORMANCE

Circuit Schematic



01a20602

Fig. 8: Panel Mode Door Control , Recirculation Door Control And Left Blend Door Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control drives the Mode Door Actuator via the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit. The Mode Door Actuator shares the (C154) Common Door Driver circuit with the blend door and Recirculation Door Actuators.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control detects a short to ground or to voltage on the (C32) Recirculation Door Driver, the (C54) Blend Door Driver, or the (C154) Common Door Driver circuits while attempting to drive the (C35) Mode Door Driver.

Possible Causes

Possible Causes
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO GROUND
RECIRCULATION DOOR ACTUATOR
MODE DOOR ACTUATOR
BLEND DOOR ACTUATOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Mode Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

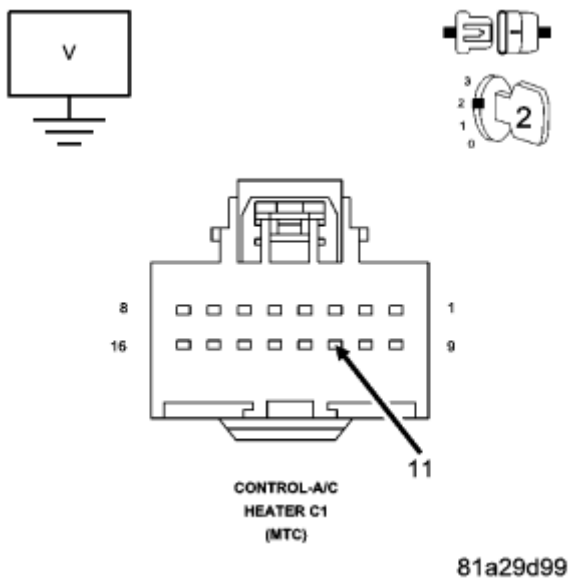


Fig. 9: Measuring Voltage Of (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Measure the voltage of the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C32) Recirculation Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

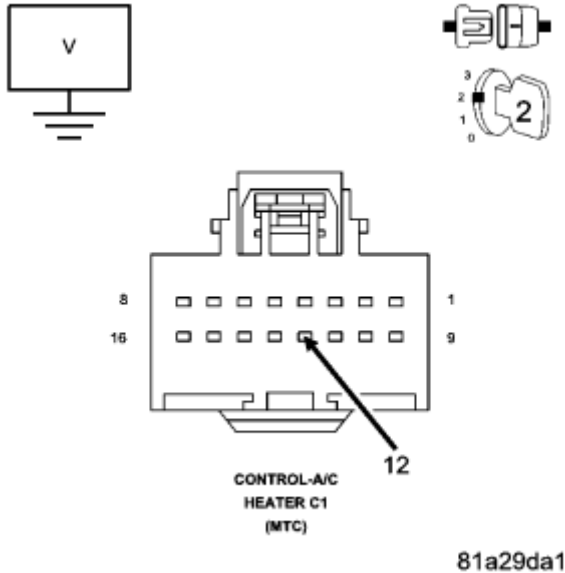


Fig. 10: Measuring Voltage Of (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage of the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C35) Mode Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (C54) BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

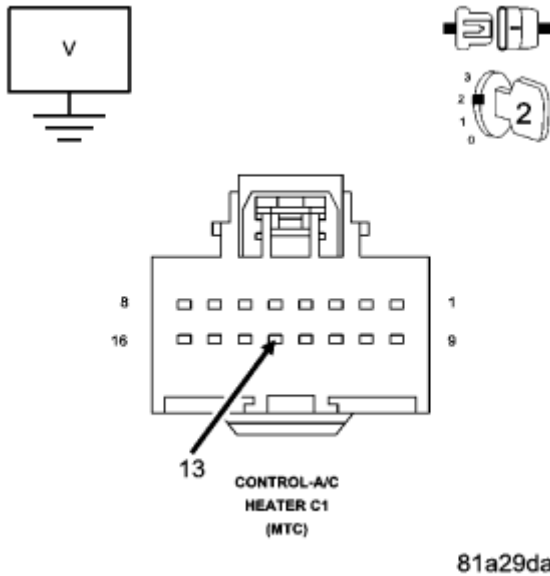


Fig. 11: Measuring Voltage Of (C54) Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage of the (C54) Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C54) Blend Door Driver circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

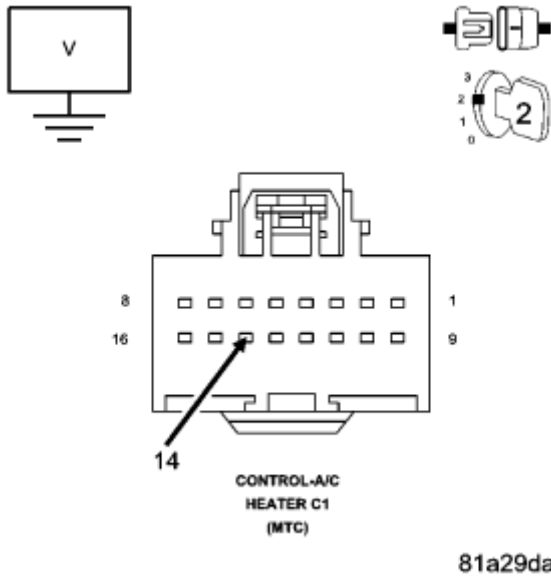


Fig. 12: Measuring Voltage Of (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage of the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

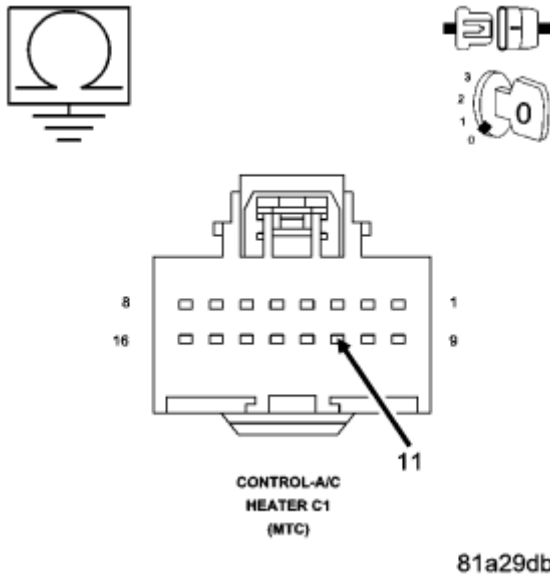
Yes

Repair the (C154) Common Door Driver circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29db9

Fig. 13: Measuring Resistance Between Ground And (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Go To 7.

No

Repair the (C32) Recirculation Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

7. CHECK (C54) DRIVER BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND

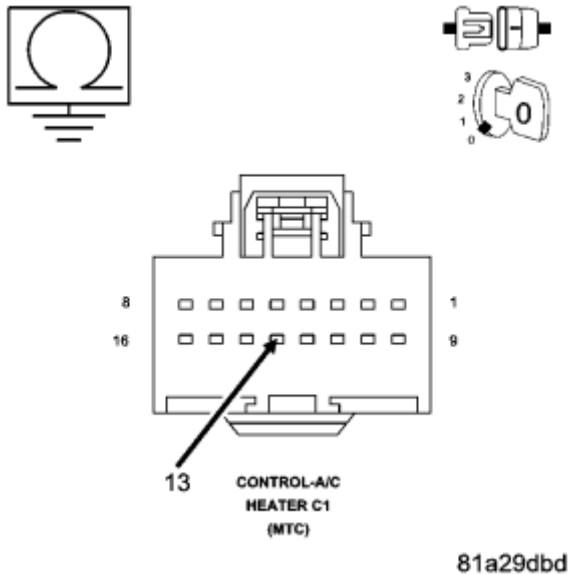


Fig. 14: Measuring Resistance Between Ground And (C54) Driver Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C54) Driver Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Go To 8.

No

Repair the (C54) Driver Blend Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

8. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND

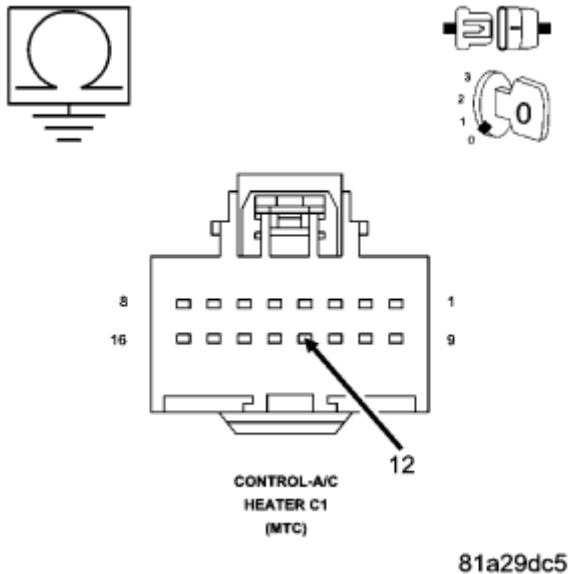


Fig. 15: Measuring Resistance Between Ground And (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

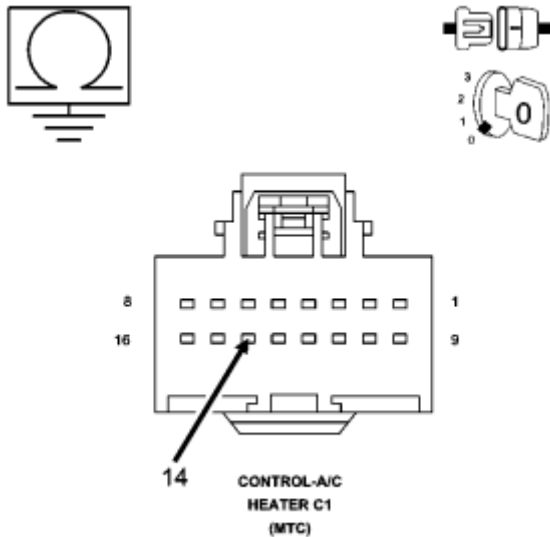
Go To 9.

No

Repair the (C35) Mode Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

9. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29dcf

Fig. 16: Measuring Resistance Between Ground And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

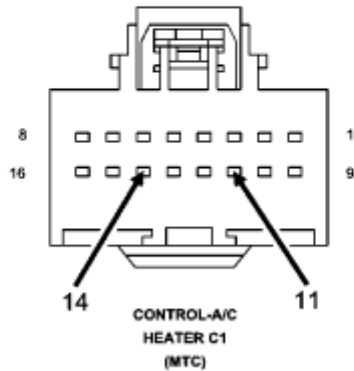
Go To 10.

No

Repair the (C154) Common Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

10. **CHECK RECIRCULATION DOOR ACTUATOR CIRCUIT RESISTANCE**



81a29de1

Fig. 17: Measuring Resistance Between (C32) Recirculation Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C32) Recirculation Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

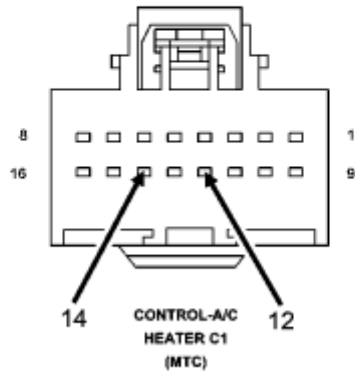
Go To 11.

No

Replace the Recirculation Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

11. CHECK MODE DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e28

Fig. 18: Measuring Resistance Between (C35) Mode Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

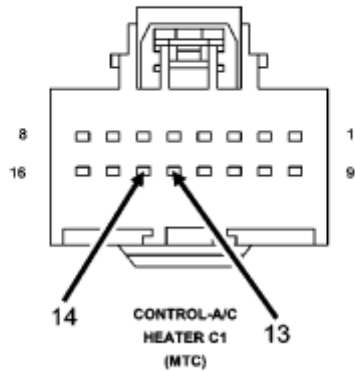
Go To 12.

No

Replace the Mode Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

12. CHECK BLEND DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e6b

Fig. 19: Measuring Resistance Between (C54) Blend Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C54) Blend Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Go To 13.

No

Replace the Blend Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

13. RUN THE ACTUATOR CALIBRATION TEST

Reconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool only display: B1040-PANEL MODE DOOR 1 CONTROL CIRCUIT/PERFORMANCE?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No, Other DTC(s) Displayed

Diagnose and repair the other DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

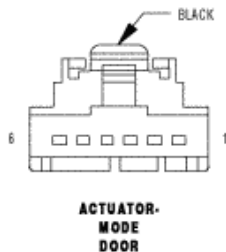
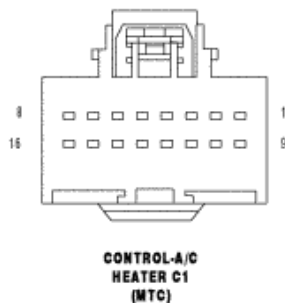
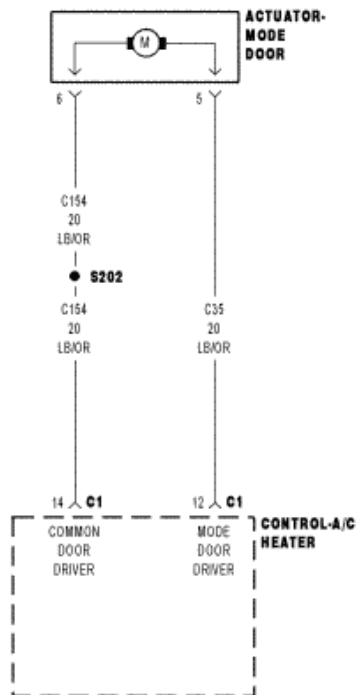
No, And No Other DTCs Displayed

Using the wiring diagram as a guide, inspect the wiring and connectors for conditions causing an intermittent short. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B1043-PANEL MODE DOOR 1 CONTROL CIRCUIT OPEN

Circuit Schematic



9100a001

Fig. 20: Panel Mode Door 1 Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control drives the Mode Door Actuator via the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

If Mode Door Actuator's electrical circuit is open.

Possible Causes

Possible Causes
(C35) MODE DOOR DRIVER CIRCUIT OPEN (C154) COMMON DOOR DRIVER CIRCUIT OPEN MODE DOOR ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Panel Mode Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

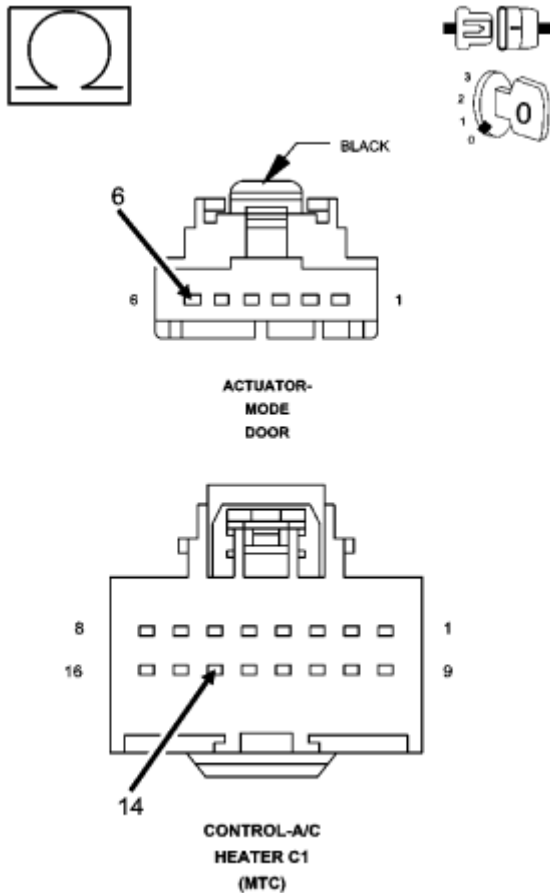
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR AN OPEN**



819faa45

Fig. 21: Measuring Resistance Of (C154) Common Door Driver Circuit Between A/C Heater Control C1 Harness Connector And Mode Door Actuator Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Disconnect the Mode Door Actuator harness connector.

Measure the resistance of the (C154) Common Door Driver circuit between the A/C Heater Control C1 harness connector and the Mode Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C154) Common Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR AN OPEN**

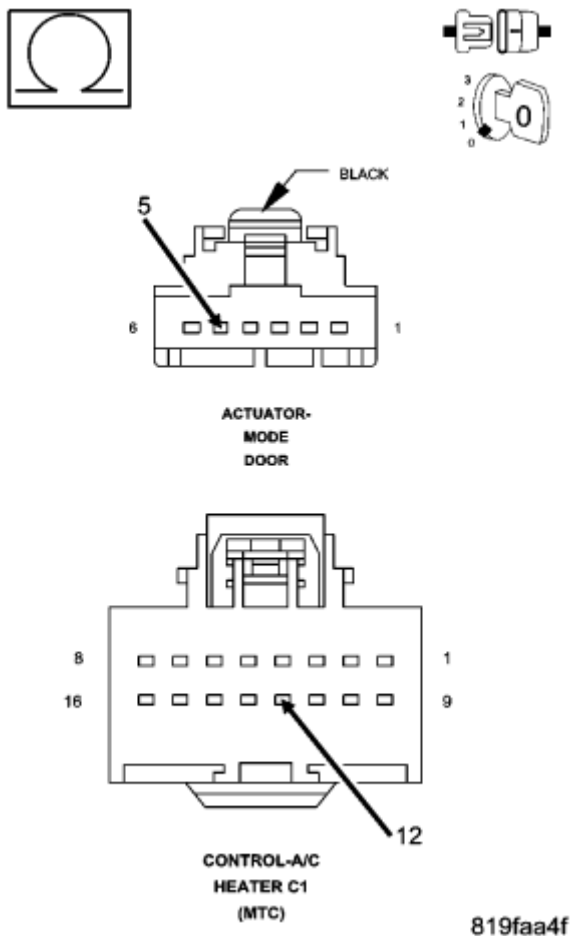


Fig. 22: Measuring Resistance Of (C35) Mode Door Driver Circuit Between A/C Heater Control C1 Harness Connector And Mode Door Actuator Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (C35) Mode Door Driver circuit between the A/C Heater Control C1 harness connector and the Mode Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C35) Mode Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK MODE DOOR ACTUATOR CIRCUIT RESISTANCE

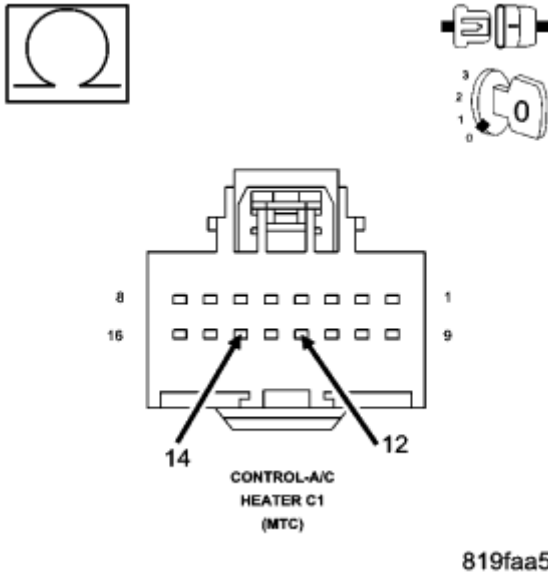


Fig. 23: Measuring Resistance Between (C35) Mode Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Reconnect the Mode Door Actuator harness connector.

Measure the resistance between the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Replace the A/C Heater Control in accordance with the service information.

No

Replace the Mode Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1044-PANEL MODE DOOR 1 TRAVEL RANGE TOO SMALL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control calibrates each actuator individually. Automatic calibration occurs upon power up after

installing a new A/C Heater Control. Manual calibration occurs by sending a command with the scan tool. The purpose of actuator calibration is to determine the total span of door travel between physical stops. To calibrate the actuator, the A/C Heater Control first moves the door to its soft stop, and then counts the number of pulses it takes to move the door to its other stop. An expected range of span is stored in the control's memory. If the measured calibration value is less than the expected range for this actuator, this DTC will set. Note that the control clears all stored calibration faults at the beginning of the calibration procedure.

Monitor Conditions

When Monitored:

During actuator calibration.

Set Conditions

- Set Condition:**

If the total span of the Mode Door is less than the low range limit.

Possible Causes

Possible Causes
DOOR DRIVER ELECTRICAL CIRCUIT(S) MODE DOOR SEIZED, BINDING, OBSTRUCTED MODE DOOR ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **CHECK FOR ACTIVE CONTROL CIRCUIT/PERFORMANCE & CONTROL CIRCUIT OPEN DTCs**

Turn the ignition on.

With the scan tool, read active HVAC DTCs.

Does the scan tool display any active CONTROL CIRCUIT/PERFORMANCE or CONTROL CIRCUIT OPEN DTCs?

Yes

Diagnose and repair the DTC(s). If present, diagnose and repair all Rear Blend and Rear Mode Door Control Circuit/Performance DTCs first, all other Control Circuit/Performance DTCs second, and all Control Circuit Open DTCs last. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Go To 2.

2. **INSPECT ACTUATOR & HOUSING ASSEMBLY FOR A CONDITION CAUSING THE DOOR TO SEIZE OR BIND**

Turn the ignition off.

Inspect the actuator, linkage, and housing assembly for a condition causing the door to seize or bind.

Are there any physical or mechanical problems with the door, housing, linkage, or actuator?

Yes

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK MODE DOOR TRAVEL**

Remove the Mode Door Actuator from the A/C Heater Housing Assembly.

By hand, attempt to rotate the door in both directions. The door should operate smoothly in both directions over approximately 90 degrees of travel.

Does the door operate smoothly in both directions over approximately 90 degrees of travel?

Yes

Replace the Mode Door Actuator in accordance with the service information. Then, Go To 4.

No

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **RUN THE ACTUATOR CALIBRATION TEST**

Turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B1045-PANEL MODE DOOR 1 TRAVEL RANGE TOO LARGE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control calibrates each actuator individually. Automatic calibration occurs upon power up after installing a new A/C Heater Control. Manual calibration occurs by sending a command with the scan tool. The purpose of actuator calibration is to determine the total span of door travel between physical stops. To calibrate the actuator, the A/C Heater Control first moves the door to its soft stop, and then counts the number of pulses it takes to move the door to its other stop. An expected range of span is stored in the control's memory. If the measured calibration value exceeds the expected range for this actuator, this DTC will set. Note that the control clears all stored calibration faults at the beginning of the calibration procedure.

Monitor Conditions

When Monitored:

During actuator calibration.

Set Conditions

- **Set Condition:**

If the total span of the Mode 1 (Floor to Panel) Door exceeds the high range limit.

Possible Causes

Possible Causes
DOOR DRIVER ELECTRICAL CIRCUIT(S) MODE DOOR OR A/C HEATER HOUSING COMPONENTS WARPED, WORN, DAMAGED, MISSING, BROKEN MODE DOOR 1 (FLOOR TO PANEL) ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **CHECK FOR ACTIVE CONTROL CIRCUIT/PERFORMANCE & CONTROL CIRCUIT OPEN DTCs**

Turn the ignition on.

With the scan tool, read active HVAC DTCs.

Does the scan tool display any active CONTROL CIRCUIT/PERFORMANCE or CONTROL CIRCUIT OPEN DTCs?

Yes

Diagnose and repair the DTC(s). If present, diagnose and repair all Rear Blend and Rear Mode Door Control Circuit/Performance DTCs first, all other Control Circuit/Performance DTCs second, and all Control Circuit Open DTCs last. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Go To 2.

2. CHECK FOR A BROKEN MODE DOOR 1 (FLOOR TO PANEL) ACTUATOR

Turn the ignition off.

Remove the Mode Door 1 (Floor to Panel) Actuator from the A/C Heater Housing Assembly.

By hand, attempt to rotate the actuator in both directions.

Does the actuator turn in either direction?

Yes

Replace the Mode Door 1 (Floor to Panel) Actuator in accordance with the service information. Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. CHECK MODE 1 (FLOOR TO PANEL) DOOR & A/C HEATER HOUSING FOR WARPED, WORN, DAMAGED, MISSING, & BROKEN COMPONENTS

Inspect for excessively worn, disconnected, missing, or broken door linkage. Inspect for a damaged or broken A/C Heater Housing Assembly. Inspect for a warped or broken door, and missing door seals. Rotate the door from stop to stop. The door should rotate approximately 90 degrees.

Are there any physical or mechanical problems with the door or housing?

Yes

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Mode Door 1 (Floor to Panel) Actuator in accordance with the service information.
Then, Go To 4.

4. RUN THE ACTUATOR CALIBRATION TEST

Turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the A/C Heater Control in accordance with the service information.

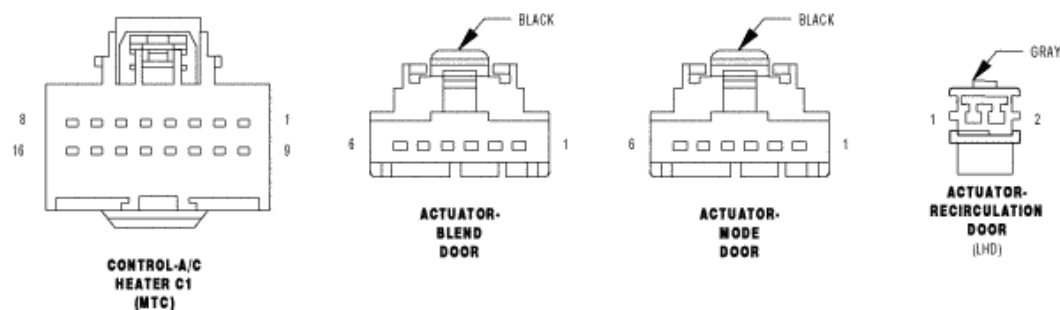
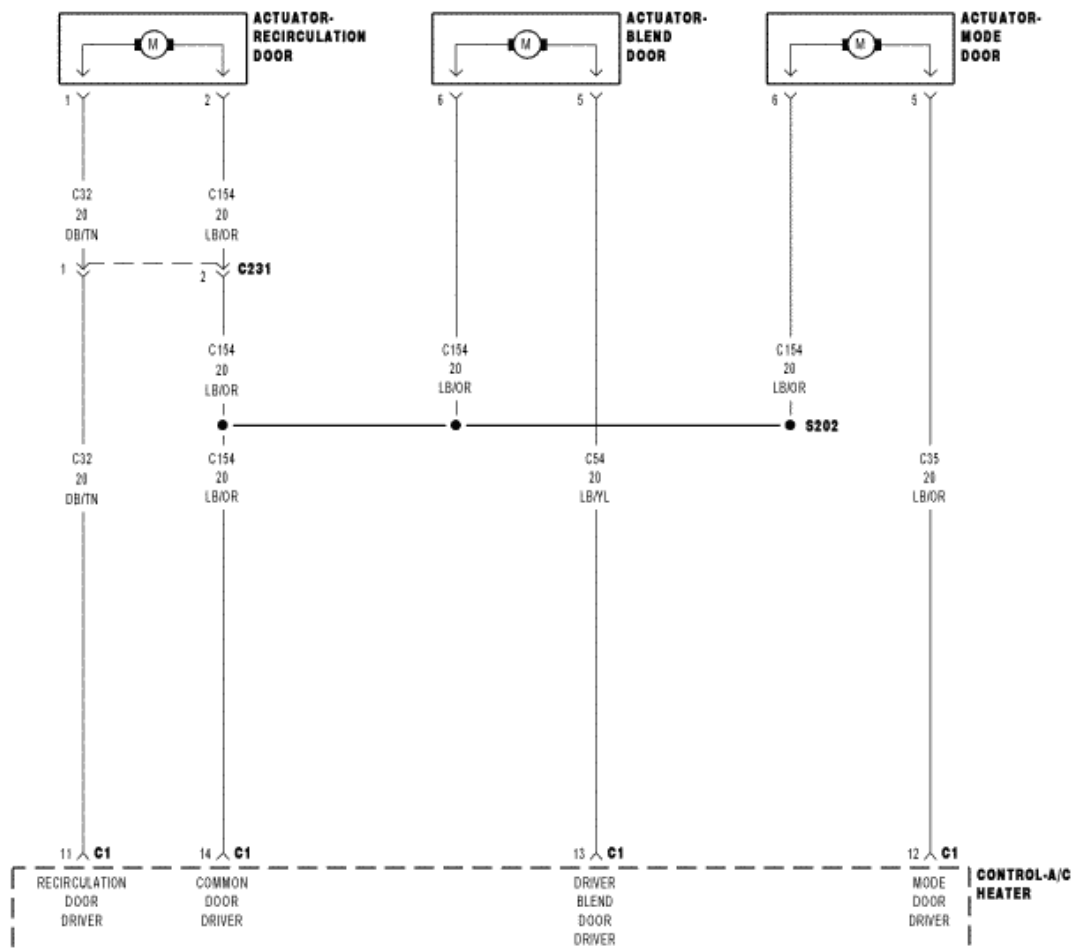
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B1058-RECIRCULATION DOOR CONTROL CIRCUIT/PERFORMANCE

Circuit Schematic



01a20602

Fig. 24: Panel Mode Door Control , Recirculation Door Control And Left Blend Door Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control drives the Recirculation Door Actuator via the (C32) Recirculation Door Driver and the (C154) Common Door Driver.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

If the A/C Heater Control detects a short to ground or to voltage on the (C32) Recirculation Door Driver, the (C54) Blend Door Driver, the (C35) Mode Door Driver, or the (C154) Common Door Driver circuits while attempting to drive the (C32) Recirculation Door Driver.

Possible Causes

Possible Causes
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO GROUND
RECIRCULATION DOOR ACTUATOR
MODE DOOR ACTUATOR
BLEND DOOR ACTUATOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Recirculation Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

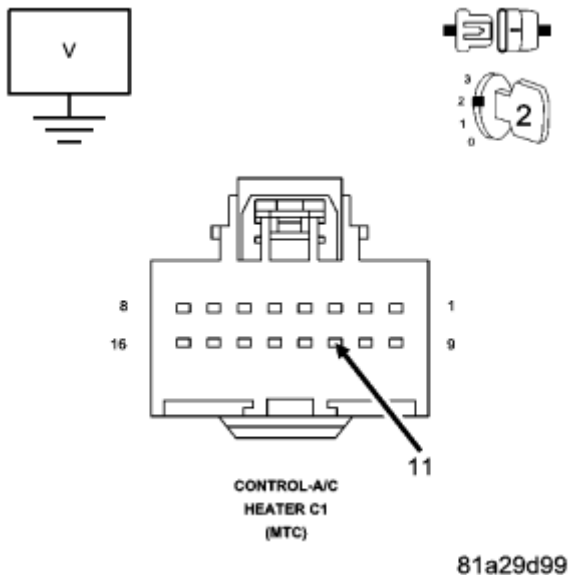


Fig. 25: Measuring Voltage Of (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Measure the voltage of the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C32) Recirculation Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

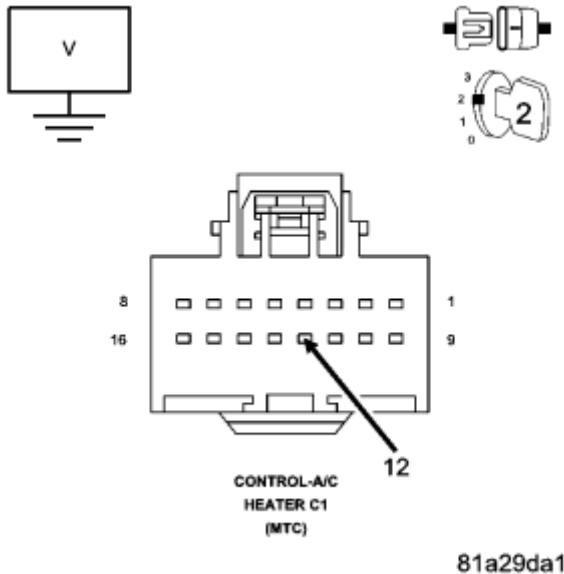


Fig. 26: Measuring Voltage Of (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage of the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C35) Mode Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (C54) BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

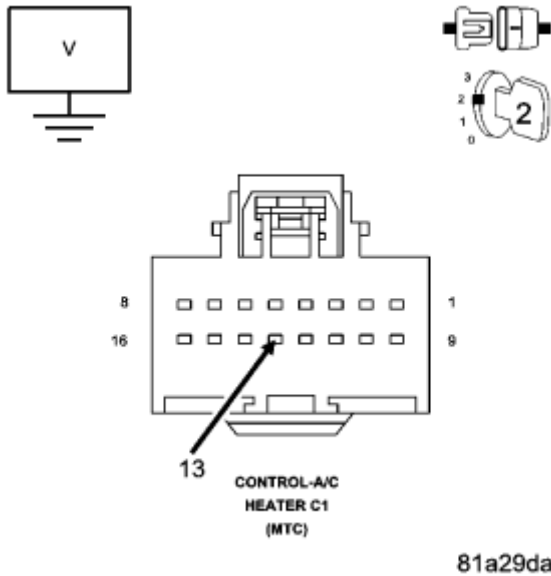


Fig. 27: Measuring Voltage Of (C54) Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage of the (C54) Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C54) Blend Door Driver circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

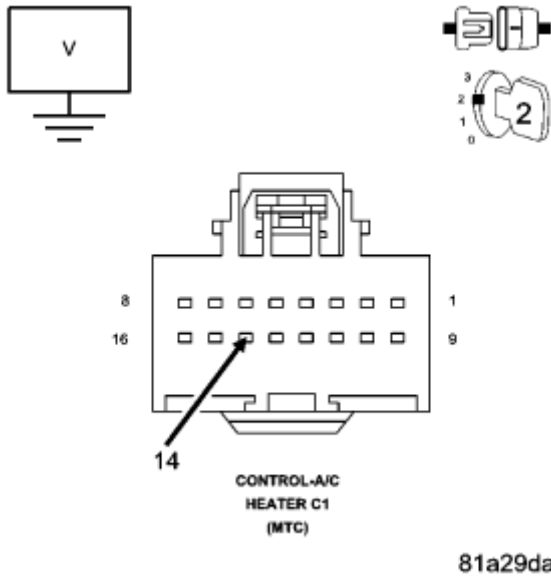


Fig. 28: Measuring Voltage Of (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage of the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C154) Common Door Driver circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND

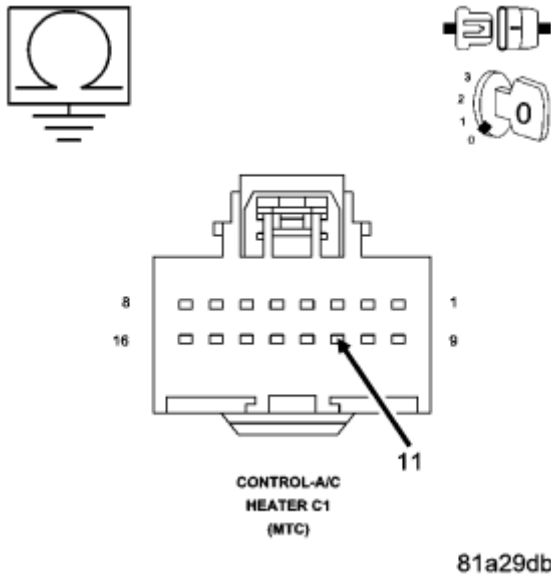


Fig. 29: Measuring Resistance Between Ground And (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Go To 7.

No

Repair the (C32) Recirculation Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

7. CHECK (C54) DRIVER BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND

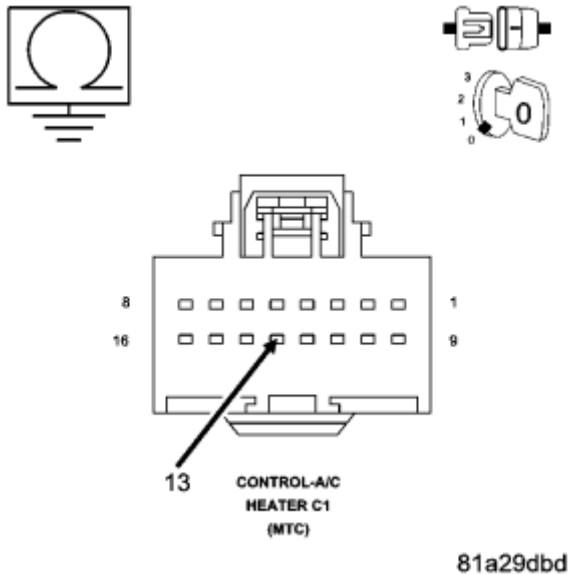


Fig. 30: Measuring Resistance Between Ground And (C54) Driver Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C54) Driver Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

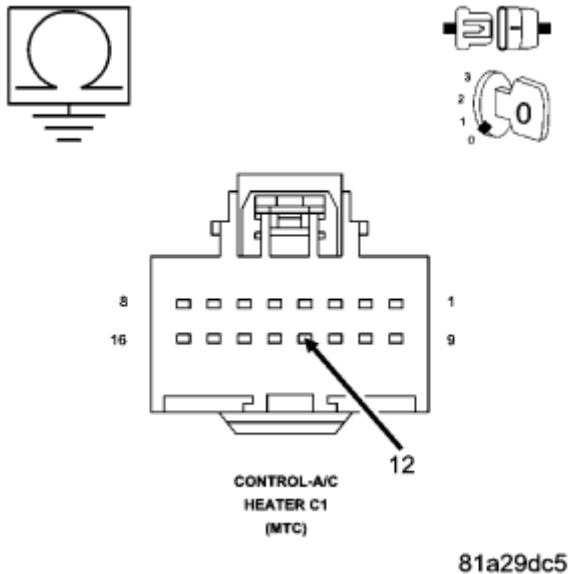
Go To 8.

No

Repair the (C54) Driver Blend Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

8. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29dc5

Fig. 31: Measuring Resistance Between Ground And (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

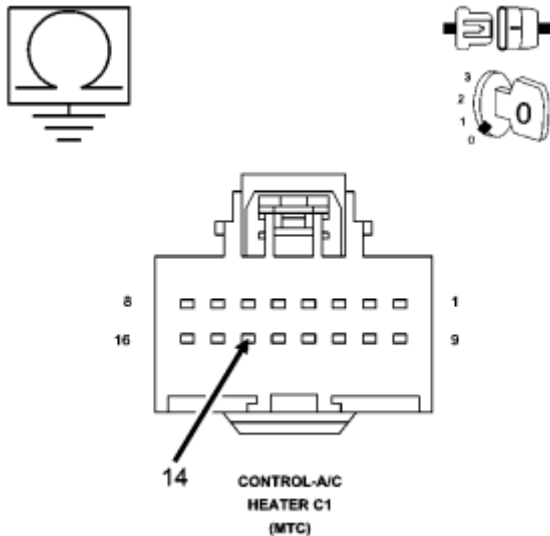
Go To 9.

No

Repair the (C35) Mode Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

9. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29dcf

Fig. 32: Measuring Resistance Between Ground And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

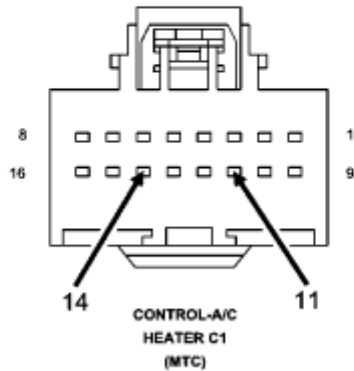
Go To 10.

No

Repair the (C154) Common Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

10. **CHECK RECIRCULATION DOOR ACTUATOR CIRCUIT RESISTANCE**



81a29de1

Fig. 33: Measuring Resistance Between (C32) Recirculation Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C32) Recirculation Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

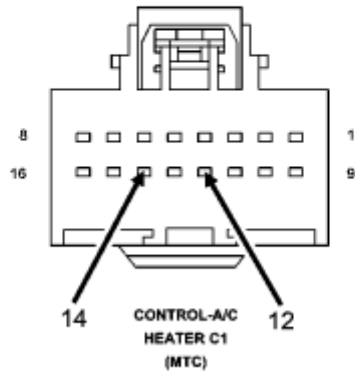
Go To 11.

No

Replace the Recirculation Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

11. CHECK MODE DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e28

Fig. 34: Measuring Resistance Between (C35) Mode Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

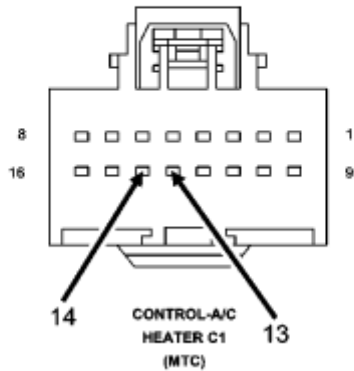
Go To 12.

No

Replace the Mode Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

12. CHECK BLEND DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e6b

Fig. 35: Measuring Resistance Between (C54) Blend Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C54) Blend Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Go To 13.

No

Replace the Blend Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

13. **RUN THE ACTUATOR CALIBRATION TEST**

Reconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool only display: B1058-RECIRCULATION DOOR CONTROL CIRCUIT/PERFORMANCE?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No, Other DTC(s) Displayed

Diagnose and repair the other DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

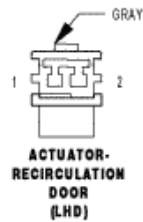
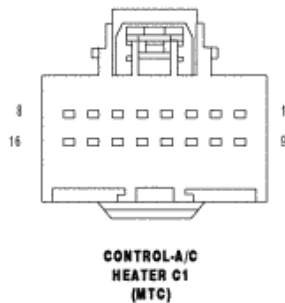
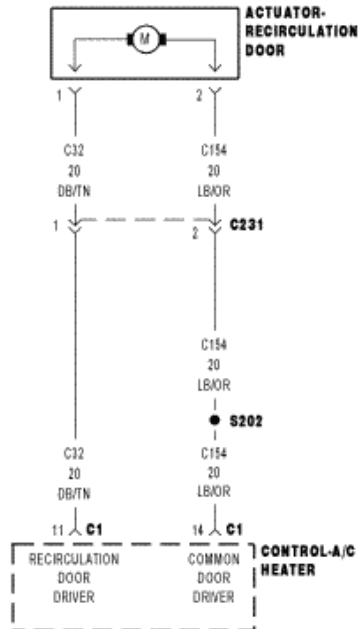
No, And No Other DTCs Displayed

Using the wiring diagram as a guide, inspect the wiring and connectors for conditions causing an intermittent short. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B105B-RECIRCULATION DOOR CONTROL CIRCUIT OPEN

Circuit Schematic



0100a000

Fig. 36: Recirculation Door Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control drives the Recirculation Door Actuator via the (C32) Recirculation Door Driver circuit and the (C154) Common Door Driver 2 circuit.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

If the Recirculation Door Actuator's electrical circuit is open.

Possible Causes

Possible Causes
(C32) RECIRCULATION DOOR DRIVER CIRCUIT OPEN (C154) COMMON DOOR DRIVER 2 CIRCUIT OPEN RECIRCULATION DOOR ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Recirculation Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR AN OPEN**

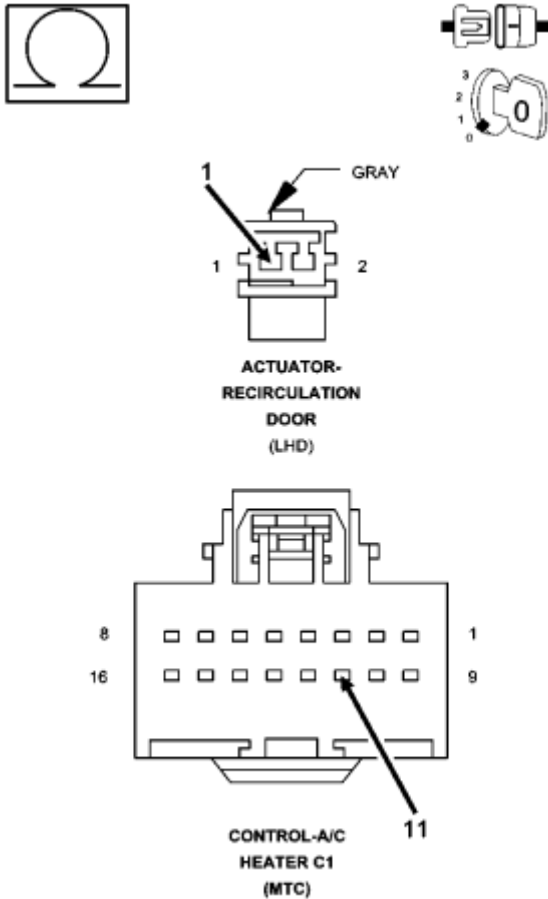


Fig. 37: Measuring Resistance Of (C32) Recirculation Door Driver Circuit Between A/C Heater Control C1 Harness Connector And Recirculation Door Actuator Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Disconnect the Recirculation Door Actuator harness connector.

Measure the resistance of the (C32) Recirculation Door Driver circuit between the A/C Heater Control C1 harness connector and the Recirculation Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C32) Recirculation Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK (C154) COMMON DOOR DRIVER 2 CIRCUIT FOR AN OPEN**

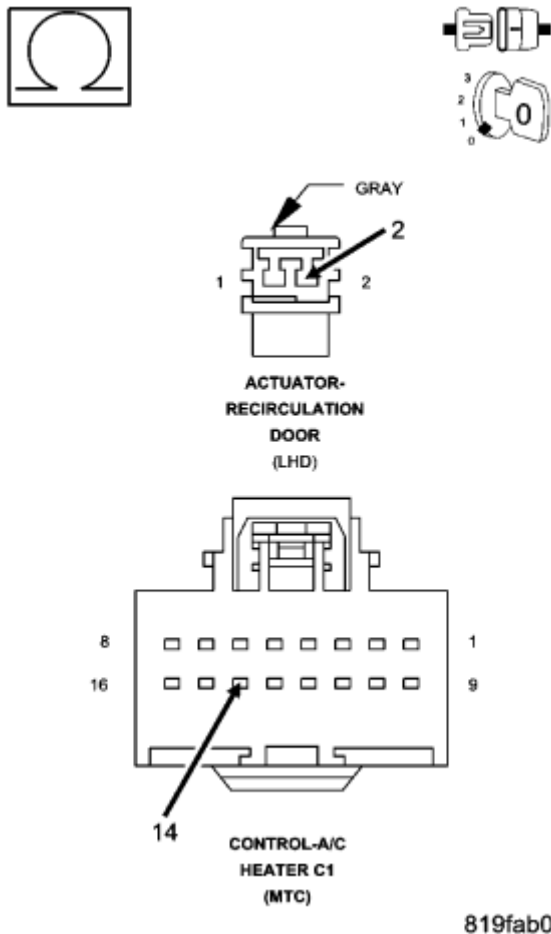


Fig. 38: Measuring Resistance Of (C154) Common Door Driver 2 Circuit Between A/C Heater Control C1 Harness Connector And Recirculation Door Actuator Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (C154) Common Door Driver 2 circuit between the A/C Heater Control C1 harness connector and the Recirculation Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C154) Common Door Driver 2 circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK RECIRCULATION DOOR ACTUATOR CIRCUIT RESISTANCE

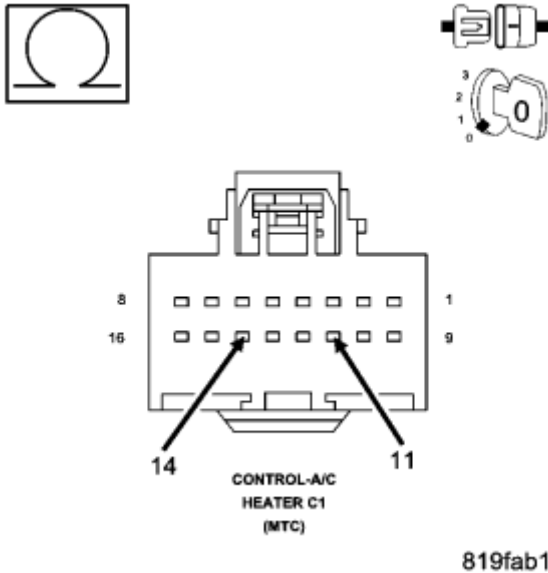


Fig. 39: Measuring Resistance Between (C32) Recirculation Door Driver Circuit And (C154) Common Door Driver 2 Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Reconnect the Recirculation Door Actuator harness connector.

Measure the resistance between the (C32) Recirculation Door Driver circuit and the (C154) Common Door Driver 2 circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Replace the Recirculation Door Actuator in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B105B-RECIRCULATION DOOR CONTROL CIRCUIT OPEN (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When actuator movement is requested.

Set Conditions

- **Set Condition:**

If the (C268) Recirculation Door Driver circuit or the (C68) Recirculation Door Common Driver circuit is open.

Possible Causes

Possible Causes
(C268) RECIRCULATION DOOR DRIVER CIRCUIT OPEN (C68) RECIRCULATION DOOR COMMON DRIVER CIRCUIT OPEN RECIRCULATION DOOR ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **CHECK FOR ACTIVE CONTROL CIRCUIT/PERFORMANCE DTCs**

Turn the ignition on.

With the scan tool, read active HVAC DTCs.

Does the scan tool display any active: XXXX CONTROL CIRCUIT/PERFORMANCE DTCs?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Go To 2.

2. **CHECK THE RECIRCULATION DOOR ACTUATOR CIRCUIT RESISTANCE**

Turn the ignition off.

Disconnect the A/C Heater Control C2 harness connector.

Measure the resistance between the (C268) Recirculation Door Driver circuit and the (C68) Recirculation Door Common Driver circuit in the A/C Heater Control C2 harness connector.

Is the resistance above 70.0 ohms?

Yes

Go To 3.

No

Replace the A/C Heater Control in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (C268) RECIRCULATION DOOR DRIVER CIRCUIT FOR AN OPEN

Disconnect the Recirculation Door Actuator harness connector.

Measure the resistance of the (C268) Recirculation Door Driver circuit between the Recirculation Door Actuator harness connector and the A/C Heater Control C2 harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 4.

No

Repair the (C268) Recirculation Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (C68) RECIRCULATION DOOR COMMON DRIVER CIRCUIT FOR AN OPEN

Measure the resistance of the (C68) Recirculation Door Common Driver circuit between the Recirculation Door Actuator harness connector and the A/C Heater Control C2 harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Recirculation Door Actuator in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (C68) Recirculation Door Common Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control calibrates each actuator individually. Automatic calibration occurs upon power up after installing a new A/C Heater Control. Manual calibration occurs by sending a command with the scan tool. The purpose of actuator calibration is to determine the total span of door travel between physical stops. To calibrate the actuator, the A/C Heater Control first moves the door to its soft stop, and then counts the number of pulses it takes to move the door to its other stop. An expected range of span is stored in the control's memory. If the measured calibration value is less than the expected range for this actuator, this DTC will set. Note that the control clears all stored calibration faults at the beginning of the calibration procedure.

Monitor Conditions

When Monitored:

During actuator calibration.

Set Conditions

- **Set Condition:**

If the total span of the Recirculation Door is less than the low range limit.

Possible Causes

Possible Causes
DOOR DRIVER ELECTRICAL CIRCUIT(S) RECIRCULATION DOOR SEIZED, BINDING, OBSTRUCTED RECIRCULATION DOOR ACTUATOR A/C HEATER CONTROL

Diagnostic Test

1. **CHECK FOR ACTIVE CONTROL CIRCUIT/PERFORMANCE & CONTROL CIRCUIT OPEN DTCs**

Turn the ignition on.

With the scan tool, read active HVAC DTCs.

Does the scan tool display any active CONTROL CIRCUIT/PERFORMANCE or CONTROL CIRCUIT OPEN DTCs?

Yes

Diagnose and repair the DTC(s). If present, diagnose and repair all Rear Blend and Rear Mode

Door Control Circuit/Performance DTCs first, all other Control Circuit/Performance DTCs second, and all Control Circuit Open DTCs last. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Go To 2.

2. INSPECT ACTUATOR & HOUSING ASSEMBLY FOR A CONDITION CAUSING THE DOOR TO SEIZE OR BIND

Turn the ignition off.

Inspect the actuator and the housing assembly for a condition causing the door to seize or bind.

Are there any physical or mechanical problems with the door, housing, or actuator?

Yes

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK RECIRCULATION DOOR TRAVEL

Remove the Recirculation Door Actuator from the A/C Heater Housing Assembly.

By hand, attempt to rotate the door in both directions. The door should operate smoothly in both directions over approximately 70 degrees of travel.

Does the door operate smoothly in both directions over approximately 70 degrees of travel?

Yes

Replace the Recirculation Door Actuator in accordance with the service information. Then, Go To 4.

No

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

4. RUN THE ACTUATOR CALIBRATION TEST

Turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B105D-RECIRCULATION DOOR TRAVEL RANGE TOO LARGE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control calibrates each actuator individually. Automatic calibration occurs upon power up after installing a new A/C Heater Control. Manual calibration occurs by sending a command with the scan tool. The purpose of actuator calibration is to determine the total span of door travel between physical stops. To calibrate the actuator, the A/C Heater Control first moves the door to its soft stop, and then counts the number of pulses it takes to move the door to its other stop. An expected range of span is stored in the control's memory. If the measured calibration value exceeds the expected range for this actuator, this DTC will set. Note that the control clears all stored calibration faults at the beginning of the calibration procedure.

Monitor Conditions

When Monitored:

During actuator calibration.

Set Conditions

- **Set Condition:**

If the total span of the Recirculation Door exceeds the high range limit.

Possible Causes

Possible Causes
DOOR DRIVER ELECTRICAL CIRCUIT(S) RECIRCULATION DOOR OR A/C HEATER HOUSING COMPONENTS WARPED, WORN, DAMAGED, MISSING, BROKEN RECIRCULATION DOOR ACTUATOR

Diagnostic Test

1. CHECK FOR ACTIVE CONTROL CIRCUIT/PERFORMANCE & CONTROL CIRCUIT OPEN DTCs

Turn the ignition on.

With the scan tool, read active HVAC DTCs.

Does the scan tool display any active CONTROL CIRCUIT/PERFORMANCE or CONTROL CIRCUIT OPEN DTCs?

Yes

Diagnose and repair the DTC(s). If present, diagnose and repair all Rear Blend and Rear Mode Door Control Circuit/Performance DTCs first, all other Control Circuit/Performance DTCs second, and all Control Circuit Open DTCs last. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Go To 2.

2. CHECK FOR A BROKEN RECIRCULATION DOOR ACTUATOR

Turn the ignition off.

Remove the Recirculation Door Actuator from the A/C Heater Housing Assembly.

By hand, attempt to rotate the actuator in both directions.

Does the actuator turn in either direction?

Yes

Replace the Recirculation Door Actuator in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. CHECK RECIRCULATION DOOR & A/C HEATER HOUSING FOR WARPED, WORN, DAMAGED, MISSING, & BROKEN COMPONENTS

Inspect for a damaged or broken A/C Heater Housing Assembly, a warped, worn, or broken door, and

missing door seals. Rotate the door from stop to stop. The door should rotate approximately 70 degrees.

Are there any physical or mechanical problems with the door or housing?

Yes

Repair as necessary in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Recirculation Door Actuator in accordance with the service information. Then, Go To 4.

4. RUN THE ACTUATOR CALIBRATION TEST

Turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the A/C Heater Control in accordance with the service information.

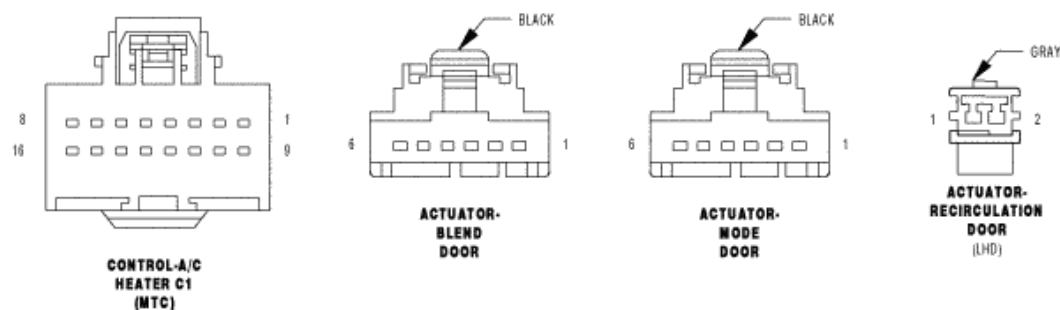
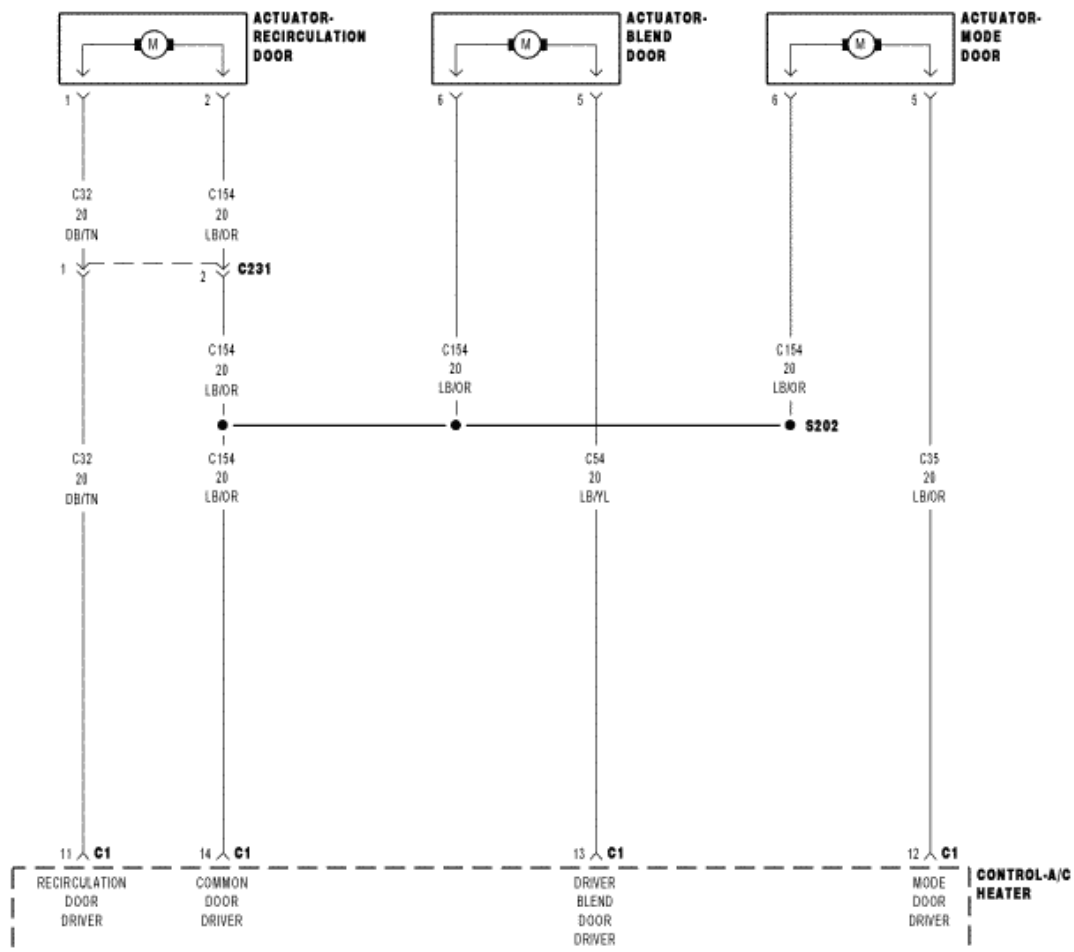
Perform **BODY VERIFICATION TEST - VER 1** .

No

Perform **BODY VERIFICATION TEST - VER 1** .

B10A2-LEFT BLEND DOOR CONTROL CIRCUIT/PERFORMANCE

Circuit Schematic



01a20602

Fig. 40: Panel Mode Door Control , Recirculation Door Control And Left Blend Door Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control monitors the door driver circuits during actuator operation for shorts to ground, shorts to battery, and shorts to other door driver circuits. If detected, the A/C Heater Control reports these types of faults as Control Circuit/Performance DTCs.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control detects a short to ground or to voltage on the (C32) Recirculation Door Driver, the (C35) Mode Door Driver, or the (C154) Common Door Driver circuits while attempting to drive the (C54) Blend Door Driver.

Possible Causes

Possible Causes
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO VOLTAGE
(C32) RECIRCULATION DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C54) BLEND DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C35) MODE DOOR DRIVER CIRCUIT SHORTED TO GROUND
(C154) COMMON DOOR DRIVER CIRCUIT SHORTED TO GROUND
RECIRCULATION DOOR ACTUATOR
MODE DOOR ACTUATOR
BLEND DOOR ACTUATOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Blend Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

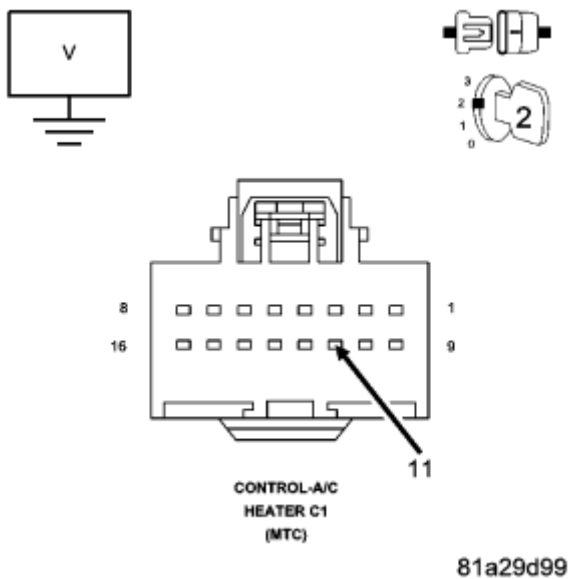


Fig. 41: Measuring Voltage Of (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Measure the voltage of the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C32) Recirculation Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

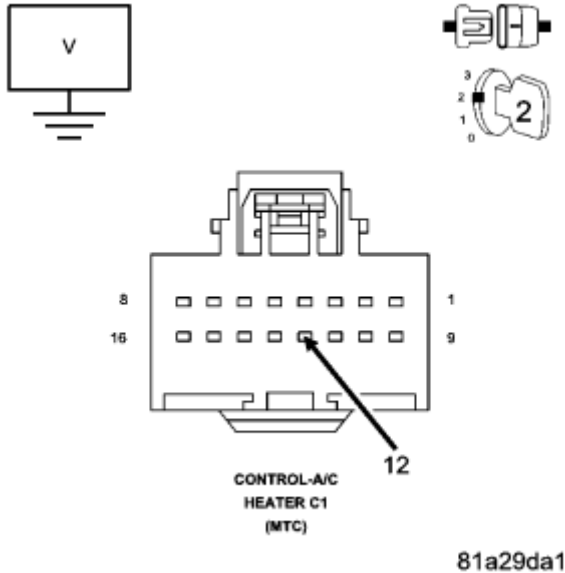


Fig. 42: Measuring Voltage Of (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage of the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (C35) Mode Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (C54) BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE

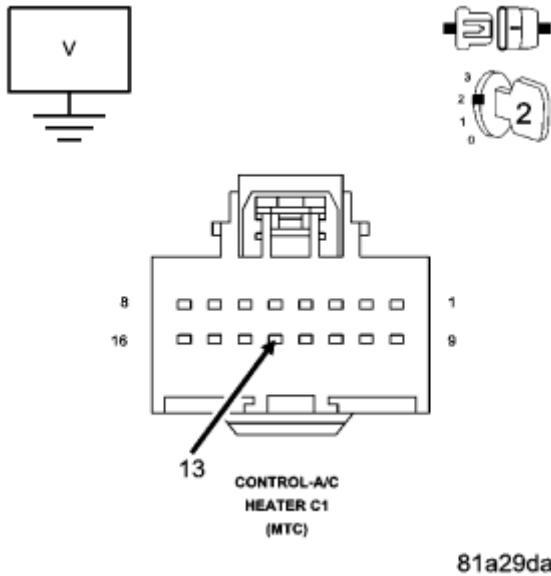


Fig. 43: Measuring Voltage Of (C54) Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the voltage of the (C54) Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

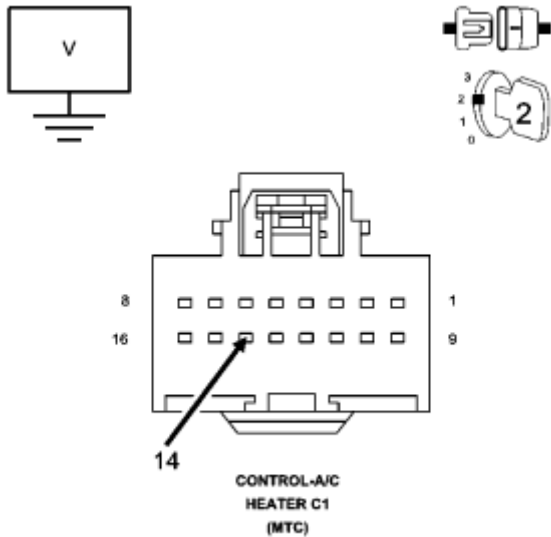
Yes

Repair the (C54) Blend Door Driver circuit for a short to voltage.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO VOLTAGE



81a29dac

Fig. 44: Measuring Voltage Of (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector

Courtesy of CHRYSLER LLC

Measure the voltage of the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

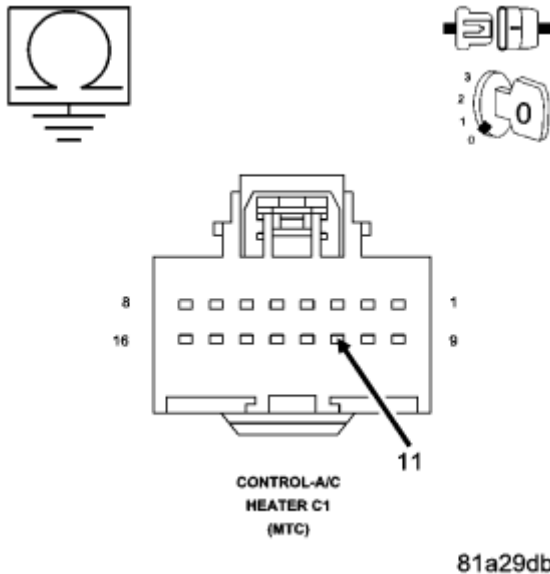
Repair the (C154) Common Door Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. CHECK (C32) RECIRCULATION DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29db9

Fig. 45: Measuring Resistance Between Ground And (C32) Recirculation Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (C32) Recirculation Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

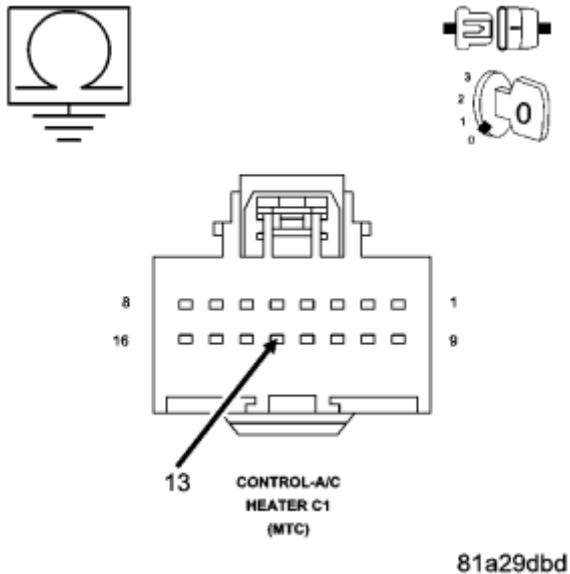
Go To 7.

No

Repair the (C32) Recirculation Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

7. CHECK (C54) DRIVER BLEND DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29dbd

Fig. 46: Measuring Resistance Between Ground And (C54) Driver Blend Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C54) Driver Blend Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Go To 8.

No

Repair the (C54) Driver Blend Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

8. CHECK (C35) MODE DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND

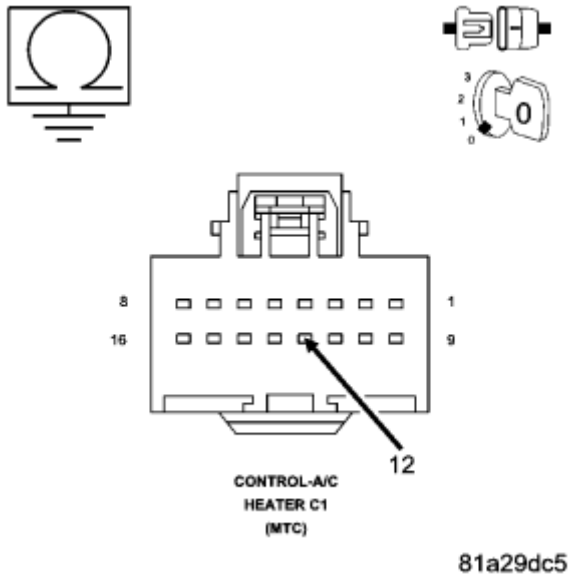


Fig. 47: Measuring Resistance Between Ground And (C35) Mode Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C35) Mode Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

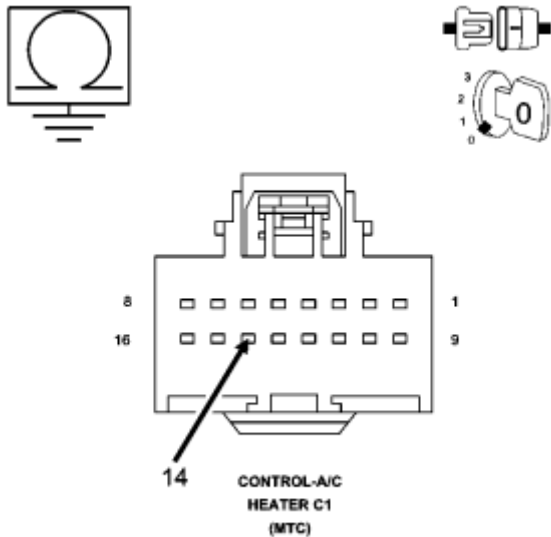
Go To 9.

No

Repair the (C35) Mode Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

9. CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR A SHORT TO GROUND



81a29dcf

Fig. 48: Measuring Resistance Between Ground And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

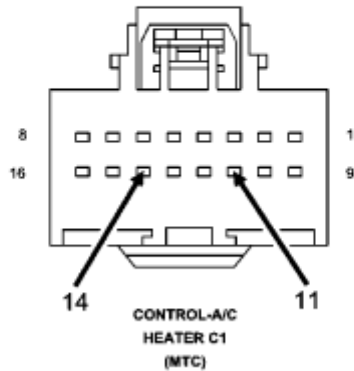
Go To 10.

No

Repair the (C154) Common Door Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

10. **CHECK RECIRCULATION DOOR ACTUATOR CIRCUIT RESISTANCE**



81a29de1

Fig. 49: Measuring Resistance Between (C32) Recirculation Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C32) Recirculation Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

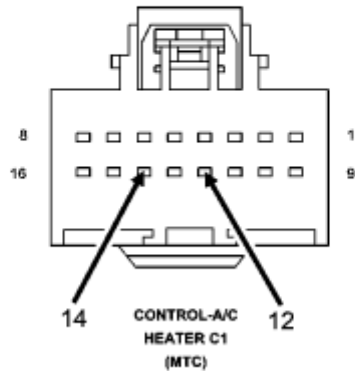
Go To 11.

No

Replace the Recirculation Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

11. CHECK MODE DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e28

Fig. 50: Measuring Resistance Between (C35) Mode Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C35) Mode Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

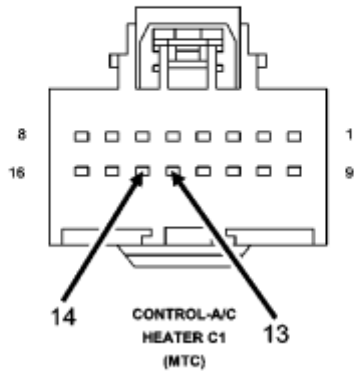
Go To 12.

No

Replace the Mode Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

12. CHECK BLEND DOOR ACTUATOR CIRCUIT RESISTANCE



81a29e6b

Fig. 51: Measuring Resistance Between (C54) Blend Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance between the (C54) Blend Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Go To 13.

No

Replace the Blend Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

13. **RUN THE ACTUATOR CALIBRATION TEST**

Reconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and then turn the ignition on.

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool only display: B10A2-LEFT BLEND DOOR CONTROL CIRCUIT/PERFORMANCE?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No, Other DTC(s) Displayed

Diagnose and repair the other DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

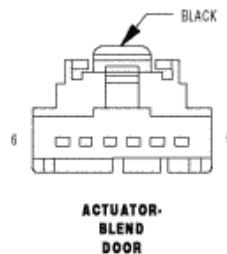
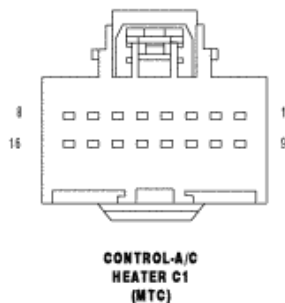
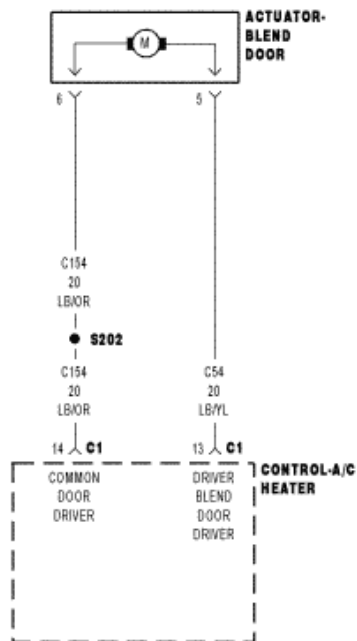
No, And No Other DTCs Displayed

Using the wiring diagram as a guide, inspect the wiring and connectors for conditions causing an intermittent short. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B10A5-LEFT BLEND DOOR CONTROL CIRCUIT OPEN

Circuit Schematic



0101010101

Fig. 52: Blend Door Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The A/C Heater Control drives the Left Blend Door Actuator via the (C54) Left Blend Door Driver circuit and the (C154) Common Door Driver circuit.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

If the Left Blend Door Actuator's electrical circuit is open.

Possible Causes

Possible Causes
(C54) DRIVER BLEND DOOR DRIVER CIRCUIT OPEN
(C154) COMMON DOOR DRIVER CIRCUIT OPEN
LEFT BLEND DOOR ACTUATOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

Using the A/C Heater Control, actuate the Left Blend Door.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

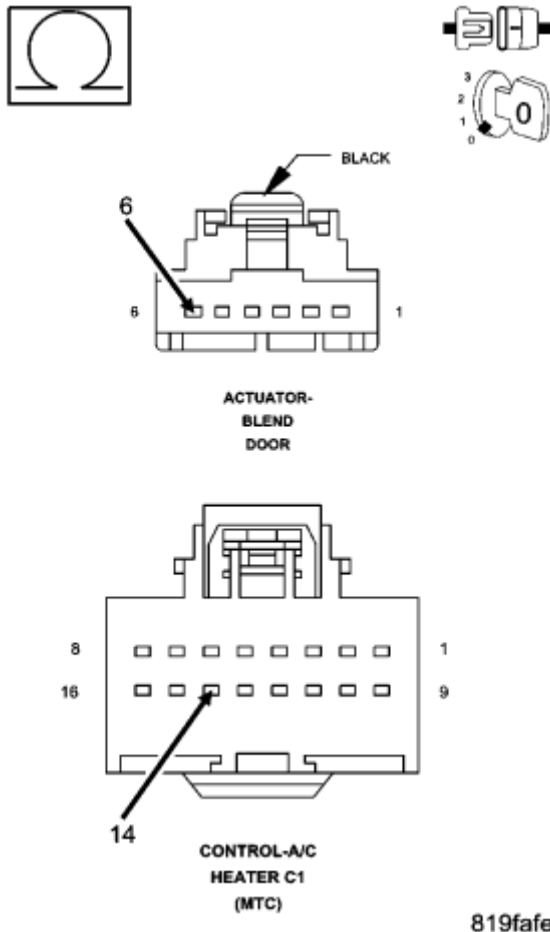
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (C154) COMMON DOOR DRIVER CIRCUIT FOR AN OPEN**



819fafa0

Fig. 53: Measuring Resistance Of (C154) Common Door Driver Circuit Between A/C Heater Control C1 Harness Connector And Left Blend Door Actuator Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Disconnect the Left Blend Door Actuator harness connector.

Measure the resistance of the (C154) Common Door Driver circuit between the A/C Heater Control C1 harness connector and the Left Blend Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C154) Common Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK (C54) LEFT BLEND DOOR DRIVER CIRCUIT FOR AN OPEN**

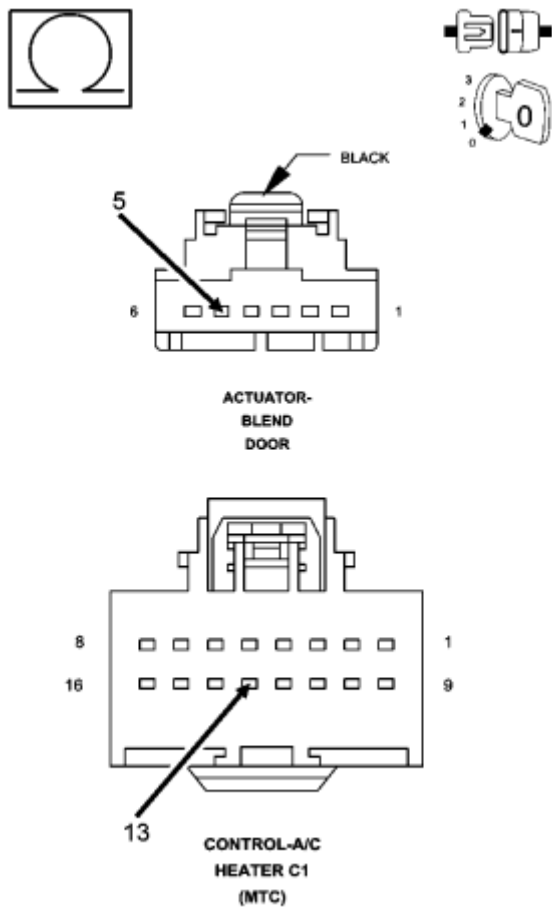


Fig. 54: Measuring Resistance Of (C54) Driver Blend Door Driver Circuit Between A/C Heater Control C1 Way Harness Connector And Left Blend Door Actuator Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (C54) Driver Blend Door Driver circuit between the A/C Heater Control C1 way harness connector and the Left Blend Door Actuator harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C54) Driver Blend Door Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK LEFT BLEND DOOR ACTUATOR CIRCUIT RESISTANCE

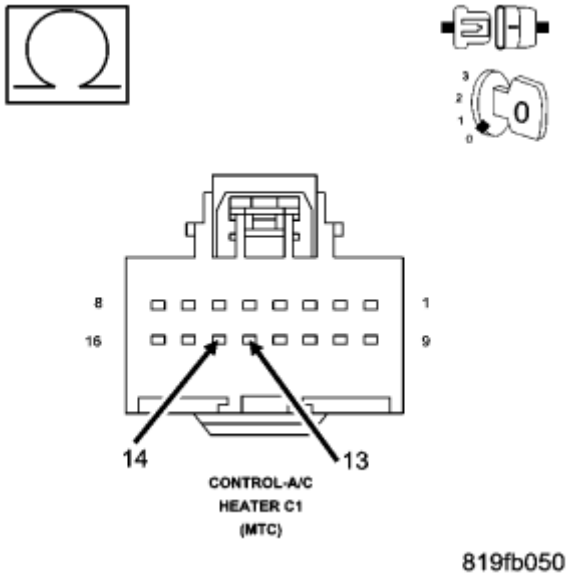


Fig. 55: Measuring Resistance Between (C54) Driver Blend Door Driver Circuit And (C154) Common Door Driver Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Reconnect the Left Blend Door Actuator harness connector.

Measure the resistance between the (C54) Driver Blend Door Driver circuit and the (C154) Common Door Driver circuit in the A/C Heater Control C1 harness connector.

Is the resistance between 30 and 40 ohms?

Yes

Replace the A/C Heater Control in accordance with the service information.

No

Replace the Mode Door Actuator in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B10B1-INFRA-RED SENSOR THERMISTOR CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the IR Sensor fails the internal self test.

Possible Causes

Possible Causes
A/C HEATER CONTROL

NOTE: This DTC must be active for the results of this test to be valid. Do not perform this test if this DTC is stored. Refer to *HVAC SYSTEM TEST for stored DTC test procedures.

Diagnostic Test

1. **REPLACE THE A/C HEATER CONTROL**

Repair

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B10B4-CABIN HEATER 1 CONTROL CIRCUIT LOW (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on, the Cabin Heater Relay energized.

Set Conditions

- **Set Condition:**

If the Totally Integrated Power Module (TIPM) detects that the (K360) Cabin Heater 1 Relay Control circuit is shorted to ground.

Possible Causes

Possible Causes
(K360) CABIN HEATER 1 RELAY CONTROL CIRCUIT SHORTED TO GROUND
(K360) CABIN HEATER 1 RELAY CONTROL CIRCUIT OPEN
CABIN HEATER RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

WARNING: When the engine is operating, do not stand in direct line with the fan, do not put your hands near the pulleys, belts or fan. Do not wear loose clothing.

NOTE: Before erasing stored DTCs, record these conditions. Attempting to duplicate these conditions may assist when checking for an active DTC.

Turn the ignition on.

With the scan tool, erase DTCs.

With the scan tool, actuate the Cabin Heater Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

2. CHECK (K360) CABIN HEATER 1 RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Remove the Cabin Heater Relay.

Measure the resistance between ground and the (K360) Cabin Heater 1 Relay Control circuit in the TIPM C1 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (K360) Cabin Heater 1 Relay Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (K360) CABIN HEATER 1 RELAY CONTROL CIRCUIT FOR AN OPEN

Measure the resistance of the (K360) Cabin Heater 1 Relay Control circuit between the Cabin Heater Relay connector and the TIPM C1 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (K360) Cabin Heater 1 Relay Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK PTC NO. 1 RELAY

Install the TIPM.

Install a substitute PTC No. 1 Relay in place of the vehicle's PTC No. 1 Relay.

Turn the ignition on.

With the scan tool, erase TIPM DTCs.

With the scan tool, actuate the PTC No. 1 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read TIPM DTCs.

Is the status Active for this DTC?

Yes

Go To 5.

No

Replace the PTC No. 1 Relay in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

5. INSPECT RELATED WIRING & CHECK FOR TSBs

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the PTC No. 1 Relay and the FCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B10B8-CABIN HEATER 2 CONTROL CIRCUIT LOW (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on, the ASD Relay energized, and the PTC No. 2 Relay command on.

Set Conditions

- **Set Condition:**

If the Totally Integrated Power Module (TIPM) detects that the (K361) PTC No. 2 Relay Control circuit is shorted to ground.

Possible Causes

Possible Causes
(K342) FUSED ASD RELAY OUTPUT CIRCUIT OPEN OR HIGH RESISTANCE
(K361) PTC NO. 2 RELAY CONTROL CIRCUIT SHORTED TO GROUND
(K361) PTC NO. 2 RELAY CONTROL CIRCUIT OPEN OR HIGH RESISTANCE
PTC NO. 2 RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **VERIFY THAT THE DTC IS ACTIVE**

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts or fan. Do not wear loose clothing.

NOTE: If the TIPM detects and stores a DTC, the TIPM also stores the environmental conditions under which the DTC was set.

NOTE: Before erasing stored DTCs, record these conditions. Attempting to duplicate these conditions may assist when checking for an active DTC.

Turn the ignition on.

With the scan tool, erase TIPM DTCs.

With the scan tool, actuate the PTC No. 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read TIPM DTCs.

Is the status Active for this DTC?

Yes

Go To 2.

No

Check for an intermittent condition by inspecting the related wiring harness for chaffed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

2. **CHECK (K342) FUSED ASD RELAY OUTPUT CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**

Turn the ignition off.

Remove the PTC No. 2 Relay.

Turn the ignition on.

Using a 12 volt test light connected to ground, check the (K342) Fused ASD Relay Output circuit in the PTC No. 2 Relay harness connector.

NOTE: **The test light should illuminate brightly. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

Go To 3.

No

Repair the (K342) Fused ASD Relay Output circuit for an open or high resistance.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK (K361) PTC NO. 2 RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (K361) PTC No. 2 Relay Control circuit in the PTC No. 2 Relay connector.

Is the resistance above 10.0 ohms?

Yes

Go To 4.

No

Repair the (K361) PTC No. 2 Relay Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK (K361) PTC NO. 2 RELAY CONTROL CIRCUIT FOR AN OPEN OR HIGH RESISTANCE**

Measure the resistance of the (K361) PTC No. 2 Relay Control circuit between the PTC No. 2 Relay connector and the TIPM connector.

Is the resistance below 10.0 ohms?

Yes

Go To 5.

No

Repair the (K361) PTC No. 2 Relay Control circuit for an open or high resistance.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK PTC NO. 2 RELAY**

Install a substitute PTC No. 2 Relay in place of the vehicle's PTC No. 2 Relay.

Turn the ignition on.

With the scan tool, erase TIPM DTCs.

With the scan tool, actuate the PTC No. 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read TIPM DTCs.

Is the status Active for this DTC?

Yes

Go To 6.

No

Replace the PTC No. 2 Relay in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **INSPECT RELATED WIRING & CHECK FOR TSBs**

Turn the ignition off.

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the PTC No. 2 Relay and the FCM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Front Control Module (FCM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B10B9-CABIN HEATER 2 CONTROL CIRCUIT HIGH (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on, the ASD Relay energized, and the PTC No. 2 Relay command on.

Set Conditions

- **Set Condition:**

If the Totally Integrated Power Module (TIPM) detects that the (K361) PTC No. 2 Relay Control circuit voltage is shorted to voltage.

Possible Causes

Possible Causes
(K361) PTC NO. 2 RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE
(K361) PTC NO. 2 RELAY CONTROL CIRCUIT OPEN OR HIGH RESISTANCE
PTC NO. 2 RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

1. VERIFY THAT THE DTC IS ACTIVE

WARNING: When the engine is operating, do not stand in direct line with the fan. Do not put your hands near the pulleys, belts or fan. Do not wear loose clothing.

NOTE: If the TIPM detects and stores a DTC, the TIPM also stores the environmental conditions under which the DTC was set.

NOTE: Before erasing stored DTCs, record these conditions. Attempting to duplicate these conditions may assist when checking for an active DTC.

Turn the ignition on.

With the scan tool, erase TIPM DTCs.

With the scan tool, actuate the PTC No. 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read TIPM DTCs.

Is the status Active for this DTC?

Yes

Go To 2.

No

Check for an intermittent condition by inspecting the related wiring harness for chaffed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

2. CHECK PTC NO. 2 RELAY

With the scan tool, erase TIPM DTCs.

Turn the ignition off.

Remove the PTC No. 2 Relay.

Turn the ignition on.

With the scan tool, actuate the PTC No. 2 Relay.

With the scan tool, read TIPM DTCs.

NOTE: The scan tool should display an open circuit DTC with the PTC No. 2 Relay removed.

Does the scan tool display: B10B9-CABIN HEATER 2 CONTROL CIRCUIT HIGH?

Yes

Go To 3.

No

Replace the PTC No. 2 Relay in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK (K361) PTC NO. 2 RELAY CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

Turn the ignition off.

Disconnect the TIPM from the Power Module.

Remove the ASD Relay from the TIPM.

Connect a jumper wire between cavity 30 and cavity 87 of the ASD Relay Connector.

Turn the ignition on.

Measure the voltage of the (K361) PTC No. 2 Relay Control circuit in the PTC No. 2 Relay connector.

Is there any voltage present?

Yes

Repair the (K361) PTC No. 2 Relay Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (K361) PTC NO. 2 RELAY CONTROL FOR AN OPEN OR HIGH RESISTANCE

Turn the ignition off.

Measure the resistance of the (K361) PTC No. 2 Relay Control circuit between the PTC No. 2 Relay connector and the TIPM connector.

Is the resistance below 10.0 ohms?

Yes

Go To 5.

No

Repair the (K361) PTC No. 2 Relay Control circuit for an open or high resistance.

Perform **BODY VERIFICATION TEST - VER 1** .

5. INSPECT RELATED WIRING & CHECK FOR TSBs

Using the wiring diagram/schematic as a guide, inspect the wiring and connectors between the PTC No. 2 Relay and the TIPM.

Look for any chafed, pierced, pinched, or partially broken wires.

Look for broken, bent, pushed out or corroded terminals.

Refer to any Technical Service Bulletins that may apply.

Were any problems found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the TIPM in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

Perform **BODY VERIFICATION TEST - VER 1** .

B10EA-BLOWER MOTOR CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts. TIPM requesting Blower Motor operation.

Set Conditions

- **Set Condition:**

If the Totally Integrated Power Module (TIPM) detects a short to voltage condition on the (C7) Blower Motor Control circuit.

Possible Causes

Possible Causes
(C7) BLOWER MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE
(C7) BLOWER MOTOR CONTROL CIRCUIT OPEN
BLOWER MOTOR
TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **VERIFY DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, erase DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the a/c control, turn on the Blower Motor.

With the scan tool, read DTCs.

Does the scan tool display active: B10EA-BLOWER MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (C7) BLOWER MOTOR CONTROL CIRCUIT FOR AN OPEN**

Turn the ignition off.

Disconnect the TIPM C8 harness connector.

Disconnect the Blower Motor harness connector.

Measure the resistance of the (C7) Blower Motor Control circuit between the TIPM C8 harness connector and the Blower Motor harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C7) Blower Motor Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (C7) BLOWER MOTOR CONTROL CIRCUIT FOR SHORT TO VOLTAGE

Turn the ignition on.

With a volt meter measure the voltage on the (C7) Blower Motor Control circuit.

Does the volt meter read above 10.0 volts?

Yes

Repair the (C7) Blower Motor Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. TOTALLY INTEGRATED POWER MODULE

Turn the ignition on.

With the scan tool, erase DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the a/c control, turn on the Blower Motor.

With the scan tool, read DTCs.

Does the scan tool display active: B10EA-BLOWER MOTOR CONTROL CIRCUIT HIGH?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Blower Motor in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B10EC-BLOWER MOTOR CONTROL CIRCUIT OVERCURRENT (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) will set this DTC if it detects an overcurrent condition on the (C7) Blower Motor Control circuit for more than 500 ms when blower motor operation is requested.

Possible Causes

Possible Causes
BLOCKAGE STALLING BLOWER MOTOR BLOWER MOTOR TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. VERIFY DTC B10EC-BLOWER MOTOR CONTROL CIRCUIT OVERCURRENT IS ACTIVE

Turn the ignition on.

With the scan tool, erase DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display active: B10EC-BLOWER MOTOR CONTROL CIRCUIT OVERCURRENT?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR PROPER BLOWER MOTOR OPERATION

Turn the ignition on.

Turn the Blower Motor on.

Does the Blower Motor operate normally?

Yes

Go To 5.

No

Go To 3.

3. CHECK FOR 12 VOLTS TO THE BLOWER MOTOR

Turn the ignition off.

Disconnect the Blower Motor harness connector.

Turn the ignition on.

Turn the Blower Motor control on.

Using a volt meter measure the voltage on the (C7) Blower Motor Control circuit in the Blower Motor harness connector.

Does the volt meter read 12 volts?

Yes

Go To 4.

No

Go To 5.

4. **CHECK FOR A BLOCKAGE STALLING THE BLOWER MOTOR**

Turn the ignition off.

Remove the Blower Motor from the HVAC housing assembly.

Look for anything on the Blower Motor and in the HVAC housing that is physically preventing Blower Motor operation.

Is anything physically preventing Blower Motor operation?

Yes

Repair as necessary. Also, check Blower Motor for proper operation. Reinstall, or replace the Blower Motor as necessary in accordance with the service information.

No

Replace the Blower Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK FOR CHAFING IN THE (C7) BLOWER MOTOR CONTROL CIRCUIT**

Turn the ignition off.

Check the (C7) Blower Motor Control circuit for wire chafing.

Is any wire chafing present?

Yes

Repair the wire chafing on the (C7) Blower Motor Control circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1138-CABIN HEATER 3 CONTROL CIRCUIT LOW (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on, the Cabin Heater Relay 2 commanded on.

Set Conditions

- **Set Condition:**

If the Totally Integrated Power Module detects the (K232) Cabin Heater Relay 2 Control circuit is shorted to ground.

Possible Causes

Possible Causes
(K232) CABIN HEATER RELAY 2 CONTROL CIRCUIT SHORTED TO GROUND
CABIN HEATER 2 RELAY
TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. **VERIFY THAT THE DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, erase DTCs.

With the scan tool, actuate the Cabin Heater 2 Relay.

Monitor the scan tool, for at least two minutes.

With the scan tool, read DTCs.

Does the scan tool, display active: B10B8-CABIN HEATER 2 CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or

contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (K232) CABIN HEATER RELAY 2 OUTPUT CIRCUIT FOR SHORT TO GROUND**

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Remove the Cabin Heater Relay 2.

Using an ohm meter measure the resistance between the (K232) Cabin Heater Relay 2 Output circuit and ground.

Does the ohm meter read open circuit?

Yes

Go To 3.

No

Repair the (K232) Cabin Heater Relay 2 Output circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **TOTALLY INTEGRATED POWER MODULE (TIPM)**

Turn the ignition on.

With the scan tool, erase DTCs.

With the scan tool, actuate the Cabin Heater 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read DTCs.

Does the scan tool display active: B10B8-CABIN HEATER 2 CONTROL CIRCUIT LOW?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Cabin Heater Relay 2 in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1139-CABIN HEATER 3 CONTROL CIRCUIT HIGH (TIPM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on, the Cabin Heater Relay 2 is commanded on.

Set Conditions

- Set Condition:**

If the Totally Integrated Power Module detects a short to voltage on the (K232) Cabin Heater Relay 2 Control circuit.

Possible Causes

Possible Causes
(K232) CABIN HEATER RELAY 2 CONTROL CIRCUIT SHORTED TO VOLTAGE CABIN HEATER RELAY 2 TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

Turn the ignition on.

With the scan tool, erase DTCs.

With the scan tool, actuate the Cabin Heater 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read DTCs.

Does the scan tool, display active: B10B9-CABIN HEATER 2 CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (K232) CABIN HEATER RELAY 2 CONTROL CIRCUIT FOR SHORT TO VOLTAGE**

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Remove the Cabin Heater Relay 2.

Turn the ignition on.

With a volt meter, measure the voltage on the (K232) Cabin Heater Relay 2 Control circuit.

Does the volt meter read 1.0 volt or above?

Yes

Repair short to voltage on the (K232) Cabin Heater Relay 2 Control circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **TOTALLY INTEGRATED POWER MODULE**

Turn the ignition on.

With the scan tool, erase DTCs.

With the scan tool, actuate the Cabin Heater 2 Relay.

Monitor the scan tool for at least two minutes.

With the scan tool, read DTCs.

Does the scan tool display active: B10B9-CABIN HEATER 2 CONTROL CIRCUIT HIGH?

Yes

Replace the Totally Integrated Power Module (TIPM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Cabin Heater Relay 2 in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1610-AMBIENT LIGHT SENSOR INPUT CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Ambient Light Sensor input is out of range toward the low voltage threshold.

Possible Causes

Possible Causes
(L24) AUTO HEADLAMPS SIGNAL CIRCUIT SHORTED TO GROUND SUNLOAD SENSOR A/C HEATER CONTROL

Diagnostic Test

1. VERIFY THE DTC IS ACTIVE

Turn the ignition switch on.

With a scan tool, read and record DTCs.

With the scan tool, clear DTCs.

Turn the ignition switch off, and then on.

Using the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK FOR ACTIVE DTC WITH SUNLOAD SENSOR HARNESS CONNECTOR DISCONNECTED**

Turn the ignition off.

Disconnect the Sunload Sensor harness connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Sunload Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK (L24) AUTO HEADLAMPS SIGNAL CIRCUIT FOR A SHORT TO GROUND**

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Measure the resistance of the (L24) Auto Headlamps Signal circuit between ground and the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L24) Auto Headlamps Signal circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1610-AMBIENT LIGHT SENSOR INPUT CIRCUIT PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

If the Ambient Light Sensor input is out of range.

Possible Causes

Possible Causes
(L24) AUTO HEADLAMPS SIGNAL CIRCUIT OPEN
(L24) AUTO HEADLAMPS SIGNAL CIRCUIT SHORTED TO GROUND
(C121) SENSOR GROUND OPEN
SUNLOAD SENSOR
A/C HEATER CONTROL

Diagnostic Test

1. **ACTIVE DTC(S) PRESENT**

Turn the ignition on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (L24) AUTO HEADLAMPS SIGNAL CIRCUIT FOR AN OPEN

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Disconnect the Sunload Sensor harness connector.

Measure the resistance of the (L24) Auto Headlamps Signal circuit between the Sunload Sensor harness connector and the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L24) Auto Headlamps Signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (L24) AUTO HEADLAMPS SIGNAL CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (L24) Auto Headlamps Signal circuit in the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Go To 4.

No

Repair the (L24) Auto Headlamps Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK (C121) SENSOR GROUND CIRCUIT FOR AN OPEN**

Measure the resistance of the (C121) Sensor Ground circuit between the Sunload Sensor harness connector and the A/C Heater Control C1 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (C121) Sensor Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **CHECK THE SUNLOAD SENSOR**

Reconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Using the scan tool, observe the Auto Headlamp signal while connecting a jumper wire between the (L24) Auto Headlamps Signal circuit and the (C121) Sensor Ground circuit in the Sunload Sensor harness connector.

Does the Auto Headlamp signal change from approximately 5 volts to 0 volts?

Yes

Replace the Sunload Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1611-AMBIENT LIGHT SENSOR INPUT CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the Ambient Light Sensor input is out of range toward the high voltage threshold.

Possible Causes

Possible Causes
(L24) AUTO HEADLAMPS SIGNAL CIRCUIT SHORTED TO VOLTAGE SUNLOAD SENSOR A/C HEATER CONTROL

Diagnostic Test

1. **CHECK FOR ACTIVE DTC WITH THE SUNLOAD SENSOR HARNESS CONNECTOR DISCONNECTED**

Turn the ignition off.

Disconnect the Sunload Sensor harness connector.

Turn the ignition on.

With the scan tool, erase HVAC DTCs.

Turn the ignition off, wait 10 seconds, and turn the ignition on.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

Replace the Sunload Sensor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (L24) AUTO HEADLAMPS SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE**

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Measure the voltage of the (L24) Auto Headlamps Signal circuit between ground and the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (L24) Auto Headlamps Signal circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

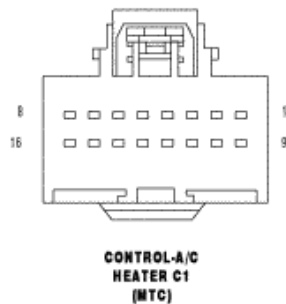
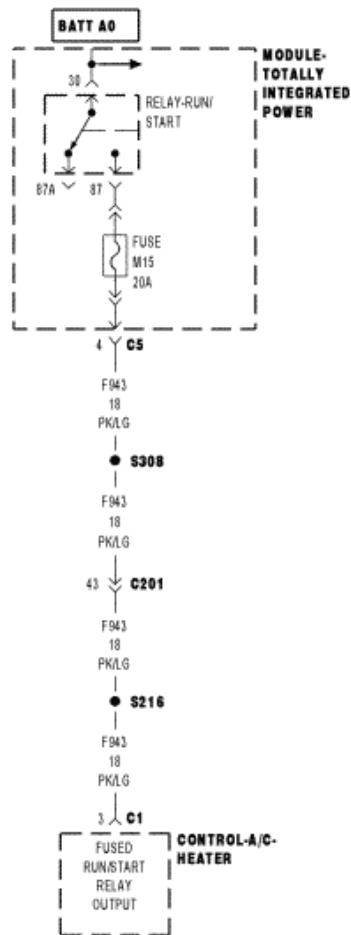
No

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B210A-SYSTEM VOLTAGE LOW

Circuit Schematic



0100200

Fig. 56: Fused Run-Start Relay Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition switch on.

Set Conditions

- **Set Condition:**

The A/C Heater Control has detected the system voltage is low.

Possible Causes

Possible Causes
(F943) FUSED RUN-START RELAY OUTPUT CIRCUIT OPEN A/C HEATER CONTROL

Diagnostic Test

1. **VERIFY THE DTC IS ACTIVE**

NOTE: **Diagnose any related Powertrain DTCs before continuing.**

Turn the ignition switch on.

With a scan tool, read and record DTCs.

With the scan tool, clear DTCs.

Turn the ignition switch off, and then on.

Using the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (F943) FUSED RUN-START RELAY OUTPUT CIRCUIT OPEN

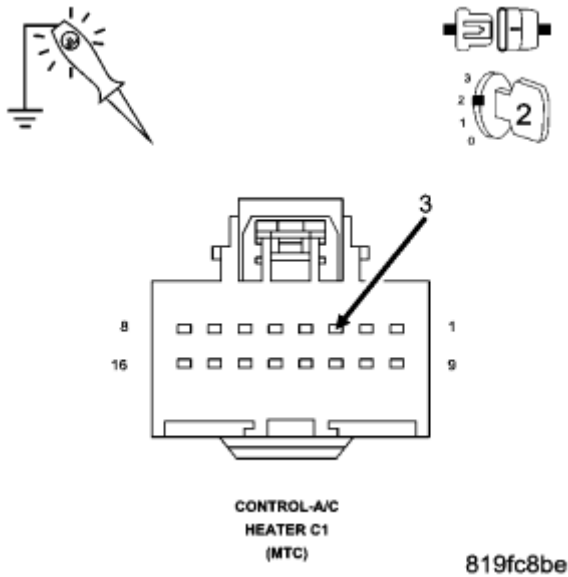


Fig. 57: Using 12 Volt Test Light Connected To Ground To Probe (F943) Fused Run-Start Relay Output Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

NOTE: Check the related fuses to the Fused Ignition Switch Output (Run-Start) circuit. If the fuse is found to be open repair the circuit for a shorted condition.

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Turn the ignition on.

Using a 12 volt test light connected to ground, probe the (F943) Fused Run-Start Relay Output circuit in the A/C Heater Control C1 harness connector.

Does the test light illuminate brightly?

Yes

Go to 3.

No

Repair the (F943) Fused Run-Start Relay Output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

3. CHECK THE A/C HEATER CONTROL

NOTE: A dirty (partial) ground can cause abnormal conditions within a system. Make sure the module has a good ground before continuing.

Turn the ignition off.

Reconnect the A/C Heater Control C1 harness connector.

While back probing, measure the voltage of the (F943) Fused Run-Start Relay Output circuit in the A/C Heater Control C1 harness connector.

Start the engine.

Using the scan tool, view battery voltage under Data Display in the Engine category.

Compare the voltage on the scan tool to the voltage reading on the voltmeter.

Is the voltage on the scan tool equal to the voltmeter reading within +/- 0.5 volt?

Yes

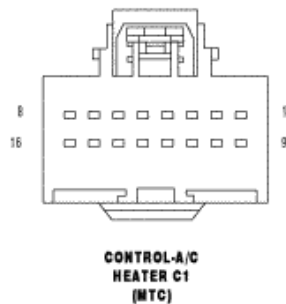
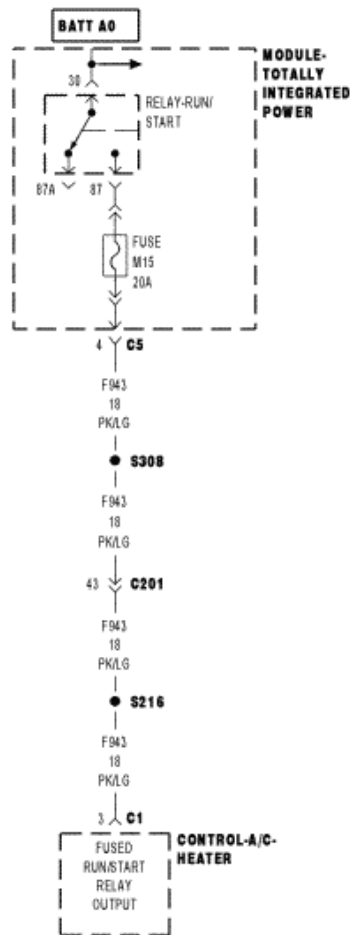
Replace the A/C Heater Control in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the circuit(s) that indicated the incorrect voltage.
Perform **SKREEM/SKIM VERIFICATION TEST** .

B210B-SYSTEM VOLTAGE HIGH

Circuit Schematic



0100200

Fig. 58: Fused Run-Start Relay Output Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition switch on.

Set Conditions

- Set Condition:

The A/C Heater Control has detected the system voltage is high.

Possible Causes

Possible Causes
(F943) FUSED RUN-START RELAY OUTPUT CIRCUIT SHORTED TO VOLTAGE A/C HEATER CONTROL

Diagnostic Test

1. ACTIVE DTC(S) PRESENT

Turn the ignition on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (F943) FUSED RUN-START RELAY OUTPUT CIRCUIT FOR A SHORT TO BATTERY VOLTAGE

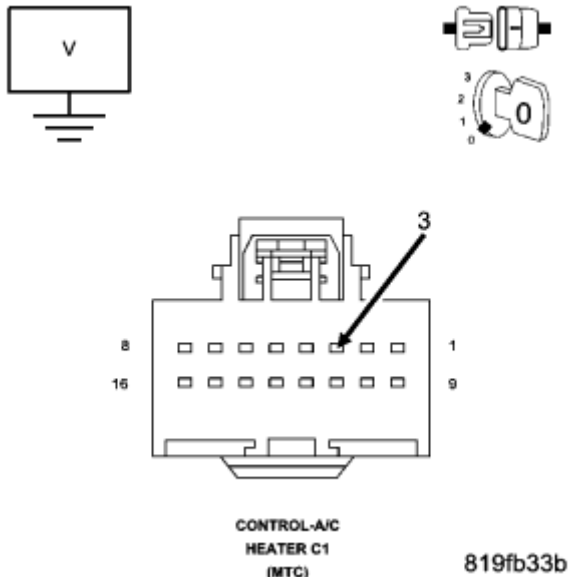


Fig. 59: Using Volt Meter Measure Voltage On (F943) Fused Run-Start Relay Output Circuit In A/C Heater Control C1 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the A/C Heater Control C1 harness connector.

Using a volt meter measure the voltage on the (F943) Fused Run-Start Relay Output circuit in the A/C Heater Control C1 harness connector.

Is there any voltage present?

Yes

Repair the (F943) Fused Run-Start Relay Output circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2214-(HVAC) CLIMATE CONTROL INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control has an internal fault. This DTC has a maturing time of 5 seconds and a de-maturing time of 10 seconds. If the DTC's status changes from active to stored it will stay in memory for 100 ignition cycles.

Possible Causes

Possible Causes
A/C HEATER CONTROL

Diagnostic Test

1. ACTIVE DTC(S) PRESENT

Turn the ignition on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

B222A-VEHICLE LINE MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The A/C Heater Control will receive and monitor the vehicle line message from the PCM and record the vehicle line if different from the last vehicle line.

Possible Causes

Possible Causes
PCM A/C HEATER CONTROL

Diagnostic Test

1. ACTIVE DTC(S) PRESENT

Turn the ignition on.

With the scan tool, check for DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK VEHICLE LINE IN PCM

With the scan tool compare the vehicle line that is programmed into the PCM to the vehicle line of the vehicle.

Does the vehicle line programmed into the PCM match the vehicle?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the A/C Heater Control in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace and program the Powertrain Control Module in accordance with the service information. Ensure the PCM is replaced with the correct vehicle line PCM.

Perform **POWERTRAIN VERIFICATION TEST** .

U0010-CAN INTERIOR BUS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

• **Set Condition:**

If the CAN Interior Bus (+) or CAN Interior Bus (-) circuit is open, shorted to voltage, or shorted to ground.

Possible Causes

Possible Causes
ACTIVE CAN BUS DTC IN THE TOTALLY INTEGRATED POWER CONTROL MODULE (D265) CAN C INTERIOR BUS (125K) (+) CIRCUIT OPEN (D264) CAN C INTERIOR BUS (125K) (-) CIRCUIT OPEN A/C HEATER CONTROL

Diagnostic Test

1. **VERIFY THE DTC IS ACTIVE**

Turn the ignition on.

With the scan tool, read HVAC DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK FOR ACTIVE CAN BUS RELATED DTCS IN THE TOTALLY INTEGRATE POWER MODULE (TIPM)

With the scan tool, read the Totally Integrated Power Module (TIPM) DTCs

Does the scan tool display any active CAN BUS related DTCs?

Yes

Diagnose and repair the DTC(s).

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK (D265) CAN INTERIOR BUS (+) CIRCUIT FOR AN OPEN

Turn the ignition off.

Disconnect the negative battery cable.

Disconnect the A/C Heater Control C1 harness connector.

Disconnect the Totally Integrated Power Module (TIPM) C7 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) circuit between the Totally Integrated Power Module (TIPM) C7 harness connector and the A/C Heater Control C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

No

Repair the (D265) CAN Interior Bus (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (D264) CAN INTERIOR BUS (-) CIRCUIT FOR AN OPEN

Measure the resistance of the (D264) CAN Interior Bus (-) circuit between the Totally Integrated Power Module (TIPM) C7 connector and the A/C Heater Control C1 harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 5.

No

Repair the (D264) CAN Interior Bus (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. CHECK (D265) CAN C INTERIOR BUS (+) CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (D265) CAN C Interior Bus (125K) (+) circuit in the A/C Heater Control C1 harness connector.

Is the resistance above 1000.0 ohms?

Yes

Go To 6.

No

Repair the (D265) CAN C Interior Bus (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

6. CHECK (D264) CAN C INTERIOR BUS (-) CIRCUIT FOR A SHORT TO GROUND

Measure the resistance between ground and the (D264) CAN C Interior Bus (125K) (-) circuit in the A/C Heater Control C1 harness connector.

Is the resistance above 1000.0 ohms?

Yes

Go To 7.

No

Repair the (D264) CAN C Interior Bus (-) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

7. **CHECK (D265) CAN C INTERIOR BUS (+) CIRCUIT FOR A SHORT TO VOLTAGE**

Turn the ignition on.

Measure the voltage of the (D265) CAN C Interior Bus (125K) (+) circuit in the A/C Heater Control C1 harness connector.

Is the voltage below 0.2 volts?

Yes

Go To 8.

No

Repair the (D265) CAN C Interior Bus (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

8. **CHECK (D264) CAN C INTERIOR BUS (-) CIRCUIT FOR A SHORT TO VOLTAGE**

Measure the voltage of the (D264) CAN C Interior Bus (125K) (-) circuit in the A/C Heater Control C1 harness connector.

Is the voltage below 0.2 volts?

Yes

Replace the A/C Heater Control in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D264) CAN C Interior Bus (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMM W/INTEGRATED POWER MODULE/FRONT CONTROL MODULE/TIPM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Totally Integrated Power Module (TIPM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER (ORC)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Occupant Restraint Controller (ORC).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Occupant Classification Module (OCM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Cluster (CCN).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0159-LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Parktronics (PTS).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0167-LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Intrusion Transceiver Control Module (ITM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0168-LOST COM WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Vehicle Security Control Module (SKREEM/WCM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0169-LOST COMMUNICATION WITH SUNROOF CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Sunroof Control Module (SCM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0181-LOST COMMUNICATION WITH HEADLAMP LEVELING TRANSLATOR

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Headlamp Leveling Translator.

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Radio.

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Amplifier (AMP).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0187-LOST COMMUNICATION WITH DVD PLAYER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the DVD Player.

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0196-LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Vehicle Entertainment System (VES).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0197-LOST COMMUNICATION WITH HANDS FREE PHONE MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Hands Free Phone Module (HFM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0200-LOST COMMUNICATION WITH PASSENGER DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Passenger Door Module (PDM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0201-LOST COMMUNICATION WITH LEFT REAR DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Left Rear Door Module (LRDM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0202-LOST COMMUNICATION WITH RIGHT REAR DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Right Rear Door Module (LRDM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0203-LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Left Front Door Module (LRDM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0203-LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Right Front Door Module (LRDM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0209-LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

If the A/C Heater Control loses communication with the Memory Seat Module (MSM).

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

***HVAC SYSTEM TEST**

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

1. HVAC SYSTEM TEST

NOTE: The HVAC System Test consists of four tests. Test 2 tests A/C system performance, Test 3 tests for mode switch, door actuator circuit, and auxiliary coolant pump circuit faults, Test 4 tests for shorted door actuator circuits, and Test 5 tests for door actuator calibration faults. Either perform all four tests for a complete system test or perform an individual test if diagnosing a specific symptom.

NOTE: Active DTCs must be resolved before diagnosing stored DTCs.

Start the engine.

With the scan tool, erase HVAC DTCs.

Choose a diagnostic test to perform

Complete HVAC System Test

Go To step 2.

A/C System Performance Test

Go To step 2.

Mode Switch, Door Actuator Ckt, & Auxiliary Coolant Pump Ckt Test

Go To step 3.

Actuator DTC Detection Test

Go To step 4.

Actuator Calibration Test

Go To step 5.

2. A/C SYSTEM PERFORMANCE TEST

NOTE: The work area ambient temperature must be above 15.6°C (60°F) and the evaporator temperature must be above 18.3°C (65°F) in order to test A/C system performance.

NOTE: Before actuating the Cool down Test, verify that the mode setting is not in a defrost position and that the A/C compressor is not running. If the

compressor is running, turn the A/C off and allow the evaporator to warm up before proceeding with the test.

NOTE: Running the Cool down test will cause the A/C status indicator to flash.

NOTE: One or more status messages will display on the scan tool after running the Cool down Test. These messages will clear after paging back out of this test function. Therefore, it is important to note all messages before doing so.

Set the mode to the Panel position.

Verify that the front blower motor operates correctly in all speeds. Diagnose and repair all blower related faults before proceeding with this test.

Set the front blower speed to high.

With the scan tool in HVAC, select System Tests and then select Cool down test. Allow the test to run to completion.

Does the scan tool display a status message that indicates a fault has occurred?

Yes, Conditions Too Cold - Test Not Run

If running, turn the A/C compressor off. Verify that the work area ambient temperature is above 15.6°C (60°F). If not, move the vehicle to a warmer work area. Verify that the evaporator temperature is above 18.3°C (65°F). If not, set the front blower to high speed and allow the blower to run for five minutes. Then, rerun the Cool down Test.

Yes, Blowers Not On High - Test Not Run

Set the front blower speed to high speed and then rerun the Cool down Test.

Yes, No Results Stored/Test Not Complete

Verify that power is not interrupted while rerunning the Cool down Test.

No

Perform **BODY VERIFICATION TEST - VER 1**.

3. **MODE SWITCH, DOOR ACTUATOR CIRCUIT, & AUXILIARY COOLANT PUMP CIRCUIT TEST**

NOTE: If at anytime a DTC becomes active during this test, proceed to the conclusion question.

NOTE: **If multiple DTCs become active, diagnose those that relate to a short circuit first.**

Set the front blower speed to low.

Set the Blend control to full cold.

Set the Mode control to Bi-Level/Recirc.

If equipped, set the Rear Fan switch on the Rear A/C Heater Control to off.

If equipped, set the Rear Blend switch on the Rear A/C Heater Control to full cold.

Monitor the scan tool for active HVAC DTCs while performing the following test steps.

Press the A/C mode switch on, wait 30 seconds, press it off, and then proceed to the next step.

Press the Rear Defrost mode switch on, wait 30 seconds, press it off, and then proceed to the next step.

Press and hold the Rear Washer mode switch for several seconds, release it, and then proceed to the next step.

Set the Blend control to full hot, wait 30 seconds and then set it to full cold.

Turn the Mode control to every door position. Leave it in each position for 30 seconds.

If equipped, set the Rear Blower control to Rear Control.

If equipped, set the Rear Fan switch on the Rear A/C Heater Control to high speed.

If equipped, slowly turn the Rear Blend switch on the Rear A/C Heater Control to full hot, wait 30 seconds and then turn it back to full cold.

If equipped, turn the Rear Fan switch on the Rear A/C Heater Control to off.

If equipped with rear HVAC, with the scan tool, select the following: Actuators, Auxiliary Coolant Pump, Start, and Constant On. Allow the pump to run for approximately one minute.

Does the scan tool display any active DTCs?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of HVAC related symptoms.

No

As necessary, either Go To step 4 or step 5, or perform BODY VERIFICATION TEST - VER 1. Refer to **STANDARD PROCEDURE** (ELECTRICAL DIAGNOSTICS). Refer to **STANDARD PROCEDURE** (SERVICE INFORMATION).

4. ACTUATOR DTC DETECTION TEST

With the scan tool, select System Tests and then select Actuator DTC Detection. When the test is complete, select View DTCs.

Does the scan tool display any DTCs?

Yes

Diagnose and repair the DTC(s). If multiple DTCs are present, beginning with the common circuits, diagnose and repair all short high DTCs and then all short low DTCs. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

Perform **BODY VERIFICATION TEST - VER 1** .

5. ACTUATOR CALIBRATION TEST

With the scan tool, select System Tests and then select Actuator Calibration Test. When the test is complete, select View DTCs.

Does the scan tool display any DTCs?

Yes

Diagnose and repair the DTC(s). Refer to **DIAGNOSTIC CODE INDEX** for a complete list of all HVAC related symptoms.

No

No problem found.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 HVAC

Heating & Air Conditioning - Service Information - Liberty

DESCRIPTION

HEATER AND AIR CONDITIONER SYSTEM

A manual temperature control (MTC) single zone type heating-A/C system or an automatic temperature controlled (ATC) single zone type heating-A/C system is available on this model.

To maintain the performance level of the heating, ventilation and air conditioning (HVAC) system, the engine cooling system must be properly maintained. The use of a bug screen is not recommended. Any obstructions in front of the radiator or A/C condenser will reduce the performance of the A/C and engine cooling systems.

The engine cooling system includes the radiator, thermostat, radiator hoses and the engine coolant pump. Refer to **COOLING** article for more information before opening or attempting any service to the engine cooling system.

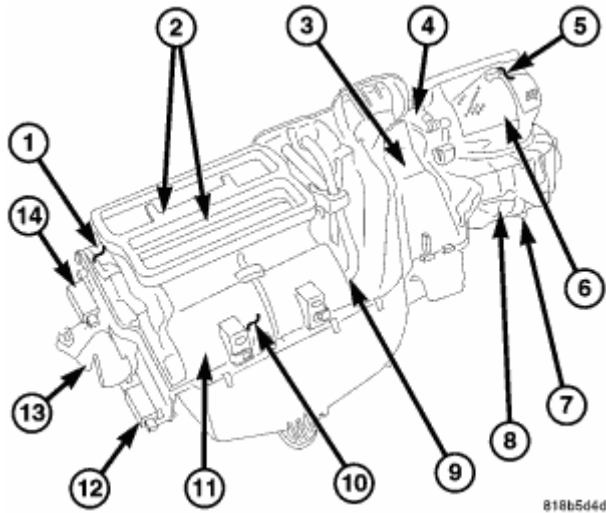


Fig. 1: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

All vehicles are equipped with a common heater, ventilation and air conditioning (HVAC) housing assembly (1). The heating-A/C system combines A/C, heating, and ventilating capabilities in a single HVAC housing assembly mounted within the passenger compartment behind the instrument panel. The HVAC housing assembly includes:

- Mode-air doors (2)
- A/C evaporator (3)
- Recirculation door actuator (4)

Air inlet housing (5)
Recirculation-air door (6)
Blower motor (7)
Blower motor resistor (8)
Heater core (9)
Air distribution housing (10)
Blend-air door (11)
Blend door actuator (12)
Floor distribution ducts (13)
Mode door actuator (14)

NOTE: An electric positive temperature coefficient (PTC) heater is used on vehicles when equipped with the 2.8L diesel engine. The PTC heater unit compensates for the lower engine coolant temperatures produced by the diesel engine. The PTC heater unit is mounted in the HVAC air distribution housing, downstream of the heater core. See DESCRIPTION.

Based upon the mode selected, conditioned air can exit the HVAC housing through one or a combination of the three main housing outlets: defrost, panel or floor. The defrost and panel outlets are located on the top of the housing and the floor outlets are located on each side of the housing. Once the conditioned air exits the HVAC housing, it is further directed through molded plastic ducts to the outlets within the vehicle interior. These outlets and their locations are as follows:

Defroster Outlet - Dual defroster outlets are located in the center of the instrument panel top cover, near the base of the windshield.

Side Window Demister Outlets - There are two side window demister outlets, one is located at each outboard end of the instrument panel and are integral to the instrument panel air outlets.

Panel Outlets - There are four panel outlets in the instrument panel, one located near each outboard end of the instrument panel facing the rear of the vehicle and two located near the top of the instrument panel center bezel.

Front Floor Outlets - There are two front floor outlets, one located above each side of the center of the floor panel near the dash panel.

Rear Floor Outlets - There are two rear floor outlets, one located on each side of the floor console near the rear of each front seat.

OPERATION

HEATER AND AIR CONDITIONER SYSTEM

Both the manual temperature control (MTC) and the automatic temperature controlled (ATC) heating-A/C systems are blend-air type systems. In a blend-air system, a blend-air door controls the amount of conditioned air that is allowed to flow through, or around the heater core. This design allows almost immediate control of output air temperature.

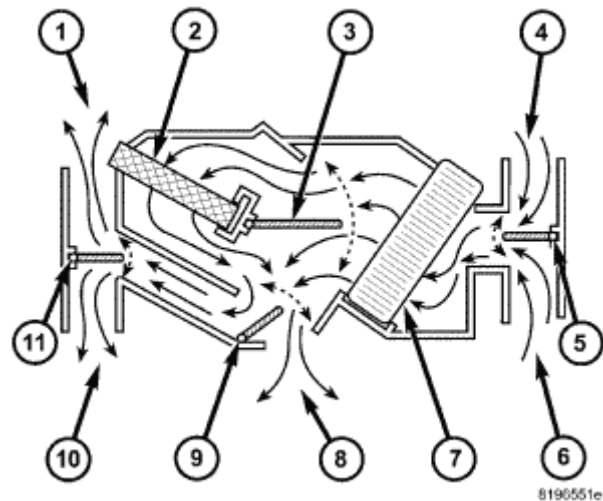


Fig. 2: Blend Air System Schematic
Courtesy of CHRYSLER LLC

NOTE: **Typical blend-air type HVAC system shown in graphic.**

The heating-A/C system pulls outside (ambient) air through the fresh air intake (4) located at the cowl panel at the base of the windshield and into the air inlet housing above the heating, ventilation and air conditioning (HVAC) housing and passes through the A/C evaporator (7). Air flow is then directed either through or around the heater core (2). This is done by adjusting the position of the blend-air door (3) with the temperature control located on the A/C-heater control in the instrument panel. Air flow is then directed out the floor outlet (8), instrument panel outlet (10) or the defroster outlet (1) in various combinations by adjusting the position of the mode-air doors (9 and 11) using the mode control located on the A/C-heater control. The temperature and mode control uses electrical actuators to operate the air doors.

The velocity of the air flow out of the outlets can be adjusted with the blower speed control located on the A/C-heater control.

The fresh air intake can be shut off by pressing the Recirculation button on the A/C-heater control. This will operate the electrically actuated recirculation-air door (5), which closes off the fresh air intake. With the fresh air intake closed, the conditioned air within the vehicle is pulled back into the HVAC housing through the recirculation air intake (6).

The A/C compressor can be engaged by pressing the A/C (snowflake) button on the A/C-heater control when the mode control is set in any floor to instrument panel position. The A/C compressor will automatically engage when the mode control is set in any Mix to Defrost position. This is done to help reduce fogging of the front windows by removing humidity from the conditioned air prior to it coming into contact with the windows.

The defroster outlet receives airflow from the HVAC housing through the molded plastic defroster duct. The airflow from the defroster outlet is directed by fixed vanes in the defroster outlet grille and cannot be adjusted.

The side window demister outlets receive airflow from the HVAC housing through the defroster duct and molded plastic demister ducts which are integral to the instrument panel. The airflow from the side window demister outlets is directed by fixed vanes in the demister outlet grilles and cannot be adjusted. The demisters

direct air from the HVAC housing through the outlets located on the top corners of the instrument panel. The demisters operate when the mode control is positioned in the floor-defrost and defrost-only settings. Some air may be noticeable from the demister outlets when the mode control is in the bi-level to floor positions.

The panel outlets receive airflow from the HVAC housing through the center panel duct and the two molded plastic panel ducts, which are integral to the instrument panel. The two end ducts direct airflow to the left and right instrument panel outlets, while the center panel duct directs airflow to the two center panel outlets. Each of these outlets can be individually adjusted to direct the flow of air.

The floor outlets receive airflow from the HVAC housing through the floor distribution ducts. The front floor outlets are integral to the molded plastic floor ducts, which are secured to the sides of the HVAC housing. The floor outlets cannot be adjusted.

NOTE: It is important to keep the air intake opening clear of debris. Leaf particles and other debris that is small enough to pass through the cowl opening screen can accumulate within the HVAC housing. The closed, warm, damp and dark environment created within the housing is ideal for the growth of certain molds, mildews and other fungi. Any accumulation of decaying plant matter provides an additional food source for fungal spores, which enter the housing with the fresh intake-air. Excess debris, as well as objectionable odors created by decaying plant matter and growing fungi can be discharged into the passenger compartment during heater-A/C operation if the air intake opening is not kept clear of debris.

This A/C system uses an A/C expansion valve to meter the flow of refrigerant to the A/C evaporator. The A/C evaporator cools and dehumidifies the incoming air prior to blending it with the heated air. To maintain minimum evaporator temperatures and prevent evaporator freezing, an evaporator temperature sensor is used. The sensor is located downstream of the evaporator and supplies an evaporator temperature signal to the A/C-heater control.

DIAGNOSIS AND TESTING

A/C PERFORMANCE

The A/C system is designed to provide the passenger compartment with low temperature and low humidity air. The A/C evaporator, located in the HVAC housing is cooled to temperatures near the freezing point. As warm damp air passes over the fins of the A/C evaporator, the air transfers its heat to the refrigerant in the evaporator coils and the moisture in the air condenses on the evaporator fins. During periods of high heat and humidity, an A/C system will be more effective in the Recirculation mode (max-A/C). With the system in the Recirculation mode, only air from the passenger compartment passes through the A/C evaporator. As the passenger compartment air dehumidifies, the A/C system performance levels rise.

Humidity has an important bearing on the temperature of the air delivered to the interior of the vehicle. It is important to understand the effect that humidity has on the performance of the A/C system. When humidity is high, the A/C evaporator has to perform a double duty. It must lower the air temperature, and it must lower the temperature of the moisture in the air that condenses on the evaporator fins. Condensing the moisture in the air transfers heat energy into the evaporator fins and coils. This reduces the amount of heat the A/C evaporator can

absorb from the air. High humidity greatly reduces the ability of the A/C evaporator to lower the temperature of the air.

However, evaporator capacity used to reduce the amount of moisture in the air is not wasted. Wringing some of the moisture out of the air entering the vehicle adds to the comfort of the passengers. Although, an owner may expect too much from their A/C system on humid days. A performance test is the best way to determine whether the system is performing up to design standards. This test also provides valuable clues as to the possible cause of trouble with the A/C system. The ambient air temperature in the location where the vehicle will be tested must be a minimum of 21° C (70° F) for this test.

A/C PERFORMANCE TEST

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible serious or fatal injury.

CAUTION: The use of an A/C recycling/charging station for purposes of determining the actual charge level of an A/C system is not recommend. Service recycling/charging stations do not reflect the correct amount of refrigerant charge in the A/C system after a single "reclaim" cycle. Tests have shown that it takes up to 3 or 4 "reclaim" cycles to remove all of the refrigerant charge. Use only the following procedure for determining the proper charge level.

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

1. Check for diagnostic trouble codes using a scan tool. If no DTCs are found in the powertrain control module (PCM) or engine control module (ECM), depending on engine application, go to step 2.
2. Connect a tachometer and a manifold gauge set or an A/C recycling/charging station.
3. Operate the heating-A/C system under the following conditions.
 - Engine at 1,000 rpm at operating temperature
 - Door or windows open
 - Transmission in Park or Neutral with parking brake set (depending on transmission application)
 - A/C-heater controls set to Recirculation mode (max-A/C), full cool, panel mode, high blower and with A/C compressor engaged. If the A/C compressor does not engage, see the A/C SYSTEM DIAGNOSIS chart.
4. Insert a thermometer in the driver side center panel air outlet and operate the vehicle a minimum of ten minutes to allow the thermometer temperature to stabilize.
5. With the A/C compressor clutch engaged, compare the air temperature at the center panel outlet and the A/C compressor discharge pressure (high side) to the A/C PERFORMANCE TEMPERATURE AND PRESSURE chart. The compressor clutch may cycle, depending upon the ambient temperature and humidity. If the clutch cycles, use the readings obtained before the clutch disengaged.

A/C PERFORMANCE TEMPERATURE AND PRESSURE

Ambient Air Temperature	21° C (70° F)	27° C (80° F)	32° C (90° F)	38° C (100° F)	43° C (110° F)
Air Temperature at Center Panel Outlet	7° C (45° F)	7° C (45° F)	13° C (55° F)	13° C (55° F)	18° C (64° F)
Compressor Inlet Pressure at Service Port (Low Side)	138 to 207 kPa (20 to 30 psi)	172 to 241 kPa (25 to 35 psi)	207 to 276 kPa (30 to 40 psi)	241 to 310 kPa (35 to 45 psi)	276 to 345 kPa (40 to 50 psi)
Condenser Outlet Pressure at Service Port (High Side)	1034 to 1724 kPa (150 to 250 psi)	1379 to 2068 kPa (200 to 300 psi)	1724 to 2413 kPa (250 to 350 psi)	1999 to 2689 kPa (290 to 390 psi)	2413 to 2965 kPa (350 to 430 psi)

6. If the air outlet temperature fails to meet the specifications in the A/C Performance Temperature and Pressure chart, or if the A/C compressor discharge pressure is high, refer to the A/C SYSTEM DIAGNOSIS chart.

A/C SYSTEM DIAGNOSIS

Condition	Possible Causes	Correction
Rapid A/C clutch cycling (ten or more cycles per minute).	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
Equal pressures, but the A/C clutch does not engage.	1. No refrigerant in the refrigerant system.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
	2. Open fuse.	2. Check the fuses in the power distribution center and the junction block. Repair the shorted circuit or component and replace the fuses as required.
	3. Inoperative A/C clutch field coil.	3. See A/C Compressor Clutch in this service information. Test the A/C clutch field coil and replace as required.
	4. Inoperative A/C clutch relay.	4. See A/C Clutch Relay in this service information. Test the A/C clutch relay and relay circuits. Repair the circuits or replace the relay as required.
	5. Improperly installed or inoperative A/C pressure transducer.	5. See A/C Pressure Transducer in this service information. Test the A/C pressure transducer and tighten or replace as required.

-	6. Inoperative evaporator temperature sensor.	6. See Evaporator Temperature Sensor in this service information. Test the evaporator temperature sensor and replace as required.
-	7. Inoperative powertrain control module (PCM) or engine control module (ECM), depending on engine application.	7. Refer to the proper Diagnostic article for testing of the PCM or ECM. Test the PCM or ECM and replace as required.
Normal pressures, but A/C Performance Test air temperatures at center panel outlet are too high.	1. Excessive refrigerant oil in system.	1. See Refrigerant Oil Level in this service information. Recover the refrigerant from the refrigerant system and inspect the refrigerant oil content. Restore the refrigerant oil to the proper level as required.
-	2. Blend door actuator improperly installed or inoperative.	2. See Blend Door Actuator in this service information. Inspect the actuator for proper operation and replace as required.
-	3. Blend-air door inoperative or sealing improperly.	3. See HVAC Housing in this service information. Inspect the blend-air door for proper operation and sealing and correct as required.
The low side pressure is normal or slightly low, and the high side pressure is too low.	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
-	2. Refrigerant flow through the A/C accumulator is restricted.	2. See A/C Accumulator in this service information. Replace the restricted accumulator as required.
-	3. Refrigerant flow through the A/C evaporator is restricted.	3. See A/C Evaporator in this service information. Replace the restricted A/C evaporator as required.
-	4. Inoperative A/C compressor.	4. See A/C Compressor in this service information. Replace the A/C compressor as required.
The low side pressure is normal or slightly high, and the high side pressure is too high.	1. A/C Condenser air flow restricted.	1. Check the A/C condenser for damaged fins, foreign objects obstructing air flow through the condenser fins, and missing or improperly installed air seals. Clean, repair, or replace components as required.
-	2. Inoperative radiator cooling fan.	2. Test the radiator cooling fan and replace as required.
-	3. Refrigerant system overcharged.	3. See Refrigerant System Charge Level in this service information. Recover the refrigerant from the refrigerant system. Charge the refrigerant system to the proper level as required.
-	4. Air in the refrigerant	4. See Refrigerant System Leaks in this

-	system.	service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
	5. Engine overheating.	5. Test the engine cooling system and repair, if required.
The low side pressure is too high, and the high side pressure is too low. - - -	1. Accessory drive belt slipping.	1. Inspect the accessory drive belt condition and tension. Replace the accessory drive belt and/or tensioner as required.
	2. Inoperative A/C expansion valve.	2. See A/C Expansion Valve in this service information. Test the expansion valve and replace as required.
	3. Inoperative A/C compressor.	3. See A/C Compressor in this service information. Replace the A/C compressor as required.
The low side pressure is too low, and the high side pressure is too high. - -	1. Restricted refrigerant flow through the refrigerant lines.	1. See Liquid Line, Suction Line and A/C Discharge Line in this service information. Inspect the refrigerant lines for kinks, tight bends or improper routing. Correct the routing or replace the refrigerant line as required.
	2. Restricted refrigerant flow through the A/C expansion valve.	2. See A/C Expansion Valve in this service information. Test the expansion valve and replace as required.
	3. Restricted refrigerant flow through the A/C condenser.	3. See A/C Condenser in this service information. Replace the restricted condenser as required.

HEATER PERFORMANCE

Before performing the following tests, refer to **COOLING** article for the procedures to check the engine coolant level and flow, engine coolant reserve/recovery system operation, accessory drive belt condition and tension, radiator air flow and the fan drive operation.

WARNING: Do not remove radiator cap when engine is hot, personal injury can result.

If vehicle has been run recently, wait 15 minutes before removing the radiator cap. Place a rag over the cap and turn it to the first safety stop. Allow pressure to escape through the overflow tube. When the system pressure stabilizes, remove the cap completely.

MAXIMUM HEATER OUTPUT

Engine coolant is delivered to the heater core through two heater hoses. With the engine idling at normal operating temperature, set the temperature control to the full hot position, the mode control to the floor position, and the blower motor control to the highest speed position. Using a test thermometer, check the temperature of the air being discharged at the front floor outlets. Compare the test thermometer reading to the HEATER TEMPERATURE REFERENCE chart.

HEATER TEMPERATURE REFERENCE

Ambient Air Temperature	16° C (60° F)	21° C (70° F)	26° C (80° F)	32° C (90° F)
Minimum Air Temperature at Floor Outlet	52° C (125° F)	56° C (133° F)	59° C (139° F)	62° C (144° F)

If the heater outlet air temperature is below the minimum specification, refer to **COOLING** article . Both of the heater hoses should be hot to the touch. The coolant return heater hose should be slightly cooler than the coolant supply heater hose. If the return hose is much cooler than the supply hose, locate and repair the engine coolant flow obstruction in the cooling system (refer to **COOLING** article for more information).

OBSTRUCTED COOLANT FLOW

Possible locations or causes of obstructed coolant flow are as follows:

- Inoperative water pump.
- Inoperative thermostat.
- Pinched or kinked heater hoses.
- Improper heater hose routing.
- Plugged heater hoses or supply and return ports at the cooling system connections.
- Plugged heater core.

If proper coolant flow through the cooling system is verified, and heater outlet air temperature is low, a mechanical problem may exist.

MECHANICAL PROBLEMS

Possible causes of insufficient heat due to mechanical problems are as follows:

- Obstructed cowl air intake.
- Obstructed heater system outlets.
- Inoperative engine thermostat.
- Inoperative blower motor system.
- Inoperative A/C-heater control.
- Inoperative blend door actuator.
- Inoperative, obstructed or improperly installed blend-air door.

TEMPERATURE CONTROL

If the heater outlet air temperature cannot be adjusted with the temperature control on the A/C-heater control, the following could require service:

- Inoperative A/C-heater control.
- Inoperative blend door actuator.

Inoperative, obstructed or improperly installed blend-air door.

Inoperative related wiring harness or connectors.

Improper engine coolant temperature.

SPECIFICATIONS

A/C SYSTEM

Item	Description	Notes
A/C Compressor	Zexel DKS-17DS (2.8L/4.0L engines)	VC-46 PAG oil
	Visteon HS-18 (3.7L engine)	VC-46 PAG oil
Freeze-up Control	Evaporator temperature sensor	Input to A/C-heater control. HVAC housing mounted.
Pressure Control	A/C pressure transducer	Input to PCM/ECM. A/C liquid line mounted. Cycles clutch off if refrigerant pressure falls below 206 kPa (30 psi) or rises above 2971 kPa (431 psi)
R-134a Refrigerant Charge Capacity	0.510 kg (1.12 lbs.)	Also see A/C Underhood Specification Label located in the engine compartment.
A/C Clutch Coil Draw	3.3 amps @ 12V $\pm$ 0.5V @ 25° C (77° F)	2.8L and 4.0L engines. A/C clutch field coil resistance when measured across coil lead connector is 4.02 ± 0.2 ohms @ 25° C (77° F).
	3.1 - 4 amps @ 12V $\pm$ 0.5V @ 21° C (70° F)	3.7L engine.
A/C Clutch Air Gap	0.30 - 0.60 mm (0.012 - 0.024 in.)	2.8L and 4.0L engines.
	0.35 - 0.65 mm (0.014 - 0.025 in.)	3.7L engine.

FASTENER TORQUE SPECIFICATIONS

Description	N.m	Ft. Lbs.	In. Lbs.
All Screws NOT Listed Below	1.2	-	10
A/C Compressor Bolts and Nut (2.8L and 4.0L Engines)	28	21	-
A/C Compressor Rear Bolts (3.7L Engine)	55	-	41
A/C Compressor Front Inboard Bolt (3.7L	40	-	30

Engine)			
A/C Compressor Front Outboard Bolt (3.7L Engine)	55	-	41
A/C Compressor Bracket to Front Cover Bolt (3.7L Engine)	40	-	30
A/C Compressor Field Coil Connector Bracket Screw (3.7L Engine)	4.3	-	38
A/C Compressor Clutch Hub Bolt (2.8L and 4.0L Engines)	15	-	133
A/C Compressor Clutch Hub Bolt (3.7L Engine)	20	-	177
A/C Condenser to Radiator Bolt	5	-	44
A/C Expansion Valve to Evaporator Tube Tapping Block Bolts	11	-	97
Discharge Line to A/C Condenser Nut	22.5	-	200
HVAC Housing to Engine Side of Dash Panel Nut	4.5	-	40
HVAC Housing to Passenger Side of Dash Panel Nuts	4.5	-	40
Suction Line Brackets to Engine Nuts (LHD 2.8L model)	4.5	-	40
Receiver/drier to A/C Condenser Bolt	22	16	-
Refrigerant Lines to A/C Expansion Valve Nut	23	17	-
Refrigerant Lines to A/C Compressor Nuts	12	-	105

SPECIAL TOOLS

HEATING-A/C SYSTEM

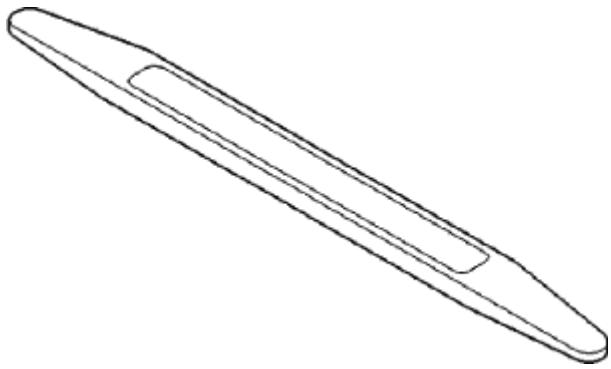


Fig. 3: Trim Stick C-4755
Courtesy of CHRYSLER LLC

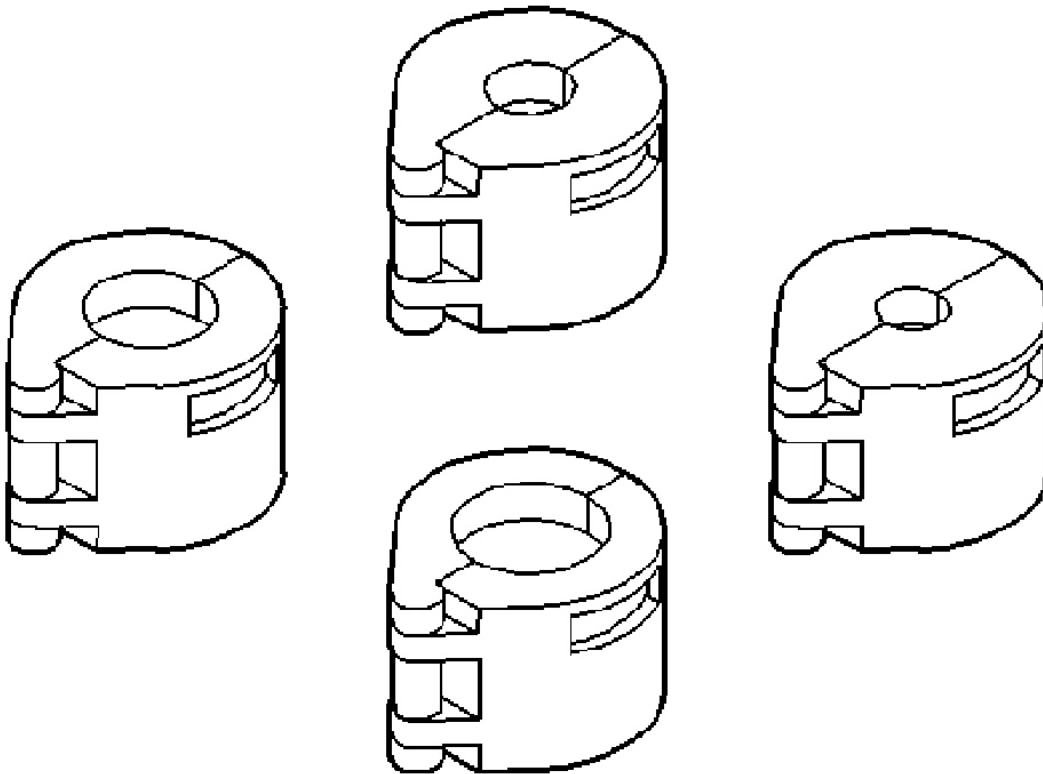


Fig. 4: A/C Line Disconnect Tools 7193
Courtesy of CHRYSLER LLC

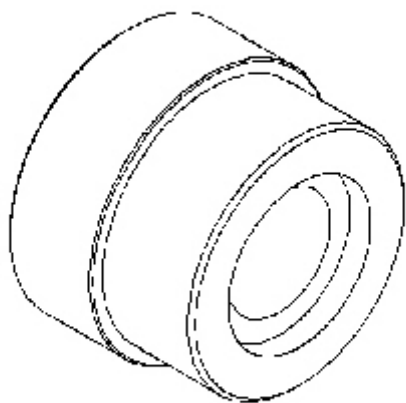


Fig. 5: Compressor Field Coil Installer 9352
Courtesy of CHRYSLER LLC

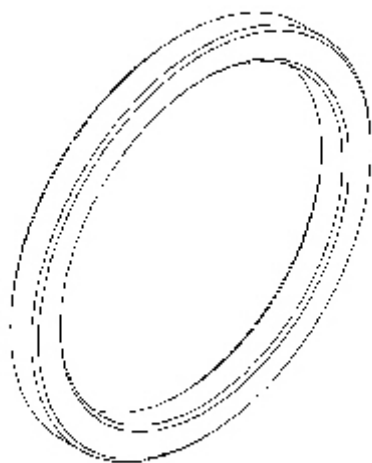


Fig. 6: Compressor Field Coil Installer Spacer 9353
Courtesy of CHRYSLER LLC

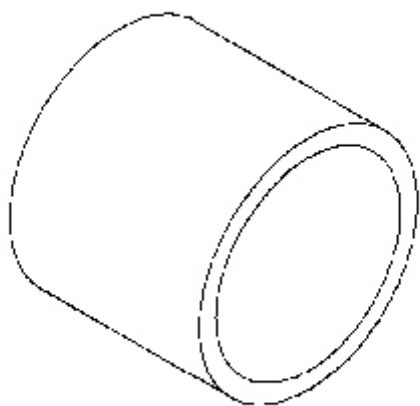


Fig. 7: Compressor Field Coil Remover 9354
Courtesy of CHRYSLER LLC

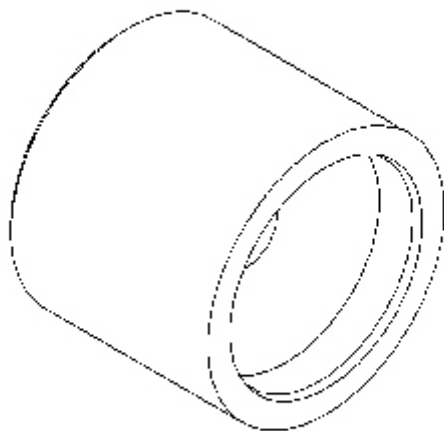


Fig. 8: Clutch Pulley Installer 9355
Courtesy of CHRYSLER LLC

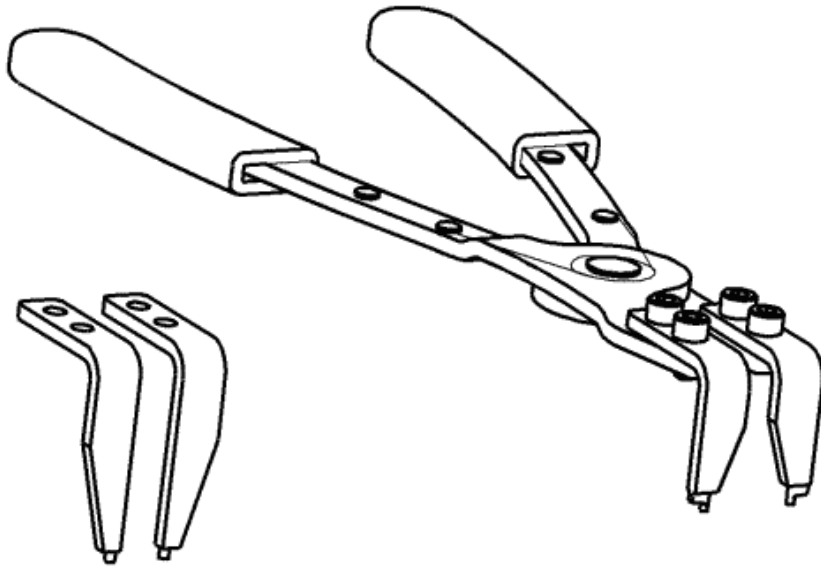


Fig. 9: Snap Ring Pliers 9764
Courtesy of CHRYSLER LLC

CONTROLS

ACTUATOR-BLEND DOOR

DESCRIPTION

ACTUATOR-BLEND DOOR

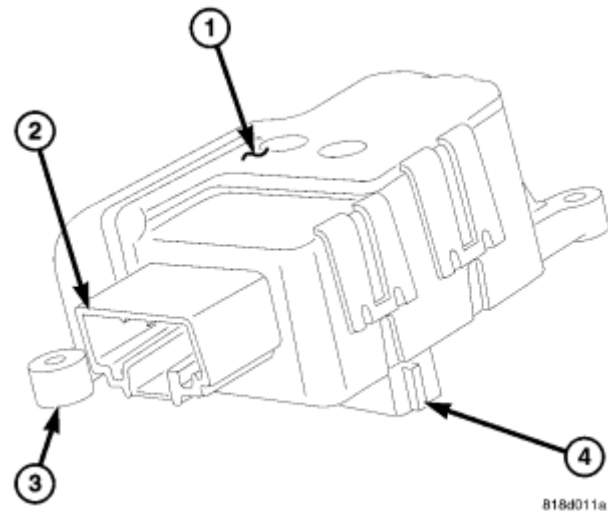


Fig. 10: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft
Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the blend-air door. The blend door actuator (1) is located on the driver side of the HVAC housing.

The blend door actuator is interchangeable with the actuators for the mode-air doors and the recirculation-air door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The blend door actuator output shaft (4) is connected to the linkage that drives the blend-air door. The blend door actuator does not require mechanical indexing to the blend-air door, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-BLEND DOOR

The blend door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The blend door actuator can move the blend-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the blend-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the blend-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the blend-air door stops and will not move.

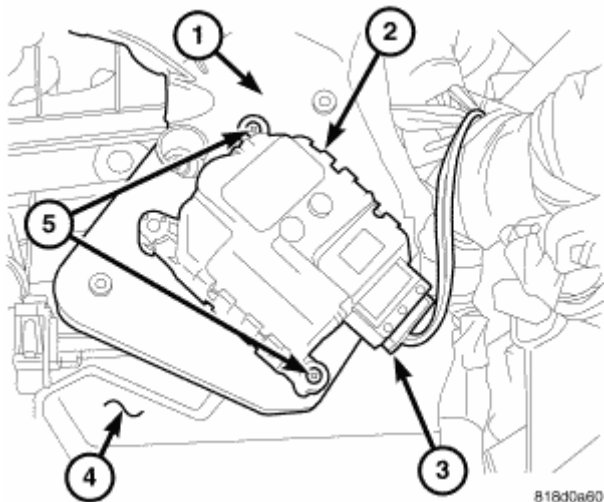
The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the blend door actuator and the blend-air door. The A/C-heater control learns the blend-air door stop positions during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the blend door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blend door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-BLEND DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.



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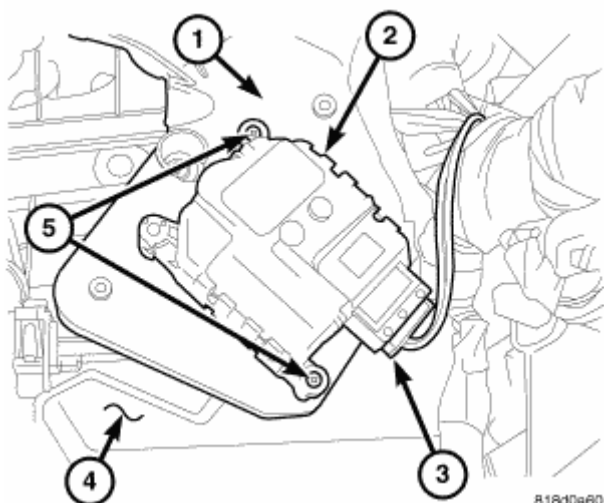
Fig. 11: Identifying Actuator Mounting Bracket, Blend Door Actuator, Wire Harness Connector, Air Distribution Housing & Screws
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL**.
3. Disconnect the wire harness connector (3) from the blend door actuator (2) located on the driver side of the air distribution housing (4).
4. Remove the two screws (5) that secure the blend door actuator to the actuator mounting bracket (1) and remove the actuator.

INSTALLATION

ACTUATOR-BLEND DOOR



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Fig. 12: Identifying Actuator Mounting Bracket, Blend Door Actuator, Wire Harness Connector, Air Distribution Housing & Screws

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blend door actuator (4) to the actuator mounting bracket (1) located on the driver side of the air distribution housing (4). Make sure the actuator output shaft is properly aligned to the door linkage. If necessary, rotate the actuator slightly to align the splines on the output shaft with those in the door linkage.
2. Install the two screws (5) that secure the blend door actuator to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
3. Connect the wire harness connector (3) to the blend door actuator.
4. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.
6. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

ACTUATOR-MODE DOOR

DESCRIPTION

ACTUATOR-MODE DOOR

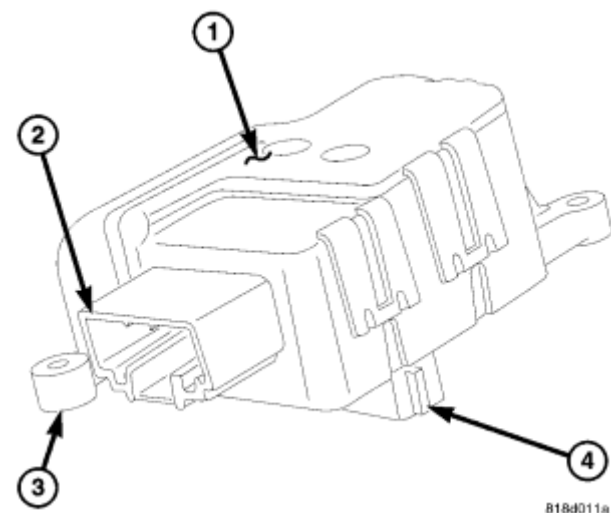


Fig. 13: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft

Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the mode-air door. The mode door actuator (1) is located on the driver side of the HVAC housing.

The mode door actuator is interchangeable with the actuators for the blend-air door and the recirculation-air

door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The mode door actuator output shaft (4) is connected to the linkage that drives the mode-air door. The mode door actuator does not require mechanical indexing to the mode-air doors, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-MODE DOOR

The mode door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The mode door actuator can move the floor, defrost/demist and the panel-air doors in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the mode-air doors will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the mode-air doors moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the mode-air doors stop and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the mode door actuator and the mode-air doors. The A/C-heater control learns the mode-air doors stop position during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the mode door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The mode door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-MODE DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

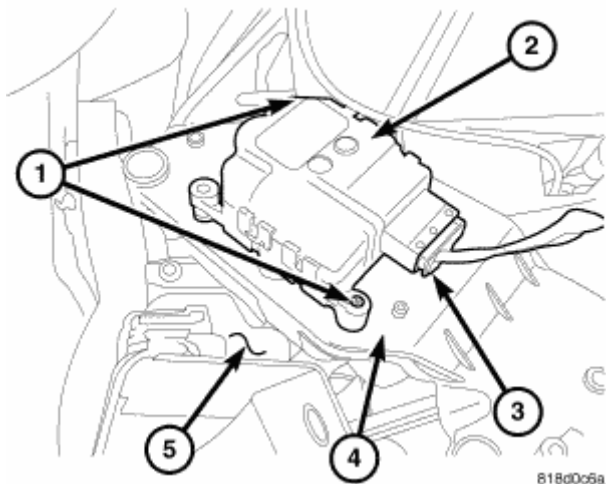


Fig. 14: Identifying Screws, Mode Door Actuator, Wire Harness Connector, Actuator Mounting Bracket & Air Distribution Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL**.
3. Disconnect the wire harness connector (3) from the mode door actuator (2) located on the driver side of the air distribution housing (5).
4. Remove the two screws (1) that secure the mode door actuator to the actuator mounting bracket (4) and remove the actuator.

INSTALLATION

ACTUATOR-MODE DOOR

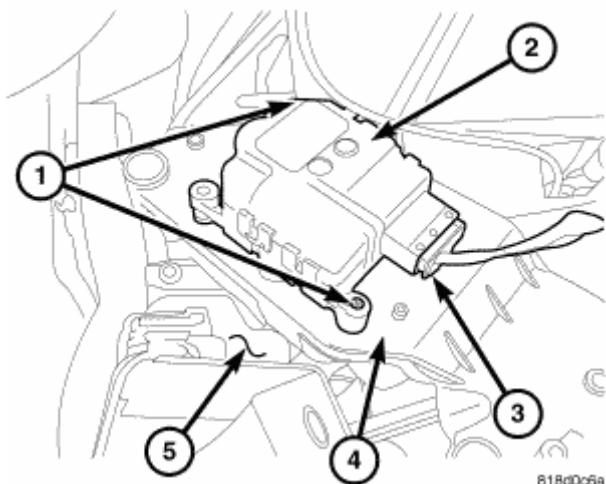


Fig. 15: Identifying Screws, Mode Door Actuator, Wire Harness Connector, Actuator Mounting Bracket & Air Distribution Housing

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the mode door actuator (2) to the actuator mounting bracket (4) located on the driver side of the air distribution housing (5). Make sure the actuator output shaft is properly aligned to the door linkage. If necessary, rotate the actuator slightly to align the splines on the output shaft with those in the mode door linkage
2. Install the two screws (1) that secure the mode door actuator to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
3. Connect the wire harness connector (3) to the mode door actuator.
4. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.
6. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

ACTUATOR-RECIRCULATION DOOR

DESCRIPTION

ACTUATOR-RECIRCULATION DOOR

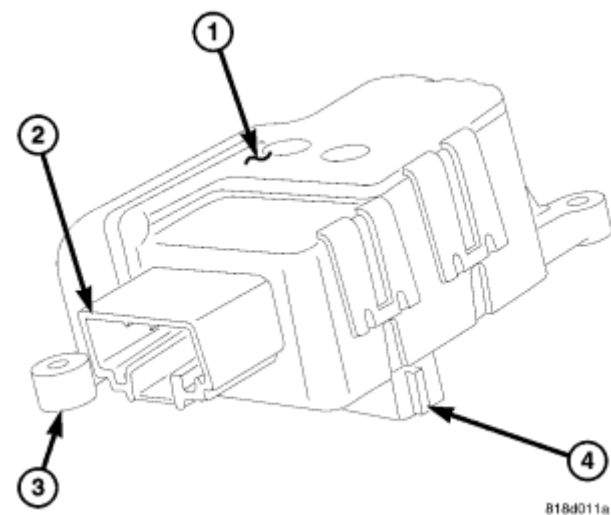


Fig. 16: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft

Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the recirculation-air door. The recirculation door actuator (1) is located on the side of the HVAC air inlet housing.

The recirculation door actuator is interchangeable with the actuators for the blend-air door and the mode-air door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The recirculation door actuator output shaft (4) is directly connected to the pivot shaft lever of the recirculation-air door. The recirculation door actuator does not require mechanical indexing to the recirculation-air door, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-RECIRCULATION DOOR

The recirculation door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The recirculation door actuator can move the recirculation-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the recirculation-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the recirculation-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the recirculation-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the recirculation door actuator and the recirculation-air door. The A/C-heater control learns the recirculation-air door stop positions during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the recirculation door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The recirculation door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-RECIRCULATION DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

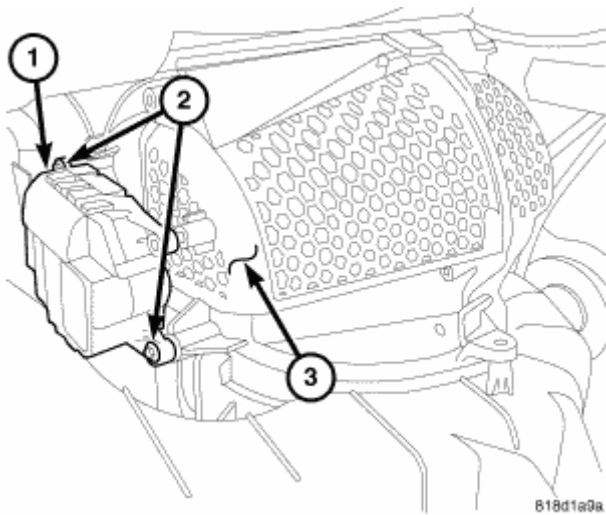


Fig. 17: Recirculation Door Actuator, Screws & Air Inlet Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. On LHD models, remove the glove box bin. Refer to **REMOVAL** .
3. On RHD models, remove the instrument panel. Refer to **REMOVAL** .
4. Remove the two screws (2) that secure the recirculation door actuator (1) to the air inlet housing (3).
5. Disconnect the wire harness connector from the recirculation door actuator and remove the actuator from the vehicle.

INSTALLATION

ACTUATOR-RECIRCULATION DOOR

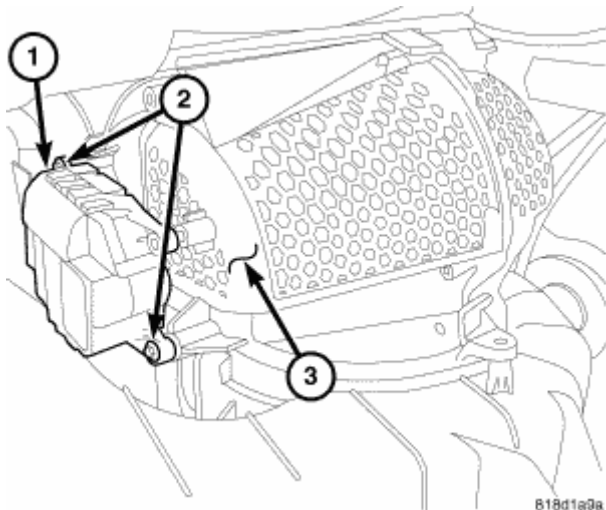


Fig. 18: Recirculation Door Actuator, Screws & Air Inlet Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Connect the wire harness connector to the recirculation door actuator (1).
2. Position the recirculation door actuator to the side of the air inlet housing (3). Make sure the actuator output shaft is properly aligned to the recirculation door pivot shaft. If necessary, rotate the actuator slightly to engage the splines on the output shaft with those in the pivot shaft.
3. Install the two screws (2) that secure the recirculation door actuator to the air inlet housing. Tighten the screws to 1.2 N.m (10 in lbs.).
4. On RHD models, install the instrument panel. Refer to **INSTALLATION** .
5. On LHD models, install the glove box bin. Refer to **INSTALLATION** .
6. Reconnect the negative battery cable.
7. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

CLUTCH-A/C COMPRESSOR

DESCRIPTION

CLUTCH-A/C COMPRESSOR

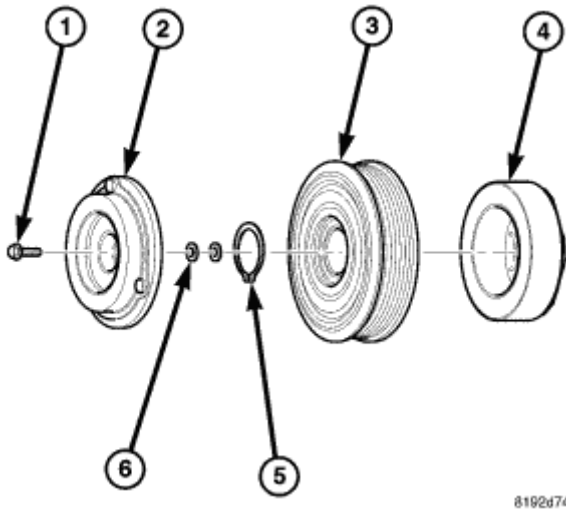
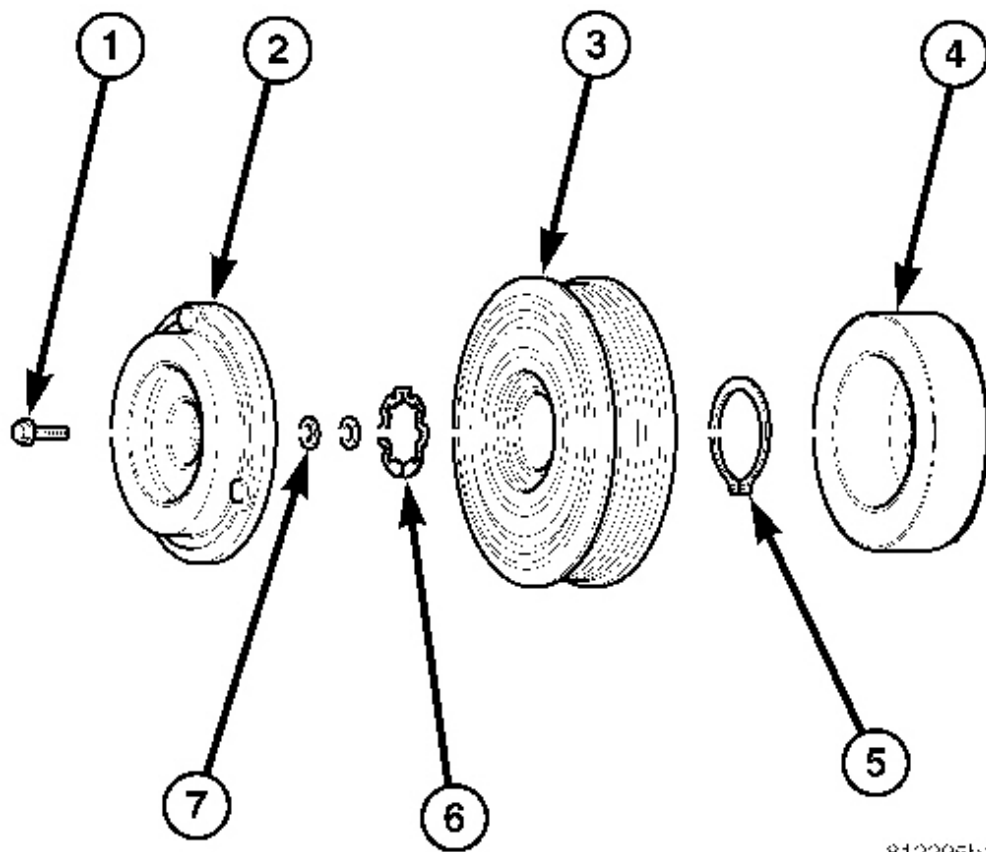


Fig. 19: Bolt, Clutch Plate, Pulley Assembly, Stationary Electromagnetic Field Coil, Snap Ring & Shims
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 2.8L and 4.0L engine use a Zexel DKS-17DS A/C compressor. The clutch assembly for this A/C compressor consists of a stationary electromagnetic field coil (4), bearing and pulley assembly (3), shims (6), and a clutch plate (2) that is splined to the compressor shaft and secured by a bolt (1). These components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt.

The A/C clutch field coil is pressed onto the front of this A/C compressor and cannot be serviced separately from the compressor. The A/C clutch bearing and pulley assembly is retained to the front of the compressor by a snap ring (5) and can be serviced separately.

CLUTCH-A/C COMPRESSOR



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Fig. 20: A/C Compressor Clutch Components
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 3.7L engine use the Visteon HS-18 A/C compressor. The clutch assembly for this A/C compressor consists of a stationary electromagnetic field coil (4), bearing and pulley assembly (3), shims (7), and a clutch plate (2) that is splined to the compressor shaft and secured by a bolt (1). These components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt.

The A/C clutch field coil is pressed onto the front of this A/C compressor and retained with a snap ring (6). The A/C clutch bearing and pulley assembly is also retained to the front of this compressor by a snap ring (5). Both the A/C clutch bearing and pulley assembly and the field coil can be serviced separately.

OPERATION

CLUTCH-A/C COMPRESSOR

The A/C compressor clutch components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt. When the electromagnetic A/C clutch field coil is energized, it magnetically draws the clutch plate into contact with the clutch pulley and drives the compressor shaft. When the coil is not energized, the pulley freewheels on the clutch hub bearing, which is part of the pulley assembly.

A/C compressor clutch engagement is controlled by the powertrain control module (PCM) or the engine control module (ECM), depending on engine application. When the A/C-heater control is set to any A/C position, it sends a request signal on the CAN-B bus to the totally integrated power module (TIPM), which then transfers the request on the CAN-C Bus to the PCM/ECM, which determines if operating conditions are correct for A/C clutch engagement. When all operating conditions have been met, the PCM/ECM sends a signal on a dedicated hard-wired circuit back to the totally integrated power module (TIPM) to energize the internal A/C clutch high side driver. When energized, the A/C clutch high side driver provides battery current to the A/C clutch field coil.

The A/C clutch control system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article or appropriate Engine ELECTRICAL DIAGNOSTICS article for more information).

The A/C compressor clutch components cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

CLUTCH-A/C COMPRESSOR

The A/C compressor clutch coil electrical circuit is controlled by the powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) through the totally integrated power module (TIPM). See **OPERATION**. Begin testing of a suspected compressor clutch coil problem by performing the preliminary checks.

PRELIMINARY CHECKS

1. Using a scan tool, check for diagnostic trouble codes (DTCs) in the A/C-heater control, TIPM and the PCM/ECM. If no DTCs are found, go to step 2. If any DTCs are found, repair as required.
2. If the A/C compressor clutch still will not engage, verify the refrigerant charge level. See **DIAGNOSIS AND TESTING**. If the refrigerant charge level is OK, go to step 3. If the refrigerant charge level is not OK, adjust the refrigerant charge as required.
3. If the A/C compressor clutch still will not engage, disconnect the wire harness connector from the A/C pressure transducer and check for battery current at the connector with the engine running and the A/C-heater control set to the A/C mode. If OK, go to **COIL CURRENT DRAW TEST**, and/or **COIL RESISTANCE TEST - 2.8L AND 4.0L ENGINES ONLY**.

COIL CURRENT DRAW TEST

1. Verify the battery state of charge. Refer to **DIAGNOSIS AND TESTING**.
2. Connect an ammeter (0 to 10 ampere scale selected) in series with the clutch field coil feed terminal.

- Connect a voltmeter (0 to 20 volt scale selected) to measure voltage across the battery and the clutch coil.
3. With the A/C-heater control in the A/C mode and the blower motor at low speed, start the engine and allow it to run at a normal idle speed.
 4. The A/C clutch should engage immediately, and the clutch field coil supply voltage should be within two volts of the battery voltage. If the field coil supply voltage is OK, go to step 5. If the field coil supply voltage is not within two volts of battery voltage, test the clutch field coil feed circuit for excessive voltage drop and repair as necessary.
 5. Refer to the following A/C CLUTCH FIELD COIL SPECIFICATIONS chart for the acceptable A/C clutch field coil current draw. If voltage is more than 12.5 volts, add electrical loads by turning on electrical accessories until voltage reads below 12.5 volts.
 - If the A/C clutch field coil current reading is zero, the coil is open and must be replaced.
 - If the A/C clutch field coil current reading is above specifications, the coil is shorted and must be replaced.

COIL RESISTANCE TEST - 2.8L AND 4.0L ENGINES ONLY

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the A/C clutch field coil connector.
3. Use an ohmmeter and measure the resistance of the clutch field coil at the field coil connector terminals.
4. Refer to the following A/C CLUTCH FIELD COIL SPECIFICATIONS chart for the acceptable A/C clutch coil resistance.
 - If the A/C clutch coil resistance reading is above specifications, the coil is shorted and must be replaced.
 - If the A/C clutch coil resistance reading is below specifications, the coil is open and must be replaced.

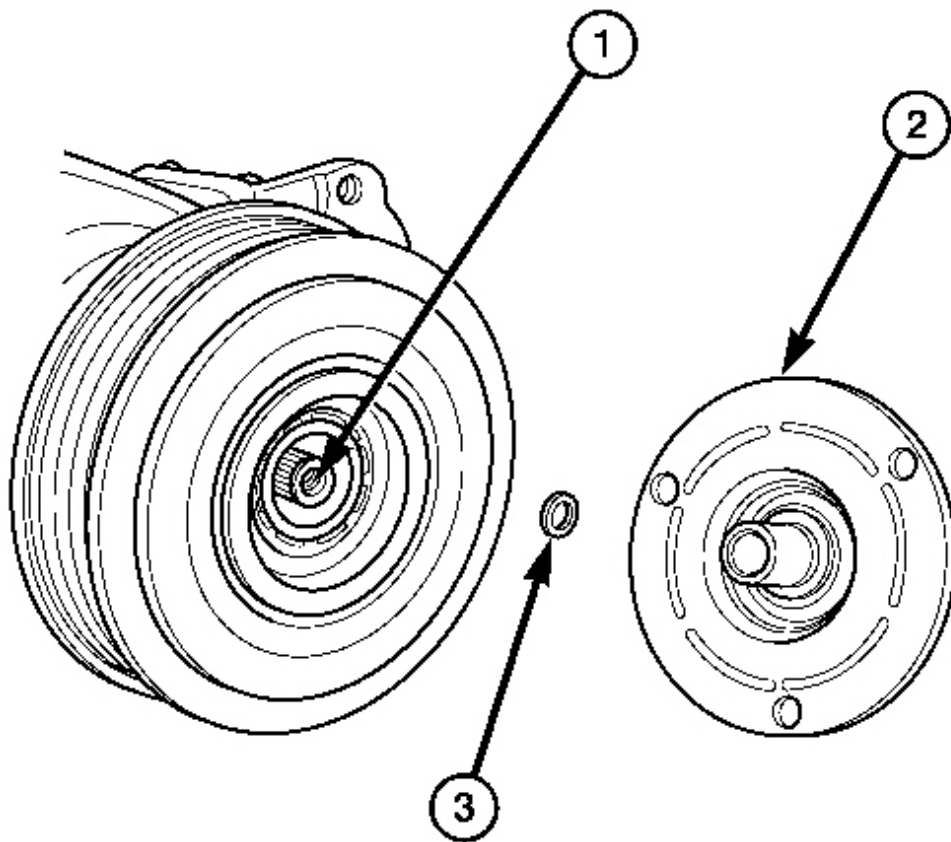
A/C CLUTCH FIELD COIL SPECIFICATIONS

A/C Compressor	Current Draw	Coil Resistance
Zexel DKS-17DS (2.8L/4.0L engines)	3.3 amps @ 12V ± 0.5V @ 25° C (77° F)	4.02 ± 0.2 ohms @ 25° C (77° F)
Visteon HS-18 (3.7L engine)	3.1 - 4 amps @ 12V ± 0.5V @ 21° C (70° F)	Not applicable

STANDARD PROCEDURE

CLUTCH-A/C COMPRESSOR

NOTE: The A/C clutch can be serviced in the vehicle. The refrigerant system can remain fully-charged during compressor clutch, pulley and bearing assembly, or coil replacement.



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Fig. 21: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

Examine the friction surfaces of the pulley and the clutch plate (2) for wear. The pulley and clutch plate should be replaced if there is excessive wear or scoring.

If the friction surfaces are oily, inspect the shaft and nose area of the A/C compressor (1) for refrigerant oil. If refrigerant oil is found, the compressor shaft seal is leaking and the A/C compressor must be replaced.

Check the pulley bearing for roughness or excessive leakage of grease. Replace the pulley and bearing assembly, if required.

CLUTCH-A/C COMPRESSOR

After a new A/C compressor clutch has been installed, cycle the compressor clutch approximately 20 times (5 seconds on, then 5 seconds off). During this procedure, set the A/C-heater controls to the A/C Recirculation Mode, the blower motor in the highest speed position, and the engine speed at 1500 to 2000 rpm. This procedure (burnishing) will seat the opposing friction surfaces and provide a higher compressor clutch torque capability.

REMOVAL

CLUTCH-A/C COMPRESSOR

NOTE: The compressor clutch assembly can be serviced with the refrigerant system fully-charged.

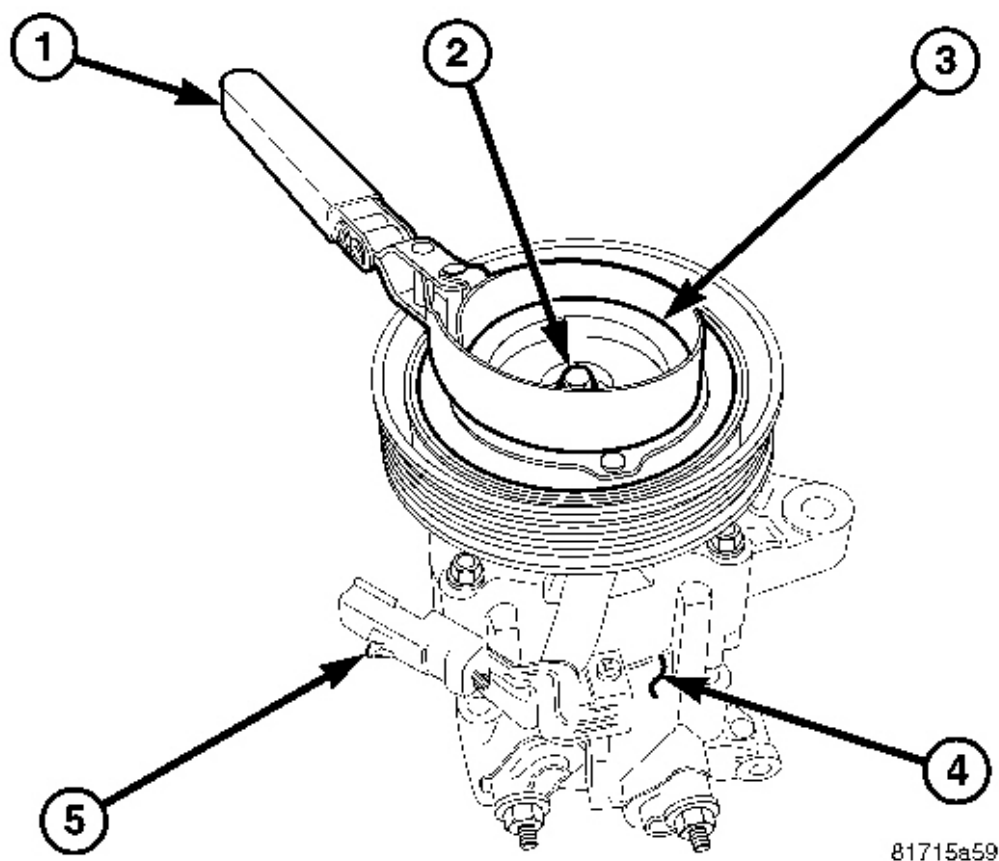


Fig. 22: Strap Wrench, Bolt, Clutch Plate, A/C Compressor & Clutch Field Coil Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate negative battery cable.
2. Remove the accessory drive belt. Refer to **REMOVAL** .
3. Disconnect the engine wire harness from the clutch field coil connector (4).
4. Remove the bolts that secure the A/C compressor (4) to the mounting bracket. See **REMOVAL**.
5. Remove the A/C compressor from the mounting bracket and support the compressor while servicing the clutch.
6. Using a strap wrench (1), remove the bolt (2) that secures the clutch plate (3) to the compressor shaft.

NOTE: The clutch plate can be removed from the compressor shaft by hand or, if required, pressed off with an 8 x 1.25 mm bolt.

NOTE: Clutch plate shim(s) may remain inside the hub of the clutch plate. Be sure to remove all of the shims from inside the hub or from the end of the compressor shaft.

7. Remove the clutch plate and shim(s) from the A/C compressor. If required, install a 8 x 1.25 mm bolt into the center of the clutch plate and turn the bolt clockwise until the clutch plate is completely removed from the A/C compressor.

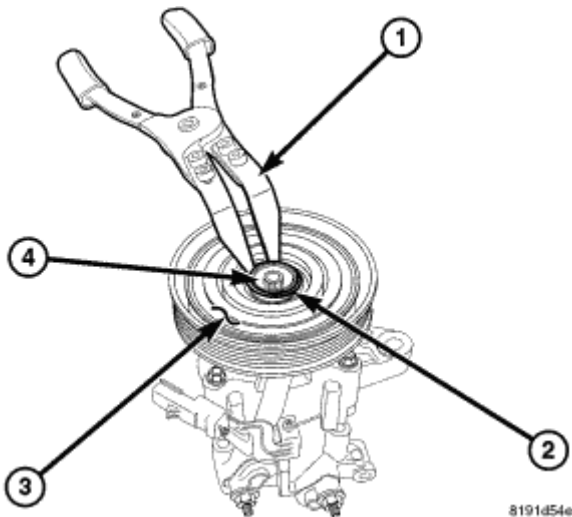
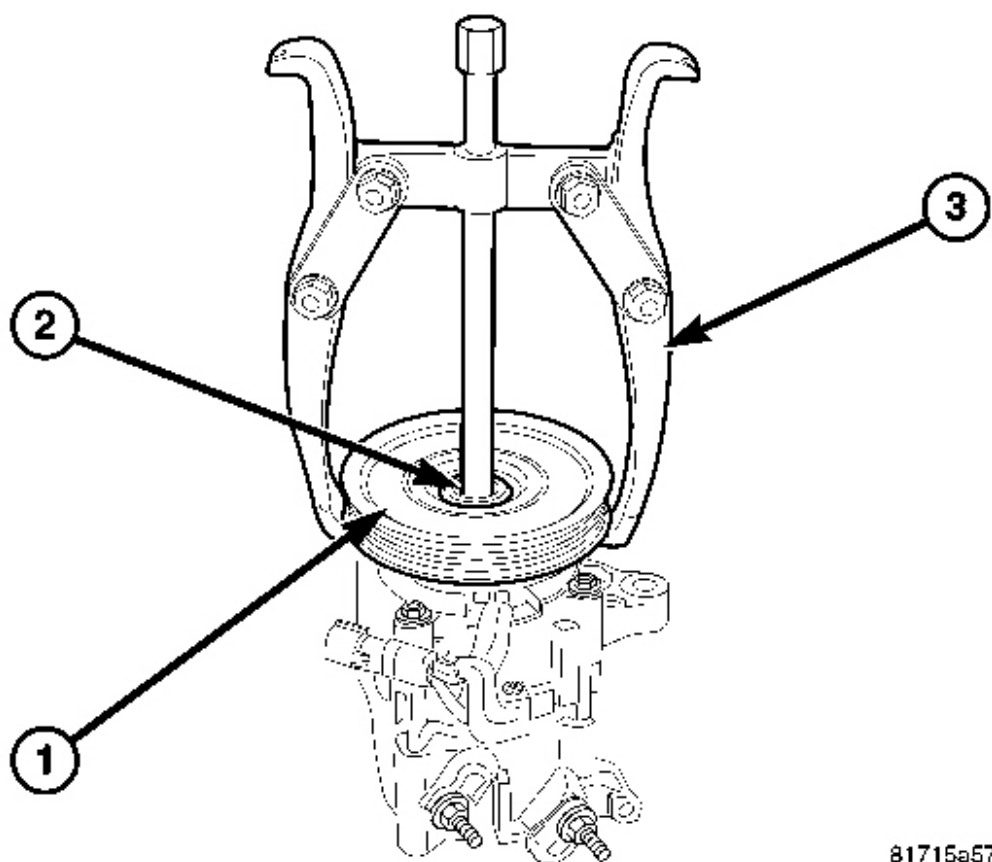


Fig. 23: Using Snap Ring Pliers To Remove/Install Snap Ring That Secures Pulley And Bearing Assembly To Front Of A/C Compressor
Courtesy of CHRYSLER LLC

8. Using snap ring pliers (Special Tool 9764 or equivalent) (1), remove the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4).

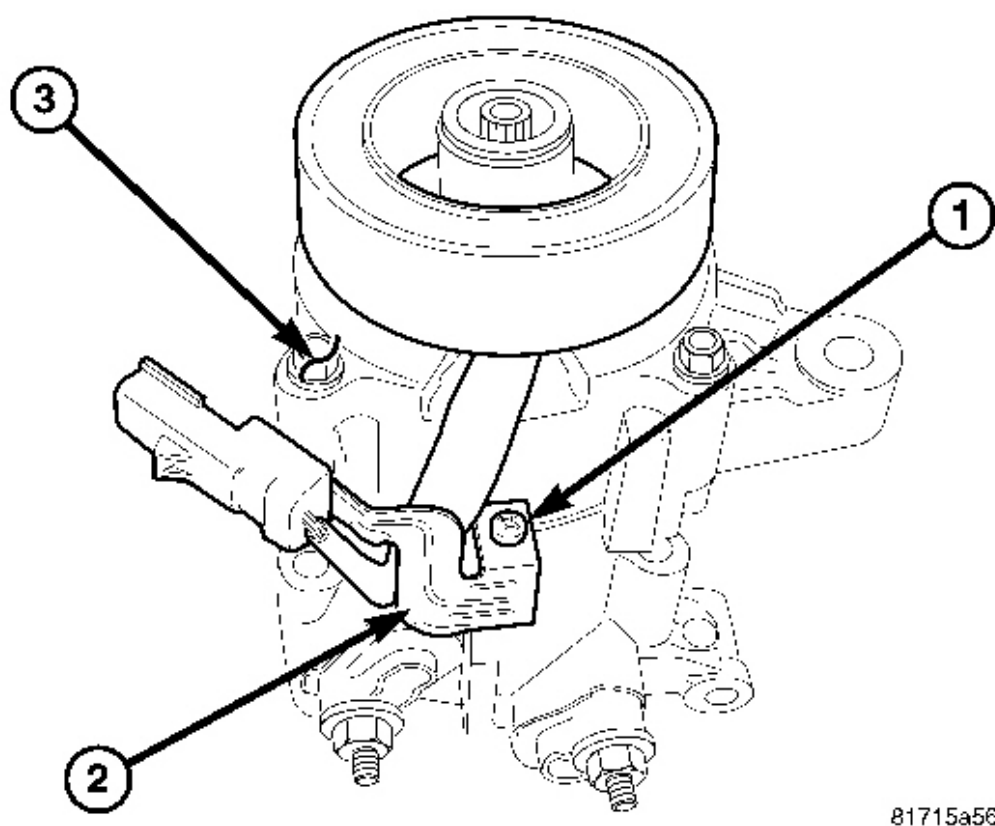


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Fig. 24: Pulley & Bearing - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

NOTE: The pulley and bearing assembly can be removed from the compressor by hand or, if required, with a two jaw puller.

9. Remove the pulley and bearing assembly (1) from the front of the A/C compressor (2). If required, install a two jaw puller (3) and turn the puller center-bolt clockwise until the pulley and bearing assembly is completely removed.



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Fig. 25: Locating Field Coil Wire Lead - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

10. Remove the screw (1) that secures the clutch field coil wire lead bracket (2) to the A/C compressor (3).

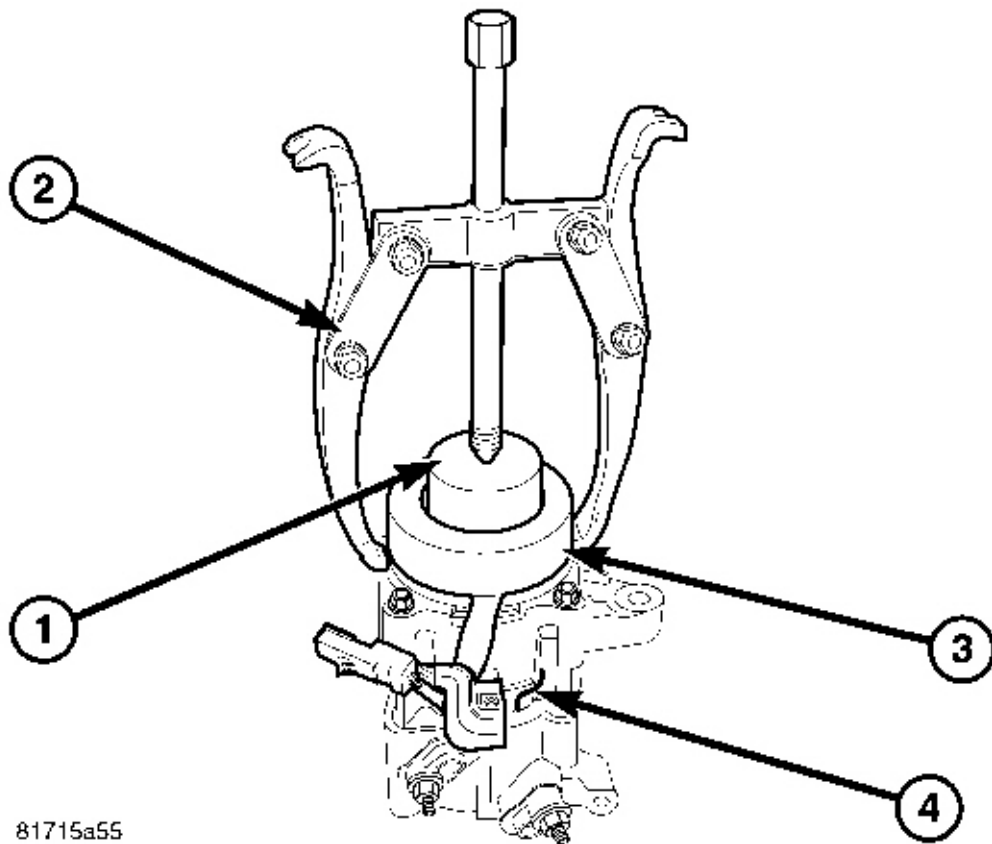


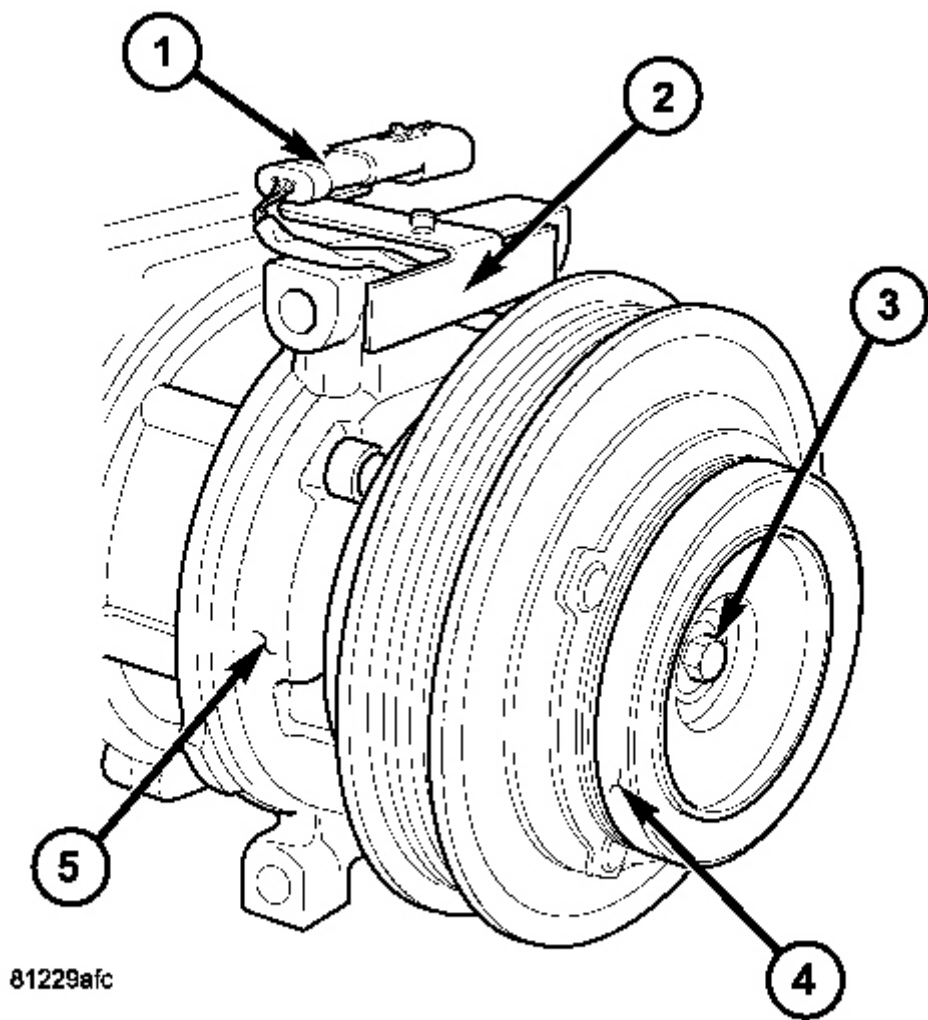
Fig. 26: Using Compressor Field Coil Remover And Two Jaw Puller To Remove Clutch Field Coil From Front Of A/C Compressor
Courtesy of CHRYSLER LLC

11. Using compressor field coil remover (Special Tool 9354 in Kit 9349) (1) and a two jaw puller (2), remove the clutch field coil (3) from the front of the A/C compressor (4).

CLUTCH-A/C COMPRESSOR

NOTE: The compressor clutch plate and pulley and bearing assembly and can be serviced with the refrigerant system fully-charged and with the A/C compressor installed on the engine.

NOTE: Typical A/C compressor and clutch assembly shown in illustrations.



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Fig. 27: Locating A/C Compressor Shaft Bolt

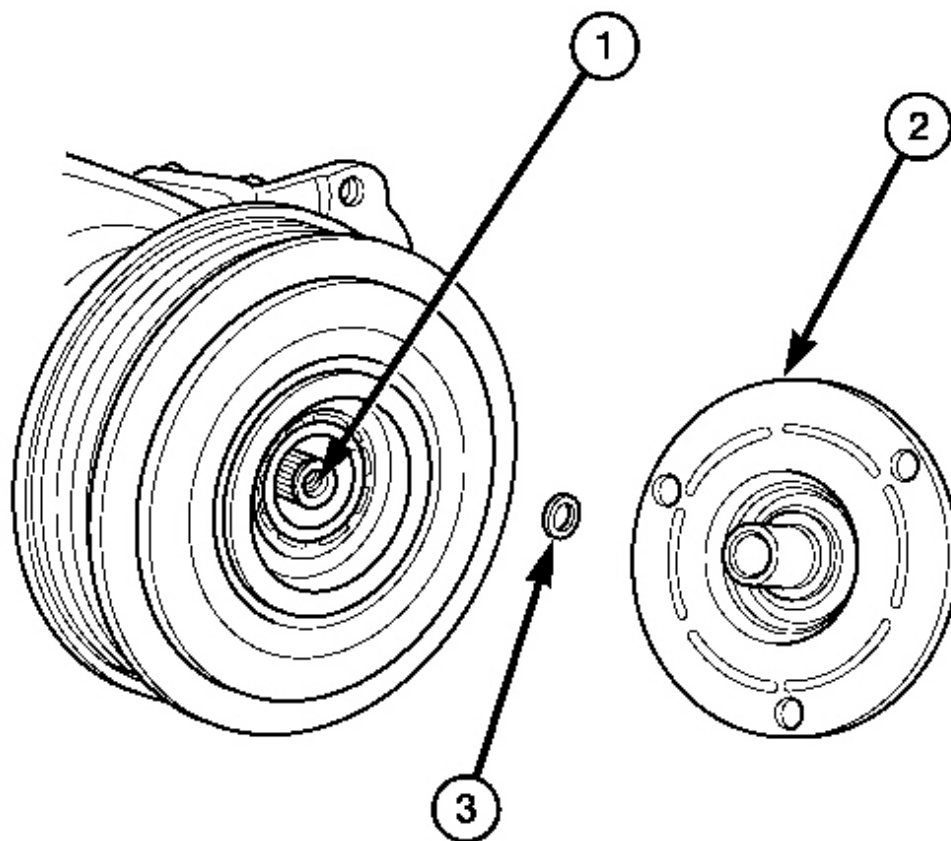
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the coolant recovery container from the front of the engine compartment. Refer to **REMOVAL** .
3. Remove the radiator fan and shroud assembly. Refer to **REMOVAL** .
4. Remove the accessory drive belt. Refer to **REMOVAL** .
5. Disconnect the engine wire harness from the compressor clutch field coil connector (1) located on the top of the A/C compressor (5).
6. Remove the screw that secures the connector bracket (2) to the A/C compressor and position the bracket

and wire lead out of the way.

NOTE: A band-type oil filter wrench or a strap wrench may be used to hold the clutch plate from turning during compressor shaft bolt removal.

7. Hold the clutch plate (4) from turning and remove the compressor shaft bolt (3).



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Fig. 28: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

CAUTION: Do not pry between the clutch plate and the pulley and bearing assembly to remove the clutch plate from the compressor shaft as

this may damage the clutch plate.

NOTE: Use care not to lose any clutch shim(s) during removal of the clutch plate, as they may be reused during the clutch plate installation process.

8. Tap the clutch plate (2) lightly with a plastic mallet to release it from the splines on the compressor shaft (1) and remove the clutch plate and shim(s) (3).

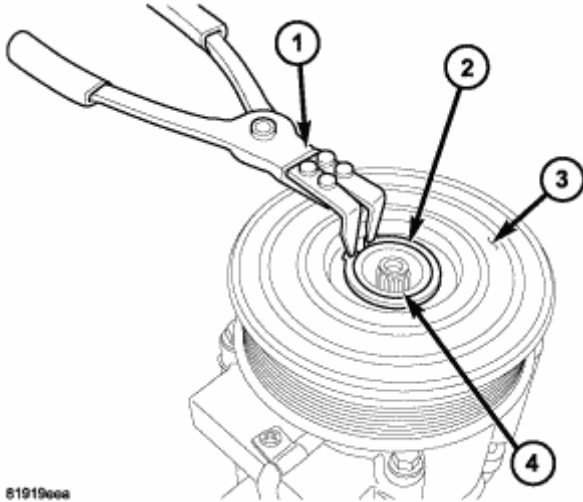


Fig. 29: PULLEY AND SNAP RING
Courtesy of CHRYSLER LLC

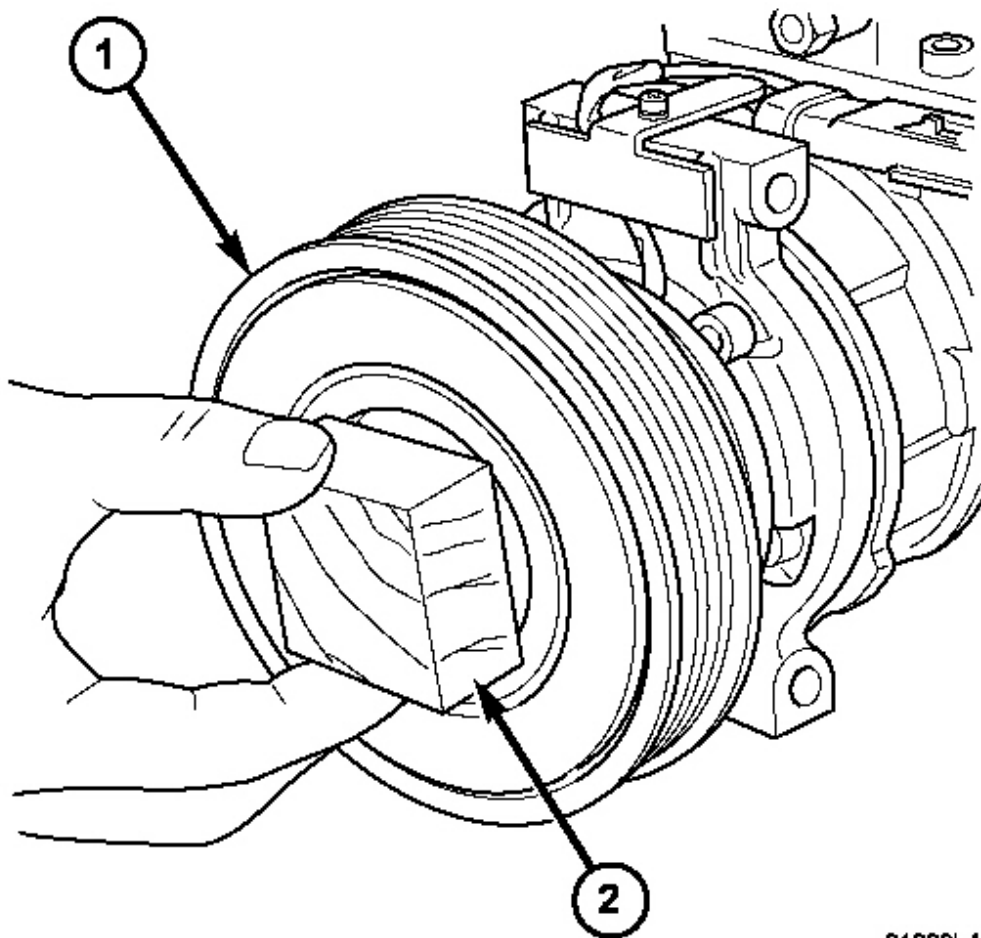
NOTE: The pulley and bearing assembly can be removed from the compressor by hand or, if required, with a two jaw puller.

9. Using Snap Ring Pliers 9764 or equivalent (1), remove the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4).
10. Remove the pulley and bearing assembly from the front of the A/C compressor. If required, install a two jaw puller and turn the puller center-bolt clockwise until the pulley and bearing assembly is completely removed.

INSTALLATION

CLUTCH-A/C COMPRESSOR

NOTE: Typical A/C compressor and clutch assembly shown in illustrations.



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Fig. 30: Installing Pulley & Bearing Assembly
Courtesy of CHRYSLER LLC

CAUTION: Be certain to position the compressor clutch field coil wire lead so that it is not damaged during A/C compressor pulley and bearing installation.

CAUTION: When installing the pulley and bearing assembly, DO NOT mar the friction surfaces of the pulley or premature failure of the clutch will result.

1. Install the pulley and bearing assembly (1) onto the front of the A/C compressor. If necessary, tap the pulley gently with a block of wood (2) placed on the pulley friction surface.

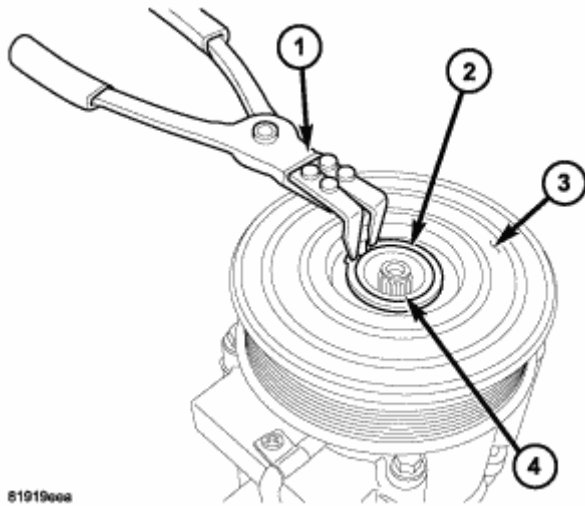
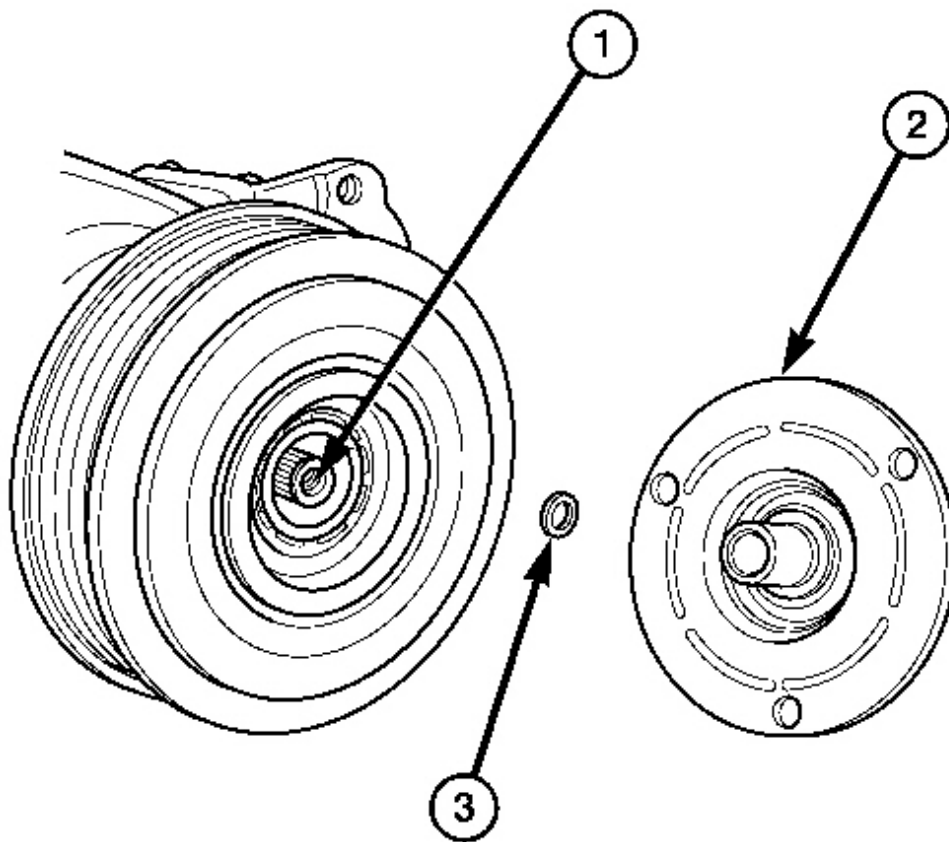


Fig. 31: PULLEY AND SNAP RING
Courtesy of CHRYSLER LLC

CAUTION: The snap ring must be fully and properly seated in the groove or it will vibrate out, resulting in a clutch failure and severe damage to the A/C compressor.

NOTE: A new snap ring must be used to secure the pulley and bearing assembly to the A/C compressor. The bevel side of the snap ring must face outward.

2. Using Snap Ring Pliers 9764 or equivalent (1), install the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4). Be certain that the snap ring is fully and properly seated in the groove.



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Fig. 32: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

3. If the original clutch plate (2) and pulley and bearing assembly are to be reused, reinstall the original shim (s) (3) onto the compressor shaft (1). If a new clutch plate and pulley and bearing assembly are being used, install a trial stack of shims 1.50 mm (0.059 in.) thick onto the compressor shaft.

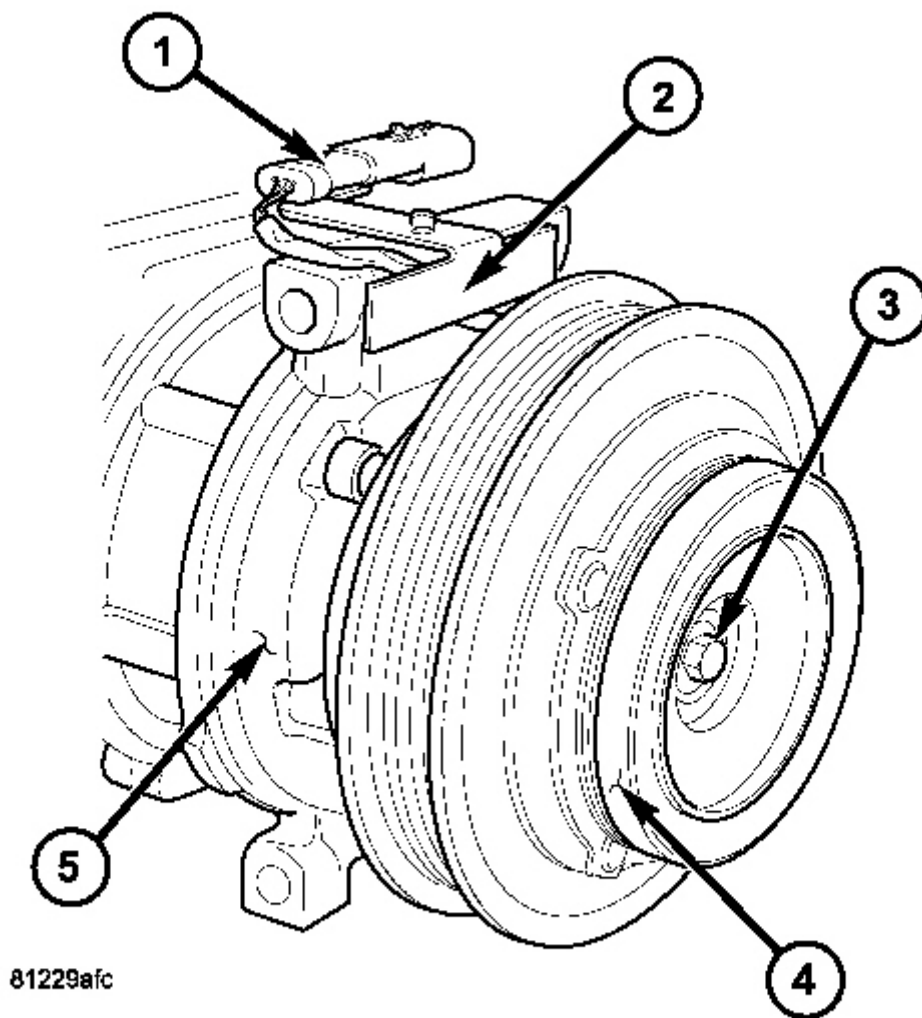


Fig. 33: Locating A/C Compressor Shaft Bolt
Courtesy of CHRYSLER LLC

4. Install the clutch plate (4) onto the front of the A/C compressor (5).
5. Install the compressor shaft bolt (3). Tighten the bolt to 20 N.m (177 in. lbs.).

NOTE: The shims may compress after tightening the shaft bolt. Check the air gap in four or more places to verify the air gap is correct. Spin the pulley before performing a final check of the air gap.

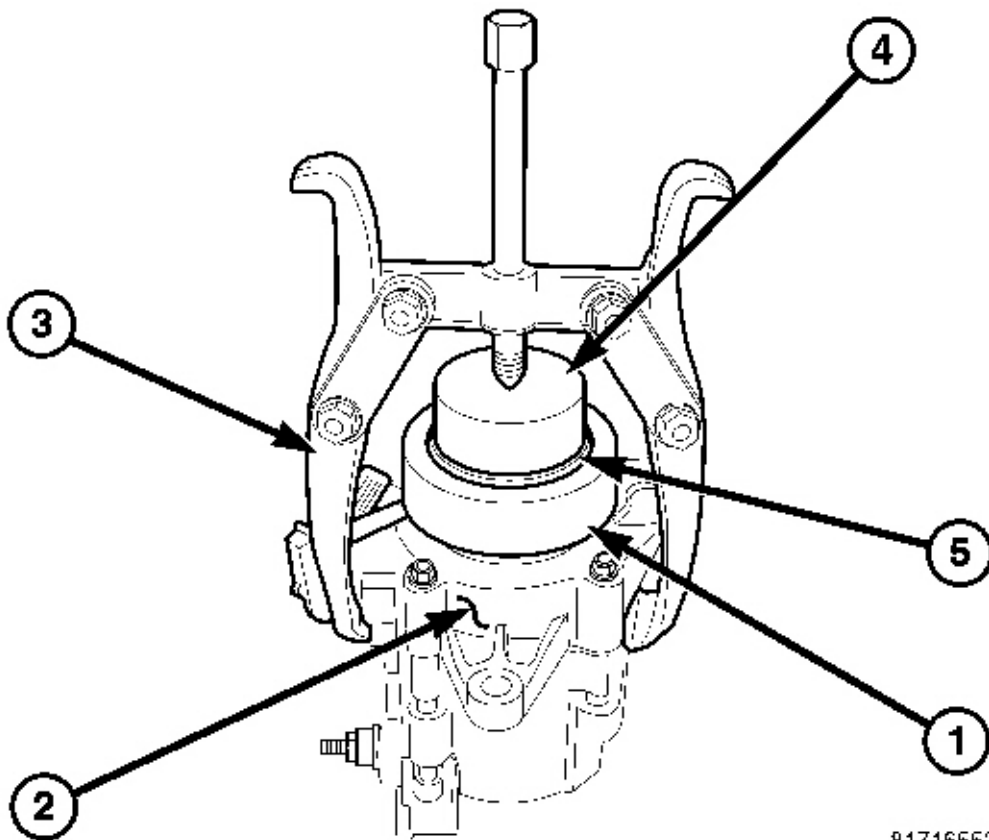
NOTE: On models with the clutch plate recessed into the pulley, use a 90° wire gap gauge to measure the clutch air gap. On other models, use a blade type feeler gauge to measure the air gap.

6. With the clutch plate assembled tight against the shim(s), measure the air gap between the clutch plate and the pulley and bearing assembly. The air gap should be between 0.30 - 0.60 mm (0.012 - 0.024 in.). If the air gap is not between specifications, add or subtract shims as needed until the correct air gap is obtained.

CAUTION: Be certain that the compressor clutch field coil wire lead is routed so that it is not pinched between the A/C compressor and the field coil connector bracket.

7. Carefully route the compressor clutch field coil wire lead and install the connector bracket (2) and retaining screw onto the A/C compressor. Tighten the screw to 4.3 N.m (38 in. lbs.).
8. Connect the engine wire harness to the compressor clutch field coil connector (1).
9. Install the accessory drive belt. Refer to **INSTALLATION** .
10. Install the radiator and fan shroud assembly. Refer to **INSTALLATION** .
11. Install the coolant recovery container. Refer to **REMOVAL** .
12. Reconnect the negative battery cable.

CLUTCH-A/C COMPRESSOR



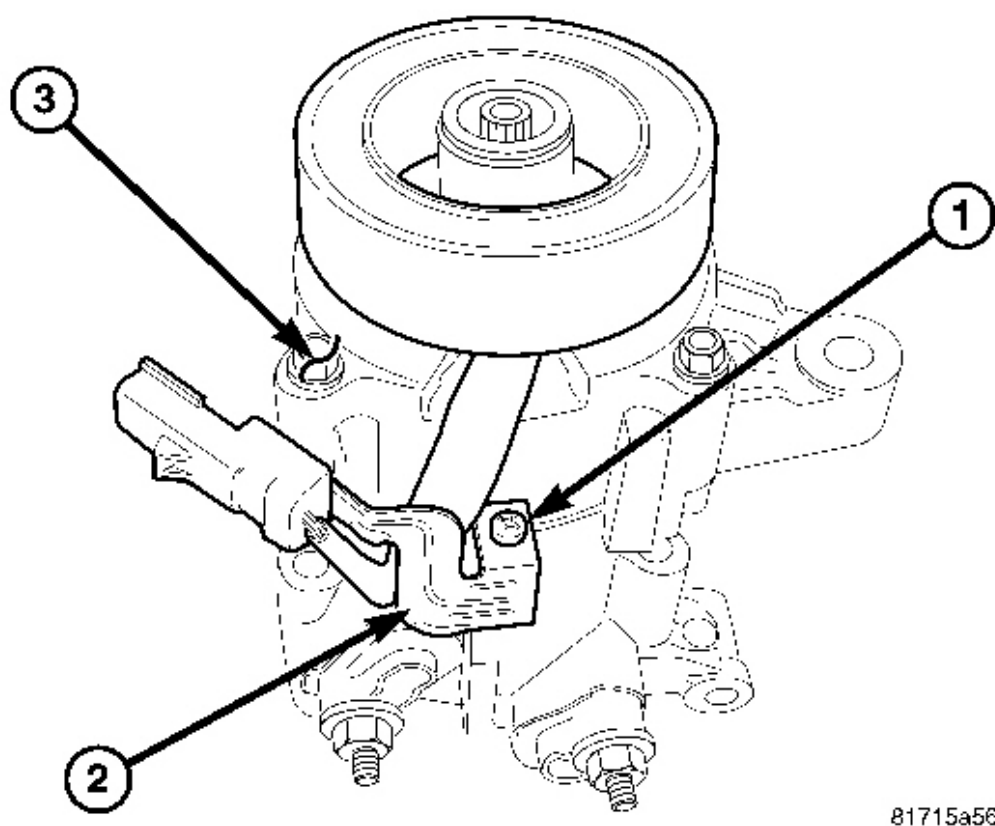
81716552

Fig. 34: Field Coil Installation - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

1. Position the A/C clutch field coil (1) squarely onto the front of the A/C compressor (2).

CAUTION: Position the A/C clutch field coil so that the coil positioning tabs and the wire harness lead are oriented in the correct direction. Failure to correctly position the field coil on the A/C compressor will result in field coil damage.

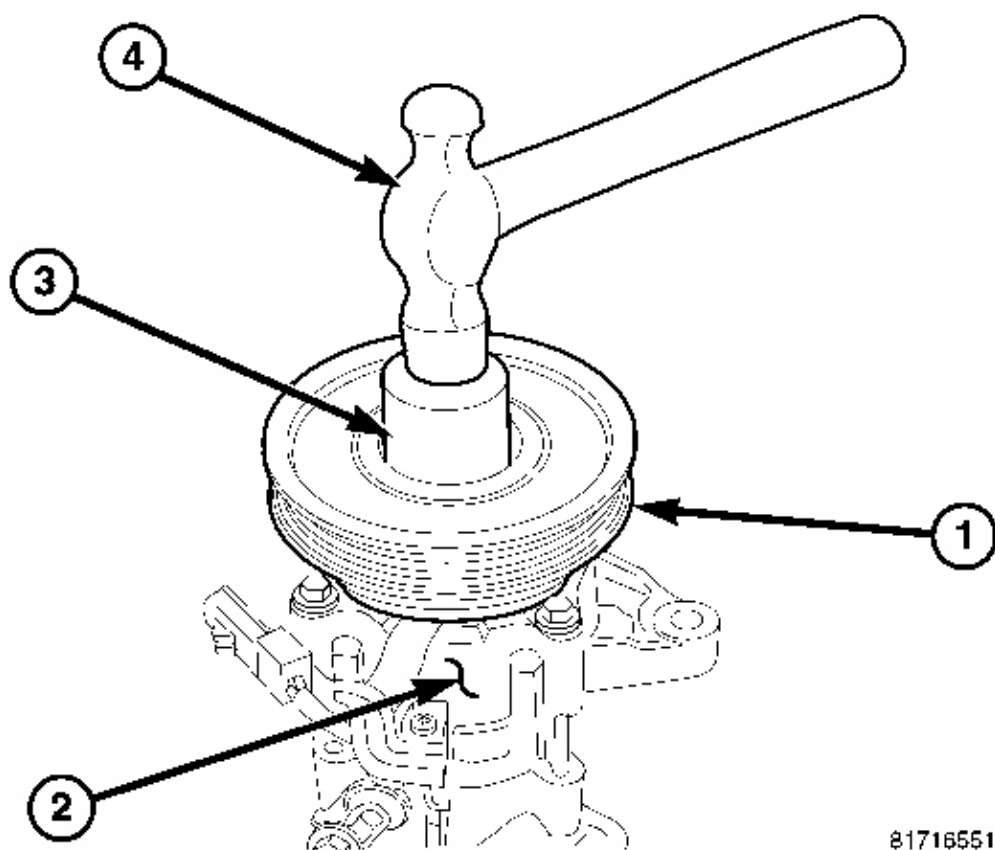
2. Align the field coil positioning tabs to the recessed area at the front of the A/C compressor and install the clutch field coil onto the compressor using a two jaw puller (3), compressor field coil installer (Special Tool 9352 in Kit 9349) (4) and the compressor field coil installer spacer (Special Tool 9353 in Kit 9349) (5).



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Fig. 35: Locating Field Coil Wire Lead - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

3. Position the clutch field coil wire lead and bracket (2) to the A/C compressor (3) and install the screw (1) that secures the bracket to the compressor. Tighten the screw to 4 N.m (35 in. lbs.).



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Fig. 36: Installing Pulley & Bearing - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

4. Align the pulley and bearing assembly (1) squarely onto the front of the A/C compressor (2).

NOTE: A distinct change of sound during the clutch pulley tapping process indicates that the pulley and bearing assembly has bottomed out against the compressor housing.

5. Using clutch pulley installer (Special Tool 9355 in Kit 9349) (3) and a hammer (4), install the pulley and bearing assembly onto the front of the A/C compressor. Tap the installer with a hammer until the pulley and bearing assembly has bottomed against the compressor housing.

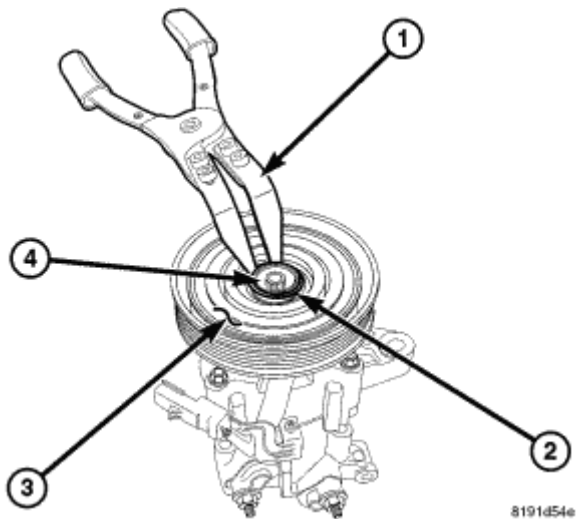


Fig. 37: Using Snap Ring Pliers To Remove/Install Snap Ring That Secures Pulley And Bearing Assembly To Front Of A/C Compressor
Courtesy of CHRYSLER LLC

CAUTION: If the snap ring is not fully seated in the groove it will vibrate out, resulting in clutch failure and severe damage to the A/C compressor.

NOTE: Install the snap ring with the beveled side of the snap ring facing outward.

6. Using snap ring pliers (Special Tool 9764 or equivalent) (1), install the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4). Make sure the snap ring is properly seated in the groove.

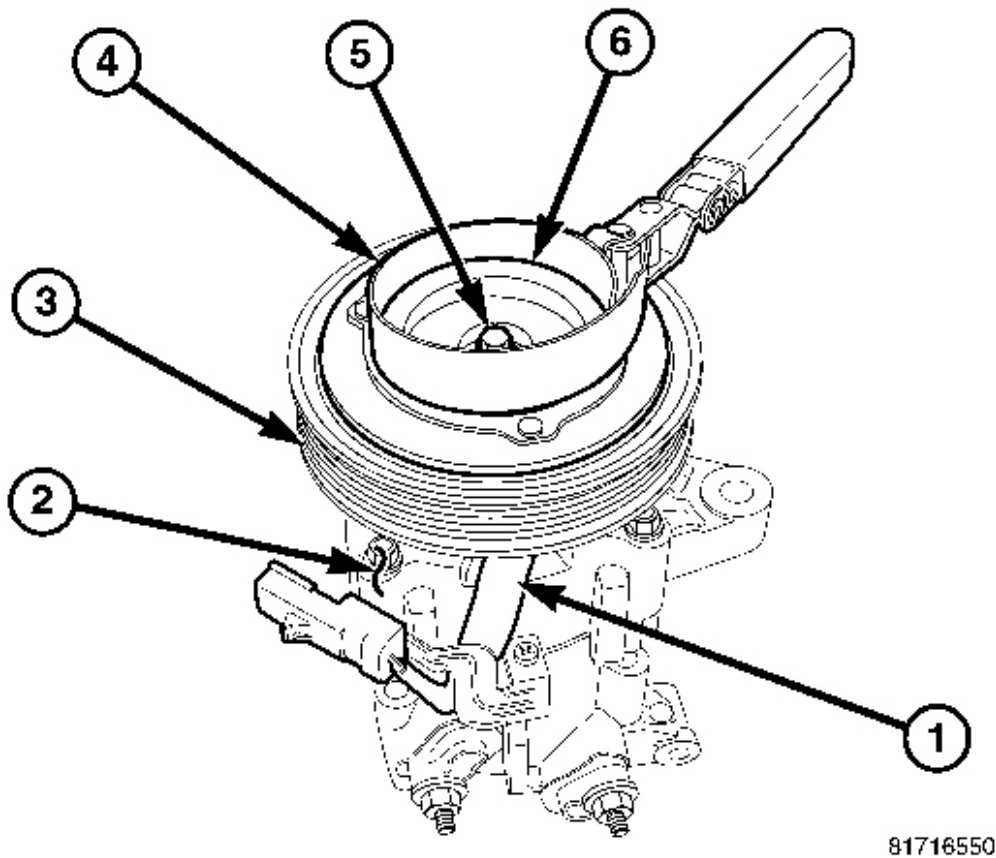
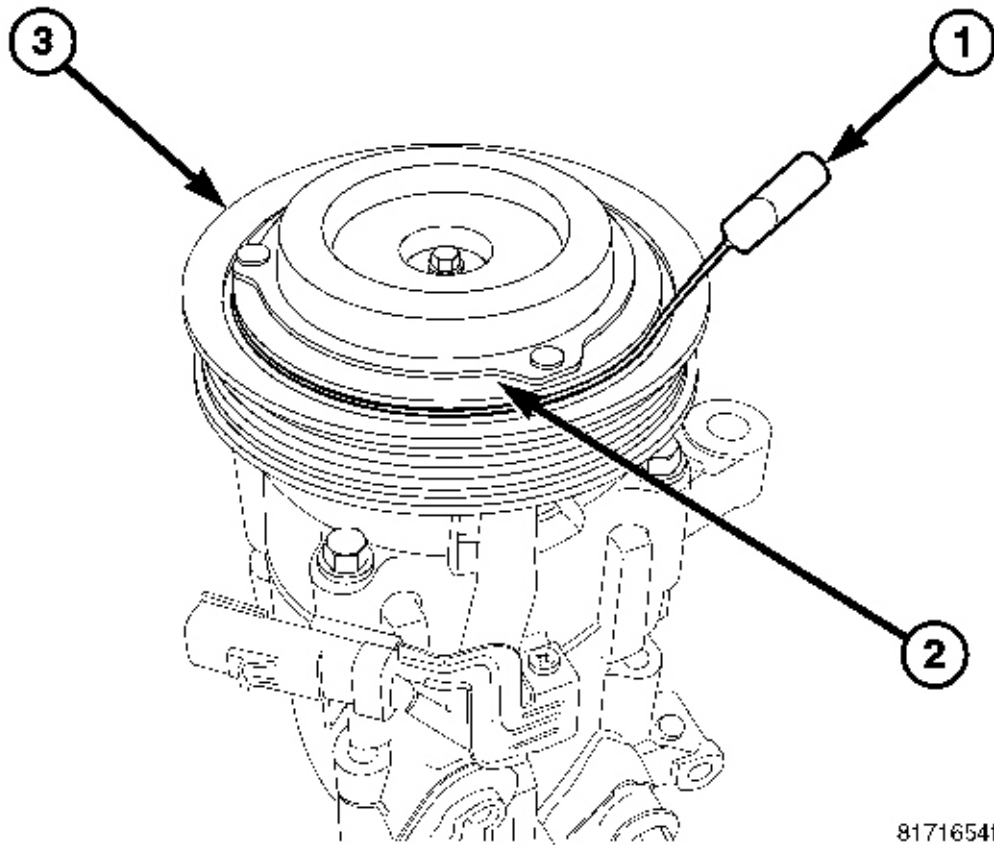


Fig. 38: Installing Clutch Bolt - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

7. Verify that there is adequate clearance for the clutch field coil wire lead (1) between the housing of the A/C compressor (2) and the pulley and bearing assembly (3).

NOTE: When installing an original or a new clutch assembly, try the original shims first. When installing a clutch onto a compressor that previously did not have a clutch, use the 1.0, 0.50 and 0.13 millimeter (0.040, 0.020 and 0.005 inch) shims from the clutch hardware package which is provided with the new clutch.

8. Install the clutch shims onto the compressor shaft.
9. Using a strap wrench (4), install the bolt (5) that secures the clutch plate (6) to the A/C compressor. Hold the clutch plate stationary with the strap wrench and tighten the bolt to 15 N.m (133 in. lbs.).



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Fig. 39: Locating Clutch Air Gap - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

10. Using 90° wire gauges (1), check the air gap between the clutch plate (2) and the pulley and bearing assembly (3). If the air gap is not between 0.35 to 0.65 millimeter (0.014 to 0.025 inch), add or subtract shims as required.
11. Position the A/C compressor onto the mounting bracket.
12. Install the bolts that secure the A/C compressor to the mounting bracket. See **INSTALLATION**.
13. Connect the engine wire harness to the compressor clutch field coil connector.
14. Install the accessory drive belt (Refer to **BELT-ACCESSORY DRIVE**).
15. Reconnect the negative battery cable.
16. Perform the Clutch Break-in Procedure. See **STANDARD PROCEDURE**.

CONTROL-A/C HEATER

DESCRIPTION

AUTOMATIC SINGLE ZONE

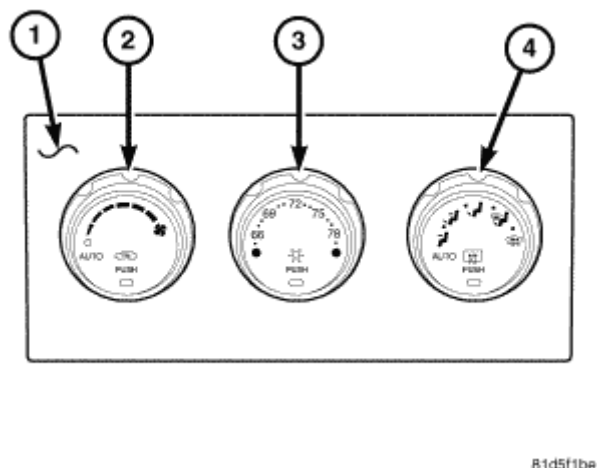


Fig. 40: A/C-Heater Control Assembly
Courtesy of CHRYSLER LLC

The A/C-heater control for the automatic temperature control (ATC) single zone system maintains the interior comfort level desired by the vehicle operator. This is accomplished by use of an infrared sensor located in the front overhead console that measures the surface temperature of the driver and front seat passengers. Based on the sensors input, the system automatically adjusts the air temperature, airflow volume, airflow distribution and amount of inside air recirculation to maintain occupant comfort, even under changing outside weather conditions. All controls are identified by ISO graphic symbols.

This ATC system offers several manual override features such as fan speed, airflow distribution and when the outside air contains smoke, odors, high humidity, or if rapid cooling is desired, the interior conditioned air can be recirculated within the vehicle.

The heating-A/C system uses electrically operated controls. These controls provide the vehicle operator with a number of setting options to help control the climate and comfort within the vehicle.

The A/C-heater control and integral computer (1) is located in the instrument panel and contains:

- a rotary control for manual and automatic blower motor speed selection and for turning the heating-A/C system on and off (2). This control also contains a push button function for recirculating the conditioned air. The control contains an indicator lamp that illuminates when the heating-A/C system is in recirculation mode.

- a rotary control for temperature control of the discharged air (3). This control also contains a push button function for manually turning the A/C system on and off. The control contains an indicator lamp that illuminates when the A/C system is in operation.

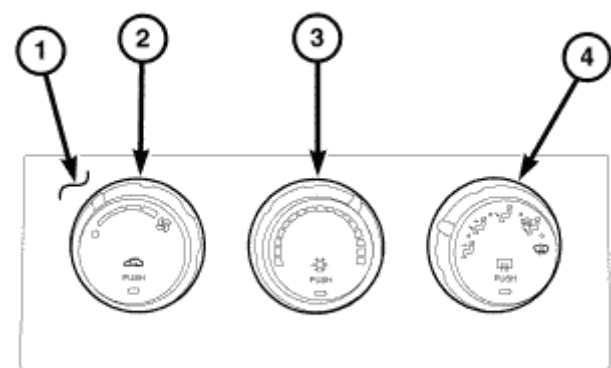
- a rotary control for manual and automatic mode control of the discharged air (4). This control also contains a push button function for turning the rear window defogger system on and off. The control contains an indicator lamp that illuminates when the rear window defogger system is in operation.

The A/C-heater control for the ATC heating and A/C system obtains vehicle speed, engine speed, engine coolant temperature, ambient temperature and refrigerant system head pressure data from the CAN-IHS bus and is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C system and run the Actuator Calibration function using a scan tool to verify that the concern is not a system issue. See **DIAGNOSIS AND TESTING**.

The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged.

CONTROL-A/C HEATER



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Fig. 41: AC Heater Control Components
Courtesy of CHRYSLER LLC

The A/C-heater control (1) for the manual temperature control (MTC) single zone heating-A/C system allows one temperature setting for the entire vehicle. All controls are identified by ISO graphic symbols.

The A/C-heater control and integral computer is located in the instrument panel and contains:

- a rotary control for fan speed selection and for turning the heating-A/C system on and off (2). This control also contains a push button function for recirculating the conditioned air. The control contains an indicator lamp that illuminates when the heating-A/C system is in recirculation mode.

- a rotary control for temperature control of the discharged air (3). This control also contains a push button function for turning the A/C system on and off. The control contains an indicator lamp that illuminates when the A/C system is in operation.

- a rotary control for mode control of the discharged air (4). This control also contains a push button function for turning the rear window defogger system on and off. The control contains an indicator lamp that illuminates when the rear window defogger system is in operation.

The A/C-heater control for this heating and A/C system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C system and run the Actuator Calibration function using a scan tool to verify that the concern is not a system issue. See **DIAGNOSIS AND TESTING**.

The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged.

REMOVAL

CONTROL-A/C HEATER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

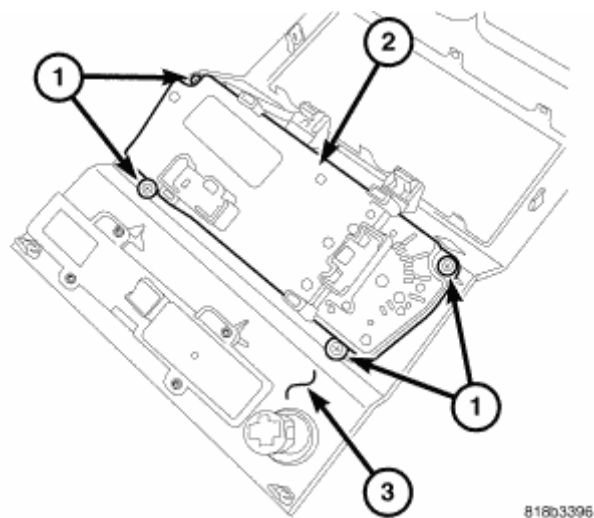


Fig. 42: A/C Heater Control - R and I
Courtesy of CHRYSLER LLC

NOTE: MTC A/C-heater control shown in illustration. ATC control similar.

1. Disconnect and isolate the negative battery cable.
2. Remove the center bezel from the instrument panel and place it on a workbench. Refer to **REMOVAL**.
3. Remove the four screws (1) that secure the A/C-heater control (2) to the instrument panel center bezel (3) and remove the control.

INSTALLATION

CONTROL-A/C HEATER

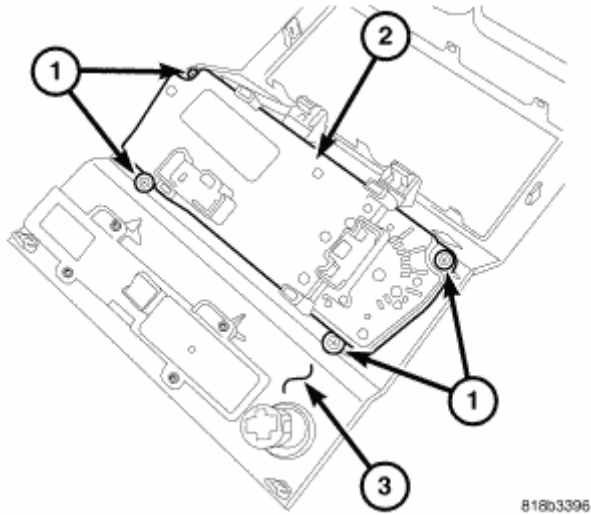


Fig. 43: A/C Heater Control - R and I
 Courtesy of CHRYSLER LLC

NOTE: MTC A/C-heater control shown in illustration. ATC control similar.

1. Install the A/C-heater control (2) onto the back of the instrument panel center bezel (3).
2. Install the four screws (1) that secure the A/C-heater control to the center bezel. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Position the center bezel to the instrument panel and connect the wire harness connectors to the back of the A/C-heater control.
4. Connect the wire harness connectors to the accessory switches and install the center bezel. Refer to **INSTALLATION** .
5. Reconnect the negative battery cable.

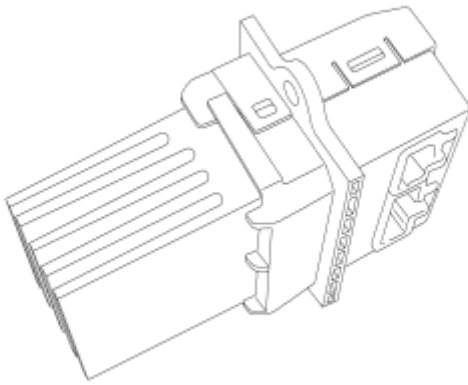
NOTE: The A/C-heater control will automatically perform the Actuator Calibration function when the ignition is initially turned on when installing a new control or when reinstalling the original control. However, the Actuator Calibration function must be manually initiated using a scan tool if the A/C-heater control has been previously installed in another vehicle (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

6. If required, initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

MODULE-POWER-BLOWER MOTOR

DESCRIPTION

DESCRIPTION



81b872ad

Fig. 44: Power-Blower Motor Module
Courtesy of CHRYSLER LLC

A blower motor power module is used on this model when equipped with the automatic temperature control (ATC) heating-A/C system. Models equipped with the manual temperature control (MTC) heating-A/C system use a blower motor resistor, instead of the blower motor power module. See **DESCRIPTION**.

The blower motor power module is mounted to the rear of the HVAC housing, directly behind the glove box. The blower motor power module consists of a molded plastic mounting plate (1) with an integral connector receptacle (2). Concealed behind the mounting plate is the power module electronic circuitry and a finned aluminum heat sink (3). The blower motor power module is accessed for service from under the instrument panel.

The blower motor power module is accessed for service through the glove box opening.

OPERATION

MODULE-POWER-BLOWER MOTOR

The blower motor power module is connected to the vehicle electrical system through a dedicated lead and connector. A second lead and connector is connected to the blower motor. The blower motor power module allows the microprocessor-based automatic temperature control (ATC) A/C-heater control to calculate and provide infinitely variable blower motor speeds based upon either manual blower switch input or the ATC programming using a pulse width modulated (PWM) circuit strategy.

The PWM voltage is applied to a comparator circuit which compares the PWM signal voltage to the blower motor feedback voltage. The resulting output drives the power module circuitry, which provides a linear output voltage to change or maintain the desired blower speed.

The blower motor power module is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blower motor power module cannot be adjusted or repaired must be replaced if inoperative or damaged.

REMOVAL

MODULE-POWER-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The heat sink for the blower motor power module may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor power module, wait five minutes to allow the heat sink to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

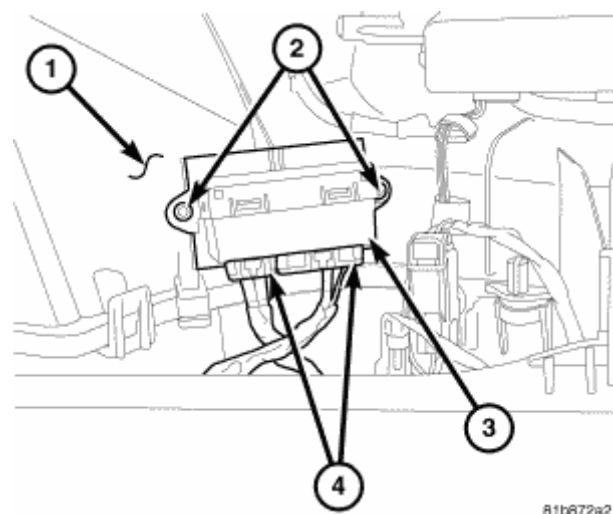


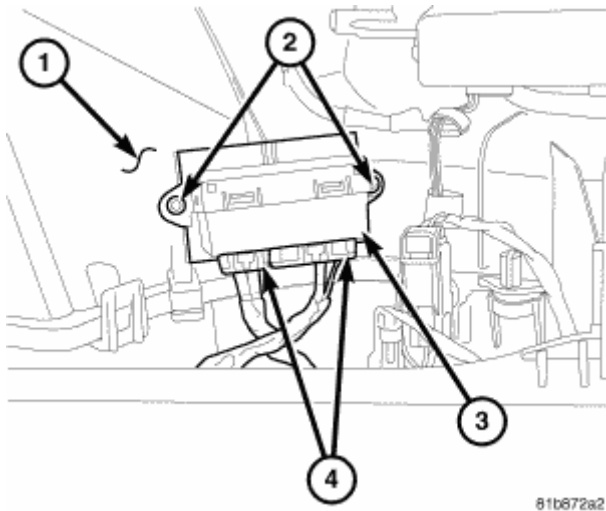
Fig. 45: HVAC Housing, Screws, Blower Motor Power Module & Wire Harness Connectors
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Lower the glove box door.
3. Disconnect the two wire harness connectors (4) from the blower motor power module (3).
4. Remove the two screws (2) that secure the blower motor power module to the HVAC housing (1) and remove the power module.

INSTALLATION

MODULE-POWER-BLOWER MOTOR



81b872a2

Fig. 46: HVAC Housing, Screws, Blower Motor Power Module & Wire Harness Connectors
 Courtesy of CHRYSLER LLC

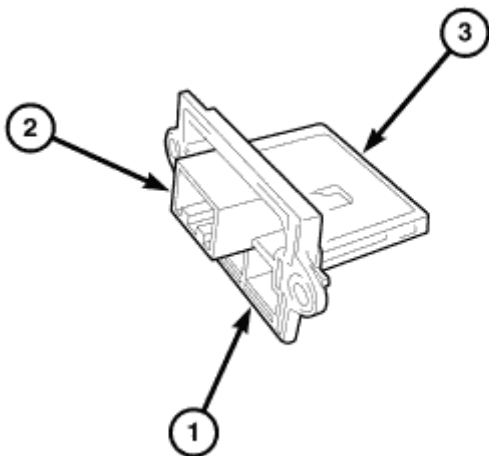
NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blower motor power module (3) into the HVAC housing (1).
2. Install the two screws (2) that secure the blower motor power module to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the wire harness connectors (4) to the blower motor power module.
4. Close the glove box door.
5. Reconnect the negative battery cable.

RESISTOR-BLOWER MOTOR

DESCRIPTION

RESISTOR-BLOWER MOTOR



81b84158

Fig. 47: Mounting Plate, Integral Wire Connector Receptacle & Metal Housing
Courtesy of CHRYSLER LLC

A blower motor resistor is used on vehicles equipped with the manual temperature control (MTC) heating-A/C system. Vehicles equipped with the automatic temperature control (ATC) heating-A/C system use a blower motor power module, instead of the blower motor resistor. See **DESCRIPTION**.

The blower motor resistor is mounted to the rear of the HVAC housing, directly behind the glove box. The blower motor resistor consists of a molded plastic mounting plate (1) with an integral wire connector receptacle (2). Concealed behind the mounting plate is the resistor circuit board located within a metal housing (3).

The blower motor resistor is accessed for service through the glove box opening.

OPERATION

RESISTOR-BLOWER MOTOR

The blower motor resistor is connected to the vehicle electrical system through a dedicated wire lead and connector of the HVAC wire harness. The blower motor resistor has multiple resistor circuits, each of which will reduce the current flow through the blower motor to change the blower motor speed.

The blower motor control in the MTC heating-A/C system directs the ground path for the blower motor through the correct resistor circuit to obtain the selected speed. With the blower motor control in the lowest speed position, the ground path for the blower motor is applied through all of the resistor circuits. Each higher speed selected with the blower motor control applies the blower motor ground path through fewer of the resistor circuits, increasing the blower motor speed. When the blower motor control is in the highest speed position, the blower motor resistor is bypassed and the blower motor receives a direct path to ground.

The blower motor resistor cannot be adjusted or repaired and it must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

RESISTOR-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions may result in accidental airbag deployment and possible serious or fatal injury.

NOTE: For circuit descriptions and diagrams, refer to **SYSTEM WIRING DIAGRAMS** article and **WIRING DIAGRAM INFORMATION** article . The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location

views for the various wire harness connectors, splices and grounds.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the blower motor resistor. See **REMOVAL**.
3. Using an ohmmeter, check for continuity between all of the blower motor resistor terminals. In each case there should be continuity. If OK, repair the wire harness circuits between the blower motor speed control and the blower motor resistor or blower motor as required. If not OK, replace the inoperative blower motor resistor.

REMOVAL

RESISTOR-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The blower motor resistor may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor resistor, wait five minutes to allow the blower motor resistors to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

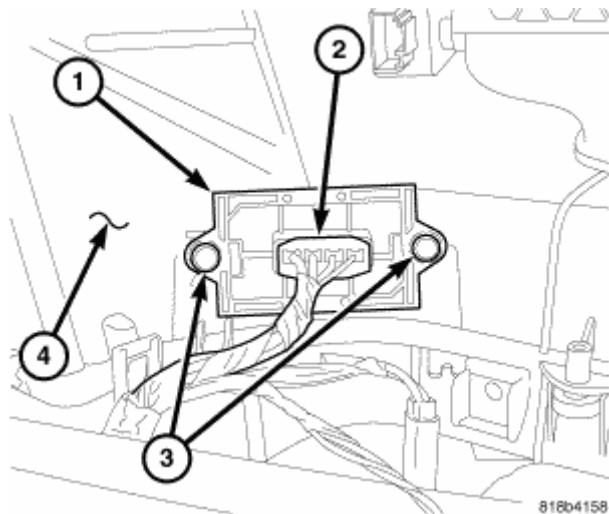


Fig. 48: Blower Motor Resistor, Wire Harness Connector, Screws & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: Typical resistor shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Lower the glove box door.
3. Disconnect the wire harness connector (2) from the blower motor resistor (1).
4. Remove the two screws (3) that secure the blower motor resistor to the HVAC housing (4) and remove the resistor.

INSTALLATION

RESISTOR-BLOWER MOTOR

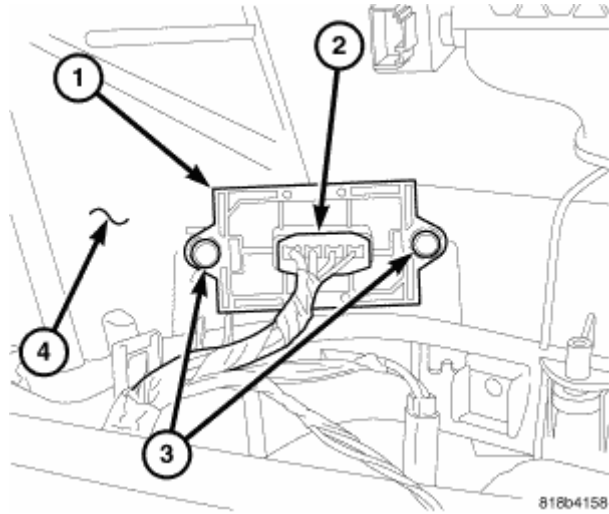


Fig. 49: Blower Motor Resistor, Wire Harness Connector, Screws & HVAC Housing
Courtesy of CHRYSLER LLC

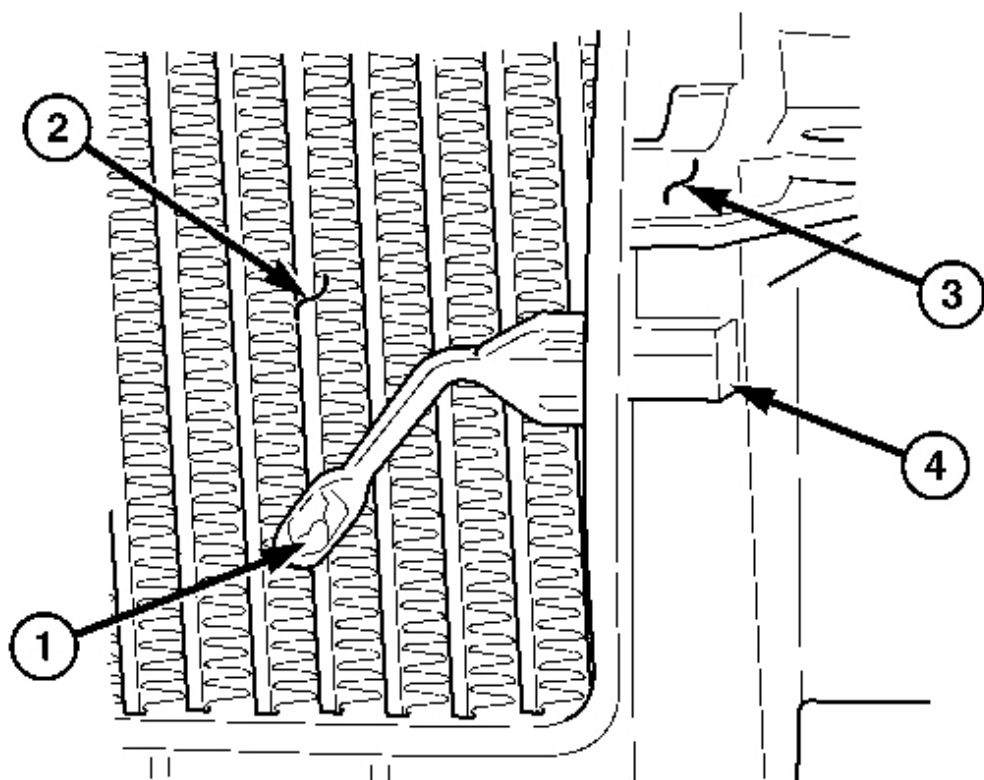
NOTE: Typical resistor shown in illustration. RHD model similar.

1. Position the blower motor resistor (1) into the HVAC housing (4).
2. Install the two screws (3) that secure the blower motor resistor to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the wire harness connector (2) to the blower motor resistor.
4. Close the glove box door.
5. Reconnect the negative battery cable.

SENSOR-EVAPORATOR TEMPERATURE

DESCRIPTION

SENSOR-EVAPORATOR TEMPERATURE



812b0cc6

Fig. 50: Sensor-Evaporator Temperature
Courtesy of CHRYSLER LLC

NOTE: Typical evaporator temperature sensor shown in graphic.

The evaporator temperature sensor (1) measures the temperature of the conditioned air downstream of the A/C evaporator (2). The evaporator temperature sensor is an electrical thermistor within a molded plastic case that is inserted into rear the HVAC housing (3) near the coldest point of the A/C evaporator. Two terminals within the connector receptacle (4) connect the sensor to the vehicle electrical system through a wire lead and connector of the instrument panel wire harness.

The external location of the evaporator temperature sensor allows the sensor to be removed or installed without disturbing the refrigerant in the A/C system.

OPERATION

SENSOR-EVAPORATOR TEMPERATURE

The evaporator temperature sensor monitors the temperature of the conditioned air downstream of the A/C evaporator and supplies an input signal to the A/C-heater control. The A/C-heater control uses the evaporator temperature sensor input signal to optimize A/C system performance and to protect the A/C system from evaporator freezing. The evaporator temperature sensor will change its internal resistance in response to the temperatures it monitors and is connected to the A/C-heater control through sensor ground circuit and a 5-volt reference signal circuit. As the temperature of the A/C evaporator decreases, the internal resistance of the evaporator temperature sensor decreases.

The A/C-heater control uses the monitored voltage reading as an indication of evaporator temperature. The A/C-heater control is programmed to respond to this input by requesting the powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) to cycle the A/C compressor clutch as necessary to optimize A/C system performance and to protect the A/C system from evaporator freezing.

The evaporator temperature sensor is diagnosed using a scan tool. See **DIAGNOSIS AND TESTING**.

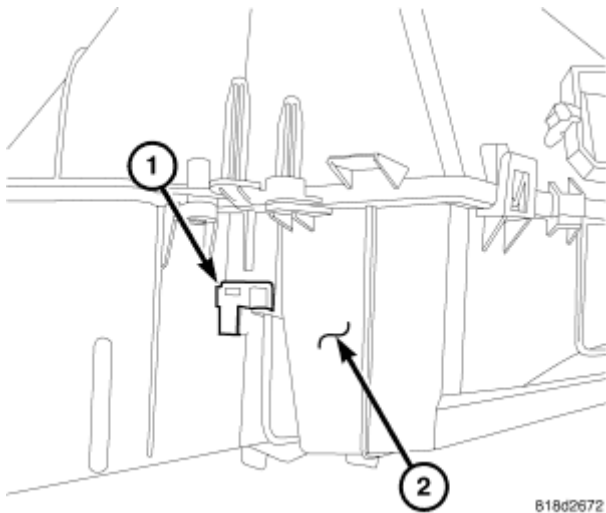
The evaporator temperature sensor cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

SENSOR-EVAPORATOR TEMPERATURE

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: Illustration shown with instrument panel removed for clarity.



818d2672

Fig. 51: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
 Courtesy of CHRYSLER LLC

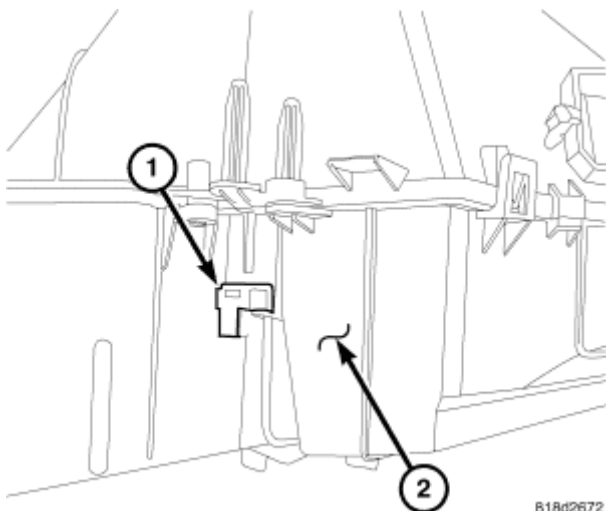
NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Partially remove the instrument panel to gain access to the evaporator temperature sensor (1) located in the rear of the HVAC housing (2), near the bottom of the instrument panel on the passenger side. Refer to **REMOVAL** .
3. Disconnect the instrument panel wire harness connector from the evaporator temperature sensor and remove the sensor from the HVAC housing.

INSTALLATION

SENSOR-EVAPORATOR TEMPERATURE

NOTE: Illustration shown with instrument panel removed for clarity.



818d2672

Fig. 52: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Install the evaporator temperature sensor (1) into rear of the HVAC housing (2) and connect the instrument panel wire harness connector.
2. Install the instrument panel. Refer to **INSTALLATION**.
3. Reconnect the negative battery cable.

SENSOR-INFRARED

DESCRIPTION

SENSOR-INFRARED

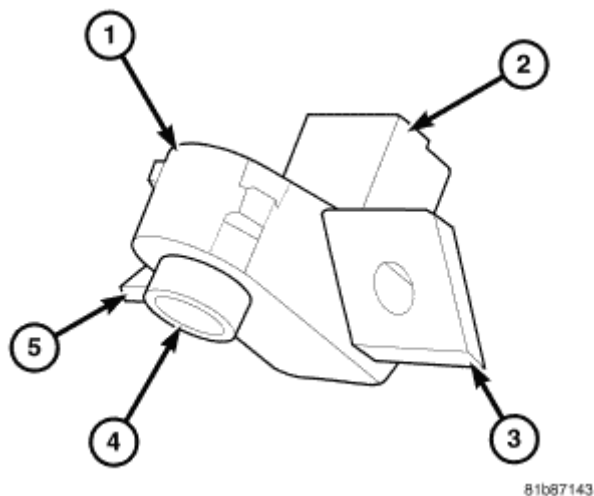


Fig. 53: Infrared Temperature Sensor, Integral Wire Connector Receptacle, Alignment Tabs & Clear Lens

Courtesy of CHRYSLER LLC

The infrared temperature sensor (1) consists of an infrared transducer concealed behind a clear lens (4) located in a molded plastic housing with an integral wire connector receptacle (2) and mounting and alignment tabs (3 and 5).

The infrared sensor is used only on models equipped with the automatic temperature control (ATC) heating-A/C system.

OPERATION

SENSOR-INFRARED

The infrared sensor detects thermal radiation emitted by the driver and front seat occupants and surroundings and converts its data into a linear pulse width modulated (PWM) output signal which is read by the automatic

temperature control (ATC) A/C-heater control. The ATC A/C-heater control uses the infrared sensor data as one of the inputs necessary to automatically control the interior cabin temperature level. By using thermal radiation (surface temperature) measurement, rather than an air temperature measurement, the ATC heating-A/C system is able to adjust itself to the comfort level as perceived by the front seat occupants. This allows the ATC system to compensate for other ambient conditions affecting comfort levels, such as solar heat gain or evaporative heat loss.

The ATC system logic responds to the infrared sensor message by calculating and adjusting the air flow temperature and air flow rate needed to properly obtain and maintain the selected comfort level temperature of the occupants. The A/C-heater control continually monitors the infrared sensor circuit, and will store diagnostic trouble codes (DTCs) for any problem it detects.

The infrared sensor is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The infrared sensor cannot be adjusted or repaired and must be replaced if inoperative or damaged.

REMOVAL

SENSOR-INFRARED

NOTE: Take the proper precautions to protect the front face of the overhead console from cosmetic damage while performing this procedure.

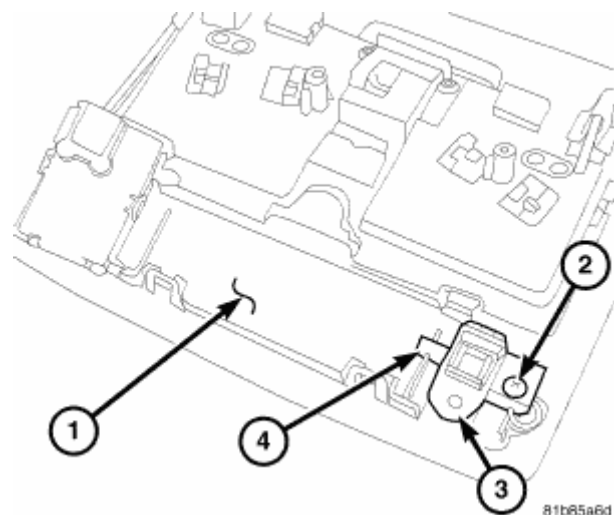


Fig. 54: Overhead Console, Screw, Infrared Sensor & Tab
Courtesy of CHRYSLER LLC

NOTE: Typical overhead console shown in graphic.

1. Disconnect and isolate the negative battery cable.
2. Remove the overhead console (1) from the headliner and place it on a workbench.
3. Remove the screw (2) that secures the infrared sensor (3) to the back of the overhead console and remove

the sensor.

INSTALLATION

SENSOR-INFRARED

NOTE: Take the proper precautions to protect the front face of the overhead console from cosmetic damage while performing this procedure.

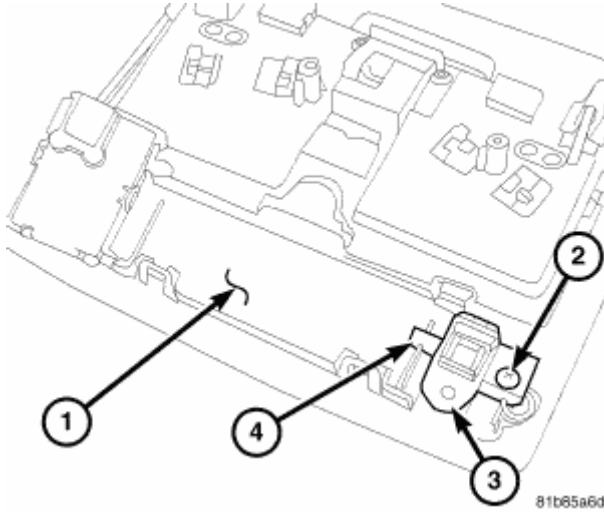


Fig. 55: Overhead Console, Screw, Infrared Sensor & Tab
Courtesy of CHRYSLER LLC

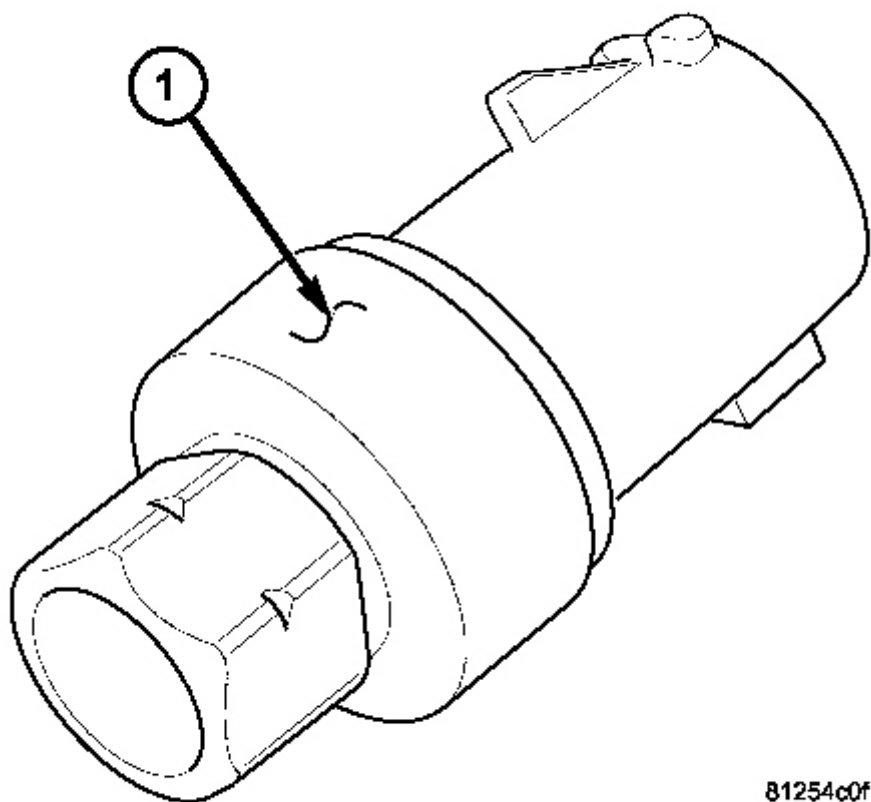
NOTE: Typical overhead console shown in graphic.

1. Position the infrared sensor (3) onto the back of the overhead console (1). Align the tab (4) on the sensor with the slot in the console.
2. Install the screw (2) that secures the infrared sensor(s) to the overhead console. Tighten the screw to 1.2 N.m (10 in. lbs).
3. Install the overhead console.
4. Reconnect the negative battery cable.

TRANSDUCER-A/C PRESSURE

DESCRIPTION

TRANSDUCER-A/C PRESSURE



81254c0f

Fig. 56: A/C Pressure Transducer
Courtesy of CHRYSLER LLC

The A/C pressure transducer (1) sends a signal to the powertrain control module (PCM) which controls both A/C compressor clutch engagement/disengagement and electric cooling fan operation. The A/C pressure transducer is mounted on a fitting located on the A/C liquid line near the dash panel. The PCM will disengage the A/C compressor clutch when high side pressure rises above 2971 kPa (431 psi) or fall below 206 kPa (30 psi).

The fitting for the A/C pressure transducer on the A/C liquid line is equipped with an O-ring seal and contains a Schrader-type valve to allow the transducer to be serviced without discharging the refrigerant system.

OPERATION

TRANSDUCER-A/C PRESSURE

The A/C pressure transducer monitors the pressures in the high side of the refrigerant system through its

connection to a fitting on the A/C liquid line. The A/C pressure transducer will change its internal resistance in response to the pressures it monitors. The powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) provides a five volt reference signal and a sensor ground to the A/C pressure transducer, then monitors the output voltage of the A/C pressure transducer on a sensor return circuit to determine refrigerant pressure. The PCM/ECM is programmed to respond to the A/C pressure transducer and other sensor inputs by controlling the operation of the A/C compressor clutch and the radiator cooling fan to help optimize A/C system performance and to protect the system components from damage. The PCM/ECM will disengage the A/C compressor clutch when high side pressure rises above 2971 kPa (431 psi) or fall below 206 kPa (30 psi). The A/C pressure transducer input to the PCM/ECM also prevents the A/C compressor clutch from engaging when ambient temperatures are below about 10° C (50° F) due to the pressure/temperature relationship of the refrigerant.

A Schrader-type valve in the A/C discharge line fitting permits the A/C pressure transducer to be removed or installed without disturbing the refrigerant in the A/C system.

The A/C pressure transducer is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The A/C pressure transducer cannot be adjusted or repaired and it must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

TRANSDUCER-A/C PRESSURE

The A/C pressure transducer is tested using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article or appropriate Engine ELECTRICAL DIAGNOSTICS article for more information). Before testing the A/C pressure transducer, be certain that the transducer wire harness connection is clean of corrosion and properly connected. For the A/C to operate, an A/C pressure transducer voltage reading between 0.451 and 4.519 volts is required. Voltages outside this range indicate a low or high refrigerant system pressure condition to the powertrain control module (PCM). The PCM is programmed to respond to a low or high refrigerant system pressure by suppressing operation of the A/C compressor. Refer to the A/C PRESSURE TRANSDUCER VOLTAGE chart for the possible conditions indicated by the transducer voltage reading.

A/C PRESSURE TRANSDUCER VOLTAGE

Voltage	Possible Indication
0.0	1. No sensor supply voltage from PCM.
-	2. Shorted sensor circuit.
-	3. Inoperative transducer.
0.150 TO 0.450	1. Ambient temperature below 10° C (50° F).
-	2. Low refrigerant system pressure.
0.451 TO 4.519	1. Normal refrigerant system pressure.
4.520 TO 4.850	1. High refrigerant system pressure.
5.0	1. Open sensor circuit.
-	2. Inoperative transducer.

REMOVAL

TRANSDUCER-A/C PRESSURE

NOTE: It is not necessary to discharge the refrigerant system to replace the A/C pressure transducer.

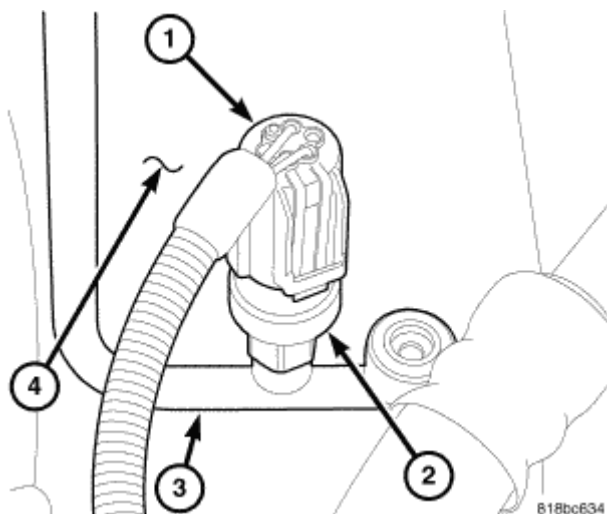


Fig. 57: Wire Harness Connector, A/C Pressure Transducer, A/C Liquid Line & Dash Panel
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector (1) from the A/C pressure transducer (2) located on the A/C liquid line (3) near the dash panel (4) in the engine compartment.
3. Remove the A/C pressure transducer from the A/C liquid line and remove and discard the O-ring seal.

INSTALLATION

TRANSDUCER-A/C PRESSURE

NOTE: Use only the specified O-ring as it is made of special material for R-134a. Use only refrigerant oil of the type required for the A/C compressor.

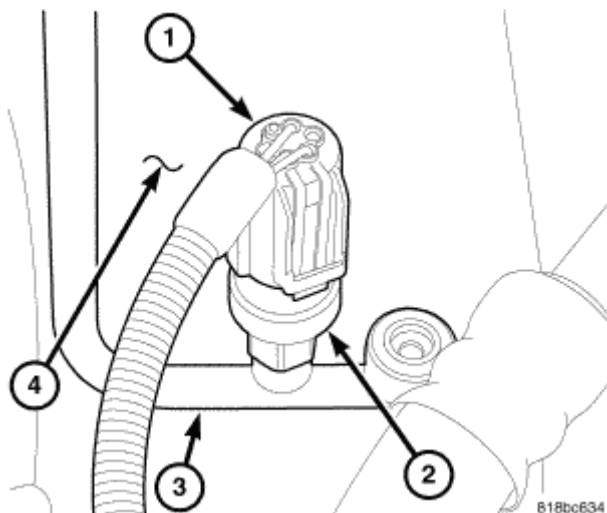


Fig. 58: Wire Harness Connector, A/C Pressure Transducer, A/C Liquid Line & Dash Panel
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Lubricate a new rubber O-ring seal with clean refrigerant oil and install it onto the A/C pressure transducer fitting.
2. Install the A/C pressure transducer (2) onto the A/C liquid line (3) near the dash panel (4). Hand-tightened the transducer securely.
3. Connect the wire harness connector (1) to the A/C pressure transducer.
4. Reconnect the negative battery cable.

DISTRIBUTION

DUCT-CENTER INSTRUMENT PANEL

REMOVAL

DUCT-CENTER INSTRUMENT PANEL

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

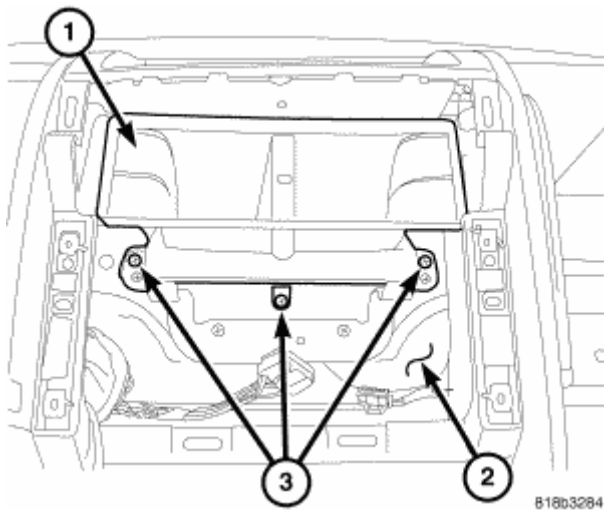


Fig. 59: Instrument Panel, Screws & Center Instrument Panel Duct
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the radio from the instrument panel. Refer to **REMOVAL** .
3. Reach through the opening in the instrument panel (2) and remove the three screws (3) that secure the center instrument panel duct (1) to the instrument panel.
4. Rotate the center instrument panel duct as necessary and remove the duct.

INSTALLATION

DUCT-CENTER INSTRUMENT PANEL

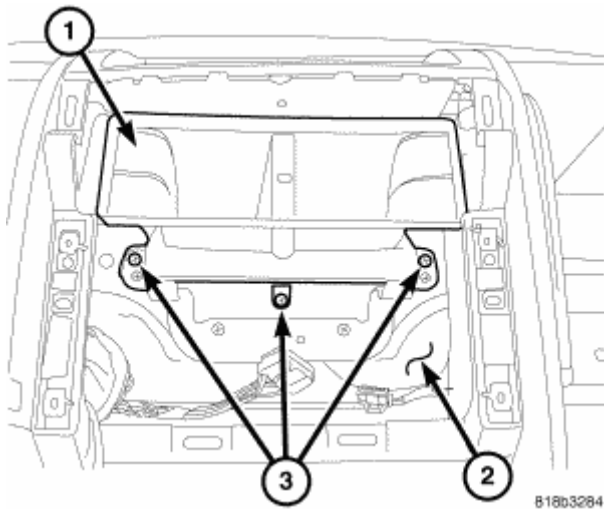


Fig. 60: Instrument Panel, Screws & Center Instrument Panel Duct
 Courtesy of CHRYSLER LLC

1. Rotate the center instrument panel duct as necessary to position the duct into the instrument panel.
2. Install the three screws (3) that secure the center instrument panel duct (1) to the instrument panel.

Tighten the screws to 1.2 N.m (10 in. lbs.).

3. Install the radio. Refer to **INSTALLATION** .
4. Reconnect the negative battery cable.

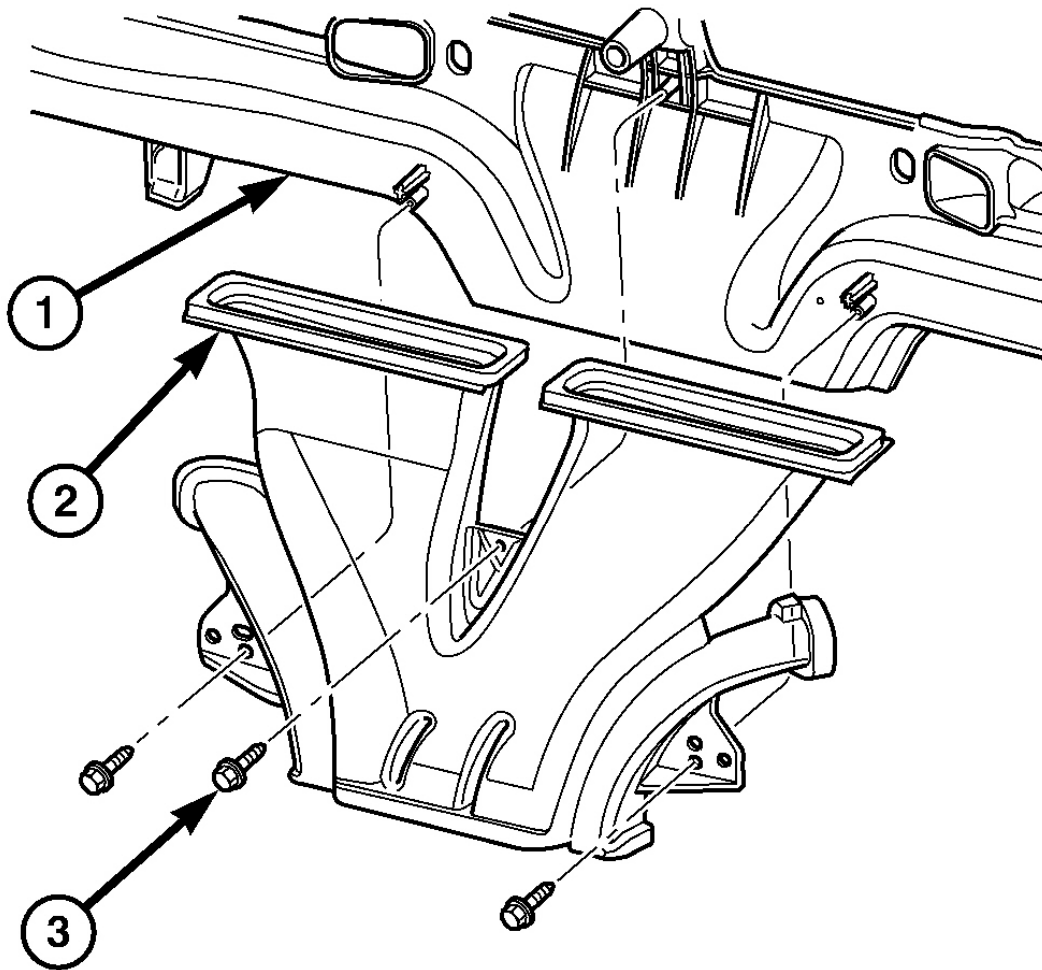
DUCT-DEFROSTER

REMOVAL

DUCT-DEFROSTER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

NOTE: Take the proper precautions to protect the front face of the instrument panel from cosmetic damage during this service procedure.



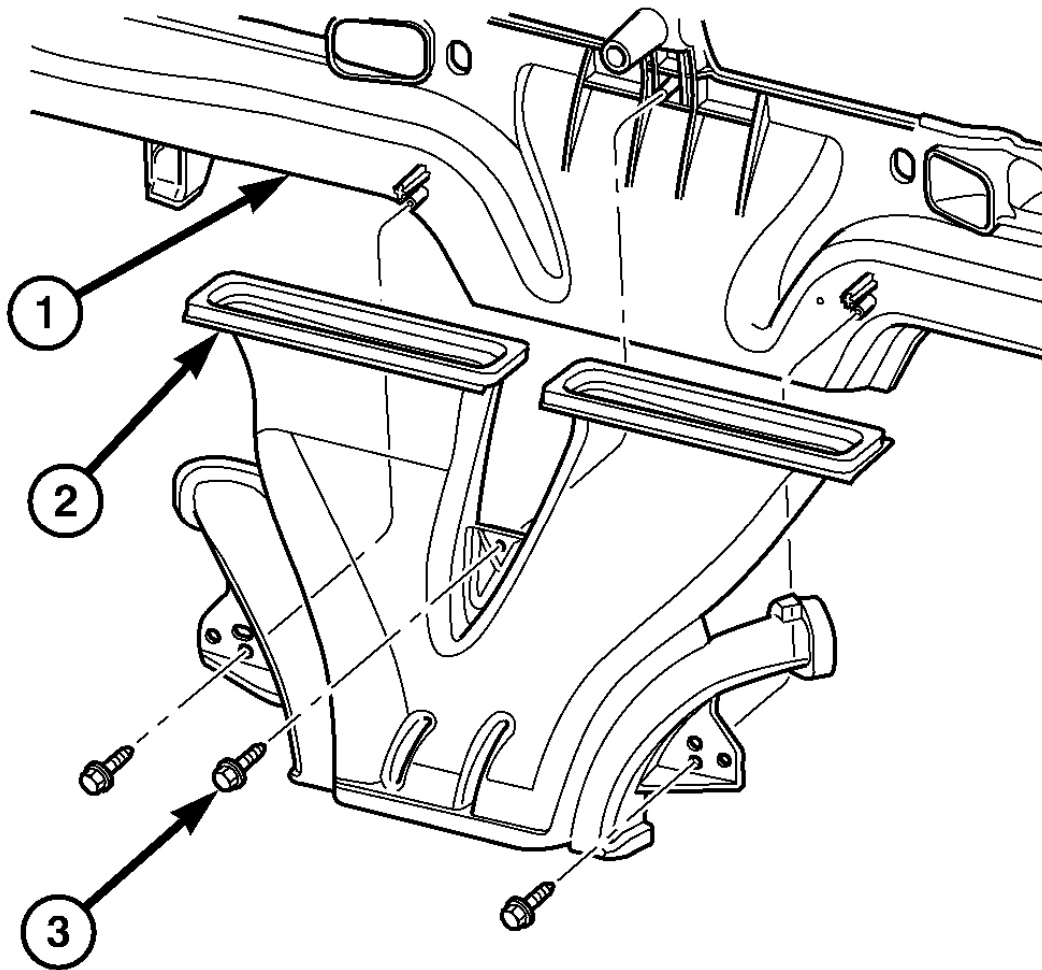
80cb43a1

Fig. 61: Defroster Duct
Courtesy of CHRYSLER LLC

1. Remove the instrument panel and place it on a workbench. Refer to **REMOVAL** .
2. Remove the three screws (3) that secure the defroster duct (2) to the instrument panel (1) and remove the duct.

INSTALLATION

DUCT-DEFROSTER



80cb43a1

Fig. 62: Defroster Duct
Courtesy of CHRYSLER LLC

1. Position the defroster duct (2) into the instrument panel (1).
2. Install the three screws (3) that secure the defroster duct to the instrument panel. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Install the instrument panel. Refer to **INSTALLATION** .

DUCT-FLOOR DISTRIBUTION

REMOVAL

DUCT-FLOOR DISTRIBUTION

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

DRIVER SIDE

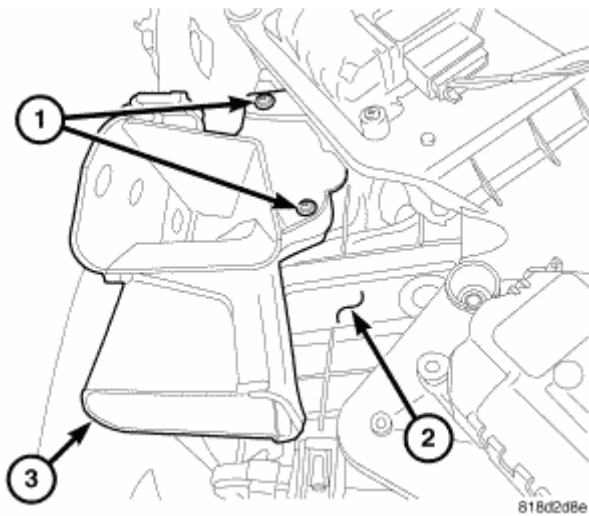


Fig. 63: Removing/Installing Screws That Secure Driver Side Front Floor Duct To Driver Side Of Air Distribution Housing And Duct
Courtesy of CHRYSLER LLC

1. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL** .
2. Remove the two screws (1) that secure the driver side front floor duct (3) to the driver side of the air distribution housing (2) and remove the duct.

PASSENGER SIDE

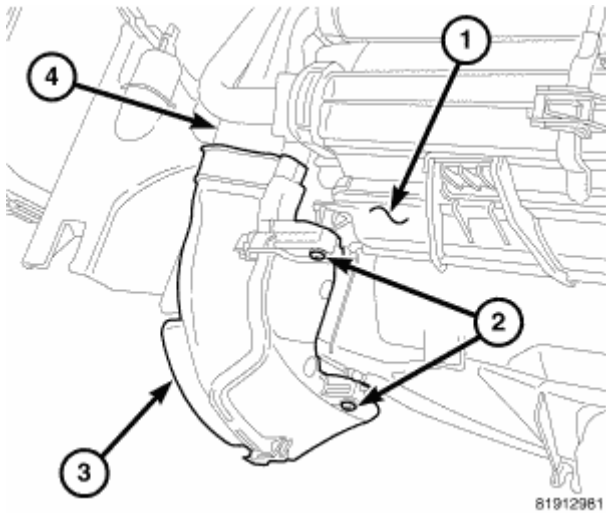


Fig. 64: HVAC Housing, Screws, Lower Front Passenger Side Floor Duct & Upper Front Passenger Side Floor Duct

Courtesy of CHRYSLER LLC

1. Remove the HVAC Housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the two screws (2) that secure the lower front passenger side floor duct (3) to the bottom of the HVAC housing (1).
3. Disconnect the lower front passenger side floor duct from the upper front passenger side floor duct (4) and remove the lower duct.

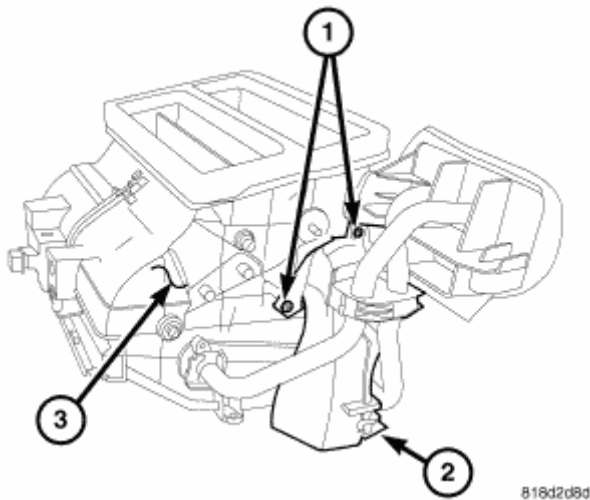


Fig. 65: Removing/Installing Two Screws That Secure Upper Front Passenger Side Floor Duct To Passenger Side Of Air Distribution Housing And Upper Duct

Courtesy of CHRYSLER LLC

NOTE: Illustration shown with air distribution housing removed from HVAC housing for clarity.

4. Remove the two screws (1) that secure the upper front passenger side floor duct to the passenger side of

the air distribution housing (3) and remove the upper duct.

INSTALLATION

DUCT-FLOOR DISTRIBUTION

NOTE: LHD model shown in illustrations. RHD model similar.

DRIVER SIDE

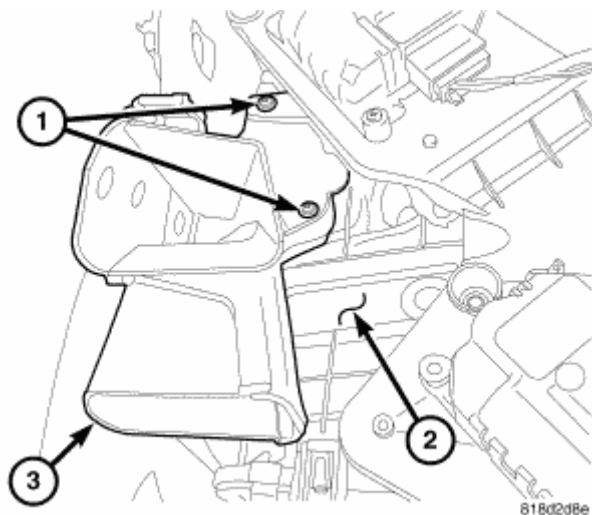


Fig. 66: Removing/Installing Screws That Secure Driver Side Front Floor Duct To Driver Side Of Air Distribution Housing And Duct
Courtesy of CHRYSLER LLC

1. Install the driver side front floor duct (3) to the driver side of the air distribution housing (2) and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
2. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION** .

PASSENGER SIDE

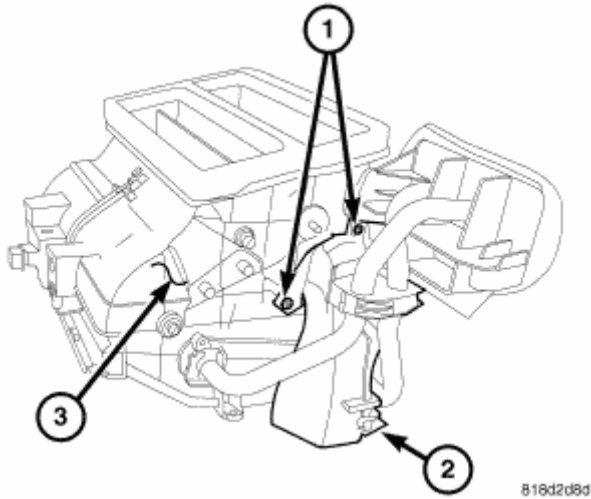


Fig. 67: Removing/Installing Two Screws That Secure Upper Front Passenger Side Floor Duct To Passenger Side Of Air Distribution Housing And Upper Duct
 Courtesy of CHRYSLER LLC

NOTE: Illustration shown with air distribution housing removed from HVAC housing for clarity.

1. Install the upper front passenger side floor duct (2) to the passenger side of the air distribution housing (3) and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

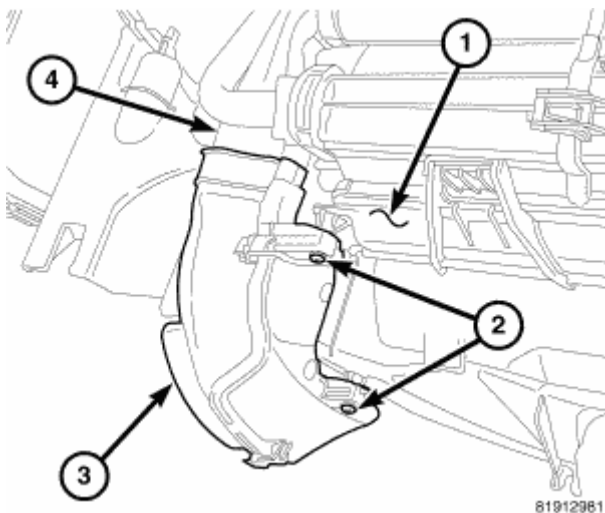


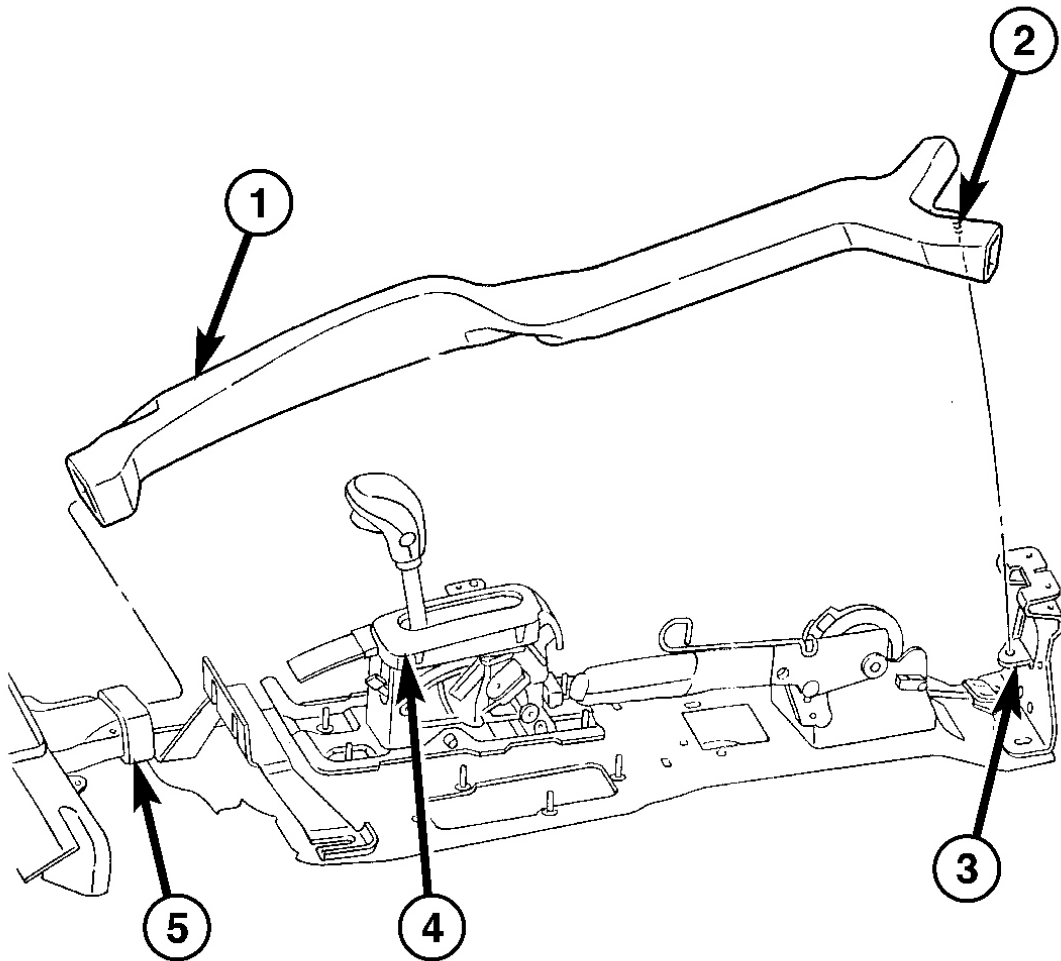
Fig. 68: HVAC Housing, Screws, Lower Front Passenger Side Floor Duct & Upper Front Passenger Side Floor Duct
 Courtesy of CHRYSLER LLC

2. Connect the lower front passenger side floor duct (3) to the upper front passenger side floor duct (4).
3. Install the two screws (2) that secure the lower front passenger side floor duct to the bottom of the HVAC housing (1). Tighten the screws to 1.2 N.m (10 in lbs.).
4. Install the HVAC housing assembly. See **INSTALLATION**.

DUCT-REAR FLOOR HEAT

REMOVAL

DUCT-REAR FLOOR HEAT



80cb41cb

Fig. 69: Rear Floor Heat Duct
Courtesy of CHRYSLER LLC

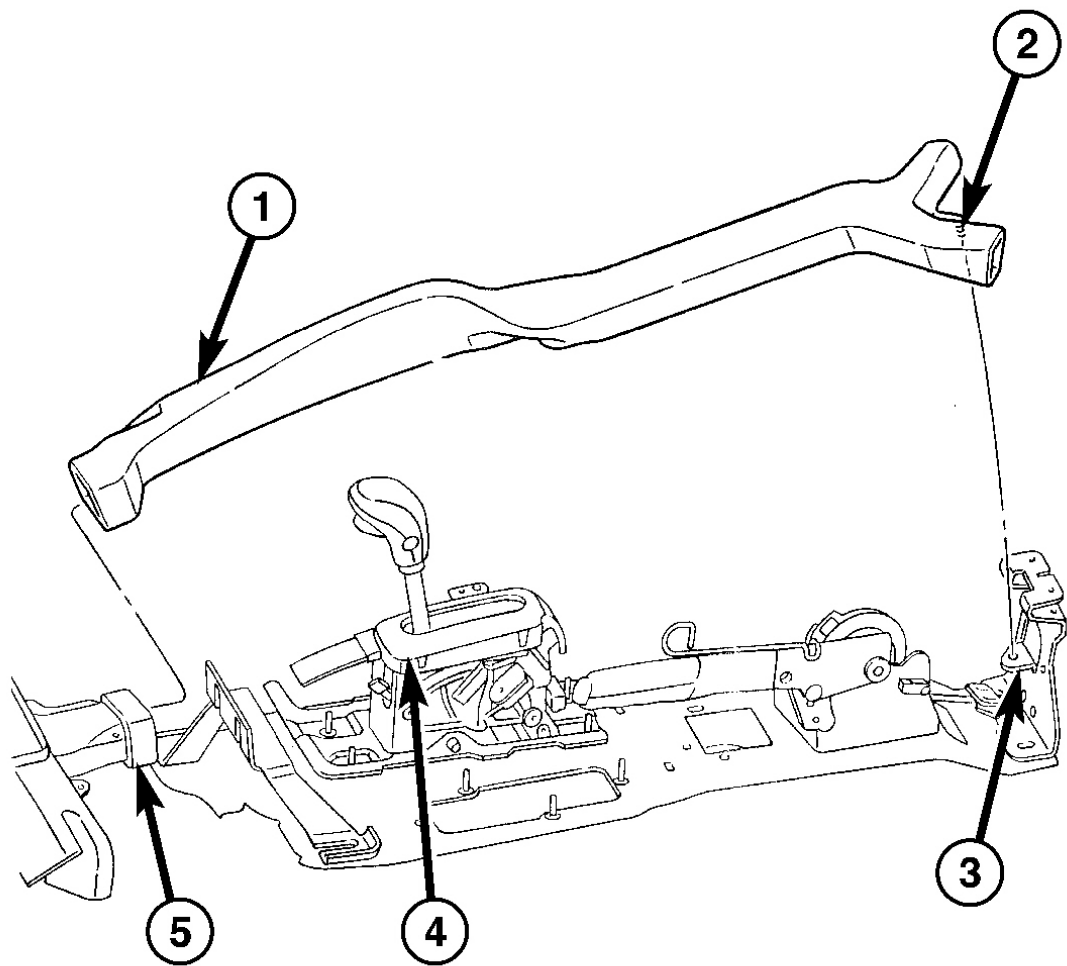
NOTE: Typical rear floor heat duct shown in graphic.

1. Remove the floor console. Refer to **REMOVAL** .
2. Remove the push-pin retainer (2) that secures the rear floor heat duct (1) to the floor console bracket (3) located behind the gear shift lever assembly (4).

3. Disconnect the rear floor heat duct from the floor distribution duct (5).
4. Remove the rear floor heat duct from the vehicle.

INSTALLATION

DUCT-REAR FLOOR HEAT



80cb41cb

Fig. 70: Rear Floor Heat Duct
Courtesy of CHRYSLER LLC

NOTE: Typical rear floor heat duct shown in graphic.

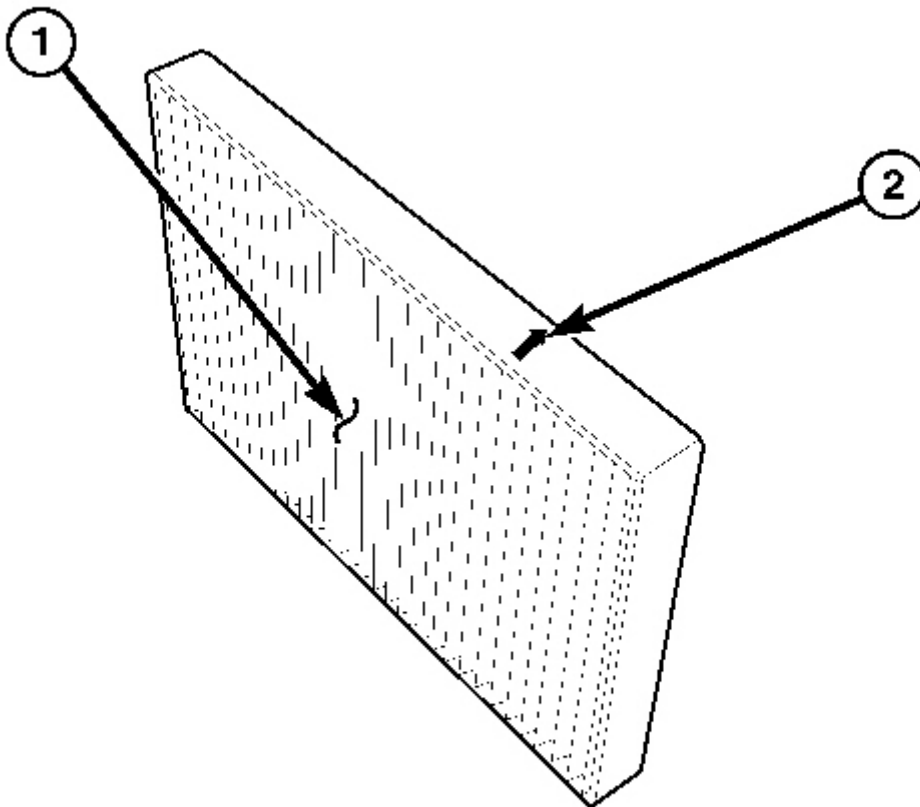
1. Position the rear floor heat duct (1) into the vehicle.

2. Connect the rear floor heat duct to the floor distribution duct (5) located in front of the gear shift lever assembly (4).
3. Install the push-pin retainer (2) that secures the rear floor heat duct to the floor console bracket (3).
4. Install the floor console. Refer to **INSTALLATION** .

FILTER-PARTICULATE AIR

DESCRIPTION

FILTER-PARTICULATE AIR



812d31e6

Fig. 71: Filter-Particulate Air Description
Courtesy of CHRYSLER LLC

Some models are equipped with a particulate air filter (1) that helps purify the outside air entering the HVAC

housing. The filter is mounted in the passenger compartment, behind the glove box bin.

The filter should be replaced at least once a year or every 24,000 km (15,000 miles) and checked if heating-A/C system performance seems lower than expected. The particulate air filter is labeled with an arrow (2) to indicate the direction of air flow through the filter.

REMOVAL

FILTER-PARTICULATE AIR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible serious or fatal injury.

WARNING: Always make sure the A/C-heater system is turned off and that the ignition switch is in the OFF position prior to servicing the particulate air filter. Never place fingers or other objects into the filter opening of the HVAC housing. Failure to follow this warning may result in serious injury.

NOTE: LHD model shown in illustrations. RHD model similar.

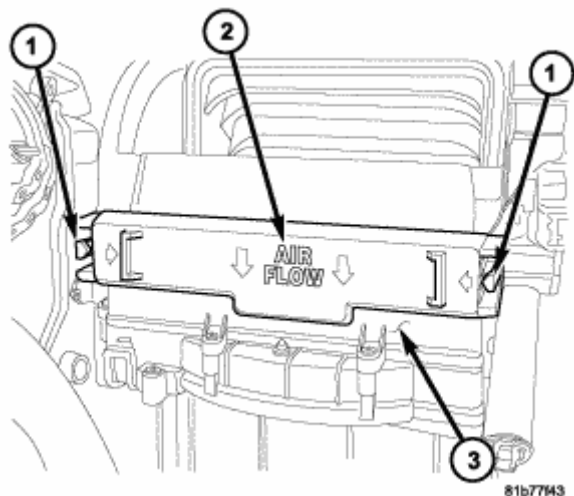


Fig. 72: Removing/Installing Particulate Filter Cover
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with instrument panel removed for clarity.

1. Remove the glove box bin. Refer to **REMOVAL** .
2. Disengage the two retaining tabs (1) that secure the particulate air filter cover (2) to the passenger side of

the HVAC housing (3) and remove the cover.

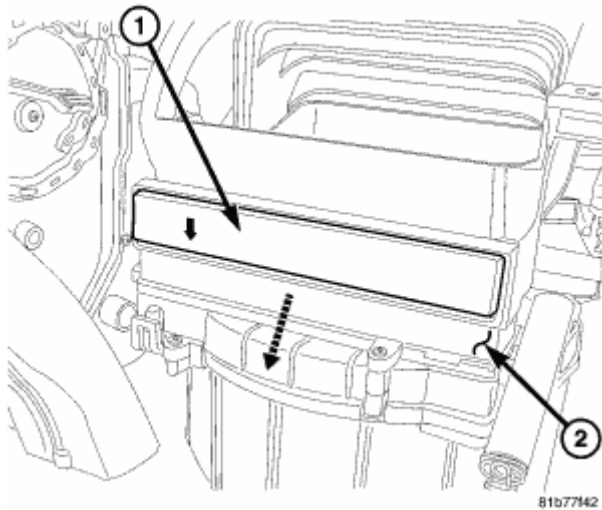


Fig. 73: Particulate Filter Removal S1
Courtesy of CHRYSLER LLC

3. Remove the particulate air filter (1) from the HVAC housing (2) by pulling the filter element straight out of the housing.

INSTALLATION

FILTER-PARTICULATE AIR

NOTE: The particulate air filter is labeled with an arrow to indicate air flow direction through the filter. Make sure to properly install the particulate air filter. Failure to properly install the filter will result in the need to replace the filter sooner than required by design.

NOTE: LHD model shown in illustrations. RHD model similar.

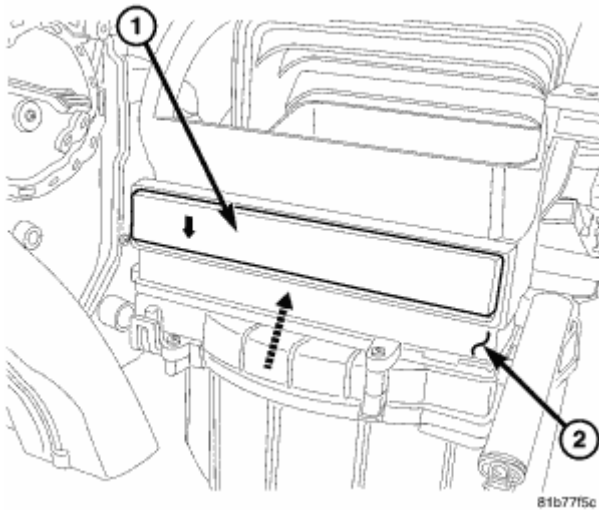


Fig. 74: Particulate Filter Install S1
Courtesy of CHRYSLER LLC

1. Install the particulate air filter (1) into the filter opening in the HVAC housing (2). Insert the particulate air filter directly into the housing with the arrow on the filter pointing to the floor.

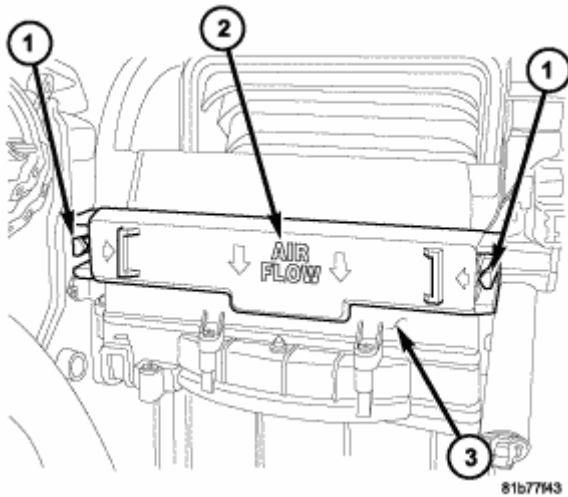


Fig. 75: Removing/Installing Particulate Filter Cover
Courtesy of CHRYSLER LLC

2. Position the particulate air filter cover (2) to the HVAC housing (3) and engage the two retaining tabs (1) that secure the cover to the housing. Make sure the retaining tabs are fully engaged.
3. Install the glove box bin. Refer to **INSTALLATION** .

HOUSING-HVAC

DESCRIPTION

HOUSING-HVAC

NOTE: LHD model shown in illustration. RHD model similar.

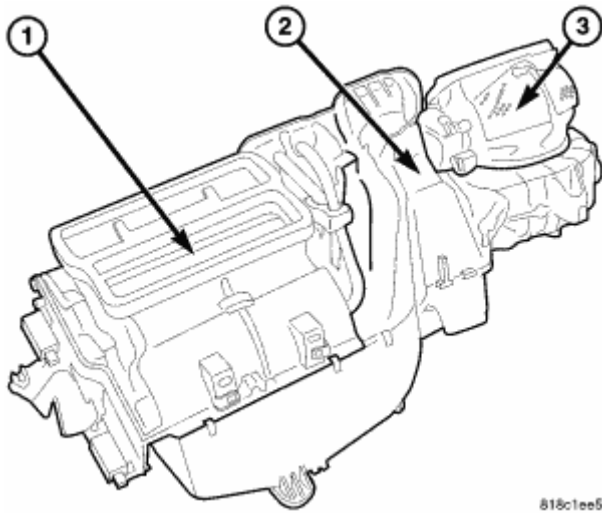


Fig. 76: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

All models are equipped with a common HVAC housing assembly that combines A/C and heating capabilities into a single unit mounted within the passenger compartment. The HVAC housing assembly consists of three separate housings:

Air distribution housing - The air distribution housing (1) is mounted to the top of the HVAC housing (2) and contains the heater core, blend-air and mode-air doors and door linkage.

Air inlet housing - The air inlet housing (3) is mounted to the passenger side end of the HVAC housing. The air inlet housing contains the recirculation-air door and actuator.

HVAC housing - The HVAC housing is mounted to the dash panel behind the instrument panel and contains the A/C evaporator. The HVAC housing consists of a upper and a lower housing that are attached together and has mounting provisions for the air inlet housing, air distribution housing, blower motor and blower motor resistor.

The heating-A/C system is a blend-air type system. The blend-air door controls the amount of conditioned air that is allowed to flow through, or around, the heater core.

The A/C system is designed for the use of a non-CFC, R-134a refrigerant and uses an A/C evaporator to cool and dehumidify the incoming air prior to blending it with the heated air. A temperature control determines the discharge air temperature by operating the temperature control cable, which moves the blend-air door. This allows an almost immediate control of the output air temperature of the system. The mode door cable operates the mode-air doors which direct the flow of the conditioned air out the various air outlets, depending on the mode selected. The recirculation door actuator operates the recirculation-air door which closes off the fresh air intake and recirculates the air already inside the vehicle. The electric recirculation door actuator and the blower motor are connected to the vehicle electrical system by the instrument panel wire harness. The blower motor controls the velocity of air flowing through the HVAC housing assembly by spinning the blower wheel within the HVAC housing at the selected speed by use of the blower motor resistor, which is located in the dash panel in the engine compartment.

The air distribution housing must be removed from the HVAC housing and disassembled for service of the blend-air and mode-air doors. The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door. The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

REMOVAL

HOUSING-AIR DISTRIBUTION

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the heater core and the blend-air and mode-air doors.

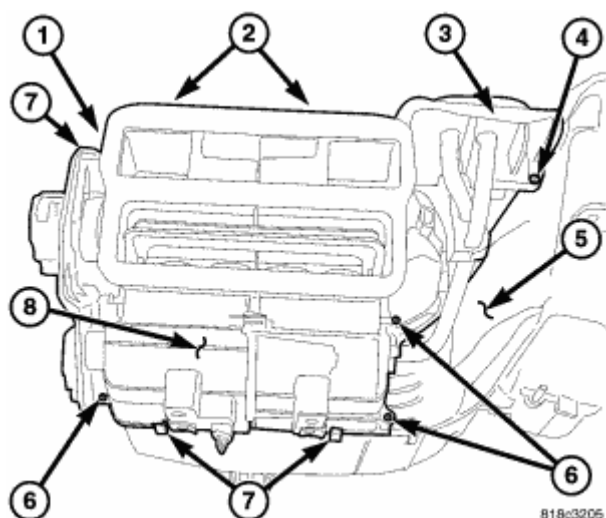


Fig. 77: Air Distribution Housing Remove/Install Components
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the HVAC housing assembly and place it on a workbench. See REMOVAL.

2. Remove the screw (4) that secures the heater core tube flange (3) to the top of the HVAC housing (5).
3. Remove the three screws (6) and three metal clips (7) that secure the air distribution housing (8) to the top of the HVAC housing.
4. Disengage the plastic retaining tab (1) that secures the front driver side of the air distribution housing to the top of the HVAC housing.
5. Tip the rear of the air distribution housing slightly upward to disengage the two plastic retaining tabs (2) that secure the front of the distribution housing to the HVAC housing and remove the distribution housing.
6. If required, disassemble the air distribution housing. See **DISASSEMBLY**.

HOUSING-AIR INLET

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door on all models.

NOTE: On RHD models, the air inlet housing must be removed from HVAC housing for service of the recirculation door actuator.

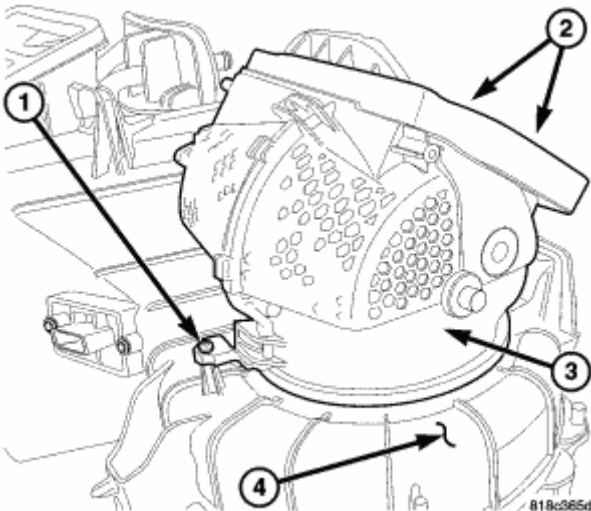


Fig. 78: Screw, Plastic Retaining Tabs, Air Inlet Housing & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: **Typical housing shown in illustration. RHD model similar.**

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the screw (1) that helps secure the rear of the air inlet housing (3) to the top of the HVAC housing (4).
3. Carefully pull the rear of the air inlet housing upward to release the inlet housing from the top of the HVAC housing and disengage the inlet housing from the two plastic retaining tabs (2) located at the front of the HVAC housing and remove the inlet housing.
4. If required, disassemble the air inlet housing. See **DISASSEMBLY**.

HOUSING-HVAC

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: **The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.**

NOTE: **LHD model shown in illustrations. RHD model similar.**

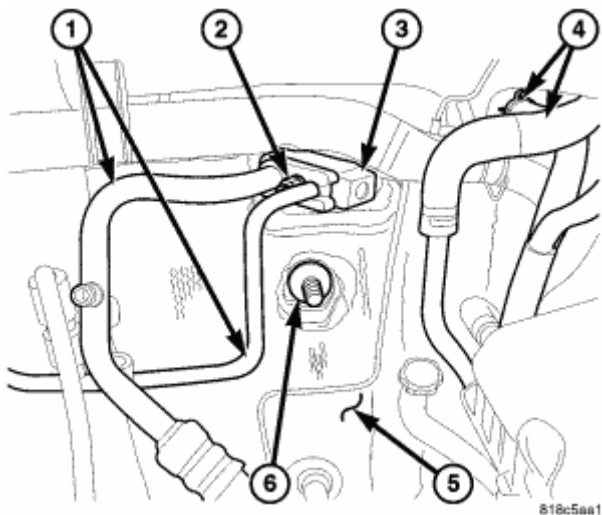


Fig. 79: Suction Line Assembly, Nuts, A/C Expansion Valve, Heater Hoses & Dash Panel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Partially drain the engine cooling system.
4. Remove the nut (2) that secures the A/C liquid and suction line assembly (1) to the A/C expansion valve (3).
5. Disconnect the A/C liquid and suction line assembly from the A/C expansion valve and remove and discard the O-ring seals.
6. Install plugs in, or tape over the opened refrigerant line fittings and the expansion valve ports.
7. Disconnect the heater hoses (4) from the heater core tubes. Install plugs in, or tape over the opened heater core tubes to prevent coolant spillage during housing removal.
8. Remove the nut (6) that secures the HVAC housing assembly to the engine compartment side of the dash panel (5).

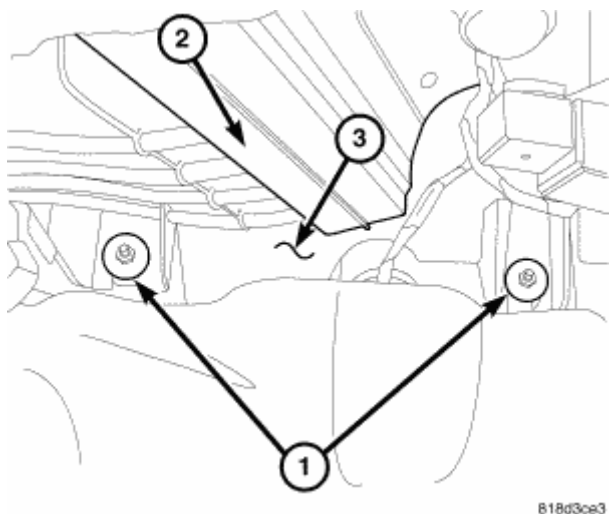


Fig. 80: Removing/Installing Nuts That Secure HVAC Housing Assembly To Passenger Side Of

Dash Panel

Courtesy of CHRYSLER LLC

9. Remove the instrument panel. Refer to **REMOVAL** .
10. Remove the rear floor duct. See **REMOVAL**.
11. Remove the two nuts (1) that secure the HVAC housing assembly (2) to the passenger side of the dash panel (3).

NOTE: Use care to ensure that the interior is covered in case of loss of residual fluids from the heater and evaporator cores.

12. Pull the HVAC housing assembly rearward and remove the housing from the passenger compartment.

SCREEN-AIR INLET

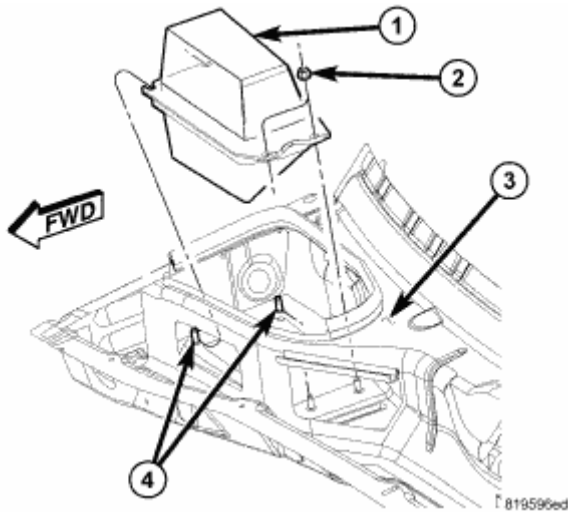


Fig. 81: Air Inlet Screen, Nuts, Cowl Panel & Retaining Studs
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the cowl grille. Refer to **REMOVAL** .
2. Remove the two nuts (2) that secure the air inlet screen (1) to the cowl panel (3).
3. Slide the air inlet screen inward to disengage the screen from the two retaining studs (4) and pull the screen straight up to remove it from the cowl.

DISASSEMBLY

HOUSING-AIR DISTRIBUTION

WARNING: The heater core tubes are not serviced separately from the heater core.
The heater core tubes should not be repositioned, loosened or removed

from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the heater core and the mode-air and blend-air doors.

NOTE: LHD model shown in illustrations. RHD model similar.

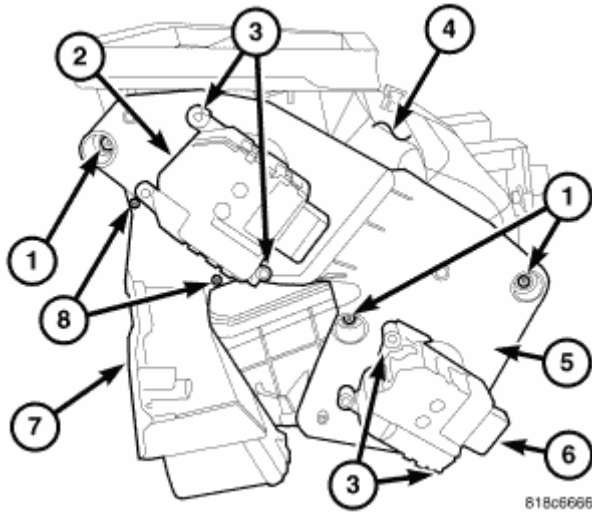


Fig. 82: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air distribution housing (4) from the HVAC housing. See **REMOVAL**.
3. Remove the screws (3) that secure the mode door actuator (2) and the blend door actuator (6) to the actuator mounting bracket (5) located on the driver side of the air distribution housing and remove the actuators.
4. Remove the three screws (1) that secure the actuator mounting bracket to the air distribution housing and remove the bracket.
5. Remove the two screws (8) that secure the driver side front floor duct (7) to the air distribution housing and remove the duct

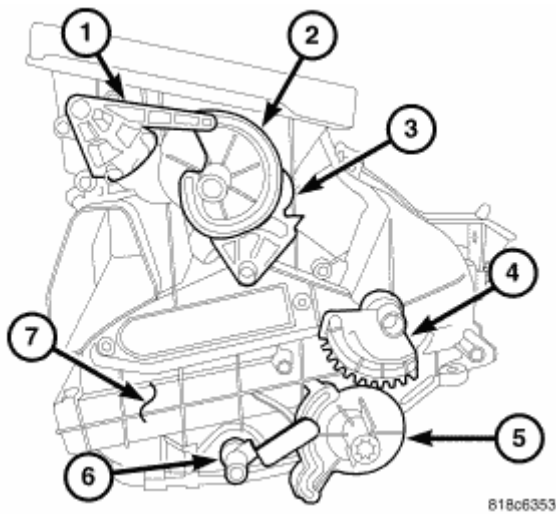


Fig. 83: Removing/Installing Defrost Door Lever/Gear Assembly, Mode Door Cam, Panel Door Gear, Blend Door Gear, Blend Door Lever And Blend Door Cam From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

6. Remove the defrost door lever and gear assembly (1), mode door cam (2), panel door gear (3), blend door gear (4), blend door lever (6) and the blend door cam (5) from the driver side of the air distribution housing (7).
7. If equipped with the 2.8L diesel engine, remove the electric positive temperature coefficient (PTC) heater unit from the air distribution housing. See **REMOVAL**.

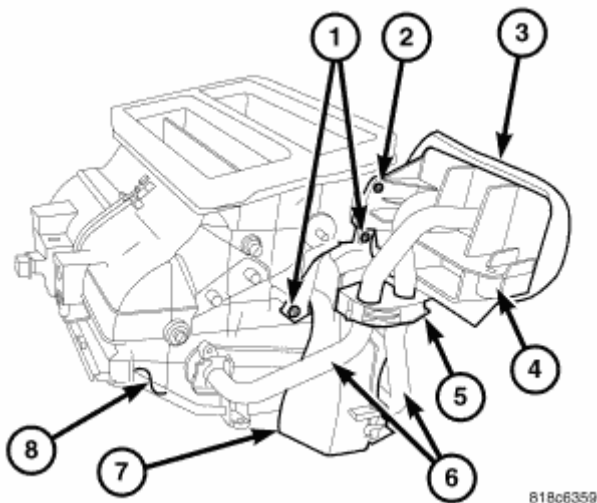


Fig. 84: Air Distribution Housing Assembly

Courtesy of CHRYSLER LLC

8. Remove the two screws (1) that secure the upper front passenger side floor duct (7) to the passenger side of the air distribution housing (8) and remove the duct.

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it

must be replaced.

9. Carefully remove the foam seal (3) from the heater core tube flange (4). If the seal is deformed or damaged, it must be replaced.
10. Remove the screw (2) that secures the heater core tube flange to the air distribution housing.
11. Disengage the plastic retainer (5) from around the heater core tubes (6) and remove the flange.

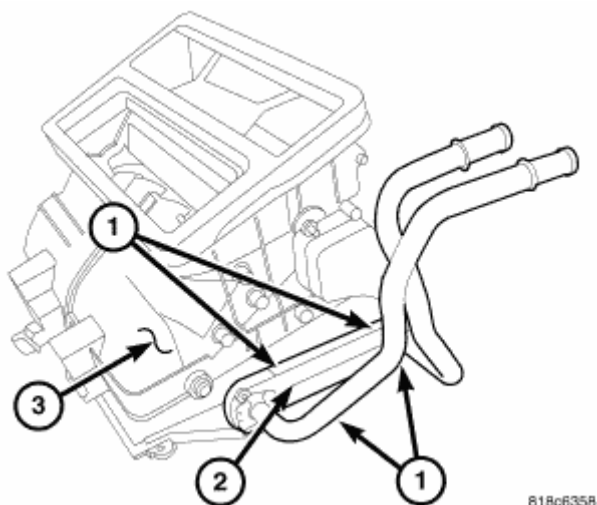


Fig. 85: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

12. Disengage the four plastic retaining tabs (1) that secure the heater core (2) to the passenger side of the air distribution housing (3) and carefully remove the heater core from the housing.

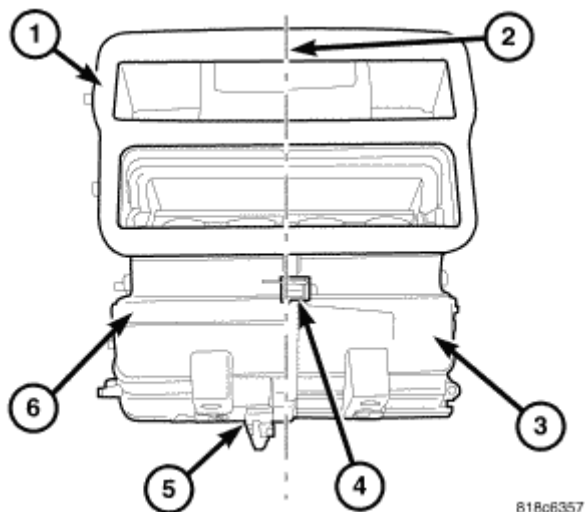
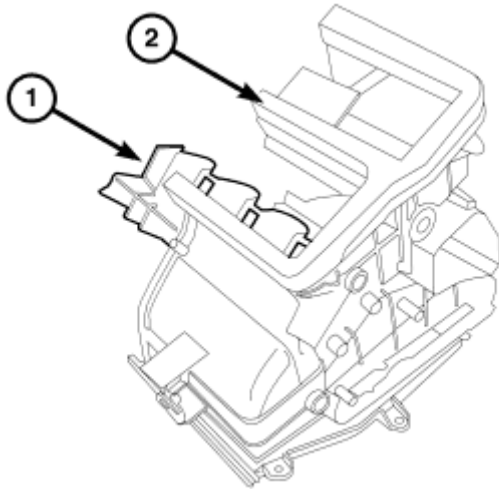


Fig. 86: Foam Seal, Parting Line, Air Distribution Housing, Parting Line, Plastic Retaining Tabs &

Screw

Courtesy of CHRYSLER LLC

13. Carefully cut the foam seal (1) along the parting line (2) of the two halves of the air distribution housing (3 and 6). If the seal is deformed or damaged, it must be replaced.
14. Remove the screw (5) that secures the two halves of the air distribution housing together located on the bottom of the housing, near the center.
15. Disengage the four plastic retaining tabs (4) and carefully separate the two halves of the air distribution housing.

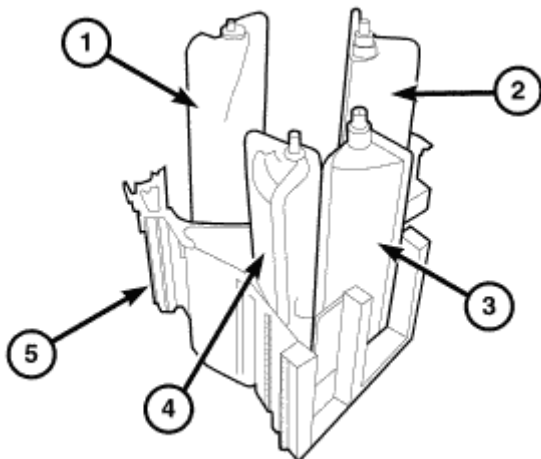


818c6355

Fig. 87: Air Deflector Vane Assembly & Air Distribution Housing

Courtesy of CHRYSLER LLC

16. Remove the air deflector vane assembly (1) from the passenger side of the air distribution housing (2). Disengage the two plastic retaining tabs (1) and slide the vane straight out of the housing.



818c6354

Fig. 88: Removing/Installing Floor-Air Door, Blend-Air Door, Panel-Air Door And Defrost-Air Door From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

NOTE: If the seal on any air door is deformed or damaged, that air door must be replaced.

17. Remove the floor-air door (1), blend-air door (2), panel-air door (3) and the defrost-air door (4) from the driver side of the air distribution housing (5) as required.

HOUSING-AIR INLET

NOTE: The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door.

NOTE: LHD model shown in illustrations. RHD model similar.

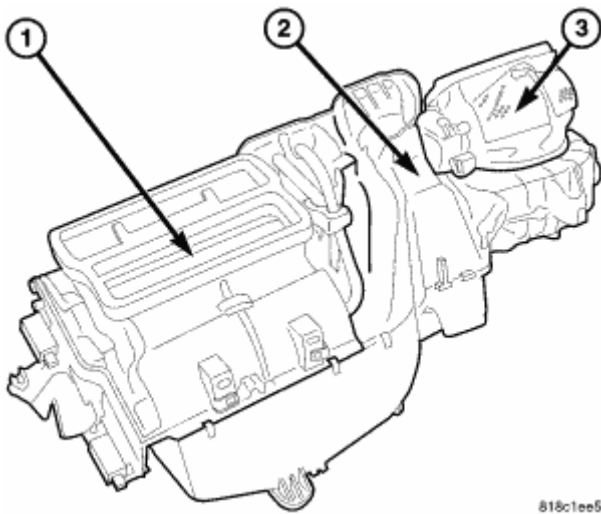


Fig. 89: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air inlet housing (3) from the HVAC housing (2). See **REMOVAL**.

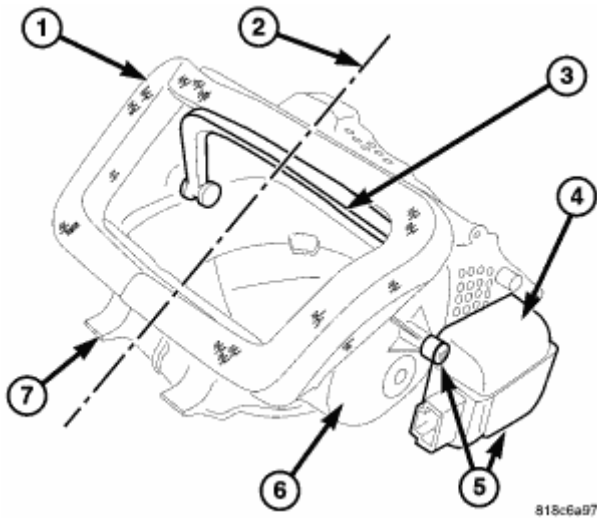


Fig. 90: Foam Seal, Parting Line, Recirculation-Air Door, Recirculation Door Actuator, Screws & Air Inlet Housing

Courtesy of CHRYSLER LLC

NOTE: If the foam seal on top of the air inlet housing is deformed or damaged, it must be replaced.

3. Carefully cut the foam seal (1) along the parting line (2) of the two halves of the air inlet housing (6 and 7). If the seal is deformed or damaged, it must be replaced.
4. Remove the two screws (5) that secure the recirculation door actuator (4) to the air inlet housing and remove the actuator.

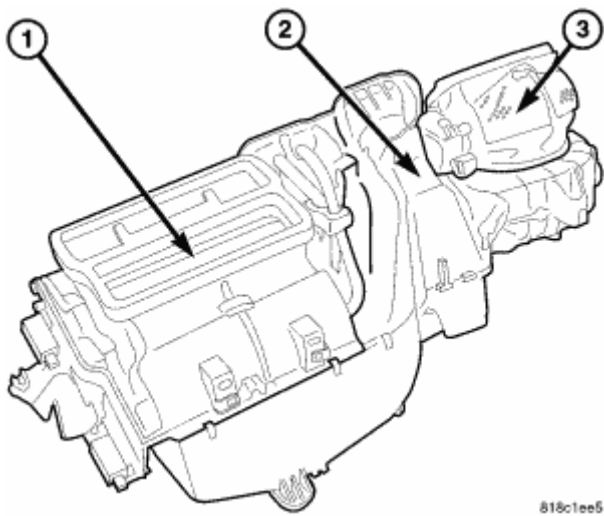
NOTE: If a rubber seal on the recirculation air-door is deformed or damaged, the air-door must be replaced.

5. Carefully disengage the three plastic retaining tabs that secure the two halves of the air inlet housing together and remove the recirculation-air door (3) from the inlet housing. If the seal on the recirculation-air door is deformed or damaged, the air-door must be replaced.

HOUSING-HVAC

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

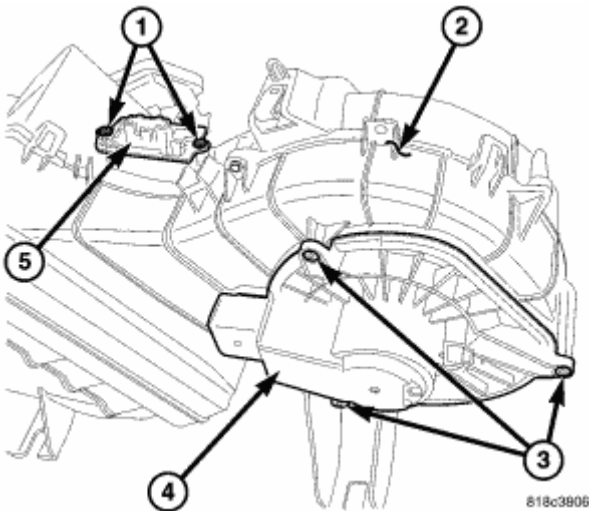
NOTE: LHD model shown in illustrations. RHD model similar.



818c1ee5

Fig. 91: Air Distribution Housing, HVAC Housing & Air Inlet Housing
 Courtesy of CHRYSLER LLC

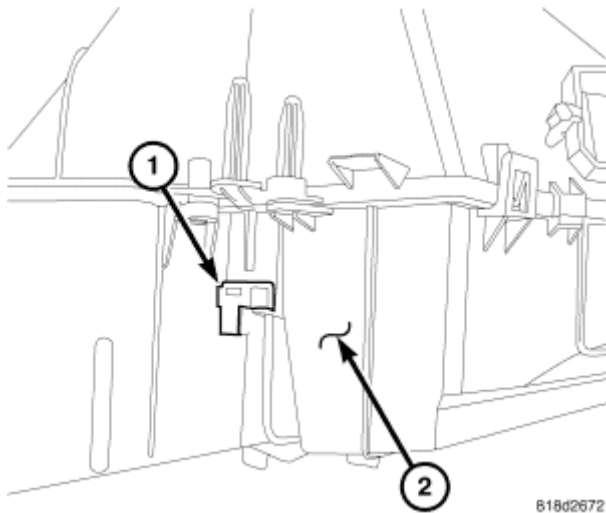
1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air distribution housing (1) from the HVAC housing (2). See **REMOVAL**.
3. Remove the air inlet housing (3) from the HVAC housing. See **REMOVAL**.
4. Remove the passenger side lower front floor duct. See **REMOVAL**.



818c3806

Fig. 92: Screws, HVAC Housing, Blower Motor & Blower Motor Resistor
 Courtesy of CHRYSLER LLC

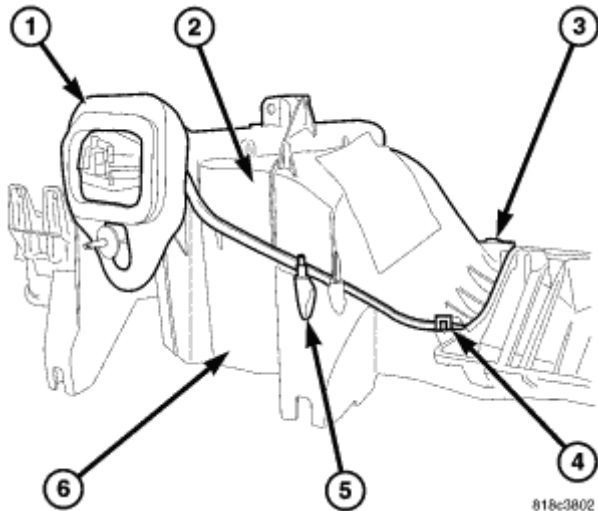
5. Remove the two screws (1) that secure the blower motor resistor (5) to the rear of the HVAC housing (2) and remove the resistor.
6. Remove the three screws (3) that secure the blower motor (4) to the bottom of the HVAC housing and remove the blower motor.



818d2672

Fig. 93: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
Courtesy of CHRYSLER LLC

7. Remove the evaporator temperature sensor (1) from the front of the HVAC housing (2).



818c3802

Fig. 94: Foam Seal, HVAC Housing, Screws, Plastic Retaining Tabs & Metal Clips
Courtesy of CHRYSLER LLC

NOTE: If the foam seal for the flange is deformed or damaged, it must be replaced.

8. Carefully remove the foam seal (1) from the front of the two halves of the HVAC housing (2 and 6). If the seal is deformed or damaged, it must be replaced.

NOTE: Be sure to remove the screws that secure the two halves of the HVAC housing together located at the bottom of the HVAC housing.

9. Remove the seven screws (5) and two metal clips (4) that secure the two halves of the HVAC housing

together.

10. Disengage the four plastic retaining tabs (4) that secure the two halves of the HVAC housing together and separate the housing halves.

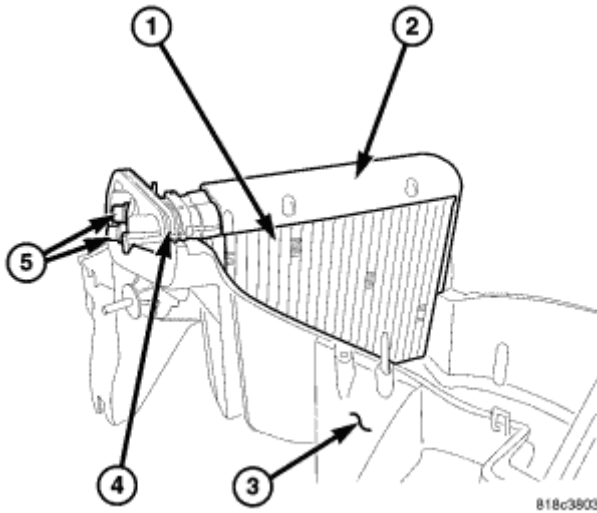


Fig. 95: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the A/C evaporator is deformed or damaged, the insulator must be replaced.

11. Carefully lift the A/C evaporator (1) and the foam insulator (2) out of the lower half of the HVAC housing (3).

NOTE: If the rubber seal around the evaporator tubes and tapping block is deformed or damaged, the seal must be replaced.

12. If required, remove the rubber seal (4) from around the evaporator tubes and tapping block (5).

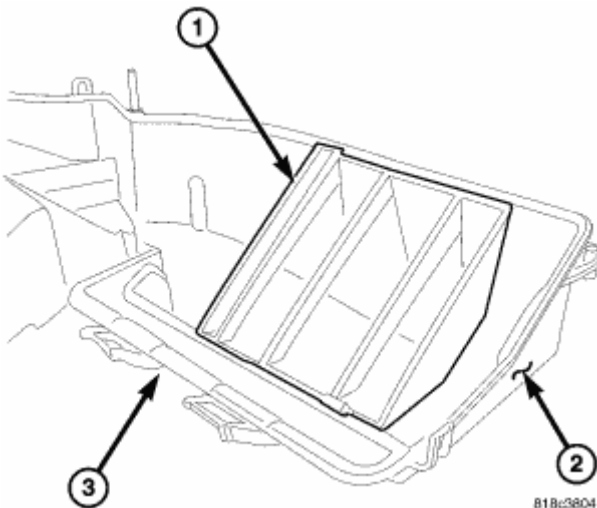


Fig. 96: Air Deflector Vane, HVAC Housing & Foam Seal
Courtesy of CHRYSLER LLC

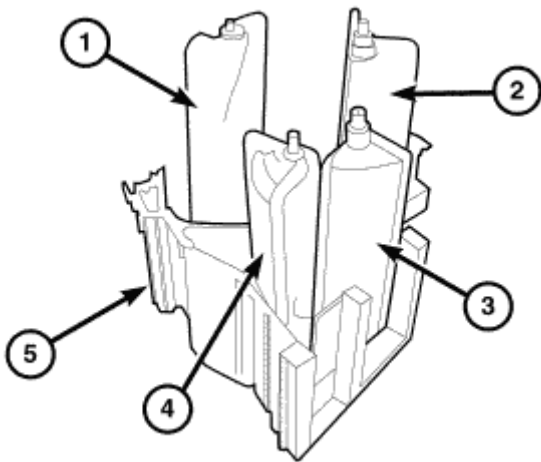
13. Disengage the retainers that secure the air deflector vane (1) to the lower half of the HVAC housing (2) and remove the deflector vane.
14. If required, remove the foam seal (3) from around the condensate drain located at the bottom of the HVAC housing.

ASSEMBLY

HOUSING-AIR DISTRIBUTION

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

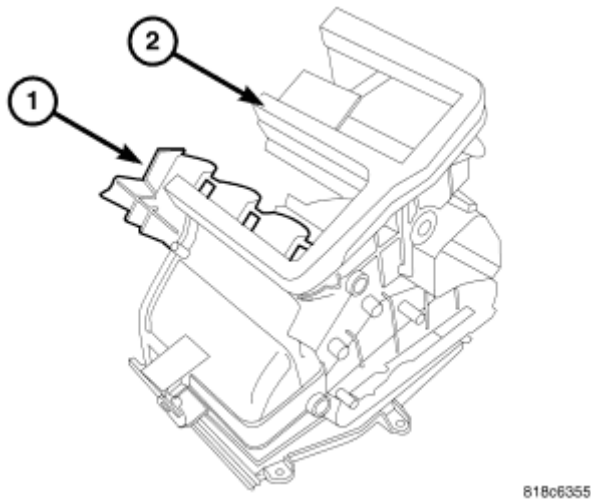


818c6354

Fig. 97: Removing/Installing Floor-Air Door, Blend-Air Door, Panel-Air Door And Defrost-Air Door From Driver Side Of Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the seal on any air door is deformed or damaged, that air door must be replaced.

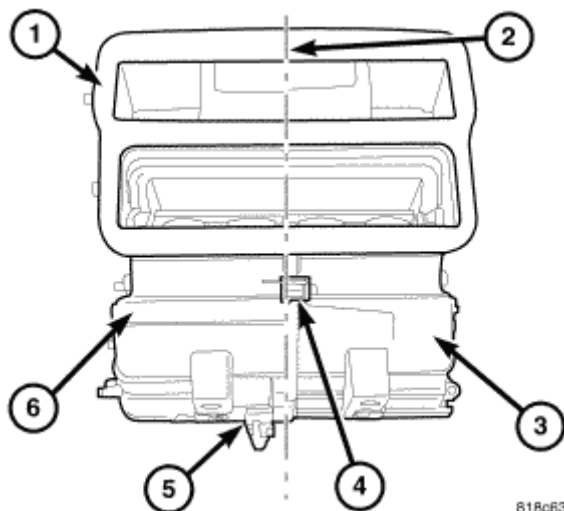
1. Install the floor-air door (1), blend-air door (2), panel-air door (3) and the defrost-air door (4) into the driver side of the air distribution housing (5) as required. Align the air door pivot shafts with the holes in the housing.



818c6355

Fig. 98: Air Deflector Vane Assembly & Air Distribution Housing
Courtesy of CHRYSLER LLC

2. Install the air deflector vane assembly (1) into the passenger side of the air distribution housing (2). Slide the vane assembly into the track in the housing and engage the two plastic retaining tabs. Make sure the retaining tabs are fully engaged.



818c6357

Fig. 99: Foam Seal, Parting Line, Air Distribution Housing, Parting Line, Plastic Retaining Tabs & Screw
Courtesy of CHRYSLER LLC

3. Align the air door pivot shafts with the holes in the passenger side of the air distribution housing (3) and carefully install passenger side of the air distribution housing (1) onto the driver side of the housing.
4. Engage the four plastic retaining tabs (4) that secure the two halves of the air distribution housing together. Make sure the retaining tabs are fully engaged.
5. Install the retaining screw (5) that secures the two halves of the air distribution housing together at the bottom of the housing, near the center. Tighten the screw to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal on top of the air distribution housing is deformed or damaged, it must be replaced.

6. Inspect the foam seal (1), especially along the parting line (2) of the two halves of the air distribution housing. Replace the seal if it is deformed or damaged.

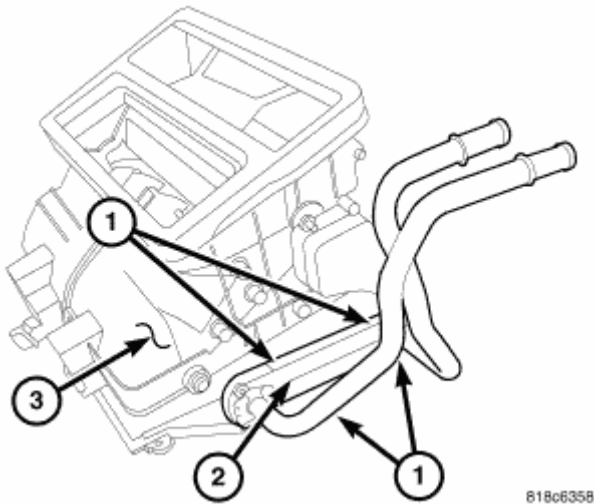


Fig. 100: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

7. Carefully install the heater core (2) into the passenger side of the air distribution housing (3) and engage the four plastic retainer tabs (1) that secure the heater core to the housing. Make sure the retaining tabs are fully engaged.

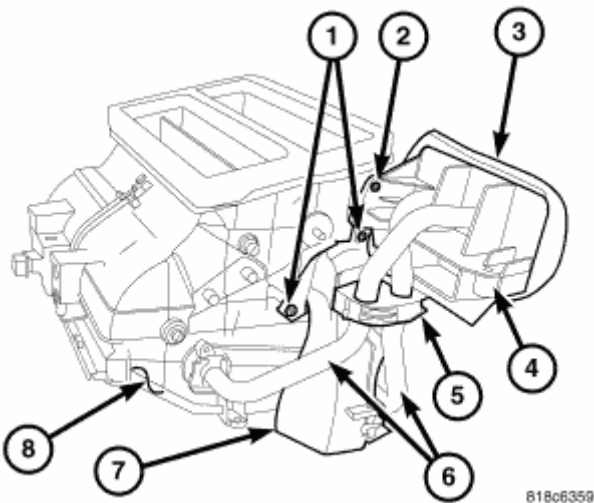
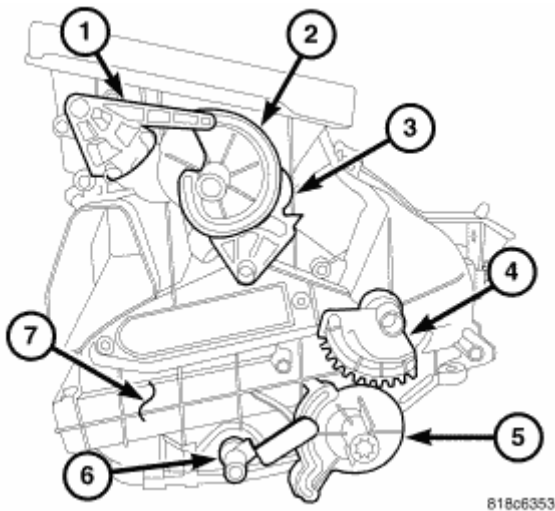


Fig. 101: Air Distribution Housing Assembly
Courtesy of CHRYSLER LLC

8. Position the heater core tube flange (4) over the heater core tubes (6) and onto the to the passenger side of the air distribution housing (8).
9. Engage the plastic retainer (5) around the heater core tubes. Make sure the retainer is fully engaged.
10. Install the screw (2) that secures the heater core tube flange to the air distribution housing. Tighten the screw to 1.2 N.m (10 in lbs.).
11. Install the upper front passenger side floor duct (7) onto the air distribution housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: **If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.**

12. Install the foam seal (3) onto the heater core tube flange.



618c6353

Fig. 102: Removing/Installing Defrost Door Lever/Gear Assembly, Mode Door Cam, Panel Door Gear, Blend Door Gear, Blend Door Lever And Blend Door Cam From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

13. If equipped with the 2.8L diesel engine, install the electric positive temperature coefficient (PTC) heater unit. See **INSTALLATION**.
14. Install the blend door cam (5), blend door lever (6), blend door gear (4), panel door gear (3), mode door cam (2), and the defrost door lever and gear assembly (1) onto the driver side of the air distribution housing (7).

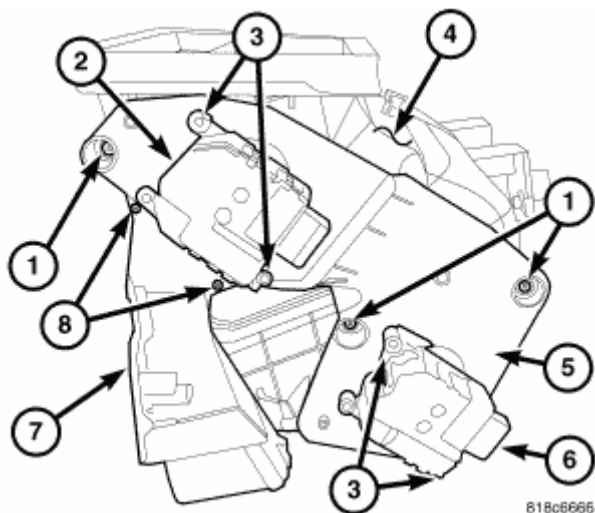


Fig. 103: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

15. Install the driver side front floor duct (7) onto the driver side of the air distribution housing (4) and install the two retaining screws (8). Tighten the screws to 1.2 N.m (10 in lbs.).
16. Position the actuator mounting bracket (5) onto the air distribution housing and install the three retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
17. Position the mode door actuator (2) and the blend door actuator (6) onto the actuator mounting bracket. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those on the door linkage.
18. Install the screws (3) that secure the mode and blend door actuators to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
19. Install the air distribution housing onto the HVAC housing. See **INSTALLATION**.
20. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-AIR INLET

NOTE: LHD model shown in illustrations. RHD model similar.

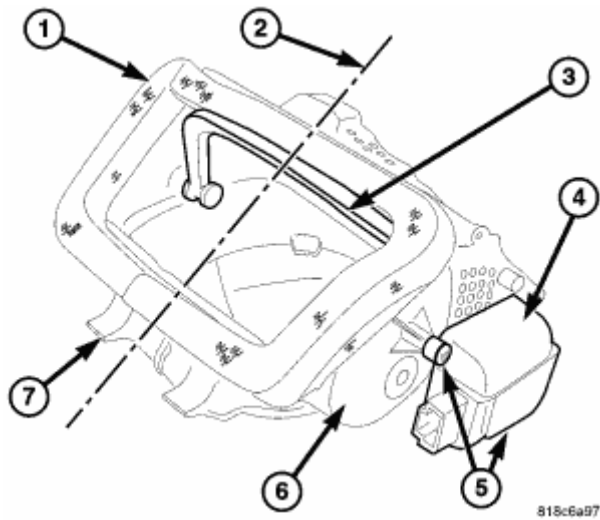


Fig. 104: Foam Seal, Parting Line, Recirculation-Air Door, Recirculation Door Actuator, Screws & Air Inlet Housing

Courtesy of CHRYSLER LLC

NOTE: If a rubber seal on the recirculation air-door is deformed or damaged, the air-door must be replaced.

1. Install the recirculation-air door (3) into the two halves of the air inlet housing (6 and 7). Align the air door pivot shaft with the holes in the housing halves.
2. Carefully install the two halves of the air inlet housing together and engage the three plastic retaining tabs. Make sure the retaining tabs are fully engaged.
3. Position the recirculation door actuator (4) to the air inlet housing. Make sure the actuator output shaft is properly aligned to the recirculation door pivot shaft. If necessary, rotate the actuator slightly to engage the splines on the output shaft with those in the pivot shaft.
4. Install the two screws (5) that secure the recirculation door actuator to the air inlet housing. Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal on top of the air inlet housing is deformed or damaged, it must be replaced.

5. Inspect the foam seal (1), especially along the parting line (2) of the two halves of the air inlet housing. Replace the seal if it is deformed or damaged.

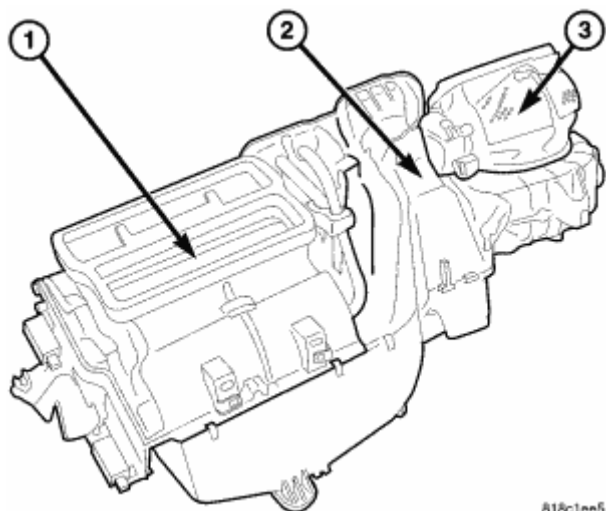


Fig. 105: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

6. Install the air inlet housing (3) onto the HVAC housing (2). See **INSTALLATION**.
7. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-HVAC

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: LHD model shown in illustrations. RHD model similar.

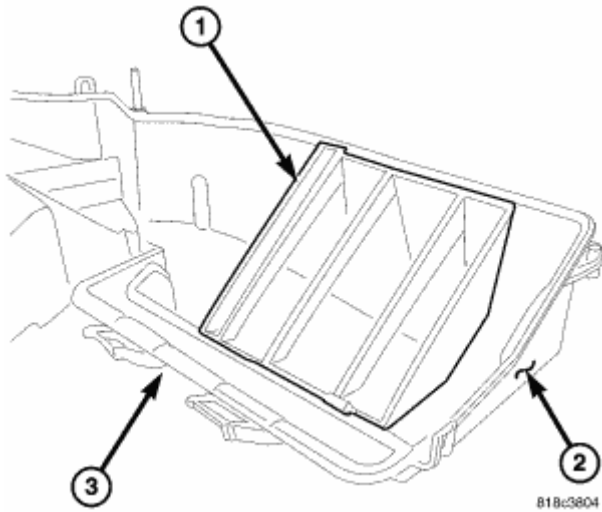


Fig. 106: Air Deflector Vane, HVAC Housing & Foam Seal
 Courtesy of CHRYSLER LLC

1. If removed, install the foam seal (3) onto the condensate drain located at the bottom of the HVAC housing (2).
2. Install the air deflector vane (1) into the lower half of the HVAC housing. Make sure the retainers are fully engaged.

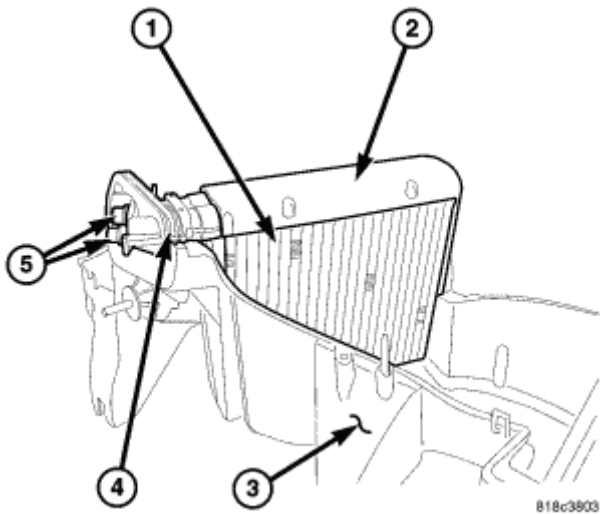


Fig. 107: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
 Courtesy of CHRYSLER LLC

NOTE: Make sure the rubber seal for the evaporator tubes and tapping block is properly positioned in the HVAC housing opening.

3. If removed, install the rubber seal (4) over the evaporator tubes and tapping block (5).

NOTE: Make sure that the foam insulator around the A/C evaporator is properly positioned within the HVAC housing.

- Carefully install the A/C evaporator (1) and foam insulator (2) into the lower half of the HVAC housing (3).

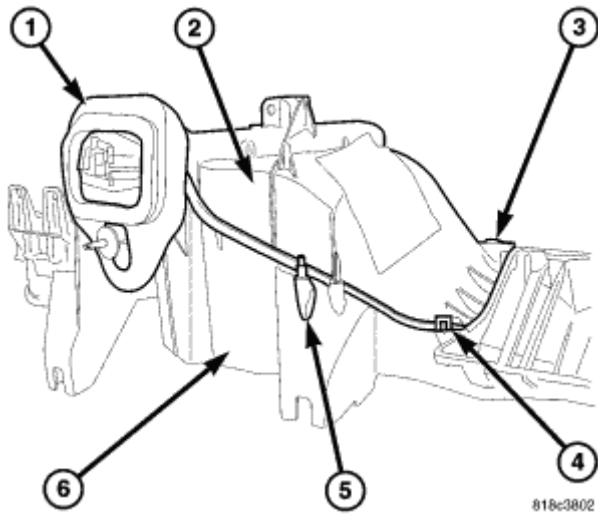


Fig. 108: Foam Seal, HVAC Housing, Screws, Plastic Retaining Tabs & Metal Clips
Courtesy of CHRYSLER LLC

- Install the two halves of the HVAC housing (2 and 6) together and engage the four plastic retaining tabs (4). Make sure the retaining tabs are fully engaged.

NOTE: Be sure to install the screws that secure the two halves of the HVAC housing together located at the bottom of the HVAC housing.

- Install the seven screws (5) and two metal clips (3) that secure the two halves of the HVAC housing together. Tighten the screws to 1.2 N.m (10 in lbs.). Make sure the metal clips are fully engaged to the housing halves.
- Install the foam seal (1) onto the front of the two HVAC housing halves.

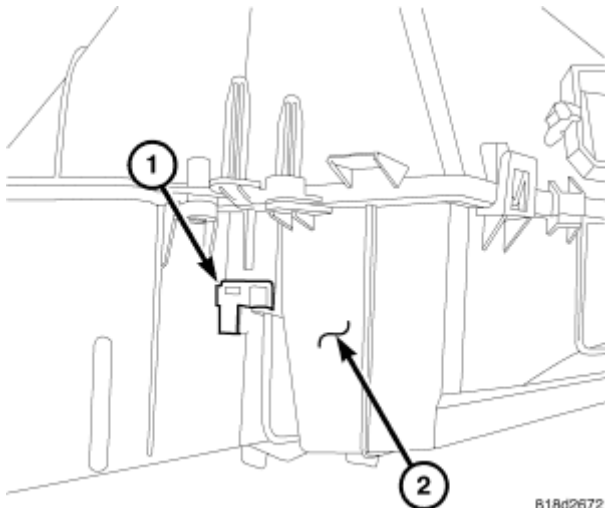


Fig. 109: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing

Courtesy of CHRYSLER LLC

8. Install the evaporator temperature sensor (1) into the front of the HVAC housing (2). Make sure the sensor is fully engaged to the housing.

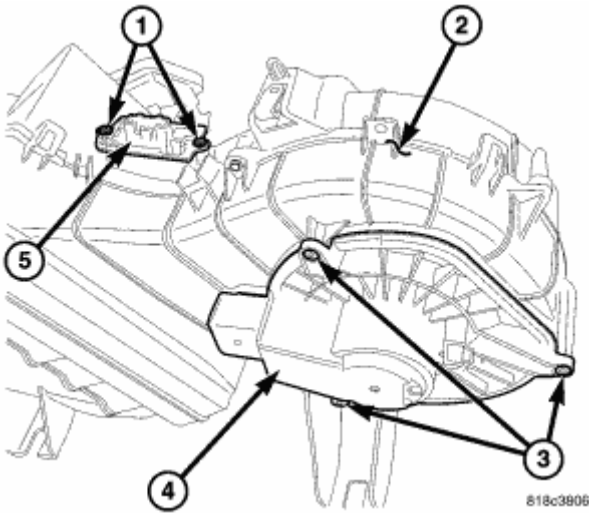


Fig. 110: Screws, HVAC Housing, Blower Motor & Blower Motor Resistor
Courtesy of CHRYSLER LLC

9. Position the blower motor (4) into the bottom of the HVAC housing (2) and install the three retaining screws (3). Tighten the screws to 1.2 N.m (10 in. lbs.).
10. Position the blower motor resistor (5) into the HVAC housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in. lbs.).

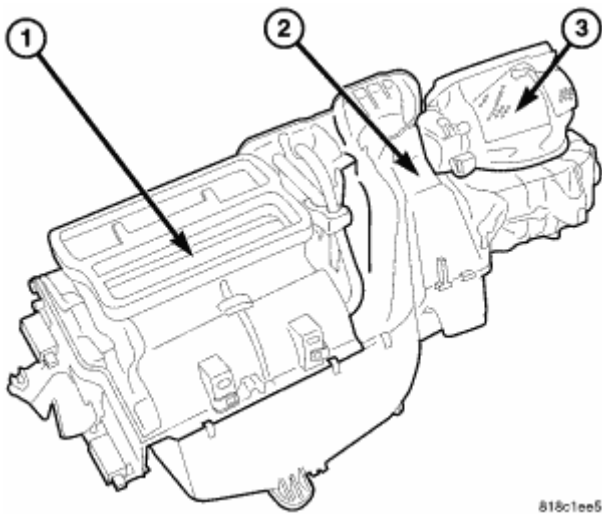


Fig. 111: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

11. Install the air inlet housing (3) onto the HVAC housing (2). See **INSTALLATION**.
12. Install the air distribution housing (1) onto the HVAC housing. See **INSTALLATION**.

13. Install the passenger side lower front floor duct. See **INSTALLATION**.

NOTE: **If the heater core is being replaced, flush the cooling system. Refer to STANDARD PROCEDURE .**

14. Install the HVAC housing assembly. See **INSTALLATION**.

15. If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

INSTALLATION

HOUSING-AIR DISTRIBUTION

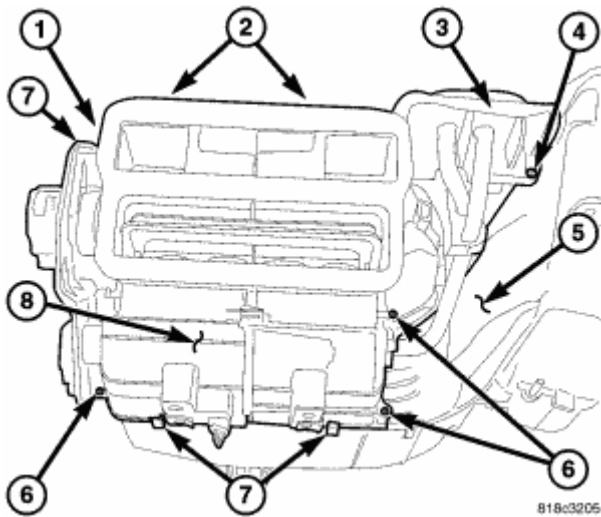


Fig. 112: Air Distribution Housing Remove/Install Components
Courtesy of CHRYSLER LLC

NOTE: **LHD model shown in illustration. RHD model similar.**

1. Position the air distribution housing (8) onto the top of the HVAC housing (5) and engage the two plastic retaining tabs (2) that secure the front of the distribution housing to the HVAC housing.
2. Engage the plastic retaining tab (1) that secures the front driver side of the air distribution housing to the HVAC housing. Make sure the passenger side floor ducts are properly connected to each other.
3. Install the three metal retaining clips (7) and three screws (6) that secure the air distribution housing to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).

NOTE: **If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.**

4. Install the screw (4) that secures the heater core tube flange (3) to the top of the HVAC housing. Tighten the screw to 1.2 N.m (10 in. lbs.).

NOTE: If the heater core is being replaced, flush the cooling system. Refer to **STANDARD PROCEDURE** .

5. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-AIR INLET

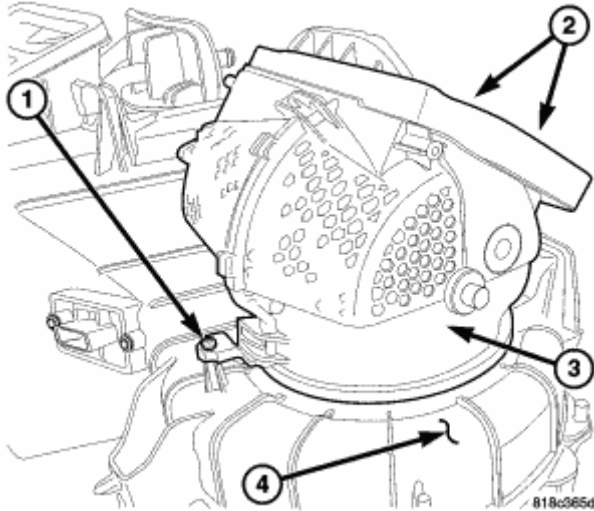


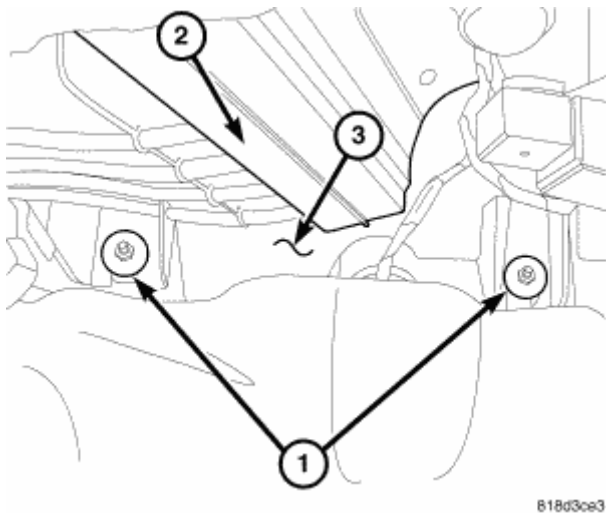
Fig. 113: Screw, Plastic Retaining Tabs, Air Inlet Housing & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: Typical housing shown in illustration. RHD model similar.

1. Position the air inlet housing (3) to the top of the HVAC housing (4) and engage the front of the inlet housing to the two plastic retaining tabs (2) located on the top of the HVAC housing.
2. Firmly push down on the rear of the air inlet housing and engage the inlet housing to the HVAC housing. Make sure the two housings are fully engaged to each other.
3. Install the screw (1) that helps secure the rear of the air inlet housing to the HVAC housing. Tighten the screw to 1.2 N.m (10 in. lbs.).
4. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-HVAC

NOTE: LHD model shown in illustrations. RHD model similar.

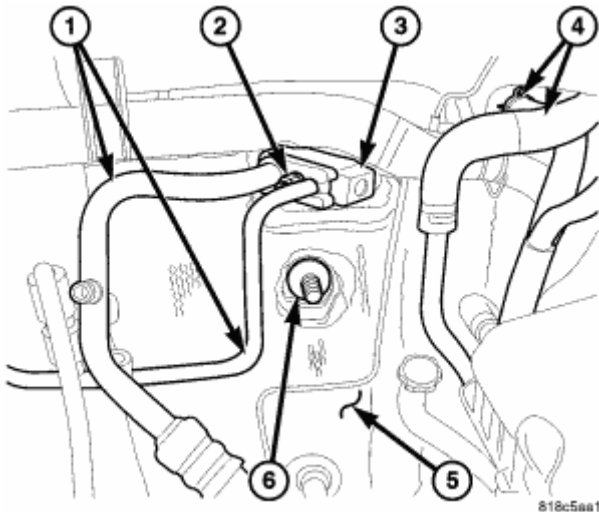


818d3ce3

Fig. 114: Removing/Installing Nuts That Secure HVAC Housing Assembly To Passenger Side Of Dash Panel

Courtesy of CHRYSLER LLC

1. Position the HVAC housing assembly (2) to the passenger side of the dash panel (3). Be certain that the housing is correctly located over the two dash panel mounting studs.
2. Install the two nuts (1) that secure the HVAC housing assembly to the dash panel. Tighten the nuts to 4.5 N.m (40 in. lbs.).
3. Install the rear floor duct. See **INSTALLATION**.
4. Install the instrument panel. Refer to **INSTALLATION**.



818c5aa1

Fig. 115: Suction Line Assembly, Nuts, A/C Expansion Valve, Heater Hoses & Dash Panel

Courtesy of CHRYSLER LLC

5. Install the nut (6) that secures the HVAC housing assembly to the engine compartment side of the dash panel (5). Tighten the nut to 4.5 N.m (40 in. lbs.).
6. Remove the previously installed plugs or caps and connect the heater hoses (4) to the heater core tubes.

7. Remove the tape or plugs from the refrigerant line fittings and the expansion valve ports.
8. Lubricate new rubber O-rings with clean refrigerant oil and install them onto the liquid and suction line fittings. Use only the specified O-ring seals as they are made of special materials compatible to the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
9. Connect the A/C liquid and suction line assembly (1) to the A/C expansion valve (3).
10. Install the nut (2) that secures the A/C liquid and suction line assembly to the A/C expansion valve. Tighten the nut to 23 N.m (17 ft. lbs.).
11. Reconnect the negative battery cable.
12. If the heater core is being replaced, flush the cooling system. Refer to **STANDARD PROCEDURE** .
13. Refill the engine cooling system. Refer to **STANDARD PROCEDURE** .
14. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.
16. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

SCREEN-AIR INLET

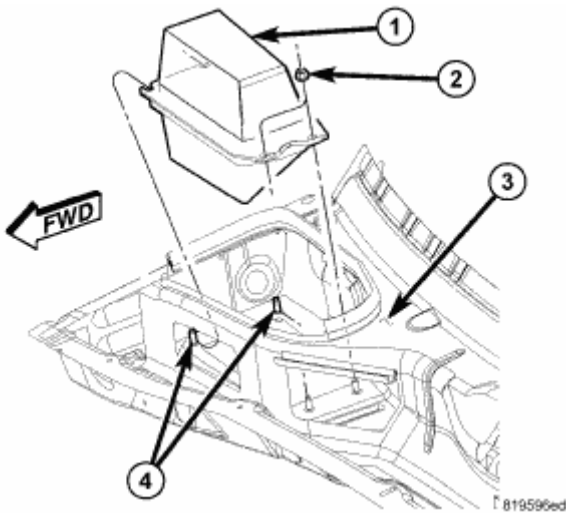


Fig. 116: Air Inlet Screen, Nuts, Cowl Panel & Retaining Studs
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the air inlet screen (1) into the cowl panel (3) and fully engage the screen onto the two retaining studs (4).
2. Install the air inlet screen onto the cowl panel and install the two retaining nuts (4). Tighten the nuts to 2.3 N.m (20 in. lbs.).
3. Install the cowl grille. Refer to **INSTALLATION** .

MOTOR-BLOWER

DESCRIPTION

MOTOR-BLOWER

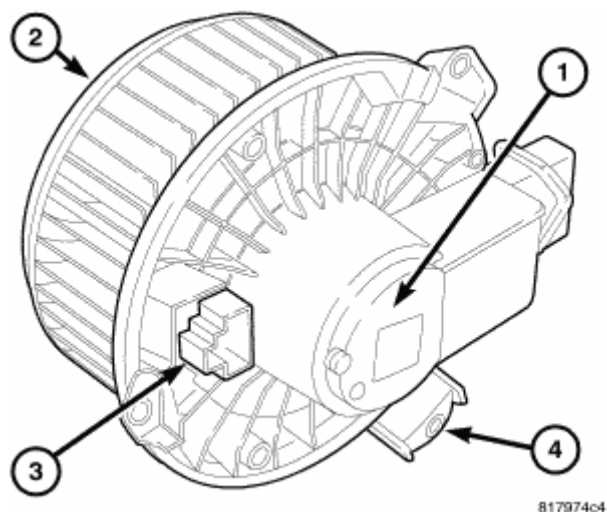


Fig. 117: Identifying Blower Motor
Courtesy of CHRYSLER LLC

NOTE: Typical blower motor shown in graphic,

The blower motor (1) is a 12-volt, direct current (DC) motor mounted within a plastic housing with three integral mounting tabs (4), an integral wire harness connector (3) and a squirrel cage-type blower wheel (2) that is secured to the blower motor shaft. The blower motor wheel is positioned within the HVAC air inlet housing, which is mounted to the passenger side end of the HVAC housing.

The blower motor can be accessed for service from underneath the instrument panel.

OPERATION

MOTOR-BLOWER

The blower motor is used to control the velocity of air moving through the HVAC housing by spinning the blower wheel within the HVAC air inlet housing at the selected speed.

The blower motor will operate whenever the ignition switch is in the Run position and the blower motor control is in any position except Off. The blower motor receives battery current through the totally integrated power module (TIPM) whenever the ignition switch is in the Run position.

Blower motor speed is controlled by regulating the ground path through or around the blower motor resistor and through the blower motor control located within the A/C-heater control.

The blower motor can be accessed for service from underneath the instrument panel.

NOTE: The blower motor is supplied with a 12V feed from the TIPM, through the blower motor resistor, whenever the ignition switch is in the RUN position. Due to an open circuit condition within the blower motor control switch the TIPM is

UNABLE to detect an OPEN circuit for the blower motor.

The blower motor control system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blower motor and blower motor wheel are factory balanced as an assembly and cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

MOTOR-BLOWER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The blower motor is supplied with a 12V feed from the TIPM, through the blower motor resistor, whenever the ignition switch is in the RUN position. Due to an open circuit condition within the blower motor control switch the TIPM is **UNABLE to detect an OPEN circuit for the blower motor.**

To determine if an open condition exists within the blower motor circuit wiring, it is necessary to disconnect the negative battery cable and check for continuity within the blower motor circuits using an ohmmeter.

OPERATION

Possible causes of an inoperative blower motor include:

- Open fuse
- Inoperative blower motor resistor
- Inoperative blower motor switch
- Inoperative blower motor
- Inoperative blower motor circuit wiring or wire harness connectors

NOISE

To determine if the blower motor is the source of the noise, simply switch the blower motor from Off to On. To verify that the blower motor is the source of the noise, unplug the blower motor wire harness connector and operate the heater-A/C system. If the noise goes away, possible causes include:

- Foreign material on fresh air inlet screen
- Foreign material in blower wheel

Foreign material in HVAC housing
Improper blower motor mounting
Deformed or damaged blower wheel
Worn blower motor bearings or brushes

VIBRATION

Possible causes of a blower motor vibration include:

Improper blower motor mounting
Foreign material in blower wheel
Deformed or damaged blower wheel
Worn blower motor bearings

REMOVAL

MOTOR-BLOWER

NOTE: The blower motor is located on the bottom of the passenger side of the HVAC housing. The blower motor can be removed from the vehicle without having to remove the HVAC housing.

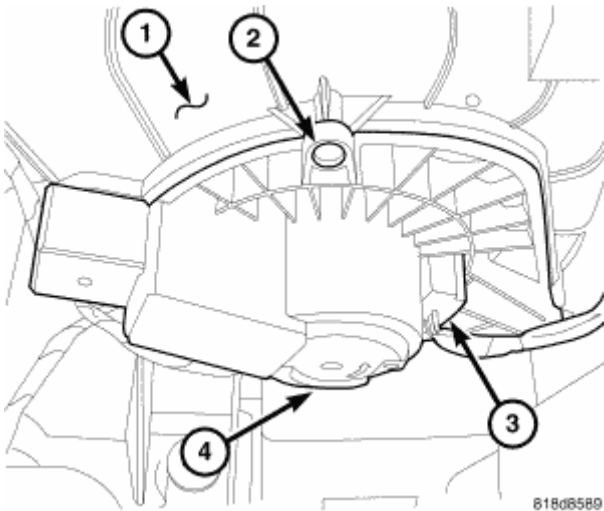


Fig. 118: HVAC Housing, Screws, Instrument Panel Wire Harness Connector & Blower Motor
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the passenger side of the instrument panel. Refer to **REMOVAL** .

3. From underneath the instrument panel, disconnect the instrument panel wire harness connector (3) from the blower motor (4).
4. Remove the three screws (2) that secure the blower motor to the bottom of the HVAC housing (1) and remove the blower motor.

INSTALLATION

MOTOR-BLOWER

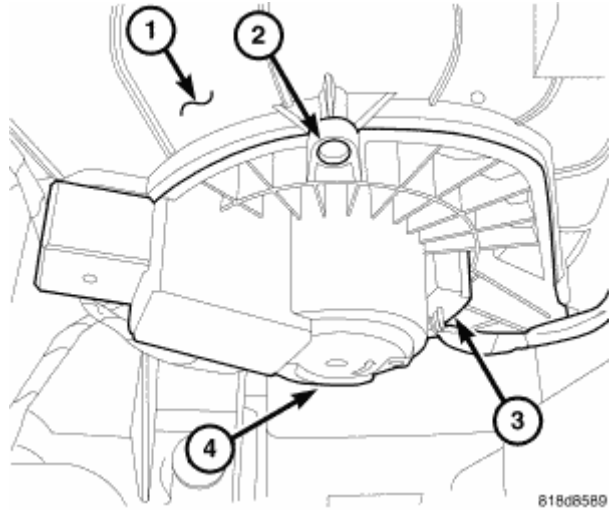


Fig. 119: HVAC Housing, Screws, Instrument Panel Wire Harness Connector & Blower Motor
Courtesy of CHRYSLER LLC

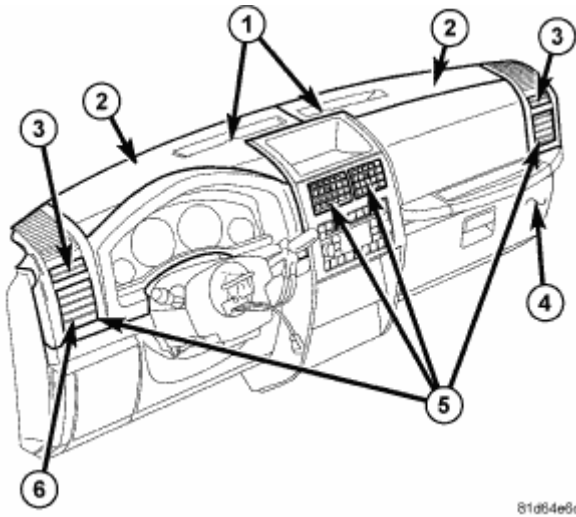
NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blower motor (4) into the bottom of the HVAC housing (1).
2. Install the three screws (2) that secure the blower motor to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the instrument panel wire harness connector (3) to the blower motor.
4. If equipped, install the silencer below the passenger side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.

OUTLET-AIR

DESCRIPTION

OUTLET-AIR



81064e6c

Fig. 120: Instrument Panel Air Outlet Locations
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

There are two defroster air outlets (1) located on the top of the instrument panel (4). The airflow from the defroster outlets is directed by fixed vanes and cannot be adjusted. The defroster air outlets are serviced with the defroster grilles (2). Refer to **REMOVAL** .

There are two side window demister air outlets (3). One located at each end of the instrument panel near the A-pillars. The airflow from the side window demister air outlets is directed by fixed vanes and cannot be adjusted. The side window demister air outlets are integral to the left and right side instrument panel air outlets and cannot be serviced separately.

There are four instrument panel air outlets (5). One air outlet is located near each outboard end of the instrument panel facing the rear of the vehicle and the other two outlets are located near the top of the instrument panel center bezel. The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to **INSTRUMENT PANEL** for further information).

Each of the instrument panel air outlets contain an air outlet grille (6) that is used to direct or shut off the flow of the conditioned air leaving the instrument panel.

REMOVAL

OUTLET-AIR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible serious or fatal injury.

NOTE: The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to INSTRUMENT PANEL for further information).

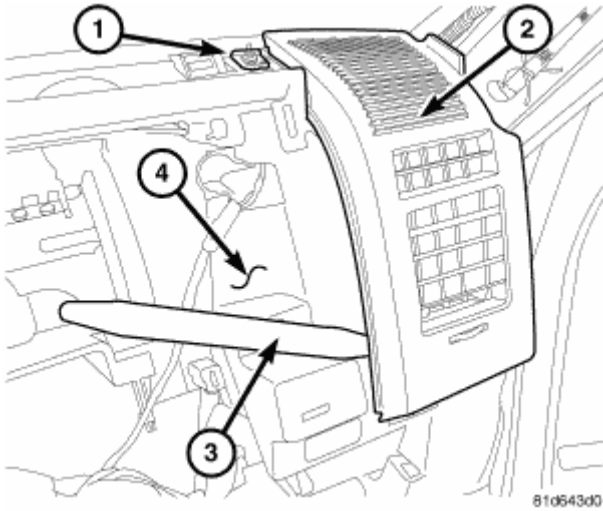


Fig. 121: Passenger Side Air Outlet Grille
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the passenger side defroster grille. Refer to REMOVAL .
3. Remove the passenger side air bag. Refer to REMOVAL .
4. Remove the passenger side A-pillar trim molding. Refer to REMOVAL .
5. Remove the screw (1) that secures the top of the air outlet (2) to the instrument panel (4).
6. Using a trim stick C-4755 or equivalent (3), gently pry the lower portion of the air outlet rearward to disengage the two metal retaining clips from the instrument panel and remove the outlet.
7. If required, carefully disengage the plastic retaining tabs that secure the air outlet grille to the back of air outlet and remove the grille from the outlet.

INSTALLATION

OUTLET-AIR

NOTE: The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to INSTRUMENT PANEL for further information).

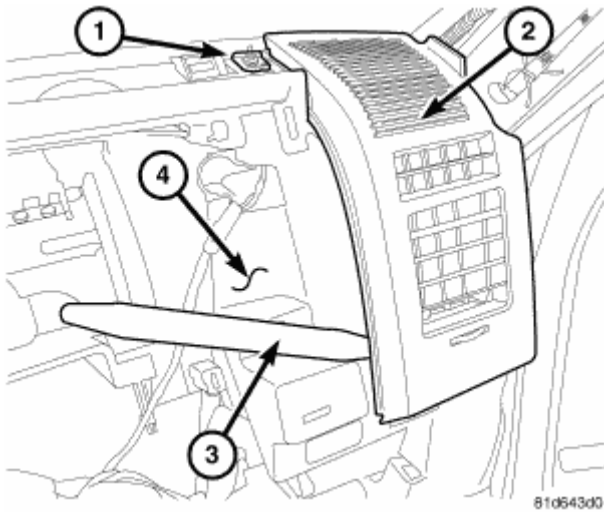


Fig. 122: Passenger Side Air Outlet Grille
 Courtesy of CHRYSLER LLC

1. If removed, carefully install the air outlet grille onto the back of air outlet and engage the plastic retaining tabs that secure grille to the outlet. Make sure the retaining tabs are fully engaged.
2. Position the instrument panel air outlet to the instrument panel and engage the two metal retaining clips to the instrument panel. Make sure the retainers are fully engaged.
3. Install the screw (1) that secures the top of the air outlet (2) to the instrument panel (4). Tighten the screw to 1.2 N.m (10 in. lbs.).
4. Install the A-pillar trim molding. Refer to **INSTALLATION** .
5. Install the passenger side air bag. Refer to **INSTALLATION** .
6. Install the defroster grille. Refer to **INSTALLATION** .
7. Reconnect the negative battery cable.

PLUMBING

DESCRIPTION

REFRIGERANT LINES

The A/C refrigerant lines and hoses are used to carry the refrigerant between the various A/C system components. The refrigerant lines and hoses for the R-134a A/C system consist of a barrier-hose design with a nylon tube sandwiched between rubber layers. The nylon tube helps to contain the R-134a refrigerant, which has a small molecular structure. The ends of the refrigerant lines are made from lightweight aluminum with brazed fittings.

Any kinks or sharp bends in the refrigerant lines and hoses will reduce the capacity of the entire A/C system and can reduce the flow of refrigerant within the system.

OPERATION

REFRIGERANT LINES

High pressures are produced in a refrigerant system when the A/C compressor is operating. Extreme care must be exercised to make sure that each of the refrigerant system connections is pressure-tight and leak free. It is a good practice to inspect all flexible hose refrigerant lines at least once a year to make sure they are in good condition and properly routed.

Depending on vehicle, model and market application, refrigerant lines are connected to each other or other A/C system components with block-type or quick-connect type fittings. To ensure the integrity of the refrigerant system, O-rings and/or gaskets may be used to seal the refrigerant system connections.

The refrigerant lines and hoses cannot be repaired and must be replaced if leaking or damaged.

WARNING

WARNING

WARNING: The A/C system contains refrigerant under high pressure. Repairs should only be performed by qualified service personnel. Serious or fatal injury may result from improper service procedures.

WARNING: Avoid breathing the refrigerant and refrigerant oil vapor or mist. Exposure may irritate the eyes, nose, and/or throat. Wear eye protection when servicing the A/C refrigerant system. Serious eye injury can result from direct contact with the refrigerant. If eye contact occurs, seek medical attention immediately.

WARNING: Do not expose the refrigerant to open flame. Poisonous gas is created when refrigerant is burned. An electronic leak detector is recommended. Serious or fatal injury may result from improper service procedures.

WARNING: If accidental A/C system discharge occurs, ventilate the work area before resuming service. Large amounts of refrigerant released in a closed work area will displace the oxygen and cause suffocation and serious or fatal injury.

WARNING: The evaporation rate of R-134a refrigerant at average temperature and altitude is extremely high. As a result, anything that comes in contact with the refrigerant will freeze. Always protect the skin or delicate objects from direct contact with the refrigerant.

WARNING: The R-134a service equipment or the vehicle refrigerant system should not be pressure tested or leak tested with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures are potentially dangerous, and may result in fire or explosion causing property damage and serious or fatal injury.

WARNING: The engine cooling system is designed to develop internal pressures up to 145 kilopascals (21 pounds per square inch). Do not remove or loosen the coolant pressure cap, cylinder block drain plugs, radiator drain, radiator hoses, heater hoses, or hose clamps while the engine cooling system is hot and under pressure. Allow the vehicle to cool for a minimum of 15 minutes before opening the cooling system for service. Failure to observe this warning can result in serious burns from the heated engine coolant.

CAUTION

CAUTION

CAUTION: Never add R-12 to a refrigerant system designed to use R-134a. Do not use R-12 equipment or parts on an R-134a A/C system. These refrigerants are not compatible and damage to the A/C system will result.

CAUTION: Never use R-12 refrigerant oil in an A/C system designed to use R-134a refrigerant oil. These refrigerant oils are not compatible and damage to the A/C system will result.

CAUTION: The use of A/C system sealers may result in damage to A/C refrigerant recovery/evacuation/recharging equipment and/or A/C system. Many federal, state/provincial and local regulations prohibit the recharge of A/C systems with known leaks. DaimlerChrysler recommends the detection of A/C system leaks through the use of approved leak detectors and fluorescent leak detection dyes. Vehicles found with A/C system sealers should be treated as contaminated and replacement of the entire A/C refrigerant system is recommended. A/C systems found to be contaminated with A/C system sealers, A/C stop-leak products or seal conditioners voids the warranty for the A/C system.

CAUTION: Recover the refrigerant before opening any fitting or connection. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.

CAUTION: If equipped, do not remove the secondary retention clip from any spring-lock coupler connection while the refrigerant system is under pressure. Recover the refrigerant before removing the secondary retention clip. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.

CAUTION: The internal parts of the A/C system will remain stable as long as moisture-free refrigerant and refrigerant oil is used. Abnormal amounts of dirt, moisture or air can upset the chemical stability. This may cause

operational troubles or even serious damage if present in more than very small quantities. Before disconnecting a component, clean the outside of the fittings thoroughly to prevent contamination from entering the refrigerant system. Keep service tools and the work area clean. Do not open the refrigerant system or uncap a replacement component until you are ready to service the system. Immediately after disconnecting a component from the refrigerant system, seal the open fittings with a cap or plug. This will prevent contamination from entering the A/C system.

CAUTION: Refrigerant oil will absorb moisture from the atmosphere if left uncapped. Do not open a container of refrigerant oil until you are ready to use it. Replace the cap on the oil container immediately after using. Store refrigerant oil only in a clean, airtight, and moisture-free container.

CAUTION: Do not overcharge the refrigerant system. Overcharging will cause excessive compressor head pressure and can cause compressor noise and A/C system failure.

DIAGNOSIS AND TESTING

REFRIGERANT SYSTEM LEAKS

WARNING: R-134a service equipment or vehicle A/C system should not be pressure tested or leak tested with compressed air. Mixture of air and R-134a can be combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing property damage and possible serious or fatal injury.

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved service equipment meeting SAE requirements to discharge an R-134a system. If accidental system discharge occurs, ventilate work area before resuming service.

NOTE: If the A/C system refrigerant charge is empty or low, a leak in the A/C system is likely. Visually inspect all A/C lines, fittings and components for an oily residue. Oil residue can be an indicator of an A/C system leak location.

NOTE: The only way to correctly determine if the A/C system is fully charged with refrigerant to perform the A/C Performance Test. See **DIAGNOSIS AND TESTING**.

Connect a suitable manifold gauge set and determine if the static A/C system pressure is above or below 345 kPa (50 psi). See **STANDARD PROCEDURE**. If less than 345 kPa (50 psi), proceed to **SYSTEM EMPTY**. If greater than 345 kPa (50 psi), go to **SYSTEM LOW**.

SYSTEM EMPTY

1. Evacuate the refrigerant system to the lowest degree of vacuum possible (approximately -88 kPa (- 26 in. Hg) or greater vacuum). See **STANDARD PROCEDURE**. Determine if the system holds a vacuum for 15 minutes. If the refrigerant system will not maintain vacuum level, proceed to step 2. If vacuum is held, a leak is probably not present.
2. Prepare and dispense 0.284 kilograms (10 ounces) of R-134a refrigerant into the evacuated refrigerant system. See **STANDARD PROCEDURE**, and proceed to step 1 of the System Low procedure.

SYSTEM LOW

1. Position the vehicle in a wind-free work area. This will aid in detecting small leaks.
2. Operate the heating-A/C system with the engine at idle under the following conditions for at least 5 minutes.
 - Doors or windows open
 - Transmission in Park or Neutral with the parking brake set (depending on transmission application)
 - A/C compressor engaged with A/C-heater controls set to Recirculation mode (max-A/C), full cool, panel mode and high speed blower.

CAUTION: A leak detector only designed for R-12 refrigerant will not detect leaks in an R-134a refrigerant system.

3. Shut the vehicle Off and wait 2-7 minutes. Then use an electronic leak detector that is designed to detect R-134a refrigerant and search for leaks. Fittings, lines or components that appear to be oily usually indicate a refrigerant leak. To inspect the A/C evaporator for leaks, insert the leak detector probe into the passenger side floor duct. A dye for R-134a is available to aid in leak detection. Use only Chrysler approved refrigerant dye.

STANDARD PROCEDURE

REFRIGERANT SYSTEM CHARGE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The Underhood HVAC Specification Label contains the refrigerant fill specification of the vehicle being serviced.

After all refrigerant system leaks have been repaired and the refrigerant system has been evacuated, a refrigerant charge can be injected into the system. See **STANDARD PROCEDURE**.

An R-134a refrigerant recovery/recycling/charging station that meets SAE Standard J2210 must be used to charge the refrigerant system with R-134a refrigerant. Refer to the operating instructions supplied by the equipment manufacturer for proper care and use of this equipment.

CHARGING PROCEDURE

CAUTION: A small amount of refrigerant oil is removed from the A/C system each time the refrigerant system is recovered and evacuated. Before charging the A/C system, you **MUST** replenish any oil lost during the recovery process. Refer the equipment manufacturer instructions for more information.

1. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
2. Connect an R-134a refrigerant recovery/recycling/charging station that meets SAE standard J2210 to the refrigerant system.
3. Refer to **A/C SYSTEM** or the Underhood HVAC Specification Label for the proper amount of the refrigerant charge.
4. Measure the proper amount of refrigerant charge and heat it to 52° C (125° F) with the charging station. See the operating instructions supplied by the equipment manufacturer for proper use of this equipment.
5. Open both the suction and discharge valves, then open the charge valve to allow the heated refrigerant to flow into the system.
6. When the transfer of refrigerant has stopped, close both the suction and discharge valves.
7. If all of the refrigerant charge did not transfer from the dispensing device, open all of the windows in the vehicle and set the heating-A/C system controls so that the A/C compressor is engaged and the blower motor is operating at its lowest speed setting. Run the engine at a steady high idle (about 1400 rpm). If the A/C compressor does not engage, test the compressor clutch circuits and repair as required.

WARNING: Take care not to open the discharge (high pressure) valve at this time. Failure to follow this warning may result in serious or fatal injury.

8. Open the low-side valve to allow the remaining refrigerant to transfer to the refrigerant system.
9. Disconnect the charging station from the refrigerant system service ports.
10. Reinstall the caps onto the refrigerant system service ports.

REFRIGERANT SYSTEM EVACUATE

NOTE: Special effort must be used to prevent moisture from entering the A/C system oil. Moisture in the oil is very difficult to remove and will cause a reliability problem with the A/C compressor.

If an A/C compressor designed to use R-134a refrigerant is left open to the atmosphere for an extended period of time. It is recommended that the refrigerant oil be drained and replaced with new oil or a new A/C compressor be used. This will eliminate the possibility of contaminating the refrigerant system.

If the refrigerant system has been open to the atmosphere, it must be evacuated before the system can be filled. Moisture and air mixed with the refrigerant will raise the compressor head pressure above acceptable operating levels. This will reduce the performance of the A/C system and damage the A/C compressor. Moisture will boil at near room temperature when exposed to vacuum. To evacuate the refrigerant system:

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

1. Recover the refrigerant system. See STANDARD PROCEDURE.
2. Connect a suitable charging station, refrigerant recovery machine or a manifold gauge set with vacuum pump and refrigerant recovery equipment. See STANDARD PROCEDURE.
3. Open the suction and discharge valves and start the vacuum pump. The vacuum pump should run a minimum of 45 minutes prior to charge to eliminate all moisture in system. When the suction gauge reads to the lowest degree of vacuum possible (approximately -88 kPa (- 26 in. Hg) or greater) for 30 minutes, close all valves and turn off vacuum pump. If the system fails to reach specified vacuum, the refrigerant system likely has a leak that must be corrected. If the refrigerant system maintains specified vacuum for at least 30 minutes, start the vacuum pump, open the suction and discharge valves. Then allow the system to evacuate an additional 10 minutes.
4. Close all valves. Turn off and disconnect the vacuum pump.
5. Charge the refrigerant system. See STANDARD PROCEDURE.

REFRIGERANT SYSTEM RECOVERY

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions may result in serious or fatal injury.

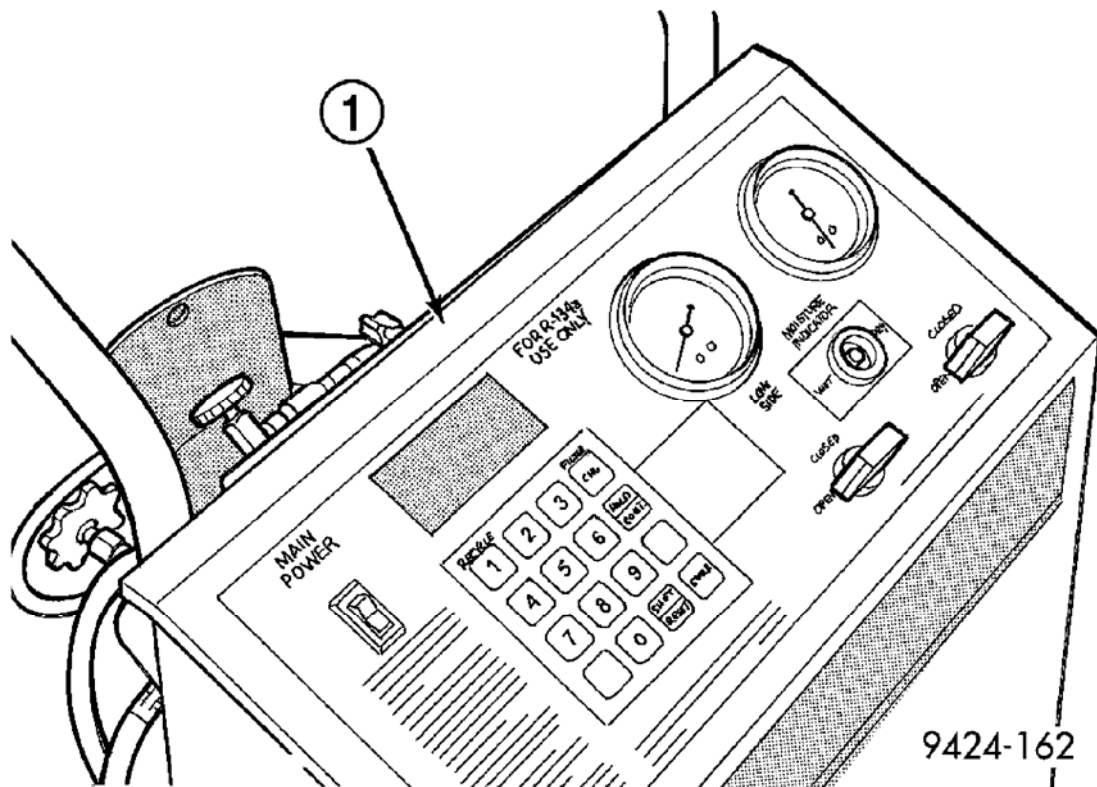


Fig. 123: Identifying R-134a Refrigerant Recovery/Recycling/Charging Station
 Courtesy of CHRYSLER LLC

An R-134a refrigerant recovery/recycling/charging station (1) that meets SAE standard J2210 must be used to recover the refrigerant from the R-134a refrigerant system. Refer to the operating instructions supplied by the equipment manufacturer for the proper care and use of this equipment.

REFRIGERANT SYSTEM SERVICE EQUIPMENT

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

WARNING: Eye protection must be worn when servicing an air conditioning refrigerant system. Turn off (rotate clockwise) all valves on the equipment being used, before connecting to or disconnecting from the refrigerant system. Failure to observe these warnings may result in personal injury or death.

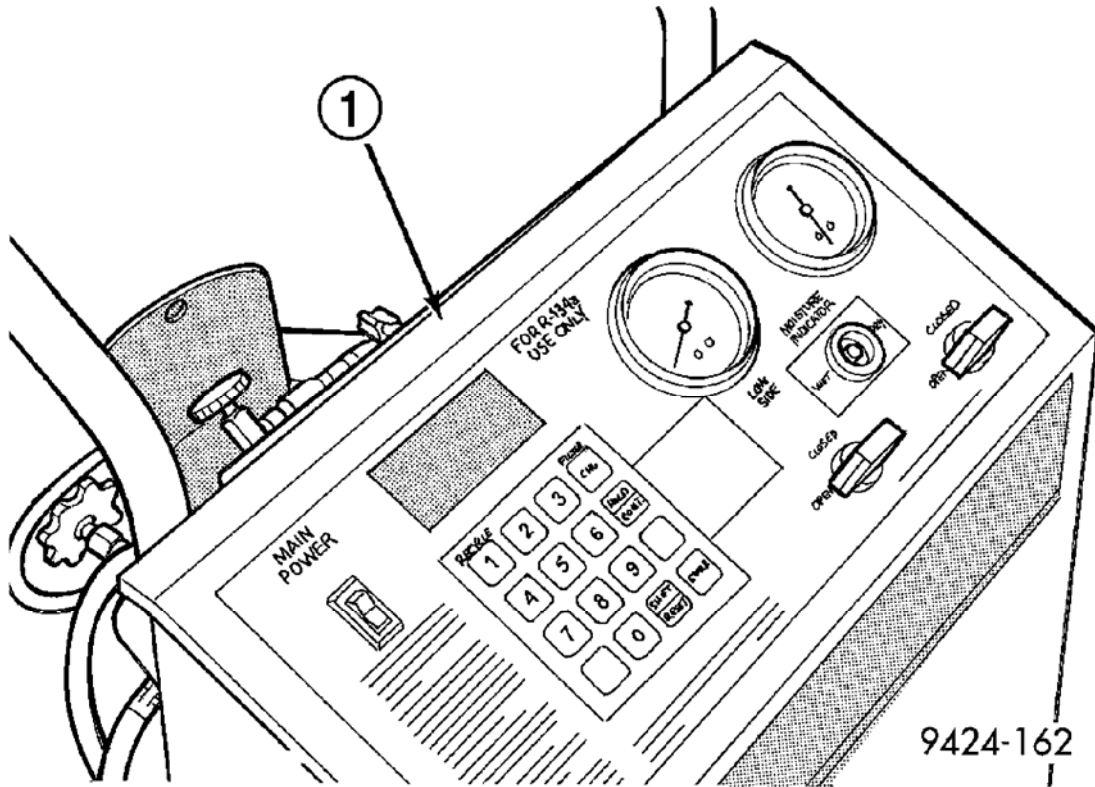
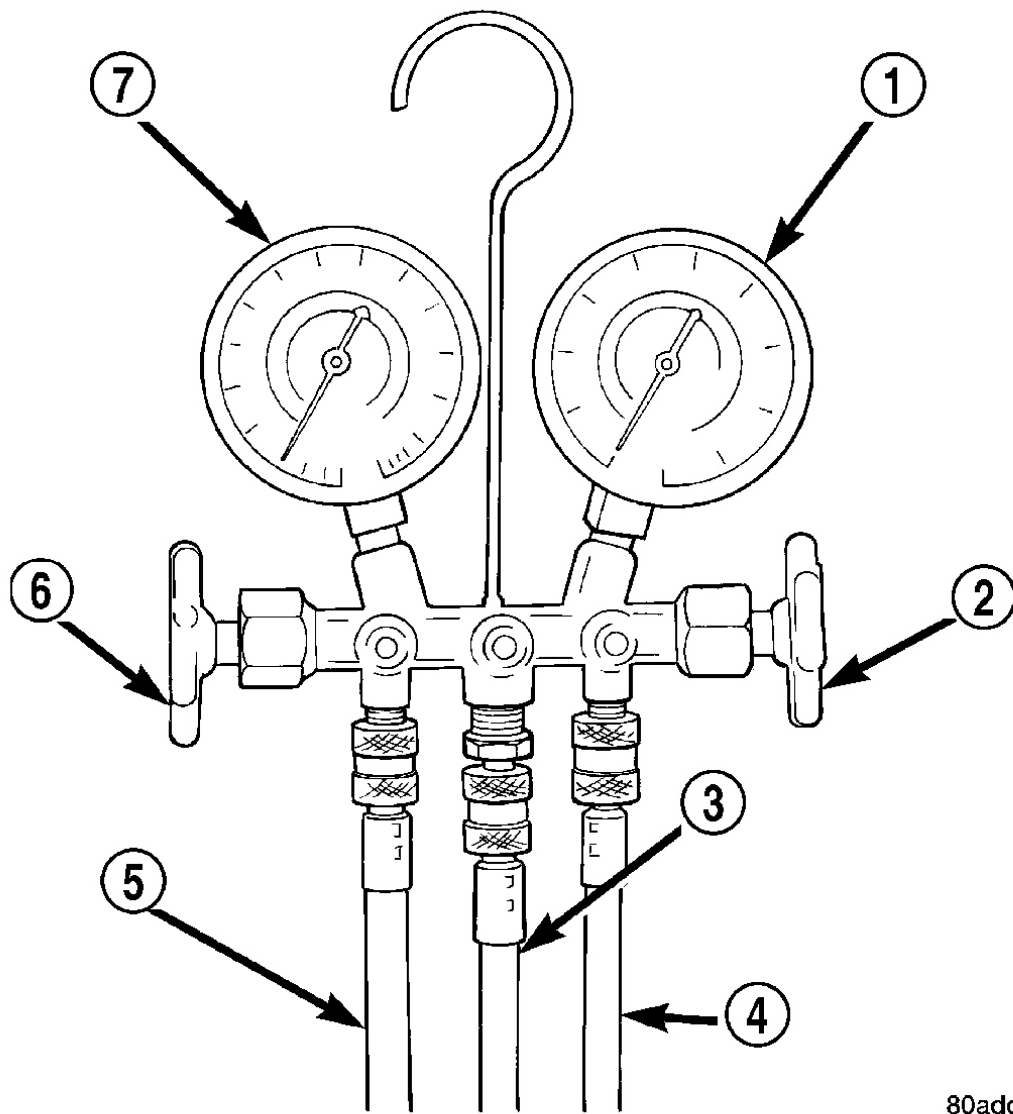


Fig. 124: Identifying R-134a Refrigerant Recovery/Recycling/Charging Station
Courtesy of CHRYSLER LLC

When servicing the A/C system, a R-134a refrigerant recovery/recycling/charging station that meets SAE standard J2210 must be used (1). Contact an automotive service equipment supplier for refrigerant recovery/recycling/charging equipment. Refer to the operating instructions supplied by the equipment manufacturer for proper care and use of this equipment.



80add30c

Fig. 125: Manifold Gauge Set - Typical
Courtesy of CHRYSLER LLC

A manifold gauge set (1) may be needed with some recovery/recycling/charging equipment. The manifold gauge set should have manual shut-off valves (2 and 6), or automatic back-flow valves located at the service port connector end of the manifold gauge set hoses (4 and 5). This will prevent refrigerant from being released into the atmosphere.

MANIFOLD GAUGE SET CONNECTIONS

CAUTION: Do not use an R-12 manifold gauge set on an R-134a system. The refrigerants are not compatible and system damage will result.

LOW PRESSURE GAUGE HOSE - The low pressure hose (Blue with Black stripe) attaches to the low-side service port. This port is located on the A/C suction line near the rear of the engine compartment.

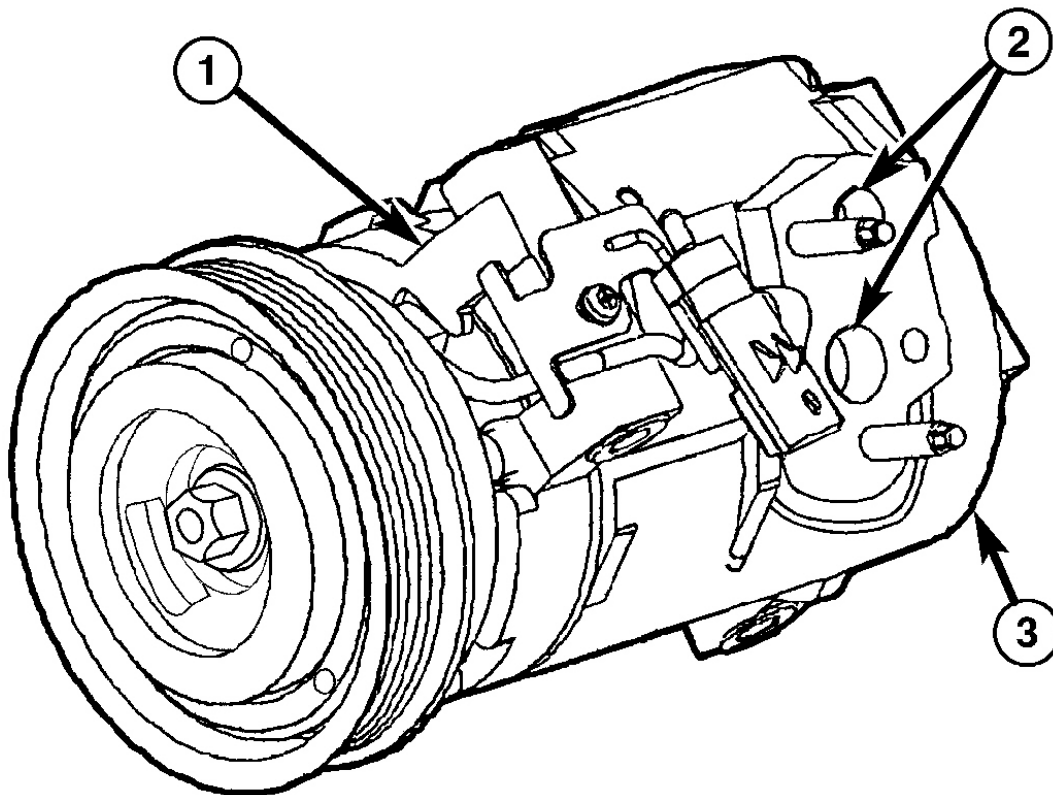
HIGH PRESSURE GAUGE HOSE - The high pressure hose (Red with Black stripe) attaches to the high-side service port. This port is located on the A/C liquid line near the front of the engine compartment.

RECOVERY, RECYCLING, EVACUATION AND CHARGING HOSE - The center manifold hose (Yellow, or White, with Black stripe) is used to recover, evacuate, and charge the refrigerant system. When the low or high pressure valves on the manifold gauge set are opened, the refrigerant in the system will escape through this hose.

COMPRESSOR-A/C

DESCRIPTION

COMPRESSOR-A/C



812c0f81

Fig. 126: Denso 10S17 Compressor
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 3.7L engine use a Visteon HS-18 A/C compressor (1). This A/C compressor is a 10 cylinder reciprocating swash plate-type compressor that uses an electrically operated clutch to engage and disengage the A/C compressor from the engine accessory drive belt.

The HS-18 A/C compressor has a fixed displacement of 180 cubic centimeters (10.9 cubic inches) and has the suction and discharge ports (2) located on the compressor cylinder head (3) at the rear of the compressor and a label which identifies the use of R-134a refrigerant.

COMPRESSOR-A/C

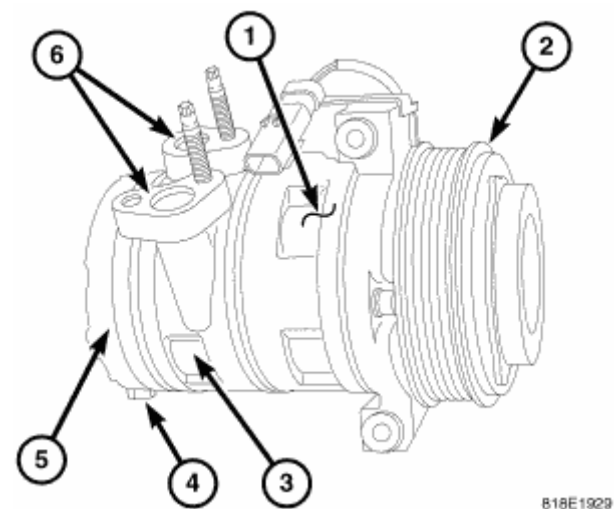


Fig. 127: A/C Compressor Components
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 2.8L and 4.0L engine use a Zexel DKS-17DS A/C compressor (1). This A/C compressor is a ten cylinder, double-acting swash plate-type compressor that uses an electrically operated clutch (2) to engage and disengage the A/C compressor from the engine accessory drive belt.

The DKS-17DS A/C compressor has a fixed displacement of 175.5 cubic centimeters (10.7 cubic inches) and has the suction and discharge ports (6) located on the compressor cylinder block (3). This A/C compressor also has an integral high pressure relief valve (4) located on the cylinder head (5) and a label which identifies the use of R-134a refrigerant.

VALVE-HIGH PRESSURE RELIEF-A/C COMPRESSOR

A high pressure relief valve is located on the A/C compressor. This mechanical valve is designed to vent refrigerant from the A/C system to protect against damage to the A/C compressor and other A/C system components, caused by condenser air flow restriction or an overcharge of refrigerant.

OPERATION

COMPRESSOR-A/C

The A/C compressor is driven by the engine through an electric clutch, drive pulley and belt arrangement. The A/C compressor is lubricated by refrigerant oil that is circulated throughout the refrigerant system with the

refrigerant.

The A/C compressor draws in low-pressure refrigerant vapor from the A/C evaporator through its suction port. It then compresses the refrigerant into a high-pressure, high-temperature refrigerant vapor, which is then pumped to the A/C condenser through the compressor discharge port.

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level can prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

The A/C compressor cannot be repaired and must be replaced if inoperative or damaged. The compressor clutch, pulley and bearing assembly, and clutch field coil are available for service. If an internal failure of the A/C compressor has occurred, the A/C receiver/drier must also be replaced. See REMOVAL.

VALVE-HIGH PRESSURE RELIEF-A/C COMPRESSOR

The high pressure relief valve vents refrigerant from the A/C system when a discharge pressure of 3430 to 3930 kPa (497 to 570 psi) or above is reached. The high pressure relief valve closes with a minimum discharge pressure of 2990 kPa (4370 psi) is reached.

The high pressure relief valve vents only enough refrigerant to reduce the A/C system pressure, and then re-seats itself. The majority of the refrigerant is conserved in the A/C system. If the high pressure relief valve vents refrigerant, it does not mean the valve is faulty.

The high pressure relief valve is factory-calibrated and cannot be adjusted or repaired, and must not be removed or otherwise disturbed. The valve is only serviced as a part of the A/C compressor.

DIAGNOSIS AND TESTING

COMPRESSOR-A/C

When investigating an A/C system related noise, you must first know the conditions under which the noise occurs. These conditions include: weather, vehicle speed, transmission in gear or neutral, engine speed, engine temperature, and any other special conditions. Noises that develop during A/C operation can often be misleading. For example: What sounds like a failed front engine bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets or a loose compressor clutch assembly.

Drive belts are speed sensitive. At different engine speeds and depending upon drive belt tension, drive belts can develop noises that are mistaken for an A/C compressor noise. Improper drive belt tension can cause a misleading noise when the compressor clutch is engaged, which may not occur when the compressor clutch is disengaged. Check the accessory drive belt condition and tension as described in Cooling before beginning this procedure.

1. Select a quiet area for testing. Duplicate the complaint conditions as much as possible. Turn the A/C compressor On and Off several times to clearly identify the compressor noise. Listen to the A/C compressor while the clutch is engaged and disengaged. Probe the A/C compressor with an engine stethoscope or a long screwdriver with the handle held to your ear to better localize the source of the noise.
2. Loosen all of the compressor mounting hardware and retighten. Check the compressor clutch retainer. Be certain that the clutch field coil is mounted securely to the A/C compressor, and that the clutch plate and pulley are properly aligned and have the correct air gap.
3. To duplicate high-ambient temperature conditions (high head pressure), restrict the air flow through the A/C condenser. Install a manifold gauge set or a scan tool to be certain that the discharge pressure does not exceed 2760 kPa (400 psi).
4. Check the refrigerant system plumbing for incorrect routing, rubbing or interference, which can cause unusual noises. Also check the refrigerant lines and hoses for kinks or sharp bends that will restrict refrigerant flow, which can cause noises. See **DESCRIPTION**.
5. If the noise is from opening and closing of the high pressure relief valve, recover, evacuate and recharge the refrigerant system. See **STANDARD PROCEDURE**.
6. If the high pressure relief valve still does not seat properly, replace the A/C compressor. See **REMOVAL**.

REMOVAL

2.8L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C compressor can be removed from the engine and repositioned without disconnecting the refrigerant lines or discharging the refrigerant system. Discharging is not necessary if servicing the A/C clutch or various engine components.

NOTE: LHD model shown in illustrations. RHD model similar.

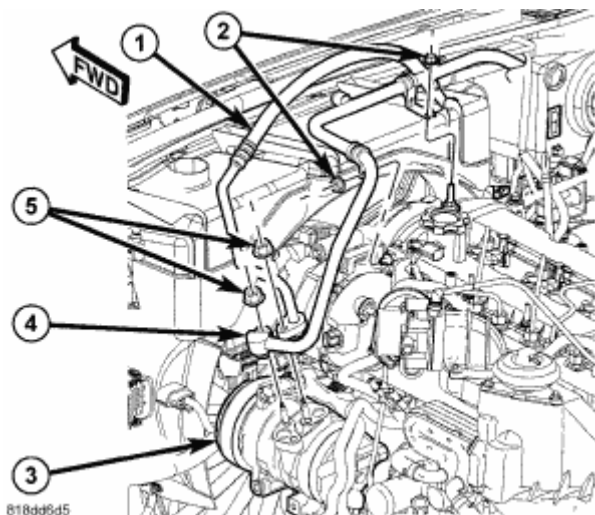


Fig. 128: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing. **REMOVAL**
4. Remove the air inlet tube from the throttle body and the charge air cooler.
5. Remove the battery. Refer to **REMOVAL** .
6. Remove the radiator fan and fan shroud. Refer to **REMOVAL** .
7. Remove the accessory drive belt. Refer to **REMOVAL** .
8. Remove the generator. Refer to **REMOVAL** .
9. On LHD models, remove the two nuts (2) that secure the A/C suction line (4) to the top of the engine.
10. Remove the nuts (5) that secures the A/C suction line and A/C discharge line (1) to the A/C compressor (3).
11. Disconnect the A/C suction and discharge lines from the A/C compressor and remove and discard the O-ring seals and gaskets.

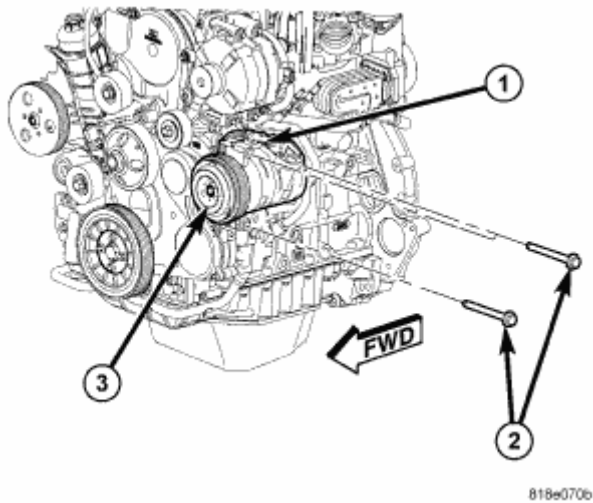


Fig. 129: A/C Clutch Field Coil Connector, Bolts & A/C Compressor
Courtesy of CHRYSLER LLC

12. Disconnect the engine wire harness from the A/C clutch field coil connector (1).
13. Support the A/C compressor (3) and remove the three bolts (2) that secure the compressor to the engine.
14. Remove the A/C compressor from the engine compartment.
15. Install plugs in, or tape over the opened refrigerant line fittings and the compressor ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C compressor can be removed from the engine and repositioned without disconnecting the refrigerant lines or discharging the refrigerant system. Discharging is not necessary if servicing the A/C clutch or various engine components.

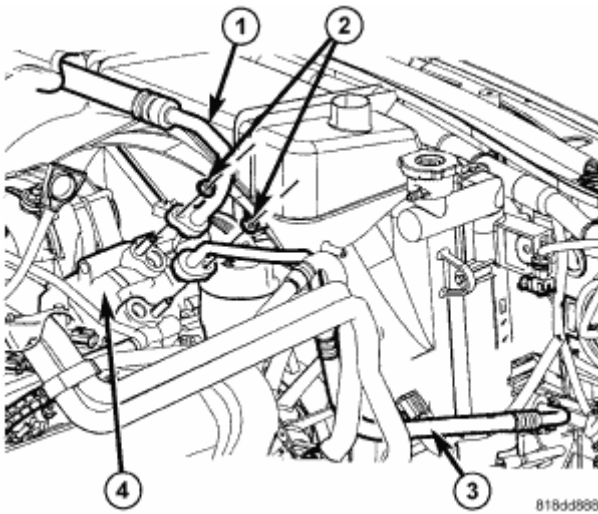


Fig. 130: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the accessory drive belt. Refer to **REMOVAL** .
5. Remove the nuts (2) that secure the A/C suction line (1) and A/C discharge line (3) to the A/C compressor (4).
6. Disconnect the A/C suction and discharge lines from the A/C compressor and remove and discard the O-ring seals and gaskets.

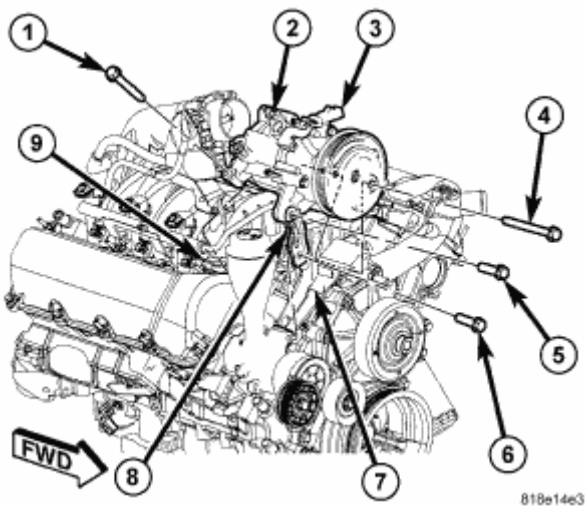


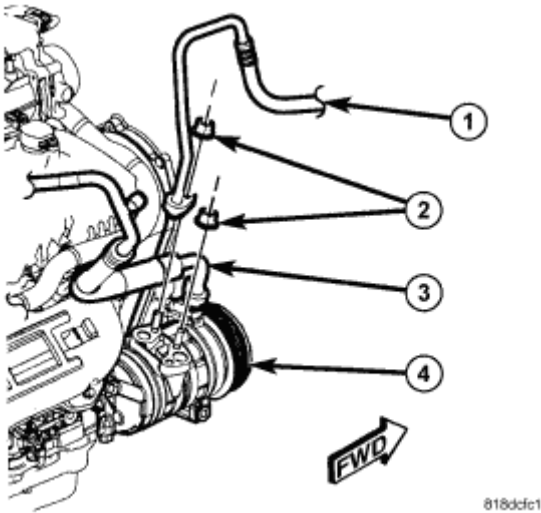
Fig. 131: A/C Compressor Components

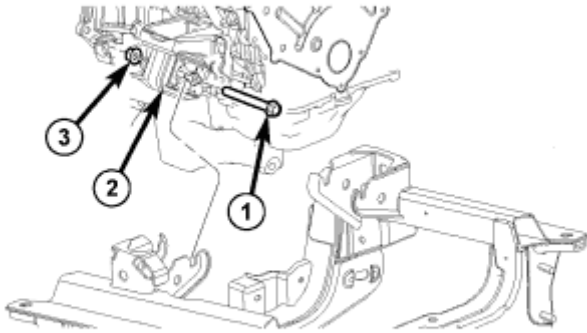
Courtesy of CHRYSLER LLC

7. Disconnect the engine wire harness from the A/C clutch field coil connector (3).

8. Loosen the bolt (6) that secures the compressor bracket (8) to the engine front cover (7).
9. Remove the bolt (1) that secures the A/C compressor (2) to the intake manifold (9).
10. Remove the two bolts (4 and 5) that secure the A/C compressor to the front of the engine.
11. Remove the A/C compressor from the engine and install plugs in, or tape over the opened refrigerant line fittings and the compressor ports.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible serious or fatal injury.





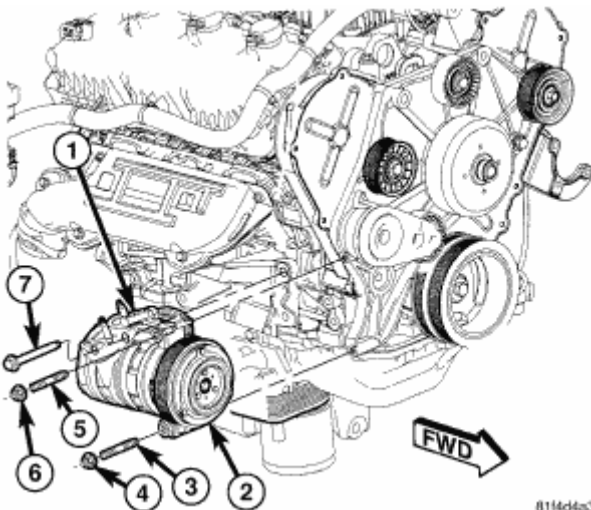
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Fig. 133: ENGINE MOUNT TO FRAME
 Courtesy of CHRYSLER LLC

8. Raise and support the vehicle.
9. Remove the nut (3) from the through bolt (1) on the right side engine mount (3).

CAUTION: Do not completely remove the right side motor mount through bolt when performing this procedure. The bolt supports the engine at the lower mount and removal of the bolt will allow the engine to sit further down in the frame, which may cause possible damage to the engine and various other components.

10. Support the engine with a suitable jack and partially remove the through bolt to allow the right side of the engine to be raised off of the motor mount.



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Fig. 134: Removing/Installing A/C Compressor

Courtesy of CHRYSLER LLC

11. Remove the jack stand and lower the vehicle.
12. Disconnect the engine wire harness from the A/C clutch field coil connector (1).

CAUTION: Use care when raising the engine when performing this procedure. Be sure to protect the bottom of the engine and various other components from damage.

13. Using a suitable floor jack and a block of wood under the oil pan to protect from damage, raise the right side of the engine to gain access to remove the stud (3) that secures the lower front of the A/C compressor (2) to the accessory drive belt bracket.
14. Remove the nut (4) and stud that secures the lower front of the A/C compressor to the accessory drive belt bracket.
15. Remove the bolt (7) that secures the rear of the A/C compressor to the engine.
16. Support the A/C compressor and remove the nut (6) and stud (5) that secures the upper front of the A/C compressor to the accessory drive belt bracket and remove the compressor.

INSTALLATION

2.8L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be removed from the new A/C compressor. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

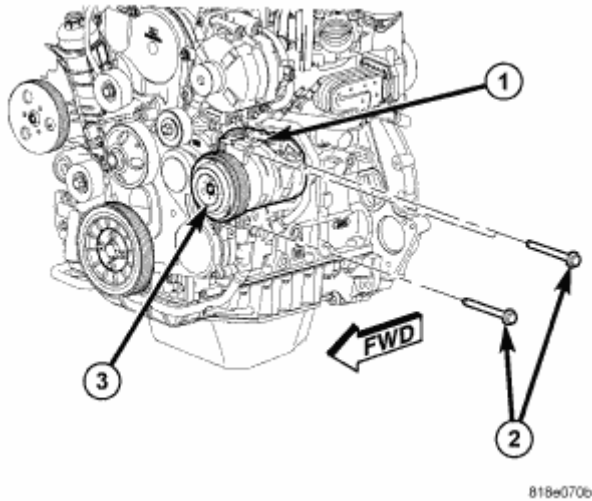


Fig. 135: A/C Clutch Field Coil Connector, Bolts & A/C Compressor
 Courtesy of CHRYSLER LLC

1. If the A/C compressor (3) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See **STANDARD PROCEDURE**. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Position the A/C compressor onto the engine.
3. Install the three bolts (2) that secure the A/C compressor to the engine. Tighten the bolts to 28 N.m (21 ft. lbs.).
4. Connect the engine wire harness to the A/C clutch field coil connector (1).

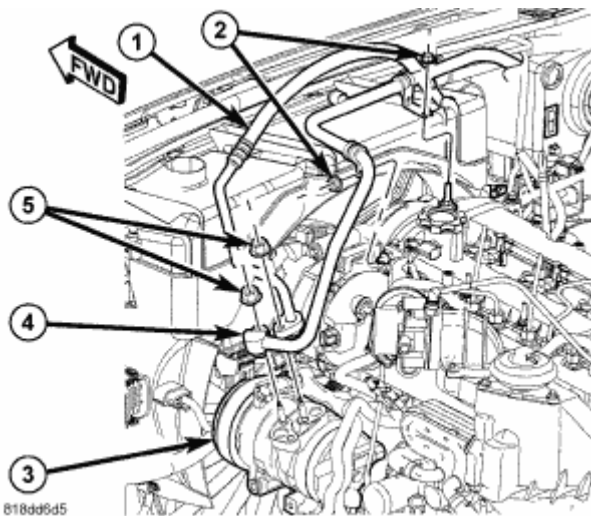


Fig. 136: Refrigerant Line System
 Courtesy of CHRYSLER LLC

5. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.

6. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
7. Connect the A/C suction line (4) and A/C discharge line (1) to the A/C compressor (3).
8. Install the nuts (5) that secure the A/C suction and discharge lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
9. On LHD models, install the two nuts (2) that secure the A/C suction line to the top of the engine. Tighten the nuts to 4.5 N.m (40 in. lbs.).
10. Install the generator. Refer to **INSTALLATION** .
11. Install the accessory drive belt. Refer to **INSTALLATION** .
12. Install the radiator fan and fan shroud. Refer to **INSTALLATION** .
13. Install the battery. Refer to **INSTALLATION** .
14. Install the air inlet tube to the throttle body and the charge air cooler. Tighten the clamps securely.
15. Install the air cleaner housing.
16. Reconnect the negative battery cable.
17. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
18. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be removed from the new A/C compressor. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

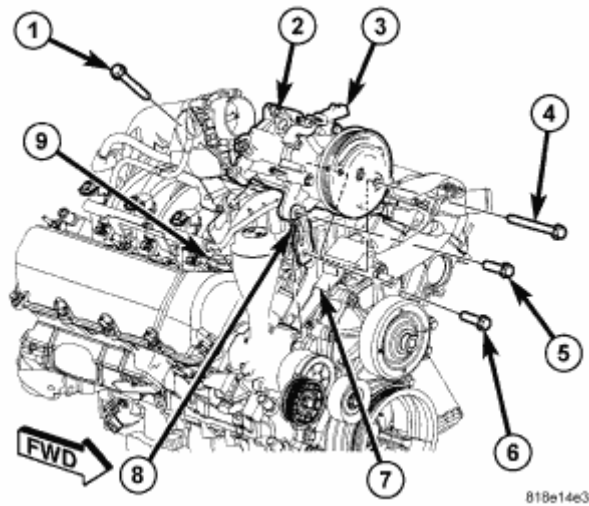


Fig. 137: A/C Compressor Components
Courtesy of CHRYSLER LLC

1. If the A/C compressor (2) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See **STANDARD PROCEDURE**. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Position the A/C compressor to the intake manifold (9) and the engine front cover (7).
3. Install and hand tighten the three compressor retaining bolts (1, 4 and 5).
4. Tighten the bolts in the following sequence:
 - The rear bolt (1) to 55 N.m (41 ft. lbs.).
 - The front inboard bolt (5) to 40 N.m (30 ft. lbs.).
 - The front outboard bolt (4) to 55 N.m (41 ft. lbs.).
5. Tighten the bolt (6) that secures the compressor bracket (8) to the engine front cover to 40 N.m (30 ft. lbs.).
6. Connect the engine wire harness to the A/C clutch field coil connector (3).

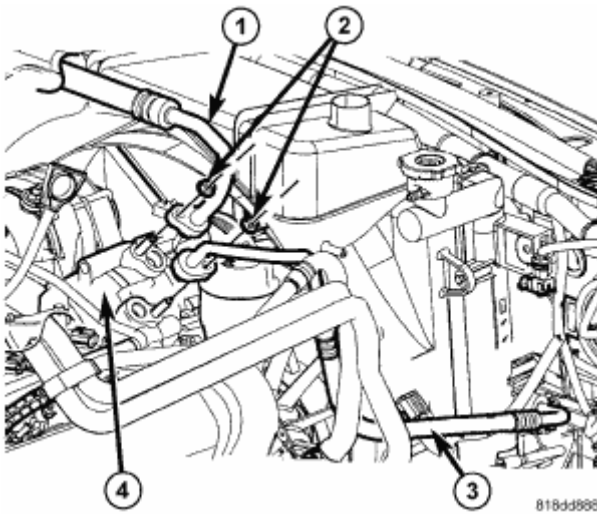


Fig. 138: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

7. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.
8. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
9. Connect the A/C suction line (1) and the A/C discharge line (3) to the A/C compressor (4).
10. Install the nuts (2) that secure the A/C suction and discharge lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
11. Install the accessory drive belt. Refer to **INSTALLATION** .
12. Install the air cleaner housing (refer to **INSTALLATION**).
13. Reconnect the negative battery cable.
14. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be removed from the

new A/C compressor. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

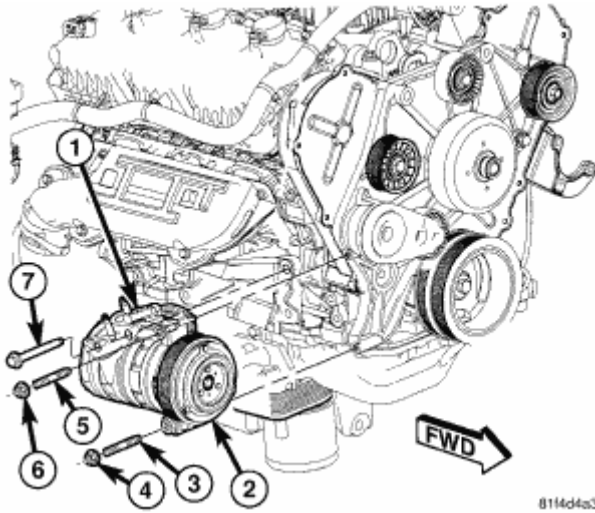


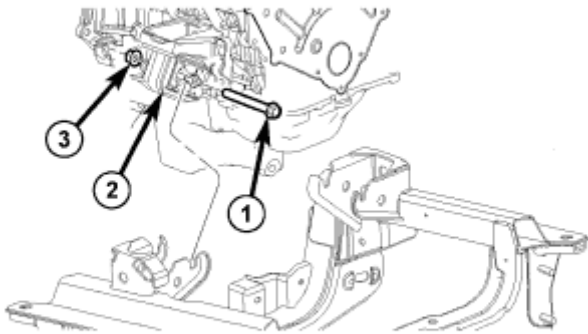
Fig. 139: Removing/Installing A/C Compressor
Courtesy of CHRYSLER LLC

1. If the A/C compressor (2) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See STANDARD PROCEDURE. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

CAUTION: Use care when raising the engine when performing this procedure. Be sure to protect the bottom of the engine and various other components from damage.

2. Using a suitable floor jack and a block of wood under the oil pan to protect from damage, raise the right side of the engine until the stud (3) that secures the lower front of the A/C compressor to the accessory drive belt bracket can be installed.
3. Install the stud that secures the lower front of the A/C compressor to the accessory drive belt bracket. Tighten the stud securely.
4. Install the stud (5) that secures the upper front of the compressor to the accessory drive belt bracket. Tighten the stud securely.
5. Loosely install the nuts (4 and 6) that secure the front of the A/C compressor to the accessory drive belt bracket.
6. Loosely install the bolt (7) that secures the rear of the A/C compressor to the engine.
7. Tighten each of the compressor fasteners to 28 N.m (21 ft. lbs.) using the following sequence:

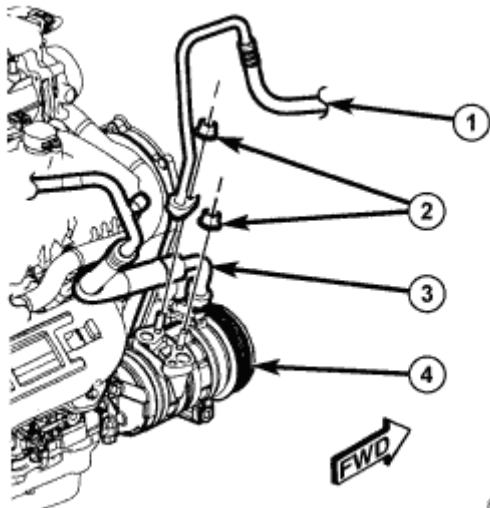
- The upper nut at front of compressor.
 - The lower nut at front of compressor.
 - The bolt at the rear of compressor.
8. Lower the right side of the engine and remove the jack and wood block.
 9. Connect the engine wire harness to the A/C clutch field coil connector (1).
 10. Lower the engine and remove the floor jack.



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Fig. 140: ENGINE MOUNT TO FRAME
Courtesy of CHRYSLER LLC

11. Raise and support the vehicle.
12. Support the engine with a suitable jack and install the through bolt (1) and nut (3) to the right side engine mount (3). Tighten the nut to 101 N.m (75 ft. lbs.).



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Fig. 141: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

13. Remove the jack stand and lower the vehicle.
14. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.
15. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
16. Connect the A/C discharge line (1) and the A/C suction line (3) to the A/C compressor (4).
17. Install the nuts (2) that secure the A/C discharge and suction lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
18. Install the accessory drive belt. Refer to **INSTALLATION** .
19. Install the air cleaner housing (refer to **INSTALLATION**).
20. Reconnect the negative battery cable.
21. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
22. Charge the refrigerant system. See **STANDARD PROCEDURE**.

CONDENSER-A/C

DESCRIPTION

CONDENSER-A/C

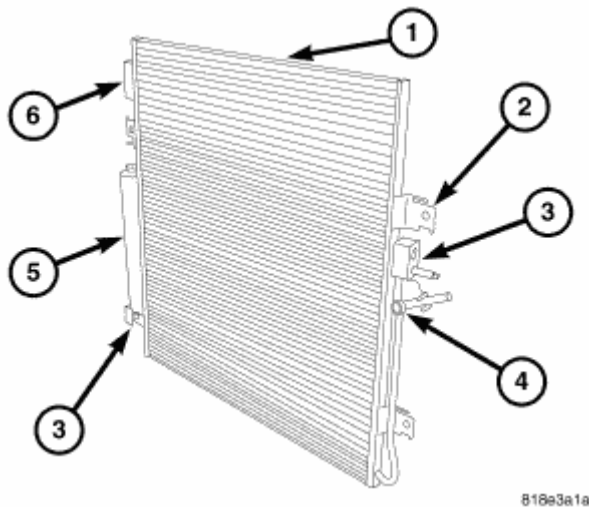


Fig. 142: A/C Condenser Components
Courtesy of CHRYSLER LLC

The A/C condenser (1) is located in the front of the engine compartment behind the front fascia. The A/C condenser is a heat exchanger that allows the high-pressure refrigerant gas being discharged by the A/C compressor to give up its heat to the air passing over the condenser fins, which causes the refrigerant to cool and change to a liquid state.

The A/C condenser is equipped with mounting provisions (2) to attach it to the radiator and has tapping blocks (3) for the A/C discharge line and for the receiver/drier (5). A spring lock coupler is used on the condenser outlet tube (4) for the A/C liquid line connection. See **DESCRIPTION**.

On automatic transmission equipped vehicles, the A/C condenser is also equipped with an integral automatic transmission cooler (6).

OPERATION

CONDENSER-A/C

When air passes through the fins of the A/C condenser, the high-pressure refrigerant gas within the A/C condenser gives up its heat. The refrigerant then condenses as it leaves the A/C condenser and becomes a high-pressure liquid. The volume of air flowing over the condenser fins is critical to the proper cooling performance of the A/C system. Therefore, it is important that there are no objects placed in front of the radiator grille openings at the front of the vehicle or foreign material on the condenser fins that might obstruct proper air flow. Also, any factory-installed air seals or shrouds must be properly reinstalled following radiator or A/C condenser service.

NOTE: **Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.**

The A/C condenser has no serviceable parts. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever a refrigerant line is removed from the A/C condenser.

The A/C condenser cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

CONDENSER-A/C

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

CAUTION: Before removing the A/C condenser, note the location of each of the radiator/condenser air seals. These air seals are used to direct air through the A/C condenser and radiator. The air seals must be reinstalled in their proper locations in order for the A/C and engine cooling systems to perform as designed.

NOTE: **LHD model shown in illustrations. RHD model similar.**

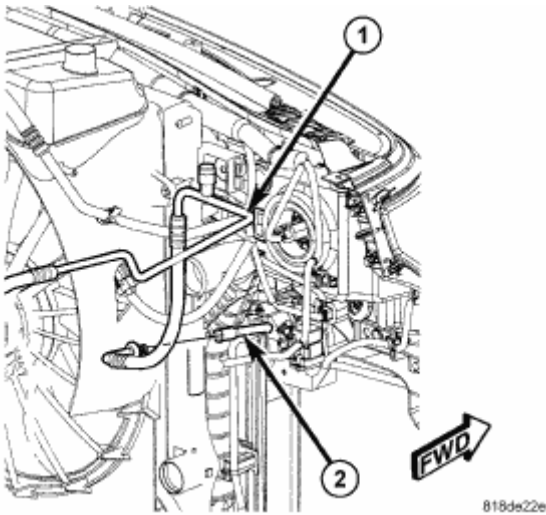


Fig. 143: A/C Liquid Line & Condenser Tube
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the engine air cleaner housing (refer to **AIR INTAKE SYSTEM**).
4. Remove the secondary retaining clip and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.

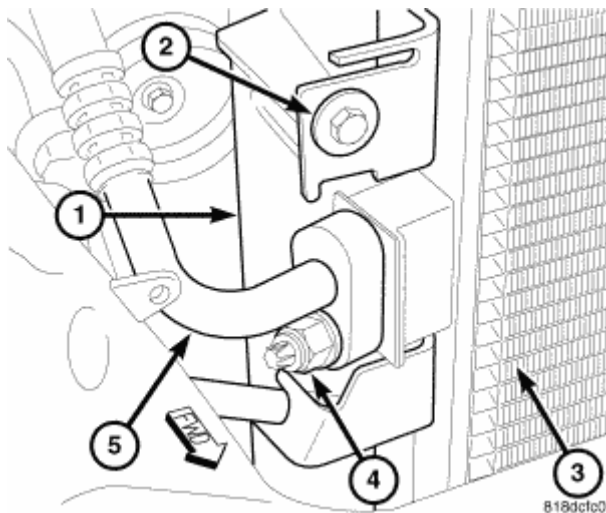


Fig. 144: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

NOTE: Upper condenser retaining bracket and bolt shown in graphic. Lower retaining bracket and bolt similar.

5. Remove the grille. Refer to **REMOVAL** .
6. If equipped with an automatic transmission, disconnect the transmission cooler lines from the

transmission cooler portion of the A/C condenser. Refer to **REMOVAL** .

7. Position the right side condenser air seal out of the way to gain access to the discharge line fitting and the lower condenser retaining bolt.

NOTE: **Rotate and tilt the A/C discharge line as necessary to disconnect it from the A/C condenser.**

8. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3) and disconnect the discharge line.
9. Remove the two bolts (2) that secure the A/C condenser to the right side of the radiator (1).
10. Carefully lift the A/C condenser straight up to disengage the condenser mounting brackets from the radiator and remove the condenser from the vehicle.
11. If required, remove the A/C receiver/drier from the A/C condenser. See **REMOVAL**.
12. Remove and discard the O-ring seals and gasket and install plugs in, or tape over the opened refrigerant line fittings and the condenser and receiver/drier ports.

INSTALLATION

CONDENSER-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The radiator/condenser air seals must be reinstalled in their proper locations in order for the A/C and engine cooling systems to perform as designed.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the A/C condenser is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

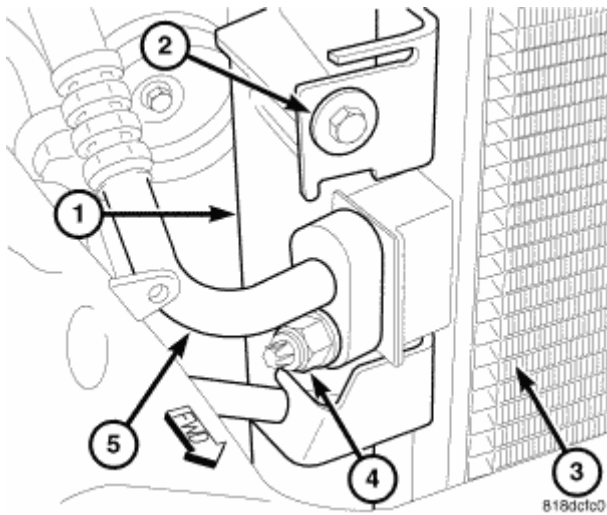


Fig. 145: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

NOTE: Upper condenser retaining bracket and bolt shown in graphic. Lower retaining bracket and bolt similar.

1. Remove the tape or plugs from the opened refrigerant line fittings and the receiver/drier and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and a new gasket onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. If removed, install the A/C receiver/drier onto the A/C condenser (3). See **INSTALLATION**.
4. Position the A/C condenser into the engine compartment and install it onto the condenser mounting brackets.
5. Install the two bolts (2) that secure the A/C condenser to the right side of the radiator (1). Tighten the bolts to 5 N.m (44 in. lbs.).

NOTE: Rotate and tilt the A/C discharge line as necessary to connect it to the A/C condenser.

6. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4). Tighten the nut to 22.5 N.m (200 in. lbs.).
7. Reposition the right side condenser air seal.
8. If equipped with an automatic transmission, connect the transmission cooler lines to the transmission cooler portion of the A/C condenser. Refer to **INSTALLATION**.
9. Install the grille. Refer to **INSTALLATION**.

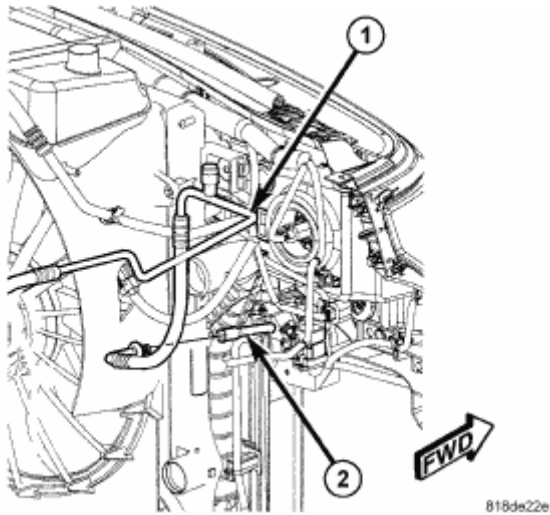


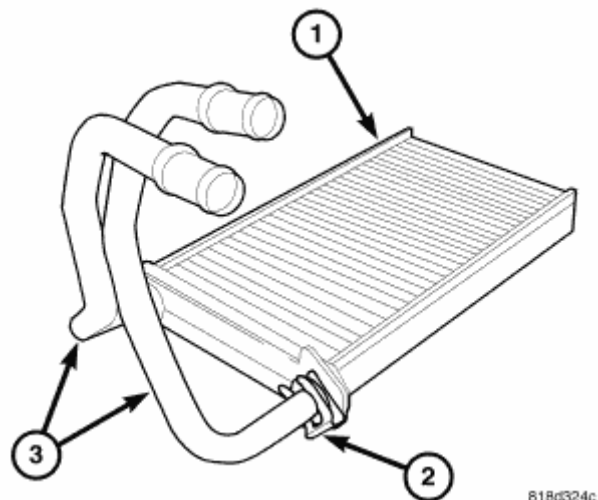
Fig. 146: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

10. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.
11. Install the engine air cleaner housing (refer to **AIR INTAKE SYSTEM**).
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
14. If the A/C condenser is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

CORE-HEATER

DESCRIPTION

CORE-HEATER



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Fig. 147: Heater Core, Metal Retaining Clamps & Heater Core Tubes
Courtesy of CHRYSLER LLC

The heater core (1) is mounted into the HVAC air distribution housing, located behind the instrument panel. The heater core is a heat exchanger made of rows of tubes and fins. The heater core is secured to the air distribution housing by four plastic retaining tabs. The heater core tubes (3) are attached to the heater core by use of metal retaining clamps (2) and rubber O-ring seals.

The heater core tubes are not serviced separately from the heater core. The air distribution housing must be removed from the vehicle to service the heater core.

OPERATION

CORE-HEATER

Engine coolant is circulated through the heater hoses to the heater core at all times. As the coolant flows through the heater core, heat is removed from the engine and is transferred to the heater core tubes and fins. Air directed through the heater core picks up the heat from the heater core fins. The blend-air door allows control of the heater output air temperature by regulating the amount of air flowing through the heater core. The blower motor speed controls the volume of air flowing through the HVAC housing.

The heater core cannot be repaired and it must be replaced if inoperative, leaking or damaged.

REMOVAL

CORE-HEATER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental

airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

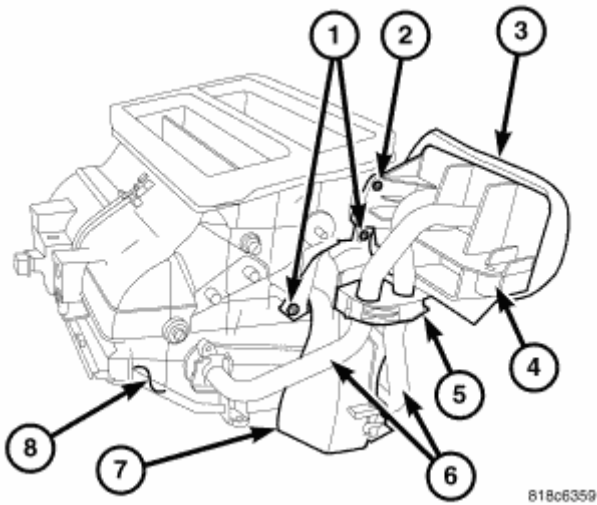
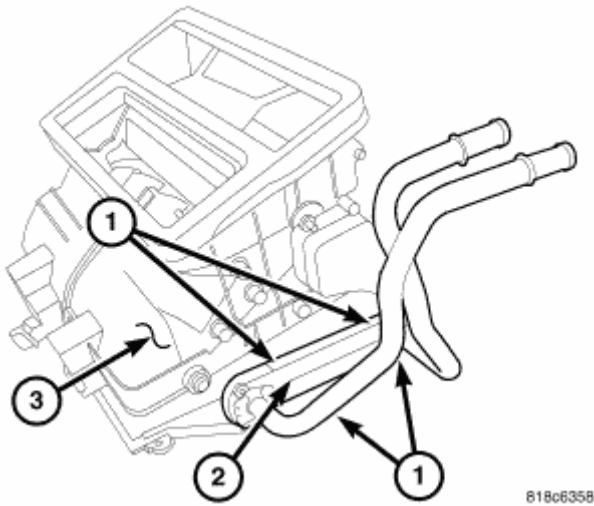


Fig. 148: Air Distribution Housing Assembly
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See REMOVAL.
2. Remove the air distribution housing from the HVAC housing. See REMOVAL.
3. Remove the two screws (1) that secure the upper front passenger side floor duct (7) to the passenger side of the air distribution housing (8) and remove the duct.

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.

4. Carefully remove the foam seal (4) from the heater core tube flange (5). If the seal is deformed or damaged, it must be replaced.
5. Remove the screw (2) that secures the heater core tube flange to the air distribution housing.
6. Disengage the plastic retainer (5) from around the heater core tubes (6) and remove the flange.



618c6358

Fig. 149: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

7. Disengage the four plastic retaining tabs (1) that secure the heater core (2) to the passenger side of the air distribution housing (3) and carefully remove the heater core from the housing.

INSTALLATION

CORE-HEATER

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

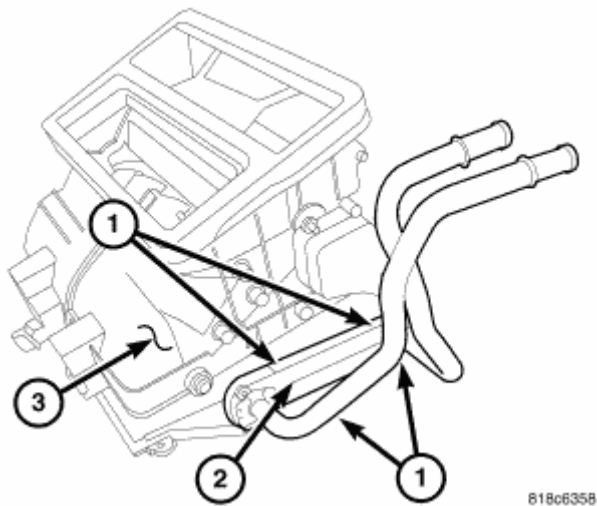


Fig. 150: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
 Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

1. Carefully install the heater core (2) into the passenger side of the air distribution housing (3) and engage the four plastic retainer tabs (1) that secure the heater core to the housing. Make sure the retaining tabs are fully engaged.

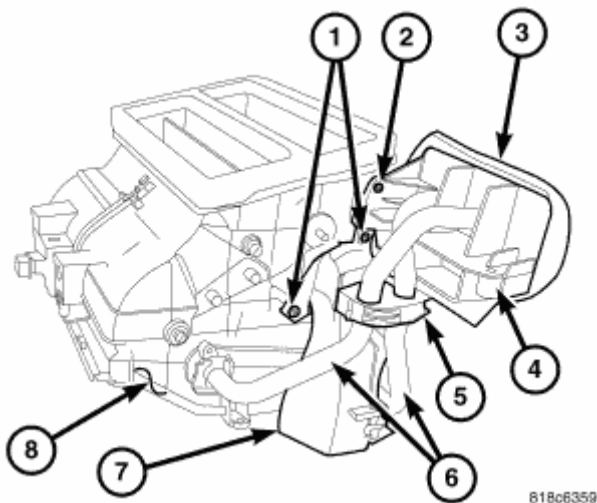


Fig. 151: Air Distribution Housing Assembly
 Courtesy of CHRYSLER LLC

2. Position the heater core tube flange (4) over the heater core tubes (6) and onto the to the passenger side of the air distribution housing (8).
3. Engage the plastic retainer (5) around the heater core tubes. Make sure the retainer is fully engaged around the tubes.
4. Install the screw (2) that secure the heater core tube flange to the air distribution housing. Tighten the

screws to 1.2 N.m (10 in lbs.).

5. Install the upper front passenger side floor duct (7) onto the air distribution housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.

6. Install the foam seal (3) onto the heater core tube flange.
7. Install the air distribution housing onto the HVAC housing. See INSTALLATION.

NOTE: If the heater core is being replaced, flush the cooling system. Refer to STANDARD PROCEDURE .

8. Install the HVAC housing assembly. See INSTALLATION.

CORE-VALVE-SERVICE PORT

DESCRIPTION

CORE-VALVE-SERVICE PORT

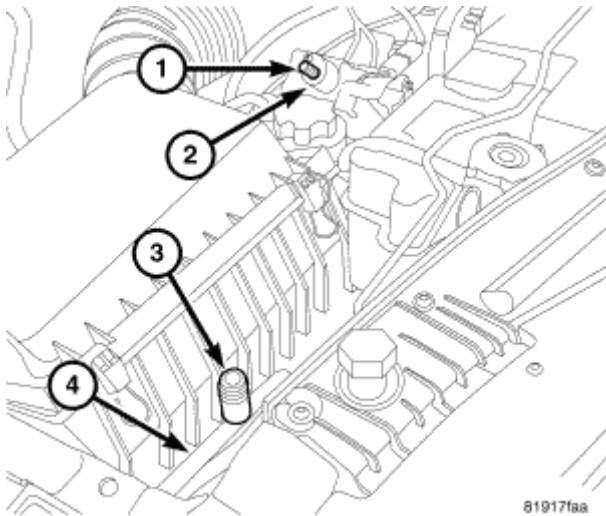


Fig. 152: Low-Side Service Port, A/C Suction Line, High-Side Service Port & A/C Liquid Line
Courtesy of CHRYSLER LLC

NOTE: 3.7L LHD model shown in illustration. 2.8L, 4.0L and RHD models similar.

Refrigerant system service ports are used to recover, recycle, evacuate, charge and test the A/C refrigerant system. Unique sizes are used on the two service ports for the R-134a refrigerant system to ensure the system is not accidentally contaminated with R-12 refrigerant or by service equipment used for R-12 refrigerant.

The low-side service port (1) is located on the A/C suction line (2) at either the rear of the engine compartment or near the A/C compressor, depending on engine and market. The high-side service port (3) is located on the

A/C liquid line (4) near the front of the engine compartment. Both the high-side and low-side A/C service port valve cores are serviceable.

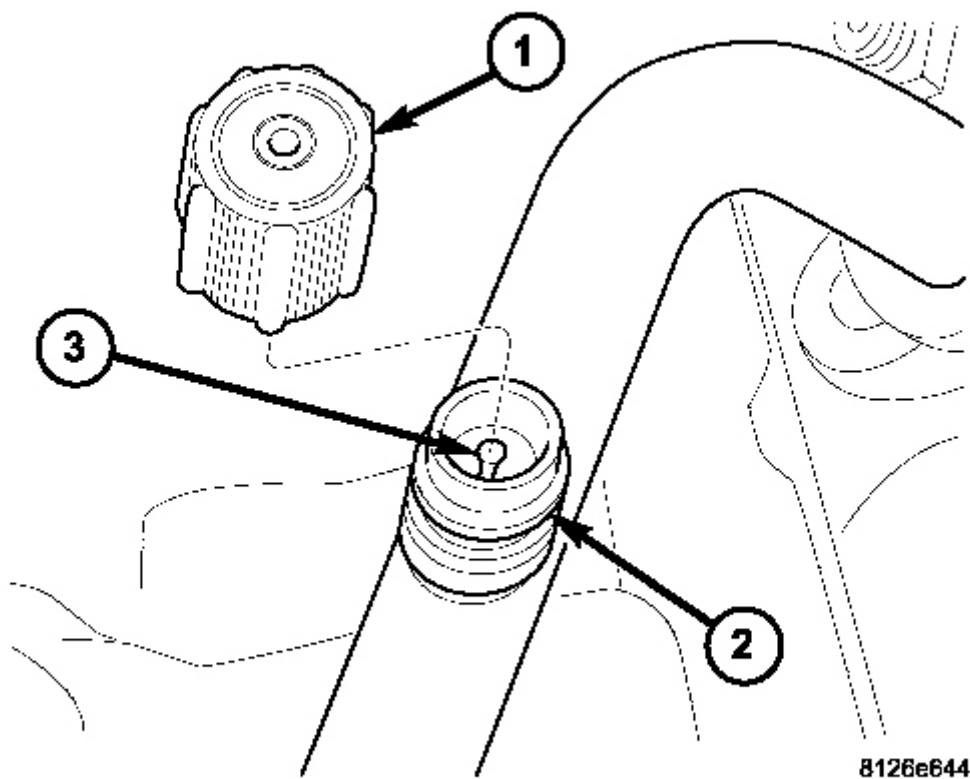
NOTE: The protective cap aids in sealing the service port and helps to protect the refrigerant system from contamination. Remember to always reinstall the protective caps onto the service ports when refrigerant system service is complete.

Each of the service ports has a threaded plastic protective cap installed over it from the factory. The service port caps are serviceable items.

REMOVAL

CORE-VALVE-SERVICE PORT

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions may result in serious or fatal injury.



8126e644

Fig. 153: Identifying A/C Service Port Components

Courtesy of CHRYSLER LLC

NOTE: Typical A/C service port shown in graphic.

1. Remove the protective cap (1) from the service port (2).
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Using a Schrader-type valve core tool, remove the valve core (3) from the service port.
4. Install a plug in, or tape over the opened service port(s).

INSTALLATION

CORE-VALVE-SERVICE PORT

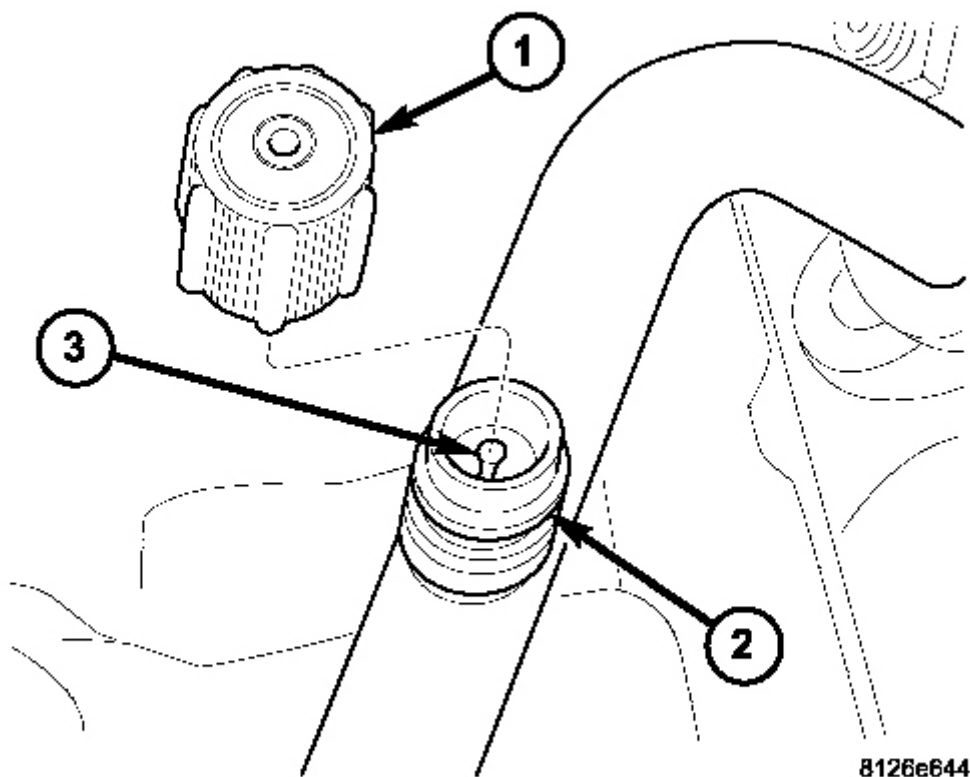


Fig. 154: Identifying A/C Service Port Components
Courtesy of CHRYSLER LLC

NOTE: Typical A/C service port shown in graphic.

1. Lubricate the valve core (3) with clean refrigerant oil prior to installation. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Remove the tape or plug from the service port (2).

CAUTION: A valve core that is not fully seated in the A/C service port can result in damage to the valve during refrigerant system evacuation and charge. Such damage may result in a loss of system refrigerant while uncoupling the charge adapters.

3. Using a Schrader-type valve core tool, install and tighten the valve core into the service port(s).
4. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.

5. Charge the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: The protective cap helps aid in service port sealing and helps protect the refrigerant system from contamination. Remember to always reinstall the protective cap onto the service port when refrigerant system service is complete.

6. Install the protective cap (1) onto the service port.

COUPLER-REFRIGERANT LINE

DESCRIPTION

COUPLER- REFRIGERANT LINE

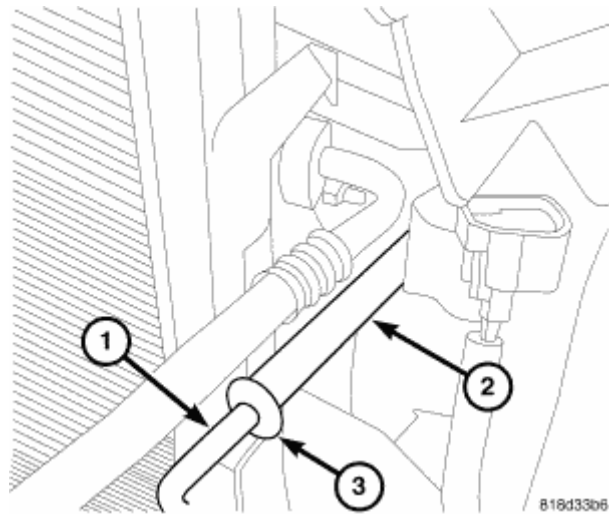


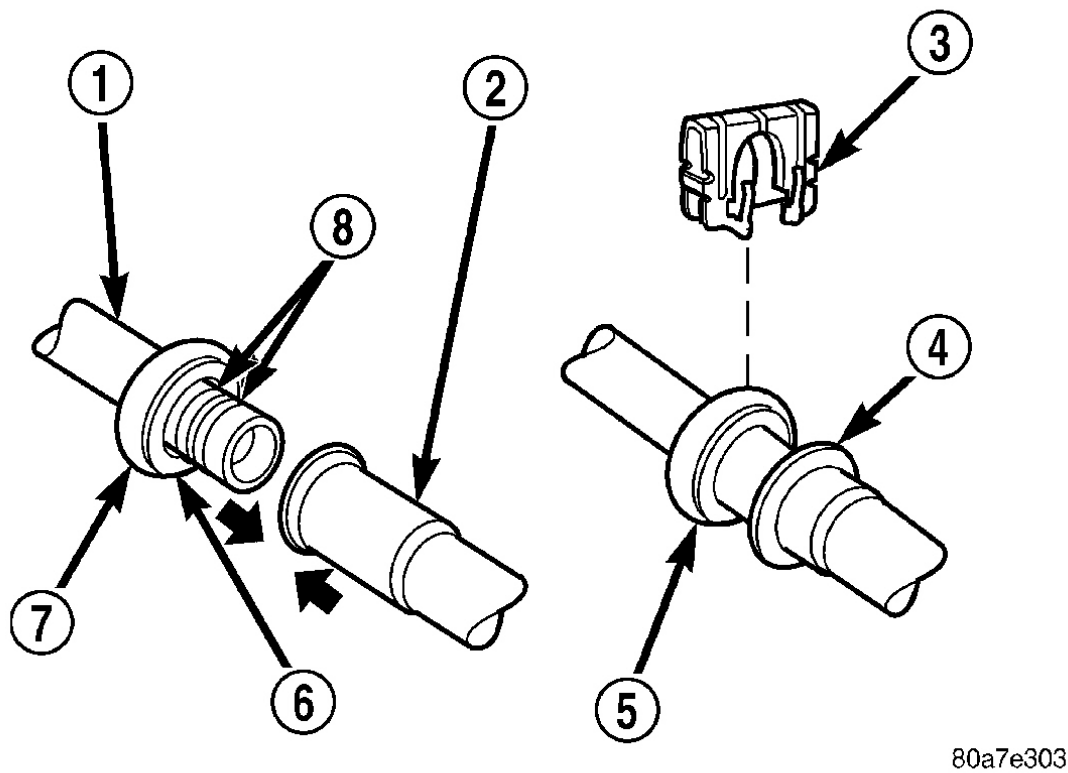
Fig. 155: A/C Liquid Line, A/C Condenser Outlet Tube & Spring-Lock Type Refrigerant Line Coupler
Courtesy of CHRYSLER LLC

The A/C liquid line (1) is attached to the A/C condenser outlet tube (2) by use of a spring-lock type refrigerant line coupler (3). A secondary retaining clip is installed over the connected coupler for added protection.

The spring-lock refrigerant line coupler requires a special disconnect tool for disengaging the two coupler halves.

OPERATION

COUPLER- REFRIGERANT LINE



80a7e303

Fig. 156: Identifying Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

The spring-lock type refrigerant line coupler is held together by a garter spring (6) inside a circular cage (7) on the male half of the fitting (1). When the two coupler halves are connected, the flared end of the female fitting (2) slips behind the garter spring inside the cage on the male fitting. The garter spring and cage prevent the flared end of the female fitting from pulling out of the cage. Some applications use a connection indicator ring (4) to help indicate when the two coupler halves are fully connected.

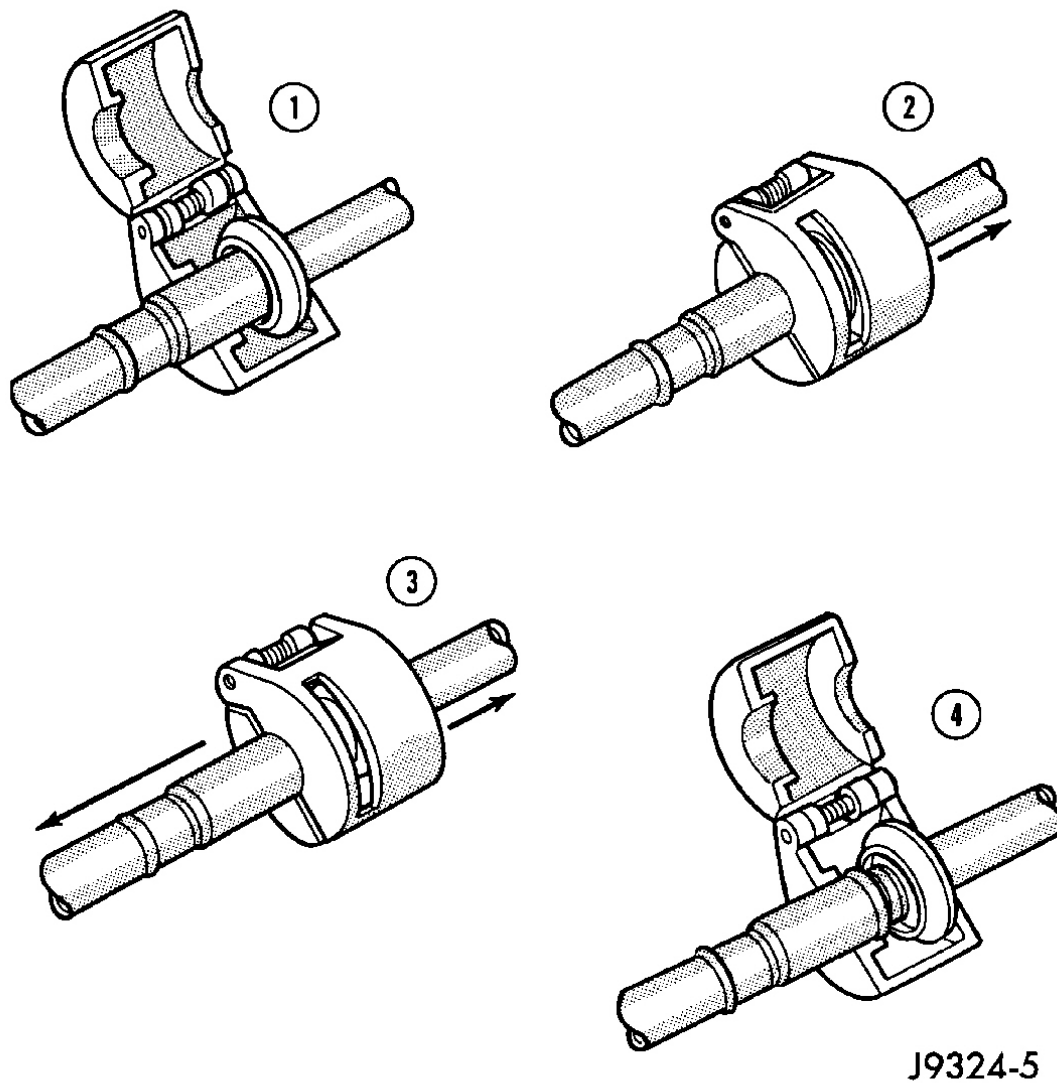
O-rings (8) are used to seal the coupler connections. These O-rings are compatible with R-134a refrigerant and must be replaced with O-rings made of the same material.

A secondary retaining clip (3) is installed over the connected coupler (5) for added protection.

REMOVAL

COUPLER- REFRIGERANT LINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.



J9324-5

Fig. 157: Disconnecting Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

1. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
2. Remove the secondary retaining clip from the spring-lock type refrigerant line coupler.
3. Fit the proper size A/C line disconnect tool (Special Tool Kit 7193 or equivalent) over the coupler cage (1).
4. Close the two halves of the A/C line disconnect tool around the coupler (2).

NOTE: The garter spring may not release if the A/C line disconnect tool is cocked while pushing it into the coupler cage opening.

5. Push the A/C line disconnect tool into the open side of the coupler cage to expand the garter spring (3). Once the garter spring is expanded, pull on the refrigerant line attached to the female half of the coupler until the flange on the female fitting is separated from the garter spring and cage on the male fitting.
6. Open and remove the A/C line disconnect tool from the refrigerant line coupler (4).

INSTALLATION

COUPLER- REFRIGERANT LINE

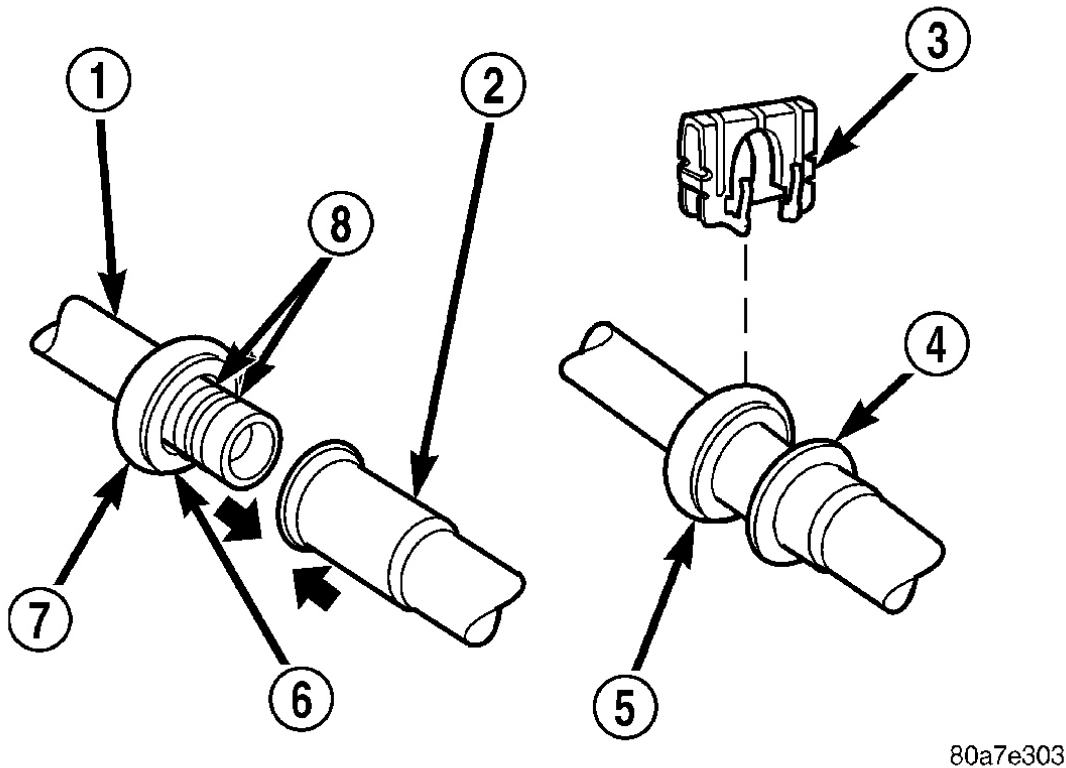


Fig. 158: Identifying Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

1. Clean any dirt or foreign material from the spring-lock type refrigerant line coupler.
2. Check to make sure that the garter spring (6) is located within the cage (7) of the male half of the refrigerant line coupler (1), and that the garter spring is not damaged.
 - If the garter spring is missing, install a new spring by pushing it into the coupler cage opening.
 - If the garter spring is damaged, remove it from the coupler cage with a small hook (DO NOT use a screwdriver) and install a new garter spring.

CAUTION: Use only the specified O-rings as they are made of a special material for the R-134a system. The use of any other O-rings may allow the

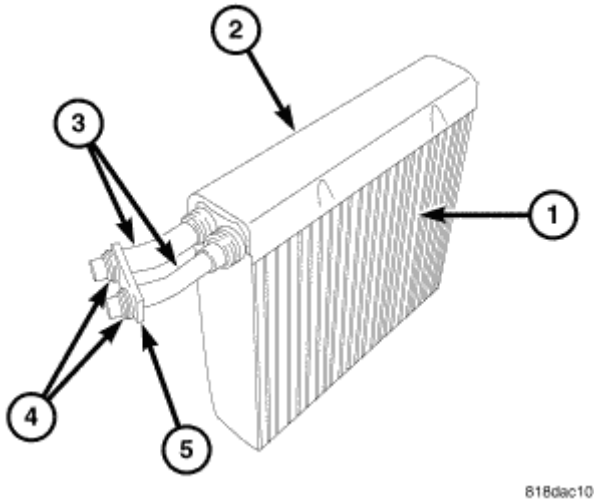
connection to leak.

3. Install new O-rings (8) on the male half of the refrigerant line coupler.
4. Lubricate the O-rings, and the inside of the female half of the refrigerant line coupler (2) with clean R-134a refrigerant oil. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
5. Position the female half of the coupler over the male half of the coupler.
6. Push together firmly on the two halves of the refrigerant line coupler until the garter spring in the cage on the male half of the coupler snaps over the flanged end on the female half of the coupler.
7. Make sure that the refrigerant line coupler is fully engaged by firmly pulling the refrigerant lines away from each other on both sides of the coupler.
8. Install the secondary retaining clip (3) over connected coupler cage (5).
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

EVAPORATOR-A/C

DESCRIPTION

EVAPORATOR-A/C



818dac10

Fig. 159: A/C Evaporator Assembly
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

The A/C evaporator (1) and its insulator (2) for the heating-A/C system is located within the HVAC housing, behind the instrument panel. The A/C evaporator is positioned in the HVAC housing so that all air entering the housing must pass over the evaporator fins before it is distributed through the heater core and heating-A/C system ducts and outlets. However, air passing over the evaporator fins will only be conditioned when the A/C compressor is engaged and circulating refrigerant through the A/C evaporator.

The A/C evaporator tubes (3) are connected and sealed to the A/C expansion valve by use of rubber O-rings (4) and a tapping block (5).

The A/C evaporator can only be serviced by removing and disassembling the HVAC housing.

OPERATION

EVAPORATOR-A/C

Refrigerant enters the A/C evaporator from the A/C expansion valve as a low-temperature, low-pressure mixture of liquid and gas. As air flows over the fins of the A/C evaporator, the humidity in the air condenses on the fins, and the heat from the air is absorbed by the refrigerant. Heat absorption causes the refrigerant to boil and vaporize. The refrigerant becomes a low-pressure gas when it leaves the A/C evaporator.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line or expansion valve is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C evaporator has no serviceable parts except for the O-ring seals. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals must be replaced whenever the A/C expansion valve is removed from the A/C evaporator.

The A/C evaporator cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

EVAPORATOR-A/C

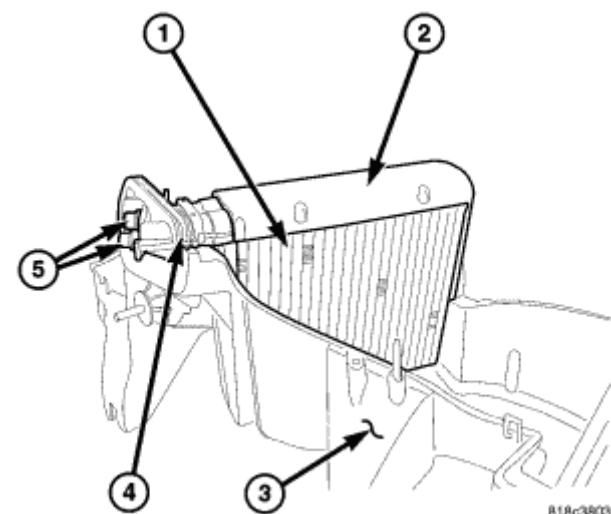


Fig. 160: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Disassemble the HVAC housing. See **DISASSEMBLY**.

NOTE: If the foam insulator around the A/C evaporator is deformed or damaged, the insulator must be replaced.

3. Carefully lift the A/C evaporator (1) and the foam insulator (2) out of the lower half of the HVAC housing (3).

NOTE: If the rubber seal around the evaporator tubes and tapping block is deformed or damaged, the seal must be replaced.

4. If required, remove the rubber seal (4) from around the evaporator tubes and tapping block (5).

INSTALLATION

EVAPORATOR-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

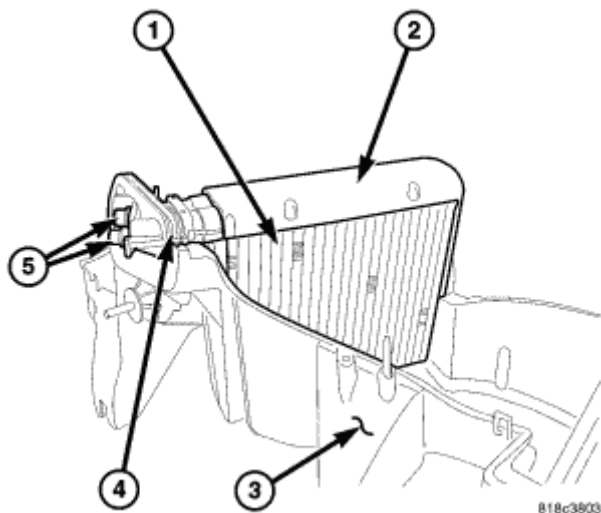


Fig. 161: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

NOTE: Make sure the rubber seal for the evaporator tubes and tapping block is properly positioned in the HVAC housing opening.

1. If removed, install the rubber seal (4) over the evaporator tubes and tapping block (5).

NOTE: Make sure that the foam insulator around the A/C evaporator is properly positioned within the HVAC housing.

2. Carefully install the A/C evaporator (1) and foam insulator (2) into the lower half of the HVAC housing (3).
3. Assemble the HVAC housing. See **ASSEMBLY**.
4. Install the HVAC housing assembly. See **INSTALLATION**.
5. If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

LINE-A/C DISCHARGE

DESCRIPTION

LINE-A/C DISCHARGE

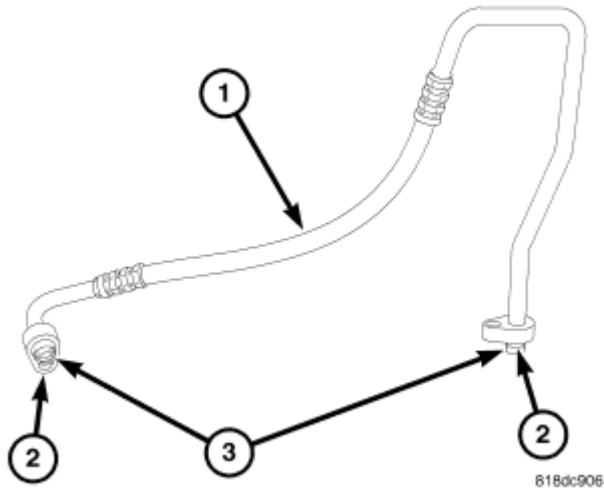


Fig. 162: A/C Discharge Line, Metal Gaskets & Rubber O-Ring Seals
Courtesy of CHRYSLER LLC

NOTE: 4.0L LHD model shown in illustration. Other models similar.

The A/C discharge line (1) is the refrigerant line that carries refrigerant from the A/C compressor to the A/C condenser.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C discharge line has no serviceable parts except for the metal gaskets (2) and rubber O-ring seals (3). The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever the A/C discharge line is removed and installed.

The A/C discharge line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

2.8L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

CAUTION: Before removing the A/C discharge line, note the location of the right side condenser air seal. This air seal is to direct air through the A/C condenser and radiator. The air seals must be reinstalled in its proper location in order for the A/C and engine cooling systems to perform as designed.

NOTE: LHD model shown in illustrations. RHD model similar.

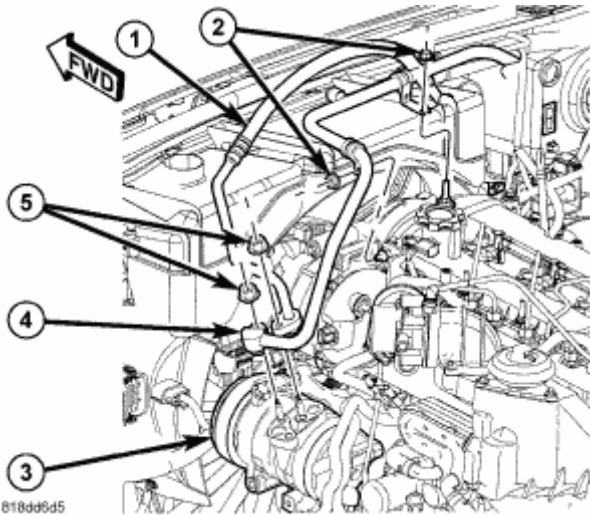


Fig. 163: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing.
4. Remove the air inlet tube from the throttle body and position it out of the way.
5. Remove the battery for clearance. Refer to **REMOVAL** .
6. Remove the nut (5) that secures the A/C discharge line (1) to the A/C compressor (3).
7. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.
8. Disengage the A/C discharge line from the plastic retaining clip located on the right side of the fan shroud.

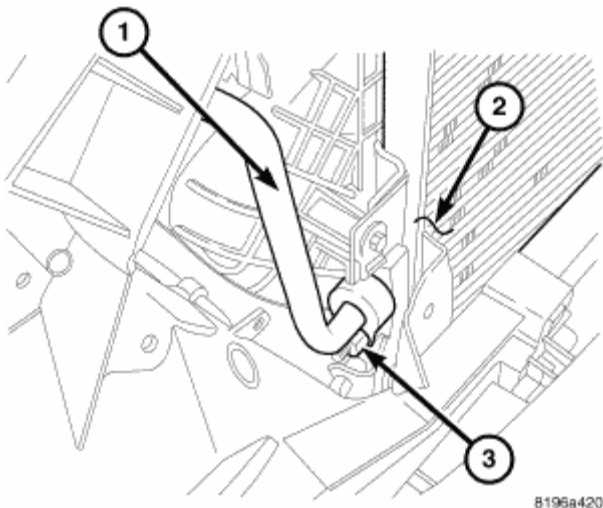


Fig. 164: Removing/Installing Nut That Secures A/C Discharge Line To A/C Condenser
Courtesy of CHRYSLER LLC

9. Remove the grille. Refer to **REMOVAL** .
10. Position the right side condenser air seal out of the way to gain access to the discharge line fitting.
11. Remove the nut (3) that secures the A/C discharge line (1) to the A/C condenser (2).

NOTE: Rotate and tilt the A/C discharge line as necessary to disconnect it from the A/C condenser.

12. Disconnect the A/C discharge line from the condenser and remove and discard the O-ring seal and gasket.
13. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

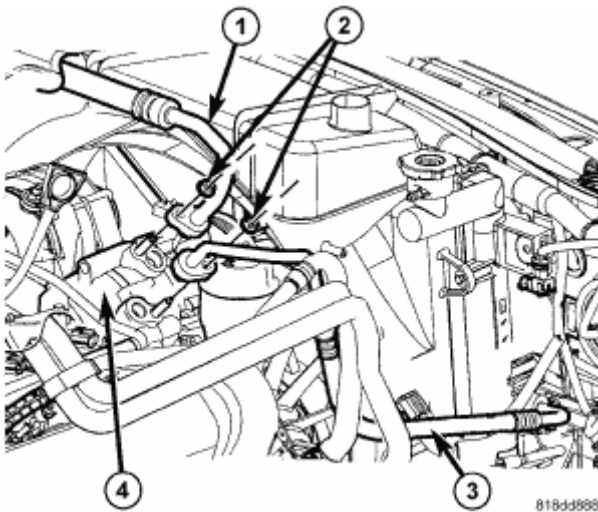


Fig. 165: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C discharge line (3) to the A/C compressor (4).
5. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.

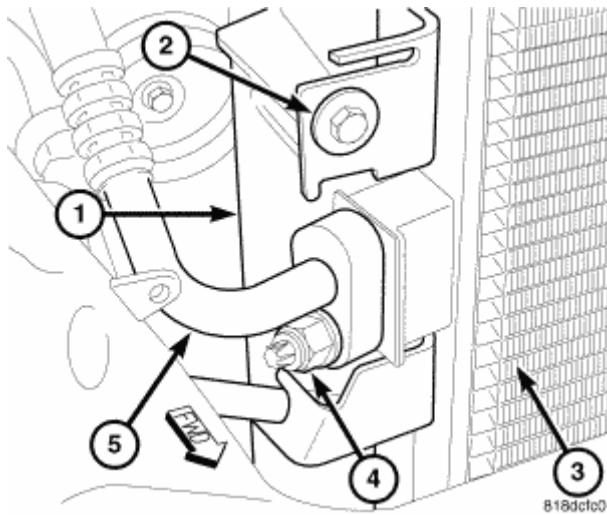


Fig. 166: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

6. Remove the grille. Refer to **REMOVAL** .
7. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3).
8. Remove the bolt (2) that secures the A/C condenser to the right side of the radiator (1).
9. For clearance, position the A/C condenser toward the left side of the vehicle and then disconnect the A/C discharge line from the condenser.
10. Remove and discard the O-ring seal and gasket from the discharge line fitting.
11. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

4.0L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

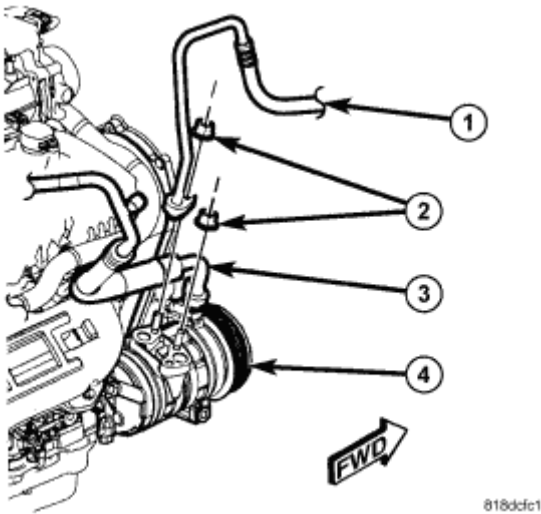


Fig. 167: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C discharge line (1) to the A/C compressor (4).
5. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.

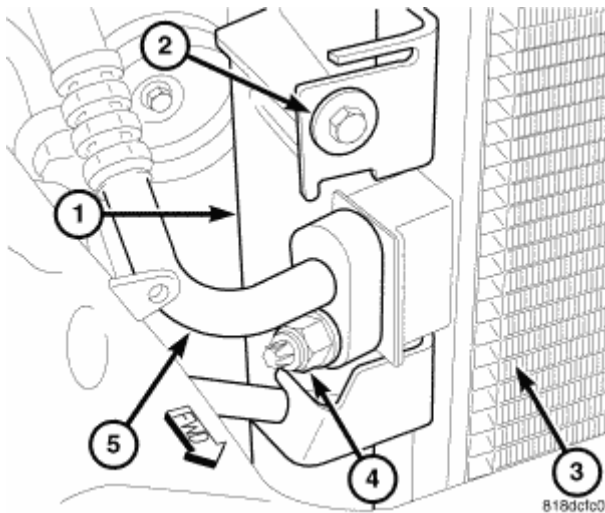


Fig. 168: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

6. Remove the grille. Refer to **REMOVAL** .
7. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3).
8. Remove the bolt (2) that secures the A/C condenser to the right side of the radiator (1).
9. For clearance, position the A/C condenser toward the left side of the vehicle and then disconnect the A/C

discharge line from the condenser.

10. Remove and discard the O-ring seal and gasket from the discharge line fitting.
11. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

INSTALLATION

2.8L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

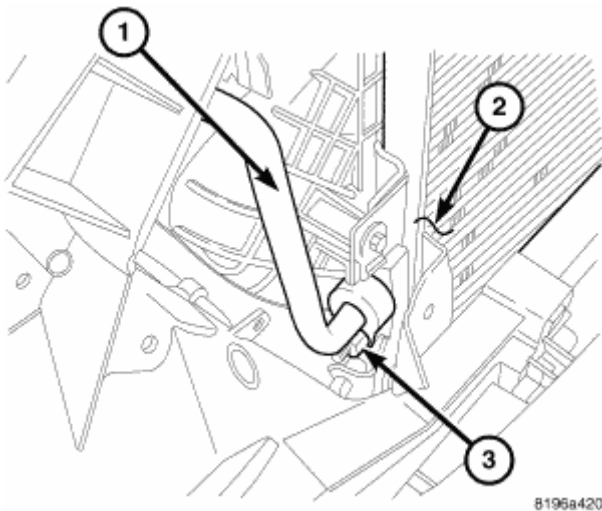


Fig. 169: Removing/Installing Nut That Secures A/C Discharge Line To A/C Condenser
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Rotate and tilt the A/C discharge line as necessary to connect it from the A/C condenser.

3. Position the A/C discharge line (1) into the engine compartment and connect it to the A/C condenser (2).
4. Install the nut (3) that secures the A/C discharge line to the A/C condenser. Tighten the nut to 22.5 N.m (200 in. lbs.).
5. Engage the A/C discharge line into the plastic retaining clip located on the right side of the fan shroud.
6. Install the grille. Refer to **INSTALLATION**.

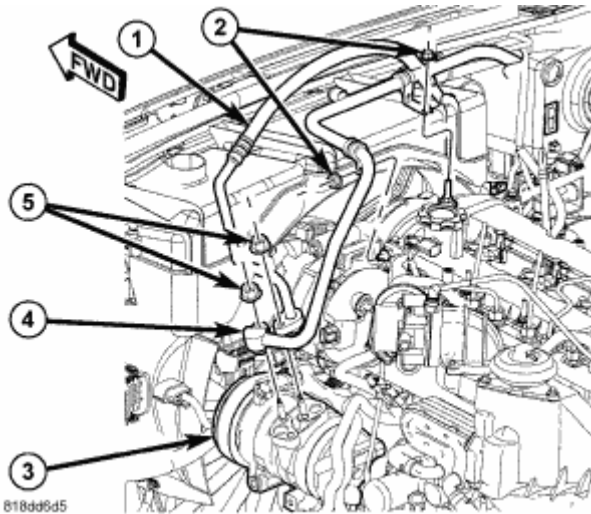


Fig. 170: Refrigerant Line System
Courtesy of CHRYSLER LLC

7. Connect the A/C discharge line (1) to the A/C compressor (4).
8. Install the nut (5) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
9. Install the battery. Refer to **INSTALLATION**.
10. Install the air inlet tube to the throttle body. Tighten the clamp securely.
11. Install the air cleaner housing.
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
14. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

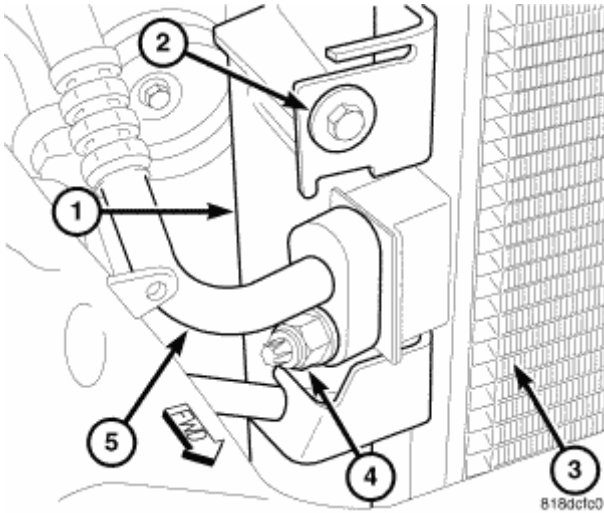


Fig. 171: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. For clearance, position the A/C condenser (3) toward the left side of the vehicle.
4. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4) hand tight.
5. Reposition the A/C condenser and install the bolt (2) that secures the condenser to the right side of the radiator (1). Tighten the bolt to 5 N.m (44 in. lbs.).
6. Tighten the nut that secures the A/C discharge line to the A/C condenser to 22.5 N.m (200 in. lbs.).
7. Install the grille. Refer to **INSTALLATION**.

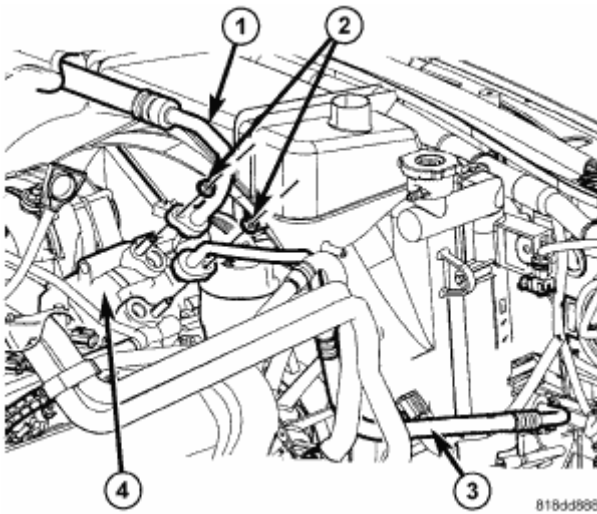


Fig. 172: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

8. Connect the A/C discharge line (3) to the A/C compressor (4).
9. Install the nut (2) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
10. Install the air cleaner housing (refer to **INSTALLATION**).
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

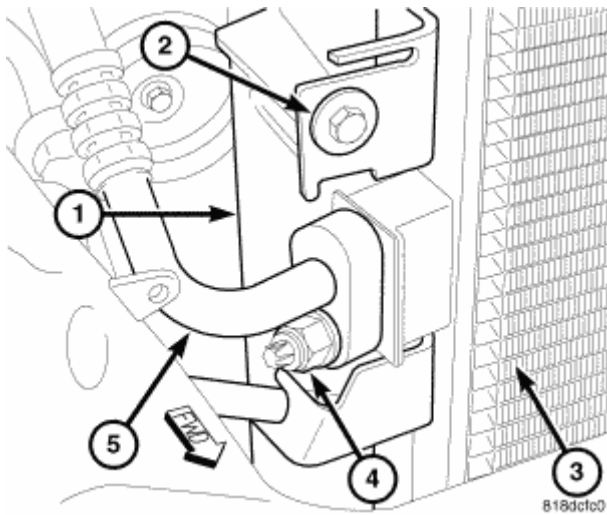


Fig. 173: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. For clearance, position the A/C condenser (3) toward the left side of the vehicle.
4. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4) hand tight.
5. Reposition the A/C condenser and install the bolt (2) that secures the condenser to the right side of the radiator (1). Tighten the bolt to 5 N.m (44 in. lbs.).
6. Tighten the nut that secures the A/C discharge line to the A/C condenser to 22.5 N.m (200 in. lbs.).
7. Install the grille. Refer to **INSTALLATION** .

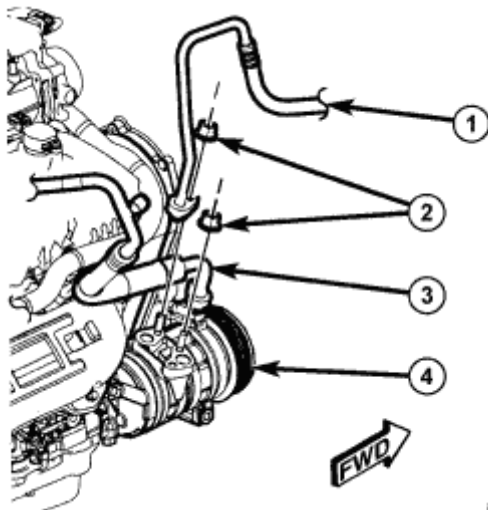


Fig. 174: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

8. Connect the A/C discharge line (1) to the A/C compressor (4).
9. Install the nut (2) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
10. Install the air cleaner housing (refer to **INSTALLATION**).
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

LINE-A/C LIQUID

DESCRIPTION

LINE-A/C LIQUID

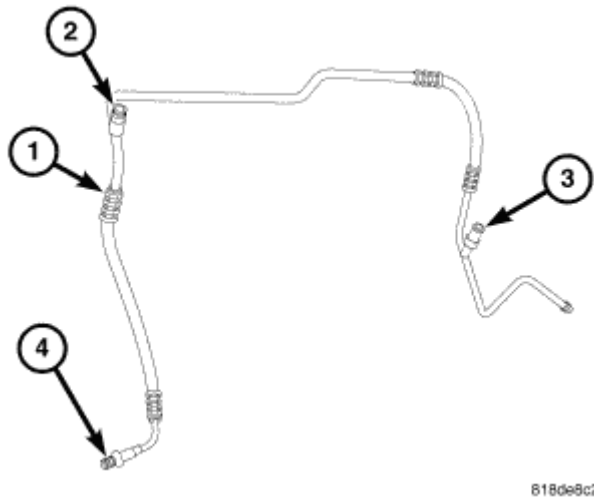


Fig. 175: A/C Liquid Line, High-Side Service Port, A/C Pressure Transducer & Condenser Outlet Tube Connection

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

The A/C liquid line (1) is the refrigerant line that carries refrigerant from the A/C condenser to the A/C expansion valve. The A/C liquid line contains the high-side service port (2), a fitting for the A/C pressure transducer (3) and uses a spring lock coupler at the condenser outlet tube connection (4). On LHD models, the A/C liquid line is serviced only as an assembly. On RHD models, the A/C liquid line is serviced in two sections and uses a spring lock coupler to connect the two sections together.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C liquid line has no serviceable parts except for the rubber O-ring seals, high-side service port valve and its protective cap and the plastic retainer clips. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals must be replaced whenever the A/C liquid line is removed and installed.

The A/C liquid line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

LHD MODEL

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

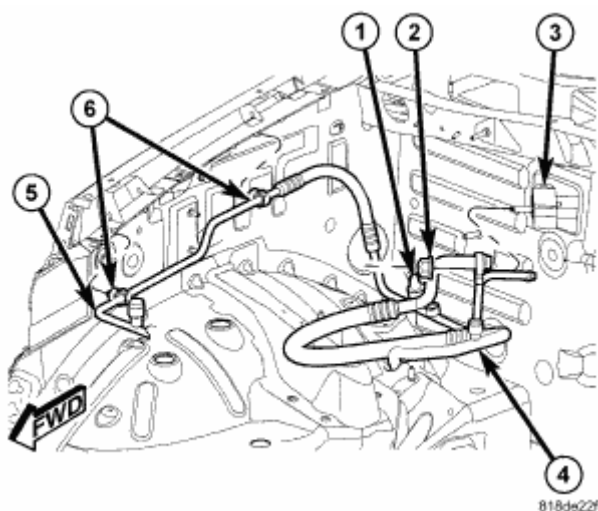


Fig. 176: Removing/Installing LHD Liquid Line
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Disconnect the wire harness connector from the A/C pressure transducer (1) located on the A/C liquid line (5) near the A/C expansion valve (3) and if required, remove the A/C pressure transducer from the A/C liquid line. See **REMOVAL**.
5. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
6. Separate the A/C liquid line from the A/C suction line and disengage the A/C liquid line from the two retaining clips (6) located on the right inner fender.

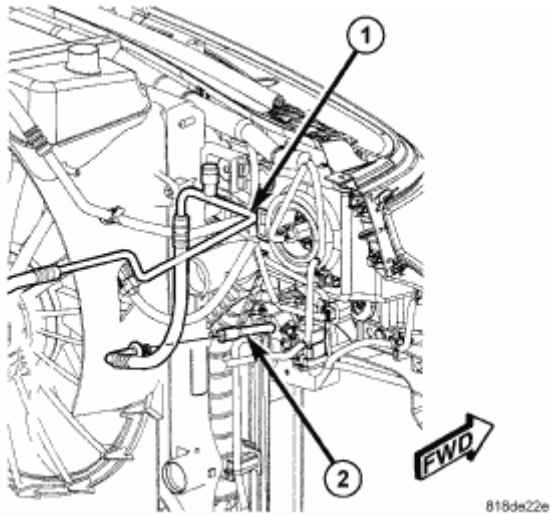


Fig. 177: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

7. Remove the secondary retaining clip and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.
8. Remove the A/C liquid line from the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the condenser and expansion valve ports.

RHD MODEL

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

FRONT SECTION

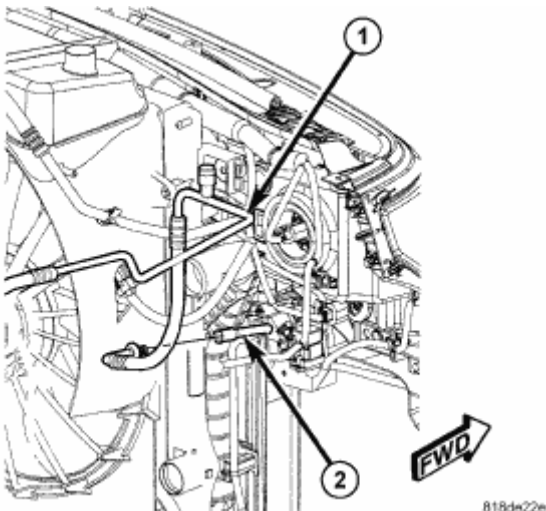


Fig. 178: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the secondary retaining clip and using the proper A/C line disconnect tool, disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.

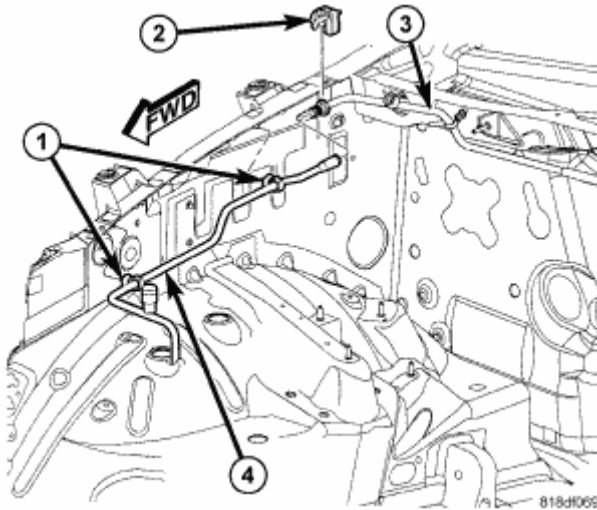


Fig. 179: Retaining Clips, Secondary Retaining Clip, A/C Liquid Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

5. Disengage the front section of the A/C liquid line (4) from the two retaining clips (1) located on the right inner fender.
6. Remove the secondary retaining clip (2) and using the proper A/C line disconnect tool, disconnect the front section of the A/C liquid line from the rear section of the A/C liquid line (3). See **REMOVAL**.
7. Remove the front section of the A/C liquid line from the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the condenser tube.

REAR SECTION

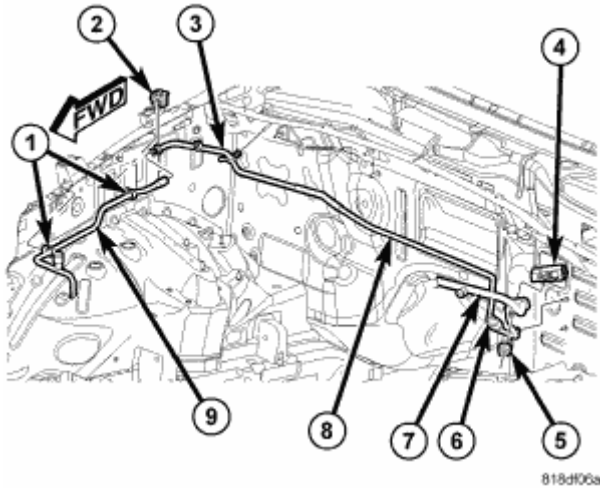


Fig. 180: Removing/Installing RHD Liquid Lines - Rear Section
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the two nuts that secure the engine coolant reservoir to the dash panel and position the reservoir out of the way.
5. Disconnect the wire harness connector from the A/C pressure transducer (6) located on the rear section of the A/C liquid line (8) near the A/C expansion valve (4) and if required, remove the A/C pressure transducer from the A/C liquid line. See **REMOVAL**.
6. Remove the nut (5) that secures the A/C suction line (7) and the rear section of the A/C liquid line to the A/C expansion valve and disconnect the lines from the valve.
7. Disengage the A/C liquid line from the retaining clips (3) located on the dash panel and the brake lines near the brake booster.
8. Separate the A/C liquid line from the A/C suction line and disengage the A/C liquid line from the two retaining clips (1) located on the right inner fender.
9. Remove the secondary retaining clip (2) and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the rear section of the A/C liquid line from the front section of the liquid line (9). See **REMOVAL**.
10. Remove the rear section of the A/C liquid line from out of the right side of the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the expansion valve ports.

INSTALLATION

LHD MODELS

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating

as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

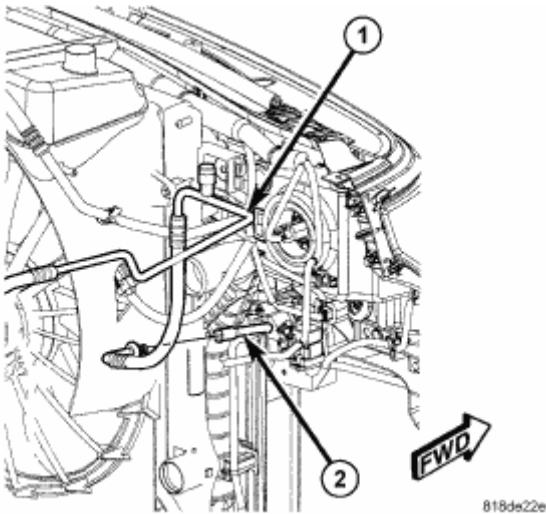


Fig. 181: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the condenser and expansion valve ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.

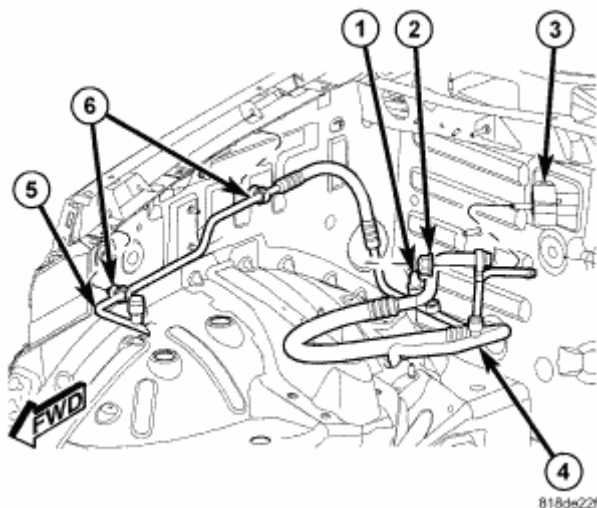


Fig. 182: Removing/Installing LHD Liquid Line
Courtesy of CHRYSLER LLC

4. Install the A/C liquid line (5) into the two retaining clips (6) located on the right inner fender.
5. Connect the A/C liquid line to the A/C suction line (4).
6. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).
7. If removed, install the A/C pressure transducer (1) onto A/C liquid line and connect the wire harness connector to the transducer. See **INSTALLATION**.
8. Install the air cleaner housing (refer to **INSTALLATION**).
9. Reconnect the negative battery cable.
10. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
11. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
12. Charge the refrigerant system. See **STANDARD PROCEDURE**.

RHD MODEL

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

FRONT SECTION

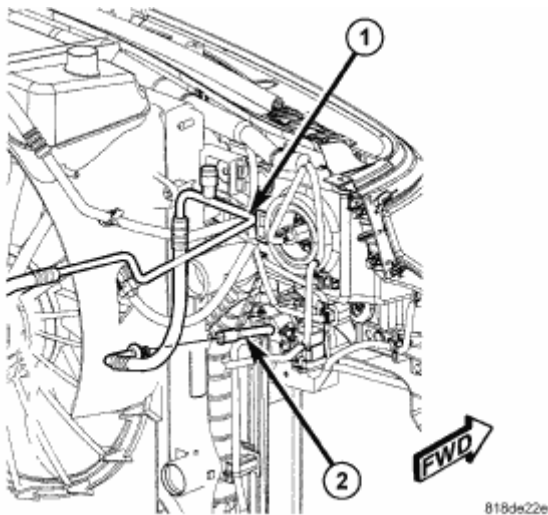


Fig. 183: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**.
2. Remove the tape or plugs from the opened refrigerant line fittings and the condenser tube port.
3. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
4. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.

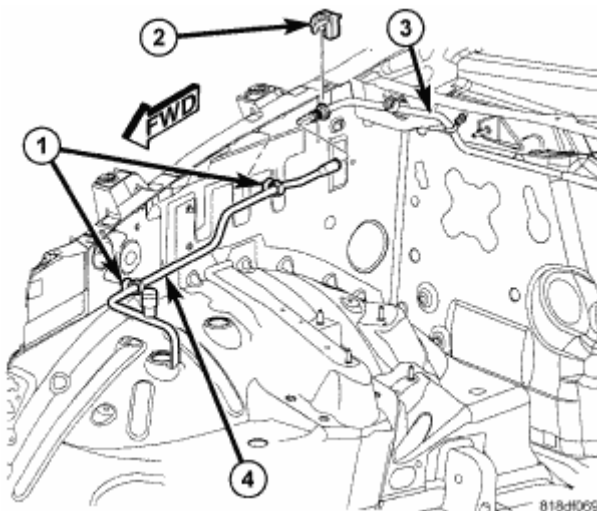


Fig. 184: Retaining Clips, Secondary Retaining Clip, A/C Liquid Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

5. Connect the front section of the A/C liquid line (4) to the rear section of the A/C liquid line (3) and install

the secondary retaining clip (2). See **INSTALLATION**.

6. Engage the A/C liquid line to the two retaining clips (1) located on the right inner fender.
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

REAR SECTION

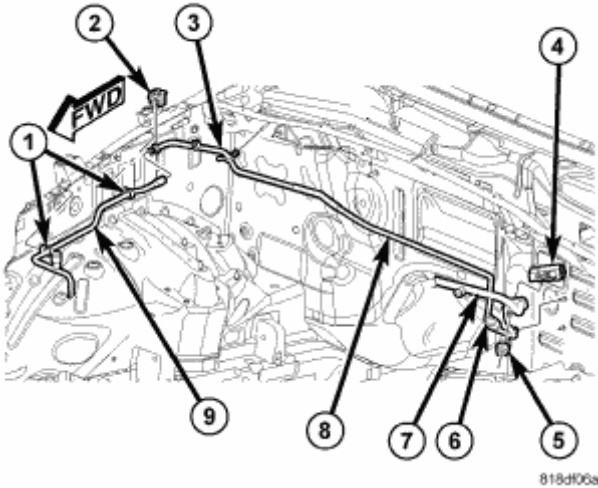


Fig. 185: Removing/Installing RHD Liquid Lines - Rear Section
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the expansion valve ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Position the rear section of the A/C liquid line (8) into the engine compartment from the right side of the vehicle. Be sure to route the liquid line behind the diesel engine fuel filter.
4. Connect the rear section of the A/C liquid line (8) to the A/C suction line (7).
5. Connect the A/C liquid and suction lines to the A/C expansion valve (4) and install the retaining nut (5). Tighten the nut to 23 N.m (17 ft. lbs.).
6. If removed, install the A/C pressure transducer (6) onto A/C liquid line and connect the wire harness connector to the transducer. See **INSTALLATION**.
7. Engage the A/C liquid line to the retaining clips (3) located on the dash panel and the brake lines near the brake booster.
8. Connect the front section of the A/C liquid line (9) to the rear section of the A/C liquid line and install the secondary retaining clip (2). See **INSTALLATION**.
9. Engage the A/C liquid line to the two retaining clips (1) located on the right inner fender.
10. Reposition the engine coolant reservoir to the dash panel and install the two retaining nuts. Tighten the nuts securely.

11. Install the air cleaner housing (refer to **INSTALLATION**).
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
14. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

LINE-A/C SUCTION

DESCRIPTION

LINE-A/C SUCTION

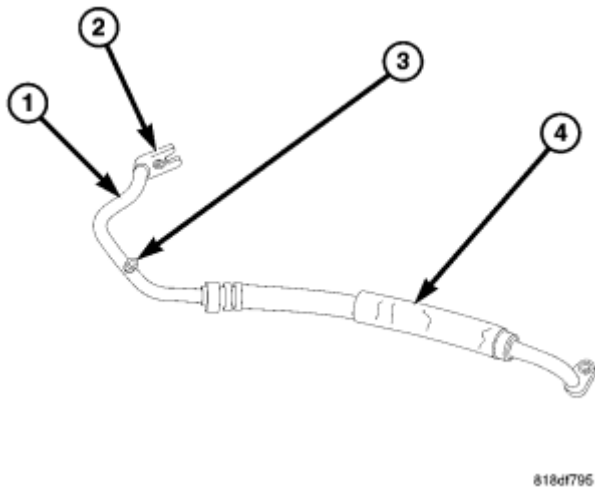


Fig. 186: A/C Suction Line, Tapping Plate, Low-Side Service Port & Heat Shield
Courtesy of CHRYSLER LLC

NOTE: **4.0L engine shown in illustration. Other engines similar.**

The A/C suction line (1) is the refrigerant line that carries refrigerant from the A/C evaporator to the A/C compressor. The A/C suction line is secured to the A/C expansion valve by a tapping plate (2) and contains the low-side service port (3) and a heat shield (4), depending on engine application.

NOTE: **Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.**

The A/C suction line has no serviceable parts except for the rubber O-ring seals, metal gasket and the low-side service port valve and its protective cap. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gasket must be replaced whenever the A/C suction line is removed and installed.

The A/C suction line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

2.8L LHD ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

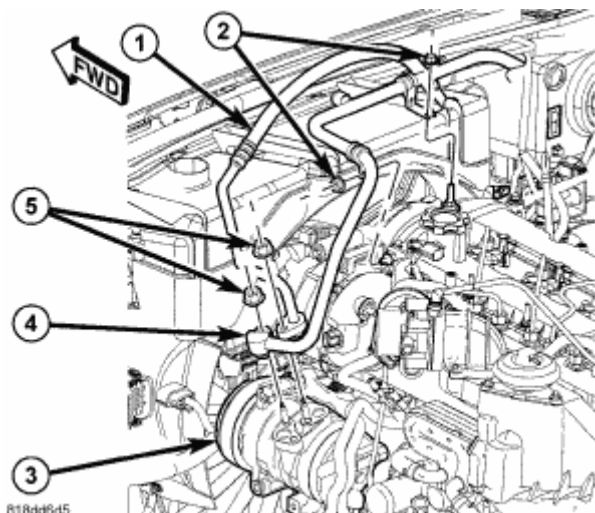


Fig. 187: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See STANDARD PROCEDURE.
3. Remove the air cleaner housing.
4. Remove the air inlet tube from the throttle body and position it out of the way.
5. Remove the battery for clearance. Refer to REMOVAL.
6. Remove the nut (5) that secures the A/C suction line (4) to the A/C compressor (3).
7. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.
8. Remove the two nuts (2) that secure the A/C suction line to the top of the engine.

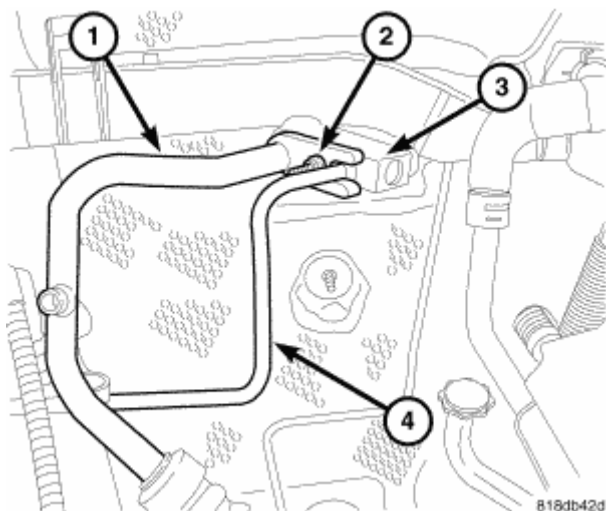


Fig. 188: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
 Courtesy of CHRYSLER LLC

9. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
10. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
11. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

2.8L RHD ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

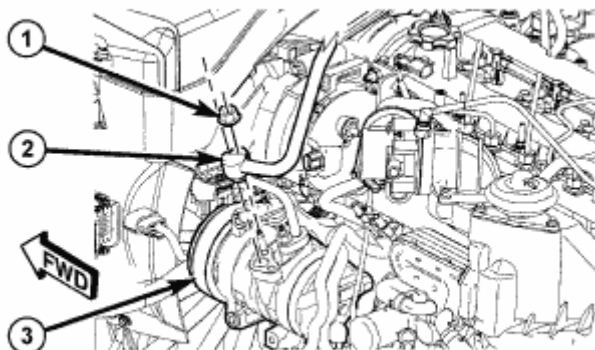


Fig. 189: Nut, A/C Suction Line & A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air inlet tube from the throttle body and position it out of the way.
4. Remove the battery for clearance. Refer to **REMOVAL** .
5. Remove the nut (1) that secures the A/C suction line (2) to the A/C compressor (3).
6. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

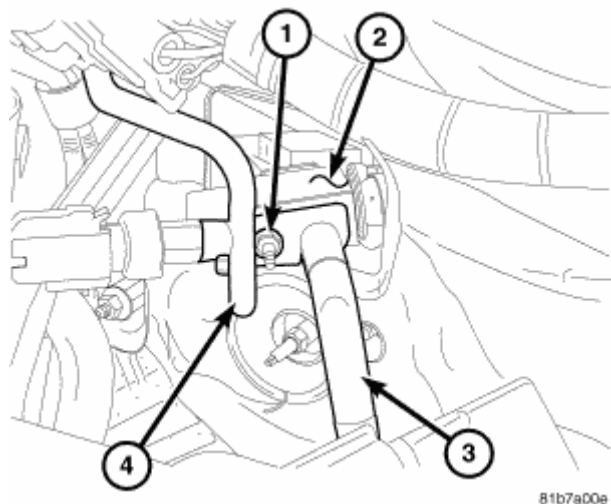


Fig. 190: Nut, A/C Expansion Valve, A/C Suction Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

7. Remove the nut (1) that secures the A/C suction line (3) and the A/C liquid line (4) to the A/C expansion valve (2) and disconnect the lines from the valve.
8. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
9. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

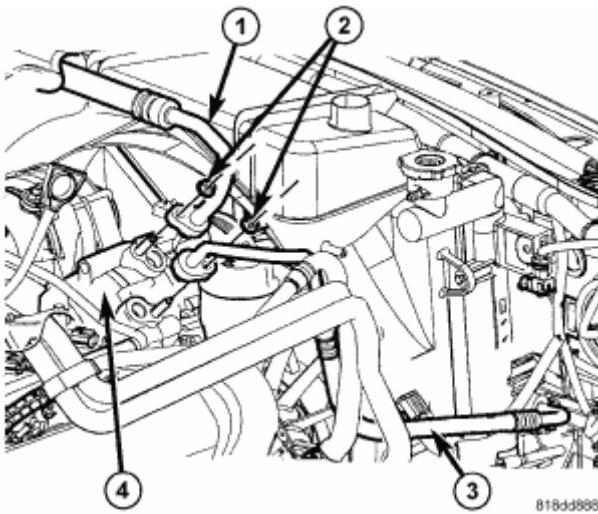


Fig. 191: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C suction line (1) to the A/C compressor (4).
5. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

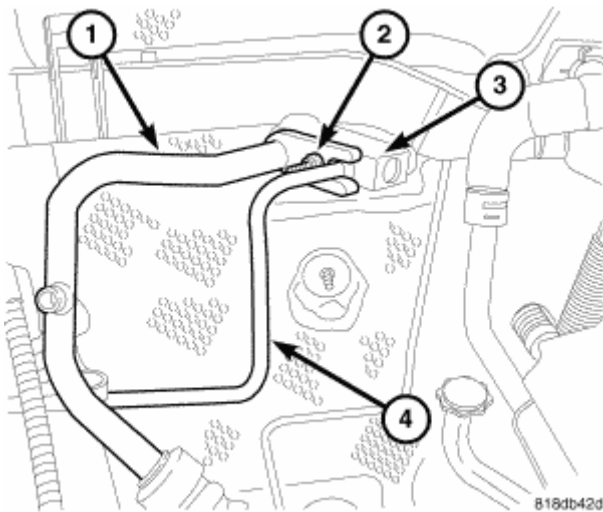


Fig. 192: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line

Courtesy of CHRYSLER LLC

6. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
7. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine

compartment.

8. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

4.0L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

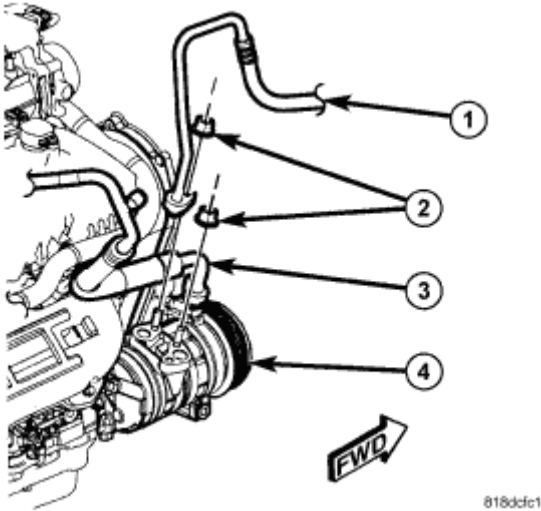


Fig. 193: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C suction line (3) to the A/C compressor (4).
5. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

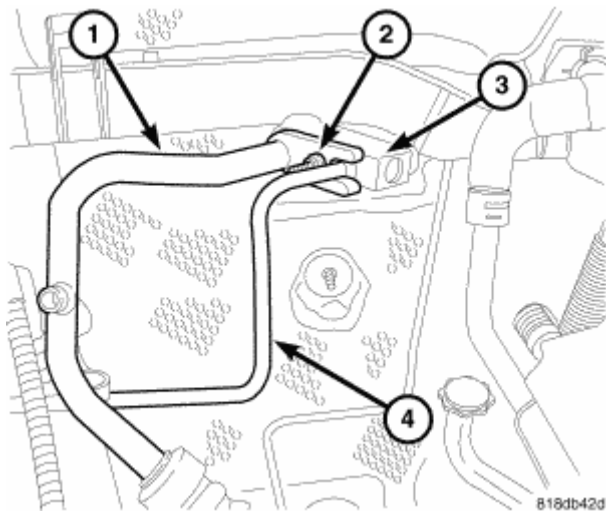


Fig. 194: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

6. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
7. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
8. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

INSTALLATION

2.8L LHD ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

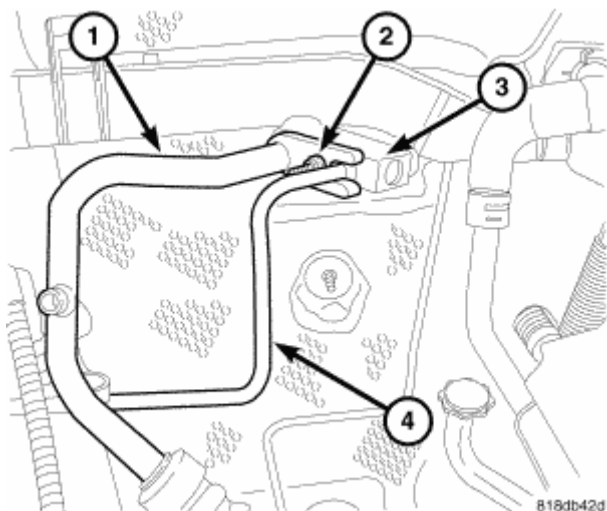


Fig. 195: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
 Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

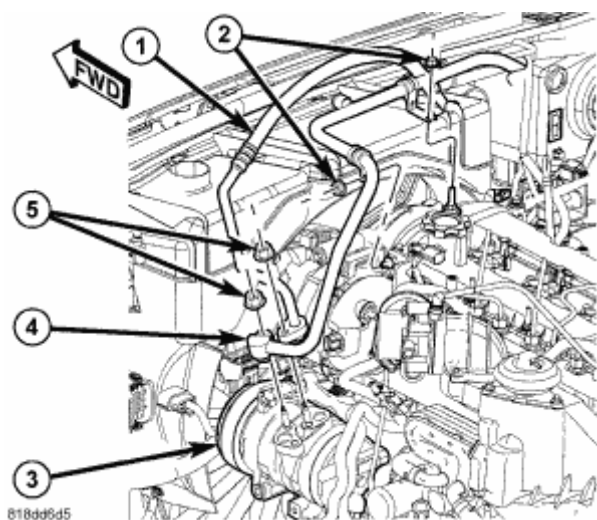


Fig. 196: Refrigerant Line System
 Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (4) to the A/C compressor (3).
6. Install the nut (5) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).

7. Install the two nuts (2) that secure the A/C suction line to the top of the engine. Tighten the nuts to 4.5 N.m (40 in. lbs.).
8. Install the battery. Refer to **INSTALLATION** .
9. Install the air inlet tube to the throttle body. Tighten the clamp securely.
10. Install the air cleaner housing.
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

2.8L RHD ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

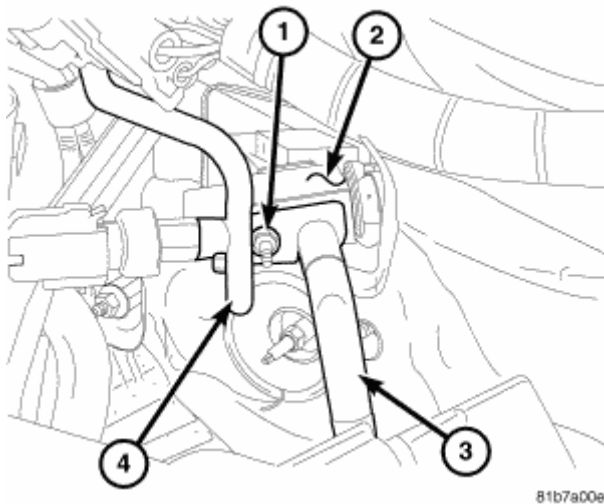
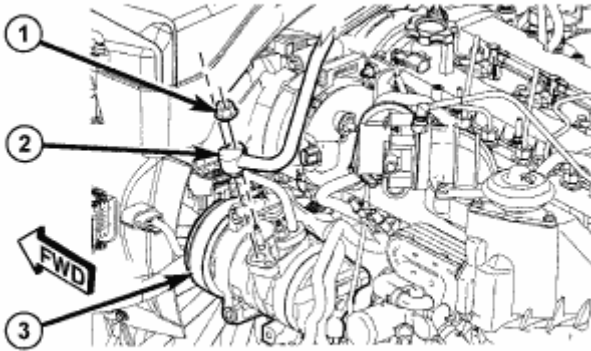


Fig. 197: Nut, A/C Expansion Valve, A/C Suction Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.

2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (3).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (2) and install the retaining nut (1). Tighten the nut to 23 N.m (17 ft. lbs.).



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Fig. 198: Nut, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (2) to the A/C compressor (3).
6. Install the nut (1) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the battery. Refer to **INSTALLATION** .
8. Install the air inlet tube to the throttle body. Tighten the clamp securely.
9. Reconnect the negative battery cable.
10. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
11. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
12. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

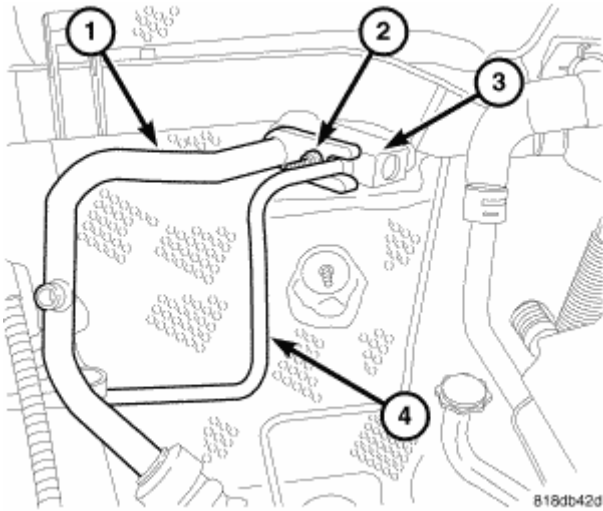


Fig. 199: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

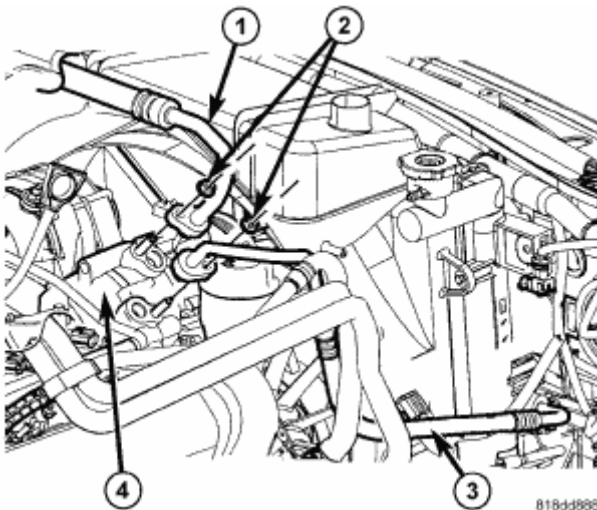


Fig. 200: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (1) to the A/C compressor (4).
6. Install the nut (2) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
11. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

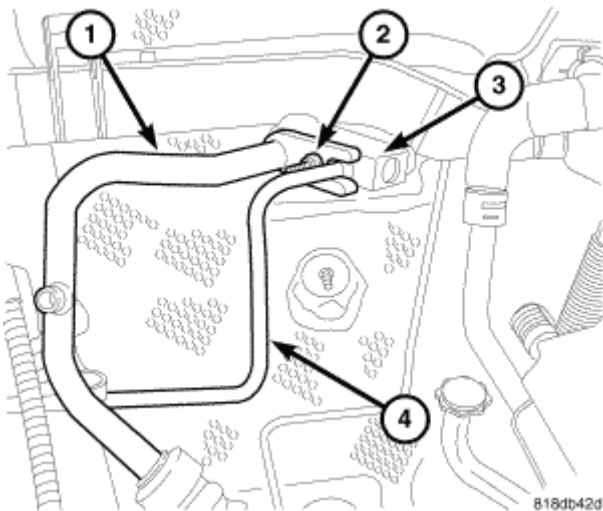


Fig. 201: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.

2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

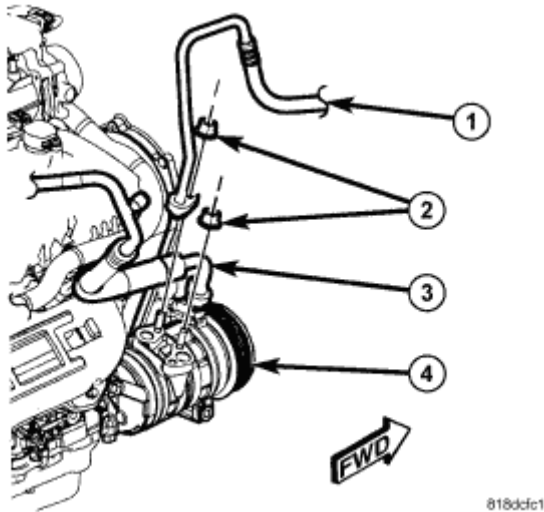


Fig. 202: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (3) to the A/C compressor (4).
6. Install the nut (2) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
11. Charge the refrigerant system. See **STANDARD PROCEDURE**.

OIL-A/C REFRIGERANT

DESCRIPTION

OIL-A/C REFRIGERANT

The refrigerant oil used in R-134a refrigerant systems is a synthetic-based, PolyAlkylene Glycol (PAG), wax-free lubricant. Mineral-based R-12 refrigerant oils are not compatible with PAG oils, and should never be introduced to an R-134a refrigerant system.

There are different PAG oils available, and each contains a different additive package. Use **only** refrigerant oil of the same type as recommended to service the refrigerant system (**always refer to the specification tag**

included with the replacement A/C compressor or the A/C Underhood Specification Label located in the engine compartment).

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level can prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

The A/C compressors used in this vehicle are designed to use VC-46 PAG refrigerant oil. Use only this type of refrigerant oil when servicing the A/C compressor.

OPERATION

OIL-A/C REFRIGERANT

After performing any refrigerant recovery or recycling operation, always replenish the refrigerant system with the same amount of the recommended refrigerant oil as was removed. Too little refrigerant oil can cause A/C compressor damage, and too much can reduce A/C system performance.

PAG refrigerant oil is more hygroscopic than mineral oil, and will absorb any moisture it comes into contact with, even moisture in the air. The PAG oil container should always be kept tightly capped until it is ready to be used. After use, recap the oil container immediately to prevent moisture contamination.

STANDARD PROCEDURE

REFRIGERANT OIL LEVEL

When an A/C system is assembled at the factory, all components except the A/C compressor are refrigerant oil free. After the refrigerant system has been charged and operated, the refrigerant oil in the A/C compressor is dispersed throughout the refrigerant system. The A/C accumulator, A/C evaporator, A/C condenser and the A/C compressor will each retain a significant amount of the needed refrigerant oil.

It is important to have the correct amount of refrigerant oil in the A/C system. This ensures proper lubrication of the A/C compressor. Too little oil will result in damage to the A/C compressor, while too much oil will reduce the cooling capacity of the A/C system and consequently result in higher discharge air temperatures.

CAUTION: The A/C compressors in this vehicle are designed to use VC-46 PAG refrigerant oil. Use only VC-46 PAG refrigerant oil or severe damage to the A/C system may occur. Always refer to the A/C Underhood Specification Label for correct oil designation. The oil container should be kept tightly capped until it is ready for use and then tightly capped after use to prevent contamination from dirt and moisture. Refrigerant oil will quickly absorb any moisture it comes in contact with, therefore, special effort must be used to keep all R-134a system components moisture-free. Moisture in the refrigerant oil is very difficult to remove and will cause a reliability problem with the A/C compressor.

NOTE: Most reclaim/recycling equipment will measure the lubricant being removed during recovery. This amount of lubricant should be added back into the system. Refer to the reclaim/recycling equipment manufacturers instructions.

It will not be necessary to check the oil level in the A/C compressor or to add oil, unless there has been an oil loss. An oil loss may occur due to component replacement, or a rupture or leak from a refrigerant line, connector fitting, component or component seal. If a leak occurs, add 30 milliliters (1 fluid ounce) of the recommended refrigerant oil to the refrigerant system after the repair has been made. Refrigerant oil loss will be evident at the leak point by the presence of a wet, shiny surface around the leak.

Refrigerant oil must be added when an A/C condenser, A/C evaporator or A/C receiver/drier is replaced. See the REFRIGERANT OIL CAPACITIES chart.

The refrigerant oil level in a new A/C compressor must first be adjusted prior to compressor installation. Refer to **COMPRESSOR OIL DRAIN PROCEDURE**.

REFRIGERANT OIL CAPACITIES

Component	ml	oz.
Total System Fill	150	5
A/C Condenser	30	1
A/C Evaporator	60	2
A/C Receiver/drier	30	1
A/C Compressor	Drain and measure the oil from the old compressor. Refer to <u>COMPRESSOR OIL DRAIN PROCEDURE</u> .	

COMPRESSOR OIL DRAIN PROCEDURE

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. Failure to properly drain and measure the refrigerant oil from the A/C compressor can prevent the A/C system from operating as designed and cause serious compressor damage.

The A/C compressor is filled with refrigerant oil from the factory. Use the following procedure to drain and measure refrigerant oil from the A/C compressor.

1. Drain all of the refrigerant oil from the old A/C compressor into a clean measured container.
2. Drain all of the refrigerant oil from the new A/C compressor into a clean measured container.
3. Refill the new A/C compressor with the same amount of refrigerant oil that was drained out of the old compressor. Use only clean refrigerant oil of the type recommended for the A/C compressor in the vehicle.
4. Install the new A/C compressor onto the engine. See **INSTALLATION**.

RECEIVER/DRIER-A/C

DESCRIPTION

RECEIVER/DRIER-A/C

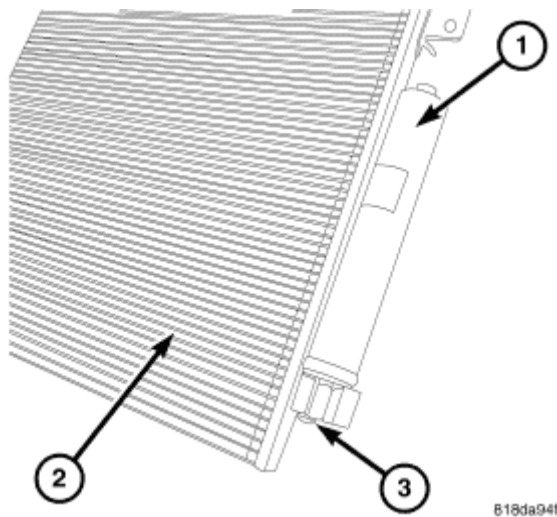


Fig. 203: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

The A/C receiver/drier (1) stores unnecessary refrigerant, filters the refrigerant, helps remove moisture from the refrigerant and retains any refrigerant vapor that may leave the A/C condenser (2) until it becomes a liquid. The A/C receiver/drier is installed on the high-side of the A/C system and is connected directly to the left end of the A/C condenser by a bolt (3). The A/C receiver/drier can be serviced separately from the A/C condenser.

OPERATION

RECEIVER/DRIER-A/C

The A/C receiver/drier performs a filtering action to prevent foreign material in the refrigerant from contaminating the A/C expansion valve. Refrigerant enters the A/C receiver/drier as a high-pressure, low temperature liquid. Desiccant inside the A/C receiver/drier absorbs any moisture which may have entered and become trapped within the refrigerant system. In addition, during periods of high demand operation of the A/C system, the A/C receiver/drier acts as a reservoir to store surplus refrigerant.

NOTE: **Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.**

The A/C receiver/drier has no serviceable parts except for the O-ring seals, gaskets and the high side service port valve and cap. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever the A/C receiver/drier is removed.

The A/C receiver/drier cannot be repaired and must be replaced if leaking or damaged, or if an internal failure of the A/C compressor has occurred.

REMOVAL

RECEIVER/DRIER-A/C

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

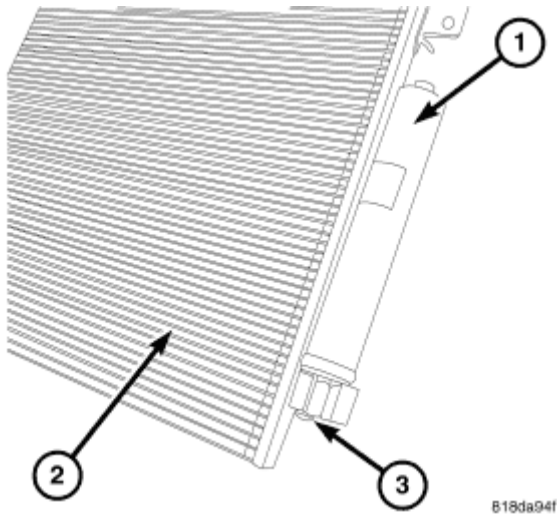


Fig. 204: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with A/C condenser removed from vehicle for clarity.

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See STANDARD PROCEDURE.
3. Remove the grille. Refer to REMOVAL.
4. Remove the air seal from the left side of the cooling module assembly.
5. Reach through the opening at the bottom of the front fascia and remove the bolt (3) that secures the A/C receiver/drier (1) to the left side A/C condenser (3).
6. Disconnect the A/C receiver/drier from the A/C condenser and remove and discard the O-ring seals.
7. Install plugs in, or tape over the opened receiver/drier fittings and the condenser ports.

INSTALLATION

RECEIVER/DRIER-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The receiver/drier must be replaced if an internal failure of the A/C

compressor has occurred. Failure to replace the receiver/drier can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the receiver/drier is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. Use only the refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

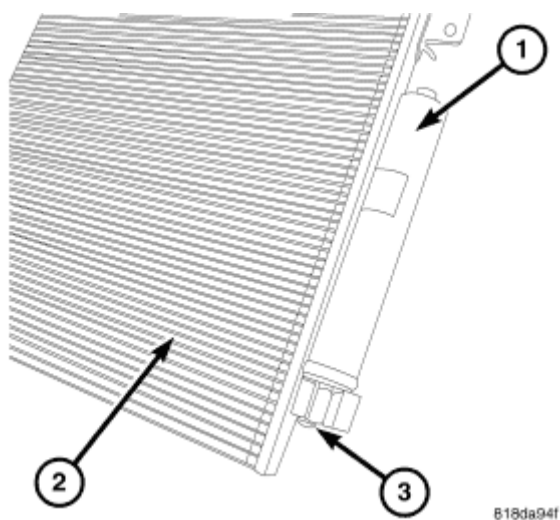


Fig. 205: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with A/C condenser removed from vehicle for clarity.

1. Remove the tape or plugs from the receiver/drier fittings and the condenser ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them onto the receiver/drier fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C receiver/drier (1) to the left end of the A/C condenser (2).
4. Install the bolt (3) that secures the A/C receiver/drier to the A/C condenser. Tighten the bolt to 22 N.m (16 ft. lbs.).
5. Install the air seal onto the left side of the cooling module assembly.
6. Install the grille. Refer to **INSTALLATION**.
7. Reconnect the negative battery cable.

- 8. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
- 9. If the A/C receiver/drier is being replaced, add 30 milliliters (1.0 fluid ounce) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
- 10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

REFRIGERANT-A/C

DESCRIPTION

REFRIGERANT-A/C

The refrigerant used in this air conditioning system is a HydroFluoroCarbon (HFC), type R-134a. Unlike R-12, which is a ChloroFluoroCarbon (CFC), R-134a refrigerant does not contain ozone-depleting chlorine. R-134a refrigerant is a non-toxic, non-flammable, clear, and colorless liquefied gas.

Even though R-134a does not contain chlorine, it must be reclaimed and recycled just like CFC-type refrigerants. This is because R-134a is a greenhouse gas and can contribute to global warming. See **STANDARD PROCEDURE**.

OPERATION

REFRIGERANT-A/C

R-134a refrigerant is not compatible with R-12 refrigerant in an A/C system. Even a small amount of R-12 refrigerant added to an R-134a refrigerant system will cause A/C compressor failure, refrigerant oil sludge or poor A/C system performance. In addition, the polyalkylene glycol (PAG) synthetic refrigerant oils used in an R-134a refrigerant system are not compatible with the mineral-based refrigerant oils used in an R-12 refrigerant system.

R-134a refrigerant system service ports, service tool couplers and refrigerant dispensing bottles have all been designed with unique fittings to ensure that an R-134a refrigerant system is not accidentally contaminated with the wrong refrigerant (R-12). There are also labels posted in the engine compartment of the vehicle and on the A/C compressor to identify that the A/C system is equipped with R-134a refrigerant.

STANDARD PROCEDURE

REFRIGERANT CHARGE LEVEL

All models	0.510 kg (1.12 lbs.)
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VALVE-A/C EXPANSION

DESCRIPTION

VALVE-A/C EXPANSION

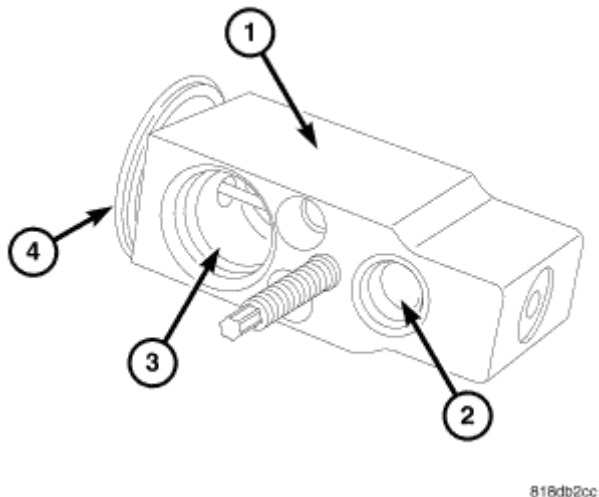


Fig. 206: A/C EXPANSION VALVE
Courtesy of CHRYSLER LLC

The A/C expansion valve controls the amount of refrigerant entering the A/C evaporator. The A/C expansion valve is of a thermostatic expansion valve (TXV) design and consists of an aluminum H-valve type body (1) with an inlet port (2), outlet port (3) and an integral thermal sensor (4).

The A/C expansion valve is located between the A/C refrigerant lines and the A/C evaporator in the engine compartment.

OPERATION

VALVE-A/C EXPANSION

The A/C expansion valve controls the high-pressure, low temperature liquid refrigerant from the A/C liquid line and converts it into a low-pressure, low-temperature mixture of liquid and gas before it enters the A/C evaporator. A mechanical sensor in the A/C expansion valve monitors the temperature and pressure of the refrigerant leaving the A/C evaporator through the A/C suction line, and adjusts the orifice size at the liquid line port to let the proper amount of refrigerant into the evaporator to meet the vehicle A/C cooling requirements. Controlling the refrigerant flow through the A/C evaporator ensures that none of the refrigerant leaving the A/C evaporator is still in a liquid state, which could damage the A/C compressor.

NOTE: **Replacement of the refrigerant line O-ring seals is required anytime a refrigerant line is disconnected from the expansion valve. Failure to replace the rubber O-ring seals could result in a refrigerant system leak.**

The A/C expansion valve is factory calibrated and cannot be adjusted or repaired and must be replaced if inoperative or damaged.

DIAGNOSIS AND TESTING

VALVE-A/C EXPANSION

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C expansion valve should only be tested following testing of the A/C compressor.

NOTE: Liquid CO₂ is required to test the A/C expansion valve. This material is available from most welding supply facilities. Liquid CO₂ is also available from companies which service and sell fire extinguishers.

When testing the A/C expansion valve, the work area and the vehicle temperature must be 21° to 27° C (70° to 85° F). To test the expansion valve:

1. Connect a charging station or manifold gauge set to the refrigerant system service ports. Verify the refrigerant charge level.
2. Close all doors, windows and vents to the passenger compartment.
3. Set the A/C-heater controls so that the A/C compressor is operating, the temperature control is in the highest temperature position, the mode-air doors is directing air output to the floor and the blower motor operating is operating at the highest speed.
4. Start the engine and allow it to idle. After the engine has reached normal operating temperature, allow the passenger compartment to heat up. This will create the need for maximum refrigerant flow into the A/C evaporator.
5. If the refrigerant charge is sufficient, the discharge (high pressure) gauge should read 827 kPa to 1655 kPa (120 psi to 240 psi). The suction (low pressure) gauge should read 207 kPa to 345 kPa (30 psi to 50 psi). If OK, go to step 6. If not OK, replace the inoperative A/C expansion valve.

WARNING: Protect the skin and eyes from exposure to liquid CO₂ or personal injury can result.

6. If the suction (low pressure) gauge reads within the specified range, freeze the A/C expansion valve for 30 seconds using liquid CO₂ or another suitable super-cold material.**Do not spray R-134a or R-12 refrigerant on the A/C expansion valve for this test.** The suction (low pressure) gauge reading should drop by 69 kPa (10 psi). If OK, go to step 7. If not OK, replace the inoperative A/C expansion valve.
7. Allow the expansion valve control head to thaw. The suction (low pressure) gauge reading should stabilize at 207 kPa to 345 kPa (30 psi to 50 psi). If not OK, replace the inoperative A/C expansion valve.
8. When expansion valve testing is complete, test the overall A/C system performance. See DIAGNOSIS AND TESTING.

REMOVAL

VALVE-A/C EXPANSION

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

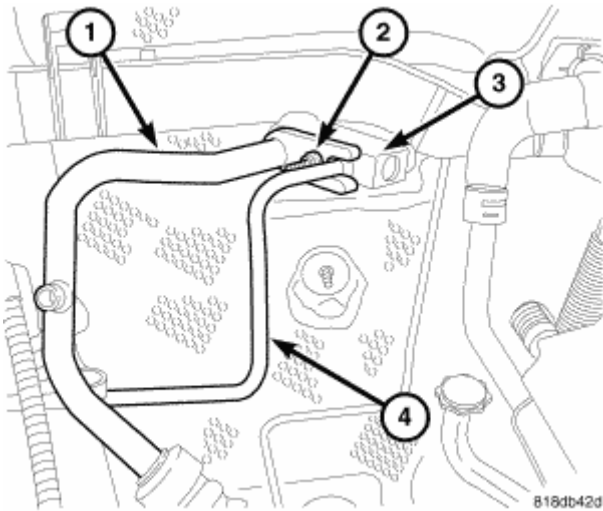


Fig. 207: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Recover the refrigerant from the refrigerant system. See STANDARD PROCEDURE.
2. Disconnect and isolate the negative battery cable.
3. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3).
4. Disconnect the A/C suction and liquid lines from the A/C expansion valve, remove and discard the O-ring seals and position the refrigerant lines out of the way.

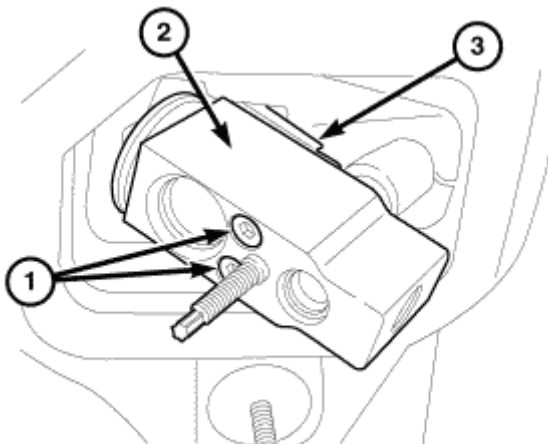


Fig. 208: Bolts, A/C Expansion Valve & Evaporator Tube Tapping Block
Courtesy of CHRYSLER LLC

5. Remove the two bolts (1) that secure the A/C expansion valve (2) to the evaporator tube tapping block (3).
6. Remove the A/C expansion valve from the evaporator tube tapping block and remove and discard the O-ring seals.
7. Install plugs in, or tape over the opened refrigerant line and evaporator tube fittings and all expansion valve ports.

INSTALLATION

VALVE-A/C EXPANSION

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

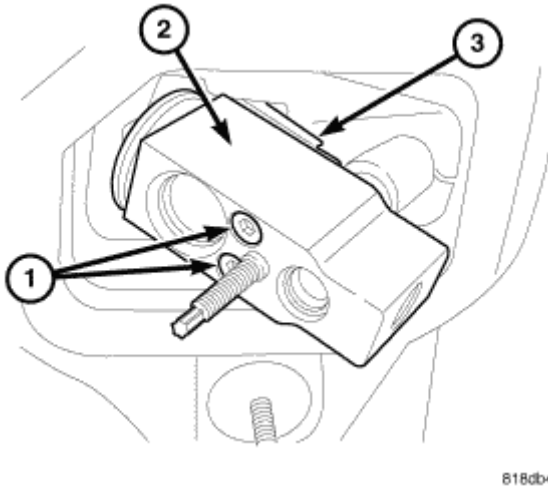


Fig. 209: Bolts, A/C Expansion Valve & Evaporator Tube Tapping Block
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line and evaporator tube fittings and all of the expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them onto the refrigerant line and evaporator tube fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Install the A/C expansion valve (2) onto the evaporator tube tapping block (3).
4. Install the two bolts (1) that secure the A/C expansion valve to the evaporator tube tapping block. Tighten the bolts to 11 N.m (97 in. lbs.).

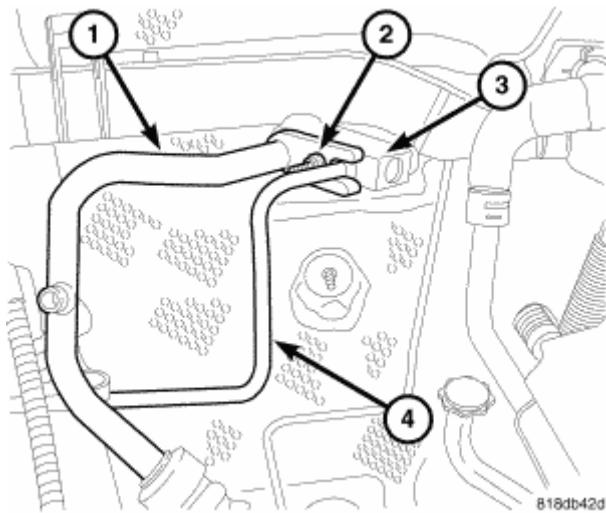


Fig. 210: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

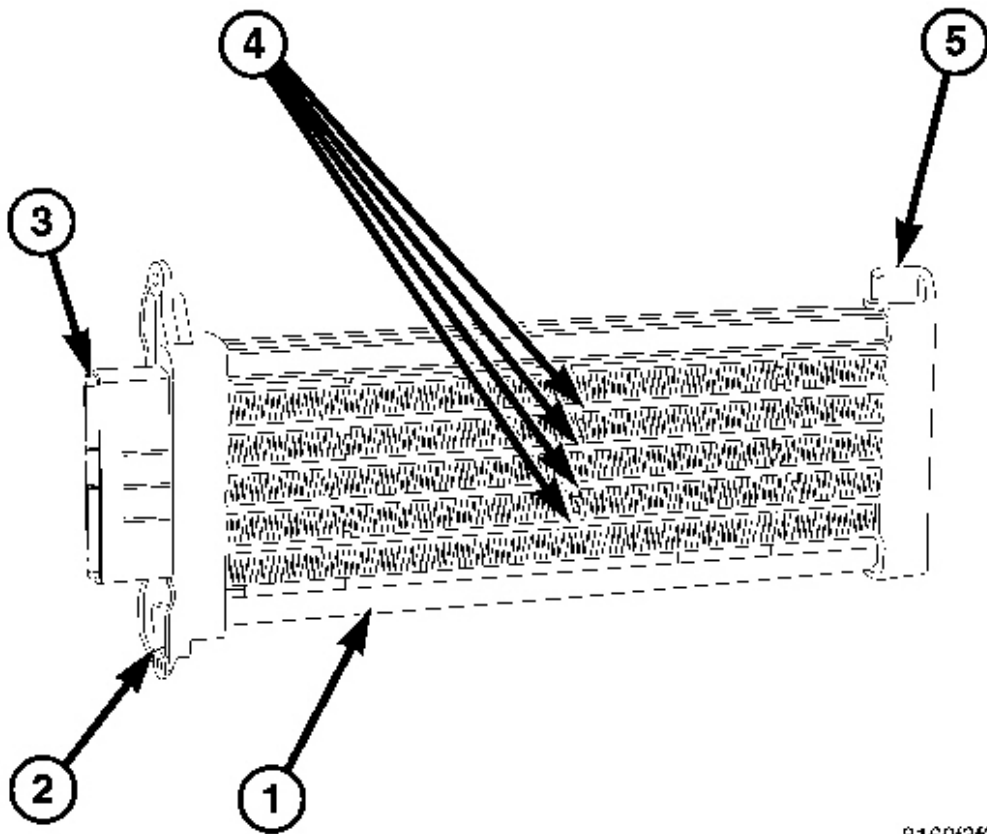
5. Connect the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3).
6. Install the nut (2) that secures the A/C suction and liquid lines to the A/C expansion valve. Tighten the nut to 23 N.m (17 ft. lbs.).
7. Reconnect the negative battery cable.
8. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
9. Recharge the refrigerant system. See **STANDARD PROCEDURE**.

HEATER-CABIN

HEATER UNIT

DESCRIPTION

HEATER UNIT



816013f0

Fig. 211: PTC Heater Unit - Description

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

An electric positive temperature coefficient (PTC) heater unit (1) is used on vehicles when equipped with the 2.8L diesel engine. The PTC heater unit aids in passenger compartment heating by compensating for the lower engine coolant temperatures produced by the diesel engine. The PTC heater unit is mounted in the HVAC air distribution housing, downstream of the heater core and is controlled by the diesel engine control module (ECM) and the totally integrated power module (TIPM) through two relays in diesel accessory fuse/relay block located below the left front fender.

The PTC heater consists of a molded plastic mounting plate (2) with an integral wire connector receptacle (3). Concealed behind the mounting plate are four heating elements with fins (4) that transfer the heat produced by the PTC heater to the conditioned air flowing within the air distribution housing. A positioning tab (5) is molded onto the end of the heater unit to help support the heater unit inside the air distribution housing. The

PTC heater unit is connected to the vehicle electrical system through the instrument panel wire harness.

The PTC heater unit is accessed for service from underneath the instrument panel.

OPERATION

HEATER UNIT

The positive temperature coefficient (PTC) heater unit dissipates 1 kW of electrical power through 4 heating bars. The totally integrated power module (TIPM) operates the two relays for the PTC heater unit. The PTC heater unit is split into two "banks". Each bank is driven separately based on alternator load. This allows for lower in-rush current and optimum battery charging. After a bank has been turned on, another bank can only be turned on 10 seconds after the previous. On average, the PTC banks are not switched more than 25 times for each vehicle start. Electrical power output is between 900-1050 W.

The control system for the PTC heater unit is diagnosed using a scan tool. Prior to replacing a PTC heater unit, check for any diagnostic trouble codes (DTCs) related to the ECM, TIPM and heating-A/C system (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The PTC heater unit cannot be adjusted or repaired and, if faulty or damaged it must be replaced.

DIAGNOSIS AND TESTING

HEATER UNIT

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible serious or fatal injury.

NOTE: For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

Prior to replacing the positive temperature coefficient (PTC) heater unit, check for any diagnostic trouble codes (DTCs) related to the engine control module (ECM), totally integrated power module (TIPM) and the heating-A/C system and repair as necessary (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the PTC heater unit. See **REMOVAL**.
3. Using an ohmmeter, check for continuity between all of the PTC heater unit terminals. In each case there

should be continuity. If OK, repair the wire harness circuits between the PTC heater unit and the TIPM. If NOT OK, replace the PTC heater unit.

REMOVAL

HEATER UNIT

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

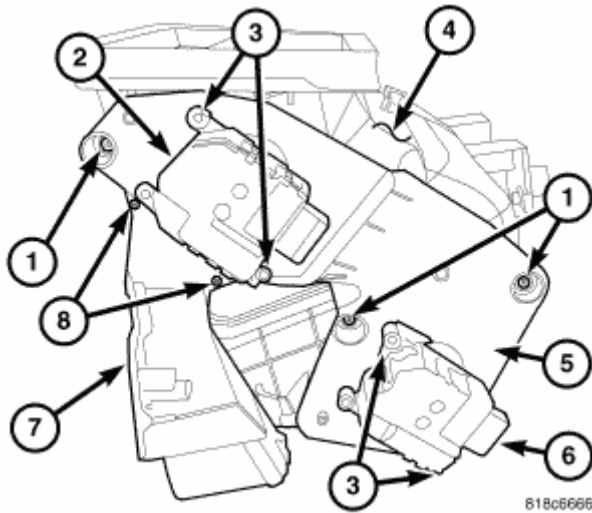


Fig. 212: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL** .
3. Disconnect the wire harness connector from the mode door actuator (2) and the blend door actuator (6) located on the driver side of the air distribution housing. See **REMOVAL**.
4. Carefully disengage the retaining tabs (3) that secure the mode door actuator and the blend door actuator to the actuator mounting bracket (5) and remove the actuators.
5. Remove the three screws (1) that secure the actuator mounting bracket to the air distribution housing and remove the bracket.
6. Remove the screw (8) that secures the driver side front floor duct (7) to the air distribution housing and remove the duct

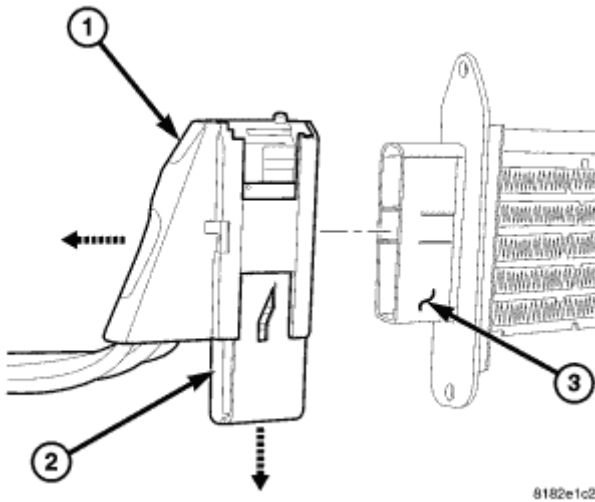


Fig. 213: PTC Heater Connector
 Courtesy of CHRYSLER LLC

NOTE: PTC heater shown in illustration removed from distribution housing for clarity.

NOTE: To disconnect the wire harness connector from the PTC heater, disengage the connector lock while pulling the connector away from the heater unit.

7. Disengage the wire connector lock (2) that secures the wire harness connector (1) to the positive temperature coefficient (PTC) heater unit (3) and disconnect the connector from the heater.

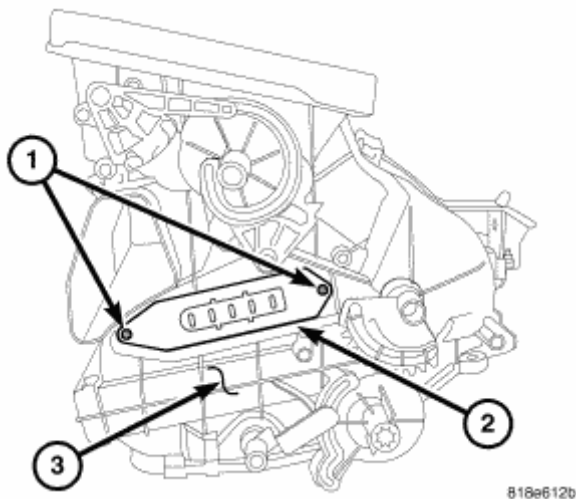


Fig. 214: Removing/Installing Screws That Secure PTC Heater Unit To Air Distribution Housing
 Courtesy of CHRYSLER LLC

8. Remove the two screws (1) that secure the PTC heater unit (2) to the air distribution housing (3).
9. Carefully pull the PTC heater unit straight out of the air distribution housing.

INSTALLATION

HEATER UNIT

NOTE: LHD model shown in illustration. RHD model similar.

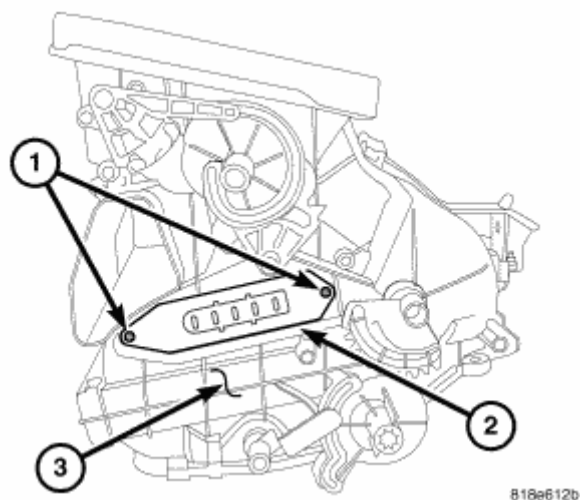


Fig. 215: Removing/Installing Screws That Secure PTC Heater Unit To Air Distribution Housing
Courtesy of CHRYSLER LLC

1. Carefully install the positive temperature coefficient (PTC) heater unit (2) into the driver side of the air distribution housing (3). Make sure to position the two locator tabs on the end of the heater unit into the molded locator indentations on the right side of the air distribution housing.
2. Install the two screws (1) that secure the PTC heater unit to the air distribution housing. Tighten the screws to 1.2 N.m (10 in. lbs.).

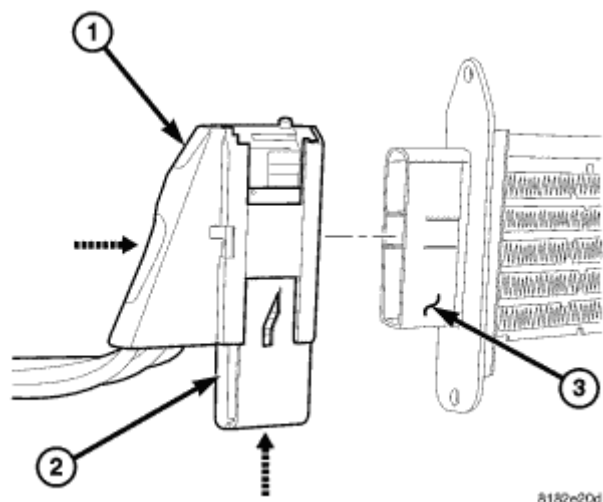


Fig. 216: PTC Heater Connector - Install
Courtesy of CHRYSLER LLC

NOTE: PTC heater shown in illustration removed from distribution housing for clarity.

3. Connect the wire harness connector (1) to the PTC heater unit (3) while pushing inward on the connector lock (2). Make sure the wire harness connector and lock are fully engaged.

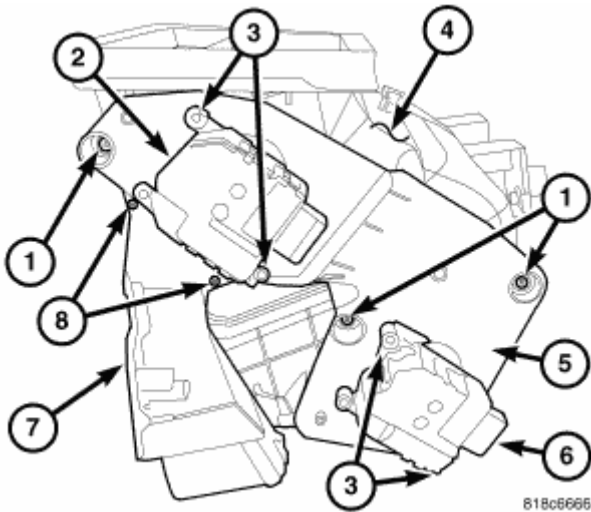


Fig. 217: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

4. Install the driver side front floor duct (7) onto the driver side of the air distribution housing (4) and install the retaining screw (8). Tighten the screw to 1.2 N.m (10 in lbs.).
5. Position the actuator mounting bracket (5) onto the air distribution housing and install the three retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
6. Position the mode door actuator (2) and the blend door actuator (6) onto the actuator mounting bracket. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those on the door linkage.

NOTE: If the retaining tabs on the actuator mounting bracket become broken during service, the alignment pins on the bracket bosses can be removed and screws can be used to retain the actuator to the bracket. Once the alignment pins are removed, pre-made holes can be found the center of the bosses, exactly where the pins were. This assures correct actuator alignment to the bracket. Use care not to overtighten the screws and damage the bosses.

7. Engage the retaining tabs (3) that secure the mode and blend door actuators to the actuator mounting bracket. Make sure the retaining tabs are fully engaged.
8. Connect the wire harness connector to the mode and blend door actuators.
9. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
10. Reconnect the negative battery cable.

RELAY-HEATER UNIT

DESCRIPTION

RELAY-HEATER UNIT

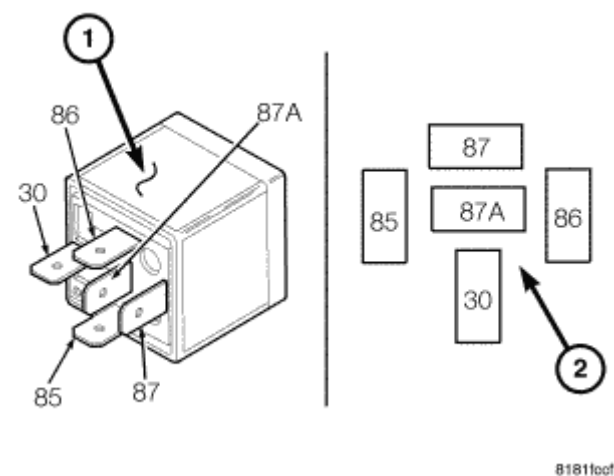


Fig. 218: STANDARD ISO-TYPE RELAY

Courtesy of CHRYSLER LLC

Two relays (1) are used for the electric positive temperature coefficient (PTC) heater system when equipped with the 2.8L diesel engine. The relays are International Standards Organization (ISO)-type relays. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns (2). The PTC relays are electromechanical devices that switch fused battery current directly to the heating elements of the PTC heater unit. The PTC relays are energized by control circuits of the totally integrated power module (TIPM).

The two PTC relays are located in the diesel accessory fuse/relay block at the right front corner of the engine compartment.

OPERATION

RELAY-HEATER UNIT

The two ISO-standard relays (1) used for the electric positive temperature coefficient (PTC) heater system are electromechanical switches that use a low current ASD power input to control the high current fused battery power output to the PTC heater unit. On each relay, the movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to one or more of the heating elements of the PTC heater.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of

the relay coil collapses.

The terminals for the PTC relays are connected to the vehicle electrical system through receptacles in the diesel accessory fuse/relay block. The inputs and outputs of the PTC relays include:

Terminals (30) receive battery current through a fusible link at all times.

Terminals (85) are connected to a ground circuit.

Terminals (86) are connected to control circuits of the totally integrated power module (TIPM).

Terminals (87) provide fused battery current to the PTC heating elements through the PTC relays only when the PTC relay coil is energized.

Terminals (87A) are not connected to any circuit in this application, but provide battery current output only when the PTC relay coil is de-energized.

The two PTC relays cannot be repaired and, if faulty or damaged they must be replaced. Refer to the appropriate wiring information for diagnosis and testing of the ISO-standard relays and for complete TIPM and HVAC wiring diagrams.

REMOVAL

RELAY-HEATER UNIT

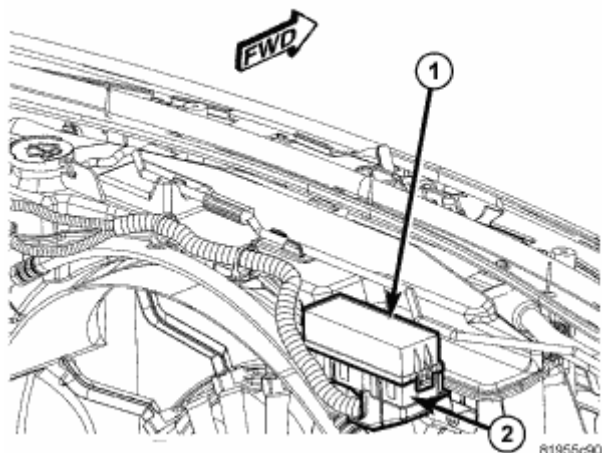


Fig. 219: Cover & Diesel Accessory Fuse/Relay Block
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Open the cover (1) of the diesel accessory fuse/relay block (2) located at the right front of the engine compartment.
3. Remove the positive temperature coefficient (PTC) relays as necessary from the fuse/relay block.

INSTALLATION

RELAY-HEATER UNIT

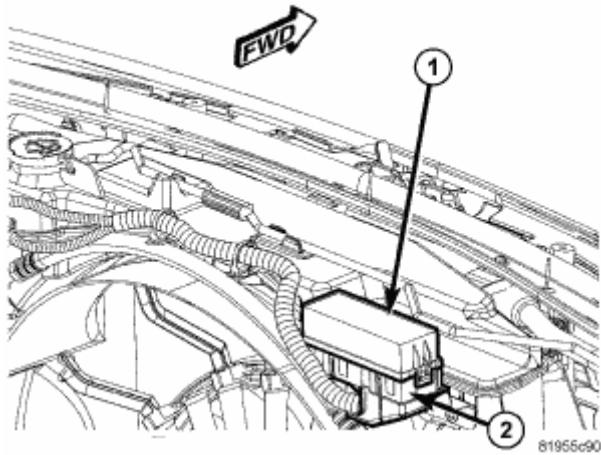


Fig. 220: Cover & Diesel Accessory Fuse/Relay Block
Courtesy of CHRYSLER LLC

1. Position the positive temperature coefficient (PTC) relays as necessary into the proper receptacle of the diesel accessory fuse/relay block (2) located at the right front of the engine compartment.
2. Align the PTC relay terminals with the terminal cavities in the fuse/relay block and push down firmly on each relay until the terminals are fully seated.
3. Close the cover (1) of the diesel accessory fuse/relay block.
4. Reconnect the negative battery cable.

2008 HVAC

Heating & Air Conditioning - Service Information - Liberty

DESCRIPTION

HEATER AND AIR CONDITIONER SYSTEM

A manual temperature control (MTC) single zone type heating-A/C system or an automatic temperature controlled (ATC) single zone type heating-A/C system is available on this model.

To maintain the performance level of the heating, ventilation and air conditioning (HVAC) system, the engine cooling system must be properly maintained. The use of a bug screen is not recommended. Any obstructions in front of the radiator or A/C condenser will reduce the performance of the A/C and engine cooling systems.

The engine cooling system includes the radiator, thermostat, radiator hoses and the engine coolant pump. Refer to **COOLING** article for more information before opening or attempting any service to the engine cooling system.

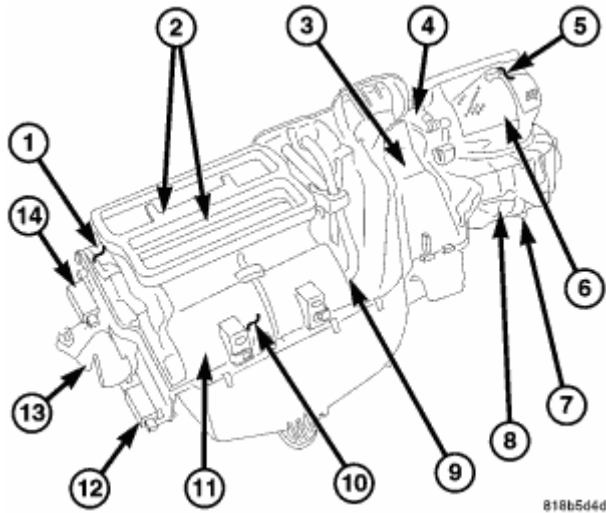


Fig. 1: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

All vehicles are equipped with a common heater, ventilation and air conditioning (HVAC) housing assembly (1). The heating-A/C system combines A/C, heating, and ventilating capabilities in a single HVAC housing assembly mounted within the passenger compartment behind the instrument panel. The HVAC housing assembly includes:

- Mode-air doors (2)
- A/C evaporator (3)
- Recirculation door actuator (4)

Air inlet housing (5)
Recirculation-air door (6)
Blower motor (7)
Blower motor resistor (8)
Heater core (9)
Air distribution housing (10)
Blend-air door (11)
Blend door actuator (12)
Floor distribution ducts (13)
Mode door actuator (14)

NOTE: An electric positive temperature coefficient (PTC) heater is used on vehicles when equipped with the 2.8L diesel engine. The PTC heater unit compensates for the lower engine coolant temperatures produced by the diesel engine. The PTC heater unit is mounted in the HVAC air distribution housing, downstream of the heater core. See DESCRIPTION.

Based upon the mode selected, conditioned air can exit the HVAC housing through one or a combination of the three main housing outlets: defrost, panel or floor. The defrost and panel outlets are located on the top of the housing and the floor outlets are located on each side of the housing. Once the conditioned air exits the HVAC housing, it is further directed through molded plastic ducts to the outlets within the vehicle interior. These outlets and their locations are as follows:

Defroster Outlet - Dual defroster outlets are located in the center of the instrument panel top cover, near the base of the windshield.

Side Window Demister Outlets - There are two side window demister outlets, one is located at each outboard end of the instrument panel and are integral to the instrument panel air outlets.

Panel Outlets - There are four panel outlets in the instrument panel, one located near each outboard end of the instrument panel facing the rear of the vehicle and two located near the top of the instrument panel center bezel.

Front Floor Outlets - There are two front floor outlets, one located above each side of the center of the floor panel near the dash panel.

Rear Floor Outlets - There are two rear floor outlets, one located on each side of the floor console near the rear of each front seat.

OPERATION

HEATER AND AIR CONDITIONER SYSTEM

Both the manual temperature control (MTC) and the automatic temperature controlled (ATC) heating-A/C systems are blend-air type systems. In a blend-air system, a blend-air door controls the amount of conditioned air that is allowed to flow through, or around the heater core. This design allows almost immediate control of output air temperature.

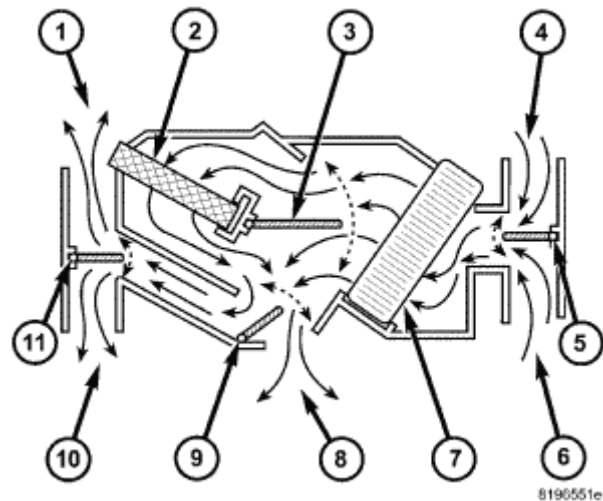


Fig. 2: Blend Air System Schematic
Courtesy of CHRYSLER LLC

NOTE: **Typical blend-air type HVAC system shown in graphic.**

The heating-A/C system pulls outside (ambient) air through the fresh air intake (4) located at the cowl panel at the base of the windshield and into the air inlet housing above the heating, ventilation and air conditioning (HVAC) housing and passes through the A/C evaporator (7). Air flow is then directed either through or around the heater core (2). This is done by adjusting the position of the blend-air door (3) with the temperature control located on the A/C-heater control in the instrument panel. Air flow is then directed out the floor outlet (8), instrument panel outlet (10) or the defroster outlet (1) in various combinations by adjusting the position of the mode-air doors (9 and 11) using the mode control located on the A/C-heater control. The temperature and mode control uses electrical actuators to operate the air doors.

The velocity of the air flow out of the outlets can be adjusted with the blower speed control located on the A/C-heater control.

The fresh air intake can be shut off by pressing the Recirculation button on the A/C-heater control. This will operate the electrically actuated recirculation-air door (5), which closes off the fresh air intake. With the fresh air intake closed, the conditioned air within the vehicle is pulled back into the HVAC housing through the recirculation air intake (6).

The A/C compressor can be engaged by pressing the A/C (snowflake) button on the A/C-heater control when the mode control is set in any floor to instrument panel position. The A/C compressor will automatically engage when the mode control is set in any Mix to Defrost position. This is done to help reduce fogging of the front windows by removing humidity from the conditioned air prior to it coming into contact with the windows.

The defroster outlet receives airflow from the HVAC housing through the molded plastic defroster duct. The airflow from the defroster outlet is directed by fixed vanes in the defroster outlet grille and cannot be adjusted.

The side window demister outlets receive airflow from the HVAC housing through the defroster duct and molded plastic demister ducts which are integral to the instrument panel. The airflow from the side window demister outlets is directed by fixed vanes in the demister outlet grilles and cannot be adjusted. The demisters

direct air from the HVAC housing through the outlets located on the top corners of the instrument panel. The demisters operate when the mode control is positioned in the floor-defrost and defrost-only settings. Some air may be noticeable from the demister outlets when the mode control is in the bi-level to floor positions.

The panel outlets receive airflow from the HVAC housing through the center panel duct and the two molded plastic panel ducts, which are integral to the instrument panel. The two end ducts direct airflow to the left and right instrument panel outlets, while the center panel duct directs airflow to the two center panel outlets. Each of these outlets can be individually adjusted to direct the flow of air.

The floor outlets receive airflow from the HVAC housing through the floor distribution ducts. The front floor outlets are integral to the molded plastic floor ducts, which are secured to the sides of the HVAC housing. The floor outlets cannot be adjusted.

NOTE: It is important to keep the air intake opening clear of debris. Leaf particles and other debris that is small enough to pass through the cowl opening screen can accumulate within the HVAC housing. The closed, warm, damp and dark environment created within the housing is ideal for the growth of certain molds, mildews and other fungi. Any accumulation of decaying plant matter provides an additional food source for fungal spores, which enter the housing with the fresh intake-air. Excess debris, as well as objectionable odors created by decaying plant matter and growing fungi can be discharged into the passenger compartment during heater-A/C operation if the air intake opening is not kept clear of debris.

This A/C system uses an A/C expansion valve to meter the flow of refrigerant to the A/C evaporator. The A/C evaporator cools and dehumidifies the incoming air prior to blending it with the heated air. To maintain minimum evaporator temperatures and prevent evaporator freezing, an evaporator temperature sensor is used. The sensor is located downstream of the evaporator and supplies an evaporator temperature signal to the A/C-heater control.

DIAGNOSIS AND TESTING

A/C PERFORMANCE

The A/C system is designed to provide the passenger compartment with low temperature and low humidity air. The A/C evaporator, located in the HVAC housing is cooled to temperatures near the freezing point. As warm damp air passes over the fins of the A/C evaporator, the air transfers its heat to the refrigerant in the evaporator coils and the moisture in the air condenses on the evaporator fins. During periods of high heat and humidity, an A/C system will be more effective in the Recirculation mode (max-A/C). With the system in the Recirculation mode, only air from the passenger compartment passes through the A/C evaporator. As the passenger compartment air dehumidifies, the A/C system performance levels rise.

Humidity has an important bearing on the temperature of the air delivered to the interior of the vehicle. It is important to understand the effect that humidity has on the performance of the A/C system. When humidity is high, the A/C evaporator has to perform a double duty. It must lower the air temperature, and it must lower the temperature of the moisture in the air that condenses on the evaporator fins. Condensing the moisture in the air transfers heat energy into the evaporator fins and coils. This reduces the amount of heat the A/C evaporator can

absorb from the air. High humidity greatly reduces the ability of the A/C evaporator to lower the temperature of the air.

However, evaporator capacity used to reduce the amount of moisture in the air is not wasted. Wringing some of the moisture out of the air entering the vehicle adds to the comfort of the passengers. Although, an owner may expect too much from their A/C system on humid days. A performance test is the best way to determine whether the system is performing up to design standards. This test also provides valuable clues as to the possible cause of trouble with the A/C system. The ambient air temperature in the location where the vehicle will be tested must be a minimum of 21° C (70° F) for this test.

A/C PERFORMANCE TEST

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible serious or fatal injury.

CAUTION: The use of an A/C recycling/charging station for purposes of determining the actual charge level of an A/C system is not recommend. Service recycling/charging stations do not reflect the correct amount of refrigerant charge in the A/C system after a single "reclaim" cycle. Tests have shown that it takes up to 3 or 4 "reclaim" cycles to remove all of the refrigerant charge. Use only the following procedure for determining the proper charge level.

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

1. Check for diagnostic trouble codes using a scan tool. If no DTCs are found in the powertrain control module (PCM) or engine control module (ECM), depending on engine application, go to step 2.
2. Connect a tachometer and a manifold gauge set or an A/C recycling/charging station.
3. Operate the heating-A/C system under the following conditions.
 - Engine at 1,000 rpm at operating temperature
 - Door or windows open
 - Transmission in Park or Neutral with parking brake set (depending on transmission application)
 - A/C-heater controls set to Recirculation mode (max-A/C), full cool, panel mode, high blower and with A/C compressor engaged. If the A/C compressor does not engage, see the A/C SYSTEM DIAGNOSIS chart.
4. Insert a thermometer in the driver side center panel air outlet and operate the vehicle a minimum of ten minutes to allow the thermometer temperature to stabilize.
5. With the A/C compressor clutch engaged, compare the air temperature at the center panel outlet and the A/C compressor discharge pressure (high side) to the A/C PERFORMANCE TEMPERATURE AND PRESSURE chart. The compressor clutch may cycle, depending upon the ambient temperature and humidity. If the clutch cycles, use the readings obtained before the clutch disengaged.

A/C PERFORMANCE TEMPERATURE AND PRESSURE

Ambient Air Temperature	21° C (70° F)	27° C (80° F)	32° C (90° F)	38° C (100° F)	43° C (110° F)
Air Temperature at Center Panel Outlet	7° C (45° F)	7° C (45° F)	13° C (55° F)	13° C (55° F)	18° C (64° F)
Compressor Inlet Pressure at Service Port (Low Side)	138 to 207 kPa (20 to 30 psi)	172 to 241 kPa (25 to 35 psi)	207 to 276 kPa (30 to 40 psi)	241 to 310 kPa (35 to 45 psi)	276 to 345 kPa (40 to 50 psi)
Condenser Outlet Pressure at Service Port (High Side)	1034 to 1724 kPa (150 to 250 psi)	1379 to 2068 kPa (200 to 300 psi)	1724 to 2413 kPa (250 to 350 psi)	1999 to 2689 kPa (290 to 390 psi)	2413 to 2965 kPa (350 to 430 psi)

6. If the air outlet temperature fails to meet the specifications in the A/C Performance Temperature and Pressure chart, or if the A/C compressor discharge pressure is high, refer to the A/C SYSTEM DIAGNOSIS chart.

A/C SYSTEM DIAGNOSIS

Condition	Possible Causes	Correction
Rapid A/C clutch cycling (ten or more cycles per minute).	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
Equal pressures, but the A/C clutch does not engage.	1. No refrigerant in the refrigerant system.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
	2. Open fuse.	2. Check the fuses in the power distribution center and the junction block. Repair the shorted circuit or component and replace the fuses as required.
	3. Inoperative A/C clutch field coil.	3. See A/C Compressor Clutch in this service information. Test the A/C clutch field coil and replace as required.
	4. Inoperative A/C clutch relay.	4. See A/C Clutch Relay in this service information. Test the A/C clutch relay and relay circuits. Repair the circuits or replace the relay as required.
	5. Improperly installed or inoperative A/C pressure transducer.	5. See A/C Pressure Transducer in this service information. Test the A/C pressure transducer and tighten or replace as required.

-	6. Inoperative evaporator temperature sensor.	6. See Evaporator Temperature Sensor in this service information. Test the evaporator temperature sensor and replace as required.
-	7. Inoperative powertrain control module (PCM) or engine control module (ECM), depending on engine application.	7. Refer to the proper Diagnostic article for testing of the PCM or ECM. Test the PCM or ECM and replace as required.
Normal pressures, but A/C Performance Test air temperatures at center panel outlet are too high.	1. Excessive refrigerant oil in system.	1. See Refrigerant Oil Level in this service information. Recover the refrigerant from the refrigerant system and inspect the refrigerant oil content. Restore the refrigerant oil to the proper level as required.
-	2. Blend door actuator improperly installed or inoperative.	2. See Blend Door Actuator in this service information. Inspect the actuator for proper operation and replace as required.
-	3. Blend-air door inoperative or sealing improperly.	3. See HVAC Housing in this service information. Inspect the blend-air door for proper operation and sealing and correct as required.
The low side pressure is normal or slightly low, and the high side pressure is too low.	1. Low refrigerant system charge.	1. See Refrigerant System Leaks in this service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
-	2. Refrigerant flow through the A/C accumulator is restricted.	2. See A/C Accumulator in this service information. Replace the restricted accumulator as required.
-	3. Refrigerant flow through the A/C evaporator is restricted.	3. See A/C Evaporator in this service information. Replace the restricted A/C evaporator as required.
-	4. Inoperative A/C compressor.	4. See A/C Compressor in this service information. Replace the A/C compressor as required.
The low side pressure is normal or slightly high, and the high side pressure is too high.	1. A/C Condenser air flow restricted.	1. Check the A/C condenser for damaged fins, foreign objects obstructing air flow through the condenser fins, and missing or improperly installed air seals. Clean, repair, or replace components as required.
-	2. Inoperative radiator cooling fan.	2. Test the radiator cooling fan and replace as required.
-	3. Refrigerant system overcharged.	3. See Refrigerant System Charge Level in this service information. Recover the refrigerant from the refrigerant system. Charge the refrigerant system to the proper level as required.
-	4. Air in the refrigerant	4. See Refrigerant System Leaks in this

-	system.	service information. Test the refrigerant system for leaks. Repair, evacuate and charge the refrigerant system as required.
	5. Engine overheating.	5. Test the engine cooling system and repair, if required.
The low side pressure is too high, and the high side pressure is too low. - - -	1. Accessory drive belt slipping.	1. Inspect the accessory drive belt condition and tension. Replace the accessory drive belt and/or tensioner as required.
	2. Inoperative A/C expansion valve.	2. See A/C Expansion Valve in this service information. Test the expansion valve and replace as required.
	3. Inoperative A/C compressor.	3. See A/C Compressor in this service information. Replace the A/C compressor as required.
The low side pressure is too low, and the high side pressure is too high. - -	1. Restricted refrigerant flow through the refrigerant lines.	1. See Liquid Line, Suction Line and A/C Discharge Line in this service information. Inspect the refrigerant lines for kinks, tight bends or improper routing. Correct the routing or replace the refrigerant line as required.
	2. Restricted refrigerant flow through the A/C expansion valve.	2. See A/C Expansion Valve in this service information. Test the expansion valve and replace as required.
	3. Restricted refrigerant flow through the A/C condenser.	3. See A/C Condenser in this service information. Replace the restricted condenser as required.

HEATER PERFORMANCE

Before performing the following tests, refer to **COOLING** article for the procedures to check the engine coolant level and flow, engine coolant reserve/recovery system operation, accessory drive belt condition and tension, radiator air flow and the fan drive operation.

WARNING: Do not remove radiator cap when engine is hot, personal injury can result.

If vehicle has been run recently, wait 15 minutes before removing the radiator cap. Place a rag over the cap and turn it to the first safety stop. Allow pressure to escape through the overflow tube. When the system pressure stabilizes, remove the cap completely.

MAXIMUM HEATER OUTPUT

Engine coolant is delivered to the heater core through two heater hoses. With the engine idling at normal operating temperature, set the temperature control to the full hot position, the mode control to the floor position, and the blower motor control to the highest speed position. Using a test thermometer, check the temperature of the air being discharged at the front floor outlets. Compare the test thermometer reading to the HEATER TEMPERATURE REFERENCE chart.

HEATER TEMPERATURE REFERENCE

Ambient Air Temperature	16° C (60° F)	21° C (70° F)	26° C (80° F)	32° C (90° F)
Minimum Air Temperature at Floor Outlet	52° C (125° F)	56° C (133° F)	59° C (139° F)	62° C (144° F)

If the heater outlet air temperature is below the minimum specification, refer to **COOLING** article . Both of the heater hoses should be hot to the touch. The coolant return heater hose should be slightly cooler than the coolant supply heater hose. If the return hose is much cooler than the supply hose, locate and repair the engine coolant flow obstruction in the cooling system (refer to **COOLING** article for more information).

OBSTRUCTED COOLANT FLOW

Possible locations or causes of obstructed coolant flow are as follows:

- Inoperative water pump.
- Inoperative thermostat.
- Pinched or kinked heater hoses.
- Improper heater hose routing.
- Plugged heater hoses or supply and return ports at the cooling system connections.
- Plugged heater core.

If proper coolant flow through the cooling system is verified, and heater outlet air temperature is low, a mechanical problem may exist.

MECHANICAL PROBLEMS

Possible causes of insufficient heat due to mechanical problems are as follows:

- Obstructed cowl air intake.
- Obstructed heater system outlets.
- Inoperative engine thermostat.
- Inoperative blower motor system.
- Inoperative A/C-heater control.
- Inoperative blend door actuator.
- Inoperative, obstructed or improperly installed blend-air door.

TEMPERATURE CONTROL

If the heater outlet air temperature cannot be adjusted with the temperature control on the A/C-heater control, the following could require service:

- Inoperative A/C-heater control.
- Inoperative blend door actuator.

Inoperative, obstructed or improperly installed blend-air door.

Inoperative related wiring harness or connectors.

Improper engine coolant temperature.

SPECIFICATIONS

A/C SYSTEM

Item	Description	Notes
A/C Compressor	Zexel DKS-17DS (2.8L/4.0L engines)	VC-46 PAG oil
	Visteon HS-18 (3.7L engine)	VC-46 PAG oil
Freeze-up Control	Evaporator temperature sensor	Input to A/C-heater control. HVAC housing mounted.
Pressure Control	A/C pressure transducer	Input to PCM/ECM. A/C liquid line mounted. Cycles clutch off if refrigerant pressure falls below 206 kPa (30 psi) or rises above 2971 kPa (431 psi)
R-134a Refrigerant Charge Capacity	0.510 kg (1.12 lbs.)	Also see A/C Underhood Specification Label located in the engine compartment.
A/C Clutch Coil Draw	3.3 amps @ 12V $\pm$ 0.5V @ 25° C (77° F)	2.8L and 4.0L engines. A/C clutch field coil resistance when measured across coil lead connector is 4.02 ± 0.2 ohms @ 25° C (77° F).
	3.1 - 4 amps @ 12V $\pm$ 0.5V @ 21° C (70° F)	3.7L engine.
A/C Clutch Air Gap	0.30 - 0.60 mm (0.012 - 0.024 in.)	2.8L and 4.0L engines.
	0.35 - 0.65 mm (0.014 - 0.025 in.)	3.7L engine.

FASTENER TORQUE SPECIFICATIONS

Description	N.m	Ft. Lbs.	In. Lbs.
All Screws NOT Listed Below	1.2	-	10
A/C Compressor Bolts and Nut (2.8L and 4.0L Engines)	28	21	-
A/C Compressor Rear Bolts (3.7L Engine)	55	-	41
A/C Compressor Front Inboard Bolt (3.7L	40	-	30

Engine)			
A/C Compressor Front Outboard Bolt (3.7L Engine)	55	-	41
A/C Compressor Bracket to Front Cover Bolt (3.7L Engine)	40	-	30
A/C Compressor Field Coil Connector Bracket Screw (3.7L Engine)	4.3	-	38
A/C Compressor Clutch Hub Bolt (2.8L and 4.0L Engines)	15	-	133
A/C Compressor Clutch Hub Bolt (3.7L Engine)	20	-	177
A/C Condenser to Radiator Bolt	5	-	44
A/C Expansion Valve to Evaporator Tube Tapping Block Bolts	11	-	97
Discharge Line to A/C Condenser Nut	22.5	-	200
HVAC Housing to Engine Side of Dash Panel Nut	4.5	-	40
HVAC Housing to Passenger Side of Dash Panel Nuts	4.5	-	40
Suction Line Brackets to Engine Nuts (LHD 2.8L model)	4.5	-	40
Receiver/drier to A/C Condenser Bolt	22	16	-
Refrigerant Lines to A/C Expansion Valve Nut	23	17	-
Refrigerant Lines to A/C Compressor Nuts	12	-	105

SPECIAL TOOLS

HEATING-A/C SYSTEM

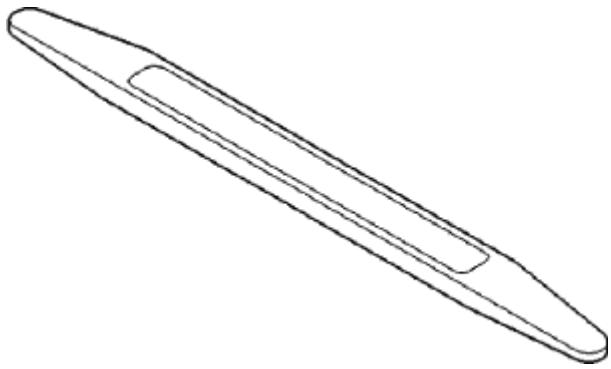


Fig. 3: Trim Stick C-4755
Courtesy of CHRYSLER LLC

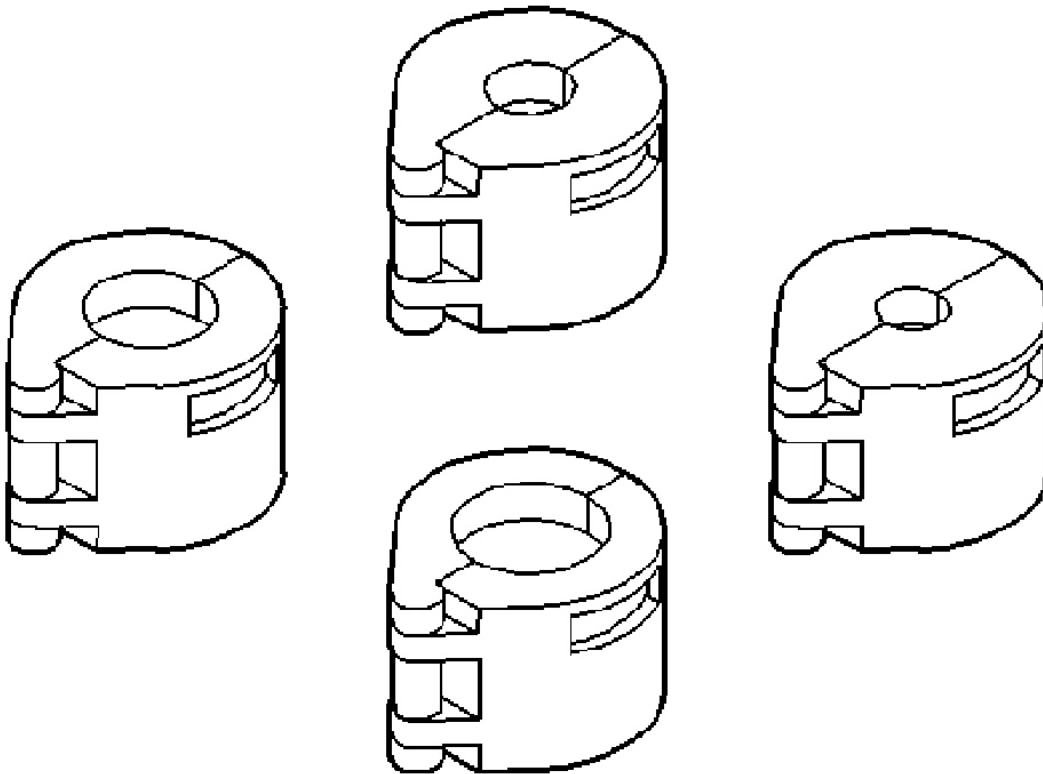


Fig. 4: A/C Line Disconnect Tools 7193
Courtesy of CHRYSLER LLC

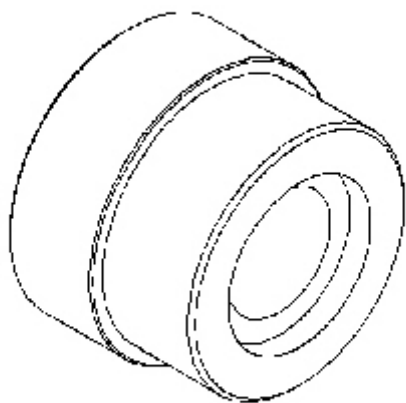


Fig. 5: Compressor Field Coil Installer 9352
Courtesy of CHRYSLER LLC

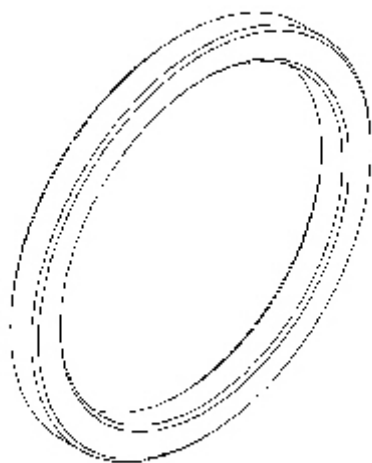


Fig. 6: Compressor Field Coil Installer Spacer 9353
Courtesy of CHRYSLER LLC

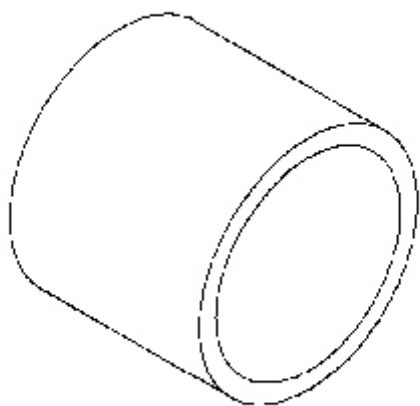


Fig. 7: Compressor Field Coil Remover 9354
Courtesy of CHRYSLER LLC

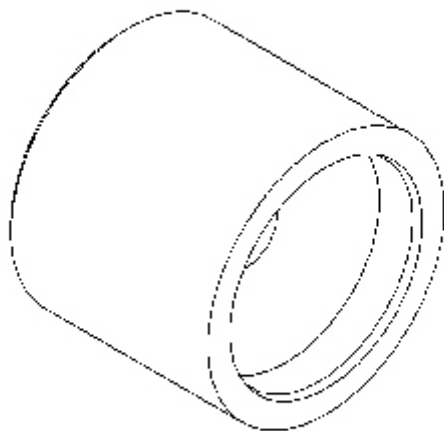


Fig. 8: Clutch Pulley Installer 9355
Courtesy of CHRYSLER LLC

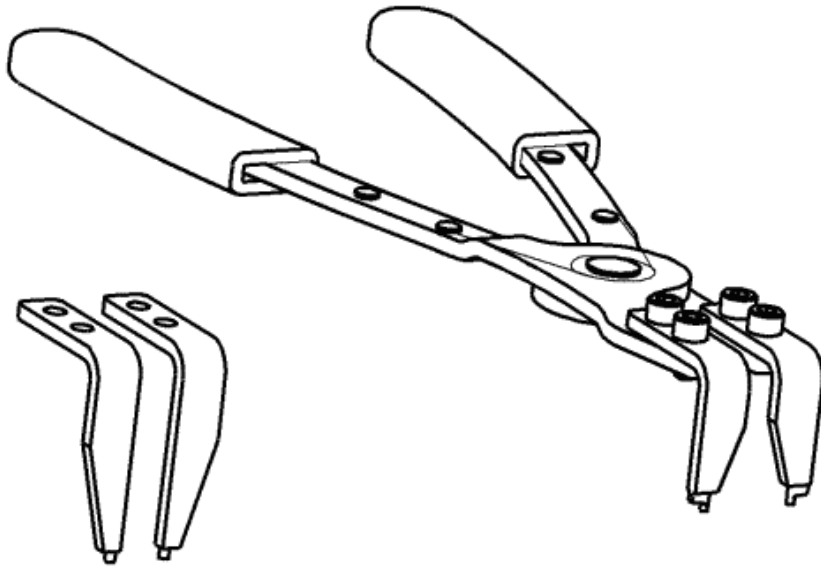


Fig. 9: Snap Ring Pliers 9764
Courtesy of CHRYSLER LLC

CONTROLS

ACTUATOR-BLEND DOOR

DESCRIPTION

ACTUATOR-BLEND DOOR

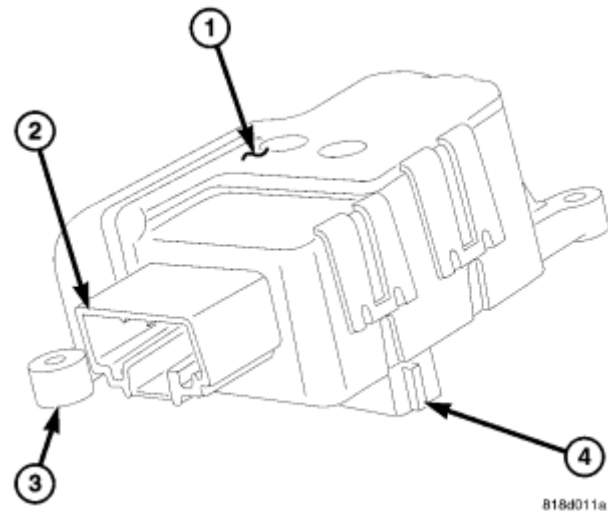


Fig. 10: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft
Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the blend-air door. The blend door actuator (1) is located on the driver side of the HVAC housing.

The blend door actuator is interchangeable with the actuators for the mode-air doors and the recirculation-air door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The blend door actuator output shaft (4) is connected to the linkage that drives the blend-air door. The blend door actuator does not require mechanical indexing to the blend-air door, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-BLEND DOOR

The blend door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The blend door actuator can move the blend-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the blend-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the blend-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the blend-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the blend door actuator and the blend-air door. The A/C-heater control learns the blend-air door stop positions during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the blend door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blend door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-BLEND DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

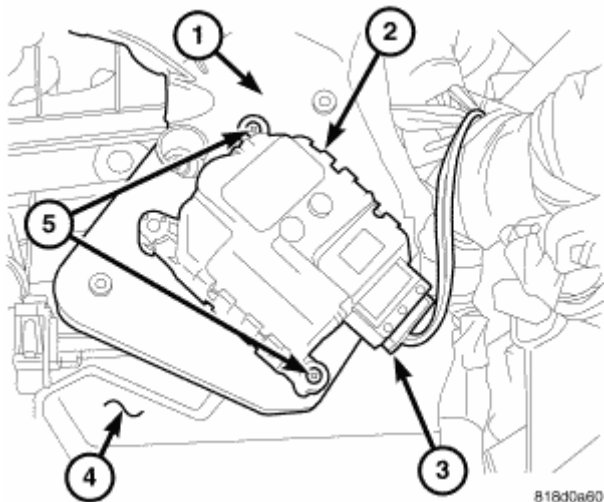


Fig. 11: Identifying Actuator Mounting Bracket, Blend Door Actuator, Wire Harness Connector, Air Distribution Housing & Screws
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL**.
3. Disconnect the wire harness connector (3) from the blend door actuator (2) located on the driver side of the air distribution housing (4).
4. Remove the two screws (5) that secure the blend door actuator to the actuator mounting bracket (1) and remove the actuator.

INSTALLATION

ACTUATOR-BLEND DOOR

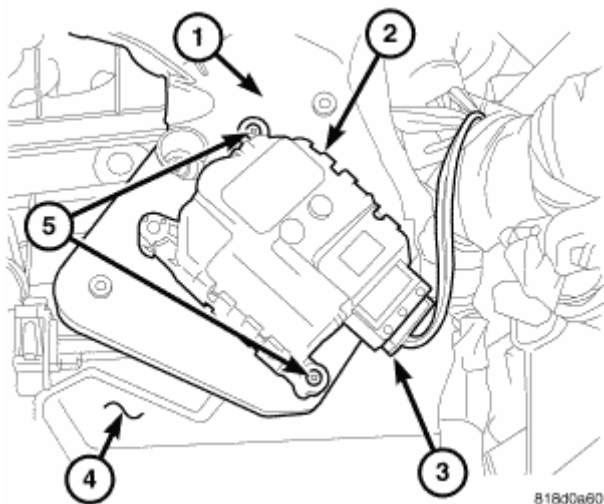


Fig. 12: Identifying Actuator Mounting Bracket, Blend Door Actuator, Wire Harness Connector, Air Distribution Housing & Screws

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blend door actuator (4) to the actuator mounting bracket (1) located on the driver side of the air distribution housing (4). Make sure the actuator output shaft is properly aligned to the door linkage. If necessary, rotate the actuator slightly to align the splines on the output shaft with those in the door linkage.
2. Install the two screws (5) that secure the blend door actuator to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
3. Connect the wire harness connector (3) to the blend door actuator.
4. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.
6. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

ACTUATOR-MODE DOOR

DESCRIPTION

ACTUATOR-MODE DOOR

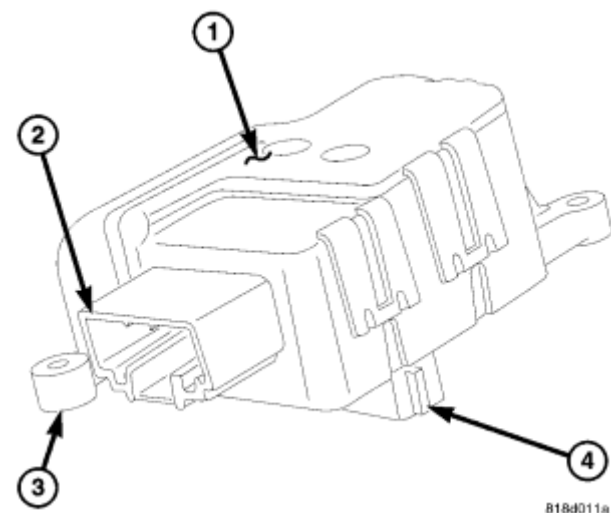


Fig. 13: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft

Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the mode-air door. The mode door actuator (1) is located on the driver side of the HVAC housing.

The mode door actuator is interchangeable with the actuators for the blend-air door and the recirculation-air

door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The mode door actuator output shaft (4) is connected to the linkage that drives the mode-air door. The mode door actuator does not require mechanical indexing to the mode-air doors, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-MODE DOOR

The mode door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The mode door actuator can move the floor, defrost/demist and the panel-air doors in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the mode-air doors will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the mode-air doors moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the mode-air doors stop and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the mode door actuator and the mode-air doors. The A/C-heater control learns the mode-air doors stop position during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the mode door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The mode door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-MODE DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

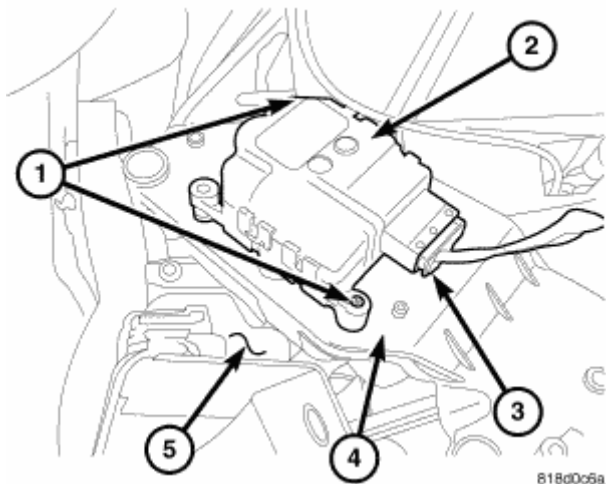


Fig. 14: Identifying Screws, Mode Door Actuator, Wire Harness Connector, Actuator Mounting Bracket & Air Distribution Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL**.
3. Disconnect the wire harness connector (3) from the mode door actuator (2) located on the driver side of the air distribution housing (5).
4. Remove the two screws (1) that secure the mode door actuator to the actuator mounting bracket (4) and remove the actuator.

INSTALLATION

ACTUATOR-MODE DOOR

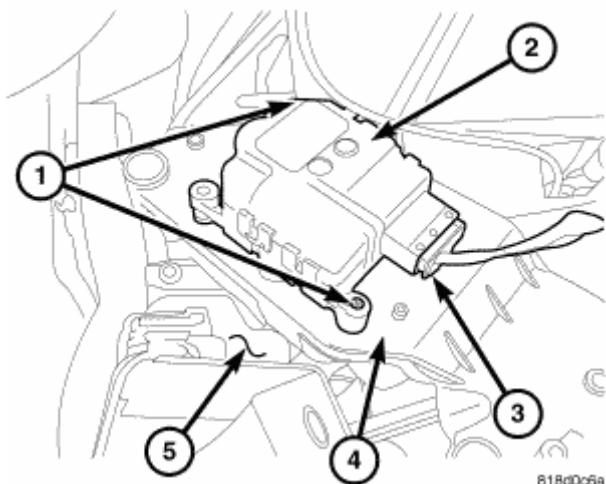


Fig. 15: Identifying Screws, Mode Door Actuator, Wire Harness Connector, Actuator Mounting Bracket & Air Distribution Housing

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the mode door actuator (2) to the actuator mounting bracket (4) located on the driver side of the air distribution housing (5). Make sure the actuator output shaft is properly aligned to the door linkage. If necessary, rotate the actuator slightly to align the splines on the output shaft with those in the mode door linkage
2. Install the two screws (1) that secure the mode door actuator to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
3. Connect the wire harness connector (3) to the mode door actuator.
4. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.
6. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

ACTUATOR-RECIRCULATION DOOR

DESCRIPTION

ACTUATOR-RECIRCULATION DOOR

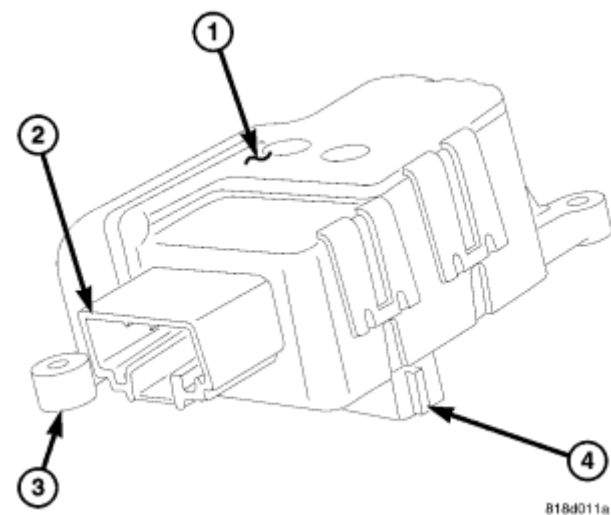


Fig. 16: Identifying Blend Door Actuator, Integral Wire Connector Receptacle, Integral Mounting Tabs & Output Shaft

Courtesy of CHRYSLER LLC

The heating-A/C system uses a reversible, 12-volt direct current (DC) servo motor which mechanically positions the recirculation-air door. The recirculation door actuator (1) is located on the side of the HVAC air inlet housing.

The recirculation door actuator is interchangeable with the actuators for the blend-air door and the mode-air door. Each actuator is contained within a black molded plastic housing with an integral wire connector receptacle (2) and integral mounting tabs (3) that allow the actuator to be secured to the HVAC housing. The recirculation door actuator output shaft (4) is directly connected to the pivot shaft lever of the recirculation-air door. The recirculation door actuator does not require mechanical indexing to the recirculation-air door, as it is electronically calibrated by the A/C-heater control.

OPERATION

ACTUATOR-RECIRCULATION DOOR

The recirculation door actuator is connected to the A/C-heater control through the vehicle electrical system by a dedicated two-wire lead and connector of the HVAC wire harness. The recirculation door actuator can move the recirculation-air door in two directions. When the A/C-heater control pulls the voltage on one side of the motor connection high and the other connection low, the recirculation-air door will move in one direction. When the A/C-heater control reverses the polarity of the voltage to the motor, the recirculation-air door moves in the opposite direction. When the A/C-heater control makes the voltage to both connections high or both connections low, the recirculation-air door stops and will not move.

The A/C-heater control uses a pulse-count positioning system to monitor the operation and relative position of the recirculation door actuator and the recirculation-air door. The A/C-heater control learns the recirculation-air door stop positions during the actuator calibration procedure and will store a diagnostic trouble code (DTC) for any problems it detects in the recirculation door actuator circuits (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The recirculation door actuator cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

ACTUATOR-RECIRCULATION DOOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

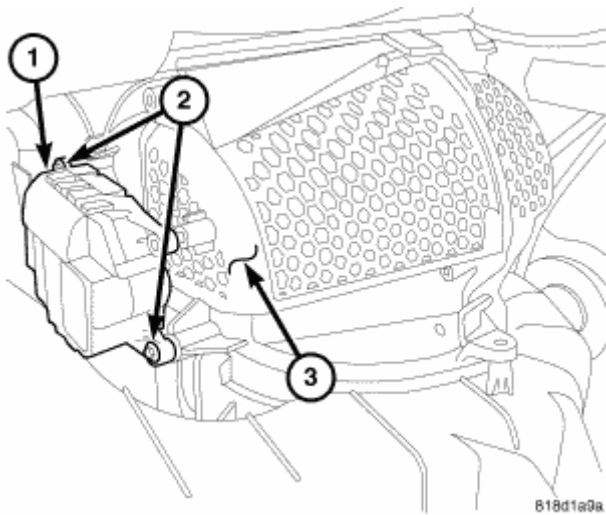


Fig. 17: Recirculation Door Actuator, Screws & Air Inlet Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. On LHD models, remove the glove box bin. Refer to **REMOVAL** .
3. On RHD models, remove the instrument panel. Refer to **REMOVAL** .
4. Remove the two screws (2) that secure the recirculation door actuator (1) to the air inlet housing (3).
5. Disconnect the wire harness connector from the recirculation door actuator and remove the actuator from the vehicle.

INSTALLATION

ACTUATOR-RECIRCULATION DOOR

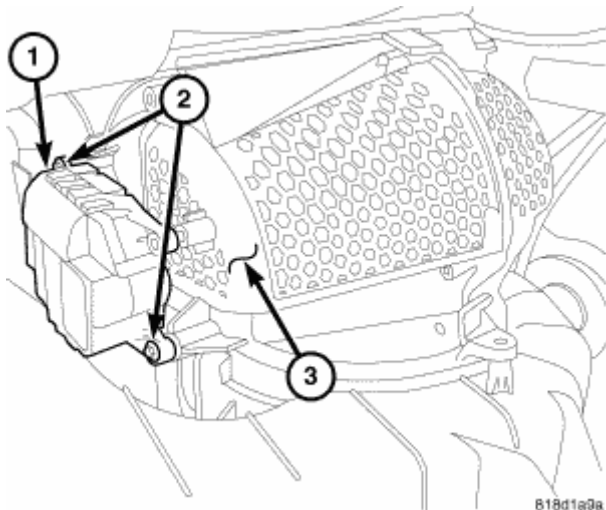


Fig. 18: Recirculation Door Actuator, Screws & Air Inlet Housing
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Connect the wire harness connector to the recirculation door actuator (1).
2. Position the recirculation door actuator to the side of the air inlet housing (3). Make sure the actuator output shaft is properly aligned to the recirculation door pivot shaft. If necessary, rotate the actuator slightly to engage the splines on the output shaft with those in the pivot shaft.
3. Install the two screws (2) that secure the recirculation door actuator to the air inlet housing. Tighten the screws to 1.2 N.m (10 in lbs.).
4. On RHD models, install the instrument panel. Refer to **INSTALLATION** .
5. On LHD models, install the glove box bin. Refer to **INSTALLATION** .
6. Reconnect the negative battery cable.
7. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

CLUTCH-A/C COMPRESSOR

DESCRIPTION

CLUTCH-A/C COMPRESSOR

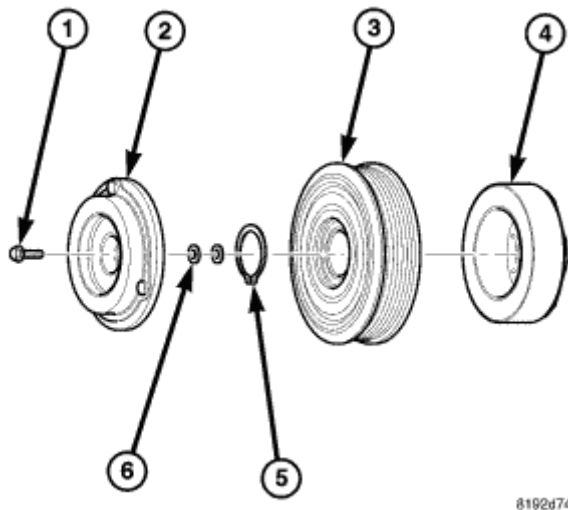


Fig. 19: Bolt, Clutch Plate, Pulley Assembly, Stationary Electromagnetic Field Coil, Snap Ring & Shims
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 2.8L and 4.0L engine use a Zexel DKS-17DS A/C compressor. The clutch assembly for this A/C compressor consists of a stationary electromagnetic field coil (4), bearing and pulley assembly (3), shims (6), and a clutch plate (2) that is splined to the compressor shaft and secured by a bolt (1). These components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt.

The A/C clutch field coil is pressed onto the front of this A/C compressor and cannot be serviced separately from the compressor. The A/C clutch bearing and pulley assembly is retained to the front of the compressor by a snap ring (5) and can be serviced separately.

CLUTCH-A/C COMPRESSOR

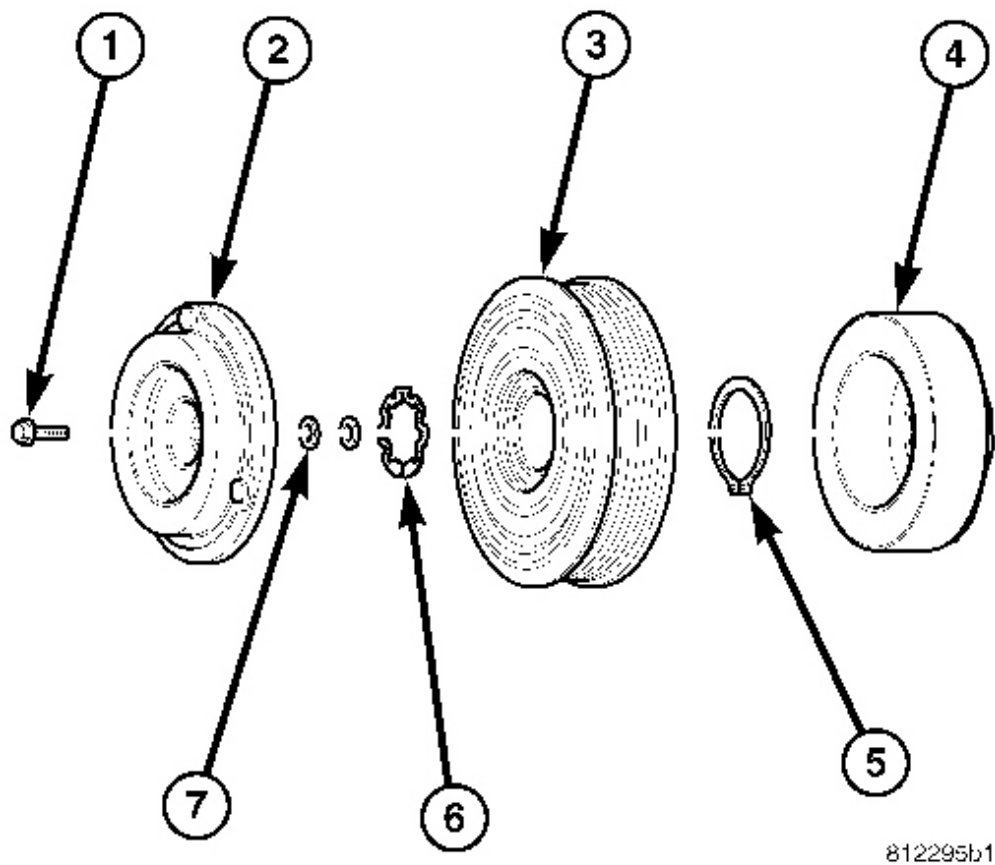


Fig. 20: A/C Compressor Clutch Components
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 3.7L engine use the Visteon HS-18 A/C compressor. The clutch assembly for this A/C compressor consists of a stationary electromagnetic field coil (4), bearing and pulley assembly (3), shims (7), and a clutch plate (2) that is splined to the compressor shaft and secured by a bolt (1). These components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt.

The A/C clutch field coil is pressed onto the front of this A/C compressor and retained with a snap ring (6). The A/C clutch bearing and pulley assembly is also retained to the front of this compressor by a snap ring (5). Both the A/C clutch bearing and pulley assembly and the field coil can be serviced separately.

OPERATION

CLUTCH-A/C COMPRESSOR

The A/C compressor clutch components provide the means to engage and disengage the A/C compressor from the engine accessory drive belt. When the electromagnetic A/C clutch field coil is energized, it magnetically draws the clutch plate into contact with the clutch pulley and drives the compressor shaft. When the coil is not energized, the pulley freewheels on the clutch hub bearing, which is part of the pulley assembly.

A/C compressor clutch engagement is controlled by the powertrain control module (PCM) or the engine control module (ECM), depending on engine application. When the A/C-heater control is set to any A/C position, it sends a request signal on the CAN-B bus to the totally integrated power module (TIPM), which then transfers the request on the CAN-C Bus to the PCM/ECM, which determines if operating conditions are correct for A/C clutch engagement. When all operating conditions have been met, the PCM/ECM sends a signal on a dedicated hard-wired circuit back to the totally integrated power module (TIPM) to energize the internal A/C clutch high side driver. When energized, the A/C clutch high side driver provides battery current to the A/C clutch field coil.

The A/C clutch control system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article or appropriate Engine ELECTRICAL DIAGNOSTICS article for more information).

The A/C compressor clutch components cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

CLUTCH-A/C COMPRESSOR

The A/C compressor clutch coil electrical circuit is controlled by the powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) through the totally integrated power module (TIPM). See **OPERATION**. Begin testing of a suspected compressor clutch coil problem by performing the preliminary checks.

PRELIMINARY CHECKS

1. Using a scan tool, check for diagnostic trouble codes (DTCs) in the A/C-heater control, TIPM and the PCM/ECM. If no DTCs are found, go to step 2. If any DTCs are found, repair as required.
2. If the A/C compressor clutch still will not engage, verify the refrigerant charge level. See **DIAGNOSIS AND TESTING**. If the refrigerant charge level is OK, go to step 3. If the refrigerant charge level is not OK, adjust the refrigerant charge as required.
3. If the A/C compressor clutch still will not engage, disconnect the wire harness connector from the A/C pressure transducer and check for battery current at the connector with the engine running and the A/C-heater control set to the A/C mode. If OK, go to **COIL CURRENT DRAW TEST**, and/or **COIL RESISTANCE TEST - 2.8L AND 4.0L ENGINES ONLY**.

COIL CURRENT DRAW TEST

1. Verify the battery state of charge. Refer to **DIAGNOSIS AND TESTING**.
2. Connect an ammeter (0 to 10 ampere scale selected) in series with the clutch field coil feed terminal.

- Connect a voltmeter (0 to 20 volt scale selected) to measure voltage across the battery and the clutch coil.
3. With the A/C-heater control in the A/C mode and the blower motor at low speed, start the engine and allow it to run at a normal idle speed.
 4. The A/C clutch should engage immediately, and the clutch field coil supply voltage should be within two volts of the battery voltage. If the field coil supply voltage is OK, go to step 5. If the field coil supply voltage is not within two volts of battery voltage, test the clutch field coil feed circuit for excessive voltage drop and repair as necessary.
 5. Refer to the following A/C CLUTCH FIELD COIL SPECIFICATIONS chart for the acceptable A/C clutch field coil current draw. If voltage is more than 12.5 volts, add electrical loads by turning on electrical accessories until voltage reads below 12.5 volts.
 - If the A/C clutch field coil current reading is zero, the coil is open and must be replaced.
 - If the A/C clutch field coil current reading is above specifications, the coil is shorted and must be replaced.

COIL RESISTANCE TEST - 2.8L AND 4.0L ENGINES ONLY

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the A/C clutch field coil connector.
3. Use an ohmmeter and measure the resistance of the clutch field coil at the field coil connector terminals.
4. Refer to the following A/C CLUTCH FIELD COIL SPECIFICATIONS chart for the acceptable A/C clutch coil resistance.
 - If the A/C clutch coil resistance reading is above specifications, the coil is shorted and must be replaced.
 - If the A/C clutch coil resistance reading is below specifications, the coil is open and must be replaced.

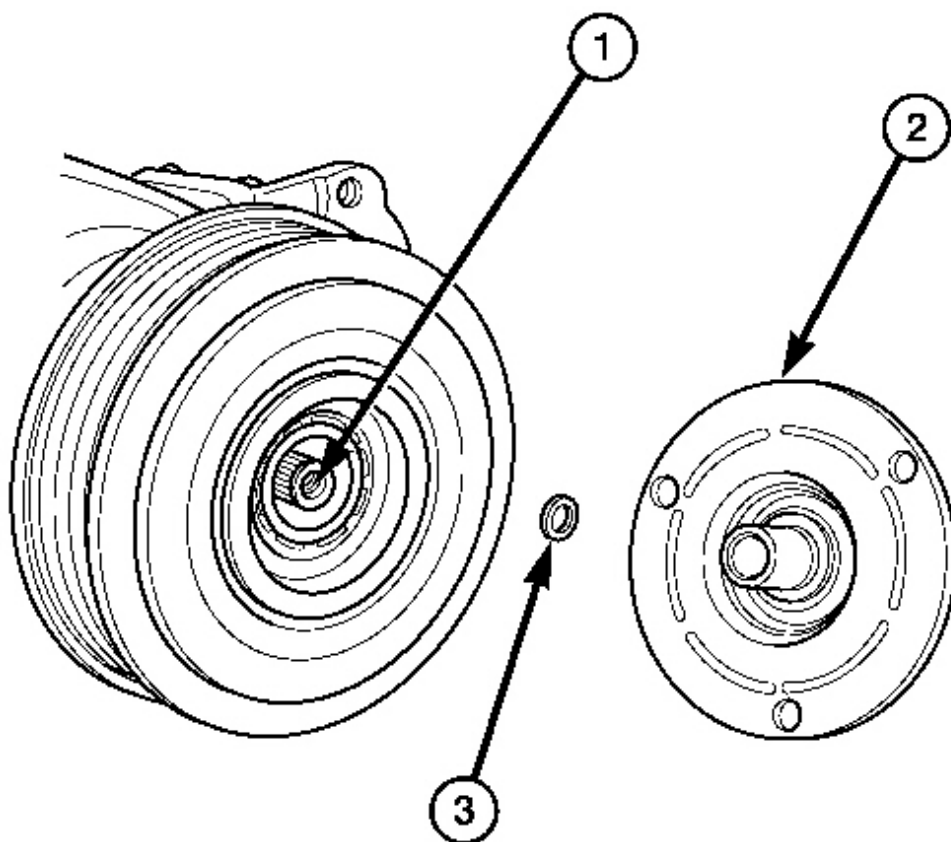
A/C CLUTCH FIELD COIL SPECIFICATIONS

A/C Compressor	Current Draw	Coil Resistance
Zexel DKS-17DS (2.8L/4.0L engines)	3.3 amps @ 12V ± 0.5V @ 25° C (77° F)	4.02 ± 0.2 ohms @ 25° C (77° F)
Visteon HS-18 (3.7L engine)	3.1 - 4 amps @ 12V ± 0.5V @ 21° C (70° F)	Not applicable

STANDARD PROCEDURE

CLUTCH-A/C COMPRESSOR

NOTE: The A/C clutch can be serviced in the vehicle. The refrigerant system can remain fully-charged during compressor clutch, pulley and bearing assembly, or coil replacement.



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Fig. 21: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

Examine the friction surfaces of the pulley and the clutch plate (2) for wear. The pulley and clutch plate should be replaced if there is excessive wear or scoring.

If the friction surfaces are oily, inspect the shaft and nose area of the A/C compressor (1) for refrigerant oil. If refrigerant oil is found, the compressor shaft seal is leaking and the A/C compressor must be replaced.

Check the pulley bearing for roughness or excessive leakage of grease. Replace the pulley and bearing assembly, if required.

CLUTCH-A/C COMPRESSOR

After a new A/C compressor clutch has been installed, cycle the compressor clutch approximately 20 times (5 seconds on, then 5 seconds off). During this procedure, set the A/C-heater controls to the A/C Recirculation Mode, the blower motor in the highest speed position, and the engine speed at 1500 to 2000 rpm. This procedure (burnishing) will seat the opposing friction surfaces and provide a higher compressor clutch torque capability.

REMOVAL

CLUTCH-A/C COMPRESSOR

NOTE: The compressor clutch assembly can be serviced with the refrigerant system fully-charged.

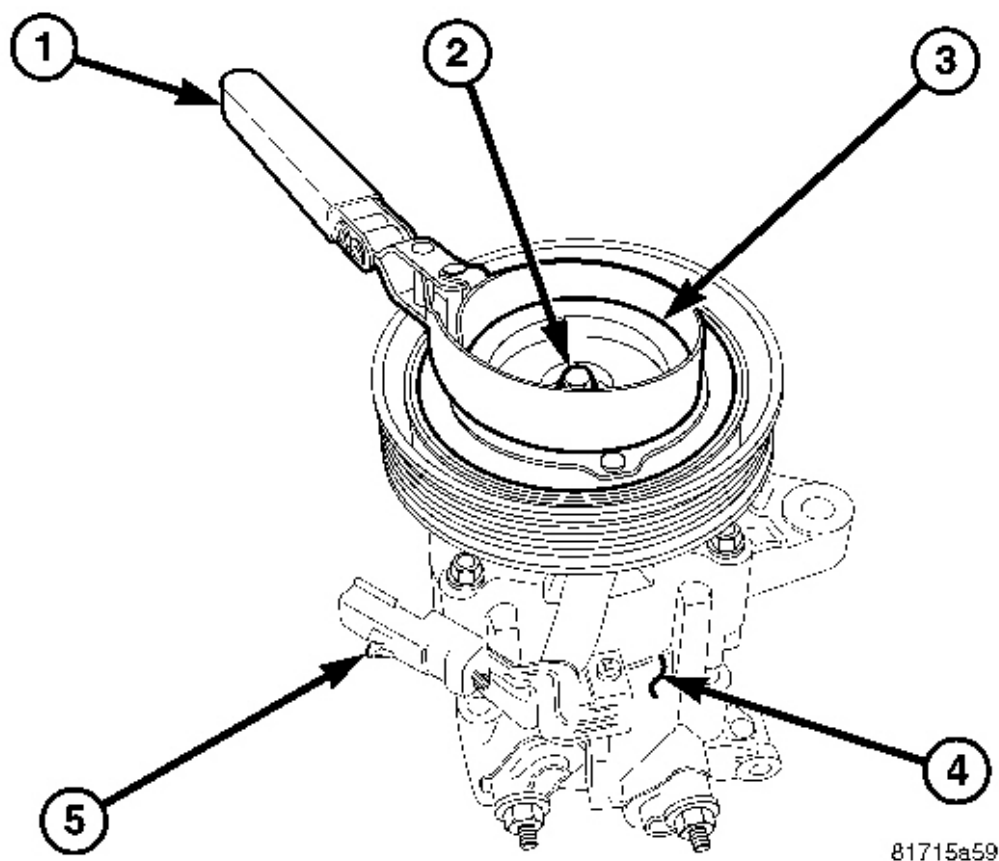


Fig. 22: Strap Wrench, Bolt, Clutch Plate, A/C Compressor & Clutch Field Coil Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate negative battery cable.
2. Remove the accessory drive belt. Refer to **REMOVAL** .
3. Disconnect the engine wire harness from the clutch field coil connector (4).
4. Remove the bolts that secure the A/C compressor (4) to the mounting bracket. See **REMOVAL**.
5. Remove the A/C compressor from the mounting bracket and support the compressor while servicing the clutch.
6. Using a strap wrench (1), remove the bolt (2) that secures the clutch plate (3) to the compressor shaft.

NOTE: The clutch plate can be removed from the compressor shaft by hand or, if required, pressed off with an 8 x 1.25 mm bolt.

NOTE: Clutch plate shim(s) may remain inside the hub of the clutch plate. Be sure to remove all of the shims from inside the hub or from the end of the compressor shaft.

7. Remove the clutch plate and shim(s) from the A/C compressor. If required, install a 8 x 1.25 mm bolt into the center of the clutch plate and turn the bolt clockwise until the clutch plate is completely removed from the A/C compressor.

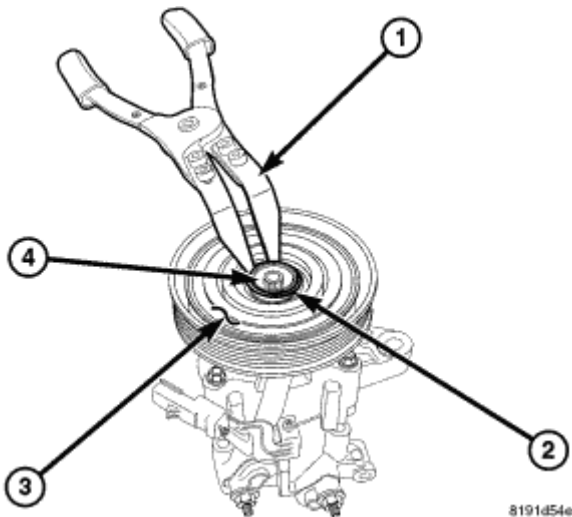
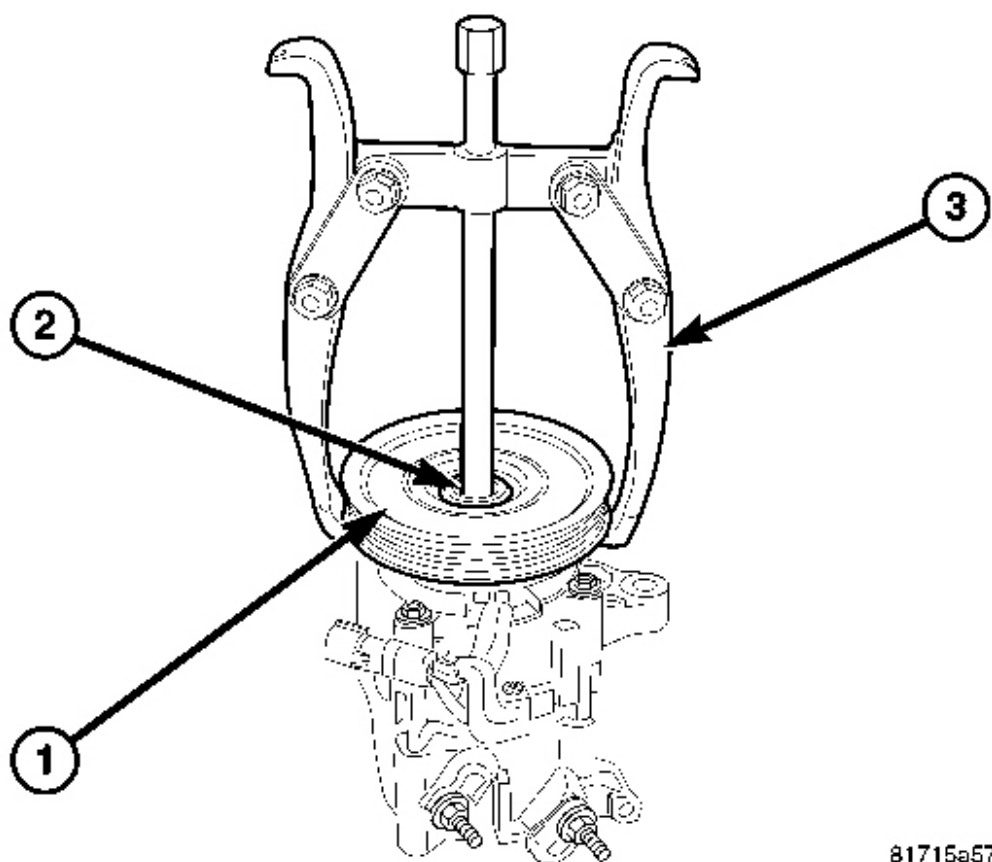


Fig. 23: Using Snap Ring Pliers To Remove/Install Snap Ring That Secures Pulley And Bearing Assembly To Front Of A/C Compressor
Courtesy of CHRYSLER LLC

8. Using snap ring pliers (Special Tool 9764 or equivalent) (1), remove the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4).

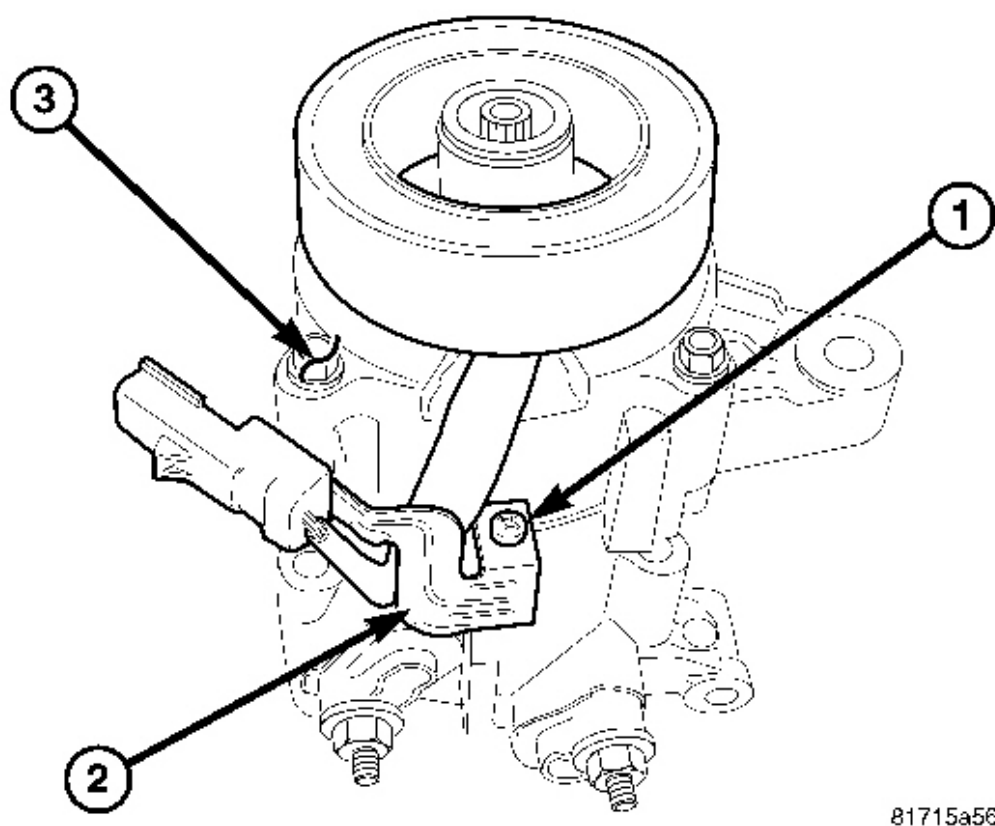


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Fig. 24: Pulley & Bearing - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

NOTE: The pulley and bearing assembly can be removed from the compressor by hand or, if required, with a two jaw puller.

9. Remove the pulley and bearing assembly (1) from the front of the A/C compressor (2). If required, install a two jaw puller (3) and turn the puller center-bolt clockwise until the pulley and bearing assembly is completely removed.



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Fig. 25: Locating Field Coil Wire Lead - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

10. Remove the screw (1) that secures the clutch field coil wire lead bracket (2) to the A/C compressor (3).

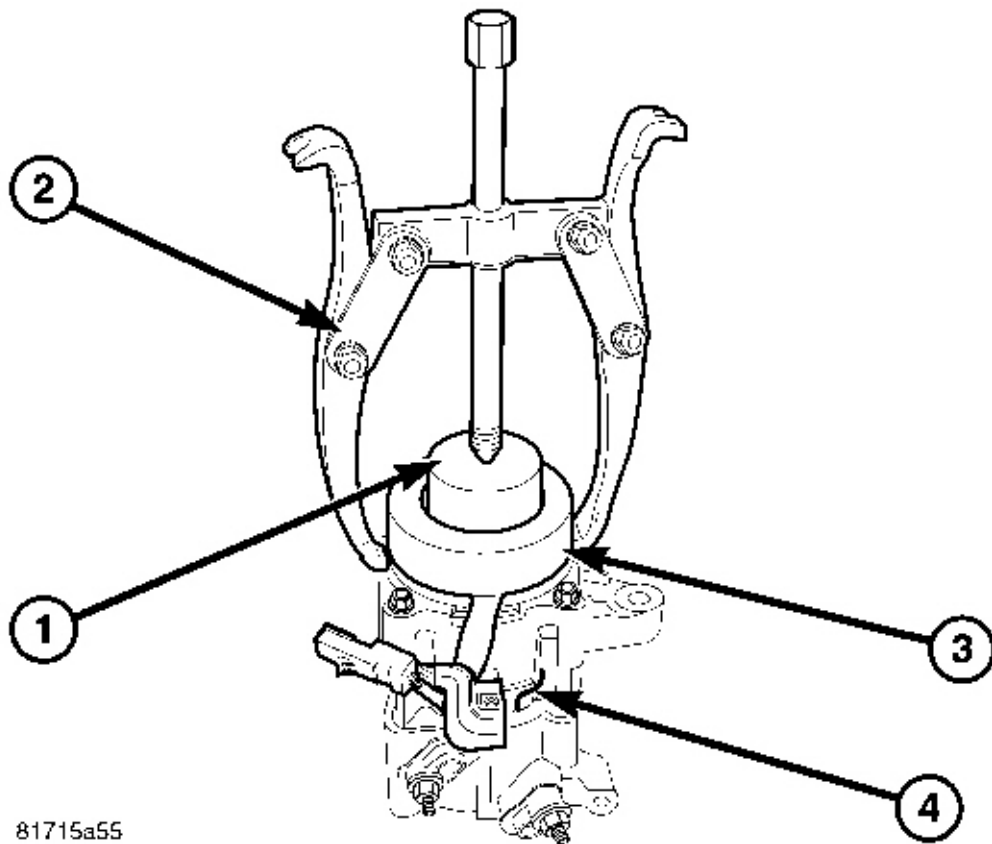


Fig. 26: Using Compressor Field Coil Remover And Two Jaw Puller To Remove Clutch Field Coil From Front Of A/C Compressor
Courtesy of CHRYSLER LLC

11. Using compressor field coil remover (Special Tool 9354 in Kit 9349) (1) and a two jaw puller (2), remove the clutch field coil (3) from the front of the A/C compressor (4).

CLUTCH-A/C COMPRESSOR

NOTE: The compressor clutch plate and pulley and bearing assembly and can be serviced with the refrigerant system fully-charged and with the A/C compressor installed on the engine.

NOTE: Typical A/C compressor and clutch assembly shown in illustrations.

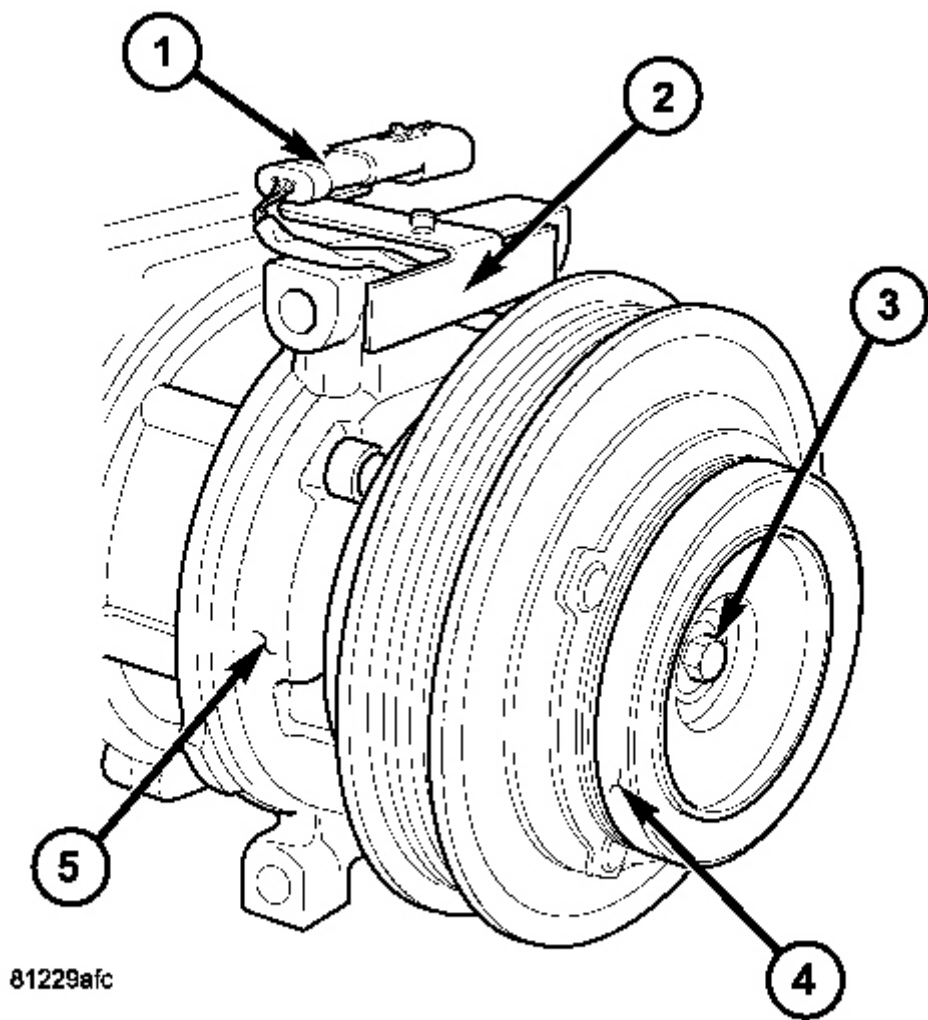


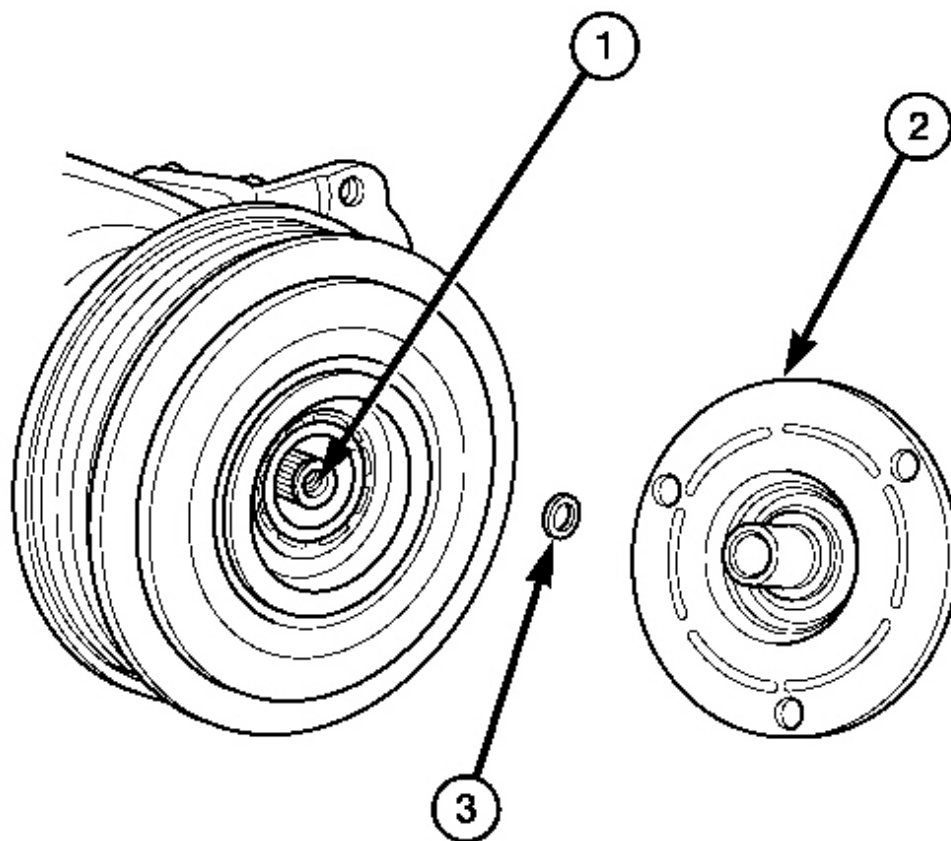
Fig. 27: Locating A/C Compressor Shaft Bolt
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the coolant recovery container from the front of the engine compartment. Refer to **REMOVAL** .
3. Remove the radiator fan and shroud assembly. Refer to **REMOVAL** .
4. Remove the accessory drive belt. Refer to **REMOVAL** .
5. Disconnect the engine wire harness from the compressor clutch field coil connector (1) located on the top of the A/C compressor (5).
6. Remove the screw that secures the connector bracket (2) to the A/C compressor and position the bracket

and wire lead out of the way.

NOTE: A band-type oil filter wrench or a strap wrench may be used to hold the clutch plate from turning during compressor shaft bolt removal.

7. Hold the clutch plate (4) from turning and remove the compressor shaft bolt (3).



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Fig. 28: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

CAUTION: Do not pry between the clutch plate and the pulley and bearing assembly to remove the clutch plate from the compressor shaft as

this may damage the clutch plate.

NOTE: Use care not to lose any clutch shim(s) during removal of the clutch plate, as they may be reused during the clutch plate installation process.

8. Tap the clutch plate (2) lightly with a plastic mallet to release it from the splines on the compressor shaft (1) and remove the clutch plate and shim(s) (3).

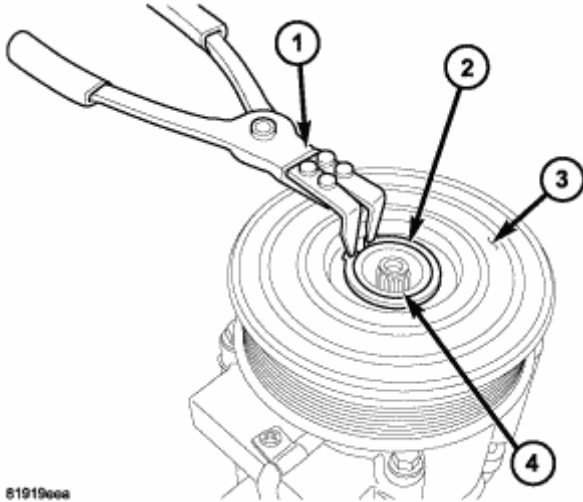


Fig. 29: PULLEY AND SNAP RING
Courtesy of CHRYSLER LLC

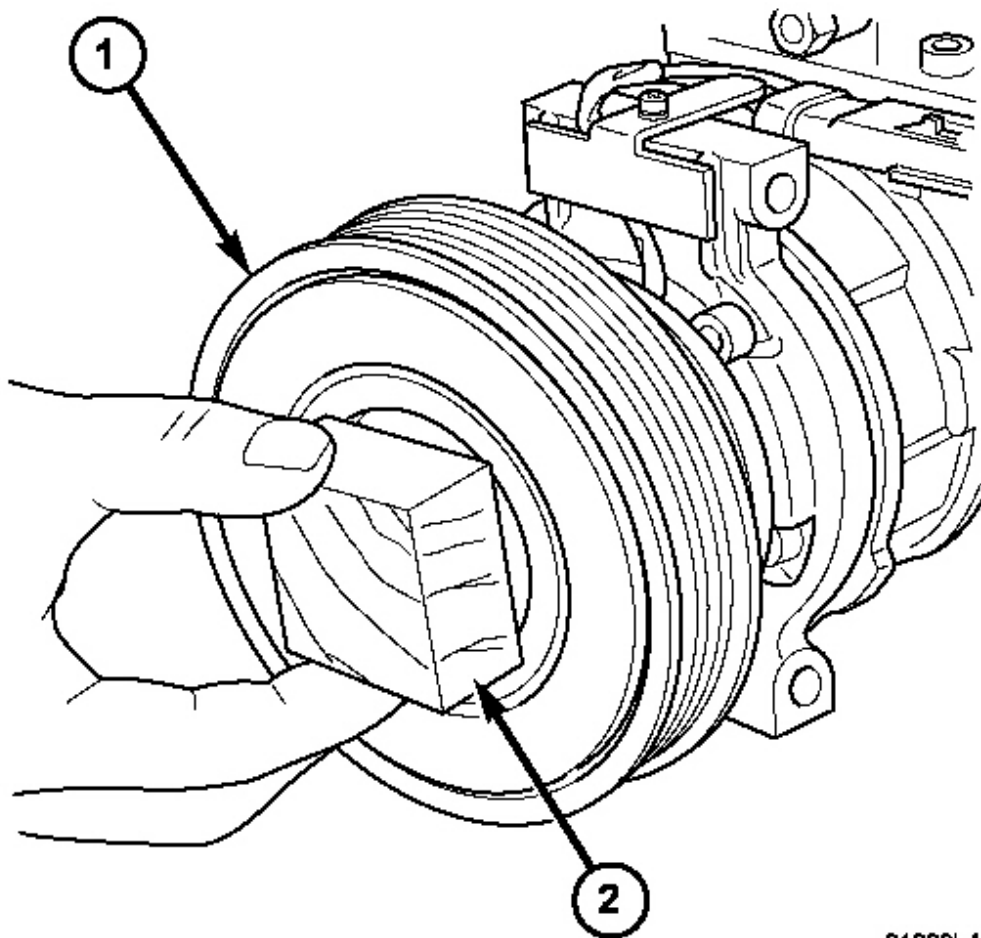
NOTE: The pulley and bearing assembly can be removed from the compressor by hand or, if required, with a two jaw puller.

9. Using Snap Ring Pliers 9764 or equivalent (1), remove the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4).
10. Remove the pulley and bearing assembly from the front of the A/C compressor. If required, install a two jaw puller and turn the puller center-bolt clockwise until the pulley and bearing assembly is completely removed.

INSTALLATION

CLUTCH-A/C COMPRESSOR

NOTE: Typical A/C compressor and clutch assembly shown in illustrations.



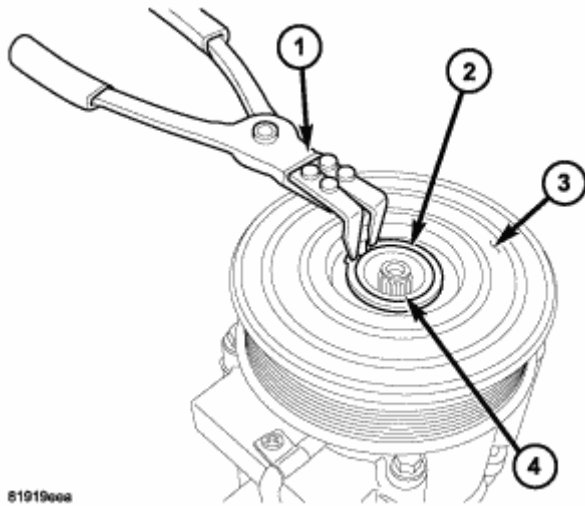
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Fig. 30: Installing Pulley & Bearing Assembly
Courtesy of CHRYSLER LLC

CAUTION: Be certain to position the compressor clutch field coil wire lead so that it is not damaged during A/C compressor pulley and bearing installation.

CAUTION: When installing the pulley and bearing assembly, DO NOT mar the friction surfaces of the pulley or premature failure of the clutch will result.

1. Install the pulley and bearing assembly (1) onto the front of the A/C compressor. If necessary, tap the pulley gently with a block of wood (2) placed on the pulley friction surface.



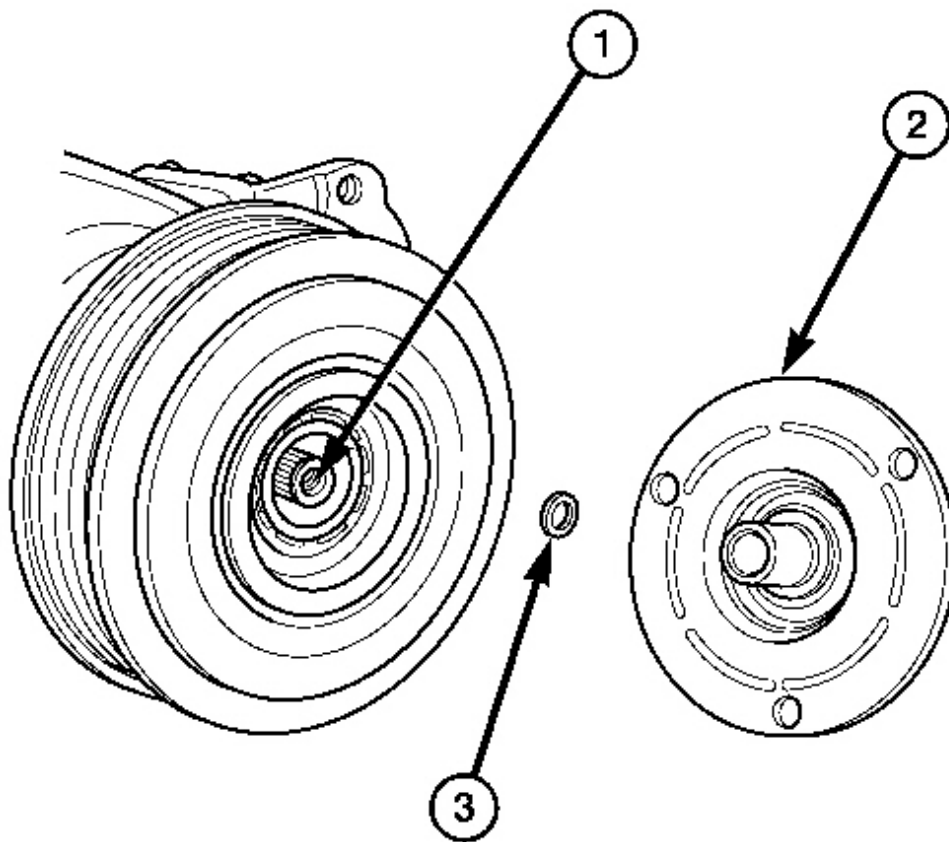
61919000

Fig. 31: PULLEY AND SNAP RING
Courtesy of CHRYSLER LLC

CAUTION: The snap ring must be fully and properly seated in the groove or it will vibrate out, resulting in a clutch failure and severe damage to the A/C compressor.

NOTE: A new snap ring must be used to secure the pulley and bearing assembly to the A/C compressor. The bevel side of the snap ring must face outward.

2. Using Snap Ring Pliers 9764 or equivalent (1), install the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4). Be certain that the snap ring is fully and properly seated in the groove.



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Fig. 32: Identifying Compressor Shaft, Clutch Plate & Shim
Courtesy of CHRYSLER LLC

3. If the original clutch plate (2) and pulley and bearing assembly are to be reused, reinstall the original shim (s) (3) onto the compressor shaft (1). If a new clutch plate and pulley and bearing assembly are being used, install a trial stack of shims 1.50 mm (0.059 in.) thick onto the compressor shaft.

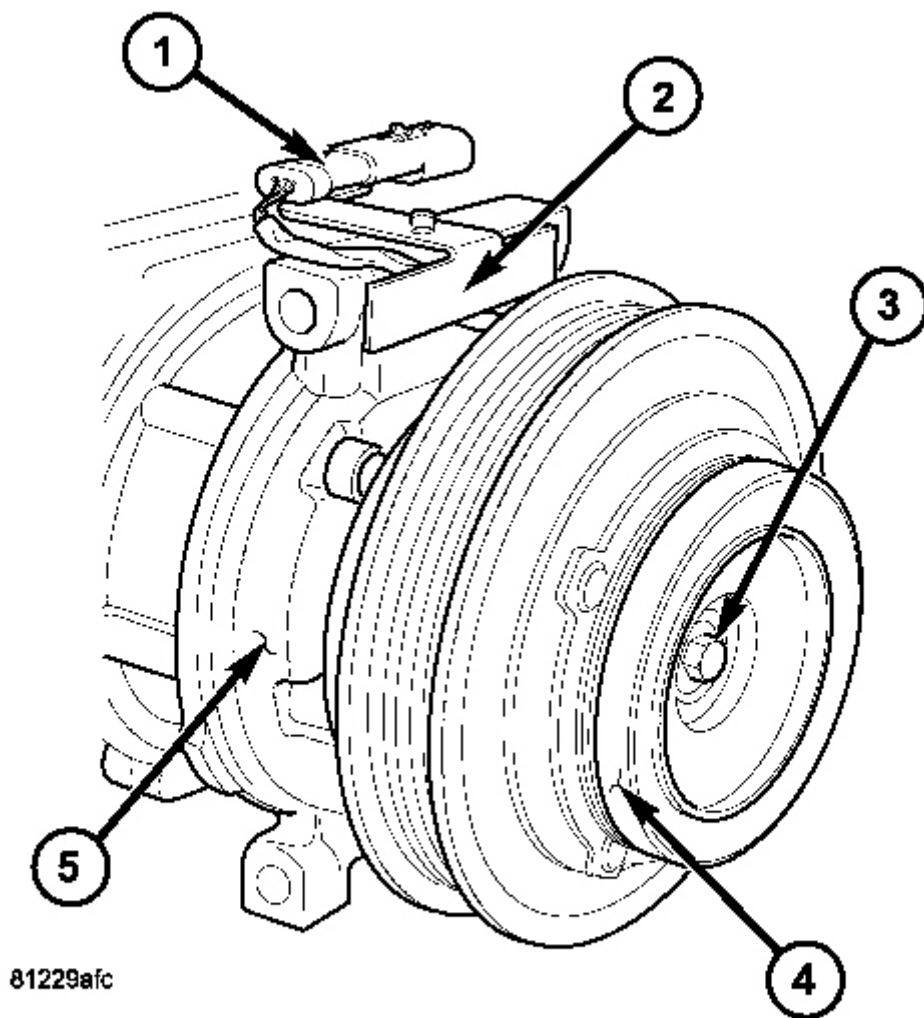


Fig. 33: Locating A/C Compressor Shaft Bolt
Courtesy of CHRYSLER LLC

4. Install the clutch plate (4) onto the front of the A/C compressor (5).
5. Install the compressor shaft bolt (3). Tighten the bolt to 20 N.m (177 in. lbs.).

NOTE: The shims may compress after tightening the shaft bolt. Check the air gap in four or more places to verify the air gap is correct. Spin the pulley before performing a final check of the air gap.

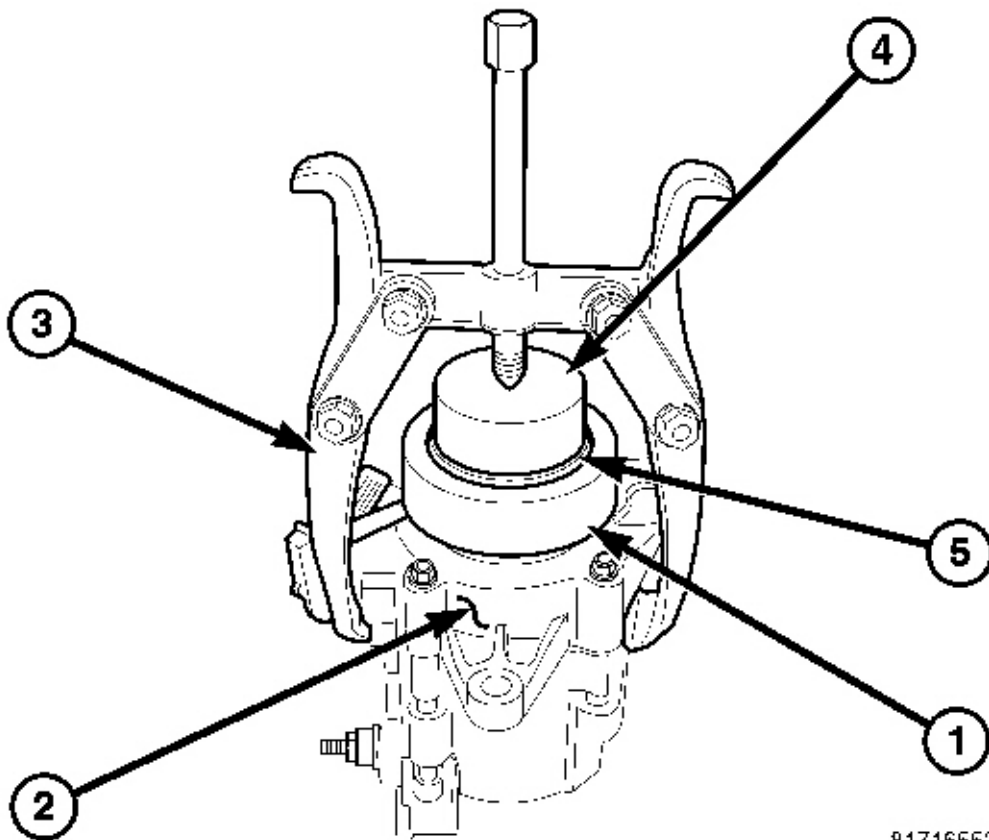
NOTE: On models with the clutch plate recessed into the pulley, use a 90° wire gap gauge to measure the clutch air gap. On other models, use a blade type feeler gauge to measure the air gap.

6. With the clutch plate assembled tight against the shim(s), measure the air gap between the clutch plate and the pulley and bearing assembly. The air gap should be between 0.30 - 0.60 mm (0.012 - 0.024 in.). If the air gap is not between specifications, add or subtract shims as needed until the correct air gap is obtained.

CAUTION: Be certain that the compressor clutch field coil wire lead is routed so that it is not pinched between the A/C compressor and the field coil connector bracket.

7. Carefully route the compressor clutch field coil wire lead and install the connector bracket (2) and retaining screw onto the A/C compressor. Tighten the screw to 4.3 N.m (38 in. lbs.).
8. Connect the engine wire harness to the compressor clutch field coil connector (1).
9. Install the accessory drive belt. Refer to **INSTALLATION** .
10. Install the radiator and fan shroud assembly. Refer to **INSTALLATION** .
11. Install the coolant recovery container. Refer to **REMOVAL** .
12. Reconnect the negative battery cable.

CLUTCH-A/C COMPRESSOR



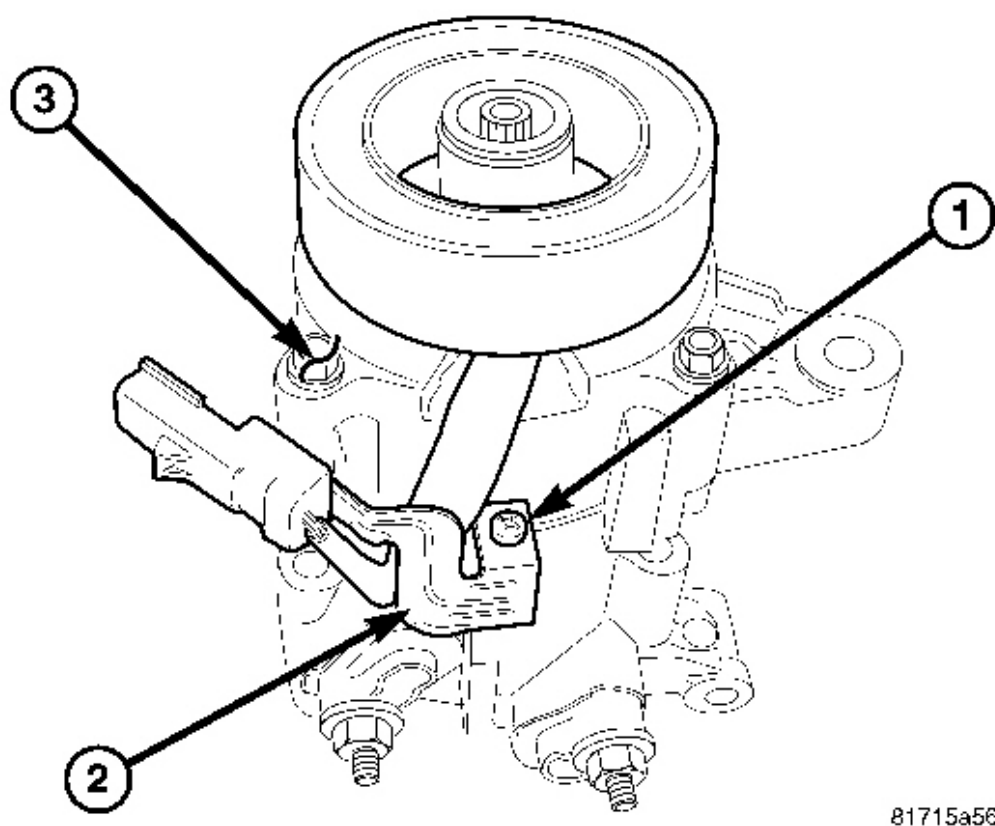
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Fig. 34: Field Coil Installation - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

1. Position the A/C clutch field coil (1) squarely onto the front of the A/C compressor (2).

CAUTION: Position the A/C clutch field coil so that the coil positioning tabs and the wire harness lead are oriented in the correct direction. Failure to correctly position the field coil on the A/C compressor will result in field coil damage.

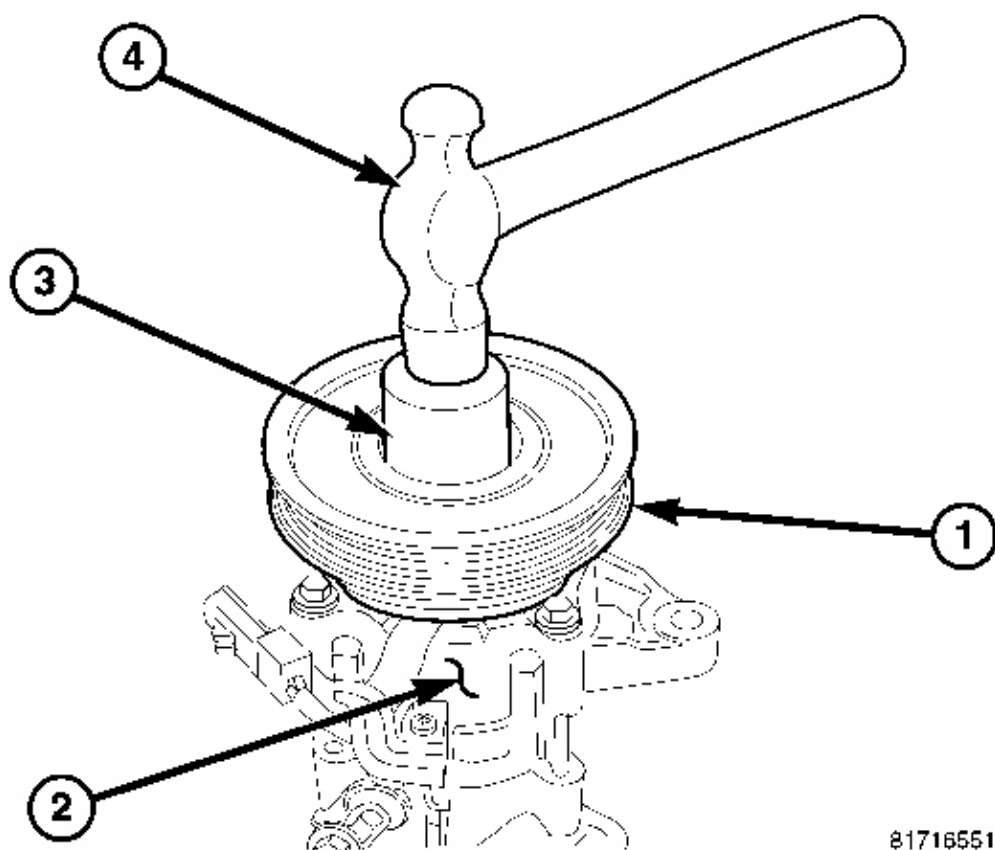
2. Align the field coil positioning tabs to the recessed area at the front of the A/C compressor and install the clutch field coil onto the compressor using a two jaw puller (3), compressor field coil installer (Special Tool 9352 in Kit 9349) (4) and the compressor field coil installer spacer (Special Tool 9353 in Kit 9349) (5).



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Fig. 35: Locating Field Coil Wire Lead - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

3. Position the clutch field coil wire lead and bracket (2) to the A/C compressor (3) and install the screw (1) that secures the bracket to the compressor. Tighten the screw to 4 N.m (35 in. lbs.).



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Fig. 36: Installing Pulley & Bearing - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

4. Align the pulley and bearing assembly (1) squarely onto the front of the A/C compressor (2).

NOTE: **A distinct change of sound during the clutch pulley tapping process indicates that the pulley and bearing assembly has bottomed out against the compressor housing.**

5. Using clutch pulley installer (Special Tool 9355 in Kit 9349) (3) and a hammer (4), install the pulley and bearing assembly onto the front of the A/C compressor. Tap the installer with a hammer until the pulley and bearing assembly has bottomed against the compressor housing.

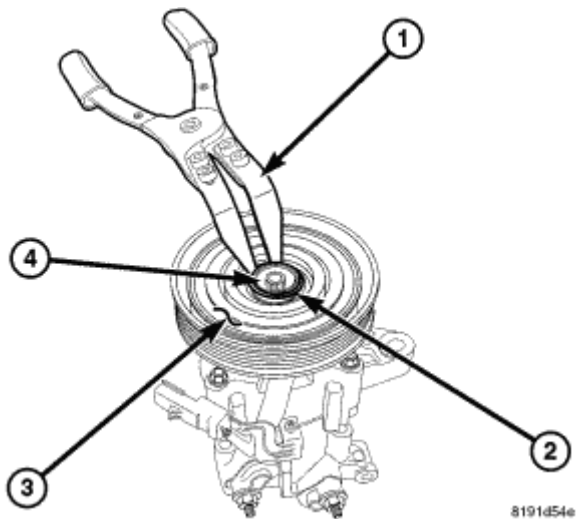


Fig. 37: Using Snap Ring Pliers To Remove/Install Snap Ring That Secures Pulley And Bearing Assembly To Front Of A/C Compressor
Courtesy of CHRYSLER LLC

CAUTION: If the snap ring is not fully seated in the groove it will vibrate out, resulting in clutch failure and severe damage to the A/C compressor.

NOTE: Install the snap ring with the beveled side of the snap ring facing outward.

6. Using snap ring pliers (Special Tool 9764 or equivalent) (1), install the snap ring (2) that secures the pulley and bearing assembly (3) to the front of the A/C compressor (4). Make sure the snap ring is properly seated in the groove.

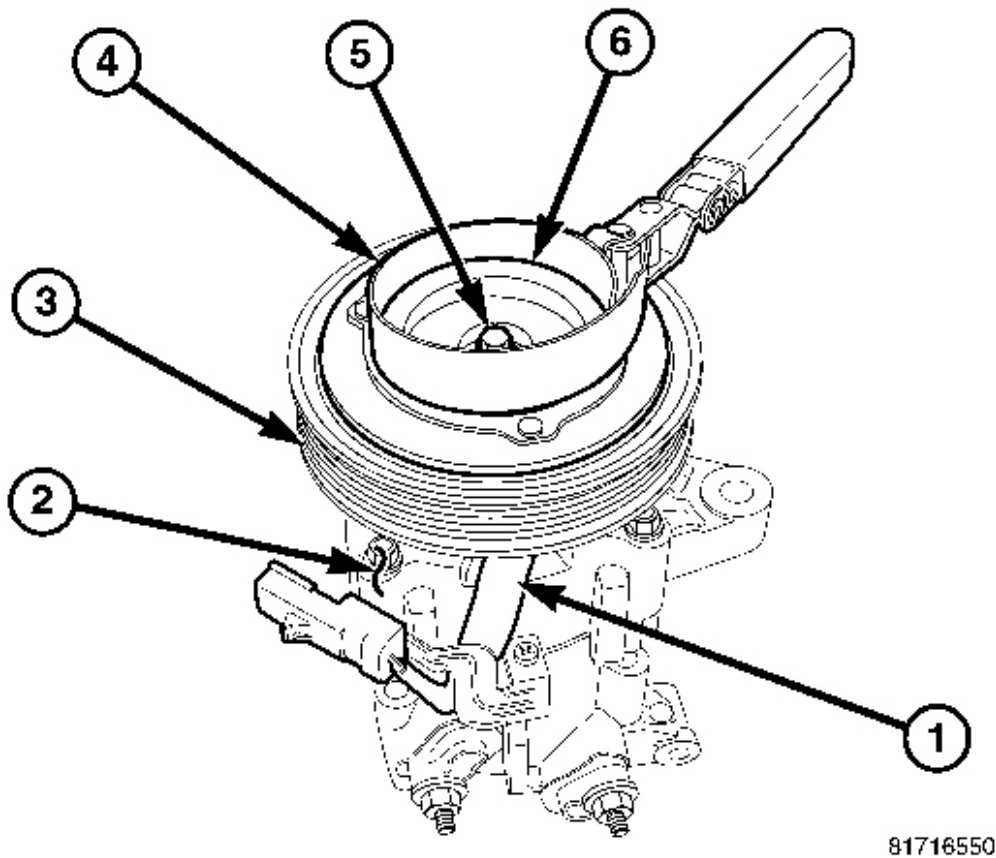
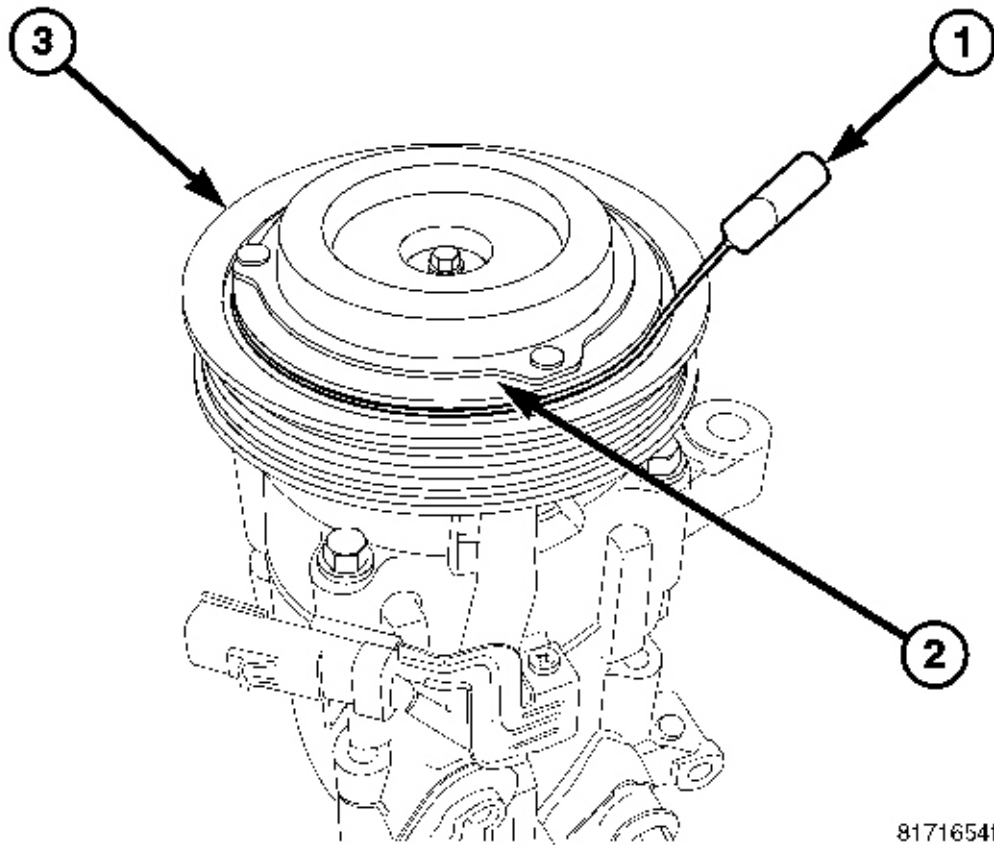


Fig. 38: Installing Clutch Bolt - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

7. Verify that there is adequate clearance for the clutch field coil wire lead (1) between the housing of the A/C compressor (2) and the pulley and bearing assembly (3).

NOTE: When installing an original or a new clutch assembly, try the original shims first. When installing a clutch onto a compressor that previously did not have a clutch, use the 1.0, 0.50 and 0.13 millimeter (0.040, 0.020 and 0.005 inch) shims from the clutch hardware package which is provided with the new clutch.

8. Install the clutch shims onto the compressor shaft.
9. Using a strap wrench (4), install the bolt (5) that secures the clutch plate (6) to the A/C compressor. Hold the clutch plate stationary with the strap wrench and tighten the bolt to 15 N.m (133 in. lbs.).



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Fig. 39: Locating Clutch Air Gap - KJ Visteon Compressor
Courtesy of CHRYSLER LLC

10. Using 90° wire gauges (1), check the air gap between the clutch plate (2) and the pulley and bearing assembly (3). If the air gap is not between 0.35 to 0.65 millimeter (0.014 to 0.025 inch), add or subtract shims as required.
11. Position the A/C compressor onto the mounting bracket.
12. Install the bolts that secure the A/C compressor to the mounting bracket. See **INSTALLATION**.
13. Connect the engine wire harness to the compressor clutch field coil connector.
14. Install the accessory drive belt (Refer to **BELT-ACCESSORY DRIVE**).
15. Reconnect the negative battery cable.
16. Perform the Clutch Break-in Procedure. See **STANDARD PROCEDURE**.

CONTROL-A/C HEATER

DESCRIPTION

AUTOMATIC SINGLE ZONE

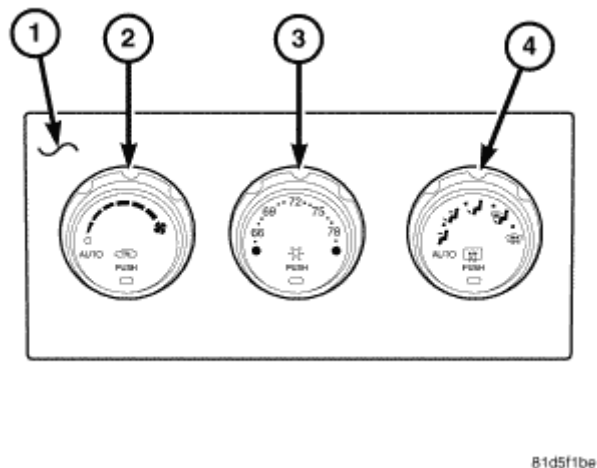


Fig. 40: A/C-Heater Control Assembly
Courtesy of CHRYSLER LLC

The A/C-heater control for the automatic temperature control (ATC) single zone system maintains the interior comfort level desired by the vehicle operator. This is accomplished by use of an infrared sensor located in the front overhead console that measures the surface temperature of the driver and front seat passengers. Based on the sensors input, the system automatically adjusts the air temperature, airflow volume, airflow distribution and amount of inside air recirculation to maintain occupant comfort, even under changing outside weather conditions. All controls are identified by ISO graphic symbols.

This ATC system offers several manual override features such as fan speed, airflow distribution and when the outside air contains smoke, odors, high humidity, or if rapid cooling is desired, the interior conditioned air can be recirculated within the vehicle.

The heating-A/C system uses electrically operated controls. These controls provide the vehicle operator with a number of setting options to help control the climate and comfort within the vehicle.

The A/C-heater control and integral computer (1) is located in the instrument panel and contains:

- a rotary control for manual and automatic blower motor speed selection and for turning the heating-A/C system on and off (2). This control also contains a push button function for recirculating the conditioned air. The control contains an indicator lamp that illuminates when the heating-A/C system is in recirculation mode.

- a rotary control for temperature control of the discharged air (3). This control also contains a push button function for manually turning the A/C system on and off. The control contains an indicator lamp that illuminates when the A/C system is in operation.

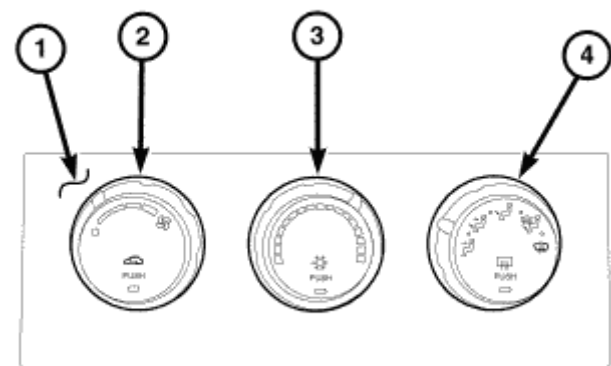
- a rotary control for manual and automatic mode control of the discharged air (4). This control also contains a push button function for turning the rear window defogger system on and off. The control contains an indicator lamp that illuminates when the rear window defogger system is in operation.

The A/C-heater control for the ATC heating and A/C system obtains vehicle speed, engine speed, engine coolant temperature, ambient temperature and refrigerant system head pressure data from the CAN-IHS bus and is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C system and run the Actuator Calibration function using a scan tool to verify that the concern is not a system issue. See **DIAGNOSIS AND TESTING**.

The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged.

CONTROL-A/C HEATER



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Fig. 41: AC Heater Control Components
Courtesy of CHRYSLER LLC

The A/C-heater control (1) for the manual temperature control (MTC) single zone heating-A/C system allows one temperature setting for the entire vehicle. All controls are identified by ISO graphic symbols.

The A/C-heater control and integral computer is located in the instrument panel and contains:

- a rotary control for fan speed selection and for turning the heating-A/C system on and off (2). This control also contains a push button function for recirculating the conditioned air. The control contains an indicator lamp that illuminates when the heating-A/C system is in recirculation mode.

- a rotary control for temperature control of the discharged air (3). This control also contains a push button function for turning the A/C system on and off. The control contains an indicator lamp that illuminates when the A/C system is in operation.

- a rotary control for mode control of the discharged air (4). This control also contains a push button function for turning the rear window defogger system on and off. The control contains an indicator lamp that illuminates when the rear window defogger system is in operation.

The A/C-heater control for this heating and A/C system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

Prior to replacing an A/C-heater control, check for any diagnostic trouble codes (DTCs) related to the heating-A/C system and run the Actuator Calibration function using a scan tool to verify that the concern is not a system issue. See **DIAGNOSIS AND TESTING**.

The A/C-heater control cannot be adjusted or repaired and must be replaced if inoperative or damaged.

REMOVAL

CONTROL-A/C HEATER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

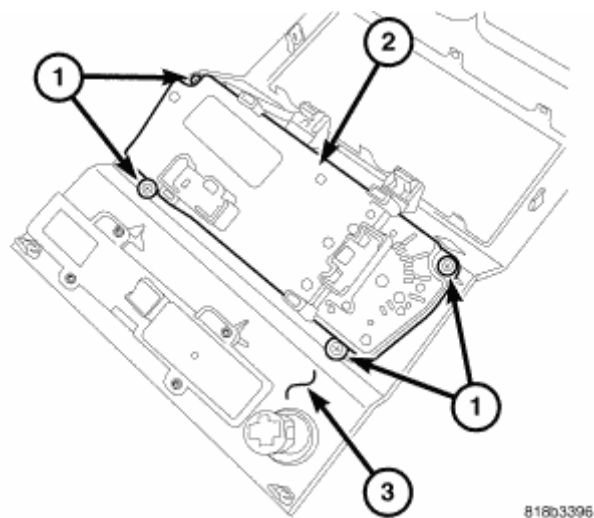


Fig. 42: A/C Heater Control - R and I
Courtesy of CHRYSLER LLC

NOTE: MTC A/C-heater control shown in illustration. ATC control similar.

1. Disconnect and isolate the negative battery cable.
2. Remove the center bezel from the instrument panel and place it on a workbench. Refer to **REMOVAL**.
3. Remove the four screws (1) that secure the A/C-heater control (2) to the instrument panel center bezel (3) and remove the control.

INSTALLATION

CONTROL-A/C HEATER

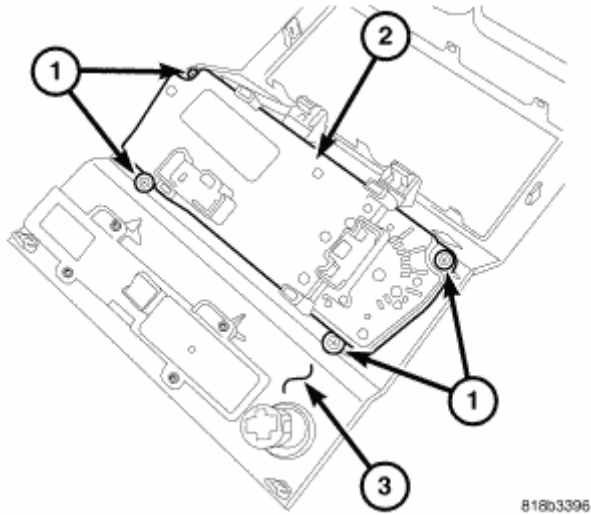


Fig. 43: A/C Heater Control - R and I
 Courtesy of CHRYSLER LLC

NOTE: MTC A/C-heater control shown in illustration. ATC control similar.

1. Install the A/C-heater control (2) onto the back of the instrument panel center bezel (3).
2. Install the four screws (1) that secure the A/C-heater control to the center bezel. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Position the center bezel to the instrument panel and connect the wire harness connectors to the back of the A/C-heater control.
4. Connect the wire harness connectors to the accessory switches and install the center bezel. Refer to **INSTALLATION** .
5. Reconnect the negative battery cable.

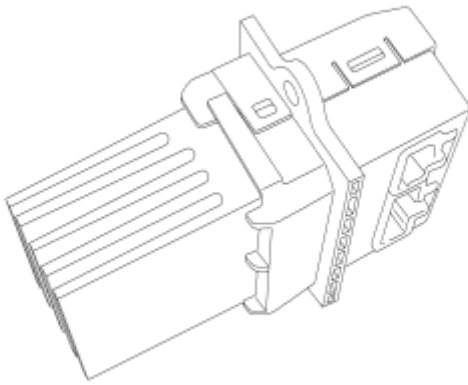
NOTE: The A/C-heater control will automatically perform the Actuator Calibration function when the ignition is initially turned on when installing a new control or when reinstalling the original control. However, the Actuator Calibration function must be manually initiated using a scan tool if the A/C-heater control has been previously installed in another vehicle (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

6. If required, initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

MODULE-POWER-BLOWER MOTOR

DESCRIPTION

DESCRIPTION



81b872ad

Fig. 44: Power-Blower Motor Module
Courtesy of CHRYSLER LLC

A blower motor power module is used on this model when equipped with the automatic temperature control (ATC) heating-A/C system. Models equipped with the manual temperature control (MTC) heating-A/C system use a blower motor resistor, instead of the blower motor power module. See **DESCRIPTION**.

The blower motor power module is mounted to the rear of the HVAC housing, directly behind the glove box. The blower motor power module consists of a molded plastic mounting plate (1) with an integral connector receptacle (2). Concealed behind the mounting plate is the power module electronic circuitry and a finned aluminum heat sink (3). The blower motor power module is accessed for service from under the instrument panel.

The blower motor power module is accessed for service through the glove box opening.

OPERATION

MODULE-POWER-BLOWER MOTOR

The blower motor power module is connected to the vehicle electrical system through a dedicated lead and connector. A second lead and connector is connected to the blower motor. The blower motor power module allows the microprocessor-based automatic temperature control (ATC) A/C-heater control to calculate and provide infinitely variable blower motor speeds based upon either manual blower switch input or the ATC programming using a pulse width modulated (PWM) circuit strategy.

The PWM voltage is applied to a comparator circuit which compares the PWM signal voltage to the blower motor feedback voltage. The resulting output drives the power module circuitry, which provides a linear output voltage to change or maintain the desired blower speed.

The blower motor power module is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blower motor power module cannot be adjusted or repaired must be replaced if inoperative or damaged.

REMOVAL

MODULE-POWER-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The heat sink for the blower motor power module may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor power module, wait five minutes to allow the heat sink to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

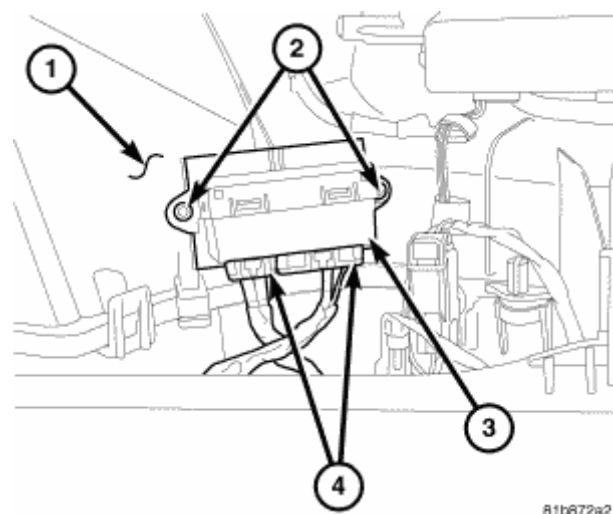


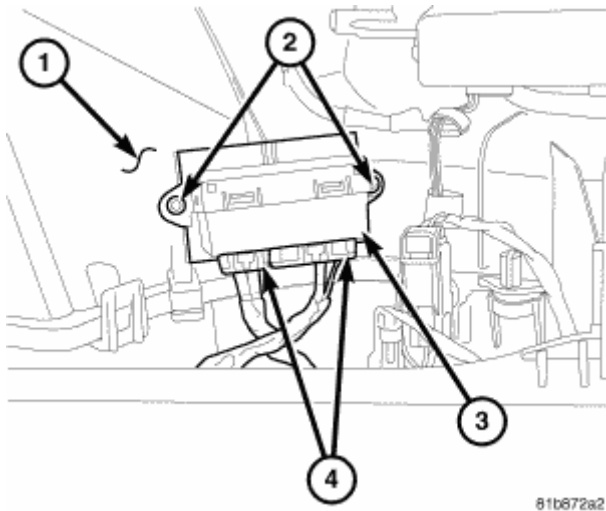
Fig. 45: HVAC Housing, Screws, Blower Motor Power Module & Wire Harness Connectors
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Lower the glove box door.
3. Disconnect the two wire harness connectors (4) from the blower motor power module (3).
4. Remove the two screws (2) that secure the blower motor power module to the HVAC housing (1) and remove the power module.

INSTALLATION

MODULE-POWER-BLOWER MOTOR



81b872a2

Fig. 46: HVAC Housing, Screws, Blower Motor Power Module & Wire Harness Connectors
 Courtesy of CHRYSLER LLC

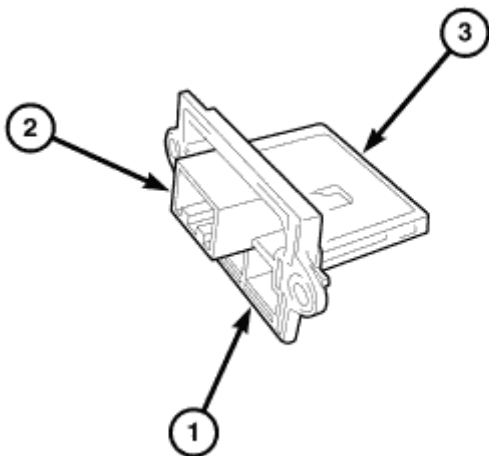
NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blower motor power module (3) into the HVAC housing (1).
2. Install the two screws (2) that secure the blower motor power module to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the wire harness connectors (4) to the blower motor power module.
4. Close the glove box door.
5. Reconnect the negative battery cable.

RESISTOR-BLOWER MOTOR

DESCRIPTION

RESISTOR-BLOWER MOTOR



81b84158

Fig. 47: Mounting Plate, Integral Wire Connector Receptacle & Metal Housing
Courtesy of CHRYSLER LLC

A blower motor resistor is used on vehicles equipped with the manual temperature control (MTC) heating-A/C system. Vehicles equipped with the automatic temperature control (ATC) heating-A/C system use a blower motor power module, instead of the blower motor resistor. See **DESCRIPTION**.

The blower motor resistor is mounted to the rear of the HVAC housing, directly behind the glove box. The blower motor resistor consists of a molded plastic mounting plate (1) with an integral wire connector receptacle (2). Concealed behind the mounting plate is the resistor circuit board located within a metal housing (3).

The blower motor resistor is accessed for service through the glove box opening.

OPERATION

RESISTOR-BLOWER MOTOR

The blower motor resistor is connected to the vehicle electrical system through a dedicated wire lead and connector of the HVAC wire harness. The blower motor resistor has multiple resistor circuits, each of which will reduce the current flow through the blower motor to change the blower motor speed.

The blower motor control in the MTC heating-A/C system directs the ground path for the blower motor through the correct resistor circuit to obtain the selected speed. With the blower motor control in the lowest speed position, the ground path for the blower motor is applied through all of the resistor circuits. Each higher speed selected with the blower motor control applies the blower motor ground path through fewer of the resistor circuits, increasing the blower motor speed. When the blower motor control is in the highest speed position, the blower motor resistor is bypassed and the blower motor receives a direct path to ground.

The blower motor resistor cannot be adjusted or repaired and it must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

RESISTOR-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions may result in accidental airbag deployment and possible serious or fatal injury.

NOTE: For circuit descriptions and diagrams, refer to **SYSTEM WIRING DIAGRAMS** article and **WIRING DIAGRAM INFORMATION** article . The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location

views for the various wire harness connectors, splices and grounds.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the blower motor resistor. See **REMOVAL**.
3. Using an ohmmeter, check for continuity between all of the blower motor resistor terminals. In each case there should be continuity. If OK, repair the wire harness circuits between the blower motor speed control and the blower motor resistor or blower motor as required. If not OK, replace the inoperative blower motor resistor.

REMOVAL

RESISTOR-BLOWER MOTOR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: The blower motor resistor may get very hot during normal operation. If the blower motor was turned on prior to servicing the blower motor resistor, wait five minutes to allow the blower motor resistors to cool before performing diagnosis or service. Failure to take this precaution can result in possible personal injury.

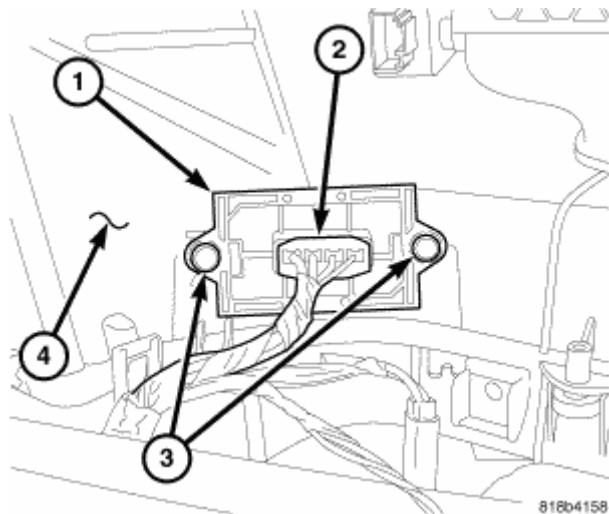


Fig. 48: Blower Motor Resistor, Wire Harness Connector, Screws & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: Typical resistor shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Lower the glove box door.
3. Disconnect the wire harness connector (2) from the blower motor resistor (1).
4. Remove the two screws (3) that secure the blower motor resistor to the HVAC housing (4) and remove the resistor.

INSTALLATION

RESISTOR-BLOWER MOTOR

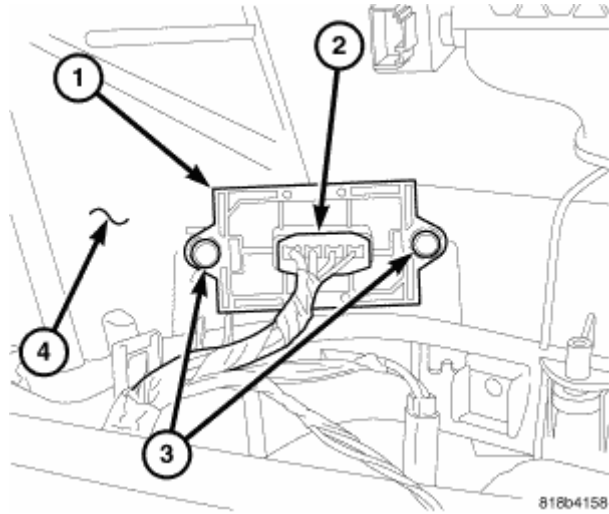


Fig. 49: Blower Motor Resistor, Wire Harness Connector, Screws & HVAC Housing
Courtesy of CHRYSLER LLC

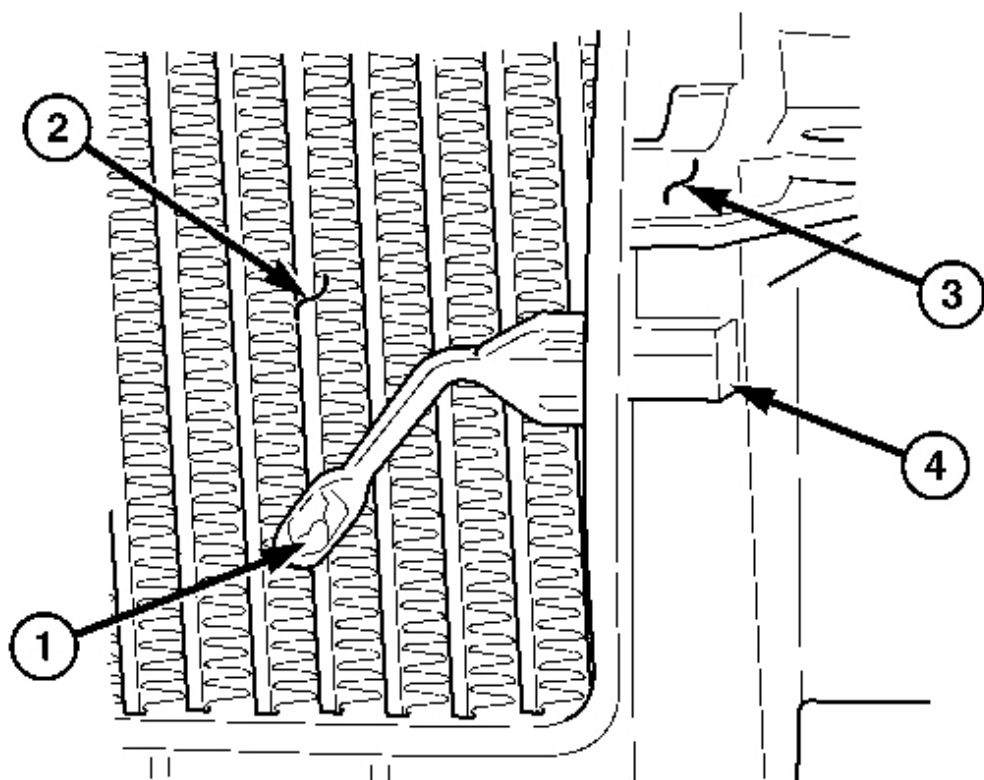
NOTE: Typical resistor shown in illustration. RHD model similar.

1. Position the blower motor resistor (1) into the HVAC housing (4).
2. Install the two screws (3) that secure the blower motor resistor to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the wire harness connector (2) to the blower motor resistor.
4. Close the glove box door.
5. Reconnect the negative battery cable.

SENSOR-EVAPORATOR TEMPERATURE

DESCRIPTION

SENSOR-EVAPORATOR TEMPERATURE



812b0cc6

Fig. 50: Sensor-Evaporator Temperature
Courtesy of CHRYSLER LLC

NOTE: Typical evaporator temperature sensor shown in graphic.

The evaporator temperature sensor (1) measures the temperature of the conditioned air downstream of the A/C evaporator (2). The evaporator temperature sensor is an electrical thermistor within a molded plastic case that is inserted into rear the HVAC housing (3) near the coldest point of the A/C evaporator. Two terminals within the connector receptacle (4) connect the sensor to the vehicle electrical system through a wire lead and connector of the instrument panel wire harness.

The external location of the evaporator temperature sensor allows the sensor to be removed or installed without disturbing the refrigerant in the A/C system.

OPERATION

SENSOR-EVAPORATOR TEMPERATURE

The evaporator temperature sensor monitors the temperature of the conditioned air downstream of the A/C evaporator and supplies an input signal to the A/C-heater control. The A/C-heater control uses the evaporator temperature sensor input signal to optimize A/C system performance and to protect the A/C system from evaporator freezing. The evaporator temperature sensor will change its internal resistance in response to the temperatures it monitors and is connected to the A/C-heater control through sensor ground circuit and a 5-volt reference signal circuit. As the temperature of the A/C evaporator decreases, the internal resistance of the evaporator temperature sensor decreases.

The A/C-heater control uses the monitored voltage reading as an indication of evaporator temperature. The A/C-heater control is programmed to respond to this input by requesting the powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) to cycle the A/C compressor clutch as necessary to optimize A/C system performance and to protect the A/C system from evaporator freezing.

The evaporator temperature sensor is diagnosed using a scan tool. See **DIAGNOSIS AND TESTING**.

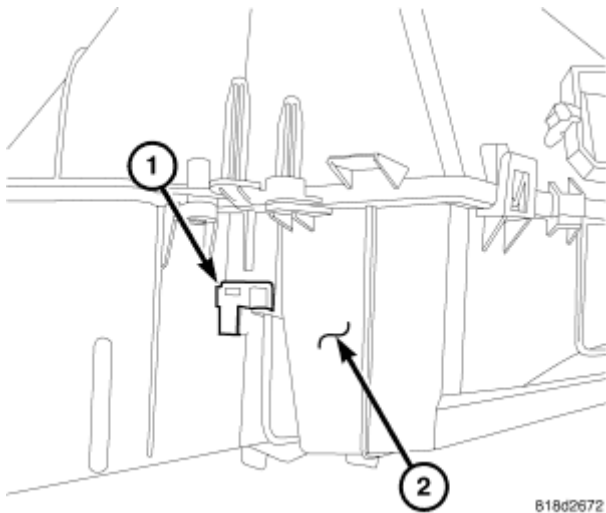
The evaporator temperature sensor cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

REMOVAL

SENSOR-EVAPORATOR TEMPERATURE

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: Illustration shown with instrument panel removed for clarity.



818d2672

Fig. 51: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
 Courtesy of CHRYSLER LLC

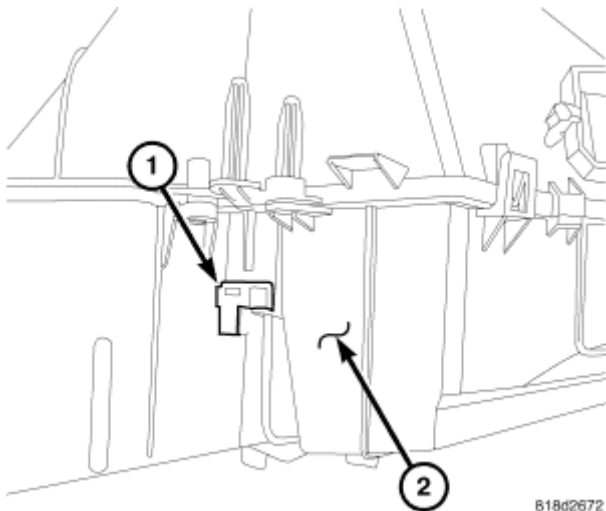
NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Partially remove the instrument panel to gain access to the evaporator temperature sensor (1) located in the rear of the HVAC housing (2), near the bottom of the instrument panel on the passenger side. Refer to **REMOVAL** .
3. Disconnect the instrument panel wire harness connector from the evaporator temperature sensor and remove the sensor from the HVAC housing.

INSTALLATION

SENSOR-EVAPORATOR TEMPERATURE

NOTE: Illustration shown with instrument panel removed for clarity.



818d2672

Fig. 52: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Install the evaporator temperature sensor (1) into rear of the HVAC housing (2) and connect the instrument panel wire harness connector.
2. Install the instrument panel. Refer to **INSTALLATION**.
3. Reconnect the negative battery cable.

SENSOR-INFRARED

DESCRIPTION

SENSOR-INFRARED

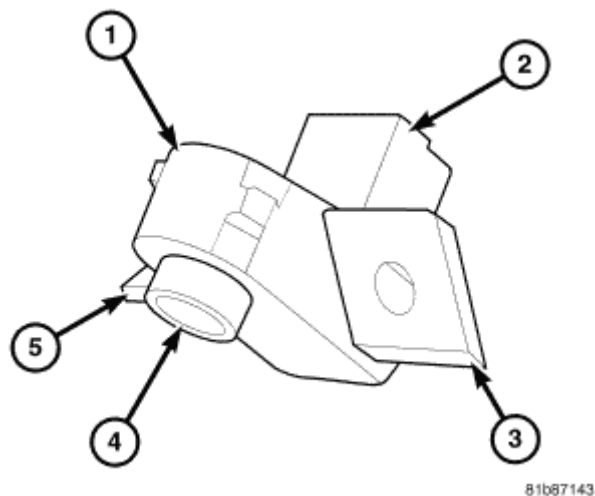


Fig. 53: Infrared Temperature Sensor, Integral Wire Connector Receptacle, Alignment Tabs & Clear Lens

Courtesy of CHRYSLER LLC

The infrared temperature sensor (1) consists of an infrared transducer concealed behind a clear lens (4) located in a molded plastic housing with an integral wire connector receptacle (2) and mounting and alignment tabs (3 and 5).

The infrared sensor is used only on models equipped with the automatic temperature control (ATC) heating-A/C system.

OPERATION

SENSOR-INFRARED

The infrared sensor detects thermal radiation emitted by the driver and front seat occupants and surroundings and converts its data into a linear pulse width modulated (PWM) output signal which is read by the automatic

temperature control (ATC) A/C-heater control. The ATC A/C-heater control uses the infrared sensor data as one of the inputs necessary to automatically control the interior cabin temperature level. By using thermal radiation (surface temperature) measurement, rather than an air temperature measurement, the ATC heating-A/C system is able to adjust itself to the comfort level as perceived by the front seat occupants. This allows the ATC system to compensate for other ambient conditions affecting comfort levels, such as solar heat gain or evaporative heat loss.

The ATC system logic responds to the infrared sensor message by calculating and adjusting the air flow temperature and air flow rate needed to properly obtain and maintain the selected comfort level temperature of the occupants. The A/C-heater control continually monitors the infrared sensor circuit, and will store diagnostic trouble codes (DTCs) for any problem it detects.

The infrared sensor is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The infrared sensor cannot be adjusted or repaired and must be replaced if inoperative or damaged.

REMOVAL

SENSOR-INFRARED

NOTE: Take the proper precautions to protect the front face of the overhead console from cosmetic damage while performing this procedure.

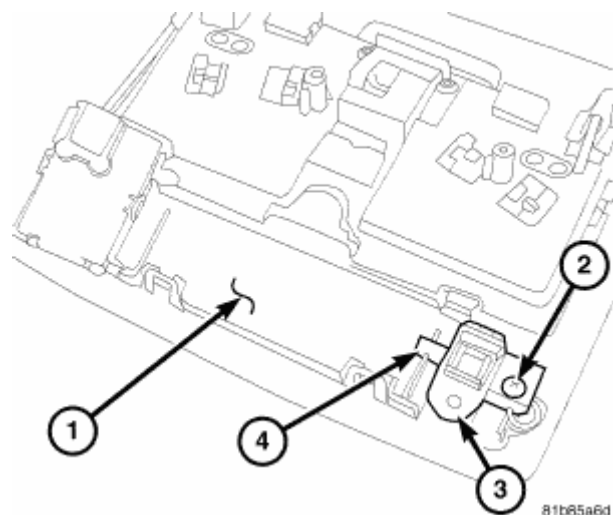


Fig. 54: Overhead Console, Screw, Infrared Sensor & Tab
Courtesy of CHRYSLER LLC

NOTE: Typical overhead console shown in graphic.

1. Disconnect and isolate the negative battery cable.
2. Remove the overhead console (1) from the headliner and place it on a workbench.
3. Remove the screw (2) that secures the infrared sensor (3) to the back of the overhead console and remove

the sensor.

INSTALLATION

SENSOR-INFRARED

NOTE: Take the proper precautions to protect the front face of the overhead console from cosmetic damage while performing this procedure.

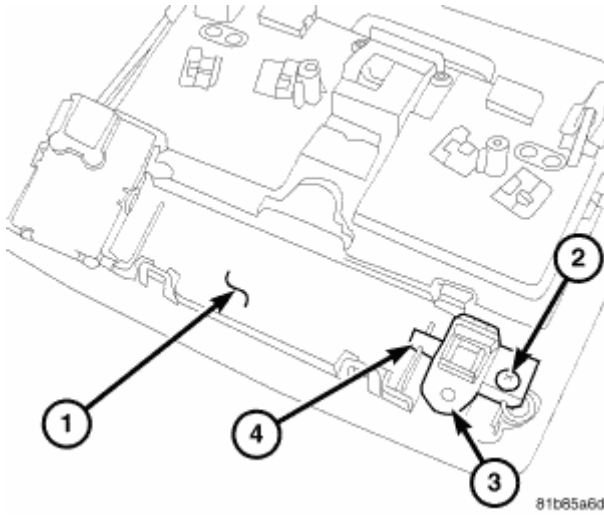


Fig. 55: Overhead Console, Screw, Infrared Sensor & Tab
Courtesy of CHRYSLER LLC

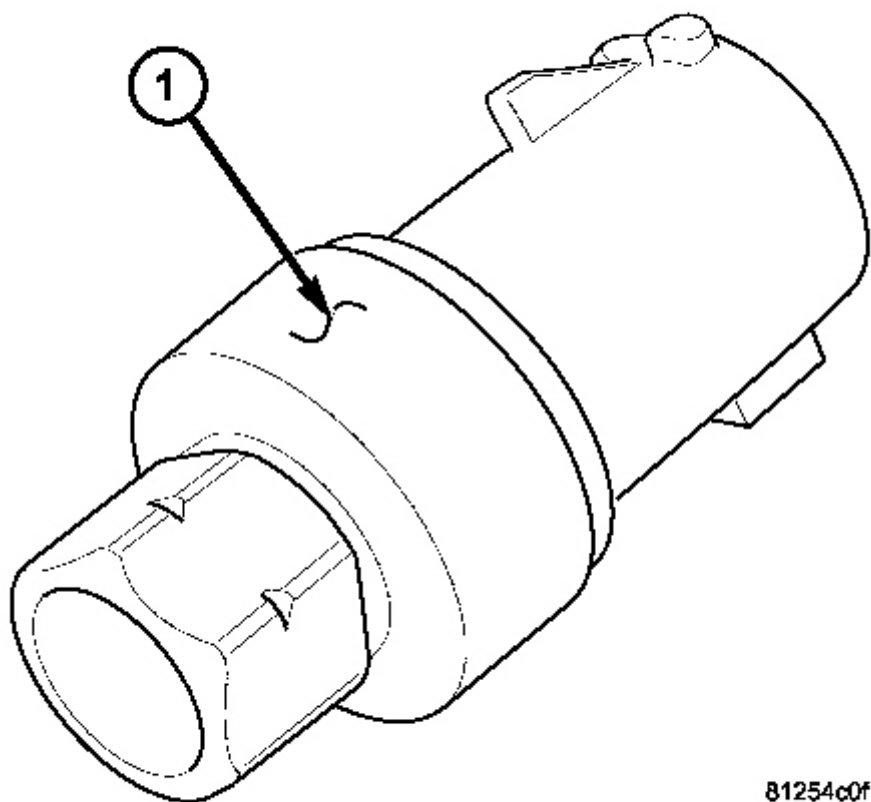
NOTE: Typical overhead console shown in graphic.

1. Position the infrared sensor (3) onto the back of the overhead console (1). Align the tab (4) on the sensor with the slot in the console.
2. Install the screw (2) that secures the infrared sensor(s) to the overhead console. Tighten the screw to 1.2 N.m (10 in. lbs).
3. Install the overhead console.
4. Reconnect the negative battery cable.

TRANSDUCER-A/C PRESSURE

DESCRIPTION

TRANSDUCER-A/C PRESSURE



81254c0f

Fig. 56: A/C Pressure Transducer
Courtesy of CHRYSLER LLC

The A/C pressure transducer (1) sends a signal to the powertrain control module (PCM) which controls both A/C compressor clutch engagement/disengagement and electric cooling fan operation. The A/C pressure transducer is mounted on a fitting located on the A/C liquid line near the dash panel. The PCM will disengage the A/C compressor clutch when high side pressure rises above 2971 kPa (431 psi) or fall below 206 kPa (30 psi).

The fitting for the A/C pressure transducer on the A/C liquid line is equipped with an O-ring seal and contains a Schrader-type valve to allow the transducer to be serviced without discharging the refrigerant system.

OPERATION

TRANSDUCER-A/C PRESSURE

The A/C pressure transducer monitors the pressures in the high side of the refrigerant system through its

connection to a fitting on the A/C liquid line. The A/C pressure transducer will change its internal resistance in response to the pressures it monitors. The powertrain control module (PCM) or the engine control module (ECM) (depending on engine application) provides a five volt reference signal and a sensor ground to the A/C pressure transducer, then monitors the output voltage of the A/C pressure transducer on a sensor return circuit to determine refrigerant pressure. The PCM/ECM is programmed to respond to the A/C pressure transducer and other sensor inputs by controlling the operation of the A/C compressor clutch and the radiator cooling fan to help optimize A/C system performance and to protect the system components from damage. The PCM/ECM will disengage the A/C compressor clutch when high side pressure rises above 2971 kPa (431 psi) or fall below 206 kPa (30 psi). The A/C pressure transducer input to the PCM/ECM also prevents the A/C compressor clutch from engaging when ambient temperatures are below about 10° C (50° F) due to the pressure/temperature relationship of the refrigerant.

A Schrader-type valve in the A/C discharge line fitting permits the A/C pressure transducer to be removed or installed without disturbing the refrigerant in the A/C system.

The A/C pressure transducer is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The A/C pressure transducer cannot be adjusted or repaired and it must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

TRANSDUCER-A/C PRESSURE

The A/C pressure transducer is tested using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article or appropriate Engine ELECTRICAL DIAGNOSTICS article for more information). Before testing the A/C pressure transducer, be certain that the transducer wire harness connection is clean of corrosion and properly connected. For the A/C to operate, an A/C pressure transducer voltage reading between 0.451 and 4.519 volts is required. Voltages outside this range indicate a low or high refrigerant system pressure condition to the powertrain control module (PCM). The PCM is programmed to respond to a low or high refrigerant system pressure by suppressing operation of the A/C compressor. Refer to the A/C PRESSURE TRANSDUCER VOLTAGE chart for the possible conditions indicated by the transducer voltage reading.

A/C PRESSURE TRANSDUCER VOLTAGE

Voltage	Possible Indication
0.0	1. No sensor supply voltage from PCM.
-	2. Shorted sensor circuit.
-	3. Inoperative transducer.
0.150 TO 0.450	1. Ambient temperature below 10° C (50° F).
-	2. Low refrigerant system pressure.
0.451 TO 4.519	1. Normal refrigerant system pressure.
4.520 TO 4.850	1. High refrigerant system pressure.
5.0	1. Open sensor circuit.
-	2. Inoperative transducer.

REMOVAL

TRANSDUCER-A/C PRESSURE

NOTE: It is not necessary to discharge the refrigerant system to replace the A/C pressure transducer.

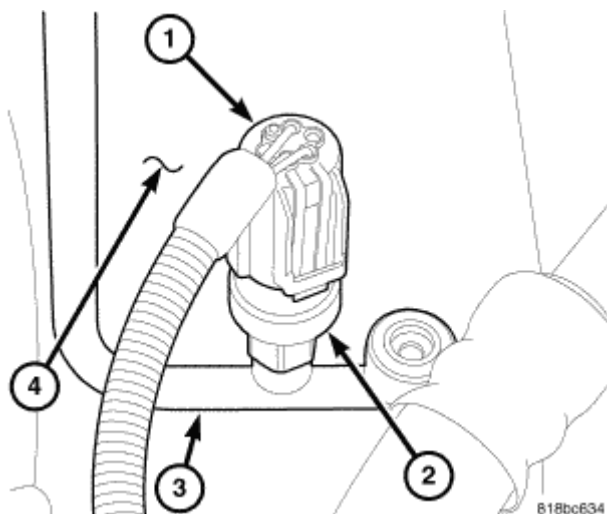


Fig. 57: Wire Harness Connector, A/C Pressure Transducer, A/C Liquid Line & Dash Panel
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector (1) from the A/C pressure transducer (2) located on the A/C liquid line (3) near the dash panel (4) in the engine compartment.
3. Remove the A/C pressure transducer from the A/C liquid line and remove and discard the O-ring seal.

INSTALLATION

TRANSDUCER-A/C PRESSURE

NOTE: Use only the specified O-ring as it is made of special material for R-134a. Use only refrigerant oil of the type required for the A/C compressor.

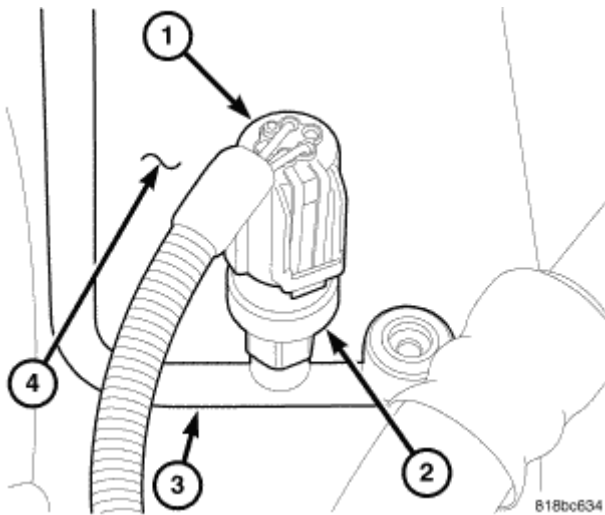


Fig. 58: Wire Harness Connector, A/C Pressure Transducer, A/C Liquid Line & Dash Panel
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Lubricate a new rubber O-ring seal with clean refrigerant oil and install it onto the A/C pressure transducer fitting.
2. Install the A/C pressure transducer (2) onto the A/C liquid line (3) near the dash panel (4). Hand-tightened the transducer securely.
3. Connect the wire harness connector (1) to the A/C pressure transducer.
4. Reconnect the negative battery cable.

DISTRIBUTION

DUCT-CENTER INSTRUMENT PANEL

REMOVAL

DUCT-CENTER INSTRUMENT PANEL

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

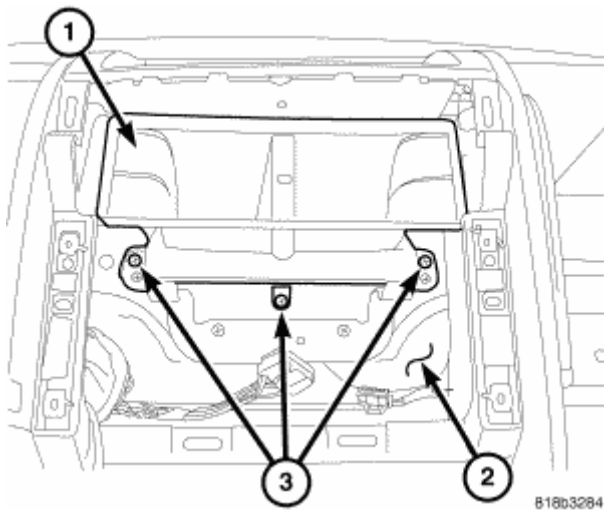


Fig. 59: Instrument Panel, Screws & Center Instrument Panel Duct
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the radio from the instrument panel. Refer to **REMOVAL** .
3. Reach through the opening in the instrument panel (2) and remove the three screws (3) that secure the center instrument panel duct (1) to the instrument panel.
4. Rotate the center instrument panel duct as necessary and remove the duct.

INSTALLATION

DUCT-CENTER INSTRUMENT PANEL

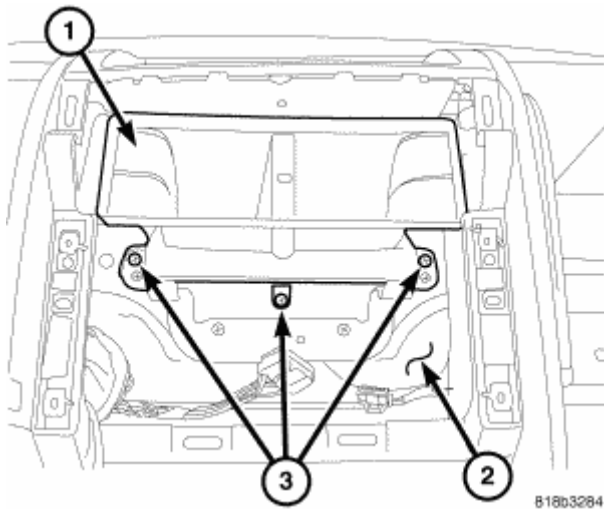


Fig. 60: Instrument Panel, Screws & Center Instrument Panel Duct
 Courtesy of CHRYSLER LLC

1. Rotate the center instrument panel duct as necessary to position the duct into the instrument panel.
2. Install the three screws (3) that secure the center instrument panel duct (1) to the instrument panel.

Tighten the screws to 1.2 N.m (10 in. lbs.).

3. Install the radio. Refer to **INSTALLATION** .
4. Reconnect the negative battery cable.

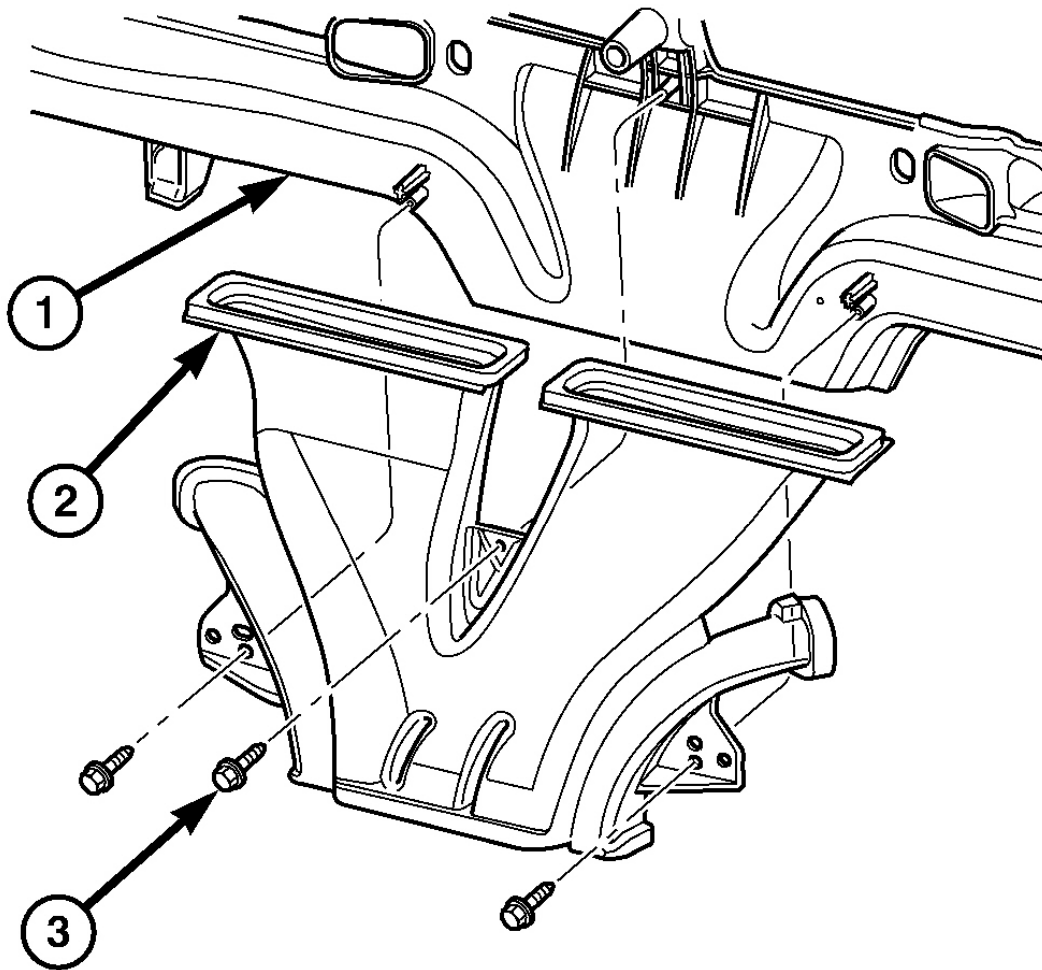
DUCT-DEFROSTER

REMOVAL

DUCT-DEFROSTER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

NOTE: Take the proper precautions to protect the front face of the instrument panel from cosmetic damage during this service procedure.



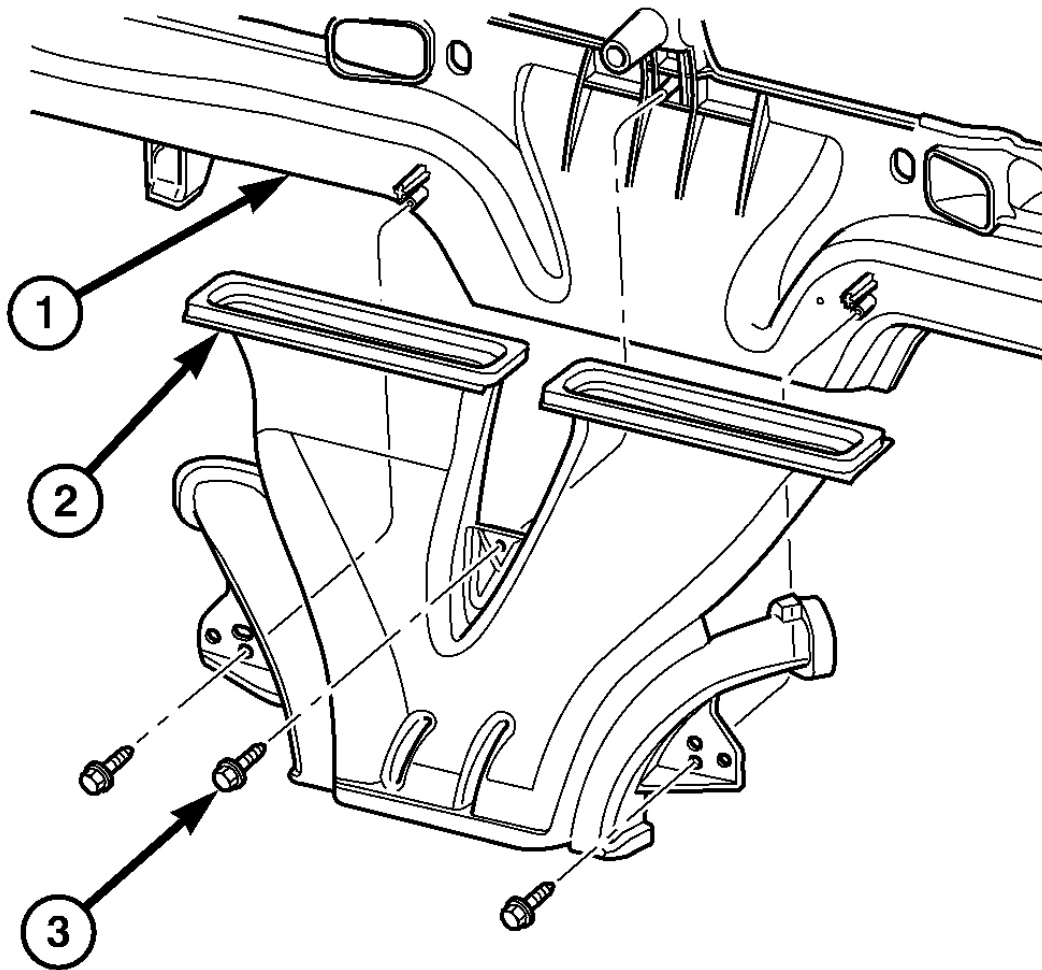
80cb43a1

Fig. 61: Defroster Duct
Courtesy of CHRYSLER LLC

1. Remove the instrument panel and place it on a workbench. Refer to **REMOVAL** .
2. Remove the three screws (3) that secure the defroster duct (2) to the instrument panel (1) and remove the duct.

INSTALLATION

DUCT-DEFROSTER



80cb43a1

Fig. 62: Defroster Duct
Courtesy of CHRYSLER LLC

1. Position the defroster duct (2) into the instrument panel (1).
2. Install the three screws (3) that secure the defroster duct to the instrument panel. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Install the instrument panel. Refer to **INSTALLATION** .

DUCT-FLOOR DISTRIBUTION

REMOVAL

DUCT-FLOOR DISTRIBUTION

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

DRIVER SIDE

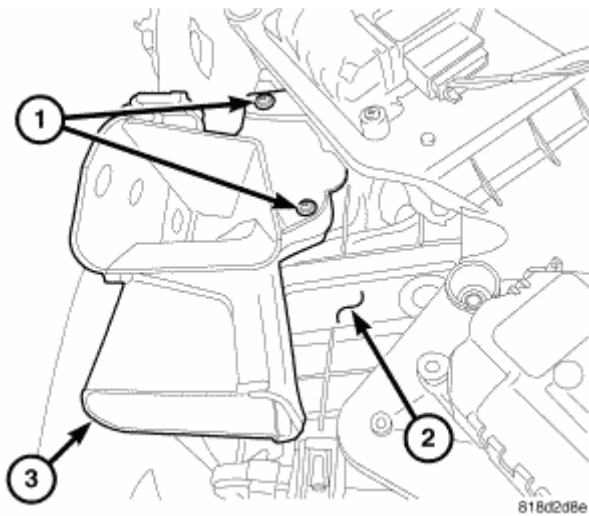


Fig. 63: Removing/Installing Screws That Secure Driver Side Front Floor Duct To Driver Side Of Air Distribution Housing And Duct
Courtesy of CHRYSLER LLC

1. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL** .
2. Remove the two screws (1) that secure the driver side front floor duct (3) to the driver side of the air distribution housing (2) and remove the duct.

PASSENGER SIDE

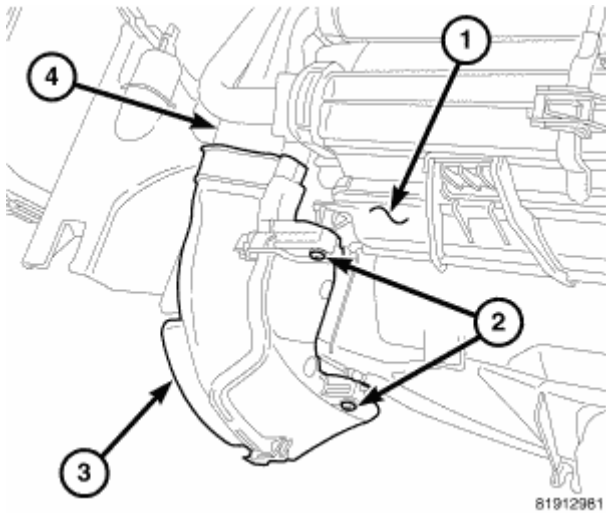


Fig. 64: HVAC Housing, Screws, Lower Front Passenger Side Floor Duct & Upper Front Passenger Side Floor Duct

Courtesy of CHRYSLER LLC

1. Remove the HVAC Housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the two screws (2) that secure the lower front passenger side floor duct (3) to the bottom of the HVAC housing (1).
3. Disconnect the lower front passenger side floor duct from the upper front passenger side floor duct (4) and remove the lower duct.

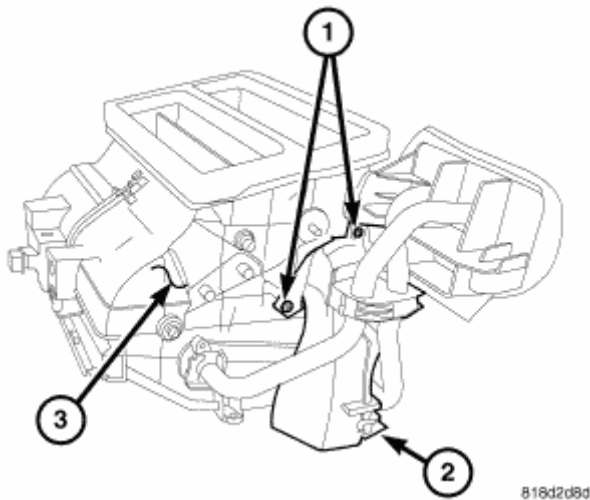


Fig. 65: Removing/Installing Two Screws That Secure Upper Front Passenger Side Floor Duct To Passenger Side Of Air Distribution Housing And Upper Duct

Courtesy of CHRYSLER LLC

NOTE: Illustration shown with air distribution housing removed from HVAC housing for clarity.

4. Remove the two screws (1) that secure the upper front passenger side floor duct to the passenger side of

the air distribution housing (3) and remove the upper duct.

INSTALLATION

DUCT-FLOOR DISTRIBUTION

NOTE: LHD model shown in illustrations. RHD model similar.

DRIVER SIDE

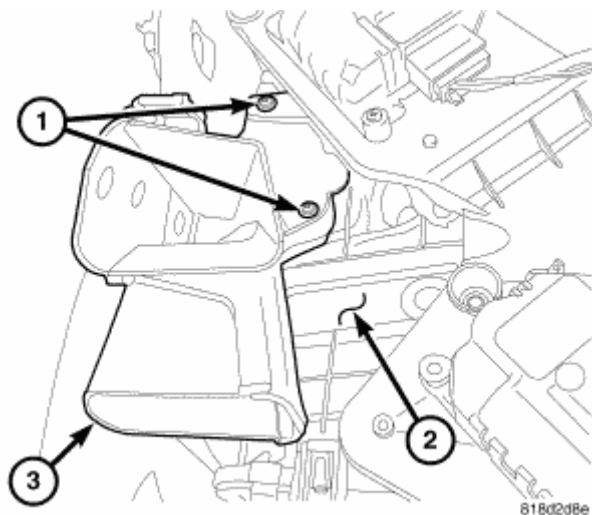


Fig. 66: Removing/Installing Screws That Secure Driver Side Front Floor Duct To Driver Side Of Air Distribution Housing And Duct
Courtesy of CHRYSLER LLC

1. Install the driver side front floor duct (3) to the driver side of the air distribution housing (2) and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
2. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION** .

PASSENGER SIDE

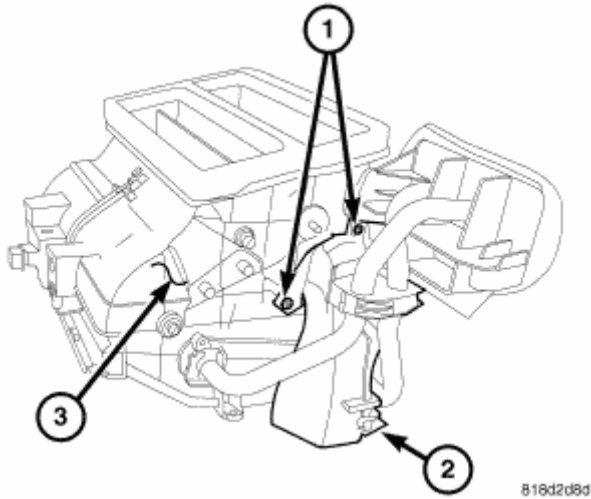


Fig. 67: Removing/Installing Two Screws That Secure Upper Front Passenger Side Floor Duct To Passenger Side Of Air Distribution Housing And Upper Duct
 Courtesy of CHRYSLER LLC

NOTE: Illustration shown with air distribution housing removed from HVAC housing for clarity.

1. Install the upper front passenger side floor duct (2) to the passenger side of the air distribution housing (3) and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

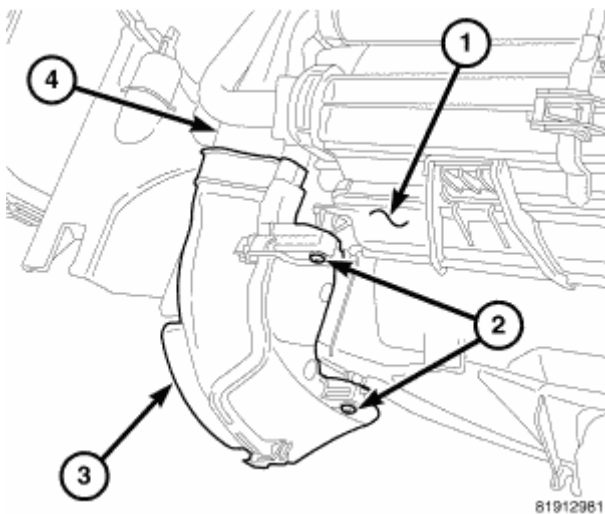


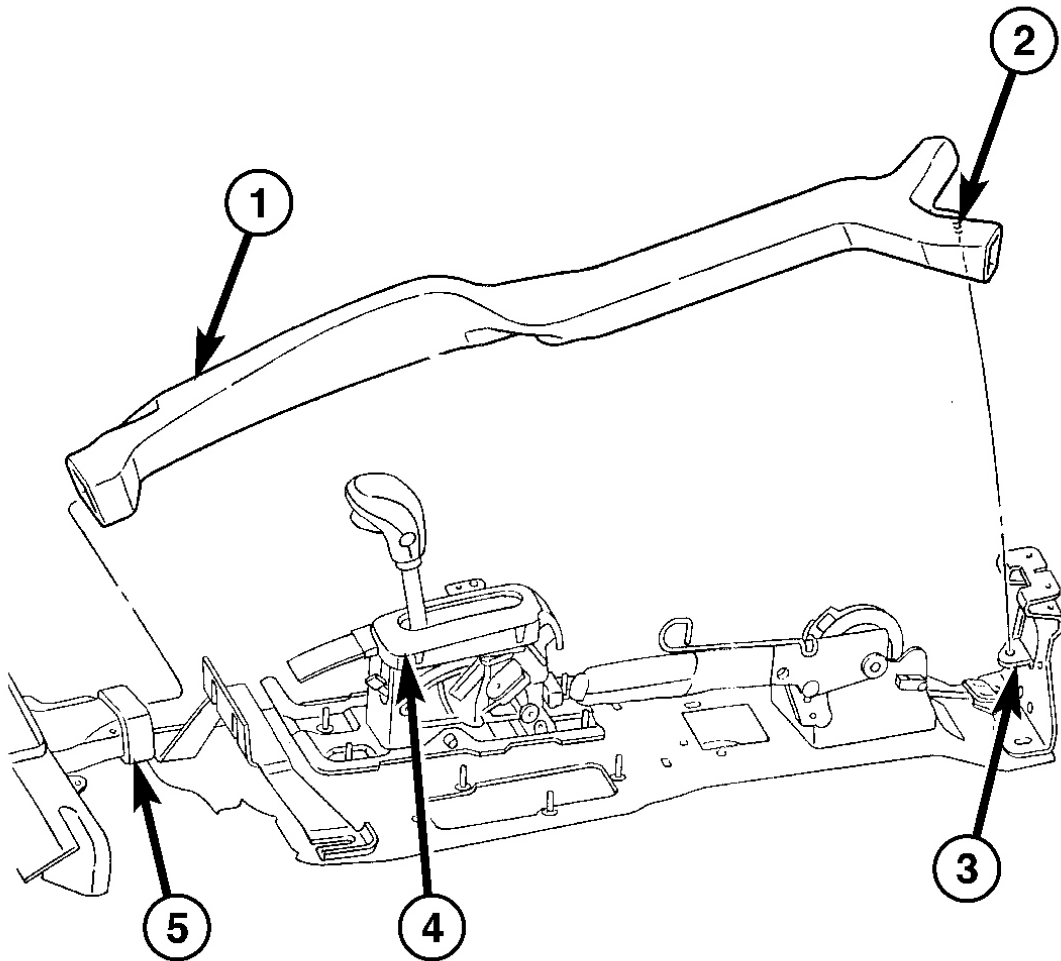
Fig. 68: HVAC Housing, Screws, Lower Front Passenger Side Floor Duct & Upper Front Passenger Side Floor Duct
 Courtesy of CHRYSLER LLC

2. Connect the lower front passenger side floor duct (3) to the upper front passenger side floor duct (4).
3. Install the two screws (2) that secure the lower front passenger side floor duct to the bottom of the HVAC housing (1). Tighten the screws to 1.2 N.m (10 in lbs.).
4. Install the HVAC housing assembly. See **INSTALLATION**.

DUCT-REAR FLOOR HEAT

REMOVAL

DUCT-REAR FLOOR HEAT



80cb41cb

Fig. 69: Rear Floor Heat Duct
Courtesy of CHRYSLER LLC

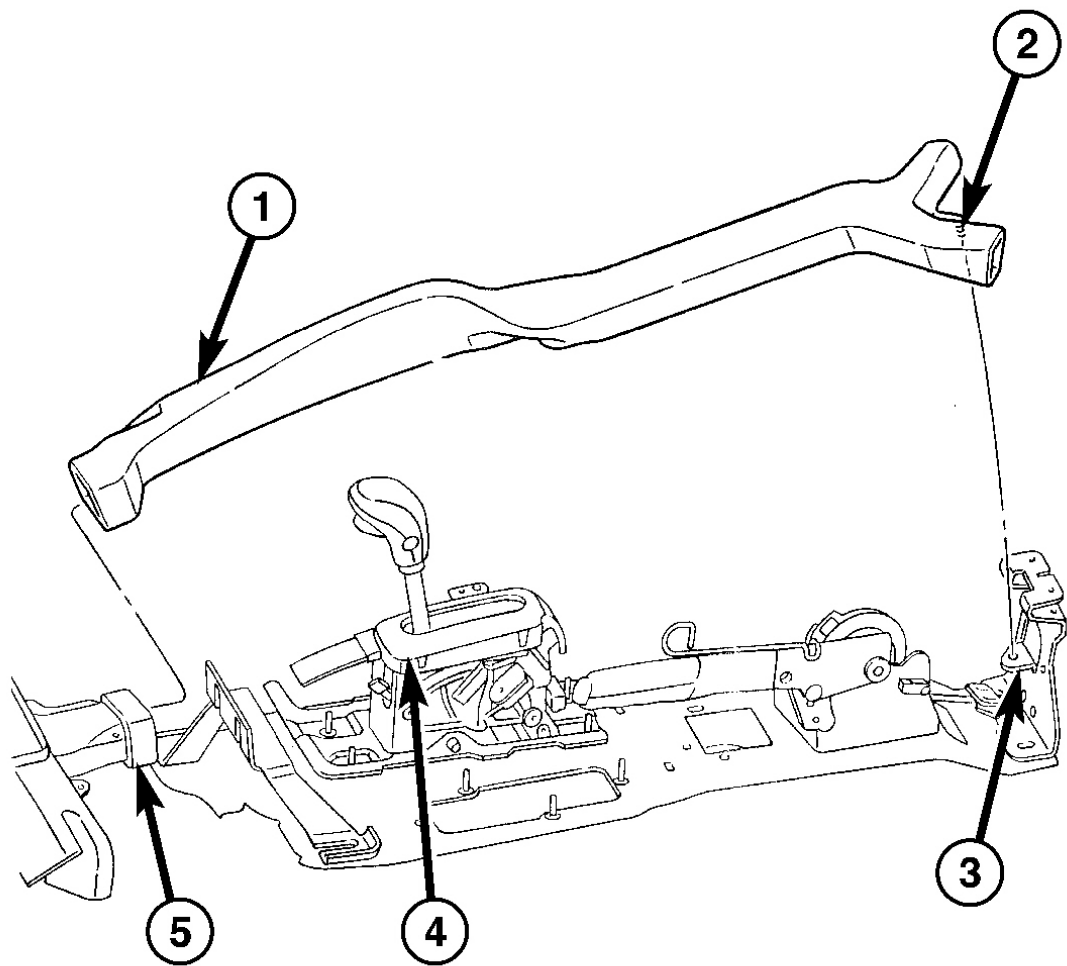
NOTE: Typical rear floor heat duct shown in graphic.

1. Remove the floor console. Refer to **REMOVAL** .
2. Remove the push-pin retainer (2) that secures the rear floor heat duct (1) to the floor console bracket (3) located behind the gear shift lever assembly (4).

3. Disconnect the rear floor heat duct from the floor distribution duct (5).
4. Remove the rear floor heat duct from the vehicle.

INSTALLATION

DUCT-REAR FLOOR HEAT



80cb41cb

Fig. 70: Rear Floor Heat Duct
Courtesy of CHRYSLER LLC

NOTE: Typical rear floor heat duct shown in graphic.

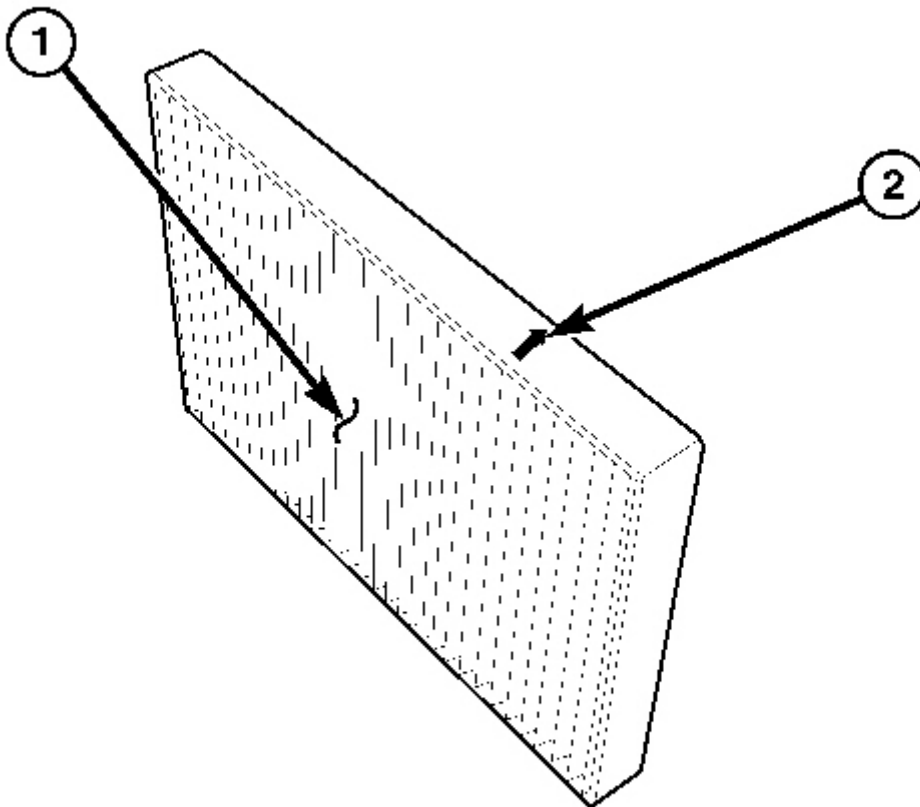
1. Position the rear floor heat duct (1) into the vehicle.

2. Connect the rear floor heat duct to the floor distribution duct (5) located in front of the gear shift lever assembly (4).
3. Install the push-pin retainer (2) that secures the rear floor heat duct to the floor console bracket (3).
4. Install the floor console. Refer to **INSTALLATION** .

FILTER-PARTICULATE AIR

DESCRIPTION

FILTER-PARTICULATE AIR



812d31e6

Fig. 71: Filter-Particulate Air Description
Courtesy of CHRYSLER LLC

Some models are equipped with a particulate air filter (1) that helps purify the outside air entering the HVAC

housing. The filter is mounted in the passenger compartment, behind the glove box bin.

The filter should be replaced at least once a year or every 24,000 km (15,000 miles) and checked if heating-A/C system performance seems lower than expected. The particulate air filter is labeled with an arrow (2) to indicate the direction of air flow through the filter.

REMOVAL

FILTER-PARTICULATE AIR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible serious or fatal injury.

WARNING: Always make sure the A/C-heater system is turned off and that the ignition switch is in the OFF position prior to servicing the particulate air filter. Never place fingers or other objects into the filter opening of the HVAC housing. Failure to follow this warning may result in serious injury.

NOTE: LHD model shown in illustrations. RHD model similar.

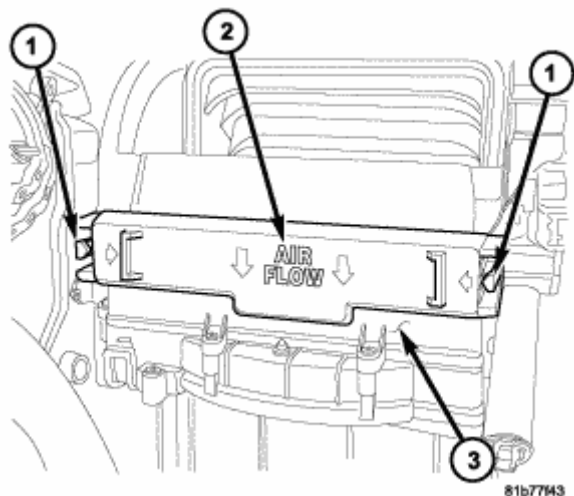


Fig. 72: Removing/Installing Particulate Filter Cover
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with instrument panel removed for clarity.

1. Remove the glove box bin. Refer to **REMOVAL** .
2. Disengage the two retaining tabs (1) that secure the particulate air filter cover (2) to the passenger side of

the HVAC housing (3) and remove the cover.

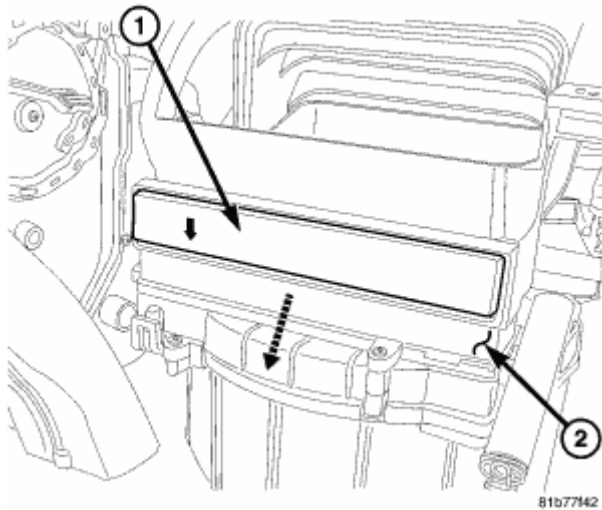


Fig. 73: Particulate Filter Removal S1
Courtesy of CHRYSLER LLC

3. Remove the particulate air filter (1) from the HVAC housing (2) by pulling the filter element straight out of the housing.

INSTALLATION

FILTER-PARTICULATE AIR

NOTE: The particulate air filter is labeled with an arrow to indicate air flow direction through the filter. Make sure to properly install the particulate air filter. Failure to properly install the filter will result in the need to replace the filter sooner than required by design.

NOTE: LHD model shown in illustrations. RHD model similar.

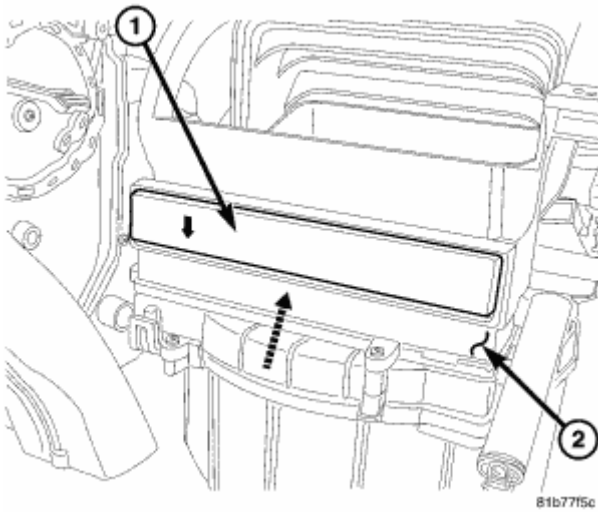


Fig. 74: Particulate Filter Install S1
Courtesy of CHRYSLER LLC

1. Install the particulate air filter (1) into the filter opening in the HVAC housing (2). Insert the particulate air filter directly into the housing with the arrow on the filter pointing to the floor.

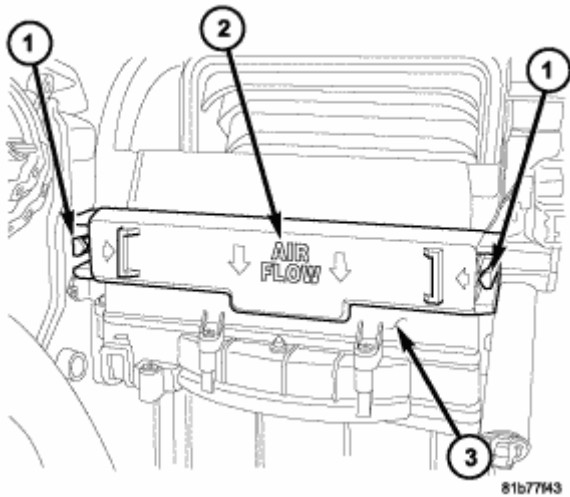


Fig. 75: Removing/Installing Particulate Filter Cover
Courtesy of CHRYSLER LLC

2. Position the particulate air filter cover (2) to the HVAC housing (3) and engage the two retaining tabs (1) that secure the cover to the housing. Make sure the retaining tabs are fully engaged.
3. Install the glove box bin. Refer to **INSTALLATION** .

HOUSING-HVAC

DESCRIPTION

HOUSING-HVAC

NOTE: LHD model shown in illustration. RHD model similar.

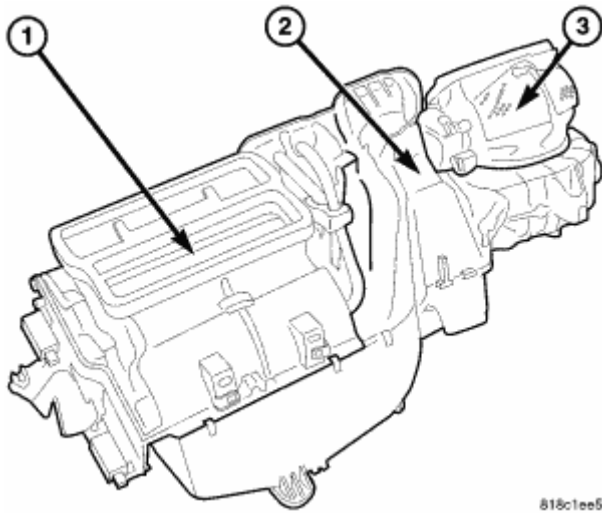


Fig. 76: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

All models are equipped with a common HVAC housing assembly that combines A/C and heating capabilities into a single unit mounted within the passenger compartment. The HVAC housing assembly consists of three separate housings:

Air distribution housing - The air distribution housing (1) is mounted to the top of the HVAC housing (2) and contains the heater core, blend-air and mode-air doors and door linkage.

Air inlet housing - The air inlet housing (3) is mounted to the passenger side end of the HVAC housing. The air inlet housing contains the recirculation-air door and actuator.

HVAC housing - The HVAC housing is mounted to the dash panel behind the instrument panel and contains the A/C evaporator. The HVAC housing consists of a upper and a lower housing that are attached together and has mounting provisions for the air inlet housing, air distribution housing, blower motor and blower motor resistor.

The heating-A/C system is a blend-air type system. The blend-air door controls the amount of conditioned air that is allowed to flow through, or around, the heater core.

The A/C system is designed for the use of a non-CFC, R-134a refrigerant and uses an A/C evaporator to cool and dehumidify the incoming air prior to blending it with the heated air. A temperature control determines the discharge air temperature by operating the temperature control cable, which moves the blend-air door. This allows an almost immediate control of the output air temperature of the system. The mode door cable operates the mode-air doors which direct the flow of the conditioned air out the various air outlets, depending on the mode selected. The recirculation door actuator operates the recirculation-air door which closes off the fresh air intake and recirculates the air already inside the vehicle. The electric recirculation door actuator and the blower motor are connected to the vehicle electrical system by the instrument panel wire harness. The blower motor controls the velocity of air flowing through the HVAC housing assembly by spinning the blower wheel within the HVAC housing at the selected speed by use of the blower motor resistor, which is located in the dash panel in the engine compartment.

The air distribution housing must be removed from the HVAC housing and disassembled for service of the blend-air and mode-air doors. The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door. The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

REMOVAL

HOUSING-AIR DISTRIBUTION

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the heater core and the blend-air and mode-air doors.

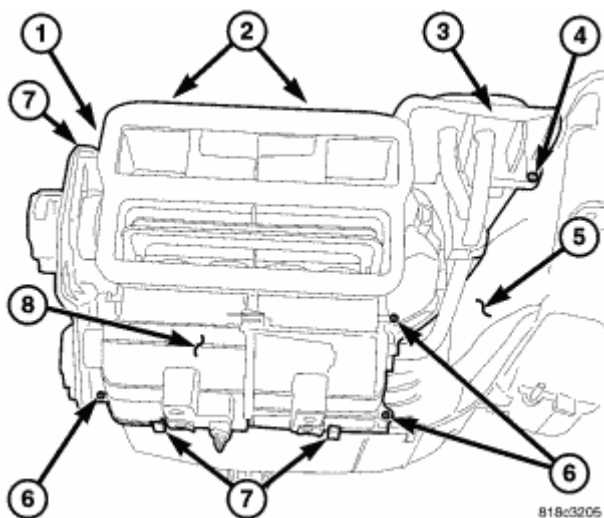


Fig. 77: Air Distribution Housing Remove/Install Components
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the HVAC housing assembly and place it on a workbench. See REMOVAL.

2. Remove the screw (4) that secures the heater core tube flange (3) to the top of the HVAC housing (5).
3. Remove the three screws (6) and three metal clips (7) that secure the air distribution housing (8) to the top of the HVAC housing.
4. Disengage the plastic retaining tab (1) that secures the front driver side of the air distribution housing to the top of the HVAC housing.
5. Tip the rear of the air distribution housing slightly upward to disengage the two plastic retaining tabs (2) that secure the front of the distribution housing to the HVAC housing and remove the distribution housing.
6. If required, disassemble the air distribution housing. See **DISASSEMBLY**.

HOUSING-AIR INLET

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door on all models.

NOTE: On RHD models, the air inlet housing must be removed from HVAC housing for service of the recirculation door actuator.

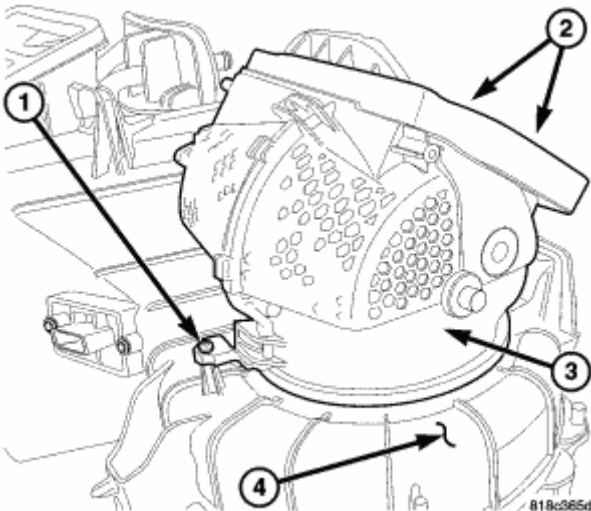


Fig. 78: Screw, Plastic Retaining Tabs, Air Inlet Housing & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: Typical housing shown in illustration. RHD model similar.

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the screw (1) that helps secure the rear of the air inlet housing (3) to the top of the HVAC housing (4).
3. Carefully pull the rear of the air inlet housing upward to release the inlet housing from the top of the HVAC housing and disengage the inlet housing from the two plastic retaining tabs (2) located at the front of the HVAC housing and remove the inlet housing.
4. If required, disassemble the air inlet housing. See **DISASSEMBLY**.

HOUSING-HVAC

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

NOTE: LHD model shown in illustrations. RHD model similar.

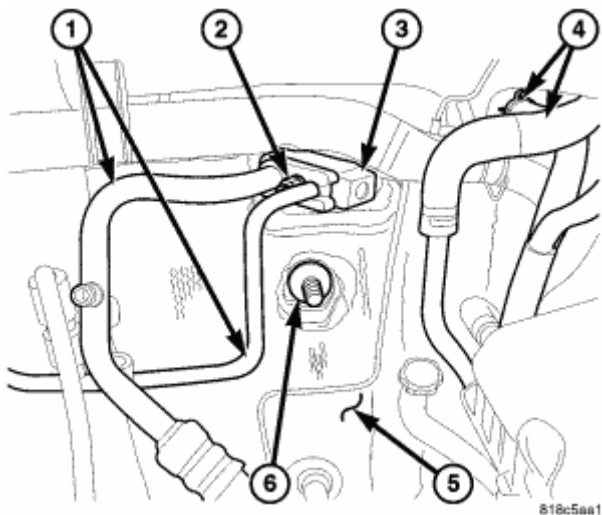


Fig. 79: Suction Line Assembly, Nuts, A/C Expansion Valve, Heater Hoses & Dash Panel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Partially drain the engine cooling system.
4. Remove the nut (2) that secures the A/C liquid and suction line assembly (1) to the A/C expansion valve (3).
5. Disconnect the A/C liquid and suction line assembly from the A/C expansion valve and remove and discard the O-ring seals.
6. Install plugs in, or tape over the opened refrigerant line fittings and the expansion valve ports.
7. Disconnect the heater hoses (4) from the heater core tubes. Install plugs in, or tape over the opened heater core tubes to prevent coolant spillage during housing removal.
8. Remove the nut (6) that secures the HVAC housing assembly to the engine compartment side of the dash panel (5).

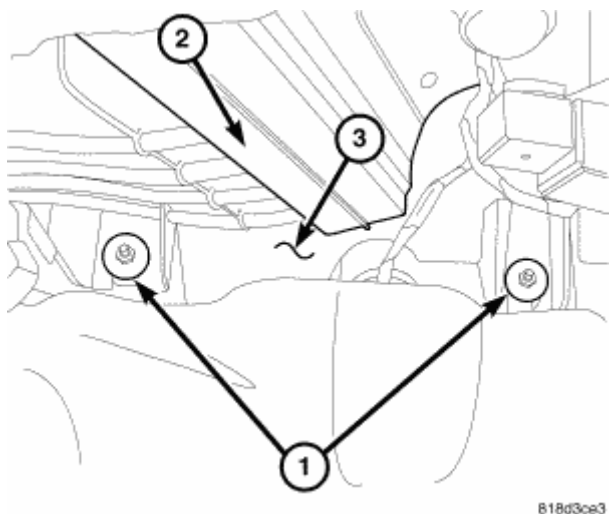


Fig. 80: Removing/Installing Nuts That Secure HVAC Housing Assembly To Passenger Side Of

Dash Panel

Courtesy of CHRYSLER LLC

9. Remove the instrument panel. Refer to **REMOVAL** .
10. Remove the rear floor duct. See **REMOVAL**.
11. Remove the two nuts (1) that secure the HVAC housing assembly (2) to the passenger side of the dash panel (3).

NOTE: Use care to ensure that the interior is covered in case of loss of residual fluids from the heater and evaporator cores.

12. Pull the HVAC housing assembly rearward and remove the housing from the passenger compartment.

SCREEN-AIR INLET

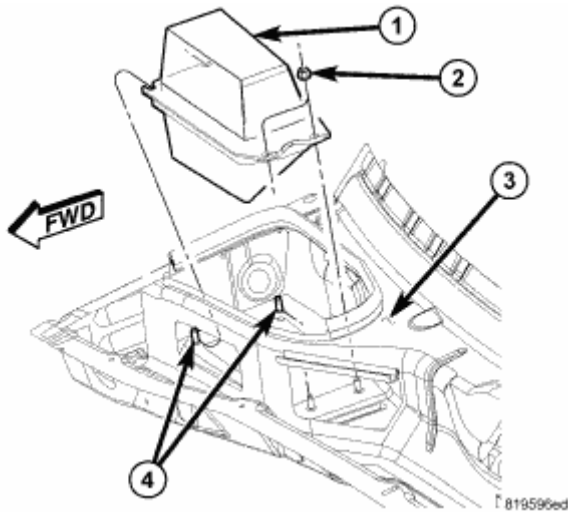


Fig. 81: Air Inlet Screen, Nuts, Cowl Panel & Retaining Studs
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the cowl grille. Refer to **REMOVAL** .
2. Remove the two nuts (2) that secure the air inlet screen (1) to the cowl panel (3).
3. Slide the air inlet screen inward to disengage the screen from the two retaining studs (4) and pull the screen straight up to remove it from the cowl.

DISASSEMBLY

HOUSING-AIR DISTRIBUTION

WARNING: The heater core tubes are not serviced separately from the heater core.
The heater core tubes should not be repositioned, loosened or removed

from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: The air distribution housing must be removed from the HVAC housing and disassembled for service of the heater core and the mode-air and blend-air doors.

NOTE: LHD model shown in illustrations. RHD model similar.

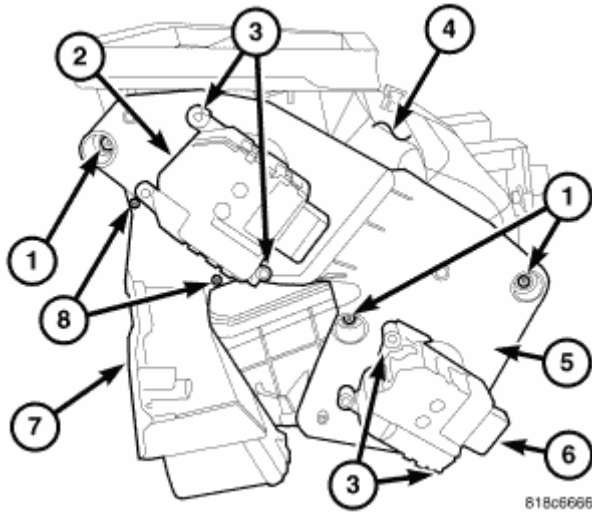


Fig. 82: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air distribution housing (4) from the HVAC housing. See **REMOVAL**.
3. Remove the screws (3) that secure the mode door actuator (2) and the blend door actuator (6) to the actuator mounting bracket (5) located on the driver side of the air distribution housing and remove the actuators.
4. Remove the three screws (1) that secure the actuator mounting bracket to the air distribution housing and remove the bracket.
5. Remove the two screws (8) that secure the driver side front floor duct (7) to the air distribution housing and remove the duct

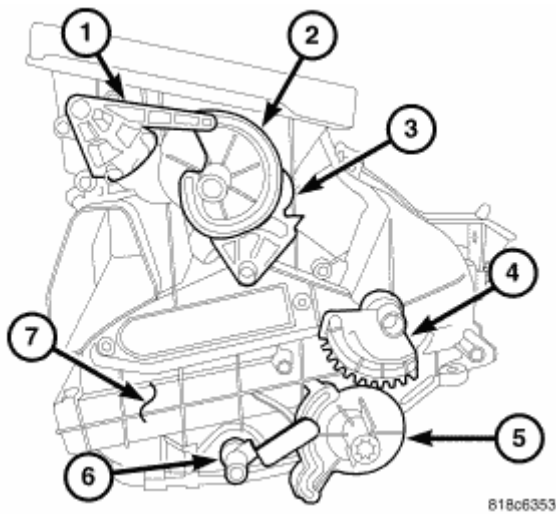


Fig. 83: Removing/Installing Defrost Door Lever/Gear Assembly, Mode Door Cam, Panel Door Gear, Blend Door Gear, Blend Door Lever And Blend Door Cam From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

6. Remove the defrost door lever and gear assembly (1), mode door cam (2), panel door gear (3), blend door gear (4), blend door lever (6) and the blend door cam (5) from the driver side of the air distribution housing (7).
7. If equipped with the 2.8L diesel engine, remove the electric positive temperature coefficient (PTC) heater unit from the air distribution housing. See **REMOVAL**.

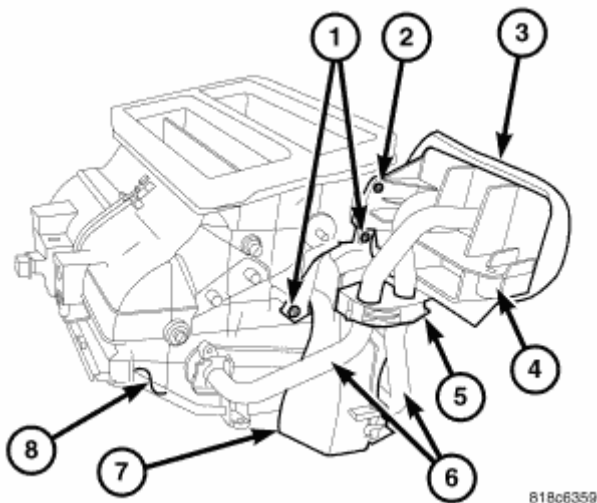


Fig. 84: Air Distribution Housing Assembly

Courtesy of CHRYSLER LLC

8. Remove the two screws (1) that secure the upper front passenger side floor duct (7) to the passenger side of the air distribution housing (8) and remove the duct.

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it

must be replaced.

9. Carefully remove the foam seal (3) from the heater core tube flange (4). If the seal is deformed or damaged, it must be replaced.
10. Remove the screw (2) that secures the heater core tube flange to the air distribution housing.
11. Disengage the plastic retainer (5) from around the heater core tubes (6) and remove the flange.

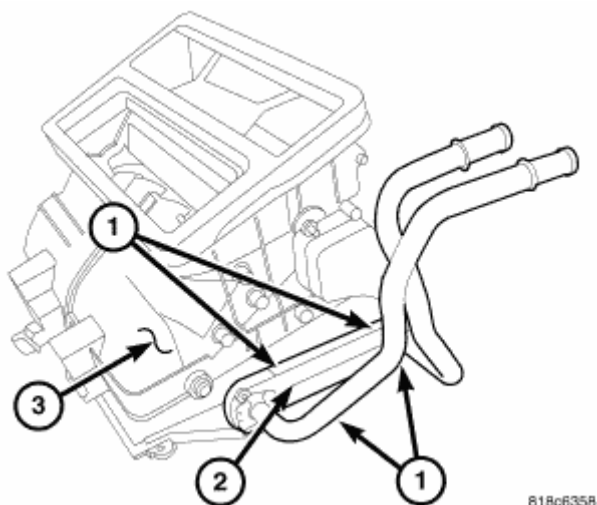


Fig. 85: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

12. Disengage the four plastic retaining tabs (1) that secure the heater core (2) to the passenger side of the air distribution housing (3) and carefully remove the heater core from the housing.

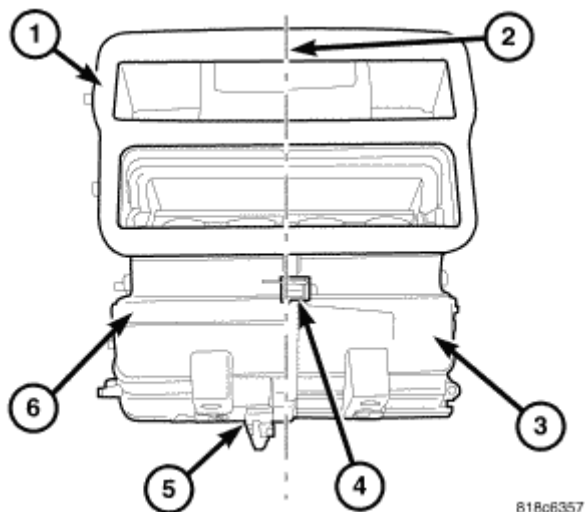
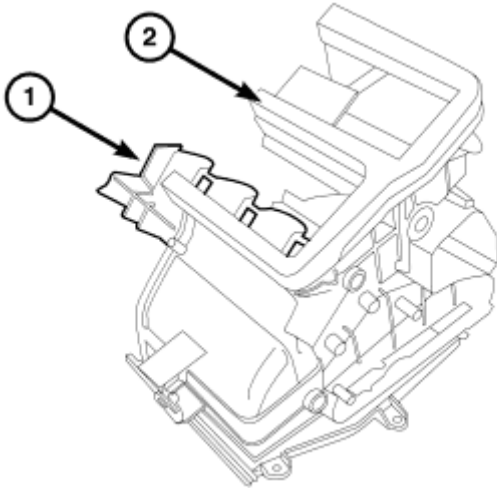


Fig. 86: Foam Seal, Parting Line, Air Distribution Housing, Parting Line, Plastic Retaining Tabs &

Screw

Courtesy of CHRYSLER LLC

13. Carefully cut the foam seal (1) along the parting line (2) of the two halves of the air distribution housing (3 and 6). If the seal is deformed or damaged, it must be replaced.
14. Remove the screw (5) that secures the two halves of the air distribution housing together located on the bottom of the housing, near the center.
15. Disengage the four plastic retaining tabs (4) and carefully separate the two halves of the air distribution housing.

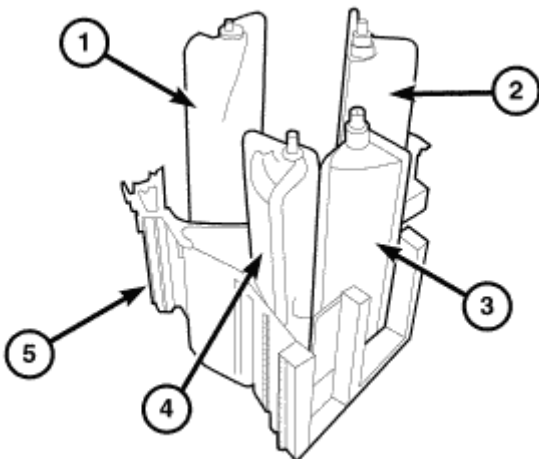


818c6355

Fig. 87: Air Deflector Vane Assembly & Air Distribution Housing

Courtesy of CHRYSLER LLC

16. Remove the air deflector vane assembly (1) from the passenger side of the air distribution housing (2). Disengage the two plastic retaining tabs (1) and slide the vane straight out of the housing.



818c6354

Fig. 88: Removing/Installing Floor-Air Door, Blend-Air Door, Panel-Air Door And Defrost-Air Door From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

NOTE: If the seal on any air door is deformed or damaged, that air door must be replaced.

17. Remove the floor-air door (1), blend-air door (2), panel-air door (3) and the defrost-air door (4) from the driver side of the air distribution housing (5) as required.

HOUSING-AIR INLET

NOTE: The air inlet housing must be removed from HVAC housing and disassembled for service of the recirculation-air door.

NOTE: LHD model shown in illustrations. RHD model similar.

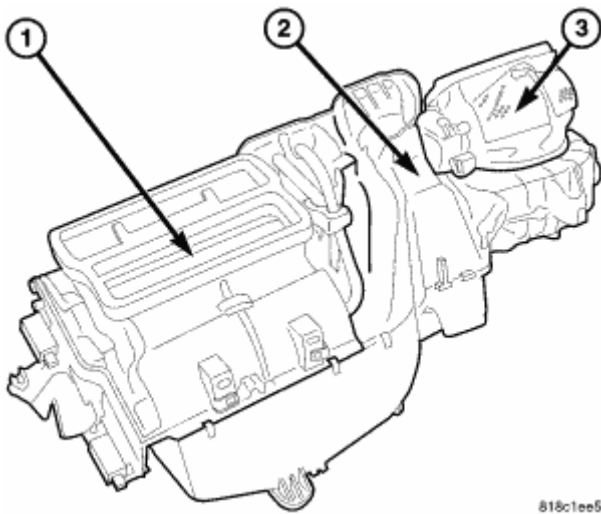


Fig. 89: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air inlet housing (3) from the HVAC housing (2). See **REMOVAL**.

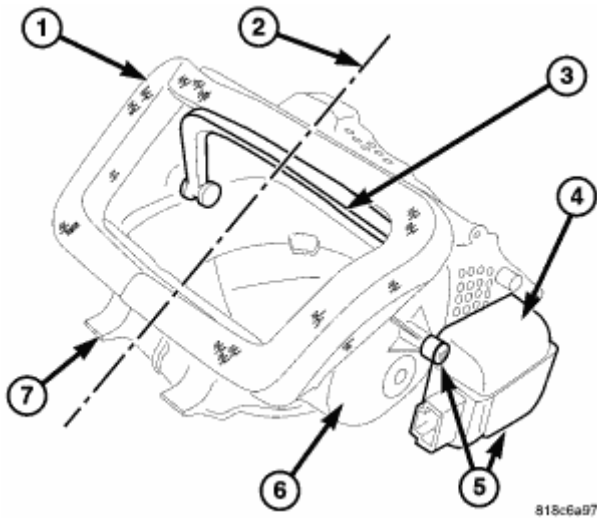


Fig. 90: Foam Seal, Parting Line, Recirculation-Air Door, Recirculation Door Actuator, Screws & Air Inlet Housing

Courtesy of CHRYSLER LLC

NOTE: If the foam seal on top of the air inlet housing is deformed or damaged, it must be replaced.

3. Carefully cut the foam seal (1) along the parting line (2) of the two halves of the air inlet housing (6 and 7). If the seal is deformed or damaged, it must be replaced.
4. Remove the two screws (5) that secure the recirculation door actuator (4) to the air inlet housing and remove the actuator.

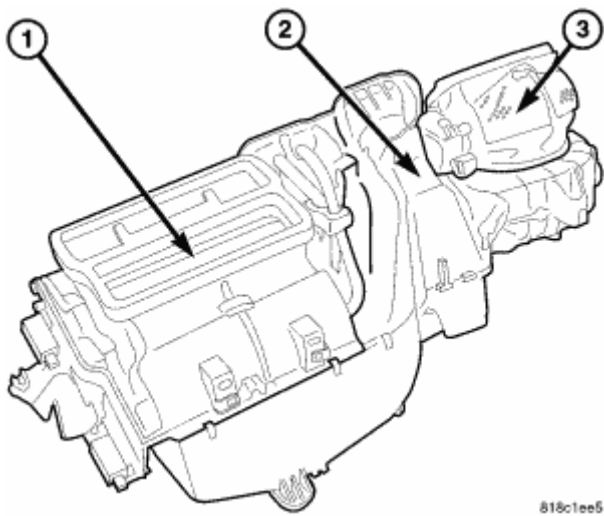
NOTE: If a rubber seal on the recirculation air-door is deformed or damaged, the air-door must be replaced.

5. Carefully disengage the three plastic retaining tabs that secure the two halves of the air inlet housing together and remove the recirculation-air door (3) from the inlet housing. If the seal on the recirculation-air door is deformed or damaged, the air-door must be replaced.

HOUSING-HVAC

NOTE: The HVAC housing must be removed from the vehicle and disassembled for service of the A/C evaporator.

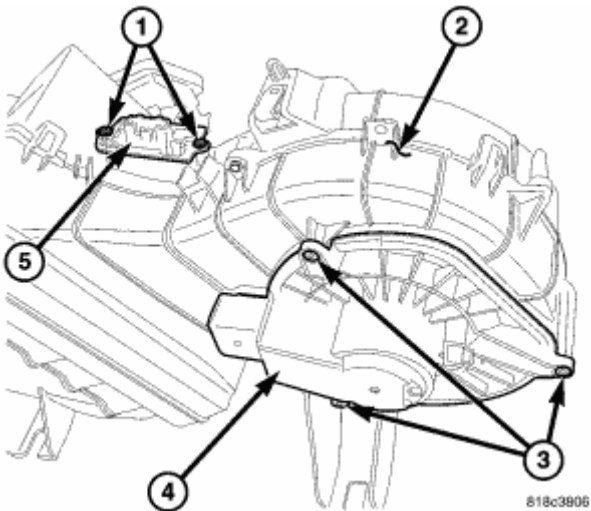
NOTE: LHD model shown in illustrations. RHD model similar.



818c1ee5

Fig. 91: Air Distribution Housing, HVAC Housing & Air Inlet Housing
 Courtesy of CHRYSLER LLC

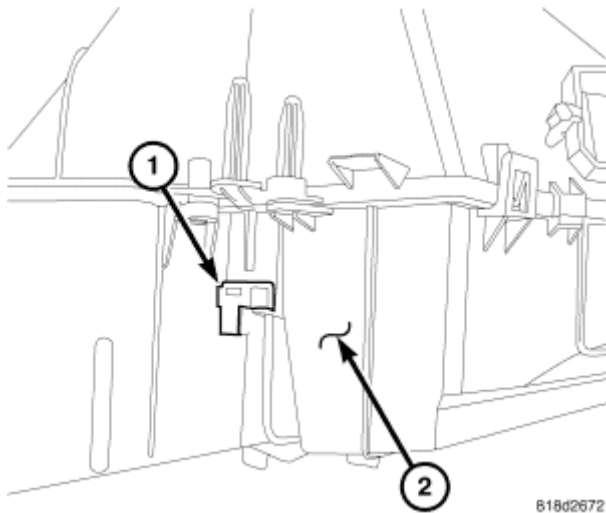
1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Remove the air distribution housing (1) from the HVAC housing (2). See **REMOVAL**.
3. Remove the air inlet housing (3) from the HVAC housing. See **REMOVAL**.
4. Remove the passenger side lower front floor duct. See **REMOVAL**.



818c3806

Fig. 92: Screws, HVAC Housing, Blower Motor & Blower Motor Resistor
 Courtesy of CHRYSLER LLC

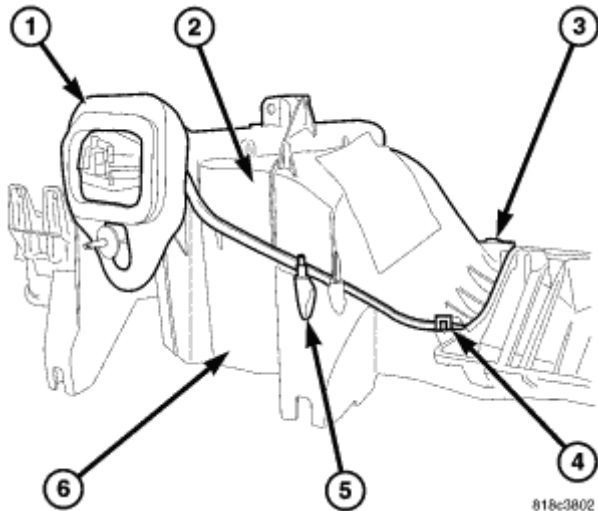
5. Remove the two screws (1) that secure the blower motor resistor (5) to the rear of the HVAC housing (2) and remove the resistor.
6. Remove the three screws (3) that secure the blower motor (4) to the bottom of the HVAC housing and remove the blower motor.



818d2672

Fig. 93: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing
 Courtesy of CHRYSLER LLC

7. Remove the evaporator temperature sensor (1) from the front of the HVAC housing (2).



818c3802

Fig. 94: Foam Seal, HVAC Housing, Screws, Plastic Retaining Tabs & Metal Clips
 Courtesy of CHRYSLER LLC

NOTE: If the foam seal for the flange is deformed or damaged, it must be replaced.

8. Carefully remove the foam seal (1) from the front of the two halves of the HVAC housing (2 and 6). If the seal is deformed or damaged, it must be replaced.

NOTE: Be sure to remove the screws that secure the two halves of the HVAC housing together located at the bottom of the HVAC housing.

9. Remove the seven screws (5) and two metal clips (4) that secure the two halves of the HVAC housing

together.

10. Disengage the four plastic retaining tabs (4) that secure the two halves of the HVAC housing together and separate the housing halves.

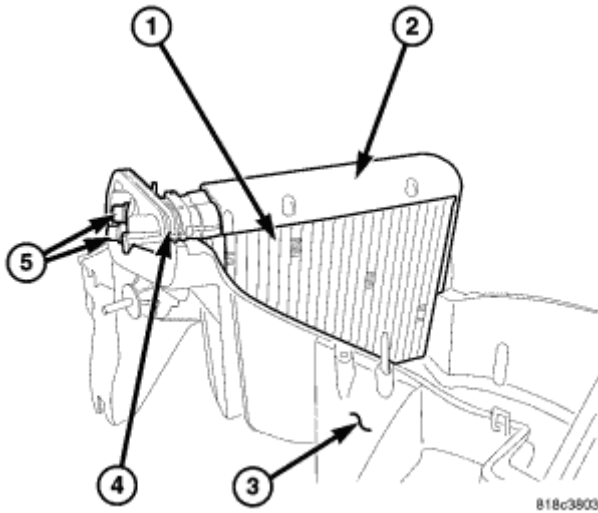


Fig. 95: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the A/C evaporator is deformed or damaged, the insulator must be replaced.

11. Carefully lift the A/C evaporator (1) and the foam insulator (2) out of the lower half of the HVAC housing (3).

NOTE: If the rubber seal around the evaporator tubes and tapping block is deformed or damaged, the seal must be replaced.

12. If required, remove the rubber seal (4) from around the evaporator tubes and tapping block (5).

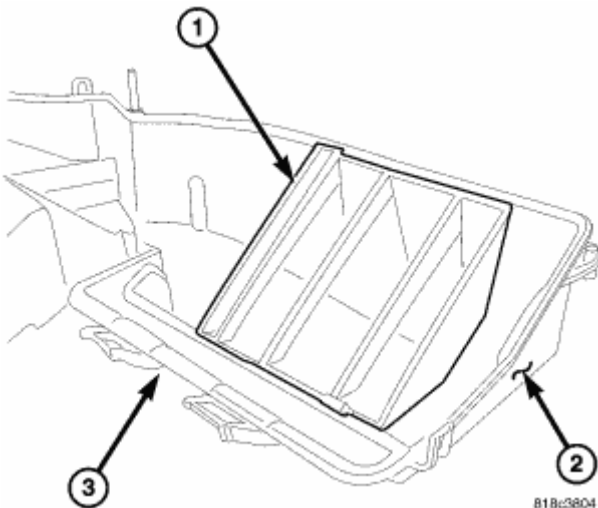


Fig. 96: Air Deflector Vane, HVAC Housing & Foam Seal
Courtesy of CHRYSLER LLC

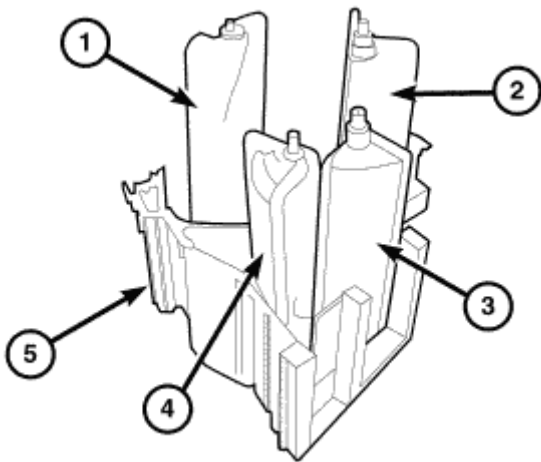
13. Disengage the retainers that secure the air deflector vane (1) to the lower half of the HVAC housing (2) and remove the deflector vane.
14. If required, remove the foam seal (3) from around the condensate drain located at the bottom of the HVAC housing.

ASSEMBLY

HOUSING-AIR DISTRIBUTION

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

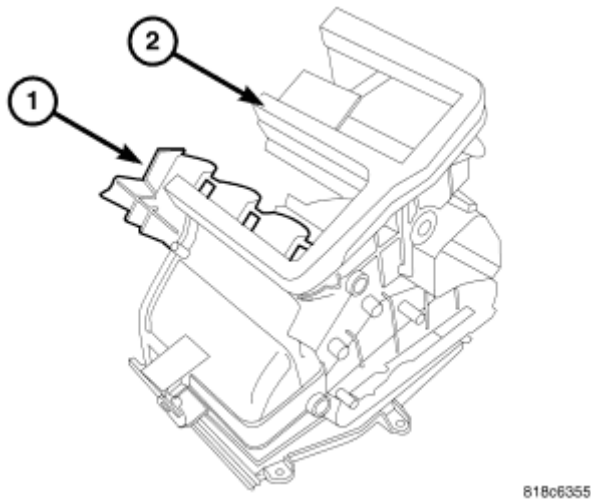


818c6354

Fig. 97: Removing/Installing Floor-Air Door, Blend-Air Door, Panel-Air Door And Defrost-Air Door From Driver Side Of Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the seal on any air door is deformed or damaged, that air door must be replaced.

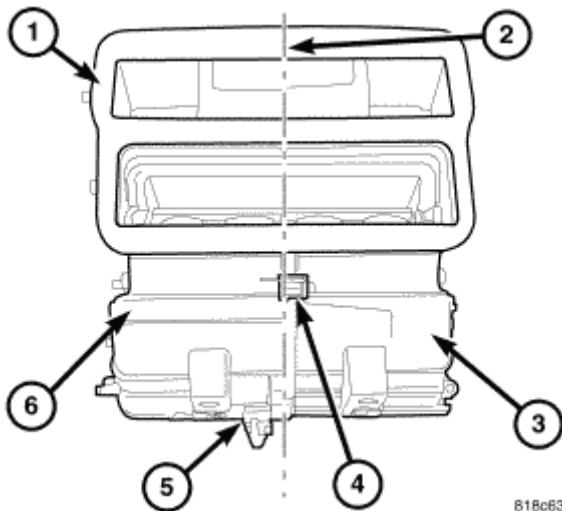
1. Install the floor-air door (1), blend-air door (2), panel-air door (3) and the defrost-air door (4) into the driver side of the air distribution housing (5) as required. Align the air door pivot shafts with the holes in the housing.



818c6355

Fig. 98: Air Deflector Vane Assembly & Air Distribution Housing
Courtesy of CHRYSLER LLC

2. Install the air deflector vane assembly (1) into the passenger side of the air distribution housing (2). Slide the vane assembly into the track in the housing and engage the two plastic retaining tabs. Make sure the retaining tabs are fully engaged.



818c6357

Fig. 99: Foam Seal, Parting Line, Air Distribution Housing, Parting Line, Plastic Retaining Tabs & Screw
Courtesy of CHRYSLER LLC

3. Align the air door pivot shafts with the holes in the passenger side of the air distribution housing (3) and carefully install passenger side of the air distribution housing (1) onto the driver side of the housing.
4. Engage the four plastic retaining tabs (4) that secure the two halves of the air distribution housing together. Make sure the retaining tabs are fully engaged.
5. Install the retaining screw (5) that secures the two halves of the air distribution housing together at the bottom of the housing, near the center. Tighten the screw to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal on top of the air distribution housing is deformed or damaged, it must be replaced.

6. Inspect the foam seal (1), especially along the parting line (2) of the two halves of the air distribution housing. Replace the seal if it is deformed or damaged.

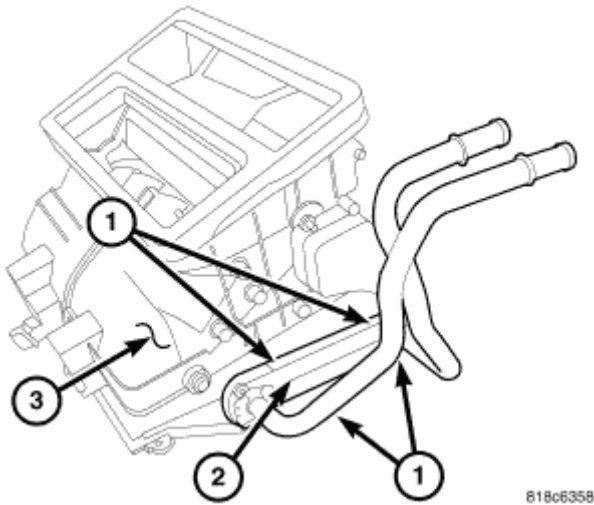


Fig. 100: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

7. Carefully install the heater core (2) into the passenger side of the air distribution housing (3) and engage the four plastic retainer tabs (1) that secure the heater core to the housing. Make sure the retaining tabs are fully engaged.

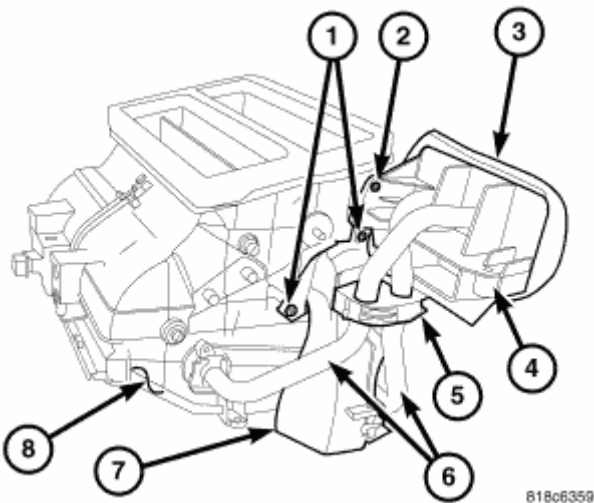
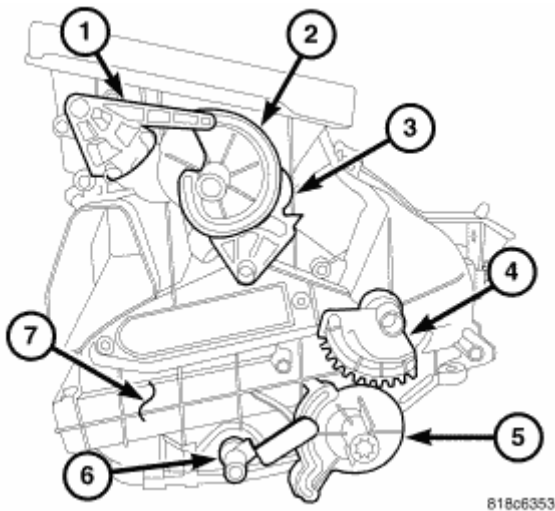


Fig. 101: Air Distribution Housing Assembly
Courtesy of CHRYSLER LLC

8. Position the heater core tube flange (4) over the heater core tubes (6) and onto the to the passenger side of the air distribution housing (8).
9. Engage the plastic retainer (5) around the heater core tubes. Make sure the retainer is fully engaged.
10. Install the screw (2) that secures the heater core tube flange to the air distribution housing. Tighten the screw to 1.2 N.m (10 in lbs.).
11. Install the upper front passenger side floor duct (7) onto the air distribution housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.

12. Install the foam seal (3) onto the heater core tube flange.



618c6353

Fig. 102: Removing/Installing Defrost Door Lever/Gear Assembly, Mode Door Cam, Panel Door Gear, Blend Door Gear, Blend Door Lever And Blend Door Cam From Driver Side Of Air Distribution Housing

Courtesy of CHRYSLER LLC

13. If equipped with the 2.8L diesel engine, install the electric positive temperature coefficient (PTC) heater unit. See **INSTALLATION**.
14. Install the blend door cam (5), blend door lever (6), blend door gear (4), panel door gear (3), mode door cam (2), and the defrost door lever and gear assembly (1) onto the driver side of the air distribution housing (7).

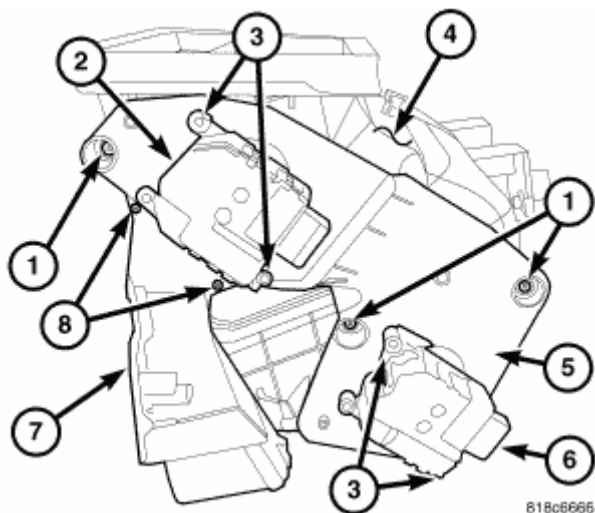


Fig. 103: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

15. Install the driver side front floor duct (7) onto the driver side of the air distribution housing (4) and install the two retaining screws (8). Tighten the screws to 1.2 N.m (10 in lbs.).
16. Position the actuator mounting bracket (5) onto the air distribution housing and install the three retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
17. Position the mode door actuator (2) and the blend door actuator (6) onto the actuator mounting bracket. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those on the door linkage.
18. Install the screws (3) that secure the mode and blend door actuators to the actuator mounting bracket. Tighten the screws to 1.2 N.m (10 in lbs.).
19. Install the air distribution housing onto the HVAC housing. See **INSTALLATION**.
20. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-AIR INLET

NOTE: LHD model shown in illustrations. RHD model similar.

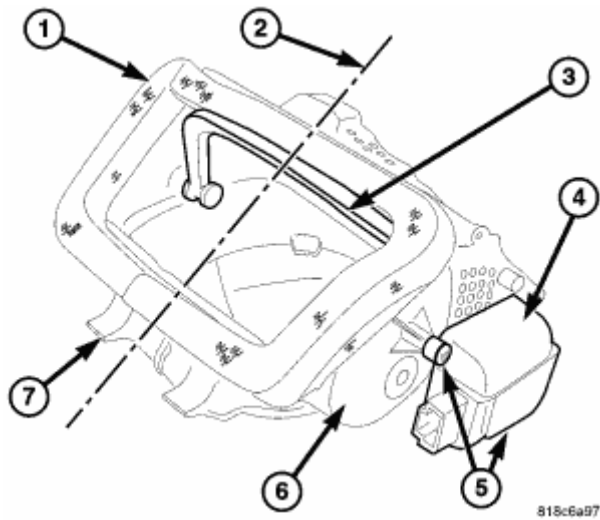


Fig. 104: Foam Seal, Parting Line, Recirculation-Air Door, Recirculation Door Actuator, Screws & Air Inlet Housing

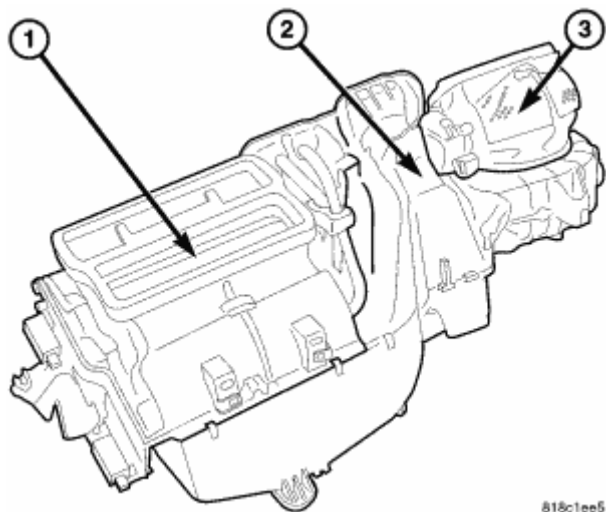
Courtesy of CHRYSLER LLC

NOTE: If a rubber seal on the recirculation air-door is deformed or damaged, the air-door must be replaced.

1. Install the recirculation-air door (3) into the two halves of the air inlet housing (6 and 7). Align the air door pivot shaft with the holes in the housing halves.
2. Carefully install the two halves of the air inlet housing together and engage the three plastic retaining tabs. Make sure the retaining tabs are fully engaged.
3. Position the recirculation door actuator (4) to the air inlet housing. Make sure the actuator output shaft is properly aligned to the recirculation door pivot shaft. If necessary, rotate the actuator slightly to engage the splines on the output shaft with those in the pivot shaft.
4. Install the two screws (5) that secure the recirculation door actuator to the air inlet housing. Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal on top of the air inlet housing is deformed or damaged, it must be replaced.

5. Inspect the foam seal (1), especially along the parting line (2) of the two halves of the air inlet housing. Replace the seal if it is deformed or damaged.



818c1ee5

Fig. 105: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

6. Install the air inlet housing (3) onto the HVAC housing (2). See **INSTALLATION**.
7. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-HVAC

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: LHD model shown in illustrations. RHD model similar.

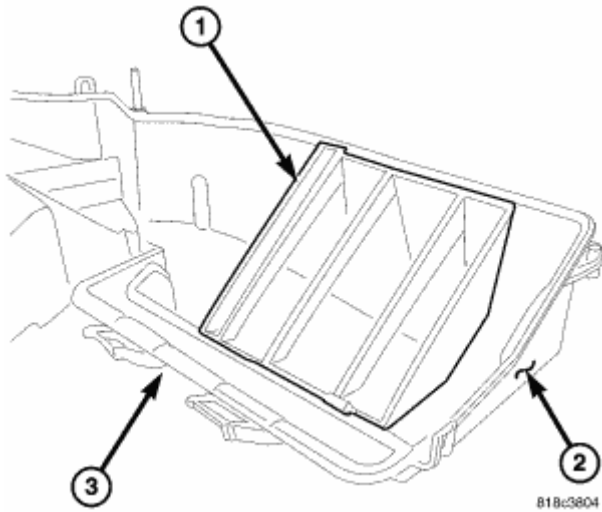


Fig. 106: Air Deflector Vane, HVAC Housing & Foam Seal
 Courtesy of CHRYSLER LLC

1. If removed, install the foam seal (3) onto the condensate drain located at the bottom of the HVAC housing (2).
2. Install the air deflector vane (1) into the lower half of the HVAC housing. Make sure the retainers are fully engaged.

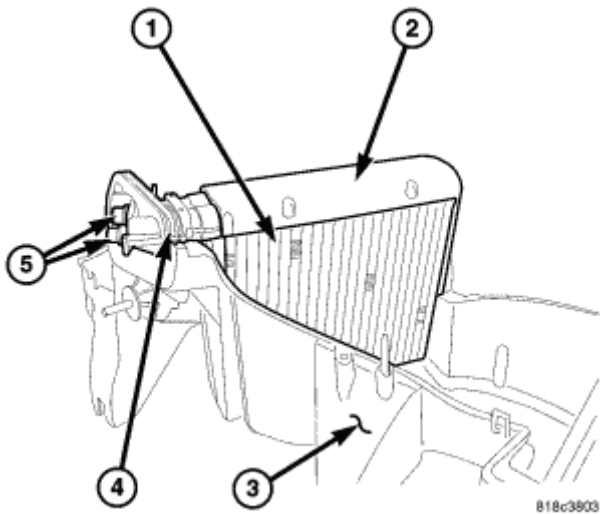


Fig. 107: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
 Courtesy of CHRYSLER LLC

NOTE: Make sure the rubber seal for the evaporator tubes and tapping block is properly positioned in the HVAC housing opening.

3. If removed, install the rubber seal (4) over the evaporator tubes and tapping block (5).

NOTE: Make sure that the foam insulator around the A/C evaporator is properly positioned within the HVAC housing.

- Carefully install the A/C evaporator (1) and foam insulator (2) into the lower half of the HVAC housing (3).

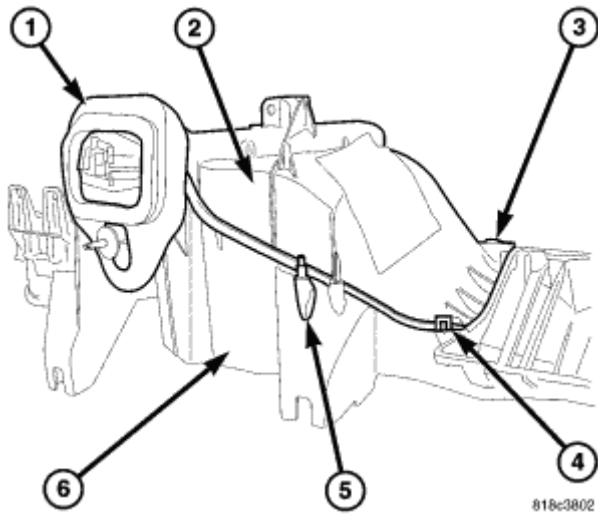


Fig. 108: Foam Seal, HVAC Housing, Screws, Plastic Retaining Tabs & Metal Clips
Courtesy of CHRYSLER LLC

- Install the two halves of the HVAC housing (2 and 6) together and engage the four plastic retaining tabs (4). Make sure the retaining tabs are fully engaged.

NOTE: Be sure to install the screws that secure the two halves of the HVAC housing together located at the bottom of the HVAC housing.

- Install the seven screws (5) and two metal clips (3) that secure the two halves of the HVAC housing together. Tighten the screws to 1.2 N.m (10 in lbs.). Make sure the metal clips are fully engaged to the housing halves.
- Install the foam seal (1) onto the front of the two HVAC housing halves.

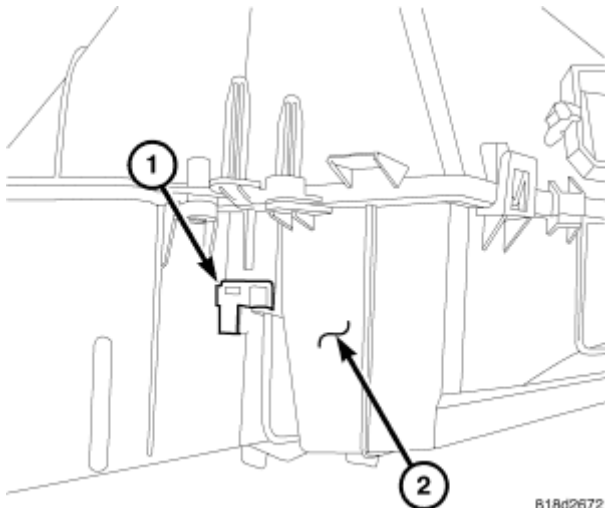


Fig. 109: Removing/Installing Evaporator Temperature Sensor From Front Of HVAC Housing

Courtesy of CHRYSLER LLC

8. Install the evaporator temperature sensor (1) into the front of the HVAC housing (2). Make sure the sensor is fully engaged to the housing.

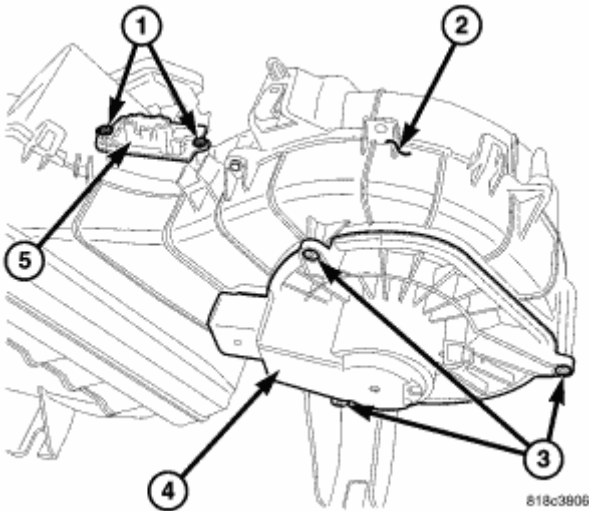


Fig. 110: Screws, HVAC Housing, Blower Motor & Blower Motor Resistor
Courtesy of CHRYSLER LLC

9. Position the blower motor (4) into the bottom of the HVAC housing (2) and install the three retaining screws (3). Tighten the screws to 1.2 N.m (10 in. lbs.).
10. Position the blower motor resistor (5) into the HVAC housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in. lbs.).

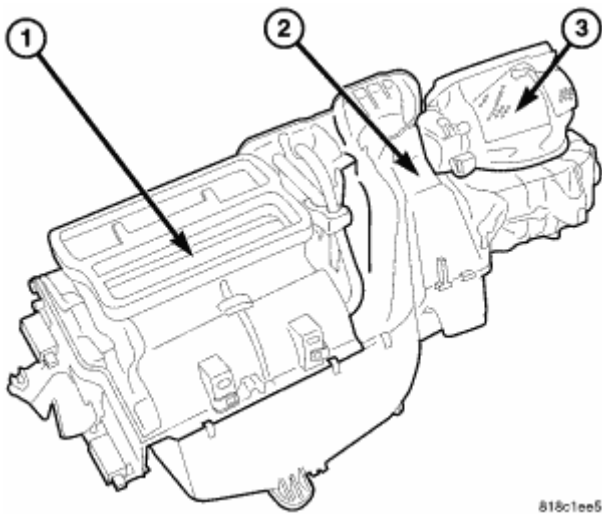


Fig. 111: Air Distribution Housing, HVAC Housing & Air Inlet Housing
Courtesy of CHRYSLER LLC

11. Install the air inlet housing (3) onto the HVAC housing (2). See **INSTALLATION**.
12. Install the air distribution housing (1) onto the HVAC housing. See **INSTALLATION**.

13. Install the passenger side lower front floor duct. See **INSTALLATION**.

NOTE: **If the heater core is being replaced, flush the cooling system. Refer to STANDARD PROCEDURE .**

14. Install the HVAC housing assembly. See **INSTALLATION**.

15. If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

INSTALLATION

HOUSING-AIR DISTRIBUTION

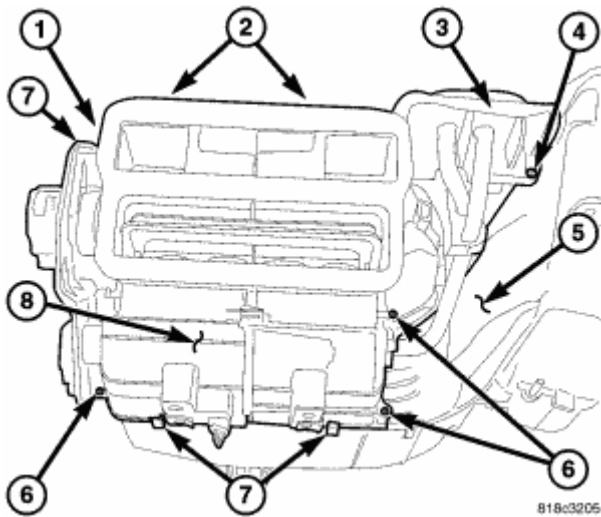


Fig. 112: Air Distribution Housing Remove/Install Components
Courtesy of CHRYSLER LLC

NOTE: **LHD model shown in illustration. RHD model similar.**

1. Position the air distribution housing (8) onto the top of the HVAC housing (5) and engage the two plastic retaining tabs (2) that secure the front of the distribution housing to the HVAC housing.
2. Engage the plastic retaining tab (1) that secures the front driver side of the air distribution housing to the HVAC housing. Make sure the passenger side floor ducts are properly connected to each other.
3. Install the three metal retaining clips (7) and three screws (6) that secure the air distribution housing to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).

NOTE: **If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.**

4. Install the screw (4) that secures the heater core tube flange (3) to the top of the HVAC housing. Tighten the screw to 1.2 N.m (10 in. lbs.).

NOTE: If the heater core is being replaced, flush the cooling system. Refer to **STANDARD PROCEDURE** .

5. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-AIR INLET

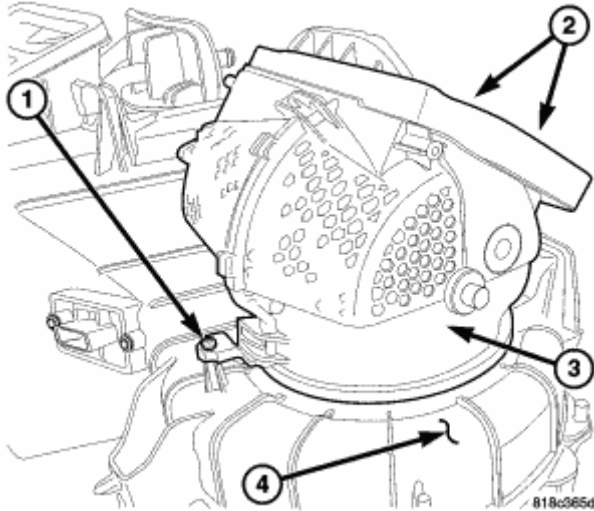


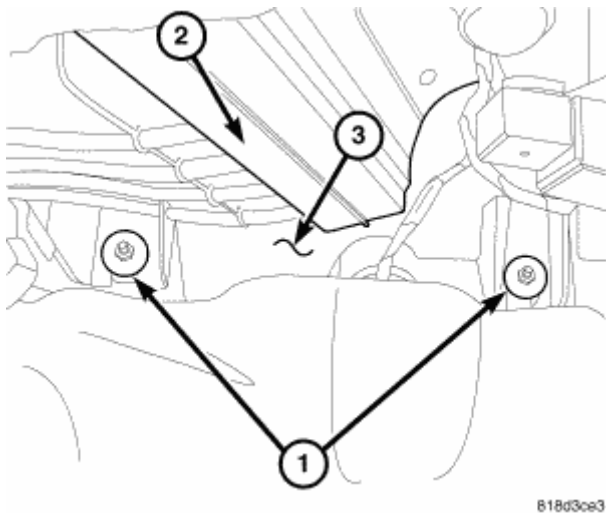
Fig. 113: Screw, Plastic Retaining Tabs, Air Inlet Housing & HVAC Housing
Courtesy of CHRYSLER LLC

NOTE: Typical housing shown in illustration. RHD model similar.

1. Position the air inlet housing (3) to the top of the HVAC housing (4) and engage the front of the inlet housing to the two plastic retaining tabs (2) located on the top of the HVAC housing.
2. Firmly push down on the rear of the air inlet housing and engage the inlet housing to the HVAC housing. Make sure the two housings are fully engaged to each other.
3. Install the screw (1) that helps secure the rear of the air inlet housing to the HVAC housing. Tighten the screw to 1.2 N.m (10 in. lbs.).
4. Install the HVAC housing assembly. See **INSTALLATION**.

HOUSING-HVAC

NOTE: LHD model shown in illustrations. RHD model similar.

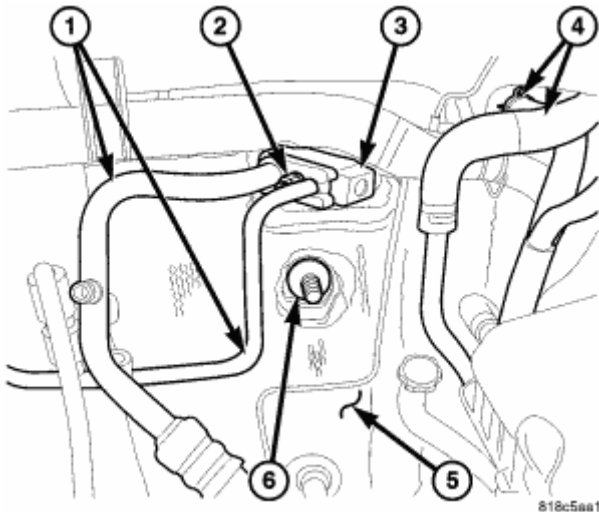


818d3ce3

Fig. 114: Removing/Installing Nuts That Secure HVAC Housing Assembly To Passenger Side Of Dash Panel

Courtesy of CHRYSLER LLC

1. Position the HVAC housing assembly (2) to the passenger side of the dash panel (3). Be certain that the housing is correctly located over the two dash panel mounting studs.
2. Install the two nuts (1) that secure the HVAC housing assembly to the dash panel. Tighten the nuts to 4.5 N.m (40 in. lbs.).
3. Install the rear floor duct. See **INSTALLATION**.
4. Install the instrument panel. Refer to **INSTALLATION**.



818c5aa1

Fig. 115: Suction Line Assembly, Nuts, A/C Expansion Valve, Heater Hoses & Dash Panel

Courtesy of CHRYSLER LLC

5. Install the nut (6) that secures the HVAC housing assembly to the engine compartment side of the dash panel (5). Tighten the nut to 4.5 N.m (40 in. lbs.).
6. Remove the previously installed plugs or caps and connect the heater hoses (4) to the heater core tubes.

7. Remove the tape or plugs from the refrigerant line fittings and the expansion valve ports.
8. Lubricate new rubber O-rings with clean refrigerant oil and install them onto the liquid and suction line fittings. Use only the specified O-ring seals as they are made of special materials compatible to the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
9. Connect the A/C liquid and suction line assembly (1) to the A/C expansion valve (3).
10. Install the nut (2) that secures the A/C liquid and suction line assembly to the A/C expansion valve. Tighten the nut to 23 N.m (17 ft. lbs.).
11. Reconnect the negative battery cable.
12. If the heater core is being replaced, flush the cooling system. Refer to **STANDARD PROCEDURE** .
13. Refill the engine cooling system. Refer to **STANDARD PROCEDURE** .
14. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.
16. Initiate the Actuator Calibration function using a scan tool. See **DIAGNOSIS AND TESTING**.

SCREEN-AIR INLET

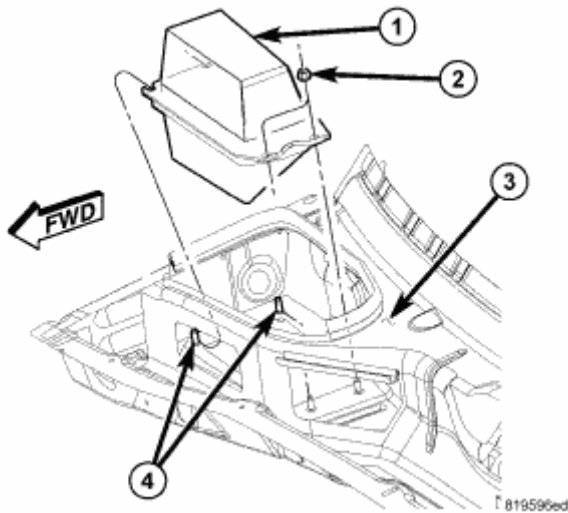


Fig. 116: Air Inlet Screen, Nuts, Cowl Panel & Retaining Studs
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Position the air inlet screen (1) into the cowl panel (3) and fully engage the screen onto the two retaining studs (4).
2. Install the air inlet screen onto the cowl panel and install the two retaining nuts (4). Tighten the nuts to 2.3 N.m (20 in. lbs.).
3. Install the cowl grille. Refer to **INSTALLATION** .

MOTOR-BLOWER

DESCRIPTION

MOTOR-BLOWER

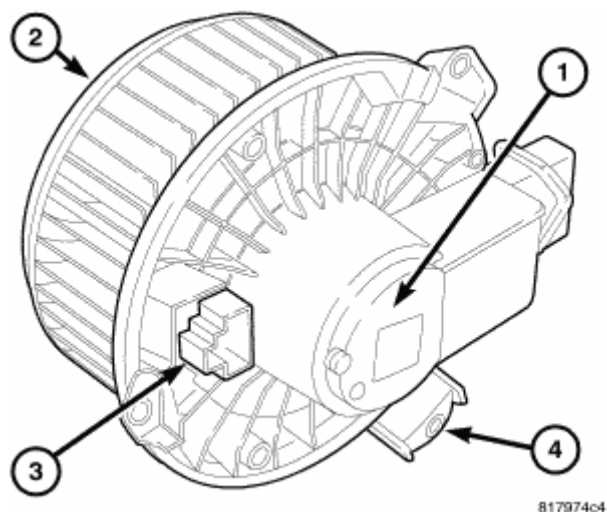


Fig. 117: Identifying Blower Motor
Courtesy of CHRYSLER LLC

NOTE: Typical blower motor shown in graphic,

The blower motor (1) is a 12-volt, direct current (DC) motor mounted within a plastic housing with three integral mounting tabs (4), an integral wire harness connector (3) and a squirrel cage-type blower wheel (2) that is secured to the blower motor shaft. The blower motor wheel is positioned within the HVAC air inlet housing, which is mounted to the passenger side end of the HVAC housing.

The blower motor can be accessed for service from underneath the instrument panel.

OPERATION

MOTOR-BLOWER

The blower motor is used to control the velocity of air moving through the HVAC housing by spinning the blower wheel within the HVAC air inlet housing at the selected speed.

The blower motor will operate whenever the ignition switch is in the Run position and the blower motor control is in any position except Off. The blower motor receives battery current through the totally integrated power module (TIPM) whenever the ignition switch is in the Run position.

Blower motor speed is controlled by regulating the ground path through or around the blower motor resistor and through the blower motor control located within the A/C-heater control.

The blower motor can be accessed for service from underneath the instrument panel.

NOTE: The blower motor is supplied with a 12V feed from the TIPM, through the blower motor resistor, whenever the ignition switch is in the RUN position. Due to an open circuit condition within the blower motor control switch the TIPM is

UNABLE to detect an OPEN circuit for the blower motor.

The blower motor control system is diagnosed using a scan tool (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The blower motor and blower motor wheel are factory balanced as an assembly and cannot be adjusted or repaired and must be replaced if found inoperative or damaged.

DIAGNOSIS AND TESTING

MOTOR-BLOWER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: The blower motor is supplied with a 12V feed from the TIPM, through the blower motor resistor, whenever the ignition switch is in the RUN position. Due to an open circuit condition within the blower motor control switch the TIPM is **UNABLE to detect an OPEN circuit for the blower motor.**

To determine if an open condition exists within the blower motor circuit wiring, it is necessary to disconnect the negative battery cable and check for continuity within the blower motor circuits using an ohmmeter.

OPERATION

Possible causes of an inoperative blower motor include:

- Open fuse
- Inoperative blower motor resistor
- Inoperative blower motor switch
- Inoperative blower motor
- Inoperative blower motor circuit wiring or wire harness connectors

NOISE

To determine if the blower motor is the source of the noise, simply switch the blower motor from Off to On. To verify that the blower motor is the source of the noise, unplug the blower motor wire harness connector and operate the heater-A/C system. If the noise goes away, possible causes include:

- Foreign material on fresh air inlet screen
- Foreign material in blower wheel

Foreign material in HVAC housing
Improper blower motor mounting
Deformed or damaged blower wheel
Worn blower motor bearings or brushes

VIBRATION

Possible causes of a blower motor vibration include:

Improper blower motor mounting
Foreign material in blower wheel
Deformed or damaged blower wheel
Worn blower motor bearings

REMOVAL

MOTOR-BLOWER

NOTE: The blower motor is located on the bottom of the passenger side of the HVAC housing. The blower motor can be removed from the vehicle without having to remove the HVAC housing.

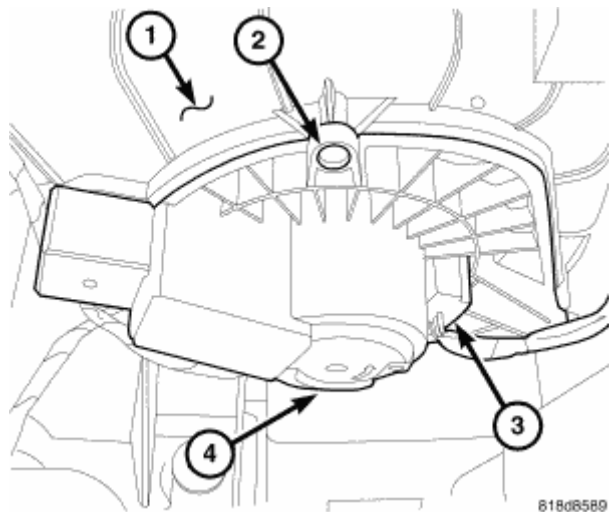


Fig. 118: HVAC Housing, Screws, Instrument Panel Wire Harness Connector & Blower Motor
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the passenger side of the instrument panel. Refer to **REMOVAL** .

3. From underneath the instrument panel, disconnect the instrument panel wire harness connector (3) from the blower motor (4).
4. Remove the three screws (2) that secure the blower motor to the bottom of the HVAC housing (1) and remove the blower motor.

INSTALLATION

MOTOR-BLOWER

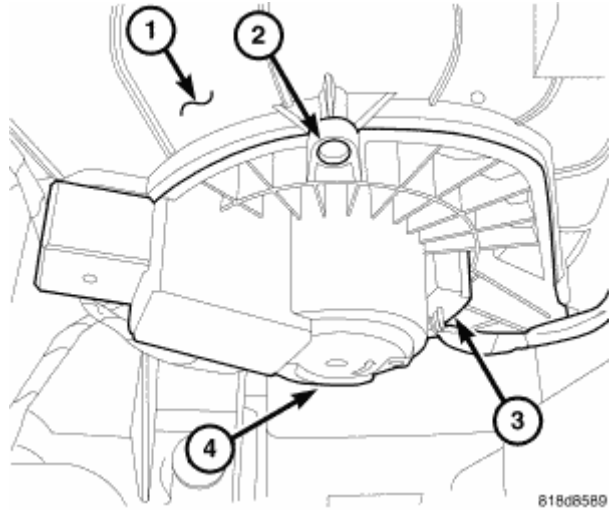


Fig. 119: HVAC Housing, Screws, Instrument Panel Wire Harness Connector & Blower Motor
Courtesy of CHRYSLER LLC

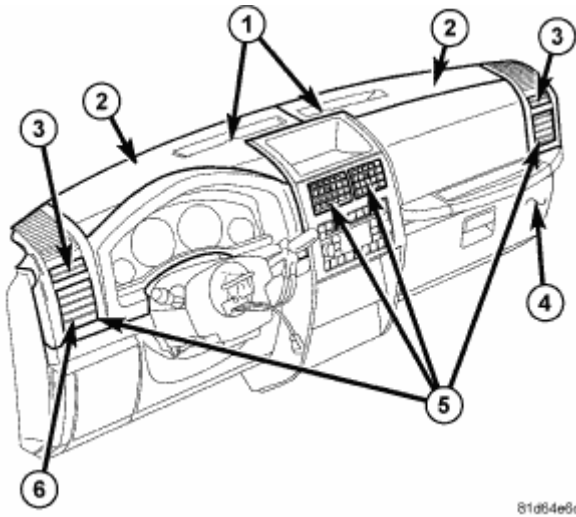
NOTE: LHD model shown in illustration. RHD model similar.

1. Position the blower motor (4) into the bottom of the HVAC housing (1).
2. Install the three screws (2) that secure the blower motor to the HVAC housing. Tighten the screws to 1.2 N.m (10 in. lbs.).
3. Connect the instrument panel wire harness connector (3) to the blower motor.
4. If equipped, install the silencer below the passenger side of the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the negative battery cable.

OUTLET-AIR

DESCRIPTION

OUTLET-AIR



81064e6c

Fig. 120: Instrument Panel Air Outlet Locations
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

There are two defroster air outlets (1) located on the top of the instrument panel (4). The airflow from the defroster outlets is directed by fixed vanes and cannot be adjusted. The defroster air outlets are serviced with the defroster grilles (2). Refer to **REMOVAL** .

There are two side window demister air outlets (3). One located at each end of the instrument panel near the A-pillars. The airflow from the side window demister air outlets is directed by fixed vanes and cannot be adjusted. The side window demister air outlets are integral to the left and right side instrument panel air outlets and cannot be serviced separately.

There are four instrument panel air outlets (5). One air outlet is located near each outboard end of the instrument panel facing the rear of the vehicle and the other two outlets are located near the top of the instrument panel center bezel. The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to **INSTRUMENT PANEL** for further information).

Each of the instrument panel air outlets contain an air outlet grille (6) that is used to direct or shut off the flow of the conditioned air leaving the instrument panel.

REMOVAL

OUTLET-AIR

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in an accidental airbag deployment and possible serious or fatal injury.

NOTE: The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to INSTRUMENT PANEL for further information).

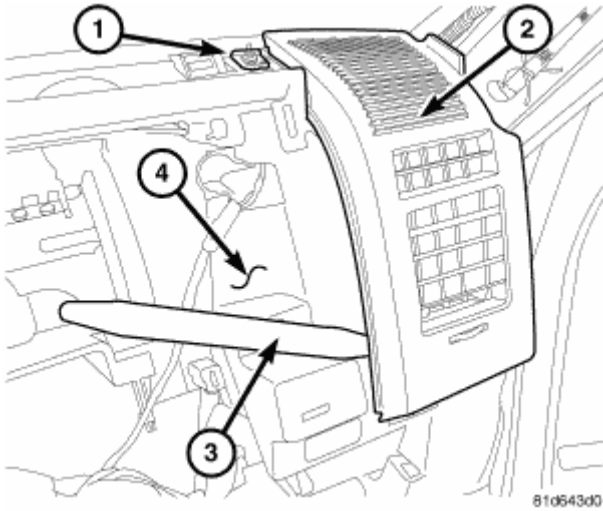


Fig. 121: Passenger Side Air Outlet Grille
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Remove the passenger side defroster grille. Refer to REMOVAL .
3. Remove the passenger side air bag. Refer to REMOVAL .
4. Remove the passenger side A-pillar trim molding. Refer to REMOVAL .
5. Remove the screw (1) that secures the top of the air outlet (2) to the instrument panel (4).
6. Using a trim stick C-4755 or equivalent (3), gently pry the lower portion of the air outlet rearward to disengage the two metal retaining clips from the instrument panel and remove the outlet.
7. If required, carefully disengage the plastic retaining tabs that secure the air outlet grille to the back of air outlet and remove the grille from the outlet.

INSTALLATION

OUTLET-AIR

NOTE: The driver side instrument panel air outlet is serviced with the instrument cluster bezel and the center air outlets are service with the center bezel (refer to INSTRUMENT PANEL for further information).

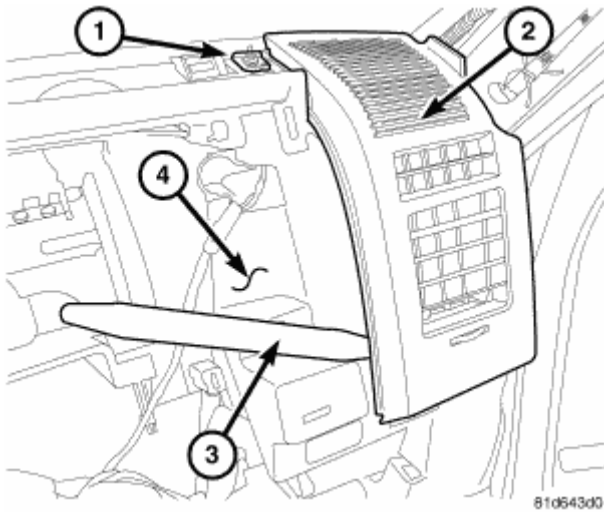


Fig. 122: Passenger Side Air Outlet Grille
Courtesy of CHRYSLER LLC

1. If removed, carefully install the air outlet grille onto the back of air outlet and engage the plastic retaining tabs that secure grille to the outlet. Make sure the retaining tabs are fully engaged.
2. Position the instrument panel air outlet to the instrument panel and engage the two metal retaining clips to the instrument panel. Make sure the retainers are fully engaged.
3. Install the screw (1) that secures the top of the air outlet (2) to the instrument panel (4). Tighten the screw to 1.2 N.m (10 in. lbs.).
4. Install the A-pillar trim molding. Refer to **INSTALLATION** .
5. Install the passenger side air bag. Refer to **INSTALLATION** .
6. Install the defroster grille. Refer to **INSTALLATION** .
7. Reconnect the negative battery cable.

PLUMBING

DESCRIPTION

REFRIGERANT LINES

The A/C refrigerant lines and hoses are used to carry the refrigerant between the various A/C system components. The refrigerant lines and hoses for the R-134a A/C system consist of a barrier-hose design with a nylon tube sandwiched between rubber layers. The nylon tube helps to contain the R-134a refrigerant, which has a small molecular structure. The ends of the refrigerant lines are made from lightweight aluminum with brazed fittings.

Any kinks or sharp bends in the refrigerant lines and hoses will reduce the capacity of the entire A/C system and can reduce the flow of refrigerant within the system.

OPERATION

REFRIGERANT LINES

High pressures are produced in a refrigerant system when the A/C compressor is operating. Extreme care must be exercised to make sure that each of the refrigerant system connections is pressure-tight and leak free. It is a good practice to inspect all flexible hose refrigerant lines at least once a year to make sure they are in good condition and properly routed.

Depending on vehicle, model and market application, refrigerant lines are connected to each other or other A/C system components with block-type or quick-connect type fittings. To ensure the integrity of the refrigerant system, O-rings and/or gaskets may be used to seal the refrigerant system connections.

The refrigerant lines and hoses cannot be repaired and must be replaced if leaking or damaged.

WARNING

WARNING

WARNING: The A/C system contains refrigerant under high pressure. Repairs should only be performed by qualified service personnel. Serious or fatal injury may result from improper service procedures.

WARNING: Avoid breathing the refrigerant and refrigerant oil vapor or mist. Exposure may irritate the eyes, nose, and/or throat. Wear eye protection when servicing the A/C refrigerant system. Serious eye injury can result from direct contact with the refrigerant. If eye contact occurs, seek medical attention immediately.

WARNING: Do not expose the refrigerant to open flame. Poisonous gas is created when refrigerant is burned. An electronic leak detector is recommended. Serious or fatal injury may result from improper service procedures.

WARNING: If accidental A/C system discharge occurs, ventilate the work area before resuming service. Large amounts of refrigerant released in a closed work area will displace the oxygen and cause suffocation and serious or fatal injury.

WARNING: The evaporation rate of R-134a refrigerant at average temperature and altitude is extremely high. As a result, anything that comes in contact with the refrigerant will freeze. Always protect the skin or delicate objects from direct contact with the refrigerant.

WARNING: The R-134a service equipment or the vehicle refrigerant system should not be pressure tested or leak tested with compressed air. Some mixtures of air and R-134a have been shown to be combustible at elevated pressures. These mixtures are potentially dangerous, and may result in fire or explosion causing property damage and serious or fatal injury.

WARNING: The engine cooling system is designed to develop internal pressures up to 145 kilopascals (21 pounds per square inch). Do not remove or loosen the coolant pressure cap, cylinder block drain plugs, radiator drain, radiator hoses, heater hoses, or hose clamps while the engine cooling system is hot and under pressure. Allow the vehicle to cool for a minimum of 15 minutes before opening the cooling system for service. Failure to observe this warning can result in serious burns from the heated engine coolant.

CAUTION

CAUTION

CAUTION: Never add R-12 to a refrigerant system designed to use R-134a. Do not use R-12 equipment or parts on an R-134a A/C system. These refrigerants are not compatible and damage to the A/C system will result.

CAUTION: Never use R-12 refrigerant oil in an A/C system designed to use R-134a refrigerant oil. These refrigerant oils are not compatible and damage to the A/C system will result.

CAUTION: The use of A/C system sealers may result in damage to A/C refrigerant recovery/evacuation/recharging equipment and/or A/C system. Many federal, state/provincial and local regulations prohibit the recharge of A/C systems with known leaks. DaimlerChrysler recommends the detection of A/C system leaks through the use of approved leak detectors and fluorescent leak detection dyes. Vehicles found with A/C system sealers should be treated as contaminated and replacement of the entire A/C refrigerant system is recommended. A/C systems found to be contaminated with A/C system sealers, A/C stop-leak products or seal conditioners voids the warranty for the A/C system.

CAUTION: Recover the refrigerant before opening any fitting or connection. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.

CAUTION: If equipped, do not remove the secondary retention clip from any spring-lock coupler connection while the refrigerant system is under pressure. Recover the refrigerant before removing the secondary retention clip. Open the fittings with caution, even after the system has been discharged. Never open or loosen a connection before recovering the refrigerant.

CAUTION: The internal parts of the A/C system will remain stable as long as moisture-free refrigerant and refrigerant oil is used. Abnormal amounts of dirt, moisture or air can upset the chemical stability. This may cause

operational troubles or even serious damage if present in more than very small quantities. Before disconnecting a component, clean the outside of the fittings thoroughly to prevent contamination from entering the refrigerant system. Keep service tools and the work area clean. Do not open the refrigerant system or uncap a replacement component until you are ready to service the system. Immediately after disconnecting a component from the refrigerant system, seal the open fittings with a cap or plug. This will prevent contamination from entering the A/C system.

CAUTION: Refrigerant oil will absorb moisture from the atmosphere if left uncapped. Do not open a container of refrigerant oil until you are ready to use it. Replace the cap on the oil container immediately after using. Store refrigerant oil only in a clean, airtight, and moisture-free container.

CAUTION: Do not overcharge the refrigerant system. Overcharging will cause excessive compressor head pressure and can cause compressor noise and A/C system failure.

DIAGNOSIS AND TESTING

REFRIGERANT SYSTEM LEAKS

WARNING: R-134a service equipment or vehicle A/C system should not be pressure tested or leak tested with compressed air. Mixture of air and R-134a can be combustible at elevated pressures. These mixtures are potentially dangerous and may result in fire or explosion causing property damage and possible serious or fatal injury.

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved service equipment meeting SAE requirements to discharge an R-134a system. If accidental system discharge occurs, ventilate work area before resuming service.

NOTE: If the A/C system refrigerant charge is empty or low, a leak in the A/C system is likely. Visually inspect all A/C lines, fittings and components for an oily residue. Oil residue can be an indicator of an A/C system leak location.

NOTE: The only way to correctly determine if the A/C system is fully charged with refrigerant to perform the A/C Performance Test. See **DIAGNOSIS AND TESTING**.

Connect a suitable manifold gauge set and determine if the static A/C system pressure is above or below 345 kPa (50 psi). See **STANDARD PROCEDURE**. If less than 345 kPa (50 psi), proceed to **SYSTEM EMPTY**. If greater than 345 kPa (50 psi), go to **SYSTEM LOW**.

SYSTEM EMPTY

1. Evacuate the refrigerant system to the lowest degree of vacuum possible (approximately -88 kPa (- 26 in. Hg) or greater vacuum). See **STANDARD PROCEDURE**. Determine if the system holds a vacuum for 15 minutes. If the refrigerant system will not maintain vacuum level, proceed to step 2. If vacuum is held, a leak is probably not present.
2. Prepare and dispense 0.284 kilograms (10 ounces) of R-134a refrigerant into the evacuated refrigerant system. See **STANDARD PROCEDURE**, and proceed to step 1 of the System Low procedure.

SYSTEM LOW

1. Position the vehicle in a wind-free work area. This will aid in detecting small leaks.
2. Operate the heating-A/C system with the engine at idle under the following conditions for at least 5 minutes.
 - Doors or windows open
 - Transmission in Park or Neutral with the parking brake set (depending on transmission application)
 - A/C compressor engaged with A/C-heater controls set to Recirculation mode (max-A/C), full cool, panel mode and high speed blower.

CAUTION: A leak detector only designed for R-12 refrigerant will not detect leaks in an R-134a refrigerant system.

3. Shut the vehicle Off and wait 2-7 minutes. Then use an electronic leak detector that is designed to detect R-134a refrigerant and search for leaks. Fittings, lines or components that appear to be oily usually indicate a refrigerant leak. To inspect the A/C evaporator for leaks, insert the leak detector probe into the passenger side floor duct. A dye for R-134a is available to aid in leak detection. Use only Chrysler approved refrigerant dye.

STANDARD PROCEDURE

REFRIGERANT SYSTEM CHARGE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The Underhood HVAC Specification Label contains the refrigerant fill specification of the vehicle being serviced.

After all refrigerant system leaks have been repaired and the refrigerant system has been evacuated, a refrigerant charge can be injected into the system. See **STANDARD PROCEDURE**.

An R-134a refrigerant recovery/recycling/charging station that meets SAE Standard J2210 must be used to charge the refrigerant system with R-134a refrigerant. Refer to the operating instructions supplied by the equipment manufacturer for proper care and use of this equipment.

CHARGING PROCEDURE

CAUTION: A small amount of refrigerant oil is removed from the A/C system each time the refrigerant system is recovered and evacuated. Before charging the A/C system, you **MUST** replenish any oil lost during the recovery process. Refer the equipment manufacturer instructions for more information.

1. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
2. Connect an R-134a refrigerant recovery/recycling/charging station that meets SAE standard J2210 to the refrigerant system.
3. Refer to **A/C SYSTEM** or the Underhood HVAC Specification Label for the proper amount of the refrigerant charge.
4. Measure the proper amount of refrigerant charge and heat it to 52° C (125° F) with the charging station. See the operating instructions supplied by the equipment manufacturer for proper use of this equipment.
5. Open both the suction and discharge valves, then open the charge valve to allow the heated refrigerant to flow into the system.
6. When the transfer of refrigerant has stopped, close both the suction and discharge valves.
7. If all of the refrigerant charge did not transfer from the dispensing device, open all of the windows in the vehicle and set the heating-A/C system controls so that the A/C compressor is engaged and the blower motor is operating at its lowest speed setting. Run the engine at a steady high idle (about 1400 rpm). If the A/C compressor does not engage, test the compressor clutch circuits and repair as required.

WARNING: Take care not to open the discharge (high pressure) valve at this time. Failure to follow this warning may result in serious or fatal injury.

8. Open the low-side valve to allow the remaining refrigerant to transfer to the refrigerant system.
9. Disconnect the charging station from the refrigerant system service ports.
10. Reinstall the caps onto the refrigerant system service ports.

REFRIGERANT SYSTEM EVACUATE

NOTE: Special effort must be used to prevent moisture from entering the A/C system oil. Moisture in the oil is very difficult to remove and will cause a reliability problem with the A/C compressor.

If an A/C compressor designed to use R-134a refrigerant is left open to the atmosphere for an extended period of time. It is recommended that the refrigerant oil be drained and replaced with new oil or a new A/C compressor be used. This will eliminate the possibility of contaminating the refrigerant system.

If the refrigerant system has been open to the atmosphere, it must be evacuated before the system can be filled. Moisture and air mixed with the refrigerant will raise the compressor head pressure above acceptable operating levels. This will reduce the performance of the A/C system and damage the A/C compressor. Moisture will boil at near room temperature when exposed to vacuum. To evacuate the refrigerant system:

NOTE: When connecting the service equipment coupling to the line fitting, verify that the valve of the coupling is fully closed. This will reduce the amount of effort required to make the connection.

1. Recover the refrigerant system. See STANDARD PROCEDURE.
2. Connect a suitable charging station, refrigerant recovery machine or a manifold gauge set with vacuum pump and refrigerant recovery equipment. See STANDARD PROCEDURE.
3. Open the suction and discharge valves and start the vacuum pump. The vacuum pump should run a minimum of 45 minutes prior to charge to eliminate all moisture in system. When the suction gauge reads to the lowest degree of vacuum possible (approximately -88 kPa (- 26 in. Hg) or greater) for 30 minutes, close all valves and turn off vacuum pump. If the system fails to reach specified vacuum, the refrigerant system likely has a leak that must be corrected. If the refrigerant system maintains specified vacuum for at least 30 minutes, start the vacuum pump, open the suction and discharge valves. Then allow the system to evacuate an additional 10 minutes.
4. Close all valves. Turn off and disconnect the vacuum pump.
5. Charge the refrigerant system. See STANDARD PROCEDURE.

REFRIGERANT SYSTEM RECOVERY

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions may result in serious or fatal injury.

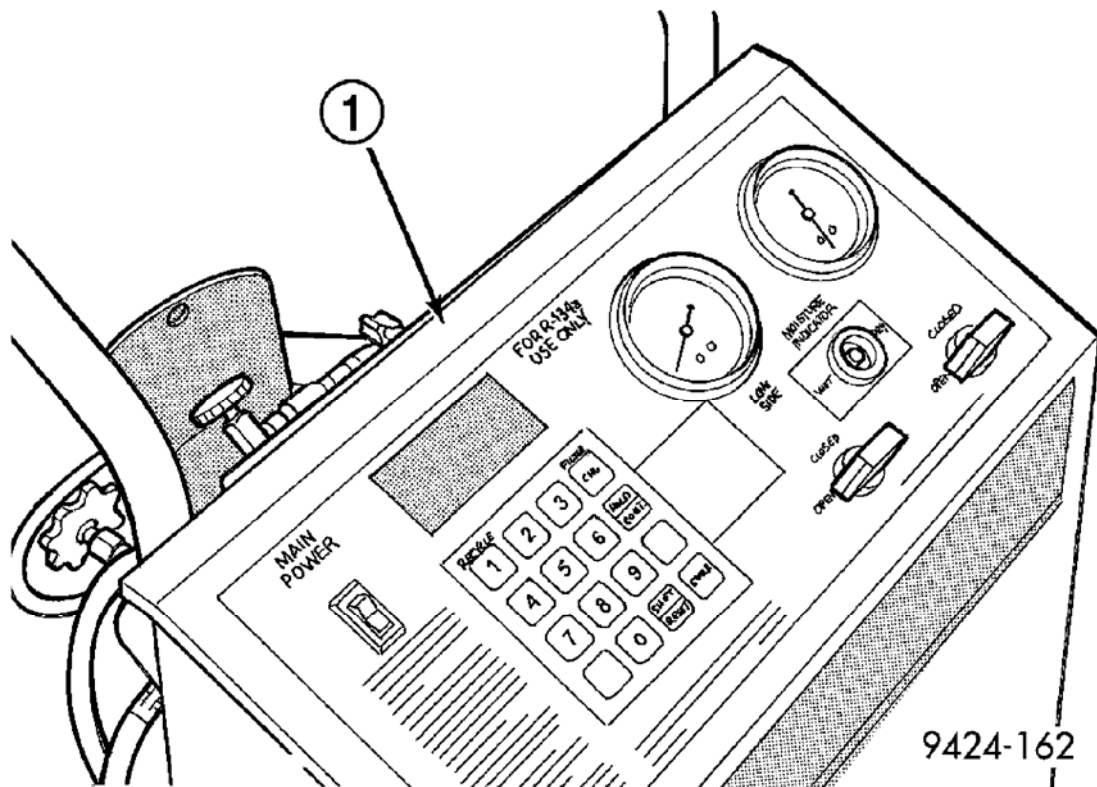


Fig. 123: Identifying R-134a Refrigerant Recovery/Recycling/Charging Station
 Courtesy of CHRYSLER LLC

An R-134a refrigerant recovery/recycling/charging station (1) that meets SAE standard J2210 must be used to recover the refrigerant from the R-134a refrigerant system. Refer to the operating instructions supplied by the equipment manufacturer for the proper care and use of this equipment.

REFRIGERANT SYSTEM SERVICE EQUIPMENT

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

WARNING: Eye protection must be worn when servicing an air conditioning refrigerant system. Turn off (rotate clockwise) all valves on the equipment being used, before connecting to or disconnecting from the refrigerant system. Failure to observe these warnings may result in personal injury or death.

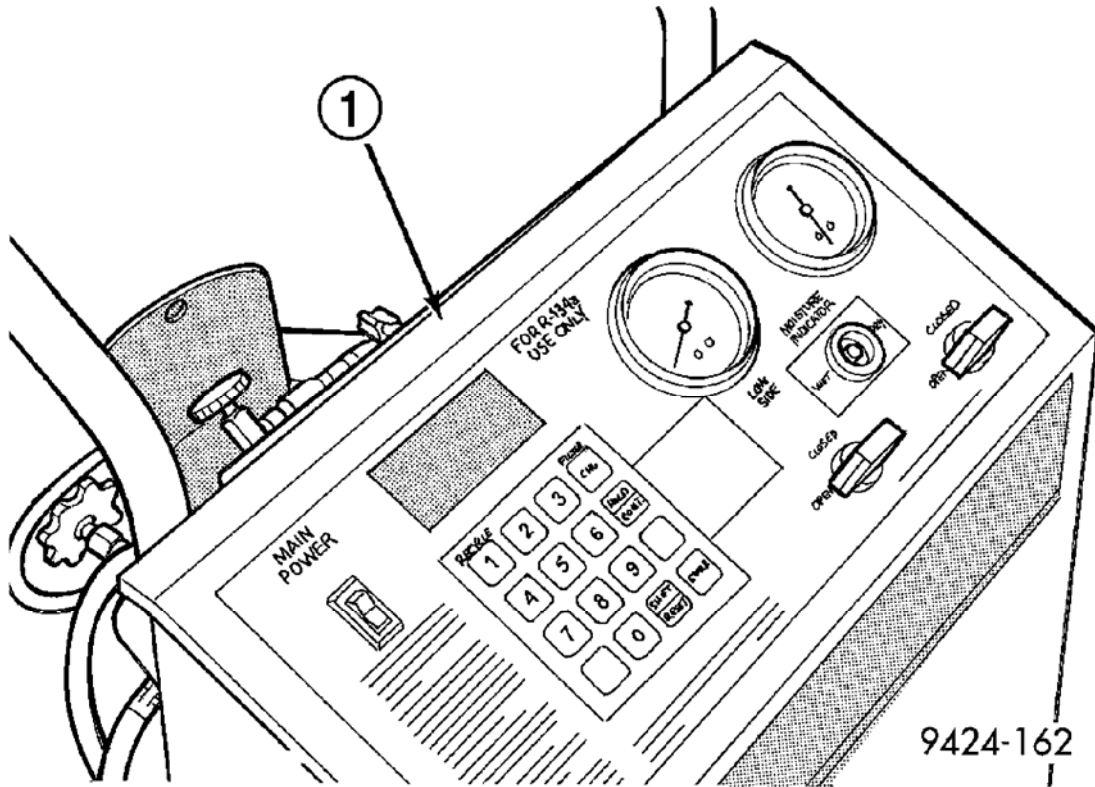
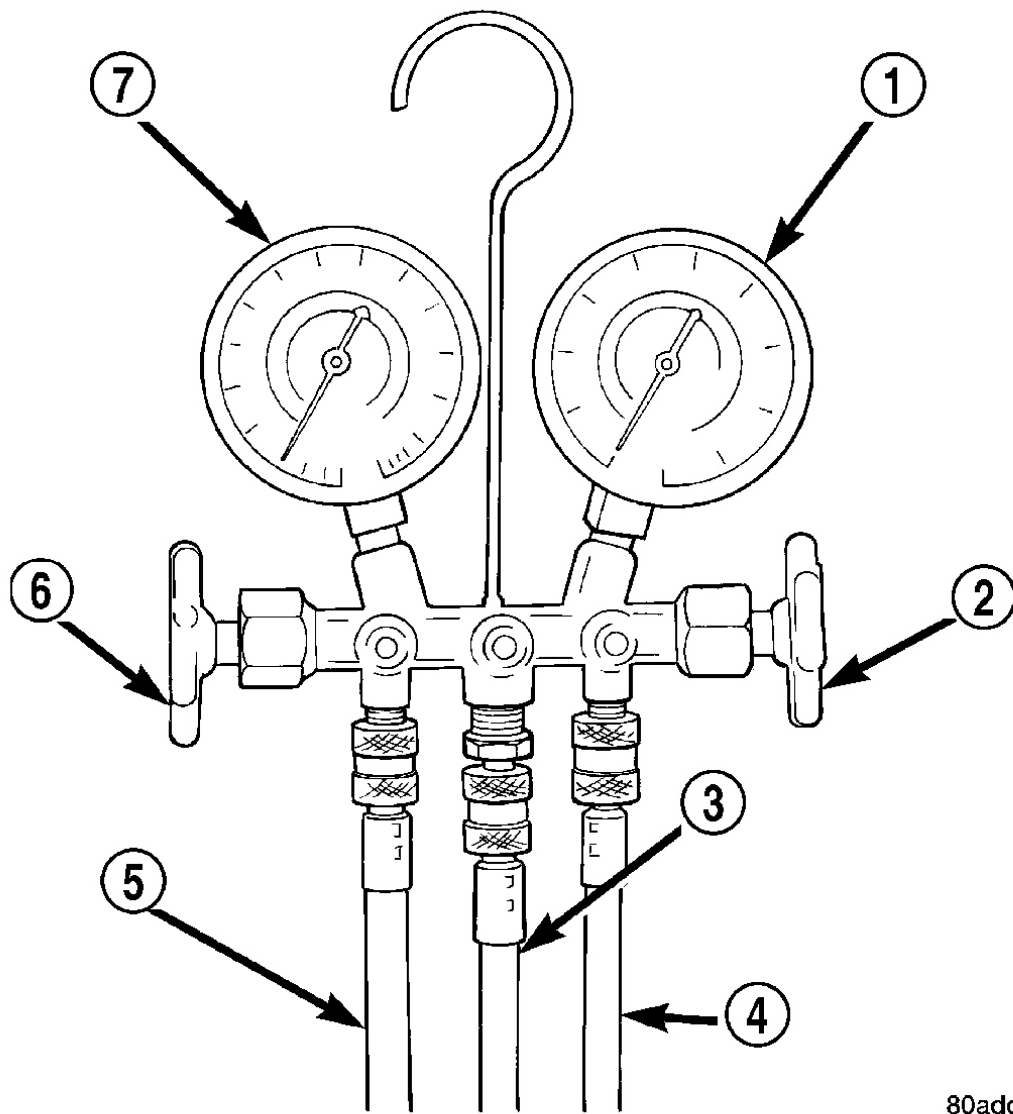


Fig. 124: Identifying R-134a Refrigerant Recovery/Recycling/Charging Station
Courtesy of CHRYSLER LLC

When servicing the A/C system, a R-134a refrigerant recovery/recycling/charging station that meets SAE standard J2210 must be used (1). Contact an automotive service equipment supplier for refrigerant recovery/recycling/charging equipment. Refer to the operating instructions supplied by the equipment manufacturer for proper care and use of this equipment.



80add30c

Fig. 125: Manifold Gauge Set - Typical
 Courtesy of CHRYSLER LLC

A manifold gauge set (1) may be needed with some recovery/recycling/charging equipment. The manifold gauge set should have manual shut-off valves (2 and 6), or automatic back-flow valves located at the service port connector end of the manifold gauge set hoses (4 and 5). This will prevent refrigerant from being released into the atmosphere.

MANIFOLD GAUGE SET CONNECTIONS

CAUTION: Do not use an R-12 manifold gauge set on an R-134a system. The refrigerants are not compatible and system damage will result.

LOW PRESSURE GAUGE HOSE - The low pressure hose (Blue with Black stripe) attaches to the low-side service port. This port is located on the A/C suction line near the rear of the engine compartment.

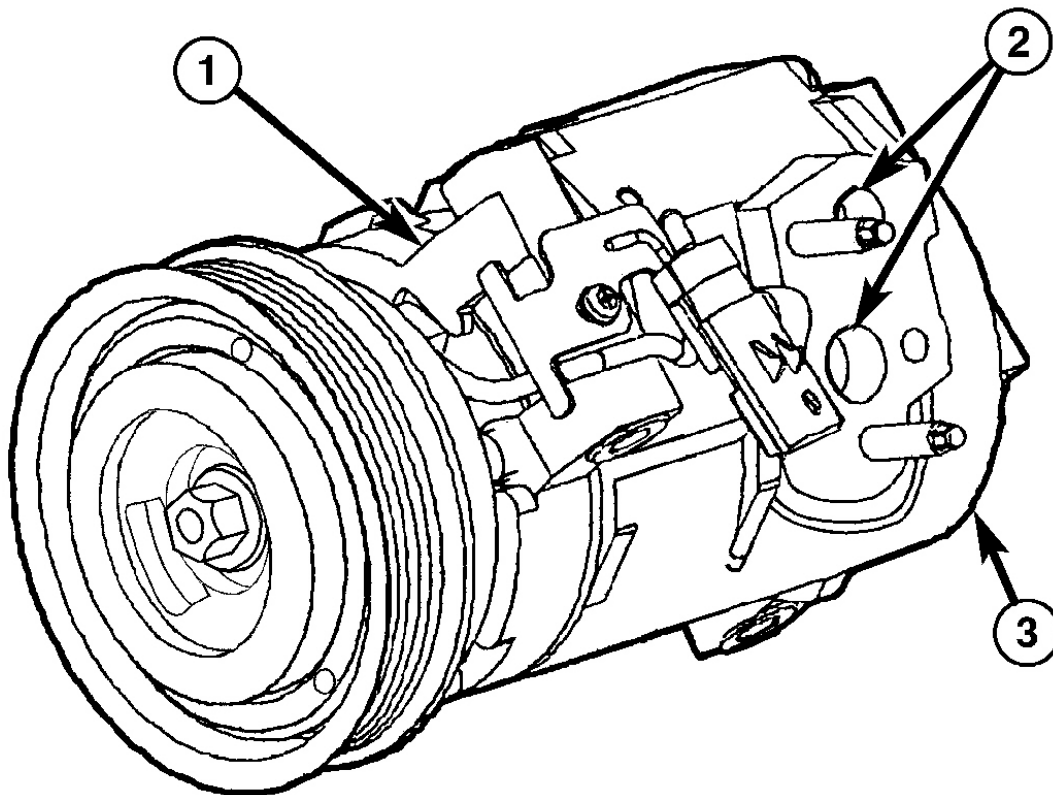
HIGH PRESSURE GAUGE HOSE - The high pressure hose (Red with Black stripe) attaches to the high-side service port. This port is located on the A/C liquid line near the front of the engine compartment.

RECOVERY, RECYCLING, EVACUATION AND CHARGING HOSE - The center manifold hose (Yellow, or White, with Black stripe) is used to recover, evacuate, and charge the refrigerant system. When the low or high pressure valves on the manifold gauge set are opened, the refrigerant in the system will escape through this hose.

COMPRESSOR-A/C

DESCRIPTION

COMPRESSOR-A/C



812c0f81

Fig. 126: Denso 10S17 Compressor
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 3.7L engine use a Visteon HS-18 A/C compressor (1). This A/C compressor is a 10 cylinder reciprocating swash plate-type compressor that uses an electrically operated clutch to engage and disengage the A/C compressor from the engine accessory drive belt.

The HS-18 A/C compressor has a fixed displacement of 180 cubic centimeters (10.9 cubic inches) and has the suction and discharge ports (2) located on the compressor cylinder head (3) at the rear of the compressor and a label which identifies the use of R-134a refrigerant.

COMPRESSOR-A/C

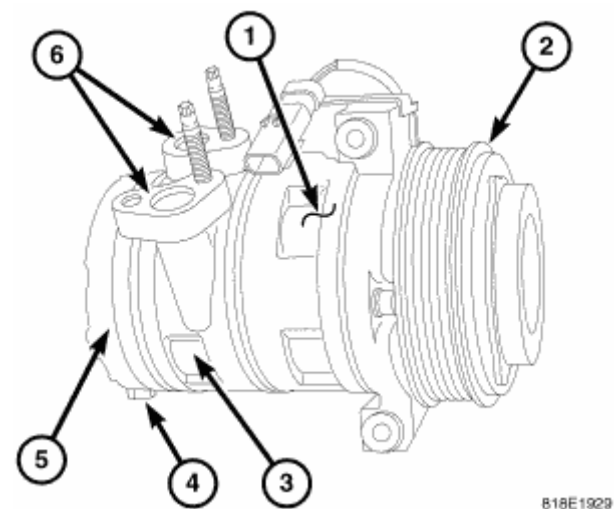


Fig. 127: A/C Compressor Components
Courtesy of CHRYSLER LLC

The A/C system on models equipped with the 2.8L and 4.0L engine use a Zexel DKS-17DS A/C compressor (1). This A/C compressor is a ten cylinder, double-acting swash plate-type compressor that uses an electrically operated clutch (2) to engage and disengage the A/C compressor from the engine accessory drive belt.

The DKS-17DS A/C compressor has a fixed displacement of 175.5 cubic centimeters (10.7 cubic inches) and has the suction and discharge ports (6) located on the compressor cylinder block (3). This A/C compressor also has an integral high pressure relief valve (4) located on the cylinder head (5) and a label which identifies the use of R-134a refrigerant.

VALVE-HIGH PRESSURE RELIEF-A/C COMPRESSOR

A high pressure relief valve is located on the A/C compressor. This mechanical valve is designed to vent refrigerant from the A/C system to protect against damage to the A/C compressor and other A/C system components, caused by condenser air flow restriction or an overcharge of refrigerant.

OPERATION

COMPRESSOR-A/C

The A/C compressor is driven by the engine through an electric clutch, drive pulley and belt arrangement. The A/C compressor is lubricated by refrigerant oil that is circulated throughout the refrigerant system with the

refrigerant.

The A/C compressor draws in low-pressure refrigerant vapor from the A/C evaporator through its suction port. It then compresses the refrigerant into a high-pressure, high-temperature refrigerant vapor, which is then pumped to the A/C condenser through the compressor discharge port.

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level can prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

The A/C compressor cannot be repaired and must be replaced if inoperative or damaged. The compressor clutch, pulley and bearing assembly, and clutch field coil are available for service. If an internal failure of the A/C compressor has occurred, the A/C receiver/drier must also be replaced. See REMOVAL.

VALVE-HIGH PRESSURE RELIEF-A/C COMPRESSOR

The high pressure relief valve vents refrigerant from the A/C system when a discharge pressure of 3430 to 3930 kPa (497 to 570 psi) or above is reached. The high pressure relief valve closes with a minimum discharge pressure of 2990 kPa (4370 psi) is reached.

The high pressure relief valve vents only enough refrigerant to reduce the A/C system pressure, and then re-seats itself. The majority of the refrigerant is conserved in the A/C system. If the high pressure relief valve vents refrigerant, it does not mean the valve is faulty.

The high pressure relief valve is factory-calibrated and cannot be adjusted or repaired, and must not be removed or otherwise disturbed. The valve is only serviced as a part of the A/C compressor.

DIAGNOSIS AND TESTING

COMPRESSOR-A/C

When investigating an A/C system related noise, you must first know the conditions under which the noise occurs. These conditions include: weather, vehicle speed, transmission in gear or neutral, engine speed, engine temperature, and any other special conditions. Noises that develop during A/C operation can often be misleading. For example: What sounds like a failed front engine bearing or connecting rod, may be caused by loose bolts, nuts, mounting brackets or a loose compressor clutch assembly.

Drive belts are speed sensitive. At different engine speeds and depending upon drive belt tension, drive belts can develop noises that are mistaken for an A/C compressor noise. Improper drive belt tension can cause a misleading noise when the compressor clutch is engaged, which may not occur when the compressor clutch is disengaged. Check the accessory drive belt condition and tension as described in Cooling before beginning this procedure.

1. Select a quiet area for testing. Duplicate the complaint conditions as much as possible. Turn the A/C compressor On and Off several times to clearly identify the compressor noise. Listen to the A/C compressor while the clutch is engaged and disengaged. Probe the A/C compressor with an engine stethoscope or a long screwdriver with the handle held to your ear to better localize the source of the noise.
2. Loosen all of the compressor mounting hardware and retighten. Check the compressor clutch retainer. Be certain that the clutch field coil is mounted securely to the A/C compressor, and that the clutch plate and pulley are properly aligned and have the correct air gap.
3. To duplicate high-ambient temperature conditions (high head pressure), restrict the air flow through the A/C condenser. Install a manifold gauge set or a scan tool to be certain that the discharge pressure does not exceed 2760 kPa (400 psi).
4. Check the refrigerant system plumbing for incorrect routing, rubbing or interference, which can cause unusual noises. Also check the refrigerant lines and hoses for kinks or sharp bends that will restrict refrigerant flow, which can cause noises. See **DESCRIPTION**.
5. If the noise is from opening and closing of the high pressure relief valve, recover, evacuate and recharge the refrigerant system. See **STANDARD PROCEDURE**.
6. If the high pressure relief valve still does not seat properly, replace the A/C compressor. See **REMOVAL**.

REMOVAL

2.8L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C compressor can be removed from the engine and repositioned without disconnecting the refrigerant lines or discharging the refrigerant system. Discharging is not necessary if servicing the A/C clutch or various engine components.

NOTE: LHD model shown in illustrations. RHD model similar.

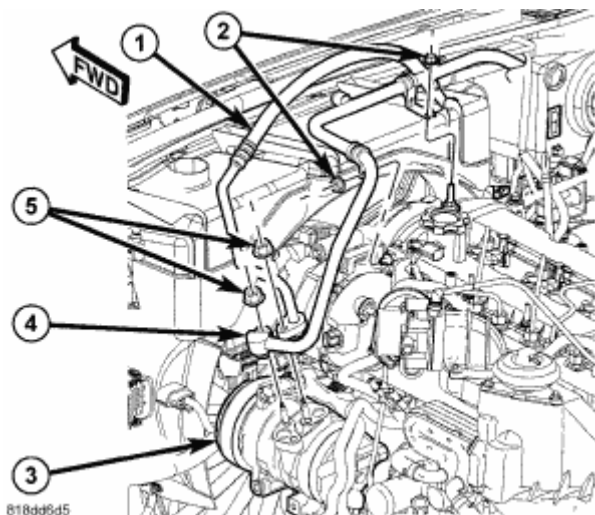


Fig. 128: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing. **REMOVAL**
4. Remove the air inlet tube from the throttle body and the charge air cooler.
5. Remove the battery. Refer to **REMOVAL** .
6. Remove the radiator fan and fan shroud. Refer to **REMOVAL** .
7. Remove the accessory drive belt. Refer to **REMOVAL** .
8. Remove the generator. Refer to **REMOVAL** .
9. On LHD models, remove the two nuts (2) that secure the A/C suction line (4) to the top of the engine.
10. Remove the nuts (5) that secures the A/C suction line and A/C discharge line (1) to the A/C compressor (3).
11. Disconnect the A/C suction and discharge lines from the A/C compressor and remove and discard the O-ring seals and gaskets.

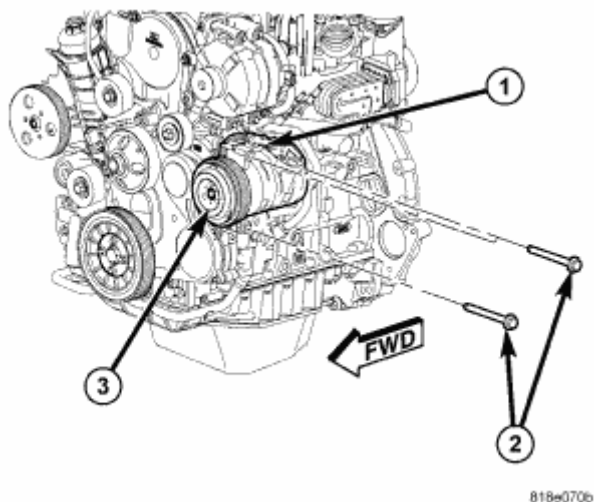


Fig. 129: A/C Clutch Field Coil Connector, Bolts & A/C Compressor
Courtesy of CHRYSLER LLC

12. Disconnect the engine wire harness from the A/C clutch field coil connector (1).
13. Support the A/C compressor (3) and remove the three bolts (2) that secure the compressor to the engine.
14. Remove the A/C compressor from the engine compartment.
15. Install plugs in, or tape over the opened refrigerant line fittings and the compressor ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C compressor can be removed from the engine and repositioned without disconnecting the refrigerant lines or discharging the refrigerant system. Discharging is not necessary if servicing the A/C clutch or various engine components.

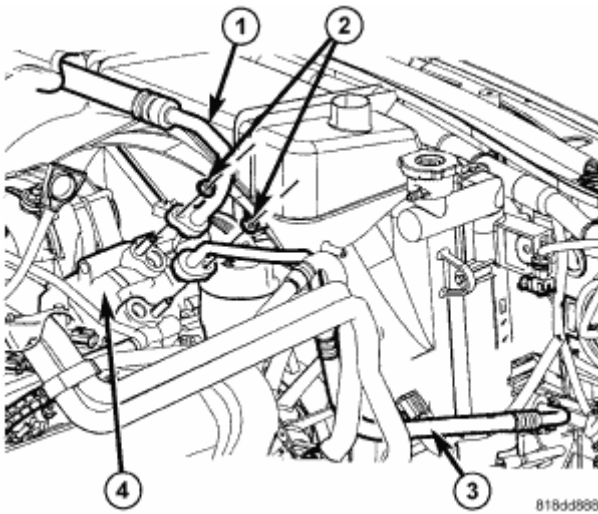


Fig. 130: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the accessory drive belt. Refer to **REMOVAL** .
5. Remove the nuts (2) that secure the A/C suction line (1) and A/C discharge line (3) to the A/C compressor (4).
6. Disconnect the A/C suction and discharge lines from the A/C compressor and remove and discard the O-ring seals and gaskets.

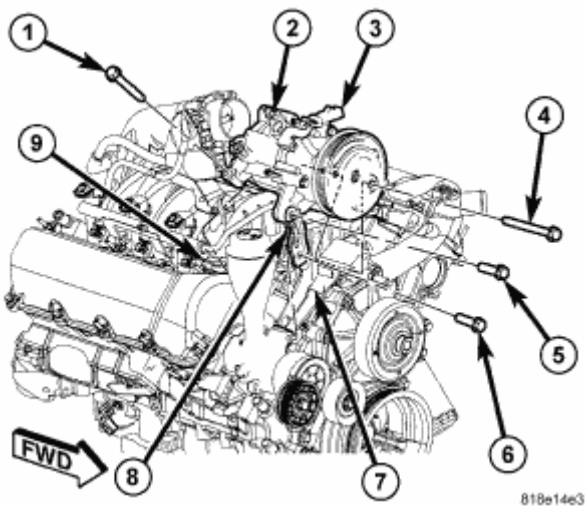


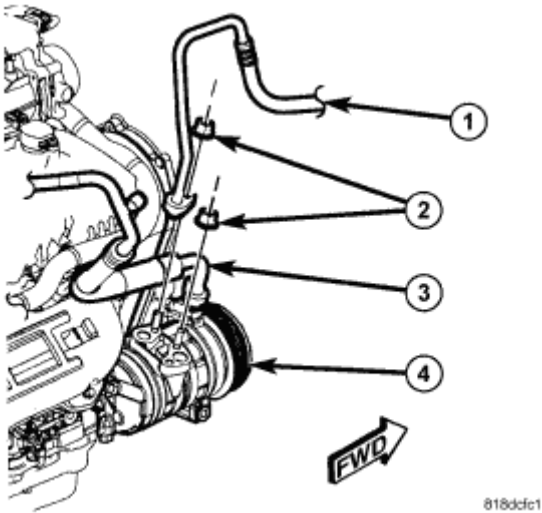
Fig. 131: A/C Compressor Components

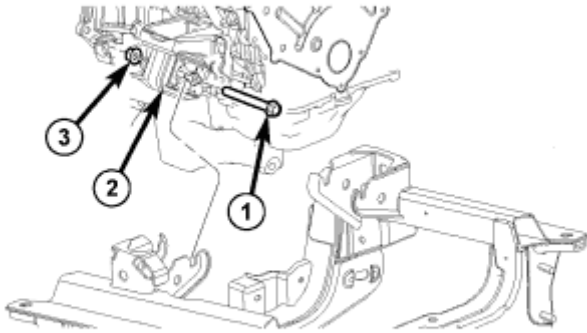
Courtesy of CHRYSLER LLC

7. Disconnect the engine wire harness from the A/C clutch field coil connector (3).

8. Loosen the bolt (6) that secures the compressor bracket (8) to the engine front cover (7).
9. Remove the bolt (1) that secures the A/C compressor (2) to the intake manifold (9).
10. Remove the two bolts (4 and 5) that secure the A/C compressor to the front of the engine.
11. Remove the A/C compressor from the engine and install plugs in, or tape over the opened refrigerant line fittings and the compressor ports.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible serious or fatal injury.





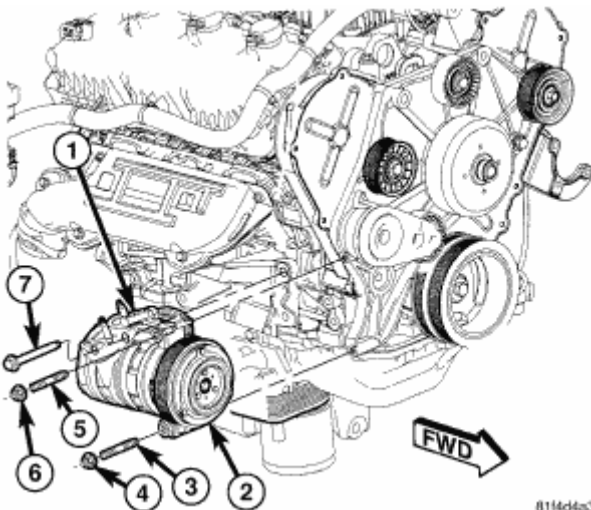
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Fig. 133: ENGINE MOUNT TO FRAME
 Courtesy of CHRYSLER LLC

8. Raise and support the vehicle.
9. Remove the nut (3) from the through bolt (1) on the right side engine mount (3).

CAUTION: Do not completely remove the right side motor mount through bolt when performing this procedure. The bolt supports the engine at the lower mount and removal of the bolt will allow the engine to sit further down in the frame, which may cause possible damage to the engine and various other components.

10. Support the engine with a suitable jack and partially remove the through bolt to allow the right side of the engine to be raised off of the motor mount.



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Fig. 134: Removing/Installing A/C Compressor

Courtesy of CHRYSLER LLC

11. Remove the jack stand and lower the vehicle.
12. Disconnect the engine wire harness from the A/C clutch field coil connector (1).

CAUTION: Use care when raising the engine when performing this procedure. Be sure to protect the bottom of the engine and various other components from damage.

13. Using a suitable floor jack and a block of wood under the oil pan to protect from damage, raise the right side of the engine to gain access to remove the stud (3) that secures the lower front of the A/C compressor (2) to the accessory drive belt bracket.
14. Remove the nut (4) and stud that secures the lower front of the A/C compressor to the accessory drive belt bracket.
15. Remove the bolt (7) that secures the rear of the A/C compressor to the engine.
16. Support the A/C compressor and remove the nut (6) and stud (5) that secures the upper front of the A/C compressor to the accessory drive belt bracket and remove the compressor.

INSTALLATION

2.8L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be removed from the new A/C compressor. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

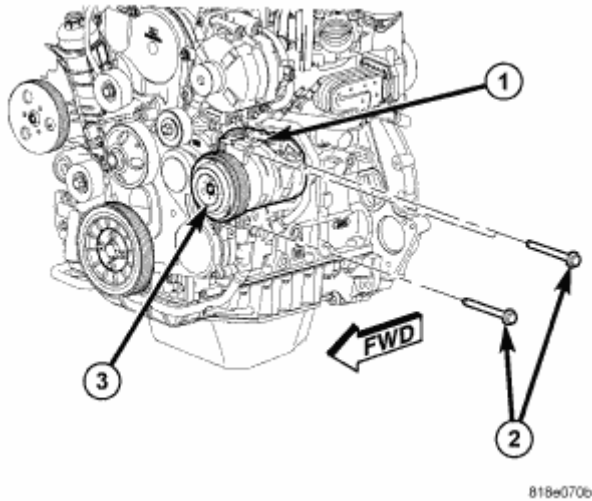


Fig. 135: A/C Clutch Field Coil Connector, Bolts & A/C Compressor
 Courtesy of CHRYSLER LLC

1. If the A/C compressor (3) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See **STANDARD PROCEDURE**. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Position the A/C compressor onto the engine.
3. Install the three bolts (2) that secure the A/C compressor to the engine. Tighten the bolts to 28 N.m (21 ft. lbs.).
4. Connect the engine wire harness to the A/C clutch field coil connector (1).

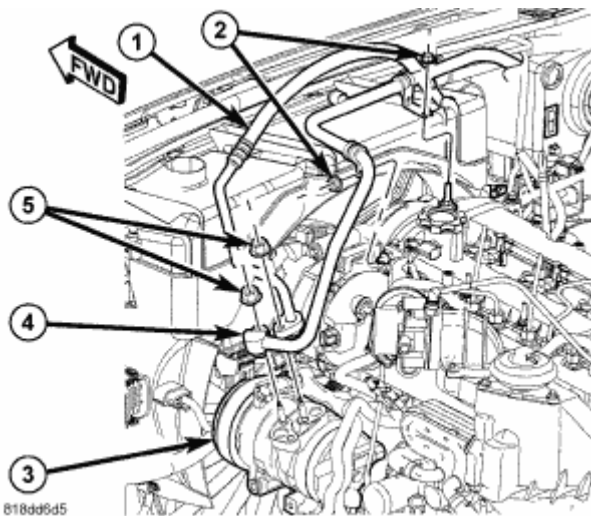


Fig. 136: Refrigerant Line System
 Courtesy of CHRYSLER LLC

5. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.

6. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
7. Connect the A/C suction line (4) and A/C discharge line (1) to the A/C compressor (3).
8. Install the nuts (5) that secure the A/C suction and discharge lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
9. On LHD models, install the two nuts (2) that secure the A/C suction line to the top of the engine. Tighten the nuts to 4.5 N.m (40 in. lbs.).
10. Install the generator. Refer to **INSTALLATION** .
11. Install the accessory drive belt. Refer to **INSTALLATION** .
12. Install the radiator fan and fan shroud. Refer to **INSTALLATION** .
13. Install the battery. Refer to **INSTALLATION** .
14. Install the air inlet tube to the throttle body and the charge air cooler. Tighten the clamps securely.
15. Install the air cleaner housing.
16. Reconnect the negative battery cable.
17. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
18. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be removed from the new A/C compressor. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

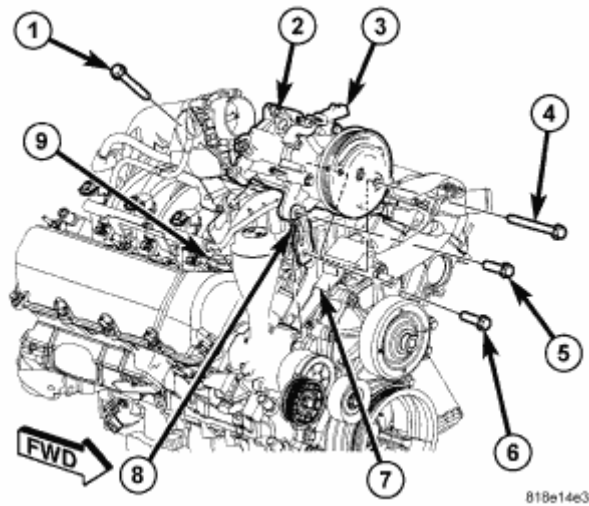


Fig. 137: A/C Compressor Components
Courtesy of CHRYSLER LLC

1. If the A/C compressor (2) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See **STANDARD PROCEDURE**. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Position the A/C compressor to the intake manifold (9) and the engine front cover (7).
3. Install and hand tighten the three compressor retaining bolts (1, 4 and 5).
4. Tighten the bolts in the following sequence:
 - The rear bolt (1) to 55 N.m (41 ft. lbs.).
 - The front inboard bolt (5) to 40 N.m (30 ft. lbs.).
 - The front outboard bolt (4) to 55 N.m (41 ft. lbs.).
5. Tighten the bolt (6) that secures the compressor bracket (8) to the engine front cover to 40 N.m (30 ft. lbs.).
6. Connect the engine wire harness to the A/C clutch field coil connector (3).

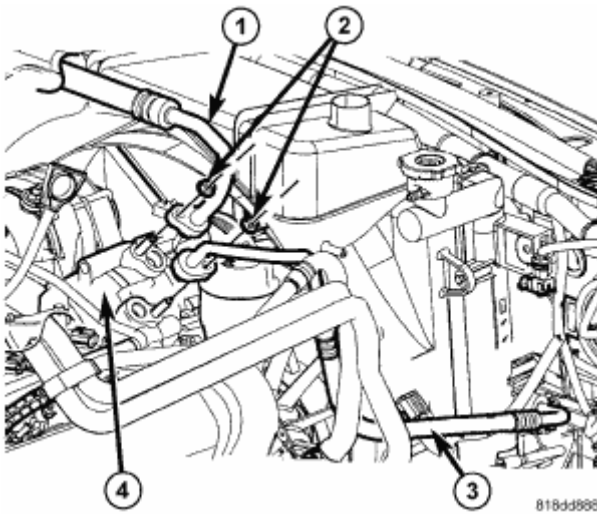


Fig. 138: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

7. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.
8. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
9. Connect the A/C suction line (1) and the A/C discharge line (3) to the A/C compressor (4).
10. Install the nuts (2) that secure the A/C suction and discharge lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
11. Install the accessory drive belt. Refer to **INSTALLATION** .
12. Install the air cleaner housing (refer to **INSTALLATION**).
13. Reconnect the negative battery cable.
14. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: If the A/C compressor is being replaced, be certain to adjust the refrigerant system oil level. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The A/C receiver/drier must be replaced if an internal failure of the A/C compressor has occurred. Failure to replace the A/C receiver/drier can cause serious damage to the replacement A/C compressor.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be removed from the

new A/C compressor. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

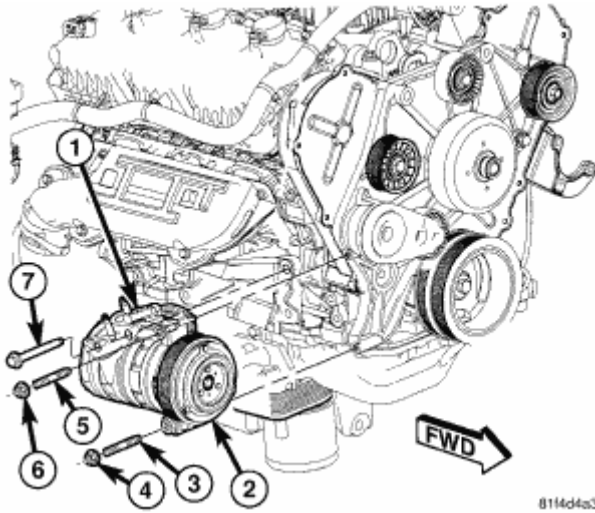


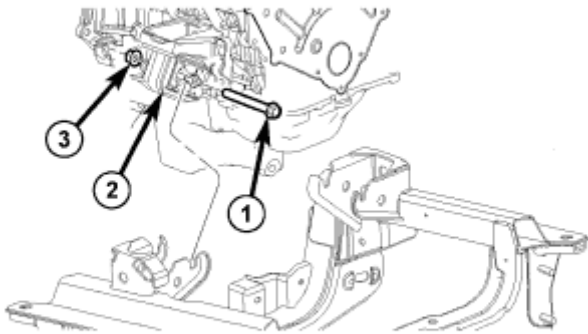
Fig. 139: Removing/Installing A/C Compressor
Courtesy of CHRYSLER LLC

1. If the A/C compressor (2) is being replaced, the refrigerant oil in the old compressor must be first drained and measured. Then the oil in the new A/C compressor must be drained. Finally, the new compressor must be refilled with the same amount of new refrigerant oil that was drained out of the old compressor. See STANDARD PROCEDURE. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

CAUTION: Use care when raising the engine when performing this procedure. Be sure to protect the bottom of the engine and various other components from damage.

2. Using a suitable floor jack and a block of wood under the oil pan to protect from damage, raise the right side of the engine until the stud (3) that secures the lower front of the A/C compressor to the accessory drive belt bracket can be installed.
3. Install the stud that secures the lower front of the A/C compressor to the accessory drive belt bracket. Tighten the stud securely.
4. Install the stud (5) that secures the upper front of the compressor to the accessory drive belt bracket. Tighten the stud securely.
5. Loosely install the nuts (4 and 6) that secure the front of the A/C compressor to the accessory drive belt bracket.
6. Loosely install the bolt (7) that secures the rear of the A/C compressor to the engine.
7. Tighten each of the compressor fasteners to 28 N.m (21 ft. lbs.) using the following sequence:

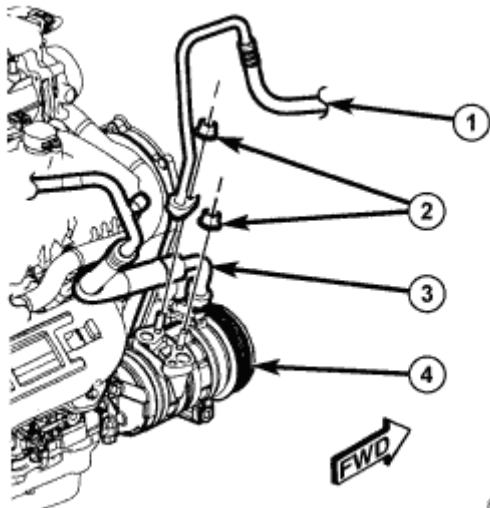
- The upper nut at front of compressor.
 - The lower nut at front of compressor.
 - The bolt at the rear of compressor.
8. Lower the right side of the engine and remove the jack and wood block.
 9. Connect the engine wire harness to the A/C clutch field coil connector (1).
 10. Lower the engine and remove the floor jack.



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Fig. 140: ENGINE MOUNT TO FRAME
Courtesy of CHRYSLER LLC

11. Raise and support the vehicle.
12. Support the engine with a suitable jack and install the through bolt (1) and nut (3) to the right side engine mount (3). Tighten the nut to 101 N.m (75 ft. lbs.).



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Fig. 141: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

13. Remove the jack stand and lower the vehicle.
14. Remove the tape or plugs from the opened refrigerant line fittings and the compressor ports.
15. Lubricate new O-ring seals with clean refrigerant oil and install them and new gaskets on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
16. Connect the A/C discharge line (1) and the A/C suction line (3) to the A/C compressor (4).
17. Install the nuts (2) that secure the A/C discharge and suction lines to the A/C compressor. Tighten the nuts to 12 N.m (105 in. lbs.).
18. Install the accessory drive belt. Refer to **INSTALLATION** .
19. Install the air cleaner housing (refer to **INSTALLATION**).
20. Reconnect the negative battery cable.
21. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
22. Charge the refrigerant system. See **STANDARD PROCEDURE**.

CONDENSER-A/C

DESCRIPTION

CONDENSER-A/C

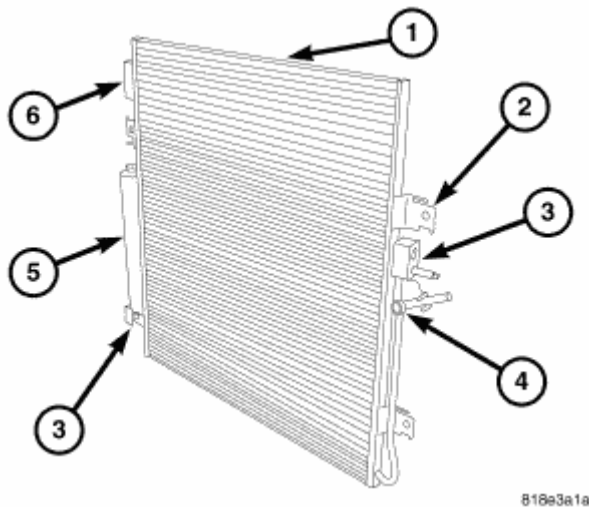


Fig. 142: A/C Condenser Components
Courtesy of CHRYSLER LLC

The A/C condenser (1) is located in the front of the engine compartment behind the front fascia. The A/C condenser is a heat exchanger that allows the high-pressure refrigerant gas being discharged by the A/C compressor to give up its heat to the air passing over the condenser fins, which causes the refrigerant to cool and change to a liquid state.

The A/C condenser is equipped with mounting provisions (2) to attach it to the radiator and has tapping blocks (3) for the A/C discharge line and for the receiver/drier (5). A spring lock coupler is used on the condenser outlet tube (4) for the A/C liquid line connection. See **DESCRIPTION**.

On automatic transmission equipped vehicles, the A/C condenser is also equipped with an integral automatic transmission cooler (6).

OPERATION

CONDENSER-A/C

When air passes through the fins of the A/C condenser, the high-pressure refrigerant gas within the A/C condenser gives up its heat. The refrigerant then condenses as it leaves the A/C condenser and becomes a high-pressure liquid. The volume of air flowing over the condenser fins is critical to the proper cooling performance of the A/C system. Therefore, it is important that there are no objects placed in front of the radiator grille openings at the front of the vehicle or foreign material on the condenser fins that might obstruct proper air flow. Also, any factory-installed air seals or shrouds must be properly reinstalled following radiator or A/C condenser service.

NOTE: **Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.**

The A/C condenser has no serviceable parts. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever a refrigerant line is removed from the A/C condenser.

The A/C condenser cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

CONDENSER-A/C

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

CAUTION: Before removing the A/C condenser, note the location of each of the radiator/condenser air seals. These air seals are used to direct air through the A/C condenser and radiator. The air seals must be reinstalled in their proper locations in order for the A/C and engine cooling systems to perform as designed.

NOTE: **LHD model shown in illustrations. RHD model similar.**

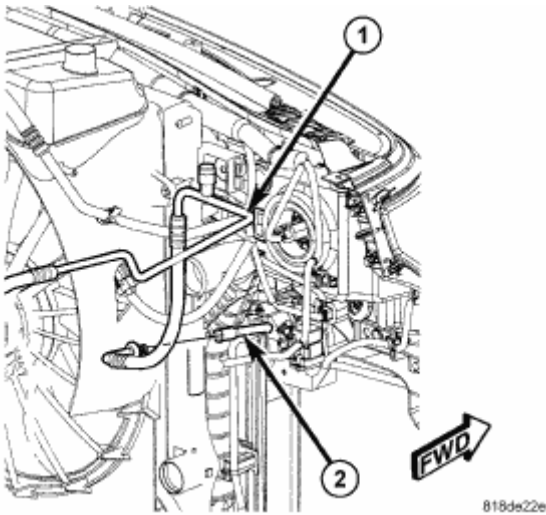


Fig. 143: A/C Liquid Line & Condenser Tube
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the engine air cleaner housing (refer to **AIR INTAKE SYSTEM**).
4. Remove the secondary retaining clip and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.

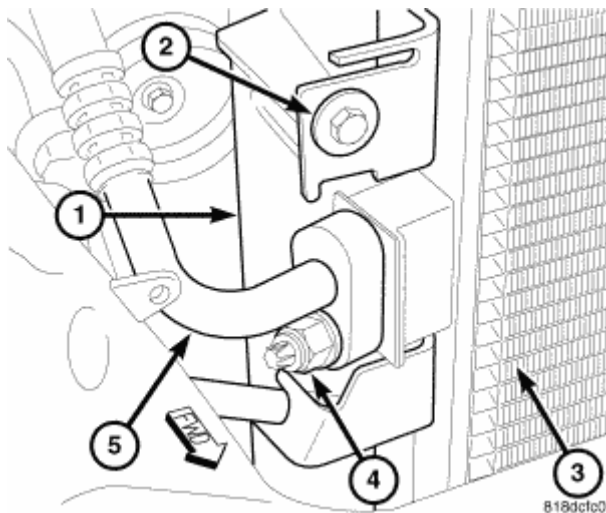


Fig. 144: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

NOTE: Upper condenser retaining bracket and bolt shown in graphic. Lower retaining bracket and bolt similar.

5. Remove the grille. Refer to **REMOVAL** .
6. If equipped with an automatic transmission, disconnect the transmission cooler lines from the

transmission cooler portion of the A/C condenser. Refer to **REMOVAL** .

7. Position the right side condenser air seal out of the way to gain access to the discharge line fitting and the lower condenser retaining bolt.

NOTE: **Rotate and tilt the A/C discharge line as necessary to disconnect it from the A/C condenser.**

8. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3) and disconnect the discharge line.
9. Remove the two bolts (2) that secure the A/C condenser to the right side of the radiator (1).
10. Carefully lift the A/C condenser straight up to disengage the condenser mounting brackets from the radiator and remove the condenser from the vehicle.
11. If required, remove the A/C receiver/drier from the A/C condenser. See **REMOVAL**.
12. Remove and discard the O-ring seals and gasket and install plugs in, or tape over the opened refrigerant line fittings and the condenser and receiver/drier ports.

INSTALLATION

CONDENSER-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The radiator/condenser air seals must be reinstalled in their proper locations in order for the A/C and engine cooling systems to perform as designed.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the A/C condenser is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

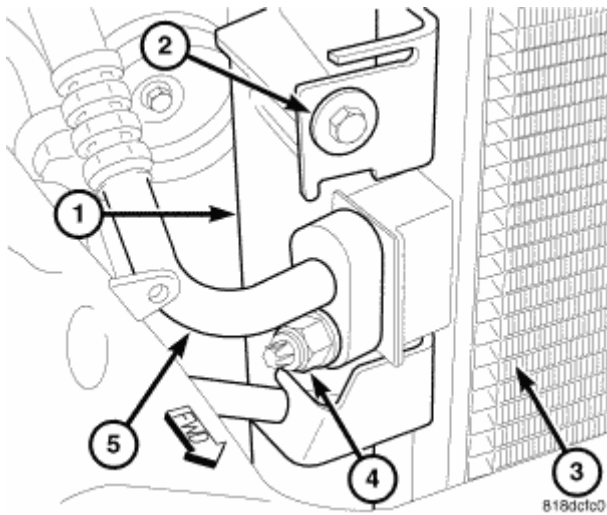


Fig. 145: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

NOTE: Upper condenser retaining bracket and bolt shown in graphic. Lower retaining bracket and bolt similar.

1. Remove the tape or plugs from the opened refrigerant line fittings and the receiver/drier and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and a new gasket onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. If removed, install the A/C receiver/drier onto the A/C condenser (3). See **INSTALLATION**.
4. Position the A/C condenser into the engine compartment and install it onto the condenser mounting brackets.
5. Install the two bolts (2) that secure the A/C condenser to the right side of the radiator (1). Tighten the bolts to 5 N.m (44 in. lbs.).

NOTE: Rotate and tilt the A/C discharge line as necessary to connect it to the A/C condenser.

6. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4). Tighten the nut to 22.5 N.m (200 in. lbs.).
7. Reposition the right side condenser air seal.
8. If equipped with an automatic transmission, connect the transmission cooler lines to the transmission cooler portion of the A/C condenser. Refer to **INSTALLATION**.
9. Install the grille. Refer to **INSTALLATION**.

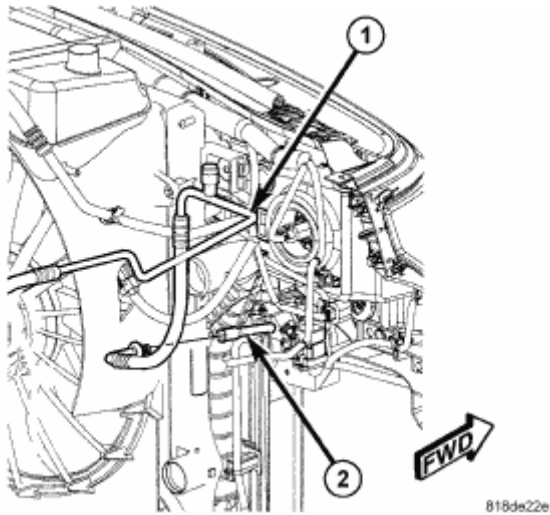


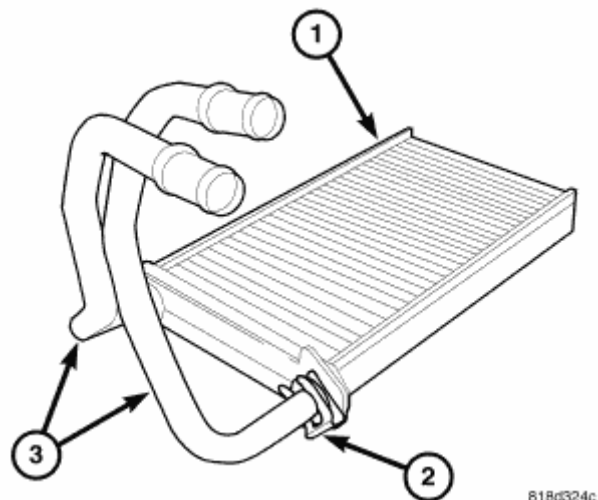
Fig. 146: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

10. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.
11. Install the engine air cleaner housing (refer to **AIR INTAKE SYSTEM**).
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
14. If the A/C condenser is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

CORE-HEATER

DESCRIPTION

CORE-HEATER



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Fig. 147: Heater Core, Metal Retaining Clamps & Heater Core Tubes
Courtesy of CHRYSLER LLC

The heater core (1) is mounted into the HVAC air distribution housing, located behind the instrument panel. The heater core is a heat exchanger made of rows of tubes and fins. The heater core is secured to the air distribution housing by four plastic retaining tabs. The heater core tubes (3) are attached to the heater core by use of metal retaining clamps (2) and rubber O-ring seals.

The heater core tubes are not serviced separately from the heater core. The air distribution housing must be removed from the vehicle to service the heater core.

OPERATION

CORE-HEATER

Engine coolant is circulated through the heater hoses to the heater core at all times. As the coolant flows through the heater core, heat is removed from the engine and is transferred to the heater core tubes and fins. Air directed through the heater core picks up the heat from the heater core fins. The blend-air door allows control of the heater output air temperature by regulating the amount of air flowing through the heater core. The blower motor speed controls the volume of air flowing through the HVAC housing.

The heater core cannot be repaired and it must be replaced if inoperative, leaking or damaged.

REMOVAL

CORE-HEATER

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental

airbag deployment and possible personal injury or death.

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

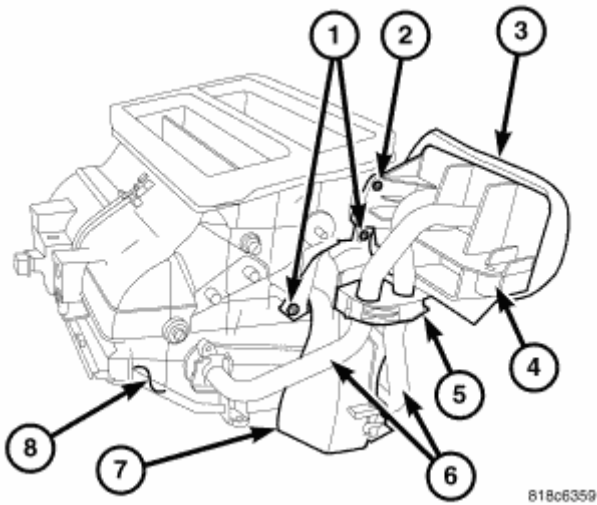


Fig. 148: Air Distribution Housing Assembly
Courtesy of CHRYSLER LLC

1. Remove the HVAC housing assembly and place it on a workbench. See REMOVAL.
2. Remove the air distribution housing from the HVAC housing. See REMOVAL.
3. Remove the two screws (1) that secure the upper front passenger side floor duct (7) to the passenger side of the air distribution housing (8) and remove the duct.

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.

4. Carefully remove the foam seal (4) from the heater core tube flange (5). If the seal is deformed or damaged, it must be replaced.
5. Remove the screw (2) that secures the heater core tube flange to the air distribution housing.
6. Disengage the plastic retainer (5) from around the heater core tubes (6) and remove the flange.

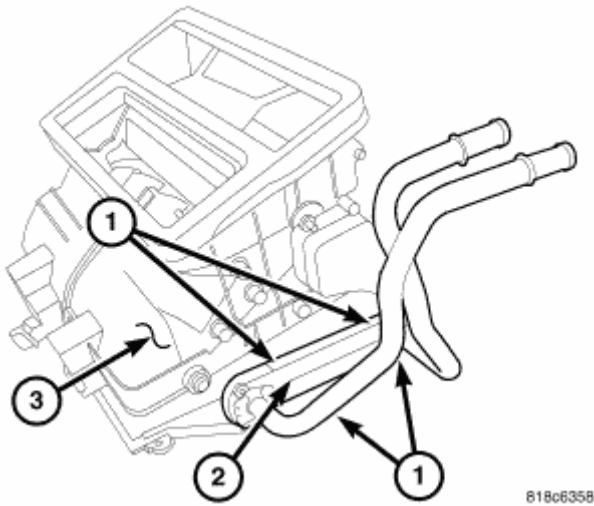


Fig. 149: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

7. Disengage the four plastic retaining tabs (1) that secure the heater core (2) to the passenger side of the air distribution housing (3) and carefully remove the heater core from the housing.

INSTALLATION

CORE-HEATER

WARNING: The heater core tubes are not serviced separately from the heater core. The heater core tubes should not be repositioned, loosened or removed from the heater core. Failure to follow this warning could result in a coolant leak and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

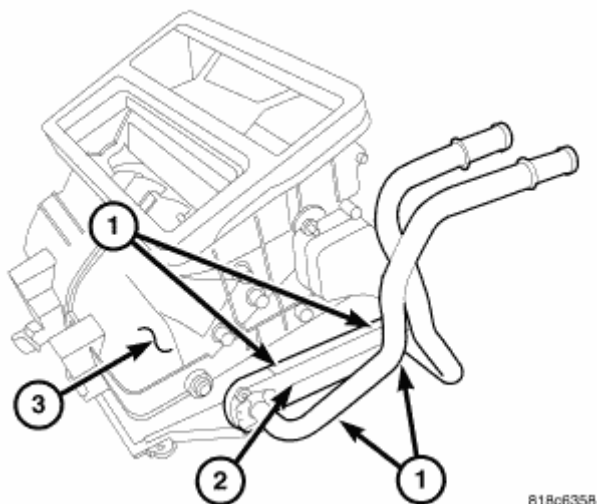


Fig. 150: Plastic Retaining Tabs, Heater Core & Air Distribution Housing
 Courtesy of CHRYSLER LLC

NOTE: If the foam insulator around the heater core is deformed or damaged, the insulator must be replaced.

1. Carefully install the heater core (2) into the passenger side of the air distribution housing (3) and engage the four plastic retainer tabs (1) that secure the heater core to the housing. Make sure the retaining tabs are fully engaged.

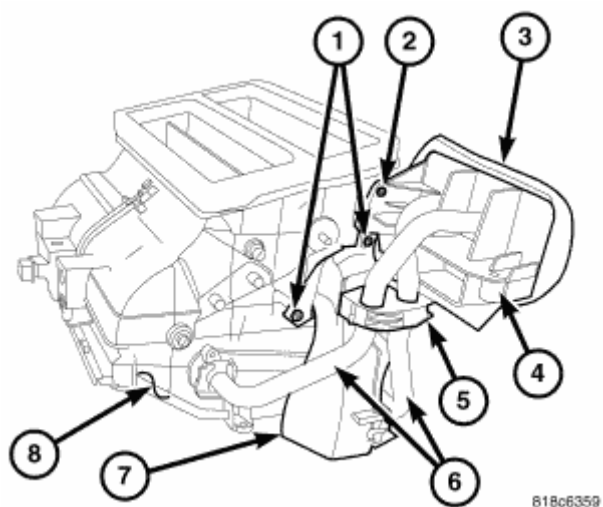


Fig. 151: Air Distribution Housing Assembly
 Courtesy of CHRYSLER LLC

2. Position the heater core tube flange (4) over the heater core tubes (6) and onto the to the passenger side of the air distribution housing (8).
3. Engage the plastic retainer (5) around the heater core tubes. Make sure the retainer is fully engaged around the tubes.
4. Install the screw (2) that secure the heater core tube flange to the air distribution housing. Tighten the

screws to 1.2 N.m (10 in lbs.).

5. Install the upper front passenger side floor duct (7) onto the air distribution housing and install the two retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).

NOTE: If the foam seal for the heater core tube flange is deformed or damaged, it must be replaced.

6. Install the foam seal (3) onto the heater core tube flange.
7. Install the air distribution housing onto the HVAC housing. See INSTALLATION.

NOTE: If the heater core is being replaced, flush the cooling system. Refer to STANDARD PROCEDURE .

8. Install the HVAC housing assembly. See INSTALLATION.

CORE-VALVE-SERVICE PORT

DESCRIPTION

CORE-VALVE-SERVICE PORT

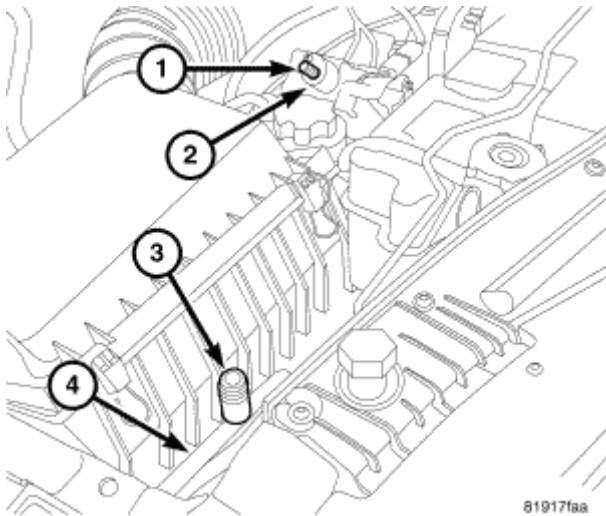


Fig. 152: Low-Side Service Port, A/C Suction Line, High-Side Service Port & A/C Liquid Line
Courtesy of CHRYSLER LLC

NOTE: 3.7L LHD model shown in illustration. 2.8L, 4.0L and RHD models similar.

Refrigerant system service ports are used to recover, recycle, evacuate, charge and test the A/C refrigerant system. Unique sizes are used on the two service ports for the R-134a refrigerant system to ensure the system is not accidentally contaminated with R-12 refrigerant or by service equipment used for R-12 refrigerant.

The low-side service port (1) is located on the A/C suction line (2) at either the rear of the engine compartment or near the A/C compressor, depending on engine and market. The high-side service port (3) is located on the

A/C liquid line (4) near the front of the engine compartment. Both the high-side and low-side A/C service port valve cores are serviceable.

NOTE: The protective cap aids in sealing the service port and helps to protect the refrigerant system from contamination. Remember to always reinstall the protective caps onto the service ports when refrigerant system service is complete.

Each of the service ports has a threaded plastic protective cap installed over it from the factory. The service port caps are serviceable items.

REMOVAL

CORE-VALVE-SERVICE PORT

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions may result in serious or fatal injury.

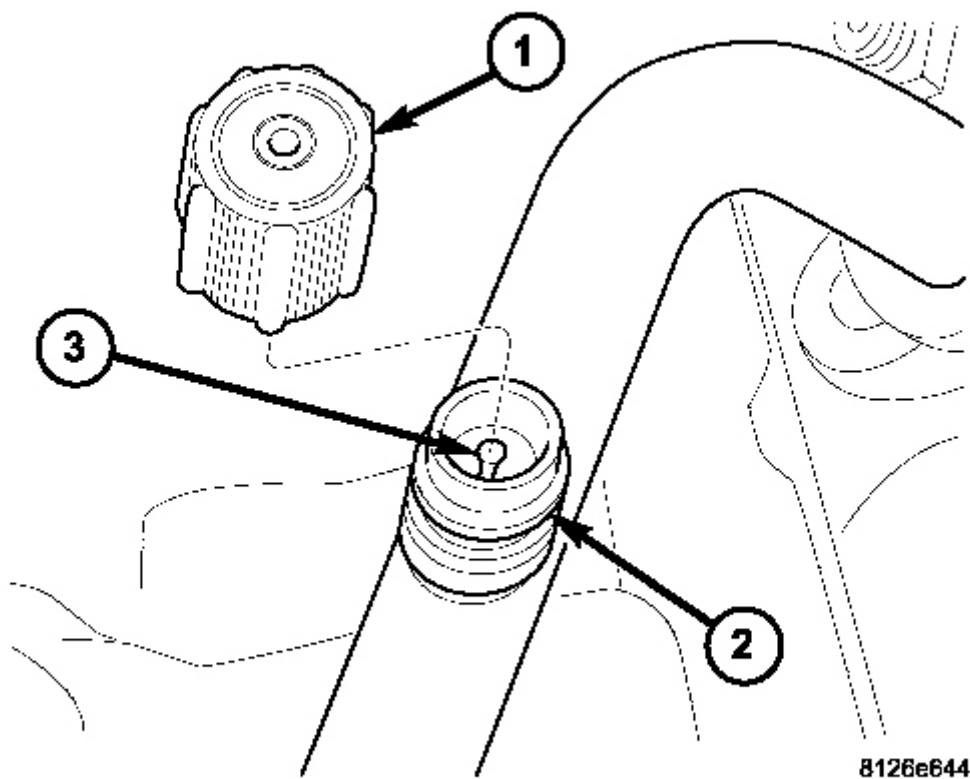


Fig. 153: Identifying A/C Service Port Components
Courtesy of CHRYSLER LLC

NOTE: Typical A/C service port shown in graphic.

1. Remove the protective cap (1) from the service port (2).
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Using a Schrader-type valve core tool, remove the valve core (3) from the service port.
4. Install a plug in, or tape over the opened service port(s).

INSTALLATION

CORE-VALVE-SERVICE PORT

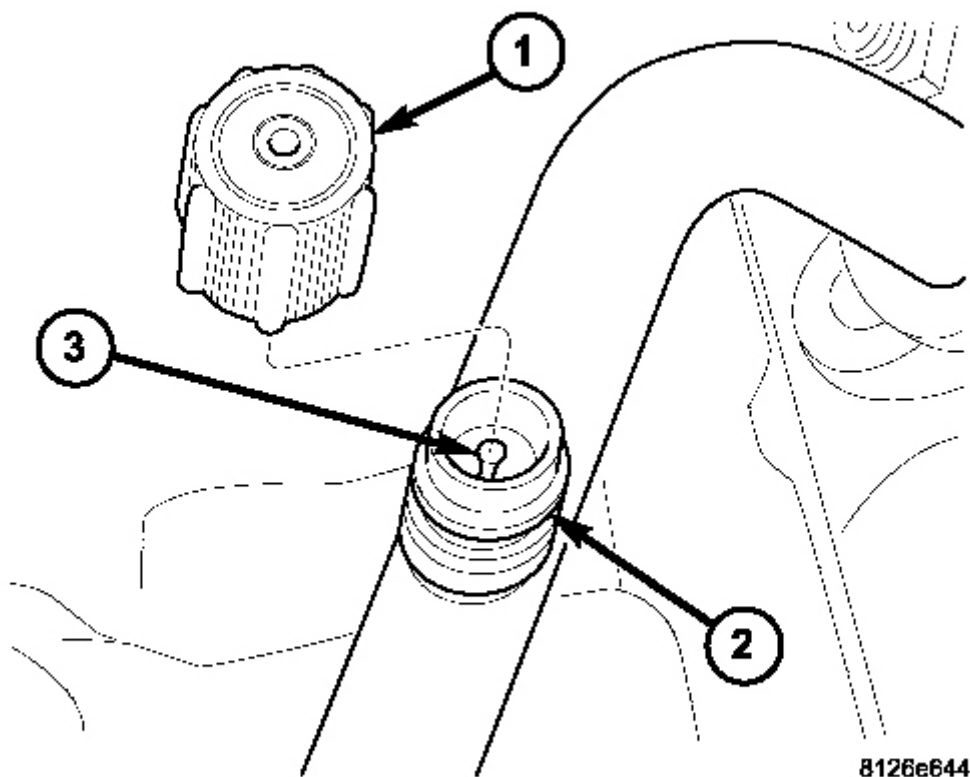


Fig. 154: Identifying A/C Service Port Components
Courtesy of CHRYSLER LLC

NOTE: Typical A/C service port shown in graphic.

1. Lubricate the valve core (3) with clean refrigerant oil prior to installation. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
2. Remove the tape or plug from the service port (2).

CAUTION: A valve core that is not fully seated in the A/C service port can result in damage to the valve during refrigerant system evacuation and charge. Such damage may result in a loss of system refrigerant while uncoupling the charge adapters.

3. Using a Schrader-type valve core tool, install and tighten the valve core into the service port(s).
4. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.

5. Charge the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: The protective cap helps aid in service port sealing and helps protect the refrigerant system from contamination. Remember to always reinstall the protective cap onto the service port when refrigerant system service is complete.

6. Install the protective cap (1) onto the service port.

COUPLER-REFRIGERANT LINE

DESCRIPTION

COUPLER- REFRIGERANT LINE

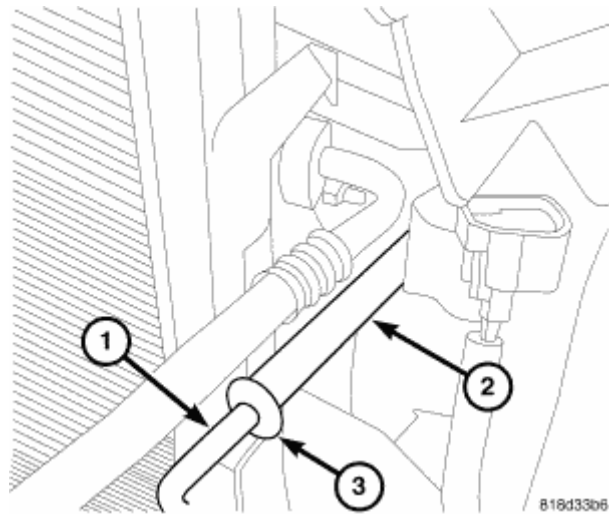


Fig. 155: A/C Liquid Line, A/C Condenser Outlet Tube & Spring-Lock Type Refrigerant Line Coupler
Courtesy of CHRYSLER LLC

The A/C liquid line (1) is attached to the A/C condenser outlet tube (2) by use of a spring-lock type refrigerant line coupler (3). A secondary retaining clip is installed over the connected coupler for added protection.

The spring-lock refrigerant line coupler requires a special disconnect tool for disengaging the two coupler halves.

OPERATION

COUPLER- REFRIGERANT LINE

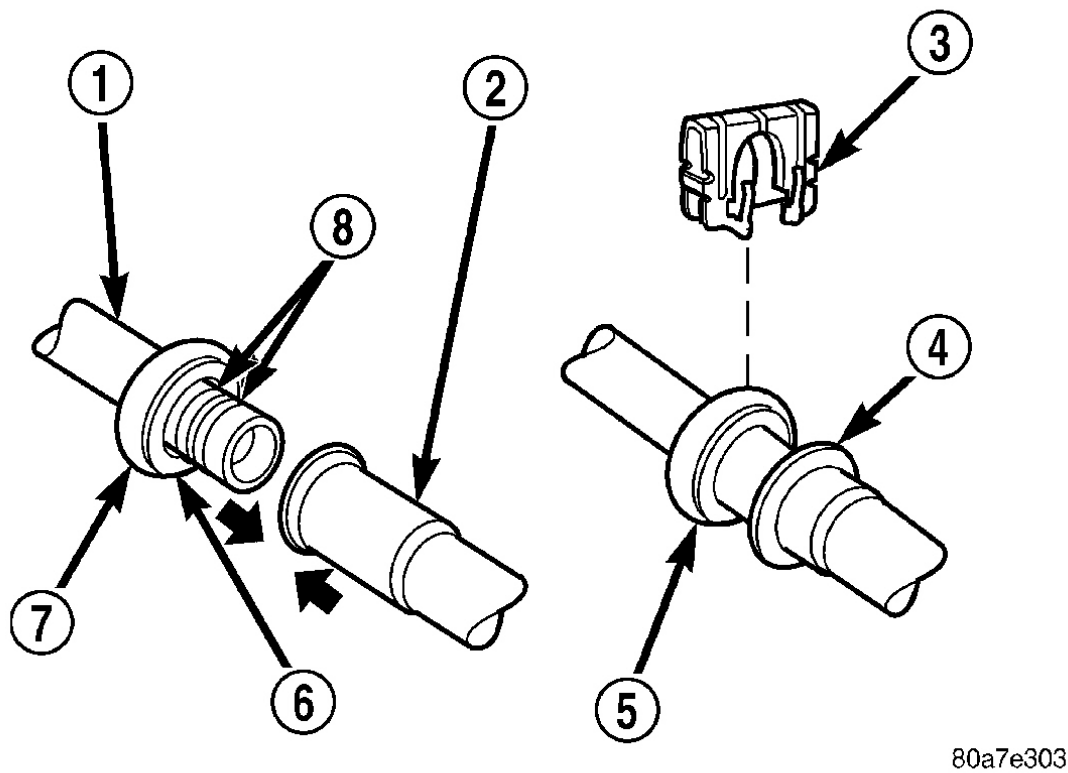


Fig. 156: Identifying Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

The spring-lock type refrigerant line coupler is held together by a garter spring (6) inside a circular cage (7) on the male half of the fitting (1). When the two coupler halves are connected, the flared end of the female fitting (2) slips behind the garter spring inside the cage on the male fitting. The garter spring and cage prevent the flared end of the female fitting from pulling out of the cage. Some applications use a connection indicator ring (4) to help indicate when the two coupler halves are fully connected.

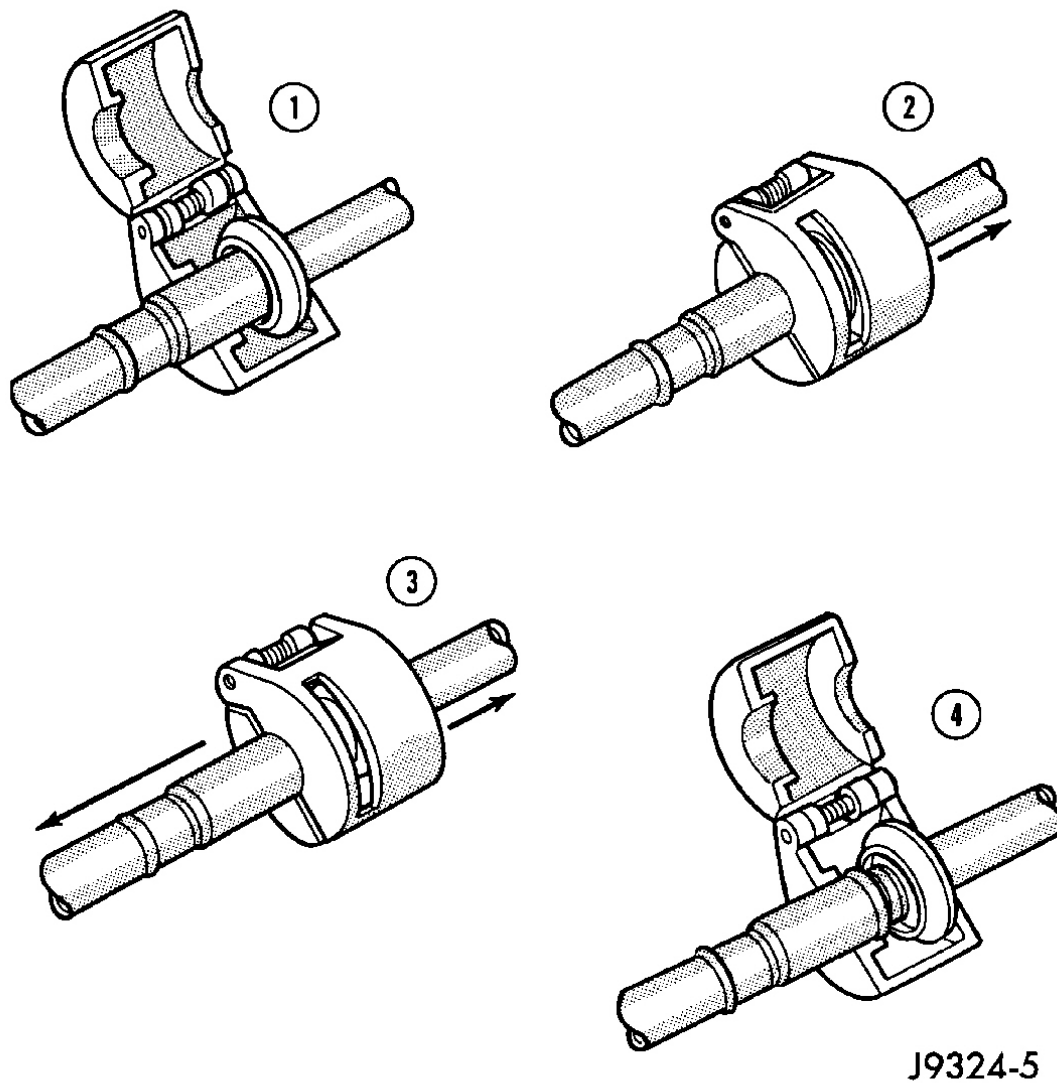
O-rings (8) are used to seal the coupler connections. These O-rings are compatible with R-134a refrigerant and must be replaced with O-rings made of the same material.

A secondary retaining clip (3) is installed over the connected coupler (5) for added protection.

REMOVAL

COUPLER- REFRIGERANT LINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.



J9324-5

Fig. 157: Disconnecting Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

1. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
2. Remove the secondary retaining clip from the spring-lock type refrigerant line coupler.
3. Fit the proper size A/C line disconnect tool (Special Tool Kit 7193 or equivalent) over the coupler cage (1).
4. Close the two halves of the A/C line disconnect tool around the coupler (2).

NOTE: The garter spring may not release if the A/C line disconnect tool is cocked while pushing it into the coupler cage opening.

5. Push the A/C line disconnect tool into the open side of the coupler cage to expand the garter spring (3). Once the garter spring is expanded, pull on the refrigerant line attached to the female half of the coupler until the flange on the female fitting is separated from the garter spring and cage on the male fitting.
6. Open and remove the A/C line disconnect tool from the refrigerant line coupler (4).

INSTALLATION

COUPLER- REFRIGERANT LINE

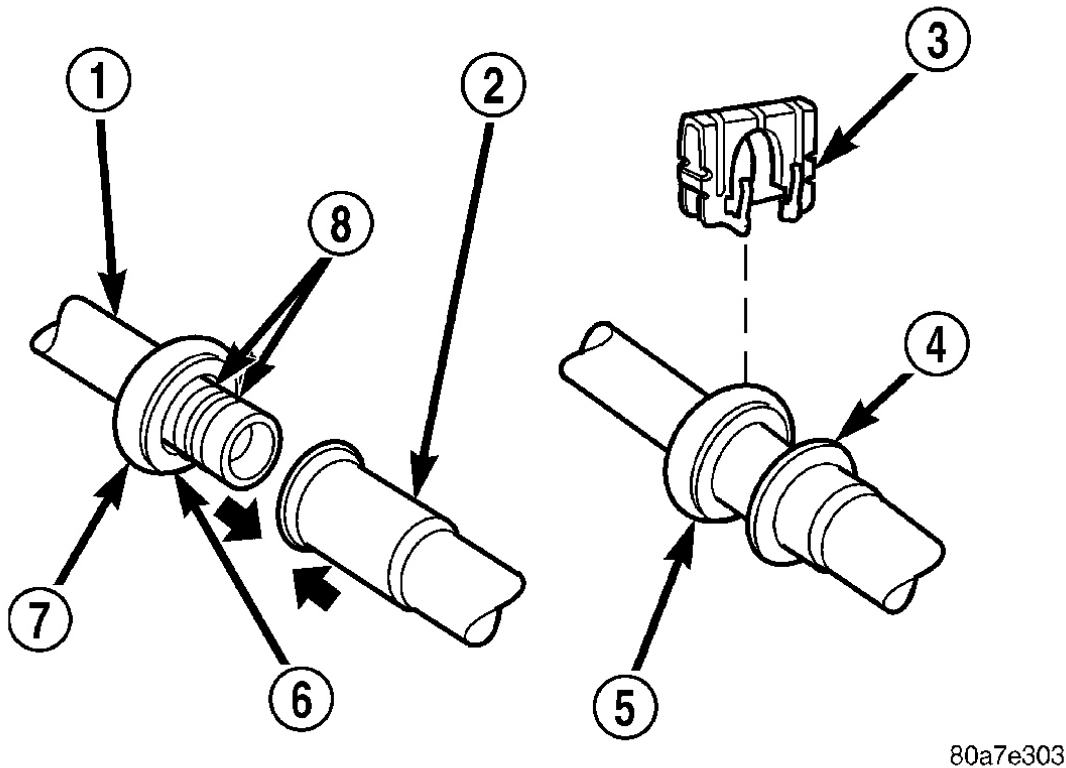


Fig. 158: Identifying Spring-Lock Type Refrigerant Line Coupler
 Courtesy of CHRYSLER LLC

1. Clean any dirt or foreign material from the spring-lock type refrigerant line coupler.
2. Check to make sure that the garter spring (6) is located within the cage (7) of the male half of the refrigerant line coupler (1), and that the garter spring is not damaged.
 - If the garter spring is missing, install a new spring by pushing it into the coupler cage opening.
 - If the garter spring is damaged, remove it from the coupler cage with a small hook (DO NOT use a screwdriver) and install a new garter spring.

CAUTION: Use only the specified O-rings as they are made of a special material for the R-134a system. The use of any other O-rings may allow the

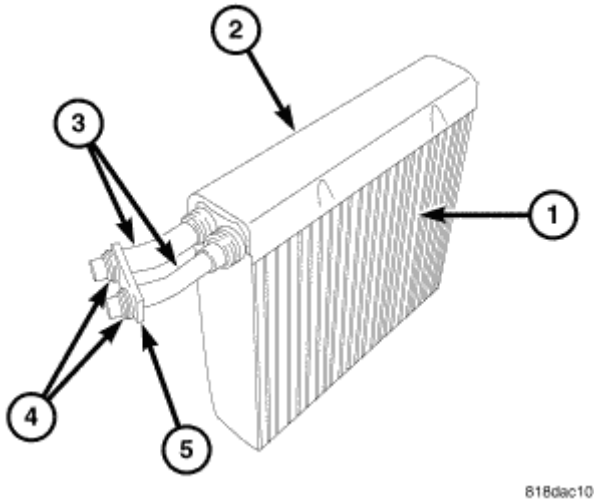
connection to leak.

3. Install new O-rings (8) on the male half of the refrigerant line coupler.
4. Lubricate the O-rings, and the inside of the female half of the refrigerant line coupler (2) with clean R-134a refrigerant oil. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
5. Position the female half of the coupler over the male half of the coupler.
6. Push together firmly on the two halves of the refrigerant line coupler until the garter spring in the cage on the male half of the coupler snaps over the flanged end on the female half of the coupler.
7. Make sure that the refrigerant line coupler is fully engaged by firmly pulling the refrigerant lines away from each other on both sides of the coupler.
8. Install the secondary retaining clip (3) over connected coupler cage (5).
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

EVAPORATOR-A/C

DESCRIPTION

EVAPORATOR-A/C



818dac10

Fig. 159: A/C Evaporator Assembly
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

The A/C evaporator (1) and its insulator (2) for the heating-A/C system is located within the HVAC housing, behind the instrument panel. The A/C evaporator is positioned in the HVAC housing so that all air entering the housing must pass over the evaporator fins before it is distributed through the heater core and heating-A/C system ducts and outlets. However, air passing over the evaporator fins will only be conditioned when the A/C compressor is engaged and circulating refrigerant through the A/C evaporator.

The A/C evaporator tubes (3) are connected and sealed to the A/C expansion valve by use of rubber O-rings (4) and a tapping block (5).

The A/C evaporator can only be serviced by removing and disassembling the HVAC housing.

OPERATION

EVAPORATOR-A/C

Refrigerant enters the A/C evaporator from the A/C expansion valve as a low-temperature, low-pressure mixture of liquid and gas. As air flows over the fins of the A/C evaporator, the humidity in the air condenses on the fins, and the heat from the air is absorbed by the refrigerant. Heat absorption causes the refrigerant to boil and vaporize. The refrigerant becomes a low-pressure gas when it leaves the A/C evaporator.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line or expansion valve is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C evaporator has no serviceable parts except for the O-ring seals. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals must be replaced whenever the A/C expansion valve is removed from the A/C evaporator.

The A/C evaporator cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

EVAPORATOR-A/C

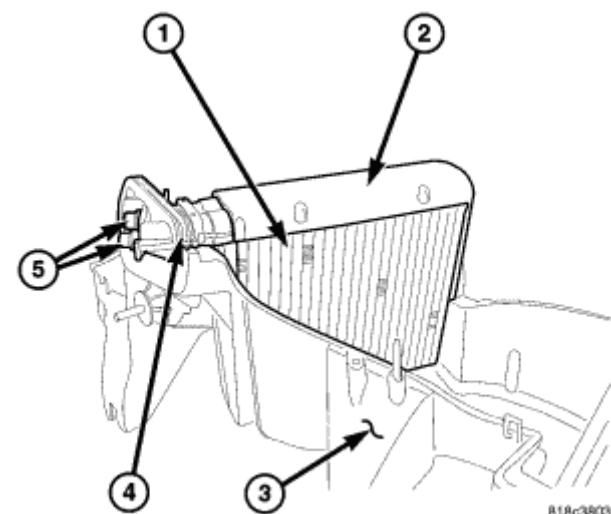


Fig. 160: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

1. Remove the HVAC housing assembly and place it on a workbench. See **REMOVAL**.
2. Disassemble the HVAC housing. See **DISASSEMBLY**.

NOTE: If the foam insulator around the A/C evaporator is deformed or damaged, the insulator must be replaced.

3. Carefully lift the A/C evaporator (1) and the foam insulator (2) out of the lower half of the HVAC housing (3).

NOTE: If the rubber seal around the evaporator tubes and tapping block is deformed or damaged, the seal must be replaced.

4. If required, remove the rubber seal (4) from around the evaporator tubes and tapping block (5).

INSTALLATION

EVAPORATOR-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

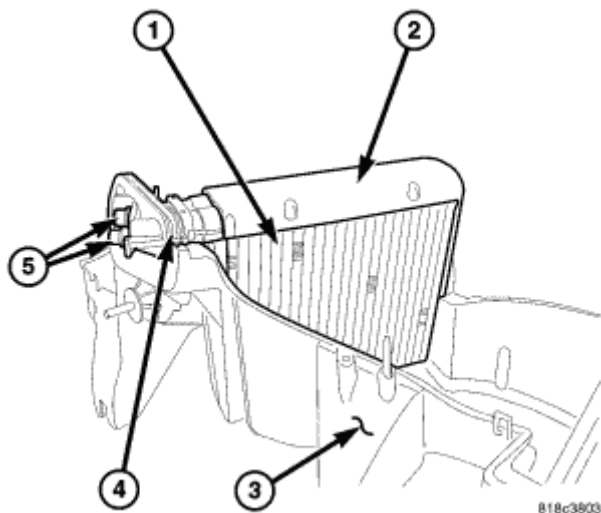


Fig. 161: A/C Evaporator, Foam Insulator, HVAC Housing, Rubber Seal & Tapping Block
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

NOTE: Make sure the rubber seal for the evaporator tubes and tapping block is properly positioned in the HVAC housing opening.

1. If removed, install the rubber seal (4) over the evaporator tubes and tapping block (5).

NOTE: Make sure that the foam insulator around the A/C evaporator is properly positioned within the HVAC housing.

2. Carefully install the A/C evaporator (1) and foam insulator (2) into the lower half of the HVAC housing (3).
3. Assemble the HVAC housing. See **ASSEMBLY**.
4. Install the HVAC housing assembly. See **INSTALLATION**.
5. If the A/C evaporator is being replaced, add 60 milliliters (2 fluid ounces) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

LINE-A/C DISCHARGE

DESCRIPTION

LINE-A/C DISCHARGE

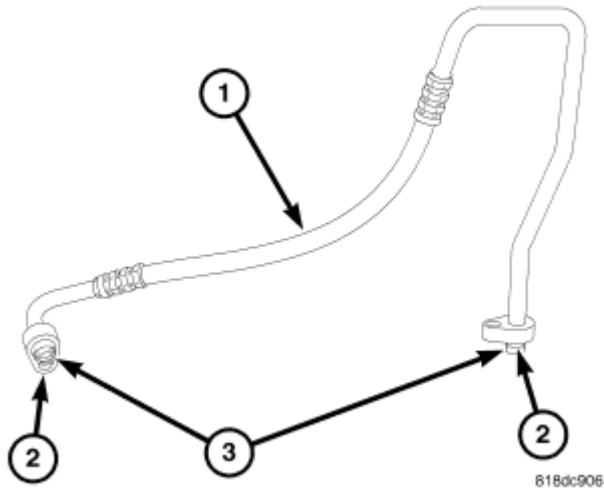


Fig. 162: A/C Discharge Line, Metal Gaskets & Rubber O-Ring Seals
Courtesy of CHRYSLER LLC

NOTE: 4.0L LHD model shown in illustration. Other models similar.

The A/C discharge line (1) is the refrigerant line that carries refrigerant from the A/C compressor to the A/C condenser.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C discharge line has no serviceable parts except for the metal gaskets (2) and rubber O-ring seals (3). The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever the A/C discharge line is removed and installed.

The A/C discharge line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

2.8L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

CAUTION: Before removing the A/C discharge line, note the location of the right side condenser air seal. This air seal is to direct air through the A/C condenser and radiator. The air seals must be reinstalled in its proper location in order for the A/C and engine cooling systems to perform as designed.

NOTE: LHD model shown in illustrations. RHD model similar.

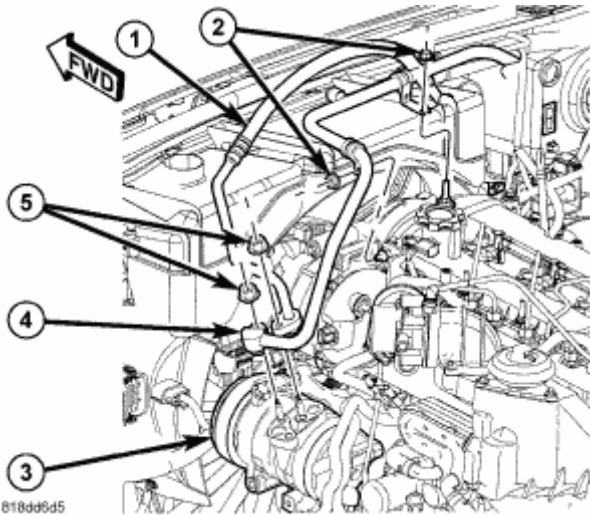


Fig. 163: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing.
4. Remove the air inlet tube from the throttle body and position it out of the way.
5. Remove the battery for clearance. Refer to **REMOVAL** .
6. Remove the nut (5) that secures the A/C discharge line (1) to the A/C compressor (3).
7. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.
8. Disengage the A/C discharge line from the plastic retaining clip located on the right side of the fan shroud.

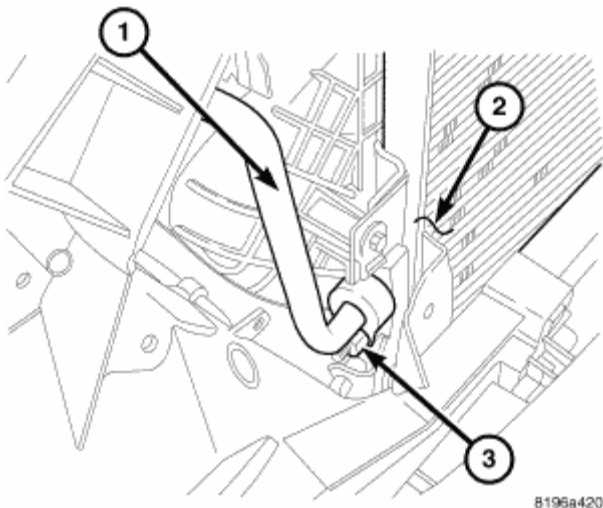


Fig. 164: Removing/Installing Nut That Secures A/C Discharge Line To A/C Condenser
Courtesy of CHRYSLER LLC

9. Remove the grille. Refer to **REMOVAL** .
10. Position the right side condenser air seal out of the way to gain access to the discharge line fitting.
11. Remove the nut (3) that secures the A/C discharge line (1) to the A/C condenser (2).

NOTE: Rotate and tilt the A/C discharge line as necessary to disconnect it from the A/C condenser.

12. Disconnect the A/C discharge line from the condenser and remove and discard the O-ring seal and gasket.
13. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

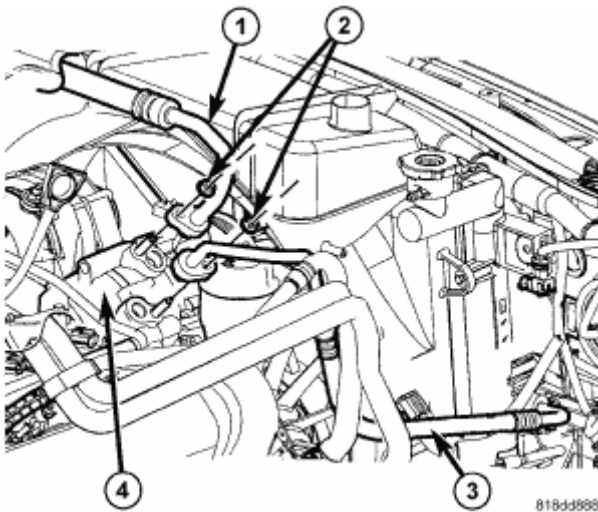


Fig. 165: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C discharge line (3) to the A/C compressor (4).
5. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.

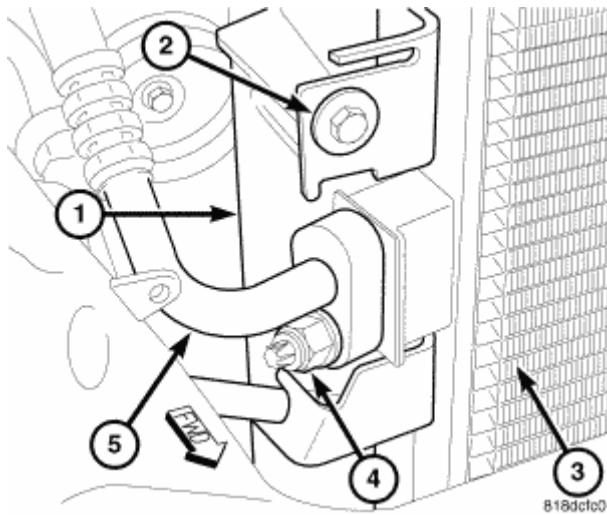


Fig. 166: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

6. Remove the grille. Refer to **REMOVAL** .
7. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3).
8. Remove the bolt (2) that secures the A/C condenser to the right side of the radiator (1).
9. For clearance, position the A/C condenser toward the left side of the vehicle and then disconnect the A/C discharge line from the condenser.
10. Remove and discard the O-ring seal and gasket from the discharge line fitting.
11. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

4.0L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

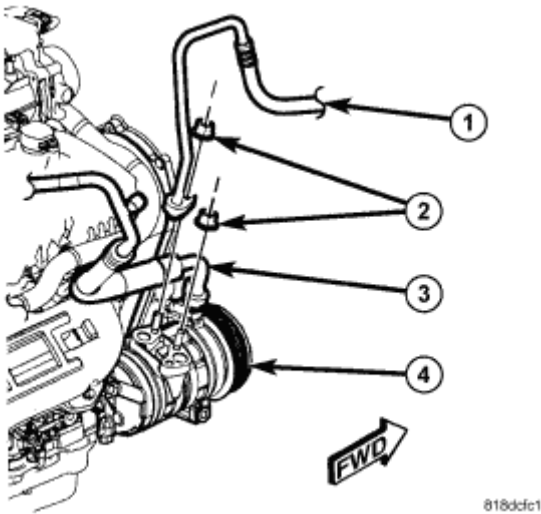


Fig. 167: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C discharge line (1) to the A/C compressor (4).
5. Disconnect the A/C discharge line from the A/C compressor and remove and discard the O-ring seal and gasket.

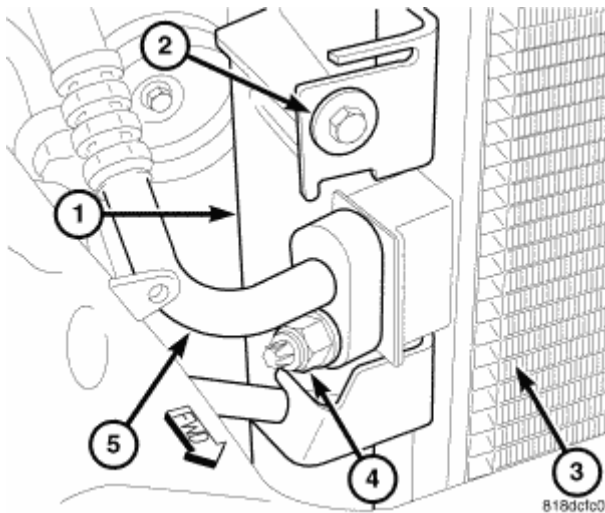


Fig. 168: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

6. Remove the grille. Refer to **REMOVAL** .
7. Remove the nut (4) that secures the A/C discharge line (5) to the A/C condenser (3).
8. Remove the bolt (2) that secures the A/C condenser to the right side of the radiator (1).
9. For clearance, position the A/C condenser toward the left side of the vehicle and then disconnect the A/C

discharge line from the condenser.

10. Remove and discard the O-ring seal and gasket from the discharge line fitting.
11. Remove the A/C discharge line from the engine compartment and install plugs in, or tape over the opened discharge line fittings and the compressor and condenser ports.

INSTALLATION

2.8L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

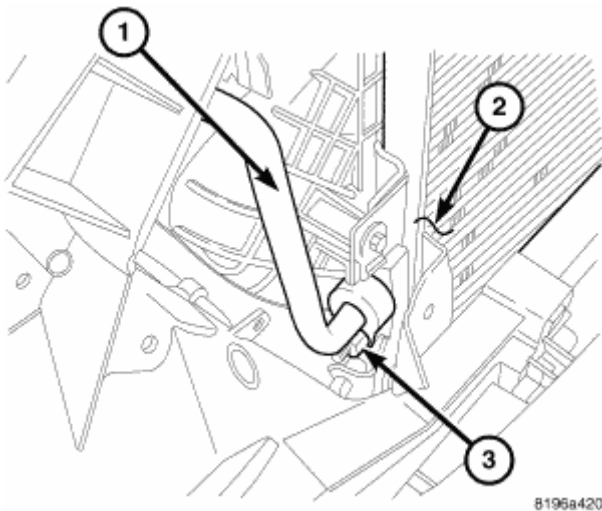


Fig. 169: Removing/Installing Nut That Secures A/C Discharge Line To A/C Condenser
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Rotate and tilt the A/C discharge line as necessary to connect it from the A/C condenser.

3. Position the A/C discharge line (1) into the engine compartment and connect it to the A/C condenser (2).
4. Install the nut (3) that secures the A/C discharge line to the A/C condenser. Tighten the nut to 22.5 N.m (200 in. lbs.).
5. Engage the A/C discharge line into the plastic retaining clip located on the right side of the fan shroud.
6. Install the grille. Refer to **INSTALLATION**.

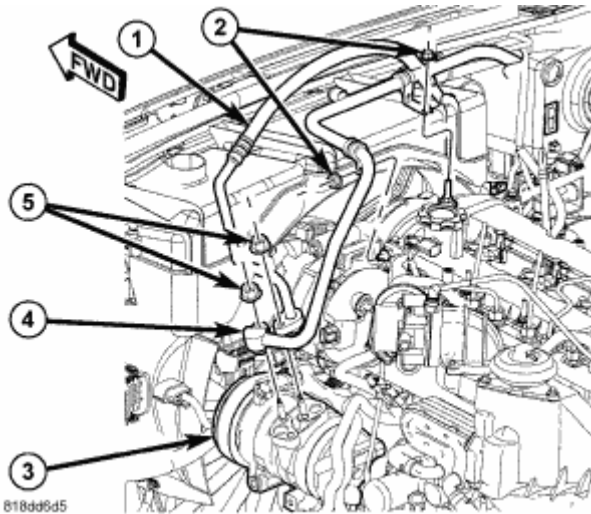


Fig. 170: Refrigerant Line System
Courtesy of CHRYSLER LLC

7. Connect the A/C discharge line (1) to the A/C compressor (4).
8. Install the nut (5) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
9. Install the battery. Refer to **INSTALLATION**.
10. Install the air inlet tube to the throttle body. Tighten the clamp securely.
11. Install the air cleaner housing.
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
14. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
15. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

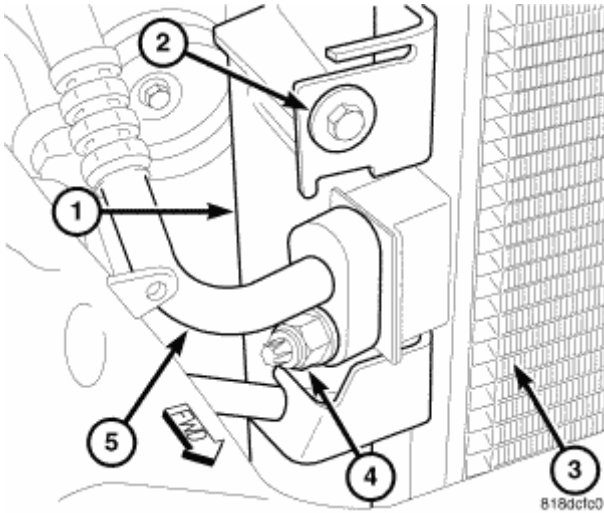


Fig. 171: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. For clearance, position the A/C condenser (3) toward the left side of the vehicle.
4. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4) hand tight.
5. Reposition the A/C condenser and install the bolt (2) that secures the condenser to the right side of the radiator (1). Tighten the bolt to 5 N.m (44 in. lbs.).
6. Tighten the nut that secures the A/C discharge line to the A/C condenser to 22.5 N.m (200 in. lbs.).
7. Install the grille. Refer to **INSTALLATION**.

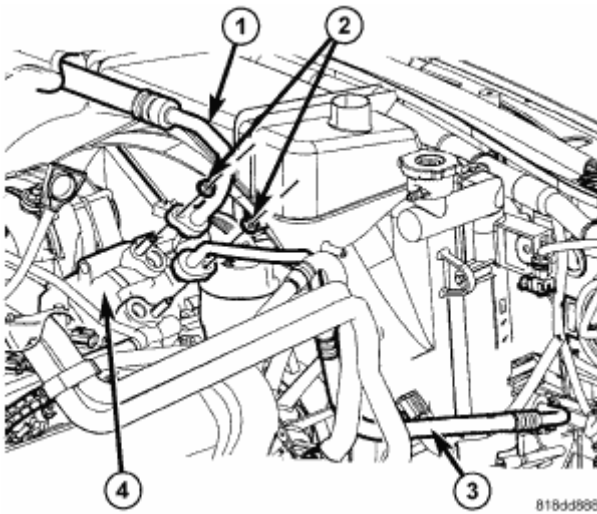


Fig. 172: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

8. Connect the A/C discharge line (3) to the A/C compressor (4).
9. Install the nut (2) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
10. Install the air cleaner housing (refer to **INSTALLATION**).
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

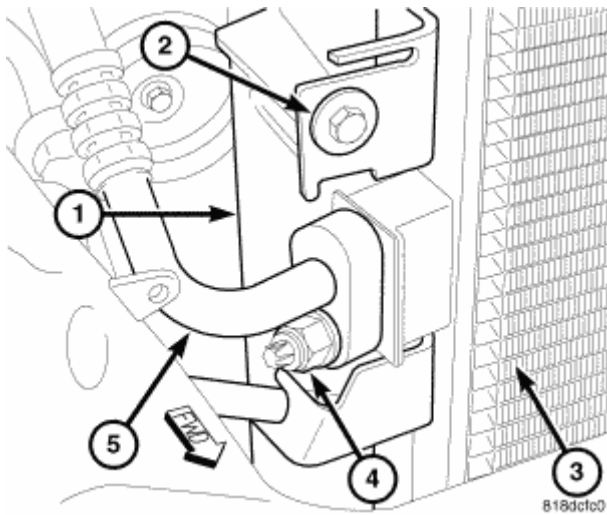


Fig. 173: Radiator, Bolts, A/C Condenser, Nut & A/C Discharge Line
 Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened discharge line fittings and compressor and condenser ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them and new gaskets onto the discharge line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. For clearance, position the A/C condenser (3) toward the left side of the vehicle.
4. Connect the A/C discharge line (5) to the A/C condenser and install the retaining nut (4) hand tight.
5. Reposition the A/C condenser and install the bolt (2) that secures the condenser to the right side of the radiator (1). Tighten the bolt to 5 N.m (44 in. lbs.).
6. Tighten the nut that secures the A/C discharge line to the A/C condenser to 22.5 N.m (200 in. lbs.).
7. Install the grille. Refer to **INSTALLATION** .

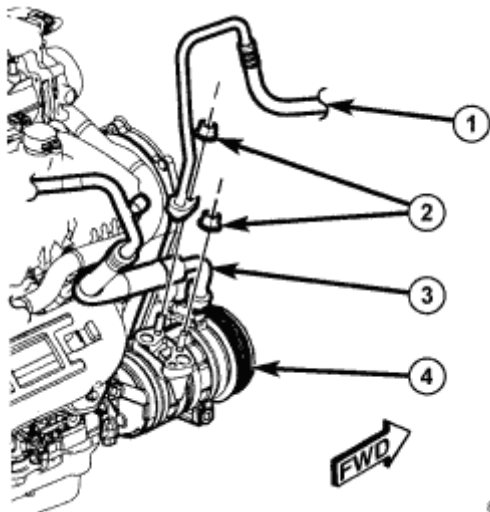


Fig. 174: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

8. Connect the A/C discharge line (1) to the A/C compressor (4).
9. Install the nut (2) that secures the A/C discharge line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
10. Install the air cleaner housing (refer to **INSTALLATION**).
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

LINE-A/C LIQUID

DESCRIPTION

LINE-A/C LIQUID

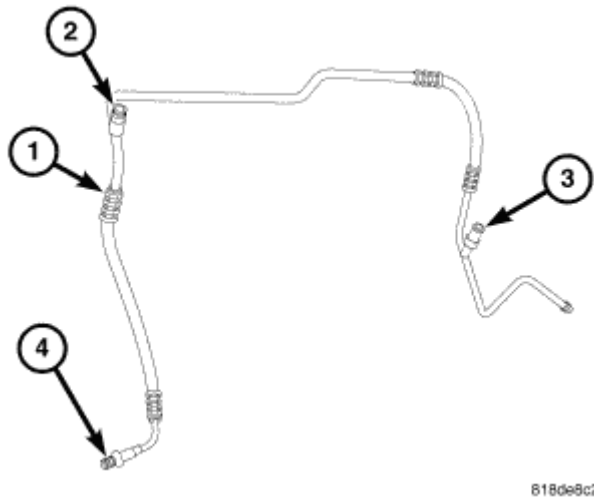


Fig. 175: A/C Liquid Line, High-Side Service Port, A/C Pressure Transducer & Condenser Outlet Tube Connection

Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

The A/C liquid line (1) is the refrigerant line that carries refrigerant from the A/C condenser to the A/C expansion valve. The A/C liquid line contains the high-side service port (2), a fitting for the A/C pressure transducer (3) and uses a spring lock coupler at the condenser outlet tube connection (4). On LHD models, the A/C liquid line is serviced only as an assembly. On RHD models, the A/C liquid line is serviced in two sections and uses a spring lock coupler to connect the two sections together.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C liquid line has no serviceable parts except for the rubber O-ring seals, high-side service port valve and its protective cap and the plastic retainer clips. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals must be replaced whenever the A/C liquid line is removed and installed.

The A/C liquid line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

LHD MODEL

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

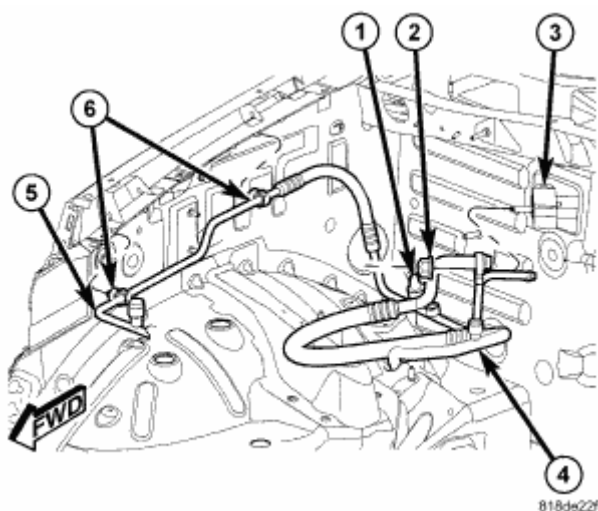


Fig. 176: Removing/Installing LHD Liquid Line
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Disconnect the wire harness connector from the A/C pressure transducer (1) located on the A/C liquid line (5) near the A/C expansion valve (3) and if required, remove the A/C pressure transducer from the A/C liquid line. See **REMOVAL**.
5. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
6. Separate the A/C liquid line from the A/C suction line and disengage the A/C liquid line from the two retaining clips (6) located on the right inner fender.

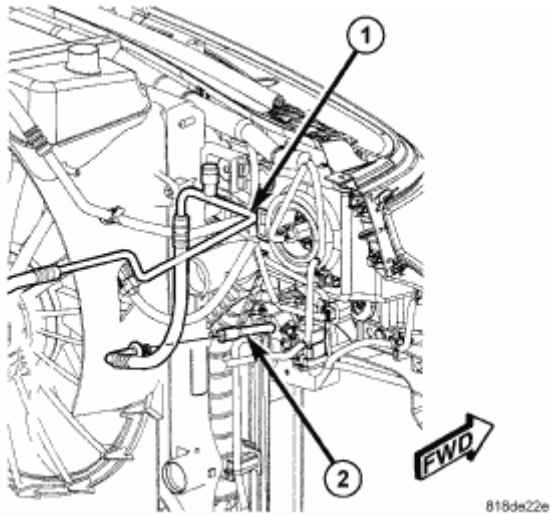


Fig. 177: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

7. Remove the secondary retaining clip and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.
8. Remove the A/C liquid line from the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the condenser and expansion valve ports.

RHD MODEL

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

FRONT SECTION

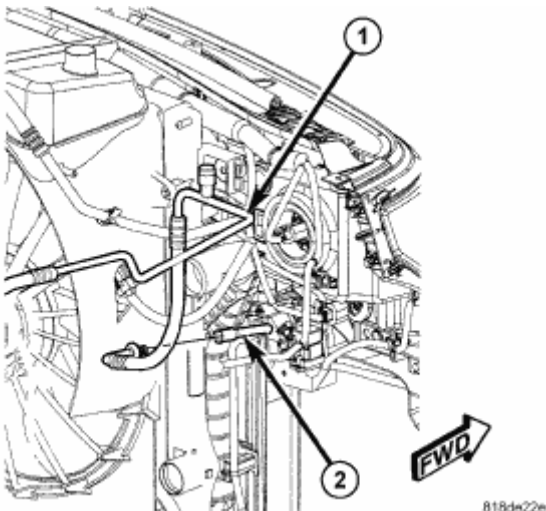


Fig. 178: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the secondary retaining clip and using the proper A/C line disconnect tool, disconnect the A/C liquid line (1) from the condenser tube (2). See **REMOVAL**.

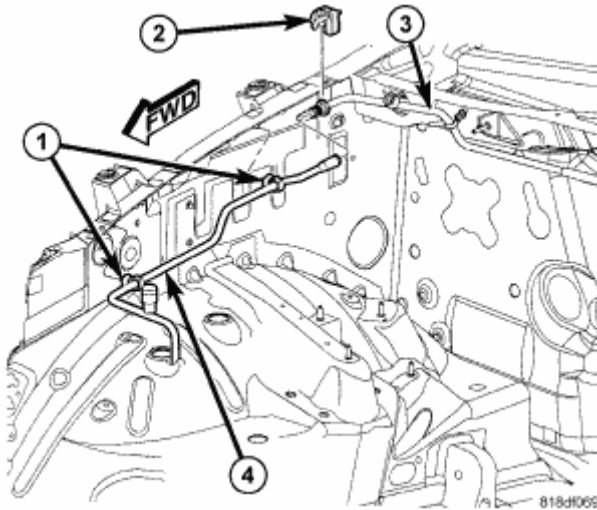


Fig. 179: Retaining Clips, Secondary Retaining Clip, A/C Liquid Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

5. Disengage the front section of the A/C liquid line (4) from the two retaining clips (1) located on the right inner fender.
6. Remove the secondary retaining clip (2) and using the proper A/C line disconnect tool, disconnect the front section of the A/C liquid line from the rear section of the A/C liquid line (3). See **REMOVAL**.
7. Remove the front section of the A/C liquid line from the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the condenser tube.

REAR SECTION

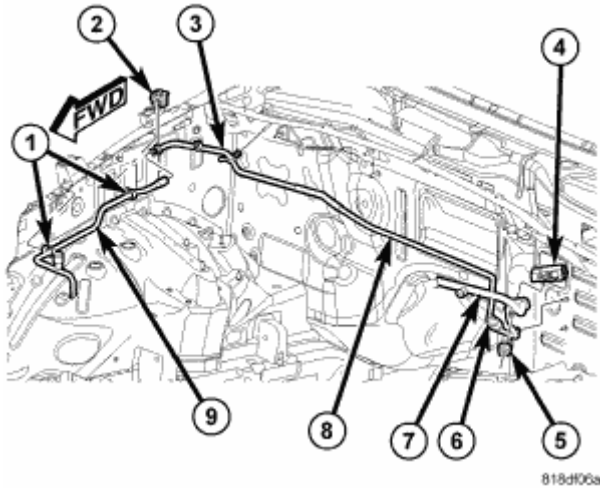


Fig. 180: Removing/Installing RHD Liquid Lines - Rear Section
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the two nuts that secure the engine coolant reservoir to the dash panel and position the reservoir out of the way.
5. Disconnect the wire harness connector from the A/C pressure transducer (6) located on the rear section of the A/C liquid line (8) near the A/C expansion valve (4) and if required, remove the A/C pressure transducer from the A/C liquid line. See **REMOVAL**.
6. Remove the nut (5) that secures the A/C suction line (7) and the rear section of the A/C liquid line to the A/C expansion valve and disconnect the lines from the valve.
7. Disengage the A/C liquid line from the retaining clips (3) located on the dash panel and the brake lines near the brake booster.
8. Separate the A/C liquid line from the A/C suction line and disengage the A/C liquid line from the two retaining clips (1) located on the right inner fender.
9. Remove the secondary retaining clip (2) and using the proper A/C line disconnect tool (Special Tool Kit 7193 or equivalent), disconnect the rear section of the A/C liquid line from the front section of the liquid line (9). See **REMOVAL**.
10. Remove the rear section of the A/C liquid line from out of the right side of the engine compartment and remove and discard the O-ring seals and install plugs in, or tape over the opened refrigerant line fittings and the expansion valve ports.

INSTALLATION

LHD MODELS

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating

as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

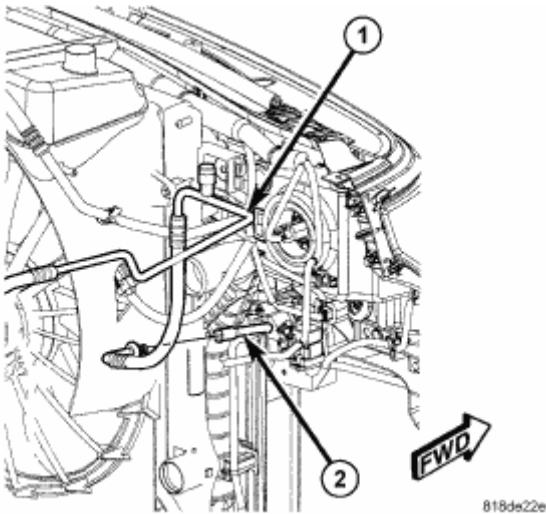


Fig. 181: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the condenser and expansion valve ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.

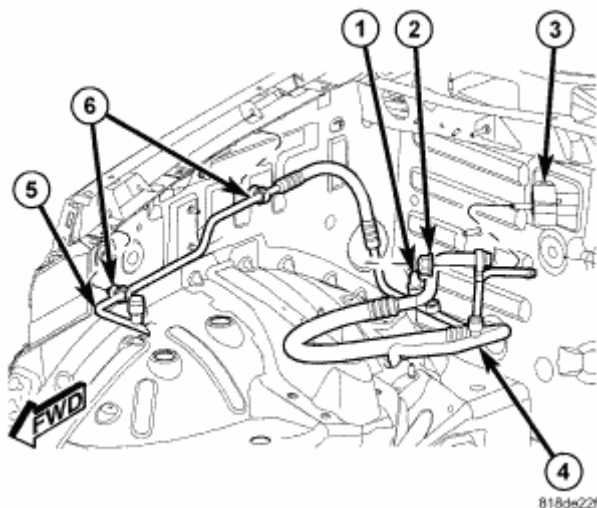


Fig. 182: Removing/Installing LHD Liquid Line
Courtesy of CHRYSLER LLC

4. Install the A/C liquid line (5) into the two retaining clips (6) located on the right inner fender.
5. Connect the A/C liquid line to the A/C suction line (4).
6. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).
7. If removed, install the A/C pressure transducer (1) onto A/C liquid line and connect the wire harness connector to the transducer. See **INSTALLATION**.
8. Install the air cleaner housing (refer to **INSTALLATION**).
9. Reconnect the negative battery cable.
10. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
11. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
12. Charge the refrigerant system. See **STANDARD PROCEDURE**.

RHD MODEL

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

FRONT SECTION

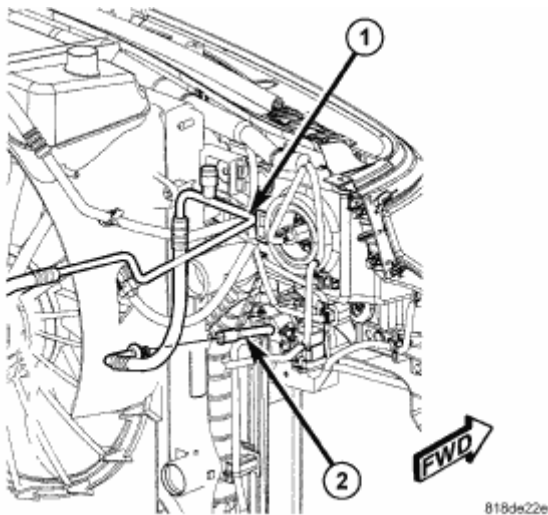


Fig. 183: A/C Liquid Line & Condenser Tube
Courtesy of CHRYSLER LLC

1. Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**.
2. Remove the tape or plugs from the opened refrigerant line fittings and the condenser tube port.
3. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
4. Connect the A/C liquid line (1) to the condenser tube (2) and install the secondary retaining clip. See **INSTALLATION**.

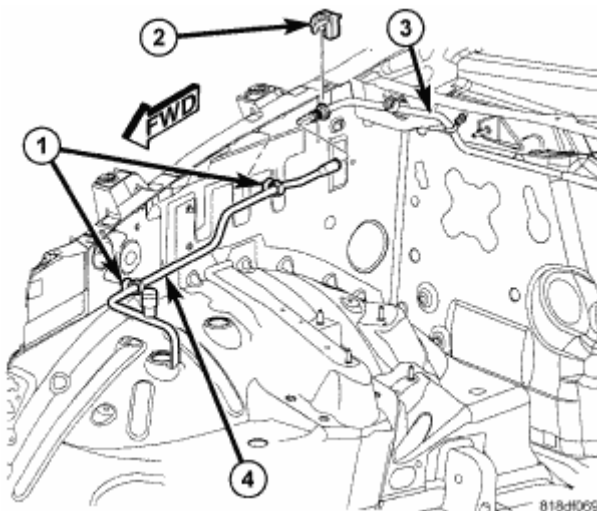


Fig. 184: Retaining Clips, Secondary Retaining Clip, A/C Liquid Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

5. Connect the front section of the A/C liquid line (4) to the rear section of the A/C liquid line (3) and install

the secondary retaining clip (2). See **INSTALLATION**.

6. Engage the A/C liquid line to the two retaining clips (1) located on the right inner fender.
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

REAR SECTION

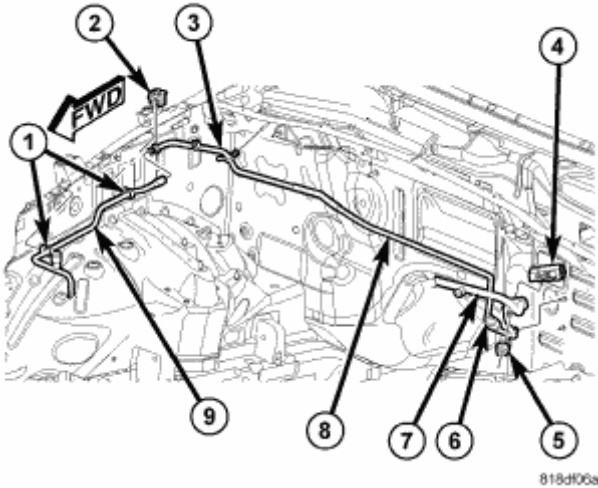


Fig. 185: Removing/Installing RHD Liquid Lines - Rear Section
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the expansion valve ports.
2. Lubricate new rubber O-ring seals with clean refrigerant oil and install them onto the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Position the rear section of the A/C liquid line (8) into the engine compartment from the right side of the vehicle. Be sure to route the liquid line behind the diesel engine fuel filter.
4. Connect the rear section of the A/C liquid line (8) to the A/C suction line (7).
5. Connect the A/C liquid and suction lines to the A/C expansion valve (4) and install the retaining nut (5). Tighten the nut to 23 N.m (17 ft. lbs.).
6. If removed, install the A/C pressure transducer (6) onto A/C liquid line and connect the wire harness connector to the transducer. See **INSTALLATION**.
7. Engage the A/C liquid line to the retaining clips (3) located on the dash panel and the brake lines near the brake booster.
8. Connect the front section of the A/C liquid line (9) to the rear section of the A/C liquid line and install the secondary retaining clip (2). See **INSTALLATION**.
9. Engage the A/C liquid line to the two retaining clips (1) located on the right inner fender.
10. Reposition the engine coolant reservoir to the dash panel and install the two retaining nuts. Tighten the nuts securely.

11. Install the air cleaner housing (refer to INSTALLATION).
12. Reconnect the negative battery cable.
13. Evacuate the refrigerant system. See STANDARD PROCEDURE.
14. Adjust the refrigerant oil level. See STANDARD PROCEDURE.
15. Charge the refrigerant system. See STANDARD PROCEDURE.

LINE-A/C SUCTION

DESCRIPTION

LINE-A/C SUCTION

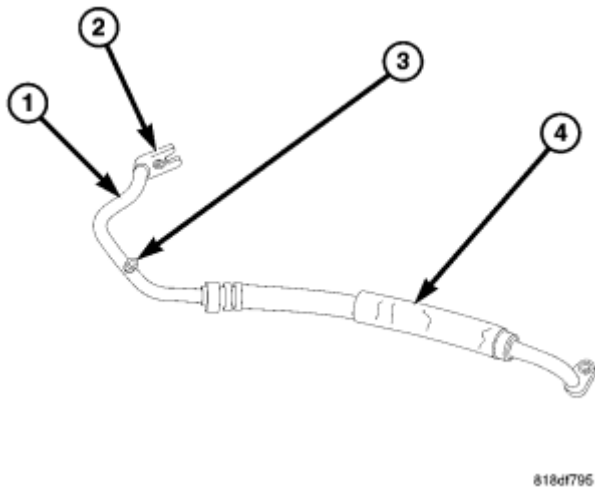


Fig. 186: A/C Suction Line, Tapping Plate, Low-Side Service Port & Heat Shield
Courtesy of CHRYSLER LLC

NOTE: 4.0L engine shown in illustration. Other engines similar.

The A/C suction line (1) is the refrigerant line that carries refrigerant from the A/C evaporator to the A/C compressor. The A/C suction line is secured to the A/C expansion valve by a tapping plate (2) and contains the low-side service port (3) and a heat shield (4), depending on engine application.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

The A/C suction line has no serviceable parts except for the rubber O-ring seals, metal gasket and the low-side service port valve and its protective cap. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gasket must be replaced whenever the A/C suction line is removed and installed.

The A/C suction line cannot be repaired and must be replaced if leaking or damaged.

REMOVAL

2.8L LHD ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

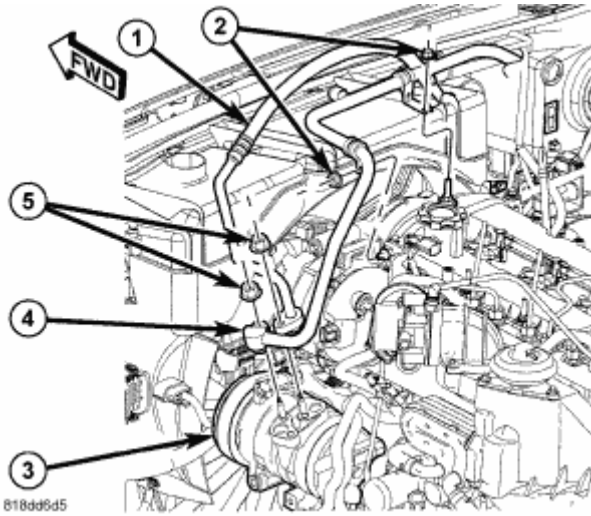


Fig. 187: Refrigerant Line System
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing.
4. Remove the air inlet tube from the throttle body and position it out of the way.
5. Remove the battery for clearance. Refer to **REMOVAL**.
6. Remove the nut (5) that secures the A/C suction line (4) to the A/C compressor (3).
7. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.
8. Remove the two nuts (2) that secure the A/C suction line to the top of the engine.

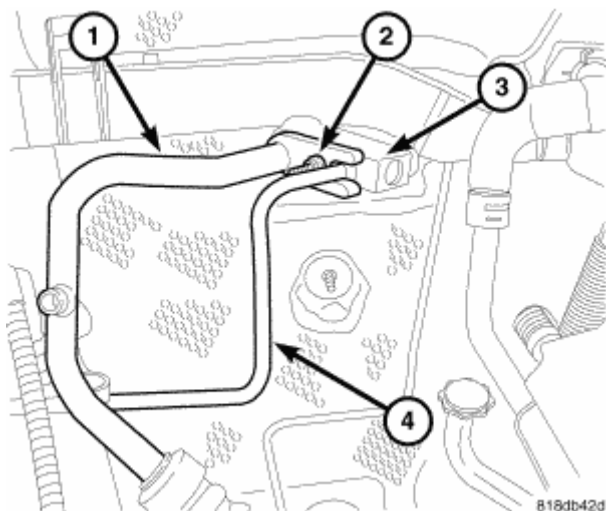


Fig. 188: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
 Courtesy of CHRYSLER LLC

9. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
10. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
11. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

2.8L RHD ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

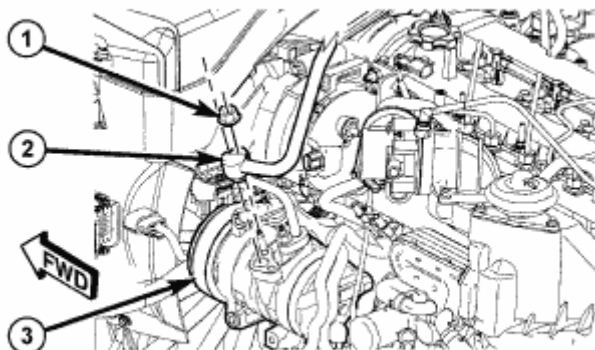


Fig. 189: Nut, A/C Suction Line & A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air inlet tube from the throttle body and position it out of the way.
4. Remove the battery for clearance. Refer to **REMOVAL** .
5. Remove the nut (1) that secures the A/C suction line (2) to the A/C compressor (3).
6. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

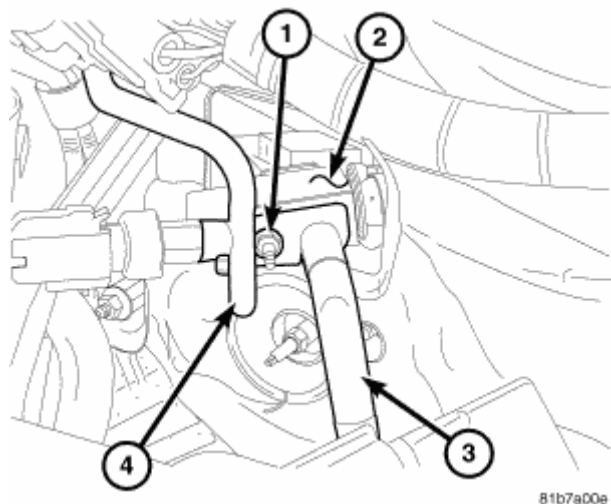


Fig. 190: Nut, A/C Expansion Valve, A/C Suction Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

7. Remove the nut (1) that secures the A/C suction line (3) and the A/C liquid line (4) to the A/C expansion valve (2) and disconnect the lines from the valve.
8. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
9. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

3.7L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

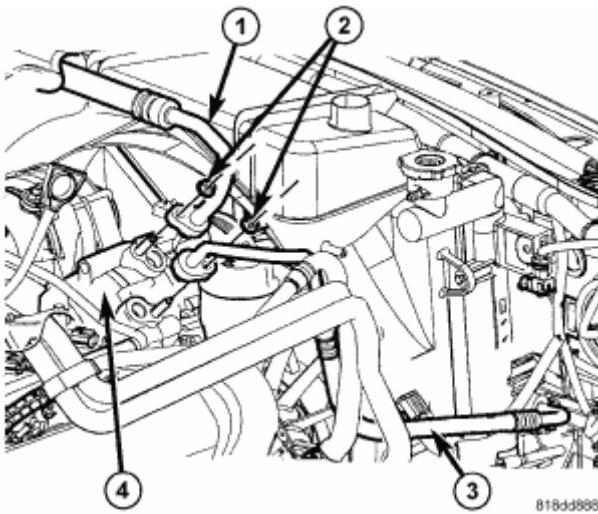


Fig. 191: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C suction line (1) to the A/C compressor (4).
5. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

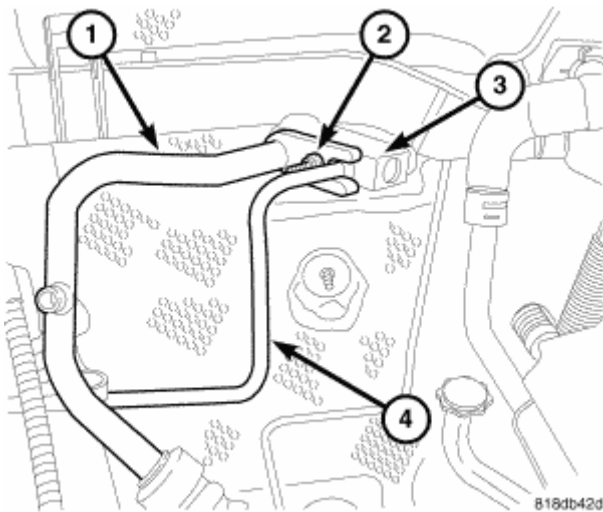


Fig. 192: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line

Courtesy of CHRYSLER LLC

6. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
7. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine

compartment.

8. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

4.0L ENGINE

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See **WARNING** and **CAUTION**. Failure to follow the warnings and cautions could result in possible personal injury or death.

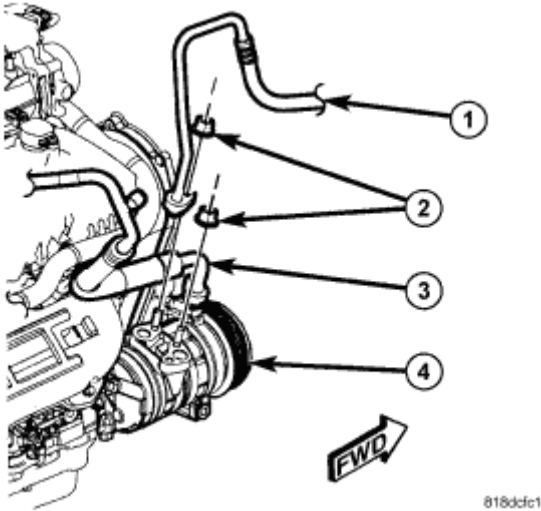


Fig. 193: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See **STANDARD PROCEDURE**.
3. Remove the air cleaner housing (refer to **REMOVAL**).
4. Remove the nut (2) that secures the A/C suction line (3) to the A/C compressor (4).
5. Disconnect the A/C suction line from the A/C compressor and remove and discard the O-ring seal and gasket.

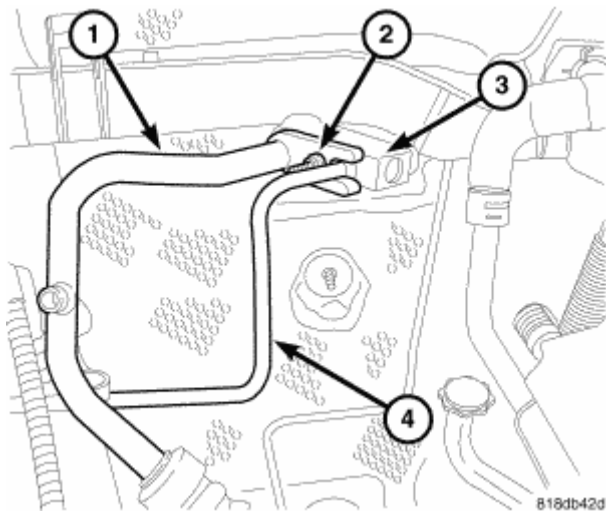


Fig. 194: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

6. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3) and disconnect the lines from the valve.
7. Separate the A/C liquid line from the A/C suction line and remove the suction line from the engine compartment.
8. Install plugs in, or tape over the opened refrigerant line fittings and the compressor and expansion valve ports.

INSTALLATION

2.8L LHD ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See STANDARD PROCEDURE.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

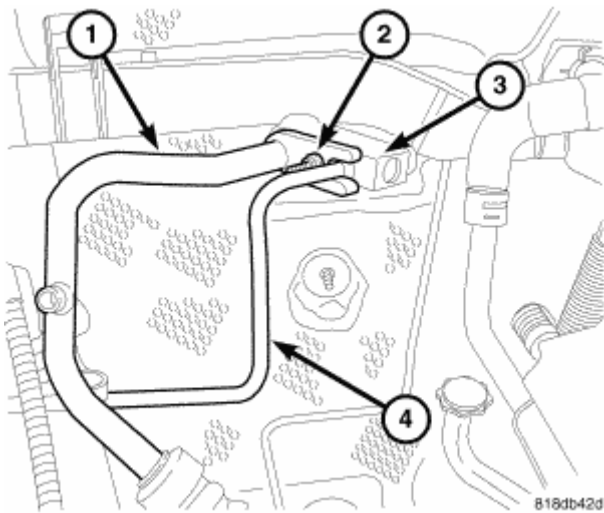


Fig. 195: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
 Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

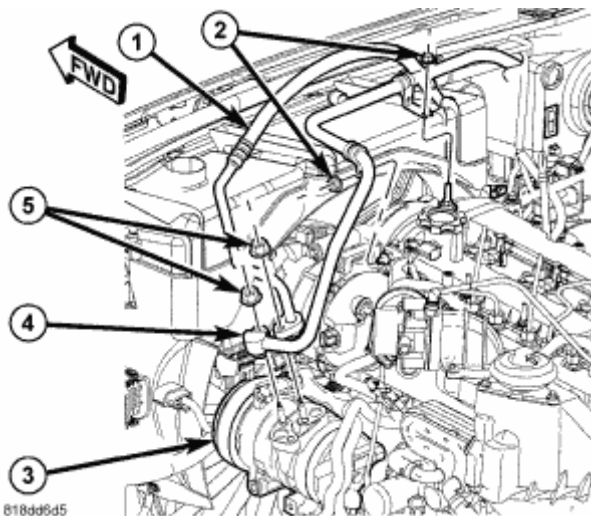


Fig. 196: Refrigerant Line System
 Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (4) to the A/C compressor (3).
6. Install the nut (5) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).

7. Install the two nuts (2) that secure the A/C suction line to the top of the engine. Tighten the nuts to 4.5 N.m (40 in. lbs.).
8. Install the battery. Refer to **INSTALLATION** .
9. Install the air inlet tube to the throttle body. Tighten the clamp securely.
10. Install the air cleaner housing.
11. Reconnect the negative battery cable.
12. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
13. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
14. Charge the refrigerant system. See **STANDARD PROCEDURE**.

2.8L RHD ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

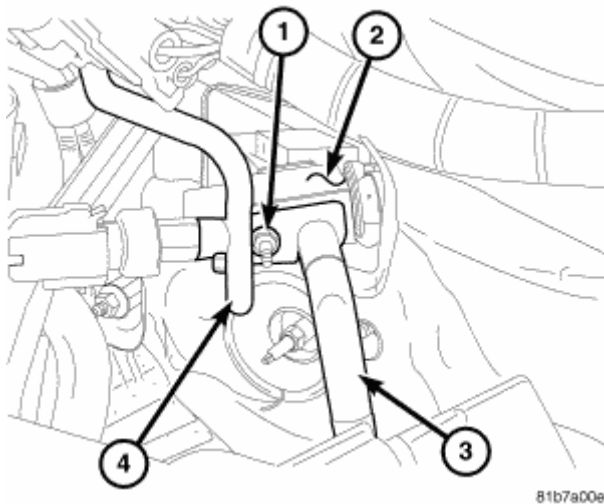
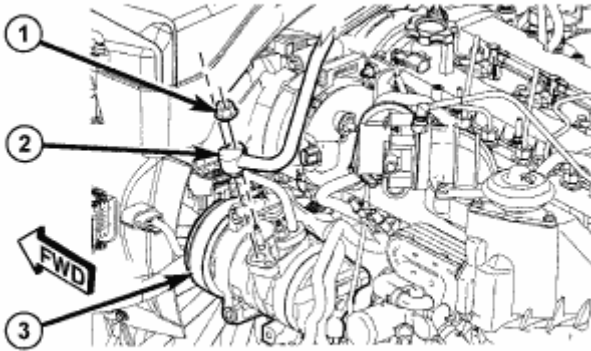


Fig. 197: Nut, A/C Expansion Valve, A/C Suction Line & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.

2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (3).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (2) and install the retaining nut (1). Tighten the nut to 23 N.m (17 ft. lbs.).



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Fig. 198: Nut, A/C Suction Line & A/C Compressor
Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (2) to the A/C compressor (3).
6. Install the nut (1) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the battery. Refer to **INSTALLATION** .
8. Install the air inlet tube to the throttle body. Tighten the clamp securely.
9. Reconnect the negative battery cable.
10. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
11. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
12. Charge the refrigerant system. See **STANDARD PROCEDURE**.

3.7L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

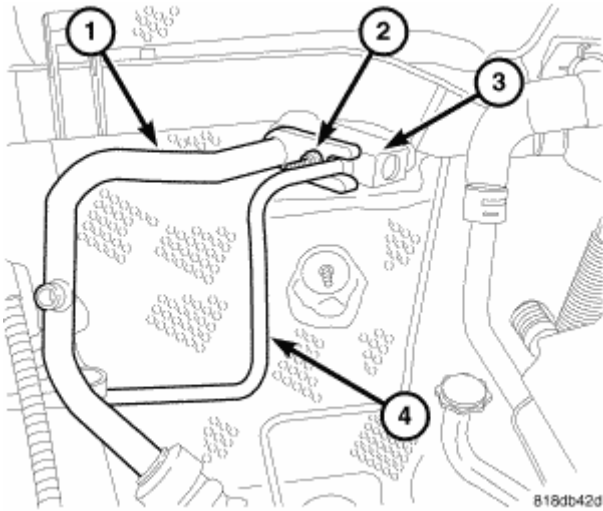


Fig. 199: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

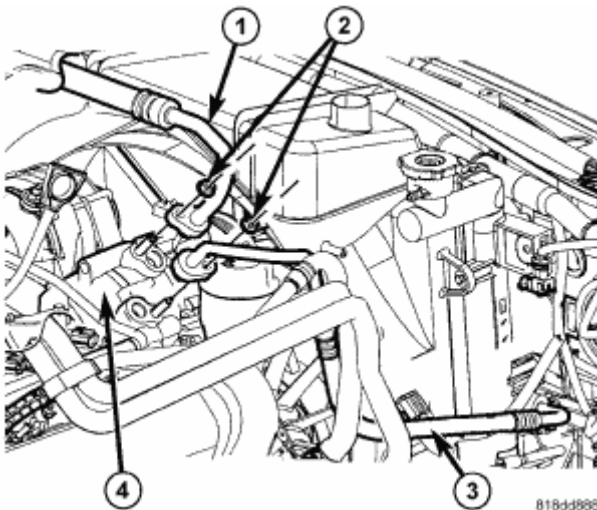


Fig. 200: Removing/Installing Nuts That Secure A/C Suction Line And A/C Discharge Line To A/C Compressor

Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (1) to the A/C compressor (4).
6. Install the nut (2) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
11. Charge the refrigerant system. See **STANDARD PROCEDURE**.

4.0L ENGINE

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See **STANDARD PROCEDURE**. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

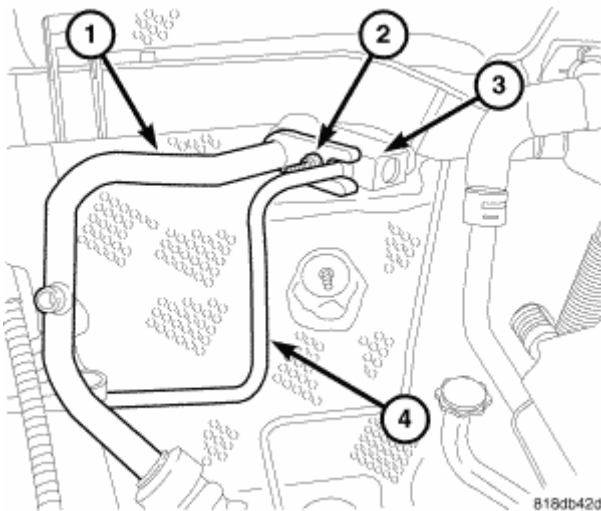


Fig. 201: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line fittings and the compressor and expansion valve ports.

2. Lubricate new O-ring seals with clean refrigerant oil and install them and a new gasket on the refrigerant line fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C liquid line (4) to the A/C suction line (1).
4. Connect the A/C liquid and suction lines to the A/C expansion valve (3) and install the retaining nut (2). Tighten the nut to 23 N.m (17 ft. lbs.).

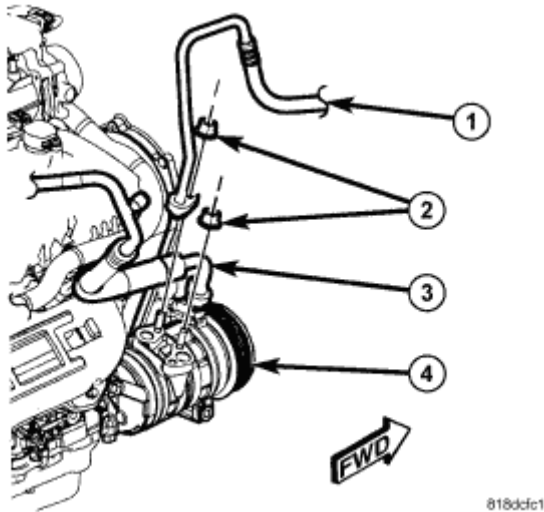


Fig. 202: A/C Discharge Line, Nuts, A/C Suction Line & A/C Compressor
 Courtesy of CHRYSLER LLC

5. Connect the A/C suction line (3) to the A/C compressor (4).
6. Install the nut (2) that secures the A/C suction line to the A/C compressor. Tighten the nut to 12 N.m (105 in. lbs.).
7. Install the air cleaner housing (refer to **INSTALLATION**).
8. Reconnect the negative battery cable.
9. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
10. Adjust the refrigerant oil level. See **STANDARD PROCEDURE**.
11. Charge the refrigerant system. See **STANDARD PROCEDURE**.

OIL-A/C REFRIGERANT

DESCRIPTION

OIL-A/C REFRIGERANT

The refrigerant oil used in R-134a refrigerant systems is a synthetic-based, PolyAlkylene Glycol (PAG), wax-free lubricant. Mineral-based R-12 refrigerant oils are not compatible with PAG oils, and should never be introduced to an R-134a refrigerant system.

There are different PAG oils available, and each contains a different additive package. Use **only** refrigerant oil of the same type as recommended to service the refrigerant system (**always refer to the specification tag**

included with the replacement A/C compressor or the A/C Underhood Specification Label located in the engine compartment).

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level can prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

The A/C compressors used in this vehicle are designed to use VC-46 PAG refrigerant oil. Use only this type of refrigerant oil when servicing the A/C compressor.

OPERATION

OIL-A/C REFRIGERANT

After performing any refrigerant recovery or recycling operation, always replenish the refrigerant system with the same amount of the recommended refrigerant oil as was removed. Too little refrigerant oil can cause A/C compressor damage, and too much can reduce A/C system performance.

PAG refrigerant oil is more hygroscopic than mineral oil, and will absorb any moisture it comes into contact with, even moisture in the air. The PAG oil container should always be kept tightly capped until it is ready to be used. After use, recap the oil container immediately to prevent moisture contamination.

STANDARD PROCEDURE

REFRIGERANT OIL LEVEL

When an A/C system is assembled at the factory, all components except the A/C compressor are refrigerant oil free. After the refrigerant system has been charged and operated, the refrigerant oil in the A/C compressor is dispersed throughout the refrigerant system. The A/C accumulator, A/C evaporator, A/C condenser and the A/C compressor will each retain a significant amount of the needed refrigerant oil.

It is important to have the correct amount of refrigerant oil in the A/C system. This ensures proper lubrication of the A/C compressor. Too little oil will result in damage to the A/C compressor, while too much oil will reduce the cooling capacity of the A/C system and consequently result in higher discharge air temperatures.

CAUTION: The A/C compressors in this vehicle are designed to use VC-46 PAG refrigerant oil. Use only VC-46 PAG refrigerant oil or severe damage to the A/C system may occur. Always refer to the A/C Underhood Specification Label for correct oil designation. The oil container should be kept tightly capped until it is ready for use and then tightly capped after use to prevent contamination from dirt and moisture. Refrigerant oil will quickly absorb any moisture it comes in contact with, therefore, special effort must be used to keep all R-134a system components moisture-free. Moisture in the refrigerant oil is very difficult to remove and will cause a reliability problem with the A/C compressor.

NOTE: Most reclaim/recycling equipment will measure the lubricant being removed during recovery. This amount of lubricant should be added back into the system. Refer to the reclaim/recycling equipment manufacturers instructions.

It will not be necessary to check the oil level in the A/C compressor or to add oil, unless there has been an oil loss. An oil loss may occur due to component replacement, or a rupture or leak from a refrigerant line, connector fitting, component or component seal. If a leak occurs, add 30 milliliters (1 fluid ounce) of the recommended refrigerant oil to the refrigerant system after the repair has been made. Refrigerant oil loss will be evident at the leak point by the presence of a wet, shiny surface around the leak.

Refrigerant oil must be added when an A/C condenser, A/C evaporator or A/C receiver/drier is replaced. See the REFRIGERANT OIL CAPACITIES chart.

The refrigerant oil level in a new A/C compressor must first be adjusted prior to compressor installation. Refer to **COMPRESSOR OIL DRAIN PROCEDURE**.

REFRIGERANT OIL CAPACITIES

Component	ml	oz.
Total System Fill	150	5
A/C Condenser	30	1
A/C Evaporator	60	2
A/C Receiver/drier	30	1
A/C Compressor	Drain and measure the oil from the old compressor. Refer to <u>COMPRESSOR OIL DRAIN PROCEDURE</u> .	

COMPRESSOR OIL DRAIN PROCEDURE

CAUTION: Be certain to adjust the refrigerant system oil level when replacing an A/C compressor. Failure to properly drain and measure the refrigerant oil from the A/C compressor can prevent the A/C system from operating as designed and cause serious compressor damage.

The A/C compressor is filled with refrigerant oil from the factory. Use the following procedure to drain and measure refrigerant oil from the A/C compressor.

1. Drain all of the refrigerant oil from the old A/C compressor into a clean measured container.
2. Drain all of the refrigerant oil from the new A/C compressor into a clean measured container.
3. Refill the new A/C compressor with the same amount of refrigerant oil that was drained out of the old compressor. Use only clean refrigerant oil of the type recommended for the A/C compressor in the vehicle.
4. Install the new A/C compressor onto the engine. See **INSTALLATION**.

RECEIVER/DRIER-A/C

DESCRIPTION

RECEIVER/DRIER-A/C

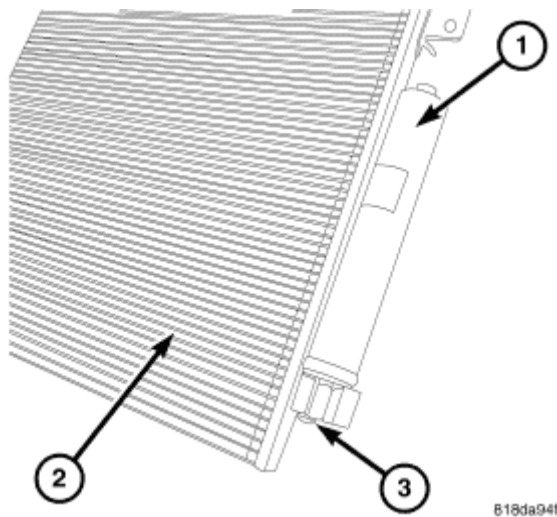


Fig. 203: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

The A/C receiver/drier (1) stores unnecessary refrigerant, filters the refrigerant, helps remove moisture from the refrigerant and retains any refrigerant vapor that may leave the A/C condenser (2) until it becomes a liquid. The A/C receiver/drier is installed on the high-side of the A/C system and is connected directly to the left end of the A/C condenser by a bolt (3). The A/C receiver/drier can be serviced separately from the A/C condenser.

OPERATION

RECEIVER/DRIER-A/C

The A/C receiver/drier performs a filtering action to prevent foreign material in the refrigerant from contaminating the A/C expansion valve. Refrigerant enters the A/C receiver/drier as a high-pressure, low temperature liquid. Desiccant inside the A/C receiver/drier absorbs any moisture which may have entered and become trapped within the refrigerant system. In addition, during periods of high demand operation of the A/C system, the A/C receiver/drier acts as a reservoir to store surplus refrigerant.

NOTE: **Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is disconnected. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.**

The A/C receiver/drier has no serviceable parts except for the O-ring seals, gaskets and the high side service port valve and cap. The O-ring seals used on the connections are made from a special type of rubber not affected by R-134a refrigerant. The O-ring seals and gaskets must be replaced whenever the A/C receiver/drier is removed.

The A/C receiver/drier cannot be repaired and must be replaced if leaking or damaged, or if an internal failure of the A/C compressor has occurred.

REMOVAL

RECEIVER/DRIER-A/C

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

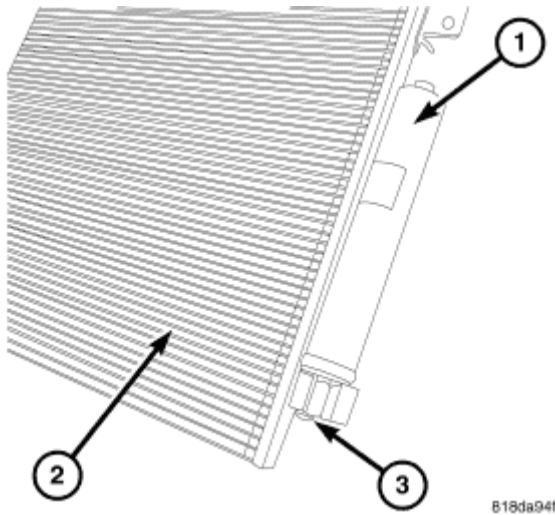


Fig. 204: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with A/C condenser removed from vehicle for clarity.

1. Disconnect and isolate the negative battery cable.
2. Recover the refrigerant from the refrigerant system. See STANDARD PROCEDURE.
3. Remove the grille. Refer to REMOVAL.
4. Remove the air seal from the left side of the cooling module assembly.
5. Reach through the opening at the bottom of the front fascia and remove the bolt (3) that secures the A/C receiver/drier (1) to the left side A/C condenser (3).
6. Disconnect the A/C receiver/drier from the A/C condenser and remove and discard the O-ring seals.
7. Install plugs in, or tape over the opened receiver/drier fittings and the condenser ports.

INSTALLATION

RECEIVER/DRIER-A/C

CAUTION: Be certain to adjust the refrigerant oil level when servicing the A/C refrigerant system. See STANDARD PROCEDURE. Failure to properly adjust the refrigerant oil level will prevent the A/C system from operating as designed and can cause serious A/C compressor damage.

CAUTION: The receiver/drier must be replaced if an internal failure of the A/C

compressor has occurred. Failure to replace the receiver/drier can cause serious A/C compressor damage.

NOTE: When replacing multiple A/C system components, refer to the **REFRIGERANT OIL CAPACITIES** chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**.

NOTE: If only the receiver/drier is being replaced, add 30 milliliters (1 fluid ounce) of refrigerant oil to the refrigerant system. Use only the refrigerant oil of the type recommended for the A/C compressor in the vehicle.

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

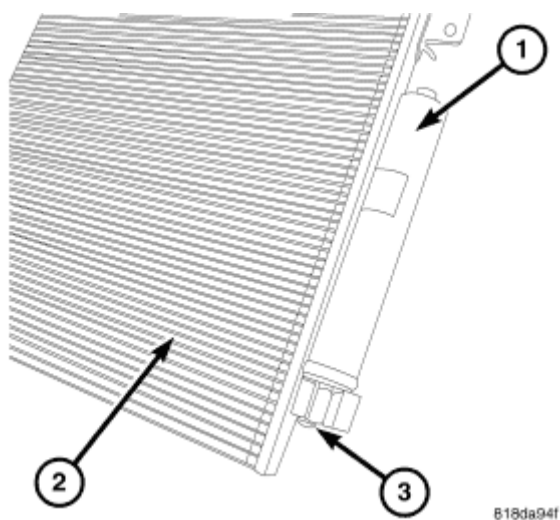


Fig. 205: A/C Receiver/Drier, Left Side A/C Condenser & Bolt
Courtesy of CHRYSLER LLC

NOTE: Illustration shown with A/C condenser removed from vehicle for clarity.

1. Remove the tape or plugs from the receiver/drier fittings and the condenser ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them onto the receiver/drier fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Connect the A/C receiver/drier (1) to the left end of the A/C condenser (2).
4. Install the bolt (3) that secures the A/C receiver/drier to the A/C condenser. Tighten the bolt to 22 N.m (16 ft. lbs.).
5. Install the air seal onto the left side of the cooling module assembly.
6. Install the grille. Refer to **INSTALLATION**.
7. Reconnect the negative battery cable.

- 8. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
- 9. If the A/C receiver/drier is being replaced, add 30 milliliters (1.0 fluid ounce) of refrigerant oil to the refrigerant system. When replacing multiple A/C system components, refer to the REFRIGERANT OIL CAPACITIES chart to determine how much oil should be added to the refrigerant system. See **STANDARD PROCEDURE**. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
- 10. Charge the refrigerant system. See **STANDARD PROCEDURE**.

REFRIGERANT-A/C

DESCRIPTION

REFRIGERANT-A/C

The refrigerant used in this air conditioning system is a HydroFluoroCarbon (HFC), type R-134a. Unlike R-12, which is a ChloroFluoroCarbon (CFC), R-134a refrigerant does not contain ozone-depleting chlorine. R-134a refrigerant is a non-toxic, non-flammable, clear, and colorless liquefied gas.

Even though R-134a does not contain chlorine, it must be reclaimed and recycled just like CFC-type refrigerants. This is because R-134a is a greenhouse gas and can contribute to global warming. See **STANDARD PROCEDURE**.

OPERATION

REFRIGERANT-A/C

R-134a refrigerant is not compatible with R-12 refrigerant in an A/C system. Even a small amount of R-12 refrigerant added to an R-134a refrigerant system will cause A/C compressor failure, refrigerant oil sludge or poor A/C system performance. In addition, the polyalkylene glycol (PAG) synthetic refrigerant oils used in an R-134a refrigerant system are not compatible with the mineral-based refrigerant oils used in an R-12 refrigerant system.

R-134a refrigerant system service ports, service tool couplers and refrigerant dispensing bottles have all been designed with unique fittings to ensure that an R-134a refrigerant system is not accidentally contaminated with the wrong refrigerant (R-12). There are also labels posted in the engine compartment of the vehicle and on the A/C compressor to identify that the A/C system is equipped with R-134a refrigerant.

STANDARD PROCEDURE

REFRIGERANT CHARGE LEVEL

All models	0.510 kg (1.12 lbs.)
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VALVE-A/C EXPANSION

DESCRIPTION

VALVE-A/C EXPANSION

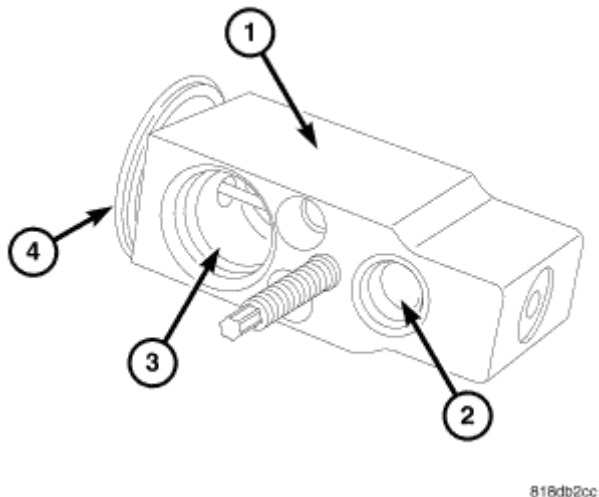


Fig. 206: A/C EXPANSION VALVE
Courtesy of CHRYSLER LLC

The A/C expansion valve controls the amount of refrigerant entering the A/C evaporator. The A/C expansion valve is of a thermostatic expansion valve (TXV) design and consists of an aluminum H-valve type body (1) with an inlet port (2), outlet port (3) and an integral thermal sensor (4).

The A/C expansion valve is located between the A/C refrigerant lines and the A/C evaporator in the engine compartment.

OPERATION

VALVE-A/C EXPANSION

The A/C expansion valve controls the high-pressure, low temperature liquid refrigerant from the A/C liquid line and converts it into a low-pressure, low-temperature mixture of liquid and gas before it enters the A/C evaporator. A mechanical sensor in the A/C expansion valve monitors the temperature and pressure of the refrigerant leaving the A/C evaporator through the A/C suction line, and adjusts the orifice size at the liquid line port to let the proper amount of refrigerant into the evaporator to meet the vehicle A/C cooling requirements. Controlling the refrigerant flow through the A/C evaporator ensures that none of the refrigerant leaving the A/C evaporator is still in a liquid state, which could damage the A/C compressor.

NOTE: **Replacement of the refrigerant line O-ring seals is required anytime a refrigerant line is disconnected from the expansion valve. Failure to replace the rubber O-ring seals could result in a refrigerant system leak.**

The A/C expansion valve is factory calibrated and cannot be adjusted or repaired and must be replaced if inoperative or damaged.

DIAGNOSIS AND TESTING

VALVE-A/C EXPANSION

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: The A/C expansion valve should only be tested following testing of the A/C compressor.

NOTE: Liquid CO2 is required to test the A/C expansion valve. This material is available from most welding supply facilities. Liquid CO2 is also available from companies which service and sell fire extinguishers.

When testing the A/C expansion valve, the work area and the vehicle temperature must be 21° to 27° C (70° to 85° F). To test the expansion valve:

1. Connect a charging station or manifold gauge set to the refrigerant system service ports. Verify the refrigerant charge level.
2. Close all doors, windows and vents to the passenger compartment.
3. Set the A/C-heater controls so that the A/C compressor is operating, the temperature control is in the highest temperature position, the mode-air doors is directing air output to the floor and the blower motor operating is operating at the highest speed.
4. Start the engine and allow it to idle. After the engine has reached normal operating temperature, allow the passenger compartment to heat up. This will create the need for maximum refrigerant flow into the A/C evaporator.
5. If the refrigerant charge is sufficient, the discharge (high pressure) gauge should read 827 kPa to 1655 kPa (120 psi to 240 psi). The suction (low pressure) gauge should read 207 kPa to 345 kPa (30 psi to 50 psi). If OK, go to step 6. If not OK, replace the inoperative A/C expansion valve.

WARNING: Protect the skin and eyes from exposure to liquid CO2 or personal injury can result.

6. If the suction (low pressure) gauge reads within the specified range, freeze the A/C expansion valve for 30 seconds using liquid CO2 or another suitable super-cold material.**Do not spray R-134a or R-12 refrigerant on the A/C expansion valve for this test.** The suction (low pressure) gauge reading should drop by 69 kPa (10 psi). If OK, go to step 7. If not OK, replace the inoperative A/C expansion valve.
7. Allow the expansion valve control head to thaw. The suction (low pressure) gauge reading should stabilize at 207 kPa to 345 kPa (30 psi to 50 psi). If not OK, replace the inoperative A/C expansion valve.
8. When expansion valve testing is complete, test the overall A/C system performance. See DIAGNOSIS AND TESTING.

REMOVAL

VALVE-A/C EXPANSION

WARNING: Refer to the applicable warnings and cautions for this system before performing the following operation. See WARNING and CAUTION. Failure to follow the warnings and cautions could result in possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

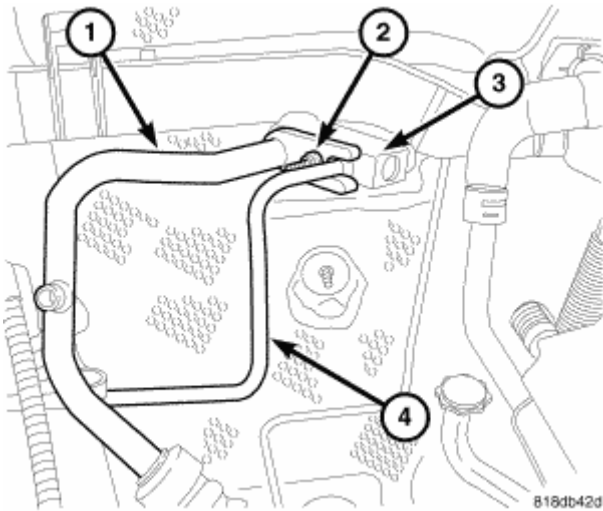


Fig. 207: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

1. Recover the refrigerant from the refrigerant system. See STANDARD PROCEDURE.
2. Disconnect and isolate the negative battery cable.
3. Remove the nut (2) that secures the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3).
4. Disconnect the A/C suction and liquid lines from the A/C expansion valve, remove and discard the O-ring seals and position the refrigerant lines out of the way.

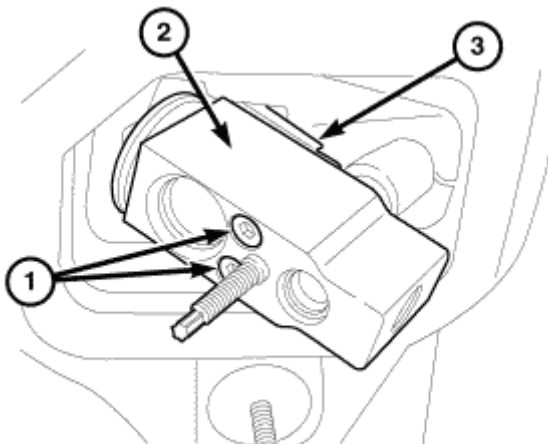


Fig. 208: Bolts, A/C Expansion Valve & Evaporator Tube Tapping Block
Courtesy of CHRYSLER LLC

5. Remove the two bolts (1) that secure the A/C expansion valve (2) to the evaporator tube tapping block (3).
6. Remove the A/C expansion valve from the evaporator tube tapping block and remove and discard the O-ring seals.
7. Install plugs in, or tape over the opened refrigerant line and evaporator tube fittings and all expansion valve ports.

INSTALLATION

VALVE-A/C EXPANSION

NOTE: Replacement of the refrigerant line O-ring seals and gaskets is required anytime a refrigerant line is opened. Failure to replace the rubber O-ring seals and metal gaskets could result in a refrigerant system leak.

NOTE: LHD model shown in illustrations. RHD model similar.

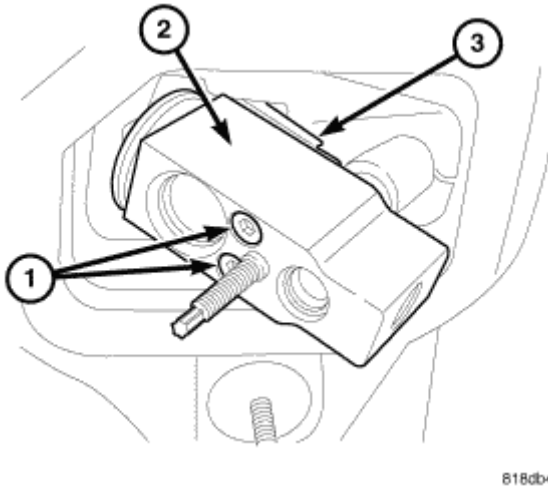


Fig. 209: Bolts, A/C Expansion Valve & Evaporator Tube Tapping Block
Courtesy of CHRYSLER LLC

1. Remove the tape or plugs from the opened refrigerant line and evaporator tube fittings and all of the expansion valve ports.
2. Lubricate new O-ring seals with clean refrigerant oil and install them onto the refrigerant line and evaporator tube fittings. Use only the specified O-rings as they are made of a special material for the R-134a system. Use only refrigerant oil of the type recommended for the A/C compressor in the vehicle.
3. Install the A/C expansion valve (2) onto the evaporator tube tapping block (3).
4. Install the two bolts (1) that secure the A/C expansion valve to the evaporator tube tapping block. Tighten the bolts to 11 N.m (97 in. lbs.).

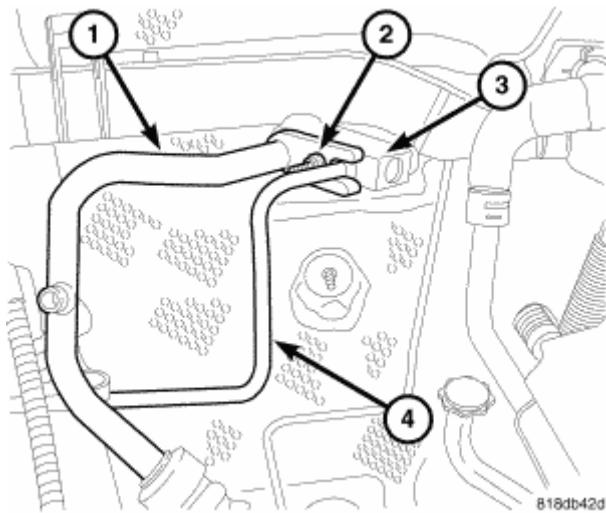


Fig. 210: A/C Suction Line, Nut, A/C Expansion Valve & A/C Liquid Line
Courtesy of CHRYSLER LLC

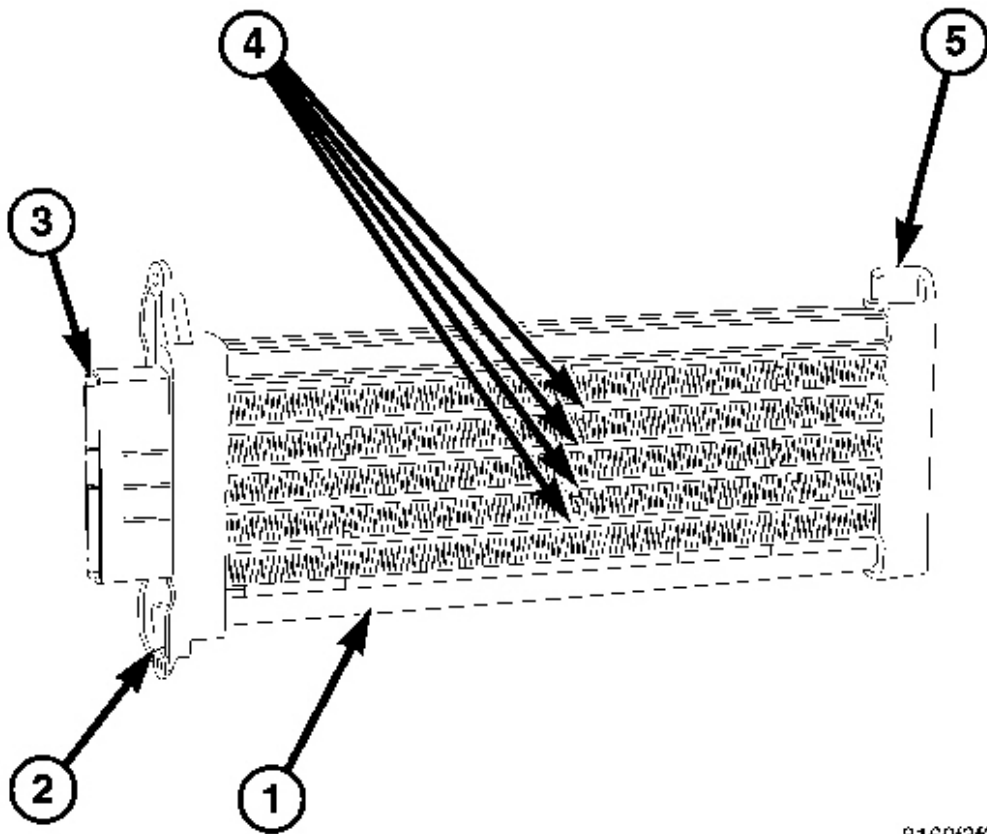
5. Connect the A/C suction line (1) and the A/C liquid line (4) to the A/C expansion valve (3).
6. Install the nut (2) that secures the A/C suction and liquid lines to the A/C expansion valve. Tighten the nut to 23 N.m (17 ft. lbs.).
7. Reconnect the negative battery cable.
8. Evacuate the refrigerant system. See **STANDARD PROCEDURE**.
9. Recharge the refrigerant system. See **STANDARD PROCEDURE**.

HEATER-CABIN

HEATER UNIT

DESCRIPTION

HEATER UNIT



816013f0

Fig. 211: PTC Heater Unit - Description
 Courtesy of CHRYSLER LLC

NOTE: LHD model shown in illustration. RHD model similar.

An electric positive temperature coefficient (PTC) heater unit (1) is used on vehicles when equipped with the 2.8L diesel engine. The PTC heater unit aids in passenger compartment heating by compensating for the lower engine coolant temperatures produced by the diesel engine. The PTC heater unit is mounted in the HVAC air distribution housing, downstream of the heater core and is controlled by the diesel engine control module (ECM) and the totally integrated power module (TIPM) through two relays in diesel accessory fuse/relay block located below the left front fender.

The PTC heater consists of a molded plastic mounting plate (2) with an integral wire connector receptacle (3). Concealed behind the mounting plate are four heating elements with fins (4) that transfer the heat produced by the PTC heater to the conditioned air flowing within the air distribution housing. A positioning tab (5) is molded onto the end of the heater unit to help support the heater unit inside the air distribution housing. The

PTC heater unit is connected to the vehicle electrical system through the instrument panel wire harness.

The PTC heater unit is accessed for service from underneath the instrument panel.

OPERATION

HEATER UNIT

The positive temperature coefficient (PTC) heater unit dissipates 1 kW of electrical power through 4 heating bars. The totally integrated power module (TIPM) operates the two relays for the PTC heater unit. The PTC heater unit is split into two "banks". Each bank is driven separately based on alternator load. This allows for lower in-rush current and optimum battery charging. After a bank has been turned on, another bank can only be turned on 10 seconds after the previous. On average, the PTC banks are not switched more than 25 times for each vehicle start. Electrical power output is between 900-1050 W.

The control system for the PTC heater unit is diagnosed using a scan tool. Prior to replacing a PTC heater unit, check for any diagnostic trouble codes (DTCs) related to the ECM, TIPM and heating-A/C system (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

The PTC heater unit cannot be adjusted or repaired and, if faulty or damaged it must be replaced.

DIAGNOSIS AND TESTING

HEATER UNIT

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible serious or fatal injury.

NOTE: For circuit descriptions and diagrams, refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

Prior to replacing the positive temperature coefficient (PTC) heater unit, check for any diagnostic trouble codes (DTCs) related to the engine control module (ECM), totally integrated power module (TIPM) and the heating-A/C system and repair as necessary (refer to **HEATING & AIR CONDITIONING - ELECTRICAL DIAGNOSTICS** article for more information).

1. Disconnect and isolate the negative battery cable.
2. Disconnect the wire harness connector from the PTC heater unit. See **REMOVAL**.
3. Using an ohmmeter, check for continuity between all of the PTC heater unit terminals. In each case there

should be continuity. If OK, repair the wire harness circuits between the PTC heater unit and the TIPM. If NOT OK, replace the PTC heater unit.

REMOVAL

HEATER UNIT

WARNING: Disable the airbag system before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Disconnect and isolate the negative battery (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury or death.

NOTE: LHD model shown in illustrations. RHD model similar.

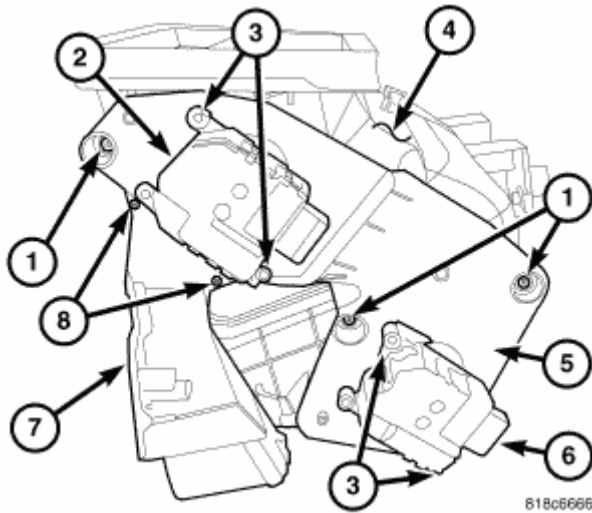


Fig. 212: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. If equipped, remove the silencer from below the driver side of the instrument panel. Refer to **REMOVAL** .
3. Disconnect the wire harness connector from the mode door actuator (2) and the blend door actuator (6) located on the driver side of the air distribution housing. See **REMOVAL**.
4. Carefully disengage the retaining tabs (3) that secure the mode door actuator and the blend door actuator to the actuator mounting bracket (5) and remove the actuators.
5. Remove the three screws (1) that secure the actuator mounting bracket to the air distribution housing and remove the bracket.
6. Remove the screw (8) that secures the driver side front floor duct (7) to the air distribution housing and remove the duct

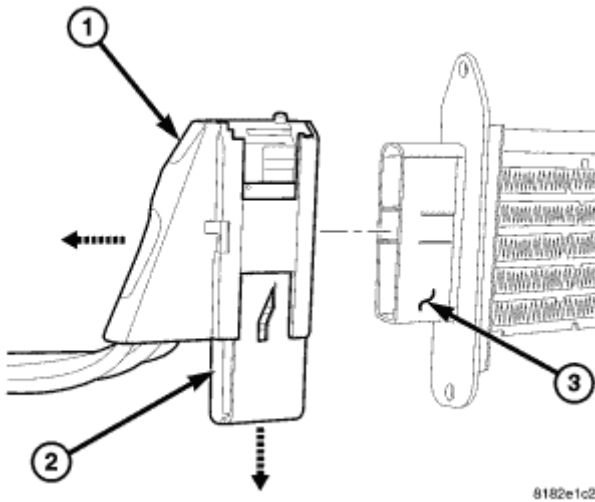


Fig. 213: PTC Heater Connector
 Courtesy of CHRYSLER LLC

NOTE: PTC heater shown in illustration removed from distribution housing for clarity.

NOTE: To disconnect the wire harness connector from the PTC heater, disengage the connector lock while pulling the connector away from the heater unit.

7. Disengage the wire connector lock (2) that secures the wire harness connector (1) to the positive temperature coefficient (PTC) heater unit (3) and disconnect the connector from the heater.

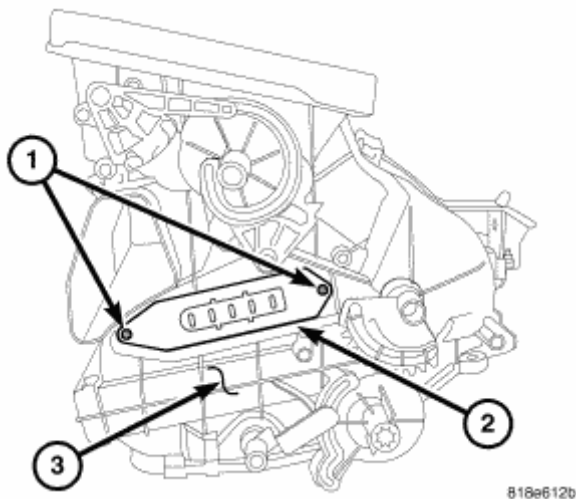


Fig. 214: Removing/Installing Screws That Secure PTC Heater Unit To Air Distribution Housing
 Courtesy of CHRYSLER LLC

8. Remove the two screws (1) that secure the PTC heater unit (2) to the air distribution housing (3).
9. Carefully pull the PTC heater unit straight out of the air distribution housing.

INSTALLATION

HEATER UNIT

NOTE: LHD model shown in illustration. RHD model similar.

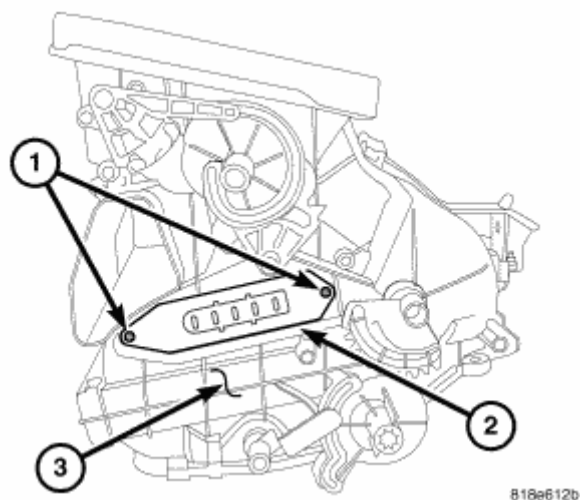


Fig. 215: Removing/Installing Screws That Secure PTC Heater Unit To Air Distribution Housing
Courtesy of CHRYSLER LLC

1. Carefully install the positive temperature coefficient (PTC) heater unit (2) into the driver side of the air distribution housing (3). Make sure to position the two locator tabs on the end of the heater unit into the molded locator indentations on the right side of the air distribution housing.
2. Install the two screws (1) that secure the PTC heater unit to the air distribution housing. Tighten the screws to 1.2 N.m (10 in. lbs.).

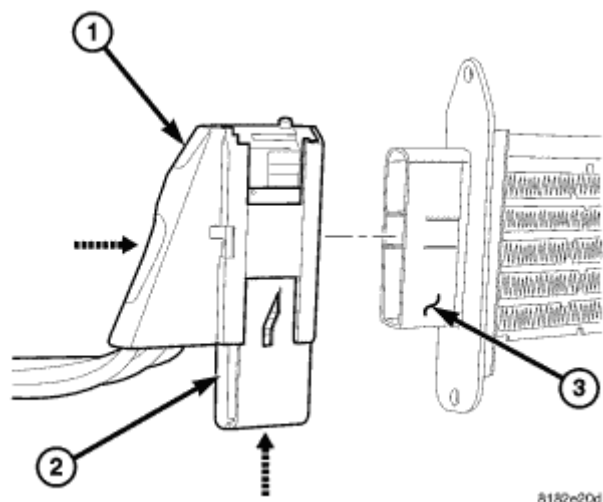


Fig. 216: PTC Heater Connector - Install
Courtesy of CHRYSLER LLC

NOTE: PTC heater shown in illustration removed from distribution housing for clarity.

3. Connect the wire harness connector (1) to the PTC heater unit (3) while pushing inward on the connector lock (2). Make sure the wire harness connector and lock are fully engaged.

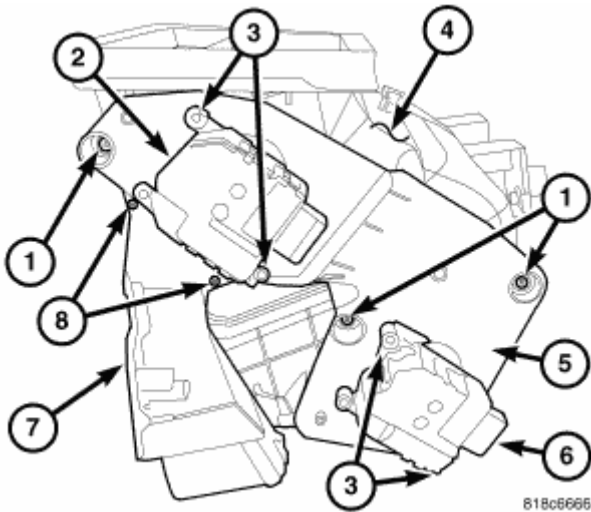


Fig. 217: HVAC Housing Assembly
Courtesy of CHRYSLER LLC

4. Install the driver side front floor duct (7) onto the driver side of the air distribution housing (4) and install the retaining screw (8). Tighten the screw to 1.2 N.m (10 in lbs.).
5. Position the actuator mounting bracket (5) onto the air distribution housing and install the three retaining screws (1). Tighten the screws to 1.2 N.m (10 in lbs.).
6. Position the mode door actuator (2) and the blend door actuator (6) onto the actuator mounting bracket. If necessary, rotate the actuator slightly to align the splines on the actuator output shaft with those on the door linkage.

NOTE: If the retaining tabs on the actuator mounting bracket become broken during service, the alignment pins on the bracket bosses can be removed and screws can be used to retain the actuator to the bracket. Once the alignment pins are removed, pre-made holes can be found the center of the bosses, exactly where the pins were. This assures correct actuator alignment to the bracket. Use care not to overtighten the screws and damage the bosses.

7. Engage the retaining tabs (3) that secure the mode and blend door actuators to the actuator mounting bracket. Make sure the retaining tabs are fully engaged.
8. Connect the wire harness connector to the mode and blend door actuators.
9. If equipped, install the silencer below the driver side of the instrument panel. Refer to **INSTALLATION**.
10. Reconnect the negative battery cable.

RELAY-HEATER UNIT

DESCRIPTION

RELAY-HEATER UNIT

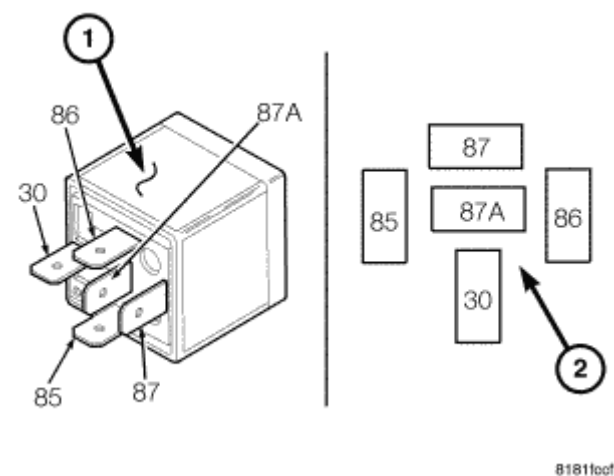


Fig. 218: STANDARD ISO-TYPE RELAY

Courtesy of CHRYSLER LLC

Two relays (1) are used for the electric positive temperature coefficient (PTC) heater system when equipped with the 2.8L diesel engine. The relays are International Standards Organization (ISO)-type relays. Relays conforming to the ISO specifications have common physical dimensions, current capacities, terminal functions and patterns (2). The PTC relays are electromechanical devices that switch fused battery current directly to the heating elements of the PTC heater unit. The PTC relays are energized by control circuits of the totally integrated power module (TIPM).

The two PTC relays are located in the diesel accessory fuse/relay block at the right front corner of the engine compartment.

OPERATION

RELAY-HEATER UNIT

The two ISO-standard relays (1) used for the electric positive temperature coefficient (PTC) heater system are electromechanical switches that use a low current ASD power input to control the high current fused battery power output to the PTC heater unit. On each relay, the movable, common feed relay contact is held against the fixed, normally closed relay contact by spring pressure. When the electromagnetic relay coil is energized, it draws the movable common feed relay contact away from the fixed, normally closed relay contact and, holds it against the fixed, normally open relay contact. This action allows high current to flow to one or more of the heating elements of the PTC heater.

When the relay coil is de-energized, spring pressure returns the movable relay contact back against the fixed, normally closed contact point. The resistor or diode is connected in parallel with the relay coil, and helps to dissipate voltage spikes and electromagnetic interference that can be generated as the electromagnetic field of

the relay coil collapses.

The terminals for the PTC relays are connected to the vehicle electrical system through receptacles in the diesel accessory fuse/relay block. The inputs and outputs of the PTC relays include:

Terminals (30) receive battery current through a fusible link at all times.

Terminals (85) are connected to a ground circuit.

Terminals (86) are connected to control circuits of the totally integrated power module (TIPM).

Terminals (87) provide fused battery current to the PTC heating elements through the PTC relays only when the PTC relay coil is energized.

Terminals (87A) are not connected to any circuit in this application, but provide battery current output only when the PTC relay coil is de-energized.

The two PTC relays cannot be repaired and, if faulty or damaged they must be replaced. Refer to the appropriate wiring information for diagnosis and testing of the ISO-standard relays and for complete TIPM and HVAC wiring diagrams.

REMOVAL

RELAY-HEATER UNIT

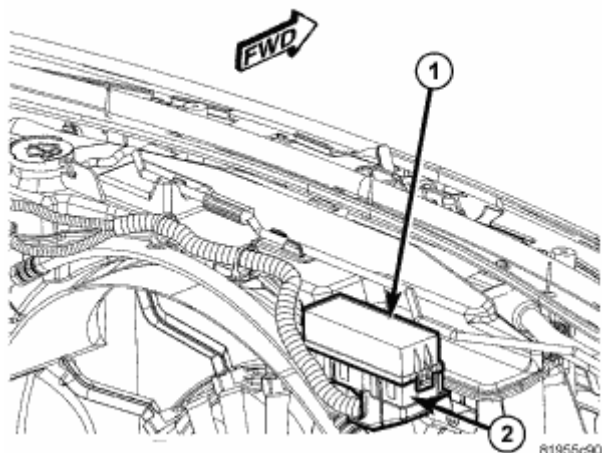


Fig. 219: Cover & Diesel Accessory Fuse/Relay Block
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the negative battery cable.
2. Open the cover (1) of the diesel accessory fuse/relay block (2) located at the right front of the engine compartment.
3. Remove the positive temperature coefficient (PTC) relays as necessary from the fuse/relay block.

INSTALLATION

RELAY-HEATER UNIT

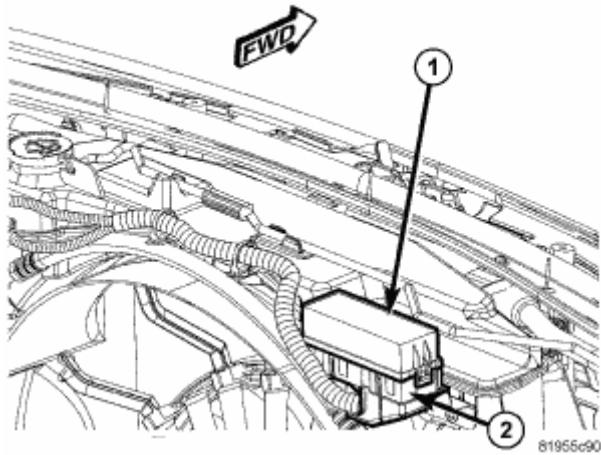


Fig. 220: Cover & Diesel Accessory Fuse/Relay Block
Courtesy of CHRYSLER LLC

1. Position the positive temperature coefficient (PTC) relays as necessary into the proper receptacle of the diesel accessory fuse/relay block (2) located at the right front of the engine compartment.
2. Align the PTC relay terminals with the terminal cavities in the fuse/relay block and push down firmly on each relay until the terminals are fully seated.
3. Close the cover (1) of the diesel accessory fuse/relay block.
4. Reconnect the negative battery cable.

2008 ACCESSORIES AND EQUIPMENT

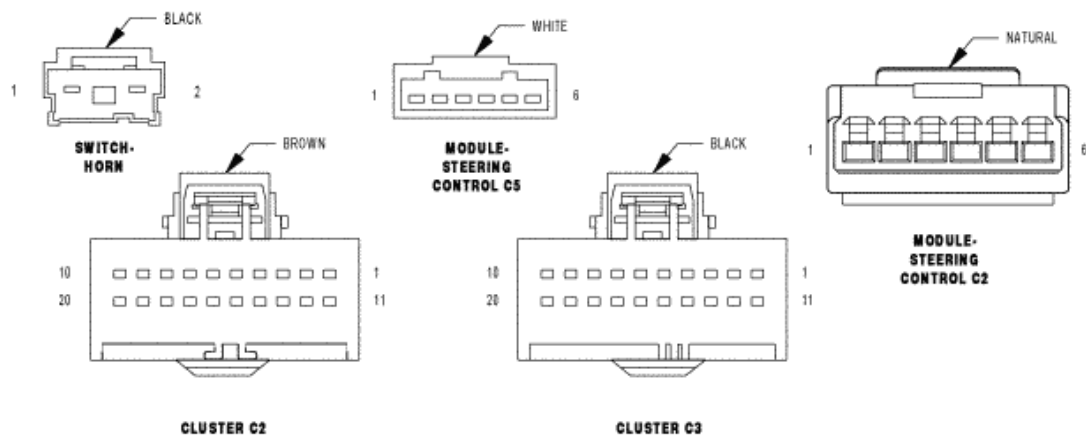
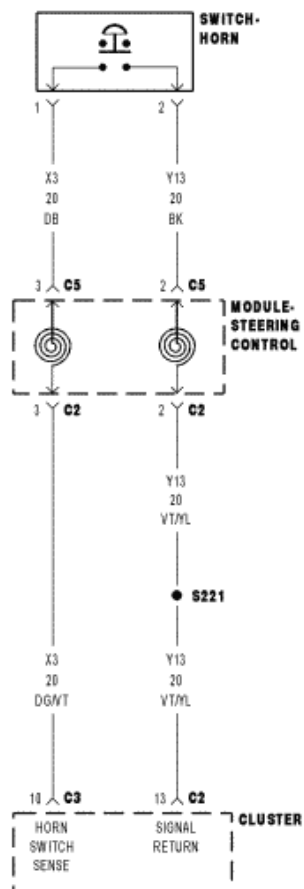
Horn System - Electrical Diagnostics - Liberty

HORN SYSTEM - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B2339-HORN SWITCH STUCK

Circuit Schematic



01a32206

Fig. 1: Horn Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- **Set Condition:**

When the Cluster senses the Horn Switch input for over 30 seconds, this code will set.

Possible Causes

Possible Causes
HORN SWITCH CLOCKSPRING (X3) HORN SWITCH SENSE CIRCUIT SHORTED TO GROUND (X3) HORN SWITCH SENSE CIRCUIT SHORTED TO (Y13) SIGNAL RETURN INSTRUMENT CLUSTER

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase DTC's

Operate the Horn Switch several times.

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display HORN SWITCH STUCK?

Yes

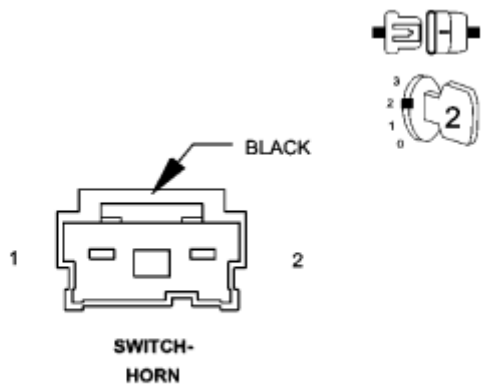
Go To 2) HORN SWITCH SHORTED.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) HORN SWITCH SHORTED



819d5904

Fig. 2: Checking Horn Switch For Short
Courtesy of CHRYSLER LLC

WARNING: To avoid serious or fatal injury, turn the ignition off, disconnect the battery and wait two minutes before proceeding.

Disconnect the Horn switch connector.

With the scan tool, erase DTC's

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display HORN SWITCH STUCK?

Yes

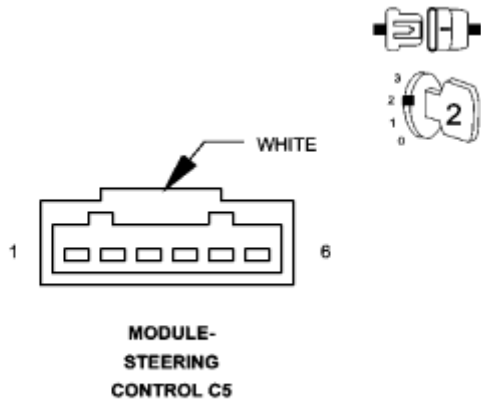
Go To 3).

No

Replace the Horn Switch.

Perform **BODY VERIFICATION TEST - VER 1** .

3) STEERING WHEEL HARNESS SHORTED



819d5967

Fig. 3: Checking Steering Wheel Harness For Short
Courtesy of CHRYSLER LLC

Disconnect the Steering Control Module C5 connector.

With the scan tool, erase DTC's

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display HORN SWITCH STUCK?

Yes

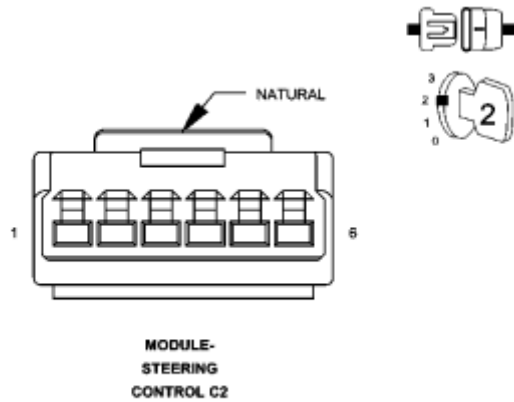
Go To 4).

No

Repair/replace the shorted steering wheel harness.

Perform **BODY VERIFICATION TEST - VER 1**.

4) STEERING CONTROL MODULE SHORTED



81a3ef33

Fig. 4: Steering Control Module C2 Connector
Courtesy of CHRYSLER LLC

Disconnect the Steering Control Module C2 connector.

With the scan tool, erase DTC's

Cycle the ignition from on to off 3 times.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display HORN SWITCH STUCK?

Yes

Go To 5).

No

Replace the Clockspring.

Perform **BODY VERIFICATION TEST - VER 1** .

5) (X3) HORN SWITCH SENSE SHORTED TO RETURN

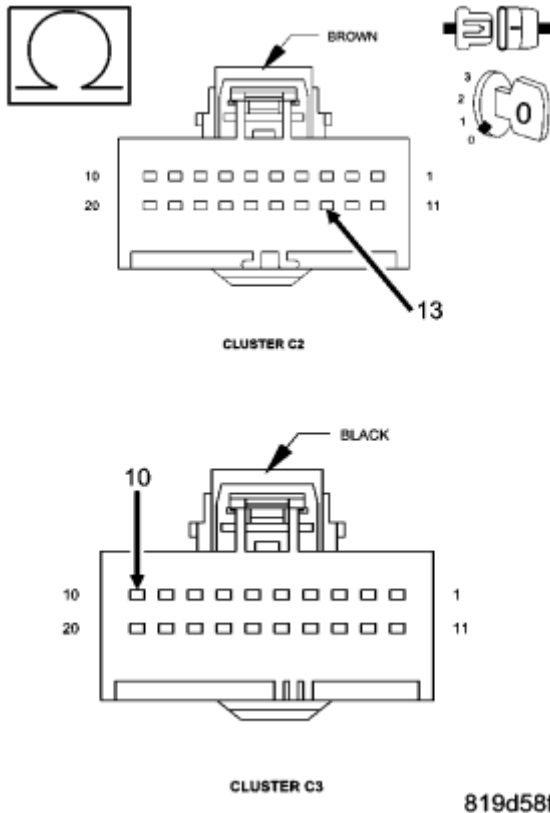


Fig. 5: Measuring Resistance Between (X3) Horn Switch Sense And (X13) Signal Return Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 and C3 connector.

Measure the resistance between (X3) Horn Switch Sense and the (X13) Signal Return circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (X3) Horn Switch Sense circuit for a short to (X13) Signal Return circuit.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 6).

6) (X3) HORN SWITCH SENSE SHORTED TO GROUND

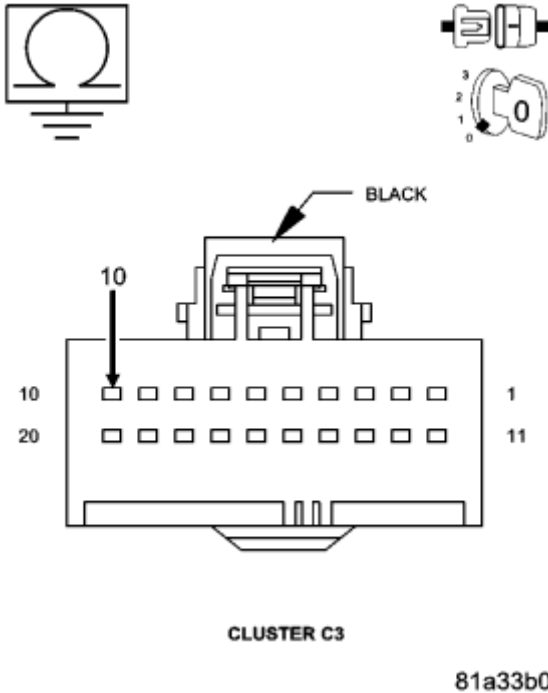


Fig. 6: Measuring (X3) Horn Switch Sense Circuit To Ground
Courtesy of CHRYSLER LLC

Measure the (X3) Horn Switch Sense circuit to ground.

Is the resistance below 1000.0 ohms?

Yes

Repair the Horn Switch Sense circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Cluster.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Horn System - Service Information - Liberty

HORN SYSTEM - SERVICE INFORMATION

DESCRIPTION

HORN SYSTEM

The dual-note horn system features dual electromagnetic horn units. The horn system includes the following major components:

- **Horn** - The two horns are located near the left side headlight.
- **Horn Fuse** - The horn fuse is located in the Totally Integrated Power Module (TIPM).
- **Horn Switch** - The horn switch is located under the driver airbag assembly.

OPERATION

HORN SYSTEM

The horn system operates on battery current received through fuse 41 and 42 in the Totally Integrated Power Module. The horn system circuit is designed so that the system will remain operational, regardless of the ignition switch position.

DIAGNOSIS AND TESTING

HORN SYSTEM

In most cases, any problem involving continually sounding horns can be quickly alleviated by removing the fuses from the Totally Integrated Power Module (TIPM).

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

HORN SYSTEM DIAGNOSIS TABLE

CONDITION	POSSIBLE CAUSES	CORRECTION
BOTH HORNS INOPERATIVE	1. Faulty fuse.	1. Check the fuses in the Totally Integrated Power Module (TIPM). Replace the fuse and repair the shorted circuit or component, if

-	2. Faulty horn switch.	required. 2. Refer to <u>SWITCH-HORN</u> for the proper diagnosis and testing procedure. Replace the horn switch or repair the open horn switch circuit, if required.
-	3. Faulty horns.	3. Refer to <u>HORN</u> for the proper diagnosis and testing procedure. Replace the horns or repair the open horn circuit, if required.
ONE HORN INOPERATIVE	1. Faulty horn.	1. Refer to <u>HORN</u> for the proper diagnosis and testing procedures. Replace the horn or repair the open horn circuit, if required.
HORN SOUNDS CONTINUOUSLY	1. Faulty horn switch.	1. Refer to <u>SWITCH-HORN</u> for the proper diagnosis and testing procedure. Replace the horn switch or repair the shorted horn switch circuit, if required.

HORN

REMOVAL

HORN

- 1. Disconnect and isolate the battery negative cable.
- 2. Disconnect the electrical harness connector from the horns.
- 3. Remove the mounting bolt.
- 4. Remove the horns.

INSTALLATION

HORN

- 1. Install the horns.
- 2. Install the mounting bolt. Tighten bolt to 25 N.m (19 ft. lbs.).
- 3. Connect the electrical harness connector to the horns
- 4. Connect the battery negative cable.

SWITCH-HORN

DESCRIPTION

HORN SWITCH

The horn switch is located in the center of the steering wheel under the flexible steering wheel pad for convenient operation.

REMOVAL

REMOVAL

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

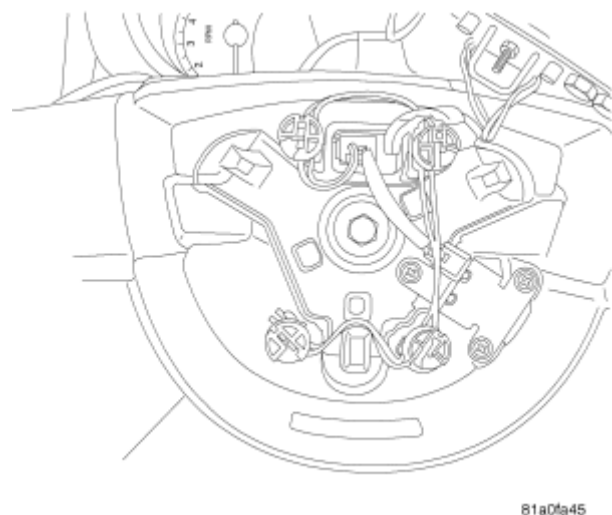


Fig. 1: Horn Switch
Courtesy of CHRYSLER LLC

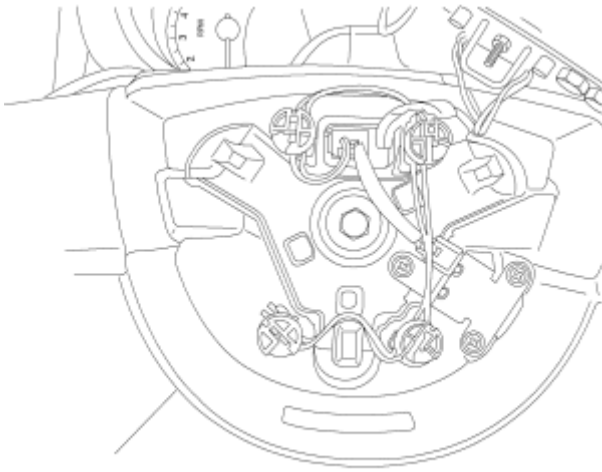
1. Disconnect and isolate the battery negative cable.
2. Remove the driver airbag. Refer to **REMOVAL** .
3. Disconnect the electrical connectors.
4. Remove horn switches.

INSTALLATION

INSTALLATION

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way

to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.



81a0fa45

Fig. 2: Horn Switch
Courtesy of CHRYSLER LLC

1. Install the horn switches.
2. Connect the electrical connectors.
3. Install the driver airbag. Refer to **INSTALLATION**.
4. Connect the battery negative cable.

2008 ENGINE

Ignition Control - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

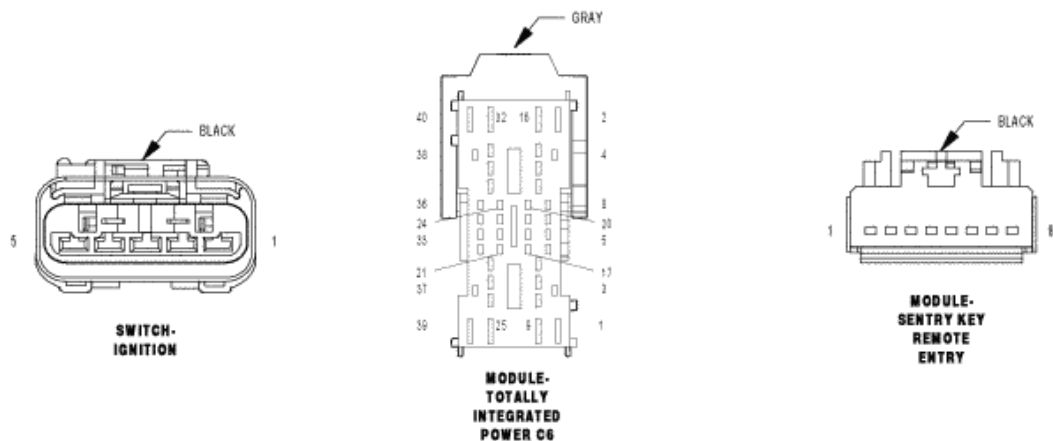
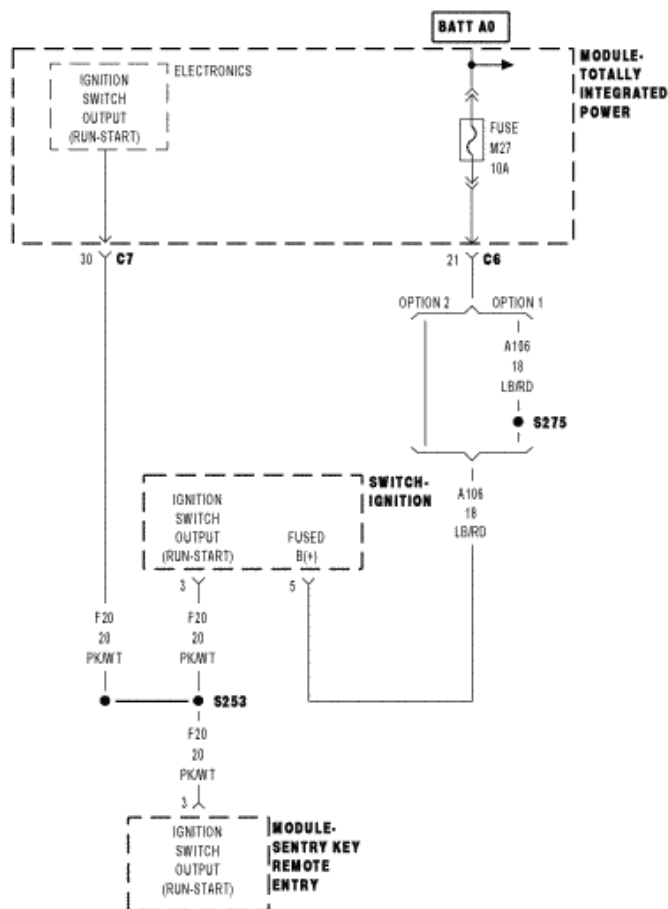
DTC	Description
<u>B2101</u>	IGNITION RUN/START INPUT CIRCUIT LOW
<u>B2102</u>	IGNITION RUN/START INPUT CIRCUIT HIGH
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>B2142</u>	IGNITION OFF DRAW (IOD) FUSE NOT PRESENT
<u>B219A</u>	IGNITION UNLOCK RUN/START CONTROL CIRCUIT OVERCURRENT
<u>B219F</u>	IGNITION OFF DRAW (IOD) FUSE BLOWN
<u>B2206</u>	CURRENT VIN MISSING / MISMATCH
<u>B222C</u>	VEHICLE CONFIGURATION NOT PROGRAMMED
<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0101</u>	LOST COMMUNICATION WITH TCM
<u>U0114</u>	LOST COMMUNICATION WITH FINAL DRIVE CONTROL MODULE
<u>U0121</u>	LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER

IGNITION CONTROL - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B2101-IGNITION RUN/START INPUT CIRCUIT LOW

Circuit Schematic



0130-1120

Fig. 1: Identifying Ignition Run/Start Input Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition switch on.

Set Conditions

- **Set Condition:**

The WCM/WIN (SKREEM) Module has detected the ignition switch input voltage below a calibrated value.

Possible Causes

Possible Causes
(F20) IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT OPEN (A106) FUSED B+ SHORTED TO GROUND IGNITION SWITCH TIPM

Diagnostic Test

1) CHECK FOR ACTIVE DTC

Turn the ignition on.

With a scan tool, read, record and erase TIPM DTCs.

Turn the ignition off for 30 seconds, then back on.

Using the scan tool, read TIPM DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2) (F20) IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT OPEN.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2) (F20) IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT OPEN

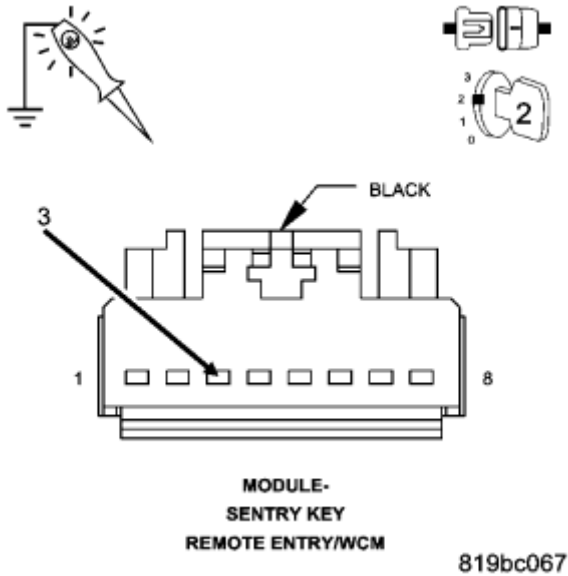


Fig. 2: Checking Ignition Switch Output (Run-Start) Circuit For Open
 Courtesy of CHRYSLER LLC

NOTE: Check the related fuse (TIPM 46) to the (F20) Ignition Switch Output (Run-Start) circuit. If blown, use the wiring diagrams as a guide to make necessary repairs.

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, probe the (F20) Ignition Switch output (Run-Start) circuit in the TIPM C7 harness connector.

Does the test light illuminate brightly?

Yes

Replace the TIPM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (F20) Ignition switch output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

Circuit Schematic

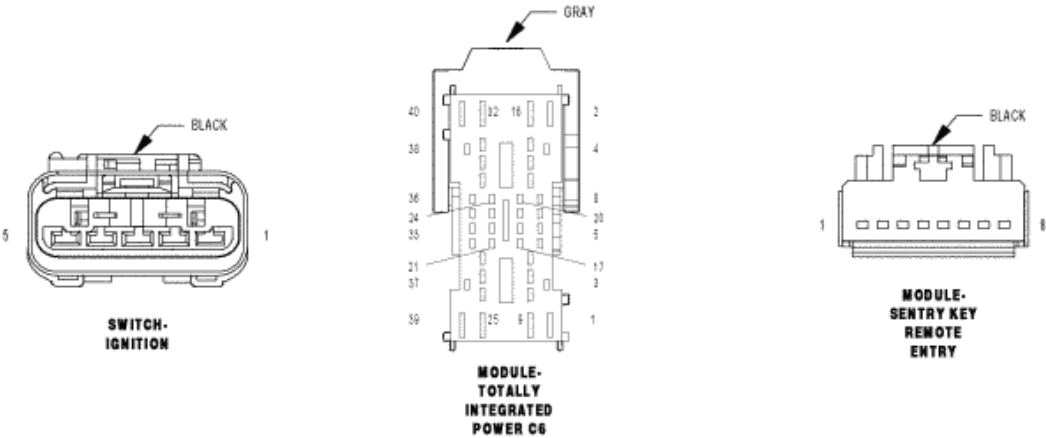
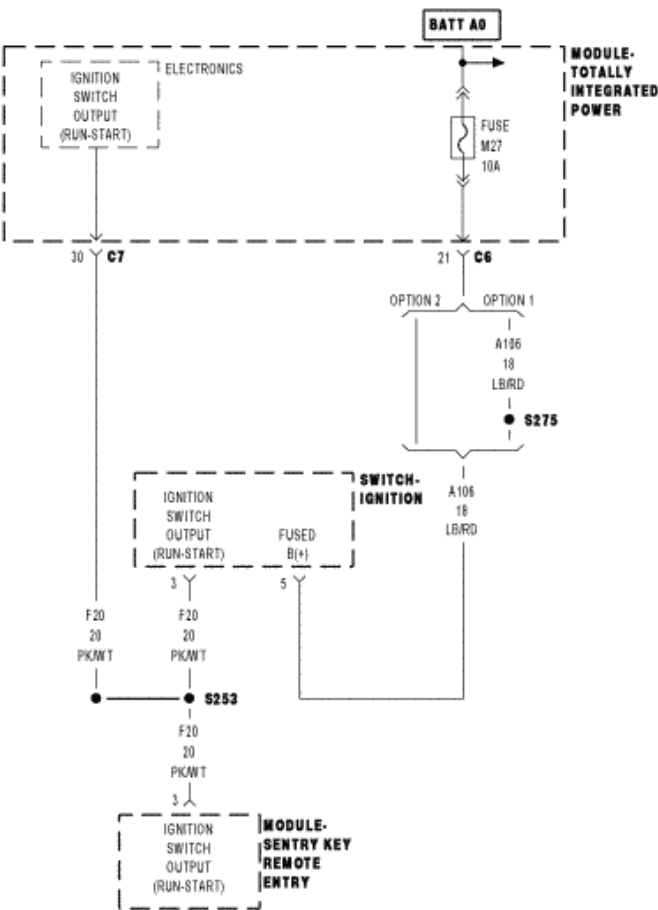


Fig. 3: Identifying Ignition Run/Start Input Circuit Schematic
Courtesy of CHRYSLER LLC

For complete wiring diagrams, refer to [SYSTEM WIRING DIAGRAMS](#) article.

Monitor Conditions

When Monitored:

With the ignition switch on.

Set Conditions

- **Set Condition:**

The WCM/WIN (SKREEM) Module has detected the ignition switch input voltage above a calibrated value.

Possible Causes

Possible Causes
(F20) IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT SHORTED TO BATTERY VOLTAGE WCM/WIN (SKREEM) MODULE

Diagnostic Test

1) CHECK FOR ACTIVE DTC

NOTE: Check to make sure the battery and charging system are operating properly. Battery and charging system problems may cause these DTC's to set.

NOTE: Diagnose any related Powertrain DTC(s) before continuing.

Turn the ignition on.

With a scan tool, read, record and erase WCM/WIN (SKREEM) DTC(s).

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

Using the scan tool, read WCM/WIN (SKREEM) DTC(s).

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2) (F20) IGNITION SWITCH OUTPUT (RUN-START) SHORTED TO BATTERY VOLTAGE

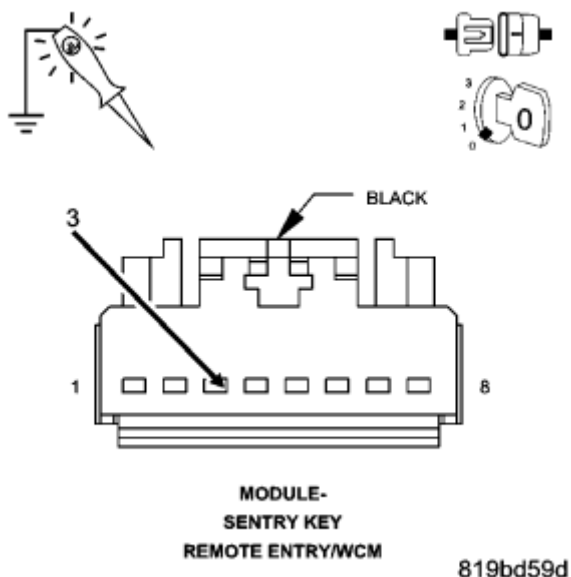


Fig. 4: Checking Ignition Switch Output (Run-Start) For Short To Battery Voltage
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the WCM/WIN (SKREEM) harness connector.

Using a 12-volt test light connected to ground, probe the (F20) Ignition Switch Output (Run-Start) circuit in the WCM/WIN (SKREEM) harness connector.

Does the test light illuminate brightly?

Yes

Repair the (F20) Ignition Switch Output (Run-Start) circuit for a short to battery voltage.

Perform **SKREEM/SKIM VERIFICATION TEST** .

No

Replace and program the WCM/WIN (SKREEM) in accordance with the service information.

Perform **SKREEM/SKIM VERIFICATION TEST** .

B210D-BATTERY VOLTAGE LOW

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Battery voltage less than 9 volts for approximately 5 to 6 seconds.

Possible Causes

Possible Causes
GENERATOR OPERATION PCM

Diagnostic Test

1) CHECK FOR ANY POWERTRAIN CONTROL MODULES DTCS

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Make sure the generator drive belt is in good operating condition.
- NOTE:

Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Turn the ignition on.

With the scan tool, read active PCM DTC's.

Does the scan tool display any active PCM DTC's?

Yes

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for the diagnostic test procedure.

No

Check the above conditions that can cause a low voltage condition. Repair as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

B210E-BATTERY VOLTAGE HIGH

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

Battery voltage greater than 16 volts for approximately 15 seconds.

Possible Causes

Possible Causes
GENERATOR PCM

Diagnostic Test

1) CHECK FOR ANY POWERTRAIN CONTROL MODULES DTCS

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Make sure the generator drive belt is in good operating condition.

NOTE: **Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.**

Turn the ignition on.

With the scan tool, read active PCM DTC's.

Does the scan tool display any active PCM DTC's?

Yes

Refer to appropriate Engine ELECTRICAL DIAGNOSTICS article for the diagnostic test procedure.

No

Check the above conditions that can cause a high voltage condition. Repair as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

B2142-IGNITION OFF DRAW (IOD) FUSE NOT PRESENT

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the Ignition on. This DTC will set only if vehicle has less that 50 miles on it. After 50 miles, DTC B219F will set.

Set Conditions

- Set Condition:**

IOD Fuse not installed in the TIPM.

Possible Causes

Possible Causes
IOD FUSE

Diagnostic Test

1) CHECK FOR ACTIVE DTC

With the scan tool, record and erase DTC's.

Cycle the ignition switch from off to on, leaving the ignition off for a minimum of 30 seconds.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

If the DTC is stored, check for an intermittent condition. Using the wiring diagram/schematic as a guide, visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2) IOD FUSE INSTALLED

Verify IOD Fuse installed in TIPM

Is IOD Fuse present?

Yes

Go To 3).

No

Install the IOD Fuse.

Perform **BODY VERIFICATION TEST - VER 1** .

3) IOD FUSE BLOWN CHECK

Is IOD Fuse blown?

Yes

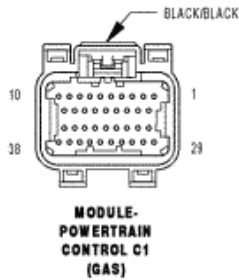
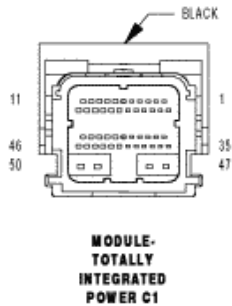
Replace the IOD Fuse.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete.

Circuit Schematic



0100-1101

Fig. 5: Fused Ignition Switch Output (Run-Start) Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to [SYSTEM WIRING DIAGRAMS](#) article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Over current condition detected on the (F1) Fused Ignition Switch Output (Run-Start) circuit.

Possible Causes

Possible Causes
TERMINAL DAMAGE OR CORROSION HIGH RESISTANCE ON THE (F1) IGNITION SWITCH OUTPUT (UNLOCK-RUN-START) CIRCUIT TIPM

Diagnostic Test

1) CHECK FOR ACTIVE DTC

With the scan tool, record and erase DTC's.

Cycle the ignition switch from off to on, leaving the ignition off for a minimum of 30 seconds.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

If the DTC is stored, check for an intermittent condition. Using the wiring diagram/schematic as a guide, visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2) INSPECT THE TIPM, PCM, AND SHIFT LEVER ASSEMBLY (NAG1) TERMINALS & WIRE HARNESS FOR A CONDITION CAUSING HIGH CIRCUIT RESISTANCE

Turn the ignition off.

Disconnect the TIPM C1 harness connector.

Disconnect the PCM C1 harness connector.

Disconnect the Shift Lever Assembly (NAG1) harness connector

Inspect the connector terminals for signs of corrosion build up and damage.

Visually inspect the wiring harness for any chafed, pierced, pinched or partially broken wires hidden in the wire insulation.

Were any of the above conditions found?

Yes

Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the TIPM in accordance with the service information

Perform **BODY VERIFICATION TEST - VER 1** .

B219F-IGNITION OFF DRAW (IOD) FUSE BLOWN

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on. This DTC will only set if vehicle has over 50 miles on it.

Set Conditions

- **Set Condition:**

IOD Fuse not installed or blown.

Possible Causes

Possible Causes
IOD FUSE NOT INSTALLED
IOD FUSE BLOWN

Diagnostic Test

1) CHECK FOR ACTIVE DTC

With the scan tool, record and erase DTC's.

Cycle the ignition switch from off to on, leaving the ignition off for a minimum of 30 seconds.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

If the DTC is stored, check for an intermittent condition. Using the wiring diagram/schematic as a guide, visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2) IOD FUSE

Verify IOD Fuse installed in TIPM.

Is IOD Fuse present?

Yes

Go To 3).

No

Replace the IOD Fuse.

Perform **BODY VERIFICATION TEST - VER 1** .

3) IOD FUSE BLOWN

Verify IOD Fuse is blown.

Is IOD Fuse blown?

Yes

Using the wiring diagrams, diagnose for a short to ground condition.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete.

B2206-CURRENT VIN MISSING / MISMATCH

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

A PCM from another vehicle has been installed in the vehicle.

Possible Causes

Possible Causes
PCM FROM ANOTHER VEHICLE INSTALLED

Diagnostic Test

1) PCM FROM ANOTHER VEHICLE INSTALLED

NOTE: This DTC is set when a PCM from another vehicle is installed into the current vehicle.

Has another PCM been installed?

Yes

Replace the PCM in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 2).

2) OTHER CAN-C MODULES SET VIN MISMATCH

Is VIN Mismatch DTC set in other CAN-C modules?

Yes

Replace the PCM in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the TIPM in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B222C-VEHICLE CONFIGURATION NOT PROGRAMMED

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- Set Condition:**

The TIPM is not configured for the vehicle.

Possible Causes

Possible Causes
TIPM

Diagnostic Test

1) CHECK FOR ACTIVE DTC

Turn the ignition on.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

Test complete.

2) ACTIVE TIPM DTC

Cycle the ignition from off to run remaining in run.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 3).

No

Test complete.

3) VIN MISMATCH DTC PRESENT

Turn the ignition on.

With the scan tool, read DTCs.

Is DTC: B2206-CURRENT VIN MISSING / MISMATCH also active?

Yes

Refer to repair procedure for DTC **B2206-CURRENT VIN MISSING / MISMATCH.**

No

Replace the TIPM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0100-LOST COMMUNICATION WITH ECM/PCM

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0101-LOST COMMUNICATION WITH TCM

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0114-LOST COMMUNICATION WITH FINAL DRIVE CONTROL MODULE

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0121-LOST COMMUNICATION WITH ANTI-LOCK BRAKE MODULE

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0164-LOST COMMUNICATION WITH HVAC CONTROL MODULE

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0168-LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Diagnostic Test

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

2008 ENGINE

Ignition Control - Service Information - Liberty

IGNITION CONTROL - SERVICE INFORMATION

DESCRIPTION

IGNITION SYSTEM-3.7L

The ignition system is controlled by the Powertrain Control Module (PCM) on all engines.

This engine uses a separate ignition coil for each cylinder. The one-piece coil bolts directly to the cylinder head. Rubber boots seal the secondary terminal ends of the coils to the top of all 6 spark plugs. A separate electrical connector is used for each coil.

Because of coil design, spark plug cables (secondary cables) are not used. A distributor is not used with the 3.7L engine.

Two knock sensors (one for each cylinder bank) are used to help control spark knock.

The Auto Shutdown (ASD) relay provides battery voltage to each ignition coil.

The ignition system consists of:

- 6 Spark Plugs
- 6 Separate Ignition Coils
- 2 Knock Sensors
- Powertrain Control Module (PCM)

Also to be considered part of the ignition system are certain inputs from the Crankshaft Position, Camshaft Position, 2 knock and MAP Sensors

SPECIFICATIONS

IGNITION COIL RESISTANCE - 3.7L V6

PRIMARY RESISTANCE 21-27°C (70-80°F)	SECONDARY RESISTANCE 21-27°C (70-80°F)
0.6 - 0.9 Ohms	6,000 - 9,000 Ohms

IGNITION TIMING

Ignition timing is not adjustable on any engine.

SPARK PLUGS

ENGINE	PLUG TYPE	ELECTRODE GAP
--------	-----------	---------------

3.7L V6

ZFR6F - 11G (NGK)

1.1 mm (0.043 in.)

SPECIFICATIONS - ENGINE FIRING ORDER - 3.7L

1 - 6 - 5 - 4 - 3 - 2

TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Camshaft Position Sensor - 3.7L	12	-	106
Crankshaft Position Sensor - 3.7L	28	21	205
Ignition Coil Mounting - 3.7L	8	-	70
* Knock Sensor - 3.7L	20	15 +/- 2	176
Spark Plugs - 3.7L	27	20	-
Tilt lever bracket	4.5	-	40
Ignition switch mounting screws	3	-	26
* Do not apply any sealant, thread-locker or adhesive to bolts. Poor sensor performance may result.	-	-	
** Torque critical tapered design. Do not exceed 15 ft. lbs. (20 N.m).	-	-	

RELAY-AUTO SHUT DOWN**REMOVAL****AUTO SHUTDOWN RELAY**

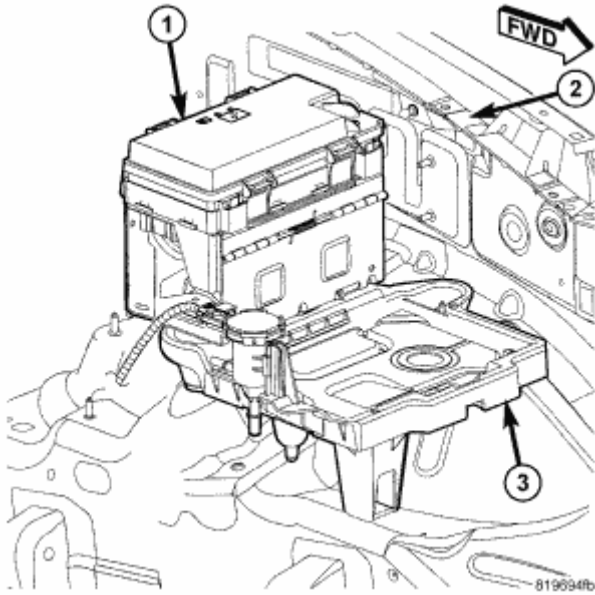


Fig. 1: Identifying ASD, Totally Integrated Power Module (TIPM) & Left Inner Fender
Courtesy of CHRYSLER LLC

The ASD relay is located in the Totally Integrated Power Module (TIPM) (1). The TIPM is located in the engine compartment near the left inner fender (2). Refer to label on TIPM cover for relay location.

1. Remove TIPM cover.
2. Remove relay from TIPM.
3. Check condition of relay terminals and TIPM connector terminals for damage or corrosion. Repair if necessary before installing relay.
4. Check for pin height (pin height should be the same for all terminals within the TIPM connector). Repair if necessary before installing relay.

INSTALLATION

AUTO SHUTDOWN RELAY

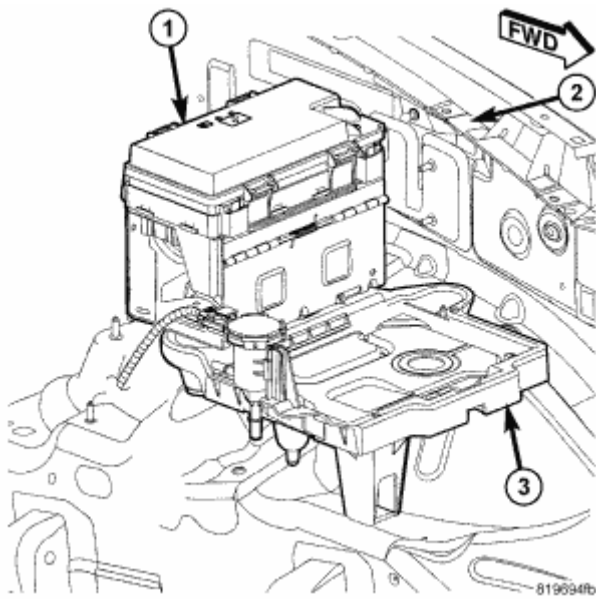


Fig. 2: Identifying ASD, Totally Integrated Power Module (TIPM) & Left Inner Fender
Courtesy of CHRYSLER LLC

1. Refer to TIPM cover for ASD relay location.
2. Install relay to TIPM (1).
3. Install cover to TIPM.

SENSOR-CAMSHAFT POSITION

REMOVAL

CAMSHAFT POSITION SENSOR - 3.7L

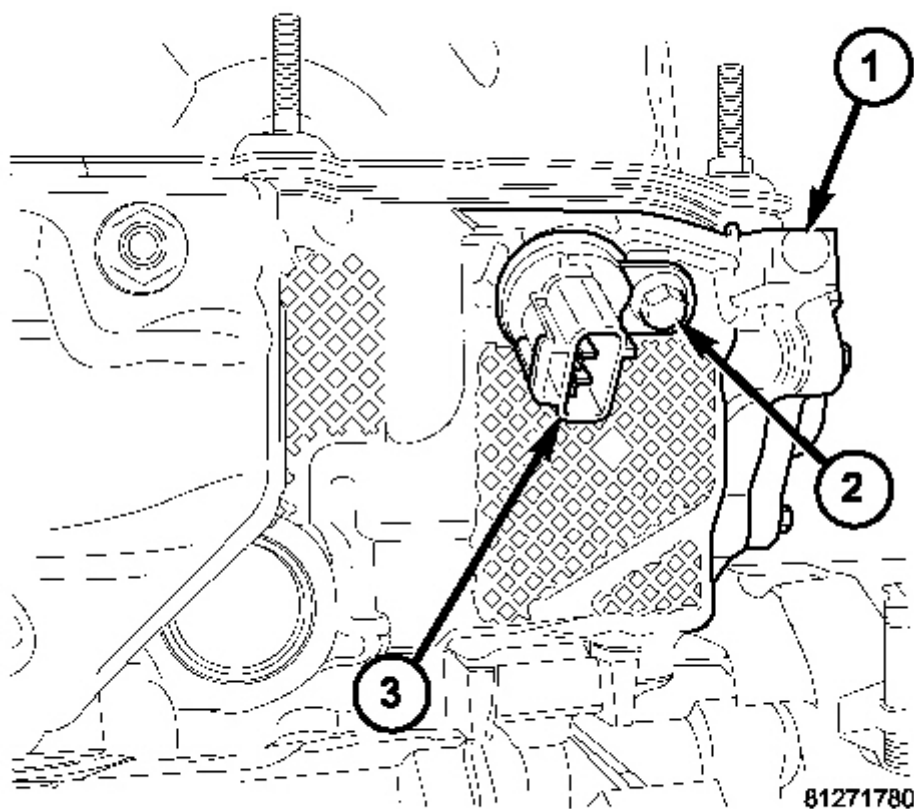


Fig. 3: Camshaft Position Sensor
Courtesy of CHRYSLER LLC

The Camshaft Position Sensor (CMP) (3) is bolted to the front/top of the right cylinder head (1).

1. Raise and support vehicle.
2. Disconnect electrical connector at CMP sensor.
3. Remove sensor mounting bolt (2).
4. Carefully twist sensor from cylinder head.
5. Check condition of sensor o-ring.

INSTALLATION

CAMSHAFT POSITION SENSOR - 3.7L

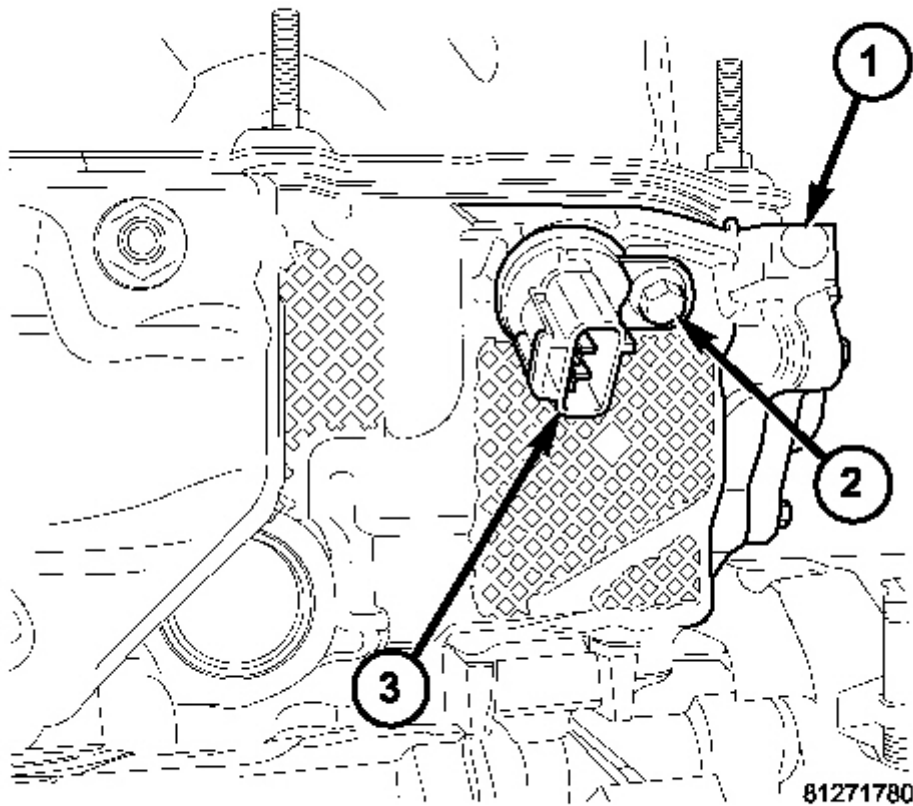


Fig. 4: Camshaft Position Sensor
Courtesy of CHRYSLER LLC

1. Clean out machined hole in cylinder head.
2. Apply a small amount of engine oil to sensor o-ring.
3. Install sensor (3) into cylinder head with a slight rocking and twisting action.

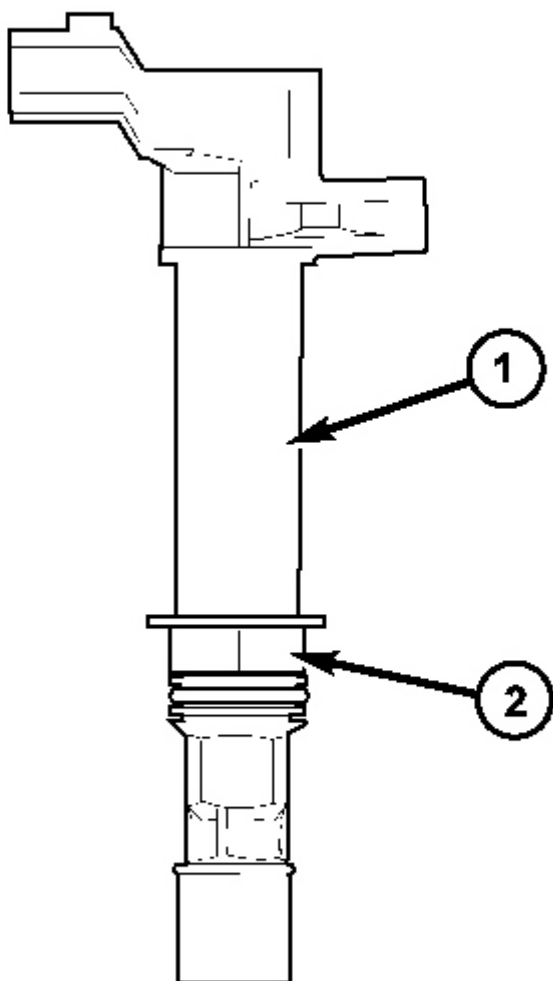
CAUTION: Before tightening sensor mounting bolt (2), be sure sensor is completely flush to cylinder head. If sensor is not flush, damage to sensor mounting tang may result.

4. Install mounting bolt (2) and tighten to 12 N.m (106 in. lbs).
5. Connect electrical connector to sensor.

COIL-IGNITION

REMOVAL

COIL-IGNITION-3.7L



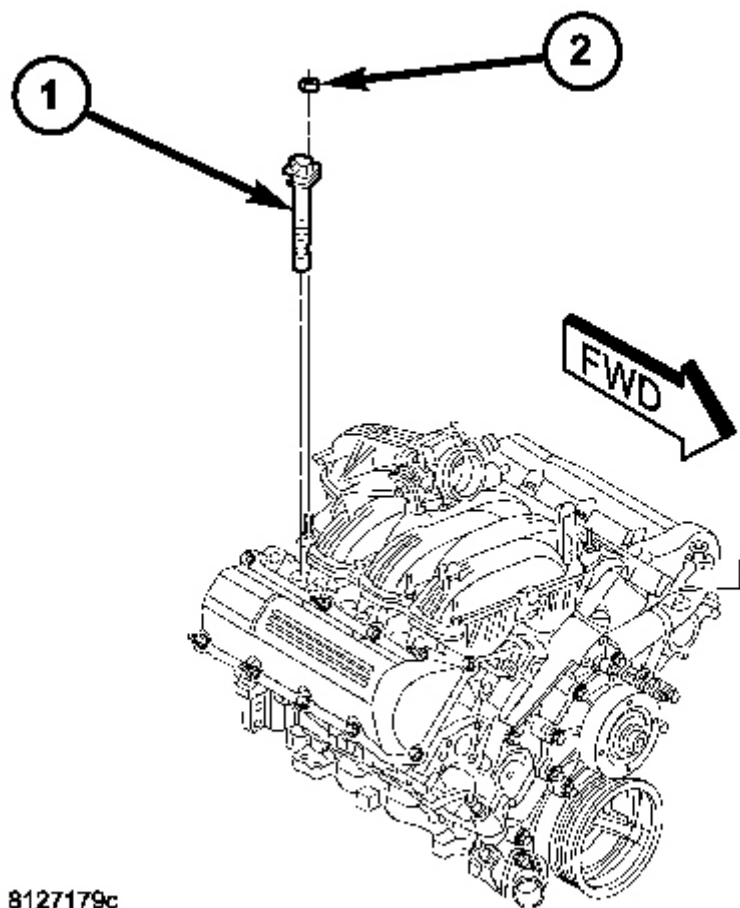
81607ec1

Fig. 5: Ignition Coil Seal Location
Courtesy of CHRYSLER LLC

An individual ignition coil (1) is used for each spark plug. The coil fits into machined holes in the cylinder head. A mounting stud/nut secures each coil to the top of the intake manifold. The bottom of the coil is equipped with a rubber boot to seal the spark plug to the coil. Inside each rubber boot is a spring. The spring is used for a mechanical contact between the coil and the top of the spark plug. These rubber boots and springs are a permanent part of the coil and are not serviced separately. An o-ring (2) is used to seal the coil at the opening

into the cylinder head.

1. Depending on which coil is being removed, the throttle body air intake tube or intake box may need to be removed to gain access to coil.
2. Disconnect electrical connector from coil by pushing downward on release lock on top of connector and pull connector from coil.
3. Clean area at base of coil with compressed air before removal.



8127179c

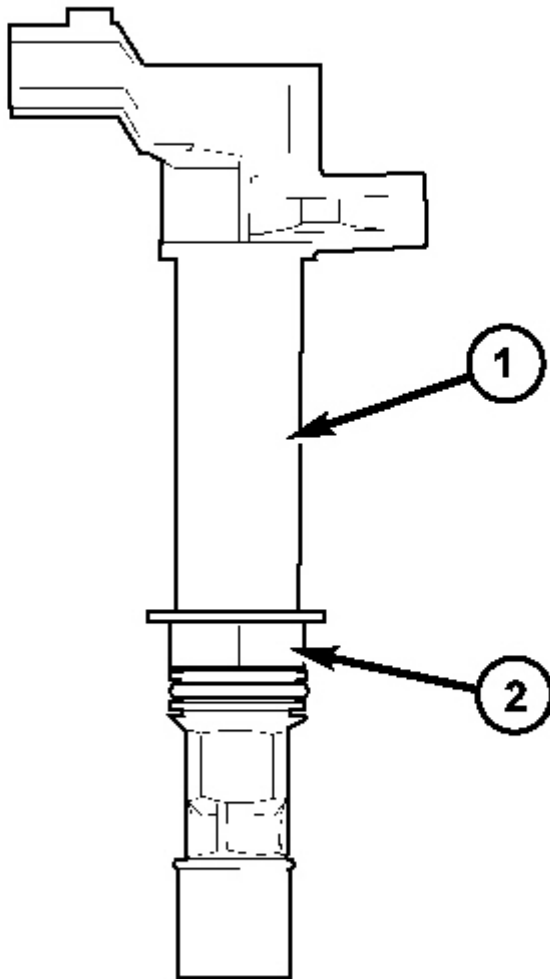
Fig. 6: Locating Ignition Coil - 3.7L
Courtesy of CHRYSLER LLC

4. Remove coil mounting nut (2) from mounting stud.
5. Carefully pull up coil from cylinder head opening with a slight twisting action.

6. Remove coil from vehicle.

INSTALLATION

COIL-IGNITION - 3.7L

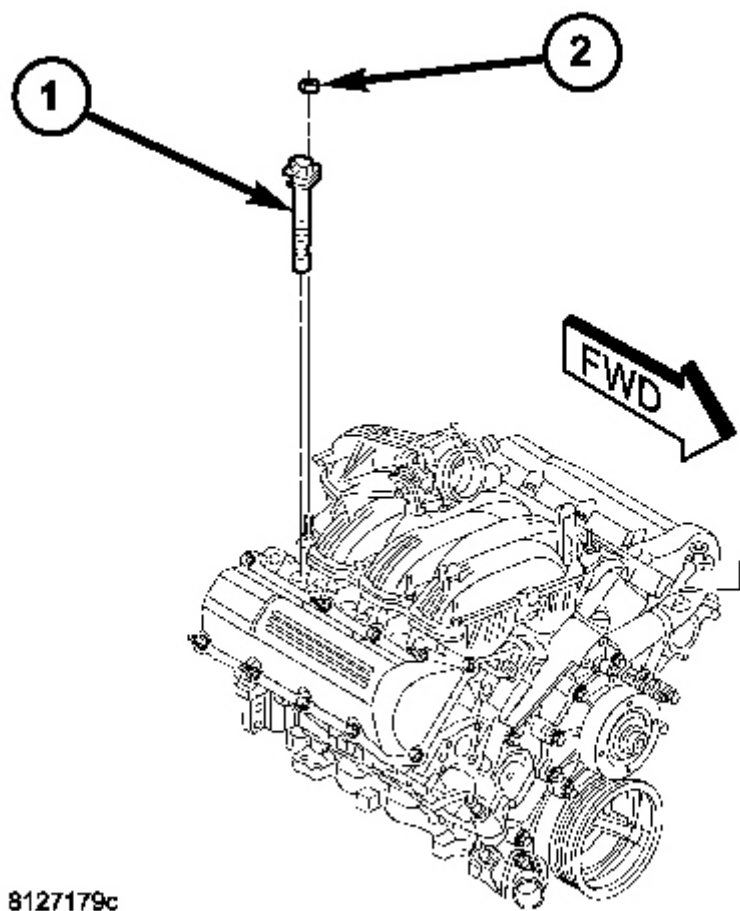


81607ec1

Fig. 7: Ignition Coil Seal Location
Courtesy of CHRYSLER LLC

1. Using compressed air, blow out any dirt or contaminants from around top of spark plug.
2. Check condition of coil O-ring (2) and replace as necessary. To aid in coil installation, apply silicone to

coil o-ring (2).



8127179c

Fig. 8: Locating Ignition Coil - 3.7L
Courtesy of CHRYSLER LLC

3. Position ignition coil (1) into cylinder head opening and push onto spark plug. Do this while guiding coil base over mounting stud.
4. Install coil mounting stud nut (2).
5. Connect electrical connector to coil by snapping into position.
6. If necessary, install throttle body air tube.

SENSOR-KNOCK

OPERATION

OPERATION - 3.7L

Two knock sensors are used; one for each cylinder bank. When the knock sensor detects a knock in one of the cylinders on the corresponding bank, it sends an input signal to the Powertrain Control Module (PCM). In response, the PCM retards ignition timing for all cylinders by a scheduled amount.

Knock sensors contain a piezoelectric material which constantly vibrates and sends an input voltage (signal) to the PCM while the engine operates. As the intensity of the crystal's vibration increases, the knock sensor output voltage also increases.

The voltage signal produced by the knock sensor increases with the amplitude of vibration. The PCM receives the knock sensor voltage signal as an input. If the signal rises above a predetermined level, the PCM will store that value in memory and retard ignition timing to reduce engine knock. If the knock sensor voltage exceeds a preset value, the PCM retards ignition timing for all cylinders. It is not a selective cylinder retard.

The PCM ignores knock sensor input during engine idle conditions. Once the engine speed exceeds a specified value, knock retard is allowed.

Knock retard uses its own short term and long term memory program.

Long term memory stores previous detonation information in its battery-backed RAM. The maximum authority that long term memory has over timing retard can be calibrated.

Short term memory is allowed to retard timing up to a preset amount under all operating conditions (as long as RPM is above the minimum RPM) except at Wide Open Throttle (WOT). The PCM, using short term memory, can respond quickly to retard timing when engine knock is detected. Short term memory is lost any time the ignition key is turned off.

NOTE: Over or under tightening the sensor mounting bolts will affect knock sensor performance, possibly causing improper spark control. Always use the specified torque when installing the knock sensors.

REMOVAL

SENSOR-KNOCK-3.7L

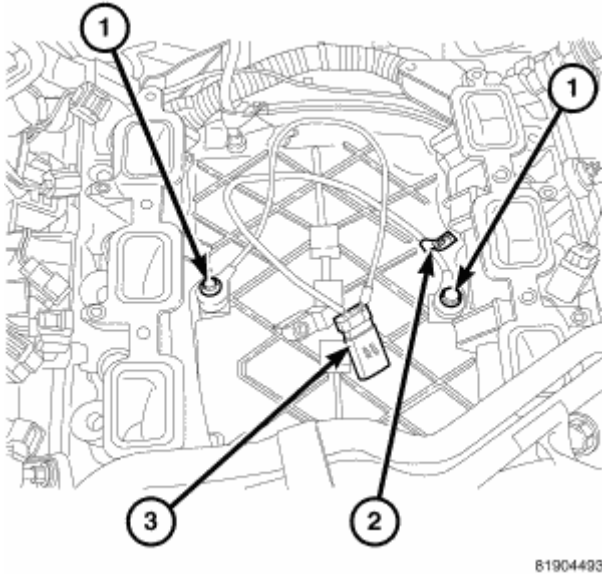


Fig. 9: KNOCK SENSOR - 3.7L
Courtesy of CHRYSLER LLC

The two knock sensors (1) are bolted into the cylinder block under the intake manifold. The two sensors share a common wiring harness using one electrical connector (3). Because of this, they must be replaced as a pair.

NOTE: **The left sensor is identified by an identification tag (LEFT) (2). It is also identified by a larger bolt head. The Powertrain Control Module (PCM) must have and know the correct sensor left/right positions. Do not mix the sensor locations.**

1. Remove intake manifold. Refer to **INSTALLATION** .
2. Disconnect knock sensor dual pigtail harness from engine wiring harness. This connection is made near rear of engine.
3. Remove both sensor mounting bolts. Note foam strip on bolt threads. This foam is used only to retain the bolts to sensors for plant assembly. It is not used as a sealant. Do not apply any adhesive, sealant or thread locking compound to these bolts.
4. Remove sensors from engine.

INSTALLATION

INSTALLATION - 3.7L

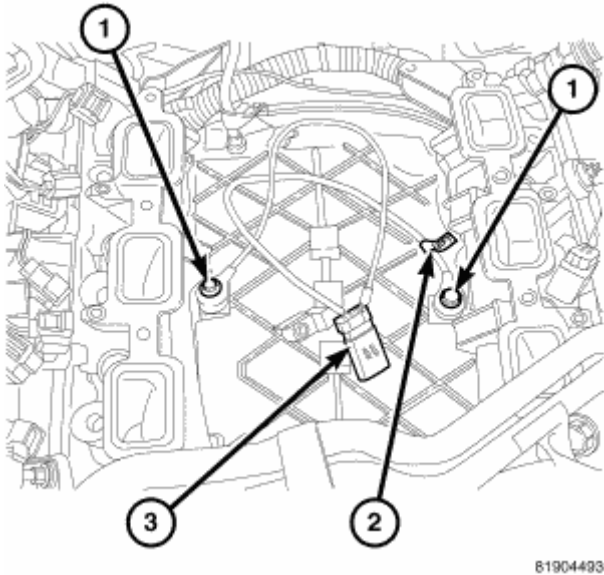


Fig. 10: KNOCK SENSOR - 3.7L
 Courtesy of CHRYSLER LLC

NOTE: The left sensor is identified by an identification tag (LEFT) (2). It is also identified by a larger bolt head. The Powertrain Control Module (PCM) must have and know the correct sensor left/right positions. Do not mix the sensor locations.

1. Thoroughly clean knock sensor mounting holes.
2. Install sensors (1) into cylinder block.

NOTE: Over or under tightening the sensor mounting bolts will affect knock sensor performance, possibly causing improper spark control. Always use the specified torque when installing the knock sensors. The torque for the knock sensor bolt is relatively light for an 8 mm bolt.

NOTE: Note foam strip on bolt threads. This foam is used only to retain the bolts to sensors for plant assembly. It is not used as a sealant. Do not apply any adhesive, sealant or thread locking compound to these bolts.

3. Install and tighten mounting bolts. Tighten to 15 +/- 2 ft. lbs. (20 N.m) (176 in. lbs).
4. Connect knock sensor wiring harness to engine harness at rear of intake manifold.
5. Install intake manifold. Refer to **INSTALLATION** .

SPARK PLUG

REMOVAL

SPARK PLUGS

Each individual spark plug is located under each ignition coil. Each individual ignition coil must be removed to gain access to each spark plug. See **REMOVAL**.

1. Remove necessary air filter tubing at throttle body.
2. Prior to removing ignition coil, spray compressed air around coil base at cylinder head.
3. Prior to removing spark plug, spray compressed air into cylinder head opening. This will help prevent foreign material from entering combustion chamber.
4. Remove spark plug from cylinder head using a quality socket with a rubber or foam insert. Also check condition of ignition coil O-ring and replace as necessary.
5. Inspect spark plug condition.

INSTALLATION

INSTALLATION

Special care should be taken when installing spark plugs into the cylinder head spark plug wells. Be sure the plugs do not drop into the plug wells as electrodes can be damaged.

Always tighten spark plugs to the specified torque. Over tightening can cause distortion resulting in a change in the spark plug gap or a cracked porcelain insulator.

1. Start the spark plug into the cylinder head by hand to avoid cross threading.
2. Tighten spark plugs. Refer to **INSTALLATION**.
3. Before installing ignition coil(s), check condition of coil O-ring and replace as necessary. To aid in coil installation, apply silicone to coil O-ring.
4. Install ignition coil(s). See **INSTALLATION**.

SPARK PLUG CABLE

DESCRIPTION

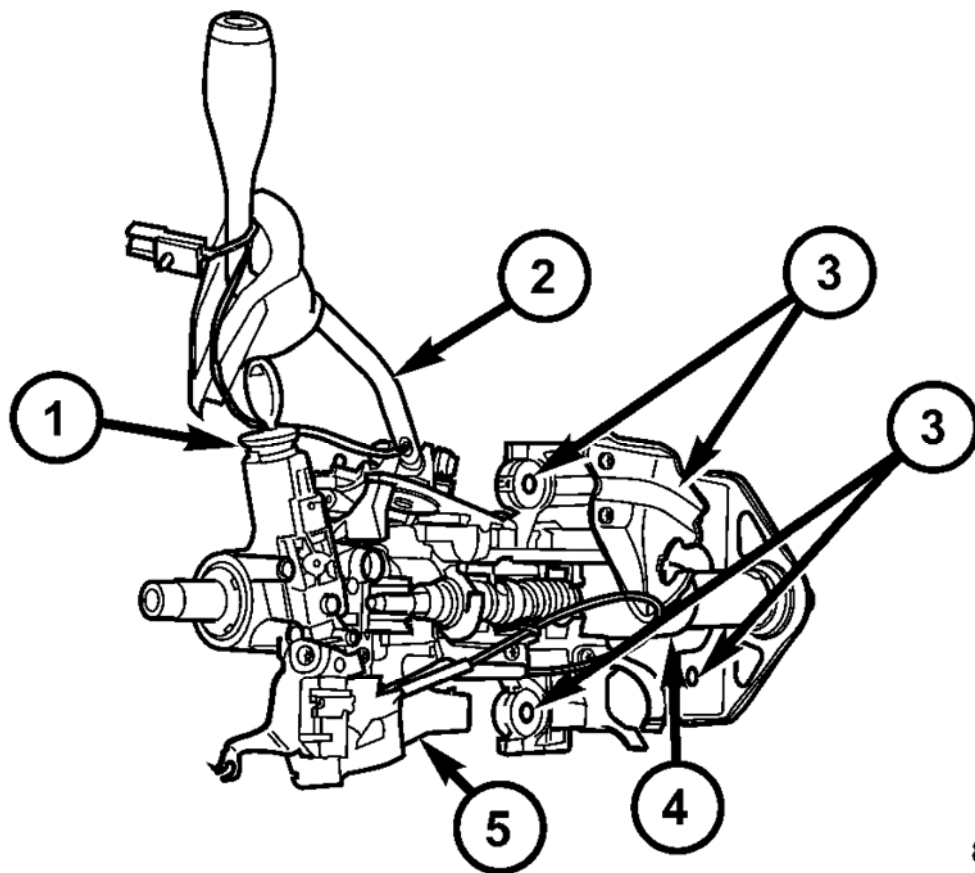
DESCRIPTION

Spark plugs cables are not used with either the 3.7L or 4.0L V6 engines.

SWITCH-IGNITION

DESCRIPTION

IGNITION SWITCH



80c9ad69

Fig. 11: Steering Column
Courtesy of CHRYSLER LLC

- | |
|--|
| <ul style="list-style-type: none">1 - KEY CYLINDER2 - GEAR SHIFT LEVER3 - MOUNTING HOLES4 - STEERING COLUMN5 - IGNITION SWITCH |
|--|

The ignition switch (5) is located on the steering column (4). It is used as the main on/off switching device for most electrical components. The mechanical key cylinder is used to engage/disengage the electrical ignition switch.

OPERATION

IGNITION SWITCH

Vehicles equipped with an automatic transmission and a steering column mounted shifter: an interlock device is located within the shift cable. This interlock device is used to lock the transmission shifter in the PARK position when the key cylinder is in any position and the brake pedal is not depressed.

DIAGNOSIS AND TESTING

IGNITION SWITCH

TEST AND REPAIR

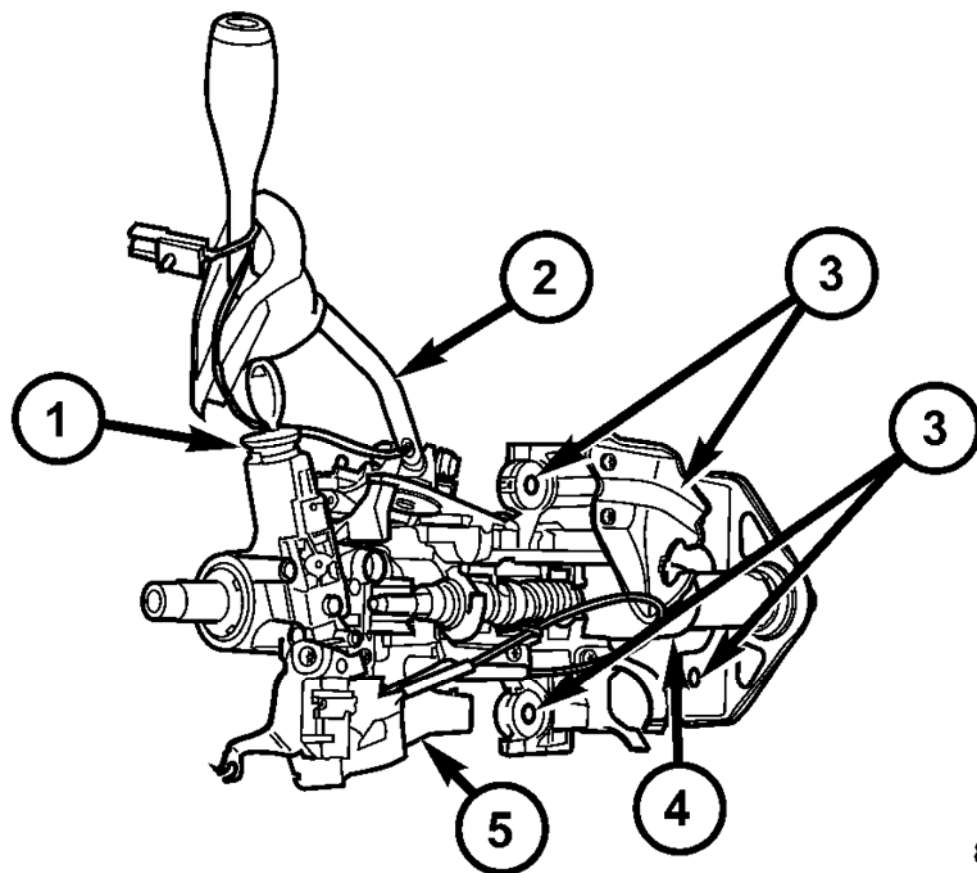
If the key removal effort is excessive on a vehicle with an automatic transmission first adjust the shift linkage. Refer to **ADJUSTMENTS** .

If the ignition switch effort is excessive, remove the ignition key cylinder from the steering column. Check the turning effort of the key cylinder. If the ignition key cylinder effort is excessive, replace the key cylinder. Refer to **REMOVAL** .

REMOVAL

IGNITION SWITCH

SERVICE PRECAUTIONS



80c9ad69

Fig. 12: Steering Column
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - KEY CYLINDER
2 - GEAR SHIFT LEVER
3 - MOUNTING HOLES
4 - STEERING COLUMN
5 - IGNITION SWITCH |
|--|

NOTE: The steering column on vehicles equipped with an automatic transmission is not equipped with an internal locking shaft with the ignition cylinder. Alternative methods of locking the steering wheel for service will have to be used.

The tilt and standard column (4) have been designed to be serviced as an assembly; without wiring, switches, shrouds, steering wheel, etc. Most steering column components can be serviced without removing the steering column from the vehicle. See Fig. 12.

Safety goggles should be worn at all times when working on steering columns.

To service the steering wheel, switches or airbag, refer to RESTRAINTS - SERVICE INFORMATION article and follow all WARNINGS and CAUTIONS.

WARNING: The airbag system is a sensitive, complex electro-mechanical unit. Before attempting to diagnose, remove or install the airbag system components you must first disconnect and isolate the battery negative (ground) cable. Then wait two minutes for the system capacitor to discharge. Failure to do so could result in accidental deployment of the air bag and possible personal injury. The fasteners, screws and bolts, originally used for the airbag components, have special coatings and are specifically designed for the airbag system. They must never be replaced with any substitutes. Anytime a new fastener is needed, replace with the correct fasteners provided in the service package or fasteners listed in the parts books.

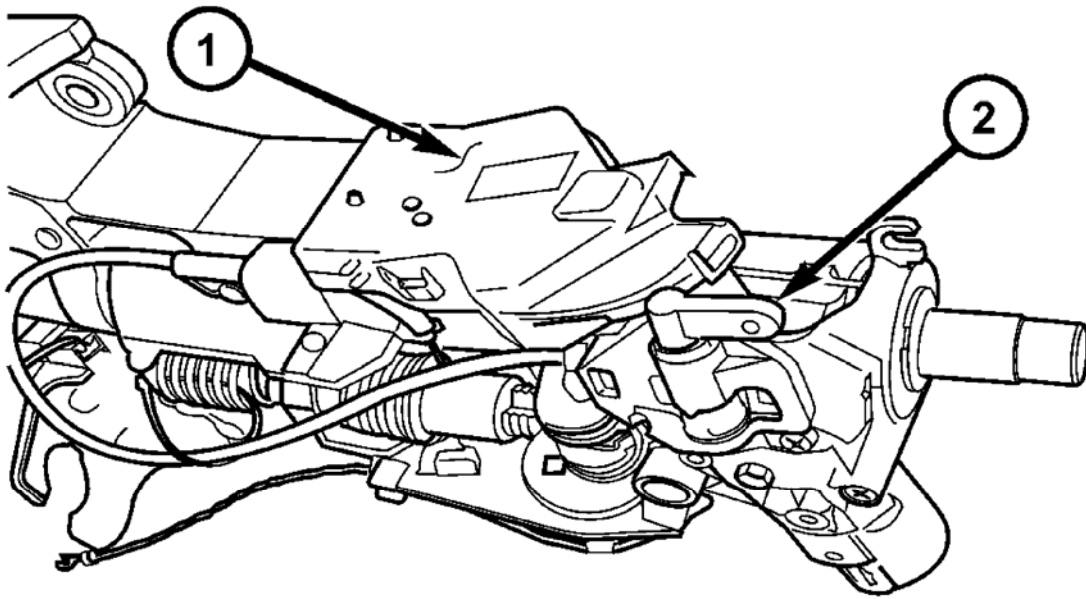
CAUTION: Do not hammer on steering column shaft. This may cause damage to the shaft or bearing.

CAUTION: Do not attempt to remove the pivot bolts to disassemble the tilting mechanism.

The ignition key must be in the key cylinder for cylinder removal. The key cylinder must be removed first before removing ignition switch.

1. Remove the negative (ground) cable from the battery.
2. Disable the airbag. Refer to REMOVAL .
3. Remove the lower and upper shrouds.
4. Remove key cylinder. Refer to REMOVAL .
5. Disconnect the lower clockspring connectors.

6. Remove the wire retainer from the tilt lever bracket.



80a7c390

Fig. 13: Ignition Switch With Tilt
Courtesy of CHRYSLER LLC

1 - IGNITION SWITCH 2 - TILT LEVER MECHANISM

7. Remove the tilt lever mounting screws to gain access to the ignition switch (1) mounting screws. See **Fig. 13**

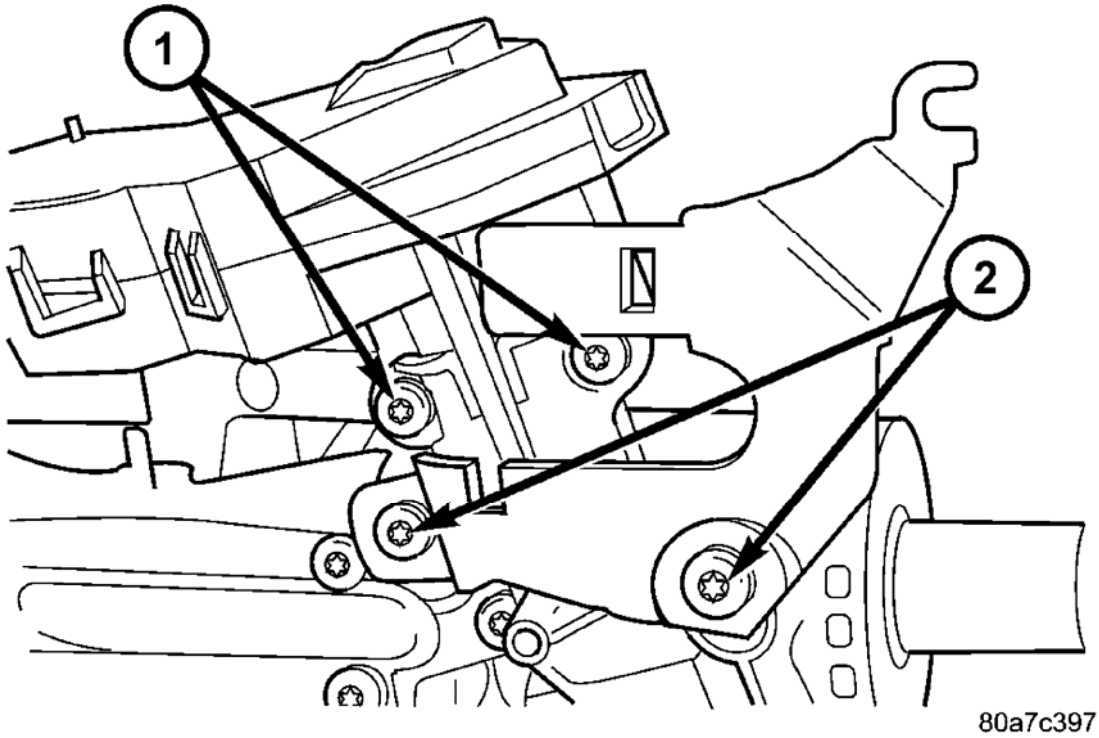
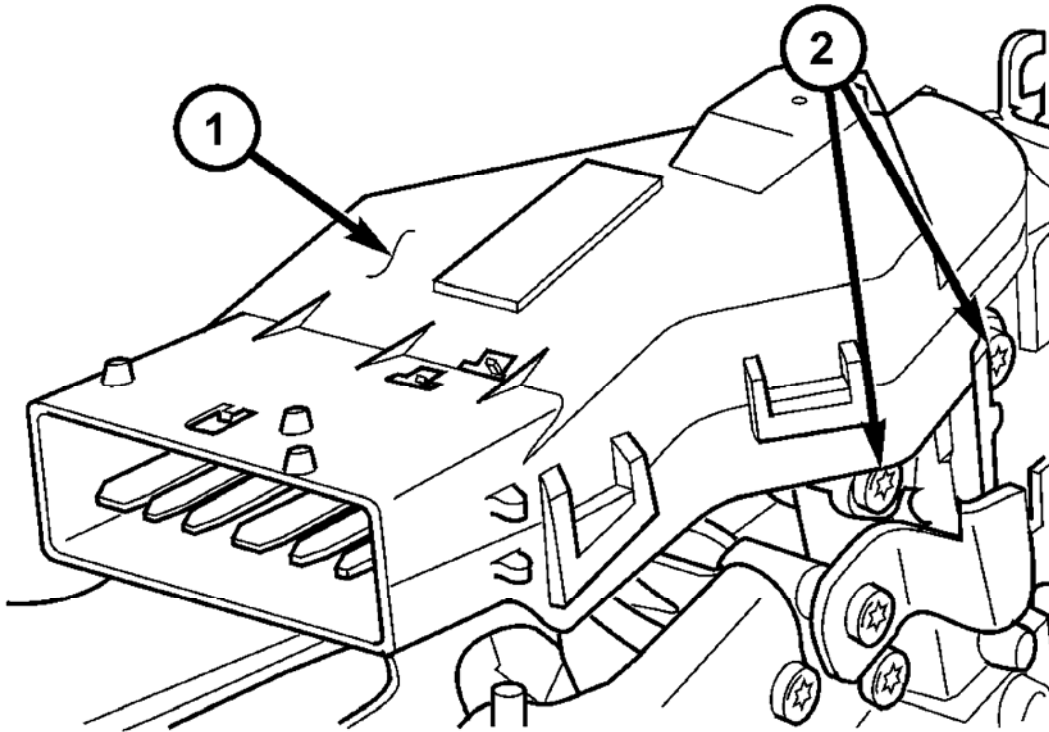


Fig. 14: Ignition Switch - Without Tilt
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - Ignition Switch Mounting Screws
2 - Non-Tilt Mounting Bracket Screws |
|---|

8. For columns without tilt remove the bracket (2) to gain access to the ignition switch mounting screws (1). See **Fig. 14**



80a7c21

Fig. 15: Ignition Switch
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - Ignition Switch
2 - Ignition Switch Mounting Screws |
|--|

9. Disconnect the electrical connector at rear of ignition switch (1). See **Fig. 15**.
10. Remove ignition switch mounting screws (2).
11. Using a small screwdriver, push on locking tab and remove switch from steering column.

INSTALLATION

IGNITION SWITCH

The ignition key must be in the key cylinder for cylinder removal. The key cylinder must be removed first before installing ignition switch.

1. Before installing ignition switch, rotate the slot in the switch to the ON position.

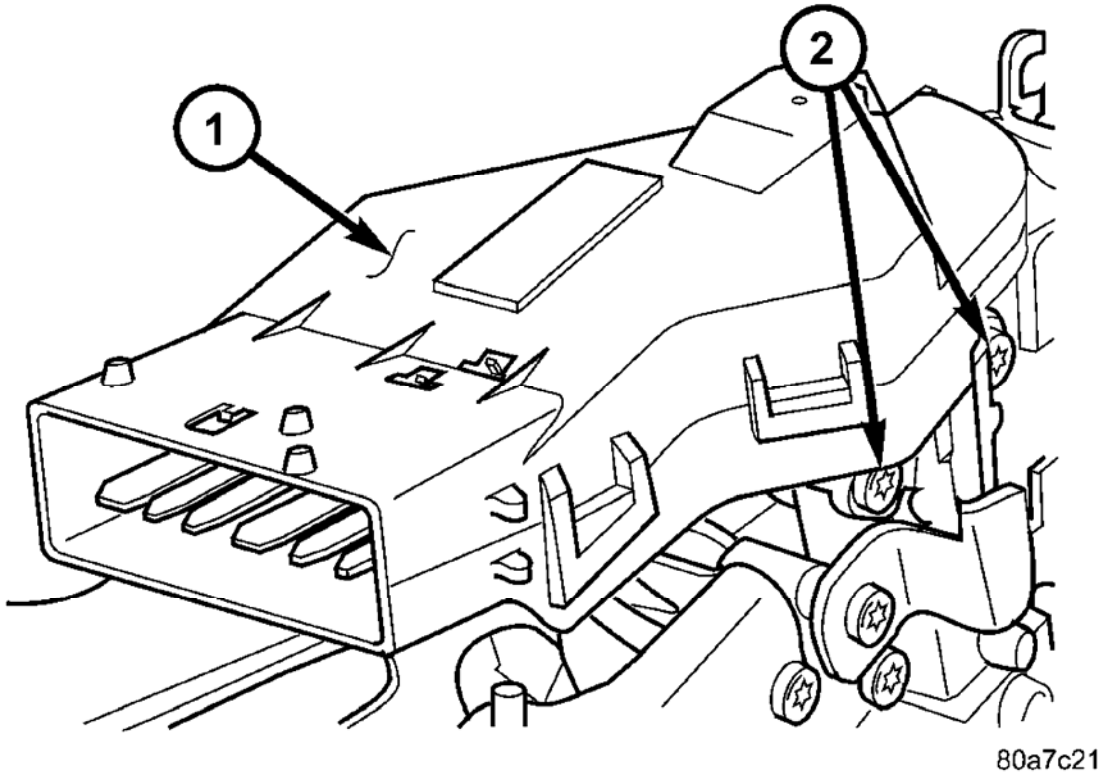
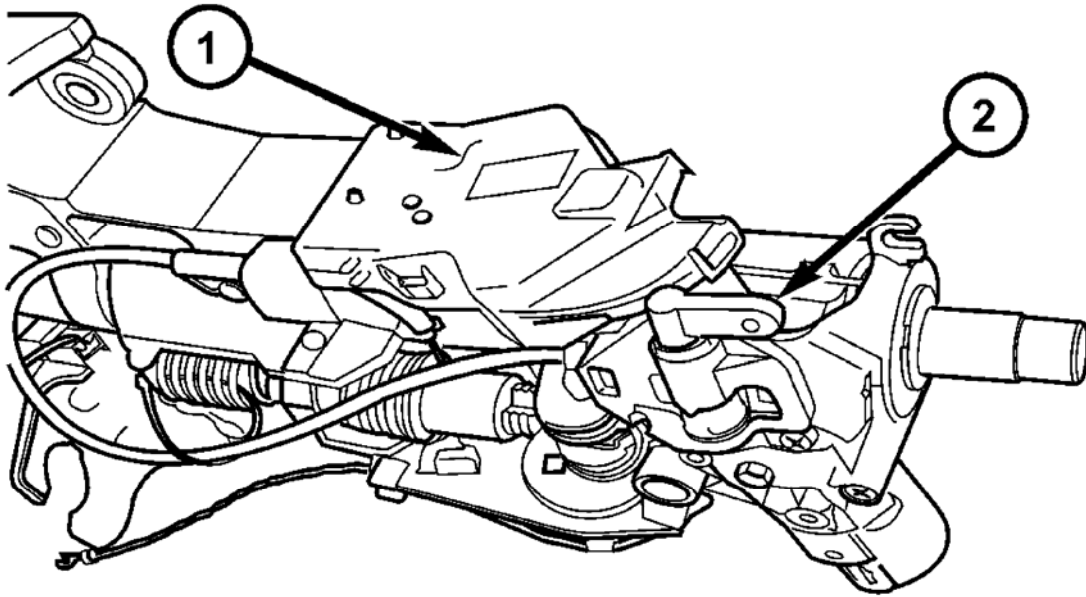


Fig. 16: Ignition Switch
Courtesy of CHRYSLER LLC

1 - Ignition Switch 2 - Ignition Switch Mounting Screws
--

2. Connect the electrical connector to rear of the ignition switch. Make sure that locking tabs are fully seated into wiring connector.
3. Position switch (1) to column and install the mounting screws (2). Tighten screw to 3 N.m (26 in. lbs.).



80a7c390

Fig. 17: Ignition Switch With Tilt
Courtesy of CHRYSLER LLC

1 - IGNITION SWITCH 2 - TILT LEVER MECHANISM

4. Install the tilt lever bracket (2) mounting screws. Tighten screws to 4.5 N.m (40 in. lbs.).

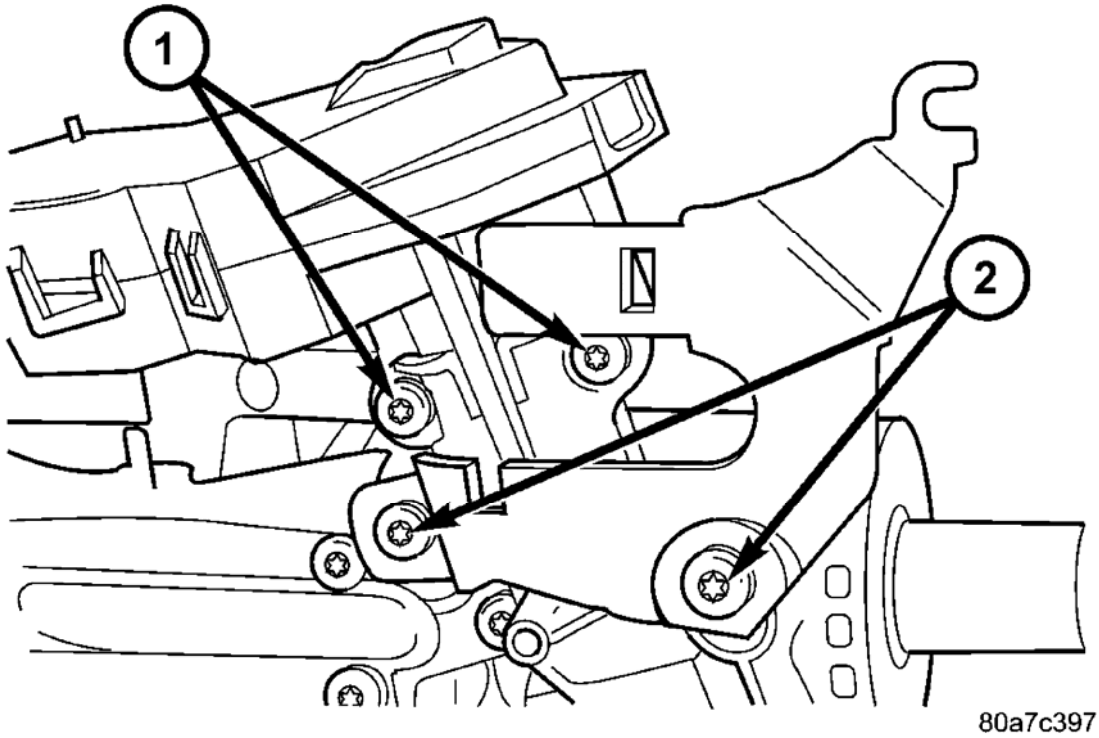
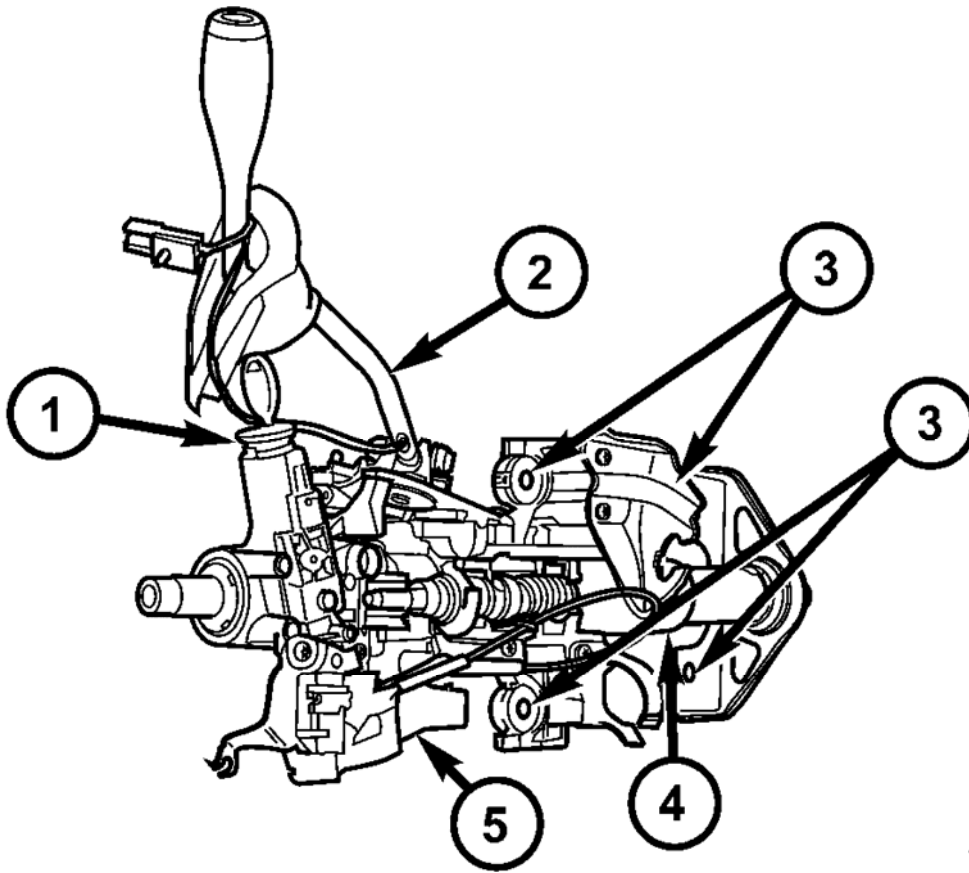


Fig. 18: Ignition Switch Without Tilt
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - Ignition Switch Mounting Screws
2 - Non-Tilt Mounting Bracket Screws |
|---|

5. If the column is non-tilt install the bracket. Tighten screws (2) to 4.5 N.m (40 in. lbs.). See **Fig. 18**



80c9ad69

Fig. 19: Steering Column
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - KEY CYLINDER
2 - GEAR SHIFT LEVER
3 - MOUNTING HOLES
4 - STEERING COLUMN
5 - IGNITION SWITCH |
|--|

6. Position the wire retainer into the tilt lever bracket.
7. Reconnect the lower clockspring connectors.
8. Install the key cylinder (1)
9. Install steering column upper and lower shrouds.
10. Enable the airbag system. Refer to **INSTALLATION** .

SWITCH-KEY-IN IGNITION

DESCRIPTION

KEY-IN IGNITION SWITCH

The key-in ignition switch is integral to the ignition switch, which is mounted on the left side of the steering column. It closes a path to ground for the Central Timer Module (CTM) when the ignition key is inserted in the ignition key cylinder and the driver door ajar switch is closed (driver door is open). The key-in ignition switch opens the ground path when the key is removed from the ignition key cylinder. The ground path is also opened when the driver door ajar switch is open (driver door is closed).

The key-in ignition switch cannot be repaired and, if faulty or damaged, the entire ignition switch must be replaced. Refer to **REMOVAL** .

DIAGNOSIS AND TESTING

IGNITION SWITCH AND KEY LOCK CYLINDER

ELECTRICAL DIAGNOSIS

For ignition switch electrical schematics, refer to Ignition Switch in the **SYSTEM WIRING DIAGRAMS** article.

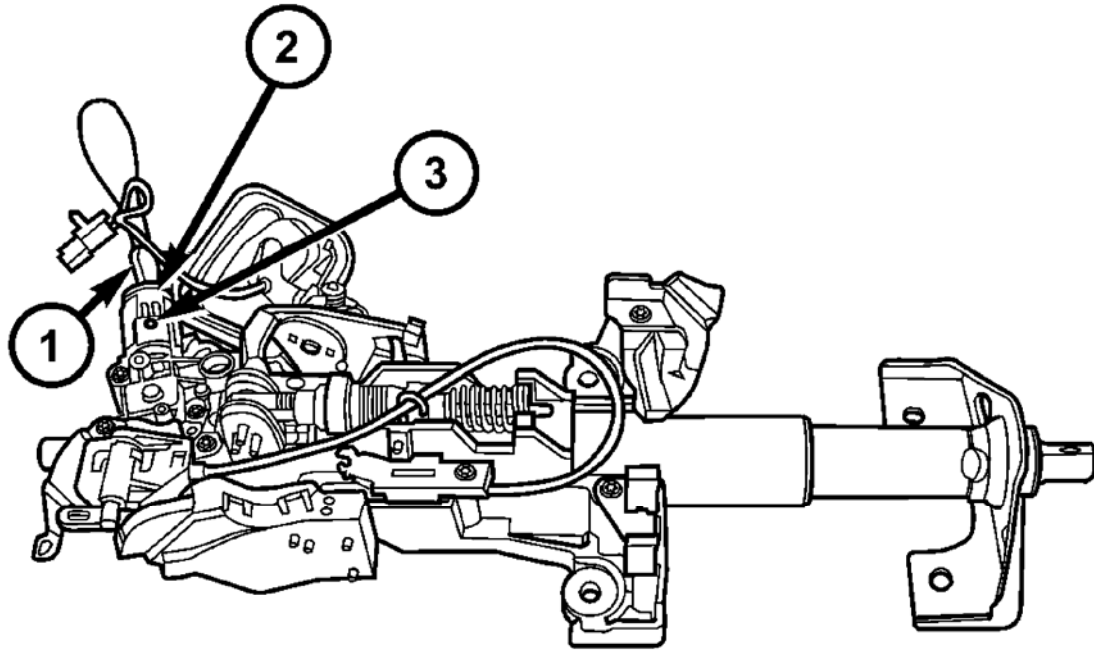
MECHANICAL DIAGNOSIS (KEY DIFFICULT TO ROTATE)

Refer to **DIAGNOSIS AND TESTING** .

CYLINDER-KEY/LOCK

REMOVAL

LOCK CYLINDER HOUSING



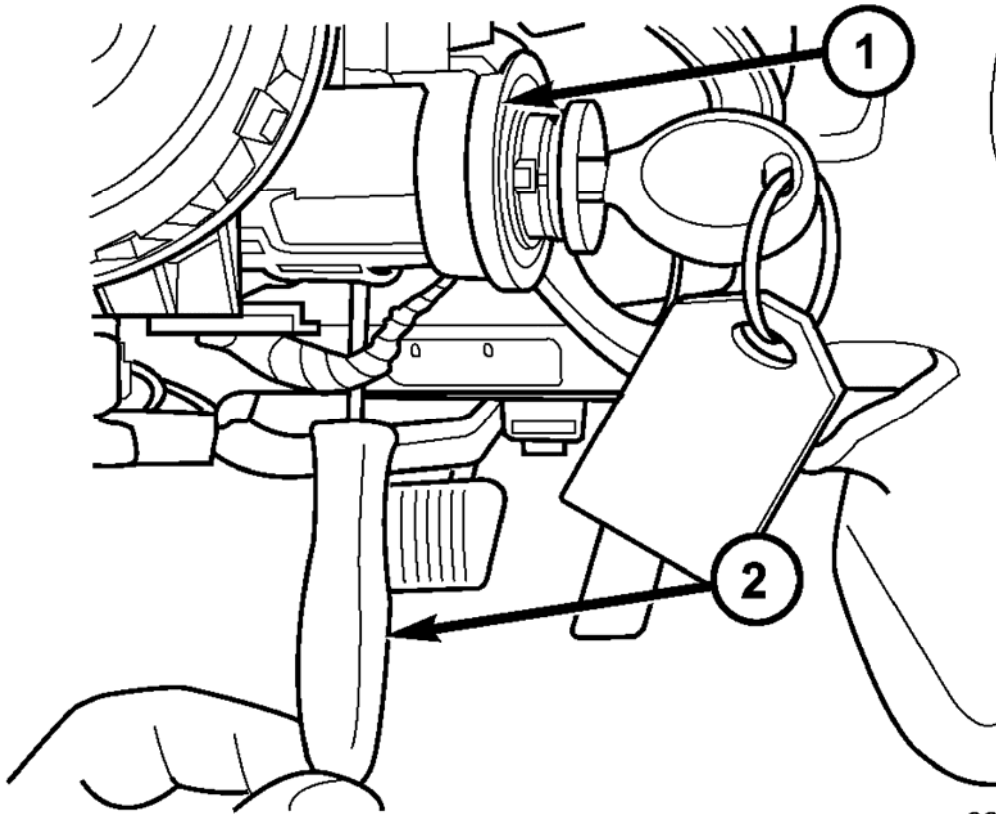
80c9b020

Fig. 20: Key Cylinder
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - KEY
2 - KEY CYLINDER
3 - RETAINING PIN HOLE |
|---|

The ignition key (1) must be in the key cylinder (2) for cylinder removal.

1. Disconnect negative cable from battery.
2. Remove upper and lower covers (shrouds) from steering column.
3. Place shifter in PARK position.
4. A retaining pin is located at side of key cylinder assembly (2). See **Fig. 20**.



80d26745

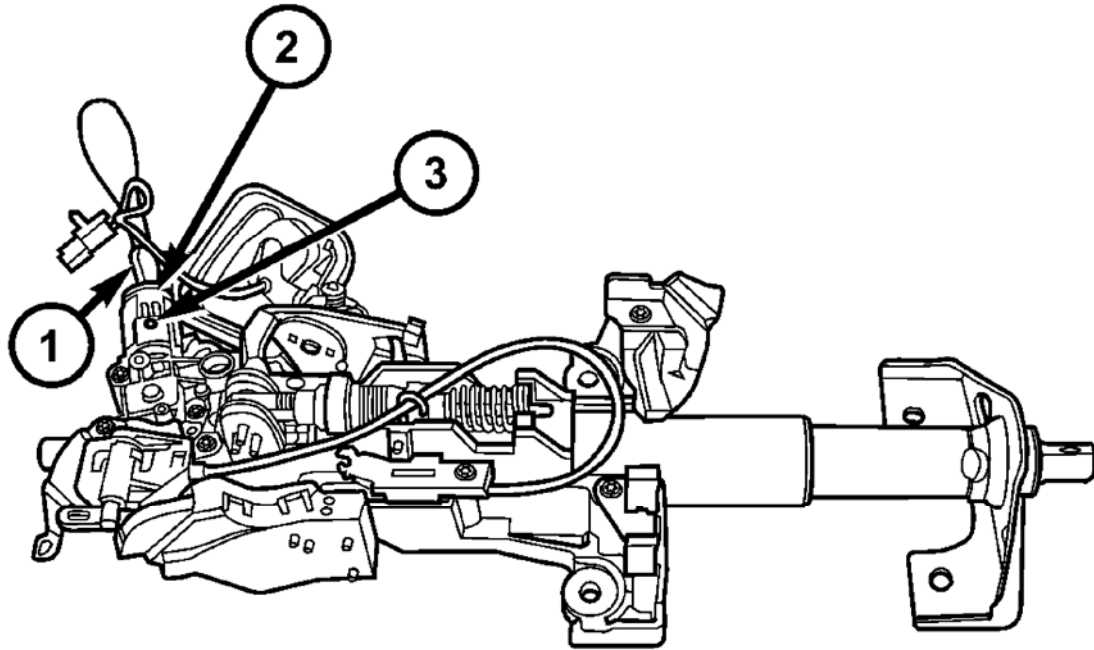
Fig. 21: Key Cylinder
Courtesy of CHRYSLER LLC

1 - KEY CYLINDER 2 - PUNCH

- Rotate key to RUN position.
- Press in on retaining pin while pulling key cylinder (1) from ignition switch. See **Fig. 21**.

INSTALLATION

LOCK CYLINDER HOUSING



80c9b020

Fig. 22: Key Cylinder
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - KEY
2 - KEY CYLINDER
3 - RETAINING PIN HOLE |
|---|

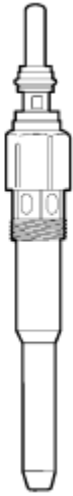
The ignition key (1) must be in the key cylinder (2) for cylinder installation.

1. Install the key cylinder into the housing using care to align the end of the key cylinder (2) with the ignition switch.
2. Push the key cylinder (2) in until it clicks.
3. Replace the upper and lower shrouds.
4. Reconnect the battery.

PLUG-GLOW 2.8L DIESEL

DESCRIPTION

GLOW PLUG



8148308e

Fig. 23: View Of Glow Plug
Courtesy of CHRYSLER LLC

CAUTION: The glow plugs operate on a 4.4-volt system. The glow plugs **DO NOT** tolerate any over voltage. Full battery voltage will destroy the glow plug immediately. **DO NOT** test the glow plugs with a 12V source as damage will occur to the glow plug.

CAUTION:

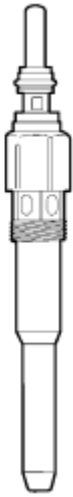
- Never bend, bump or knock the fast metallic glow plugs.
- Fast metallic glow plugs must not be handled loose in a container. Store, handle, and transport them only in original boxes.
- If there is any doubt about the proper condition of a glow plug, do not reuse it.
- Do not clean the glow plugs with abrasive or aggressive media.
- Avoid dipping the glow plug into fluids.
- Read Diagnostic Trouble Codes (DTCs). If a glow plug problem is indicated, do not start the engine.

CAUTION: Disregarding these instructions may cause severe engine damage.

Glow plugs are used to help start a cold or cool engine. The glow plugs will heat up and glow to heat the combustion chamber of each cylinder. An individual glow plug is used for each cylinder.

OPERATION

GLOW PLUG



8148308e

Fig. 24: View Of Glow Plug
Courtesy of CHRYSLER LLC

CAUTION: The glow plugs operate on a 4.4-volt system. DO NOT test the glow plugs with a 12 V source as damage will occur to the glow plug(s).

The Engine Control Module (ECM) monitors various engine sensors. When the ignition key is turned to the ON position, the ECM sends a signal to the glow plug module (relay) to turn on, and cycle, the glow plugs for a pre-determined amount of time, plus illuminate the glow plug light in the instrument panel. Once activated, the element inside of the core of the glow plug begins to glow. Each glow plug draws approximately 8 amps, for a total system amperage of 32 amps at 22° C (72° F) ambient temperature. If there is a fault with the glow plug system, the ECM will store a fault code.

DIAGNOSIS AND TESTING

GLOW PLUG SYSTEM

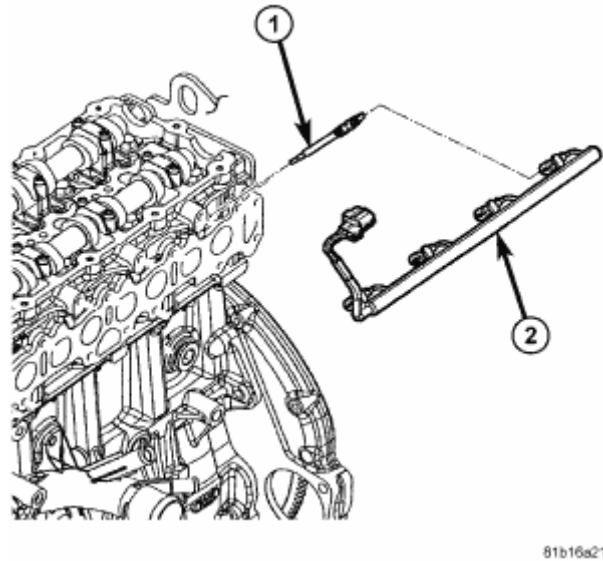
CAUTION: DO NOT attempt to start the engine until the glow plug system tests correctly.

1. Measure the electrical resistance of each glow plug while it is still installed in the cylinder head. Resistance should be less than 0.8 ohm; between the electrical connector point on the glow plug and the cylinder head. The ground contact on the DVOM must be as close as possible to the point where the glow plug contacts the cylinder head to avoid erratic resistance measurements.
2. If the resistance is out of tolerance, remove the glow plug from the cylinder head and check the resistance again.
3. Use the actuator test function of the scan tool to test the glow plug module and glow plug lamp. The glow plug module's on-board diagnostic tests will automatically check the electrical condition of the entire glow plug system.
4. After the scan tool glow plug actuator test function is complete, if MIL is OFF and no glow plug DTCs are present, testing is complete and the engine can be started.

5. If MIL is still ON, check the harness connectors of glow plugs, repair any loose or damaged connections, and run the glow plug actuator test again.
6. If MIL is still ON and glow plug DTCs are present, refer to appropriate diagnostic information, and follow the diagnostic test(s) related to the active or stored DTCs.

REMOVAL

REMOVAL



81b16a21

Fig. 25: GLOW PLUG WIRING HARNESS
Courtesy of CHRYSLER LLC

The four glow plugs (1) are attached to cylinder head below fuel rail.

1. Disconnect negative battery cable.
2. Remove fuel rail and high-pressure fuel lines.
3. Disconnect glow plug wiring harness (2) at all four glow plugs (1).

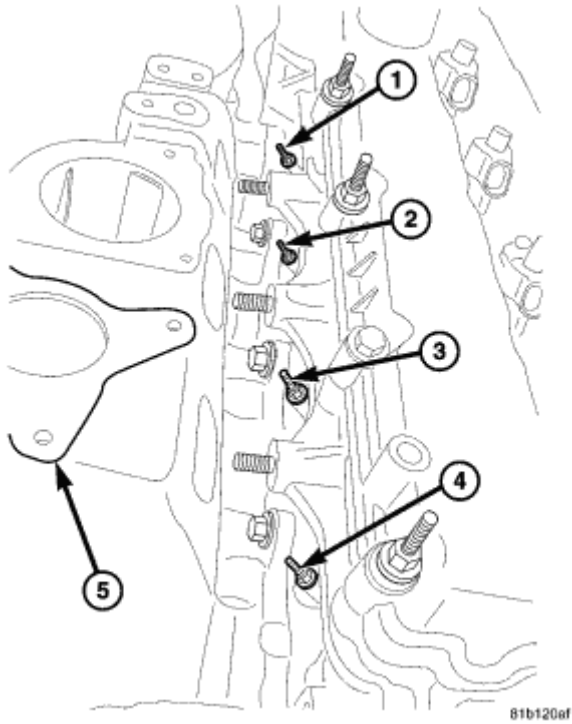


Fig. 26: GLOW PLUGS - 2.8L DIESEL
Courtesy of CHRYSLER LLC

4. Use a socket to loosen glow plug(s) (1), (2), (3) or (4). After loosening, attach a flexible tool such as a rubber hose to remove glow plug from cylinder head.

CAUTION: After plug removal, do not bend, knock, or drop the glow plugs while handling (any mechanical impact may damage the glow plug).

INSTALLATION

INSTALLATION

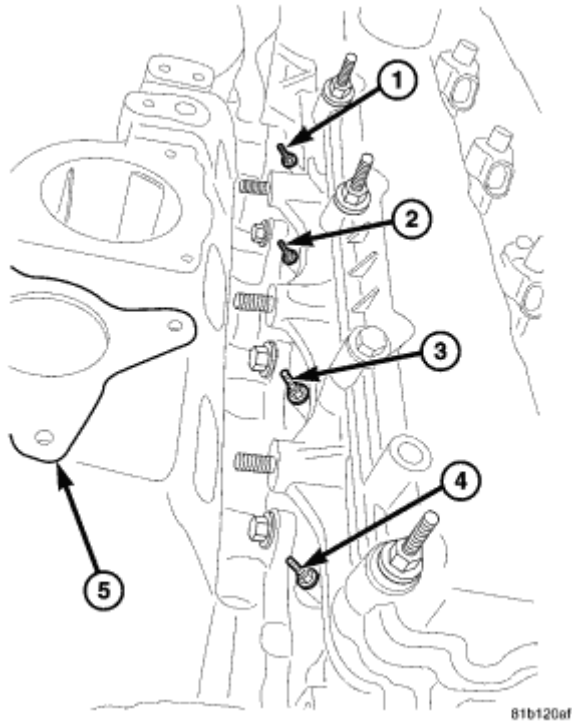


Fig. 27: GLOW PLUGS - 2.8L DIESEL
 Courtesy of CHRYSLER LLC

1. Apply a small amount of clean diesel oil or motor oil to glow plug threads.
2. Attach a flexible tool such as a rubber hose to install glow plug into cylinder head. Tighten each plug to 14 N.m (10 ft. lbs.) (124 in. lbs.) torque.

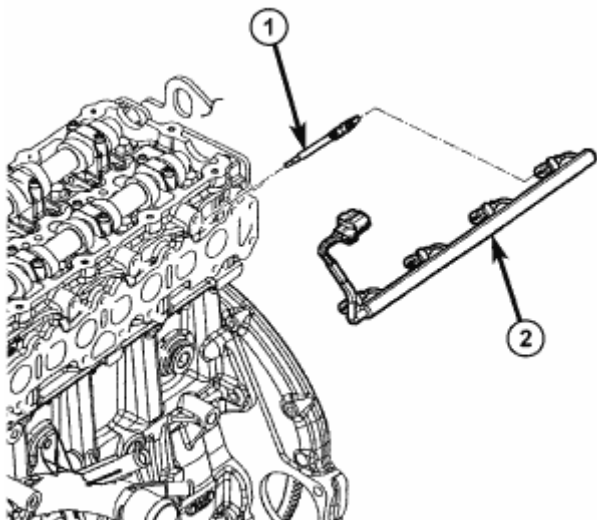


Fig. 28: GLOW PLUG WIRING HARNESS
 Courtesy of CHRYSLER LLC

3. Connect glow plug wiring harness (2) to all four glow plugs (1).
4. Install fuel rail and high-pressure fuel lines.
5. Connect negative battery cable.

RELAY-GLOW PLUG 2.8L DIESEL

REMOVAL

REMOVAL

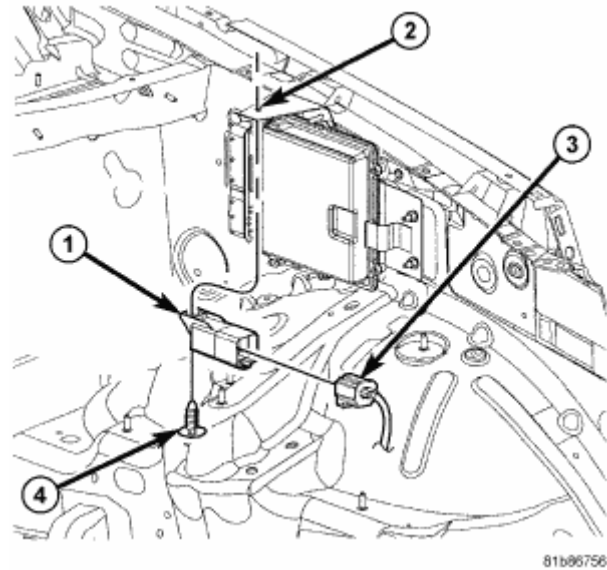


Fig. 29: GLOW PLUG RELAY
Courtesy of CHRYSLER LLC

The glow plug relay (module) (1) is located in the engine compartment. It is attached to the ECM mounting bracket (2).

1. Remove pin (4).
2. Disconnect electrical connector (3) and remove relay.

INSTALLATION

INSTALLATION

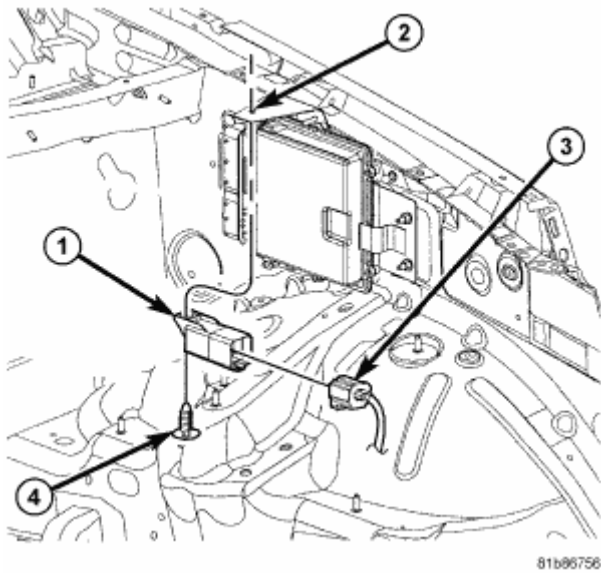


Fig. 30: GLOW PLUG RELAY
Courtesy of CHRYSLER LLC

The glow plug relay (module) (1) is located in the engine compartment. It is attached to the ECM mounting bracket (2).

1. Connect electrical connector (3) to relay (1).
2. Position relay to mounting bracket (2) and install pin (4).

2008 ACCESSORIES AND EQUIPMENT

Instrument Cluster - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B123F</u>	MENU SWITCH STUCK
<u>B127A</u>	COMPASS PERFORMANCE
<u>B1286</u>	COMPASS/TEMP BUTTON PERFORMANCE
<u>B1287</u>	RESET SWITCH PERFORMANCE
<u>B1288</u>	TRIP/TOGGLE SWITCH PERFORMANCE
<u>B1502</u>	STEERING WHEEL CONTROL DOWN SWITCH PERFORMANCE
<u>B1503</u>	STEERING WHEEL CONTROL RIGHT SWITCH PERFORMANCE
<u>B1613</u>	PANEL ILLUMINATION CONTROL CIRCUIT LOW
<u>B1615</u>	PANEL ILLUMINATION CONTROL CIRCUIT OPEN
<u>B210D</u>	BATTERY VOLTAGE LOW
<u>B210E</u>	BATTERY VOLTAGE HIGH
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0161</u>	LOST COMMUNICATION WITH COMPASS MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0208</u>	LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE
<u>U1008</u>	LIN 1 BUS
<u>U1109</u>	LOST COMMUNICATION WITH LIN STEERING WHEEL CONTROLS
<u>U113B</u>	LOST COMMUNICATION WITH SWITCH BANK MODULE
<u>U1149</u>	LOST COMMUNICATION WITH MULTIFUNCTION SWITCH

INSTRUMENT CLUSTER - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B123F-MENU SWITCH STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Instrument Cluster detects the Menu Switch active for greater than 20 seconds.

Possible Causes

Possible Causes
INSTRUMENT CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the MENU switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

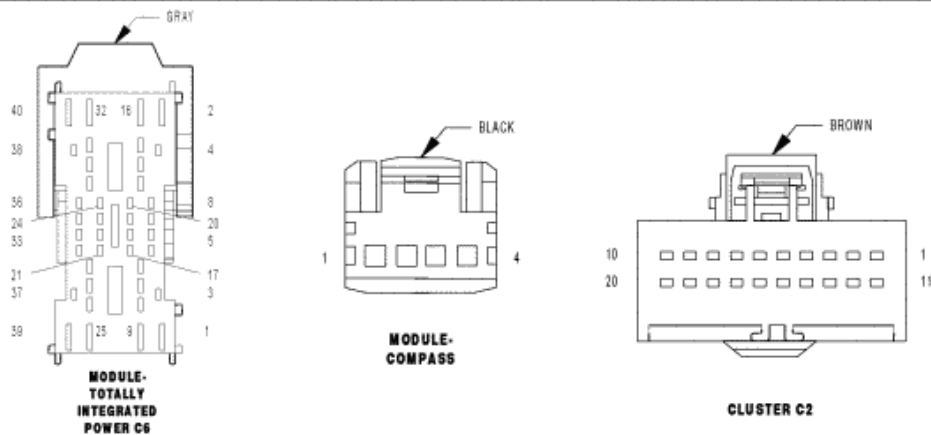
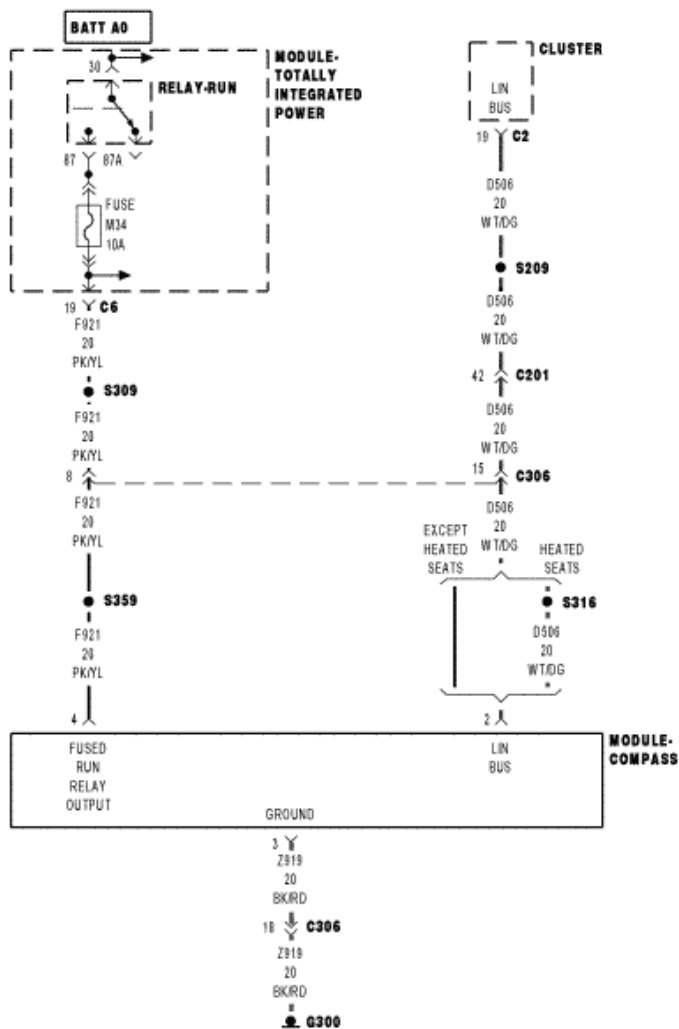
Replace the Instrument Cluster in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B127A-COMPASS PERFORMANCE

Circuit Schematic



0041481c

Fig. 1: Compass Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Compass performance.

Possible Causes

Possible Causes
(F921) FUSED RUN RELAY OUTPUT CIRCUIT OPEN (Z916) GROUND CIRCUIT OPEN COMPASS MODULE CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

NOTE: Remove any electronic devices (laptop computers, cell phones) from the instrument panel.

NOTE: Before proceeding, check the compass variance and calibration in accordance with the service information.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (F921) FUSED RUN RELAY OUTPUT CIRCUIT OPEN

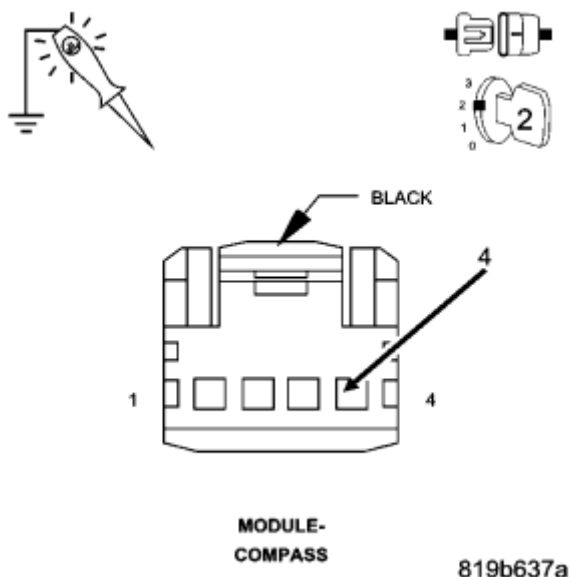


Fig. 2: Measuring Voltage Of (F921) Fused Run Relay Output Circuit For An Ope
Courtesy of CHRYSLER LLC

Measure the voltage of the (F921) Fused Run Relay Output circuit for an open.

Is the voltage above 10 volts?

Yes

Go To 3.

No

Repair the (F921) Fused Run Relay Output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (Z916) GROUND CIRCUIT OPEN

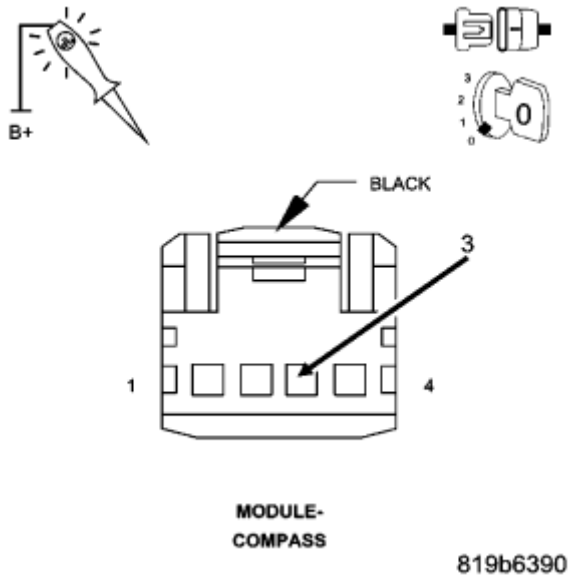


Fig. 3: Measuring Resistance Of (Z916) Ground Circuit For An Open
 Courtesy of CHRYSLER LLC

Measure the resistance of the (Z916) Ground circuit for an open.

Is the resistance above 10K ohms?

Yes

Repair the (Z916) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Compass Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1286-COMPASS/TEMP BUTTON PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The Instrument Cluster detects the Compass/Temp Button active for greater than 20 seconds.

Possible Causes

Possible Causes
INSTRUMENT CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the Compass/Temp switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the Instrument Cluster in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B1287-RESET SWITCH PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The Instrument Cluster detects the Reset Switch active for greater than 20 seconds.

Possible Causes

Possible Causes
INSTRUMENT CLUSTER

Diagnostic Test

1. CHECK FOR AN ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the Reset switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the Instrument Cluster in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B1288-TRIP/TOGGLE SWITCH PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Instrument Cluster detects the Trip/Toggle Switch active for greater than 20 seconds.

Possible Causes

Possible Causes
INSTRUMENT CLUSTER

Diagnostic Test

1. CHECK FOR AN ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the Trip/Toggle switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the Instrument Cluster in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B1502-STEERING WHEEL CONTROL DOWN SWITCH PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:

The Instrument Cluster detects the Steering Wheel Control Down Switch active for greater than 20 seconds.

Possible Causes

Possible Causes
INSTRUMENT CLUSTER

Diagnostic Test

1. CHECK FOR AN ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the Steering Wheel Control Down Switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the Steering Wheel Control Down Switch in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B1503-STEERING WHEEL CONTROL RIGHT SWITCH PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:

The Instrument Cluster detects the Steering Wheel Control Right Switch active for greater than 20 seconds.

Possible Causes

--

Possible Causes

INSTRUMENT CLUSTER

Diagnostic Test

1. CHECK FOR AN ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase DTCs.

Press the Steering Wheel Control Right Switch three times.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Replace the Steering Wheel Control Right Switch in accordance with the service information.

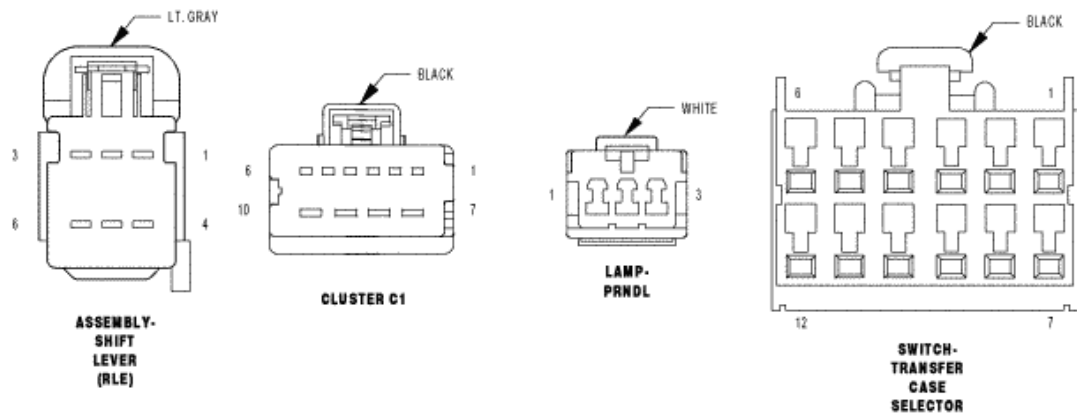
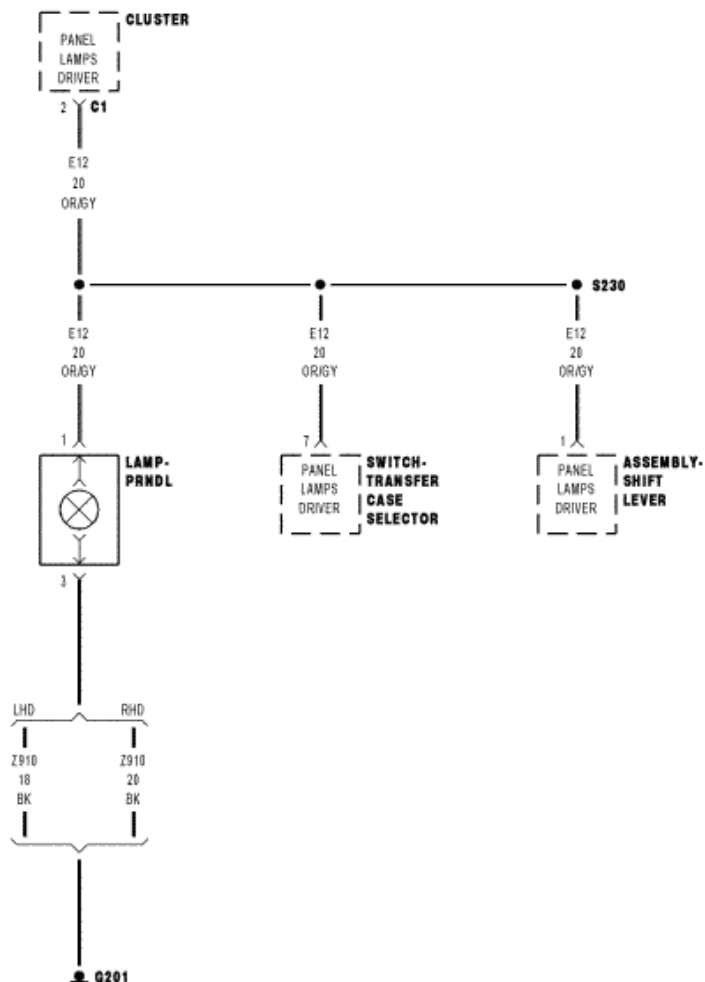
Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete

B1613-PANEL ILLUMINATION CONTROL CIRCUIT LOW

Circuit Schematic



01414503

Fig. 4: Panel Illumination Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on and the Panel Illumination active.

Set Conditions

- **Set Condition:**

Panel Illumination Status LOW.

Possible Causes

Possible Causes
(E12) PANEL LAMPS DRIVER CIRCUIT SHORTED TO GROUND
PRNDL LAMP SHORTED TO GROUND
TRANSFER CASE SELECTOR SWITCH LAMP SHORTED TO GROUND
SHIFT ASSEMBLY LAMP SHORTED TO GROUND
CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Activate the Panel Illumination.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK EACH NON-FUNCTIONING COMPONENT FOR AN INTERNAL SHORT TO GROUND**

NOTE: **Using the wiring diagram as a guide disconnect each non-functioning component one at a time while checking for the DTC to become stored. Repeat these steps for each component.**

Turn the ignition off.

Disconnect the non-functioning component harness connector.

Turn the ignition on.

Activate the Panel Illumination.

With the scan tool, read DTCs.

Is the DTC still active?

Yes

Go To 3.

No

Replace the non-functioning component that when disconnected caused the DTC to become stored in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK THE (E12) PANEL LAMPS DRIVER CIRCUIT FOR A SHORT TO GROUND**

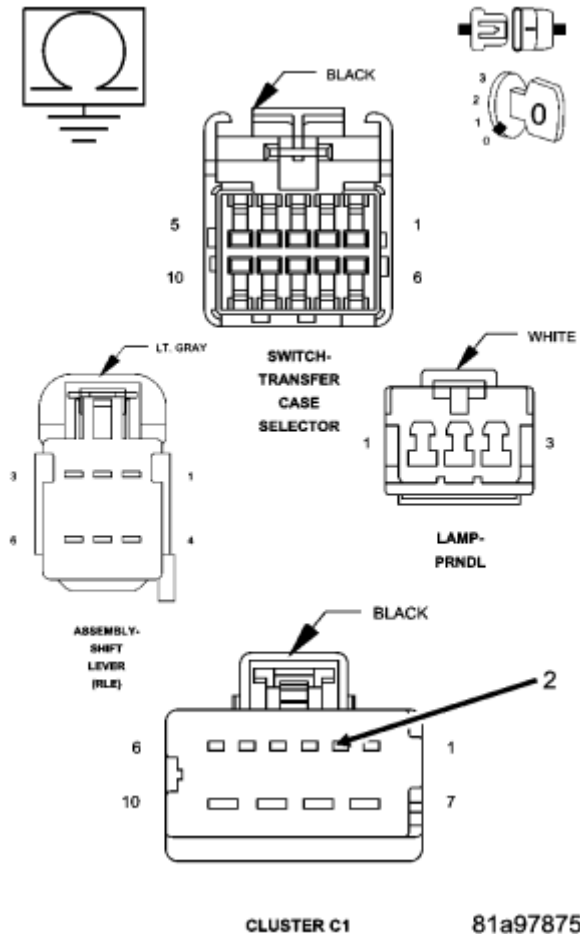


Fig. 5: Measuring Resistance To Ground On (E12) Panel Lamps Driver Circuit From Instrument Cluster C1 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C1 harness connector.

With all (E12) Panel Lamps Driver circuit components disconnected, measure the resistance to ground on the (E12) Panel Lamps Driver Circuit from the Instrument Cluster C1 harness connector.

Is the resistance less than 10K ohms?

Yes

Repair the (E12) Panel Lamps Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

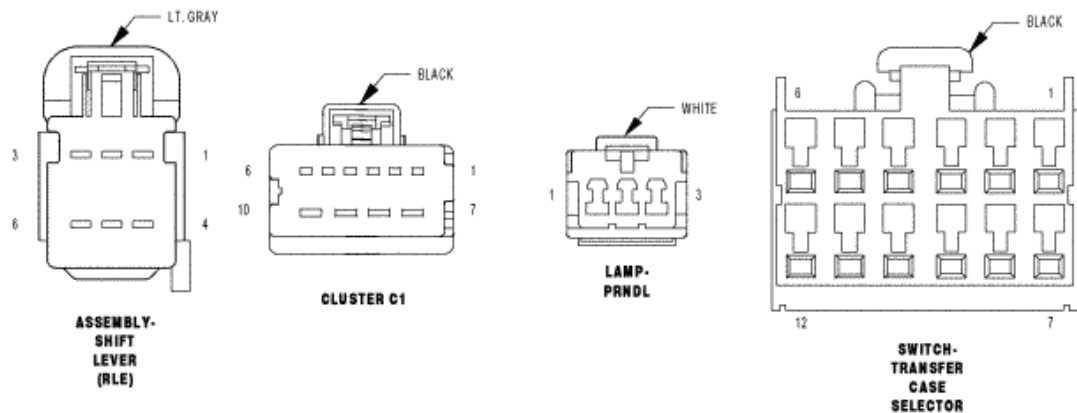
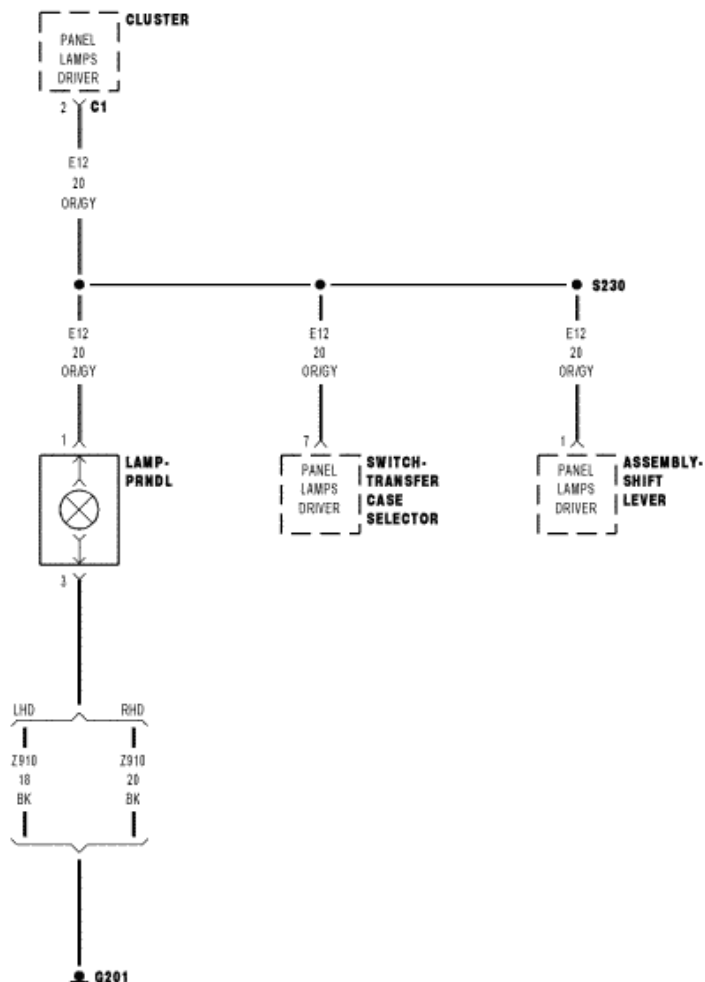
No

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1615-PANEL ILLUMINATION CONTROL CIRCUIT OPEN

Circuit Schematic



01414503

Fig. 6: Panel Illumination Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on and the Panel Illumination circuit active.

Set Conditions

- Set Condition:

The Instrument Cluster detects an open condition on the Panel Illumination Control circuit.

Possible Causes

Possible Causes
(E12) PANEL LAMPS DRIVER CIRCUIT OPEN INSTRUMENT CLUSTER

Diagnostic Test

1. CHECK FOR AN ACTIVE DTC

Turn the ignition on.

With the scan tool, record and erase DTCs.

Activate the Panel Illumination.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE (E12) PANEL LAMPS DRIVER CIRCUIT FOR AN OPEN

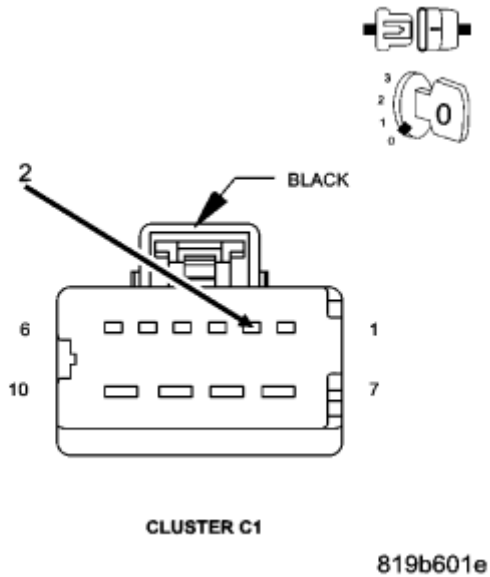


Fig. 7: Checking Panel Lamps Driver Circuit For Open
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C1 harness connector.

Inspect the connector and associated wiring for the Panel illumination circuit.

Using a fused jumper wire connected to 12 volts, probe cavity 2 of the Cluster C1 harness connector.

Did the components illuminate?

Yes

Replace the Instrument Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Using the wiring diagrams as a guide, locate and repair the (E12) Panel Lamps Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B210D-BATTERY VOLTAGE LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Battery voltage less than 9 volts for approximately 5 to 6 seconds.

Possible Causes

Possible Causes
GENERATOR OPERATION PCM

Diagnostic Test

1. **CHECK FOR ANY POWERTRAIN CONTROL MODULES DTCS**

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Make sure the generator drive belt is in good operating condition.
- NOTE:

Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Turn the ignition on.

With the scan tool, read active PCM DTC's.

Does the scan tool display any active PCM DTC's?

Yes

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

No

Check the above conditions that can cause a low voltage condition. Repair as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

B210E-BATTERY VOLTAGE HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Battery voltage greater than 16 volts for approximately 15 seconds.

Possible Causes

Possible Causes
GENERATOR PCM

Diagnostic Test

1. CHECK FOR ANY POWERTRAIN CONTROL MODULES DTCS

- NOTE:

Make sure the Battery is in good condition. Using the Midtronics Battery Tester, test the Battery before continuing.
- NOTE:

Inspect the vehicle for after market accessories that may exceed the Generator System output.
- NOTE:

Make sure the generator drive belt is in good operating condition.
- NOTE:

Inspect the fuses in the TIPM. If an open fuse is found, use the wire diagram/schematic as a guide, inspect the wiring and connectors for damage.

Turn the ignition on.

With the scan tool, read active PCM DTC's.

Does the scan tool display any active PCM DTC's?

Yes

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

No

Check the above conditions that can cause a high voltage condition. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

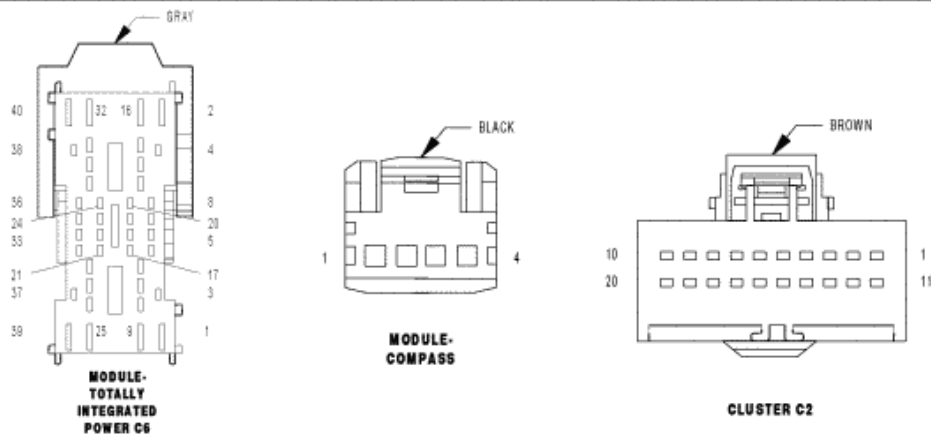
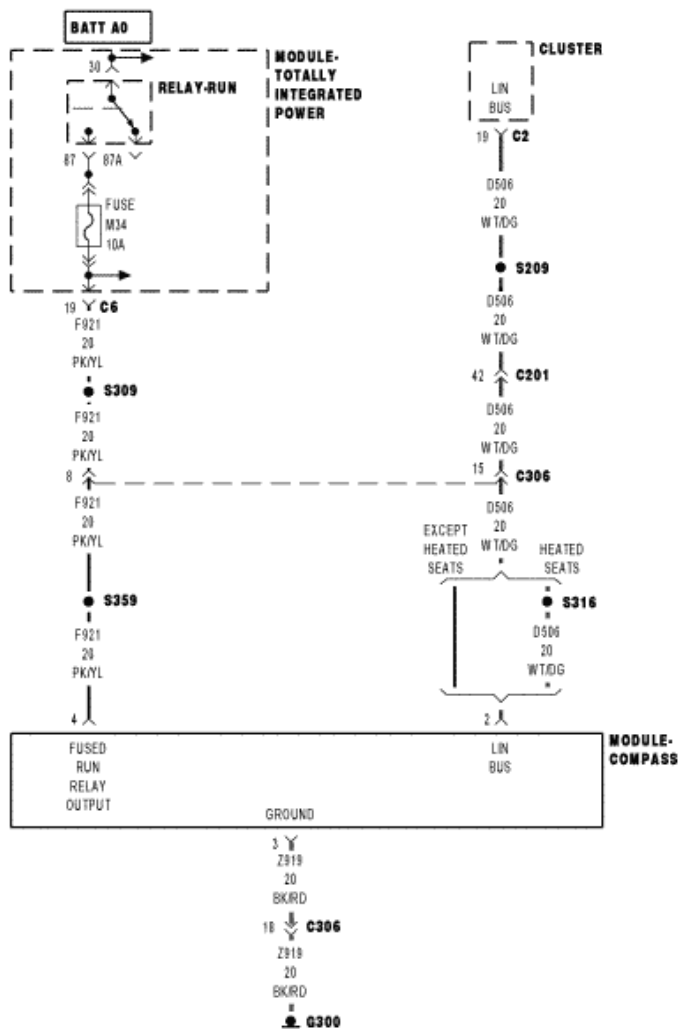
Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0161-LOST COMMUNICATION WITH COMPASS MODULE

Circuit Schematic



00014810c

Fig. 8: Compass Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Cluster does not receive information from the Compass Module.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN (F921) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN (Z916) GROUND CIRCUIT OPEN COMPASS MODULE INSTRUMENT CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

NOTE: Remove any electronic devices (laptop computers, cell phones) from the instrument panel.

NOTE: Before proceeding, check the compass variance and calibration in accordance with the service information.

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (D506) LIN BUS CIRCUIT

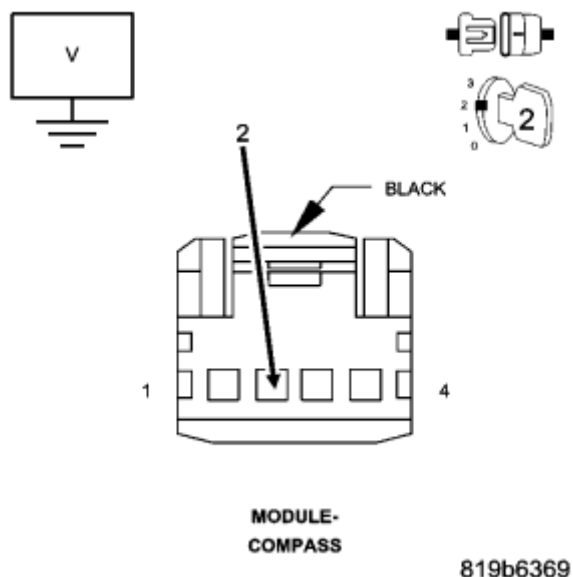


Fig. 9: Measuring Voltage Of (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Compass Module harness connector.

Turn the ignition on.

Measure the voltage of the (D506) LIN BUS circuit.

Is the voltage above 5 volts?

Yes

Go To 4.

No

Go To 3.

3. (D506) LIN BUS CIRCUIT OPEN

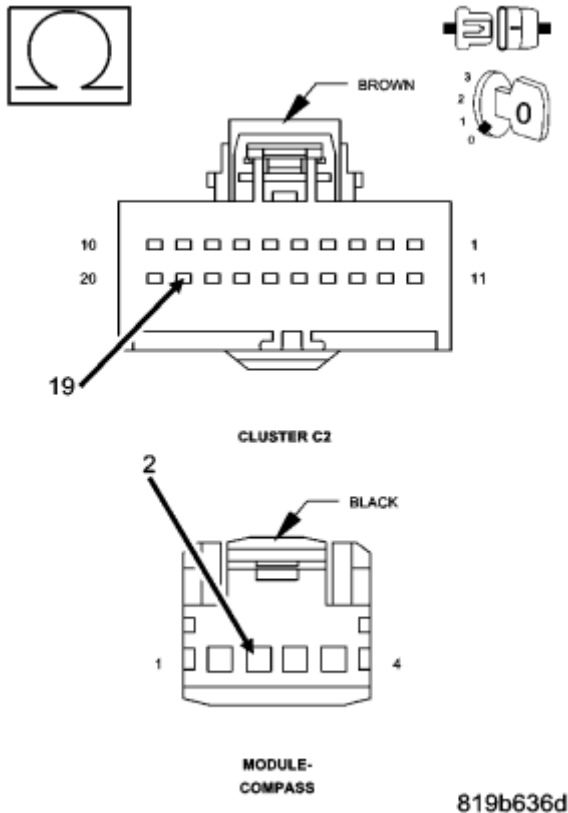


Fig. 10: Measuring Resistance Of (D506) LIN Bus Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Measure the resistance of the (D506) LIN BUS circuit.

Is the resistance below 10K ohms?

Yes

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D506) LIN BUS circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (F921) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN

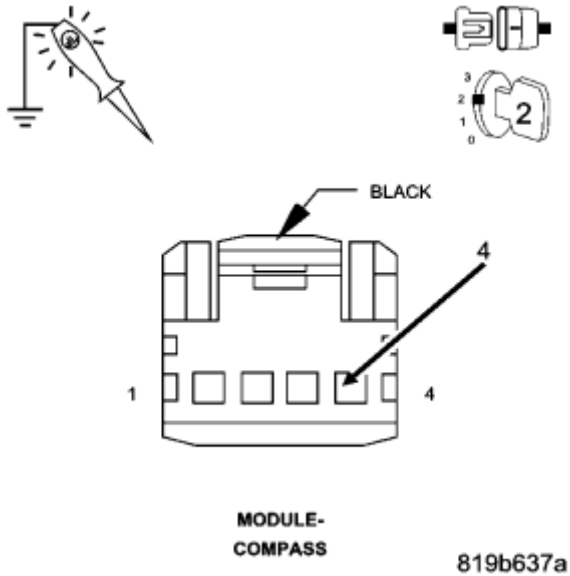


Fig. 11: Measuring Voltage Of (F921) Fused Run Relay Output Circuit For An Ope
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F921) Fused Ignition Switch Output (RUN) circuit at the Compass Module harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (F921) Fused Ignition Switch Output (RUN) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **(Z916) GROUND CIRCUIT OPEN**

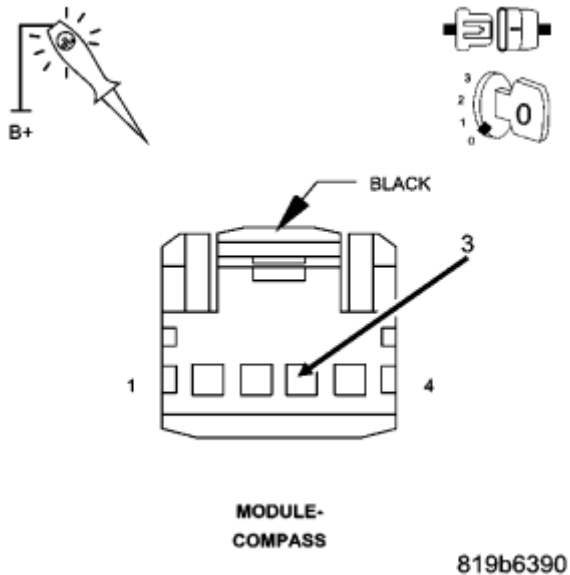


Fig. 12: Measuring Resistance Of (Z916) Ground Circuit For An Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z916) Ground circuit at the Compass Module harness connector.

Does the test light illuminate brightly?

Yes

Replace the Compass Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z916) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0208-LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE

Circuit Schematic

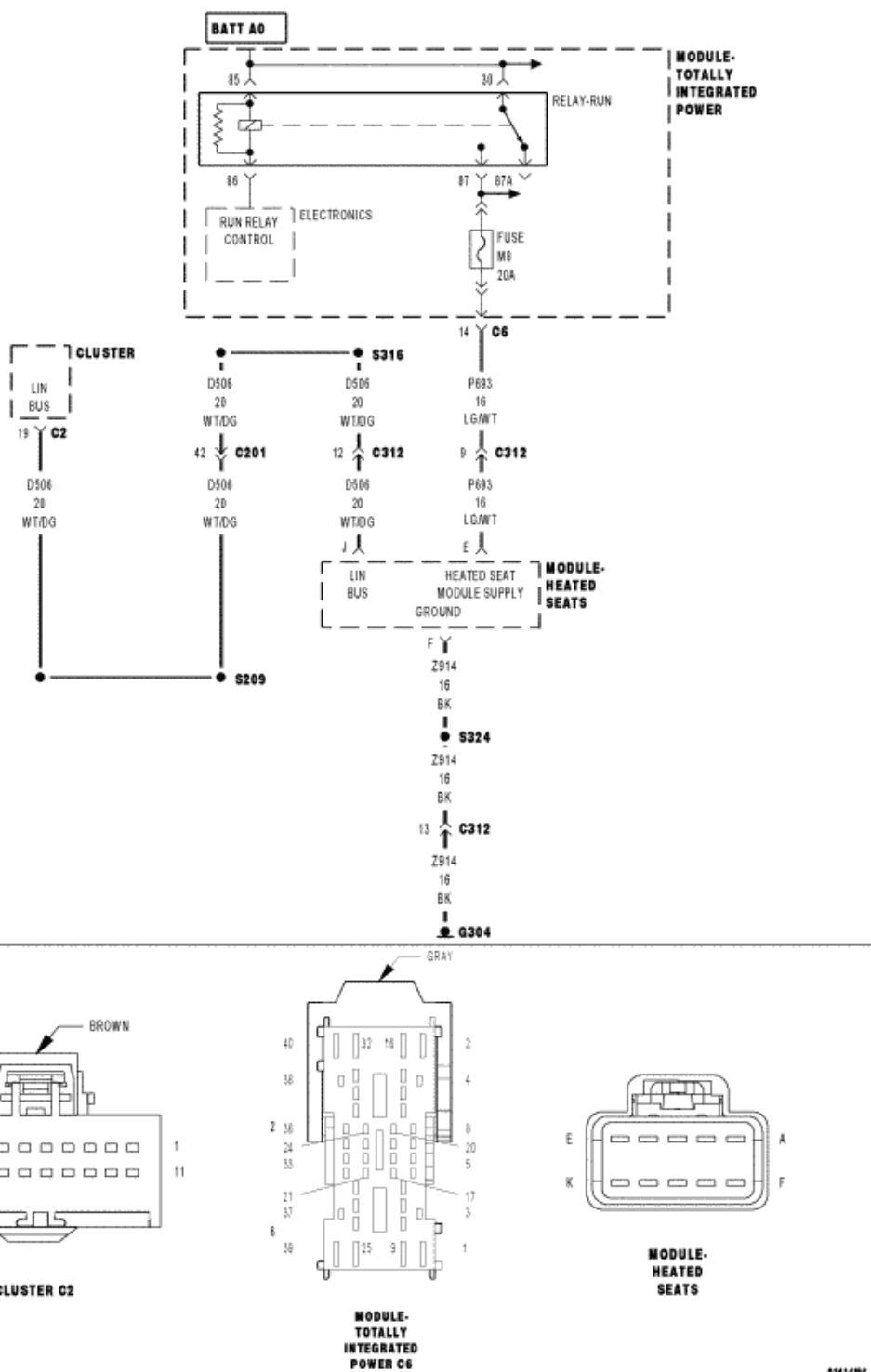


Fig. 13: Heated Seat Control Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Instrument Cluster does not receive information from the Heated Seats Control Module.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN (P693) HEATED SEAT MODULE SUPPLY CIRCUIT OPEN (Z914A) GROUND CIRCUIT OPEN HEATED SEATS MODULE INSTRUMENT CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display the DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(D506) LIN BUS CIRCUIT OPEN**

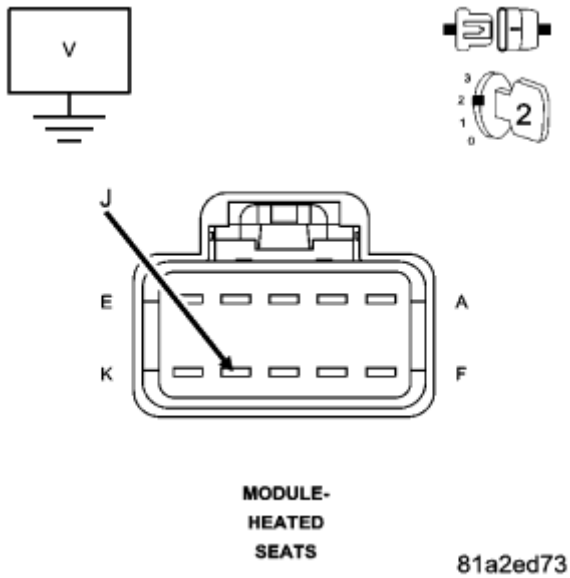


Fig. 14: Measuring Voltage Of (D506) LIN BUS Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Heated Seats Module harness connector.

Turn the ignition on.

Measure the voltage of the (D506) LIN BUS circuit.

Is the voltage above 5 volts?

Yes

Go To 4.

No

Go To 3.

3. **(D506) LIN BUS CIRCUIT OPEN**

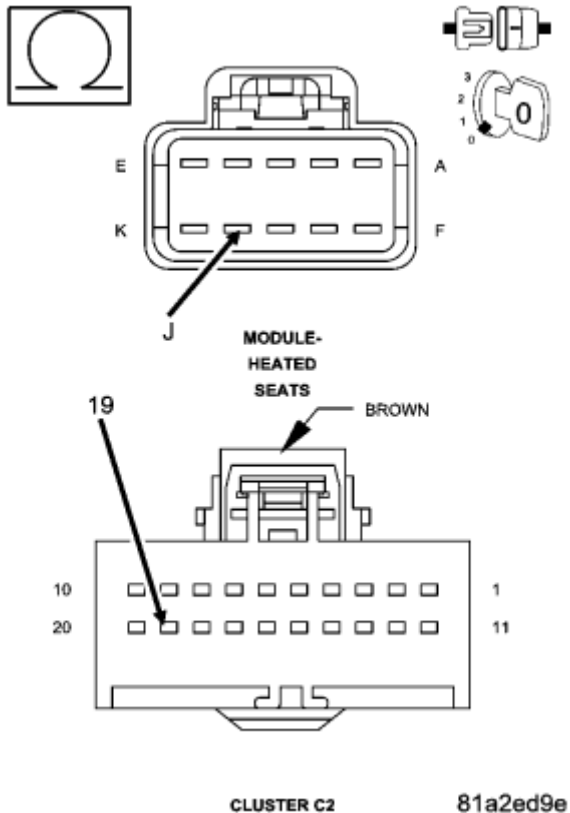


Fig. 15: Measuring Resistance Of (D506) LIN BUS Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Turn the ignition on.

Measure the resistance of the (D506) LIN BUS circuit.

Is the resistance below 10K ohms?

Yes

Replace the Instrument Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D506) LIN BUS circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (P693) HEATED SEAT MODULE SUPPLY

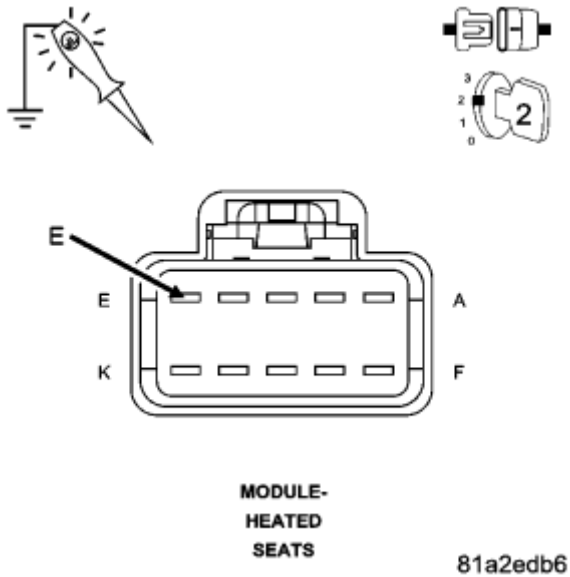


Fig. 16: Using 12-Volt Test Light Connected To Ground To Check (P693) Heated Seat Module Supply Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to ground, check the (P693) Heated Seat Module Supply circuit.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (P693) Heated Seat Module Supply circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. (Z914A) GROUND CIRCUIT OPEN

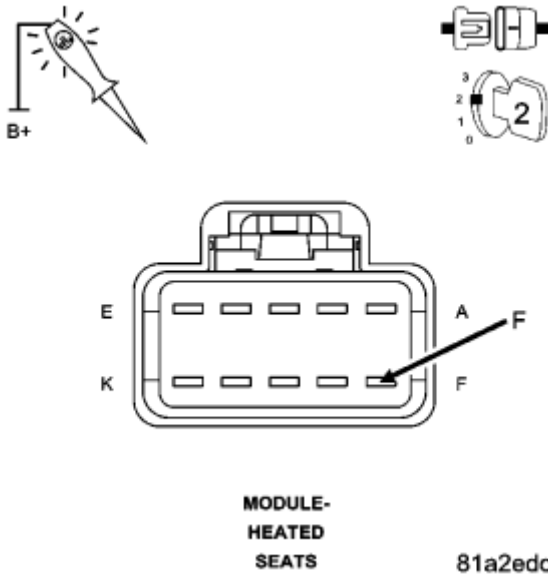


Fig. 17: Using 12-Volt Test Light Connected To 12 Volts To Check (Z914A) Ground Circuit
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12 volts, check the (Z914A) Ground circuit.

Does the test light illuminate brightly?

Yes

Replace the Heated Seats Module in accordance with the service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z914A) ground circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

U1008-LIN 1 BUS

Circuit Schematic

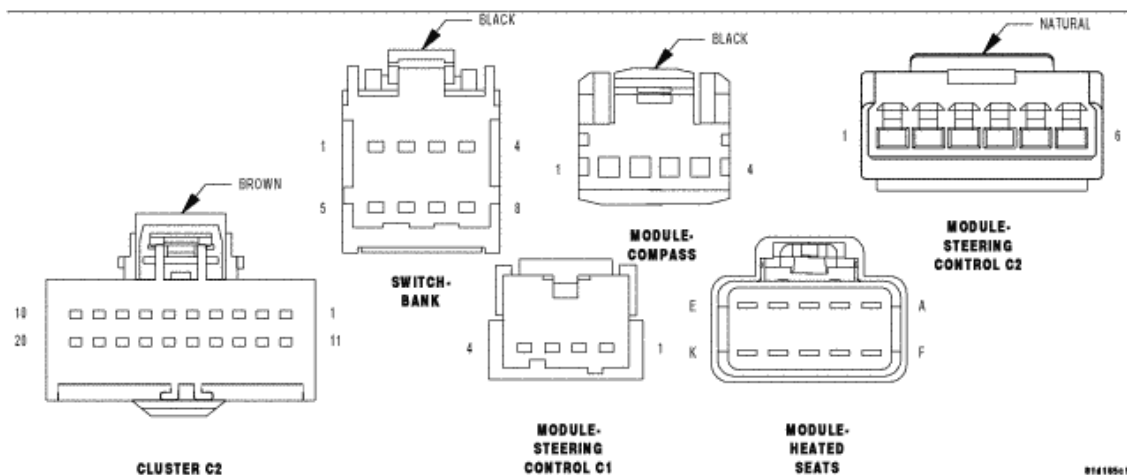
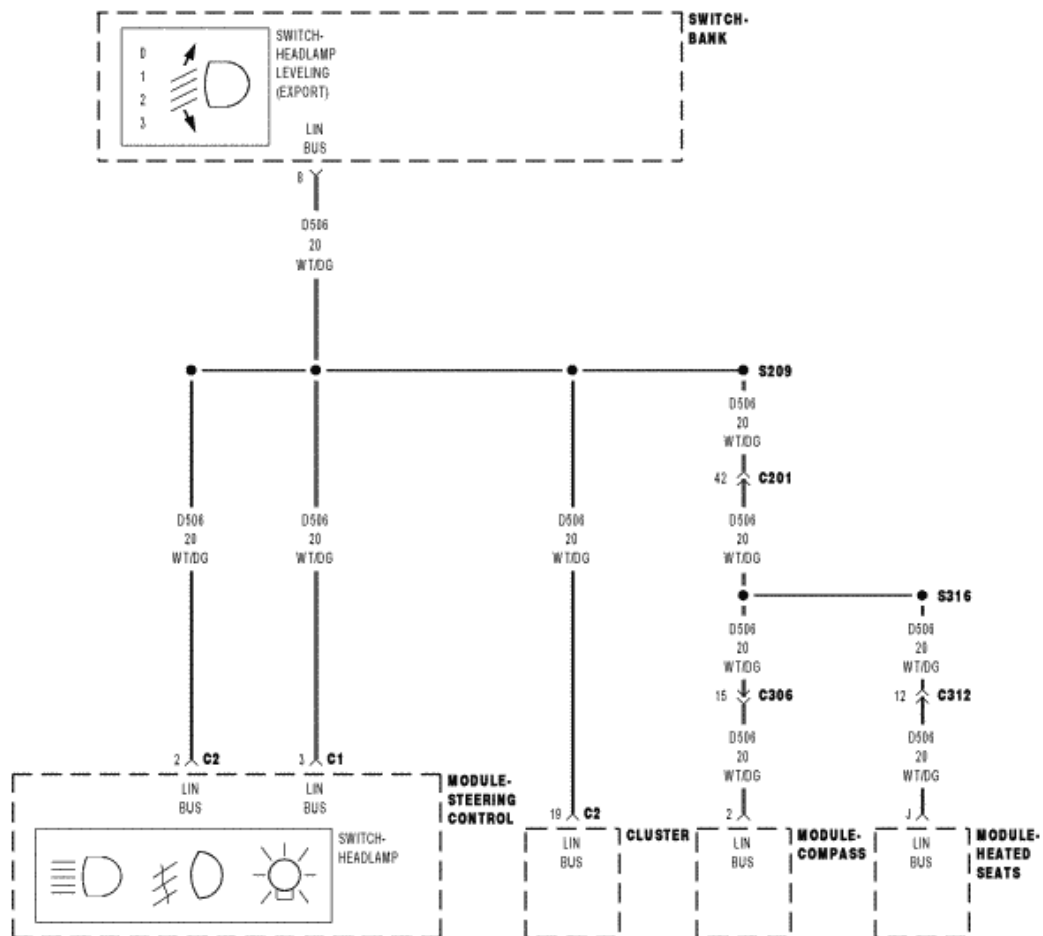


Fig. 18: LIN Bus Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

LIN 1 Bus Performance.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN
(D506) LIN BUS CIRCUIT SHORT TO GROUND
CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display: U1008-LIN 1 BUS?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **SHORTED COMPONENT**

NOTE: **After disconnecting each component, check DTCs with the scan tool.**

Turn the ignition on.

Disconnect the Compass Module harness connector.

Disconnect the Heated Seat Module harness connector.

Disconnect the Switch Bank harness connector.

Disconnect the Steering Control Module C1 and C2 harness connectors.

With each component disconnected, did the DTC U1008-LIN 1 BUS change from active to stored?

Yes

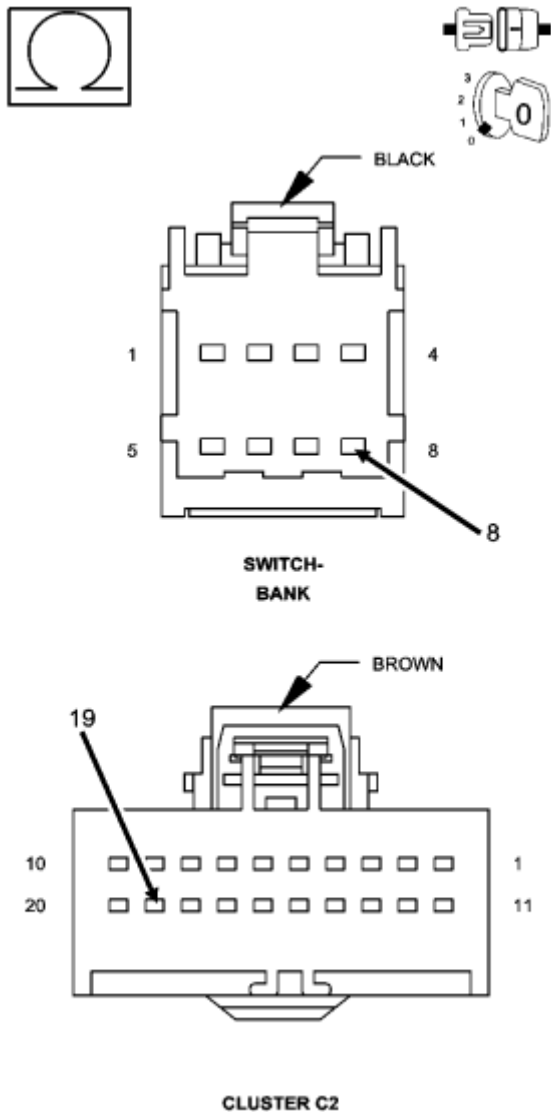
Replace the component that caused the DTC U1008-LIN 1 BUS to change from active to stored.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **(D506) LIN BUS CIRCUIT OPEN**



81d16649

Fig. 19: Measuring The Resistance Of The (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 harness connector.

Disconnect the Switch Bank harness connector.

Measure the resistance of the (D506) LIN Bus circuit.

Is the resistance above 10K ohms?

Yes

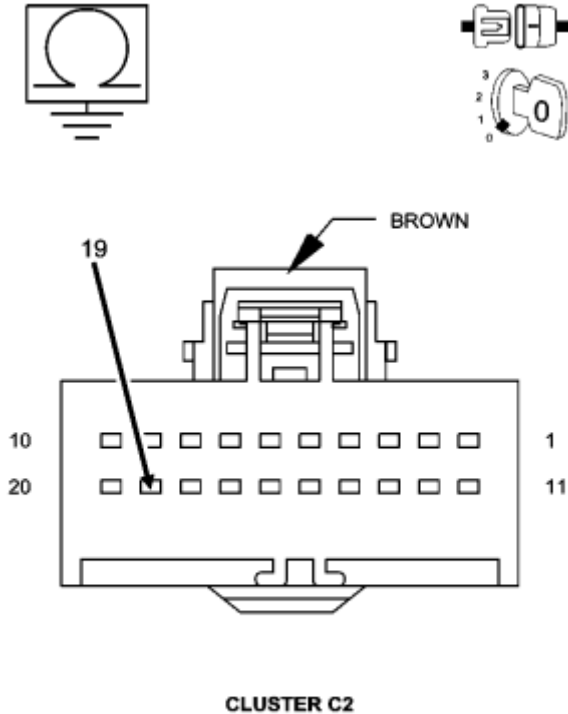
Repair the (D506) LIN Bus circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (D506) LIN BUS CIRCUIT SHORT TO GROUND



818d2f47

Fig. 20: Measuring Resistance To Ground On (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance to ground on the (D506) LIN Bus circuit.

Is the resistance below 10K ohms?

Yes

Repair the (D506) LIN Bus circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

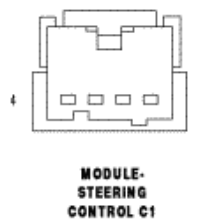
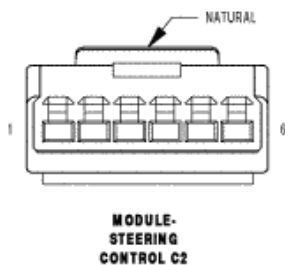
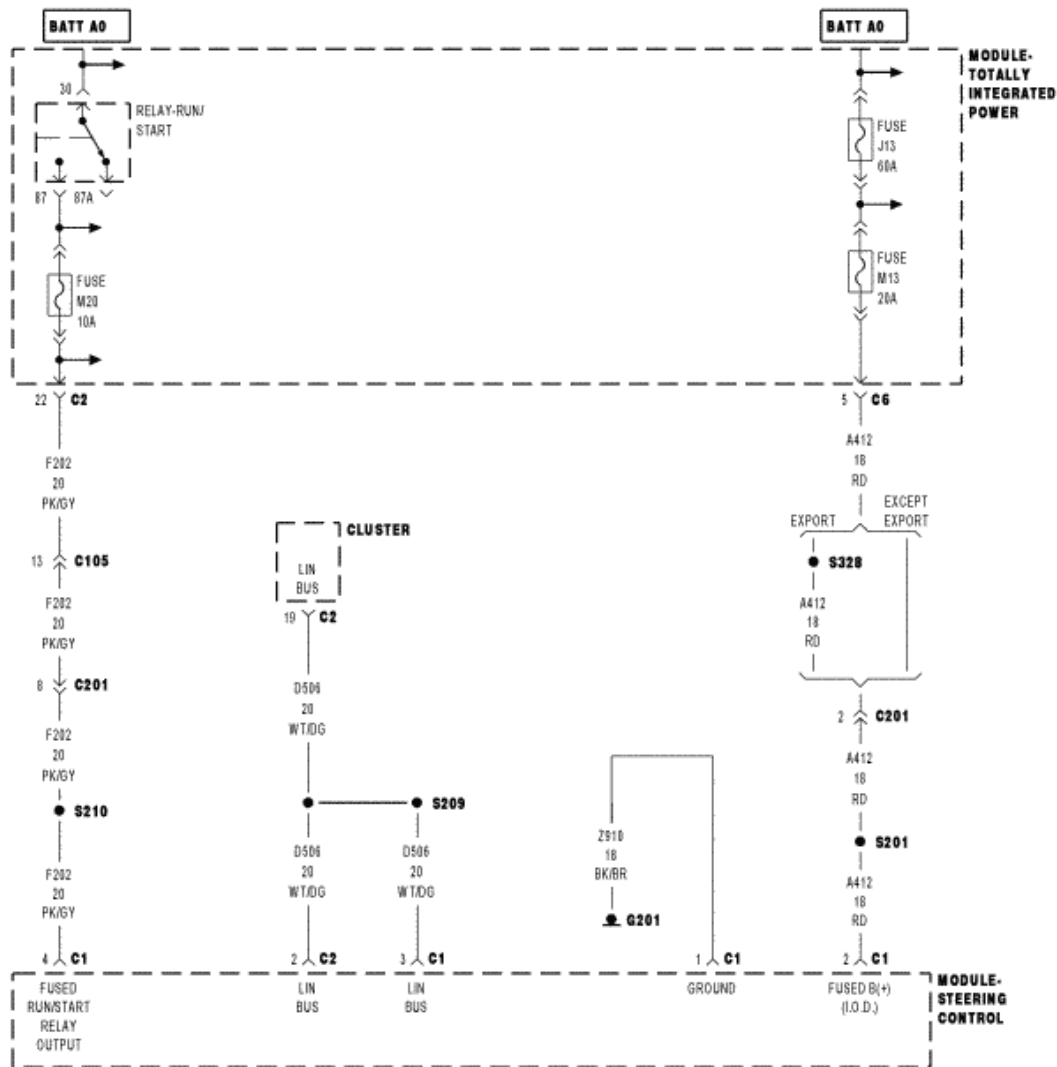
No

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U1109-LOST COMMUNICATION WITH LIN STEERING WHEEL CONTROLS

Circuit Schematic



01a2c761

Fig. 21: Steering Wheel Controls Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Cluster does not receive information from the Steering Wheel Controls.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN (F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN (A412) FUSED B(+) (I.O.D.) CIRCUIT OPEN (Z910) GROUND CIRCUIT OPEN STEERING CONTROL MODULE CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (D506) LIN BUS CIRCUIT

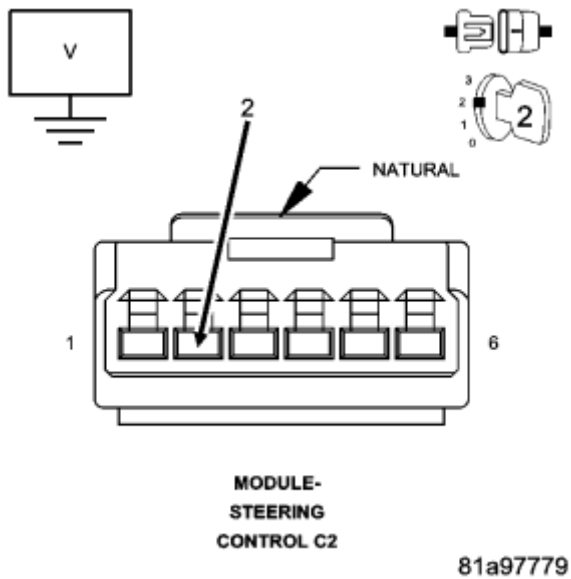


Fig. 22: Measuring Voltage Of (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Steering Control Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (D506) LIN BUS circuit.

Is the voltage above 5 volts?

Yes

Go To 4.

No

Go To 3.

3. (D506) LIN BUS CIRCUIT OPEN

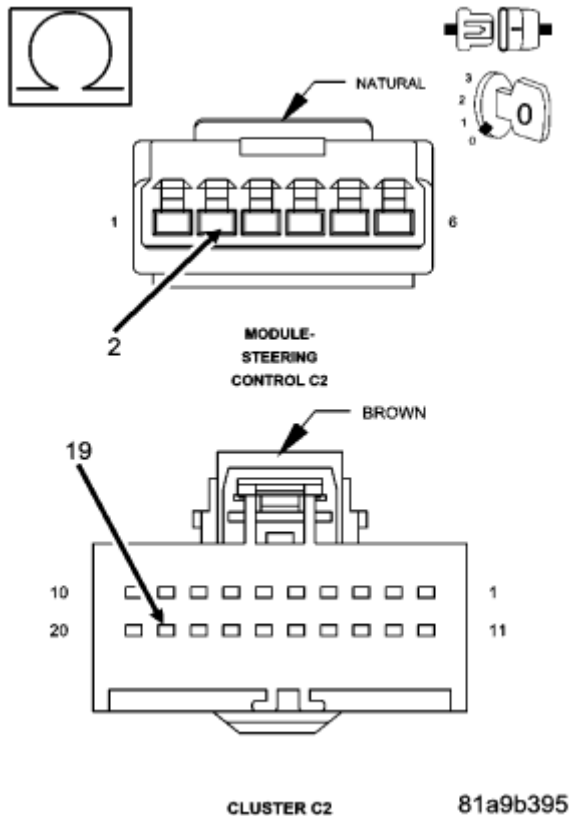


Fig. 23: Measuring Resistance Of (D506) LIN Bus Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 harness connector.

Measure the resistance of the (D506) LIN BUS circuit.

Is the resistance below 10K ohms?

Yes

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D506) LIN BUS circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (F202) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN

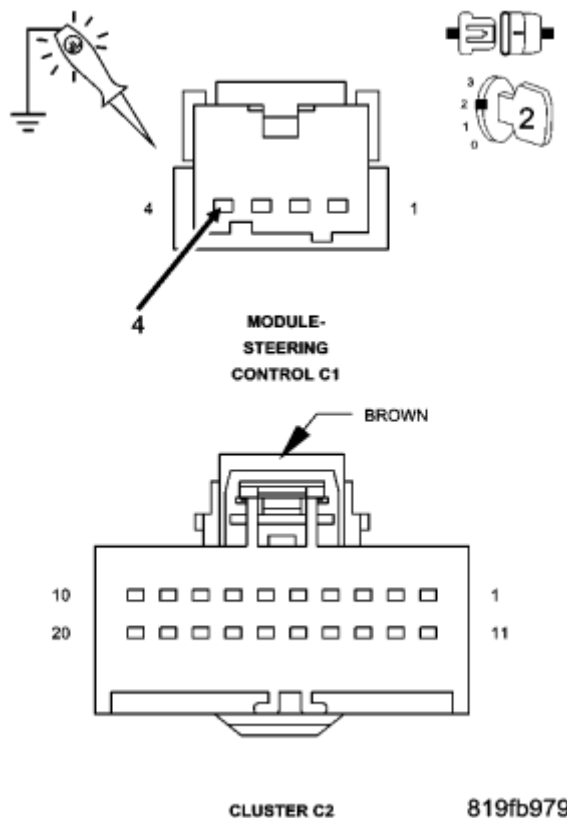


Fig. 24: Using 12-Volt Test Light Connected To Ground To Check Fused RUN/START Relay Output Circuit At Steering Control Module Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Disconnect the Steering Control Module C1 harness connector.

Using a 12-volt test light connected to ground, check the (F202) Fused RUN/START Relay Output circuit at the Steering Control Module C1 harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (F202) Fused RUN/START Relay Output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **(A412) FUSED B(+) (I.O.D.) CIRCUIT OPEN**

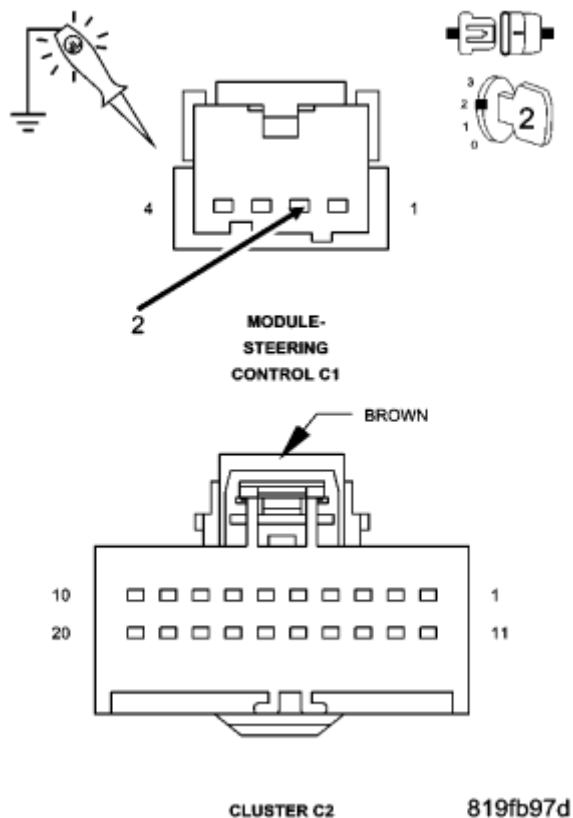


Fig. 25: Using 12-Volt Test Light Connected To Ground To Check (A412) Fused B+ (I.O.D.) Circuit At Steering Control Module Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (A412) Fused B+ (I.O.D.) circuit at the Steering Control Module C1 harness connector.

Does the test light illuminate brightly?

Yes

Go To 6.

No

Repair the (A412) Fused B+ (I.O.D.) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

6. (Z910) GROUND CIRCUIT OPEN

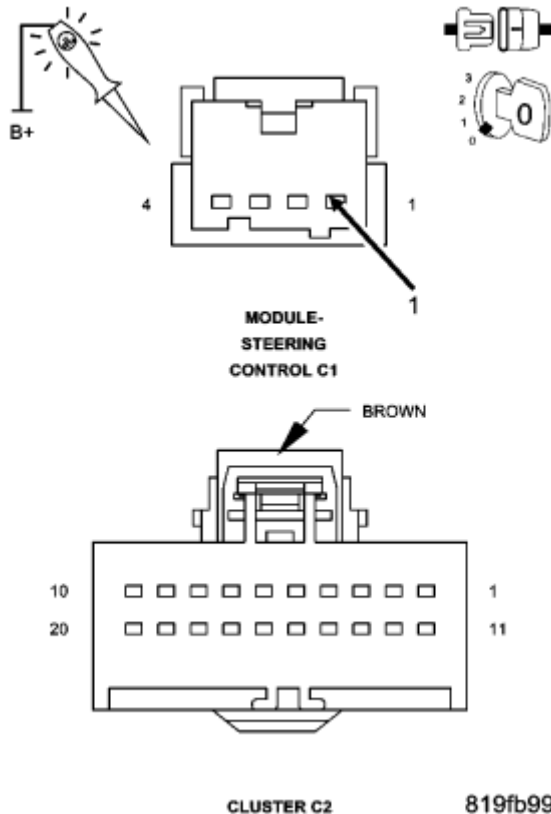


Fig. 26: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit At Steering Control Module Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) Ground circuit at the Steering Control Module C1 harness connector.

Does the test light illuminate brightly?

Yes

Replace the Steering Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

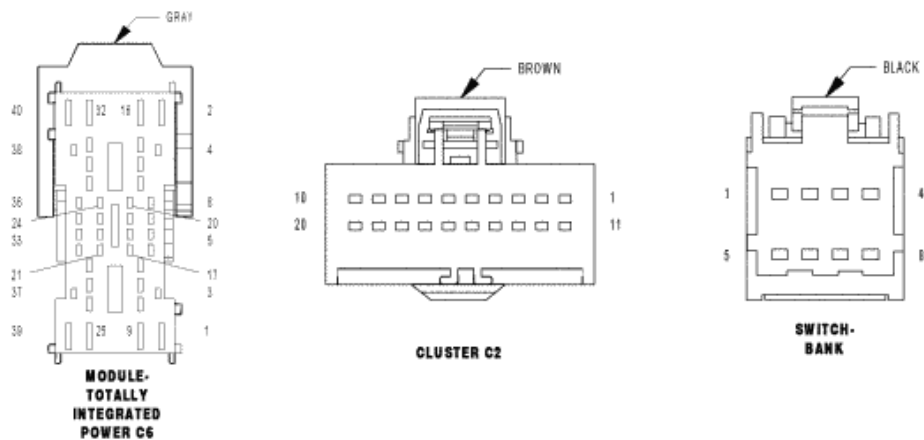
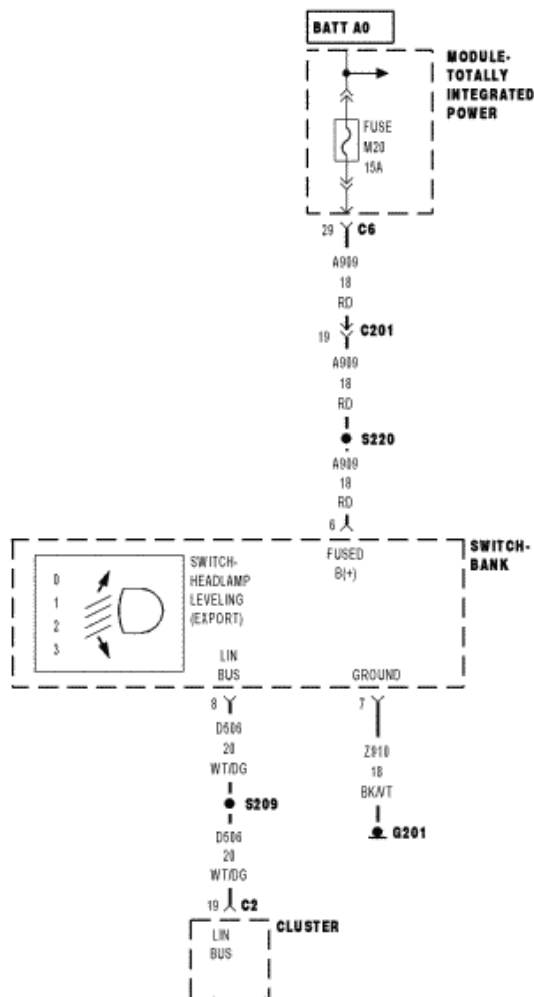
No

Repair the (Z916) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U113B-LOST COMMUNICATION WITH SWITCH BANK MODULE

Circuit Schematic



01010000

Fig. 27: Switch Bank Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Cluster does not receive information from the Switch Bank Module.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN (A108/A909) FUSED B+ CIRCUIT OPEN (Z911) GROUND CIRCUIT OPEN SWITCH BANK MODULE CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

Turn the ignition on.

With the scan tool, record and erase DTCs.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(D506) LIN BUS CIRCUIT**

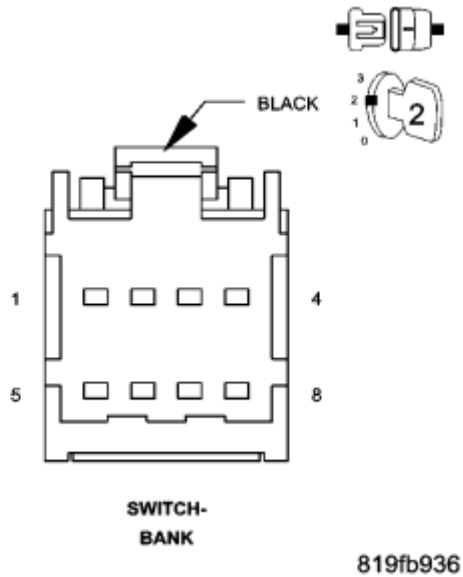


Fig. 28: Switch Bank Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Switch Bank Module harness connector.

Turn the ignition on.

Measure the voltage of the (D506) LIN BUS circuit.

Is the voltage above 5 volts?

Yes

Go To 4.

No

Go To 3.

3. (D506) LIN BUS CIRCUIT OPEN

Turn the ignition off.

Disconnect the Cluster C2 harness connector.

Measure the resistance of the (D506) LIN BUS circuit.

Is the resistance below 10K ohms?

Yes

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D506) LIN BUS circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (A909) FUSED B+ CIRCUIT OPEN

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (A909) Fused B+ circuit at the Switch Bank Module harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (A909) Fused B+ circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. (Z910) GROUND CIRCUIT OPEN

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) Ground circuit at the Switch Bank Module harness connector.

Does the test light illuminate brightly?

Yes

Replace the Switch Bank Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z910) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U1149-LOST COMMUNICATION WITH MULTIFUNCTION SWITCH

Circuit Schematic

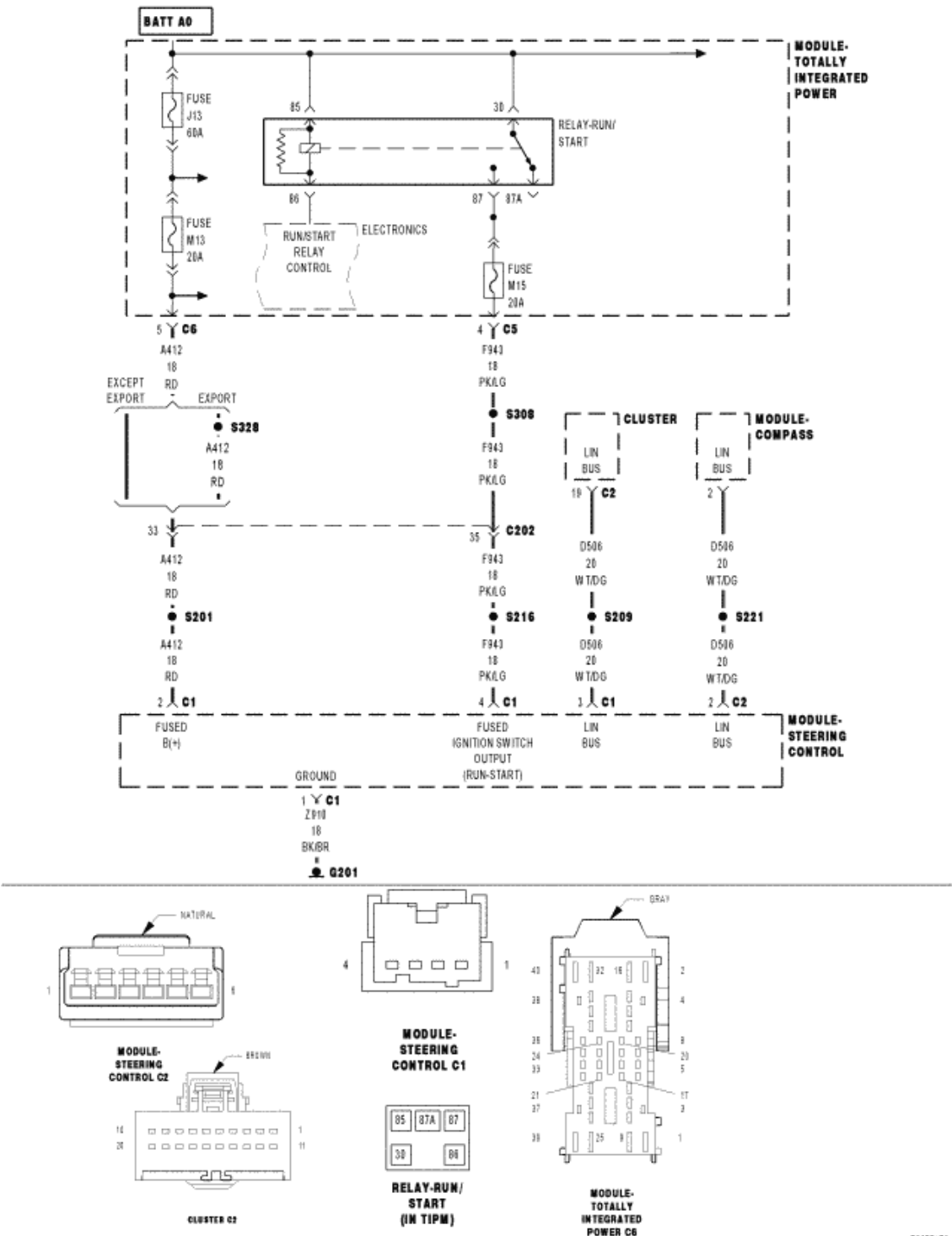


Fig. 29: Multifunction Switch Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Cluster does not receive information from the Steering Control Module.

Possible Causes

Possible Causes
(D506) LIN BUS CIRCUIT OPEN (F943) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN (A412) FUSED B(+) (I.O.D.) CIRCUIT OPEN (Z910) GROUND CIRCUIT OPEN STEERING CONTROL MODULE CLUSTER

Diagnostic Test

1. **CHECK FOR AN ACTIVE DTC**

NOTE: Before proceeding with this diagnostic process, verify the proper connection of the SCM C1 harness connector. A loose connection at this connector will cause this DTC to set.

Turn the ignition off.

Gently pull the SCM C1 connector harness to verify the locking tab is fully engaged. If the connector locking tab is not fully engaged, push to seat the connector locking tab.

Turn the ignition on.

Wait 30 seconds.

With the scan tool, read DTCs.

Does the scan tool display this DTC as active?

Yes

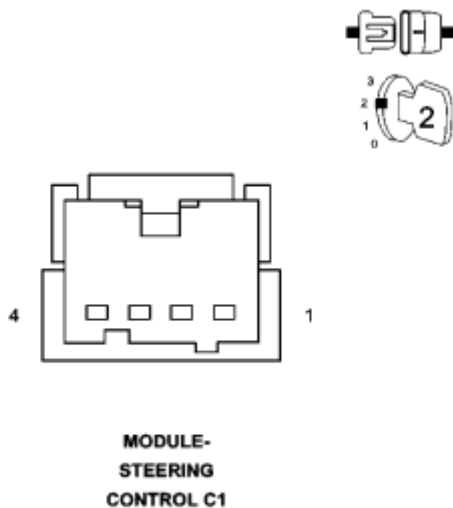
Go To 2.

No

The condition that caused this code to set is not present at this time. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (D506) LIN BUS CIRCUIT



819fb971

Fig. 30: Steering Control Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Steering Control Module harness connector.

Turn the ignition on.

Measure the voltage of the (D506) LIN BUS circuit.

Is the voltage above 5 volts?

Yes

Go To 4.

No

Go To 3.

3. **(D506) LIN BUS CIRCUIT OPEN**

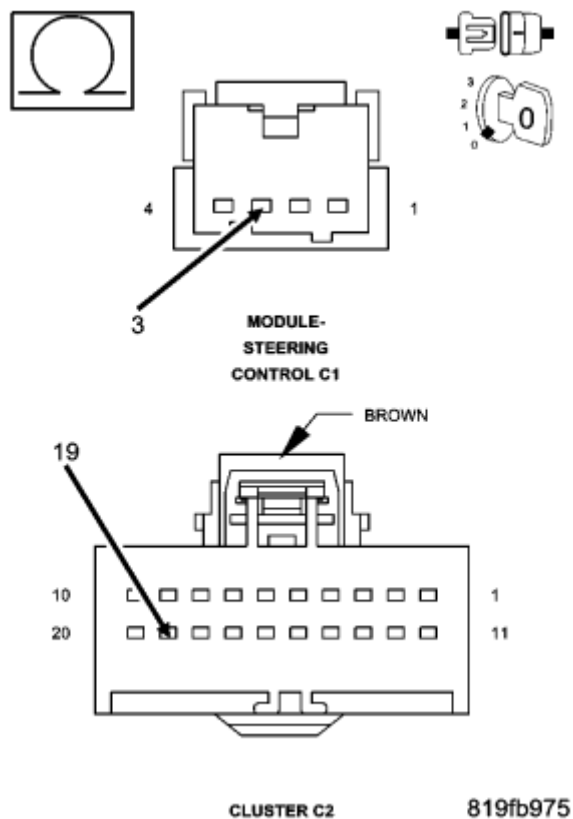


Fig. 31: Measuring Resistance Of (D506) LIN Bus Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Cluster C2 harness connector.

Measure the resistance of the (D506) LIN BUS circuit.

Is the resistance below 10K ohms?

Yes

Replace the Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Repair the (D506) LIN BUS circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **(F943) FUSED RUN/START RELAY OUTPUT CIRCUIT OPEN**

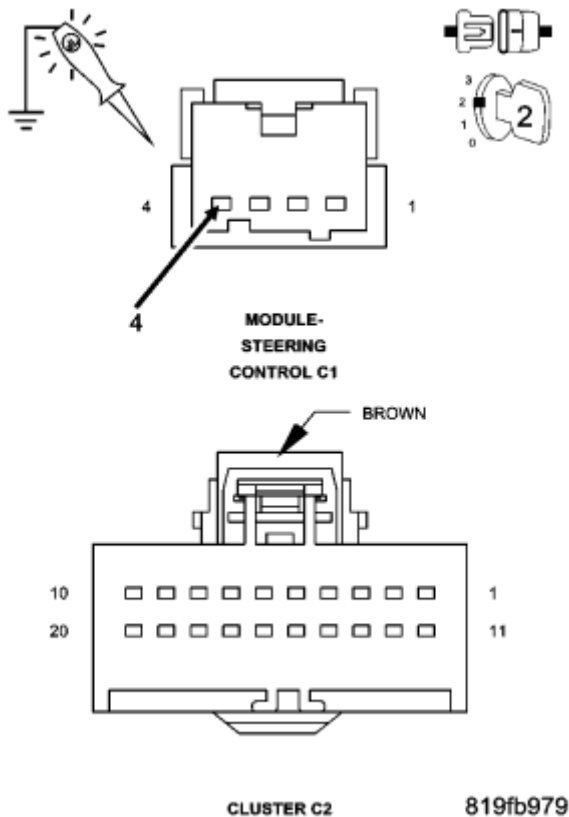


Fig. 32: Using 12-Volt Test Light Connected To Ground To Check Fused RUN/START Relay Output Circuit At Steering Control Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (F943) Fused RUN/START Relay Output circuit at the Steering Control Module harness connector.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (F943) Fused RUN/START Relay Output circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

5. (A412) FUSED B+(+) (I.O.D.) CIRCUIT OPEN

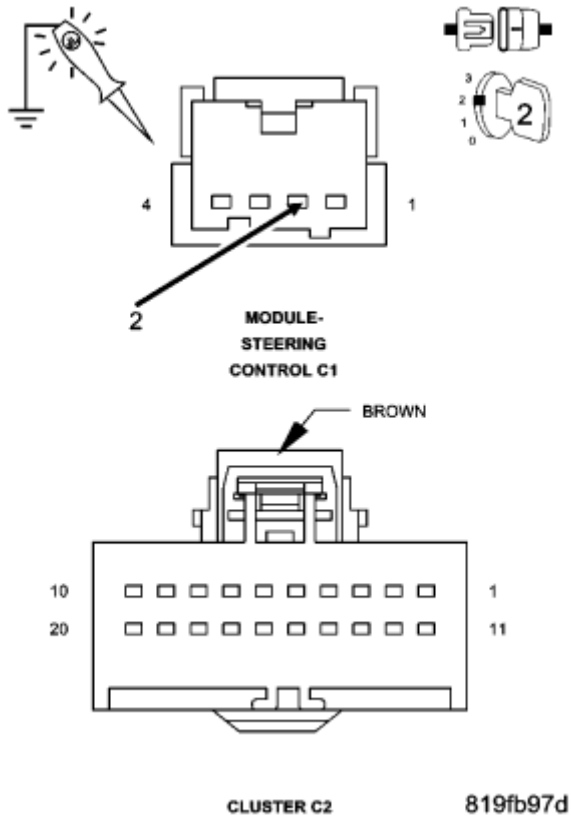


Fig. 33: Using 12-Volt Test Light Connected To Ground To Check (A412) Fused B+ (I.O.D.) Circuit At Steering Control Module Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connected to ground, check the (A412) Fused B+ (I.O.D.) circuit at the Steering Control Module harness connector.

Does the test light illuminate brightly?

Yes

Go To 6.

No

Repair the (A412) Fused B+ (I.O.D.) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (Z910) GROUND CIRCUIT OPEN

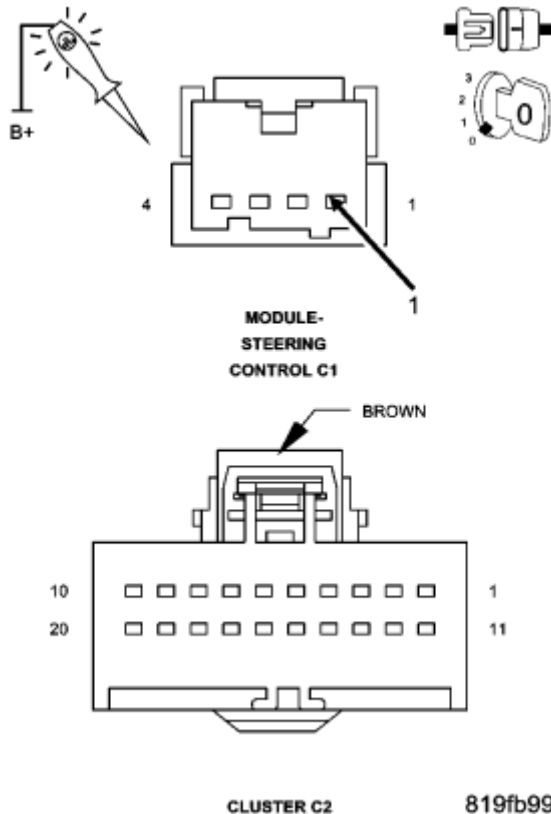


Fig. 34: Using 12-Volt Test Light Connected To 12-Volts To Check (Z910) Ground Circuit At Steering Control Module Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z910) Ground circuit at the Steering Control Module harness connector.

Does the test light illuminate brightly?

Yes

Replace the Steering Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z916) ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Instrument Cluster - Service Information - Liberty

INSTRUMENT CLUSTER - SERVICE INFORMATION

DESCRIPTION

INSTRUMENT CLUSTER

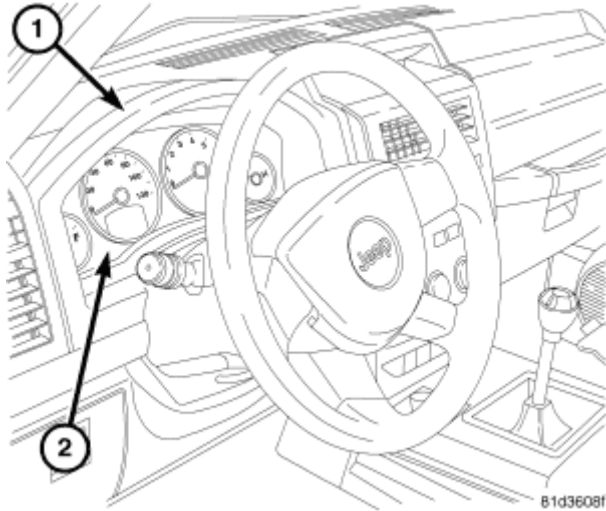


Fig. 1: Instrument Cluster
Courtesy of CHRYSLER LLC

The instrument cluster (2) for this vehicle is an ElectroMechanical Instrument Cluster (EMIC) that is located in the instrument panel above the steering column opening, directly in front of the driver. The remainder of the EMIC, including the mounts and the electrical connections, are concealed within the instrument panel below the cluster bezel (1). The instrument cluster for this vehicle also includes the hardware and software necessary to serve as the electronic body control module and is sometimes referred to as the Cab Compartment Node or CCN.

Besides analog gauges and indicators, the EMIC module incorporates one standard blue-green digital Vacuum Fluorescent Display (VFD) unit. A second optional VFD unit is available in some vehicles. The standard VFD is a fixed segment unit for displaying odometer information, automatic transmission gear selector position (PRNDL), and several other indicators. The optional compass/temperature VFD unit is a large fixed segment display. The optional Electronic Vehicle Information Center (EVIC) VFD unit is a large reconfigurable display unit. These optional VFD units serve as the visual display for the compass, the outside temperature, the trip computer, the audio system settings as well as the user interface for the customer programmable features, numerous textual warning or reminder indicators and certain diagnostic information depending upon vehicle equipment.

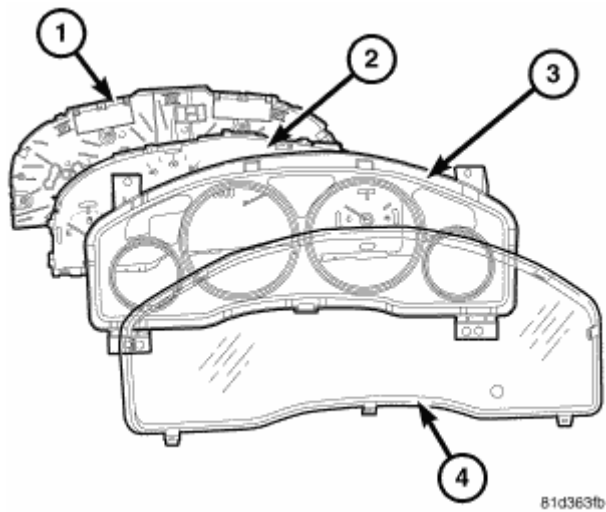


Fig. 2: Cluster Hood And Mask Unit
Courtesy of CHRYSLER LLC

The EMIC gauges and indicators are visible through a dedicated opening in the cluster bezel and are protected by a clear plastic cluster lens (4). Nine integral latch formations on the lens secure it to the cluster hood and mask unit (3). Just behind the cluster lens is the cluster hood and integral mask, which is constructed of molded black plastic. The hood serves as a visor and shields the face of the cluster from ambient light and reflections to reduce glare, while the cluster mask serves to separate and define the individual gauges and trims the outside perimeter of the cluster overlay. The hood and mask unit has nine integral latch features that secure it to the outer perimeter of the cluster housing (2). The hood and mask unit also has four integral mounting tabs, one on each upper and lower corner that secure the EMIC to the molded plastic instrument panel cluster carrier with four screws.

The rear of the cluster housing and the EMIC electronic circuitry are protected by a molded black plastic rear cover (1), which is also secured to the cluster housing by two integral latch features and to the cluster hood and mask unit by eight latch features. The rear cover includes clearance holes for the four cluster connector receptacles. The connector receptacles on the back of the cluster electronic circuit board connect the EMIC to the vehicle electrical system through four take outs with connectors from the instrument panel wire harness.

Sandwiched between the rear cover and the hood and mask unit is the cluster housing. The molded white plastic cluster housing serves as the carrier for the cluster circuit board and circuitry, the cluster connector receptacles, the two major and two minor gauges, a Light Emitting Diode (LED) for each cluster indicator, the VFD display units, an audible tone transducer, several LED units for general cluster illumination, the cluster overlay, and the gauge pointers. The standard equipment molded black plastic odometer/trip odometer switch button extends from the face of the cluster housing through dedicated holes in the cluster mask and the cluster lens adjacent to the standard VFD unit.

The cluster overlay is a laminated plastic unit. The dark, visible, outer surface of the overlay is marked with all of the gauge dial faces and graduations, but this layer is also translucent. The darkness of this outer layer prevents the cluster from appearing cluttered or busy by concealing the cluster indicators that are not illuminated, while the translucence of this layer allows those indicators and icons that are illuminated to be readily visible. The underlying layer of the overlay is opaque and allows light from the LED for each of the various indicators and illumination lamps behind it to be visible through the outer layer of the overlay through

predetermined stencil-like cutouts. Openings in the overlay at the base of the tachometer and the speedometer dial faces have smoked clear lenses through which the illuminated VFD units can be viewed.

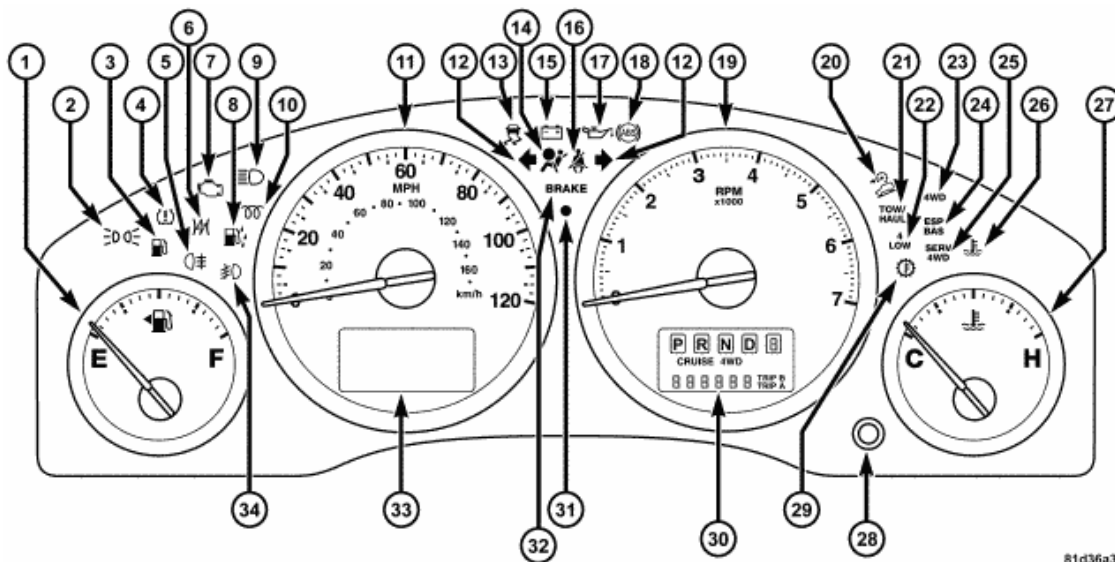
Several versions of the EMIC module are offered on this vehicle. These versions accommodate all of the variations of optional equipment and regulatory requirements for the various markets in which the vehicle is offered. The microprocessor-based EMIC utilizes integrated circuitry and information carried on the Controller Area Network (CAN) data bus and the Local Interface Network (LIN) data bus along with several hard wired analog and multiplexed inputs to monitor sensors and switches throughout the vehicle. In response to those inputs, the internal circuitry and programming of the EMIC allow it to control and integrate many electronic functions and features of the vehicle through both hard wired outputs and the transmission of electronic message outputs to other electronic modules in the vehicle over the CAN and LIN data busses. Refer to **DESCRIPTION** .

Besides typical instrument cluster gauge and indicator support, the electronic functions and features that the EMIC supports or controls include the following:

- **Audible Warnings** - The EMIC electronic circuit board is equipped with an audible tone transducer and programming that allows it to provide various audible alerts to the vehicle operator. These alerts include single chime tones and continuous slow or fast tones. An electromechanical relay is also soldered onto the circuit board to produce audible clicks that are used to emulate the sound of a conventional turn signal or hazard warning flasher.
- **Compass/Temperature Display Support** - The EMIC provides support for each of the functions and features of the compass/temperature display, as well as for the odometer push button switch, which also provides user inputs to control the compass/temperature display options.
- **Electronic Vehicle Information Center Display Support** - The EMIC provides support for each of the functions and features of the Electronic Vehicle Information Center (EVIC) display. This includes support for the compass, thermometer and audio system mode, customer programmable features, textual warnings, premium Tire Pressure Monitor (TPM), trip computer, U-Connect™ Hands-Free communication and the switch inputs from the two EVIC rocker switches located on the front surface of the steering wheel spokes that are used to control and configure many of the displays. This also includes display arbitrator programming, which controls the priorities, sequences, and transition of information that is displayed in the EVIC display, particularly when multiple display requests are received simultaneously.
- **Enhanced Accident Response Support** - The EMIC monitors inputs from the Occupant Restraint Controller (ORC) and the Powertrain Control Module (PCM) to automatically turn ON the interior lighting after an airbag deployment event, 10 seconds after the vehicle speed is zero. The interior lighting remains illuminated until the key is removed from the ignition switch lock cylinder, at which time the interior lighting returns to normal operation and control. These Enhanced Accident Response System (EARS) features are each dependent upon a functional vehicle electrical system following the vehicle impact event.
- **Exterior Lighting Switch Support** - The EMIC monitors electronic **exterior lighting switch** , and **turn signal switch status** messages from the Steering Control Module (SCM) on the steering column over the LIN data bus and transmits the appropriate electronic **exterior lighting** and **turn signal request** messages to the Totally Integrated Power Module (TIPM) over the CAN data bus to support the exterior lighting functions.
- **Horn Switch Support** - On vehicles without the optional EVIC, the EMIC receives a hard wired input from the horn switch on the steering wheel. On vehicles with the optional EVIC, the EMIC receives

electronic **horn switch status** messages from the Steering Wheel Switch Module (SWSM) over the LIN bus. In either case, the EMIC then provides electronic **horn request** messages over the CAN data bus to support the horn function.

- **Interior Lamp Load Shedding** - The EMIC provides a battery saver feature which will automatically turn OFF all interior lamps if they remain ON after a timed interval of about ten minutes.
- **Interior Lighting Control** - The EMIC monitors electronic messages and hard wired inputs from the reading lamp switches, the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM), the Steering Control Module (SCM) and the Totally Integrated Power Module (TIPM) to provide courtesy lamp control. This includes support for timed illuminated entry with theater-style fade-to-OFF and courtesy illumination DEFEAT features.
- **Local Interface Network Master Module** - The EMIC is the master module for the LIN data bus. In this role it gathers information from the compass sensor, the Heated Seat Module (HSM), the instrument panel switch pod, the Steering Wheel Switch Module (SWSM), the SCM and the remote compass module, then either acts on that information directly or places electronic messages on the CAN data bus for use by other modules
- **Panel Lamps Dimming Control** - The EMIC monitors electronic **dimming level** messages received from the panel lamps dimmer switch input to the SCM over the LIN data bus, then provides both a hard wired 12-volt Pulse-Width Modulated (PWM) output and electronic message outputs over the CAN data bus and the LIN data bus that synchronizes the dimming level of all panel lamps dimmer controlled lamps with that of the cluster general illumination lighting.
- **Wiper and Washer Switch Support** - The EMIC monitors electronic **wiper switch** and **washer switch status** messages from the SCM on the steering column over the LIN data bus and transmits the appropriate electronic **wiper** and **washer request** messages to the TIPM over the CAN data bus to support the wiper and washer system functions, including the headlamps-on with wipers programmable feature.



81d36a35

Fig. 3: Gauge Indicators
Courtesy of CHRYSLER LLC

The EMIC houses four analog gauges and has provisions for up to 30 indicators. Some of the EMIC indicators are automatically configured when the EMIC is connected to the vehicle electrical system for compatibility with

certain optional equipment or equipment required for regulatory purposes in certain markets. While each EMIC may have provisions for indicators to support every available option, the configurable indicators will not be functional in a vehicle that does not have the equipment that an indicator supports.

The EMIC includes the following analog gauges:

- **Engine Temperature Gauge (27)**
- **Fuel Gauge (1)**
- **Speedometer (11)**
- **Tachometer (19)**

The EMIC includes the following VFD display units:

- **Odometer Display (30)** - includes Cruise indicator, Gear Selector indicator and Four-Wheel Drive (4WD) indicator
- **Compass-Temperature or Electronic Vehicle Information Center Display (33)**

The EMIC includes provisions for the following indicators:

- **Airbag Indicator (14)**
- **Ajar Indicators (30 or 33)** - text in odometer display for doors, liftgate and liftgate glass in clusters without EVIC, or icons in the EVIC display of vehicles with that option
- **Antilock Brake System (ABS) Indicator (18)**
- **Brake Indicator (32)** - text only for U.S. market, icon only for markets outside U.S.
- **Change Oil Indicator** - textual message in odometer display (30) on all domestic market vehicles and only BUX market vehicles equipped with a 2.8L diesel engine and an optional diesel particulate filter
- **Charging Indicator (15)**
- **Cruise Indicator** - textual message in odometer display (30)
- **Electronic Stability Program (ESP)/Brake Assist System (BAS) Indicator (24)**
- **Electronic Throttle Control (ETC) Indicator (6)**
- **Engine Coolant Temperature Indicator (26)**
- **Four-Wheel Drive Full-Time (Green) Indicator** - textual message in odometer display (30) with optional four-wheel drive system only
- **Four-Wheel Drive Part-Time (Amber) Indicator (23)** - with optional four-wheel drive system only
- **Four-Wheel Drive Low Indicator (22)** - with optional four-wheel drive system only
- **Front Fog Lamp Indicator (34)** - with optional front fog lamps only
- **Gas Cap Indicator** - textual message in odometer display (30)
- **Gear Selector Indicator** - in odometer display (30) with automatic transmission only
- **High Beam Indicator (9)**
- **Hill Descent Indicator (20)** - with optional four-wheel drive system only
- **Low Fuel Indicator (3)**

- **Low Oil Pressure Indicator (17)**
- **Malfunction Indicator Lamp (MIL) (7)**
- **No Bus Indicator** - textual message in odometer display (30)
- **No Fuse Indicator** - textual message in odometer display (30)
- **Position Lamp Indicator (2)** - on vehicles manufactured for certain export markets
- **Rear Fog Lamp Indicator (5)** - in markets where rear fog lamps are available only
- **Seat Belt Indicator (16)**
- **Security Indicator (31)**
- **Service Four-Wheel Drive (4WD) Indicator (25)** - with optional four-wheel drive system only
- **Tire Pressure Monitor (TPM) Indicator (4)**
- **Tow/Haul Indicator (21)** - with automatic transmission only
- **Traction Control/Electronic Stability Program (ESP) Indicator (13)**
- **Transmission Temperature Indicator (29)** - with automatic transmission only
- **Turn Signal (Right and Left) Indicators (12)**
- **Wait-To-Start Indicator (10)** - with diesel engine only
- **Water-In-Fuel Indicator (8)** - with diesel engine only

Each indicator in the EMIC, except those located within a VFD unit, is illuminated by a dedicated LED that is soldered onto the EMIC electronic circuit board. Cluster illumination is accomplished by several dimmable LED units, which illuminate each of the gauge dial faces for visibility when the exterior lighting is turned ON. These LED units are not available for service replacement and, if damaged or ineffective, the entire EMIC must be replaced.

Hard wired circuitry connects the EMIC to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the EMIC through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

The EMIC module for this vehicle is serviced only as a complete unit. The EMIC module cannot be adjusted or repaired. If a gauge, an LED unit, a VFD unit, the electronic circuit board, the circuit board hardware, the cluster overlay or the cluster housing are damaged or ineffective, the entire EMIC module must be replaced. The cluster lens and the cluster hood and mask unit are available for separate service replacement.

OPERATION

INSTRUMENT CLUSTER

The ElectroMechanical Instrument Cluster (EMIC) in this vehicle also includes the hardware and software necessary to serve as the electronic body control module and is sometimes referred to as the Cab Compartment Node or CCN. The following information deals primarily with the instrument cluster functions of this unit.

Additional details of the electronic body control functions of this unit may be found within the service information for the system or component that the EMIC controls. For example: Additional details of the audible warning functions of the EMIC are found within the Chime/Buzzer service information.

The EMIC is designed to allow the vehicle operator to monitor the conditions of many of the vehicle components and operating systems. The gauges and indicators in the EMIC provide valuable information about the various standard and optional powertrains, fuel and emissions systems, cooling systems, lighting systems, safety systems and many other convenience items. The EMIC is installed in the instrument panel so that all of these monitors can be easily viewed by the vehicle operator when driving, while still allowing relative ease of access for service.

The microprocessor-based EMIC hardware and software uses various inputs to control the gauges and indicators visible on the face of the cluster. Some of these inputs are hard wired, but most are in the form of electronic messages that are transmitted by other electronic modules over the Controller Area Network (CAN) data bus or the Local Interface Network (LIN) data bus. The EMIC is the master node for the LIN data bus. Refer to **OPERATION** .

The EMIC microprocessor smooths the input data using algorithms to provide gauge readings that are accurate, stable and responsive to operating conditions. These algorithms are designed to provide gauge readings during normal operation that are consistent with customer expectations. However, when abnormal conditions exist such as high coolant temperature, the algorithm can drive the gauge pointer to an extreme position and the microprocessor can sound a chime through the on-board audible tone transducer to provide distinct visual and audible indications of a problem to the vehicle operator. The EMIC may also produce audible warnings for other electronic modules in the vehicle based upon electronic **tone request** messages received over the CAN or LIN data bus. Each audible warning is intended to provide the vehicle operator with an audible alert to supplement a visual indication.

The EMIC circuitry operates on battery current received through a fused B(+) fuse on a non-switched fused B (+) circuit, and on battery current received through a fused ignition switch output (run-start) fuse on a fused ignition switch output (run-start) circuit. This arrangement allows the EMIC to provide some features regardless of the ignition switch position, while other features will operate only with the ignition switch in the ON or START positions. The EMIC circuitry is grounded through a ground circuit and take out of the instrument panel wire harness with an eyelet terminal connector that is secured by a ground screw to a ground location on the instrument panel structural support.

The EMIC also has a self-diagnostic actuator test capability, which will test each of the CAN or LIN bus message-controlled functions of the cluster by lighting the appropriate indicators, positioning the gauge needles at several predetermined calibration points across the gauge faces, and illuminating all segments of the Vacuum-Fluorescent Display (VFD) units. See **DIAGNOSIS AND TESTING**.

GAUGES

All gauges receive battery current through the EMIC circuitry only when the ignition switch is in the ON or START positions. With the ignition switch in the OFF position battery current is not supplied to any gauges, and the EMIC circuitry is programmed to move all of the gauge needles back to the low end of their respective scales. Therefore, the gauges do not accurately indicate any vehicle condition unless the ignition switch is in the ON or START positions.

Each of the EMIC gauges contains an electronically controlled stepper motor unit. The EMIC circuitry completely controls the activation and deactivation of these stepper motors to position each gauge needle in the appropriate position based upon cluster programming and electronic messages received over the CAN or LIN data bus.

The gauges are diagnosed using the self-diagnostic Cab Compartment Node (CCN) actuator test. Proper testing of the CAN or LIN data bus and the electronic data bus message inputs to the EMIC that control each gauge requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information. Specific operation details for each gauge may be found elsewhere in this service information.

VACUUM-FLUORESCENT DISPLAYS

The Vacuum-Fluorescent Display (VFD) units are soldered to the EMIC electronic circuit board. Both the standard odometer unit located below the tachometer and the optional compass/temperature unit located below the minor gauge set are fixed segment displays. The optional Electronic Vehicle Information Center (EVIC) VFD unit located below the minor gauge set is a reconfigurable segment display. With the ignition switch in the OFF or ACCESSORY positions, both VFD displays are activated and the total odometer information is displayed when the driver door is opened (Rental Car Mode) and are deactivated when the driver door is closed or after five minutes, whichever occurs first. Otherwise, both display units are active when the ignition switch is in the ON or START positions, and inactive when the ignition switch is in the OFF or ACCESSORY positions.

The illumination intensity of the VFD units is controlled by the EMIC circuitry based upon electronic **dimming level** messages received over the CAN data bus indicating the exterior lighting is turned ON and the dimming level selected using the panel dimmer function of the control sleeve on the control stalk of the left (lighting) multi-function switch. The illumination intensity of the EMIC VFD units is synchronized with that of other display units in the vehicle by sending the same electronic **dimming level** message inputs to all electronic modules in the vehicle over the CAN or LIN data bus. However, if the Malfunction Indicator Lamp (MIL) is active in domestic market vehicles, the odometer VFD will illuminate at full daytime brightness until the MIL is extinguished.

The odometer VFD unit has several display capabilities including odometer, trip odometer A and B, gear selector indication (PRNDL) for vehicles with an automatic transmission, several warning or reminder indications, and various diagnostic information when certain fault conditions exist. On vehicles not equipped with the optional compass/temperature display or EVIC, the odometer display toggles to an outside temperature display following Trip B. The compass/temperature VFD unit displays numerous warning or reminder textual messages, compass, temperature, the customer programmable features interface and various diagnostic information when certain fault conditions exist. An odometer/trip odometer switch on the EMIC circuit board is used to control many of the display modes of the VFD units. These switches are actuated manually by depressing the odometer/trip odometer push button that extends through the lower edge of the cluster lens, adjacent to the odometer VFD.

Actuating the odometer/trip odometer push button momentarily with the ignition switch in the ON position will toggle the odometer VFD between the odometer and trip odometer modes. Depressing the odometer/trip odometer push button for about two seconds while the VFD is in the trip odometer mode will reset the trip odometer value to zero. Holding the odometer/trip odometer push button depressed while turning the ignition switch from the OFF position to the ON position will initiate the CCN self-diagnostic actuator test. The EMIC microprocessor remembers which odometer display mode is active when the ignition switch is turned to the OFF position, and returns the display to that mode when the ignition switch is turned ON again.

Actuating the odometer/trip odometer push button momentarily with the ignition switch in the ON position will toggle the CMTC VFD between the various display functions and the various customer programmable feature selectors. The EMIC microprocessor remembers which display modes are active when the ignition switch is turned to the OFF position, and returns the display to that mode when the ignition switch is turned ON again.

Both VFD units are diagnosed using the self-diagnostic Cab Compartment Node (CCN) actuator test. See **DIAGNOSIS AND TESTING**. Proper testing of the CAN or LIN data bus message inputs to the EMIC that control some of the VFD functions requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information. Specific operation details for the odometer, the trip odometer, the gear selector indicator, the compass/temperature display, the EVIC and the various warning and reminder indicator functions of the VFD units may be found elsewhere in this service information.

INDICATORS

Indicators are located in various positions within the EMIC and are all connected to the EMIC electronic circuit board. Some indicators operate based upon hard wired inputs to the EMIC, but most are controlled by CAN or LIN data bus messages from other electronic modules in the vehicle. Some are controlled by a combination of hard wired inputs, electronic messaging and EMIC programming. If the EMIC loses CAN data bus communication, the EMIC circuitry will automatically turn ON the Malfunction Indicator Lamp (MIL) until CAN data bus communication is restored.

The various EMIC indicators are controlled by different strategies; some receive fused ignition switch output from the EMIC circuitry and have a switched ground, while others are grounded through the EMIC circuitry and have a switched battery feed. However, all indicators are completely controlled by the EMIC microprocessor based upon various hard wired and electronic message inputs. The cruise and 4WD indicators located within the odometer VFD unit are dimmable. All other indicators are illuminated at a fixed intensity, which is not affected by the selected illumination intensity of the EMIC general illumination LED units. The illumination intensity of the dimmable indicators is synchronized with that of the general illumination lighting.

In addition, certain indicators in this instrument cluster are automatically or self-configured. This feature allows the configurable indicators to be enabled by the EMIC circuitry for compatibility with certain optional equipment. These indicators are enabled or disabled by an electronic **configuration** message sent to the EMIC by the Totally Integrated Power Module (TIPM). The TIPM defaults for the ABS indicator and airbag indicator are enabled, and these configuration settings must be programmatically disabled in the TIPM using a diagnostic scan tool for vehicles that do not have this equipment. The automatically or self-configured indicators remain latent in each EMIC at all times and will be active only when the EMIC receives the appropriate CAN or LIN bus message inputs for that optional system or equipment.

The hard wired indicator inputs may be diagnosed using conventional diagnostic tools and procedures. However, the EMIC circuitry and electronic CAN or LIN data bus message controlled indicators are diagnosed using the self-diagnostic Cab Compartment Node (CCN) actuator test. See **DIAGNOSIS AND TESTING**. Proper testing of the CAN or LIN data bus and the electronic data bus message inputs to the EMIC that control each indicator requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information. Specific details of the operation for each indicator may be found elsewhere in this service information.

CLUSTER ILLUMINATION

The EMIC has several Light Emitting Diode (LED) units that provide cluster back lighting whenever the

ignition switch is in the ON or START positions or when the exterior lighting is turned ON. The illumination intensity of these LED units is adjusted when the panel lamps dimmer function of the control sleeve on the control stalk of the left (lighting) multi-function switch is rotated to one of six available minor detent positions. The EMIC monitors an electronic **dimming level** message input received over the LIN data bus from the Steering Control Module (SCM) to determine the selected lighting level. In response to that input, the EMIC electronic circuitry converts a fused 12-volt input it receives on a hard wired panel lamps dimmer switch signal circuit into a 12-volt Pulse Width Modulated (PWM) output.

The EMIC uses this PWM output to control the illumination intensity of the cluster general illumination lighting and the VFD units on the EMIC circuit board, then provides a synchronized PWM output on various hard wired fused panel lamps dimmer switch signal circuits to control and synchronize the illumination intensity of other incandescent illumination lamps in the vehicle. The EMIC also transmits electronic **dimming level** messages over the CAN and LIN data bus to other electronic modules in the vehicle to control and synchronize the illumination intensity of their display units to that of the EMIC displays.

The hard wired panel lamps dimmer outputs from the EMIC may be diagnosed using conventional diagnostic tools and procedures. However, proper testing of the PWM processing of the EMIC and the electronic **dimming level** messages received by the EMIC over the LIN data bus requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

DIAGNOSIS AND TESTING

INSTRUMENT CLUSTER

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

If all of the instrument cluster gauges and indicators are ineffective, be certain to check the instrument cluster fused B(+) fuse and the instrument cluster fused B(+) and ground circuits for shorts or opens. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

If an individual hard wired gauge or indicator is ineffective, refer to the diagnosis and testing service information for that specific gauge or indicator. If an individual Controller Area Network (CAN) or Local Interface Network (LIN) data bus message-controlled gauge or indicator is ineffective, perform the Actuator Test as follows:

CAUTION: Instrument clusters used in this vehicle automatically configure themselves for compatibility with the features and optional equipment in

the vehicle in which they are initially installed. The instrument cluster is programmed to do this by embedding the Vehicle Identification Number (VIN) and other information critical to proper cluster operation into electronic memory. This embedded information is learned through electronic messages received from other electronic modules in the vehicle over the Controller Area Network (CAN) data bus, and through certain hard wired inputs received when the cluster is connected to the vehicle electrically. Once configured, the instrument cluster memory may be irreparably damaged and certain irreversible configuration errors may occur if the cluster is connected electrically to another vehicle; or, if an electronic module from another vehicle is connected that provides data to the instrument cluster (including odometer values) that conflicts with that which was previously learned and stored. Therefore, the practice of exchanging (swapping) instrument clusters and other electronic modules in this vehicle with those removed from another vehicle must always be avoided. Failure to observe this caution may result in instrument cluster damage, which is not reimbursable under the terms of the product warranty. Service replacement instrument clusters are provided with the correct VIN, and the certified odometer and engine hours values embedded into cluster memory, but will otherwise be automatically configured for compatibility with the features and optional equipment in the vehicle in which they are initially installed.

NOTE: Certain indicators in this instrument cluster are automatically configured. This feature allows those indicators to be activated or deactivated for compatibility with certain optional equipment. If the problem being diagnosed involves improper illumination of the cruise indicator, the electronic throttle control indicator, the fog lamp indicator, any of the four-wheel drive indicators, the transmission overtemp indicator, the security indicator or the gear selector indicator, disconnect and isolate the battery negative cable. After about five minutes, reconnect the battery negative cable and turn the ignition switch to the ON position. The instrument cluster should automatically relearn the equipment in the vehicle and properly configure the configurable indicators accordingly.

ACTUATOR TEST

The instrument cluster actuator test will put the instrument cluster into its self-diagnostic mode. In this mode the instrument cluster can perform a self-diagnostic test that will confirm that the instrument cluster circuitry, the gauges and the indicators are capable of operating as designed. During the actuator test the instrument cluster circuitry will position each of the gauge needles at various calibration points, illuminate each of the segments in the Vacuum-Fluorescent Display (VFD) units, and turn all of the indicators ON and OFF again.

Successful completion of the actuator test will confirm that the instrument cluster is operational. However, there may still be a problem with the CAN or LIN data bus, the Powertrain Control Module (PCM), the Totally Integrated Power Module (TIPM), the Controller Antilock Brake (CAB), the Occupant Restraint Controller (ORC), the compass module, the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM), the Steering Wheel Switch Module (SWSM) or the inputs to one of these electronic

control modules. Use a diagnostic scan tool to diagnose these components. Refer to the appropriate diagnostic information.

1. Begin the test with the ignition switch in the OFF position.
2. Depress the odometer/trip odometer switch button.
3. While still holding the odometer/trip odometer switch button depressed, turn the ignition switch to the ON position, but do not start the engine.
4. Release the odometer/trip odometer switch button.
5. The instrument cluster will simultaneously begin to illuminate all of the operational segments in the VFD units, and perform a bulb check of each operational LED indicator. The VFD segments and LED indicators remain illuminated as each gauge needle is swept to several calibration points and back. If a VFD segment or an LED indicator fails to illuminate, or if a gauge needle fails to sweep through the calibration points and back during this test, the instrument cluster must be replaced.
6. The actuator test is now completed. The instrument cluster will automatically exit the self-diagnostic mode and return to normal operation at the completion of the test. The actuator test will be aborted if the ignition switch is turned to the OFF position, or if an electronic **vehicle speed** message indicating that the vehicle is moving is received over the CAN data bus during the test.
7. Go back to step 1 to repeat the test, if necessary.

REMOVAL

INSTRUMENT CLUSTER

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

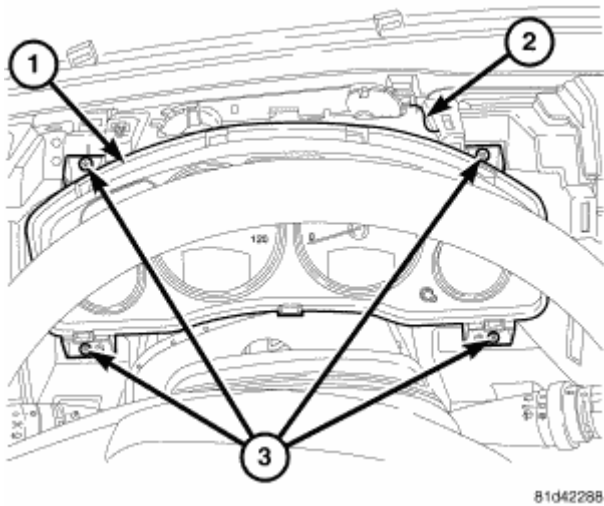


Fig. 4: Instrument Cluster
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the cluster bezel from the instrument panel. Refer to **REMOVAL** .
3. Remove the four screws (3) that secure the instrument cluster (1) to the instrument panel base trim (2).
4. Pull the top of the instrument cluster rearward far enough to access and disconnect the instrument panel wire harness connectors from the connector receptacles on the back of the cluster housing.
5. Remove the instrument cluster from the instrument panel.

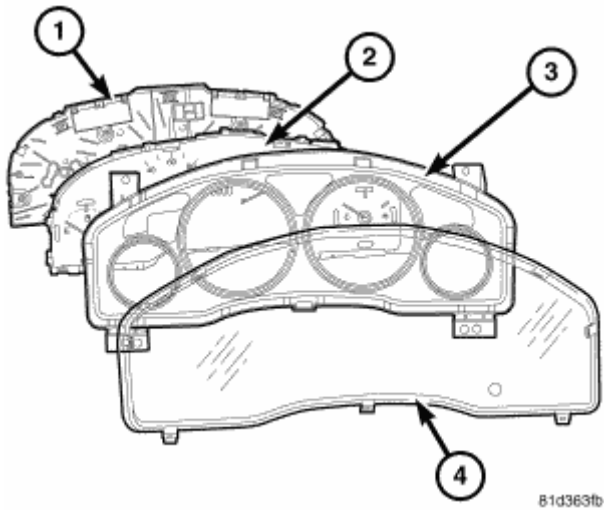
DISASSEMBLY

INSTRUMENT CLUSTER

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Some of the components for the instrument cluster used in this vehicle are serviced individually. The serviced components include the cluster lens and the cluster hood and mask unit. Following are the procedures for disassembling these components from the instrument cluster.

CLUSTER LENS

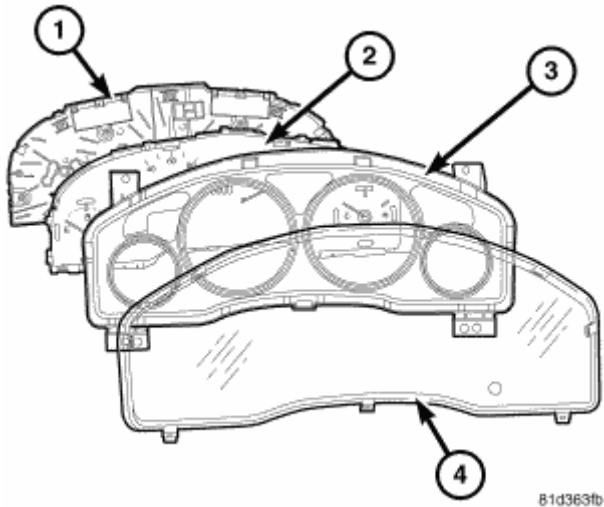


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Fig. 5: Instrument Cluster
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the instrument cluster from the instrument panel. See **REMOVAL**.
3. Working around the perimeter of the cluster, disengage each of the nine integral latch features that secure the cluster lens (4) to the cluster hood and mask unit (3).
4. Remove the lens from the face of the cluster hood and mask unit.

CLUSTER HOOD AND MASK



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Fig. 6: Instrument Cluster
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the instrument cluster from the instrument panel. See **REMOVAL**.
3. Remove the cluster lens (4) from the face of the cluster hood and mask unit (3). Refer to **CLUSTER LENS**.

4. Working around the perimeter of the cluster, disengage each of the integral latch features that secure the cluster hood and mask unit to the cluster housing (2).
5. Remove the hood and mask unit from the face of the instrument cluster.

ASSEMBLY

INSTRUMENT CLUSTER

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: Some of the components for the instrument cluster used in this vehicle are serviced individually. The serviced components include the cluster lens and the cluster hood and mask unit. Following are the procedures for assembling these components onto the instrument cluster.

CLUSTER LENS

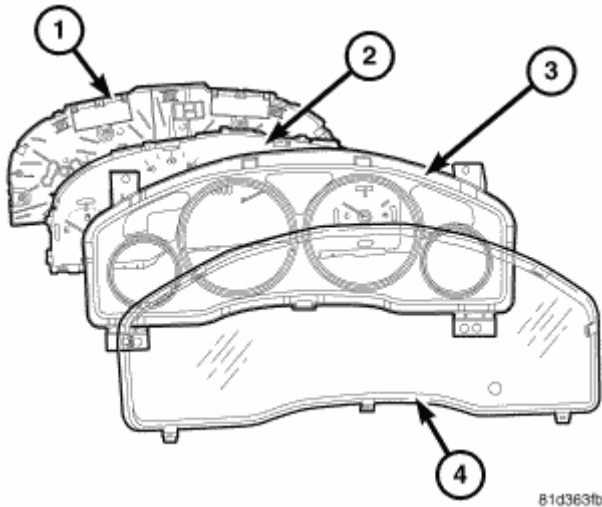


Fig. 7: Instrument Cluster
Courtesy of CHRYSLER LLC

1. Position the cluster lens (4) over the face of the cluster hood and mask unit (3). Be certain that the odometer/trip odometer switch push button is installed through the clearance hole in the lens.
2. Working around the perimeter of the cluster, press the lens over the face of the hood and mask until each of the integral latch features is fully engaged in the receptacles of the hood and mask.

3. Reinstall the instrument cluster onto the instrument panel. See INSTALLATION.
4. Reconnect the battery negative cable.

CLUSTER HOOD AND MASK

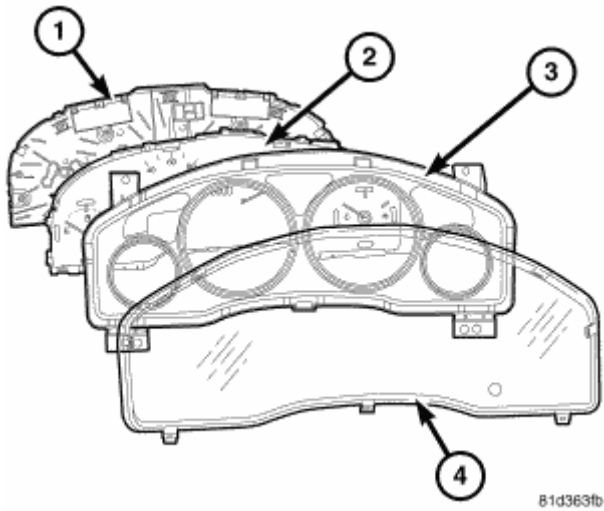


Fig. 8: Instrument Cluster
Courtesy of CHRYSLER LLC

1. Position the cluster hood and mask unit (3) over the face of the cluster housing (2). Be certain that the odometer/trip odometer switch push button is inserted through the clearance hole in the mask.
2. Working around the perimeter of the cluster, press the hood and mask over the face of the cluster housing until each of the integral latch features is fully engaged with the housing.
3. Reinstall the cluster lens (4) onto the face of the cluster hood and mask unit. Refer to CLUSTER LENS.
4. Reinstall the instrument cluster onto the instrument panel. See INSTALLATION.
5. Reconnect the battery negative cable.

INSTALLATION

INSTRUMENT CLUSTER

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

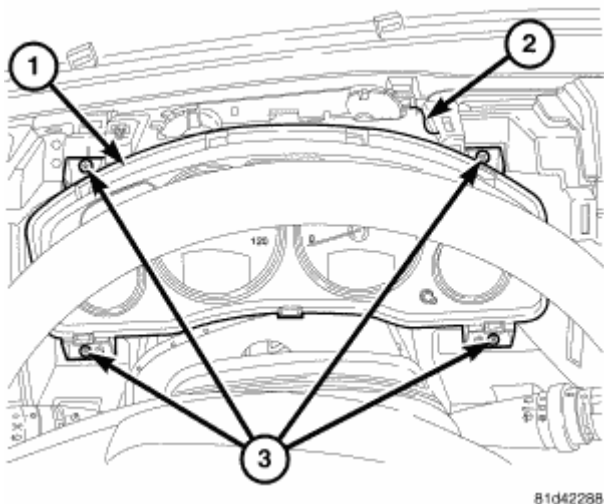


Fig. 9: Instrument Cluster
 Courtesy of CHRYSLER LLC

1. Position the instrument cluster (1) close enough to the instrument panel to reconnect the instrument panel wire harness connectors to the connector receptacles on the back of the cluster housing.
2. Position the instrument cluster mounting tabs to the mounting holes in the instrument panel base trim (2).
3. Install and tighten the four screws (3) that secure the mounting tabs of the instrument cluster. Tighten the screws to 2 N.m (17 in. lbs.).
4. Reinstall the cluster bezel onto the instrument panel. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

NOTE: Certain indicators in this instrument cluster are automatically configured. This feature allows those indicators to be activated or deactivated for compatibility with certain optional equipment. If a problem is noted that involves improper illumination of an indicator, disconnect and isolate the battery negative cable. After about five minutes, reconnect the battery negative cable and turn the ignition switch to the ON position. The instrument cluster should automatically relearn the equipment in the vehicle and properly configure the configurable indicators accordingly.

SPECIFICATIONS

INSTRUMENT CLUSTER

TORQUE SPECIFICATIONS

DESCRIPTION	N-m	Ft. Lbs.	In. Lbs.
Instrument Cluster Mounting Screws	2	-	17
Instrument Panel Switch Pod Mounting Screws	2	-	17

ABS INDICATOR

DESCRIPTION

ABS INDICATOR



Fig. 10: ABS Indicator
Courtesy of CHRYSLER LLC

An Antilock Brake System (ABS) indicator is standard equipment on all instrument clusters. This indicator is located near the top of the overlay, between the speedometer and the tachometer. Illumination of this indicator may also be accompanied by the display of certain textual messages in the cluster odometer display.

The ABS indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Failure of Anti-lock Braking System** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The ABS indicator is serviced as a unit with the instrument cluster.

OPERATION

ABS INDICATOR

The ABS indicator gives an indication to the vehicle operator when the ABS system, or a circuit or component of the system is ineffective. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Controller Antilock Brake (CAB) over the Controller Area Network (CAN) data bus.

The ABS indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to

ground by the instrument cluster transistor. The instrument cluster will turn ON the ABS indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the ABS indicator is illuminated for about three seconds as a bulb test. The entire bulb test is a function of the CAB.
- **ABS Indicator Lamp-On Message** - Each time the cluster receives an electronic **ABS indicator lamp-ON** message from the CAB, the ABS indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster receives no lamp-ON or lamp-OFF messages from the CAB for five consecutive message cycles, the ABS indicator is illuminated. The indicator remains illuminated until the cluster receives a valid message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the instrument cluster is put through the actuator test and the Totally Integrated Power Module (TIPM) is configured for the ABS option, the ABS indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.
- **ABS Diagnostic Test** - The ABS indicator is blinked ON and OFF by lamp-ON and lamp-OFF messages from the CAB during the performance of the ABS diagnostic tests.

The CAB continually monitors the ABS circuits and sensors to decide whether the system is in good operating condition. The CAB then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the CAB sends a lamp-ON message after the bulb test, it indicates that the CAB has detected a system malfunction or that the ABS system has become ineffective. The CAB will store a Diagnostic Trouble Code (DTC) for any malfunction it detects. Each time the ABS indicator fails to light due to an open or short in the cluster ABS indicator circuit, the cluster sends a message notifying the CAB of the condition, then the instrument cluster and the CAB will each store a DTC and the cluster will flash the brake indicator ON and OFF as a backup to notify the vehicle operator.

For proper diagnosis of the antilock brake system, the CAB, the EMIC, the CAN data bus or the electronic communication related to ABS indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

AIRBAG INDICATOR

DESCRIPTION

AIRBAG INDICATOR



Fig. 11: Identifying Airbag Indicator
Courtesy of CHRYSLER LLC

An airbag indicator is standard equipment on all instrument clusters. However, the instrument cluster can be programmed to disable this indicator on vehicles that are not equipped with the airbag system, which is not available in some markets. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The airbag indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Airbag** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The airbag indicator is serviced as a unit with the instrument cluster.

OPERATION

AIRBAG INDICATOR

The airbag indicator gives an indication to the vehicle operator when the airbag system, or a circuit or component of the system is ineffective. The airbag indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Occupant Restraint Controller (ORC) over the Controller Area Network (CAN) data bus.

The airbag indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the airbag indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the airbag indicator is illuminated for about six to eight seconds. The entire bulb test is a function of the ORC.
- **Airbag Indicator Lamp-On Message** - Each time the cluster receives an electronic **airbag indicator lamp-ON** message from the ORC, the airbag indicator will be illuminated. The indicator remains illuminated for about 12 seconds or until the cluster receives a lamp-OFF message from the ORC, whichever is longer. This indicator will also be extinguished when the ignition switch is turned to the OFF position.
- **Communication Error** - If the cluster receives no lamp-ON or lamp-OFF messages from the ORC for 10 consecutive message cycles, the airbag indicator is illuminated. The indicator remains illuminated until the cluster receives a single lamp-OFF message from the ORC.
- **Actuator Test** - Each time the cluster is put through the actuator test, the airbag indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry. The actuator test illumination of the airbag indicator is a function of the instrument cluster.

The ORC continually monitors the airbag system circuits and sensors to decide whether the system is in good operating condition. The ORC then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the ORC sends a lamp-ON message after the bulb test, it indicates that the ORC has detected a system malfunction or that the airbags and seat belt tensioners may not deploy when required, or may deploy when not required. The ORC will store a Diagnostic Trouble Code (DTC) for any malfunction it detects. Each time the airbag indicator fails to illuminate due to an open or short in the cluster airbag indicator circuit, the cluster sends a message notifying the ORC of the condition, then the instrument cluster and the ORC will each store a DTC.

For proper diagnosis of the airbag system, the ORC, the EMIC, the CAN data bus or the electronic communication related to airbag indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

AJAR INDICATORS

DESCRIPTION

AJAR INDICATORS

Door, liftgate and liftgate glass ajar indicators are standard equipment on all instrument clusters. The ajar indications appear within the fixed segment odometer Vacuum-Fluorescent Display (VFD) unit. However, on vehicles equipped with an optional Electronic Vehicle Information Center (EVIC), the ajar indications in the odometer VFD are electronically suppressed so as not to duplicate indications that are provided by the EVIC. The odometer VFD ajar indicators are textual messages that appear in place of the odometer/trip odometer information.

The odometer VFD unit is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located at the base of the cluster overlay tachometer dial face. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The ajar indicator textual messages appear in the same blue-green color and at the same lighting level as the other information displayed in the odometer VFD when it is illuminated by the instrument cluster electronic circuit board.

The ajar indicators are serviced as a unit with the odometer VFD unit in the instrument cluster.

OPERATION

AJAR INDICATORS

The ajar indicators give an indication to the vehicle operator that one or more of the passenger compartment doors or the liftgate may be open or not completely latched. These indicators are controlled by the instrument cluster logic circuit based upon cluster programming and electronic **ajar switch status** messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The ajar indicator function of the odometer Vacuum-Fluorescent Display (VFD) unit is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the VFD ajar indications can occur regardless of the ignition switch position. The instrument cluster will turn ON the ajar indicator for the following reasons:

- **Ajar Switch Message Input** - Each time the cluster receives a door or liftgate ajar switch status message indicating that a door, the liftgate or any combination of these is open or not completely latched with the ignition switch in any position, the appropriate ajar textual message will be illuminated. If the cluster detects a vehicle speed input greater than zero (kilometers or miles-per-hour) while the ignition switch is in the ON or START positions, the ajar indication will be accompanied by a single chime tone. When the ignition switch is in any position except ON or START, any and all ajar indications will time out after about five minutes.

The TIPM continually monitors the door and liftgate ajar switches to determine the status of the doors and liftgate. The TIPM then sends the proper ajar switch status messages to the EMIC. The door and liftgate ajar switches and their circuits may be diagnosed using conventional diagnostic tools and methods. Refer to the appropriate wiring information.

BRAKE/PARK BRAKE INDICATOR

DESCRIPTION

BRAKE INDICATOR



Fig. 12: Identifying Brake/Park Brake Indicator
Courtesy of CHRYSLER LLC

A brake indicator is standard equipment on all instrument clusters. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The brake indicator consists of a stencil-like cutout in the opaque layer of the instrument cluster overlay. The word **BRAKE** is cutout for vehicles manufactured for sale in the U.S. market, or the International Control and Display Symbol icon for **Brake Failure** is cutout for vehicles manufactured for all other markets. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The brake indicator is serviced as a unit with the instrument cluster.

OPERATION

BRAKE INDICATOR

The brake indicator gives an indication to the vehicle operator when the parking brake is applied, when there are certain brake hydraulic system malfunctions as indicated by a low brake hydraulic fluid level condition, or when the brake fluid level switch is disconnected. The brake indicator can also give an indication when certain faults are detected in the Antilock Brake System (ABS). This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming, electronic messages received by the cluster from the Controller Antilock Brake (CAB) over the Controller Area Network (CAN) data bus, and a hard wired input from the park brake switch.

The brake indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the brake indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the brake indicator is illuminated

by the instrument cluster for about three seconds as a bulb test.

- **Brake Indicator Lamp-On Message** - Each time the cluster receives an electronic **brake indicator lamp-ON** message from the CAB, the brake indicator will be illuminated. The CAB may also send lamp-ON messages as feedback during ABS diagnostic procedures. The indicator remains illuminated until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Park Brake Switch Input** - Each time the cluster detects ground on the park brake switch sense circuit (park brake switch closed = park brake applied or not fully released) while the ignition switch is in the ON position, the brake indicator flashes ON and OFF. The indicator continues to flash until the park brake switch sense input to the cluster is an open circuit (park brake switch open = park brake fully released), or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Antilock Brake System (ABS) Indicator Backup** - If the instrument cluster detects a fault in the ABS indicator circuit it will send a message indicating the fault to the Controller Antilock Brake (CAB), then flash the brake indicator ON and OFF. The cluster will continue to flash the brake indicator until the ABS indicator circuit fault is resolved, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the instrument cluster is put through the actuator test, the brake indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The park brake switch on the park brake lever mechanism provides a hard wired ground input to the instrument cluster circuitry through the park brake switch sense circuit whenever the park brake is applied or not fully released. The Totally Integrated Power Module (TIPM) monitors the brake fluid level switch on the brake master cylinder reservoir, then sends the appropriate electronic messages to the CAB. The CAB continually monitors the ABS system circuits and sensors to decide whether the system is in good operating condition. The CAB then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the CAB sends a lamp-ON message after the bulb test, it indicates that the CAB has detected a brake hydraulic system malfunction or that the ABS system has become ineffective. The CAB will store a Diagnostic Trouble Code (DTC) for any malfunction it detects.

The hard wired park brake switch input to the EMIC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. For proper diagnosis of the brake fluid level switch, the ABS, the CAB, the EMIC, the TIPM, the CAN data bus or the electronic communication related to brake indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

DIAGNOSIS AND TESTING

BRAKE INDICATOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in

accidental airbag deployment.

The hard wired park brake switch input to the ElectroMechanical Instrument Cluster (EMIC) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods may not prove conclusive in the diagnosis of the EMIC, the Controller Antilock Brake (CAB), the Totally Integrated Power Module (TIPM), the Controller Area Network (CAN) data bus, or the electronic message inputs also used by the EMIC to provide brake indicator operation. The most reliable, efficient, and accurate means to diagnose the EMIC, the CAB, the TIPM, the CAN data bus or the electronic communication related to brake indicator operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

CHANGE OIL INDICATOR

DESCRIPTION

CHANGE OIL INDICATOR

A change oil indicator is standard equipment on all instrument clusters. However, on vehicles manufactured for export markets except those equipped with a 2.8 liter diesel engine and an optional diesel particulate filter, this indicator is electronically disabled. This indicator is located within the odometer/trip odometer Vacuum Fluorescent Display (VFD) unit. The change oil indicator consists of cycling textual **CHANGE** and **OIL** messages which appear in place of the odometer/trip odometer information in the odometer VFD unit.

The odometer VFD is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer gauge dial face of the cluster overlay. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The change oil textual messages appear in the same blue-green color and at the same lighting level as the odometer information when they are illuminated by the instrument cluster electronic circuit board.

The change oil indicator is serviced as a unit with the VFD in the instrument cluster.

OPERATION

CHANGE OIL INDICATOR

The change oil indicator gives an indication to the vehicle operator when a duty-cycle algorithm contained within the software of the Powertrain Control Module (PCM) determines that a recommended oil change interval has been attained. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages received over the Controller Area Network (CAN) data bus from the PCM.

The change oil indicator function of the Vacuum Fluorescent Display (VFD) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the VFD

change oil indication will always be OFF when the ignition switch is in any position except ON or START. The instrument cluster will turn ON the change oil indicator for the following reasons:

- **Change Oil Indicator Lamp-On Message** - Each time the ignition switch is turned to the ON position and the cluster receives an electronic **change oil indicator lamp-ON** message from the PCM indicating that a duty-cycle based recommended oil change interval has been attained, the change oil indicator will be illuminated for about three seconds, until the trip odometer reset switch button is depressed, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Change Oil Indicator Reset Procedure** - Once an engine oil change has been completed, the PCM duty cycle counters can be reset using the following procedure. Turn the ignition switch to the ON position, but DO NOT start the engine. Slowly depress and release the accelerator pedal fully three times within ten seconds. Turn the ignition switch to the OFF position. If the change oil indicator illuminates the next time the engine is started, repeat this procedure.

The PCM continually monitors numerous sensor inputs to determine the duty-cycles to which the engine is being subjected. A pre-programmed algorithm within the PCM then determines when to send the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the change oil indicator, the PCM, the EMIC, the CAN data bus or the electronic communication related to change oil indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

CHARGING INDICATOR

DESCRIPTION

CHARGING INDICATOR

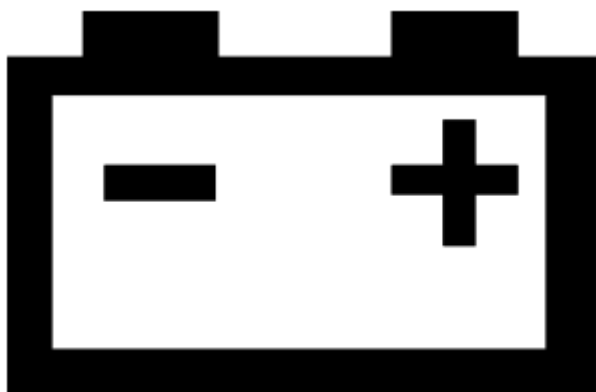


Fig. 13: Charging Indicator
Courtesy of CHRYSLER LLC

A charging indicator is standard equipment on all instrument clusters. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The charging indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for

Battery Charging Condition in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The charging indicator is serviced as a unit with the instrument cluster.

OPERATION

CHARGING INDICATOR

The charging indicator gives an indication to the vehicle operator when the electrical system voltage is too low or too high. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The charging indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the charging indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the charging indicator is illuminated by the instrument cluster for about three seconds as a bulb test.
- **Voltage Low Message** - Each time the cluster receives an electronic **system voltage** message from the PCM indicating the voltage is low (less than about 11.5 volts is a charge fail condition), the charging indicator will be illuminated. The indicator remains illuminated until the cluster receives a message from the PCM indicating the voltage is normal (greater than about 12.0 volts, but less than 16.0 volts), or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Voltage High Message** - Each time the cluster receives an electronic **system voltage** message from the PCM indicating the voltage is high (greater than about 16.0 volts), the charging indicator will be illuminated. The indicator remains illuminated until the cluster receives a message from the PCM indicating the voltage is normal (less than about 15.5 volts, but greater than 11.5 volts), or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the charging indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the electrical system voltage to control the generator output. The PCM then sends the proper messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the instrument cluster turns ON the charging indicator due to a charge fail or voltage high condition, it may indicate that the charging system requires service.

For proper diagnosis of the charging system, the PCM, the EMIC, the CAN data bus or the electronic communication related to charging indicator operation a diagnostic scan tool is required. Refer to the

appropriate diagnostic information.

CRUISE INDICATOR

DESCRIPTION

CRUISE INDICATOR



Fig. 14: Cruise Indicator
Courtesy of CHRYSLER LLC

A cruise indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the optional speed control system, this indicator is electronically disabled. This indicator is located within the odometer Vacuum Fluorescent Display (VFD) unit.

The cruise indicator consists of the text **CRUISE** in the VFD display. The odometer VFD unit is soldered onto the instrument cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer gauge dial face of the cluster overlay. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The cruise indicator text appears in a blue-green color and at the same lighting level as the odometer information when it is illuminated by the instrument cluster electronic circuit board.

During daylight hours (exterior lamps are OFF) the odometer VFD unit is illuminated at full brightness for clear visibility. At night (exterior lamps are ON), the VFD lighting level is adjusted with the other cluster illumination lamps using the panel lamps dimmer function of the interior lighting control sleeve on the left multi-function switch control stalk. However, a PARADE mode position of the control sleeve allows the VFD unit to be illuminated at full brightness if the exterior lamps are turned ON during daylight hours.

The cruise indicator is serviced as a unit with the odometer VFD unit in the instrument cluster.

OPERATION

CRUISE INDICATOR

The cruise indicator gives an indication to the vehicle operator when the speed control system is ON, regardless of whether the speed control is engaged. This indicator is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The cruise indicator is completely controlled by the instrument cluster logic circuit, and that logic will only

allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the indicator will always be OFF when the ignition switch is in any position except ON or START. The indicator only illuminates when it is energized by the instrument cluster logic circuit. The instrument cluster will turn ON the cruise indicator for the following reasons:

- **Cruise Indicator Lamp-On Message** - Each time the cluster receives an electronic **cruise indicator lamp-ON** message from the PCM indicating the speed control system is ON, the cruise indicator is illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the cruise indicator will be turned ON, then OFF again during the Vacuum Fluorescent Display (VFD) portion of the test in order to confirm the functionality of the VFD and the cluster control circuitry.

The PCM continually monitors the speed control switches to determine the appropriate outputs to the speed control servo. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the speed control system, the PCM, the EMIC, the CAN data bus or the electronic communication related to cruise indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

ENGINE TEMPERATURE GAUGE

DESCRIPTION

ENGINE TEMPERATURE GAUGE



Fig. 15: Engine Temperature Gauge
Courtesy of CHRYSLER LLC

An engine coolant temperature gauge is standard equipment on all instrument clusters. This gauge is located on the right side of the instrument cluster, to the right of the tachometer. The gauge consists of a movable gauge

needle or pointer controlled by the instrument cluster circuitry and a fixed 120 degree gauge scale on the cluster overlay that reads left-to-right from **C** (or Cold) to **H** (or Hot). An International Control and Display Symbol icon for **Engine Coolant Temperature** is located on the cluster overlay, above the hub of the gauge needle.

The engine coolant temperature gauge graphics are white, gray and black against a black field except for a single red graduation at the high end of the gauge scale, making them clearly visible within the instrument cluster in daylight. When illuminated from behind by the panel lamps dimmer controlled cluster illumination lighting with the ignition switch in the ON or START positions or with the exterior lamps turned ON, the graphics all retain their unilluminated colors and appearance. The orange gauge needle has internal optical illumination. Gauge illumination is provided by Light Emitting Diode (LED) units soldered onto the instrument cluster electronic circuit board.

The engine coolant temperature gauge is serviced as a unit with the instrument cluster.

OPERATION

ENGINE TEMPERATURE GAUGE

The engine coolant temperature gauge gives an indication to the vehicle operator of the engine coolant temperature. This gauge is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The engine coolant temperature gauge is driven by an electronic stepper motor unit that receives battery current on the instrument cluster electronic circuit board through the fused ignition switch output (run-start) circuit whenever the ignition switch is in the ON or START positions. The cluster is programmed to move the gauge needle back to the low end of the scale after the ignition switch is turned to the OFF position. The instrument cluster circuitry controls the gauge needle position and provides the following features:

- **Engine Temperature Message** - Each time the cluster receives an electronic **engine temperature** message from the PCM indicating the temperature is between the low end of normal [about 41 °C (105 °F) for gasoline engines, or about 28 °C (82 °F) for diesel engines] and the high end of normal [about 124 °C (255 °F) for gasoline engines, or about 115 °C (239 °F) for diesel engines], the gauge needle is moved to the actual relative temperature position on the gauge scale.
- **Engine Temperature Low Message** - Each time the cluster receives an electronic **engine temperature** message from the PCM indicating the temperature is low [at or below about 40 °C (104 °F) for gasoline engines, or about 27 °C (81 °F) for diesel engines], the gauge needle is held below the graduation on the far left end of the gauge scale. The gauge needle remains below the low end of the gauge scale until the cluster receives a message from the PCM indicating that the temperature is above the low end of normal, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Engine Temperature High or Critical Message** - Each time the cluster receives an electronic **engine temperature** message from the PCM indicating the temperature is high [at or above about 127 °C (261 °F) for gasoline engines, or about 118 °C (244 °F) for diesel engines], the gauge needle is moved to the red graduation at the high end of the gauge scale, the engine temperature indicator is illuminated and a single chime tone is sounded. The gauge needle remains at the red graduation and the engine temperature indicator remains illuminated until the cluster receives a message from the PCM indicating that the temperature is below about 124 °C (255 °F) for gasoline engines, or about 115 °C (239 °F) for diesel engines, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone

feature will only repeat during the same ignition cycle if the engine temperature indicator is cycled OFF and then ON again by the appropriate messages from the PCM.

- **Communication Error** - If the cluster fails to receive an **engine temperature** message, it will hold the gauge needle at the last indication for about five seconds or until the ignition switch is turned to the OFF position, whichever occurs first. After five seconds, the cluster will move the gauge needle to the low end of the gauge scale.
- **Actuator Test** - Each time the cluster is put through the actuator test, the engine coolant temperature gauge needle will be swept to several calibration points on the gauge scale in a prescribed sequence in order to confirm the functionality of the gauge and the cluster control circuitry.

The PCM continually monitors the engine coolant temperature sensor to determine the engine operating temperature. The PCM then sends the proper messages to the ElectroMechanical Instrument Cluster (EMIC). If the instrument cluster turns ON the engine temperature indicator due to a high or critical engine coolant temperature gauge reading, it may indicate that the engine or the engine cooling system requires service.

For proper diagnosis of the engine coolant temperature sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to engine coolant temperature gauge operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

ENGINE TEMPERATURE INDICATOR

DESCRIPTION

ENGINE TEMPERATURE INDICATOR



Fig. 16: Identifying Engine Temperature Indicator
Courtesy of CHRYSLER LLC

An engine temperature indicator is standard equipment on all instrument clusters. The engine temperature indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The engine temperature indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Engine Coolant Temperature** in the opaque layer of the instrument cluster overlay. The dark

outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The engine temperature indicator is serviced as a unit with the instrument cluster.

OPERATION

ENGINE TEMPERATURE INDICATOR

The engine temperature indicator gives an indication to the vehicle operator when the engine temperature gauge reading reflects a condition requiring immediate attention. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The engine temperature indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the engine temperature indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the engine temperature indicator is illuminated for about two seconds as a bulb test. The entire bulb test is a function of the PCM.
- **Engine Temperature High or Critical Message** - Each time the cluster receives an electronic **engine temperature** message from the PCM indicating the temperature is high [at or above about 127 °C (261 °F) for gasoline engines, or about 118 °C (244 °F) for diesel engines], the engine temperature indicator will be illuminated and a single chime tone is sounded. The indicator remains illuminated until the cluster receives a message from the PCM indicating that the temperature is below about 124 °C (255 °F) for gasoline engines, or about 115 °C (239 °F) for diesel engines, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone feature will only repeat during the same ignition cycle if the engine temperature indicator is cycled OFF, then ON again by the appropriate messages from the PCM.
- **Actuator Test** - Each time the cluster is put through the actuator test, the engine temperature indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the engine coolant temperature sensor to determine the engine operating temperature. The PCM then sends the proper messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). For further diagnosis of the engine temperature indicator or the instrument cluster circuitry that controls the LED, see **DIAGNOSIS AND TESTING**. If the instrument cluster turns ON the engine temperature indicator due to a high engine temperature gauge reading, it may indicate that the engine or the engine cooling system requires service.

For proper diagnosis of the engine coolant temperature sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to engine temperature indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

ELECTRONIC STABILITY PROGRAM/BRAKE ASSIST SYSTEM INDICATOR

DESCRIPTION

ESP/BAS INDICATOR



Fig. 17: Electronic Stability Program/Brake Assist System Indicator
Courtesy of CHRYSLER LLC

An Electronic Stability Program (ESP)/Brake Assist System (BAS) indicator is standard equipment on all instrument clusters. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The ESP/BAS indicator consists of a stencil-like cutout of the text **ESP BAS** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The ESP/BAS indicator is serviced as a unit with the instrument cluster.

OPERATION

ESP/BAS INDICATOR

The ESP/BAS indicator gives an indication to the vehicle operator when the Electronic Stability Program (ESP)/Brake Assist System (BAS) has been activated. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Controller Antilock Brake (CAB) and the All-Wheel Drive Control Module (AWDCM) over the Controller Area Network (CAN) data bus.

The ESP/BAS indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the ESP/BAS indicator

for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the ESP/BAS indicator is illuminated for about four seconds as a bulb test.
- **ESP/BAS Indicator Lamp-On Message** - Each time the cluster receives an electronic **ESP/BAS indicator lamp-ON** message from the CAB indicating that the ESP/BAS system has been activated, the ESP/BAS indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **ESP Full Off Textual Message** - Each time the cluster receives an electronic **ESP Full OFF indicator lamp-ON** message from the CAB indicating that the ESP/BAS system has been manually disabled, an **ESP Full OFF** textual message will appear within the cluster odometer display. The **ESP Full OFF** textual message remains displayed until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **ESP Permanent Disable Textual Message** - Each time the cluster receives an electronic **ESP Permanent Disable** message from the CAB indicating that the ESP/BAS system has been permanently disabled, an **ESP OFF** textual message will appear within the cluster odometer display for about 10 seconds each time the ignition switch is turned to the ON position.
- **Actuator Test** - Each time the cluster is put through the actuator test, the ESP/BAS indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The CAB continually monitors the ESP/BAS circuits and sensors to decide whether the system is in good operating condition and the proper outputs to the components of the system. The CAB then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the ESP/BAS system, the CAB, the AWDCM, the EMIC, the CAN data bus or the electronic communication related to the ESP/BAS indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

ETC INDICATOR

DESCRIPTION

ELECTRONIC THROTTLE CONTROL INDICATOR

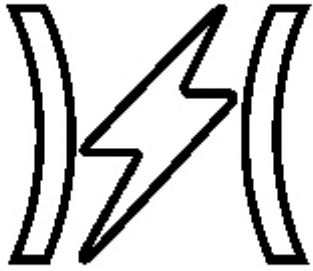


Fig. 18: Electronic Throttle Control Indicator
Courtesy of CHRYSLER LLC

An Electronic Throttle Control (ETC) indicator is standard equipment on all instrument clusters. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The ETC indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Electronic Throttle Control** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The ETC indicator is serviced as a unit with the instrument cluster.

OPERATION

ELECTRONIC THROTTLE CONTROL INDICATOR

The Electronic Throttle Control (ETC) indicator gives an indication to the vehicle operator when the ETC system, or a circuit or component of the system is ineffective. The ETC indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The ETC indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the ETC indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the ETC indicator is illuminated

for about three seconds. The entire bulb test is a function of the instrument cluster.

- **ETC Indicator Lamp-On Message** - Each time the cluster receives an electronic **ETC indicator lamp-ON** message from the PCM, the ETC indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the PCM message. The indicator remains illuminated solid or continues to flash for about 12 seconds or until the cluster receives a lamp-OFF message from the PCM, whichever is longer. If the indicator is illuminated solid with the engine running the vehicle will usually remain drivable. If the indicator is flashing with the engine running the vehicle may require towing. A flashing indicator means the ETC system requires immediate service. The indicator will be extinguished when the ignition switch is turned to the OFF position.
- **Actuator Test** - Each time the cluster is put through the actuator test, the ETC indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry. The actuator test illumination of the ETC indicator is a function of the PCM.

The PCM continually monitors the ETC system circuits and sensors to decide whether the system is in good operating condition. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the PCM sends a lamp-ON message after the bulb test, it indicates that the PCM has detected an ETC system malfunction or that the ETC system is ineffective. The PCM will store a Diagnostic Trouble Code (DTC) for any malfunction it detects. Each time the ETC indicator fails to illuminate due to an open or short in the cluster ETC indicator circuit, the cluster sends a message notifying the PCM of the condition, then the EMIC and the PCM will each store a DTC.

For proper diagnosis of the ETC system, the PCM, the EMIC, the CAN data bus or the electronic communication related to ETC indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

FRONT FOG LAMP INDICATOR

DESCRIPTION

FRONT FOG LAMP INDICATOR



Fig. 19: Front Fog Lamp Indicator
Courtesy of CHRYSLER LLC

A front fog lamp indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the optional front fog lamps, this indicator is electronically disabled. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The front fog lamp indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Front Fog Light** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A green Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in green through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The front fog lamp indicator is serviced as a unit with the instrument cluster.

OPERATION

FRONT FOG LAMP INDICATOR

The front fog lamp indicator gives an indication to the vehicle operator whenever the front fog lamps are illuminated. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The front fog lamp indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the front fog lamp indicator for the following reasons:

- **Front Fog Indicator Lamp-On Message** - Each time the cluster receives an electronic **front fog indicator lamp-ON** message from the TIPM indicating the front fog lamps are turned ON, the front fog lamp indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the exterior lamp load shedding (battery saver) timed interval expires, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the front fog lamp indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors electronic **exterior lighting request** messages from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to determine the appropriate outputs to the front fog lamps. The TIPM activates or deactivates the front fog lamps then sends the proper lamp-ON or lamp-OFF message back to the EMIC.

For proper diagnosis of the front fog lamp system, the TIPM, the EMIC, the CAN data bus or the electronic communication related to front fog lamp indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

FUEL GAUGE

DESCRIPTION

FUEL GAUGE



Fig. 20: Fuel Gauge
Courtesy of CHRYSLER LLC

A fuel gauge is standard equipment on all instrument clusters. This gauge is located on the left side of the instrument cluster, to the left of the speedometer. The gauge consists of a movable gauge needle or pointer controlled by the instrument cluster circuitry and a fixed 120 degree gauge scale on the cluster overlay that reads left-to-right from **E** (or Empty) to **F** (or Full). An International Control and Display Symbol icon for **Fuel** is located on the cluster overlay, above the hub of the gauge needle. An arrowhead pointed to the left side of the vehicle is imprinted on the cluster overlay next to the **Fuel** icon on the gauge to provide the driver with a reminder as to the location of the fuel filler access.

The fuel gauge graphics are white, gray and black against a black field except for a single red graduation at the low end of the gauge scale, making them clearly visible within the instrument cluster in daylight. When illuminated from behind by the panel lamps dimmer controlled cluster illumination lighting with the ignition switch in the ON or START positions or with the exterior lamps turned ON, the graphics all retain their unilluminated colors and appearance. The orange gauge needle has internal optical illumination. Gauge illumination is provided by Light Emitting Diode (LED) units soldered onto the instrument cluster electronic circuit board.

The fuel gauge is serviced as a unit with the instrument cluster.

OPERATION

FUEL GAUGE

The fuel gauge gives an indication to the vehicle operator of the level of fuel in the fuel tank. This gauge is controlled by the instrument cluster circuit board based upon cluster programming and electronic **fuel level**

messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The fuel gauge is driven by an electronic stepper motor unit that receives battery current on the instrument cluster electronic circuit board through the fused ignition switch output (run-start) circuit whenever the ignition switch is in the ON or START positions. The cluster is programmed to move the gauge needle back to the low end of the scale after the ignition switch is turned to the OFF position. The instrument cluster circuitry controls the gauge needle position and provides the following features:

- **Fuel Level Message** - The TIPM provides a constant current source to the fuel level sending unit and monitors a return input on a fuel level sense circuit. The resistance through the fuel level sending unit increases as the fuel level rises and decreases as the fuel level falls causing changes in the fuel level sense input voltage. The TIPM then sends the appropriate electronic **fuel level** messages to the cluster. The cluster programming applies an algorithm to calculate the proper fuel gauge needle position based upon the fuel level message input, then moves the gauge needle to the proper relative position on the gauge scale. This algorithm is used to dampen gauge needle movement against the negative effect that fuel sloshing within the fuel tank can have on accurate inputs from the fuel tank sending unit to the TIPM.
- **Less Than 11 Percent Tank Full Message** - Each time the fuel level message to the cluster indicates the fuel tank is about 11 percent full or less for 10 consecutive seconds and the vehicle speed is zero, or for 60 consecutive seconds and the vehicle speed is greater than zero, the gauge needle is moved to about the one-sixteenth graduation on the gauge scale, the low fuel indicator is illuminated, and a single chime tone is sounded. The low fuel indicator remains illuminated until the fuel level message indicates that the fuel tank is greater than about 14 percent full for 10 consecutive seconds and the vehicle speed is zero, or for 60 consecutive seconds and the vehicle speed is greater than zero, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone feature will only repeat during the same ignition cycle if the low fuel indicator is cycled OFF and then ON again by the appropriate messages from the TIPM.
- **Less Than Empty Stop Message** - Each time the cluster receives a fuel level message indicating the fuel level in the fuel tank is less than the **E** (or Empty) gauge needle stop position for five consecutive seconds, the gauge needle is moved to the low end of the gauge scale and the low fuel indicator is illuminated immediately. This input would indicate that the fuel level sense input to the TIPM is a short circuit.
- **More Than Full Stop Message** - Each time the cluster receives a fuel level message indicating the fuel level in the fuel tank is more than the **F** (or Full) gauge needle stop position for five consecutive seconds, the gauge needle is moved to the low end of the gauge scale and the low fuel indicator is illuminated immediately. This input would indicate that the fuel level sense input to the TIPM is an open circuit.
- **Actuator Test** - Each time the cluster is put through the actuator test, the fuel gauge needle will be swept to several calibration points on the gauge scale in a prescribed sequence in order to confirm the functionality of the gauge and the cluster control circuitry.

The TIPM continually monitors the fuel tank sending unit to determine the level of fuel in the fuel tank. The TIPM then sends the proper electronic **fuel level** message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. The TIPM will store a Diagnostic Trouble Code (DTC) for any fault detected in the fuel level sense circuit.

For proper diagnosis of the fuel tank sending unit, the TIPM, the EMIC, the CAN data bus or the electronic

communication related to fuel gauge operation or fuel level data processing a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

GAS CAP INDICATOR

DESCRIPTION

GAS CAP INDICATOR

A gas cap indicator is standard equipment on all instrument clusters. However, on vehicles equipped with the optional diesel engine, as well as those manufactured for the Chinese market, this indicator is electronically disabled. The gas cap indication appears within the odometer Vacuum Fluorescent Display (VFD) unit. The gas cap indicator consists of a textual **gas cap** message which appears in place of the odometer information in the odometer display.

The odometer VFD is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer gauge dial face of the cluster overlay. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The gas cap textual message appears in the same blue-green color and at the same lighting level as the odometer information when it is illuminated by the instrument cluster electronic circuit board.

The gas cap indicator is serviced as a unit with the VFD in the instrument cluster.

OPERATION

GAS CAP INDICATOR

The gas cap indicator gives an indication to the vehicle operator when there is a gross leak detected in the on-board fuel vapor recovery system. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages received over the Controller Area Network (CAN) data bus from the Powertrain Control Module (PCM).

The gas cap indicator function of the odometer Vacuum Fluorescent Display (VFD) unit is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the odometer VFD gas cap indication will always be OFF when the ignition switch is in any position except ON or START. The instrument cluster will turn ON the gas cap indicator for the following reasons:

- **Gas Cap Indicator Lamp-On Message** - Each time the cluster receives an electronic **gas cap indicator lamp-ON** message from the PCM indicating there is a gross leak in the vapor recovery system, the gas cap indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first.

The PCM continually monitors the on board vapor recovery system to determine whether there are air leaks in the system. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the EMIC turns ON the gas cap indicator due to a monitored gross leak in the vapor recovery system, it may indicate that the gas cap has been removed or is improperly installed.

For proper diagnosis of the on board vapor recovery system, the PCM, the EMIC, the CAN data bus or the electronic communication related to gas cap indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

GEAR SELECTOR INDICATOR

DESCRIPTION

GEAR SELECTOR INDICATOR



Fig. 21: Gear Selector Indicator
Courtesy of CHRYSLER LLC

An electronic automatic transmission gear selector indicator is standard factory-installed equipment on this vehicle. However, on vehicles not equipped with an optional automatic transmission, this indicator is electronically disabled. The gear selector indicator information is displayed in the upper portion of the odometer Vacuum Fluorescent Display (VFD) unit. This VFD unit is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer dial face of the cluster overlay. The dark lens over the VFD unit prevents the indicator from being clearly visible when it is not illuminated.

The gear selector indicator displays the following characters from left to right: **P** , **R** , **N** , **D** and a fifth, reconfigurable character. The reconfigurable character can be any number **1** through **6** . Each character appears in a blue-green color and at the same lighting level as the odometer information. Respectively, these characters represent the PARK, REVERSE, NEUTRAL, DRIVE and each of the forward drive gear positions of the transmission gear selector lever on the floor panel transmission tunnel. The indicator also illuminates a box around the character that represents the currently selected lever position.

During daylight hours (exterior lamps are OFF) the VFD unit is illuminated at full brightness for clear visibility. At night (exterior lamps are ON), the VFD unit lighting level is adjusted with the other cluster general illumination lamps using the panel lamps dimmer function of the interior lighting control sleeve on the left

multi-function switch control stalk. However, a PARADE mode position of the control sleeve allows the VFD unit to be illuminated at full brightness if the exterior lamps are turned ON during daylight hours.

The gear selector indicator is serviced as a unit with the VFD unit in the instrument cluster.

OPERATION

GEAR SELECTOR INDICATOR

The electronic gear selector indicator gives an indication to the vehicle operator of the transmission gear that has been selected with the automatic transmission gear selector lever. This indicator is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The gear selector indicator information is displayed by the odometer Vacuum Fluorescent Display (VFD) unit soldered onto the instrument cluster electronic circuit board, and the VFD will not display the gear selector indicator information after the ignition switch is turned to the OFF position. Each time the cluster is disconnected from battery current for more than about five minutes, it must configure itself for the automatic transmission type that is in the vehicle once it is reconnected to battery current. The instrument cluster circuitry operates the gear selector indicator to provide the following features:

- **Selected Gear Message** - Each time the cluster receives an electronic **selected gear** message from the PCM, a box will be illuminated around the appropriate character in the gear selector indicator. The box will remain illuminated until the cluster receives a different **selected gear** message, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster fails to receive a **selected gear** message from the PCM within three seconds, the instrument cluster circuitry will display all gear selector positions boxed (selected) until a valid **selected gear** message is received or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the odometer VFD unit will display all of its characters at once to confirm the functionality of the VFD unit and the cluster control circuitry.

The PCM continually monitors a hard wired multiplex input from the Transmission Range Sensor (TRS), then sends the proper message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the TRS, the PCM, the EMIC, the CAN data bus or the electronic communication related to gear selector indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

HIGH BEAM INDICATOR

DESCRIPTION

HIGH BEAM INDICATOR



Fig. 22: High Beam Indicator
Courtesy of CHRYSLER LLC

A high beam indicator is standard equipment on all instrument clusters. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The high beam indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **High Beam** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A blue Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in blue through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The high beam indicator is serviced as a unit with the instrument cluster.

OPERATION

HIGH BEAM INDICATOR

The high beam indicator gives an indication to the vehicle operator whenever the headlamp high beams are illuminated. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The high beam indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the high beam indicator for the following reasons:

- **High Beam Indicator Lamp-On Message** - Each time the cluster receives an electronic **high beam indicator lamp-ON** message from the TIPM indicating the high beam lamps are turned ON, the high beam indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the exterior lamp load shedding (battery saver) timed interval expires, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the high beam indicator will be

turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors electronic **exterior lighting request** messages from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to determine the appropriate outputs to the headlamps. The TIPM activates or deactivates the headlamp high beams then sends the proper lamp-ON or lamp-OFF message back to the EMIC.

For proper diagnosis of the headlamp system, the TIPM, the EMIC, the CAN data bus or the electronic communication related to high beam indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

HILL DESCENT INDICATOR

DESCRIPTION

HILL DESCENT INDICATOR



Fig. 23: Hill Descent Indicator
Courtesy of CHRYSLER LLC

A hill descent indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional four-wheel drive system, this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The hill descent indicator consists of a stencil-like cutout of an icon depicting a vehicle descending a hill in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A green Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in green through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The hill descent indicator is serviced as a unit with the instrument cluster.

OPERATION

HILL DESCENT INDICATOR

The hill descent indicator gives an indication to the vehicle operator when the four-wheel drive transfer case gear selector is in the **4WD LOW** position and the hill descent control push button in the instrument panel switch pod has been depressed to turn the feature ON. This feature uses the grade sensing logic of the Controller Antilock Brake (CAB) to sense the vehicle is descending a hill and employs the brake system to automatically control the hill descent speed of the vehicle. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages received over the Controller Area Network (CAN) data bus from the CAB.

The hill descent indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the hill descent indicator for the following reasons:

- **Hill Descent Indicator Lamp-On Message** - Each time the cluster receives an electronic **hill descent indicator lamp-ON** message from the CAB, the indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the hill descent indicator will be turned ON, then OFF again during the LED portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The CAB continually monitors electronic message inputs from the Totally Integrated Power Module (TIPM) and the ElectroMechanical Instrument Cluster (EMIC) to determine the status of the four-wheel drive system and the hill descent control switch, then monitors its own internal grade sensing logic to determine when the hill descent mode should be engaged. The CAB then sends the proper lamp-ON or lamp-OFF message to the EMIC.

For proper diagnosis of the hill descent control switch, the TIPM, the CAB, the EMIC, the CAN data bus or the electronic communication related to hill descent indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

INSTRUMENT PANEL SWITCH POD

DESCRIPTION

INSTRUMENT PANEL SWITCH POD

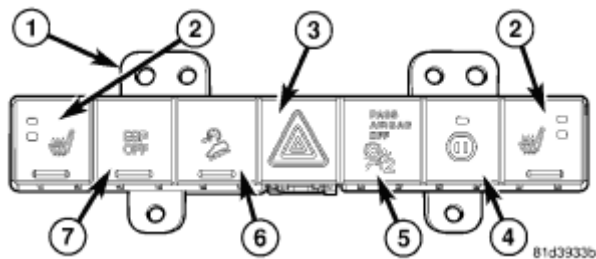


Fig. 24: Instrument Panel Switch Pod

Courtesy of CHRYSLER LLC

The instrument panel switch pod (1) is located just below the heater and air conditioner controls in the center stack area of the instrument panel. This switch is available in multiple configurations, which varies from two single push button switches to as many as five push button switches and an indicator lamp, depending upon the optional equipment in the vehicle. The pod may include the following switches or indicators:

- **Alternating Current (AC) Power Inverter Outlet Switch (4)**
- **Driver and Passenger Side Heated Seat Switches (2)**
- **Electronic Stability Program (ESP) Off Switch (7)**
- **Hazard Warning Switch (3)**
- **Headlamp Leveling Switch (Not Shown In Illustration)**
- **Hill Descent Control Switch (6)**
- **Park Assist Switch (Not Shown In Illustration)**
- **Passenger Airbag On/Off Indicator (5)**

The switch housing and the push buttons are constructed of molded plastic. Each push button has a smooth finish and is clearly identified with the appropriate text and International Control and Display Symbol icons. Several of the push buttons feature Light Emitting Diode (LED) units to give the vehicle operator an indication when the function of that switch is currently active. Only the hazard warning switch push button latches, while the remaining switches feature momentary operation.

Four screws secure the switch to the back of the instrument panel center bezel through integral mounting tabs that are molded into each corner of the switch housing. The back of the switch housing has an integral connector receptacle containing terminal pins that connect the switch to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

Panel lamps dimmer controlled illumination lamps integral to the circuit board within the switch provide back lighting for visibility at night, but these lamps are not serviceable. The individual switches in the instrument panel switch pod cannot be repaired and are not serviced separately. If any component within the switch pod is ineffective or damaged, the entire switch pod unit must be replaced.

OPERATION

INSTRUMENT PANEL SWITCH POD

For information covering details of operation for the individual switches or indicator contained within the instrument panel switch pod, refer to the specific service information covering the system to which that switch

or indicator belongs.

REMOVAL

INSTRUMENT PANEL SWITCH POD

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

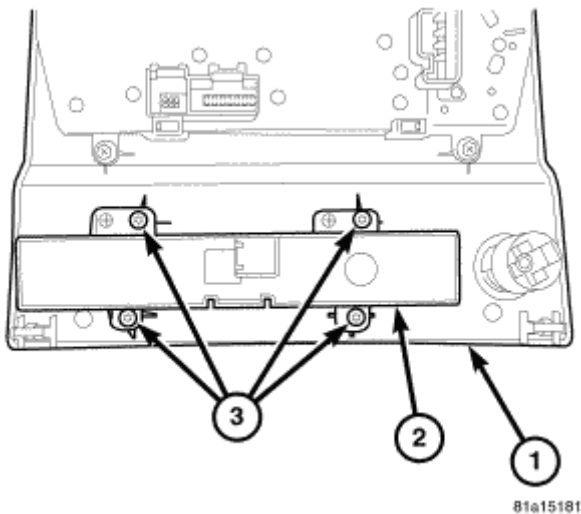


Fig. 25: Identifying Center Bezel, Instrument Panel Switch Pod & Screws
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the center bezel (1) from the instrument panel. Refer to **REMOVAL**.
3. Disconnect the wire harness connector from the back of the instrument panel switch pod (2).
4. Remove the four screws (3) that secure the switch pod to the back of the center bezel.
5. Remove the switch pod from the center bezel.

INSTALLATION

INSTRUMENT PANEL SWITCH POD

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS),

seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: There are several different instrument panel switch pods available, depending upon the optional equipment content of the vehicle. Be certain that a replacement switch pod matches the optional equipment of the vehicle into which it is being installed.

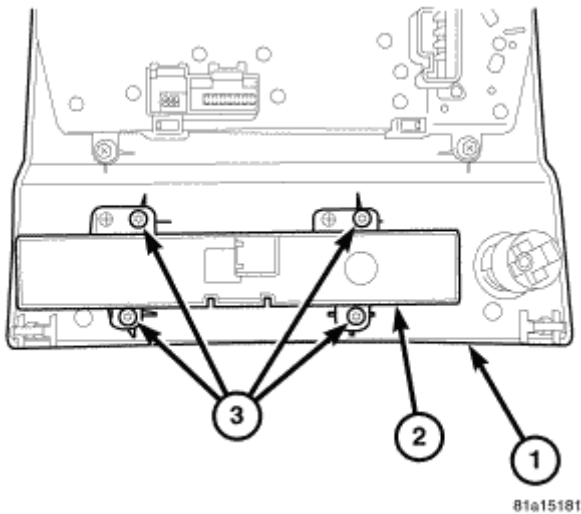


Fig. 26: Identifying Center Bezel, Instrument Panel Switch Pod & Screws
Courtesy of CHRYSLER LLC

1. Position the instrument panel switch pod (2) to the back of the center bezel (1).
2. Install and tighten the four screws (3) that secure the switch pod to the center bezel. Tighten the screws to 2 N.m (17 in. lbs.).
3. Reconnect the wire harness connector to the back of the switch pod.
4. Reinstall the center bezel onto the instrument panel. Refer to **INSTALLATION**.
5. Reconnect the battery negative cable.

LOW FUEL INDICATOR

DESCRIPTION

LOW FUEL INDICATOR



Fig. 27: Identifying Low Fuel Indicator
Courtesy of CHRYSLER LLC

A low fuel indicator is standard equipment on all instrument clusters. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The low fuel indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Fuel** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The low fuel indicator is serviced as a unit with the instrument cluster.

OPERATION

LOW FUEL INDICATOR

The low fuel indicator gives an indication to the vehicle operator when the level of fuel in the fuel tank becomes low. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic **fuel level** messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The low fuel indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the low fuel indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the low fuel indicator is illuminated for about three seconds as a bulb test.
- **Less Than 11 Percent Tank Full Message** - The TIPM provides a constant current source to the fuel level sending unit and monitors a return input on a fuel level sense circuit. The resistance through the fuel

level sending unit increases as the fuel level rises and decreases as the fuel level falls causing changes in the fuel level sense input voltage. The TIPM then sends the appropriate electronic **fuel level** messages to the cluster. Each time the fuel level messages to the cluster indicate the fuel tank is about 11 percent full or less for 10 consecutive seconds and the vehicle speed is zero, or for 60 consecutive seconds and the vehicle speed is greater than zero, the gauge needle is moved to the appropriate position on the gauge scale, the low fuel indicator is illuminated, and a single chime tone is sounded. The low fuel indicator remains illuminated until the fuel level messages indicate that the fuel tank is greater than about 14 percent full for 10 consecutive seconds and the vehicle speed is zero, or for 60 consecutive seconds and the vehicle speed is greater than zero, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone feature will only repeat during the same ignition cycle if the low fuel indicator is cycled OFF and then ON again by the appropriate messages from the TIPM.

- **Less Than Empty Stop Message** - Each time the cluster receives a fuel level message indicating the fuel level in the fuel tank is less than the **E** (or Empty) gauge needle stop position for five consecutive seconds, the gauge needle is moved to the low end of the gauge scale and the low fuel indicator is illuminated immediately. This input would indicate that the fuel level sense input to the TIPM is a short circuit.
- **More Than Full Stop Message** - Each time the cluster receives a fuel level message indicating the fuel level in the fuel tank is more than the **F** (or Full) gauge needle stop position for five consecutive seconds, the gauge needle is moved to the low end of the gauge scale and the low fuel indicator is illuminated immediately. This input would indicate that the fuel level sense input to the TIPM is an open circuit.

The TIPM continually monitors the fuel tank sending unit to determine the level of fuel in the fuel tank. The TIPM then sends the proper electronic **fuel level** message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. The TIPM will store a Diagnostic Trouble Code (DTC) for any fault detected in the fuel level sense circuit.

For proper diagnosis of the fuel tank sending unit, the TIPM, the EMIC, the CAN data bus or the electronic communication related to low fuel indicator operation or fuel level data processing a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

LOW OIL PRESSURE INDICATOR

DESCRIPTION

LOW OIL PRESSURE INDICATOR



Fig. 28: Low Oil Pressure Indicator
Courtesy of CHRYSLER LLC

A low oil pressure indicator is standard equipment on all instrument clusters. This indicator is located near the

top of the cluster overlay, between the speedometer and the tachometer.

The low oil pressure indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Engine Oil** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The low oil pressure indicator is serviced as a unit with the instrument cluster.

OPERATION

LOW OIL PRESSURE INDICATOR

The low oil pressure indicator gives an indication to the vehicle operator when the engine oil pressure reading reflects a condition requiring immediate attention. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The low oil pressure indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the low oil pressure indicator for the following reasons:

- **Engine Oil Pressure Low Message** - Each time the cluster receives an electronic **engine oil pressure** message from the PCM indicating the pressure is about 6.9 kPa (1 psi) or lower, the low oil pressure indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the PCM message. The indicator remains illuminated solid or flashing until the cluster receives a message from the PCM indicating that the pressure is above about 6.9 kPa (1 psi), or until the ignition switch is turned to the OFF position, whichever occurs first. The cluster will only turn the indicator ON in response to low engine oil pressure if the engine speed is greater than zero.
- **Actuator Test** - Each time the cluster is put through the actuator test, the low oil pressure indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the engine oil pressure sensor to determine the engine oil pressure. The PCM then sends the proper messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the EMIC turns ON the indicator after the bulb test, it may indicate that the engine or the engine oiling system requires service.

For proper diagnosis of the engine oil pressure sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to low oil pressure indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

MALFUNCTION INDICATOR LAMP (MIL)

DESCRIPTION

MALFUNCTION INDICATOR

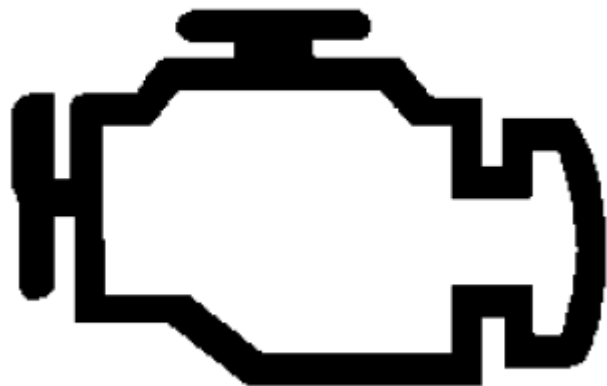


Fig. 29: Malfunction Indicator Lamp
Courtesy of CHRYSLER LLC

A Malfunction Indicator Lamp (MIL) is standard equipment on all instrument clusters. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The MIL consists of a stencil-like cutout of the International Control and Display Symbol icon for **Engine** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The MIL is serviced as a unit with the instrument cluster.

OPERATION

MALFUNCTION INDICATOR

The Malfunction Indicator Lamp (MIL) gives an indication to the vehicle operator when the Powertrain Control Module (PCM) has recorded a Diagnostic Trouble Code (DTC) for an On-Board Diagnostics II (OBDII) emissions-related circuit or component malfunction. The MIL is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the PCM over the Controller Area Network (CAN) data bus.

The MIL Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the

fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the MIL for the following reasons

- **Bulb Test** - Each time the ignition switch is turned to the ON position the indicator is illuminated for about 15 seconds as a bulb test. The entire bulb test is a function of the PCM.
- **MIL Lamp-On Message** - Each time the cluster receives an electronic **MIL lamp-ON** message from the PCM, the indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the PCM message. For some DTCs, if a problem does not recur, the PCM will send a lamp-OFF message automatically. Other DTCs may require that a fault be repaired and the PCM be reset before a lamp-OFF message will be sent. For more information on the PCM, and the DTC set and reset parameters, refer to **EMISSIONS CONTROL** article .
- **Communication Error** - If the cluster receives no lamp-ON or lamp-OFF messages from the PCM for 10 consecutive message cycles, the MIL is illuminated by the instrument cluster to indicate a loss of bus communication. The indicator remains controlled and illuminated by the cluster until a valid message is received from the PCM.
- **Actuator Test** - Each time the cluster is put through the actuator test, the MIL indicator will be turned ON during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the fuel and emissions system circuits and sensors to decide whether the system is in good operating condition. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the EMIC turns ON the MIL after the bulb test, it may indicate that a malfunction has occurred and that the fuel and emissions systems require service.

For proper diagnosis of the fuel and emissions systems, the PCM, the EMIC, the CAN data bus or the electronic communication related to MIL operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

NO BUS INDICATOR

DESCRIPTION

NO BUS INDICATOR

A no bus indicator is standard equipment on all instrument clusters. The no bus indication appears within the fixed segment odometer Vacuum Fluorescent Display (VFD) unit. The odometer no bus indicator consists of a textual **noBUS** message that appears in place of the odometer/trip odometer information.

The odometer VFD is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located at the base of the cluster overlay right gauge dial face (Dodge) or the tachometer dial face (Chrysler). The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The no bus textual message appears in the same blue-green color and at the same lighting level as the other information displayed in the odometer VFD unit when it is illuminated by the instrument cluster electronic circuit board.

During daylight hours (exterior lamps are OFF) the odometer VFD unit is illuminated at full brightness for clear visibility. At night (exterior lamps are ON), the VFD lighting level is adjusted with the other cluster illumination lamps using the panel lamps dimmer thumbwheel of the headlamp switch on the instrument panel. However, a PARADE mode position of the thumbwheel allows the VFD unit to be illuminated at full brightness if the exterior lamps are turned ON during daylight hours.

The no bus indicator is serviced as a unit with the odometer VFD unit in the instrument cluster.

OPERATION

NO BUS INDICATOR

The no bus indicator gives an indication to the vehicle operator when the electronic communication data bus is ineffective. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages not being received over the Controller Area Network (CAN) data bus from the Totally Integrated Power Module (TIPM).

The no bus indicator function of the odometer Vacuum Fluorescent Display (VFD) unit is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the odometer VFD no bus indication will always be OFF when the ignition switch is in any position except ON or START. The instrument cluster will turn ON the no bus indicator for the following reasons:

- **No Electronic Communication Messages** - Each time the ignition switch is turned to the ON position and the cluster does not receive electronic communication messages over the CAN data bus, the no bus indicator will be illuminated. The indicator remains illuminated, until CAN bus communication is restored or until the ignition switch is turned to the OFF position, whichever occurs first.

The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) continually monitors the CAN data bus to determine the status of many sensors and systems throughout the vehicle. If bus communication is interrupted, the EMIC cannot provide accurate displays and outputs.

For proper diagnosis of the no bus indicator, the EMIC, the CAN data bus or the electronic communication related to no bus indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

NO FUSE INDICATOR

DESCRIPTION

NO FUSE INDICATOR

A no fuse indicator is standard equipment on all instrument clusters. However, in vehicles built for the Chinese market this indicator is electronically disabled. The no fuse indication appears within the odometer/trip odometer Vacuum Fluorescent Display (VFD) unit. The no fuse indicator consists of a textual **noFUSE** message which appears in place of the odometer/trip odometer information in the odometer display.

The odometer VFD is soldered onto the cluster electronic circuit board, and is visible through a window with a

smoked clear lens located on the lower edge of the tachometer gauge dial face of the cluster overlay. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The no fuse textual message appears in the same blue-green color and at the same lighting level as the odometer information when it is illuminated by the instrument cluster electronic circuit board.

The no fuse indicator is serviced as a unit with the odometer VFD in the instrument cluster.

OPERATION

NO FUSE INDICATOR

The no fuse indicator gives an indication to the vehicle operator when the Ignition Off Draw (IOD) fuse is ineffective or is not installed. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages received over the Controller Area Network (CAN) data bus from the Totally Integrated Power Module (TIPM).

The no fuse indicator function of the odometer Vacuum Fluorescent Display (VFD) unit is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the odometer VFD no fuse indication will always be OFF when the ignition switch is in any position except ON or START. The instrument cluster will turn ON the no fuse indicator for the following reasons:

- **No Fuse Indicator Lamp-On Message** - Each time the ignition switch is turned to the ON position and the cluster receives an electronic **no fuse indicator lamp-ON** message from the TIPM indicating that the IOD fuse is missing or ineffective, the no fuse indicator will be illuminated. The indicator remains illuminated for about three seconds, until the IOD fuse is installed, until the trip odometer reset switch button is depressed or until the ignition switch is turned to the OFF position, whichever occurs first.

The TIPM continually monitors the IOD circuit to determine the status of the IOD fuse, then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the CAN data bus.

For proper diagnosis of the no fuse indicator, the TIPM, the EMIC, the CAN data bus or the electronic communication related to no fuse indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

ODOMETER

DESCRIPTION

ODOMETER/TRIP ODOMETER



Fig. 30: Odometer/Trip Odometer
Courtesy of CHRYSLER LLC

An odometer and trip odometer are standard factory-installed equipment in all instrument clusters. The odometer and trip odometer are displayed in a common electronic, blue-green Vacuum-Fluorescent Display (VFD) unit. This VFD unit is soldered onto the cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer in the lower right area of the cluster overlay. The dark lens over the VFD prevents the indicator from being clearly visible when it is not illuminated.

The odometer and trip odometer information are not displayed simultaneously. The trip odometer reset switch on the instrument cluster circuit board toggles the display between odometer and trip odometer modes by depressing the odometer/trip odometer switch button that extends through the lower edge of the cluster lens, just right of the tachometer. When the trip odometer information is displayed, the text **TRIP A** or **TRIP B** is also illuminated in the lower right corner of the odometer/trip odometer VFD in a blue-green color and at the same lighting level as the trip odometer information.

The odometer and trip odometer information are stored in the instrument cluster memory. This information can be increased when the proper inputs are provided to the instrument cluster, but the information cannot be decreased. The odometer can display values up to 999,999 kilometers (999,999 miles). The odometer latches at these values, and will not roll over to zero. The trip odometer can display values up to 999.9 kilometers (999.9 miles) before it rolls over to zero.

The odometer display does not show leading zeroes, does not have a decimal point and will not show values less than a full unit (kilometer or mile). The unit of measure (**km** or **miles**) for the odometer display is not shown in the VFD. The unit of measure for the instrument cluster odometer/trip odometer is selected at the time that it is manufactured, and cannot be changed. The odometer has a RENTAL CAR mode, which will illuminate the odometer information in the VFD whenever the driver side front door is opened with the ignition switch in the OFF or ACCESSORY positions.

During daylight hours (exterior lamps are OFF) the odometer VFD is illuminated at full brightness for clear visibility. At night (exterior lamps are ON), the VFD lighting level is adjusted with the other cluster general

illumination lamps using the panel lamps dimmer function of the interior lighting control sleeve on the left multi-function switch control stalk. However, a PARADE mode position of the control sleeve allows the VFD to be illuminated at full brightness if the exterior lamps are turned ON during daylight hours.

The odometer/trip odometer VFD, the trip odometer switch and the trip odometer push button are serviced as a unit with the instrument cluster.

OPERATION

ODOMETER/TRIP ODOMETER

The odometer and trip odometer give an indication to the vehicle operator of the distance the vehicle has traveled. This indicator is controlled by the instrument cluster circuitry based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The odometer and trip odometer information is displayed by the instrument cluster odometer/trip odometer Vacuum Fluorescent Display (VFD). The VFD will display the odometer information whenever the driver side front door is opened with the ignition switch in the OFF or ACCESSORY positions. The instrument cluster circuitry controls the VFD and provides the following features:

- **Odometer/Trip Odometer Display Toggling** - Actuating the trip odometer reset switch button momentarily with the VFD illuminated will toggle the display between the odometer and trip odometer A and B information. Each time the VFD is illuminated with the ignition switch in the ON or START positions, the display will automatically return to the last mode previously selected (odometer or trip odometer).
- **Trip Odometer Reset** - When the trip odometer reset switch button is pressed and held for longer than about two seconds with the ignition switch in the ON or START positions, the trip odometer will be reset to **0.0** kilometers (miles). The VFD must be displaying the trip odometer information in order for the trip odometer information to be reset.
- **Gas Cap Message Display** - On vehicles manufactured with a United States country code, each time the cluster receives an electronic message from the PCM indicating a monitored leak in the evaporative emissions system, the cluster replaces the displayed odometer/trip odometer value with the textual message, **gas cap** . This message serves as a reminder to the vehicle operator to check that the gas cap is properly installed and tightened, but could also indicate another source of air leakage in the on-board evaporative and vapor recovery emissions systems. Unless the leak is corrected, this message will latch and remain displayed during the current and each subsequent ignition cycle until the trip odometer reset button is pressed and released momentarily, which will revert the display to the odometer/trip odometer information that was last displayed for the remainder of that ignition cycle. Once the source of a leak has been corrected, either momentarily pressing the trip odometer reset button or cycling the ignition switch will unlatch the message and return the odometer/trip odometer to normal operation.
- **Communication Error** - If the cluster fails to receive an electronic **distance** message during normal operation, it will hold and display the last data received until the ignition switch is turned to the OFF position. If the cluster does not receive a **distance** message within one second after the ignition switch is turned to the ON position, it will display the last distance value stored in the cluster memory. If the cluster is unable to display odometer information due to an error internal to the cluster, the VFD will display **error** .

- **Actuator Test** - Each time the cluster is put through the actuator test, the odometer VFD will display all of its segments simultaneously during the VFD portion of the test to confirm the functionality of the VFD and the cluster control circuitry.

The PCM continually monitors the vehicle speed pulse information received from the wheel speed sensors, then sends the proper messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the wheel speed sensors, the PCM, the EMIC, the CAN data bus or the electronic communication related to odometer/trip odometer operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

POSITION LAMP INDICATOR

DESCRIPTION

POSITION LAMP INDICATOR



Fig. 31: Position Lamp Indicator
Courtesy of CHRYSLER LLC

A position lamp indicator is standard equipment only on instrument clusters for vehicles manufactured for sale in certain export markets. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The position lamp indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Position Lights, Side Lights** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A green Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in green through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The position lamp indicator is serviced as a unit with the instrument cluster.

OPERATION

POSITION LAMP INDICATOR

The position lamp indicator gives an indication to the vehicle operator whenever the position lamps (exterior lighting) are illuminated. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The position lamp indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the position lamp indicator for the following reasons:

- **Position Lamp Indicator Lamp-On Message** - Each time the cluster receives an electronic **position lamp indicator lamp-ON** message from the TIPM indicating the position lamps are turned ON, the position lamp indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the exterior lamp load shedding (battery saver) timed interval expires, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the position lamp indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors electronic **exterior lighting switch request** messages from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to determine the appropriate outputs to the park lamp relay. The TIPM activates or deactivates the park lamp relay then sends the proper lamp-ON or lamp-OFF message back to the EMIC.

For proper diagnosis of the position lamp system, the TIPM, the EMIC, the CAN data bus or the electronic communication related to position lamp indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

REAR FOG LAMP INDICATOR

DESCRIPTION

REAR FOG LAMP INDICATOR

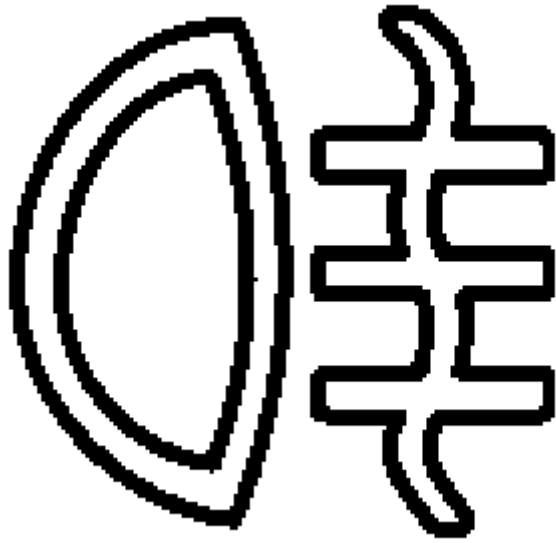


Fig. 32: Rear Fog Lamp Indicator
Courtesy of CHRYSLER LLC

A rear fog lamp indicator is standard equipment on all instrument clusters for certain markets where rear fog lamps are available. However, on vehicles not equipped with the optional rear fog lamps, this indicator is electronically disabled. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The rear fog lamp indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Rear Fog Light** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The rear fog lamp indicator is serviced as a unit with the instrument cluster.

OPERATION

REAR FOG LAMP INDICATOR

The rear fog lamp indicator gives an indication to the vehicle operator whenever the rear fog lamps are illuminated. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The rear fog lamp indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the rear fog lamp indicator for the following reasons:

- **Rear Fog Indicator Lamp-On Message** - Each time the cluster receives an electronic **rear fog indicator lamp-ON** message from the TIPM indicating the rear fog lamps are turned ON, the rear fog lamp indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the exterior lamp load shedding (battery saver) timed interval expires, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the rear fog lamp indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors electronic **exterior lighting request** messages from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to determine the appropriate outputs to the rear fog lamps. The TIPM activates or deactivates the rear fog lamps then sends the proper lamp-ON or lamp-OFF message back to the EMIC.

For proper diagnosis of the rear fog lamp system, the TIPM, the EMIC, the CAN data bus or the electronic communication related to rear fog lamp indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

SEATBELT INDICATOR

DESCRIPTION

SEATBELT INDICATOR



Fig. 33: Seatbelt Indicator
Courtesy of CHRYSLER LLC

A seatbelt indicator is standard equipment on all instrument clusters. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The seatbelt indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Seat Belt** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The seatbelt indicator is serviced as a unit with the instrument cluster.

OPERATION

SEATBELT INDICATOR

The seatbelt indicator gives an indication to the vehicle operator of the status of the front seat belts. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic **driver side** and **passenger side front seat belt switch status** messages received over the Controller Area Network (CAN) data bus.

The seatbelt indicator also includes a programmable enhanced seatbelt reminder or BELTMINDER feature that is enabled when the vehicle is shipped from the factory. This BELTMINDER feature can be disabled and enabled by the customer using a specific programming event sequence, or by the dealer using a diagnostic scan tool.

The seatbelt indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the seatbelt indicator for the following reasons:

- **Seatbelt Reminder Function** - Each time the cluster receives a battery current input on the fused ignition switch output (run-start) circuit, the indicator will be illuminated as a seatbelt reminder for about six seconds, or until the ignition switch is turned to the OFF position, whichever occurs first. This reminder function will occur regardless of the status of the seatbelt switch inputs to the cluster.
- **Front Seatbelt Not Buckled Message - Beltminder Active** - Following the seatbelt reminder function, each time the cluster receives an electronic **driver side** or **passenger side front seat belt unbuckled status** message with the ignition switch in the START or ON positions, the indicator will be illuminated. In addition, if a front seat belt remains unbuckled about 4 seconds after the conclusion of the seatbelt reminder function, the seatbelt indicator will begin to cycle between flashing ON and OFF for 3 seconds, then lighting solid for 2 seconds. The seatbelt indicator will continue to cycle between flashing and solid illumination for 13 complete cycles, until electronic **driver side** and **passenger side front seat belt buckled status** messages are received, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Front Seatbelt Not Buckled Message - Beltminder Inactive** - Following the seatbelt reminder function, each time the cluster receives an electronic **driver side** or **passenger side front seat belt unbuckled**

status message with the ignition switch in the START or ON positions, the indicator will be illuminated. The seatbelt indicator remains illuminated until electronic **driver side** and **passenger side front seat belt buckled status** messages are received, or until the ignition switch is turned to the OFF position, whichever occurs first.

- **Actuator Test** - Each time the cluster is put through the actuator test, the seatbelt indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The driver side seat belt switch is connected in series between ground and the seat belt switch sense circuit input to the Totally Integrated Power Module (TIPM), while the passenger side seat belt switch is connected between an output and an input of the Occupant Restraint Controller (ORC). The ORC also monitors inputs from the Occupant Classification Module (OCM) to determine whether the passenger side front seat is occupied. The TIPM and the ORC continually monitor these inputs, then send the proper status messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the CAN data bus.

For proper diagnosis of the seat belt switches, the TIPM, the OCM, the ORC, the EMIC, the CAN data bus or the electronic communication related to seat belt indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

STANDARD PROCEDURE

ENHANCED SEATBELT REMINDER PROGRAMMING

The seatbelt indicator also includes a programmable enhanced seatbelt reminder or BELTMINDER feature that is enabled when the vehicle is shipped from the factory. This BELTMINDER feature provides extended and modified visual seatbelt indicator and audible chime warning responses to an unbuckled driver side front seat belt or an occupied passenger side front seat with an unbuckled passenger side front seat belt. The BELTMINDER feature may be disabled or enabled by the customer using the programming sequence that follows, or by the dealer using a diagnostic scan tool.

CUSTOMER PROGRAMMING SEQUENCE

NOTE: **The following sequence of events must occur within 60 seconds of the ignition switch being placed in the ON position in order for the programming to be completed successfully.**

1. With all doors closed and the ignition switch in any position except ON or START, buckle the driver side front seat belt.
2. Turn the ignition switch to the ON position and wait for the seatbelt indicator reminder function to conclude (about six seconds).
3. Unbuckle and buckle the driver side front seat belt three or more times, ending with the belt buckled.
4. Turn the ignition switch to any position except ON or START to toggle the BELTMINDER feature from its current setting (from active to inactive, or from inactive to active). A single chime tone will provide an audible confirmation that the programming sequence has been successfully completed.

SECURITY INDICATOR

DESCRIPTION

SECURITY INDICATOR

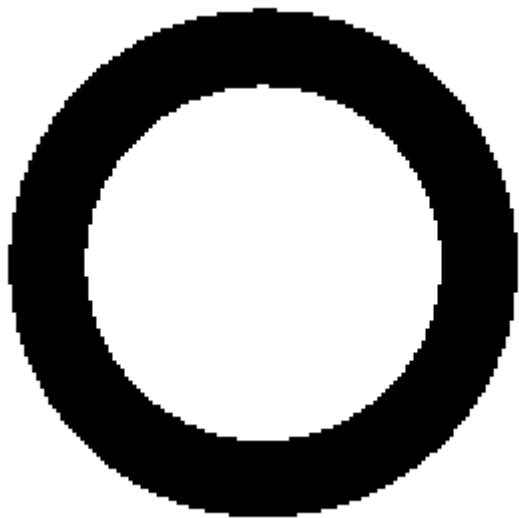


Fig. 34: Security Indicator
Courtesy of CHRYSLER LLC

A security indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the optional Vehicle Theft Security System (VTSS), this indicator is electronically disabled. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The security indicator consists of a small round cutout in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The security indicator is serviced as a unit with the instrument cluster.

OPERATION

SECURITY INDICATOR

The security indicator gives an indication to the vehicle operator when the Vehicle Theft Security System (VTSS) is arming or is armed. On vehicles equipped with the Sentry Key Immobilizer System (SKIS), the security indicator also gives an indication to the vehicle operator of the status of the SKIS. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming, and electronic **security indicator request** messages received by the cluster from the Totally Integrated Power Module (TIPM) or the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM) over the Controller Area Network (CAN) data bus.

The security indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, the LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. Depending upon the programmed condition, the indicator can be illuminated solid, flashed at a slow rate (0.5 Hertz, 12.5 percent duty cycle), or flashed at a fast rate (1 Hertz, 50 percent duty cycle). The instrument cluster will turn ON the security indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the security indicator illuminates for about two seconds as a bulb test. The entire bulb test is a function of the SKREEM.
- **Security Indicator Lamp-On Message** - During the 16 second VTSS arming function, the TIPM will request the cluster flash the security indicator ON and OFF repeatedly at a steady, fast rate to indicate that the VTSS is in the process of arming. Following successful VTSS arming, the TIPM will request the cluster flash the security indicator ON and OFF continuously at a slower rate to indicate that the VTSS is armed. The security indicator continues flashing at the slower rate until the VTSS is disarmed or triggered. If the VTSS has alarmed and rearmed, the TIPM will request the cluster flash the security indicator at a steady, slow rate for about 30 seconds after the VTSS is disarmed.
- **SKIS Indicator Lamp-On Message** - Each time the cluster receives an electronic **SKIS indicator lamp-ON** message from the SKREEM, the security indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the SKREEM message. The indicator remains illuminated solid or continues to flash until the cluster receives a lamp-OFF message from the SKREEM, or until the ignition switch is turned to the OFF position, whichever occurs first. For more information on the SKIS and the security indicator control parameters, refer to **OPERATION** .
- **Communication Error** - If the cluster receives no lamp-ON or lamp-OFF messages from the TIPM or the SKREEM for 10 consecutive message cycles, the security indicator is illuminated by the instrument cluster. The indicator remains controlled and illuminated by the cluster until a valid lamp-ON or lamp-OFF message is received from the SKREEM.
- **Actuator Test** - Each time the instrument cluster is put through the actuator test, the security indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM sends electronic **security indicator request** messages to control the security indicator whenever the ignition switch is in the OFF position and the VTSS is arming, armed, or alarming. Whenever the ignition switch is in the ON or START positions, the SKREEM performs a self-test to decide whether the SKIS is in good operating condition and whether a valid key is present in the ignition lock cylinder. The SKREEM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the cluster flashes the security indicator upon ignition ON, or turns ON the security indicator solid after the bulb test, it indicates that a SKIS malfunction has occurred or that the SKIS is ineffective.

For proper diagnosis of the VTSS, the SKIS, the SKREEM, the TIPM, the EMIC, the CAN data bus or the electronic communication related to security indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

SERVICE 4WD INDICATOR

DESCRIPTION

SERVICE 4WD INDICATOR



Fig. 35: Service 4WD Indicator
Courtesy of CHRYSLER LLC

A service 4WD indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the optional four-wheel drive system and electronically shifted transfer case, this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The service 4WD indicator consists of a stencil-like cutout of the text **SERV 4WD** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The service 4WD indicator is serviced as a unit with the instrument cluster.

OPERATION

SERVICE 4WD INDICATOR

The service 4WD indicator gives an indication to the vehicle operator when the Totally Integrated Power Module (TIPM) has recorded a Diagnostic Trouble Code (DTC) for an electronic transfer case circuit or component malfunction. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster over the Controller Area Network (CAN) data bus.

The service 4WD indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF

when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the service 4WD indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the service 4WD indicator is illuminated for about two seconds as a bulb test.
- **Service 4WD Indicator Lamp-On Message** - Each time the cluster receives an electronic **service 4WD indicator lamp-ON** message from the TIPM, the service 4WD indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster receives no lamp-ON or lamp-OFF messages from the TIPM for 10 seconds, the service 4WD indicator is illuminated by the cluster to indicate a loss of TIPM communication. The indicator remains controlled and illuminated by the cluster until a valid message is received from the TIPM.
- **Actuator Test** - Each time the cluster is put through the actuator test, the service 4WD indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors the electronic transfer case control circuits and transfer case shift motor/mode sensor assembly to determine the condition of the system. The TIPM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC).

For proper diagnosis of the TIPM, the EMIC, the CAN data bus or the electronic communication related to service 4WD indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

SHIFT INDICATOR (TRANSFER CASE)

DESCRIPTION

4 LOW INDICATOR



Fig. 36: Identifying 4 Low Indicator
Courtesy of CHRYSLER LLC

A 4 low indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the optional four-wheel drive system, this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The 4 low indicator consists of a stencil-like cutout of the text **4 LOW** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The 4 low indicator is serviced as a unit with the instrument cluster.

4WD INDICATOR - FULL-TIME



Fig. 37: Identifying 4WD Indicator
Courtesy of CHRYSLER LLC

A 4WD full-time indicator is standard equipment on all instrument clusters. However, on vehicles not equipped

with an optional four-wheel drive system, this indicator is electronically disabled. This indicator is located within the odometer Vacuum Fluorescent Display (VFD) unit.

The 4WD full-time indicator consists of the text **4WD** in the VFD display. The odometer VFD unit is soldered onto the instrument cluster electronic circuit board, and is visible through a window with a smoked clear lens located on the lower edge of the tachometer gauge dial face of the cluster overlay. The dark lens over the VFD prevents it from being clearly visible when it is not illuminated. The 4WD full-time indicator text appears in the same blue-green color and at the same lighting level as the odometer information when it is illuminated by the instrument cluster electronic circuit board.

During daylight hours (exterior lamps are OFF) the odometer VFD unit is illuminated at full brightness for clear visibility. At night (exterior lamps are ON), the VFD lighting level is adjusted with the other cluster illumination lamps using the panel lamps dimmer function of the interior lighting control sleeve on the left multi-function switch control stalk. However, a PARADE mode position of the control sleeve allows the VFD unit to be illuminated at full brightness if the exterior lamps are turned ON during daylight hours.

The 4WD full-time indicator is serviced as a unit with the odometer VFD unit in the instrument cluster.

4WD INDICATOR - PART-TIME



Fig. 38: Identifying 4WD Indicator
Courtesy of CHRYSLER LLC

A 4WD part-time indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional four-wheel drive system, this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The 4WD part-time indicator consists of a stencil-like cutout of the text **4WD** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The 4WD part-time indicator is serviced as a unit with the instrument cluster.

OPERATION

4 LOW INDICATOR

The 4 low indicator gives an indication to the vehicle operator when the electronic transfer case has been shifted into the **4WD LOW** mode. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The 4 low indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the 4 low indicator for the following reasons:

- **4 Low Indicator Lamp-On Message** - Each time the cluster receives an electronic **4 low indicator lamp-ON** message from the TIPM, the indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the 4 low indicator will be turned ON, then OFF again during the LED portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors the electronic transfer case through the transfer case shift motor/mode sensor assembly or the manual transfer case through the transfer case switch to determine when the **4WD LOW** mode is engaged. The TIPM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the transfer case shift motor/mode sensor, the transfer case switch, the TIPM, the EMIC, the CAN data bus or the electronic communication related to 4 low indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

4WD INDICATOR - FULL-TIME

The 4WD full-time indicator gives an indication to the vehicle operator when the transfer case has been shifted into a **4WD FULL-TIME** mode. This indicator is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The 4WD full-time indicator is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the indicator will always be OFF when the ignition switch is in any position except ON or START. The indicator only illuminates when it is energized by the instrument cluster logic circuit. The instrument cluster will turn ON the 4WD full-time indicator for the following reasons:

- **4WD Full-Time Indicator Lamp-On Message** - Each time the cluster receives an electronic **4WD full-time indicator lamp-ON** message from the TIPM, the indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the 4WD full-time indicator will be

turned ON, then OFF again during the Vacuum Fluorescent Display (VFD) portion of the test in order to confirm the functionality of the VFD and the cluster control circuitry.

The TIPM continually monitors the electronic transfer case through the transfer case shift motor/mode sensor assembly or the manual transfer case through the transfer case switch to determine when the **4WD FULL-TIME** mode is engaged. The TIPM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the transfer case shift motor/mode sensor, the transfer case switch, the TIPM, the EMIC, the CAN data bus or the electronic communication related to 4WD full-time indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

4WD INDICATOR - PART-TIME

The 4WD part-time indicator gives an indication to the vehicle operator when the transfer case has been shifted into a **4WD PART-TIME** mode. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

The 4WD part-time indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the 4WD part-time indicator for the following reasons:

- **4WD Part-Time Indicator Lamp-On Message** - Each time the cluster receives an electronic **4WD part-time indicator lamp-ON** message from the TIPM, the indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the TIPM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the 4WD part-time indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The TIPM continually monitors the electronic transfer case through the transfer case shift motor/mode sensor assembly or the manual transfer case through the transfer case switch to determine when the **4WD PART-TIME** mode is engaged. The TIPM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the transfer case shift motor/mode sensor, the transfer case switch, the TIPM, the EMIC, the CAN data bus or the electronic communication related to 4WD part-time indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

SPEEDOMETER

DESCRIPTION

SPEEDOMETER

MPH km/h

Fig. 39: Speedometer
Courtesy of CHRYSLER LLC

A speedometer is standard equipment on all instrument clusters. The speedometer is located to the left of center of the instrument cluster, between the tachometer and the fuel gauge. The speedometer consists of a movable gauge needle or pointer controlled by the instrument cluster circuitry and a fixed 200 degree primary scale on the gauge dial face that reads left-to-right either from **0** to **120** or **140** mph, or from **0** to **240** km/h, depending upon the market for which the vehicle is manufactured.

Each version also has a secondary inner scale on the gauge dial face that provides the equivalent opposite units from the primary scale. Text appearing on the cluster overlay below the center of the primary scale or below the high end of the secondary scale abbreviates the unit of measure for that scale (either **MPH** or **km/h**).

The speedometer graphics are white, gray and black against a black field, making them clearly visible within the instrument cluster in daylight. When illuminated from behind by the panel lamps dimmer controlled cluster illumination lighting with the ignition switch in the ON or START positions or with the exterior lamps turned ON, the graphics retain their unilluminated colors and appearance. The orange gauge needle has internal optical illumination. Gauge illumination is provided by Light Emitting Diode (LED) units soldered onto the instrument cluster electronic circuit board.

The speedometer is serviced as a unit with the instrument cluster.

OPERATION

SPEEDOMETER

The speedometer gives an indication to the vehicle operator of the vehicle road speed. This gauge is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The speedometer is driven by an electronic stepper motor unit that receives battery current on the instrument

cluster electronic circuit board through the fused ignition switch output (run-start) circuit whenever the ignition switch is in the ON or START positions. The cluster is programmed to move the gauge needle back to the low end of the scale after the ignition switch is turned to the OFF position. The instrument cluster circuitry controls the gauge needle position and provides the following features:

- **Vehicle Speed Message** - Each time the cluster receives an electronic **vehicle speed** message from the PCM it will calculate the correct vehicle speed reading and position the gauge needle at that relative speed position on the gauge scale. The cluster will receive a new message and reposition the gauge pointer accordingly about every 88 milliseconds. The gauge needle will continually be positioned at the relative vehicle speed position on the gauge scale until the vehicle stops moving, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster fails to receive a speed message, it will hold the gauge needle at the last indication for about three seconds, or until the ignition switch is turned to the OFF position, whichever occurs first. After three seconds, the gauge needle will return to the left end of the gauge scale.
- **Actuator Test** - Each time the cluster is put through the actuator test, the speedometer needle will be swept to several calibration points on the gauge scale in a prescribed sequence in order to confirm the functionality of the gauge and the cluster control circuitry.

The PCM continually monitors the Vehicle Speed Sensor (VSS) to determine the vehicle road speed. The PCM then sends the proper **vehicle speed** messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the VSS, the PCM, the EMIC, the CAN data bus or the electronic communication related to speedometer operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TACHOMETER

DESCRIPTION

TACHOMETER

RPM X 1000

Fig. 40: Tachometer
Courtesy of CHRYSLER LLC

A tachometer is standard equipment on all instrument clusters. The tachometer is located to the right of center of the instrument cluster, between the speedometer and the engine coolant temperature gauge. The tachometer consists of a movable gauge needle or pointer controlled by the instrument cluster circuitry and a fixed 200 degree scale on the gauge dial face that reads left-to-right either from **0** to **7** for vehicles with a gasoline engine, or from **0** to **6** for vehicles with a diesel engine. The text **RPM X 1000** imprinted on the cluster overlay directly below the center of the scale and above the hub of the tachometer needle identifies that each number on the tachometer scale is to be multiplied by 1000 RPM.

The tachometer graphics are white, gray and black against a black field except for several red graduations that designate the red line area at the high end of the gauge scale, making them clearly visible within the instrument cluster in daylight. When illuminated from behind by the panel lamps dimmer controlled cluster illumination lighting with the ignition switch in the ON or START positions or with the exterior lamps turned ON, the graphics retain their unilluminated colors and appearance. The orange gauge needle has internal optical illumination. Gauge illumination is provided by Light Emitting Diode (LED) units soldered onto the instrument cluster electronic circuit board.

The tachometer is serviced as a unit with the instrument cluster.

OPERATION

TACHOMETER

The tachometer gives an indication to the vehicle operator of the engine speed. This gauge is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The tachometer is driven by an electronic stepper motor unit that receives battery current on the instrument cluster electronic circuit board through the fused ignition switch output (run-start) circuit whenever the ignition

switch is in the ON or START positions. The cluster is programmed to move the gauge needle back to the low end of the scale after the ignition switch is turned to the OFF position. The instrument cluster circuitry controls the gauge needle position and provides the following features:

- **Engine Speed Message** - Each time the cluster receives an electronic **engine speed** message from the PCM it will calculate the correct engine speed reading and position the gauge needle at that relative speed position on the gauge scale. The cluster will receive a new message and reposition the gauge pointer accordingly about every 88 milliseconds. The gauge needle will continually be repositioned at the relative engine speed position on the gauge scale until the engine stops running, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster fails to receive a speed message, it will hold the gauge needle at the last indication for about three seconds, or until the ignition switch is turned to the OFF position, whichever occurs first. After three seconds, the gauge needle will return to the left end of the gauge scale.
- **Actuator Test** - Each time the cluster is put through the actuator test, the tachometer needle will be swept to several calibration points on the gauge scale in a prescribed sequence in order to confirm the functionality of the gauge and the cluster control circuitry.

The PCM continually monitors the crankshaft position sensor to determine the engine speed. The PCM then sends the proper **engine speed** messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the crankshaft position sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to tachometer operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TOW/HAUL INDICATOR

DESCRIPTION

TOW/HAUL INDICATOR

**TOW/
HAUL**

Fig. 41: Identifying Tow/Haul Indicator
Courtesy of CHRYSLER LLC

A tow/haul indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional automatic transmission this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The tow/haul indicator consists of a stencil-like cutout of the text **TOW/HAUL** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The tow/haul indicator is serviced as a unit with the instrument cluster.

OPERATION

TOW/HAUL INDICATOR

The tow/haul indicator gives an indication to the vehicle operator when the tow/haul function of the tow/haul switch has been selected, revising the shift schedule of the electronically controlled automatic transmission. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The tow/haul indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the tow/haul indicator for the following reasons:

- **Tow/Haul Indicator Lamp-On Message** - Each time the cluster receives an electronic **tow/haul indicator lamp-ON** message from the PCM indicating that the tow/haul shift schedule has been selected, the indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the tow/haul indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the tow/haul switch to determine the proper outputs to the automatic transmission. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). For further diagnosis of the tow/haul indicator or the instrument cluster circuitry that controls the LED, see **DIAGNOSIS AND TESTING**.

For proper diagnosis of the transmission control system, the PCM, the EMIC, the CAN data bus or the electronic communication related to tow/haul indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TIRE PRESSURE MONITOR INDICATOR

DESCRIPTION

TIRE PRESSURE MONITOR INDICATOR



Fig. 42: Tire Pressure Monitor Indicator
Courtesy of CHRYSLER LLC

A Tire Pressure Monitor (TPM) indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with the TPM system, this indicator is electronically disabled. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The TPM indicator consists of a stencil-like cutout of an icon that represents a cross-section of a tire with a centered exclamation point in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The TPM indicator is serviced as a unit with the instrument cluster.

OPERATION

TIRE PRESSURE MONITOR INDICATOR

The Tire Pressure Monitor (TPM) indicator gives an indication to the vehicle operator of the status of the TPM system. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Sentry Key Remote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or Wireless Control Module/WCM) over the Controller Area Network (CAN) data bus.

The TPM indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the TPM indicator for the

following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position, the SKREEM sends an electronic **TPM indicator lamp-ON** message to the cluster to illuminate the TPM indicator for about three seconds as a bulb test.
- **TPM Indicator Lamp-On Message** - Each time the cluster receives an electronic **TPM indicator lamp-ON** message from the SKREEM, the TPM indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the SKREEM message. The indicator remains illuminated until the cluster receives a lamp-OFF message from the SKREEM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the cluster receives no TPM lamp-ON or lamp-OFF messages from the SKREEM for six consecutive seconds, the TPM indicator is illuminated by the instrument cluster. The indicator remains controlled and illuminated by the cluster until a valid lamp-ON or lamp-OFF message is received from the SKREEM.
- **Actuator Test** - Each time the cluster is put through the actuator test, the TPM indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The SKREEM performs a self-test each time the ignition switch is turned to the ON position to decide whether the TPM system is in good operating condition and whether the tire inflation pressures are too high or too low. The SKREEM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the instrument cluster turns ON the TPM indicator after the bulb test, it indicates that the inflation pressure of a tire is too low or that a malfunction has occurred and the TPM system is ineffective.

For proper diagnosis of the TPM system, the SKREEM, the EMIC, the CAN data bus or the electronic communication related to TPM indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TRACTION CONTROL INDICATOR

DESCRIPTION

TRACTION CONTROL INDICATOR



Fig. 43: Traction Control Indicator

Courtesy of CHRYSLER LLC

A traction control indicator is standard equipment on all instrument clusters. This indicator is located near the top of the cluster overlay, between the speedometer and the tachometer.

The traction control indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Stability - Anti-Spin** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The traction control indicator is serviced as a unit with the instrument cluster.

OPERATION

TRACTION CONTROL INDICATOR

The traction control indicator gives an indication to the vehicle operator when the Electronic Stability Program (ESP)/Brake Assist System (BAS)/Traction Control System (TCS) has been activated. This indicator is controlled by the instrument cluster logic circuit based upon cluster programming and electronic messages received by the cluster from the Controller Antilock Brake (CAB) over the Controller Area Network (CAN) data bus.

The traction control indicator is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the indicator will always be OFF when the ignition switch is in any position except ON or START. The indicator only illuminates when it is provided a path to ground by the instrument cluster circuitry. The instrument cluster will turn ON the traction control indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the traction control indicator is illuminated for about four seconds as a bulb test. The entire bulb test is a function of the CAB.
- **Traction Control Indicator Lamp-On Message** - Each time the cluster receives an electronic **traction control indicator lamp-ON** message from the CAB indicating that the ESP/BAS/TCS has been activated, the traction control indicator will be illuminated. The indicator can be flashed ON and OFF, or illuminated solid, as dictated by the CAB message. The indicator remains illuminated solid or continues to flash until the cluster receives a lamp-OFF message from the CAB, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Actuator Test** - Each time the cluster is put through the actuator test, the traction control indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The CAB continually monitors the traction control switch to determine the proper outputs to the components of the Antilock Brake System (ABS). The CAB then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the traction control switch, the ESP/BAS/TCS, the CAB, the EMIC, the CAN data bus or the electronic communication related to traction control indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TRANS TEMP INDICATOR

DESCRIPTION

TRANSMISSION OVERTEMP INDICATOR



Fig. 44: Identifying Transmission Over-Temperature
Courtesy of CHRYSLER LLC

A transmission over-temperature indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional automatic transmission, this indicator is electronically disabled. This indicator is located above the engine coolant temperature gauge on the cluster overlay, to the right of the tachometer.

The transmission over-temperature indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Transmission Temperature** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. A red Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in red through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The transmission over-temperature indicator is serviced as a unit with the instrument cluster.

OPERATION

TRANSMISSION OVERTEMP INDICATOR

The transmission over-temperature indicator gives an indication to the vehicle operator when the transmission fluid temperature is excessive, which may lead to accelerated transmission component wear or failure. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The transmission over-temperature indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the transmission over-temperature indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the transmission over-temperature indicator is illuminated for about two seconds as a bulb test.
- **Trans Over-Temp Indicator Lamp-On Message** - Each time the cluster receives an electronic **trans over-temp indicator lamp-ON** message from the PCM indicating that the transmission fluid temperature is 135 °C (275 °F) or higher, the indicator will be illuminated and a single chime tone is sounded. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first. The chime tone feature will only repeat during the same ignition cycle if the indicator is cycled OFF and then ON again by the appropriate lamp-ON and lamp-OFF messages from the PCM.
- **Actuator Test** - Each time the cluster is put through the actuator test, the transmission over-temperature indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the transmission temperature sensor to determine the transmission operating condition. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). If the instrument cluster illuminates the transmission over-temperature indicator due to a high transmission oil temperature condition, it may indicate that the transmission or the transmission cooling system are being overloaded, or that they require service. For further diagnosis of the transmission over-temperature indicator or the instrument cluster circuitry that controls the LED, see **DIAGNOSIS AND TESTING**.

For proper diagnosis of the transmission temperature sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to transmission over-temperature indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

TURN SIGNAL INDICATOR

DESCRIPTION

TURN SIGNAL INDICATOR

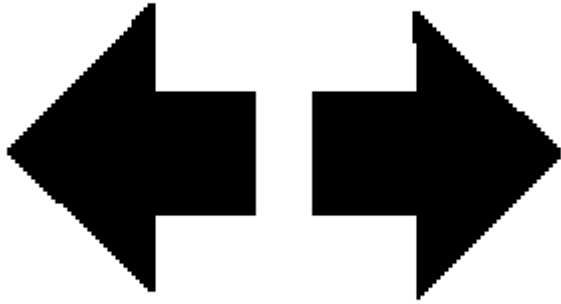


Fig. 45: Turn Signal Indicator
Courtesy of CHRYSLER LLC

Two turn signal indicators, one right and one left, are standard equipment on all instrument clusters. These indicators are located near the top of the cluster overlay, between the speedometer and the tachometer. Illumination of this indicator may also be accompanied by the display of a turn signal-on warning textual message in the cluster reconfigurable Vacuum Fluorescent Display (VFD) unit.

Each turn signal indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Turn Warning** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents these icons from being clearly visible when they are not illuminated. A green Light Emitting Diode (LED) behind each cutout in the opaque layer of the overlay causes the indicator to appear in green through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The turn signal indicators are serviced as a unit with the instrument cluster.

OPERATION

TURN SIGNAL INDICATOR

The turn signal indicators give an indication to the vehicle operator that the turn signal (left or right indicator flashing) or hazard warning (both left and right indicators flashing) have been selected and are operating. These indicators are controlled by transistors on the instrument cluster electronic circuit board based upon the cluster programming and electronic messages received from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus.

Each turn signal indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will allow this indicator to operate whenever the instrument cluster receives a battery current input on the fused B(+) circuit. Therefore, each LED can be illuminated regardless of the ignition switch position. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor.

The instrument cluster will turn ON the turn signal indicators for the following reasons:

- **Turn Signal Indicator Lamp-On Message** - Each time the cluster receives an electronic **right** or **left turn signal-ON** message from the TIPM over the CAN data bus, the appropriate turn signal indicator will be flashed ON and OFF. The TIPM also sends the appropriate electronic message to the cluster to control the flash rate of the turn signal indicators, as well as to control the click rate of an electromechanical relay soldered onto the cluster electronic circuit board that emulates the sound emitted by a conventional turn signal flasher. The turn signal indicators continue to flash ON and OFF until the cluster receives a lamp-OFF message from the TIPM, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Hazard Warning Indicator Lamp-On Message** - Each time the cluster receives an electronic **hazard warning-ON** message from the TIPM over the CAN data bus, both turn signal indicators will be flashed ON and OFF. The TIPM also sends the appropriate electronic messages to the cluster to control the flash rate of the right and left turn signal indicators, as well as to control the click rate of an electromechanical relay soldered onto the cluster electronic circuit board that emulates the sound emitted by a conventional hazard warning flasher. The turn signal indicators continue to flash ON and OFF until the cluster receives a hazard warning-OFF message from the TIPM.
- **Turn Signal-On Textual Warning Message** - When the cluster detects that a turn signal has been active continuously for 1.6 kilometers (1 mile) with the vehicle speed greater than 22 kilometers-per-hour (15 miles-per hour) a chime tone will be sounded and, if the vehicle is so equipped, a **TURN SIGNAL ON** textual message will appear within the instrument cluster reconfigurable Vacuum Fluorescent Display (VFD) unit.
- **Lamp Out Mode** - If the TIPM detects an ineffective turn signal lamp or circuit, it increases the flash rate for the remaining operative turn signals and sends an electronic message to the instrument cluster. To provide an indication of the problem to the vehicle operator the instrument cluster then increases the flash rate of the turn signal indicators, the click rate of the electromechanical relay and, if the vehicle is so equipped, displays a **TURN SIGNAL LAMP OUT** textual message in the reconfigurable VFD unit.
- **Actuator Test** - Each time the cluster is put through the actuator test, the turn signal indicators will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of each LED and the cluster control circuitry.

The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) continually monitors the electronic messages from the TIPM to determine the proper turn signal and hazard warning indicator operation.

For proper diagnosis of the turn signal and hazard warning system, the multi-function switch, the TIPM, the EMIC, the CAN data bus or the electronic communication related to turn signal indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

WAIT-TO-START INDICATOR

DESCRIPTION

WAIT-TO-START INDICATOR



Fig. 46: Wait-To-Start Indicator
Courtesy of CHRYSLER LLC

A wait-to-start indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional diesel engine, this indicator is electronically disabled. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The wait-to-start indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Diesel Preheat** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The wait-to-start indicator is serviced as a unit with the instrument cluster.

OPERATION

WAIT-TO-START INDICATOR

The wait-to-start indicator gives an indication to the vehicle operator when the diesel engine is too cool for efficient and reliable engine starting, and the engine glow plugs are energized in their pre-heat operating mode. This indicator is controlled by a transistor on the instrument cluster circuit board based upon cluster programming and electronic messages received by the cluster from the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus.

The wait-to-start indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the wait-to-start indicator for the following reasons:

- **Wait-To-Start Indicator Lamp-On Message** - Each time the cluster receives an electronic **wait-to-start indicator lamp-ON** message from the PCM indicating that the air temperature is too cool for efficient and reliable engine starting and the glow plugs are energized in their pre-heat mode, the wait-to-start indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF

message from the PCM, until the PCM detects that the engine is running, or until the ignition switch is turned to the OFF position, whichever occurs first.

- **Actuator Test** - Each time the cluster is put through the actuator test, the wait-to-start indicator will be turned ON, then OFF again during the bulb check portion of the test to confirm the functionality of the LED and the cluster control circuitry.

The PCM continually monitors the glow plug control circuits to determine when they are energized in their pre-heat operating mode. The PCM then sends the proper lamp-ON or lamp-OFF message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the glow plug control circuits, the PCM, the EMIC, the CAN data bus or the electronic communication related to wait-to-start indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

WATER-IN-FUEL INDICATOR

DESCRIPTION

WATER-IN-FUEL INDICATOR



Fig. 47: Identifying Water-In-Fuel Indicator
Courtesy of CHRYSLER LLC

A water-in-fuel indicator is standard equipment on all instrument clusters. However, on vehicles not equipped with an optional diesel engine, this indicator is electronically disabled. This indicator is located above the fuel gauge on the cluster overlay, to the left of the speedometer.

The water-in-fuel indicator consists of a stencil-like cutout of the International Control and Display Symbol icon for **Water In Fuel** in the opaque layer of the instrument cluster overlay. The dark outer layer of the overlay prevents the indicator from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the cutout in the opaque layer of the overlay causes the indicator to appear in amber through the translucent outer layer of the overlay when it is illuminated from behind by the LED, which is soldered onto the instrument cluster electronic circuit board.

The water-in-fuel indicator is serviced as a unit with the instrument cluster.

OPERATION

WATER-IN-FUEL INDICATOR

The water-in-fuel indicator gives an indication to the vehicle operator when there is excessive water detected in the diesel fuel. This indicator is controlled by the instrument cluster circuit board based upon cluster programming and electronic messages received over the Controller Area Network (CAN) data bus from the Powertrain Control Module (PCM).

The water-in-fuel indicator Light Emitting Diode (LED) is completely controlled by the instrument cluster logic circuit, and that logic will only allow this indicator to operate when the instrument cluster receives a battery current input on the fused ignition switch output (run-start) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON or START. The LED only illuminates when it is provided a path to ground by the instrument cluster transistor. The instrument cluster will turn ON the water-in-fuel indicator for the following reasons:

- **Water-In-Fuel Indicator Lamp-On Message** - Each time the cluster receives an electronic **water-in-fuel indicator lamp-ON** message from the PCM indicating there is excessive water in the diesel fuel system, the water-in-fuel indicator will be illuminated. The indicator remains illuminated until the cluster receives a lamp-OFF message from the PCM, or until the ignition switch is turned to the OFF position, whichever occurs first.

The PCM continually monitors the water-in-fuel sensor to determine whether there is excessive water in the diesel fuel system. The PCM then sends the proper electronic **water-in-fuel** message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

For proper diagnosis of the water-in-fuel-sensor, the PCM, the EMIC, the CAN data bus or the electronic communication related to water-in-fuel indicator operation a diagnostic scan tool is required. Refer to the appropriate diagnostic information.

2008 ACCESSORIES AND EQUIPMENT

Lamps/Lighting - Exterior - Electrical/Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B162B</u>	LEFT LOW BEAM CONTROL CIRCUIT LOW
<u>B162C</u>	LT LOW BEAM CONTROL CKT HI
<u>B162F</u>	RIGHT LOW BEAM CONTROL CIRCUIT LOW
<u>B1630</u>	RIGHT LOW BEAM CONTROL CIRCUIT HIGH
<u>B1633</u>	LEFT HI BEAM CONTROL CIRCUIT LOW
<u>B1634</u>	LEFT HI BEAM CONTROL CIRCUIT HIGH
<u>B1637</u>	RIGHT HI BEAM CONTROL CIRCUIT LOW
<u>B1638</u>	RIGHT HI BEAM CONTROL CIRCUIT HIGH
<u>B163B</u>	FRONT LEFT TURN CONTROL CIRCUIT LOW
<u>B163C</u>	FRONT LEFT TURN CONTROL CIRCUIT HIGH
<u>B163F</u>	FRONT RIGHT TURN CONTROL CIRCUIT LOW
<u>B1640</u>	FRONT RIGHT TURN CONTROL CIRCUIT HIGH
<u>B1643</u>	REAR LEFT TURN CONTROL CIRCUIT LOW
<u>B1644</u>	REAR LEFT TURN CONTROL CIRCUIT HIGH
<u>B1644</u>	RIGHT STOP LAMP CONTROL CIRCUIT HIGH
<u>B1647</u>	REAR RIGHT TURN CONTROL CIRCUIT LOW
<u>B1648</u>	REAR RIGHT TURN CONTROL CIRCUIT HIGH
<u>B165C</u>	PARK LAMP CONTROL CIRCUIT LOW
<u>B165D</u>	PARK LAMP CONTROL CIRCUIT HIGH
<u>B166C</u>	LEFT TRAILER TOW LAMP CONTROL CIRCUIT HIGH
<u>B166F</u>	RIGHT TRAILER TOW LAMP CONTROL CIRCUIT LOW
<u>B1670</u>	RIGHT TRAILER TOW LAMP CONTROL CIRCUIT HIGH
<u>B16B1</u>	LEFT STOP LAMP CONTROL CIRCUIT HIGH
<u>B16F8</u>	FRONT LEFT FOG LAMP CONTROL CIRCUIT LOW
<u>B16F9</u>	FRONT LEFT FOG LAMP CONTROL CIRCUIT HIGH
<u>B16FC</u>	FRONT RIGHT FOG LAMP CONTROL CIRCUIT LOW
<u>B16FD</u>	FRONT RIGHT FOG LAMP CONTROL CIRCUIT HIGH
<u>B17B8</u>	LEFT STOP LAMP CONTROL CIRCUIT OVERCURRENT
<u>B17BA</u>	HEADLAMP LEVELING MOTOR CONTROL CIRCUIT OVERCURRENT
<u>B17BD</u>	LEFT SIDEMARKER LAMP CONTROL CIRCUIT HIGH
<u>B17BF</u>	LEFT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT
<u>B17C2</u>	RIGHT SIDEMARKER LAMP CONTROL CIRCUIT HIGH
<u>B17C4</u>	RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT

LAMPS/LIGHTING - EXTERIOR-ELECTRICAL/DIAGNOSTICS

DIAGNOSIS AND TESTING

B162B-LEFT LOW BEAM CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Headlamps activated.

Set Conditions

- Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L43) LEFT LOW BEAM CONTROL CIRCUIT SHORT TO GROUND
LEFT LOW BEAM BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B162B-LEFT LOW BEAM CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **LEFT LOW BEAM BULB**

Turn the ignition off.

Disconnect the Left Low Beam Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

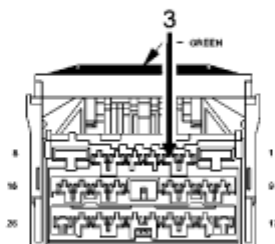
Go To 3.

No

Replace the Left Low Beam Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(L43) LEFT LOW BEAM CONTROL CIRCUIT SHORT TO GROUND**



MODULE-
TOTALLY
INTEGRATED
POWER C1

Fig. 1: Measuring Resistance Between Ground And (L43) Left Low Beam Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Left Headlamp harness connector.

Measure the resistance between ground and the (L43) Left Low Beam Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L43) Left Low Beam Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B162C-LT LOW BEAM CONTROL CKT HI

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects an OPEN condition when the low beam is on.

Possible Causes

Possible Causes
CHECK (L911) LEFT HEADLAMP RETURN SIGNAL (L911) LEFT HEADLAMP RETURN SIGNAL CHECK (L43) LEFT LOW BEAM CONTROL CIRCUIT

(L43) LEFT LOW BEAM CONTROL CIRCUIT OPEN
LEFT LOW BEAM BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B162C-LEFT LOW BEAM CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (L911) LEFT HEADLAMP RETURN SIGNAL

Turn the ignition off.

Disconnect the Left Low Beam Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe the (L911) left headlamp return signal circuit.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Go To 3.

3. (L911) LEFT HEADLAMP RETURN SIGNAL

Measure the resistance of the (L911) left headlamp return signal circuit at the Left Low Beam harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L911) left headlamp return signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L43) LEFT LOW BEAM CONTROL CIRCUIT

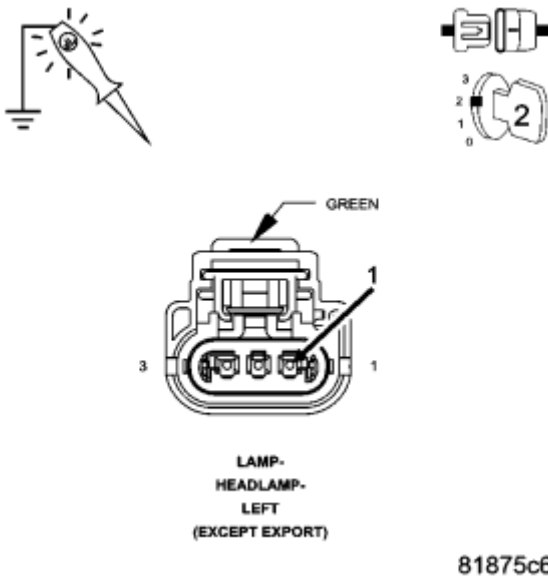


Fig. 2: Checking Left Low Beam Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L43) Left Low Beam Control circuit.

Does the test light illuminate brightly with the headlamps switch turned on, and shut off with the headlamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L43) LEFT LOW BEAM CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L43) Left Low Beam Control circuit between the Left Low Beam harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L43) Left Low Beam Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B162F-RIGHT LOW BEAM CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Headlamps activated.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a SHORT condition when the right low beam is on.

Possible Causes

Possible Causes
(L44) RIGHT LOW BEAM CONTROL CIRCUIT SHORT TO GROUND
RIGHT LOW BEAM BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B162F-RIGHT LOW BEAM CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. RIGHT LOW BEAM BULB

Turn the ignition off.

Disconnect the Right Low Beam Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Right Low Beam Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L44) RIGHT LOW BEAM CONTROL CIRCUIT SHORT TO GROUND

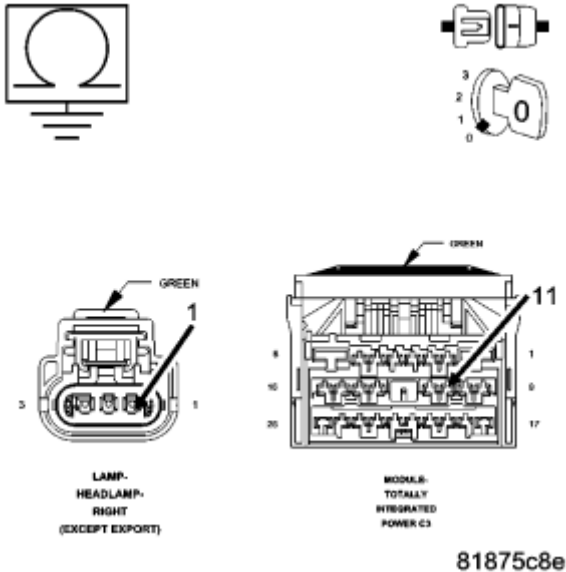


Fig. 3: Measuring Resistance Between Ground And (L44) Right Low Beam Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Right Headlamp harness connector.

Measure the resistance between ground and the (L44) Right Low Beam Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L44) Right Low Beam Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B1630-RIGHT LOW BEAM CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (L910) RIGHT HEADLAMP RETURN SIGNAL (L910) RIGHT HEADLAMP RETURN SIGNAL CHECK (L44) RIGHT LOW BEAM CONTROL CIRCUIT (L44) RIGHT LOW BEAM CONTROL CIRCUIT OPEN (L44) RIGHT LOW BEAM CONTROL CIRCUIT SHORTED TO VOLTAGE RIGHT LOW BEAM BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B1630-RIGHT LOW BEAM CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (L910) RIGHT HEADLAMP RETURN SIGNAL

Turn the ignition off.

Disconnect the Right Low Beam Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe the (L910) right headlamp return signal circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (L910) RIGHT HEADLAMP RETURN SIGNAL

Measure the resistance of the (L910) right headlamp return signal circuit at the Right Low Beam harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L910) right headlamp return signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L44) RIGHT LOW BEAM CONTROL CIRCUIT

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L44) Right Low Beam Control circuit.

Does the test light illuminate brightly with the headlamps switch turned on, and shut off with the headlamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L44) RIGHT LOW BEAM CONTROL CIRCUIT OPEN

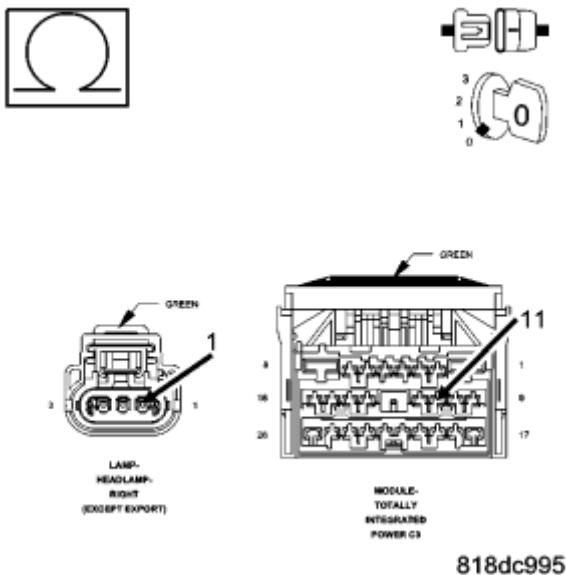


Fig. 4: Measuring Resistance Of (L44) Right Low Beam Control Circuit Between Right Low Beam Harness Connector And TIPM C3 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L44) Right Low Beam Control circuit between the Right Low Beam harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L44) Right Low Beam Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **(L44) RIGHT LOW BEAM CONTROL CIRCUIT SHORTED TO VOLTAGE**

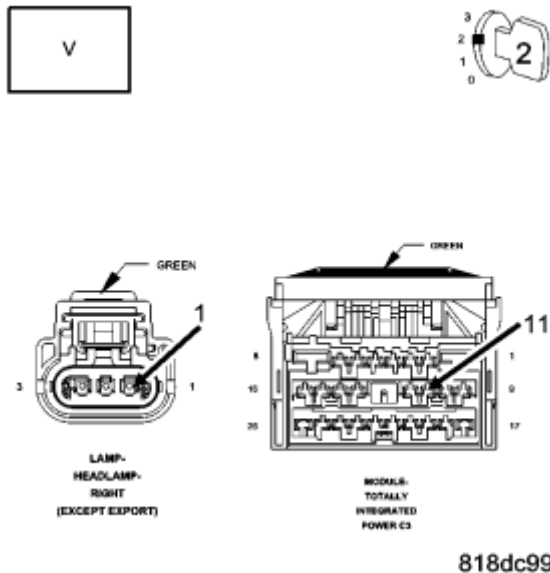


Fig. 5: Measuring For Voltage On (L44) Right Low Beam Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure for voltage on the (L44) Right Low Beam Control circuit.

Is there any voltage present?

Yes

Repair the (L44) Right Low Beam Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1633-LEFT HI BEAM CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Headlamps activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L33) LEFT HIGH BEAM CONTROL CIRCUIT SHORT TO GROUND
LEFT HIGH BEAM BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the High Beam Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B1633-LEFT HIGH BEAM CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **LEFT HIGH BEAM BULB**

Turn the ignition off.

Disconnect the Left High Beam Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

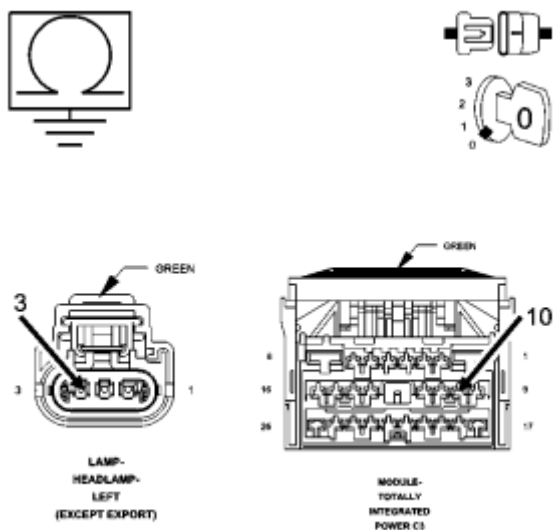
Go To 3.

No

Replace the Left High Beam Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L33) LEFT HIGH BEAM CONTROL CIRCUIT SHORT TO GROUND



81875da2

Fig. 6: Measuring Resistance Between Ground And (L33) Left High Beam Control Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Left Headlamp harness connector.

Measure the resistance between ground and the (L33) Left High Beam Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L33) Left High Beam Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1634-LEFT HI BEAM CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (L911) LEFT HEADLAMP RETURN SIGNAL (L911) LEFT HEADLAMP RETURN SIGNAL OPEN CHECK (L33) LEFT HIGH BEAM CONTROL CIRCUIT (L33) LEFT HIGH BEAM CONTROL CIRCUIT OPEN (L33) LEFT HIGH BEAM CONTROL CIRCUIT SHORT TO VOLTAGE LEFT HIGH BEAM BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the High Beam Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B1634-LEFT HIGH BEAM CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (L911) LEFT HEADLAMP RETURN SIGNAL

Turn the ignition off.

Disconnect the Left High Beam Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe the (L911) left headlamp return signal circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (L911) LEFT HEADLAMP RETURN SIGNAL

Measure the resistance of the (L911) left headlamp return signal circuit at the Left High Beam harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L911) left headlamp return signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L33) LEFT HIGH BEAM CONTROL CIRCUIT

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L33) Left High Beam Control circuit.

Does the test light illuminate brightly with the headlamps switch turned on, and shut off with the headlamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L33) LEFT HIGH BEAM CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L33) Left High Beam Control Circuit between the Left Headlamp harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L33) Left High Beam Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L33) LEFT HIGH BEAM CONTROL CIRCUIT SHORT TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L33) Left High Beam Control circuit.

Is there any voltage present?

Yes

Repair the (L33) Left High Beam Control circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1637-RIGHT HI BEAM CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the High Beam Headlamps activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L34) RIGHT HIGH BEAM CONTROL CIRCUIT SHORT TO GROUND
RIGHT HIGH BEAM BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the High Beam Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B1637-RIGHT HIGH BEAM CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. RIGHT HIGH BEAM BULB

Turn the ignition off.

Disconnect the Right High Beam Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Right High Beam Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L34) RIGHT HIGH BEAM CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Right Headlamp harness connector.

Measure the resistance between ground and the Right High Beam Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L34) Right High Beam Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1638-RIGHT HI BEAM CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (L910) RIGHT HEADLAMP RETURN SIGNAL CIRCUIT (L910) RIGHT HEADLAMP RETURN SIGNAL CIRCUIT OPEN CHECK (L34) RIGHT HIGH BEAM CONTROL CIRCUIT (L34) RIGHT HIGH BEAM CONTROL CIRCUIT OPEN (L34) RIGHT HIGH BEAM CONTROL CIRCUIT SHORT TO VOLTAGE RIGHT HIGH BEAM BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B1638-RIGHT HIGH BEAM CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (L910) RIGHT HEADLAMP RETURN SIGNAL CIRCUIT

Turn the ignition off.

Disconnect the Right High Beam Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe the (L910) right headlamp return signal circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (L910) RIGHT HEADLAMP RETURN SIGNAL CIRCUIT OPEN

Measure the resistance of the (L910) right headlamp return signal circuit at the Right High Beam harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L910) right headlamp return signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L34) RIGHT HIGH BEAM CONTROL CIRCUIT

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L34) Right High Beam Control circuit.

Does the test light illuminate brightly with the headlamps switch turned on, and shut off with the headlamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L34) RIGHT HIGH BEAM CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L34) Right High Beam Control circuit between the Right Headlamp harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L34) Right High Beam Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L34) HIGH BEAM CONTROL CIRCUIT SHORT TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L34) High Beam Control circuit.

Is there any voltage present?

Yes

Repair the (L34) High Beam Control circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

B163B-FRONT LEFT TURN CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Turn Signal activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND FRONT LEFT TURN SIGNAL BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B163B-FRONT LEFT TURN LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **FRONT LEFT TURN SIGNAL BULB**

Turn the ignition off.

Disconnect the Front Left Turn Signal Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Front Left Turn Signal Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND**

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Front Left Turn Signal Lamp harness connector.

Measure the resistance between ground and the (L61) Front Left Turn Signal Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L61) Front Left Turn Signal Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B163C-FRONT LEFT TURN CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z904) GROUND CIRCUIT (Z904) GROUND CIRCUIT OPEN CHECK (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT OPEN (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE FRONT LEFT TURN LAMP BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B163C-FRONT LEFT TURN LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (Z904) GROUND CIRCUITS

Turn the ignition off.

Disconnect the Front Left Turn Signal Lamp assembly harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z904) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z904) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z904) Ground circuit(s) at the Front Left Turn Signal Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z904) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT

Turn the ignition on.

With the Left Turn Signal still on and a 12-volt test light connected to ground, check the (L61) Front Left Turn Signal Control circuit.

Does the test light blink brightly from on to off with the turn signal indicator?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L61) Front Left Turn Signal Control circuit between the Front Left Turn Signal Lamp assembly harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L61) Front Left Turn Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L61) FRONT LEFT TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L61) Front Left Turn Signal Control circuit.

Is there any voltage present?

No

Repair the (L61) Front Left Turn Signal Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B163F-FRONT RIGHT TURN CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Turn Signal activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND FRONT RIGHT TURN SIGNAL BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Right Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B163F-FRONT RIGHT TURN LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. FRONT RIGHT TURN SIGNAL BULB

Turn the ignition off.

Disconnect the Front Right Turn Signal Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Front Right Turn Signal Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Disconnect the Right Front Turn Signal Lamp harness connector.

Measure the resistance between ground and the (L60) Right Front Turn Signal Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L60) Right Front Turn Signal Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1640-FRONT RIGHT TURN CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z904) GROUND CIRCUIT (Z904) GROUND CIRCUIT OPEN CHECK (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT OPEN (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE FRONT RIGHT TURN SIGNAL BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Right Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B1640-FRONT RIGHT TURN LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK (Z904) GROUND CIRCUITS

Turn the ignition off.

Disconnect the Front Right Turn Signal Lamp assembly harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z904) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z904) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z904) Ground circuit(s) at the Front Right Turn Signal Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z904) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT

Turn the ignition on.

With the Right Turn Signal still on and a 12-volt test light connected to ground, check the (L60) Front Right Turn Signal Control circuit.

Does the test light blink brightly from on to off with the turn signal indicator?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L60) FRONT RIGHT TURN SIGNAL CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (L60) Front Right Turn Signal Control circuit between the Front Right Turn Signal Lamp assembly harness connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L60) Front Right Turn Signal Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **(L60) RIGHT TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE**

Turn the ignition on.

Measure for voltage on the (L60) Front Right Turn Signal Control circuit.

Is there any voltage present?

No

Repair the (L60) Front Right Turn Signal Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1643-REAR LEFT TURN CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Turn Signal activated.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L63) REAR LEFT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND
REAR LEFT TURN SIGNAL BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B1643-REAR LEFT TURN LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REAR LEFT TURN SIGNAL BULB

Turn the ignition off.

Disconnect the Rear Left Turn Signal Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Rear Left Turn Signal Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L63) LEFT TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the Left Rear Tail Lamp harness connector.

Measure the resistance between ground and the (L63) Rear Left Turn Signal Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L63) Rear Left Turn Signal Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1644-REAR LEFT TURN CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z910) GROUND CIRCUIT (Z910) GROUND CIRCUIT OPEN CHECK (L63) LEFT REAR TURN SIGNAL CONTROL CIRCUIT (L63) LEFT REAR TURN SIGNAL CONTROL CIRCUIT OPEN (L63) LEFT REAR TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B1644-REAR LEFT TURN LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. CHECK (Z910) GROUND CIRCUITS

Turn the ignition off.

Disconnect the Left Rear Turn Signal Lamp assembly harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z910) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z910) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z910) Ground circuit(s) at the Left Rear Turn Signal Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z910) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L63) LEFT REAR TURN SIGNAL CONTROL CIRCUIT

Turn the ignition on.

With the Left Turn Signal still on and a 12-volt test light connected to ground, check the (L63) Left Rear Turn Signal Control circuit.

Does the test light blink brightly from on to off with the turn signal indicator?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L63) LEFT TURN SIGNAL CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (L63) Left Rear Turn Signal Control circuit between the Left Rear Tail Lamp assembly harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L63) Left Rear Turn Signal Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **(L63) LEFT REAR TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE**

Turn the ignition on.

Measure for voltage on the (L63) Left Rear Turn Signal Control circuit.

Is there any voltage present?

Yes

Repair short to voltage on the (L63) Left Rear Turn Signal Control circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1644-RIGHT STOP LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z920) GROUND CIRCUIT (Z920) GROUND CIRCUIT OPEN CHECK (L54) RIGHT STOP LAMP CONTROL CIRCUIT (L54) RIGHT STOP LAMP CONTROL CIRCUIT OPEN (L54) RIGHT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE RIGHT STOP LAMP BULB

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Stop Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16B5-RIGHT STOP LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (Z920) GROUND CIRCUITS

Disconnect the Right Rear Tail Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z920) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z920) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z920) Ground circuit(s) at the Right Rear Tail Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z920) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L54) RIGHT STOP LAMP CONTROL CIRCUIT

Turn the ignition on.

With the Stop Lamps still on and a 12-volt test light connected to ground, check the (L54) Right Stop Lamp Control circuit.

Does the test light illuminate brightly?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L54) RIGHT STOP LAMP CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C7 connector.

Measure the resistance of the (L54) Right Stop Lamp Control circuit between the Right Rear Tail Lamp harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

No

Go To 6.

Yes

Repair the (L54) Right Stop Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **(L54) RIGHT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE**

Turn the ignition on.

Measure the voltage between (L54) Right Stop Lamp Control circuit and ground.

Is there any voltage present?

Yes

Repair the (L54) Right Stop Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1647-REAR RIGHT TURN CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Turn Signal activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND
RIGHT REAR TURN SIGNAL BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Right Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B1647-REAR RIGHT TURN LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. REAR RIGHT TURN SIGNAL BULB

Turn the ignition off.

Disconnect the Right Rear Turn Signal Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Right Rear Turn Signal Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the Right Rear Tail Lamp harness connector.

Measure the resistance between ground and the (L62) Right Rear Turn Signal Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (L62) Right Rear Turn Signal Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

B1648-REAR RIGHT TURN CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z910) GROUND CIRCUIT (Z910) GROUND CIRCUIT OPEN CHECK (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT OPEN (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Right Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B1648-REAR RIGHT TURN LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (Z910) GROUND CIRCUITS

Turn the ignition off.

Disconnect the Right Rear Turn Signal Lamp assembly harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z910) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z910) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z910) Ground circuit(s) at the Right Rear Turn Signal Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z910) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT

Turn the ignition on.

With the Right Turn Signal still on and a 12-volt test light connected to ground, check the (L62) Right Rear Turn Signal Control circuit.

Does the test light blink brightly from on to off with the turn signal indicator?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (L62) Right Rear Turn Signal Control circuit between the Right Rear Tail Lamp assembly harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L62) Right Rear Turn Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **(L62) RIGHT REAR TURN SIGNAL CONTROL CIRCUIT SHORTED TO VOLTAGE**

Turn the ignition on.

Measure for voltage on the (L62) Right Rear Turn Signal Control circuit.

Is there any voltage present?

Yes

Repair the (L62) Right Rear Turn Signal Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B165C-PARK LAMP CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Park Lamps activated.

Set Conditions

• **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L17)(L217) FUSED PARK LAMP CONTROL CIRCUIT SHORT TO GROUND TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Park Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B165C-PARK LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (L17)(L217) FUSED PARK LAMP CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C5 harness connector.

Disconnect the Park Lamp harness connectors.

Measure the resistance between ground and the (L17) (L217) Fused Park Lamp Control circuits.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Repair the (L17)(L217) Fused Park Lamp Control circuits for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
(L17)(L217) FUSED PARK LAMP CONTROL CIRCUITS OPEN TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Park Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B165D-PARK LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(L17)(L217) FUSED PARK LAMP CONTROL CIRCUITS OPEN**

Turn the ignition off.

Disconnect the TIPM C5 harness connector.

Disconnect the Park Lamp harness connector.

Measure the resistance of the (L17)(L217) Fused Park Lamp Control circuits between the Park Lamp Harness Connectors and the TIPM C5 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L17)(L217) Fused Park Lamp Control circuits for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B166C-LEFT TRAILER TOW LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The Totally Integrated Power Module (TIPM) detects an HIGH condition.

Possible Causes

Possible Causes
(L673) LEFT TRAILER TOW LAMP CONTROL CIRCUIT OPEN
(L673) LEFT TRAILER TOW LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn on the Left Turn Signal.

With the scan tool, read DTC's.

Does the scan tool display active: B166C-LEFT TRAILER TOW LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (L673) LEFT TRAILER TOW LAMP CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C6 harness connector.

Disconnect the Left Trailer Tow Lamp harness connectors.

Measure the resistance of the (L673) Left Trailer Tow Lamp Control circuit between the Left Trailer Tow Lamp harness connectors and the TIPM C6 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L673) Left Trailer Tow Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (L673) LEFT TRAILER TOW LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure the voltage on the (L673) Left Trailer Tow Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L673) Left Trailer Tow Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B166F-RIGHT TRAILER TOW LAMP CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The Totally Integrated Power Module (TIPM) Detects a LOW condition.

Possible Causes

Possible Causes
(L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT SHORT TO GROUND TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn on the Right Turn Signal.

With the scan tool, read DTC's.

Does the scan tool display active: B166F-RIGHT TRAILER TOW LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1**.

2. (L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C6 harness connector.

Measure the resistance between ground and the (L674) Right Trailer Tow Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1**.

No

Repair the (L674) Right Trailer Tow Lamp Control circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1**.

B1670-RIGHT TRAILER TOW LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) Detects a HIGH condition.

Possible Causes

Possible Causes
(L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT OPEN
(L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn on the Right Turn Signal.

With the scan tool, read DTC's.

Does the scan tool display active: B1670-RIGHT TRAILER TOW LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or

contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C6 harness connector.

Disconnect the Right Trailer Tow Lamp harness connectors.

Measure the resistance of the (L674) Right Trailer Tow Lamp Control circuit between the Right Trailer Tow Lamp harness connectors and the TIPM C6 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L674) Right Trailer Tow Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (L674) RIGHT TRAILER TOW LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure the voltage on the (L674) Right Trailer Tow Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L674) Right Trailer Tow Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B16B1-LEFT STOP LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z919) GROUND CIRCUIT (Z919) GROUND CIRCUIT OPEN CHECK (L53) LEFT STOP LAMP CONTROL CIRCUIT (L53) LEFT STOP LAMP CONTROL CIRCUIT OPEN (L53) LEFT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE LEFT STOP LAMP BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Stop Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16B1-LEFT STOP LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (Z919) GROUND CIRCUITS**

Turn the ignition off.

Disconnect the Left Rear Tail Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z919) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. **(Z919) GROUND CIRCUIT OPEN**

Measure the resistance of the appropriate (Z919) Ground circuit(s) at the Left Rear Tail Lamp assembly harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z919) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK (L53) LEFT STOP LAMP CONTROL CIRCUIT**

Turn the ignition on.

With the Stop Lamps still on and a 12-volt test light connected to ground, check the (L53) Left Stop Lamp Control circuit.

Does the test light illuminate brightly?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L53) LEFT STOP LAMP CONTROL CIRCUIT OPEN

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (L53) Left Rear Turn Signal Control circuit between the Left Rear Tail Lamp harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L53) Turn Signal Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L53) LEFT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L53) Left Stop Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L53) Left Stop Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B16F8-FRONT LEFT FOG LAMP CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Front Fog Lamps activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT SHORT TO GROUND
FRONT LEFT FOG LAMP BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Front Fog Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16F8-FRONT LEFT FOG LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **FRONT LEFT FOG LAMP BULB**

Turn the ignition off.

Disconnect the Front Left Fog Lamp Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Front Left Fog Lamp Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT SHORT TO GROUND**

Turn the ignition off.

Disconnect the TIPM C4 harness connector.

Measure the resistance between ground and the (L89) Front Left Fog Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

No

Repair the (L89) Front Left Fog Lamp Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B16F9-FRONT LEFT FOG LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z904) GROUND CIRCUIT (Z904) GROUND CIRCUIT OPEN CHECK (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT OPEN (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE FRONT LEFT FOG LAMP BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Front Fog Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16F9-FRONT LEFT FOG LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK (Z904) GROUND CIRCUITS**

Disconnect the Front Left Fog Lamp harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z904) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z904) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z904) Ground circuit(s) at the Front Left Fog Lamp harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z904) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L89) Front Left Fog Lamp Control circuit.

Does the test light illuminate brightly with the fog lamp switch turned on, and shut off with the fog lamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C4 harness connector.

Measure the resistance between the (L89) Front Left Fog Lamp Control circuit and the Front Left Fog Lamp harness connector to the TIPM C4 connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L89) Front Left Fog Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L89) FRONT LEFT FOG LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure the voltage of the (L89) Front Left Fog Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L89) Front Left Fog Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B16FC-FRONT RIGHT FOG LAMP CONTROL CIRCUIT LOW

Additional Wiring

For complete wiring diagram refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the Front Fog Lamps activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a LOW condition.

Possible Causes

Possible Causes
(L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT SHORT TO GROUND
FRONT RIGHT FOG LAMP BULB
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Front Fog Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16FC- FRONT RIGHT FOG LAMP CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **FRONT RIGHT FOG LAMP BULB**

Turn the ignition off.

Disconnect the Front Right Fog Lamp Bulb.

Turn the ignition on.

With the scan tool, read DTC's.

Does the DTC reset?

Yes

Go To 3.

No

Replace the Front Right Fog Lamp Bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C4 harness connector.

Measure the resistance between ground and the Front Right Fog Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

No

Repair the (L90) Front Right Fog Lamp Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B16FD-FRONT RIGHT FOG LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
CHECK (Z904) GROUND CIRCUIT (Z904) GROUND CIRCUIT OPEN CHECK (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT OPEN (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE FRONT RIGHT FOG LAMP BULB TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Front Fog Lamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B16FD-FRONT RIGHT FOG LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK (Z904) GROUND CIRCUITS

Disconnect the Front Right Fog Lamp assembly harness connector.

With a 12-volt test light connected to 12-volts, probe each (Z904) Ground circuit.

Does the test light illuminate brightly on each ground circuit?

Yes

Go To 4.

No

Go To 3.

3. (Z904) GROUND CIRCUIT OPEN

Measure the resistance of the appropriate (Z904) Ground circuit(s) at the Front Right Fog Lamp harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the appropriate (Z904) Ground circuit(s) for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT

Turn the ignition on.

With a 12-volt test light connected to ground, check the (L90) Front Right Fog Lamp Control circuit.

Does the test light illuminate brightly with the fog lamp switch turned on, and shut off with the fog lamps turned off?

Yes

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C4 harness connector.

Measure the resistance of the (L90) Front Right Fog Lamp Control circuit between the Front Right Fog Lamp assembly harness connector and the TIPM C4 connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (L90) Front Right Fog Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

6. (L90) FRONT RIGHT FOG LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure the voltage of the (L90) Front Right Fog Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L90) Front Right Fog Lamp Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B17B8-LEFT STOP LAMP CONTROL CIRCUIT OVERCURRENT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a OVERCURRENT condition.

Possible Causes

Possible Causes
(L53) LEFT STOP LAMP CONTROL CIRCUIT SHORT TO GROUND
(L53) LEFT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Left Turn Signals on.

With the scan tool, read DTC's.

Does the scan tool read active: B17B8-LEFT STOP LAMP CONTROL CIRCUIT OVERCURRENT?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. LEFT STOP LAMP BULB

Turn the ignition off.

Remove Left Stop Lamp Bulb.

Inspect the Left Stop Lamp Bulb.

Is the inoperative bulb OK?

Yes

Go To 3.

No

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L53) LEFT STOP LAMP CONTROL CIRCUIT SHORT TO GROUND

Disconnect the TIPM C7 harness connector.

Disconnect the Left Stop Lamp harness connector.

Measure the resistance between ground and the (L53) Left Stop Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Go To 4.

No

Repair the (L53) Left Stop Lamp Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (L53) LEFT STOP LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L53) Left Stop Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L53) Left Stop Lamp Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B17BA-HEADLAMP LEVELING MOTOR CONTROL CIRCUIT OVERCURRENT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a OVERCURRENT condition.

Possible Causes

Possible Causes
(L133) HEADLAMP LEVELING MOTOR CONTROL CIRCUIT SHORT TO GROUND
(L133) HEADLAMP LEVELING MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Headlamps on.

With the scan tool, read DTC's.

Does the scan tool display active: B17BA-HEADLAMP LEVELING MOTOR CONTROL CIRCUIT OVERCURRENT?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (L133) HEADLAMP LEVELING MOTOR CONTROL CIRCUIT SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Disconnect the Headlamp harness connector.

Measure the resistance between ground and the (L133) Headlamp Leveling Motor Control circuit.

Is the resistance above 10k ohms?

Yes

Go To 3.

No

Repair the (L133) Headlamp Leveling Motor Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L133) HEADLAMP LEVELING MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L133) Headlamp Leveling Motor Control circuit.

Is there any voltage present?

Yes

Repair the (L133) Headlamp Leveling Motor Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B17BD-LEFT SIDEMARKER LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
(L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT OPEN
(L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B17BD-LEFT SIDEMARKER LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. LEFT REAR TURN SIGNAL BULB

Turn the ignition off.

Remove Left Rear Turn Signal Bulb.

Inspect the Left Rear Turn Signal Bulb.

Is the inoperative bulb OK?

Yes

Go To 3.

No

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT OPEN

Disconnect the TIPM C4 harness connector.

Disconnect the Left Sidemarker Lamp assembly harness connector.

Measure the resistance of the (L163) Left Sidemarker Lamp Control circuit between the Left Sidemarker Lamp assembly harness connector and the TIPM C4 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L163) Left Sidemarker Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L163) Left Sidemarker Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L163) Left Sidemarker Lamp Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

B17BF-LEFT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a OVERCURRENT condition.

Possible Causes

Possible Causes
(L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORT TO GROUND (L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B17BF-LEFT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **LEFT REAR TURN SIGNAL BULB**

Turn the ignition off.

Remove Left Rear Turn Signal Bulb.

Inspect the Left Rear Turn Signal Bulb.

Is the inoperative bulb OK?

Yes

Go To 3.

No

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORT TO GROUND**

Disconnect the TIPM C4 harness connector.

Disconnect the Left Sidemarkers Lamp harness connector.

Measure the resistance between ground and the (L163) Left Sidemarkers Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Go To 4.

No

Repair the (L163) Left Sidemarkers Lamp Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (L163) LEFT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L163) Left Sidemarker Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L163) Left Sidemarker Lamp Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B17C2-RIGHT SIDEMARKER LAMP CONTROL CIRCUIT HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:

When the Totally Integrated Power Module (TIPM) detects a HIGH condition.

Possible Causes

Possible Causes
(L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OPEN
(L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Right Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B17C2-RIGHT SIDEMARKER LAMP CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. RIGHT REAR TURN SIGNAL BULB

Turn the ignition off.

Remove Right Rear Turn Signal Bulb.

Inspect the Right Rear Turn Signal Bulb.

Is the inoperative bulb OK?

Yes

Go To 3.

No

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OPEN

Disconnect the TIPM C4 harness connector.

Disconnect the Right Sidemarker Lamp assembly harness connector.

Measure the resistance of the (L162) Right Sidemarkers Lamp Control circuit between the Right Sidemarkers Lamp assembly harness connector and the TIPM C4 harness connector.

Does the ohm meter read open circuit?

Yes

Repair the (L162) Right Sidemarkers Lamp Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L162) Right Sidemarkers Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L162) Right Sidemarkers Lamp Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B17C4-RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects a OVERCURRENT condition.

Possible Causes

Possible Causes
(L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORT TO GROUND
(L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's

Turn the Left Turn Signal on.

With the scan tool, read DTC's.

Does the scan tool display active: B17C4-RIGHT SIDEMARKER LAMP CONTROL CIRCUIT OVERCURRENT?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2. RIGHT REAR TURN SIGNAL BULB

Turn the ignition off.

Remove Right Rear Turn Signal Bulb.

Inspect the Right Rear Turn Signal Bulb.

Is the inoperative bulb OK?

Yes

Go To 3.

No

Replace the Inoperative bulb in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORT TO GROUND

Disconnect the TIPM C4 harness connector.

Disconnect the Right Sidemarker Lamp harness connector.

Measure the resistance between ground and the (L162) Right Sidemarker Lamp Control circuit.

Is the resistance above 10k ohms?

Yes

Go To 4.

No

Repair the (L162) Right Sidemarker Lamp Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (L162) RIGHT SIDEMARKER LAMP CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (L162) Right Sidemarker Lamp Control circuit.

Is there any voltage present?

Yes

Repair the (L162) Right Sidemarker Lamp Control circuit short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Lamps/lighting - Exterior - Service Information - Liberty

LAMPS/LIGHTING - EXTERIOR - SERVICE INFORMATION

DESCRIPTION

LAMPS/LIGHTING - EXTERIOR

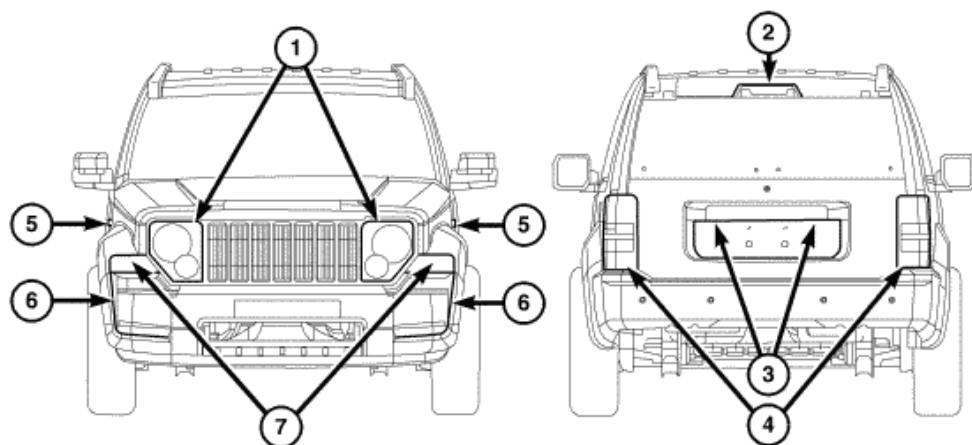


Fig. 1: Exterior Lighting System
Courtesy of CHRYSLER LLC

The exterior lighting system for this vehicle includes the following exterior lamp units:

- **Center High Mounted Stop Lamp (2)** - A standard equipment Center High Mounted Stop Lamp (CHMSL) is centered on the upper liftgate header above the liftgate glass opening at the rear of the vehicle.
- **Front Lamp Units (1)** - A standard equipment front lamp unit is located at each outboard end of the grille assembly in the front end module.
- **Front Park/Turn Signal Lamps (7)** - Standard equipment front park/turn signal lamp units are mounted to each forward-facing end of the front fascia, adjacent to the front lamp units.
- **Front Side Marker Lamps (6)** - Standard equipment front side marker lamp units are mounted to each outboard-facing end of the front fascia on domestic market vehicles. On export market vehicles these lamps are replaced by a non-illuminated white reflector.
- **License Plate Lamps (3)** - Two standard equipment rear license plate lamp units are integral to the light bar assembly, just above the license plate tub formation in the outer liftgate panel.
- **Rear Lamp Units (4)** - A standard equipment rear lamp unit is mounted to the rear of each quarter panel on either side of the liftgate opening.
- **Repeater Lamps (5)** - A repeater lamp is mounted to each front fender just behind the front wheel opening on vehicles manufactured for export market vehicles where they are required.

These exterior lighting lamp units and their controls are combined to provide the following exterior lighting

features:

- **Backup Lamps** - The backup (or reverse) lamps include a clear bulb, reflector and clear lens that are integral to each rear lamp unit.
- **Brake Lamps** - The brake (or stop) lamps include a clear bulb, reflector and red lens that are integral to each rear lamp unit, and the red lens and multiple Light-Emitting Diode (LED) units of the CHMSL.
- **Daytime Running Lamps** - Vehicles manufactured for sale in Canada illuminate the high beam headlamp bulb in each front lamp unit at a reduced intensity to serve as the Daytime Running Lamps (DRL). United States fleet vehicles illuminate the low beam headlamp bulb in each front lamp unit to serve as DRL.
- **Exterior Lamp Fail-Safe Operation** - The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and the Totally Integrated Power Module (TIPM) provide a fail-safe feature which will automatically turn ON the low beam headlamps and all park lamps when the ignition switch is in the ON position and there is no detected input from the Steering Control Module (SCM), or when there is no communication over the Local Interface Network (LIN) or Controller Area Network (CAN) data buses.
- **Exterior Lamp Load Shedding** - The TIPM provides a battery saver feature which will automatically turn OFF all exterior lamps (except park lamps in certain markets) that remain ON with the ignition switch in the LOCK position after a timed interval of about eight minutes.
- **Front Fog Lamps** - The standard equipment front fog lamps include the clear bulb, adjustable reflector and clear lens integral to each front lamp unit.
- **Hazard Warning Lamps** - The hazard warning lamps include the bulbs, reflectors and lenses of each lamp in the right and left, front and rear turn signal circuits.
- **Headlamp Delay** - The standard equipment low or high beam headlamps remain illuminated for a customer-programmable delay period of 0 (disabled), 30, 60 or 90 seconds when the headlamps are turned OFF after the ignition switch has been turned to the OFF position.
- **Headlamps** - The headlamps include a single, dual filament halogen bulb, an adjustable reflector and a clear lens integral to each front lamp unit.
- **Headlamp Leveling** - Headlamp leveling is available only in certain markets where it is required equipment. A headlamp leveling actuator motor on each headlamp unit and a headlamp leveling switch integral to the switch pod in the instrument panel allow the headlamp beam pattern to be adjusted by the vehicle operator from the interior of the vehicle to compensate for passenger or cargo loads.
- **Optical Horn** - Also known as flash-to-pass, the beam selection function of the left (lighting) multi-function switch control stalk has a momentary intermediate position that allows the headlamp high beams to be flashed momentarily, without changing the headlamp beam selection.
- **Park Lamps** - The front park lamps include the amber bulbs, the reflectors and the clear lenses of the front park/turn signal lamp units as well as the clear bulbs and the amber lenses of the front side marker lamps or the clear position lamp bulb integral to each front lamp unit. The rear park lamps include a clear bulb, a reflector and a red lens integral to each rear lamp unit as well as the clear bulb and lens of the license plate lamp units.
- **Rear Fog Lamps** - Rear fog lamps are available only in certain markets where they are required equipment. The rear fog lamps include a clear bulb, a reflector and a red lens that are integral to each rear lamp unit.
- **Turn Signal Lamps** - The front turn signal lamps include an amber bulb, a reflector, and a clear lens that are integral to each front park/turn signal lamp unit and the front side marker lamps. In certain markets

where required, the repeater lamps on each front fender replace the front side marker lamps in the front turn signal circuits. The rear turn signal lamps include a clear bulb, a reflector and a red lens integral to each rear lamp unit for domestic market vehicles, or an amber bulb and a clear lens for export market vehicles.

Other components of the exterior lighting system for this vehicle include:

- **Backup Lamp Switch** - A plunger-type backup lamp switch is installed through the transmission housing of vehicles equipped with a manual transmission and is actuated by the shifter mechanism within the transmission when REVERSE gear is selected. On vehicles with an optional automatic transmission a stand-alone Transmission Range Sensor (TRS) performs the backup lamp switch function.
- **Brake Lamp Switch** - A plunger-type brake lamp switch is located on the brake pedal support bracket under the instrument panel and is actuated by the brake pedal arm when the brake pedal is depressed.
- **Clockspring** - The clockspring includes an integral turn signal cancel cam, which provides automatic turn signal cancellation as the steering wheel is rotated back to its centered position following a vehicle turning maneuver. The clockspring is located near the top of the steering column, directly beneath the steering wheel. Refer to **DESCRIPTION** .
- **Hazard Switch** - A latching push button-actuated hazard switch is integral to the switch pod located just below the heater and air conditioner controls in the center stack area of the instrument panel.
- **Headlamp Leveling Switch** - A four mode push button-actuated headlamp leveling switch is integral to the switch pod located just below the heater and air conditioner controls in the center stack area of the instrument panel of vehicles manufactured for certain markets where the headlamp leveling feature is required.
- **Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) is also known as the Cab Compartment Node (CCN) in this vehicle. The EMIC/CCN is located in the instrument panel above the steering column opening, directly in front of the driver. Refer to **DESCRIPTION** .
- **Instrument Panel Switch Pod** - The instrument panel switch pod contains the hazard switch and, on vehicles so equipped, the headlamp leveling switch. The switch pod is located just below the heater and air conditioner controls in the center stack area of the instrument panel. Refer to **DESCRIPTION** .
- **Left Multi-Function Switch** - The left (lighting) multi-function switch is located on the steering column, just below the steering wheel. A control stalk that extends from the left side of the switch is used to select the turn signal lamps (right or left) and to select the headlamp beam (low, high or optical horn). A control knob on the control stalk is used to select the park lamps, headlamps or fog lamps.
- **Park Brake Switch** - A park brake switch is located on the park brake lever mechanism on the floor panel transmission tunnel between the two front seats.
- **Steering Control Module** - The Steering Control Module (SCM) is located within the left multi-function switch housing on the top of the steering column, just below the steering wheel. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. Refer to **DESCRIPTION** .
- **Trailer Tow Wiring Adapter** - Vehicles equipped with a factory-installed trailer towing package have a wiring adapter provided that adapts the factory-installed heavy duty 7-way trailer tow connector to a conventional 4-way light duty connector.
- **Trailer Tow Connector** - Vehicles equipped with a factory-installed trailer towing package have a heavy duty 7-way trailer tow connector installed in a bracket on the trailer hitch receiver.

Hard wired circuitry connects the exterior lighting system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the exterior lighting components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

OPERATION

LAMPS/LIGHTING - EXTERIOR

Following are paragraphs that briefly describe the operation of each of the major exterior lighting systems. The lamps and the hard wired circuits between components related to the exterior lighting system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the exterior lighting system or the electronic controls or communication between modules and other devices that provide some features of the exterior lighting system. The most reliable, efficient, and accurate means to diagnose the exterior lighting system or the electronic controls and communication related to exterior lighting system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

BACKUP LAMPS

The backup (or reverse) lamps have a path to ground at all times through a takeout and eyelet terminal of the unibody wire harness that is secured by a nut to a ground stud on the body sheet metal within the passenger compartment. On vehicles with a manual transmission, the backup lamp switch provides a hard wired input to the Totally Integrated Power Module (TIPM) through a reverse switch signal circuit and the TIPM provides battery voltage to the backup lamps on the backup lamp feed circuit whenever the ignition switch is not in the LOCK position and the REVERSE position is selected with the transmission shift linkage.

On vehicles with an automatic transmission the Powertrain Control Module (PCM) or the Transmission Control Module (TCM) monitors a multiplex input from the Transmission Range Sensor (TRS), then sends the proper electronic **transmission gear selector status** messages to the TIPM over the Controller Area Network (CAN) data bus. Whenever the ignition switch is not in the LOCK position and the TIPM receives an electronic message indicating the status of the transmission gear selector is REVERSE, it provides a battery voltage output through a high side driver to the backup lamps on the backup lamp feed circuit.

BRAKE LAMPS

The brake (or stop) lamps and the Center High Mounted Stop Lamp (CHMSL) each have a path to ground at all times through a takeout and eyelet terminal of the body wire harness that is secured by a nut to a ground stud on the body sheet metal within the passenger compartment. The CHMSL receives battery voltage directly on the brake lamp switch output circuit when the brake lamp switch is closed by the brake pedal arm. The TIPM also

receives battery voltage on the brake lamp switch output circuit, which it uses as a logic input to energize the brake lamps. The TIPM provides battery voltage to the brake lamps through two high side drivers on the tail/stop lamp rear feed circuit when it receives the proper input from the closed brake lamp switch.

DAYTIME RUNNING LAMPS

Vehicles manufactured for sale in Canada illuminate the high beam filament of both headlamp bulbs at a reduced intensity when the engine is running, the parking brake is released, the headlamps are turned OFF, and the optional automatic transmission gear selector lever is in any position except PARK. The park lamps may be ON or OFF for DRL to operate. For vehicles with a manual transmission, the Daytime Running Lamps (DRL) will operate in any transmission gear selector lever position. In fleet vehicles manufactured for the U. S. and Mexican markets, DRL operates in the same manner, but the low beam filament of both headlamp bulbs is used rather than the high beam filament. The TIPM must be programmed appropriately for this feature to be enabled.

Once enabled, anytime the TIPM receives electronic messages over the CAN data bus from the Powertrain Control Module (PCM) indicating the engine is running, from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) indicating the status of the left (lighting) multi-function switch is in any position except headlamps ON and the parking brake lever is released, and from the Powertrain Control Module (PCM) or the Transmission Control Module (TCM) indicating the automatic transmission gear selector lever is in any position except PARK, the TIPM provides a pulse width modulated voltage output to the headlamp high beam bulb filaments through high side drivers on the right and left high or low beam feed circuits to produce illumination at a reduced intensity.

FRONT FOG LAMPS

The front fog lamps have a path to ground at all times through their connection to the engine compartment wire harness. The engine compartment wire harness has takeouts with eyelet terminals that are secured by nuts to ground studs on the front end sheet metal within the engine compartment. The Steering Control Module (SCM) monitors a hard wired multiplex input from the left multi-function switch to determine whether the fog lamps are selected, then sends an electronic **front fog lamp switch status** message to the EMIC over the Local Interface Network (LIN) data bus and the EMIC relays an electronic **front fog lamp request** message to the TIPM over the CAN data bus.

When the TIPM receives a **front fog lamp request** message it then controls front fog lamp operation by controlling a battery voltage output through high side drivers on right and left fog lamp feed circuits. The TIPM also sends the appropriate electronic message back to the EMIC to illuminate or extinguish the front fog lamp indicator. In certain markets where required, the TIPM will automatically de-energize the front fog lamps any time the headlamp high beams are selected.

The TIPM also provides a battery saver (load shedding) feature for the front fog lamps, which will turn these lamps OFF if they are left ON for more than about eight minutes with the ignition switch in the LOCK position or if there is a charging system failure.

Each front fog lamp shares a reflector with the headlamp and is adjusted in concert with the headlamp for the same side of the vehicle.

HAZARD WARNING LAMPS

The hazard warning system includes the EMIC, the TIPM and the hazard switch in the switch pod located in the center stack area of the instrument panel, below the air conditioner and heater controls. The hazard switch provides a hard wired input to the TIPM. When the TIPM receives an input from the hazard switch it controls hazard warning system operation and flash rate by controlling battery voltage outputs through high side drivers on the right and left turn signal feed circuits.

The TIPM also sends the appropriate electronic messages back to the EMIC over the CAN data bus to control the illumination and flash rate of the right and left turn signal indicators, as well as to control the click rate of an electromechanical relay soldered onto the EMIC electronic circuit board that emulates the sound emitted by a conventional hazard warning flasher.

HEADLAMPS

The headlamp system includes the SCM, the EMIC, the TIPM, and the left (lighting) multi-function switch on the steering column. The headlamp bulbs have a path to ground at all times through their connection to the engine compartment wire harness. The engine compartment harness has takeouts with eyelet terminals that are secured by nuts to ground studs on the front end sheet metal within the engine compartment. The TIPM will store a Diagnostic Trouble Code (DTC) for any shorts or opens in the headlamp circuits.

The SCM monitors a hard wired multiplex input to determine the status of the left multi-function switch and whether the headlamp high or low beams are selected. The SCM then sends the appropriate electronic **headlamp switch** and **headlamp beam select switch status** messages to the EMIC over the LIN data bus. The EMIC then sends the appropriate electronic **headlamp request** and **headlamp beam request** messages to the TIPM over the CAN data bus. The TIPM responds to these messages by providing a pulse width modulated voltage output to the headlamps through high side drivers on the right and left low and high beam feed circuits to illuminate the selected headlamp filaments. The TIPM also sends the appropriate electronic messages to the EMIC to control the illumination of the high beam indicator. When the optical horn feature is selected, the low beams will shut OFF about 200 milliseconds after the high beams are activated.

The TIPM also remembers which beams (LOW or HIGH) were selected when the headlamps were last turned OFF, and energizes those beams again the next time the headlamps are turned ON. The TIPM provides a battery saver (load shedding) feature for the headlamps, which will turn these lamps OFF if they are left ON for more than about eight minutes with the ignition switch in the LOCK position. The SCM and the EMIC each provide a fail-safe feature for the headlamps, which will cause the TIPM to turn the low beam headlamps ON automatically if there is no input available from the left multi-function switch. The TIPM also provides a fail-safe feature for the headlamps that will turn the headlamps ON automatically whenever a loss of CAN bus communication is detected with the ignition switch in the ON position.

Each headlamp includes an integral reflector adjustment screw (domestic markets) or screws (export markets) to be used for static aiming of the headlamps and front fog lamps.

HEADLAMP DELAY

The headlamp delay feature includes the left (lighting) multi-function switch, the SCM, the EMIC and the TIPM. This feature has customer programmable delay intervals of 0 seconds (disabled), 30 seconds, 60 seconds and 90 seconds. If the left multi-function switch remains in the headlamp ON position until after the ignition switch is turned to the OFF position, then the headlamps will remain illuminated until after the selected delay interval has elapsed. The park lamps will not stay ON during the headlamp delay interval. The default delay

interval is zero seconds (disabled), but can be reprogrammed by the customer using the customer programmable features function of the EMIC.

HEADLAMP LEVELING

In certain markets where required, a headlamp leveling system is provided on the vehicle. The headlamp leveling system includes unique front headlamp units each connected to a headlamp leveling actuator motor, and a rocker-actuated headlamp leveling switch integral to the switch pod in the instrument panel center stack. The headlamp leveling system allows the headlamp beams to be adjusted to one of four vertical positions to compensate for changes in inclination caused by the loading of the vehicle suspension. The leveling motors are mechanically connected through an integral pushrod to the adjustable headlamp mounting collar.

Each time the headlamp leveling switch is depressed the circuitry of the switch pod provides an electronic **select status up** or **select status down** message input to the EMIC over the LIN data bus. The EMIC then sends the appropriate electronic **select request up** or **select request down** messages to the TIPM over the CAN data bus. The TIPM responds to these messages by providing a voltage output to the headlamp leveling motors through high side drivers on the headlamp leveling motor right and left signal circuits to move the headlamp reflectors to the selected position based upon the voltage input received from the TIPM. The TIPM also sends the appropriate electronic messages back to the EMIC and the EMIC relays the message back to the switch to control the illumination of the **1**, **2**, or **3** Light Emitting Diode (LED) selected position indicator in the leveling switch button. The EMIC and TIPM logic will only allow the headlamp leveling system to operate while the ignition switch is in the ON position and the exterior lighting is turned ON.

PARK LAMPS

The park lamps system includes the left (lighting) multi-function switch, the SCM, the EMIC and the TIPM. The front park/turn lamp and the position lamp bulbs each have a path to ground at all times through their connection to the engine compartment wire harness. The engine compartment wire harness has takeouts with eyelet terminals that are secured by nuts to ground studs on the front end sheet metal within the engine compartment. The rear lamp units and license plate lamp bulbs have a path to ground at all times through a takeout and eyelet terminal of the body wire harness that is secured by a nut to a ground stud on the body sheet metal within the passenger compartment.

The SCM monitors a hard wired multiplex input from the left multi-function switch, then sends the appropriate electronic **headlamp switch status** messages to the EMIC over the LIN data bus. Then the EMIC relays the appropriate electronic message to the TIPM over the CAN data bus. The TIPM responds to these messages by providing a battery voltage output to the appropriate lamp bulbs through high side drivers on the proper park/tail/license/running lamp right and left circuits. The TIPM and the SCM also send the appropriate electronic messages to the EMIC to control the illumination and lighting level of the panel lamps.

The TIPM provides a battery saver (load shedding) feature for the park lamps, which will turn these lamps OFF if they are left ON for more than about eight minutes with the ignition switch in the LOCK position. The SCM and the EMIC each provide a fail-safe feature for the park lamps, which will send an electronic message to the TIPM to turn these lamps ON automatically if there is no input available from the left multi-function switch. The TIPM also provides a fail-safe feature for the park lamps that will turn these lamps ON automatically whenever a loss of CAN bus communication is detected with the ignition switch in the ON position.

REAR FOG LAMPS

Rear fog lamps are installed on vehicles manufactured for all export markets. The rear fog lamp system includes the left (lighting) multi-function switch, the SCM, the EMIC and the TIPM. The rear fog lamp bulbs have a path to ground at all times through a takeout and eyelet terminal of the body wire harness that is secured by a nut to a ground stud on the body sheet metal within the passenger compartment.

The SCM monitors a hard wired multiplex input from the left multi-function switch to determine whether the rear fog lamps are selected, then sends electronic **rear fog lamp switch status** messages to the EMIC over the LIN data bus. Then the EMIC relays an electronic **rear fog lamp request** message to the TIPM over the CAN data bus. The TIPM responds to this message by providing a battery voltage output to the rear fog lamp bulbs through high side drivers on the fog lamp relay control rear circuit. The TIPM also sends the appropriate electronic message back to the EMIC to control the rear fog lamp indicator.

The TIPM will automatically energize and de-energize the front fog lamps in concert with the rear fog lamps. The TIPM also provides a battery saver (load shedding) feature for the rear fog lamps, which will turn these lamps OFF if they are left ON for more than about eight minutes with the ignition switch in the LOCK position.

TRAILER TOW WIRING

Domestic market vehicles equipped with an optional trailer tow package include a trailer tow take out of the body wire harness connected to a molded, seven-way trailer tow connector and an integral cover that are snapped into a bracket on the trailer hitch receiver platform.

TURN SIGNAL LAMPS

The turn signal lamps system includes the left (lighting) multi-function switch, the SCM, the EMIC and the TIPM. The front turn signal lamp bulbs each have a path to ground at all times through their connection to the engine compartment wire harness. The engine compartment wire harness has a takeout with an eyelet terminal that is secured by a nut to a ground stud on the body sheet metal within the engine compartment. The rear turn signal lamp bulbs have a path to ground at all times through a takeout and eyelet terminal of the body wire harness that is secured by a nut to a ground stud on the body sheet metal within the passenger compartment.

The SCM monitors a hard wired multiplex input from the left multi-function switch to determine the status of the turn signal switch, then sends the appropriate electronic **turn signal switch status** messages to the EMIC over the LIN data bus. Then the EMIC relays an electronic **turn signal request** message to the TIPM over the CAN data bus. The TIPM responds to these messages by controlling a battery voltage output and the flash rate for either the right or left turn signal lamps through high side drivers on the appropriate right or left turn signal feed circuits. The TIPM also sends the appropriate electronic messages back to the EMIC to control the illumination and flash rate of the right or left turn signal indicators, as well as to control the click rate of an electromechanical relay soldered onto the EMIC electronic circuit board that emulates the sound emitted by a conventional turn signal flasher.

The EMIC also provides a **turn signal ON warning** that will generate repetitive chimes to indicate that a turn signal has been active continuously for 1.6 kilometers (1 mile) with the vehicle speed greater than 22 kilometers-per-hour (15 miles-per hour). Vehicles built for markets other than the United States and Canada have a revised distance threshold of 4 kilometers (2.49 miles) for this feature. The chime will continue until the turn signal input becomes inactive or until the vehicle speed message indicates that the speed is less than 22 kilometers-per-hour (15 miles-per-hour), whichever occurs first.

WARNING

LAMPS/LIGHTING - EXTERIOR

WARNING: To avoid serious or fatal injury eye protection should be used when servicing any glass components.

CAUTION: Do not contaminate the glass of halogen bulbs with fingerprints or allow contact with other possibly oily surfaces. Reduced bulb life will result.

CAUTION: Do not use bulbs with higher candle power than indicated in the **BULB APPLICATION TABLE**. See **SPECIFICATIONS**. In addition, do not use fuses, circuit breakers or relays having greater amperage value than indicated on the fuse panel or in the Owner's Manual. Damage to lamps, lenses, wiring and other related electrical components can result.

DIAGNOSIS AND TESTING

LAMPS/LIGHTING - EXTERIOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: When diagnosing the exterior lighting circuits, remember that high generator output can burn out bulbs rapidly and repeatedly; and, that dim or flickering bulbs can be caused by low generator output or poor battery condition. If one of these symptoms is a problem on the vehicle, be certain to diagnose the battery and charging system, then repair as necessary.

NOTE: A good ground is necessary for proper lighting operation. If a lighting problem is being diagnosed that involves multiple symptoms, systems, or components, the problem can often be traced to a loose, corroded, or open ground.

The lamps and the hard wired circuits between components related to the exterior lighting system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the exterior lighting system or the electronic controls or communication between modules and other devices that provide some features of the exterior lighting system. The most reliable, efficient, and accurate means to diagnose the exterior lighting system or the electronic controls and communication related to exterior lighting system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

BACKUP LAMPS

CONDITION	POSSIBLE CAUSES	CORRECTION
BACKUP LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit. 4. Ineffective switch. 5. Ineffective TIPM inputs or outputs.	1. Test and replace backup lamp bulb if required. 2. Test and repair open backup lamp ground circuit if required. 3. Test and repair open backup lamp feed circuit if required. 4. Test and replace backup lamp switch (manual transmission) or transmission range sensor (automatic transmission) if required. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
BACKUP LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Ineffective switch. 3. Ineffective TIPM inputs or outputs.	1. Test and repair shorted backup lamp feed circuit if required. 2. Test and replace backup lamp switch (manual transmission) or transmission range sensor (automatic transmission) if required. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

BRAKE LAMPS

NOTE: The Center High Mounted Stop Lamp (CHMSL) is illuminated by several Light-Emitting Diode (LED) units that are soldered to the electronic circuit board within the lamp housing. The CHMSL is hard wired to the output of the brake lamp switch, while the brake lamps are powered by high side drivers within the TIPM based upon an input from the brake lamp switch. If the brake lamps and all of the LED units within the CHMSL fail to operate, diagnose and repair the brake lamps before attempting to repair the CHMSL. If the brake lamps operate but none of the CHMSL LED units illuminate, test and repair the CHMSL ground or feed circuit if required. If some of the CHMSL LED units operate and others do not, the CHMSL assembly must be replaced with a new unit.

CONDITION	POSSIBLE CAUSES	CORRECTION

BRAKE LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective fuse. 4. Ineffective feed circuit. 5. Ineffective switch. 6. Ineffective TIPM inputs or outputs.	1. Test and replace brake lamp bulb if required. 2. Test and repair open brake lamp ground circuit if required. 3. Test and replace the fuse in the TIPM if required. 4. Test and repair open brake lamp switch output circuit or stop lamp output circuit if required. 5. Test and replace brake lamp switch if required. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
BRAKE LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Improperly adjusted switch. 3. Ineffective switch. 4. Ineffective TIPM inputs or outputs.	1. Test and repair shorted brake lamp switch output circuit or stop lamp output circuit if required. 2. Adjust the brake lamp switch if required. 3. Test and replace brake lamp switch if required. 4. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

DAYTIME RUNNING LAMPS

NOTE: Before performing the following tests, determine whether the headlamp low and high beams operate. If the headlamp low and high beams are also ineffective, diagnose and repair that problem before attempting to repair the Daytime Running Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
DAYTIME RUNNING LAMPS WILL NOT ILLUMINATE	1. Incorrect TIPM programming. 2. Automatic transmission in PARK position. 3. Parking brake applied. 4. Engine not running. 5. Ineffective TIPM inputs or outputs.	1. Use a diagnostic scan tool to check and configure TIPM if required. 2. Place the transmission gear selector lever in any position except PARK. 3. Release the parking brake. 4. Start the engine. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

FRONT FOG LAMPS

NOTE: The front fog lamp switch is integral to the left multi-function switch/Steering Control Module (SCM), which communicates with the ElectroMechanical Instrument Cluster (EMIC)/Cab Compartment Node (CCN) over the Local Interface Network (LIN) data bus. Before performing any of the following tests, determine whether the other functions of the left multi-function switch/SCM are operational. If the other left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Front Fog Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT FOG LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit. 4. Ineffective EMIC (CCN) inputs or outputs. 5. Ineffective TIPM inputs or outputs.	1. Test and replace front fog lamp bulb if required. 2. Test and repair open front fog lamp ground circuit if required. 3. Test and repair open front fog lamp feed circuit if required. 4. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
FRONT FOG LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Ineffective EMIC (CCN) inputs or outputs. 3. Ineffective TIPM inputs or outputs.	1. Test and repair shorted front fog lamp feed circuit if required. 2. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

HAZARD WARNING LAMPS

NOTE: The hazard switch is integral to the instrument panel switch bank, which communicates with the EMIC/CCN over the LIN data bus. Before performing any of the following tests, confirm whether the left and right turn signals operate satisfactorily. Then determine whether the other functions of the instrument panel switch bank are operational. If the turn signals are ineffective or operate improperly, or if the other instrument panel switch bank functions are ineffective, diagnose and repair those problems before attempting to repair the Hazard Warning Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
HAZARD WARNING LAMPS DO NOT FLASH	1. Ineffective EMIC (CCN) inputs or outputs.	1. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information.

	2. Ineffective TIPM inputs or outputs.	2. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
HAZARD WARNING LAMPS DO NOT STOP FLASHING	1. Ineffective EMIC (CCN) inputs or outputs. 2. Ineffective TIPM inputs or outputs.	1. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 2. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

HEADLAMPS

NOTE: As part of the exterior lighting failsafe feature, upon ignition ON, all exterior park lamps and the headlamp low beams will illuminate regardless of the left multi-function switch control knob position if the SCM cannot detect an input from the left multi-function switch, or if there is a loss of communication between the left multi-function switch/SCM and the EMIC or between the EMIC and the TIPM. Diagnose and repair those problems before attempting to repair the Headlamps. In addition, the TIPM will store a Diagnostic Trouble Code (DTC) for an open or shorted headlamp circuit.

CONDITION	POSSIBLE CAUSES	CORRECTION
HEADLAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit. 4. Ineffective EMIC (CCN) inputs or outputs. 5. Ineffective TIPM inputs or outputs.	1. Test and replace headlamp bulb if required. 2. Test and repair open headlamp ground circuit if required. 3. Test and repair open headlamp low beam or high beam feed circuit if required. 4. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
HEADLAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Ineffective EMIC (CCN) inputs or outputs. 3. Ineffective TIPM inputs or outputs.	1. Test and repair shorted headlamp low beam or high beam feed circuit if required. 2. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
HEADLAMPS ILLUMINATE WITH IGNITION ON AND	1. Loss of LIN or CAN data bus communication.	1. Test and repair the LIN or CAN data bus if required. Refer to the appropriate

HEADLAMP SWITCH OFF (FAIL-SAFE OPERATION)		diagnostic information.
HEADLAMPS WILL NOT SWITCH FROM HIGH TO LOW BEAMS, OR FROM LOW TO HIGH BEAMS	1. Ineffective EMIC (CCN) inputs or outputs. 2. Ineffective TIPM inputs or outputs.	1. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 2. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

HEADLAMP LEVELING

NOTE: **The headlamp leveling switch is integral to the instrument panel switch bank, which communicates with the EMIC/CCN over the LIN data bus. Before performing any of the following tests, confirm whether the park lamps operate satisfactorily. Then determine whether the other functions of the instrument panel switch bank are operational. If the park lamps are ineffective or operate improperly, or if the other instrument panel switch bank functions are ineffective, diagnose and repair those problems before attempting to repair the Headlamp Leveling function.**

CONDITION	POSSIBLE CAUSES	CORRECTION
ONE LEVELING MOTOR IS INEFFECTIVE	1. Ineffective ground circuit. 2. Ineffective feed circuit. 3. Ineffective signal circuit. 4. Ineffective motor.	1. Test and repair open leveling motor ground circuit if required. 2. Test and repair open leveling motor feed circuit if required. 3. Test and repair open headlamp leveling motor signal circuit if required. 4. Test and replace headlamp leveling motor if required.
BOTH LEVELING MOTORS ARE INEFFECTIVE	1. Ineffective EMIC (CCN) inputs or outputs. 2. Ineffective motor ground circuit. 3. Ineffective motor feed circuit. 4. Ineffective signal circuit. 5. Ineffective TIPM inputs or outputs. 6. Ineffective motors.	1. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 2. Test and repair open leveling motor ground circuit if required. 3. Test and repair open leveling motor feed circuit if required. 4. Test and repair open or shorted headlamp leveling motor signal circuit if required. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 6. Test and replace leveling motors if required.

PARK LAMPS

NOTE: As part of the exterior lighting failsafe feature, upon ignition ON, all exterior park lamps and the headlamp low beams will illuminate regardless of the left multi-function switch control knob position if the SCM cannot detect an input from the left multi-function switch, or if there is a loss of communication between the left multi-function switch/SCM and the EMIC or between the EMIC and the TIPM. Diagnose and repair those problems before attempting to repair the Park Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
PARK LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit. 4. Ineffective EMIC (CCN) inputs or outputs. 5. Ineffective TIPM inputs or outputs.	1. Test and replace park lamp bulb if required. 2. Test and repair open park lamp ground circuit if required. 3. Test and repair open park lamp feed circuit if required. 4. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
PARK LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Ineffective EMIC (CCN) inputs or outputs. 3. Ineffective TIPM inputs or outputs.	1. Test and repair shorted park lamp feed circuit if required. 2. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

REAR FOG LAMPS

NOTE: The rear fog lamp switch is integral to the left multi-function switch/SCM, which communicates with the EMIC/CCN over the LIN data bus. Before performing any of the following tests, determine whether the other functions of the left multi-function switch/SCM are operational. If the other left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Rear Fog Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
REAR FOG LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit.	1. Test and replace rear fog lamp bulb if required. 2. Test and repair open rear fog lamp ground circuit if required. 3. Test and repair open fog lamp relay

	4. Ineffective EMIC (CCN) inputs or outputs. 5. Incorrect TIPM configuration. 6. Ineffective TIPM inputs or outputs.	control rear circuit if required. 4. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to check and correct the TIPM configuration settings if required. Refer to the appropriate diagnostic information. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
REAR FOG LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit. 2. Ineffective EMIC (CCN) inputs or outputs. 3. Ineffective TIPM inputs or outputs.	1. Test and repair shorted fog lamp relay control rear circuit if required. 2. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.

TURN SIGNAL LAMPS

NOTE: The turn signal switch is integral to the left multi-function switch/SCM, which communicates with the EMIC/CCN over the LIN data bus. Before performing any of the following tests, determine whether the other functions of the left multi-function switch/SCM are operational. If the other left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Turn Signal Lamps.

CONDITION	POSSIBLE CAUSES	CORRECTION
ONE TURN SIGNAL LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit. 4. Ineffective TIPM inputs or outputs.	1. Test and replace turn signal bulb if required. 2. Test and repair open ground circuit if required. 3. Test and repair open right or left turn signal feed circuit if required. 4. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information.
ALL RIGHT SIDE OR ALL LEFT SIDE TURN SIGNAL LAMPS (OR BOTH SIDES) DO NOT FLASH	1. Ineffective feed circuit. 2. Ineffective EMIC (CCN) inputs or outputs. 3. Ineffective TIPM inputs or outputs.	1. Test and repair open right or left turn signal feed circuit if required. 2. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the

		appropriate diagnostic information.
ALL RIGHT SIDE OR ALL LEFT SIDE TURN SIGNALS FLASH TOO RAPIDLY (MORE THAN 100 FLASHES PER MINUTE)	1. Ineffective or missing bulb. 2. Ineffective ground circuit. 3. Ineffective feed circuit.	1. Test and replace turn signal bulb if required. 2. Test and repair open bulb ground circuit if required. 3. Test and repair open right or left turn signal feed circuit if required.
TURN SIGNALS DO NOT AUTOMATICALLY CANCEL -	1. Ineffective cancel cam. 2. Ineffective cancel actuator.	1. Inspect and replace the turn signal cancel cam (clockspring) if required. 2. Inspect and replace the turn signal cancel actuator (left multi-function switch) if required.

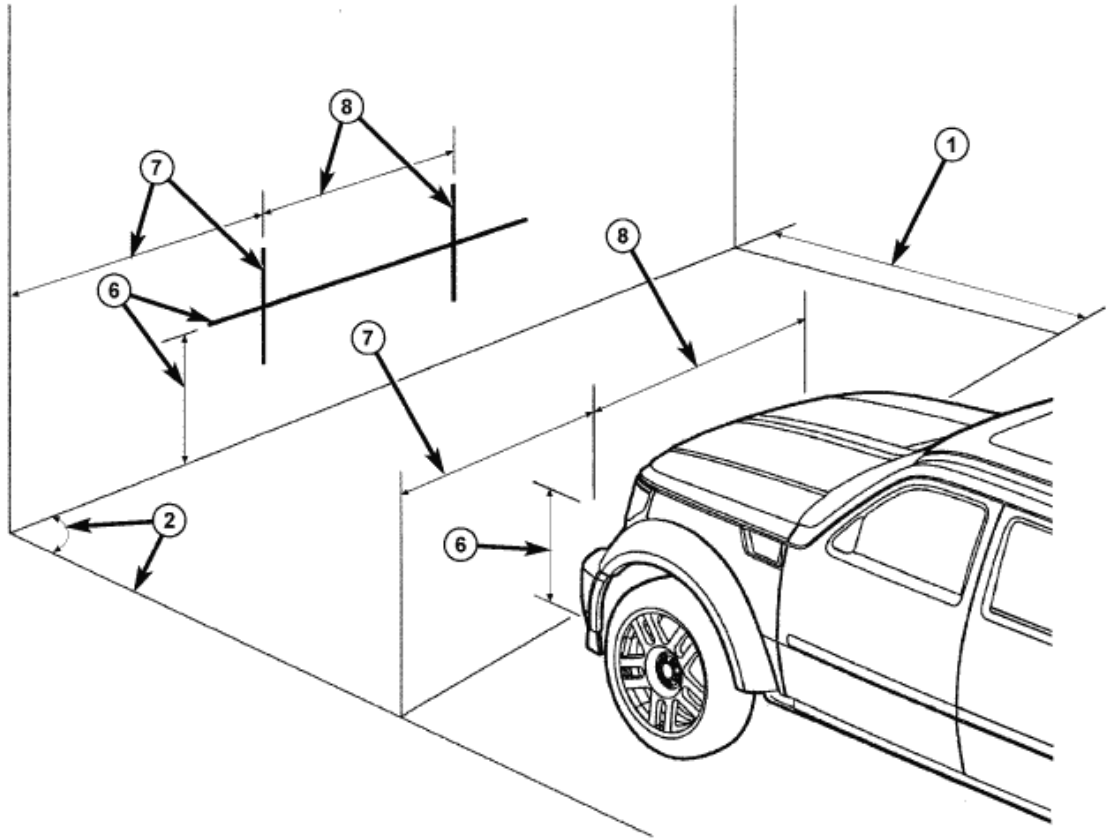
STANDARD PROCEDURE

FRONT LAMP AIMING

VEHICLE PREPARATION FOR LAMP ALIGNMENT

1. Check for and correct any burnt out bulbs.
2. If the vehicle is equipped with headlamp leveling, be certain that the headlamp leveling switch is in the **0** position.
3. Repair or replace any ineffective, worn or damaged body or suspension components that could hinder proper lamp alignment.
4. Verify proper tire inflation pressures.
5. Remove any accumulations of mud, snow or ice from the vehicle underbody and clean the front lamp lenses.
6. Verify that there is no load in the vehicle (cargo or passengers), except for the driver.
7. The fuel tank should be FULL. Add 2.94 kilograms (6.5 pounds) of weight over the fuel tank for each estimated gallon of missing fuel.
8. Verify correct vehicle suspension height.

LAMP ALIGNMENT SCREEN PREPARATION



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Fig. 2: Lamp Alignment Screen Preparation
Courtesy of CHRYSLER LLC

The procedure that follows will prepare a suitable front lamp alignment screen.

1. Tape a line on a level floor 7.62 meters (25 feet) away from and parallel to the flat wall that will be used as the lamp alignment screen. The level floor will be used as the horizontal zero reference.
2. An adjacent wall or floor member that is perpendicular to the alignment screen can be used as the vertical zero reference. If there is no adjacent wall or floor member that is perpendicular to the screen, tape a second line on the floor perpendicular to both the alignment screen and the first line, and outboard of either side of where the vehicle will be positioned. This will be used as the vertical zero reference.
3. Position the vehicle so that the side of the vehicle is parallel to the vertical zero reference, and so that the front of the lamp lenses are in the vertical plane of the parallel line taped on the floor 7.62 meters (25 feet) away from the screen.
4. Rock the vehicle side-to-side three times to allow the suspension to stabilize.
5. Jounce the front suspension three times by pushing downward on the front bumper and releasing.
6. Measure the distance between the optical center of one of the lamps being aimed (head or fog) and the floor (horizontal zero reference). Transfer this measurement to the alignment screen with a piece of tape placed horizontally to the floor. This line will be used as the lamp horizontal reference.
7. Measure the distance between the vertical zero reference and the optical center of the nearest lamp being

aimed (head or fog). Transfer this measurement to the alignment screen with a piece of tape placed vertically across the appropriate (head or fog) lamp horizontal reference. This is the centerline reference for the first lamp.

8. Measure the distance on center between the first and the second lamp being aimed. Transfer this measurement to the alignment screen with a second piece of tape placed vertically across the appropriate (head or fog) lamp horizontal reference. This is the centerline reference for the second lamp.

HEADLAMP ALIGNMENT

NOTE: Due to the linear nature of the headlamp cutoff, a properly aimed low beam headlamp will project the top edge of the high intensity pattern on the alignment screen from the horizontal line to 50 millimeters (2 inches) below the horizontal line for domestic market vehicles, or to 125 millimeters (5 inches) below the horizontal line for export market vehicles. No horizontal (right/left) adjustment is required for this headlamp beam pattern in domestic market vehicles. Export market vehicles have a second horizontal (right/left) adjustment screw provided. The high beam pattern will be correct when the low beams are properly aimed.

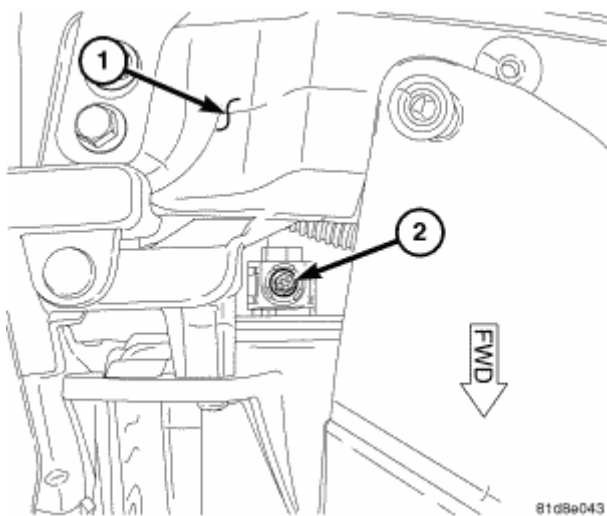


Fig. 3: Headlamp Vertical Adjustment Screw
Courtesy of CHRYSLER LLC

1. Turn the headlamps ON and select the LOW beams for vehicles in all markets.
2. On all vehicles except those with headlamp leveling, use a screwdriver to rotate the headlamp vertical adjustment screw (2) on the back of the front lamp unit just inboard of the fender and forward of the upper radiator crossmember (1) to adjust the beam height as required.
3. For export markets only, use a screwdriver to rotate the headlamp horizontal adjustment screw on each headlamp to adjust the beam right or left as required.

FOG LAMP ALIGNMENT

NOTE: Each front fog lamp shares a common reflector with the headlamp for that side

of the vehicle and is automatically adjusted correctly when the headlamp is properly adjusted.

SPECIFICATIONS

LAMPS/LIGHTING - EXTERIOR

BULB APPLICATION TABLE

LAMP	BULB
BACKUP	921 (W16W)
BRAKE	3157 (P27W/7W)
CENTER HIGH MOUNTED STOP	LIGHT-EMITTING DIODES SERVICED IN ASSEMBLY
FRONT FOG	9145 (H10)
FRONT PARK/TURN SIGNAL	3157AK - DOMESTIC 3757AK (PY27W/7W) - EXPORT
FRONT SIDE MARKER (DOMESTIC ONLY)	168
HEADLAMP	9008 (H13) - DOMESTIC 9003 (H4 60/55W) - EXPORT
LICENSE PLATE	W5W
POSITION (EXPORT ONLY)	W5W
REAR FOG (EXPORT ONLY)	3157 (P27W/7W)
REAR PARK	3157 (P27W/7W)
REAR SIDE MARKER	3157 (P27W/7W)
REAR TURN SIGNAL	3757A (PY27W/7W)
REPEATER (EXPORT ONLY)	WY5W

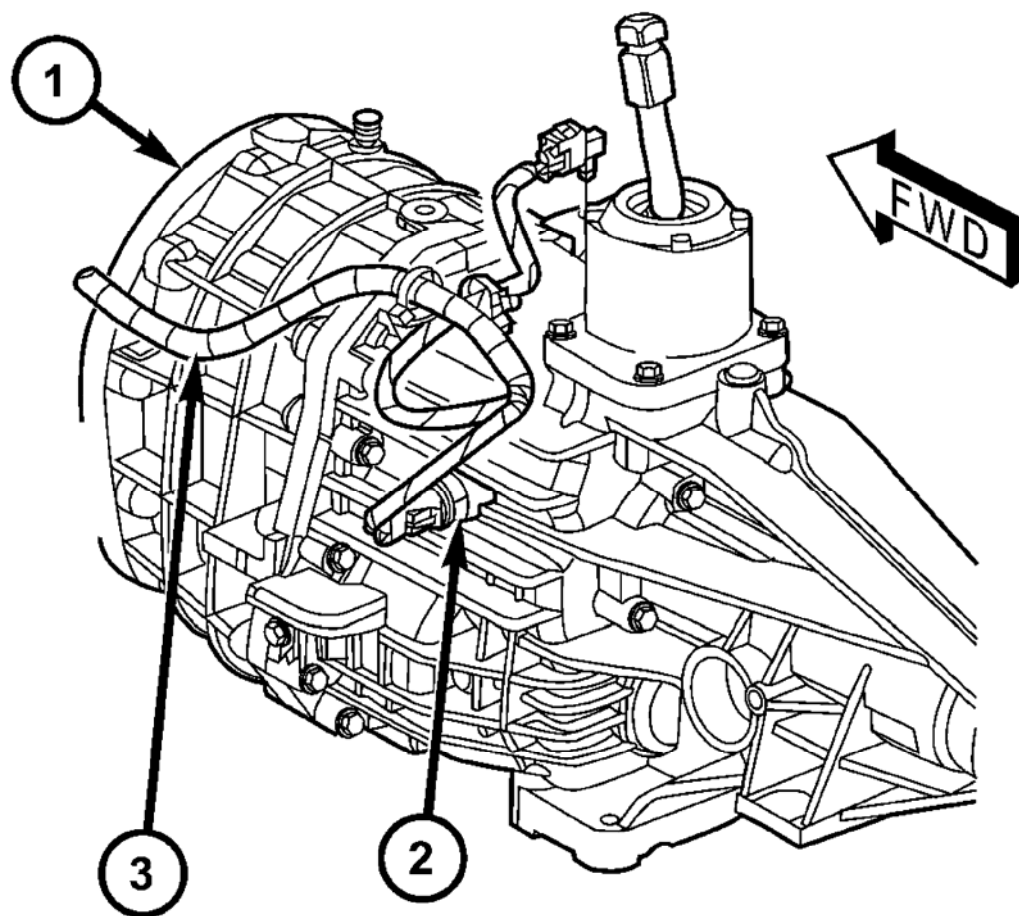
TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Center High Mounted Stop Lamp (CHMSL) Mounting Screws	2.5	-	20
Front Fog Lamp Mounting Screws	2	-	18
Front Lamp Unit Mounting Nuts	3	-	23
Left Multi-Function Switch Mounting Screw	1	-	10
Park Brake Switch Mounting Screw	2.5	-	24
Rear Lamp Unit Mounting Screws	5.5	-	50
Rear Lamp Unit Socket Plate Mounting Screws	1	-	12

SWITCH-BACKUP LAMP

DESCRIPTION

BACKUP LAMP SWITCH



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Fig. 4: Identifying Backup Lamp Switch
Courtesy of CHRYSLER LLC

Vehicles equipped with a manual transmission (1) have a normally open, spring-loaded plunger type backup lamp switch (2). Vehicles with an optional electronic automatic transmission have a Transmission Range Sensor (TRS) that is used to perform several functions, including that of the backup lamp switch. The TRS is described in further detail elsewhere in this service information. Refer to the service and diagnostic information for the automatic transmission type installed in the vehicle.

The backup lamp switch is located in a threaded hole on the side of the manual transmission housing. The switch has a threaded body and a hex formation near the plunger end of the switch. An integral connector receptacle at the end of the switch opposite the plunger connects the switch to the vehicle electrical system through a take out and connector of the engine wire harness. When installed, only the switch connector and the

hex formation are visible on the outside of the transmission housing.

The backup lamp switch cannot be adjusted or repaired and, if ineffective or damaged, the entire switch unit must be replaced.

OPERATION

BACKUP LAMP SWITCH

The backup lamp switch controls a path to ground for the Totally Integrated Power Module (TIPM) on the reverse switch signal circuit. The TIPM reads this input through an internal pull-up, then controls an output through a high side driver that regulates the flow of battery voltage to the backup lamp bulbs as appropriate on the backup lamp feed circuit. The switch plunger is mechanically actuated by the gearshift mechanism within the transmission, which will depress the switch plunger and close the switch contacts whenever the REVERSE gear has been selected. The switch receives ground at all times through a take out and eyelet terminal of the engine wire harness that is secured by a nut to a ground stud on the body sheet metal within the engine compartment of the vehicle.

The backup lamp switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

DIAGNOSIS AND TESTING

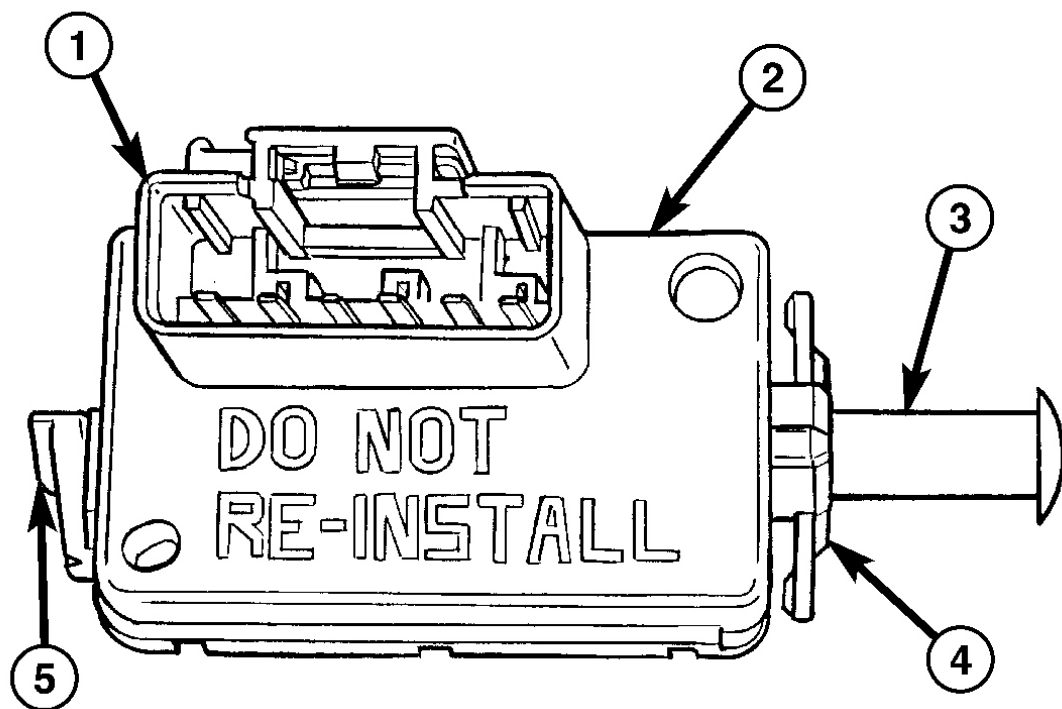
BACKUP LAMP SWITCH

1. Disconnect and isolate the battery negative cable.
2. Raise and support the vehicle.
3. Locate and disconnect the engine wire harness connector from the backup lamp switch connector receptacle.
4. Check for continuity between the two terminal pins in the backup lamp switch connector receptacle.
 - With the gear selector lever in the REVERSE position, there should be continuity.
 - With the gear selector lever in any position other than REVERSE, there should be no continuity.
5. If the switch fails either of these two continuity tests, replace the ineffective backup lamp switch.

BRAKE LAMP SWITCH

DESCRIPTION

BRAKE LAMP SWITCH



80c92641

Fig. 5: Brake Lamp Switch
Courtesy of CHRYSLER LLC

The brake lamp switch (2) is a three circuit, spring-loaded plunger actuated switch that is secured to the steering column support bracket under the instrument panel on the driver side of the vehicle. The molded plastic switch housing has an integral connector receptacle (1) containing six terminal pins and featuring a Connector Position Assurance (CPA) lock. The switch is connected to the vehicle electrical system through a dedicated take out of the instrument panel wire harness.

The switch plunger (3) extends through a mounting collar (4) on one end of the switch housing. The plunger has a one time telescoping self-adjustment feature that is activated after the switch is installed by moving an adjustment release lever (5) on the opposite end of the switch housing clockwise, until it locks into a position that is parallel to the connector receptacle.

An installed brake lamp switch cannot be readjusted or repaired. If the switch is damaged, ineffective, or removed from its mounting position for any reason, it must be replaced with a new unit.

OPERATION

BRAKE LAMP SWITCH

The brake lamp switch controls three independent circuits. These circuits are described as follows:

- **Brake Lamp Switch Circuit** - A normally open brake lamp switch circuit receives a battery voltage input, and supplies this battery voltage to the brake lamps and the Controller Antilock Brake (CAB) on a brake lamp switch output circuit only when the brake pedal is depressed (brake lamp switch plunger released).
- **Brake Lamp Switch Signal Circuit** - A normally closed brake lamp switch signal circuit receives a direct path to ground, and supplies this ground input to the Powertrain Control Module (PCM) on a brake lamp switch sense circuit only when the brake pedal is released (brake lamp switch plunger is depressed).
- **Speed Control Circuit** - A normally closed speed control circuit receives a battery voltage input from the PCM on a speed control supply circuit, and supplies this battery voltage to the speed control servo solenoids (dump, vacuum, and vent) on a speed control brake switch output circuit only when the speed control system is turned ON and the brake pedal is released (brake lamp switch plunger is depressed).

The components of the self-adjusting brake switch plunger consist of a two-piece telescoping plunger, a split plunger locking collar, and a release wedge. The release lever has a shaft with a wedge that spreads the plunger locking collar to an open or released position. After the switch is installed and the brake pedal is released, the plunger telescopes to the correct adjustment position. When the release lever is moved to the release position, the wedge is disengaged from the locking collar causing the collar to apply a clamping pressure to the two plunger halves, fixing the plunger length.

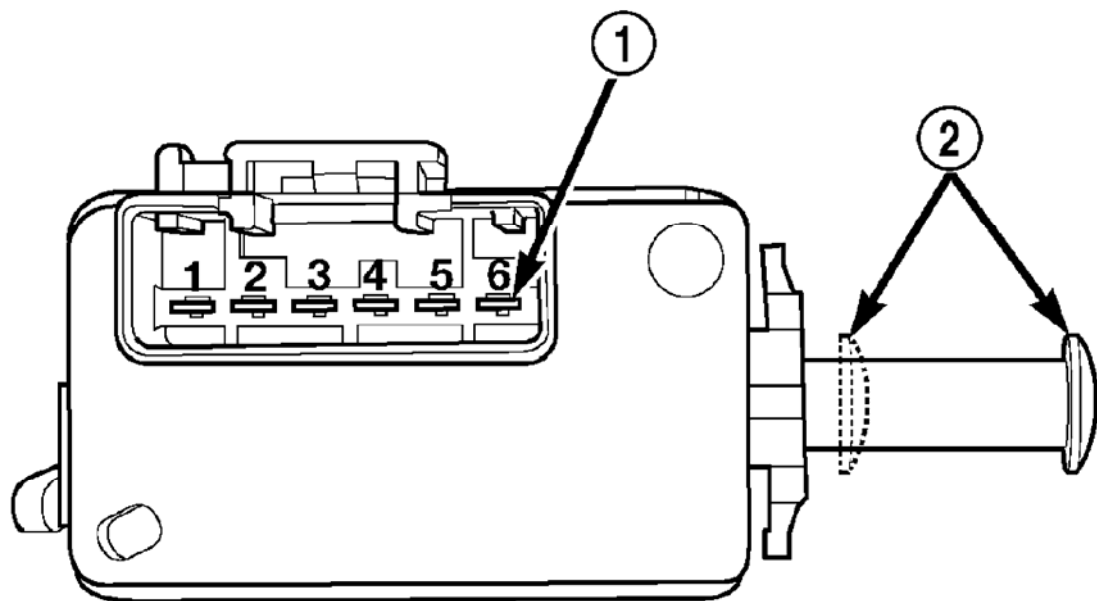
The brake lamp switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

DIAGNOSIS AND TESTING

BRAKE LAMP SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

CAUTION: Do not remove the brake lamp switch from the mounting bracket. The self-adjusting switch plunger is a one time only feature. If the switch is removed from the mounting bracket, it **MUST** be replaced with a new switch.



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Fig. 6: Brake Lamp Switch Terminal Identification

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connector from the brake lamp switch.
3. Using an ohmmeter, perform the continuity tests at the terminal pins (1) in the brake lamp switch connector receptacle as shown in the BRAKE LAMP SWITCH TESTS table.

BRAKE LAMP SWITCH TESTS	
PLUNGER POSITION (2)	CONTINUITY BETWEEN (1)
Released (Extended)	Pins 1 and 2
Compressed (Depressed)	Pins 3 and 4, 5 and 6

4. If the switch fails any of the continuity tests, replace the ineffective brake lamp switch as required.

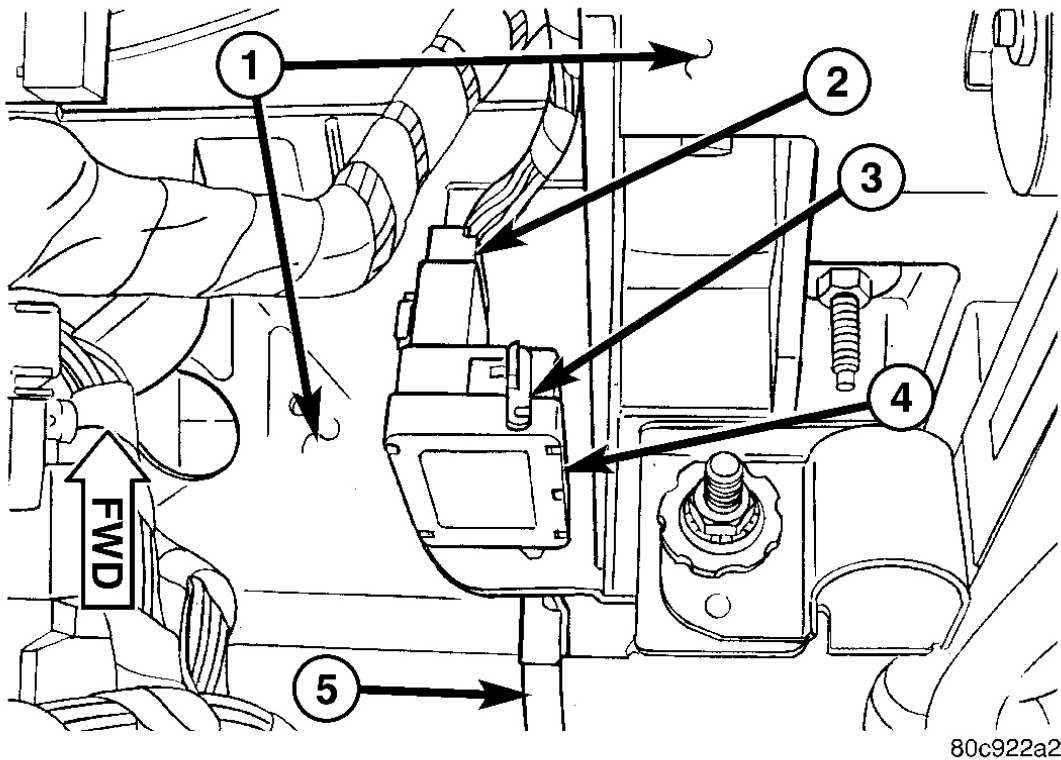
REMOVAL

BRAKE LAMP SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable

the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

CAUTION: The brake lamp switch self-adjusting switch plunger is a one time only feature. If the switch is removed from the mounting bracket, it **MUST** be replaced with a new switch.



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Fig. 7: Removing/Installing Brake Lamp Switch
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the steering column opening cover from the instrument panel. Refer to **REMOVAL**.
3. Locate the brake lamp switch (4) near the support bracket (1) on the lower steering column.
4. Disconnect the wire harness connector (2) from the brake lamp switch.
5. Rotate the brake lamp switch housing counterclockwise about 30 degrees to align the tabs on the switch

locking collar with the keyed mounting hole in the switch mounting bracket.

6. Pull the switch straight back from the keyed hole to remove it from the bracket.
7. Discard the removed brake lamp switch.

INSTALLATION

BRAKE LAMP SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

CAUTION: The brake lamp switch self-adjusting switch plunger is a one time only feature. If the switch is removed from the mounting bracket, it **MUST** be replaced with a new switch.

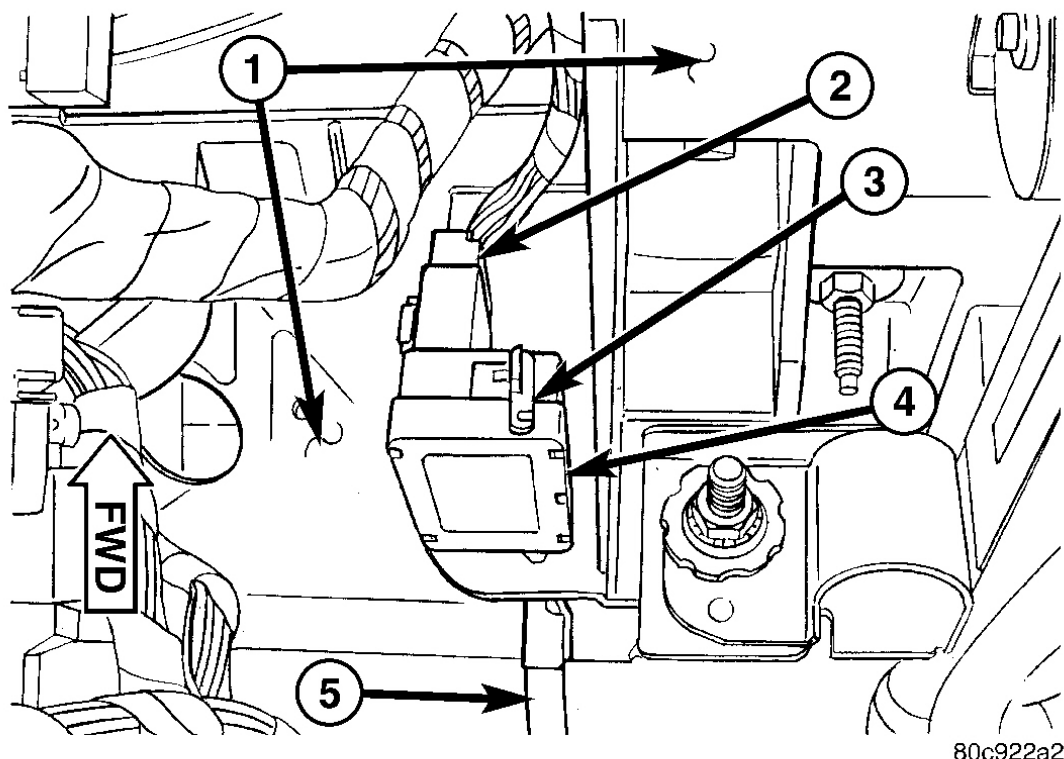


Fig. 8: Removing/Installing Brake Lamp Switch
Courtesy of CHRYSLER LLC

1. Depress and hold the brake pedal (5) in the depressed position.
2. Align the tabs on the brake lamp switch (4) locking collar with the keyed hole in the switch mounting bracket.
3. Insert the tabs on the brake lamp switch locking collar through the keyed hole in the switch mounting bracket until the switch housing is firmly seated against the bracket.
4. Rotate the switch clockwise about 30 degrees to engage the tabs on the locking collar with the switch mounting bracket.
5. Release the brake pedal.

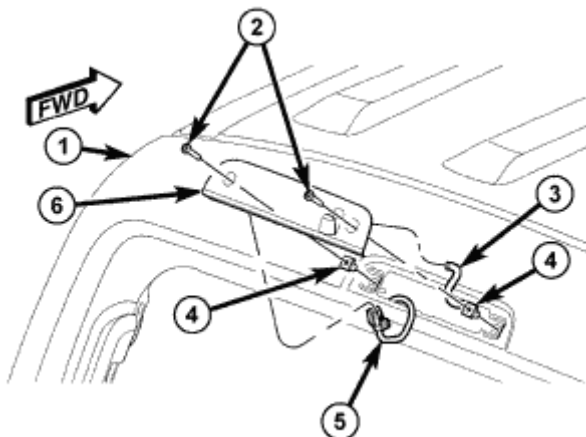
CAUTION: Do not release or pull up on the brake pedal before the switch plunger adjustment has been completed.

6. Release the brake pedal, but do not pull it upward.
7. Rotate the plunger adjustment release lever (3) clockwise until it locks into place. The lever should be parallel to the brake lamp switch connector receptacle. This action will set the switch plunger length to a final adjustment position and cannot be undone. If not performed properly the first time, a new brake lamp switch **must** be installed.
8. Reconnect the wire harness connector (2) to the brake lamp switch.
9. Reinstall the steering column opening cover onto the instrument panel. Refer to **INSTALLATION**.
10. Reconnect the battery negative cable.

LAMP-HIGH MOUNTED STOP

REMOVAL

CENTER HIGH MOUNTED STOP LAMP



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Fig. 9: Identifying Liftgate Outer Panel, Screws, Washer Supply Hose, Plastic Nuts, Liftgate Wire

Harness Connector & Center High Mounted Stop Lamp (CHMSL)

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the two screws (2) that secure the Center High Mounted Stop Lamp (CHMSL) (6) to the upper header of the liftgate outer panel (1).
3. Pull the CHMSL down and away from the liftgate far enough to access and disconnect the washer supply hose (3) from the barbed nipple of the rear washer nozzle at the back of the lamp housing.
4. Disconnect the liftgate wire harness connector (5) from the back of the lamp housing.
5. Remove the CHMSL from the liftgate.

INSTALLATION

CENTER HIGH MOUNTED STOP LAMP

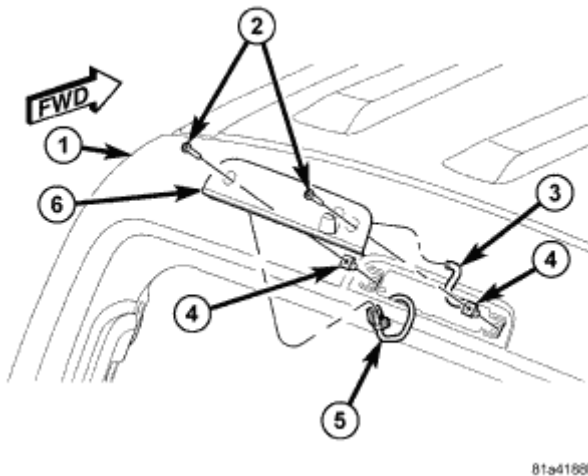


Fig. 10: Identifying Liftgate Outer Panel, Screws, Washer Supply Hose, Plastic Nuts, Liftgate Wire Harness Connector & Center High Mounted Stop Lamp (CHMSL)

Courtesy of CHRYSLER LLC

1. Check to be certain that the two plastic nuts (4) are properly installed and in good condition on each side of the Center High Mounted Stop Lamp (CHMSL) (6) opening in the upper header of the liftgate outer panel (1).
2. Position the CHMSL near the liftgate opening.
3. Reconnect the liftgate wire harness connector (5) to the back of the lamp housing.
4. Reconnect the washer supply hose (3) to the barbed nipple of the rear washer nozzle at the back of the lamp housing.
5. Position the CHMSL into the liftgate opening with the lower edge slightly away from the liftgate.
6. Move the CHMSL left-to-right to align the temporary locator on the back of the CHMSL with the locator notch in the liftgate opening.
7. Slide the CHMSL slightly upward then rock the lower edge into the opening so that the retention feature holds the CHMSL to the liftgate without fasteners.

8. Install and tighten the right side screw (2) that secures the CHMSL to the liftgate, followed by the left side screw. Tighten the screws to 2.5 N.m (20 in. lbs.).
9. Reconnect the battery negative cable.

FRONT LAMP UNIT

STANDARD PROCEDURE

FRONT LAMP MOISTURE CLEARING

Some occasional moisture accumulation inside a vented front lamp unit is normal and appears as a fogging on the inside of the lamp lens, similar to the fog that sometimes appears on the inside of a windshield. This condition is caused by rapidly changing temperature and humidity levels between the air internal and external to the lamp, and will usually dissipate once the temperature and humidity conditions have been allowed to stabilize. Accelerated removal of such moisture may be accomplished by activating the headlamps on HIGH beam for about 15 minutes.

However, water droplets larger than 1 millimeter (0.039 inch) in size accumulated on the inside of the lamp lens, water droplets visible on most internal lamp surfaces or large quantities of water within the lamp indicates a problem with the lamp sealing that has allowed excessive amounts of water to enter the lamp. Once such excessive moisture has entered the lamp, it will always be present and will never disappear. A lamp with permanent internal moisture should be replaced.

REMOVAL

FRONT FOG LAMP BULB

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

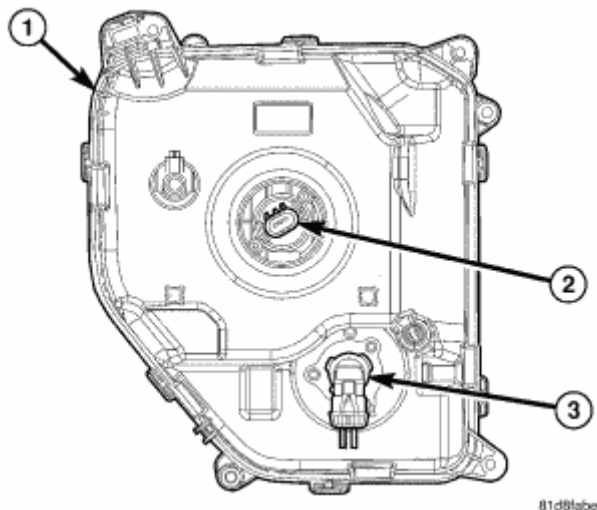


Fig. 11: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connector from the connector receptacle integral to the front fog lamp bulb (3) on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
3. Firmly grasp the bulb base and rotate it counterclockwise about 30 degrees to unlock it.
4. Pull the bulb and base straight out from the keyed opening in the housing.

FRONT LAMP UNIT

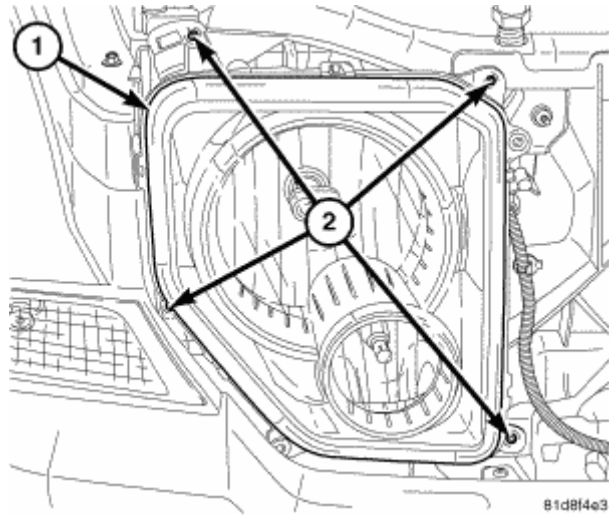


Fig. 12: Front Lamp Unit
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the grille from the front of the vehicle. Refer to **REMOVAL** .
3. Remove the four screws (2) that secure the front lamp unit (1) to the front end module carrier.
4. Pull the front lamp unit away from the front end module far enough to access and disconnect the wire harness connections on the back of the lamp housing.
5. Remove the front lamp unit from the vehicle.

HEADLAMP BULB - DOMESTIC

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

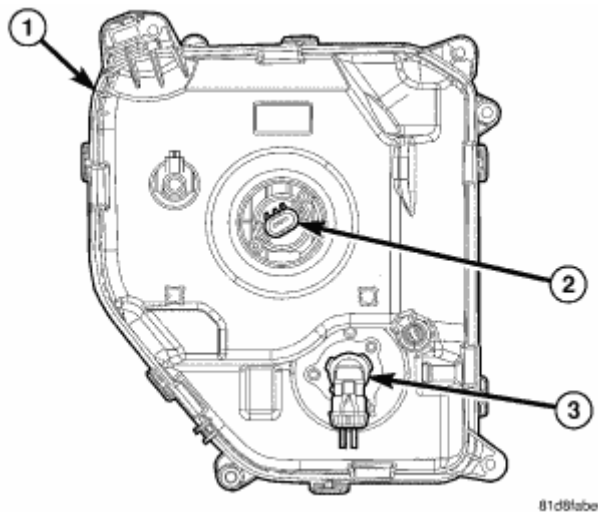


Fig. 13: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connector from the connector receptacle integral to the headlamp bulb (2) on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
3. Firmly grasp the bulb base and rotate it counterclockwise about 30 degrees to unlock it.
4. Pull the bulb and base straight out from the keyed opening in the reflector.

HEADLAMP BULB - EXPORT

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

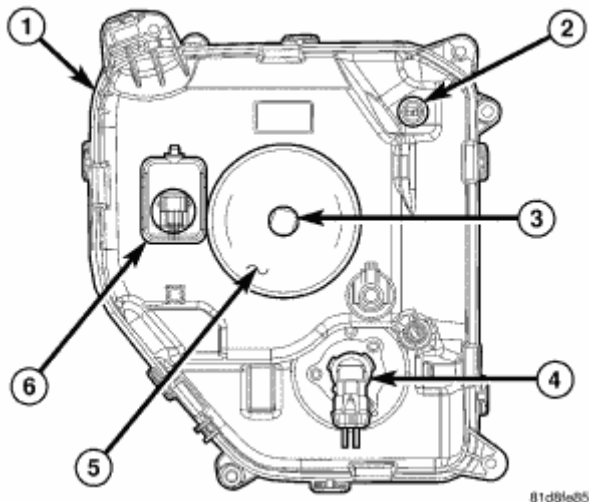


Fig. 14: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connector from the headlamp bulb base (3) on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
3. Remove the rubber boot seal (5) from the back of the front lamp unit housing and the headlamp bulb base.
4. Pinch the two ends of the wire bulb retainer together and disengage them from the hooks that secure them to the bulb flange on the reflector.
5. Pivot the wire retainer up off of the flange of the headlamp bulb base and out of the way.
6. Pull the bulb straight out of the keyed opening in the headlamp reflector.

POSITION LAMP BULB

NOTE: The following procedure applies only to vehicles manufactured for export markets. Vehicles manufactured for domestic markets do not have a position lamp bulb, socket or wiring provided in the front lamp unit.

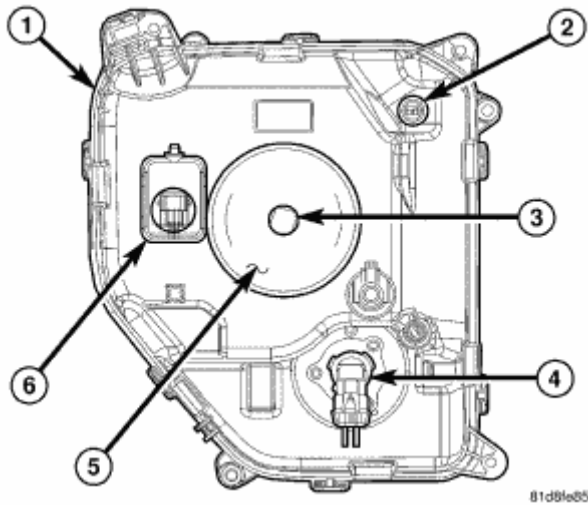


Fig. 15: Front Lamp Unit Housing
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Disconnect the wire harness connector from the connector receptacle integral to the position lamp bulb socket (2) on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
3. Firmly grasp the position lamp bulb socket on the back of the housing and rotate it counterclockwise about 30 degrees to unlock it.
4. Pull the socket and bulb straight out from the keyed opening in the housing.
5. Pull the base of the bulb straight out of the socket.

INSTALLATION

FRONT FOG LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

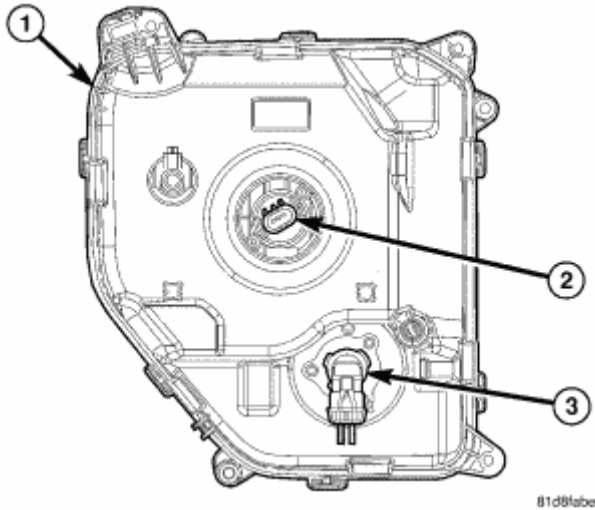


Fig. 16: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Align the front fog lamp bulb and base (2) with the keyed opening on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
2. Insert the bulb into the housing until the base is firmly seated.
3. Rotate the bulb base clockwise about 30 degrees to lock it into place. The bulb connector receptacle should be pointed straight downward.
4. Reconnect the wire harness connector to the connector receptacle integral to the front fog lamp bulb base.
5. Reconnect the battery negative cable.

FRONT LAMP UNIT

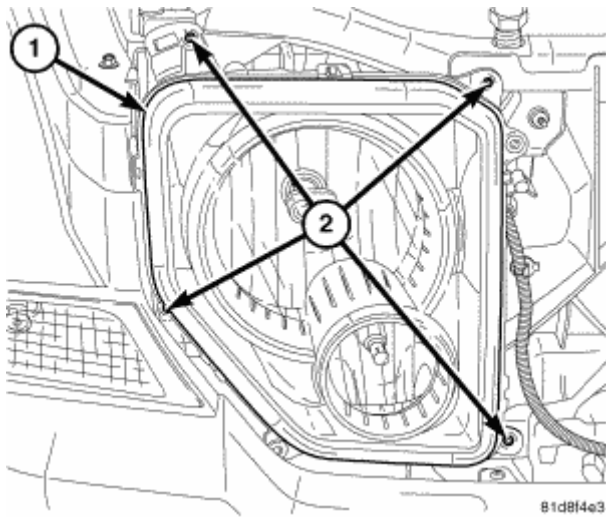


Fig. 17: Front Lamp Unit
Courtesy of CHRYSLER LLC

1. Position the front lamp unit (1) close enough to the front of the vehicle to reconnect the wire harness connections to the back of the lamp.
2. Position the lamp to the front end module carrier.
3. Install and tighten the four screws (2) that secure the front lamp unit to the front end module carrier. Tighten the screws securely.
4. Reinstall the grille onto the front of the vehicle. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.
6. Confirm proper headlamp alignment. See **STANDARD PROCEDURE**.

HEADLAMP BULB - DOMESTIC

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

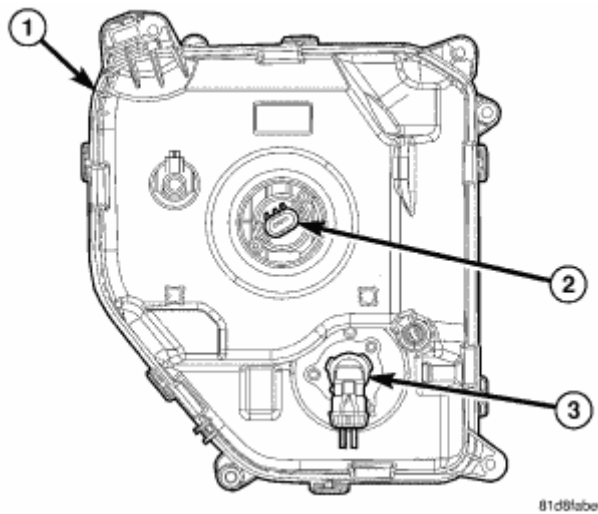


Fig. 18: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Align the headlamp bulb and base (2) with the keyed opening on the back of the front lamp unit (1) reflector located on the back of the front end module carrier.
2. Insert the bulb into the reflector until the base is firmly seated.
3. Rotate the bulb base clockwise about 30 degrees to lock it into place.
4. Reconnect the wire harness connector to the connector receptacle integral to the headlamp bulb base.
5. Reconnect the battery negative cable.

HEADLAMP BULB - EXPORT

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

CAUTION: Do not contaminate the bulb glass by touching it with your fingers or by allowing it to contact other oily surfaces. Shortened bulb life will result.

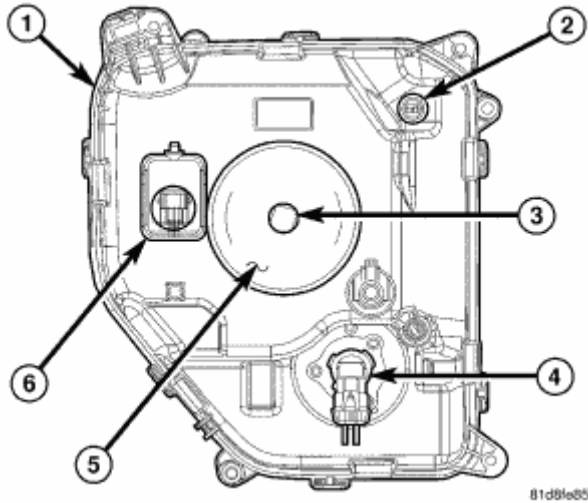


Fig. 19: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Align the headlamp bulb and base (3) with the keyed opening in the reflector on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
2. Insert the bulb into the reflector until the base is fully seated, then pivot the wire bulb retainer back over the bulb flange.
3. Pinch the two ends of the wire bulb retainer together and engage them under the hooks to secure them to the bulb flange of the reflector.
4. Position the center opening of the rubber boot seal (5) over the base of the headlamp bulb and push it fully over the bulb base.
5. Position the outer circumference of the boot seal over the flange on the back of the front lamp unit housing and pull it over the housing flange until the seal is fully engaged.
6. Reconnect the wire harness connector to the headlamp bulb base on the back of the front lamp unit housing.
7. Reconnect the battery negative cable.

POSITION LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: The following procedure applies only to vehicles manufactured for export markets. Vehicles manufactured for domestic markets do not have a position lamp bulb, socket or wiring provided in the front lamp unit.

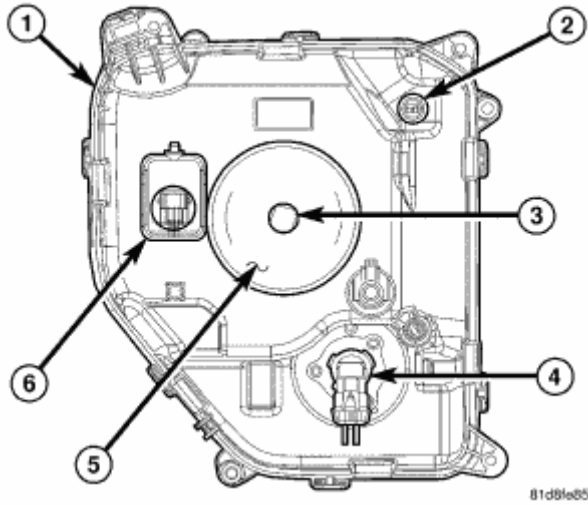


Fig. 20: Front Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Align the base of the bulb with the position lamp bulb socket (2).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Align the socket and bulb with the keyed opening on the back of the front lamp unit housing (1) located on the back of the front end module carrier.
4. Insert the socket and bulb straight into the housing until the socket is firmly seated.
5. Rotate the socket clockwise about 30 degrees to lock it into place.
6. Reconnect the wire harness connector to the connector receptacle integral to the position lamp bulb socket.
7. Reconnect the battery negative cable.

FRONT SIDE MARKER LAMP

REMOVAL

FRONT SIDE MARKER BULB

NOTE: The following procedure applies only to vehicles manufactured for domestic markets. Vehicles manufactured for export markets do not have a bulb, socket or wiring provided to illuminate the front side marker compartment of the front lamp unit. The front side marker for export vehicles is replaced by a white reflector.

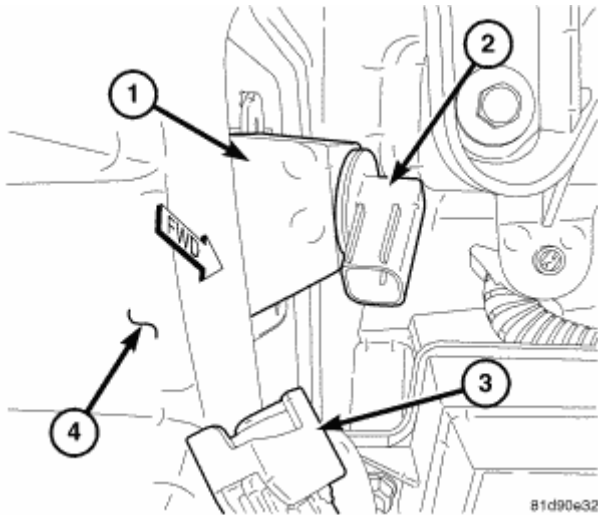


Fig. 21: Front Side Marker Lamp Housing
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the liner from the front of the front fender wheel house. Refer to **REMOVAL** .
3. Disconnect the wire harness connector (3) from the connector receptacle integral to the bulb socket (2) on the back of the front side marker lamp housing (1) located on the inside of the outboard-facing end of the front fascia (4).
4. Firmly grasp the bulb socket on the back of the lamp housing and rotate it counterclockwise about 30 degrees to unlock it.
5. Pull the socket and bulb straight out from the keyed opening in the lamp housing.
6. Pull the base of the bulb straight out of the socket.

FRONT SIDE MARKER LAMP

NOTE: **The following procedure applies only to vehicles manufactured for domestic markets. Vehicles manufactured for export markets do not have a bulb, socket or wiring provided to illuminate the front side marker compartment of the front lamp unit. The front side marker for export vehicles is replaced by a white reflector.**

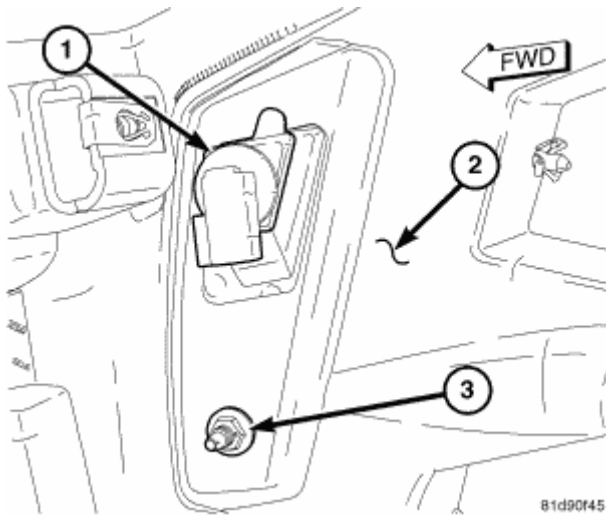


Fig. 22: Lamp Housing
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the liner from the front of the front fender wheel house. Refer to **REMOVAL** .
3. Disconnect the wire harness connector from the connector receptacle integral to the bulb socket on the back of the front side marker lamp housing (1) located on the inside of the outboard-facing end of the front fascia (2).
4. Remove the nut (3) that secures the stud near the bottom of the lamp housing to the inside surface of the front fascia.
5. Disengage the lower edge of the lamp from the outer surface of the front fascia, then pull it slightly downward to disengage the tab at the top of the housing from the notch in the fascia.

INSTALLATION

FRONT SIDE MARKER BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: The following procedure applies only to vehicles manufactured for domestic markets. Vehicles manufactured for export markets do not have a bulb, socket or wiring provided to illuminate the front side marker compartment of the front lamp unit. The front side marker for export vehicles is replaced by a white reflector.

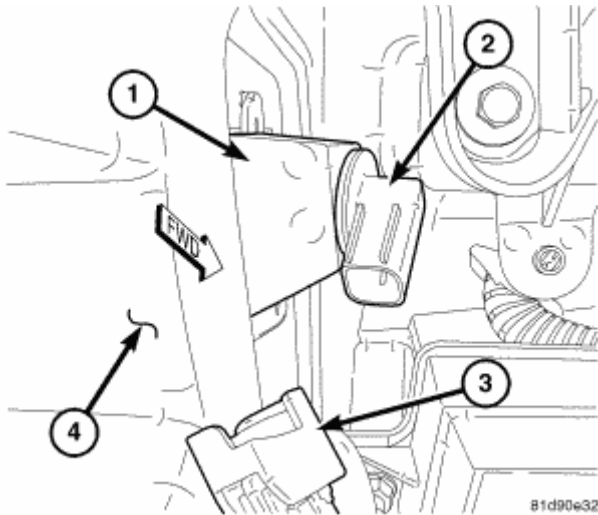


Fig. 23: Front Side Marker Lamp Housing
 Courtesy of CHRYSLER LLC

1. Align the base of the bulb with the front side marker bulb socket (2).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Align the socket and bulb with the keyed opening on the back of the front side marker lamp housing (1) located on the inside of the outboard-facing end of the front fascia (4).
4. Insert the socket and bulb into the housing until the socket is firmly seated.
5. Rotate the socket clockwise about 30 degrees to lock it into place. The connector receptacle integral to the bulb socket should be pointed downward.
6. Reconnect the wire harness connector (3) to the connector receptacle integral to the bulb socket.
7. Reinstall the liner to the front of the front fender wheel house. Refer to **INSTALLATION** .
8. Reconnect the battery negative cable.

FRONT SIDE MARKER LAMP

NOTE: The following procedure applies only to vehicles manufactured for domestic markets. Vehicles manufactured for export markets do not have a bulb, socket or wiring provided to illuminate the front side marker compartment of the front lamp unit. The front side marker for export vehicles is replaced by a white reflector.

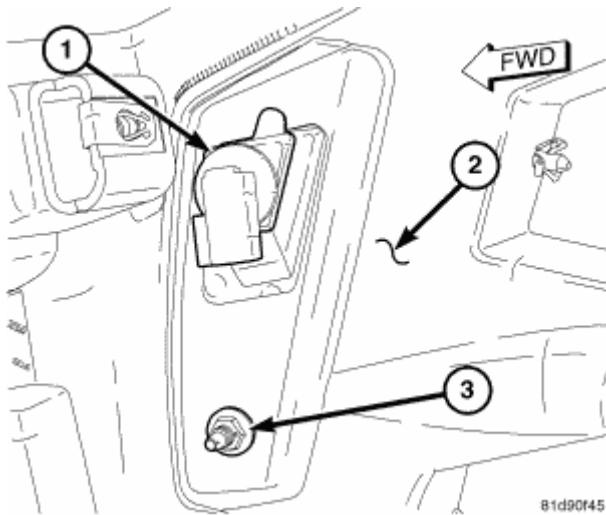


Fig. 24: Lamp Housing
Courtesy of CHRYSLER LLC

1. From the outer surface of the front fascia engage the tab at the top of the front side marker lamp housing into the notch of the outboard-facing end of the fascia, then insert the stud on the bottom of the housing into the mounting hole.
2. Install and tighten the nut (3) that secures the stud near the bottom of the lamp housing (1) to the inside surface of the front fascia (2). Tighten the nut securely.
3. Reconnect the wire harness connector (3) to the connector receptacle integral to the bulb socket.
4. Reinstall the liner to the front of the front fender wheel house. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

HAZARD SWITCH

DESCRIPTION

HAZARD SWITCH

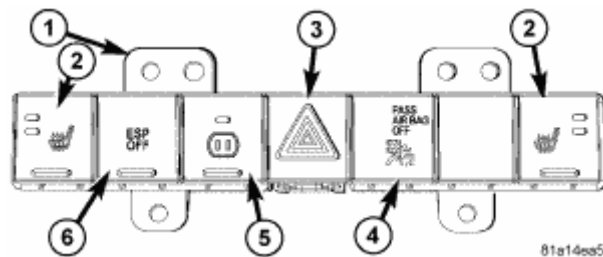


Fig. 25: Identifying Occupant Classification System Switches & Indicators
Courtesy of CHRYSLER LLC

The hazard switch (3) is integral to the instrument panel switch pod (1), which is secured to the instrument panel center bezel just below the heater and air conditioner controls. A red, stencil-like International Control and Display Symbol icon for **Hazard Warning** identifies the hazard switch button. The remainder of the hazard switch circuitry is concealed within the instrument panel switch pod.

The hazard switch button has panel lamps dimmer controlled illumination for night visibility. The switch button latches to a slightly lowered position when the hazard warning system is activated and the icon on the switch button will illuminate at an increased intensity while the turn signals and turn signal indicators are flashing. The switch button unlatches to a position flush with the other push buttons in the switch pod when the hazard warning is deactivated.

All of the circuitry and components of the hazard switch are contained within a molded black plastic instrument panel switch pod housing. A single connector receptacle is integral to the back of the switch pod housing. The switch is connected to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

The hazard switch cannot be adjusted or repaired and, if ineffective or damaged, the entire instrument panel switch pod unit must be replaced. Refer to **REMOVAL** .

OPERATION

HAZARD SWITCH

The status of the hazard switch is continually monitored by the circuitry within the instrument panel switch pod. The switch pod receives battery voltage at all times on a fused battery feed circuit, and a path to ground at all times through the instrument panel wire harness. The only other inputs to the switch pod consists of electronic communication with the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the single wire Local Interface Network (LIN) data bus.

Whenever the hazard switch is in its unlatched and raised position, the hazard warning system is selected and the switch pod circuitry sends a hard wired output to the Totally Integrated Power Module (TIPM) over the CAN data bus. When the TIPM receives a hazard switch input it then controls hazard warning system operation and flash rate by controlling battery voltage outputs through high side drivers on the right and left turn signal feed circuits. The TIPM also sends the appropriate electronic messages back to the EMIC to control the illumination and flash rate of the right and left turn signal indicators, as well as to control the click rate of an electromechanical relay soldered onto the EMIC electronic circuit board that emulates the sound emitted by a conventional hazard warning flasher. The EMIC then sends messages back to the switch pod to control the illumination of the hazard switch push button.

The hard wired circuits for the instrument panel switch pod may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the hazard warning switch or the electronic controls and communication between other modules and devices that provide some features of the hazard warning system. The most reliable, efficient, and accurate means to diagnose the hazard switch or the electronic controls and communication related to hazard warning system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

HEADLAMP LEVELING MOTOR

DESCRIPTION

HEADLAMP LEVELING MOTOR

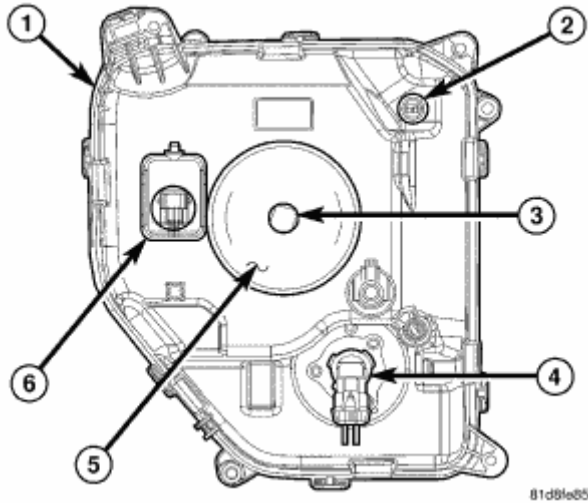


Fig. 26: Headlamp Components
Courtesy of CHRYSLER LLC

The headlamp leveling motor (6) is located on the rear outboard side of each front lamp unit housing (1) on vehicles equipped with the headlamp leveling system, which is available only in certain markets where it is required equipment. The motor is encased within a molded plastic housing and is secured by an integral wedge-type mounting boss to a keyed flange on the back of the front lamp unit housing. A rubber seal around the circumference of the mounting boss seals the motor to the lamp housing.

The outside of the motor housing features an integral molded connector on its rearward surface and a plastic pushrod with a ball formation on its free end extends from the motor mounting boss. Within the motor housing is a 12-volt Direct Current (DC) servo motor, an electronic controller board that includes the motor logic circuits, and an integral screw-drive transmission. The headlamp leveling motor is connected to the vehicle electrical system through a dedicated take out and connector of the front end module wire harness.

The headlamp leveling motor is serviced as a unit with the front lamp unit. The motor cannot be repaired and, if ineffective or damaged, the entire front lamp unit must be replaced.

OPERATION

HEADLAMP LEVELING MOTOR

The controller board and logic circuitry of the headlamp leveling motor controls motor operation based upon a voltage signal input received from the Totally Integrated Power Module (TIPM). The TIPM uses electronic messages received over the Controller Area Network (CAN) data bus from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to determine the correct voltage signal to provide the leveling motor, while the EMIC uses electronic messages received over the Local Interface Network (LIN) data bus from the instrument panel switch pod to monitor the headlamp leveling switch selection.

The headlamp leveling motors have a path to ground at all times. The motors operate on battery voltage received through the headlamp low beam feed circuits so that the system will only operate when the headlamp low beams are turned ON. When the motor is energized it will extend or retract the motor pushrod through an integral screw-drive transmission. The ball on the end of the pushrod is snapped into a socket on the back of the reflector within the front lamp unit housing, which will cause the reflector to move as the pushrod is extended

or retracted, changing the angle at which the light is projected from the headlamp low beam bulb filaments.

The hard wired circuits for the headlamp leveling motors may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the active electronic elements within the headlamp leveling motors or the electronic controls and communication between other modules and devices that provide some features of the headlamp leveling system. The most reliable, efficient, and accurate means to diagnose the headlamp leveling motor or the electronic controls and communication related to headlamp leveling system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

SWITCH-HEADLAMP LEVELING

DESCRIPTION

HEADLAMP LEVELING SWITCH

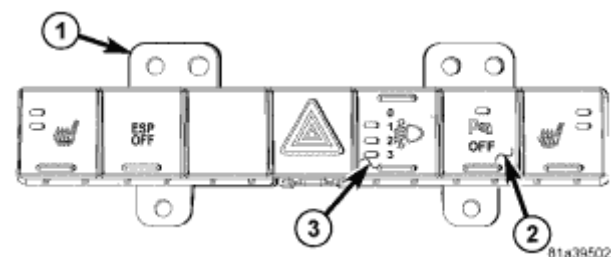


Fig. 27: Identifying Headlamp Leveling Switch
Courtesy of CHRYSLER LLC

The headlamp leveling switch (3) is used only on vehicles manufactured for certain markets where the headlamp leveling system is required. The headlamp leveling switch is integral to the switch pod (1) on the instrument panel. A stencil-like International Control and Display Symbol icon for **Headlamp Levelling Control** identifies the headlamp leveling switch button. The switch push button is also marked with the numbers **0** , **1** , **2** , and **3** , which indicates each of the four headlamp leveling positions. Each higher number represents a lower aiming position of the headlamp beam relative to the road surface.

The headlamp leveling switch button has panel lamps dimmer controlled illumination for night visibility. The switch button also features a jewel like Light Emitting Diode (LED) indicator adjacent to the numbers **1** , **2** , and **3** . The appropriate LED is illuminated when that headlamp position is currently selected. The momentary switch push button is operated by depressing, then releasing the top or bottom of the button in a rocker manner to enable the selection of a sequentially higher or lower position with each button press.

All of the circuitry and components of the headlamp leveling switch are contained within a molded black plastic instrument panel switch pod housing. A single connector receptacle is integral to the back of the switch pod housing. The switch is connected to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

The headlamp leveling switch cannot be adjusted or repaired and, if ineffective or damaged, the entire instrument panel switch pod unit must be replaced. Refer to **REMOVAL** .

OPERATION

HEADLAMP LEVELING SWITCH

The status of the headlamp leveling switch is continually monitored by the circuitry within the instrument panel switch pod. The switch pod receives battery voltage at all times on a fused battery feed circuit, and a path to ground at all times through the instrument panel wire harness. The only other inputs to and outputs from the switch pod consist of electronic communication with the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the single wire Local Interface Network (LIN) data bus.

Whenever the headlamp leveling switch push button is depressed the switch pod circuitry sends an electronic **select status up** or **select status down** message input to the EMIC over the LIN data bus. The EMIC then sends the appropriate electronic **select request up** or **select request down** message to the TIPM over the CAN data bus.

The TIPM responds to these messages by providing a voltage output to the headlamp leveling motors through high side drivers on the headlamp leveling motor right and left signal circuits to move the headlamp reflectors to the selected position based upon the voltage input received from the TIPM. The TIPM also sends the appropriate electronic messages back to the EMIC and the EMIC relays the messages back to the switch pod to control the illumination of the **1** , **2** , or **3** Light Emitting Diode (LED) selected position indicator in the leveling switch button. The EMIC and TIPM logic will only allow the headlamp leveling system to operate while the ignition switch is in the ON position and the exterior lighting is turned ON.

The hard wired circuits for the instrument panel switch pod may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the headlamp leveling switch or the electronic controls and communication between other modules and devices that provide some features of the headlamp leveling system. The most reliable, efficient, and accurate means to diagnose the headlamp leveling switch or the electronic controls and communication related to headlamp leveling system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

LEFT MULTI-FUNCTION SWITCH

DESCRIPTION

LEFT MULTI- FUNCTION SWITCH

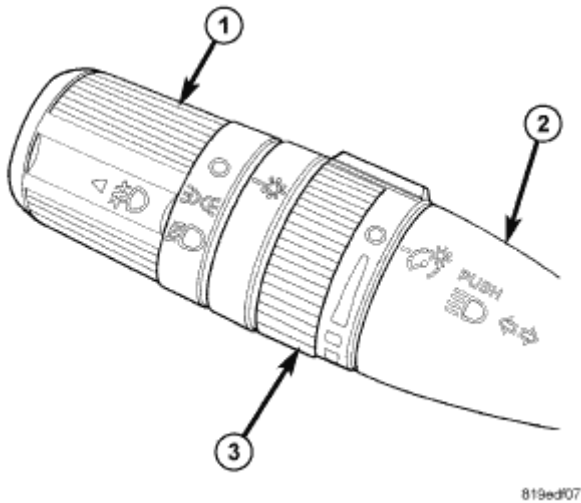


Fig. 28: Left Multi-Function Switch
 Courtesy of CHRYSLER LLC

The left (lighting) multi-function switch is located on the left side of the steering column, just below the steering wheel. This switch is the primary control for the interior and exterior lighting systems. The only visible components of the switch are the control stalk (2), control knob (1) and control sleeve (3) that extend through the steering column shrouds on the left side of the column. The remainder of the switch including its mounting provisions, its electrical connection, and the turn signal cancel actuator are concealed beneath the shrouds.

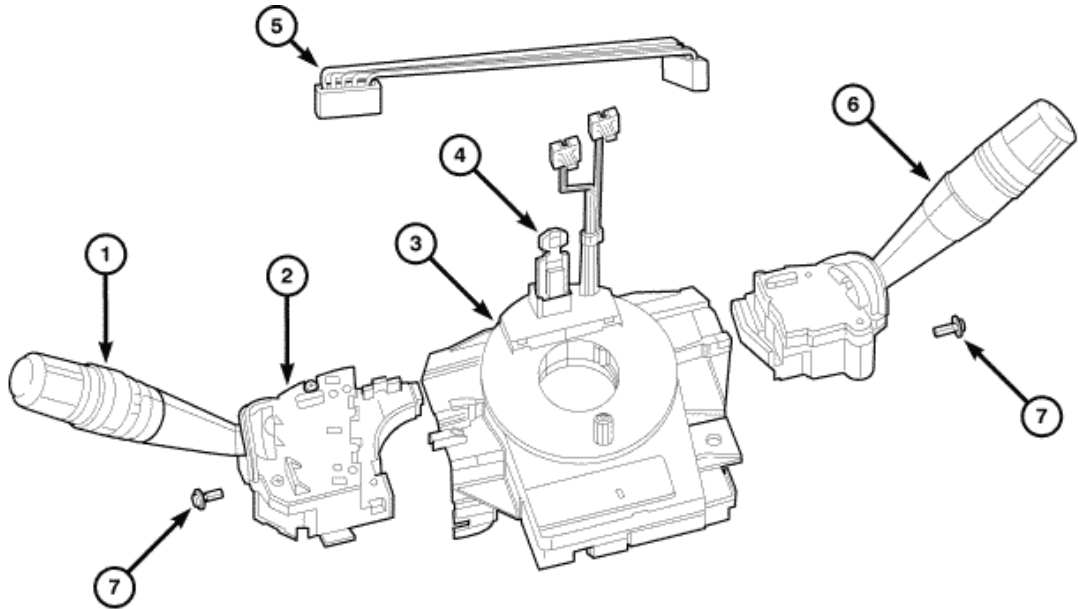


Fig. 29: Steering Control Module
 Courtesy of CHRYSLER LLC

The switch housing (2) and controls (1) are constructed of molded black plastic. Each of the switch controls has white International Control and Display Symbol graphics applied to it, which clearly identify its many functions. A single screw (7) through a mounting tab integral to the back of the switch housing, and a slide tab integral to the bottom of the switch housing secure the switch to the mounting bracket integral to the

clockspring (3).

The Steering Control Module (SCM) is internal to the switch housing. The switch outputs are internally connected directly to the SCM. A single connector receptacle containing seven terminal pins is integral to the inboard end of the switch housing and connects the right multi-function switch (6) through a jumper wire harness (5) directly to the SCM. An integral connector receptacle on the back of the switch housing connects the SCM to the vehicle electrical system through a dedicated take out and connector of the instrument panel wire harness.

The left multi-function switch provides the vehicle operator with a control interface for the following exterior lighting system functions:

- **Front Fog Lamps** - For vehicles so equipped, the left multi-function switch control knob provides detent switching for the optional front fog lamps.
- **Headlamps** - The left multi-function switch control knob provides detent switching for the headlamps.
- **Headlamp Beam Selection** - The left multi-function switch control stalk provides detent switching for selection of the headlamp high or low beams.
- **Headlamp Optical Horn** - The left multi-function switch control stalk includes momentary switching of the headlamp high beam circuits to provide an optical horn feature (sometimes referred to as flash-to-pass), which allows the vehicle operator to momentarily flash the headlamp high beams as an optical signalling device.
- **Park Lamps** - The left multi-function switch control knob provides detent switching for the park lamps.
- **Rear Fog Lamps** - For vehicles so equipped, the left multi-function switch control knob provides detent switching for the optional rear fog lamps. Rear fog lamps are optional only for vehicles manufactured for certain markets, where they are required.
- **Turn Signal Control** - The left multi-function switch control stalk provides both momentary non-detent switching and detent switching with automatic cancellation for both the left and right turn signal lamps.

The left multi-function switch also provides the vehicle operator with a control interface for the following interior lighting functions:

- **Interior Lamps Defeat** - The left multi-function switch control ring provides detent switching to DEFEAT the illumination of all interior courtesy lamps when a door, the rear flip-up glass, or the liftgate are opened.
- **Interior Lamps On** - The left multi-function switch control ring provides detent switching to simultaneously illuminate all interior courtesy lamps.
- **Panel Lamps Dimming** - The left multi-function switch control ring provides simultaneous adjustable control of the illumination intensity of all instrument panel lighting at one of five available illumination intensity levels.
- **Parade Mode** - The left multi-function switch control ring provides detent switching for a PARADE mode that maximizes the illumination intensity of all instrument panel lighting for visibility when driving in daylight with the exterior lamps turned ON.

The left multi-function switch cannot be adjusted or repaired. If any function of the switch is ineffective, or if the switch is damaged, the entire switch unit must be replaced. The clockspring (with the multi-function switch

mounting bracket), the left multi-function switch (with the SCM), the right multi-function switch and the jumper wire harness are each available for separate service replacement.

OPERATION

LEFT MULTI- FUNCTION SWITCH

The left (lighting) multi-function switch uses resistor multiplexing to control the many functions and features it provides using a minimal number of hard wired circuits. The switch receives clean grounds from the Steering Control Module (SCM), then provides resistor multiplexed return outputs to the SCM to indicate the selected switch positions. The SCM then sends electronic **switch status** messages over a Local Interface Network (LIN) data bus to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), and the EMIC relays electronic **switch request** messages over the Controller Area Network (CAN) data bus to other electronic modules in the vehicle.

If the SCM detects no inputs from the left multi-function switch, it transmits an electronic **Signal Not Available (SNA)** status message over the LIN data bus. The SNA status signals the EMIC to request other electronic modules to implement a failsafe mode of operation for the exterior lighting systems. The failsafe mode automatically turns the exterior lighting ON when the ignition switch is in the ON position, and OFF when the ignition switch is in the OFF position.

The hard wired inputs and outputs of the left multi-function switch and SCM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, the most reliable, efficient and accurate means to diagnose this component requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

EXTERIOR LIGHTING

Following are descriptions of how the left multi-function switch is operated to control the many exterior lighting functions and features it provides:

- **Front Fog Lamps** - The optional front fog lamps are requested when the left multi-function switch control knob is pulled outward to the front fog lamps detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **exterior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **exterior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle. The switch control knob incorporates an internal cam mechanism that will only allow the front fog lamps to be selected while the headlamp ON position is also selected, and will automatically move the control knob to the front fog lamps OFF position when the control knob is rotated to deselect the headlamps.
- **Headlamps** - The headlamps are requested when the left multi-function switch control knob is rotated to the headlamps ON detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **exterior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **exterior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Headlamp Beam Selection** - The headlamp high beams are selected when the left multi-function switch control stalk is pushed forward to the high beam selection detent position. The low beams are selected when the control stalk is pulled rearward to the low beam selection detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **beam select switch**

status message over the LIN data bus to the EMIC, which relays an electronic **beam select switch request** message over the CAN data bus to other electronic modules in the vehicle.

- **Headlamp Optical Horn** - The headlamp optical horn is selected each time the left multi-function switch control stalk is pulled fully rearward to a momentary position. The headlamp high beams will remain illuminated for as long as the control stalk is held in this momentary position and the low beams will be restored when the control stalk is released. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **beam select switch status** message over the LIN data bus to the EMIC, which relays an electronic **beam select switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Park Lamps** - The headlamps are requested when the left multi-function switch control knob is rotated to the park lamps ON detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **exterior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **exterior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Rear Fog Lamps** - The optional rear fog lamps are requested when the left multi-function switch control knob is pulled outward to the front fog lamps detent position and then rotated to the rear fog lamps detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **exterior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **exterior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle. The switch control knob incorporates an internal cam mechanism that will only allow the rear fog lamps to be selected while the front fog lamps ON position is also selected, and will automatically move the control knob to the rear fog lamp OFF position when the control knob is pushed in to deselect the front fog lamps.
- **Turn Signal Control** - The turn signals are requested when the left multi-function switch control stalk is moved downward (left signal) or upward (right signal). The control stalk has a detent position in each direction that provides turn signals with automatic cancellation, and an intermediate, momentary position in each direction that automatically provides three turn signal blinks as a LANE CHANGE feature when the control stalk is tapped or will energize the turn signals for as long as the control stalk is held in the momentary position. When the control stalk is moved to a detent turn signal switch position, a cancel actuator extends through an opening in the side of the clockspring case toward the center of the steering column. A turn signal cancel cam that is integral to the clockspring rotor rotates with the steering wheel and the cam lobes contact the cancel actuator when it is extended from the left multi-function switch. When the steering wheel is rotated during a turning maneuver, one of the turn signal cancel cam lobes will contact the turn signal cancel actuator. The cancel actuator latches against the cancel cam rotation in the direction opposite that which is signaled. If the left turn signal detent is selected, the lobes of the cancel cam will ratchet past the cancel actuator when the steering wheel is rotated to the left, but will unlatch the cancel actuator as the steering wheel rotates to the right and returns to center, which will cancel the turn signal event and release the control stalk from the detent so it returns to the neutral OFF position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **exterior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **exterior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.

INTERIOR LIGHTING

Following are descriptions of the how the left multi-function switch is operated to control the many interior lighting functions and features it provides:

- **Interior Lamps Defeat** - The interior lamps defeat feature is requested when the left multi-function switch control sleeve is rotated to the interior lamps DEFEAT detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **interior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **interior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Interior Lamps On** - The interior lamps ON feature is requested when the left multi-function switch control sleeve is rotated to the interior lamps ON detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **interior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **interior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Panel Lamps Dimming** - The panel lamps dimming function is active only when the left multi-function switch control knob is in any exterior lighting ON position. With the exterior lighting ON, the panel lamps dimming level is requested when the left multi-function switch control sleeve is rotated to any one of five minor detent positions. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **interior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **interior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.
- **Parade Mode** - The PARADE (or funeral) mode is active only when the left multi-function switch control knob is in any exterior lighting ON position. With the exterior lighting ON, the PARADE mode is requested when the left multi-function switch control sleeve is rotated to the PARADE mode detent position. The SCM reads the resistor multiplexed input from the left multi-function switch and sends an electronic **interior lighting switch status** message over the LIN data bus to the EMIC, which relays an electronic **interior lighting switch request** message over the CAN data bus to other electronic modules in the vehicle.

REMOVAL

LEFT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

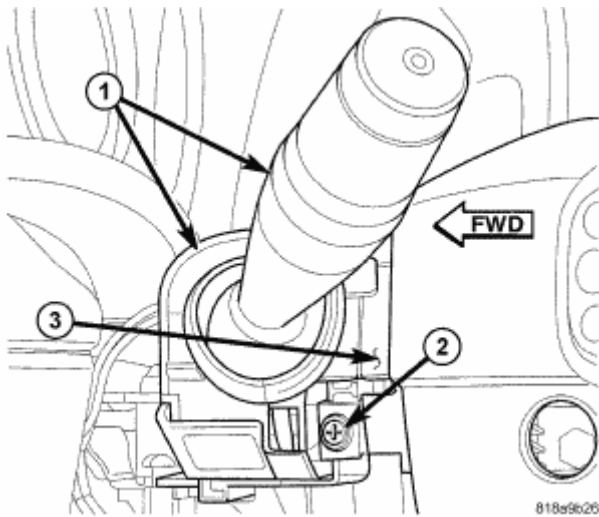


Fig. 30: Left Multi-Function Switch Replacement
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove both the upper and lower shrouds from the steering column. Refer to **REMOVAL** .
3. Disconnect the instrument panel wire harness connector from the connector receptacle on the back of the left multi-function switch.
4. Remove the screw (2) that secures the left multi-function switch (1) to the mounting bracket integral to the left side of the clockspring (3) on the steering column.
5. Slide the switch away from the clockspring far enough to disengage the slide tabs on the switch housing from the channel formations in the mounting bracket.
6. Disconnect the jumper wire harness connector from the connector receptacle on the inboard end of the left multi-function switch.
7. Remove the switch from the clockspring.

INSTALLATION

LEFT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

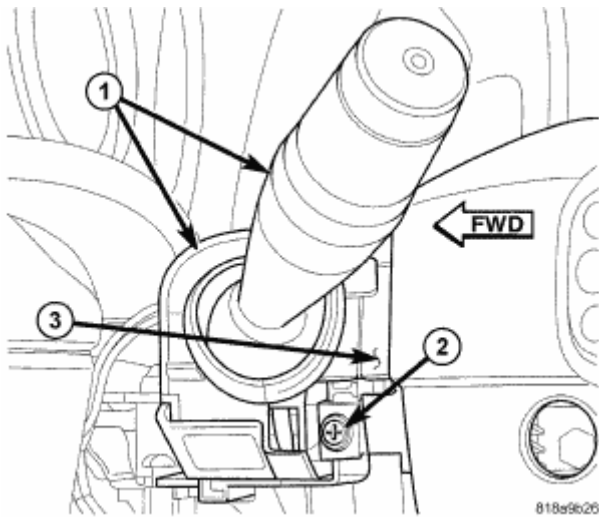


Fig. 31: Left Multi-Function Switch Replacement
Courtesy of CHRYSLER LLC

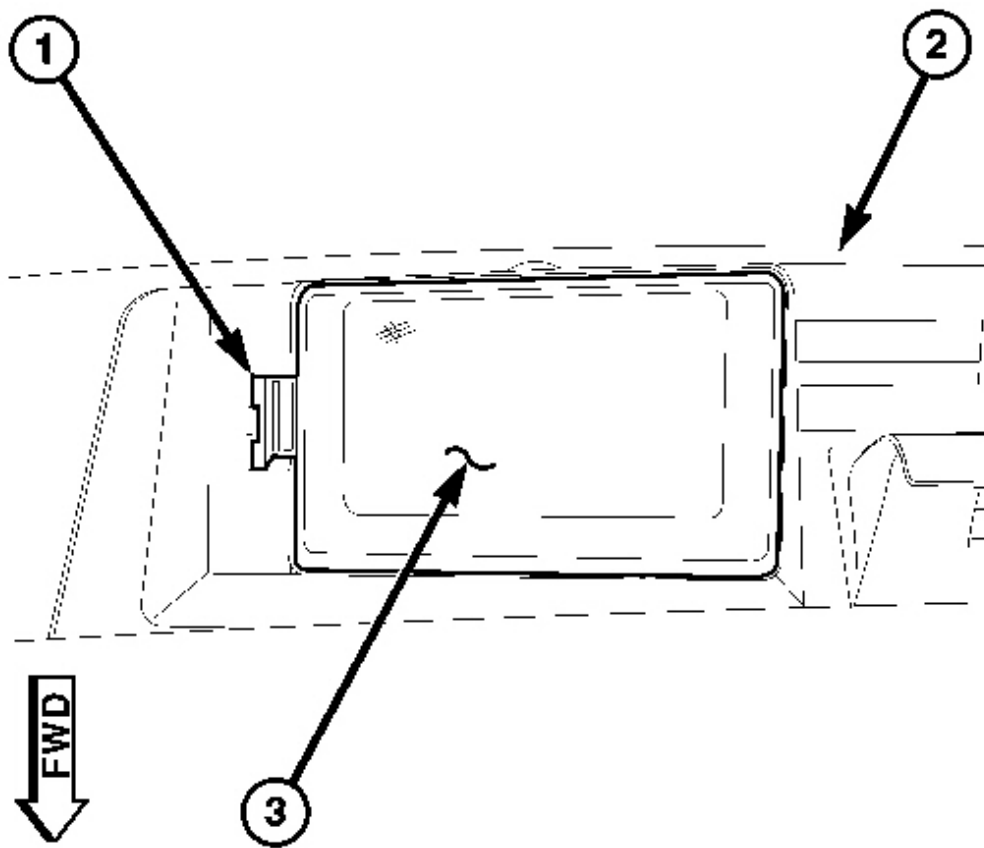
1. Position the left multi-function switch (1) close enough to the mounting bracket (3) integral to the left side of the clockspring to reconnect the jumper wire harness connector to the connector receptacle on the inboard side of the switch housing.
2. Align the slide tabs on the switch housing with the channel formations integral to the clockspring mounting bracket, then slide the switch into the bracket until it is firmly seated.
3. Install and tighten the screw (2) that secures the mounting tab on the front of the left multi-function switch to the mounting bracket on the clockspring. Tighten the screw to 1 N.m (10 in. lbs.).
4. Reconnect the instrument panel wire harness connector to the connector receptacle on the back of the switch housing.
5. Reinstall the upper and lower shrouds onto the steering column. Refer to **INSTALLATION** .
6. Reconnect the battery negative cable.

LICENSE PLATE LAMP

REMOVAL

LICENSE PLATE LAMP BULB

NOTE: The following procedure is for replacement of a license plate lamp bulb. The license plate lamps are integral to the liftgate handle and light bar unit. If any part of this unit is ineffective or damaged, the entire handle and light bar unit must be replaced.



815be3cf

Fig. 32: Locating License Plate Lamp
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Reach under the liftgate handle and light bar unit (2) to access and depress the latch tab (1) on the outboard side of the license plate lamp lens toward the lens (3).
3. Pull the outboard side of the lens downward far enough to disengage the two tabs on the inboard side of the lens from the lamp housing.
4. Remove the lens from under the handle and light bar.

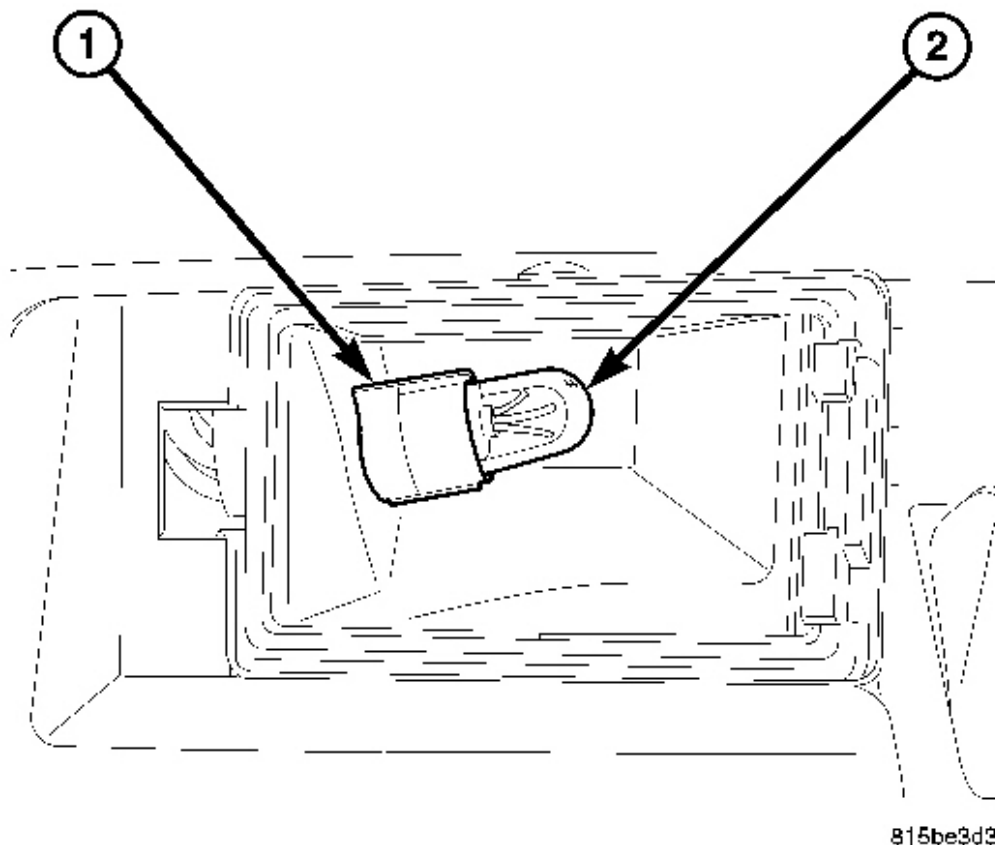


Fig. 33: Removing/Installing Bulb
Courtesy of CHRYSLER LLC

5. Firmly grasp and pull the bulb (2) straight out of the socket (1) in the outboard side of the lamp housing.

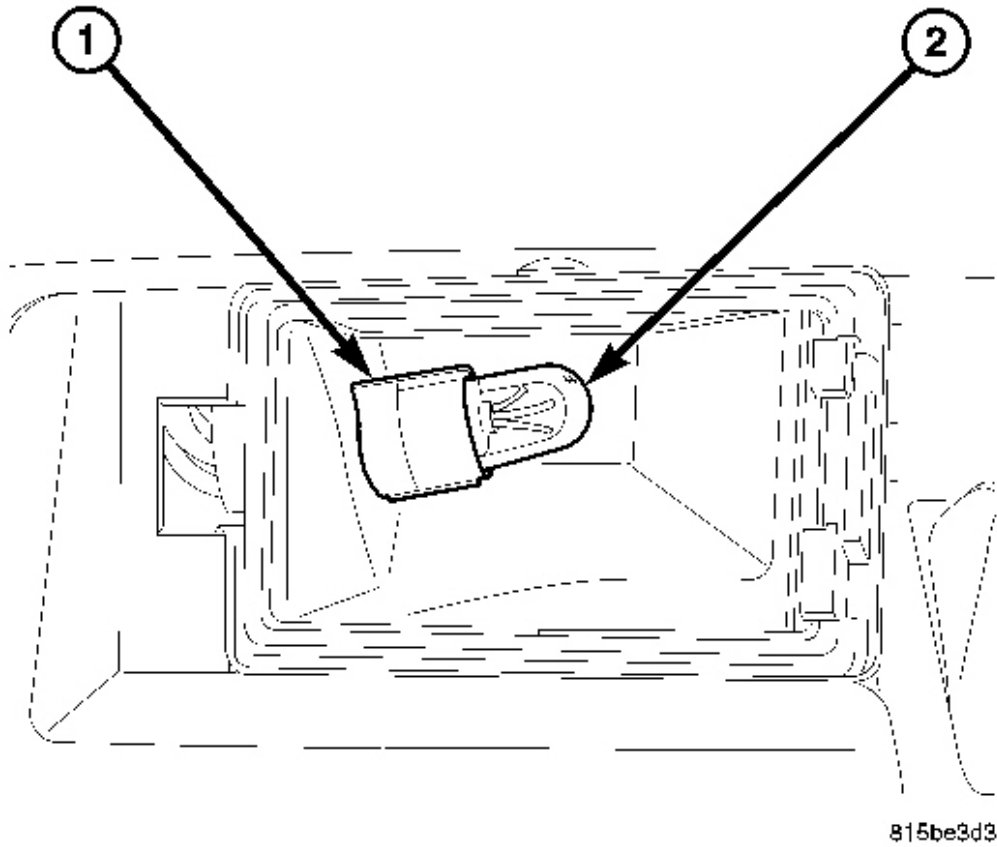
INSTALLATION

LICENSE PLATE LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: The following procedure is for replacement of a license plate lamp bulb. The license plate lamps are integral to the liftgate handle and light bar unit. If any part of this unit is ineffective or damaged, the entire handle and light bar unit

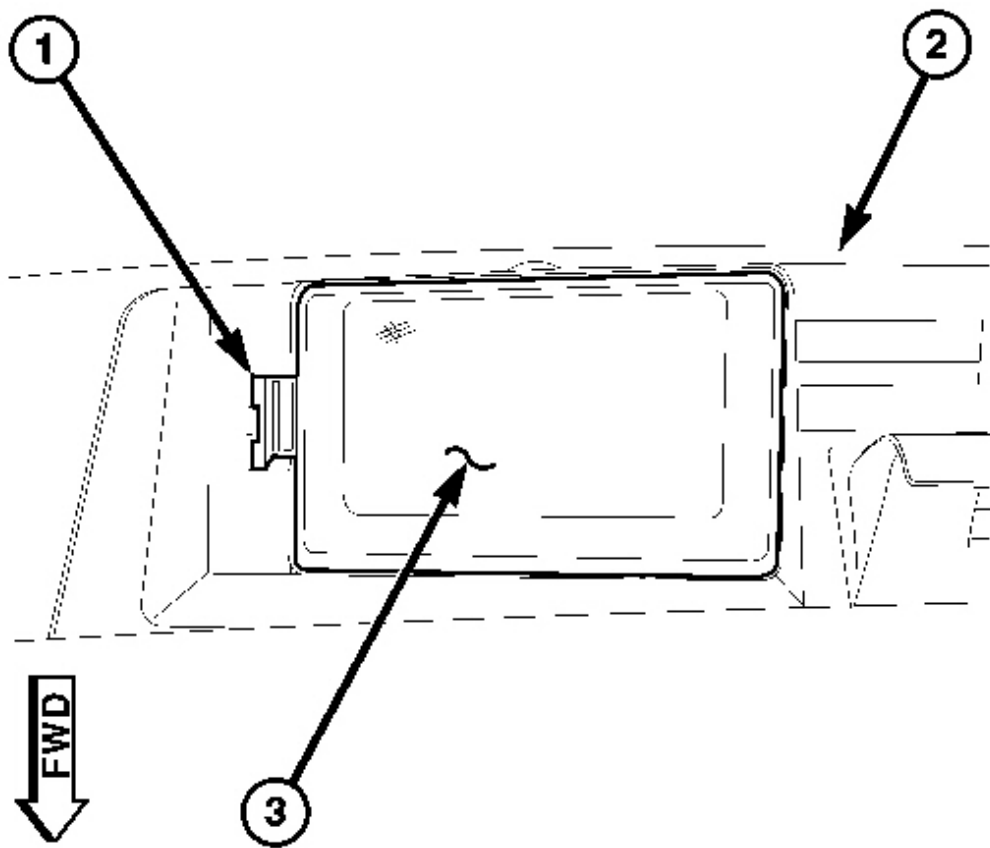
must be replaced.



815be3d3

Fig. 34: Removing/Installing Bulb
Courtesy of CHRYSLER LLC

1. Align the base of the bulb (2) with the socket (1) in the outboard side of the license plate lamp housing.
2. Push the bulb straight into the socket until the base is firmly seated.



815be3cf

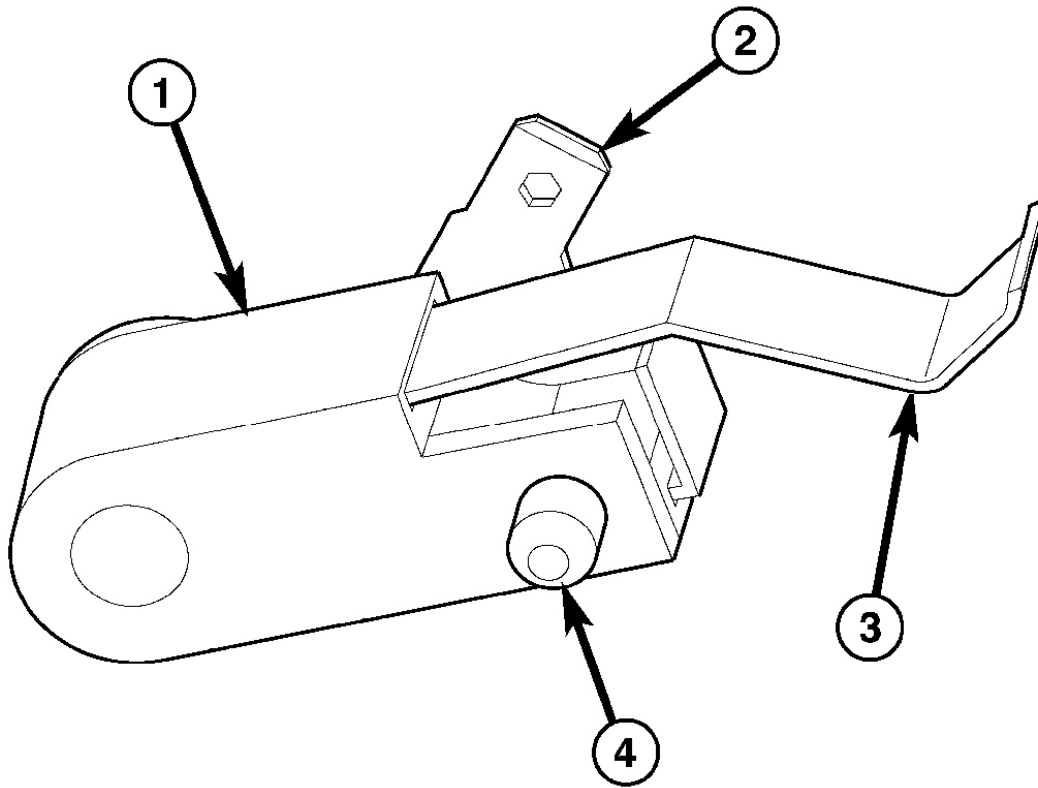
Fig. 35: Locating License Plate Lamp
Courtesy of CHRYSLER LLC

3. Position the lens (3) over the lamp housing under the handle and light bar unit (2).
4. Engage the two tabs on the inboard side of the lens into the slots on the inboard side of the lamp housing.
5. Push the outboard side of the lens upward until the lens latch tab (1) is fully engaged in the lamp housing.
6. Reconnect the battery negative cable.

PARK BRAKE SWITCH

DESCRIPTION

PARK BRAKE SWITCH



81460874

Fig. 36: Park Brake Switch
Courtesy of CHRYSLER LLC

The park brake switch (1) is located on the park brake lever mechanism on the floor panel transmission tunnel below the center floor console. This switch includes a spade-type output terminal (2) that connects the switch to the vehicle electrical system through a dedicated take out and connector of the body wire harness. The output terminal is integral to the stationary contact within a molded plastic insulator. A locating tab (4) on the insulator engages a slot in the park brake lever mechanism for positive switch location. External to the insulator is a movable leaf contact (3) with an integral grounding lug on one end and an integral actuating lever and follower on the opposite end. The switch is secured to and grounded by a single screw to the park brake lever mechanism.

The park brake switch cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced.

OPERATION

PARK BRAKE SWITCH

The park brake switch is a normally closed, mechanically actuated leaf contact switch that is operated by the park brake lever mechanism. The switch is grounded through its mounting to the park brake lever mechanism.

and provides a ground input to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) on a park brake switch sense circuit whenever the park brake is applied, and opens this circuit whenever the park brake is released. The park brake switch sense input to the EMIC is used for control of the brake indicator and may also be used as a logic input for other electronic features in the vehicle.

The park brake switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

DIAGNOSIS AND TESTING

PARK BRAKE SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: If the brake indicator stays ON with the ignition switch in the ON position and the park brake released, or comes ON while driving, the brake system must be diagnosed and repaired prior to performing the following tests. Refer to DIAGNOSIS AND TESTING . If no brake system problem is found, the following procedures will help to locate a shorted or open park brake switch sense circuit, or an ineffective park brake switch.

INDICATOR ILLUMINATES DURING BULB TEST, BUT DOES NOT WHEN PARK BRAKE APPLIED

1. Disconnect and isolate the battery negative cable. Disconnect the wire harness connector for the park brake switch from the switch terminal. Apply the parking brake. Check for continuity between the park brake switch terminal and a good ground. There should be continuity. If OK, go to step 2. If not OK, replace the ineffective park brake switch.
2. Disconnect the instrument panel wire harness connector from the cluster connector receptacle. Check for continuity between the park brake switch sense circuit cavities of the wire harness connector for the park brake switch and the wire harness connector for the instrument cluster. There should be continuity. If not OK, repair the open park brake switch sense circuit between the park brake switch and the instrument cluster as required.

INDICATOR REMAINS ILLUMINATED - BRAKE SYSTEM CHECKS OK

1. Disconnect and isolate the battery negative cable. Disconnect the wire harness connector for the park brake switch from the switch terminal. Check for continuity between the terminal of the park brake switch and a good ground. There should be no continuity with the park brake released, and continuity with the park brake applied. If OK, go to step 2. If not OK, replace the ineffective park brake switch.

2. Disconnect the instrument panel wire harness connector from the cluster connector receptacle. Check for continuity between the park brake switch sense circuit cavity of the wire harness connector for the park brake switch and a good ground. There should be no continuity. If not OK, repair the shorted park brake switch sense circuit between the park brake switch and the instrument cluster as required.

REMOVAL

PARK BRAKE SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

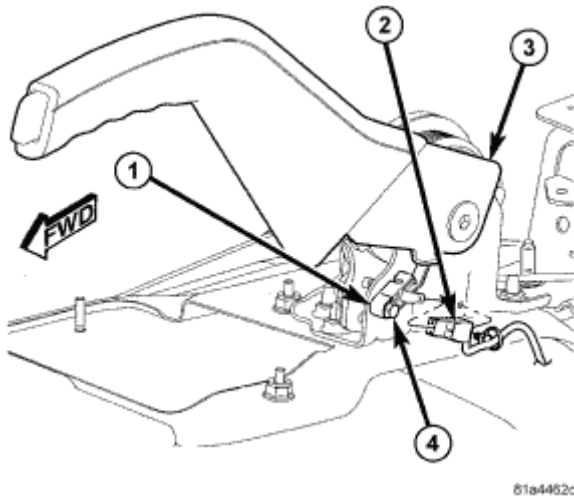


Fig. 37: Identifying Park Brake Switch, Wire Harness Connector, Parking Brake Lever Mechanism & Screw

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the console from the floor panel transmission tunnel. Refer to **REMOVAL** .
3. Apply the parking brake lever mechanism (3).
4. Disconnect the wire harness connector (2) from the terminal of the park brake switch (1) located on the left side of the park brake lever mechanism.
5. Remove the screw (4) that secures the park brake switch to the park brake lever mechanism.
6. Remove the switch from the park brake lever mechanism.

INSTALLATION

PARK BRAKE SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

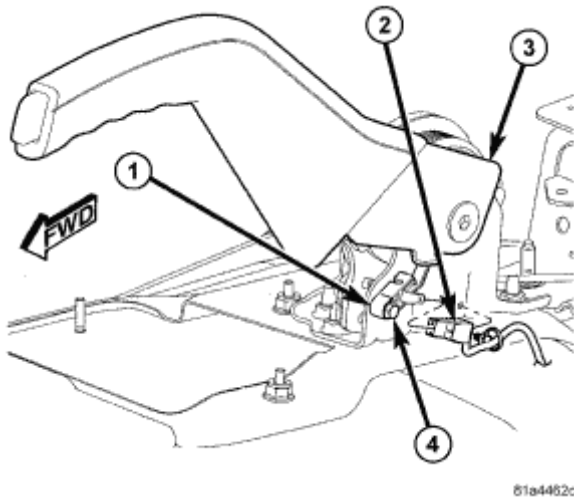


Fig. 38: Identifying Park Brake Switch, Wire Harness Connector, Parking Brake Lever Mechanism & Screw

Courtesy of CHRYSLER LLC

1. Position park brake switch (1) onto the left side of the park brake lever mechanism (3). Be certain to engage the locating pin on the back of the switch insulator into the locating slot in the lever mechanism bracket.
2. Install and tighten the screw (4) that secures the park brake switch to the park brake lever mechanism. Tighten the screw to 2.5 N.m (24 in. lbs.).
3. Reconnect the wire harness connector (2) to the terminal of the park brake switch.
4. Reinstall the console onto the floor panel transmission tunnel. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.
6. Turn the ignition switch to the On position and check for proper brake indicator operation with the parking brake applied, then release the parking brake and check that the brake indicator extinguishes.

PARK/TURN SIGNAL LAMP

REMOVAL

FRONT PARK/TURN SIGNAL LAMP

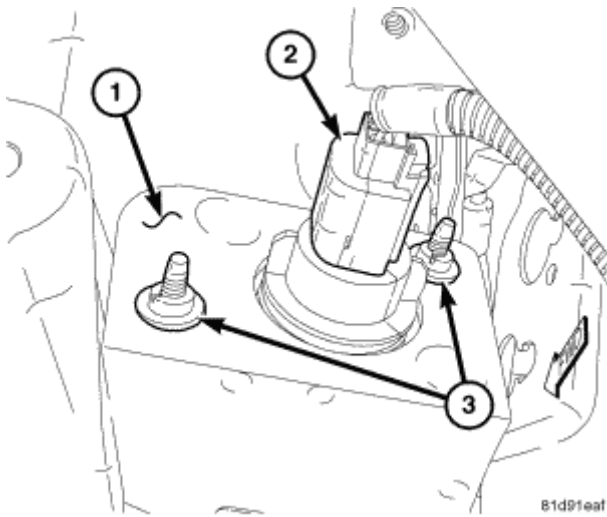


Fig. 39: Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the liner from the front of the front fender wheel house. Refer to **REMOVAL** .
3. Disconnect the wire harness connector (2) from the connector receptacle integral to the bulb socket on the back of the front park/turn signal lamp housing located on the inside of the forward-facing end of the front fascia (1).
4. Remove the two nuts (3) that secure the studs of the lamp housing to the inside surface of the front fascia.
5. Remove the lamp from the outer surface of the front fascia.

FRONT PARK/TURN SIGNAL LAMP BULB

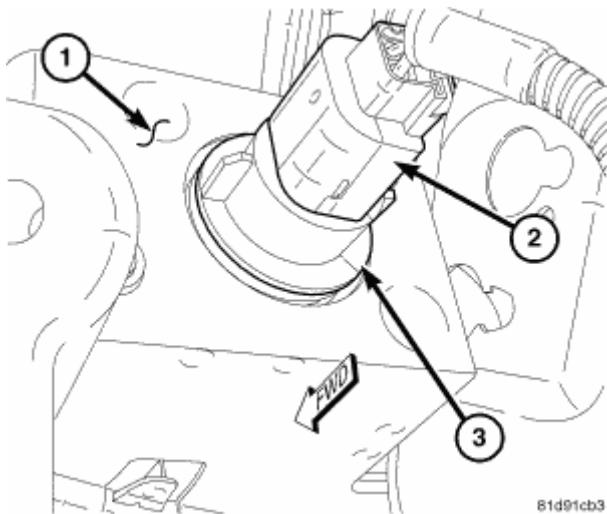


Fig. 40: Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the liner from the front of the front fender wheel house. Refer to **REMOVAL** .

3. Disconnect the wire harness connector (2) from the connector receptacle integral to the park/turn signal bulb socket (3) on the back of the park/turn signal lamp housing located on the back of the inside of the forward facing end of the front fascia (1).
4. Firmly grasp the socket and rotate it counterclockwise about 30 degrees to unlock it.
5. Pull the socket and bulb straight out from the keyed opening in the lamp housing.
6. Pull the base of the bulb straight out of the socket.

INSTALLATION

FRONT PARK/TURN SIGNAL LAMP

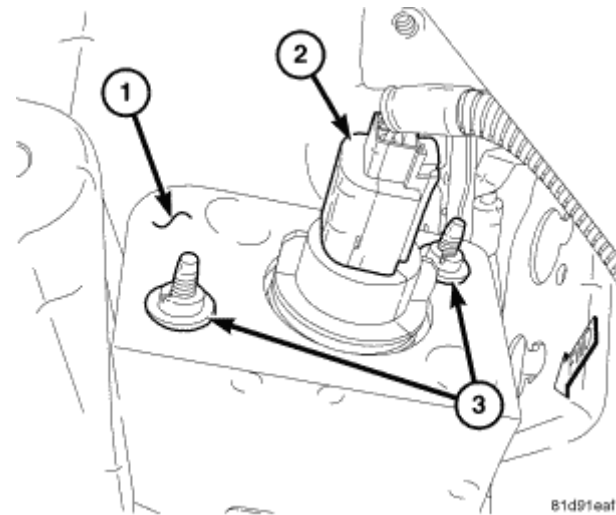


Fig. 41: Wire Harness Connector
 Courtesy of CHRYSLER LLC

1. Position the front park/turn signal lamp to the outer surface of the front fascia by inserting the studs on the back of the lamp housing into the mounting holes of the fascia.
2. Install and tighten the two nuts (3) that secure the studs of the lamp housing to the inside surface of the front fascia (1). Tighten the nuts securely.
3. Reconnect the wire harness connector (2) to the connector receptacle integral to the bulb socket.
4. Reinstall the liner to the front of the front fender wheel house. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

FRONT PARK/TURN SIGNAL LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

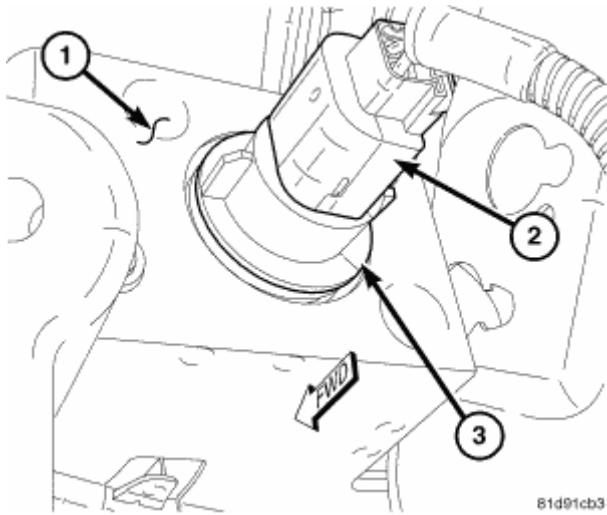


Fig. 42: Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Align the base of the bulb with the park/turn signal bulb socket (3).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Align the socket and bulb with the keyed opening in the back of the front park/turn signal lamp housing located on the back of the inside of the forward facing end of the front fascia (1).
4. Insert the socket and bulb into the housing until the socket is firmly seated.
5. Rotate the socket clockwise about 30 degrees to lock it into place.
6. Reconnect the wire harness connector (2) to the connector receptacle integral to the park/turn signal bulb socket on the back of the lamp housing.
7. Reinstall the liner to the front of the front fender wheel house. Refer to **INSTALLATION** .
8. Reconnect the battery negative cable.

REAR LAMP UNIT

REMOVAL

REAR LAMP UNIT

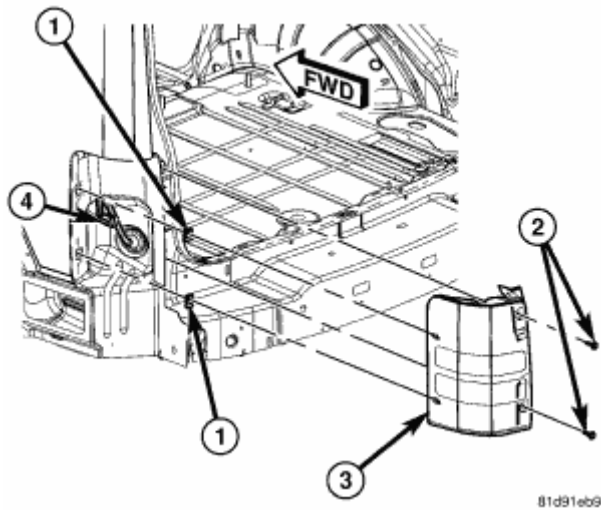


Fig. 43: Rear Lamp Unit
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Open the liftgate to access and remove the two screws (2) that secure the rear lamp unit (3) to the side jamb of the liftgate opening.
3. Pull the outboard side of the rear lamp unit rearward far enough to unsnap the two ball studs on the outboard side of the lamp housing from the two plastic grommets (1) in the rear body sheet metal.
4. Disconnect the wire harness connector (4) from the connector receptacle on the socket plate on the back of the lamp housing.
5. Remove the lamp from the vehicle.
6. Remove the two plastic grommets from the rear body sheet metal and discard.

REAR LAMP UNIT BULB

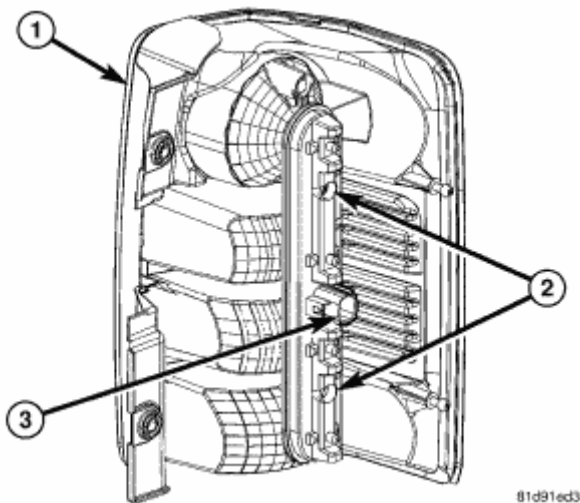


Fig. 44: Rear Lamp Unit
Courtesy of CHRYSLER LLC

NOTE: The rear lamp unit may contain up to four bulbs, depending upon the market for which the vehicle was manufactured. The service procedures for each bulb are the same, only the bulb sizes and types may differ.

1. Disconnect and isolate the battery negative cable.
2. Remove the rear lamp unit (1) from the rear body sheet metal. See **REMOVAL**.
3. Remove the two screws (2) that secure the socket plate (3) to the back of the rear lamp unit housing.
4. Remove the socket plate from the rear lamp.
5. Pull the base of the bulb straight out of the socket plate.

INSTALLATION

REAR LAMP UNIT

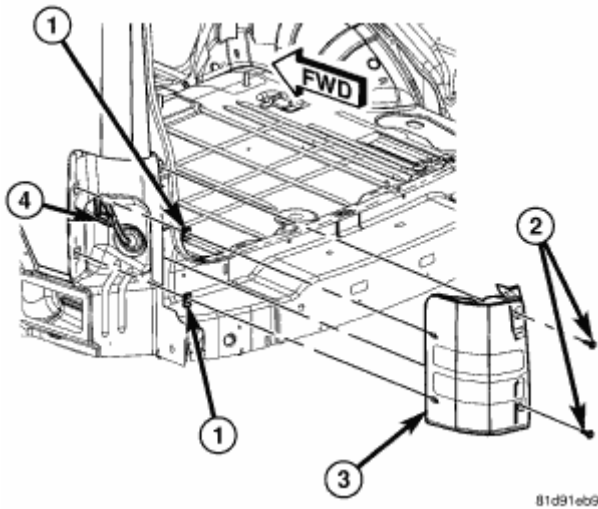


Fig. 45: Rear Lamp Unit
Courtesy of CHRYSLER LLC

1. Install two new plastic grommets (1) into the rear body sheet metal.
2. Position the rear lamp unit (3) to the lamp opening in the rear body sheet metal.
3. Reconnect the wire harness connector (4) to the connector receptacle on the socket plate on the back of the lamp housing.
4. Align the two ball studs on the outboard side of the rear lamp housing with the two plastic grommets in the rear body sheet metal.
5. Using hand pressure, push firmly and evenly on the outboard side of the lamp until the two ball studs snap into the plastic grommets.
6. Install and tighten the two screws (2) that secure the inboard side of the lamp housing to the side jamb of the liftgate opening. Tighten the screws to 5.5 N.m (50 in. lbs.).
7. Reconnect the battery negative cable.

REAR LAMP UNIT BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

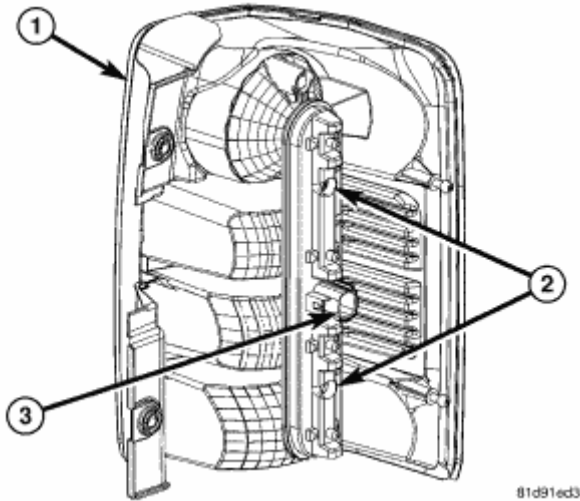


Fig. 46: Rear Lamp Unit
Courtesy of CHRYSLER LLC

NOTE: The rear lamp unit may contain up to four bulbs, depending upon the market for which the vehicle was manufactured. The service procedures for each bulb are the same, only the bulb sizes and types may differ.

1. Align the base of the bulb with the socket in the rear lamp unit socket plate (3).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Be certain that a rubber sealing washer is properly installed and in good condition around the base of each bulb on the socket plate.
4. Align the bulbs in the socket plate with the openings on the back of the rear lamp unit housing (1).
5. Insert the bulbs straight into the housing until the socket plate is firmly seated against the housing.
6. Install and tighten the two screws (2) that secure the socket plate to the housing. Tighten the screws to 1 N.m (12 in. lbs.).
7. Reinstall the rear lamp unit onto the end of the rear body sheet metal. See **INSTALLATION**.
8. Reconnect the battery negative cable.

REPEATER LAMP

REMOVAL

REPEATER LAMP

NOTE: Repeater lamps are used only on vehicles manufactured for certain markets where these lamps are required.

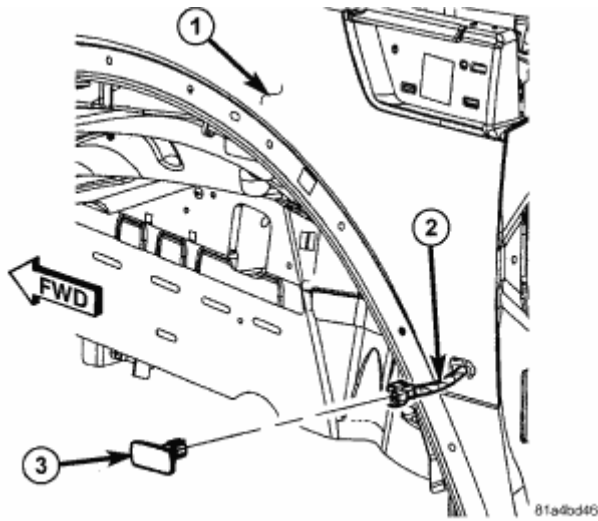


Fig. 47: Identifying Fender, Wire Harness Connector & Lamp Lens/Housing
Courtesy of CHRYSLER LLC

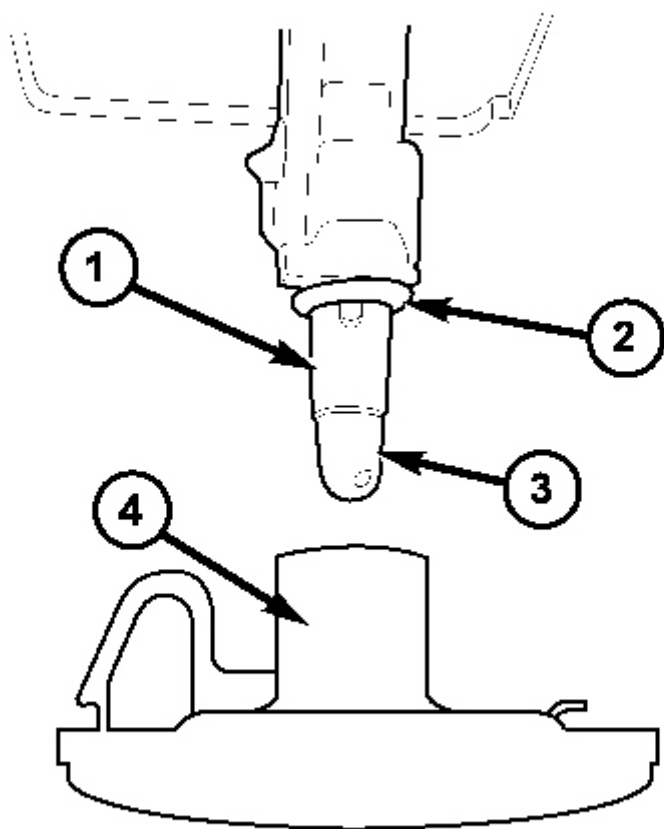
1. Disconnect and isolate the battery negative cable.

NOTE: The same repeater lamp is used on both sides of the vehicle. Regardless of which side of the vehicle the lamp is on, when properly oriented the fixed hook tab integral to the back of the lamp housing is on the right-hand side of the lamp and the latch feature is on the left-hand side.

2. Using hand pressure, press the right edge of the repeater lamp lens/housing (3) toward the left against the spring pressure of the latch feature, then pull the right edge of the lamp outward far enough to disengage the hook tab from the right side of the mounting hole in the fender (1).
3. Pull the lamp out from the fender far enough to access and disconnect the wire harness connector (2) from the bulb socket on the back of the lamp lens/housing.
4. Remove the repeater lamp from the fender.

REPEATER LAMP BULB

NOTE: Repeater lamps are used only on vehicles manufactured for certain markets where these lamps are required.



815bb10d

Fig. 48: Remove/Install Repeater Lamp Bulb

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the repeater lamp from the fender mounting hole, but do not disconnect the wire harness connector. See **REMOVAL**.
3. Firmly grasp the bulb socket (1) on the back of the lamp lens/housing (4) and rotate it counterclockwise about 30 degrees to unlock it.
4. Pull the socket and bulb straight out from the keyed opening in the housing.
5. Pull the base of the bulb (3) straight out of the socket.

INSTALLATION

REPEATER LAMP

NOTE: Repeater lamps are used only on vehicles manufactured for certain markets where these lamps are required.

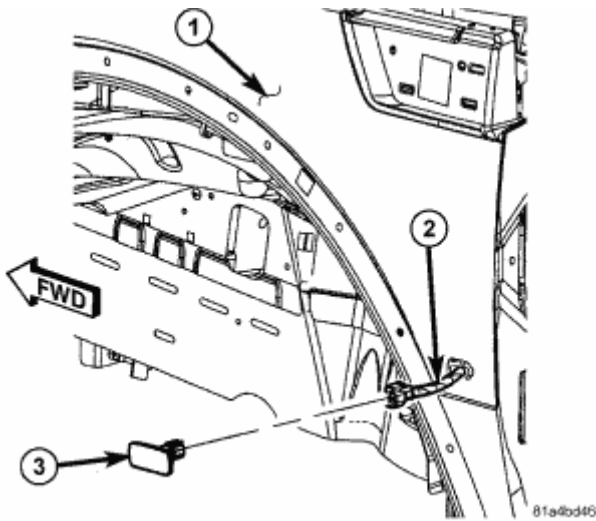


Fig. 49: Identifying Fender, Wire Harness Connector & Lamp Lens/Housing
Courtesy of CHRYSLER LLC

1. Position the repeater lamp lens/housing (3) close enough to the mounting hole in the fender (1) to access and reconnect the wire harness connector (2) to the bulb socket on the back of the lamp lens/housing.

NOTE: The same repeater lamp is used on both sides of the vehicle. Regardless of which side of the vehicle the lamp is on, when properly oriented the fixed hook tab integral to the back of the lamp housing is on the right-hand side of the lamp and the latch feature is on the left-hand side.

2. With the lamp lens/housing properly oriented, engage the hook tab on the back of the right side of the lamp with the right edge of the fender mounting hole.
3. Using hand pressure, press the left side of the lamp lens/housing into the mounting hole against the spring pressure of the latch feature until the latch snaps into place.
4. Reconnect the battery negative cable.

REPEATER LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: Repeater lamps are used only on vehicles manufactured for certain markets where these lamps are required.

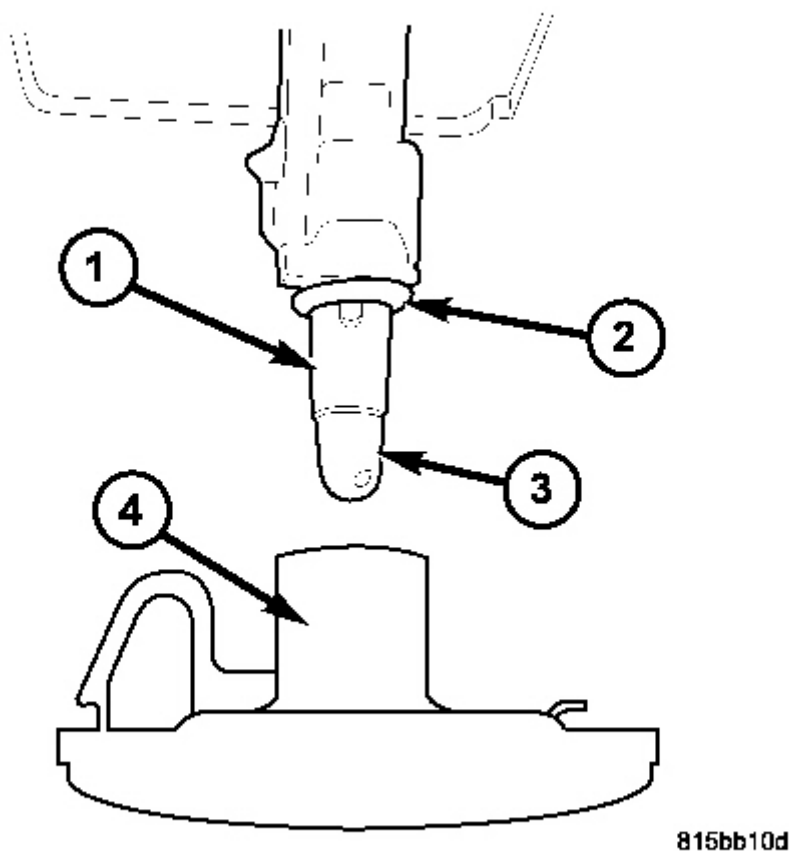


Fig. 50: Remove/Install Repeater Lamp Bulb
Courtesy of CHRYSLER LLC

1. Align the base of the bulb (3) with the socket (1).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Be certain that a rubber O-ring seal (2) is properly installed and in good condition around the base of the bulb socket.
4. Align the socket and bulb with the keyed opening on the back of the repeater lamp lens/housing (4).
5. Insert the socket and bulb into the housing until the socket is firmly seated.
6. Rotate the socket clockwise about 30 degrees to lock it into place.
7. Reinstall the repeater lamp into the fender mounting hole. See **INSTALLATION**.
8. Reconnect the battery negative cable.

REMOVAL

TRAILER TOW CONNECTOR

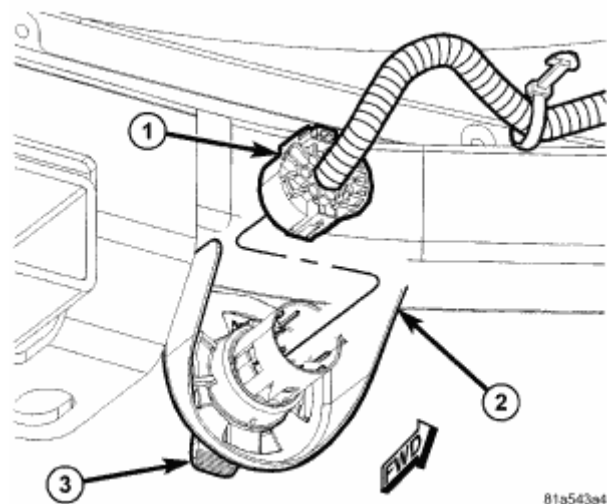


Fig. 51: Identifying Body Wire Harness Connector, Bracket & Trailer Tow Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Reach underneath and behind the bracket (2) for the trailer tow connector (3) to access and disconnect the body wire harness connector (1).

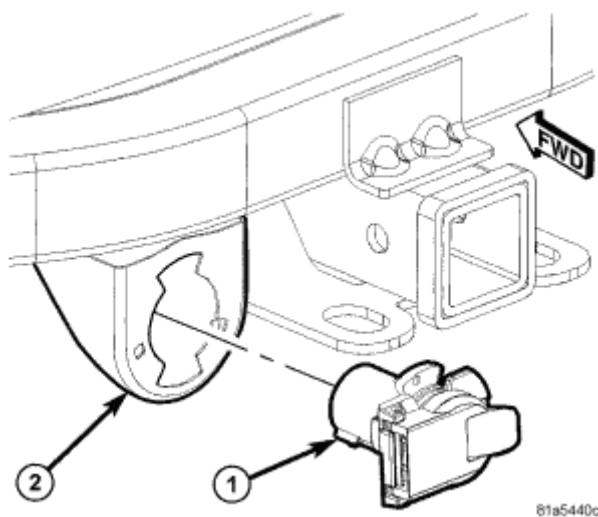


Fig. 52: Identifying Trailer Tow Connector & Bracket
Courtesy of CHRYSLER LLC

3. Grasp the trailer tow connector (1) firmly from the face of the bracket (2) and rotate it 90 degrees counterclockwise to unlock it.
4. Pull the trailer tow connector straight rearward to remove it from the hitch receiver bracket.

INSTALLATION

TRAILER TOW CONNECTOR

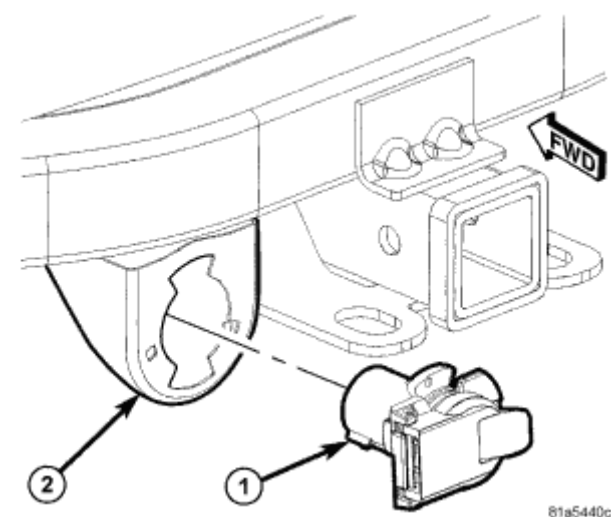


Fig. 53: Identifying Trailer Tow Connector & Bracket
Courtesy of CHRYSLER LLC

1. Align the trailer tow connector (1) to the keyed mounting hole in the bracket (2) of the trailer hitch receiver.
2. Insert the connector into the bracket until it is firmly seated.
3. Rotate the connector clockwise 90 degrees to lock it into place.

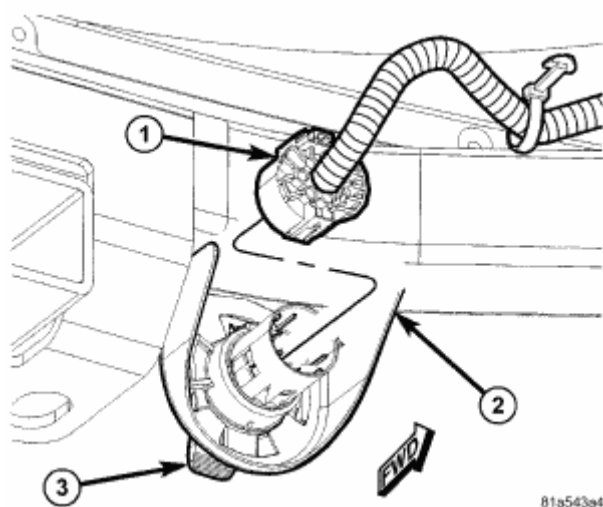


Fig. 54: Identifying Body Wire Harness Connector, Bracket & Trailer Tow Connector
Courtesy of CHRYSLER LLC

4. Reach underneath and behind the bracket (2) for the trailer tow connector (3) to access and reconnect the body wire harness connector (1).
5. Reconnect the battery negative cable.

TRAILER TOW WIRING

DESCRIPTION

TRAILER TOW WIRING

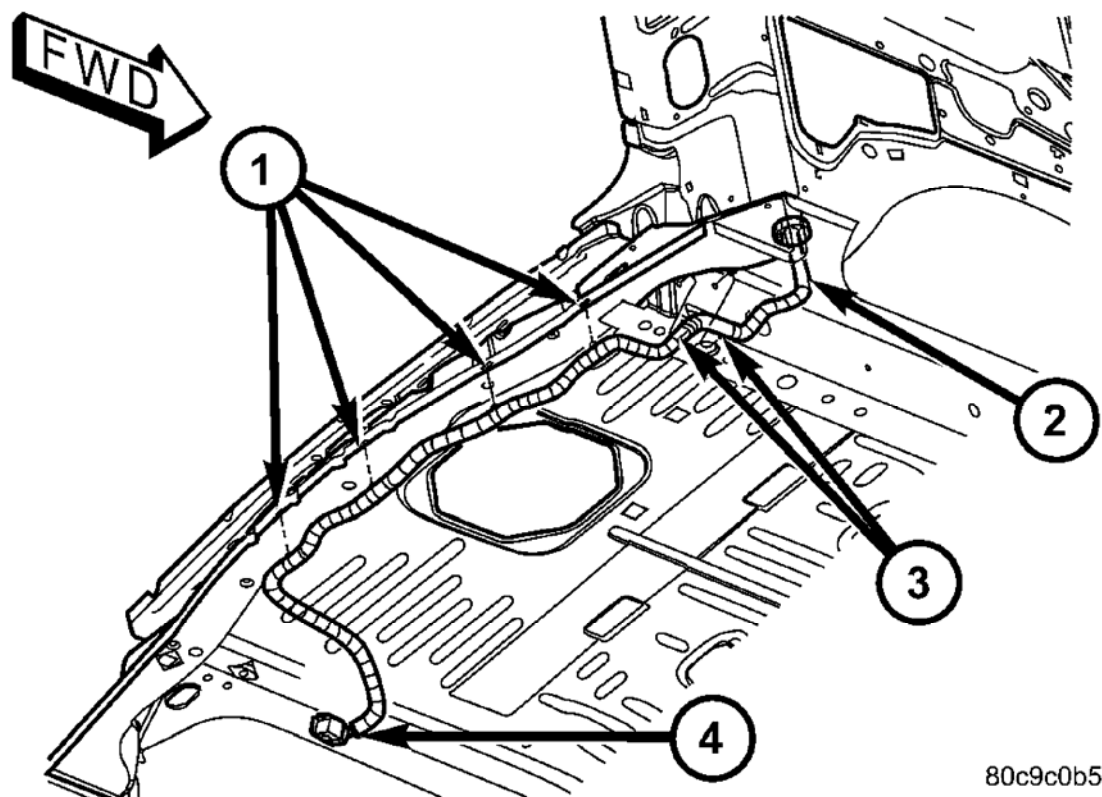


Fig. 55: Trailer Tow Wiring
Courtesy of CHRYSLER LLC

Vehicles equipped with an optional factory-installed trailer towing package have a rear body wire harness that includes a trailer tow wiring take out (2) secured beneath the rear underbody with retainer clips (1 and 3). A molded connector (4) at the end of the take out is connected to a heavy duty, sealed, 7-pin trailer tow connector located on a bracket on the trailer hitch receiver. The rear body harness includes a second take out with a trailer tow relay connector bank and the four trailer tow relays that isolate the right turn signal, left turn signal, and brake lamp circuits of the vehicle from the electrical system of the trailer. The fourth relay in the connector bank provides a fused ignition switch output (run) source of battery voltage to the trailer tow connector through a trailer tow relay output circuit.

The package also includes an adapter harness (stored beneath the left rear seat cushion of the vehicle when it is shipped from the factory) that adapts the 7-pin trailer tow connector to a standard, light-duty, 4-pin trailer tow connector. Refer to the appropriate wiring information.

TURN SIGNAL CANCEL CAM

DESCRIPTION

TURN SIGNAL CANCEL CAM

The turn signal cancel cam is concealed within the clockspring case on the steering column. The turn signal cancel cam consists of integral eccentrics on the outer circumference of the molded plastic clockspring rotor. The clockspring mechanism provides turn signal cancellation as well as a constant electrical connection between the horn switch, driver airbag, speed control switches, Electronic Vehicle Information Center (EVIC) switches and remote radio switches on the steering wheel and the instrument panel wire harness on the steering column. The housing of the clockspring is secured to the steering column and remains stationary. The rotor of the clockspring, including the turn signal cancel cam lobes rotate with the steering wheel.

The turn signal cancel cam is serviced as a unit with the clockspring and cannot be repaired. If ineffective or damaged, the entire clockspring unit must be replaced. Refer to **REMOVAL** .

OPERATION

TURN SIGNAL CANCEL CAM

When the left multi-function switch control stalk is moved to a latched turn signal ON position, a turn signal cancel actuator is extended from the inside surface of the switch housing through a small rectangular opening on the left side of the clockspring case toward the turn signal cancel cam. As the steering wheel is rotated to complete the turn, one of the cam eccentrics will contact the actuator, automatically cancelling the turn signal event and releasing the latched left multi-function switch control stalk to the neutral or OFF position.

2008 ACCESSORIES AND EQUIPMENT

Lamps/Lighting - Interior - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

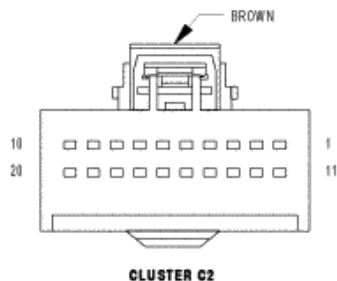
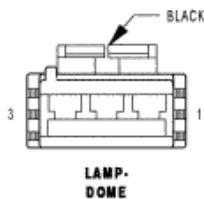
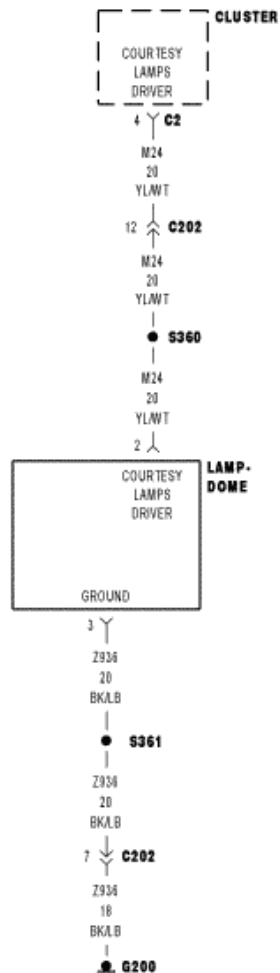
DTC	Description
<u>B161A</u>	COURTESY/DOME LAMP CONTROL CIRCUIT
<u>B161E</u>	READING LAMP CONTROL CIRCUIT

LAMPS/LIGHTING - INTERIOR - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B161A-COURTESY/DOME LAMP CONTROL CIRCUIT

Circuit Schematic



0190439

Fig. 1: Courtesy/Dome Lamp Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- **Set Condition:**
- When the Instrument Cluster detects a short to battery on the Control circuit.

Possible Causes

Possible Causes
(M24) COURTESY LAMPS DRIVER CIRCUIT SHORT TO GROUND
(M24) COURTESY LAMPS DRIVER CIRCUIT OPEN
INSTRUMENT CLUSTER

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

Clear all Instrument Cluster DTC's

Turn the Courtesy Lamps on.

With the scan tool, read DTC's.

Does the scan tool read: B161A-COURTESY/DOME LAMP CONTROL CIRCUIT?

Yes

Go To 2).

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) CHECK THE (M24) COURTESY LAMPS DRIVER CIRCUIT FOR A SHORT TO GROUND

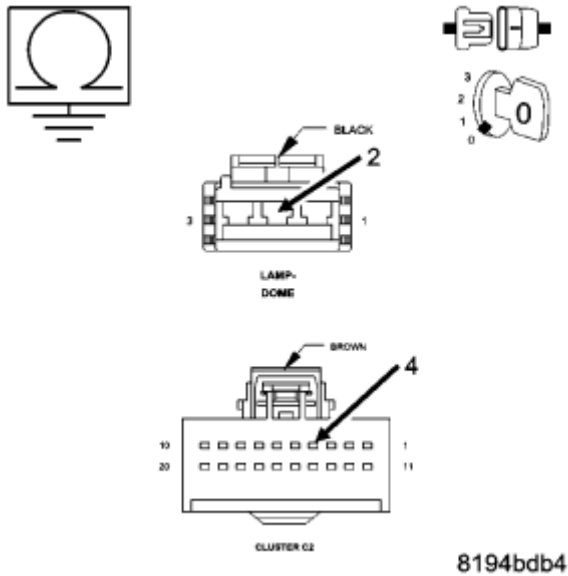


Fig. 2: Checking Courtesy Lamps Driver Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Measure the resistance between the (M24) Courtesy Lamp Driver circuit and ground.

Is the resistance below 5.0 ohms?

Yes

Repair the (M24) Courtesy Lamp Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3).

3) CHECK THE (M24) COURTESY LAMPS DRIVER CIRCUIT FOR AN OPEN

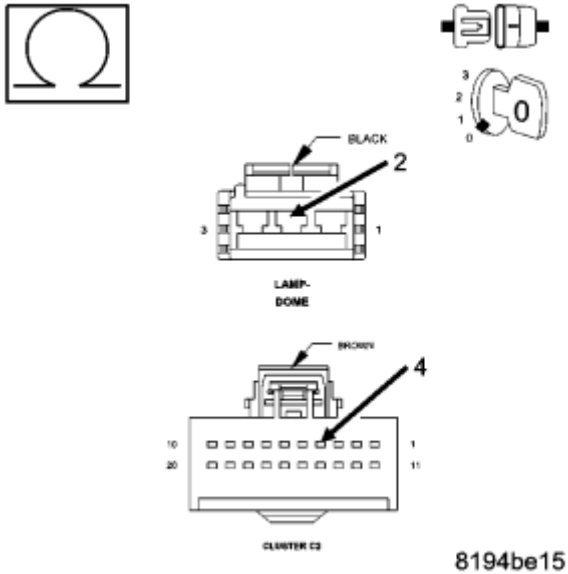


Fig. 3: Checking Courtesy Lamps Driver Circuit For Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Turn the ignition on.

Measure the voltage of the (M24) Courtesy Lamp Driver circuit.

Is the voltage below 10.0 volts?

Yes

Repair the (M24) Courtesy Lamp Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

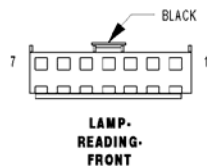
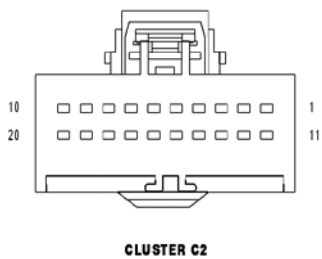
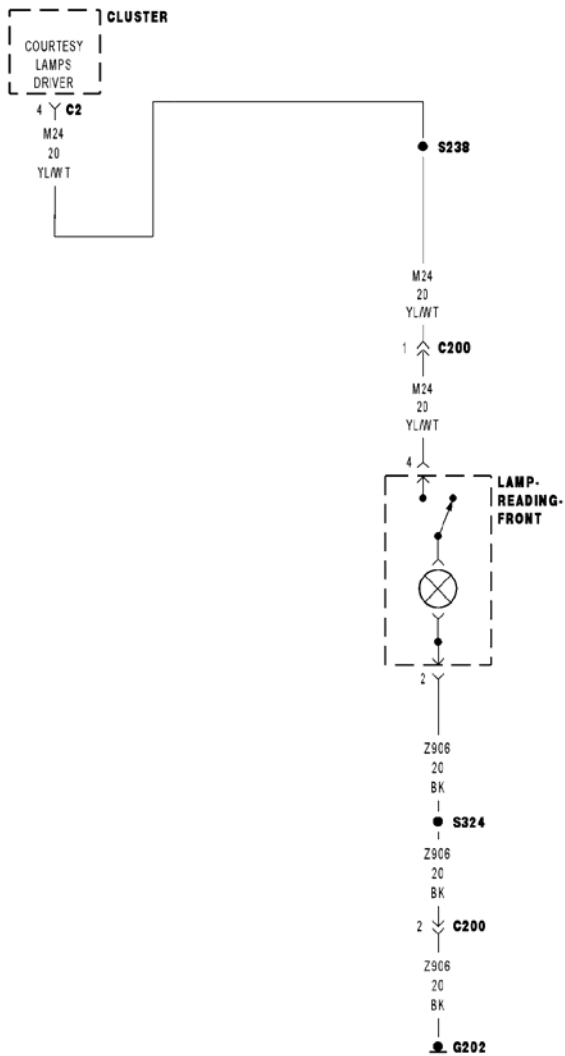
No

Replace the Instrument Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B161E-READING LAMP CONTROL CIRCUIT

Circuit Schematic



0172-0916

Fig. 4: Reading Lamp Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to [SYSTEM WIRING DIAGRAMS](#) article.

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- **Set Condition:**
- When the Instrument Cluster detects a short to battery on the Control circuit.

Possible Causes

Possible Causes
(M24) COURTESY LAMP DRIVER CIRCUIT SHORT TO GROUND
(M24) COURTESY LAMP DRIVER CIRCUIT OPEN
INSTRUMENT CLUSTER

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

Clear all Instrument Cluster DTC's

Turn the Courtesy Lamps on.

With the scan tool, read DTC's.

Does the scan tool read: B161E-READING LAMP CONTROL CIRCUIT?

Yes

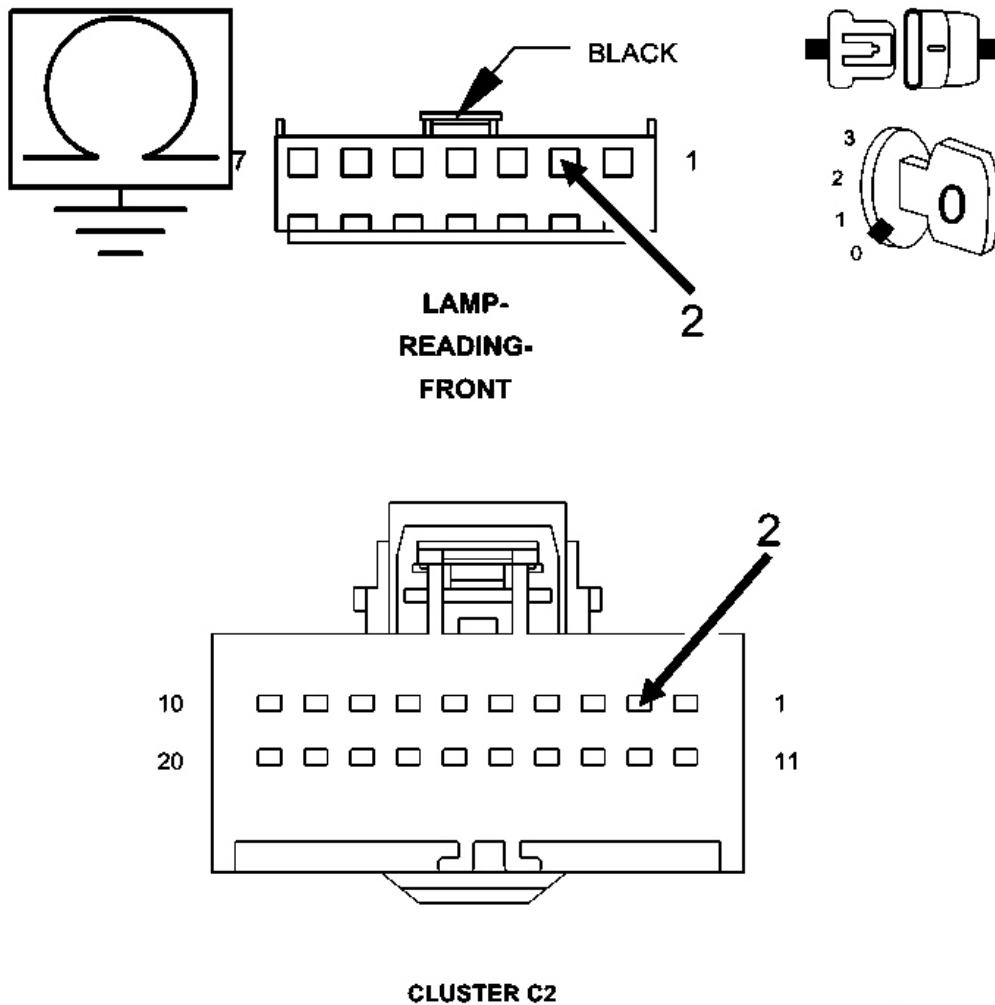
Go To 2).

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) CHECK THE (M24) COURTESY LAMP DRIVER CIRCUIT FOR A SHORT TO GROUND



8172a930

Fig. 5: Checking Courtesy Lamp Driver Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Measure the resistance between the (M24) Courtesy Lamp Driver circuit and ground.

Is the resistance below 5.0 ohms?

Yes

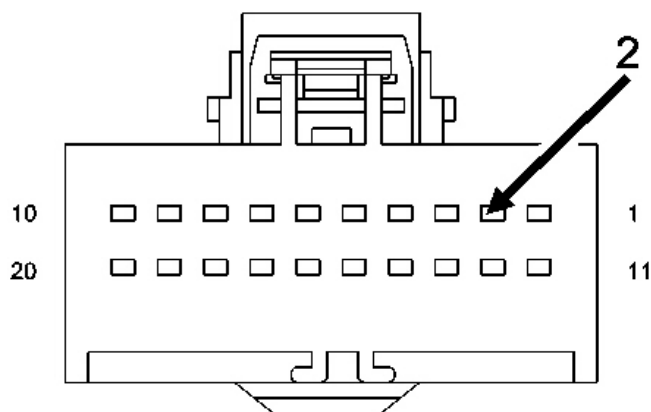
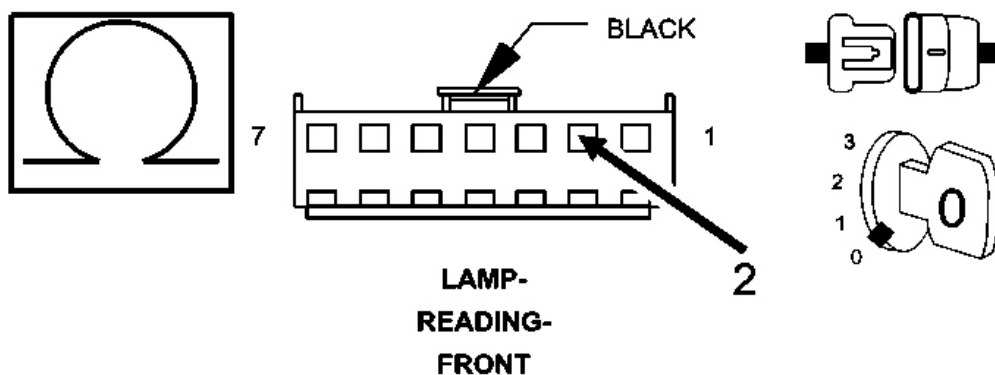
Repair the (M24) Courtesy Lamp Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3).

3) CHECK THE (M24) COURTESY LAMP DRIVER CIRCUIT FOR AN OPEN



CLUSTER C2

8172a93a

Fig. 6: Checking Courtesy Lamp Driver Circuit For An Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Instrument Cluster C2 harness connector.

Activate the left and right vanity lamps (if equipped), the glove box lamp, and the left and right door handle lamps.

Turn the ignition on.

Measure the voltage of the (M24) Glove Box Lamp Driver circuit.

Is the voltage below 10.0 volts?

Yes

Repair the (M24) Courtesy Lamp Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Instrument Cluster in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

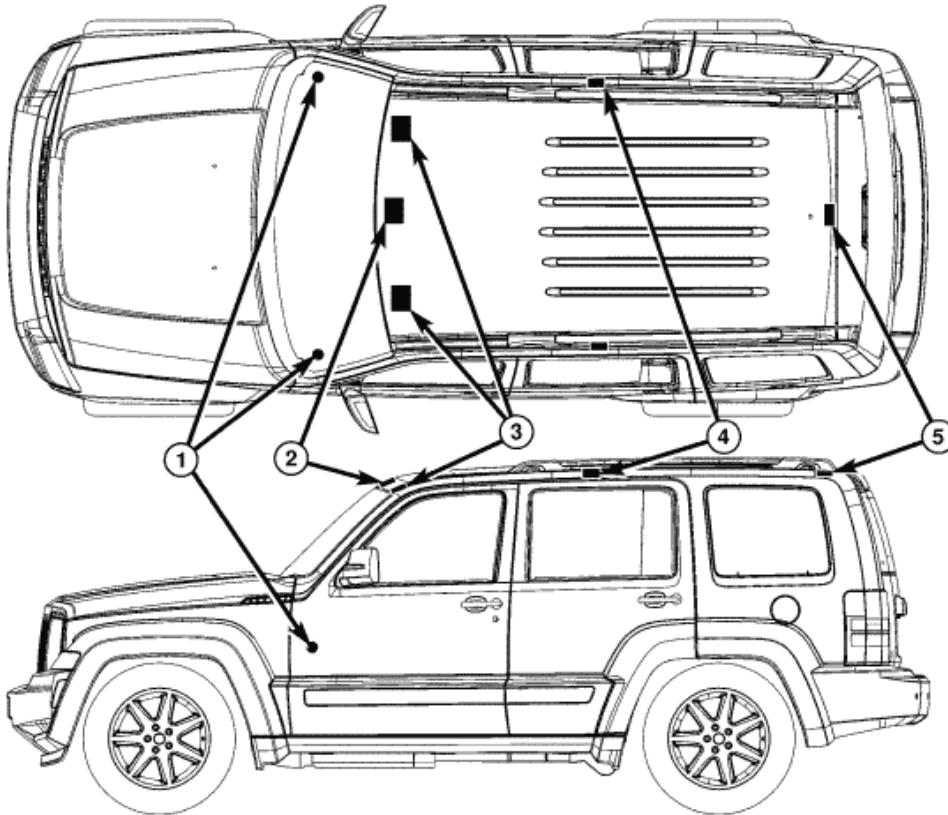
2008 ACCESSORIES AND EQUIPMENT

Lamps/Lighting - Interior - Service Information - Liberty

LAMPS/LIGHTING - INTERIOR - SERVICE INFORMATION

DESCRIPTION

LAMPS/LIGHTING - INTERIOR



81d5f1a8

Fig. 1: Interior Lamps
Courtesy of CHRYSLER LLC

The interior lighting system for this vehicle includes incandescent lighting on two separate circuits: the dome/courtesy lamp circuit and the panel lamps dimmer circuit. The lamps on the dome/courtesy circuit include:

- **Cargo Lamp (5)** - A cargo lamp is located in the headliner near the rear roof header and is controlled by both the courtesy lamp circuit and an independent lens-actuated switch to illuminate the rear cargo area of the vehicle.
- **Courtesy Lamps (1)** - Available courtesy lamps are located below both the right and left side of the instrument panel, and are controlled by the courtesy lamp circuit.
- **Front Dome Lamp (2)** - A standard front dome lamp including two bulbs is located in the headliner

between the sun visors near the windshield header. These lamps are controlled by both the courtesy lamp circuit and independent push button switches on the lamp housing adjacent to each bulb.

- **Reading Lamps (2)** - Available front seat driver side and passenger side reading lamps located in the optional mini overhead console in the headliner between the sun visors near the windshield header are controlled by both the courtesy lamp circuit and independent lens-actuated switches.
- **Second Row Dome/Reading Lamps (4)** - The second row seat dome/reading lamps are controlled by both the courtesy lamp circuit and independent lens-actuated switches. These lamps are integral to the grab handles located on the headliner above each rear door opening adjacent to each outboard second row seating position.
- **Vanity Lamps (3)** - An optional single-intensity vanity lamp is located above a covered mirror on both the right and left sun visors. These lamps are controlled by an integral vanity mirror cover-actuated switch on the courtesy lamp circuit.

Most controls on the instrument panel and elsewhere on the interior of the vehicle are illuminated by the panel lamps dimmer circuit for night visibility. All except the automatic transmission gear selector bezel lamp have miniature incandescent bulbs, Light-Emitting Diode (LED) units or a combination of the two lighting types that are soldered to internal circuit boards and are not serviceable.

The optional automatic transmission gear selector bezel lamp is located on the left side of the gear selector lever mechanism just beneath the bezel on the floor panel transmission tunnel. This lamp has a replaceable incandescent bulb.

Other components of the interior lighting system for this vehicle include:

- **Door Ajar Switches** - A door ajar switch is integral to the door latch mechanism of each front and rear door.
- **Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) is also known as the Cab Compartment Node (CCN) in this vehicle. The EMIC/CCN is located in the instrument panel above the steering column opening, directly in front of the driver. Refer to **DESCRIPTION** .
- **Left Multi-Function Switch** - The left (lighting) multi-function switch is located on the steering column, just below the steering wheel. A control sleeve on the control stalk that extends from the left side of the switch is used to select the panel lamps dimmer lighting level or the courtesy lamp circuit operating mode. Refer to **DESCRIPTION** .
- **Liftgate Ajar Switch** - A liftgate ajar switch is integral to the latch mechanism of the liftgate.
- **Liftgate Flip-Up Glass Ajar Switch** - A liftgate flip-up glass ajar switch is integral to the latch mechanism of the liftgate flip-up glass.
- **Steering Control Module** - The Steering Control Module (SCM) is located within the left multi-function switch housing on the top of the steering column, just below the steering wheel. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module** - The Totally Integrated Power Module (TIPM) is located in the engine compartment near the battery. Refer to **DESCRIPTION** .

Hard wired circuitry connects the interior lighting system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical

system and to the interior lighting components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

OPERATION

LAMPS/LIGHTING - INTERIOR

The lamps of the interior lighting system can be divided into two general classifications based upon the circuit that controls their operation: The courtesy lamp circuit (which includes the courtesy lamp load shed circuits for each lamp as well as the convenience circuits for those lamps with independent switching), or the panel lamps dimmer circuit. Following are paragraphs that briefly describe the operation of each of these interior lighting circuits.

The lamps and the hard wired circuits between components related to the interior lighting system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the interior lighting system or the electronic controls or communication between modules and other devices that provide some features of the interior lighting system. The most reliable, efficient, and accurate means to diagnose the interior lighting system or the electronic controls and communication related to interior lighting system operation requires the use of a diagnostic scan tool.

COURTESY LAMP CIRCUIT

The courtesy lamp circuit includes the courtesy lamps located under each outboard end of the instrument panel and, depending upon the selected vehicle options may include either the front dome lamp located on the headliner between the sun visors near the windshield header or the map/reading lamps located in the mini overhead console near the windshield header, the second row dome/reading lamps located in the headliner near the roof rail above each rear door opening, the cargo lamp located in the headliner near the center of the rear header above the cargo area, and the vanity lamps located in the sun visors. The lamps in the courtesy lamp circuit are provided with battery voltage and ground by the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) using internal drivers through a courtesy lamp driver circuit and two ground circuits based upon electronic **ajar switch status** message inputs received from the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus. The EMIC also uses electronic **left multi-function switch** and **ignition switch status** message inputs received from the Steering Control Module (SCM) over the Local Interface Network (LIN) data bus to control these outputs.

After all of the ajar switch inputs to the TIPM transition to open, the EMIC will keep the courtesy lamps illuminated for about 30 seconds, then fade the lamps to OFF (theater dimming) over about 3 seconds. The EMIC also provides courtesy lamp operation based upon the electronic **left multi-function switch status** messages received from the SCM, and provides an illuminated entry feature in response to certain electronic message inputs received from the Sentry Key Remote Entry Module (SKREEM) (also known as the Sentry Key

Immobilizer Module/SKIM or the Wireless Control Module/WCM) and the Occupant Restraint Controller (ORC) over the CAN data bus. A courtesy lamp DEFEAT mode based upon an electronic **left multi-function switch status** message received from the SCM will cause the EMIC to override normal courtesy lamp operation based upon any ajar switch inputs to the TIPM.

For those lamps on the courtesy lamp circuit with independent switching such as the front dome lamp, the optional reading lamps, the second row dome/reading lamps, the cargo lamp and the vanity lamps, the EMIC provides a second battery feed to the switches using another internal driver through a separate courtesy lamp load shed circuit (also known as the convenience circuit). The EMIC provides a battery saver (load shedding) feature for all courtesy lamps, which will automatically turn these lamps OFF if they are left ON for more than about eight minutes with the ignition switch in the OFF position.

PANEL LAMPS DIMMER CIRCUIT

The panel lamps dimmer circuit actually includes several circuits. These circuits control the illumination and dimming level of the heater-air conditioner controls and the automatic transmission gear selector bezel lamp. All lamps in the panel lamps dimmer circuits are provided a path to ground at all times through a hard wired ground circuit. These lamps are illuminated by a 12-volt Pulse Width Modulated (PWM) output of the EMIC through the panel lamps dimmer circuit.

This shared PWM output synchronizes the selected illumination intensity level of all of the lamps in the panel lamps dimmer circuits. The EMIC uses electronic **left multi-function switch status** and **dimming level** message inputs received from the SCM over the LIN data bus. The SCM sends the proper **left multi-function switch status** and **dimming level** messages based upon the exterior lighting selection of the control knob and the dimming level selection of the control sleeve on the left multi-function switch control stalk.

The EMIC, the instrument panel switch pod and the radio use the **dimming level** messages from the SCM to control the illumination intensity of their own back lighting and controls. In addition, when the control sleeve of the left multi-function switch is moved to the PARADE (or funeral) mode detent position, all of the Vacuum Fluorescent Display (VFD) units in the vehicle are illuminated at their full intensity levels for increased visibility when the vehicle is driven during daylight hours with the exterior lights turned ON. The PARADE mode has no effect on the illumination intensity of incandescent panel lamps.

WARNING

LAMPS/LIGHTING - INTERIOR

WARNING: To avoid serious or fatal injury eye protection should be used when servicing any glass components.

CAUTION: Do not use bulbs with higher candle power than indicated in the Bulb Application table. See **SPECIFICATIONS**. In addition, do not use fuses, circuit breakers or relays having a greater amperage value than indicated on the fuse panel or in the Owner's Manual. Damage to lamps, lenses, wiring and other related electrical components can result.

DIAGNOSIS AND TESTING

LAMPS/LIGHTING - INTERIOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: When diagnosing the interior lighting circuits, remember that high generator output can burn out bulbs rapidly and repeatedly; and, that dim or flickering bulbs can be caused by low generator output or poor battery condition. If one of these symptoms is a problem on the vehicle, be certain to diagnose the battery and charging system, then repair as necessary.

NOTE: A good ground is necessary for proper lighting operation. If a lighting problem is being diagnosed that involves multiple symptoms, systems, or components, the problem can often be traced to a loose, corroded, or open ground.

The lamps and the hard wired circuits between components related to the interior lighting system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the interior lighting system or the electronic controls or communication between modules and other devices that provide some features of the interior lighting system. The most reliable, efficient, and accurate means to diagnose the interior lighting system or the electronic controls and communication related to interior lighting system operation requires the use of a diagnostic scan tool.

COURTESY LAMP CIRCUIT

CONDITION	POSSIBLE CAUSES	CORRECTION
A SINGLE LAMP IN THE COURTESY LAMP CIRCUIT DOES NOT ILLUMINATE	1. Ineffective or missing bulb. 2. Ineffective lamp switch. 3. Ineffective ground circuit. 4. Ineffective feed circuit.	1. Test and replace the courtesy lamp bulb if required. 2. Test and replace a map/reading lamp switch if required. 3. Test and repair the open ground circuit if required. 4. Test and repair the open feed circuit if required.
ALL LAMPS IN THE	1. Ineffective ground circuit.	1. Test and repair the open ground circuit

COURTESY LAMP CIRCUIT DO NOT ILLUMINATE	2. Ineffective feed circuit. 3. Courtesy DEFEAT feature turned ON. 4. Ineffective courtesy lamp control circuit. 5. Ineffective EMIC inputs or outputs.	if required. 2. Test and repair the open feed circuit if required. 3. Turn courtesy DEFEAT feature OFF. 4. Test and repair the courtesy lamp control circuit if required. 5. Use a diagnostic scan tool to test the EMIC inputs and outputs.
A SINGLE LAMP IN THE COURTESY LAMP CIRCUIT DOES NOT EXTINGUISH	1. Ineffective lamp switch.	1. Test and replace a map/reading lamp switch if required.
ALL LAMPS IN THE COURTESY LAMP CIRCUIT DO NOT EXTINGUISH	1. Ineffective ajar switch. 2. Ineffective ajar switch sense circuit. 3. Ineffective TIPM inputs or outputs. 4. Ineffective EMIC inputs or outputs.	1. Test and replace a door ajar or liftgate ajar switch if required. 2. Test and repair the shorted ajar switch sense circuit if required. 3. Use a diagnostic scan tool to test the TIPM inputs and outputs. 4. Use a diagnostic scan tool to test the EMIC inputs and outputs.

PANEL LAMPS DIMMER CIRCUIT

NOTE: As part of the exterior lighting fail-safe feature, upon ignition ON, all of the panel lamps dimmer circuit lamps will illuminate at full intensity and the exterior park lamps and headlamp low beams will illuminate regardless of the left multi-function switch control knob position if the Steering Control Module (SCM) cannot detect an input from the left multi-function switch, or if there is a loss of data bus communication.

CONDITION	POSSIBLE CAUSES	CORRECTION
A SINGLE LAMP DOES NOT ILLUMINATE	1. Ineffective or missing bulb or Light Emitting Diode (LED) unit. 2. Ineffective ground circuit. 3. Ineffective feed circuit.	1. Test and replace the lamp bulb or LED unit if required. 2. Test and repair the open lamp ground circuit if required. 3. Test and repair the open lamp feed circuit if required.
A SINGLE LAMP DOES NOT EXTINGUISH	1. Ineffective feed circuit.	1. Test and repair the shorted lamp feed circuit if required.
ALL LAMPS DO NOT ILLUMINATE	1. Ineffective ground circuit. 2. Ineffective feed circuit.	1. Test and repair the open lamp ground circuit if required. 2. Test and repair the open lamp feed circuit if required.

	3. Ineffective EMIC inputs or outputs.	3. Use a diagnostic scan tool to test the EMIC inputs and outputs.
ALL LAMPS ILLUMINATE AT FULL INTENSITY AT IGNITION ON	1. Ineffective EMIC inputs or outputs. 2. Loss of data bus communication.	1. Use a diagnostic scan tool to test the EMIC inputs and outputs. 2. Use a diagnostic scan tool to test the data bus.

SPECIFICATIONS

LAMPS/LIGHTING - INTERIOR

COURTESY LAMPS

BULB APPLICATION TABLE

LAMP	BULB
CARGO LAMP	578
COURTESY	906
FRONT DOME	578
FRONT DOME/READING	578
SECOND ROW DOME/READING LAMP	W5W
VANITY LAMP	MOPAR® 6501966

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Under Instrument Panel Courtesy Lamp Mounting Screw	2	-	17

PANEL LAMPS

BULB APPLICATION TABLE

LAMP	BULB
GEAR SELECTOR BEZEL	37

AJAR SWITCH

DESCRIPTION

DOOR AJAR SWITCH

This vehicle has one door ajar switch for each door. Each switch is concealed within and integral to its respective door latch unit. The switches are momentary leaf contact-type units that are actuated by the mechanisms internal to the door latch. A short pigtail wire and connector on each door latch connects the door ajar switch to the vehicle electrical system through its respective door wire harness.

The door ajar switches cannot be adjusted or repaired and, if ineffective or damaged, the door latch unit must be replaced. Refer to **REMOVAL** for front latch, or **REMOVAL** for rear latch.

FLIP-UP GLASS AJAR SWITCH

A liftgate flip-up glass ajar switch is standard equipment on this vehicle. The switch is concealed within and integral to the liftgate flip-up glass latch unit. The switch is a momentary leaf contact-type unit that is actuated by the flip-up glass latch mechanism. An integral connector receptacle on the flip-up glass latch connects the ajar switch to the vehicle electrical system through the liftgate wire harness.

The flip-up glass ajar switch cannot be adjusted or repaired and, if ineffective or damaged, the flip-up glass latch unit must be replaced. Refer to **REMOVAL** .

LIFTGATE AJAR SWITCH

A liftgate ajar switch is standard equipment on this vehicle. The switch is concealed within and integral to the liftgate latch unit. The switch is a momentary leaf contact-type unit that is actuated by the liftgate latch mechanism. An integral connector receptacle on the liftgate latch connects the liftgate ajar switch to the vehicle electrical system through the liftgate wire harness.

The liftgate ajar switch cannot be adjusted or repaired and, if ineffective or damaged, the liftgate latch unit must be replaced. Refer to **REMOVAL** .

OPERATION

DOOR AJAR SWITCH

The door ajar switches are actuated by the mechanisms internal to the door latch. When a door is closed and properly latched, its door ajar switch is an open circuit. When a door is open or only partially latched, the door ajar switch is a closed circuit. The door ajar switches are hard wired in series between a body ground and the Totally Integrated Power Module (TIPM). The TIPM reads the hard wired door ajar switch inputs through internal pull-ups, then uses these inputs to control many electronic functions and features of the vehicle. The TIPM also sends electronic **door ajar switch status** messages over the Controller Area Network (CAN) data bus.

The door ajar switches as well as the hard wired inputs and outputs of the switches may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

FLIP-UP GLASS AJAR SWITCH

The liftgate flip-up glass ajar switch is actuated by the flip-up glass latch mechanism. When the flip-up glass is closed and properly latched, its ajar switch is an open circuit. When the glass is open or only partially latched, the ajar switch is a closed circuit. The flip-up glass ajar switch is hard wired in series between a body ground and the Totally Integrated Power Module (TIPM). The TIPM reads the hard wired flip-up glass ajar switch input through an internal pull-up, then uses this input to control many electronic functions and features of the vehicle. The TIPM also sends electronic **flip-up glass ajar switch status** messages over the Controller Area Network (CAN) data bus.

The flip-up glass ajar switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

LIFTGATE AJAR SWITCH

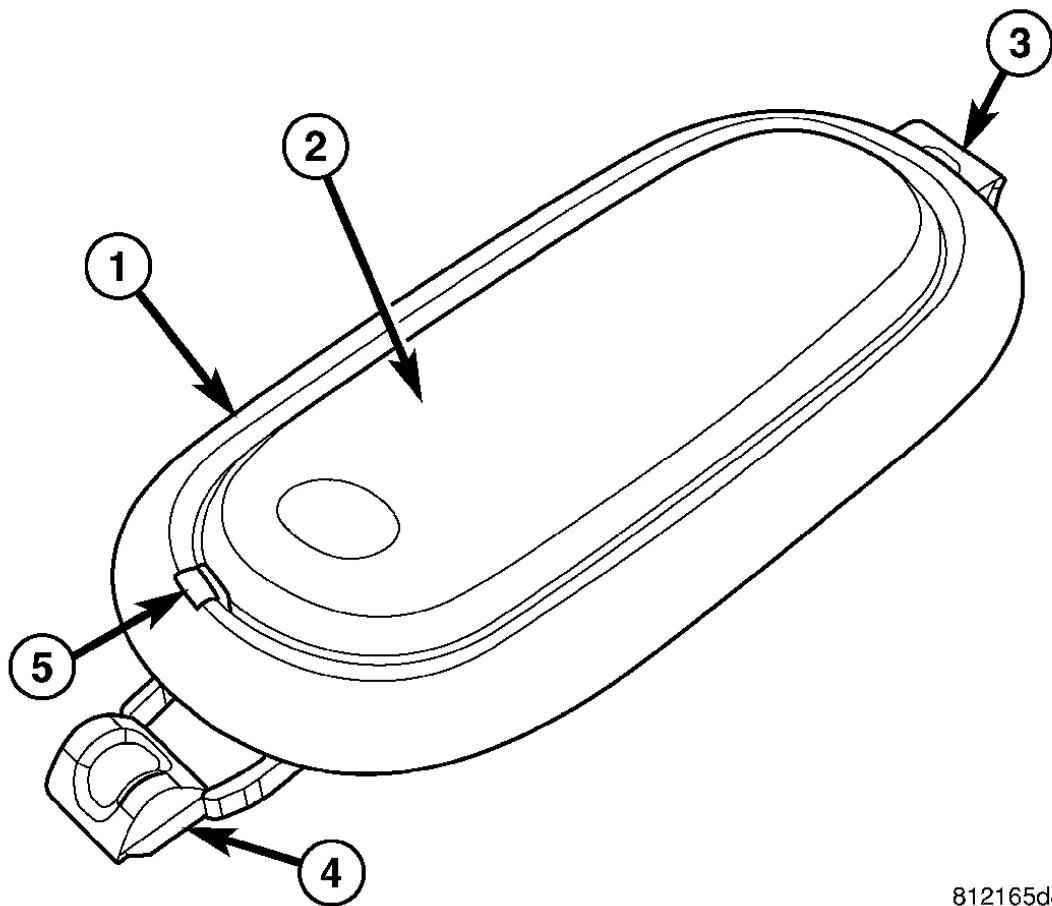
The liftgate ajar switch is actuated by the liftgate latch mechanism. When the liftgate is closed and properly latched, its liftgate ajar switch is an open circuit. When the liftgate is open or only partially latched, the liftgate ajar switch is a closed circuit. The liftgate ajar switch is hard wired in series between a body ground and the Totally Integrated Power Module (TIPM). The TIPM reads the hard wired liftgate ajar switch input through an internal pull-up, then uses this input to control many electronic functions and features of the vehicle. The TIPM also sends electronic **liftgate ajar switch status** messages over the Controller Area Network (CAN) data bus.

The liftgate ajar switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information.

CARGO LAMP

REMOVAL

CARGO LAMP

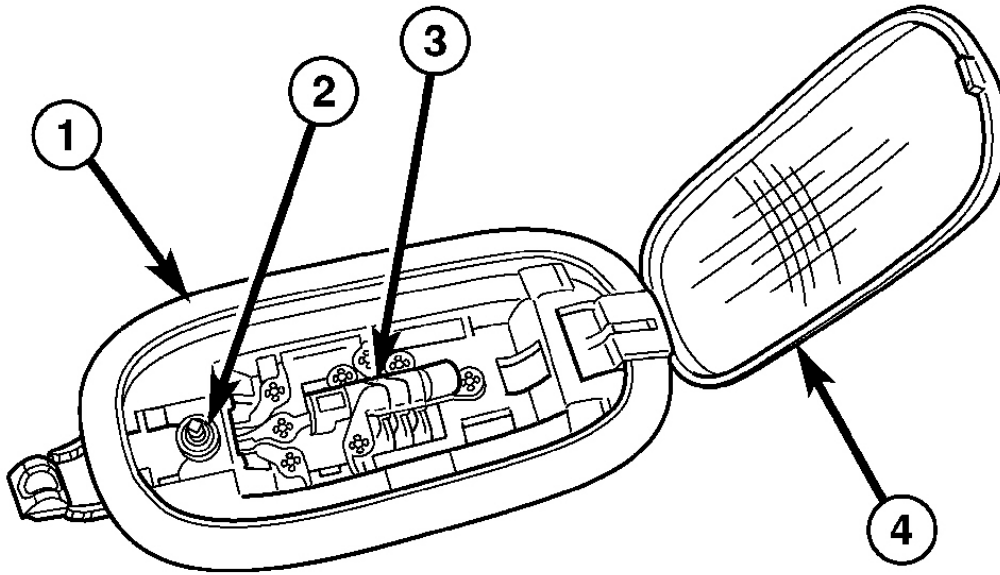


812165d8

Fig. 2: Removing/Installing Cargo Lamp Unit
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Insert the tip of a small flat bladed screwdriver into the notch (5) between the lens (2) and the housing (1) on one side of the cargo lamp unit.
3. Gently pry the end of the lens outward until it unsnaps from the housing.
4. Swing the lens outward until it is perpendicular to the housing.
5. Pull the lens hinge/retainer (3) end of the housing outward slightly from the headliner, then slide the exposed end of the housing away from the mounting hole far enough to disengage the fixed retainer (4) on the notched end from the headliner.
6. Pull the lamp away from the headliner mounting hole far enough to access and disconnect the wire harness connector from the back of the lamp.
7. Remove the lamp from the vehicle.

CARGO LAMP BULB



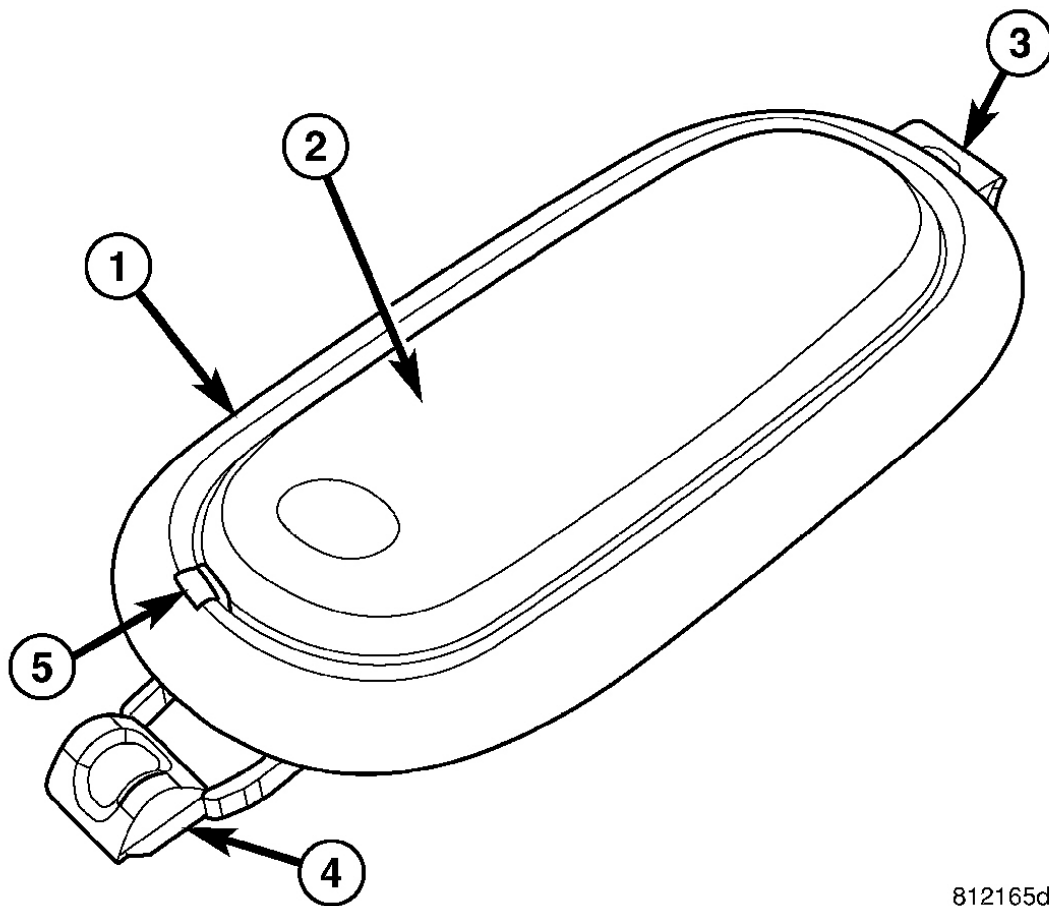
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Fig. 3: Removing/Installing Cargo Lamp Bulb
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Insert the tip of a small flat-bladed screwdriver into the notch on one side of the cargo lamp between the lens (4) and the lamp housing (1).
3. Gently pry the notched edge of the lens downward until it unsnaps from the housing.
4. Swing the notched end of the lens downward far enough to access the bulb (3).
5. Carefully unsnap the bulb from the two bulb holders within the cargo lamp housing.

INSTALLATION

CARGO LAMP



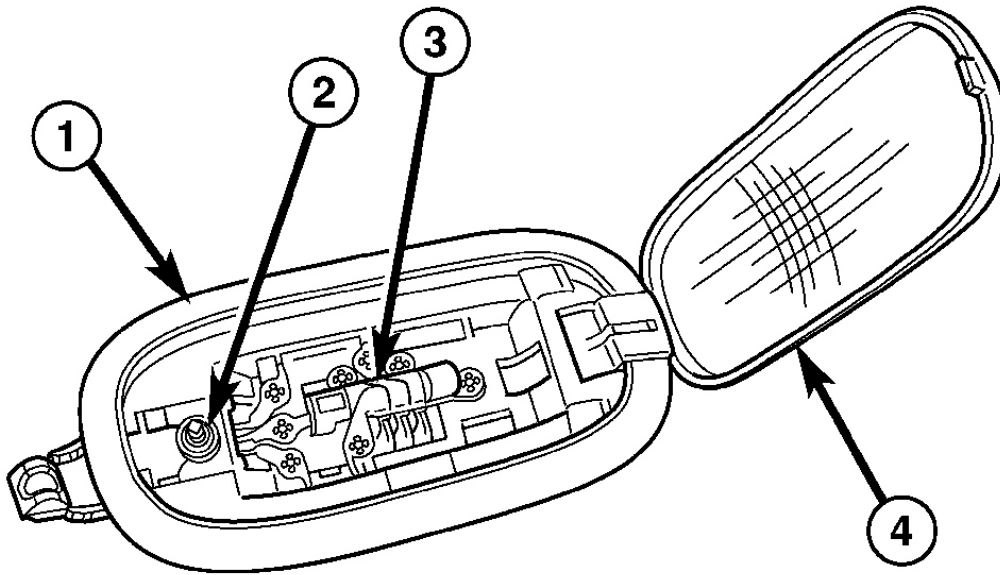
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Fig. 4: Removing/Installing Cargo Lamp Unit
Courtesy of CHRYSLER LLC

1. Position the dome lamp unit (1) to the mounting hole in the headliner.
2. Reconnect the wire harness connector to the connector on the back of the lamp.
3. Insert the fixed retainer (4) on the notched end of the lamp housing up into one side of the mounting hole in the headliner.
4. Slide the notched end of the housing into the mounting hole far enough to engage the lens hinge/retainer (3) into the opposite side of the hole in the headliner.
5. Gently and evenly press the lens hinge/retainer end of the lamp into the mounting hole until the bezel of the lamp housing is flush with the headliner.
6. Swing the notched end of the lamp lens (2) into position against the lamp housing, then press on the lens firmly and evenly until it snaps into the housing.
7. Reconnect the battery negative cable.

CARGO LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.



81216a1d

Fig. 5: Removing/Installing Cargo Lamp Bulb
Courtesy of CHRYSLER LLC

1. Align the ends of the bulb (3) with the two bulb holders within the cargo lamp housing (1).
2. Carefully press the bulb firmly and evenly into the bulb holders until it snaps into place.
3. Swing the notched end of the lens (4) up into position against the housing, then press upward on the lens firmly and evenly until it snaps into the housing.
4. Reconnect the battery negative cable.

COURTESY LAMP

REMOVAL

COURTESY LAMP

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

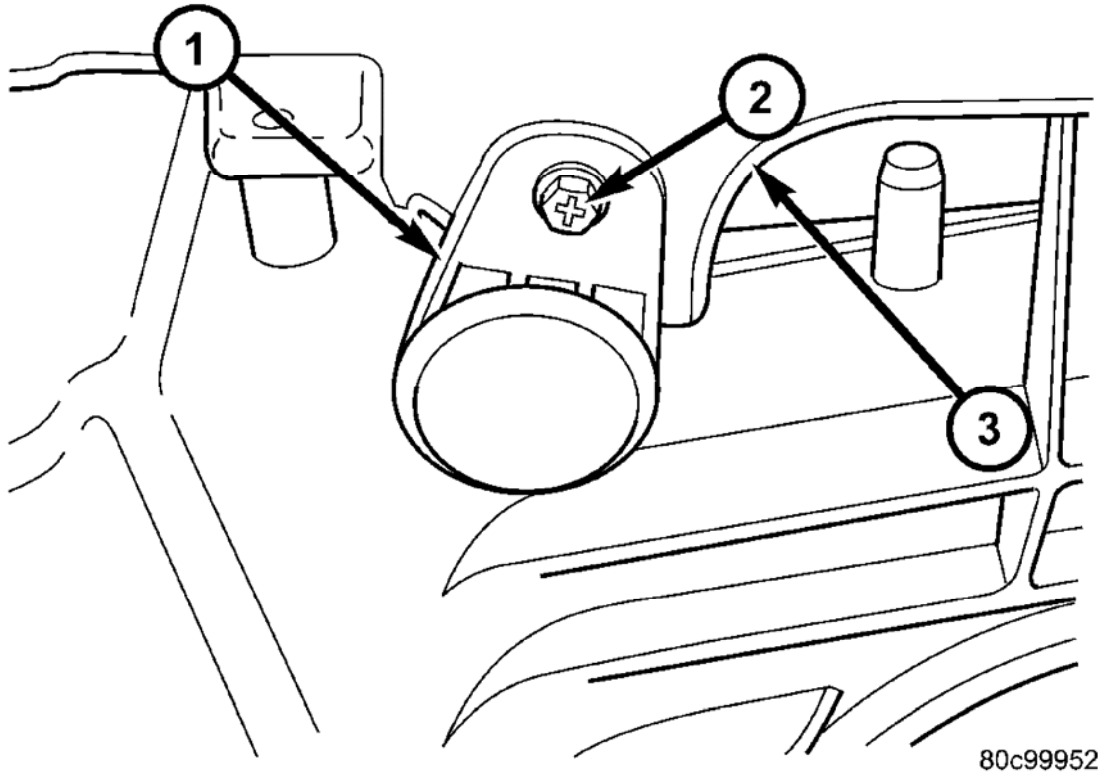


Fig. 6: Courtesy Lamp
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the screw (2) that secures the integral mounting tab of the courtesy lamp unit (1) to the lower instrument panel (3).
3. Pull the courtesy lamp down from the lower instrument panel far enough to access and disconnect the instrument panel wire harness connector from the back of the courtesy lamp.
4. Remove the courtesy lamp from under the instrument panel.

COURTESY LAMP BULB

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

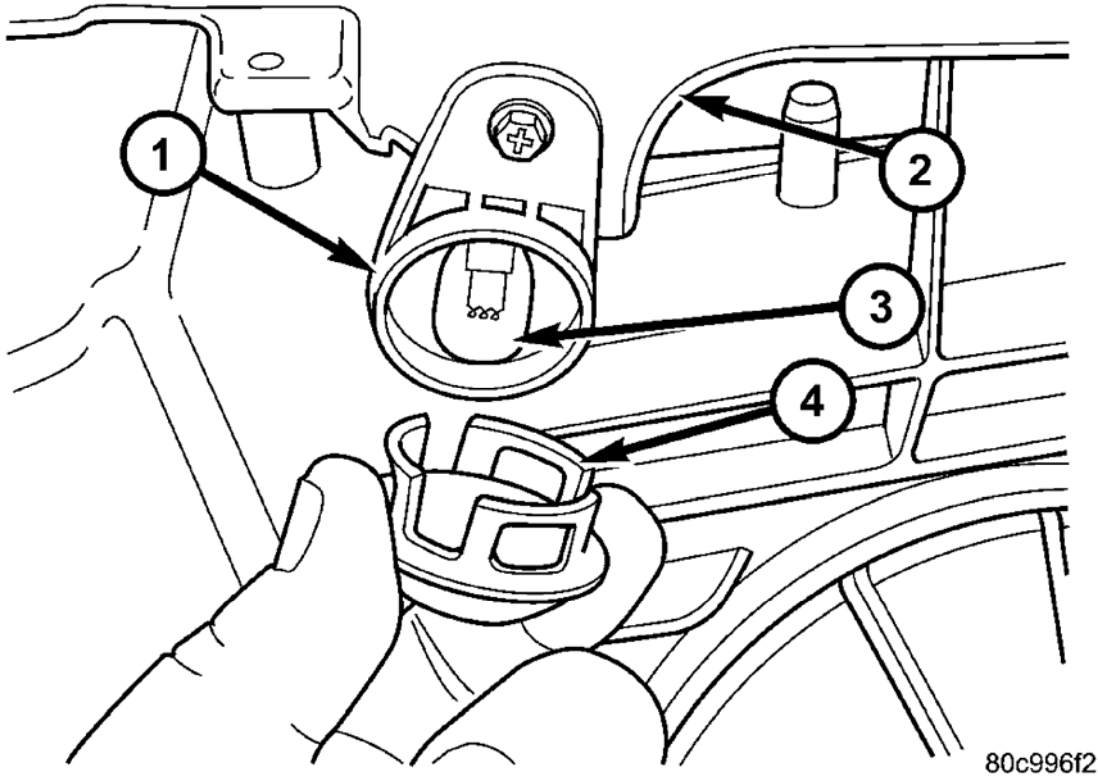


Fig. 7: Courtesy Lamp Lens
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Support the courtesy lamp unit housing (1) with one hand while firmly grasping the flange on the outer circumference of the lens (4) with the other hand, then pull the lens straight down to unsnap it from the housing.
3. Pull the bulb (3) straight out of the courtesy lamp socket.

INSTALLATION

COURTESY LAMP

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

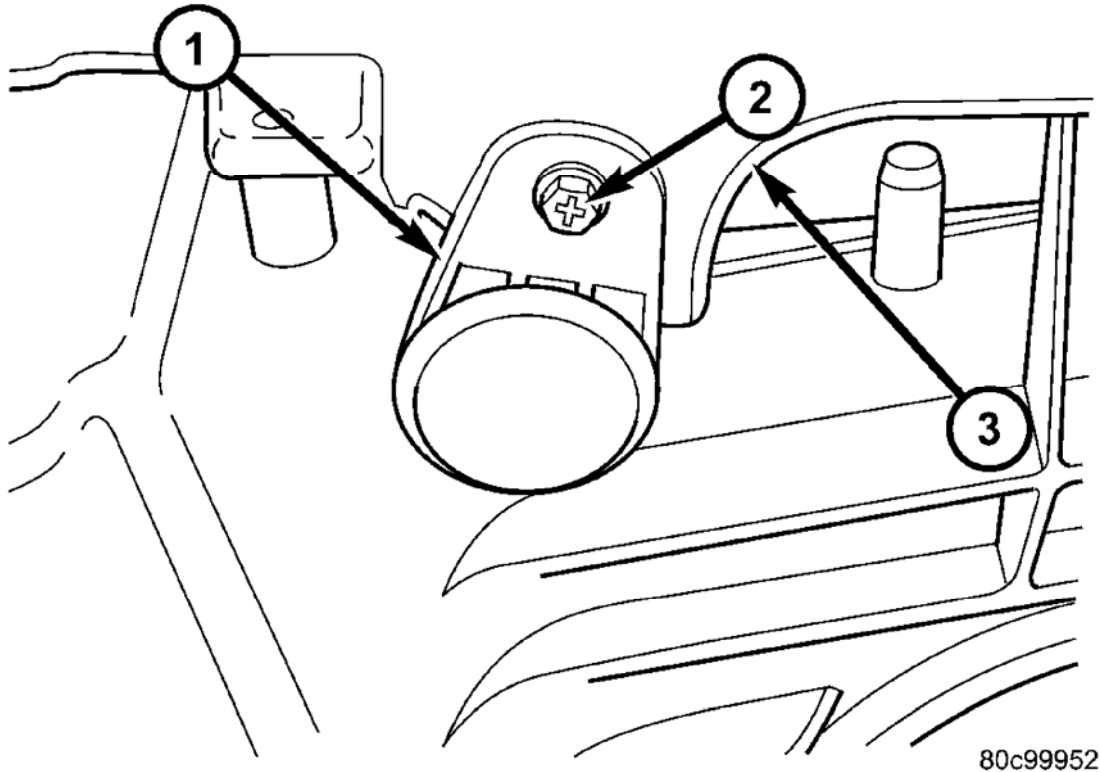


Fig. 8: Courtesy Lamp
Courtesy of CHRYSLER LLC

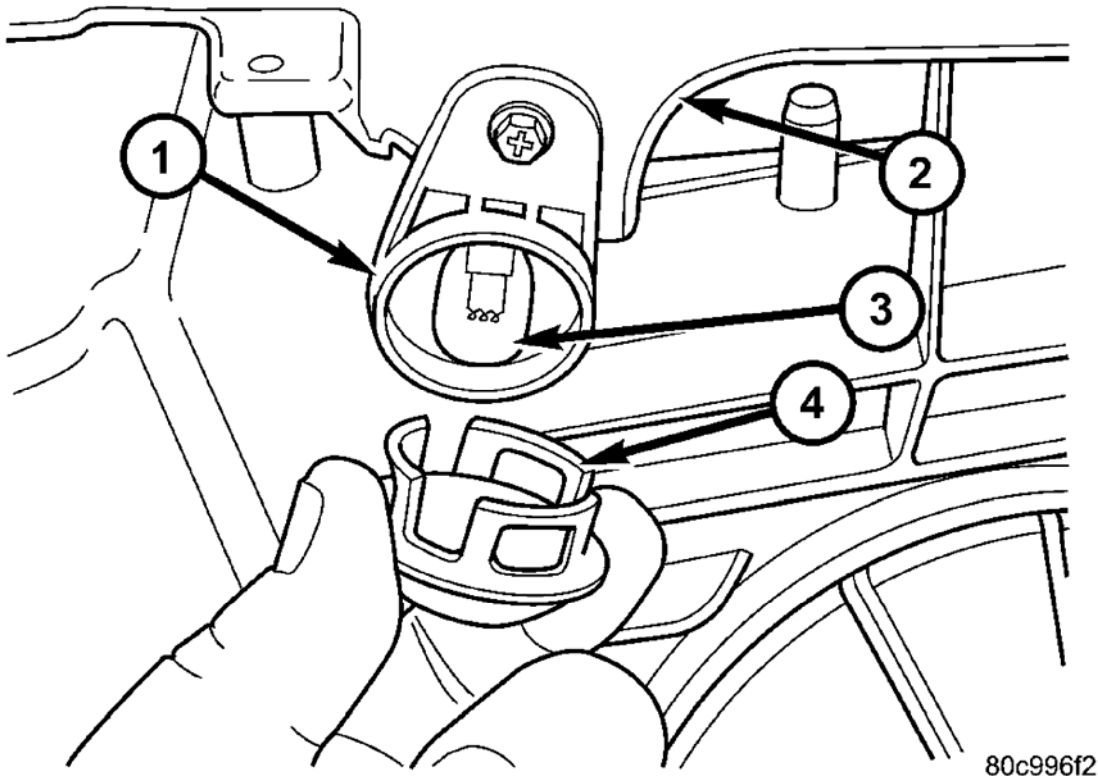
1. Position the courtesy lamp unit (1) under the instrument panel.
2. Reconnect the instrument panel wire harness connector to the back of the courtesy lamp.
3. Position the courtesy lamp to the lower instrument panel (3).
4. Install and tighten the screw (2) that secures the integral mounting tab of the courtesy lamp to the lower instrument panel. Tighten the screw to 2 N.m (17 in. lbs.).
5. Reconnect the negative battery cable.

COURTESY LAMP BULB

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, occupant classification system, seat belt tensioner, impact sensor, or instrument panel component diagnosis or

service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.



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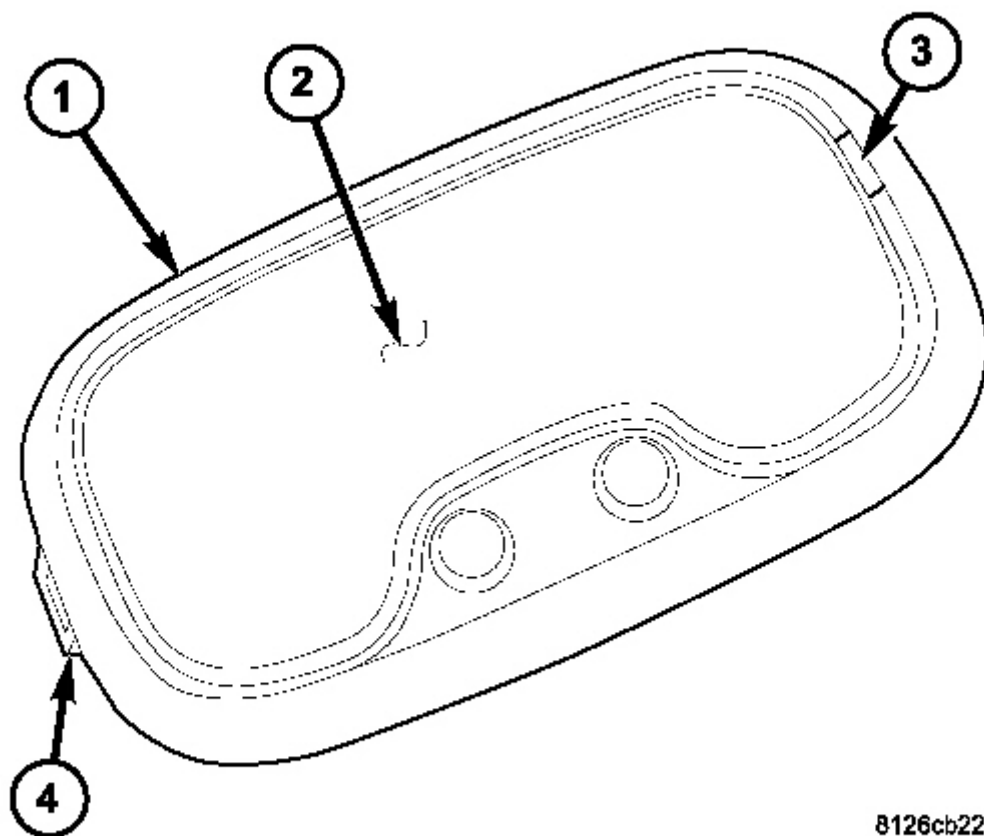
Fig. 9: Courtesy Lamp Lens
Courtesy of CHRYSLER LLC

1. Align the base of the bulb (3) with the courtesy lamp socket.
2. Push the bulb straight into the lamp socket until the base is firmly seated.
3. Align the lens (4) with the courtesy lamp unit housing (1).
4. Support the lamp housing with one hand while firmly and evenly pushing the lens into the housing with the other hand, until the lens snaps into place.
5. Reconnect the battery negative cable.

DOME LAMP

REMOVAL

FRONT DOME LAMP



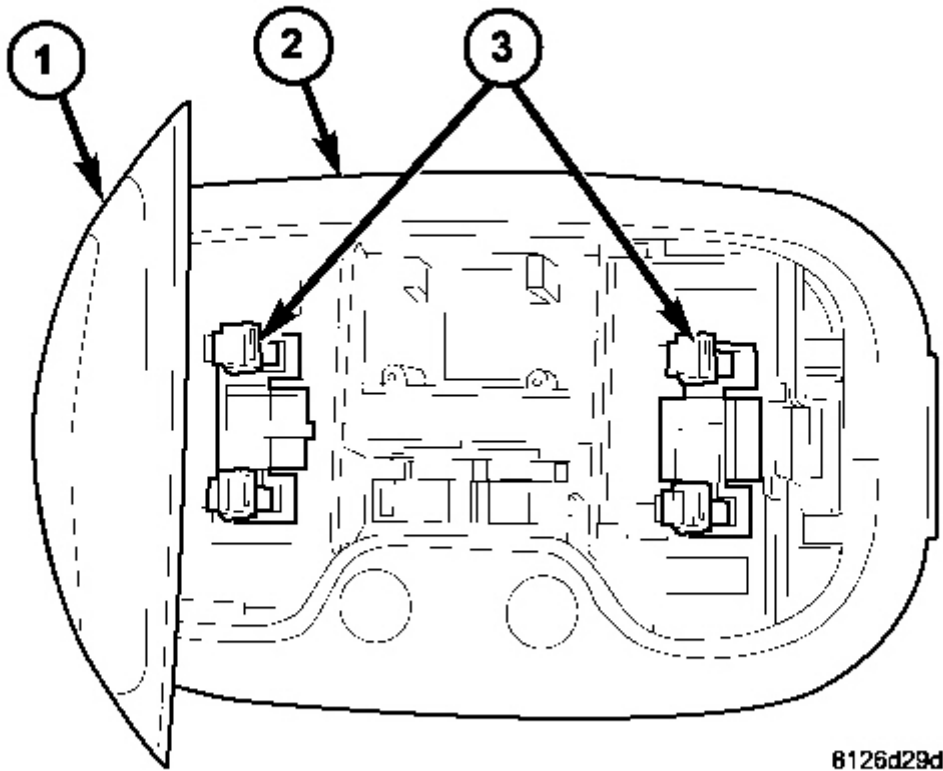
8126cb22

Fig. 10: Identifying Housing, Lens, Notch & Lens Hinge/Retainer
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Insert the tip of a small flat bladed screwdriver into the notch (3) between the lens (2) and the housing (1) on one side of the dome lamp unit.
3. Gently pry the end of the lens downward until it unsnaps from the housing.
4. Swing the lens downward until it is perpendicular to the housing.
5. Pull the lens hinge/retainer (4) end of the housing downward slightly from the headliner, then slide the lowered end of the housing away from the mounting hole far enough to disengage the fixed retainer on the notched end from the headliner.

6. Pull the lamp away from the headliner mounting hole far enough to disconnect the wire harness connector from the back of the lamp.
7. Remove the lamp from the vehicle.

FRONT DOME LAMP BULB



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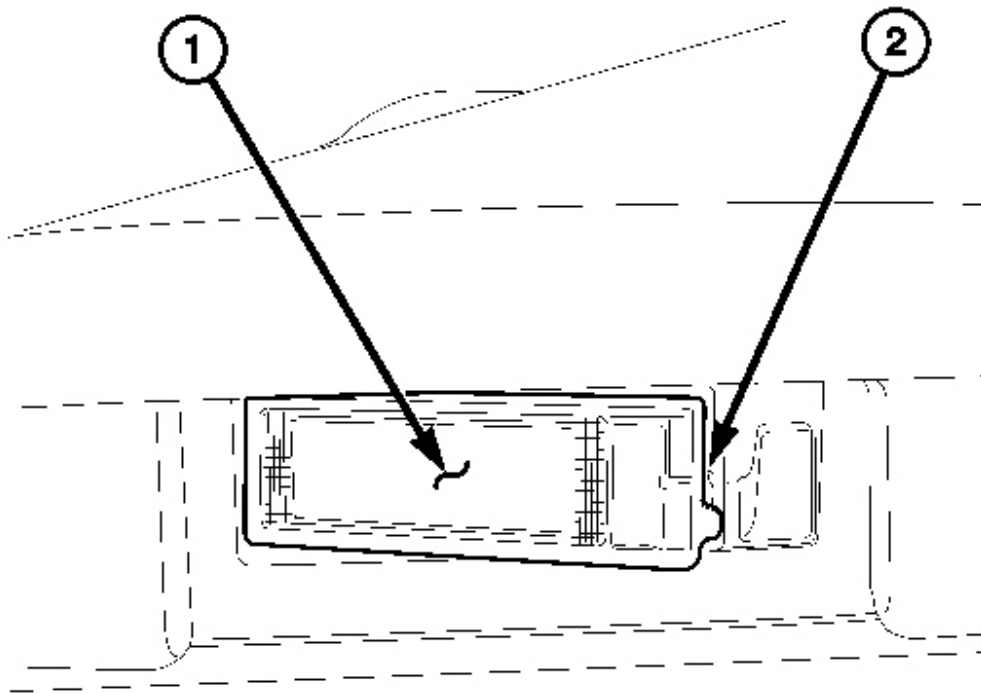
Fig. 11: Identifying Front Dome Lamp Lens & Bulb
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the front dome lamp from the headliner. See **REMOVAL**.
3. With the lamp lens (1) in the open position, carefully unsnap the bulb (3) from the two bulb holders within the front dome lamp housing (2).

SECOND ROW DOME/READING LAMP BULB

NOTE: The second row reading lamps are integral to the grab handle in the headliner

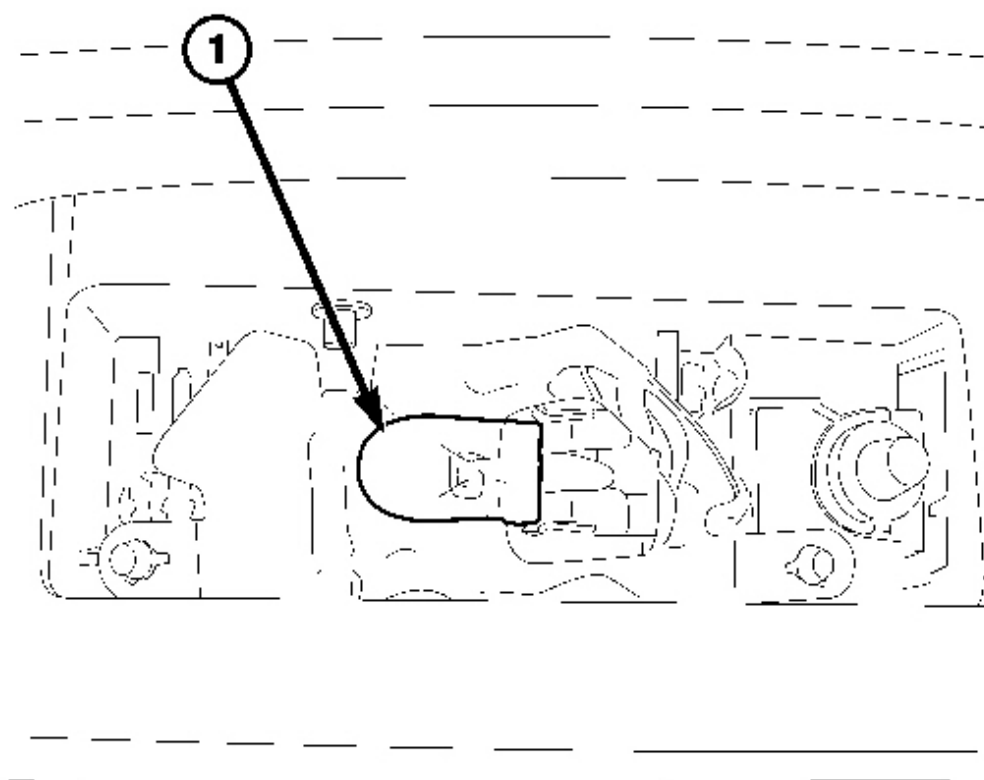
on the inner roof side rail over each outboard rear seating position. Refer to INTERIOR for the handle service procedure.



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Fig. 12: Removing/Installing Second Row Reading Lamp Lens
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Using a small thin-bladed screwdriver, gently pry the upper corner at the forward end (2) of the reading lamp lens (1) away from the grab handle far enough to unsnap it from the lamp housing.
3. Pull the front end of the lens outward far enough to disengage the large tab at the rear of the lens from the lamp housing.



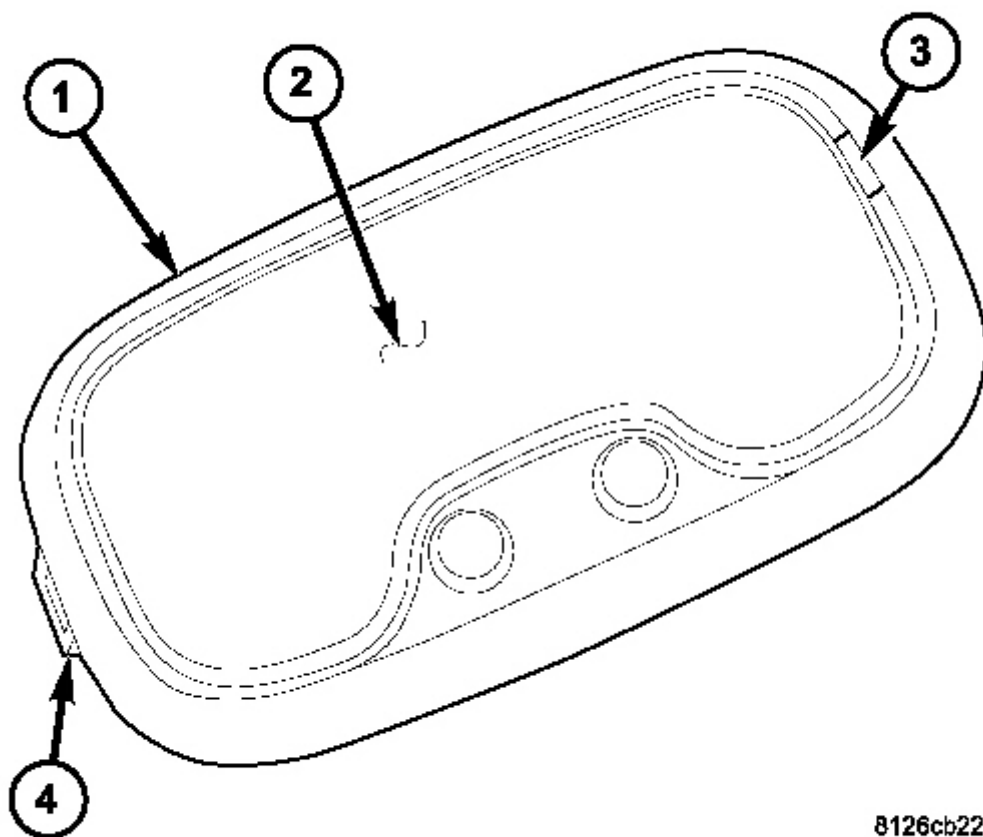
814a8d26

Fig. 13: Removing/Installing Second Row Reading Lamp Bulb
Courtesy of CHRYSLER LLC

4. Pull the base of the bulb (1) straight out of the bulb holder within the lamp housing.

INSTALLATION

FRONT DOME LAMP



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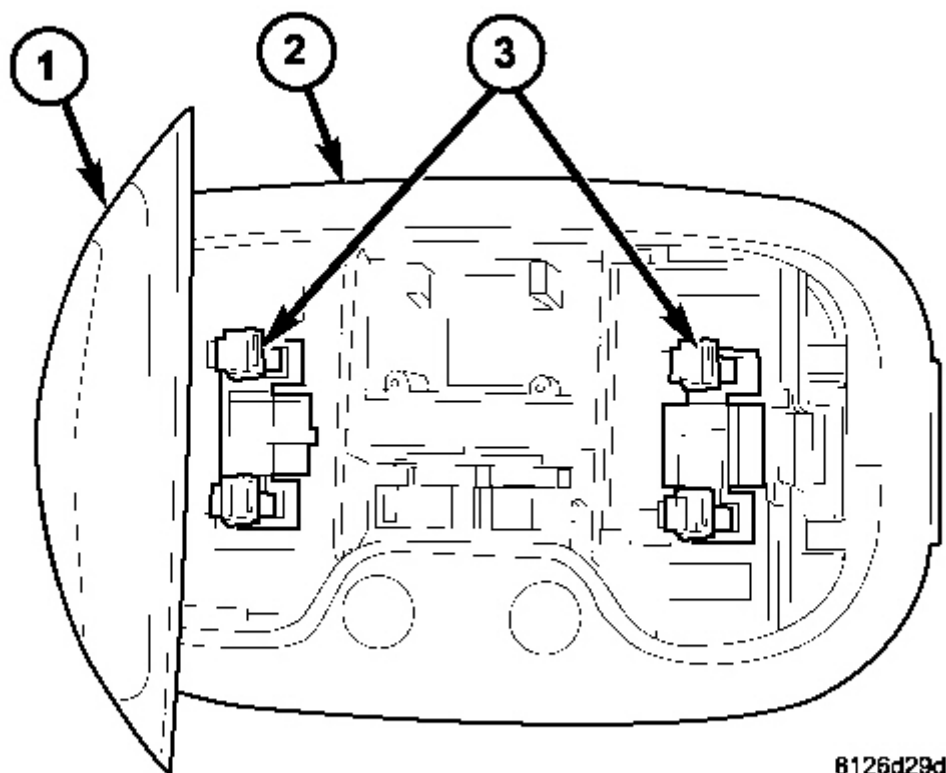
Fig. 14: Identifying Housing, Lens, Notch & Lens Hinge/Retainer

Courtesy of CHRYSLER LLC

1. Position the dome lamp unit (1) to the mounting hole in the headliner.
2. Reconnect the wire harness connector to the connector on the back of the lamp.
3. Insert the fixed retainer on the notched end of the lamp housing up into one side of the mounting hole in the headliner.
4. Slide the notched end of the housing into the mounting hole far enough to engage the lens hinge/retainer (4) into the opposite side of the hole in the headliner.
5. Gently and evenly press the lens hinge/retainer end of the lamp upward into the mounting hole until the bezel of the lamp housing is flush with the headliner.
6. Swing the notched end of the lamp lens (2) up into position against the lamp housing, then press upward on the lens firmly and evenly until it snaps into the housing.
7. Reconnect the battery negative cable.

FRONT DOME LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.



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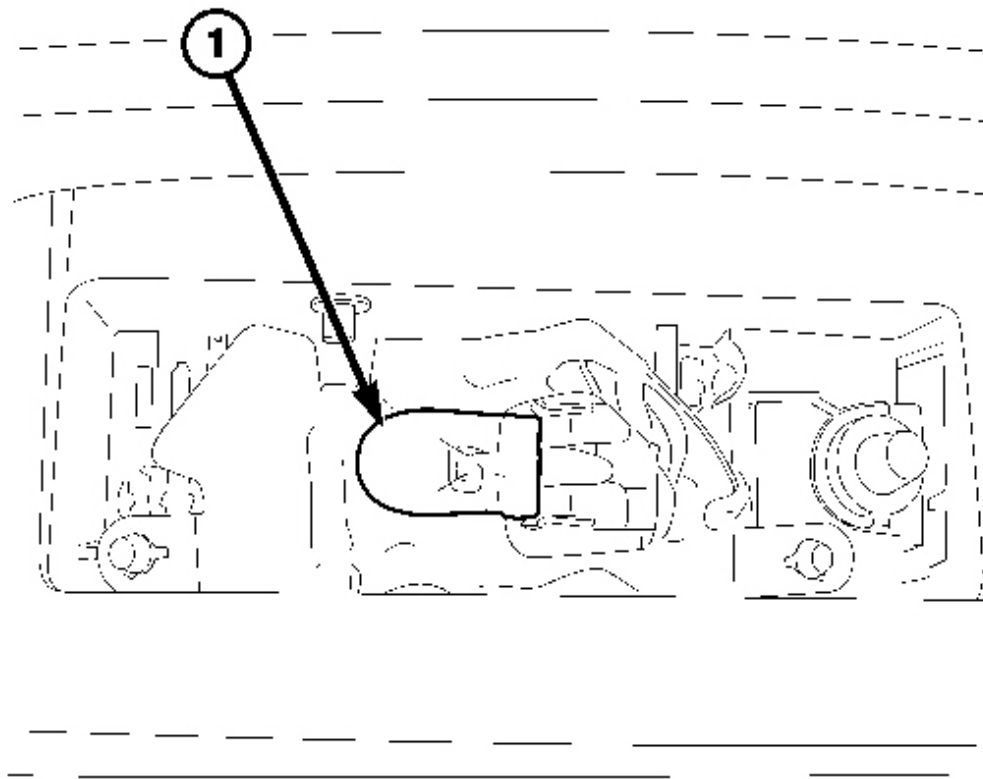
Fig. 15: Identifying Front Dome Lamp Lens & Bulb
Courtesy of CHRYSLER LLC

1. With the dome lamp lens (1) in the open position, align the ends of the bulb (3) with the two bulb holders within the front dome lamp housing (2).
2. Carefully press the bulb firmly and evenly into the bulb holders until it snaps into place.
3. Reinstall the lamp into the headliner. See **INSTALLATION**.
4. Reconnect the battery negative cable.

SECOND ROW DOME/READING LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

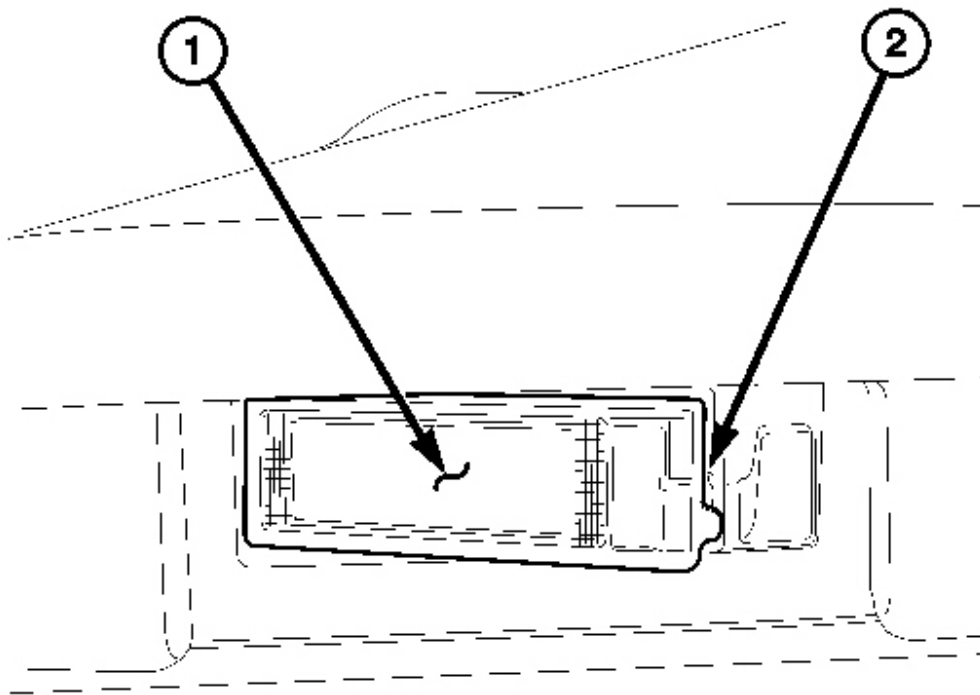
NOTE: The second row reading lamps are integral to the grab handle in the headliner on the inner roof side rail over each outboard rear seating position. Refer to INTERIOR for the handle service procedure.



814a8d26

Fig. 16: Removing/Installing Second Row Reading Lamp Bulb
Courtesy of CHRYSLER LLC

1. Align the base of the bulb (1) with the bulb holder within the reading lamp housing.
2. Push the bulb into the holder until the base is fully seated.



814a8d06

Fig. 17: Removing/Installing Second Row Reading Lamp Lens
Courtesy of CHRYSLER LLC

3. Insert the large tab on the rear end of the lamp lens (1) into the rear of the lamp housing.
4. Using hand pressure, push the small tab at the upper front corner of the lens (2) rearward and inward towards the lamp housing until it snaps into place.
5. Reconnect the battery negative cable.

GEAR SELECTOR LAMP

REMOVAL

GEAR SELECTOR LAMP BULB

NOTE: This procedure applies only to vehicles equipped with an optional automatic

transmission.

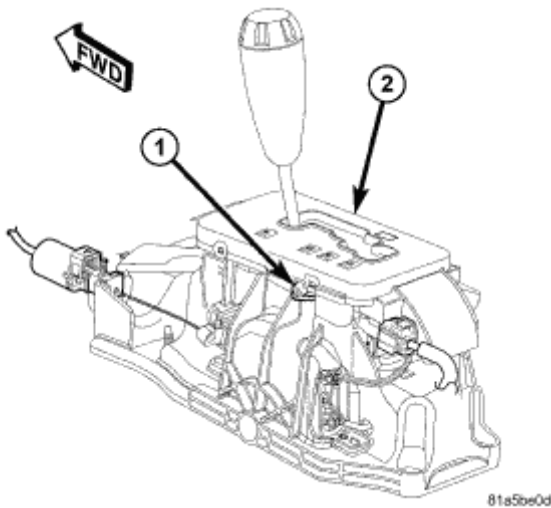


Fig. 18: Identifying Bulb Socket & Gear Selector Bezel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the center floor console from over the gear selector lever and bezel (2).
3. Firmly grasp the bulb socket (1) on the left lower edge of the bezel housing and rotate it counterclockwise about 30 degrees to unlock it.
4. Pull the socket and bulb straight out from the keyed opening in the housing.
5. Pull the base of the bulb straight out of the socket.

INSTALLATION

GEAR SELECTOR LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: This procedure applies only to vehicles equipped with an optional automatic transmission.

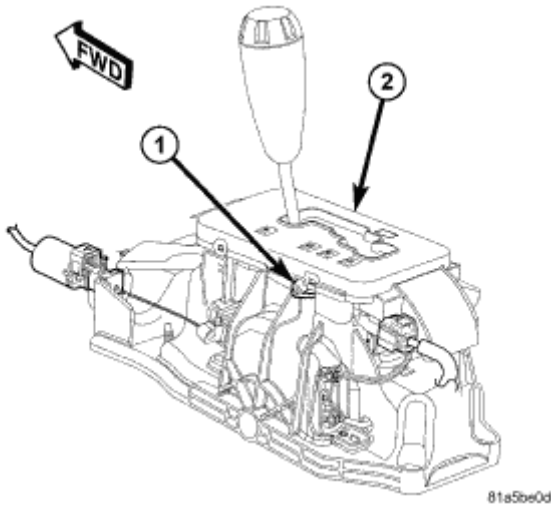


Fig. 19: Identifying Bulb Socket & Gear Selector Bezel
Courtesy of CHRYSLER LLC

1. Align the base of the bulb with the gear selector bulb socket (1).
2. Push the bulb straight into the socket until the base is firmly seated.
3. Align the socket and bulb with the keyed opening on the left lower edge of the gear selector bezel (2) housing.
4. Insert the socket and bulb into the housing until the socket is firmly seated.
5. Rotate the socket clockwise about 30 degrees to lock it into place.
6. Reinstall the center floor console over the gear selector lever and bezel.
7. Reconnect the battery negative cable.

READING LAMP

REMOVAL

READING LAMP BULB

NOTE: The reading lamps are integral to the mini overhead console in the headliner near the windshield.

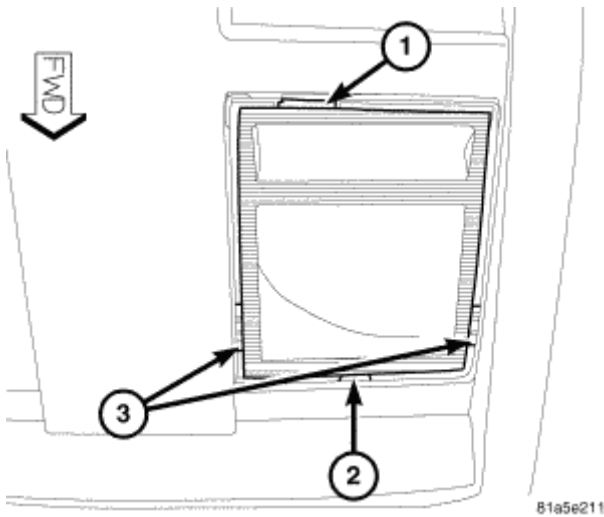


Fig. 20: Identifying Switch Tab, Lens & Pivot Pins
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Using a small thin-bladed screwdriver, gently pry the notched (forward) end (2) of the reading lamp lens away from the mini overhead console far enough to unsnap the lens from the two pivot pins (3) in the lamp housing.
3. Pull the notched end of the lens downward and slide it forward far enough to disengage the switch tab (1) on the rearward edge of the lens from between the mini overhead console and the switch plunger.
4. Remove the lens from the housing.

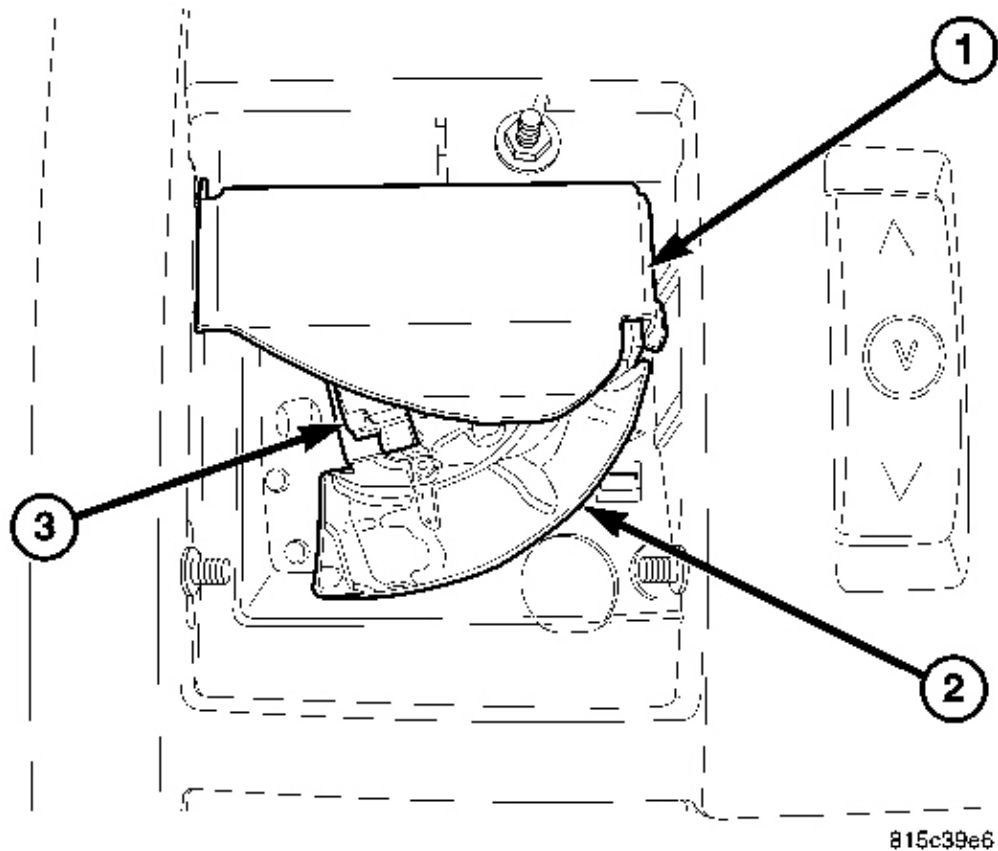


Fig. 21: Identifying Overhead Reading Lamp Shield, Reflector & Bulb
Courtesy of CHRYSLER LLC

5. Using a small thin-bladed screwdriver, gently pry either side of the shield (1) inward from the lamp housing toward the reflector (2) and bulb (3) far enough to remove the shield from the housing.

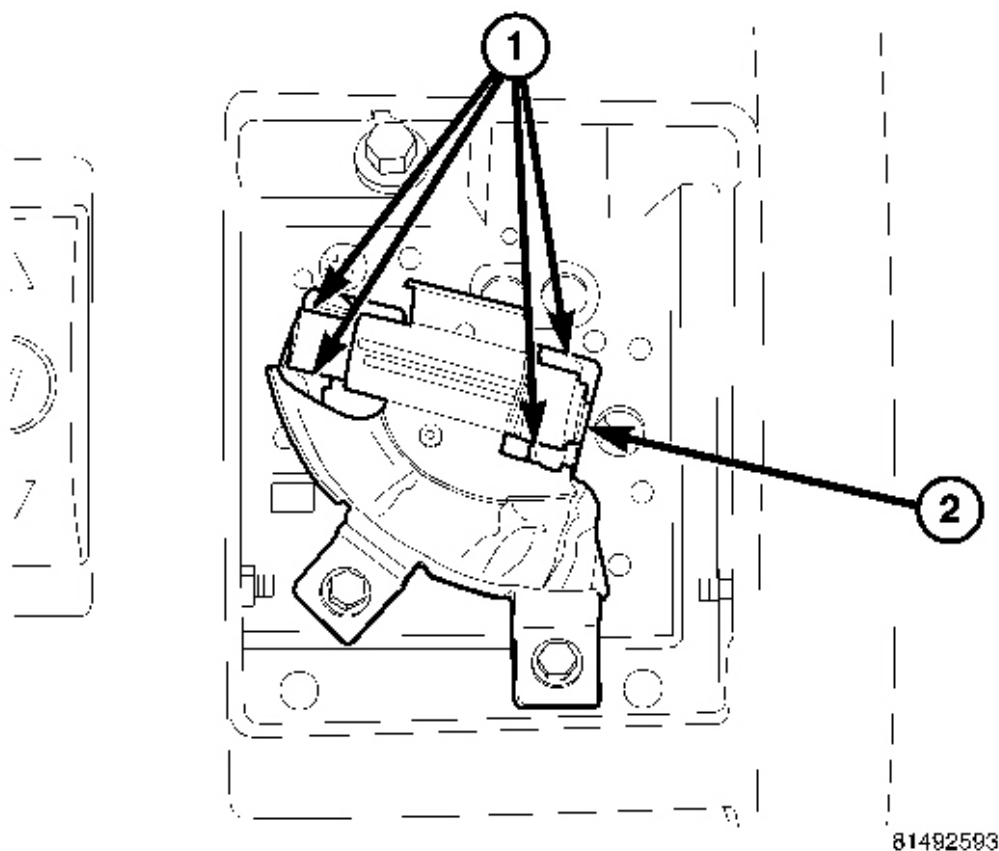


Fig. 22: View Of Reading Lamp Bulb & Holder
Courtesy of CHRYSLER LLC

6. Carefully unsnap the bulb (2) from the two bulb holders (1) within the lamp housing.
7. Remove the bulb from the lamp.

INSTALLATION

READING LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: The reading lamps are integral to the mini overhead console in the headliner

near the windshield.

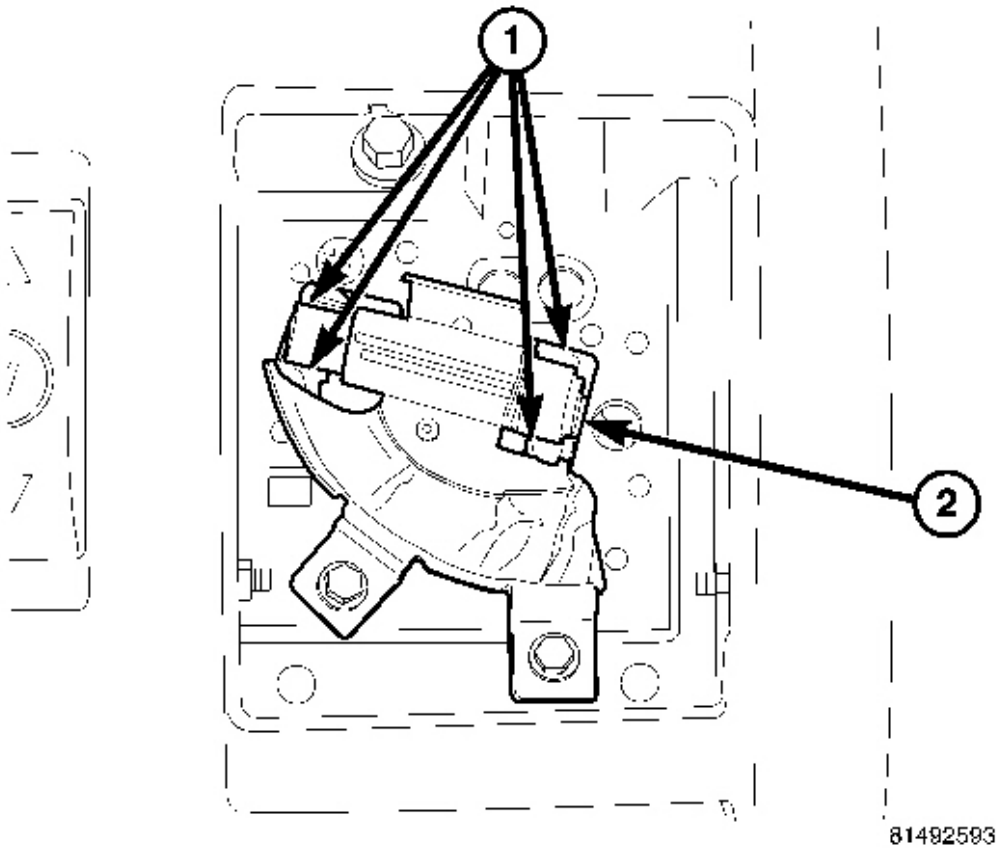


Fig. 23: View Of Reading Lamp Bulb & Holder
Courtesy of CHRYSLER LLC

1. Align the ends of the bulb (2) with the two bulb holders (1) within the mini overhead console lamp housing.
2. Carefully press the bulb firmly and evenly into the bulb holders until it snaps into place.

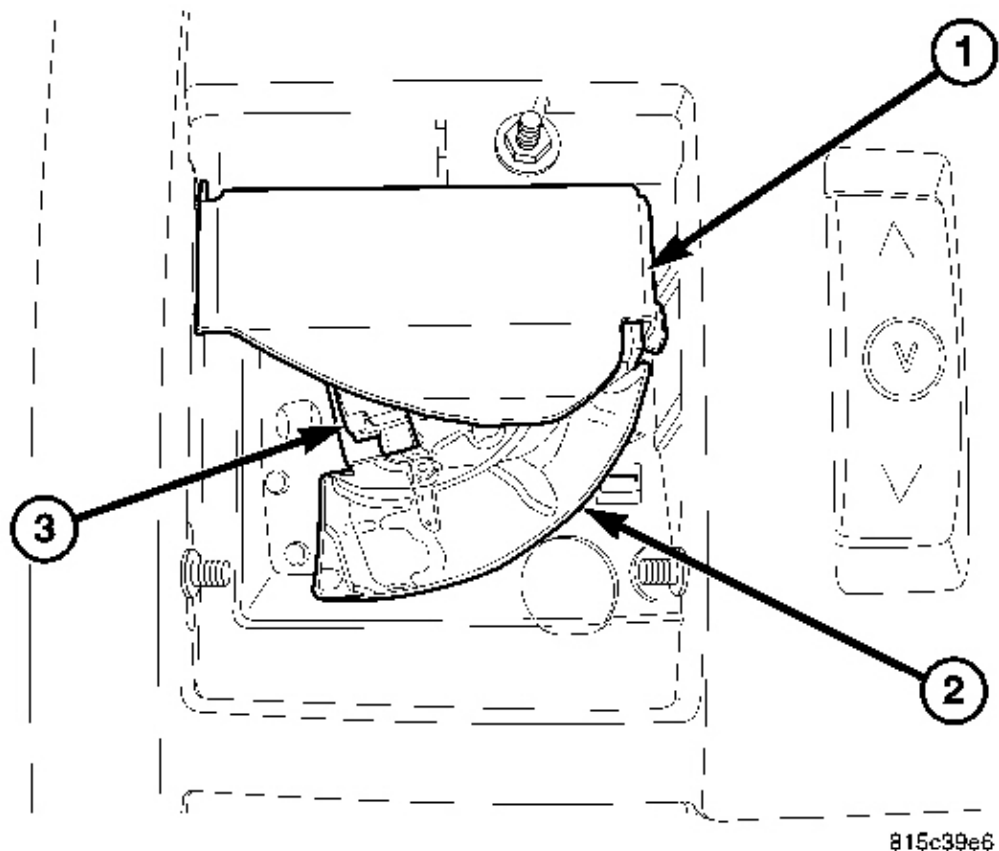


Fig. 24: Identifying Overhead Reading Lamp Shield, Reflector & Bulb
Courtesy of CHRYSLER LLC

3. Position the shield (1) over the lamp reflector (2) and bulb (3) within the lamp housing.
4. Using hand pressure, push both sides of the shield up into the housing to secure it into place.

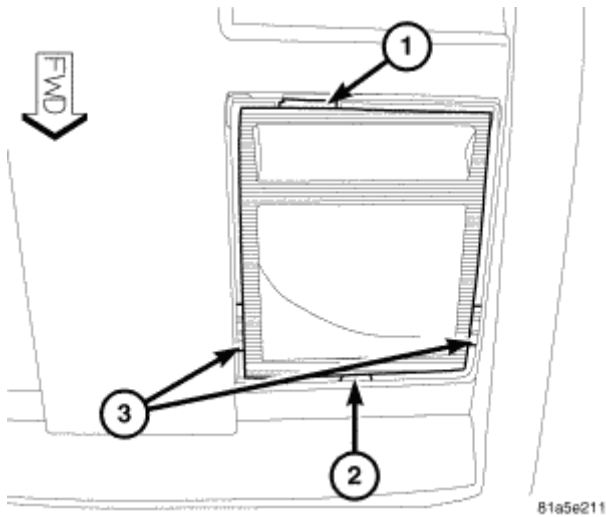


Fig. 25: Identifying Switch Tab, Lens & Pivot Pins
 Courtesy of CHRYSLER LLC

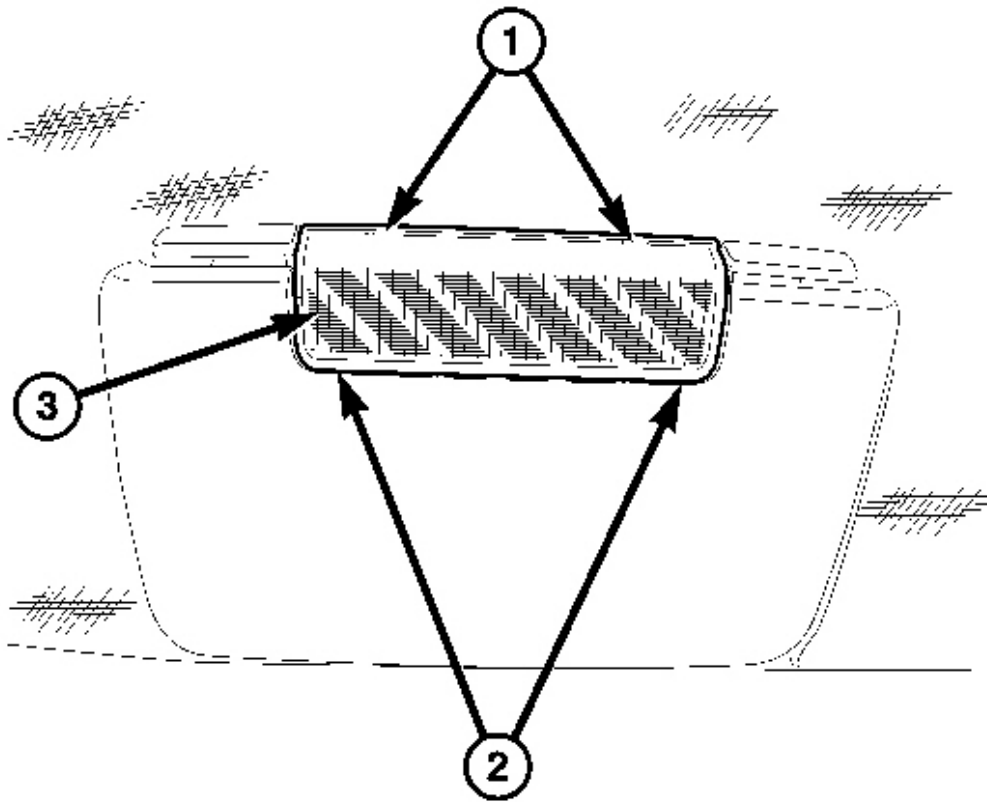
5. Engage the switch tab (1) on the rearward edge of the lens (2) between the mini overhead console and the switch plunger.
6. Position the pivots on both forward sides of the lens over the pivot pins (3) in the lamp housing.
7. Using hand pressure over both lens pivots, press upward firmly and evenly until both pivots snap into place.
8. Reconnect the battery negative cable.

VANITY LAMP

REMOVAL

VANITY LAMP BULB

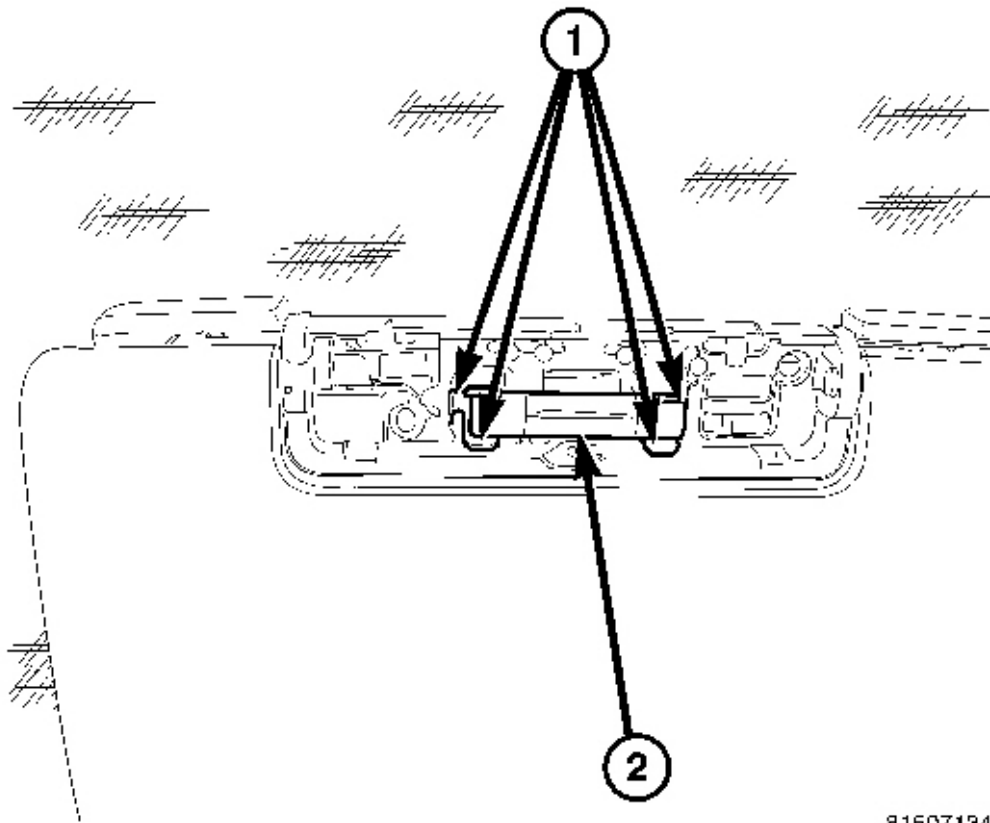
NOTE: Vehicles equipped with optional vanity lamps have a single lamp above a covered mirror that is integral to each sun visor. Each lamp is independently controlled by an integral switch that is automatically actuated by the mirror cover. The bulb types and service procedures are identical for both of these lamps.



815070ce

Fig. 26: Identifying Vanity Lamp Lens
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Using a small flat-bladed screwdriver, gently pry the upper edge of the lens (3) away from the vanity lamp housing far enough to disengage the two snap features (1).
3. Pull the upper edge of the lens away from the visor far enough to disengage the two tabs (2) at the bottom of the lens from the lamp housing.



81507134

Fig. 27: Removing/Installing Vanity Lamp Bulb
Courtesy of CHRYSLER LLC

4. Carefully unsnap the bulb (2) from the two bulb holders (1) within the lamp housing.
5. Remove the bulb from the lamp.

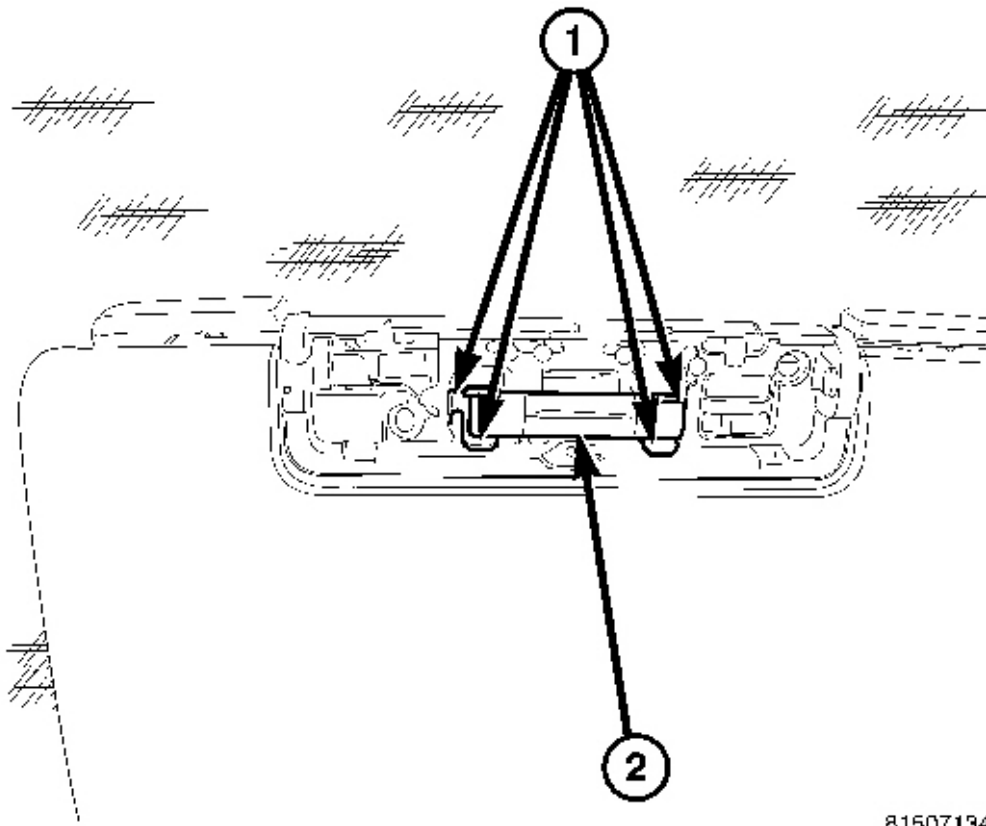
INSTALLATION

VANITY LAMP BULB

CAUTION: Always use the correct bulb size and type for replacement. An incorrect bulb size or type may overheat and cause damage to the lamp, the socket or the lamp wiring.

NOTE: Vehicles equipped with optional vanity lamps have a single lamp above a covered mirror that is integral to each sun visor. Each lamp is independently

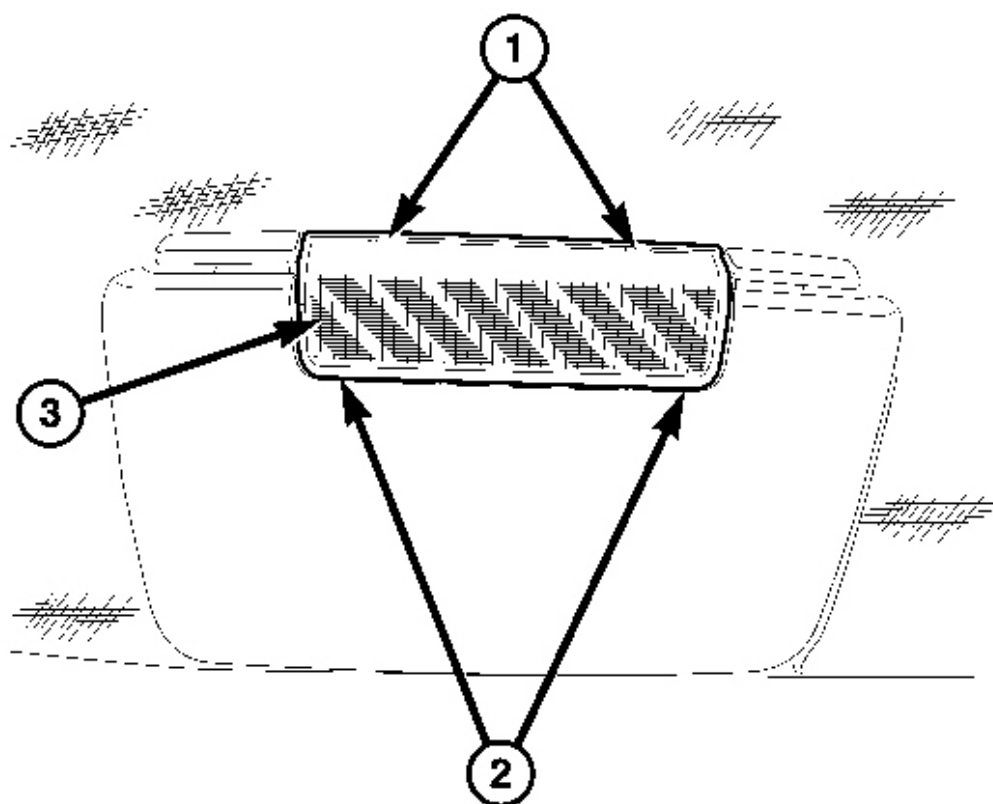
controlled by an integral switch that is automatically actuated by the mirror cover. The bulb types and service procedures are identical for both of these lamps.



81507134

Fig. 28: Removing/Installing Vanity Lamp Bulb
Courtesy of CHRYSLER LLC

1. Align the ends of the bulb (2) with the two bulb holders (1) within the vanity lamp housing.
2. Carefully press the bulb firmly and evenly into the bulb holders until it snaps into place.



815070ce

Fig. 29: Identifying Vanity Lamp Lens
Courtesy of CHRYSLER LLC

3. Engage the two tabs (2) on the lower edge of the lens (3) within the bottom of the lamp housing.
4. Using hand pressure, press the upper edge of the lens over the top of the lamp housing until the two tabs (1) at the top of the lens snap into place.
5. Reconnect the battery negative cable.

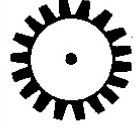
2008 MAINTENANCE

Lubrication & Maintenance - Liberty

INTERNATIONAL SYMBOLS

DESCRIPTION

INTERNATIONAL SYMBOLS

	ENGINE OIL		BRAKE FLUID
	AUTOMATIC TRANSMISSION FLUID		POWER STEERING FLUID
	ENGINE COOLANT		WINDSHIELD WASHER FLUID

8097ddbdc

Fig. 1: International Symbols
Courtesy of CHRYSLER LLC

DaimlerChrysler Corporation uses international symbols to identify engine compartment lubricant and fluid inspection and fill locations. See **Fig. 1**.

PARTS & LUBRICANT RECOMMENDATION

DESCRIPTION

FLUID TYPES

When service is required, Chrysler recommends that only Mopar® brand parts, lubricants and chemicals be used. Mopar® provides the best engineered products for servicing Chrysler vehicles.

Only lubricants bearing designations defined by the following organization should be used to service a Chrysler

vehicle:

Society of Automotive Engineers (SAE)

American Petroleum Institute (API). See **Fig. 2**.

National Lubricating Grease Institute (NLGI)

European Automobile Manufacturers Association (ACEA)

API QUALITY CLASSIFICATION



9400-9

Fig. 2: API Symbol

Courtesy of CHRYSLER LLC

This symbol on the front of an oil container means that the oil has been certified by the American Petroleum Institute (API) to meet all the lubrication requirements specified by Chrysler.

GEAR LUBRICANTS

SAE ratings also apply to multigrade gear lubricants. In addition, API classification defines the lubricant's usage, such as API GL-5 and SAE 75W-90.

PARTS & LUBRICATION RECOMMENDATIONS

CHASSIS

Component	Fluid, Lubricant, or Genuine Part
Steering Gear & Linkage, Ball Joints, Prop Shafts & Yokes, Wheel Bearings	Mopar® Multi-Purpose Lubricant NLGI Grade 2 EP, GC-LB

BODY

Component	Fluid, Lubricant, and Genuine Part
Hinges:	
Door & Hood	Mopar® Engine Oil
Swing Gate	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Latches: Door, Hood/Safety Catch, Swing Gate	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Seat Regulator & Track	Mopar® Multi-Purpose Lube NLGI Grade 2 EP, GC-LB
Lock Cylinders	Mopar® Lock Cylinder Lube

FLUID TYPES

DESCRIPTION

A/C REFRIGERANT

The refrigerant used in this air conditioning system is a HydroFluoroCarbon (HFC), type R-134a. Unlike R-12, which is a ChloroFluoroCarbon (CFC), R-134a refrigerant does not contain ozone-depleting chlorine. R-134a refrigerant is a non-toxic, non-flammable, clear and colorless liquefied gas.

CAUTION: R-134a refrigerant is not compatible with R-12 refrigerant in an A/C system. Even a small amount of R-12 refrigerant added to an R-134a refrigerant system will cause A/C compressor failure.

The A/C refrigerant system is filled-for-life at the factory and requires no regular maintenance. Although not required at specific intervals, the charge level should be checked if system performance deteriorates or if a noise or leak is suspected. Refer to **DIAGNOSIS AND TESTING** .

ATF+4 POWER STEERING FLUID

Mopar® ATF +4, Automatic Transmission Fluid is required in the power steering system. Substitute fluids can induce power steering system failure.

Mopar® ATF +4, Automatic Transmission Fluid when new is red in color. The ATF is dyed red so it can be identified from other fluids used in the vehicle such as engine oil or antifreeze. The red color is not permanent and is not an indicator of fluid condition. As the vehicle is driven, the ATF will begin to look darker in color and may eventually become brown. **This is normal.** ATF+4 also has a unique odor that may change with age. Consequently, odor and color cannot be used to indicate the fluid condition or the need for a fluid change.

AUTOMATIC TRANSMISSION FLUID

NOTE: Refer to Service Procedures in this service information for fluid level checking procedures.

Mopar® ATF +4, Automatic Transmission Fluid is the recommended fluid for DaimlerChrysler automatic transmissions.

Dexron II fluid IS NOT recommended. Clutch chatter can result from the use of improper fluid.

Mopar® ATF +4, Automatic Transmission Fluid when new is red in color. The ATF is dyed red so it can be identified from other fluids used in the vehicle such as engine oil or antifreeze. The red color is not permanent and is not an indicator of fluid condition. As the vehicle is driven, the ATF will begin to look darker in color and may eventually become brown. **This is normal.** ATF+4 also has a unique odor that may change with age. Consequently, odor and color cannot be used to indicate the fluid condition or the need for a fluid change.

FLUID ADDITIVES

DaimlerChrysler strongly recommends against the addition of any fluids to the transmission, other than those automatic transmission fluids listed above. Exceptions to this policy are the use of special dyes to aid in detecting fluid leaks.

Various "special" additives and supplements exist that claim to improve shift feel and/or quality. These additives and others also claim to improve converter clutch operation and inhibit overheating, oxidation, varnish, and sludge. These claims have not been supported to the satisfaction of DaimlerChrysler and these additives **must not be used.** The use of transmission "sealers" should also be avoided, since they may adversely affect the integrity of transmission seals.

BRAKE FLUID

The brake fluid used in this vehicle must conform to DOT 3 specifications and SAE J1703 standards. No other type of brake fluid is recommended or approved for usage in the vehicle brake system. Use only Mopar brake fluid or an equivalent from a tightly sealed container.

CAUTION: Never use reclaimed brake fluid or fluid from a container which has been left open. An open container of brake fluid will absorb moisture from the air and contaminate the fluid.

CAUTION: Never use any type of a petroleum-based fluid in the brake hydraulic system. Use of such type fluids will result in seal damage of the vehicle brake hydraulic system causing a failure of the vehicle brake system. Petroleum based fluids would be items such as engine oil, transmission fluid, power steering fluid, etc.

COOLANT

WARNING: Antifreeze is an ethylene glycol based coolant and is harmful if swallowed or inhaled. If swallowed, drink two glasses of water and induce vomiting. If inhaled, move to fresh air area. Seek medical attention immediately. Do

not store in open or unmarked containers. Wash skin and clothing thoroughly after coming in contact with ethylene glycol. Keep out of reach of children. Dispose of glycol based coolant properly, contact your dealer or government agency for location of collection center in your area. Do not open a cooling system when the engine is at operating temperature or hot under pressure, personal injury can result. Avoid radiator cooling fan when engine compartment related service is performed, personal injury can result.

CAUTION: Use of Propylene Glycol based coolants is not recommended, as they provide less freeze protection and less corrosion protection.

The cooling system is designed around the coolant. The coolant must accept heat from engine metal, in the cylinder head area near the exhaust valves and engine block. Then coolant carries the heat to the radiator where the tube/fin radiator can transfer the heat to the air.

The use of aluminum cylinder blocks, cylinder heads, and water pumps requires special corrosion protection. Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769), or the equivalent ethylene glycol based coolant with organic corrosion inhibitors (called HOAT, for Hybrid Organic Additive Technology) is recommended. This coolant offers the best engine cooling without corrosion when mixed with 50% Ethylene Glycol and 50% distilled water to obtain a freeze point of -37°C (-35°F). If it loses color or becomes contaminated, drain, flush, and replace with fresh properly mixed coolant solution.

CAUTION: Mopar® Antifreeze/Coolant, 5 Year/100,000 Mile Formula (MS-9769) may not be mixed with any other type of antifreeze. Mixing of coolants other than specified (non-HOAT or other HOAT), may result in engine damage that may not be covered under the new vehicle warranty, and decreased corrosion protection.

COOLANT PERFORMANCE

The required ethylene-glycol (antifreeze) and water mixture depends upon climate and vehicle operating conditions. The coolant performance of various mixtures follows:

Pure Water- Water can absorb more heat than a mixture of water and ethylene-glycol. This is for purpose of heat transfer only. Water also freezes at a higher temperature and allows corrosion.

100 percent Ethylene-Glycol- The corrosion inhibiting additives in ethylene-glycol need the presence of water to dissolve. Without water, additives form deposits in system. These act as insulation causing temperature to rise to as high as 149°C (300°F). This temperature is hot enough to melt plastic and soften solder. The increased temperature can result in engine detonation. In addition, 100 percent ethylene-glycol freezes at -22°C (-8°F).

50/50 Ethylene-Glycol and Water -Is the recommended mixture, it provides protection against freezing to -37°C (-34°F). The antifreeze concentration **must always** be a minimum of 44 percent, year-round in all climates. If percentage is lower, engine parts may be eroded by cavitation. Maximum protection against freezing is provided with a 68 percent antifreeze concentration, which prevents freezing down to -67.7°C (-90°F). A higher

percentage will freeze at a warmer temperature. Also, a higher percentage of antifreeze can cause the engine to overheat because specific heat of antifreeze is lower than that of water.

CAUTION: Richer antifreeze mixtures cannot be measured with normal field equipment and can cause problems associated with 100 percent ethylene-glycol.

CAUTION: Do not use coolant additives that are claimed to improve engine cooling.

ENGINE OIL

WARNING: New or used engine oil can be irritating to the skin. Avoid prolonged or repeated skin contact with engine oil. Contaminants in used engine oil, caused by internal combustion, can be hazardous to your health. Thoroughly wash exposed skin with soap and water. Do not wash skin with gasoline, diesel fuel, thinner, or solvents, health problems can result. Do not pollute, dispose of used engine oil properly. Contact your dealer or government agency for location of collection center in your area.

Only lubricants bearing designations defined by the following organization should be used.

Society of Automotive Engineers (SAE)

American Petroleum Institute (API)

National Lubricating Grease Institute (NLGI)

Association des Constructeurs Europeens d' Automobiles (European Automobile Manufacturers Association) (ACEA)

API SERVICE GRADE CERTIFIED

Use an engine oil that is API Certified. MOPAR® provides engine oils, that meet or exceed this requirement.

SAE VISCOSITY



81364ec7

Fig. 3: Oil Filler Cap
Courtesy of CHRYSLER LLC

An SAE viscosity grade is used to specify the viscosity of engine oil. Use only engine oils with multiple viscosities. These are specified with a dual SAE viscosity grade which indicates the cold-to-hot temperature viscosity range. Select an engine oil that is best suited to your particular temperature range. **Refer to your engine oil filler cap for the recommended engine oil viscosity for your vehicle.**

Engine Oil Viscosity (2.8L Diesel Engines)

For vehicles equipped with a Diesel Particulate Filter (DPF), use ESP fully synthetic, low ash oil that meets DaimlerChrysler Material Standard MS-11106 must be used.

For vehicles not equipped with a DPF, use ESP fully synthetic oil that meets DaimlerChrysler Material Standard MS-10725 may be used.

ACEA Categories

For countries that use the ACEA European Oil Categories for Service Fill Oils, use engine oils that meet the requirements of ACEA A1/B1, A2/B2, or A3/B3.

ENERGY CONSERVING OIL

An Energy Conserving type oil is recommended for gasoline engines. The designation of ENERGY CONSERVING is located on the label of an engine oil container.

CONTAINER IDENTIFICATION



9400-9

Fig. 4: API Certification Mark
Courtesy of CHRYSLER LLC

Standard engine oil identification notations have been adopted to aid in the proper selection of engine oil. The identifying notations are located on the front label of engine oil plastic bottles and the top of engine oil cans.

This symbol means that the oil has been certified by the American Petroleum Institute (API). DaimlerChrysler only recommends API Certified engine oils. Use Mopar® engine oil or equivalent.

SYNTHETIC ENGINE OILS

There are a number of engine oils being promoted as either synthetic or semi-synthetic. If you chose to use such a product, use **only** those oils that meet the American Petroleum Institute (API) and SAE viscosity standard. Follow the service schedule that describes your driving type.

ENGINE OIL ADDITIVES/SUPPLEMENTS

The manufacturer **does not recommend** the addition of any engine oil additives/supplements to the specified engine oil. Engine oil additives/supplements should not be used to enhance engine oil performance. Engine oil additives/supplements should not be used to extend engine oil change intervals. No additive is known to be safe for engine durability and can degrade emission components. Additives can contain undesirable materials that harm the long term durability of engines by:

Doubling the level of phosphorus in the engine oil. The ILSAC (International Lubricant Standard

Approval Committee) GF-2 and GF-3 standards require that engine oil contain no more than 0.10% phosphorus to protect the vehicles emissions performance. Addition of engine oil additives/supplements can poison, from the added sulfur and phosphorus, catalysts and hinder efforts to guarantee emissions performance to 80,000 miles.

Altering the viscosity characteristics of the engine oil so that it no longer meets the requirements of the specified viscosity grade.

Creating potential for an undesirable additive compatibility interaction in the engine crankcase. Generally it is not desirable to mix additive packages from different suppliers in the crankcase; there have been reports of low temperature engine failures caused by additive package incompatibility with such mixtures.

MANUAL TRANSMISSION

NOTE: DaimlerChrysler recommends using Mopar® lubricants or lubricants of equal quality.

NSG370 - Mopar® Manual Transmission Lubricant MS-9224

TRANSFER CASE - MP1522

The MP1522 transfer case uses MOPAR® ATF + 4 automatic transmission fluid.

TRANSFER CASE - MP3022

The MP3022 transfer case uses MOPAR® ATF + 4 automatic transmission fluid.

OPERATION

AUTOMATIC TRANSMISSION FLUID

The automatic transmission fluid is selected based upon several qualities. The fluid must provide a high level of protection for the internal components by providing a lubricating film between adjacent metal components. The fluid must also be thermally stable so that it can maintain a consistent viscosity through a large temperature range. If the viscosity stays constant through the temperature range of operation, transmission operation and shift feel will remain consistent. Transmission fluid must also be a good conductor of heat. The fluid must absorb heat from the internal transmission components and transfer that heat to the transmission case.

FLUID - CAPACITIES & RECOMMENDED

SPECIFICATIONS

SPECIFICATIONS

ENGINE - EXCEPT EXPORT

Component	Fluids, Lubricants and Genuine Parts
Engine Coolant	Mopar® Antifreeze/Coolant 5 Year/100,000 Mile Formula HOAT (Hybrid Organic Additive Technology) or equivalent.

Engine Oil	Use API Certified SAE 5W-20 Engine Oil meeting the requirements of DaimlerChrysler Material Standard MS-6395. Refer to the engine oil fill cap for correct SAE grade.
Engine Oil Filter	Mopar ® Engine Oil Filter, P/N 5281090 or equivalent.
Spark Plugs	ZFR6F-11 (Gap .043 in [1.1 mm])
Fuel Selection	87 Octane, (R+M)/2 Method

ENGINE - EXPORT

Component	Fluids, Lubricants, and Genuine Parts
Engine Coolant	Mopar ® Antifreeze/Coolant 5 Year/100,000 Mile Formula HOAT (Hybrid Organic Additive Technology)
Engine Oil (Gasoline Engines) - Non ACEA Categories	Use API Certified SAE 5W-20 engine oil, meeting the requirements of DaimlerChrysler Material Standard MS-6395. Refer to your engine oil filler cap for correct SAE grade. SAE 5W-30 engine oil approved to MB 229.31 or MB 229.51 may be used when SAE 5W-20 engine oil is not available.
Engine Oil (Gasoline Engines) - ACEA Categories	For countries that use the ACEA European Oil Categories for Service Fill Oils, use engine oils meeting the requirements of ACEA C3, and approved to MB 229.31 or MB 229.51. SAE 5W-30 engine oil approved to MB 229.31 or MB 229.51 may be used when SAE 5W-20 engine oil is not available.
Engine Oil - Diesel (without Particulate Filter)	Use SAE 0W-40 diesel engine oils confirming to API Quality CI-4 or CJ-4. For countries that use the ACEA European Oil Categories for Service Fill Oils, use engine oils meeting the requirements of ACEA C3 and approved to MB 229.31 or MB 229.51.
Engine Oil - Diesel (with Particulate Filter)	Use SAE 5W-30 diesel engine oils conforming to API Quality CI-4 or CJ-4. For countries that use the ACEA European Oil Categories for Service Fill Oils, use engine oils meeting the requirements of ACEA C3 (LOW ASH) and approved to MB 229.31 or MB 229.51.
Spark Plugs (3.7 Liter Engine)	ZFR6F-11 (Gap .043 in [1.1 mm])
Engine Oil Filter (3.7 Liter Engine)	Mopar ® 5281090 or equivalent.
Engine Oil Filter (2.8 Liter Diesel Engine)	Mopar ® Oil Filter (P/N 5003558AA)
Fuel Selection (3.7 Liter Engine)	91 Octane
Fuel Selection (Diesel Engine)	50 Cetane or higher (Less than 15 ppm Sulfur).

CHASSIS

Component	Fluids, Lubricants and Genuine Parts.
Automatic Transmission	Mopar ® ATF+4, Automatic Transmission Fluid.
Manual Transmission	Mopar ® Manual Transmission Lubricant or equivalent (meeting the requirements of DaimlerChrysler Material Standard MS-9224)
Transfer Case	Mopar ® ATF+4, Automatic Transmission Fluid.

Brake Master Cylinder/Manual Transmission Clutch System	Mopar ® DOT 3 Brake Fluid, SAE J1703 should be used. If DOT 3, SAE J1703 brake fluid is not available, then DOT 4 is acceptable. Use only recommended brake fluids.
Power Steering Reservoir	Mopar ® ATF+4, Automatic Transmission Fluid.

AXLES

-	-	U.S.	Metric
Front Axle			
186 FIA (Model 30)	SAE 80W-90 Multipurpose Type, GL-5 Gear Lubricant or equivalent.	2.6 Pints	1.24 Liters
Rear Axle			
8 1/4	SAE 75W-140 Synthetic Gear Lubricant or equivalent.	4.4 Pints	2.08 Liters

CAPACITIES

-	U.S.	Metric
Fuel (Approximate)	-	-
3.7/4.0 Liter Engine	19.5 Gallons	73.8 Liters
2.8 Liter Diesel Engine	18.5 Gallons	70 Liters
Engine Oil with Filter	-	-
3.7 Liter Engine (SAE 5W-20, API Certified Engine Oil)	5 Quarts	4.7 Liters
4.0 Liter Engine (SAE 10W-30, API Certified Engine Oil)	5.5 Quarts	5.2 Liters
2.8 Liter Diesel Engine	7 Quarts	6.6 Liters
Cooling System *	-	-
3.7 Liter Engine (Mopar ® Antifreeze/Engine Coolant 5 Year/100,000 Mile Formula)	14 Quarts	13.2 Liters
4.0 Liter Engine (Mopar ® Antifreeze/Engine Coolant 5 Year/100,000 Mile Formula)	14 Quarts	13.2 Liters
2.8 Liter Diesel Engine (Mopar ® Antifreeze/Engine Coolant 5 Year/100,000 Mile Formula or equivalent).	11.8 Quarts	11.1 Liters

* Includes heater and coolant recovery bottle filled to MAX level.

POWER STEERING SYSTEM

Power steering fluid capacities are dependent on engine/chassis options as well as steering gear/cooler options. Depending on type and size of internal cooler, length and inside diameter of cooler lines, or use of an auxiliary cooler, these capacities may vary. Refer to **STANDARD PROCEDURE** .

A/C REFRIGERANT SYSTEM		
All Models	1.12 Pounds	0.510 Kilograms
AUTOMATIC TRANSMISSION		
Service Fill - NAG1	10.6 Pints	5.0 Liters
Overhaul - NAG1	16.3 Pints<--	7.7 Liters<--
Service Fill - 42RLE	8.0 Pints	3.8 Liters
O-haul Fill - 42RLE	17.6 Pints<--	8.3 Liters<--
<--Dry fill capacity depending on type and size of internal cooler, length and inside diameter of cooler lines, or use of an auxiliary cooler, these figures may vary.		
TRANSFER CASE		
MP1522 (Approximate dry fill or fill to bottom edge of the fill plug hole.)	3.80 Pints	1.80 Liters
MP3022 (Approximate dry fill or fill to bottom edge of the fill plug hole.)	4.01 Pints	1.90 Liters
MANUAL TRANSMISSION		
NSG370 (Approximate dry fill or fill to bottom edge of the fill plug hole.)	3.17 Pints	1.5 Liters
*Nominal refill capacities are shown. A variation may be observed from vehicle to vehicle due to manufacturing tolerance and refill procedure.		

MAINTENANCE SCHEDULES

DESCRIPTION

MAINTENANCE SCHEDULES - GAS

The oil change indicator system will remind you that it is time to take your vehicle in for scheduled maintenance.

On Electronic Vehicle Information Center (EVIC) equipped vehicles, "Oil Change Required" will be displayed in the EVIC and a single chime will sound, indicating that an oil change is necessary.

On Non-EVIC equipped vehicles, "Change Oil" will flash in the instrument cluster odometer and a single chime will sound, indicating that an oil change is necessary.

Based on engine operation conditions the oil change indicator message will illuminate, this means that service is required for your vehicle. Have your vehicle serviced as soon as possible, within the next 500 mi (805 km).

NOTE: **The oil change indicator message will not monitor the time since the last oil change. Change your vehicles oil if it has been six months since your last oil change even if the oil change indicator message is NOT illuminated.**

Change your engine oil more often if you drive your vehicle off-road for an extended period of time.

Under no circumstances should oil change intervals exceed 6,000 mi (10 000 km) or 6 months, whichever comes first.

Your authorized dealer will reset the oil change indicator message after completing the scheduled oil change. If a scheduled oil change is performed by someone other than your authorized dealer, the message can be reset by referring to **CHANGE OIL INDICATOR** .

At Each Stop for Fuel

- Check the engine oil level about five minutes after a fully warmed engine is shut off. Checking the oil level while the vehicle is on level ground will improve the accuracy of the oil level reading. Add oil only when the level is at or below the ADD or MIN mark.
- Check the windshield washer solvent and add if required.

Once a Month

- Check tire pressure and look for unusual wear or damage.
- Inspect the battery and clean and tighten the terminals as required.
- Check the fluid levels of coolant reservoir, brake master cylinder, and power steering, and add as needed.
- Check all lights and other electrical items for correct operation.

At Each Oil Change

- Change the engine oil filter.
- Inspect the brake hoses and lines.
- Check the manual transmission fluid level.
- Check the coolant level, hoses, and clamps.

CAUTION: Failure to perform the required maintenance items may result in damage to the vehicle.

REQUIRED MAINTENANCE INTERVALS

Maintenance Items	Perform Maintenance Every		
	(Where time and mileage are listed, follow the interval that occurs first.)		
	Miles	Kilometers	or Months
Change the engine oil and engine oil filter.	6,000	10 000	6
Rotate the tires.	6,000	10 000	6
If using your vehicle in dusty or off-road conditions, inspect the engine air cleaner filter, and replace if necessary.	12,000	20 000	12

Inspect the brake linings, and replace if necessary.	12,000	20 000	12
Replace the air conditioning air filter (if equipped).	12,000	20 000	12
Inspect the front and rear axle lubricant. Change the lubricant if using your vehicle for police, taxi, fleet, off-road, or frequent trailer towing.	18,000	30 000	18
Inspect the CV Joints. Perform the first inspection at 12,000 mi (20 000 km) or 12 months.	24,000	40 000	24
Inspect the exhaust system. Perform the first inspection at 12,000 mi (20 000 km) or 12 months.	24,000	40 000	24
Inspect the front suspension, tie rod ends and boot seals, and replace if necessary.	24,000	40 000	24
Replace the engine air cleaner filter.	30,000	50 000	30
Change the manual transmission fluid if using your vehicle for any of the following: trailer towing, snow plowing, heavy loading, taxi, police, delivery service (commercial service), off-road, desert operation, or more than 50% of your driving is at sustained high speeds during hot weather, above 90°F (32°C).	30,000	50 000	30
Inspect the transfer case fluid.	30,000	50 000	30
Replace the spark plugs.	30,000	50 000	30
Change the automatic transmission fluid and filter if using your vehicle for police, taxi, fleet, off-road, or frequent trailer towing.	60,000	100 000	60
Change the transfer case fluid if using your vehicle for any of the following: police, taxi, fleet, off-road, or frequent trailer towing.	60,000	100 000	60
Inspect and replace the PCV valve if necessary.	90,000	150 000	90
Flush and replace the engine coolant.	102,000	170 000	60
Change the automatic transmission fluid and filter.	120,000	200 000	120
Replace the accessory drive belt(s).	120,000	200 000	120

WARNING: You can be badly injured working on or around a motor vehicle. Do only that service work for which you have the knowledge and the right equipment. If you have any doubt about your ability to perform a service job, take your vehicle to a competent mechanic.

There are two maintenance schedules that show the **required** service for your vehicle.

First is Schedule "**A**". It is for vehicles that are not operated under any of the conditions listed under Schedule "B."

Second is Schedule "**B**". It is for vehicles that are operated under the conditions that are listed below and at the beginning of the schedule.

- Day or night temperatures are below 0°C (32°F).
- Stop and go driving.
- Extensive engine idling.
- Driving in dusty conditions.
- Short trips of less than 16.2 km (10 miles).
- More than 50% of your driving is at sustained high speeds during hot weather, above 32°C (90°F).
- Trailer towing.
- Taxi, police, or delivery service (commercial service).
- Off-road or desert driving.

NOTE: **Most vehicles are operated under the conditions listed for Schedule "B."**

Use the schedule that best describes your driving conditions. Where time and mileage are listed, follow the interval that occurs first.

CAUTION: Failure to perform the required maintenance items may result in damage to the vehicle.

At Each Stop for Fuel

- Check the engine oil level about 5 minutes after a fully warmed engine is shut off. Checking the oil level while the vehicle is on level ground will improve the accuracy of the oil level reading. Add oil only when the level is at or below the ADD or MIN mark.
- Check the windshield washer solvent, add as required.

Once a Month

- Check the tire pressure and look for unusual wear or damage.
- Inspect the battery, and clean and tighten the terminals as required.
- Check the fluid levels of the coolant reservoir, brake master cylinder, and transmission, and add as needed.
- Check all lights and all other electrical items for correct operation.

At Each Oil Change

- Change the engine oil filter.
- Inspect the exhaust system.
- Inspect brake hoses.
- Inspect the CV joints (If equipped) and front suspension components.
- Check the coolant level, hoses, and clamps.
- After completion of off-road operation, the underside of the vehicle should be thoroughly inspected. Examine threaded fasteners for looseness.

Schedule "A"

Kilometers (Miles) [Months]	12 000 (7,500) [6]	24 000 (15,000) [12]	36 000 (22,500) [18]	48 000 (30,000) [24]
Change the engine oil and engine oil filter.	X	X	X	X
Rotate the tires.	X	X	X	X
Inspect the engine air filter element, and replace if necessary.	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	X
Inspect the brake linings.	-	-	X	-
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X
Inspect the transfer case fluid, add as necessary.	-	-	-	X

Kilometers (Miles) [Months]	60 000 (37,500) [30]	72 000 (45,000) [36]	84 000 (52,500) [42]	96 000 (60,000) [48]
Change the engine oil and engine oil filter.	X	X	X	X
Rotate the tires.	X	X	X	X
Inspect the engine air filter element, and replace if necessary.	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	X
Inspect the brake linings.	-	X	-	-
Inspect the drive belt, and replace as needed.	-	-	-	X
Flush and replace the engine coolant/anti-freeze. Where both time and mileage are indicated, follow the interval which occurs first.	-	-	-	X
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X
Inspect transfer case fluid, add as necessary.	-	-	-	X

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Kilometers (Miles) [Months]	108 000 (67,500) [54]	120 000 (75,000) [60]	132 000 (82,500) [66]	144 000 (90,000) [72]
Change the engine oil and engine oil filter.	X	X	X	X
Rotate the tires.	X	X	X	X
Inspect the engine air filter element, and replace if necessary.	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	X
Inspect the brake linings.	X	-	-	X
Inspect the drive belt, and replace as needed. Not required if previously replaced (3.7L Only).	X	-	X	-
Inspect the drive belt, and replace as needed. Not required if previously replaced (4.0L Only).	-	X	-	X
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X
Inspect transfer case fluid, add as necessary.	-	-	-	X
Flush and replace the engine coolant/anti-freeze. Where both time and mileage are indicated, follow the interval which occurs first.	-	X	-	-

Kilometers (Miles) [Months]	156 000 (97,500) [78]	168 000 (105,000) [84]	180 000 (112,500) [90]	192 000 (120,000) [96]
Change the engine oil and engine oil filter.	X	X	X	X
Rotate the tires.	X	X	X	X
Inspect the engine air filter element, and replace if necessary.	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	X
Replace the spark plugs (4.0L Only).	X	-	-	-
Inspect the timing belt, replace if necessary (4.0L Only).	-	X	-	-
Inspect the brake linings.	-	-	X	-
Inspect the drive belt, and replace as needed. Not required if previously replaced (3.7L Only).	X	-	-	X
Inspect the drive belt, and replace as needed. Not required if previously replaced (4.0L Only).	-	X	-	X
Flush and replace the engine coolant/anti-freeze	X	-	-	-

if not done at 60 months.				
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X
Drain and refill the transfer case fluid.	-	-	-	X

Inspection and service should be performed anytime a malfunction is observed or suspected. Retain all receipts.

<-- This maintenance is recommended by the manufacturer to the owner, but it is not required to maintain emissions warranty.

Schedule "B"

Follow schedule "B" if you usually operate your vehicle under one or more of the following conditions.

- Day or night temperatures are below 0°C (32°F).
- Stop and go driving.
- Extensive engine idling.
- Driving in dusty conditions.
- Short trips of less than 16.2 km (10 miles).
- More than 50% of your driving is at sustained high speeds during hot weather, above 32°C (90°F).
- Trailer towing.
- Taxi, police, or delivery service (commercial service).
- Off-road or desert driving.

Kilometers (Miles)	5 000 (3,000)	10 000 (6,000)	14 000 (9,000)	19 000 (12,000)	24 000 (15,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	-	X	-	X	-
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the brake linings.	-	-	-	X	-
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X

Kilometers (Miles)	29 000 (18,000)	34 000 (21,000)	38 000 (24,000)	43 000 (27,000)	48 000 (30,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	X	-	X	-	X

Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	-	X
Inspect the brake linings.	-	-	X	-	-
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X

Kilometers (Miles)	53 000 (33,000)	58 000 (36,000)	62 000 (39,000)	67 000 (42,000)	72 000 (45,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	-	X	-	X	-
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the drive belt, and replace as needed.	-	-	-	-	X
Inspect the brake linings.	-	X	-	-	-
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X

Kilometers (Miles)	77 000 (48,000)	82 000 (51,000)	86 000 (54,000)	91 000 (57,000)	96 000 (60,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	X	-	X	-	X
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	-	X
Inspect the drive belt, and replace as needed. Not required if belt was previously.	-	-	-	-	X

Inspect the brake linings.	X	-	-	-	X
Inspect manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the automatic transmission fluid. Replace main sump filter and spin-on cooler return filter (if equipped).!	-	-	-	-	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Drain and refill the transfer case fluid.	-	-	-	-	X
Flush and replace the engine coolant/anti-freeze.	-	-	-	-	X

Kilometers (Miles)	101 000 (63,000)	106 000 (66,000)	110 000 (69,000)	115 000 (72,000)	120 000 (75,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	-	X	-	X	-
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the drive belt, and replace as needed. Not required if belt was previously replaced.	-	-	-	-	X
Inspect the brake linings.	-	-	-	X	-
Inspect manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X

Kilometers (Miles)	125 000 (78,000)	130 000 (81,000)	134 000 (84,000)	139 000 (87,000)	144 000 (90,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	X	-	X	-	X
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	-	X
Inspect the drive belt, and replace as needed. Not required if belt was previously replaced.	-	-	-	-	X

Inspect the brake linings.	-	-	X	-	-
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X

Kilometers (Miles)	149 000 (93,000)	154 000 (96,000)	158 000 (99,000)	163 000 (102,000)	168 000 (105,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	-	X	-	X	-
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Replace the spark plugs (4.0L Only).	-	-	X	-	-
Inspect the timing belt, replace if necessary (4.0L Only).	-	-	-	X	-
Inspect the drive belt, and replace as needed. Not required if belt was previously replaced.	-	-	-	-	X
Inspect the brake linings.	-	X	-	-	-
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	-	-	-	X
Flush and replace the engine coolant/anti-freeze, if not done at 60,000 miles (96 000 km).	-	-	-	X	-

Kilometers (Miles)	173 000 (108,000)	178 000 (111,000)	182 000 (114,000)	187 000 (117,000)	192 000 (120,000)
Change the engine oil and engine oil filter, if not replaced at 3 months.	X	X	X	X	X
Rotate the tires.	X	-	X	-	X
Inspect the engine air filter element, replace if necessary.	-	-	-	-	X
Inspect the PCV Valve, and replace if necessary.<--	-	-	-	-	X
Replace the spark plugs (3.7L Only).	-	-	-	-	X
Inspect the drive belt, and replace as					

needed. Not required if belt was previously replaced.	-	-	-	-	X
Inspect the brake linings.	X	-	-	-	X
Drain and refill the front and rear axle fluid.	-	-	-	-	X
Inspect the manual transmission fluid, add as necessary (3.7L Only).	X	X	X	X	X
Drain and refill the automatic transmission fluid. Replace main sump filter and spin-on cooler return filter (if equipped).!	-	-	-	-	X
Drain and refill the transfer case fluid.	-	-	-	-	X
Flush and replace the engine coolant/anti-freeze, if not replaced at 102,000 miles (163 000 km).	-	-	-	-	X

Inspection and service should also be performed anytime a malfunction is observed or suspected. Retain all receipts.

! Applies only if vehicle is used for frequent trailer towing or fleet/commercial service.

<-- This maintenance is recommended by the manufacturer to the owner, but is not required to maintain emissions warranty.

MAINTENANCE SCHEDULES - EXPORT DIESEL

There are two maintenance schedules that show the **required** service for your vehicle.

First is Schedule "**A**". It is for vehicles that are not operated under any of the conditions listed under Schedule "B".

Second is Schedule "**B**". It is for vehicles that are operated under the conditions that are listed below and at the beginning of the schedule.

- Day or night temperatures are below 0°C (32°F).
- Stop and go driving.
- Extensive engine idling.
- Driving in dusty conditions.
- Short trips of less than 16.2 km (10 miles).
- More than 50% of your driving is at sustained high speeds during hot weather, above 32°C (90°F).
- Trailer towing.
- Taxi, police, or delivery service (commercial service).
- Off-road or desert driving.

NOTE: Most vehicles are operated under the conditions listed for Schedule "B".

Use the schedule that best describes your driving conditions. Where time and mileage are listed, follow the interval that occurs first.

CAUTION: Failure to perform the required maintenance items may result in damage to the vehicle.

At Each Stop for Fuel

Check the engine oil level about 5 minutes after a fully warmed engine is shut off. Checking the oil level while the vehicle is on level ground will improve the accuracy of the oil level reading. Add oil only when the level is at or below the ADD or MIN mark.

Check the windshield washer solvent and add if required.

Once a Month

Check the tire pressure and look for unusual wear or damage.

Inspect the battery and clean and tighten the terminals as required.

Check the fluid levels of coolant reservoir, brake master cylinder, power steering and transmission and add as needed.

Check all lights and all other electrical items for correct operation.

At Each Oil Change

Change the engine oil filter.

Inspect the exhaust system.

Inspect brake hoses.

Check the engine coolant/anti-freeze level, hoses, and clamps.

Inspect engine accessory drive belts. Replace as necessary.

Inspect for the presence of water in the fuel filter/water separator unit.

Schedule "A"

Kilometers (Miles)	20 000 (12,500)	40 000 (25,000)	60 000 (37,500)	80 000 (50,000)	100 000 (62,500)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	X	-	X	-	X
Replace the engine air filter element.	-	X	-	X	-
Replace the fuel filter/water separator unit.	-	X	-	X	-
Replace the engine accessory drive belt.	-	-	-	-	X
Inspect the brake linings.	-	X	-	X	-

Inspect the manual transmission fluid, add if necessary.	-	X	-	X	-
Inspect the transfer case fluid, add if necessary.	-	-	-	X	-

Kilometers (Miles)	120 000 (75,000)	140 000 (87,500)	160 000 (100,000)	180 000 (112,500)	200 000 (125,000)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	-	X	-	X	X
Replace the engine air filter element.	X	-	X	-	X
Replace the fuel filter/water separator unit.	X	-	X	-	X
Flush and replace the engine coolant.	-	-	X	-	X
Replace the engine accessory drive belt.	-	-	-	-	X
Replace the engine timing belt, and timing belt tensioner.	-	-	-	-	X
Inspect the brake linings.	X	-	X	-	X
Inspect the manual transmission fluid, add if necessary.	X	-	X	-	X
Inspect the transfer case fluid, add if necessary.	-	-	X	-	-

Inspection and service should be performed anytime a malfunction is observed or suspected. Retain all receipts.

Schedule "B"

Follow schedule "B" if you usually operate your vehicle under one or more of the following conditions.

- Day or night temperatures are below 0°C (32°F).
- Stop and go driving.
- Extensive engine idling.
- Driving in dusty conditions.
- Short trips of less than 16.2 km (10 miles).
- More than 50% of your driving is at sustained high speeds during hot weather, above 32°C (90°F).
- Trailer towing.
- Taxi, police, or delivery service (commercial service).
- Off-road or desert driving.

Kilometers (Miles)	10 000 (6,250)	20 000 (12,500)	30 000 (18,750)	40 000 (25,000)	50 000 (31,250)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element.	X	X	X	X	X

Replace as necessary.					
Replace the engine air filter element.	-	X	-	X	-
Replace the fuel filter/water separator unit.	-	-	-	X	-
Inspect the brake linings.	-	X	-	X	-
Drain and refill the front and rear axle fluid.	-	X	-	X	-

Kilometers (Miles)	60 000 (37,500)	70 000 (43,750)	80 000 (50,000)	90 000 (56,250)	100 000 (62,500)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	X	X	X	X	X
Replace the engine air filter element.	X	-	X	-	X
Replace the fuel filter/water separator unit.	-	-	X	-	-
Replace the engine accessory drive belt.	X	-	-	-	-
Inspect the brake linings.	X	-	X	-	X
Drain and refill the front and rear axle fluid.	X	-	X	-	X
Drain and refill the transfer case fluid.	-	-	-	-	X
Drain and refill the automatic transmission fluid, and replace sump filter.<--	-	-	-	-	X

Kilometers (Miles)	10 000 (6,250)	20 000 (12,500)	30 000 (18,750)	40 000 (25,000)	50 000 (31,250)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	X	-	X	-	X
Replace the engine air filter element.	-	X	-	X	-
Replace the fuel filter/water separator unit.	-	-	-	X	-
Drain and refill the front and rear axle fluid.	-	X	-	X	-
Inspect the brake linings.	-	X	-	X	-
Inspect the manual transmission fluid, add if necessary.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	X	-	X	-
Drain and refill the front and rear axle fluid.	-	X	-	X	-

Kilometers	60 000	70 000	80 000	90 000	100 000
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(Miles)	(37,500)	(43,750)	(50,000)	(56,250)	(62,500)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	-	X	-	X	-
Replace the engine air filter element.	X	-	X	-	X
Replace the fuel filter/water separator unit.	-	-	X	-	-
Replace the engine accessory drive belt.	X	-	-	-	-
Inspect the brake linings.	X	-	X	-	X
Drain and refill the front and rear axle fluid.	X	-	X	-	X
Inspect the transfer case fluid, add if necessary.	X	-	X	-	X
Inspect the manual transmission fluid, add if necessary.	-	-	-	-	X
Drain and refill the automatic transmission fluid. Replace main sump filter and spin-on cooler return filter (if equipped).	-	-	-	-	X

Kilometers (Miles)	110 000 (68,750)	120 000 (75,000)	130 000 (81,250)	140 000 (87,500)	150 000 (93,750)
Change the engine oil and engine oil filter.	X	X	X	X	X
Inspect the engine air filter element. Replace as necessary.	X	X	X	X	X
Replace the engine air filter element.	-	X	-	X	-
Replace the engine accessory drive belt.	-	X	-	-	-
Replace the fuel filter/water separator unit.	-	X	-	-	-
Inspect the brake linings.	-	X	-	X	-
Inspect the manual transmission fluid, add if necessary.	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	-	X	-	X	-
Drain and refill the front and rear axle fluid.	-	X	-	X	-

Kilometers (Miles)	160 000 (100,000)	170 000 (106,250)	180 000 (112,500)	190 000 (118,750)	200 000 (125,000)
Change the engine oil and engine oil filter.	X	X	X	X	X

Inspect the engine air filter element. Replace as necessary.	-	X	-	X	-
Replace the engine air filter element.	X	-	X	-	X
Replace the engine accessory drive belt.	-	-	X	-	-
Replace the engine timing belt, and timing belt tensioner.	-	-	-	-	X
Replace the fuel filter/water separator unit.	X	-	-	-	X
Flush and replace the engine coolant/anti-freeze.	X	-	-	-	-
Inspect the brake linings.	X	-	X	-	X
Inspect the manual transmission fluid, add if necessary.	-	-	-	-	X
Drain and refill the automatic transmission fluid. Replace main sump filter and spin-on cooler return filter (if equipped).	-	-	-	-	X
Inspect the transfer case fluid, add if necessary.	X	-	X	-	X
Drain and refill the front and rear axle fluid.	X	-	X	-	X

<-- Applies only if vehicle is used for frequent trailer towing, or fleet/commercial service.

Inspection and service should be performed anytime a malfunction is observed or suspected. Retain all receipts.

FLUID FILL/CHECK LOCATIONS

DESCRIPTION

FLUID FILL/CHECK LOCATIONS

The fluid check/fill point locations are located in each applicable service information.

HOISTING

STANDARD PROCEDURE

HOISTING RECOMMENDATIONS

Refer to the Owner's Manual for emergency vehicle lifting procedures.

When properly positioned, a floor jack can be used to lift the vehicle. Support the vehicle in the raised position

with jack stands at the front and rear ends of the frame rails.

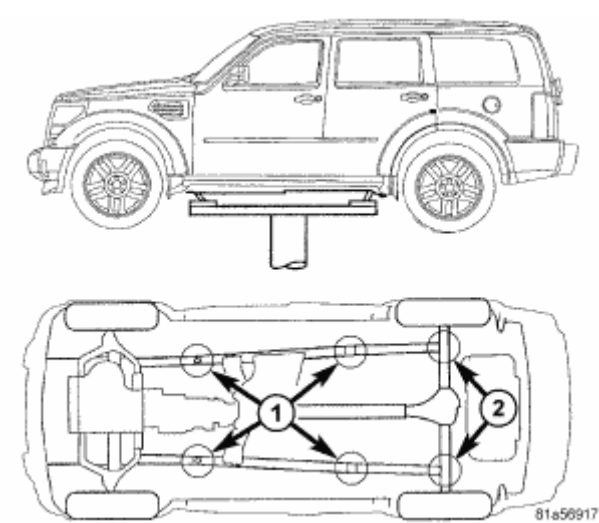


Fig. 5: Lift Contact Points
Courtesy of CHRYSLER LLC

1 -	Frame Contact Lift (Single Post) Chassis Lift (Non-Axle Dual Post)
-	Outboard Lift (Dual Post) Floor Jack
2 -	Floor Jack

CAUTION: Do not attempt to lift the vehicle with a floor jack positioned under:

- A body side sill.
- A steering linkage component.
- A drive shaft.
- The engine or transmission oil pan.
- The fuel tank.
- A front suspension arm.
- Transfer case.

NOTE: Use the correct sub-frame rail or frame rail lifting locations only.

HOIST

Refer to the Owner's Manual for emergency vehicle lifting procedures.

A vehicle can be lifted with:

A single-post, frame-contact hoist.

A twin-post, chassis hoist.

A ramp-type, drive-on hoist.

NOTE: When a frame-contact type hoist is used, verify that the lifting pads are positioned properly.

WARNING: The hoisting and jack lifting points provided are for a complete vehicle. When a chassis or drivetrain component is removed from a vehicle, the center of gravity is altered making some hoisting conditions unstable. Properly support or secure vehicle to hoisting device when these conditions exist.

JUMP STARTING

STANDARD PROCEDURE

JUMP STARTING PROCEDURE

WARNING: Review all safety precautions and warnings in the battery system service information. Refer to STANDARD PROCEDURE .

Do not jump start a frozen battery, personal injury can result.

If equipped, do not jump start when maintenance free battery indicator dot is yellow or bright color.

Do not jump start a vehicle when the battery fluid is below the top of lead plates.

Do not allow jumper cable clamps to touch each other when connected to a booster source.

Do not use open flame near battery.

Remove metallic jewelry worn on hands or wrists to avoid injury by accidental arcing of battery current.

When using a high output boosting device, do not allow battery voltage to exceed 15 volts. Refer to instructions provided with device being used.

Failure to follow these instructions may result in personal injury.

CAUTION: When using another vehicle as a booster, do not allow vehicles to touch. Electrical systems can be damaged on either vehicle.

TO JUMP START A DISABLED VEHICLE:

1. Raise hood on disabled vehicle and visually inspect engine compartment for:
 - Generator drive belt condition and tension.
 - Fuel fumes or leakage, correct if necessary.
 - Frozen battery.
 - Yellow or bright color test indicator, if equipped.
 - Low battery fluid level.

CAUTION: If the cause of starting problem on disabled vehicle is severe, damage to booster vehicle charging system can result.

2. When using another vehicle as a booster source, turn off all accessories, place gear selector in park or neutral, set park brake or equivalent and operate engine at 1200 RPM.
3. On disabled vehicle, place gear selector in park or neutral and set park brake or equivalent. Turn OFF all accessories.
4. Connect jumper cables to booster battery. RED clamp to positive terminal (+). BLACK clamp to negative terminal (-). DO NOT allow clamps at opposite end of cables to touch, electrical arc will result. See **Fig. 6**. Review all warnings in this procedure.
5. On disabled vehicle, connect RED jumper cable clamp to battery positive (+) terminal. Connect BLACK jumper cable clamp to the engine as close to the ground cable connection as possible. See **Fig. 6**.

CAUTION: Do not crank starter motor on disabled vehicle for more than 15 seconds, starter will overheat and could fail.

6. Allow battery in disabled vehicle to charge to at least 12.4 volts (75% charge) before attempting to start engine. If engine does not start within 15 seconds, stop cranking engine and allow starter to cool (15 min.), before cranking again.

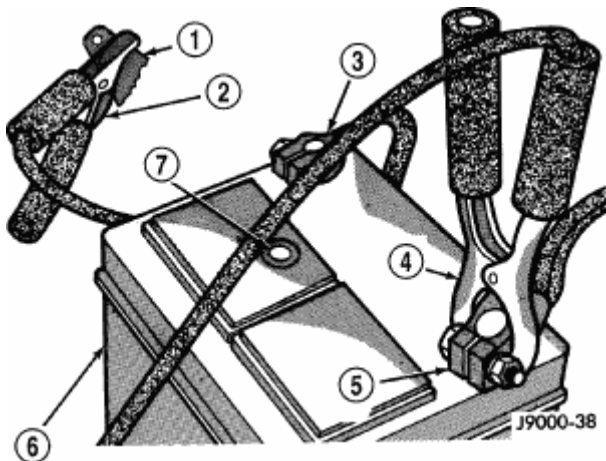


Fig. 6: Connecting Jumper Cables To Battery
Courtesy of CHRYSLER LLC

- 1 - ENGINE GROUND
- 2 - NEGATIVE JUMPER CABLE
- 3 - BATTERY NEGATIVE CABLE
- 4 - POSITIVE JUMPER CABLE
- 5 - BATTERY POSITIVE CABLE
- 6 - BATTERY
- 7 - TEST INDICATOR (IF EQUIPPED)

DISCONNECT CABLE CLAMPS AS FOLLOWS:

Disconnect BLACK cable clamp from engine ground on disabled vehicle.

When using a booster vehicle, disconnect BLACK cable clamp from battery negative terminal.

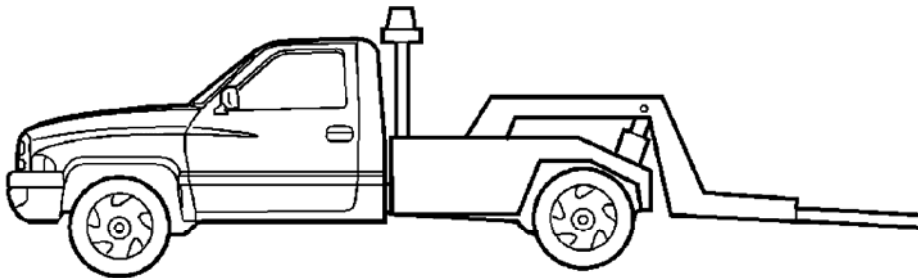
Disconnect RED cable clamp from battery positive terminal.

Disconnect RED cable clamp from battery positive terminal on disabled vehicle.

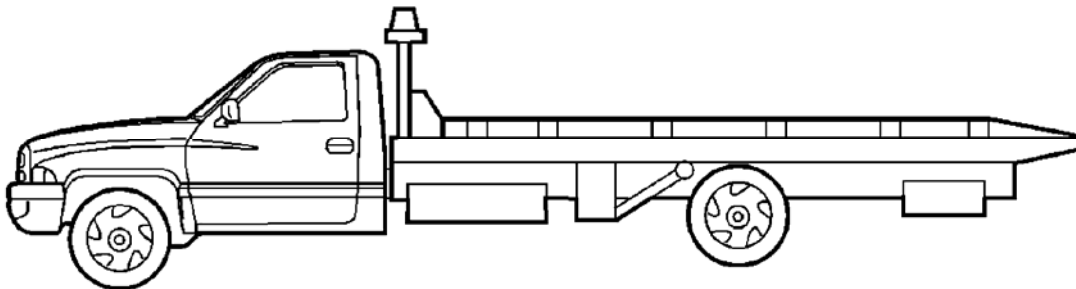
TOWING

STANDARD PROCEDURE

TOWING



WHEEL LIFT



FLAT BED

80a7aebb

Fig. 7: Tow Vehicles With Approved Equipment
Courtesy of CHRYSLER LLC

A vehicle equipped with SAE approved wheel lift-type towing equipment can be used to tow Jeep vehicles. When towing a 4WD vehicle using a wheel-lift towing device, use tow dollies under the opposite end of the vehicle. A vehicle with flatbed device can also be used to transport a disabled vehicle.

SAFETY PRECAUTIONS

CAUTION: The following safety precautions must be observed when towing a vehicle:

Secure loose and protruding parts.

Always use a safety chain system that is independent of the lifting and towing equipment.

Do not allow towing equipment to contact the disabled vehicle's fuel tank.

Do not allow anyone under the disabled vehicle while it is lifted by the towing device.

Do not allow passengers to ride in a vehicle being towed.

Always observe state and local laws regarding towing regulations.

Do not tow a vehicle in a manner that could jeopardize the safety of the operator, pedestrians or other motorists.

Do not attach tow chains, T-hooks, or J-hooks to a bumper, steering linkage, drive shafts or a non-reinforced frame hole.

Do not tow a heavily loaded vehicle. Use a flatbed device to transport a loaded vehicle.

TWO-WHEEL - DRIVE VEHICLE TOWING

DaimlerChrysler Corporation recommends that a vehicle be towed with the rear end lifted, whenever possible.

WARNING: When towing a disabled vehicle and the drive wheels are secured in a wheel lift or tow dollies, ensure the transmission is in the park position (automatic transmission) or a forward drive gear (manual transmission).

WARNING: Ensure vehicle is on a level surface or the wheels are blocked to prevent vehicle from rolling.

TWO WHEEL DRIVE TOWING - REAR END LIFTED

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

Provided that the transmission is operable, tow with the transmission in N (Neutral) and the ignition key in the OFF position along with the front wheels raised and the rear wheels on the ground. The speed must not exceed 30 mph (50 km/h) and the distance must not exceed 15 miles (25 km).

If the vehicle is to be towed more than 15 miles (25 km) or faster than 30 mph, it must be towed on a flatbed, or with the rear wheels raised and the front wheels on the ground, or with the front end raised and the rear wheels

on a towing dolly.

1. Attach wheel lift device to rear wheels.
2. Place the transmission in neutral.
3. Raise vehicle to towing position.
4. Attach safety chains. Route chains so not to interfere with tail pipe when vehicle is lifted.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

5. Secure steering wheel in straight ahead position with a clamp device designed for towing.
6. Place transmission in park.

CAUTION: Towing the vehicle, with the rear wheels on the ground, at more than 30 mph (50 km/h) or for more than 15 miles (25 km) can cause severe transmission damage.

TWO WHEEL DRIVE TOWING - FRONT END LIFTED

CAUTION: Many vehicles are equipped with air dams, spoilers, and/or ground effect panels. To avoid component damage, a wheel-lift towing vehicle or a flat-bed hauling vehicle is recommended.

1. Attach wheel lift device to rear wheels.
2. Place the transmission in neutral.
3. Raise the rear of the vehicle off the ground and install tow dollies under rear wheels.
4. Attach wheel lift device to front wheels and raise vehicle to towing position.
5. Attach the safety chains.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

6. Turn the ignition switch to the OFF position to unlock the steering wheel.
7. Secure steering wheel in straight ahead position with a clamp device designed for towing.
8. Place transmission in park.

FOUR-WHEEL - DRIVE VEHICLE TOWING

DaimlerChrysler Corporation recommends that a 4WD vehicle be transported on a flat-bed device. A Wheel-lift device can be used provided **the trailing wheels are off the ground and positioned in tow dollies.**

WARNING: When towing a disabled vehicle and the drive wheels are secured in a wheel lift or tow dollies, ensure the transmission is in the park position.

CAUTION: Many vehicles are equipped with air dams, spoilers, and/or ground effect panels. To avoid component damage, a wheel-lift towing vehicle or a flat-bed hauling vehicle is recommended.

FOUR WHEEL DRIVE TOWING - REAR END LIFTED

WARNING: Ensure vehicle is on a level surface or the wheels are blocked to prevent vehicle from rolling.

1. Attach wheel lift device to front wheels.
2. Place the transmission in neutral.
3. Raise the front of the vehicle off the ground and install tow dollies under front wheels.
4. Attach wheel lift device to rear wheels and raise vehicle to towing position.
5. Attach safety chains. Route chains so not to interfere with tail pipe when vehicle is lifted.
6. Turn the ignition switch to the OFF position to unlock the steering wheel.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

7. Secure steering wheel in straight ahead position with a clamp device designed for towing.
8. Place transmission in park.

FOUR WHEEL DRIVE TOWING - FRONT END LIFTED

WARNING: Ensure vehicle is on a level surface or the wheels are blocked to prevent vehicle from rolling.

1. Attach wheel lift device to rear wheels.
2. Place the transmission in neutral.
3. Raise the rear of the vehicle off the ground and install tow dollies under rear wheels.
4. Attach wheel lift device to front wheels and raise vehicle to towing position.
5. Attach the safety chains.

CAUTION: Do not use steering column lock to secure steering wheel during towing operation.

6. Secure steering wheel in straight ahead position with a clamp device designed for towing.
7. Place transmission in park.

2008 MANUAL TRANSMISSION

NSG370 - Service Information - Liberty

MANUAL TRANSMISSION - NSG370

DIAGNOSIS AND TESTING

MANUAL TRANSMISSION - NSG370

LOW LUBRICANT LEVEL

A low transmission lubricant level is generally the result of a leak, inadequate lubricant fill or incorrect lubricant level check.

Rear transmission leaks will be from the oil seals or component mating surfaces.

Front transmission leaks will be from the front input shaft retainer seal. Lubricant may drip from the clutch housing after extended operation. If leak is severe, it may contaminate the clutch disc.

Lubricant level check can only be made when the vehicle is level and allowing the lubricant to settle for a minute before checking. This will ensure an accurate check and avoid an under filled or over filled condition.

HARD SHIFTING

Hard shifting is usually caused by low lubricant level, improper or contaminated lubricants. This will cause noise, excessive wear, internal bind, and hard shifting. Substantial lubricant leaks can result in gear, shift rail, synchro, and bearing damage. The first indications of component damage is usually hard shifting and noise.

Shift component damage, clutch adjustment, worn pressure plate or disc are also causes of increased shift effort. If clutch problem is advanced, gear clash during shifts can result. Worn or damaged synchronizer rings can cause gear clash when shifting into any forward gear. In some new or rebuilt transmissions, new synchro rings may tend to stick slightly causing hard or noisy shifts. In most cases, this condition will decline as the rings wear-in.

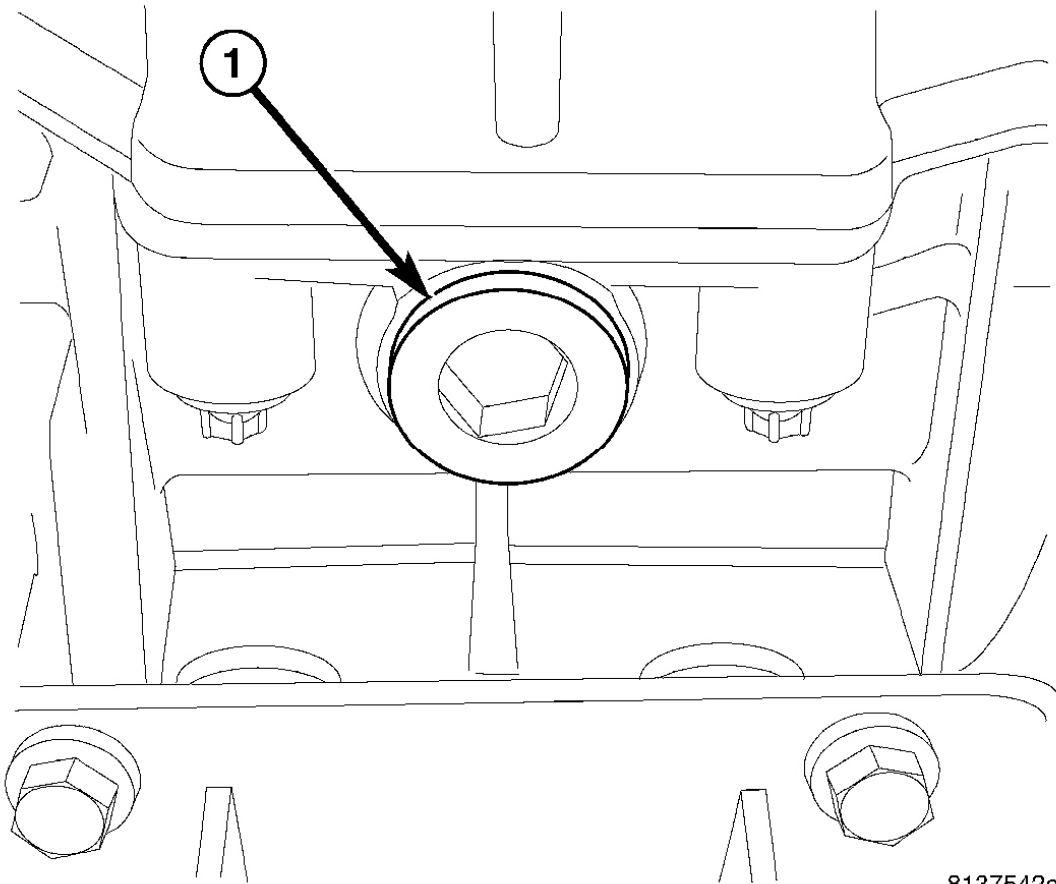
TRANSMISSION NOISE

Most manual transmissions make some noise during normal operation. Rotating gears generate a mild whine that is audible, but generally only at extreme speeds.

Severe, highly audible transmission noise is generally the initial indicator of a lubricant problem. Insufficient, improper or contaminated lubricant will promote rapid wear of gears, synchronizers, shift rails, forks and bearings. The overheating caused by a lubricant problem, can also lead to gear and bearing damage.

STANDARD PROCEDURE

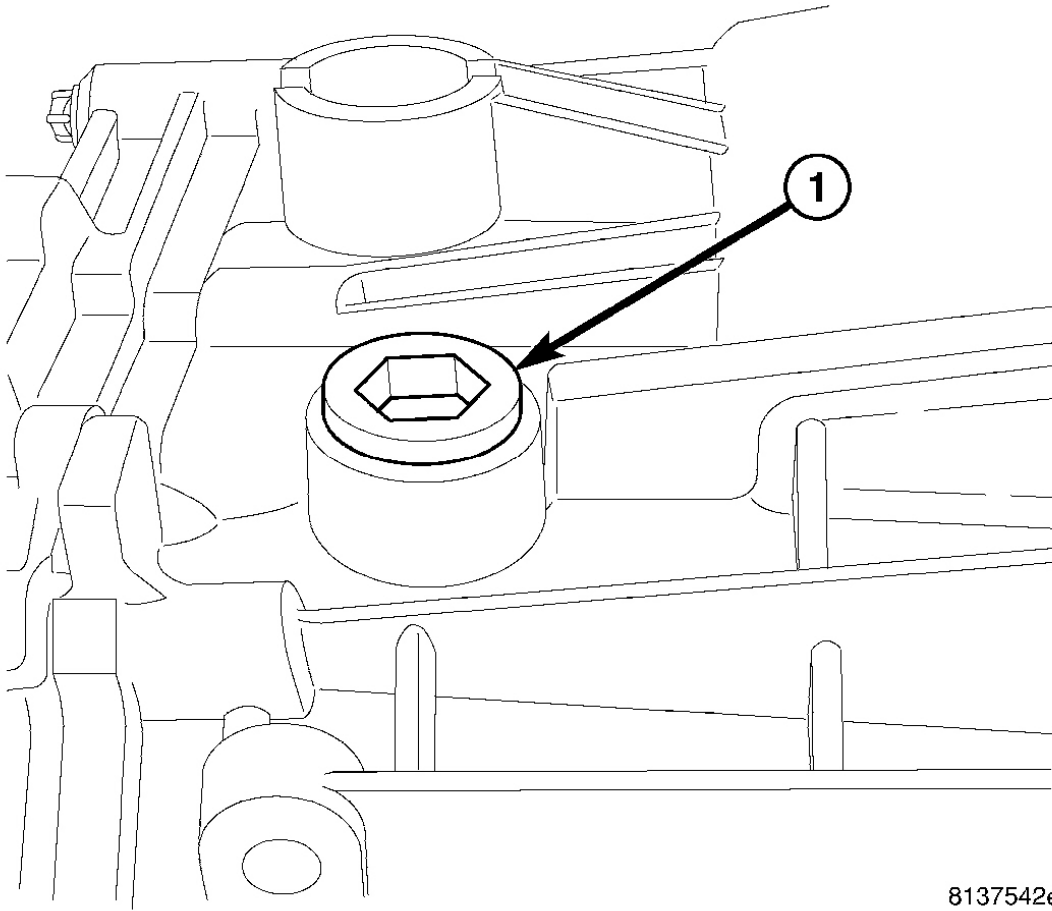
STANDARD PROCEDURE-DRAIN & FILL



8137542a

Fig. 1: Drain Plug
Courtesy of CHRYSLER LLC

1. With vehicle in neutral, position vehicle on hoist.
2. Remove drain plug (1) and drain fluid.



8137542e

Fig. 2: Fill Plug

Courtesy of CHRYSLER LLC

3. Install drain plug and remove fill plug (1).
4. Fill transmission with 1.5 L (3.17 pts.) of Mopar® Manual Transmission Lubricant MS-9224 or to the bottom of the fill plug (1) hole.

REMOVAL

MANUAL TRANSMISSION - NSG370

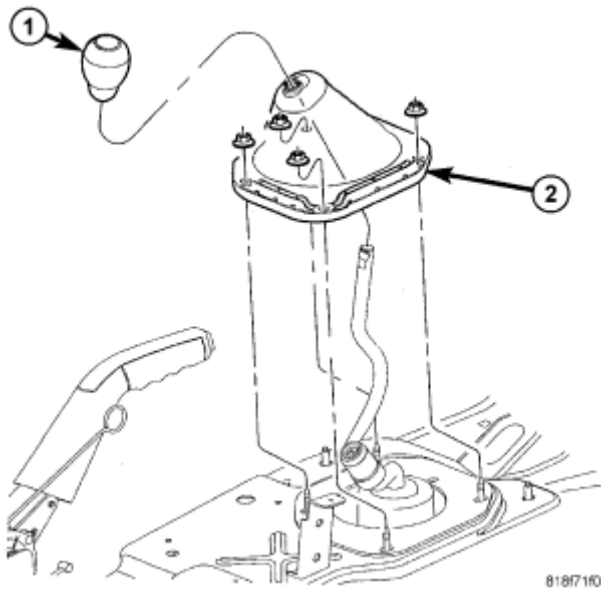


Fig. 3: Identifying Shift Knob & Boot
 Courtesy of CHRYSLER LLC

1. Disconnect negative battery cable.
2. Remove the console manual shift bezel. Refer to **REMOVAL** .

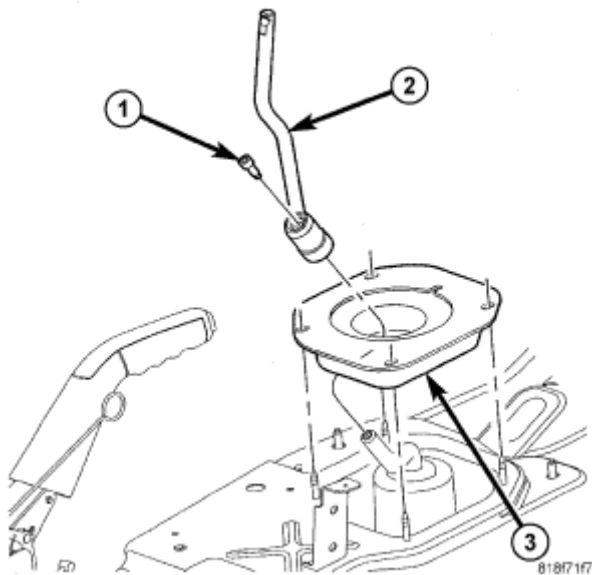
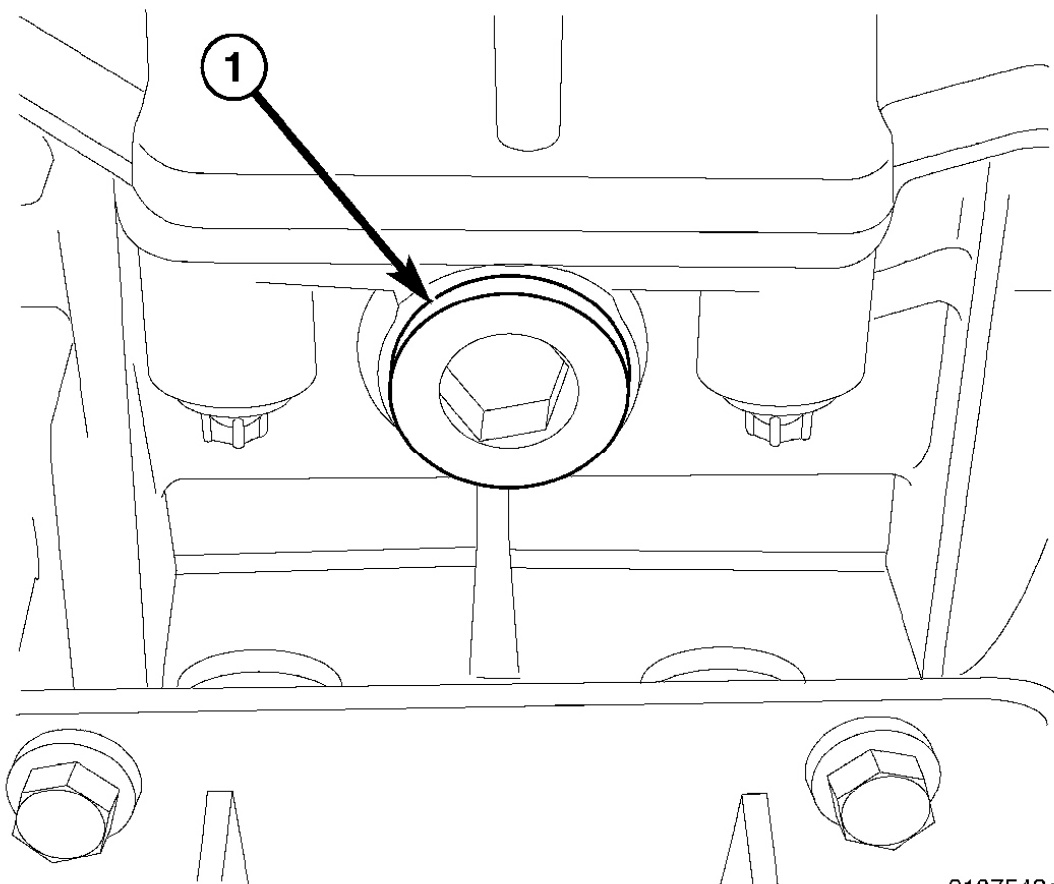


Fig. 4: Removing/Installing Shift Lever Screw, Lever And Inner Boot
 Courtesy of CHRYSLER LLC

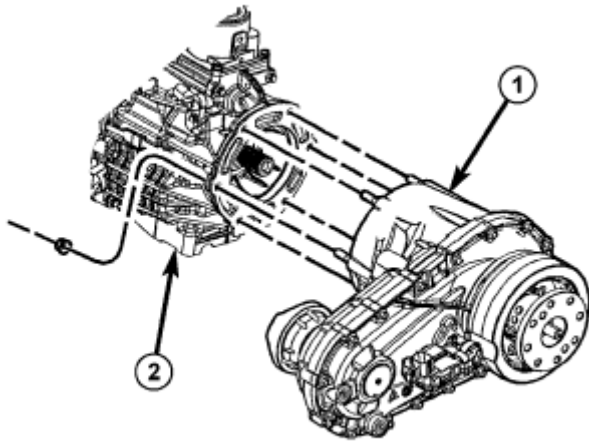
3. Remove the floor console. Refer to **REMOVAL** .



8137542a

Fig. 5: Drain Plug
Courtesy of CHRYSLER LLC

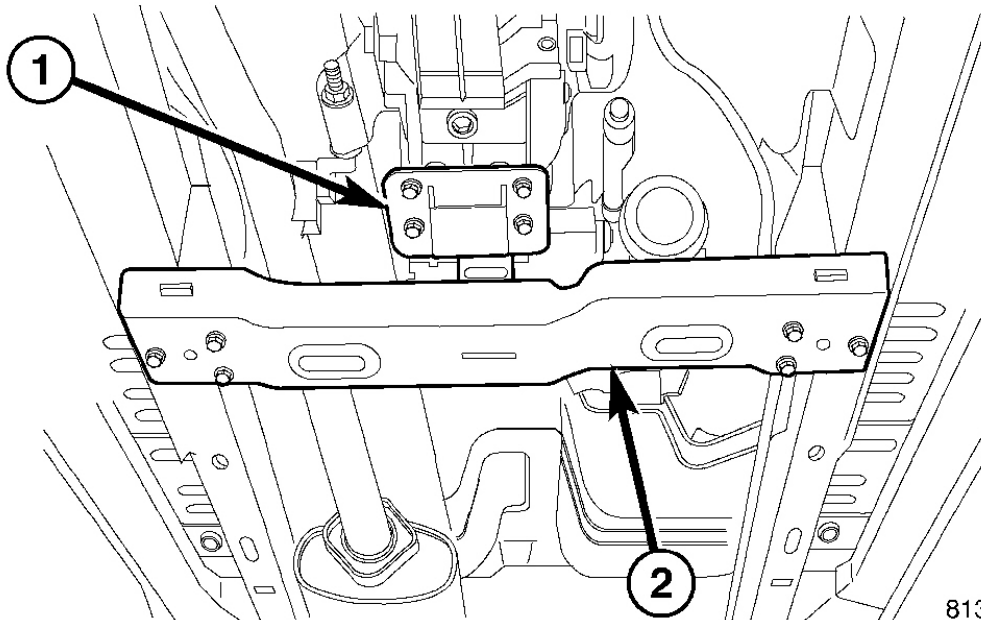
4. With vehicle in neutral, position vehicle on hoist.
5. Remove drain plug (1) and drain fluid.



8187742

Fig. 6: Identifying Transfer Case & Transmission
 Courtesy of CHRYSLER LLC

6. Mark installation reference marks on propeller shaft/shafts and remove shafts.
7. Remove transfer case shift cable, wiring connector and vent hose, if equipped.
8. Remove transfer case (1) from transmission (2), if equipped.



81375373

Fig. 7: Transmission Mount & Crossmember
 Courtesy of CHRYSLER LLC

9. Support transmission with jack.
10. Remove transmission mount (1) bolts and crossmember (2) bolts. Remove transmission mount (1) with crossmember (2).

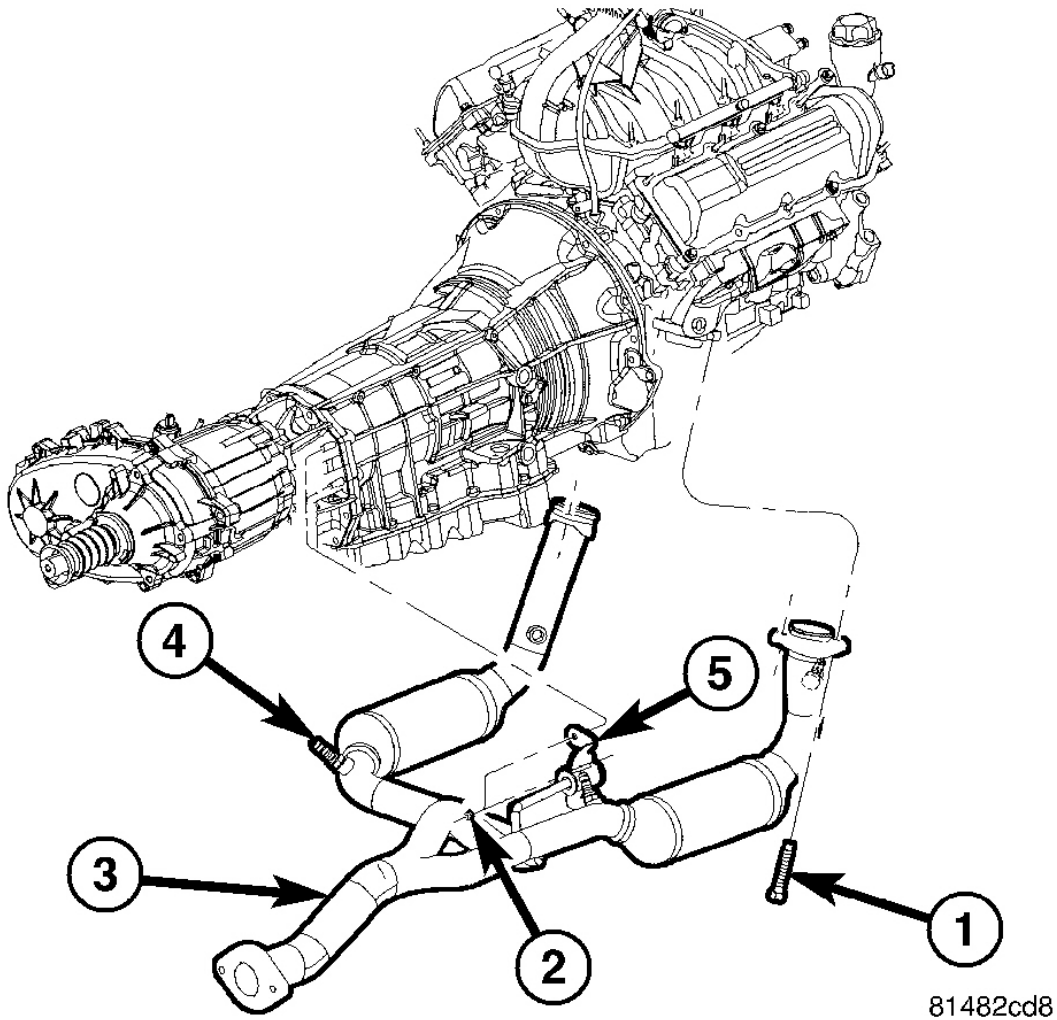
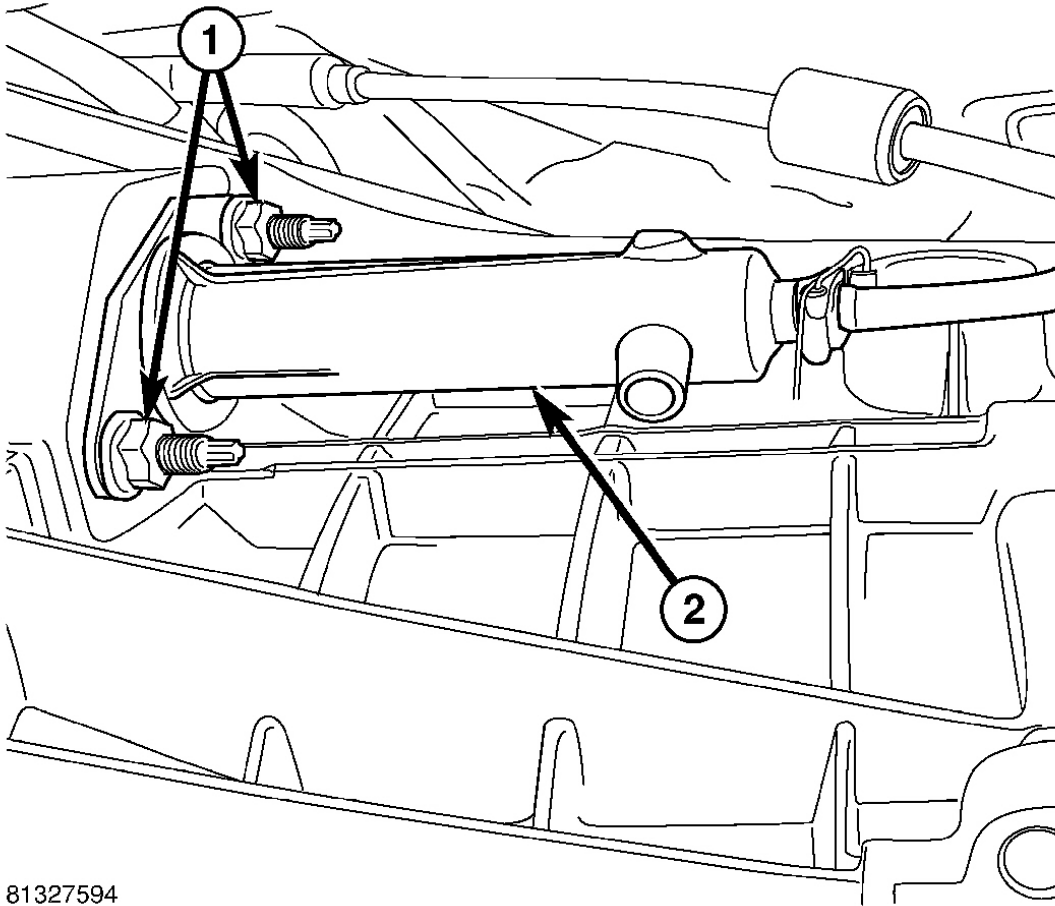


Fig. 8: 3.7L Catalytic Converter - Typical
Courtesy of CHRYSLER LLC

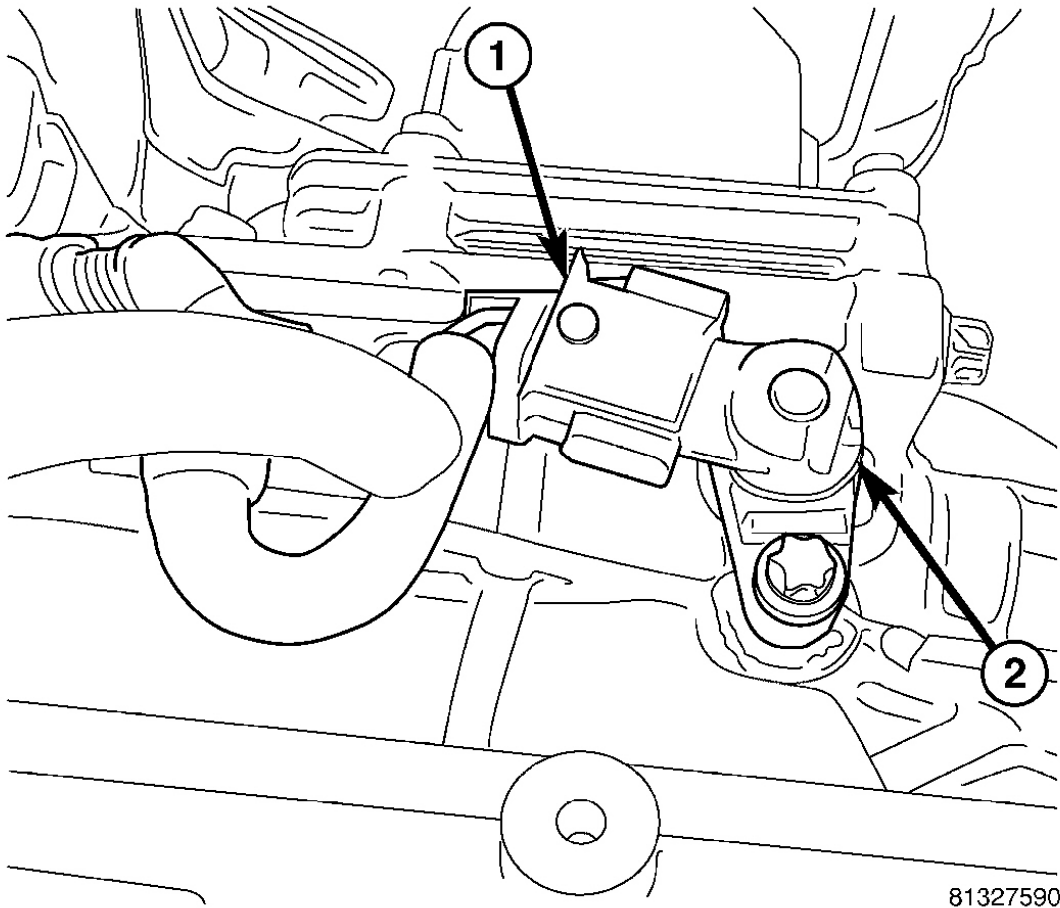
11. Vehicles with 3.7L engine, remove exhaust pipe with converters (3).



81327594

Fig. 9: Identifying Clutch Slave Cylinder Nuts & Cylinder
Courtesy of CHRYSLER LLC

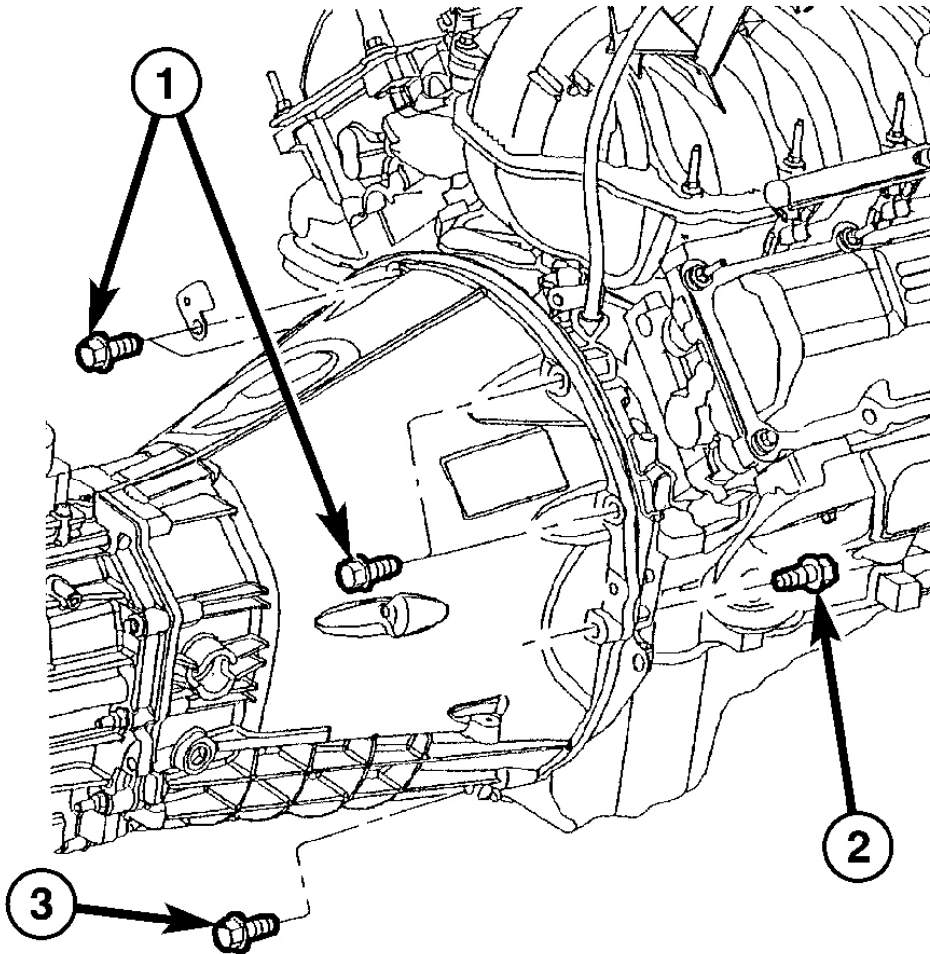
12. Remove clutch slave cylinder nuts (1) and remove cylinder (2).



81327590

Fig. 10: Backup Lamp Switch & Wiring Connector
Courtesy of CHRYSLER LLC

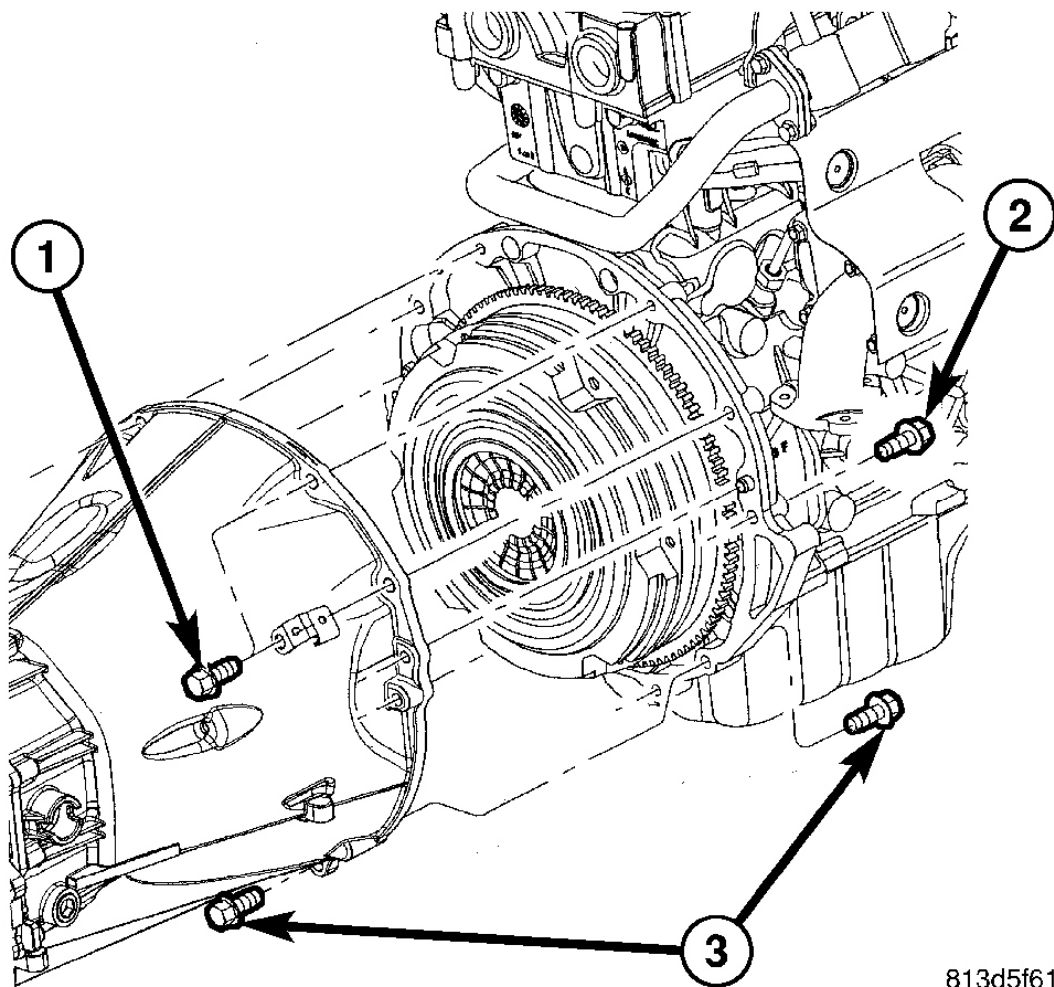
13. Remove backup lamp switch (1) wiring connector (2).



813d6069

Fig. 11: 3.7L Engine, Transmission & Bolts
Courtesy of CHRYSLER LLC

14. Remove starter bolts and remove starter.
15. Remove transmission bolts (1,2,3) on 3.7L engine and remove transmission.



813d5f61

Fig. 12: 2.8L Diesel Engine, Transmission & Bolts
Courtesy of CHRYSLER LLC

16. Remove transmission bolts (1,2,3) on 2.8L diesel engine and remove transmission.

DISASSEMBLY

MANUAL TRANSMISSION - NSG370

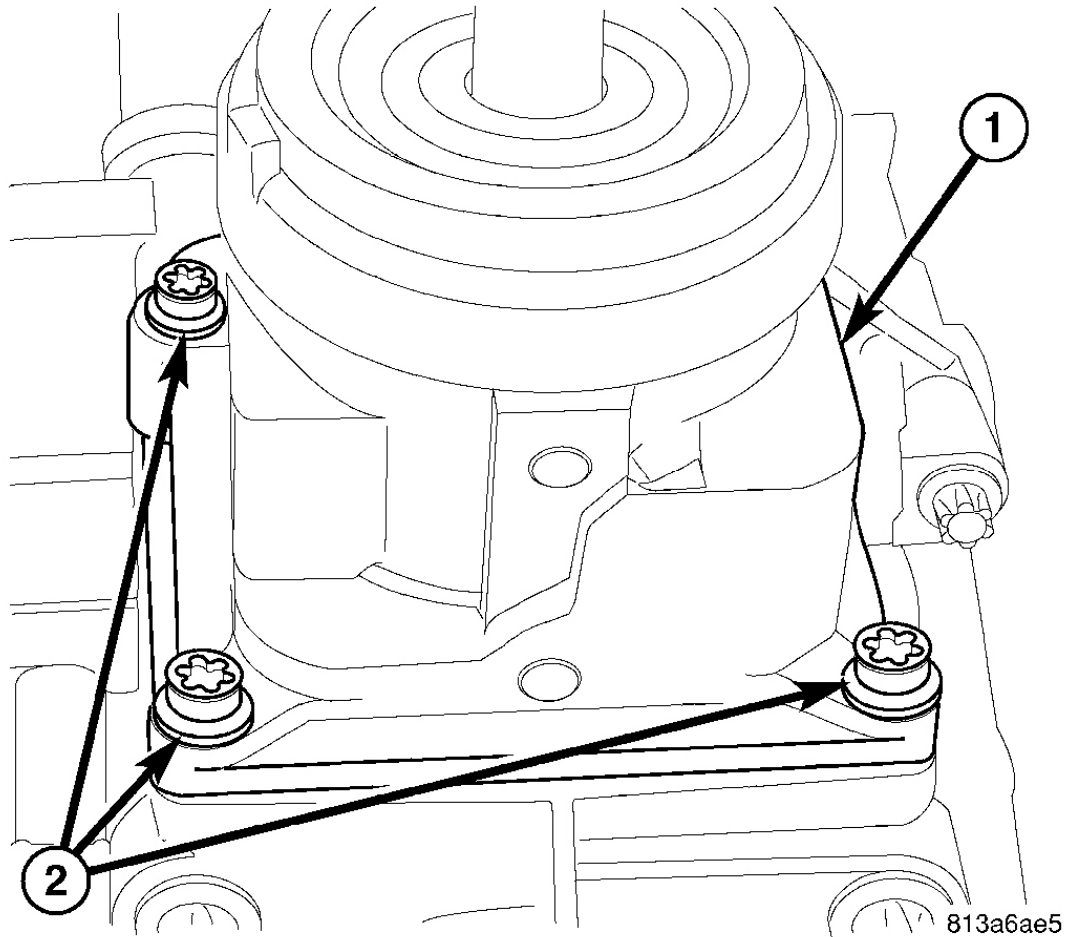


Fig. 13: Identifying Shift Tower & Bolts
Courtesy of CHRYSLER LLC

1. Remove shift tower (1) bolts (2) and remove tower.

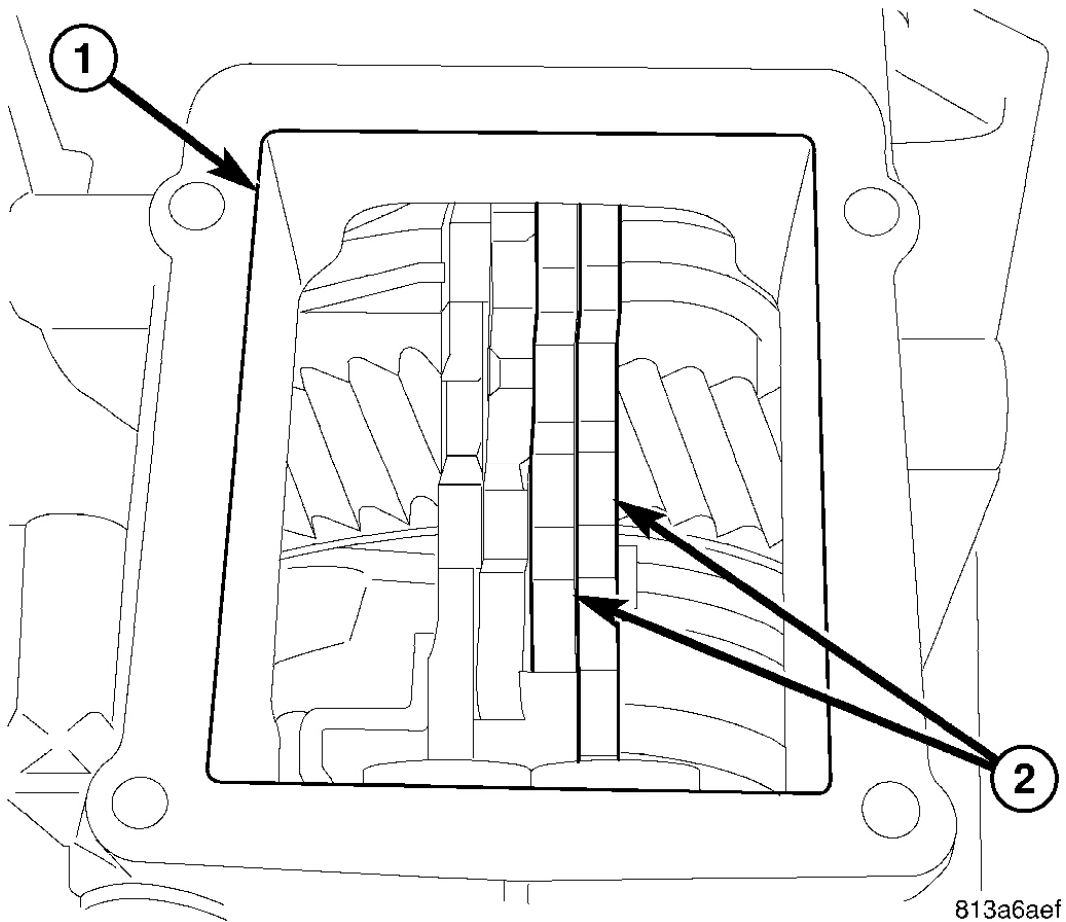
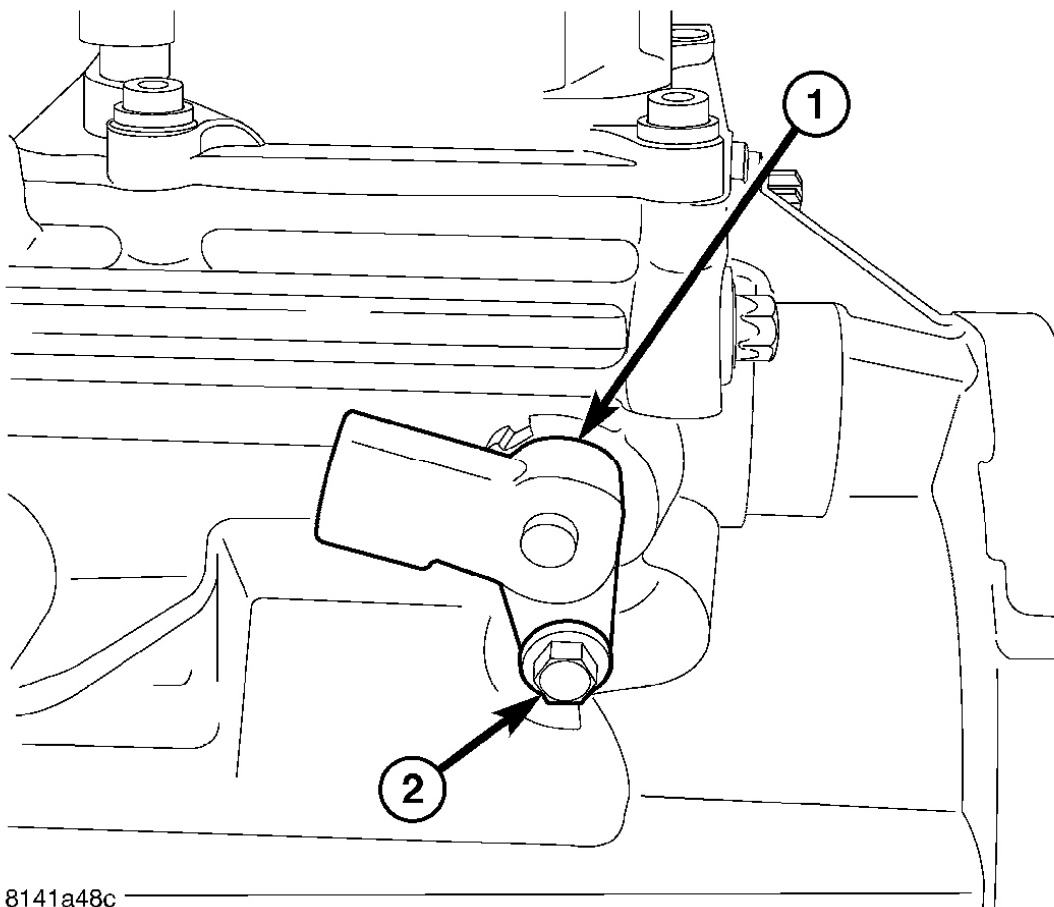


Fig. 14: View Of Shift Tower Opening & Shift Rails
Courtesy of CHRYSLER LLC

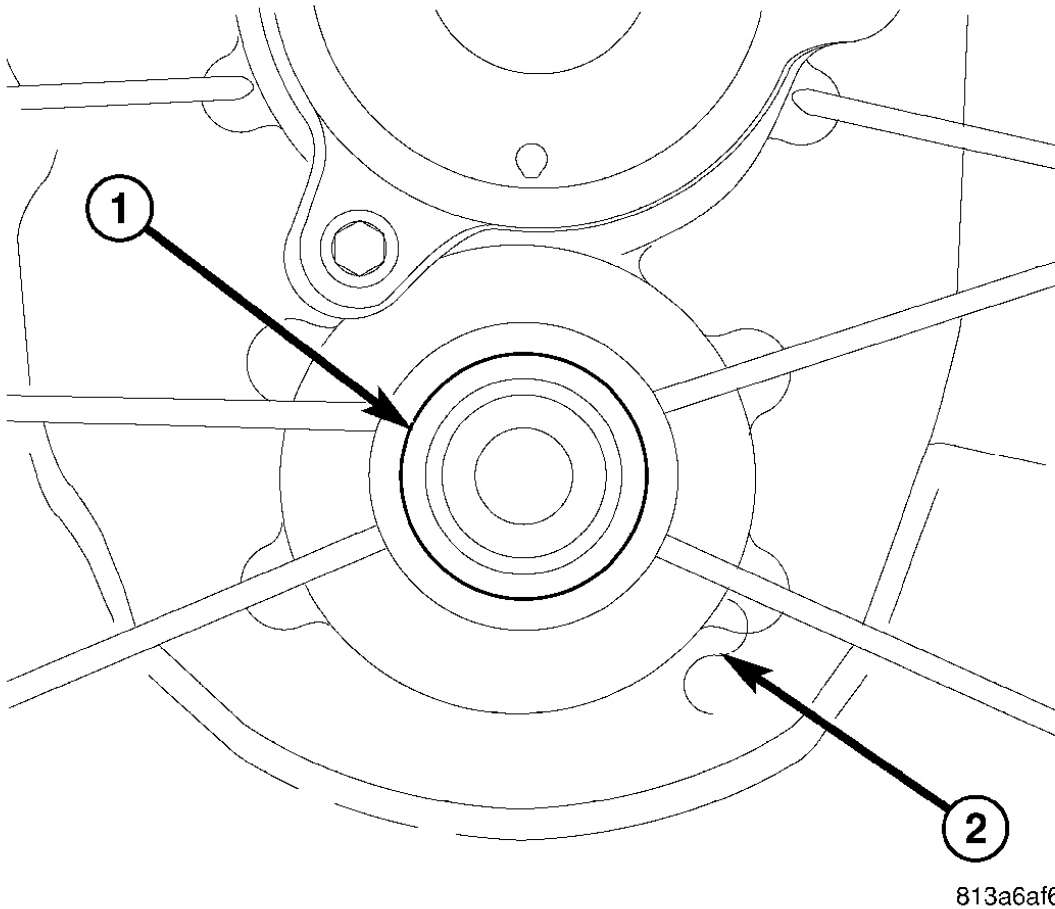
2. Through shift tower opening (1) shift two shift rails (2) forward to engage two gears.



8141a48c

Fig. 15: Identifying Back-Up Lamp Switch & Bolt
Courtesy of CHRYSLER LLC

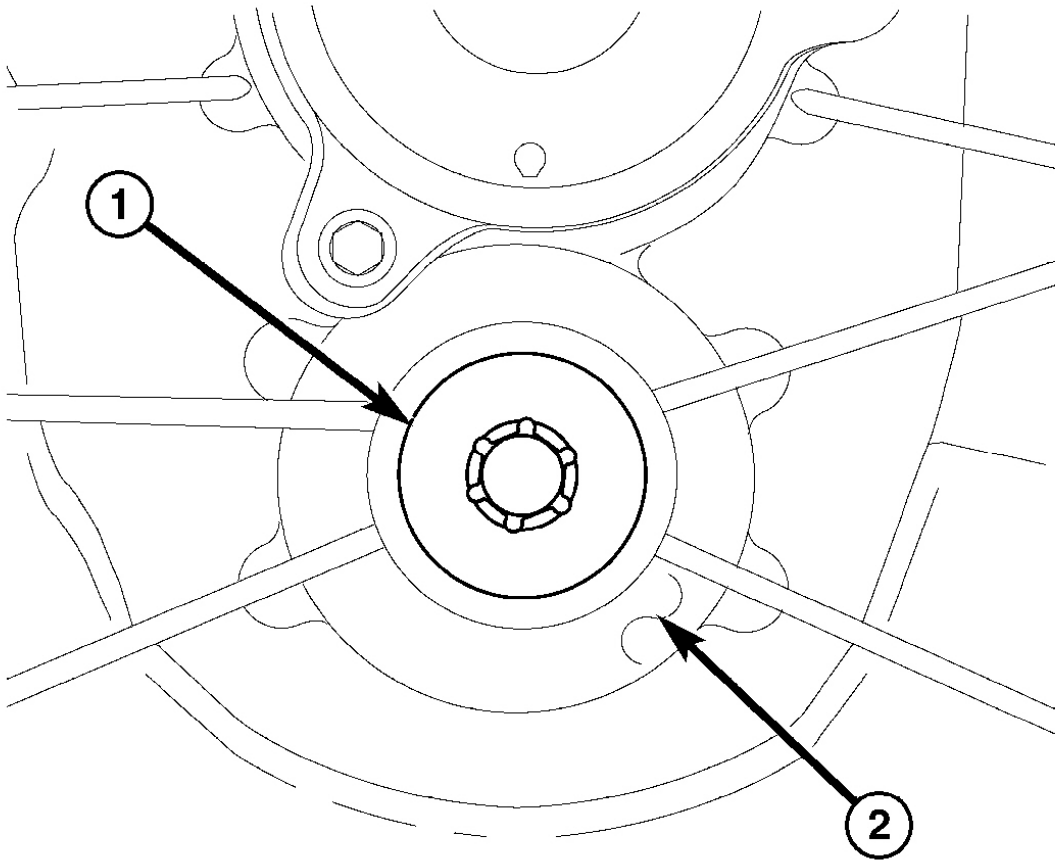
3. Remove back-up lamp switch (1) bolt (2) and remove switch.



813a6af6

Fig. 16: Identifying Countershaft Plug & Front Housing
Courtesy of CHRYSLER LLC

4. Remove countershaft plug (1) from the front housing (2) with a seal pick.



813a6b01

Fig. 17: Identifying Countershaft Bolt & Front Housing
Courtesy of CHRYSLER LLC

5. Remove countershaft bolt (1) from the front housing (2).

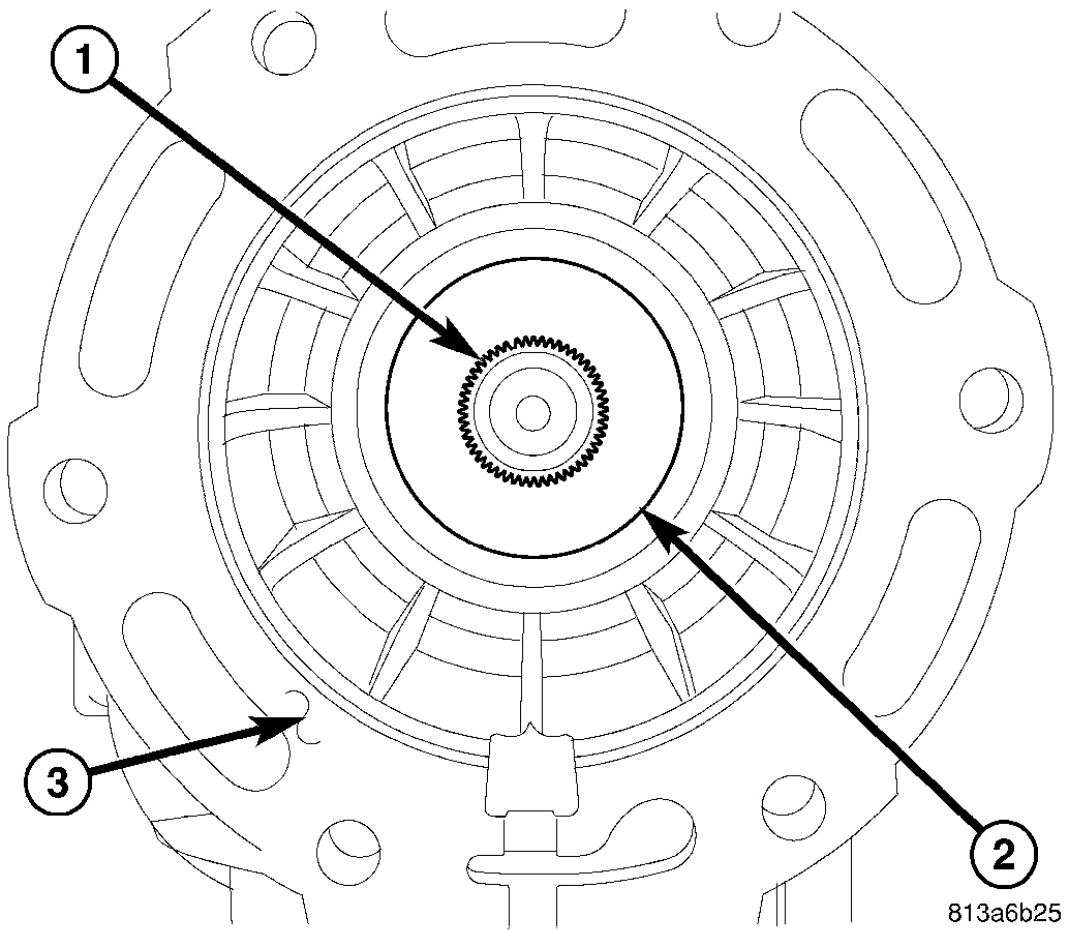


Fig. 18: Identifying Output Shaft, Seal & Rear Housing
Courtesy of CHRYSLER LLC

6. Remove output shaft (1) seal (2) from rear housing (3) with a seal pick.

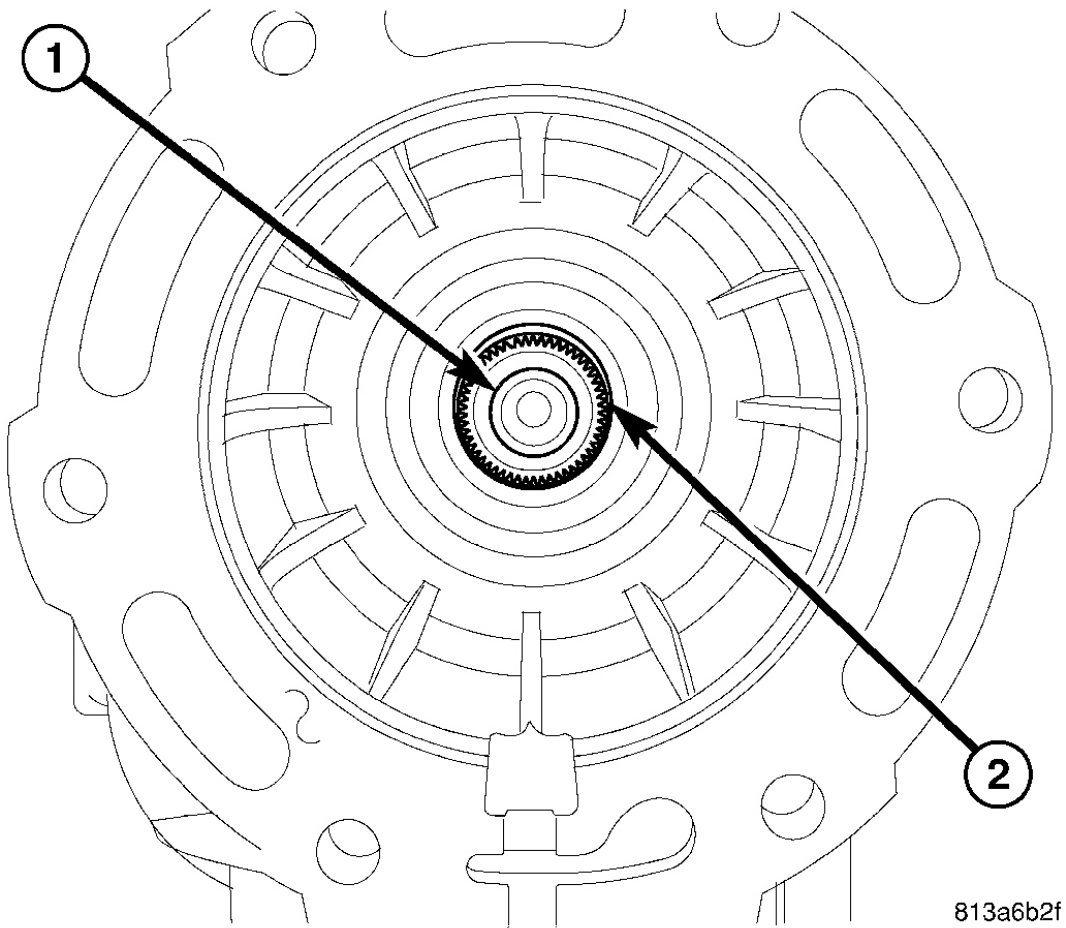
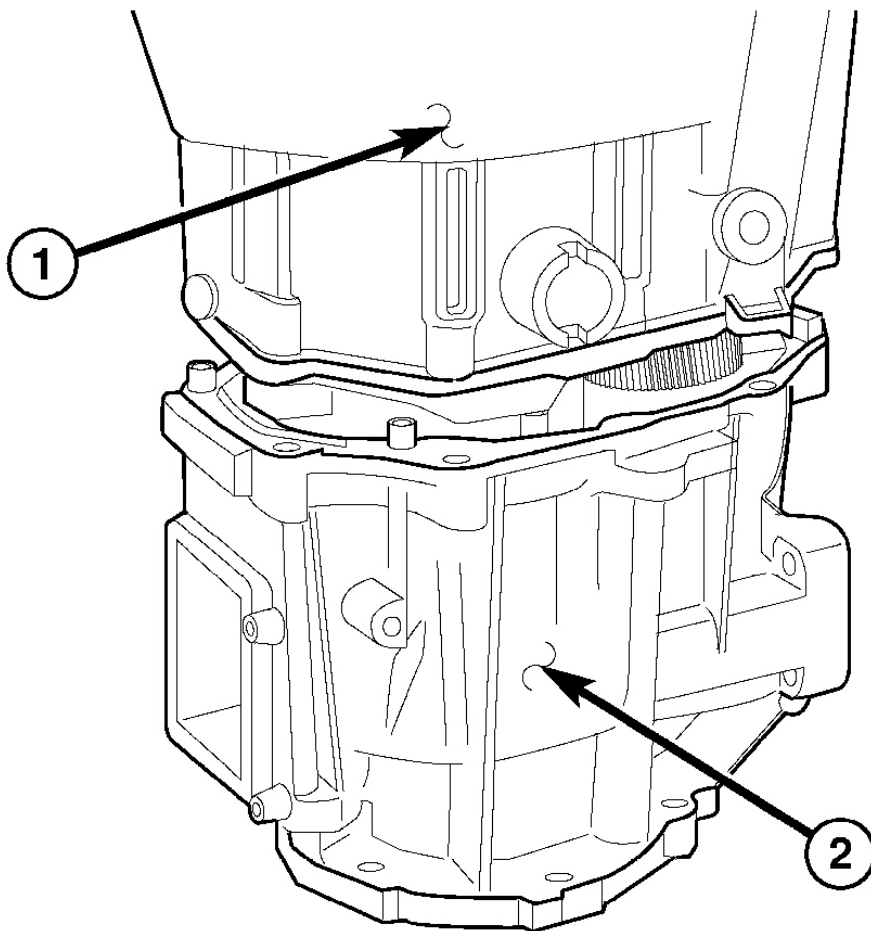


Fig. 19: Identifying Output Shaft & Snap Ring
Courtesy of CHRYSLER LLC

7. Remove output shaft (1) snap ring (2) 4x4 only.



813a6b05

Fig. 20: Identifying Front Housing & Rear Housing
Courtesy of CHRYSLER LLC

8. Stand transmission on the rear housing and remove the housing bolts.
9. Remove front housing (1) from the rear housing (2).

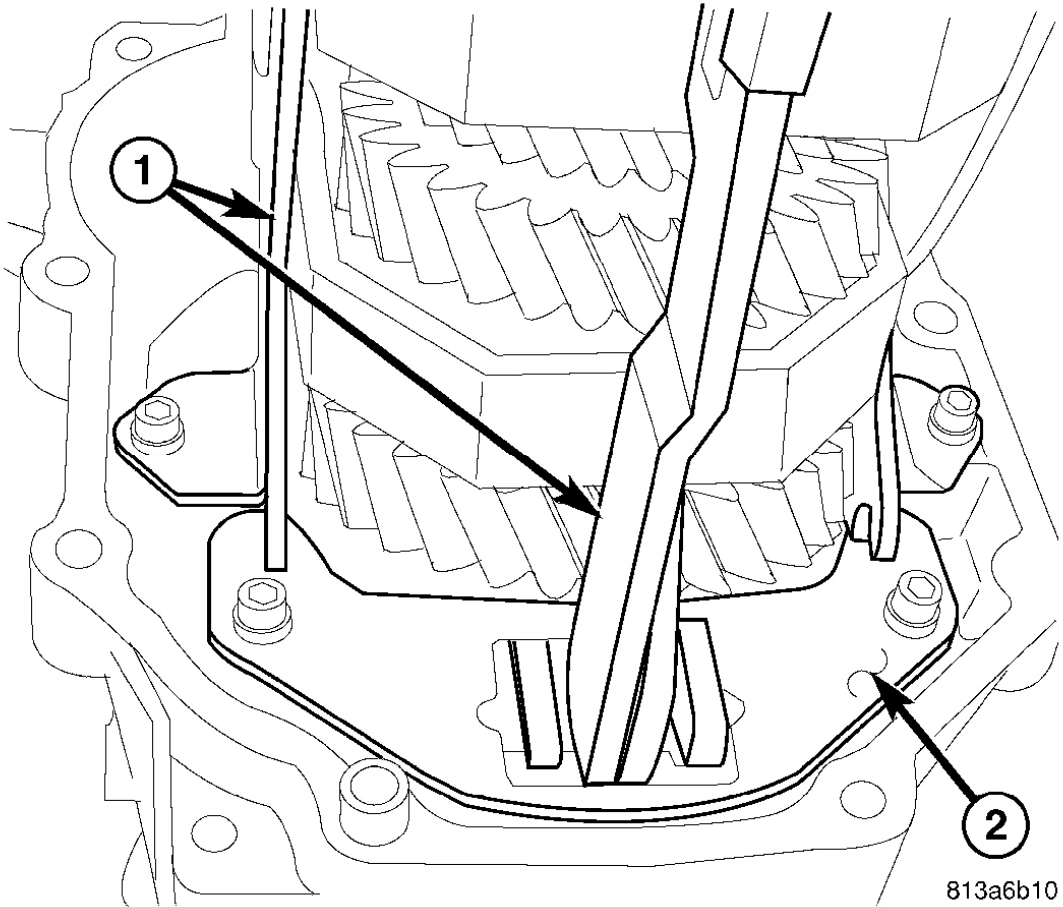


Fig. 21: Identifying Shift Rails & Support Plate
Courtesy of CHRYSLER LLC

10. Remove shift rails (1) support plate (2) bolts.

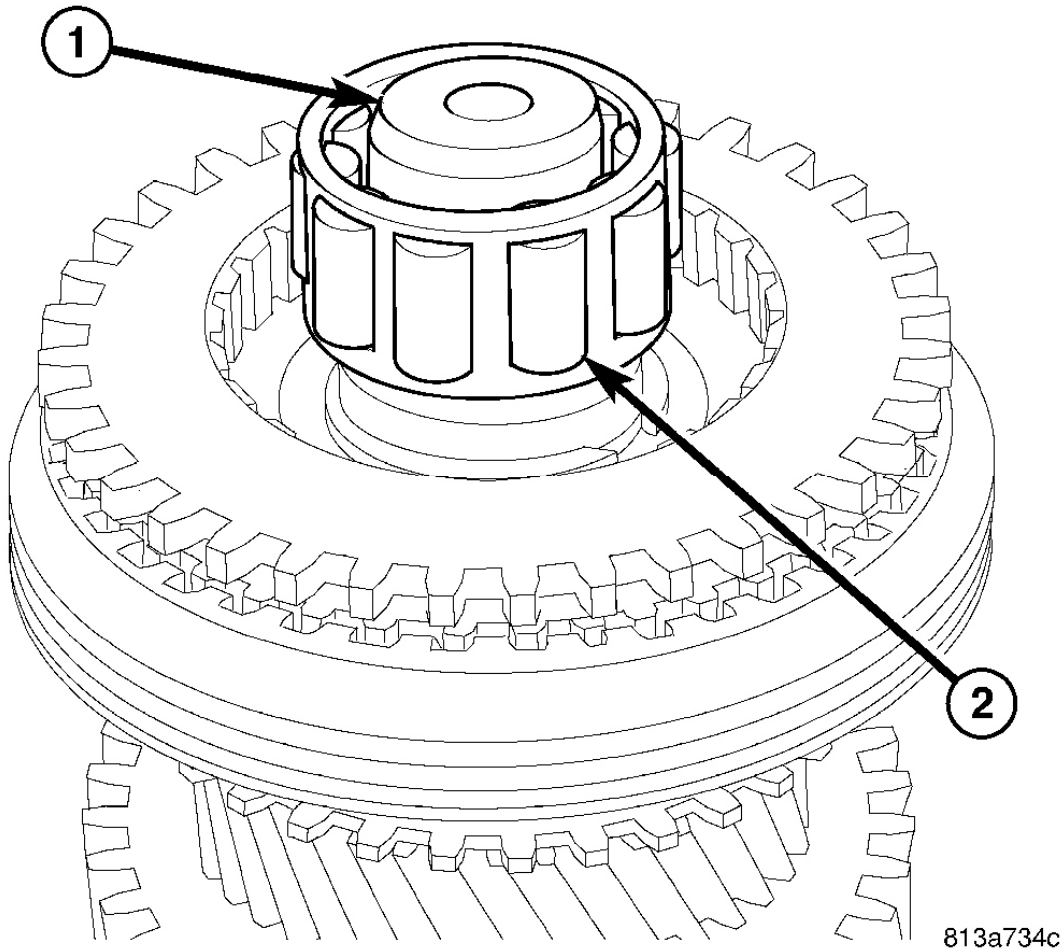


Fig. 22: Identifying Input Shaft & Roller Bearing
Courtesy of CHRYSLER LLC

11. Remove input shaft (1) roller bearing (2).

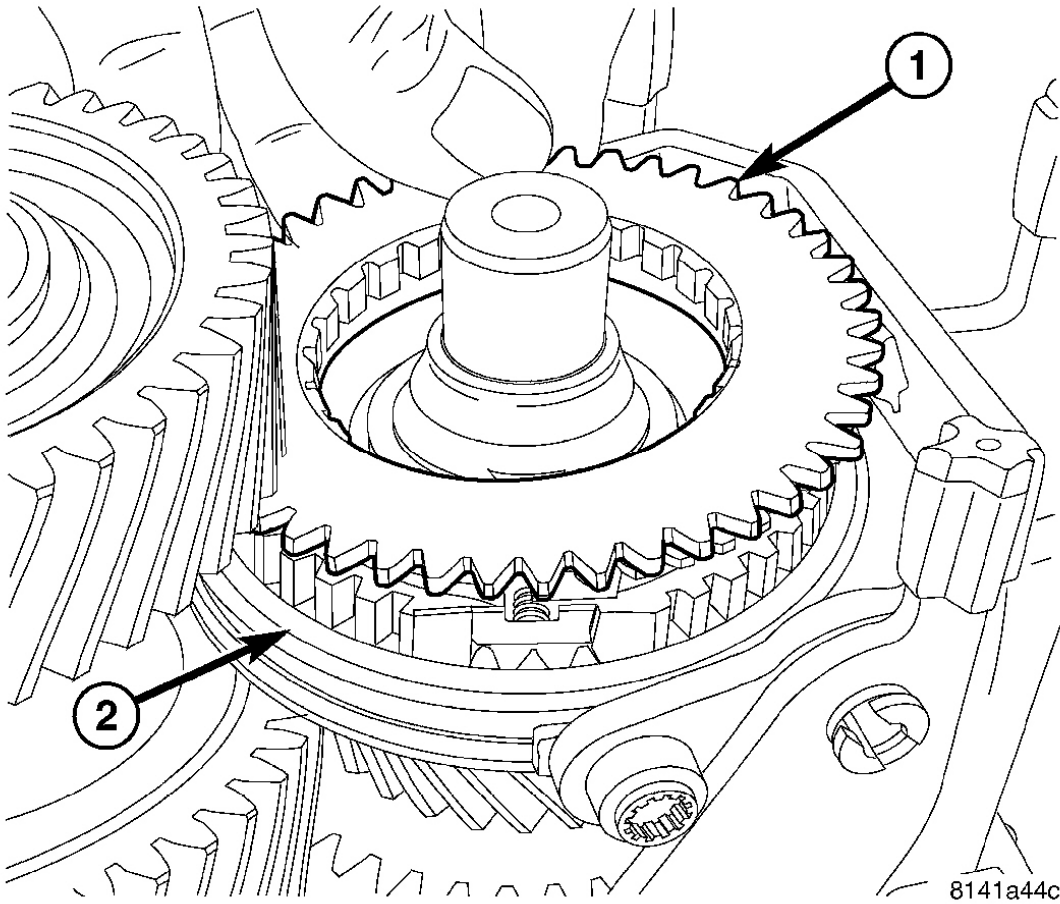


Fig. 23: Identifying Fifth Gear Synchronizer Blocker Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

12. Remove fifth gear synchronizer blocker ring (1) from 5-6 synchronizer hub (2).

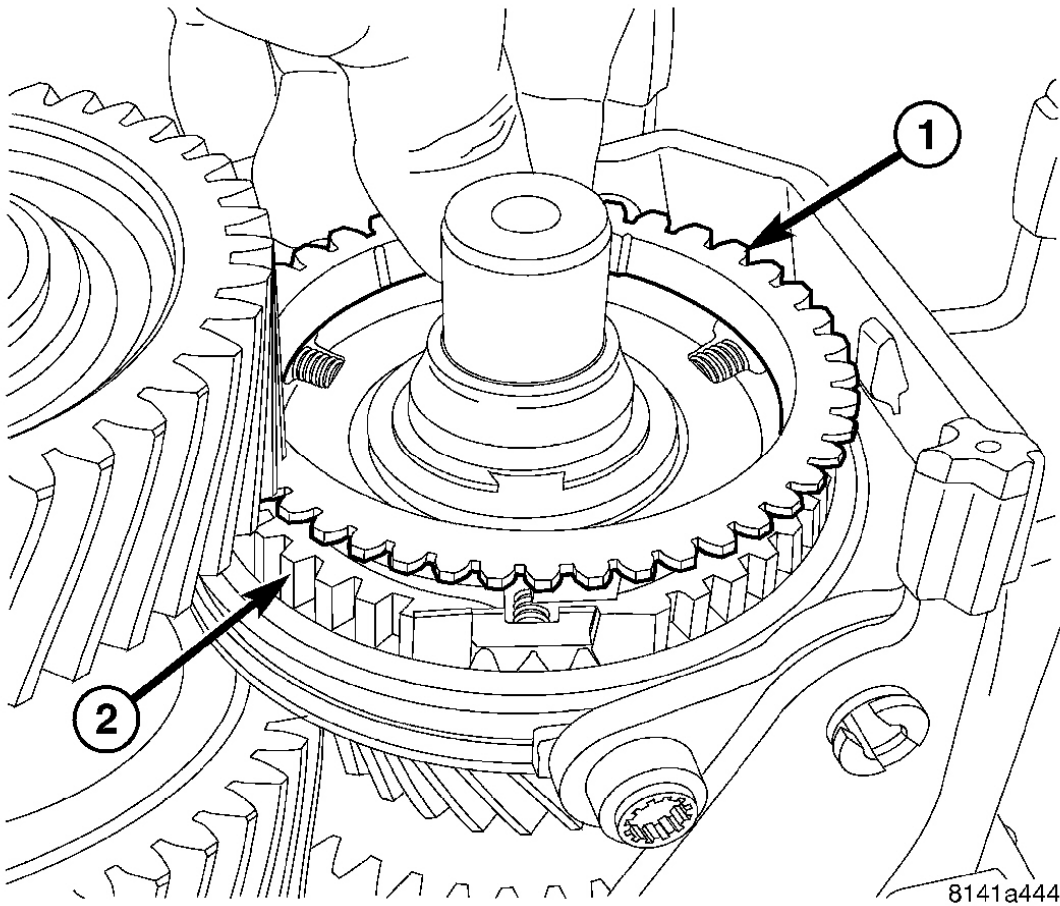
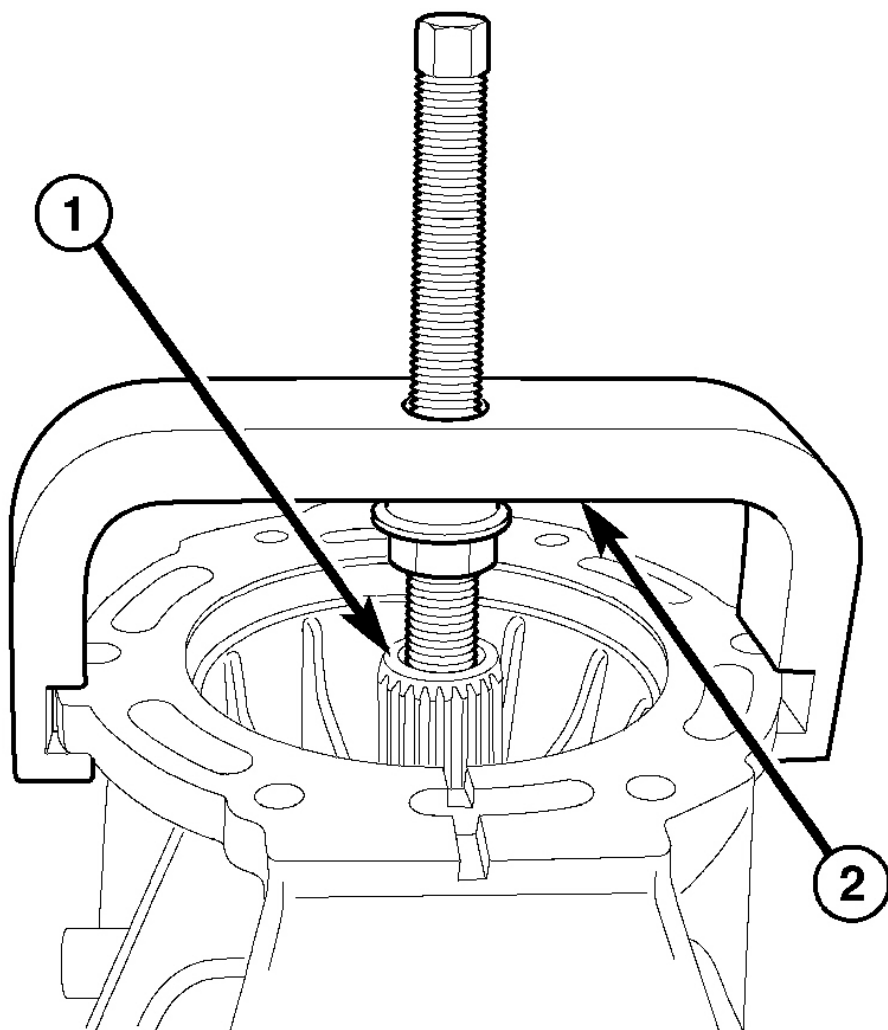


Fig. 24: Identifying Fifth Gear Synchronizer Friction Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

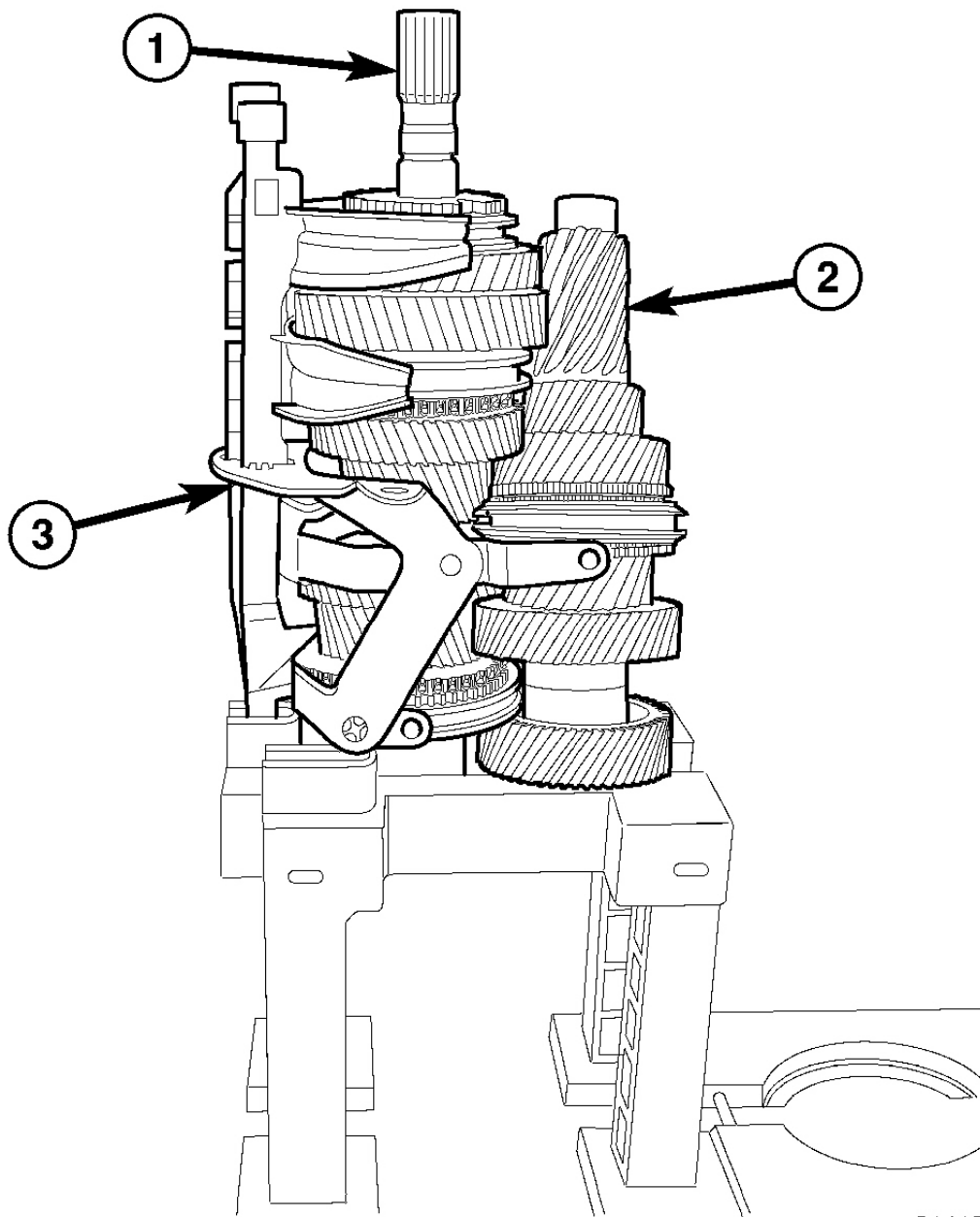
13. Remove fifth gear synchronizer friction ring (1) from 5-6 synchronizer hub (2).



81415117

Fig. 25: Identifying Mainshaft & Remover/Installer 9636
Courtesy of CHRYSLER LLC

14. Set geartrain and shift rails with rear housing into Fixture 9633.
15. Remove mainshaft (1) from rear housing bearing with Remover/Installer 9636 (2).

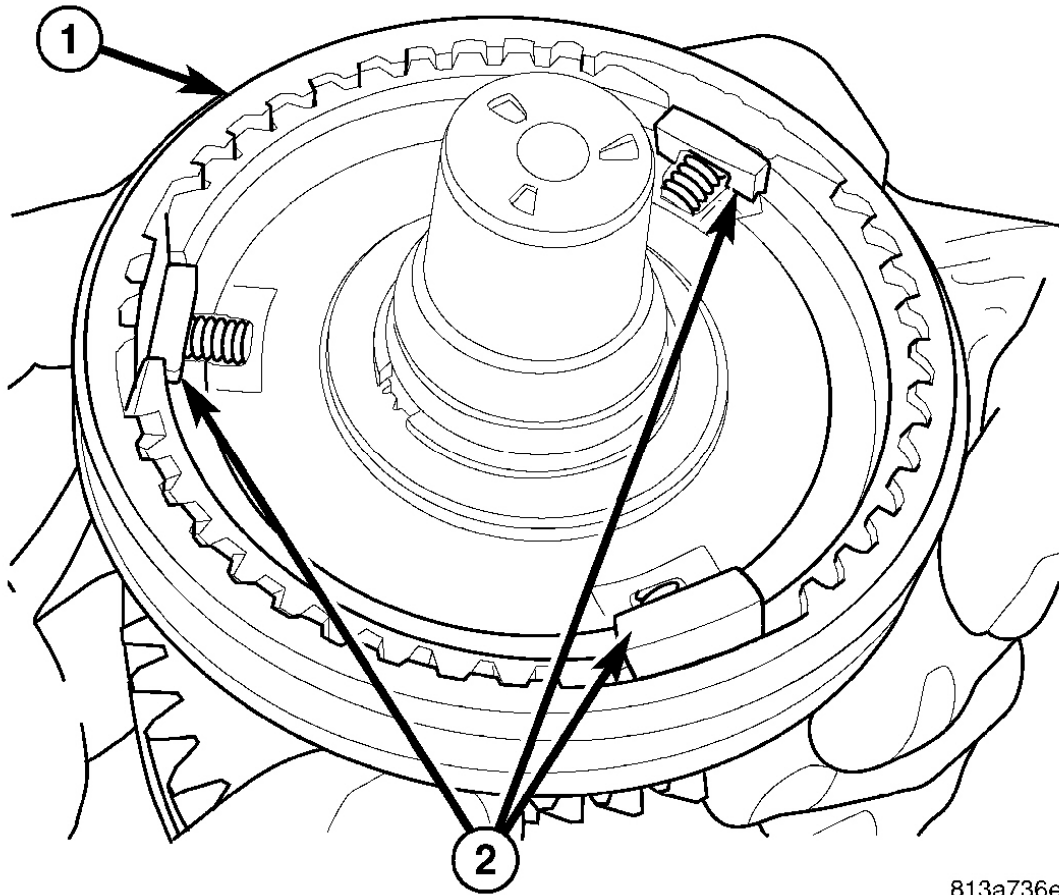


81415250

Fig. 26: Identifying Mainshaft, Countershaft & Shift Rails/Forks
Courtesy of CHRYSLER LLC

16. Remove mainshaft (1), countershaft (2) and shift rails/forks (3) from fixture.

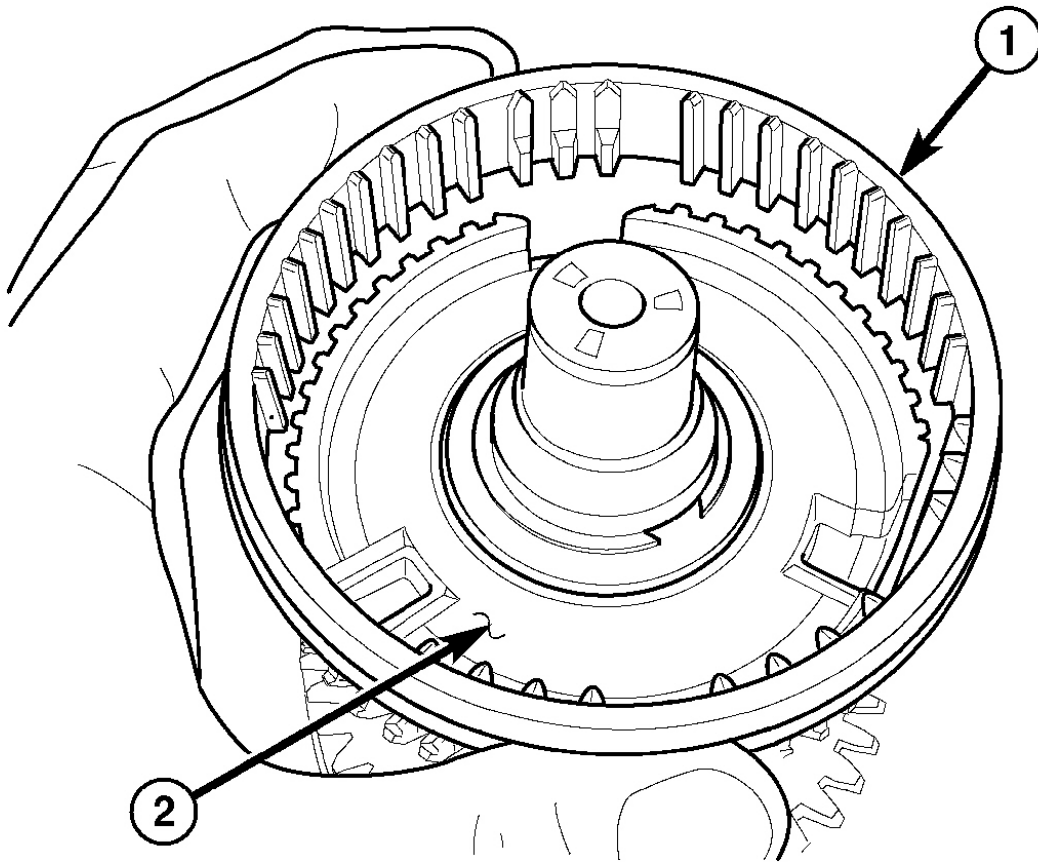
MAINSHAFT



813a736e

Fig. 27: Identifying 5-6 Synchronizer Sleeve & Detents
Courtesy of CHRYSLER LLC

1. Clamp build Fixture 9648 in a vise. Install mainshaft with 5-6 synchronizer facing up in build Fixture 9648.
2. Push 5-6 synchronizer sleeve (1) down on hub and remove detents (2) springs and balls.



813c9a79

Fig. 28: Identifying 5-6 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

3. Remove 5-6 synchronizer sleeve (1) from synchronizer hub (2).

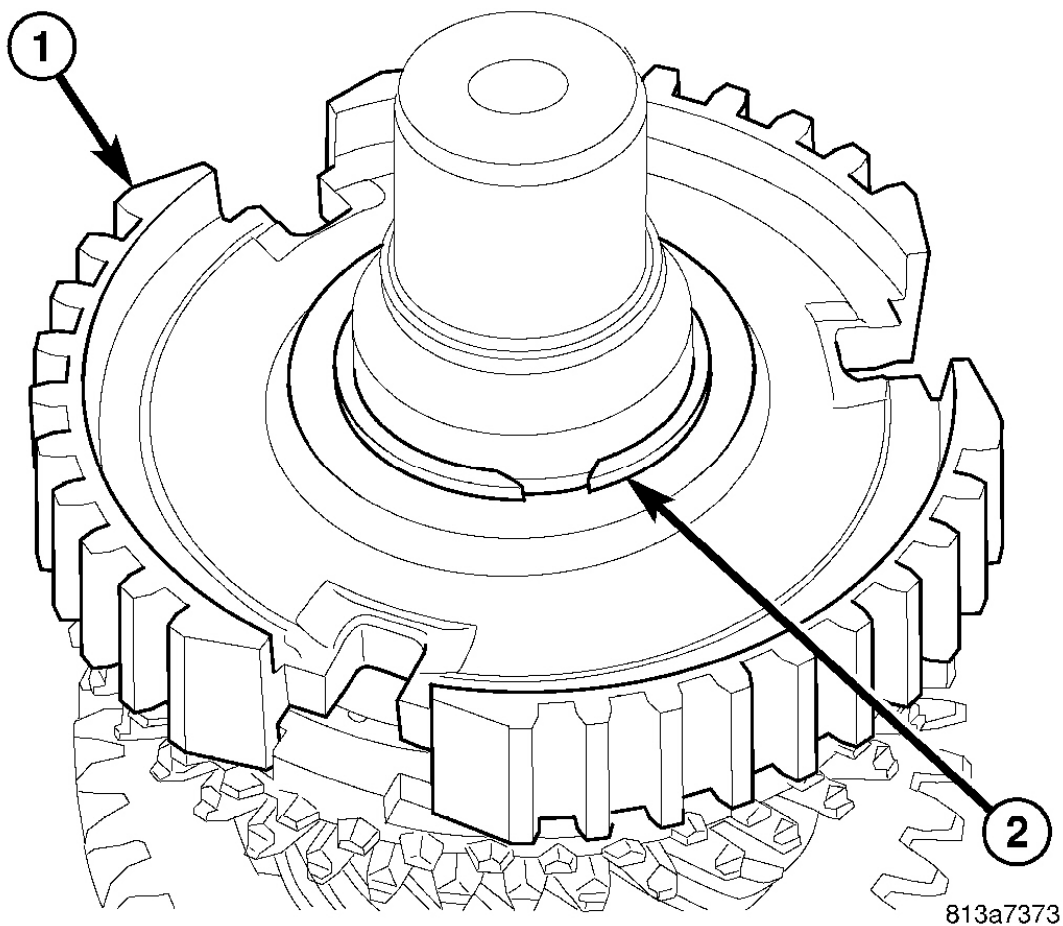
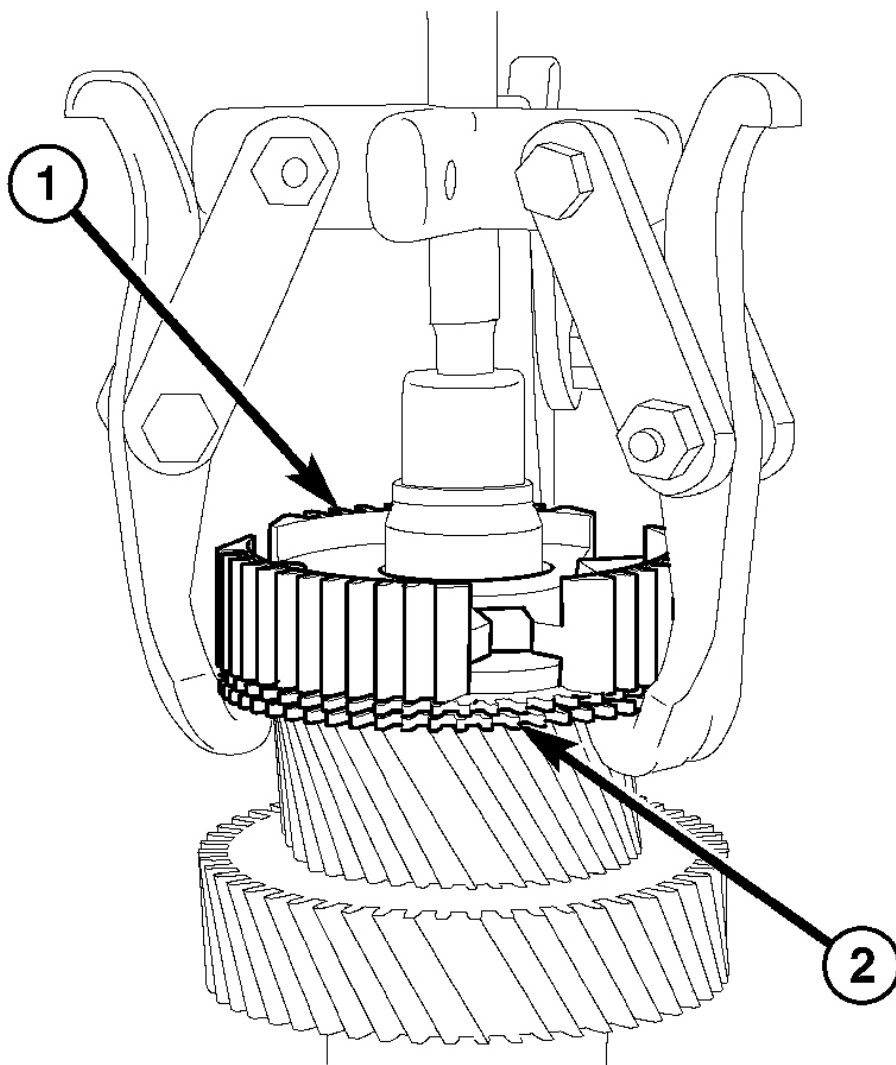


Fig. 29: Identifying 5-6 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

4. Remove 5-6 synchronizer hub (1) snap ring (2) and record location.

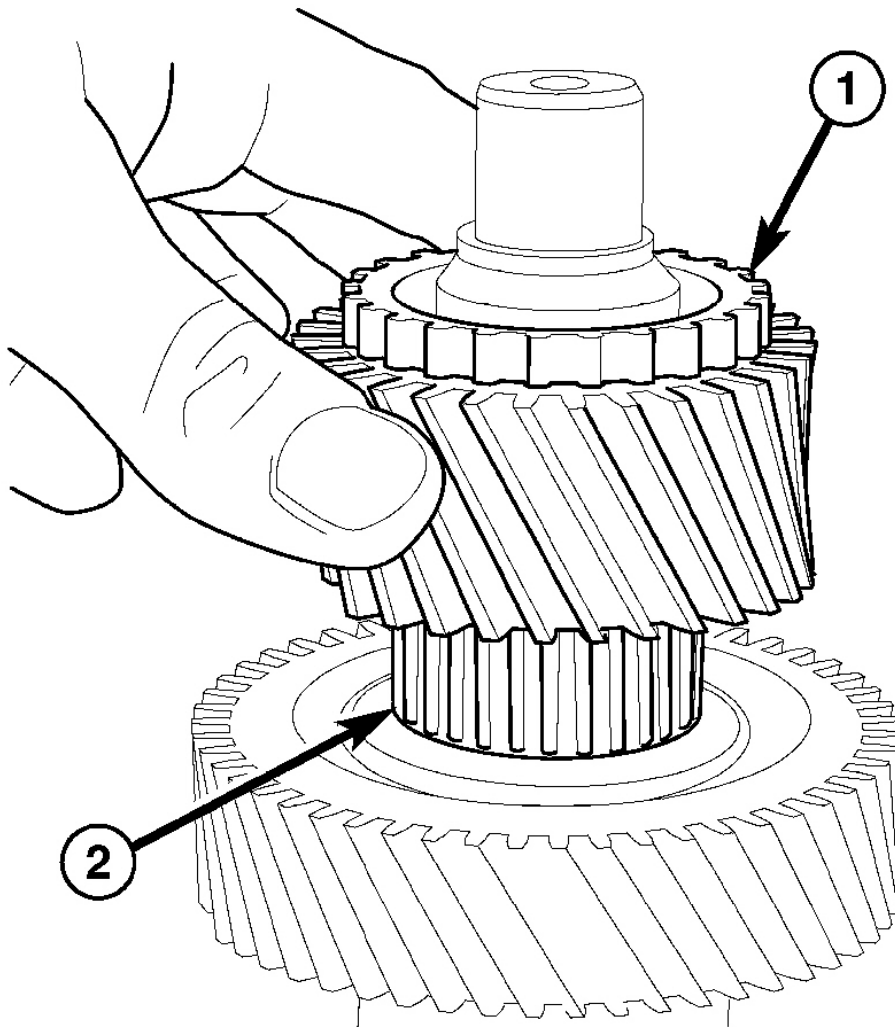
NOTE: All snap rings are select fit from the factory, and must be installed in their original location.



813a7377

Fig. 30: Identifying 5-6 Synchronizer Hub & Sixth Gear Synchronizer Rings
Courtesy of CHRYSLER LLC

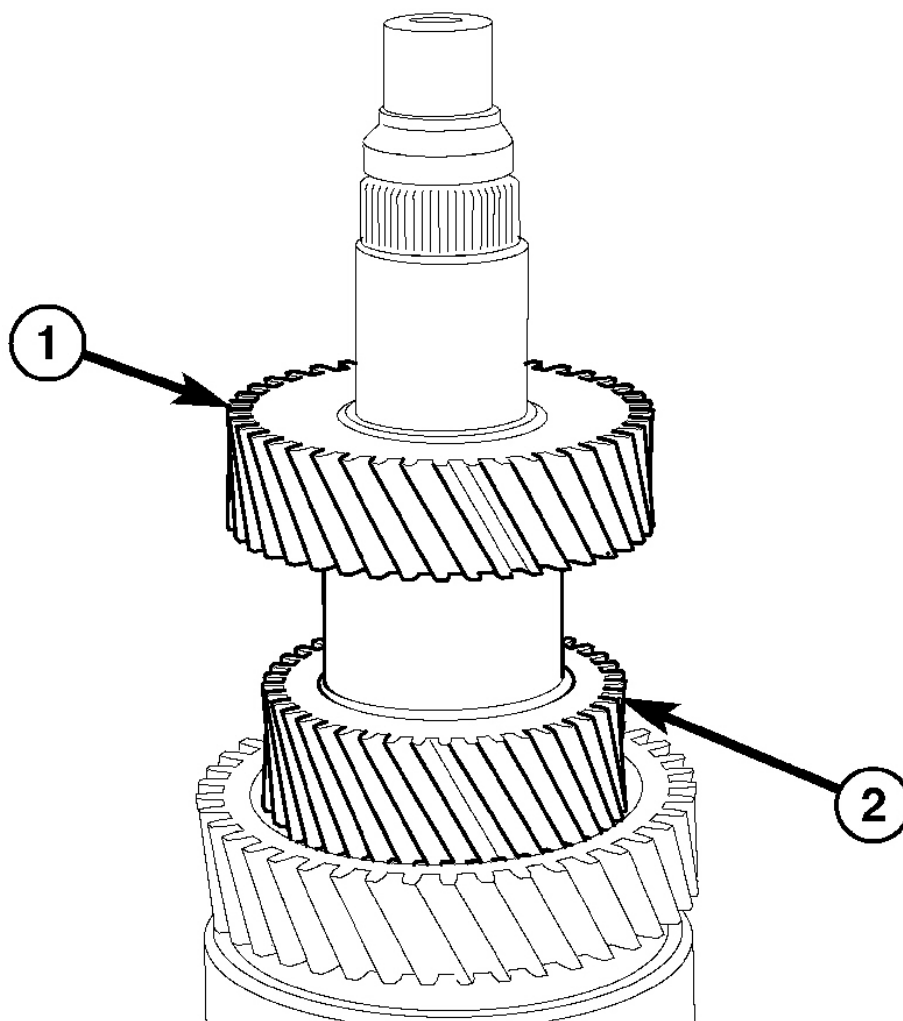
5. Remove 5-6 synchronizer hub (1) and sixth gear synchronizer rings (2) with a three jaw puller. Place puller jaws under sixth gear synchronizer rings (2).



813a737b

Fig. 31: Sixth Gear & Bearing
Courtesy of CHRYSLER LLC

6. Remove sixth gear (1) and bearing (2).



813a7380

Fig. 32: View Of 3rd & 4th Gear
Courtesy of CHRYSLER LLC

7. Third gear (1) and fourth gear (2) are serviced with the mainshaft only.
8. Remove mainshaft from Fixture 9648. Turn fixture over in vise and set opposite end of mainshaft into the fixture.

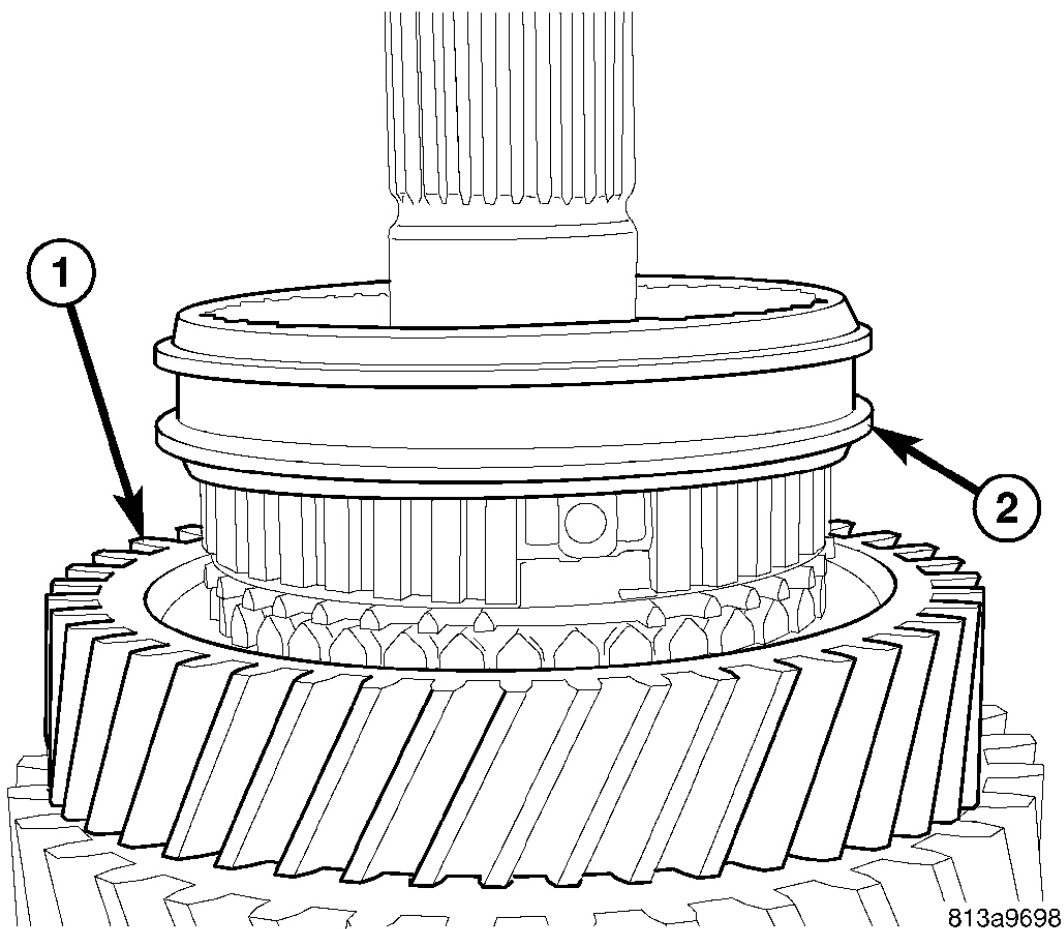
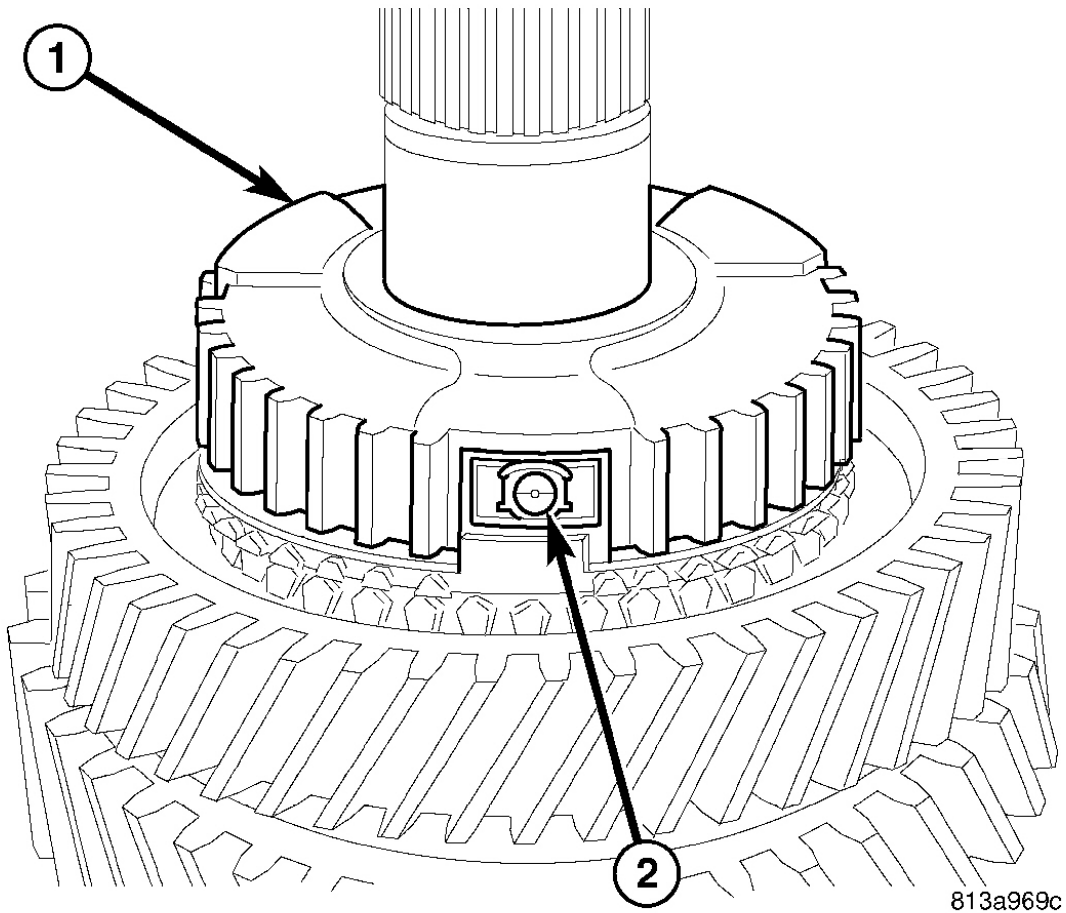


Fig. 33: Identifying Reverse Gear & Synchronizer Sleeve
Courtesy of CHRYSLER LLC

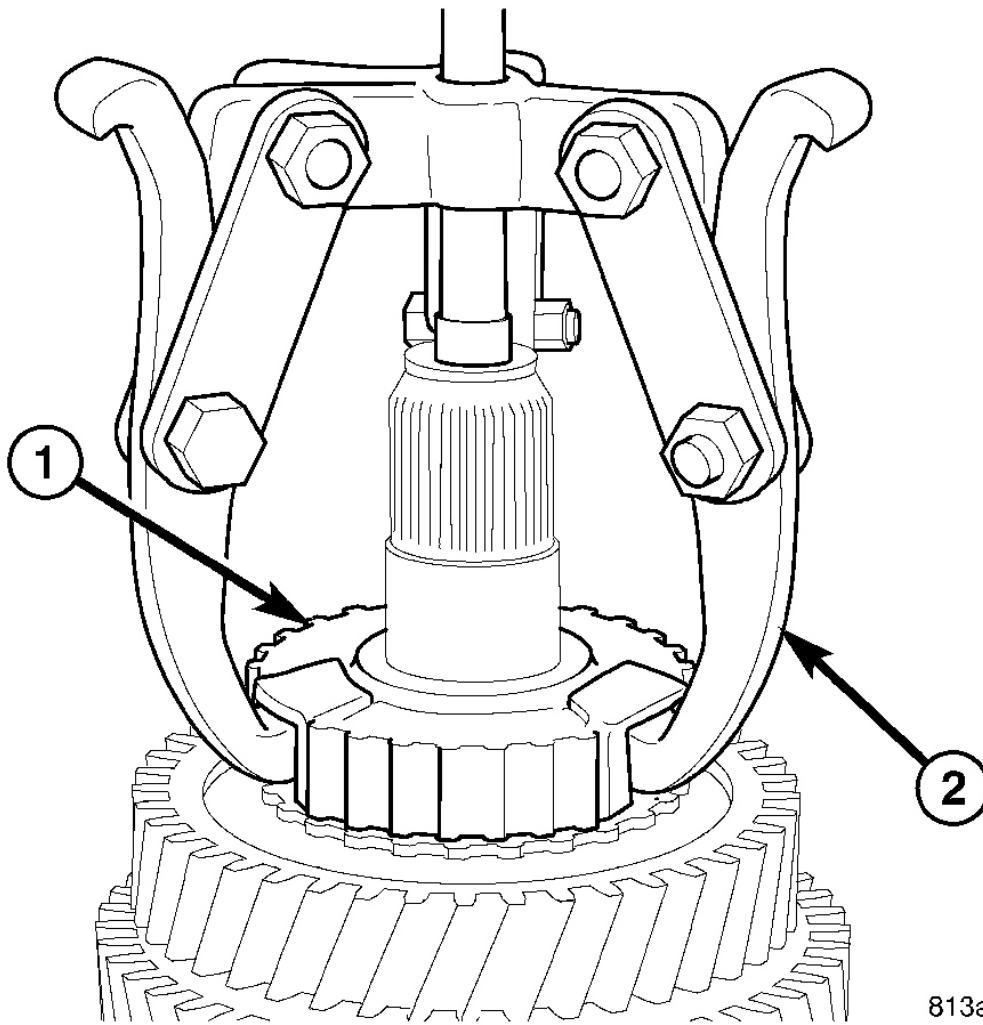
9. Remove reverse gear (1) synchronizer sleeve (2) off synchronizer hub.



813a969c

Fig. 34: Identifying Reverse Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

10. Remove reverse synchronizer hub (1) detents (2).



813a96a2

Fig. 35: Identifying Reverse Synchronizer Hub & Three Jaw Puller
Courtesy of CHRYSLER LLC

11. Remove reverse synchronizer hub (1) with three jaw puller (2). Place puller jaws in hub detent openings.

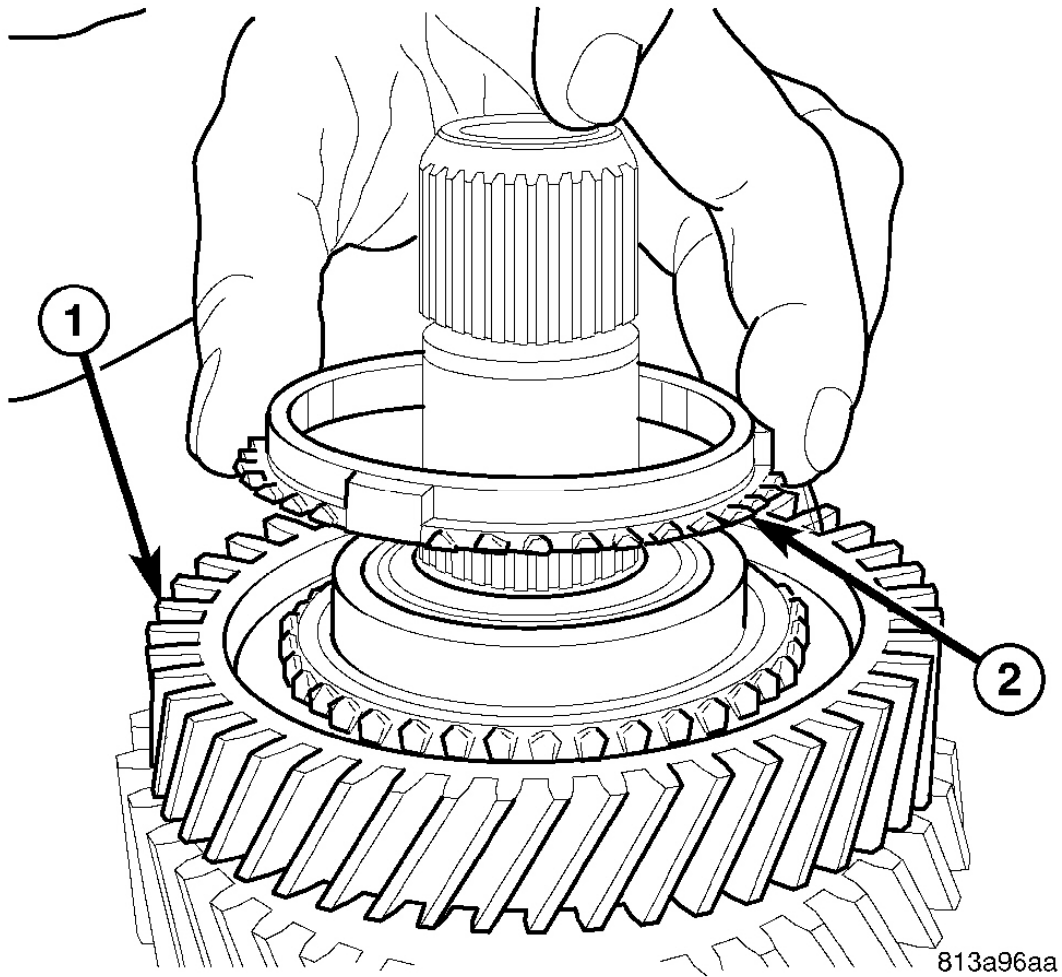


Fig. 36: Identifying Reverse Gear & Synchronizer Ring
Courtesy of CHRYSLER LLC

12. Remove reverse gear (1) synchronizer ring (2).

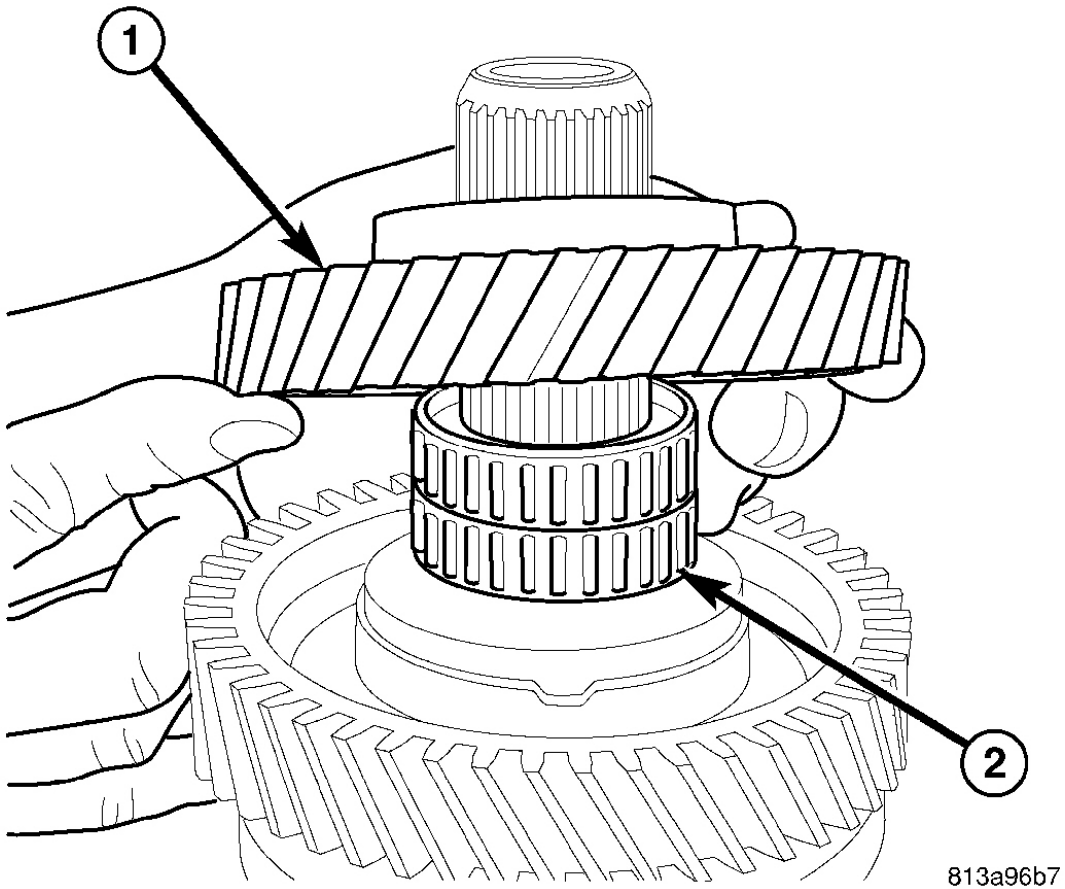


Fig. 37: Identifying Reverse Gear & Bearing
Courtesy of CHRYSLER LLC

13. Remove reverse gear (1) and bearing (2).

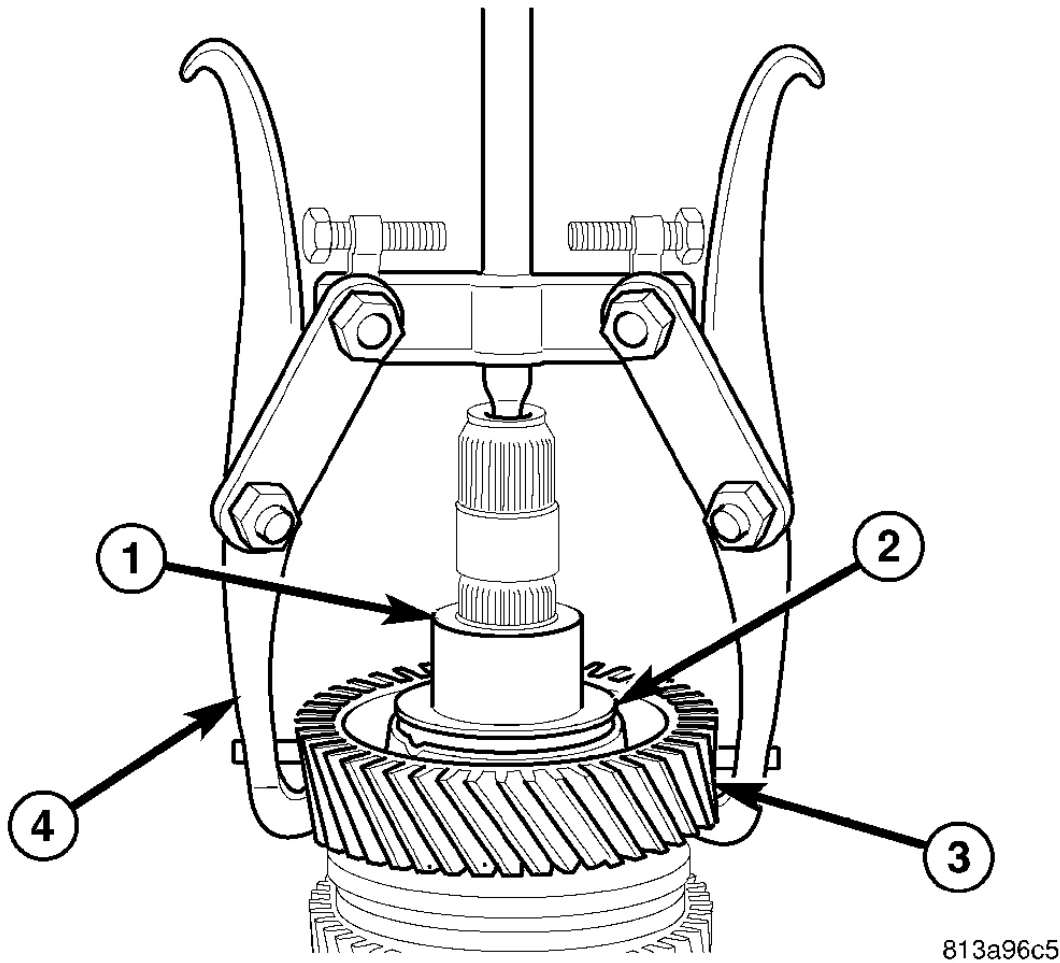
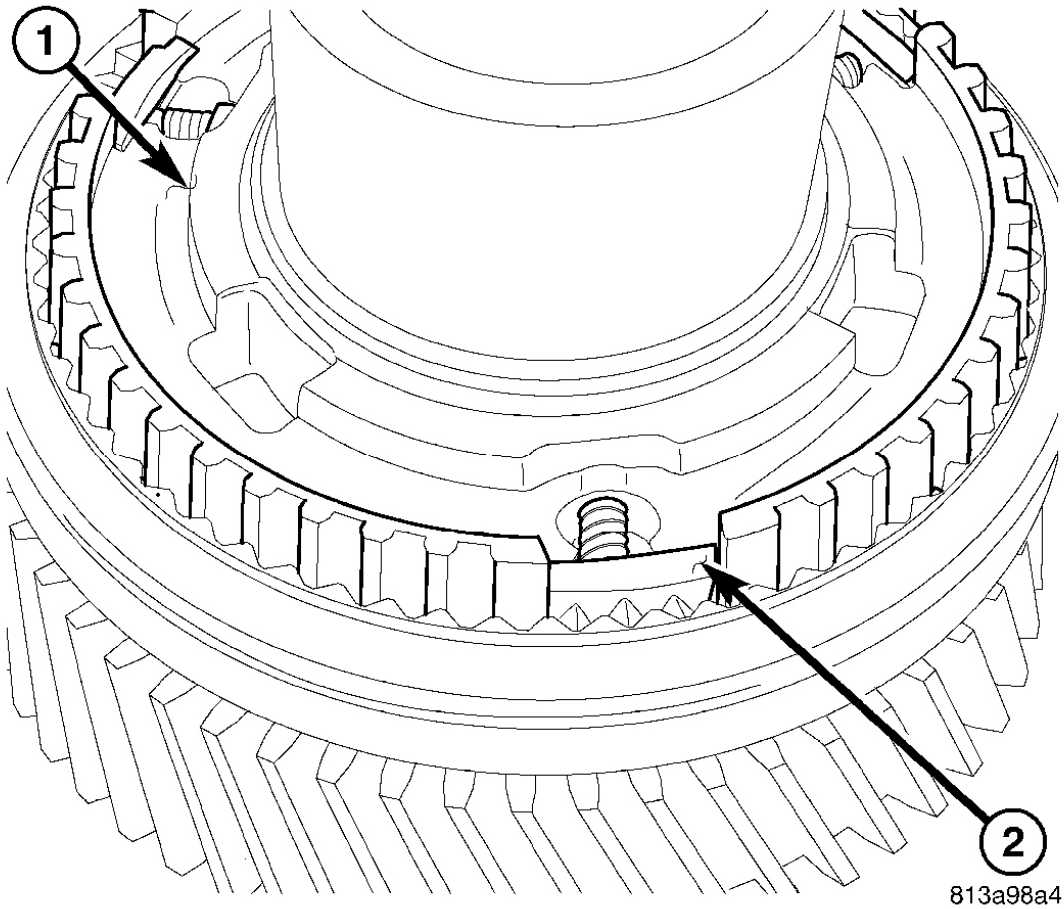


Fig. 38: Identifying Reverse Gear Bearing Race, Thrust Washer, First Gear & Puller
Courtesy of CHRYSLER LLC

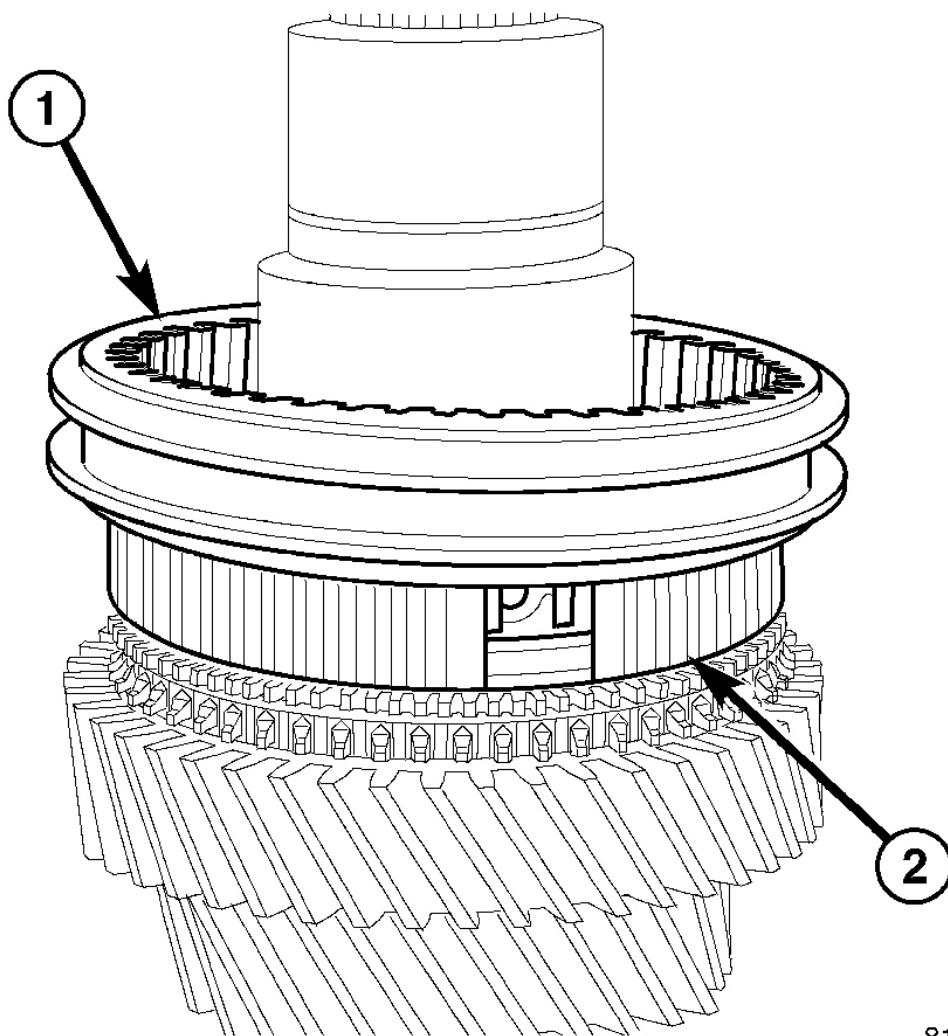
14. Remove reverse gear bearing race (1), thrust washer (2) and first gear (3) with puller (4). Place puller jaws under first gear (3).
15. Remove first gear bearing.



813a98a4

Fig. 39: Identifying Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

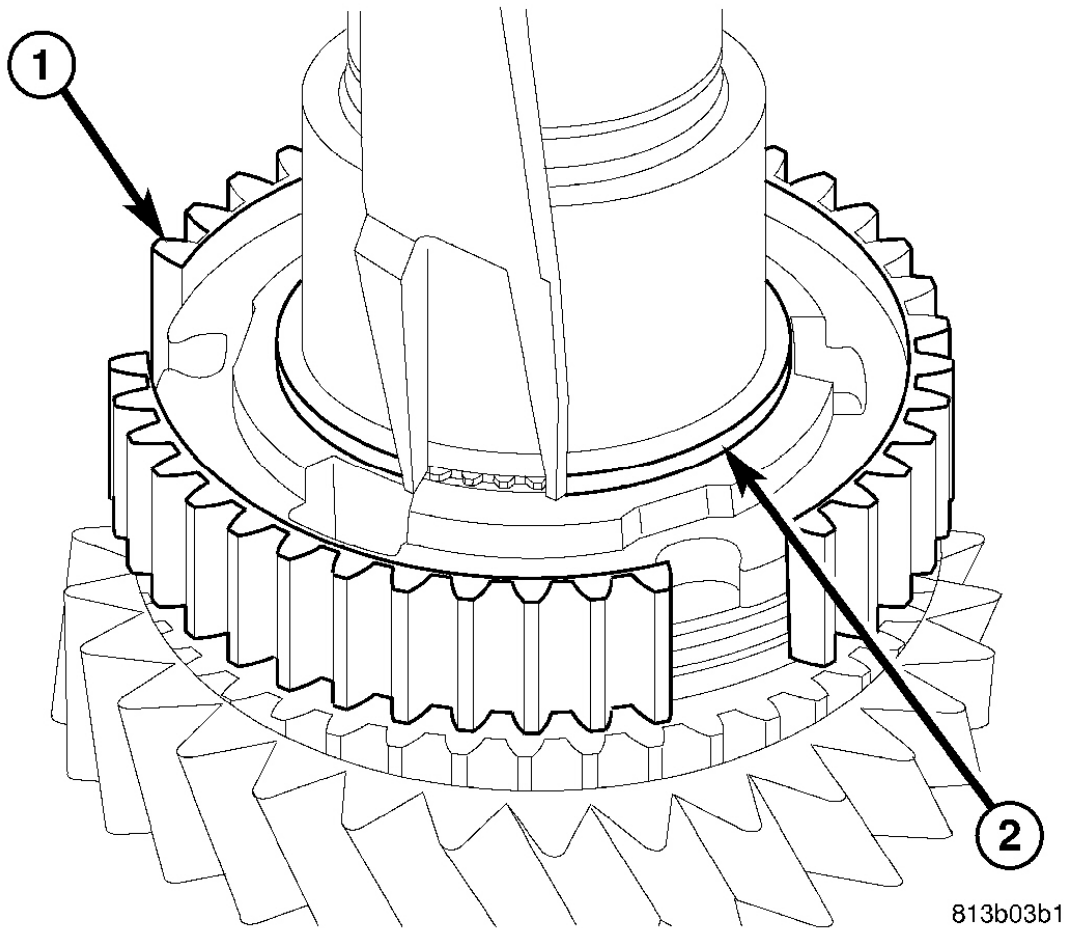
16. Remove first gear synchronizer rings.
17. Push 1-2 synchronizer sleeve down on synchronizer hub (1) detents (2), balls and springs.



813a98ab

Fig. 40: Identifying 1-2 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

18. Remove 1-2 synchronizer sleeve (1) from synchronizer hub (2).

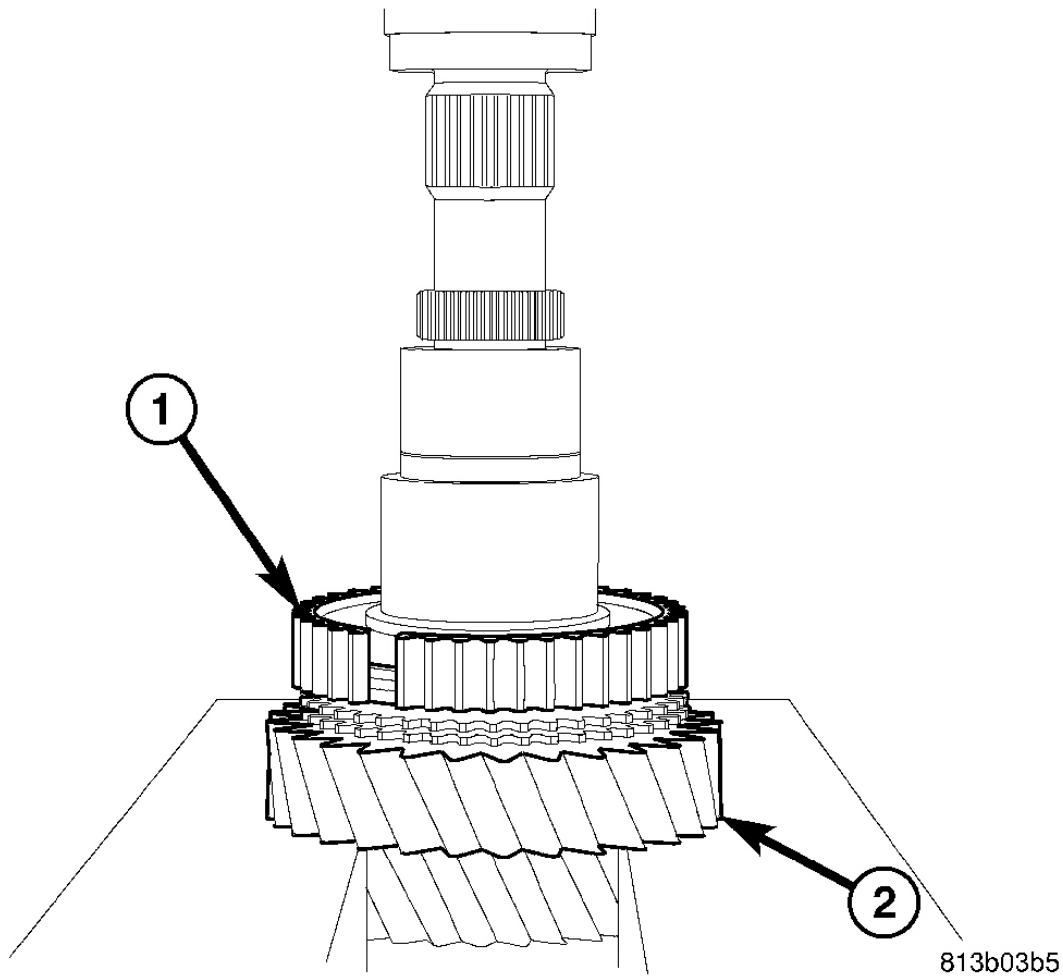


813b03b1

Fig. 41: Identifying 1-2 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

19. Remove 1-2 synchronizer hub (1) snap ring (2).

NOTE: All snap rings are select fit from the factory, and must be installed in their original location.

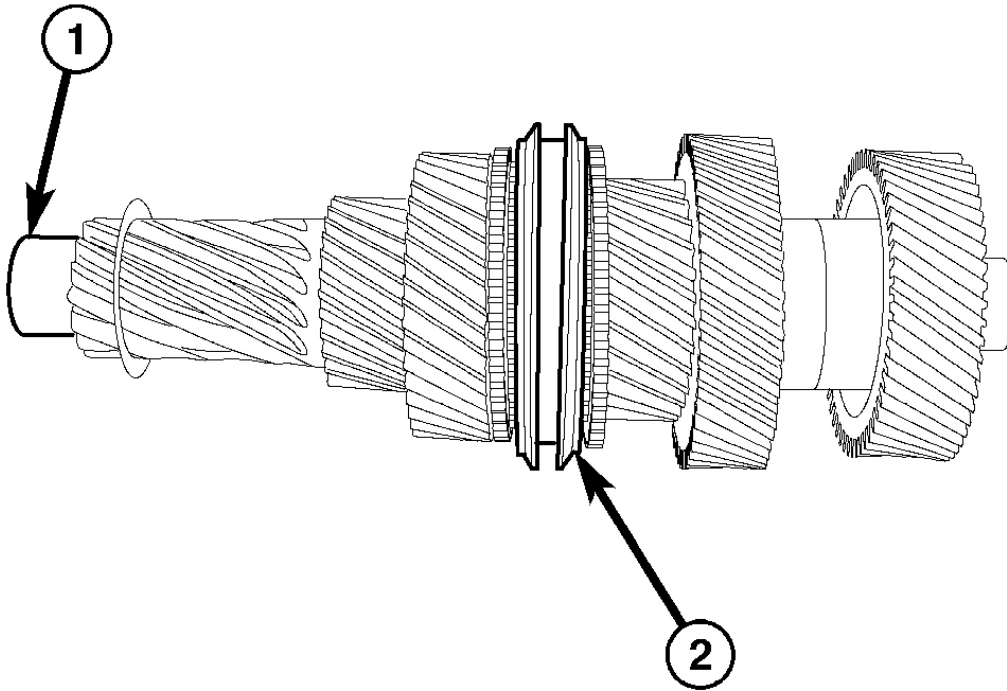


813b03b5

Fig. 42: Identifying 1-2 Synchronizer Hub & Second Gear
Courtesy of CHRYSLER LLC

20. Remove 1-2 synchronizer hub (1), synchronizer rings and second gear (2) off shaft with a press. Place second gear (2) on press plates and press shaft through 1-2 synchronizer hub (1), synchronizer rings and second gear (2)

COUNTERSHAFT

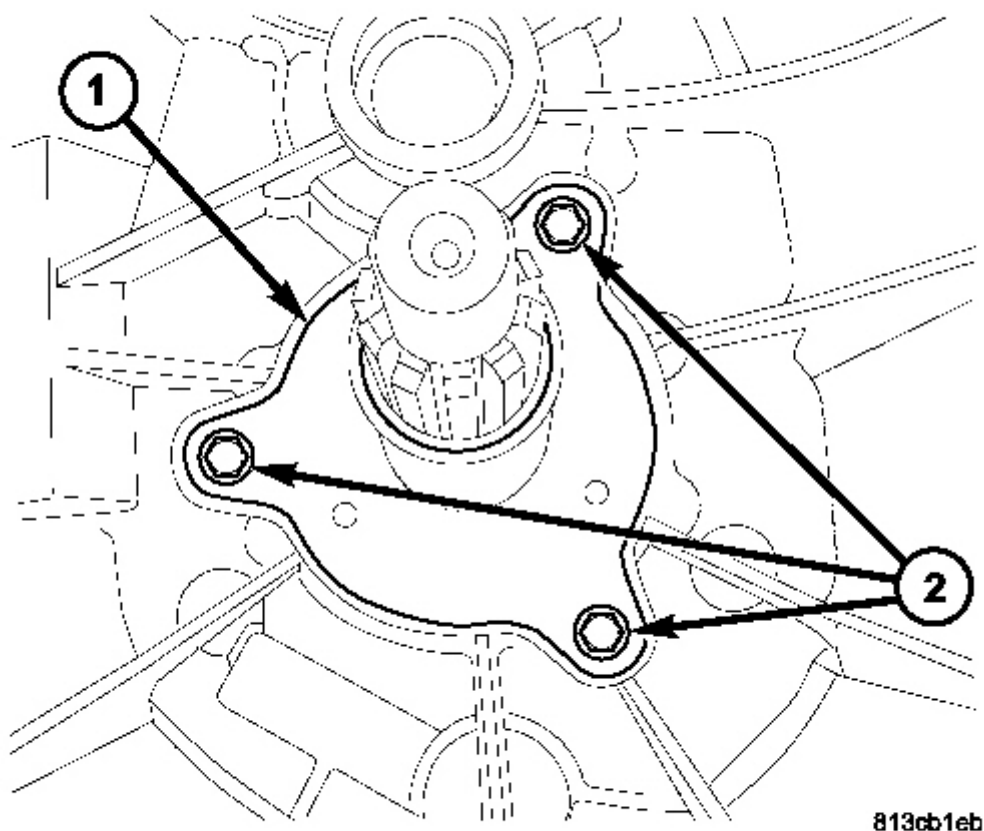


813c9828

Fig. 43: Identifying Bearing Surfaces & 3-4 Synchronizer Assembly
Courtesy of CHRYSLER LLC

The countershaft (1) and 3-4 synchronizer (2) are serviced as an assembly only.

FRONT HOUSING



813cb1eb

Fig. 44: View Of Input Shaft Retainer & Bolts
Courtesy of CHRYSLER LLC

1. Remove input shaft retainer bolts (2) and remove retainer (1).

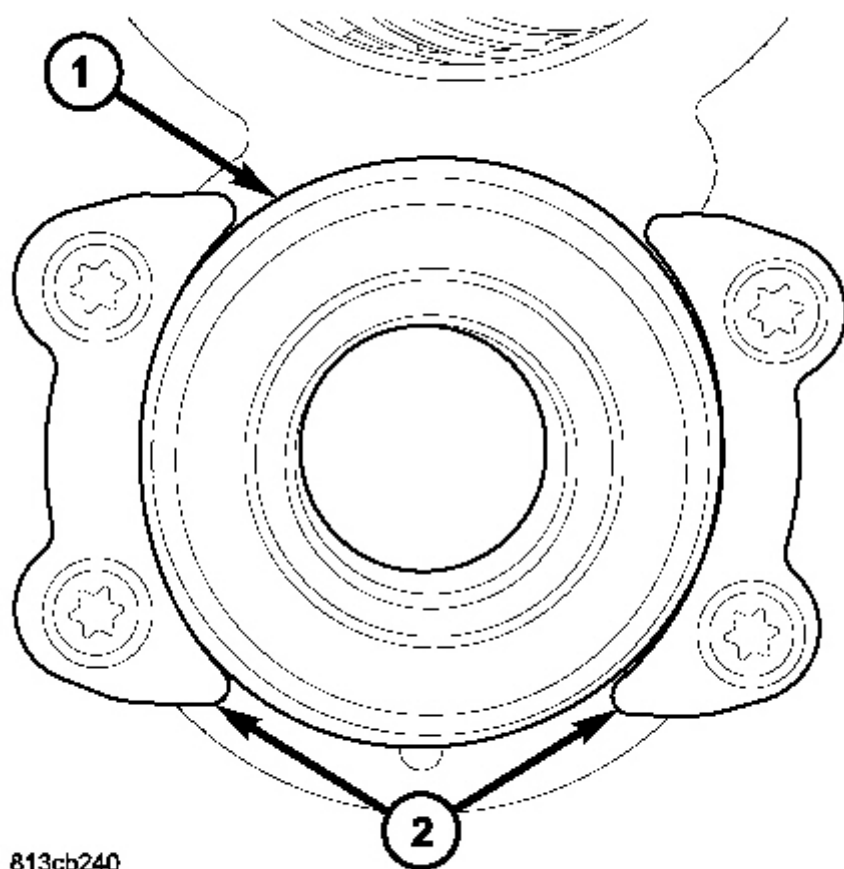
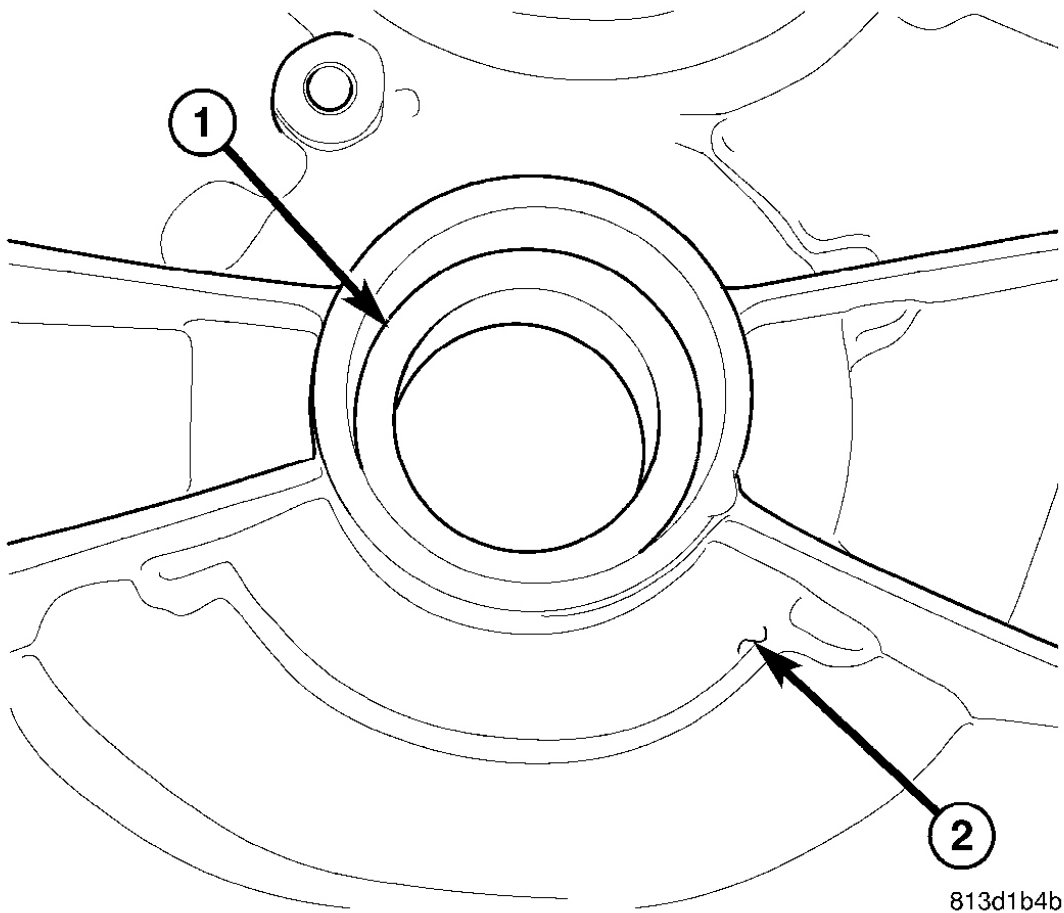


Fig. 45: Countershaft Bearing & Retainer
Courtesy of CHRYSLER LLC

2. Remove countershaft bearing (1) retainer (2) bolts and remove retainers.



813d1b4b

Fig. 46: Identifying Countershaft Bearing & Housing
Courtesy of CHRYSLER LLC

3. Remove countershaft bearing (1) from housing (2) with a hammer and driver.

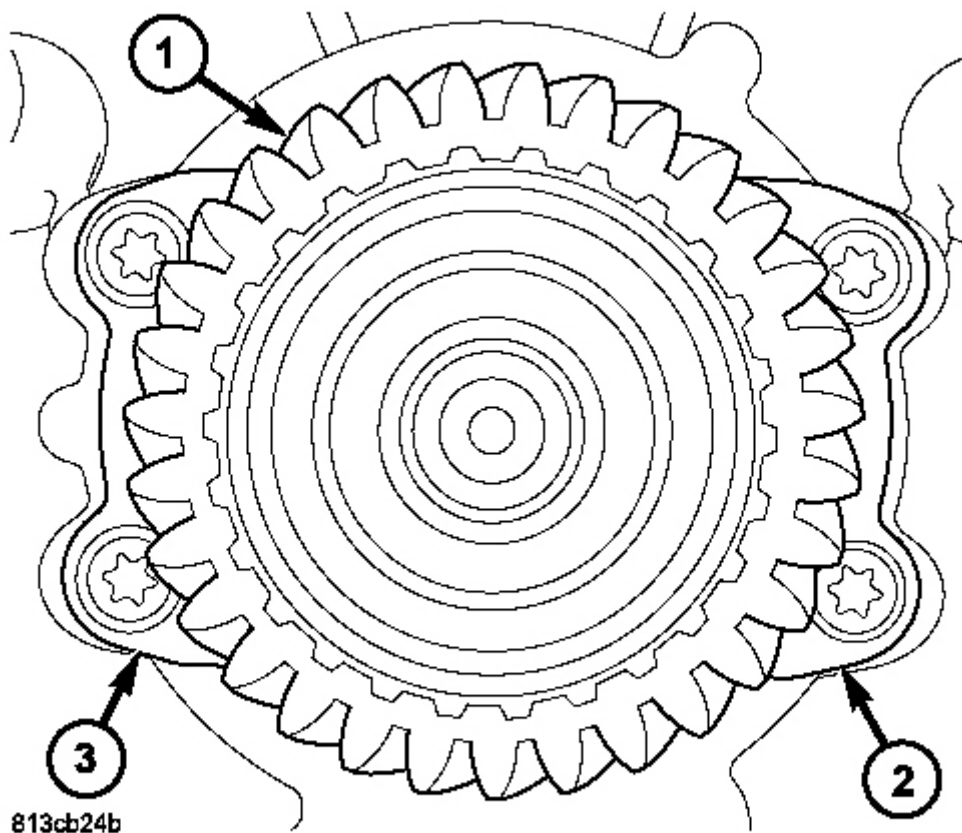
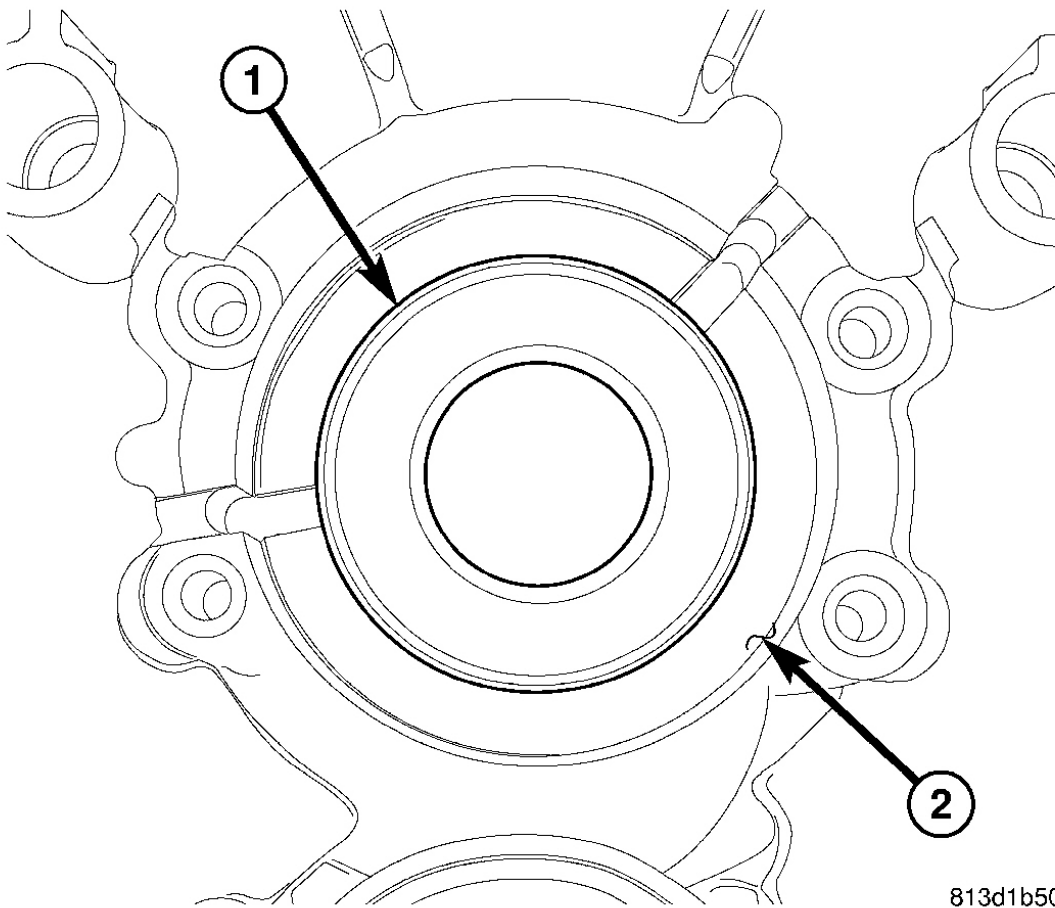


Fig. 47: Identifying Input Shaft & Bearing Retainers
Courtesy of CHRYSLER LLC

4. Remove input shaft (1) bearing retainer bolts and remove retainers (2, 3).
5. Remove input shaft and bearing from housing with a dead blow hammer.



813d1b50

Fig. 48: Identifying Input Shaft Seal & Housing
Courtesy of CHRYSLER LLC

6. Remove input shaft seal (1) from housing (2) with a hammer and driver.

INPUT SHAFT

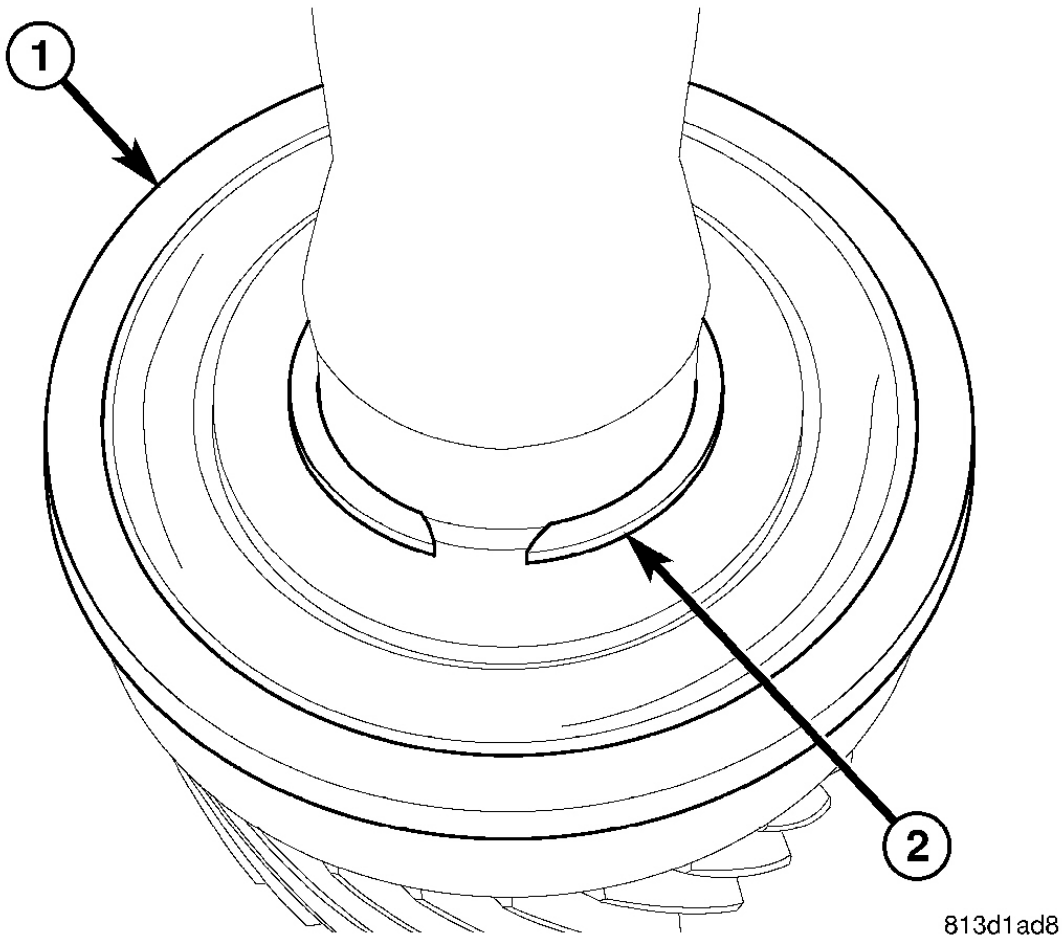


Fig. 49: Identifying Input Shaft Bearing & Snap Ring
Courtesy of CHRYSLER LLC

1. Remove input shaft bearing (1) snap ring (2).

NOTE: All snap rings are select fit from the factory, and must be installed in their original location.

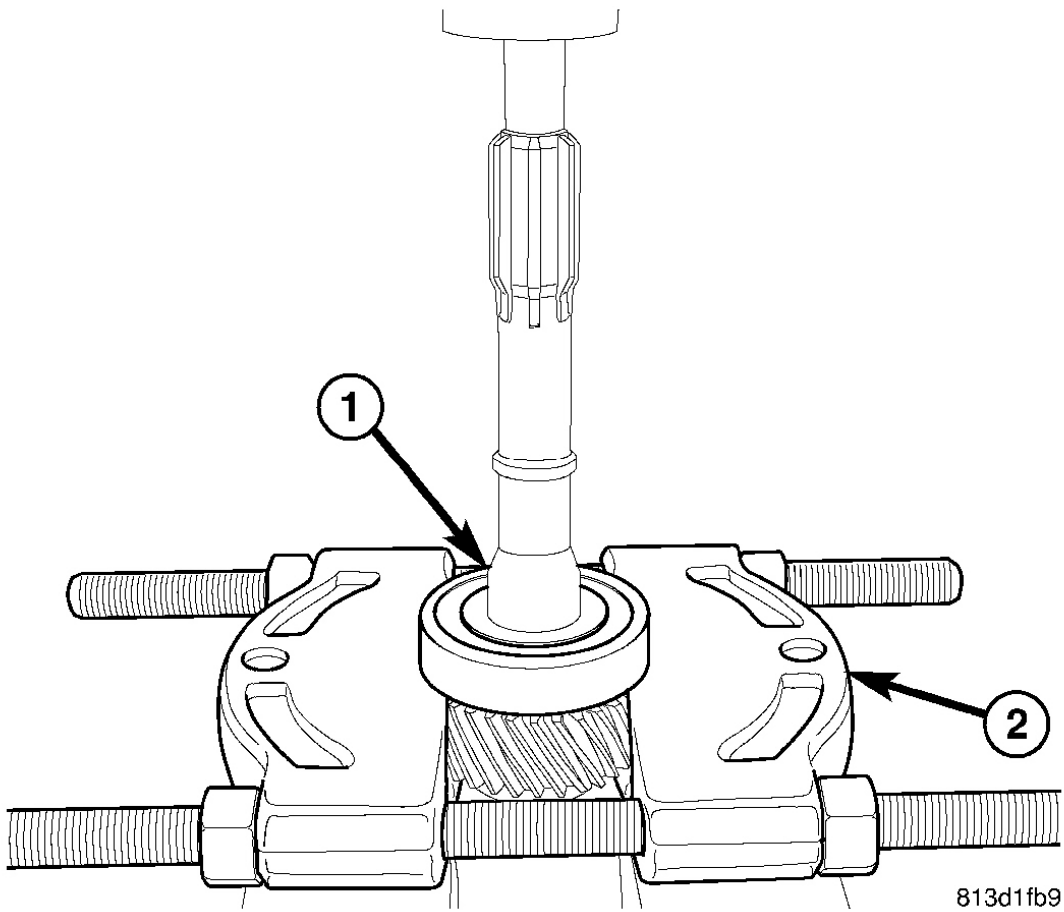


Fig. 50: Identifying Input Shaft Bearing & Splitter 1130
Courtesy of CHRYSLER LLC

2. Remove input shaft bearing (1) from input shaft with a Splitter 1130 (2) and press. Place splitter around bearing retainer lip and press input shaft through the bearing.

REAR HOUSING

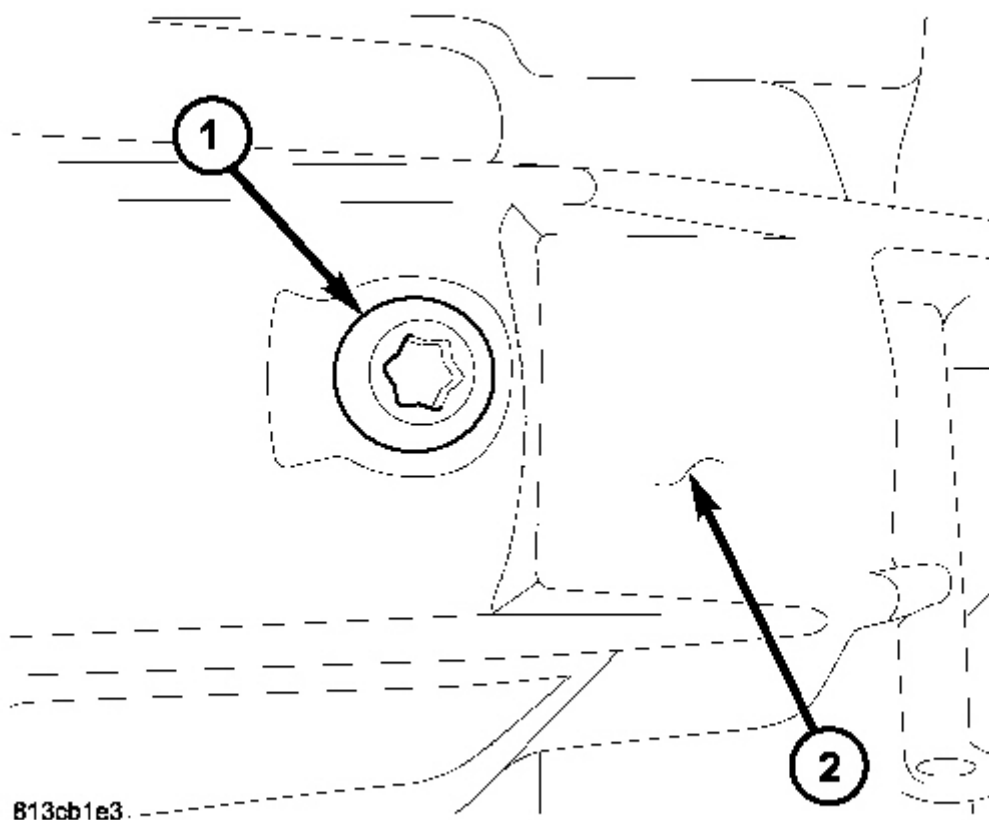


Fig. 51: Idler Shaft Bolt
Courtesy of CHRYSLER LLC

1. Remove reverse idler gear shaft bolt (1) from housing (2).

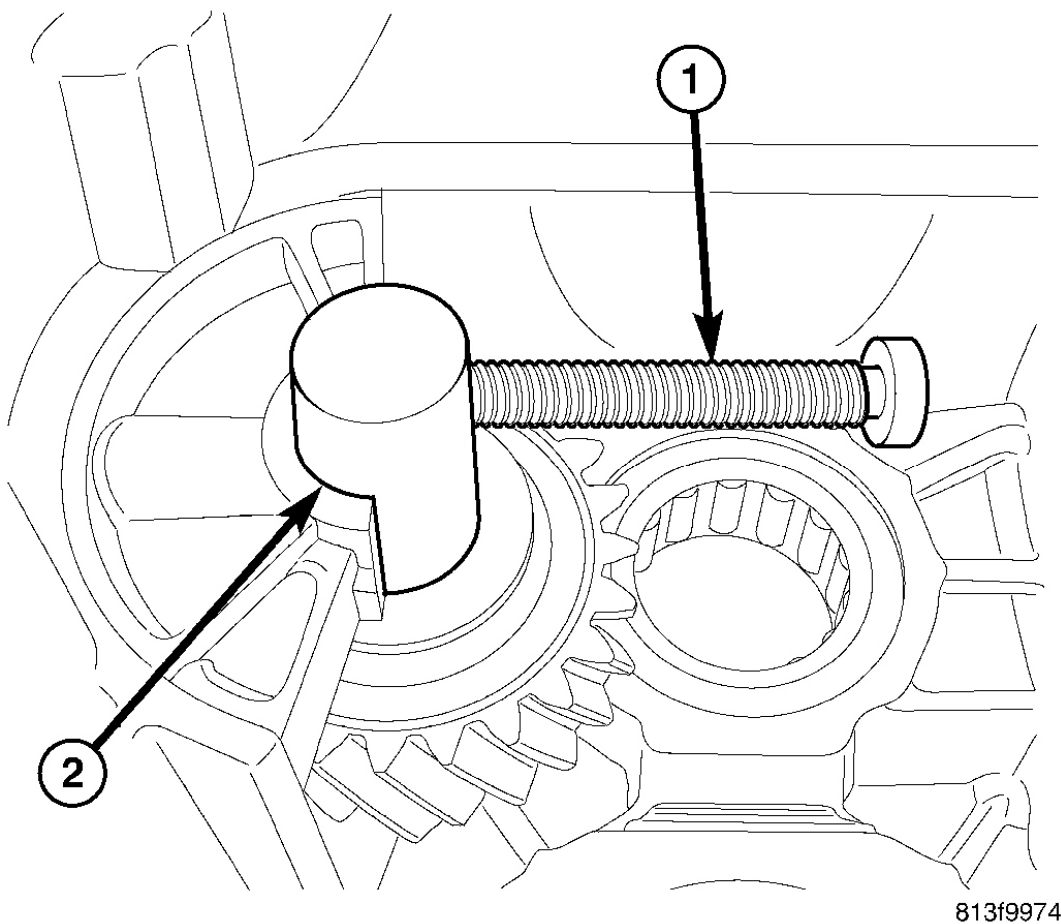
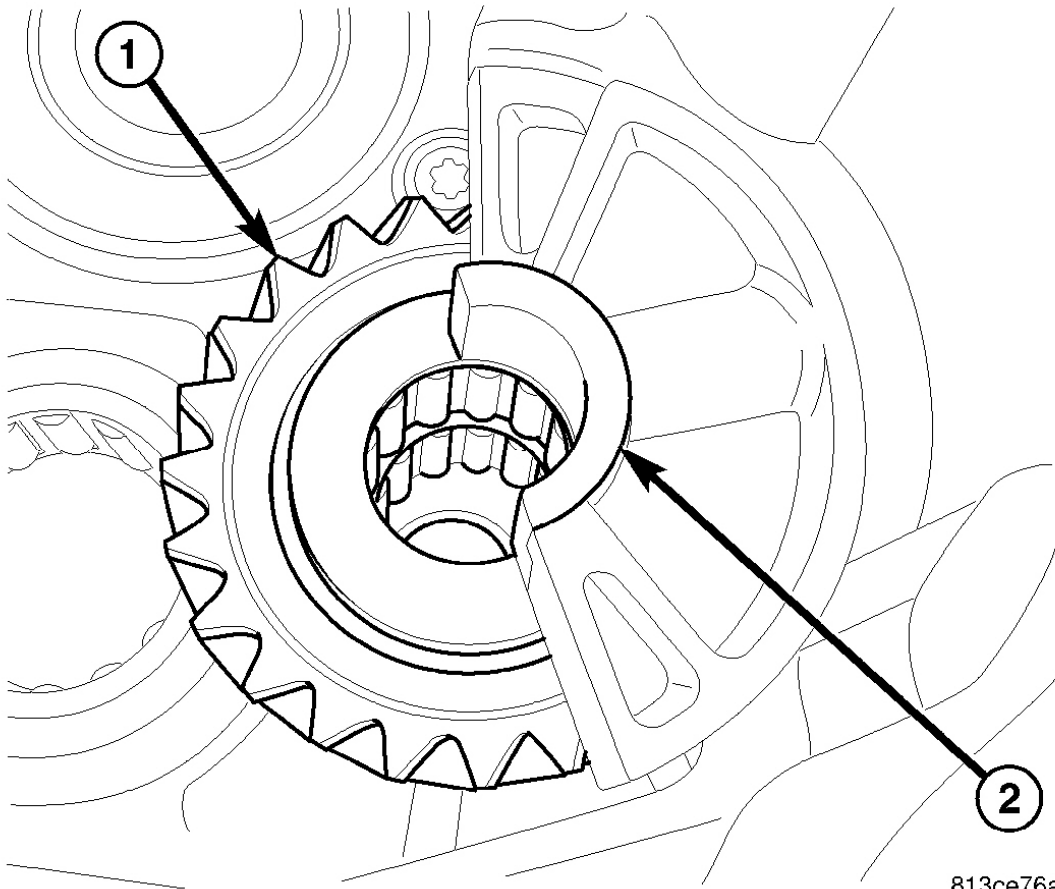


Fig. 52: Pull Idler Shaft
Courtesy of CHRYSLER LLC

2. Thread idler gear shaft bolt (1) into the shaft (2). Then work shaft (2) out of the idler gear.



813ce76a

Fig. 53: Idler Gear & Shaft Support
Courtesy of CHRYSLER LLC

3. Remove reverse idler gear (1) shaft support (2).

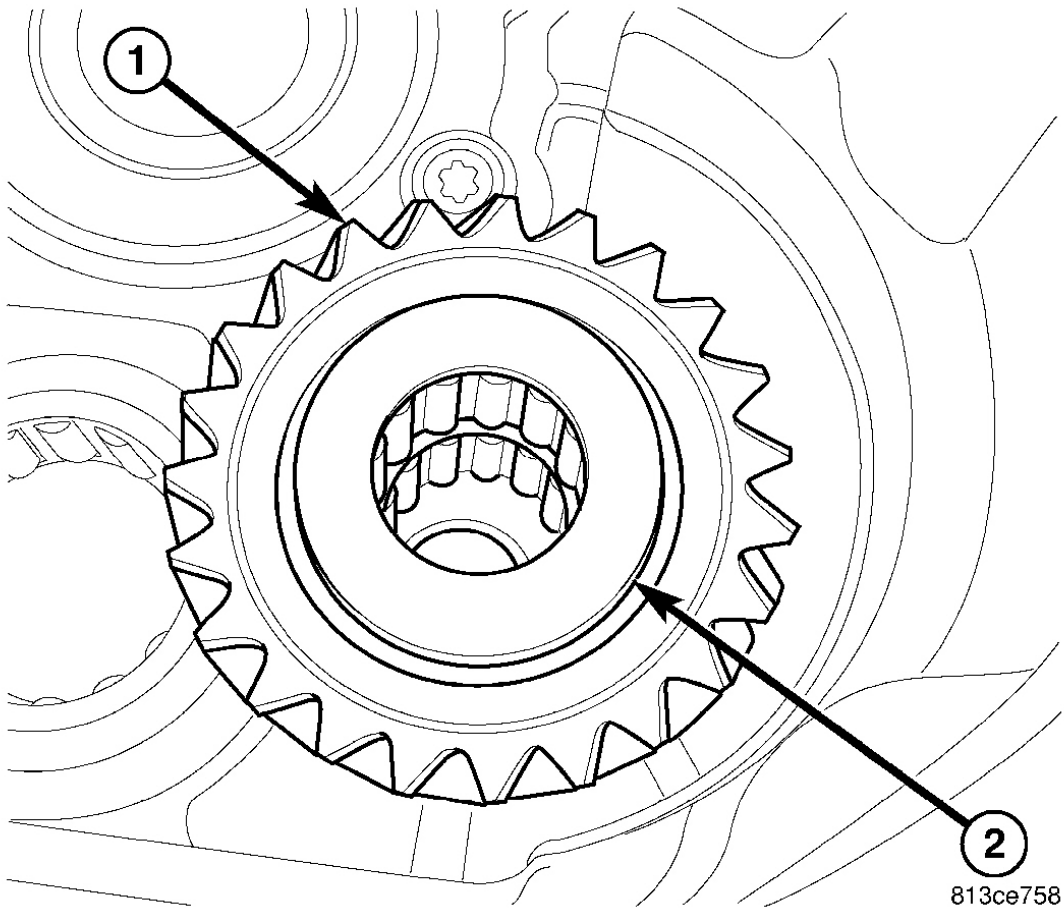
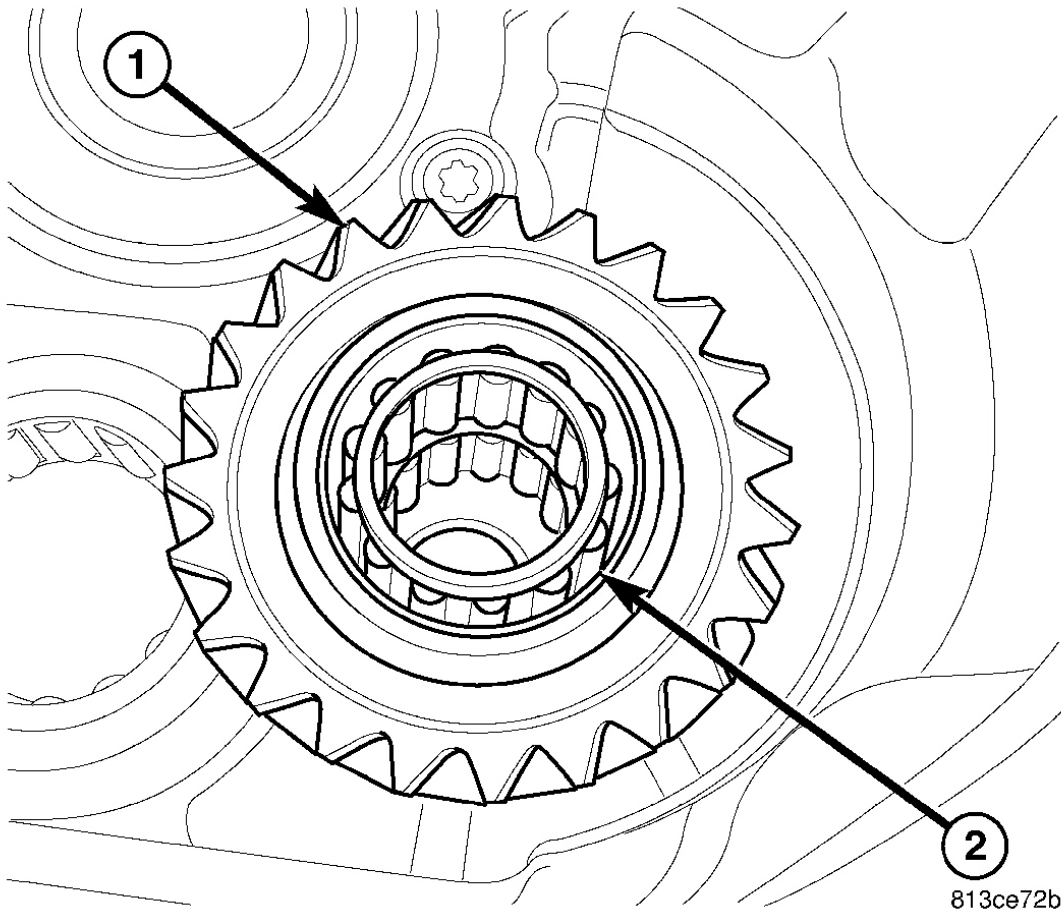


Fig. 54: Idler Gear & Thrust Washer
Courtesy of CHRYSLER LLC

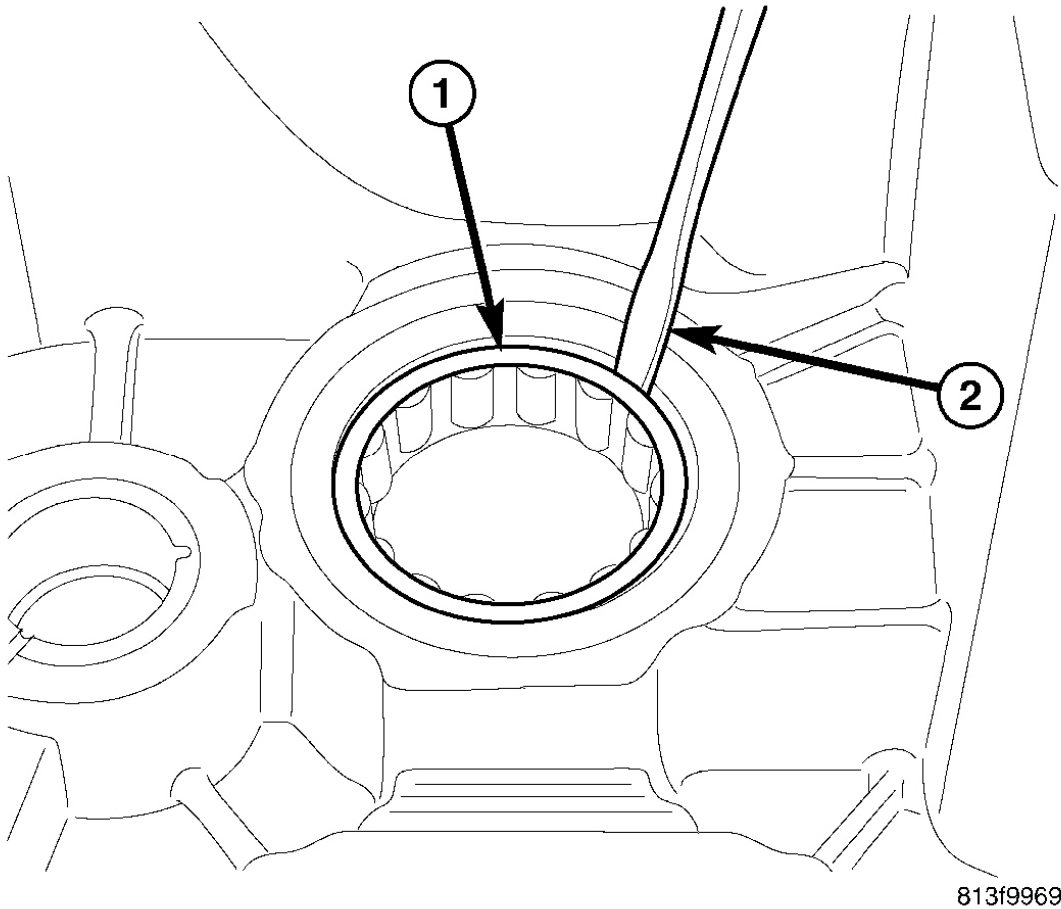
4. Remove reverse idler gear (1) thrust washer (2).



813ce72b

Fig. 55: Idler Gear & Bearing
Courtesy of CHRYSLER LLC

5. Remove reverse idler gear (1) and bearing (2).



813f9969

Fig. 56: Bearing Cage
Courtesy of CHRYSLER LLC

6. Break plastic countershaft roller bearing cage (1) with a screw driver (2). Then remove cage and roller bearing.

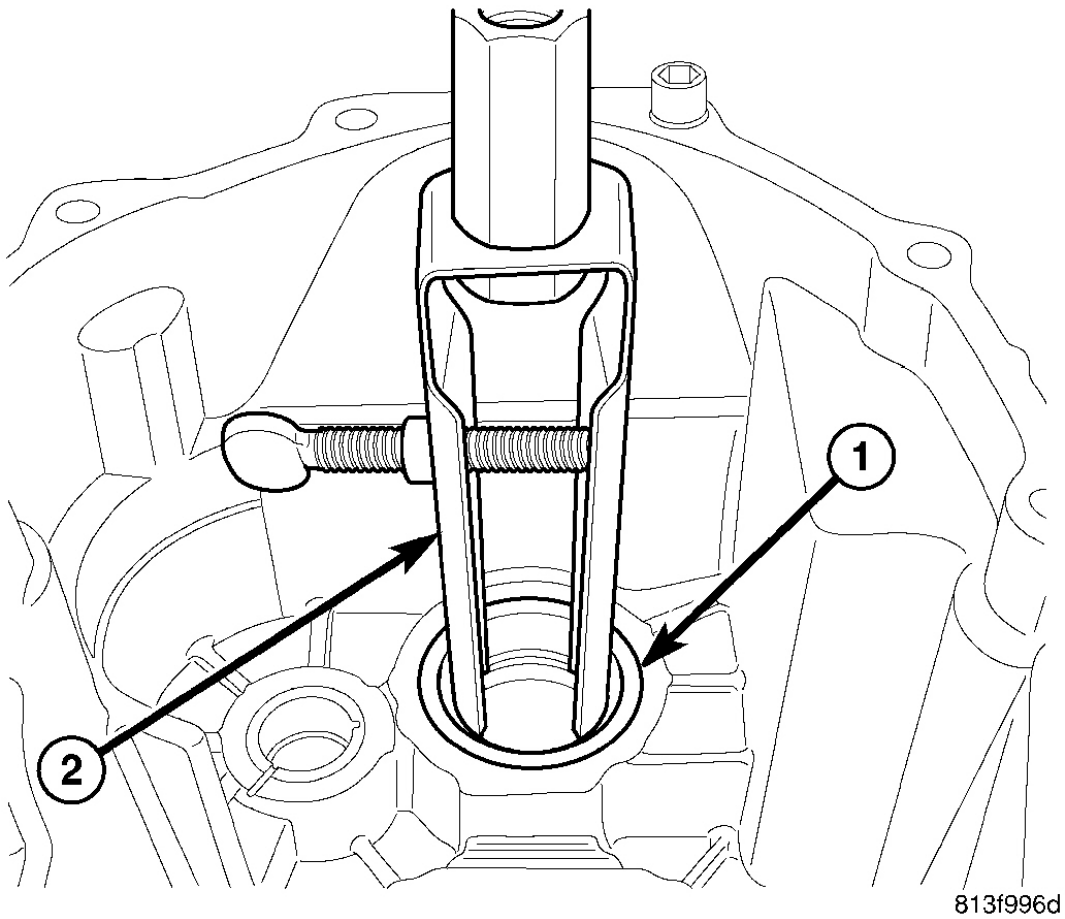
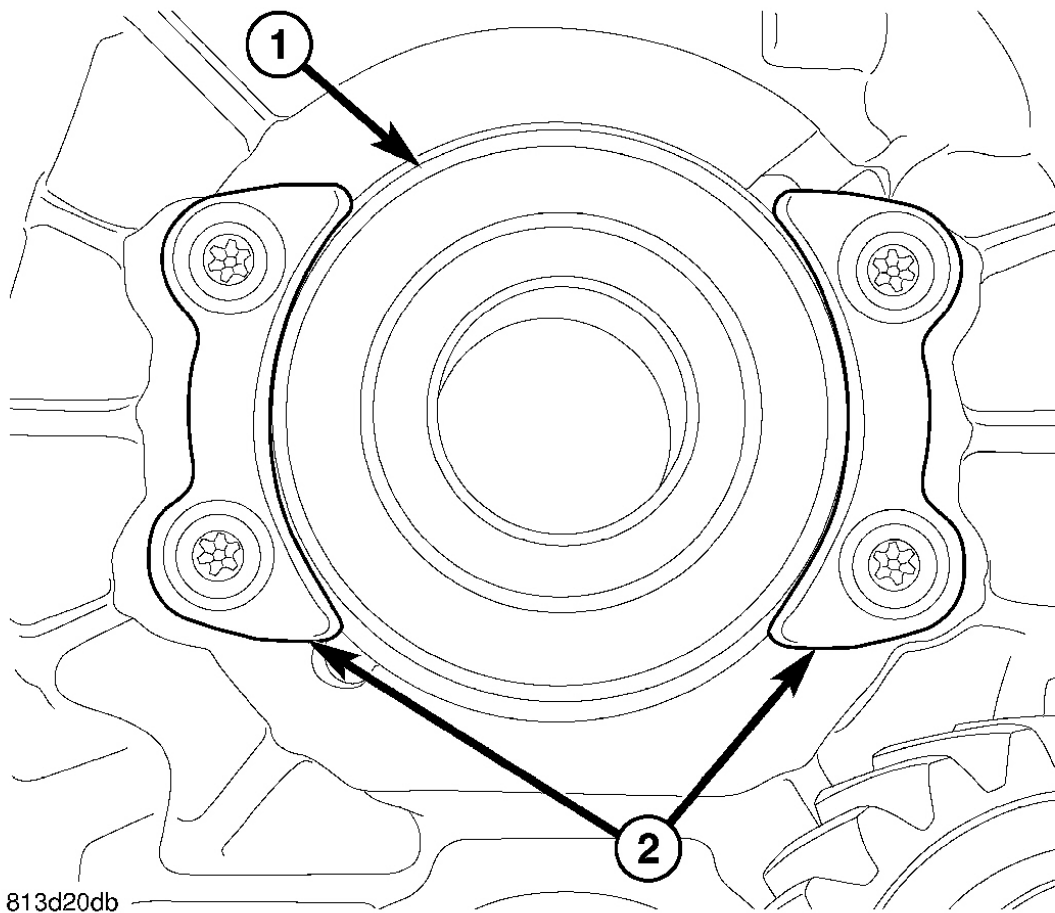


Fig. 57: Bearing Shell Puller
Courtesy of CHRYSLER LLC

7. Remove countershaft roller bearing shell (1) from the rear housing with Remover 7794-A (2) and Slide Hammer C-637.



813d20db

Fig. 58: Rear Mainshaft Bearing Retainer
Courtesy of CHRYSLER LLC

8. Remove mainshaft bearing (1) retainer bolts and remove retainers (2).
9. Remove bearing from housing with a hammer and driver.

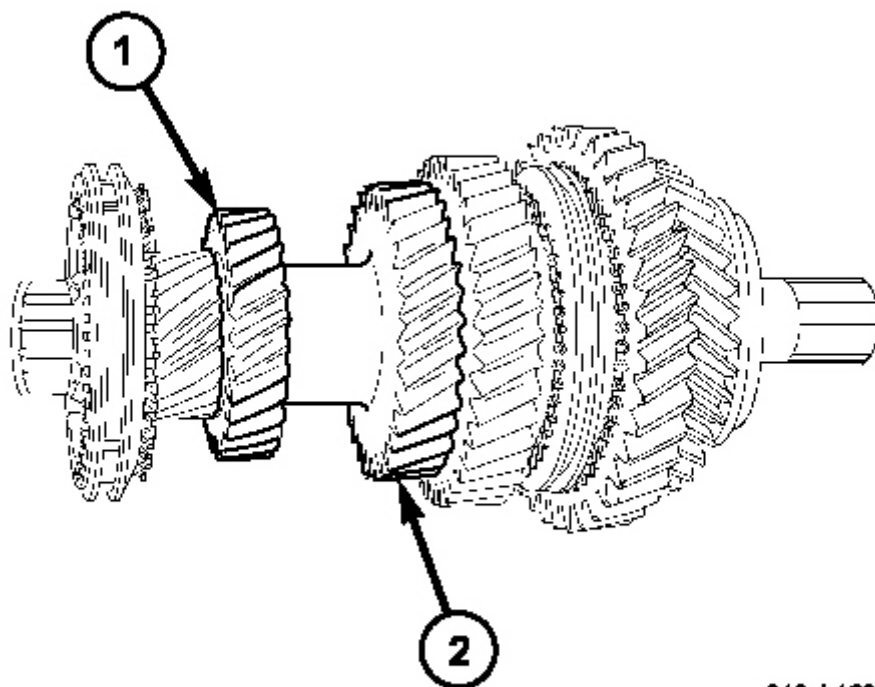
CLEANING

MANUAL TRANSMISSION - NSG370

Clean gears, shafts, shift components and transmission housings with a standard parts cleaning solvent. Do not use acid or corrosive base solvents. Dry all parts except bearings with compressed air.

Clean shaft bearings with a mild solvent such as Mopar™ degreasing solvent or similar solvents. Do not dry the bearings with compressed air. Allow the bearings to either air dry or wipe them dry with clean shop towels.

INSPECTION



813cb160

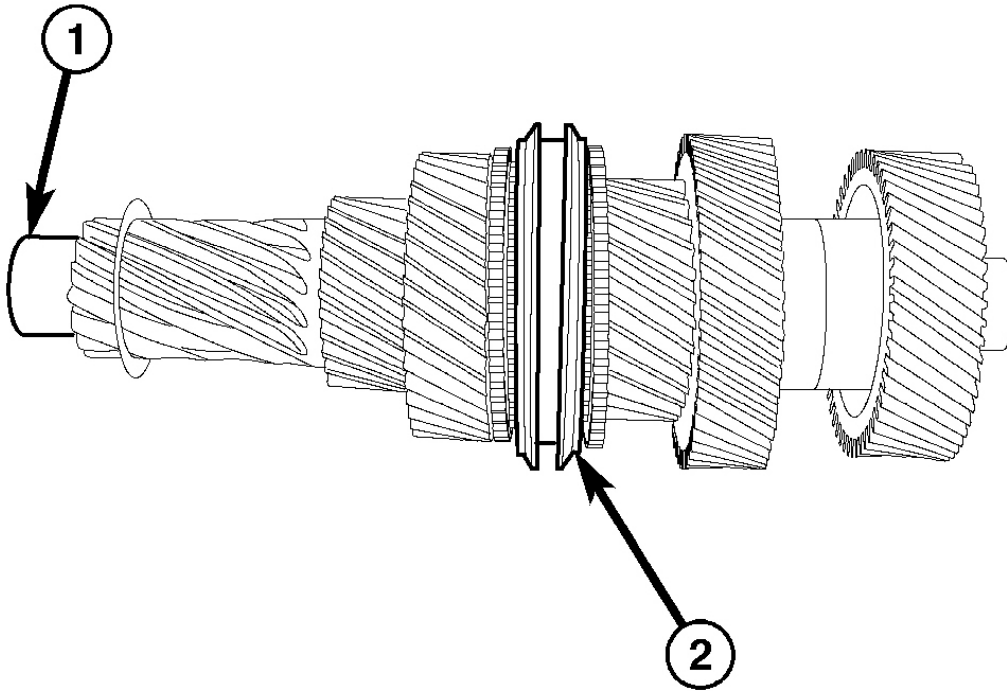
Fig. 59: Mainshaft
Courtesy of CHRYSLER LLC

NOTE: Minor corrosion, nicks, or pitting can be smoothed with 400 grit emery and polished out with crocus cloth.

Bearings: Inspect for worn, cracked, flat-spotted or brinnelled.

Gears: Inspect for worn, chipped or cracked teeth. Inspect bearing surfaces for ware or flat-spotted.

Mainshaft: Inspect for worn splines, snap ring grooves and threads. Inspect bearing surfaces for ware or flat-spotted. **Third gear (1) and fourth gear (2) are serviced with mainshaft only.**

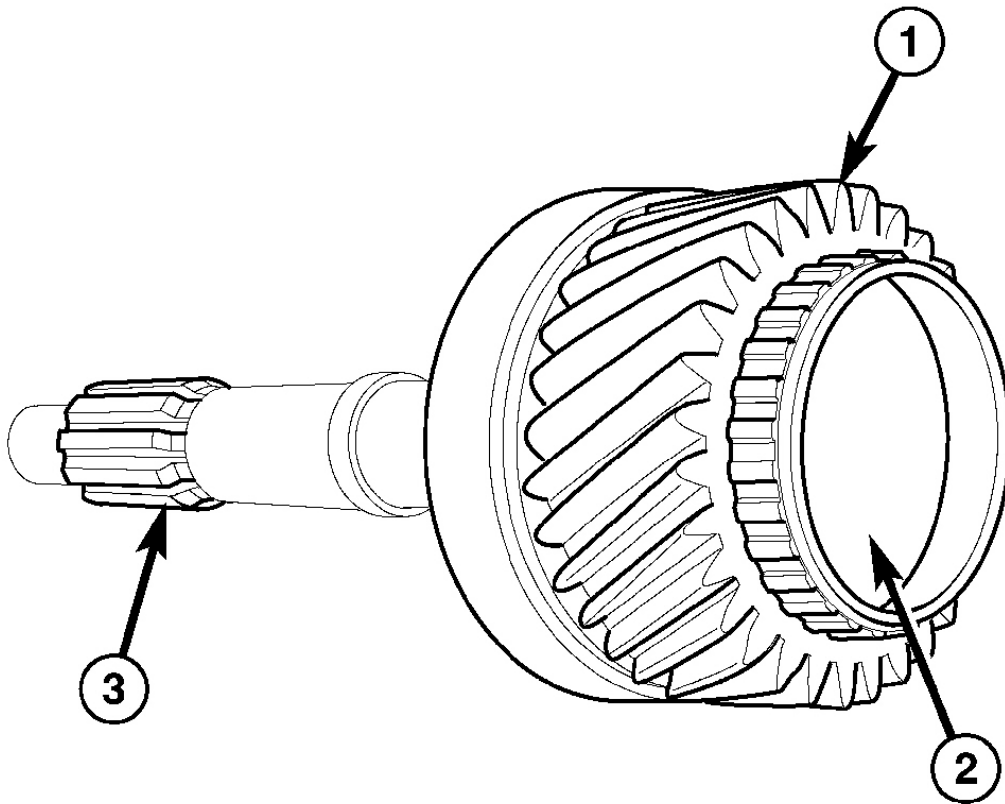


813c9828

Fig. 60: Identifying Bearing Surfaces & 3-4 Synchronizer Assembly
Courtesy of CHRYSLER LLC

Countershaft: Inspect for worn, chipped or cracked teeth. Inspect bearing surfaces (1) for wear or flat-spots. Inspect 3-4 synchronizer assembly (2). Inspect oil slinger for cracks. **The countershaft is serviced as an assembly.**

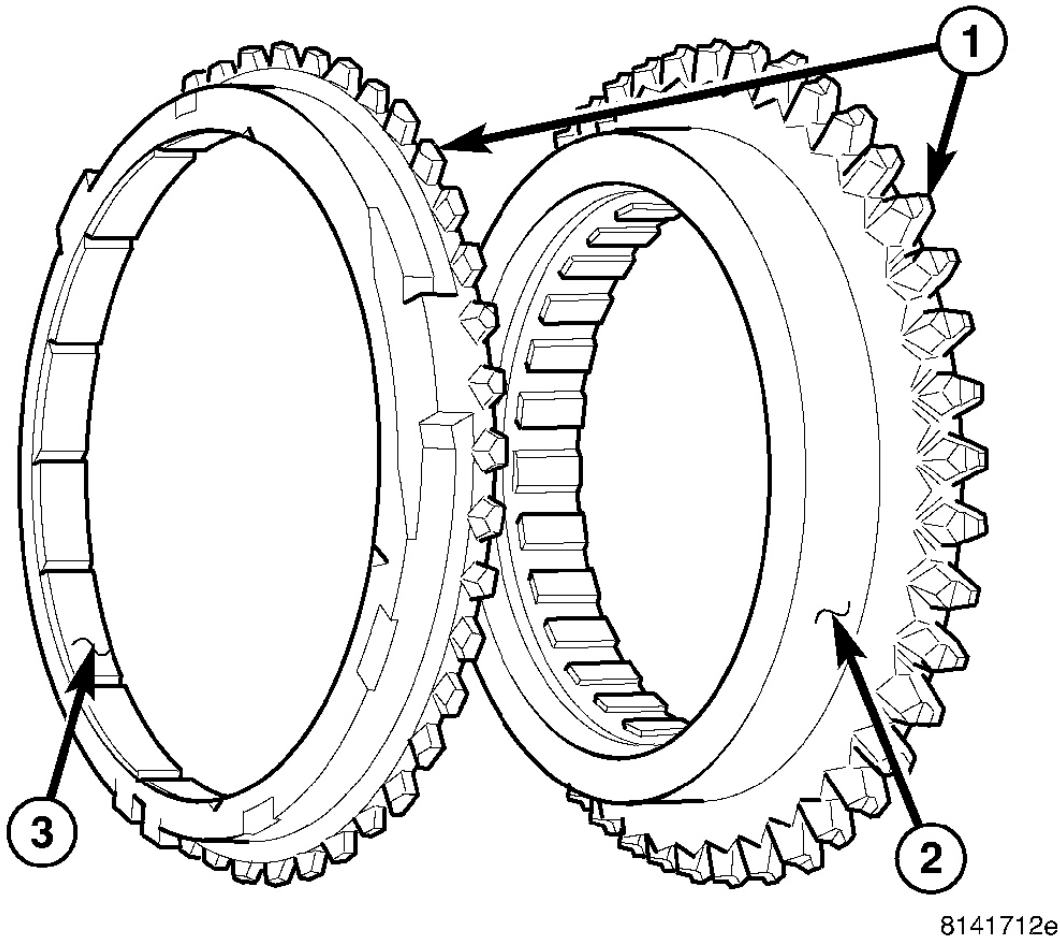
Oil Slinger: Inspect first/reverse oil slinger for cracks.



814170a3

Fig. 61: Input Shaft
Courtesy of CHRYSLER LLC

Input Shaft: Inspect for worn, chipped or cracked teeth (1). Inspect bearing surface (2) for wear or flat-spots. Inspect for worn splines (3).



8141712e

Fig. 62: Synchronizer Rings
Courtesy of CHRYSLER LLC

Synchronizer components: Inspect for worn, chipped or cracked teeth (1) and burned friction surface (2) or flaking off friction material (3). **Synchronizers are serviced as an assembly. 3-4 synchronizer assembly is serviced with countershaft.**

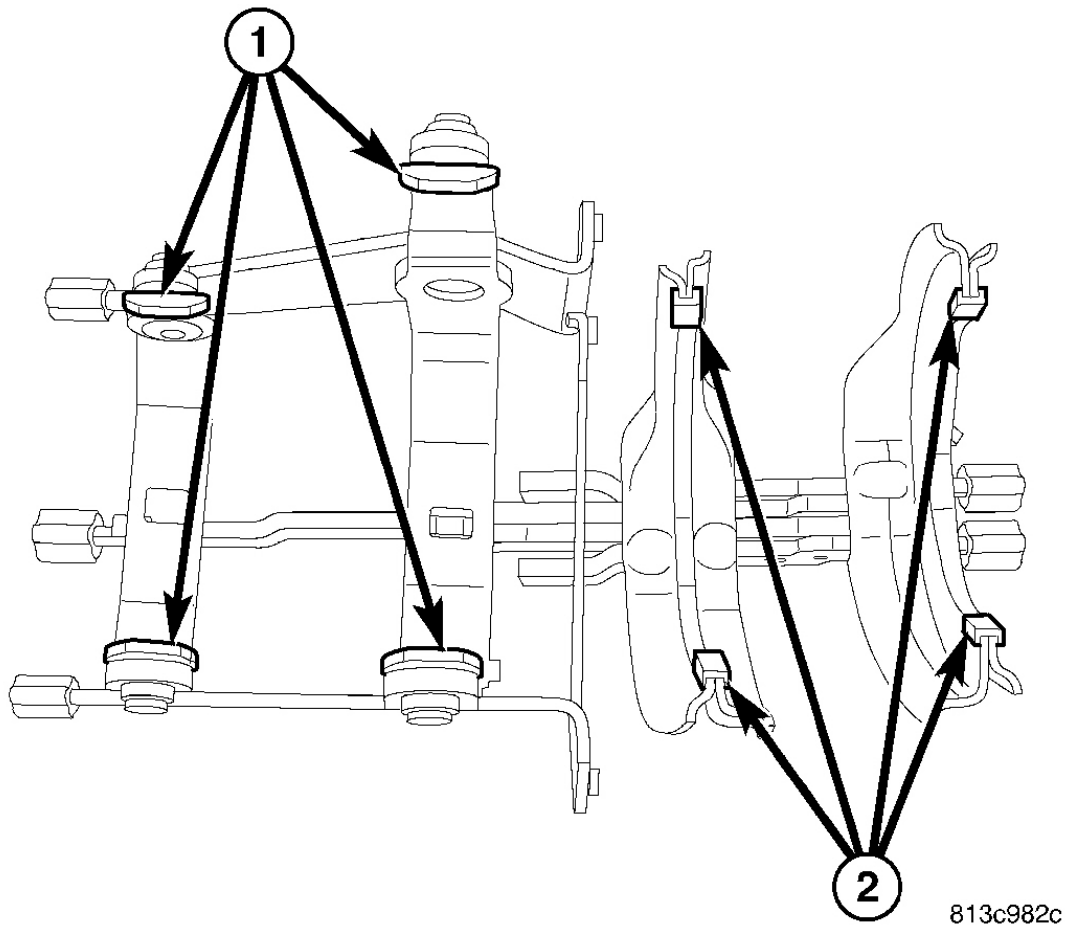
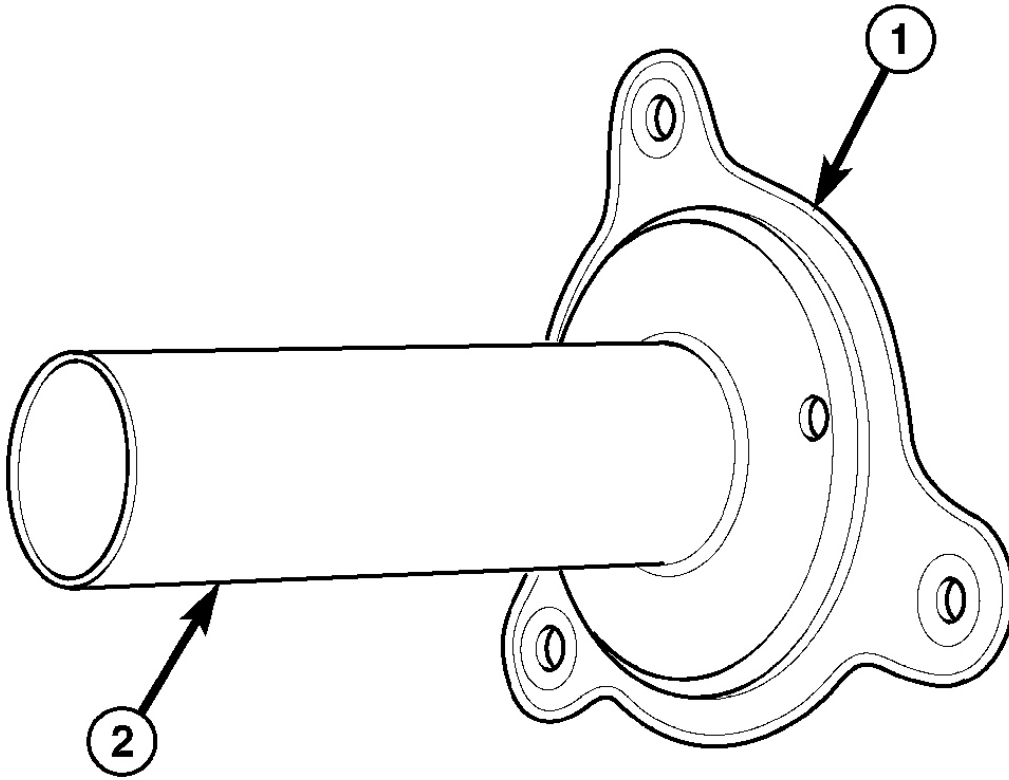


Fig. 63: Shift Forks
Courtesy of CHRYSLER LLC

Shift forks: Inspect shift forks and shoes (1) for wear and distortion. Check fit of fork shoes in synchronizer sleeve to ensure parts fit and work smoothly, replace if necessary. If shift fork pads (2) are worn, the shift fork must be replaced.

Housing/Tail housing: Inspect sealing and mating surfaces are free of burrs and nicks. Inspect alignment dowels are tight and in good condition.



81416ff3

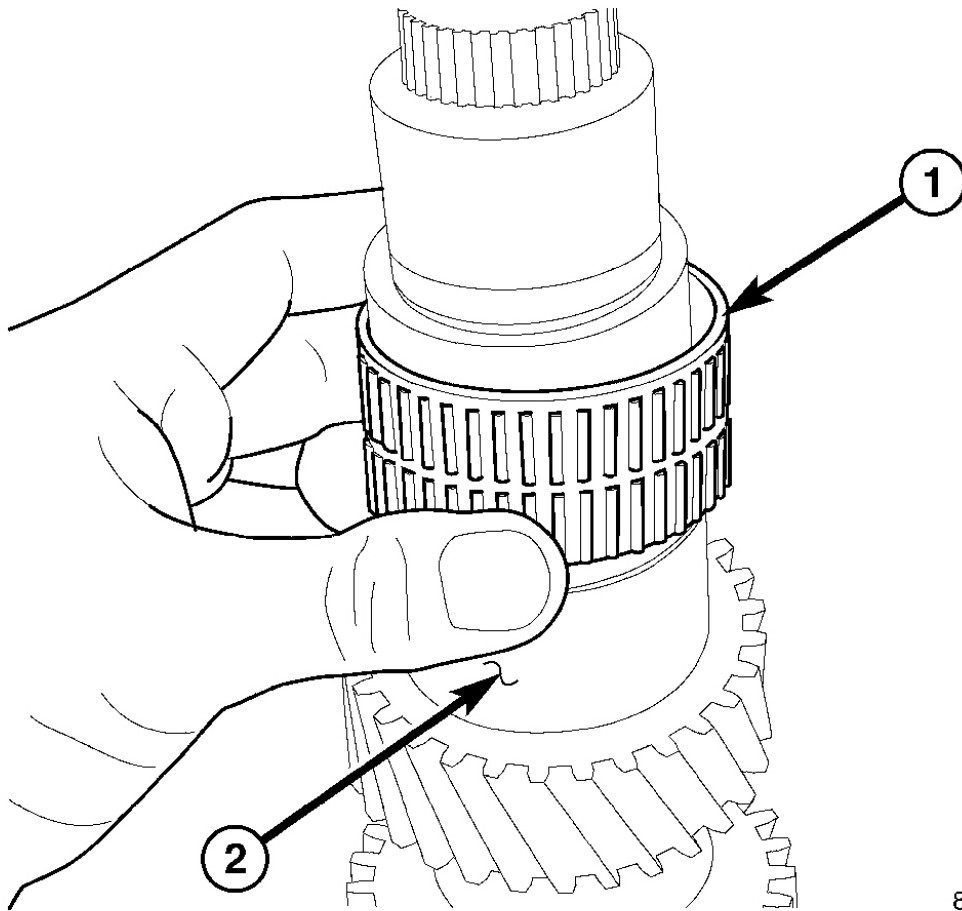
Fig. 64: Identifying Retainer Input Shaft
Courtesy of CHRYSLER LLC

Input Shaft Retainer: Inspect retainer (1) release bearing slide surface (2).

ASSEMBLY

MANUAL TRANSMISSION - NSG370

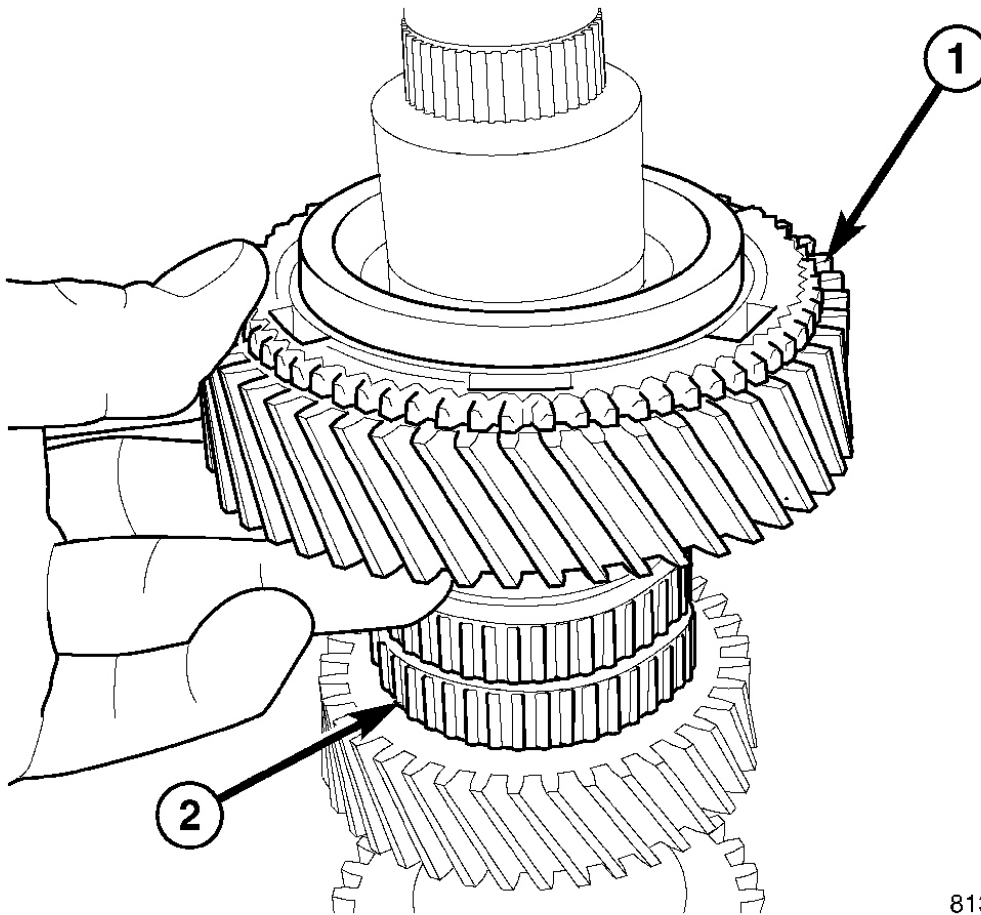
MAINSHAFT



813c9c6e

Fig. 65: Second Gear Bearing
Courtesy of CHRYSLER LLC

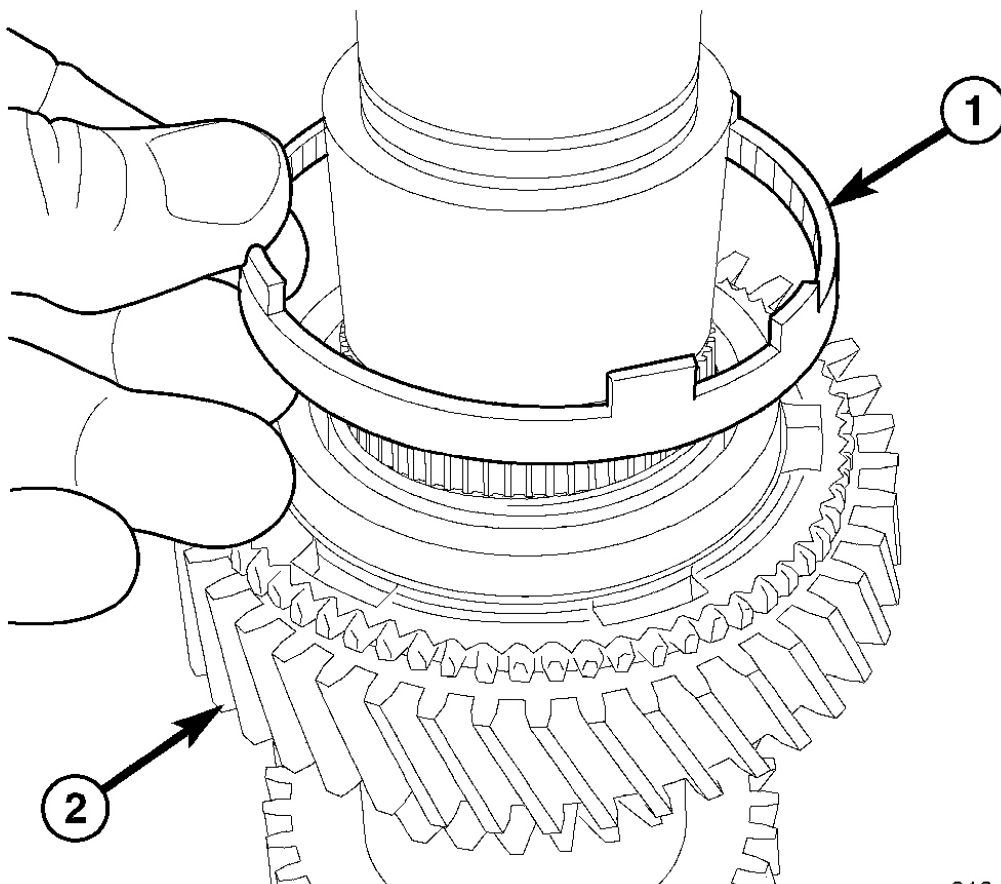
1. Place mainshaft in Fixture 9648 mounted in a vise.
2. Install second gear bearing (1) on mainshaft (2).



813c9caa

Fig. 66: Second Gear
Courtesy of CHRYSLER LLC

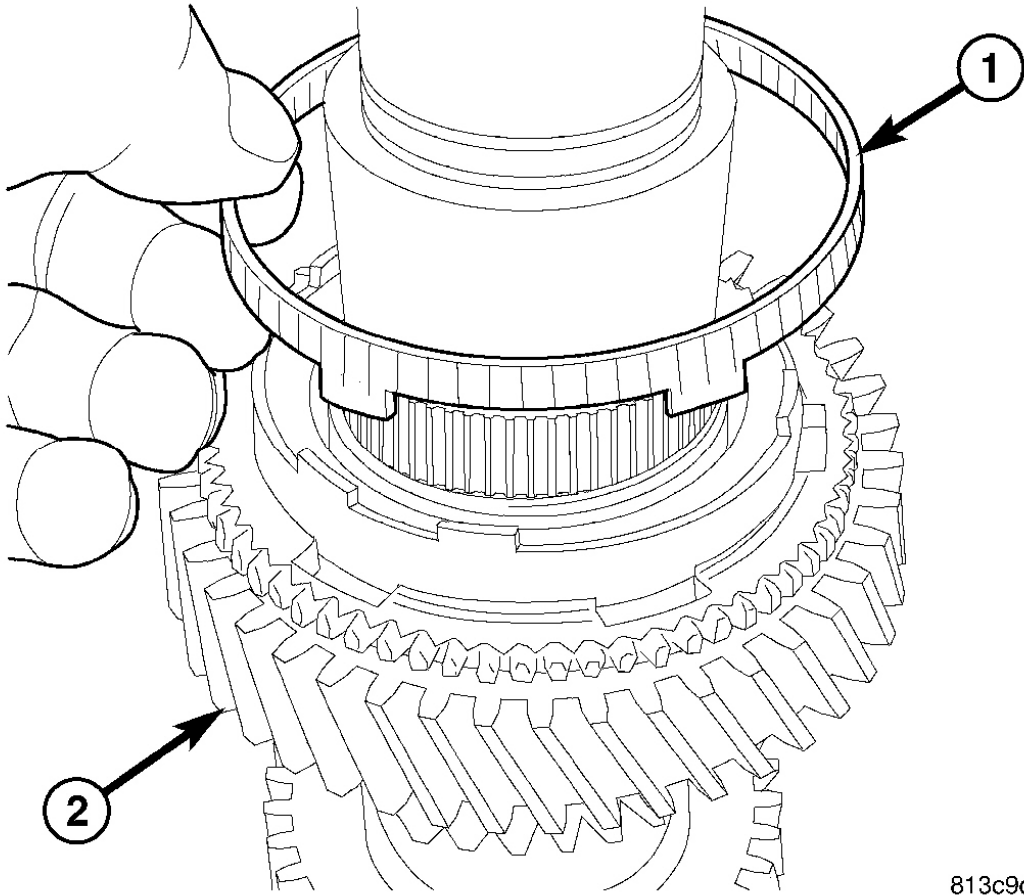
3. Install second gear (1) and bearing (2) on mainshaft.



813c9ce2

Fig. 67: 2nd Inner Friction Ring
Courtesy of CHRYSLER LLC

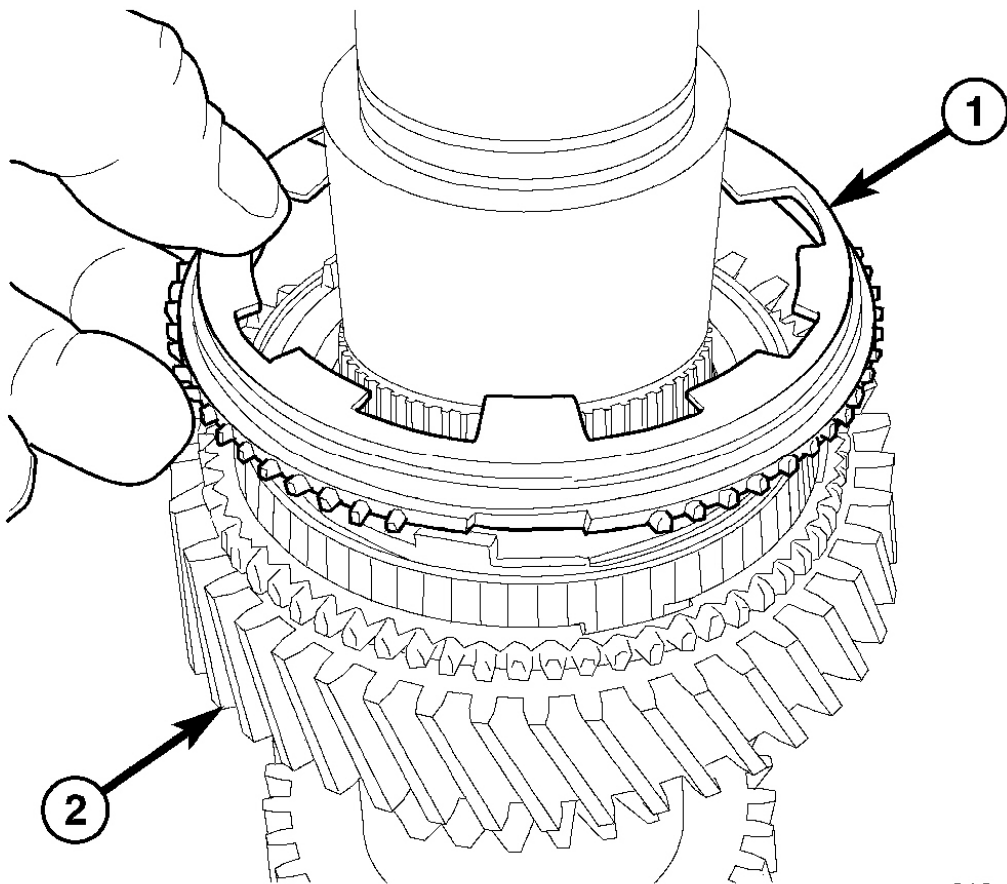
4. Install inner synchronizer friction ring (1) on second gear (2).



813c9d07

Fig. 68: 2nd Outer Friction Ring
Courtesy of CHRYSLER LLC

5. Install outer synchronizer friction ring (1) on second gear (2).



813c9d2c

Fig. 69: 2nd Blocker Ring
Courtesy of CHRYSLER LLC

6. Install synchronizer blocker ring (1) on second gear (2).

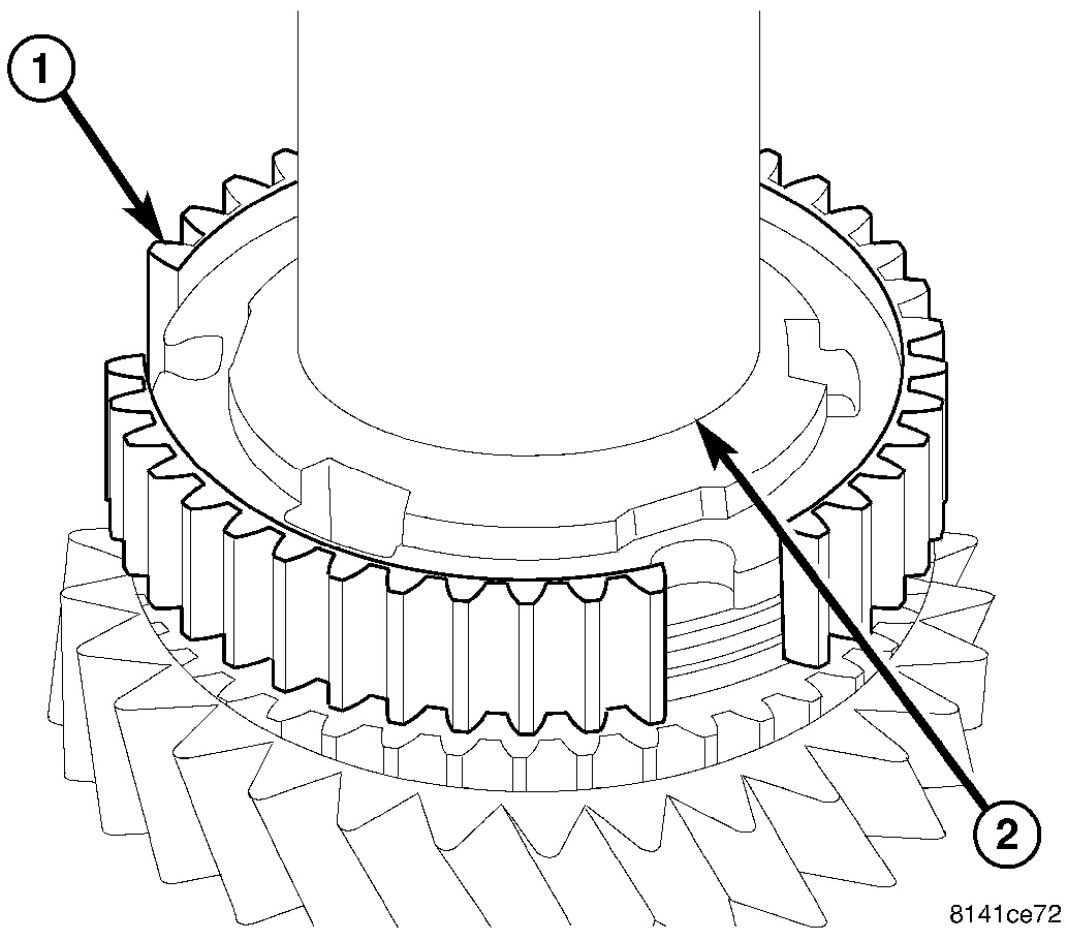


Fig. 70: 1-2 Synchro Hub Installer
Courtesy of CHRYSLER LLC

7. Install 1-2 synchronizer hub (1) with Installer 8228 (2) and a press. Align hub detent openings with synchronizer rings.

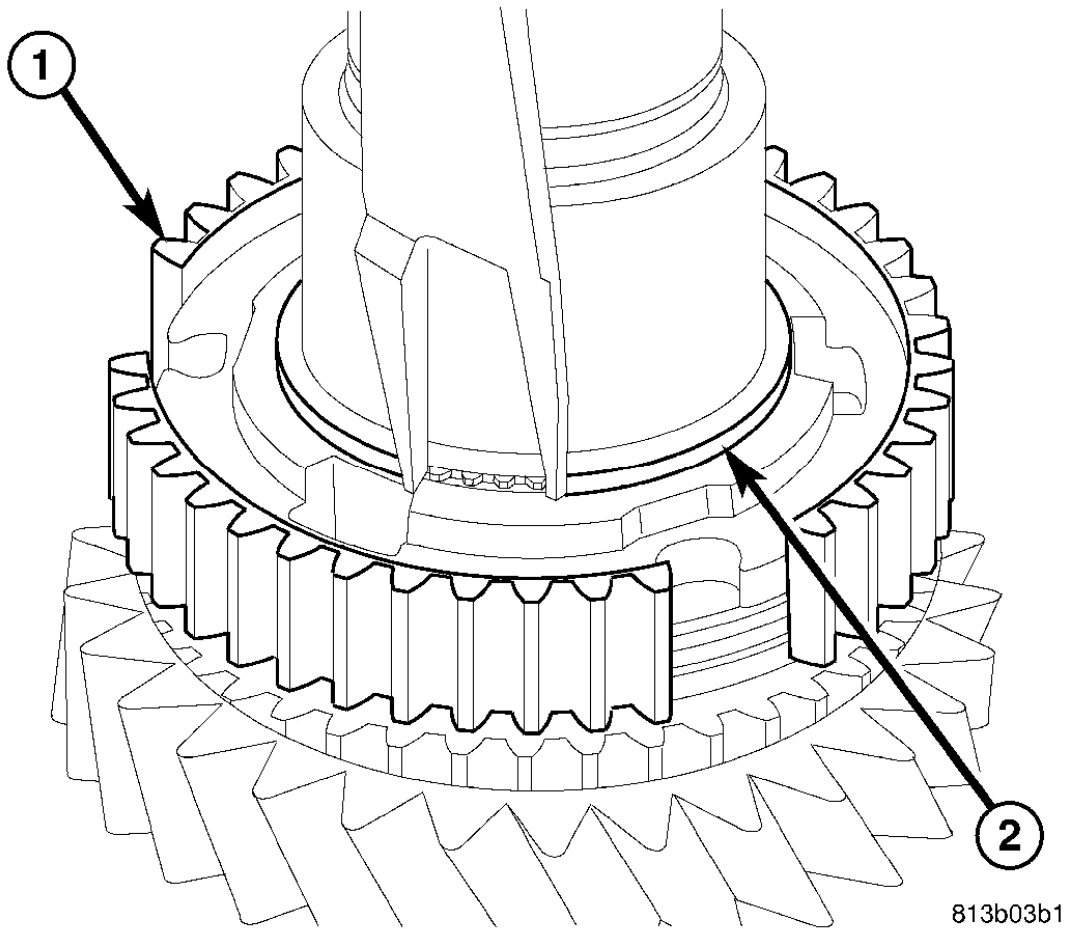
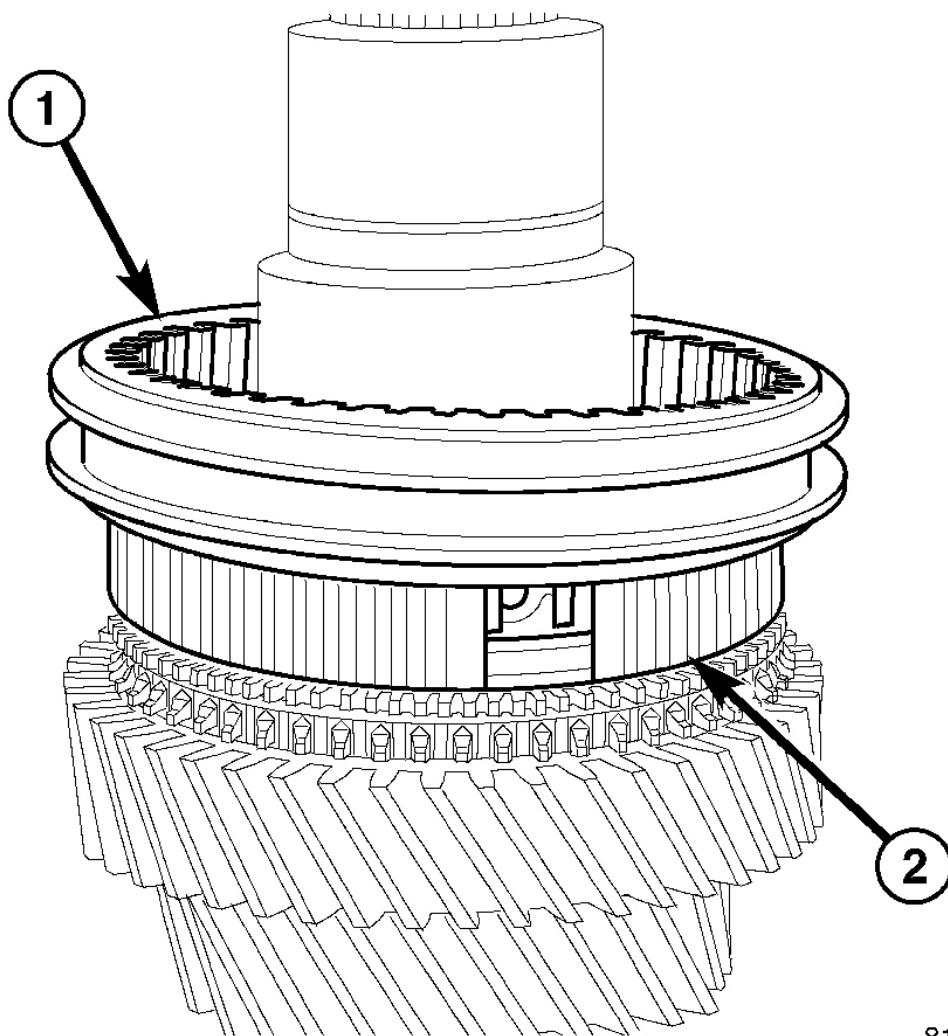


Fig. 71: Identifying 1-2 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

8. Install 1-2 synchronizer hub (1) snap ring (2).

NOTE: Reuse original snap ring or thickest ring that will fit.



813a98ab

Fig. 72: Identifying 1-2 Synchronizer Sleeve & Synchronizer Hub
Courtesy of CHRYSLER LLC

9. Install 1-2 synchronizer sleeve (1) and push to the bottom of the synchronizer hub (2).

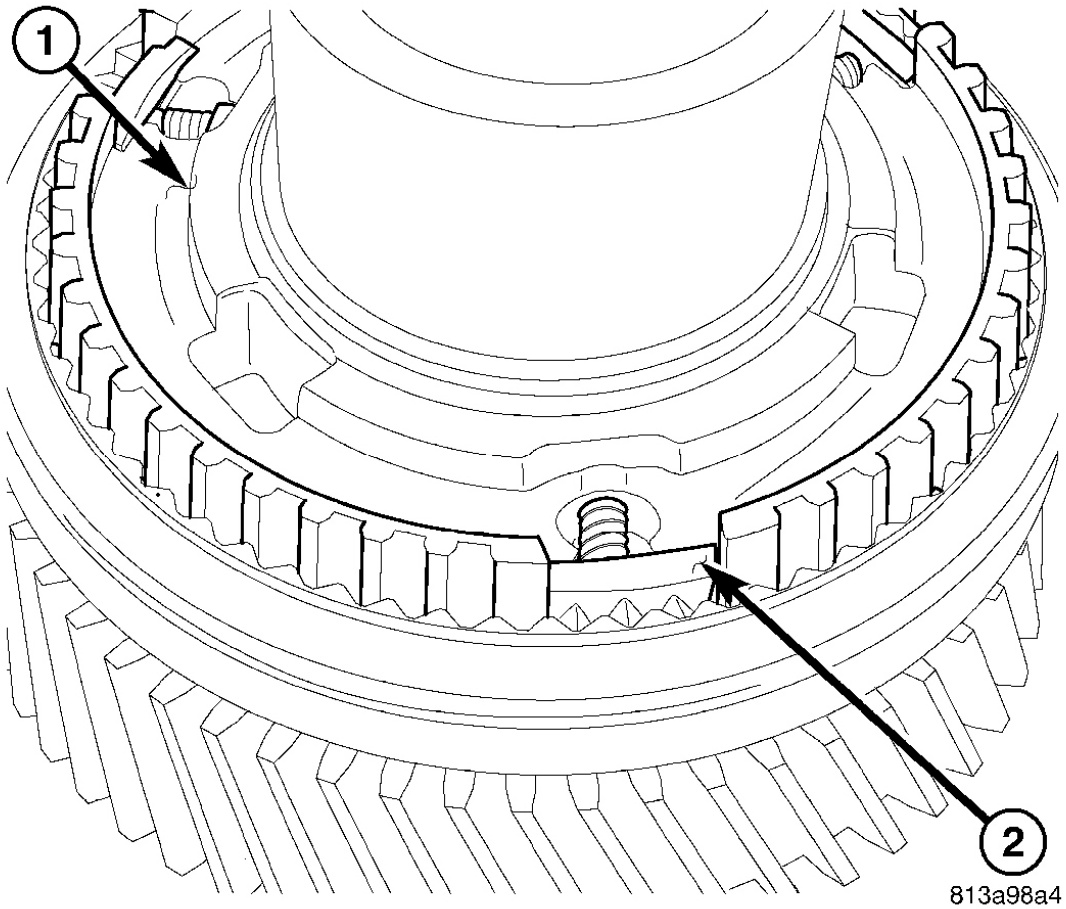


Fig. 73: Identifying Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

10. Install 1-2 synchronizer hub (1) detents, springs, and balls (2).

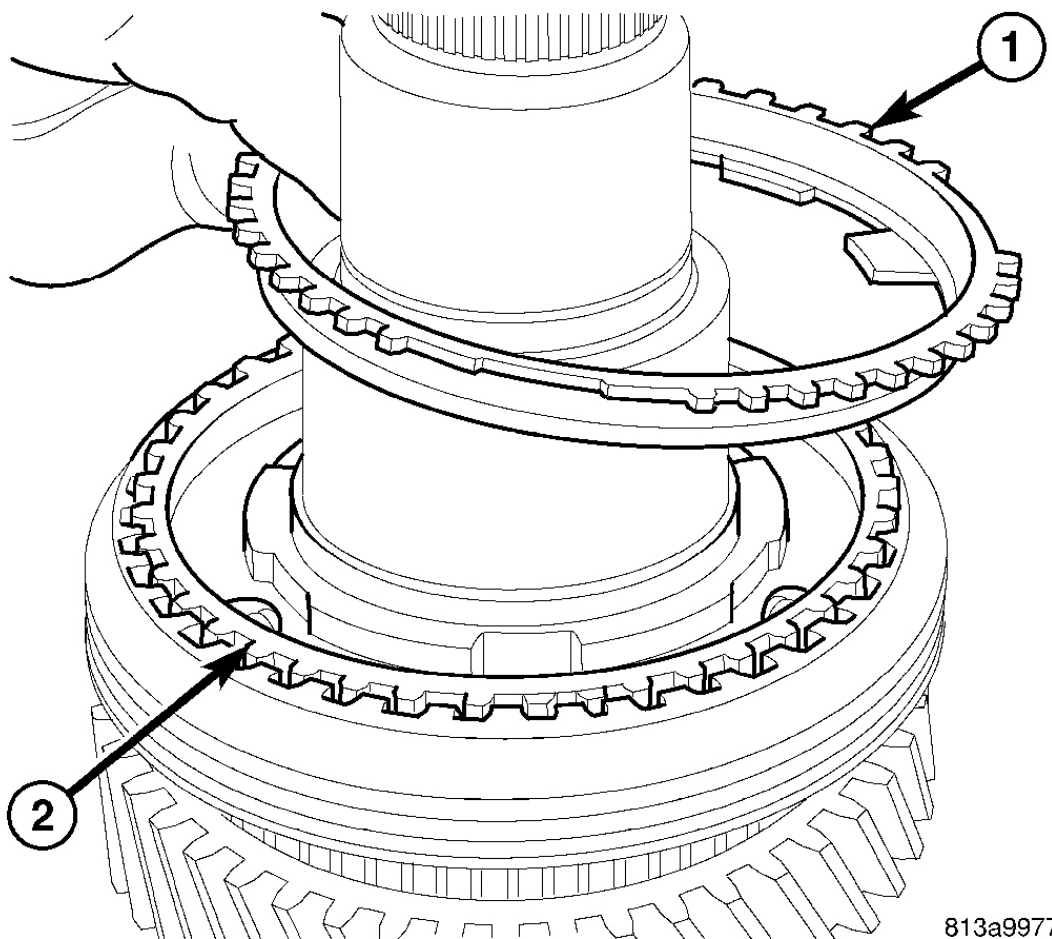


Fig. 74: First Gear Outer Blocker Ring
Courtesy of CHRYSLER LLC

11. Install first gear blocker ring (1) into synchronizer hub (2).

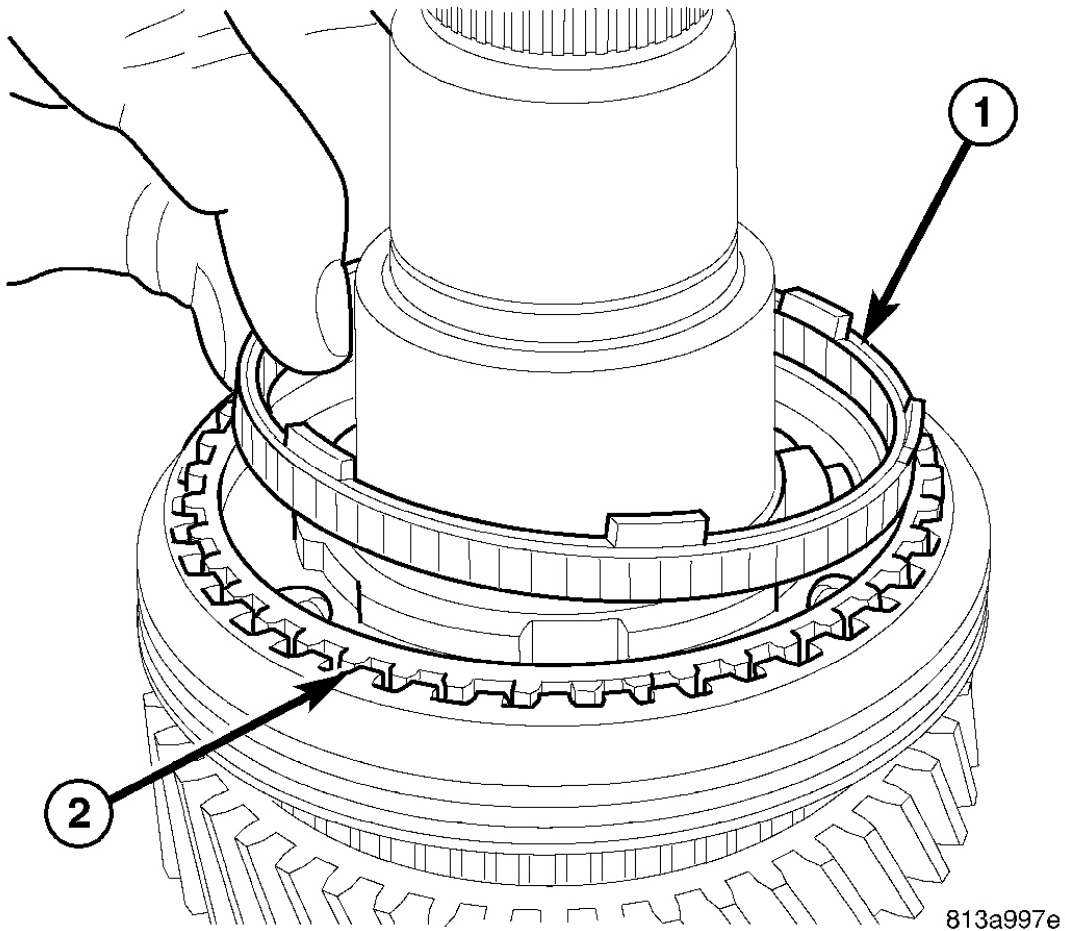
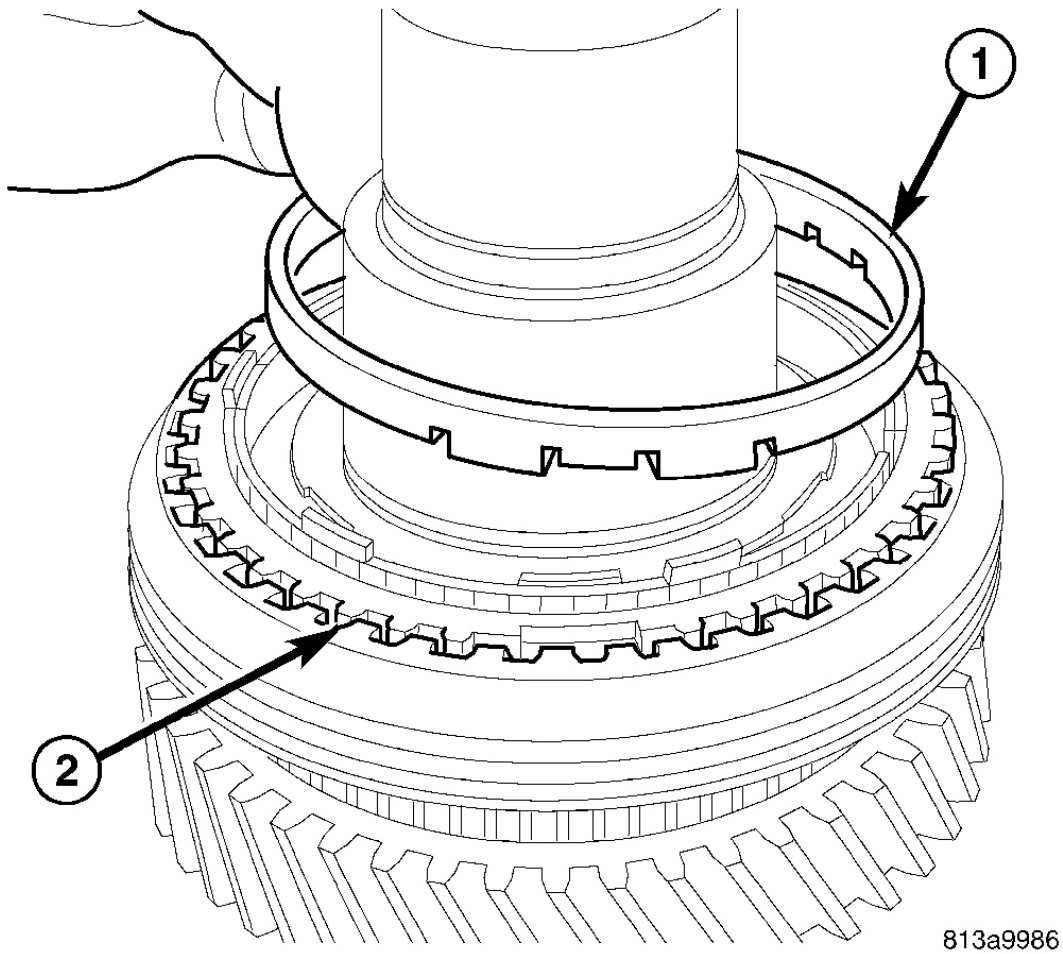


Fig. 75: First Gear Friction Ring
Courtesy of CHRYSLER LLC

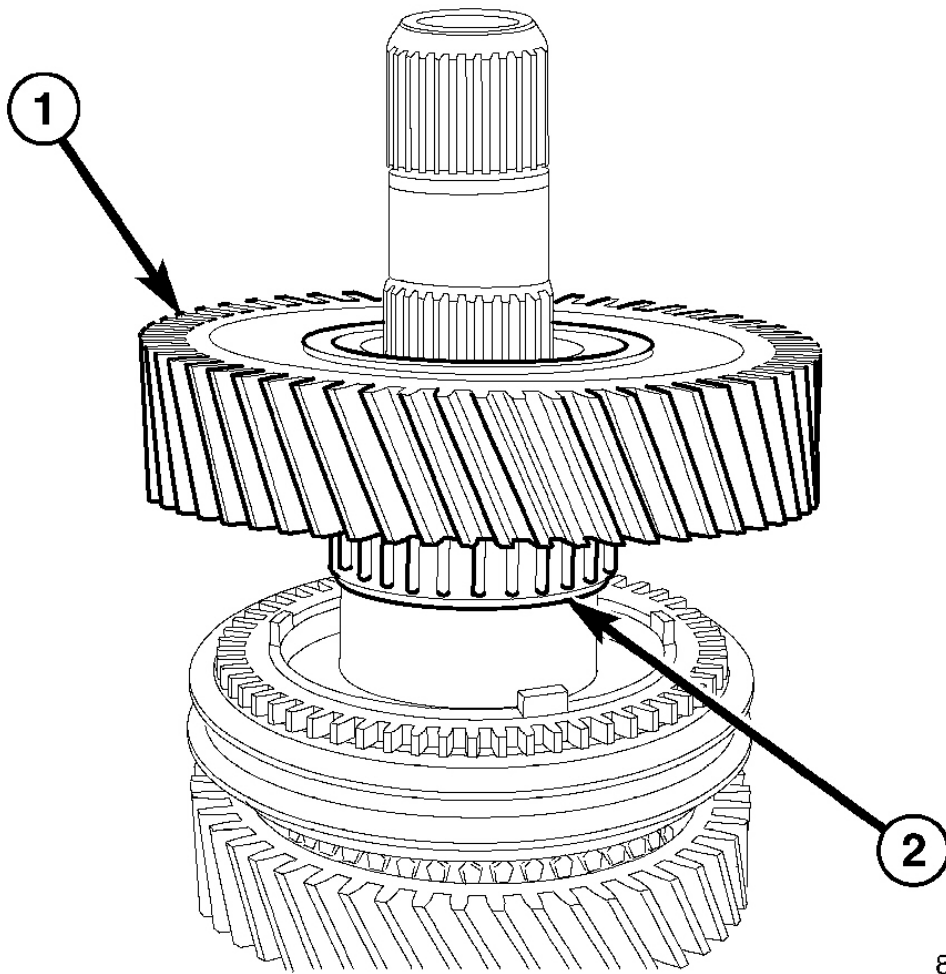
12. Install first gear outer friction ring (1) into synchronizer hub (2).



813a9986

Fig. 76: First Gear Inner Blocker Ring
Courtesy of CHRYSLER LLC

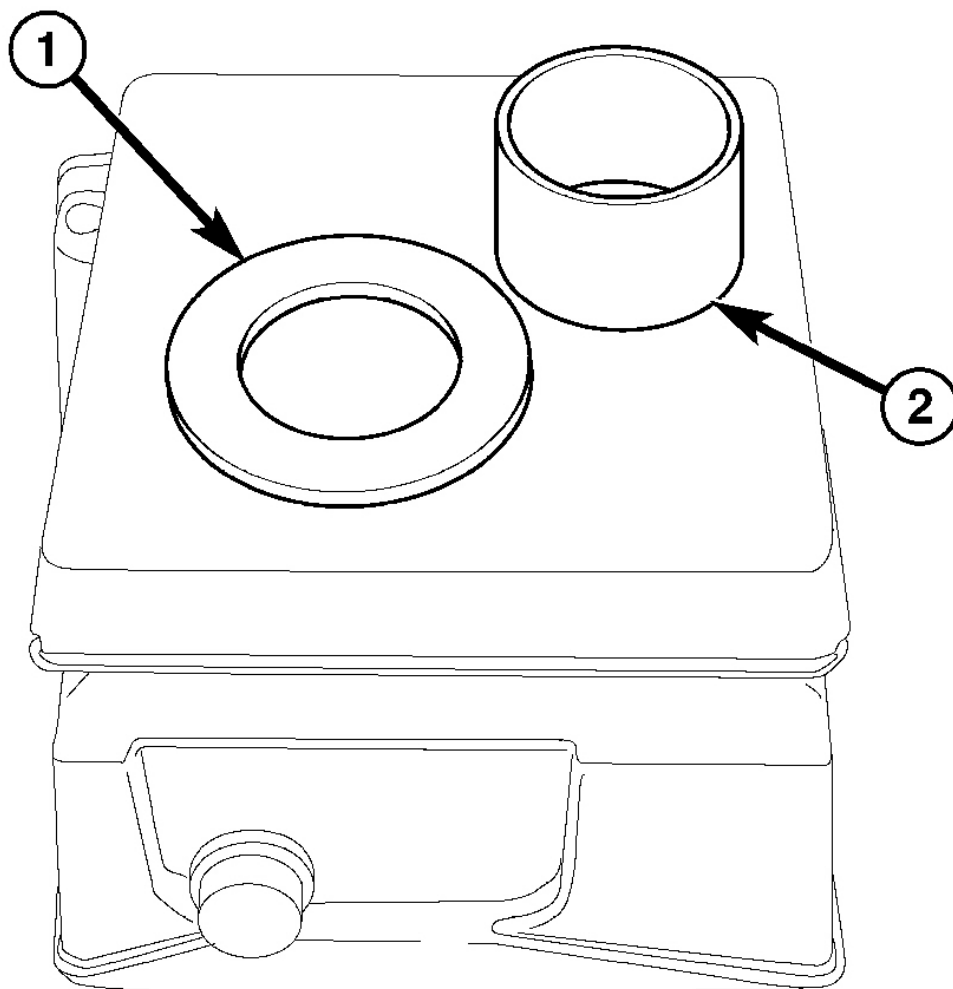
13. Install first gear inner friction ring (1) into synchronizer hub (2).



813c57d5

Fig. 77: 1st Gear & Bearing
Courtesy of CHRYSLER LLC

14. Install first gear (1) and bearing (2). Then center 1-2 synchronizer sleeve on synchronizer hub.



813eed6a

Fig. 78: Washer & Race
Courtesy of CHRYSLER LLC

WARNING: Use welding gloves when handling heated components. Failure to follow these instructions will result in personal injury.

CAUTION: A bearing heater is used to assemble first gear thrust washer (1) and reverse gear bearing race (2). Use only a bearing heater/hot plate and follow manufacture's instructions. Heat components to 100 - 177 Celsius (212° Min. - 350° Max Fahrenheit). Never use an open flame to heat components. Never leave components on heater for an extended amount of time. If component is discolored after heating, the component has been overheated and must not be used. Failure to

following these instructions will result in component damage.

15. Heat first gear thrust washer (1) and reverse gear bearing race (2) with bearing heater to maximum of 177 Celsius (350° Fahrenheit).

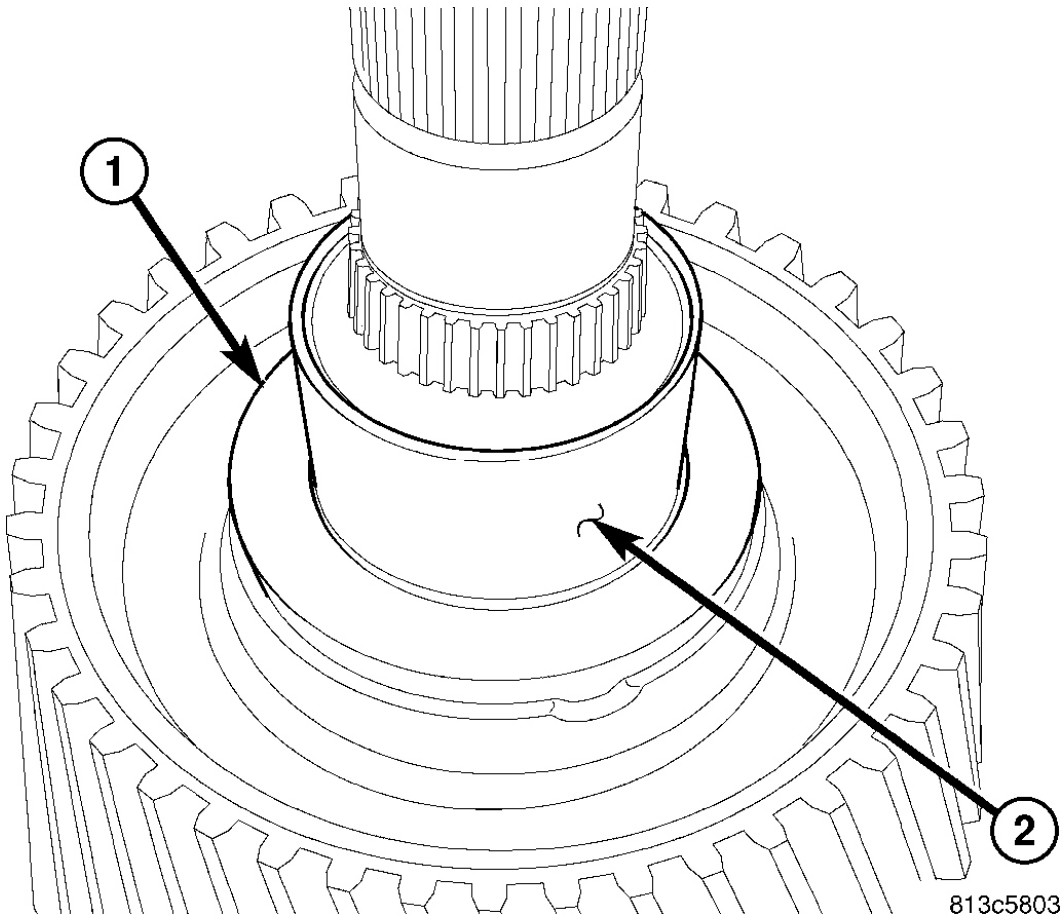


Fig. 79: Thrust Washer & Race
Courtesy of CHRYSLER LLC

16. Using welding gloves or tongs, install first gear thrust washer (1) then reverse gear bearing race (2).

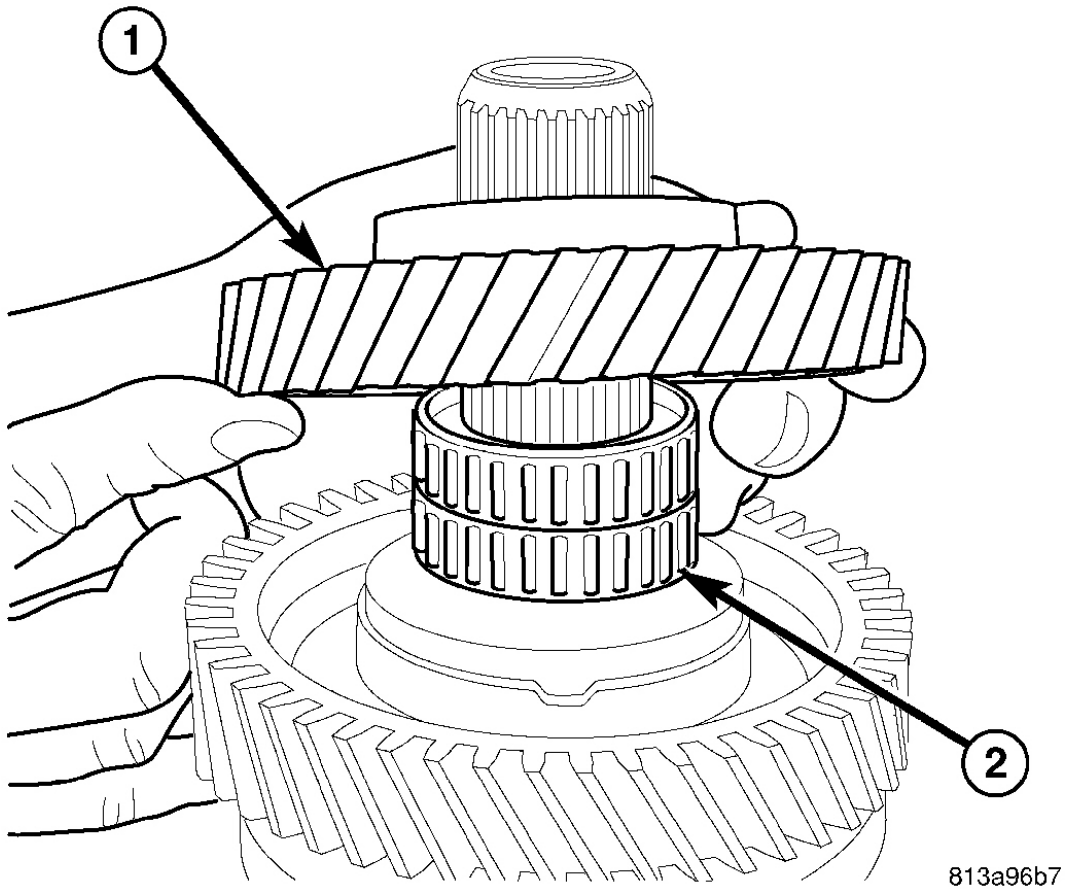


Fig. 80: Identifying Reverse Gear & Bearing
Courtesy of CHRYSLER LLC

17. Install reverse gear (1) and bearing (2).

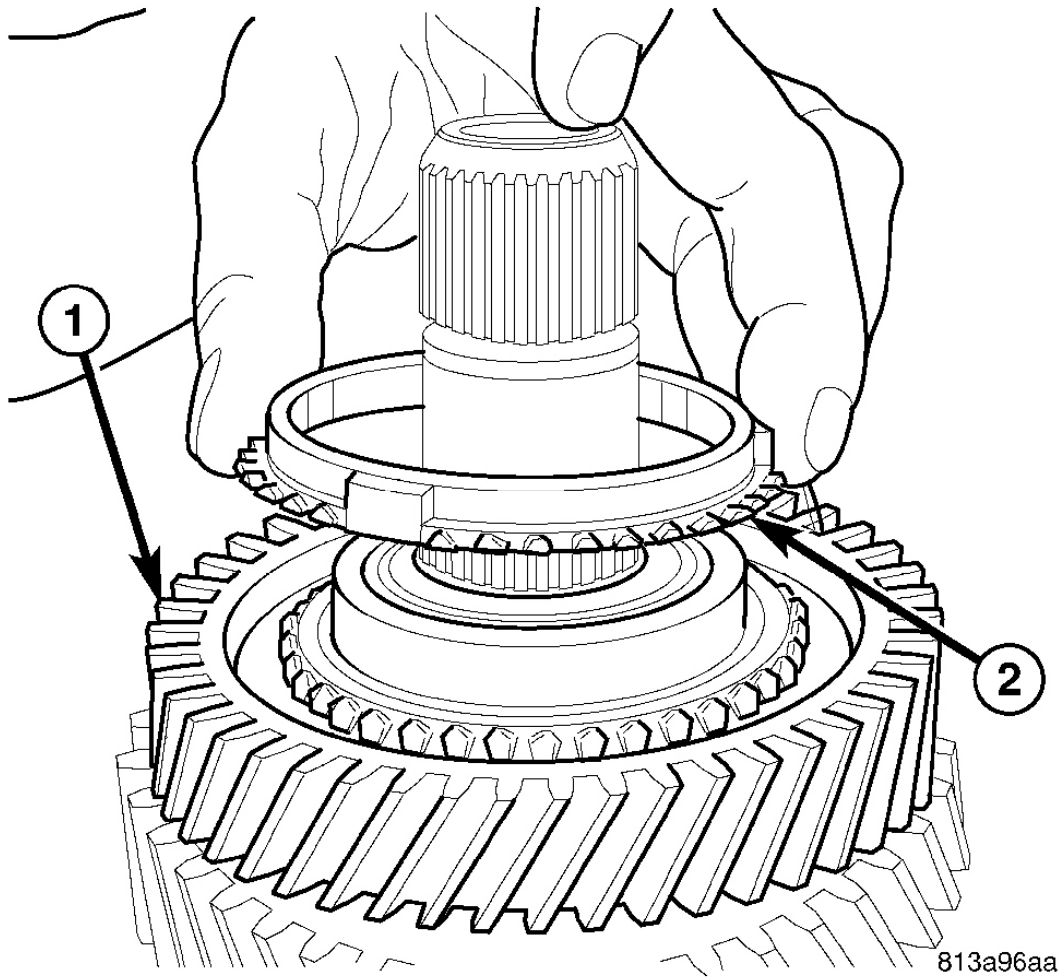
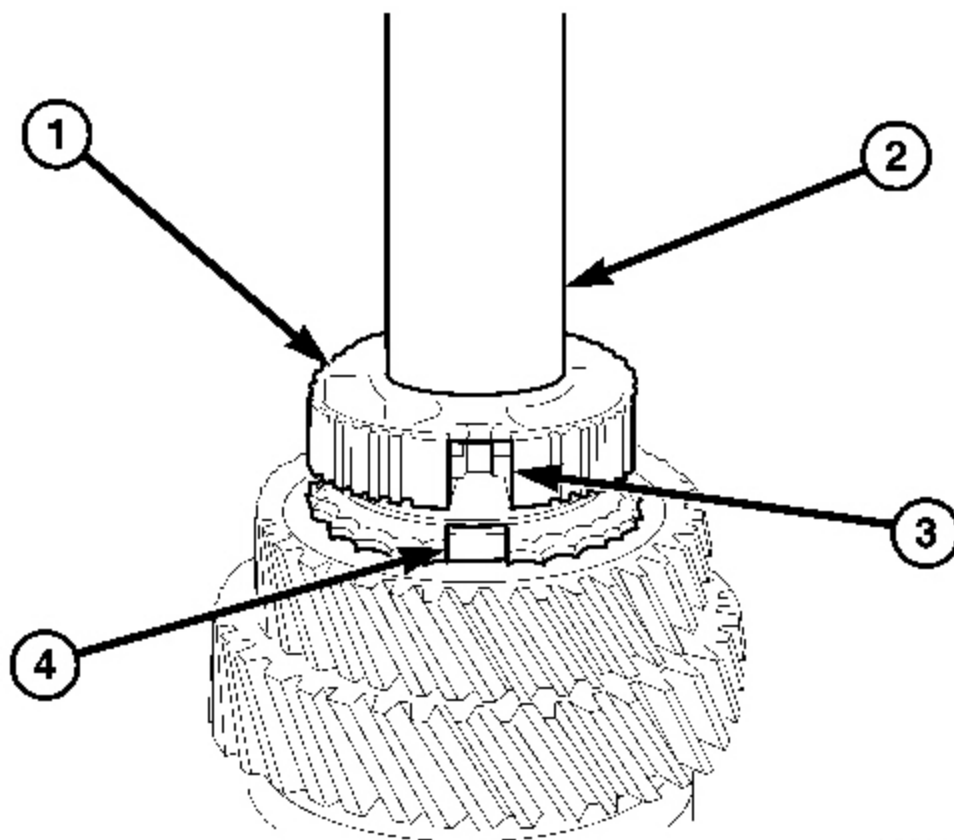


Fig. 81: Identifying Reverse Gear & Synchronizer Ring
Courtesy of CHRYSLER LLC

18. Install reverse gear (1) synchronizer friction ring (2).



81402631

Fig. 82: Reverse Hub Installer
Courtesy of CHRYSLER LLC

19. Install reverse gear synchronizer hub (1) on mainshaft with Installer W-262 (2) and a press. Align hub detent opening (3) with friction ring (4) lugs.

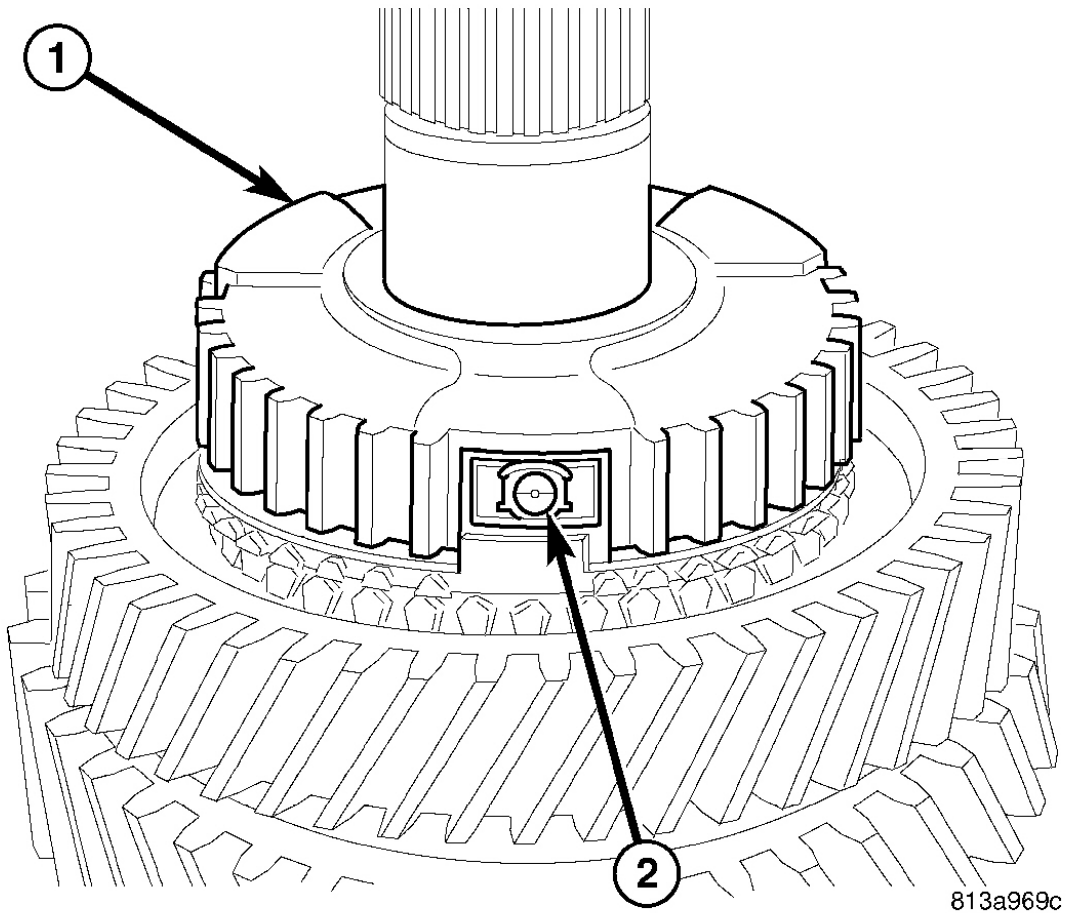
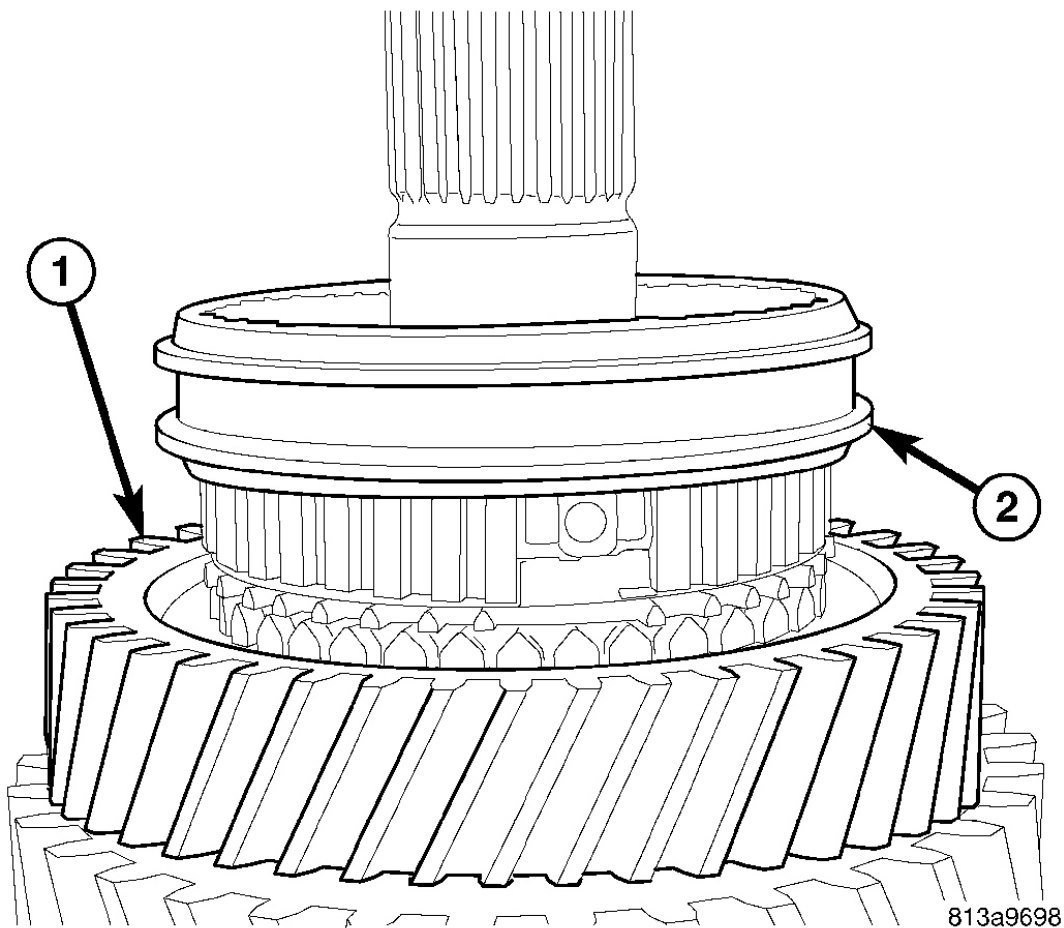


Fig. 83: Identifying Reverse Synchronizer Hub & Detents
Courtesy of CHRYSLER LLC

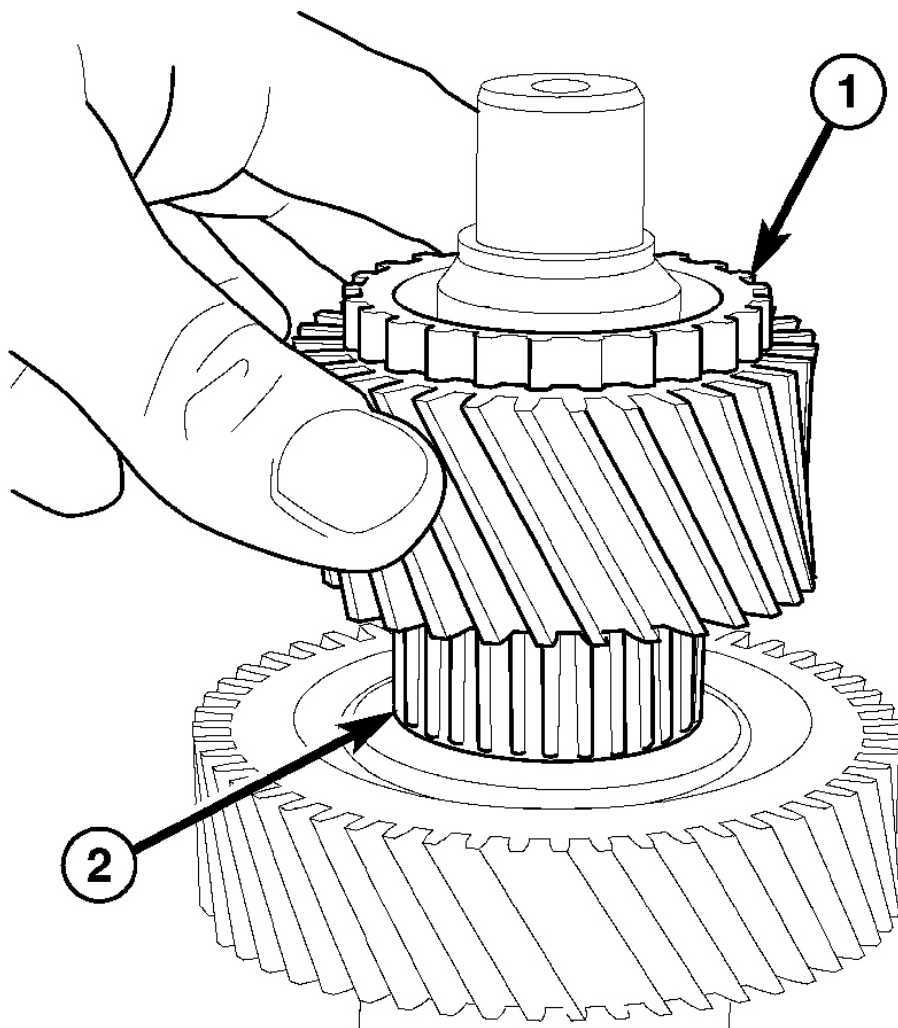
20. Install reverse gear synchronizer hub (1) detents (2).



813a9698

Fig. 84: Identifying Reverse Gear & Synchronizer Sleeve
Courtesy of CHRYSLER LLC

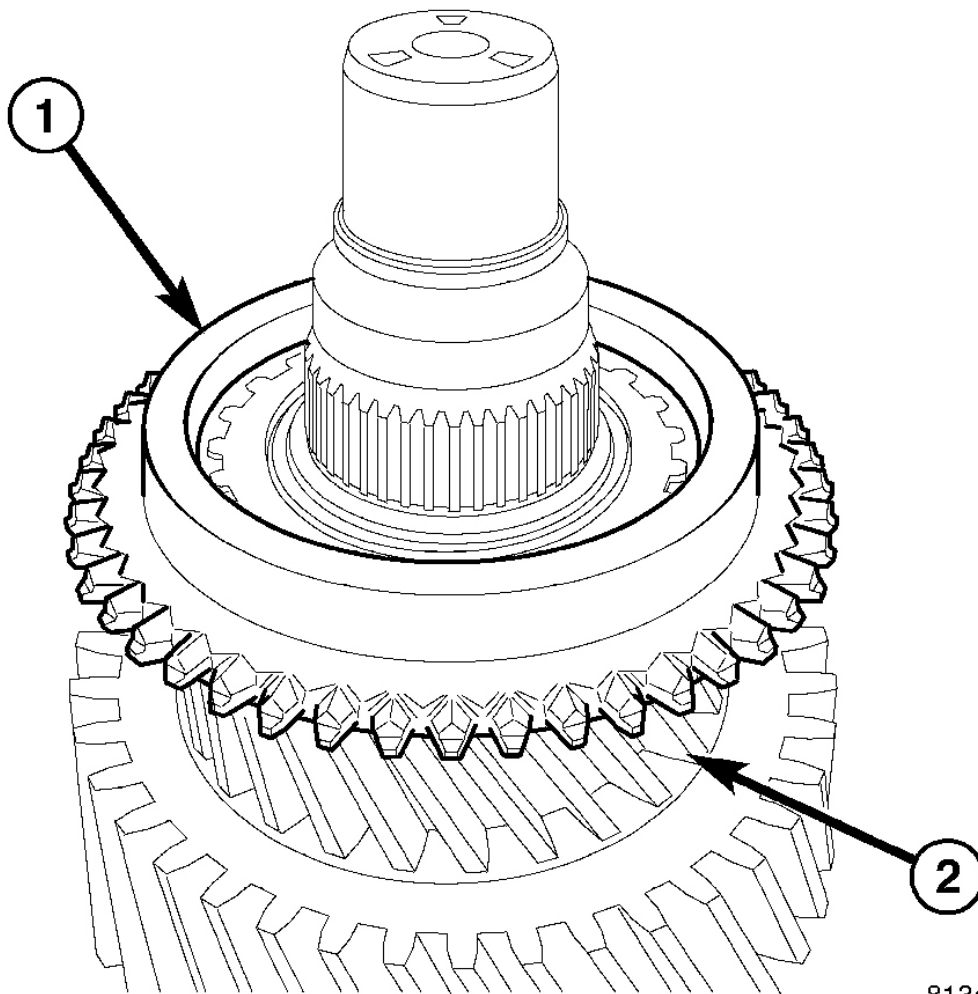
21. Install reverse gear (1) synchronizer sleeve (2) with tooth points pointing down and center sleeve on synchronizer hub.
22. Remove mainshaft from Fixture 9648. Turn fixture over in the vise, then install opposite end of mainshaft in the fixture.



813a737b

Fig. 85: Sixth Gear & Bearing
Courtesy of CHRYSLER LLC

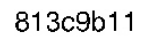
23. Install sixth gear (1) and bearing (2) on mainshaft.



813c9b0a

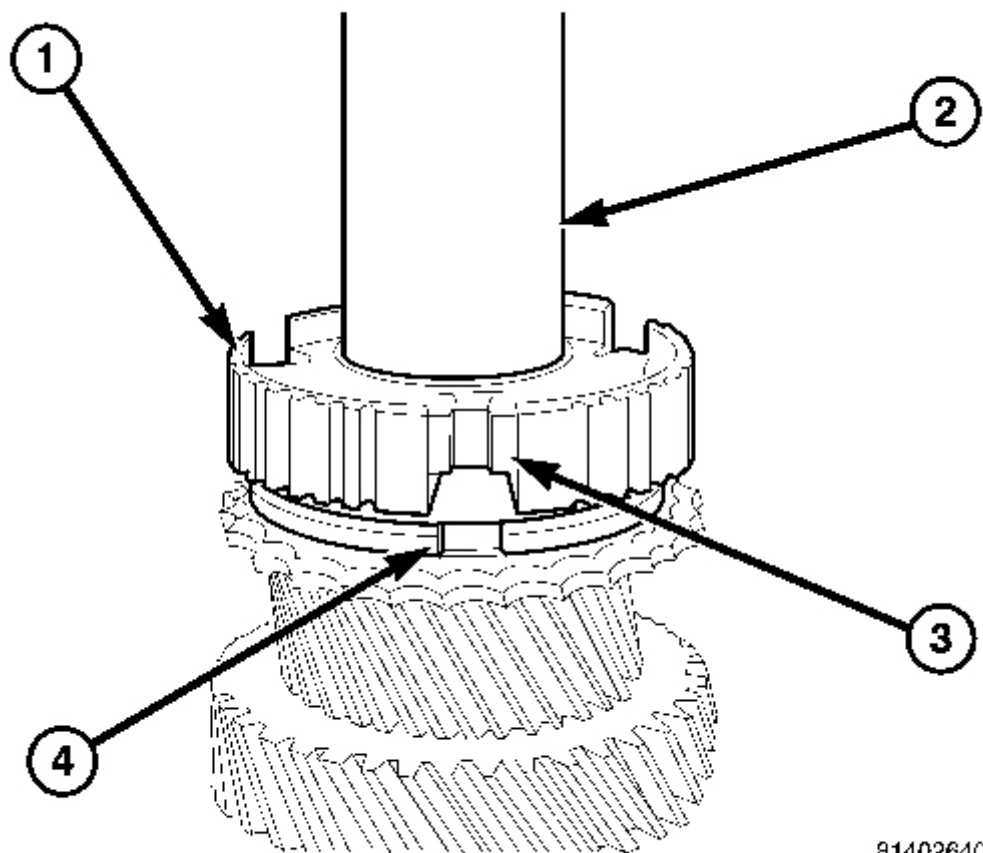
Fig. 86: 6th Gear Blocker Ring
Courtesy of CHRYSLER LLC

24. Install sixth gear synchronizer blocker ring (1) on sixth gear (2).



Courtesy of CHRYSLER LLC

25. Install sixth gear synchronizer friction ring (1) on sixth gear (2).



81402640

Fig. 88: 5-6 Hub Installer
Courtesy of CHRYSLER LLC

26. Install 5-6 synchronizer hub (1) with Installer W-262 (2) and a press. Align hub detent opening (3) with friction ring lugs (4).

NOTE: 5-6 synchronizer hub center, is offset and must be install with larger offset down.

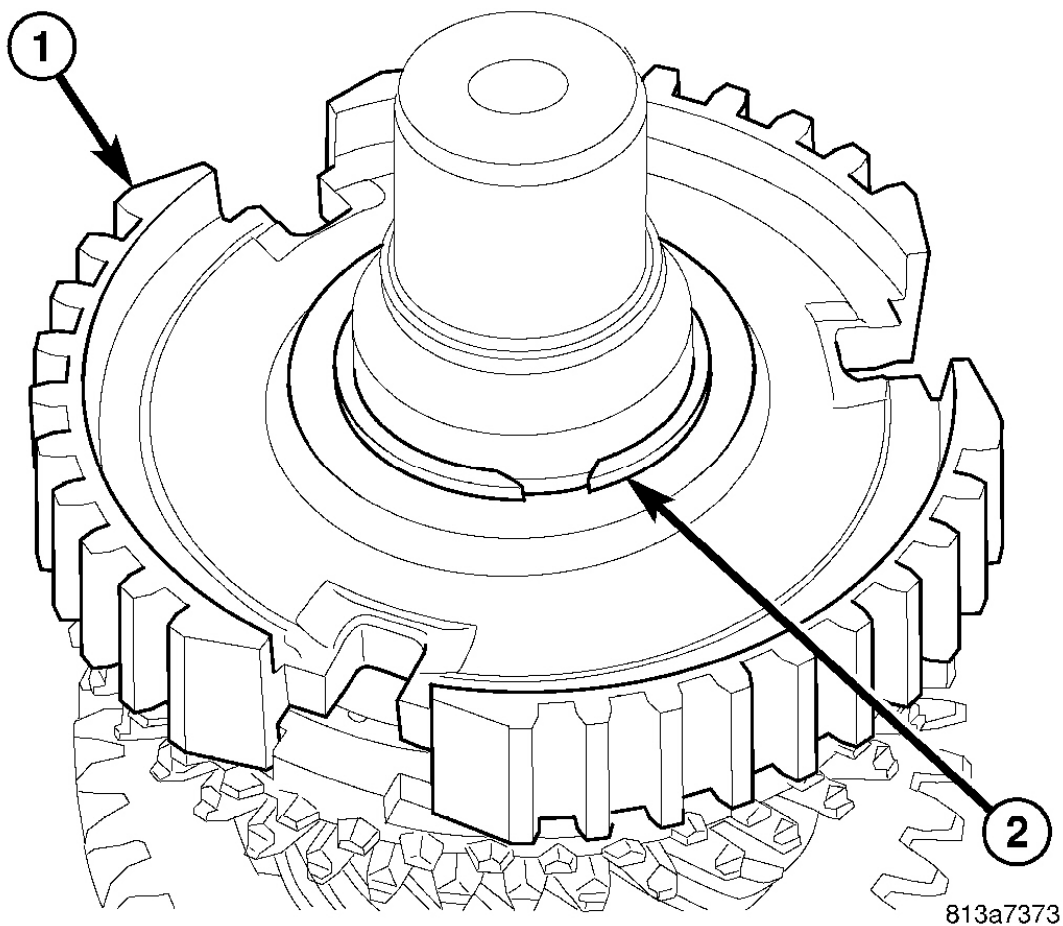


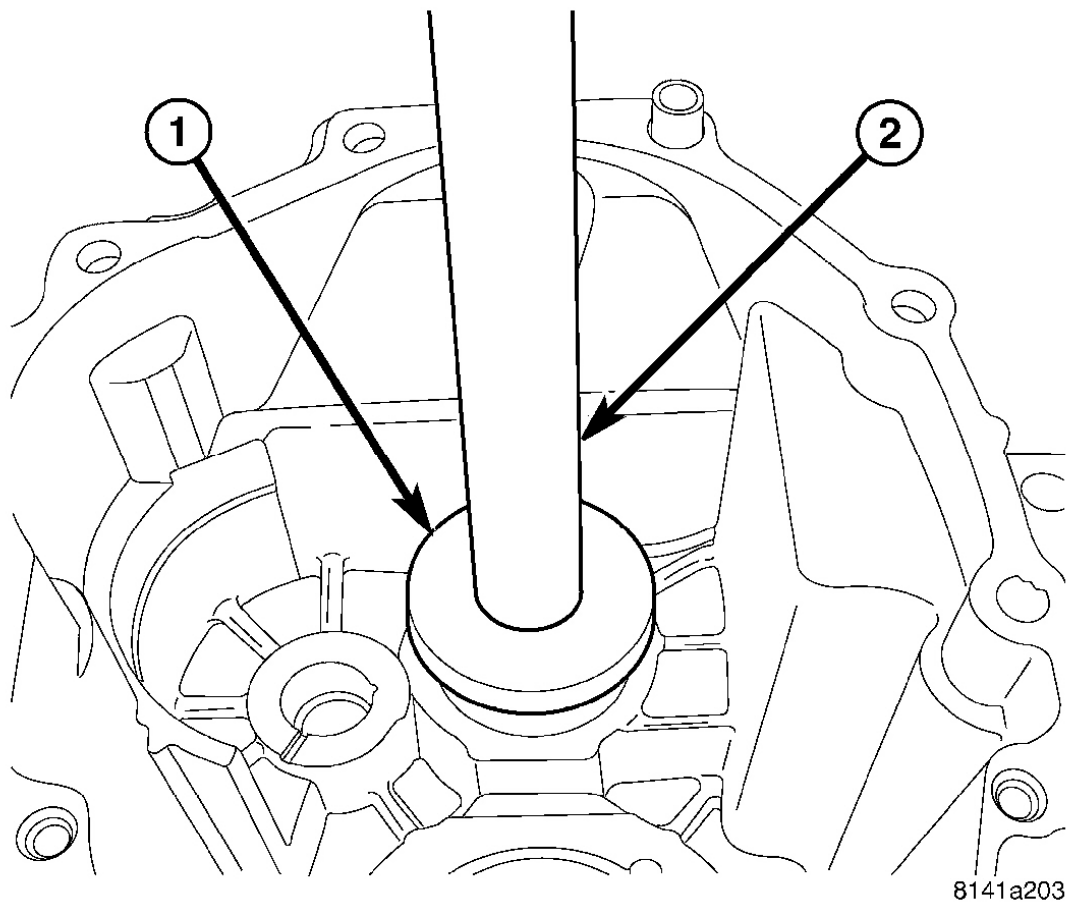
Fig. 89: Identifying 5-6 Synchronizer Hub & Snap Ring
Courtesy of CHRYSLER LLC

27. Install 5-6 synchronizer hub (1) snap ring (2).

NOTE: Reuse original snap ring or thickest ring that will fit.

28. Install 5-6 synchronizer sleeve on hub (1).

REAR HOUSING



8141a203

Fig. 90: Rear Countershaft Bearing
Courtesy of CHRYSLER LLC

1. Install countershaft bearing into rear housing with Installer 9643 (1) and Handle C-4171 (2).

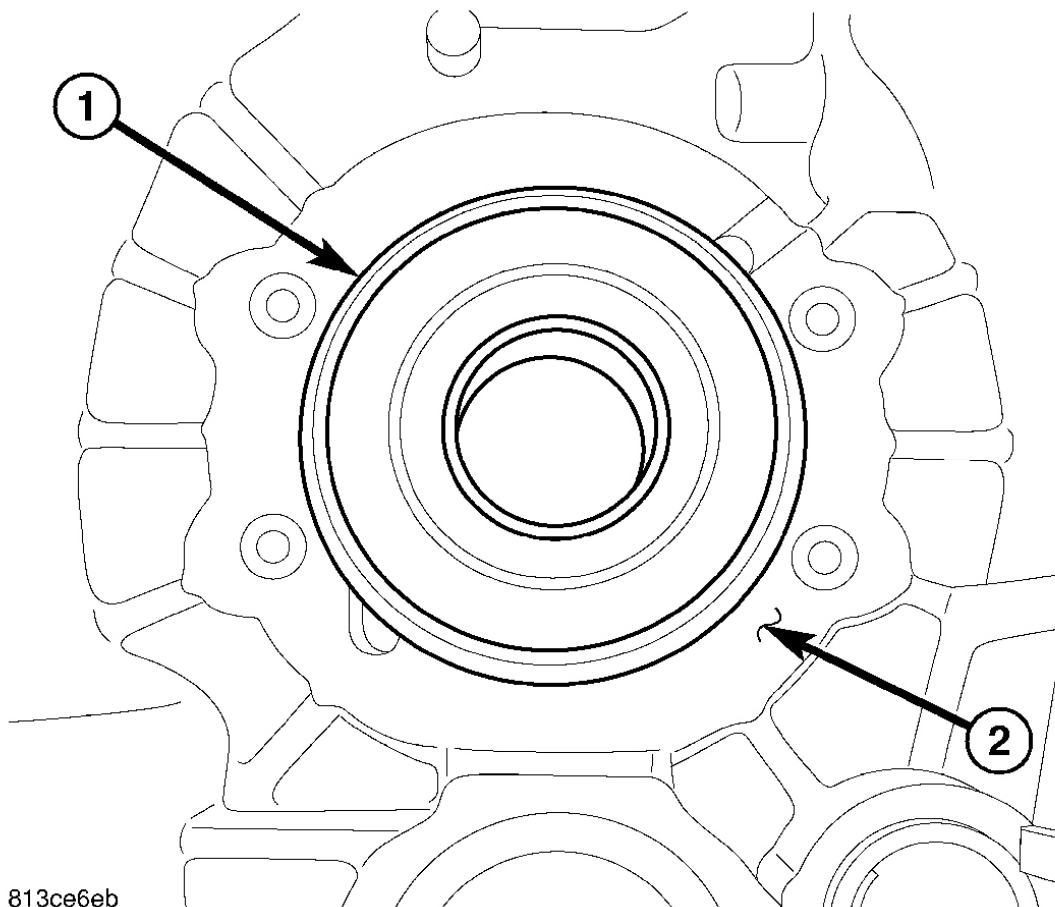
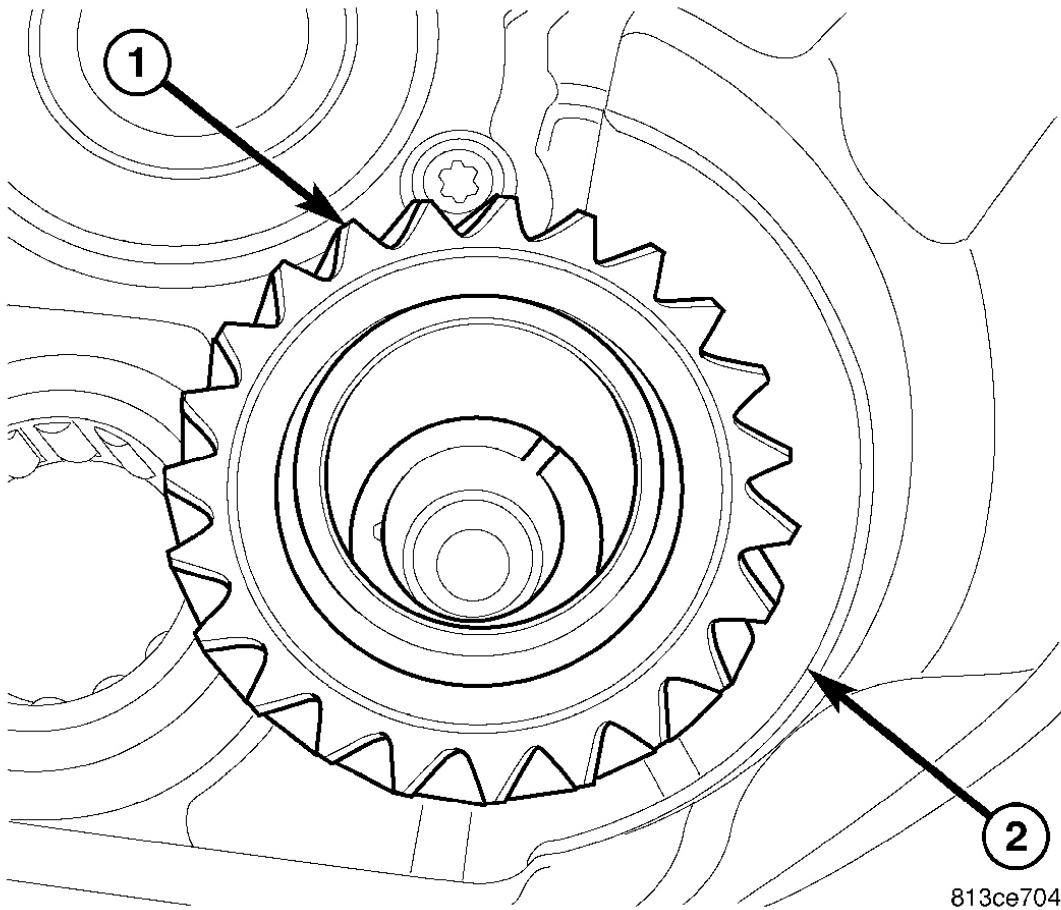


Fig. 91: Rear Housing Mainshaft Bearing
Courtesy of CHRYSLER LLC

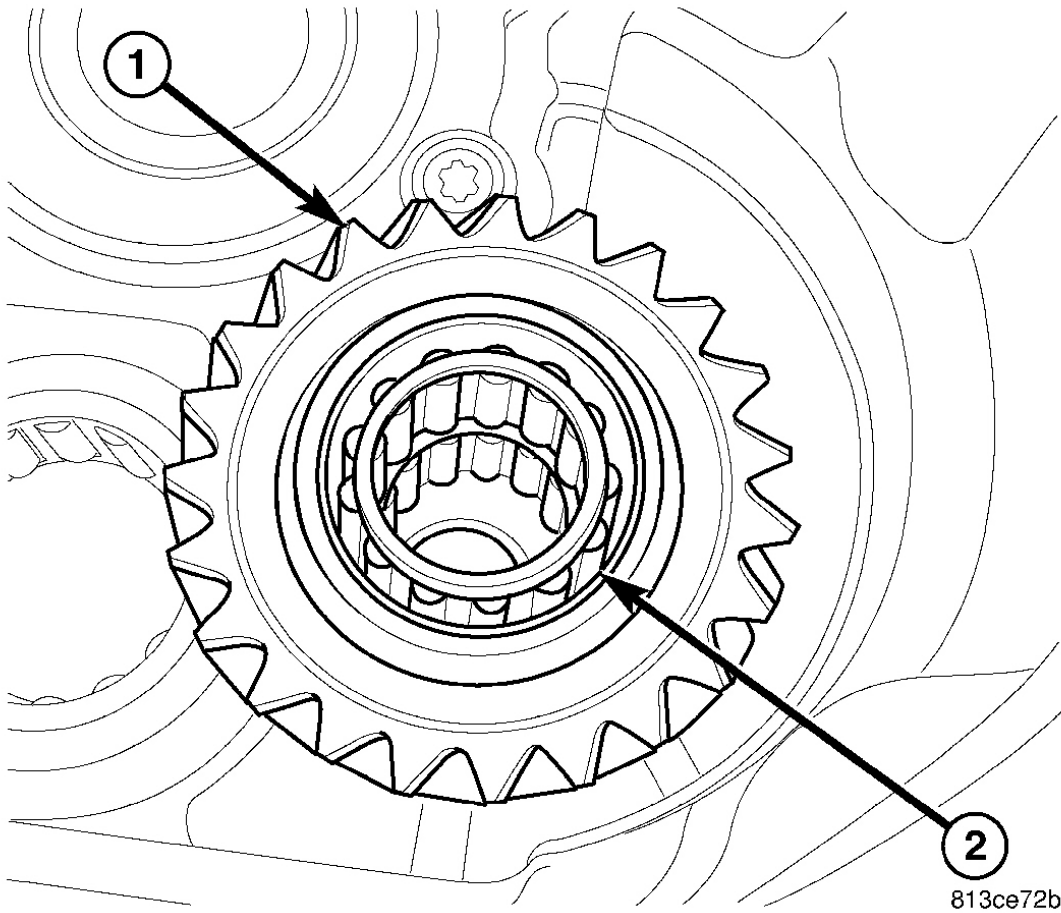
2. Install mainshaft bearing (1) into housing (2).
3. Install bearing retainer and tighten bolts to 10 N.m (7.3 ft. lbs.).



813ce704

Fig. 92: Reverse Idler Gear
Courtesy of CHRYSLER LLC

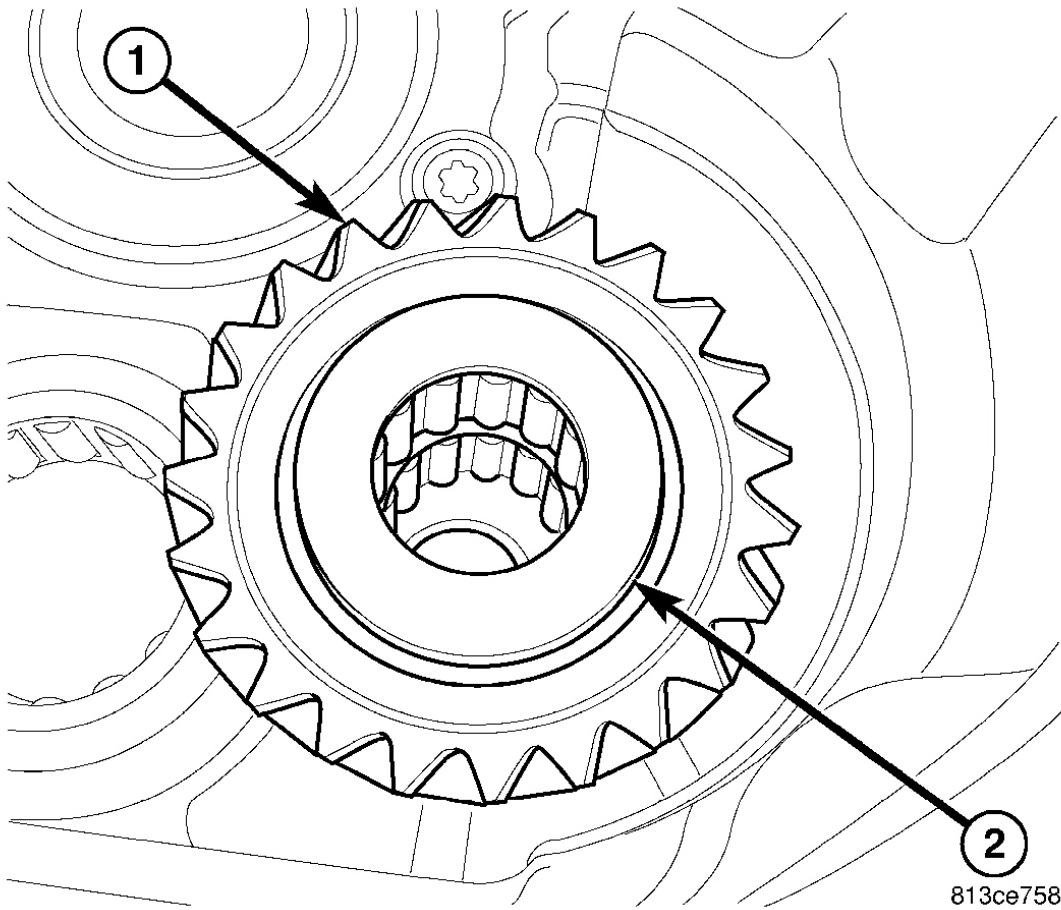
4. Install reverse idler gear (1) into housing (2).



813ce72b

Fig. 93: Idler Gear & Bearing
Courtesy of CHRYSLER LLC

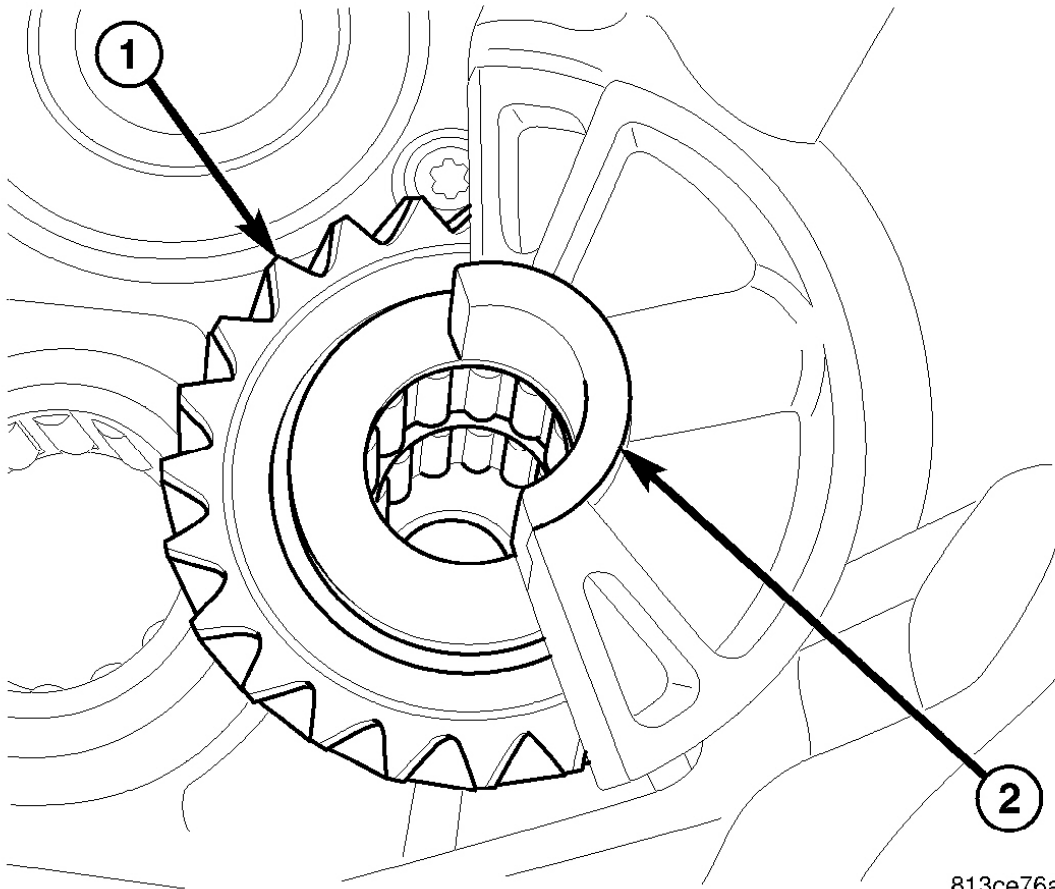
5. Install idler gear (1) bearing (2) into gear.



813ce758

Fig. 94: Idler Gear & Thrust Washer
Courtesy of CHRYSLER LLC

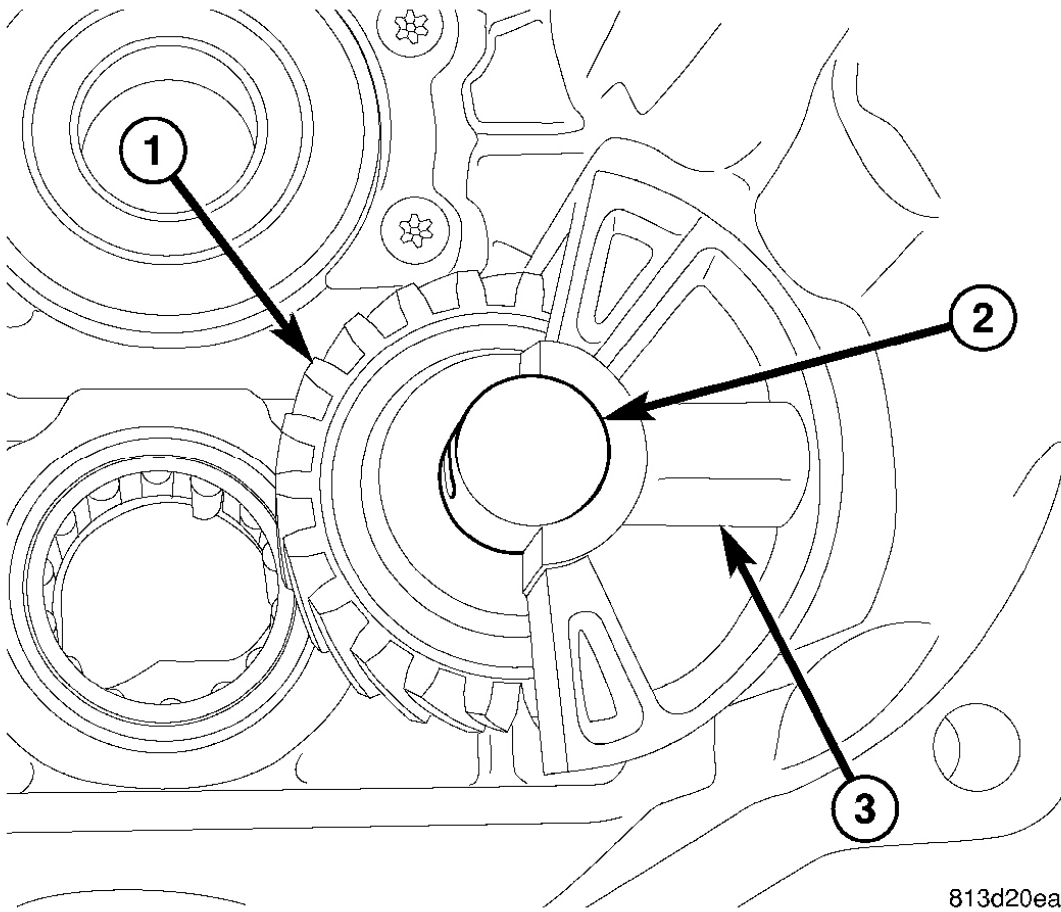
6. Install idler gear (1) thrust washer (2) on idler gear.



813ce76a

Fig. 95: Idler Gear & Shaft Support
Courtesy of CHRYSLER LLC

7. Install idler gear (1) shaft support (2) into housing.



813d20ea

Fig. 96: Idler Gear Shaft
Courtesy of CHRYSLER LLC

8. Install idler gear (1) shaft (2) with shaft bolt hole aligned with shaft support hole (3).

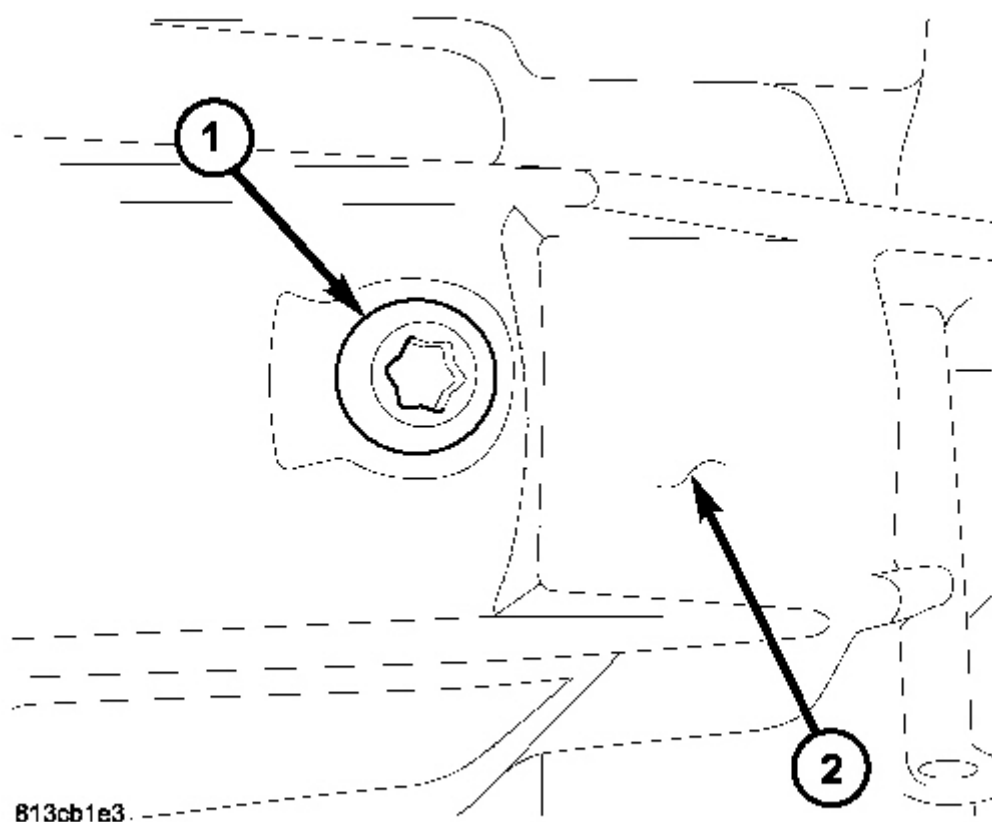
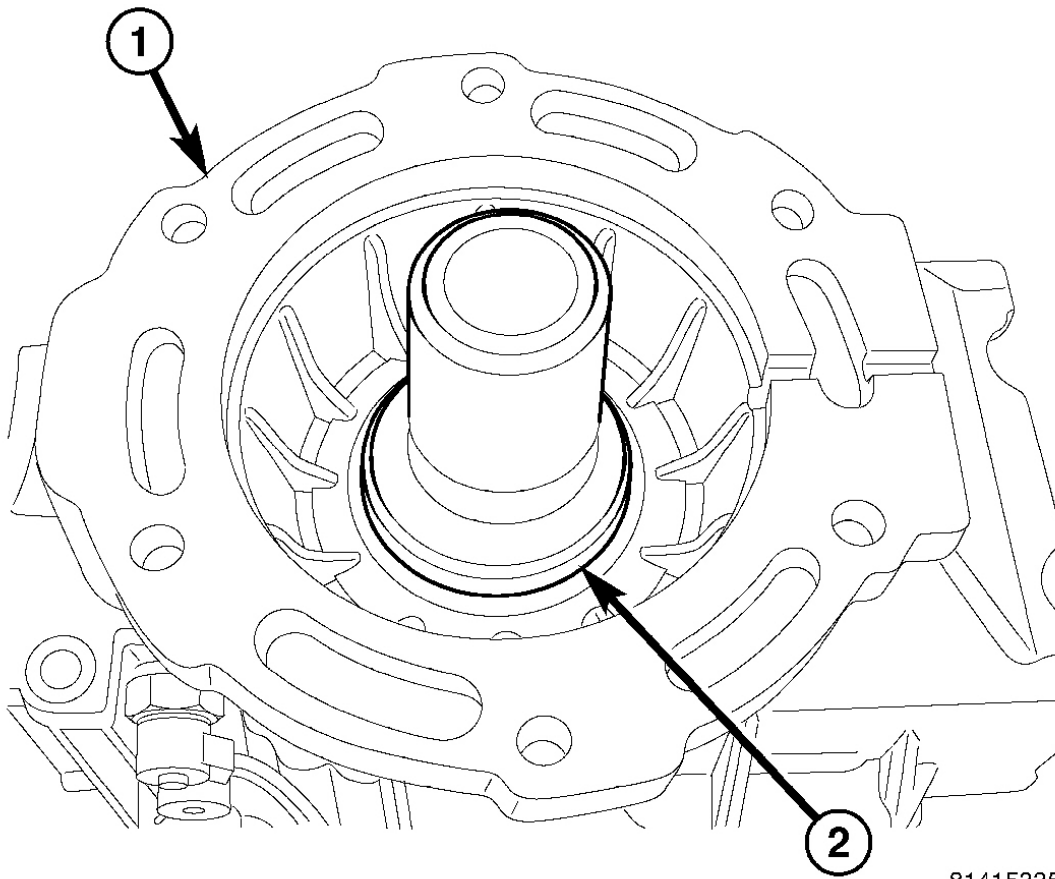


Fig. 97: Idler Shaft Bolt
Courtesy of CHRYSLER LLC

9. Install idler gear shaft bolt (1) into the housing (2) and tighten to 20 N.m (15 ft. lbs.).



81415335

Fig. 98: Output Shaft Seal 4x4
Courtesy of CHRYSLER LLC

10. Install 4x4 output shaft seal into rear housing (1) with Installer 9638 (2). Install 4x2 output shaft seal into rear housing with Installer 9635 and Installer 6448A.

INPUT SHAFT

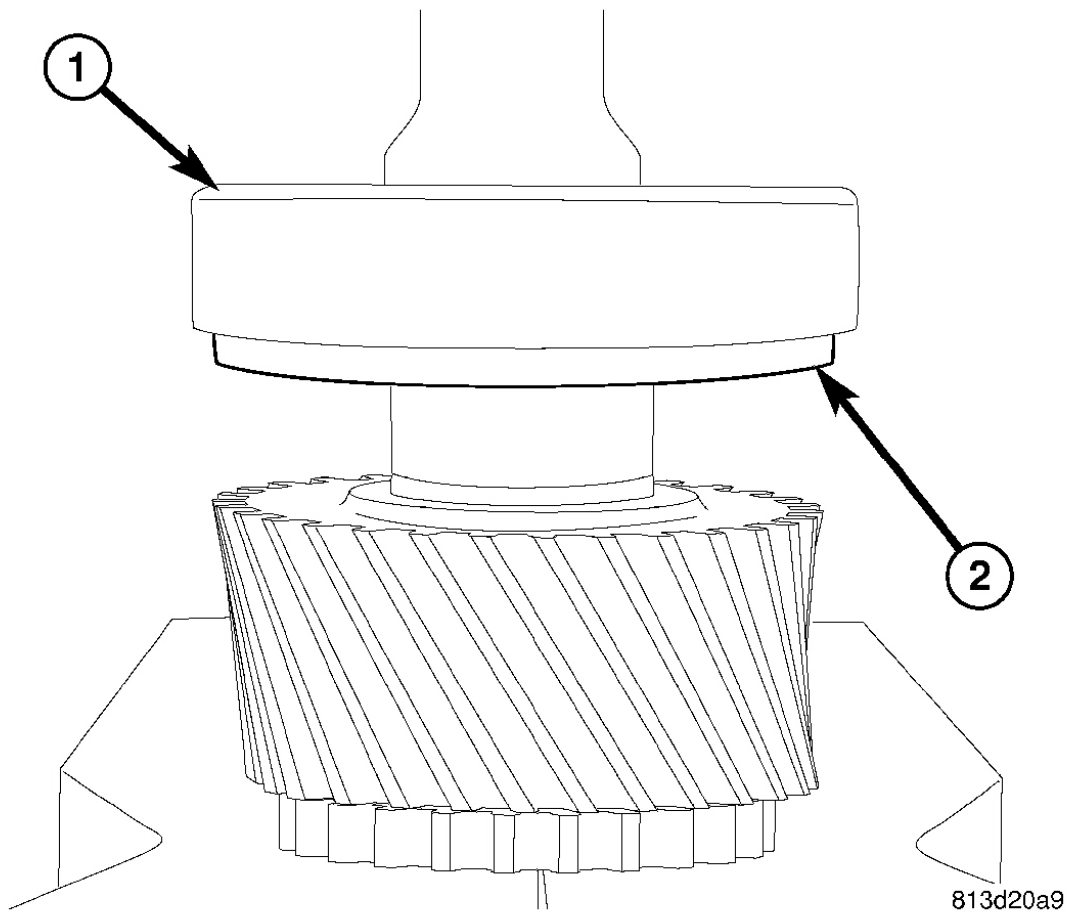
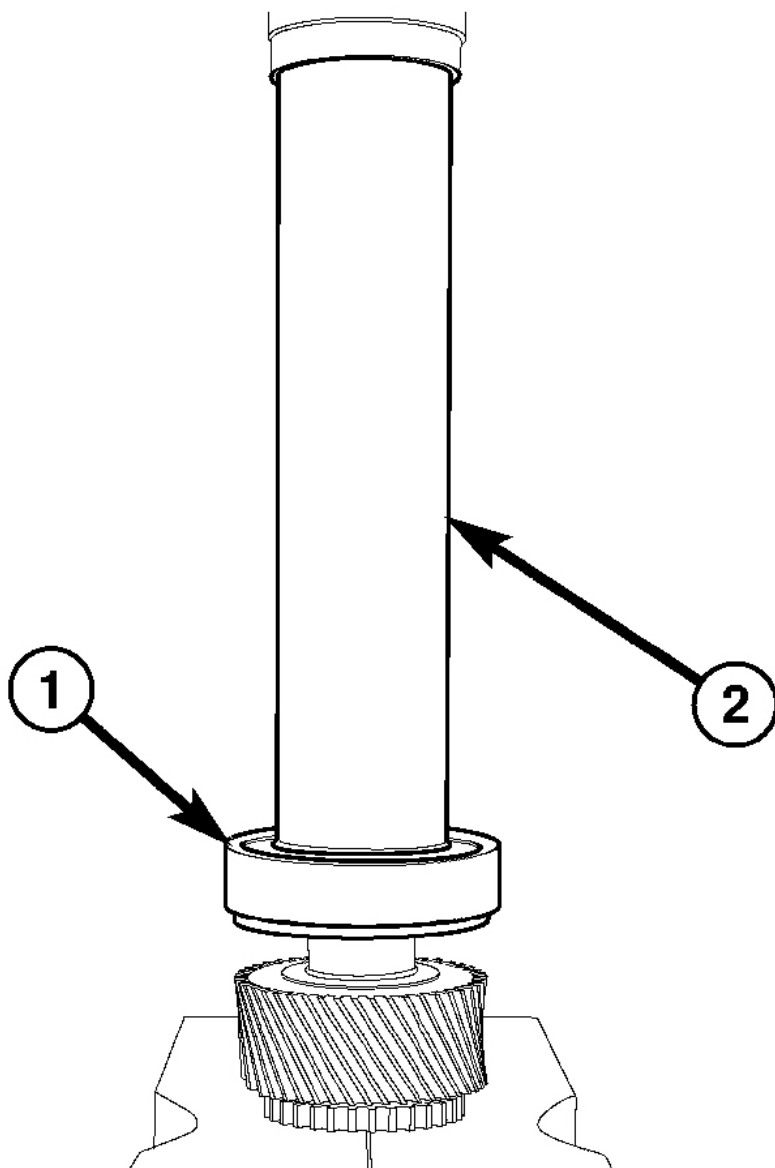


Fig. 99: Input Shaft Bearing Lip
Courtesy of CHRYSLER LLC

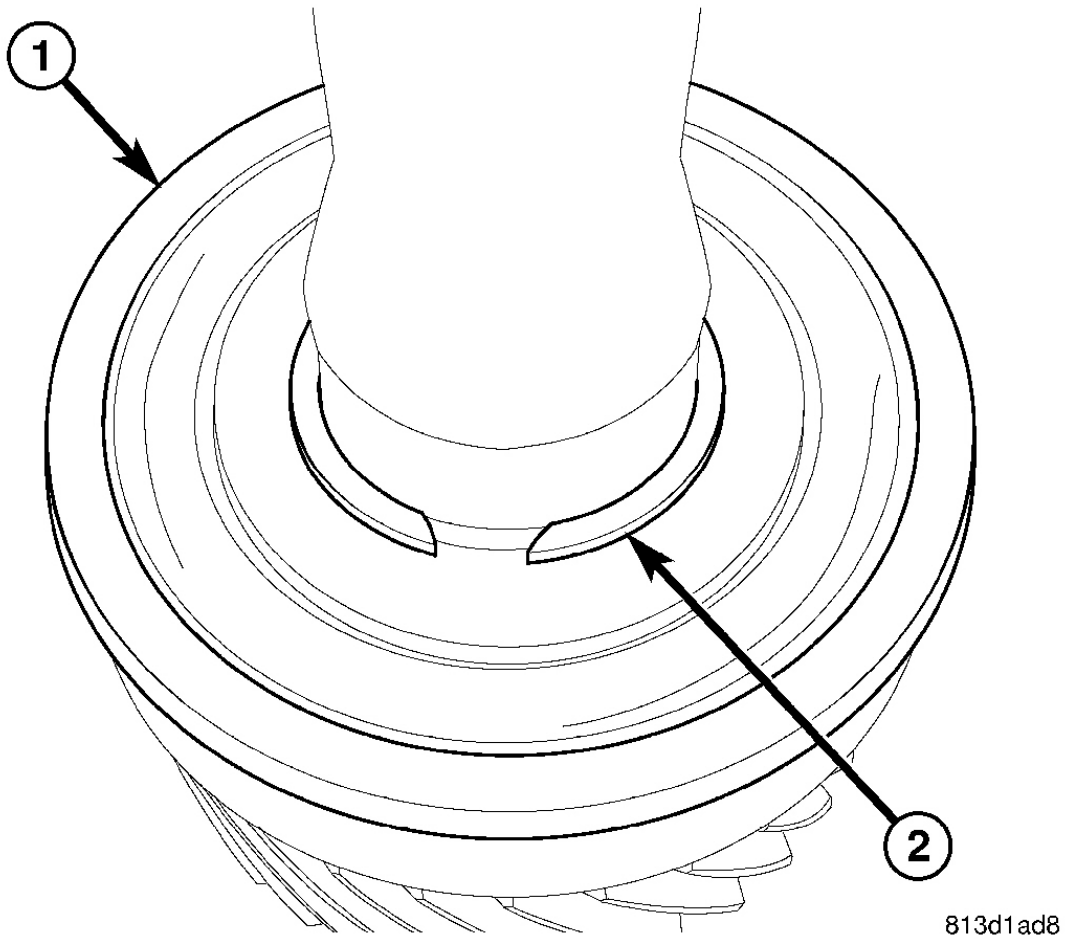
1. Install input shaft bearing (1) on input shaft with the bearing retainer lip (2) facing fifth gear.



813d1fc2

Fig. 100: Input Shaft Bearing Installer
Courtesy of CHRYSLER LLC

2. Install input shaft bearing (1) with Installer 6448A (2) and a press.



813d1ad8

Fig. 101: Identifying Input Shaft Bearing & Snap Ring
Courtesy of CHRYSLER LLC

3. Install input shaft bearing (1) snap ring (2).

NOTE: Reuse original snap ring or thickest ring that will fit.

FRONT HOUSING

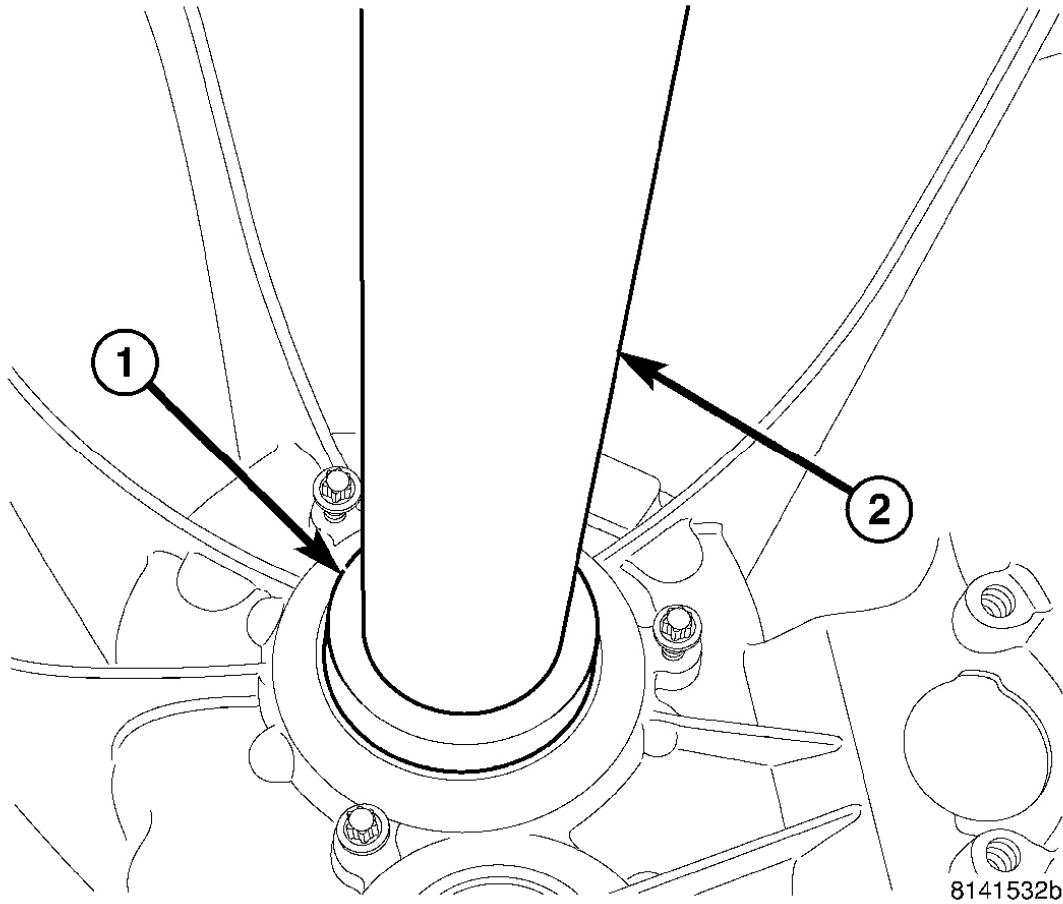
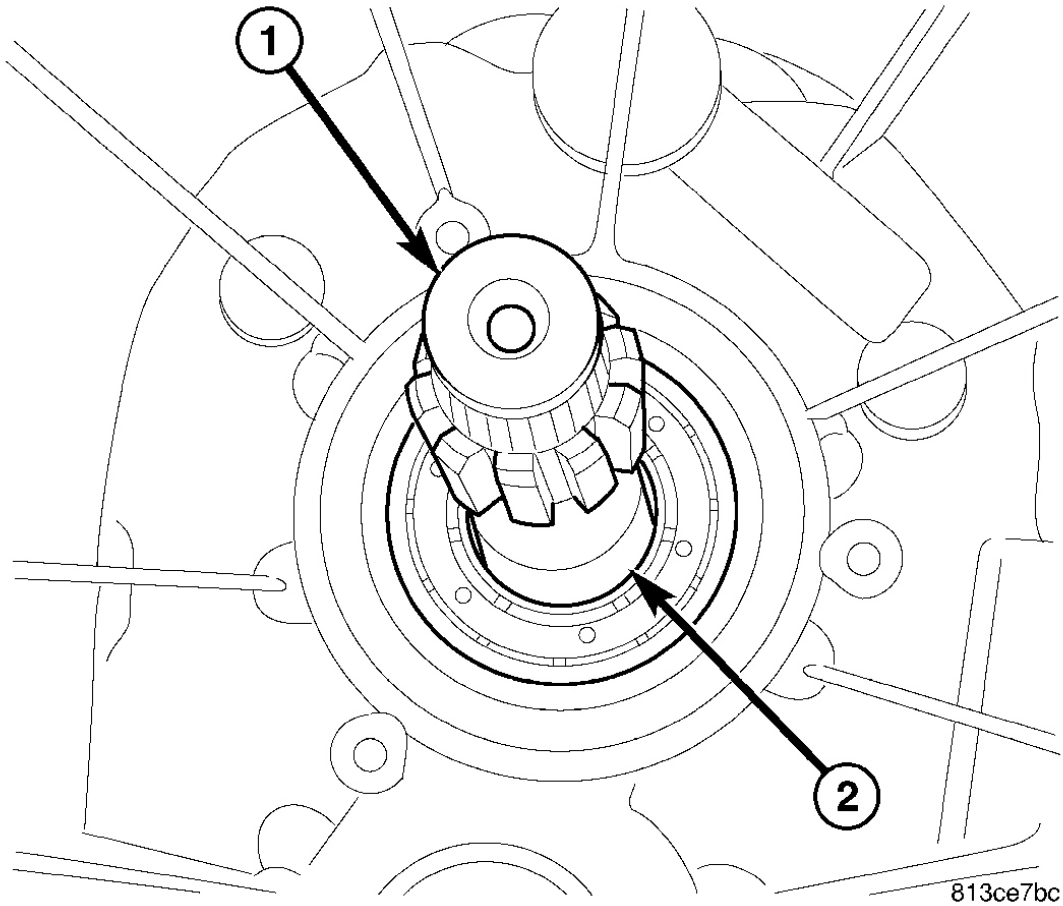


Fig. 102: Input Shaft Seal Installer
Courtesy of CHRYSLER LLC

1. Install input shaft seal with Installer 9635 (1) Installer 6448A (2).



813ce7bc

Fig. 103: Input Shaft In Housing
Courtesy of CHRYSLER LLC

2. Install input shaft (1) with bearing (2) into housing.

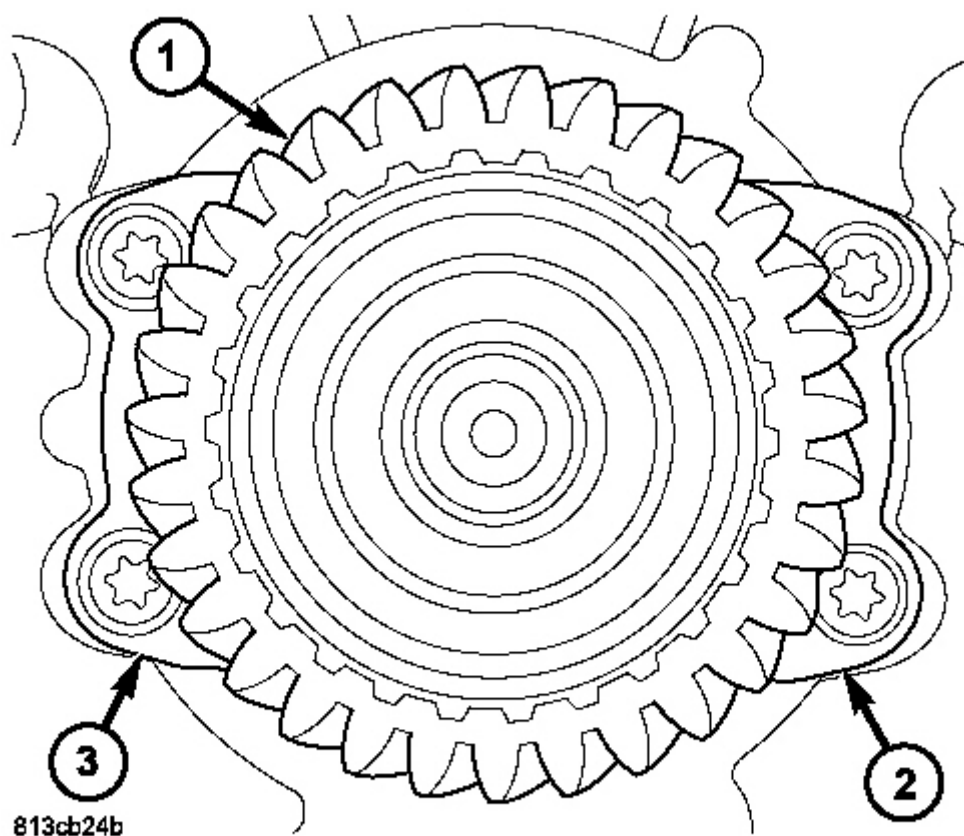
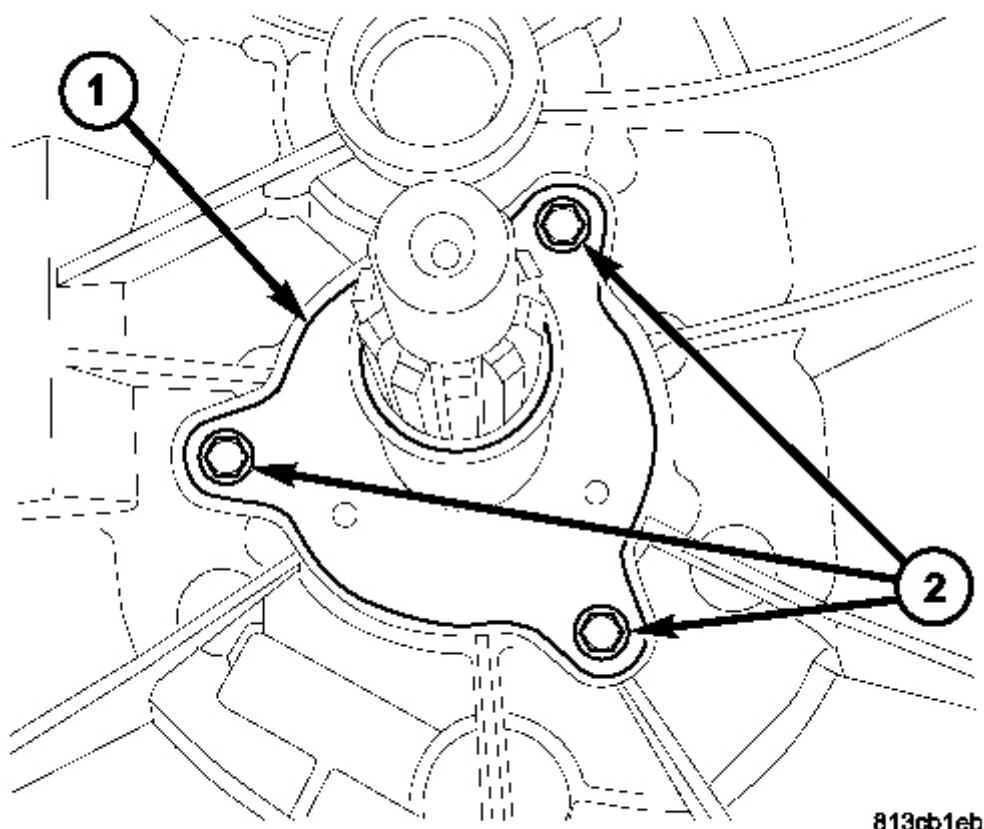


Fig. 104: Identifying Input Shaft & Bearing Retainers
Courtesy of CHRYSLER LLC

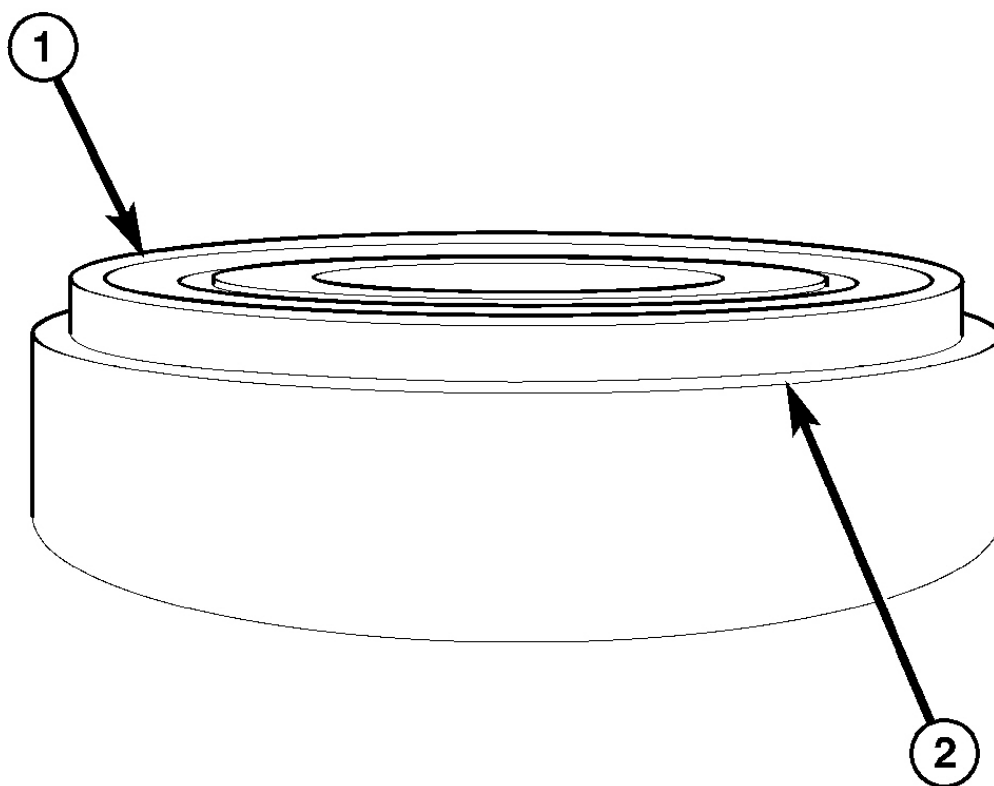
3. Install input shaft (1) bearing retainers (2, 3) and tighten bolts to 10 N.m (88 in. lbs.).



813cb1eb

Fig. 105: View Of Input Shaft Retainer & Bolts
Courtesy of CHRYSLER LLC

4. Install input shaft retainer (1) and tighten bolts (2) to 9 N.m (80 in. lbs.).



813ce6cf

Fig. 106: Bearing Retainer Lip
Courtesy of CHRYSLER LLC

5. Install countershaft bearing (1) into housing with bearing retainer lip (2) facing up.

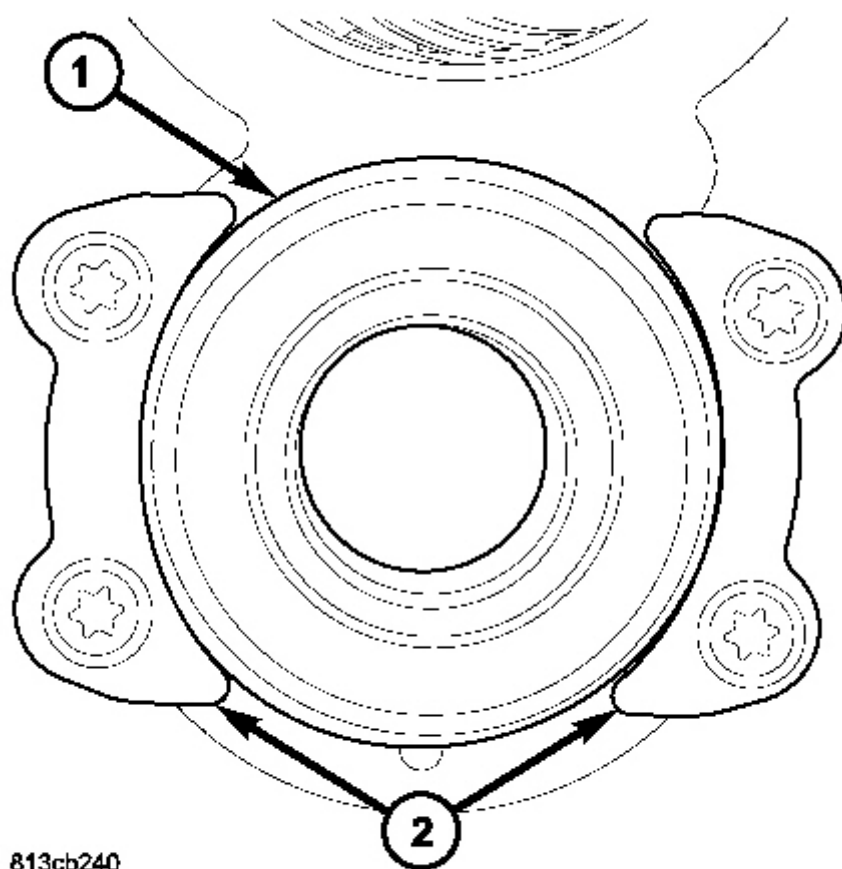
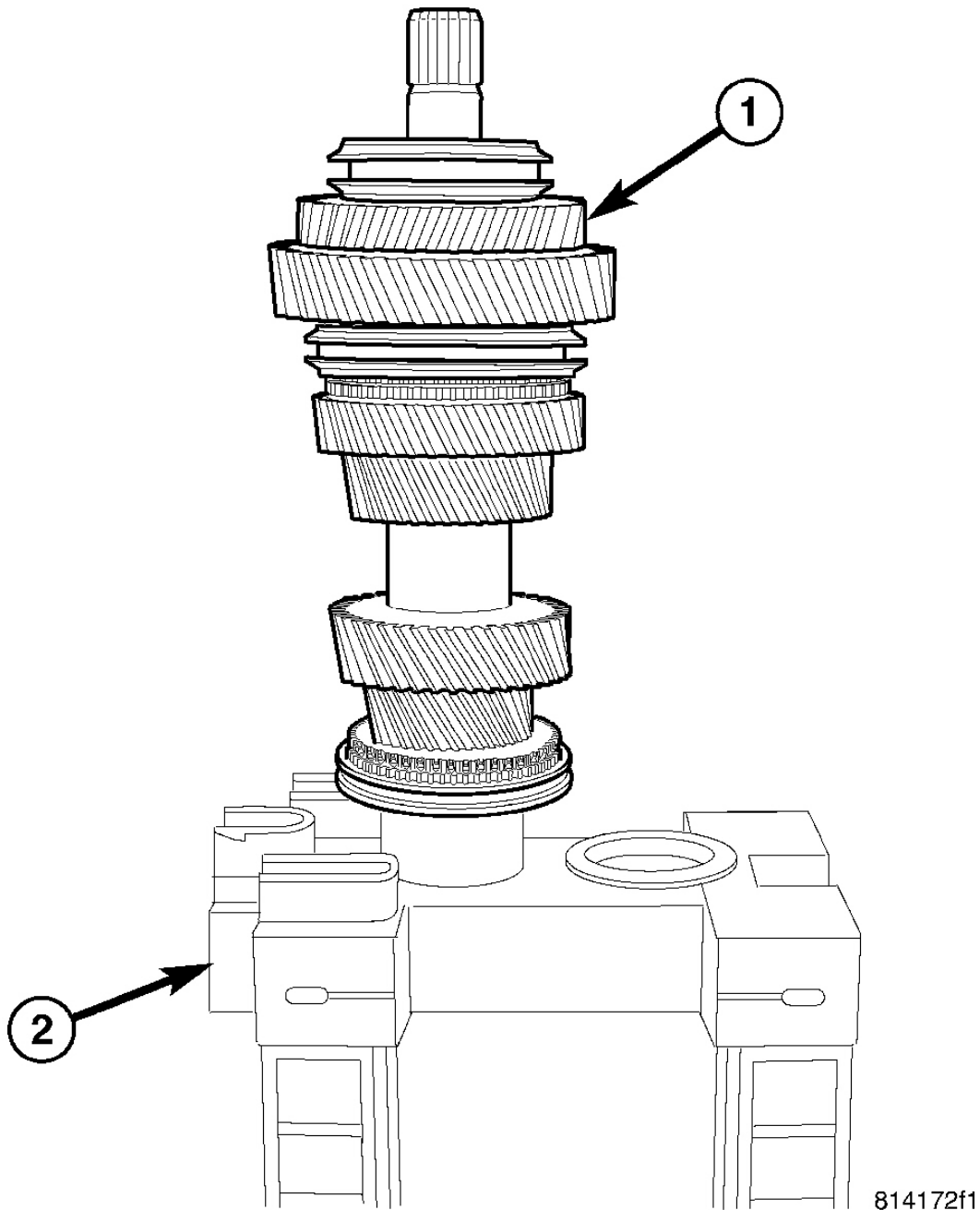


Fig. 107: Countershaft Bearing & Retainer
Courtesy of CHRYSLER LLC

6. Install countershaft bearing (1) retainers (2) and tighten bolts to 10 N.m (88 in. lbs.).

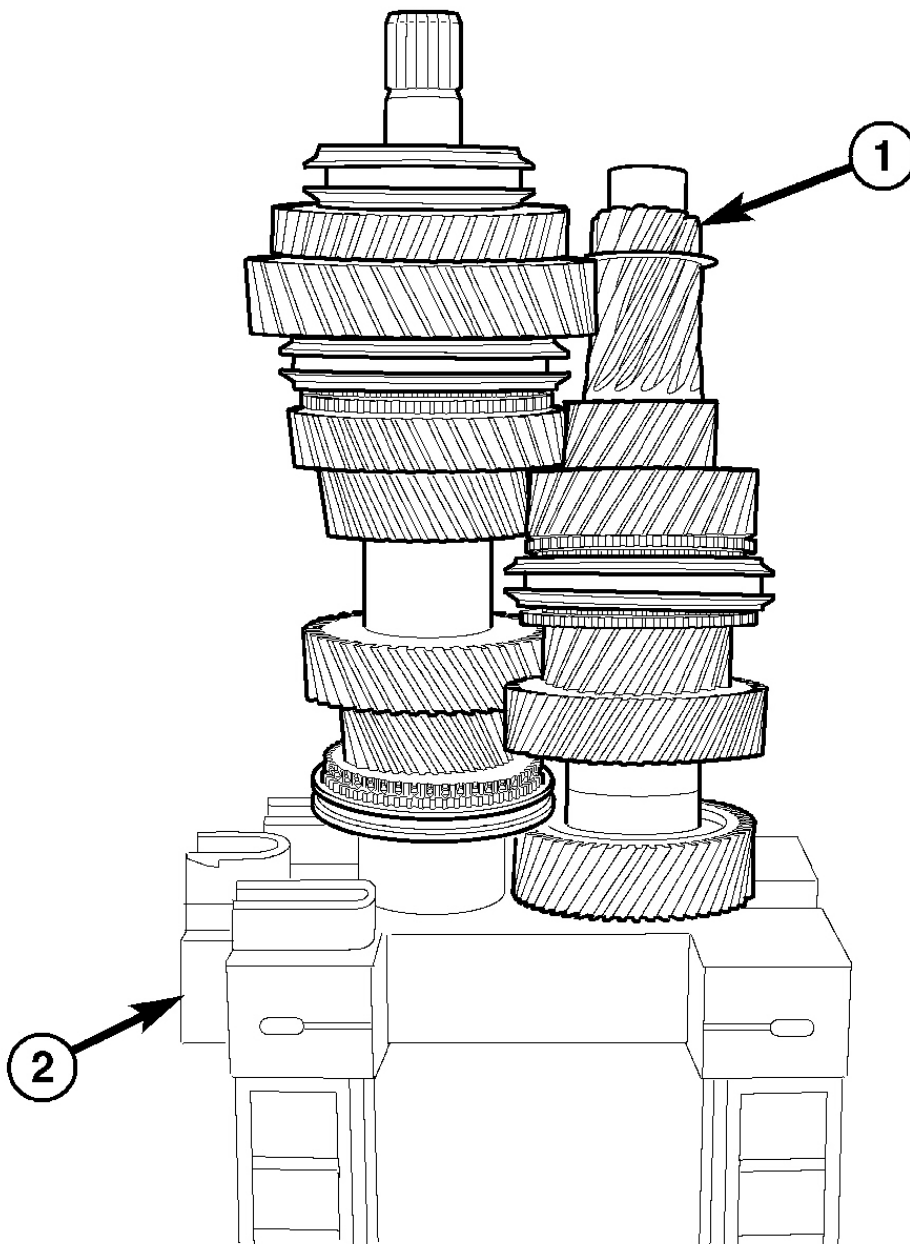
FINAL ASSEMBLY



814172f1

Fig. 108: Mainshaft In Fixture
Courtesy of CHRYSLER LLC

1. Install mainshaft (1) onto Build Fixture 9633 (2).



814172f5

Fig. 109: Countershaft In Fixture
Courtesy of CHRYSLER LLC

2. Install countershaft (1) onto Build Fixture 9633 (2).

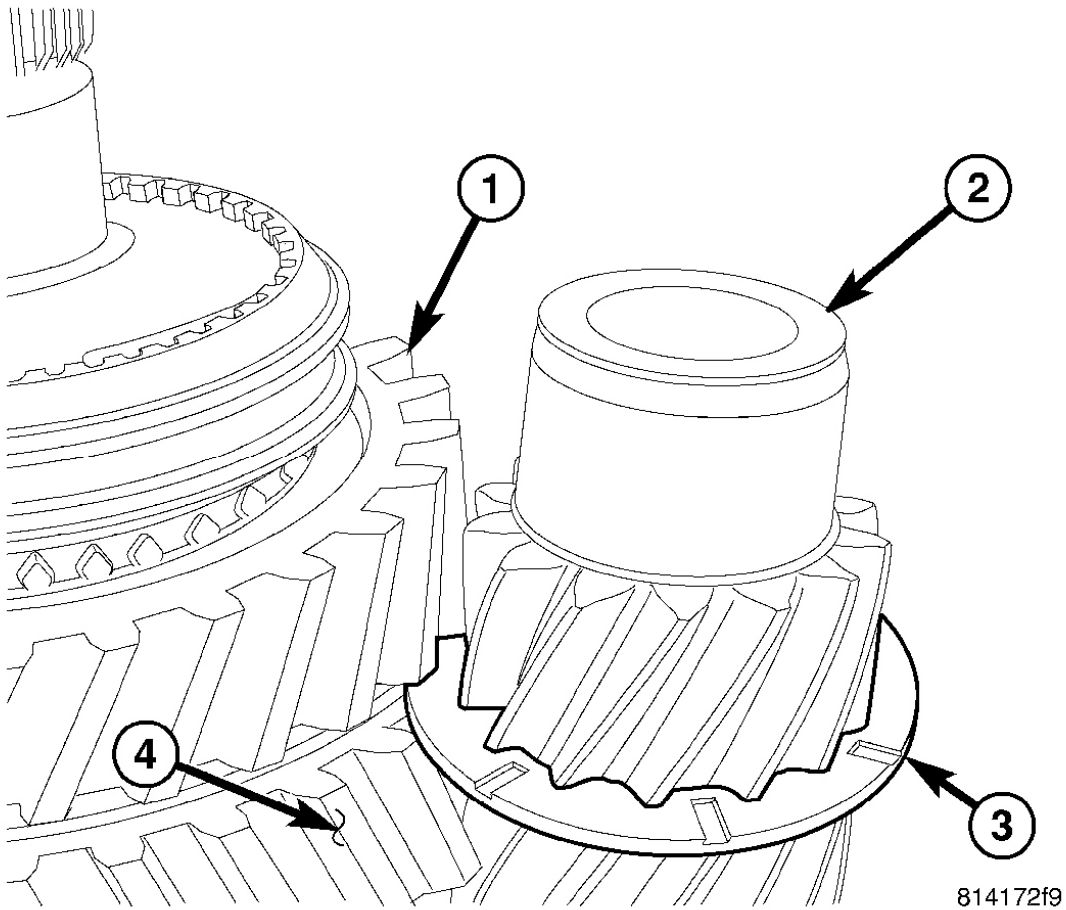
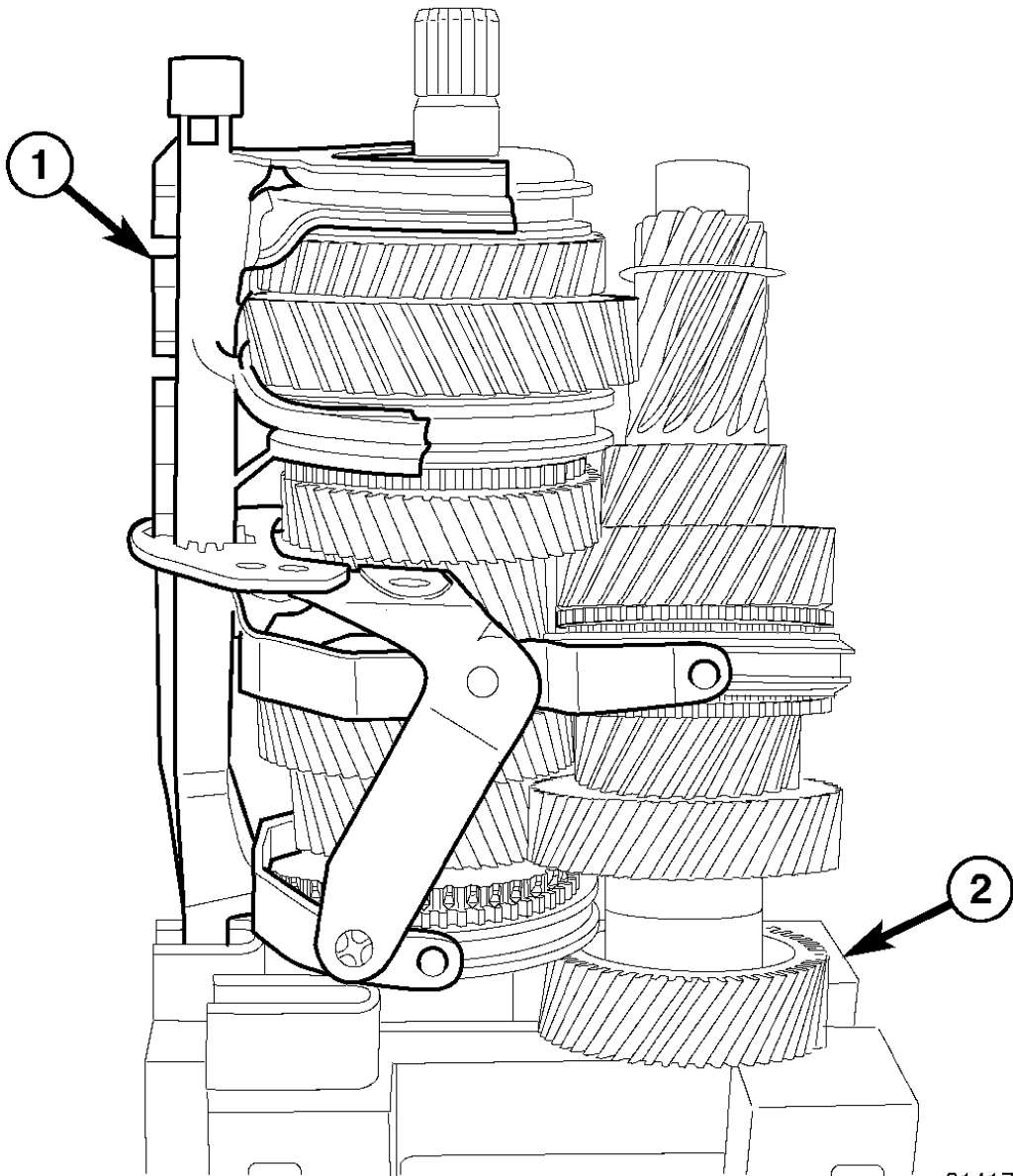


Fig. 110: Oil Slinger
Courtesy of CHRYSLER LLC

3. Install oil slinger (3) on countershaft (2) between reverse (1) and first gear (4).

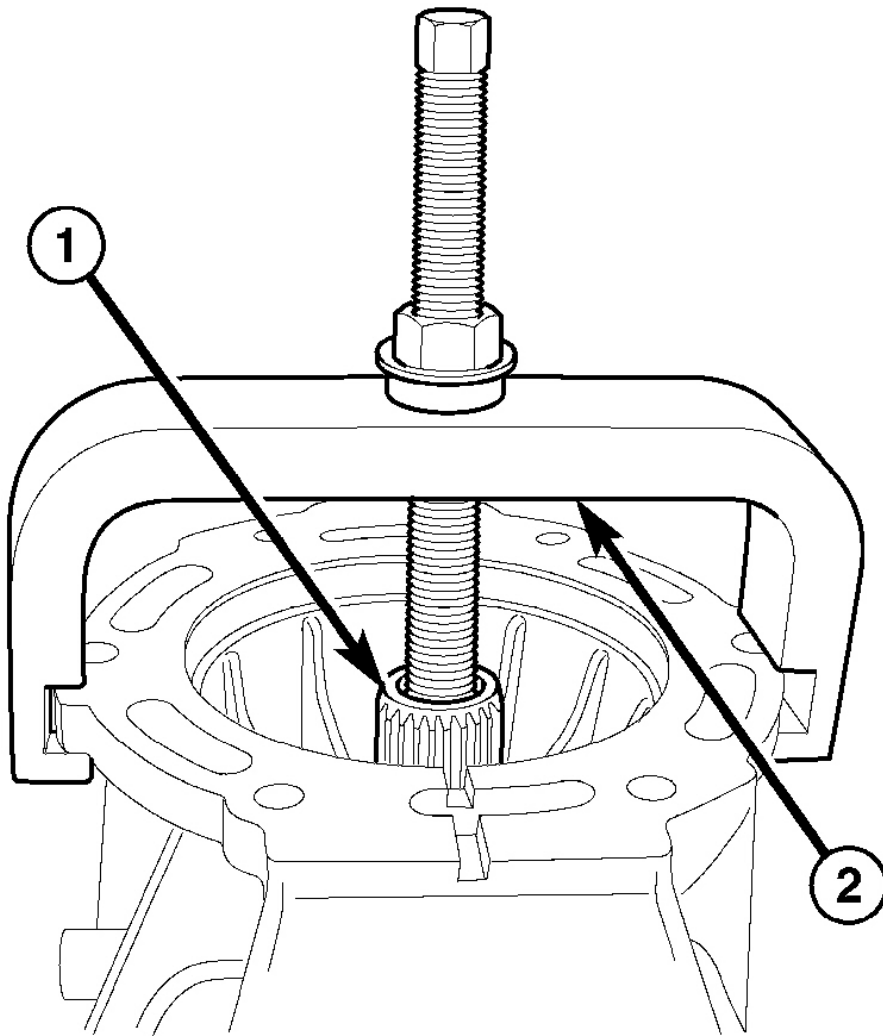
CAUTION: Oil slinger is fragile and can crack during installation. Failure to follow these instructions will result in cracking the oil slinger and lack of oil to first/reverse bearing.



814172fd

Fig. 111: Shift Rails/Forks In Fixture
Courtesy of CHRYSLER LLC

4. Install shift rails and forks (1) onto Build Fixture 9633 (2) and countershaft/mainshaft.



81415320

Fig. 112: Mainshaft Installer
Courtesy of CHRYSLER LLC

5. Install rear housing on mainshaft (1) with Installer 9636 (2).

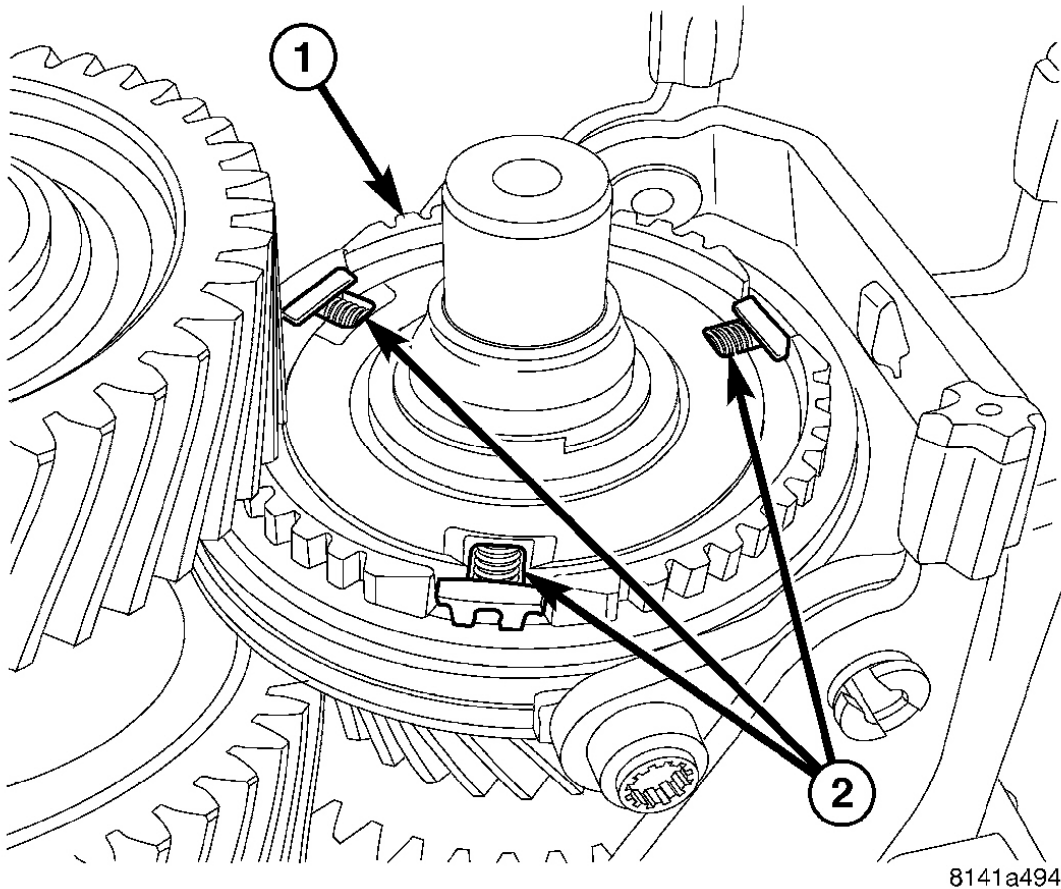


Fig. 113: 5-6 Synchronizer Detents
Courtesy of CHRYSLER LLC

6. Remove rear housing with mainshaft, countershaft and shift rails from fixture. Set assembly on rear housing with shafts pointing up.
7. Install 5-6 synchronizer hub (1) detents, springs, and balls (2).

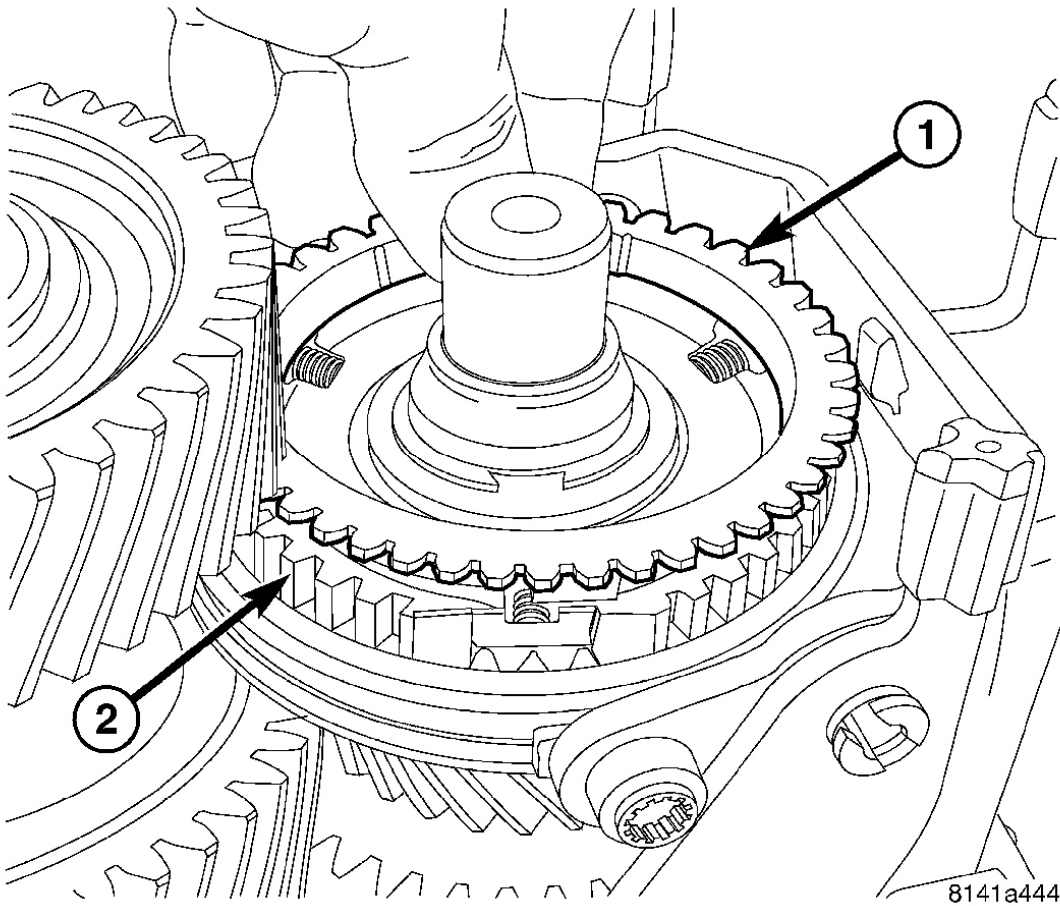


Fig. 114: Identifying Fifth Gear Synchronizer Friction Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

8. Install fifth gear synchronizer friction ring (1) on 5-6 synchronizer hub (2).

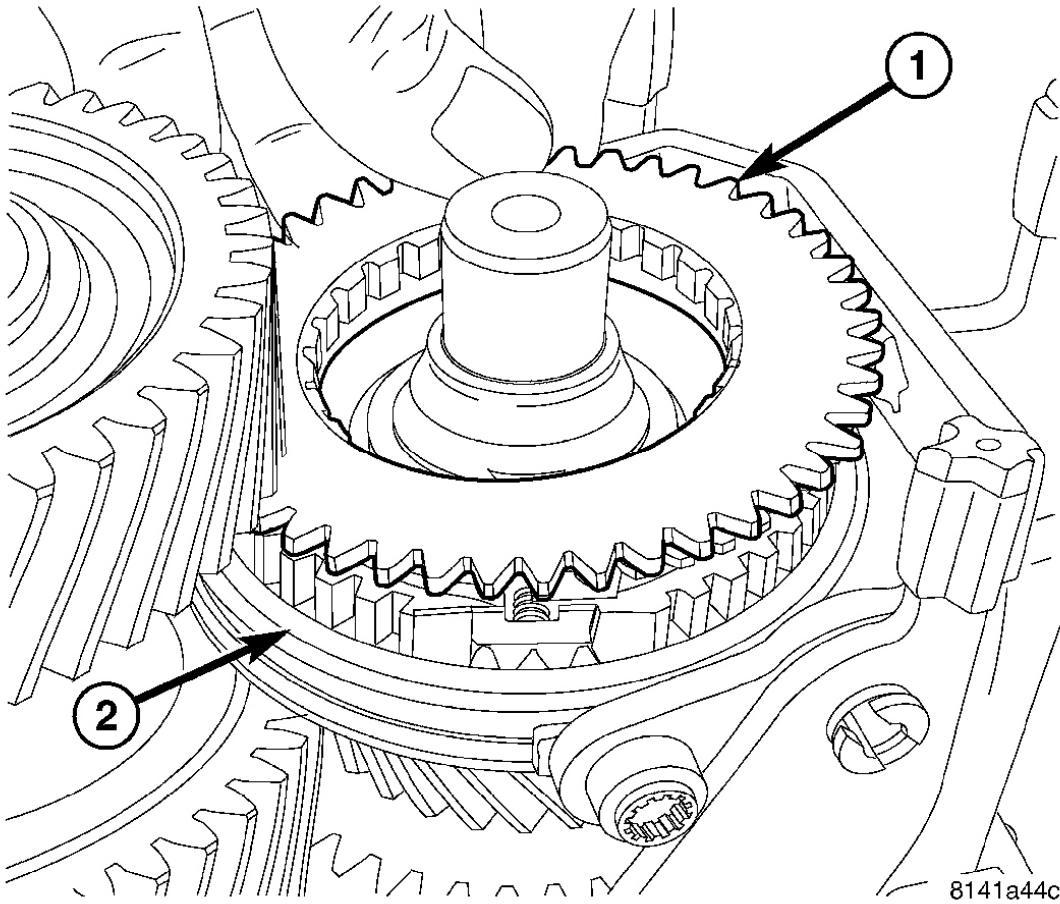
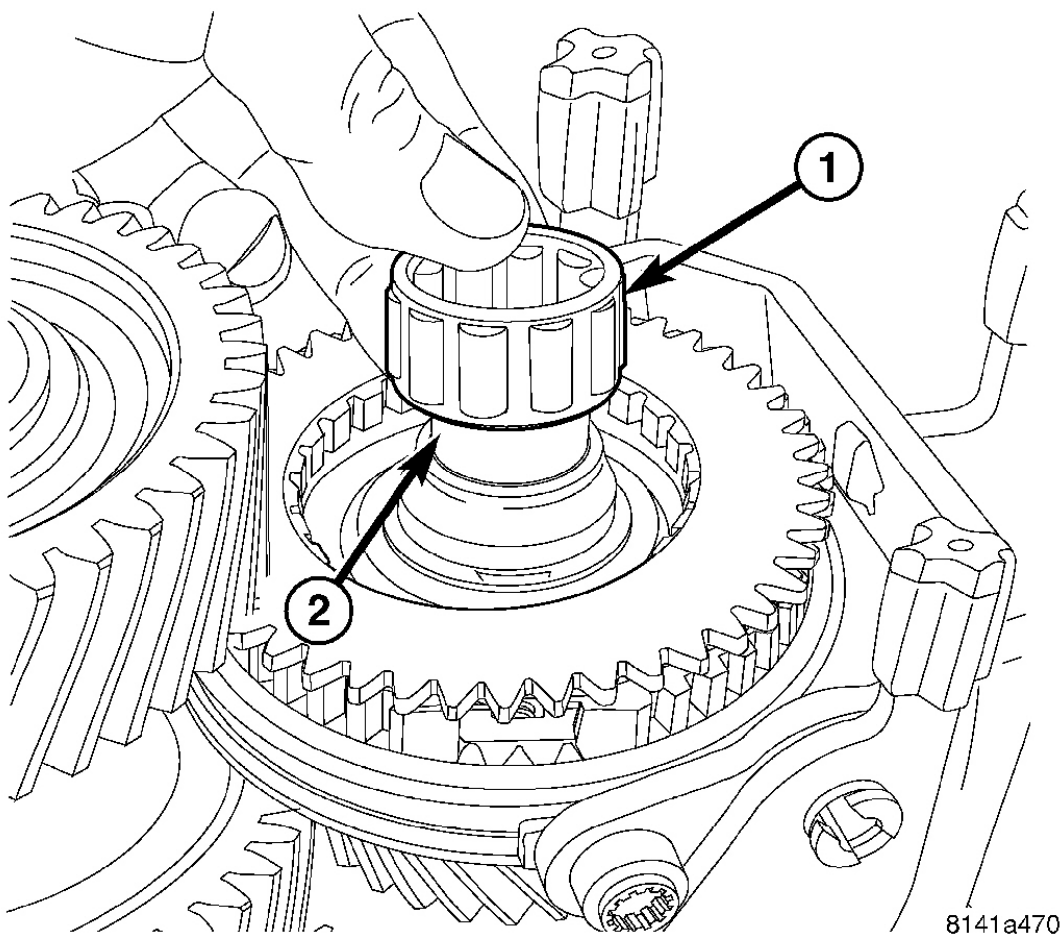


Fig. 115: Identifying Fifth Gear Synchronizer Blocker Ring & 5-6 Synchronizer Hub
Courtesy of CHRYSLER LLC

9. Install fifth gear blocker ring (1) on 5-6 synchronizer hub (2). Then hold blocker ring and center synchronizer sleeve.



8141a470

Fig. 116: Input Shaft Roller Bearing
Courtesy of CHRYSLER LLC

10. Install input shaft roller bearing (1) on mainshaft (2).

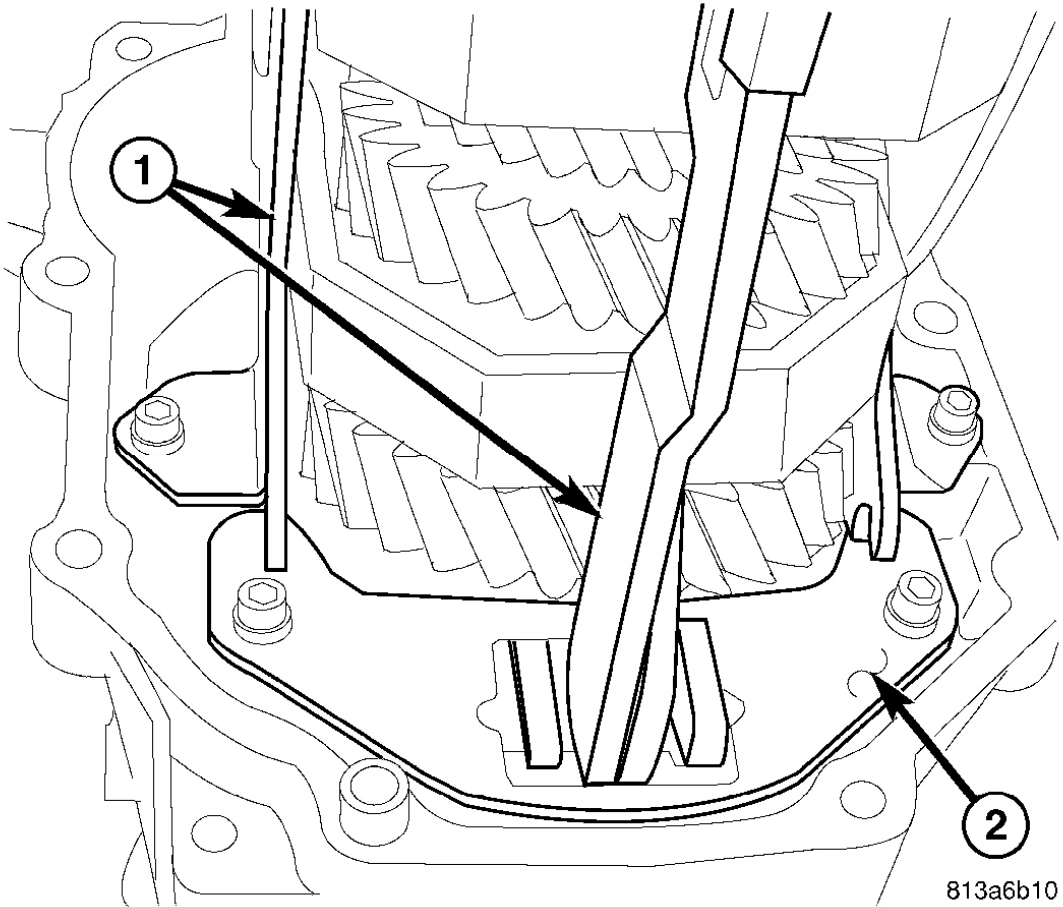
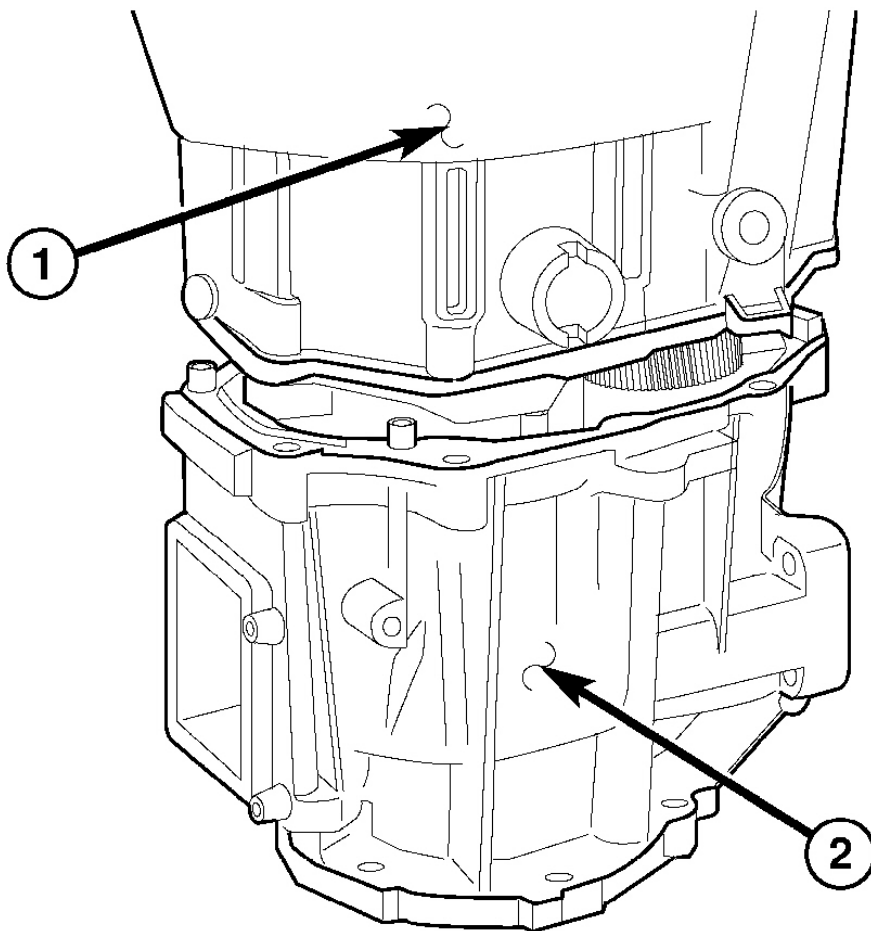


Fig. 117: Identifying Shift Rails & Support Plate
Courtesy of CHRYSLER LLC

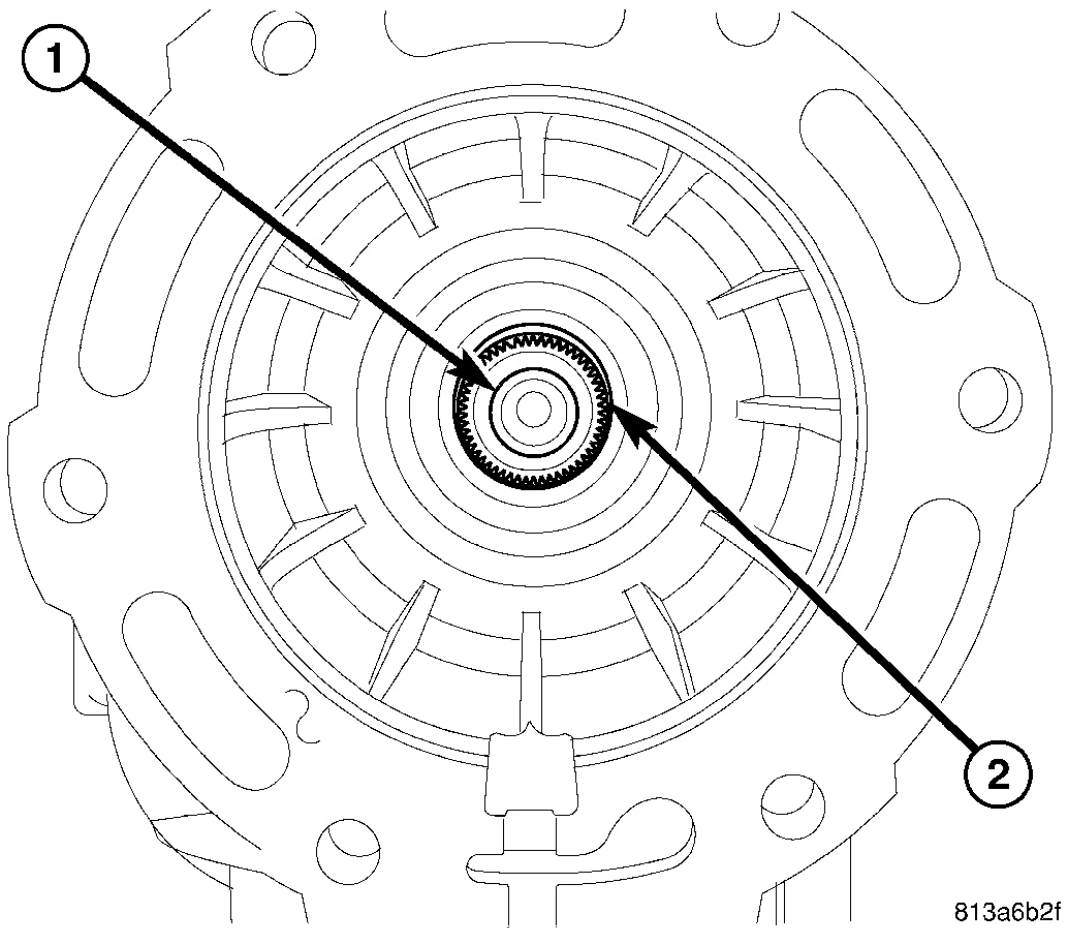
11. Install shift rail (1) support plate (2) bolts and tighten to 8 N.m (71 in. lbs.).



813a6b05

Fig. 118: Identifying Front Housing & Rear Housing
Courtesy of CHRYSLER LLC

12. Apply MOPAR® Gasket Maker to front housing.
13. Install front housing (1) on rear housing (2) and tighten bolts to 28 N.m (21 ft. lbs.).



813a6b2f

Fig. 119: Identifying Output Shaft & Snap Ring
Courtesy of CHRYSLER LLC

14. Install output shaft (1) snap ring (2) 4x4 only.

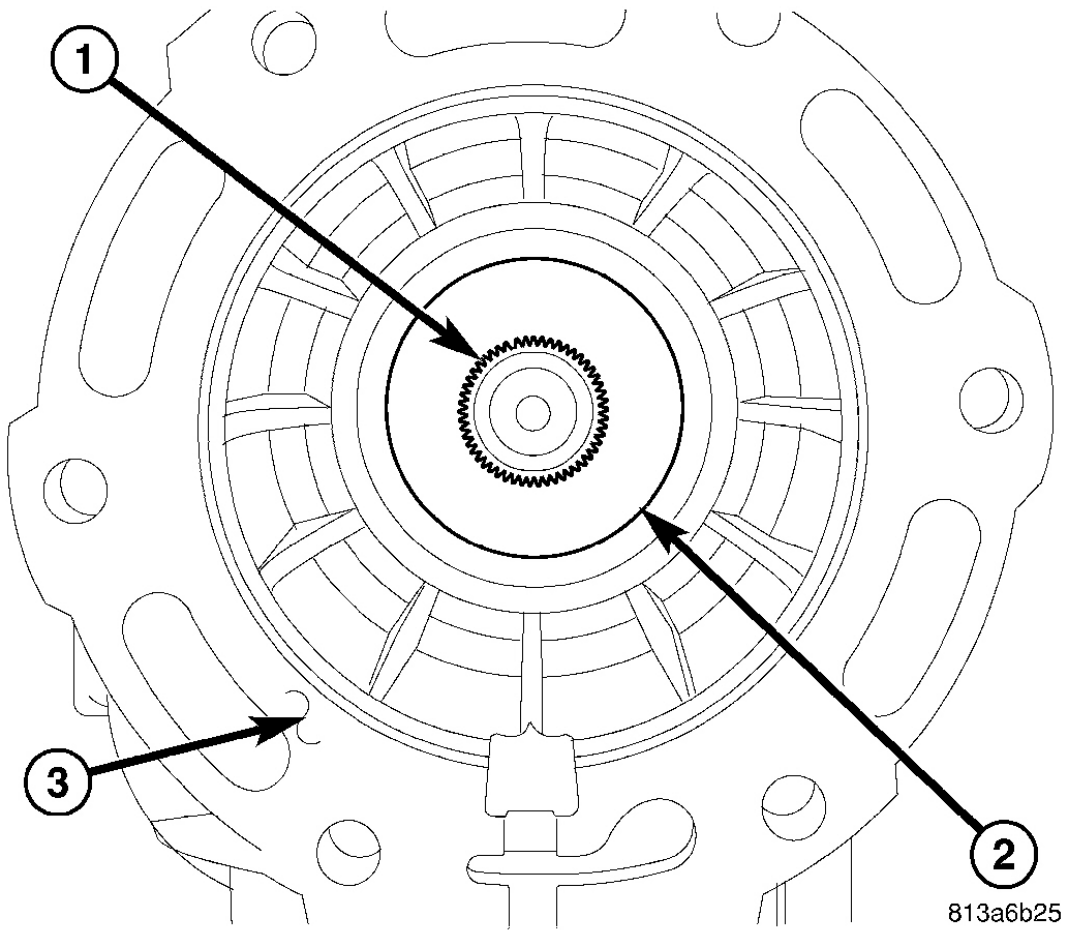


Fig. 120: Identifying Output Shaft, Seal & Rear Housing
Courtesy of CHRYSLER LLC

15. Install output shaft (1) seal (2) in rear housing with Installer 9638.

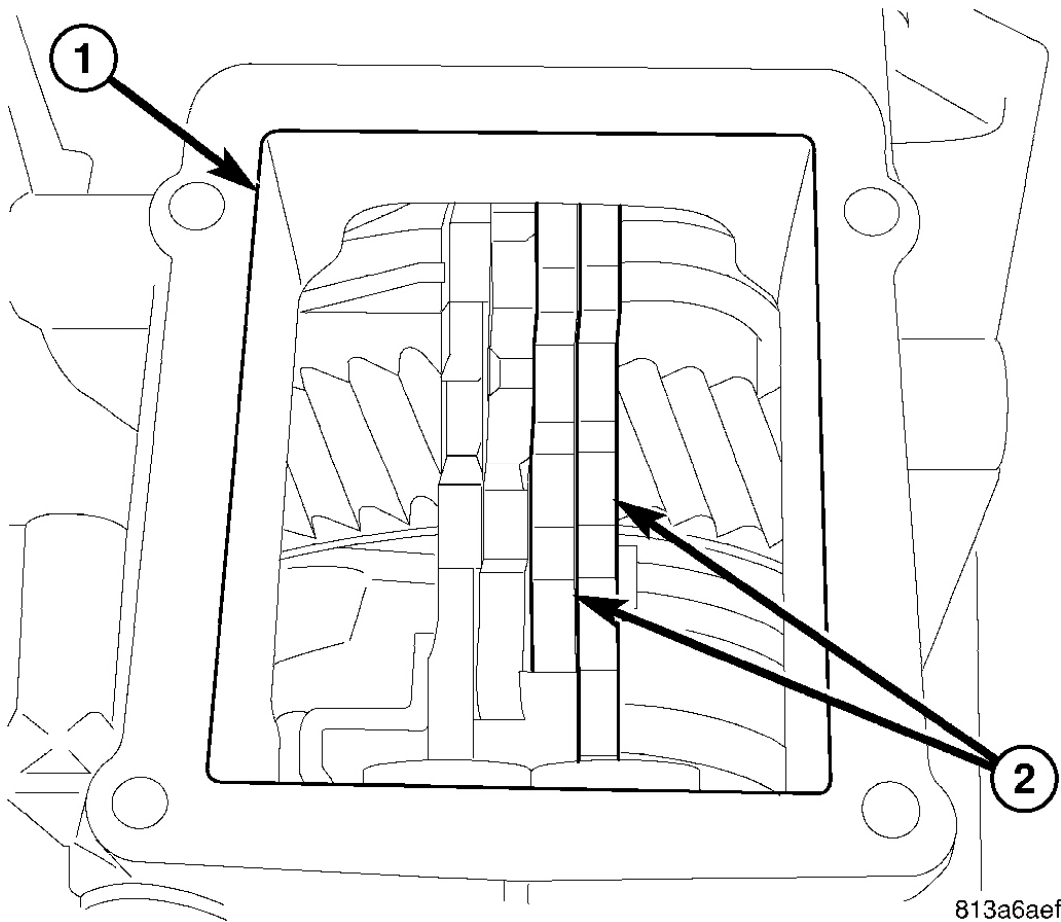
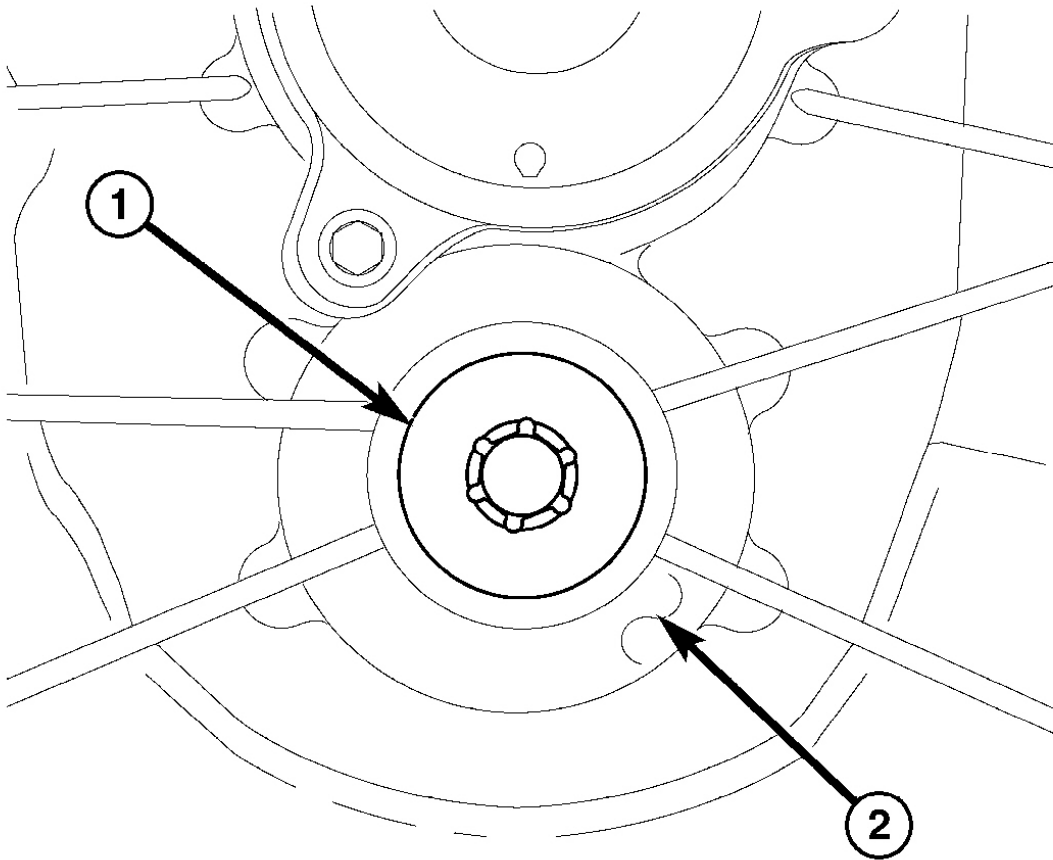


Fig. 121: View Of Shift Tower Opening & Shift Rails
Courtesy of CHRYSLER LLC

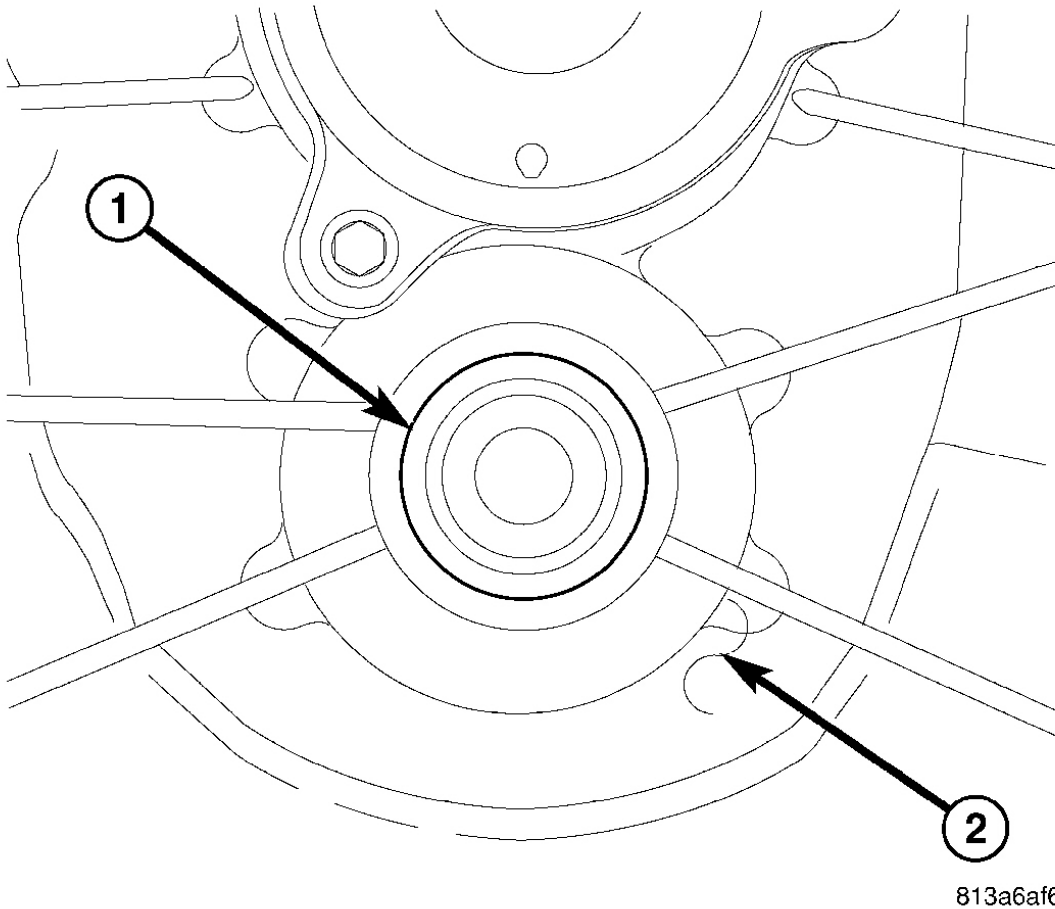
16. Through the shift tower opening (1) move two shift rails (2) forward to lock the transmission in two gear.



813a6b01

Fig. 122: Identifying Countershaft Bolt & Front Housing
Courtesy of CHRYSLER LLC

17. Install countershaft bolt (1) into the front housing (2) and tighten to 100 N.m (74 ft. lbs.).



813a6af6

Fig. 123: Identifying Countershaft Plug & Front Housing
Courtesy of CHRYSLER LLC

18. Install countershaft plug (1) in front housing (2) with Installer 7829-A and Handle C-4171.

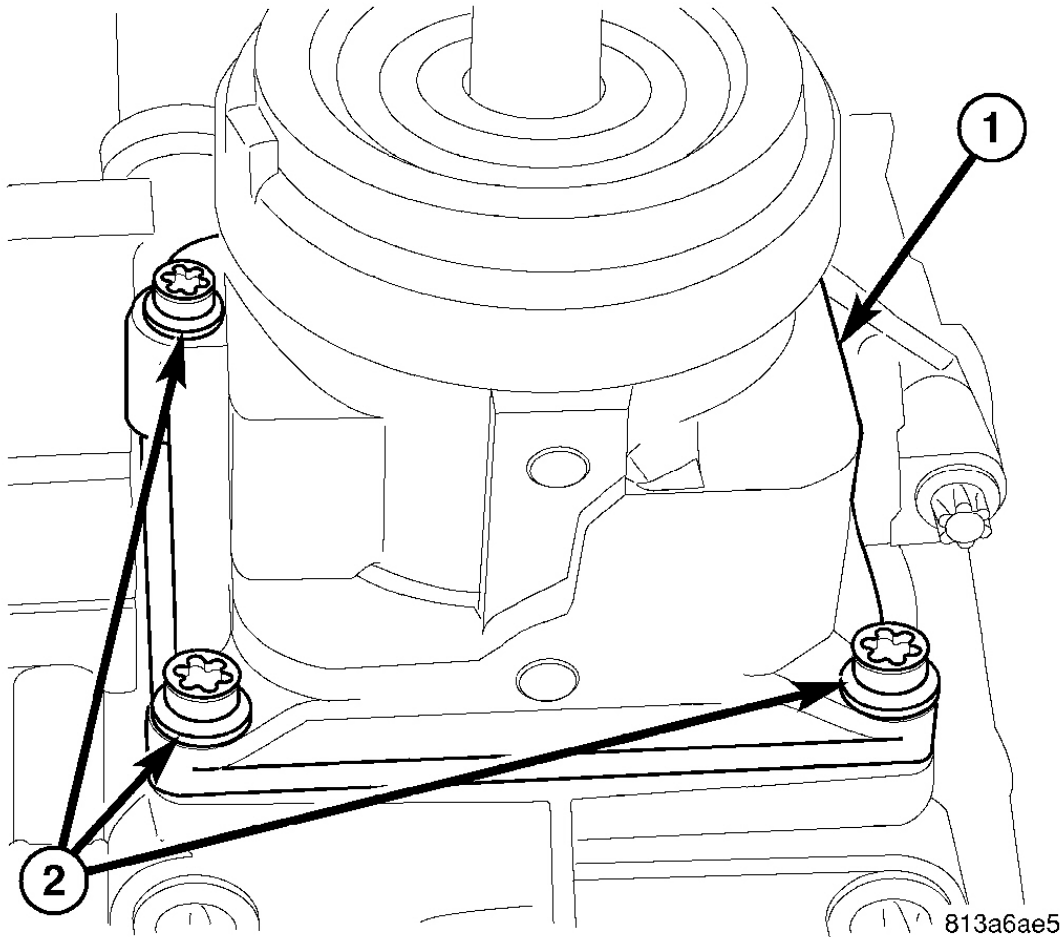
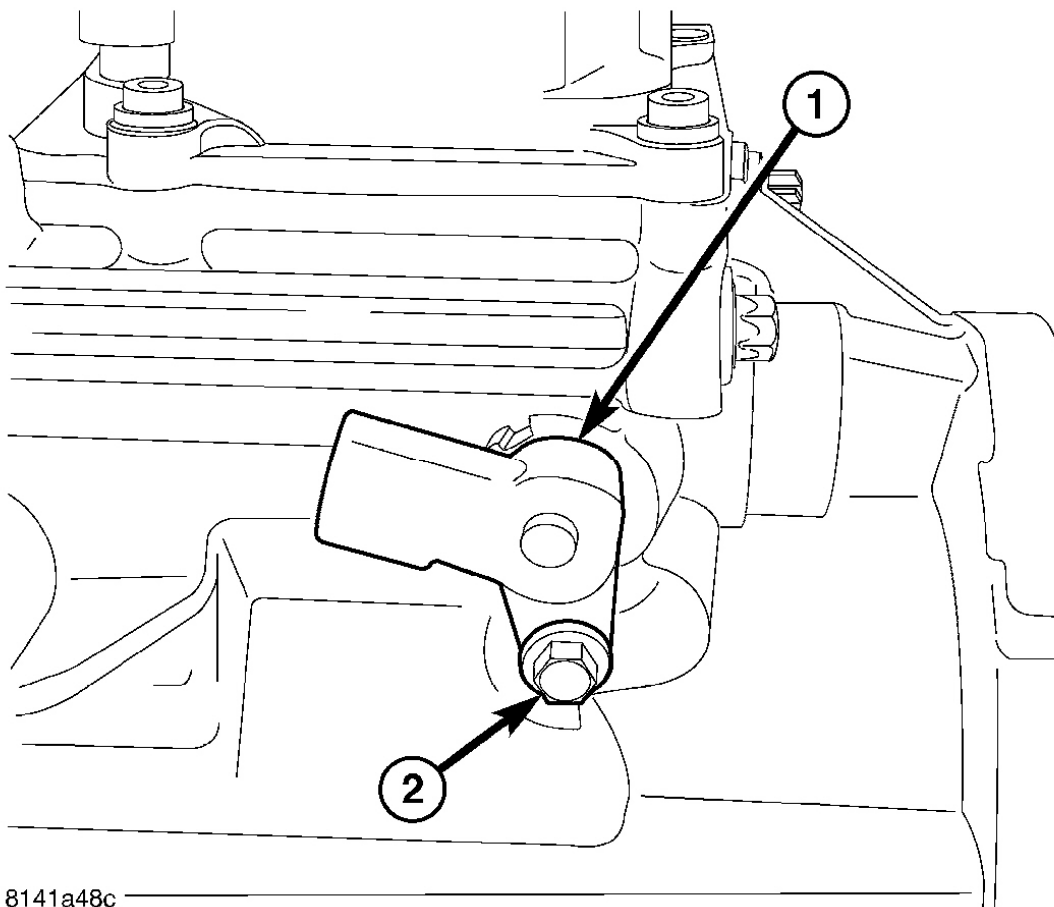


Fig. 124: Identifying Shift Tower & Bolts
Courtesy of CHRYSLER LLC

19. Move shift rails to neutral.
20. To prevent sealant from plugging the transmission vent, apply just a thin film of MOPAR® Gasket Maker to the shift tower (1) mating surface.
21. Install shift tower (1) and tighten bolts (2) to 14 N.m (10 ft. lbs.).



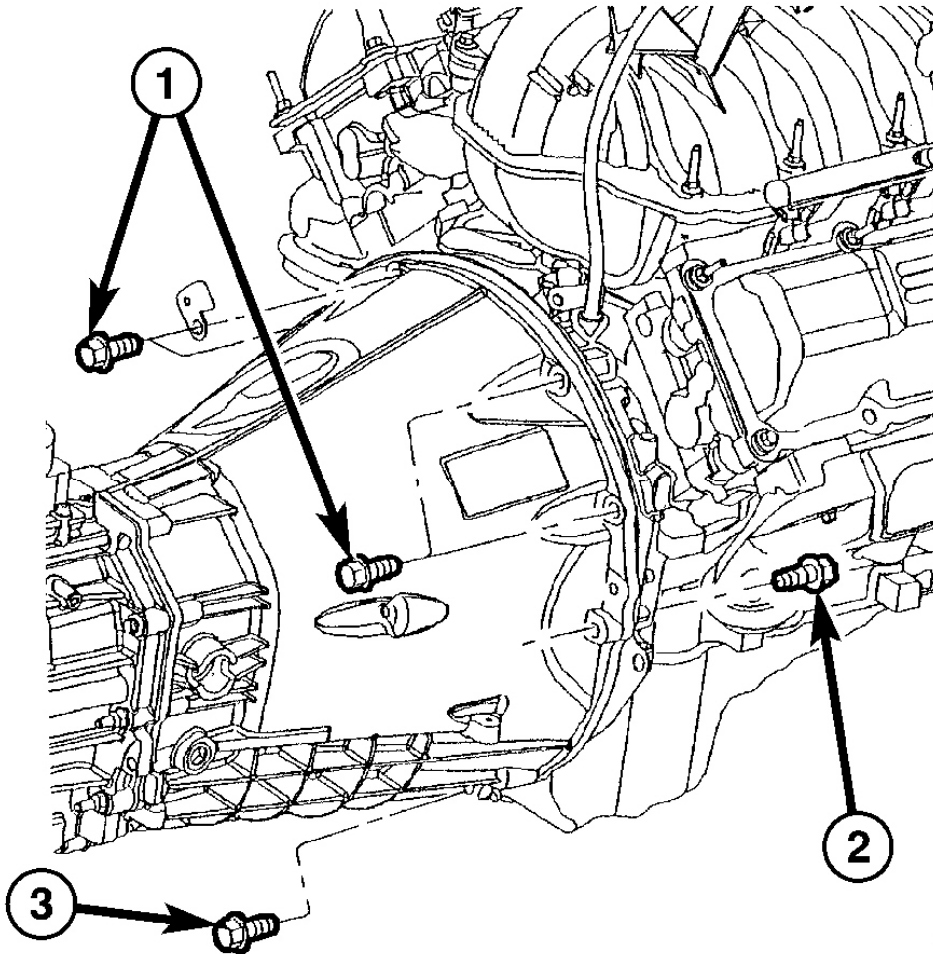
8141a48c

Fig. 125: Identifying Back-Up Lamp Switch & Bolt
Courtesy of CHRYSLER LLC

22. Install back up lamp switch (1) and bolt (2).

INSTALLATION

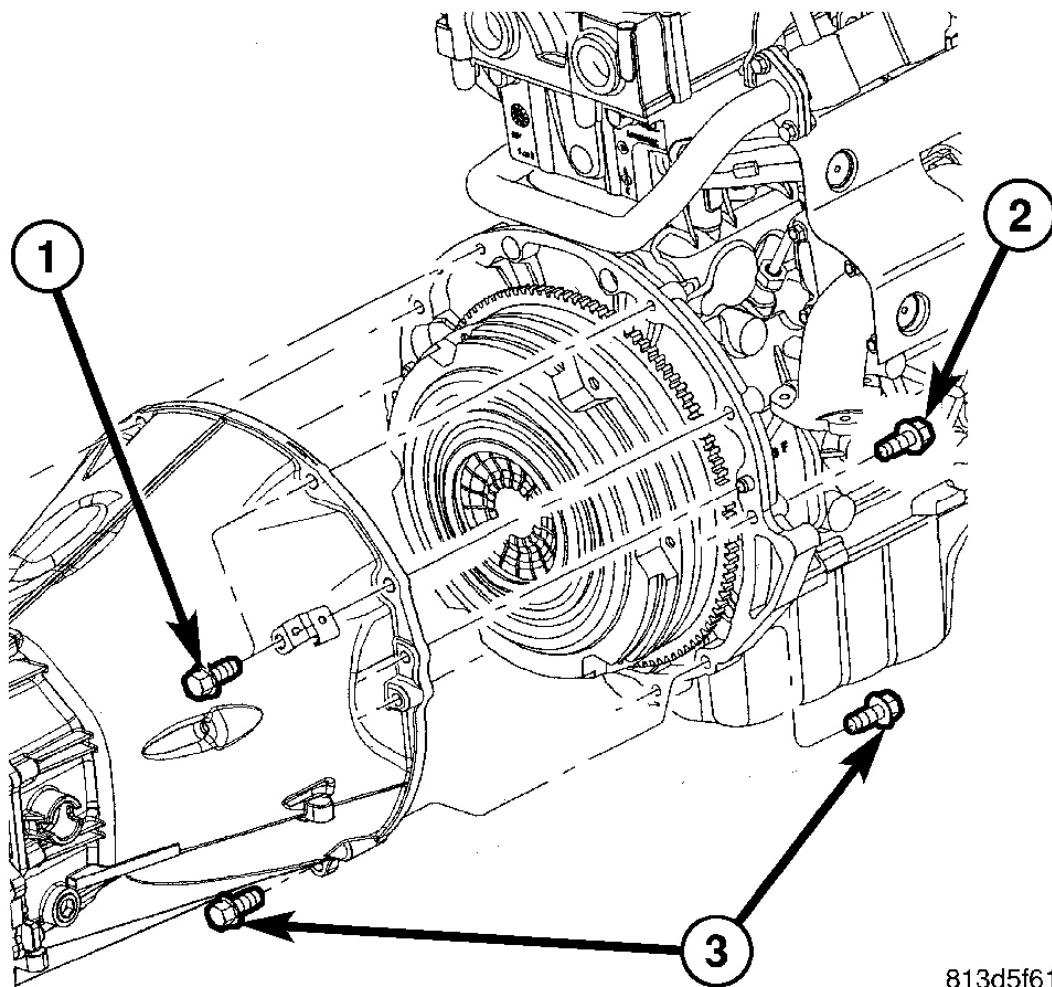
MANUAL TRANSMISSION - NSG370



813d6069

Fig. 126: 3.7L Engine, Transmission & Bolts
Courtesy of CHRYSLER LLC

1. Install transmission on engine.
2. On 3.7L engine tighten bolts (1) to 41 N.m (30 ft. lbs.). Tighten bolts (2) to 67 N.m (50 ft. lbs.). Tighten bolts (3) to 54 N.m (40 ft. lbs.).



813d5f61

Fig. 127: 2.8L Diesel Engine, Transmission & Bolts
Courtesy of CHRYSLER LLC

3. On 2.8L diesel engine tighten bolts (1) to 41 N.m (30 ft. lbs.). Tighten bolts (2) to 67 N.m (50 ft. lbs.). Tighten bolts (3) to 54 N.m (40 ft. lbs.).

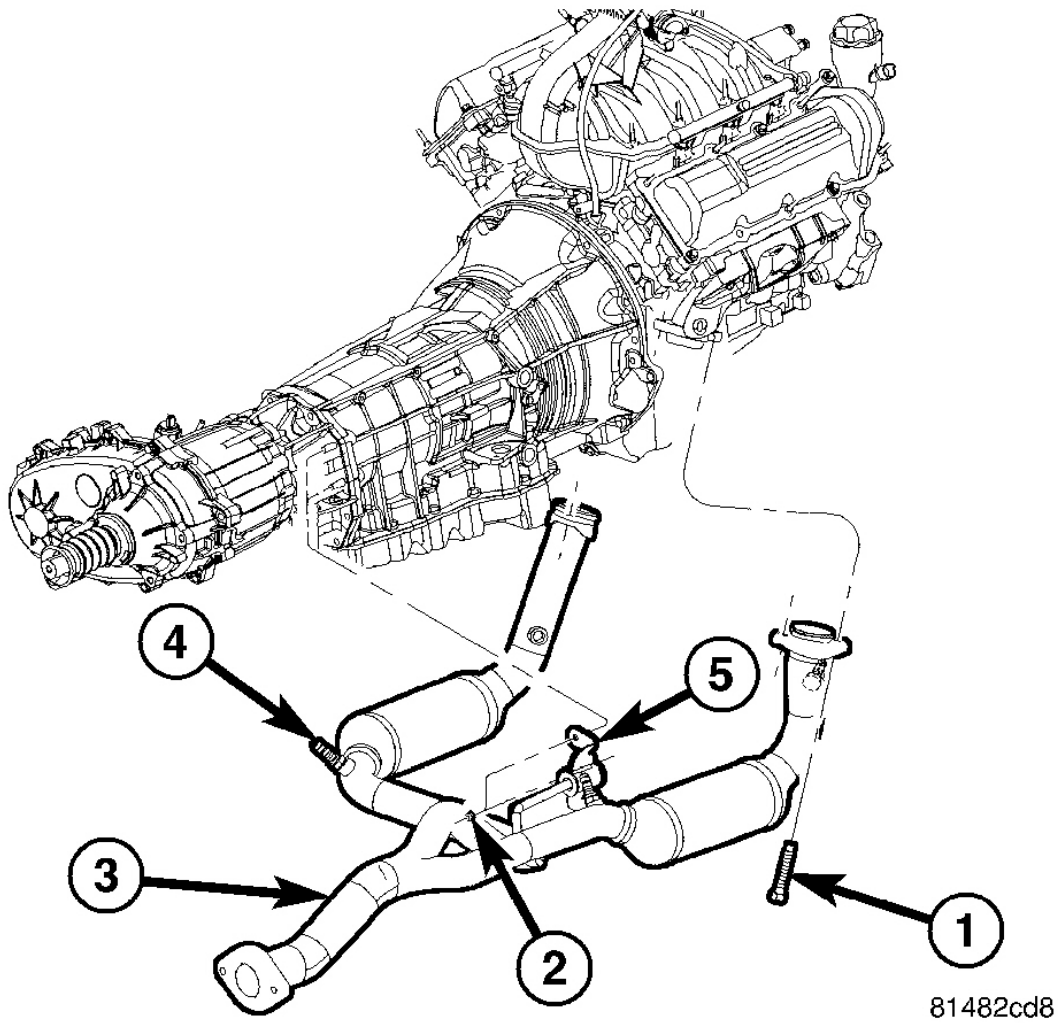
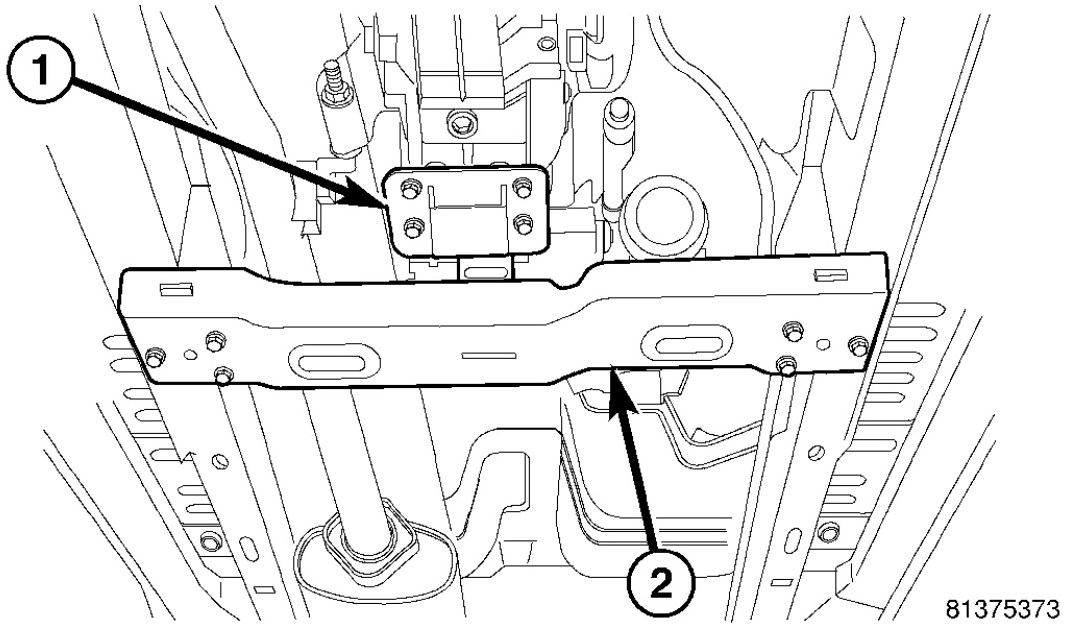


Fig. 128: 3.7L Catalytic Converter - Typical
Courtesy of CHRYSLER LLC

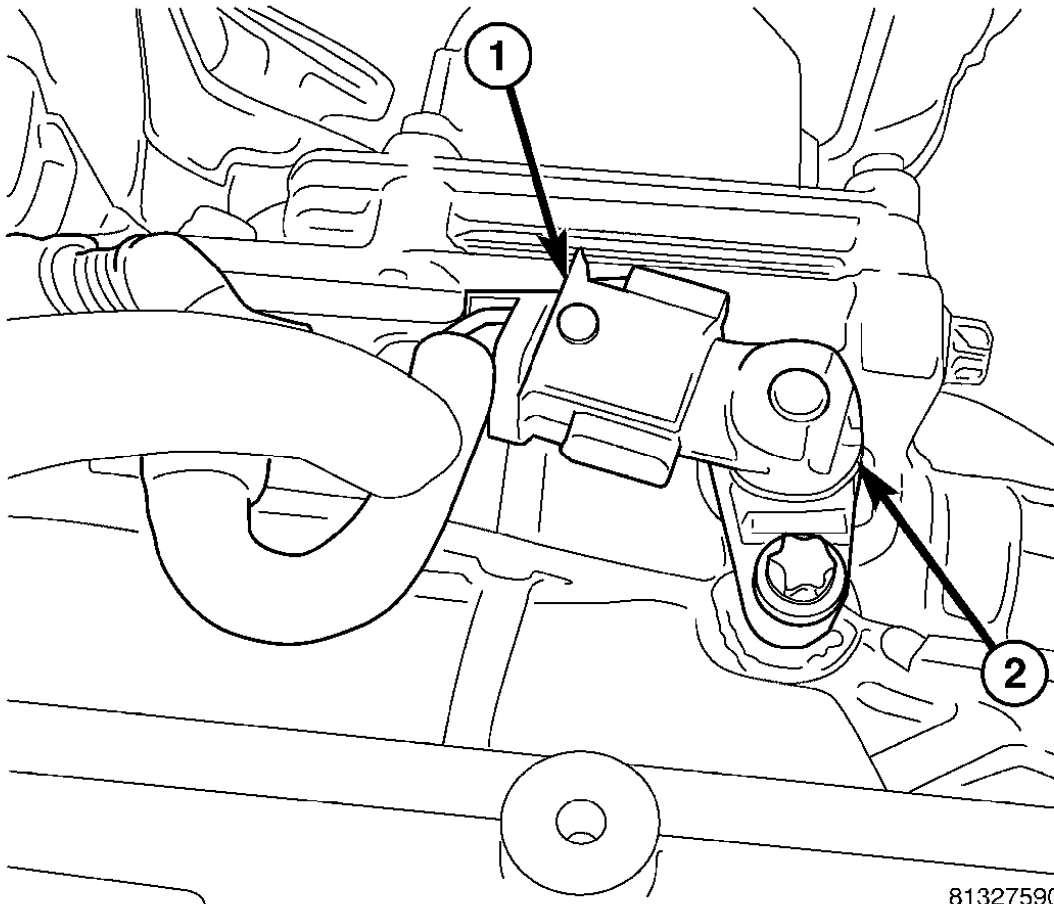
4. Vehicles with 3.7L engine install exhaust pipe with converters (3).



81375373

Fig. 129: Transmission Mount & Crossmember
Courtesy of CHRYSLER LLC

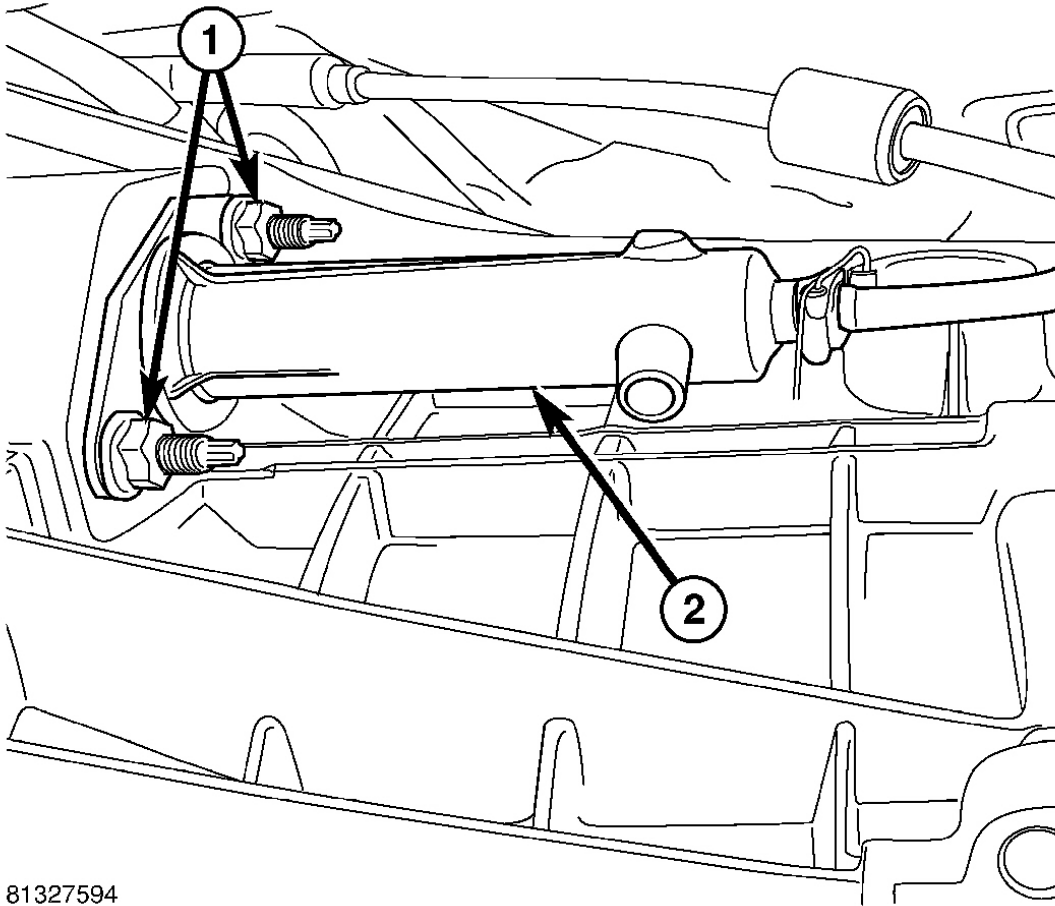
5. Install transmission crossmember (2) and tighten bolts to 47 N.m (35 ft. lbs.). Install transmission mount (1) bolts and tighten to 47 N.m (35 ft. lbs.).



81327590

Fig. 130: Backup Lamp Switch & Wiring Connector
Courtesy of CHRYSLER LLC

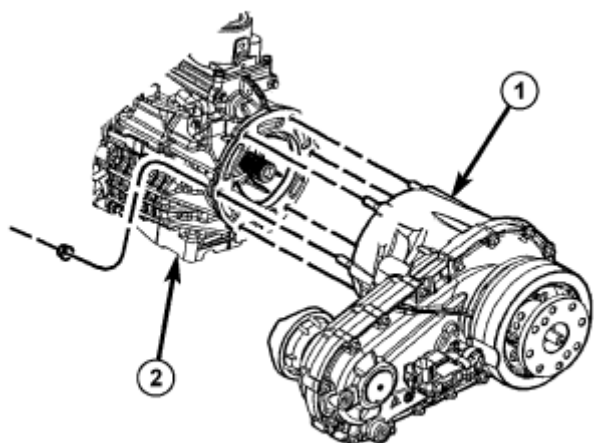
6. Install backup lamp (2) wiring connector (1).



81327594

Fig. 131: Identifying Clutch Slave Cylinder Nuts & Cylinder
Courtesy of CHRYSLER LLC

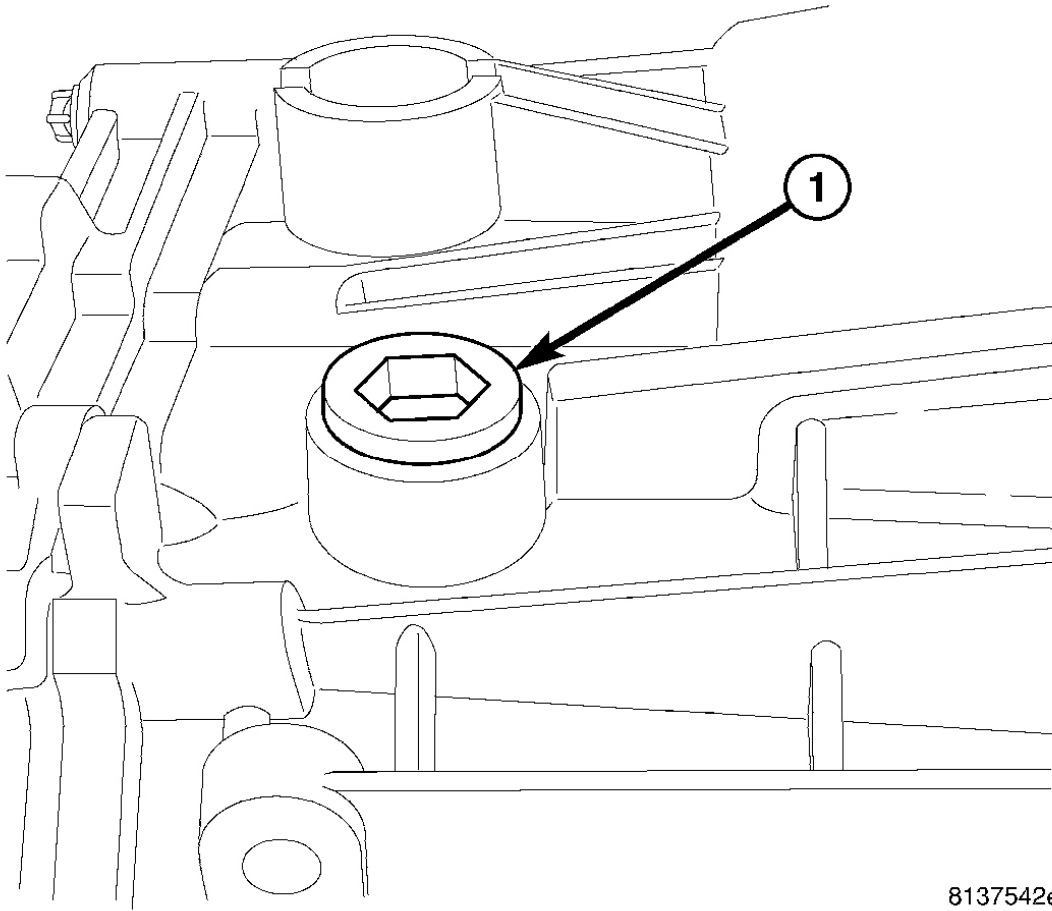
7. Install clutch slave cylinder (2) and mounting nuts (1).



818f7742

Fig. 132: Identifying Transfer Case & Transmission
Courtesy of CHRYSLER LLC

8. Install transfer case (1) on transmission (2), if equipped.
9. Install propeller shaft/shafts with reference marks aligned.



8137542e

Fig. 133: Fill Plug
Courtesy of CHRYSLER LLC

10. Remove fill plug (1) and fill transmission to specifications.

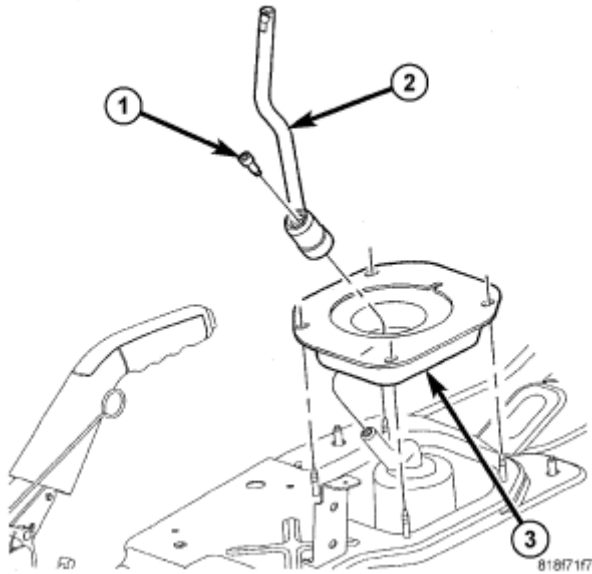


Fig. 134: Removing/Installing Shift Lever Screw, Lever And Inner Boot
 Courtesy of CHRYSLER LLC

11. Install inner shift boot (3), shift lever (2) and lever screw (1).

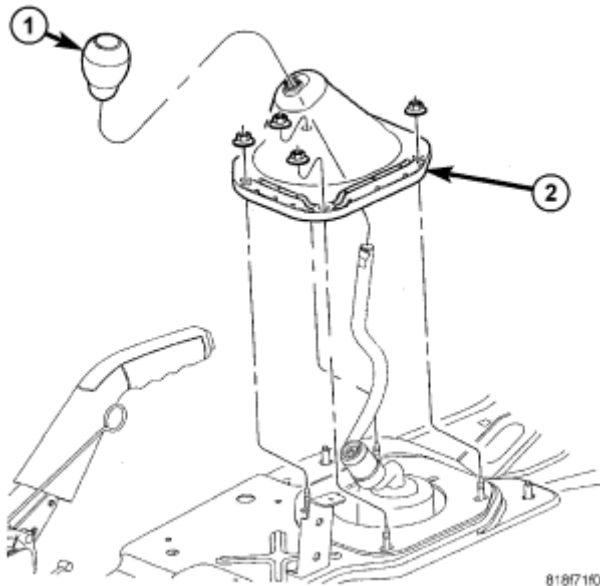


Fig. 135: Identifying Shift Knob & Boot
 Courtesy of CHRYSLER LLC

12. Install shift boot (2), shift knob (1) and console.
13. Connect battery.

SPECIFICATIONS

TORQUE

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Drain Plug	30	22	-
Fill Plug	30	22	-
Shift Tower Bolts	14	10	-
Housing Bolts	28	21	-
Input Shaft Retainer Bolts	9	-	80
Bearing Retainer Bolts	10	-	88
Shift Rail Support Bolts	8	-	71
Idler Gear Shaft Bolt	20	15	-
Countershaft Bolt	100	74	-
Transmission Mount to Transmission Bolts	47	35	-
Transmission Top Four Bolts	40	30	-
Transmission Side Two Bolts	68	50	-
Transmission Bottom Four Bolts	54	40	-
2WD Transmission Damper Bolts	175	130	-

GEAR RATIO

GEAR	RATIO
FIRST	4.46
SECOND	2.61
THIRD	1.72
FOURTH	1.25
FIFTH	1.00
SIXTH	0.84
REVERSE	4.06

SPECIAL TOOLS

MANUAL TRANSMISSION - NSG370

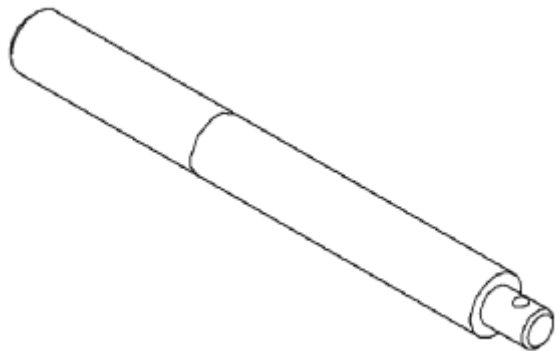


Fig. 136: Handle C-4171
Courtesy of CHRYSLER LLC

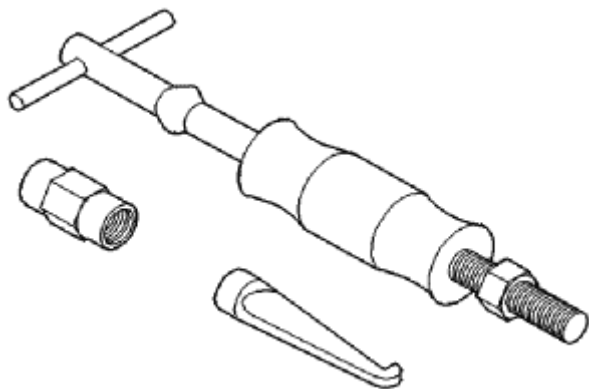


Fig. 137: Slide Hammer C-637
Courtesy of CHRYSLER LLC

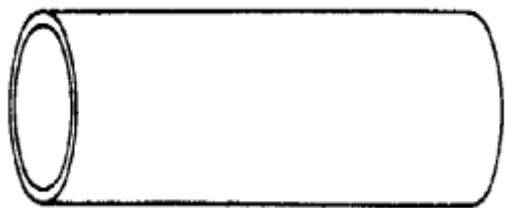


Fig. 138: Hub Installer W-262
Courtesy of CHRYSLER LLC

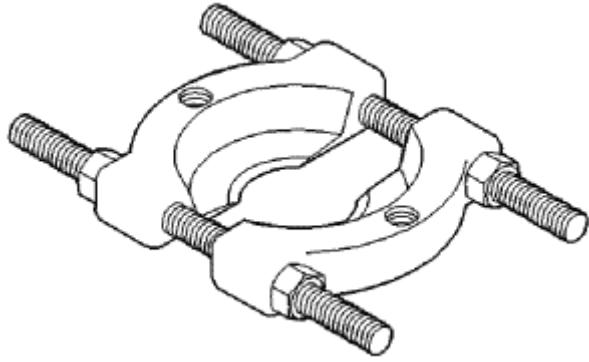


Fig. 139: Bearing Splitter 1130
Courtesy of CHRYSLER LLC

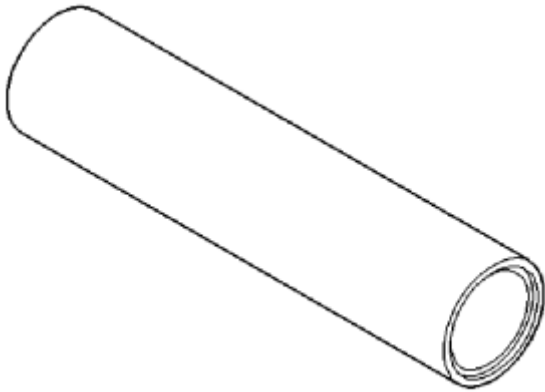


Fig. 140: Bearing Installer 6448A
Courtesy of CHRYSLER LLC

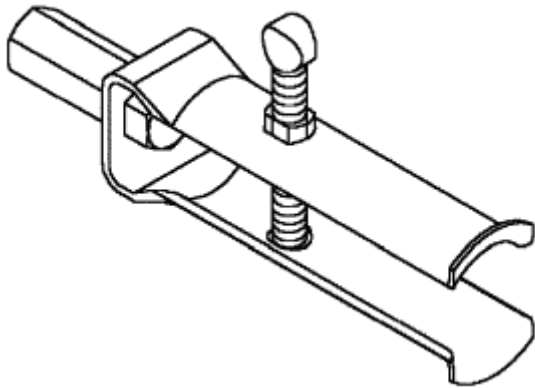


Fig. 141: Bearing Remover 7794-A
Courtesy of CHRYSLER LLC

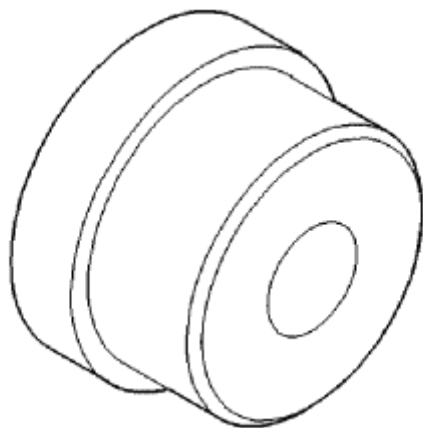


Fig. 142: Plug Installer 7829-A
Courtesy of CHRYSLER LLC

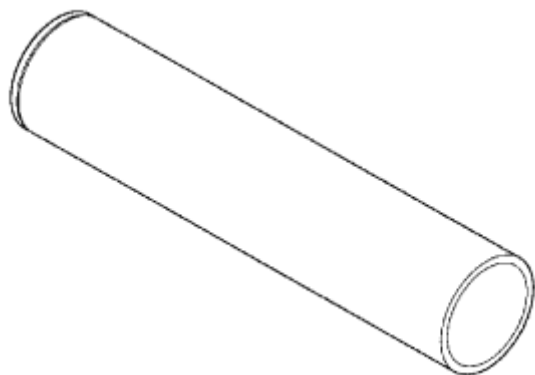


Fig. 143: Hub Installer 8228
Courtesy of CHRYSLER LLC

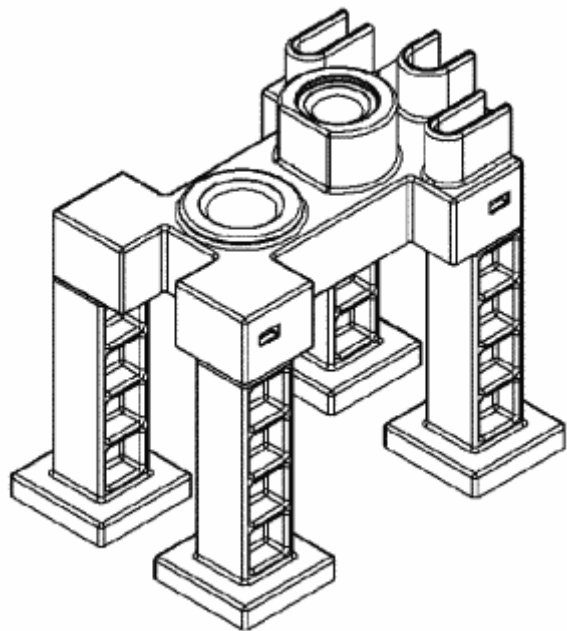


Fig. 144: Build Fixture 9633
Courtesy of CHRYSLER LLC

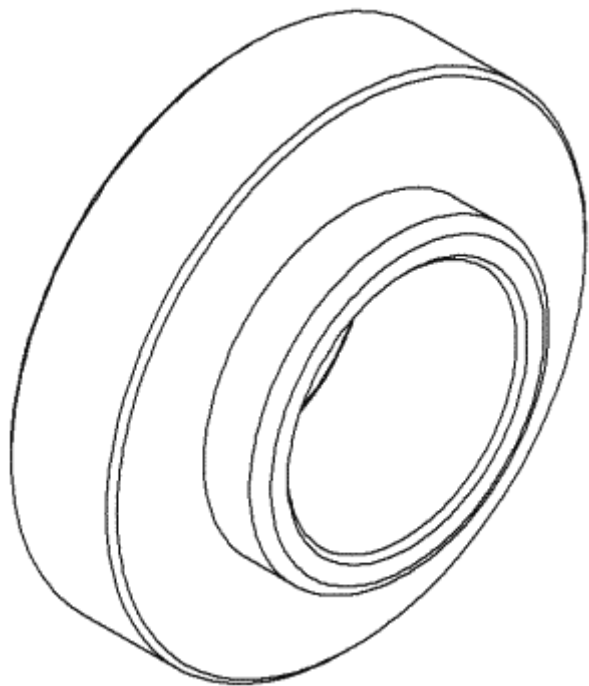


Fig. 145: Seal Installer 9635
Courtesy of CHRYSLER LLC

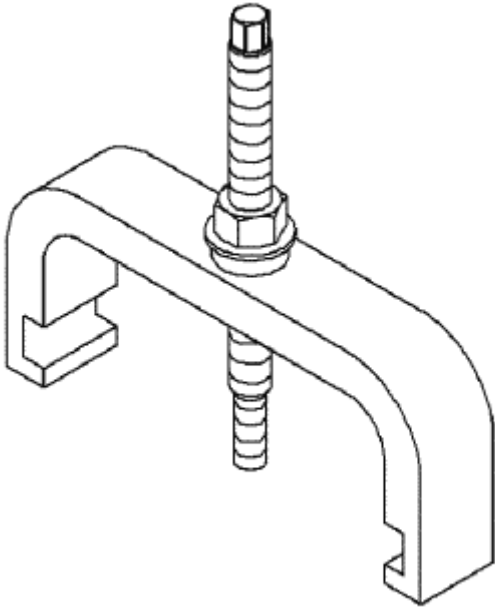


Fig. 146: Shaft Remover/Installer 9636
Courtesy of CHRYSLER LLC

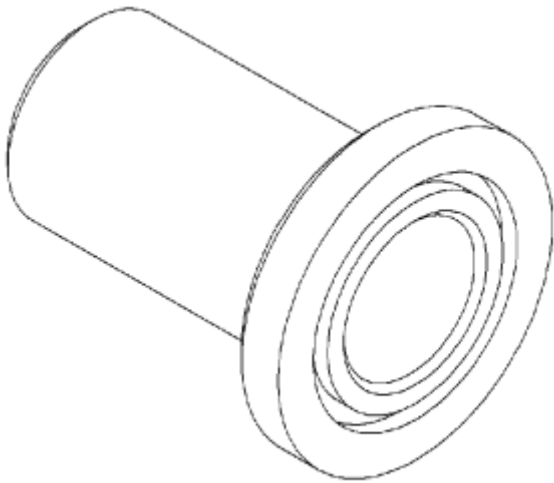


Fig. 147: Seal Installer 9638
Courtesy of CHRYSLER LLC

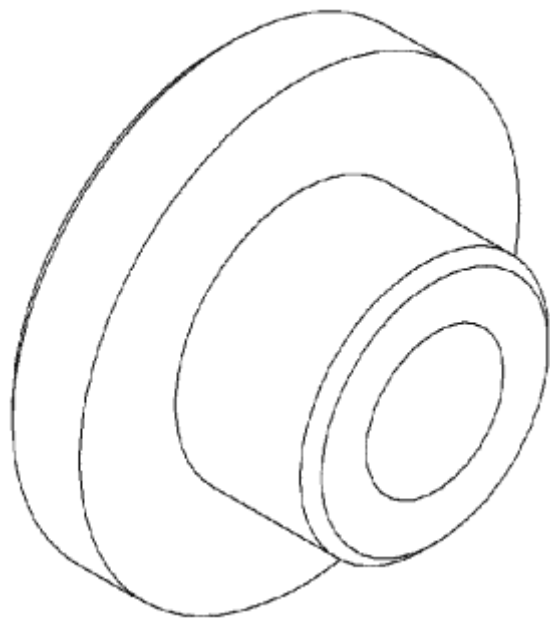


Fig. 148: Bearing Installer 9643
Courtesy of CHRYSLER LLC

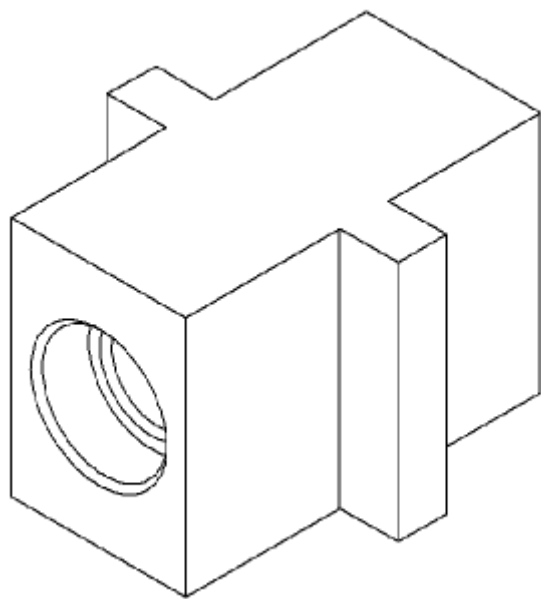


Fig. 149: Mainshaft Build Fixture 9648
Courtesy of CHRYSLER LLC

2008 ACCESSORIES AND EQUIPMENT

Message Center - Service Information - Liberty

MESSAGE CENTER - SERVICE INFORMATION

SPECIAL TOOLS

OVERHEAD CONSOLE SYSTEMS

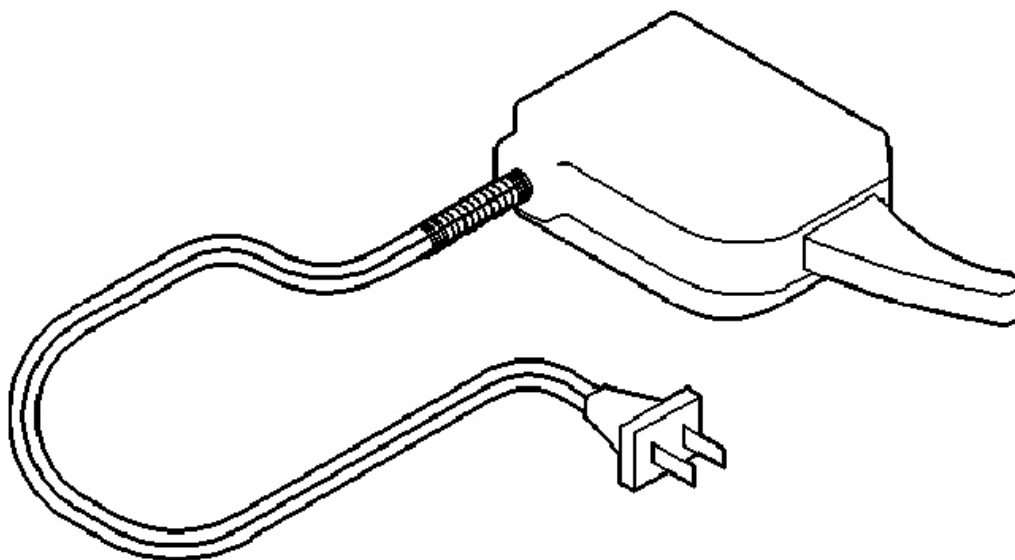
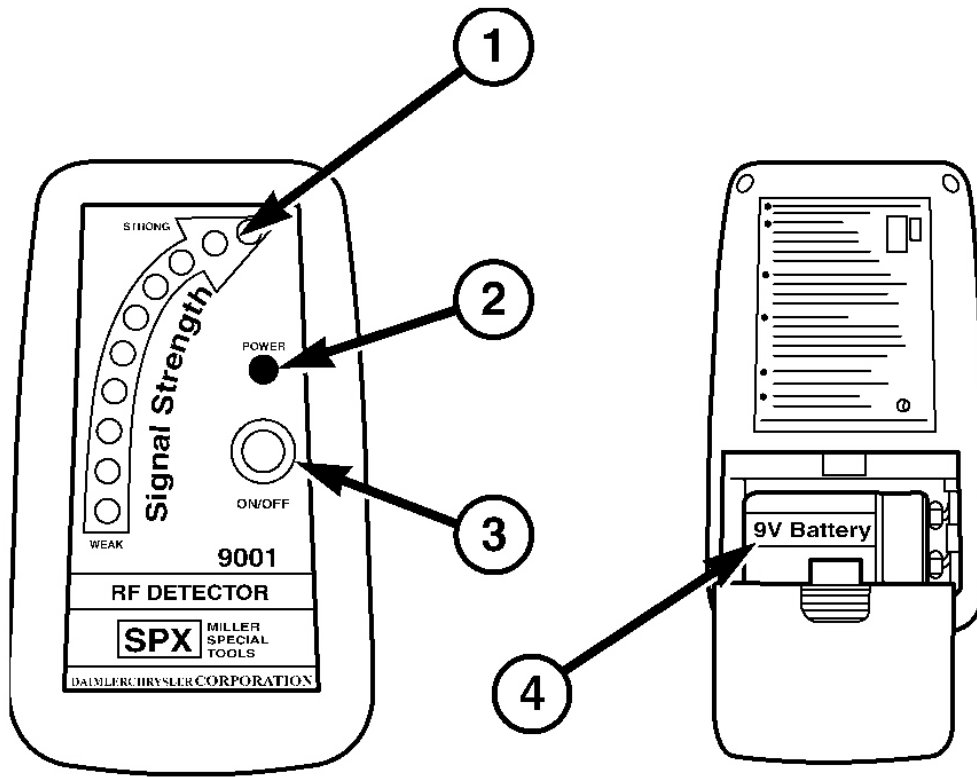


Fig. 1: DEGAUSSING TOOL 6029
Courtesy of CHRYSLER LLC



80f230cb

Fig. 2: Radio Frequency Detector
 Courtesy of CHRYSLER LLC

COMPASS TEMPERATURE FUNCTION

DESCRIPTION

ELECTRONIC VEHICLE INFORMATION CENTER

Instrument Cluster With Compass And Temperature Display

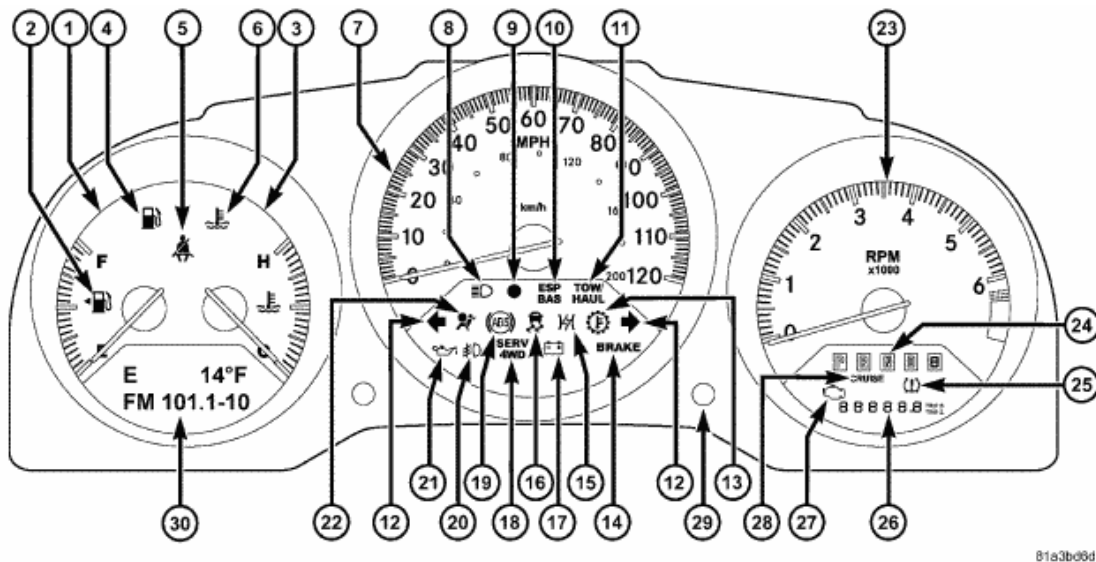


Fig. 3: Instrument Cluster With Electronic Vehicle Information Center (EVIC)
 Courtesy of CHRYSLER LLC

NOTE: Instrument cluster with Electronic Vehicle Information Center (EVIC) shown in illustration. Instrument cluster with Temperature Display and instrument cluster with Compass Temperature Display similar.

The Compass Temperature Display functions are available on the mid level instrument cluster. The compass and temperature readout is displayed in the lower left part of the instrument cluster (30) below the fuel (1) and engine coolant temperature (3) gauges. The display shows the current ambient temperature and one of eight compass readings identifying which direction the vehicle is facing. Pressing and holding the instrument cluster push-button (29) allows setting of the variance zone and manual calibration of the compass.

The display in the lower right part of the instrument cluster (26) below the tachometer (23) shows the vehicle odometer related functions. These functions include Trip Odometer (ODO), Trip A and Trip B readouts. The instrument cluster push-button (29) can be used to scroll through the different odometer functions. Refer to **DESCRIPTION** for additional information on the instrument cluster and related functions.

The Compass Temperature Display system is comprised of several different components. Those components are:

- Instrument Cluster (sometimes referred to as Cab Compartment Node)
- Ambient Temperature Sensor
- Remote Compass Module (RCM)
- Controller Area Network (CAN) Data Bus
- Local Interface Network (LIN) Data Bus
- Totally Integrated Power Module

The compass temperature display and the instrument cluster button are part of the Instrument Cluster assembly and cannot be serviced as separate components. If the display or button are inoperative the complete Instrument

Cluster assembly must be replaced. Refer to **REMOVAL** .

Instrument Cluster With Temperature Display

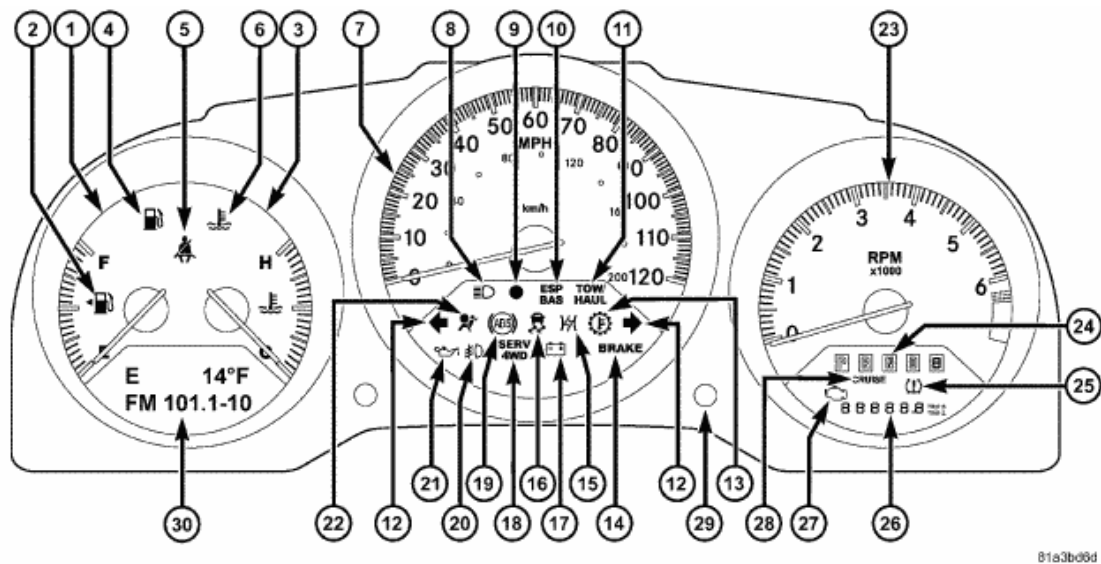


Fig. 4: Instrument Cluster With Electronic Vehicle Information Center (EVIC)
Courtesy of CHRYSLER LLC

NOTE: Instrument cluster with Electronic Vehicle Information Center (EVIC) shown in illustration. Instrument cluster with Temperature Display and instrument cluster with Compass Temperature Display similar.

The Temperature Display function is available on the base level instrument cluster. The temperature readout for the base level cluster is displayed in the lower right part of the instrument cluster (26) below the tachometer (23). The display shows the current ambient temperature. The display also shows the vehicle odometer related functions. These functions include Trip Odometer (ODO), Trip A and Trip B readouts. The instrument cluster push-button (29) can be used to scroll through the different odometer functions. Refer to **DESCRIPTION** for additional information on the instrument cluster and related functions.

OPERATION

ELECTRONIC VEHICLE INFORMATION CENTER

The Compass Temperature Display system uses both non-switched and ignition switched sources of battery current so that some of its features remain operational at any time, while others may only operate with the ignition switch in the ON position. When the ignition switch is turned to the ON position, the display will return to the last function being displayed before the ignition was turned to the OFF position. Pressing and holding the instrument cluster push-button allows setting variance zones and manual calibration of the compass.

The Compass Temperature Display system is comprised of several different components that communicate over the Controller Area Network (CAN) and Local Interface Network (LIN) Data Bus circuits. If the system is inoperative a scan tool and the appropriate diagnostic information must be used to diagnose the system and related data buses.

DIAGNOSIS AND TESTING

COMPASS TEMPERATURE FUNCTION

CAUTION: Do not place any external magnets, such as magnetic roof mount antennas, in the vicinity of the Remote Compass Module (RCM) located above the headliner in the rear of the vehicle. Do not place any electronic devices (cell phones, laptop computers, PDAs, portable DVD players, etc), on or near the rear of the roof as the RCM performance may be effected. Do not use magnetic tools when servicing the RCM.

The Compass and Temperature data is obtained from several components on the Controller Area Network (CAN) and Local Interface Network (LIN) Data Bus circuits. The Compass Temperature Display will not function properly if the bus messages from any of these components is not received. If no Compass Temperature Display data is present or the display is inaccurate, check the CAN and LIN Data Bus circuit communications, the Instrument Cluster functions, the Remote Compass Module (RCM) and the Totally Integrated Power Module (TIPM). Should the RCM become disconnected or the signal from the RCM is lost, the instrument cluster will display dashes "- -".

The use of a scan tool and the proper diagnostic procedures information are recommended for further testing of the Instrument Cluster, the RCM, the CAN Data Bus and the LIN Data Bus circuits. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

STANDARD PROCEDURE

COMPASS DEMAGNETIZING

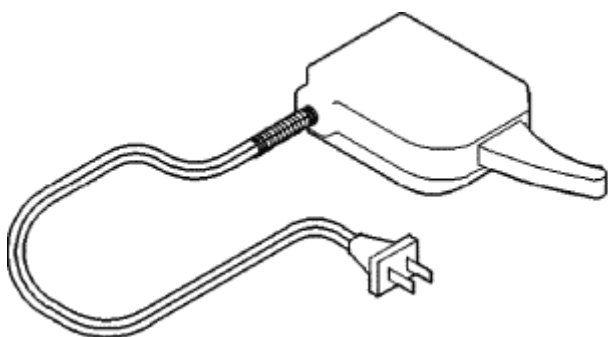
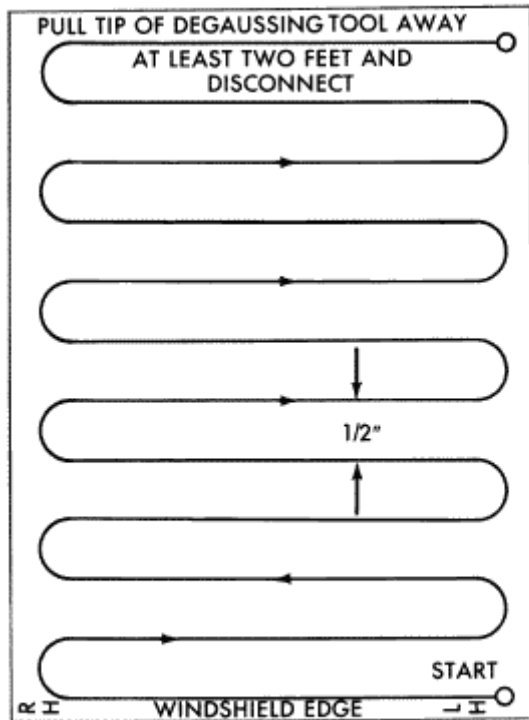


Fig. 5: DEGAUSSING TOOL #6029
Courtesy of CHRYSLER LLC

A degaussing tool (Special Tool 6029) is used to demagnetize, or degauss, the overhead console forward mounting screw and the roof panel above the overhead console. Equivalent units must be rated as continuous duty for 110/115 volts and 60 Hz. They must also have a field strength of over 350 gauss at 7 millimeters (0.25 inch) beyond the tip of the probe.

To demagnetize the roof panel proceed as follows:

1. Be certain that the ignition switch is in the Off position, before you begin the demagnetizing procedure.



J908E-27

Fig. 6: Demagnetizing Roof Panel Procedure
Courtesy of CHRYSLER LLC

2. Place a piece of paper approximately 22 by 28 centimeters (8.5 by 11 inches), oriented on the vehicle lengthwise from rear to front, on the center line of the roof at the rear liftgate. The purpose of the paper is to protect the roof panel from scratches, and to define the area to be demagnetized.
3. Connect the degaussing tool to an electrical outlet, while keeping the tool at least 61 centimeters (2 feet) away from the vehicle.
4. Slowly approach the center line of the roof panel at the rear liftgate, with the degaussing tool connected.
5. Contact the roof panel with the plastic coated tip of the degaussing tool. Be sure that the template is in place to avoid scratching the roof panel. Using a slow, back-and-forth sweeping motion, and allowing 13 millimeters (0.50 inch) between passes, move the tool at least 11 centimeters (4 inches) to each side of the roof center line, and 28 centimeters (11 inches) forward of the rear liftgate.
6. With the degaussing tool still energized, slowly back it away from the roof panel. When the tip of the tool is at least 61 centimeters (2 feet) from the roof panel, disconnect the tool.
7. Calibrate the compass and adjust the compass variance. See **STANDARD PROCEDURE**.

MANUAL COMPASS CALIBRATION

CAUTION: Do not place any external magnets, such as magnetic roof mount antennas, in the vicinity of the Remote Compass Module (RCM) located above the headliner in the rear of the vehicle. Do not place any electronic devices (cell phones, laptop computers, PDAs, portable DVD players, etc), on or near the rear of the roof as the RCM performance may be effected.

Do not use magnetic tools when servicing the RCM.

NOTE: Manual calibration is required anytime a new RCM is installed. The RCM can be calibrated by performing the following procedure.

The electronic compass unit features a continuous self-calibrating feature. This feature automatically updates the compass calibration as the vehicle is driven. This allows the compass unit to compensate for small changes in the residual magnetism that the vehicle may acquire during normal use. If the compass readings appear to be erratic or the Compass Temperature Displays "CAL", perform the following calibration procedure. Also, any time a new RCM is installed, it must be manually calibrated using this procedure.

Manually calibrate the compass as follows:

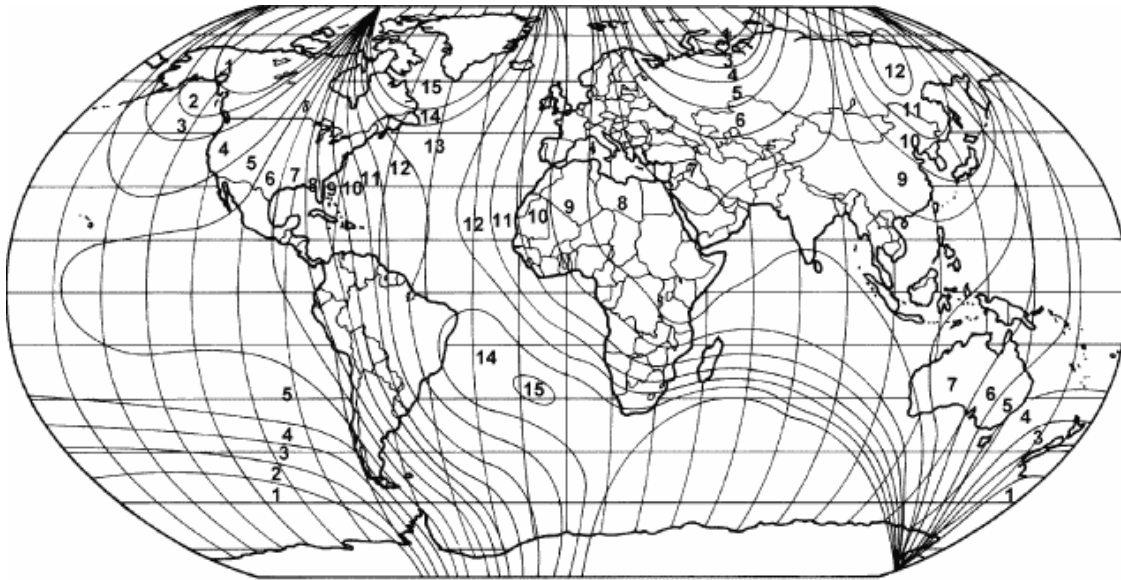
NOTE: Do not attempt to calibrate the compass near large metal objects such as other vehicles, large buildings, or bridges; or, near overhead or underground power lines.

1. Start the engine but leave the vehicle in "PARK".
2. Depress the instrument cluster button for approximately 10 seconds until the current variance zone is displayed.
3. Once in the current variance zone is displayed depress the instrument cluster button for approximately 10 seconds until the "CAL" message is displayed solidly not blinking.
4. To complete the compass calibration, drive the vehicle in one or more complete 360 degree circles under 8 km/h (5 mph) in an area free of large metal objects such as other vehicles, large buildings, or bridges; or, near overhead or underground power lines, until the "CAL" indicator turns off. The compass will now function normally.

NOTE: If the compass display indicates an inaccurate compass heading or the display is locked up, the RCM may be inoperative or the vehicle may need to be demagnetized. Perform the Compass Demagnetizing Procedure prior to performing any system diagnosis. See STANDARD PROCEDURE.

NOTE: If the "CAL" message remains in the display or if the compass heading is inaccurate following the calibration procedure and there are no internal compass faults, either there is excessive magnetism near the compass, or the unit is inoperative. Repeat the calibration procedure at least one more time prior to performing any system diagnosis.

NOTE: If the wrong direction is still indicated in the compass display, the area selected for calibration may be too close to a strong magnetic field. Repeat the calibration procedure in another location.



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Fig. 7: Variance Settings
Courtesy of CHRYSLER LLC

NOTE: If the vehicle is taken on long trips into a new variance zone the compass function may be effected. Compass variance will need to be updated to the new zone number to function properly.

Compass variance, also known as magnetic declination, is the difference in angle between magnetic north and geographic north. In some geographic locations, the difference between magnetic and geographic north is great enough to cause the compass to give inaccurate readings. To optimize compass accuracy, the compass variance should be properly set according to the compass variance map zone for the region that the vehicle is in.

To set the compass variance:

1. Using the Variance Settings map, find your geographic location and note the zone number.
2. Turn the ignition switch to the ON position.
3. Depress the instrument cluster button for approximately 10 seconds until the current variance zone is displayed.

NOTE: The default for the compass variance from the factory is 8. During programming, the Zone value will wrap around from Zone 15 to Zone 1.

4. To change the zone, press and hold (longer than two seconds) the instrument cluster button to increment the variance one step. Repeat as necessary, with individual long (longer than two seconds) instrument cluster button presses for each increment, until the desired variance is achieved. When the correct zone is displayed, wait approximately 15 seconds. The instrument cluster will store the new variance value in memory and the compass will resume normal operation.
5. Confirm that the correct directions are now indicated by the compass.

ELECTRONIC VEHICLE INFORMATION CENTER

DESCRIPTION

ELECTRONIC VEHICLE INFORMATION CENTER

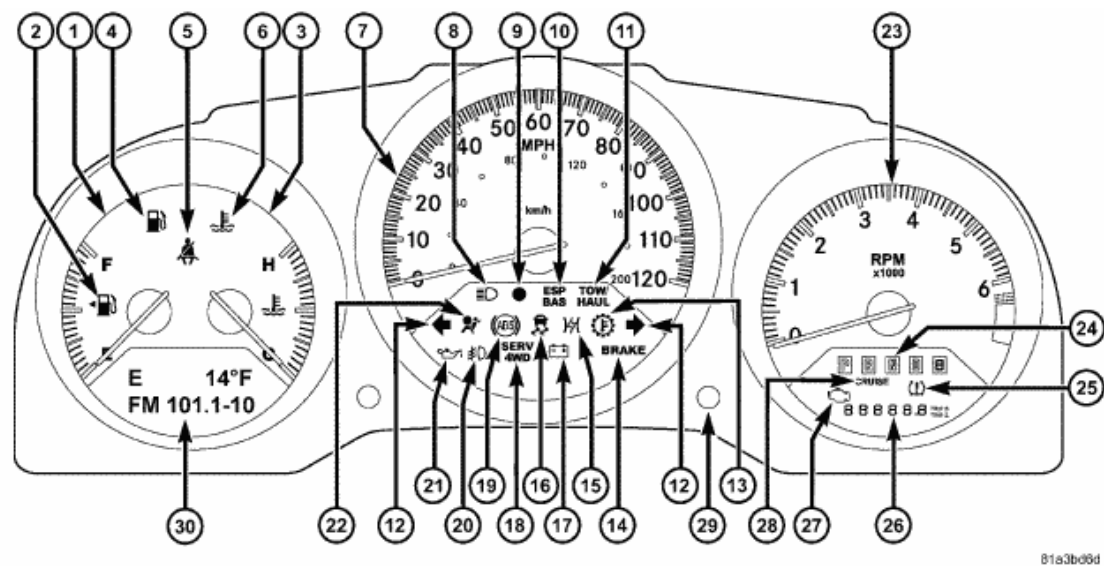


Fig. 8: Instrument Cluster With Electronic Vehicle Information Center (EVIC)
Courtesy of CHRYSLER LLC

The Electronic Vehicle Information Center (EVIC) features a driver-interactive display (30). The display is located in the lower left part of the instrument cluster below the fuel (1) and engine temperature (3) gauges.

The display in the lower right part of the instrument cluster (26) below the tachometer (23) shows the vehicle odometer related functions. These functions include Trip Odometer (ODO), Trip A and Trip B readouts. The instrument cluster push-button (29) can be used to scroll through the different odometer functions. Refer to **DESCRIPTION** for additional information on the instrument cluster and related functions.

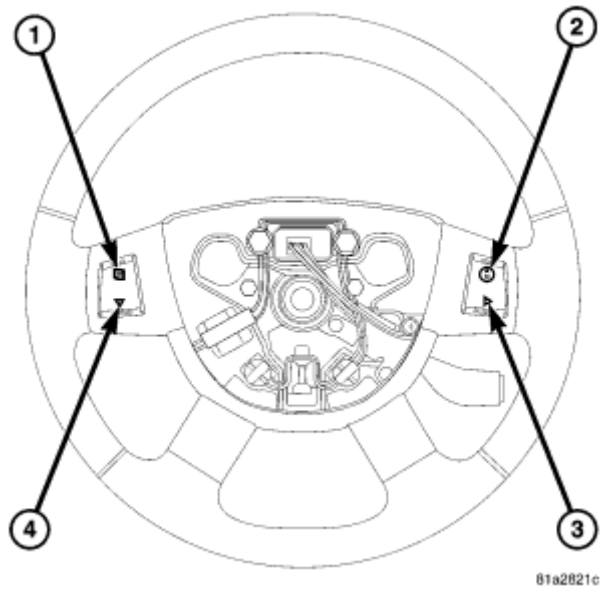


Fig. 9: EVIC Function Buttons
Courtesy of CHRYSLER LLC

The EVIC system conveniently allows the driver to navigate through and select a variety of useful information by pressing the EVIC function buttons located on the steering wheel. The EVIC displays information related to the following:

- System Status
- Vehicle information warning message displays
- Tire Pressure Monitor System (TPM) - If Equipped
- Personal Settings (customer programmable features)
- Compass display
- Outside temperature display
- Trip computer functions
- UConnect™ hands-free communication system displays - If Equipped
- Navigation system screens - If Equipped
- Audio mode display

The EVIC system is comprised of several different components. Those components are:

- Instrument Cluster (sometimes referred to as Cab Compartment Node [CCN])
- Steering Wheel Function Buttons
- Ambient Temperature Sensor
- Remote Compass Module (RCM)
- Controller Area Network (CAN) Data Bus
- Local Interface Network (LIN) Data Bus

The EVIC display is part of the Instrument Cluster assembly and is not serviced as a separate component. If the display is inoperative the complete Instrument Cluster assembly must be replaced. Refer to **REMOVAL** .

OPERATION

ELECTRONIC VEHICLE INFORMATION CENTER

The Electronic Vehicle Information Center (EVIC) uses both non-switched and ignition switched sources of battery current so that some of its features remain operational at any time, while others may only operate with the ignition switch in the "ON" position. When the ignition switch is turned to the "ON" position, the EVIC display will return to the last function being displayed before the ignition was turned to the "OFF" position.

The EVIC system is comprised of several different components that communicate over the Controller Area Network (CAN) and Local Interface Network (LIN) Data Buses. **If the system is inoperative a scan tool and the appropriate diagnostic information must be used to diagnose the system.**

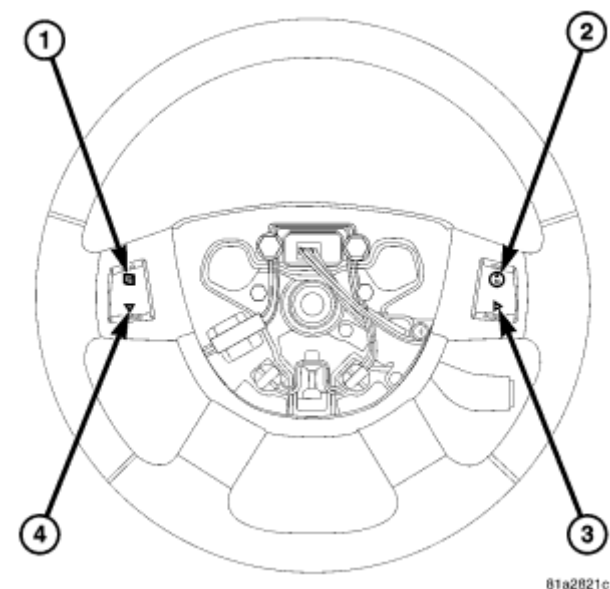


Fig. 10: EVIC Function Buttons
Courtesy of CHRYSLER LLC

The EVIC function buttons are used to operate the different functions of the EVIC system. Pressing and releasing the **MENU** button (1) allows the driver to select the Compass/Temperature, Trip Computer, Personal Settings or System Status functions. The **STEP** button (4) is used to toggle through options or features of the Trip Computer, Personal Settings or System Status functions. Pressing and releasing the **RESET** button (3) allows the selection of setting or resetting of the function currently displayed at that time. Pressing and releasing the **C/T** (compass/temperature) button (2) will cause the EVIC to return to the compass/temperature display mode from any other mode.

EVIC DISPLAY MODES

SYSTEM STATUS MODE

System display mode displays warnings and user interaction messages on the EVIC display. The driver can scroll to view multiple messages by using the **STEP** button. System warnings will always over ride the current display as they become active.

When the appropriate conditions exist, the EVIC displays the following messages:

- Turn Signal On (with a continuous warning chime)
- Left Front Turn Signal Lamp Out (with a single chime)
- Left Rear Turn Signal Lamp Out (with a single chime)
- Right Front Turn Signal Lamp Out (with a single chime)
- Right Rear Turn Signal Lamp Out (with a single chime)
- RKE Battery Low (with a single chime)
- Personal Settings Not Available - Vehicle Not in Park (automatic transmissions) or vehicle in motion (manual transmissions)
- Left/Right Front Door Ajar (one or more, with a single chime if speed is above 1 mph)
- Left/Right Rear Door Ajar (one or more, with a single chime if speed is above 1 mph)
- Door (S) Ajar (with a single chime if vehicle is in motion)
- Liftgate Ajar (with a single chime)
- Left Front Low Pressure (with a single chime)
- Left Rear Low Pressure (with a single chime)
- Right Front Low Pressure (with a single chime)
- Right Rear Low Pressure (with a single chime)
- Check TPM System (with a single chime)
- Check Gascap

PERSONAL SETTINGS MODE (CUSTOMER PROGRAMMABLE FEATURES)

Allows the driver to set and recall features when the transmission is in Park by pressing and releasing the **MENU** button until Personal Settings is displayed in the EVIC. Pressing and releasing the **STEP** button will scroll through the following personal settings choices:

Language When in this display you may select one of five languages for all display nomenclature, including the trip functions and the navigation system (if equipped). Press the **RESET** button while in this display to select English, Espanol, or Francais. Then, as you continue, the information will display in the selected language.

NOTE: **The EVIC will not change the UConnect™ language selection.**

Lock Doors Automatically at 15 mph (24 km/h) When ON is selected, all doors will lock automatically when the vehicle reaches a speed of 15 mph (24 km/h). To make your selection, press and release the **RESET** button until "ON" or "OFF" appears.

Unlock Doors Automatically on Exit When ON is selected, all doors will unlock when the vehicle is stopped and the transmission is in the P (Park) or N (Neutral) position and the driver's door is opened. To

make your selection, press and release the **RESET** button until "ON" or "OFF" appears.

Remote Key Unlock When DRIVER DOOR 1ST PRESS is selected, only the driver's door will unlock on the first press of the remote keyless entry unlock button. When Driver Door 1st Press is selected, you must press the remote keyless entry unlock button twice to unlock the passenger's doors. When ALL DOORS 1ST PRESS is selected, all of the doors will unlock on the first press of the remote keyless entry unlock button. To make your selection, press and release the **RESET** button until "Driver Door 1st Press" or "All Doors 1st Press" appears.

Sound Horn with Remote Key Lock When ON is selected, a short horn sound will occur when the remote keyless entry "Lock" button is pressed. This feature may be selected with or without the flash lights on lock/unlock feature. To make your selection, press and release the **RESET** button until "ON" or "OFF" appears.

Flash Lights with Remote Key Lock When ON is selected, the front and rear turn signals will flash when the doors are locked or unlocked with the remote keyless entry transmitter. This feature may be selected with or without the sound horn on lock feature selected. To make your selection, press and release the **RESET** button until "ON" or "OFF" appears.

Delay Turning Headlights Off When this feature is selected, the driver can choose to have the headlights remain on for 0, 30, 60, or 90 seconds when exiting the vehicle. To make your selection, press and release the **RESET** button until "0," "30," "60," or "90" appears.

Turn Headlights On with Remote Key Unlock When this feature is selected, the headlights will activate and remain on for up to 90 seconds when the doors are unlocked with the remote keyless entry transmitter. To make your selection, press and release the **RESET** button until "OFF," "30 sec," "60 sec," or "90 sec." appears.

Delay Power Off to Accessories Until Exit When this feature is selected, the power window switches, radio, hands-free system (if equipped), DVD video system (if equipped), power sunroof (if equipped), and power outlets will remain active for up to 60 minutes after the ignition switch is turned off. Opening a vehicle door will cancel this feature. To make your selection, press and release the **RESET** button until "Off," "45 sec," "5 min," or "10 min." appears.

Confirmation of Voice Commands - If Equipped When ON is selected, all voice commands from the UConnect™ system are confirmed. To make your selection, press and release the **RESET** button until "ON" or "OFF" appears.

Display Units of Measure in The EVIC, odometer, and navigation system (if equipped) can be changed between English and Metric units of measure. To make your selection, press and release the **RESET** button until "US" or "METRIC" appears.

COMPASS/TEMPERATURE

Compass heading and outside temperature are displayed on the EVIC display screen. One of eight compass headings to indicate the direction the vehicle is facing (N, S, E, W, NE, NW, SE, SW) and one of 15 compass variance settings can be programmed. Outside temperature is displayed in °C (degrees Celsius) or °F (degrees Fahrenheit). The audio mode is always present when the compass/temperature function is displayed.

TRIP COMPUTER

Press and release the **MENU** button until one of the following Trip Functions displays in the EVIC:

Average Fuel Economy

Distance To Empty
Elapsed Time
Display Units of Measure in

Press the **STEP** button to cycle through all the Trip Computer functions.

The Trip Functions mode displays the following information:

Average Fuel Economy Shows the average fuel economy since the last reset. When the fuel economy is reset, the display will read "RESET" or show dashes for two seconds. Then, the history information will be erased, and the averaging will continue from the last fuel average reading before the reset.

Distance To Empty (DTE) Shows the estimated distance that can be traveled with the fuel remaining in the tank. This estimated distance is determined by a weighted average of the instantaneous and average fuel economy, according to the current fuel tank level. DTE cannot be reset through the **RESET** button. When the DTE value is less than 30 miles (48 km) estimated driving distance, the DTE display will change to a text display of "LOW FUEL." This display will continue until the vehicle runs out of fuel. Adding a significant amount of fuel to the vehicle will turn off the "LOW FUEL" text and a new DTE value will display.

Elapsed Time Shows the total elapsed time of travel since the last reset when the ignition switch is in the ACC position. Elapsed time will increment when the ignition switch is in the ON or START position.

Display Units of Measure in: To make your selection, press and release the **RESET** button until "US" or "METRIC" appears.

To Reset The Display Reset will only occur while a resettable function is being displayed. Press and release the **RESET** button once to clear the resettable function being displayed. To reset all resettable functions, press and release the **RESET** button a second time within 3 seconds of resetting the currently displayed function (>Reset ALL will display during this 3 second window).

HANDS FREE TELEPHONE MODE - IF EQUIPPED

Provides the following information and features for the optional hands-free communications system:

Phone status: idle, voice mail, roaming, battery strength and signal strength in increments of 20 percent
Call status: Incoming call, connecting, connected, air time in minutes and seconds, call ended, busy, call failed, roaming and no phone connection
UConnect Active
Caller ID phone number display

DIAGNOSIS AND TESTING

ELECTRONIC VEHICLE INFORMATION CENTER

CAUTION: Do not place any external magnets, such as magnetic roof mount antennas, in the vicinity of the Remote Compass Module (RCM) located above the headliner in the rear of the vehicle. Do not place any electronic

devices (cell phones, laptop computers, PDAs, portable DVD players, etc), on or near the rear of the roof as the RCM performance may be effected. Do not use magnetic tools when servicing the RCM.

The Electronic Vehicle Information Center (EVIC) data is obtained from several components on the Controller Area Network (CAN) and Local Interface Network (LIN) Data Bus circuits. The EVIC will not function properly if the bus messages from any of these components is not receive. If no EVIC data is displayed or the display indicates dashes "- -", check the CAN and LIN Data Bus circuit communications, the Instrument Cluster functions, the Remote Compass Module (RCM) and the Totally Integrated Power Module (TIPM). Should the RCM become disconnected, the instrument cluster display will go blank.

The use of a scan tool and the proper diagnostic procedures information are recommended for further testing of the Instrument Cluster, the RCM, the CAN Data Bus and the LIN Data Bus circuits. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information.

STANDARD PROCEDURE

COMPASS DEMAGNETIZING

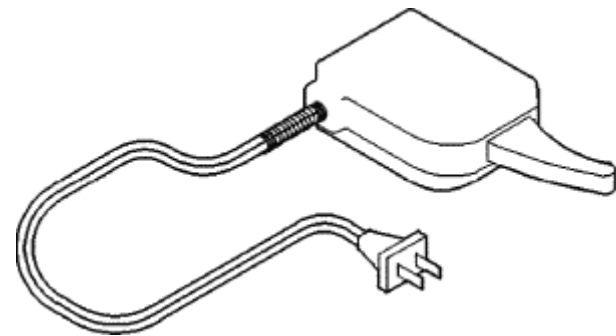
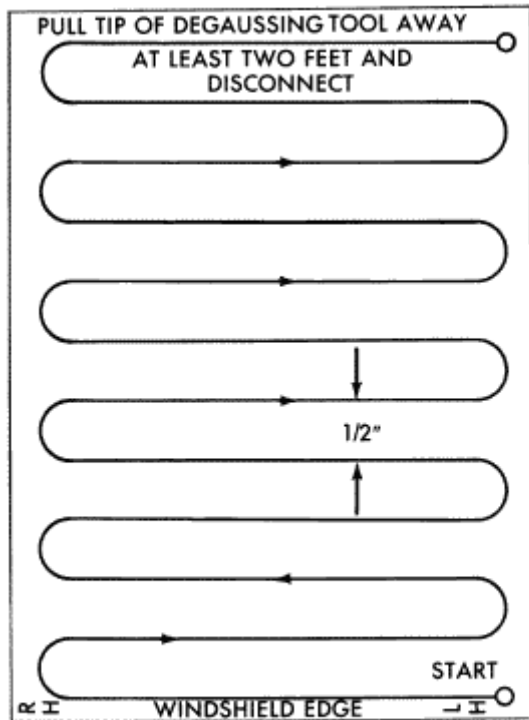


Fig. 11: DEGAUSSING TOOL #6029
Courtesy of CHRYSLER LLC

A degaussing tool (Special Tool 6029) is used to demagnetize, or degauss, the overhead console forward mounting screw and the roof panel above the overhead console. Equivalent units must be rated as continuous duty for 110/115 volts and 60 Hz. They must also have a field strength of over 350 gauss at 7 millimeters (0.25 inch) beyond the tip of the probe.

To demagnetize the roof panel proceed as follows:

1. Be certain that the ignition switch is in the Off position, before you begin the demagnetizing procedure.

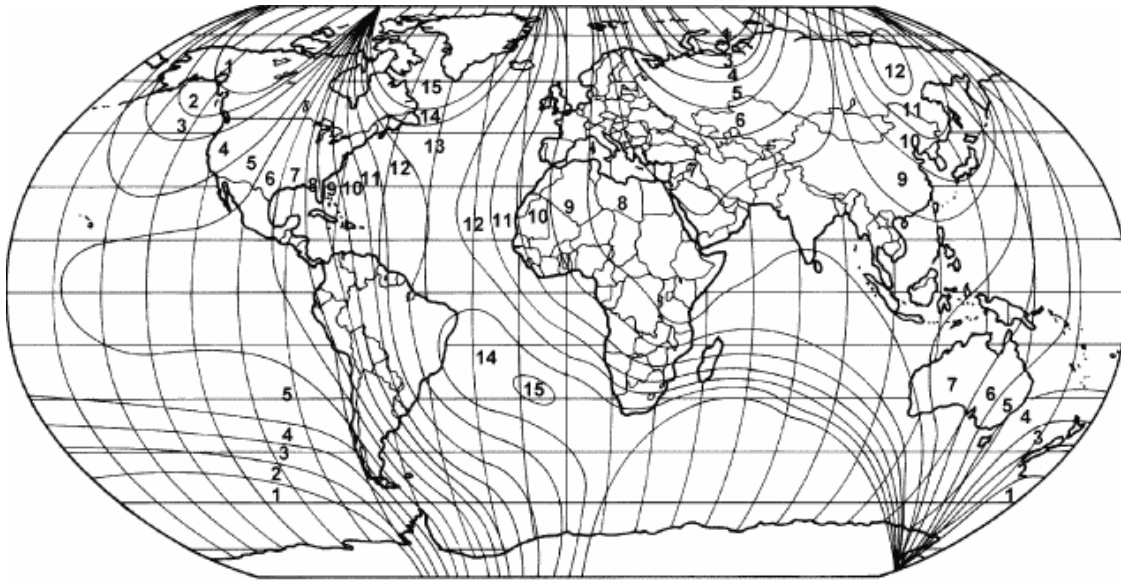


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Fig. 12: Compass Demagnetizing
Courtesy of CHRYSLER LLC

2. Place a piece of paper approximately 22 by 28 centimeters (8.5 by 11 inches), oriented on the vehicle lengthwise from rear to front, on the center line of the roof at the rear liftgate. The purpose of the paper is to protect the roof panel from scratches, and to define the area to be demagnetized.
3. Connect the degaussing tool to an electrical outlet, while keeping the tool at least 61 centimeters (2 feet) away from the vehicle.
4. Slowly approach the center line of the roof panel at the rear liftgate, with the degaussing tool connected.
5. Contact the roof panel with the plastic coated tip of the degaussing tool. Be sure that the template is in place to avoid scratching the roof panel. Using a slow, back-and-forth sweeping motion, and allowing 13 millimeters (0.50 inch) between passes, move the tool at least 11 centimeters (4 inches) to each side of the roof center line, and 28 centimeters (11 inches) forward of the rear liftgate.
6. With the degaussing tool still energized, slowly back it away from the roof panel. When the tip of the tool is at least 61 centimeters (2 feet) from the roof panel, disconnect the tool.
7. Calibrate the compass and adjust the compass variance. See **STANDARD PROCEDURE**.

COMPASS VARIANCE ADJUSTMENT



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Fig. 13: Variance Settings
Courtesy of CHRYSLER LLC

Compass variance, also known as magnetic declination, is the difference in angle between magnetic north and true geographic north. In some geographic locations, the difference between magnetic and geographic north is great enough to cause the compass to give false readings. If this problem occurs, the compass variance must be set.

NOTE: If the vehicle is taken on long trips into a new variance zone the compass function may be effected. Compass variance will need to be updated to the new zone number to function properly.

NOTE: The default for the compass variance from the factory is 8.

To set the compass variance:

1. Using the Variance Settings Map, find your geographic location and note the zone number.

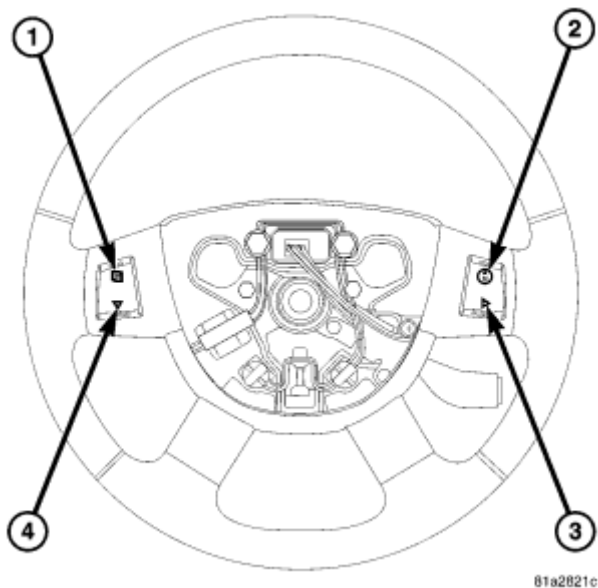


Fig. 14: EVIC Function Buttons
Courtesy of CHRYSLER LLC

2. Turn the ignition switch to the ON/RUN position. Press and release the **MENU** push button (1) until "Personal Settings" is displayed.
3. Press the **STEP** push button (4) until "Compass Variance" is displayed.
4. Momentarily depress and release the **RESET** push button (3) to toggle through the zone numbers (1-15), until the zone number for your geographic location appears in the display.

NOTE: **The default for the compass variance from the factory is 8. During programming, the Zone value will wrap around from Zone 15 to Zone 1.**

5. Momentarily depress and release the **C/T** push button (2) to enter the displayed zone number into the compass unit memory.
6. Confirm that the correct directions are now indicated by the compass.

MANUAL COMPASS CALIBRATION

CAUTION: Do not place any external magnets, such as magnetic roof mount antennas, in the vicinity of the Remote Compass Module (RCM) located above the headliner in the rear of the vehicle. Do not place any electronic devices (cell phones, laptop computers, PDAs, portable DVD players, etc), on or near the rear of the roof as the RCM performance may be effected. Do not use magnetic tools when servicing the RCM.

NOTE: **Confirmation that the proper variance zone is programmed, is recommended whenever manual compass calibration is performed. See STANDARD PROCEDURE for the appropriate procedure.**

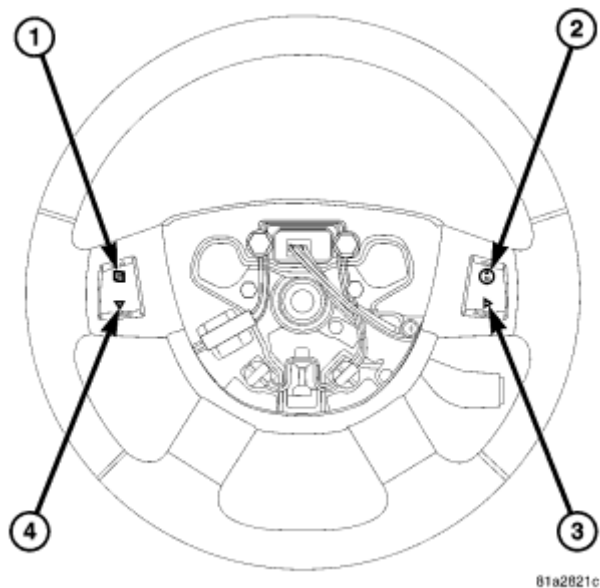


Fig. 15: EVIC Function Buttons
Courtesy of CHRYSLER LLC

The electronic compass unit features a self-calibrating design, which simplifies the calibration procedure. This feature automatically updates the compass calibration while the vehicle is being driven. This allows the compass unit to compensate for small changes in the residual magnetism that the vehicle may acquire during normal use. If the compass readings appear to be erratic or the Electronic Vehicle Information Center (EVIC) displays "CAL", perform the following manual calibration procedure. Also, any time EVIC service replacement components are installed, they must be calibrated using this procedure. Do not attempt to calibrate the compass near large metal objects such as other vehicles, large buildings, or bridges; or, near overhead or underground power lines.

Calibrate the compass manually as follows:

1. Turn the ignition switch to the ON/RUN position. Press and release the **MENU** push button (1) until "Personal Settings" is displayed.
2. Press the **STEP** push button (4) until "Calibrate Compass" is displayed.
3. Momentarily depress and release the **RESET** push button (3) to initiate the calibration procedure. The "CAL" symbol will come on solid in the EVIC display.
4. Slowly drive the vehicle on a level surface, away from large metal objects and power lines, through one or two **complete** circles not exceeding 8 km/h (5 mph). The "CAL" message will disappear from the display to indicate successful compass calibration.

NOTE: A blank compass display indicates that vehicle degaussing (demagnetizing) may be necessary.

NOTE: If the "CAL" message remains in the display, either there is excessive magnetism near the compass, or the EVIC is inoperative. Attempt the calibration procedure at least one more time before performing EVIC diagnosis.

NOTE: If the wrong direction is still indicated in the compass display, the area selected for calibration may be too close to a strong magnetic field. Repeat the manual calibration procedure in another location.

HOMELINK TRANSCEIVER

DESCRIPTION

UNIVERSAL TRANSMITTER

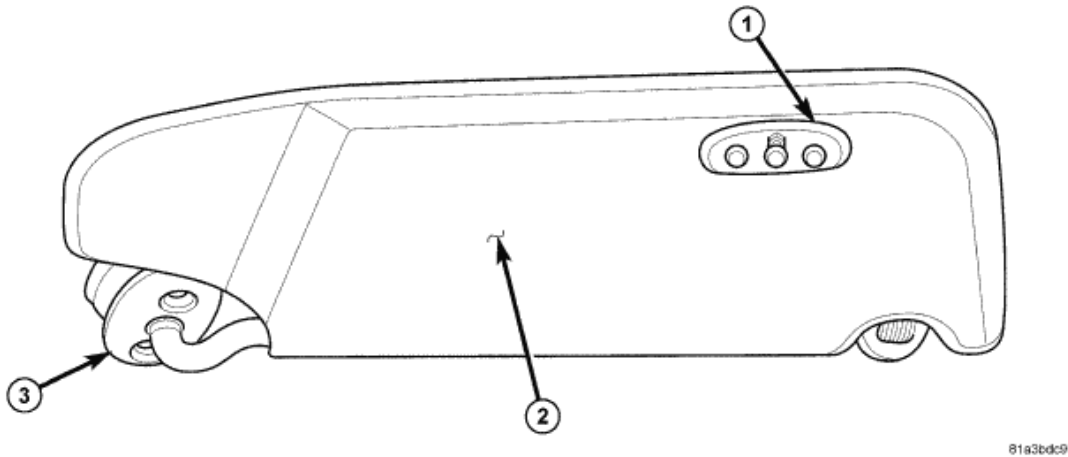


Fig. 16: Homelink(R) Transceiver & Drivers Side Sun Visor Assembly
Courtesy of CHRYSLER LLC

Some vehicles are equipped with the HomeLink® transceiver (1). The transceiver is located in the drivers side sun visor assembly (2). The only visible component of the HomeLink® transceiver are the three push buttons. The buttons are marked with one, two or three dots, respectively, for identification of each channel.

Each of the three HomeLink® transceiver push buttons controls an independent radio transmitter channel. Each of these three channels can be trained to transmit a different radio frequency signal for the remote operation of garage door openers, motorized gate openers, home or office lighting, security systems or just about any other device that can be equipped with a radio receiver in the 280 to 435 MegaHertz (MHz) frequency range for remote operation. The transceiver is capable of operating systems using either rolling code or non-rolling code technology. The system will not transmit operating signals if the Vehicle Theft Security System is armed.

The HomeLink® transceiver cannot be repaired, and is available for service only with the visor assembly. If any part of the component is inoperative or damaged, the complete visor assembly must be replaced. Refer to **REMOVAL** .

OPERATION

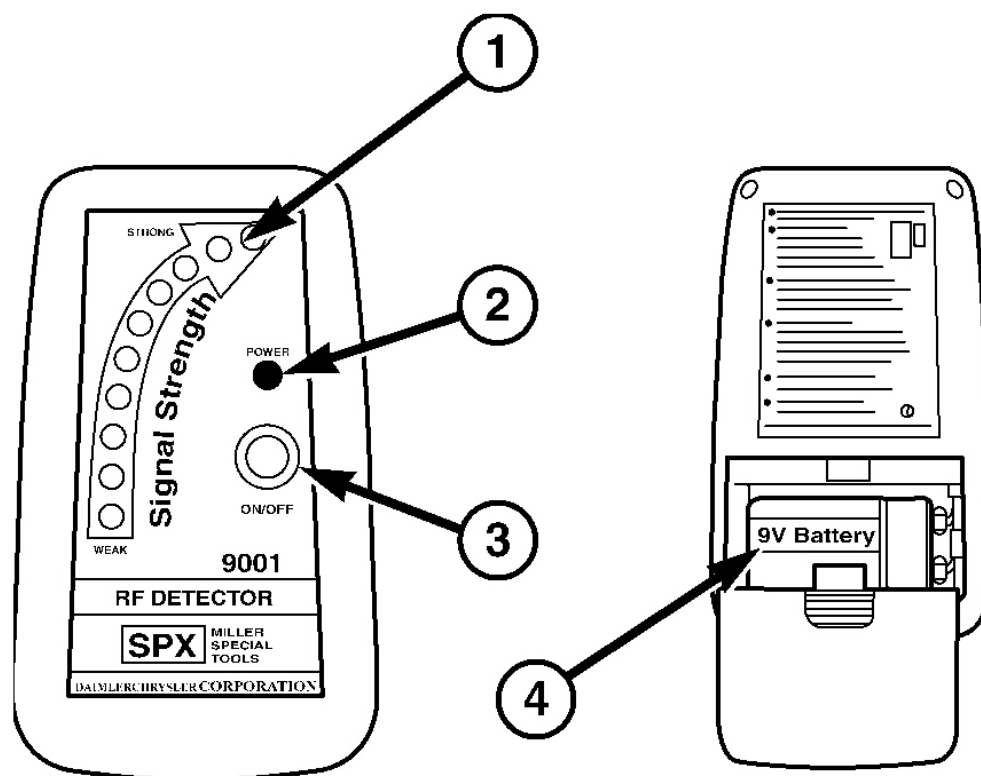
UNIVERSAL TRANSMITTER

The HomeLink® transceiver operates on a non-switched source of battery current so the unit will remain functional, regardless of the ignition switch position. For more information on the features, programming

procedures and operation of the HomeLink® transceiver, see the owner's manual.

DIAGNOSIS AND TESTING

UNIVERSAL TRANSMITTER



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Fig. 17: Radio Frequency Detector
Courtesy of CHRYSLER LLC

If the HomeLink® transceiver is inoperative, retrain the transceiver with a known good transmitter, insuring the transmitter battery is OK. See **STANDARD PROCEDURE** for the proper procedure. Test the universal transmitter operation again. If the unit is still inoperative, test the universal transmitter with Radio Frequency Detector special tool as described below:

1. Turn the Radio Frequency (RF) Detector ON (3). A "chirp" will sound and the green power Light

- Emitting Diode (LED) will light (2). If the green LED does not light, replace the battery (4).
2. Hold the RF detector within one inch of the TRAINED universal transmitter and press any of the transmitters buttons.
 3. The red signal detection LEDs (1) will light and the tool will beep if a radio signal is detected. Repeat this test for all three transmitter buttons. If the tool does not detect a radio signal for any of the three buttons, replace the inoperative HomeLink® transceiver assembly. Refer to **REMOVAL** .

STANDARD PROCEDURE

ERASING TRANSMITTER CODES

NOTE: Individual channels cannot be erased. Erasing the HomeLink® transceiver codes will erase ALL programmed codes.

To erase programming from all three buttons (individual buttons cannot be erased but can be "reprogrammed"), follow the step noted:

Press and hold the two outer HomeLink® transceiver buttons until the indicator light begins to flash-after 20 seconds. Release both buttons. Do not hold for longer than 30 seconds. HomeLink® is now in the train (or learning) mode and can be programmed at any time beginning with "Programming". See **STANDARD PROCEDURE**.

PROGRAMMING TRANSMITTER CODES

WARNING: Vehicle exhaust contains carbon monoxide, a dangerous gas. Do not run the vehicle's exhaust while training the transceiver. Exhaust gas can cause serious injury or death.

WARNING: Your motorized door or gate may open and close while you are training the HomeLink® transceiver if the vehicle is in range of the motorized device. Do not train the HomeLink® transceiver if people or pets are in the path of the door or gate. A moving door or gate can cause serious injury or death to people and pets or damage to objects.

NOTE: When programming a garage door opener, it is advised to park outside the garage. It is also recommended that a new battery be placed in the hand-held transmitter of the device being programmed to the HomeLink® transceiver for quicker training and accurate transmission of the radio-frequency signal.

NOTE: If programing the HomeLink® transceiver is unsuccessful using the following procedure, refer to the Owner's Manual for the current customer assistance phone number.

1. Press and hold the two outer HomeLink® transceiver buttons, and release only when the indicator light begins to flash (after 20 seconds). **Do not** hold the buttons for longer than 30 seconds and **do not** repeat step one to program a second and/or third hand-held transmitter to the remaining two HomeLink®

transceiver buttons.

2. Position the end of your hand-held transmitter 3-8 cm (1-3 inches) away from the HomeLink® transceiver buttons while keeping the indicator light in view.
3. Simultaneously press and hold both the HomeLink® transceiver button that you want to train and the hand-held transmitter button. **Do not release the buttons until step 4 has been completed.**
4. The HomeLink® transceiver indicator light will flash slowly and then rapidly after HomeLink® successfully receives the frequency signal from the hand-held transmitter. Release both buttons after the indicator light changes from the slow to rapid flash.
5. Press and hold the just trained HomeLink® transceiver button and observe the indicator light. If the indicator light **stays on constantly, programming is complete** and your device should activate when the button is pressed and released.

NOTE: To program the remaining two buttons, begin with "Programming" step 2. Do not repeat step 1.

If the indicator light blinks rapidly for two seconds and then turns to a constant light, continue with "Programming" steps 6-8 to complete the programming of a rolling code equipped device (most commonly a garage door opener).

6. At the garage door opener receiver (motor-head unit) in the garage, locate the "learn" or "smart" button. This can usually be found where the hanging antenna wire is attached to the motor-head unit.
7. Firmly press and release the "learn" or "smart" button. (The name and color of the button may vary by manufacturer.)

NOTE: There are 30 seconds in which to initiate step 8.

8. Return to the vehicle and firmly **press, hold for two seconds and release** the programmed HomeLink® transceiver button. Repeat the "**press/hold/release**" sequence a second time, and, depending on the brand of the garage door opener (or other rolling code equipped device), repeat this sequence a third time to complete the programming.

The HomeLink® transceiver should now activate your rolling code equipped device.

NOTE: To program the remaining two HomeLink® transceiver buttons, begin with "Programming" step 2. Do not repeat step 1.

Canadian Programming/Gate Programming

Canadian radio-frequency laws require transmitter signals to "time-out" (or quit) after several seconds of transmission which may not be long enough for the HomeLink® transceiver to pick up the signal during programming. Similar to this Canadian law, some U.S. gate operators are designed to "time-out" in the same manner.

If you live in Canada or you are having difficulties programming a gate operator by using the "Programming"

procedures (regardless of where you live), **replace "Programming HomeLink® Transceiver Codes" step 3** with the following:

NOTE: When programming a garage door opener or gate operator, it is advised to **unplug the device or move the vehicle out of range during the "cycling" process to prevent possible overheating.**

3. Continue to press and hold the HomeLink® transceiver button while you **press and release every two seconds** ("cycle") your hand-held transmitter until the frequency signal has successfully been accepted. The indicator light will flash slowly and then rapidly. Proceed with "Programming" step 4 to complete.

REPROGRAMMING TRANSMITTER CODES

WARNING: Vehicle exhaust contains carbon monoxide, a dangerous gas. Do not run the vehicle's exhaust while training the HomeLink® transceiver. Exhaust gas can cause serious injury or death.

WARNING: Your motorized door or gate may open and close while you are training the HomeLink® transceiver if the vehicle is in range of the motorized device. Do not train the HomeLink® transceiver if people or pets are in the path of the door or gate. A moving door or gate can cause serious injury or death to people and pets or damage to objects.

NOTE: If programing the HomeLink® transceiver is unsuccessful using the following procedure, refer to the Owner's Manual for the current customer assistance phone number.

To program a device to the HomeLink® transceiver using a button previously trained, follow these steps:

1. Press and hold the desired HomeLink® transceiver button. **DO NOT** release the button. The indicator light will begin to flash after 20 seconds. Without releasing the HomeLink® transceiver button, proceed to step 2.
2. Position the end of your hand-held transmitter 3-8 cm (1-3 inches) away from the HomeLink® transceiver button while keeping the indicator light in view.
3. Simultaneously press and hold both the HomeLink® transceiver button that you want to train and the hand-held transmitter buttons. **Do not release the buttons until step 4 has been completed.**
4. The HomeLink® transceiver indicator light will flash slowly and then rapidly after it successfully receives the frequency signal from the hand-held transmitter. Release both buttons after the indicator light changes from the slow to the rapid flash.
5. Press and hold the just trained HomeLink® transceiver button and observe the indicator light. If the indicator light **stays on constantly, reprogramming is complete** and your device should activate when the button is pressed and released.

NOTE: If the indicator light blinks rapidly for two seconds and then turns to a constant light, continue with "Reprogramming" steps 6-8 to complete the

programming of a rolling code equipped device (most commonly a garage door opener).

6. At the garage door opener receiver (motor-head unit) in the garage, locate the "learn" or "smart" button. This can usually be found where the hanging antenna wire is attached to the motor-head unit.
7. Firmly press and release the "learn" or "smart" button. (The name and color of the button may vary by manufacturer.)

NOTE: There are 30 seconds in which to initiate step 8.

8. Return to the vehicle and firmly **press, hold for two seconds and release** the reprogrammed HomeLink® transceiver button. Repeat the "**press/hold/release**" sequence a second time, and, depending on the brand of the garage door opener (or other rolling code equipped device), repeat this sequence a third time to complete the reprogramming.

The HomeLink® transceiver should now activate your rolling code equipped device.

Canadian radio-frequency laws require transmitter signals to "time-out" (or quit) after several seconds of transmission which may not be long enough for the HomeLink® transceiver to pick up the signal during programming. Similar to this Canadian law, some U.S. gate operators are designed to "time-out" in the same manner.

If you live in Canada or you are having difficulties programming a gate operator by using the "Programming" procedures (regardless of where you live), **replace "Reprogramming HomeLink® Transceiver Codes" step 3** with the following:

NOTE: When programming a garage door opener or gate operator, it is advised to unplug the device or move the vehicle out of range during the "cycling" process to prevent possible overheating.

3. Continue to press and hold the HomeLink® transceiver button while you **press and release every two seconds** ("cycle") your hand-held transmitter until the frequency signal has successfully been accepted. The indicator light will flash slowly and then rapidly. Proceed with "Programming" step 4 to complete.

SENSOR-AMBIENT TEMPERATURE

DESCRIPTION

AMBIENT TEMP SENSOR

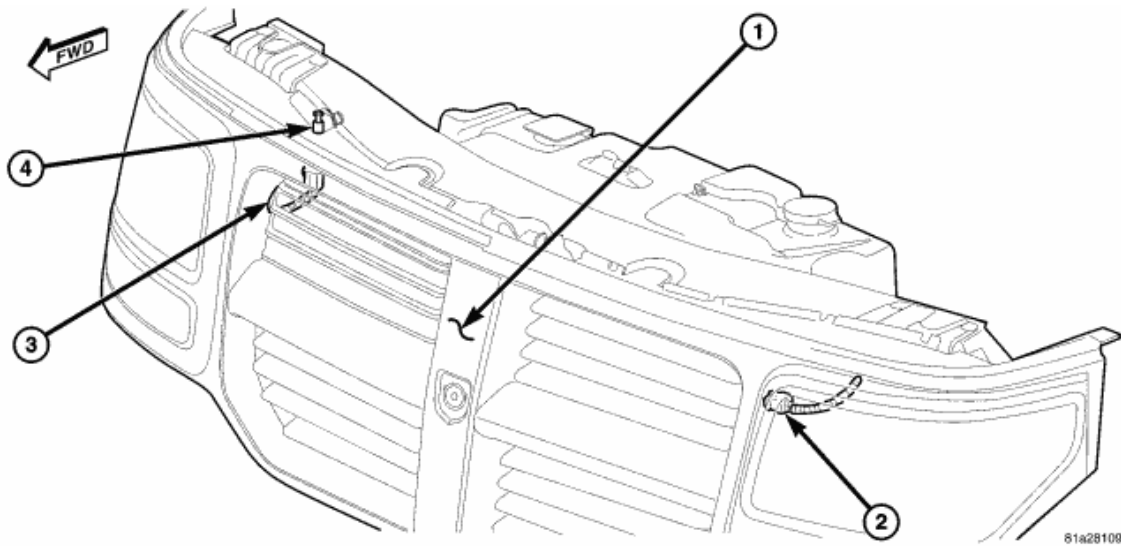
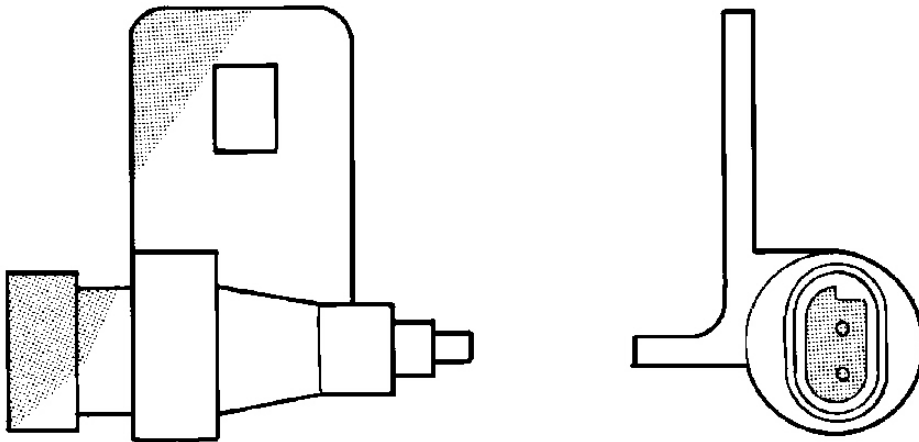


Fig. 18: Ambient Temperature Sensor Location
 Courtesy of CHRYSLER LLC

The ambient temperature sensor (2) is a variable resistor mounted to a bracket that is secured to the left side of the radiator support, behind the grille (1) and in front of the engine compartment.



938C-10

Fig. 19: Identifying Ambient Air Temperature Sensor
 Courtesy of CHRYSLER LLC

The ambient temperature sensor cannot be adjusted or repaired and, if inoperative or damaged, it must be replaced.

OPERATION

AMBIENT TEMPERATURE SENSOR

The ambient temperature sensor is a variable resistor that operates on a five-volt reference signal. The resistance in the sensor changes as temperature changes, changing the temperature sensor signal circuit voltage to the Totally Integrated Power Module (TIPM). Based upon the resistance in the sensor, the instrument cluster, sometimes referred to as the Cab Compartment Node (CCN), display senses a specific voltage on the Controller Area Network (CAN) data bus circuit, which corresponds to a specific temperature. The applicable instrument cluster display then displays the proper ambient temperature.

DIAGNOSIS AND TESTING

AMBIENT TEMP SENSOR

The temperature function is supported by the ambient temperature sensor, a wiring circuit, the Controller Area Network (CAN) data bus, the Local Area Network (LIN) data bus and the Totally Integrated Power Module (TIPM). When the sensor is exposed to temperatures above 60° C (130° F), or if the sensor circuit is shorted, 60° C (130° F) will appear in the display in place of the temperature. When the sensor is exposed to temperatures below - 40° C (- 40° F) or if the sensor circuit is open, - 40° C (- 40° F) will appear in the display.

The ambient temperature sensor circuit can be diagnosed using the following Temperature System Test, and Sensor Test. If the temperature sensor and circuit are confirmed to be OK, but the temperature display is inoperative or incorrect, further testing of the instrument cluster may be necessary. Refer to **DIAGNOSIS AND TESTING** for the appropriate procedure.

TEMPERATURE SYSTEM TEST

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article . The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

NOTE: **Temperature readings do not update immediately. Allow up to 60 seconds after the ignition switch is turned to the "ON" position for readings to meet test specifications.**

1. Turn the ignition switch to the "OFF" position. Disconnect the wire harness connector from the ambient temperature sensor.
2. Turn the ignition switch to the "ON" position. The display should now read - 40° C (- 40° F). If OK, go to step 3. If not OK, repair the shorted sensor return circuit or ambient temperature sensor signal circuit to the ambient temperature sensor as required.
3. Turn the ignition switch to the "OFF" position. Taking care not to damage the wire terminals, connect a jumper wire between the two terminals in the body half of the ambient temperature sensor harness connector.
4. Turn the ignition switch to the "ON" position. The display should now read 60° C (130° F). If OK, go to step 5. If not OK, repair the open sensor return circuit or ambient temperature sensor signal circuit to the ambient temperature sensor as required.

NOTE: If the EVIC display does not show the ambient temperature in step 4, the vehicle may need to be driven several miles at a speed greater than 32 km/h (20 mph) for the temperature to update.

5. Turn the ignition switch to the "OFF" position. Remove the jumper wire. Turn the ignition switch to the "ON" position and wait until the display again reads - 40° C (- 40° F). Turn the ignition switch to the "OFF" position. Reconnect the ambient temperature sensor. Turn the ignition switch to the "ON" position. The display should now read the ambient temperature. If OK, the problem is intermittent. Perform further diagnosis while manipulating the related wire harnesses and components. If not OK, go to step 6.
6. Clear any Diagnostic Trouble Codes that may have been set while performing the test. Perform further diagnosis of the CAN data bus circuit, the LIN data bus circuit, the TIPM and the ambient temperature sensor (refer to **SENSOR TEST**).

SENSOR TEST

1. Turn the ignition switch to the Off position. Disconnect the ambient temperature sensor harness connector.
2. Measure the resistance of the ambient temperature sensor. At - 40° C (- 40° F), the sensor resistance is 336 kilohms. At 55° C (130° F), the sensor resistance is 2.488 kilohms. The sensor resistance should read between these two values. If OK, further testing of the instrument cluster may be necessary. Refer to **DIAGNOSIS AND TESTING** for the appropriate procedure. If not OK, replace the inoperative ambient temperature sensor.

REMOVAL

AMBIENT TEMP SENSOR

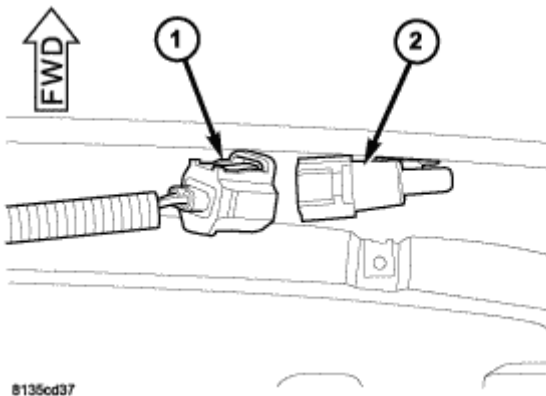


Fig. 20: Ambient Temperature Sensor Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the grille. Refer to **REMOVAL** .
3. Disconnect the wire harness connector (1) from the ambient temperature sensor (2).

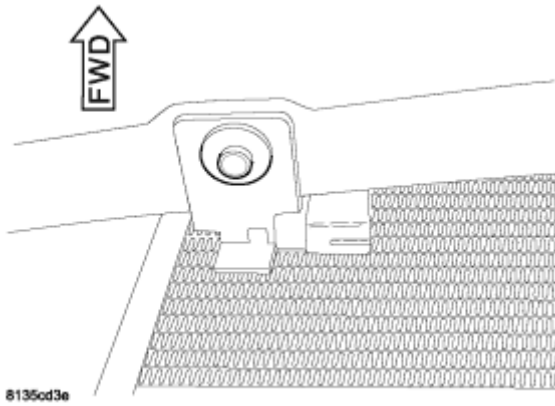


Fig. 21: Ambient Temperature Sensor Bracket
Courtesy of CHRYSLER LLC

4. Remove the fastener that secures the ambient temperature sensor to the radiator support.
5. Remove the ambient temperature sensor from the vehicle.

INSTALLATION

AMBIENT TEMP SENSOR

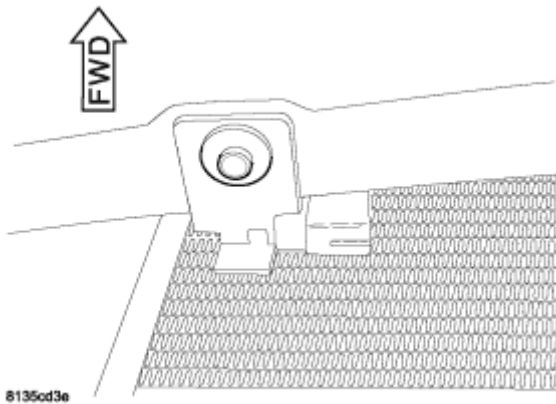


Fig. 22: Ambient Temperature Sensor Bracket
Courtesy of CHRYSLER LLC

1. Position the ambient temperature sensor in the vehicle.
2. Install the fastener that secures the ambient temperature sensor to the radiator support.

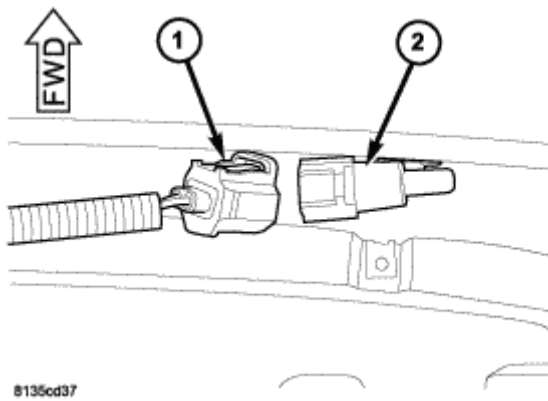


Fig. 23: Ambient Temperature Sensor Wire Harness Connector
Courtesy of CHRYSLER LLC

3. Connect the wire harness connector (1) to the ambient temperature sensor (2).
4. Install the grille. Refer to **INSTALLATION** .
5. Connect the battery negative cable.

MODULE

DESCRIPTION

DESCRIPTION

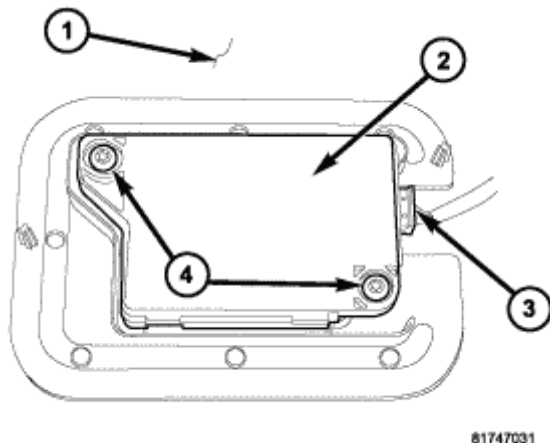


Fig. 24: Remote Compass Module (RCM)
Courtesy of CHRYSLER LLC

The Remote Compass Module (RCM) (2) is a separate stand alone module mounted to the top side of the headliner (1). The module is located at the rear left of the vehicle. The RCM can be accessed by removing both quarter trim panels and the headliner molding, then carefully lowering the rear of the headliner at the D-pillar area.

If the compass position sensor (Remote Compass Module) is inoperative and requires replacement. See **REMOVAL** for the appropriate procedure.

DIAGNOSIS AND TESTING

DIAGNOSIS & TESTING

The Remote Compass Module (RCM) data is transferred on the Controller Area Network (CAN) Data Bus circuit. The RCM and Electronic Vehicle Information Center (EVIC)/Compass Temperature Display will not function properly if the bus messages are not properly received. If no EVIC/Compass Temperature Display data is displayed, check the CAN Data Bus circuit communications, the RCM, the Instrument Cluster functions and the Totally Integrated Power Module (TIPM). **Any diagnosis of the RCM and EVIC/Compass Temperature Display system should begin with the use of a scan tool and the appropriate diagnostic service information.**

For complete circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article . The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

REMOVAL

REMOVAL

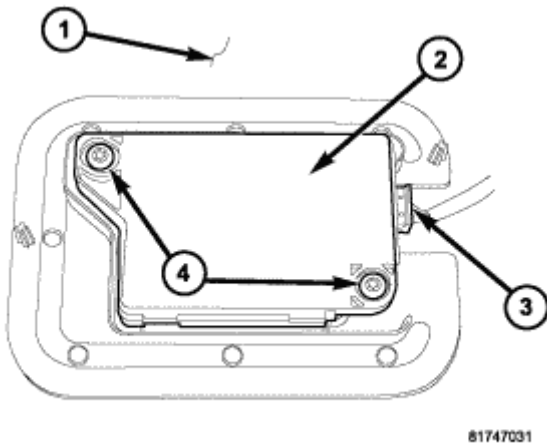


Fig. 25: Headliner, RCM, RCM Electrical Connector & RCM Retaining Screws
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the headliner (1) to gain access to the Remote Compass Module (RCM) (2). Refer to **REMOVAL** for the appropriate procedure.
3. Disconnect the RCM electrical connector (3).
4. Remove the RCM retaining screws (4).
5. Remove the RCM (2) from the vehicle.

INSTALLATION

INSTALLATION

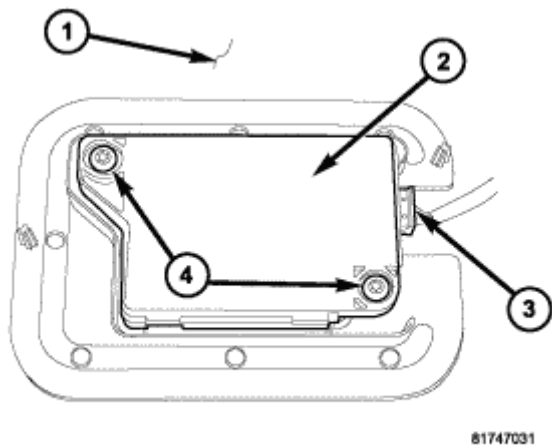


Fig. 26: Headliner, Remote Compass Module (RCM), Electrical Connector & RCM Retaining Screws
Courtesy of CHRYSLER LLC

1. Position the Remote Compass Module (RCM) (2) into the bracket on the upper side of the headliner (1).
2. Install the RCM retaining screws (4).
3. Connect the electrical connector (3).
4. Install the headliner assembly. Refer to **INSTALLATION**.
5. Connect the battery negative cable.
6. Perform the Compass Variance Adjustment. See **STANDARD PROCEDURE**.
7. Perform the Manual Compass Calibration. See **STANDARD PROCEDURE**.
8. Verify proper compass operation.

2008 ACCESSORIES AND EQUIPMENT

Navigation/Telecommunication - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B143B</u>	MICROPHONE 1 CIRCUIT LOW
<u>B143B</u>	MICROPHONE 1 CIRCUIT LOW (RADIO)
<u>B143C</u>	MICROPHONE 1 CIRCUIT HIGH
<u>B143C</u>	MICROPHONE 1 CIRCUIT HIGH (RADIO)
<u>B143E</u>	MICROPHONE 2 CIRCUIT LOW
<u>B143E</u>	MICROPHONE 2 CIRCUIT LOW (RADIO)
<u>B143F</u>	MICROPHONE 2 CIRCUIT HIGH
<u>B143F</u>	MICROPHONE 2 CIRCUIT HIGH (RADIO)
<u>B1459</u>	TELEMATICS MIRROR CONTROL CIRCUIT LOW
<u>B145A</u>	TELEMATICS MIRROR CONTROL CIRCUIT HIGH
<u>B145B</u>	TELEMATICS MIRROR CONTROL CIRCUIT OPEN
<u>B2205</u>	ORIGINAL VIN MISSING/MISMATCH
<u>B2223</u>	(HFM) HANDS FREE PHONE INTERNAL
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B222E</u>	FLASH CHECKSUM PERFORMANCE
<u>B2230</u>	RAM WRITE PERFORMANCE
<u>U0019</u>	CAN B BUS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0151</u>	LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER
<u>U0154</u>	LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0156</u>	LOST COMMUNICATION WITH EOM
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0168</u>	LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)
<u>U0184</u>	LOST COMMUNICATION WITH RADIO
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0195</u>	LOST COMMUNICATION WITH SDARS
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE
<u>U0199</u>	LOST COMMUNICATION WITH DRIVER DOOR MODULE
<u>U0200</u>	LOST COMMUNICATION WITH PASSENGER DOOR MODULE
<u>U0208</u>	LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE
<u>U0209</u>	LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

NAVIGATION/TELECOMMUNICATION - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B143B-MICROPHONE 1 CIRCUIT LOW

Circuit Schematic

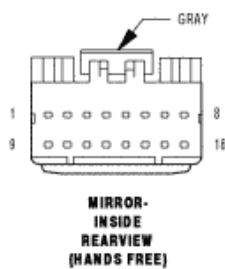
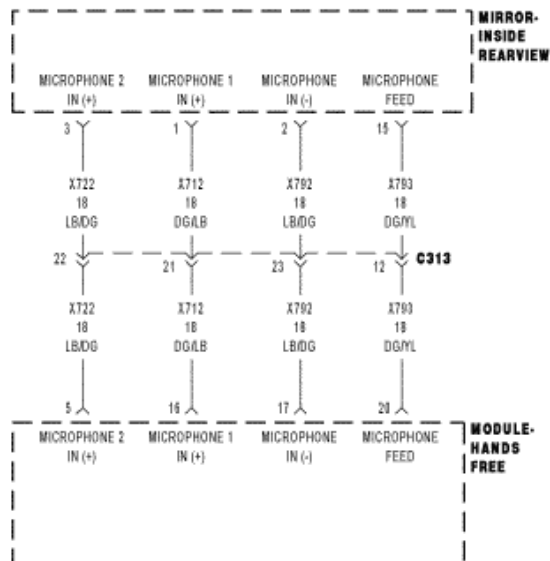


Fig. 1: Microphone Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X712) MICROPHONE 1 IN (+) CIRCUIT SHORTED TO GROUND INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

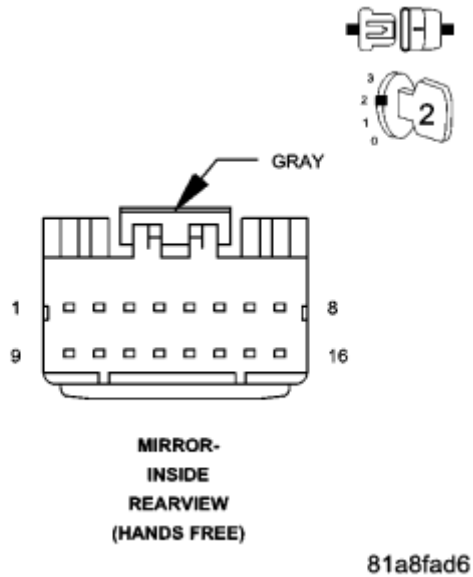


Fig. 2: Inside Rearview Mirror C2 Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Inside Rearview Mirror C2 harness connector.

Turn the ignition on.

With the scan tool, read the DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Inside Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X712) MICROPHONE 1 IN (+) CIRCUIT SHORTED TO GROUND

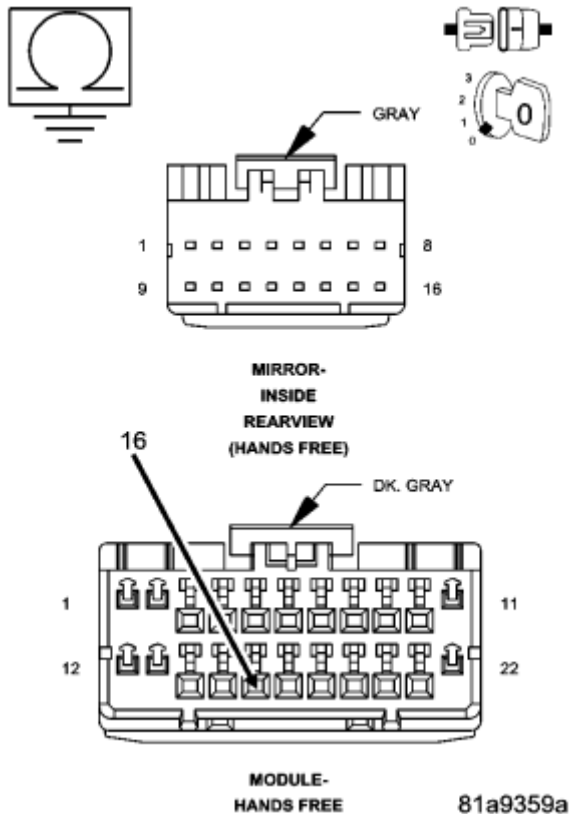


Fig. 3: Measuring Resistance Between Ground And (X712) Microphone 1 Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Measure the resistance between ground and the (X712) Microphone 1 circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X712) Microphone 1 circuit for short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

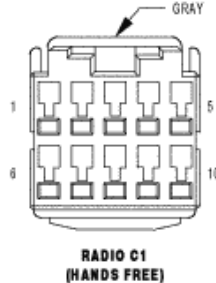
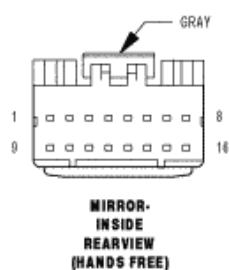
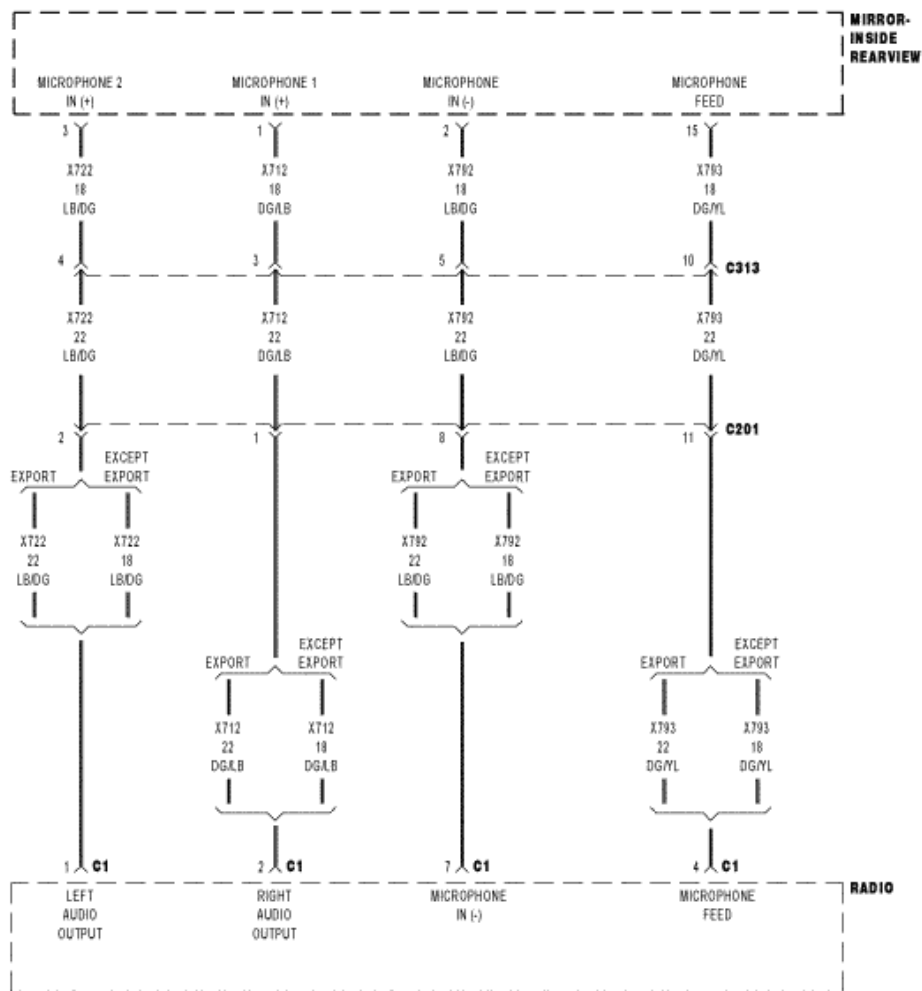
No

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B143B-MICROPHONE 1 CIRCUIT LOW (RADIO)

Circuit Schematic



81667926

Fig. 4: Radio Microphone Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X712) MICROPHONE 1 IN (+) CIRCUIT SHORTED TO GROUND INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

Turn the ignition off.

Disconnect the Inside Rearview Mirror C2 harness connector.

Turn the ignition on.

With the scan tool, read the DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Inside Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X712) MICROPHONE 1 IN (+) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Measure the resistance between ground and the (X712) Microphone 1 circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X712) Microphone 1 circuit for short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B143C-MICROPHONE 1 CIRCUIT HIGH

Circuit Schematic

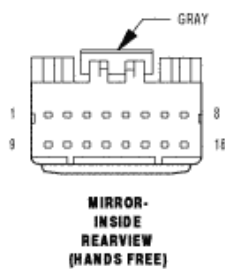
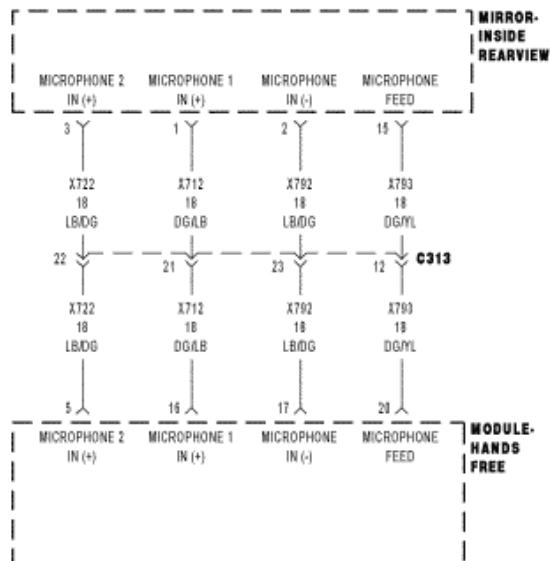


Fig. 5: Microphone Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X712) MICROPHONE 1 IN (+) CIRCUIT OPEN
(X712) MICROPHONE 1 IN (+) CIRCUITS SHORTED TO VOLTAGE
INSIDE REARVIEW MIRROR
HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

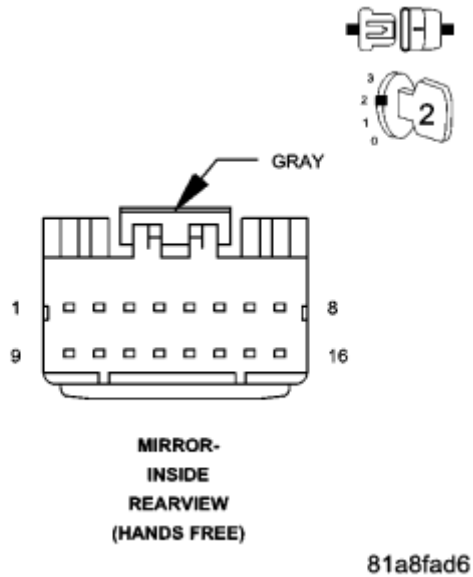


Fig. 6: Inside Rearview Mirror C2 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X712) MICROPHONE CIRCUITS SHORTED TO VOLTAGE

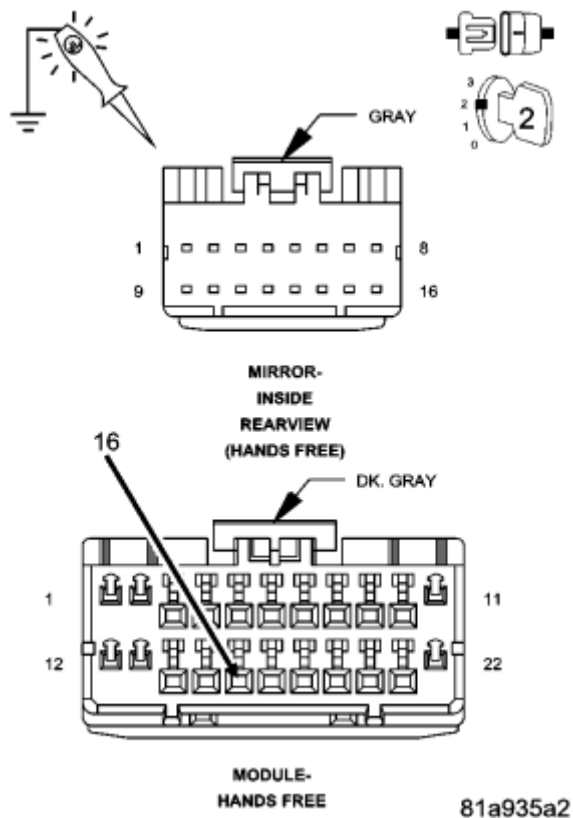


Fig. 7: Measuring Voltage Of (X712) Microphone Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Turn the ignition on.

Measure the voltage of the (X712) Microphone circuit.

Is the voltage above 1.0 volt?

Yes

Repair the (X712) Microphone circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (X712) MICROPHONE 1 IN (+) CIRCUIT OPEN

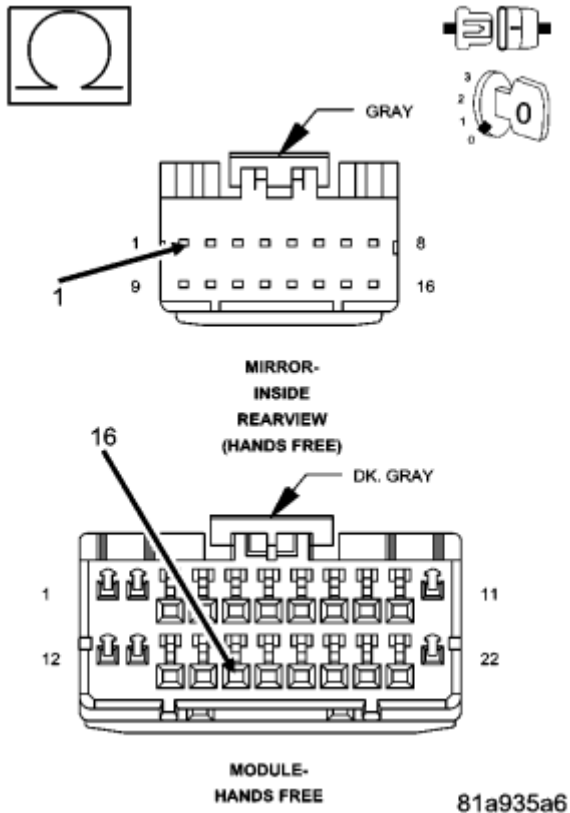


Fig. 8: Measuring Resistance Of (X712) Microphone 1 IN (+) Circuit Between HFM Connector And Inside Rearview Mirror Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (X712) Microphone 1 IN (+) circuit between the HFM connector and the inside rearview mirror connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

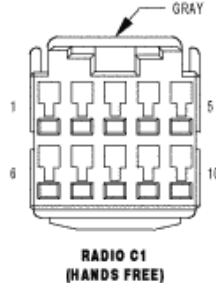
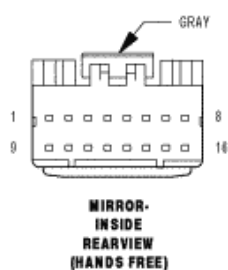
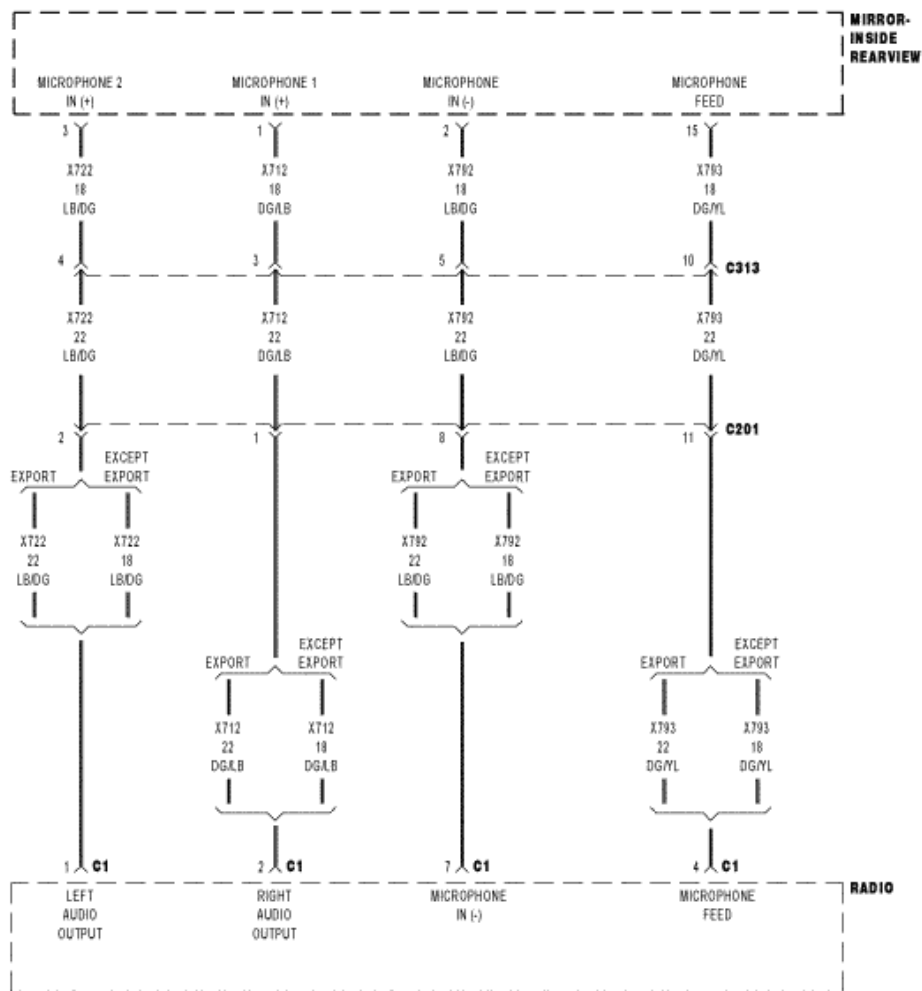
No

Repair the (X712) Microphone 1 IN (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B143C-MICROPHONE 1 CIRCUIT HIGH (RADIO)

Circuit Schematic



81667926

Fig. 9: Radio Microphone Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X712) MICROPHONE 1 IN (+) CIRCUIT OPEN
(X712) MICROPHONE 1 IN (+) CIRCUITS SHORTED TO VOLTAGE
INSIDE REARVIEW MIRROR
HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

Turn the ignition off.

Disconnect the Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X712) MICROPHONE CIRCUITS SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Turn the ignition on.

Measure the voltage of the (X712) Microphone circuit.

Is the voltage above 1.0 volt?

Yes

Repair the (X712) Microphone circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (X712) MICROPHONE 1 IN (+) CIRCUIT OPEN

Turn the ignition off.

Measure the resistance of the (X712) Microphone 1 IN (+) circuit between the HFM connector and the inside rearview mirror connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (X712) Microphone 1 IN (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B143E-MICROPHONE 2 CIRCUIT LOW

Circuit Schematic

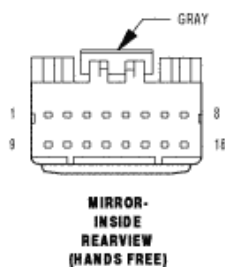
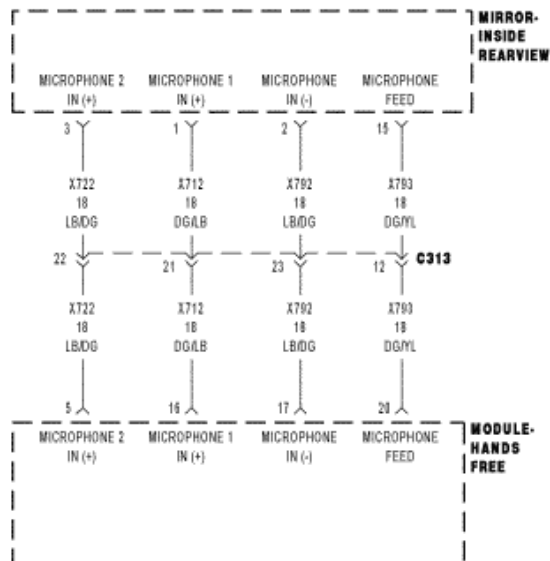


Fig. 10: Microphone Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X722) MICROPHONE 2 IN (+) CIRCUIT SHORTED TO GROUND INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

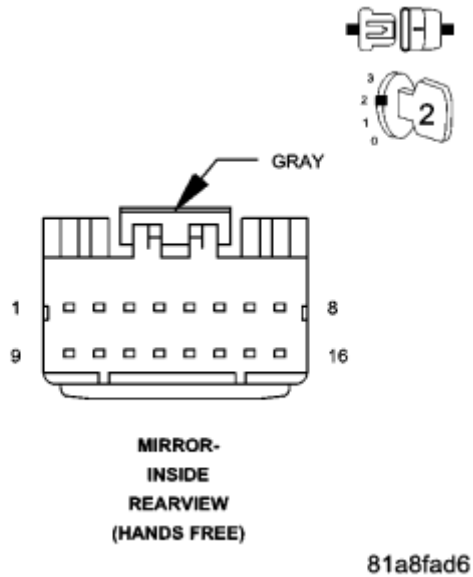


Fig. 11: Inside Rearview Mirror C2 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Inside Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Inside Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1**.

3. (X722) MICROPHONE 2 IN (+) CIRCUIT SHORTED TO GROUND

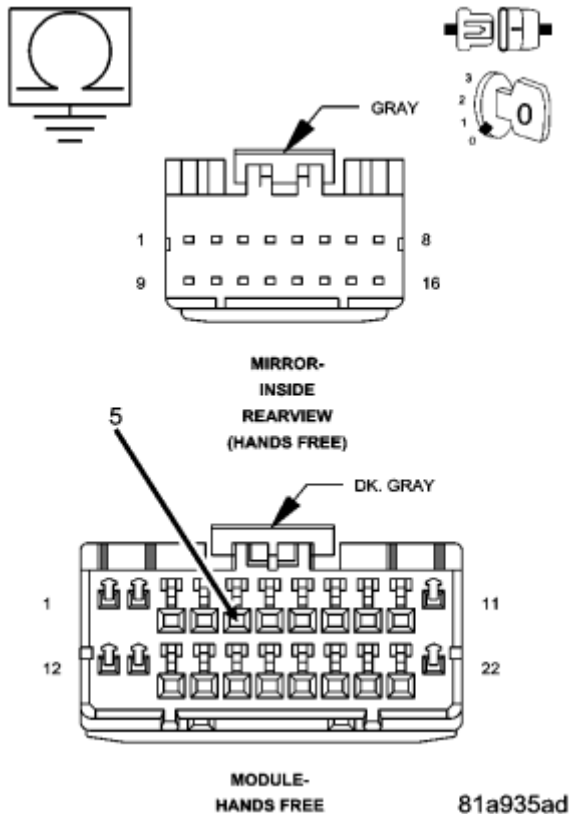


Fig. 12: Measuring Resistance Between Ground And (X722) Microphone 2 Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Measure the resistance between ground and the (X722) Microphone 2 circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X722) Microphone 2 circuit for short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

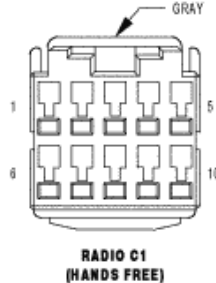
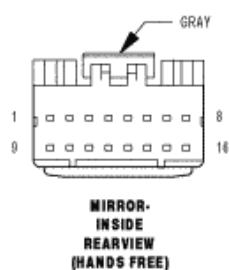
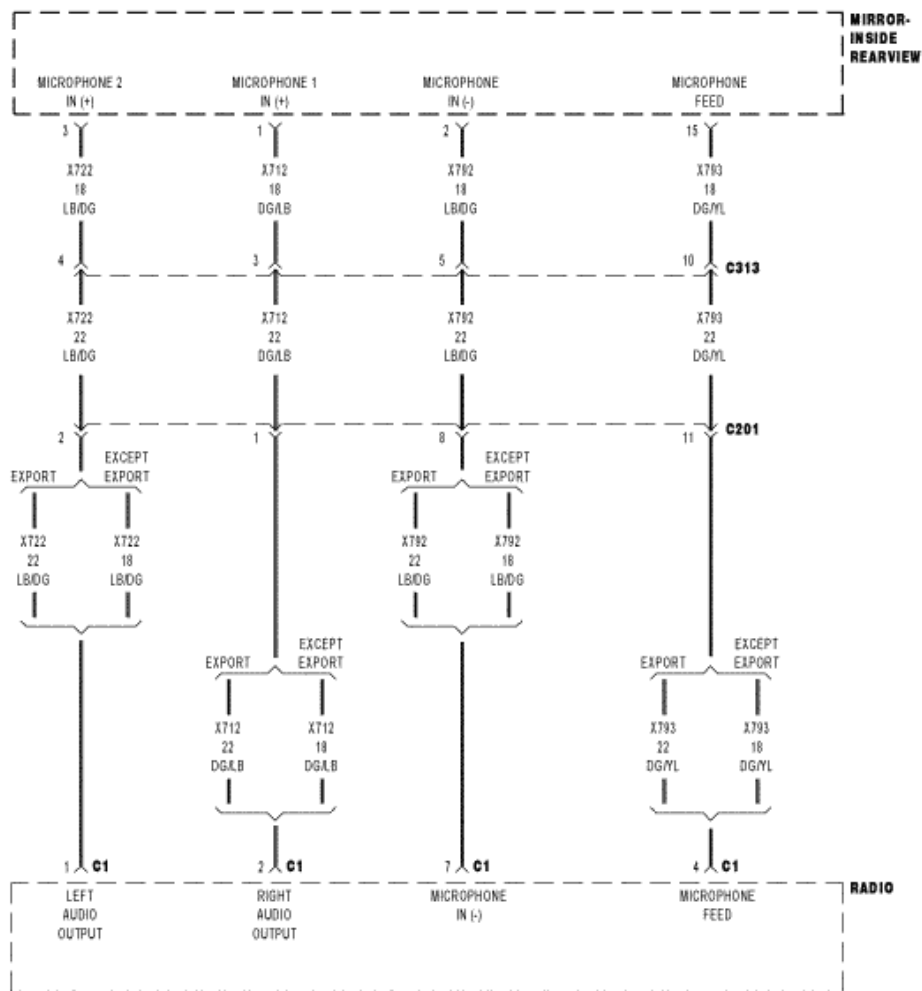
No

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B143E-MICROPHONE 2 CIRCUIT LOW (RADIO)

Circuit Schematic



81667926

Fig. 13: Radio Microphone Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X722) MICROPHONE 2 IN (+) CIRCUIT SHORTED TO GROUND INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

Turn the ignition off.

Disconnect the Inside Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Inside Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X722) MICROPHONE 2 IN (+) CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Measure the resistance between ground and the (X722) Microphone 2 circuit.

Is the resistance below 10K ohms?

Yes

Repair the (X722) Microphone 2 circuit for short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B143F-MICROPHONE 2 CIRCUIT HIGH

Circuit Schematic

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X722) MICROPHONE 2 IN (+) CIRCUIT OPEN
(X722) MICROPHONE 2 IN (+) CIRCUITS SHORTED TO VOLTAGE
INSIDE REARVIEW MIRROR
HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

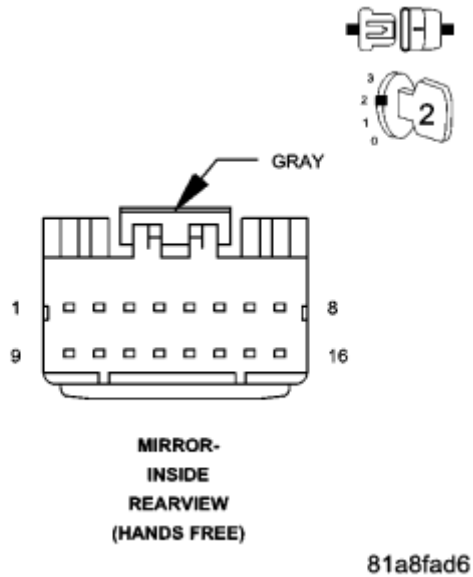


Fig. 15: Inside Rearview Mirror C2 Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X722) MICROPHONE CIRCUITS SHORTED TO VOLTAGE

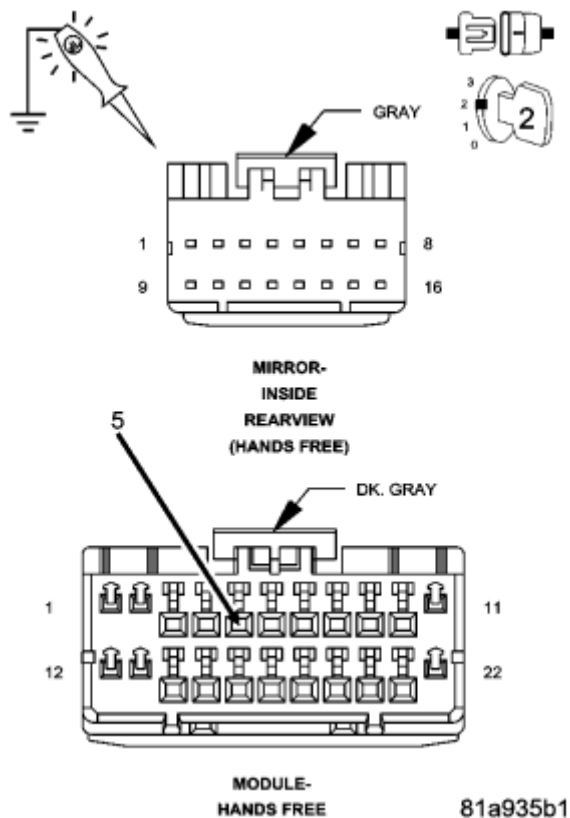


Fig. 16: Measuring Voltage Of (X722) Microphone Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Turn the ignition on.

Measure the voltage of the (X722) Microphone circuit.

Is the voltage above 1.0 volt?

Yes

Repair the (X722) Microphone circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (X722) MICROPHONE 2 IN (+) CIRCUIT OPEN

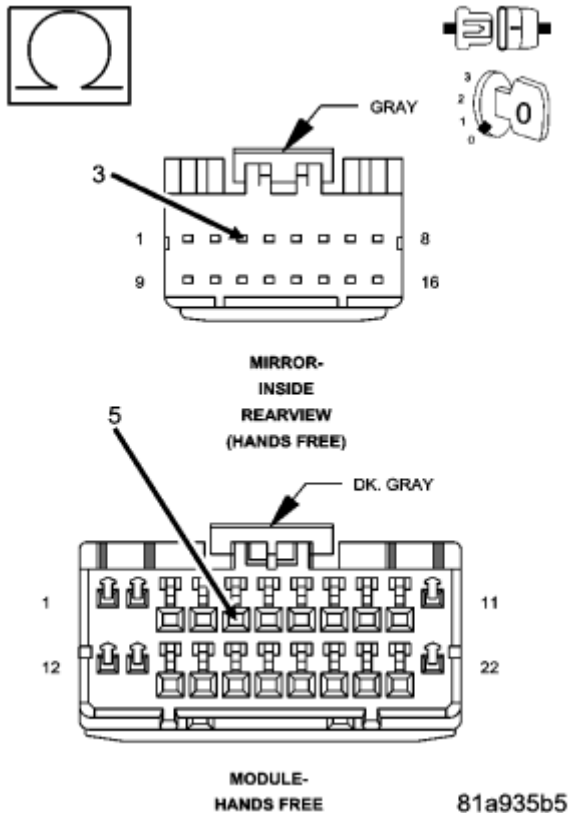


Fig. 17: Measuring Resistance Of (X722) Microphone 2 IN (+) Circuit Between HFM Connector And Inside Rearview Mirror Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (X722) Microphone 2 IN (+) circuit between the HFM connector and the inside rearview mirror connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

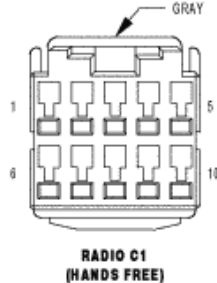
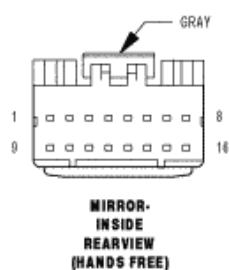
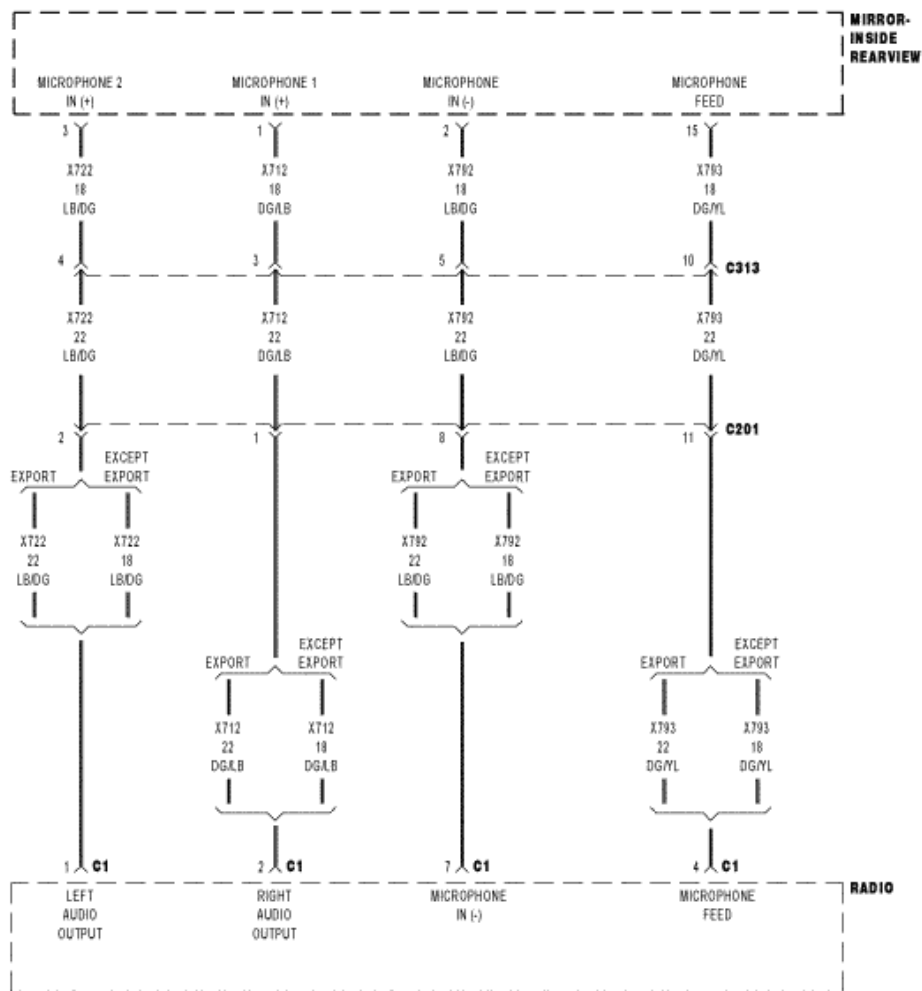
No

Repair the (X722) Microphone 2 IN (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B143F-MICROPHONE 2 CIRCUIT HIGH (RADIO)

Circuit Schematic



81667926

Fig. 18: Radio Microphone Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault in any of the microphone circuits.

Possible Causes

Possible Causes
(X722) MICROPHONE 2 IN (+) CIRCUIT OPEN
(X722) MICROPHONE 2 IN (+) CIRCUITS SHORTED TO VOLTAGE
INSIDE REARVIEW MIRROR
HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **INSIDE REARVIEW MIRROR**

Turn the ignition off.

Disconnect the Rearview Mirror harness connector.

Turn the ignition on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 3.

No

Replace the Rearview Mirror in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

3. (X722) MICROPHONE CIRCUITS SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Turn the ignition on.

Measure the voltage of the (X722) Microphone circuit.

Is the voltage above 1.0 volt?

Yes

Repair the (X722) Microphone circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (X722) MICROPHONE 2 IN (+) CIRCUIT OPEN

Turn the ignition off.

Measure the resistance of the (X722) Microphone 2 IN (+) circuit between the HFM connector and the inside rearview mirror connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

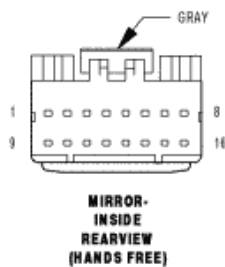
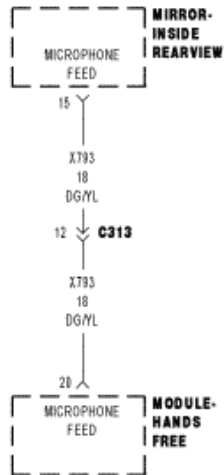
No

Repair the (X722) Microphone 2 IN (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1459-TELEMATICS MIRROR CONTROL CIRCUIT LOW

Circuit Schematic



01A01775

Fig. 19: Microphone Feed Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects low voltage on the (X793) Microphone Feed circuit.

Possible Causes

Possible Causes
(X793) MICROPHONE FEED CIRCUIT SHORT TO GROUND INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **(X793) MICROPHONE FEED CIRCUIT SHORT TO GROUND**

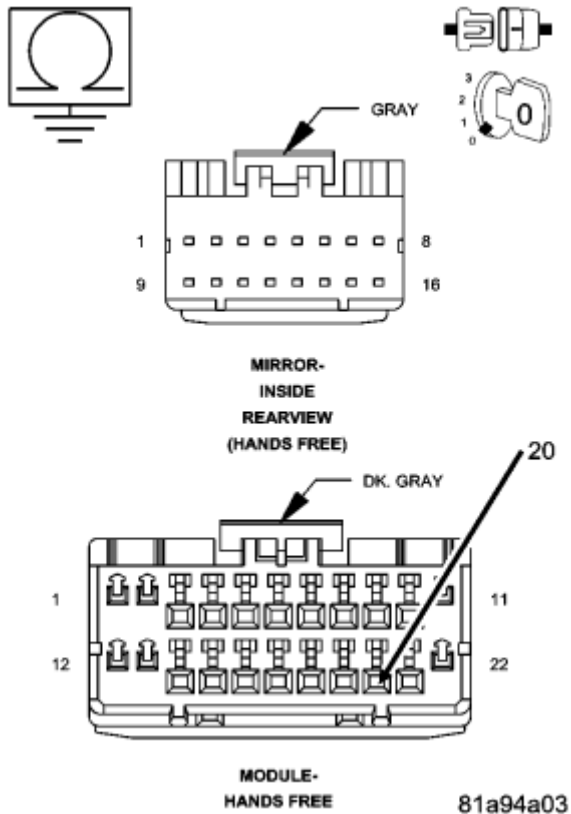


Fig. 20: Measuring Resistance Between Ground And (X793) Microphone Feed Circuit
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and the (X793) Microphone Feed circuit

Is the resistance below 100.0 ohms?

Yes

Repair the (X793) Microphone Feed circuit for short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. INSIDE REARVIEW MIRROR

Replace the Inside Rearview Mirror in accordance with the service information.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

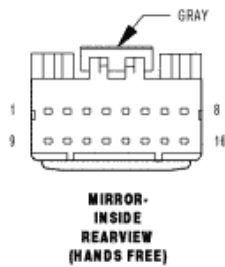
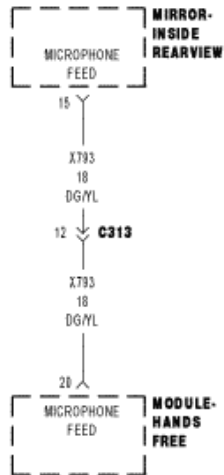
No

Repair is complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B145A-TELEMATICS MIRROR CONTROL CIRCUIT HIGH

Circuit Schematic



01A01770

Fig. 21: Microphone Feed Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects high voltage on the (X793) Microphone Feed circuit.

Possible Causes

Possible Causes
(X793) MICROPHONE FEED CIRCUIT SHORT TO VOLTAGE INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **(X793) MICROPHONE FEED CIRCUIT SHORT TO VOLTAGE**

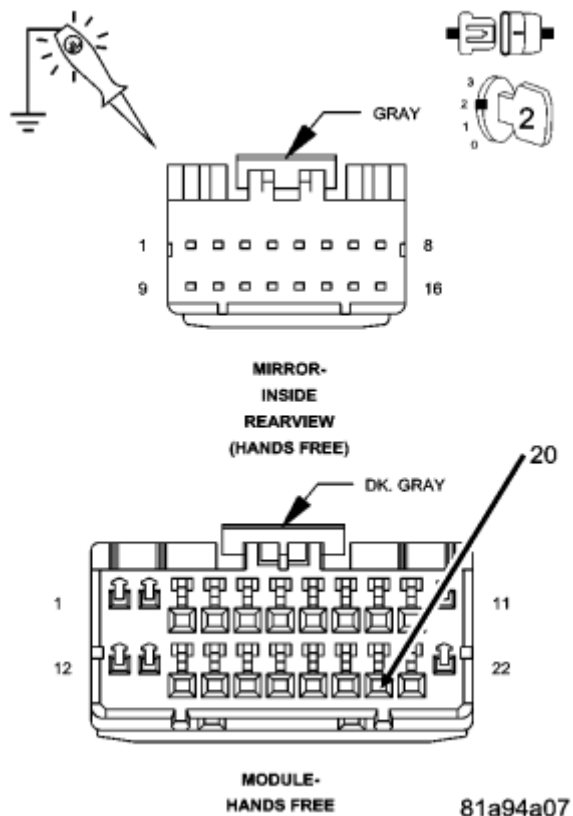


Fig. 22: Measuring Voltage Of (X793) Microphone Feed Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage of the (X793) Microphone Feed circuit.

Is the voltage above 1.0 volt?

Yes

Repair the (X793) Microphone Feed circuit for short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. INSIDE REARVIEW MIRROR

Replace the Inside Rearview Mirror in accordance with the service information.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

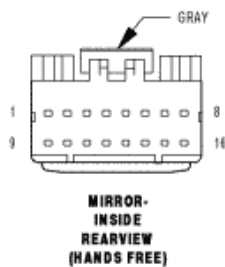
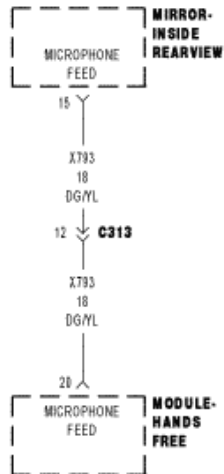
No

Repair is complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B145B-TELEMATICS MIRROR CONTROL CIRCUIT OPEN

Circuit Schematic



01A01776

Fig. 23: Microphone Feed Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects an open on the (X793) Microphone Feed circuit.

Possible Causes

Possible Causes
(X793) MICROPHONE FEED CIRCUIT OPEN INSIDE REARVIEW MIRROR HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **(X793) MICROPHONE FEED CIRCUIT OPEN**

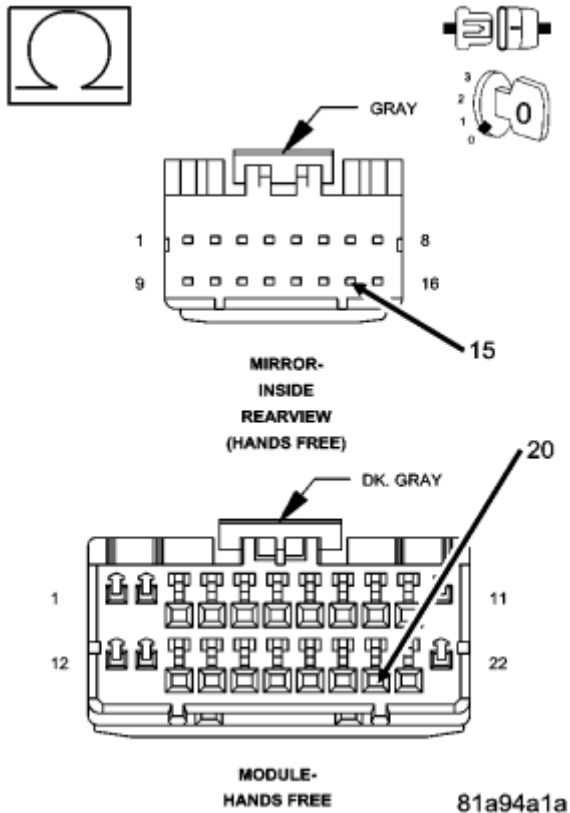


Fig. 24: Measuring Resistance Of (X793) Microphone Feed Circuit Between HFM Connector And Inside Rearview Mirror Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module harness connector.

Disconnect the Inside Rearview Mirror harness connector.

Measure the resistance of the (X793) Microphone Feed circuit between the HFM connector and the inside rearview mirror connector.

Is the resistance below 5.0 ohms?

Yes

Go To 3.

No

Repair the (X793) Microphone Feed circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **INSIDE REARVIEW MIRROR**

Replace the Inside Rearview Mirror in accordance with the service information.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

Attempt to make a phone call with the system.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair is complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B2205-ORIGINAL VIN MISSING/MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The Hands Free Module will receive and monitor the VIN message from the PCM and record the VIN if different from the last VIN.

Possible Causes

Possible Causes
INCORRECT VIN PROGRAMMED IN PCM

Diagnostic Test

1. CHECK FOR ACTIVE DTC

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. CHECK VIN IN PCM

With the scan tool compare the VIN that is programmed into the PCM to the VIN on the vehicle.

Does the VIN programmed into the PCM match the vehicles VIN?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Program the correct VIN in the PCM and retest the HFM system.

B2223-(HFM) HANDS FREE PHONE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault during an internal diagnostic check.

Possible Causes

Possible Causes
HANDS FREE MODULE

Diagnostic Test

1. **REPLACE THE HANDS FREE MODULE IF DTC IS ACTIVE**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

B222A-VEHICLE LINE MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module will receive and monitor the vehicle line message from the PCM and record the vehicle line if different from the last vehicle line.

Possible Causes

Possible Causes
INCORRECT PCM HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **CHECK VEHICLE LINE IN PCM**

With the scan tool compare the vehicle line that is programmed into the PCM to the vehicle line of the vehicle.

Does the vehicle line programmed into the PCM match the vehicle?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Hands Free Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace and program the Powertrain Control Module in accordance with the service information.
Ensure the PCM is replaced with the correct vehicle line PCM.
Perform **BODY VERIFICATION TEST - VER 1** .

B222E-FLASH CHECKSUM PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault during an internal diagnostic check.

Possible Causes

Possible Causes
HANDS FREE MODULE

Diagnostic Test

1. **REPLACE THE HANDS FREE MODULE IF DTC IS ACTIVE**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Replace and program the Hands Free Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness

connectors. Look for broken, bent, pushed out, or corroded terminals.

B2230-RAM WRITE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Hands Free Module detects a fault during an internal diagnostic check.

Possible Causes

Possible Causes
HANDS FREE MODULE

Diagnostic Test

1. **REPLACE THE HANDS FREE MODULE IF DTC IS ACTIVE**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

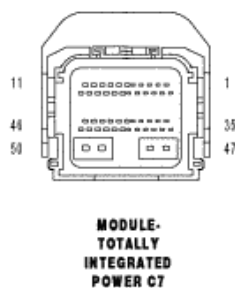
Yes

Replace and program the Hands Free Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

Circuit Schematic



814877

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

- Set Condition:**

Whenever the CAN Interior Bus (+) or (-) circuits are open, shorted to voltage, or shorted to ground.

Possible Causes

Possible Causes
CAN INTERIOR BUS DTC's IN TIPM (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN HANDS FREE MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTCS**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **CHECK TIPM DTC's**

With the scan tool, read TIPM active DTC's

Does the scan tool display any CAN Interior Bus DTCs - ACTIVE?

Yes

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. (D265) CAN INTERIOR BUS (+) CIRCUIT OPEN

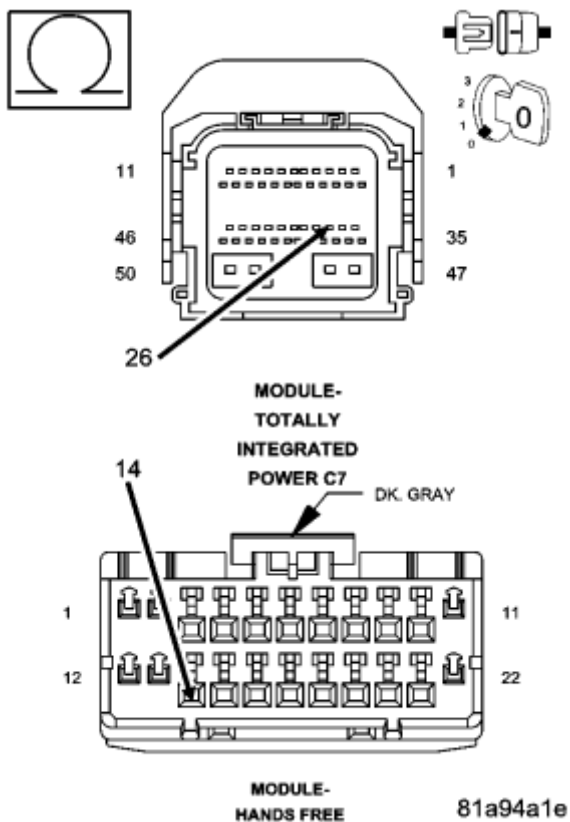


Fig. 26: Measuring Resistance Of (D265) CAN Interior BUS (+) Circuit Between TIPM C7 Connector And Hands Free Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Hands Free Module connector.

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (D265) CAN Interior Bus (+) circuit between the TIPM C7 connector and

the Hands Free Module connector.

Is the resistance below 2.0 ohms?

Yes

Go To 4.

No

Repair the (D265) CAN Interior Bus (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (D264) CAN INTERIOR BUS (-) CIRCUIT OPEN

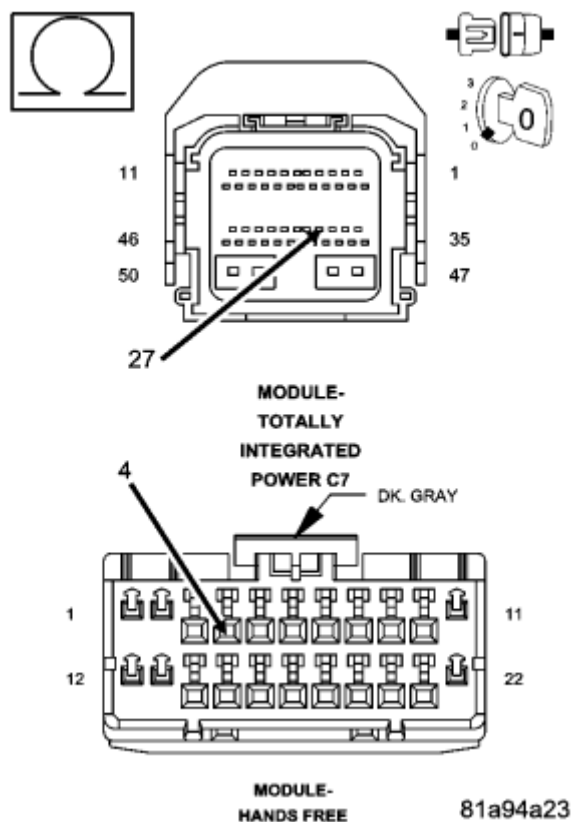


Fig. 27: Measuring Resistance Of (D264) CAN Interior BUS (-) Circuit Between TIPM C7 Harness Connector And Hands Free Module Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (D264) CAN Interior Bus (-) circuit between the TIPM C7 harness connector and the Hands Free Module connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Hands Free Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D264) CAN Interior Bus (-) circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0151-LOST COMMUNICATION WITH OCCUPANT RESTRAINT CONTROLLER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0154-LOST COMMUNICATION WITH OCCUPANT CLASSIFICATION MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0156-LOST COMMUNICATION WITH EOM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0164-LOST COMMUNICATION WITH HVAC CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0168-LOST COMMUNICATION WITH VEHICLE SECURITY CONTROL MODULE (SKREEM/WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0195-LOST COMMUNICATION WITH SDARS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0196-LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0199-LOST COMMUNICATION WITH DRIVER DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0200-LOST COMMUNICATION WITH PASSENGER DOOR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0208-LOST COMMUNICATION WITH HEATED SEAT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

U0209-LOST COMMUNICATION WITH MEMORY SEAT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** . for the diagnostic test procedure.

2008 ACCESSORIES AND EQUIPMENT

Navigation/Telecommunication - Service Information - Liberty

NAVIGATION/TELECOMMUNICATION - SERVICE INFORMATION

DESCRIPTION

NAVIGATION/TELECOMMUNICATION

TELECOMMUNICATIONS

The hands-free cellular system on this vehicle uses Bluetooth™ technology to provide wireless communication between the operator's compatible cellular telephone and the vehicle's on-board receiver.

The system uses voice recognition technology to control operation. The incoming voice is broadcast through the vehicle's radio speakers, automatically overriding any other audio signals on the front speakers when the hands-free system is in use. A microphone in the rearview mirror picks up vehicle occupant's voices. If a call is in progress when the ignition is switched off, the call will be transferred to the hand-held telephone.

The system will communicate with a telephone that is anywhere within the vehicle. However, covering the hand held phone or the hands-free phone module with a metal object may block the signal. The system will recognize up to seven telephones, each of which is given a spoken identification by the user during the setup process. The system includes Spanish and French voice recognition in addition to English.

The hands free module is contained within the radio for premium systems. The hands free module is located in the right rear of the vehicle behind the rear quarter panel.

NAVIGATION

The navigation system offers several new customer features for expanded usability and convenience with hands-free voice-activated operation in addition to the touch screen buttons. The navigation system uses the Bluetooth™ microphone in the rear view mirror. Navigation routes can be based on a variety of formats including some of the following:

- Destination entry by street intersection, city, zip code, street name, street address and number, state/province/country and phone number

- Stop/change route

- Save current position

- Personal menu, including Guide Me Home (Go Home), Trip Itinerary, List of Saved Locations, Favorite Points of Interest (from a data base), Manage Personal User and Choose User

- Personal Interests including recent routes, address book, Where Am I Now, Emergency (police stations, Dodge dealerships, fire stations, hospitals and emergency care centers), Trail and geo- coordinates

- Route options include shortest, quickest, maximize freeways, minimize freeways, avoid toll roads and avoid ferries

- Navigation can be put into DEMO mode to enhance trip planning

This navigation system will support Traffic Messaging. Traffic Messaging displays voice and pop up warning messages for medium and high priority situations on the route such as road closures due to accidents/hazardous situations and it can even generate a traffic detour for a traffic event located on the route.

OPERATION

NAVIGATION/TELECOMMUNICATION

TELECOMMUNICATION

Two buttons on the rearview mirror, identified with ISO icons, control the system: A "phone" button turns the system on and off; a "voice recognition" (or voice command) button prompts the hands-free system to listen for a voice command. The system includes the following features:

- Phone book - Stores telephone numbers for later recall by name or other verbal identification, called a voice tag, and memory location.
- Four memory locations - Home, Work, Mobile, and Pager. A maximum of 32 unique names or voice tags may be stored at the same time, with a different number in each of the four memory locations.
- Voice tag dialing - Dials the number associated with a voice tag and memory location.
- Digit dialing - Dials the telephone number by recognizing the names of the digits as they are spoken.
- Receiving calls - A voice prompt notifies the user of an incoming call. Pressing the UConnect button accepts or rejects the call.
- Privacy Mode - Switches the call to the handheld telephone and the hands-free system and back again using the "voice recognition" (or "voice command") button and a voice command, if desired.

NAVIGATION

The navigation system collects data from GPS satellites in orbit around the Earth. This information is sent to the radio to be processed and provides the user with present location and is used to provide the route planning and guidance as the vehicle is driven.

HANDS FREE MODULE

REMOVAL

HANDS FREE MODULE

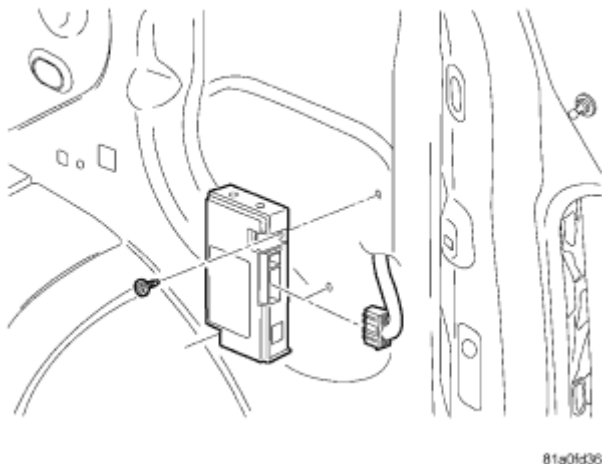


Fig. 1: Removing Hands Free Module
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the right quarter trim panel. Refer to **REMOVAL** .
3. Remove mounting fasteners.
4. Disconnect electrical harness connector.

INSTALLATION

HANDS FREE MODULE

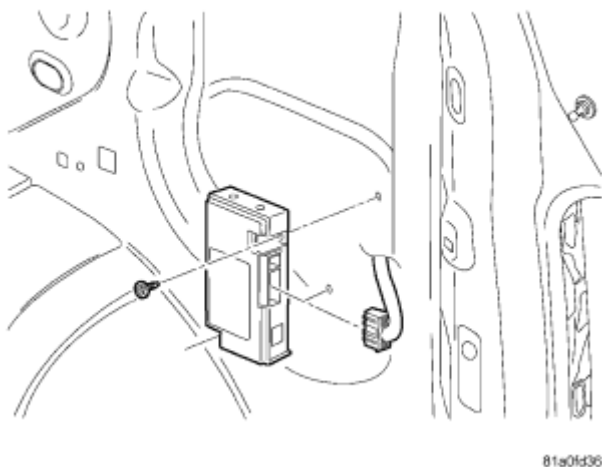


Fig. 2: Installing Hands Free Module
Courtesy of CHRYSLER LLC

1. Connect electrical harness connector.
2. Position module, and install mounting fasteners.
3. Install quarter trim panel. Refer to **INSTALLATION** .

4. Connect battery negative cable.

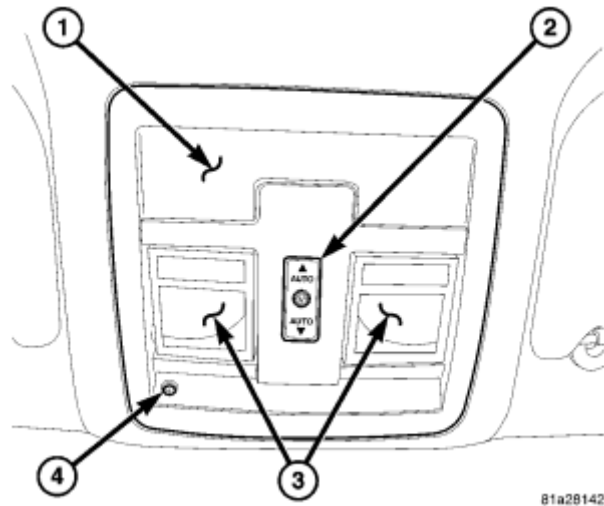
2008 ACCESSORIES AND EQUIPMENT

Overhead Console - Service Information - Liberty

OVERHEAD CONSOLE - SERVICE INFORMATION

DESCRIPTION

OVERHEAD CONSOLE



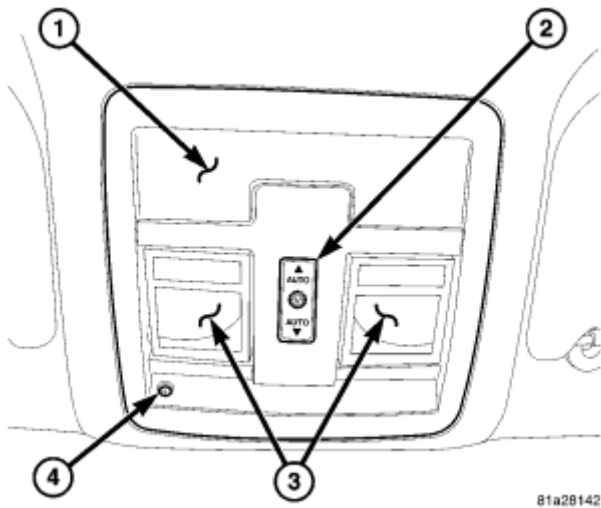
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Fig. 1: Identifying Overhead Console, Sunroof Switch, Courtesy Lamps & Infrared Temperature Sensor
Courtesy of CHRYSLER LLC

An overhead console (1) is standard factory-installed equipment on this model. All overhead consoles are equipped with two reading and courtesy lamps (3). On vehicles equipped with a power sunroof, the sunroof switch (2) is located between the two reading and courtesy lamps. On vehicles equipped with automatic climate control an infrared temperature sensor (4) is located on the front edge of the overhead console. The overhead console is mounted with three snap clips into a molded plastic retainer bracket located above the headliner to provide secure overhead console attachment.

REMOVAL

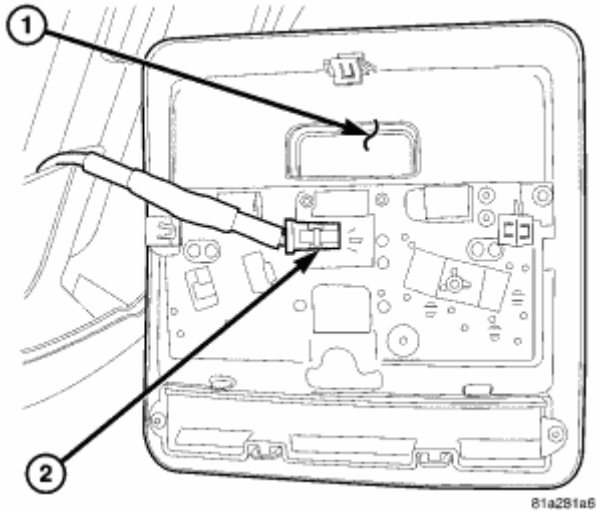
OVERHEAD CONSOLE



81a28142

Fig. 2: Identifying Overhead Console, Sunroof Switch, Courtesy Lamps & Infrared Temperature Sensor
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Using your fingertips, grasp the sides of the overhead console (1) and pull straight down evenly to disengage the three snap clips from the mounting bracket.



81a281a6

Fig. 3: Identifying Overhead Console & Wire Harness Connector
 Courtesy of CHRYSLER LLC

3. Lower the overhead console (1) far enough to access the wire harness connector (2).
4. If equipped, disconnect the courtesy lamps, infrared temperature sensor and power sunroof switch electrical connectors.
5. Remove the overhead console (1) assembly from the vehicle.

INSTALLATION

OVERHEAD CONSOLE

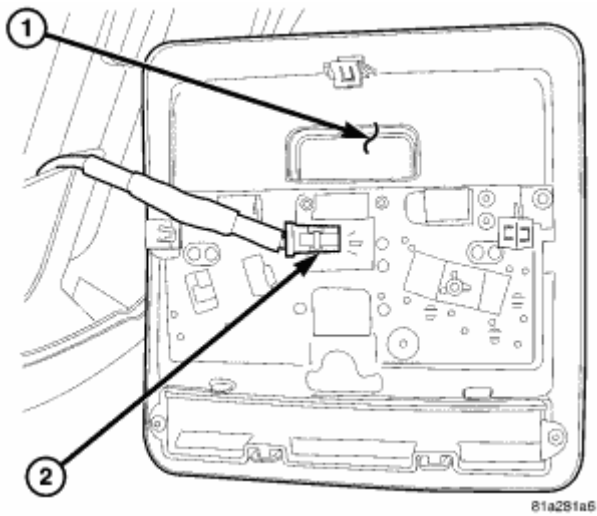


Fig. 4: Identifying Overhead Console & Wire Harness Connector
 Courtesy of CHRYSLER LLC

1. Position the overhead console (1) in the vehicle near the headliner assembly.
2. If equipped, connect the courtesy lamps, infrared temperature sensor and power sunroof switch electrical connectors (2).

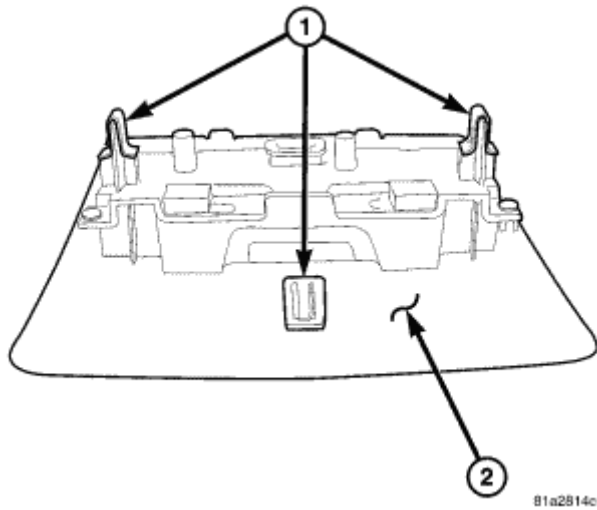


Fig. 5: Identifying Snap Clips & Overhead Console
 Courtesy of CHRYSLER LLC

3. Grasp the sides of the overhead console (2) and push straight up evenly to engage the three snap clips (1) into the mounting bracket.
4. Connect the battery negative cable.

2008 ACCESSORIES AND EQUIPMENT

Power Distribution - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
P129C	INVERTER CONTROL CIRCUIT HIGH (TIPM)
P129E	INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)

POWER DISTRIBUTION - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

P129C-INVERTER CONTROL CIRCUIT HIGH (TIPM)

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10 volts. Once the inverter switch has been turned on, the CCN sends a request to the TIPM to turn on the Inverter.

Set Conditions

- **Set Condition:**

An open or shorted high condition has been detected in the Inverter Control output circuit by the TIPM. One Trip Fault. Three good trips to turn off the MIL.

Possible Causes

Possible Causes
(P805) INVERTER CONTROL OUTPUT CIRCUIT OPEN
(P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE
INVERTER MODULE
TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1) ACTIVE DTC

Ignition on, engine not running.

With a scan tool, select View DTCs.

Is the DTC Active at this time?

Yes

Go To 2) (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE.

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2) (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Inverter Module harness connector.

Disconnect the TIPM C7 harness connector.

Turn the ignition on.

Measure the voltage of the (P805) Inverter Control Output circuit at the Inverter Module harness connector.

Is voltage present?

Yes

Repair the short to voltage in the (P805) Inverter Control Output circuit.

No

Go To 3).

3) INVERTER MODULE

Turn the ignition off.

Reconnect the TIPM harness connector.

Using a test light connected to ground, probe the Inverter Enable Switch Signal circuit at the Inverter Module harness connector.

Using the scan tool, actuate the Inverter Enable control.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

Replace the Inverter Module per Service Information.
Perform **POWERTRAIN VERIFICATION TEST** .

No

Go To 4).

4) (P805) INVERTER CONTROL OUTPUT CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM harness connector.

Disconnect the Inverter Module harness connector.

Measure the resistance of the (P805) Inverter Control Output circuit between the TIPM and Inverter Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Totally Integrated Power Module per Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the open in the (P805) Inverter Control Output circuit.

P129E-INVERTER CONTROL CIRCUIT OVERCURRENT (TIPM)

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on. Battery voltage greater than 10.4 volts.

Set Conditions

- **Set Condition:**

An overcurrent condition is detected in the Inverter Control Output circuit. One Trip Fault. Three good trips to turn off the MIL.

Possible Causes

Possible Causes
TERMINAL DAMAGE OR CORROSION (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO GROUND INVERTER MODULE TOTALLY INTEGRATED POWER MODULE (TIPM)

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1) ACTIVE DTC

Ignition on, engine not running.

NOTE: Low battery voltage can also cause excessive current draw, in very hot and very cold ambient temperatures. Make sure the battery can pass a load test before continuing.

With a scan tool, select View DTCs.

Look closely at the temperatures at which this DTC set.

Is the DTC Active at this time?

Yes

Go To 2).

No

Refer to the **INTERMITTENT CONDITION** Diagnostic Procedure.

2) (P805) INVERTER CONTROL OUTPUT CIRCUIT SHORTED TO GROUND

Turn the ignition off.

Disconnect the TIPM harness connector.

Disconnect the Inverter Module harness connector.

Inspect the wiring connections for corrosion and repair as necessary.

Measure the resistance between ground and the (P805) Inverter Control Output circuit at the Inverter Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Go To 3).

No

Repair the short to ground in the (P805) Inverter Control Output circuit.

3) INVERTER MODULE

Turn the ignition off.

Reconnect the TIPM harness connector.

Using a test light connected to ground, probe the Inverter Enable Switch Signal circuit at the Inverter Module harness connector.

Using the scan tool, actuate the Inverter Enable control.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Does the test light illuminate brightly?

Yes

Replace the Inverter Module per Service Information.

Perform **POWERTRAIN VERIFICATION TEST** .

No

Replace the Totally Integrated Power Module per Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Power Distribution - Service Information - Liberty

POWER DISTRIBUTION

DESCRIPTION

POWER DISTRIBUTION

The power distribution system for this vehicle consists of the Totally Integrated Power Module (TIPM) and related fuses, relays and wiring connectors.

OPERATION

POWER DISTRIBUTION

The power distribution system for this vehicle is designed to provide safe, reliable, centralized, and convenient to access, distribution of the electrical current required to operate all of the many standard and optional factory-installed electrical and electronic powertrain, chassis, safety, comfort and convenience systems. At the same time, these systems were designed to provide centralized locations for conducting diagnosis of faulty circuits, and for sourcing the additional current requirements of many aftermarket vehicle accessory and convenience items.

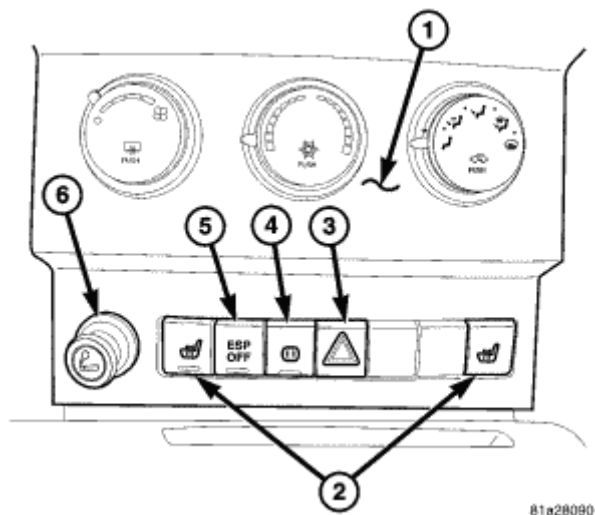
These power distribution systems also incorporate various types of circuit control and protection features, including fuses and relays.

CIGAR LIGHTER/POWER OUTLET

DESCRIPTION

CIGAR LIGHTER/POWER OUTLET

INSTRUMENT PANEL MOUNTED

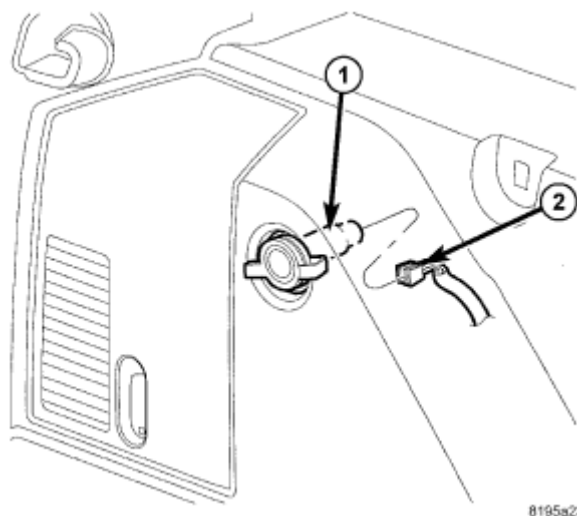


81a28090

Fig. 1: Heated Seat System Components
Courtesy of CHRYSLER LLC

An instrument panel mounted cigar lighter/power outlet receptacle (6) is available on this model. On models equipped with the optional Smoker's Package, the cigar lighter knob and heating element are included. On models without the Smoker's Package, the cigar lighter receptacle is equipped with a snap fit plastic cap and is treated as an auxiliary power outlet. The cigar lighter receptacle is installed in the instrument panel accessory switch bezel (1), which is located near the bottom of the instrument panel center stack area, below the radio. The cigar lighter base is secured by a snap fit within the left lower bezel. This power outlet has a constant 12 volt battery feed.

REAR CARGO MOUNTED



8195a23d

Fig. 2: Quarter Trim Panel Electrical Connector
Courtesy of CHRYSLER LLC

A rear cargo area power outlet (1) is standard equipment on this vehicle. The rear power outlet is installed in the left rear quarter trim panel, near the spare tire jack. The power outlet base and mount are secured by a snap fit within the quarter trim panel. A plastic protective cap snaps into the power outlet base when the power outlet is

not being used, and hangs from the power outlet base mount by an integral bail strap while the power outlet is in use. While the power outlet is very similar to a cigar lighter base unit, it does not include the two small spring-clip retainers inside the bottom of the receptacle shell that are used to secure the cigar lighter heating element to the insulated contact. It has 12 volt battery voltage when the ignition is in the ON or ACC positions.

OPERATION

CIGAR LIGHTER/POWER OUTLET

CIGAR LIGHTER/POWER OUTLET

The cigar lighter consists of two major components: a knob and heating element unit, and the cigar lighter base or receptacle shell. The receptacle shell is connected to ground, and an insulated contact in the bottom of the shell is connected to battery current.

The cigar lighter knob and heating element are encased within a spring-loaded housing, which also features a sliding protective heat shield. When the knob and heating element are inserted in the receptacle shell, the heating element resistor coil is grounded through its housing to the receptacle shell. If the cigar lighter knob is pushed inward, the heat shield slides up toward the knob exposing the heating element, and the heating element extends from the housing toward the insulated contact in the bottom of the receptacle shell.

Two small spring-clip retainers are located on either side of the insulated contact inside the bottom of the receptacle shell. These clips engage and hold the heating element against the insulated contact long enough for the resistor coil to heat up. When the heating element is engaged with the contact, battery current can flow through the resistor coil to ground, causing the resistor coil to heat.

When the resistor coil becomes sufficiently heated, excess heat radiates from the heating element causing the spring-clips to expand. Once the spring-clips expand far enough to release the heating element, the spring-loaded housing forces the knob and heating element to pop back outward to their relaxed position. When the cigar lighter knob and element are pulled out of the receptacle shell, the protective heat shield slides downward on the housing so that the heating element is recessed and shielded around its circumference for safety.

POWER OUTLET

The power outlet base or receptacle shell is connected to ground, and an insulated contact in the bottom of the shell is connected to battery current. The power outlet receives battery voltage from a fuse in the Totally Integrated Power Module (TIPM) when the ignition is in the ON or ACC positions.

REMOVAL

CIGAR LIGHTER/POWER OUTLET

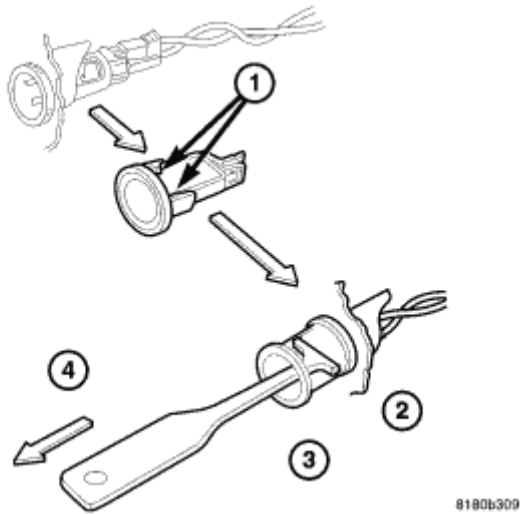


Fig. 3: Removing Cigar Lighter/Power Outlet
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Look inside and note position of the retaining bosses (1).
3. Using special tool 9857 Power Outlet Remover. Insert the tool forcing the bosses out of base.
4. Pull out the base through mounting ring by gently rocking the tool (3).
5. Disconnect the base wires.
6. Set base aside and remove base mount ring.

INSTALLATION

CIGAR LIGHTER/POWER OUTLET

1. Position mount ring to the instrument panel and feed the wires through ring. Index the cap and the mount ring with the index tab at 9 o'clock to the key in the instrument panel. Install the ring.
2. Connect wires to base. Orient base alignment rib at 11 o'clock to mate the groove in mount ring at the same location.
3. Push base into the bezel till it locks.
4. Install cigar lighter cap.
5. Connect the battery negative cable.

IOD FUSE

DESCRIPTION

IOD FUSE

All vehicles are equipped with an Ignition-Off Draw (IOD) fuse that is disconnected within the Totally Integrated Power Module (TIPM) when the vehicle is shipped from the factory. Dealer personnel are to push the IOD fuse down until fully seated in the TIPM as part of the preparation procedures performed just prior to new

vehicle delivery.

OPERATION

IOD FUSE

The term ignition-off draw identifies a normal condition where power is being drained from the battery with the ignition switch in the Off position. The IOD fuse feeds the memory and sleep mode functions for some of the electronic modules in the vehicle as well as various other accessories that require battery current when the ignition switch is in the Off position, including the clock. The only reason the IOD fuse is pulled out is to reduce the normal IOD of the vehicle electrical system during new vehicle transportation and pre-delivery storage to reduce battery depletion, while still allowing vehicle operation so that the vehicle can be loaded, unloaded and moved as needed by both vehicle transportation company and dealer personnel.

The IOD fuse is pulled out from the Totally Integrated Power Module (TIPM) fuse cavity J13 when the vehicle is shipped from the assembly plant. Dealer personnel must push the IOD fuse down until fully seated in the TIPM when the vehicle is being prepared for delivery in order to restore full electrical system operation. Once the vehicle is prepared for delivery, the IOD function of this fuse becomes transparent and the fuse that has been assigned the IOD designation becomes only another Fused B(+) circuit fuse. The IOD fuse serves no useful purpose to the dealer technician in the service or diagnosis of any vehicle system or condition, other than the same purpose as that of any other standard circuit protection device.

The IOD fuse can be used by the vehicle owner as a convenient means of reducing battery depletion when a vehicle is to be stored for periods not to exceed about thirty days. However, it must be remembered that pulling out the IOD fuse will not eliminate IOD, but only reduce this normal condition. If a vehicle will be stored for more than about thirty days, the battery negative cable should be disconnected to eliminate normal IOD; and, the battery should be tested and recharged at regular intervals during the vehicle storage period to prevent the battery from becoming discharged or damaged.

REMOVAL

IOD FUSE

NOTE: When removing or installing the IOD fuse, it is important that the ignition switch be in the Off position. Failure to place the ignition switch in the Off position can cause the radio display to become scrambled when the IOD fuse is installed. Removing and installing the IOD fuse again with the ignition switch in the Off position will usually correct the scrambled radio display condition.

1. Turn the ignition switch to the Off position.
2. Open the cover of the Totally Integrated Power Module (TIPM).
3. Pull up fuse J13 until it is in the pre-stage position from the TIPM.

INSTALLATION

IOD FUSE

CAUTION: It is extremely important that the Ignition Off Draw (IOD) fuse is fully seated into the Totally Integrated Power Module (TIPM) fuse cavity. Failure to install the fuse correctly could result in erratic electrical systems behavior.

1. Open the TIPM cover.
2. Insert fuse J13 into the TIPM. Push fuse down until it is fully seated in the TIPM cavity.
3. Close the TIPM cover.

MODULE-INVERTER

DESCRIPTION

DESCRIPTION

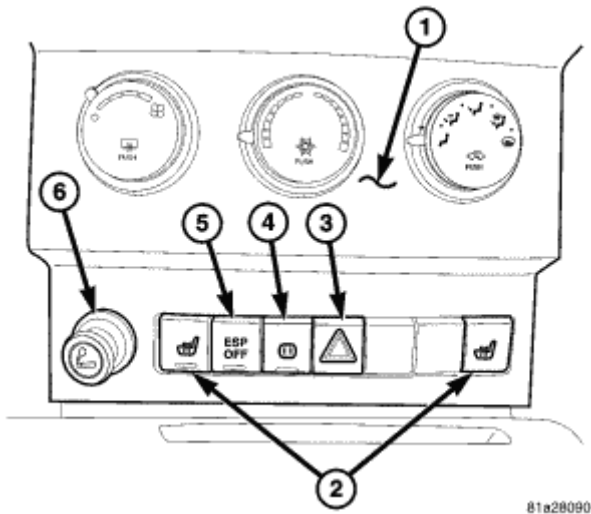


Fig. 4: Heated Seat System Components
Courtesy of CHRYSLER LLC

The inverter module is located under the right rear seat cushion. The A/C outlet is mounted in the rear of the center floor console. The inverter module provides A/C power for user accessories when the 115 Volt AC outlet switch (4) in the instrument panel center stack (1) is in the "ON" position. The inverter converts the 12 Volt DC from the vehicle battery system to a 115 Volt AC output. The outlet switch is part of the accessory switch bank assembly and is not available for service as an individual part. If the switch is damaged or inoperative the complete accessory switch bank assembly must be replaced. Refer to **REMOVAL** for the appropriate procedure.

OPERATION

OPERATION

The 115 volt AC power outlet switch receives 12 volts from the Totally Integrated Power Module (TIPM) and passes it as an enable signal to the inverter module. The inverter module also receives 12 volts via the TIPM and inverts this to a 115 volt AC output. The enable signal received from the power outlet switch enables the

inverter to convert the received voltage and pass it to the power outlet to power external devices.

DIAGNOSIS AND TESTING

DIAGNOSIS AND TESTING

For complete circuit diagrams, refer to the **SYSTEM WIRING DIAGRAMS** article.

WARNING: Disable the airbag system before attempting any steering wheel, steering column, seat belt tensioner, side airbag, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the airbag system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the airbag system. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

115 VOLT POWER OUTLET DIAGNOSIS

CONDITION	POSSIBLE CAUSES	CORRECTION
NO POWER AT THE 115 VOLT POWER OUTLET	1. Fuse inoperative.	1. Check Totally Integrated Power Module (TIPM) fuse number 37. Replace fuse, if required.
	2. Power outlet connector damaged.	2. Check for loose or corroded power outlet connector. Repair, if required.
	3. Inverter module connector damaged.	3. Check for loose or corroded inverter module connector. Repair, if required.
	4. Wiring damaged.	4. Check for shorted or open wires. Repair wiring, if required.
	5. Inverter module ground damaged.	5. Check for continuity between the inverter module and a known good ground. There should be continuity. Repair ground, if required.
	6. Power outlet inoperative.	6. Replace the power outlet.
	7. Inverter module inoperative.	7. Replace the inverter module.
	8. Power outlet switch inoperative.	6. Replace the accessory switch bank.

REMOVAL

REMOVAL

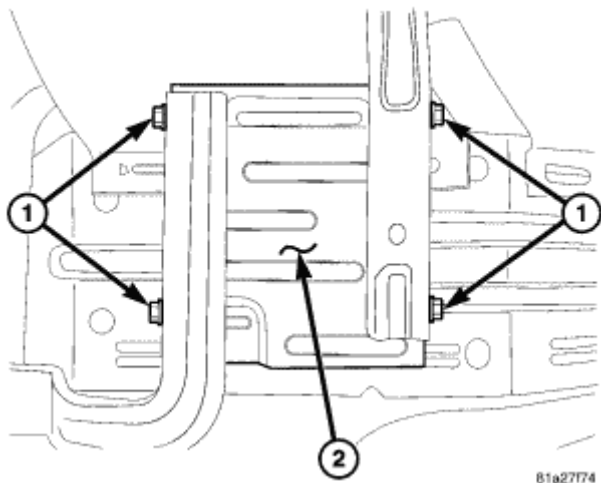


Fig. 5: Identifying Fasteners & Inverter Module
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the rear seat assembly. Refer to **REMOVAL** .
3. Remove the fasteners (1) from the mounting brackets of the inverter module (2).
4. Remove the inverter module.

INSTALLATION

INSTALLATION

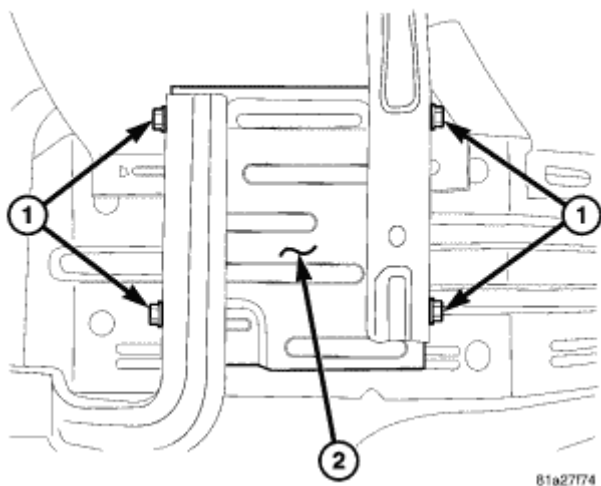


Fig. 6: Identifying Fasteners & Inverter Module
 Courtesy of CHRYSLER LLC

1. Position the inverter module (2) on the mounting bracket assembly.
2. Install the fasteners (1).

3. Install the rear seat assembly. Refer to **INSTALLATION** .
4. Connect the battery negative cable.

MODULE-TOTALLY INTEGRATED POWER

DESCRIPTION

POWER DISTRIBUTION CENTER

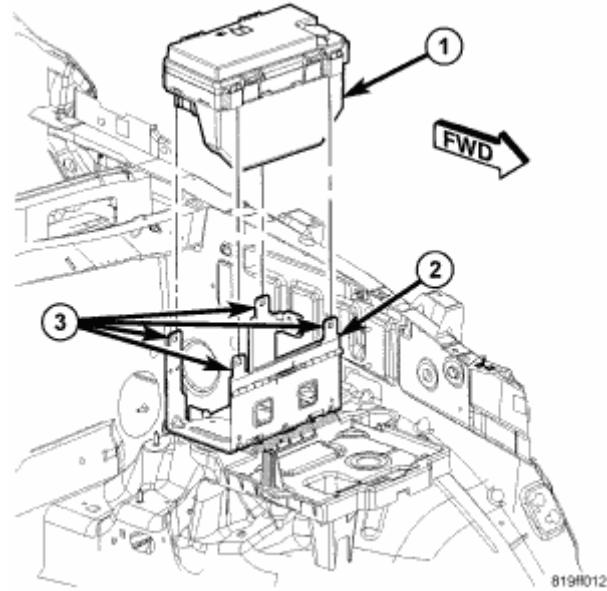


Fig. 7: Identifying Integrated Power Module (TIPM), TIPM Mounting Bracket & Mounting Tabs
Courtesy of CHRYSLER LLC

All of the electrical current distributed throughout this vehicle is directed through the standard equipment Totally Integrated Power Module (TIPM) (1). The molded plastic TIPM housing is located in the left front corner of the engine compartment, just behind the battery. The TIPM housing has a molded plastic cover. The TIPM cover is easily opened for service access and has a convenient fuse layout label affixed to the inside surface of the cover to ensure proper component identification.

The TIPM housing is secured to the TIPM mounting bracket (2) by four mounting tabs (3) and four clips integral to the TIPM housing. The TIPM mounting bracket is secured to the battery tray with three screws and two mounting tabs integral to the battery tray.

OPERATION

POWER DISTRIBUTION CENTER

All of the current to the Totally Integrated Power Module (TIPM) comes directly from the positive battery cable to a stud located on the top of the TIPM. The cable is secured to the TIPM stud with a nut. Internal connection of all the TIPM circuits is accomplished by an intricate network of hard wiring and bus bars. Refer to **SYSTEM WIRING DIAGRAMS** for complete circuit diagrams.

The fuses, relays and TIPM housing assembly are available for service replacement.

REMOVAL

POWER DISTRIBUTION CENTER

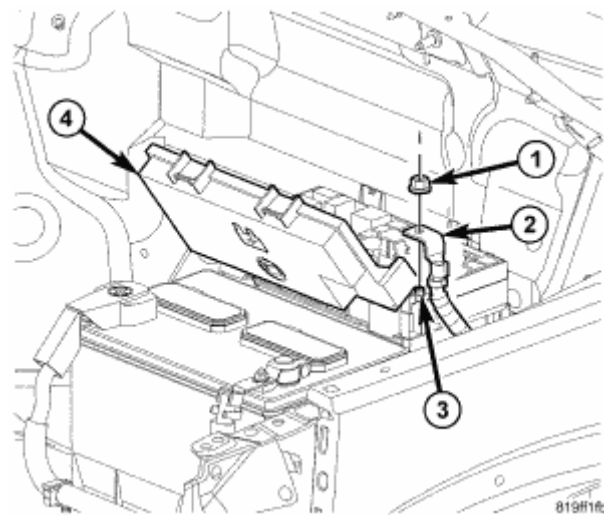


Fig. 8: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover

Courtesy of CHRYSLER LLC

1. Open hood.
2. Disconnect and isolate the battery negative cable.
3. Open the Totally Integrated Power Module (TIPM) cover (4).
4. Remove the TIPM positive cable retaining nut (1) and remove the cable (2) from the mounting stud (3).

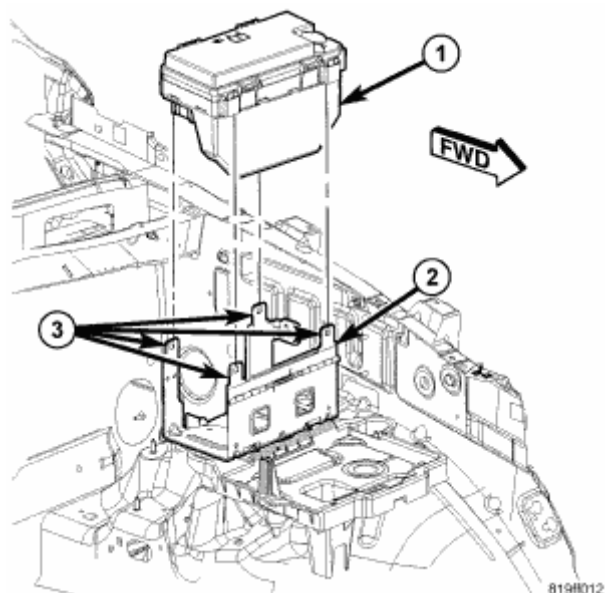


Fig. 9: Identifying Integrated Power Module (TIPM), TIPM Mounting Bracket & Mounting Tabs

Courtesy of CHRYSLER LLC

5. Using an appropriate flat bladed tool, depress the four mounting clips to disengage and remove the TIPM housing (1) from the TIPM bracket mounting tabs (3).

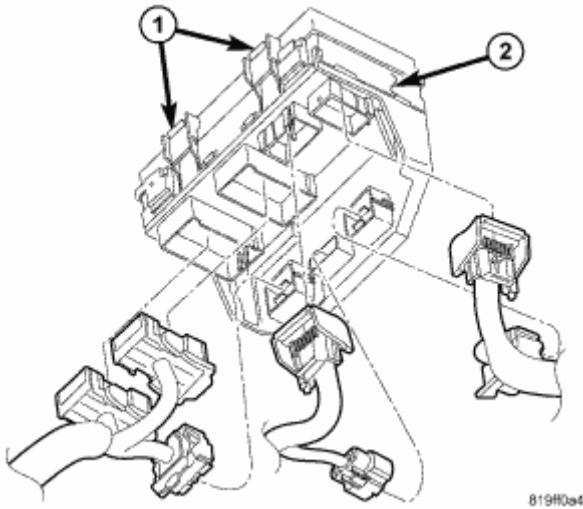


Fig. 10: Disconnecting/Connecting TIPM Wire Harness Connectors
Courtesy of CHRYSLER LLC

6. Disconnect each of the seven TIPM wire harness connectors from the TIPM housing (2).
7. Remove the TIPM from the vehicle.

INSTALLATION

POWER DISTRIBUTION CENTER

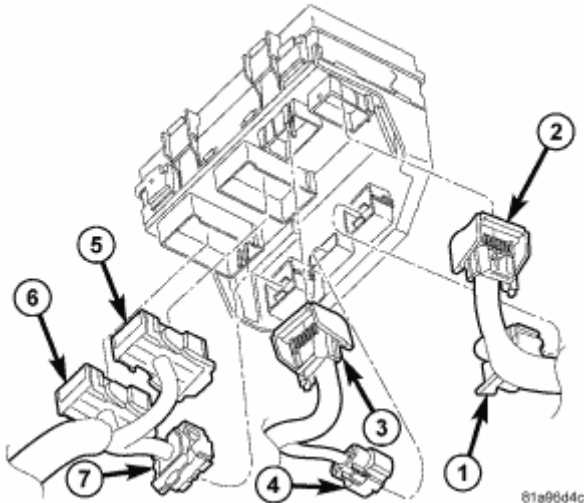


Fig. 11: Identifying TIPM Wire Harness Connectors
Courtesy of CHRYSLER LLC

CAUTION: The original Cab Compartment Node (CCN) and Powertrain Control Module (PCM) must be installed and functioning properly prior to powering up the new Totally Integrated Power Module (TIPM). The TIPM receives vehicle configuration data from the CCN and Vehicle Identification Number information from the PCM. If configuration information becomes lost or corrupted, the data can be obtained from DealerCONNECT

1. Position the TIPM into the engine compartment.
2. Connect each of the seven TIPM wire harness connectors in the order shown in illustration.

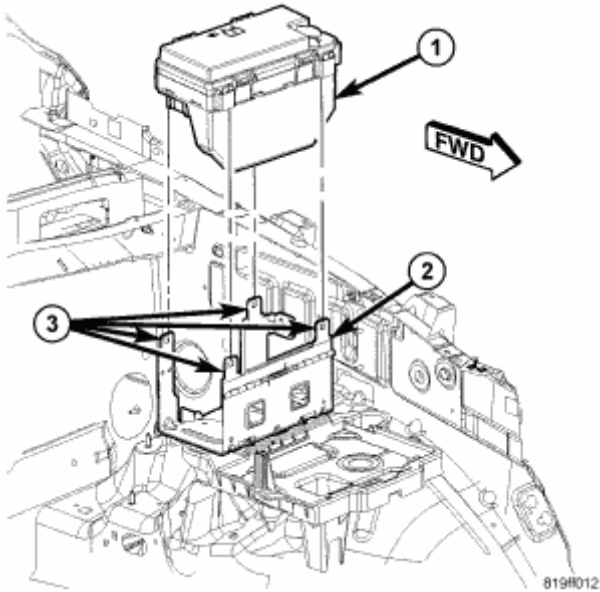


Fig. 12: Identifying Integrated Power Module (TIPM), TIPM Mounting Bracket & Mounting Tabs
Courtesy of CHRYSLER LLC

3. Position the TIPM (1) onto the mounting bracket (2) and push down until the four mounting clips are fully seated onto the mounting tabs (3).

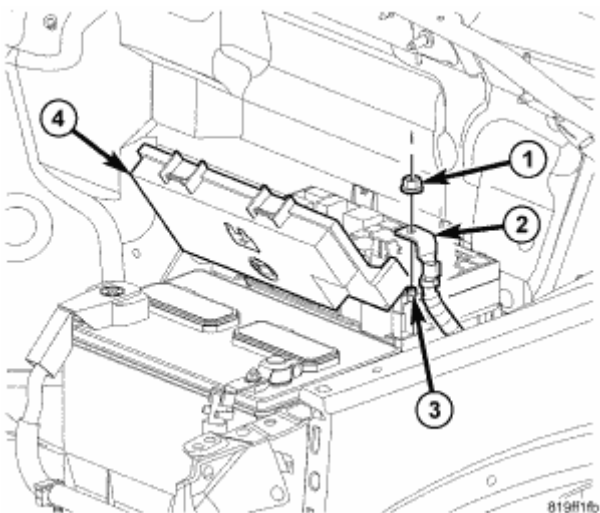


Fig. 13: TIPM Positive Cable Retaining Nut, Cable, Mounting Stud & Totally Integrated Power Module (TIPM) Cover

Courtesy of CHRYSLER LLC

4. Open the TIPM cover (4) and position the TIPM positive cable (2) onto the mounting stud (3) and install the retaining nut (1). Tighten the nut to 20 - 28 N.m (180 - 250 in. lbs.).
5. Fully seat the Airbag fuse holder (two fuses in one yellow carrier) and the Ignition Off Draw (IOD) fuse.
6. Close the TIPM cover (4).
7. Connect the battery negative cable.
8. Close the hood.
9. Insert the ignition key and turn it to the "RUN" position and wait twelve seconds. The TIPM will collect the necessary vehicle configuration and VIN data from the CCN and PCM at this time. After twelve seconds turn the ignition key to the "OFF" position and then back to the "ON" position and verify proper vehicle systems operation.

POWER OUTLET-AC

REMOVAL

REMOVAL

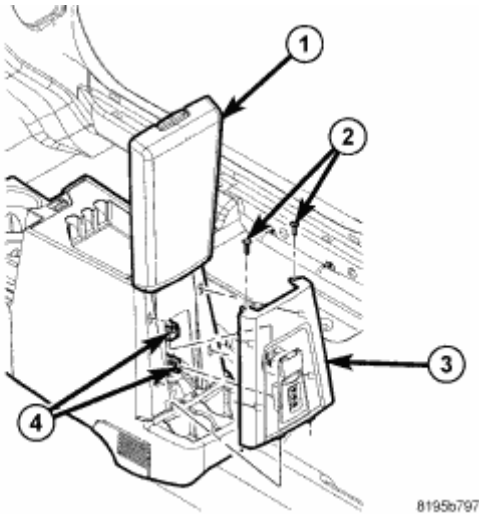


Fig. 14: Identifying Console Lid, Screws, Panel & Electrical Connectors
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Open the console lid (1) and remove the two screws (2).
3. Using a trim stick C-4755 or equivalent, release the fasteners at all of the locations around the floor console trim panel (3).
4. Lift up and rearward to release the panel (3) from the floor console.
5. Disconnect the electrical connectors (4) from the panel (3).
6. Remove AC power outlet from the trim panel.

INSTALLATION

INSTALLATION

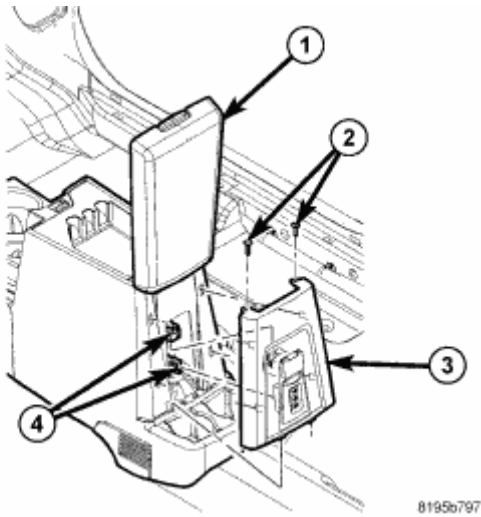


Fig. 15: Identifying Console Lid, Screws, Panel & Electrical Connectors
Courtesy of CHRYSLER LLC

1. Install the AC power outlet into the floor console trim panel (3).
2. Connect the electrical connectors (4) to the panel (3).
3. Align the trim panel (3) to the console, use hand pressure to seat the clips.
4. Install the two screws (2) to the trim panel (3).
5. Connect the battery negative cable.

2008 ACCESSORIES AND EQUIPMENT

Power Locks - Service Information - Liberty

POWER LOCKS - SERVICE INFORMATION

DESCRIPTION

POWER LOCKS

POWER LOCKS

The power lock system allows all of the doors and the tailgate to be locked or unlocked electrically by operating a switch on either front door trim panel. The power lock system receives non-switched battery current through a fuse in the Totally Integrated Power Module (TIPM), so that the power locks remain operational, regardless of the ignition switch position.

The TIPM locks the doors and tailgate automatically when the vehicle is driven beyond the speed of 25.7 Km/h (15 mph), all doors are closed and the accelerator pedal is depressed. The rolling door lock feature can be disabled if desired.

This vehicle also offers several customer programmable features, which allows the selection of several optional electronic features to suit individual preferences.

The power lock system for this vehicle can also be operated remotely using the available Remote Keyless Entry (RKE) system radio frequency transmitters, if equipped.

Certain functions and features of the power lock system rely upon resources shared with other electronic modules in the vehicle over the Controlled Area Network (CAN). For proper diagnosis of these electronic modules or of the CAN, the use of a scan tool and the appropriate diagnostic information are required.

REMOTE KEYLESS ENTRY

The RKE system allows the use of a remote battery-powered radio transmitter to signal the TIPM to actuate the power lock system. The RKE receiver operates on non-switched battery current through a fuse in the TIPM, so that the system remains operational, regardless of the ignition switch position.

Certain RKE transmitters are also equipped with a Panic button. If the Panic button on the RKE transmitter is depressed, the horn will sound and the exterior lights will flash on the vehicle for about three minutes, or until the Panic button is depressed a second time. A vehicle speed of about 25.7 Km/h (15 mph) will also cancel the panic event.

The RKE system can also perform other functions on this vehicle. If the vehicle is equipped with the optional Vehicle Theft Security System (VTSS), the RKE transmitter will arm the VTSS when the Lock button is depressed, and disarm the VTSS when the Unlock button is depressed.

The RKE system includes two transmitters when the vehicle is shipped from the factory, but the system can retain the vehicle access codes of up to four transmitters. The transmitter codes are retained in the RKE receiver

memory, even if the battery is disconnected. If an RKE transmitter is faulty or lost, new transmitter vehicle access codes can be programmed into the system using a scan tool.

This vehicle also offers several customer programmable features, which allows the selection of several optional electronic features to suit individual preferences. Customer programmable feature options affecting the RKE system include:

- **Remote Unlock Sequence** - Allows the option of having only the driver side front door unlock when the RKE transmitter Unlock button is depressed the first time. The remaining doors and the tailgate unlock when the button is depressed a second time within 5 seconds of the first unlock press. Another option is having all doors and the tailgate unlock upon the first depression of the RKE transmitter Unlock button.
- **Sound Horn on Lock** - Allows the option of having the horn sound a short chirp as an audible verification that the RKE system received a valid Lock request from the RKE transmitter, or having no audible verification. This feature is not available on export vehicles.
- **Flash Lights with Lock and Unlock** - Allows the option of having the lights flash as an optical verification that the RKE system received a valid Lock request or Unlock request from the RKE transmitter, or having no optical verification.
- **Programming Additional Transmitters** - Allows up to four transmitter vehicle access codes to be stored in the receiver memory. This feature is not available on export vehicles.

Certain functions and features of the RKE system rely upon resources shared with other electronic modules in the vehicle over the Controlled Area Network (CAN). For diagnosis of these electronic modules or of the CAN, the use of a scan tool and the appropriate diagnostic information are required.

COMBINATION FLASHER

This flasher can be energized by the TIPM to flash all of the park/turn signal lamps as an optical alert for the RKE panic function and if the Flash Lights with Lock/Unlock programmable feature is enabled, as an optical verification for the RKE lock/unlock event.

LOW BEAM HEADLAMP RELAY

This relay can be energized by the TIPM to flash the headlamp low beams as an optical alert for the RKE panic function.

OPERATION

POWER LOCKS

POWER LOCKS

The Totally Integrated Power Module (TIPM) locks or unlocks the doors when an actuation input signal from a door lock switch or Remote Keyless Entry Module (RKE) is received. The TIPM turns on the output drivers and provides a voltage level to the door lock motor for a specified time. All passenger doors can be locked or unlocked using a mechanical button mounted on the door trim panel. The front passenger doors and tailgate can be locked or unlocked by using the key cylinder (tailgate cylinder does not lock/unlock vehicle. It only unlocks the tailgate). The tailgate will lock and can not be unlocked if the rear wiper switch is activated (this prevents the wiper from operating when the tailgate is ajar). The tailgate will also lock if battery power is lost and then

restored.

AUTOMATIC DOOR LOCKS

When the automatic door locks are ENABLED the door locks will lock when the vehicle is moving at about 25.7 Km/h (15 mph), all doors are closed and the accelerator pedal is depressed. This feature can be switched ON or OFF as desired. When the system is DISABLED the door locks will operate normally, but will not lock automatically when the vehicle is rolling. Once the automatic door locks have been actuated, they will not try to lock the doors again until a door is opened.

DOOR LOCK INHIBIT

If the key is in the ignition, in any position, and either front door is ajar, the doors can not be locked, but the unlock function still operates. Pressing the RKE lock/unlock button under these conditions will result in a normal lock/unlock activation.

After the key is removed from the Ignition Switch, or the doors are closed, the power door locks will operate normally.

DOOR LOCK CIRCUIT PROTECTION

The TIPM controls the door lock relays. If the door lock switch is actuated continuously for more than five seconds the TIPM will turn the output driver OFF (the TIPM would consider the switch stuck). Each lock motor is protected with a Positive Temperature Coefficient device that prevents motor burn out.

REMOTE KEYLESS ENTRY

LOCK : Pressing the LOCK button locks all doors, sounds horn (chirp) if enabled, and arms the Vehicle Theft Security System, if enabled. The chirp verifies that the RKE receiver has sent a message to the TIPM for door lock operation. If a door has not been closed before pressing the LOCK button, the vehicle may not be secured and the VTSS (if equipped) will not arm until the door is closed.

UNLOCK : Pressing the UNLOCK button once will unlock the driver's door and activate the illuminated entry system and disarm Vehicle Theft Security System, if equipped. Pressing the UNLOCK button twice within five seconds will unlock all doors.

PANIC : If equipped, pressing the PANIC button sounds the horns at half second intervals, flashes the exterior lamps, and turns ON the interior lamps. The panic alarm will remain on for three minutes, or until the PANIC button is actuated again or the ignition switch is turned to the RUN position.

The Remote Keyless Entry Module is capable of retaining the transmitter Vehicle Access Code(s) in its memory even after vehicle power has been interrupted.

DIAGNOSIS AND TESTING

POWER LOCKS

The Totally Integrated Power Module (TIPM) enters a reduced power mode after the key is turned OFF. All diagnosis and testing of the power lock system must be done with the key in the ON position unless otherwise stated.

The most reliable, efficient, and accurate means to diagnose the power lock system requires the use of a scan tool and the proper Electrical Diagnostics article. The scan tool can provide confirmation that the CAN data bus is functional, that all of the electronic modules are sending and receiving the proper messages on the CAN data bus, and that the power lock motors are being sent the proper hard wired outputs by the relays for them to perform their power lock system functions.

Following are tests that will help to diagnose the hard wired components and circuits of the power lock system. However, these tests may not prove conclusive in the diagnosis of this system. In order to obtain conclusive testing of the power lock system, the Controlled Area Network (CAN) and all of the electronic modules that provide inputs to, or receive outputs from the power lock system components must be checked.

The TIPM will set Diagnostic Trouble Codes (DTC) for the power lock system.

Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

PRELIMINARY DIAGNOSIS

As a preliminary diagnosis for the power lock system, note the system operation while you actuate both the Lock and Unlock functions with the power lock switches and with the Remote Keyless Entry (RKE) transmitter. Then, proceed as follows:

If the entire power lock system fails to function with either the power lock switches or the RKE transmitter, check the fused B(+) fuse in the Junction Block (JB).

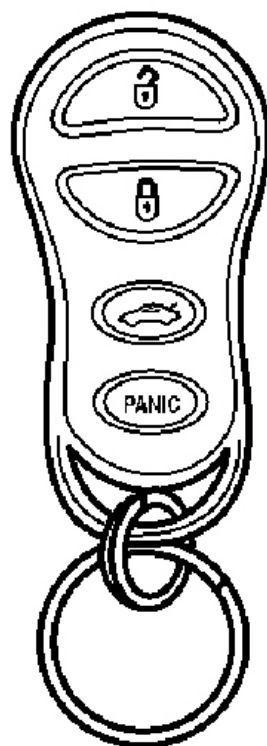
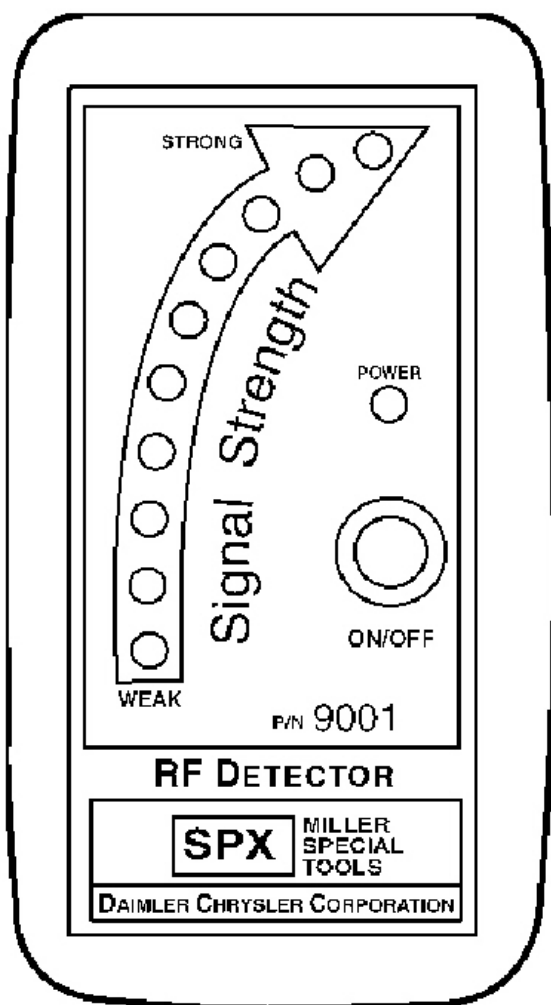
If the power lock system functions with both power lock switches, but not with the RKE transmitter, proceed to diagnosis of the Remote Keyless Entry (RKE) system. See **DIAGNOSIS AND TESTING**.

If the driver side power lock switch operates only the driver side front door power lock motor, but all other power lock motors operate with the passenger side power lock switch or the RKE transmitter, use a scan tool and the appropriate diagnostic information to diagnose the Controlled Area Network (CAN).

If only one power lock motor fails to operate with both power lock switches and the RKE transmitter, proceed to diagnosis of the power lock motor. See **DIAGNOSIS AND TESTING**.

SPECIAL TOOLS

SPECIAL TOOLS



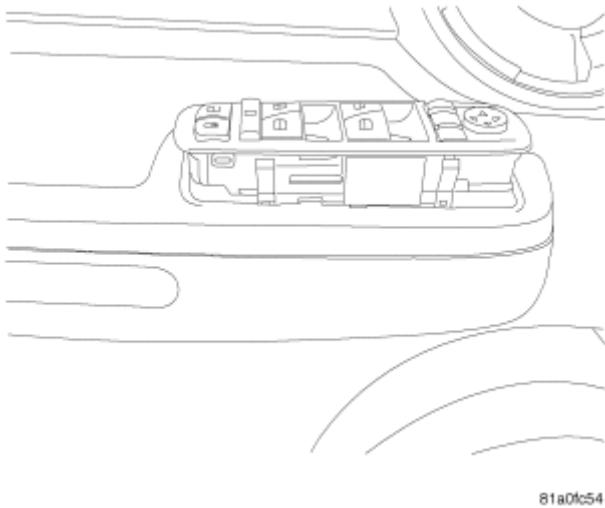
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Fig. 1: Testing Transmitter Using Special Tool
 Courtesy of CHRYSLER LLC

DOOR LOCK/UNLOCK SWITCH

REMOVAL

DOOR LOCK / UNLOCK SWITCH



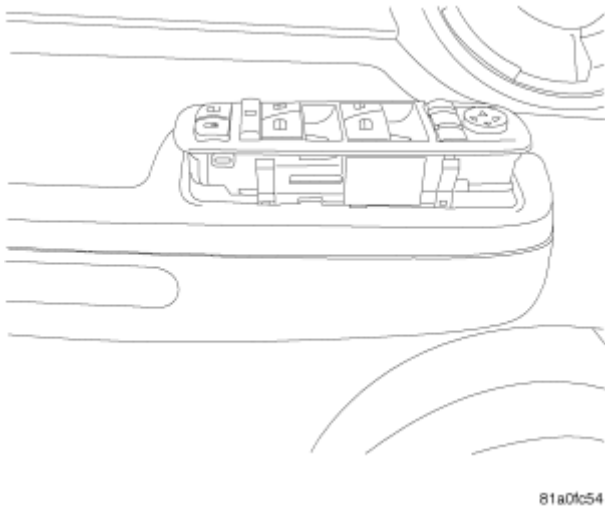
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Fig. 2: Door Lock/Unlock Switch
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Gently pry the switch from the door trim panel.
3. Disconnect electrical harness connector from switch.

INSTALLATION

DOOR LOCK / UNLOCK SWITCH



81a0tc54

Fig. 3: Door Lock/Unlock Switch
Courtesy of CHRYSLER LLC

1. Connect the electrical harness connector to the switch.
2. Press the switch into place.
3. Connect the battery negative cable.

DOOR LOCK MOTOR

DESCRIPTION

DOOR LOCK MOTOR

The lock mechanisms are actuated by a reversible electric motor mounted within each door and tailgate. The power lock motors are integral to the door latch units.

The power lock motors cannot be adjusted or repaired and, if faulty or damaged, the door latch unit must be replaced.

OPERATION

DOOR LOCK MOTOR

The door lock motors are controlled by relays. A positive and negative battery connection to the two motor terminals will cause the motor to move in one direction. Reversing the current will cause the motor to move in the opposite direction.

DIAGNOSIS AND TESTING

DOOR LOCK MOTOR

The most reliable, efficient, and accurate means to diagnose the power lock system requires the use of a scan tool and the proper Electrical Diagnostics article. Refer to the appropriate wiring information.

REMOTE KEYLESS ENTRY MODULE

REMOVAL

REMOTE KEYLESS ENTRY MODULE

. Refer to **REMOVAL** .

INSTALLATION

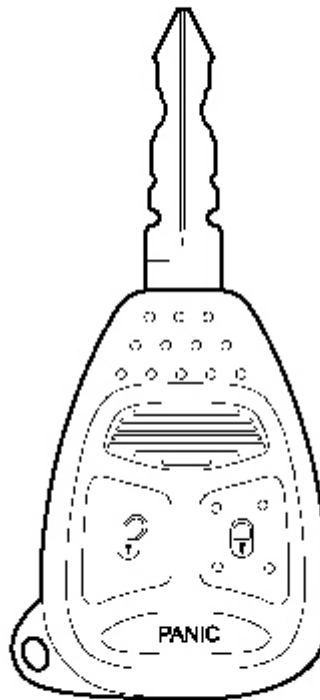
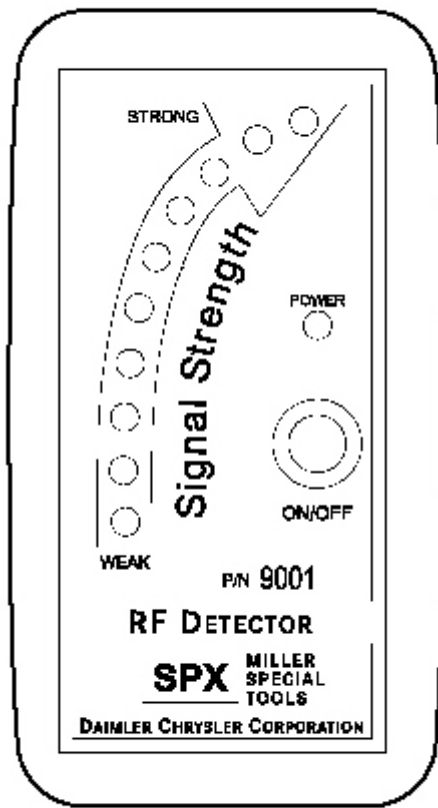
REMOTE KEYLESS ENTRY MODULE

. Refer to **INSTALLATION** .

REMOTE KEYLESS ENTRY TRANSMITTER

DIAGNOSIS AND TESTING

REMOTE KEYLESS ENTRY TRANSMITTER



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Fig. 4: View Of Remote Keyless Entry Transmitter
 Courtesy of CHRYSLER LLC

Using special tool 9001, first test to ensure that the transmitter is functioning. Typical testing distance is 2.5 centimeters (1 inch) for Asian transmitters and 30.5 centimeters (12 inches) for all others. To test, position the transmitter as shown. Press any transmitter button, then test each button individually. The tool will beep if a radio signal strength that lights five or more LED's is detected. Repeat this test three times. If transmitter fails any of the test refer to the Diagnostic article.

STANDARD PROCEDURE

RKE TRANSMITTER BATTERIES

The Remote Keyless Entry (RKE) transmitter case snaps open and shut for battery access. To replace the RKE transmitter batteries:

1. Using a thin coin, gently pry at the notch in the center seam of the RKE transmitter case halves near the

key ring until the two halves unsnap.

2. Lift the back half of the transmitter case off of the RKE transmitter.
3. Remove the two batteries from the RKE transmitter.
4. Replace the two batteries with new Panasonic 2016 (if equipped with one battery, use 2032), or equivalent. Be certain that the batteries are installed with their polarity correctly oriented.
5. Align the two RKE transmitter case halves with each other, and squeeze them firmly and evenly together until they snap back into place.

RKE TRANSMITTER CUSTOMER PREFERENCES

AUTOMATIC (ROLLING) LOCKS

The rolling locks feature can be toggled ON/OFF by using the scan tool only.

HORN CHIRP DISABLING / ENABLING

The horn chirp can be toggled using the scan tool or by using the Remote Keyless Entry (RKE) transmitter.

To DISABLE (cancel) the horn chirp feature, press and hold the transmitter LOCK button for four to ten seconds. While pressing the LOCK button in, press the UNLOCK button. Release both buttons.

To ENABLE the horn chirp feature, repeat the above procedure.

OPTICAL CHIRP (FLASH) DISABLING / ENABLING

The optical chirp can be toggled using the scan tool or by using the Remote Keyless Entry (RKE) transmitter.

To DISABLE (cancel) the optical chirp feature, press and hold the transmitter LOCK button for four to ten seconds. While pressing the LOCK button in, press the TAILGATE RELEASE button. Release both buttons.

To ENABLE the optical chirp feature, repeat the above procedure.

TAIL GATE RELEASE DELAY

Press the UNLOCK button for four to ten seconds. While pressing the UNLOCK button, press the TAIL GATE RELEASE button. Release both buttons.

This will toggle between PRESS AND HOLD and PRESS (no delay).

UNLOCK SEQUENCE

The unlock sequence can be toggled using the scan tool or by using the Remote Keyless Entry (RKE) transmitter.

Press and hold the transmitter UNLOCK button for four to ten seconds. While pressing the UNLOCK button in, press the LOCK button. Release both buttons.

This will toggle between Driver door first and Unlock all doors function.

RKE TRANSMITTER PROGRAMING

New Remote Keyless Entry (RKE) transmitters can be programed using the scan tool and the proper Diagnostic article, if no functioning transmitter is available. The scan tool can provide confirmation that the Controlled Area Network (CAN) is functional, and that all of the electronic modules are sending and receiving the proper messages on the CAN data bus.

The following procedure can be used as long as one functioning transmitter is available:

1. Turn ignition to the RUN position (allow ignition chimes to stop).
2. Using any original (working) transmitter, press the UNLOCK button for 4 to 10 seconds.
3. Within the specified 4 to 10 seconds, continue pressing the UNLOCK button and press the PANIC button for 1 second, and release both buttons (a chime will sound to indicate that the transmitter programming mode has been entered - allow 3 seconds for chime to sound).
4. Press LOCK and UNLOCK buttons simultaneously for 1 second and release.
5. Press and release any button on the same transmitter and a chime will sound after successfully programming the transmitter.
6. Repeat steps 4 to 6 to program additional transmitters.
7. Turn ignition to the OFF position. Transmitter programming mode will discontinue after 60 seconds. All transmitter programming must be completed within time specified.

SPECIFICATIONS

REMOTE KEYLESS ENTRY TRANSMITTER

RANGE

Normal operation range is up to a distance of 3 to 7 meters (10 to 23 ft.) of the vehicle. Range may be better or worse depending on the environment around the vehicle.

TAILGATE CYLINDER LOCK SWITCH

DESCRIPTION

TAILGATE CYLINDER LOCK SWITCH

The tailgate cylinder lock switch is integral to the key lock cylinder inside the tailgate. The tailgate cylinder lock switch is a normally-open momentary switch that is hard wired directly to the Totally Integrated Power Module (TIPM), and closes a path to ground through an internal resistor when the lock cylinder is rotated to the unlock or lock position.

The tailgate cylinder lock switch cannot be adjusted or repaired.

OPERATION

TAILGATE CYLINDER LOCK SWITCH

The tailgate cylinder lock switch is actuated when the key is inserted in the lock cylinder and turned to the unlock or lock position. The tailgate cylinder lock switch closes a path to ground through an internal resistor for the Totally Integrated Power Module (TIPM) when the tailgate key lock cylinder is in the lock or unlock position, and opens the ground path when the lock cylinder is in the neutral position. The TIPM reads the switch status, then sends the proper switch status messages to other electronic modules over the Controlled Area Network (CAN). The tailgate cylinder lock switch unlock status message is used by the TIPM as an input for Vehicle Theft Security System (VTSS) operation and to tell the TIPM to lock or unlock the tailgate. There is no mechanical linkage between the tailgate key cylinder and the latches.

DIAGNOSIS AND TESTING

TAILGATE CYLINDER LOCK SWITCH

- 1. Disconnect and isolate the battery negative cable.
- 2. Remove tailgate trim panel. Refer to **REMOVAL** .
- 3. Disconnect tailgate cylinder lock switch harness connector.
- 4. Using a ohmmeter, test for resistances as shown in the TAILGATE CYLINDER LOCK SWITCH TABLE.

TAILGATE CYLINDER LOCK SWITCH TABLE

SWITCH POSITION	RESISTANCE
NEUTRAL	0 OHMS
LOCK (CLOCKWISE)	2 K OHMS ± 10 %
UNLOCK (COUNTERCLOCKWISE)	470 OHMS ± 10 %

- 5. If switch resistance is not correct, replace switch.

REMOVAL

TAILGATE CYLINDER LOCK SWITCH

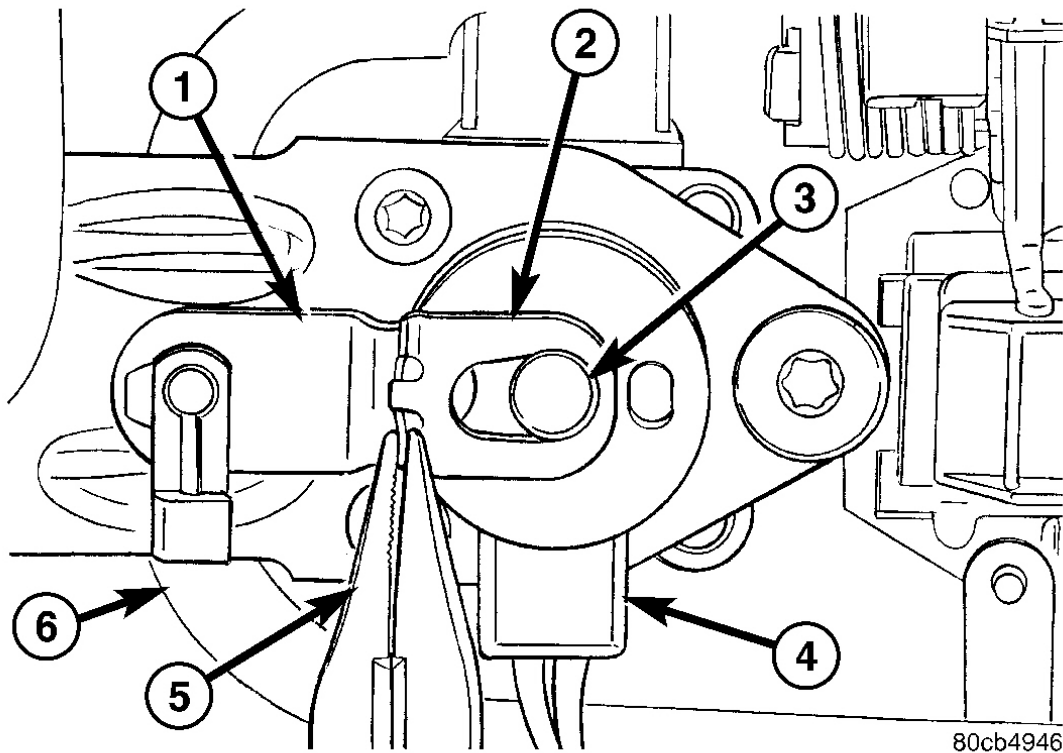


Fig. 5: Removing/Installing Lock Cylinder Switch - Typical
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the tailgate trim panel. Refer to **REMOVAL** .
3. Remove the retainer clip from the pin on the back of the door lock cylinder (3).
4. Remove the washer from the pin on the back of the door lock cylinder.
5. Remove the door cylinder lock switch (4) from the back of the lock cylinder.

INSTALLATION

TAILGATE CYLINDER LOCK SWITCH

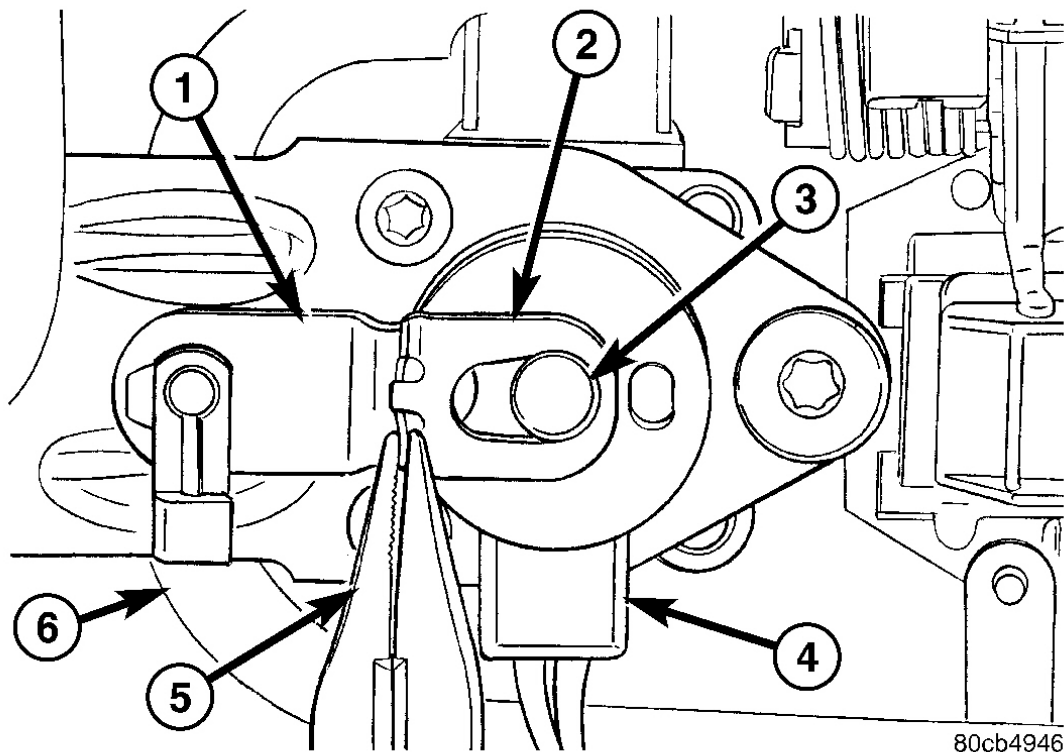


Fig. 6: Removing/Installing Lock Cylinder Switch - Typical
Courtesy of CHRYSLER LLC

1. Position the tailgate cylinder lock switch (4) onto the back of the lock cylinder (3) with the wire harness oriented toward the bottom.
2. Position the washer over the switch.
3. Install the retainer (2) clip onto the pin on the back of the tailgate lock cylinder. Be certain that the center tab of the retainer is engaged in the retention hole on the lock lever.
4. Install the trim panel. Refer to **INSTALLATION** .
5. Connect the battery negative cable.

2008 ACCESSORIES AND EQUIPMENT

Power Seats - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1D62</u>	POWER SEAT SWITCH STUCK
<u>B1D63</u>	POWER SEAT SWITCH OPEN
<u>B1D6D</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT LOW
<u>B1D6E</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT HIGH
<u>B1D71</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D72</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D75</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D76</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D7B</u>	SEAT HORIZONTAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D7F</u>	SEAT FRONT VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D83</u>	SEAT REAR VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D9B</u>	SEAT HORIZONTAL FRONT STOP NOT LEARNED
<u>B210D</u>	BATTERY VOLTAGE LOW - MSM
<u>B210E</u>	BATTERY VOLTAGE HIGH - MSM
<u>B221C</u>	MEMORY SEAT MODULE INTERNAL
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE LEFT FRONT
<u>U0204</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

POWER SEATS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1D62-POWER SEAT SWITCH STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Memory Seat Module detects the Driver Seat Switch engaged in an active position for over 50 seconds, this code will set.

Possible Causes

Possible Causes
DRIVER SEAT SWITCH

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Press the Driver Seat Switch in all directions several times.

Wait one minute.

With the scan tool, read DTC's.

Does the scan tool display active: B1D62-POWER SEAT SWITCH STUCK?

Yes

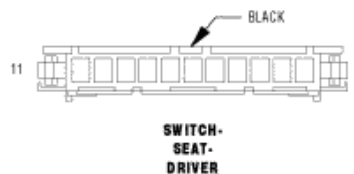
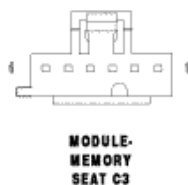
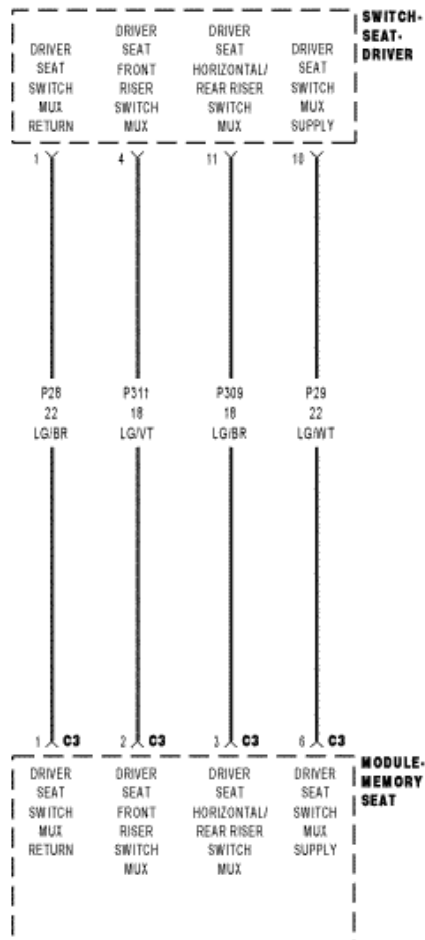
Replace the Driver Seat Switch in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D63-POWER SEAT SWITCH OPEN

Circuit Schematic



0107ea02

Fig. 1: Power Seat Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Memory Seat Module detects an open Driver Seat Switch MUX circuit this code will set.

Possible Causes

Possible Causes
(P309) DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX CIRCUIT OPEN OR SHORT TO GROUND
(P311) DRIVER SEAT FRONT RISER SWITCH MUX CIRCUIT OPEN OR SHORT TO GROUND
(P28) DRIVER SEAT SWITCH MUX RETURN CIRCUIT OPEN OR SHORT TO GROUND
(P29) DRIVER SEAT SWITCH MUX SUPPLY CIRCUIT OPEN OR SHORT TO GROUND
DRIVER SEAT SWITCH
MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Press the Driver Seat Switch in all directions several times.

Wait one minute.

With the scan tool, read DTC's.

Does the scan tool display active: B1D63-POWER SEAT SWITCH OPEN?

Yes

Go To 2.

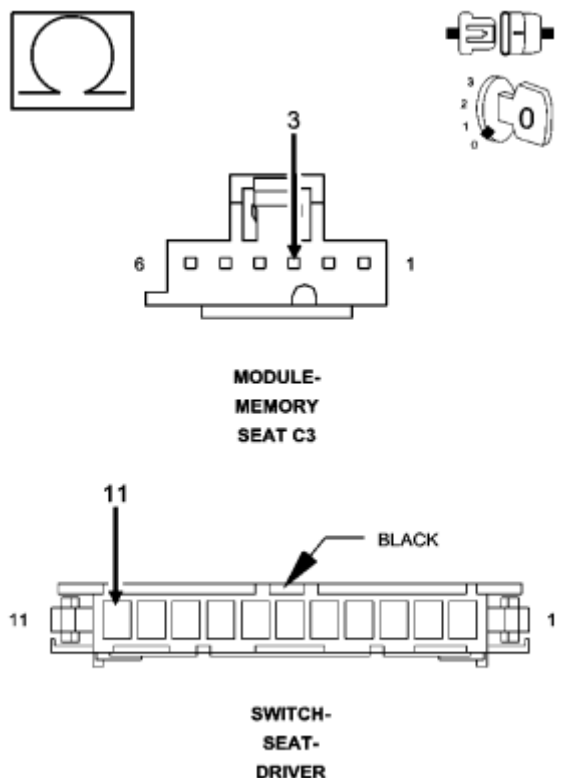
No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **(P309) DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX CIRCUIT OPEN**



81d6a122

Fig. 2: Measuring The Resistance Of The (P309) Driver Seat Horizontal/Rear Riser Switch Mux Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Seat Switch.

Disconnect the Memory Seat Module C3 harness connector.

Measure the resistance of the (P309) Driver Seat Horizontal/Rear Riser Switch MUX between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

Go To 3.

No

Repair the (P309) Driver Seat Horizontal/Rear Riser Switch MUX for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **(P311) DRIVER SEAT FRONT RISER SWITCH MUX CIRCUIT OPEN**

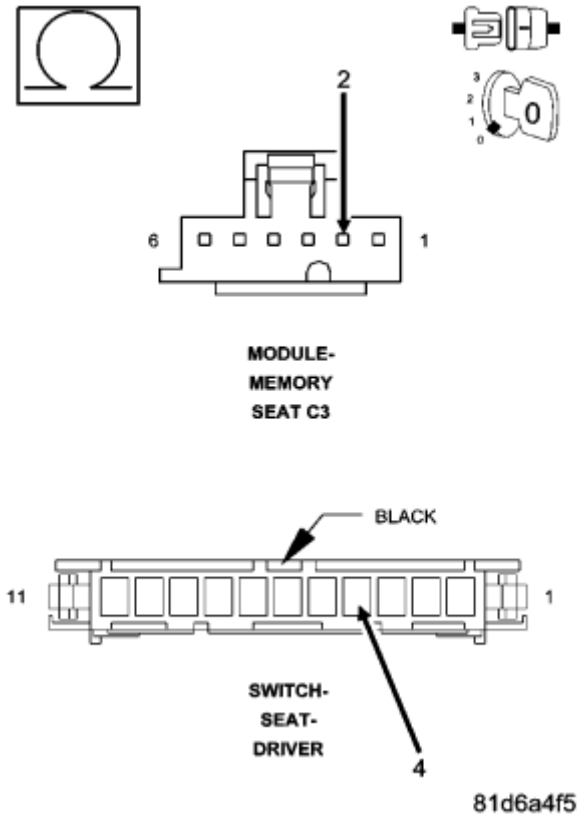


Fig. 3: Measuring The Resistance Of The (P311) Driver Seat Front Riser Switch Mux Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P311) Driver Seat Front Riser Switch MUX between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

Go To 4.

No

Repair the (P311) Driver Seat Front Riser Switch MUX for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

4. **(P28) DRIVER SEAT SWITCH MUX RETURN CIRCUIT OPEN**

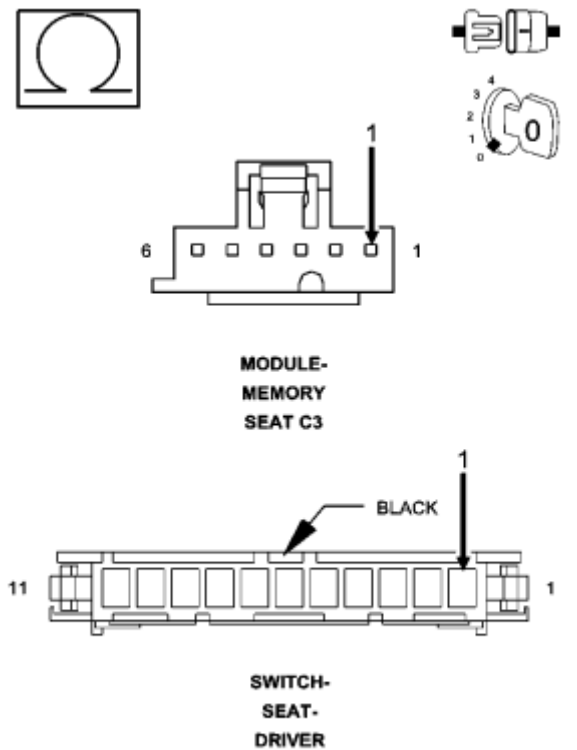


Fig. 4: Measuring The Resistance Of The (P28) Driver Seat Switch Mux Return Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P28) Driver Seat Switch MUX Return between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

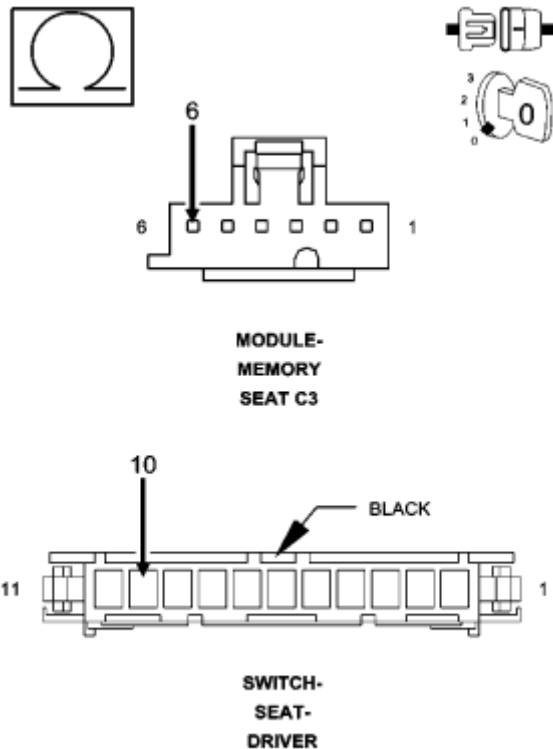
Go To 5.

No

Repair the (P28) Driver Seat Switch MUX Return circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

5. **(P29) DRIVER SEAT SWITCH MUX SUPPLY CIRCUIT OPEN**



81d6a533

Fig. 5: Measuring The Resistance Of The (P29) Driver Seat Switch Mux Supply Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P29) Driver Seat Switch MUX Supply between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

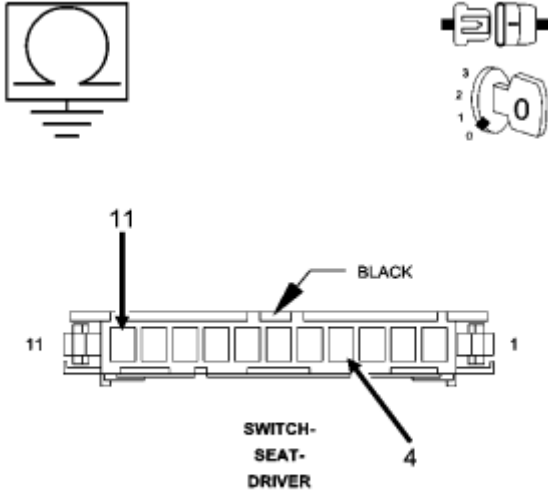
Go To 6.

No

Repair the (P29) Driver Seat Switch MUX Supply for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. CHECK THE DRIVER SEAT SWITCH CIRCUIT RESISTANCES TO GROUND



81d6ae2b

Fig. 6: Measuring The Resistance Between Ground And Each Of The Driver Seat Switch Circuits At The Driver Seat Switch Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and each of the Driver Seat Switch circuits at the Driver Seat Switch harness connector.

Is the resistance above 10k ohms for each circuit?

Yes

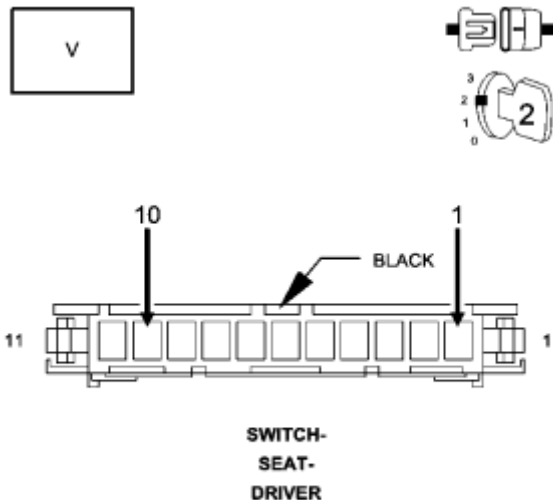
Go To 7.

No

Repair the circuit(s) that measured below 10k ohms for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK THE MSM SENSOR SUPPLY AND SENSOR RETURN



81d6ae3c

Fig. 7: Measuring The Voltage Between The (P29) Driver Seat Switch Mux Supply Circuit And The (P28) Driver Seat Switch Mux Return Circuit At The Driver Seat Switch Harness Connector
 Courtesy of CHRYSLER LLC

Reconnect the Memory Seat Module C3 harness connector.

Turn the ignition on.

Measure the voltage between the (P29) Driver Seat Switch MUX Supply circuit and the (P28) Driver Seat Switch MUX Return circuit at the Driver Seat Switch harness connector.

Is the voltage above 11.0 volts?

Yes

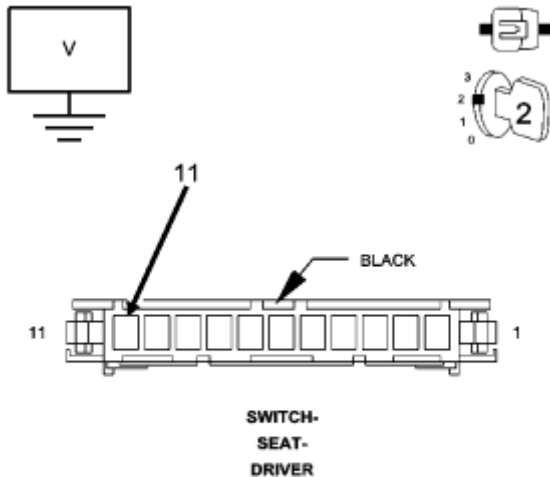
Go To. 8.

No

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. DRIVER SEAT HORIZONTAL SWITCH



81d6ae64

Fig. 8: Checking Driver Seat Horizontal Switch
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect the Driver Seat Switch harness connector.

Turn the ignition on.

Backprobe and measure the voltage of the (P309) Driver Seat Horizontal Rear Riser Switch MUX circuit while moving the Driver Seat Switch horizontally and the rear riser up, down.

NOTE: The Voltage readings for all positions should be between 1.0 volt and 5.0 volts.

Is the voltage between 1.0 and 5.0 volts when the Driver Seat Switch is moved to each position?

Yes

Go To 9.

No

Replace the Driver Seat Switch.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

9. DRIVER SEAT FRONT RISER SWITCH

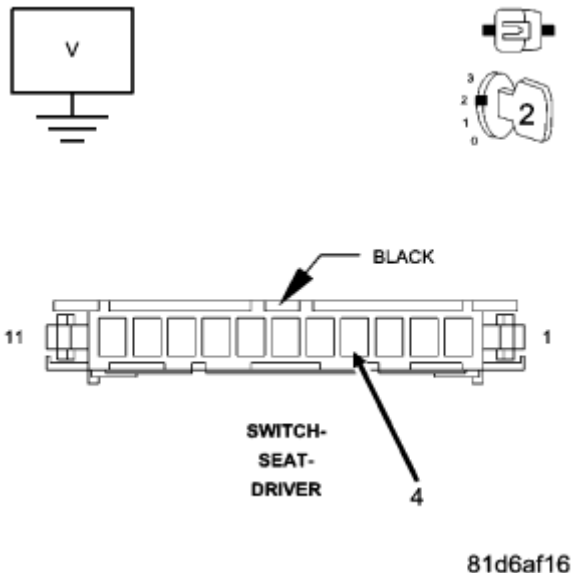


Fig. 9: Checking Driver Seat Front Riser Switch
 Courtesy of CHRYSLER LLC

Backprobe and measure the voltage of the (P311) Driver Seat Front Riser MUX circuit while moving the Driver Seat Front Riser Switch forward and rearward.

NOTE: The Voltage readings for all positions should be between 1.0 volt and 5.0 volts.

Is the voltage between 1.0 and 5.0 volts when the Driver Seat Switch is moved to each position?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

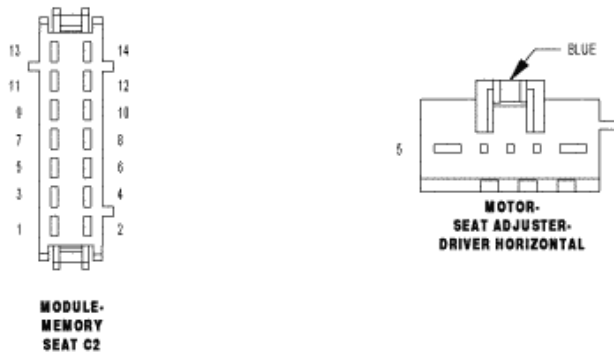
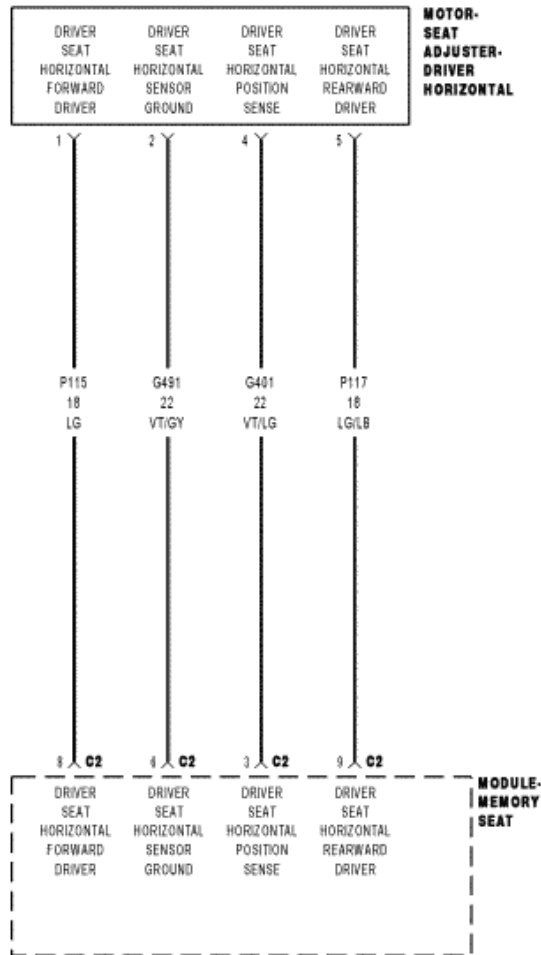
No

Replace the Driver Seat Switch.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D6D-SEAT HORIZONTAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic



01430000

Fig. 10: Seat Horizontal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO GROUND DRIVER HORIZONTAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Horizontal position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

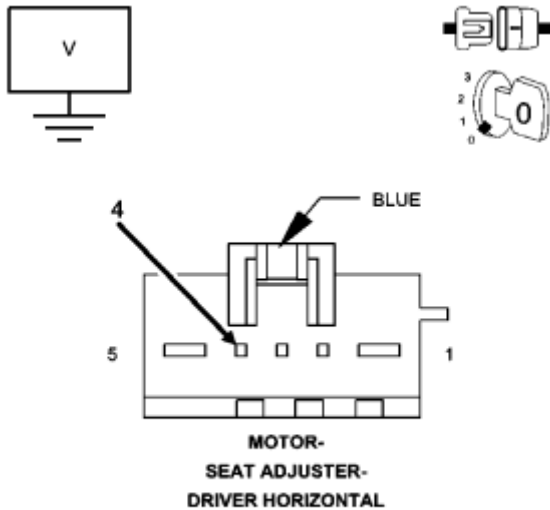
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT VOLTAGE**



81d6e55b

Fig. 11: Measuring The Voltage Of The (G401) Driver Seat Horizontal Position Sense Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Actuate the seat switch in the affected position for the next step.

Measure the voltage of the (G401) Driver Seat Horizontal Position Sense circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

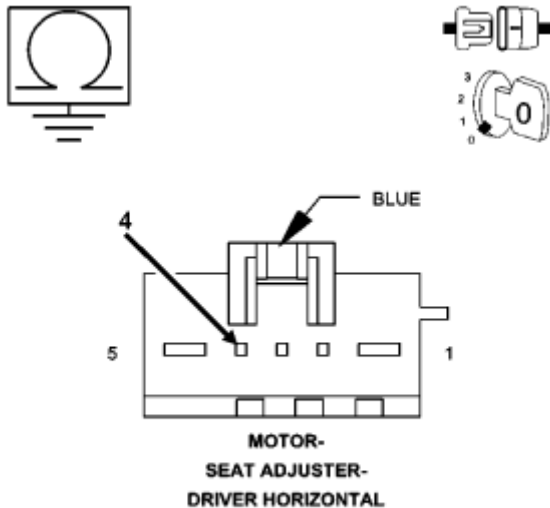
Yes

Replace the Seat Track Horizontal Motor assembly in accordance with the Service Information.
 Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND**



81d6e593

Fig. 12: Measuring The Resistance Between Ground And The (G401) Driver Seat Horizontal Position Sense Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G401) Driver Seat Horizontal Position Sense circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

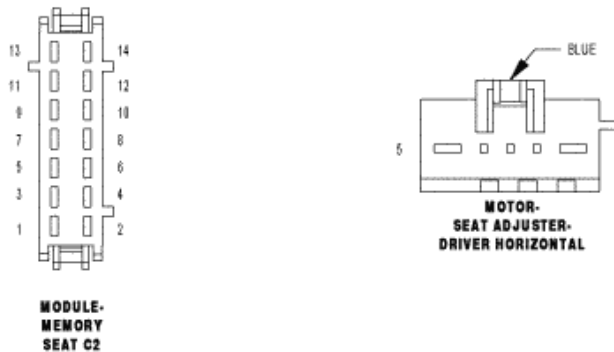
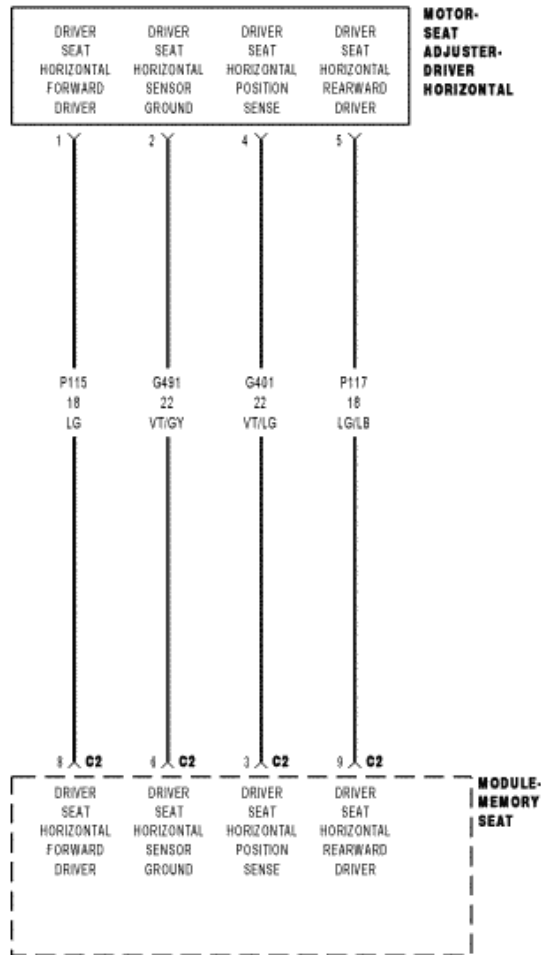
No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D6E-SEAT HORIZONTAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic



01430000

Fig. 13: Seat Horizontal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN
DRIVER HORIZONTAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the horizontal position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **DRIVER HORIZONTAL SEAT ADJUSTER MOTOR**

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the horizontal positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go to 3.

No

Replace the Driver Horizontal Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE**

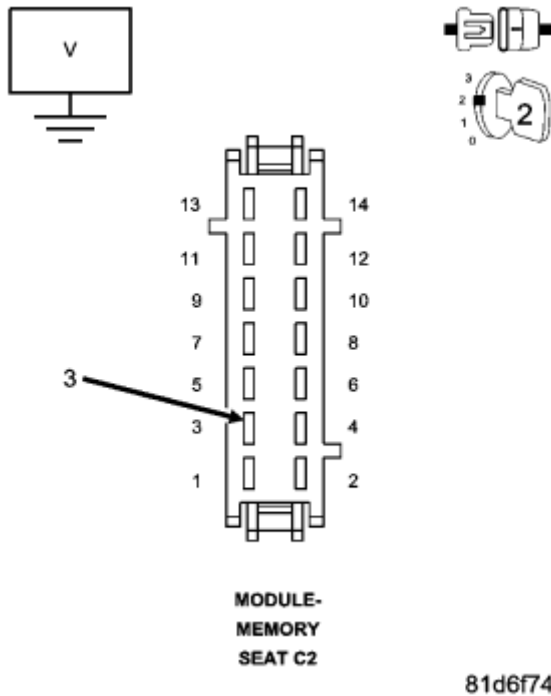


Fig. 14: Measuring The Voltage Of The (G401) Driver Seat Horizontal Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G401) Driver Seat Horizontal Position Sense circuit.

Is there any voltage present?

Yes

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. **(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT**

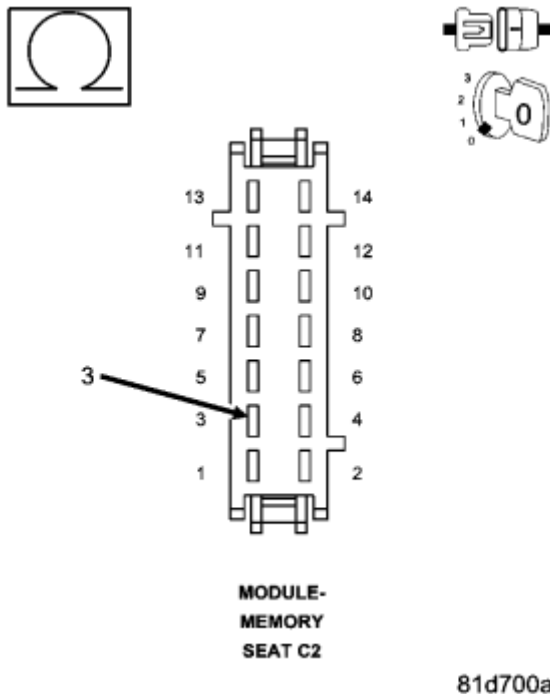


Fig. 15: Measuring The (G401) Driver Seat Horizontal Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the (G401) Driver Seat Horizontal Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present?

Yes

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to another circuit.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN

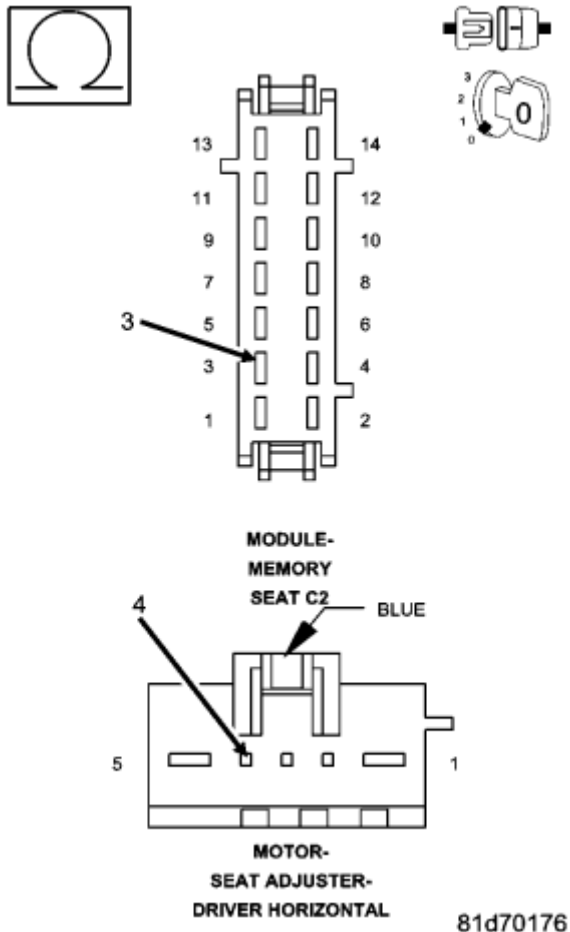


Fig. 16: Measuring The Resistance Of The (G401) Driver Seat Horizontal Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Horizontal Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G401) Driver Seat Horizontal Position Sense circuit between the Memory Seat Module C2 harness connector and the Driver Horizontal Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D71-SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic

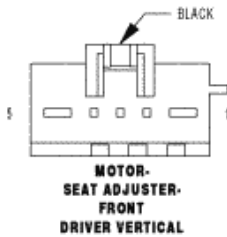
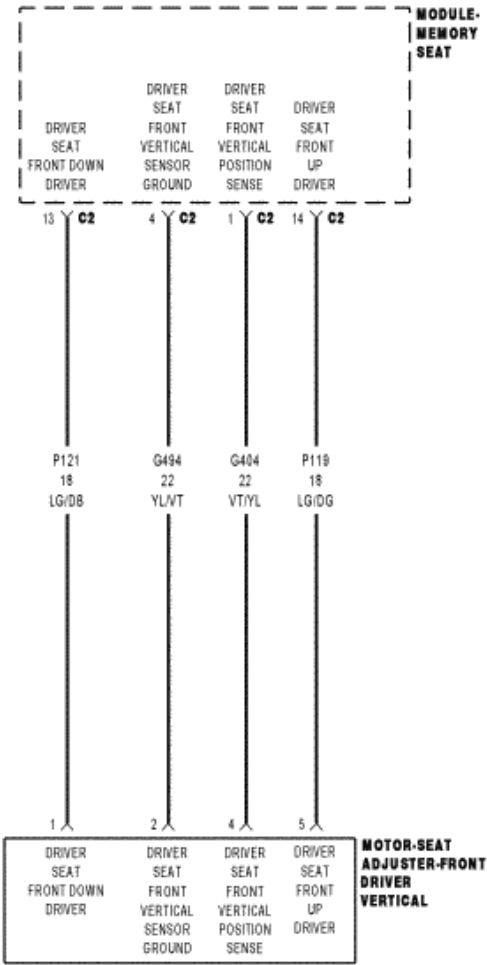


Fig. 17: Seat Front Vertical Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT SHORTED TO GROUND FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent

condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. CHECK THE (G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT VOLTAGE

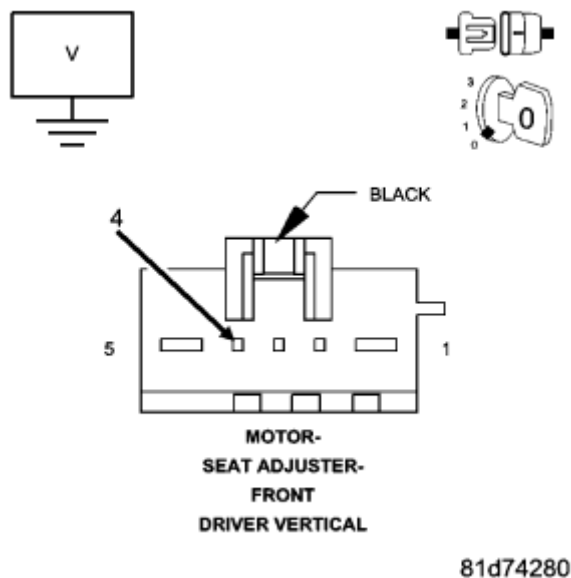


Fig. 18: Measuring The Voltage Of The (G404) Driver Seat Vertical Position Sense Circuit At The Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Vertical Seat Adjuster Motor harness connector.

Measure the voltage of the (G404) Driver Seat Vertical Position Sense circuit at the Driver Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

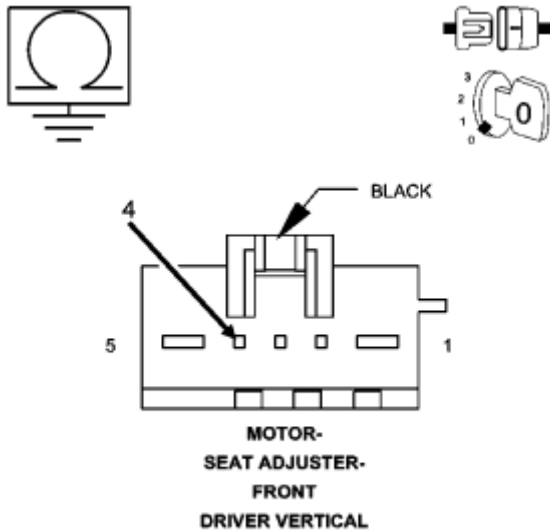
Yes

Replace the Seat Track Vertical Motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. CHECK THE (G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND



81d7430f

Fig. 19: Measuring The Resistance Between Ground And The (G404) Driver Seat Vertical Position Sense Circuit At The Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G404) Driver Seat Vertical Position Sense circuit at the Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

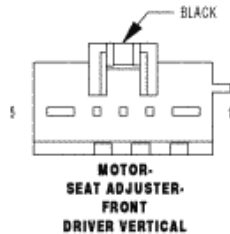
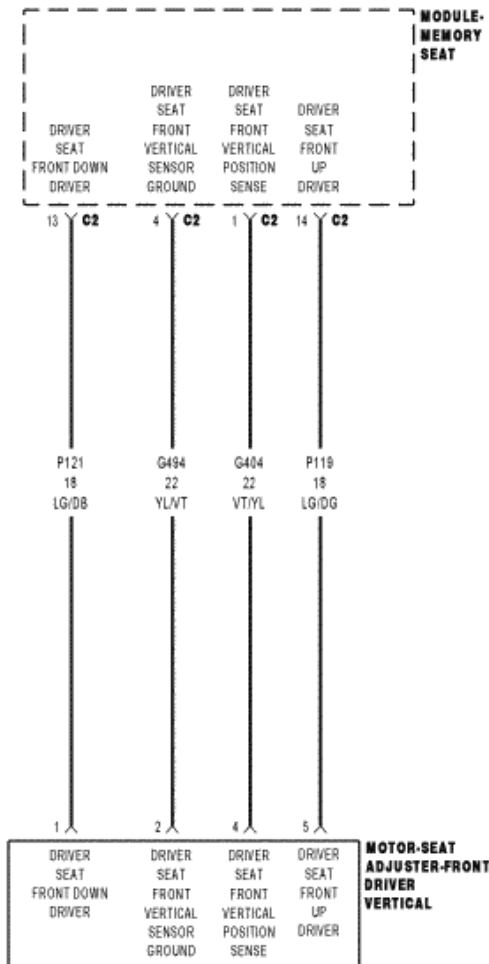
No

Repair the (G404) Driver Seat Vertical Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D72-SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic



01431900

Fig. 20: Seat Front Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN
FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. DRIVER VERTICAL SEAT ADJUSTER MOTOR

Turn the ignition off.

Disconnect the Front Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the Front Vertical positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

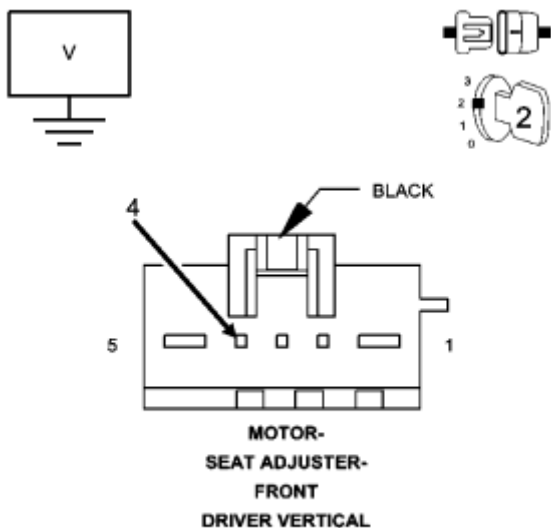
Go to 3.

No

Replace the Driver Front Vertical Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE



81d74fdd

Fig. 21: Measuring The Voltage Of The (G404) Driver Seat Front Vertical Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G404) Driver Seat Front Vertical Position Sense circuit.

Is there any voltage present?

Yes

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT

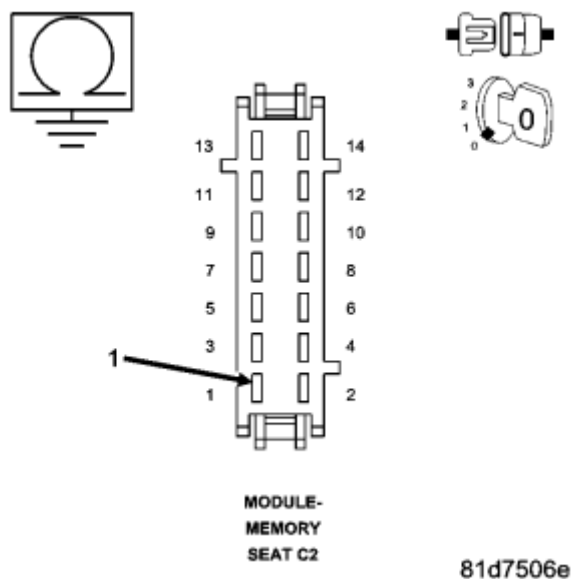


Fig. 22: Measuring The (G404) Driver Seat Front Vertical Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the (G404) Driver Seat Front Vertical Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present?

Yes

Repair the (G404) Driver Seat Vertical Position Sense circuit for a short to another circuit.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. **(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN**

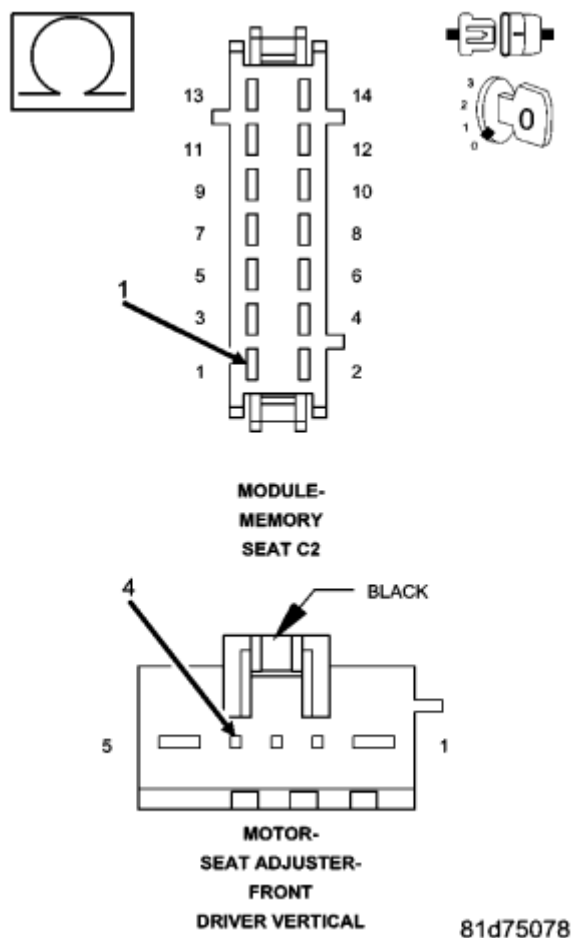


Fig. 23: Measuring The Resistance Of The (G404) Driver Seat Front Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Vertical Seat Adjuster Motor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G404) Driver Seat Front Vertical Position Sense circuit between the

Memory Seat Module C2 harness connector and the Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

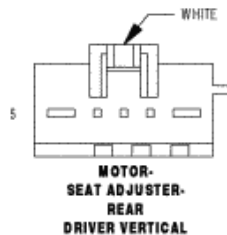
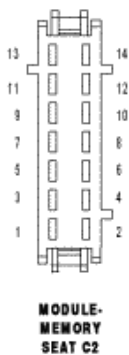
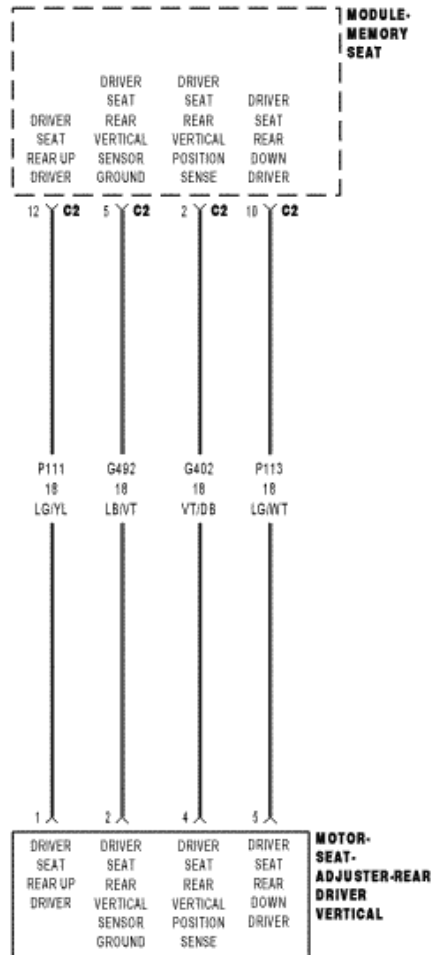
No

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D75-SEAT REAR VERTICAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic



01421000

Fig. 24: Seat Rear Vertical Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO GROUND REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

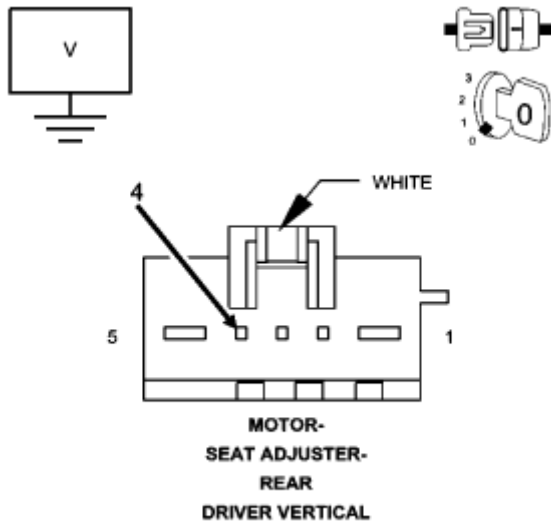
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT VOLTAGE**



81d76392

Fig. 25: Measuring The Voltage Of The (G402) Driver Seat Rear Vertical Position Sense Circuit At The Rear Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Rear Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage of the (G402) Driver Seat Rear Vertical Position Sense circuit at the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

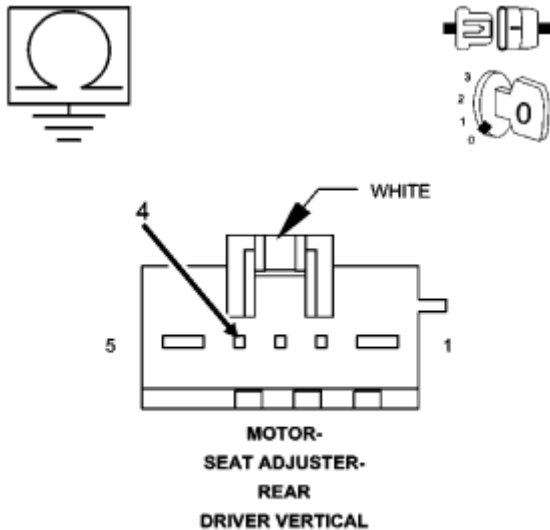
Yes

Replace the Seat Track Vertical Motor assembly in accordance with the Service Information.
 Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND**



81d76405

Fig. 26: Measuring The Resistance Between Ground And The (G402) Driver Seat Rear Vertical Position Sense Circuit At The Rear Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G402) Driver Seat Rear Vertical Position Sense circuit at the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D76-SEAT REAR VERTICAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic

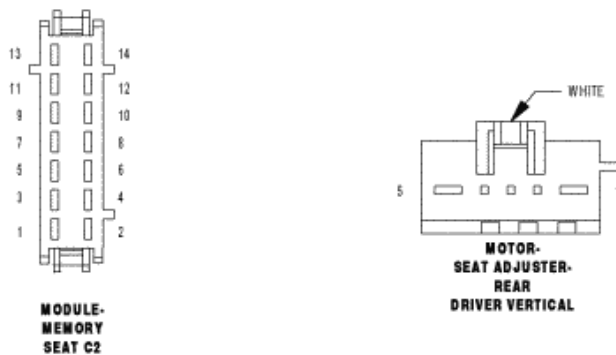
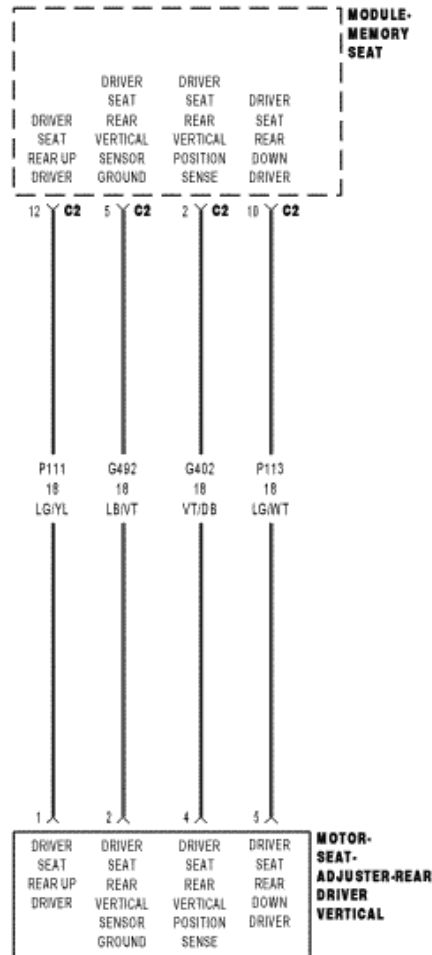


Fig. 27: Seat Rear Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN
REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR

Turn the ignition off.

Disconnect the Rear Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the Vertical positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

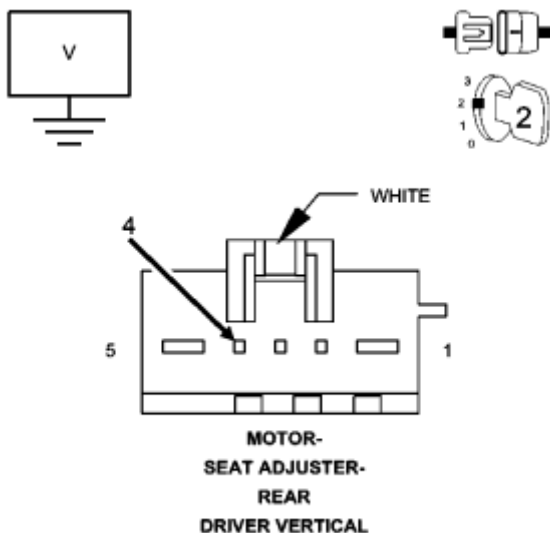
Go to 3.

No

Replace the Rear Driver Vertical Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE



81d773f4

Fig. 28: Measuring The Voltage Of The (G402) Driver Seat Rear Vertical Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G402) Driver Seat Rear Vertical Position Sense circuit.

Is there any voltage present?

Yes

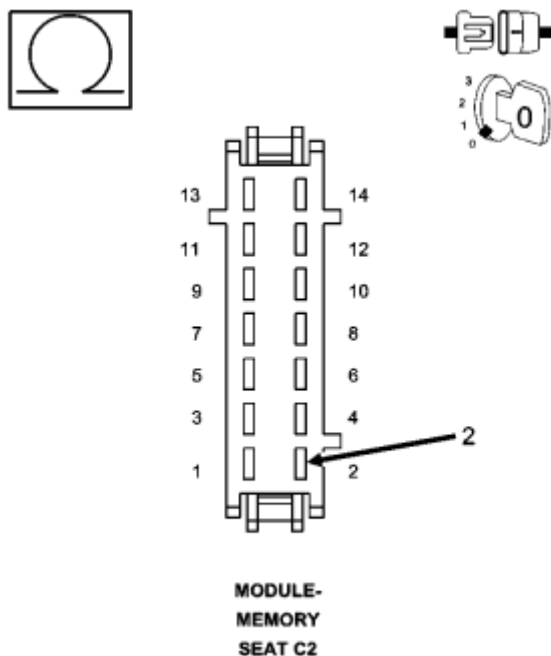
Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT



81d77971

Fig. 29: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present to other circuits?

Yes

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to another circuit.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN

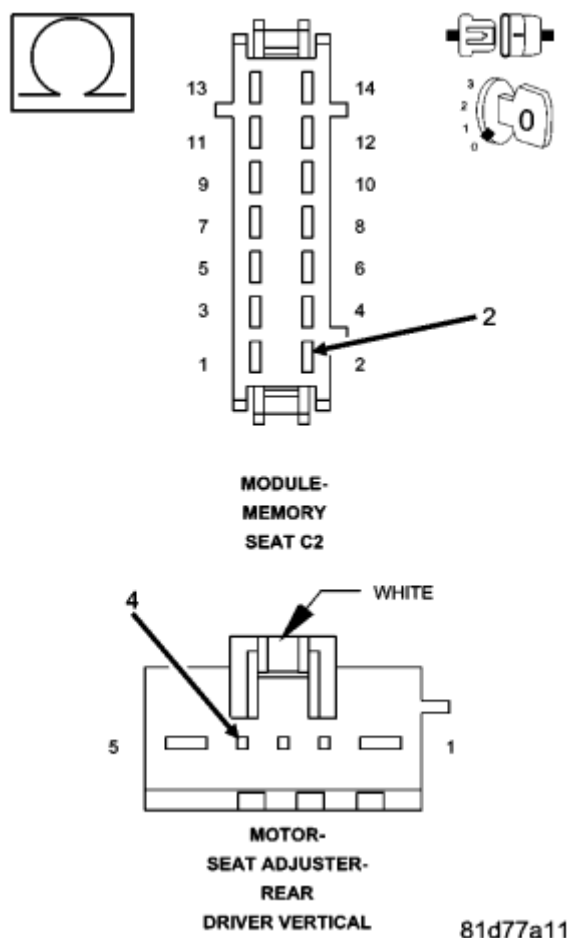


Fig. 30: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Rear Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit between the Memory Seat Module C2 harness connector and the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

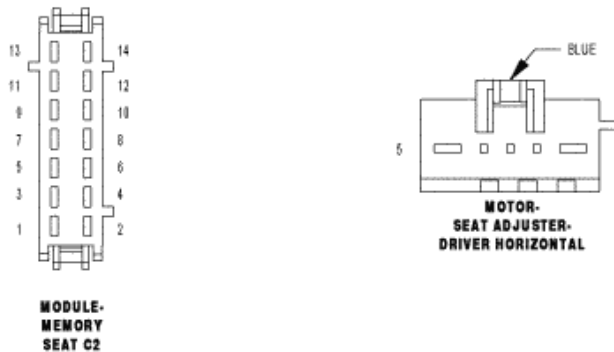
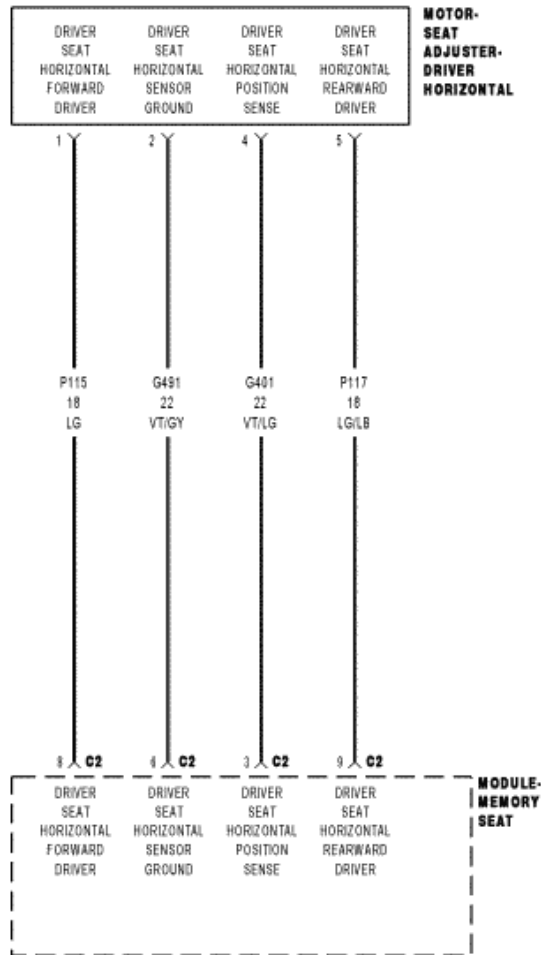
No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D7B-SEAT HORIZONTAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01430600

Fig. 31: Seat Horizontal Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the seat motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN (G491) DRIVER SEAT HORIZONTAL SENSOR GROUND CIRCUIT OPEN (P115) DRIVER SEAT HORIZONTAL FORWARD DRIVER (P117) DRIVER SEAT HORIZONTAL REARWARD DRIVER DRIVER HORIZONTAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the horizontal forward and rearward position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

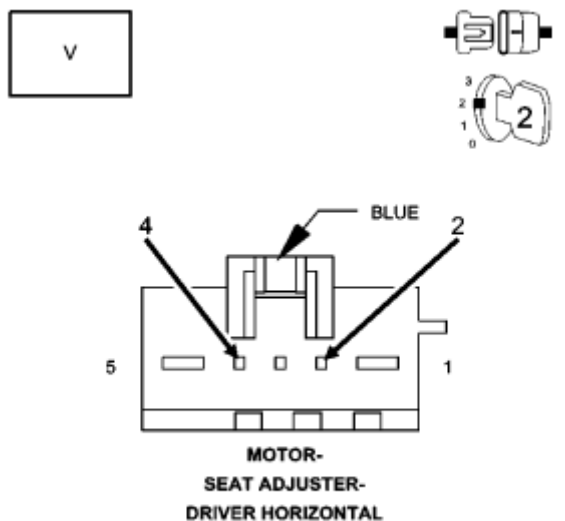
Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT VOLTAGE



81d7efe3

Fig. 32: Measuring The Voltage Between The (G401) Driver Seat Horizontal Position Sense Circuit And The (G491) Driver Seat Horizontal Sensor Ground Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G401) Driver Seat Horizontal Position Sense circuit and the (G491) Driver Seat Horizontal Sensor Ground circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT HORIZONTAL FORWARD/REARWARD DRIVER CIRCUIT VOLTAGE

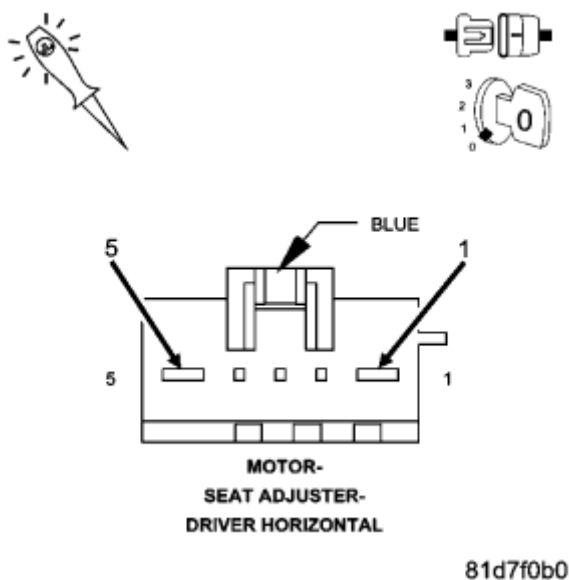


Fig. 33: Checking The Driver Seat Horizontal Forward/Rearward Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P115) Driver Seat Horizontal Forward Driver circuit and the other lead to (P117) Driver Seat Horizontal Rearward Driver circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Horizontal forward and rearward position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/horizontal motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR AN OPEN**

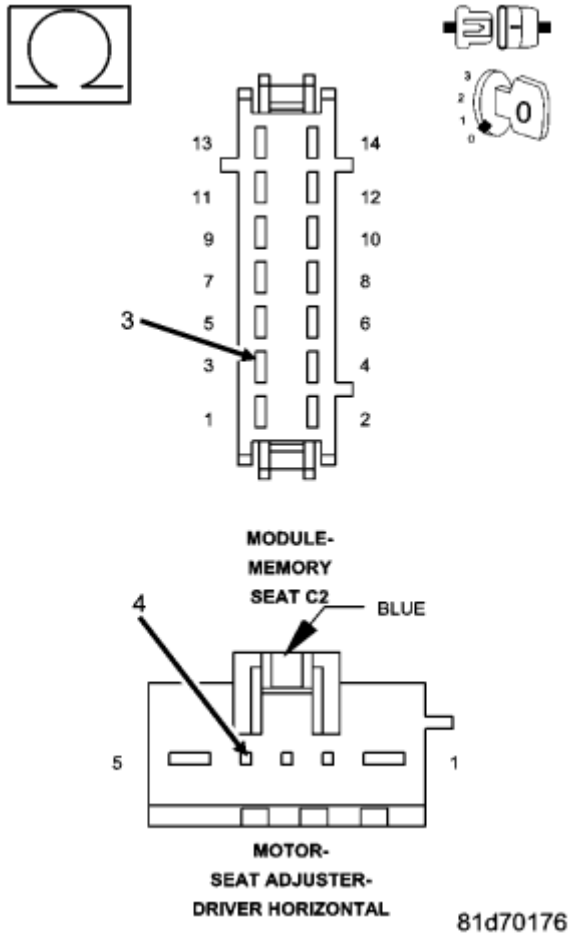


Fig. 34: Measuring The Resistance Of The (G401) Driver Seat Horizontal Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Horizontal Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G401) Driver Seat Horizontal Position Sense circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G491) DRIVER SEAT HORIZONTAL SENSOR GROUND CIRCUIT FOR AN OPEN**

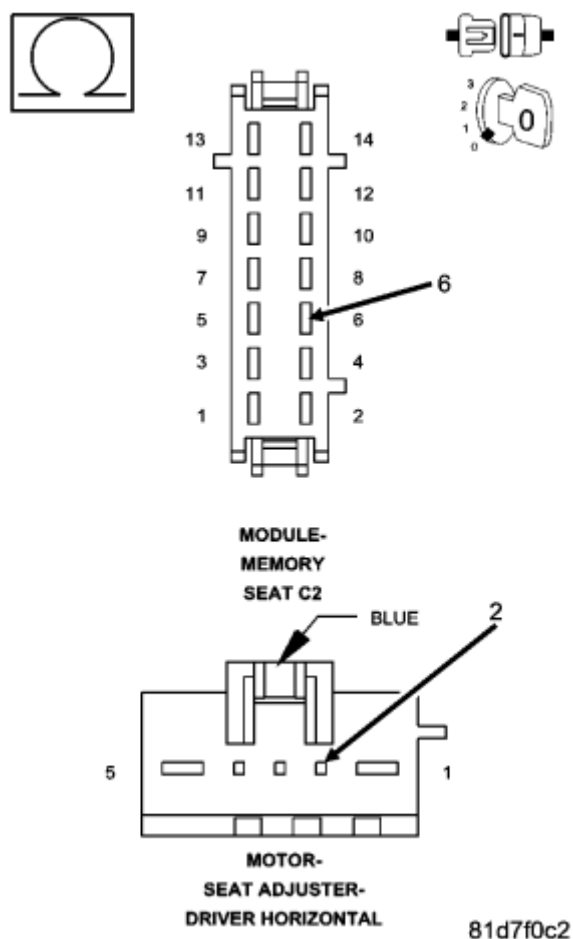


Fig. 35: Measuring The Resistance Of The (G491) Driver Seat Horizontal Sensor Ground Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G491) Driver Seat Horizontal Sensor Ground circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G491) Driver Seat Horizontal Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P115) DRIVER SEAT HORIZONTAL FORWARD DRIVER CIRCUIT FOR AN OPEN**

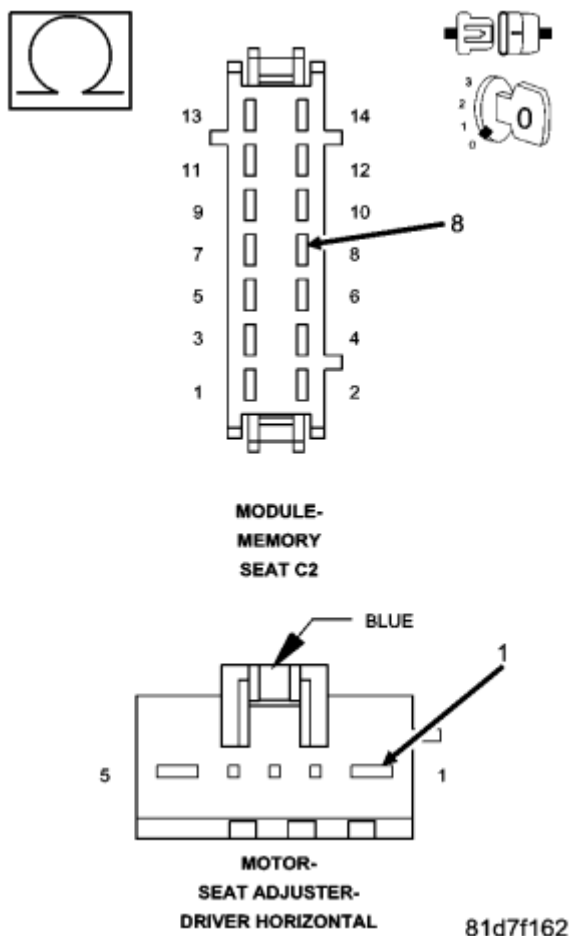


Fig. 36: Measuring The Resistance Of The (P115) Driver Seat Horizontal Forward Driver Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P115) Driver Seat Horizontal Forward Driver circuit between the Driver Horizontal Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P115) Driver Seat Horizontal Forward Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. CHECK THE (P117) DRIVER SEAT HORIZONTAL REARWARD DRIVER CIRCUIT FOR AN OPEN

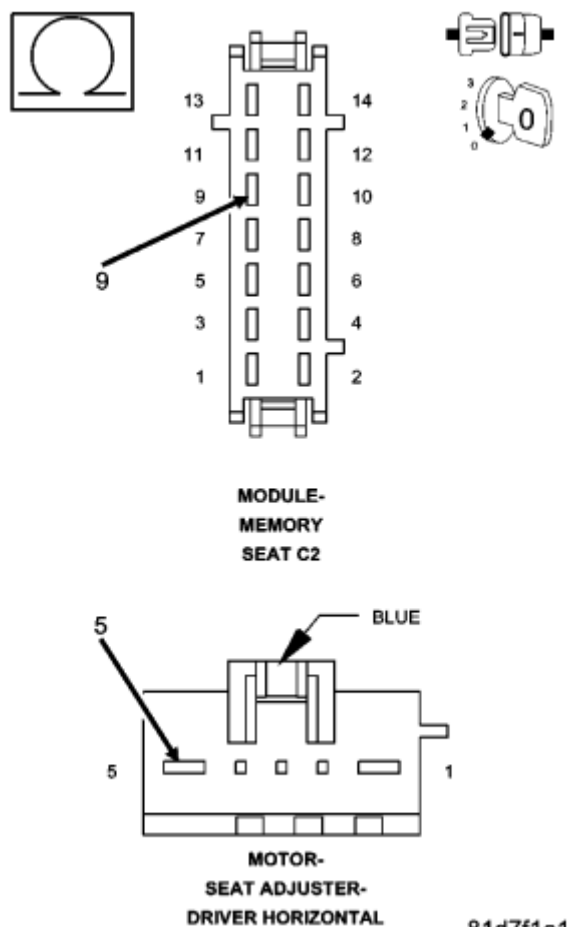


Fig. 37: Measuring The Resistance Of The (P117) Driver Seat Horizontal Rearward Driver Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P117) Driver Seat Horizontal Rearward Driver circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

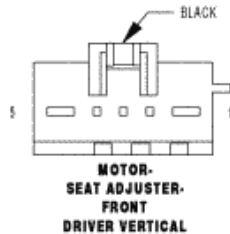
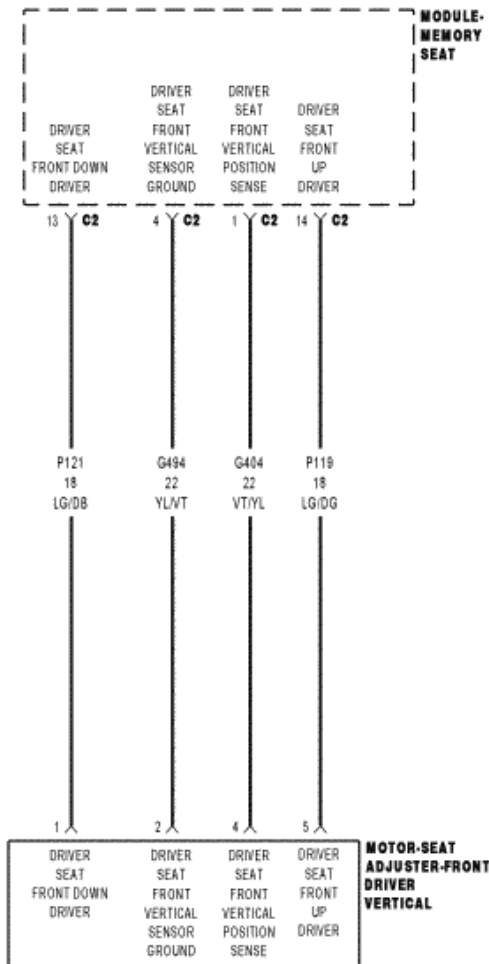
No

Repair the (P117) Driver Seat Horizontal Rearward Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D7F-SEAT FRONT VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01431900

Fig. 38: Seat Front Vertical Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the Seat Motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN (G494) DRIVER SEAT FRONT VERTICAL SENSOR GROUND CIRCUIT OPEN (P119) DRIVER SEAT FRONT VERTICAL UP DRIVER (P121) DRIVER SEAT FRONT VERTICAL DOWN DRIVER FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Front Vertical up and down position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **CHECK THE (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT VOLTAGE**

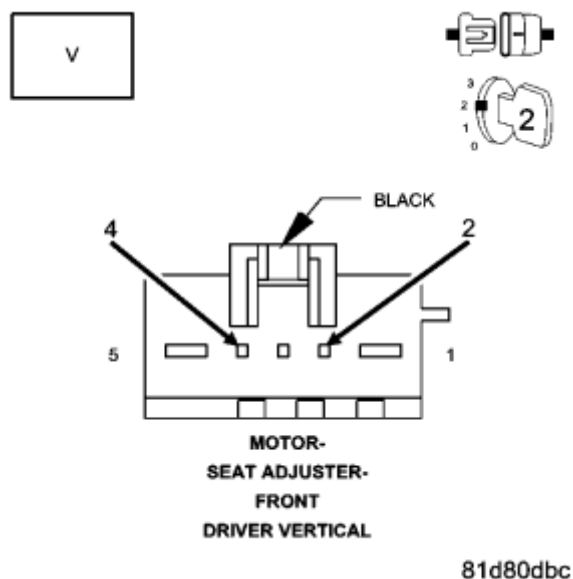


Fig. 39: Measuring The Voltage Between The (G404) Driver Seat Front Vertical Position Sense Circuit And The (G494) Driver Seat Front Vertical Sensor Ground Circuit At The Driver Front Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Front Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G404) Driver Seat Front Vertical Position Sense circuit and the (G494) Driver Seat Front Vertical Sensor Ground circuit at the Driver Front Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT FRONT VERTICAL UP/DOWN DRIVER CIRCUIT VOLTAGE

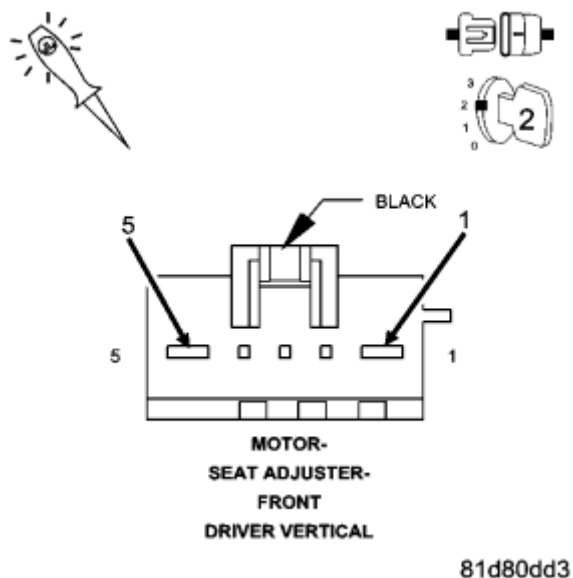


Fig. 40: Checking The Driver Seat Front Vertical Up/Down Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P119) Driver Seat Front Vertical Up Driver circuit and the other lead to (P121) Driver Seat Front Vertical Down Driver circuit at the Driver Front Vertical Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Front Vertical up and down position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/Front Vertical motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR AN OPEN**

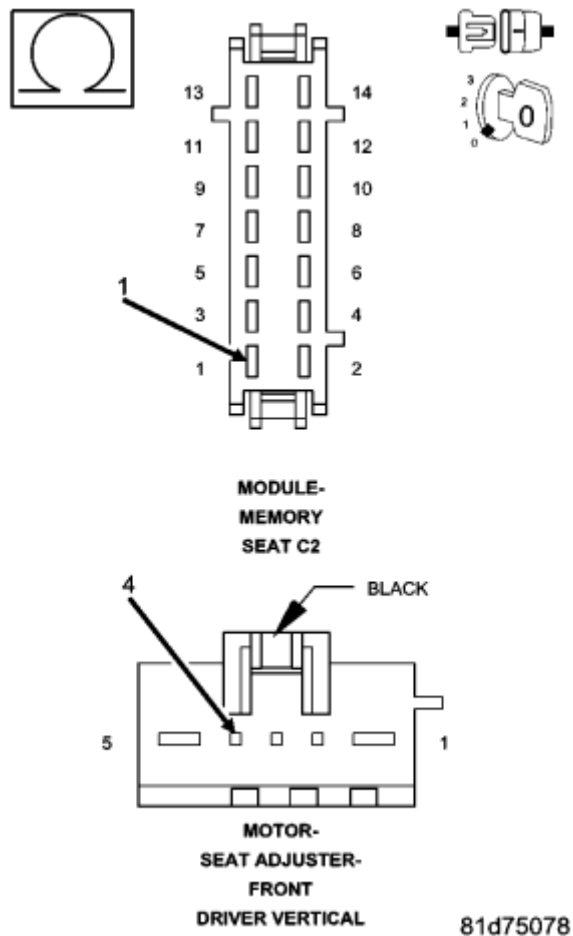


Fig. 41: Measuring The Resistance Of The (G404) Driver Seat Front Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G404) Driver Seat Front Vertical Position Sense circuit between the Driver Front Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G494) DRIVER SEAT FRONT VERTICAL SENSOR GROUND CIRCUIT FOR AN OPEN**

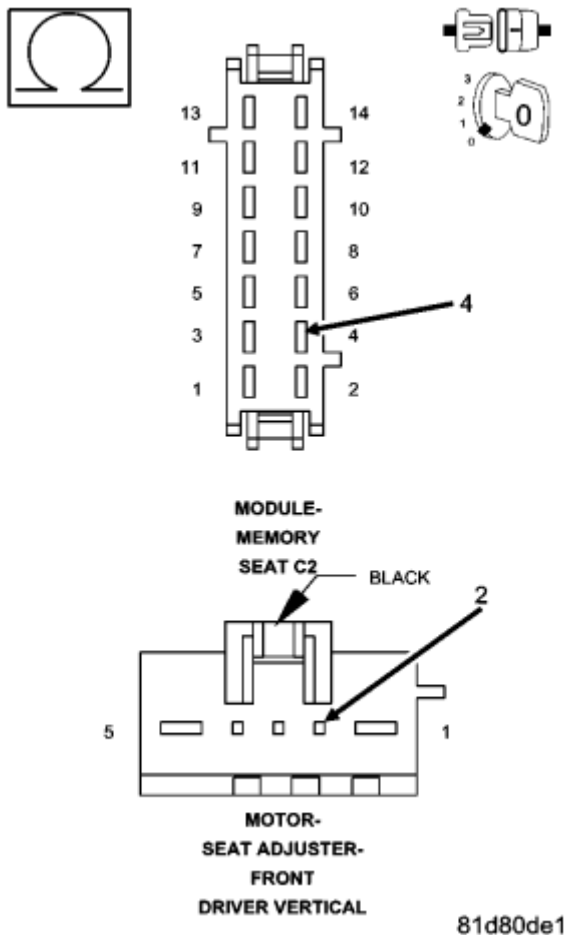


Fig. 42: Measuring The Resistance Of The (G494) Driver Seat Front Vertical Sensor Ground Circuit Between The Driver Front Vertical Seat Adjuster Motor Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G494) Driver Seat Front Vertical Sensor Ground circuit between the Driver Front Vertical Seat Adjuster Motor connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G494) Driver Seat Front Vertical Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P119) DRIVER SEAT FRONT VERTICAL UP DRIVER CIRCUIT FOR AN OPEN**

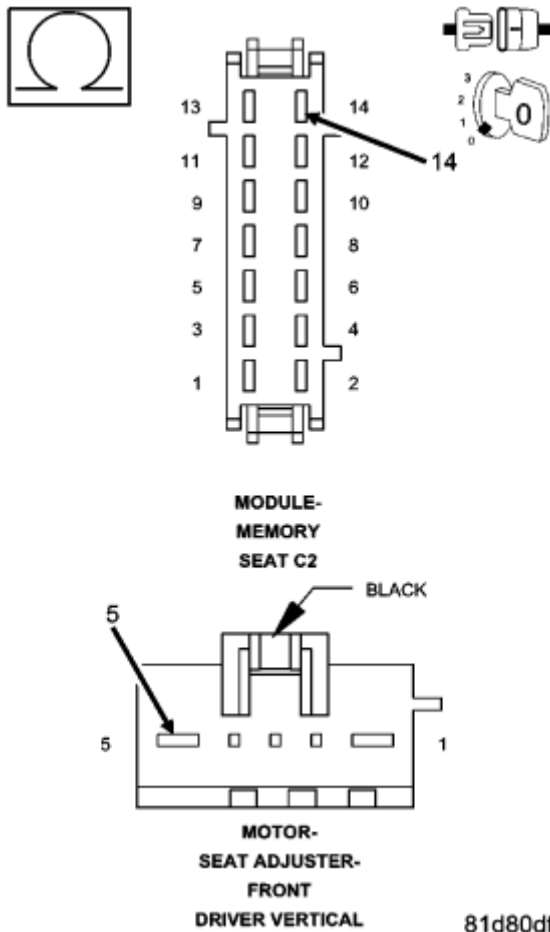


Fig. 43: Measuring The Resistance Of The (P119) Driver Seat Front Vertical Up Driver Circuit Between The Driver Front Vertical Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P119) Driver Seat Front Vertical Up Driver circuit between the Driver

Front Vertical Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P119) Driver Seat Front Vertical Up Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. CHECK THE (P121) DRIVER SEAT FRONT VERTICAL DOWN DRIVER CIRCUIT FOR AN OPEN

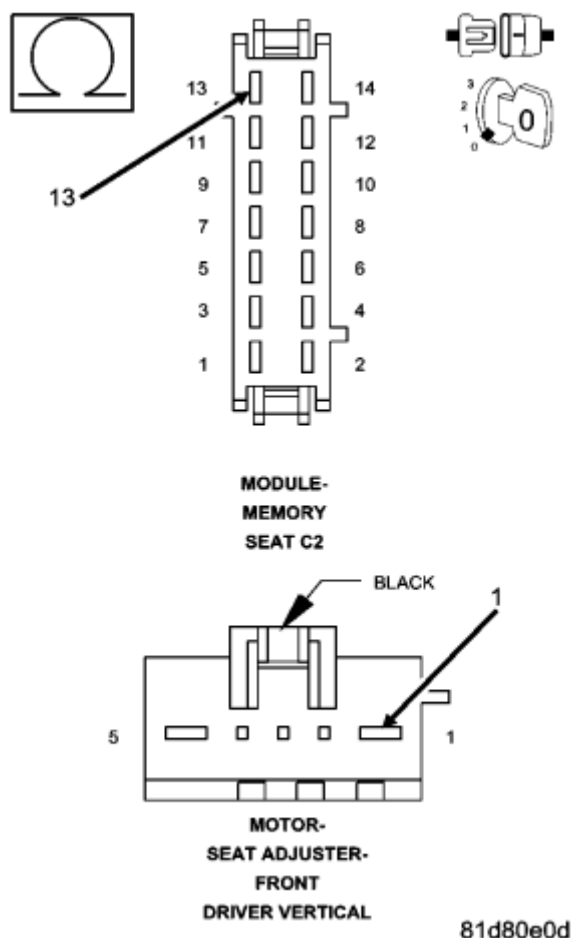


Fig. 44: Measuring The Resistance Of The (P121) Driver Seat Front Vertical Down Driver Circuit Between The Driver Front Vertical Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P121) Driver Seat Front Vertical Down Driver circuit between the Driver Front Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

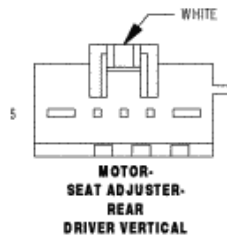
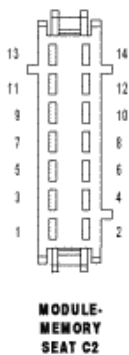
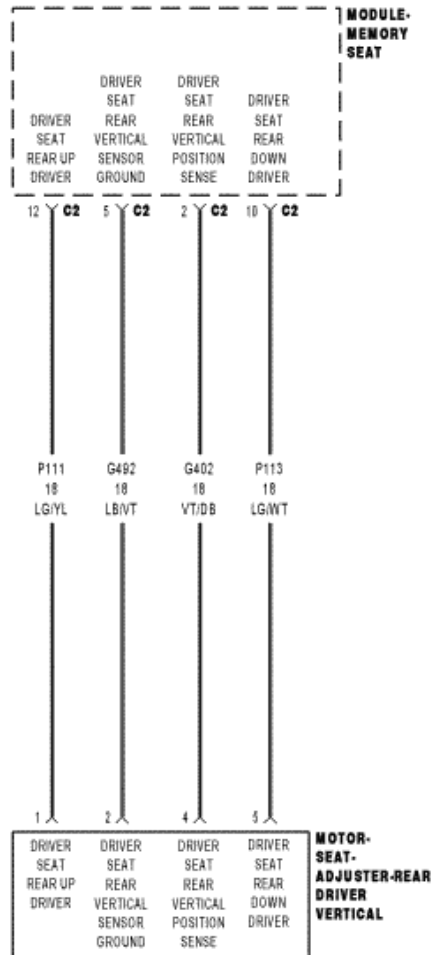
No

Repair the (P121) Driver Seat Front Vertical Down Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D83-SEAT REAR VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01421000

Fig. 45: Seat Rear Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the Seat Motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN (G492) DRIVER SEAT REAR VERTICAL SENSOR GROUND CIRCUIT OPEN (P111) DRIVER SEAT REAR VERTICAL UP DRIVER (P113) DRIVER SEAT REAR VERTICAL DOWN DRIVER REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Rear Vertical up and down position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT VOLTAGE**

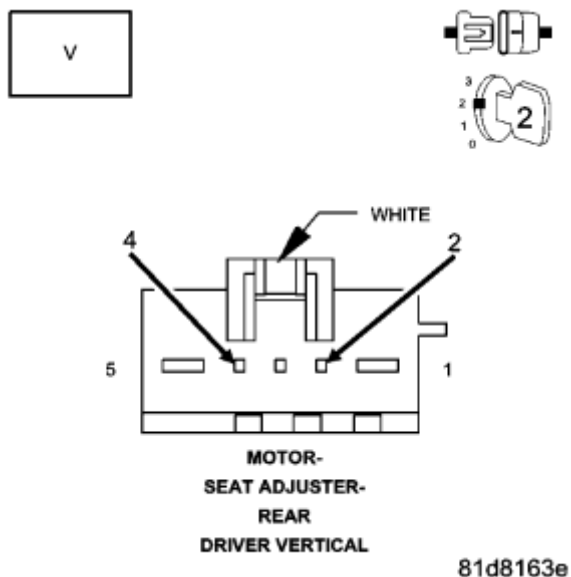


Fig. 46: Measuring The Voltage Between The (G402) Driver Seat Rear Vertical Position Sense Circuit And The (G492) Driver Seat Rear Vertical Sensor Ground Circuit At The Driver Rear Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Rear Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G402) Driver Seat Rear Vertical Position Sense circuit and the (G492) Driver Seat Rear Vertical Sensor Ground circuit at the Driver Rear Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT REAR VERTICAL UP/DOWN DRIVER CIRCUIT VOLTAGE

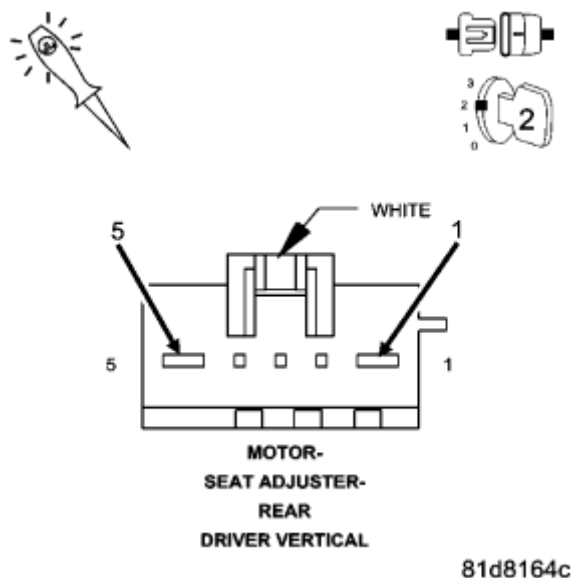


Fig. 47: Checking The Driver Seat Rear Vertical Up/Down Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P111) Driver Seat Rear Vertical Up Driver circuit and the other lead to (P113) Driver Seat Rear Vertical Down Driver circuit at the Driver Rear Vertical Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Rear Vertical up and down position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/Rear Vertical motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR AN OPEN**

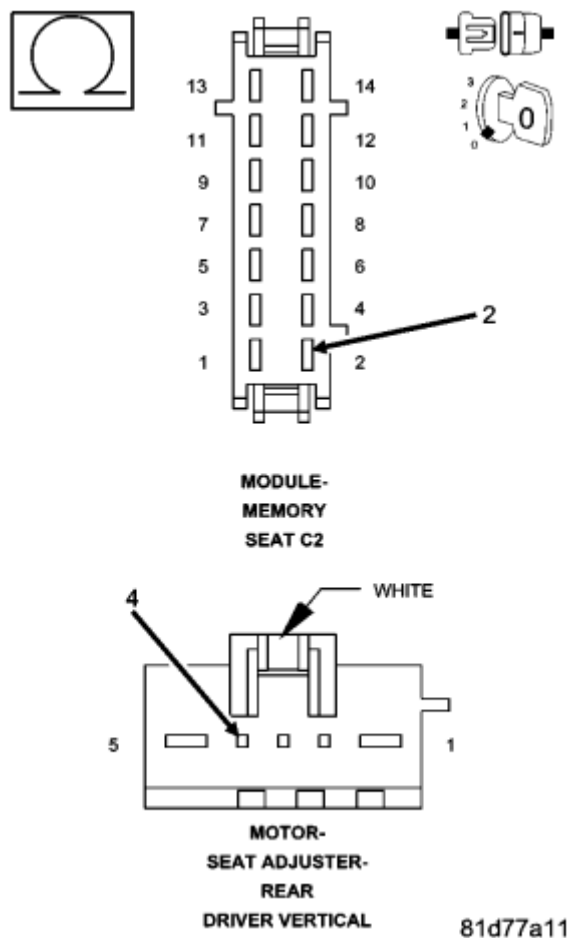


Fig. 48: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Rear Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G492) DRIVER SEAT REAR VERTICAL SENSOR GROUND CIRCUIT FOR AN OPEN**

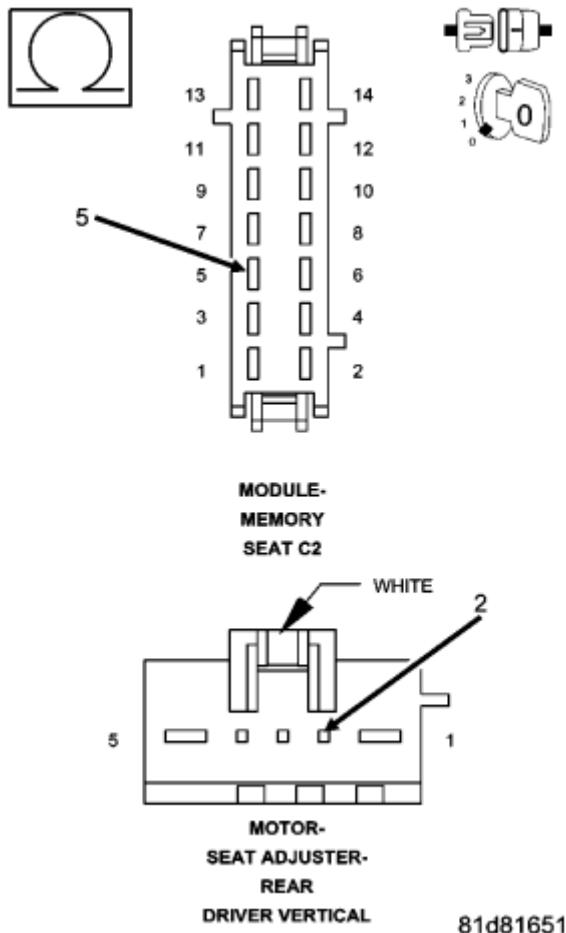


Fig. 49: Measuring The Resistance Of The (G492) Driver Seat Rear Vertical Sensor Ground Circuit Between The Driver Rear Vertical Seat Adjuster Motor Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G492) Driver Seat Rear Vertical Sensor Ground circuit between the Driver Rear Vertical Seat Adjuster Motor connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G492) Driver Seat Rear Vertical Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P111) DRIVER SEAT REAR VERTICAL UP DRIVER CIRCUIT FOR AN OPEN**

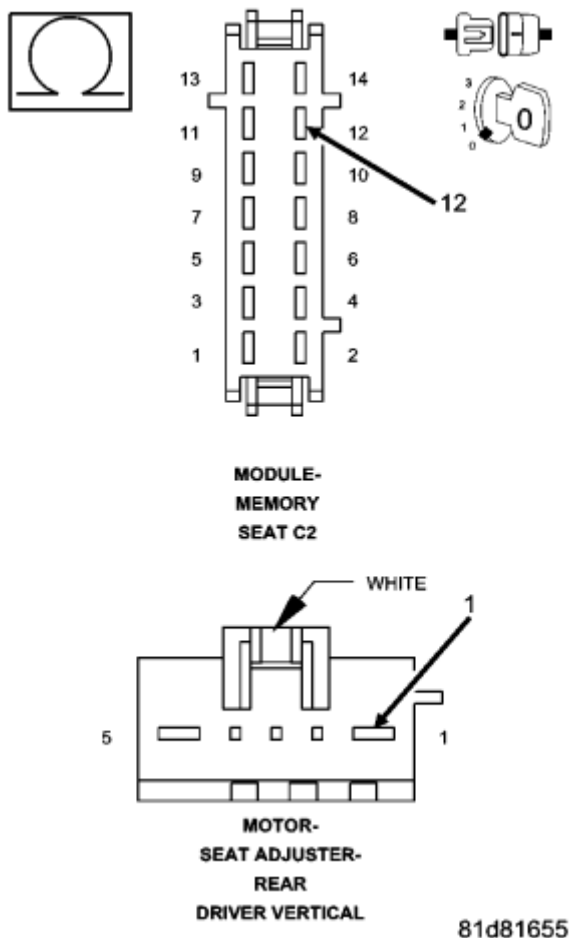


Fig. 50: Measuring The Resistance Of The (P111) Driver Seat Rear Vertical Up Driver Circuit Between The Driver Rear Vertical Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P111) Driver Seat Rear Vertical Up Driver circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P111) Driver Seat Rear Vertical Up Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. **CHECK THE (P113) DRIVER SEAT REAR VERTICAL DOWN DRIVER CIRCUIT FOR AN OPEN**

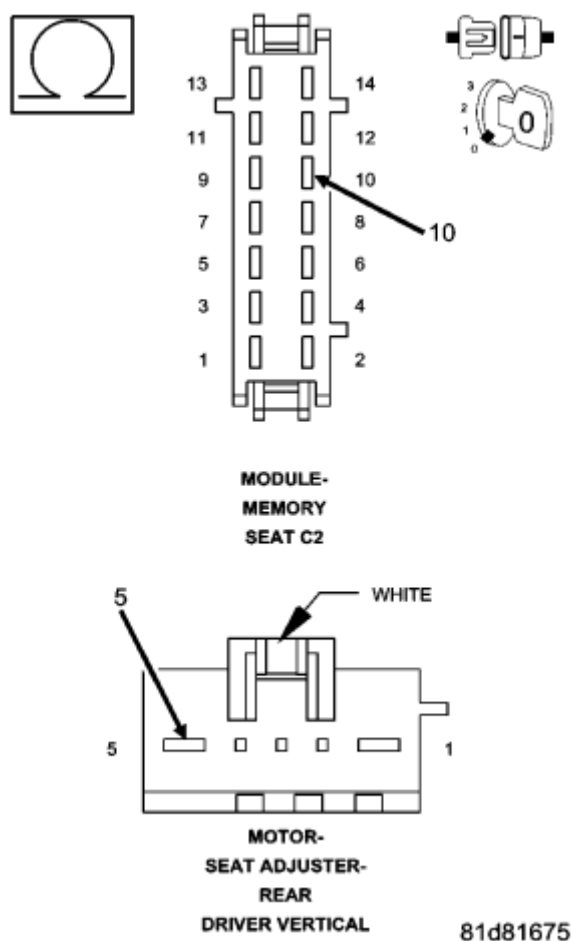


Fig. 51: Measuring The Resistance Of The (P113) Driver Seat Rear Vertical Down Driver Circuit Between The Driver Rear Vertical Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P113) Driver Seat Rear Vertical Down Driver circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness

connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (P113) Driver Seat Rear Vertical Down Driver circuit for an open.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D9B-SEAT HORIZONTAL FRONT STOP NOT LEARNED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- Set Condition:**

Seat becomes de-standardized. If the seat is not standardized, an Easy Exit/Entry function can not be performed. If seat is standardized (learn seat cushion horizontal front hardstop) and then becomes de-standardized (conditions are: seat cushion motor is 5% past the expected hard stop position or seat cushion hall sensor failure is occurred), a DTC is logged.

Possible Causes

Possible Causes
OTHER DIAGNOSTIC TROUBLE CODES SET IN THE MEMORY SEAT MODULE
SEAT STANDARDIZATION ROUTINE NOT PERFORMED

Diagnostic Test

1. CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor or circuit performance DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat in the full forward horizontal position.

With the scan tool, read DTC's.

Does the scan tool display active: B1D9B-SEAT HORIZONTAL FRONT STOP NOT LEARNED?

Yes

With the scan tool, perform the Memory Seat Module (MSM) Standard Routine.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B210D-BATTERY VOLTAGE LOW - MSM

Circuit Schematic

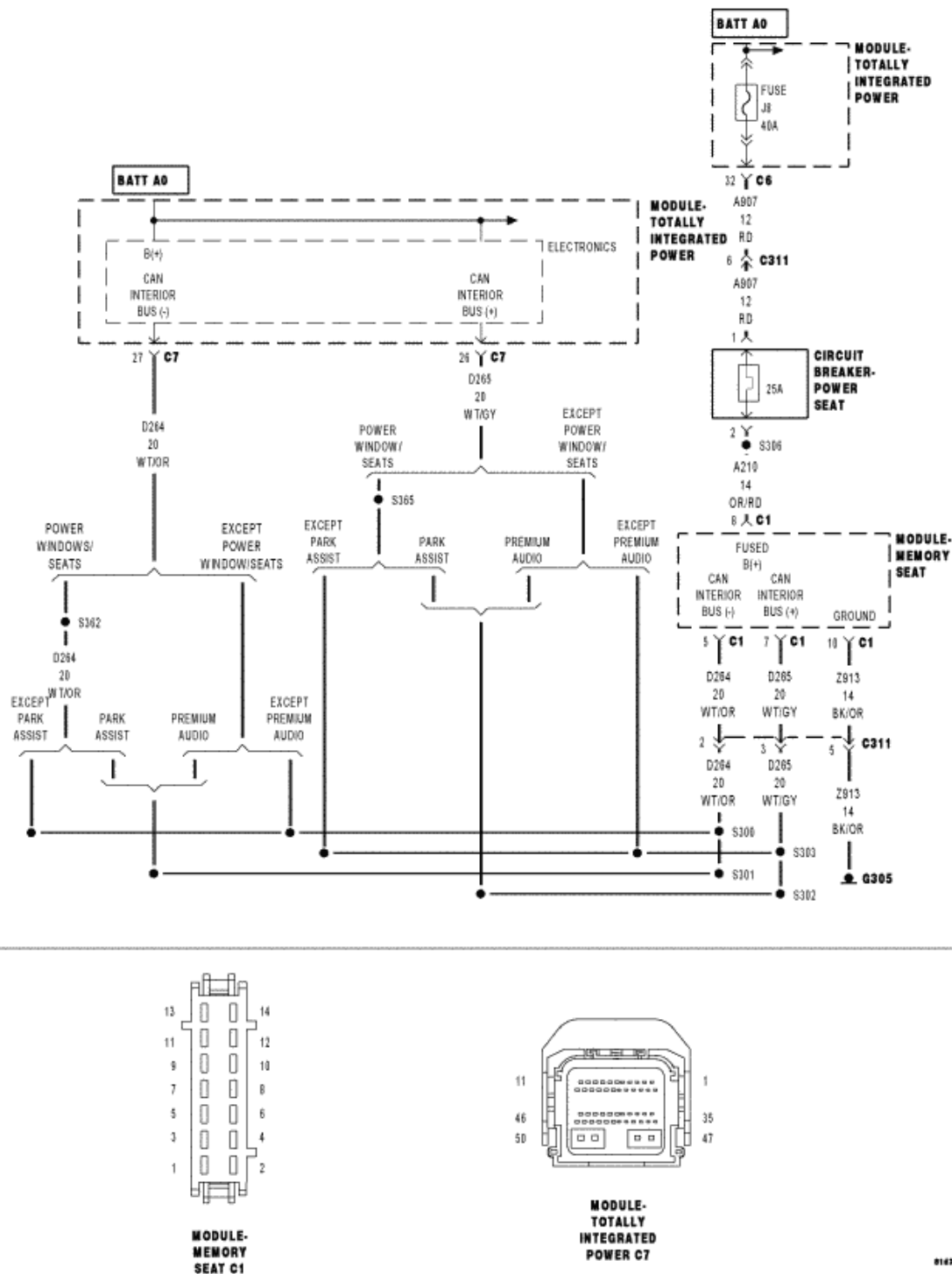


Fig. 52: Battery Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Engine running, during seat motor operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Memory Seat Module (MSM) receives a low charging system voltage message over the CAN Interior Bus or detects voltage under 9.5 volts on the (A210) Fused B(+) circuit.

Possible Causes

Possible Causes
CHARGING SYSTEM VOLTAGE LOW (A210) FUSED B(+) CIRCUIT OPEN (Z913) GROUND CIRCUIT OPEN MEMORY SEAT MODULE

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK PCM FOR CHARGING SYSTEM DTC**

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain/Engine Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, erase all DTC's.

Turn the ignition switch to the OFF position then start the engine and operate the driver power seat.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (A210) FUSED B(+) CIRCUIT OPEN

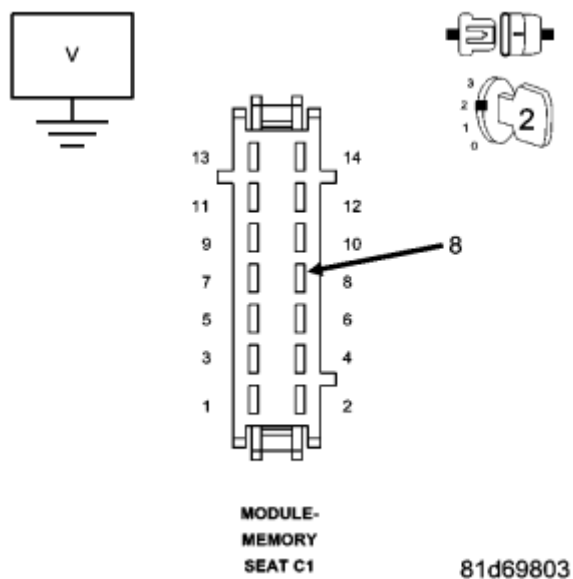


Fig. 53: Measuring The Voltage On The (A210) Fused B(+) Circuit At The Memory Seat Module Harness Connector And Compare To Voltage At The Vehicles Battery
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C1 harness connector.

Start the engine and let idle.

Measure the voltage on the (A210) Fused B(+) circuit at the Memory Seat Module C1 harness connector and compare to voltage at the vehicle battery.

Is the voltage at the Memory Seat Module connector the same as measured at the battery?

Yes

Go To 4.

No

Repair the (A210) Fused B(+) circuit as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

4. (Z913) GROUND CIRCUIT OPEN

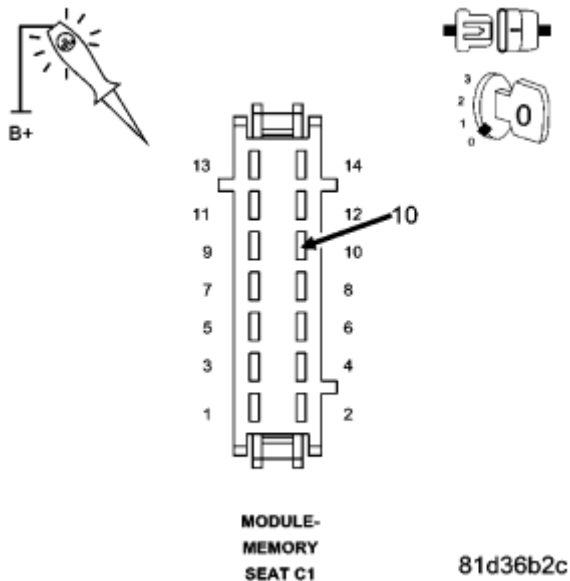


Fig. 54: Checking The (Z913) Ground Circuit At The Memory Seat Module C1 Harness Connector Using A 12-Volt Test Light Connected To 12-Volts
Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z913) Ground circuit at the Memory Seat Module C1 harness connector.

Does the test light illuminate brightly?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (Z913) Ground circuit as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B210E-BATTERY VOLTAGE HIGH - MSM

Circuit Schematic

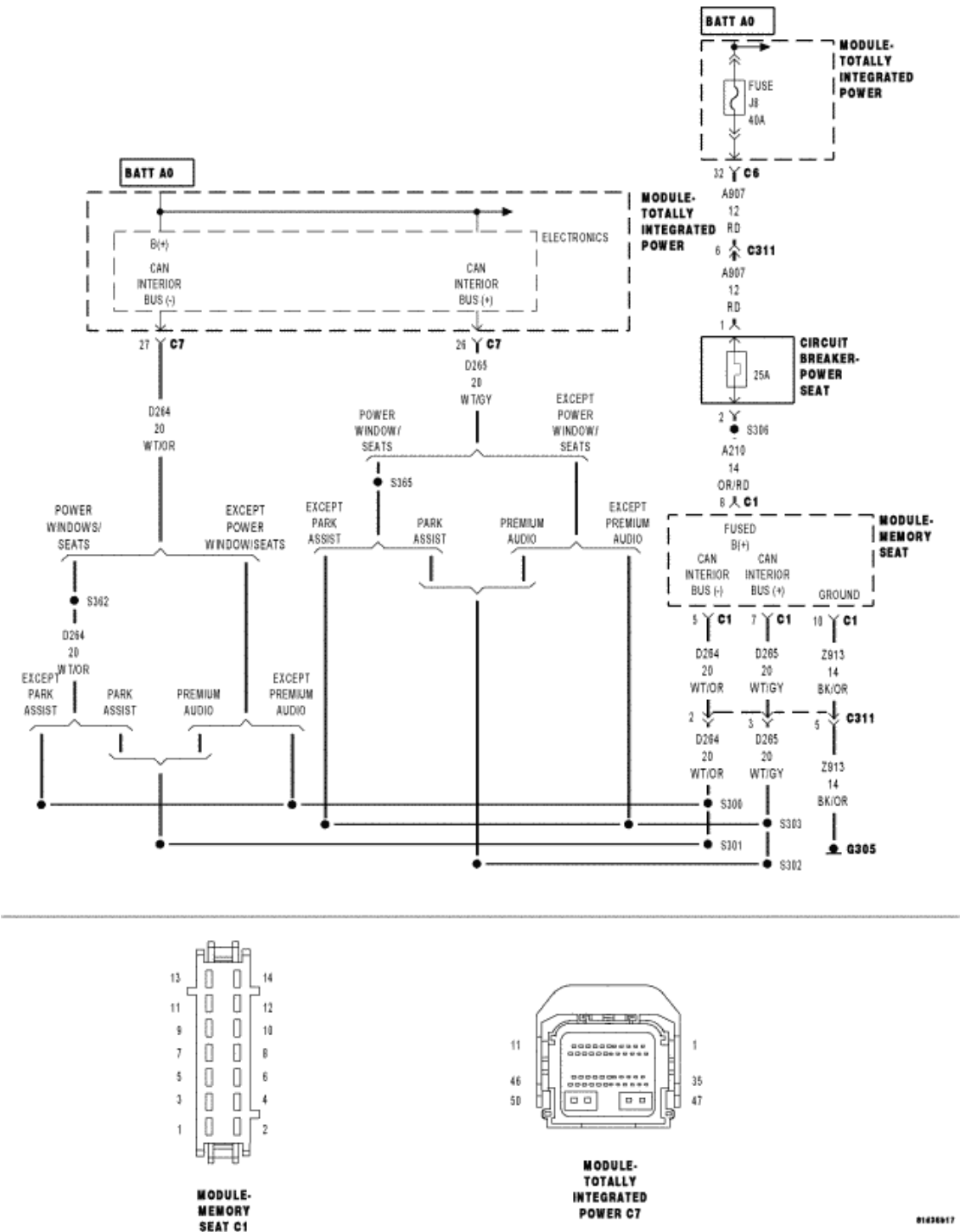


Fig. 55: Battery Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Engine running, during seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Memory Seat Module (MSM) receives a high charging system voltage message over the CAN Interior Bus or detects voltage over 16.5 volts on the (A210) Fused B(+) circuit.

Possible Causes

Possible Causes
CHARGING SYSTEM VOLTAGE HIGH (A210) FUSED B(+) CIRCUIT OPEN MEMORY SEAT MODULE

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK PCM/ECM FOR CHARGING SYSTEM DTC**

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, record and erase DTC's

Turn the ignition switch to the OFF position then start the engine and let run for one minute.

Attempt to operate the Driver Power Seat.

With the scan tool, read DTC's.

Does the scan tool display active this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. CHECK THE VOLTAGE ON THE (A210) FUSED B(+) CIRCUIT

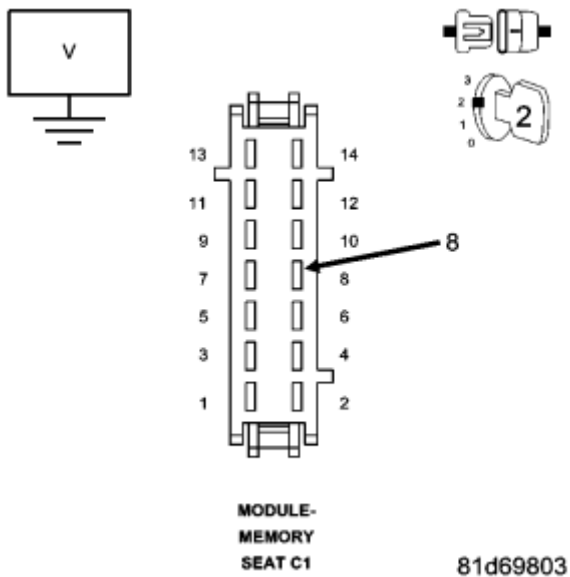


Fig. 56: Measuring The Voltage On The (A210) Fused B(+) Circuit At The Memory Seat Module Harness Connector And Compare To Voltage At The Vehicles Battery
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module harness connector.

Start the engine and let idle.

Measure the voltage on the (A210) Fused B(+) circuit at the Memory Seat Module harness connector and compare to voltage at the vehicles battery.

Is the voltage at the Memory Seat Module connector the same as measured at the battery?

Yes

Replace the Memory Seat Module in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (A210) Fused B(+) circuit as necessary.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B221C-MEMORY SEAT MODULE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on.

Set Conditions

• **Set Condition:**

This code is set immediately if the Memory Seat Module (MSM) internal self test fails.

Possible Causes

Possible Causes
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

With the scan tool, erase all DTC's.

Cycle the ignition switch off then back on.

With the scan tool, read DTC's.

Does the scan tool display active: B221C-MEMORY SEAT MODULE INTERNAL?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

U0011-CAN INTERIOR BUS OFF PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Perform U0010-CAN INTERIOR BUS diagnostic procedure.

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0203-LOST COMMUNICATION WITH DOOR MODULE LEFT FRONT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0204-LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

POWER SEAT SYSTEM VERIFICATION TEST - VER 1

Diagnostic Test

1. Perform Power Seat System Verification Test

Disconnect all jumper wires and reconnect all previously disconnected components and connectors.

Ensure that all accessories are turned off.

Ensure that the battery is fully charged.

Turn the ignition on.

If either the Memory Seat Module or the Driver Horizontal Seat Adjuster Motor/Seat Track was replaced, the MSM Standard Routine must be performed using the scan tool.

With the scan tool, record and erase DTCs from all modules.

Operate the driver seat in all positions.

With the Memory Switch on the Driver's Door, program the Driver's Seat No. 1 Button to a desired position and Driver No. 2 Button to a different position.

Verify that both Memory positions can be recalled from the RKE transmitter and the Memory Switch on the Driver's Door.

Turn the ignition off, wait 10 seconds, and then turn the ignition on.

With the scan tool, select ECU View.

Check for DTCs in the modules.

Are DTCs present in any of the modules or is the original condition still present?

Yes

The repair is not complete. Refer to the related article for the DTC or symptom that is still present.

No

The repair is complete.

2008 ACCESSORIES AND EQUIPMENT

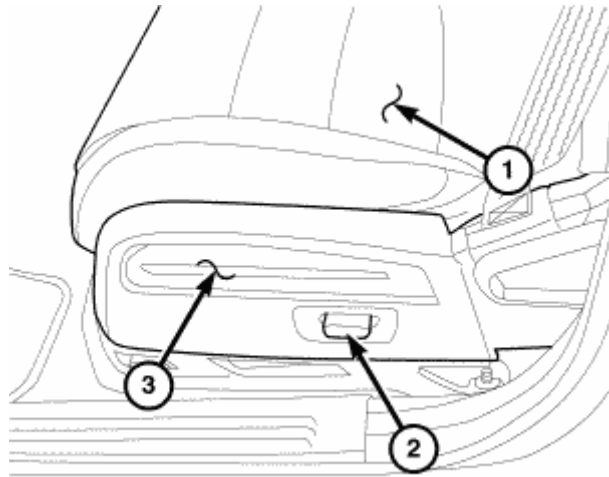
Power Seats - Service Information - Liberty

POWER SEATS - SERVICE INFORMATION

DESCRIPTION

POWER SEAT SYSTEM

POWER SEAT SYSTEM



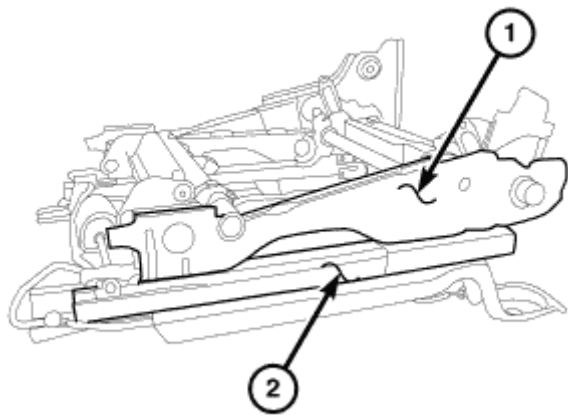
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Fig. 1: Identifying Power Seat Switch, Seat Cushion & Seat Cushion Side Shield

Courtesy of CHRYSLER LLC

NOTE: Driver seat shown in illustration, passenger seat similar.

The power seat system allows the driver and front seat passenger to electrically adjust the seating position using the power seat switch assembly (2) located on the outboard seat cushion side shield (3).

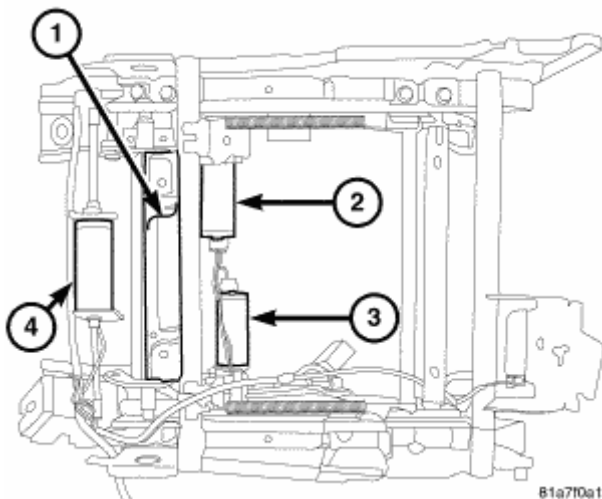


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Fig. 2: Identifying Upper Power Seat Adjuster & Lower Power Seat Adjuster
 Courtesy of CHRYSLER LLC

A driver side six-way power seat is available on this vehicle. The power seat includes a six-way adjustable seat cushion track. The six-way power seat can be adjusted back up, back down, front up, front down, forward and rearward. A two-way front passenger seat is also available as an option. The front passenger seat can be adjusted forward and rearward only. The power seat system is also available with the heated seat option. Refer to **DESCRIPTION** for additional information on the heated seats.

The power seat adjuster can be made up of the upper and lower power seat adjuster assemblies. The upper power seat adjuster (1) is used for the driver power seat only. It contains two reversible motors that are connected to worm-drive gearboxes that move the seat adjusters through screw-type drive units. These motors control the front seat tilt, rear seat tilt and when activated together the height of the driver seat. The lower power seat adjuster (2) is used on both the driver and front passenger power seats. It contains one reversible motor that is connected to a worm-drive gearbox that moves the seat adjuster through a screw-type drive unit. This motor is responsible for the fore and aft movement of the driver seat. Each motor contains a self-resetting circuit breaker to protect it from overload. Consecutive or frequent resetting of the circuit breakers may damaged the motors.



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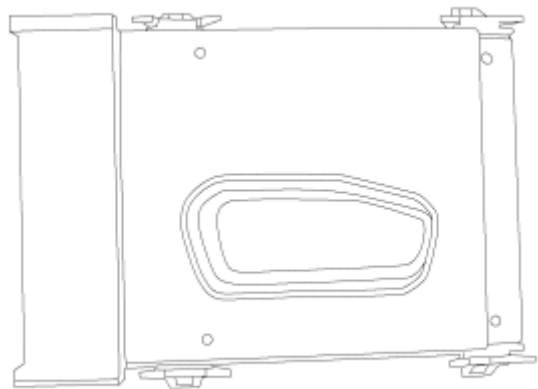
Fig. 3: Front/Rear Tilt Motor, Reversible Motor & Power Seat Track Unit
Courtesy of CHRYSLER LLC

The power seat system for this vehicle includes the following major components:

The **Front Tilt Motor (2)** is located on the upper power seat adjuster assembly and controls the up and down movement of the seat front only. The front tilt motor is part of the power seat track unit (1) and must be replaced as an assembly. See **REMOVAL**.

The **Rear Tilt Motor (3)** is located on the upper power seat adjuster assembly and controls the up and down movement of the seat rear only. The front tilt motor is part of the power seat track unit (1) and must be replaced as an assembly. See **REMOVAL**.

The **Lower Power Seat Adjuster** contains one reversible motor (4) that is connected to a worm-drive gearbox that moves the seat adjuster through a screw-type drive unit. This motor is responsible for the fore and aft movement of the driver seat. The motor is part of the power seat track unit (1) and must be replaced as an assembly. See **REMOVAL**.



81aB2c41

Fig. 4: Power Seat Switch
Courtesy of CHRYSLER LLC

Power Seat Switch - Vehicles may be equipped with a driver side six-way power seat switch. The power seat switch has a paddle-type lever mounted on the outboard seat side shield. Movement of the seat cushion mimics the action of the switch paddle.

MEMORY SEAT SYSTEM

An electronic memory seat system is available on certain models. The memory system is able to store and recall all driver side power seat positions and driver outside mirror position. The system can be set for two different drivers. On vehicles with a factory installed radio connected to the Controller Area Network (CAN) data bus network, the memory system is also able to store and recall up to twelve radio station presets (six AM and six FM), for two drivers. The memory system will also store and recall the last station listened to for each driver, even if it is not one of the twelve preset stations.

The memory system will automatically recall all of these settings when a button of the memory switch is depressed, or when the doors are unlocked using the Remote Keyless Entry (RKE) transmitter (if enabled). If the vehicle has more than two drivers the RKE transmitter recall of memory features can be disabled. This is a customer programmable feature of the Electronic Vehicle Information Center (EVIC) set through the use of the appropriate steering wheel switches. Refer to **OPERATION** for additional information on the customer programmable features.

The memory system also has an "Easy Entry and /Exit" feature that provides the driver with more room to enter or exit the vehicle. When the seat is in a memorized position, it will move rearward 60 millimeters or to the end of its travel, whichever occurs first, when the key is removed from the ignition switch lock cylinder. This is also a customer programmable feature of the Electronic Vehicle Information Center (EVIC) set through the use of the appropriate steering wheel switches.

The memory system includes the following components:

Memory Selector Switch - located in the driver door trim panel.

Driver Door Module (DDM) - located in the driver door, behind the trim panel.

Hall Effect Sensors - Outside Mirror - The hall effect sensor is permanently installed on the outside mirror motor. This hall effect sensor is used to provide a reference signal to the memory seat module, letting the module know the exact position of the mirror.

Sentry Key Remote Entry Module (SKREEM) - located at ignition key cylinder.

Remote Keyless Entry (RKE) Transmitter - located with ignition key.

Memory Seat Module (MSM) - located underneath the driver seat and also controls the Adjustable Pedals.

Hall Effect Sensors - Seat Track - These hall effect sensors are permanently installed in each of the power seat track motors. They are used to provide a reference signal to the memory heated seat mirror module, letting the module know the exact position of the seat cushion and recliner.

Radio - located in the instrument panel center stack.

Certain functions and features of the memory system rely upon resources shared with other electronic modules in the vehicle over the Controller Area Network (CAN) bus. The CAN bus allows the sharing of sensor information. This helps to reduce wire harness complexity, internal controller hardware, and component sensor current loads. At the same time, this system provides increased reliability, enhanced diagnostics, and allows the addition of many new feature capabilities. For diagnosis of these electronic modules or of the CAN bus, the use of a scan tool and the proper diagnostic procedures information are needed.

OPERATION

POWER SEAT SYSTEM

The power seat system receives battery current through a fuse in the Totally Integrated Power Module (TIPM) so that the power seats remain operational, regardless of the ignition switch position.

When a power seat switch is actuated, a battery feed and a ground path are applied through the power seat switch contacts to the appropriate motor or motors. The motor and drive unit operate to move the seat in the selected direction until the switch is released, or until the travel limit of the power seat track is reached. When

the switch is moved in the opposite direction, the battery feed and ground path to the motor is reversed through the switch contacts. This causes the motor to run in the opposite direction.

DIAGNOSIS AND TESTING

MEMORY SEAT SYSTEM

In order to obtain conclusive testing of the power seats with and without the memory system option, the Controller Area Network (CAN) bus, and all of the electronic modules that provide inputs to, or receive outputs from the memory system components must be checked. Use a scan tool and the proper diagnostic information to accurately diagnose the power seat/memory seat systems.

If the driver power seat exhibits an interrupted or jerky motion, ensure the wire harness is connected correctly. To verify the concern, obtain a scan tool and energize each axis one at a time. If any axis stops in approximately 2 seconds (without hitting the end of travel), the feedback for that axis may have an open, short or be incorrectly connected. Check the wiring to that axis (module to motor). Repair any wiring problems and retry that axis. Refer to appropriate wiring information for complete circuit schematic or connector pin-out information.

NOTE: Vehicles equipped with the memory/heated seat option utilize a low voltage cut-off feature. This feature turns off the 12V power to the power seat system anytime vehicle voltage is below 11.0V. Be certain to check the vehicle electrical system for proper voltage anytime the power seat system appears inoperative.

Before any testing of the power seat system is attempted, the battery should be fully-charged.

POWER SEAT ADJUSTER

Operate the power seat switch and move the seat in all directions. The seat should move in each of the selected directions.

If the power seat adjuster fails to operate in more than one direction, proceed as follows:

1. Inspect the power seat adjuster motors to ensure the electrical connectors are fully seated to the motors. If OK, go to step 2. If not OK, connect the electrical connector to the fully seated position.
2. Check the power seat fuse in the Totally Integrated Power Module (TIPM). If OK, go to step 3. If not OK, replace the inoperative fuse.
3. Remove the power seat switch from the seat cushion side panel. Check for battery voltage at the fused B (+) circuit cavity of the power seat switch wire harness connector. If OK, go to step 4. If not OK, repair the open circuit to the TIPM as required.
4. Check for continuity between the ground circuit cavity of the power seat switch wire harness connector and a good ground. There should be continuity. If OK, go to step 5. If not OK, repair the open circuit to ground as required.
5. See **DIAGNOSIS AND TESTING**. If the switch tests OK, check the wire harness between the power seat switch and the motor. If the circuits check OK, replace the faulty power seat motor, track or seat back frame assembly. If the circuits are not OK, repair the wire harness as required.

POWER SEAT DIAGNOSIS CHART

SYMPTOM	POSSIBLE CAUSE	CORRECTION
Power seat inoperative in all directions	Blown Fuse or inoperative circuit breaker	Check for damaged wiring and possible circuit short, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Power seat switch	Perform appropriate power seat switch test. See DIAGNOSIS AND TESTING . Replace switch as necessary.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Fore/aft seat movement completely inoperative	Power seat switch	Perform appropriate power seat switch test. See DIAGNOSIS AND TESTING . Replace switch as necessary
	Fore aft motor or flex drive cable.	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Up/down seat movement completely inoperative	Power seat switch	Perform appropriate power seat switch test. See DIAGNOSIS AND TESTING . Replace switch as necessary
	Height adjust motor or drive assembly	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Seat tilt movement completely inoperative	Power seat switch	Perform appropriate power seat switch test. See DIAGNOSIS AND TESTING . Replace switch as necessary
	Front tilt motor or drive assembly	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
		Perform appropriate power seat switch

Seat power recline movement completely inoperative	Power seat switch	test. See DIAGNOSIS AND TESTING . Replace switch as necessary
	Recline motor or drive assembly	Replace the power seat back frame assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Seat motion chattering or vibrating during fore/aft movement	Foreign material under seat or in seat track	Remove foreign material. Clean and lubricate seat tracks as necessary
	Poor seat track lubrication	Lubricate the lower portion of the effected seat tracks
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Loosen seat track to vehicle mounting bolts. Using the power seat switch, move the effected seat reward to the track stops. Tighten track bolts to proper torque and recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Fore aft motor or flex drive cable.	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Seat motion chattering or vibrating during up/down movement	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor height adjust motor drive assembly lubrication	Lubricate the height adjust motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	height adjust motor or drive assembly	Replace the power seat track assembly.

	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Seat motion chattering or vibrating during seat tilt movement	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor front tilt motor drive assembly lubrication	Lubricate the front tilt motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Front tilt motor or drive assembly	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Seat motion chattering or vibrating during power recline movement	Foreign material in seat back frame pivots or drive shaft	Remove foreign material. Clean and lubricate seat back frame pivots and drive shaft as necessary
	Poor seat back frame pivot or drive shaft lubrication	Lubricate the seat back frame pivots and drive shaft
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected seat back frame pivots and drive shaft. Recheck seat operation. If seat motion is still abnormal, replace the seat back frame assembly.
	Recline motor or drive assembly	Replace the seat back frame assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Slow seat motion during	Battery voltage low	Check vehicle charging system operation. Repair charging system and charge

fore/aft movement		battery as necessary
	Poor power seat system ground	Check for loose ground connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Foreign material under seat or in seat track	Remove foreign material. Clean and lubricate seat tracks as necessary
	Poor seat track lubrication	Lubricate the lower portion of the effected seat tracks
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Loosen seat track to vehicle mounting bolts. Using the power seat switch, move the effected seat reward to the track stops. Tighten track bolts to proper torque and recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Fore aft motor or flex drive cable.	Replace the power seat track assembly.
Slow seat motion during up/down movement	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Battery voltage low	Check vehicle charging system operation. Repair charging system and charge battery as necessary
	Poor power seat system ground	Check for loose ground connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor height adjust motor drive assembly lubrication	Lubricate the height adjust motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace

		the power seat track assembly.
	Height adjust motor or drive assembly	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Slow seat motion during seat tilt movement	Battery voltage low	Check vehicle charging system operation. Repair charging system and charge battery as necessary
	Poor power seat system ground	Check for loose ground connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor front tilt motor drive assembly lubrication	Lubricate the front tilt motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Front tilt motor or drive assembly	Replace the power seat track assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Slow seat motion during power recline movement	Battery voltage low	Check vehicle charging system operation. Repair charging system and charge battery as necessary
	Poor power seat system ground	Check for loose ground connections or damaged wiring, Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
	Foreign material in seat back	Remove foreign material. Clean and lubricate seat back frame pivots and drive

	frame pivots or drive shaft	shaft as necessary
	Poor seat back frame pivot or drive shaft lubrication	Lubricate the seat back frame pivots and drive shaft
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected seat back frame pivots and drive shaft. Recheck seat operation. If seat motion is still abnormal, replace the seat back frame assembly.
	Recline motor or drive assembly	Replace the seat back frame assembly.
	Wiring problems (system or vehicle)	Check for loose wire connections or damaged wiring. Refer to the appropriate wiring information for complete circuit schematic or connector pin-out information. Repair as necessary
Squeaks, noises and rattles during fore/aft movement	Foreign material under seat or in seat track	Remove foreign material. Clean and lubricate seat tracks as necessary
	Poor seat track lubrication	Lubricate the lower portion of the effected seat tracks
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Loosen seat track to vehicle mounting bolts. Using the power seat switch, move the effected seat reward to the track stops. Tighten track bolts to proper torque and recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Fore aft motor or flex drive cable.	Replace the power seat track assembly.
Squeaks, noises and rattles during up/down movement	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor height adjust motor drive assembly lubrication	Lubricate the height adjust motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.

-	height adjust motor or drive assembly	Replace the power seat track assembly.
Squeaks, noises and rattles during seat tilt movement	Foreign material under seat or in upper seat track pivots	Remove foreign material. Clean and lubricate upper seat track pivots as necessary
	Poor upper seat track pivot lubrication	Lubricate the effected upper seat track pivots
	Poor front tilt motor drive assembly lubrication	Lubricate the front tilt motor drive assembly
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected upper seat track pivots. Recheck seat operation. If seat motion is still abnormal, replace the power seat track assembly.
	Front tilt motor or drive assembly	Replace the power seat track assembly.
Squeaks, noises and rattles during power recline movement	Foreign material in seat back frame pivots or drive shaft	Remove foreign material. Clean and lubricate seat back frame pivots and drive shaft as necessary
	Poor seat back frame pivot or drive shaft lubrication	Lubricate the seat back frame pivots and drive shaft
	Loose components	Check and tighten loose components as necessary
	Binding or sticking of components	Inspect and lubricate the effected seat back frame pivots and drive shaft. Recheck seat operation. If seat motion is still abnormal, replace the seat back frame assembly.
	Recline motor or drive assembly	Replace the seat back frame assembly.

STANDARD PROCEDURE

MEMORY SYSTEM PROGRAMMING

The Memory Seat Module (MSM) interfaces with the Remote Keyless Entry (RKE) system via the Controller Area Network (CAN) bus. The proper procedure of setting and recalling a memory position using the RKE is as follows:

1. Press and release memory switch 1 or 2 to recall memory position 1 or 2.
2. Adjust the seat, recliner, adjustable pedal position, set radio station presets, and the side view mirrors to the desired position.
3. Press momentarily and release memory switch S.
4. Within five seconds, press momentarily and release memory switch 1.

5. To link the RKE transmitter: within ten seconds, press and release the "LOCK" button on one of the RKE transmitters

To program the second driver's position, repeat the above procedure using memory switch 2. The second RKE transmitter can be programmed in the same fashion as indicated in step 5.

NOTE: The module will abort a recall if the transmission is moved out of park or if any seat movement is activated whether manually or by memory recall. The module will also abort a recall if any movement of the adjustable pedals is detected.

To recall either of the programmed positions momentarily press and release either memory selector switch 1 or 2. If using RKE, just press and release the "UNLOCK" button on the proper transmitter for either position 1 or 2.

A recall is possible any time the vehicle transmission is in PARK and the seatbelt is unbuckled. This condition is monitored by the MSM.

SWITCH-MEMORY

DESCRIPTION

MEMORY SWITCH

Vehicles equipped with the memory system have a memory switch mounted to the driver side front door trim panel. This switch is used to set and recall all of the memory system settings for up to two drivers. The memory switch is a resistor multiplexed unit that is hard wired to the left Front Door Module (FDM). The left FDM in turn sends out the memory system set and recall requests to the other electronic modules over the Controller Area Network (CAN) data bus.

The memory switch cannot be adjusted or repaired and, if inoperative or damaged, it must be replaced.

OPERATION

MEMORY SWITCH

The memory switch has three momentary switch buttons labeled Set, 1 and 2. When the memory set switch is depressed, a resistance value is sent to the left Front Door Module (FDM) via hard wired connections. When the memory system is in "set" mode a chime will be generated and a message will appear in the electronic vehicle information center display (if equipped).

REMOVAL

MEMORY SWITCH

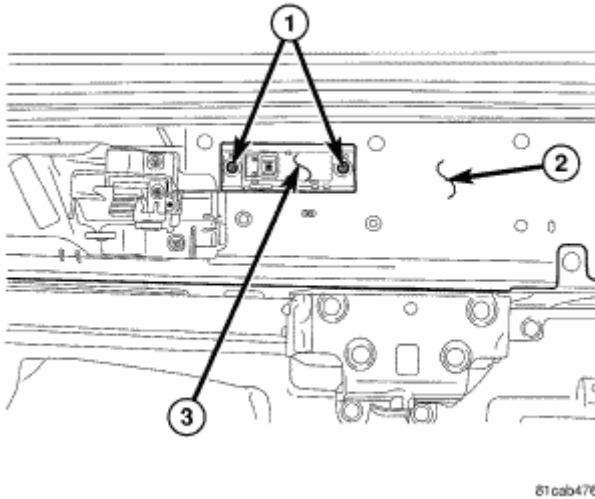


Fig. 5: Identifying Screws
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the driver front door trim panel. Refer to **REMOVAL** .
3. Remove the two screws (1) that secure the memory switch (3) to the back of the driver front door trim panel (2).
4. Remove the memory switch.

INSTALLATION

MEMORY SWITCH

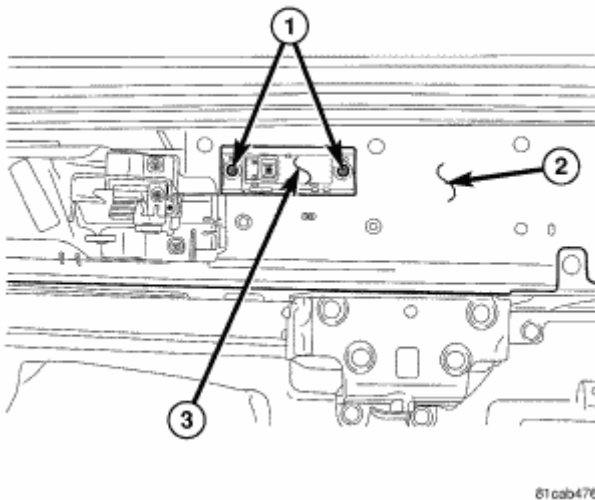


Fig. 6: Identifying Screws
Courtesy of CHRYSLER LLC

1. Position the memory switch (3) and install and tighten the two screws (1) that secure it to the back of the driver front door trim panel (2).

2. Install the driver front door trim panel. Refer to **INSTALLATION** .
3. Reconnect the battery negative cable.

SWITCH - POWER SEAT

DESCRIPTION

SEAT SWITCH

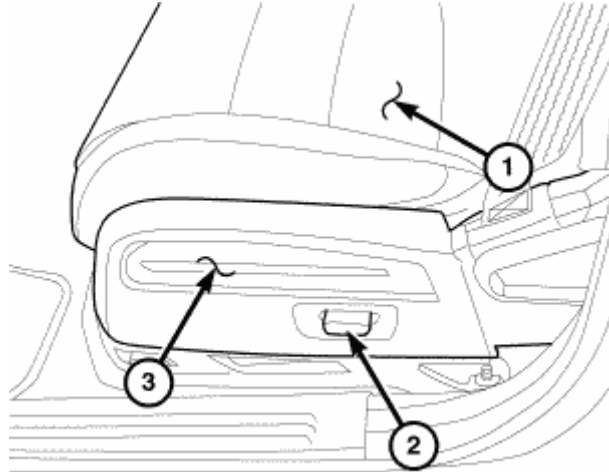


Fig. 7: Driver Seat Switch
Courtesy of CHRYSLER LLC

NOTE: Driver seat switch shown in illustration, passenger seat switch similar.

The driver power seat can be adjusted in six different ways and the passenger power seat can be adjusted fore and aft using the power seat switch. The power seat switch (2) is located on the lower outboard side of the seat cushion (1) on the seat cushion side shield (3). The power seat system incorporates a seat switch with a seat cushion control paddle.

The individual components in the power seat switch assembly cannot be repaired. If the switch is damaged or inoperative, the entire power seat switch must be replaced.

OPERATION

SEAT SWITCH

When a power seat switch is actuated, a battery feed and a ground path are applied through the switch contacts to the power seat track adjuster motor. The selected adjuster motor operates to move the seat through its drive unit in the selected direction until the switch is released, or until the travel limit of the adjuster is reached. When the switch is moved in the opposite direction, the battery feed and ground path to the motor are reversed through the switch contacts. This causes the adjuster motor to run in the opposite direction.

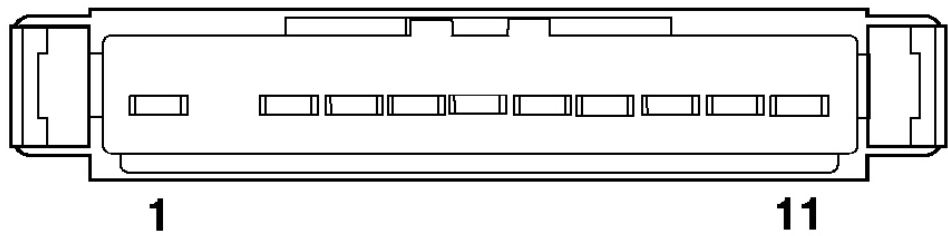
No power seat switch should be held applied in any direction after the adjuster has reached its travel limit. The

power seat adjuster motors each contain a self-resetting circuit breaker to protect them from overload. However, consecutive or frequent resetting of the circuit breaker may result in motor damage.

DIAGNOSIS AND TESTING

POWER SEAT SWITCH

DRIVER WITHOUT MEMORY SEAT SYSTEM



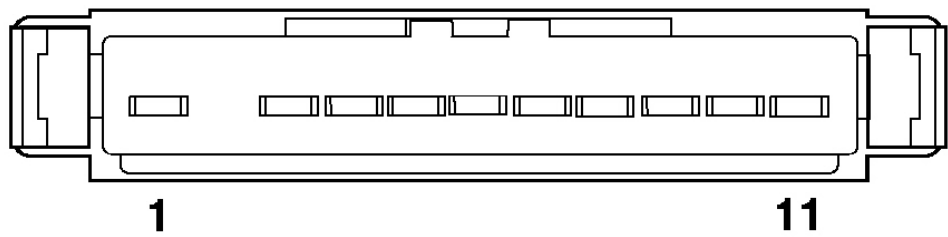
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Fig. 8: Power Seat Switch Terminals
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the power seat switch from the power seat. See **REMOVAL**.
3. Use an ohmmeter to test the continuity of the power seat switch. Refer to **DRIVER POWER SEAT SWITCH WITHOUT MEMORY SEAT SYSTEM CONTINUITY** table. If not OK, replace the faulty power seat switch. If switch tests OK, see **DIAGNOSIS AND TESTING**.

DRIVER POWER SEAT SWITCH WITHOUT MEMORY SEAT SYSTEM CONTINUITY

SWITCH POSITION	CONTINUITY BETWEEN
OFF	7-1, 7-3, 7-4, 7-5, 7-8, 7-9, 7-10, 7-11
HORIZONTAL FORWARD	6-8, 7-1, 7-3, 7-4, 7-5, 7-9, 7-10, 7-11
HORIZONTAL REARWARD	6-4, 7-1, 7-3, 7-5, 7-8, 7-9, 7-10, 7-11
FRONT TILT DOWN	6-5, 7-1, 7-3, 7-4, 7-8, 7-9, 7-10, 7-11
FRONT TILT UP	6-9, 7-1, 7-3, 7-4, 7-5, 7-8, 7-10, 7-11
REAR TILT DOWN	6-10, 7-1, 7-3, 7-4, 7-5, 7-8, 7-9, 7-11
REAR TILT UP	6-11, 7-1, 7-3, 7-4, 7-5, 7-8, 7-9, 7-10



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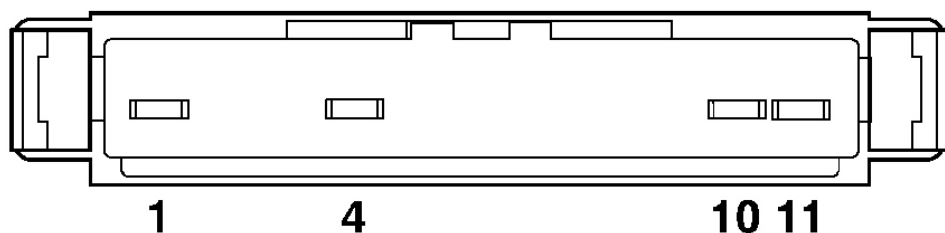
Fig. 9: Power Seat Switch Terminals
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the power seat switch from the power seat. See **REMOVAL**.
3. Use an ohmmeter to test the continuity of the power seat switch. Refer to **PASSENGER POWER SEAT SWITCH CONTINUITY** table. If not OK, replace the faulty power seat switch. If switch tests OK, see **DIAGNOSIS AND TESTING**.

PASSENGER POWER SEAT SWITCH CONTINUITY

SWITCH POSITION	CONTINUITY BETWEEN
OFF	7-1, 7-3, 7-4, 7-5, 7-8, 7-9, 7-10, 7-11
HORIZONTAL FORWARD	6-8, 7-1, 7-3, 7-4, 7-5, 7-9, 7-10, 7-11
HORIZONTAL REARWARD	6-4, 7-1, 7-3, 7-5, 7-8, 7-9, 7-10, 7-11

DRIVER WITH MEMORY SEAT SYSTEM



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Fig. 10: Power Seat Switch Terminals
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the power seat switch from the power seat. See **REMOVAL**.
3. Use an ohmmeter to test the resistance of the power seat switch. Refer to **DRIVER POWER SEAT SWITCH WITH MEMORY SEAT SYSTEM CONTINUITY** table. If not OK, replace the faulty power seat switch. If switch tests OK, see **DIAGNOSIS AND TESTING**.

DRIVER POWER SEAT SWITCH WITH MEMORY SEAT SYSTEM CONTINUITY

SWITCH POSITION	CONTINUITY BETWEEN	RESISTANCE VALUE
OFF	10-4	OPEN
OFF	10-11	OPEN
OFF	1-4	47 OHMS
OFF	1-11	47 OHMS
REAR TILT UP	10-11	169 OHMS
REAR TILT DOWN	10-11	76 OHMS
HORIZONTAL FORWARD	10-11	43 OHMS
HORIZONTAL REARWARD	10-11	10 OHMS
FRONT TILT UP	10-4	169 OHMS
FRONT TILT DOWN	10-4	76 OHMS
ALL RESISTANCE VALUES ARE $\pm$ FIVE PERCENT		

REMOVAL

SEAT SWITCH

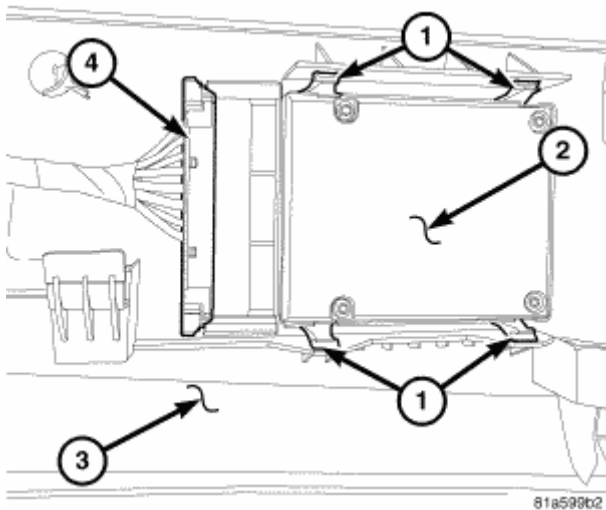


Fig. 11: Identifying Mounting Tabs, Power Seat Switch, Seat Cushion Side Shield & Power Seat Switch Electrical Harness Connector
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the outboard seat cushion side shield (3).
3. Disconnect the power seat switch electrical harness connector (4).
4. Using a small flat bladed tool, gently release the four mounting tabs (1) that secure the power seat switch (2) and separate switch from side shield (3).

INSTALLATION

SEAT SWITCH

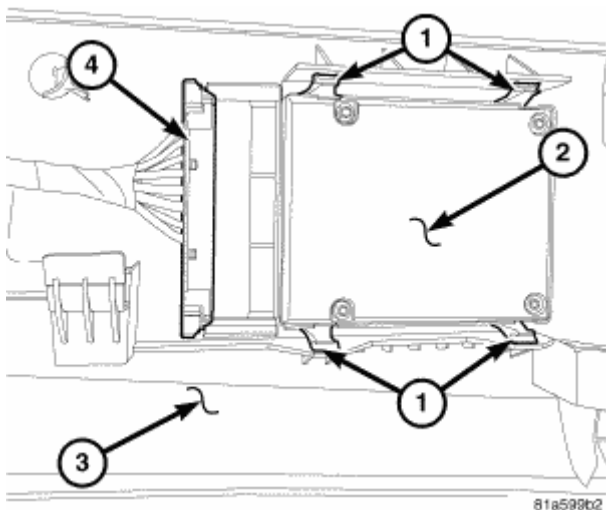


Fig. 12: Identifying Mounting Tabs, Power Seat Switch, Seat Cushion Side Shield & Power Seat Switch Electrical Connector
 Courtesy of CHRYSLER LLC

1. Position the power seat switch (2) onto the seat cushion side shield (3). Gently apply pressure to the switch until the four mounting tabs (1) are fully seated into place.
2. Connect the power seat switch electrical connector (4).
3. Install the seat cushion outboard side shield.
4. Connect the battery negative cable.
5. Verify normal operation of the power seat assembly.

TRACK - POWER SEAT

REMOVAL

POWER SEAT TRACK

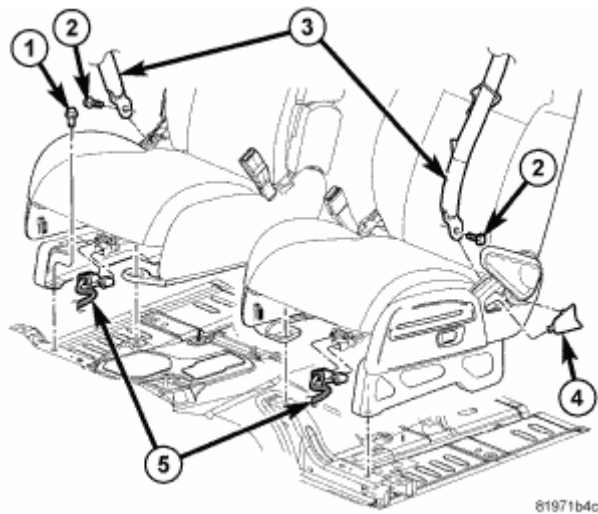
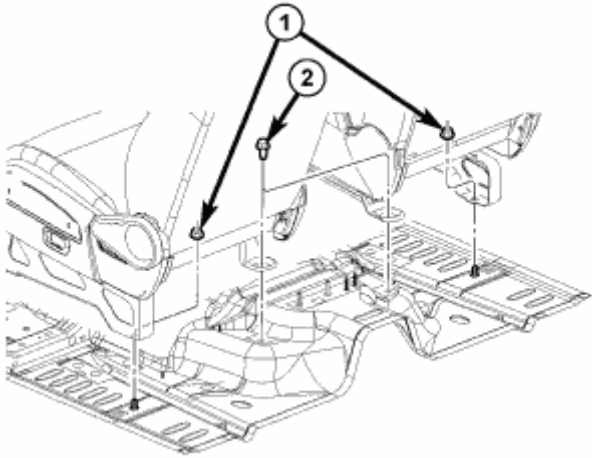


Fig. 13: Side Shield, Seat Belt Bolts, Seat Belts, Front Bolts, Electrical Connectors
 Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. Refer to WARNING .

1. Disconnect and isolate the battery negative cable.
2. Remove the head rests to ease with seat removal.
3. Remove the side shield (4) to expose the seat belt bolts.
4. Position the recliner lever up and remove the seat belt bolts (2) and seat belts (3). Refer to REMOVAL .
5. Slide the seats back and remove the front bolts (1).
6. Disconnect the electrical connectors (5).



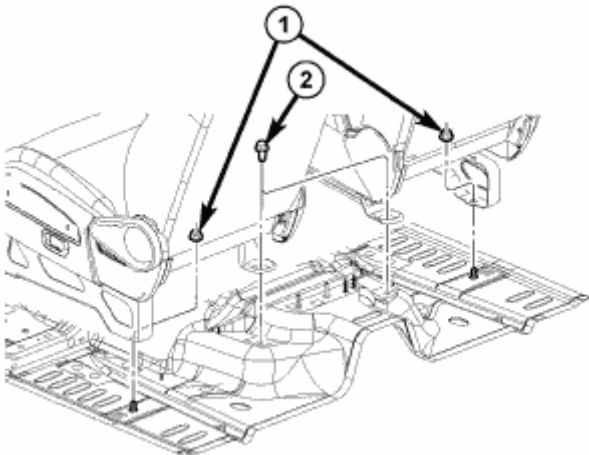
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Fig. 14: Rear Nuts and Bolts
Courtesy of CHRYSLER LLC

7. Slide the seats to forward position and remove the rear nuts (1) and bolts (2).
8. Remove the seats from the vehicle.
9. Remove bolts attaching seat frame to cushion pan.
10. Disconnect wire harness fasteners from cushion pan.
11. Remove seat back.
12. Remove seat cushion tension springs.
13. Remove power seat track nuts.
14. Remove power seat track from riser.
15. Remove any parts that need to be transferred to the new seat track assembly.

INSTALLATION

POWER SEAT TRACK



81971b50

Fig. 15: Rear Nuts and Bolts
Courtesy of CHRYSLER LLC

WARNING: Before proceeding with the following repair procedure, review all warnings and cautions. Refer to WARNING .

NOTE: Start all seat fasteners first before tightening to specifications.

1. Install the seats to the vehicle.
2. Install any parts that need to be transferred from the old seat track assembly.
3. Place power seat track in position on the seat frame ensuring motor is installed correctly into seat risers.
4. Install power seat track to seat riser nuts.
5. Install seat springs.
6. Connect wire harness fasteners to the cushion pan.
7. Install bolts attaching power seat track to cushion pan.
8. Install seat back. Tighten recliner bolts to 12 N.m (9 ft. lbs.) torque. Tighten pivot bolts to 40 N.m (30 ft. lbs.) torque.
9. Slide the seats to the rearward position, connect the electrical connectors (5) and install the bolts (1).
10. Tighten the inboard bolts first then tighten the outboard bolts (1) to 62 N.m (46 ft. lbs.).
11. Install the seat belts (3) and bolts (2). Refer to INSTALLATION .

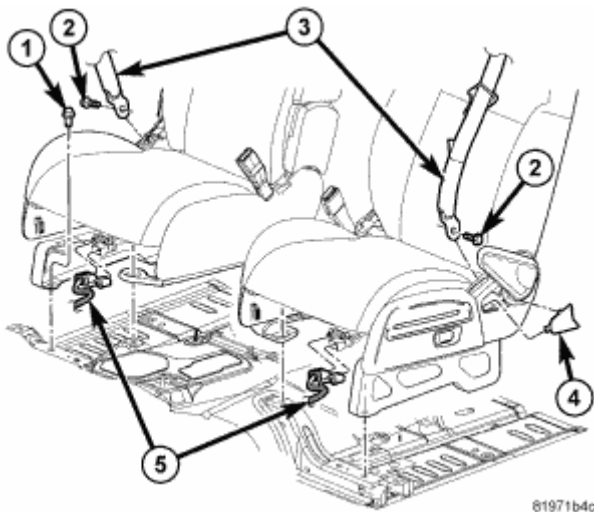


Fig. 16: Side Shield, Seat Belt Bolts, Seat Belts, Front Bolts, Electrical Connectors
Courtesy of CHRYSLER LLC

12. Tighten the rear nuts (1) to 62 N.m (46 ft. lbs.).
13. Tighten the rear bolts (2) to 62 N.m (46 ft. lbs.).
14. Install the side shield (4) to the seats.
15. Install the head rest to the seats.

16. Do not reconnect the battery negative cable at this time. The supplemental restraint system verification test procedure should be performed following service of any supplemental restraint system component. Refer to **STANDARD PROCEDURE** .
17. Following successful completion of the supplemental restraint system verification test procedure, perform the Occupant Classification System Verification Test using a scan tool.
18. Verify normal operation of the power seat assembly.

2008 ACCESSORIES AND EQUIPMENT

Power Top-Full Open Retractable - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B210A</u>	SYSTEM VOLTAGE LOW
<u>B210B</u>	SYSTEM VOLTAGE HIGH
<u>B210D</u>	BATTERY VOLTAGE LOW - MEMORY MIRROR MODULE
<u>B210E</u>	BATTERY VOLTAGE HIGH - MEMORY MIRROR MODULE
<u>B2125</u>	SENSOR SUPPLY VOLTAGE PERFORMANCE
<u>B2206</u>	CURRENT VIN MISSING/MISMATCH
<u>B2227</u>	SUNROOF ECU INTERNAL
<u>B2582</u>	FULL OPEN ROOF REARWARD OPEN SWITCH CIRCUIT PERFORMANCE
<u>B2585</u>	FULL OPEN ROOF FORWARD OPEN SWITCH CIRCUIT PERFORMANCE
<u>B2588</u>	FULL OPEN ROOF CLOSE SWITCH CIRCUIT PERFORMANCE
<u>B258B</u>	FULL OPEN ROOF FRONT MOTOR CONTROL PERFORMANCE
<u>B258F</u>	FULL OPEN ROOF REAR MOTOR CONTROL PERFORMANCE
<u>B2593</u>	FULL OPEN ROOF FORWARD POSITION SENSOR 1 PERFORMANCE
<u>B2594</u>	FULL OPEN ROOF FORWARD POSITION SENSOR 2 PERFORMANCE
<u>B2595</u>	FULL OPEN ROOF REARWARD POSITION SENSOR 1 PERFORMANCE
<u>B2596</u>	FULL OPEN ROOF REARWARD POSITION SENSOR 2 PERFORMANCE
<u>U0010</u>	CAN INTERIOR BUS
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN

POWER TOP-FULL OPEN RETRACTABLE DIAGNOSTICS

DIAGNOSIS AND TESTING

B210A-SYSTEM VOLTAGE LOW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Sunroof Module detects input voltage below 10.0 volts for over 15 seconds, this code will set.

Possible Causes

Possible Causes
LOW BATTERY VOLTAGE (A959) FUSED B+ CIRCUIT HIGH RESISTANCE SUNROOF MODULE

Diagnostic Test

1. **CHECK ENGINE DTC's**

NOTE: **Ensure the battery is fully charged and serviceable before proceeding.**

With the scan tool, read ENGINE DTC's

Are there any ENGINE DTC's present?

No

Go To 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, record and erase DTC's

Start the engine and run for two minutes.

With the scan tool, read DTC's.

Does the scan tool display B210A-SYSTEM VOLTAGE LOW?

Yes

Go To 3.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **CHECK THE (A906) FUSED B+ CIRCUIT FOR HIGH RESISTANCE**

Using the scan tool, read the Battery Voltage of the Sunroof Module.

Using the scan tool, read the Battery Voltage of the TIPM (Central Gateway).

Is the voltage within 0.2 volt of each module?

Yes

Replace the Sunroof Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (A906) Fused B+ circuit for high resistance.

Perform **BODY VERIFICATION TEST - VER 1** .

B210B-SYSTEM VOLTAGE HIGH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- Set Condition:**

When the Sunroof Module detects input voltage above 16 volts for over 15 seconds, this code will set.

Possible Causes

Possible Causes
HIGH BATTERY VOLTAGE SUNROOF MODULE

Diagnostic Test

1. CHECK ENGINE DTC's

NOTE: Ensure the battery is fully charged and serviceable before proceeding.

With the scan tool, read ENGINE DTC's

Are there any ENGINE DTC's present?

No

Go To 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase DTC's

Start the engine and run for two minutes.

With the scan tool, read DTC's.

Does the scan tool display B210B-SYSTEM VOLTAGE HIGH?

Yes

Replace the Power Sunroof Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B210D-BATTERY VOLTAGE LOW - MEMORY MIRROR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Anytime the module senses voltage input below 9.0 volts (motor operating or not). After this code is set, it becomes stored when the voltage exceeds 9.1 volts.

Possible Causes

Possible Causes
LOW VOLTAGE ENGINE DTC (A906) FUSED B(+) CIRCUIT RESISTANCE SUNROOF MOTOR/MODULE

Diagnostic Test

1. **CHECK ENGINE DTC's**

NOTE: **Ensure the battery is fully charged before proceeding.**

With the scan tool, read ENGINE DTC's

Are there any ENGINE BATTERY OR CHARGING SYSTEM DTC's present?

No

Go to 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, record and erase DTC's

Start the engine and run for 2 minutes.

Turn the ignition off.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display BATTERY VOLTAGE LOW in the Sunroof module only?

Yes

Go To 4.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE SUNROOF MOTOR/MODULE

NOTE: To further diagnose the sunroof, it is necessary to lower or remove the headliner.

Turn the ignition off.

Disconnect the Sunroof Motor/Module harness connector.

NOTE: Ensure the A-Pillar connector is connected before proceeding.

Test for an open or high resistance on the (A906) Fused B(+) circuit by connecting a 12-volt test light between the (A932) Fused B(+) circuit and the (Z919) Ground circuit in the Sunroof Motor/Module harness connector. The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Replace the Sunroof Motor/Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. CHECK (A906) FUSED B(+) AND (Z919) GROUND CIRCUITS FOR AN OPEN

NOTE: Ensure the A-Pillar connector is connected before proceeding.

Using a 12-volt test light connected to 12 volts, probe the (Z919) Ground circuit in the Sunroof Motor/Module harness connector. The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Repair the (A906) Fused B(+) circuit for an open or high resistance.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z919) Ground circuit for an open or high resistance.
Perform **BODY VERIFICATION TEST - VER 1** .

B210E-BATTERY VOLTAGE HIGH - MEMORY MIRROR MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Anytime the module senses voltage input above 16 volts. This code will become stored when the voltage drops below 15.9 volts.

Possible Causes

Possible Causes
HIGH VOLTAGE ENGINE DTC SUNROOF MOTOR/ MODULE

Diagnostic Test

1. CHECK ENGINE DTC's

With the scan tool, read ENGINE DTC's

Are there any ENGINE DTC's present?

No

Go to 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase DTC's

Start the engine and run for two minutes.

Cycle the ignition from on to off three times.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display BATTERY VOLTAGE HIGH in this module only?

Yes

Replace the Sunroof Motor/Module in accordance with service information. Refer to **REMOVAL** .
Refer to **REMOVAL** .

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B2125-SENSOR SUPPLY VOLTAGE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Sunroof module is awake.

Set Conditions

- **Set Condition:**

Whenever the module has determined that there is a motor or electronic malfunction, this code will set.

Possible Causes

Possible Causes
SUNROOF MOTOR/MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Sunroof Switch in all positions several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Replace the Sunroof Motor/Module.

Perform the Sunroof Position Calibration, refer to **STANDARD PROCEDURE** . Perform the Excessive Force Limitation Calibration, , refer to **STANDARD PROCEDURE** .

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Operate the Sunroof several times and recheck for DTC's. If the code reappears now or later, replace the Sunroof Motor/Module.

B2206-CURRENT VIN MISSING/MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The module will receive and monitor the VIN message from the PCM and record the VIN if different from the last VIN.

Possible Causes

Possible Causes
INCORRECT VIN PROGRAMMED IN PCM
SUNROOF MOTOR/MODULE

Diagnostic Test

1. **CHECK FOR ACTIVE DTC**

With the scan tool, read the active DTC's.

Cycle the ignition switch from off to on at least 5 times, leaving the ignition on for a minimum of 90 seconds per cycle.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

2. **CHECK VIN IN PCM**

With the scan tool compare the VIN that is programmed into the PCM to the VIN on the vehicle.

Does the VIN programmed into the PCM match the vehicles VIN?

Yes

Inspect the wiring and connectors for damage or shorted circuits. If ok, replace and program the Sunroof Motor/Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Program the correct VIN in the PCM and retest.
Perform **BODY VERIFICATION TEST - VER 1** .

B2227-SUNROOF ECU INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Sunroof module is awake.

Set Conditions

- **Set Condition:**

Whenever the module has determined that there is a motor or electronic malfunction, this code will set.

Possible Causes

Possible Causes
SUNROOF MOTOR/MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Sunroof Switch in all positions several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Replace the Sunroof Motor/Module.

Perform the Sunroof Position Calibration, refer to **STANDARD PROCEDURE** . Perform the Excessive Force Limitation Calibration, , refer to **STANDARD PROCEDURE** .

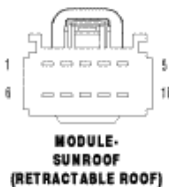
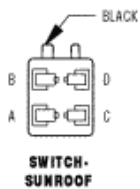
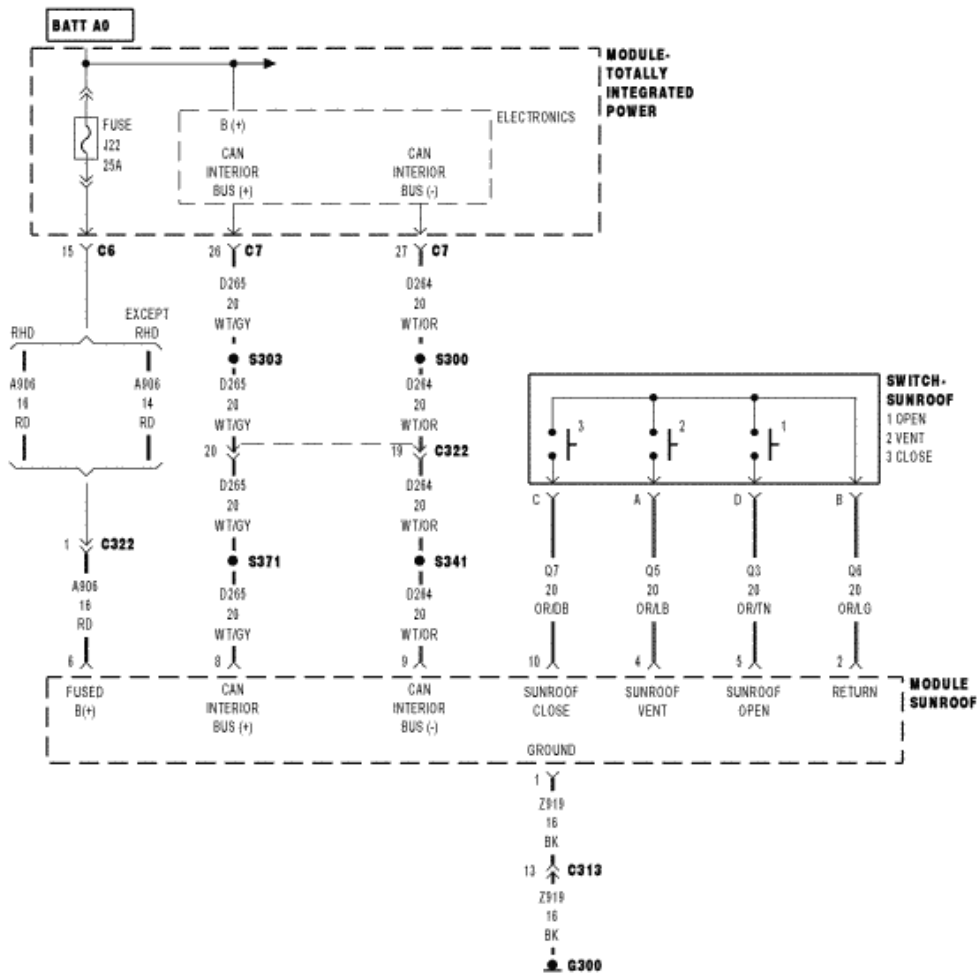
Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Operate the Sunroof several times and recheck for DTC's. If the code reappears now or later, replace the Sunroof Motor/Module.

B2582-FULL OPEN ROOF REARWARD OPEN SWITCH CIRCUIT PERFORMANCE

Circuit Schematic



014000a7

Fig. 1: Full Open Roof Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Anytime the Sunroof is being operated.

Set Conditions

- **Set Condition:**

This code will set when the Sunroof/Motor Module does not receive the Sunroof Switch signal.

Possible Causes

Possible Causes
SUNROOF SWITCH
SUNROOF/MOTOR MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Sunroof.

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE POWER SUNROOF SWITCH**

Using the scan tool monitor the Sunroof Switch inputs.

Does the Sunroof Switch change state?

No

Replace the Sunroof Switch in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

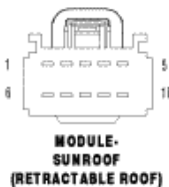
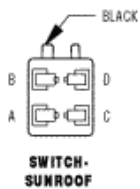
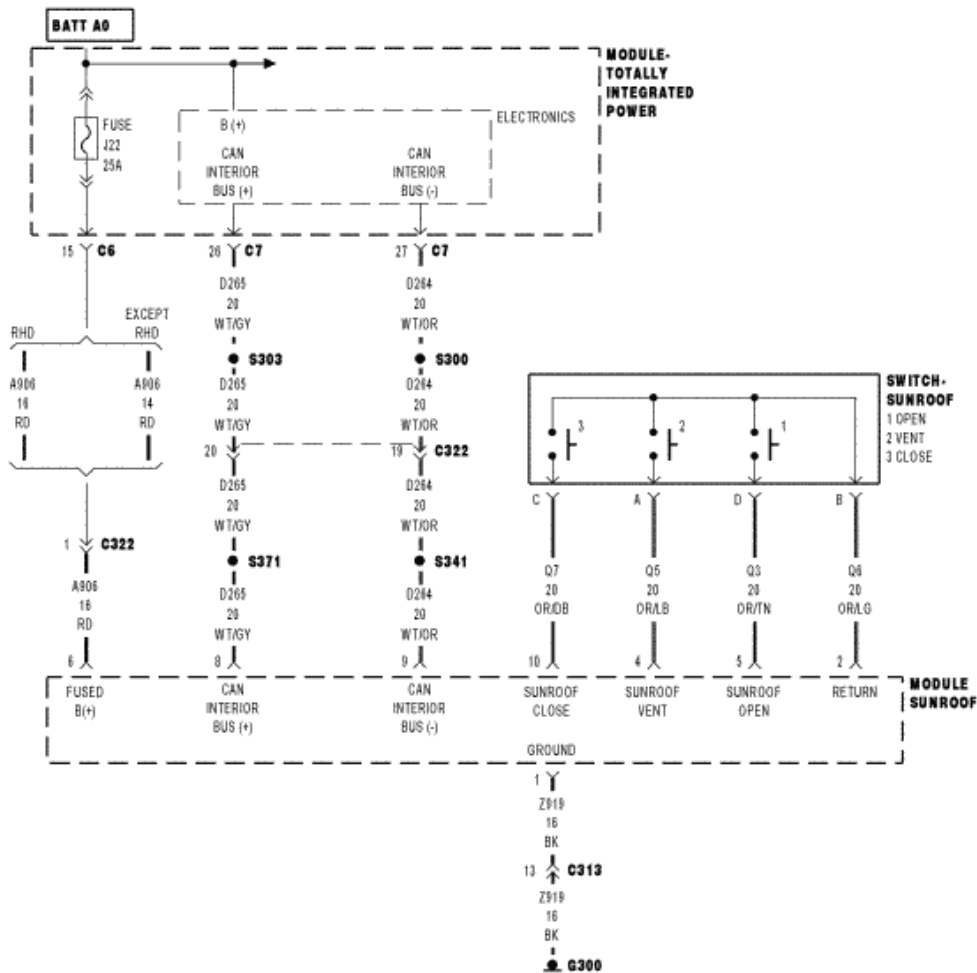
Yes

Replace the Sunroof/Motor Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2585-FULL OPEN ROOF FORWARD OPEN SWITCH CIRCUIT PERFORMANCE

Circuit Schematic



014000a7

Fig. 2: Full Open Roof Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

This code will set when the Full Open Roof Control Module does not receive the switch input within 500 msec after power up.

Possible Causes

Possible Causes
SUNROOF SWITCH SUNROOF MOTOR/MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's and any DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Sliding Roof.

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE POWER ROOF FOR MECHANICAL PROBLEMS**

Examine the Full Power Roof for proper alignment, worn or binding rollers and cables, loose/damaged

weatherstrip, and track assembly for wear or anything that would cause an obstruction to proper operation.

Were there any mechanical problems found?

Yes

Refer to appropriate Service information article for the related symptom(s).

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE FULL POWER ROOF SWITCH

Turn the ignition off.

Turn the ignition on.

With the scan tool, monitor the Full Power Roof Switch state.

Does the state of the Full Power Roof Switch change when the switch is operated?

No

Replace the Full Power Roof Switch in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

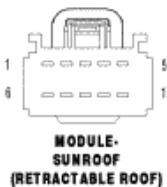
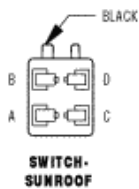
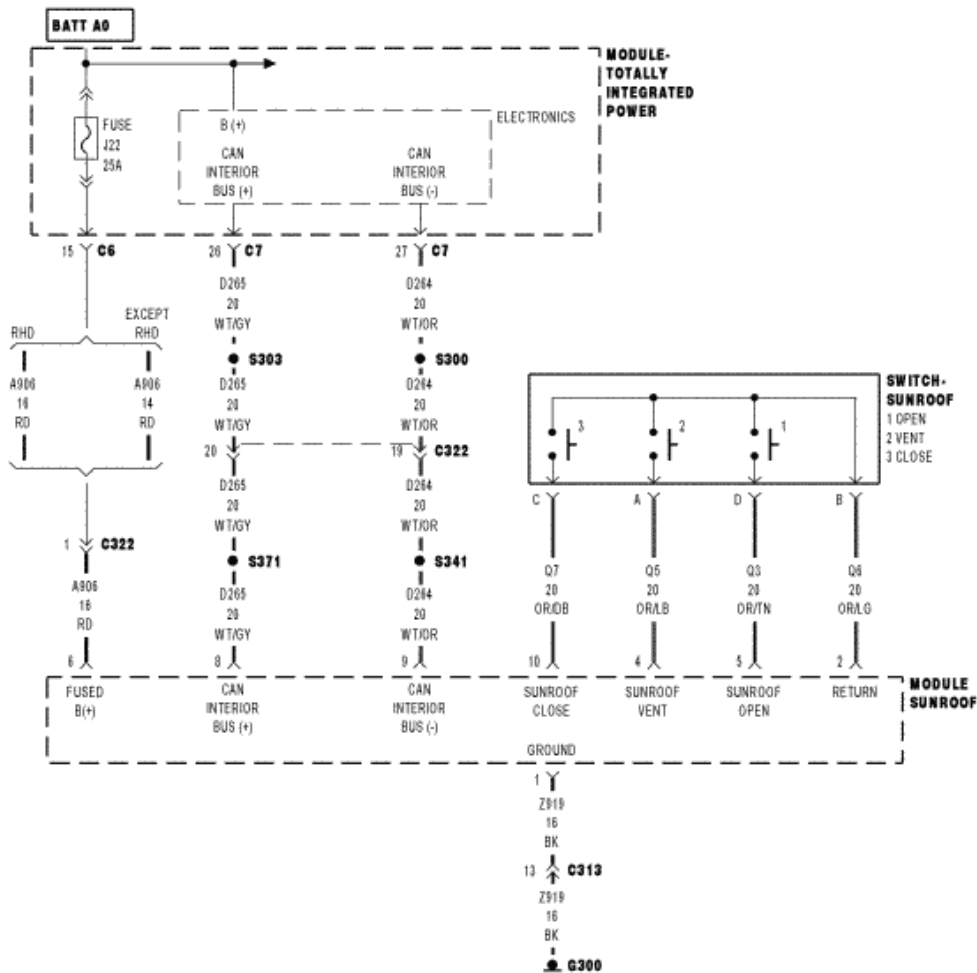
Yes

Replace the Full Power Roof Motor/Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2588-FULL OPEN ROOF CLOSE SWITCH CIRCUIT PERFORMANCE

Circuit Schematic



014000a7

Fig. 3: Full Open Roof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Anytime the Full Power Top Switch is in operation.

Set Conditions

- **Set Condition:**

This code will set when the Power Top Module does not see any top movement 500 msec after switch activation.

Possible Causes

Possible Causes
POWER SUNROOF HARNESS SUNROOF SWITCH POWER SUNROOF MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's and any Power Top DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE POWER SUNROOF SWITCH**

Using the scan tool check for proper sunroof switch operation.

Does the scan tool show the switch change state when operated?

Yes

Replace the Full Power Top Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **POWER SUNROOF MODULE**

Turn the ignition off.

Check the Full Power Top jumper harness for possible damage.

Is there any present damage to the harness?

No

Replace the Full Power Top Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

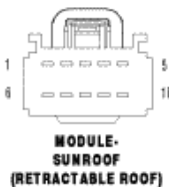
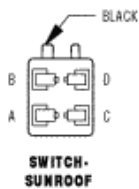
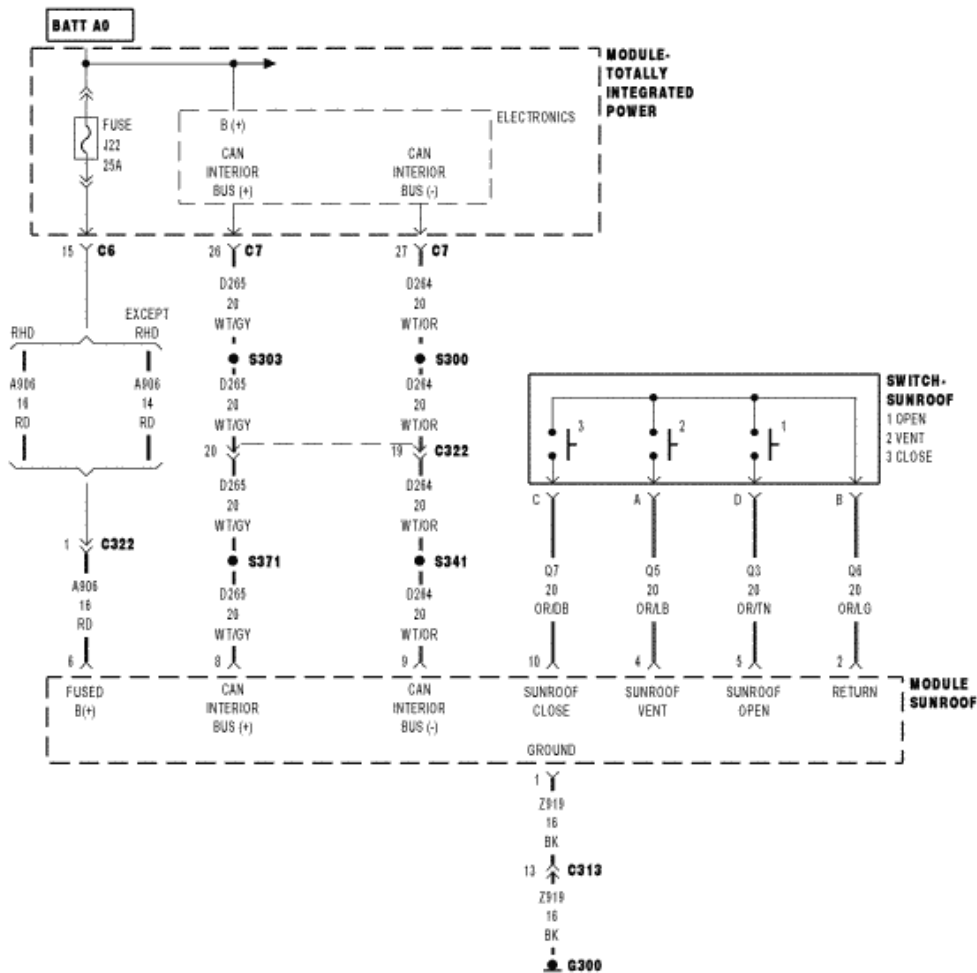
Yes

Replace the Full Power Top jumper harness in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B258B-FULL OPEN ROOF FRONT MOTOR CONTROL PERFORMANCE

Circuit Schematic



014000a7

Fig. 4: Full Open Roof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Front Power Top Motor does not operate.

Possible Causes

Possible Causes
FRONT POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **FRONT POWER TOP CONTROL MOTOR**

Disconnect the Front Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Front Power Top Control Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

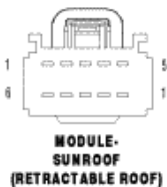
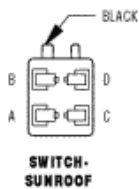
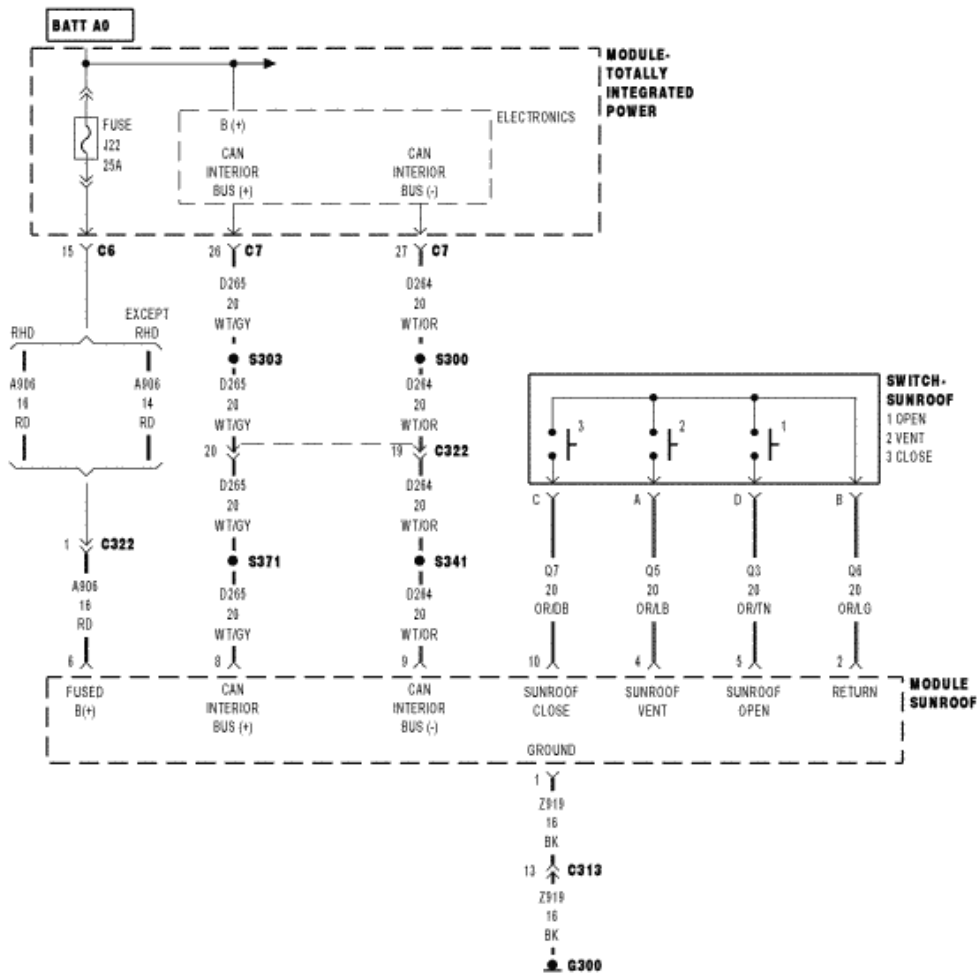
No

Replace the Power Top Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B258F-FULL OPEN ROOF REAR MOTOR CONTROL PERFORMANCE

Circuit Schematic



014000a7

Fig. 5: Full Open Roof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Rear Power Top Motor does not operate.

Possible Causes

Possible Causes
REAR POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REAR POWER TOP CONTROL MOTOR**

Disconnect the Rear Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Rear Power Top Control Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

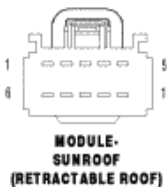
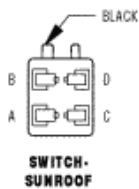
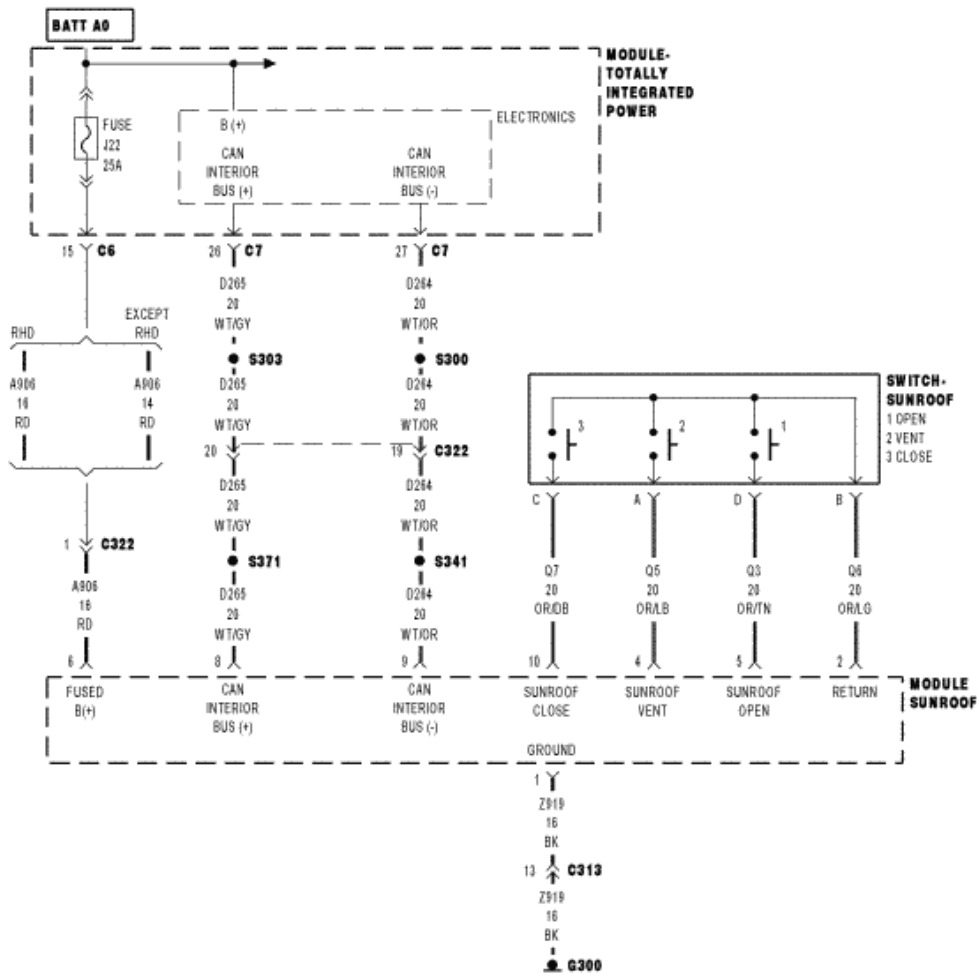
No

Replace the Power Top Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2593-FULL OPEN ROOF FORWARD POSITION SENSOR 1 PERFORMANCE

Circuit Schematic



014000a7

Fig. 6: Full Open Roof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Forward Power Top Motor does not operate.

Possible Causes

Possible Causes
FORWARD POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **FORWARD POWER TOP CONTROL MOTOR**

Disconnect the Forward Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Forward Power Top Control Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

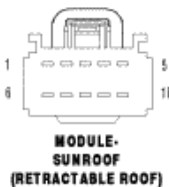
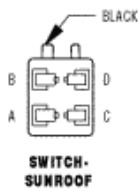
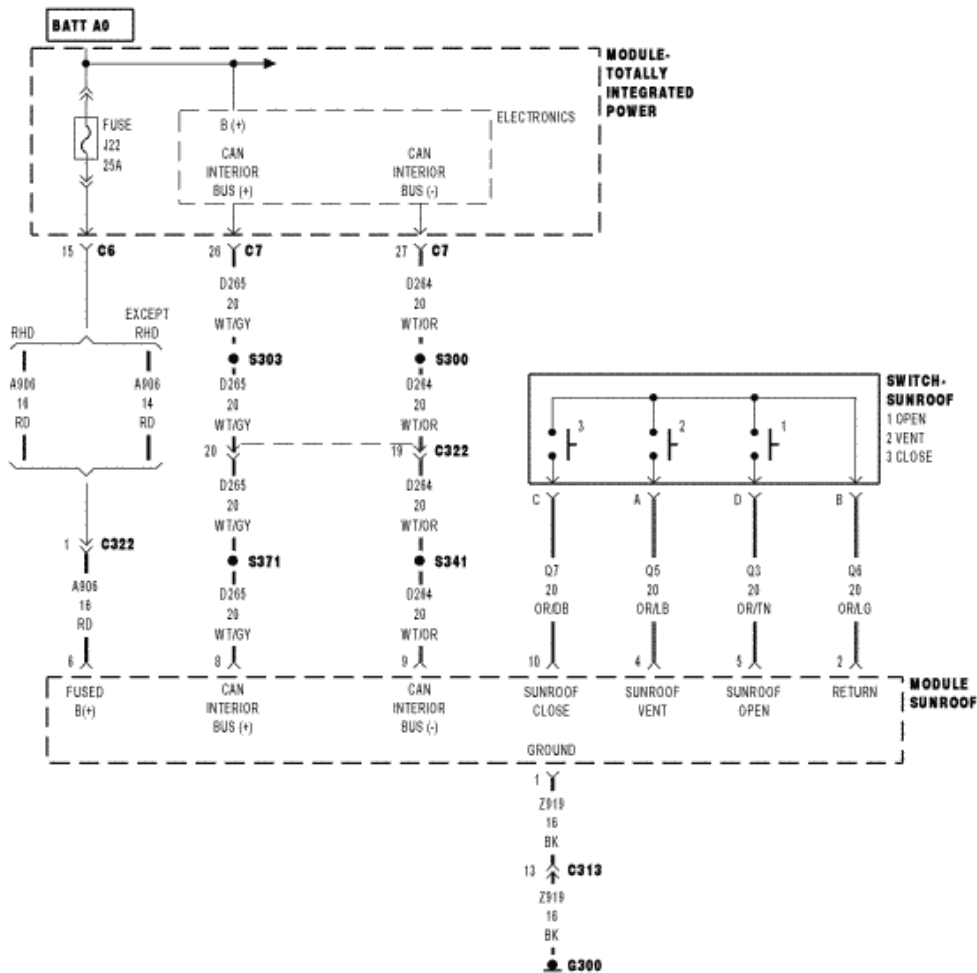
No

Replace the Power Top Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2594-FULL OPEN ROOF FORWARD POSITION SENSOR 2 PERFORMANCE

Circuit Schematic



014000a7

Fig. 7: Full Open Roof Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Forward Power Top Motor does not operate.

Possible Causes

Possible Causes
FORWARD POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REAR POWER TOP CONTROL MOTOR**

Disconnect the Forward Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Forward Power Top Control Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

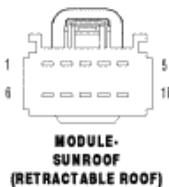
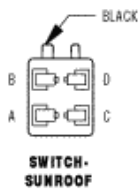
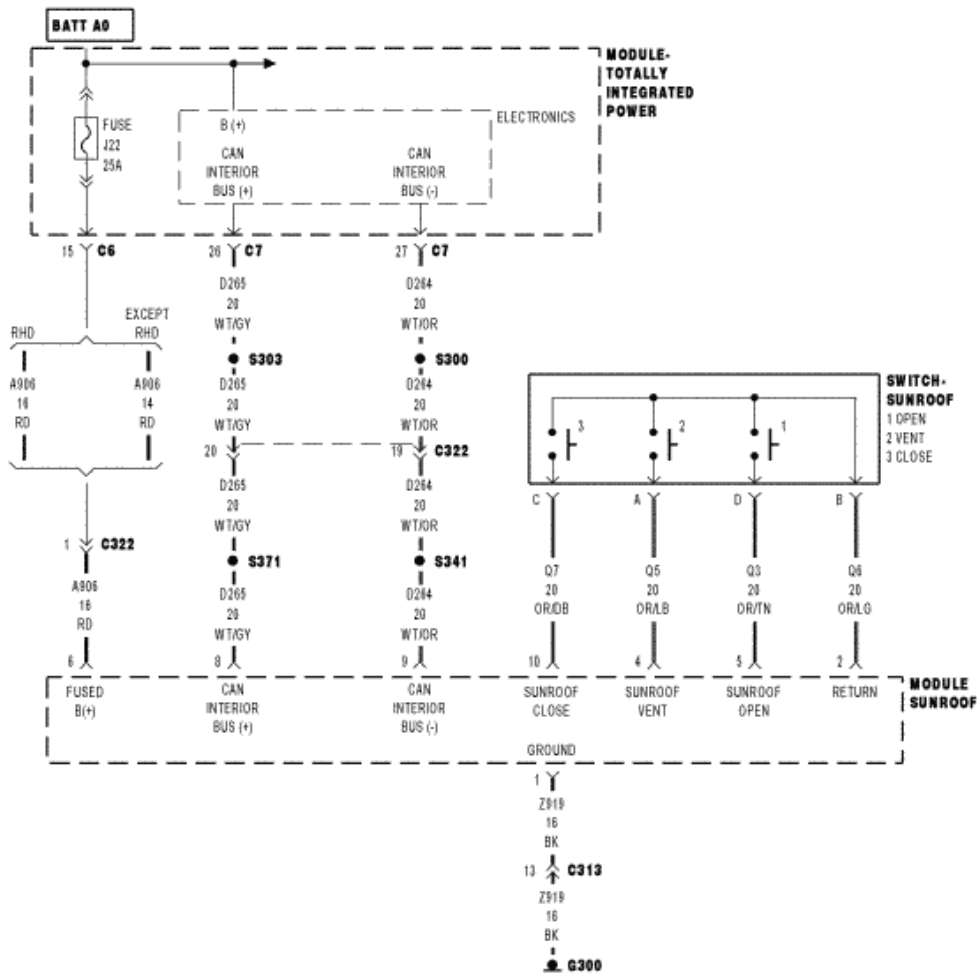
No

Replace the Power Top Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2595-FULL OPEN ROOF REARWARD POSITION SENSOR 1 PERFORMANCE

Circuit Schematic



014000a7

Fig. 8: Full Open Roof Module Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Rear Power Top Motor does not operate.

Possible Causes

Possible Causes
REAR POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REAR POWER TOP CONTROL MOTOR**

Disconnect the Rear Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Rear Power Top Control Motor in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

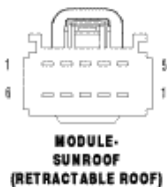
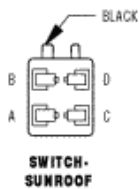
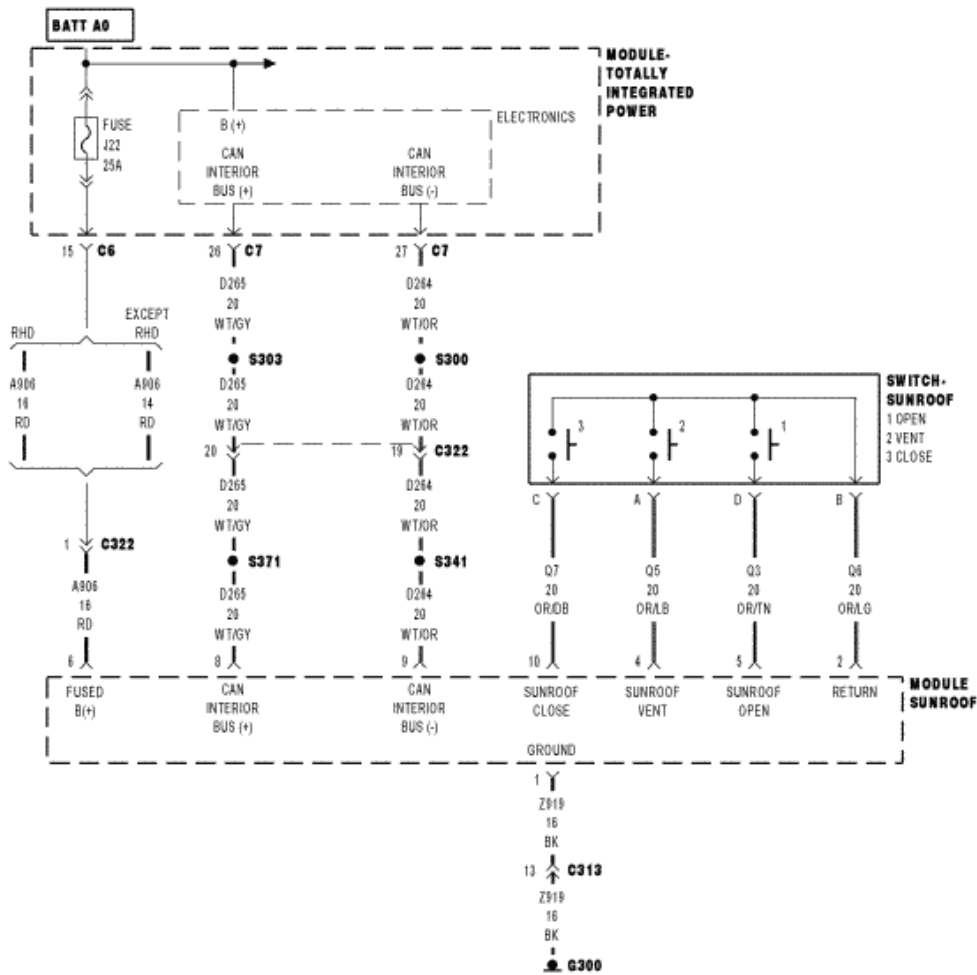
No

Replace the Power Top Control Module in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2596-FULL OPEN ROOF REARWARD POSITION SENSOR 2 PERFORMANCE

Circuit Schematic



014000a7

Fig. 9: Full Open Roof Module Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

When the Power Top Module receives an input from the Power Top Switch and the Rear Power Top Motor does not operate.

Possible Causes

Possible Causes
REAR POWER TOP MOTOR POWER TOP CONTROL MODULE

Diagnostic Test

1. **CHECK FOR DTCS**

With the scan tool, record DTC's.

Erase the DTCs.

Turn the ignition off, wait 10 seconds, then turn the ignition on.

Attempt to operate the Power Top

With the scan tool, read DTCs.

Does the scan tool display this DTC?

Yes

Go To 2.

No

Using the wiring diagrams as a guide, inspect the wiring and connectors for an intermittent condition.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **REAR POWER TOP CONTROL MOTOR**

Disconnect the Rear Power Top Control Motor harness connector.

Using a volt meter measure the voltage at the Power Top Control Motor.

Does the volt meter display above 10.0 volts?

Yes

Replace the Rear Power Top Control Motor in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Power Top Control Module in accordance with the service information.
Perform **BODY VERIFICATION TEST - VER 1** .

U0010-CAN INTERIOR BUS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously

Set Conditions

• **Set Condition:**

Whenever the CAN C Interior Bus (125K) (+) or CAN C Interior Bus (125K) (-) circuit is open, shorted to voltage or shorted to ground.

Possible Causes

Possible Causes
CAN C INTERIOR BUS (125K) DTCs IN THE TOTALLY INTEGRATED POWER MODULE (TIPM) (D265) CAN C INTERIOR BUS (125K) (+) CIRCUIT OPEN (D264) CAN C INTERIOR BUS (125K) (-) CIRCUIT OPEN SUNROOF MOTOR/MODULE

Diagnostic Test

1. CHECK FOR ACTIVE DTCS

Turn the ignition on.

With the scan tool, read the active DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2.

No

If the DTC is stored, check for an intermittent condition. Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK TIPM DTCS

With the scan tool, read TIPM active DTC's

Does the scan tool display any active CAN C INTERIOR BUS DTCS?

Yes

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

No

Go To 3.

3. CHECK THE (D265) CAN C INTERIOR BUS (125K) (+) CIRCUIT FOR A SHORT TO VOLTAGE

Turn the ignition off.

Disconnect the negative battery cable.

Disconnect the Sunroof Motor/Module harness connector.

Disconnect the TIPM C7 harness connector.

Turn the ignition on.

Measure the voltage of the (D265) CAN Interior Bus (125K) (+) circuit in the TIPM C7 harness connector.

Is the voltage below 0.2 volts?

Yes

Go To 4.

No

Repair the (D265) CAN C Interior Bus (125K) (+) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

4. **CHECK THE (D264) CAN C INTERIOR BUS (125K) (-) CIRCUIT FOR A SHORT TO VOLTAGE**

Turn the ignition on.

Measure the voltage of the (D264) CAN Interior Bus (125K) (-) circuit in the TIPM C7 harness connector.

Is the voltage below 0.2 volts?

Yes

Go To 5.

No

Repair the (D264) CAN C Interior Bus (125K) (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

5. **CHECK THE (D265) CAN C INTERIOR BUS (125K) (+) CIRCUIT FOR A SHORT TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D265) CAN Interior Bus (125K) (+) circuit in the TIPM C7 harness connector.

Is the resistance above 10,000 ohms?

Yes

Go To 6.

No

Repair the (D265) CAN C Interior Bus (125K) (+) circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

6. **CHECK THE (D264) CAN C INTERIOR BUS (125K) (-) CIRCUIT FOR A SHORT TO GROUND**

Turn the ignition off.

Measure the resistance between ground and the (D264) CAN Interior Bus (125K) (-) circuit in the TIPM C7 harness connector.

Is the resistance above 10,000 ohms?

Yes

Go To 7.

No

Repair the (D264) CAN C Interior Bus (125K) (-) circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

7. CHECK THE (D265) CAN C INTERIOR BUS (125K) (+) CIRCUIT FOR AN OPEN

Measure the resistance of the (D265) CAN Interior Bus (125K) (+) circuit between the TIPM C7 harness connector and the Sunroof Motor/Module harness connector.

Is the resistance below 2.0 ohms?

Yes

Go To 8.

No

Repair the (D265) CAN C Interior Bus (125K) (+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

8. CHECK THE (D264) CAN C INTERIOR BUS (125K) (-) CIRCUIT FOR AN OPEN

Measure the resistance of the (D264) CAN C Interior Bus (125K) (-) circuit between the TIPM C7 harness connector and the Sunroof Motor/Module harness connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Sunroof Motor/Module in accordance with the service information.

Perform the Sunroof Position Calibration, refer to **STANDARD PROCEDURE** . Perform the Excessive Force Limitation Calibration, refer to **STANDARD PROCEDURE** .

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D264) CAN C Interior Bus (125K) (-) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

2008 ACCESSORIES AND EQUIPMENT

Power Top/Sunroof - Service Information - Liberty

POWER TOP/SUNROOF - SERVICE INFORMATION

DESCRIPTION

SUNROOF OPERATION

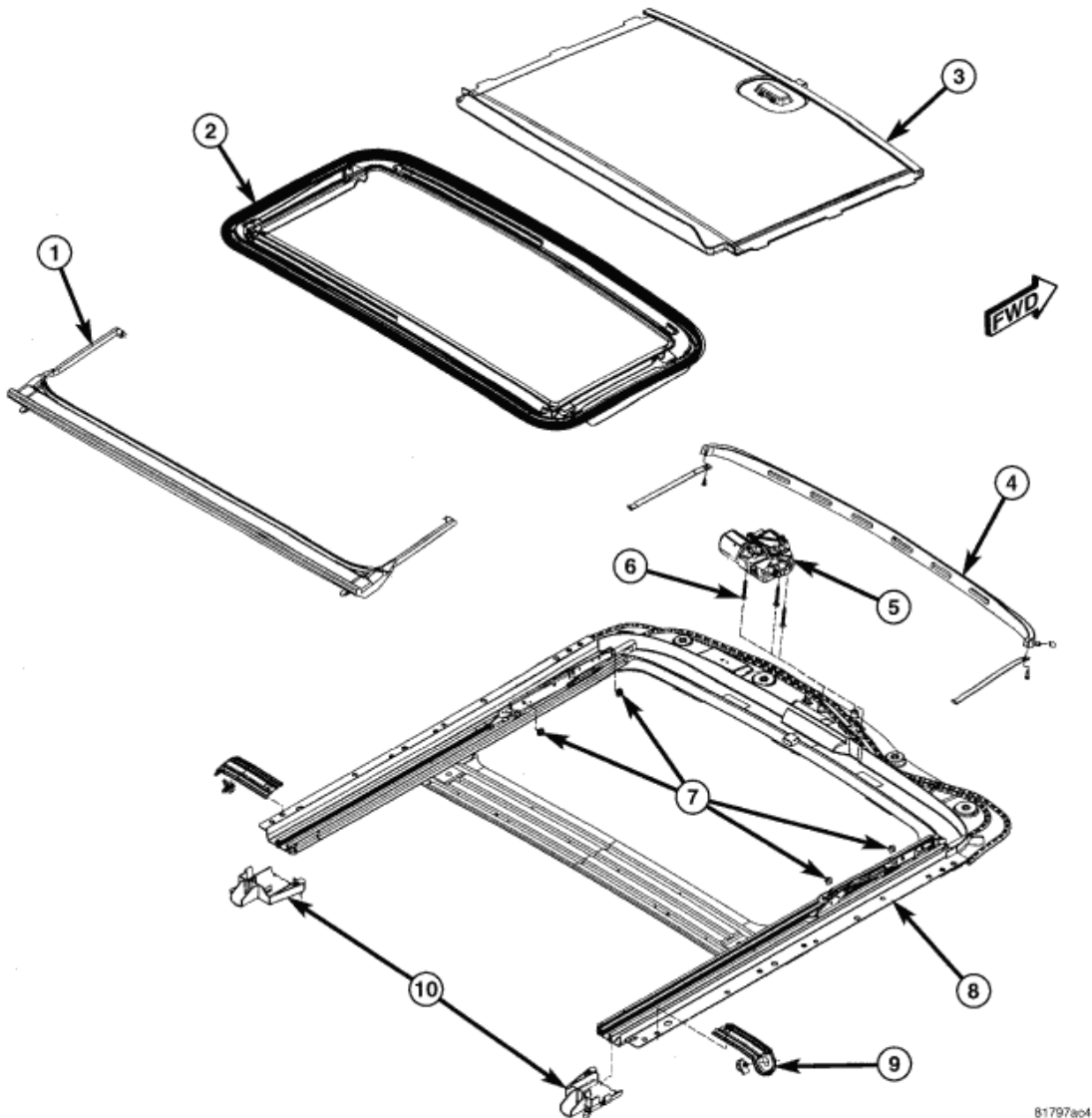


Fig. 1: Power Top/Sunroof Components
Courtesy of CHRYSLER LLC

- 1 - DRAIN TROUGH
- 2 - GLASS ASSEMBLY

- 3 - SUN SHADE
- 4 - WIND DEFLECTOR
- 5 - MOTOR
- 6 - MOTOR SCREWS (3) 3 N.m (26 in. lbs.)
- 7 - GLASS ASSEMBLY SCREWS (4) 3.5 N.m (31 in. lbs.)
- 8 - FRAME ASSEMBLY
- 9 - BRACKETS
- 10 - END CAPS

WARNING: Keep fingers and other body parts out of sunroof opening at all times.

The sunroof features a power sliding glass panel and a sunshade which can be manually positioned anywhere along its travel, rearward of glass panel front edge.

The sunroof is electrically operated from two switches located in the overhead console. To operate the sunroof the ignition switch must be in either the Accessory or On/Run position. One switch (vent) is a push button type and opens the sunroof to the vent position only. The other switch (open/close) is a rocker type for opening and closing the sunroof. Pressing and releasing the open button once the sunroof will express open and the wind deflector will raise. If the button is pressed a second time the sunroof will stop in that position. Pressing and holding the close button will close the sunroof. If the close button is released the sunroof will stop in that position. Also, by pressing the close button the sunroof will close automatically.

SUNROOF OPERATION INSTRUCTIONS

SWITCH INPUTS			
-	OPEN	CLOSE	VENT
FULL VENT	1. Push and hold switch until glass stops in flush closed position glass will then express open 2. Press switch for less than 0.65 seconds for express to full open.	1. Push and hold switch until glass stops in flush closed position. 2. Press switch for less than 0.65 seconds for express to flush closed.	No action -
VENT RANGE	1. Push and hold switch until glass passes through flush closed position. Glass will then open 2. Press switch for less than 0.65 seconds for express to full open.	1. Push and hold switch until glass stops in flush closed position. 2. Press switch for less than 0.65 seconds for express to flush closed.	1. Push and hold switch until glass stops in full vent position. 2. Press switch for less than 0.65 seconds for express to full vent.
	1. Press switch for less than 0.65 seconds for express to full open.	No action	1. Press and hold switch. Glass will travel through flush closed to full vent. Glass will stop when

FLUSH	2. Press switch for more than 0.65 seconds and glass will stop when switch is released	-	switch is released or when fully vented. 2. Press switch for less than 0.65 seconds for express to full vent.
FULL OPEN	No action -	1. Press and hold switch until glass stops in flush closed position or anywhere in between. 2. Press switch for less than 0.65 seconds for express to flush closed.	1. Press and hold switch. Glass will travel through flush closed to full vent. Glass will stop when switch is released. 2. Press switch for less than 0.65 seconds for express to full vent.

OPERATION

POWER SUNROOF

This vehicle has a vent, tilt and slide power sunroof system with express (one-touch) open/close feature. The sunroof system receives battery feed through the "sunroof" relay and a 25 amp mini fuse located in the Totally Integrated Power Module (TIPM). The sunroof system power is supplied when the ignition switch is in the RUN and ACCESSORY positions. The sunroof will operate normally with the key in any position while the Accessory Delay system is active.

The sunroof is electrically operated from two switches located in the overhead console in between the two reading lamps. The "VENT" switch is a push button type switch and opens the sunroof to the vent position only. The other switch "OPEN/CLOSED" is a rocker type switch for opening and closing the sunroof. Pressing and releasing the open button once, the sunroof will express open and the wind deflector will raise. If the button is pressed a second time the sunroof will stop in that position. Pressing and releasing the close button once will express close the sunroof. If the close button is pressed a second time during the express close operation the sunroof will stop in that position.

DIAGNOSIS AND TESTING

DIAGNOSTIC PROCEDURES

Before beginning sunroof diagnostics verify that all other power accessories are in proper operating condition. Refer to **SUNROOF DIAGNOSIS CHART** for possible causes. If not, a common electrical problem may exist. Refer to **SYSTEM WIRING DIAGRAMS** article for circuit, splice and component descriptions. Check the condition of the circuit protection (20 amp circuit breaker in the Totally Integrated Power Module (TIPM)). Inspect all wiring connector pins for proper engagement and continuity. Check for battery voltage at the power sunroof drive motor. Refer to **SYSTEM WIRING DIAGRAMS** article for circuit information. If battery voltage of more than 9 volts is detected at the drive motor, proceed with the following tests (the drive motor will not operate at less than 9 volts).

Before beginning diagnosis for wind noise or water leaks, verify that the problem was not caused by releasing

the control switch before the sunroof was fully closed. The sunroof module has a water-management system. If however, the sunroof glass is in a partial closed position, high pressure water may be forced beyond the water management system boundaries and onto the headlining.

SUNROOF DIAGNOSIS CHART

SYMPTOM	POSSIBLE CAUSE
Sunroof motor inoperative.	Faulty control switch. Faulty circuit ground between sunroof drive motor, control switch, and body harness. Faulty power circuit between sunroof drive motor, control switch, and body harness. Faulty drive motor. Faulty drive motor electrical connector.
Audible whine when switch is depressed, sunroof does not operate.	Faulty drive motor. Binding cable.
Audible clicking or ratcheting when switch is pressed, sunroof does not operate.	Broken or worn drive cable. Worn drive motor gear. Mechanisms not synchronized.
Sunroof vents and opens, but does not close.	Binding cable. Faulty circuit. Faulty control switch. Faulty drive motor. Broken trough guide
Sunroof vents, but does not open.	Binding cable or mechanism. Faulty circuit. Faulty switch. Faulty drive motor.
Sunroof does not vent.	Binding cable or mechanism. Faulty circuit. Faulty control switch. Faulty drive motor.
Sunroof water leak.	Drain tubes clogged or kinked or disconnected from the sunroof. Glass panel improperly adjusted. Faulty glass panel seal.
Gurgling sound from sunroof.	Low spot in drain hose routing, allowing water to stand.
Wind noise from sunroof.	Front of glass panel too high or rear too low. Wind deflector not deploying. Glass not centered in opening. Faulty glass panel seal.
Rattles from open sunroof while driving.	Loose or broken attaching hardware. Worn or broken mechanism.
Sunroof does not stop in the fully closed	Drive motor has lost position of glass, teach procedure

position.

required to reprogram drive motor. Refer to **DRIVE MOTOR TEACH PROCEDURE**.

MOTOR/MODULE - SUNROOF

STANDARD PROCEDURE

DRIVE MOTOR TEACH PROCEDURE

REPLACEMENT DRIVE MOTOR

1. Press and hold the sunroof switch open until the sunroof glass fully opens, automatically reverses direction, and stops at a position just forward of the full open position.
2. Release sunroof switch.
3. Within five seconds of releasing sunroof switch, press and hold the sunroof switch open again until the sunroof glass closes, goes into vent position, and then finally stops in the closed position.
4. Release sunroof switch. Sunroof will now operate normally.

ORIGINAL DRIVE MOTOR

1. Press and hold sunroof switch open until the sunroof glass opens and stops.
2. Release sunroof switch.
3. Press and hold sunroof switch open once again for at least 10 seconds. After 10 seconds of pressing the switch open, the sunroof glass will automatically move and stop at a new location.
4. Release sunroof switch.
5. Within five seconds of releasing the sunroof switch, press and hold the switch open again until the sunroof glass closes, goes into vent position, and then finally stops in the closed position.
6. Release sunroof switch. The sunroof will now operate normally.

REMOVAL

MOTOR-SUNROOF - W/CONTROL UNIT

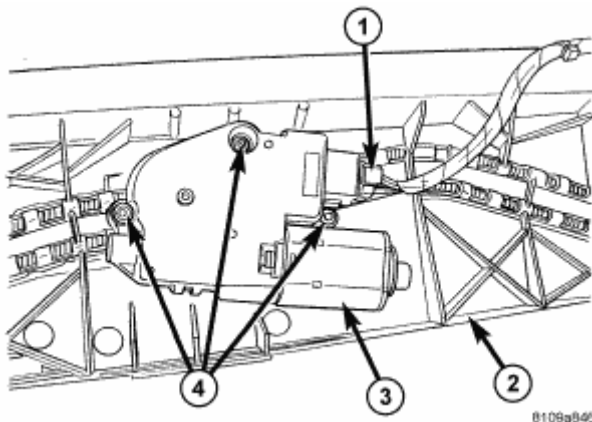


Fig. 2: Sunroof Motor Components (W/Control Unit)

Courtesy of CHRYSLER LLC

- 1 - ELECTRICAL CONNECTOR
- 2 - MODULE ASSEMBLY
- 3 - DRIVE MOTOR
- 4 - MOUNTING SCREWS

1. Remove headliner. Refer to **REMOVAL** .
2. Disconnect the electrical connector (1).
3. Remove three motor assembly attaching screws (4) from bottom side of motor assembly (3) and remove motor assembly from the motor bracket.

INSTALLATION

MOTOR-SUNROOF - W/CONTROL UNIT

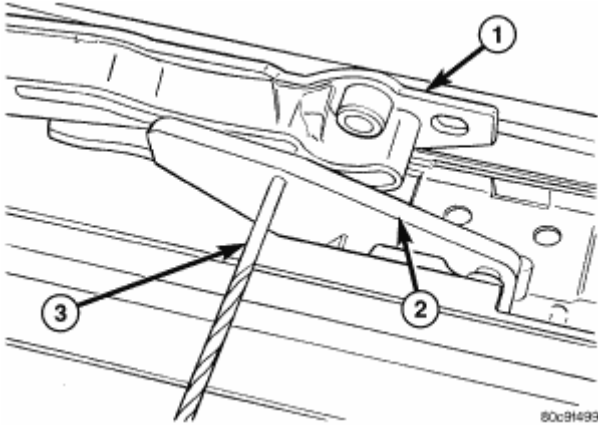


Fig. 3: Lift Arm Positioning
Courtesy of CHRYSLER LLC

- 1 - LIFTER ARM
- 2 - TROLLEY
- 3 - ALIGNMENT PIN

1. If sunroof was open when drive motor was removed, carefully move glass panel into closed position and remove glass panel. Refer to **REMOVAL** .
2. Set lifter arm timing by manually sliding the mechanisms (1) in the track until timing holes in the trollies are aligned with the timing holes in the lifter arm cams (2) and insert pins (3) into the mechanisms to hold mechanisms in closed position.

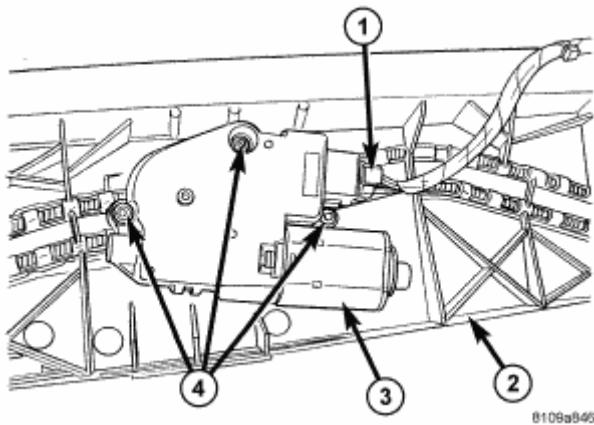


Fig. 4: Sunroof Motor Components (W/Control Unit)
Courtesy of CHRYSLER LLC

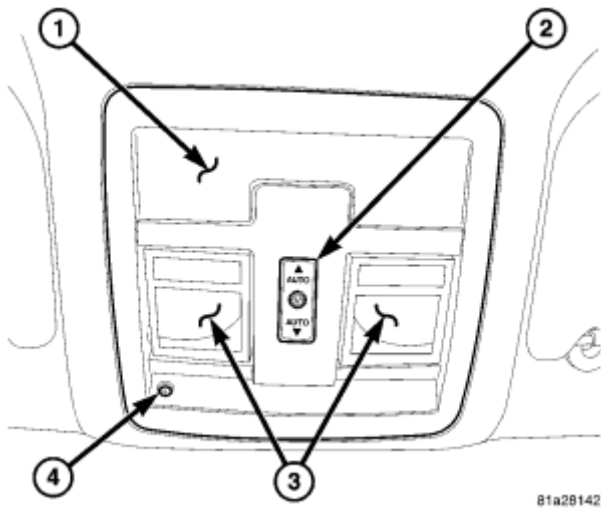
- 1 - ELECTRICAL CONNECTOR
- 2 - MODULE ASSEMBLY
- 3 - DRIVE MOTOR
- 4 - MOUNTING SCREWS

3. Place motor (3) into position and install screws (4) attaching motor to bracket (2).
4. Tighten the screws (4) to 3 N.m (26 in. lbs.).
5. If sunroof glass panel was removed previously, remove the timing pins and install the sunroof glass panel. Refer to **INSTALLATION** .
6. Partially install the headliner and connect the sunroof wiring electrical connectors. Refer to **INSTALLATION** .
7. Temporarily install sunroof switch and perform the sunroof motor teach procedure. See **STANDARD PROCEDURE**.
8. Test sunroof operation, adjust glass as necessary. Refer to **ADJUSTMENTS** .
9. Complete the headliner installation. Refer to **INSTALLATION** .

SWITCH-SUNROOF

DESCRIPTION

SUNROOF SWITCH



81a28142

Fig. 5: Identifying Overhead Console, Sunroof Switch, Courtesy Lamps & Infrared Temperature Sensor
 Courtesy of CHRYSLER LLC

The power sunroof switch (2) is a combination push-button and rocker switch module mounted in the overhead console assembly (1). The sunroof switch is a direct contact unit that is directly wired to the sunroof motor/module assembly. The sunroof switch performs the following functions:

- Power sunroof open (back of switch pushed)
- Power sunroof express open (back of switch pushed and released)
- Power sunroof closed (front of switch pushed)
- Power sunroof express closed (front of switch pushed and released)
- Power sunroof vent (switch center button pushed)

The power sunroof switch is part of the overhead console assembly and cannot be serviced separately. If the switch is damaged or inoperative the overhead console assembly must be replaced. Refer to **REMOVAL** .

OPERATION

SUNROOF SWITCH

The sunroof is electrically operated from two switches located in the headliner on the courtesy/reading lamp assembly. The power sunroof switch is hard wired to the sunroof motor/module assembly. The "VENT" switch is a push button type switch and opens the sunroof to the vent position only. The other switch "OPEN/CLOSED" is a rocker type switch for opening and closing the sunroof. Pressing and releasing the open button once, the sunroof will express open and the wind deflector will raise. If the button is pressed a second time the sunroof will stop in that position. Pressing and releasing the close button once will express close the sunroof. If the close button is pressed a second time during the express close operation the sunroof will stop in that position.

The switch is grounded at one terminal and receives a 5 volt signal from the sunroof motor/module on the remaining three terminals. The switch pulls down the 5 volt reference voltage from the module signaling it to perform the desired function.

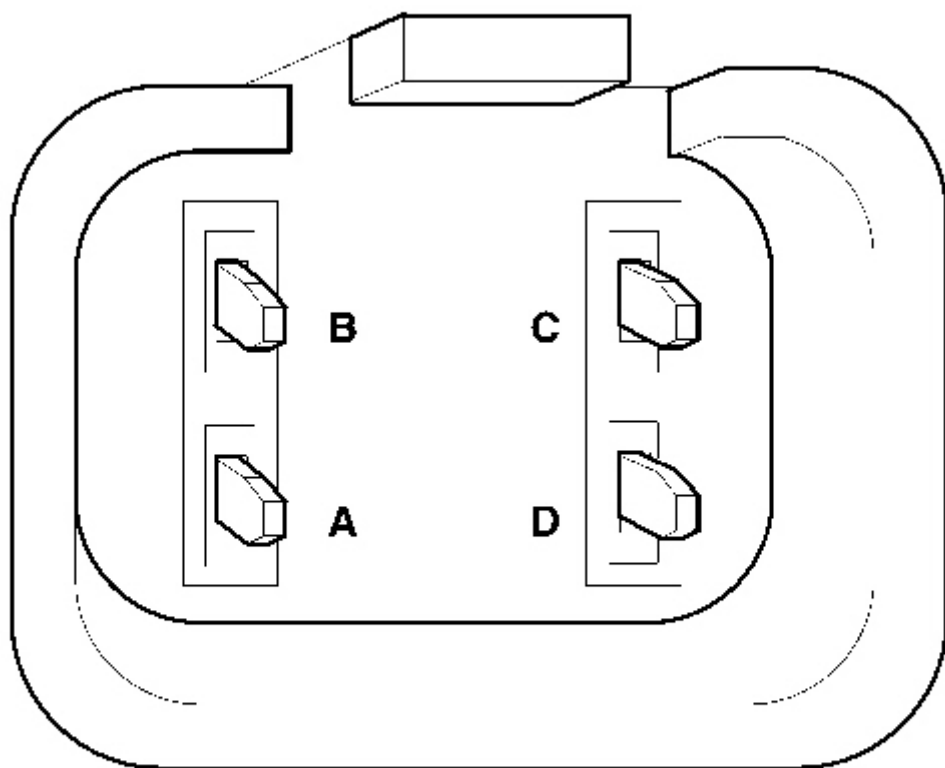
For complete circuit diagrams, refer to the **SYSTEM WIRING DIAGRAMS** article. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

DIAGNOSIS AND TESTING

SUNROOF SWITCH

For complete circuit diagrams, refer to the **SYSTEM WIRING DIAGRAMS** article. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

1. Remove the overhead console, refer to **REMOVAL** .
2. Disconnect the power sunroof switch wire harness connector.
3. With the ignition key in the "RUN" position check for 5 volts on the "OPEN", "CLOSE" and "VENT" circuits of the sunroof switch harness connector. If OK, go to step 4. If not OK, inspect the wiring harness and connectors between the motor/module and switch for damage and repair as necessary.
4. With the ignition key in the "OFF" position check for continuity between the ground circuit of the sunroof switch harness connector and a known good ground. Continuity should be present. If OK, go to step 5. If not OK, inspect the wiring harness and connector and repair the ground circuit as necessary.



813794bc

Fig. 6: Identifying Power Sunroof Switch Terminal Connectors

Courtesy of CHRYSLER LLC

5. Using an ohmmeter, test the continuity of the power sunroof switch in each switch position. Refer to **POWER SUNROOF SWITCH CONTINUITY TABLE**. If OK, inspect the wiring harness and connectors for damage and repair as necessary. If not OK, replace the overhead console assembly, refer to **REMOVAL** .

POWER SUNROOF SWITCH CONTINUITY TABLE

SWITCH POSITION	CONTINUITY BETWEEN PINS
OFF	NO CONTINUITY
SUNROOF OPEN	B & D
SUNROOF CLOSED	B & C
SUNROOF VENT	B & A

2008 ACCESSORIES AND EQUIPMENT

Power Windows - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B16A4</u>	PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT LOW - PDM
<u>B16A5</u>	PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT HIGH - PDM
<u>B1854</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT LOW - DDM
<u>B1855</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM
<u>B1856</u>	DRIVER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM
<u>B1858</u>	DRIVER WINDOW POSITION SENSOR POWER SUPPLY LOW - DDM
<u>B1859</u>	DRIVER WINDOW POSITION SENSOR POWER SUPPLY HIGH - DDM
<u>B185D</u>	PASSENGER WINDOW SWITCH CIRCUIT STUCK - PDM
<u>B185F</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT LOW - PDM
<u>B1860</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM
<u>B1861</u>	PASSENGER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM
<u>B1863</u>	WINDOW POSITION SENSOR POWER SUPPLY LOW - RHD ONLY - PDM
<u>B1864</u>	PASSENGER WINDOW POSITION SENSOR POWER SUPPLY HIGH - RHD ONLY - PDM
<u>B18B5</u>	MASTER SWITCH - FRONT LEFT WINDOW SWITCH STUCK
<u>B18B6</u>	MASTER SWITCH - FRONT RIGHT WINDOW SWITCH STUCK
<u>B210D</u>	BATTERY VOLTAGE LOW - DDM/PDM
<u>B210E</u>	BATTERY VOLTAGE HIGH - DDM/PDM
<u>B225D,B225E</u>	DOOR MODULE FRONT LEFT/RIGHT INTERNAL
<u>B226E</u>	MASTER POWER WINDOW SWITCH INTERNAL
<u>B2577</u>	PASSENGER WINDOW NOT CALIBRATED/LOST CALIBRATION - PDM
<u>B2578</u>	DRIVER WINDOW NOT CALIBRATED/LOST CALIBRATION - DDM
<u>B2580</u>	DRIVER WINDOW POSITION SENSOR(S) NO SIGNAL - DDM
<u>B2581</u>	PASSENGER WINDOW POSITION SENSOR(S) NO SIGNAL - RHD ONLY - PDM
<u>U0010</u>	CAN INTERIOR BUS
<u>U0011</u>	CAN INTERIOR BUS OFF PREFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE
<u>U0164</u>	LOST COMMUNICATION WITH HVAC CONTROL MODULE
<u>U0167</u>	LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE
<u>U0184</u>	LOST COMMUNICATION WITH RADIO

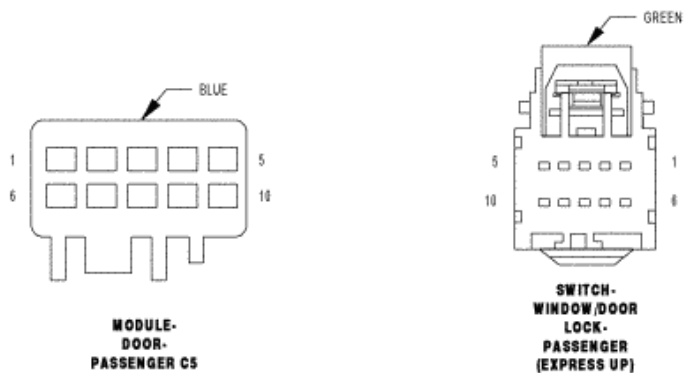
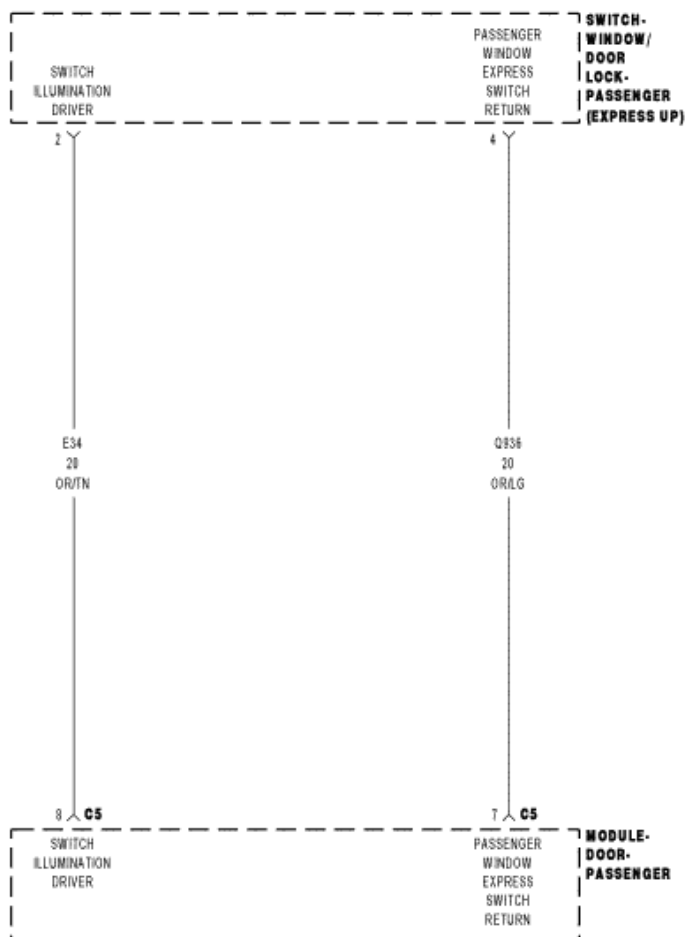
<u>U0186</u>	LOST COMMUNICATION WITH AUDIO AMPLIFIER
<u>U0196</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - FIRST ROW
<u>U0197</u>	LOST COMMUNICATION WITH HANDS FREE PHONE MODULE
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT
<u>U0204</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT
<u>U0249</u>	LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - LAST ROW
<u>U113D</u>	LOST COMMUNICATION WITH MASTER POWER WINDOW SWITCH

POWER WINDOWS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B16A4-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT LOW - PDM

Circuit Schematic



019975a7

Fig. 1: Passenger Window Switch Backlighting Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake, the park lamps are on and the window lock out switch is on.

Set Conditions

- **Set Condition:**

When the Passenger Window Express Switch Illumination Driver circuit falls below 3.0 volts for over 25 ms. and the above conditions are met, this code will set.

Possible Causes

Possible Causes
(E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT SHORT TO GROUND
(E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT SHORT TO (Q936) PASSENGER WINDOW EXPRESS SWITCH RETURN
WINDOW/DOOR LOCK SWITCH SHORTED
PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Ensure the passenger window lock out switch is on.

Turn the park lights on.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B16A4-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT LOW?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW/DOOR LOCK SWITCH SHORTED

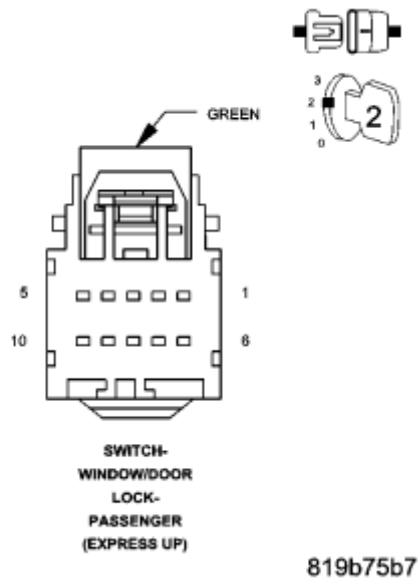


Fig. 2: Passenger Window/Door Lock Switch Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Window/Door Lock Switch connector.

Ensure the passenger window lock out switch is on and the park lamps are still on.

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display B16A4-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT LOW?

No

Replace the Window/Door Lock Switch.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. **(E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT SHORT TO GROUND**

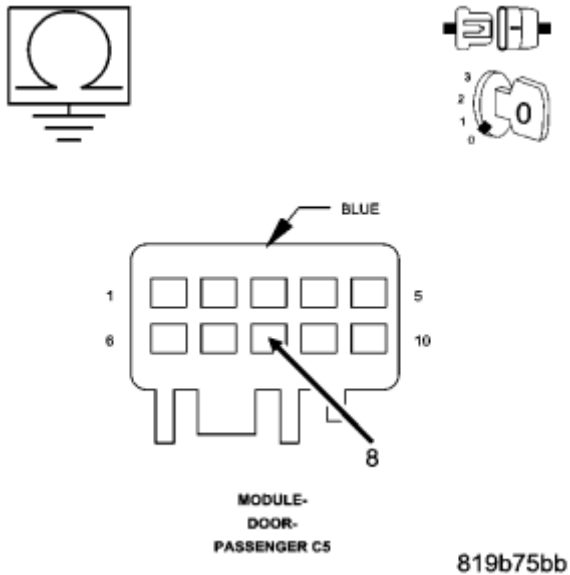


Fig. 3: Measuring Resistance Between Ground And (E34) Passenger Window Express Switch Illumination Driver Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Turn the park lamps off.

Disconnect the Passenger Door Module C5 connector.

Measure the resistance between Ground and the (E34) Passenger Window Express Switch Illumination Driver circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (E34) Passenger Window Express Switch Illumination Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **(E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT**

SHORT TO (Q936) PASSENGER WINDOW EXPRESS SWITCH RETURN

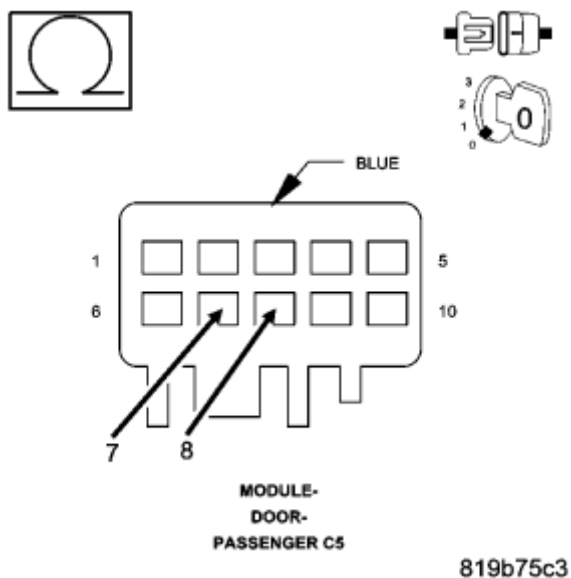


Fig. 4: Measuring Resistance Between (E34) Passenger Window Express Switch Illumination Driver Circuit And (Q936) Passenger Window Express Switch Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (E34) Passenger Window Express Switch Illumination Driver circuit and the (Q936) Passenger Window Express Switch Return circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (E34) Passenger Window Express Switch Illumination Driver circuit for a short to the (Q936) Passenger Window Express Switch Return circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

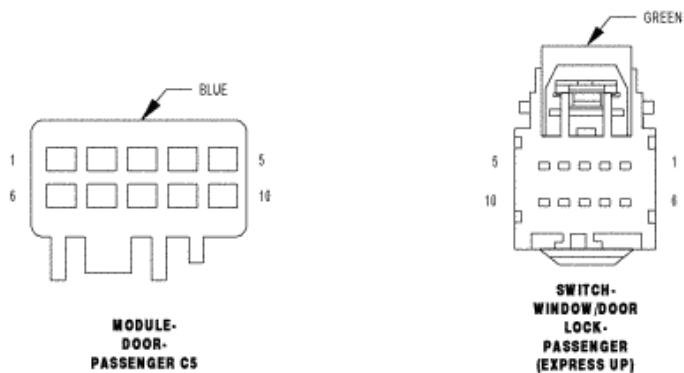
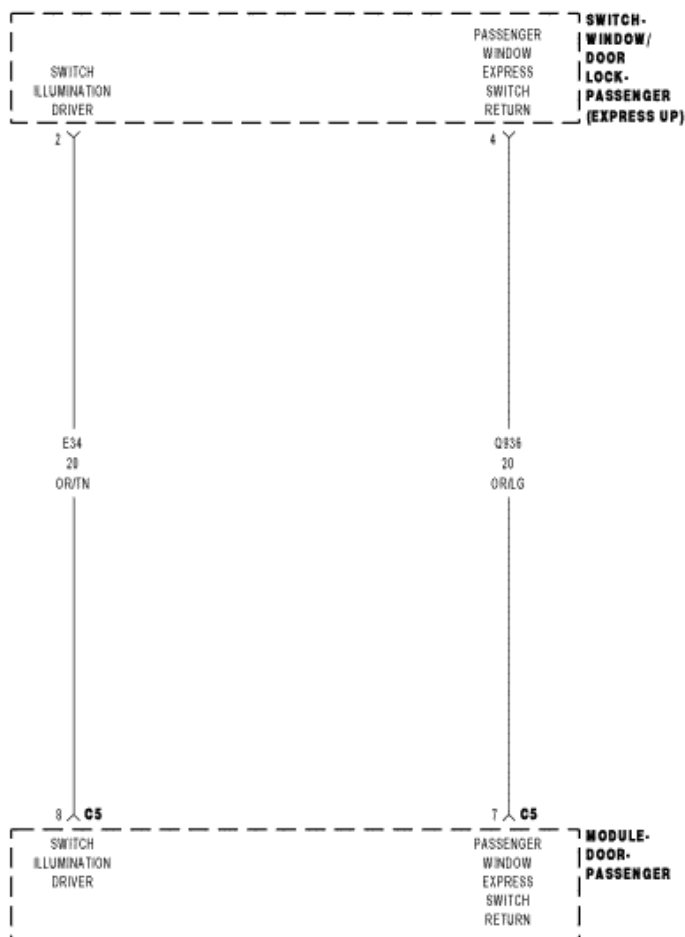
No

Replace the Passenger Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

B16A5-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT HIGH - PDM

Circuit Schematic



019975a7

Fig. 5: Passenger Window Switch Backlighting Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the power is turned off to the module and it goes from awake to sleep mode.

Set Conditions

- **Set Condition:**

When the Passenger Window Express Switch Illumination Driver circuit is above 2.5 volts for over 15 ms. and the switch illumination output is turned off.

Possible Causes

Possible Causes
(E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT SHORT TO VOLTAGE WINDOW/DOOR LOCK SWITCH SHORTED PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Ensure the passenger window lock out switch is off.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B16A5-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT HIGH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW/DOOR LOCK SWITCH SHORTED

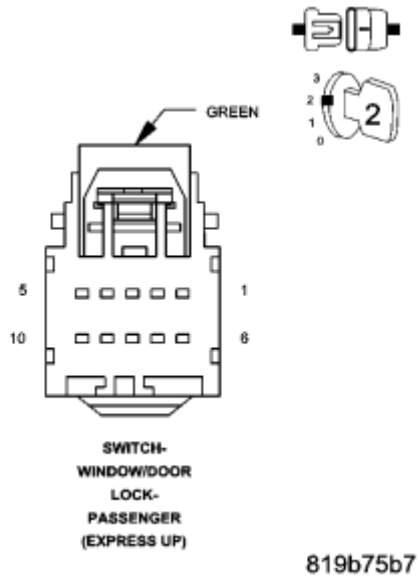


Fig. 6: Passenger Window/Door Lock Switch Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Window/Door Lock Switch connector.

Turn the ignition on.

Operate the passenger window lock out switch several times.

With the scan tool, read DTC's.

Does the scan tool display B16A5-PASSENGER WINDOW SWITCH BACKLIGHTING CIRCUIT HIGH?

No

Replace the Window/Door Lock Switch.

Perform **BODY VERIFICATION TEST - VER 1**.

Yes

Go To 3.

3. (E34) PASSENGER WINDOW EXPRESS SWITCH ILLUMINATION DRIVER CIRCUIT SHORT TO VOLTAGE

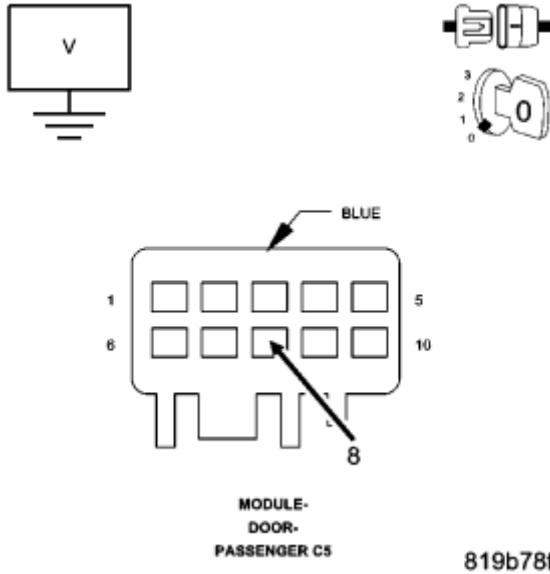


Fig. 7: Measuring Voltage Between (E34) Passenger Window Express Switch Illumination Driver Circuit And Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C5 connector.

Turn the ignition on.

Measure the voltage between the (E34) Passenger Window Express Switch Illumination Driver circuit and Ground.

Is there any voltage present?

Yes

Repair the (E34) Passenger Window Express Switch Illumination Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

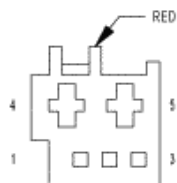
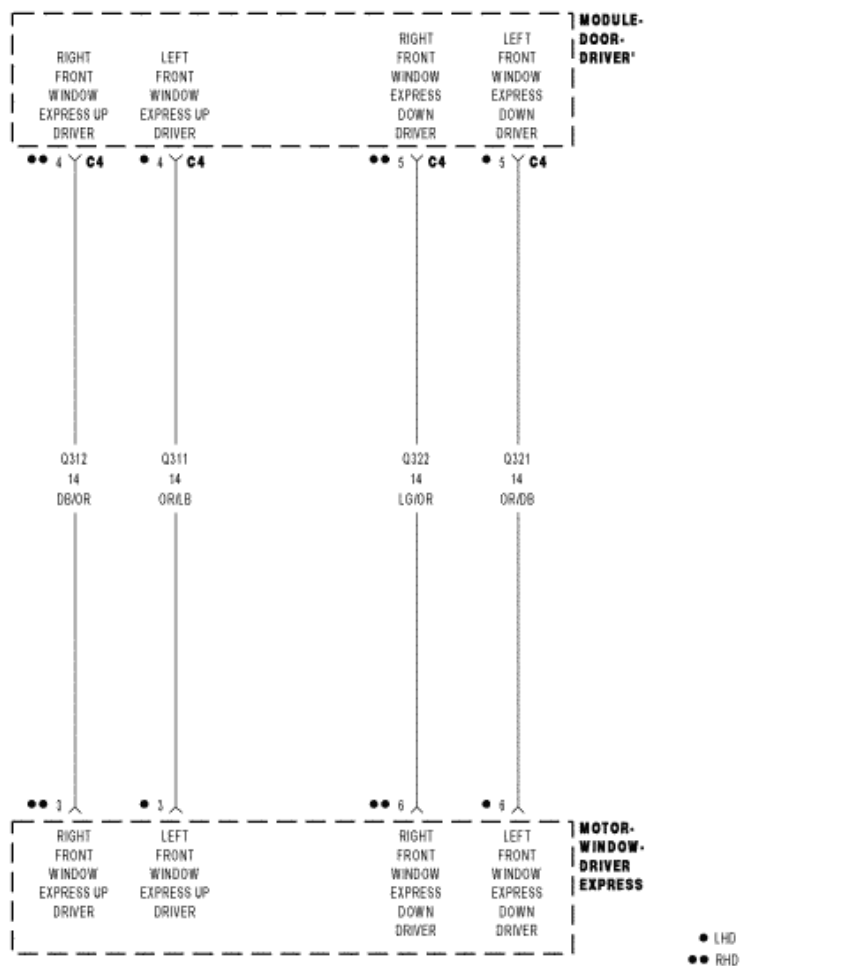
No

Replace the Passenger Door Module.

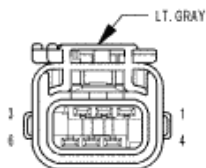
Perform **BODY VERIFICATION TEST - VER 1** .

B1854-DRIVER WINDOW MOTOR CONTROL CIRCUIT LOW - DDM

Circuit Schematic



MODULE-DOOR-DRIVER C4



MOTOR-WINDOW-DRIVER EXPRESS (EXCEPT BASE)

01990ccc

Fig. 8: Driver Window Motor Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When both Driver Window Driver circuits (Up and Down) are grounded during a window movement command, this code will set.

Possible Causes

Possible Causes
(Q321) (LHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND
(Q322) (RHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND
(Q311) (LHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND
(Q312) (RHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND
(Q321) (LHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORTED TO THE
(Q311) (LHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT
(Q322) (RHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORTED TO THE
(Q312) (RHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT
WINDOW MOTOR SHORTED
DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for different names and circuit numbers.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1854-DRIVER WINDOW MOTOR CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR SHORTED

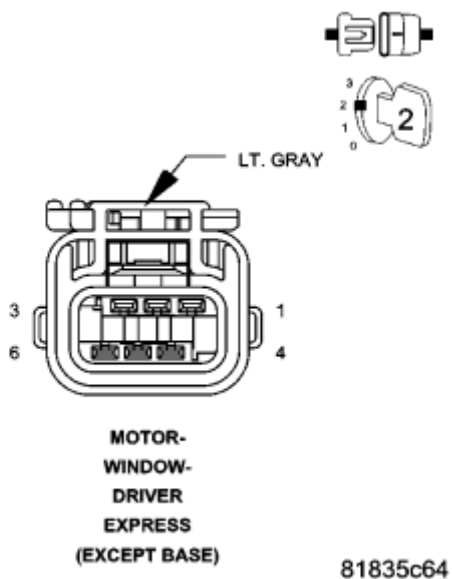


Fig. 9: Identifying Driver Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Driver Window Motor connector.

Turn the ignition on.

Operate the driver window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B1854-DRIVER WINDOW MOTOR CONTROL CIRCUIT LOW?

No

Replace the Driver Window Motor in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1**.

Yes

Go To 3.

3. (Q321) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND

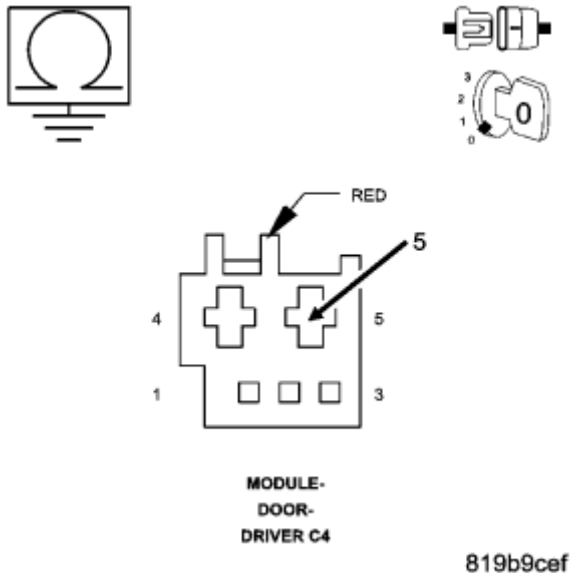


Fig. 10: Measuring Resistance Between Ground And (Q321) Left Front Window Express Down Driver Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Measure the resistance between Ground and the (Q321) Left Front Window Express Down Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q321) Left Front Window Express Down Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 4.

4. (Q311) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND

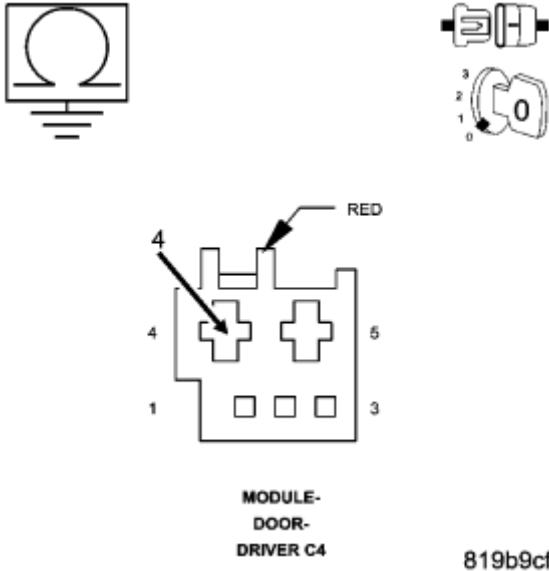


Fig. 11: Measuring Resistance Between Ground And (Q311) Left Front Window Express Up Driver Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between Ground and the (Q311) Left Front Window Express Up Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

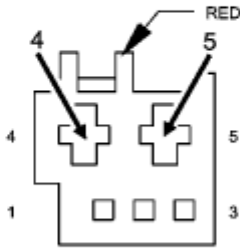
Repair the (Q311) Left Front Window Express Up Driver circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (Q321) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO (Q311) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT



MODULE-
DOOR-
DRIVER C4

819b9d25

Fig. 12: Measuring Resistance Between (Q321) Left Front Window Express Down Driver Circuit And (Q311) Driver Window Express Up Driver Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (Q321) Left Front Window Express Down Driver circuit and the (Q311) Driver Window Express Up Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q321) Left Front Window Express Down Driver circuit for a short to the (Q311) Left Front Window Express Up Driver circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

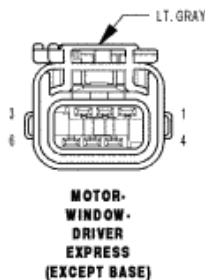
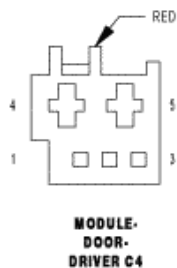
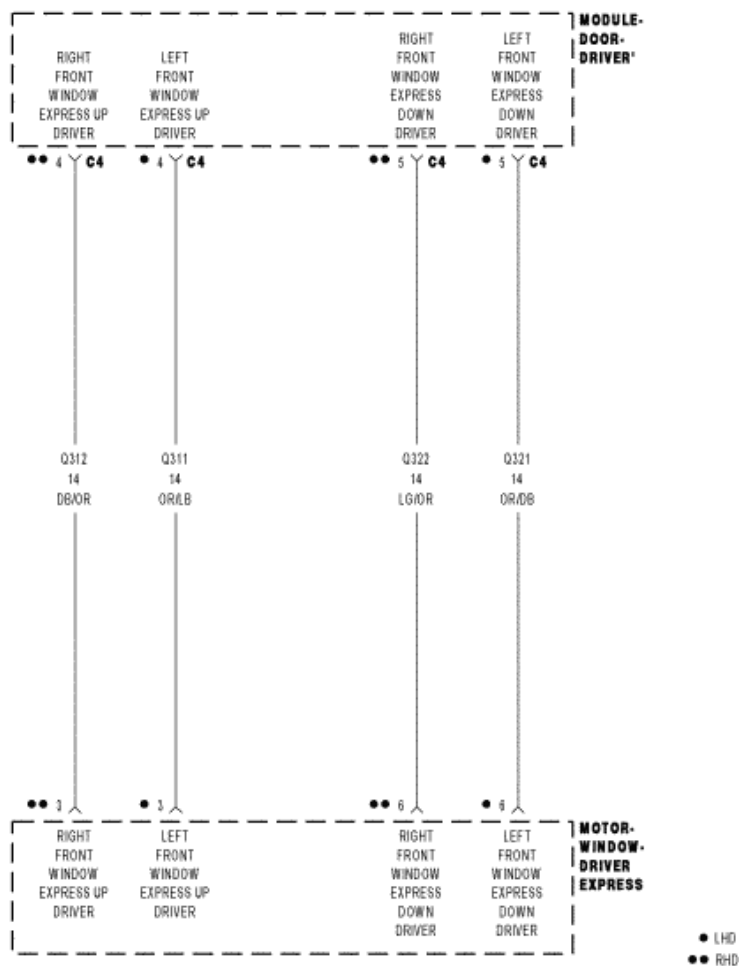
No

Replace the Driver Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1855-DRIVER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM

Circuit Schematic



01990ccc

Fig. 13: Driver Window Motor Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When both Driver Window Driver circuits (Up and Down) are supplied with voltage during a window movement command for more than five ms, this code will set.

Possible Causes

Possible Causes
(Q321) (LHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE
(Q322) (RHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE
(Q311) (LHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE
(Q312) (RHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE
WINDOW MOTOR (REGULATOR)
DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for difference names and circuit numbers.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1855-DRIVER WINDOW MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR SHORTED

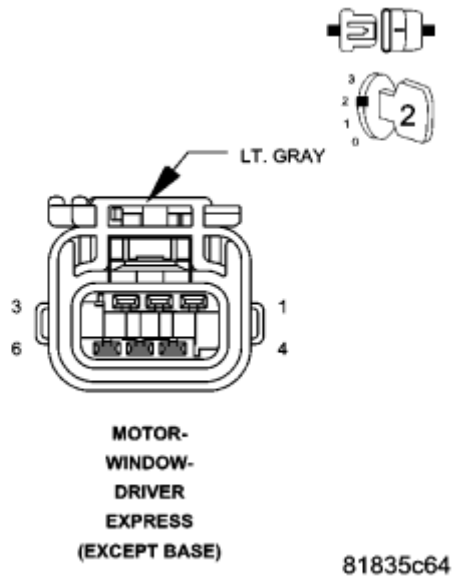


Fig. 14: Identifying Driver Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Driver Window Motor connector.

Turn the ignition on.

Operate the driver window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B1855-DRIVER WINDOW MOTOR CONTROL CIRCUIT HIGH?

No

Replace the Driver Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1**.

Yes

Go To 3.

3. (Q321) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE

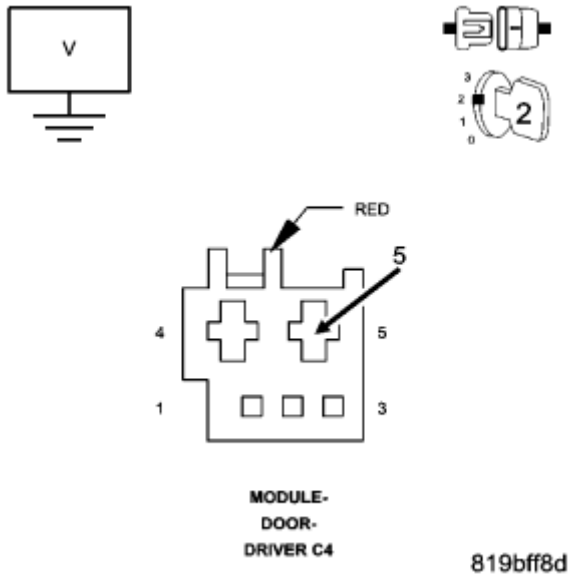


Fig. 15: Measuring Voltage Between (Q321) Left Front Window Express Down Driver Circuit And Ground

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Turn the ignition on.

Measure the voltage between the (Q321) Left Front Window Express Down Driver circuit and Ground.

Is there any voltage present?

Yes

Repair the (Q321) Left Front Window Express Down Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 4.

4. (Q311) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE

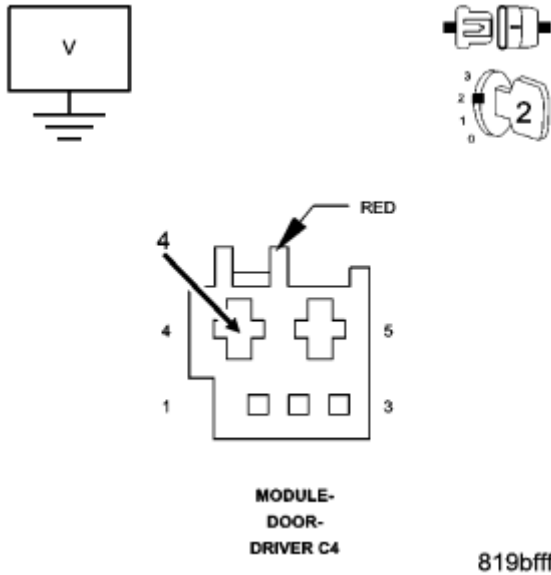


Fig. 16: Measuring Voltage Between (Q311) Left Front Window Express Up Driver Circuit And Ground

Courtesy of CHRYSLER LLC

Measure the voltage between the (Q311) Left Front Window Express Up Driver circuit and Ground.

Is there any voltage present?

Yes

Repair the (Q311) Left Front Window Express Up Driver circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

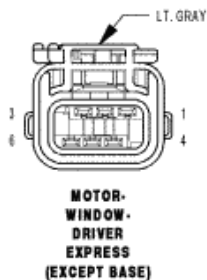
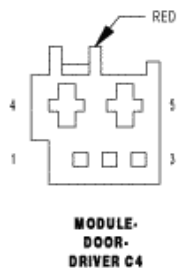
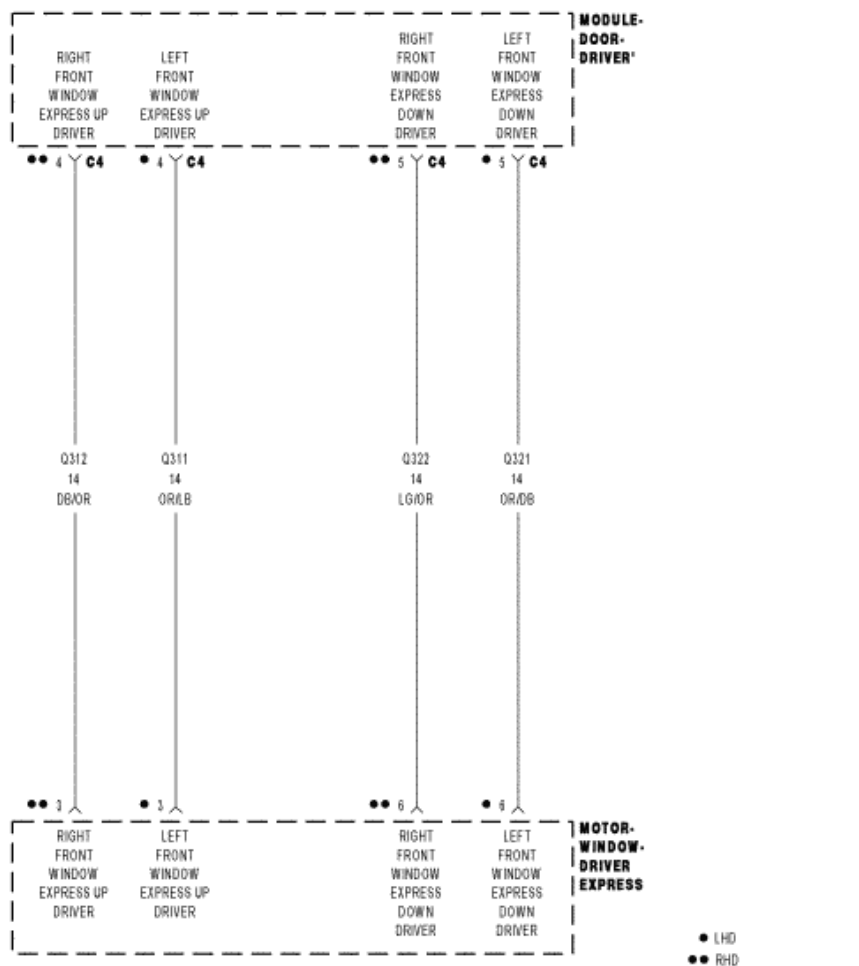
No

Replace the Driver Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

B1856-DRIVER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM

Circuit Schematic



01990ccc

Fig. 17: Driver Window Motor Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When one or both Driver Window Driver circuits (Up and Down) are not supplied with voltage, when they should be, during a window movement command for more than five ms, this code will set.

Possible Causes

Possible Causes
(Q321) (LHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN (Q322) (RHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN (Q311) (LHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN (Q312) (RHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN WINDOW MOTOR (REGULATOR) DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for difference names and circuit numbers.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1856-DRIVER WINDOW MOTOR CONTROL CIRCUIT OPEN?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR OR CIRCUIT OPEN

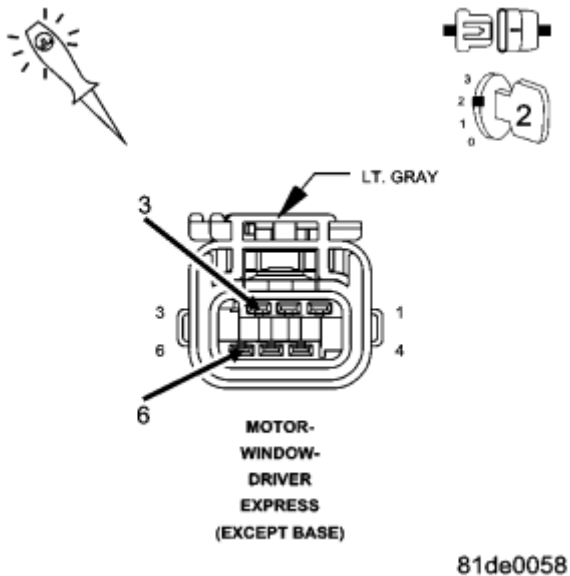


Fig. 18: Connecting Test Light Between (Q311) Left Front Window Express Up Driver Circuit And (Q321) Left Front Window Express Down Driver Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Express Window Motor connector.

Connect a test light between the (Q311) Left Front Window Express Up Driver circuit and the (Q321) Left Front Window Express Down Driver circuit

Turn the ignition on.

Trip the driver door latch to the closed position.

Operate the driver window switch up and down several times while observing the test light.

Does the test light illuminate brightly when the switch is pressed in both directions? With the express up window, the test light may only flash momentarily.

Yes

Replace the Driver Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **(Q321) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN**

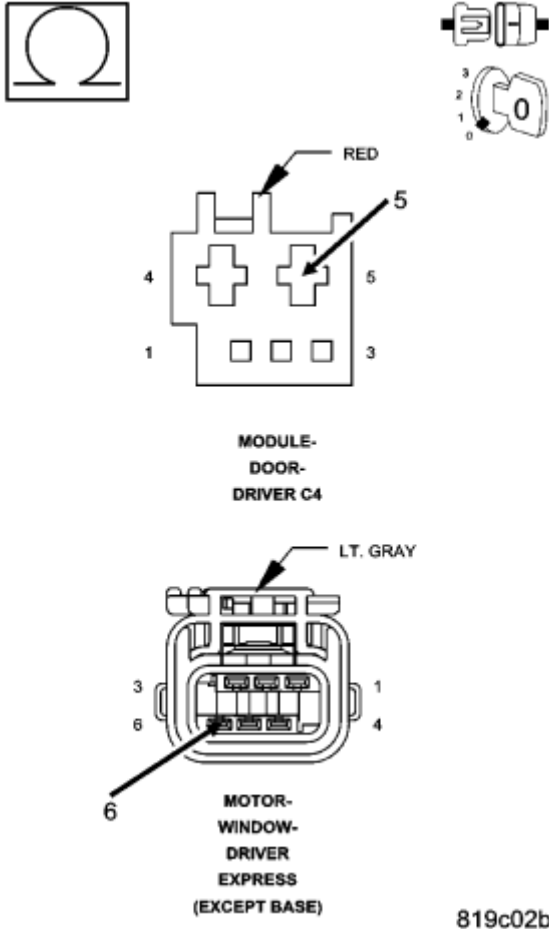


Fig. 19: Measuring Resistance Of (Q321) Left Front Window Express Down Driver Circuit Between C4 Module Connector And Motor Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Measure the resistance of the (Q321) Left Front Window Express Down Driver circuit between the C4 module connector and the motor connector.

Is the resistance below 2.0 ohms?

No

Repair the (Q321) Left Front Window Express Down Driver circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 4.

4. (Q311) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN

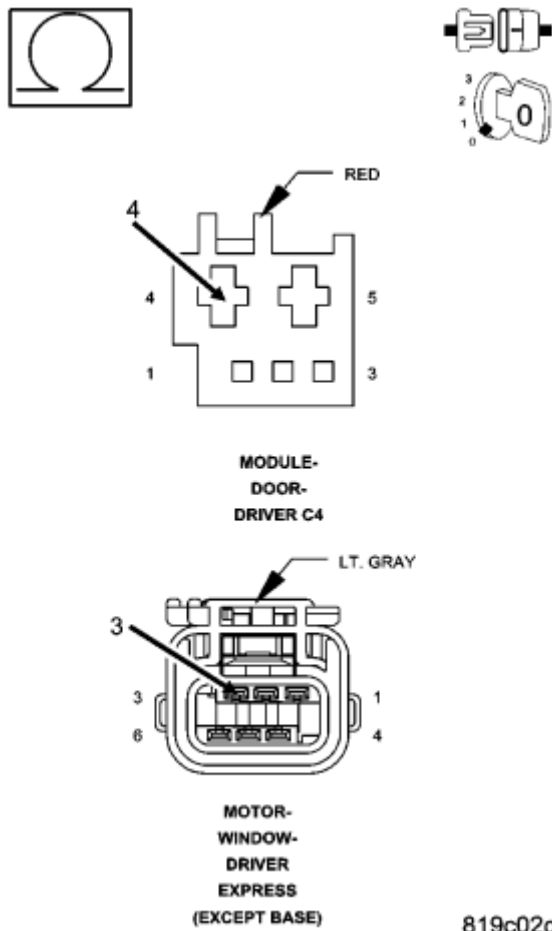


Fig. 20: Measuring Resistance Of (Q311) Left Front Window Express Up Driver Circuit Between C4 Module Connector And Motor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (Q311) Left Front Window Express Up Driver circuit between the C4 module connector and the motor connector.

Is the resistance below 2.0 ohms?

No

Repair the (Q311) Left Front Window Express Up Driver circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Driver Door Module.
Perform **BODY VERIFICATION TEST - VER 1** .

B1858-DRIVER WINDOW POSITION SENSOR POWER SUPPLY LOW - DDM

Circuit Schematic

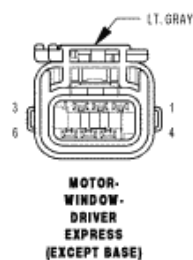
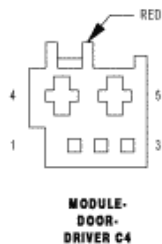
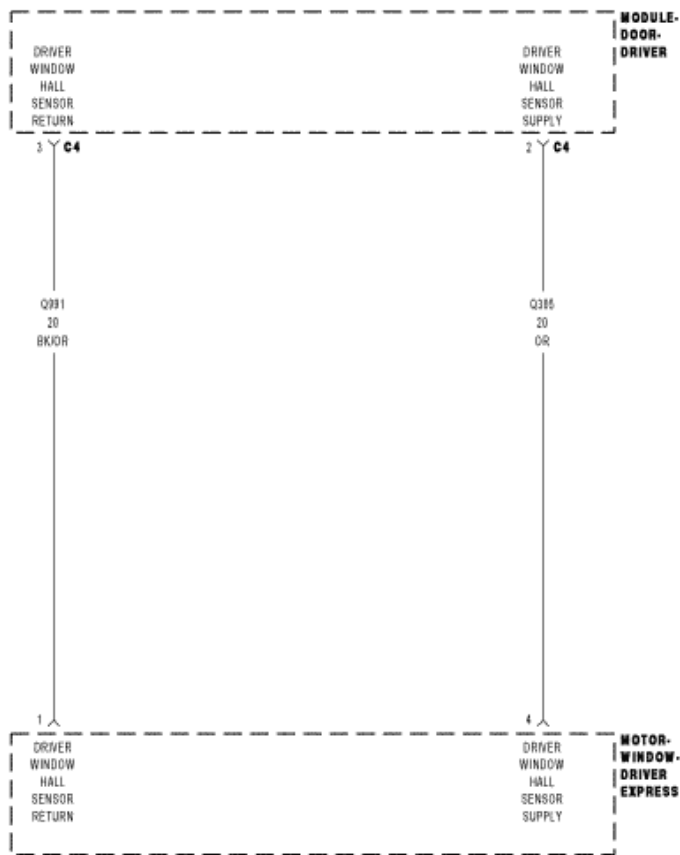


Fig. 21: Driver Window Hall Sensor Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When the Driver Window Hall Sensor Supply circuit falls below 0.8 volts for over 480 ms, this code will set.

Possible Causes

Possible Causes
(Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO GROUND WINDOW MOTOR SHORTED DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1858-DRIVER WINDOW POSITION SENSOR POWER SUPPLY LOW?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR SHORTED

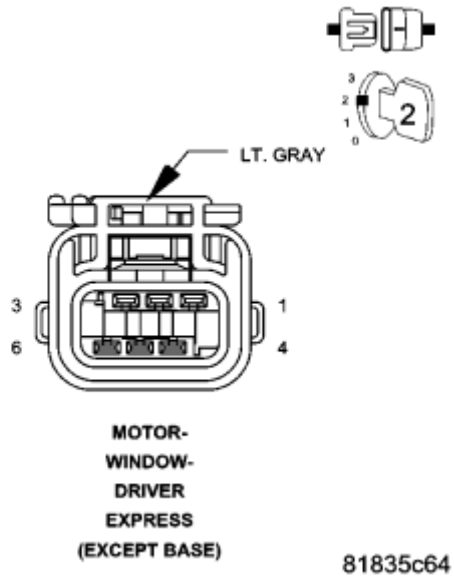


Fig. 22: Identifying Driver Window Motor Connector
 Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Driver Window Motor connector.

Turn the ignition on.

Operate the driver window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B1858-DRIVER WINDOW POSITION SENSOR POWER SUPPLY LOW?

No

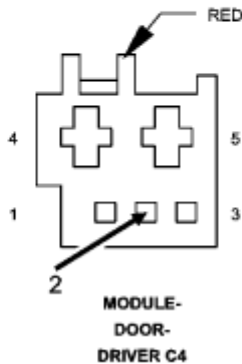
Replace the Window Motor (regulator).

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO GROUND



819c100d

Fig. 23: Measuring Resistance Between Ground And (Q305) Driver Window Hall Sensor Supply Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Measure the resistance between Ground and the (Q305) Driver Window Hall Sensor Supply circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q305) Driver Window Hall Sensor Supply circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Driver Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1859-DRIVER WINDOW POSITION SENSOR POWER SUPPLY HIGH - DDM

Circuit Schematic

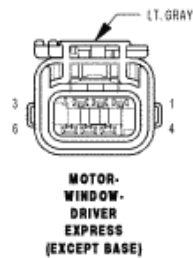
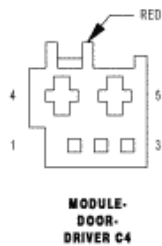
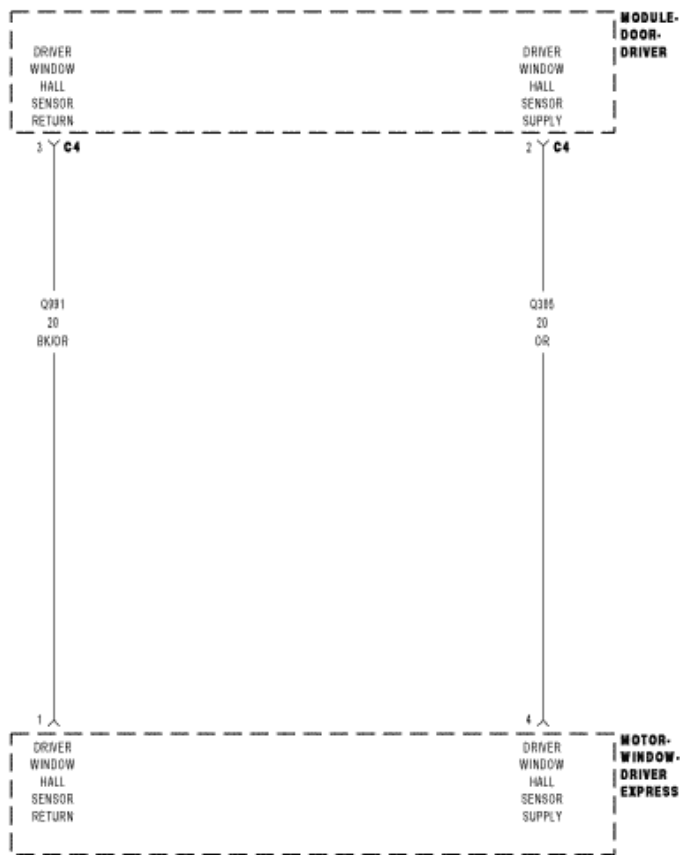


Fig. 24: Driver Window Hall Sensor Supply Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the power is turned off to the module and it goes from being awake to sleep mode.

Set Conditions

- **Set Condition:**

When the Driver Window Hall Sensor Supply circuit is above 1.5 volts for over 15 ms. and the power to the module has been turned off, this code will set.

Possible Causes

Possible Causes
(Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO VOLTAGE DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Wait 30 seconds.

With the scan tool, read the active DTC's.

Does the scan tool display B1859-DRIVER WINDOW POSITION SENSOR POWER SUPPLY HIGH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. (Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO VOLTAGE

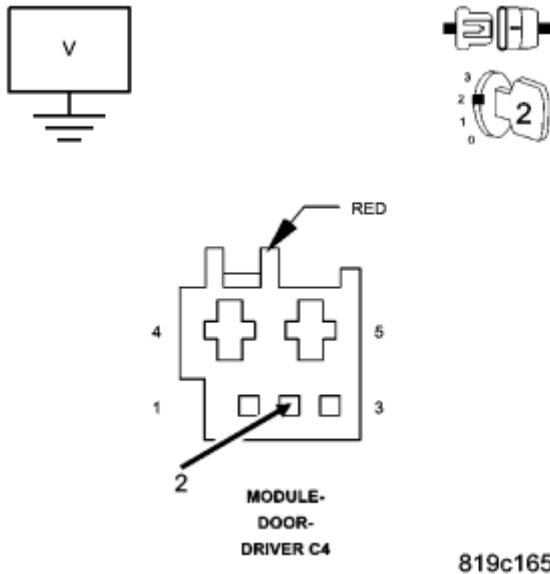


Fig. 25: Measuring Voltage Between (Q305) Driver Window Hall Sensor Supply Circuit And Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Turn the ignition on.

Measure the voltage between the (Q305) Driver Window Hall Sensor Supply circuit and Ground.

Is the voltage above 1.5 volts?

Yes

Repair the (Q305) Driver Window Hall Sensor Supply circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

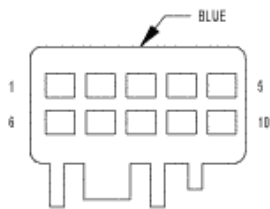
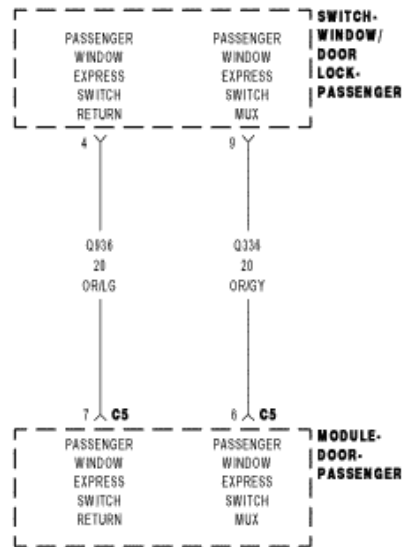
No

Replace the Driver Door Module in accordance with service information.

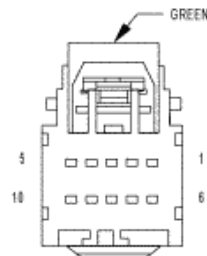
Perform **BODY VERIFICATION TEST - VER 1** .

B185D-PASSENGER WINDOW SWITCH CIRCUIT STUCK - PDM

Circuit Schematic



**MODULE-
DOOR-
PASSENGER C5**



**SWITCH-
WINDOW/DOOR
LOCK-
PASSENGER
(EXPRESS UP)**

019c23aa

Fig. 26: Passenger Window Express Switch Mux Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When the Passenger Window Express Switch Mux circuit is resisted for over 30 seconds.

Possible Causes

Possible Causes
(Q336) PASSENGER WINDOW EXPRESS SWITCH MUX CIRCUIT PARTIAL SHORT TO GROUND
(Q336) PASSENGER WINDOW EXPRESS SWITCH MUX CIRCUIT SHORT TO THE (Q936) PASSENGER WINDOW EXPRESS SWITCH RETURN CIRCUIT
WINDOW/DOOR LOCK SWITCH SHORT TO GROUND
PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Passenger Window Switch in all positions several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B185D-PASSENGER WINDOW SWITCH CIRCUIT STUCK?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Check for a sticking switch and using the wiring diagram/schematic as a guide, inspect the wiring and connectors.
Perform **BODY VERIFICATION TEST - VER 1** .

2. PASSENGER WINDOW SWITCH SHORTED

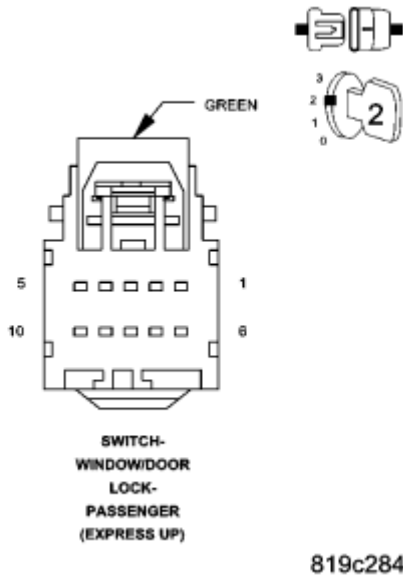


Fig. 27: Passenger Window/Door Lock Switch Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Disconnect the Passenger Window/Door Lock Switch connector.

With the scan tool, read DTC's.

Does the scan tool display B185D-PASSENGER WINDOW SWITCH CIRCUIT STUCK?

No

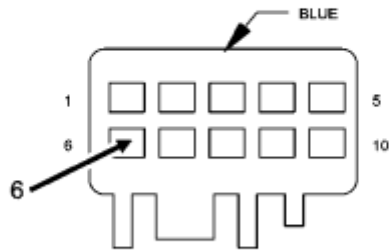
Replace the Passenger Express Window/Door Lock Switch.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (Q336) PASSENGER WINDOW EXPRESS SWITCH MUX CIRCUIT SHORT TO GROUND



MODULE-
DOOR-
PASSENGER C5

819c2849

Fig. 28: Measuring Resistance Between Ground And (Q336) Passenger Window Express Switch Mux Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C5 connector.

Measure the resistance between ground and the (Q336) Passenger Window Express Switch Mux circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (Q336) Passenger Window Express Switch Mux circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. **(Q336) PASSENGER WINDOW EXPRESS SWITCH MUX CIRCUIT SHORT TO (Q936) PASSENGER EXPRESS SWITCH RETURN CIRCUIT**

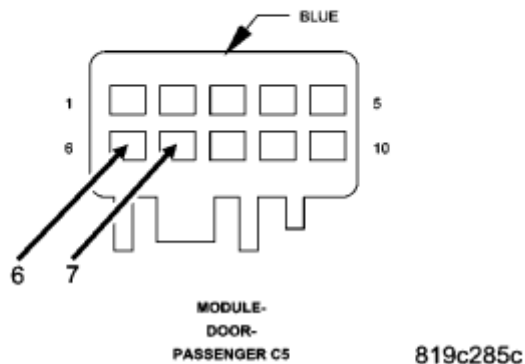


Fig. 29: Measuring Resistance Between (Q336) Passenger Window Express Switch Mux Circuit And (Q936) Passenger Express Switch Return Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (Q336) Passenger Window Express Switch Mux circuit and the (Q936) Passenger Express Switch Return circuit.

Is the resistance below 10000.0 ohms?

Yes

Repair the (Q336) Passenger Express Switch Mux circuit for a short to the (Q936) Passenger Window Express Switch Return circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

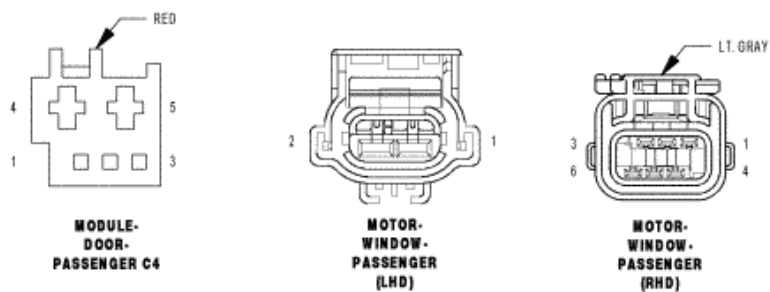
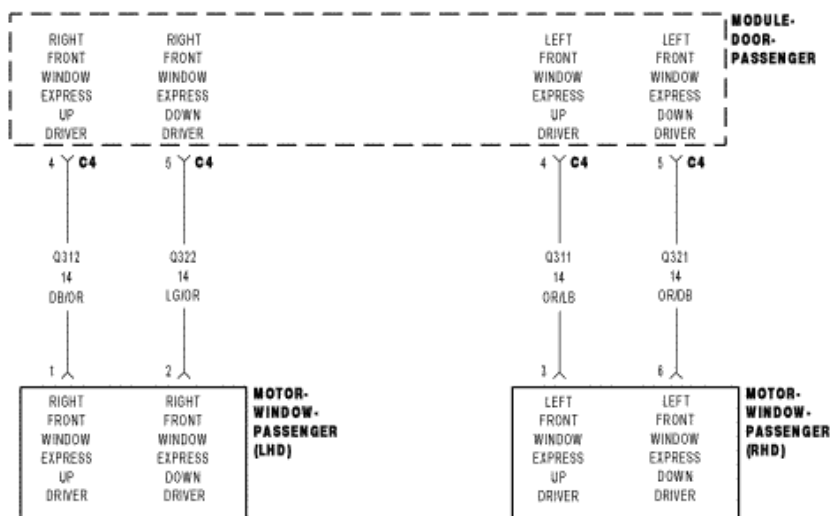
No

Replace the Passenger Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

B185F-PASSENGER WINDOW MOTOR CONTROL CIRCUIT LOW - PDM

Circuit Schematic



0140M07

Fig. 30: Passenger Window Motor Control Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the window motor is operating.

Set Conditions

NOTE: Even though the Left Hand Drive vehicles are NOT equipped with Express Up Windows, the circuits are still named Express if the vehicle has the Driver Express Up feature.

- Set Condition:

When both Passenger Window Driver circuits (Up and Down) are grounded during a window movement command, this code will set.

Possible Causes

Possible Causes
(Q322) (LHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND
(Q321) (RHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND
(Q312) (LHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND
(Q311) (RHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND
(Q322) (LHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORTED TO THE (Q312) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT
(Q321) (RHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORTED TO THE (Q311) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT
WINDOW MOTOR SHORTED
PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

NOTE: This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for difference in names and circuit numbers.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B185F-PASSENGER WINDOW MOTOR CONTROL CIRCUIT LOW?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1**.

2. WINDOW MOTOR SHORTED

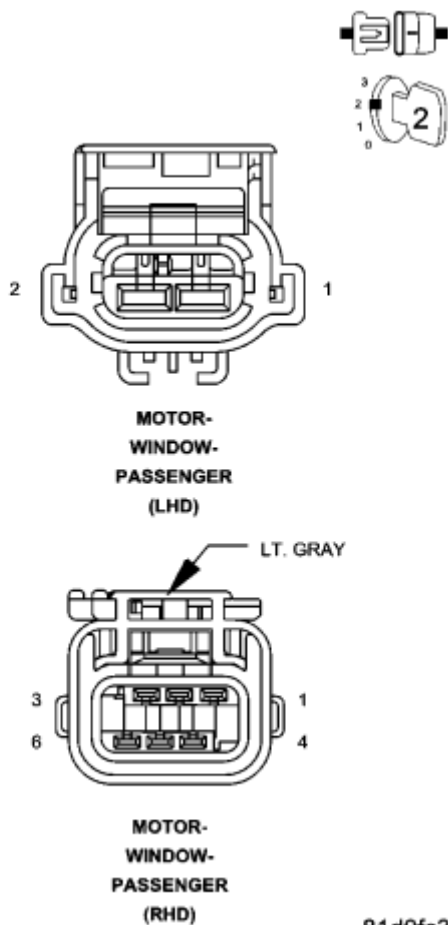


Fig. 31: Passenger Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Window Motor connector.

Turn the ignition on.

Operate the passenger window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B185F-PASSENGER WINDOW MOTOR CONTROL CIRCUIT LOW?

No

Replace the Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (Q322) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO GROUND

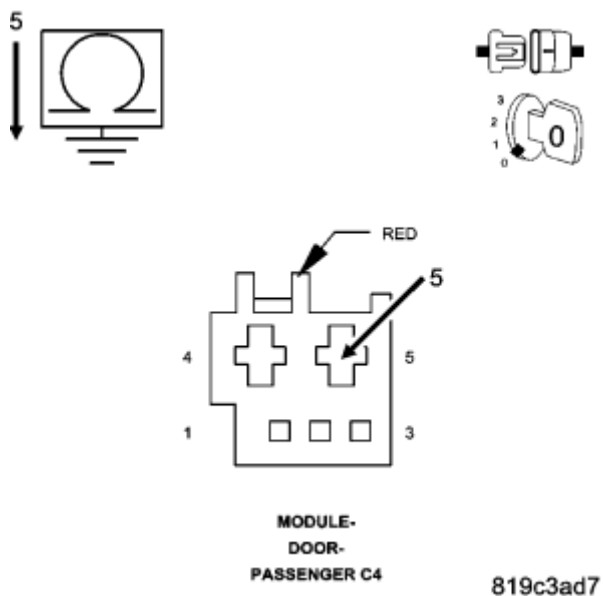


Fig. 32: Measuring Resistance Between Ground And (Q322) Right Front Window Express Down Driver Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Measure the resistance between Ground and the (Q322) Right Front Window Express Down Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q322) Right Front Window Express Down Driver circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (Q312) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO GROUND

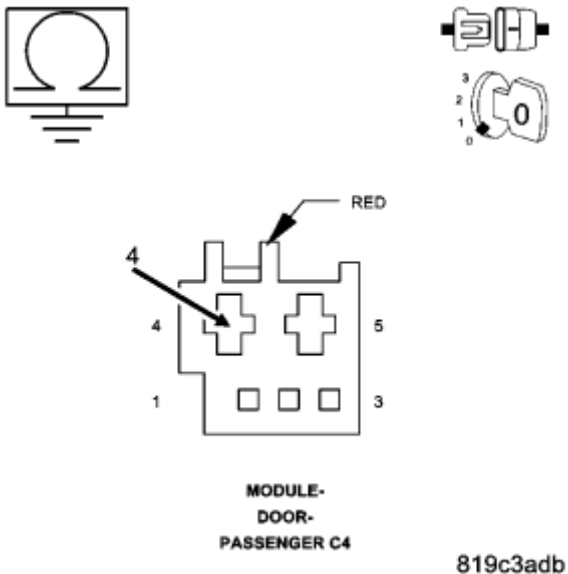


Fig. 33: Measuring Resistance Between Ground And (Q312) Right Front Window Express Up Driver Circuit

Courtesy of CHRYSLER LLC

Measure the resistance between Ground and the (Q312) Right Front Window Express Up Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q312) Right Front Window Express Up Driver circuit for a short to ground.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. **(Q322) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO (Q312) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT**

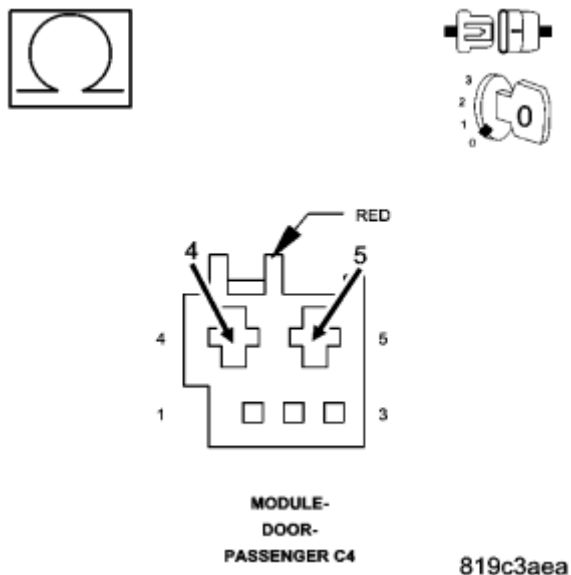


Fig. 34: Measuring Resistance Between (Q322) Right Front Window Express Down Driver Circuit And (Q312) Right Front Window Express Up Driver Circuit
Courtesy of CHRYSLER LLC

Measure the resistance between the (Q322) Right Front Window Express Down Driver circuit and the (Q312) Right Front Window Express Up Driver circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q322) Right Front Window Express Down Driver circuit for a short to the (Q312) Right Front Window Express Up Driver circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

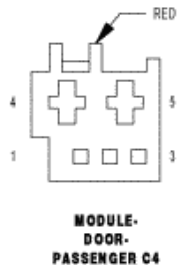
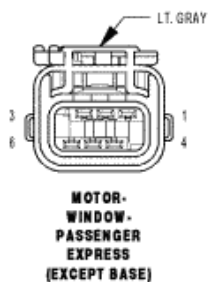
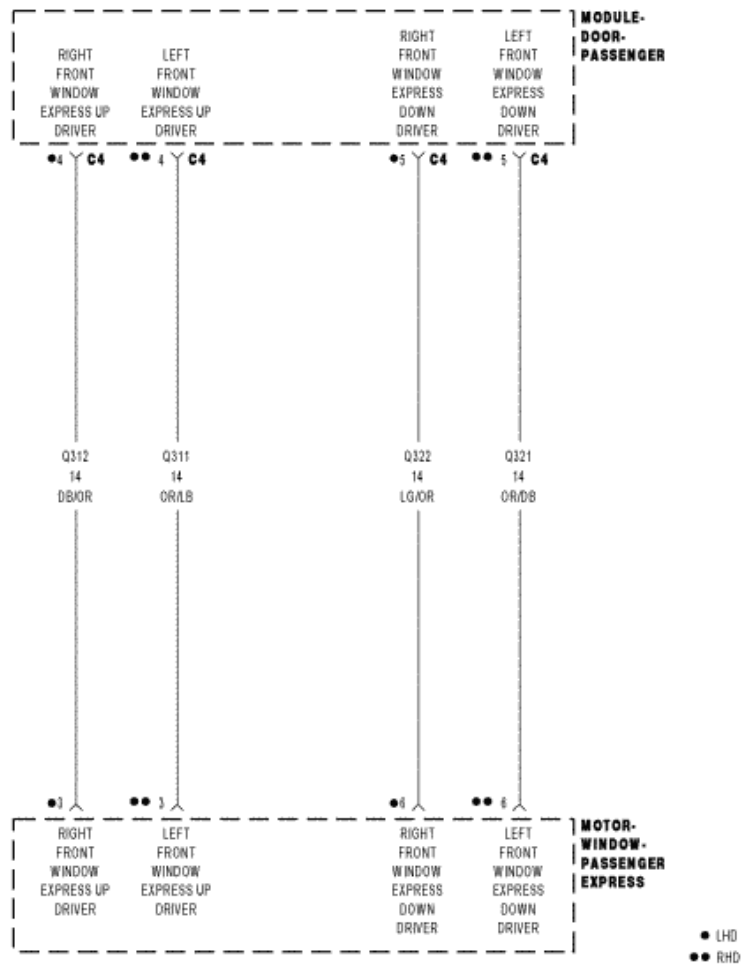
No

Replace the Passenger Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1860-PASSENGER WINDOW MOTOR CONTROL CIRCUIT HIGH - DDM

Circuit Schematic



019c7ab0

Fig. 35: Passenger Window Driver Circuits Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When both Passenger Window Driver circuits (Up and Down) are supplied with voltage during a window movement command for more than five ms, this code will set.

Possible Causes

Possible Causes
(Q322) (LHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE
(Q321) (RHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE
(Q312) (LHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE
(Q311) (RHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE
WINDOW MOTOR (REGULATOR)
PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for different names and circuit numbers.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1860-PASSENGER WINDOW MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR SHORTED

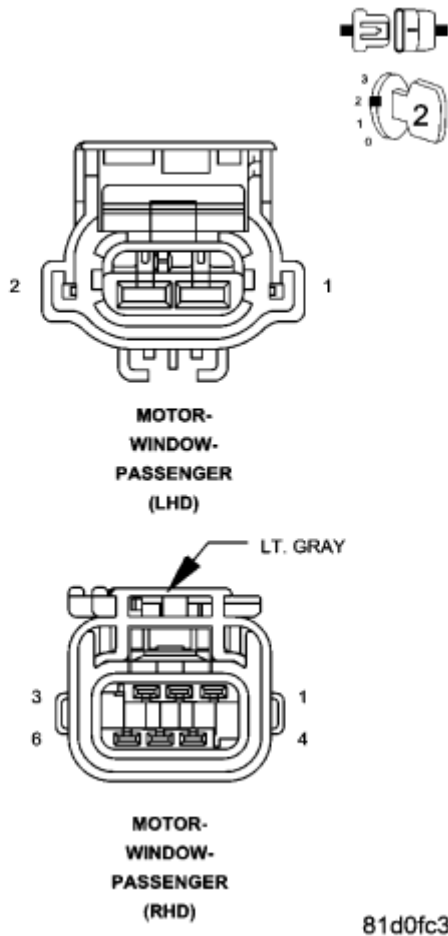


Fig. 36: Passenger Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Window Motor connector.

Turn the ignition on.

Operate the driver window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B1860-PASSENGER WINDOW MOTOR CONTROL CIRCUIT HIGH?

No

Replace the Passenger Window Motor (regulator) in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. **(Q322) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT SHORT TO VOLTAGE**

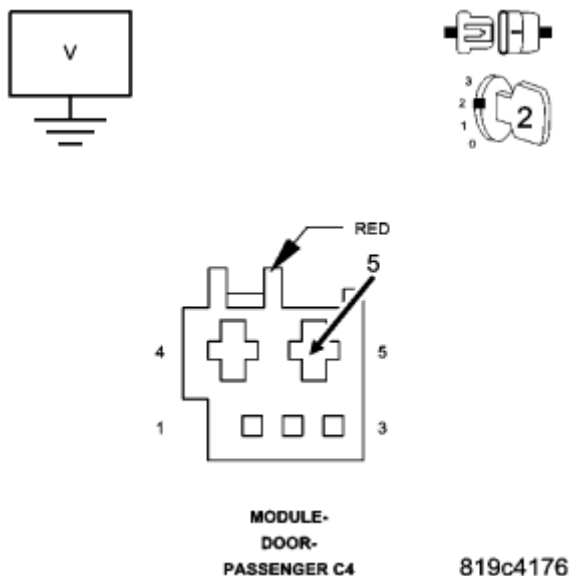


Fig. 37: Measuring Voltage Between (Q322) Right Front Window Express Down Driver Circuit And Ground
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Turn the ignition on.

Measure the voltage between the (Q322) Right Front Window Express Down Driver circuit and Ground.

Is there any voltage present?

Yes

Repair the (Q322) Right Front Window Express Down Driver circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4.

4. (Q312) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT SHORT TO VOLTAGE

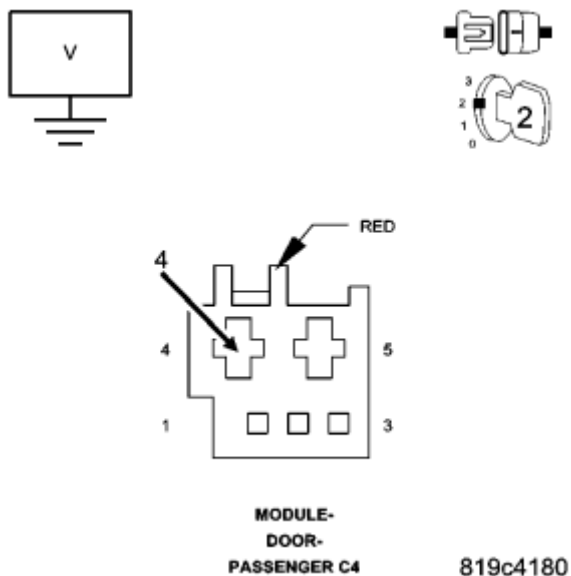


Fig. 38: Measuring Voltage Between (Q312) Right Front Window Express Up Driver Circuit And Ground

Courtesy of CHRYSLER LLC

Measure the voltage between the (Q312) Right Front Window Express Up Driver circuit and Ground.

Is there any voltage present?

Yes

Repair the (Q312) Right Front Window Express Up Driver circuit for a short to voltage.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Passenger Door Module in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1861-PASSENGER WINDOW MOTOR CONTROL CIRCUIT OPEN - DDM

Circuit Schematic

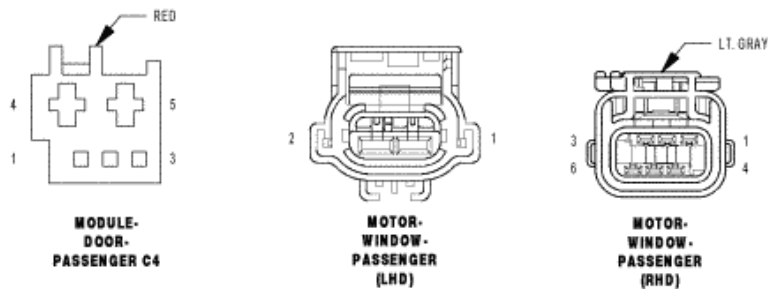
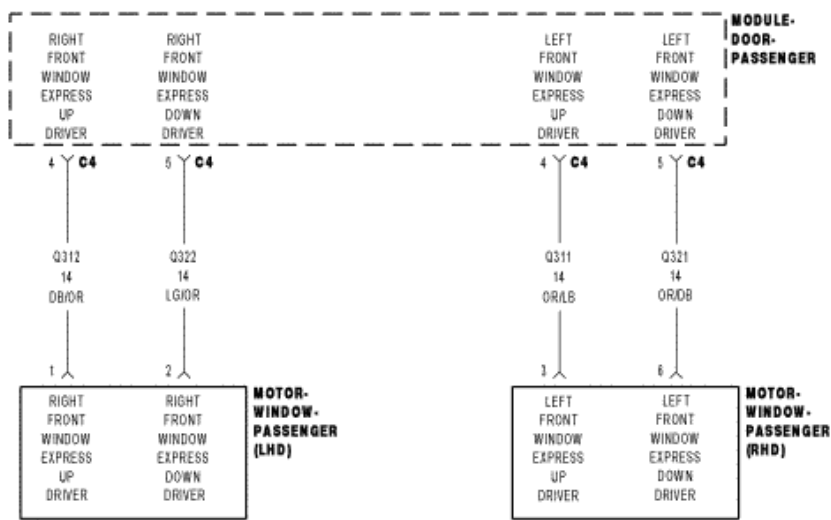


Fig. 39: Passenger Window Motor Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When one or both Passenger Window Driver circuits (Up and Down) are not supplied with voltage, when they should be, during a window movement command for more than five ms, this code will set.

Possible Causes

Possible Causes
(Q322) (LHD) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN
(Q321) (RHD) LEFT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN
(Q312) (LHD) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN
(Q311) (RHD) LEFT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN
WINDOW MOTOR (REGULATOR)
PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: **This test shows text for a Left Hand Drive (LHD) vehicle. Right Hand Drive (RHD) vehicles use the same cavities. Refer to the schematic for difference names and circuit numbers.**

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1861-PASSENGER WINDOW MOTOR CONTROL CIRCUIT OPEN?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MOTOR OR CIRCUIT OPEN

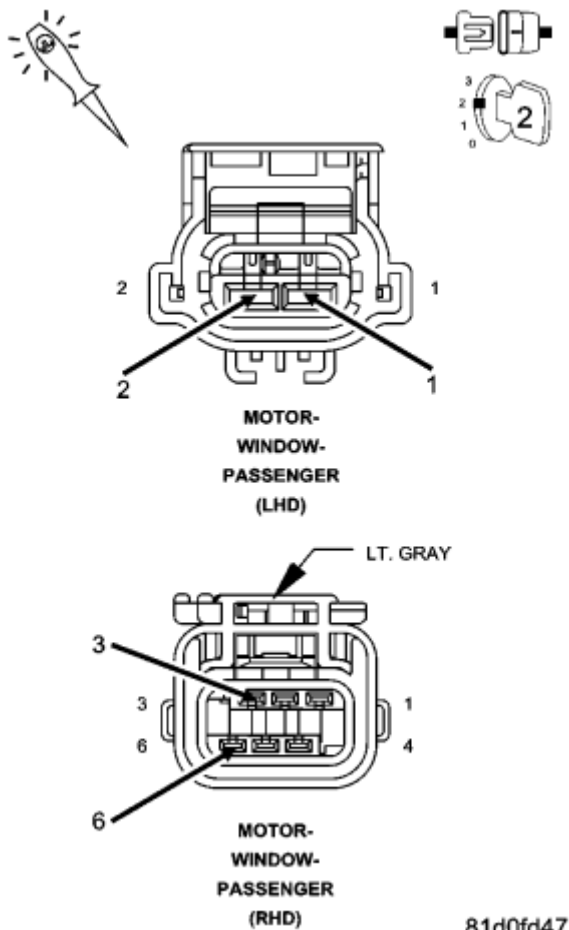


Fig. 40: Checking Window Motor Or Circuit Open
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Express Window Motor connector.

Connect a test light between the (Q312) Right Front Window Express Up Driver circuit and the (Q322) Right Front Window Express Down Driver circuit

Turn the ignition on.

Operate the passenger window switch up and down several times while observing the test light.

Does the test light illuminate brightly when the switch is pressed in both directions? With the express up window, the test light will only flash momentarily each time the switch is actuated.

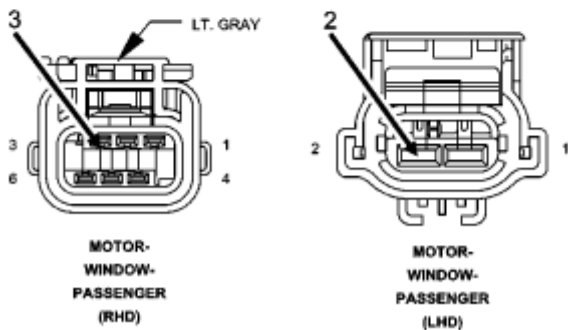
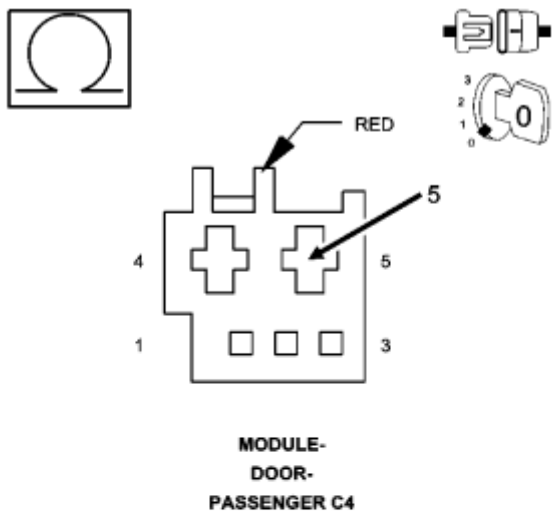
Yes

Replace the Passenger Window Motor (regulator) in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 3.

3. (Q322) RIGHT FRONT WINDOW EXPRESS DOWN DRIVER CIRCUIT OPEN



81efcf6a

Fig. 41: Measuring The Resistance Of The (Q322) Right Front Window Express Down Driver Circuit Between The C4 Module Connector And The Motor Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Measure the resistance of the (Q322) Right Front Window Express Down Driver circuit between the C4 module connector and the motor connector.

Is the resistance below 2.0 ohms?

No

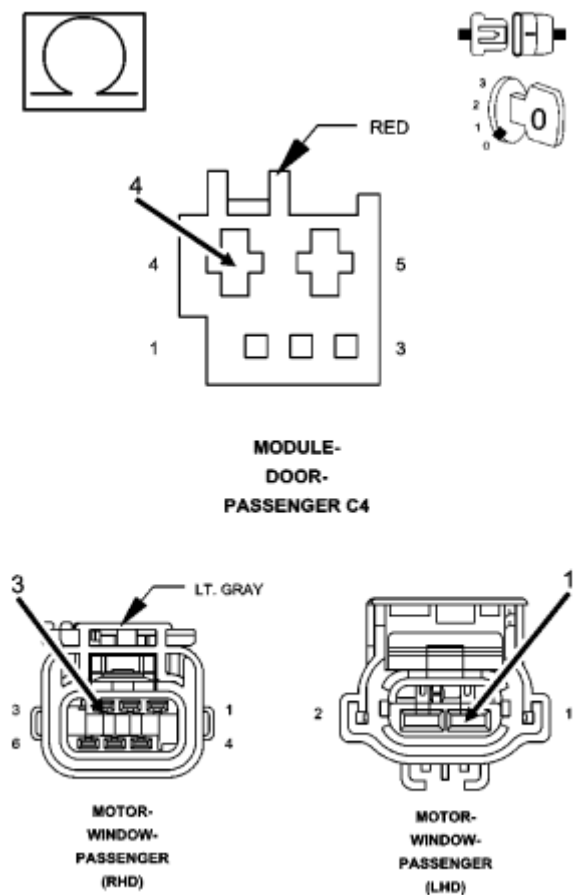
Repair the (Q322) Right Front Window Express Down Driver circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 4.

4. (Q312) RIGHT FRONT WINDOW EXPRESS UP DRIVER CIRCUIT OPEN



81d0fd5a

Fig. 42: Measuring The Resistance Of The (Q312) Right Front Window Express Up Driver Circuit

Between The C4 Module Connector And The Motor Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (Q312) Right Front Window Express Up Driver circuit between the C4 module connector and the motor connector.

Is the resistance below 2.0 ohms?

No

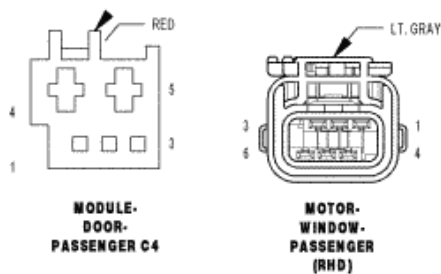
Repair the (Q312) Right Front Window Express Up Driver circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Passenger Door Module in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B1863-WINDOW POSITION SENSOR POWER SUPPLY LOW - RHD ONLY - PDM

Circuit Schematic



01400000

Fig. 43: Passenger Window Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When the Passenger Window Hall Sensor Supply circuit falls below 0.8 volts for over 480 ms, this code will set.

Possible Causes

Possible Causes
(Q306) PASSENGER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO GROUND WINDOW MOTOR SHORTED PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B1863-PASSENGER WINDOW POSITION SENSOR POWER SUPPLY LOW?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **WINDOW MOTOR SHORTED**

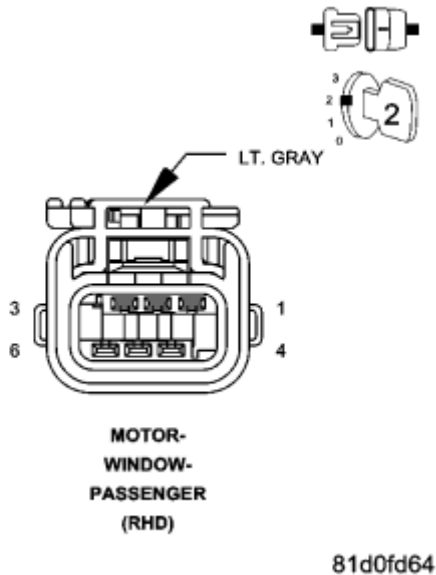


Fig. 44: Passenger Express Window Motor Connector
 Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Express Window Motor connector.

Turn the ignition on.

Operate the passenger window switch up and down several times.

With the scan tool, read DTC's.

Does the scan tool display B1863-PASSENGER WINDOW POSITION SENSOR POWER SUPPLY LOW?

No

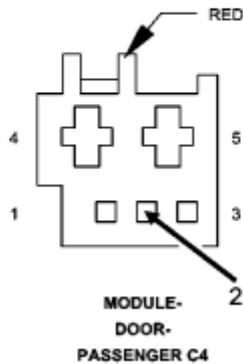
Replace the Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Go To 3.

3. (Q306) PASSENGER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO GROUND



819c6053

Fig. 45: Measuring Resistance Between Ground And (Q306) Passenger Window Hall Sensor Supply Circuit

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Measure the resistance between Ground and the (Q306) Passenger Window Hall Sensor Supply circuit.

Is the resistance below 1000.0 ohms?

Yes

Repair the (Q306) Passenger Window Hall Sensor Supply circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

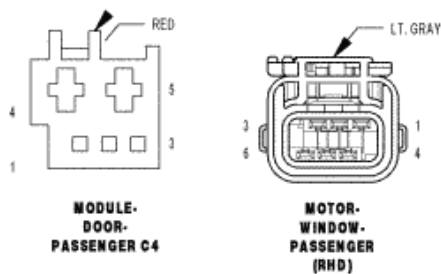
No

Replace the Passenger Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1864-PASSENGER WINDOW POSITION SENSOR POWER SUPPLY HIGH - RHD ONLY - PDM

Circuit Schematic



01400000

Fig. 46: Passenger Window Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the power is turned off to the module and it goes from being awake to sleep mode.

Set Conditions

- **Set Condition:**

When the Passenger Window Hall Sensor Supply circuit is above 1.5 volts for over 15 ms. and the power to the module has been turned off, this code will set.

Possible Causes

Possible Causes
(Q306) PASSENGER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO VOLTAGE PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read the stored DTC's.

Does the scan tool display B1864-PASSENGER WINDOW POSITION SENSOR POWER SUPPLY HIGH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(Q306) PASSENGER WINDOW HALL SENSOR SUPPLY CIRCUIT SHORT TO VOLTAGE**

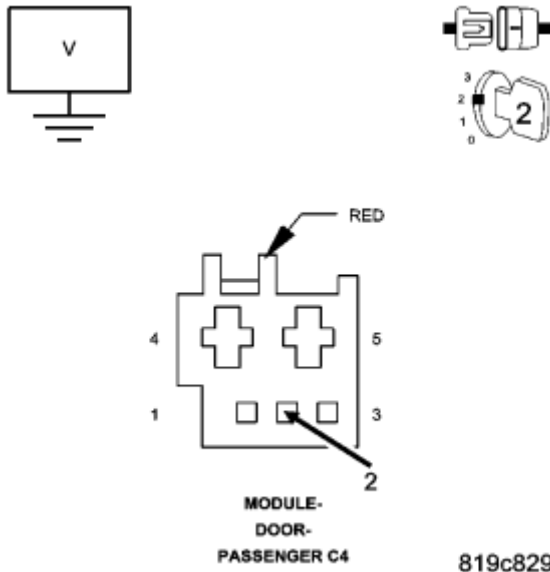


Fig. 47: Measuring Voltage Between (Q306) Passenger Window Hall Sensor Supply Circuit And Ground

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Turn the ignition on.

Measure the voltage between the (Q306) Passenger Window Hall Sensor Supply circuit and Ground.

Is there any voltage present?

Yes

Repair the (Q306) Passenger Window Hall Sensor Supply circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Passenger Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B18B5-MASTER SWITCH - FRONT LEFT WINDOW SWITCH STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Whenever the module detects a Front Left Window signal from the master power window switch, for over 30 seconds, this code will set.

Possible Causes

Possible Causes
MASTER POWER WINDOW SWITCH

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Front Left Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B18B5-MASTER SWITCH-FRONT LEFT WINDOW SWITCH STUCK?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Operate the switch several more times. If the switch ever sticks, replace it.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **MASTER POWER WINDOW/DOOR LOCK SWITCH**

NOTE: Anytime this code is active, the switch must be replaced.

Repair

Replace the Express Window/Door Lock Switch in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B18B6-MASTER SWITCH - FRONT RIGHT WINDOW SWITCH STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Whenever the module detects a Front Right Window signal from the master power window switch, for over 30 seconds, this code will set.

Possible Causes

Possible Causes
MASTER POWER WINDOW SWITCH

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Front Right Window up and down several times from the master switch.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B18B6-MASTER SWITCH-FRONT RIGHT WINDOW SWITCH STUCK?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Operate the switch several more times. If the switch ever sticks, replace it.

Perform **BODY VERIFICATION TEST - VER 1** .

2. MASTER POWER WINDOW/DOOR LOCK SWITCH

NOTE: **Anytime this code is active, the switch must be replaced.**

Repair

Replace the Express Window/Door Lock Switch in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B210D-BATTERY VOLTAGE LOW - DDM/PDM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

• **Set Condition:**

Anytime the module senses voltage input below 9.0 volts, this code will set.

Possible Causes

Possible Causes
LOW VOLTAGE ENGINE DTC (A215) (DDM), A214 (PDM) FUSED B(+) CIRCUIT HAS HIGH RESISTANCE (Z913) GROUND CIRCUIT HAS HIGH RESISTANCE DRIVER OR PASSENGER DOOR MODULE

Diagnostic Test

1. CHECK ENGINE DTC's

With the scan tool, read ENGINE DTC's

Are there any ENGINE DTC's present?

No

Go to 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase DTC's

Start the engine and run for 2 minutes.

With the scan tool, read DTC's. in the Door Module.

Does the scan tool display B210D-BATTERY VOLTAGE LOW?

Yes

Go To 3.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1**.

3. (A214), (A215) FUSED B(+) OR (Z913) GROUND CIRCUITS RESISTED

Disconnect all door module connectors.

Refer to connector pinouts in **SYSTEM WIRING DIAGRAMS** for the door module connectors

Test all (A214) or (A215) Fused B(+) circuits by connecting a 12-volt test light between the Fused B(+) circuit and the (Z913) Ground circuits in the door module connectors. The test light must illuminate brightly. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

Replace the appropriate door module in accordance with Service Information.

No

Test the Fused B(+) and the Ground circuits to determine which one has the high resistance. Repair the circuit for high resistance.

Perform **BODY VERIFICATION TEST - VER 1** .

B210E-BATTERY VOLTAGE HIGH - DDM/PDM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Anytime the module senses voltage input above 15.9 volts, this code will set.

Possible Causes

Possible Causes
HIGH VOLTAGE ENGINE DTC DRIVER OR PASSENGER DOOR MODULE

Diagnostic Test

1. CHECK ENGINE DTC's

With the scan tool, read ENGINE DTC's

Are there any ENGINE DTC's present?

No

Go to 2.

Yes

Refer to symptom list for problems related to ENGINE.

2. TEST FOR INTERMITTENT CONDITION

With the scan tool, record and erase DTC's

Start the engine and run for two minutes.

With the scan tool, read DTC's.

Does the scan tool display B210E-BATTERY VOLTAGE HIGH?

Yes

Replace the appropriate Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

B225D,B225E-DOOR MODULE FRONT LEFT/RIGHT INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Whenever the module detects an EEPROM failure

Possible Causes

Possible Causes
DRIVER OR PASSENGER DOOR MODULE

Diagnostic Test

1. **Replace the Door Module**

NOTE: Anytime this code is logged, the module must be replaced.

Repair

Replace the appropriate Door Module in accordance with service information.
Perform **BODY VERIFICATION TEST - VER 1** .

B226E-MASTER POWER WINDOW SWITCH INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At all times.

Set Conditions

- **Set Condition:**

Whenever the module detects an out of range signal from the master power window switch, for over 30 seconds, this code will set.

Possible Causes

Possible Causes
See <u>DTC U113D</u>

Diagnostic Test

1. MASTER POWER WINDOW SWITCH

NOTE: Whenever this code appears, use the diagnostics for DTC U113D.

Repair

Perform diagnostic procedure for U113D. See **DIAGNOSIS AND TESTING**.

B2577-PASSENGER WINDOW NOT CALIBRATED/LOST CALIBRATION - PDM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the window motor is operating.

Set Conditions

- **Set Condition:**

When the Door Module has lost the parameters for window travel, this code will set.

Possible Causes

Possible Causes
MODULE NOT CALIBRATED EXPRESS WINDOW SWITCH PASSENGER DOOR MODULE (PDM)

Theory Of Operation

This code will always set anytime the battery or the door module connector is disconnected.

NOTE: **If there are any other Power Window DTC's, repair them before continuing.**

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B2577-PASSENGER WINDOW NOT CALIBRATED/LOST CALIBRATION ?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MODULE NOT CALIBRATED

Run the window to the full up position and continue to hold the switch for an additional 2 seconds.

Run the window to the full down position and continue to hold the switch for an additional 2 seconds.

Again run the window to the full up position and continue to hold the switch for an additional 2 seconds.

Lower the window all the way down then press and release the switch to the express up position.

Did the window move to the full up position?

No

Go To 3.

Yes

Test complete.

3. EXPRESS SWITCH

Is the express feature inoperative from both front door switches?

Yes

Replace the Passenger Door Module.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the defective Express Window Switch assembly.

Perform **BODY VERIFICATION TEST - VER 1** .

B2578-DRIVER WINDOW NOT CALIBRATED/LOST CALIBRATION - DDM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the window motor is operating.

Set Conditions

- **Set Condition:**

When the Door Module has lost the parameters for window travel, this code will set.

Possible Causes

Possible Causes
MODULE NOT CALIBRATED EXPRESS WINDOW SWITCH DRIVER DOOR MODULE (DDM)

This code will always set anytime the battery or the door module connector is disconnected.

NOTE: **If there are any other Power Window DTC's, repair them before continuing.**

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B2578-DRIVER WINDOW NOT CALIBRATED/LOST CALIBRATION ?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. WINDOW MODULE NOT CALIBRATED

Run the window to the full up position and continue to hold the switch for an additional 2 seconds.

Run the window to the full down position and continue to hold the switch for an additional 2 seconds.

Again run the window to the full up position and continue to hold the switch for an additional 2 seconds.

Lower the window all the way down then press and release the switch to the express up position.

Did the window move to the full up position?

No

Go To 3.

Yes

Test complete.

3. EXPRESS WINDOW SWITCH

Turn the ignition off.

Move the Driver Express Switch from the idle position to the up position and then to the express up position.

Is there two definite detent positions felt?

Yes

Replace the Driver Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

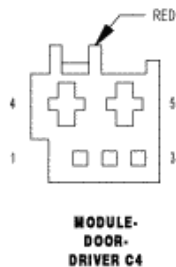
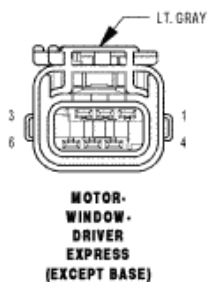
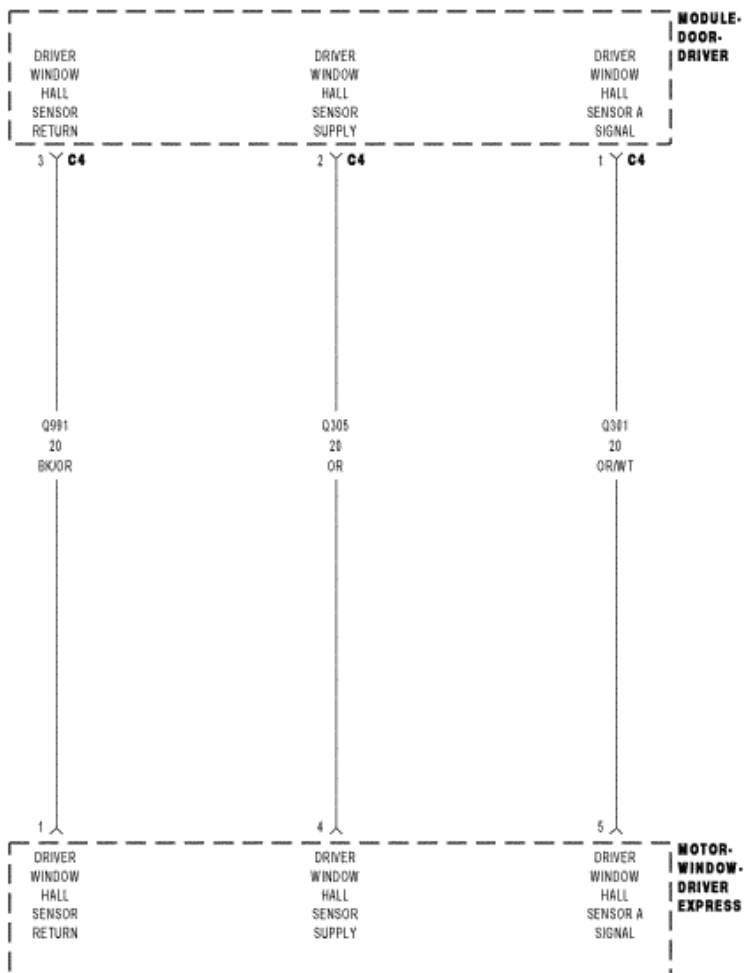
No

Replace the Driver Express Window Switch assembly.

Perform **BODY VERIFICATION TEST - VER 1** .

B2580-DRIVER WINDOW POSITION SENSOR(S) NO SIGNAL - DDM

Circuit Schematic



019ca95a

Fig. 48: Driver Window Position Sensor(s) Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the window motor is operating.

Set Conditions

- **Set Condition:**

When the door module does not sense a pulse from the hall sensor, during a window movement, this code will set.

Possible Causes

Possible Causes
(Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT OPEN (Q301) DRIVER WINDOW HALL SENSOR A CIRCUIT OPEN WINDOW MOTOR DRIVER DOOR MODULE (DDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Driver Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B2580-DRIVER WINDOW POSITION SENSOR(S) NO SIGNAL?

Yes

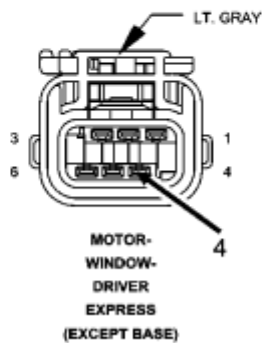
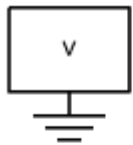
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(Q305) DRIVER WINDOW HALL SENSOR SUPPLY CIRCUIT OPEN**



8193116e

Fig. 49: Driver Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Driver Window Motor connector.

Measure the voltage between the (Q305) Driver Window Hall Sensor Supply circuit and Ground.

Turn the ignition on.

Is the voltage above 9.5 volts?

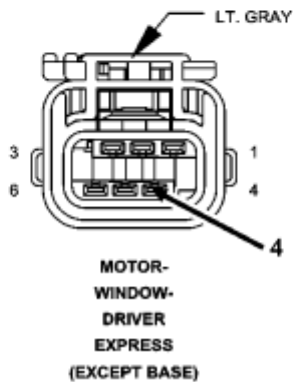
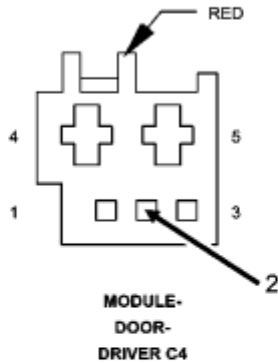
No

Go To 3.

Yes

Go To 4.

3. (Q305) HALL SENSOR SUPPLY CIRCUIT OPEN



819ce986

Fig. 50: Measuring Resistance Of (Q305) Driver Window Hall Sensor Supply Circuit Between Module Connector And Motor Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Measure the resistance of the (Q305) Driver Window Hall Sensor Supply circuit between the Module connector and the Motor connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Driver Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Repair the (Q305) Driver Window Hall Sensor Supply circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **(Q301) DRIVER WINDOW HALL SENSOR A SIGNAL CIRCUIT OPEN**

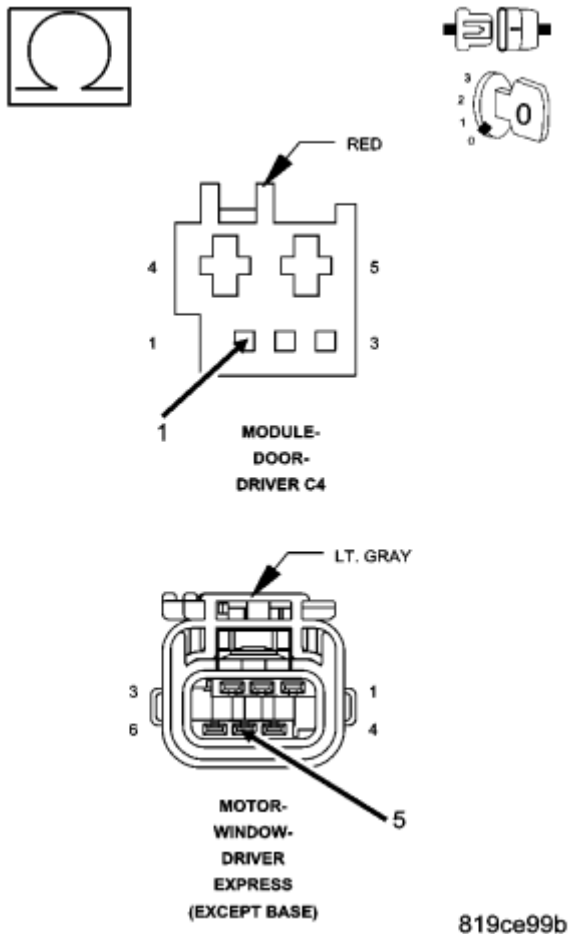


Fig. 51: Measuring Resistance Of (Q301) Driver Window Hall Sensor A Signal Circuit Between Module Connector And Motor Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C4 connector.

Measure the resistance of the (Q301) Driver Window Hall Sensor A Signal circuit between the Module connector and the Motor connector.

Is the resistance below 2.0 ohms?

No

Repair the (Q301) Driver Window Hall Sensor A Signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

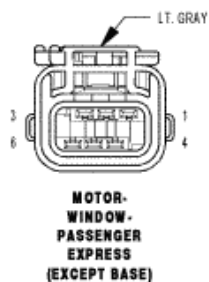
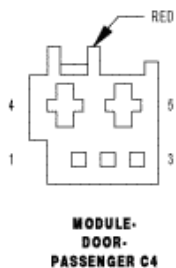
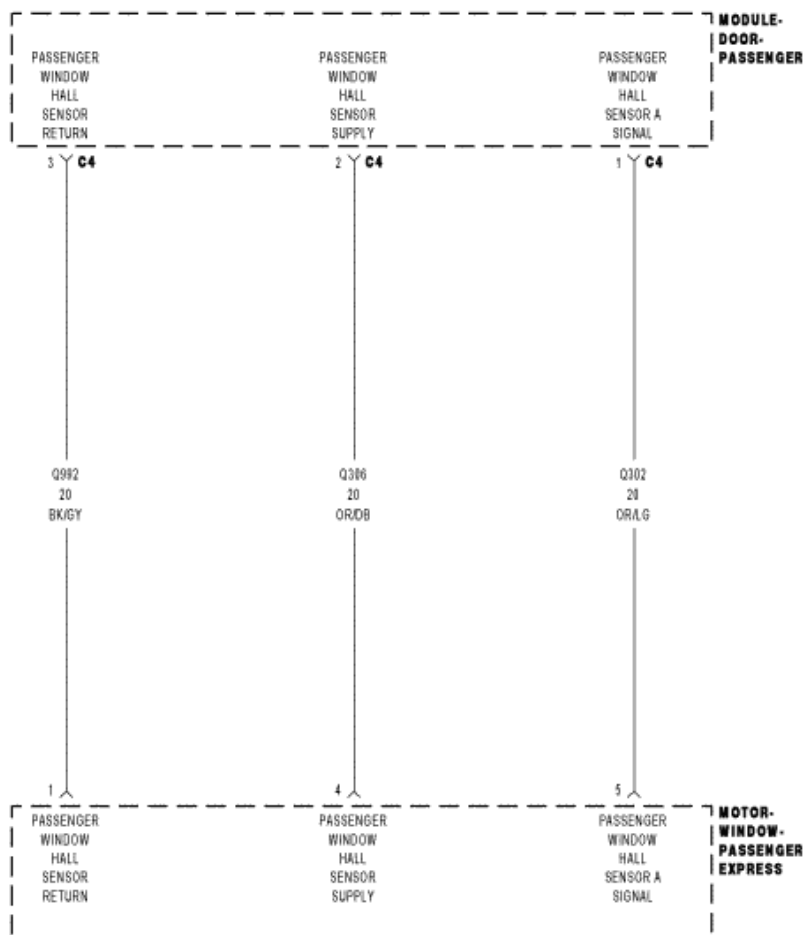
Yes

Replace the Driver Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

B2581-PASSENGER WINDOW POSITION SENSOR(S) NO SIGNAL - RHD ONLY - PDM

Circuit Schematic



01000001

Fig. 52: Passenger Window Position Sensor(s) Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the window motor is operating.

Set Conditions

- **Set Condition:**

When the door module does not sense a pulse from the hall sensor, during a window movement, this code will set.

Possible Causes

Possible Causes
(Q306) PASSENGER WINDOW HALL SENSOR SUPPLY CIRCUIT OPEN (Q302) PASSENGER WINDOW HALL SENSOR A CIRCUIT OPEN WINDOW MOTOR (REGULATOR) PASSENGER DOOR MODULE (PDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's

Operate the Passenger Window up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display B2581-PASSENGER WINDOW POSITION SENSOR(S) NO SIGNAL?

Yes

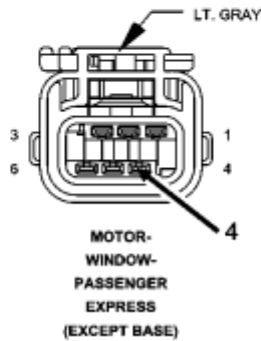
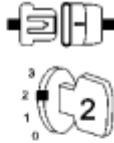
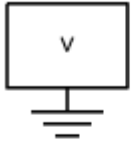
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(Q306) HALL SENSOR SUPPLY CIRCUIT OPEN**



8192eae0

Fig. 53: Passenger Window Motor Connector
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Passenger Window Motor connector.

Turn the ignition on.

Measure the voltage between the (Q306) Passenger Window Hall Sensor Supply circuit and Ground.

Turn the ignition on.

Is the voltage above 9.5 volts?

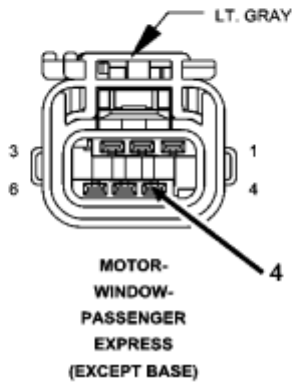
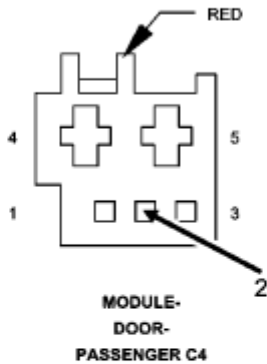
No

Go To 3.

Yes

Go To 4.

3. (Q306) HALL SENSOR SUPPLY CIRCUIT OPEN



819cfbaf

Fig. 54: Measuring Resistance Of (Q306) Passenger Window Hall Sensor Supply Circuit Between Module Connector And Motor Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Measure the resistance of the (Q306) Passenger Window Hall Sensor Supply circuit between the Module connector and the Motor connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Passenger Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Q306) Passenger Window Hall Sensor Supply circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

4. **(Q302) PASSENGER WINDOW HALL SENSOR A SIGNAL CIRCUIT OPEN**

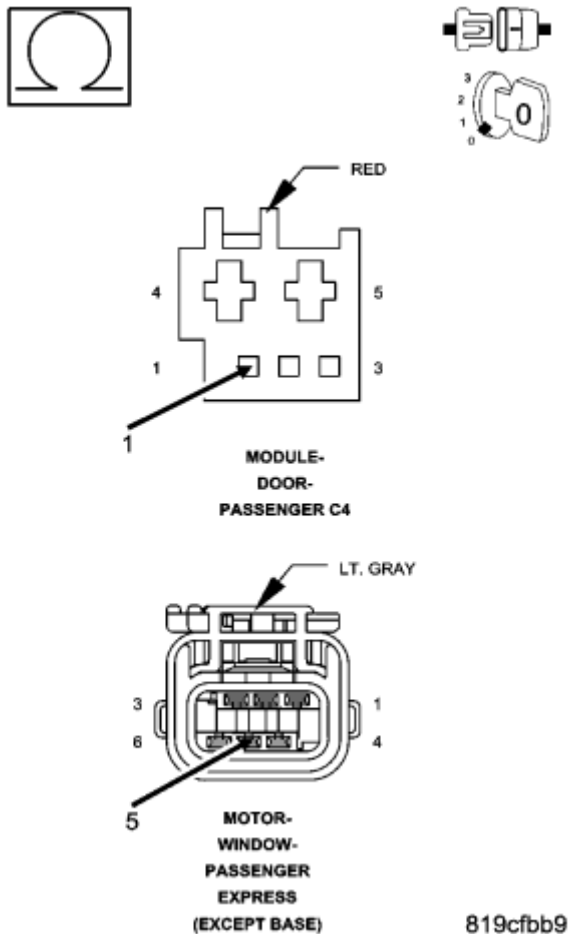


Fig. 55: Measuring Resistance Of (Q302) Passenger Window Hall Sensor A Signal Circuit Between Module Connector And Motor Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Passenger Door Module C4 connector.

Measure the resistance of the (Q302) Passenger Window Hall Sensor A Signal circuit between the Module connector and the Motor connector.

Is the resistance below 2.0 ohms?

No

Repair the (Q302) Passenger Window Hall Sensor Signal A circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Passenger Window Motor (regulator) in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

U0010-CAN INTERIOR BUS

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0011-CAN INTERIOR BUS OFF PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0159-LOST COMMUNICATION WITH PARKING ASSIST CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0164-LOST COMMUNICATION WITH HVAC CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0167-LOST COMMUNICATION WITH INTRUSION TRANSCEIVER CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0184-LOST COMMUNICATION WITH RADIO

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0186-LOST COMMUNICATION WITH AUDIO AMPLIFIER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0196-LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - FIRST ROW

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0197-LOST COMMUNICATION WITH HANDS FREE PHONE MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0203-LOST COMMUNICATION WITH DOOR MODULE FRONT LEFT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0204-LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0249-LOST COMMUNICATION WITH VEHICLE ENTERTAINMENT CONTROL MODULE - LAST ROW

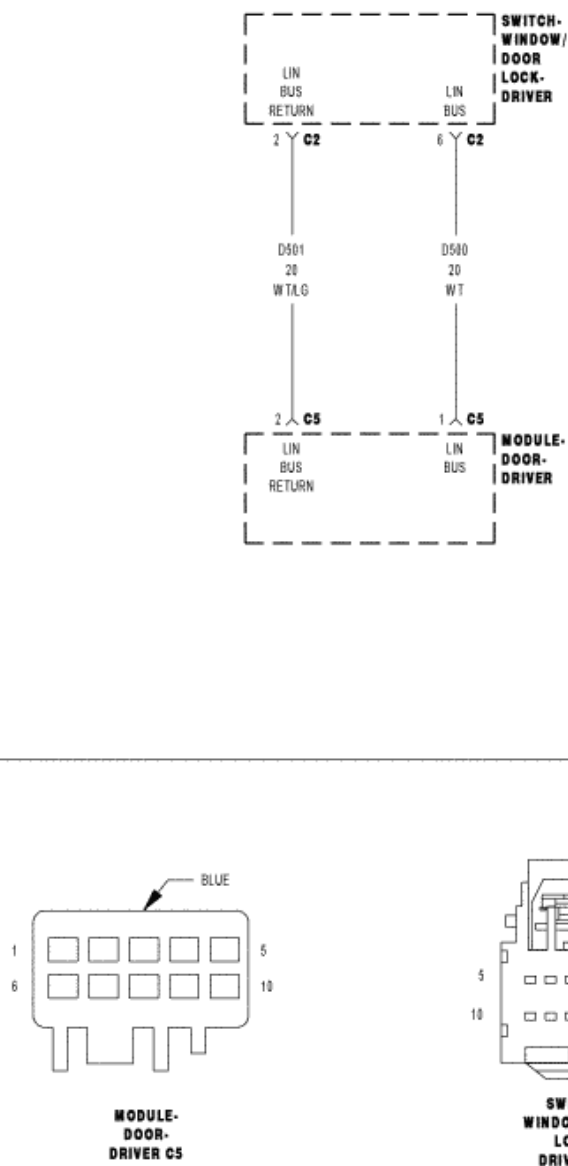
Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U113D-LOST COMMUNICATION WITH MASTER POWER WINDOW SWITCH

Circuit Schematic



01942500

Fig. 56: Lost Communication With Master Power Window Switch Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the module is awake.

Set Conditions

- **Set Condition:**

When one or both door modules have lost communication with the Driver Express Window/Door Lock Switch, this code will set.

Possible Causes

Possible Causes
(D500) LIN BUS CIRCUIT SHORT TO GROUND (D500) LIN BUS CIRCUIT SHORT TO VOLTAGE (D500) LIN BUS CIRCUIT OPEN (D501) LIN BUS RETURN CIRCUIT OPEN DRIVER EXPRESS WINDOW/DOOR LOCK SWITCH DOOR MODULE (DDM)

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

NOTE: If the scan tool displays any other power window DTC(s), repair them first before continuing.

Turn the ignition on.

With the scan tool, record and erase DTC's

Try to operate the Front Windows up and down several times.

Wait 30 seconds.

With the scan tool, read DTC's.

Does the scan tool display: U113D-LOST COMMUNICATION WITH MASTER POWER WINDOW SWITCH?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE LIN BUS CIRCUIT

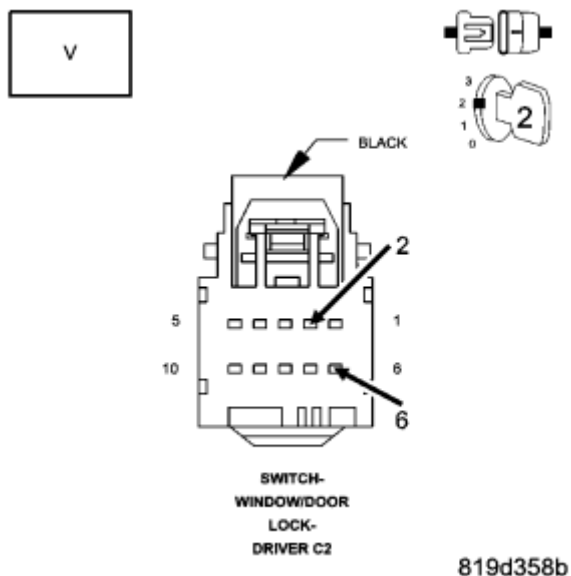


Fig. 57: Measuring Voltage Between (D500) LIN Bus Circuit And (D501) LIN Bus Return Circuit
Courtesy of CHRYSLER LLC

With the scan tool, erase DTC's.

Turn the ignition off.

Disconnect the Driver Window/Door Lock Switch C2 connector.

Turn the ignition on.

Measure the voltage between the (D500) LIN Bus circuit and the (D501) LIN Bus Return circuit.

Is the voltage above 8.0 volts?

No

Go To 4.

Yes

Go To 3.

3. (D500) LIN BUS CIRCUIT SHORT TO VOLTAGE

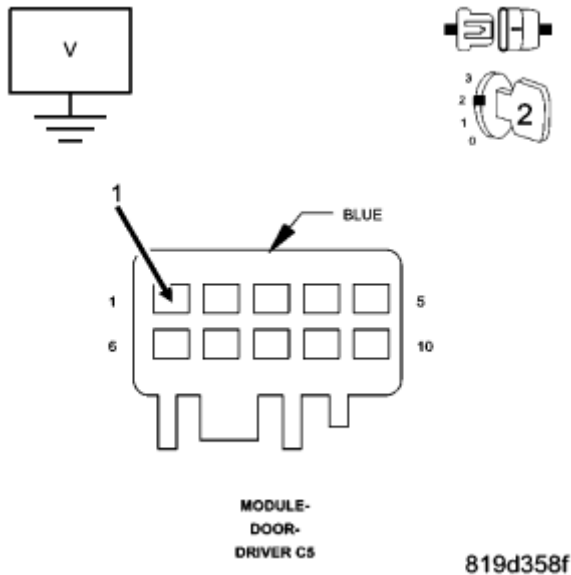


Fig. 58: Measuring Voltage Between Ground And (D500) LIN Bus Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C5 connector.

Turn the ignition on.

Measure the voltage between Ground and the (D500) LIN Bus circuit.

Is there any voltage present?

Yes

Repair the (D500) LIN Bus circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Driver Window/Door Lock Switch.

Perform **BODY VERIFICATION TEST - VER 1** .

4. (D501) LIN BUS RETURN CIRCUIT OPEN

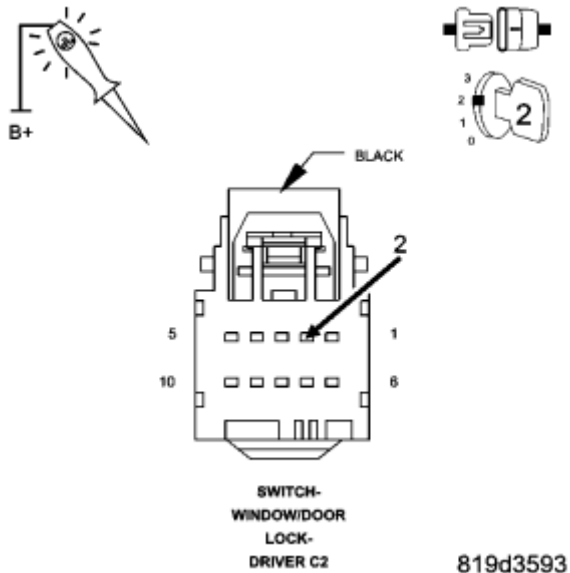


Fig. 59: Using 12-Volt Test Light Connected To 12-Volts To Check (D501) LIN Bus Return Circuit In Window Switch Connector
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (D501) LIN Bus Return circuit in the Window Switch connector.

Does the test light illuminate brightly?

Yes

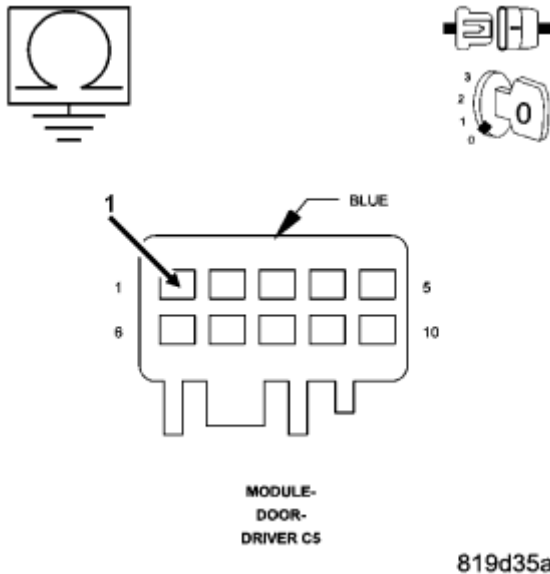
Go To 5.

No

Repair the (D501) LIN Bus Return circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

5. (D500) LIN BUS CIRCUIT SHORT TO GROUND



819d35a9

Fig. 60: Measuring Resistance Between Ground And (D500) LIN Bus Circuit In Door Module C4 Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Door Module C5 connector.

Measure the resistance between Ground and the (D500) LIN Bus circuit in the Door Module C4 connector.

Is the resistance below 10,000.0 ohms?

Yes

Repair the (D500) LIN Bus circuit for a short to the ground.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. (D500) LIN BUS CIRCUIT OPEN

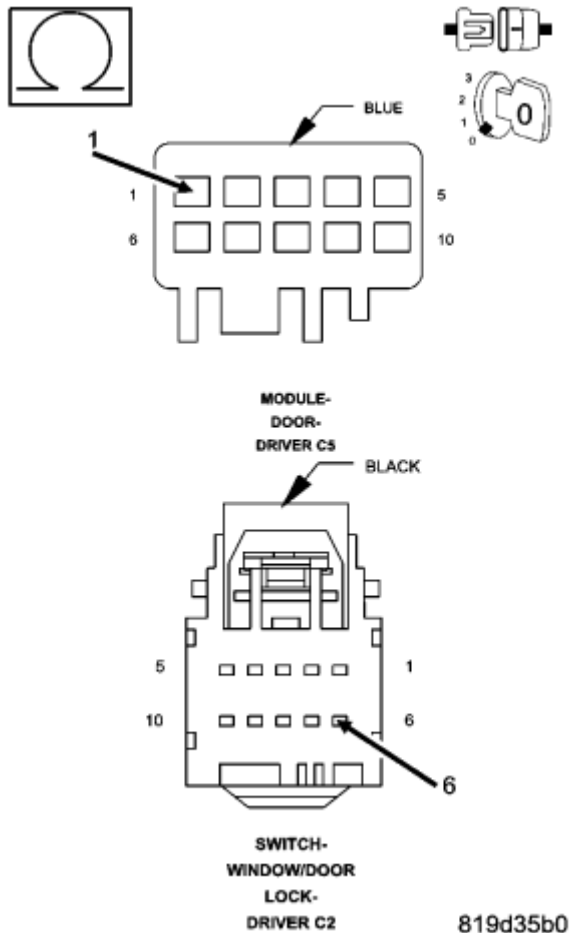


Fig. 61: Measuring Resistance Of (D500) LIN Bus Circuit Between Door Module C5 Connector And Driver Express Window/Door Lock Switch Connector
 Courtesy of CHRYSLER LLC

Measure the resistance of the (D500) LIN Bus circuit between the Door Module C5 connector and the Driver Express Window/Door Lock Switch connector.

Is the resistance below 2.0 ohms?

No

Repair the (D500) LIN Bus circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

Yes

Replace the Driver Door Module in accordance with service information.

Perform **BODY VERIFICATION TEST - VER 1** .

2008 ACCESSORIES AND EQUIPMENT

Power Windows - Service Information - Liberty

POWER WINDOWS - SERVICE INFORMATION

DESCRIPTION

POWER WINDOWS

The power window system allows each of the door windows to be raised and lowered electrically by actuating a switch on the center console. A master switch on the front of the center console allows the driver to raise or lower each of the passenger door windows and to lock out the individual switches on the rear of the center console from operation. The power window system receives battery feed through a fuse in the Totally Integrated Power Module (TIPM), only when the ignition switch is in the RUN or ACCESSORY position.

OPERATION

POWER WINDOWS

WINDOW SWITCH

The power window switches control the battery and ground feeds to the power window motors. Both of the rear door power window switches receive their battery and ground feeds through the circuitry of the front window switch. When the power window lockout switch is in the Lock position, the battery feed for the rear door window switches is interrupted.

WINDOW MOTOR

Front door window lift motors use permanent type magnets. The B+ and ground applied at the motor terminal pins will cause the motor to rotate in one direction. Reversing current through the motor terminals will cause the motor to rotate in the opposite direction.

Refer to the **SYSTEM WIRING DIAGRAMS** article.

DIAGNOSIS AND TESTING

POWER WINDOWS

WIRING VOLTAGE TEST

The following wiring test determines whether or not voltage is continuous through the body harness to the front switch.

1. Remove the power window switch and bezel. See **REMOVAL**.
2. Disconnect wire connector from back of power window switch.
3. Switch ignition to the ON position.

4. Connect the clip end of a 12 volt test light to Pin 14 of the window switch harness connector. Touch the test light probe to Pin 10.
 - If the test light illuminates, the wiring circuit between the battery and switch is OK.
 - If the lamp does not illuminate, first check fuse 13 in the Totally Integrated Power Module (TIPM). If fuse 13 is OK, then check for a broken wire.

Refer to the **SYSTEM WIRING DIAGRAMS** article.

POWER WINDOW MOTOR TEST

NOTE: **The power window motor test does not apply to models with the auto-express feature.**

If the power window motor is receiving proper current and ground and does not operate, proceed with motor test. Refer to the **SYSTEM WIRING DIAGRAMS** article.

1. Remove front door trim panel as necessary to gain access to power window motor wire connector. Refer to **REMOVAL** .
2. Disconnect power window motor wire connector from door harness.
3. Using two jumper wires, connect one to a battery (+) source and the other to a good ground (-).
4. Connect the Negative (-) jumper probe to one of the motor connector terminals.
5. Momentarily touch the Positive (+) jumper probe to the other motor connector terminal.

When positive probe is connected the motor should rotate in one direction to either move window up or down. If window is all the way up or down the motor will grunt and the inner door panel will flex when actuated in that one direction.

6. Reverse jumper probes at the motor connector terminals and window should now move in opposite direction. If window does not move or grunt, replace the motor.

If window moved completely up or down, reverse the jumper probes and cycle window to the opposite position to verify full operation.

If motor grunts and does not move, verify that regulator is not binding.

STANDARD PROCEDURE

STANDARD PROCEDURE-EXPRESS WINDOWS

Anytime the battery is disconnected or in a run down/low voltage state, the auto-up (express) windows must be calibrated.

To calibrate the auto-express feature, perform the following:

1. Turn the Ignition to the Run position.

2. Using the scan tool, perform an ECU reset.
3. Position the window at the midpoint of travel.
4. Move the driver side front window upward until the window stalls in the full up position. Allow the window motor to stall for at least 2 seconds before releasing the switch.
5. Move the driver side front window downward until the window stalls in the full down position. Allow the window motor to stall for at least 2 second before releasing the switch.
6. Repeat steps 3, 4 and 5 for the passenger side front window.
7. Verify the windows are properly calibrated by operating the express down and up features. Repeat this procedure if the calibration failed. If unable to properly calibrate after the second attempt, check the Driver's Door Module (DDM) and Passenger's Door Module (PDM) for Diagnostic Trouble Codes (DTCs) and correct as required.

WINDOW MOTOR

REMOVAL

WINDOW MOTOR

The window motor is incorporated into the window regulator assembly. If the window motor requires replacement, the window regulator must be replaced. Refer to **REMOVAL** for front window, or **REMOVAL** for rear window.

WINDOW SWITCH

REMOVAL

WINDOW SWITCH

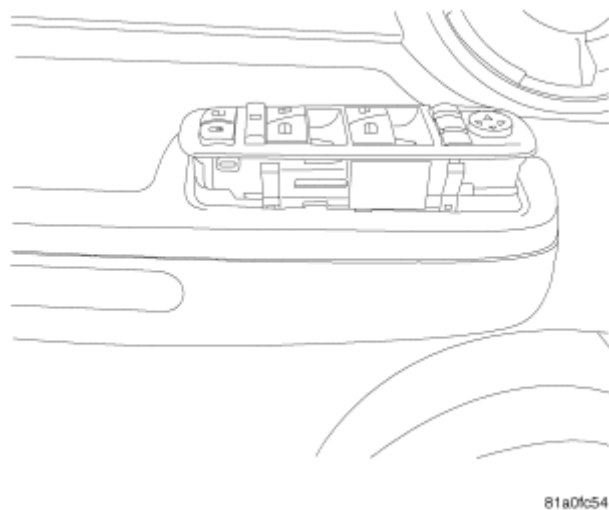


Fig. 1: Removing Window Switch
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.

2. Gently pry the switch from the door trim panel.
3. Disconnect electrical harness connector from switch.

INSTALLATION

WINDOW SWITCH

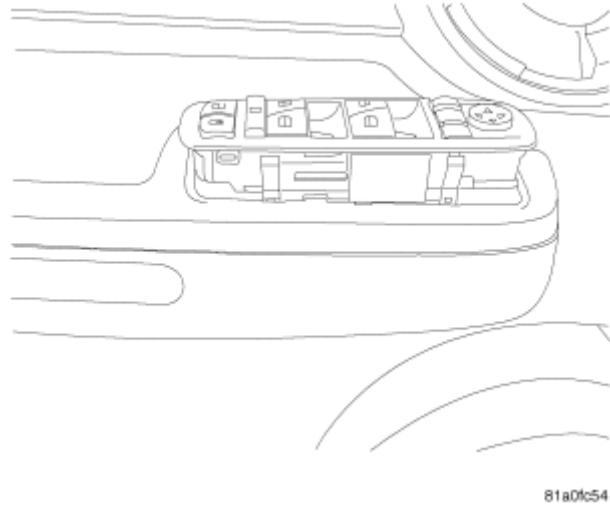


Fig. 2: Installing Window Switch
Courtesy of CHRYSLER LLC

1. Connect the electrical harness connector to the switch.
2. Press the switch into place.
3. Connect the battery negative cable.

2008 ACCESSORIES AND EQUIPMENT

Power Seats - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1D62</u>	POWER SEAT SWITCH STUCK
<u>B1D63</u>	POWER SEAT SWITCH OPEN
<u>B1D6D</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT LOW
<u>B1D6E</u>	SEAT HORIZONTAL POSITION SENSOR CIRCUIT HIGH
<u>B1D71</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D72</u>	SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D75</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT LOW
<u>B1D76</u>	SEAT REAR VERTICAL POSITION SENSOR CIRCUIT HIGH
<u>B1D7B</u>	SEAT HORIZONTAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D7F</u>	SEAT FRONT VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D83</u>	SEAT REAR VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE
<u>B1D9B</u>	SEAT HORIZONTAL FRONT STOP NOT LEARNED
<u>B210D</u>	BATTERY VOLTAGE LOW - MSM
<u>B210E</u>	BATTERY VOLTAGE HIGH - MSM
<u>B221C</u>	MEMORY SEAT MODULE INTERNAL
<u>U0011</u>	CAN INTERIOR BUS OFF PERFORMANCE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0203</u>	LOST COMMUNICATION WITH DOOR MODULE LEFT FRONT
<u>U0204</u>	LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

POWER SEATS - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1D62-POWER SEAT SWITCH STUCK

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

When the Memory Seat Module detects the Driver Seat Switch engaged in an active position for over 50 seconds, this code will set.

Possible Causes

Possible Causes
DRIVER SEAT SWITCH

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Press the Driver Seat Switch in all directions several times.

Wait one minute.

With the scan tool, read DTC's.

Does the scan tool display active: B1D62-POWER SEAT SWITCH STUCK?

Yes

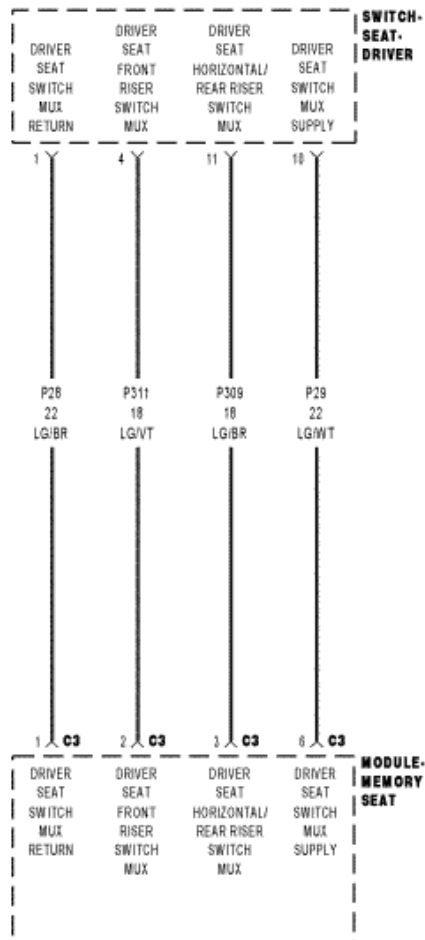
Replace the Driver Seat Switch in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

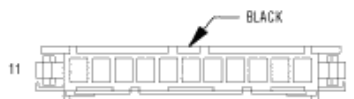
The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D63-POWER SEAT SWITCH OPEN

Circuit Schematic



MODULE-MEMORY SEAT C3



SWITCH-SEAT-DRIVER

0107ea02

Fig. 1: Power Seat Switch Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Memory Seat Module detects an open Driver Seat Switch MUX circuit this code will set.

Possible Causes

Possible Causes
(P309) DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX CIRCUIT OPEN OR SHORT TO GROUND
(P311) DRIVER SEAT FRONT RISER SWITCH MUX CIRCUIT OPEN OR SHORT TO GROUND
(P28) DRIVER SEAT SWITCH MUX RETURN CIRCUIT OPEN OR SHORT TO GROUND
(P29) DRIVER SEAT SWITCH MUX SUPPLY CIRCUIT OPEN OR SHORT TO GROUND
DRIVER SEAT SWITCH
MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Press the Driver Seat Switch in all directions several times.

Wait one minute.

With the scan tool, read DTC's.

Does the scan tool display active: B1D63-POWER SEAT SWITCH OPEN?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken

wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **(P309) DRIVER SEAT HORIZONTAL/REAR RISER SWITCH MUX CIRCUIT OPEN**

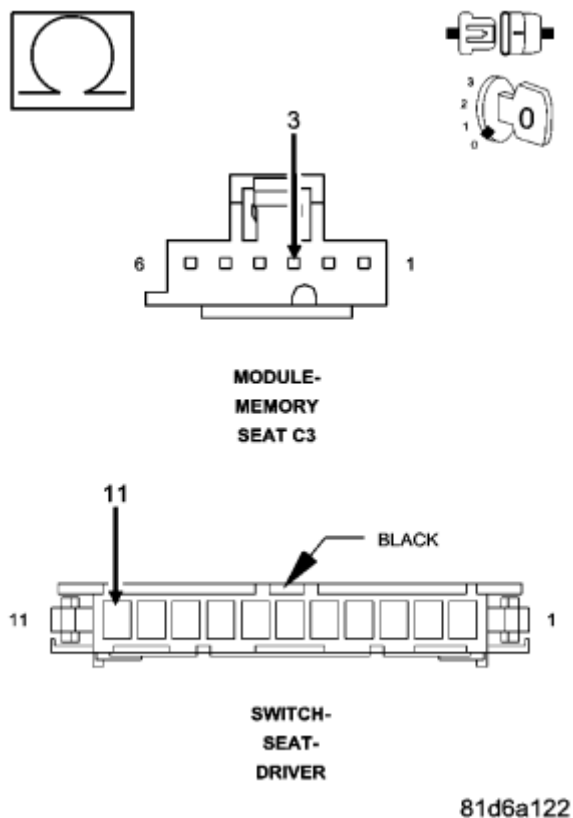


Fig. 2: Measuring The Resistance Of The (P309) Driver Seat Horizontal/Rear Riser Switch Mux Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Seat Switch.

Disconnect the Memory Seat Module C3 harness connector.

Measure the resistance of the (P309) Driver Seat Horizontal/Rear Riser Switch MUX between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

Go To 3.

No

Repair the (P309) Driver Seat Horizontal/Rear Riser Switch MUX for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **(P311) DRIVER SEAT FRONT RISER SWITCH MUX CIRCUIT OPEN**

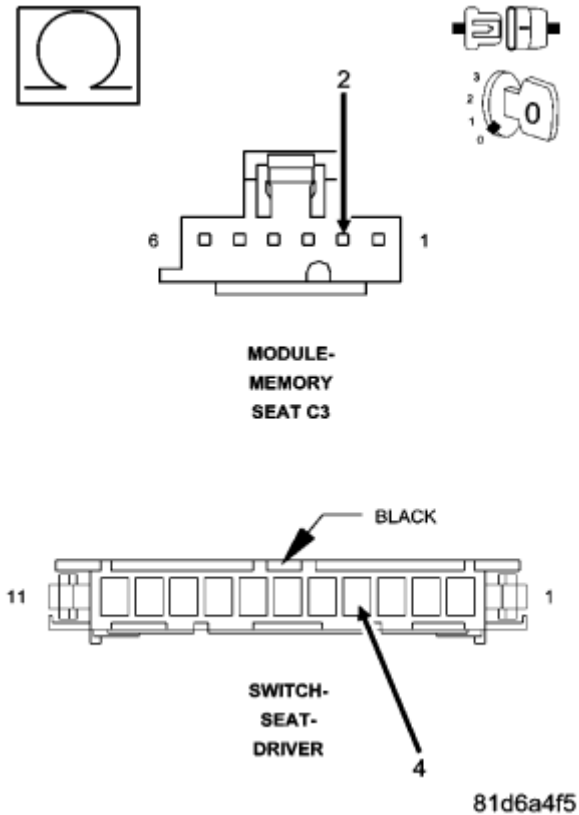


Fig. 3: Measuring The Resistance Of The (P311) Driver Seat Front Riser Switch Mux Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P311) Driver Seat Front Riser Switch MUX between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

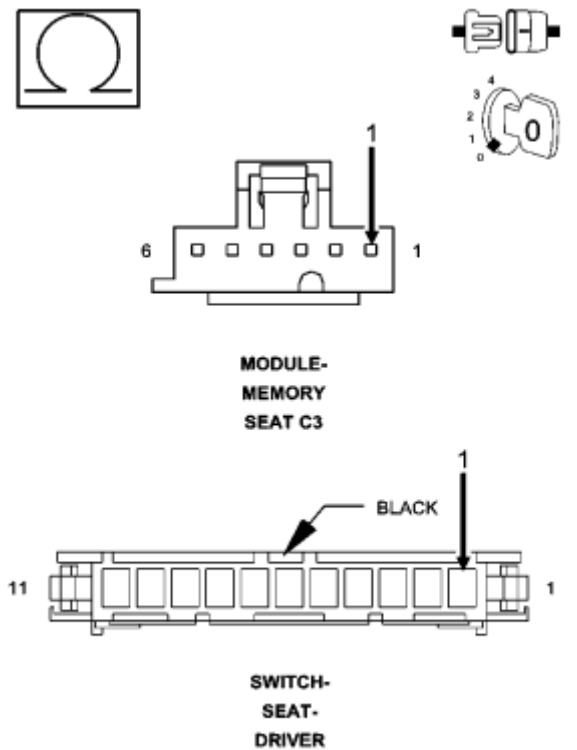
Go To 4.

No

Repair the (P311) Driver Seat Front Riser Switch MUX for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

4. **(P28) DRIVER SEAT SWITCH MUX RETURN CIRCUIT OPEN**



81d6a5bb

Fig. 4: Measuring The Resistance Of The (P28) Driver Seat Switch Mux Return Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P28) Driver Seat Switch MUX Return between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

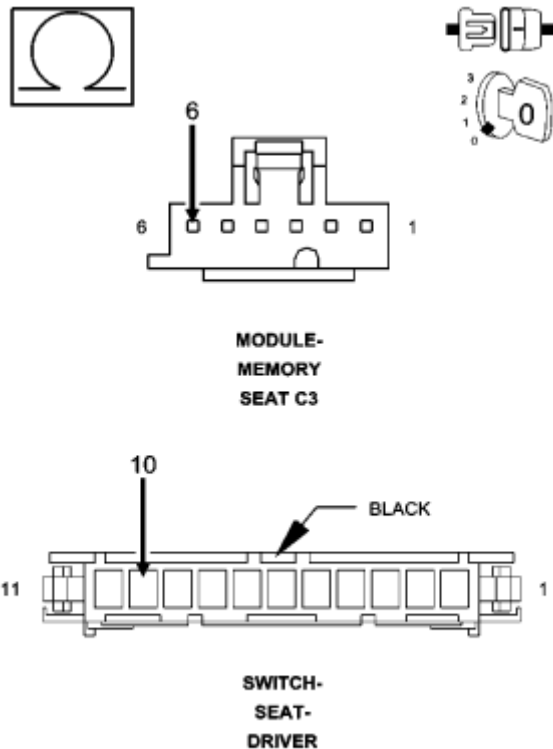
Go To 5.

No

Repair the (P28) Driver Seat Switch MUX Return circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

5. **(P29) DRIVER SEAT SWITCH MUX SUPPLY CIRCUIT OPEN**



81d6a533

Fig. 5: Measuring The Resistance Of The (P29) Driver Seat Switch Mux Supply Between The Driver Seat Switch Harness Connector And The Memory Seat Module C3 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P29) Driver Seat Switch MUX Supply between the Driver Seat Switch harness connector and the Memory Seat Module C3 harness connector.

Is the resistance below 3.0 ohms?

Yes

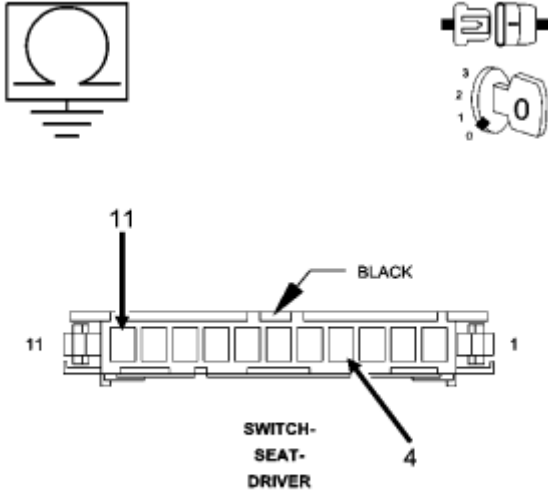
Go To 6.

No

Repair the (P29) Driver Seat Switch MUX Supply for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. CHECK THE DRIVER SEAT SWITCH CIRCUIT RESISTANCES TO GROUND



81d6ae2b

Fig. 6: Measuring The Resistance Between Ground And Each Of The Driver Seat Switch Circuits At The Driver Seat Switch Harness Connector
 Courtesy of CHRYSLER LLC

Measure the resistance between ground and each of the Driver Seat Switch circuits at the Driver Seat Switch harness connector.

Is the resistance above 10k ohms for each circuit?

Yes

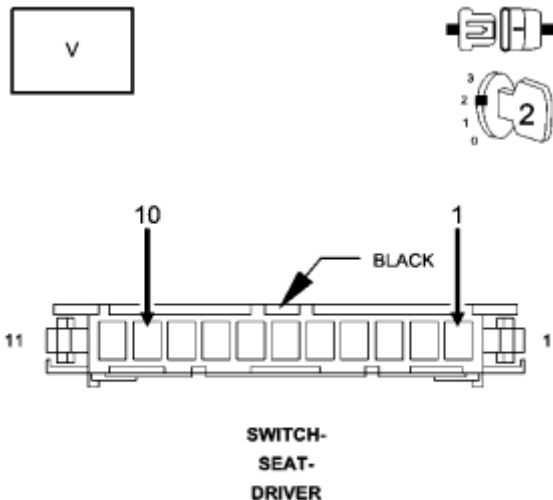
Go To 7.

No

Repair the circuit(s) that measured below 10k ohms for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. CHECK THE MSM SENSOR SUPPLY AND SENSOR RETURN



81d6ae3c

Fig. 7: Measuring The Voltage Between The (P29) Driver Seat Switch Mux Supply Circuit And The (P28) Driver Seat Switch Mux Return Circuit At The Driver Seat Switch Harness Connector
 Courtesy of CHRYSLER LLC

Reconnect the Memory Seat Module C3 harness connector.

Turn the ignition on.

Measure the voltage between the (P29) Driver Seat Switch MUX Supply circuit and the (P28) Driver Seat Switch MUX Return circuit at the Driver Seat Switch harness connector.

Is the voltage above 11.0 volts?

Yes

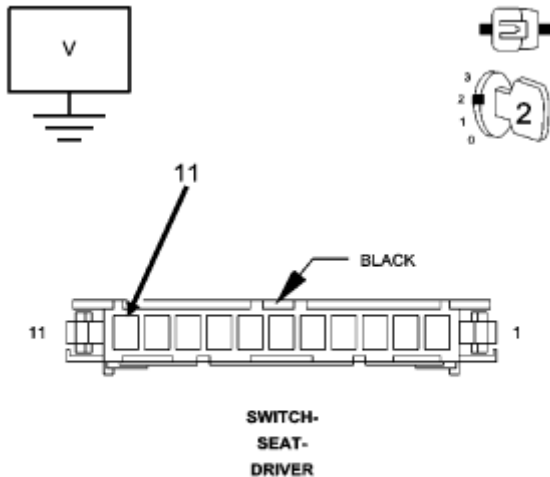
Go To. 8.

No

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. DRIVER SEAT HORIZONTAL SWITCH



81d6ae64

Fig. 8: Checking Driver Seat Horizontal Switch
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Reconnect the Driver Seat Switch harness connector.

Turn the ignition on.

Backprobe and measure the voltage of the (P309) Driver Seat Horizontal Rear Riser Switch MUX circuit while moving the Driver Seat Switch horizontally and the rear riser up, down.

NOTE: The Voltage readings for all positions should be between 1.0 volt and 5.0 volts.

Is the voltage between 1.0 and 5.0 volts when the Driver Seat Switch is moved to each position?

Yes

Go To 9.

No

Replace the Driver Seat Switch.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

9. DRIVER SEAT FRONT RISER SWITCH

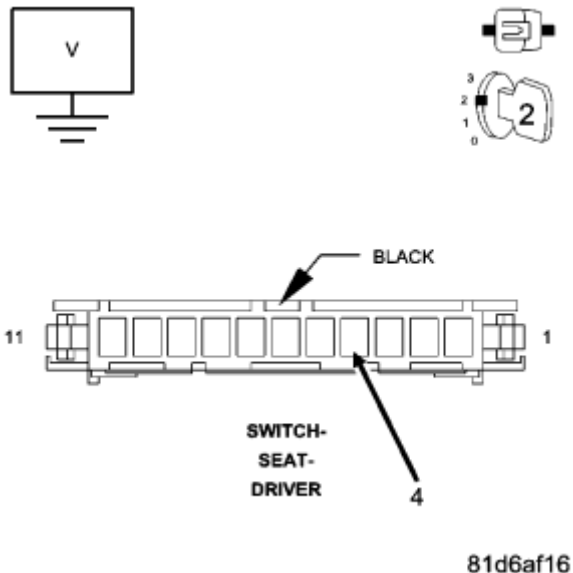


Fig. 9: Checking Driver Seat Front Riser Switch
 Courtesy of CHRYSLER LLC

Backprobe and measure the voltage of the (P311) Driver Seat Front Riser MUX circuit while moving the Driver Seat Front Riser Switch forward and rearward.

NOTE: The Voltage readings for all positions should be between 1.0 volt and 5.0 volts.

Is the voltage between 1.0 and 5.0 volts when the Driver Seat Switch is moved to each position?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

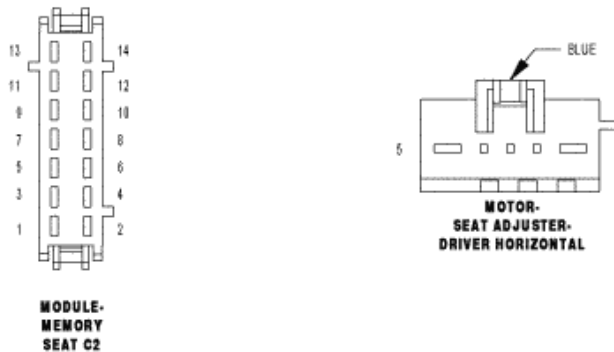
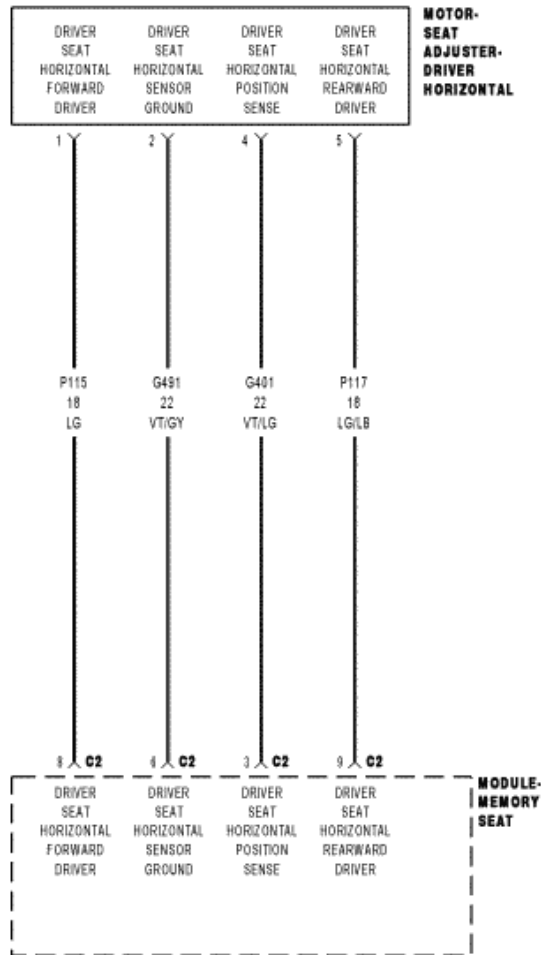
No

Replace the Driver Seat Switch.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D6D-SEAT HORIZONTAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic



01430000

Fig. 10: Seat Horizontal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO GROUND DRIVER HORIZONTAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Horizontal position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

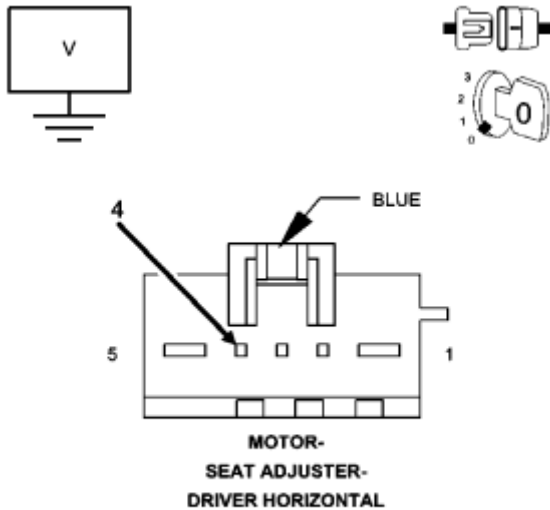
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT VOLTAGE**



81d6e55b

Fig. 11: Measuring The Voltage Of The (G401) Driver Seat Horizontal Position Sense Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Actuate the seat switch in the affected position for the next step.

Measure the voltage of the (G401) Driver Seat Horizontal Position Sense circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

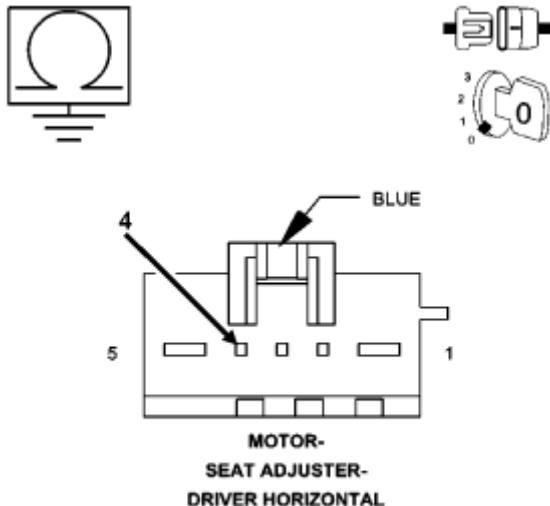
Yes

Replace the Seat Track Horizontal Motor assembly in accordance with the Service Information.
 Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND**



81d6e593

Fig. 12: Measuring The Resistance Between Ground And The (G401) Driver Seat Horizontal Position Sense Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G401) Driver Seat Horizontal Position Sense circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

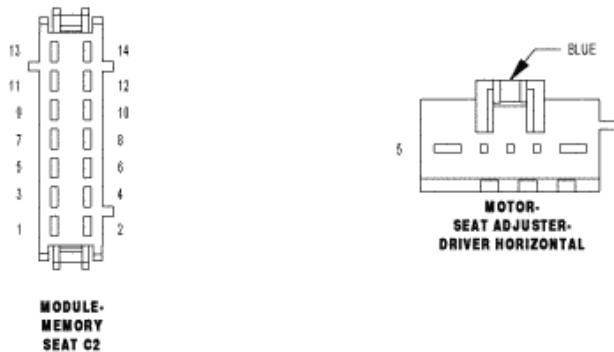
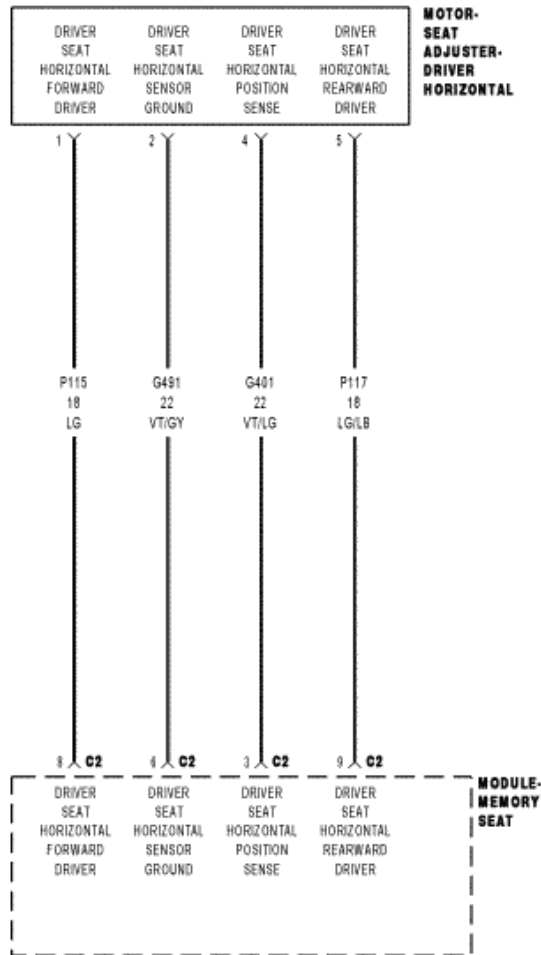
No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D6E-SEAT HORIZONTAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic



01430600

Fig. 13: Seat Horizontal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN
DRIVER HORIZONTAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the horizontal position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **DRIVER HORIZONTAL SEAT ADJUSTER MOTOR**

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the horizontal positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go to 3.

No

Replace the Driver Horizontal Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE**

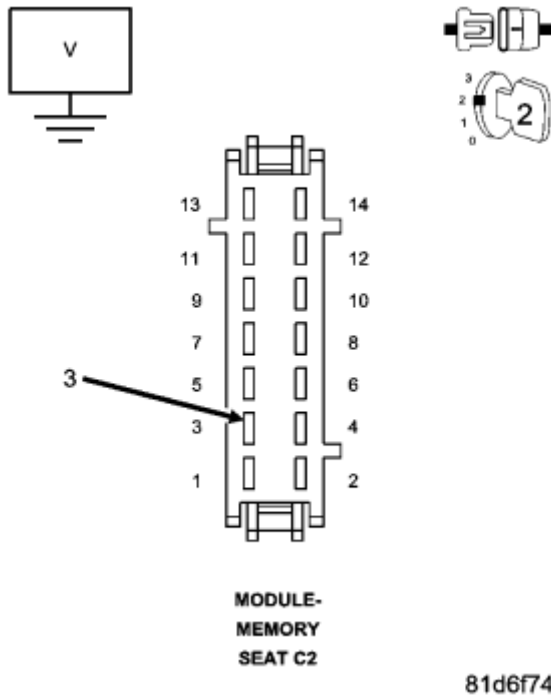


Fig. 14: Measuring The Voltage Of The (G401) Driver Seat Horizontal Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G401) Driver Seat Horizontal Position Sense circuit.

Is there any voltage present?

Yes

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. **(G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT**

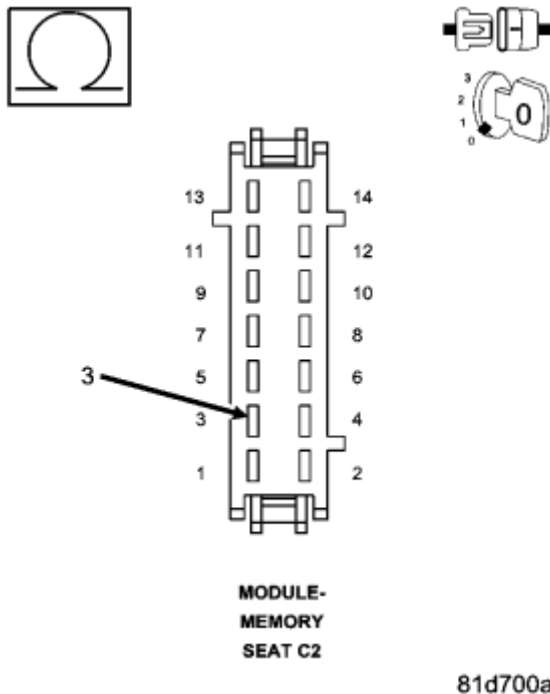


Fig. 15: Measuring The (G401) Driver Seat Horizontal Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the (G401) Driver Seat Horizontal Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present?

Yes

Repair the (G401) Driver Seat Horizontal Position Sense circuit for a short to another circuit.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN

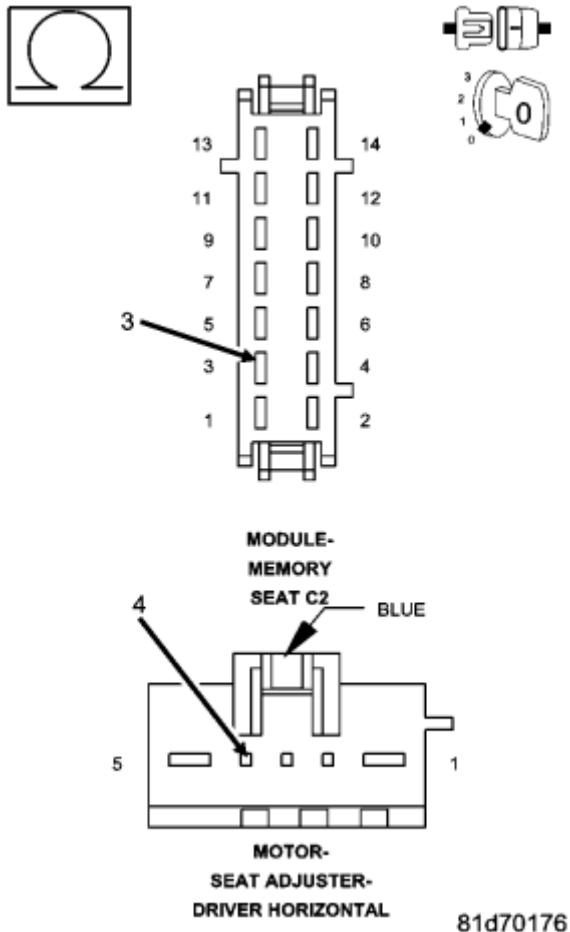


Fig. 16: Measuring The Resistance Of The (G401) Driver Seat Horizontal Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Horizontal Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G401) Driver Seat Horizontal Position Sense circuit between the Memory Seat Module C2 harness connector and the Driver Horizontal Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

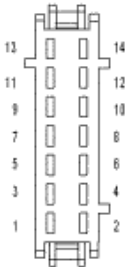
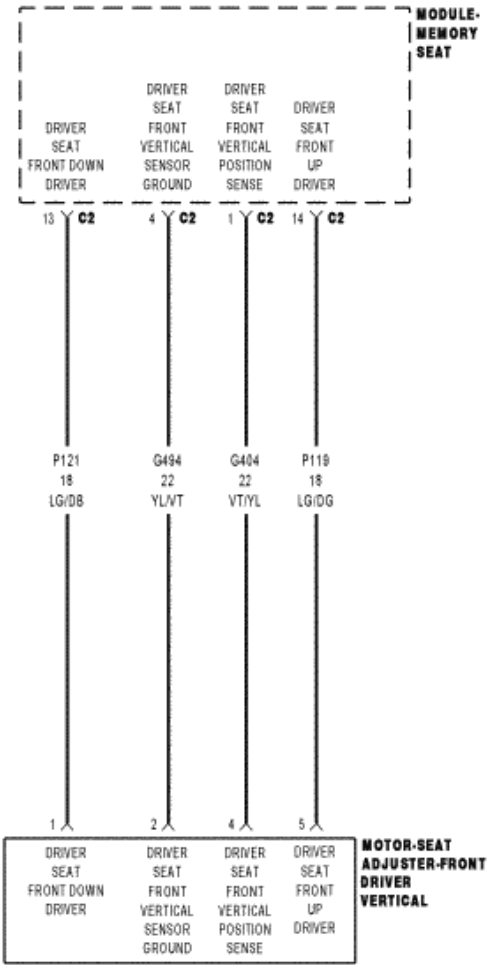
No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for an open.

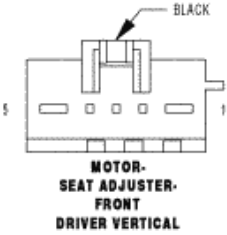
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D71-SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic



MODULE-MEMORY SEAT C2



MOTOR-SEAT ADJUSTER-FRONT DRIVER VERTICAL

Fig. 17: Seat Front Vertical Position Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT SHORTED TO GROUND FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent

condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. CHECK THE (G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT VOLTAGE

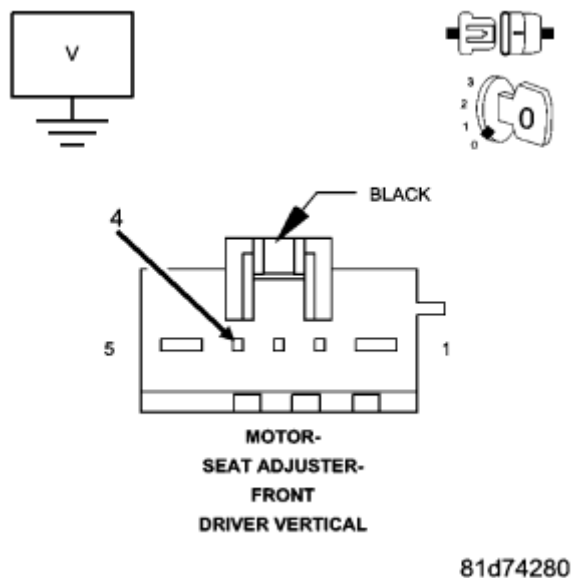


Fig. 18: Measuring The Voltage Of The (G404) Driver Seat Vertical Position Sense Circuit At The Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Vertical Seat Adjuster Motor harness connector.

Measure the voltage of the (G404) Driver Seat Vertical Position Sense circuit at the Driver Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

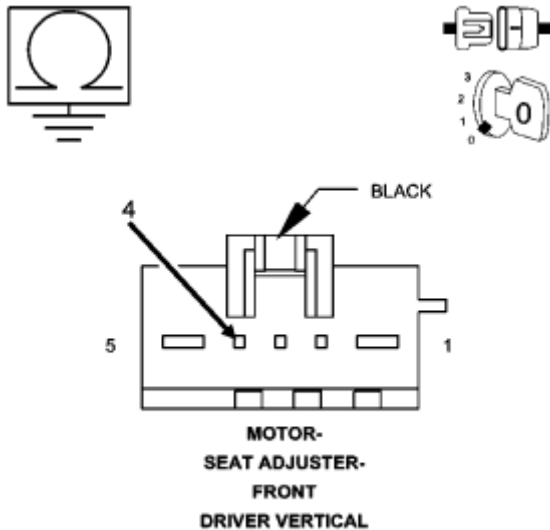
Yes

Replace the Seat Track Vertical Motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. CHECK THE (G404) DRIVER SEAT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND



81d7430f

Fig. 19: Measuring The Resistance Between Ground And The (G404) Driver Seat Vertical Position Sense Circuit At The Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G404) Driver Seat Vertical Position Sense circuit at the Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

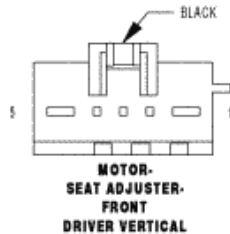
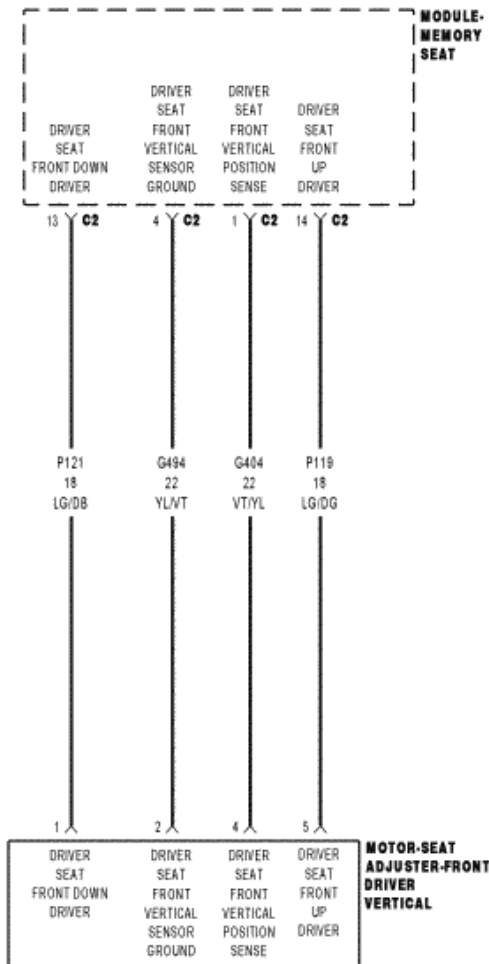
No

Repair the (G404) Driver Seat Vertical Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D72-SEAT FRONT VERTICAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic



01431900

Fig. 20: Seat Front Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN
FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. DRIVER VERTICAL SEAT ADJUSTER MOTOR

Turn the ignition off.

Disconnect the Front Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the Front Vertical positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

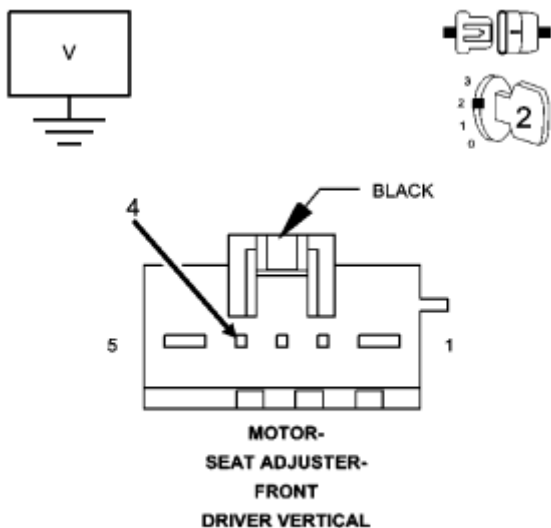
Go to 3.

No

Replace the Driver Front Vertical Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE



81d74fdd

Fig. 21: Measuring The Voltage Of The (G404) Driver Seat Front Vertical Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G404) Driver Seat Front Vertical Position Sense circuit.

Is there any voltage present?

Yes

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT

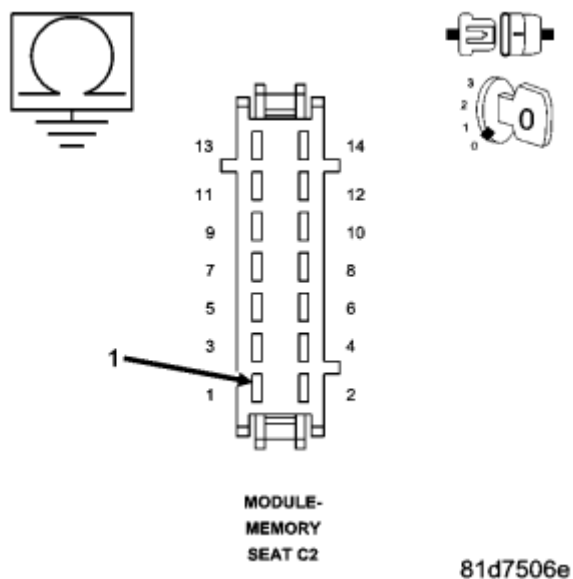


Fig. 22: Measuring The (G404) Driver Seat Front Vertical Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the (G404) Driver Seat Front Vertical Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present?

Yes

Repair the (G404) Driver Seat Vertical Position Sense circuit for a short to another circuit.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. **(G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN**

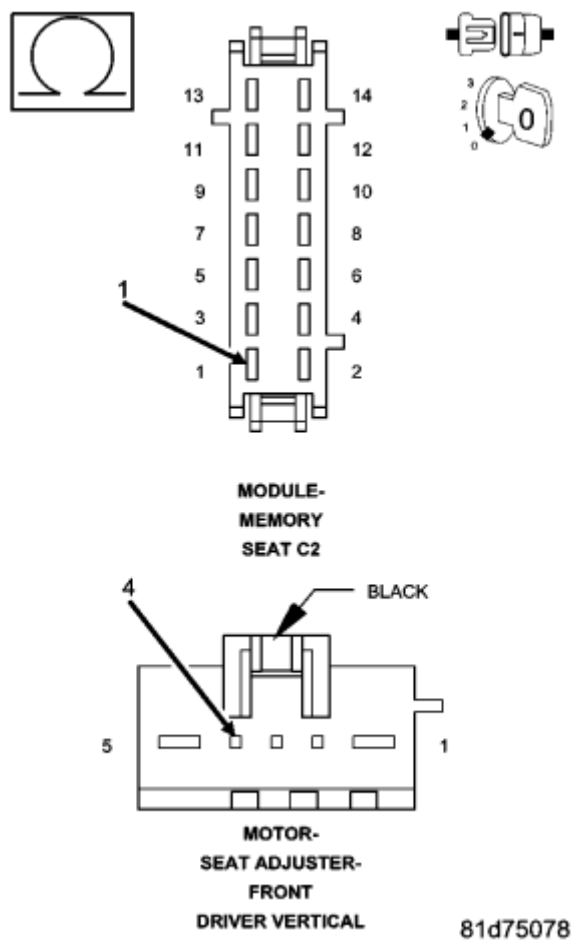


Fig. 23: Measuring The Resistance Of The (G404) Driver Seat Front Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Vertical Seat Adjuster Motor Harness Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G404) Driver Seat Front Vertical Position Sense circuit between the

Memory Seat Module C2 harness connector and the Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D75-SEAT REAR VERTICAL POSITION SENSOR CIRCUIT LOW

Circuit Schematic

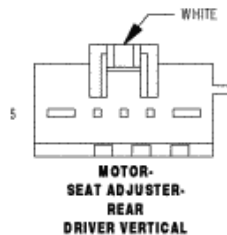
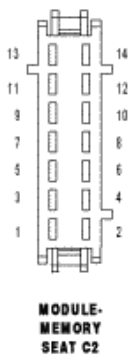
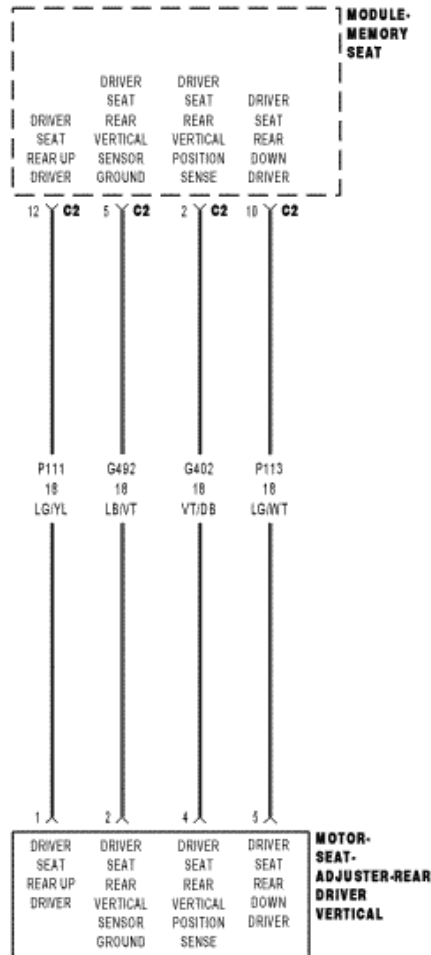


Fig. 24: Seat Rear Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If sensor voltage is not within a specified range this DTC will set.

Possible Causes

Possible Causes
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO GROUND REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

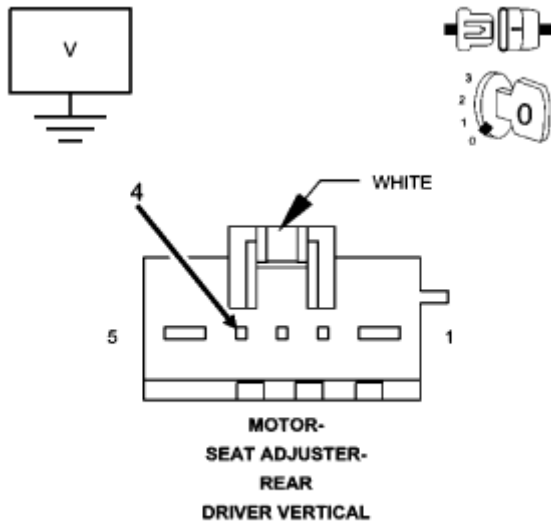
Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT VOLTAGE**



81d76392

Fig. 25: Measuring The Voltage Of The (G402) Driver Seat Rear Vertical Position Sense Circuit At The Rear Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Rear Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage of the (G402) Driver Seat Rear Vertical Position Sense circuit at the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

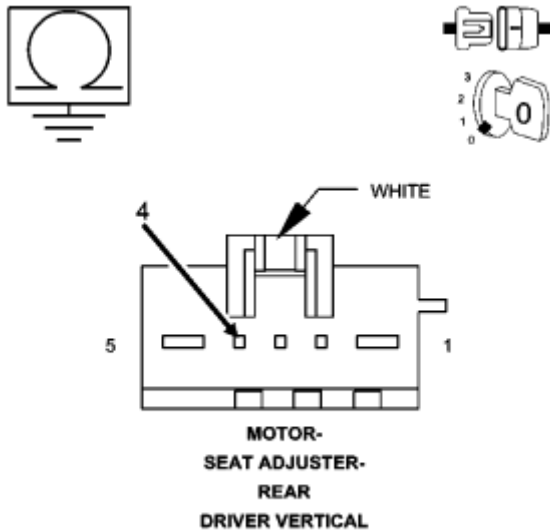
Yes

Replace the Seat Track Vertical Motor assembly in accordance with the Service Information.
 Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 3.

3. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO GROUND**



81d76405

Fig. 26: Measuring The Resistance Between Ground And The (G402) Driver Seat Rear Vertical Position Sense Circuit At The Rear Driver Vertical Seat Adjuster Motor Harness Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance between ground and the (G402) Driver Seat Rear Vertical Position Sense circuit at the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance above 10k ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

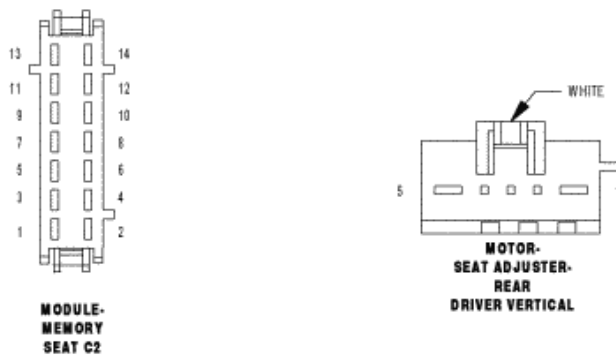
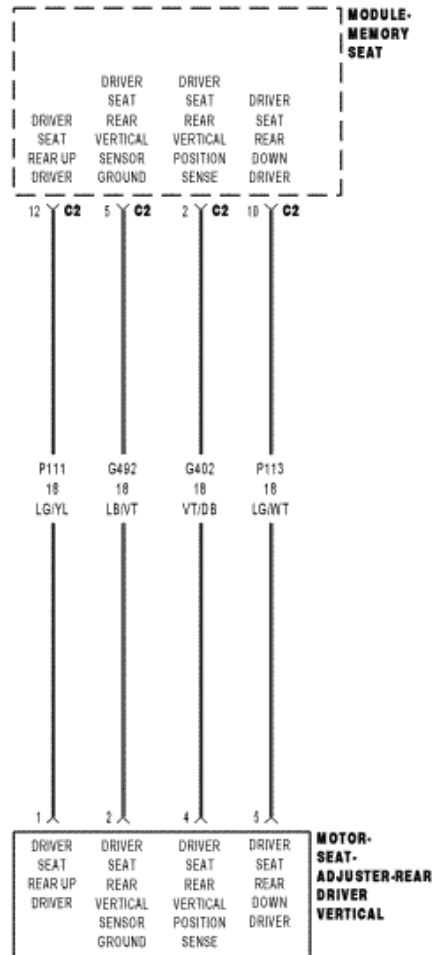
No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to ground.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D76-SEAT REAR VERTICAL POSITION SENSOR CIRCUIT HIGH

Circuit Schematic



01421000

Fig. 27: Seat Rear Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If during motor operation the sensor voltage is not within a specified range this code will set.

Possible Causes

Possible Causes
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO VOLTAGE
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT SHORTED TO ANOTHER CIRCUIT
(G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN
REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Vertical position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 2.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

2. REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR

Turn the ignition off.

Disconnect the Rear Driver Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat switch in the Vertical positions three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

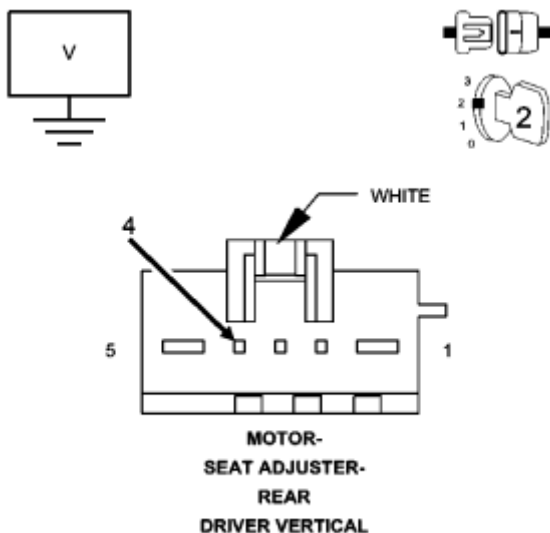
Go to 3.

No

Replace the Rear Driver Vertical Seat Adjuster Motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO VOLTAGE



81d773f4

Fig. 28: Measuring The Voltage Of The (G402) Driver Seat Rear Vertical Position Sense Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Turn the ignition on.

Measure the voltage of the (G402) Driver Seat Rear Vertical Position Sense circuit.

Is there any voltage present?

Yes

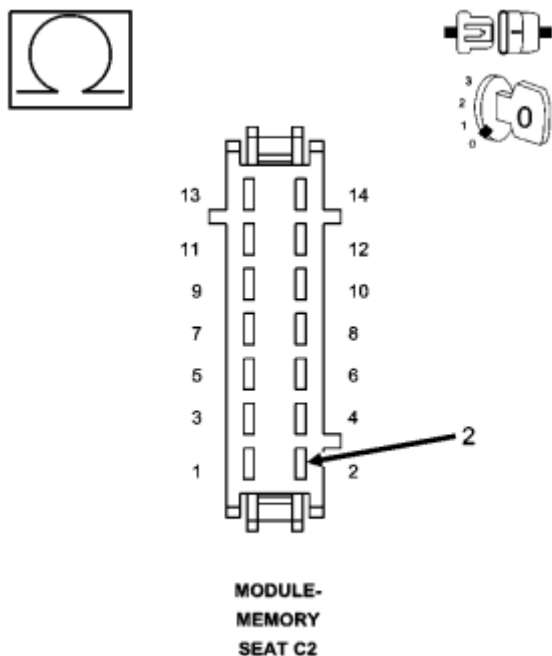
Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to voltage.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 4.

4. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR A SHORT TO ANOTHER CIRCUIT



81d77971

Fig. 29: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit To Other Circuits In The Memory Seat Module C2 Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit to other circuits in the Memory Seat Module C2 connector.

Is there any continuity present to other circuits?

Yes

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for a short to another circuit.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go to 5.

5. (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN

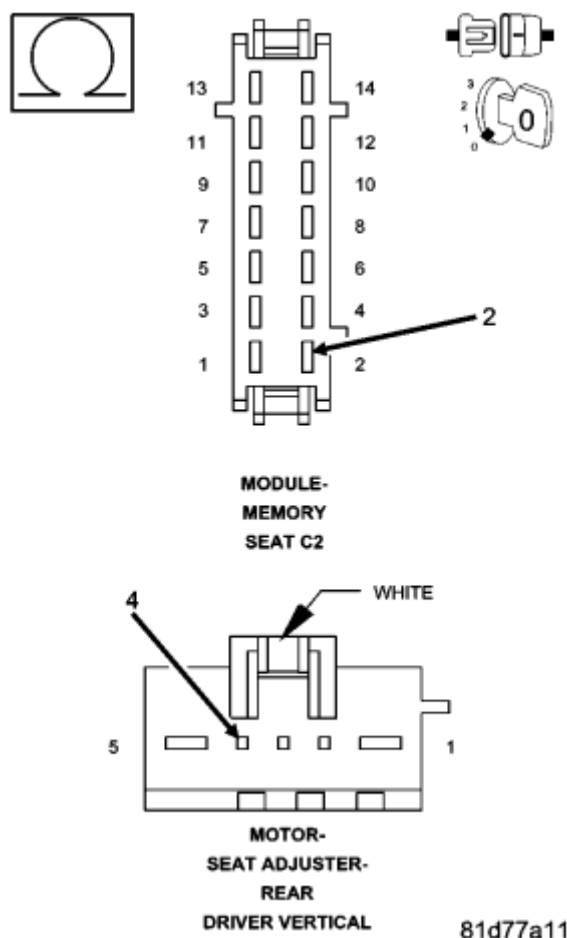


Fig. 30: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Rear Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit between the Memory Seat Module C2 harness connector and the Rear Driver Vertical Seat Adjuster Motor harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

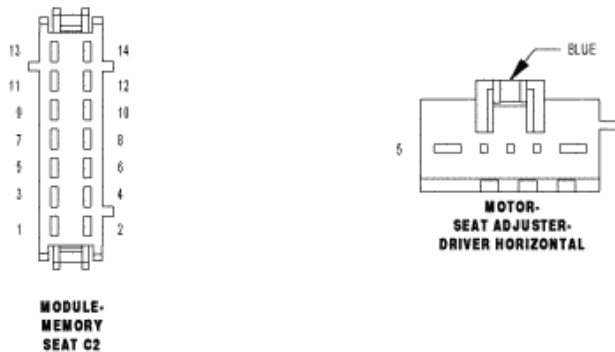
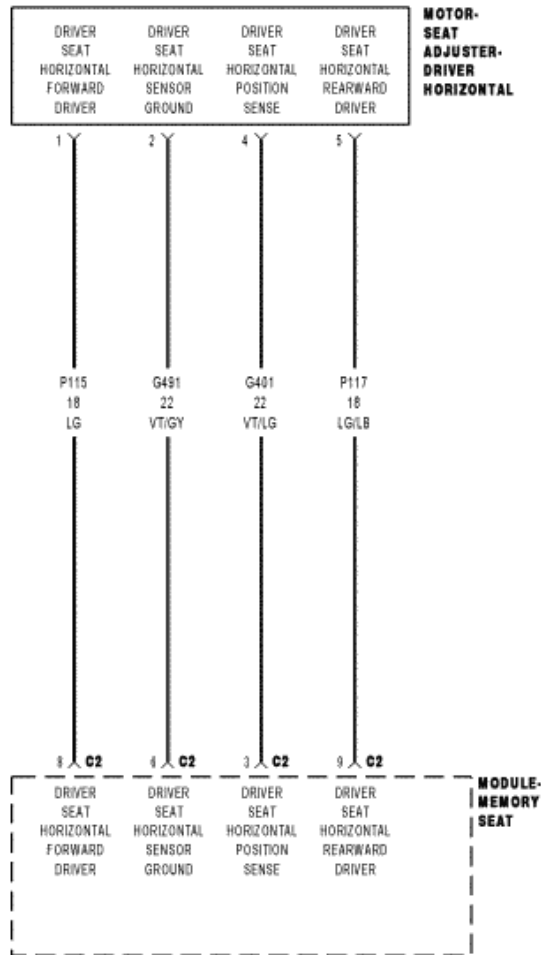
No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D7B-SEAT HORIZONTAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01430000

Fig. 31: Seat Horizontal Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the seat motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT OPEN (G491) DRIVER SEAT HORIZONTAL SENSOR GROUND CIRCUIT OPEN (P115) DRIVER SEAT HORIZONTAL FORWARD DRIVER (P117) DRIVER SEAT HORIZONTAL REARWARD DRIVER DRIVER HORIZONTAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the horizontal forward and rearward position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

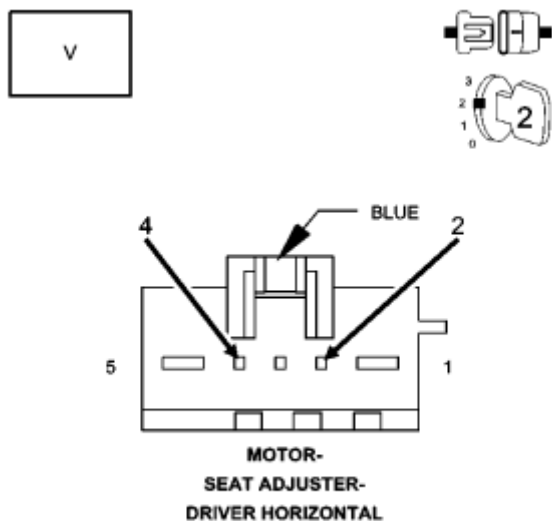
Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT VOLTAGE



81d7efe3

Fig. 32: Measuring The Voltage Between The (G401) Driver Seat Horizontal Position Sense Circuit And The (G491) Driver Seat Horizontal Sensor Ground Circuit At The Driver Horizontal Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Horizontal Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G401) Driver Seat Horizontal Position Sense circuit and the (G491) Driver Seat Horizontal Sensor Ground circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT HORIZONTAL FORWARD/REARWARD DRIVER CIRCUIT VOLTAGE

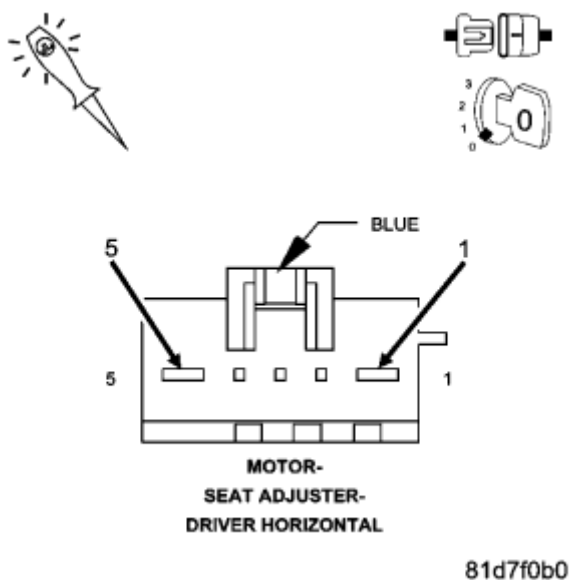


Fig. 33: Checking The Driver Seat Horizontal Forward/Rearward Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P115) Driver Seat Horizontal Forward Driver circuit and the other lead to (P117) Driver Seat Horizontal Rearward Driver circuit at the Driver Horizontal Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Horizontal forward and rearward position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/horizontal motor assembly in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G401) DRIVER SEAT HORIZONTAL POSITION SENSE CIRCUIT FOR AN OPEN**

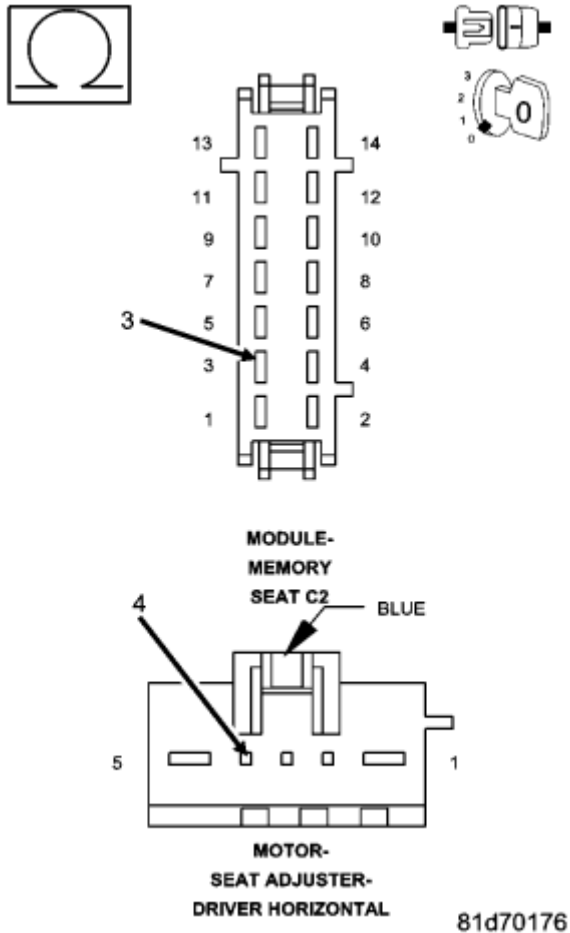


Fig. 34: Measuring The Resistance Of The (G401) Driver Seat Horizontal Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Horizontal Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G401) Driver Seat Horizontal Position Sense circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G401) Driver Seat Horizontal Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G491) DRIVER SEAT HORIZONTAL SENSOR GROUND CIRCUIT FOR AN OPEN**

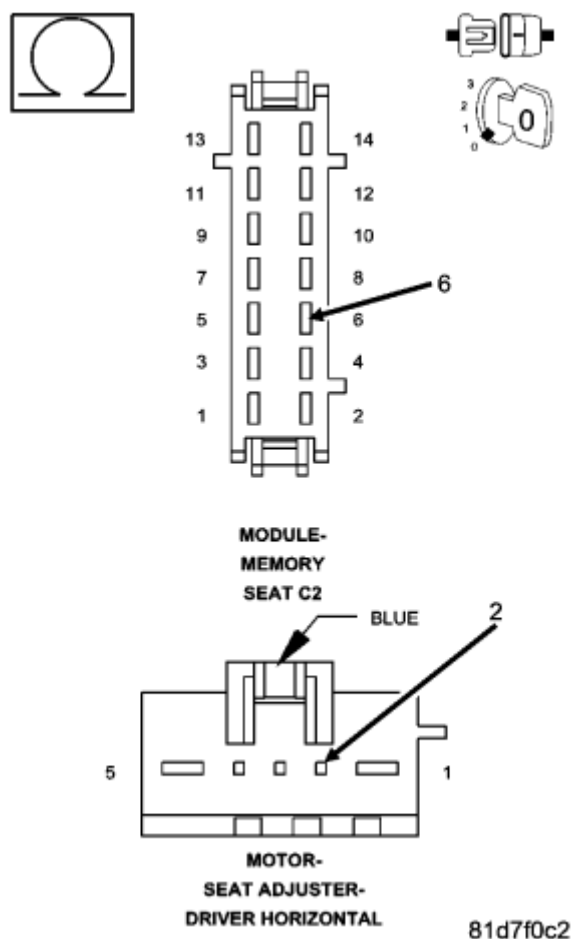


Fig. 35: Measuring The Resistance Of The (G491) Driver Seat Horizontal Sensor Ground Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Measure the resistance of the (G491) Driver Seat Horizontal Sensor Ground circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G491) Driver Seat Horizontal Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P115) DRIVER SEAT HORIZONTAL FORWARD DRIVER CIRCUIT FOR AN OPEN**

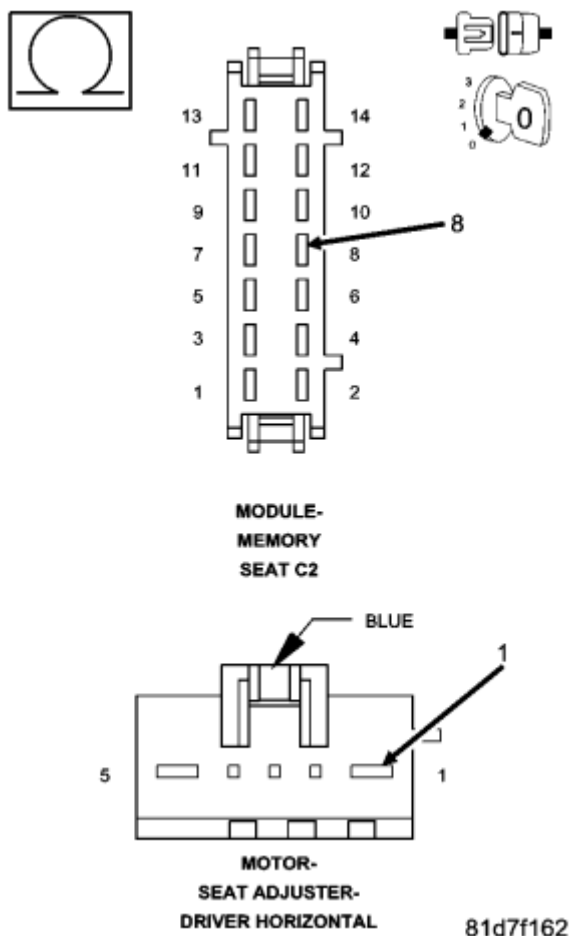


Fig. 36: Measuring The Resistance Of The (P115) Driver Seat Horizontal Forward Driver Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P115) Driver Seat Horizontal Forward Driver circuit between the Driver Horizontal Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P115) Driver Seat Horizontal Forward Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. CHECK THE (P117) DRIVER SEAT HORIZONTAL REARWARD DRIVER CIRCUIT FOR AN OPEN

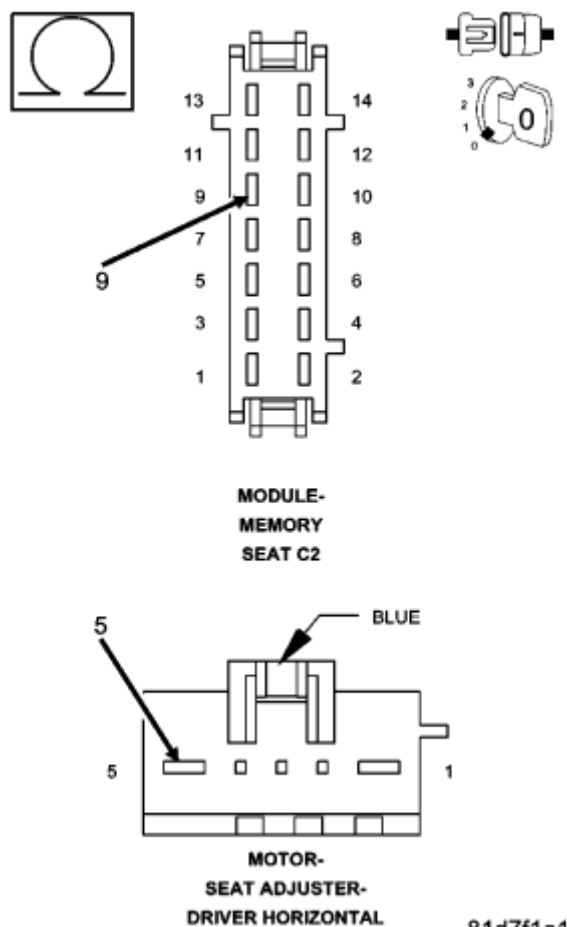


Fig. 37: Measuring The Resistance Of The (P117) Driver Seat Horizontal Rearward Driver Circuit Between The Driver Horizontal Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P117) Driver Seat Horizontal Rearward Driver circuit between the Driver Horizontal Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

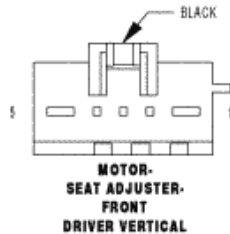
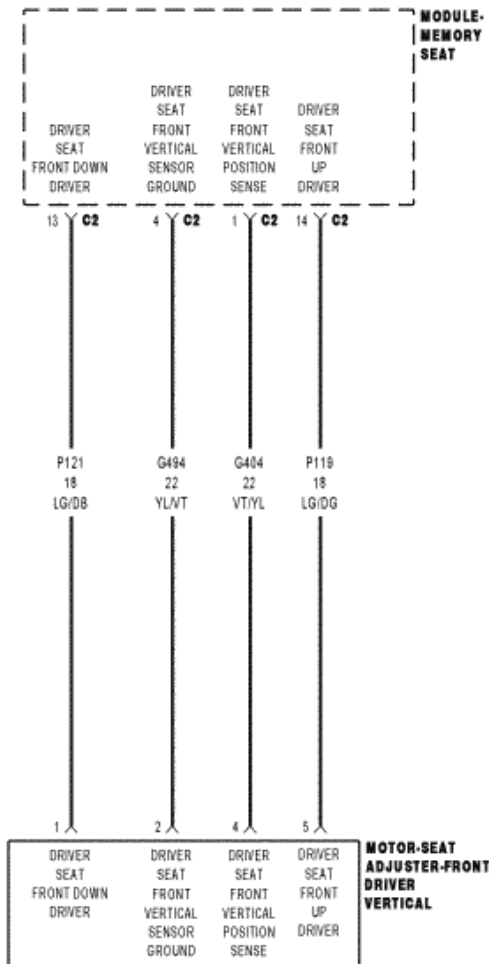
No

Repair the (P117) Driver Seat Horizontal Rearward Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D7F-SEAT FRONT VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01431900

Fig. 38: Seat Front Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the Seat Motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT OPEN (G494) DRIVER SEAT FRONT VERTICAL SENSOR GROUND CIRCUIT OPEN (P119) DRIVER SEAT FRONT VERTICAL UP DRIVER (P121) DRIVER SEAT FRONT VERTICAL DOWN DRIVER FRONT DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Front Vertical up and down position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **CHECK THE (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT VOLTAGE**

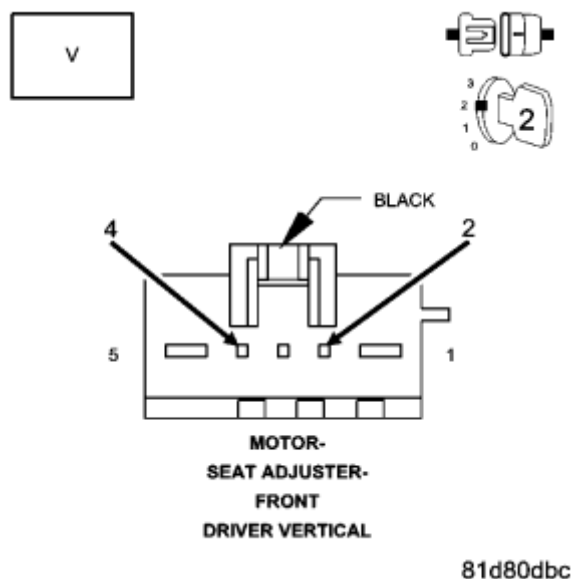


Fig. 39: Measuring The Voltage Between The (G404) Driver Seat Front Vertical Position Sense Circuit And The (G494) Driver Seat Front Vertical Sensor Ground Circuit At The Driver Front Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Front Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G404) Driver Seat Front Vertical Position Sense circuit and the (G494) Driver Seat Front Vertical Sensor Ground circuit at the Driver Front Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT FRONT VERTICAL UP/DOWN DRIVER CIRCUIT VOLTAGE

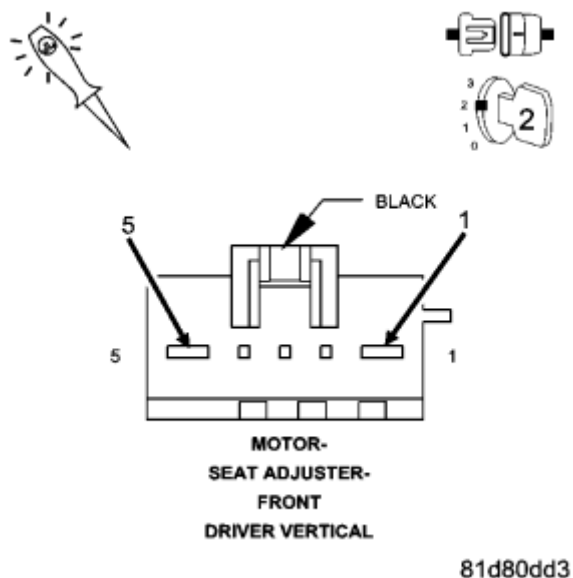


Fig. 40: Checking The Driver Seat Front Vertical Up/Down Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P119) Driver Seat Front Vertical Up Driver circuit and the other lead to (P121) Driver Seat Front Vertical Down Driver circuit at the Driver Front Vertical Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Front Vertical up and down position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/Front Vertical motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G404) DRIVER SEAT FRONT VERTICAL POSITION SENSE CIRCUIT FOR AN OPEN**

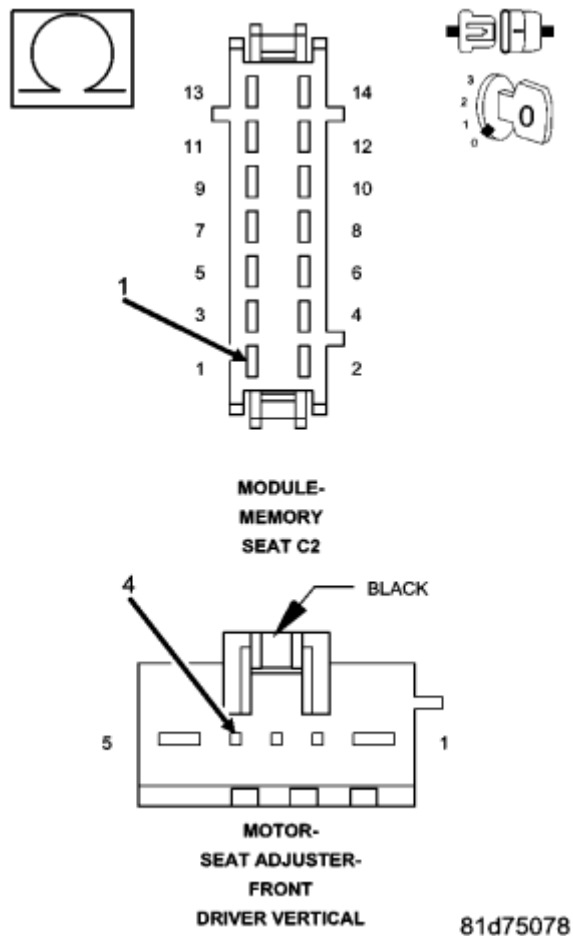


Fig. 41: Measuring The Resistance Of The (G404) Driver Seat Front Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G404) Driver Seat Front Vertical Position Sense circuit between the Driver Front Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G404) Driver Seat Front Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G494) DRIVER SEAT FRONT VERTICAL SENSOR GROUND CIRCUIT FOR AN OPEN**

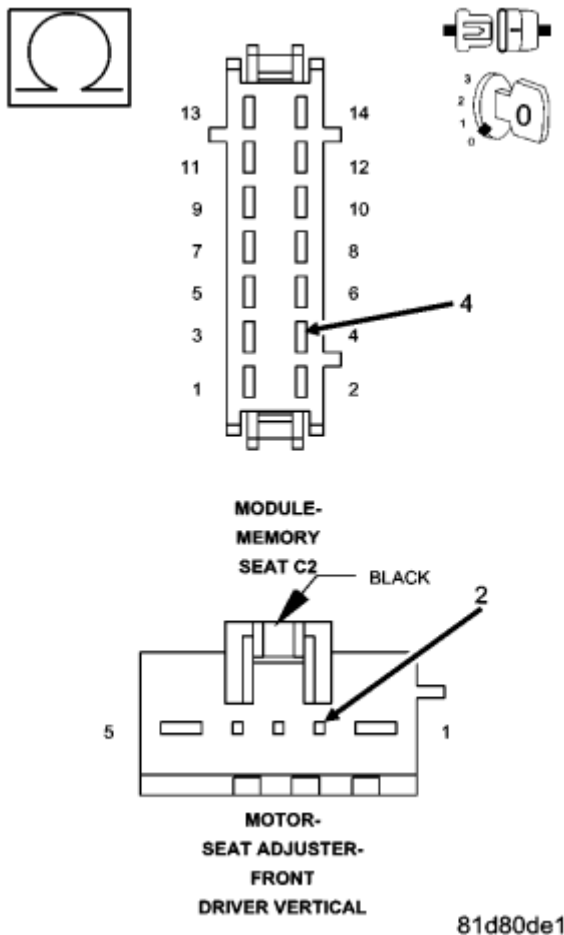


Fig. 42: Measuring The Resistance Of The (G494) Driver Seat Front Vertical Sensor Ground Circuit Between The Driver Front Vertical Seat Adjuster Motor Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G494) Driver Seat Front Vertical Sensor Ground circuit between the Driver Front Vertical Seat Adjuster Motor connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G494) Driver Seat Front Vertical Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P119) DRIVER SEAT FRONT VERTICAL UP DRIVER CIRCUIT FOR AN OPEN**

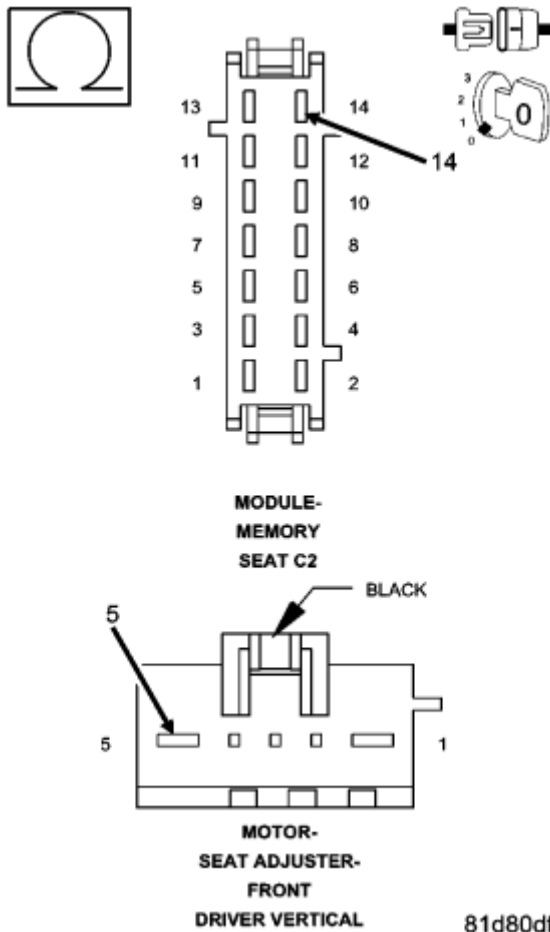


Fig. 43: Measuring The Resistance Of The (P119) Driver Seat Front Vertical Up Driver Circuit Between The Driver Front Vertical Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector

Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P119) Driver Seat Front Vertical Up Driver circuit between the Driver

Front Vertical Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P119) Driver Seat Front Vertical Up Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. CHECK THE (P121) DRIVER SEAT FRONT VERTICAL DOWN DRIVER CIRCUIT FOR AN OPEN

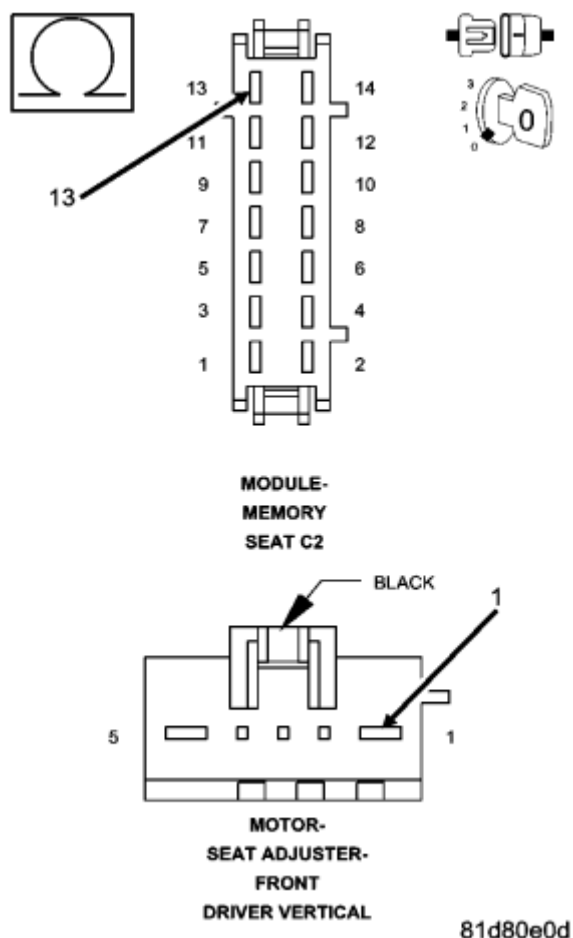


Fig. 44: Measuring The Resistance Of The (P121) Driver Seat Front Vertical Down Driver Circuit Between The Driver Front Vertical Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P121) Driver Seat Front Vertical Down Driver circuit between the Driver Front Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

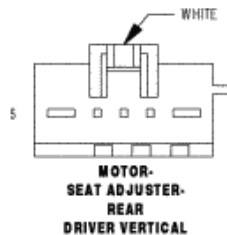
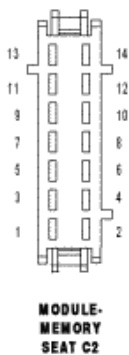
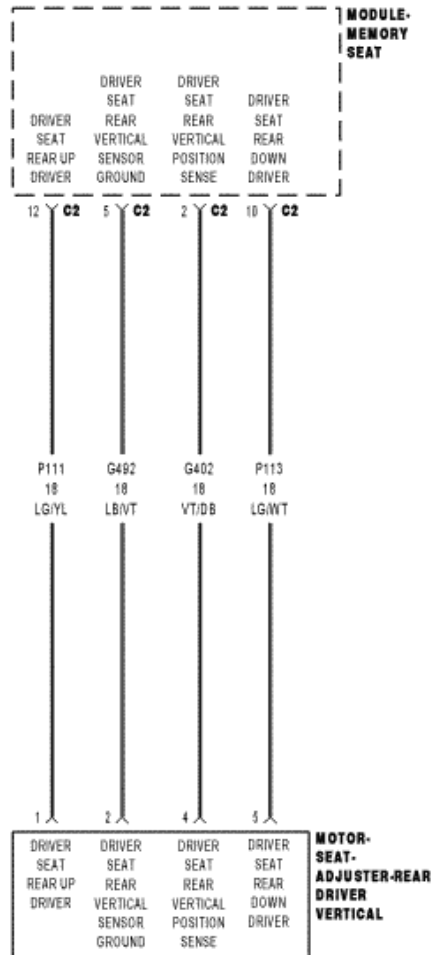
No

Repair the (P121) Driver Seat Front Vertical Down Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D83-SEAT REAR VERTICAL MOTOR CONTROL CIRCUIT PERFORMANCE

Circuit Schematic



01421000

Fig. 45: Seat Rear Vertical Position Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- **Set Condition:**

If the Memory Seat Module does not detect the rotation of the Seat Motor this DTC will set.

Possible Causes

Possible Causes
SEAT POSITION SENSOR CIRCUIT DIAGNOSTIC TROUBLE CODES (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT OPEN (G492) DRIVER SEAT REAR VERTICAL SENSOR GROUND CIRCUIT OPEN (P111) DRIVER SEAT REAR VERTICAL UP DRIVER (P113) DRIVER SEAT REAR VERTICAL DOWN DRIVER REAR DRIVER VERTICAL SEAT ADJUSTER MOTOR MEMORY SEAT MODULE

Diagnostic Test

1. **CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES**

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the Driver Seat Switch in the Rear Vertical up and down position three times.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT VOLTAGE**

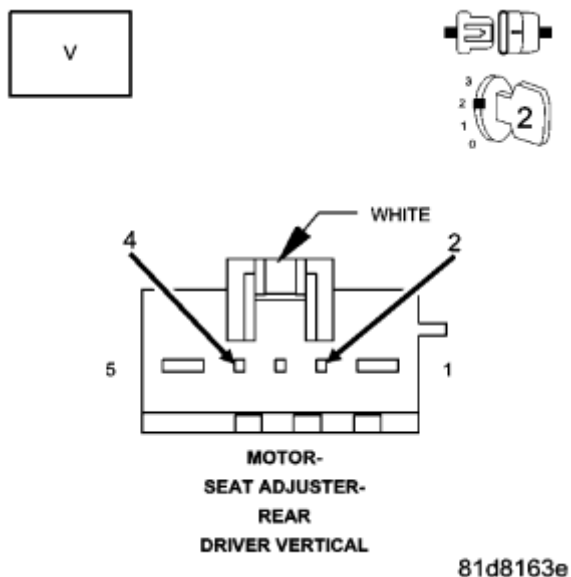


Fig. 46: Measuring The Voltage Between The (G402) Driver Seat Rear Vertical Position Sense Circuit And The (G492) Driver Seat Rear Vertical Sensor Ground Circuit At The Driver Rear Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Driver Rear Vertical Seat Adjuster Motor harness connector.

Turn the ignition on.

Measure the voltage between the (G402) Driver Seat Rear Vertical Position Sense circuit and the (G492) Driver Seat Rear Vertical Sensor Ground circuit at the Driver Rear Vertical Seat Adjuster Motor harness connector.

Is the voltage above 10.0 volts?

Yes

Go To 4.

No

Go To 5.

4. CHECK THE DRIVER SEAT REAR VERTICAL UP/DOWN DRIVER CIRCUIT VOLTAGE

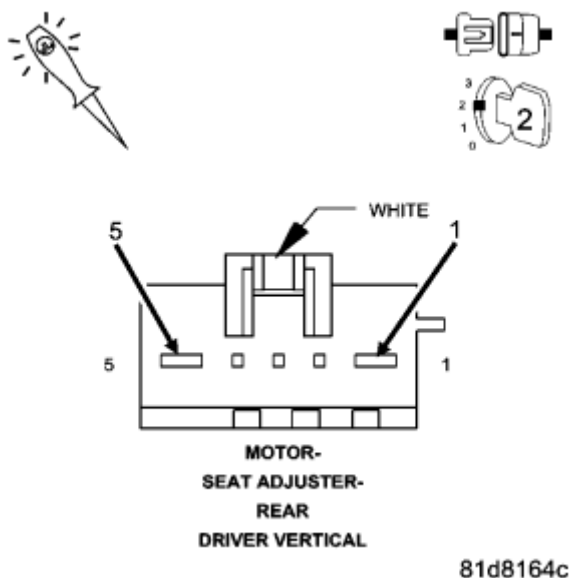


Fig. 47: Checking The Driver Seat Rear Vertical Up/Down Driver Circuit Voltage
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect one lead to the (P111) Driver Seat Rear Vertical Up Driver circuit and the other lead to (P113) Driver Seat Rear Vertical Down Driver circuit at the Driver Rear Vertical Seat Adjuster Motor harness connector.

Move the Driver Seat Switch in the Rear Vertical up and down position.

Does the test light illuminate with the seat switch engaged in both positions?

Yes

Replace the track/Rear Vertical motor assembly in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Go To 7.

5. **CHECK THE (G402) DRIVER SEAT REAR VERTICAL POSITION SENSE CIRCUIT FOR AN OPEN**

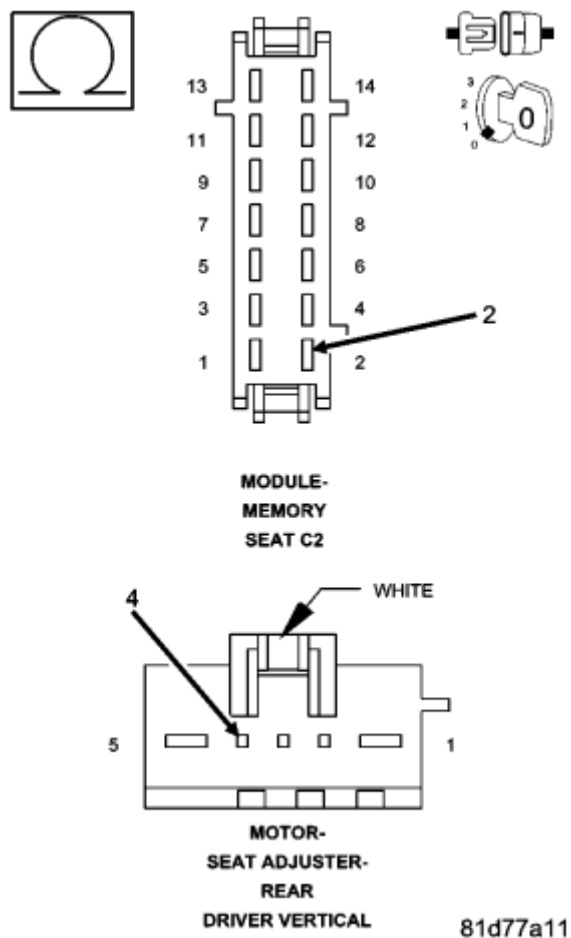


Fig. 48: Measuring The Resistance Of The (G402) Driver Seat Rear Vertical Position Sense Circuit Between The Memory Seat Module C2 Harness Connector And The Rear Driver Vertical Seat Adjuster Motor Harness Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (G402) Driver Seat Rear Vertical Position Sense circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 6.

No

Repair the (G402) Driver Seat Rear Vertical Position Sense circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

6. **CHECK THE (G492) DRIVER SEAT REAR VERTICAL SENSOR GROUND CIRCUIT FOR AN OPEN**

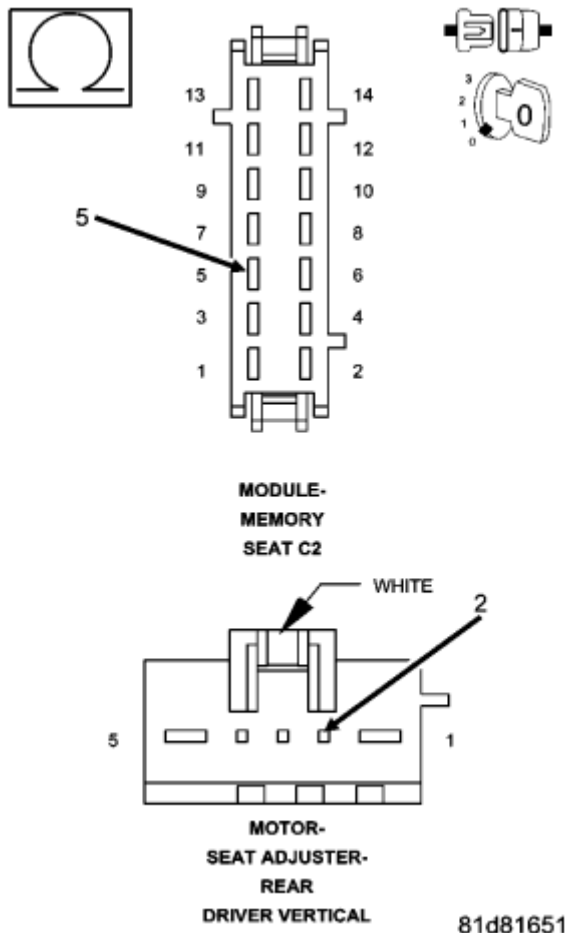


Fig. 49: Measuring The Resistance Of The (G492) Driver Seat Rear Vertical Sensor Ground Circuit Between The Driver Rear Vertical Seat Adjuster Motor Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (G492) Driver Seat Rear Vertical Sensor Ground circuit between the Driver Rear Vertical Seat Adjuster Motor connector and the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (G492) Driver Seat Rear Vertical Sensor Ground circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

7. **CHECK THE (P111) DRIVER SEAT REAR VERTICAL UP DRIVER CIRCUIT FOR AN OPEN**

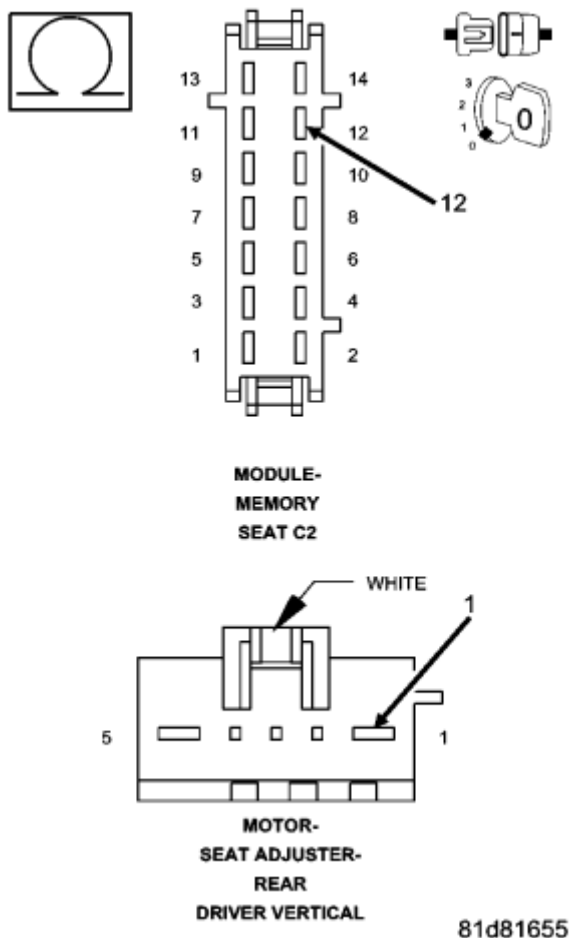


Fig. 50: Measuring The Resistance Of The (P111) Driver Seat Rear Vertical Up Driver Circuit Between The Driver Rear Vertical Seat Adjuster Motor Harness Connector To The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Disconnect the Memory Seat Module C2 harness connector.

Measure the resistance of the (P111) Driver Seat Rear Vertical Up Driver circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector to the Memory Seat Module C2 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 8.

No

Repair the (P111) Driver Seat Rear Vertical Up Driver circuit for an open.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

8. **CHECK THE (P113) DRIVER SEAT REAR VERTICAL DOWN DRIVER CIRCUIT FOR AN OPEN**

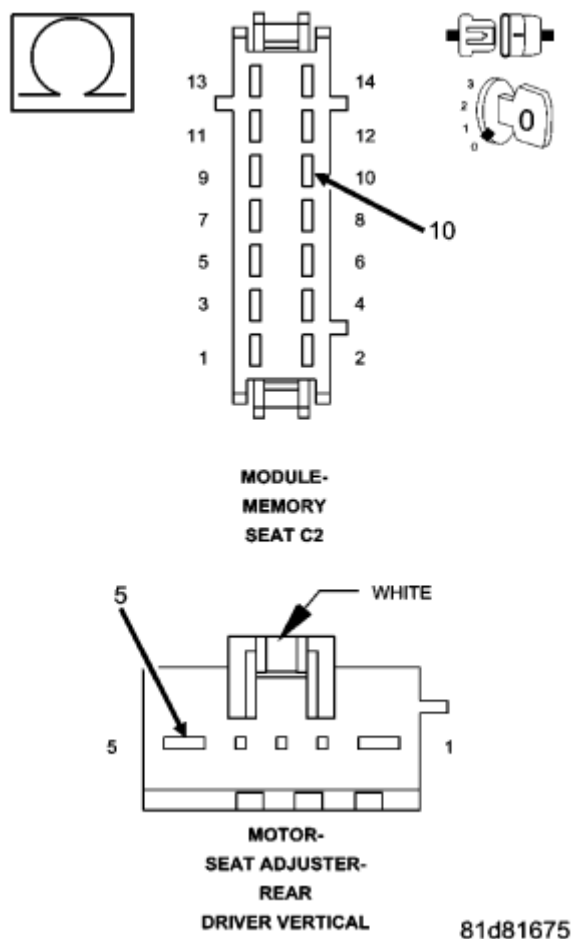


Fig. 51: Measuring The Resistance Of The (P113) Driver Seat Rear Vertical Down Driver Circuit Between The Driver Rear Vertical Seat Adjuster Motor Harness Connector And The Memory Seat Module C2 Harness Connector
Courtesy of CHRYSLER LLC

Measure the resistance of the (P113) Driver Seat Rear Vertical Down Driver circuit between the Driver Rear Vertical Seat Adjuster Motor harness connector and the Memory Seat Module C2 harness

connector.

Is the resistance below 10.0 ohms?

Yes

Replace the Memory Seat Module in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (P113) Driver Seat Rear Vertical Down Driver circuit for an open.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B1D9B-SEAT HORIZONTAL FRONT STOP NOT LEARNED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Whenever the Seat Motor is activated.

Set Conditions

- Set Condition:**

Seat becomes de-standardized. If the seat is not standardized, an Easy Exit/Entry function can not be performed. If seat is standardized (learn seat cushion horizontal front hardstop) and then becomes de-standardized (conditions are: seat cushion motor is 5% past the expected hard stop position or seat cushion hall sensor failure is occurred), a DTC is logged.

Possible Causes

Possible Causes
OTHER DIAGNOSTIC TROUBLE CODES SET IN THE MEMORY SEAT MODULE
SEAT STANDARDIZATION ROUTINE NOT PERFORMED

Diagnostic Test

1. CHECK FOR RELATED DIAGNOSTIC TROUBLE CODES

Turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display any seat position sensor or circuit performance DTC's?

Yes

Diagnose and repair the other DTC(s) first. Refer to **DIAGNOSTIC CODE INDEX** for a complete list of symptoms.

No

Go To 2.

2. TEST FOR INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, erase all DTC's.

Move the seat in the full forward horizontal position.

With the scan tool, read DTC's.

Does the scan tool display active: B1D9B-SEAT HORIZONTAL FRONT STOP NOT LEARNED?

Yes

With the scan tool, perform the Memory Seat Module (MSM) Standard Routine.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B210D-BATTERY VOLTAGE LOW - MSM

Circuit Schematic

Monitor Conditions

When Monitored:

Engine running, during seat motor operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Memory Seat Module (MSM) receives a low charging system voltage message over the CAN Interior Bus or detects voltage under 9.5 volts on the (A210) Fused B(+) circuit.

Possible Causes

Possible Causes
CHARGING SYSTEM VOLTAGE LOW (A210) FUSED B(+) CIRCUIT OPEN (Z913) GROUND CIRCUIT OPEN MEMORY SEAT MODULE

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK PCM FOR CHARGING SYSTEM DTC**

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain/Engine Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, erase all DTC's.

Turn the ignition switch to the OFF position then start the engine and operate the driver power seat.

With the scan tool, read DTC's.

Does the scan tool display this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. (A210) FUSED B(+) CIRCUIT OPEN

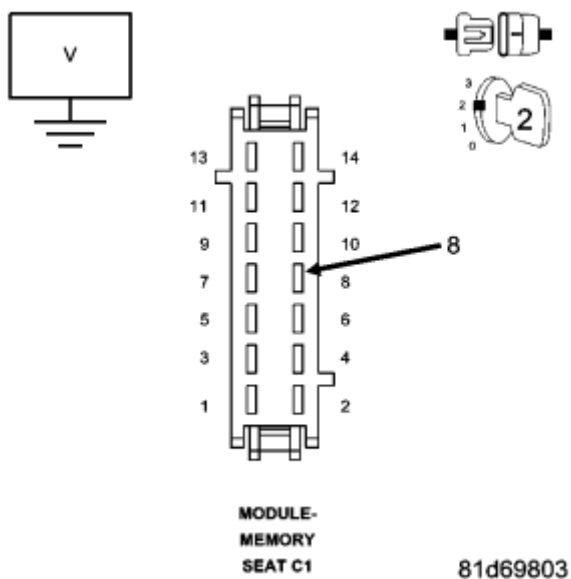


Fig. 53: Measuring The Voltage On The (A210) Fused B(+) Circuit At The Memory Seat Module Harness Connector And Compare To Voltage At The Vehicles Battery
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module C1 harness connector.

Start the engine and let idle.

Measure the voltage on the (A210) Fused B(+) circuit at the Memory Seat Module C1 harness connector and compare to voltage at the vehicle battery.

Is the voltage at the Memory Seat Module connector the same as measured at the battery?

Yes

Go To 4.

No

Repair the (A210) Fused B(+) circuit as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

4. (Z913) GROUND CIRCUIT OPEN

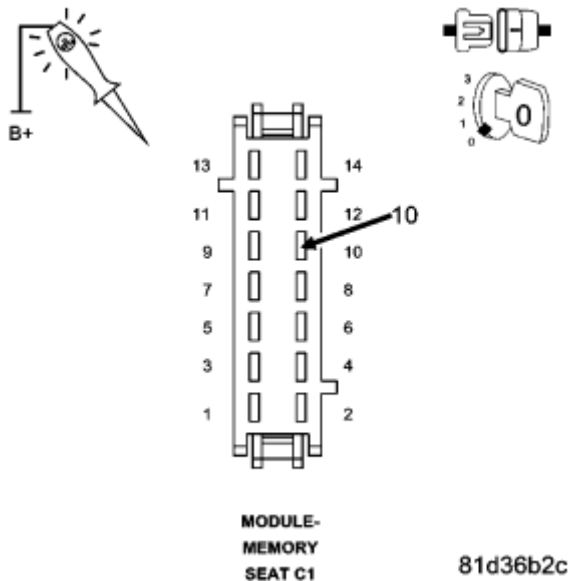


Fig. 54: Checking The (Z913) Ground Circuit At The Memory Seat Module C1 Harness Connector Using A 12-Volt Test Light Connected To 12-Volts
Courtesy of CHRYSLER LLC

Turn the ignition off.

Using a 12-volt test light connected to 12-volts, check the (Z913) Ground circuit at the Memory Seat Module C1 harness connector.

Does the test light illuminate brightly?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (Z913) Ground circuit as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B210E-BATTERY VOLTAGE HIGH - MSM

Circuit Schematic

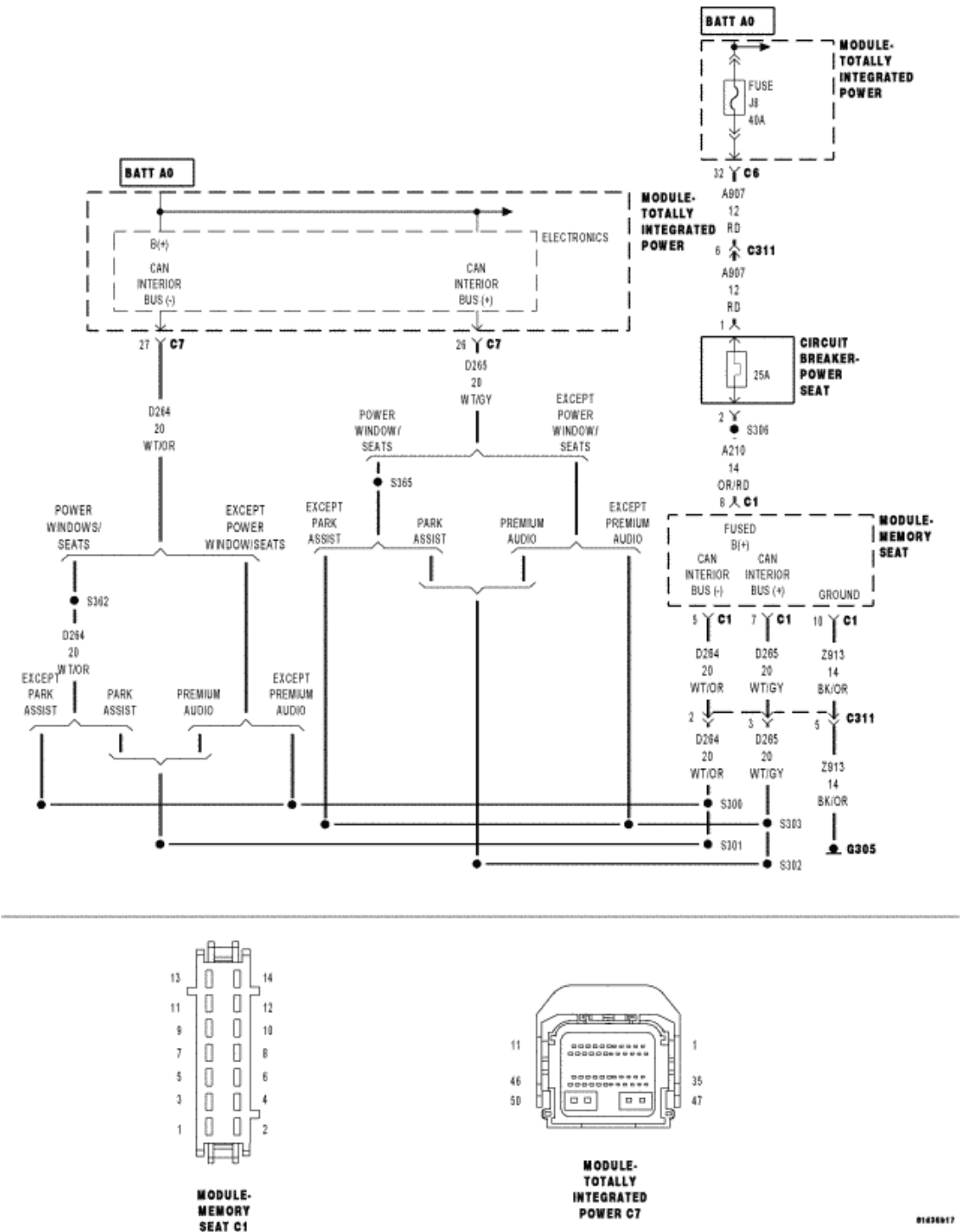


Fig. 55: Battery Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Engine running, during seat operation.

Set Conditions

- **Set Condition:**

This code is set immediately after the Memory Seat Module (MSM) receives a high charging system voltage message over the CAN Interior Bus or detects voltage over 16.5 volts on the (A210) Fused B(+) circuit.

Possible Causes

Possible Causes
CHARGING SYSTEM VOLTAGE HIGH (A210) FUSED B(+) CIRCUIT OPEN MEMORY SEAT MODULE

Always perform the **PRE-DIAGNOSTIC TROUBLESHOOTING PROCEDURE** before proceeding.

Diagnostic Test

1. **CHECK PCM/ECM FOR CHARGING SYSTEM DTC**

With the scan tool, read Powertrain Control Module DTC's.

Are there any Charging System DTC's set in the Powertrain Control Module?

Yes

(Refer to **DIAGNOSIS AND TESTING**) for Charging System diagnostic procedures.

No

Go To 2.

2. **TEST FOR INTERMITTENT CONDITION**

With the scan tool, record and erase DTC's

Turn the ignition switch to the OFF position then start the engine and let run for one minute.

Attempt to operate the Driver Power Seat.

With the scan tool, read DTC's.

Does the scan tool display active this DTC?

Yes

Go To 3.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

3. CHECK THE VOLTAGE ON THE (A210) FUSED B(+) CIRCUIT

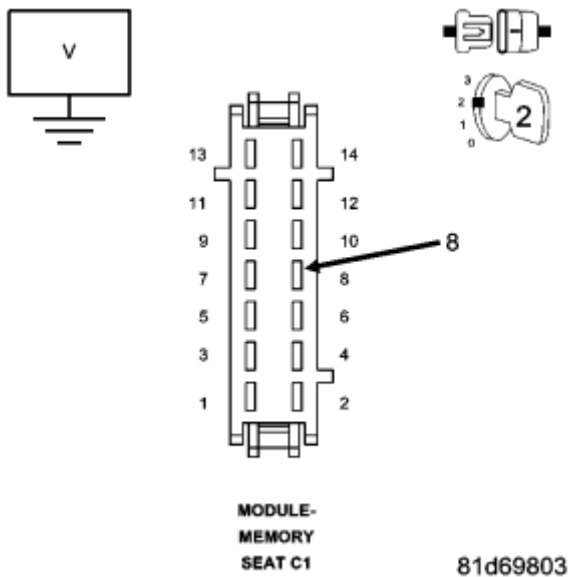


Fig. 56: Measuring The Voltage On The (A210) Fused B(+) Circuit At The Memory Seat Module Harness Connector And Compare To Voltage At The Vehicles Battery
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Memory Seat Module harness connector.

Start the engine and let idle.

Measure the voltage on the (A210) Fused B(+) circuit at the Memory Seat Module harness connector and compare to voltage at the vehicles battery.

Is the voltage at the Memory Seat Module connector the same as measured at the battery?

Yes

Replace the Memory Seat Module in accordance with the Service Information.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

Repair the (A210) Fused B(+) circuit as necessary.
Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

B221C-MEMORY SEAT MODULE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on.

Set Conditions

• **Set Condition:**

This code is set immediately if the Memory Seat Module (MSM) internal self test fails.

Possible Causes

Possible Causes
MEMORY SEAT MODULE

Diagnostic Test

1. TEST FOR INTERMITTENT CONDITION

With the scan tool, erase all DTC's.

Cycle the ignition switch off then back on.

With the scan tool, read DTC's.

Does the scan tool display active: B221C-MEMORY SEAT MODULE INTERNAL?

Yes

Replace the Memory Seat Module in accordance with the Service Information.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **POWER SEAT SYSTEM VERIFICATION TEST - VER 1.**

U0011-CAN INTERIOR BUS OFF PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Perform U0010-CAN INTERIOR BUS diagnostic procedure.

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0203-LOST COMMUNICATION WITH DOOR MODULE LEFT FRONT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0204-LOST COMMUNICATION WITH DOOR MODULE FRONT RIGHT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

POWER SEAT SYSTEM VERIFICATION TEST - VER 1

Diagnostic Test

1. Perform Power Seat System Verification Test

Disconnect all jumper wires and reconnect all previously disconnected components and connectors.

Ensure that all accessories are turned off.

Ensure that the battery is fully charged.

Turn the ignition on.

If either the Memory Seat Module or the Driver Horizontal Seat Adjuster Motor/Seat Track was replaced, the MSM Standard Routine must be performed using the scan tool.

With the scan tool, record and erase DTCs from all modules.

Operate the driver seat in all positions.

With the Memory Switch on the Driver's Door, program the Driver's Seat No. 1 Button to a desired position and Driver No. 2 Button to a different position.

Verify that both Memory positions can be recalled from the RKE transmitter and the Memory Switch on the Driver's Door.

Turn the ignition off, wait 10 seconds, and then turn the ignition on.

With the scan tool, select ECU View.

Check for DTCs in the modules.

Are DTCs present in any of the modules or is the original condition still present?

Yes

The repair is not complete. Refer to the related article for the DTC or symptom that is still present.

No

The repair is complete.

2008 RESTRAINTS

Service Information - Liberty

RESTRAINTS - SERVICE INFORMATION

DESCRIPTION

RESTRAINT SYSTEM

An occupant restraint system is standard factory-installed safety equipment on this vehicle. Available occupant restraints for this vehicle include both active and passive types. Active restraints are those which require the vehicle occupants to take some action to employ, such as fastening a seat belt; while passive restraints require no action by the vehicle occupants to be employed.

ACTIVE RESTRAINTS

The active restraints for this vehicle include:

- **Child Restraint Anchors** - All vehicles are equipped with three, fixed-position, child seat upper tether anchors for the second row seat. Two anchors are integral to the back of the left rear seat back panel, and one is integral to the right rear seat back panel. Two lower anchors are also provided for each outboard second row seating position. Except for the left inboard anchor, these lower anchors are integral to the seat brackets on the rear floor panel. The left inboard anchor is integral to the left seat cushion frame. The lower anchors are all accessed from the front of the second row seats, where the seat back meets the seat cushion.
- **Front Seat Belts** - Both front seating positions are equipped with three-point seat belt systems employing lower B-pillar mounted inertia latch-type emergency locking retractors, height-adjustable upper B-pillar mounted turning loops, a traveling lower seat belt anchor secured to the outboard side of the seat frame, and a traveling end-release seat belt buckle secured to the inboard side of the seat frame. The front seat belt buckles include an integral seat belt switch that detects whether the front seat belts have been fastened.
- **Second Row Seat Belts** - All second row seating positions are equipped with three-point seat belt systems. The outboard seating position belts employ lower C-pillar mounted inertia latch-type emergency locking retractors, fixed position upper C-pillar mounted turning loops and fixed lower seat belt anchors secured to the floor panel. The second row center seating position belt has an inertia latch-type emergency locking retractor that is integral to the left rear seat back panel. The second row center seating position belt lower anchor is secured to the floor panel. All three rear seat belts have fixed end-release seat belt buckles secured to the floor panel, a double buckle unit on the right side and a single buckle unit on the left side.

PASSIVE RESTRAINTS

SRS

AIRBAG

8098029e

Fig. 1: SRS Emblem
Courtesy of CHRYSLER LLC

The passive restraints available for this vehicle include the following:

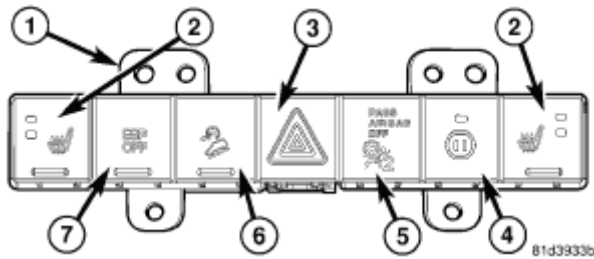


Fig. 2: Instrument Panel Switch Pod
Courtesy of CHRYSLER LLC

- **Dual Front Airbags** - Multistage driver and front passenger airbags are used in this vehicle. This airbag system consists of passive, inflatable, Supplemental Restraint System (SRS) components and vehicles with this equipment can be readily identified by the **SRS - AIRBAG** logo molded into the driver airbag trim cover in the center of the steering wheel and also into the passenger airbag door on the instrument panel above the glove box. Vehicles with the airbag system can also be identified by the airbag indicator, which will illuminate in the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) for about seven seconds as a bulb test each time the ignition switch is turned to the ON position. Pyrotechnic-type seat belt tensioners are also included for the driver and passenger front seat belts of all airbag equipped vehicles to work in conjunction with the dual front and side curtain airbags.
- **Occupant Classification System** - Vehicles manufactured for sale in North America (except Mexico) also include an Occupant Classification System (OCS) with components that are located on the passenger

side front seat. These components include an Occupant Classification Module (OCM) and four seat weight sensors on the passenger side front seat. Vehicles equipped with the OCS components can be readily identified by a passenger airbag on/off indicator (4) located to the right of the hazard switch (3) in the instrument panel switch pod (1) near the base of the instrument panel center bezel.

- **Side Curtain Airbags** - Side curtain airbags are standard equipment for this vehicle when it is also equipped with dual front airbags. This airbag system consists of passive, inflatable SRS components and vehicles with this equipment can be readily identified by a molded identification trim plug with the **SRS - AIRBAG** logo located near the tops of the B and C-pillar trim.

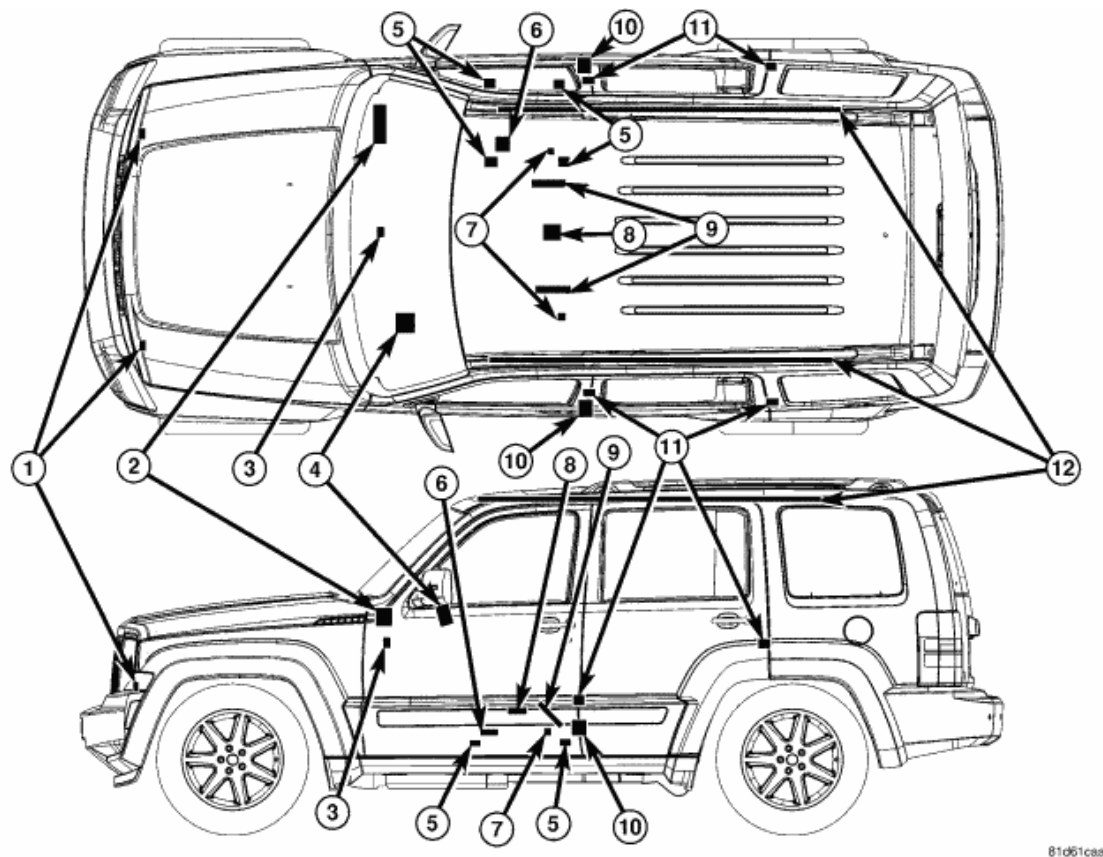


Fig. 3: SRS System
Courtesy of CHRYSLER LLC

The SRS includes the following major components, which are described in further detail elsewhere in this service information:

Airbag Indicator - The airbag indicator is integral to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), which is located on the instrument panel in front of the driver.

Clockspring - The clockspring is located near the top of the steering column, directly beneath the steering wheel.

Driver Airbag (4) - The driver airbag is located in the center of the steering wheel, beneath the driver airbag trim cover.

Driver Knee Blocker - The driver knee blocker is a structural unit secured to the back side of and

integral to the instrument panel steering column opening cover.

Front Impact Sensor (1) - Two front impact sensors are used on vehicles equipped with dual front airbags, one left side and one right side. One sensor is located on the back side of the front end module carrier on either side of the radiator and inboard of the headlamp within the engine compartment.

Occupant Classification Module (6) - Vehicles equipped with the Occupant Classification System (OCS) include an Occupant Classification Module (OCM) which is secured to a bracket on the inboard side of the inboard passenger side seat track riser beneath the seat cushion.

Occupant Restraint Controller (8) - The Occupant Restraint Controller (ORC) is located on a mount on the floor panel transmission tunnel rearward of the transmission gear selector, and is concealed beneath the center floor console.

Passenger Airbag (2) - The passenger airbag is located in the instrument panel, beneath the passenger airbag door on the instrument panel above the glove box on the passenger side of the vehicle.

Passenger Airbag On/Off Indicator (3) - Vehicles with the Occupant Classification System (OCS) include a passenger airbag on/off indicator which is located in the instrument panel switch pod near the base of the instrument panel lower center bezel.

Passenger Knee Blocker - The passenger knee blocker is a structural reinforcement that is integral to and concealed within the glove box door.

Seat Belt Tensioner (9 and 10) - Vehicles equipped with dual front airbags have seat belt buckle tensioners integral to both front seat belt buckle units (9) for export market vehicles, or to only the driver side front seat belt buckle for domestic market vehicles. Seat belt retractor tensioner units (10) are used in all markets on vehicles equipped with dual front airbags. The seat belt buckle tensioner units are located on the inboard rear corner of the front seat cushion frame. The seat belt retractor tensioner units are secured to the right and left inner B-pillars and concealed beneath the lower B-pillar trim.

Seat Weight Sensor (5) - Vehicles equipped with the Occupant Classification System (OCS) include four seat weight sensors, one on each corner of the passenger side front seat between the lower seat adjuster tracks and the seat track risers.

Side Curtain Airbag (12) - A side curtain airbag is secured to each inside roof side rail above the headliner, and extends from the A-pillar to just beyond the C-pillar.

Side Impact Sensor (11) - Four side impact sensors are used on vehicles equipped with side curtain airbags, two left side and two right side. One sensor is located behind the trim above the front seat belt retractor on each inner B-pillar and one is located above the second row outboard retractor on each inner C-pillar.

The ORC, the OCM, and the EMIC each contain a microprocessor and programming that allow them to communicate with each other using the Controller Area Network (CAN) data bus. This method of communication is used by the ORC for control of the airbag indicator in the EMIC. Refer to **DESCRIPTION**.

Hard wired circuitry connects the SRS components to each other through the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system, and to the SRS components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

OPERATION

RESTRAINT SYSTEM

ACTIVE RESTRAINTS

The primary passenger restraints in this or any other vehicle are the standard equipment factory-installed seat belts and child restraint anchors. Seat belts and child restraint anchors are referred to as an active restraint because the vehicle occupants are required to physically fasten and properly adjust these restraints in order to benefit from them.

PASSIVE RESTRAINTS

The passive restraints are referred to as a Supplemental Restraint System (SRS) because they were designed and are intended to enhance the protection for the occupants of the vehicle **only** when used in conjunction with the seat belts. They are referred to as passive restraints because the vehicle occupants are not required to do anything to make them operate; however, the vehicle occupants must be wearing their seat belts in order to obtain the maximum safety benefit from the factory-installed SRS components.

The SRS electrical circuits are continuously monitored and controlled by a microprocessor and software contained within the Occupant Restraint Controller (ORC). An airbag indicator in the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) illuminates for about seven seconds as a bulb test each time the ignition switch is turned to the ON or START positions. Following the bulb test, the airbag indicator is turned ON or OFF by the ORC to indicate the status of the SRS. If the airbag indicator comes ON at any time other than during the bulb test, it indicates that there is a problem in the SRS electrical circuits. Such a problem may cause airbags not to deploy when required, or to deploy when not required.

Deployment of the SRS components depends upon the angle and severity of an impact. Deployment is not based upon vehicle speed; rather, deployment is based upon the rate of deceleration as measured by the forces of gravity (G force) upon the acceleration-type impact sensors. When an impact is severe enough, the microprocessor in the ORC signals the inflator of the appropriate airbag units to deploy their airbag cushions. The front seat belt retractor tensioners and, if equipped, buckle tensioners are provided with a deployment signal by the ORC in conjunction with the front or side curtain airbags. The side curtain airbags are provided with a deployment signal individually by the ORC based upon a side impact sensor input for the same side of the vehicle.

During a frontal vehicle impact, the knee blockers work in concert with properly fastened and adjusted seat belts to restrain both the driver and the front seat passenger in the proper position for an airbag deployment. The knee blockers also absorb and distribute the crash energy from the driver and the front seat passenger to the structure of the instrument panel. The seat belt tensioners remove the slack from the front seat belts to provide further assurance that the driver and front seat passenger are properly positioned and restrained for an airbag deployment.

Typically, the vehicle occupants recall more about the events preceding and following a collision than they do of an airbag deployment itself. This is because the airbag deployment and deflation occur very rapidly. In a typical 48 kilometer-per-hour (30 mile-per-hour) barrier impact, from the moment of impact until the airbags are fully inflated takes about 40 milliseconds. Within one to two seconds from the moment of impact, the

airbags are almost entirely deflated. The times cited for these events are approximations, which apply only to a barrier impact at the given speed. Actual times will vary somewhat, depending upon the vehicle speed, impact angle, severity of the impact, and the type of collision.

When the ORC monitors a problem in any of the SRS circuits or components, including the seat belt tensioners, it stores a fault code or Diagnostic Trouble Code (DTC) in its memory circuit and sends an electronic message to the EMIC to turn ON the airbag indicator. The hard wired circuits between components related to the SRS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SRS or the electronic controls or communication between other modules and devices that provide features of the SRS. The most reliable, efficient, and accurate means to diagnose the SRS or the electronic controls and communication related to SRS operation, as well as the retrieval or erasure of a DTC requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

OCCUPANT CLASSIFICATION SYSTEM

In vehicles equipped with the Occupant Classification System (OCS), the OCS automatically suppresses or enables passenger airbag and seat belt tensioner operation based upon whether or not the passenger side front seat is occupied and, if the seat is occupied, classifies the size of the occupant and whether the seat is occupied by a child seat. The passenger airbag and seat belt tensioners are disabled when the system senses the seat is occupied by a child seat or a person below a minimum weight threshold.

The OCS has an Occupant Classification Module (OCM) that monitors inputs from the seat weight sensors under the passenger side front seat cushion. Based upon those inputs the microprocessor within the OCM classifies the occupant of the passenger side front seat. The OCM then sends electronic **occupant classification** messages to the Occupant Restraint Controller (ORC). The microprocessor and programming of the ORC determines whether to enable or disable the deployment circuits for the passenger airbag and seat belt tensioners; and, if enabled, what force level should be used to deploy each front airbag.

The OCS electrical circuits and components are continuously monitored by the OCM, and the OCM is continuously monitored by the ORC. A passenger airbag on/off indicator is located in the instrument panel switch pod near the base of the instrument panel center bezel. This indicator receives battery current whenever the ignition switch is in the ON or START positions, and illuminates only when the ORC pulls the indicator control circuit to ground. The indicator illuminates for about seven seconds as a bulb test each time the ignition switch is turned to the ON or START positions. Following the bulb test, the indicator is turned ON or OFF by the ORC based upon the electronic **occupant classification** messages received from the OCM. This indicator is illuminated whenever the seat is occupied and passenger airbag and seat belt tensioner operation has been suppressed. The indicator is turned OFF whenever the seat is empty or when the seat is occupied and the passenger airbag and seat belt tensioners are enabled.

When the OCM monitors a problem in any of the OCS circuits or components, it stores a fault code or DTC in its memory circuit and sends an electronic message to the ORC. The ORC then sends an electronic message to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to turn ON the airbag indicator. If for any reason the OCM is unable to classify the occupant it sends an electronic

message to the ORC, and the ORC suppresses passenger airbag and seat belt tensioner operation. The hard wired circuits between components related to the OCS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the OCS or the electronic controls or communication between other modules and devices that provide features of the OCS. The most reliable, efficient, and accurate means to diagnose the OCS or the electronic controls or communication related to OCS operation, as well as the retrieval or erasure of a DTC requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

WARNING

RESTRAINT SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with the Supplemental Restraint System (SRS), never attempt to repair the electrically conductive circuits or wiring components related to the SRS. Such repairs can compromise the conductivity and current carrying capacity of those critical electrical circuits, which may cause SRS components not to deploy when required, or to deploy when not required. Any wire harness containing broken, cut, burned or otherwise damaged electrically conductive SRS wiring, terminals or connector components must be removed and replaced with an entire new wire harness. Only minor cuts or abrasions of wire and terminal insulation where the conductive material has not been damaged, or connector insulators where the integrity of the latching and locking mechanisms have not been compromised may be repaired using appropriate methods.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service.

The ORC contains a rollover sensor, which enables the system to deploy the side curtain airbags in the event of a vehicle rollover event. If an ORC is accidentally rolled during service while still connected to battery power, the side curtain airbags will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, before performing any welding operations disconnect and isolate the battery negative (ground) cable and disconnect all wire harness connectors from the Occupant Restraint Controller (ORC). Failure to take the proper precautions could result in accidental airbag deployment and other possible damage to the Supplemental Restraint System (SRS) circuits and components.

WARNING: To avoid serious or fatal injury, do not attempt to dismantle an airbag unit or tamper with its inflator. Do not puncture, incinerate, or bring into contact with electricity. Do not store at temperatures exceeding 93° C (200° F). An airbag inflator unit may contain sodium azide and potassium nitrate. These materials are poisonous and extremely flammable. Contact with acid, water, or heavy metals may produce harmful and irritating gases (sodium hydroxide is formed in the presence of moisture) or combustible compounds. An airbag inflator unit may also contain a gas canister pressurized to over 17.24 kPa (2500 psi).

WARNING: To avoid serious or fatal injury when handling a seat belt tensioner retractor, proper care should be exercised to keep fingers out from under the retractor cover and away from the seat belt webbing where it exits from the retractor cover.

WARNING: To avoid serious or fatal injury, replace all Supplemental Restraint System (SRS) components only with parts specified in the DaimlerChrysler Mopar® Parts Catalog. Substitute parts may appear interchangeable, but internal differences may result in inferior occupant protection.

WARNING: To avoid serious or fatal injury, the fasteners, screws, and bolts originally used for the Supplemental Restraint System (SRS) components must never be replaced with any substitutes. These fasteners have special coatings and are specifically designed for the SRS. Any time a new fastener is needed, replace it with the correct fasteners provided in the service package or specified in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury when a steering column has an airbag unit attached, never place the column on the floor or any other surface with the steering wheel or airbag unit face down.

DIAGNOSIS AND TESTING

RESTRAINT SYSTEM

The hard wired circuits between modules and components related to the Supplemental Restraint System (SRS) may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SRS or the electronic controls or communication between other modules and devices that provide features of the SRS. The most reliable, efficient, and accurate means to diagnose the SRS or the electronic controls and communication related to SRS operation, as well as the retrieval or erasure of a DTC requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

In addition to a diagnostic scan tool that contains the latest version of the proper diagnostic software, certain diagnostic procedures for the SRS may require the use of the SRS Load Tool special tool along with the appropriate Load Tool Jumpers and Adapters or the Occupant Classification System (OCS) Seat Weight special tool. Refer to the appropriate diagnostic information.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

STANDARD PROCEDURE

HANDLING NON-DEPLOYED SUPPLEMENTAL RESTRAINTS

At no time should any source of electricity be permitted near the inflator on the back of a non-deployed airbag or seat belt tensioner. When carrying a non-deployed airbag, the trim cover or airbag cushion side of the unit should be pointed away from the body to minimize injury in the event of an accidental deployment. If the airbag unit is placed on a bench or any other surface, the trim cover or airbag cushion side of the unit should be face up to minimize movement in the event of an accidental deployment.

When handling a non-deployed seat belt retractor tensioner, take proper care to keep fingers out from under the retractor cover and away from the seat belt webbing where it exits from the retractor cover. When handling a non-deployed seat belt buckle tensioner, take proper care to keep fingers away from the scabbard between the buckle and the tensioner unit. In addition, the Supplemental Restraint System (SRS) should be disarmed whenever any steering wheel, steering column, seat belt tensioner, airbag, impact sensor Occupant Classification System (OCS), or instrument panel components require diagnosis or service. Failure to observe this warning could result in accidental airbag deployment and possible personal injury.

All damaged, ineffective or non-deployed airbags and seat belt tensioners which are replaced on vehicles are to be handled and disposed of properly. If an airbag or seat belt tensioner unit is ineffective or damaged and non-deployed, refer to the Hazardous Substance Control System for information regarding the potentially hazardous properties of the subject component and the proper safe handling procedures. Then dispose of all non-deployed and deployed airbags and seat belt tensioners in a manner consistent with state, provincial, local and federal regulations.

SUPPLEMENTAL RESTRAINT STORAGE

Airbags and seat belt tensioners must be stored in their original, special container until they are used for service. Also, they must be stored in a clean, dry environment; away from sources of extreme heat, sparks, and high electrical energy. Always place or store any airbag on a surface with its trim cover or airbag cushion side facing up, to minimize movement in case of an accidental deployment.

SERVICE AFTER A SUPPLEMENTAL RESTRAINT DEPLOYMENT

Any vehicle which is to be returned to use following a Supplemental Restraint System (SRS) component deployment, must have the deployed restraints replaced. In addition, if the driver airbag has been deployed, the clockspring and the steering column must be replaced. If the passenger airbag is deployed, the passenger airbag door and both passenger airbag squib connectors must be replaced. The seat belt tensioners are deployed by the same signal that deploys either the driver and passenger front airbags or the side curtain airbags and must also be replaced if any front or side airbag has been deployed.

If a side curtain airbag has been deployed, the complete airbag unit, the headliner, as well as the upper A, B, C and D-pillar trim must be replaced. These components are not intended for reuse and will be damaged or weakened as a result of a SRS component deployment, which may or may not be obvious during a visual inspection. On vehicles with an optional sunroof, the sunroof drain tubes and hoses must be closely inspected following a side curtain airbag deployment.

It is also critical that the mounting surfaces and mounting brackets for the Occupant Restraint Controller (ORC), side impact sensors and front impact sensors be closely inspected and restored to their original conditions following any vehicle impact damage. Because the ORC and each impact sensor are used by the SRS to monitor or confirm the direction and severity of a vehicle impact, improper orientation or insecure fastening of these components may cause airbags not to deploy when required, or to deploy when not required.

Never attempt to repair the electrically conductive circuits or wiring components related to the SRS. Such repairs can compromise the conductivity and current carrying capacity of those critical electrical circuits, which may cause SRS components not to deploy when required, or to deploy when not required. Any wire harness containing broken, cut, burned or otherwise damaged electrically conductive SRS wiring, terminals or connector components must be removed and replaced with an entire new wire harness. Only minor cuts or abrasions of wire and terminal insulation where the conductive material has not been damaged, or connector insulators where the integrity of the latching and locking mechanisms have not been compromised may be repaired using appropriate methods.

All other vehicle components should be closely inspected following any SRS component deployment, but are to be replaced only as required by the extent of the visible damage incurred.

AIRBAG SQUIB STATUS

Multistage airbags with multiple initiators (squibs) must be checked to determine that all squibs were used during the deployment event. The driver and passenger airbags in this vehicle are deployed by electrical signals generated by the Occupant Restraint Controller (ORC) through the driver or passenger squib 1 and squib 2 circuits to the two initiators in the airbag inflators. Typically, both initiators are used and all potentially hazardous chemicals are burned during an airbag deployment event. However, it is possible for only one initiator to be used; therefore, it is always necessary to confirm that both initiators have been used in order to avoid the improper handling or disposal of potentially live pyrotechnic or hazardous materials. The following procedure should be performed using a diagnostic scan tool to verify the status of both airbag squibs before either deployed airbag is removed from the vehicle for disposal.

CAUTION: Deployed front airbags having two initiators (squibs) in the airbag inflator may or may not have live pyrotechnic material within the inflator. Do not dispose of these airbags unless you are certain of complete deployment. Refer to the Hazardous Substance Control System for information regarding the potentially hazardous properties of the subject component and the proper safe handling procedures. Then dispose of all non-deployed and deployed airbags and seat belt tensioners in a manner consistent with state, provincial, local and federal regulations.

- 1. Be certain that the diagnostic scan tool contains the latest version of the proper diagnostic software. Connect the scan tool to the 16-way Data Link Connector (DLC). The DLC is located on the driver side lower edge of the instrument panel, inboard of the steering column.
- 2. Turn the ignition switch to the ON position.
- 3. Using the scan tool, read and record the active (current) Diagnostic Trouble Code (DTC) data.

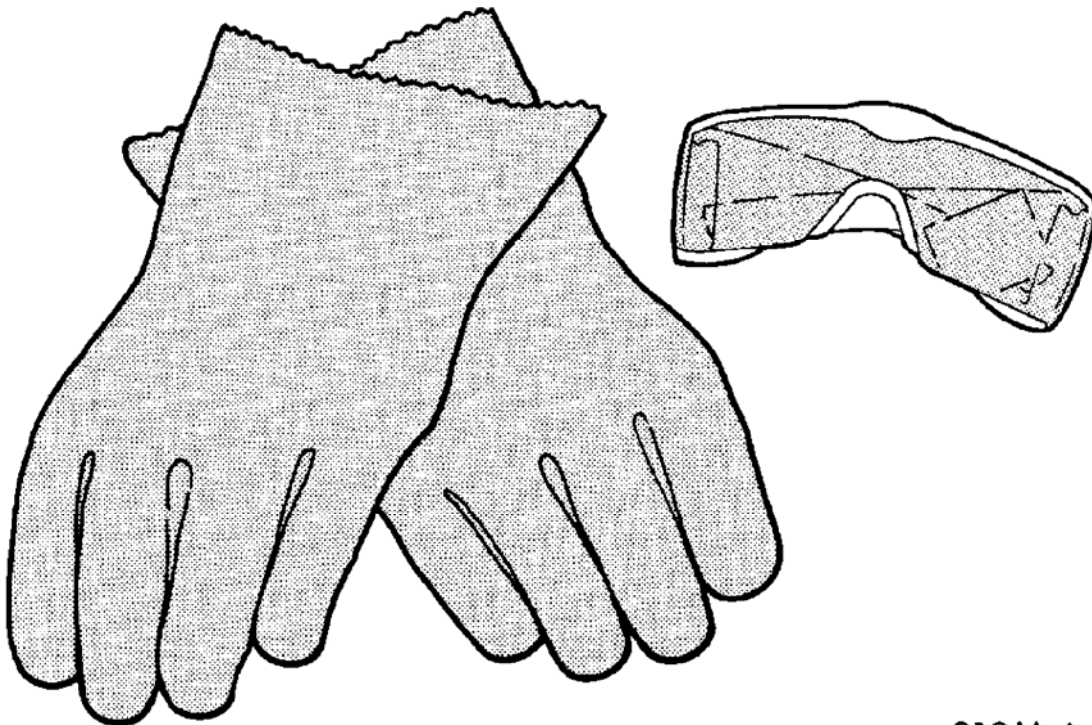
Using the active DTC information, refer to the **AIRBAG SQUIB STATUS** table to determine the status of both driver and passenger airbag squibs.

AIRBAG SQUIB STATUS		
IF THE ACTIVE DTC IS:	CONDITIONS	SQUIB STATUS
Driver or Passenger Squib 1 open	AND the stored DTC minutes for both Driver or Passenger squibs are within 15	Both Squib 1 and 2 were used.

Driver or Passenger Squib 2 open	minutes of each other	
Driver or Passenger Squib 1 open	AND the stored DTC minutes for Driver or Passenger Squib 2 open is GREATER than the stored DTC minutes for Driver or Passenger Squib 1 by 15 minutes or more	Squib 1 was used; Squib 2 is live.
Driver or Passenger Squib 2 open		
Driver or Passenger Squib 1 open	AND the stored DTC minutes for Driver or Passenger Squib 1 open is GREATER than the stored DTC minutes for Driver or Passenger Squib 2 by 15 minutes or more	Squib 1 is live; Squib 2 was used.
Driver or Passenger Squib 2 open		
Driver or Passenger Squib 1 open	AND Driver or Passenger Squib 2 open is NOT an active code	Squib 1 was used; Squib 2 is live.
Driver or Passenger Squib 2 open	AND Driver or Passenger Squib 1 open is NOT an active code	Squib 1 is live; Squib 2 was used.

NOTE: If none of the Driver or Passenger Squib 1 or 2 open are active codes, the status of the airbag squibs is unknown. In this case the airbag should be handled and disposed of as if the squibs were both live.

CLEANUP PROCEDURE



918M-4

Fig. 4: Wear Safety Glasses & Rubber Gloves - Typical
Courtesy of CHRYSLER LLC

Following a Supplemental Restraint System (SRS) component deployment, the vehicle interior will contain a powdery residue. This residue consists primarily of harmless particulate by-products of the small pyrotechnic charge that initiates the propellant used to deploy a SRS component. However, this residue may also contain traces of sodium hydroxide powder, a chemical by-product of the propellant material that is used to generate the inert gas that inflates the airbag. Since sodium hydroxide powder can irritate the skin, eyes, nose, or throat, be certain to wear safety glasses, rubber gloves, and a long-sleeved shirt during cleanup.

WARNING: To avoid serious or fatal injury, if you experience skin irritation during cleanup, run cool water over the affected area. Also, if you experience irritation of the nose or throat, exit the vehicle for fresh air until the irritation ceases. If irritation continues, see a physician.

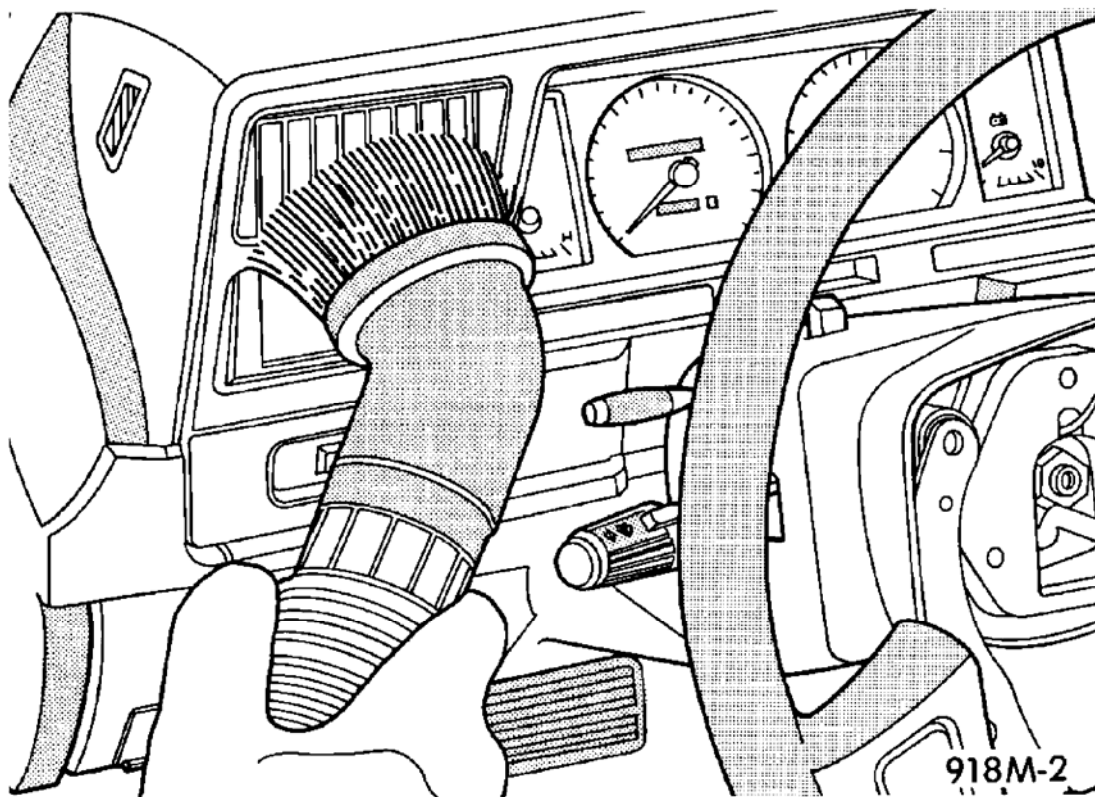


Fig. 5: Vacuum Heater & A/C Outlets - Typical
Courtesy of CHRYSLER LLC

1. Begin the cleanup by using a vacuum cleaner to remove any residual powder from the vehicle interior. Clean from outside the vehicle and work your way inside, so that you avoid kneeling or sitting on a non-cleaned area.
2. Be certain to vacuum the heater and air conditioning outlets as well. Run the heater and air conditioner blower on the lowest speed setting and vacuum any powder expelled from the outlets.

CAUTION: Deployed front airbags having two initiators (squibs) in the airbag

inflator may or may not have live pyrotechnic material within the inflator. Do not dispose of these airbags unless you are certain of complete deployment. Refer to AIRBAG SQUIB STATUS. All damaged, ineffective, or non-deployed Supplemental Restraint System (SRS) components which are replaced on vehicles are to be handled and disposed of properly. If an airbag or seat belt tensioner unit is ineffective or damaged and non-deployed, refer to the Hazardous Substance Control System for information regarding the potentially hazardous properties of the subject component and the proper safe handling procedures. Then dispose of all non-deployed and deployed airbags and seat belt tensioners in a manner consistent with state, provincial, local and federal regulations.

3. Next, remove the deployed SRS components from the vehicle. Refer to the appropriate service removal procedures.
4. You may need to vacuum the interior of the vehicle a second time to recover all of the powder.

VERIFICATION TEST - SUPPLEMENTAL RESTRAINT SYSTEM

NOTE: The following procedure should be performed using a diagnostic scan tool to verify proper Supplemental Restraint System (SRS) operation following the service or replacement of any SRS component. In addition, if the vehicle is equipped with the Occupant Classification System (OCS) and one of the passenger front seat SRS components has been replaced, following successful completion of the SRS Verification Test procedure, perform the OCS Verification Test using a diagnostic scan tool. Refer to the appropriate diagnostic procedures.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

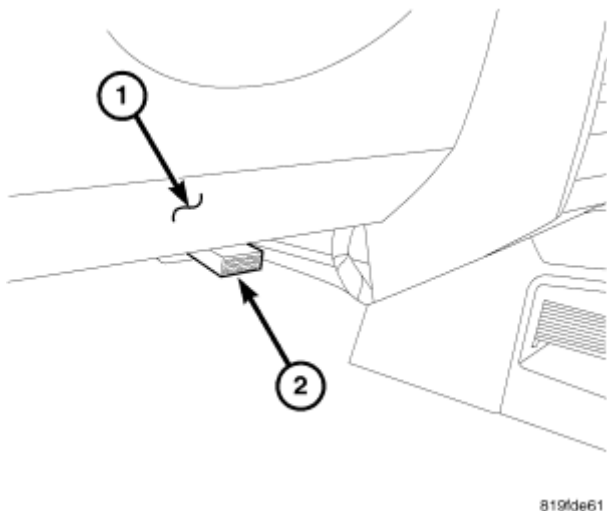


Fig. 6: Identifying Data Link Connector (DLC) & Steering Column Opening Cover
 Courtesy of CHRYSLER LLC

1. During the following test, the battery negative cable remains disconnected and isolated, as it was during the Supplemental Restraint System (SRS) component removal and installation procedures.
2. Be certain that the diagnostic scan tool contains the latest version of the proper diagnostic software. Connect the scan tool to the 16-way Data Link Connector (DLC) (2). The DLC is located on the driver side lower edge of the instrument panel (1), inboard of the steering column.
3. Turn the ignition switch to the ON position and exit the vehicle with the scan tool.
4. Check to be certain that nobody is in the vehicle, then reconnect the battery negative cable.
5. Using the scan tool, read and record the active (current) Diagnostic Trouble Code (DTC) data.
6. Next, use the scan tool to read and record any stored (historical) DTC data.
7. If any DTC is step 5.
8. Use the scan tool to erase the stored DTC data. If any problems remain, the stored DTC data will not erase. Refer to the appropriate diagnostic information to diagnose any stored DTC that will not erase. If the stored DTC information is successfully erased, go to step 9.
9. Turn the ignition switch to the OFF position for about 15 seconds, and then back to the ON position. Observe the airbag indicator in the instrument cluster. It should light for six to eight seconds, and then go out. This indicates that the SRS is functioning normally and that the repairs are complete. If the airbag indicator fails to light, or lights and stays ON, there is still an active SRS fault or malfunction. Refer to the appropriate diagnostic information to diagnose the problem.

SPECIFICATIONS

RESTRAINT SYSTEM TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Clockspring Mounting Screws	3	-	27
Curtain Airbag Mounting	8	-	71

Nuts			
Front Impact Sensor Mounting Nut	8	-	71
Side Impact Sensor Mounting Nut	7	-	62
Occupant Classification Module Mounting Screws	2	-	20
Occupant Restraint Controller Mounting Screws	10.5	-	95
Occupant Restraint Controller Mounting Nuts	10.5	-	95
Passenger Airbag Lower Instrument Panel Bracket Nuts	20	15	-
Passenger Airbag Lower Mounting Nuts	7	-	62
Passenger Airbag Upper Instrument Panel Bracket To Structural Duct Screw	2.9	-	25
Passenger Airbag Upper Instrument Panel Bracket Mounting Screws	29.5	21	-
Front Seat Belt Buckle Lower Anchor Mounting Screw	43	32	-
Second Row Center and Right Outboard Seat Belt Buckle Mounting Screw	55	41	-
Second Row Seat Cushion Leg Mounting Screws	54	40	-
Second Row Center Seat Belt Anchor and Left Outboard Buckle Mounting Nut	62.5	46	-
Front Seat Belt Retractor Lower Bracket Mounting Screw	44.5	33	-
Front Seat Belt Turning Loop Mounting Screw	44.5	33	-
Front Seat Belt Lower Anchor Mounting Screw	44.5	33	-
Second Row Center Seat Belt Retractor Mounting Screw	55	41	-

Second Row Outboard Seat Belt Retractor Lower Bracket Mounting Screw	44.5	33	-
Second Row Outboard Seat Belt Turning Loop Mounting Screw	44.5	33	-
Second Row Outboard Seat Belt Lower Anchor Mounting Nut	62.5	46	-
Seat Belt Turning Loop Adjuster Mounting Screw	44.5	33	-
Seat Weight Sensor to Seat Adjuster Track Mounting Nuts	28	21	-
Seat Weight Sensor to Seat Riser Mounting Nut	44.5	33	-

SPECIAL TOOLS

SPECIAL TOOLS

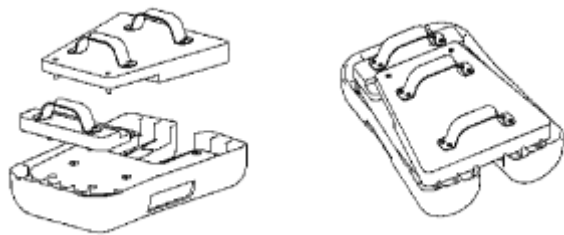


Fig. 7: OCS Seat Weight Tool No. 9077
Courtesy of CHRYSLER LLC

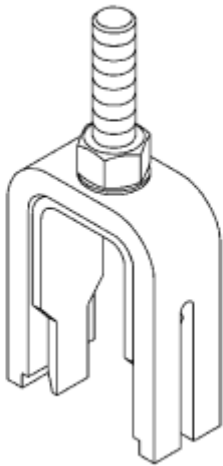


Fig. 8: Strain Gauge Alignment Tool No. 9689
Courtesy of CHRYSLER LLC



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Fig. 9: SRS Load Tool Kit No. 8443 or 8443A
Courtesy of CHRYSLER LLC

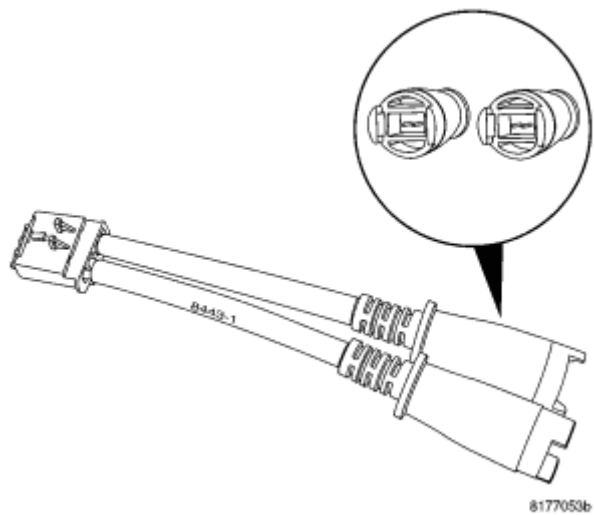


Fig. 10: Jumper No. 8443-1
Courtesy of CHRYSLER LLC

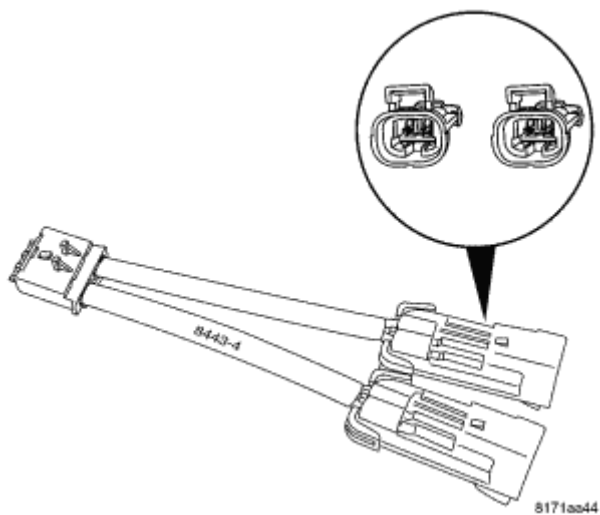


Fig. 11: Jumper No. 8443-4
Courtesy of CHRYSLER LLC

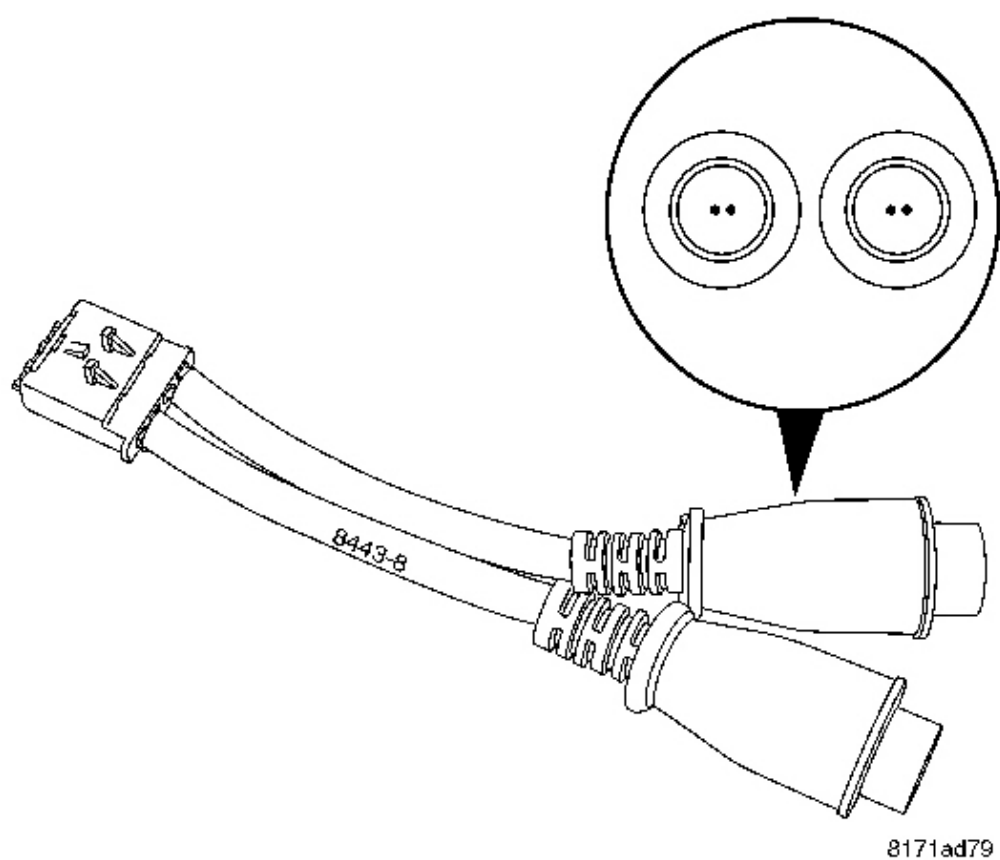
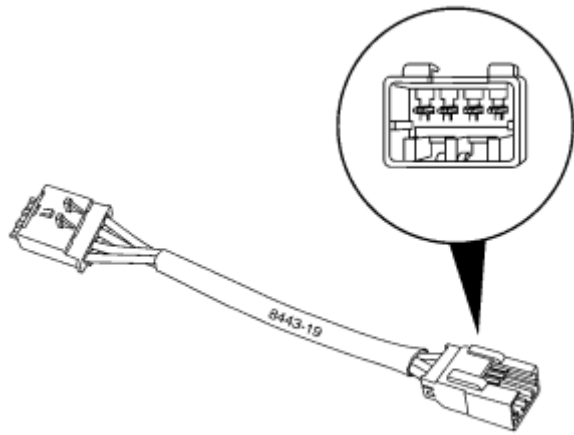
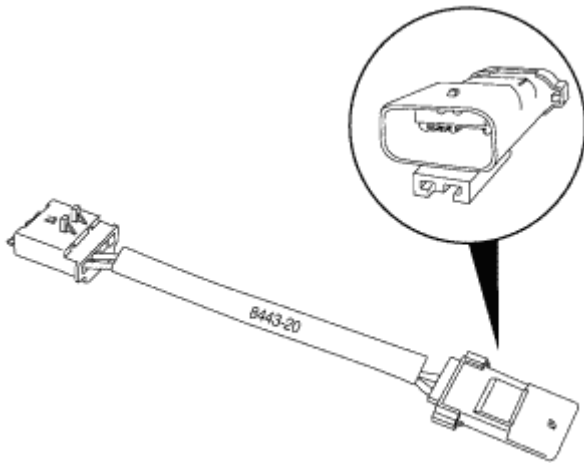


Fig. 12: Jumper No. 8443-8
Courtesy of CHRYSLER LLC



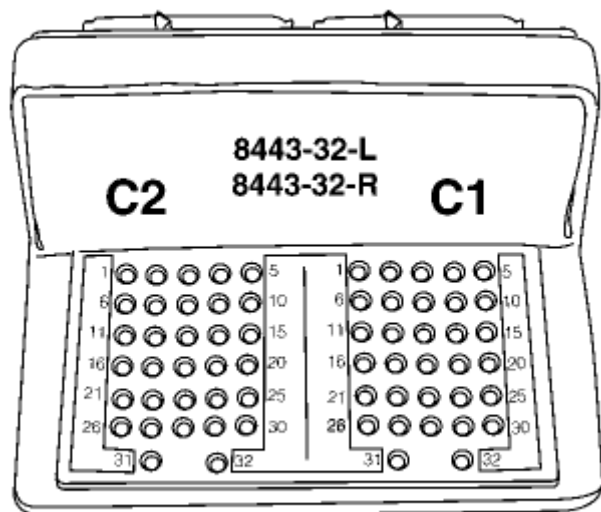
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Fig. 13: Jumper No. 8443-19
 Courtesy of CHRYSLER LLC



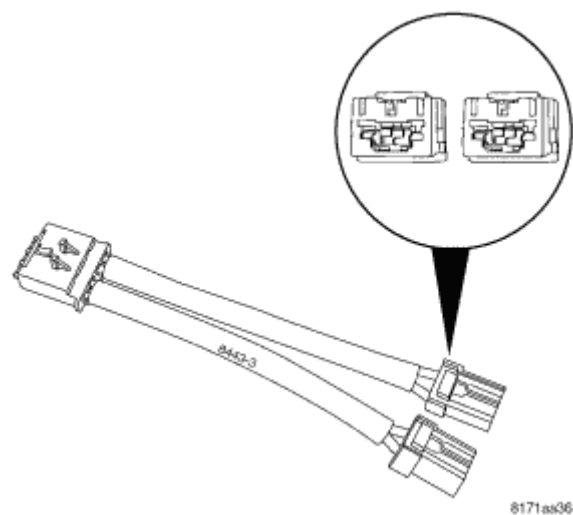
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Fig. 14: Jumper No. 8443-20
 Courtesy of CHRYSLER LLC



819bdb44

Fig. 15: Adapter No. 8443-32-R (BLACK)
Courtesy of CHRYSLER LLC



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Fig. 16: Jumper No. 8443-3
Courtesy of CHRYSLER LLC

CHILD RESTRAINT ANCHOR

DESCRIPTION

CHILD RESTRAINT ANCHOR

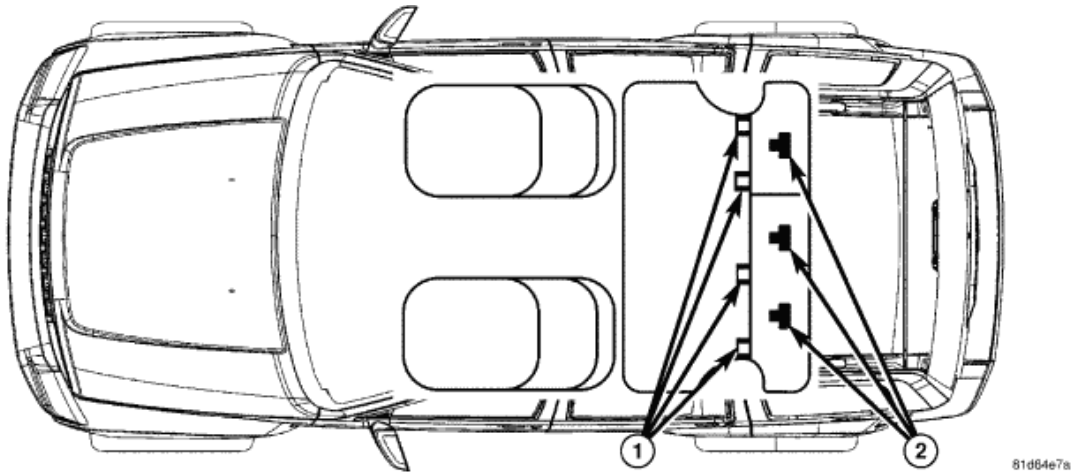


Fig. 17: Lower Anchors and Tether
Courtesy of CHRYSLER LLC

This vehicle is equipped with a Lower Anchors and Tether for Children, or LATCH child restraint anchorage system. The second row seats in these vehicles are equipped with a fixed-position child restraint upper tether anchor (2) for both the center and the two outboard seating positions, and child restraint lower anchors (1) for the two outboard seating positions.

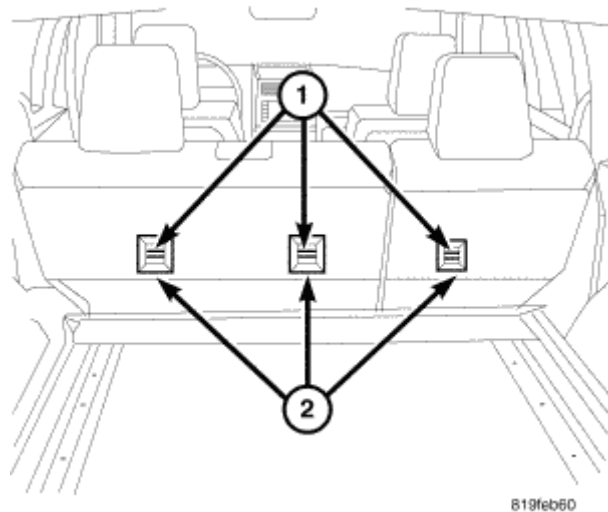
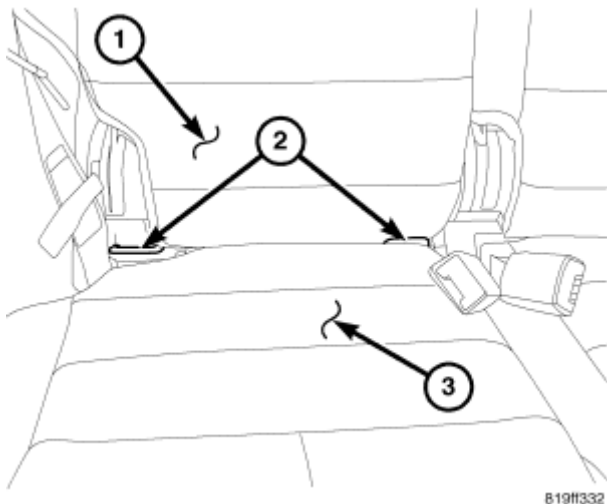


Fig. 18: Identifying Upper Tether Anchors & Molded Plastic Trim Bezel
Courtesy of CHRYSLER LLC

The upper tether anchors (1) are each integral to the second row seat back panels. These anchors are each constructed from short lengths of heavy-gauge steel wire that is securely welded into stamped steel cups that are integral to the seat back panels. There is a separate molded plastic trim bezel (2) located around each of these anchors. The child restraint upper tether anchors cannot be adjusted or repaired and, if ineffective or damaged, they must be replaced as a unit with their respective second row seat back panels.



81911332

Fig. 19: Identifying Second Row Seat Back, Lower Anchors & Seat Cushion
 Courtesy of CHRYSLER LLC

The lower anchors (2) for this vehicle are integral to their respective second row seat brackets, which are secured to the rear floor panel at the front with studs and nuts, and at the rear with screws. These anchors are each constructed from a heavy-gauge steel wire loop that is securely welded to the seat bracket. The anchor loops are located where the second row seat back (1) meets the seat cushion (3). The child restraint lower tether anchors cannot be adjusted or repaired and, if ineffective or damaged, they must be replaced as a unit with their respective second row seat brackets.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

OPERATION

CHILD RESTRAINT ANCHOR

All vehicles manufactured for sale in the United States and Canada are required to be equipped with a Lower Anchors and Tether for Children, or LATCH child restraint anchorage system. The second row seats in this vehicle have two pairs of anchor provisions for installing a LATCH-compatible child seat. A single seat may be mounted in the center seating position, or one in each outboard seating position.

With LATCH, child seats are secured by direct attachment to the vehicle seat structure, rather than by the seat belts. With LATCH-compatible child seats, lower anchors attach to the seat structure through heavy-gauge wire loops located at the intersection between the seat cushion and the seat back surfaces.

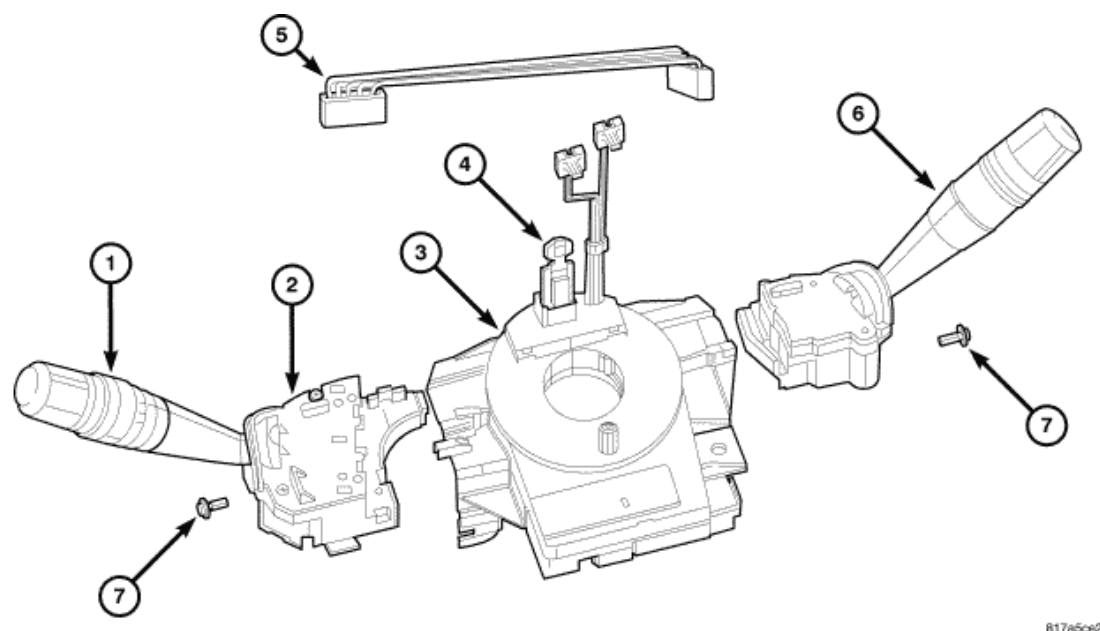
Three upper tether anchors are integral to the second row seat back frames to secure the top tether strap of child seats equipped with this feature. These upper tether anchors work with both LATCH-compatible and other child seats equipped with a top tether strap.

The owner's information packet in the vehicle glove box contains details and suggestions on the proper use of all of the factory-installed child restraint anchors.

CLOCKSPRING

DESCRIPTION

CLOCKSPRING



817a5ce2

Fig. 20: Steering Control Module
Courtesy of CHRYSLER LLC

The clockspring (3) for this vehicle is secured near the top of the steering column below the steering wheel. The clockspring also includes an integral, internal turn signal cancel cam and a Steering Angle Sensor (SAS) that are both serviced as a unit with the clockspring. The clockspring also supports the left (lighting) multi-function switch (1), the Steering Control Module (SCM) internal to the left multi-function switch housing (2), and the right (wiper) multi-function switch (6). Each of these switches and the jumper wire harness (5) between the two multi-function switches can be separated from and are serviced individually from the clockspring.

The clockspring case includes integral tabs for mounting the unit with three screws to the steering column lock housing as well as integral provisions for mounting and supporting both multi-function switches. The multi-function switches are each secured to the clockspring with a single screw (7). The SAS within the clockspring

includes an electronic circuit board and a microprocessor, which allows it to communicate with other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. The SAS circuitry, the clockspring, and the turn signal cancel cam are all contained within a flat, molded plastic case.

The clockspring case includes three connector receptacles that face toward the instrument panel. Within the plastic case is a spool-like molded plastic rotor with a large exposed hub. The upper surface of the rotor hub has a large center hole, two short pigtail wires with connectors, and a connector receptacle that faces toward the steering wheel. The lower surface of the rotor has an integral dowel or drive pin that also faces toward the steering wheel. Wound around the rotor spool within the case is a long ribbon-like tape that consists of several thin copper wire leads sandwiched between two thin plastic membranes. The outer end of the tape terminates at two of the connector receptacles that face the instrument panel, while the inner end of the tape terminates at the pigtail wires and connector receptacle on the hub of the clockspring rotor that face the steering wheel. The outer surface of the rotor hub rim within the clockspring case also has the integral lobes of the turn signal cancel cam.

The service replacement clockspring is shipped pre-centered and with a molded plastic locking pin (4) installed. The locking pin secures the centered clockspring rotor to the clockspring case during shipment and handling, but must be removed after the clockspring is installed on the steering column and the steering wheel is installed. See **STANDARD PROCEDURE**.

The clockspring cannot be repaired. If the clockspring is ineffective, damaged, or if the driver airbag has been deployed, the clockspring/turn signal cancel cam/SAS unit must be replaced.

OPERATION

CLOCKSPRING

The clockspring is a mechanical electrical circuit component that is used to provide continuous electrical continuity between the fixed instrument panel wire harness and certain electrical components mounted on or in the rotating steering wheel. On this vehicle the rotating electrical components include the driver airbag, the horn switch, the speed control switch, the remote radio switches and the Electronic Vehicle Information Center (EVIC) control switches, if the vehicle is so equipped. The clockspring is positioned and secured near the top of the steering column. The fixed connector receptacles on the back of the fixed clockspring case connect the clockspring to the vehicle electrical system through three take outs with connectors from the instrument panel wire harness.

The turn signal cancel cam is integral to the rim of the clockspring rotor hub within the clockspring case so it also moves with the rotation of the steering wheel. Two short, black-sleeved pigtail wires on the upper surface of the clockspring rotor connect the clockspring to the driver airbag, while a steering wheel wire harness connected to the connector receptacle on the upper surface of the clockspring rotor complete circuits to the horn switch, the speed control switch and, if the vehicle is so equipped, to the optional remote radio switches and EVIC control switches on the steering wheel. The third connector receptacle is dedicated to the inputs and outputs of the Steering Angle Sensor (SAS) internal to the clockspring case.

Like the clockspring in a timepiece, the clockspring tape has travel limits and can be damaged by being wound too tightly during full stop-to-stop steering wheel rotation. To prevent this from occurring, the clockspring is centered when it is installed on the steering column. Centering the clockspring indexes the clockspring tape to the movable steering components so that the tape can operate within its designed travel limits. However, if the steering wheel is removed from the steering column, if the clockspring is removed from the steering column, or

if the steering shaft is disconnected from the steering gear, the clockspring spool can change position relative to the other steering components. The clockspring must be re-centered following completion of this service or the tape may be damaged.

Service replacement clocksprings are shipped pre-centered and with a plastic locking pin installed. This locking pin should not be removed until the steering wheel has been installed on the steering column. If the locking pin is removed before the steering wheel is installed on a steering column, the clockspring centering procedure must be performed. See **STANDARD PROCEDURE**. Proper clockspring installation may be confirmed by viewing the SAS data using a diagnostic scan tool.

The hard wired clockspring circuits as well as the hard wired inputs and outputs of the SAS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SAS or the electronic controls or communication between other modules and devices that provide features of the Electronic Stability Program (ESP) or Supplemental Restraint System (SRS). The most reliable, efficient, and accurate means to diagnose the SAS or the electronic controls and communication related to ESP or SRS operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

STANDARD PROCEDURE

CLOCKSPRING CENTERING

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: A service replacement clockspring is shipped with the clockspring pre-centered and with a molded plastic locking pin installed. This locking pin should not be removed until the steering wheel has been installed on the steering column. If the locking pin is removed before the steering wheel is installed, the clockspring centering procedure must be performed.

NOTE: When a clockspring is installed into a vehicle without properly centering and locking the entire steering system, the Steering Angle Sensor (SAS) data does not agree with the true position of the steering system and causes the Electronic Stability Program (ESP) system to shut down. This may also damage the clockspring without any immediate malfunction. Unlike some other DaimlerChrysler vehicles, this SAS never requires calibration. However, upon each new ignition ON cycle, the steering wheel must be rotated slightly to initialize the SAS.

NOTE: Determining if the clockspring/SAS is centered is also possible electrically using the diagnostic scan tool. Steering wheel position is displayed as ANGLE with a range of up to 900 degrees. Refer to the appropriate menu item on the diagnostic scan tool.

NOTE: Before starting this procedure, be certain to turn the steering wheel until the front wheels are in the straight-ahead position and that the entire steering system is locked or inhibited from rotation.

NOTE: The clockspring may be centered and the rotor may be rotated freely once the steering wheel has been removed.

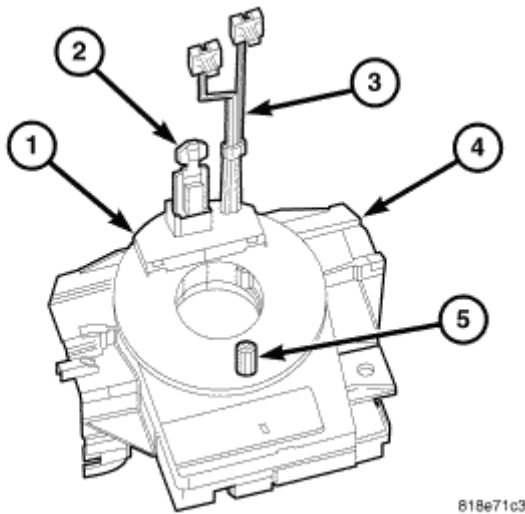


Fig. 21: Identifying Clockspring Components
Courtesy of CHRYSLER LLC

1. Place the front wheels in the straight-ahead position and inhibit the steering column shaft from rotation.
2. Remove the steering wheel from the steering shaft. Refer to **REMOVAL**.
3. Rotate the clockspring rotor (1) clockwise to the end of its travel. **Do not apply excessive torque.**
4. From the end of the clockwise travel, rotate the rotor about two and one-half turns counterclockwise. Turn the rotor slightly clockwise or counterclockwise as necessary so that the clockspring airbag pigtail wires (3) and connector receptacle are at the top and the dowel or drive pin (5) is at the bottom.
5. The clockspring is now centered. Secure the clockspring rotor to the clockspring case using a locking pin (2) or some similar device to maintain clockspring centering until the steering wheel is reinstalled on the steering column.

REMOVAL

CLOCKSPRING

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering

wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: A service replacement clockspring is shipped with the clockspring pre-centered and with a molded plastic locking pin installed. This locking pin should not be removed until the steering wheel has been installed on the steering column. If the locking pin is removed before the steering wheel is installed, the clockspring centering procedure must be performed.

NOTE: When a clockspring is installed into a vehicle without properly centering and locking the entire steering system, the Steering Angle Sensor (SAS) data does not agree with the true position of the steering system and causes the Electronic Stability Program (ESP) system to shut down. This may also damage the clockspring without any immediate malfunction. Unlike some other DaimlerChrysler vehicles, this SAS never requires calibration. See STANDARD PROCEDURE.

NOTE: Determining if the clockspring/SAS is centered is also possible electrically using the diagnostic scan tool. Steering wheel position is displayed as ANGLE with a range of up to 900 degrees. Refer to the appropriate menu item on the diagnostic scan tool.

NOTE: Before starting this procedure, be certain to turn the steering wheel until the front wheels are in the straight-ahead position and that the entire steering system is locked or inhibited from rotation.

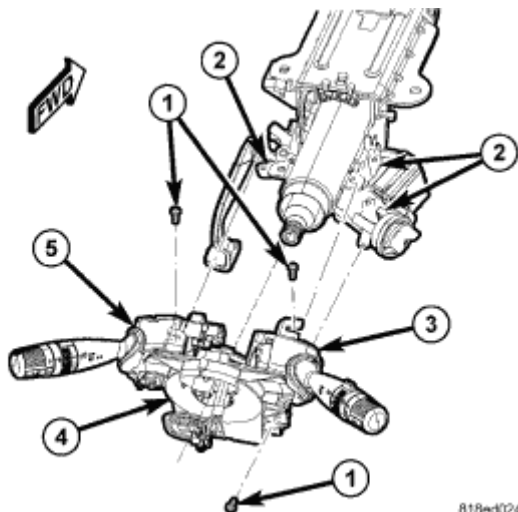


Fig. 22: Replacing Clockspring
Courtesy of CHRYSLER LLC

1. Place the front wheels in the straight ahead position and inhibit the steering column shaft from rotation.
2. Disconnect and isolate the battery negative cable.
3. Remove the steering wheel from the steering shaft. Refer to **REMOVAL** .
4. If the removed clockspring is to be reused, be certain to secure the clockspring rotor to the clockspring case to maintain clockspring centering until the steering wheel is reinstalled on the steering column. If clockspring centering is not maintained, the clockspring must be centered again before the steering wheel is reinstalled. See **STANDARD PROCEDURE**.
5. Move the steering column to the fully lowered position and leave the tilt release lever in the released (down) position.
6. Remove the upper and lower shrouds from the steering column. Refer to **REMOVAL** .
7. Remove the right multi-function switch (3) from the clockspring (4). Refer to **REMOVAL** .
8. Remove the left multi-function switch (5) from the clockspring. Refer to **REMOVAL** .
9. Remove the three screws (1) that secure the clockspring to the steering column lock housing (2).

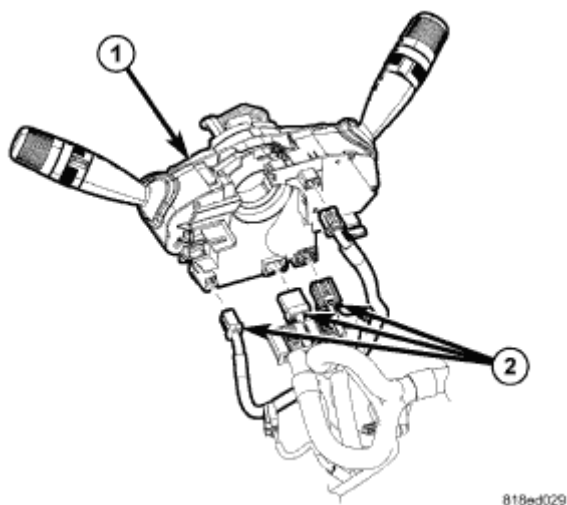


Fig. 23: Instrument Panel Wire Harness Connectors
Courtesy of CHRYSLER LLC

10. Pull the clockspring (1) away from the steering column lock housing far enough to access and disconnect the three instrument panel wire harness connectors (2) from the receptacles on the back of the clockspring case.
11. Remove the clockspring from the steering column.

INSTALLATION

CLOCKSPRING

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering

wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: A service replacement clockspring is shipped with the clockspring pre-centered and with a molded plastic locking pin installed. This locking pin should not be removed until the steering wheel has been installed on the steering column. If the locking pin is removed before the steering wheel is installed, the clockspring centering procedure must be performed.

NOTE: When a clockspring is installed into a vehicle without properly centering and locking the entire steering system, the Steering Angle Sensor (SAS) data does not agree with the true position of the steering system and causes the Electronic Stability Program (ESP) system to shut down. This may also damage the clockspring without any immediate malfunction. Unlike some other DaimlerChrysler vehicles, this SAS never requires calibration. See STANDARD PROCEDURE.

NOTE: Determining if the clockspring/SAS is centered is also possible electrically using the diagnostic scan tool. Steering wheel position is displayed as ANGLE with a range of up to 900 degrees. Refer to the appropriate menu item on the diagnostic scan tool.

NOTE: Before starting this procedure, be certain to turn the steering wheel until the front wheels are in the straight-ahead position and that the entire steering system is locked or inhibited from rotation.

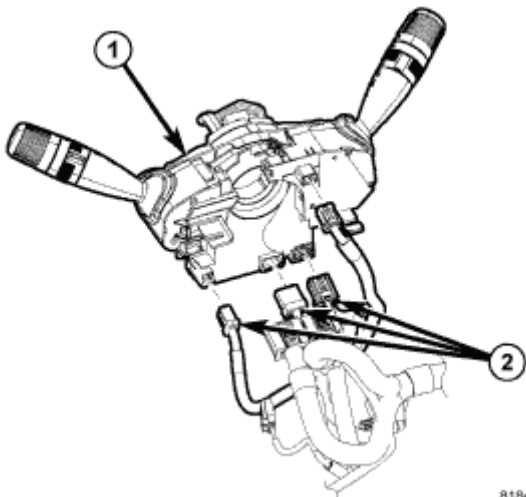


Fig. 24: Instrument Panel Wire Harness Connectors
Courtesy of CHRYSLER LLC

1. If a new clockspring (1) is being installed, transfer the multifunction switch jumper harness from the old clockspring or position a new jumper harness onto the new clockspring.
2. Carefully slide the clockspring down over the steering column upper shaft far enough to reconnect the three instrument panel wire harness connectors (2) to the receptacles on the back of the clockspring case.

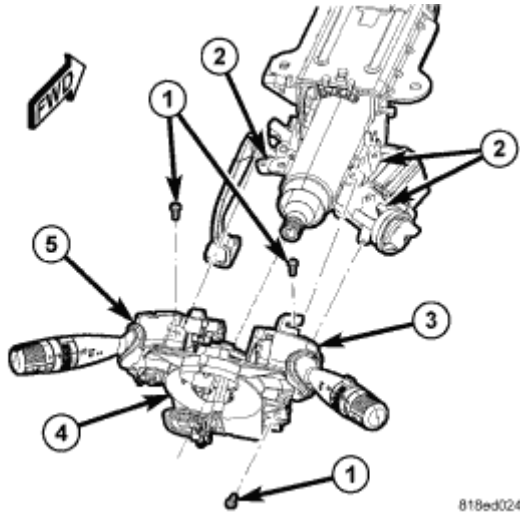


Fig. 25: Replacing Clockspring
Courtesy of CHRYSLER LLC

3. Position the clockspring (4) onto the steering column lock housing (2).
4. Install and tighten the three screws (1) that secure the clockspring to the lock housing in the following sequence: lower right, upper left, upper right. Tighten the screws to 3 N.m (27 in. lbs.).

NOTE: Use of an improper sequence when tightening the clockspring mounting screws may result in an audible ticking noise as the steering wheel is rotated.

5. Reinstall the left multi-function switch (5) onto the clockspring. Refer to **INSTALLATION**.
6. Reinstall the right multi-function switch (3) onto the clockspring. Refer to **INSTALLATION**.
7. Reinstall the upper and lower shrouds onto the steering column. Refer to **INSTALLATION**.
8. Move the steering column back to the fully raised position and move the tilt release lever back to the locked (up) position.
9. Reinstall the steering wheel onto the steering column. Refer to **INSTALLATION**.
10. Remove the plastic locking pin that secures the clockspring rotor to the clockspring case to maintain clockspring centering.
11. Reconnect the battery negative cable.

CURTAIN AIRBAG

DESCRIPTION

SIDE CURTAIN AIRBAG



8098029e

Fig. 26: SRS Emblem
Courtesy of CHRYSLER LLC

Side curtain airbags are standard equipment for this vehicle when it is also equipped with dual front airbags. These airbags are passive, inflatable, Supplemental Restraint System (SRS) components, and vehicles with this equipment can be readily identified by a molded identification trim plug with the **SRS - AIRBAG** logo located near the tops of the B and C-pillar trim. This system is designed to reduce injuries to the vehicle occupants in the event of a side impact collision or a vehicle rollover incident.

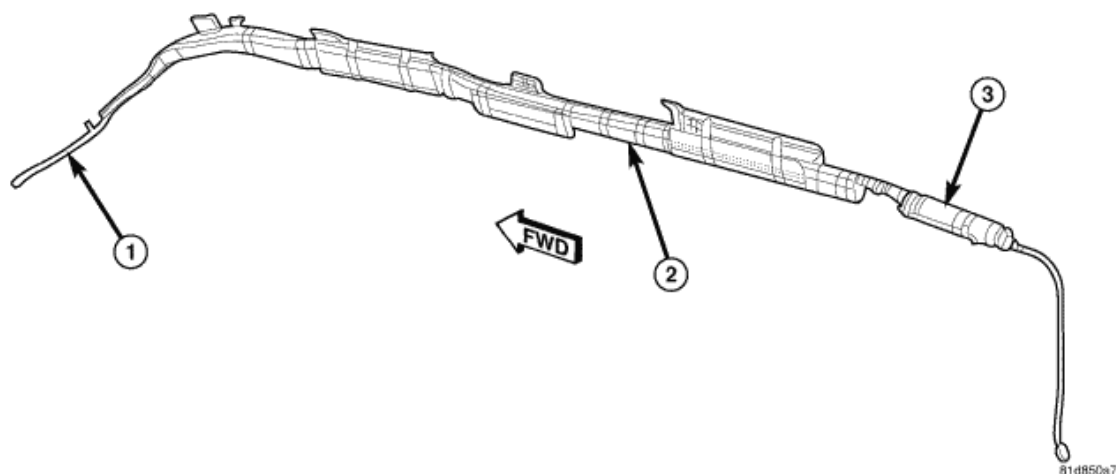


Fig. 27: Curtain Airbag Units
Courtesy of CHRYSLER LLC

Each vehicle has two individually controlled curtain airbag units (2). These airbag units are concealed and mounted above the headliner where they are each secured to one of the roof side rails by two plastic push-in fasteners and to studs on the inner roof side rail by nuts. Each folded airbag cushion is contained within a fabric wrap and has molded plastic ramps at the B and C-pillars as well as an extruded grab handle deflector shield above the rear door opening. The airbag units extend along the roof rail from the A-pillar at the front of the vehicle to just behind the C-pillar at the rear of the vehicle.

A long tether (1) extends down the A-pillar from the front of the airbag cushion. The tether is secured to mounting holes in the inner A-pillar sheet metal with a plastic push-in routing clip and is secured to the base of the A-pillar near the belt line with a metal key engaged into a slot in the A-pillar. A plastic push-in fastener fills the A-pillar slot after the metal key is installed to prevent the key from becoming disengaged.

The hybrid-type inflator (3) for each airbag is secured to the roof rail at the rear of the airbag unit between the C-pillar and the D-pillar, and is connected to the airbag cushion by a tubular manifold. The bracket holding the inflator is secured by nuts to two studs on the inner roof side rail.

One end of a two-wire pigtail harness connects to the initiator at the forward end of the curtain airbag inflator. The other end is routed down the D-pillar with plastic push-in routing clips and connects to the body wire harness near the belt line, which connects the airbag unit to the Occupant Restraint Controller (ORC).

The side curtain airbag unit cannot be adjusted or repaired and must be replaced if deployed, ineffective, or in any way damaged. Once a side curtain airbag has been deployed, the complete airbag unit, the headliner, the upper A, B, C and D-pillar trim, and all other visibly damaged components must be replaced.

OPERATION

SIDE CURTAIN AIRBAG

Each side curtain airbag is deployed individually by an electrical signal generated by the Occupant Restraint Controller (ORC) to which it is connected through left or right curtain airbag line 1 and line 2 (or squib) circuits. The hybrid-type inflator assembly for each airbag contains a small canister of highly compressed inert gas. When the ORC sends the proper electrical signal to the airbag inflator, the electrical energy creates enough heat to ignite chemical pellets within the inflator.

Once ignited, these chemicals burn rapidly and produce the pressure necessary to rupture a containment disk in the inert gas canister. The inflator and inert gas canister are sealed and connected to a tubular manifold so that all of the released gas is directed into the folded curtain airbag cushion, causing the cushion to inflate. As the airbag cushion inflates it will drop down from the roof rail between the edge of the headliner and the side glass/body pillars to form a curtain-like cushion to protect the vehicle occupants during a side impact collision or a vehicle rollover incident.

The front tether keeps the front portion of the bag taut to the side of the vehicle, thus ensuring that the bag will deploy in the proper position. Following the airbag deployment, the airbag cushion slowly deflates by venting the inert gas through the loose weave of the cushion fabric, and the deflated cushion hangs down loosely from the roof rail.

Proper diagnosis of the side curtain airbag inflator and squib circuits requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

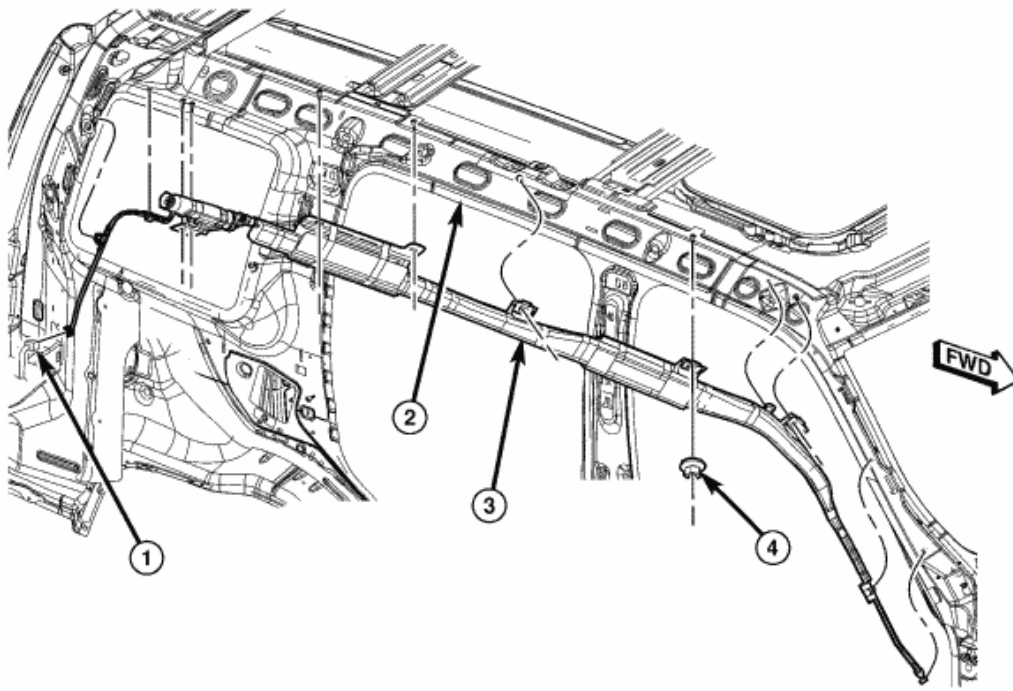
SIDE CURTAIN AIRBAG

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury when removing a deployed airbag, rubber gloves, eye protection, and a long-sleeved shirt should be worn. There may be deposits on the airbag unit and other interior surfaces. In large doses, these deposits may cause irritation to the skin and eyes.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the side curtain airbag, or becoming entrapped between the side curtain airbag cushion and the headliner. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged side curtain airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the side curtain airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.



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Fig. 28: Inner Roof Side Rail
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the headliner from the vehicle. Refer to **REMOVAL**.
3. Disconnect the pigtail wire harness from the body wire harness connector (1) for the side curtain airbag (3) located on the inner D-pillar near the belt line.
4. Remove the seven nuts (4) that secure the side curtain airbag and the inflator bracket to the studs on the inner roof side rail (2).
5. Remove the push-in fastener that secures the side curtain airbag tether metal key in the slot near the base of the inner A-pillar.
6. Disengage the tether metal key from the A-pillar slot.
7. Disengage the plastic push-in routing clip that secures the tether to the inner A-pillar.
8. Disengage the plastic push-in routing clips that secure the pigtail wire harness to the inner D-pillar.
9. Disengage the two plastic push-in fasteners that secure the airbag unit to the inner roof side rail.
10. Remove the side curtain airbag from the vehicle as a unit.

INSTALLATION

SIDE CURTAIN AIRBAG

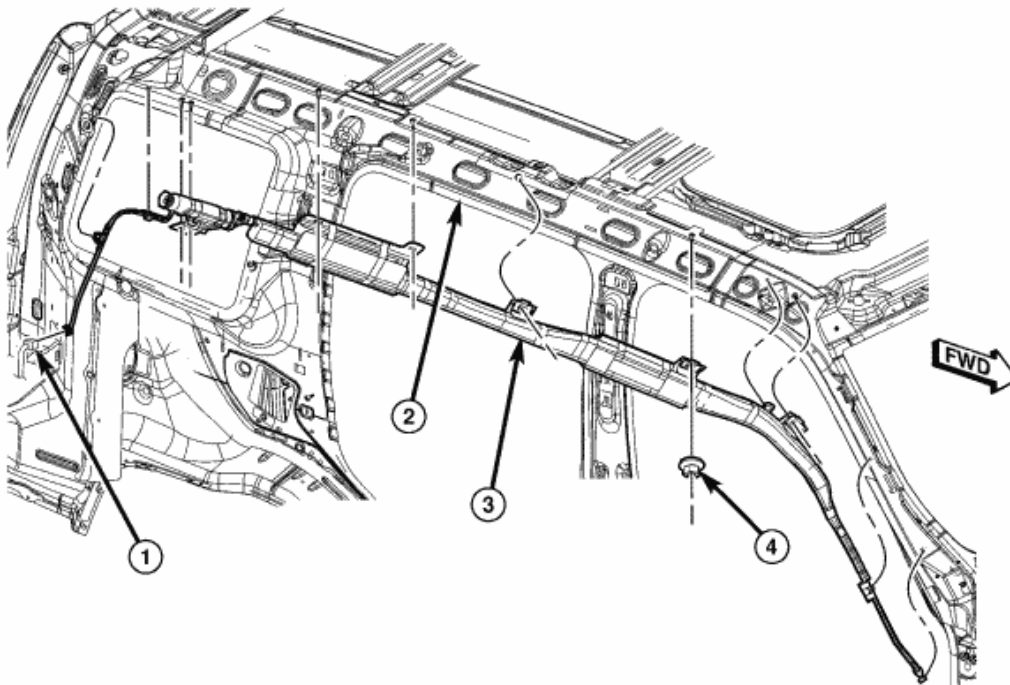
WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS),

seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury when removing a deployed airbag, rubber gloves, eye protection, and a long-sleeved shirt should be worn. There may be deposits on the airbag unit and other interior surfaces. In large doses, these deposits may cause irritation to the skin and eyes.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the side curtain airbag, or becoming entrapped between the side curtain airbag cushion and the headliner. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged side curtain airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the side curtain airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.



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Fig. 29: Inner Roof Side Rail

Courtesy of CHRYSLER LLC

1. Position the side curtain airbag (3) into the vehicle as a unit.
2. Engage the airbag inflator bracket over the studs at the rear of the inner roof side rail (2) and loosely install the nuts (4).
3. Engage the front plastic push-in fastener that secures the airbag unit to the inner roof side rail.
4. Engage the plastic push-in routing clip that secures the tether to the inner A-pillar.
5. Engage the side curtain airbag tether metal key into the slot near the base of the inner A-pillar.
6. Install a plastic push-in fastener to secure the tether metal key within the inner A-pillar slot.
7. Position the side curtain airbag mounting tabs and the inflator bracket onto the studs on the inner roof side rail.
8. Working from the rear of the vehicle to the front, install and tighten the remaining nuts that secure the side curtain airbag to the studs on the inner roof rail. Tighten all of the nuts including those that secure the inflator bracket to 8 N.m (71 in. lbs.).
9. Reconnect the pigtail wire harness (9) to the body wire harness connector (1) for the side curtain airbag located on the inner D-pillar near the belt line.
10. Engage the plastic push-in routing clips that secure the jumper wire harness to the inner D-pillar.
11. Reinstall the headliner into the vehicle. Refer to **INSTALLATION**.
12. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

DRIVER AIRBAG

DESCRIPTION

DRIVER AIRBAG

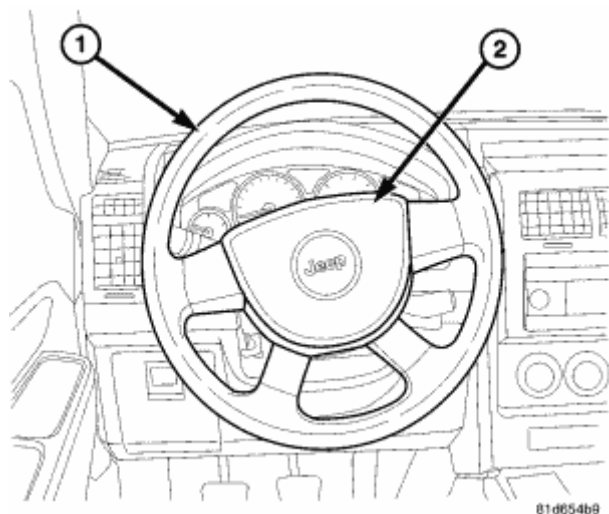


Fig. 30: Airbag Protective Trim Cover

Courtesy of CHRYSLER LLC

The injection molded, thermoplastic driver airbag protective trim cover (2) is the most visible part of the driver airbag. The driver airbag is located in the center of the steering wheel (1), where it is secured to the armature within the hub cavity of the four-spoke steering wheel. An injection molded emblem with the Jeep logo is applied to the center of the trim cover.

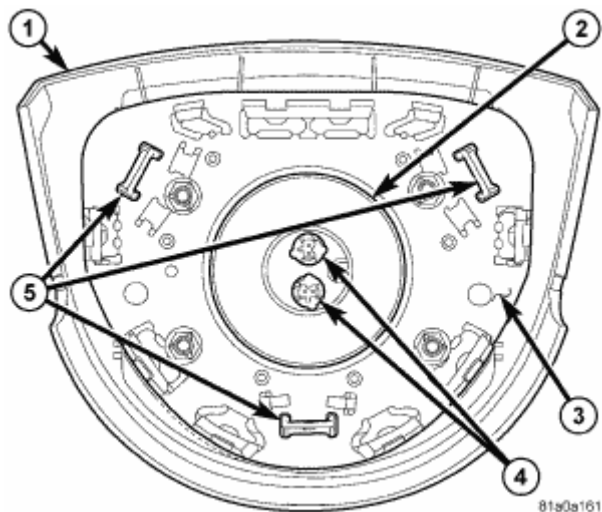


Fig. 31: Identifying Trim Cover, Inflator, Housing, Snap Retainers & Receptacles
Courtesy of CHRYSLER LLC

Concealed beneath the driver air bag trim cover are the folded airbag cushion, the airbag housing, the airbag inflator and the retainers that secure the inflator to the housing. The airbag cushion, housing (3), and inflator (2) are secured within an integral receptacle molded into the back of the trim cover (1). The vertical walls of this receptacle have numerous integral latch features that are inserted through numerous openings around the perimeter of the airbag housing. After the trim cover latches are fully seated in the housing a blocking tab integral to the housing is bent down to block the latch feature of the trim cover, locking the trim cover securely into place on the airbag housing. Three wire loop snap retainers (5) extend from the housing to secure the airbag to the steering wheel armature. The snap retainer at the 6 o'clock position has a distinctive V-shape to ensure proper orientation of the airbag when it is installed onto the steering wheel.

The airbag used in this vehicle is a multistage-type that complies with revised federal airbag standards to deploy with less force than those used in some prior vehicles. A radial deploying 67.3 centimeter (26.5 inch) diameter fabric airbag cushion with internal tethers is used. The airbag inflator is a dual-initiator, non-azide, pyrotechnic-type unit and is secured to the stamped metal airbag housing using four flanged hex nuts. Two keyed and color-coded connector receptacles (4) on the driver airbag inflator connect the two inflator initiators to the vehicle electrical system through two yellow-jacketed, two-wire pigtail harnesses of the clockspring.

The driver airbag cannot be repaired, and must be replaced if deployed, ineffective, or in any way damaged.

OPERATION

DRIVER AIRBAG

The multistage driver airbag is deployed by electrical signals generated by the Occupant Restraint Controller (ORC) through the driver airbag squib 1 and squib 2 circuits to the two initiators in the airbag inflator. By using two initiators, the airbag can be deployed at multiple levels of force. The force level is controlled by the ORC to

suit the monitored impact conditions by providing one of several delay intervals between the electrical signals provided to the two initiators. The longer the delay between these signals, the less forcefully the airbag will deploy.

When the ORC sends the proper electrical signals to each initiator, the electrical energy generates enough heat to initiate a small pyrotechnic charge which, in turn ignites chemical pellets within the inflator. Once ignited, these chemical pellets burn rapidly and produce a large quantity of inert gas. The inflator is sealed to the back of the airbag housing and a diffuser in the inflator directs all of the inert gas into the airbag cushion, causing the cushion to inflate. As the cushion inflates, the driver airbag trim cover will split at predetermined breakout lines, then fold back out of the way. Following an airbag deployment, the airbag cushion quickly deflates by venting the inert gas towards the instrument panel through vent holes within the fabric used to construct the back (steering wheel side) panel of the airbag cushion.

Some of the chemicals used to create the inert gas may be considered hazardous while in their solid state before they are burned, but they are securely sealed within the airbag inflator. Typically, both initiators are used and all potentially hazardous chemicals are burned during an airbag deployment event. However, it is possible for only one initiator to be used during a deployment due to an airbag system fault; therefore, it is necessary to always confirm that both initiators have been used in order to avoid the improper disposal of potentially live pyrotechnic or hazardous materials. See **STANDARD PROCEDURE**.

The inert gas that is produced when the chemicals are burned is harmless. However, a small amount of residue from the burned chemicals may cause some temporary discomfort if it contacts the skin, eyes, or breathing passages. If skin or eye irritation is noted, rinse the affected area with plenty of cool, clean water. If breathing passages are irritated, move to another area where there is plenty of clean, fresh air to breath. If the irritation is not alleviated by these actions, contact a physician.

Proper diagnosis of the driver airbag inflator and squib circuits requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

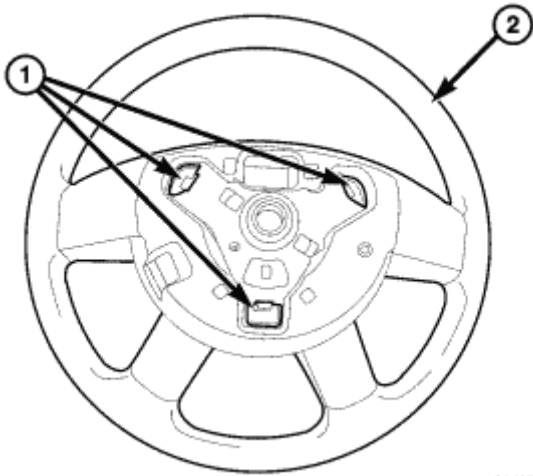
REMOVAL

DRIVER AIRBAG

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury when removing a deployed airbag, rubber gloves, eye protection, and a long-sleeved shirt should be worn. There may be deposits on the airbag cushion and other interior surfaces. In large doses, these deposits may cause irritation to the skin and eyes.

NOTE: The following procedure is for replacement of an ineffective or damaged driver airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the driver airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.



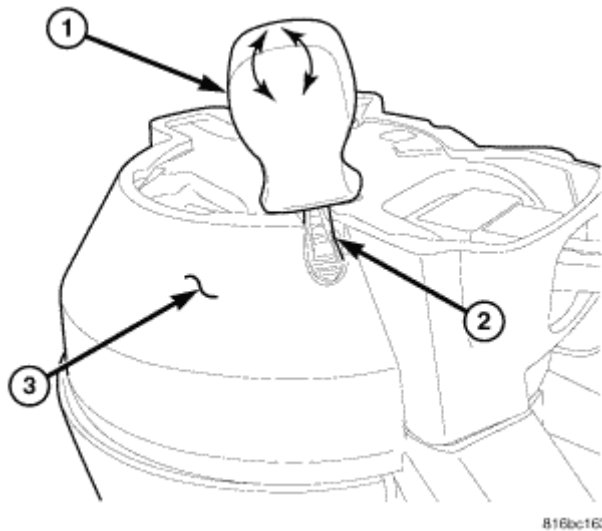
81d67741

Fig. 32: Identifying Airbag Retainer Access Holes & Steering Wheel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Release the steering column tilt lever and lower the column to its most downward position for easiest driver airbag removal access.

NOTE: It may be helpful to use a small mirror to aid visibility during the initial attempt to remove the driver airbag from the steering wheel.

3. There are three airbag retainer access holes (1) on the instrument panel side of the hub of the steering wheel (2), located at the two o'clock, six o'clock and ten o'clock positions. The steering wheel must be rotated to bring each of these access holes up to the twelve o'clock position of the steering column one at a time for removal access.

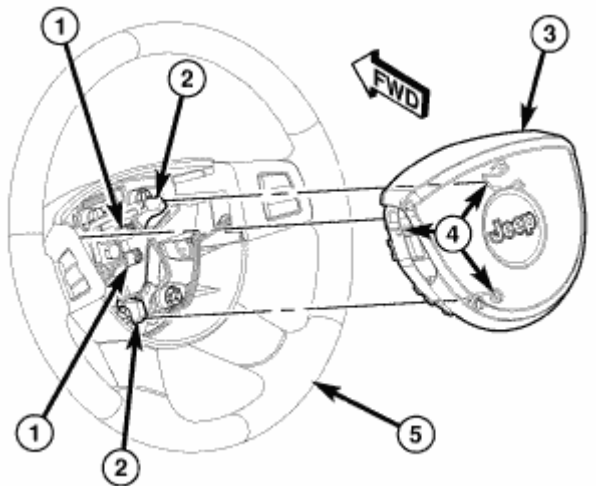


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Fig. 33: Identifying Flat-Bladed Screwdriver, Screwdriver Blade & Steering Wheel Hub Trim Cover

Courtesy of CHRYSLER LLC

4. Insert the tip of a short handled, flat-bladed screwdriver (1) into either of the upper (two o'clock or ten o'clock) access holes of the steering wheel hub trim cover (3) being certain to place the screwdriver blade (2) on the inboard side of the airbag snap retainer wire loop.



81d6555c

Fig. 34: Driver Airbag System

Courtesy of CHRYSLER LLC

5. Twist the screwdriver handle in either direction far enough to disengage the snap retainer wire loop (4) from the hook (2) of the steering wheel armature. At the same time, gently pull the driver airbag (3) away from the steering wheel (5) to prevent the retainer from snapping back into place over the hook once it is disengaged.
6. Repeat step 4, and step 5 at the other upper (two o'clock or ten o'clock) access hole to disengage the other upper snap retainer wire loop.
7. Repeat step 4, and step 5 at the lower (six o'clock) access hole to disengage the lower snap retainer wire

loop. The lower snap retainer wire loop has a distinctive V-shape and must always be installed onto the six o'clock hook of the steering wheel armature.

8. Pull the driver airbag away from the steering wheel far enough to access the electrical connections (1) at the back of the airbag housing.

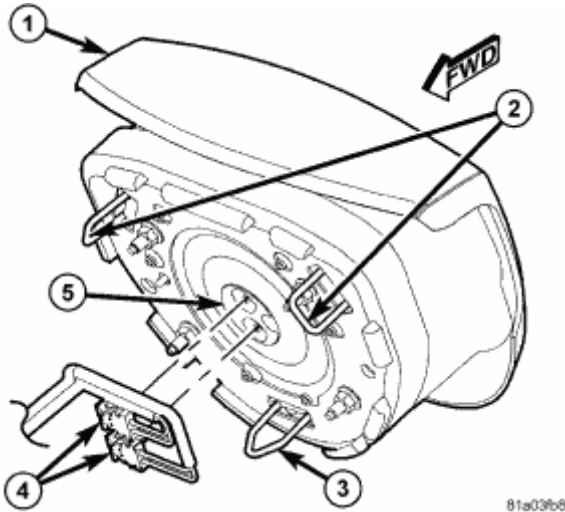


Fig. 35: Identifying Driver Airbag, Lower Airbag Snap Retainer Wire Loop, Electrical Connections & Airbag Inflator

Courtesy of CHRYSLER LLC

CAUTION: Do not pull on the clockspring pigtail wires or pry on the connector insulator to disengage the connector from the driver airbag inflator connector receptacle. Improper removal of these pigtail wires and their connector insulators can result in damage to the airbag circuits or the connector insulators.

9. The clockspring driver airbag pigtail wire connectors (4) are secured by an integral lock to the airbag inflator (5) connector receptacles, which are located on the back of the driver airbag (1) housing. Firmly grasp and pull the lock straight out from the connector insulator, then pull the insulators straight out from the airbag inflator to disconnect them from the connector receptacles.
10. Remove the driver airbag from the steering wheel.
11. If the driver airbag has been deployed, the clockspring must be replaced. See **REMOVAL**.

INSTALLATION

DRIVER AIRBAG

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before

performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the driver airbag, or becoming entrapped between the driver airbag cushion and the driver airbag trim cover. Failure to observe this warning could result in occupant injuries upon airbag deployment.

WARNING: To avoid serious or fatal injury, the driver airbag trim cover must never be painted. Replacement airbags are serviced with trim covers in the original colors. Paint may change the way in which the material of the trim cover responds to an airbag deployment. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged driver airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the driver airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.

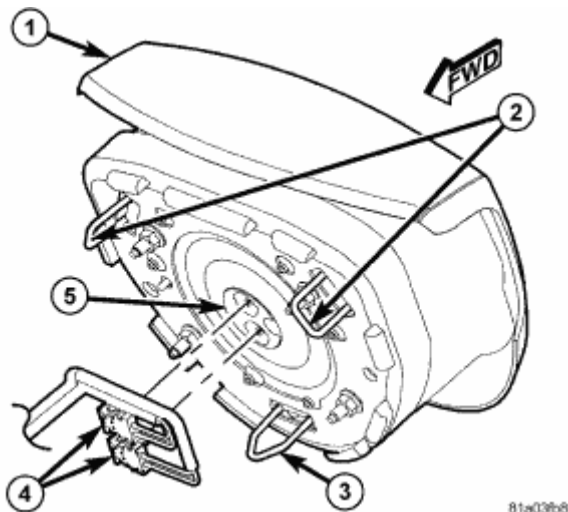


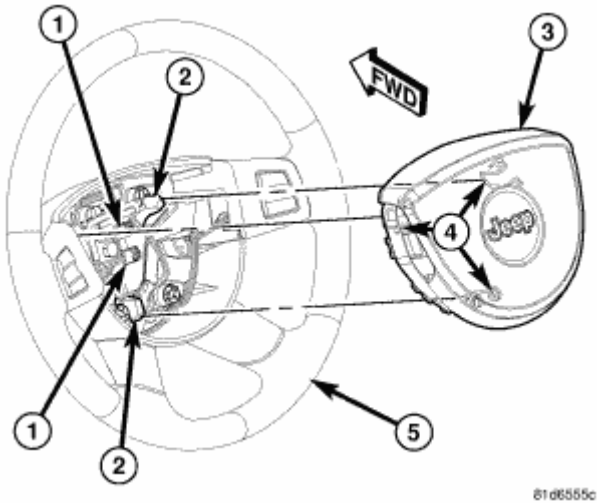
Fig. 36: Identifying Driver Airbag, Lower Airbag Snap Retainer Wire Loop, Electrical Connections & Airbag Inflator

Courtesy of CHRYSLER LLC

1. Position the driver airbag (1) close enough to the steering wheel to reconnect the electrical connections (4) to the back of the airbag housing.
2. When installing the driver airbag, reconnect the two clockspring driver airbag pigtail wire connectors to the airbag inflator (5) connector receptacles by pressing straight in on the connectors, then push the locks straight into the connectors. Be certain to engage each keyed and color-coded connector to the matching

connector receptacle.

3. Carefully position the driver airbag into the steering wheel hub. Be certain that the clockspring pigtail wires are not pinched between the driver airbag and the horn switch or the steering wheel armature.
4. Engage the lower airbag snap retainer wire loop (3) onto the lower hook of the steering wheel armature. The lower snap retainer wire loop has a distinctive V-shape and must always be installed onto the six o'clock hook of the steering wheel armature.



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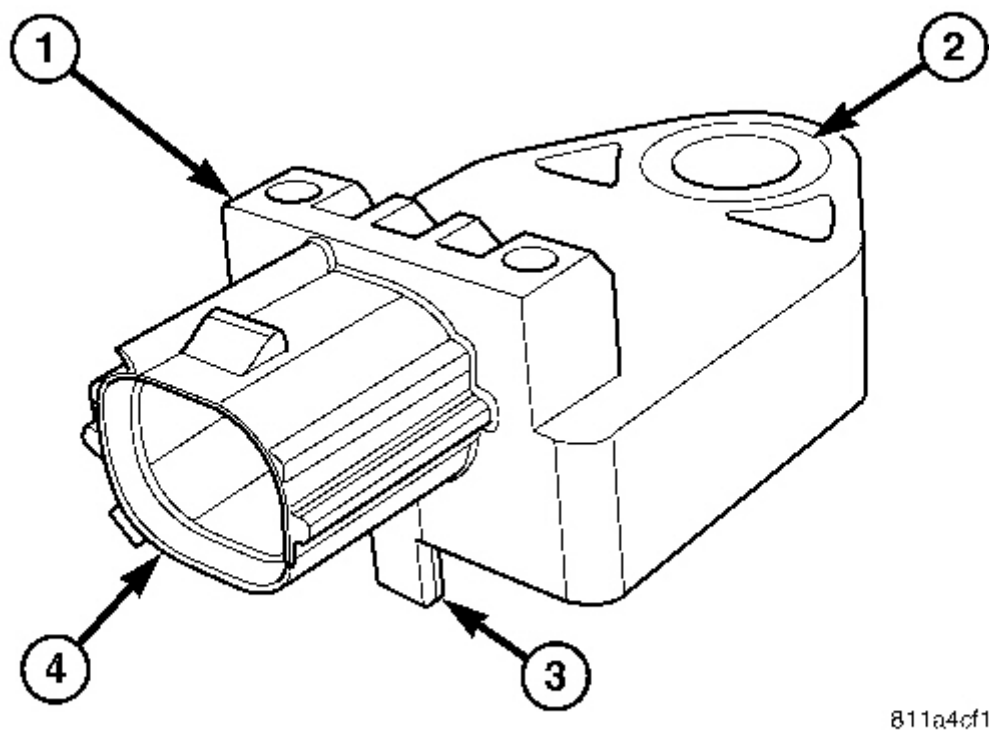
Fig. 37: Driver Airbag System
Courtesy of CHRYSLER LLC

5. Roll the driver airbag (3) upwards and press firmly and evenly over the two upper snap retainer wire loop (4) locations simultaneously until they snap into place over the two upper hooks (2) of the steering wheel armature.
6. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

IMPACT SENSOR

DESCRIPTION

FRONT IMPACT SENSOR



811a4cf1

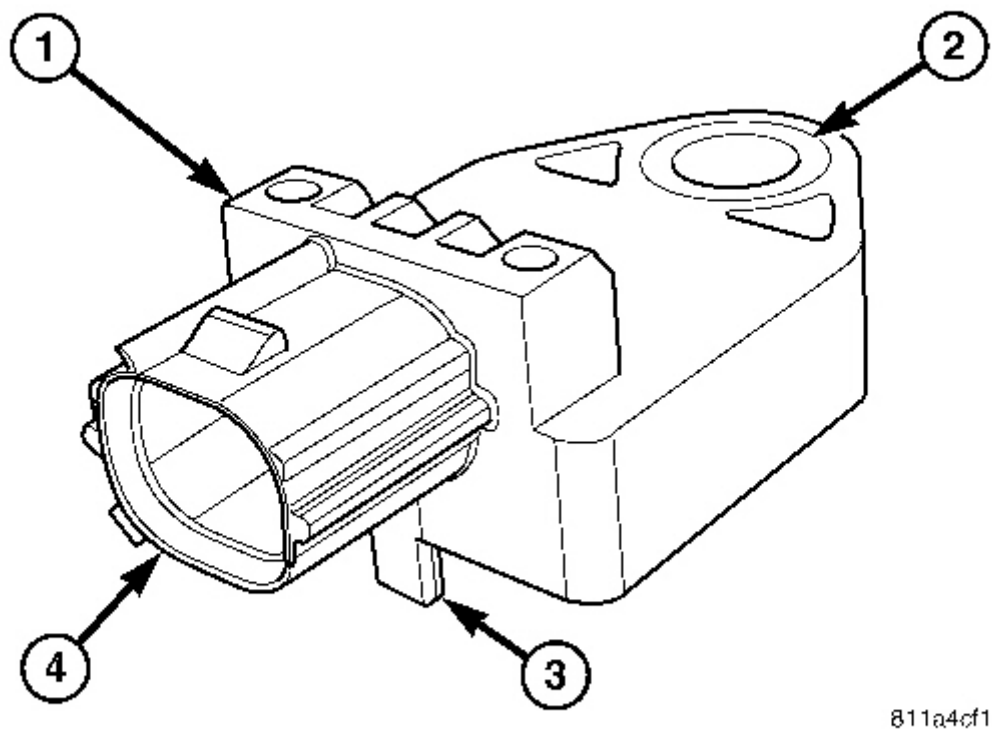
Fig. 38: Impact Sensor Components
Courtesy of CHRYSLER LLC

Two front impact sensors (1) are used on this vehicle, one each for the left and right sides of the vehicle. These sensors are mounted remotely from the impact sensor that is internal to the Occupant Restraint Controller (ORC). Each front sensor is secured with a nut to a stud on a bracket on the back of the front end module carrier on either side of the cooling module, below and inboard of the front combination lamp unit within the engine compartment. The sensor housing has an integral connector receptacle (4), an integral anti-rotation pin (3), and an integral mounting hole (2) with a metal sleeve to provide crush protection.

The right and left front impact sensors are identical in construction and calibration. A cavity in the center of the molded black plastic impact sensor housing contains the electronic circuitry of the sensor which includes an electronic communication chip and an electronic impact sensor. A nylon cover is laser-welded over the cavity to seal and protect the internal electronic circuitry and components. The front impact sensors are each connected to the vehicle electrical system through a short jumper wire harness to a dedicated take out and connector of the body wire harness.

The impact sensors cannot be repaired or adjusted and, if damaged or ineffective, they must be replaced.

SIDE IMPACT SENSOR



811a4cf1

Fig. 39: Impact Sensor Components
Courtesy of CHRYSLER LLC

Two side impact sensors (1) are used on this vehicle when it is equipped with the side curtain airbags, two each for the left and right sides of the vehicle. These sensors are mounted remotely from the impact sensor that is internal to the Occupant Restraint Controller (ORC). Each side sensor is secured with a nut to a stud on the inner right or left B-pillar above the front seat belt retractor, or to a stud on the right or left inner C-pillar just forward of the second row outboard seat belt retractor within the passenger compartment. The sensor housing has an integral connector receptacle (4), an integral anti-rotation pin (3), and an integral mounting hole (2) with a metal sleeve to provide crush protection.

The right and left side impact sensors are identical in construction and calibration. A cavity in the center of the molded black plastic impact sensor housing contains the electronic circuitry of the sensor which includes an electronic communication chip and an electronic impact sensor. A nylon cover is laser-welded over the cavity to seal and protect the internal electronic circuitry and components. The side impact sensors are each connected to the vehicle electrical system through a dedicated take out and connector of the body wire harness.

The impact sensors cannot be repaired or adjusted and, if damaged or ineffective, they must be replaced.

OPERATION

FRONT IMPACT SENSOR

The front impact sensors are electronic accelerometers that sense the rate of vehicle deceleration, which provides verification of the direction and severity of an impact. Each sensor also contains an electronic communication chip that allows the unit to communicate the sensor status as well as sensor fault information to the microprocessor in the Occupant Restraint Controller (ORC).

The ORC microprocessor continuously monitors all of the passive restraint system electrical circuits to determine the system readiness. If the ORC detects a monitored system fault, it sets a Diagnostic Trouble Code (DTC) and controls the airbag indicator operation accordingly. The impact sensors each receive battery current and ground through dedicated left and right sensor plus and minus circuits from the ORC. The impact sensors and the ORC communicate by modulating the voltage in the sensor plus circuit.

The hard wired circuits between the front impact sensors and the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the impact sensors or the electronic controls or communication between other modules and devices that provide features of the supplemental restraint system. The most reliable, efficient, and accurate means to diagnose the impact sensors or the electronic controls and communication related to front impact sensor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

SIDE IMPACT SENSOR

The side impact sensors are electronic accelerometers that sense the rate of vehicle deceleration, which provides verification of the direction and severity of an impact. Each sensor also contains an electronic communication chip that allows the unit to communicate the sensor status as well as sensor fault information to the microprocessor in the Occupant Restraint Controller (ORC).

The ORC microprocessor continuously monitors all of the side passive restraint system electrical circuits to determine the system readiness. If the ORC detects a monitored system fault, it sets a Diagnostic Trouble Code (DTC) and controls the airbag indicator operation accordingly. The impact sensors each receive battery current and ground through the same left or right sensor plus and minus circuits in a series arrangement from the ORC. The impact sensors and the ORC communicate by modulating the voltage in the sensor plus circuit.

The hard wired circuits between the side impact sensors and the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the impact sensors or the electronic controls or communication between other modules and devices that provide features of the supplemental restraint system. The most reliable, efficient, and accurate means to diagnose the impact sensors or the electronic controls and communication related to side impact sensor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

FRONT IMPACT SENSOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the front impact sensor, as it can damage the impact sensor or affect its calibration. The front impact sensor enables the system to deploy the front Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper front SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

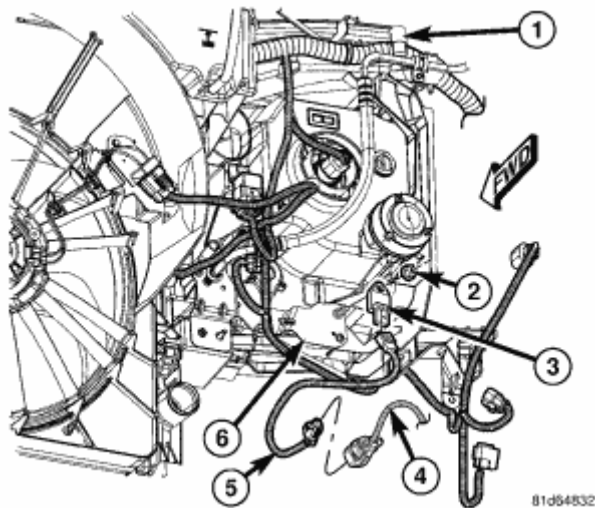


Fig. 40: Front Impact Sensor, Body Wire Harness, Jumper Wire Harness
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Service access for the right front impact sensor is accomplished by removing the air filter housing from the engine compartment. Service access for the left front impact sensor is accomplished by raising and supporting the vehicle, then removing the access plug from the front of the left front wheel house liner.
3. Remove the nut (2) that secures the front impact sensor (3) to the stud on the bracket (6) on the back (engine compartment side) of the front end module carrier (1) below and inboard of the front lamp unit.

4. Disconnect one end of the jumper wire harness (5) from the right or left front impact sensor connector receptacle or from the body wire harness (4).
5. Remove the right or left front impact sensor from the engine compartment.

SIDE IMPACT SENSOR - B-PILLAR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the side impact sensor, as it can damage the impact sensor or affect its calibration. The side impact sensor enables the system to deploy the side Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper side SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

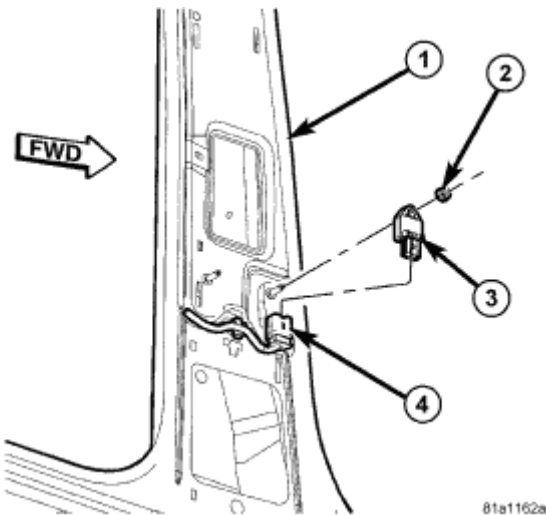


Fig. 41: Identifying B-Pillar, Nut, Side Impact Sensor & Body Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Adjust the driver or passenger side front seat to its most forward position for easiest access to the B-pillar trim.

2. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
3. Remove the trim from the inside of the lower right or left B-pillar (1). Refer to **REMOVAL** .
4. Remove the nut (2) that secures the side impact sensor (3) to the weld stud on the lower B-pillar.
5. Remove the sensor from the weld stud on the inner B-pillar.
6. Disconnect the body wire harness connector (4) from the sensor connector receptacle.

SIDE IMPACT SENSOR - C-PILLAR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the side impact sensor, as it can damage the impact sensor or affect its calibration. The side impact sensor enables the system to deploy the side Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper side SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

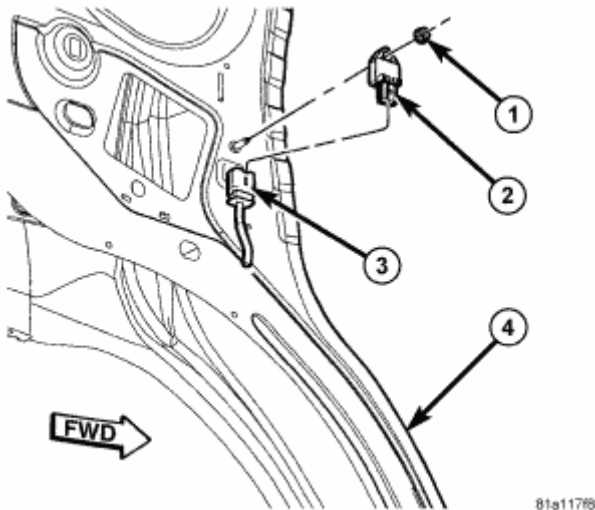


Fig. 42: Identifying Nut, Side Impact Sensor, Body Wire Harness Connector & C-Pillar
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the lower trim from the inside of the lower right or left C-pillar (4). Refer to **REMOVAL** .
3. Remove the nut (1) that secures the side impact sensor (2) to the weld stud on the lower C-pillar.
4. Remove the sensor from the weld stud on the inner C-pillar.
5. Disconnect the body wire harness connector (3) for the side impact sensor from the sensor connector receptacle.

INSTALLATION

FRONT IMPACT SENSOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the front impact sensor, as it can damage the impact sensor or affect its calibration. The front impact sensor enables the system to deploy the front Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper front SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

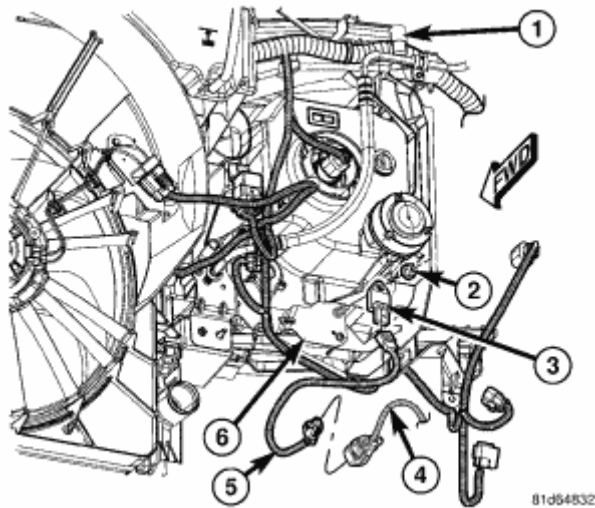


Fig. 43: Front Impact Sensor, Body Wire Harness, Jumper Wire Harness
Courtesy of CHRYSLER LLC

1. Service access for the right front impact sensor is accomplished by removing the air filter housing from the engine compartment. Service access for the left front impact sensor is accomplished by raising and supporting the vehicle, then removing the access plug from the front of the left front wheel house liner.
2. Position the right or left front impact sensor (3) into the engine compartment.
3. Reconnect the jumper wire harness (5) to the right or left front impact sensor connector receptacle or to the body wire harness (4).
4. Position the sensor onto the stud on the bracket (6) on the back (engine compartment side) of the front end module carrier (1) below and inboard of the front lamp unit. Be certain that the anti-rotation pin on the back of the sensor is engaged in the clearance notch of the bracket and that the connector receptacle is pointed straight downward.
5. Install and tighten the nut (2) that secures the sensor to the stud on the bracket. Tighten the nut to 8 N.m (71 in. lbs.).
6. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE.**

SIDE IMPACT SENSOR - B-PILLAR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the side impact sensor, as it can damage the impact sensor or affect its calibration. The side impact sensor enables the system to deploy the side Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper side SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

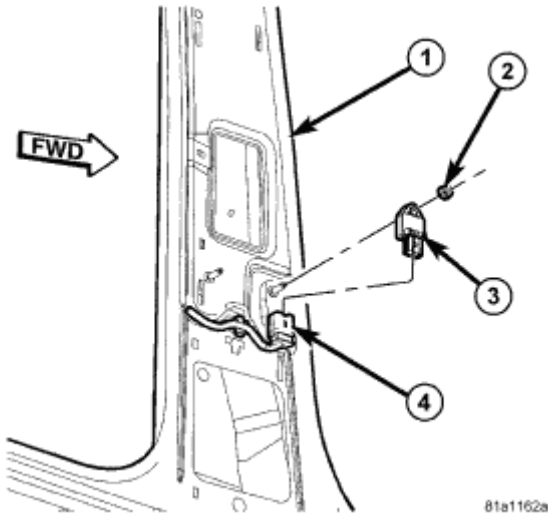


Fig. 44: Identifying B-Pillar, Nut, Side Impact Sensor & Body Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Reconnect the body wire harness connector (4) to the side impact sensor (3) connector receptacle.
2. Position the sensor onto the weld stud on the inner B-pillar (1). Be certain that the anti-rotation pin on the back of the sensor is engaged in the clearance hole of the B-pillar.
3. Install and tighten the nut (2) that secures the sensor to the weld stud on the inner B-pillar. Tighten the nut to 7 N.m (62 in. lbs.).
4. Reinstall the lower trim onto the inside of the B-pillar. Refer to **INSTALLATION**.
5. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

SIDE IMPACT SENSOR - C-PILLAR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before

performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the side impact sensor, as it can damage the impact sensor or affect its calibration. The side impact sensor enables the system to deploy the side Supplemental Restraint System (SRS) components. If an impact sensor is accidentally dropped during service, the sensor must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper side SRS component deployment.

NOTE: The front and side impact sensors are interchangeable.

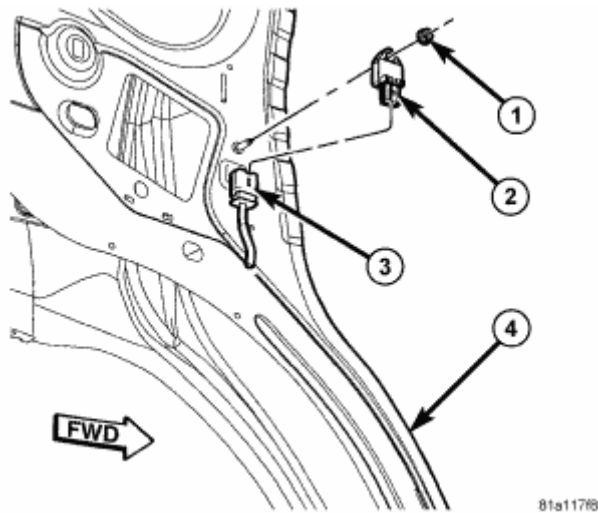


Fig. 45: Identifying Nut, Side Impact Sensor, Body Wire Harness Connector & C-Pillar
Courtesy of CHRYSLER LLC

1. Reconnect the body wire harness connector (3) to the side impact sensor (2) connector receptacle.
2. Position the impact sensor onto the weld stud on the inner C-pillar (4). Be certain that the anti-rotation pin on the back of the sensor is engaged in the clearance hole of the C-pillar.
3. Install and tighten the nut (1) that secures the sensor to the weld stud on the inner C-pillar. Tighten the nut to 7 N.m (62 in. lbs.).
4. Reinstall the trim onto the inside of the lower C-pillar. Refer to **INSTALLATION** .
5. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

OCCUPANT CLASSIFICATION MODULE

DESCRIPTION

OCCUPANT CLASSIFICATION MODULE

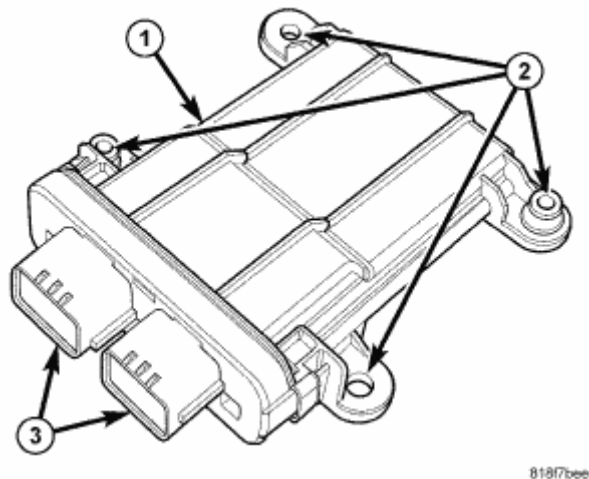


Fig. 46: Occupant Classification Module
Courtesy of CHRYSLER LLC

The Occupant Classification Module (OCM) (1) is secured with two screws to a stamped metal bracket on the inboard passenger side front seat riser beneath the seat cushion. Concealed within a hollow in the center of the molded plastic OCM housing is a microprocessor and the other electronic circuitry of the module. The module housing is sealed to enclose and protect the internal electronic circuitry.

Four mounting tabs (2) and two connector receptacles (3) are integral to the OCM housing. The two mounting tabs designed to accept self tapping screws are used to secure the module to the mounting bracket, while the remaining two mounting tabs are unused in this application. The connector receptacles contain terminal pins that connect the OCM to the vehicle electrical system through dedicated take outs and connectors of the passenger side front seat wire harness.

The OCM and all of the other components of the Occupant Classification System (OCS) including the passenger side front seat, the seat weight sensors, and the seat adjusters, cushion, back, frame, foam, springs, and wiring harness are a factory-calibrated and assembled unit. Any time any one of these components is removed or replaced for any reason, the OCM must be re-calibrated using a diagnostic scan tool, the Occupant Classification Seat Weight special tool, and the Occupant Classification System Verification Test. Refer to the appropriate diagnostic procedures.

The OCM cannot be adjusted or repaired and, if damaged or ineffective, it must be replaced. The OCM software is flash programmable. A non-calibrated OCM is available for separate service replacement.

OPERATION

OCCUPANT CLASSIFICATION MODULE

The microprocessor in the Occupant Classification Module (OCM) contains the Occupant Classification System (OCS) logic circuits. The OCM uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is also used for OCS diagnosis and testing through the 16-way data link

connector located on the driver side lower edge of the instrument panel.

The OCM provides voltage to the four seat weight sensors located on the corners of the passenger side front seat. The OCM then monitors return inputs from each of the sensors on dedicated hard wired data communication circuits. The seat weight sensor inputs allow the OCM to determine whether the passenger side front seat is occupied and the relative size of the occupant by providing a weight-sensing reference to the load on the seat.

Pre-programmed decision algorithms and OCS calibration allow the OCM microprocessor to determine when passenger airbag protection is appropriate based upon the seat load as signaled by the seat weight sensors. When the programmed conditions are met, the OCM sends the proper electronic **occupant classification** messages over the CAN data bus to the Occupant Restraint Controller (ORC), and the ORC controls the deployment circuits for the passenger side front supplemental restraints. On vehicles so equipped, the ORC also provides a control output for the passenger airbag on/off indicator in the instrument panel based upon the electronic **occupant classification** messages it receives from the OCM.

The OCM microprocessor continuously monitors all of the OCS electrical circuits and components to determine the system readiness. If the OCM detects a monitored system fault, it sets an active and stored Diagnostic Trouble Code (DTC) and sends the appropriate electronic messages to the ORC over the CAN data bus. Then the ORC sets a DTC and sends messages to control the airbag indicator operation accordingly. An active fault only remains for the duration of the fault, or in some cases for the duration of the current ignition switch cycle, while a stored fault causes a DTC to be stored in memory by the OCM and the ORC. For some DTCs, if a fault does not recur for a number of ignition cycles, the OCM will automatically erase the stored DTC. For other internal faults, the stored DTC is latched forever.

The OCM receives battery current on a fused B(+) circuit through a fuse in the Totally Integrated Power Module (TIPM) and receives electronic **ignition switch status** messages indicating the ignition switch position over the CAN data bus. The OCM receives ground through a ground circuit and take out of the body wire harness. These connections allow the OCM to be operational whenever the ignition switch is in the ON or START positions.

The hard wired inputs and outputs for the OCM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the OCM or the electronic controls and communication between other modules and devices that provide features of the OCS. The most reliable, efficient, and accurate means to diagnose the OCM or the electronic controls and communication related to OCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

OCCUPANT CLASSIFICATION MODULE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before

performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: A non-calibrated Occupant Classification Module (OCM) is available for separate service replacement. The OCM and all of the other components of the Occupant Classification System (OCS) including the passenger side front seat, the seat weight sensors, and the passenger seat adjusters, cushion, back, frame, foam, springs, and wiring harness are a factory-calibrated and assembled unit. Any time any one of these components is removed or replaced for any reason, the OCM must be re-calibrated using a diagnostic scan tool, the Occupant Classification Seat Weight special tool, and the Occupant Classification System Verification Test. Refer to the appropriate diagnostic procedures.

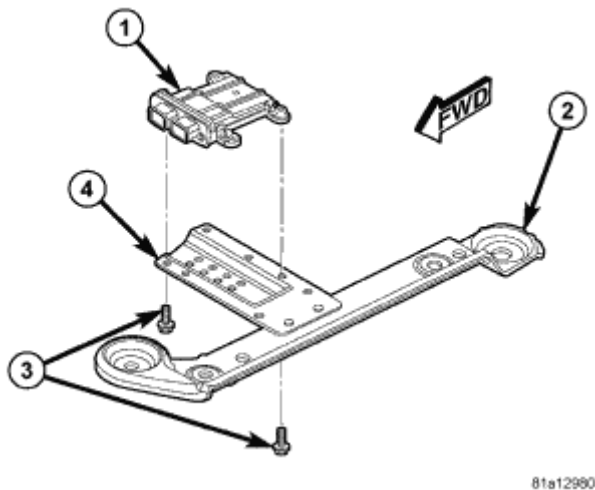


Fig. 47: Identifying Occupant Classification Module (OCM), Inboard Passenger Side Front Seat Riser, Screws & Mounting Bracket
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Reach under the front edge of the passenger side front seat cushion to access and disconnect the two seat wire harness connectors from the Occupant Classification Module (OCM) (1) connector receptacles located on the forward-facing end of the module.
3. Remove the two screws (3) that secure the OCM to the top of the mounting bracket (4) on the inboard passenger side front seat riser (2).
4. Remove the OCM from under the passenger side front seat cushion.

INSTALLATION

OCCUPANT CLASSIFICATION MODULE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

NOTE: A non-calibrated Occupant Classification Module (OCM) is available for separate service replacement. The OCM and all of the other components of the Occupant Classification System (OCS) including the passenger side front seat, the seat weight sensors, and the passenger seat adjusters, cushion, back, frame, foam, springs, and wiring harness are a factory-calibrated and assembled unit. Any time any one of these components is removed or replaced for any reason, the OCM must be re-calibrated using a diagnostic scan tool, the Occupant Classification Seat Weight special tool, and the Occupant Classification System Verification Test. Refer to the appropriate diagnostic procedures.

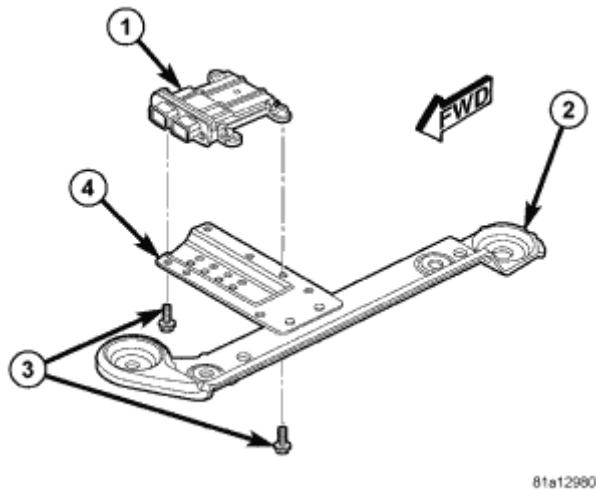


Fig. 48: Identifying Occupant Classification Module (OCM), Inboard Passenger Side Front Seat Riser, Screws & Mounting Bracket

Courtesy of CHRYSLER LLC

1. Reach under the front edge of the passenger side front seat cushion to carefully position the Occupant Classification Module (OCM) (1) to the top of the mounting bracket (4) on the inboard passenger side front seat riser (2). When the OCM is correctly positioned, the connector receptacles on the module will be pointed forward.
2. Install and tighten the two screws (3) that secure the OCM to the mounting bracket. Tighten the screws to 2 N.m (20 in. lbs.).
3. Reconnect the two seat wire harness connectors to the OCM connector receptacles located on the

forward-facing end of the module. Be certain that the latches on each connector are fully engaged.

4. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.
5. Following successful completion of the SRS verification test procedure, perform the Occupant Classification System Verification Test using a diagnostic scan tool. Refer to the appropriate diagnostic procedures.

OCCUPANT RESTRAINT CONTROLLER

DESCRIPTION

OCCUPANT RESTRAINT CONTROLLER

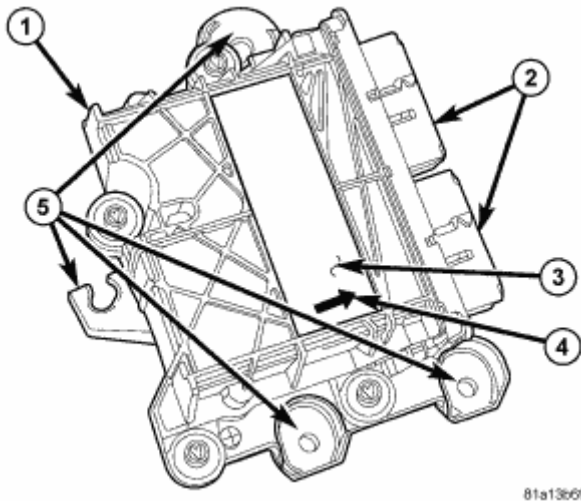


Fig. 49: Identifying Occupant Restraint Controller (ORC), Electrical Connector Receptacle, Label, Arrow & Mounting Bracket
Courtesy of CHRYSLER LLC

The Occupant Restraint Controller (ORC) (1) is secured with four screws to a molded plastic mounting bracket (5). The mounting bracket and ORC unit is then secured with two nuts and two screws to a stamped steel mounting bracket welded onto the top of the floor panel transmission tunnel between the two front seats beneath the floor console and rearward of the transmission gearshift mechanism in the passenger compartment of the vehicle. Concealed within a hollow in the center of the molded plastic ORC housing is the electronic circuitry of the ORC which includes a microprocessor, an electronic impact sensor, an electronic safing sensor, and an energy storage capacitor. A molded plastic end cover plate with a rubber O-ring seal is secured to the open end of the ORC housing with two integral latch features to enclose and protect the internal electronic circuitry and components.

An arrow (4) printed on the label (3) on the top of the ORC housing provides a visual verification of the proper orientation of the unit, and should always be pointed toward the front of the vehicle. The ORC housing has four integral mounting flanges with metal sleeves to provide crush protection. Two molded plastic electrical connector receptacles (2) are integral to the end cover plate. These receptacles connect the ORC to the vehicle electrical system through dedicated take outs and connectors from the instrument panel and the body wire

harnesses.

The impact sensor and safing sensor internal to the ORC are calibrated for the specific vehicle, and are only serviced as a unit with the ORC. The ORC cannot be repaired or adjusted and, if damaged or ineffective, it must be replaced as a unit with the molded plastic mounting bracket.

OPERATION

OCCUPANT RESTRAINT CONTROLLER

The microprocessor in the Occupant Restraint Controller (ORC) contains the Supplemental Restraint System (SRS) logic circuits and controls all of the SRS components. The ORC uses On-Board Diagnostics (OBD) and can communicate with other electronic modules in the vehicle as well as with the diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is used for control of the airbag indicator in the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and for SRS diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel. Refer to **OPERATION**.

The ORC microprocessor continuously monitors all of the SRS electrical circuits to determine the system readiness. If the ORC detects a monitored system fault, it sets an active and stored Diagnostic Trouble Code (DTC) and sends electronic messages to the EMIC over the CAN data bus to turn ON the airbag indicator. An active fault only remains for the duration of the fault, or in some cases for the duration of the current ignition switch cycle, while a stored fault causes a DTC to be stored in memory by the ORC. For some DTCs, if a fault does not recur for a number of ignition cycles, the ORC will automatically erase the stored DTC. For other internal faults, the stored DTC is latched forever.

On vehicles so equipped, the ORC provides voltage to the seat track position sensors on the inboard passenger and driver side front seat upper seat tracks. The ORC then monitors return inputs from each of the sensors on dedicated hard wired data communication circuits. The seat track position sensors provide additional logic inputs to the ORC microprocessor that allow it to determine the position of the front seat passenger and the driver relative to the front airbags for determining the force level with which to deploy the multistage front airbags.

On vehicles equipped with the Occupant Classification System (OCS), the ORC communicates with the Occupant Classification Module (OCM) over the CAN data bus. The ORC will internally disable the passenger airbag and seat belt tensioner deployment circuits if the OCM detects that the passenger side front seat is unoccupied or that it is occupied by a load that is inappropriate for an airbag deployment. The ORC also provides a control output to the passenger airbag on/off indicator through the passenger airbag indicator driver circuit. The OCM notifies the ORC when it has detected a monitored system fault and stored a DTC in its memory for any ineffective OCS component or circuit, then the ORC sets a DTC and controls the airbag indicator operation accordingly.

The ORC receives battery current through two circuits; a fused ignition switch output (run) circuit through a fuse in the Totally Integrated Power Module (TIPM), and a fused ignition switch output (run-start) circuit through a second fuse in the TIPM. The ORC receives ground through a ground circuit and take out of the instrument panel wire harness. These connections allow the ORC to be operational whenever the ignition switch is in the START or ON positions. Refer to the appropriate wiring information for additional details.

The ORC also contains an energy-storage capacitor. When the ignition switch is in the START or ON positions, this capacitor is continually being charged with enough electrical energy to deploy the SRS components for up to one second following a battery disconnect or failure. The purpose of the capacitor is to provide backup SRS protection in case there is a loss of battery current supply to the ORC during an impact.

Two sensors are contained within the ORC, an electronic impact sensor and a safing sensor. The ORC also monitors inputs from two remote front impact sensors located on the back of the right and left ends of the front end module carrier inboard of the headlamps near the front of the vehicle. The electronic impact sensors are accelerometers that sense the rate of vehicle deceleration, which provides verification of the direction and severity of an impact. The ORC also monitors inputs from an internal rollover sensor and four additional remote impact sensors located on the left and right inner B and C-pillars to control deployment of the side curtain airbag units.

The safing sensor is an electronic accelerometer sensor within the ORC that provides an additional logic input to the ORC microprocessor. The safing sensor is used to verify the need for a SRS component deployment by detecting impact energy of a lesser magnitude than that of the primary electronic impact sensors, and must exceed a safing threshold in order for the airbags to deploy. A second safing sensor within the ORC provides confirmation to the ORC microprocessor of side impact forces. This second safing sensor is a bi-directional unit that detects impact forces from either side of the vehicle.

Pre-programmed decision algorithms in the ORC microprocessor determine when the deceleration rate as signaled by the impact sensors and the safing sensors indicate an impact that is severe enough to require SRS protection and, based upon the severity of the monitored impact, determines the level of front airbag deployment force required for each front seating position. When the programmed conditions are met, the ORC sends the proper electrical signals to deploy the dual multistage front airbags at the programmed force levels, the front seat belt tensioners and either side curtain airbag unit. For vehicles equipped with the OCS, the passenger side front airbag and seat belt tensioner will be deployed by the ORC only if enabled by the OCM messages (passenger airbag on/off indicator OFF) at the time of the impact.

The hard wired inputs and outputs for the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the ORC or the electronic controls or communication between other modules and devices that provide features of the supplemental restraint system. The most reliable, efficient, and accurate means to diagnose the ORC or the electronic controls and communication related to ORC operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

OCCUPANT RESTRAINT CONTROLLER

WARNING: To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service. The ORC contains a rollover sensor, which enables the system to deploy the side airbags in the event of a vehicle rollover event. If an ORC is accidentally rolled during service while still connected to battery power, the side curtain airbags will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor

to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the Occupant Restraint Controller (ORC), as it can damage the impact sensor or affect its calibration. The ORC contains the impact sensor, which enables the system to deploy the SRS components. If an ORC is accidentally dropped during service, the module must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper SRS component deployment.

CAUTION: On vehicles equipped with the Occupant Classification System (OCS), never replace both the Occupant Restraint Controller (ORC) and the Occupant Classification Module (OCM) at the same time. If both require replacement, replace one. Then perform the Supplemental Restraint System (SRS) verification test before replacing the other. Both the ORC and the OCM store OCS calibration data, which they transfer to one another when one of them is replaced. If both are replaced at the same time, an irreversible fault will be set in both modules.

NOTE: The Occupant Restraint Controller (ORC) should only be removed as a complete unit with the molded plastic mounting bracket. The service replacement ORC is supplied already installed on a new bracket.

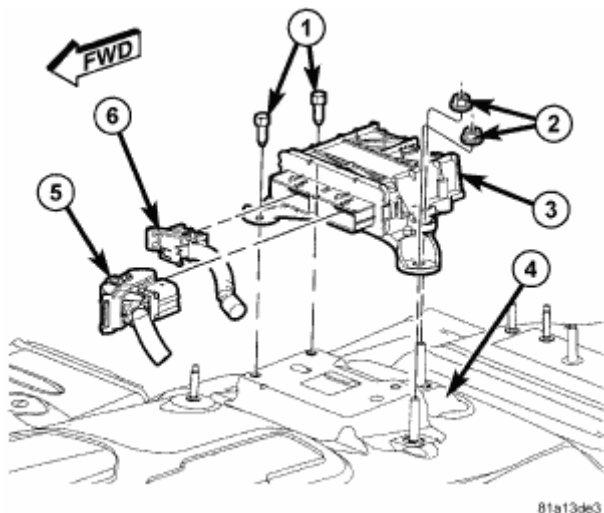


Fig. 50: Identifying Screws, Nuts, Occupant Restraint Controller, ORC Mount, Body Wire Harness Connector & Instrument Panel Wire Harness Connector
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the center console from the top of the floor panel transmission tunnel. Refer to **REMOVAL** .
3. Unlatch and disconnect the body wire harness connector (5) and the instrument panel wire harness connector (6) from the Occupant Restraint Controller (ORC) (3) connector receptacles located on the forward-facing side of the module. To disconnect the wire harness connectors from the ORC, depress the release tab and lift the lever arm on each connector.
4. Remove the two nuts (2) that secure the left side of the ORC mounting bracket to the two studs on the ORC mount (4) welded onto the top of the floor panel transmission tunnel.
5. Remove the two screws (1) that secure the right side of the ORC mounting bracket to the ORC mount.
6. Remove the ORC and mounting bracket unit from the ORC mount.

INSTALLATION

OCCUPANT RESTRAINT CONTROLLER

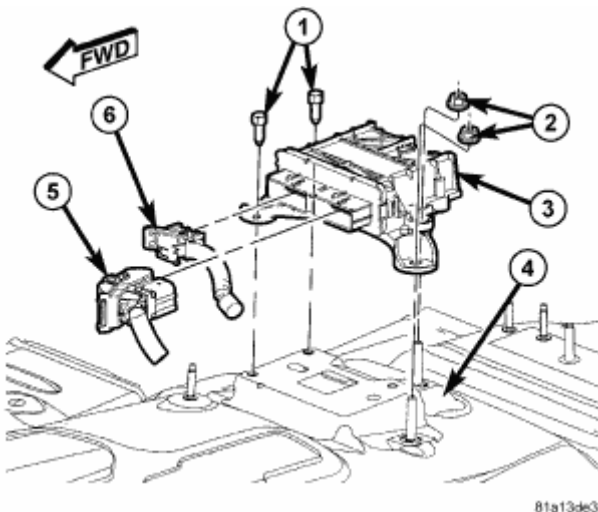
WARNING: To avoid serious or fatal injury on vehicles equipped with side curtain airbags, disable the Supplemental Restraint System (SRS) before attempting any Occupant Restraint Controller (ORC) diagnosis or service. The ORC contains a rollover sensor, which enables the system to deploy the side airbags in the event of a vehicle rollover event. If an ORC is accidentally rolled during service while still connected to battery power, the side curtain airbags will deploy. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, never strike or drop the Occupant Restraint Controller (ORC), as it can damage the impact sensor or affect its calibration. The ORC contains the impact sensor, which enables the system to deploy the SRS components. If an ORC is accidentally dropped during service, the module must be scrapped and replaced with a new unit. Failure to observe this warning could result in accidental, incomplete, or improper SRS component deployment.

CAUTION: On vehicles equipped with the Occupant Classification System (OCS), never replace both the Occupant Restraint Controller (ORC) and the Occupant Classification Module (OCM) at the same time. If both require replacement, replace one. Then perform the Supplemental Restraint System (SRS) verification test before replacing the other. Both the ORC and the OCM store OCS calibration data, which they transfer to one another when one of them is replaced. If both are replaced at the same time, an irreversible fault will be set in both modules.

NOTE: The Occupant Restraint Controller (ORC) should only be removed as a complete unit with the molded plastic mounting bracket. The service replacement ORC is supplied already installed on a new bracket.



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Fig. 51: Identifying Screws, Nuts, Occupant Restraint Controller, ORC Mount, Body Wire Harness

Connector & Instrument Panel Wire Harness Connector

Courtesy of CHRYSLER LLC

1. Carefully position the Occupant Restraint Controller (ORC) and mounting bracket unit (3) onto the two studs on the left side of the ORC mount (4) on the floor panel transmission tunnel. When the ORC is correctly positioned, the bracket will fit flush with the mount and the orientation arrow on the label on top of the housing will be pointed forward in the vehicle.
2. Install and tighten the two screws (1) that secure the right side of the ORC mounting bracket to the ORC mount. Tighten the screws to 10.5 N.m (95 in. lbs.).
3. Install and tighten the two nuts (2) that secure the left side of the ORC mounting bracket to the two studs on the ORC mount. Tighten the nuts to 10.5 N.m (95 in. lbs.).
4. Reconnect the instrument panel wire harness connector (6) and the body wire harness connector (5) to the ORC connector receptacles located on the forward-facing side of the module. Be certain that the latches on the connectors are each fully engaged.
5. Reinstall the center console onto the top of the floor panel transmission tunnel. Refer to **INSTALLATION**.
6. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

PASSENGER AIRBAG

DESCRIPTION

PASSENGER AIRBAG

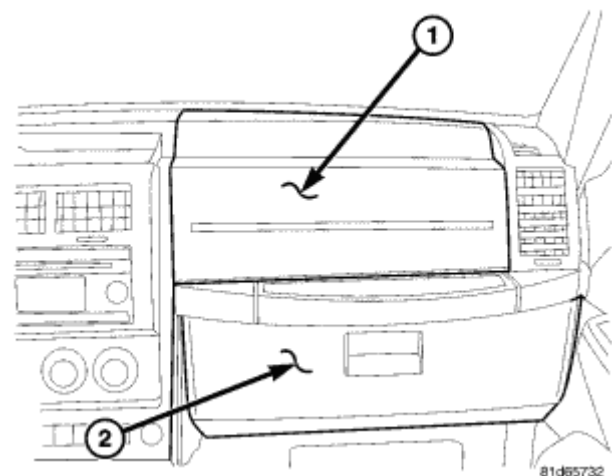


Fig. 52: Passenger Airbag Door
Courtesy of CHRYSLER LLC

The rearward facing surface of the injection molded, thermoplastic passenger airbag door (1) is the most visible part of the passenger airbag. The passenger airbag door is located above the glove box (2) opening on the top and face of the instrument panel in front of the front seat passenger seating position. The upper and lower edges

of the airbag door are secured with integral snap features to the instrument panel base trim.

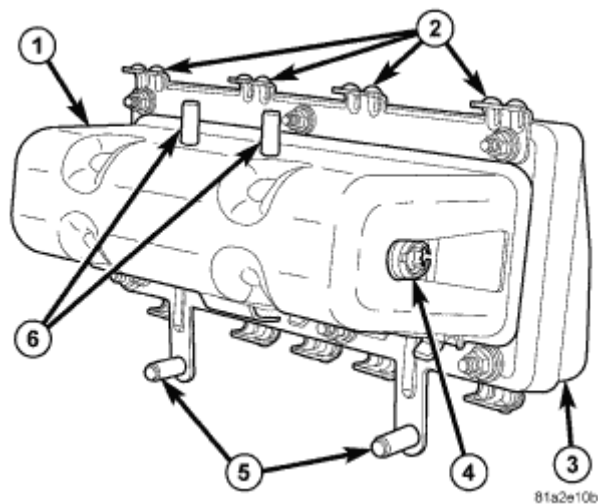


Fig. 53: Identifying Passenger Airbag Housing, Stamped Hook Formations, Airbag Cushion, Inflator Initiators, Lower Studs & Upper Studs
Courtesy of CHRYSLER LLC

Located behind the passenger airbag door within the instrument panel is the passenger airbag unit. The passenger airbag unit is secured through two lower studs (5) to the instrument panel structural support armature above the glove box opening. While the two upper studs (6) are secured to a heavy stamped steel instrument panel bracket secured to the dash panel near the lower windshield fence line.

The passenger airbag housing (1) fits into a molded receptacle on the back of the airbag door, where several stamped hook formations (2) on the upper and lower edges of the airbag housing are engaged in mating small window openings on the upper and lower flanges of the receptacle to secure the airbag door to the airbag housing. These airbag door fasteners and mounting provisions are all concealed beneath the instrument panel base trim.

The passenger airbag unit used in this vehicle is a multistage, Next Generation-type that complies with revised federal airbag standards to deploy with less force than those used in some prior vehicles. The passenger airbag unit consists of a stamped metal housing, the airbag cushion (3), and a dual initiator airbag inflator. The airbag housing contains the airbag inflator and the folded airbag cushion. An approximately 80 centimeter (31.5 inch) wide by 90 centimeter (35.5 inch) high rectangular fabric cushion with internal tethers is used.

The airbag inflator is a non-azide, hybrid-type unit that is secured to and sealed within the airbag housing. The two inflator initiators (4) are connected to the vehicle electrical system through dedicated take outs and connectors of the instrument panel wire harness with connector insulators that connect directly to the two inflator initiators. The connector insulators are uniquely keyed and color-coded to ensure they can only be connected to the correct initiator.

A service replacement passenger airbag does not include the airbag door. The passenger airbag door may be disassembled from the passenger airbag and is available for individual service replacement. The passenger airbag unit cannot be repaired and must be replaced if deployed, ineffective, or in any way damaged.

OPERATION

PASSENGER AIRBAG

The multistage passenger airbag is deployed by electrical signals generated by the Occupant Restraint Controller (ORC) through the passenger airbag squib 1 and squib 2 circuits to the two initiators of the hybrid airbag inflator. By using two initiators, the airbag can be deployed at multiple levels of force. The force level is controlled by the ORC to suit the monitored impact conditions by providing one of several delay intervals between the electrical signals provided to the two initiators. The longer the delay between these signals, the less forcefully the airbag will deploy.

When the ORC sends the proper electrical signals to each initiator, the electrical energy generates enough heat to initiate a small pyrotechnic charge which produces the pressure necessary to rupture a containment disk in an inert gas canister. The inflator and inert gas canister are sealed to the airbag cushion and a diffuser in the inflator directs all of the inert gas into the airbag cushion, causing the cushion to inflate. As the cushion inflates, the passenger airbag door will split horizontally at predetermined tear seam lines concealed on the inside surface of the door. The upper half of the door pivots up and the lower half pivots down and out of the way. Following an airbag deployment, the airbag cushion quickly deflates by venting the inert gas through a vent hole in each fabric side panel of the airbag cushion.

Typically, both initiators are used during an airbag deployment event. However, it is possible for only one initiator to be used during a deployment due to an airbag system fault; therefore, it is necessary to always confirm that both initiators have been used in order to avoid the improper disposal of potentially live pyrotechnic materials. See **STANDARD PROCEDURE**.

Proper diagnosis of the passenger airbag inflator and the passenger airbag squib circuits requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

PASSENGER AIRBAG

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury when removing a deployed airbag, rubber gloves, eye protection, and a long-sleeved shirt should be worn. There may be deposits on the airbag unit and other interior surfaces. In large doses, these deposits may cause irritation to the skin and eyes.

NOTE: The following procedure is for replacement of an ineffective or damaged passenger airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the passenger airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.

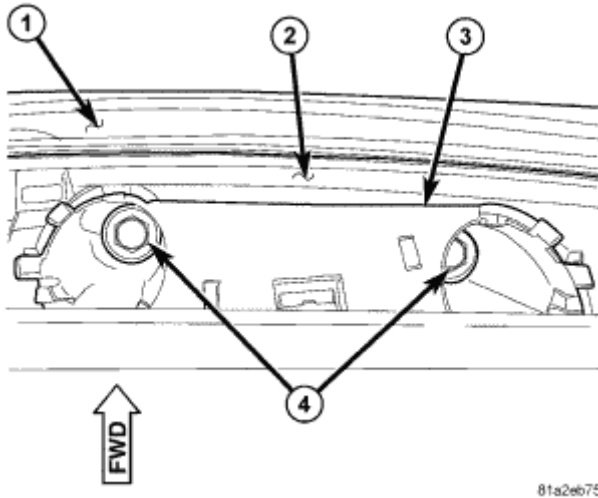


Fig. 54: Identifying Windshield, Instrument Panel, Screw Guide & Screws
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the top cover from the instrument panel. Refer to REMOVAL .
3. Remove the two screws (4) from the screw guide (3) on the top of the instrument panel (2) near the windshield (1) that secure the instrument panel bracket for the passenger airbag to the dash panel.
4. Using a trim stick or another suitable wide flat-bladed tool, pry the screw guide away from the top of the instrument panel far enough to disengage the two integral latch features that secure it and remove the screw guide to allow access to the trim screw that secures the passenger airbag instrument panel bracket to the instrument panel structural duct.
5. Work through the rectangular hole in the top of the instrument panel beneath the removed screw guide to access and remove the one screw that secures the center tab of the passenger airbag instrument panel bracket to the structural duct.

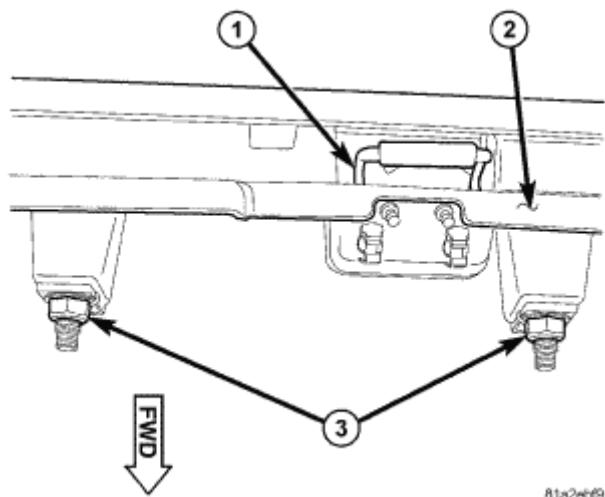


Fig. 55: Identifying Glove Box Latch Striker, Upper Glove Box Opening & Nuts
Courtesy of CHRYSLER LLC

6. Remove the glove box from the instrument panel. Refer to **REMOVAL** .
7. Remove the grab handle from the instrument panel. Refer to **REMOVAL** .
8. Reach up into the instrument panel above the upper glove box opening (2) to access and remove the two nuts (3) that secure the passenger airbag lower studs to the instrument panel base trim on each side of the glove box latch striker (1).
9. Using a trim stick or another suitable wide flat-bladed tool, gently pry the lower edge of the passenger airbag door rearward away from the upper glove box opening reinforcement far enough to disengage the snap features on the door from the receptacles in the instrument panel base trim.
10. Grasp the lower edge of the passenger airbag door and gently pull the door and airbag rearward far enough to disengage the upper snap features from the receptacles in the instrument panel base trim and to access the two instrument panel wire harness connections to the airbag inflators at each side of the airbag housing.

CAUTION: Do not pull on the instrument panel wire harness take outs or pry on the connector insulators to disengage the connectors from the passenger airbag inflator connector receptacles. Improper removal of these take outs and their connector insulators can result in damage to the airbag circuits or connector insulators.

11. The instrument panel passenger airbag wire harness connectors are secured by integral latches to the airbag inflator connector receptacles, which are located on the sides of the passenger airbag housing. Depress the latches on each side of each connector insulator and pull the insulators straight out from the airbag inflator to disconnect them from the connector receptacles.
12. Remove the passenger airbag, airbag door and instrument panel bracket from the instrument panel as a unit.

DISASSEMBLY

PASSENGER AIRBAG DOOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, service of this unit should be performed only by DaimlerChrysler-trained and authorized dealer service technicians. Failure to take the proper precautions or to follow the proper procedures could result in accidental, incomplete, or improper airbag deployment and possible occupant injuries.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the passenger airbag, or becoming entrapped between the passenger airbag cushion and the passenger airbag door. Failure to observe this warning could result in occupant injuries upon airbag deployment.

WARNING: To avoid serious or fatal injury, the passenger airbag door must never be painted. Replacement airbag doors are serviced in the original colors. Paint may change the way in which the material of the airbag door responds to an airbag deployment. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedures can be used to replace the passenger airbag door. If the passenger airbag is deployed, the passenger airbag unit and the airbag door must both be replaced.

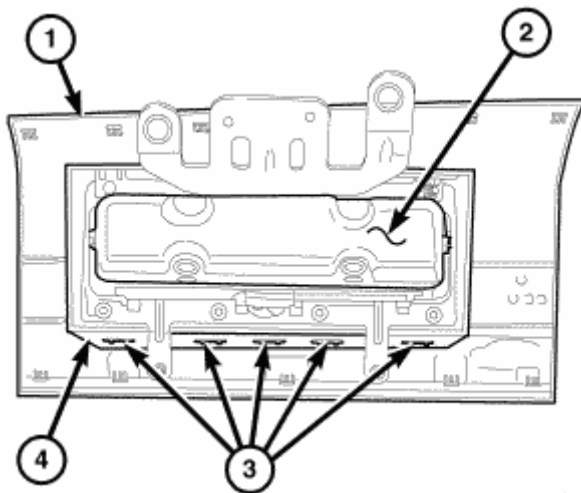


Fig. 56: Identifying Passenger Airbag Door, Airbag Housing, Lower Hooks & Receptacle
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the passenger airbag from the instrument panel. See **REMOVAL**.
3. Place the passenger airbag on a suitable work surface with the passenger airbag door (1) facing down. If the airbag door will be reused, be certain to take the proper precautions to prevent the airbag door from receiving cosmetic damage during the following procedures.
4. Disengage each of the upper hooks of the airbag housing (2) from the windows in the upper wall of the receptacle (4) on the back of the airbag door. To disengage the hooks, use hand pressure to push the adjacent edge of the airbag housing firmly and evenly downward into the airbag door receptacle, while at the same time pulling outward on that edge of the receptacle wall.
5. With all of the upper hooks disengaged, roll the top of the airbag housing upward to disengage the lower hooks (3) then lift the housing, inflator and cushion from the receptacle on the back of the passenger airbag door.

PASSENGER AIRBAG INSTRUMENT PANEL BRACKET

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, service of this unit should be performed only by DaimlerChrysler-trained and authorized dealer service technicians. Failure to take the proper precautions or to follow the proper procedures could result in accidental, incomplete, or improper airbag deployment and possible occupant injuries.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the passenger airbag, or becoming entrapped between the passenger airbag cushion and the passenger airbag door. Failure to observe this warning could result in occupant injuries upon airbag deployment.

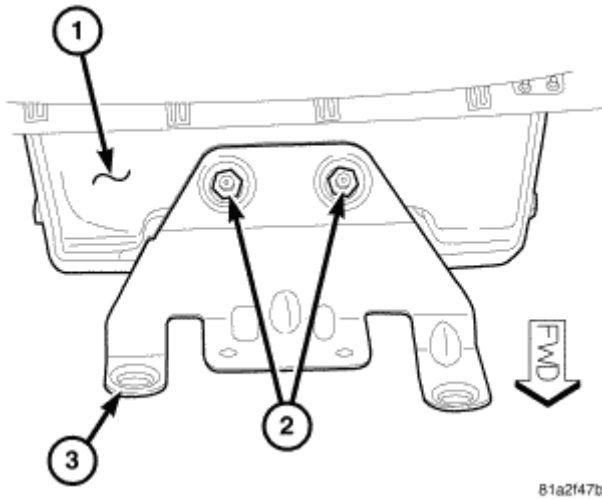


Fig. 57: Identifying Airbag Housing, Nuts & Passenger Airbag Instrument Panel Bracket
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the passenger airbag from the instrument panel. See **REMOVAL**.
3. Place the passenger airbag instrument panel bracket (3) facing up. Be certain to take the proper precautions to prevent the airbag door from receiving cosmetic damage during the following procedures.
4. Remove the two nuts (2) that secure the bracket to the two studs on the top of the airbag housing (1).
5. Remove the bracket from the studs.

ASSEMBLY

PASSENGER AIRBAG DOOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, service of this unit should be performed only by DaimlerChrysler-trained and authorized dealer service technicians. Failure to take the proper precautions or to follow the proper procedures could result in accidental, incomplete, or improper airbag deployment and possible occupant injuries.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the passenger airbag, or becoming entrapped between the passenger airbag cushion and the passenger airbag door. Failure to observe this warning could result in occupant injuries upon airbag deployment.

WARNING: To avoid serious or fatal injury, the passenger airbag door must never be painted. Replacement airbag doors are serviced in the original colors. Paint may change the way in which the material of the airbag door responds to an airbag deployment. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedures can be used to replace the passenger airbag door. If the passenger airbag is deployed, the passenger airbag unit and the airbag door must both be replaced.

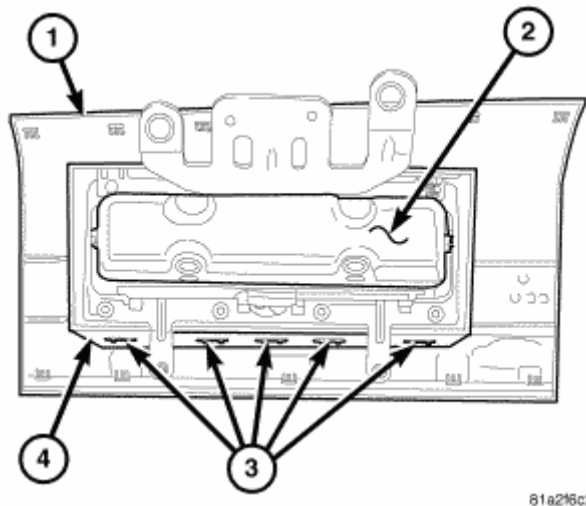


Fig. 58: Identifying Passenger Airbag Door, Airbag Housing, Lower Hooks & Receptacle
Courtesy of CHRYSLER LLC

1. Place the passenger airbag door (1) on a suitable work surface with the airbag receptacle (4) facing up. Be certain to take the proper precautions to prevent the airbag door from receiving cosmetic damage during the following procedures.
2. Carefully position the passenger airbag housing (2) into the airbag door receptacle.
3. Work around the perimeter of the unit engaging each of the nine hooks (3) on the housing through the windows in the upper and lower walls of the airbag door receptacle.
4. After the passenger airbag has been assembled, try pulling the airbag door and the airbag housing away from each other. Visually verify that this action has fully seated all of the windows of the airbag door into the cradles of the airbag housing hooks.
5. Reinstall the passenger airbag into the instrument panel. See **INSTALLATION**.

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, service of this unit should be performed only by DaimlerChrysler-trained and authorized dealer service technicians. Failure to take the proper precautions or to follow the proper procedures could result in accidental, incomplete, or improper airbag deployment and possible occupant injuries.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the passenger airbag, or becoming entrapped between the passenger airbag cushion and the passenger airbag door. Failure to observe this warning could result in occupant injuries upon airbag deployment.

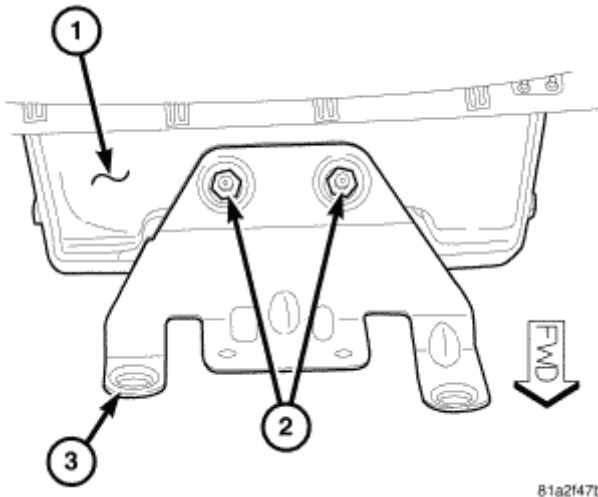


Fig. 59: Identifying Airbag Housing, Nuts & Passenger Airbag Instrument Panel Bracket
Courtesy of CHRYSLER LLC

1. Place the passenger airbag on a suitable work surface with the housing (1) facing up. Be certain to take the proper precautions to prevent the airbag door from receiving cosmetic damage during the following procedures.
2. Carefully position the passenger airbag instrument panel bracket (3) over the two studs on the top of the airbag housing.
3. Install and tighten the two nuts (2) that secure the bracket to the studs on the housing. Tighten the nuts to 20 N.m (15 ft. lbs.).

4. Reinstall the passenger airbag onto the instrument panel. See INSTALLATION.

INSTALLATION

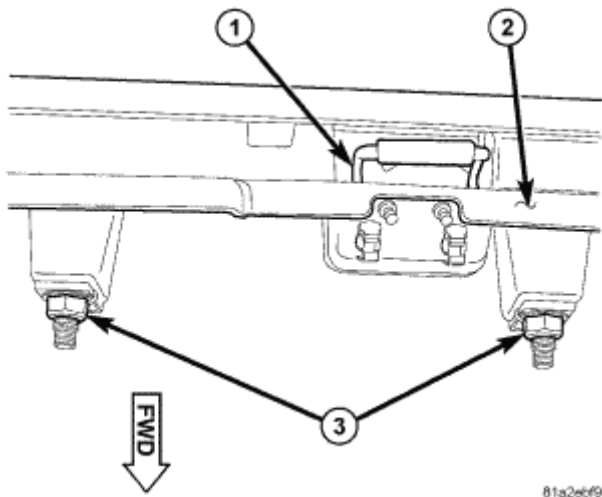
PASSENGER AIRBAG

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury, use extreme care to prevent any foreign material from entering the passenger airbag, or becoming entrapped between the passenger airbag cushion and the passenger airbag door. Failure to observe this warning could result in occupant injuries upon airbag deployment.

WARNING: To avoid serious or fatal injury, the passenger airbag door must never be painted. Replacement passenger airbag units are serviced with doors in the original colors. Paint may change the way in which the material of the airbag door responds to an airbag deployment. Failure to observe this warning could result in occupant injuries upon airbag deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged passenger airbag. If the airbag is ineffective or damaged, but not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the passenger airbag has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the airbag from the vehicle. See STANDARD PROCEDURE.



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Fig. 60: Identifying Glove Box Latch Striker, Upper Glove Box Opening & Nuts
Courtesy of CHRYSLER LLC

1. Position the passenger airbag, airbag door and instrument panel bracket to the opening in the face of the instrument panel base trim as a unit.
2. Reconnect the two connector insulators of the instrument panel wire harness take outs to the airbag inflator connector receptacles on each side of the airbag housing by pressing straight in on the connectors. Be certain to engage each keyed and color-coded connector to the matching connector receptacle. You can be certain that each connector is fully engaged in its receptacle by listening carefully for a distinct, audible click as the connector latches snap into place.
3. Slide the passenger airbag forward being certain that the instrument panel bracket is engaged between the dash panel and the instrument panel structural support at the lower windshield fence line and that the two lower studs of the airbag are engaged in the holes of the instrument panel base trim. It may be necessary to angle the forward end of the unit slightly downward and then roll it upward to engage the instrument panel bracket properly between the fence line and the structural support.
4. Reach up into the instrument panel above the upper glove box opening (2) to install and tighten the two nuts (3) that secure the passenger airbag lower studs to the instrument panel base trim on each side of the glove box latch striker (1). Tighten the nuts to 7 N.m (62 in. lbs.).
5. Reinstall the grab handle onto the instrument panel. Refer to **INSTALLATION** .
6. Reinstall the glove box into the instrument panel. Refer to **INSTALLATION** .

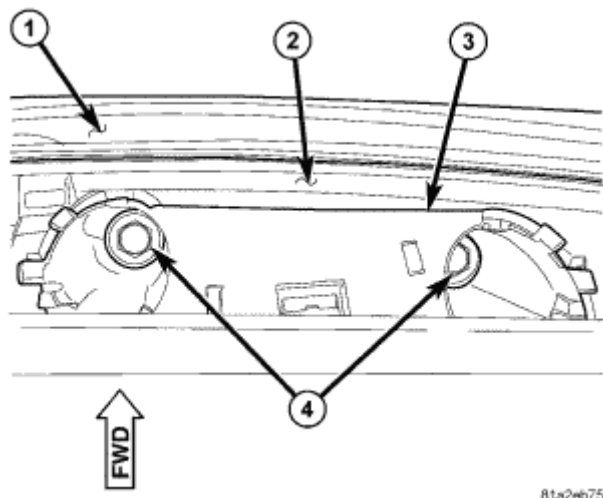


Fig. 61: Identifying Windshield, Instrument Panel, Screw Guide & Screws
Courtesy of CHRYSLER LLC

7. Work through the rectangular hole in the top of the instrument panel to install and tighten the one screw that secures the center tab of the passenger airbag instrument panel bracket to the instrument panel structural duct. Tighten the screw to 2.9 N.m (25 in. lbs.).
8. Position the screw guide (3) onto the top of the instrument panel (2) near the windshield (1) and, using hand pressure, press the screw guide downward until both integral latch features snap into place.
9. Install and tighten the two screws (4) through the screw guide that secure the instrument panel bracket for the passenger airbag to the dash panel. Tighten the screws to 29.5 N.m (21.5 ft. lbs.).
10. Using hand pressure, press the top of the passenger airbag door forward and downward until each snap feature on the upper edge of the airbag door is fully engaged into its receptacle in the instrument panel base trim.
11. Using hand pressure, wrap the passenger airbag door downward tightly against the instrument panel, then push forward until each snap feature on the lower edge of the airbag door is fully engaged into its receptacle in the instrument panel base trim.
12. Visually verify that each of the snap features of the airbag door is fully engaged in the instrument panel. There will be a distinct bulge in the door over any snap that is not fully engaged.
13. Reinstall the top cover onto the instrument panel. Refer to **INSTALLATION**.
14. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

PASSENGER AIRBAG ON/OFF INDICATOR

DESCRIPTION

PASSENGER AIRBAG ON/OFF INDICATOR

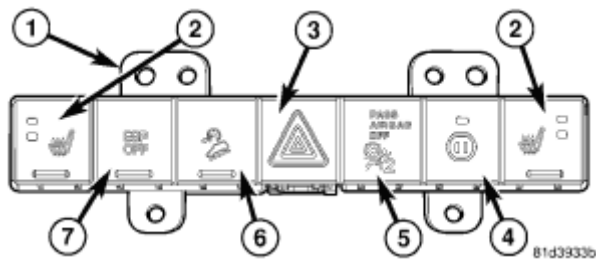


Fig. 62: Instrument Panel Switch Pod

Courtesy of CHRYSLER LLC

Vehicles equipped with the Occupant Classification System (OCS) include a passenger airbag on/off indicator (5), which is located just to the right of the hazard switch (3) in the center of the instrument panel switch pod (1) near the base of the instrument panel center bezel. The passenger airbag on/off indicator consists of a molded plastic housing and a rectangular dark translucent outer lens.

The opaque text **PASS AIRBAG OFF** and an opaque International Control and Display Symbol icon for **Passenger Airbag Off or Not Available** are imprinted on the back of the lens within the indicator. The dark outer lens prevents the indicator text and icon from being clearly visible when it is not illuminated. An amber Light Emitting Diode (LED) behind the lens causes the text and icon to appear silhouetted against an amber field through the translucent lens when the indicator is illuminated from behind by the LED.

The passenger airbag on/off indicator cannot be repaired or adjusted and, if ineffective or damaged, the switch pod unit must be replaced. Refer to **REMOVAL**.

OPERATION

PASSENGER AIRBAG ON/OFF INDICATOR

In the Occupant Classification System (OCS) the passenger airbag on/off indicator gives an indication when the passenger airbag and seat belt tensioner deployment circuits are disabled by the Occupant Restraint Controller (ORC). This indicator is controlled by a transistor within the ORC through a hard wired output based upon ORC programming and electronic **occupant classification** messages received by the ORC over the Controller Area Network (CAN) data bus from the Occupant Classification Module (OCM).

The passenger airbag on/off indicator Light Emitting Diode (LED) is completely controlled by the ORC. The LED receives a battery current input on a fused ignition switch output (run) circuit. Therefore, the LED will always be OFF when the ignition switch is in any position except ON. The LED only illuminates when it is provided a path to ground by the ORC transistor. The ORC will turn ON the passenger airbag on/off indicator for the following reasons:

- **Bulb Test** - Each time the ignition switch is turned to the ON position the passenger airbag on/off indicator is illuminated for about six seconds.
- **Child Seat Detected (or Load Less Than Minimum Weight Threshold) Occupant Classification Message** - Each time the ORC receives an electronic message from the OCM indicating a child seat has been detected in the passenger side front seat (or that the seat load is less than a minimum weight threshold) the passenger airbag and seat belt tensioner deployment circuits are deactivated and the passenger airbag on/off indicator will be illuminated. The indicator remains illuminated until the ORC

receives an **occupant classification** message indicating that the passenger side front seat is empty, that the seat is occupied by a load equal to or greater than a minimum weight threshold, or until the ignition switch is turned to the OFF position, whichever occurs first.

- **Load Undetermined Occupant Classification Message** - Each time the ORC receives an electronic message from the OCM indicating that a load cannot be determined in the passenger side front seat, the passenger airbag and seat belt tensioner deployment circuits are deactivated and the passenger airbag on/off indicator will be illuminated. The indicator remains illuminated until the ORC receives an **occupant classification** message indicating that the passenger side front seat is empty, that the seat is occupied by a load equal to or greater than a minimum weight threshold, or until the ignition switch is turned to the OFF position, whichever occurs first.
- **Communication Error** - If the ORC receives invalid **occupant classification** messages or no messages from the OCM, the passenger airbag on/off indicator is illuminated. The indicator remains illuminated until the ORC receives a valid message from the OCM indicating that the passenger side front seat is empty, that the seat is occupied by a load equal to or greater than a minimum weight threshold, or until the ignition switch is turned to the OFF position, whichever occurs first.

The ORC continually monitors the **occupant classification** messages from the OCM to decide whether the passenger airbag and seat belt tensioner deployment circuits should be activated or deactivated. Note that there may be several seconds of delay between changes in the detected occupant status and passenger airbag on/off indications. This is a programmed feature of the OCM used to prevent a flashing indicator condition resulting from the normal shifting of occupant weight on the passenger seat cushion. The ORC then provides the proper control output to turn the passenger airbag on/off indicator ON or OFF.

The ORC will store a Diagnostic Trouble Code (DTC) for any malfunction it detects. The hard wired circuits between the passenger airbag on/off indicator and the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the passenger airbag on/off indicator or the electronic controls and communication between other modules and devices that provide features of the OCS. The most reliable, efficient, and accurate means to diagnose the passenger airbag on/off indicator or the electronic controls and communication related to passenger airbag on/off indicator operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

SEAT BELT BUCKLE

REMOVAL

FRONT SEAT BELT BUCKLE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), do not modify the front passenger seat assembly or center floor console in any way. Do not use any prior year, subsequent year, secondary or aftermarket seat trim covers. At no time should any Supplemental Restraint System (SRS) or OCS component be modified or replaced with any part except those which are specified for the particular vehicle application in the DaimlerChrysler Mopar® Parts Catalog. Failure to observe these precautions could cause an OCS miscalibration condition, which may result in the passenger airbag failing to deploy when required or deploying when not required.

WARNING: To avoid serious or fatal injury, never strike or drop a seat weight sensor or the passenger side front seat assembly to which the sensors are secured as it can damage the sensors or affect their calibration. The seat weight sensors and the passenger side front seat assembly must be handled with care to avoid damage to the sensors. Do not sit upon or place any loads upon a passenger side front seat while it is removed from its mounts in or outside of the vehicle. If an individual sensor is dropped or damaged, replace the sensor with a new and unused unit. If a seat has been dropped during removal or loaded while removed from its mounts, replace each of the seat weight sensors with new and unused units. Failure to observe this warning could result in an accidental, incomplete, or improper passenger side front Supplemental Restraint System (SRS) component deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), any time the passenger side front seat assembly has been removed or loosened from the vehicle for service of any vehicle component or system the Occupant Classification System (OCS) Verification Test must be performed using a diagnostic scan tool and the Occupant Classification Seat Weight special tool following reinstallation. Refer to the appropriate diagnostic procedures. Failure to

observe this warning could result in an accidental, incomplete, or improper passenger side front Supplemental Restraint System (SRS) component deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged seat belt buckle unit. The front seat belt buckle in this vehicle may include a seat belt tensioner. If the front seat belt buckle is equipped with a tensioner that is ineffective or damaged, but the seat belt tensioner is not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the seat belt tensioner has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the unit from the vehicle. See STANDARD PROCEDURE.

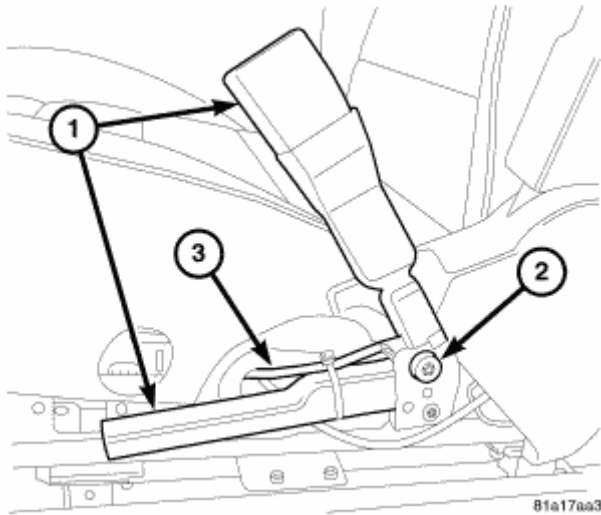


Fig. 63: Identifying Front Seat Belt Buckle And Tensioner Unit, Screw & Pigtail Wire
Courtesy of CHRYSLER LLC

1. Move the front seat to its middle position for easiest access to the front seat mounting provisions.
2. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
3. Remove the front seat from the vehicle. Refer to REMOVAL .
4. Disconnect the seat belt tensioner (if equipped) and seat belt switch pigtail wire (3) connector from the seat wire harness connector located under the seat cushion near the inboard side of the seat.
5. Remove the screw (2) that secures the front seat belt buckle (1) lower anchor and, if equipped, the tensioner unit to the back of the inboard seat cushion frame.
6. Pull the buckle or the buckle and tensioner unit away from the inboard side of the seat while feeding the pigtail wire and connector from under the seat out through the clearance hole in the inboard seat cushion frame.
7. Remove the seat belt buckle or the buckle and tensioner from the front seat as a unit.

SECOND ROW CENTER ANCHOR AND LEFT SEAT BELT BUCKLE

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

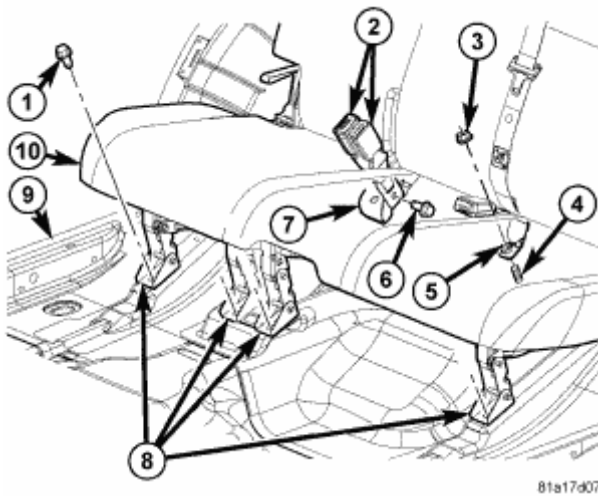


Fig. 64: Second Row Center And Seat Belt Buckle Components
Courtesy of CHRYSLER LLC

NOTE: The anchor plates for the left outboard second row seat belt buckle and the second row center seat belt anchor are secured to each other by a soft metal grommet as an assembly aid during the manufacturing process and, once removed, the grommet does not require reinstallation.

1. Remove the four screws (1) that secure the second row seat cushion legs (8) to the rear floor panel (9).
2. Lift the front edge of the seat cushions (10) up against the seat backs for access to the second row center seat belt and left outboard seat belt buckle anchors (5) on the rear floor panel.
3. Remove the nut (3) that secures the center seat belt and left buckle anchors to the stud (4) on the rear floor panel.
4. Lift the anchors off of the stud on the rear floor panel.
5. Using an appropriate drill or chisel, carefully remove the soft metal grommet that secures the two anchor plates to each other.
6. Remove the second row left outboard buckle and anchor from between the seat back and the seat cushion

as a unit.

SECOND ROW CENTER AND RIGHT SEAT BELT BUCKLES

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

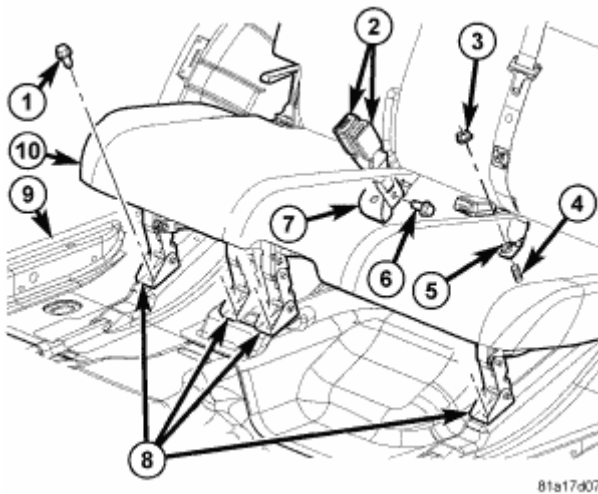


Fig. 65: Second Row Center And Seat Belt Buckle Components

Courtesy of CHRYSLER LLC

1. Remove the four screws (1) that secure the second row seat cushion legs (8) to the rear floor panel (9).
2. Lift the front edge of the seat cushions (10) up against the seat backs for access to the forward end of the right center seat bracket (7).
3. Remove the screw (6) that secures the lower anchor for the center and right seat belt buckle unit (2) to the inboard side of the right center seat bracket.
4. Remove the center and right seat belt buckle unit from between the second row seat cushions as a unit.

INSTALLATION

FRONT SEAT BELT BUCKLE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), do not modify the front passenger seat assembly or center floor console in any way. Do not use any prior year, subsequent year, secondary or aftermarket seat trim covers. At no time should any Supplemental Restraint System (SRS) or OCS component be modified or replaced with any part except those which are specified for the particular vehicle application in the DaimlerChrysler Mopar® Parts Catalog. Failure to observe these precautions could cause an OCS miscalibration condition, which may result in the passenger airbag failing to deploy when required or deploying when not required.

WARNING: To avoid serious or fatal injury, never strike or drop a seat weight sensor or the passenger side front seat assembly to which the sensors are secured as it can damage the sensors or affect their calibration. The seat weight sensors and the passenger side front seat assembly must be handled with care to avoid damage to the sensors. Do not sit upon or place any loads upon a passenger side front seat while it is removed from its mounts in or outside of the vehicle. If an individual sensor is dropped or damaged, replace the sensor with a new and unused unit. If a seat has been dropped during removal or loaded while removed from its mounts, replace each of the seat weight sensors with new and unused units. Failure to observe this warning could result in an accidental, incomplete,

or improper passenger side front Supplemental Restraint System (SRS) component deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), any time the passenger side front seat assembly has been removed or loosened from the vehicle for service of any vehicle component or system the Occupant Classification System (OCS) Verification Test must be performed using a diagnostic scan tool and the Occupant Classification Seat Weight special tool following reinstallation. Refer to the appropriate diagnostic procedures. Failure to observe this warning could result in an accidental, incomplete, or improper passenger side front Supplemental Restraint System (SRS) component deployment.

NOTE: The following procedure is for replacement of an ineffective or damaged seat belt buckle unit. The front seat belt buckle in this vehicle may include a seat belt tensioner. If the front seat belt buckle is equipped with a tensioner that is ineffective or damaged, but the seat belt tensioner is not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the seat belt tensioner has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the unit from the vehicle. See STANDARD PROCEDURE.

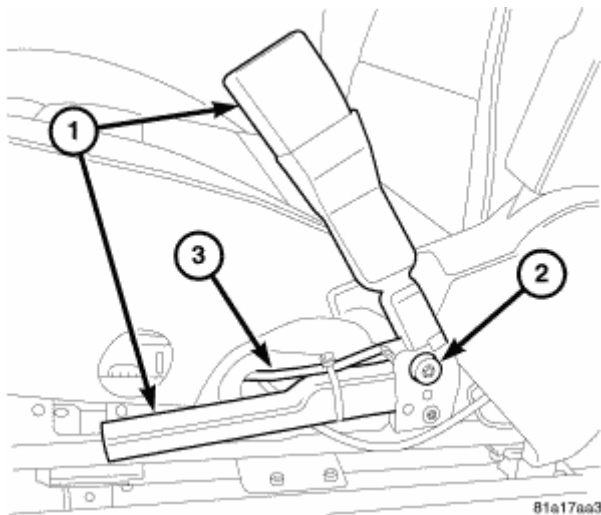


Fig. 66: Identifying Front Seat Belt Buckle And Tensioner Unit, Screw & Pigtail Wire
Courtesy of CHRYSLER LLC

1. Position the front seat belt buckle or the buckle and tensioner unit (1) to the inboard seat cushion frame.
2. Insert the seat belt tensioner (if equipped) and seat belt switch pigtail wire (3) connector under the seat through the clearance hole in the inboard seat cushion frame.
3. Position the front seat belt buckle lower anchor to the back of the inboard seat cushion frame.
4. Install and tighten the screw (2) that secures the front seat belt buckle anchor to the seat cushion frame.

Tighten the screw to 43 N.m (32 ft. lbs.).

5. Reconnect the seat belt buckle tensioner (if equipped) and the seat belt switch pigtail wire connector to the seat wire harness connector located under the seat cushion near the inboard side of the seat.
6. Reinstall the front seat into the vehicle. Refer to **INSTALLATION**.
7. If the buckle is equipped with a tensioner, do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

SECOND ROW CENTER ANCHOR AND LEFT SEAT BELT BUCKLE

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

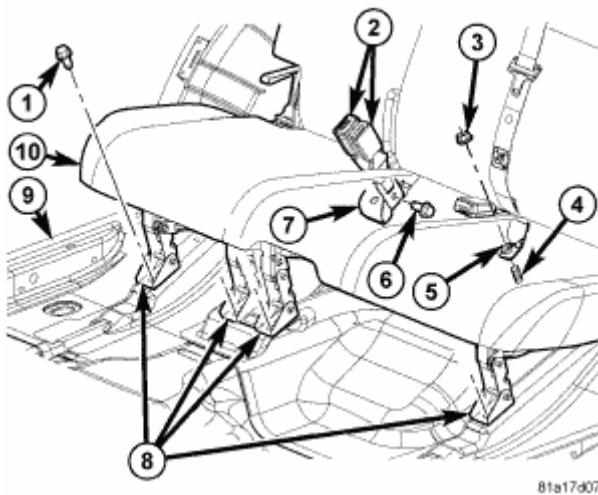


Fig. 67: Second Row Center And Seat Belt Buckle Components
Courtesy of CHRYSLER LLC

NOTE: The anchor plates for the left outboard second row seat belt buckle and the second row center seat belt anchor are secured to each other by a soft metal grommet as an assembly aid during the manufacturing process and, once removed, the grommet does not require reinstallation.

1. Position the second row left outboard buckle anchor plate (5) between the seat back and the seat cushion (10).
2. Lower the second row center seat belt and left outboard seat belt buckle anchors over the stud (4) on the rear floor panel (9).
3. Install and tighten the nut (3) that secures the anchors to the stud on the rear floor panel. Tighten the nut to 62.5 N.m (46 ft. lbs.).
4. Lower the front edge of the seat cushions downward and align the seat cushion legs (8) to the holes in the rear floor panel.
5. Install and tighten the four screws (1) that secure the legs to the floor panel. Tighten the screws to 54 N.m (40 ft. lbs.).

SECOND ROW CENTER AND RIGHT SEAT BELT BUCKLES

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

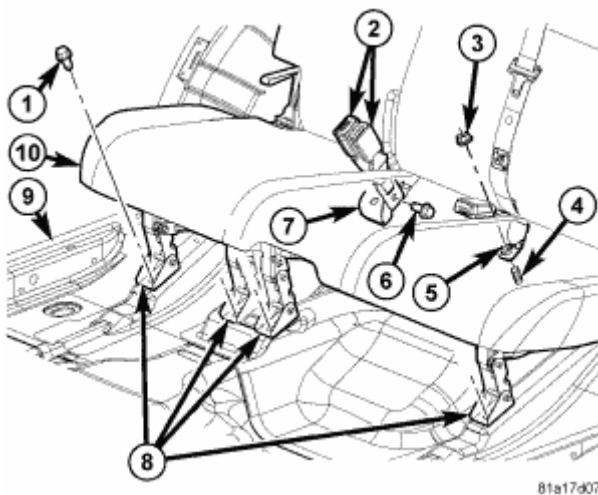


Fig. 68: Second Row Center And Seat Belt Buckle Components
 Courtesy of CHRYSLER LLC

1. Position the center and right seat belt buckle unit (2) between the second row seat cushions (10).

2. Position the lower anchor of the seat belt buckle unit to the inboard side of the right center seat bracket (7). Be certain that the anti-rotation tab on the anchor is engaged in the notch of the bracket.
3. Install and tighten the screw (6) that secures the buckle anchor to the right center seat bracket. Tighten the screw to 55 N.m (41 ft. lbs.).
4. Lower the front edge of the seat cushions downward and align the seat cushion legs (8) to the holes in the rear floor panel (9).
5. Install and tighten the four screws (1) that secure the legs to the floor panel. Tighten the screws to 54 N.m (40 ft. lbs.).

SEAT BELT AND RETRACTOR

DESCRIPTION

AUTOMATIC LOCKING RETRACTOR

The seat belt retractors used in all seating positions include an inertia-type, emergency locking mechanism as standard equipment. However, the retractor locking mechanisms for the front passenger and both second row outboard seating positions are mechanically switchable from an emergency locking retractor to an automatic locking retractor. The primary function of this feature is to securely accommodate a child seat in any of these seating positions of the vehicle without the need for a self-cinching seat belt tip half latch plate unit or another supplemental device that would be required to prevent the seat belt webbing from unwinding freely from the retractor spool of an inertia-type emergency locking retractor mechanism.

The automatic locking mechanism is integral to the seat belt and retractor unit and is concealed beneath a molded plastic cover located on one side of the retractor spool. The automatic locking mechanism cannot be adjusted or repaired and, if ineffective or damaged, the entire seat belt and retractor unit must be replaced.

OPERATION

AUTOMATIC LOCKING RETRACTOR

The locked mode of the automatic locking retractor is engaged and the retractor is switched from operating as a standard inertia-type emergency locking retractor by first buckling the combination lap and shoulder belt buckle. Then grasp the shoulder belt and pull all of the webbing out of the retractor. Once all of the belt webbing is extracted from the spool, the retractor will automatically become engaged in the pre-locked automatic locking mode and will make a light, audible clicking or ratcheting sound as the shoulder belt is allowed to retract to confirm that the automatic locking mode is now engaged. Once the automatic locking mode is engaged, the retractor will remain locked and the belt will remain tight around whatever it is restraining.

The retractor is returned to standard emergency locking (inertia) mode by unbuckling the combination lap and shoulder belt buckle and allowing the belt webbing to be almost fully retracted onto the retractor spool. The emergency locking mode is confirmed by the absence of the light, audible clicking or ratcheting sound as the belt webbing retracts. This mode will allow the belt to unwind from and wind onto the retractor spool freely unless and until a predetermined inertia load is sensed, or until the retractor is again switched to the automatic locking mode.

STANDARD PROCEDURE

WEB STOP BUTTON REPLACEMENT

The webbing of each of the tip half seat belts in this vehicle is equipped with a molded plastic web stop button, which holds the latch plate of the seat belt tip half in a readily accessible stored position and prevents it from falling to the lower belt anchor while the belt is not in use. If this button becomes damaged or separated from the belt webbing, it may be successfully replaced using the following procedure without the need for removing or replacing the entire seat belt assembly.

The web stop button replacement kit includes two molded plastic replacement button halves: a male button half with a pointed spike in its center, and a female button half with a hole in its center. The button halves are not available separately. In addition to the button replacement kit, a pair of wheel weight pliers (such as KD Tools® #3358, Snap-on® #WWPR13A or equivalent) and a gel-type super adhesive glue (such as Mopar® Bond-All Gel #04467709 or equivalent) are required.

NOTE: **Avoid using heavy-duty, truck-style wheel weight pliers as the jaws may not close far enough to successfully complete web stop button replacement.**

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

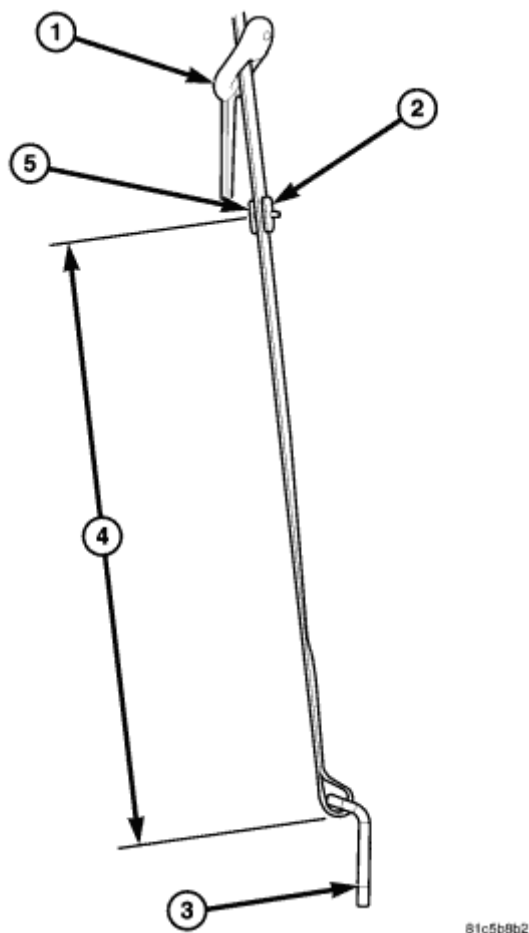


Fig. 69: Seatbelt Anchor Components

Courtesy of CHRYSLER LLC

1. Carefully inspect the seat belt webbing to identify the hole or a witness mark where the original web stop button halves (2 and 5) were installed. If no distinct evidence of the prior button location is found, go to Step 2. If the original button location is clearly evident, go to Step 3.
2. Find the appropriate dimension in the WEB STOP BUTTON LOCATION table. Measure and mark that distance (4) in the center of the belt webbing from the point where the webbing is secured to the seat belt lower anchor plate (3).

WEB STOP BUTTON LOCATION	
SEATING POSITION	DIMENSION
FRONT	350 plus or minus 10 millimeters (13.78 plus or minus 0.39 inches)
SECOND ROW CENTER OR OUTBOARD	280 plus or minus 15 millimeters (11.02 plus or minus 0.59 inches)

CAUTION: Be certain that the seat belt latch plate (1) is located and secured

above the web stop button location mark before installing the replacement button.

3. Working from the side of the seat belt webbing that faces the interior of the vehicle, pierce the webbing with the spike in the center of the male button half. The male button head should face the interior of the vehicle.

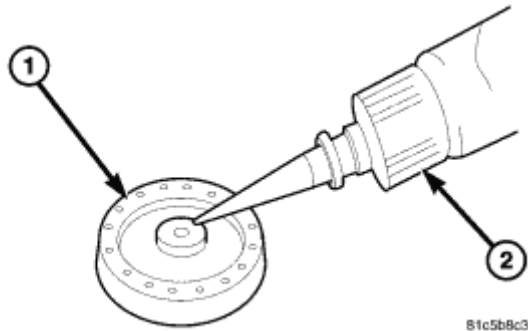


Fig. 70: Gel-type Super Adhesive Glue
Courtesy of CHRYSLER LLC

4. Apply a small dot of gel-type super adhesive glue (2) around the center hole on the back side of the female button half (1).
5. Press the female button half over the spike of the male button half that protrudes through the side of the belt webbing that faces away from the interior of the vehicle.

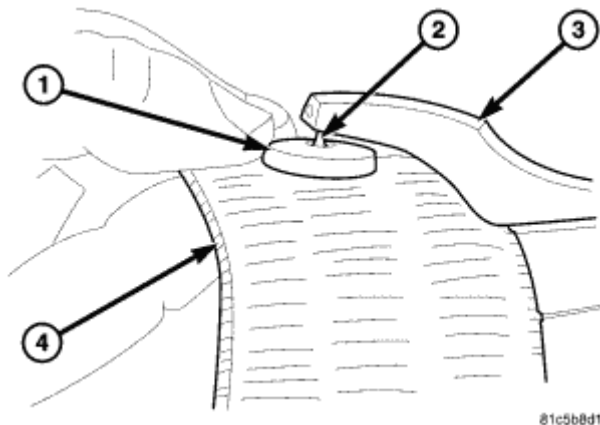


Fig. 71: Flattening Button Half
Courtesy of CHRYSLER LLC

6. Use the flat anvil-like jaw (3) of the wheel weight pliers to flatten the sharp spike (2) of the male button half that protrudes through the female button half (1) on the back side of the belt webbing (4).

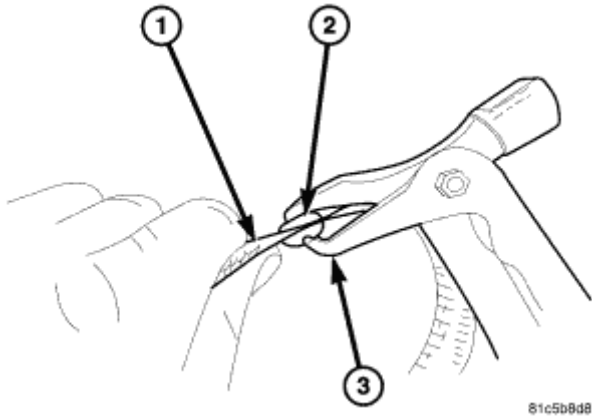


Fig. 72: Forming Button Half
Courtesy of CHRYSLER LLC

7. Carefully use the curved jaw (3) of the wheel weight pliers to compress and form the flattened spike of the male button half (2) on the back side of the seat belt webbing (1) until it is concave and entirely below the outer convex surface of the female button half.
8. Check to be certain that the web stop button is secure.

REMOVAL

FRONT SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

- NOTE:** The only component of this seat belt and retractor unit that is available for individual service replacement is the plastic web stop button that prevents the latch plate from falling to the floor while in the stored position. Refer to the instructions supplied with the service kit for the proper web stop button replacement procedures.
- NOTE:** The following procedure is for replacement of an ineffective or damaged seat belt and retractor unit. The front retractor also includes a seat belt tensioner. If the front seat belt or retractor is ineffective or damaged, but the seat belt tensioner is not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the seat belt tensioner has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the unit from the vehicle. See STANDARD PROCEDURE.
- NOTE:** All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See DESCRIPTION.

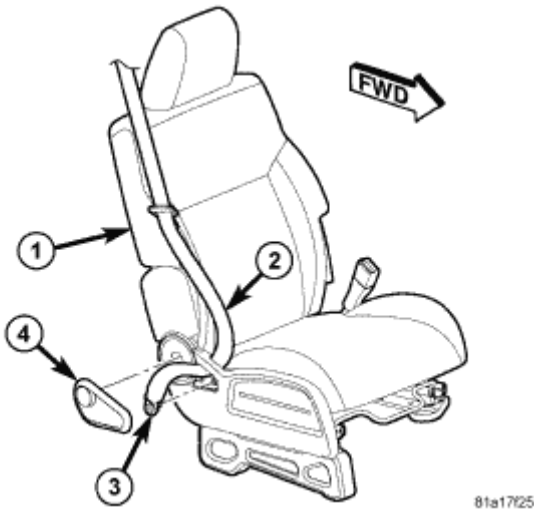


Fig. 73: Identifying Front Seat, Front Seat Belt, Screw & Seat Back Recliner Handle
Courtesy of CHRYSLER LLC

1. Adjust the front seat (1) to its most forward position for easiest access to the front seat belt (2) lower anchor and the B-pillar trim.
2. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.

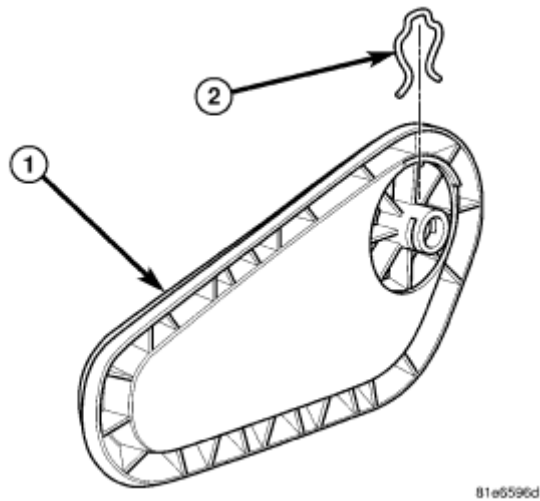


Fig. 74: Identifying Seat Back Recliner Handle & Spring Clip
 Courtesy of CHRYSLER LLC

3. Using a trim stick or another suitable wide flat-bladed tool, gently pry the seat back recliner handle (1) to release the spring clip (2) and remove the handle from the recliner mechanism shaft at the rear of the outboard seat side shield. Optionally, a manual window regulator handle clip removal tool may be used to remove the spring clip from the handle before removing the handle from the recliner mechanism shaft.
4. Using a trim stick or another suitable wide flat-bladed tool, gently pry the rear edge of the seat belt anchor cover to remove it from the outboard seat side shield.
5. Remove the screw that secures the lower anchor to the outboard side of the front seat cushion frame.

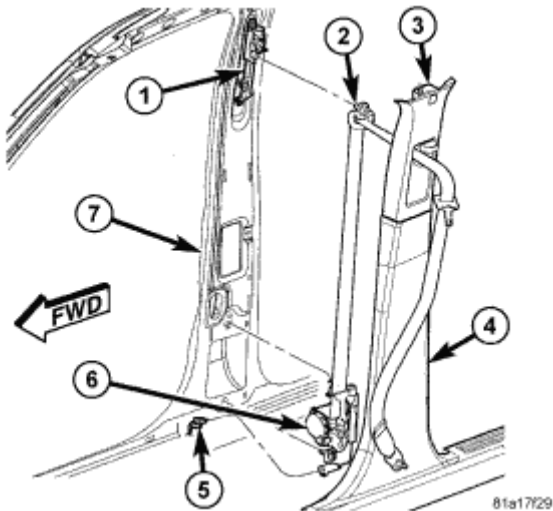


Fig. 75: Identifying Height Adjuster, Seat Belt Turning Loop, Upper Trim, Lower Trim, Body Wire Harness Connector, Lower Retractor & B-Pillar
 Courtesy of CHRYSLER LLC

6. Remove the upper trim (3) from the inside of the B-pillar (7). Refer to **REMOVAL** .
7. Remove the screw that secures the seat belt turning loop (2) to the height adjuster (1) on the upper B-pillar.

8. Remove the seat belt turning loop from the height adjuster.
9. Remove the lower trim (4) from the inside of the B-pillar. Refer to **REMOVAL** .
10. Disconnect the body wire harness connector (5) from the seat belt tensioner pigtail wire connector.
11. Remove the screw that secures the lower retractor (6) bracket to the B-pillar.
12. Disengage the engagement tab on the upper retractor bracket/seat belt web guide from the engagement slot in the B-pillar.
13. Remove the front seat belt and retractor from the B-pillar as a unit.

SECOND ROW CENTER SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

NOTE: All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See **DESCRIPTION**.

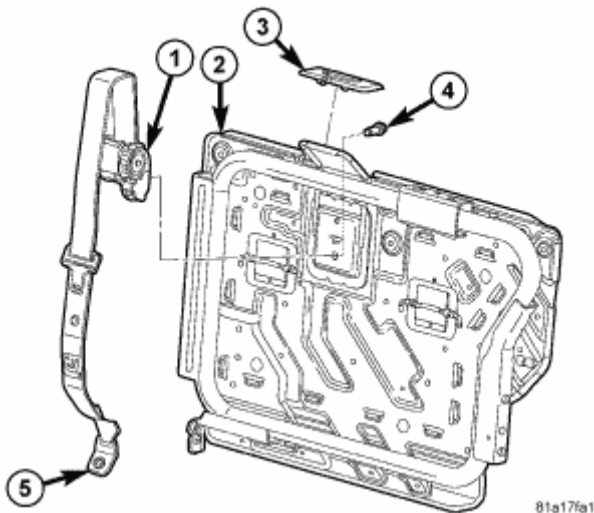


Fig. 76: Identifying Second Row Center Seat Belt Retractor, Seat Back Panel, Bezel, Screw & Anchor Unit

Courtesy of CHRYSLER LLC

NOTE: The anchor plates for the left outboard second row seat belt buckle and the second row center seat belt anchor are secured to each other by a soft metal grommet as an assembly aid during the manufacturing process and, once removed, the grommet does not require reinstallation.

1. Remove the left second row seat belt buckle and center seat belt lower anchor unit (5) from the rear floor panel and separate them from each other. See **REMOVAL**.
2. Remove the second row seat from the vehicle as a unit and place it on a suitable work surface. Be certain to take the proper precautions to prevent the trim cover from receiving cosmetic damage during the following procedures. Refer to **REMOVAL** .
3. Remove the bezel (3), trim cover and foam from the 60 percent seat back panel (2). Refer to **DISASSEMBLY** .
4. Remove the screw (4) that secures the second row center seat belt retractor (1) to the seat back panel.
5. Remove the second row center seat belt and retractor unit from the seat back panel.

SECOND ROW OUTBOARD SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

NOTE: All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See **DESCRIPTION**.

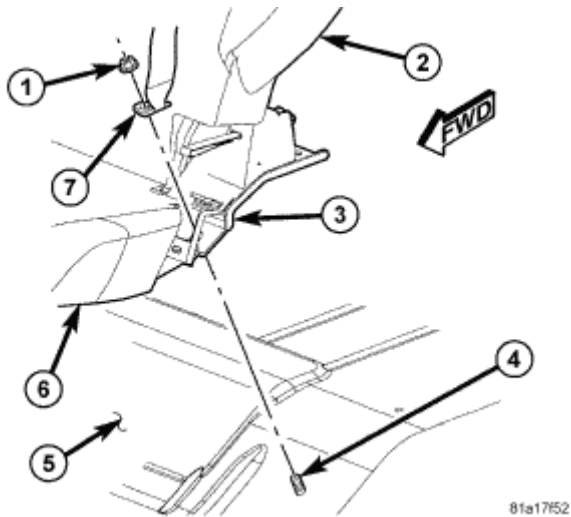


Fig. 77: Identifying Nut, Second Row Seat Back, Outboard Seat Bracket, Stud, Rear Floor Panel, Seat Cushion & Seat Belt Lower Anchor
 Courtesy of CHRYSLER LLC

1. Reach through the outboard opening between the second row seat back (2) and seat cushion (6) to access and remove the nut (1) that secures the seat belt lower anchor (7) and the forward end of the outboard seat bracket (3) to the rear floor panel (5).
2. Remove the seat belt lower anchor from the stud (4).

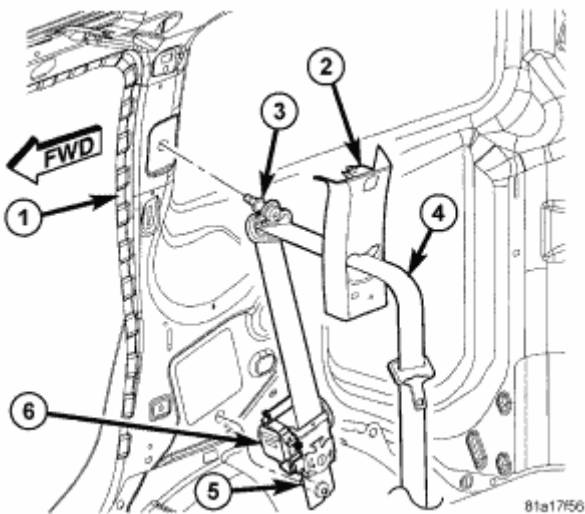


Fig. 78: Identifying Inner C-Pillar, Trim, Screws, Second Row Outboard Seat Belt & Retractor
 Courtesy of CHRYSLER LLC

3. Remove the trim (2) from the inner C-pillar (1). Refer to **REMOVAL** .
4. Remove the screw (3) that secures the seat belt turning loop to the upper C-pillar.
5. Remove the quarter trim panel from the inner lower C-pillar. Refer to **REMOVAL** .
6. Remove the screw (5) that secures the retractor (6) bracket to the lower C-pillar.
7. Remove the second row outboard seat belt (4) and retractor from the C-pillar as a unit.

INSTALLATION

FRONT SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

NOTE: The only component of this seat belt and retractor unit that is available for individual service replacement is the plastic web stop button that prevents the latch plate from falling to the floor while in the stored position. Refer to the instructions supplied with the service kit for the proper web stop button replacement procedures.

NOTE: The following procedure is for replacement of an ineffective or damaged seat belt and retractor unit. The front retractor also includes a seat belt tensioner. If the front seat belt or retractor is ineffective or damaged, but the seat belt tensioner is not deployed, review the recommended procedures for handling non-deployed supplemental restraints. If the seat belt tensioner has been deployed, review the recommended procedures for service after a supplemental restraint deployment before removing the unit from the vehicle. See STANDARD PROCEDURE.

NOTE: All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See DESCRIPTION.

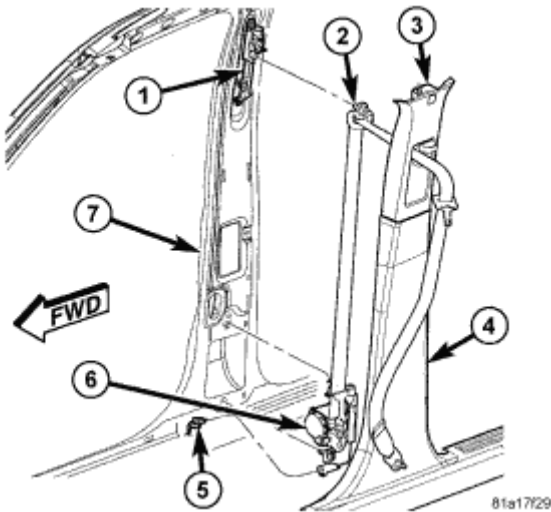


Fig. 79: Identifying Height Adjuster, Seat Belt Turning Loop, Upper Trim, Lower Trim, Body Wire Harness Connector, Lower Retractor & B-Pillar
 Courtesy of CHRYSLER LLC

1. Position the front seat belt and retractor (6) to the inner B-pillar (7) as a unit. Be certain to engage the tab on the upper retractor bracket/seat belt web guide into the engagement slot in the lower B-pillar.
2. Install and tighten the screw that secures the lower retractor bracket to the B-pillar. Tighten the screw to 44.5 N.m (33 ft. lbs.).
3. Reconnect the body wire harness connector (5) to the seat belt tensioner pigtail wire connector.
4. Reinstall the lower trim (4) onto the inside of the B-pillar. Refer to **INSTALLATION** .
5. Position the seat belt turning loop (2) onto the height adjuster (1) on the upper B-pillar. Be certain that the seat belt webbing between the retractor and the turning loop is not twisted.
6. Install and tighten the screw that secures the seat belt turning loop to the height adjuster. Tighten the screw to 44.5 N.m (33 ft. lbs.).
7. Reinstall the upper trim (4) onto the inside of the B-pillar. Refer to **INSTALLATION** .

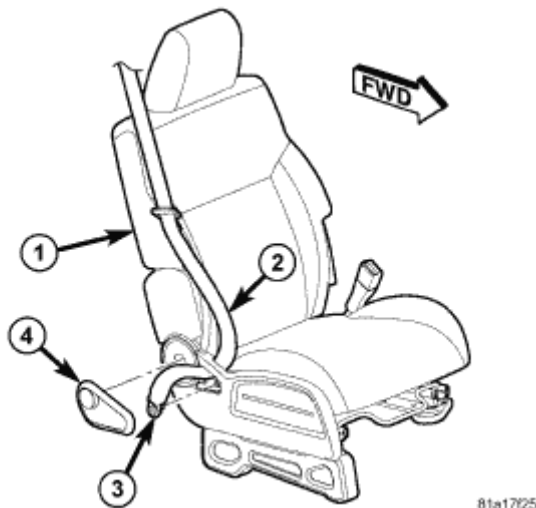


Fig. 80: Identifying Front Seat, Front Seat Belt, Screw & Seat Back Recliner Handle

Courtesy of CHRYSLER LLC

8. Position the front seat belt (2) lower anchor to the outboard side of the front seat (1) cushion frame. Be certain that the seat belt webbing between the turning loop and the lower anchor is not twisted.
9. Install and tighten the screw (3) that secures the lower anchor to the front seat cushion frame. Tighten the screw to 44.5 N.m (33 ft. lbs.).
10. Insert the engagement tab of the seat belt anchor cover into the front of the opening near the rear of the outboard seat side shield. Using hand pressure, press firmly and evenly on the rear of the cover until it snaps into place.
11. Align the seat back recliner handle (4) to the recliner mechanism shaft near the rear of the outboard seat side shield. Using hand pressure, press firmly and evenly on the handle until it snaps into place.
12. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.

SECOND ROW CENTER SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

NOTE: All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See **DESCRIPTION**.

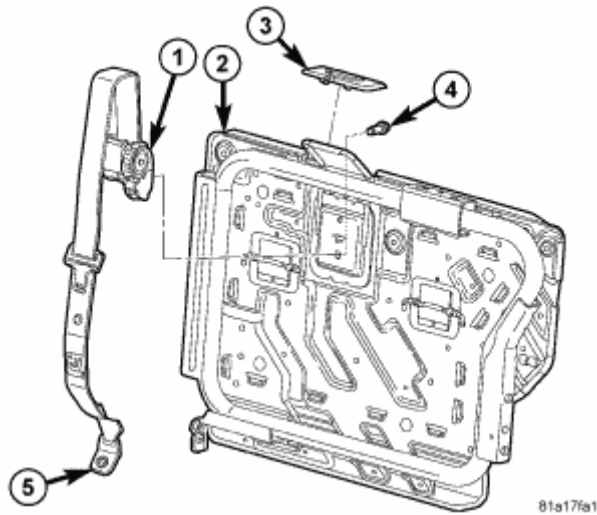


Fig. 81: Identifying Second Row Center Seat Belt Retractor, Seat Back Panel, Bezel, Screw & Anchor Unit

Courtesy of CHRYSLER LLC

NOTE: The anchor plates for the left outboard second row seat belt buckle and the second row center seat belt anchor are secured to each other by a soft metal grommet as an assembly aid during the manufacturing process and, once removed, the grommet does not require reinstallation.

1. Position the second row center seat belt and retractor unit (1) onto the 60 percent seat back panel (2). Be certain to engage the tab on the retractor frame into the keyed hole in the back panel.
2. Install and tighten the screw (4) that secures the retractor to the seat back panel. Tighten the screw to 55 N.m (41 ft. lbs.).
3. Reinstall the foam, trim cover and bezel (3) onto the seat back panel. Be certain the seat belt webbing between the retractor and the bezel is not twisted. Refer to **ASSEMBLY** .
4. Reinstall the second row seat into the vehicle as a unit. Refer to **INSTALLATION** .
5. Reinstall the left second row seat belt buckle and center seat belt lower anchor unit (5) onto the rear floor panel. See **INSTALLATION**.

SECOND ROW OUTBOARD SEAT BELT AND RETRACTOR

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and

unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

NOTE: All seat belt retractors except the driver side front and the second row center retractor include a switchable automatic locking mechanism. See **DESCRIPTION.**

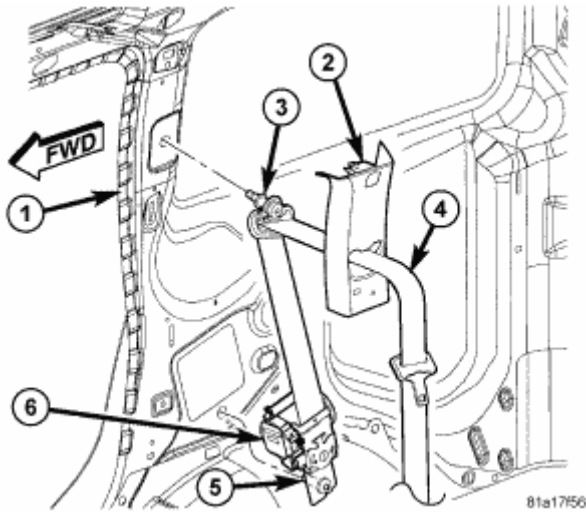


Fig. 82: Identifying Inner C-Pillar, Trim, Screws, Second Row Outboard Seat Belt & Retractor
Courtesy of CHRYSLER LLC

1. Position the second row outboard seat belt (4) and retractor (6) to the lower inner C-pillar (1) as a unit.
2. Install and tighten the screw (5) that secures the retractor bracket to the lower C-pillar. Tighten the screw to 44.5 N.m (33 ft. lbs.).
3. Reinstall the quarter trim panel onto the lower C-pillar. Refer to **INSTALLATION**.
4. Position the seat belt turning loop to the upper C-pillar. Be certain the seat belt webbing between the retractor and the turning loop is not twisted.
5. Install and tighten the screw (3) that secures the seat belt turning loop to the upper C-pillar. Tighten the screw to 44.5 N.m (33 ft. lbs.).
6. Reinstall the trim (2) onto the upper C-pillar. Refer to **INSTALLATION**.

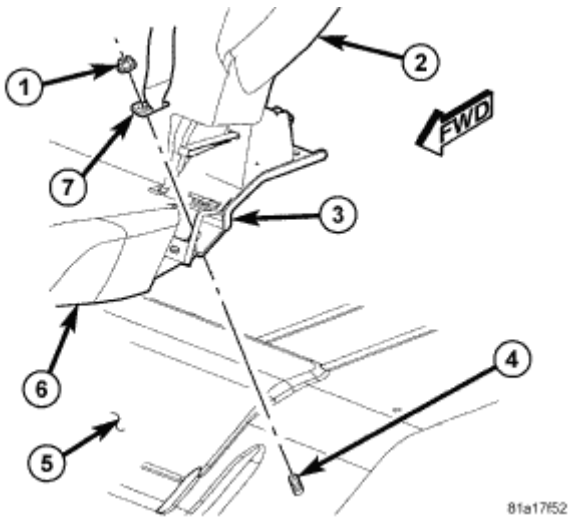


Fig. 83: Identifying Nut, Second Row Seat Back, Outboard Seat Bracket, Stud, Rear Floor Panel, Seat Cushion & Seat Belt Lower Anchor
 Courtesy of CHRYSLER LLC

7. Reach through the outboard opening between the second row seat back (2) and seat cushion (6) to position the lower seat belt anchor (7) over the stud (4) at the forward end of the outboard seat bracket (3) on the rear floor panel (5). Be certain the seat belt webbing between the turning loop and the lower anchor is not twisted.
8. Install and tighten the nut (1) that secures the lower seat belt anchor and the seat bracket to the stud. Tighten the nut to 62.5 N.m (46 ft. lbs.).

SEAT BELT SWITCH

DESCRIPTION

SEAT BELT SWITCH

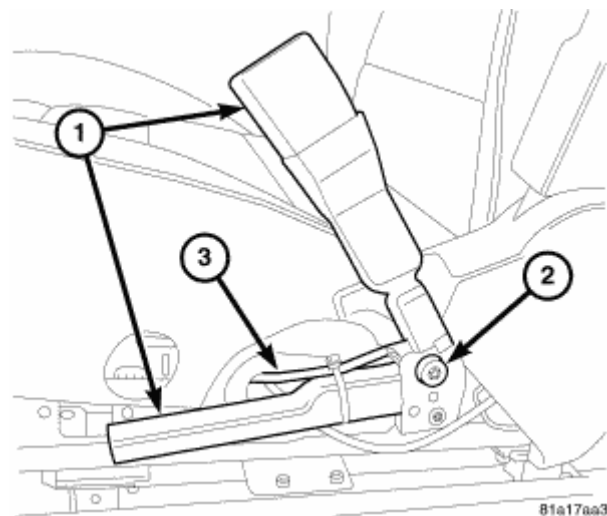


Fig. 84: Identifying Front Seat Belt Buckle And Tensioner Unit, Screw & Pigtail Wire
 Courtesy of CHRYSLER LLC

Two different seat belt switches are used in the front seat buckles of this vehicle. The driver side uses a mechanical switch, while the passenger side is actually a Hall Effect-type sensor. The driver side switch is a small, normally open, single pole, single throw, leaf contact, momentary switch. The driver side seat belt switch is integral to the buckle of the driver side front seat belt buckle. The passenger side switch consists of a fixed-position, Hall Effect Integrated Circuit (IC) chip and a small permanent magnet that is integral to the passenger side front seat belt buckle. The front seat belt buckles (1) are located on a molded plastic scabbard and secured along with the seat belt buckle tensioner mechanism by a screw (2) near the back of the inboard front seat cushion frame.

The seat belt switches are connected to the vehicle electrical system through a two-lead pigtail wire (3) and a four-way connector shared with the buckle tensioner squib circuits on the front seat belt buckle-half, which is connected to a wire harness connector and take out of the seat wire harness routed beneath the front seat cushion. On the passenger side, a one kilohm diagnostic resistor is connected in parallel with the IC where the two pigtail wire leads connect to the IC pins.

The seat belt switches cannot be adjusted or repaired. If ineffective or damaged, the entire front seat belt buckle-half and tensioner unit must be replaced.

OPERATION

SEAT BELT SWITCH

DRIVER SIDE

The driver side front seat belt switch is a hard wired input to the Totally Integrated Power Module (TIPM), which provides electronic **driver side seat belt switch status** messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the Controller Area Network (CAN) data bus. The EMIC controls the seat belt indicator based upon these electronic **driver side seat belt switch status** message inputs.

When the driver side front seat belt tip-half is inserted into the seat belt buckle, the switch closes the path to ground; and, when the driver side front seat belt tip-half is removed from the seat belt buckle, the switch opens the ground path. The switch is actuated by the latch mechanism within the seat belt buckle.

The seat belt switch is connected in series between ground and the seat belt switch sense input of the TIPM. The seat belt switch receives ground at all times through its pigtail wire connection to the seat wire harness from a take out of the body wire harness. An eyelet terminal connector on the body wire harness ground take out is secured beneath a ground screw on the left cowl side inner panel, beneath the instrument panel. The TIPM monitors the condition of the driver seat belt switch circuits and will send an electronic message to illuminate the airbag indicator in the EMIC then store a Diagnostic Trouble Code (DTC) for any fault that is detected.

The hard wired circuits between the driver side seat belt switch and the TIPM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the switch or the electronic controls or communication between other modules and devices that provide features of the supplemental restraint system. The most reliable, efficient, and accurate means to diagnose the driver side seat belt switch or the electronic controls and communication related to seat belt switch operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

PASSENGER SIDE

The passenger side front seat belt switch is a hard wired input to the Occupant Restraint Controller (ORC). A spring-loaded slide with a small window-like opening is integral to the buckle latch mechanism. When a seat belt tip-half is inserted and latched into the seat belt buckle, the slide is pushed downward and the window of the slide exposes the Hall Effect Integrated Circuit (IC) chip within the buckle. The field of the permanent magnet induces a current within the chip. The chip provides this induced current as an output to the ORC. When the seat belt is unbuckled, the spring-loaded slide moves upward and shields the IC from the field of the permanent magnet, causing the output current from the seat belt switch to be reduced.

The passenger side seat belt switch receives a clean ground from the ORC through a hard wired connection, and the ORC senses the status of the seat belt buckle by monitoring the modulation of voltage through its connection to the seat belt switch output. The ORC provides electronic **passenger side seat belt switch status** messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the Controller Area Network (CAN) data bus. The EMIC controls the seat belt indicator based upon these electronic **passenger side seat belt switch status** message inputs. The ORC also monitors the condition of the passenger side seat belt switch circuits and will send an electronic message to illuminate the airbag indicator in the EMIC, then store a DTC for any fault that is detected.

The hard wired circuits between the passenger side seat belt switch and the ORC may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the switch or the electronic controls or communication between other modules and devices that provide features of the supplemental restraint system. The most reliable, efficient, and accurate means to diagnose the passenger side seat belt switch or the electronic controls and communication related to seat belt switch operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

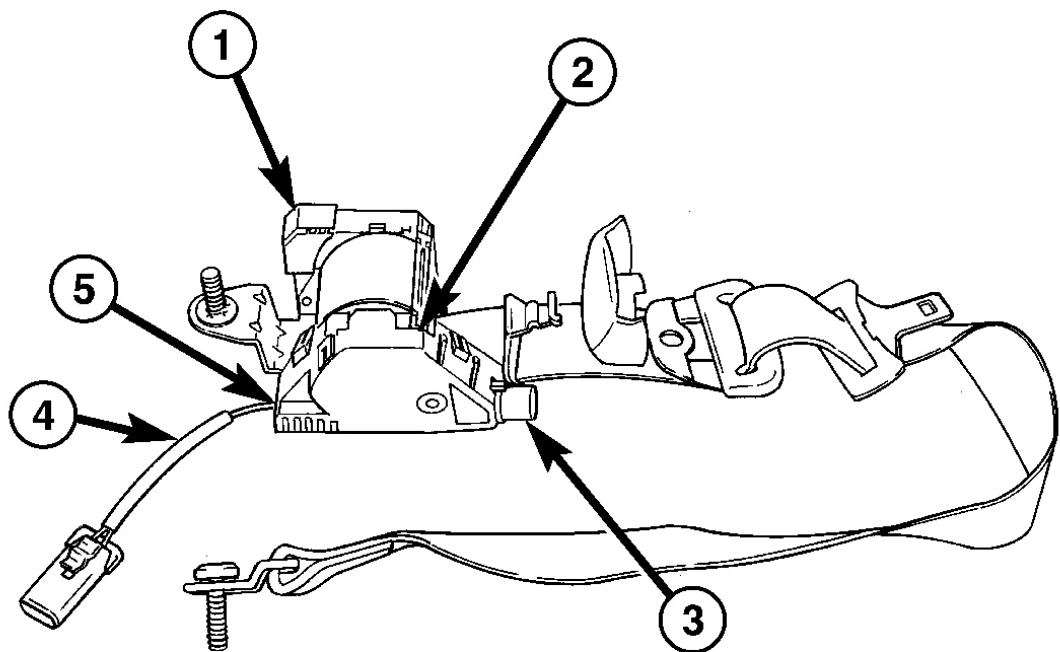
SEAT BELT TENSIONER

DESCRIPTION

SEAT BELT TENSIONER

The driver side front seat belt incorporates dual tensioners: one integral to the retractor, and one integral to the buckle. In vehicles manufactured for domestic markets, the passenger side front seat belt uses a single tensioner integral to the retractor. In vehicles manufactured for export markets, the passenger side front seat belt incorporates dual tensioners: one integral to the retractor, and one integral to the buckle.

RETRACTOR TENSIONER



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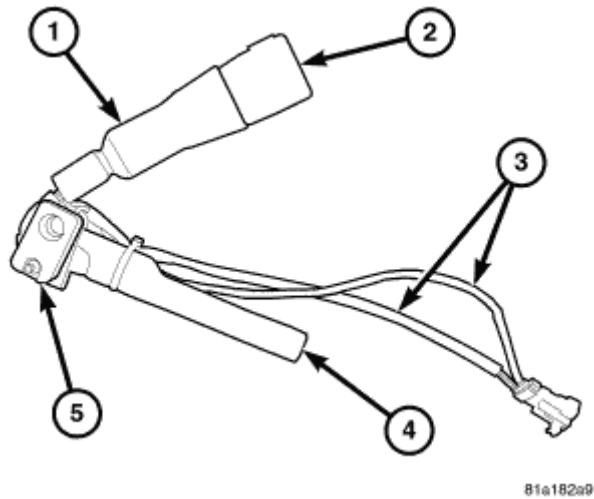
Fig. 85: Seat Belt Tensioner
Courtesy of CHRYSLER LLC

Seat belt retractor tensioners supplement the dual front and side curtain airbag system for all versions of this vehicle. These tensioners are integral to the front seat belt and retractor units (1), which are secured to the B-pillars on the right and left sides of the vehicle. The retractors are concealed beneath the molded plastic B-pillar trim. The seat belt tensioner consists primarily of a molded plastic tensioner housing (2), a tubular metal piston housing (3), a piston, a short rack gear, a set of pinion gears, a pyrotechnically activated gas generator (5), and a short pigtail wire (4).

All of these components are located on one side of the retractor spool on the outside of the retractor housing. The seat belt tensioners are controlled by the Occupant Restraint Controller (ORC) and are connected to the vehicle electrical system through dedicated take outs of the body wire harness by keyed and latching molded plastic connector insulators to ensure a secure connection.

The retractor tensioners cannot be repaired and, if ineffective or damaged, the entire front seat belt and retractor unit must be replaced. The retractor tensioners are not intended for reuse and must be replaced following any front airbag deployment. A locked retractor that will not allow the seat belt webbing to be retracted or extracted is a sure indication that the seat belt tensioner has been deployed and requires replacement. See **REMOVAL**.

BUCKLE TENSIONER



81a182a9

Fig. 86: Identifying Molded Plastic Scabbard, Buckle, Pigtail Harnesses, Steel Cylinder Tube & Bracket
 Courtesy of CHRYSLER LLC

A driver side seat belt buckle tensioner supplements the dual front and side curtain airbags for all versions of this vehicle. In vehicles manufactured for export markets, a passenger side seat belt buckle tensioner also supplements the dual front and side curtain airbags. This tensioner is integral to the front seat belt buckle unit, which is secured by a large screw to the outside of the inboard seat cushion frame of the front seat. The buckle tensioner consists primarily of a buckle (2), a molded plastic scabbard (1), a cable and piston, a cable guide and bracket (5), a steel cylinder tube (4), and a small pyrotechnically activated gas generator.

The buckle tensioner is controlled by the Occupant Restraint Controller (ORC) and is connected to the vehicle electrical system through a dedicated take out of the seat wire harness by a keyed and latching yellow molded plastic connector insulator to ensure a secure connection. The buckle tensioner connector is shared by two pigtail harnesses (3): one two-wire squib pigtail and a second two-wire pigtail for the integral seat belt switch.

The buckle tensioner cannot be repaired and, if ineffective or damaged, the entire front seat belt buckle unit must be replaced. If the front airbags have been deployed, the buckle tensioners have also been deployed. The buckle tensioners are not intended for reuse and must be replaced following any front airbag deployment. See **REMOVAL**.

OPERATION

SEAT BELT TENSIONER

The seat belt retractor and buckle tensioners are deployed by a signal generated by the Occupant Restraint Controller (ORC) through the driver or passenger seat belt tensioner line 1 and line 2 (or squib) circuits. When the ORC sends the proper electrical signal to the tensioners, the electrical energy generates enough heat to initiate a small pyrotechnic gas generator.

On the retractor tensioner, the gas generator is installed in one end of the tubular metal piston housing, which contains a piston and a small rack gear. As the gas expands, it pushes the piston and the rack gear through the tube. The rack gear engages a pinion gear that drives a gear set in the tensioner housing, which rotates the seat belt retractor spool causing the slack to be removed from the front seat belts.

On the buckle tensioner, the gas generator is installed in one end of the tubular metal piston housing, which contains a piston secured to one end of a cable. The cable is routed around an integral guide to the buckle, which is secured to the opposite end of the cable. As the gas expands, it pushes the piston and the cable through the tube and pulls the buckle downward, causing the slack to be removed from the driver side front seat belt.

Removing excess slack from the front seat belts not only keeps the occupants properly positioned for an airbag deployment following a frontal impact of the vehicle, but also helps to reduce injuries that the occupants of the front seat might experience in these situations as a result of a harmful contact with the steering wheel, steering column, instrument panel or windshield. Also, the seat belt retractor has a torsion bar mechanism that is designed to deform in order to control the loading being applied to the occupants by the seat belts during a frontal impact, further reducing the potential for occupant injuries.

The ORC monitors the condition of the seat belt tensioners through circuit resistance, and will illuminate the airbag indicator in the ElectroMechanical Instrument Cluster (EMIC) and store a Diagnostic Trouble Code (DTC) for any fault that is detected. Proper diagnosis of the seat belt tensioner gas generator and squib circuits requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

SEAT BELT TURNING LOOP ADJUSTER

REMOVAL

SEAT BELT TURNING LOOP ADJUSTER

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

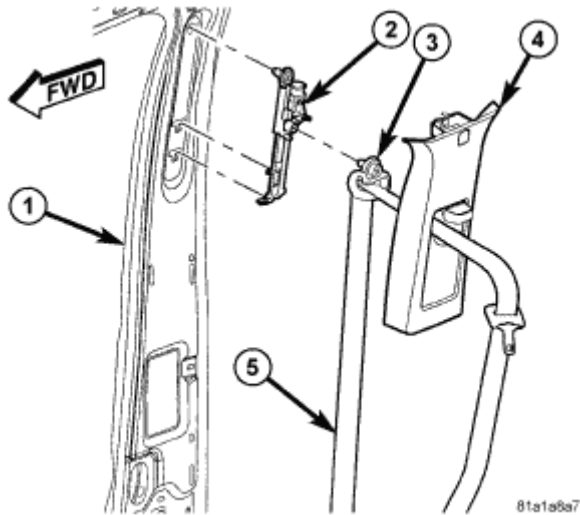


Fig. 87: Identifying B-Pillar, Height Adjuster, Seat Belt Turning Loop & Upper Trim
Courtesy of CHRYSLER LLC

1. Remove the upper trim (4) from the inside of the B-pillar (1). Refer to **REMOVAL** .
2. Remove the screw that secures the seat belt turning loop (3) to the height adjuster (2) on the upper B-pillar.
3. Remove the seat belt turning loop from the height adjuster.
4. Remove the screw that secures the upper end of the seat belt turning loop adjuster to the upper B-pillar.
5. Pull the turning loop adjuster upward and away from the B-pillar far enough to disengage the tabs on the lower end of the adjuster from the keyed holes in the B-pillar.
6. Remove the seat belt turning loop adjuster from the B-pillar.

INSTALLATION

SEAT BELT TURNING LOOP ADJUSTER

WARNING: To avoid serious or fatal injury during and following any seat belt or child restraint anchor service, carefully inspect all seat belts, buckles, mounting hardware, retractors, tether straps, and anchors for proper installation, operation, or damage. Replace any belt that is cut, frayed, or torn. Straighten any belt that is twisted. Tighten any loose fasteners. Replace any belt that has a damaged or ineffective buckle or retractor. Replace any belt that has a bent or damaged latch plate or anchor plate. Replace any child restraint anchor or the unit to which the anchor is integral that has been bent or damaged. Never attempt to repair a seat belt or child restraint component. Always replace damaged or ineffective seat belt and child restraint components with the correct, new and unused replacement parts listed in the DaimlerChrysler Mopar® Parts Catalog.

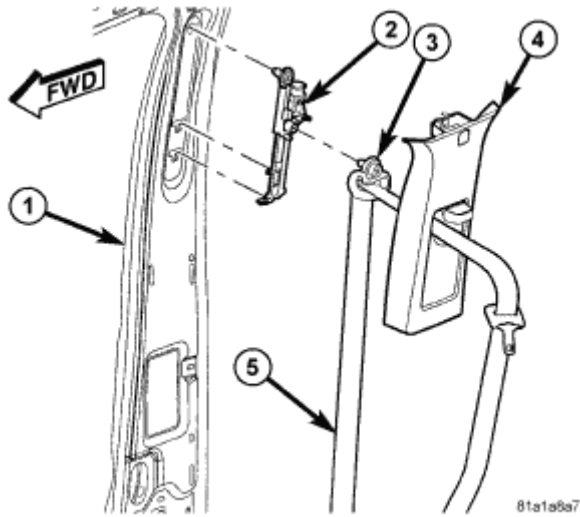


Fig. 88: Identifying B-Pillar, Height Adjuster, Seat Belt Turning Loop & Upper Trim
Courtesy of CHRYSLER LLC

1. Position the seat belt turning loop adjuster (2) to the inner B-pillar (1).
2. Engage the tabs on the lower end of the adjuster into the keyed holes in the B-pillar.
3. Position the upper end of the turning loop adjuster against the B-pillar.
4. Install and tighten the screw that secures the seat belt turning loop adjuster to the upper B-pillar. Tighten the screw to 44.5 N.m (33 ft. lbs.).
5. Position the seat belt turning loop (3) onto the height adjuster on the upper B-pillar. Be certain that the seat belt webbing (5) between the retractor and the turning loop, and between the turning loop and the lower anchor is not twisted.
6. Install and tighten the screw that secures the seat belt turning loop to the height adjuster. Tighten the screw to 44.5 N.m (33 ft. lbs.).
7. Reinstall the upper trim (4) onto the inside of the B-pillar. Refer to **INSTALLATION**.

SEAT WEIGHT SENSOR

DESCRIPTION

SEAT WEIGHT SENSOR

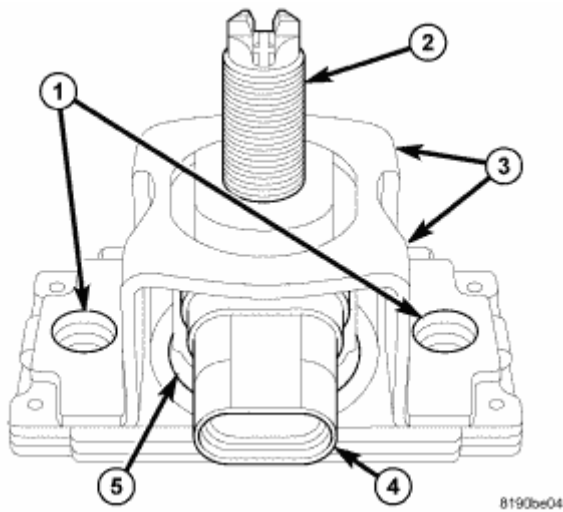


Fig. 89: Identifying Sensor Mounting Flange, Threaded Mounting Stud, Stamped Metal Cage, Sensor Body & Receptacle

Courtesy of CHRYSLER LLC

The seat weight sensors are strain gauge-type units. The electronic elements of the sensor are encased within the sensor body (5) and the sensor body is located within a stamped metal cage (3). Four sensors are used in the Occupant Classification System (OCS). The sensors are located below the seat cushion between the seat adjuster track and the seat track riser at each corner of the passenger side front seat.

A threaded mounting stud (2) on each sensor body is secured by a nut to the seat track riser, and two nuts secure each sensor mounting flange (1) to two studs integral to the front and rear of the inboard and outboard passenger side lower seat adjuster tracks. A molded connector receptacle (4) integral to each sensor body is oriented towards the center of the seat and is connected to the vehicle electrical system through a dedicated connector and take out of the passenger seat wire harness beneath the seat cushion.

The seat weight sensors cannot be adjusted or repaired and, if ineffective or damaged, the entire sensor must be replaced.

OPERATION

SEAT WEIGHT SENSOR

The seat weight sensor units are designed to sense the relative weight of a load applied to the passenger side front seat, which provides a logic input to the microprocessor of the Occupant Classification Module (OCM). When any load is applied to the seat the load is transmitted through the sensor mounting stud to the sensor body (strain gauge) of each sensor, causing a change of electrical resistance through the strain gauge. These changes in resistance within the internal sensor circuitry change the sensor output voltage.

Each weight sensor receives a nominal five volts and a ground through parallel hard wired circuits from the OCM. The OCM then monitors the output voltage of each sensor on dedicated hard wired data communication circuits. The OCM also monitors the condition of the sensor circuits and will store a Diagnostic Trouble Code (DTC) for any fault that is detected, then send messages to the Occupant Restraint Controller (ORC) to illuminate the airbag indicator in the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN).

The hard wired circuits between the seat weight sensor and the OCM may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the seat weight sensors or the electronic controls and communication between other modules and devices that provide features of the Occupant Classification System (OCS). The most reliable, efficient, and accurate means to diagnose the seat weight sensors or the electronic controls and communication related to seat weight sensor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

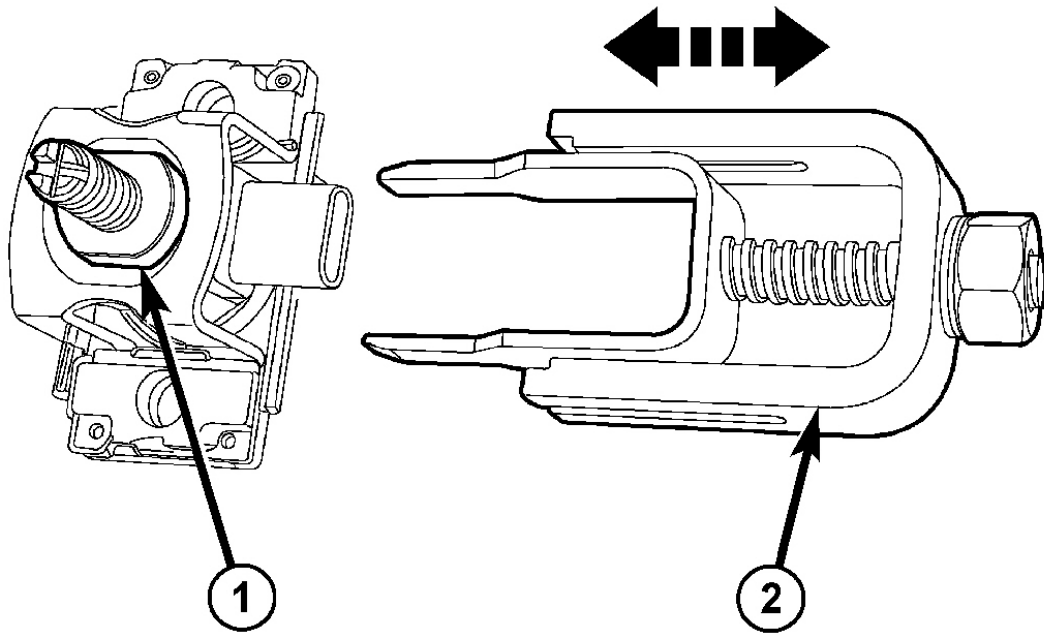
REMOVAL

SEAT WEIGHT SENSOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), do not modify the front passenger seat assembly or center floor console in any way. Do not use any prior year, subsequent year, secondary or aftermarket seat trim covers. At no time should any Supplemental Restraint System (SRS) or OCS component be modified or replaced with any part except those which are specified for the particular vehicle application in the DaimlerChrysler Mopar® Parts Catalog. Failure to observe these precautions could cause an OCS miscalibration condition, which may result in the passenger airbag failing to deploy when required or deploying when not required.

WARNING: To avoid serious or fatal injury, never strike or drop a seat weight sensor or the passenger side front seat assembly to which the sensors are secured as it can damage the sensors or affect their calibration. The seat weight sensors and the passenger side front seat assembly must be handled with care to avoid damage to the sensors. Do not sit upon or place any loads upon a passenger side front seat while it is removed from its mounts in or outside of the vehicle. If an individual sensor is dropped or damaged, replace the sensor with a new and unused unit. If a seat has been dropped during removal or loaded while removed from its mounts, replace each of the seat weight sensors with new and unused units. Failure to observe this warning could result in an accidental, incomplete, or improper passenger side front supplemental restraint deployment.

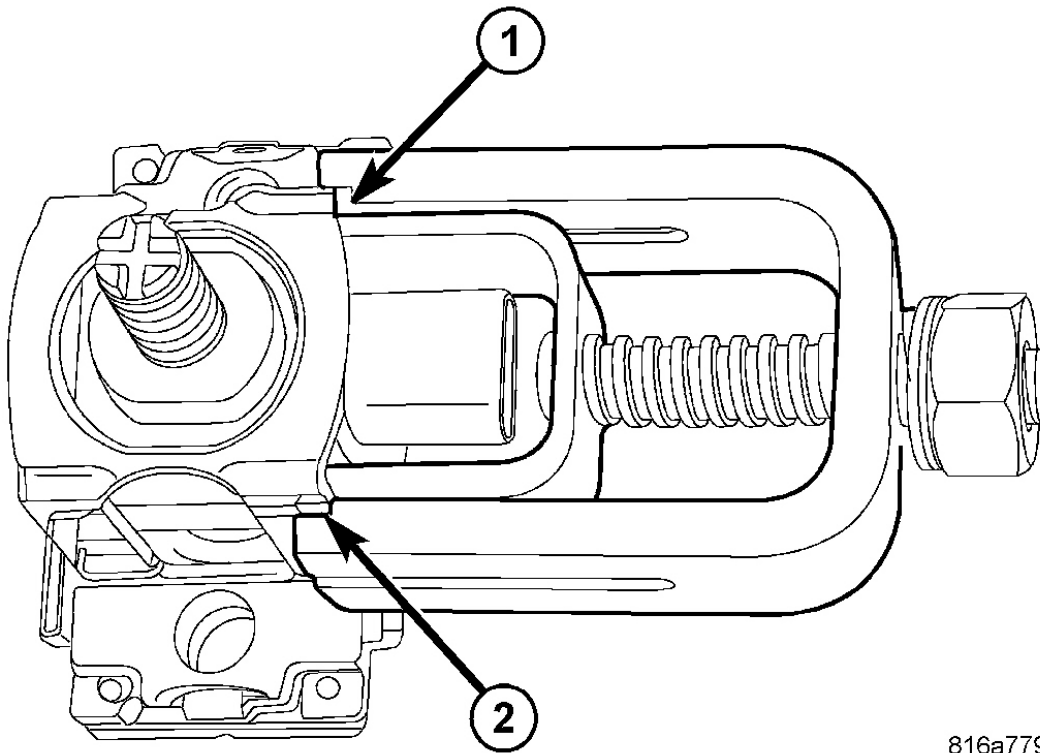


816a7796

Fig. 90: Removing/Installing Seat Weight Sensor
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable. Wait two minutes for the system capacitor to discharge before further service.
2. Remove the passenger side front seat from the vehicle. Refer to **REMOVAL** .
3. From the underside of the seat, disconnect the seat wire harness from the connector receptacles of each of the four weight sensors.
4. Disconnect the seat wire harness from the connector receptacle of the seat track position sensor located on the inboard side of the inboard seat adjuster upper track near the rear of the seat track.

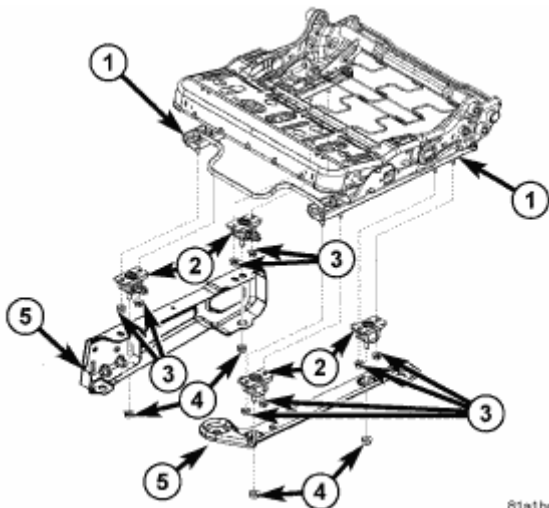
CAUTION: A strain gauge alignment tool (Special Tool No. 9689) (2) must be used to secure the body of the seat weight sensor (1) from any rotation during removal or installation of the nut that secures the sensor stud to the seat track riser. In addition, the sensor fasteners should always be serviced using hand tools **ONLY**, and not electric or pneumatic power tools. Failure to observe these cautions may result in irreversible sensor damage requiring sensor replacement.



816a779e

Fig. 91: Identifying Center Fork & Tool Support Yoke
 Courtesy of CHRYSLER LLC

5. Install the strain gauge alignment tool (Special Tool 9689) on the sensors by inserting the center fork (1) of the tool between the flats on each side of the sensor body and inside of the cage, then seating the tool support yoke (2) firmly against the outside of the sensor cage.



81a1bca1

Fig. 92: Identifying Passenger Side Front Seat Adjuster, Seat Weight Sensor, Nuts & Seat Track

Risers

Courtesy of CHRYSLER LLC

6. With the alignment tool securing the body of the seat weight sensor (2), remove the nut (4) that secures the sensor stud to the seat track riser (5).
7. Transfer the special tool to each weight sensor, one at a time, and remove the nuts that secure the sensor studs to the seat track risers until all four nuts have been removed.
8. Carefully separate the seat track risers from the seat weight sensor studs.
9. Remove the two nuts (3) that secure the sensor to the studs on the lower track of the seat adjuster (1).
10. Remove the seat weight sensor from the seat adjuster.

INSTALLATION

SEAT WEIGHT SENSOR

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), do not modify the front passenger seat assembly or center floor console in any way. Do not use any prior year, subsequent year, secondary or aftermarket seat trim covers. At no time should any Supplemental Restraint System (SRS) or OCS component be modified or replaced with any part except those which are specified for the particular vehicle application in the DaimlerChrysler Mopar® Parts Catalog. Failure to observe these precautions could cause an OCS miscalibration condition, which may result in the passenger airbag failing to deploy when required or deploying when not required.

WARNING: To avoid serious or fatal injury, never strike or drop a seat weight sensor or the passenger side front seat assembly to which the sensors are secured as it can damage the sensors or affect their calibration. The seat weight sensors and the passenger side front seat assembly must be handled with care to avoid damage to the sensors. Do not sit upon or place any loads upon a passenger side front seat while it is removed from its mounts in or outside of the vehicle. If an individual sensor is dropped or damaged, replace the sensor with a new and unused unit. If a seat has been dropped during removal or loaded while removed from its mounts, replace each of the seat weight sensors with new and unused units.

Failure to observe this warning could result in an accidental, incomplete, or improper passenger side front supplemental restraint deployment.

WARNING: To avoid serious or fatal injury on vehicles equipped with the Occupant Classification System (OCS), any time the passenger side front seat assembly has been removed or loosened from the vehicle for service of any vehicle component or system the Occupant Classification System (OCS) Verification Test must be performed using a diagnostic scan tool and the Occupant Classification Seat Weight special tool following reinstallation. Refer to the appropriate diagnostic procedures. Failure to observe this warning could result in an accidental, incomplete, or improper passenger side front supplemental restraint deployment.

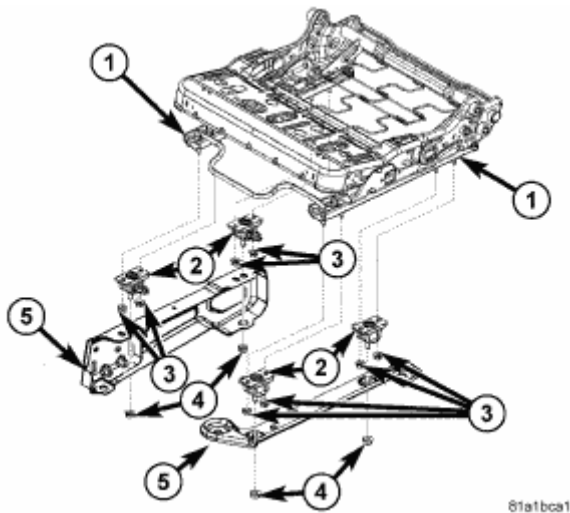
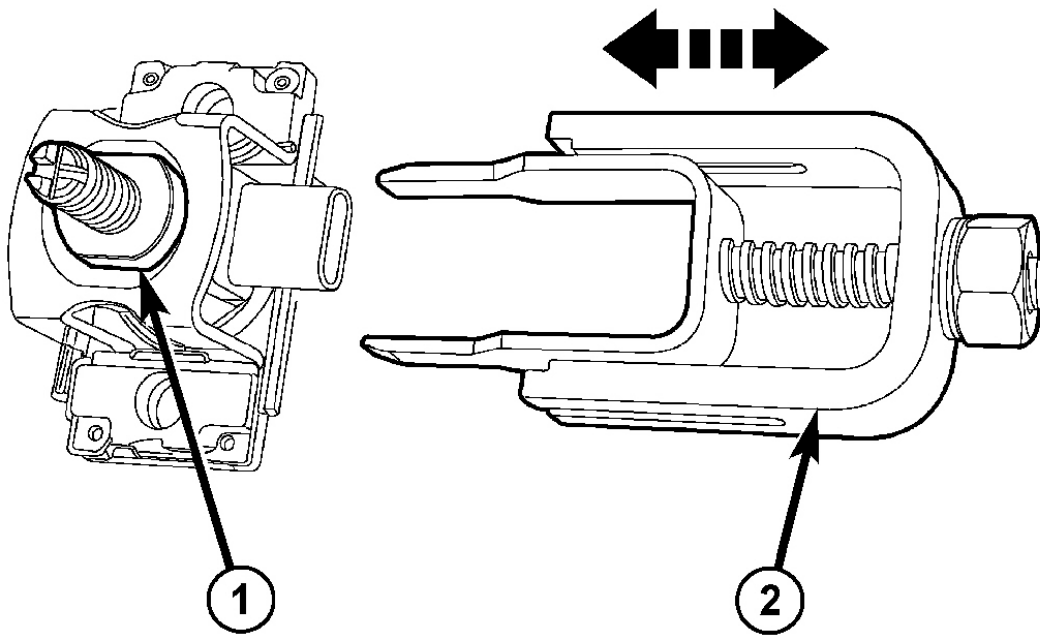


Fig. 93: Identifying Passenger Side Front Seat Adjuster, Seat Weight Sensor, Nuts & Seat Track Risers
Courtesy of CHRYSLER LLC

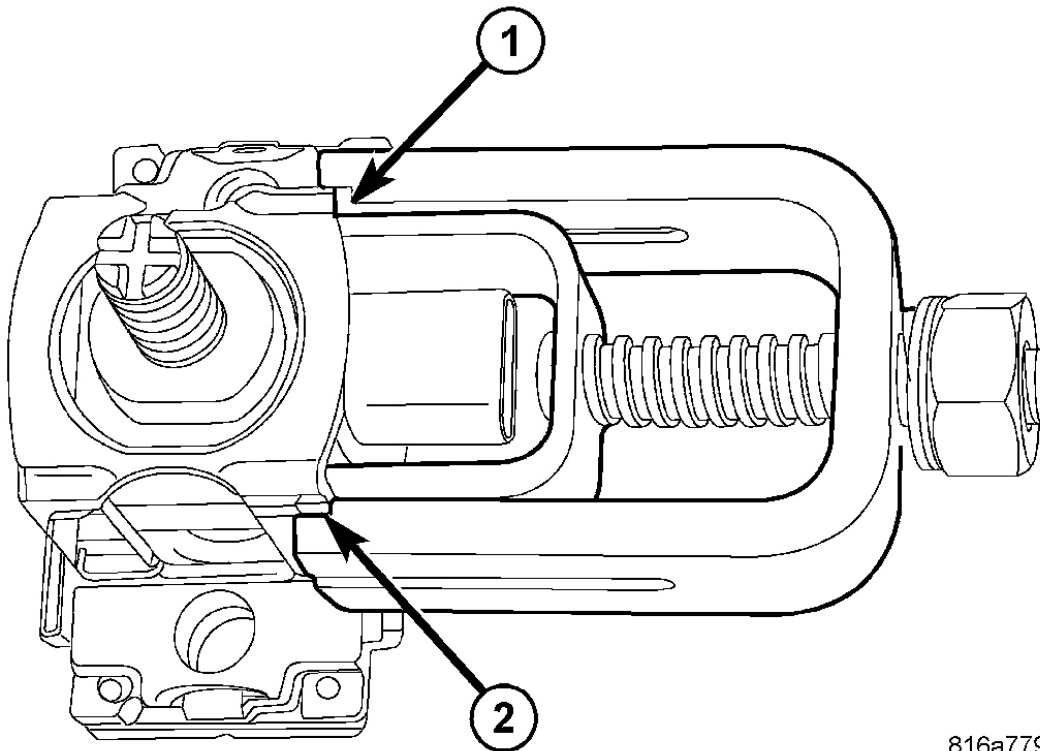
1. Position the seat weight sensor (2) over the studs on the lower track of the passenger side front seat adjuster (1).
2. Install and tighten the two nuts (3) that secure the sensor to the studs. Tighten the nuts to 28 N.m (21 ft. lbs.).
3. Carefully position the seat track risers (5) over all four seat weight sensor studs.



816a7796

Fig. 94: Removing/Installing Seat Weight Sensor
Courtesy of CHRYSLER LLC

CAUTION: A strain gauge alignment tool (Special Tool No. 9689) (2) must be used to secure the body of the seat weight sensor (1) from any rotation during removal or installation of the nut that secures the sensor stud to the seat track riser. In addition, the sensor fasteners should always be serviced using hand tools **ONLY**, and not electric or pneumatic power tools. Failure to observe these cautions may result in irreversible sensor damage requiring sensor replacement.



816a779e

Fig. 95: Identifying Center Fork & Tool Support Yoke
Courtesy of CHRYSLER LLC

4. Install the strain gauge alignment tool (Special Tool 9689) on the sensors by inserting the center fork (1) of the tool between the flats on each side of the sensor body and inside of the cage, then seating the tool support yoke (2) firmly against the outside of the sensor cage.
5. With the alignment tool securing the body of the seat weight sensor, install and tighten the nut that secures the sensor stud to the seat track riser. Tighten the nut to 44.5 N.m (33 ft. lbs.).
6. Transfer the special tool to each weight sensor, one at a time, then install and tighten the nuts that secure each of the four sensor studs to the seat track risers until all four nuts have been installed and tightened.
7. From the underside of the seat, reconnect the seat wire harness to the connector receptacle of the seat track position sensor located on the inboard side of the inboard seat adjuster upper track near the rear of the seat track.
8. Reconnect the seat wire harness to the connector receptacles of each of the four weight sensors.
9. Reinstall the passenger side front seat into the vehicle. Refer to **INSTALLATION**.
10. Do not reconnect the battery negative cable at this time. The Supplemental Restraint System (SRS) verification test procedure should be performed following service of any SRS component. See **STANDARD PROCEDURE**.
11. Following successful completion of the SRS verification test procedure, perform the Occupant Classification System (OCS) Verification Test using a diagnostic scan tool and the Occupant Classification Seat Weight special tool. Refer to the appropriate diagnostic procedures.

2008 ACCESSORIES AND EQUIPMENT

Speed Control - Liberty

SPEED CONTROL

SWITCH

REMOVAL

REMOVAL

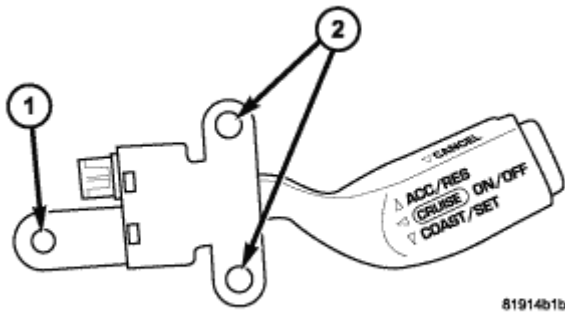


Fig. 1: Speed Control Switch
Courtesy of CHRYSLER LLC

Mounting hole (1) uses a screw. Depending on model line, mounting holes (2) may use either two screws, or one screw and a locating pin.

WARNING:

Do not place a non-deployed airbag face down on a hard surface as the airbag will propel into the air if accidentally deployed, and could result in serious or fatal injury.

Disconnect and isolate the battery negative (ground) cable before beginning steering wheel removal or installation. This will disable the front airbag system. Failure to disconnect the battery could result in accidental front airbag module deployment and possible personal injury.

Allow the front airbag system capacitor to discharge for two minutes before removing the steering wheel or any front airbag system component.

The speed control switch is mounted in the steering wheel and wired through the clock spring device under the airbag module.

1. Adjust steering wheel until tires are in STRAIGHT-AHEAD position.

2. Remove negative battery cable.
3. Turn off ignition.
4. Remove air bag. Refer **REMOVAL** .

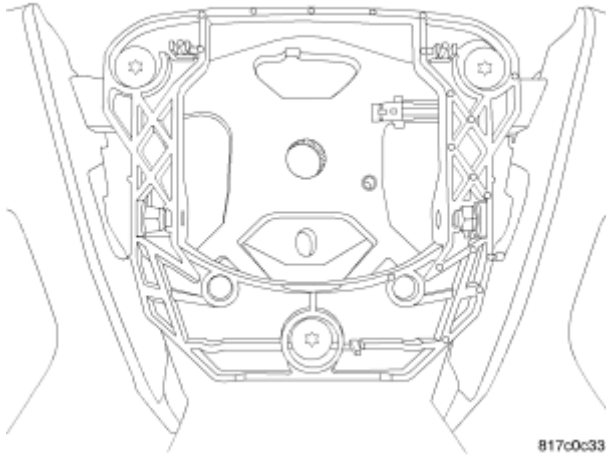
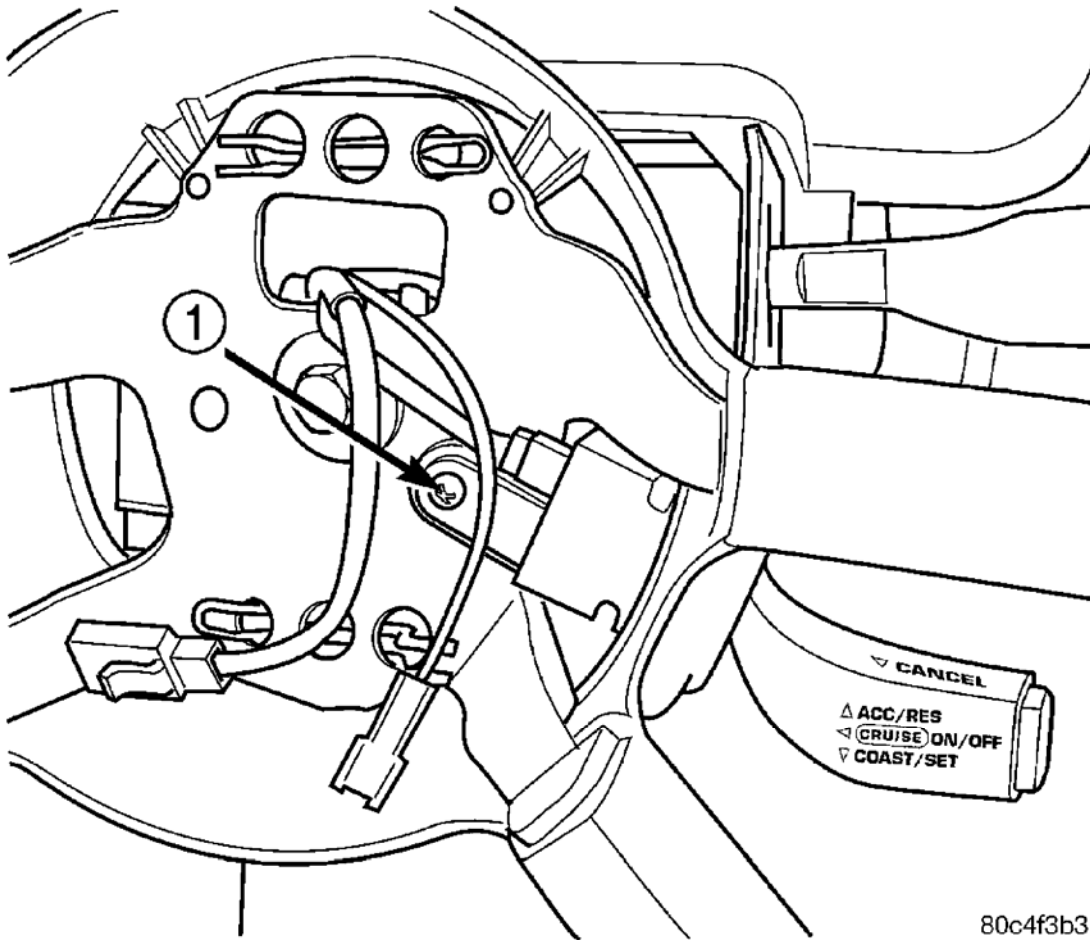


Fig. 2: Horn Switch

Courtesy of CHRYSLER LLC

5. Disconnect connector from clockspring.
6. Remove three mounting fasteners.
7. Remove horn switch.



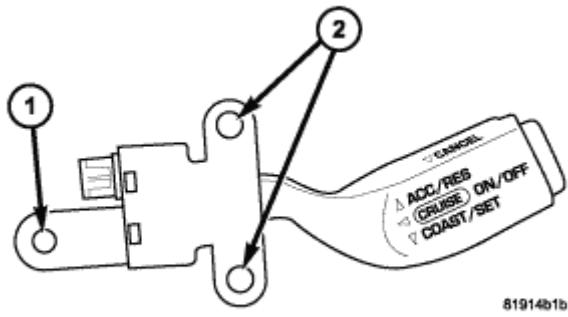
80c4f3b3

Fig. 3: Switch Top Mounting Screw
Courtesy of CHRYSLER LLC

8. Remove either two or three speed control switch mounting screws (1).
9. Disconnect electrical connector.
10. Remove switch.

INSTALLATION

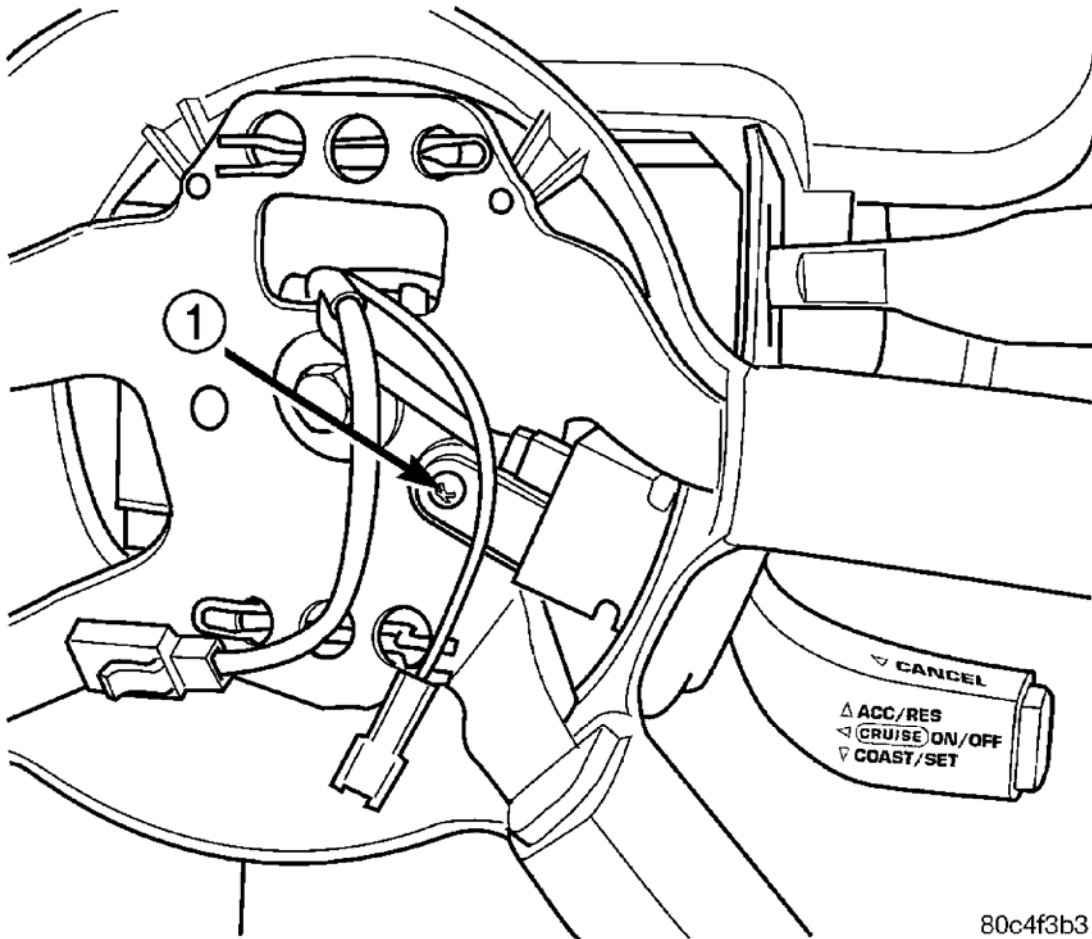
INSTALLATION



81914b1b

Fig. 4: Speed Control Switch
 Courtesy of CHRYSLER LLC

Mounting hole (1) uses a screw. Depending on model line, mounting holes (2) may use either two screws, or one screw and a locating pin.



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Fig. 5: Switch Top Mounting Screw

Courtesy of CHRYSLER LLC

1. Connect electrical connector to speed control switch.
2. Install speed control switch mounting screws.
3. Tighten screws (1) to 1.6 N.m (15 in. lbs.). Make sure rubber seal is in place around switch.

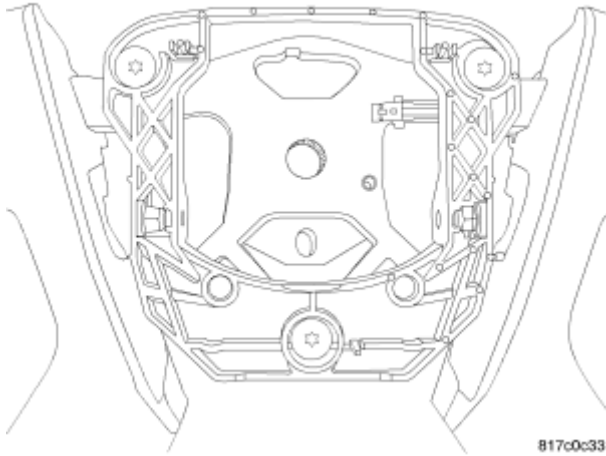


Fig. 6: Horn Switch

Courtesy of CHRYSLER LLC

4. Install horn switch.
5. Install three mounting fasteners.
6. Connect electrical connector to clockspring.
7. Install driver airbag. Refer to **INSTALLATION** .

WARNING: Do not connect battery negative cable yet. Refer first to airbag system test. Refer to DIAGNOSIS AND TESTING .

8. Reconnect battery using Airbag System Test procedure in Restraints. Refer to **DIAGNOSIS AND TESTING** .
9. Close hood.
10. Verify vehicle and system operation.

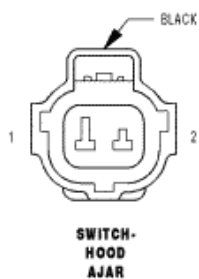
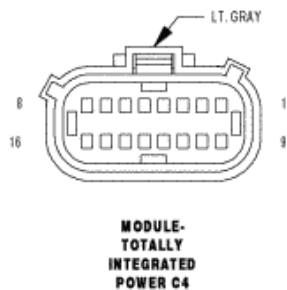
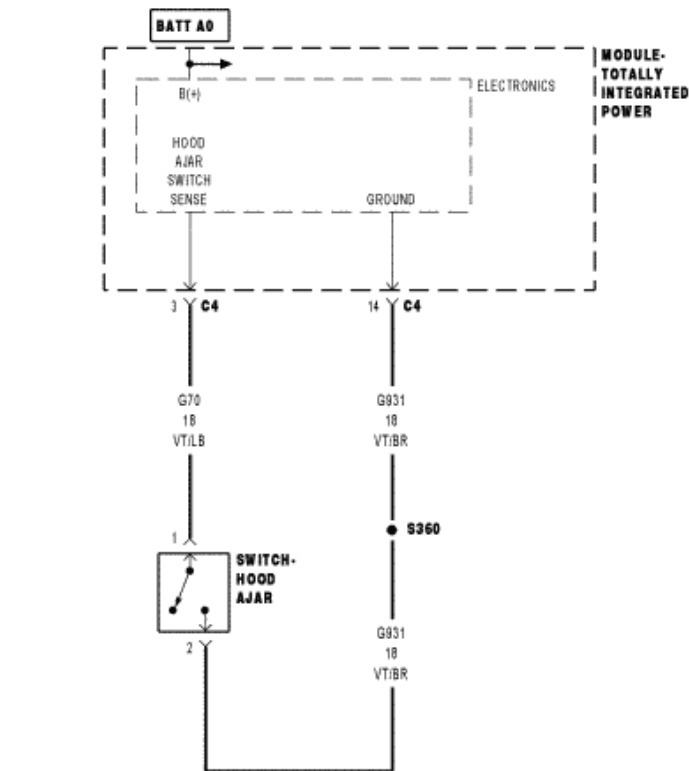
2008 ENGINE

Starting - Electrical Diagnostics - Liberty

STARTING - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1820-HOOD AJAR INPUT CIRCUIT HIGH



9164430

Fig. 1: Hood Ajar Switch Circuit Schematic
 Courtesy of CHRYSLER LLC

For complete wiring diagrams, refer to [SYSTEM WIRING DIAGRAMS](#) article.

When Monitored:

Continuously

Set Condition:

When the TIPM senses the Hood Ajar Switch Sense circuit is open this code will set.

Possible Causes
(G931) GROUND CIRCUIT OPEN
(G70) HOOD AJAR SWITCH SENSE CIRCUIT SHORT TO VOLTAGE
(G70) HOOD AJAR SWITCH SENSE CIRCUIT OPEN
HOOD AJAR SWITCH OPEN
TOTALLY INTEGRATED POWER MODULE (TIPM)

Diagnostic Test

1) TEST FOR INTERMITTENT CONDITION

NOTE: **Open the hood and ensure the Hood Ajar Switch is connected before proceeding**

With the scan tool, record and erase DTC's

Close the hood.

Cycle the ignition from on to off.

Turn the ignition on.

Open then close the hood.

With the scan tool, read DTC's.

Does the scan tool display B1820-HOOD AJAR INPUT CIRCUIT HIGH?

Yes

Go To step 2).

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2) HOOD AJAR SWITCH OPEN

Disconnect the Hood Ajar Switch harness connector.

Depress the plunger of the hood ajar switch and measure the resistance between the two terminals of the switch.

Is the resistance approximately 1K ohms?

Yes

Go To step 3).

No

Replace the Hood Ajar Switch.

Perform **BODY VERIFICATION TEST - VER 1** .

3) (G931) GROUND CIRCUIT OPEN

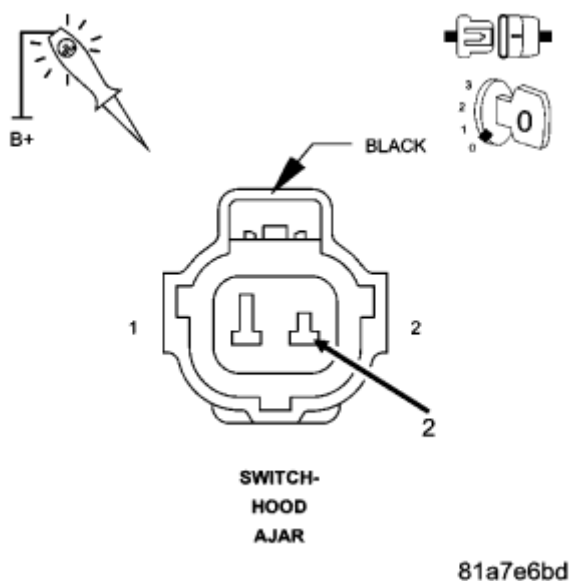


Fig. 2: Using 12-Volt Test Light Connected To 12-Volts To Check Ground Circuit
Courtesy of CHRYSLER LLC

Using a 12-volt Test Light connected to 12-volts, check the (G931) Ground circuit.

Does the test light illuminate?

Yes

Go To step 4).

No

Repair the (G931) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4) (G70) HOOD AJAR SWITCH SENSE CIRCUIT SHORT TO VOLTAGE

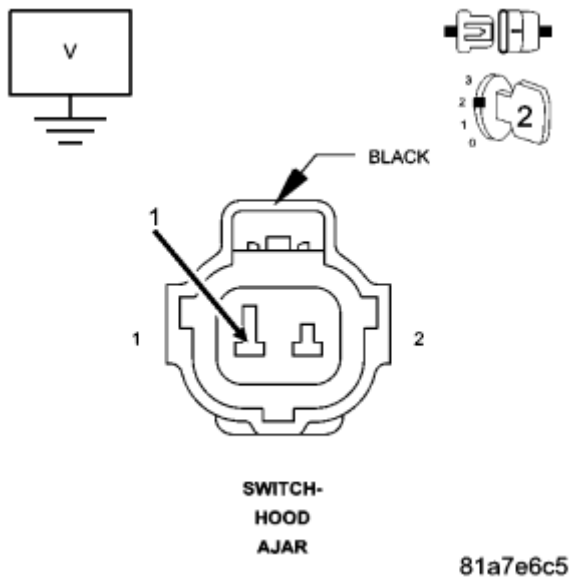


Fig. 3: Measuring Voltage Between (G70) Hood Ajar Switch Sense Circuit And Ground
Courtesy of CHRYSLER LLC

Disconnect the TIPM C4 connector.

Turn the ignition on.

Measure the voltage between the (G70) Hood Ajar Switch Sense circuit and ground.

Is there any voltage present?

Yes

Repair the (G70) Hood Ajar Switch Sense circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To step 5).

5) (G70) HOOD AJAR SWITCH SENSE CIRCUIT OPEN

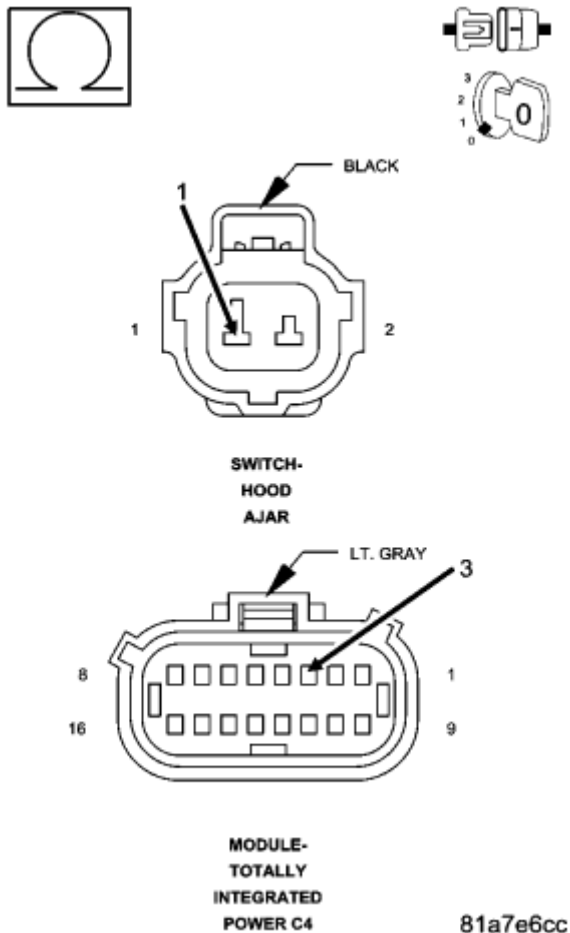


Fig. 4: Measuring Resistance Of (G70) Hood Ajar Switch Sense Circuit Between TIPM C4 Connector And Hood Ajar Switch Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance of the (G70) Hood Ajar Switch Sense circuit between the TIPM C4 connector and the Hood Ajar Switch connector.

Is the resistance below 2.0 ohms?

Yes

Replace the Totally Integrated Module (TIPM) in accordance with the service information.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (G70) Hood Ajar Switch Sense circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

***REMOTE START INOPERATIVE**

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Possible Causes
REMOTE START PARAMETERS NOT MET

Diagnostic Test

1) REMOTE START PARAMETERS NOT MET / FAULTY COMPONENT

Refer to the Data Display in the scan tool to view possible causes of the inoperative Remote Start System.

Repair

See the following list below for possible causes for the inoperative Remote Start System:

- ABORT
- BATTERY VOLTAGE HIGH
- BATTERY VOLTAGE LOW
- BRAKE PRESSED
- COOLANT TEMPERATURE HIGH
- CRANK NO START
- DRIVER DOOR AJAR
- EXCESSIVE GLOW PLUG TIME (DIESEL ONLY)
- FAILED COUNTER REACHED (START)
- HAZARD LAMPS (SWITCH PRESSED)
- HOOD AJAR
- IGNITION IN RUN/START
- IGNITION NOT IN LOCK
- IGNITION SNA (SIGNAL NOT AVAILABLE FROM OTHER MODULE)
- INVALID KEY
- KEY IN IGNITION
- LEFT REAR DOOR AJAR
- LOW RPM SHUTDOWN
- MIL ON
- NO AUTOMATIC TRANSMISSION
- NO HOOD SWITCH (INOPERATIVE)
- NORMAL TIME OUT CUSTOMER ACCESS
- NORMAL TIME OUT RUN MODE (15 MINUTES)
- NOT CONFIGURED

NOT ENABLED
NOT IN PARK OR NEUTRAL
NOT PROGRAMMED
OIL PRESSURE LOW
PANIC MODE (ACTIVATED)
PASSENGER DOOR AJAR
POWER LOSS
RIGHT REAR DOOR AJAR
RKE OFF MESSAGE
RPM TOO HIGH (EXCEEDS 2500)
START COUNTER REACHED
TRUNK/LIFTGATE AJAR
VEHICLE SPEED HIGH
VTA ALARMING

If all of the previous items checked OK, and the remote starting system will not operate, refer to ***REMOTE START INOPERATIVE-ANTENNA** for further information.

***REMOTE START INOPERATIVE-ANTENNA**

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Theory of Operation

The customer may notice that the signal range of the Remote Keyless Entry (RKE) system is reduced. The RKE key fob may need to be closer than 3 meters (10 feet) before the functions available on the key fob will operate. This condition may be due to the RKE antenna. The diagnostic flow chart is provide as a diagnostic aid for dealer technician.

Diagnostic Test

1) LOCK/UNLOCK FUNCTION

NOTE: For all RKE tests, the key must be out of the ignition.

Does the Lock/Unlock function with the interior door switches?

Yes

Go To step 2).

No

Perform Power Lock/Unlock System diagnosis.

2) RKE FUNCTION AT 20 FEET

Does the RKE Function at 20 feet?

Yes

Go To step 3).

No

Go To step 4).

3) RKE FUNCTION AT 100 FEET

Does the RKE Function at 100 feet?

Yes

Test complete.

No

Replace the antenna in accordance with the service information.

4) WCM DTCS

Does the WCM display any DTCS?

Yes

Perform WCM diagnosis.

No

Go To step 5).

5) RKE FUNCTION INSIDE VEHICLE

Sit inside the vehicle.

Push the Key Fob RKE Lock/Unlock buttons.

Does the RKE Lock/Unlock work?

Yes

Go To step 6).

No

Go To step 9).

6) ANTENNA COAX CABLE NOT PROPERLY CONNECTED

Pull on the Antenna COAX cable connector at the WCM.

Did the connector come off without releasing the lock tab (not properly seated)?

Yes

Connect Antenna

Go To step 2).

No

Go To step 7).

7) VERIFY COAX CONNECTION AT WCM

Pull Antenna connector off WCM. Verify no bent pins.

Are there any bent pins?

Yes

Replace antenna.

Go To step 2).

No

Go To step 8).

8) PINCHED WIRE

Inspect the ANTENNA Lead COAX Cable for a pinched wire.

Has the COAX cable been pinched or damaged?

Yes

Replace antenna.

Go To step 2).

No

Perform WCM diagnostics.

9) RKE FUNCTION INSIDE VEHICLE

Disconnect the Antenna COAX Cable lead connector to WCM.

Sit inside the vehicle. Push the RKE Key Fob Lock/Unlock buttons.

Does the RKE Lock/Unlock work?

Yes

Replace the antenna.

No

Go To step 10).

10) CHECK FOR 12 VOLTS AT WCM

Connect the Antenna Lead to WCM.

Disconnect the WCM harness connector.

Using the appropriate wiring diagrams, check for Fused B+ at the WCM harness connector.

Is Fused B+ present?

Yes

Perform WCM diagnostics.

No

Repair the appropriate circuits.

2008 ENGINE

Starting System - Service Information - Liberty

STARTING SYSTEM

DESCRIPTION

DESCRIPTION

The Remote Starting System allows the vehicle to be started up to 300 feet (91 meters) away from the vehicle using the remote keyless entry key fob which is part of your ignition key. In order to remote start your vehicle, the hood, liftgate, and all of the doors must be closed. To remotely start your vehicle, press the "Lock" button on the key fob once, then within three seconds press the "Remote Start" button twice. To indicate that the vehicle is about to start, the parking lights will flash and the horn will sound briefly. Once the vehicle has started, the engine will run for 15 minutes. To cancel remote start, press the "Remote Start" button twice within two seconds. To enter the vehicle while the engine is running during a remote start, you must first unlock the vehicle using the "Unlock" button on the key fob. After the vehicle is unlocked, you have 60 seconds to enter the vehicle, insert the key into the ignition, and move it to the RUN position. Otherwise, the engine will cancel remote start and automatically turn off. Remote start will also cancel if any of the following occur:

- If the engine stalls or RPM exceeds 2500.

- Any engine warning lamps come on.

- The hood is opened.

- The hazard switch is pressed.

- The transmission is moved out of P (Park).

The vehicle can be started remotely up to a maximum of two times. The vehicle is also allowed a maximum of one failed start, where the remote start sequence was initiated but cancelled before the engine begins to crank. After either of these conditions, or if the Vehicle Theft Alarm is alarming, or if the PANIC button was pressed, the vehicle must be reset by inserting a valid key into the ignition and moving it to the RUN position, then back to LOCK.

STARTING SYSTEM

The starting system consists of:

- Starter relay

- Starter motor (including an integral starter solenoid)

Other components to be considered as part of starting system are:

- Battery

- Battery cables

- Ignition switch and key lock cylinder

Clutch pedal position switch (manual transmission)
Park/neutral position switch (automatic transmission)
Wire harnesses and connections.

The Battery, Starting, and Charging systems operate in conjunction with one another, and must be tested as a complete system. For correct operation of starting/charging systems, all components used in these 3 systems must perform within specifications. When attempting to diagnose any of these systems, it is important that you keep their interdependency in mind.

The diagnostic procedures used in each of these articles include the most basic conventional diagnostic methods, to the more sophisticated On-Board Diagnostics (OBD) built into the Powertrain Control Module (PCM). Use of an induction-type milliampere ammeter, volt/ohmmeter, battery charger, carbon pile rheostat (load tester), and 12-volt test lamp may be required.

Certain starting system components are monitored by the PCM and may produce a Diagnostic Trouble Code (DTC).

OPERATION

OPERATION

Remote Start Operating Conditions

In order to operate remote start, the following conditions must be met:

- Key fob sequence must be operated within a 100 meter range of the vehicle.
- The vehicle must be in Park.
- Key is not in the ignition.
- The hazard switch off.
- Vehicle Theft Alarm or Panic is not alarming.
- Doors and hood must be closed.
- The battery voltage is normal (11 to 15 volts).

Remote Start Shut Down/Deactivate Conditions

Engine will NOT start or will shut down/deactivate during any of the following conditions:

- Key in Ignition.
- Doors or hood are opened before remote unlock.
- Hazard Switch depressed.
- Panic or theft alarm active.
- Brake applied.
- A prior remote start cranked the engine , but failed to start the engine.
- Battery voltage NOT in the normal range.

- High (run away) or Low Idle (stall) RPM.
- MIL Active.
- High Engine Coolant Temperature.
- Low Engine Oil Pressure.

Initiate Remote Start

To Remote Start the vehicle:

1. Press remote button on the Key Fob twice within 5 seconds.

NOTE: Engine will run for 15 minutes after a remote start is initiated. After 15 minutes, the engine will shut off. The system allows for only two sequential remote starts without a key ignition cycle.

2. Unlock vehicle with Key Fob to enter the vehicle.
3. Put key in ignition, turn key to run position to exit remote start and enter a normal start without engine shut off.

Identification that Remote Start is Activated

To identify that Remote Start has been activated the following will occur:

- Horn will sound and lights will flash to acknowledge a start command was received.
- Park Lamps will turn on to indicate that the engine is running in remote start mode.

Terminate Remote Start

To terminate Remote Start, press Remote Start button on the Key Fob once.

NOTE: In order to avoid inadvertent shut downs, the one-time press to shut down the vehicle will be disabled for two seconds after receipt of a valid remote start request.

STARTING SYSTEM

The starting system components form two separate circuits. A high-amperage feed circuit that feeds the starter motor between 150 and 350 amperes (700 amperes - diesel engine), and a low-amperage control circuit that operates on less than 20 amperes. The high-amperage feed circuit components include the battery, the battery cables, the contact disc portion of the starter solenoid, and the starter motor. The low-amperage control circuit components include the ignition switch, the clutch pedal position switch (manual transmission), the park/neutral position switch (automatic transmission), the starter relay, the electromagnetic windings of the starter solenoid, and the connecting wire harness components.

If the vehicle is equipped with a manual transmission, it has a clutch pedal position switch installed in series between the ignition switch and the coil battery terminal of the starter relay. This normally open switch prevents

the starter relay from being energized when the ignition switch is turned to the momentary Start position, unless the clutch pedal is depressed. This feature prevents starter motor operation while the clutch disc and the flywheel are engaged. The starter relay coil ground terminal is always grounded on vehicles with a manual transmission.

If the vehicle is equipped with an automatic transmission, battery voltage is supplied through the low-amperage control circuit to the coil battery terminal of the starter relay when the ignition switch is turned to the momentary Start position. The park/neutral position switch is installed in series between the starter relay coil ground terminal and ground. This normally open switch prevents the starter relay from being energized and the starter motor from operating unless the automatic transmission gear selector is in the Neutral or Park positions.

When the starter relay coil is energized, the normally open relay contacts close. The relay contacts connect the relay common feed terminal to the relay normally open terminal. The closed relay contacts energize the starter solenoid coil windings.

The energized solenoid pull-in coil pulls in the solenoid plunger. The solenoid plunger pulls the shift lever in the starter motor. This engages the starter overrunning clutch and pinion gear with the starter ring gear on the manual transmission flywheel or on the automatic transmission torque converter or torque converter drive plate.

As the solenoid plunger reaches the end of its travel, the solenoid contact disc completes the high-amperage starter feed circuit and energizes the solenoid plunger hold-in coil. Current now flows between the solenoid battery terminal and the starter motor, energizing the starter.

Once the engine starts, the overrunning clutch protects the starter motor from damage by allowing the starter pinion gear to spin faster than the pinion shaft. When the driver releases the ignition switch to the On position, the starter relay coil is de-energized. This causes the relay contacts to open. When the relay contacts open, the starter solenoid plunger hold-in coil is de-energized.

When the solenoid plunger hold-in coil is de-energized, the solenoid plunger return spring returns the plunger to its relaxed position. This causes the contact disc to open the starter feed circuit, and the shift lever to disengage the overrunning clutch and pinion gear from the starter ring gear.

DIAGNOSIS AND TESTING

D & T REMOTE STARTING SYSTEM

Before attempting to diagnose a problem with the remote starting system, first be sure the starter motor and starter solenoid are working properly. The starter should operate with the use of the standard ignition key in the ignition switch. Any starter or solenoid problems must be repaired first.

Also be sure the engine will easily start and run with the use of the standard ignition key in the ignition switch. Any engine running, idling or driveability problems must be repaired first.

Also note that the remote start system will automatically be cancelled if any of the following occur:

- IF THE ENGINE STALLS OR RPM EXCEEDS 2500
- NORMAL TIME OUT RUN MODE (15 MINUTES)

- CUSTOMER MOVES IGNITION INTO RUN/START
- ANY VEHICLE DOOR AJAR
- TRUNK/LIFTGATE AJAR
- HOOD AJAR
- START COUNTER REACHED
- LOW RPM SHUTDOWN
- KEY IN IGNITION
- BRAKE PRESSED
- THE HAZARD SWITCH IS PRESSED
- NOT IN PARK OR NEUTRAL
- VEHICLE SPEED HIGH
- VTA ALARM TRIGGERED
- PANIC MODE ACTIVATED
- BATTERY VOLTAGE HIGH
- BATTERY VOLTAGE LOW
- LOSS OF BATTERY VOLTAGE
- MIL ON
- LOW OIL PRESSURE
- COOLANT TEMPERATURE HIGH
- CRANK NO START
- RKE OFF MESSAGE
- VEHICLE NOT CONFIGURED
- HOOD SWITCH NOT INSTALLED OR INOPERATIVE
- NO AUTOMATIC TRANSMISSION
- INVALID KEY
- IGNITION SNA
- IGNITION NOT IN LOCK
- EXCESSIVE GLOW PLUG TIME (DIESEL ONLY)
- VEHICLE IN SHIPPING MODE
- VEHICLE NOT PROGRAMMED

If all of the previous items checked OK, and the remote starting system will not operate, refer to **STARTING - ELECTRICAL DIAGNOSTICS** for further information.

STARTING SYSTEM

The battery, starting, and charging systems operate in conjunction with one another, and must be tested as a complete system. For correct starting/charging system operation, all of the components involved in these three systems must perform within specifications.

Starting System Diagnosis

CONDITION	POSSIBLE CAUSE	CORRECTION
STARTER FAILS TO OPERATE.	1. Battery discharged or faulty.	1. Refer to <u>BATTERY SYSTEM - SERVICE INFORMATION</u> . Charge or replace battery, if required.
	2. Starting circuit wiring faulty.	2. Refer to <u>SYSTEM WIRING DIAGRAMS</u> article . Test and repair starter feed and/or control circuits, if required.
	3. Starter relay faulty.	3. The starter relay is located within the TIPM (Totally Integrated Power Module). Refer to <u>*ETC INTERMITTENT NO CRANK CONDITION</u>
	4. Ignition switch faulty.	4. Refer to <u>SWITCH-IGNITION</u> and <u>CYLINDER-KEY/LOCK</u> . Replace ignition switch if required.
	5. Clutch pedal position switch faulty.	5. Refer to <u>SWITCH-CLUTCH PEDAL POSITION</u> .
	6. Park/Neutral position switch faulty or misadjusted.	6. Refer to <u>TRANSMISSION RANGE SENSOR</u> . Replace park/neutral position switch if required.
	7. Starter solenoid faulty.	7. Refer to <u>MOTOR - STARTER</u> . Replace starter motor assembly if required.
	8. Starter motor faulty.	8. If all other starting system components and circuits test OK, replace starter motor.
STARTER ENGAGES, FAILS TO TURN ENGINE.	1. Battery discharged or faulty.	1. Refer to <u>BATTERY SYSTEM - SERVICE INFORMATION</u> article . Charge or replace battery if required.
	2. Starting circuit wiring faulty.	2. Refer to <u>SYSTEM WIRING DIAGRAMS</u> article . Test and repair starter feed and/or control circuits if required.
	3. Starter motor faulty.	3. If all other starting system components and circuits test OK, replace starter motor assembly.
	4. Engine seized.	4. Refer to <u>3.7L - SERVICE INFORMATION</u> article.
STARTER ENGAGES, SPINS OUT BEFORE ENGINE STARTS.	1. Starter ring gear faulty.	1. Refer to <u>MOTOR - STARTER</u> . Remove starter motor to inspect starter ring gear. Replace starter ring gear if required.
	2. Starter motor faulty.	2. If all other starting system components and circuits test OK, replace starter motor assembly.
STARTER DOES NOT DISENGAGE.	1. Starter motor improperly installed.	1. Refer to <u>MOTOR - STARTER</u> . Tighten starter mounting hardware to

		correct torque specifications.
	2. Starter relay faulty.	2. The starter relay is located within the TIPM (Totally Integrated Power Module). Refer to <u>*NO CRANK CONDITION</u> .
	3. Ignition switch faulty.	3. Refer to <u>SWITCH-IGNITION</u> and <u>CYLINDER-KEY/LOCK</u> . Replace ignition switch if required.
	4. Starter motor faulty.	4. If all other starting system components and circuits test OK, replace starter motor.

INSPECTION

For complete starter wiring circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article . Before removing any unit from starting system for repair or diagnosis, perform the following inspections:

WARNING: On vehicles equipped with airbags, refer to **RESTRAINTS - SERVICE INFORMATION** article , before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

Battery - Visually inspect battery for indications of physical damage and loose or corroded cable connections. Determine state-of-charge and cranking capacity of battery. Charge or replace battery if required. **Note: If equipped with diesel engine, a dual battery system may be used, and both batteries must be inspected.**

Ignition Switch - Visually inspect ignition switch for indications of physical damage and loose or corroded wire harness connections. Refer to **Ignition Switch and Key Lock Cylinder**.

Clutch Pedal Position Switch - If equipped with manual transmission, visually inspect clutch pedal position switch for indications of physical damage and loose or corroded wire harness connections. Refer to **SWITCH-CLUTCH PEDAL POSITION** .

Park/Neutral Position Switch - If equipped with automatic transmission, visually inspect park/neutral position switch for indications of physical damage and loose or corroded wire harness connections. Refer to **TRANSMISSION RANGE SENSOR** .

Starter Relay - The starter relay is located within the TIPM (Totally Integrated Power Module). Refer to ***NO CRANK CONDITION** .

Starter Motor - Visually inspect starter motor for indications of physical damage and loose or corroded wire harness connections.

Starter Solenoid - Visually inspect starter solenoid for indications of physical damage and loose or corroded wire harness connections.

Wiring - Visually inspect wire harnesses for damage. Repair or replace any faulty wiring, as required. Refer to **SYSTEM WIRING DIAGRAMS** article .

TESTING

COLD CRANKING TEST

NOTE: For complete starter wiring circuit diagrams, refer to SYSTEM WIRING DIAGRAMS article . The battery must be fully-charged and load-tested before proceeding.

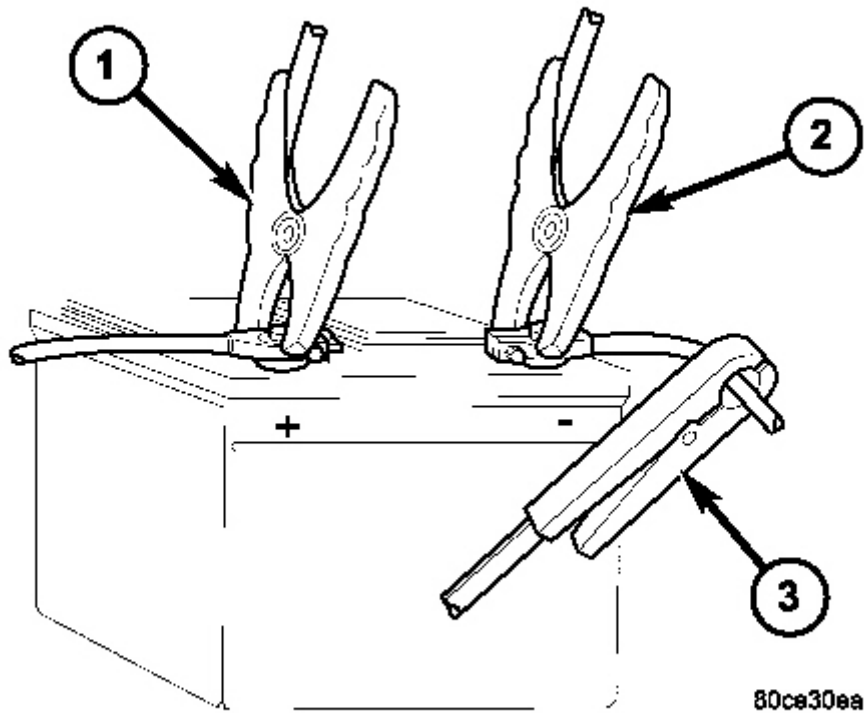


Fig. 1: Connecting Volt-Ampere Tester To Battery Terminals - Typical
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - POSITIVE CLAMP
2 - NEGATIVE CLAMP
3 - INDUCTION AMMETER CLAMP |
|---|

1. Connect volt-ampere tester (1) and (2) to battery terminals. See **Fig. 1**. See instructions provided by manufacturer of volt-ampere tester being used. **Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, tester should be connected to battery on left side of vehicle only. Also, tester current reading must be taken from positive battery cable lead that connects to starter motor.**
2. Fully engage parking brake.
3. If equipped with manual transmission, place gearshift selector lever in Neutral position and block clutch

pedal in fully depressed position. If equipped with automatic transmission, place gearshift selector lever in Park position.

4. Verify that all lamps and accessories are turned off.
5. To prevent a gasoline engine from starting, remove either the ignition run fuse, or the fuel pump control fuse. To prevent a diesel engine from starting, disconnect the electrical connectors at both the camshaft and crankshaft position sensors.

WARNING: Attempt to start engine a few times before proceeding with following step.

NOTE: A cold engine will increase starter current (amperage) draw reading, and reduce battery voltage reading.

6. Rotate and hold ignition switch in Start position. Note cranking voltage and current (amperage) draw readings shown on volt-ampere tester.
 - If voltage reads below 9.6 volts, refer to **Starter Motor** . If starter motor is OK, refer to **Engine Diagnosis** in 9, Engine for further testing of engine. If starter motor is not OK, replace faulty starter motor.
 - If voltage reads above 9.6 volts and current (amperage) draw reads below specifications, refer to **FEED CIRCUIT TEST**.
 - If voltage reads 12.5 volts or greater and starter motor does not turn, refer to **CONTROL CIRCUIT TESTING**.
 - If voltage reads 12.5 volts or greater and starter motor turns very slowly, refer to **FEED CIRCUIT TEST**.

FEED CIRCUIT TEST

The starter feed circuit test (voltage drop method) will determine if there is excessive resistance in high-amperage feed circuit. For complete starter wiring circuit diagrams, refer to **SYSTEM WIRING DIAGRAMS** article .

When performing these tests, it is important to remember that voltage drop is giving an indication of resistance between two points at which voltmeter probes are attached.

Example: When testing resistance of positive battery cable, touch voltmeter leads to positive battery cable clamp and cable connector at starter solenoid. If you probe positive battery terminal post and cable connector at starter solenoid, you are reading combined voltage drop in positive battery cable clamp-to-terminal post connection and positive battery cable.

The following operation will require a voltmeter accurate to 1/10 (0.10) volt. Before performing tests, be certain that following procedures are accomplished:

Battery is fully-charged and load-tested.

Fully engage parking brake.

If equipped with manual transmission, place gearshift selector lever in Neutral position and block clutch

pedal in fully depressed position. If equipped with automatic transmission, place gearshift selector lever in Park position.

Verify that all lamps and accessories are turned off.

To prevent a gasoline engine from starting, remove Automatic ShutDown (ASD) relay. To prevent a diesel engine from starting, remove Fuel Pump Relay. These relays are located in Power Distribution Center (PDC). Refer to label on PDC cover for relay location.

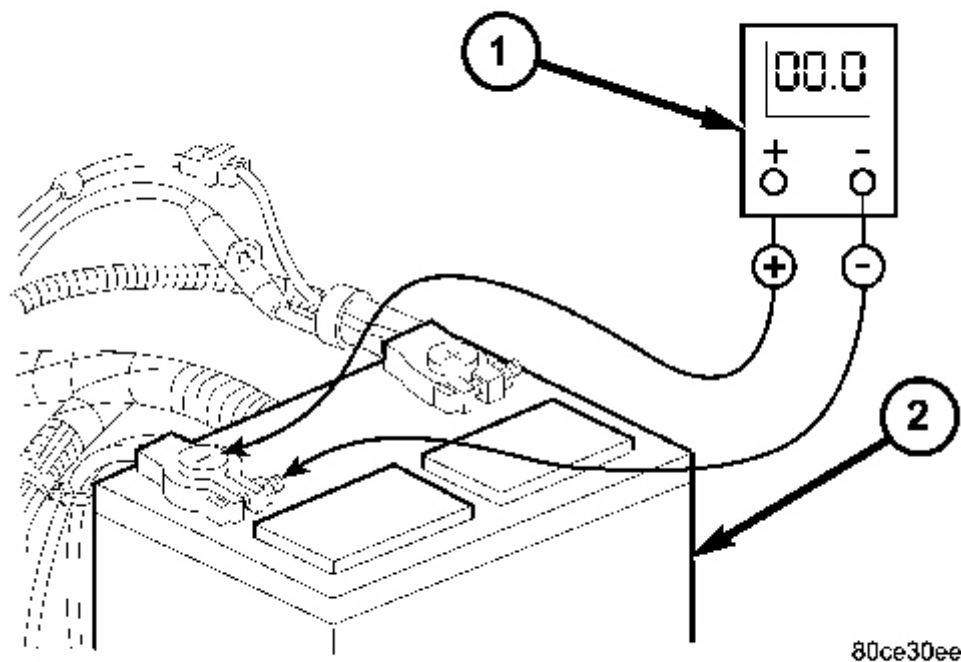


Fig. 2: Testing Battery Negative Connection Resistance - Typical
Courtesy of CHRYSLER LLC

1 - VOLTMETER
2 - BATTERY

1. Connect positive lead of voltmeter (1) to negative battery cable terminal post. Connect negative lead of voltmeter to negative battery cable clamp. See **Fig. 2**. Rotate and hold ignition switch in Start position. Observe voltmeter. If voltage is detected, correct poor contact between cable clamp and terminal post.
Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, procedure must be performed twice, once for each battery.

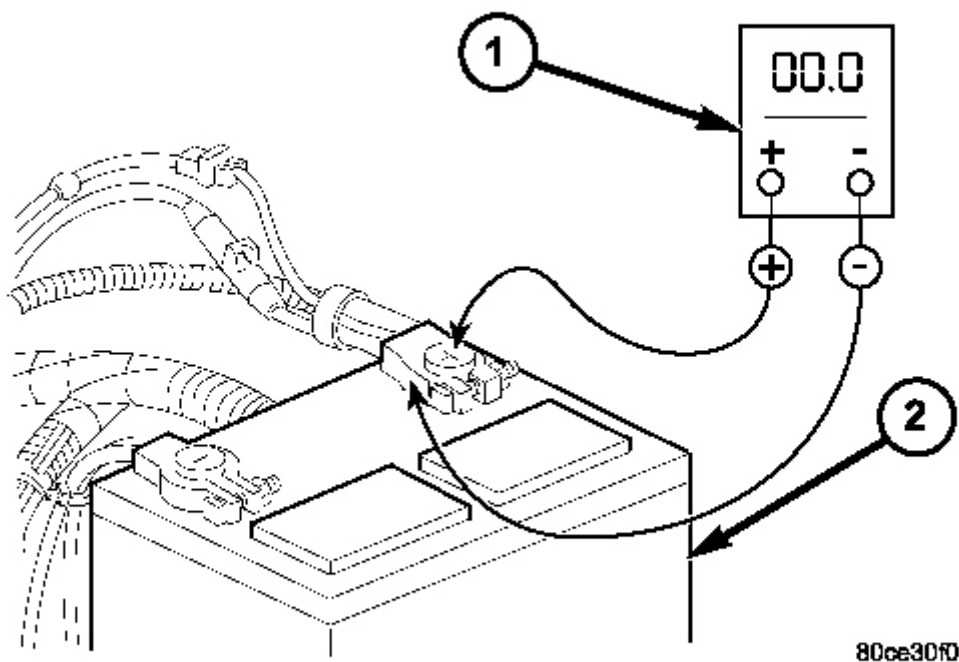


Fig. 3: Testing Battery Positive Connection Resistance - Typical
Courtesy of CHRYSLER LLC

1 - VOLTMETER 2 - BATTERY

2. Connect positive lead of voltmeter to positive battery terminal post. Connect negative lead of voltmeter to battery positive cable clamp. See **Fig. 3**. Rotate and hold ignition switch in Start position. Observe voltmeter. If voltage is detected, correct poor contact between cable clamp and terminal post. **Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, this procedure must be performed twice, once for each battery.**

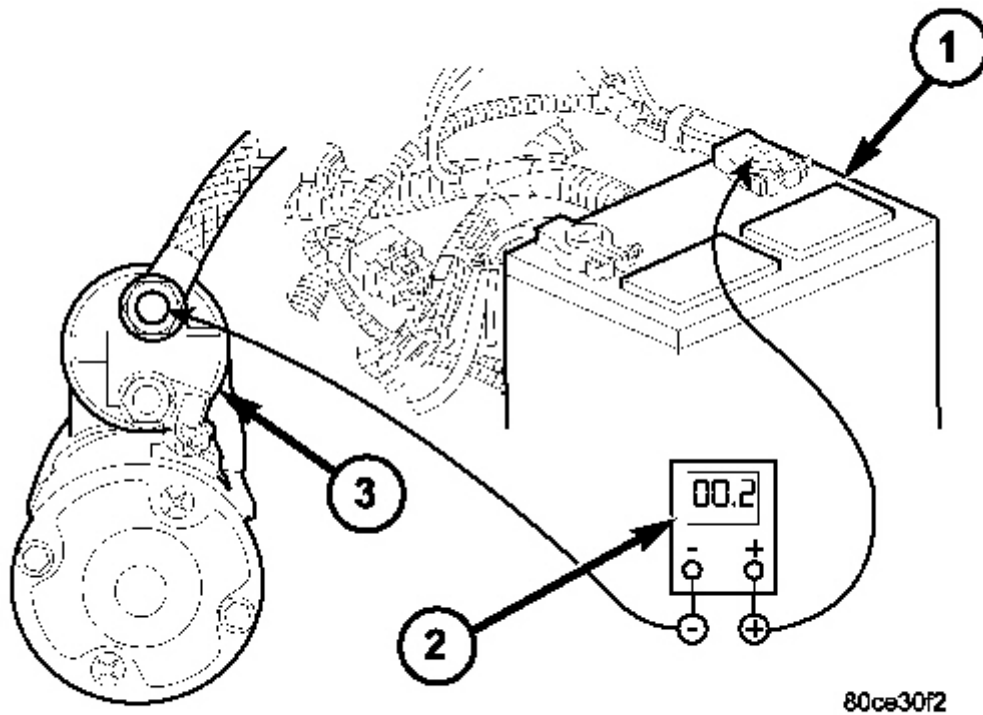


Fig. 4: Testing Battery Positive Cable Resistance - Typical
Courtesy of CHRYSLER LLC

1 - BATTERY
2 - VOLTMETER
3 - STARTER MOTOR

3. Connect voltmeter to measure between battery positive terminal post and starter solenoid battery terminal stud. See **Fig. 4**. Rotate and hold ignition switch in Start position. Observe voltmeter. If reading is above 0.2 volt, clean and tighten battery cable connection at solenoid. Repeat test. If reading is still above 0.2 volt, replace faulty positive battery cable. **Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, this procedure must be performed on driver side battery only.**

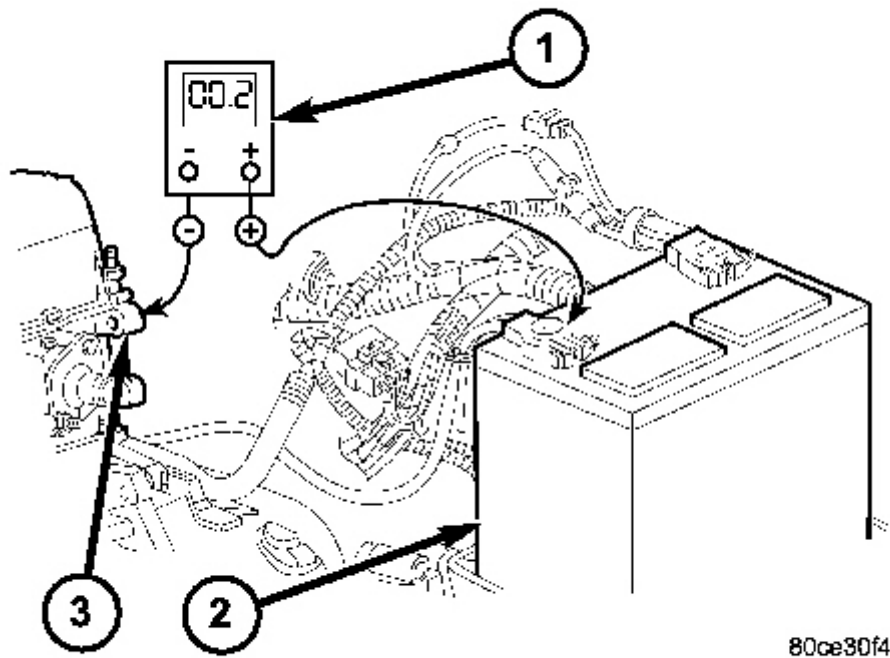


Fig. 5: Testing Ground Circuit Resistance - Typical
Courtesy of CHRYSLER LLC

1 - VOLTMETER
2 - BATTERY
3 - ENGINE GROUND

4. Connect voltmeter to measure between negative battery terminal post and a good clean ground on engine block. See **Fig. 5**. Rotate and hold ignition switch in Start position. Observe voltmeter. If reading is above 0.2 volt, clean and tighten negative battery cable attachment on engine block. Repeat test. If reading is still above 0.2 volt, replace faulty negative battery cable. **Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, this procedure must be performed twice, once for each battery.**

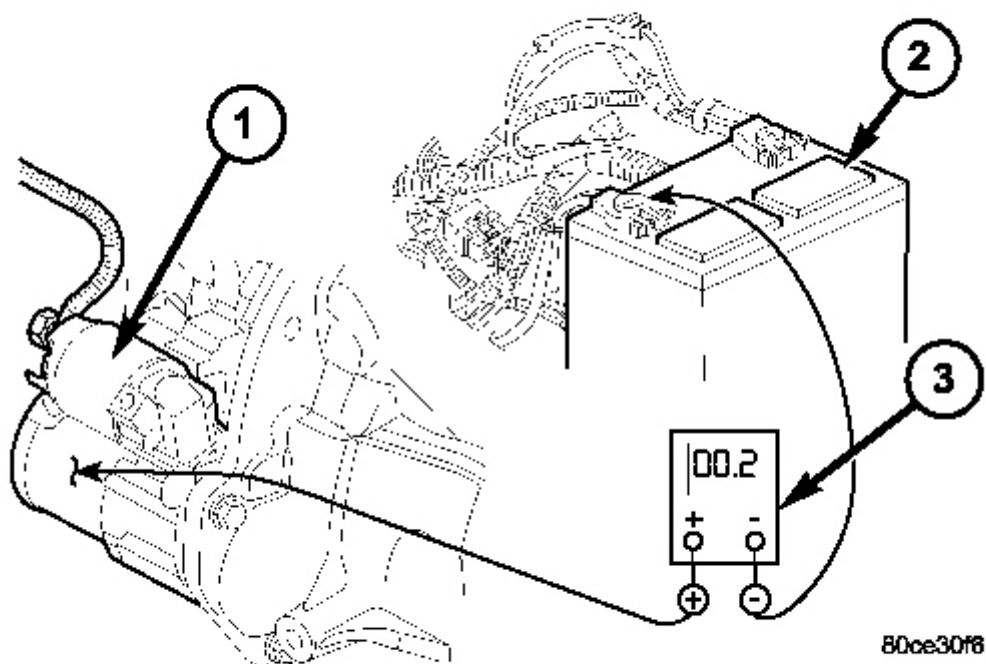


Fig. 6: Testing Starter Ground - Typical
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - STARTER MOTOR
2 - BATTERY
3 - VOLTMETER |
|---|

5. Connect positive lead of voltmeter to starter housing. Connect negative lead of voltmeter to negative battery terminal post. See **Fig. 6**. Rotate and hold ignition switch in Start position. Observe voltmeter. If reading is above 0.2 volt, correct poor starter to engine block ground contact. **Note: Certain diesel equipped models use dual batteries. If equipped with dual battery system, this procedure must be performed on driver side battery only.**
6. If equipped with dual battery system (certain diesel equipped models), connect positive lead of voltmeter to positive battery cable clamp on battery located on left side of vehicle. Connect negative lead of voltmeter to positive battery terminal post on battery located on right side of vehicle. Rotate and hold ignition switch in Start position. Observe voltmeter. If reading is above 0.2 volt, clean and tighten battery cables at both batteries. Repeat test. If reading is still above 0.2 volt, replace faulty positive battery cable.

If resistance tests detect no feed circuit problems, refer to **Starter Motor** .

CONTROL CIRCUIT TESTING

The starter control circuit components should be tested in the order in which they are listed, as follows:

Starter Relay - Refer to **Starter Relay** . The starter relay is located within the TIPM (Totally Integrated Power Module). Refer to "no crank condition" in 9 - Engine - Electrical Diagnosis.

Starter Solenoid - Refer to **Starter Motor** .

Ignition Switch - Refer to **Ignition Switch and Key Lock Cylinder**

Clutch Pedal Position Switch - If equipped with manual transmission, refer to **SWITCH-CLUTCH PEDAL POSITION** .

Park/Neutral Position Switch - If equipped with automatic transmission, refer to **TRANSMISSION RANGE SENSOR** .

Wire harnesses and connections - Refer to **SYSTEM WIRING DIAGRAMS** article .

SPECIFICATIONS

SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Starter Solenoid Battery Cable Nut	11	-	100
Starter Mounting Bolts - 3.7L	54	40	-
Starter Mounting Bolts - 2.8L Diesel	41	30	-
Starter Heat Shield Mounting Bolts	6	-	55

STARTING SYSTEM

STARTER MOTOR		
Engine Application	3.7L	2.8L Diesel
Power Rating	1.2 Kilowatt	2.2 Kilowatt
* Cranking Amperage Draw Test	100 - 200 Amperes	500 Amperes
* Test at operating temperature. Cold engine, tight (new) engine, or heavy oil will increase starter amperage draw.		
**The starter is equipped with permanent magnets. Never strike the starter case to attempt to loosen a sticking/stuck armature as permanent magnets may crack or break.		

MOTOR - STARTER

DIAGNOSIS AND TESTING

STARTER MOTOR

Correct starter motor operation can be confirmed by performing the following free running bench test. This test can only be performed with starter motor removed from vehicle.

1. Remove starter motor from vehicle.
2. Mount starter motor securely in a soft-jawed bench vise. The vise jaws should be clamped on the mounting flange of starter motor. Never clamp on starter motor by field frame.
3. Connect a suitable volt-ampere tester and a 12-volt battery to starter motor in series, and set ammeter to 100 ampere scale. See instructions provided by manufacturer of volt-ampere tester being used.
4. Install jumper wire from solenoid terminal to solenoid battery terminal. The starter motor should operate. If starter motor fails to operate, replace faulty starter motor assembly.
5. Adjust carbon pile load of tester to obtain free running test voltage.
6. Note reading on ammeter and compare reading to free running test maximum amperage draw.
7. If ammeter reading exceeds maximum amperage draw specification, replace faulty starter motor assembly.

STARTER SOLENOID

Certain vehicles with certain engines may require starter motor removal for the following test.

1. If necessary, remove starter motor from vehicle.
2. Disconnect solenoid connector wiring from starter motor.

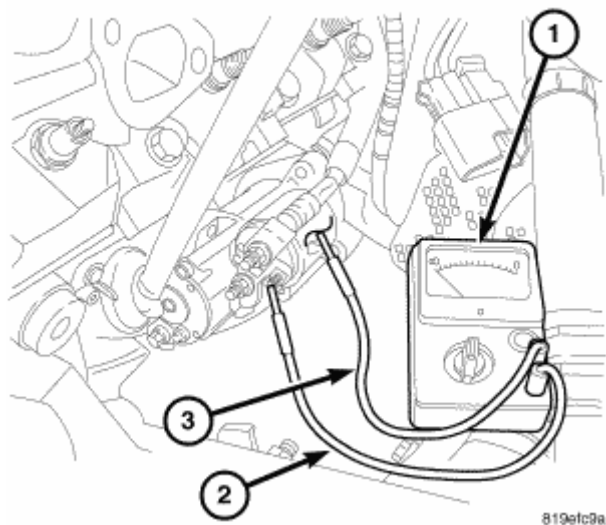
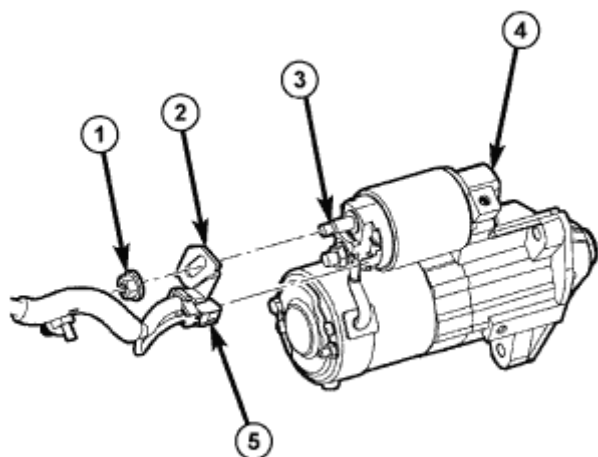


Fig. 7: SOLENOID CONTINUITY TEST
Courtesy of CHRYSLER LLC

3. Check for continuity between solenoid terminal (2) and solenoid case (3). There should be continuity. If not OK, replace faulty starter motor assembly.

REMOVAL

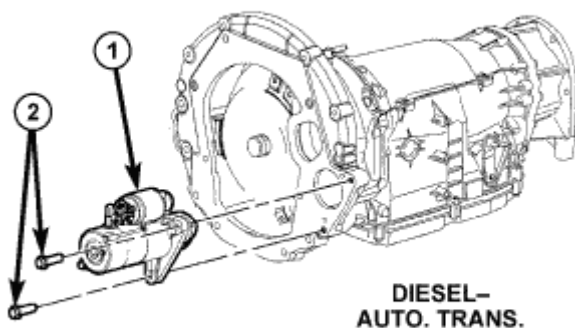
REMOVAL - 2.8L DIESEL



81968854

Fig. 8: Identifying Solenoid Nut, Mounting Stud, Electrical Connector & Battery Cable Assembly
Courtesy of CHRYSLER LLC

1. Disconnect and isolate negative battery cable.
2. Raise and support vehicle.
3. **Four Wheel Drive Equipped:** Remove front propeller shaft.
4. Remove solenoid nut (1) from mounting stud (3).
5. After nut (1) has been removed, pull battery cable from mounting stud (3) while removing electrical connector (5) from solenoid terminal.



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Fig. 9: STARTER MOTOR - 2.8L DIESEL AUTO. TRANS.

Courtesy of CHRYSLER LLC

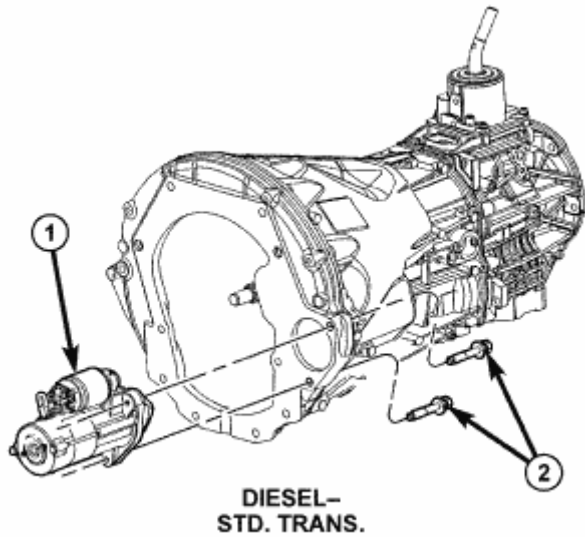


Fig. 10: STARTER MOTOR - 2.8L DIESEL STD. TRANS.
Courtesy of CHRYSLER LLC

6. Remove two starter mounting bolts (2).
7. Remove starter assembly (1) from transmission.
8. Rotate starter assembly (1) to allow removal from vehicle.

REMOVAL - 3.7L

1. Disconnect and isolate negative battery cable.
2. Raise and support vehicle.
3. **Four Wheel Drive Equipped:** Remove front propeller shaft.

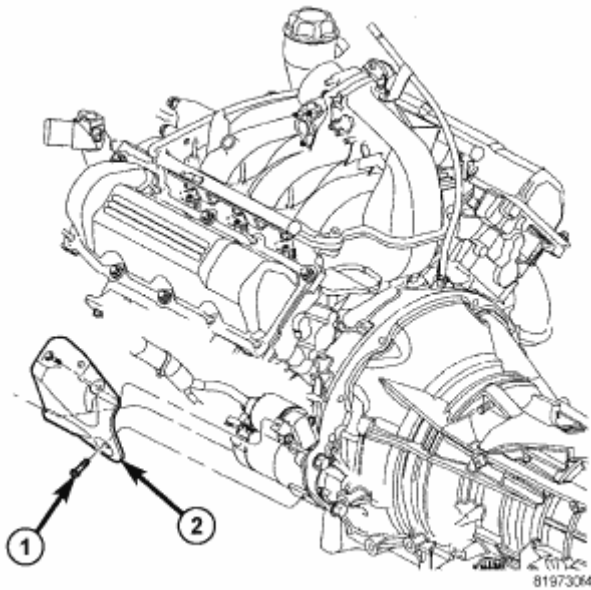


Fig. 11: STARTER HEAT SHIELD - 3.7L
 Courtesy of CHRYSLER LLC

4. Remove two heat shield bolts (1) and remove starter heat shield (2).

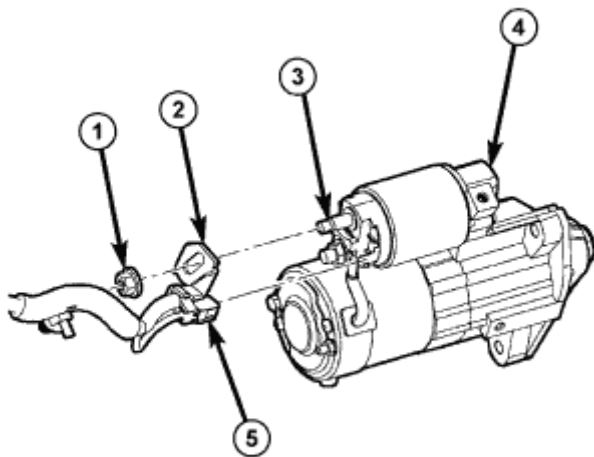
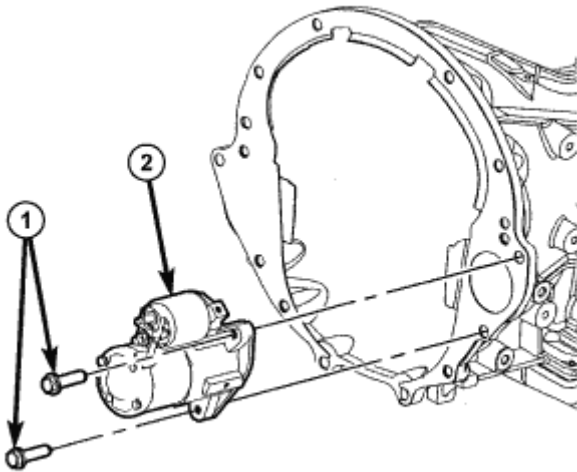


Fig. 12: Identifying Solenoid Nut, Mounting Stud, Electrical Connector & Battery Cable Assembly
 Courtesy of CHRYSLER LLC

5. Remove solenoid nut (1) from mounting stud (3).
6. After nut (1) has been removed, pull battery cable from mounting stud (3) while removing electrical connector (5) from solenoid terminal.



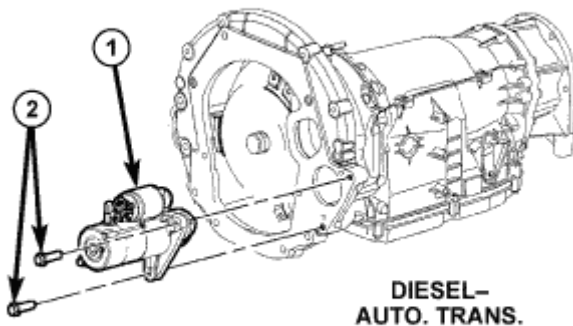
819688ca

Fig. 13: STARTER MOTOR - 3.7L
Courtesy of CHRYSLER LLC

7. Remove two starter mounting bolts (1).
8. Remove starter assembly (2) from transmission.
9. Rotate starter assembly to allow removal from vehicle.

INSTALLATION

INSTALLATION - 2.8L DIESEL



81968964

Fig. 14: STARTER MOTOR - 2.8L DIESEL AUTO. TRANS.
Courtesy of CHRYSLER LLC

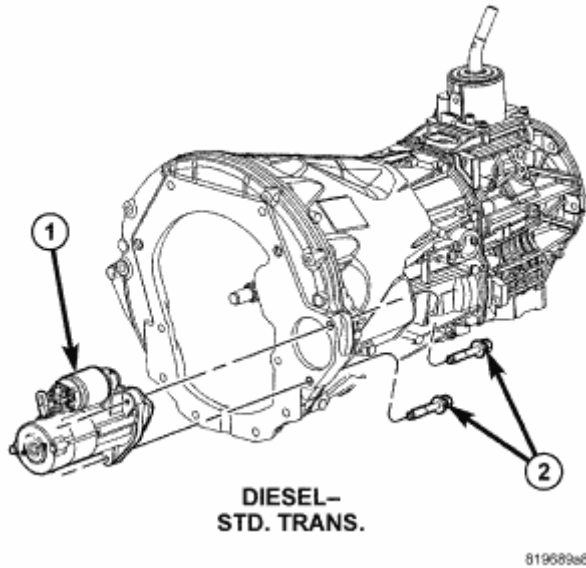


Fig. 15: STARTER MOTOR - 2.8L DIESEL STD. TRANS.
 Courtesy of CHRYSLER LLC

1. Rotate starter assembly (1) to allow positioning into transmission.
2. Install two starter mounting bolts (2) and tighten. Refer to **SPECIFICATIONS**.

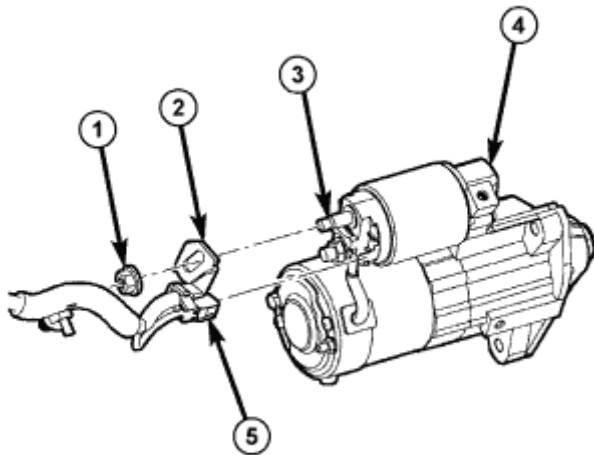


Fig. 16: Identifying Solenoid Nut, Mounting Stud, Electrical Connector & Battery Cable Assembly
 Courtesy of CHRYSLER LLC

3. Position battery cable assembly (2) onto stud (3) while pushing solenoid connector (5) onto solenoid terminal.
4. Install nut (1) and tighten. Refer to **SPECIFICATIONS**.
5. **Four Wheel Drive Equipped:** Install front propeller shaft.

6. Lower vehicle.
7. Connect negative battery cable.

INSTALLATION - 3.7L

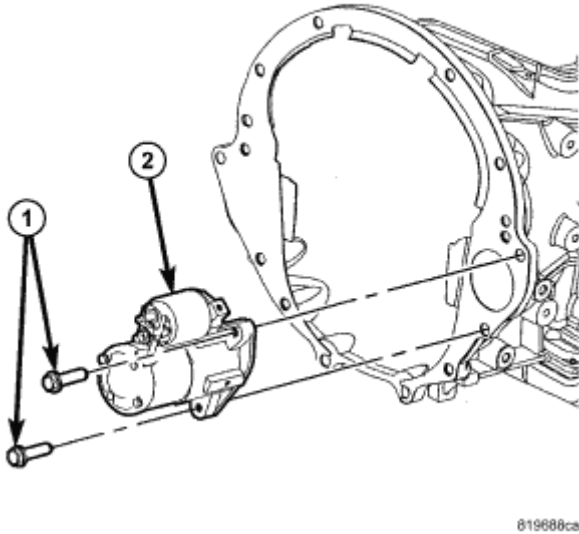


Fig. 17: STARTER MOTOR - 3.7L
Courtesy of CHRYSLER LLC

1. Rotate starter assembly (2) to allow positioning into transmission.
2. Install two starter mounting bolts (1) and tighten. Refer to **SPECIFICATIONS**.

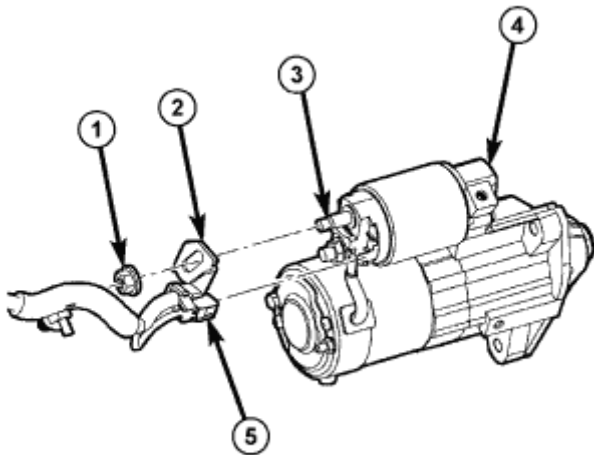


Fig. 18: Identifying Solenoid Nut, Mounting Stud, Electrical Connector & Battery Cable Assembly
Courtesy of CHRYSLER LLC

3. Position battery cable assembly (2) onto stud (3) while pushing solenoid connector (5) onto solenoid terminal.
4. Install nut (1) and tighten. Refer to **SPECIFICATIONS**.

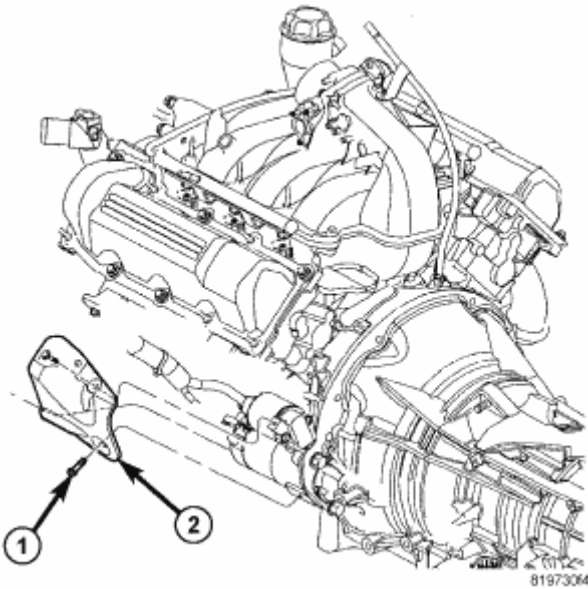


Fig. 19: STARTER HEAT SHIELD - 3.7L
Courtesy of CHRYSLER LLC

5. Position starter heat shield (2) and install two bolts (1).
6. **Four Wheel Drive Equipped:** Install front propeller shaft.
7. Lower vehicle.
8. Connect negative battery cable.

RELAY - STARTER MOTOR

DESCRIPTION

STARTER RELAY

The starter relay is an electromechanical device that switches battery current to the pull-in coil of the starter solenoid when ignition switch is turned to Start position. The starter relay is located in the Power Distribution Center (PDC) in the engine compartment. See PDC cover for relay identification and location.

The starter relay is an International Standards Organization (ISO) relay. Relays conforming to ISO specifications have common physical dimensions, current capacities, terminal patterns, and terminal functions.

The starter relay cannot be repaired or adjusted and, if faulty or damaged, it must be replaced.

OPERATION

STARTER RELAY

The ISO relay consists of an electromagnetic coil, a resistor or diode, and three (two fixed and one movable) electrical contacts. The movable (common feed) relay contact is held against one of the fixed contacts (normally closed) by spring pressure. When electromagnetic coil is energized, it draws the movable contact away from normally closed fixed contact, and holds it against the other (normally open) fixed contact.

When electromagnetic coil is de-energized, spring pressure returns movable contact to normally closed position. The resistor or diode is connected in parallel with electromagnetic coil within relay, and helps to dissipate voltage spikes produced when coil is de-energized.

REMOVAL

STARTER RELAY

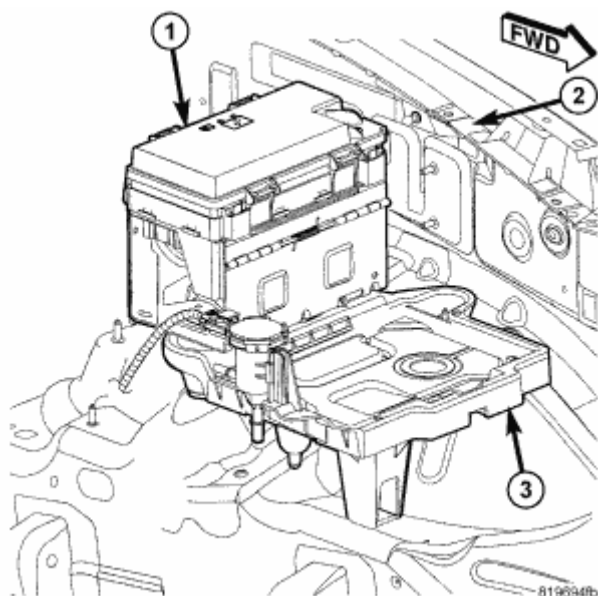


Fig. 20: Identifying Power Distribution Center (PDC) & Left Inner Fender
Courtesy of CHRYSLER LLC

The fuel pump relay is located in the Power Distribution Center (PDC) (1). The PDC is located in the engine compartment near the left inner fender (2). Refer to label on PDC cover for relay location.

1. Remove PDC cover.
2. Remove relay from PDC.
3. Check condition of relay terminals and PDC connector terminals for damage or corrosion. Repair if necessary before installing relay.
4. Check for pin height (pin height should be the same for all terminals within the PDC connector). Repair if necessary before installing relay.

INSTALLATION

STARTER RELAY

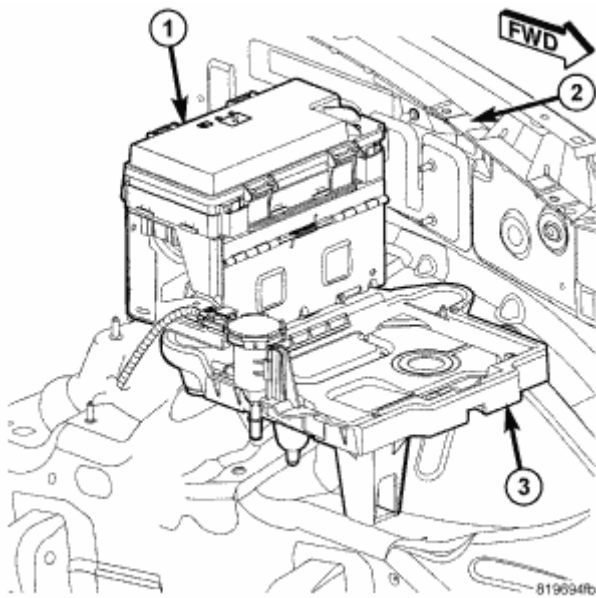


Fig. 21: Identifying Power Distribution Center (PDC) & Left Inner Fender
Courtesy of CHRYSLER LLC

1. Refer to Power Distribution Center (PDC) cover for starter relay location.
2. Install relay to PDC (1).
3. Install cover to PDC.

MODULE-REMOTE START ANTENNA

DESCRIPTION

MODULE - REMOTE START ANTENNA

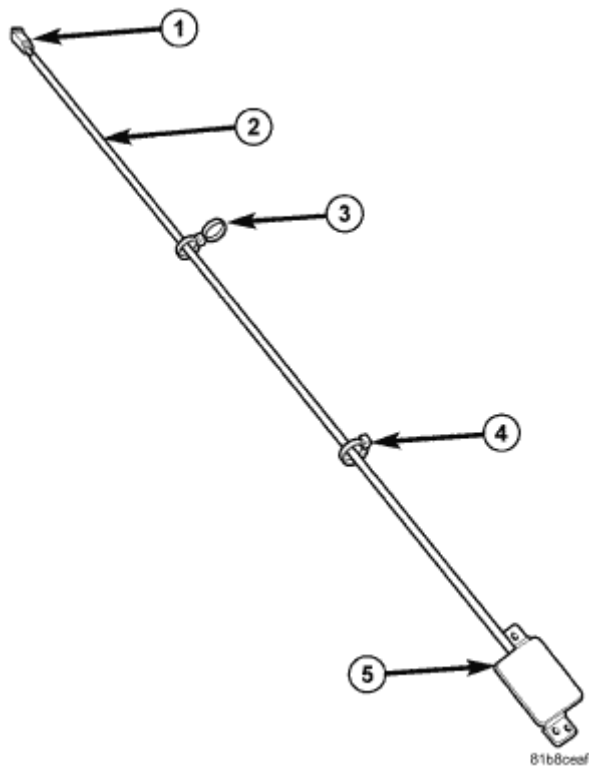


Fig. 22: REMOTE START ANTENNA MODULE ASSEMBLY
Courtesy of CHRYSLER LLC

The Remote Start Antenna Module Assembly consists of an electrical connection to the WCM/WIN (1), a length of coaxial cable (2), two mounting clips (3) and (4), and a control module/antenna (5).

OPERATION

OPERATION

The remote start antenna is located behind the instrument cluster. The antenna interfaces with the Wireless Control Module (WCM) through a coaxial electrical cable and electrical connector. The antenna helps to amplify the signal for the Remote Keyless Entry (RKE) key fob.

REMOVAL

REMOVAL

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in

accidental airbag deployment.

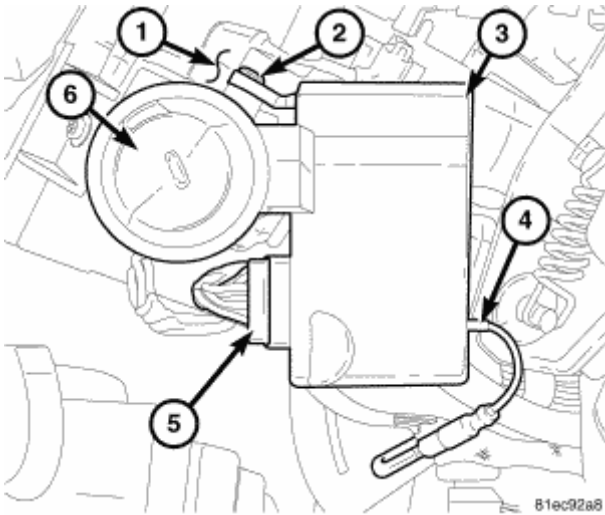


Fig. 23: Identifying Mounting Bracket, Screw, Sentry Key Remote Entry Module (SKREEM), Start Antenna Coaxial Cable Connector, Instrument Panel Wire Harness Connector & Lock Cylinder
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove but do not disconnect the right multi-function switch from the integral mounting bracket (1) on the right side of the clockspring and position it so that the Sentry Key Remote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) mounting screw (2) may be accessed. Refer to **REMOVAL** .
3. Disconnect the instrument panel wire harness connector (5) from the SKREEM (3) connector receptacle.
4. Remove the screw (2) that secures the SKREEM to the boss on the top of the ignition lock cylinder housing (6).
5. Disengage the SKREEM antenna ring from around the ignition lock housing and remove the SKREEM from the steering column.
6. Remove the coaxial electrical cable connector (4) from the SKREEM (3).

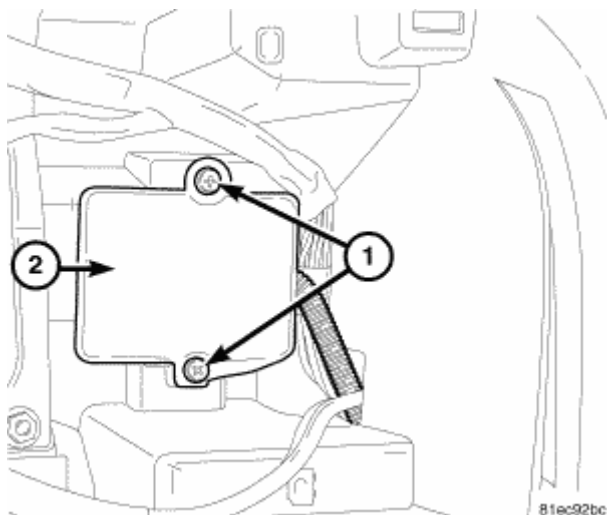


Fig. 24: ANTENNA MODULE
Courtesy of CHRYSLER LLC

7. Remove the instrument cluster, Refer to **REMOVAL** .

NOTE: During removal of the remote start antenna note the routing location of the coaxial cable.

8. Remove the remote start antenna coaxial cable from mounting clips, if equipped.
9. Remove the screws (1) from remote start antenna module (2) and remove from instrument panel assembly.

INSTALLATION

INSTALLATION

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

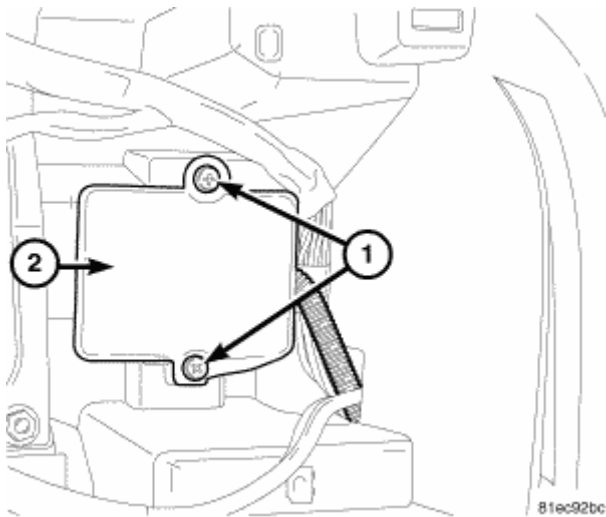


Fig. 25: ANTENNA MODULE
 Courtesy of CHRYSLER LLC

1. Install the remote start antenna module (2), and screws (1) to instrument panel assembly. Tighten screws to 2.5 N.m (22 in. lbs.).
2. Install the instrument cluster. Refer to **INSTALLATION** .
3. Route the remote start coaxial cable in the position noted during the removal procedure.
4. Install the remote start antenna coaxial cable to mounting clips, if equipped.

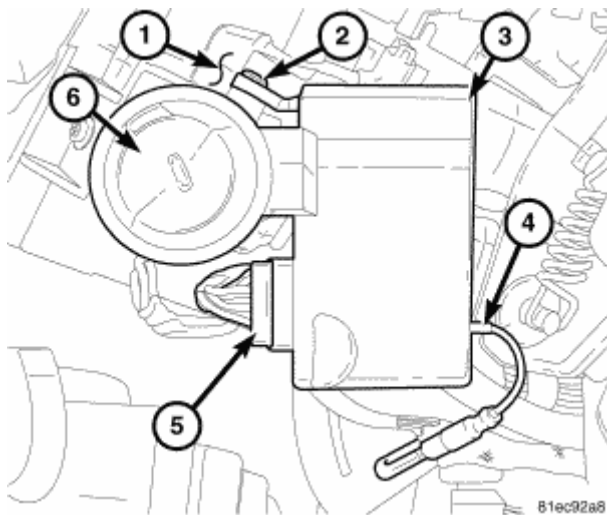


Fig. 26: Identifying Mounting Bracket, Screw, Sentry Key Remote Entry Module (SKREEM), Start Antenna Coaxial Cable Connector, Instrument Panel Wire Harness Connector & Lock Cylinder
 Courtesy of CHRYSLER LLC

5. Connect remote start antenna coaxial cable connector (4) to the Sentry Key Remote Entry Module (SKREEM) (3) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM).
6. Position the SKREEM onto the steering column ignition lock housing with the antenna ring oriented around the lock cylinder (6).

7. Install and tighten the screw (2) that secures the SKREEM mounting bracket to the boss on the top of the ignition lock housing. Tighten the screw to 2 N.m (20 in. lbs.).
8. Reconnect the instrument panel wire harness connector (5) to the SKREEM connector receptacle.
9. Reinstall the right multi-function switch onto the integral mounting bracket (1) on the right side of the clockspring. Refer to **INSTALLATION** .
10. Reconnect the battery negative cable.

NOTE: On vehicles equipped with the Sentry Key Immobilizer System (SKIS), when the SKREEM is replaced with a new unit, a diagnostic scan tool **MUST** be used to initialize the new SKREEM and to program at least two Sentry Key transponders before the vehicle can be operated. Refer to **STANDARD PROCEDURE** .

NOTE: On vehicles equipped with a Tire Pressure Monitoring (TPM) system and a full-sized matching spare tire and wheel assembly, when the SKREEM or the spare tire pressure sensor is replaced with a new unit, a diagnostic scan tool **MUST** be used to run a routine that allows the SKREEM to be programmed with the ID number and location of the spare tire pressure sensor mounted in the wheel of the spare tire. This may be done using a TPM-RKE Analyzer special tool by following the programming steps outlined in the diagnostic scan tool for Program Tire Sensor ID w/TPM Tool under Miscellaneous Functions for the WCM/Wireless Control Module menu item. If a TPM-RKE Analyzer special tool is not available, the spare tire must be dismounted from its wheel to access and note the ID number on the spare tire pressure sensor so that the ID code for that sensor can be programmed into the new SKREEM. Follow the programming steps outlined in the diagnostic scan tool for Learn Spare Tire Sensor ID also found under Miscellaneous Functions for the WCM/Wireless Control Module menu item. Refer to **INSTALLATION** .

2008 STEERING

Steering - Liberty

DESCRIPTION

STEERING SYSTEM

Power steering systems consist of:

- Steering column & Intermediate Shaft
- Rack and pinion steering gear
- Belt driven hydraulic steering pump
- Pump pressure, supply and return hoses
- Oil Cooler

OPERATION

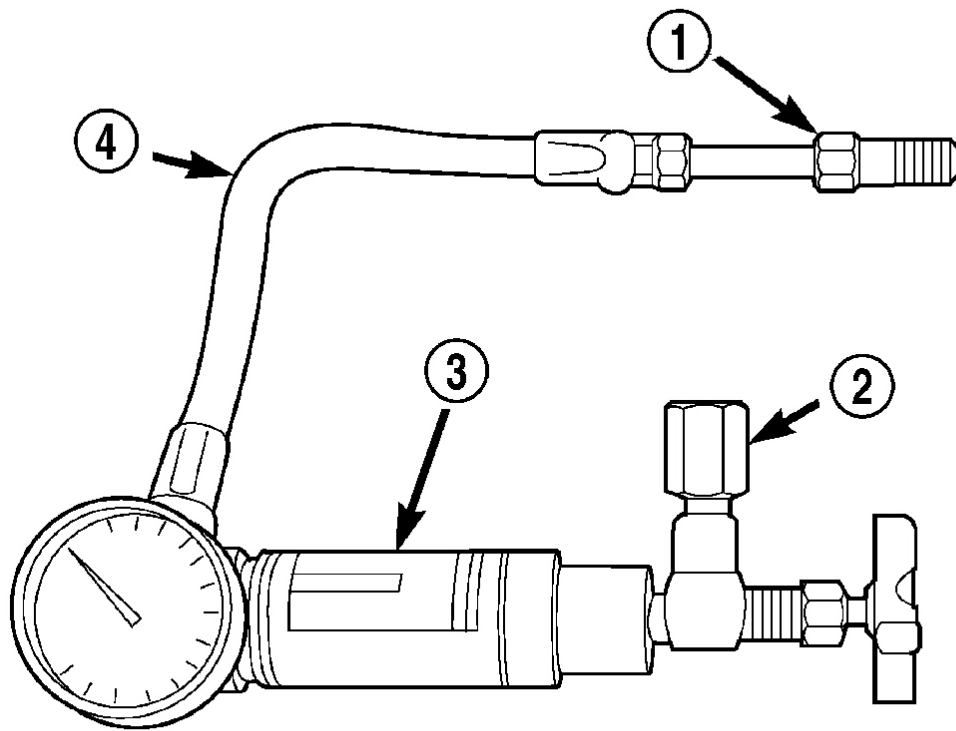
STEERING SYSTEM

The steering column intermediate shaft attaches the steering column to the gear pinion. The rotation of the pinion moves the gear rack from side-to-side. This lateral action of the rack pushes and pulls the tie rods to change the direction of the front wheels.

Power assist is provided by an engine mounted hydraulic pump. The pump supplies hydraulic fluid to the steering gear. All vehicles are equipped with an oil cooler.

DIAGNOSIS AND TESTING

POWER STEERING FLOW AND PRESSURE



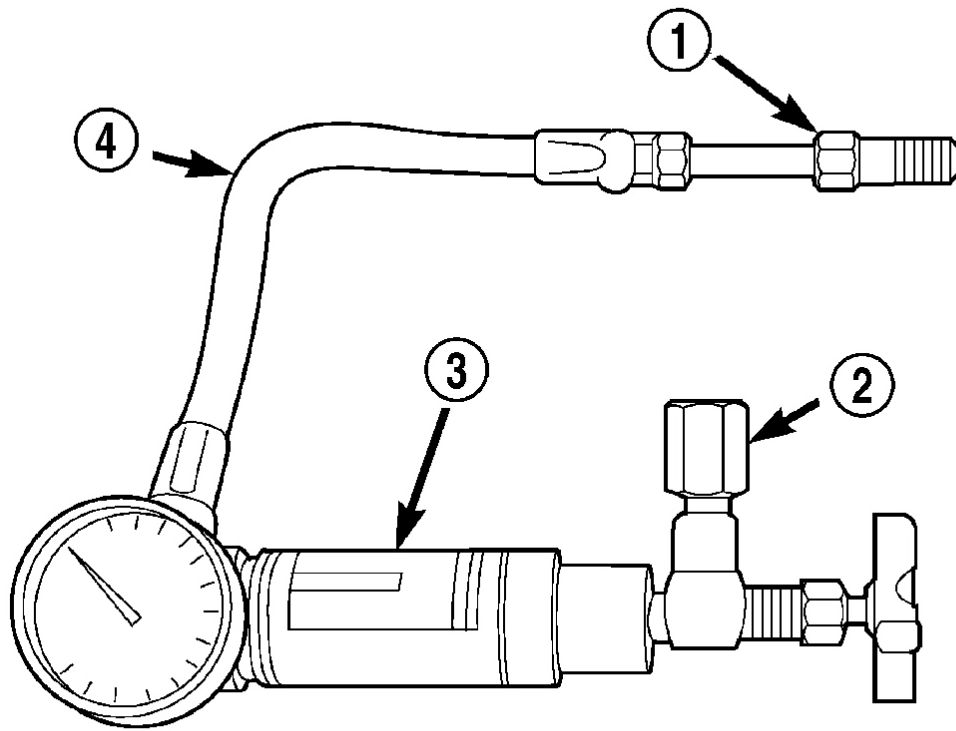
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Fig. 1: Analyzer With Tube & Adapter
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - TUBE |
| 2 - ADAPTER FITTINGS |
| 3 - ANALYZER |
| 4 - GAUGE HOSE |

The following procedure is used to test the operation of the power steering system on the vehicle. This test will provide the gallons per minute (GPM) or flow rate of the power steering pump along with the maximum relief pressure. Perform test any time a power steering system problem is present. This test will determine if the power steering pump or power steering gear is not functioning properly. The following pressure and flow test is performed using Power Steering Analyzer Tool kit 6815 and Adapter Kit 6893. See **Fig. 1**.

FLOW AND PRESSURE TEST



80ae82e2

Fig. 2: Analyzer With Tube & Adapter
Courtesy of CHRYSLER LLC

1 - TUBE
2 - ADAPTER FITTINGS
3 - ANALYZER
4 - GAUGE HOSE

1. Check the power steering belt to ensure it is in good condition and adjusted properly.
2. Connect pressure gauge hose from the Power Steering Analyzer to Tube 6844.
3. Connect Adapter 6826 to Power Steering Analyzer test valve end.
4. Disconnect the high pressure hose from the power steering pump.
5. Connect the tube to the pump hose fitting.
6. Connect the power steering hose from the steering gear to the adapter.
7. Open the test valve completely.
8. Start engine and let idle long enough to circulate power steering fluid through flow/pressure test gauge and to get air out of the fluid. Then shut off engine.
9. Check fluid level, add fluid as necessary. Start engine again and let idle.
10. Check for air bubbles, evacuate if necessary.

- 11. Gauge should read below 862 kPa (125 psi). If above, inspect the hoses for restrictions and repair as necessary. The initial pressure reading should be in the range of 345-552 kPa (50-80 psi).
- 12. Increase the engine speed to 1500 RPM and read the flow meter. If the flow rate (GPM) is below specification, (refer to **PUMP SPECIFICATION** chart for GPM) the pump should be replaced.

CAUTION: The following test procedure involves testing maximum pump pressure output and flow control valve operation. Do not leave valve closed for more than three seconds as the pump could be damaged.

- 13. Close valve fully three times and record highest pressure indicated each time. **All three readings must be above specifications and within 345 kPa (50 psi) of each other.**
Pressures above specifications but not within 345 kPa (50 psi) of each other, replace pump.
Pressures within 345 kPa (50 psi) of each other but below specifications, replace pump.
- 14. Open the test valve and turn the steering wheel to the extreme left and right positions three times against the stops. Record the highest pressure reading at each position. Compare readings to the pump specifications chart. If pressure readings are not within 50 psi of each other, the gear is leaking internally and must be replaced.

CAUTION: Do not force the pump to operate against the stops for more than 2 to 3 seconds at a time because, pump damage will result.

PUMP SPECIFICATION

ENGINE	RELIEF PRESSURE	FLOW RATE (GPM) AT 1500 RPM
ALL	10342 kPa, PREFERRED (1450 psi) with a MAX 1550 psi & 7929 kPa, MIN (1400 psi)	2.4 - 2.8

STEERING SYSTEM DIAGNOSIS CHARTS

NOTE: There are three diagnosis charts following that cover **NOISE, VIBRATION AND HARSHNESS (NVH) ISSUES, PERFORMANCE ISSUES, and FLUID ISSUES.**

NOISE, VIBRATION AND HARSHNESS (NVH) ISSUES

CONDITION	POSSIBLE CAUSES	EVALUATION/CORRECTION
OBJECTIONABLE HISS OR WHISTLE WHILE TURNING STEERING WHEEL WHEN STATIONARY OR MOVING SLOWLY*	1. Damaged or mispositioned steering column shaft/coupling dash boot seal.	1. Check to ensure boot is properly installed and seals against sheet metal. Reposition or replace steering column shaft/coupling dash boot seal as necessary.
	2. Mis-routed power steering hose.	2. Check routing of power steering hoses. Ensure hoses do not come in unwanted contact with other components and objects.

	3. Restriction in pressure or return hose. 4. Noisy valve in power steering gear.	3. Using an electronic listening tool, determine if noise is coming from either pressure or return hose. Replace hose that noise is present within. 4. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u>
RATTLE OR EXCESSIVE CLUNK**	1. Power steering gear loose on engine cradle/crossmember. 2. Loose strut assembly mounting fasteners at tower or knuckle. 3. Excessive play in outer tie rod. 4. Engine cradle/crossmember mounting fasteners loose at frame or bushings worn. 5. Wheel Mounting (Lug) nuts loose. 6. Power steering hose touching the body or frame of vehicle. 7. Stabilizer bar link joints worn (occurs with steering input only when moving, not stationary). 8. Loose lower control arm mounting bolts at engine cradle, frame or crossmember (occurs with steering input only when moving, not stationary). 9. Loose intermediate shaft or column. 10. Lower control arm pivot bushing worn (occurs with steering input only when moving, not stationary). 11. Internal power steering gear noise. 12. Loose inner tie rod.	1. Check fastener torque and tighten to specifications. Replace as necessary. Check steering wheel center following repair. 2. Check fastener torque and tighten to specifications. 3. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u> 4. Check fastener torque and tighten to specifications. Inspect bushings and repair as necessary. 5. Inspect wheel mounting (Lug) nuts and studs and repair as necessary. Tighten nuts to specifications. 6. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u> 7. At park, jounce only one side of vehicle front to exercise stabilizer bar. Replace stabilizer bar link. 8. Check control arm mounting bolts and tighten to specified torque. 9. Rotate intermediate (steering) shaft in relationship to gear, checking for free-play. Check column fasteners and tighten to specifications as necessary. 10. Inspect bushings for wear and replace lower control arm as necessary. 11. Drive vehicle on rough road, then steer rapidly back and forth when stopped. Replace power steering gear as necessary. 12. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u>

-	13. Damaged engine cradle/crossmember.	13. Inspect the cradle/crossmember for cracks or other damage. Replace as necessary.
POPPING NOISE - - - - -	1. Loose steering gear mounting fasteners. 2. Loose outer tie rod mounting nut or jam nut. 3. Loose intermediate (steering) shaft coupling at gear input shaft. 4. Worn tie rod (outer or inner). 5. Worn axle half-shaft.	1. Check fasteners for proper torque and retighten as necessary. 2. Check fastener torque. Replace nuts as necessary and tighten to specifications. 3. Make sure coupling is fully seated on gear input shaft. Retighten or re-seat as necessary. 4. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u> 5. For evaluation and correction, refer to <u>DIAGNOSIS AND TESTING .</u>
CHIRP OR SQUEAL (POWER STEERING PUMP) - - - - -	1. Loose power steering pump drive belt. 2. Pulley alignment incorrect. 3. Malfunctioning belt auto-tensioner 4. Power steering pump noisy (worn bearing/bushing noise). 5. Generator or water pump noisy.	1. Inspect belt. Replace belt if worn or glazed. Tighten/adjust power steering pump drive belt if equipped with a manual tensioner. 2. Realign accessory drives. 3. Verify belt tension. Replace belt auto-tensioner. 4. Using an electronic listening tool, determine if noise is coming from pump. Replace power steering pump as required. 5. Using an electronic listening tool, determine if noise is coming from Generator or water pump. Replace faulty component.
WHINE, GROWL, MOAN OR GROAN (POWER STEERING PUMP)*** - - -	1. Low power steering fluid level. 2. Air in power steering fluid. 3. Power steering hose touching body or frame of vehicle. 4. Wear of power steering pump internal components.	1. Fill power steering fluid reservoir to proper level and check for leaks (make sure all air is bled from the system fluid). 2. Inspect for excessive air bubbles in fluid (fluid will appear foamy and lighter in color). Inspect hoses for leaks and replace as necessary. Bleed air from fluid. See <u>STANDARD PROCEDURE.</u> 3. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u> 4. For evaluation and correction, see <u>DIAGNOSIS AND TESTING.</u>
COLD START WHINE OR MOAN (POWER STEERING PUMP)*** -	1. Low power steering fluid level. 2. Extremely low ambient temperature (near 0 F° (-18 C°) or below)	1. Fill power steering fluid reservoir to proper level and check for leaks (make sure all air is bled from the system fluid). 2. Some noise is expected as pump attempts to pull cold, thick fluid. Noise should go away as vehicle warms up. Acceptable levels of excessive noise are one second at 0 F° (-18 C°)

		and 15 seconds at -20 F° (-29 C°). If noise is excessive, look for poor sealing on the return hose or a possible fluid leak.
SQUEAKING OR RUBBING SOUND	1. Steering column shroud or shaft rubbing. 2. Clockspring inside steering column noisy. 3. Boot/dash seal lubrication inadequate. 4. Steering gear outer tie rod noisy. 5. Steering gear internally noisy.	1. While turning the steering wheel, listen down column to locate. Check interference between moving components. Move or realign shrouds or shaft as necessary. Replace components if this does not correct problem. 2. Remove clockspring and reinstall steering wheel for testing. If noise is gone, replace clockspring. 3. Remove boot seal and recheck for noise. Lubricate seal as necessary. 4. While a helper turns the steering wheel, use an electronic listening tool to determine if noise is coming from either outer tie rod. Replace outer tie rods as necessary. 5. Remove dash seal boot, then exercise the steering wheel. If noise is still present at gear, replace steering gear.
SCRUBBING OR KNOCKING SOUND.	1. Incorrect tire or wheel size. 2. Worn motor or transmission mount. 3. Tires contacting wheel well. 4. Interference between moving steering components and other components. 5. Accessory drive pulley rubbing against another component.	1. Replace incorrect size tire or wheel with original equipment size. 2. Drive vehicle, moving accelerator pedal rapidly up and down attempting to locate noise. Try in both forward and reverse. Replace mounts as necessary. 3. Make sure wheel house is properly positioned. If not, reposition as necessary. If steering wheel is properly centered, check steering gear travel left to right by rotating the steering wheel to each stop. Steering wheel should rotate the same amount in both directions from center. If not, replace steering gear. 4. Check for bent or misaligned components. Correct or replace as necessary. 5. Check pulleys for wear. Check for worn engine or transmission mount. Reposition components or replace mounts as necessary.

NOTE: *** There is some noise in all power steering systems. One of the most common is a hissing sound evident when turning the steering wheel when at a standstill or when parking and the steering wheel is at the end of its travel. Hiss is a very high frequency noise similar to that experienced while slowly closing a water**

tap. The noise is present in every valve and results when high velocity fluid passes valve orifice edges. There is no relationship between this noise and the performance of the steering system.

NOTE: **** A light clunk may be felt or heard during steering wheel reversal while vehicle is stationary. This results from internal steering gear rack movement at the bushings and in no way affects the performance of the steering system. This movement may be felt in the steering components during steering wheel reversal.**

NOTE: ***** Power steering pump growl/moan/groan results from the development of high pressure fluid flow. Normally this noise level should not be high enough to be objectionable.**

PERFORMANCE ISSUES

CONDITION	POSSIBLE CAUSES	EVALUATION/CORRECTION
STEERING WHEEL OR COLUMN HAS FREEPLAY/LASH/LOOSENESS (CLUNKING OR RATTLING)	1. Loose coupling pinch bolt at gear input shaft. 2. Power steering gear loose on cradle/crossmember. 3. Excessive freeplay or noise from steering column bearings. 4. Excessive intermediate (steering) shaft coupling u-joint free-play. 5. Loose or worn outer tie rod. 6. Lack of lubrication in lower ball joint or ball joint is damaged. 7. Excessive lash inside steering gear.	1. Check pinch bolt torque. Replace pinch bolt if equipped with thread locker patch and tighten to specifications. 2. Inspect gear mounting bolts. Replace if necessary and tighten to specifications. 3. Replace steering column. 4. Rotate steering wheel back-and-forth while watching coupling. Observe for free-play. Replace intermediate shaft as necessary. 5. For evaluation and correction, see <u>DIAGNOSIS AND TESTING</u> . 6. For evaluation, refer to <u>DIAGNOSIS AND TESTING</u> . Lubricate ball joint if equipped with a zerk fitting and check for function. If not equipped with a zerk fitting, test and replace ball joint as necessary. 7. Disconnect intermediate shaft and turn steering gear input shaft. Observe for any movement without a corresponding tire movement. Replace steering gear as necessary.
STEERING WHEEL HAS FORE AND AFT LOOSENESS.	1. Steering wheel retaining bolt loose.	1. Check steering wheel retaining bolt torque and tighten to specifications as

	2. Loose steering column to instrument panel fasteners. 3. Steering column lower bearing spring retainer slipped on steering column shaft.	necessary. 2. Check steering column to instrument panel fastener torque and tighten to specifications as necessary. 3. Pull steering wheel fore-and-aft while observing movement. Replace steering column as necessary.
STEERING WHEEL, DASH OR VEHICLE VIBRATES DURING STEERING MANEUVERS (ESPECIALLY AT LOW SPEED OR STANDSTILL).	1. Air in power steering fluid. 2. Tire(s) not properly inflated. 3. Excessive engine vibration. 4. Loose tie rod end jam nut. 5. Overcharged air conditioning (A/C) system. 6. Grounded, damaged or loose engine mount. 7. Loose or worn outer tie rod. 8. Steering gear noisy.	1. Inspect for excessive air bubbles in fluid (fluid will appear foamy and lighter in color). Inspect hoses for leaks and replace as necessary. Bleed air from fluid. See <u>STANDARD PROCEDURE</u>. 2. Check and inflate tires to the specified pressure. 3. Ensure that the engine is tuned properly. 4. Check torque and tighten the inner to outer tie rod jam nut to specifications. 5. Turn A/C off and verify issue goes away. Repair A/C as necessary. 6. Visually inspect for damaged or misaligned mounts. Check fastener torque. Replace, realign or retighten as necessary. 7. For evaluation and correction, see <u>DIAGNOSIS AND TESTING</u>. 8. During a parking event at 0 mph, verify there is vibration only with steering. Steer in both directions and verify that the noise follows the steering input. Check TSB's for any known issues. Replace steering gear as necessary.
STEERING CATCHES, SURGES OR STICKS IN CERTAIN POSITIONS OR IS DIFFICULT TO TURN.	1. Low power steering fluid level. 2. Tire(s) not properly inflated. 3. Loose or slipping power steering/accessory drive belt. 4. Lack of lubrication	1. Check fluid level and fill to proper level as necessary. Check for leaks. Make sure all air is bled from system. 2. Check and inflate tires to the specified pressure. 3. Verify belt tension. Replace belt auto-tensioner and belt as necessary. 4. For evaluation, refer to <u>DIAGNOSIS</u>

	in lower ball joint or ball joint is damaged. 5. Lack of lubrication in steering gear outer tie rod end(s). 6. Faulty power steering pump. 7. Excessive friction in intermediate shaft/coupler joint. 8. Excessive friction in steering column. 9. Worn or binding seat and bearing in front strut assembly. 10. Faulty steering gear.	<u>AND TESTING</u> . Lubricate ball joint if equipped with a zerk fitting and check for function. If not equipped with a zerk fitting, test and replace ball joint as necessary. 5. For evaluation and correction, see <u>DIAGNOSIS AND TESTING</u>. 6. Perform Power Steering Flow and Pressure Test. See <u>DIAGNOSIS AND TESTING</u>. Look for low or erratic flow or pressure. Replace power steering pump as necessary. 7. Disconnect intermediate shaft/coupler at steering gear and check joint for smooth operation in all directions. Replace intermediate shaft/coupler joint. 8. Disconnect intermediate shaft/coupler at steering gear. Turn steering wheel two revolutions in either direction from on center and check for smooth operation. DO NOT turn past two revolutions. Damage to the clockspring may occur. Replace steering column as necessary. 9. Disconnect outer tie rod ends from knuckles, then turn tire and wheel assembly checking for smooth operation. Replace front strut assembly seat and bearing. 10. With vehicle on hoist, tires unsupported and engine off, steer gear throughout travel and check for smooth operation. Replace steering gear (only after all previous components have been checked).
STEERING WHEEL DOES NOT RETURN TO CENTER POSITION.	1. Tire(s) not properly inflated. 2. Improper front wheel alignment. 3. Lack of lubrication in lower ball joint or ball joint is damaged.	1. Check and inflate tires to the specified pressure. 2. Check and adjust wheel alignment as necessary. 3. For evaluation, refer to <u>DIAGNOSIS AND TESTING</u> . Lubricate ball joint if equipped with a zerk fitting and check for function. If not equipped with a zerk fitting, test and replace ball joint as necessary.

	4. Excessive friction in intermediate shaft/coupler joint. 5. Excessive friction in steering column. 6. Worn or binding seat and bearing in front strut assembly. 7. Excessive friction in power steering gear.	4. Disconnect intermediate shaft/coupler at steering gear and check joint for smooth operation in all directions. Replace intermediate shaft/coupler joint. 5. Disconnect intermediate shaft/coupler at steering gear. Turn steering wheel two revolutions in either direction from on center and check for smooth operation. DO NOT turn past two revolutions. Damage to the clockspring may occur. Replace steering column as necessary. 6. Disconnect steering gear outer tie rod ends at knuckles, then turn tire and wheel assembly in and out checking for smooth operation. Replace seat and bearing as necessary. 7. With vehicle on hoist, tires unsupported and engine off, steer gear throughout travel and check for smooth operation. Replace steering gear (only after all previous components have been checked).
EXCESSIVE STEERING WHEEL KICKBACK FROM ROAD INPUTS	1. Air in power steering fluid. 2. Power steering gear loose on cradle/crossmember. 3. Steering column, coupling or intermediate shaft worn or loose. 4. Power steering pump flow is too low.	1. Inspect for excessive air bubbles in fluid (fluid will appear foamy and lighter in color). Inspect hoses for leaks and replace as necessary. Bleed air from fluid. See <u>STANDARD PROCEDURE</u>. 2. Inspect gear mounting bolts. Replace if necessary and tighten to specifications. 3. Rotate steering wheel back-and-forth while inspecting intermediate shaft going into steering gear. Look for excessive free-play. Retighten if loose bolt is found. Replace steering column, coupling or intermediate shaft if necessary. 4. Perform Power Steering Flow and Pressure Test. See <u>DIAGNOSIS AND TESTING</u>. Look for low or erratic flow or pressure. Replace power steering pump as necessary.

CONDITION	POSSIBLE CAUSES	EVALUATION/CORRECTION
LOW FLUID LEVEL WITH VISIBLE LEAK.	1. Loose power steering hose fittings or connections. 2. Damaged or missing O-ring at power steering hose tube nuts. 3. Power steering line or hose failure. 4. Power steering component leaking (reservoir, pump, gear).	1. Check torque on all tube nuts (at gear and pump). Inspect clamps at all rubber hose connections for correct position, damage and tension. Tighten tube nuts as required. Reposition or replace clamps at hose connections. Clean joints and reinspect for leaks. 2. Remove tube nut and inspect O-ring. If damaged or missing, replace O-ring. Clean joints and reinspect for leaks. 3. Clean fluid from around suspect areas. Run vehicle and inspect for leaks. Look inside reservoir to see if air is being ingested. Replace hoses as necessary. 4. Clean fluid from around suspect areas. Run vehicle and inspect for leaks. Look inside reservoir to see if air is being ingested. Replace power steering component as necessary.
AERATED FLUID.*	1. Low power steering fluid level. 2. Air leak at power steering supply hose, reservoir or pump. 3. Air leak at power steering supply hose, reservoir or pump.	1. Check fluid level and fill to proper level as necessary. Check for leaks. Make sure all air is bled from system. 2. Inspect components. Put a hand vacuum pump on the reservoir and verify that the system can keep a vacuum. System should not lose more than 1 psi in 2 minutes (make sure vacuum pump is sealed well to the reservoir). 3. Inspect components. Place a hand vacuum pump with Adapter 9688 on reservoir and verify that system can sustain vacuum. System should not lose more than 1 psi in 2 minutes (make sure vacuum pump is sealed well to the reservoir). Replace steering component as necessary.
RESERVOIR FLUID OVERFLOW OR FLUID THAT IS MILKY IN COLOR	1. Water contamination of power steering fluid.	1. Inspect fluid for milky appearance. Completely drain power steering fluid. Refill and bleed system. See <u>STANDARD PROCEDURE</u> .

NOTE: * Extremely cold temperatures may cause power steering fluid aeration. The air should work its way out of the system as the fluid warms.

STANDARD PROCEDURE

POWER STEERING SYSTEM BLEED PROCEDURE

WARNING: The fluid level should be checked with engine off to prevent injury from moving components.

CAUTION: Mopar® Power Steering Fluid + 4 or Mopar® ATF+4 Automatic Transmission Fluid is to be used in the power steering system. Both

Fluids have the same material standard specifications (MS-9602). No other power steering or automatic transmission fluid is to be used in the system. Damage may result to the power steering pump and system if another fluid is used. Do not overfill the system.

CAUTION: If the air is not purged from the power steering system correctly, pump failure could result.

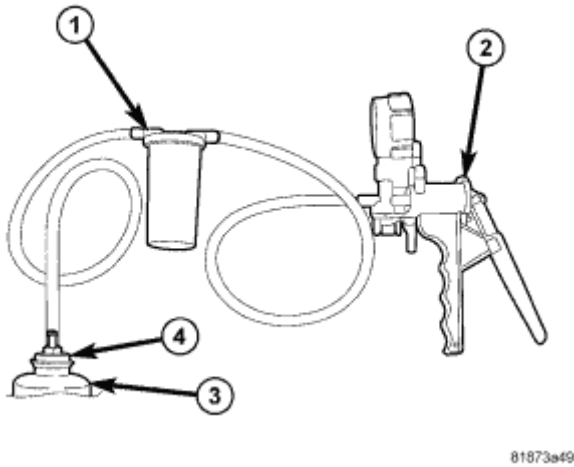


Fig. 3: HAND VACUUM PUMP ON RESERVOIR
Courtesy of CHRYSLER LLC

NOTE: Be sure the vacuum tool used in the following procedure is clean and free of any fluids.

1. Check the fluid level. As measured on the side of the reservoir, the level should indicate between MAX and MIN when the fluid is at normal ambient temperature. Adjust the fluid level as necessary. See **STANDARD PROCEDURE**.
2. Tightly insert Power Steering Cap Adapter (4), Special Tool 9688, into the mouth of the reservoir (3).

CAUTION: Failure to use a the vacuum pump reservoir (1) may allow power steering fluid to be sucked into the hand vacuum pump.

3. Attach Hand Vacuum Pump (2), Special Tool C-4207 or equivalent, with reservoir (1) attached, to the Power Steering Cap Adapter (4).

CAUTION: Do not run the engine while vacuum is applied to the power steering system. Damage to the power steering pump can occur.

NOTE: When performing the following step make sure the vacuum level is maintained during the entire time period.

4. Using Hand Vacuum Pump (2), apply 68-85 kPa (20-25 in. Hg) of vacuum to the system for a minimum of three minutes.
5. Slowly release the vacuum and remove the special tools.
6. Adjust the fluid level as necessary. Refer to step 1.
7. Repeat step 1 through step 6 until the fluid no longer drops when vacuum is applied.
8. Start the engine and cycle the steering wheel lock-to-lock three times.

NOTE: **Do not hold the steering wheel at the stops.**

9. Stop the engine and check for leaks at all connections.
10. Check for any signs of air in the reservoir and check the fluid level. If air is present, repeat the procedure as necessary.

SPECIAL TOOLS

STEERING COLUMN

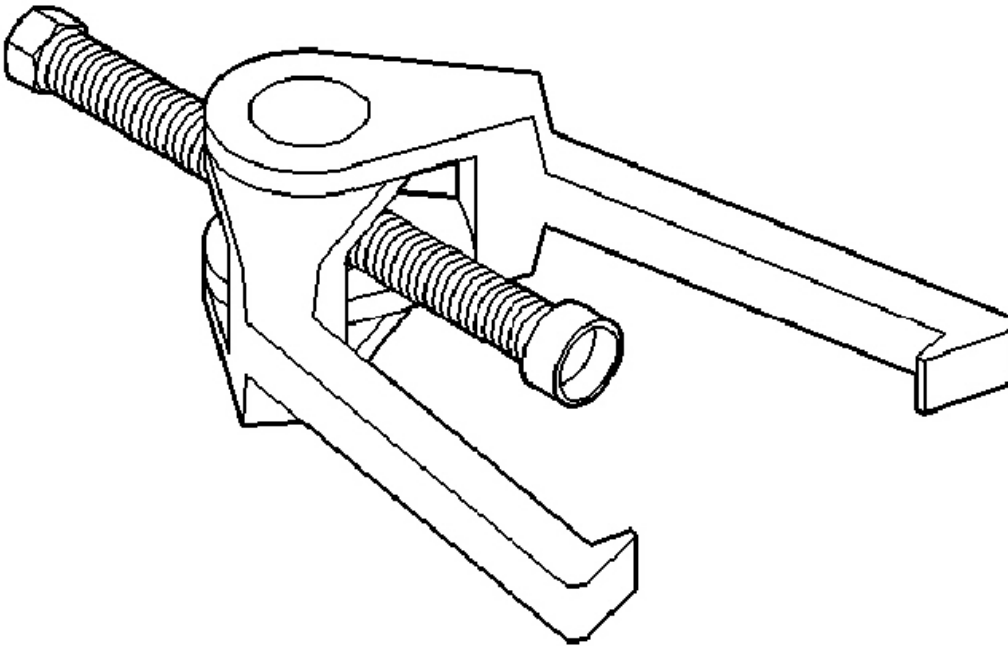


Fig. 4: Puller C-3894-A
Courtesy of CHRYSLER LLC

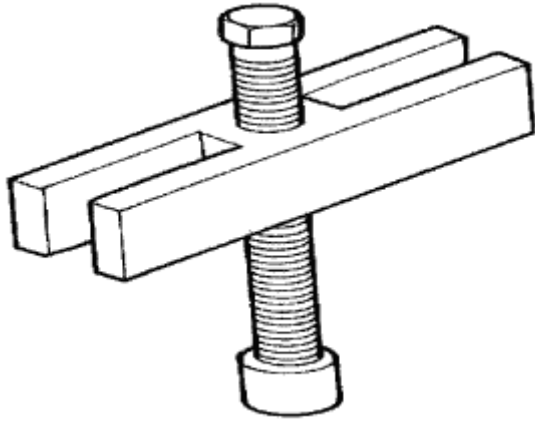


Fig. 5: PULLER L-4407-A
Courtesy of CHRYSLER LLC

COLUMN

DESCRIPTION

STEERING COLUMN

NOTE: The steering column on vehicles with an automatic transmission may not be equipped with an internal locking shaft that allows the ignition key cylinder to be locked with the key. Alternative methods of locking the steering wheel for service will have to be used.

The steering column has been designed to be serviced as an assembly. The column is connected to the steering gear with a one piece shaft. The upper half has a support bearing mounted to a bracket. The bracket mounts to the frame rail with two nuts. The shaft is serviceable. The key cylinder, switches, clock spring, trim shrouds and steering wheel are serviced separately.

OPERATION

STEERING COLUMN

Safety goggles should be worn at all times when working on steering columns.

To service the steering wheel, switches or airbag, refer to **RESTRAINTS - SERVICE INFORMATION** article and follow all WARNINGS and CAUTIONS.

WARNING: The airbag system is a sensitive, complex electro-mechanical unit. Before attempting to diagnose, remove or install the airbag system components you must first disconnect and isolate the battery negative (ground) cable. Then wait two minutes for the system capacitor to discharge. Failure to do so could result in accidental deployment of the airbag and possible

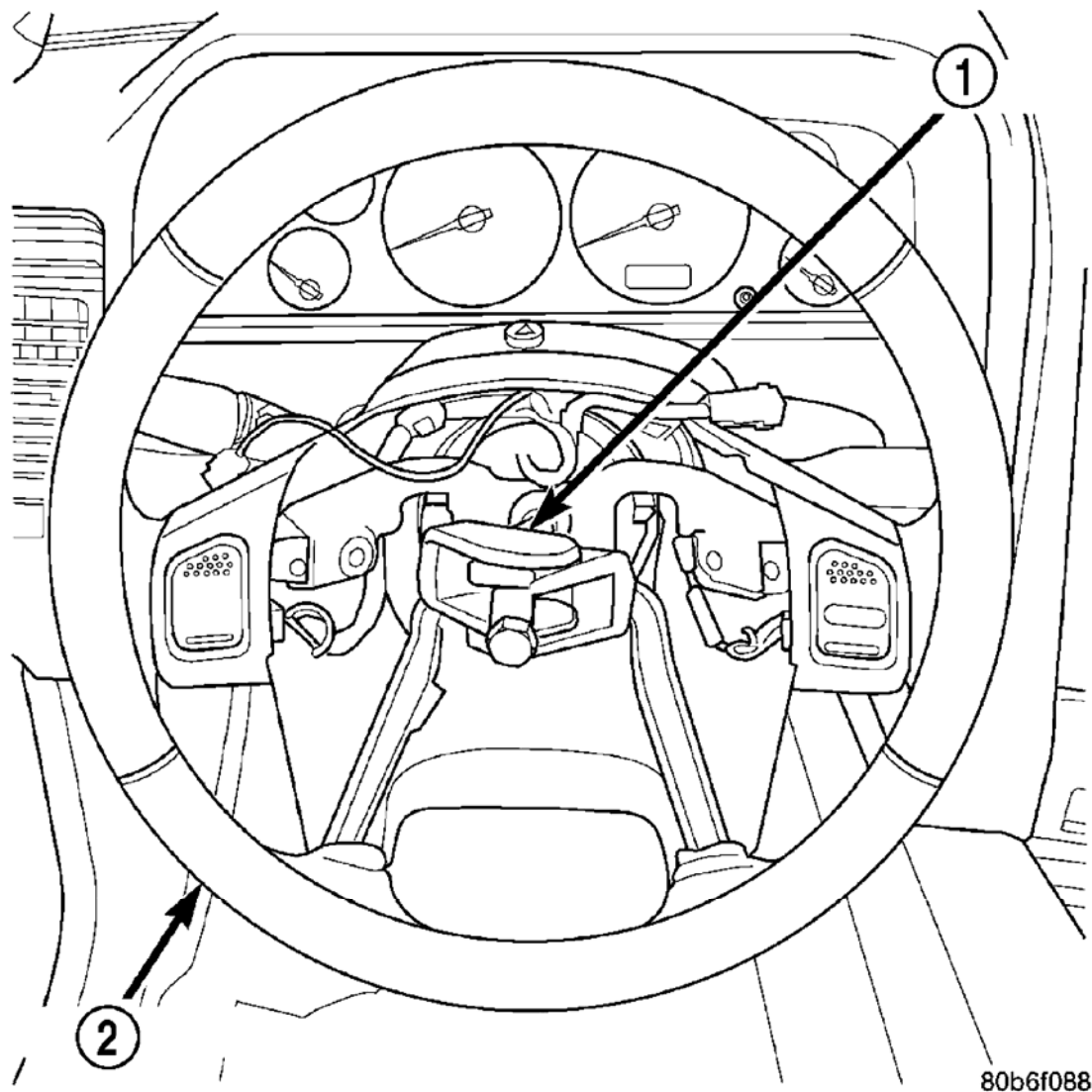
personal injury. The fasteners, screws, and bolts, originally used for the airbag components, have special coatings and are specifically designed for the airbag system. They must never be replaced with any substitutes. Anytime a new fastener is needed, replace with the correct fasteners provided in the service package or fasteners listed in the parts books.

REMOVAL

STEERING COLUMN

1. Position front wheels **straight ahead**.
2. Remove and isolate the negative ground cable from the battery.
3. Remove the airbag, refer to **REMOVAL** .

NOTE: **If equipped with cruise control, disconnect clock spring harness from the cruise switch harness on the steering wheel.**



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Fig. 6: Steering Wheel Puller
Courtesy of CHRYSLER LLC

1 - PULLER C-3894-A
2 - STEERING WHEEL

4. Remove the steering wheel (2) with puller C-3894-A (1) or an appropriate puller. See **Fig. 6**. See **REMOVAL**.

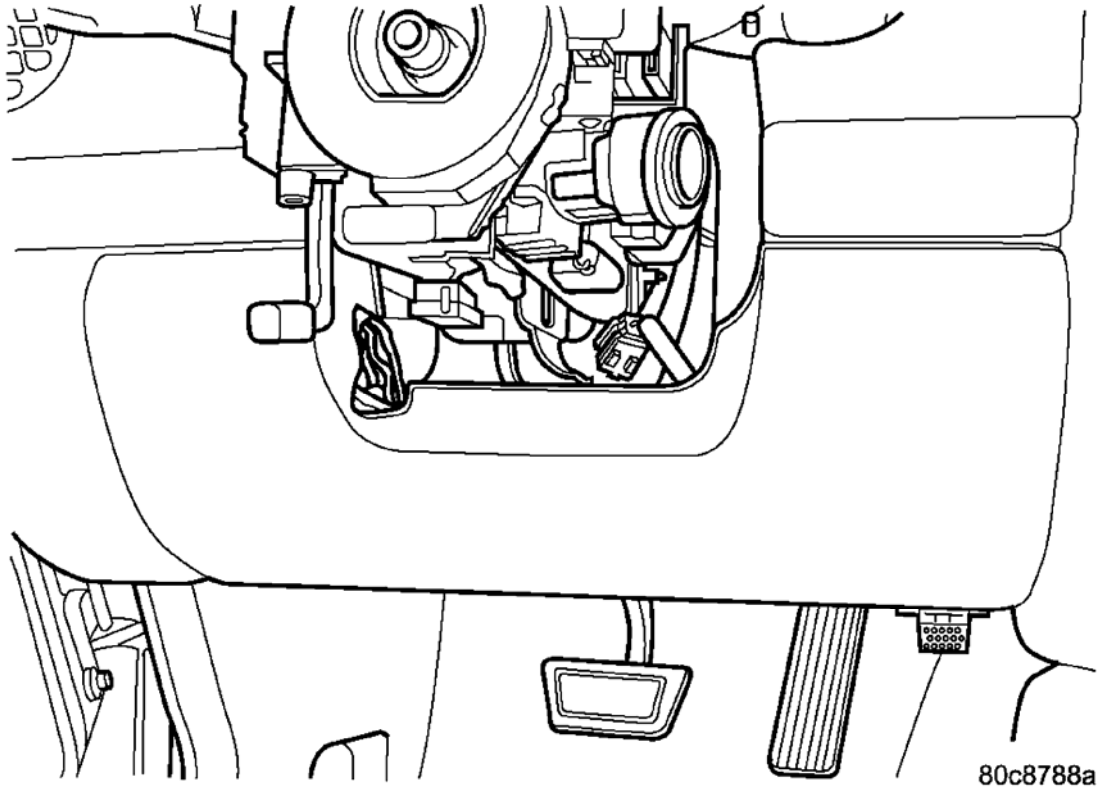
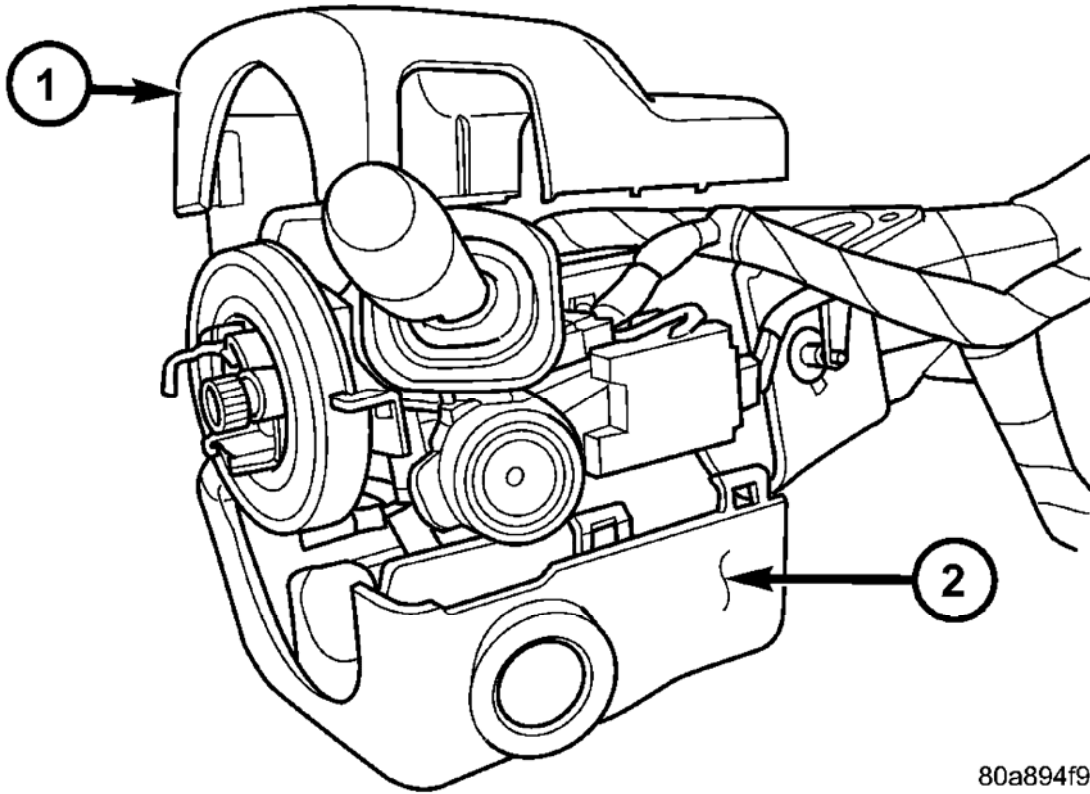


Fig. 7: Knee Blocker
Courtesy of CHRYSLER LLC

5. Remove steering column opening cover, refer to **REMOVAL** .



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Fig. 8: Removing/Installing Shroud
Courtesy of CHRYSLER LLC

1 - Upper Shroud 2 - Lower Shroud

6. Remove screws from the lower column shroud (2) and remove both the upper and lower shrouds. See **Fig. 8**.

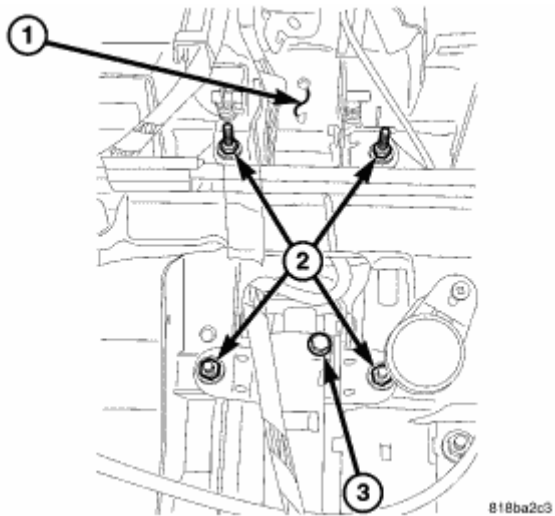


Fig. 9: STEERING COLUMN BOLTS
 Courtesy of CHRYSLER LLC

7. Turn ignition key to the on position.
8. If vehicle is equipped with automatic transmission, disconnect shifter interlock cable from the column.
9. Remove the steering coupler bolt and column mounting nuts (2) then lower column (1) off the mounting studs.

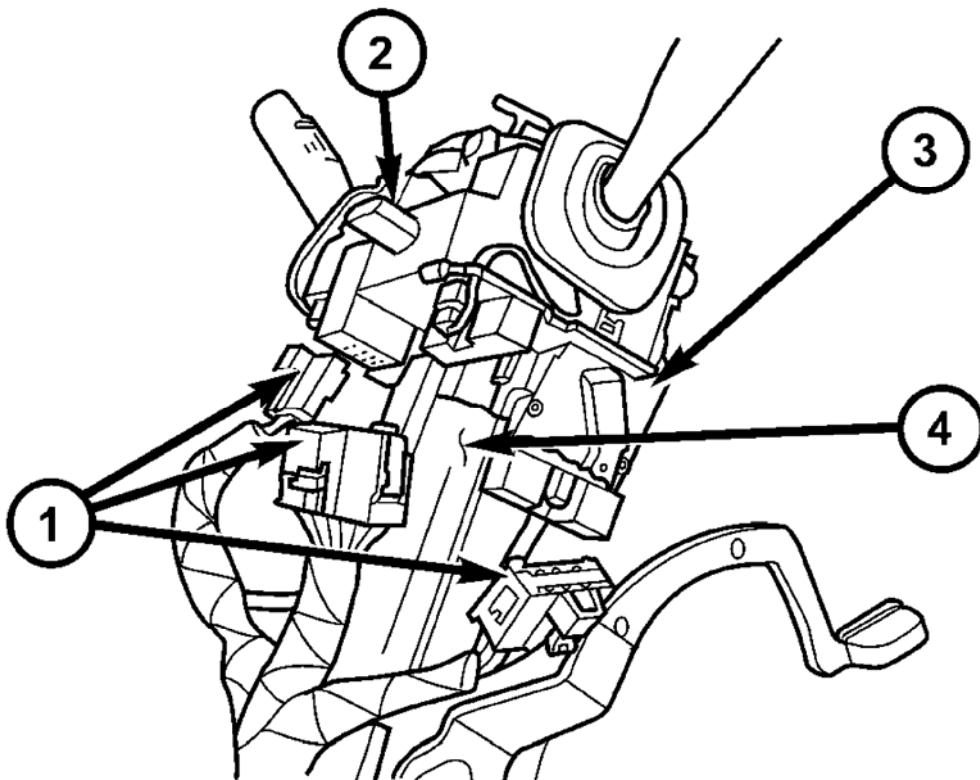
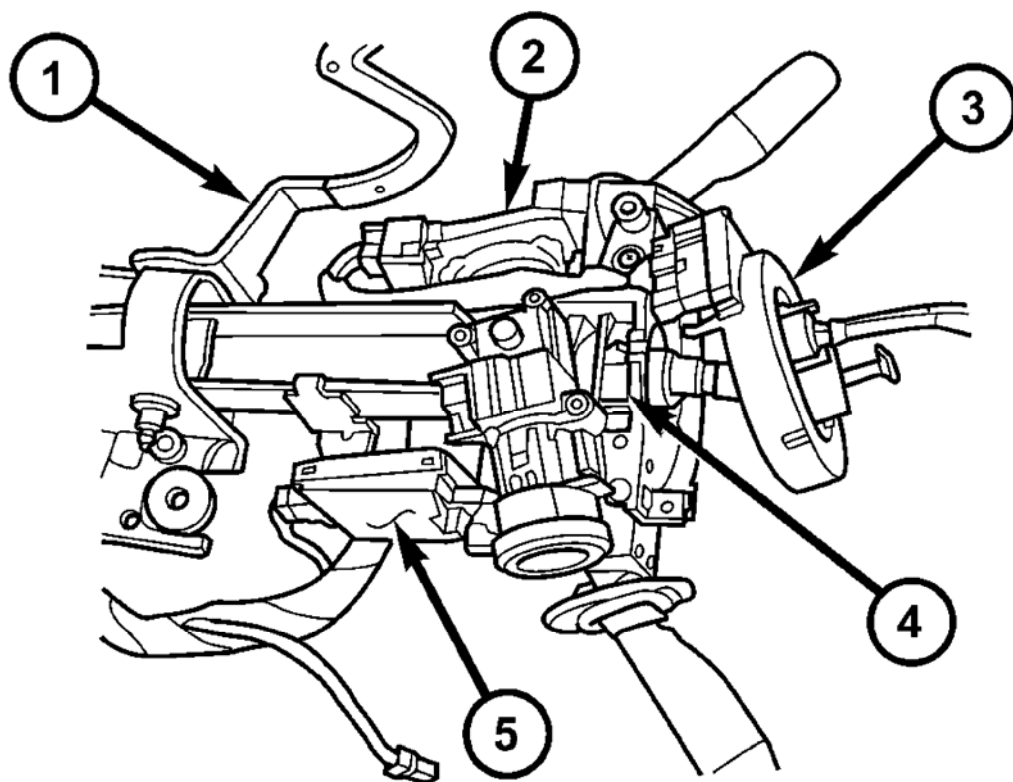


Fig. 10: Identifying Column Wiring Harness
Courtesy of CHRYSLER LLC

- 1 - Column Wiring Harness
- 2 - Multi-function Switch
- 3 - Ignition Switch
- 4 - Steering Column

10. Disconnect and remove the wiring harness (1) from the column. See **Fig. 10**.
11. Slide the shifter interlock cable from the tie straps.



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Fig. 11: Clock Spring
Courtesy of CHRYSLER LLC

- 1 - Tilt Lever
- 2 - Ignition Switch
- 3 - Clockspring
- 4 - Steering Column
- 5 - SKIM/SKREEM

12. Remove column (4).

13. Transfer the necessary parts if needed.
14. Remove clock spring (3), switches, (SKREEM if equipped) (5) See **Fig. 11**. Refer to **REMOVAL** .

INSTALLATION

STEERING COLUMN

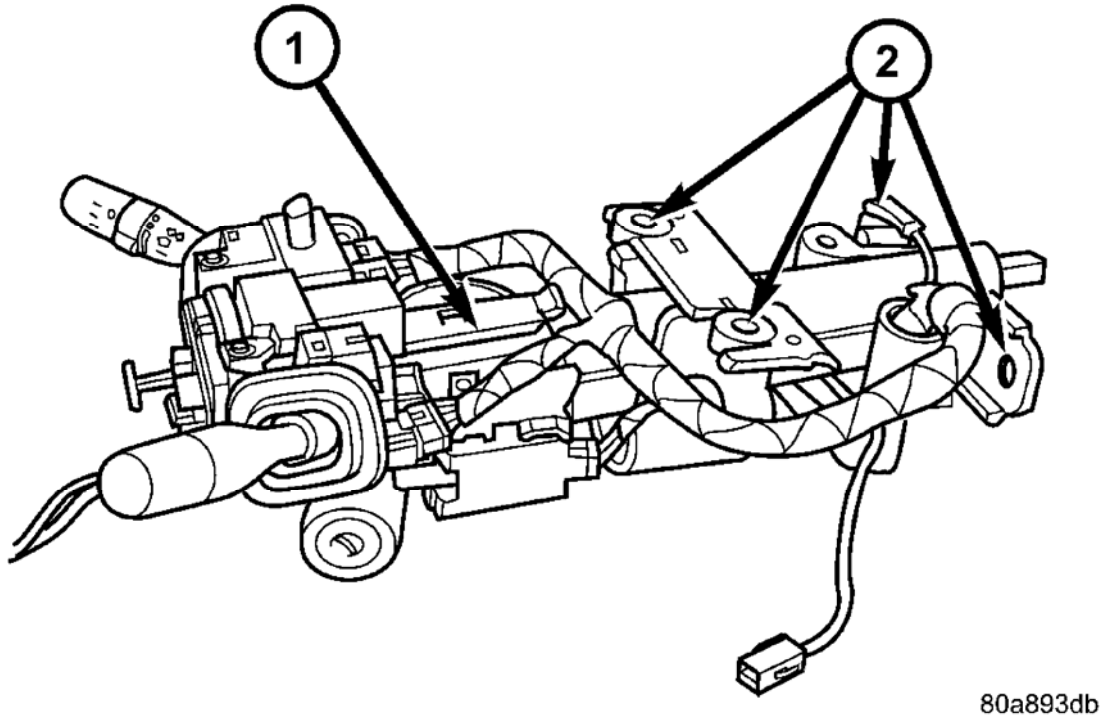
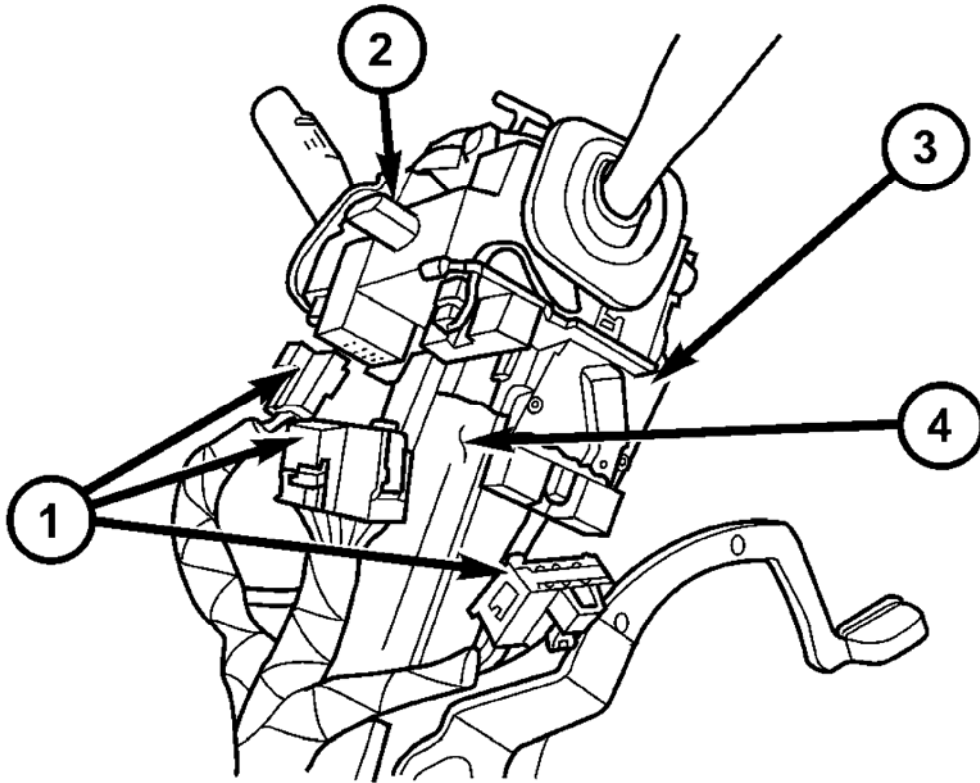


Fig. 12: Steering Column Mounting
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - Steering Column
2 - Mounting Holes |
|---|

1. Align and install column (1) into the steering coupler. See **Fig. 12**.



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Fig. 13: Identifying Column Wiring Harness
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - Column Wiring Harness2 - Multi-function Switch3 - Ignition Switch4 - Steering Column |
|---|

2. Install column harness (1) and connect harness to switches. See **Fig. 13**.
3. Reroute the shifter interlock cable through the tie straps.

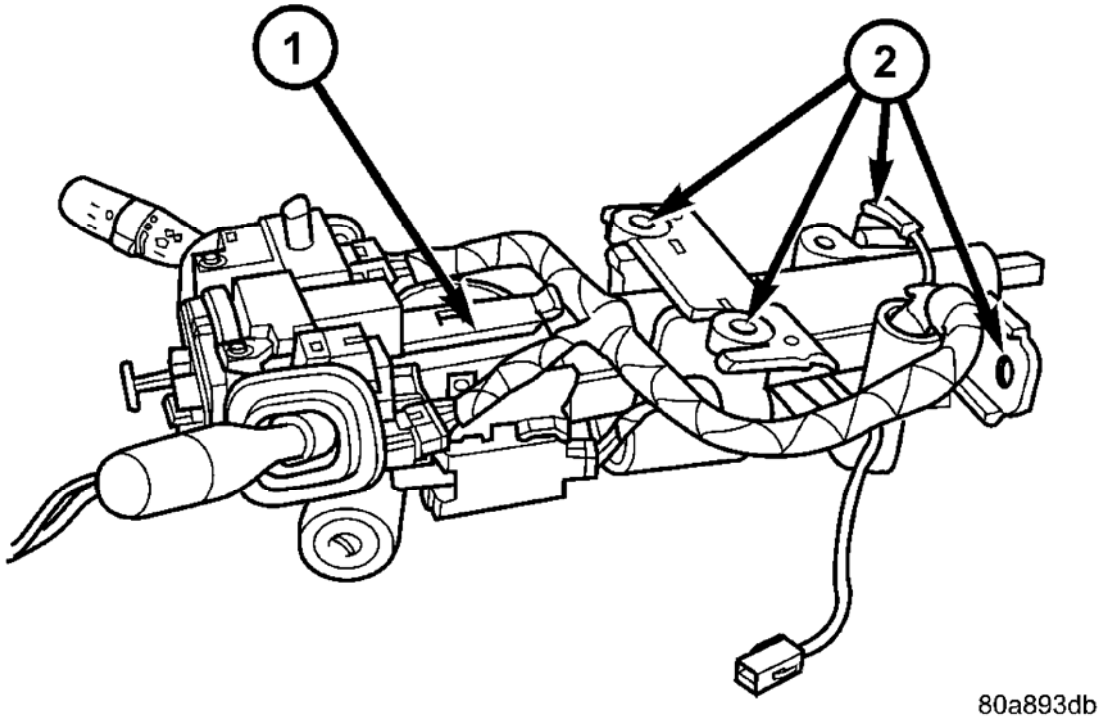


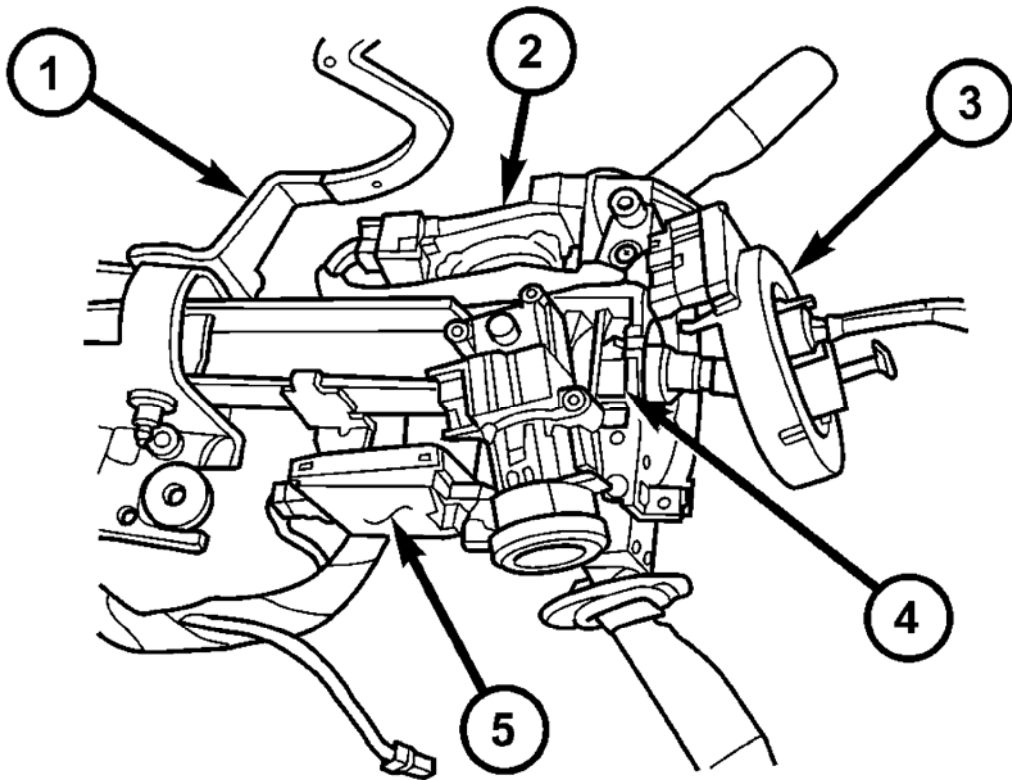
Fig. 14: Steering Column Mounting
Courtesy of CHRYSLER LLC

1 - Steering Column 2 - Mounting Holes

4. Install the column (1) onto the mounting studs (2). See **Fig. 12**.
5. Install the two mounting nuts and the two mounting bolts all finger tight.

CAUTION: Lower nuts must be installed and tightened first then the upper nuts in order to prevent damage to the capsules.

6. Tighten the lower mounting nuts to 17 N.m (150 in. lbs.).
7. Tighten the upper mounting nuts to 17 N.m (150 in. lbs.).

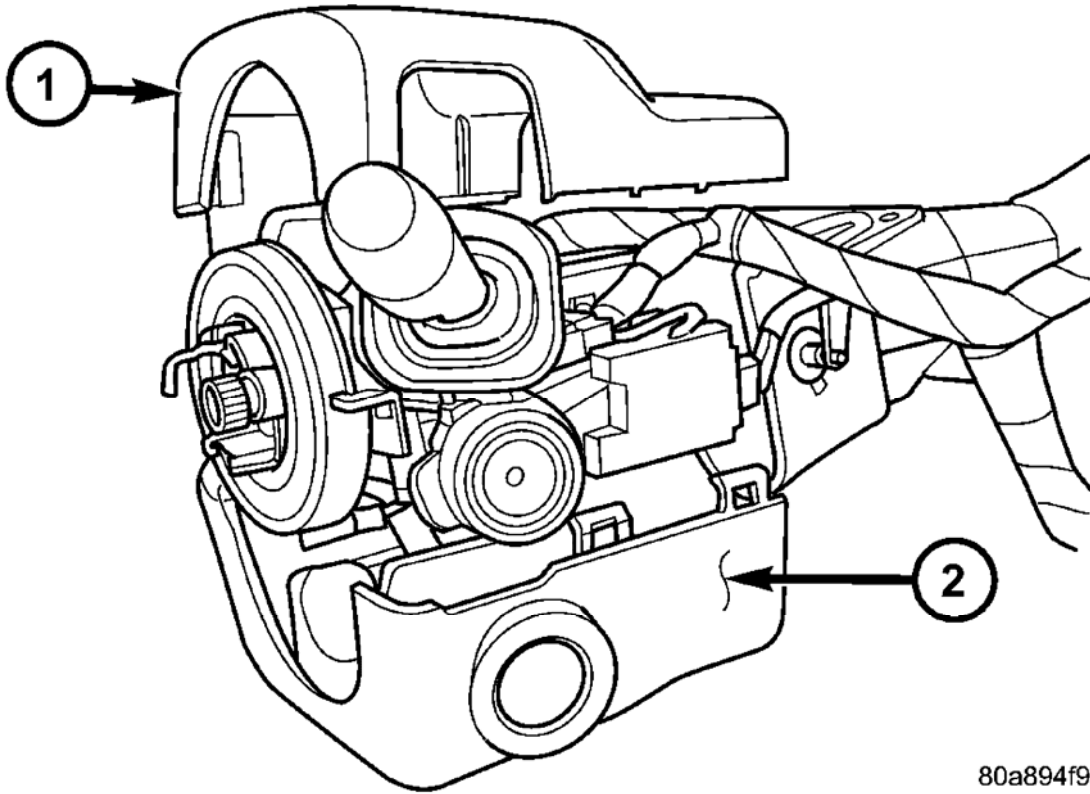


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Fig. 15: Clock Spring
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - Tilt Lever
2 - Ignition Switch
3 - Clockspring
4 - Steering Column
5 - SKIM/SKREEM |
|--|

8. Install the steering column coupler bolt and tighten to 53 N.m (39 ft. lbs.).
9. Reconnect the shifter interlock cable.
10. Center the clock spring (3) (if necessary) and install it on the column (4). See **Fig. 15**, refer to **INSTALLATION** .



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Fig. 16: Removing/Installing Shroud
Courtesy of CHRYSLER LLC

1 - Upper Shroud 2 - Lower Shroud

11. Snap together the column shrouds (1&2) and install the mounting screws. See **Fig. 16**.

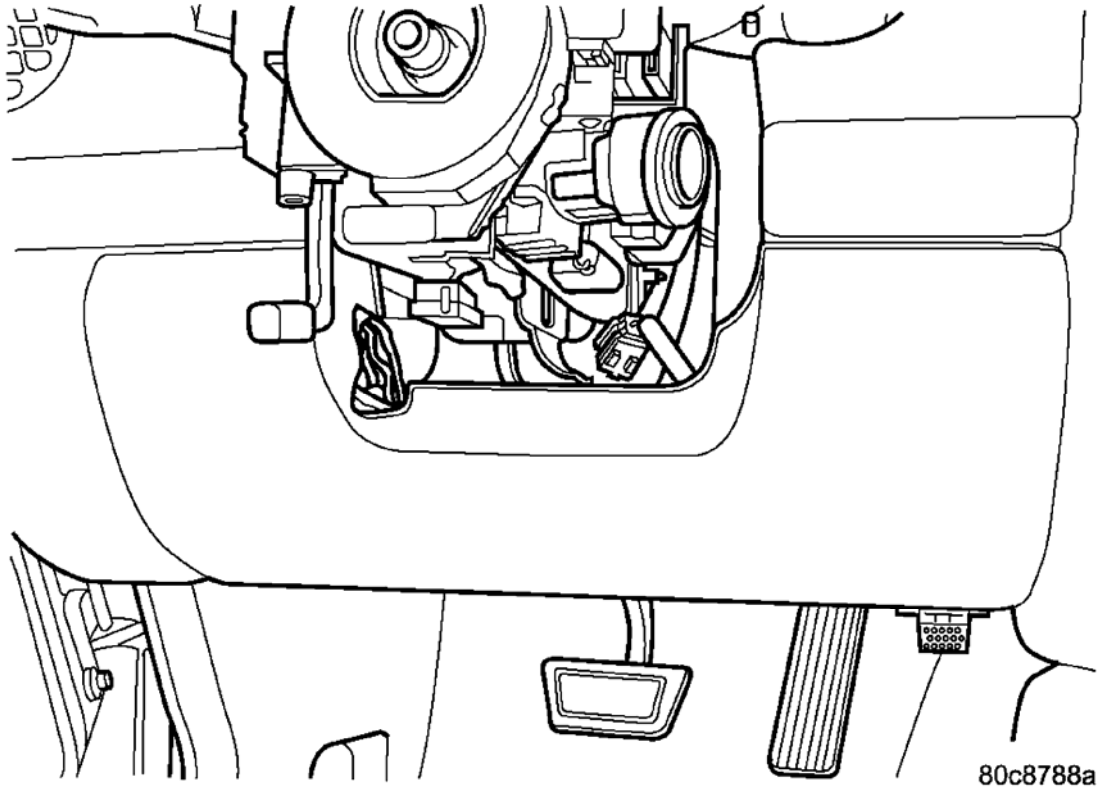


Fig. 17: Knee Blocker
Courtesy of CHRYSLER LLC

12. Install the steering column opening cover. Refer to **INSTALLATION** .

NOTE: Do not reuse the old steering wheel bolt (a new bolt must be used)

NOTE: Be certain that the steering wheel mounting bolt is tightened to the proper torque specification to ensure proper clockspring operation.

13. Install the steering wheel and tighten bolt to 54 N.m (40 ft. lbs.). See **INSTALLATION**.

NOTE: If equipped with cruise control, connect clock spring harness to cruise switch harness on the steering wheel.

14. Install the airbag, refer to **INSTALLATION** .

15. Install the negative battery terminal.

SPECIFICATIONS

TORQUE CHART

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Steering Wheel Bolt	54	40	-
Steering Column Mounting Bolts	17	-	150
Steering Column Coupler Bolt	53	39	-
Intermediate Shaft Lower Support Bearing Nuts	12	9	106
Intermediate Shaft Lower Coupler Bolt	53	39	-
Ignition Switch Screws	2	-	17

IGNITION SWITCH

DESCRIPTION

SWITCH-IGNITION

The electrical ignition switch is located on the steering column. It is used as the main on/off switching device for most electrical components. The mechanical key cylinder is used to engage/disengage the electrical ignition switch.

DIAGNOSIS AND TESTING

SWITCH-IGNITION

ELECTRICAL DIAGNOSIS

For ignition switch electrical schematics, Refer to the appropriate service information for the component.

MECHANICAL DIAGNOSIS (KEY DIFFICULT TO ROTATE)

Vehicles equipped with an automatic transmission and a floor mounted shifter: a cable is used to connect the interlock device in the steering column assembly, to the transmission floor shift lever. This interlock system is used to lock the transmission shifter in the PARK position when the key cylinder is rotated to any position. If the ignition key is difficult to rotate to or from any position, it may not be the fault of the key cylinder or the steering column components. The brake transmission shift interlock cable may be out of adjustment. Refer to **ADJUSTMENTS** . The interlock system within the steering column is not serviceable. If repair is necessary, the steering column assembly must be replaced. See **REMOVAL**.

Vehicles equipped with a manual transmission and a floor mounted shifter: on certain models, a button is located on the steering column behind the ignition key cylinder. The button must be manually depressed to allow rotation of the ignition key cylinder to any position. If it is difficult to rotate the key to any position, the lever mechanism may be defective. This mechanism is not serviceable. If repair is necessary, the steering column assembly must be replaced. See **REMOVAL**.

REMOVAL

SWITCH-IGNITION

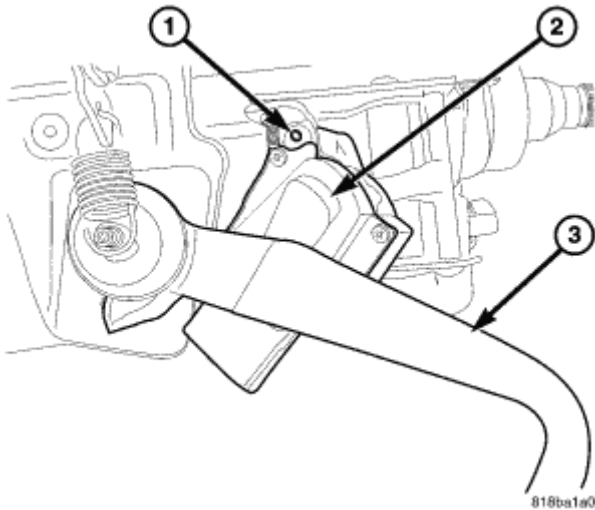


Fig. 18: IGNITION SWITCH SCREW
Courtesy of CHRYSLER LLC

1. Remove the steering column shrouds.

NOTE: The ignition key must be in the key cylinder for cylinder removal. The key cylinder must be removed first before removing ignition switch.

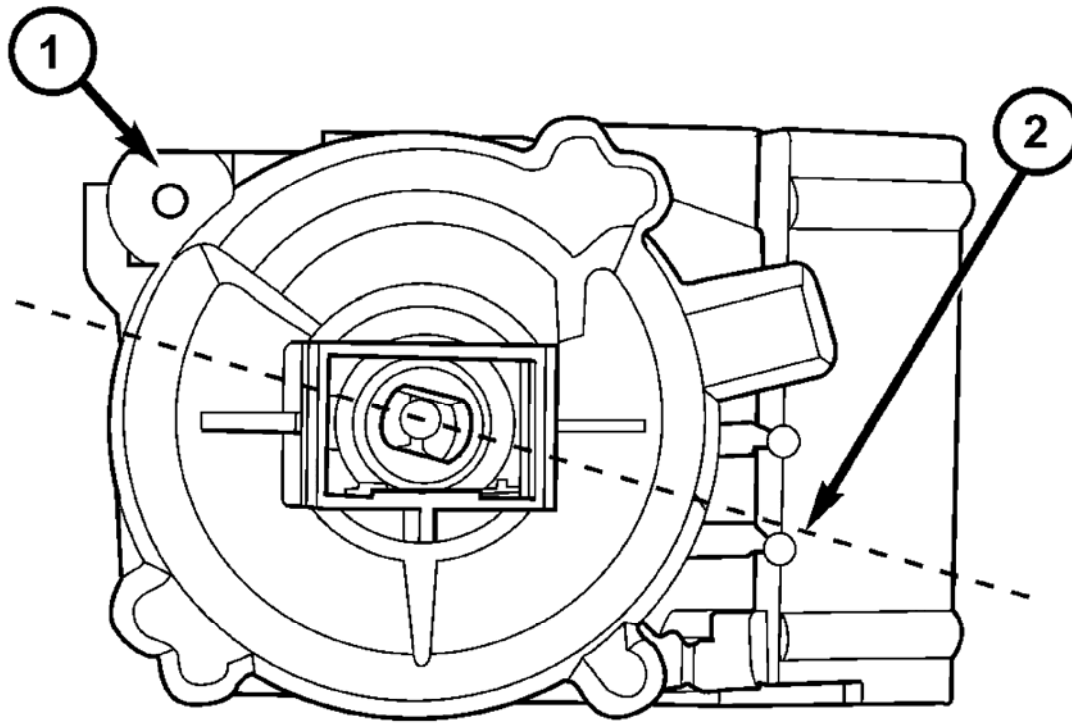
2. Remove lock cylinder. See **REMOVAL**.
3. Remove the multi-function switch.
4. Disconnect the electrical connector at the rear of the ignition switch.
5. Remove the ignition switch mounting screw (1). Use tamper proof Torx bit to remove the screw.

NOTE: Tilt arm (3) must be moved to allow removal of the switch.

6. Pull the ignition switch (2) straight out to remove from the locking tabs.

INSTALLATION

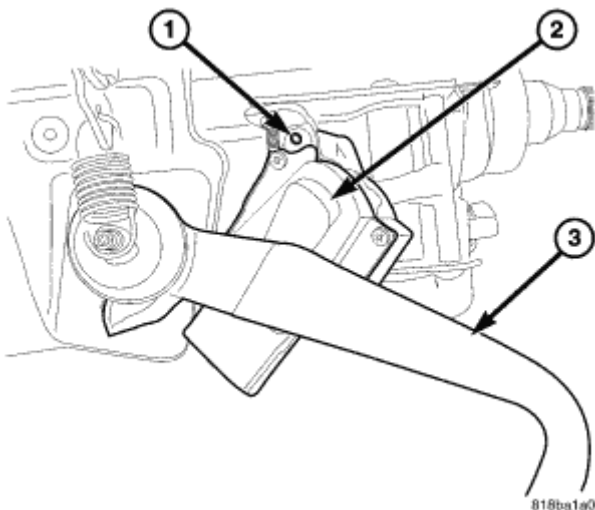
SWITCH-IGNITION



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Fig. 19: Ignition Switch On Position
 Courtesy of CHRYSLER LLC

1. Before installing ignition switch (1), rotate the slot in the switch to the ON position (2).



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Fig. 20: IGNITION SWITCH SCREW
 Courtesy of CHRYSLER LLC

NOTE: Tilt arm (3) must be moved to allow installation of the switch.

2. Position the switch (2) to the column and install tamper proof screw (1). Tighten screw to 2 N.m (17 in. lbs.).
3. Connect the electrical connector to rear of ignition switch. Make sure that locking tab is fully seated into wiring connector.

NOTE: The ignition key must be in the key cylinder for cylinder installation. The key cylinder must be aligned with the ignition switch for installation.

4. Install the lock cylinder. See INSTALLATION.
5. Test the operation of the lock cylinder for smooth rotating.
6. Install the multi-function switch.
7. Install steering column lower cover.

KEY-IN IGNITION SWITCH

DESCRIPTION

SWITCH-KEY IN IGNITION

The key-in ignition switch is integral to the ignition switch, which is mounted on the left side of the steering column, opposite the ignition cylinder. It closes a path to ground for the instrument cluster chime warning circuitry when the ignition key is inserted in the ignition lock cylinder and the driver door jamb switch is closed (driver door is open). The key-in ignition switch opens the ground path when the key is removed from the ignition cylinder.

The key-in ignition switch cannot be repaired and, if faulty or damaged, the entire ignition switch must be replaced. See REMOVAL.

DIAGNOSIS AND TESTING

SWITCH-KEY-IN IGNITION

For circuit descriptions and diagrams, Refer to the appropriate service information on the individual components.

WARNING: On vehicles equipped with airbags, refer to RESTRAINTS - SERVICE INFORMATION article before attempting any steering wheel, steering column, or instrument panel component diagnosis or service. Failure to take the proper precautions could result in accidental airbag deployment and possible personal injury.

1. Disconnect and isolate the battery negative cable. Remove the steering column shrouds. Unplug the key-in ignition switch wire harness connector from the ignition switch.
2. Check for continuity between the key-in switch sense circuit and the left front door jamb switch sense

circuit terminals of the key-in ignition switch. There should be continuity with the key in the ignition cylinder, and no continuity with the key removed from the ignition cylinder. If OK, go to step 3. If not OK, replace the faulty ignition switch assembly.

3. Check for continuity between the left front door jamb switch sense circuit cavity of the key-in ignition switch wire harness connector and a good ground. There should be continuity with the driver door open, and no continuity with the driver door closed. If OK, see the diagnosis for Instrument Cluster in this service information. If not OK, repair the circuit to the driver door jamb switch as required.

KEY CYLINDER

REMOVAL

CYLINDER-KEY

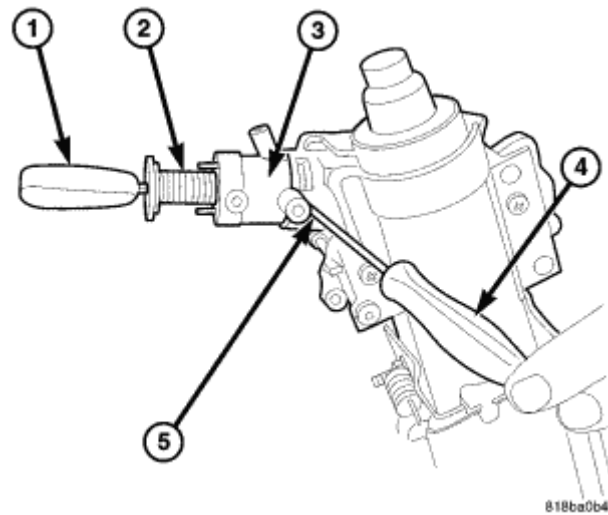


Fig. 21: LOCK CYLINDER REMOVAL
Courtesy of CHRYSLER LLC

The ignition key (1) must be in the key cylinder (2) for cylinder removal. The key cylinder must be removed first before removing ignition switch.

1. If equipped with an automatic transmission, place shifter in PARK position.
2. Remove the shroud covers.
3. Remove the remote keyless entry (SKREEM) module.
4. Remove the halo ring around the cylinder.
5. Rotate key to RUN position.
6. A release pin is located on the bottom of the key cylinder (5) with the access hole on the top of the lock cylinder housing (3).
7. Position a small screwdriver or pin punch (4) into pin access hole (5).
8. Push the pin punch (5) up while pulling key cylinder (2) from lock cylinder housing (3).

INSTALLATION

CYLINDER-KEY

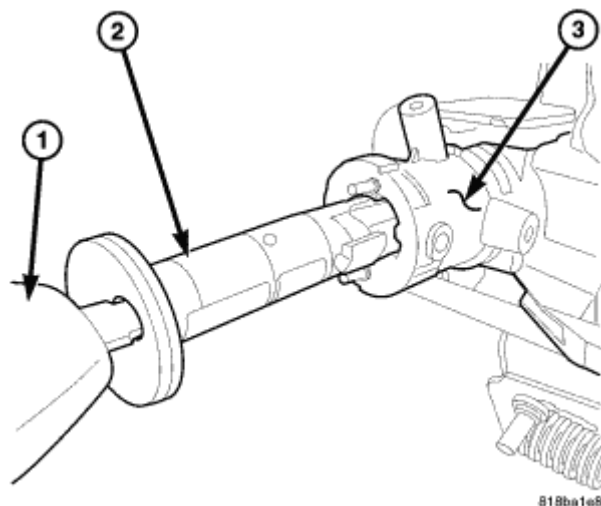


Fig. 22: CYLINDER INSTALL
Courtesy of CHRYSLER LLC

The ignition key (1) must be in the key cylinder (2) for cylinder installation.

1. Install the key cylinder (2) into the housing (3) using care to align the end of the key cylinder with the ignition switch.
2. Push the key cylinder (2) in until it clicks.
3. Rotate the key to the insert position.
4. Install the halo ring around the key cylinder housing.
5. Install the (SKREEM) module.
6. Install the shroud covers.

HOUSING-LOCK CYLINDER

REMOVAL

LOCK CYLINDER HOUSING

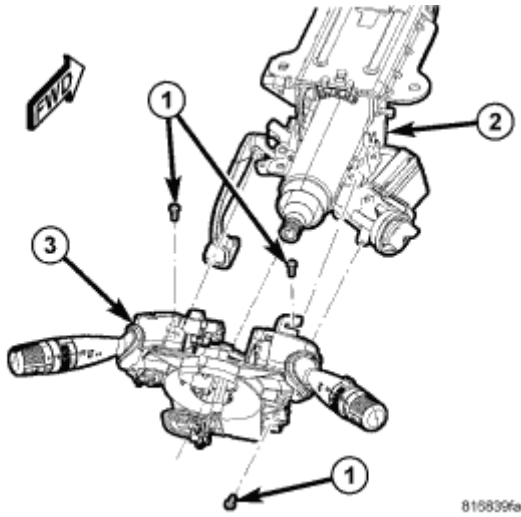


Fig. 23: SCCM MOUNTING
Courtesy of CHRYSLER LLC

1. Access and remove the Steering Column Control Module (SCCM) (3) from the steering column (2). Refer to **REMOVAL** .

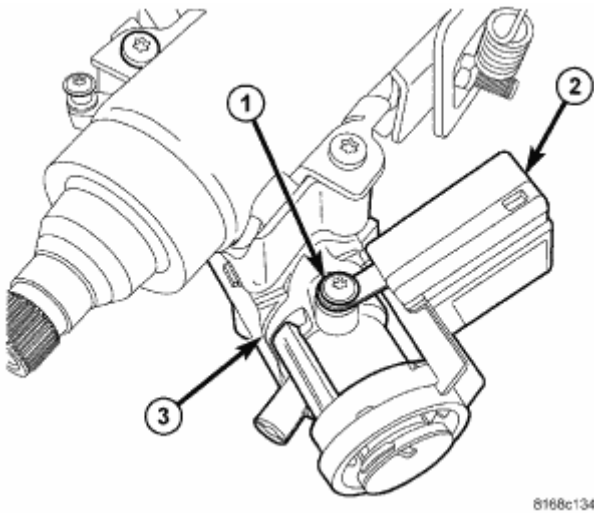


Fig. 24: SKREEM (WCM) MOUNTING SCREW
Courtesy of CHRYSLER LLC

2. Remove the screw (1) fastening the SKREEM/WCM (2) to the lock cylinder housing (3).
3. Unhook the SKREEM/WCM (2) retainer fingers from the lock cylinder housing (3) and remove it.

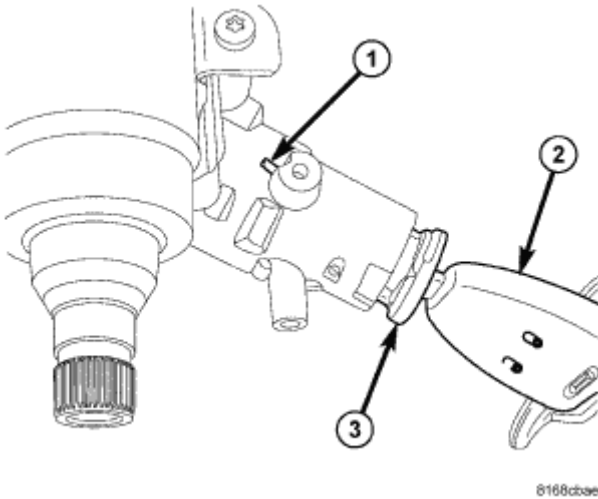


Fig. 25: ACCESS HOLE FOR LOCK CYLINDER REMOVAL
 Courtesy of CHRYSLER LLC

4. Insert the key (2) and turn the key cylinder (3) to the RUN position.
5. Insert an appropriate tool into the slot (1) formed into the lock cylinder housing depressing the key cylinder retaining tab.
6. Pull the key cylinder and key straight out of the lock cylinder housing as one unit.

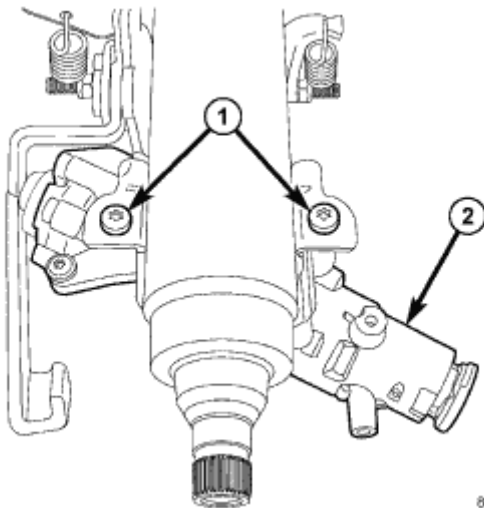
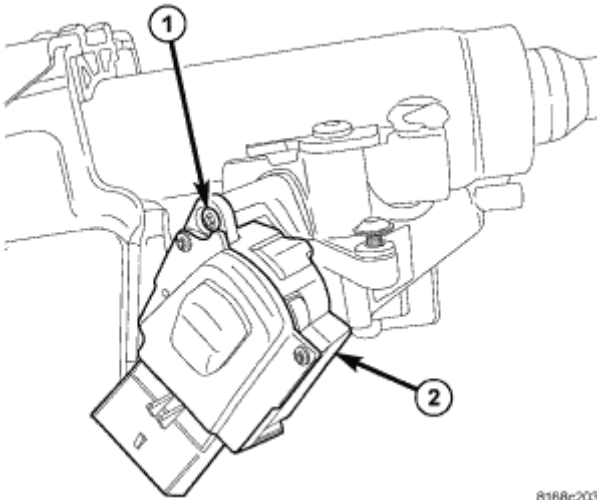


Fig. 26: LOCK CYLINDER HOUSING MOUNTING
 Courtesy of CHRYSLER LLC

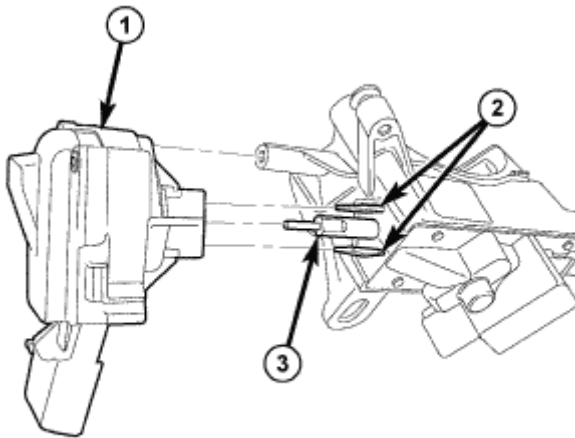
7. Using a Tamper-Proof Torx® Plus (five point) 30 bit, remove the two screws (1) fastening the lock cylinder housing (2) to the column.
8. Remove the lock cylinder housing from the steering column.



8168c203

Fig. 27: IGNITION SWITCH MOUNTING SCREW
 Courtesy of CHRYSLER LLC

9. Remove the ignition module (2) mounting screw (1).



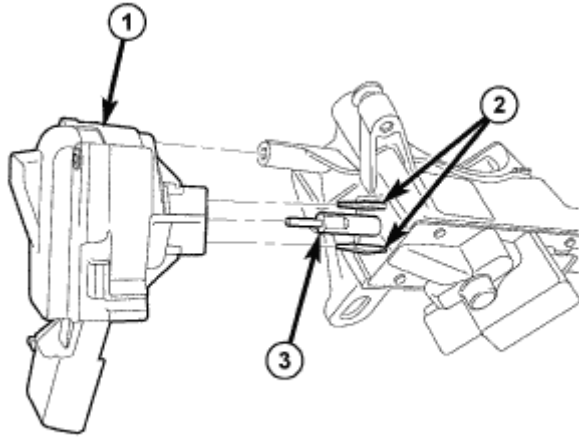
8168c204

Fig. 28: IGNITION SWITCH REMOVAL/INSTALLATION
 Courtesy of CHRYSLER LLC

10. Pull the module (1) straight out and off the retaining tabs (2) located on the lock cylinder housing.

INSTALLATION

LOCK CYLINDER HOUSING

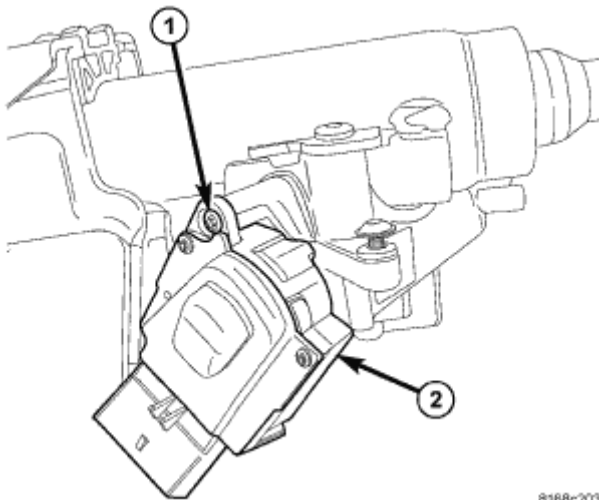


8168cb64

Fig. 29: IGNITION SWITCH REMOVAL/INSTALLATION
 Courtesy of CHRYSLER LLC

NOTE: Ignition module must be installed prior to lock housing installation on column. Otherwise, the tilt lever will obstruct installation of ignition switch.

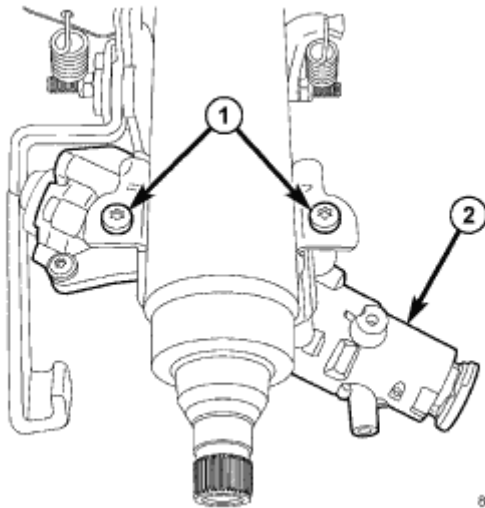
1. Ensure the ignition module is in the RUN position and the actuator shaft in the lock housing is in the RUN position.
2. Align the ignition module with the pin (3), actuator shaft and retaining tabs (2) located on the lock cylinder housing. Carefully install the module, snapping it into place over the retaining tabs.



8168c203

Fig. 30: IGNITION SWITCH MOUNTING SCREW
 Courtesy of CHRYSLER LLC

3. Install the ignition module (2) mounting screw (1). Tighten the screw to 2 N.m (18 in. lbs.).

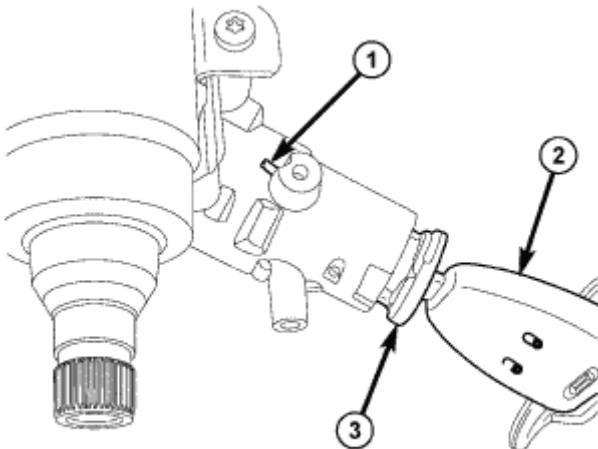


8168cbc2

Fig. 31: LOCK CYLINDER HOUSING MOUNTING
 Courtesy of CHRYSLER LLC

NOTE: Ignition module needs to be installed on lock cylinder housing before housing installation to clear tilt lever.

4. Position the lock cylinder housing in the RUN position.
5. Align the lock cylinder housing (2) with the steering column.
6. Install the two screws (1) fastening the lock cylinder housing (2) to the column. Tighten the screws to 12 N.m (110 in. lbs.).



8168cbc3e

Fig. 32: ACCESS HOLE FOR LOCK CYLINDER REMOVAL
 Courtesy of CHRYSLER LLC

7. Place the actuator in the lock cylinder housing to the RUN position (if not already there).
8. Insert the key into the key cylinder and turn the key cylinder to the RUN position.
9. Align the retaining tab on the key cylinder with the slot in the top of the lock cylinder housing.

10. Slide the key cylinder into the lock cylinder housing until the key cylinder retaining tab locks the cylinder into place.
11. Rotate the key back and forth (OFF to START), then remove and reinstall it, making sure the key cylinder and lock cylinder housing operate properly.

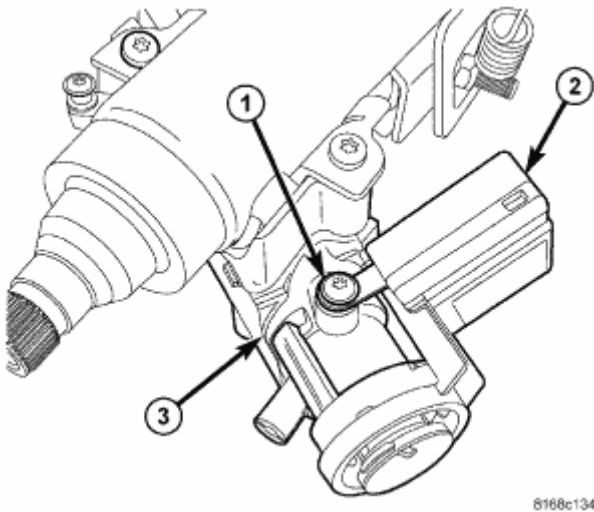


Fig. 33: SKREEM (WCM) MOUNTING SCREW
Courtesy of CHRYSLER LLC

12. Slide the ring of the SKREEM/WCM (2) over the lock cylinder housing (3) and engage the retainer fingers in the recesses formed on the lock cylinder housing.
13. Install the screw (1) fastening the SKREEM/WCM (2) to the lock cylinder housing (3). Tighten the screw to 2.5 N.m (22 in. lbs.).

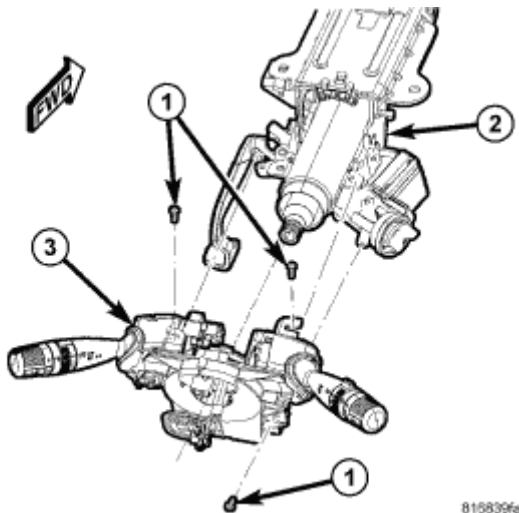


Fig. 34: SCCM MOUNTING
Courtesy of CHRYSLER LLC

14. Install the Steering Column Control Module (SCCM) (3) and all components removed to access it. Refer to **INSTALLATION**.

15. Check operation of all steering column mounted components.

INTERMEDIATE SHAFT

REMOVAL

STEERING INTERMEDIATE SHAFT - 3.7L & DIESEL

1. Disconnect the negative battery cable.
2. Remove knee blocker cover and knee blocker, refer to **REMOVAL** .

NOTE: The steering column on vehicles with an automatic transmission may not be equipped with an internal locking shaft that allows the ignition key cylinder to be locked with the key. Alternative methods of locking the steering wheel for service will have to be used.

3. Lock the steering wheel with the tires in the straight ahead position.

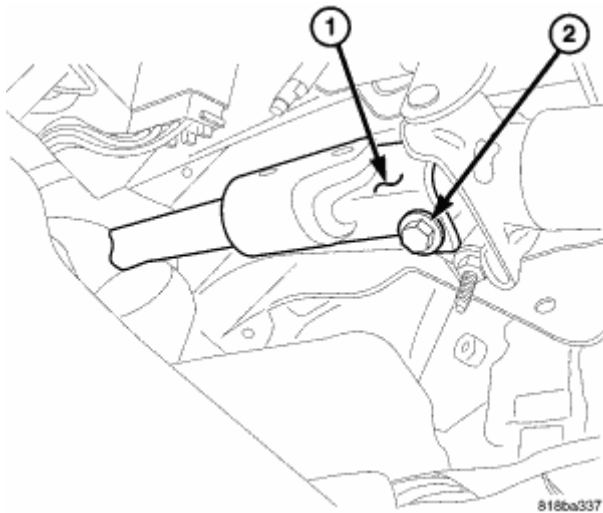


Fig. 35: UPPER COUPLING
Courtesy of CHRYSLER LLC

4. Remove the lower column pinch bolt (2).
5. Lower the steering coupler (1) shaft from the column.

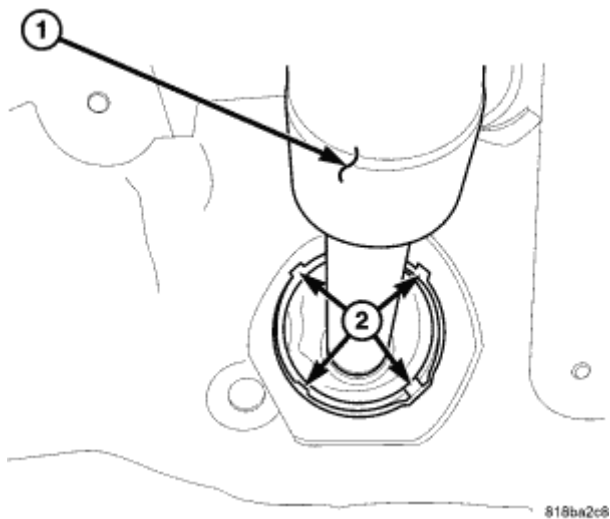


Fig. 36: BOOT TANGS
 Courtesy of CHRYSLER LLC

6. Remove the intermediate shaft seal by pushing in the four tangs (2) securing it to the panel.

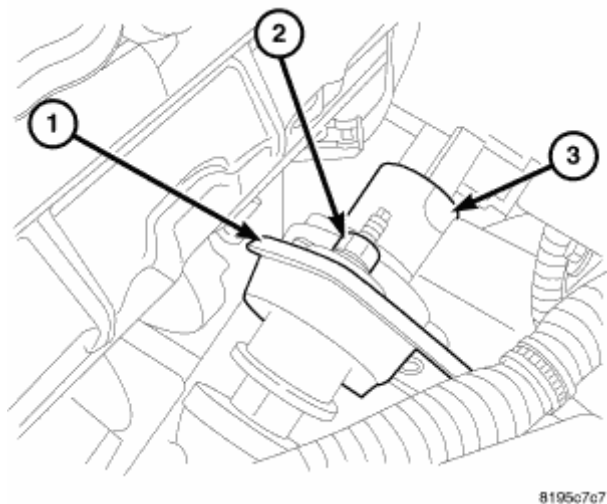


Fig. 37: BEARING
 Courtesy of CHRYSLER LLC

Remove the nuts (2) for the intermediate shaft support bearing (1).

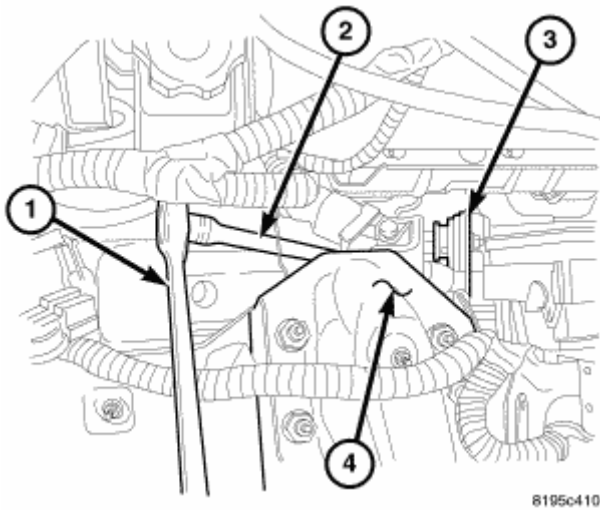


Fig. 38: BEARING BRACKET
Courtesy of CHRYSLER LLC

7. Remove the center support bearing bracket (3) from the mount on the shock tower (4) using a ratchet (1) with an extension (2).

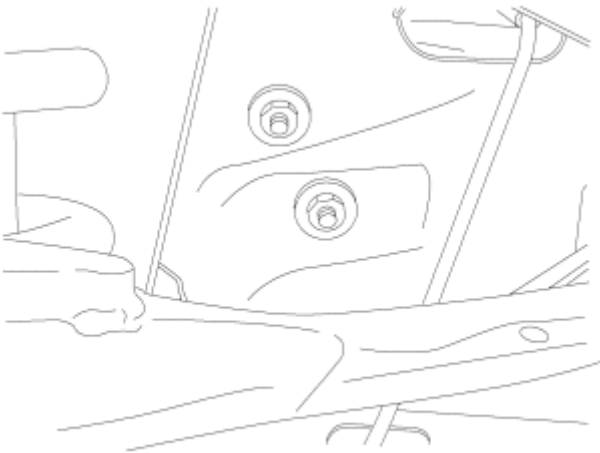


Fig. 39: BRACKET NUTS
Courtesy of CHRYSLER LLC

8. Remove the nuts from the shock tower **if removing the bracket.**

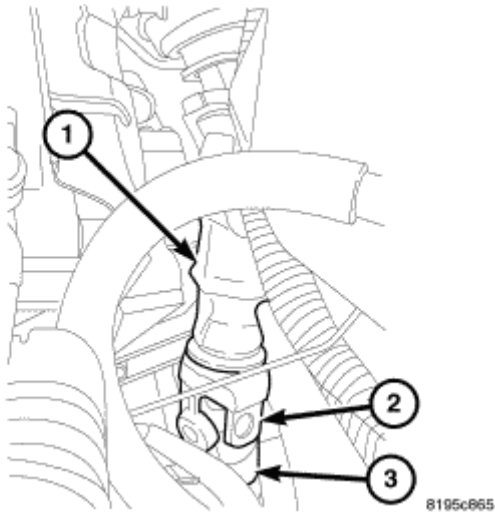


Fig. 40: LOWER COUPLING
Courtesy of CHRYSLER LLC

9. Remove the lower coupler pinch bolt (3) at the steering gear.
10. Remove the coupler (2) at the steering gear.
11. Remove the intermediate shaft (1) from the vehicle.
12. Remove the center support bearing from the steering shaft (if replacing the intermediate shaft).

INSTALLATION

STEERING INTERMEDIATE SHAFT - 3.7L & DIESEL

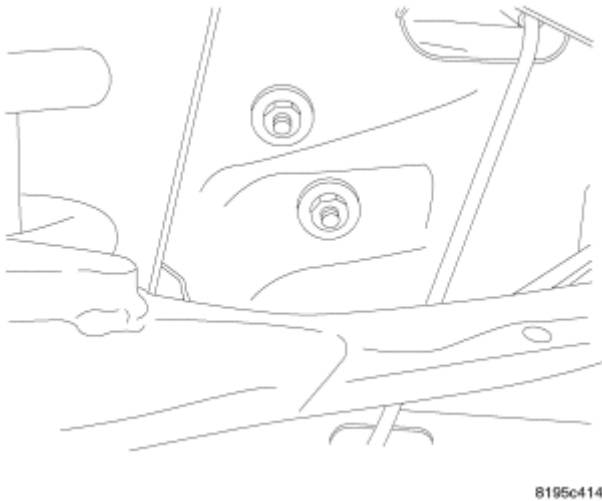


Fig. 41: BRACKET NUTS
Courtesy of CHRYSLER LLC

1. Install the center support bearing bracket to the shock tower (if removed). Tighten to 12 N.m (106 in.lbs.).

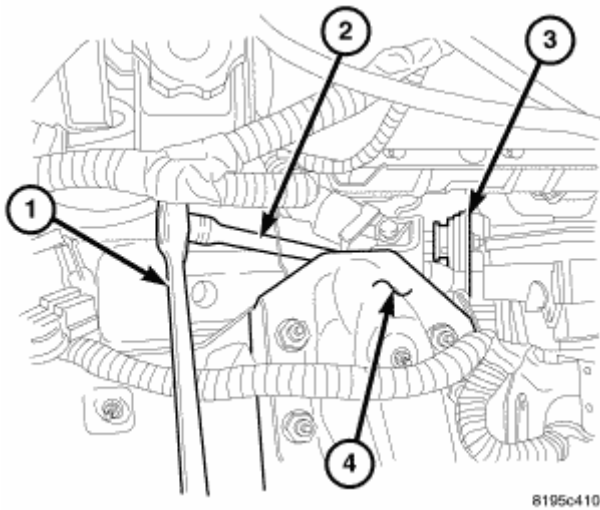


Fig. 42: BEARING BRACKET
Courtesy of CHRYSLER LLC

2. Install the intermediate shaft to the vehicle and install and tighten the center support bearing to the bracket (3) nuts.

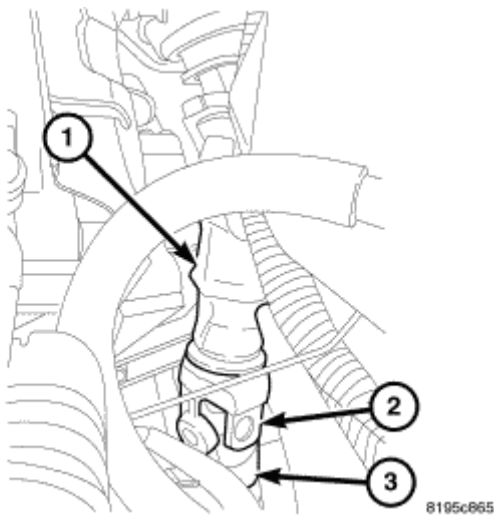


Fig. 43: LOWER COUPLING
Courtesy of CHRYSLER LLC

3. Install the coupler (2) at the steering gear.
4. Install the lower coupler pinch bolt (3) at the steering gear and tighten the bolt to 53 N.m (39 ft. lbs).

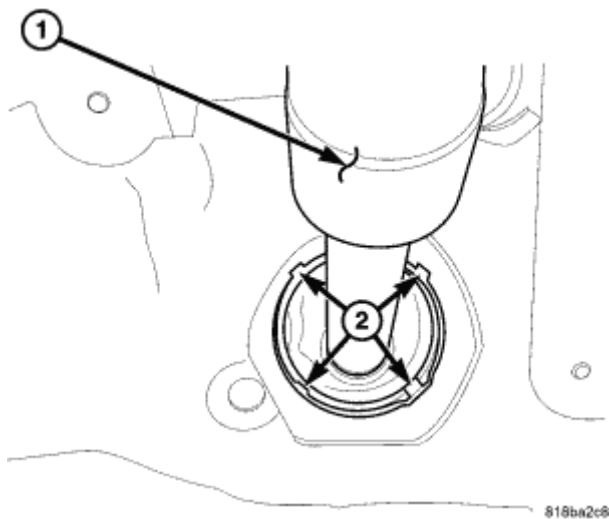


Fig. 44: BOOT TANGS
Courtesy of CHRYSLER LLC

5. Install the intermediate shaft seal by pushing it in securing the four tangs (2) to the panel.

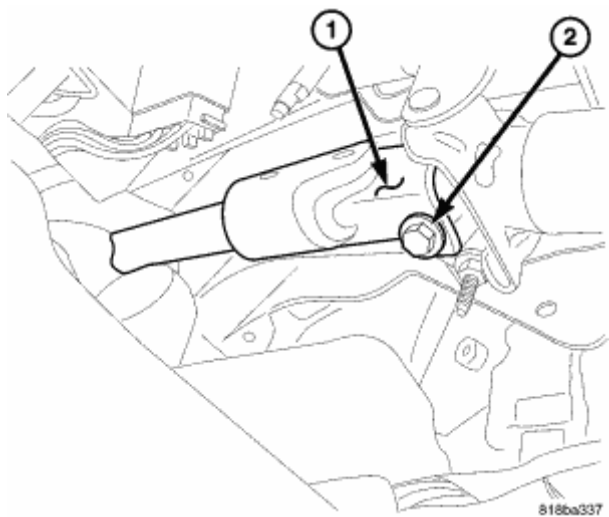


Fig. 45: UPPER COUPLING
Courtesy of CHRYSLER LLC

6. Install the steering coupler shaft (1) to the column.
7. Install the upper pinch bolt (2) and tighten the bolt to 53 N.m (39 ft. lbs.).
8. Unlock the steering wheel.
9. Install the knee blocker cover and knee blocker. Refer to **INSTALLATION**.
10. Reconnect the negative battery cable.

STEERING WHEEL

REMOVAL

STEERING WHEEL

1. Disable and remove the drivers side airbag. Refer to **REMOVAL** .
2. Partially remove the steering wheel bolt and leave the bolt in the column.

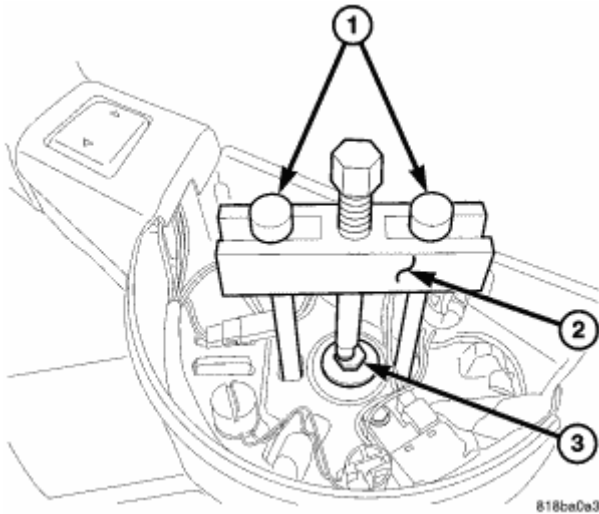


Fig. 46: STEERING WHEEL PULLER
Courtesy of CHRYSLER LLC

3. Install puller special tool L-4407A puller (2) with OTC® 7929A jaws (1) or equivalent using the top of the bolt (3) to push on.

NOTE: Ensure the puller jaws (1) are seated in the pockets of the steering wheel armature.

4. Remove the steering wheel.

INSTALLATION

STEERING WHEEL

NOTE: Do not reuse the old steering wheel bolt (a new bolt must be used)

1. Install steering wheel to the column

NOTE: Be certain that the steering wheel mounting bolt is tightened to the proper torque specification to ensure proper clockspring operation.

2. Install the new steering wheel bolt. Tighten the bolt to 54 N.m (40 ft. lbs.).
3. Install the drivers side air bag. Refer to **INSTALLATION** .

GEAR

DESCRIPTION

RACK & PINION STEERING GEAR

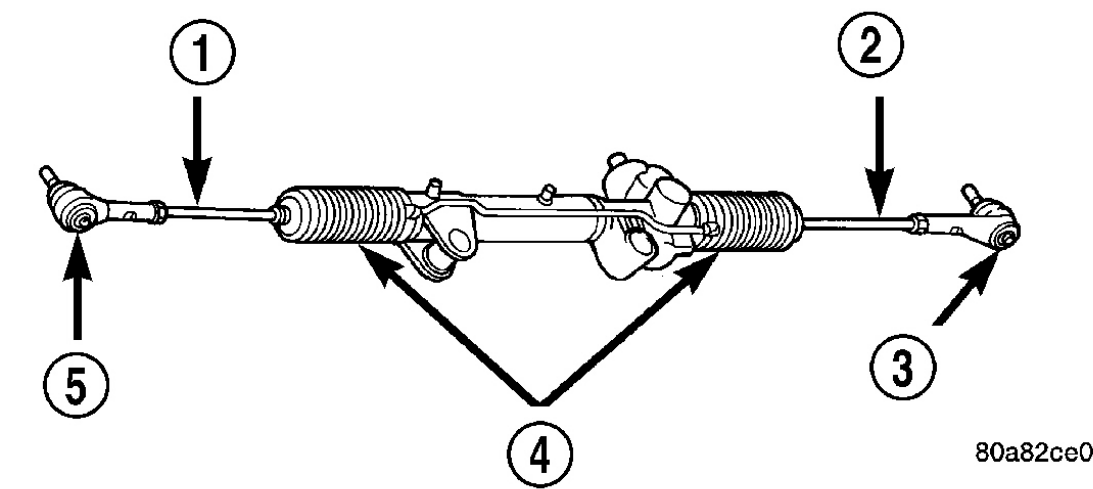


Fig. 47: Rack & Pinion Steering Gear
Courtesy of CHRYSLER LLC

1 - TIE ROD - INNER
2 - TIE ROD - INNER
3 - TIE ROD END - OUTER LH
4 - BOOTS
5 - TIE ROD END - OUTER RH

A rack and pinion steering gear is made up of two main components, the pinion shaft and the rack. The gear cannot be adjusted or internally serviced. If a malfunction or a fluid leak occurs, the gear must be replaced as an assembly. With the exception of the outer tie rods (3&5) which are serviced separately. See **Fig. 47**.

OPERATION

RACK & PINION STEERING GEAR

The steering column intermediate shaft is attached to the gear pinion. The rotation of the pinion moves the gear rack from side-to-side. This lateral action of the rack pushes and pulls the tie rods, which are connected to the steering knuckles to change the direction of the front wheels.

DIAGNOSIS AND TESTING

POWER STEERING GEAR

NOTE: This information is designed to be used in conjunction with the diagnostic charts at the beginning of the Steering article. See **DIAGNOSIS AND TESTING.**

OBJECTIONABLE HISS OR WHISTLE POSSIBLY CAUSED BY A NOISY STEERING GEAR

1. Check and adjust power steering fluid level in the reservoir as necessary. See **STANDARD PROCEDURE.**
2. Start the vehicle and heat system by steering lock-to-lock 5 times with the engine running at 3000 RPM. Do not hold the gear against the stops for more than 5 seconds at a time.
3. Return the engine to idle speed.
4. Listen for the noise when turning the wheel slowly off center during a dry park maneuver.
5. Replace power steering gear if the hiss or whistle is present. See **REMOVAL.**

REMOVAL

RACK & PINION - 2WD

1. Siphon the power steering fluid from the power steering reservoir.

NOTE: The steering column on vehicles with an automatic transmission may not be equipped with an internal locking shaft that allows the ignition key cylinder to be locked with the key. Alternative methods of locking the steering wheel for service will have to be used.

2. Lock the steering wheel to prevent spinning of the clockspring.
3. Raise and support the vehicle.
4. Remove the tire and wheel assembly.

NOTE: Mark the alignment adjusting cams and tie rod end jam nuts on the steering gear for easier installation.

5. Remove the tie rod end nuts.
6. Separate tie rod ends from the knuckles with Puller C-3894-A.

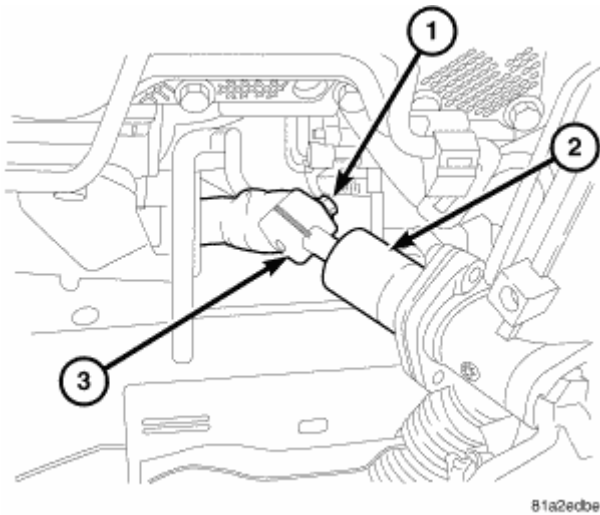


Fig. 48: INTERMEDIATE SHAFT COUPLER
 Courtesy of CHRYSLER LLC

7. Remove the lower intermediate shaft coupler pinch bolt and slide the coupler off the gear.

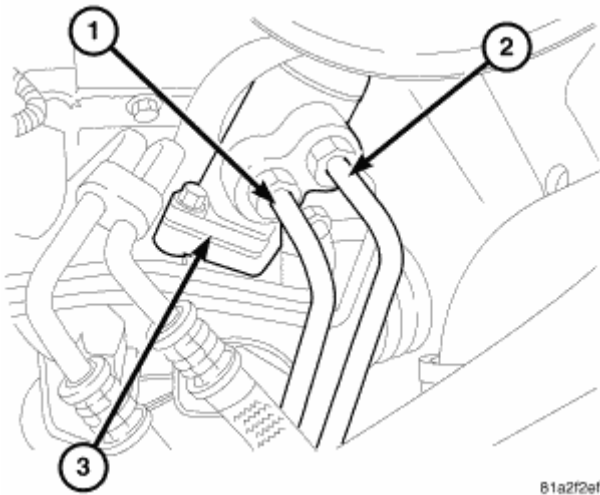


Fig. 49: LINES AT GEAR
 Courtesy of CHRYSLER LLC

8. Remove the power steering lines (1&2) from the gear (3).

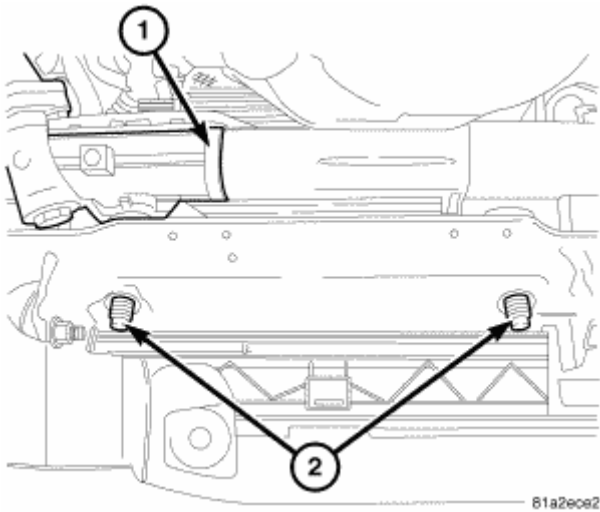


Fig. 50: MOUNTING BOLTS
 Courtesy of CHRYSLER LLC

9. Remove the mounting bolts (2) from the gear (1) to the front cradle.
10. Remove the steering gear (1) from the vehicle.

RACK & PINION - 4WD

1. Siphon the power steering fluid from the power steering reservoir.

NOTE: The steering column on vehicles with an automatic transmission may not be equipped with an internal locking shaft that allows the ignition key cylinder to be locked with the key. Alternative methods of locking the steering wheel for service will have to be used.

2. Lock the steering wheel to prevent spinning of the clockspring.

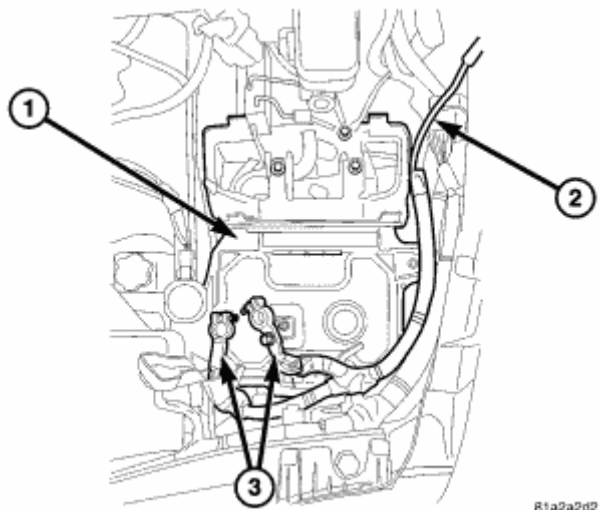


Fig. 51: BATTERY TRAY

Courtesy of CHRYSLER LLC

3. Disconnect the battery (3).
4. Remove the battery. Refer to **REMOVAL** .
5. Unclip the power center (2) and move it to the side out of the way to access the battery tray (1).
6. Remove the battery tray (1). Refer to **REMOVAL** .

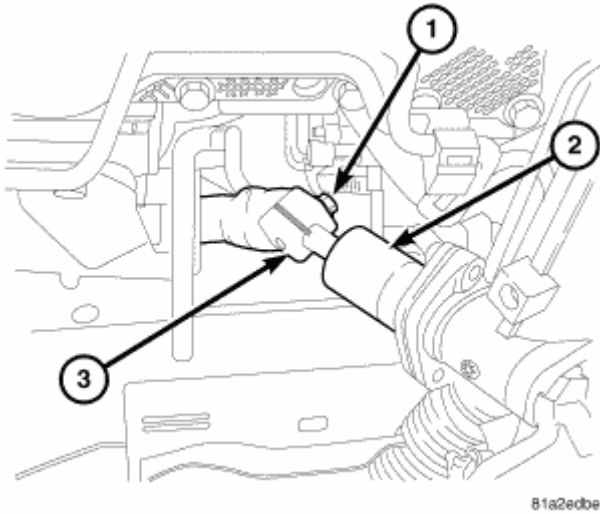


Fig. 52: INTERMEDIATE SHAFT COUPLER
Courtesy of CHRYSLER LLC

7. Remove the lower intermediate shaft coupler pinch bolt and slide the coupler off the gear.
8. Raise and support the vehicle.
9. Remove the tire and wheel assembly.

NOTE: **Mark the alignment adjusting cams and tie rod end jam nuts on the steering gear for easier installation.**

10. Remove the tie rod end nuts.
11. Separate tie rod ends from the knuckles with Puller C-3894-A.

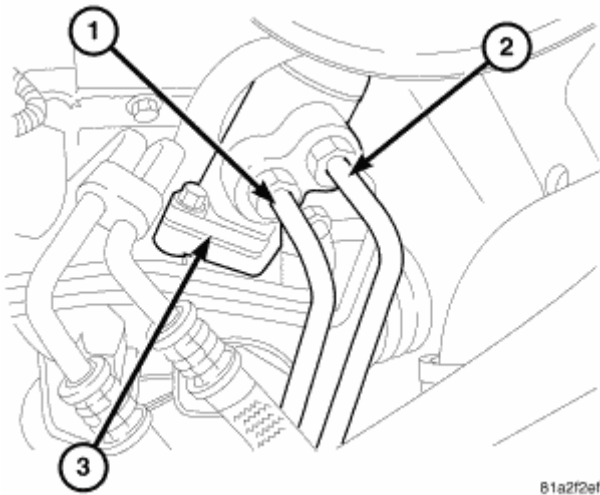


Fig. 53: LINES AT GEAR
Courtesy of CHRYSLER LLC

12. Remove the power steering lines (1&2) from the gear (3).

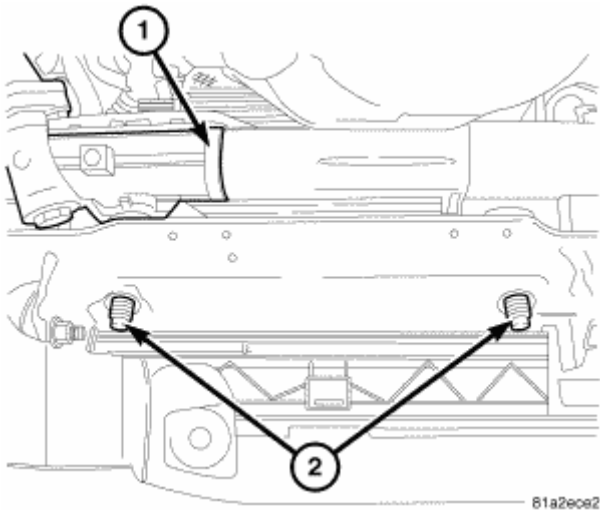


Fig. 54: MOUNTING BOLTS
Courtesy of CHRYSLER LLC

13. Remove the mounting bolts (2) from the gear (1) to the front cradle.
14. Remove the left front lower suspension arm cam/bolt and lower the control arm enough to get the axle mounting bracket bolt out. **This must be done to remove the axle mounting bracket.**
15. Remove the axle mounting bracket.
16. Remove the oil filter and trough.
17. Put the steering gear in the full right position and lower the gear out of the vehicle.
18. Remove the steering gear (1) from the vehicle.

INSTALLATION

RACK & PINION - 2WD

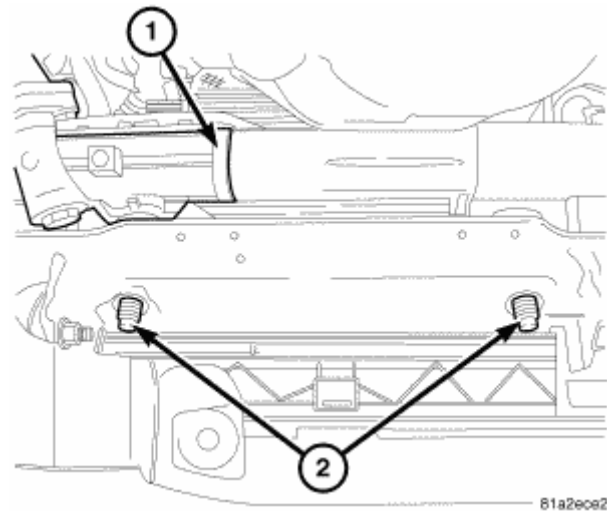


Fig. 55: MOUNTING BOLTS
Courtesy of CHRYSLER LLC

1. Transfer the outer tie rod ends to the new steering gear (if needed).
2. Install the steering gear (1) to the vehicle.
3. Install the gear mounting bolts (2) to the front cradle. Tighten the gear mounting bolts to 176 N.m (130 ft.lbs.).

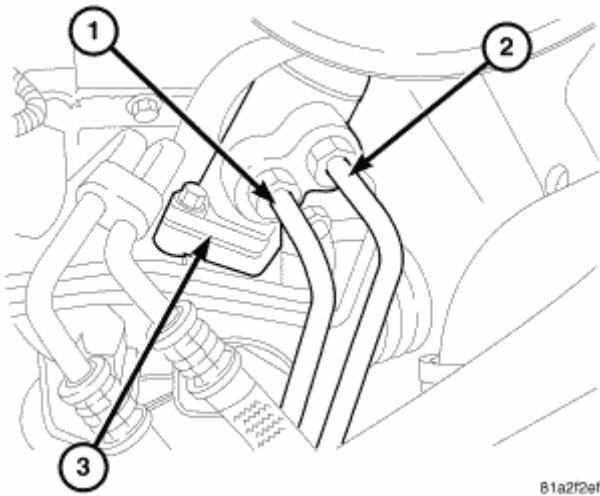


Fig. 56: LINES AT GEAR
Courtesy of CHRYSLER LLC

4. Install the power steering lines (1&2) to the gear (1). Tighten the tube nuts to 27 N.m (20 ft.lbs.).

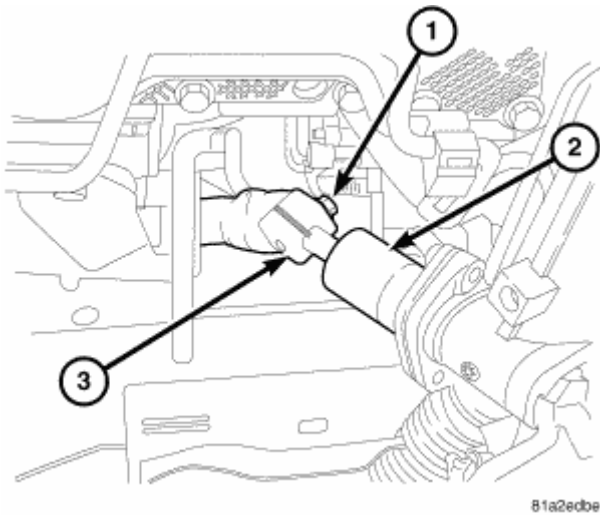


Fig. 57: INTERMEDIATE SHAFT COUPLER
 Courtesy of CHRYSLER LLC

5. Install the lower coupler pinch bolt and slide the coupler on to the gear. Tighten to 53 N.m (39 ft.lbs.).
6. Install the tie rod end to the knuckle and tighten the nuts to 41 N.m (30 ft.lbs.) Plus an additional 90° turn.
7. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
8. Install the skid plate. Refer to **INSTALLATION** .
9. Lower the vehicle.
10. Unlock the steering wheel.
11. Fill the power steering fluid. See **STANDARD PROCEDURE**.
12. Reset the toe and center the steering wheel. Refer to **STANDARD PROCEDURE** .

RACK & PINION - 4WD

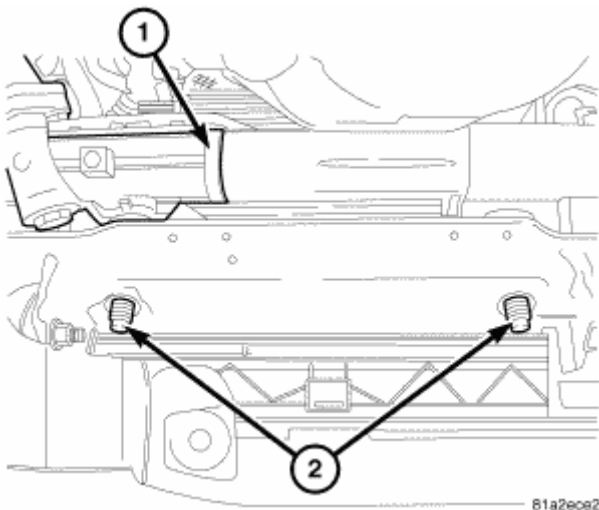


Fig. 58: MOUNTING BOLTS
 Courtesy of CHRYSLER LLC

1. Transfer the outer tie rod ends to the new steering gear (if needed).
2. Install the steering gear (1) to the vehicle.
3. Install the gear mounting bolts (2) to the front cradle. Tighten the gear mounting bolts to 176 N.m (130 ft.lbs.).

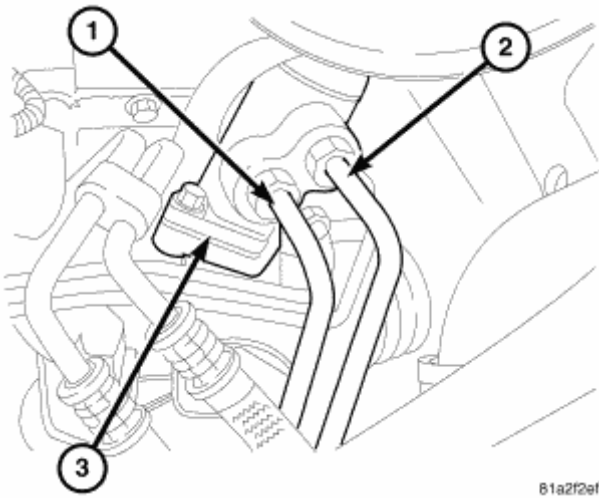


Fig. 59: LINES AT GEAR
Courtesy of CHRYSLER LLC

4. Install the power steering lines (1&2) to the gear (3). Tighten the tube nuts to 27 N.m (20 ft.lbs.).
5. Install the oil filter trough and filter.
6. Install the axle mounting bracket.
7. Install the left lower control arm into position and install the cam/bolt.
8. Install the tie rod end to the knuckle and tighten the nuts to 41 N.m (30 ft.lbs.) Plus an additional 90° turn.
9. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE**.
10. Lower the vehicle.

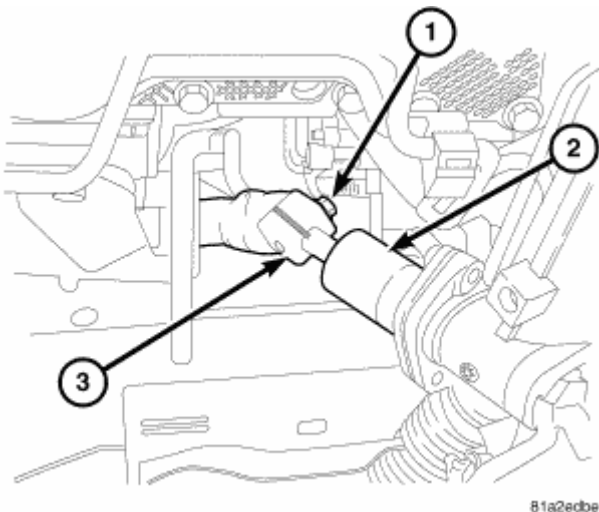


Fig. 60: INTERMEDIATE SHAFT COUPLER
Courtesy of CHRYSLER LLC

11. Install the lower coupler pinch bolt and slide the coupler on to the gear. Tighten to 53 N.m (39 ft.lbs.).

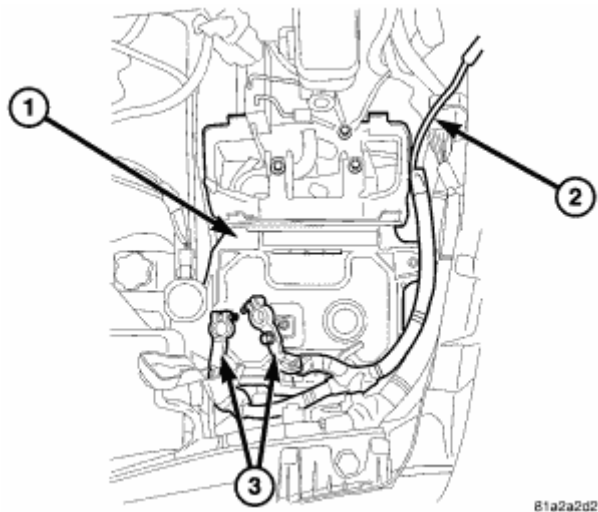


Fig. 61: BATTERY TRAY
Courtesy of CHRYSLER LLC

12. Install the battery tray (1). Refer to **INSTALLATION** .
13. Install the battery. Refer to **INSTALLATION** .
14. Reinstall the power center (2) back into place.
15. Reconnect the battery cables (3).
16. Unlock the steering wheel.
17. Fill the power steering fluid. See **STANDARD PROCEDURE**.
18. Perform a wheel alignment. Refer to **STANDARD PROCEDURE** .

SPECIFICATIONS

TORQUE CHART

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Rack and Pinion Steering Gear to Frame Bolts	176	130	-
Rack and Pinion Steering Gear Intermediate Shaft Bolt	53	39	-
Intermediate Shaft Lower Support Bearing Nuts	12	9	106
Tie Rod End Knuckle Nut	41 Plus an additional 90° turn	30 Plus an additional 90° turn	-

Tie Rod End Jam Nut	75	55	-
Power Steering Line Pressure Line	27	20	-
Power Steering Line Return Line	27	20	-

SPECIAL TOOLS

RACK & PINION STEERING GEAR

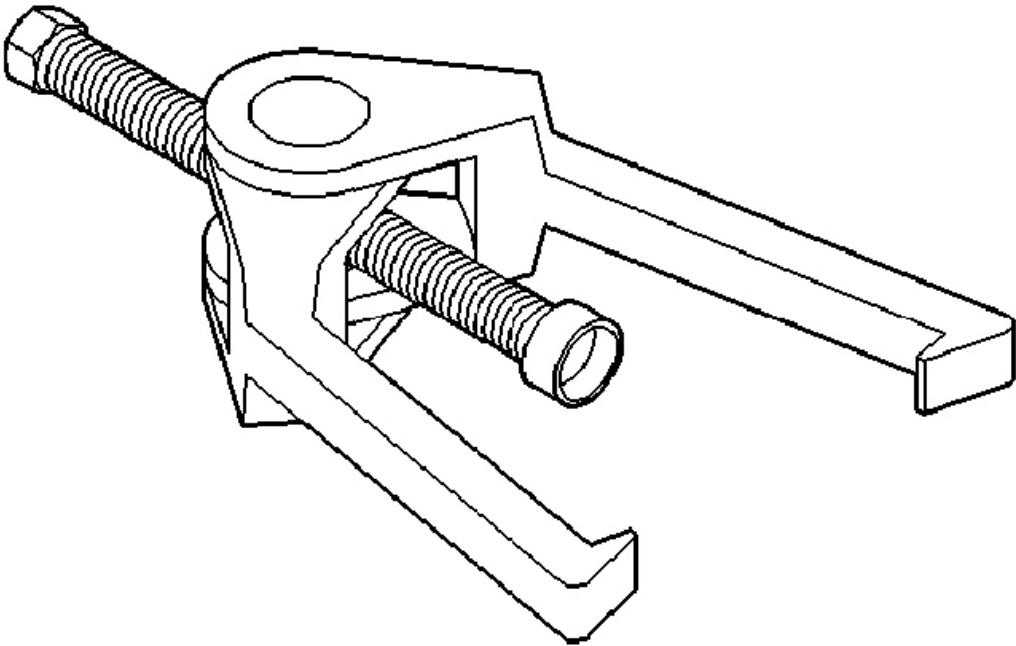


Fig. 62: Puller C-3894-A
 Courtesy of CHRYSLER LLC

LINKAGE

TIE ROD END

DIAGNOSIS AND TESTING

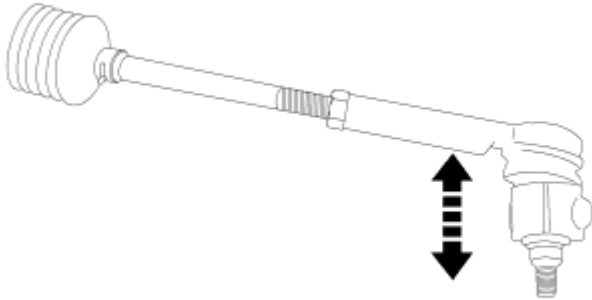
TIE ROD

Tie rod free-play can be measured using the following hand methods:

NOTE: When checking free-play, **DO NOT** rotate the tie rod. Just because a tie rod rotates easily, it is not necessarily faulty.

NOTE: Always check and repair (if necessary) outer tie rod free-play before checking inner tie rod free-play. False results can otherwise be obtained.

OUTER TIE ROD

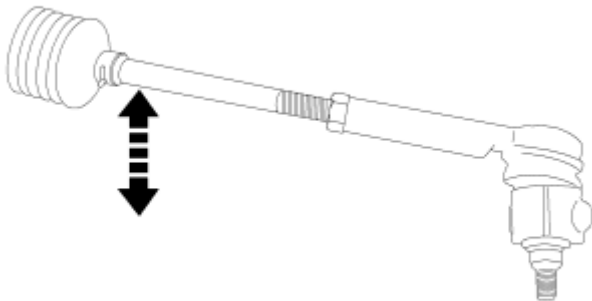


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Fig. 63: Checking Outer Tie Rod Free Play
Courtesy of CHRYSLER LLC

Grasp the outer tie rod near the ball stud and attempt to move the tie rod straight up and down. If any free-play is felt, replace the outer tie rod. See **REMOVAL**. If no free-play is felt at the outer tie rod, attempt to move the inner tie rod in the same manner. Refer to the following procedure.

INNER TIE ROD



81896F38

Fig. 64: Checking Inner Tie Rod Free Play

Courtesy of CHRYSLER LLC

Grasp the inner tie rod near the steering gear bellows and attempt to move the tie rod straight up and down. If any free-play is felt, replace the steering gear. See **REMOVAL**.

STANDARD PROCEDURE

STEERING LINKAGE

The tie rod end and ball stud seals should be inspected during all oil changes. If a seal is damaged, replace the tie rod.

CAUTION: If any steering components are replaced or serviced an alignment must be performed, to ensure the vehicle meets all alignment specifications.

REMOVAL

OUTER TIE ROD END

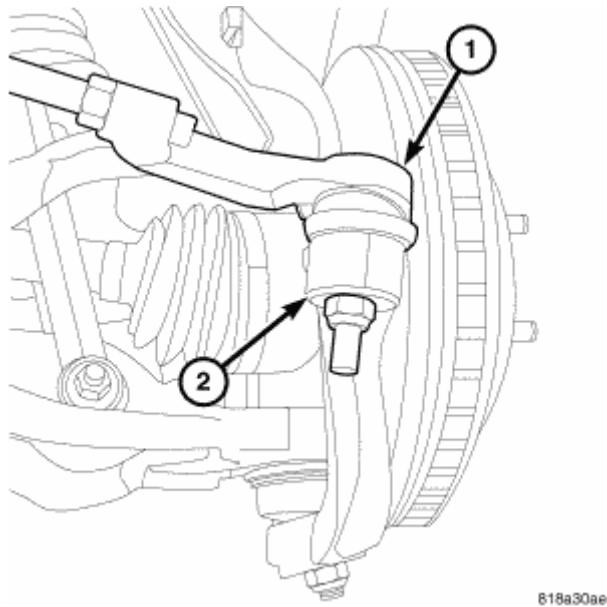


Fig. 65: TIE ROD END

Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.

NOTE: Mark the outer to inner tie rod end for easier installation.

3. Loosen the tie rod end jam nut.
4. Remove the outer tie rod end nut (2).

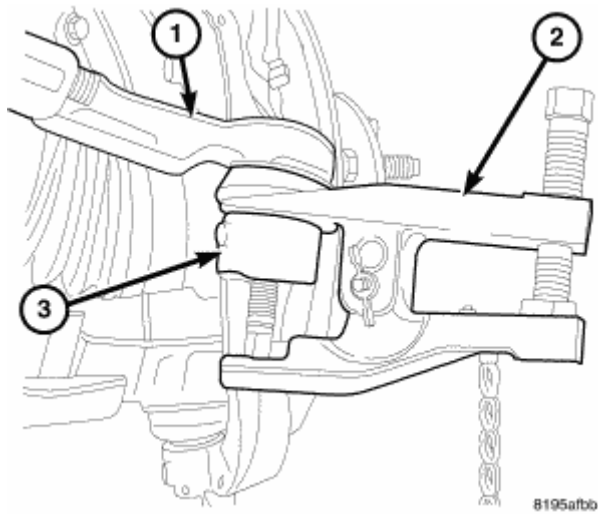


Fig. 66: TIE ROD TOOL
Courtesy of CHRYSLER LLC

NOTE: Never use anything other than the specified tool to disassemble the ball joints & tie rods from the steering knuckle. Ball joint seal or knuckle damage can result.

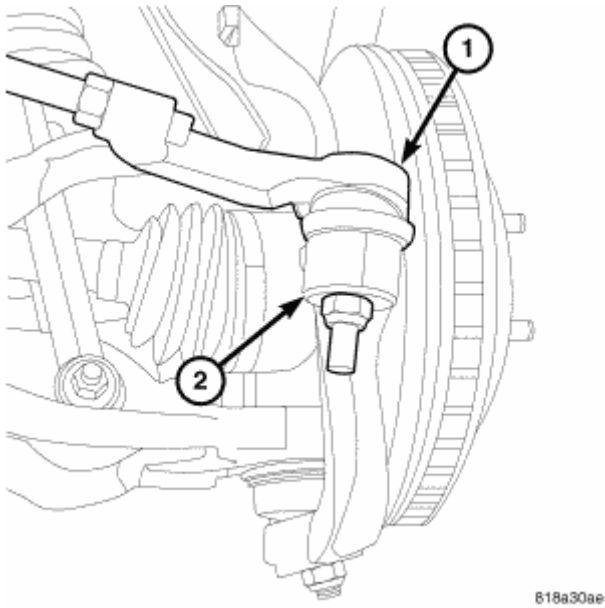
5. Separate the outer tie rod end (1) from the knuckle (3) using tool 9360 (2).

NOTE: Count the number of turns when removing.

6. Remove the outer tie rod end (1) from the inner tie rod.

INSTALLATION

OUTER TIE ROD END



618a30ae

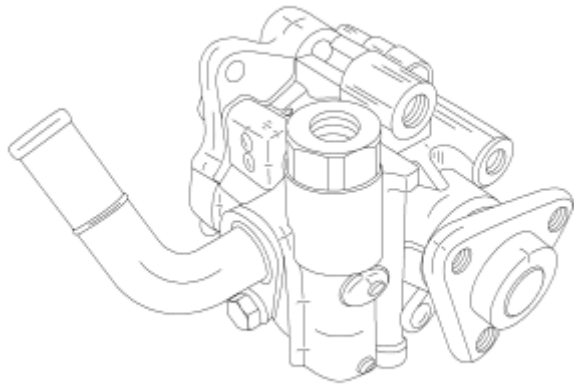
Fig. 67: TIE ROD END
Courtesy of CHRYSLER LLC

1. Install the outer tie rod end (1) to the inner tie rod end to the exact number of turns that it was removed.
2. Install the outer tie rod end (1) to the knuckle. Tighten the nut (2) to 41 N.m (30 ft.lbs.) Plus an additional 90° turn.
3. Tighten the jam nut to 75 N.m (55 ft.lbs).
4. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
5. Reset the toe and center the steering wheel. Refer to **STANDARD PROCEDURE** .

PUMP

DESCRIPTION

2.8L POWER STEERING PUMP

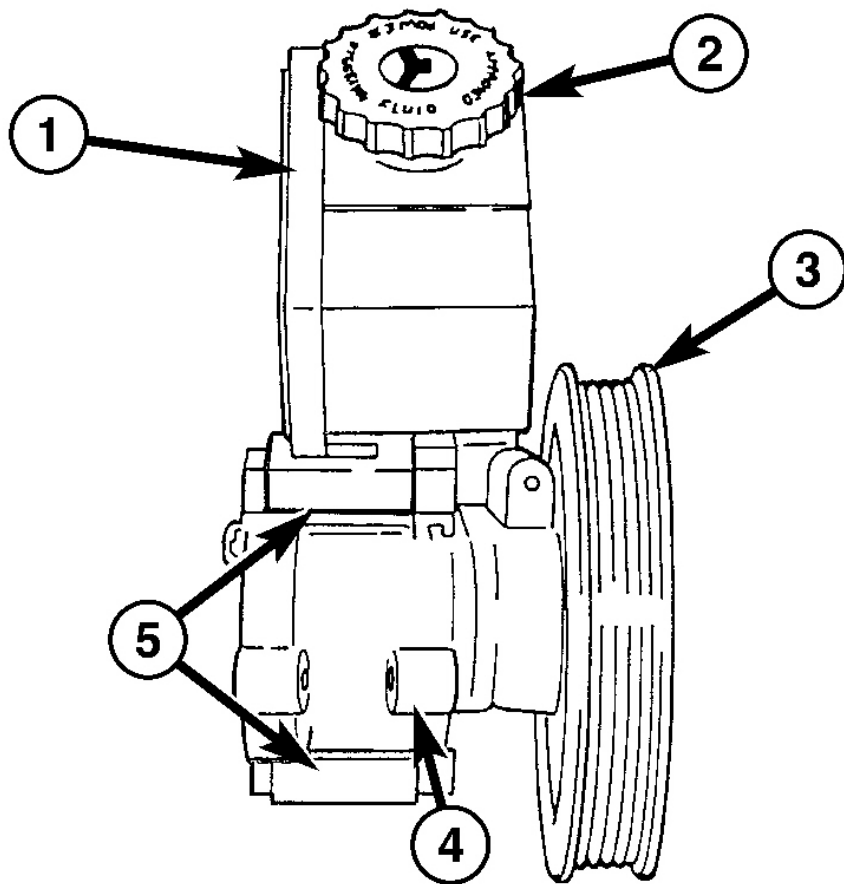


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Fig. 68: DIESEL PUMP
Courtesy of CHRYSLER LLC

Hydraulic pressure for the power steering system is provided by a belt driven power steering pump. The pump shaft has a bolt-on drive pulley that is belt driven by the crankshaft pulley. The reservoir is separate from the pump body. The power steering pump is connected to the steering gear by the pressure and return hoses.

3.7L POWER STEERING PUMP



80c8a8d8

Fig. 69: Power Steering Pump Assembly
Courtesy of CHRYSLER LLC

- 1 - RESERVOIR
- 2 - CAP
- 3 - PULLEY
- 4 - PUMP BODY
- 5 - RESERVOIR RETAINING CLIPS

Hydraulic pressure for the power steering system is provided by a belt driven power steering pump (4). See **Fig. 69**. The pump shaft has a pressed-on high strength plastic drive pulley (3) that is belt driven by the crankshaft pulley.

OPERATION

POWER STEERING PUMP

The power steering pump is a constant flow rate and displacement, vane-type pump. The pump internal parts operate submerged in fluid. The flow control orifice is part of the high pressure line fitting. The pressure relief valve inside the flow control valve limits the pump pressure.

NOTE: **Power steering pumps have different pressure rates and are not interchangeable with other pumps.**

DIAGNOSIS AND TESTING

POWER STEERING PUMP AND HOSES

NOTE: **This information is designed to be used in conjunction with the diagnostic charts at the beginning of the Steering article. See DIAGNOSIS AND TESTING.**

CHECKING FOR WEAR OF POWER STEERING PUMP INTERNAL COMPONENTS

1. Place gear selector in PARK (or NEUTRAL) with wheels chalked.
2. With the engine idling, have a helper turn the steering wheel.
3. Using an electronic listening tool, determine if noise is coming from the pump.
4. Increase the engine speed and have a helper turn the steering wheel. Does the noise change with load?
5. Replace the power steering pump if excessive noise is present. See **REMOVAL**.

CHECKING FOR POWER STEERING HOSES TOUCHING BODY OR FRAME OF VEHICLE

Check hoses and hose tubes as following:

Inspect hoses and hose tubes for witness marks. If witness marks are present, adjust hose(s) to the proper position by loosening, repositioning and tightening attachments to the specified torque. See **SPECIFICATIONS**. **Do not bend tubing to adjust.** Replace the hose assembly if damaged.

Check fastener torque of hose mounting brackets and tube nuts. See **SPECIFICATIONS**.

Have a helper bump the steering gear off of the stops to induce pressure fluctuations which may move the hose. If hose contact is made, adjust hose(s) to the proper position by loosening, repositioning and tightening attachments to the specified torque. See **SPECIFICATIONS**. **Do not bend tubing to adjust.** Replace the hose assembly if damaged.

REMOVAL

POWER STEERING PUMP - 2.8L DIESEL

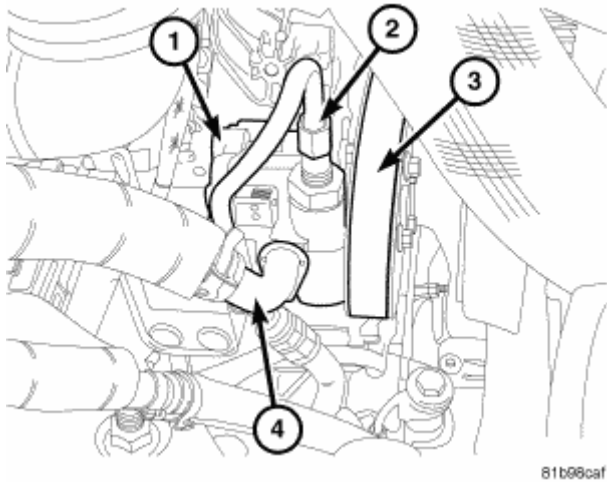


Fig. 70: PUMP
 Courtesy of CHRYSLER LLC

1. Siphon out as much power steering fluid as possible.
2. Remove the air cleaner housing (Refer to **REMOVAL**).
3. Remove the turbo air inlet tube.
4. Remove the serpentine drive belt (3). Refer to **REMOVAL** .
5. Remove the power steering hoses (2&4).

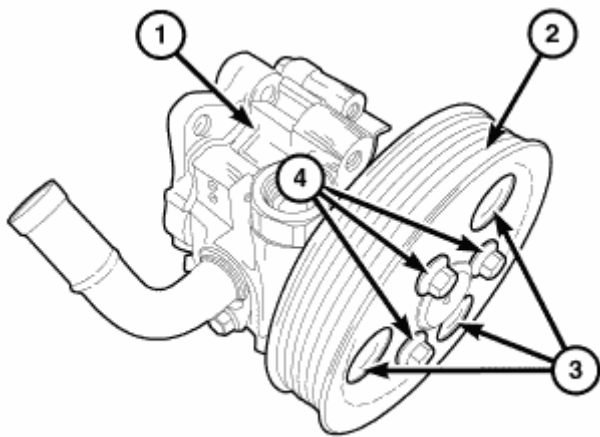
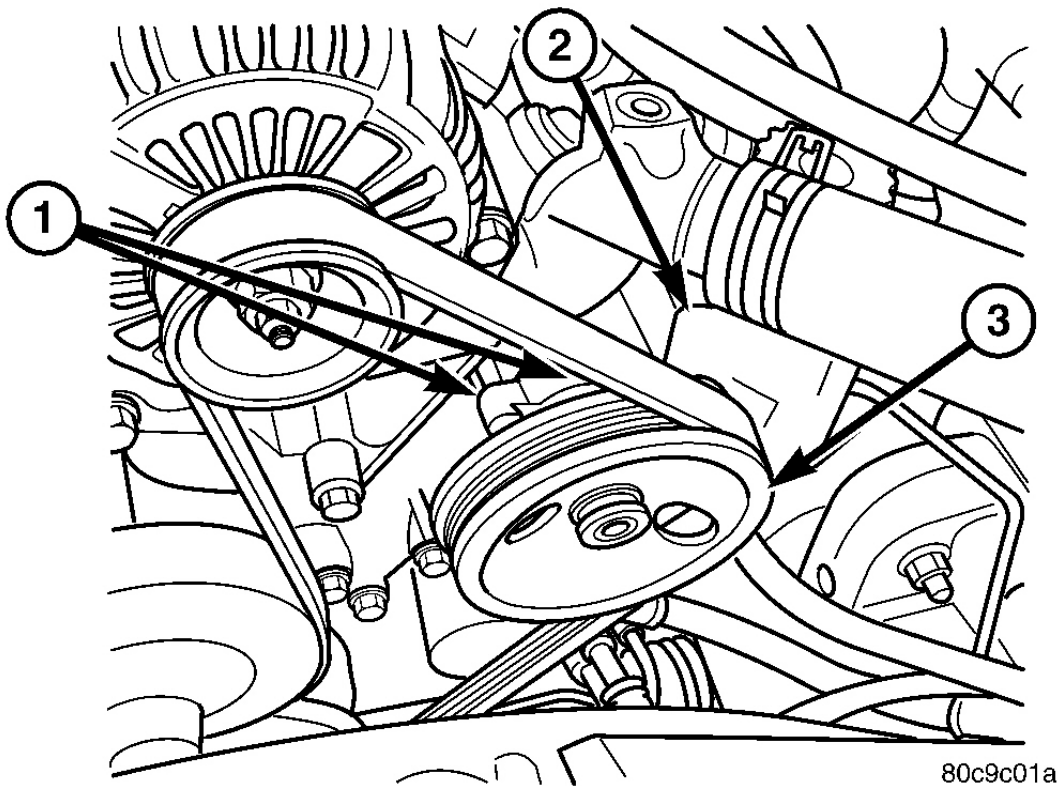


Fig. 71: ACCESS HOLES
 Courtesy of CHRYSLER LLC

6. Remove the three bolts (2) securing the pump (1) to the engine through the pulley access holes (3).
7. Remove the pump (1) from the vehicle.

POWER STEERING PUMP - 3.7L

1. Siphon out as much power steering fluid as possible.



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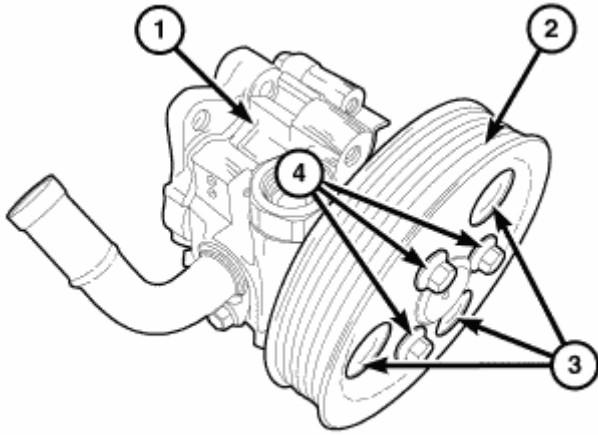
Fig. 72: Power Steering Pump - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - MOUNTING BOLTS
2 - RESERVOIR
3 - STEEL PULLEY |
|---|

2. Remove the serpentine drive belt. Refer to **REMOVAL** .
3. Remove the power steering high pressure hose at the pump.
4. Remove the return hose at the pump.
5. Remove the three bolts (1) securing the pump to the engine through the holes in the pulley (3).
6. Remove the pump from the vehicle.

INSTALLATION

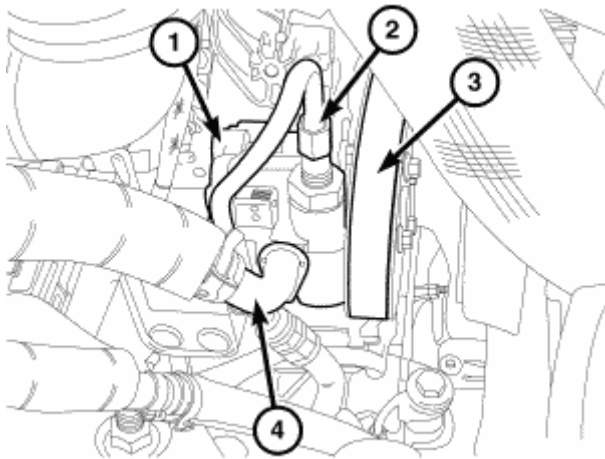
POWER STEERING PUMP - 2.8L DIESEL



81b98e16

Fig. 73: ACCESS HOLES
 Courtesy of CHRYSLER LLC

1. Install the pump (1) to the vehicle.
2. Install the three bolts securing the pump (1) to the engine through the access holes (3) and tighten to 28 N.m (21 ft. lbs.).



81b98caf

Fig. 74: PUMP
 Courtesy of CHRYSLER LLC

3. Install the pressure power steering hoses (2). Tighten to 31 N.m (23 ft. lbs.).
4. Reclamp the supply hose (4) to the pump (1).
5. Install the serpentine belt (3). Refer to **INSTALLATION** .
6. Install the air inlet tube.
7. Install the air cleaner housing (Refer to **REMOVAL**).
8. Refill the power steering fluid and bleed the system. See **STANDARD PROCEDURE**.

POWER STEERING PUMP - 3.7L

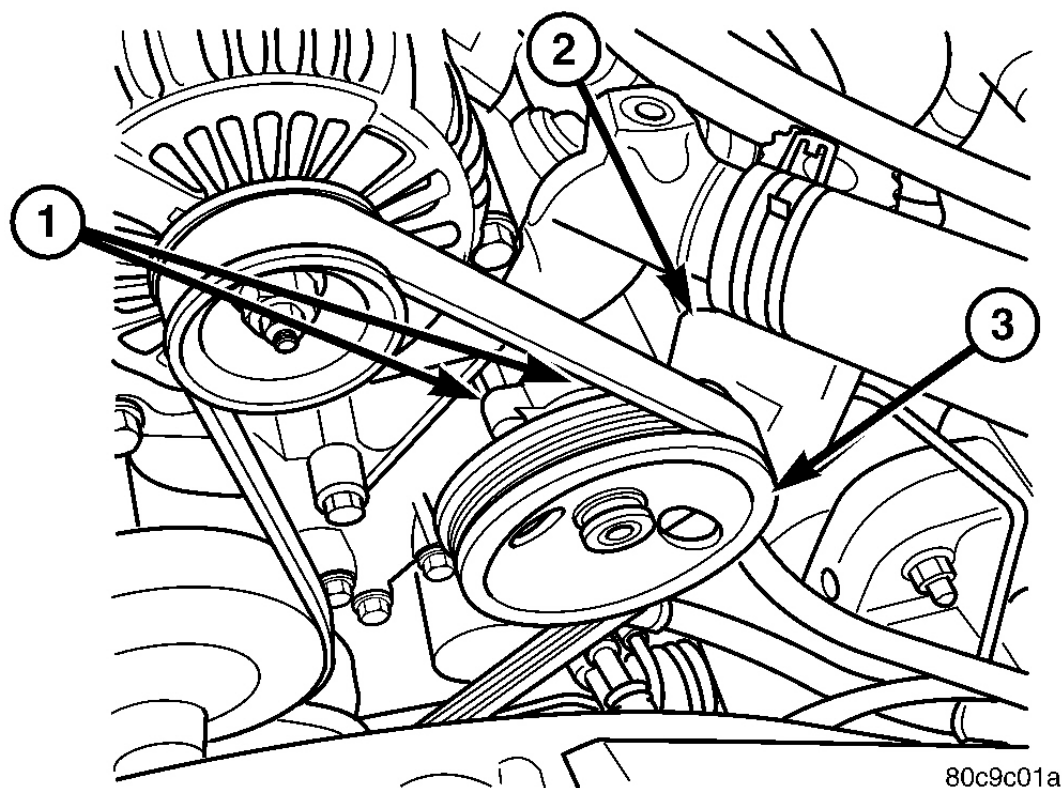


Fig. 75: Power Steering Pump - 3.7L
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - MOUNTING BOLTS
2 - RESERVOIR
3 - STEEL PULLEY |
|---|

1. Install the pump to the vehicle.
2. Install the three bolts (1) securing the pump to the engine. Tighten the bolts to 28 N.m (21 ft.lbs.). See **Fig. 75**.
3. Install the power steering hoses. Tighten to 27 N.m (20 ft.lbs.).
4. Install the serpentine belt. Refer to **INSTALLATION**.
5. Refill the power steering fluid and check for leaks. See **STANDARD PROCEDURE**.

SPECIFICATIONS

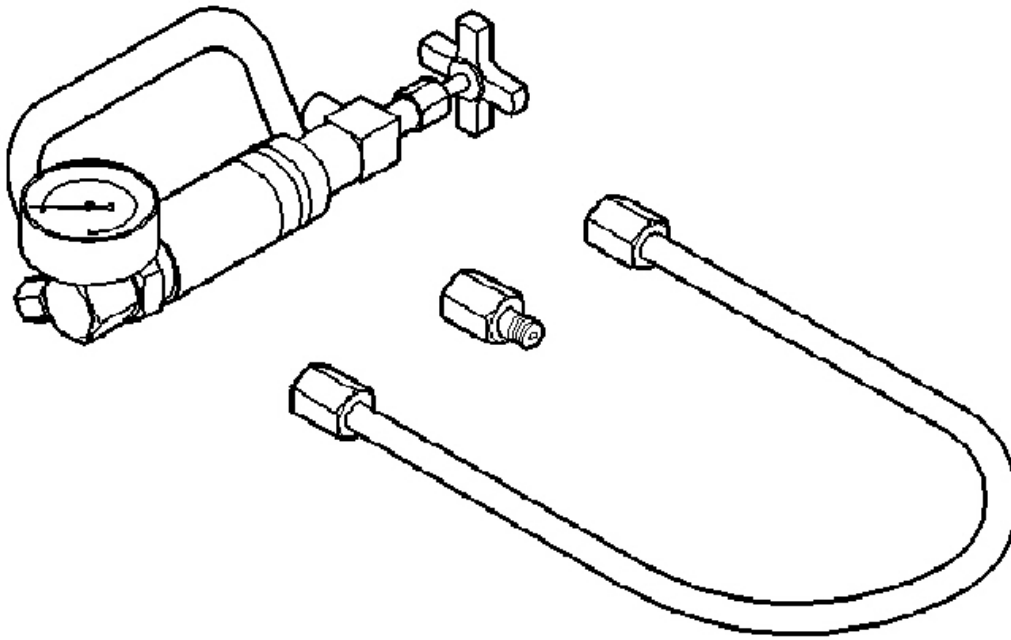
TORQUE CHART

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Power Steering Pump to Engine	28	21	250
Power Steering Pump Bracket to Engine (DIESEL)	47	35	-
Power Steering Remote Reservoir (DIESEL)	12	9	105
Power Steering to Pump Pressure Line	31	23	275
Power Steering Pump Pressure Line Bracket to Body (DIESEL)	20	14	175
Power Steering Remote Reservoir Mounting Bracket Screw (DIESEL)	12	9	105
Power Steering Pulley to Pump (DIESEL)	28	21	250
Power Steering Fluid Cooler Screws	4	3	35

SPECIAL TOOLS

POWER STEERING PUMP



8011c958

Fig. 76: Power Steering Pressure Analyzer Set 6815
Courtesy of CHRYSLER LLC

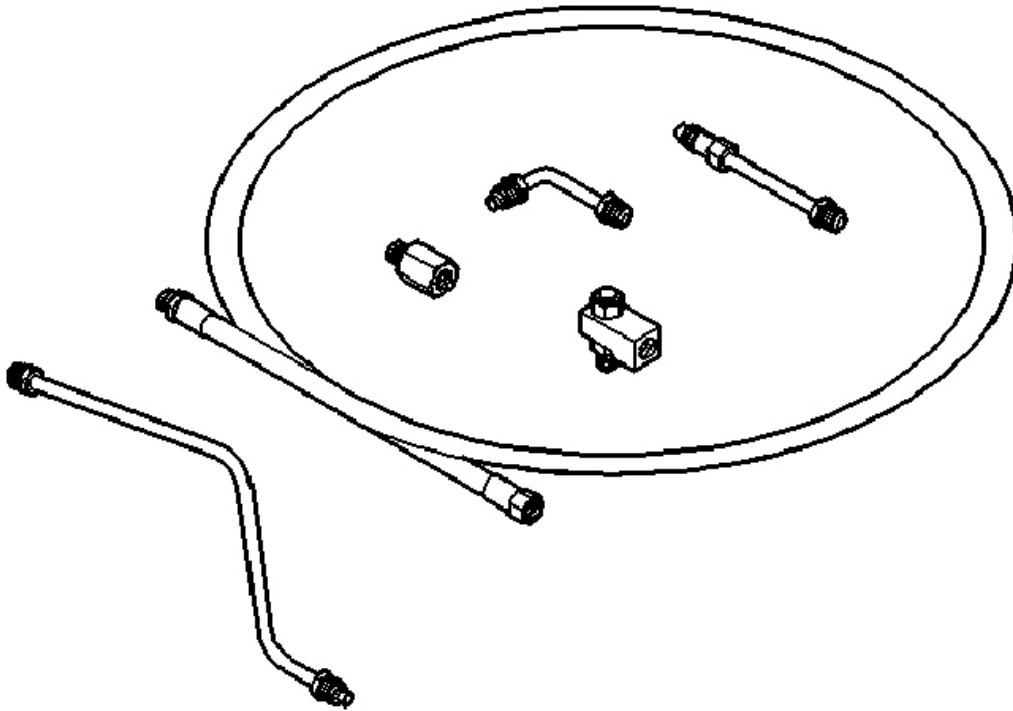
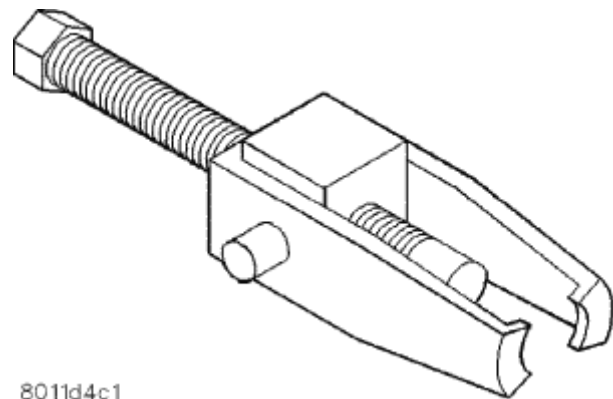


Fig. 77: Power Steering Flow/Pressure Tester 6893 Adapters
 Courtesy of CHRYSLER LLC



8011d4c1
Fig. 78: Puller C-4333
 Courtesy of CHRYSLER LLC

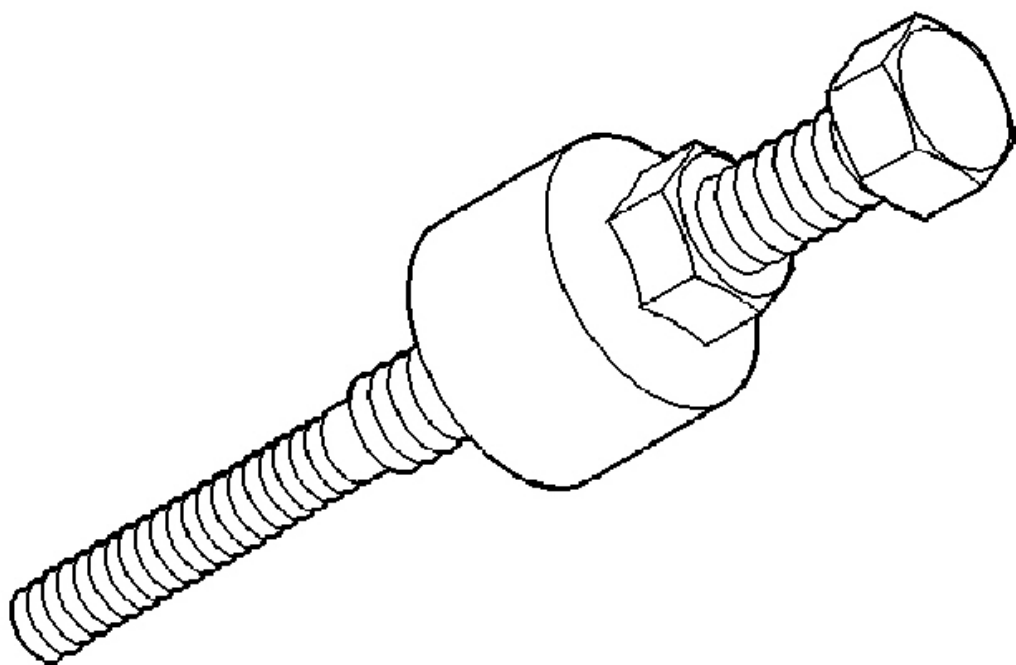


Fig. 79: Installer C-4063B
Courtesy of CHRYSLER LLC

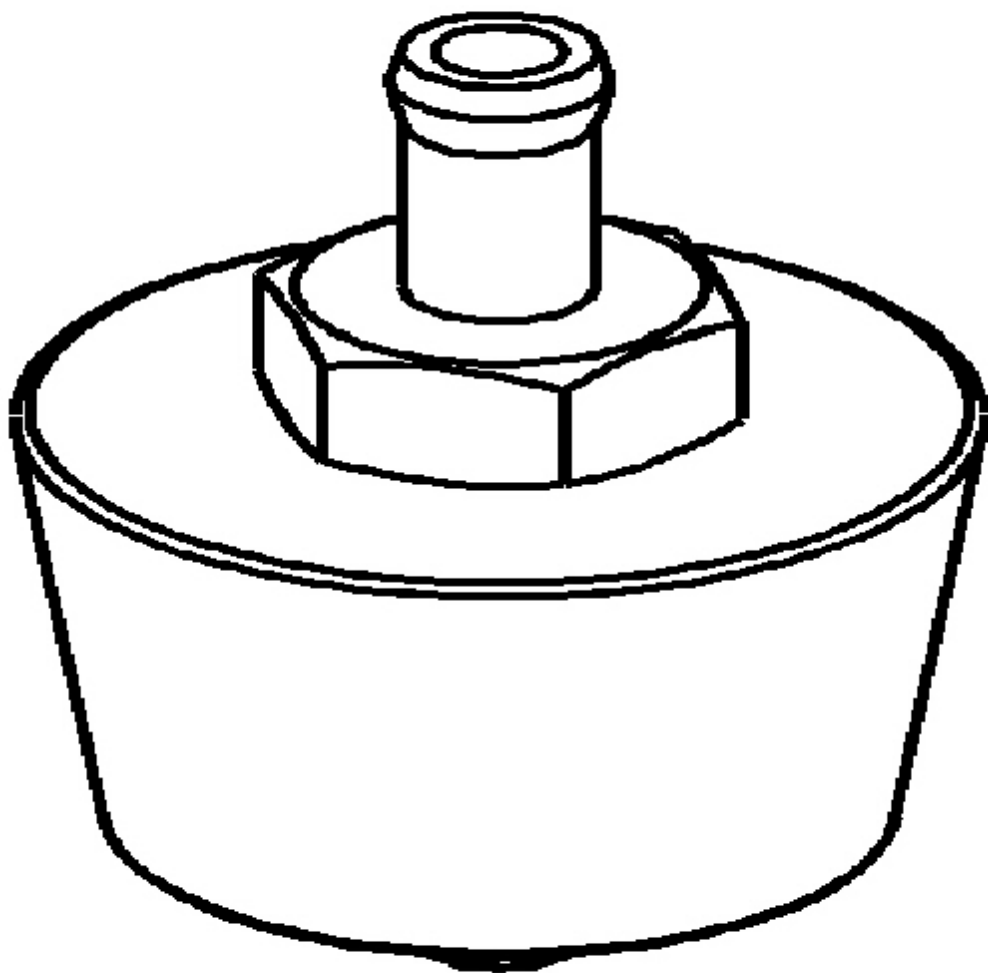


Fig. 80: Reservoir Vacuum Plug - 9688
Courtesy of CHRYSLER LLC

FLUID

DESCRIPTION

ATF+4, TYPE 9602

The recommended fluid for the power steering system is Mopar® ATF +4.

Mopar® ATF+4, when new is red in color. The ATF+4 is dyed red so it can be identified from other fluids used in the vehicle such as engine oil or antifreeze. The red color is not permanent and is not an indicator of fluid

condition. As the vehicle is driven, the ATF+4 will begin to look darker in color and may eventually become brown. **THIS IS NORMAL.** ATF+4 also has a unique odor that may change with age. Consequently, odor and color cannot be used to indicate the fluid condition or the need for a fluid change.

STANDARD PROCEDURE

POWER STEERING FLUID LEVEL CHECKING

WARNING: The fluid level should be checked with engine off to prevent injury from moving components.

CAUTION: MOPAR® ATF+4 is to be used in the power steering system. No other power steering or automatic transmission fluid is to be used in the system. Damage may result to the power steering pump and system if any other fluid is used, and do not overfill.

NOTE: Power steering reservoir does not contain a dipstick. Fluid level indicators are molded into the side of the reservoir **WITH REMOTE RESERVOIR.**

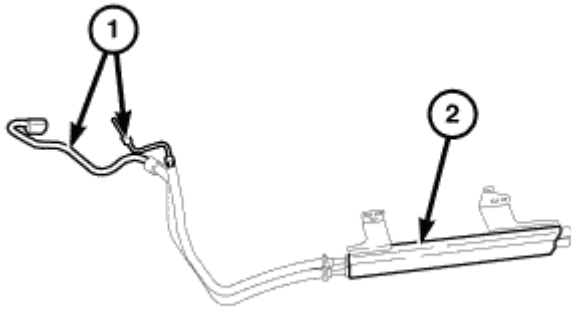
The power steering fluid level can be viewed on the dipstick attached to the filler cap. Before opening power steering system, wipe the reservoir filler cap free of dirt and debris. Remove the cap and check the fluid level on its dipstick. When the fluid is at normal ambient temperature, approximately 21°C to 27°C (70°F to 80°F), the fluid level should read between the minimum and maximum on dipstick (GAS) or Reservoir (DIESEL). Only add fluid when the vehicle is cold.

Use only Mopar® ATF+4 . Do not overfill the power steering system.

FLUID COOLER

DESCRIPTION

FLUID COOLER



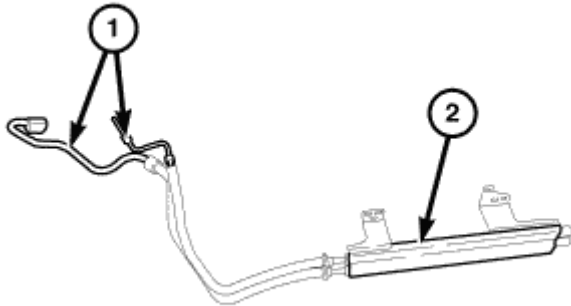
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Fig. 81: FLUID COOLER WITH HOSES
Courtesy of CHRYSLER LLC

The power steering fluid cooler (2) is located at the front of the vehicle. It is mounted in front of the vehicle and just rearward of the front fascia. The cooler is positioned so it is in the air flow through the front fascia of the vehicle. The cooler can be serviced without the return hoses (1).

OPERATION

POWER STEERING FLUID COOLER



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Fig. 82: FLUID COOLER WITH HOSES
Courtesy of CHRYSLER LLC

The purpose of the power steering fluid cooler (2) is to keep the temperature of the power steering system fluid from rising to a level that would affect the performance of the power steering system.

The cooler used on this vehicle is referred to as a fluid-to-air type cooler. This means that the air flow across the fin/tubes of the cooler is used to extract the heat from the cooler which it has absorbed from the power steering

fluid flowing through it. The cooler is placed in series with the power steering fluid return line, between the steering gear and the power steering fluid reservoir. This lowers the temperature of the power steering fluid prior to it entering the power steering fluid reservoir where it is resupplied to the power steering pump.

REMOVAL

FLUID COOLER

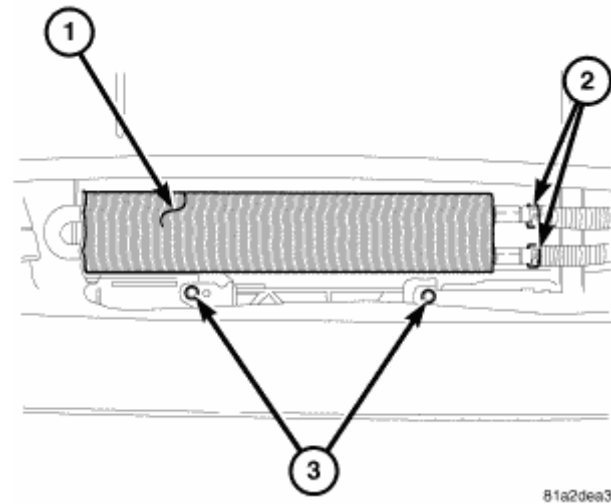


Fig. 83: 4.0L COOLER MOUNTING SCREWS
Courtesy of CHRYSLER LLC

1. Siphon the power steering fluid.
2. Raise and support the vehicle.
3. Remove the hose clamps (2) from the cooler lines.
4. Remove the 3 mounting screws (3) for the cooler (1).

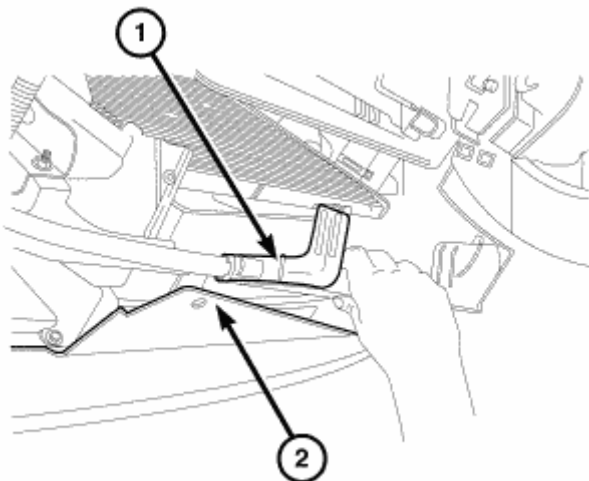
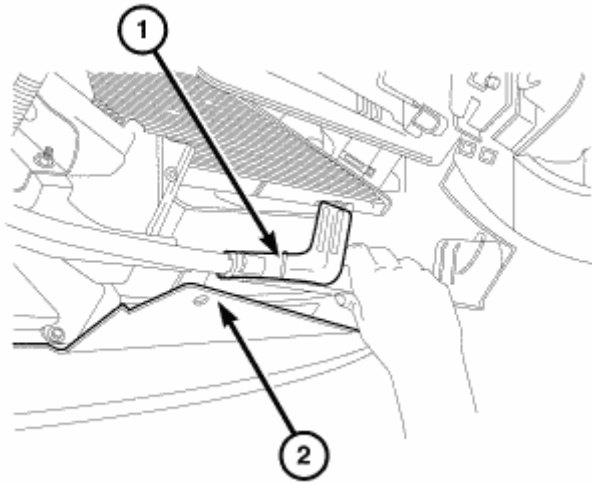


Fig. 84: 4.0L COOLER IN-OUT
Courtesy of CHRYSLER LLC

5. Remove the front fascia push pins and lower the fascia (2) to remove the cooler (1) from the bottom.

INSTALLATION

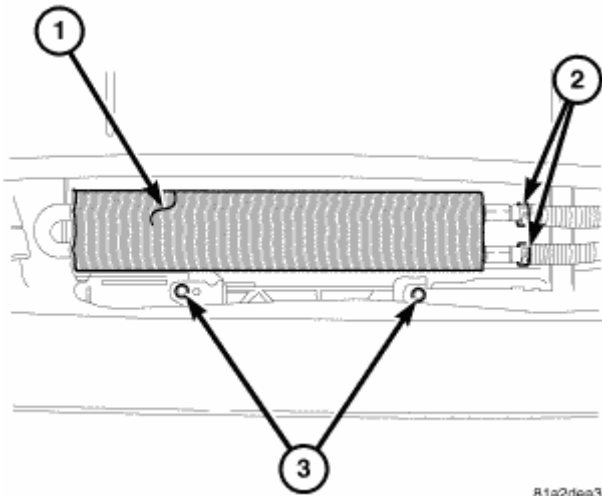
FLUID COOLER



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Fig. 85: 4.0L COOLER IN-OUT
Courtesy of CHRYSLER LLC

1. Install the cooler (1) from the bottom between the front fascia (2) and core support.
2. Install the front fascia push pins.



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Fig. 86: 4.0L COOLER MOUNTING SCREWS
Courtesy of CHRYSLER LLC

3. Install the 3 mounting screws (3) for the cooler (1). Tighten to 4 N.m (35 in. lbs.).
4. Install and reclamp (2) the cooler hoses to the cooler (1) using new crimp clamps.
5. Lower the vehicle.

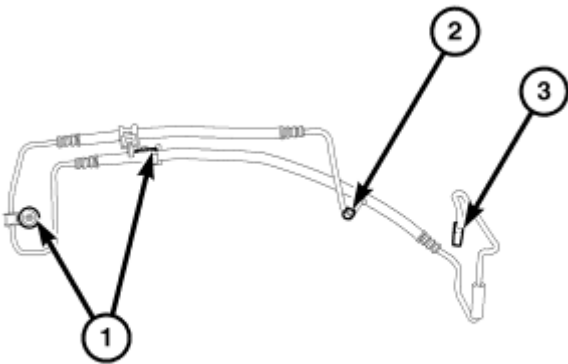
6. Refill the power steering fluid. See **STANDARD PROCEDURE**.

HOSES

REMOVAL

PRESSURE HOSE

1. Siphon out as much power steering fluid as possible.
2. Remove air cleaner housing (Refer to **REMOVAL**).
3. Remove the washer/coolant reservoir assembly.
4. Remove the fan shroud.
5. Remove power steering belt. Refer to **REMOVAL** .



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Fig. 87: PRESSURE HOSE 4.0L
Courtesy of CHRYSLER LLC

6. Remove pressure hose (3) at the pump.
7. Remove the pressure hose (2) from the gear.

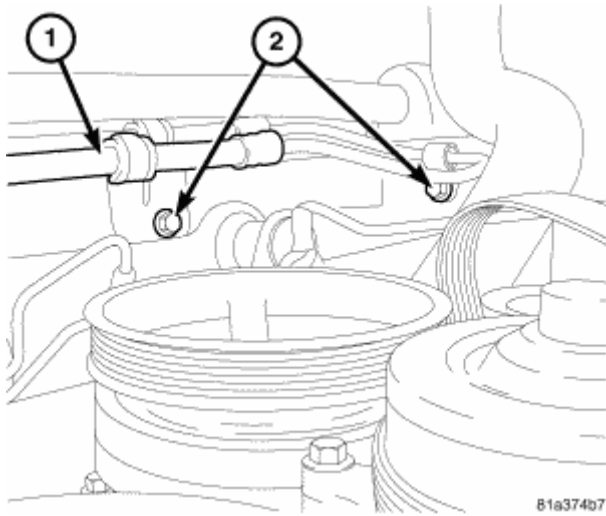


Fig. 88: HOSE MOUNTING
Courtesy of CHRYSLER LLC

8. Remove the pressure hose (1) mounting bolts (2) to the frame.
9. Remove the pressure hose (1) from the vehicle.

PRESSURE HOSE - DIESEL

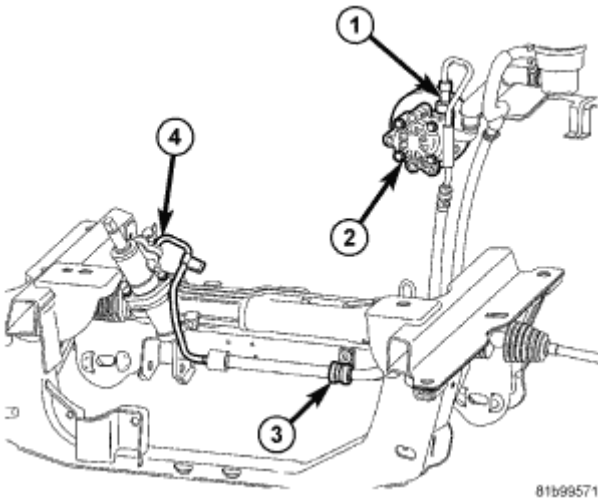


Fig. 89: HOSES
Courtesy of CHRYSLER LLC

1. Siphon the power steering fluid from the reservoir.
2. Remove the air box (Refer to **REMOVAL**).
3. Remove the pressure line (1) at the pump (2).
4. Raise and support the vehicle.
5. Remove the pressure line mounting bracket bolts (3) at the frame.
6. Remove the pressure line at the gear (4)

7. Remove the pressure hose (1) from the vehicle.

RETURN COOLER TO RESERVOIR

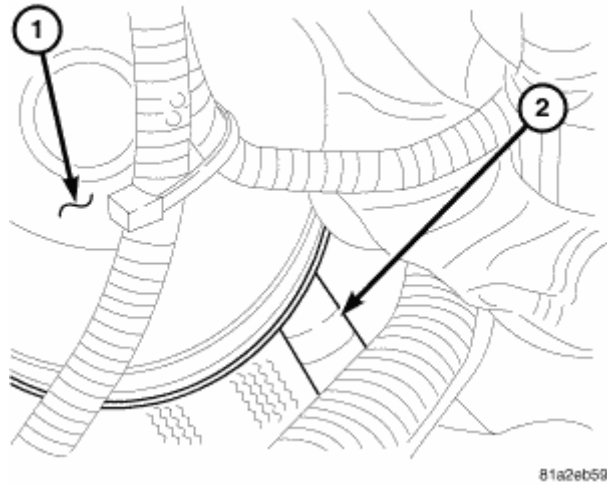


Fig. 90: RETURN HOSE
Courtesy of CHRYSLER LLC

1. Siphon the power steering fluid.
2. Remove the return hose (2) from the reservoir (1).
3. Raise and support the vehicle.

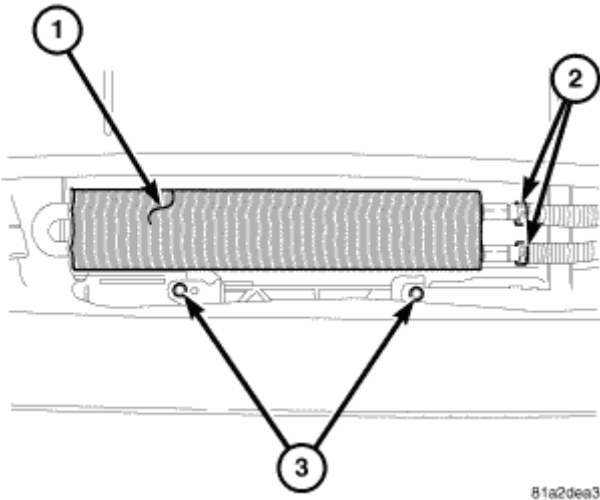


Fig. 91: 4.0L COOLER MOUNTING SCREWS
Courtesy of CHRYSLER LLC

4. Remove the hose clamp (2) for the cooler to reservoir hose from the cooler (1).

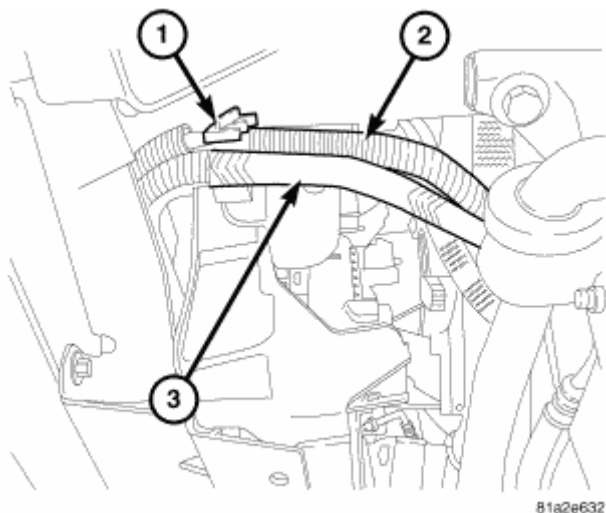


Fig. 92: ROUTING CLIP
 Courtesy of CHRYSLER LLC

5. Remove the return hose assembly from the routing clip (1).
6. Remove the 3 push pins and lower the front fascia.
7. Remove the hose from the vehicle.

RETURN GEAR TO COOLER

1. Siphon out as much power steering fluid as possible.
2. Remove air cleaner housing (Refer to **REMOVAL**).
3. Remove the washer/coolant reservoir assembly.
4. Remove the fan shroud.
5. Raise and support the vehicle.

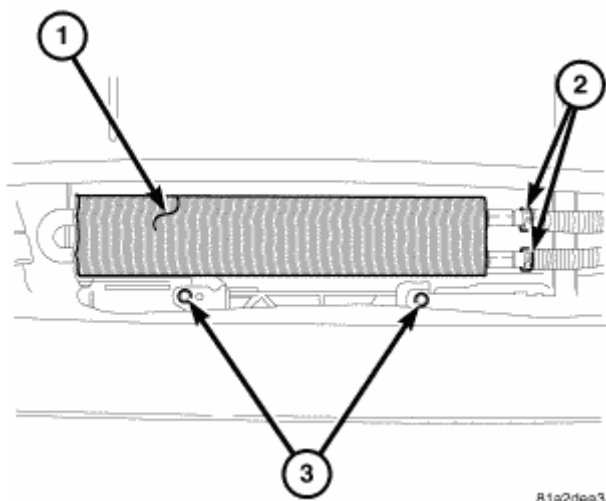


Fig. 93: 4.0L COOLER MOUNTING SCREWS
 Courtesy of CHRYSLER LLC

6. Remove the hose clamp (2) for the return hose from the cooler (1).

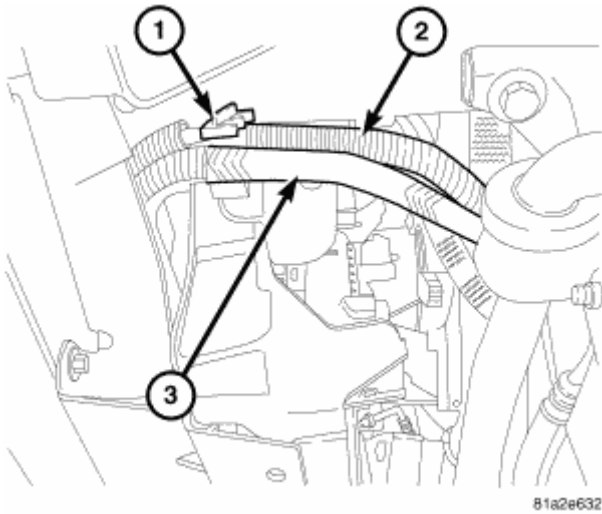


Fig. 94: ROUTING CLIP
Courtesy of CHRYSLER LLC

7. Remove the return hose at the steering gear.
8. Remove the return hose routing clip (1).
9. Remove the hose/line from the vehicle.

RETURN LINE DIESEL

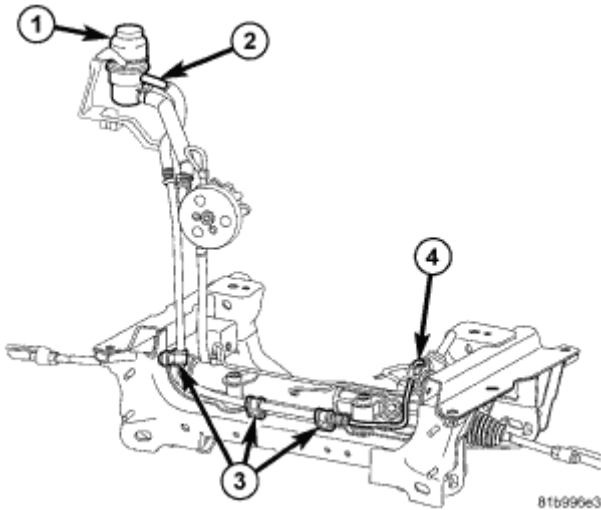


Fig. 95: RETURN HOSE
Courtesy of CHRYSLER LLC

1. Siphon the power steering fluid from the reservoir.
2. Remove the air box (Refer to **REMOVAL** .
3. Remove the return hose (2) at the reservoir (1).

4. Remove the return line at the gear (4).
5. Remove the return line mounting bracket bolts (3) at the frame.
6. Remove the return hose (2) from the vehicle.

SUPPLY HOSE -DIESEL

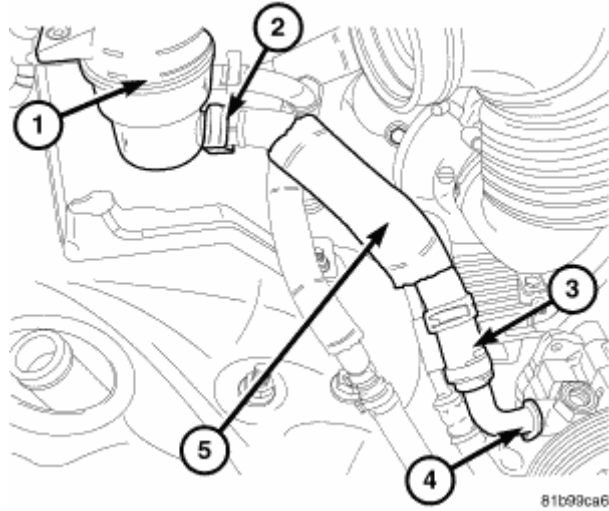
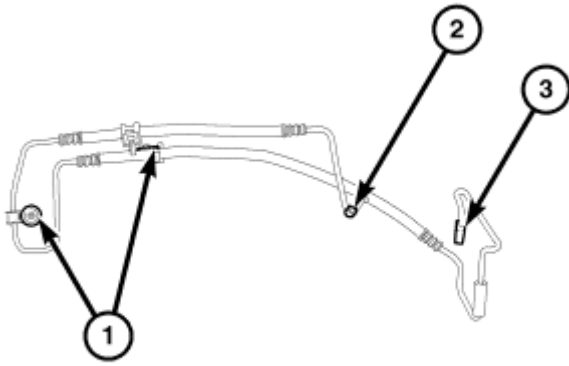


Fig. 96: SUPPLY HOSE
Courtesy of CHRYSLER LLC

1. Siphon the power steering fluid from the reservoir (1).
2. Remove the air box (Refer to **REMOVAL**).
3. Remove the supply hose (2) at the reservoir (1).
4. Remove the supply hose (3) at the pump (4).
5. Remove the supply hose (5) from the vehicle.

INSTALLATION

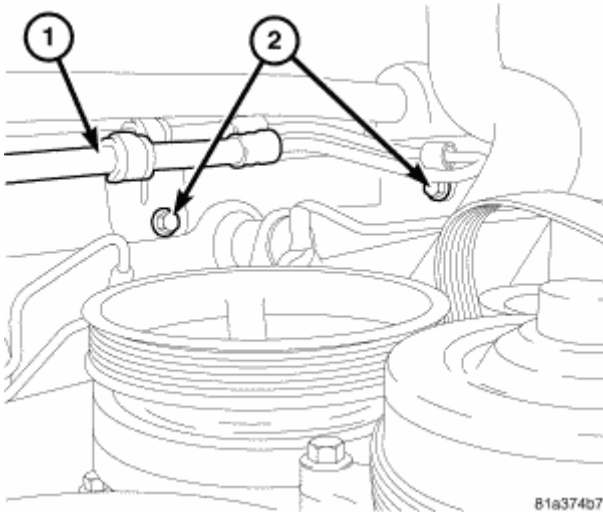
PRESSURE HOSE



81a2e687

Fig. 97: PRESSURE HOSE 4.0L
Courtesy of CHRYSLER LLC

1. Install the pressure hose (2) at the gear.
2. Install pressure line (3) into pump. Thread pressure line tube nut into pump and tighten to 31 N.m (275 in. lbs.).



81a374b7

Fig. 98: HOSE MOUNTING
Courtesy of CHRYSLER LLC

3. Install the pressure hose mounting bolts (2) to the frame. Tighten to 12 N.m (105 in. lbs.).
4. Install power steering belt. Refer to **INSTALLATION** .
5. Install the fan shroud.
6. Install the washer/coolant reservoir assembly.
7. Install air cleaner housing (Refer to **INSTALLATION**).
8. Fill and bleed power steering system. See **STANDARD PROCEDURE**.
9. Inspect for leaks.

PRESSURE HOSE - DIESEL

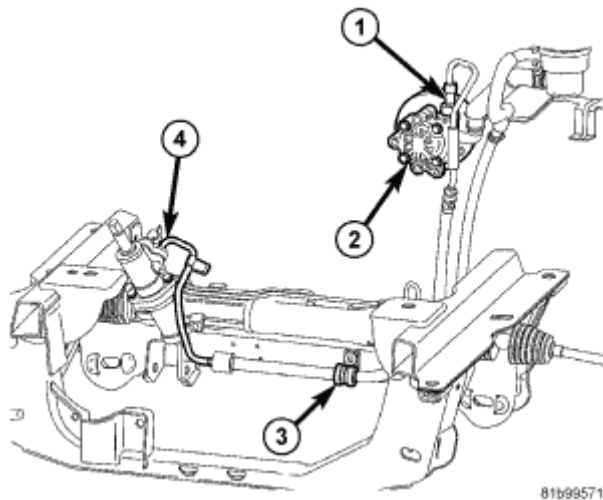


Fig. 99: HOSES

Courtesy of CHRYSLER LLC

1. Install the pressure hose (1) to the vehicle.
2. Install the pressure hose mounting bracket bolts (3) to the frame.
3. Install the pressure hose at the gear (4).
4. Install the pressure line (1) at the pump (2).
5. Install the airbox (Refer to **INSTALLATION**).
6. Refill the power steering fluid.
7. Bleed the power steering system. See **STANDARD PROCEDURE**.
8. Check for leaks.

RETURN COOLER TO RESERVOIR

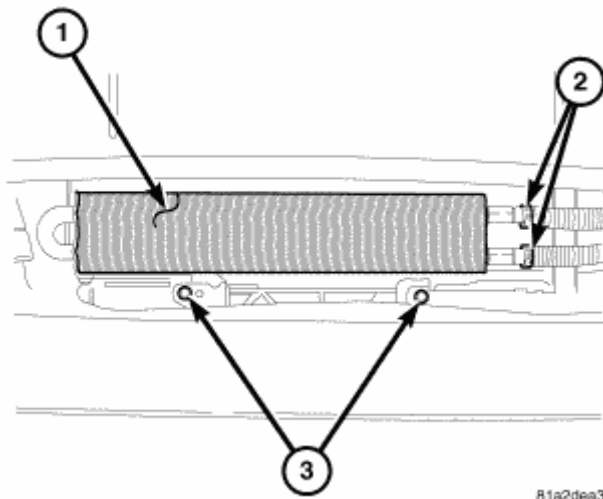


Fig. 100: 4.0L COOLER MOUNTING SCREWS

Courtesy of CHRYSLER LLC

1. Install the hose to the vehicle.
2. Install the 3 push pins and install the front fascia into position.
3. Install the hose to the cooler (1) and reclamp (2) with a new hose crimp clamp.

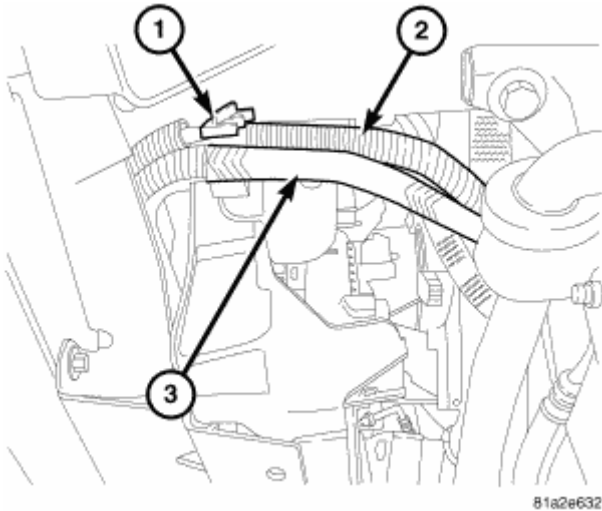


Fig. 101: ROUTING CLIP

Courtesy of CHRYSLER LLC

4. Install the return hose assembly routing clip (1).

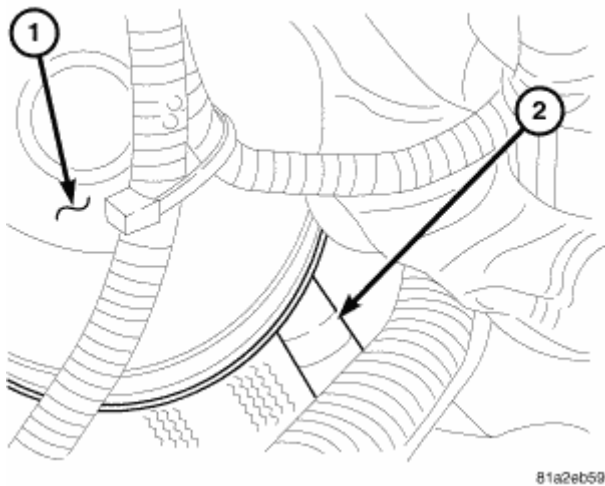


Fig. 102: RETURN HOSE

Courtesy of CHRYSLER LLC

5. Install a new hose clamp for the cooler to reservoir hose (2) to the reservoir (1).
6. Lower the vehicle.
7. Fill and bleed power steering system. See **STANDARD PROCEDURE**.

8. Inspect for leaks.

RETURN GEAR TO COOLER

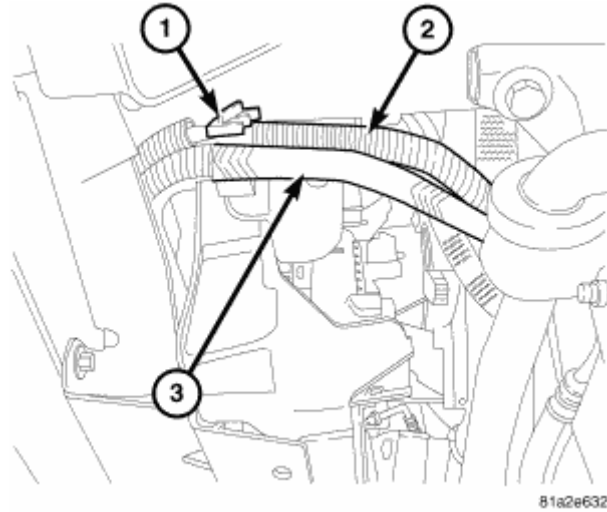


Fig. 103: ROUTING CLIP
Courtesy of CHRYSLER LLC

1. Install the return hose/line at the mounting clip (1).

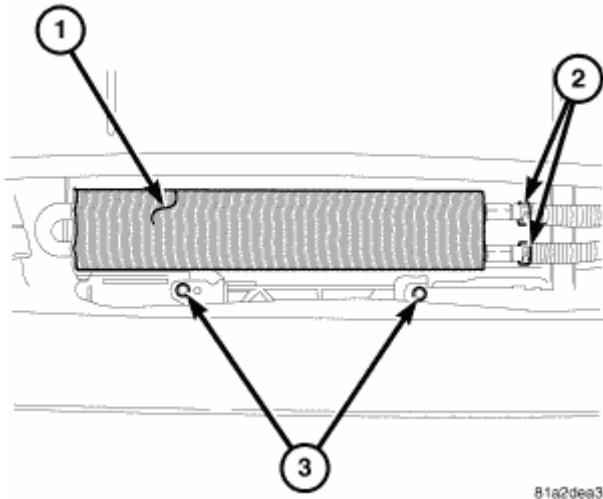


Fig. 104: 4.0L COOLER MOUNTING SCREWS
Courtesy of CHRYSLER LLC

2. Install return hose to the steering gear.
3. Install return hose to the cooler (1) and reclamp (2) with a new crimp clamp.
4. Install the fan shroud.
5. Install the washer/coolant reservoir assembly.
6. Install air cleaner housing (Refer to **INSTALLATION**).

7. Fill and bleed power steering system. See **STANDARD PROCEDURE**.
8. Inspect for leaks.

RETURN LINE DIESEL

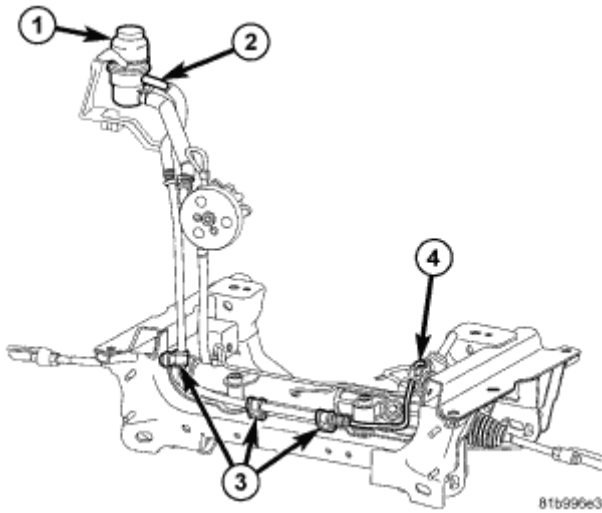


Fig. 105: RETURN HOSE
Courtesy of CHRYSLER LLC

1. Install the return hose (2) to the vehicle
2. Install the return hose mounting bracket bolts (3) to the frame.
3. Install the return hose at the gear (4).
4. Install the return hose (2) at the reservoir (1).
5. Install the airbox (Refer to **INSTALLATION**).
6. Refill the power steering fluid.
7. Bleed the power steering system. See **STANDARD PROCEDURE**.
8. Check for leaks.

SUPPLY HOSE DIESEL

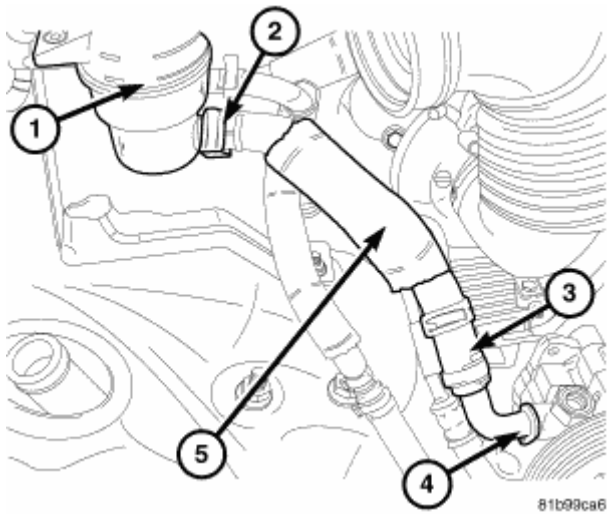


Fig. 106: SUPPLY HOSE
 Courtesy of CHRYSLER LLC

1. Install the supply hose (5) to the reservoir (1) and pump (4).
2. Reclamp the supply hose at the pump (3).
3. Reclamp the supply hose at the reservoir (2).
4. Install the airbox (Refer to **INSTALLATION**).
5. Refill the power steering fluid.
6. Bleed the power steering system. See **STANDARD PROCEDURE**.
7. Check for leaks.

PULLEY

REMOVAL

PULLEY - DIESEL ENGINE

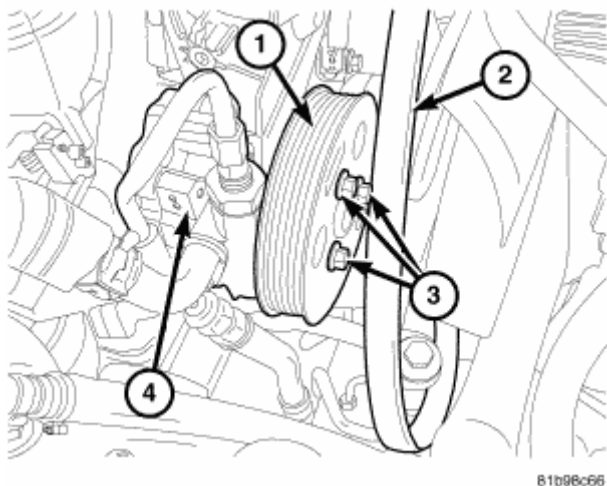
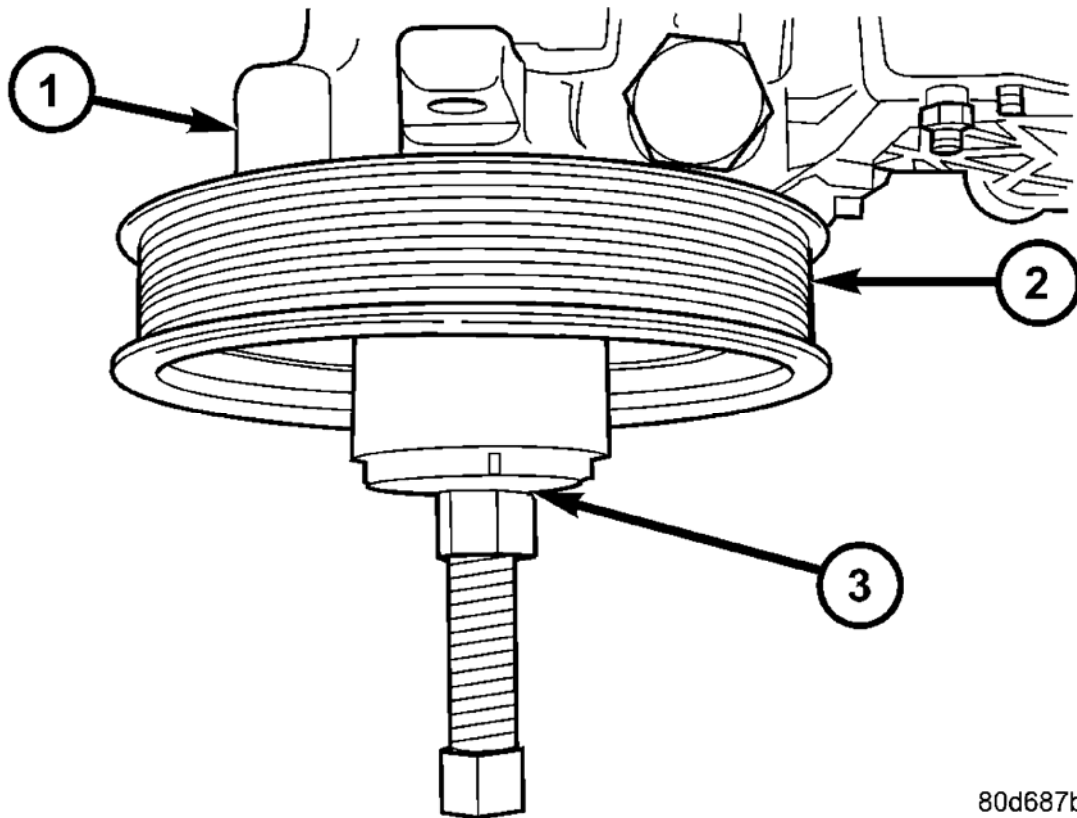


Fig. 107: PULLEY
Courtesy of CHRYSLER LLC

1. Remove the air cleaner box (Refer to **REMOVAL**).
2. Remove the air inlet tube.
3. Remove the serpentine drive belt (2).
4. Remove the three bolts (3) securing the pulley (1) to the pump (4).

PULLEY- GAS ENGINE



80d687b0

Fig. 108: Removing Pulley
Courtesy of CHRYSLER LLC

CAUTION: Do not reuse the old power steering pump pulley it is not intended for reuse. A new pulley must be installed if removed.

1. Remove air cleaner housing (Refer to **REMOVAL**).
2. Remove the washer/coolant reservoir assembly.
3. Remove the fan shroud.
4. Remove power steering belt. Refer to **REMOVAL** .

5. Remove the pulley (2) from the pump using (OTC® 7185) power steering pulley removal tool or equivalent (3).

INSTALLATION

PULLEY - DIESEL ENGINE

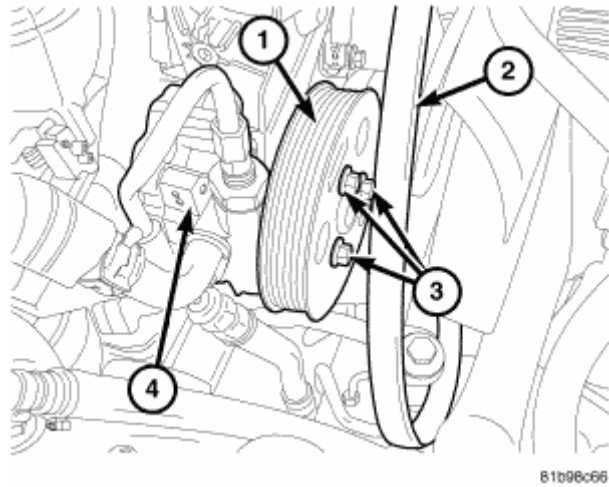
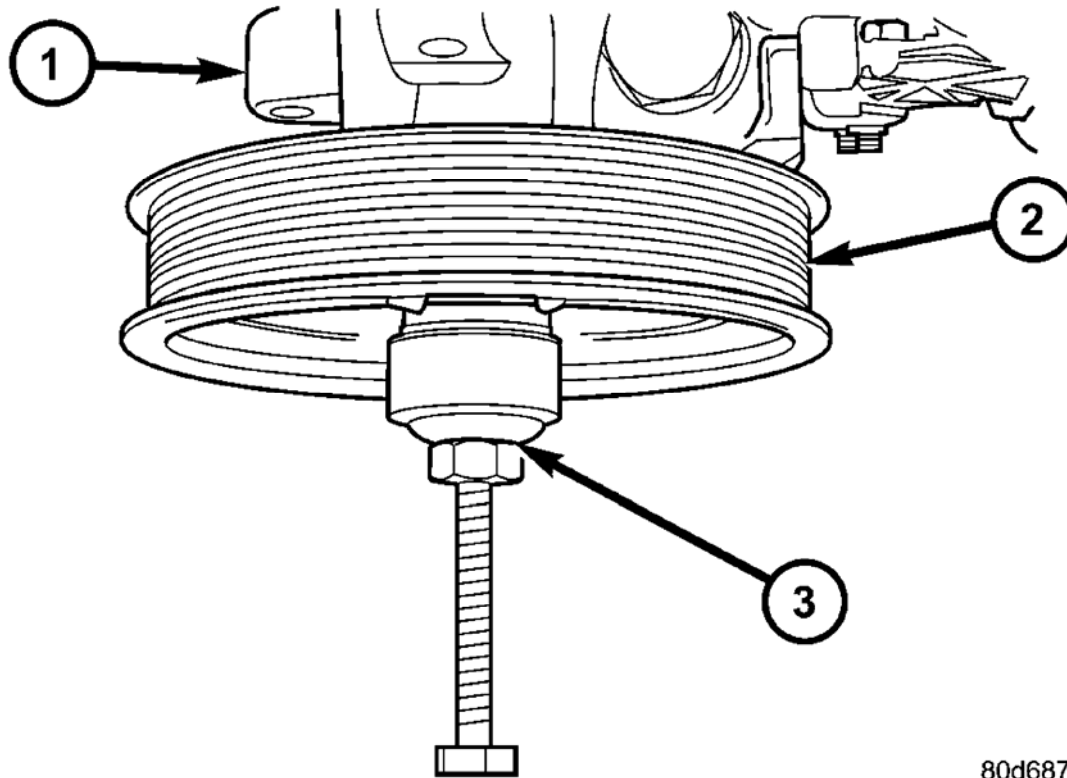


Fig. 109: PULLEY

Courtesy of CHRYSLER LLC

1. Install the pulley (1) to the pump shaft.
2. Install the three bolts (3) securing the pulley (1) to the pump (4). Tighten to 47 N.m (35 ft. lbs.).
3. Install the serpentine belt (2).
4. Install the air inlet tube.
5. Install the air cleaner box (Refer to **INSTALLATION**).

PULLEY - GAS ENGINE



80d687bd

Fig. 110: Installing Pulley
Courtesy of CHRYSLER LLC

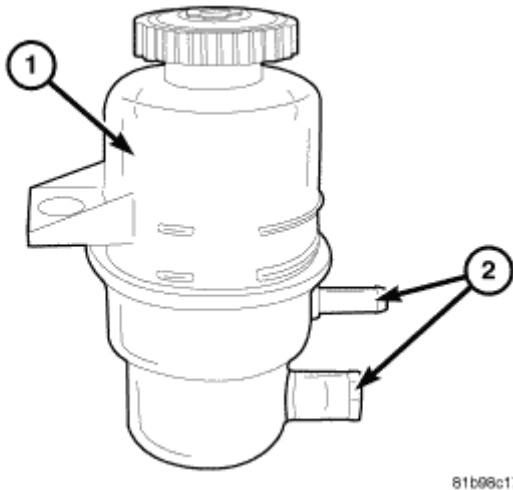
CAUTION: Do not reuse the old power steering pump pulley it is not intended for reuse. A new pulley must be installed if removed.

1. Replace the pulley (2) if it's bent, cracked, or loose.
2. Install the pulley (2) on the pump (1) using (OTC ® 7771) power steering pulley installation tool or equivalent (3) making sure it is flush with the end of the shaft. Ensure the tool and pulley remain aligned with the pump shaft.
3. Install the air box assembly (Refer to **INSTALLATION**).
4. Install power steering belt. Refer to **INSTALLATION** .
5. Install the fan shroud.
6. Install the washer/coolant reservoir assembly.
7. Install air cleaner housing (Refer to **INSTALLATION**)

RESERVOIR

DESCRIPTION

RESERVOIR



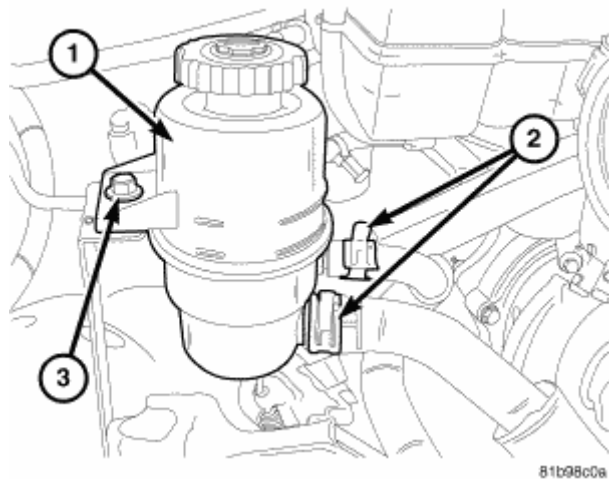
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Fig. 111: FLUID RESERVOIR DIESEL
 Courtesy of CHRYSLER LLC

Only the diesel engine reservoir (1) is serviced separately. The 3.7L & 4.0L power steering reservoirs are not serviced separately from the pump.

REMOVAL

FLUID RESERVOIR - DIESEL



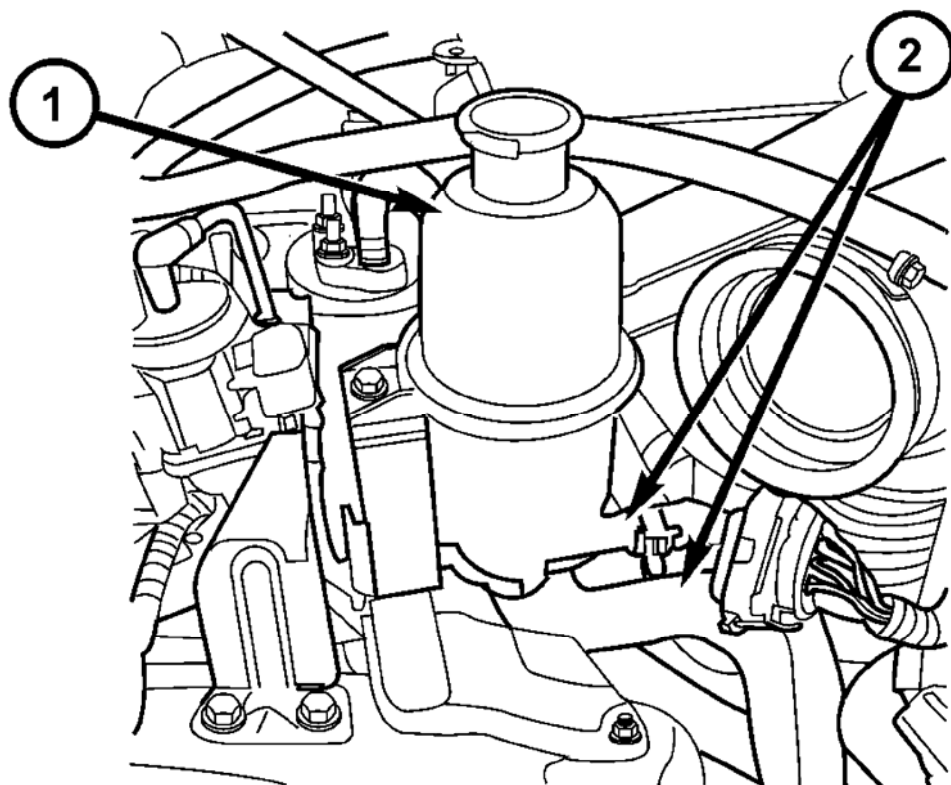
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Fig. 112: RESERVOIR
 Courtesy of CHRYSLER LLC

1. Siphon out as much power steering fluid as possible.
2. Remove the power steering hoses (2).
3. Remove the bolt securing the reservoir (3) to the mounting bracket.
4. Remove the reservoir (1).

INSTALLATION

FLUID RESERVOIR - DIESEL



80c67469

Fig. 113: Reservoir
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FLUID RESERVOIR
2 - RETURN HOSES |
|---|

1. Install the reservoir (1) to the mounting bracket.
2. Install and tighten the bolt to 12 N.m (9 ft. lbs.).
3. Install the hoses (2).
4. Refill the power steering fluid and check for leaks. See **STANDARD PROCEDURE**.

2008 SUSPENSION

Suspension - Liberty

DIAGNOSIS AND TESTING

SUSPENSION AND STEERING SYSTEM

CONDITION	POSSIBLE CAUSES	CORRECTION
FRONT END NOISE	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components.	1. Replace wheel bearings. 2. Tighten or replace components as necessary.
EXCESSIVE PLAY IN STEERING	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Loose or worn steering gear.	1. Replace wheel bearings. 2. Tighten or replace components as necessary. 3. Adjust or replace steering gear.
FRONT WHEELS SHIMMY	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Tires worn or out of balance. 4. Alignment.	1. Replace wheel bearings. 2. Tighten or replace components as necessary. 3. Replace or balance tires. 4. Align vehicle to specifications.
VEHICLE INSTABILITY	1. Loose or worn wheel bearings. 2. Loose or worn steering or suspension components. 3. Tire pressure. 4. Alignment.	1. Replace wheel bearings. 2. Tighten or replace components as necessary. 3. Adjust tire pressure. 4. Align vehicle to specifications.
EXCESSIVE STEERING EFFORT	1. Loose or worn steering gear. 2. Power steering fluid low. 3. Column coupler binding. 4. Tire pressure. 5. Alignment.	1. Adjust or replace steering gear. 2. Add fluid and repair leak. 3. Replace coupler. 4. Adjust tire pressure. 5. Align vehicle to specifications.
VEHICLE PULLS TO ONE SIDE DURING BRAKING	1. Uneven tire pressure. 2. Worn brake components. 3. Air in brake line.	1. Adjust tire pressure. 2. Repair brakes as necessary. 3. Repair as necessary.
VEHICLE LEADS OR DRIFTS FROM STRAIGHT AHEAD DIRECTION ON UNCROWNED ROAD	1. Radial tire lead. 2. Brakes dragging. 3. Weak or broken spring. 4. Uneven tire pressure. 5. Wheel Alignment. 6. Loose or worn steering or suspension components. 7. Cross caster out of spec.	1. Cross front tires. 2. Repair brake as necessary. 3. Replace spring. 4. Adjust tire pressure. 5. Align vehicle. 6. Repair as necessary. 7. Align vehicle.
KNOCKING, RATTLING OR SQUEAKING	1. Worn shock bushings. 2. Loose, worn or bent	1. Replace shock. 2. Inspect, tighten or replace

	steering/suspension components. 3. Shock valve.	components as necessary. 3. Replace shock.
IMPROPER TRACKING	Loose, worn or bent steering/suspension components. -	Inspect, tighten or replace components as necessary. -

WHEEL ALIGNMENT

DESCRIPTION

WHEEL ALIGNMENT

NOTE: Suspension components with rubber/urethane bushings should be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

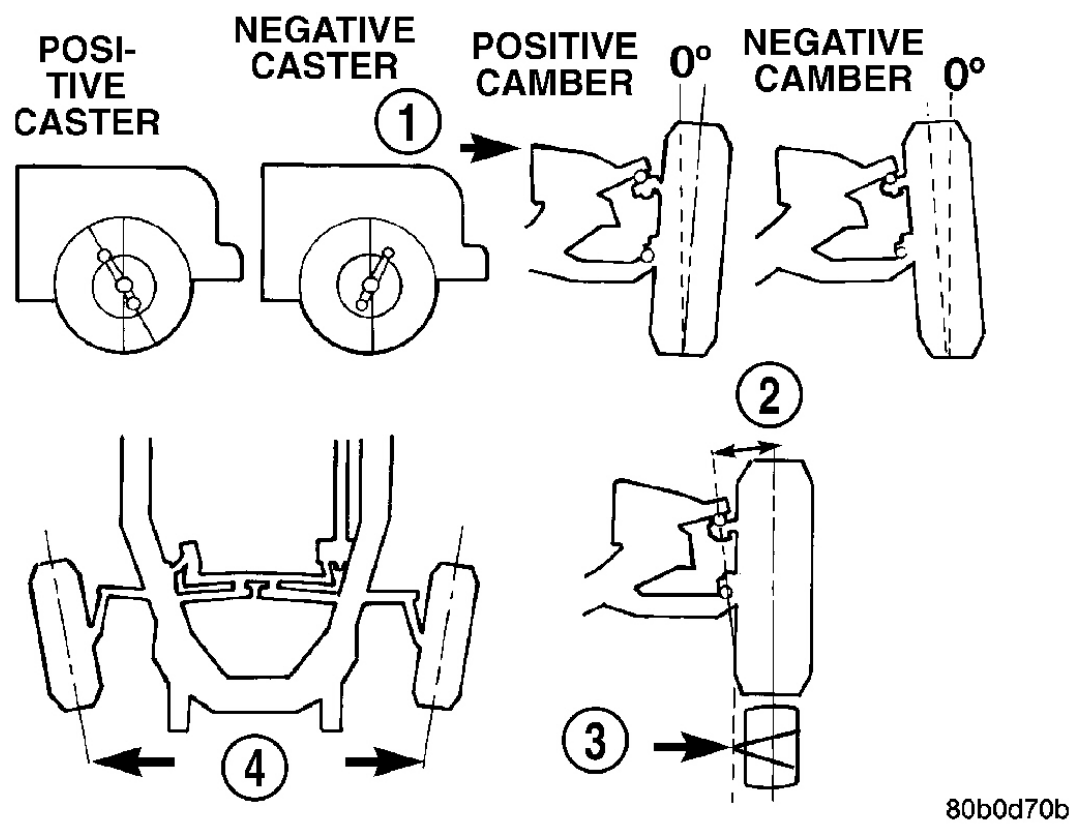


Fig. 1: Wheel Alignment Measurements - Caster, Camber, Toe & Thrust Angle
 Courtesy of CHRYSLER LLC

1 - FRONT OF VEHICLE
2 - STEERING AXIS INCLINATION
3 - PIVOT POINT
4 - TOE-IN

Wheel alignment involves the correct positioning of the wheels in relation to the vehicle. The positioning is accomplished through suspension and steering linkage adjustments. An alignment is considered essential for efficient steering, good directional stability and to minimize tire wear. The most important measurements of an alignment are caster, camber and toe.

CAUTION: Never attempt to modify suspension or steering components by heating or bending.

NOTE: Periodic lubrication of the front suspension/steering system components may be required. Rubber bushings must never be lubricated.

OPERATION

WHEEL ALIGNMENT

CASTER is the forward or rearward tilt of the steering knuckle from vertical. Tilting the top of the knuckle forward provides negative caster. Tilting the top of the knuckle rearward provides positive caster. Positive caster promotes directional stability. This angle enables the front wheels to return to a straight ahead position after turns. See **Fig. 1**.

CAMBER is the inward or outward tilt of the wheel relative to the center of the vehicle. Tilting the top of the wheel inward provides negative camber. Tilting the top of the wheel outward provides positive camber. Incorrect camber will cause wear on the inside or outside edge of the tire. See **Fig. 1**.

TOE is the difference between the leading inside edges and trailing inside edges of the front tires. Wheel toe position out of specification cause's unstable steering, uneven tire wear and steering wheel off-center. The wheel toe position is the **final** front wheel alignment adjustment. See **Fig. 1**.

THRUST ANGLE is the angle of the rear axle relative to the centerline of the vehicle. Incorrect thrust angle can cause off-center steering and excessive tire wear. This angle is not adjustable, damaged component(s) must be replaced to correct the thrust angle. See **Fig. 1**.

STANDARD PROCEDURE

CAMBER AND CASTER ADJUSTMENT

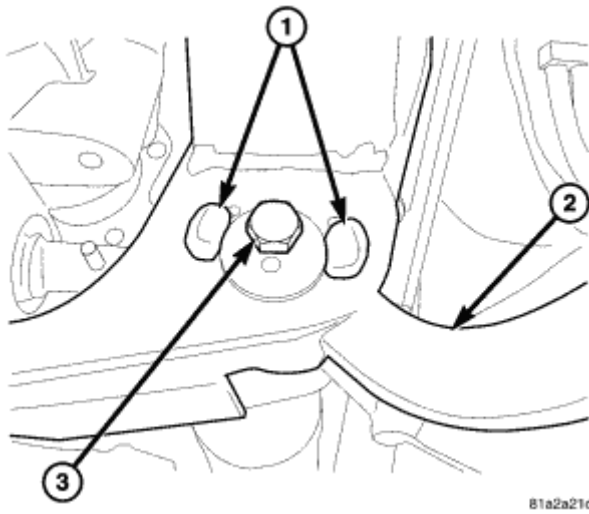


Fig. 2: Identifying Lower Control Arm, Control Arm Pivot Bolts & Rail Brackets
 Courtesy of CHRYSLER LLC

Camber and caster angle adjustments involve changing the position of the lower control arm cam bolts (3).

COMPLETE WHEEL ALIGNMENT

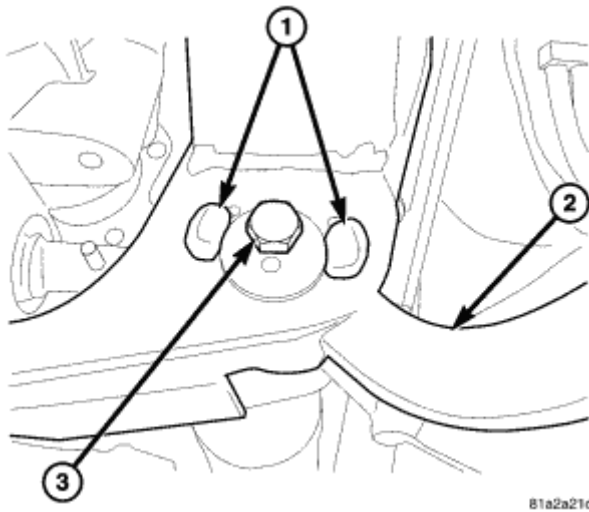


Fig. 3: Identifying Lower Control Arm, Control Arm Pivot Bolts & Rail Brackets
 Courtesy of CHRYSLER LLC

Camber and caster angle adjustments involve changing the position of the lower suspension arm cam bolts (3).

CASTER

Moving the rear position of the cam bolt in or out, will change the caster angle significantly and camber angle only slightly. To maintain the camber angle while adjusting caster, move the rear cam bolt in or out. Then move the front cam bolt slightly in the opposite direction.

To increase positive caster angle, move the rear position cam bolt outward (from the engine). Move the front

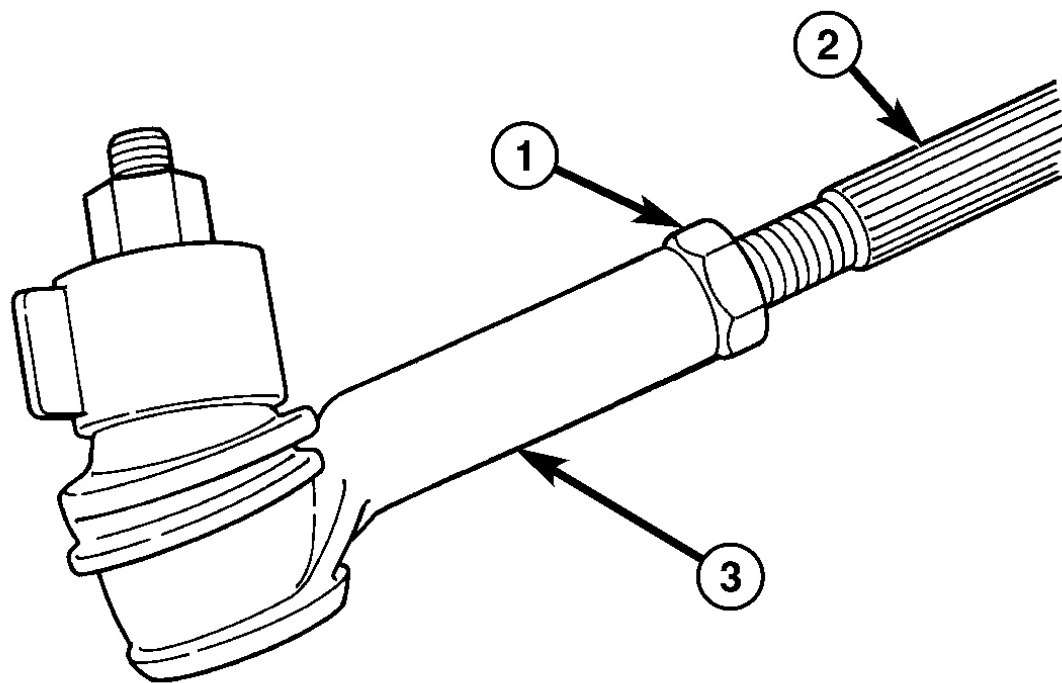
cam bolt inward (toward the engine) slightly until the specified camber angle is obtained.

CAMBER

Move the rear position cam bolt outward (from the engine). Move the forward position cam bolt inward (toward the engine).

After adjustment is made tighten the cam bolt nuts to proper torque specification.

TOE ADJUSTMENT



80cdf759

Fig. 4: Tie Rod End
Courtesy of CHRYSLER LLC

The wheel toe position adjustment is the final adjustment.

1. Start the engine and turn wheels both ways before straightening the wheels. Secure the steering wheel with the front wheels in the straight-ahead position.
2. Turn off engine.
3. Loosen the tie rod jam nuts (1).

NOTE: Each front wheel should be adjusted for one-half of the total toe position

specification. This will ensure the steering wheel will be centered when the wheels are positioned straight-ahead.

4. Adjust the wheel toe position by turning the tie rod as necessary.
5. Tighten the tie rod jam nut (1) to 75 N.m (55 ft. lbs.).
6. Verify the specifications.

HEIGHT MEASUREMENT

CURB HEIGHT

NOTE: The suspension is non-adjustable.

The vehicle suspension height should be measured before performing wheel alignment procedure. Also when front suspension components have been replaced. This measure must be performed with the vehicle supporting it's own weight and taken on both sides of the vehicle.

Front and rear curb heights are not adjustable. The spring selections at assembly determine curb height for acceptable appearance of the vehicle. Curb height dimensions assume full fluids (including fuel) and zero passengers. Refer to the CURB HEIGHT SPECIFICATIONS table below for front curb height dimensions.

Vehicle curb height audits should be performed utilizing the following procedure:

1. Drive the vehicle straight and forward on a non-tacky surface for a minimum of 20 feet to neutralize track width.
2. Bounce the front of the vehicle five times.
3. Measure and record the dimensions

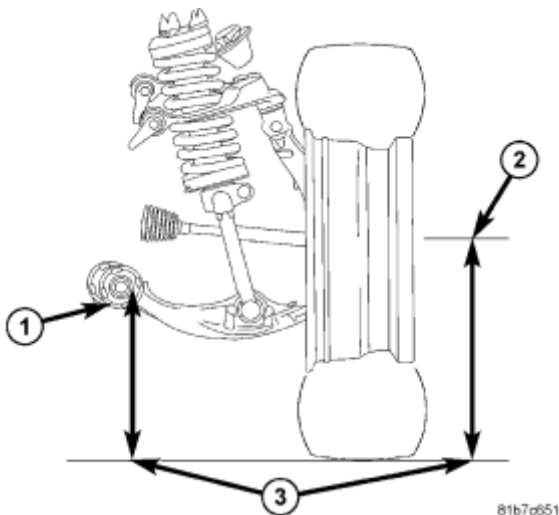


Fig. 5: Front Curb Height
Courtesy of CHRYSLER LLC

4. Front - On each side of the vehicle, measure the distance from the center of the front lower control arm

- bushing bolt (1) to the ground (3) **Record the measurement** . Next measure the distance from the spindle center (2) to the ground (3) **Record the measurement**.
5. Take the two measurements and subtract them to get the curb height specification.

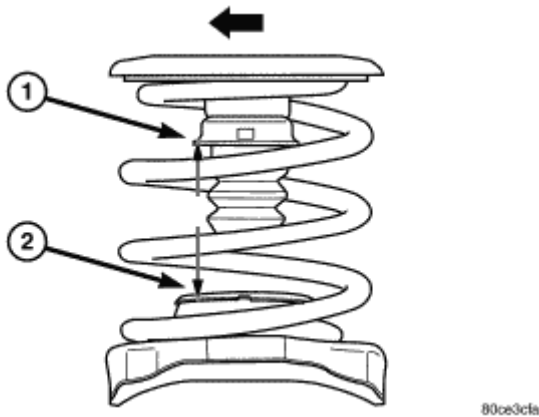


Fig. 6: Identifying Jounce Cup & Strike Surface
Courtesy of CHRYSLER LLC

REAR CURB HEIGHT Rear curb height is defined by the relative vertical distance between the top of the lower spring seat strike surface and the bottom of the jounce cup (true metal to metal jounce travel). This is to be measured vertically inside the coil from the point intersecting the inboard edge and the for/aft center of the jounce cup (1) down to the strike surface (2).

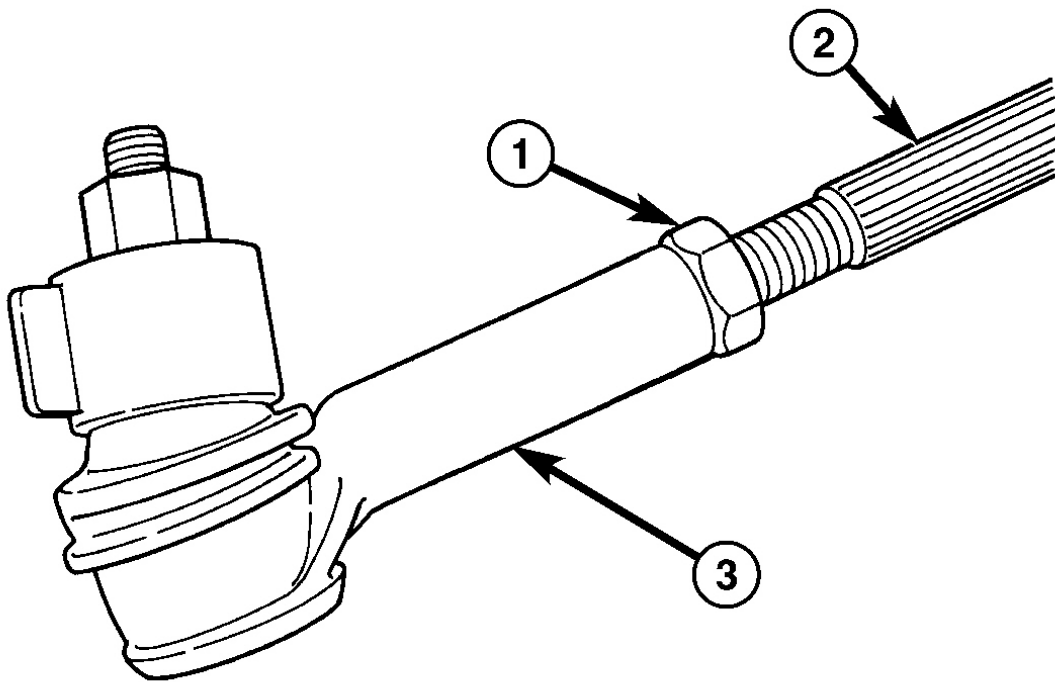
CURB HEIGHT SPECIFICATIONS

MODEL	FRONT	FRONT CROSS HEIGHT	REAR	REAR CROSS (LEFT - RIGHT)
ALL	62 mm ± 10 mm 2.44 in. ± 0.39 in	0 mm ± 7 mm 0 in. ± 0.27 in	107 mm ± 10 mm 4.21 in. ± 0.39 in.	0 mm ± 7 mm 0 in. ± 0.27 in.

TOE ADJUSTMENT

The wheel toe position adjustment is the final adjustment.

1. Start the engine and turn wheels both ways before straightening the wheels. Secure the steering wheel with the front wheels in the straight-ahead position.
2. Turn off the engine.



80cdf759

Fig. 7: Tie Rod End
Courtesy of CHRYSLER LLC

3. Loosen the tie rod jam nuts (1).

NOTE: Each front wheel should be adjusted for one-half of the total toe position specification. This will ensure the steering wheel will be centered when the wheels are positioned straight-ahead.

4. Adjust the wheel toe position by turning the tie rod as necessary. See **Fig. 7**.
5. Tighten the tie rod jam nut (1) to 75 N.m (55 ft. lbs.).
6. Verify the specifications.

SPECIFICATIONS

ALIGNMENT

NOTE: Specifications are in degrees.

FRONT

DESCRIPTION	SPECIFICATION		
PREFERRED	CASTER $3.3^{\circ} \pm 0.5^{\circ}$	CAMBER $-0.375^{\circ} \pm 0.375^{\circ}$	TOTAL TOE-IN $0.2^{\circ} \pm 0.125^{\circ}$
RANGE	2.8° to 3.8°	-0.750° to 0°	$+0.075^{\circ}$ to $+0.325^{\circ}$
MAX RT/LT DIFFERENCE	0.5°	0.7°	0.13°

REAR

DESCRIPTION	SPECIFICATION		
PREFERRED	CAMBER $-0.25^{\circ} \pm 0.375^{\circ}$	THRUST ANGLE 0° to $\pm 0.25^{\circ}$	TOTAL TOE-IN 0.25° to $\pm 0.41^{\circ}$
RANGE	-0.625° to $+0.125^{\circ}$	-0.25° to $+0.25^{\circ}$	-0.16° to $+0.66^{\circ}$

FRONT

DESCRIPTION

FRONT SUSPENSION

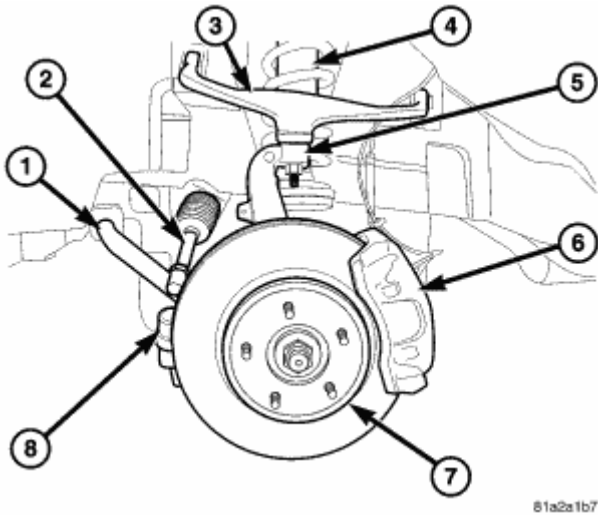


Fig. 8: Front Suspension
Courtesy of CHRYSLER LLC

NOTE: Suspension components with rubber/urethane bushings should be tightened with the full weight of the vehicle at normal ride height. It is important to have the springs supporting the full weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

The front suspension is designed to allow each wheel to adapt to different road surfaces independently. The wheels are mounted to hub bearings on the steering knuckle spindles (5). The hub bearings are sealed and lubricated for life. The steering knuckles turn (pivot) on ball joints integral to the outboard portion of the upper

control arms (3) and pressed into the lower control arm. The ball joints and outer tie rods are lubricated for life.

WARNING

REAR SUSPENSION

WARNING: Suspension components with rubber bushings must be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort will be affected and cause premature bushing wear.

NOTE: Never use anything other than the specified tool to disassemble the ball joints & tie rods from the steering knuckle. Ball joint seal or knuckle damage can result.

SPECIFICATIONS

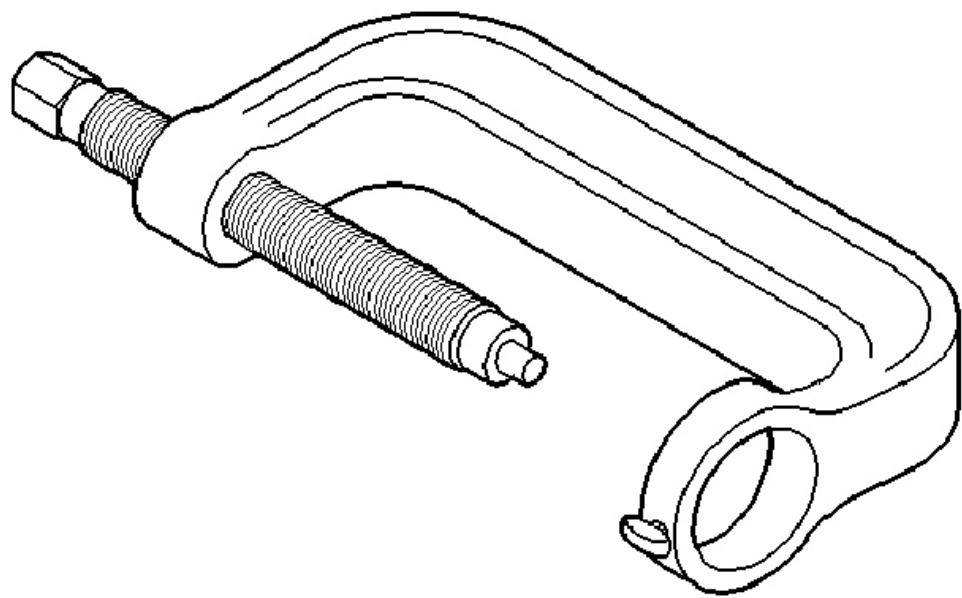
TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Front Shock Absorber Clevis Bracket Upper Nut	108	80	-
Front Shock Absorber Clevis Bracket Lower Nut	150	110	-
Front Shock Absorber Top (4) Mounting Nuts	108	80	-
Front Shock to Spring and Insulator Nut	41	30	-
Upper Suspension Arm Front Nut	122	90	-
Upper Suspension Arm Rear Nut	122	90	-
Lower Suspension Arm Front Nut	170	125	-
Lower Suspension Arm Rear Nut	170	125	-
Stabilizer Bar Clamp Nut	149	110	-
Stabilizer Bar Link Upper Nut	115	85	-
Stabilizer Bar Link Lower bolt	102	75	-
Hub/Bearing Bolt	130	96	-
Hub/Bearing Halfshaft Nut	136	100	-

Upper Ball Joint Nut Tighten to 41 N.m (30 ft lbs), make sure nut is seated to the knuckle. Rotate nut to an additional 90°	41 plus Rotate nut to an additional 90°	30 plus Rotate nut to an additional 90°	-
Lower Ball Joint Nut Tighten to 54 N.m (40 ft lbs), make sure nut is seated against knuckle. Rotate nut an additional 90°	54 plus Rotate nut an additional 90°	40 plus Rotate nut an additional 90°	-
Outer Tie Rod End Nut to Knuckle	41 plus Rotate nut an additional 90°	30 plus Rotate nut an additional 90°	-
Wheel Speed Sensor	13.5	10	-

SPECIAL TOOLS

FRONT SUSPENSION



c-4212f-8011d4af

Fig. 9: Ball Joint Press - C-4212F
Courtesy of CHRYSLER LLC

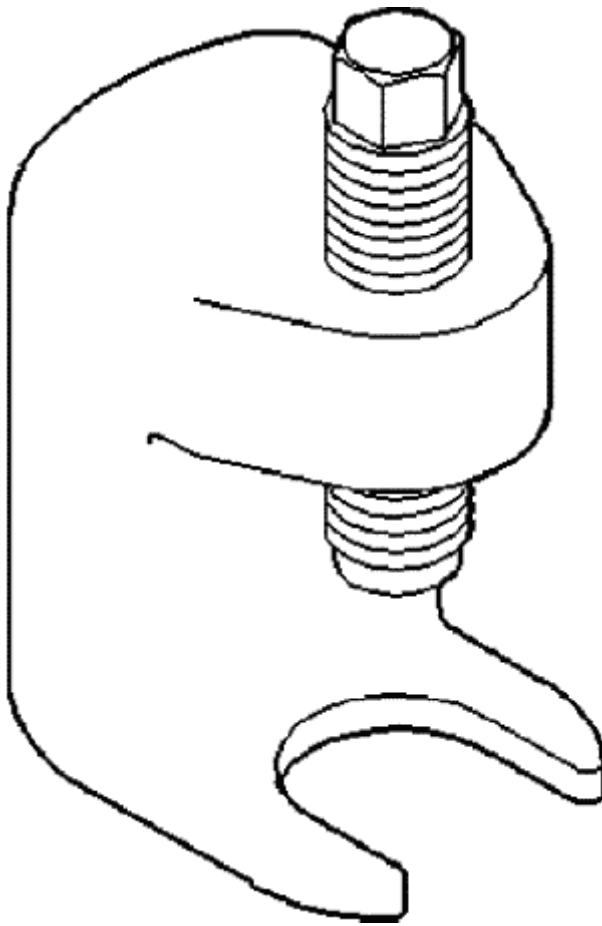


Fig. 10: Remover C-4150A
Courtesy of CHRYSLER LLC

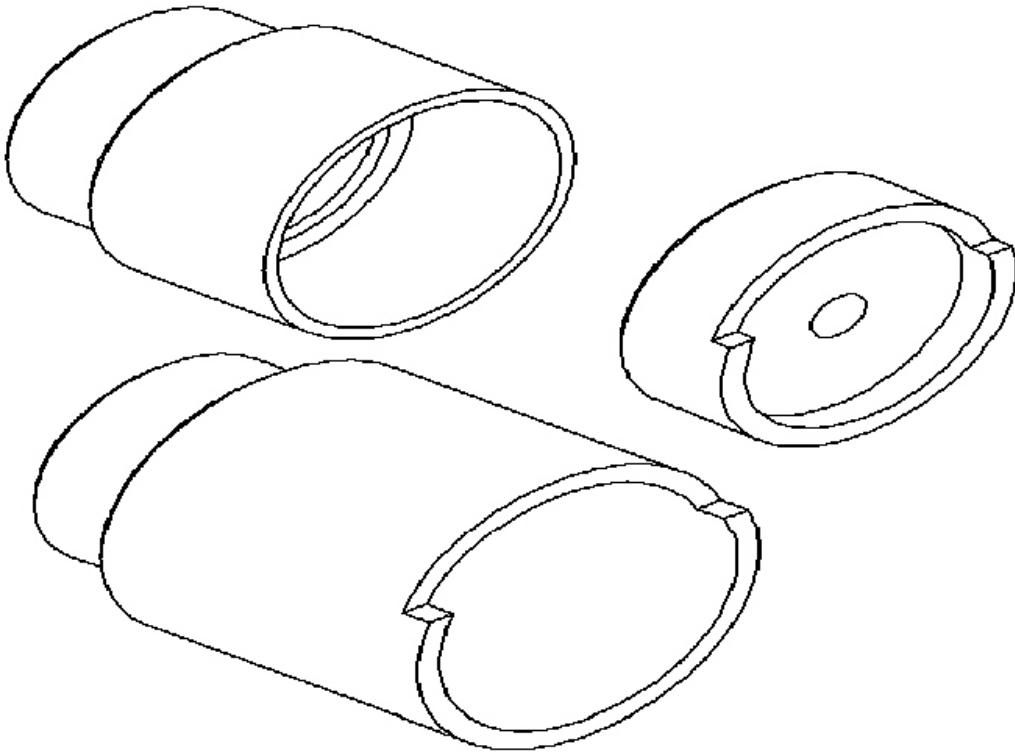


Fig. 11: Ball Joint - 9654
Courtesy of CHRYSLER LLC

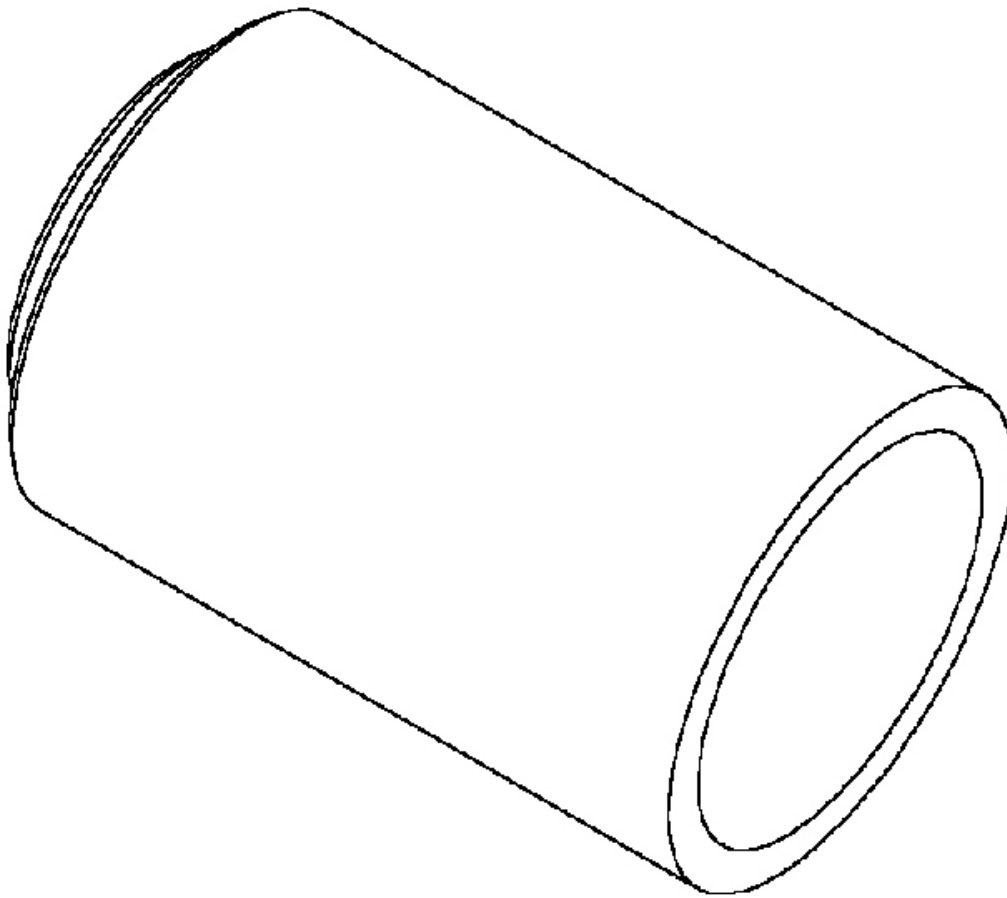


Fig. 12: Receiver Cup - 6761
Courtesy of CHRYSLER LLC



Fig. 13: Clevis Bushing - 9956
Courtesy of CHRYSLER LLC

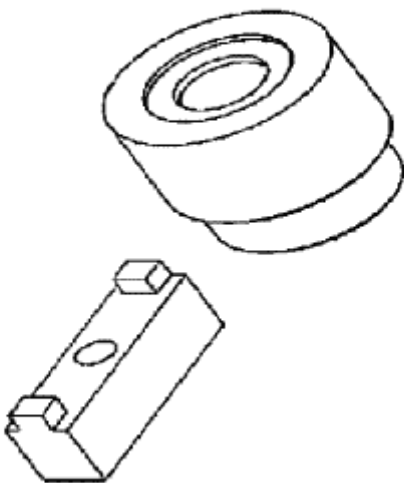


Fig. 14: Clevis Bushing - 9957
Courtesy of CHRYSLER LLC



Fig. 15: LCA Bushing - 9334
Courtesy of CHRYSLER LLC

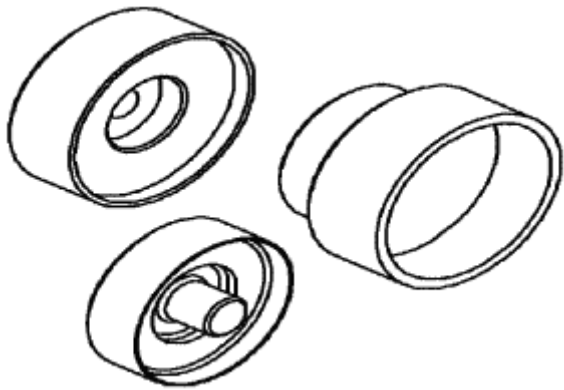


Fig. 16: LCA Bushing - 9603
Courtesy of CHRYSLER LLC

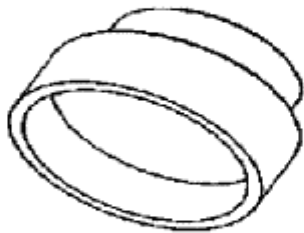


Fig. 17: LCA Bushing - 9969
Courtesy of CHRYSLER LLC

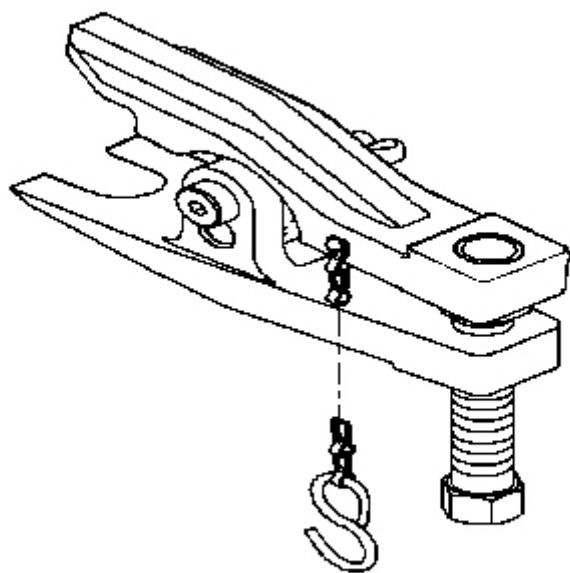


Fig. 18: Remover, Ball Stud 9360
Courtesy of CHRYSLER LLC

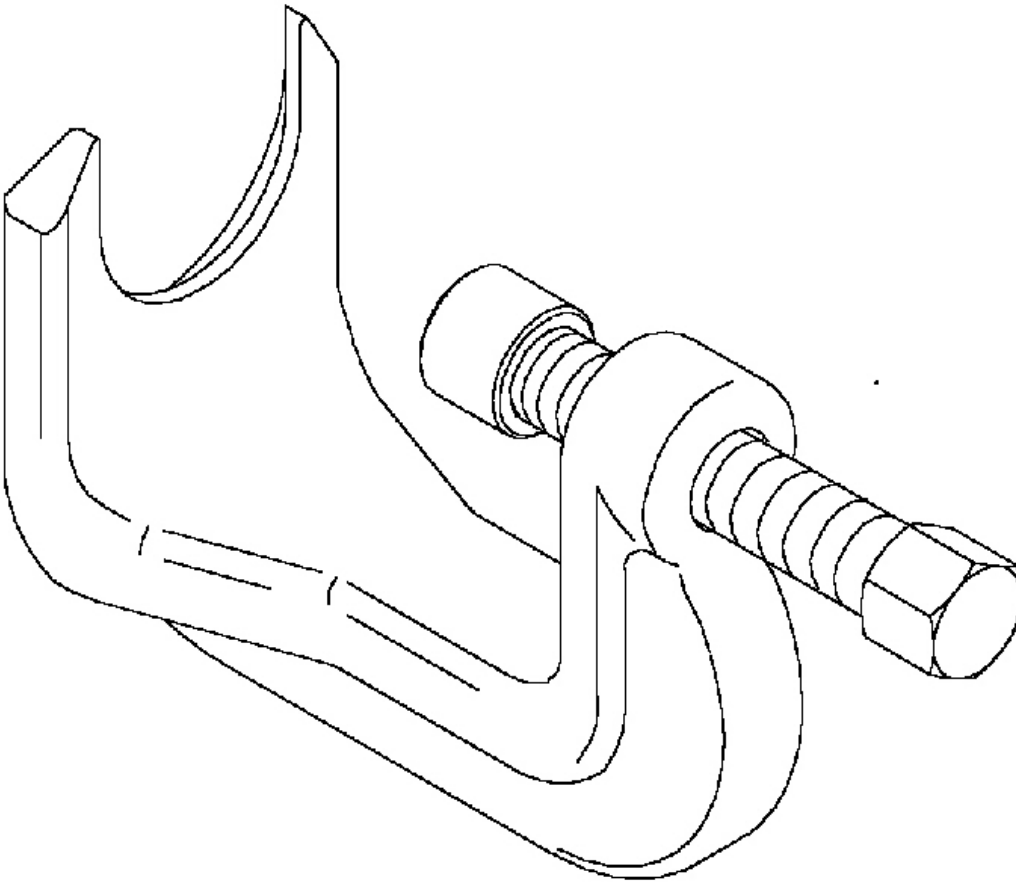


Fig. 19: Puller - 8677
Courtesy of CHRYSLER LLC

BUSHINGS

REMOVAL

BUSHINGS-CLEVIS BRACKET

1. Remove the tire and wheel assembly.
2. Remove the disc brake rotor. Refer to **REMOVAL** .
3. Remove the wheel speed sensor. Refer to **REMOVAL** .
4. Remove the lower stabilizer link at the lower control arm.
5. Remove the lower clevis bolt at the control arm.

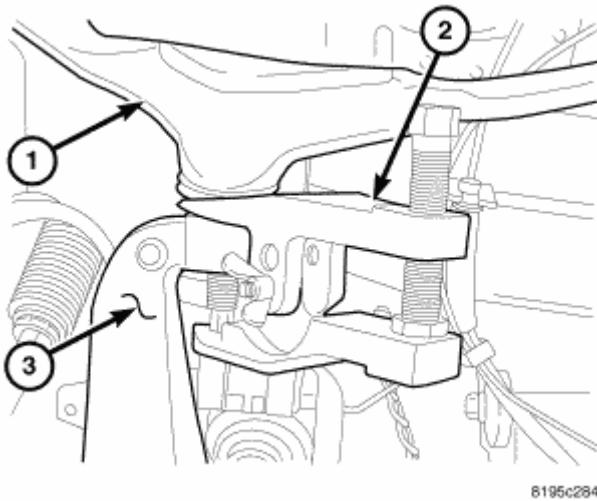


Fig. 20: Upper Ball Joint Separation
 Courtesy of CHRYSLER LLC

6. Remove the upper ball joint nut.
7. Separate the upper ball joint from the knuckle using special tool 9360 separator (2).
8. Lower the control arm enough to install the press tool.

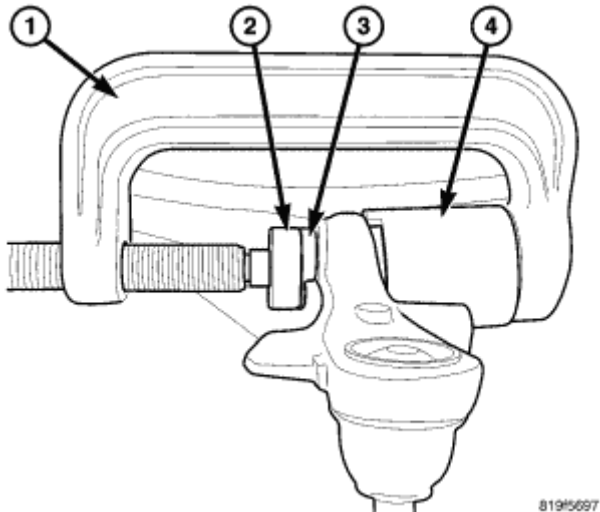


Fig. 21: Clevis Bushing Removal
 Courtesy of CHRYSLER LLC

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

9. Press the bushing (3) out using special tools C-4212F (Press) (1), 9956 (receiver) (4) and 9653-1 (driver) (2).

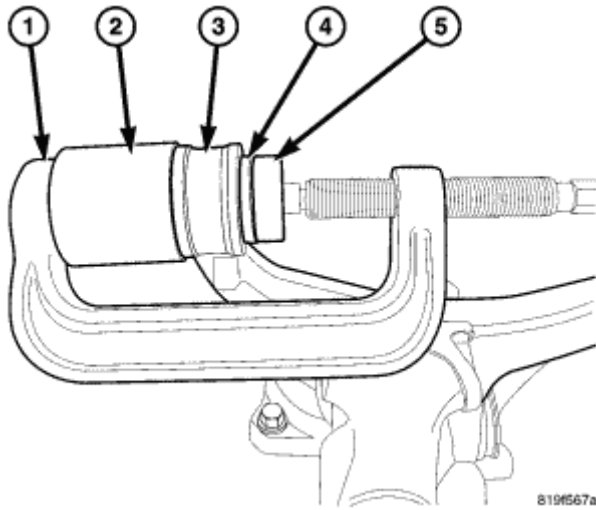


Fig. 22: LCA Bushing Removal
 Courtesy of CHRYSLER LLC

1. Remove the lower control arm. See **REMOVAL**.
2. Secure the control arm in a vise.

NOTE: **Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.**

3. Press the bushing (4) out using special tools C-4212F (Press) (1), 9334-5 (Receiver) (2) and 9603-3 (Driver) (5).

BUSHINGS-STABILIZER BAR

1. Raise vehicle on hoist.
2. Remove the stabilizer bushing clamps.
3. Remove the stabilizer bushings from the stabilizer bar.

INSTALLATION

BUSHINGS-CLEVIS BRACKET

NOTE: **Suspension components with rubber/urethane bushings should be tightened with the full weight of the vehicle at normal ride height. It is important to have the springs supporting the full weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.**

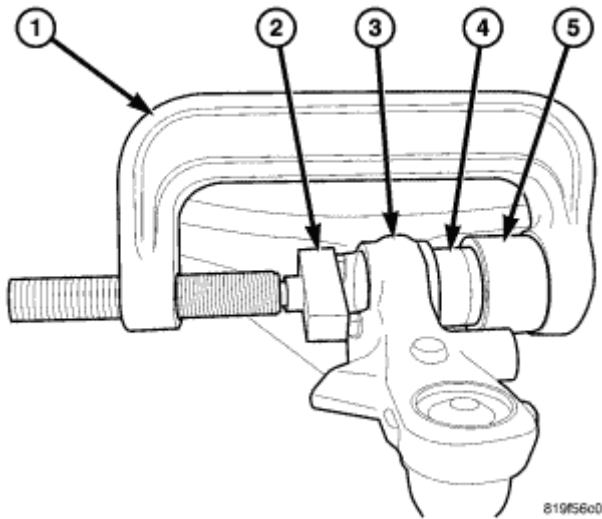


Fig. 23: Clevis Bushing Install
Courtesy of CHRYSLER LLC

NOTE: **Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.**

1. Install the new clevis bracket bushing (4) into the lower control arm (3) using special tools C-4212F (Press) (1), 9957-2 (Depth Gauge) (2), 9957-1 (driver) (5).
2. Install the upper ball joint to the knuckle and tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.
3. Install the clevis bolt to the lower control arm and tighten the bolt to 150 N.m (110 ft. lbs.).
4. Install the stabilizer link lower bolt to the control arm and tighten the bolt to 102 N.m (75 ft. lbs.).
5. Install the wheel speed sensor. Refer to **INSTALLATION** .
6. Install the disc brake rotor. Refer to **INSTALLATION** .
7. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
8. Lower the vehicle.

BUSHINGS-LOWER CONTROL ARM

NOTE: **Suspension components with rubber/urethane bushings should be tightened with the full weight of the vehicle at normal ride height. It is important to have the springs supporting the full weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.**

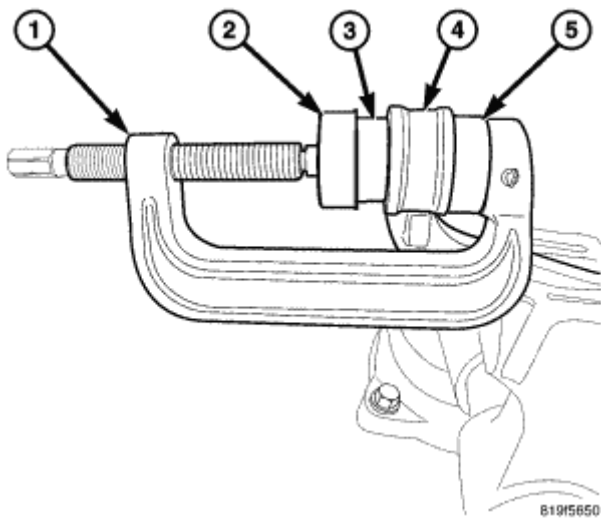


Fig. 24: LCA Bushing Install
Courtesy of CHRYSLER LLC

NOTE: **Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.**

1. Install the new lower control arm bushings (3) into the lower control arm (4) using tools C-4212F (Press) (1), 9603-1 (driver) (2) and 9969-1 (receiver) (5) making sure the receiver cup is properly centered for the bushing to be pressed in to the proper depth.
2. Remove the control arm from the vise.
3. Install the lower control arm. See **INSTALLATION**.
4. Perform a wheel alignment. See **STANDARD PROCEDURE**.

BUSHINGS-STABILIZER BAR

NOTE: **Suspension components with rubber/urethane bushings should be tightened with the full weight of the vehicle at normal ride height. It is important to have the springs supporting the full weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.**

1. Install the stabilizer bushings to the stabilizer bar.
2. Install the stabilizer bushing clamps. Tighten the nuts to 149 N.m (110 ft. lbs.).
3. Lower the vehicle.

HUB/BEARING

REMOVAL

HUB/BEARING

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the caliper adapter. Refer to **REMOVAL** .

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

4. Remove the disc brake rotor. Refer to **REMOVAL** .
5. Remove the wheel speed sensor. Refer to **REMOVAL** .

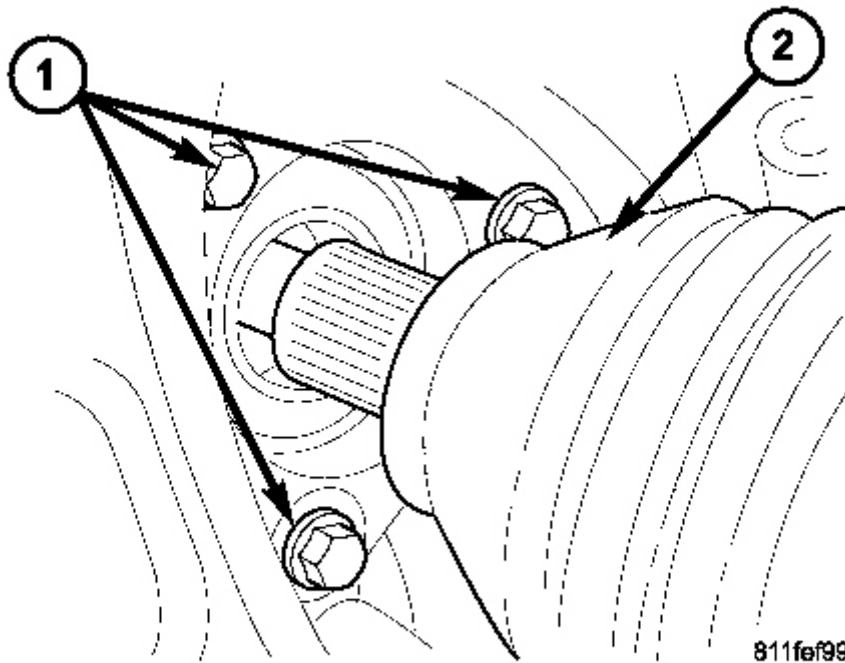


Fig. 25: View Of Hub/Bearing Mounting Bolts
Courtesy of CHRYSLER LLC

6. Remove the axle shaft nut. (if equipped with four wheel drive)
7. Remove the three mounting bolts (1) for the hub/bearing assembly.
8. Remove the hub/bearing.

INSTALLATION

HUB/BEARING

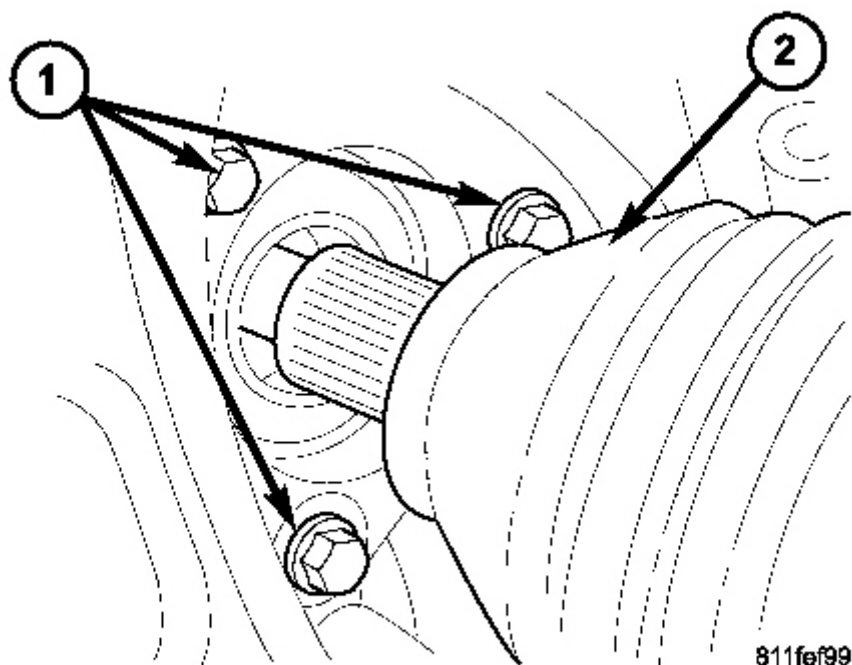


Fig. 26: View Of Hub/Bearing Mounting Bolts
Courtesy of CHRYSLER LLC

1. Install the hub/bearing assembly to the vehicle.
2. Install the three mounting bolts (1) for the hub/bearing. Tighten the bolt to 130 N.m (96 ft. lbs.).
3. Install the axle shaft nut. Tighten the nut to 135 N.m (100 ft. lbs.). (if equipped with four wheel drive)
4. Install the wheel speed sensor to the hub. Tighten the bolt to 13.5 N.m (10 ft. lbs.). Refer to **INSTALLATION** .
5. Install the disc brake rotor. Refer to **INSTALLATION** .
6. Install the disc brake caliper adapter. Tighten the nut to 135 N.m (100 ft. lbs.). Refer to **INSTALLATION** .
7. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .

KNUCKLE

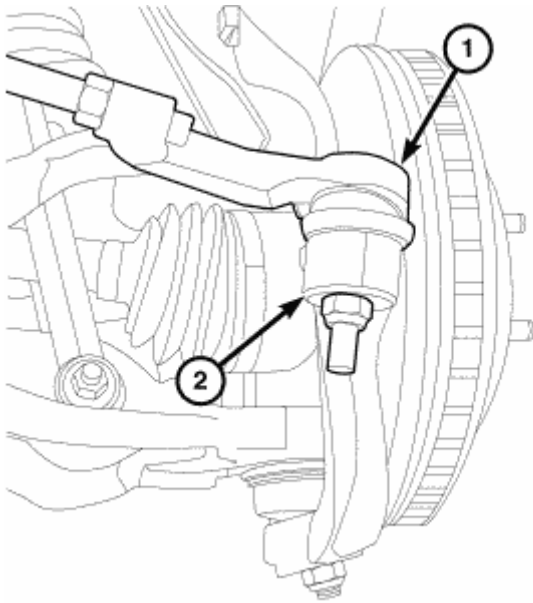
REMOVAL

KNUCKLE

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the caliper adapter. Refer to **REMOVAL** .

CAUTION: Never allow the disc brake caliper to hang from the brake hose. Damage to the brake hose will result. Provide a suitable support to hang the caliper securely.

4. Remove the disc brake rotor. Refer to **REMOVAL** .
5. Remove the wheel speed sensor. Refer to **REMOVAL** .
6. Remove the axle shaft nut. (if equipped with four wheel drive)



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Fig. 27: Identifying Tie Rod End & Steering Knuckle
Courtesy of CHRYSLER LLC

7. Remove the outer tie rod nut (2).

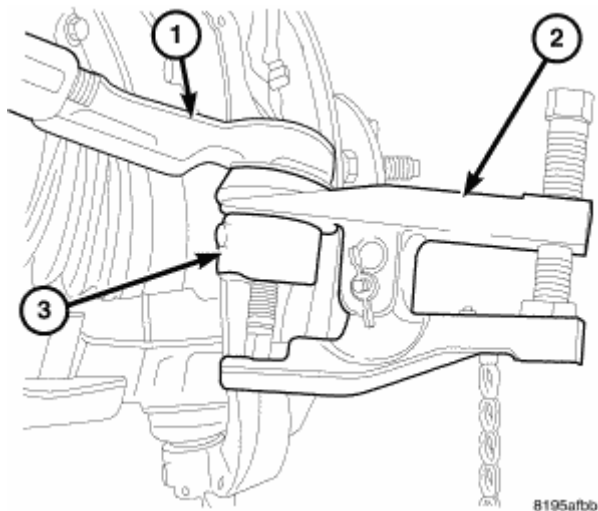


Fig. 28: Identifying Tie Rod, Steering Knuckle & Special Tool 9360
 Courtesy of CHRYSLER LLC

8. Separate the outer tie rod end (1) from the steering knuckle (3) using tool 9360 (2). Refer to **REMOVAL** .

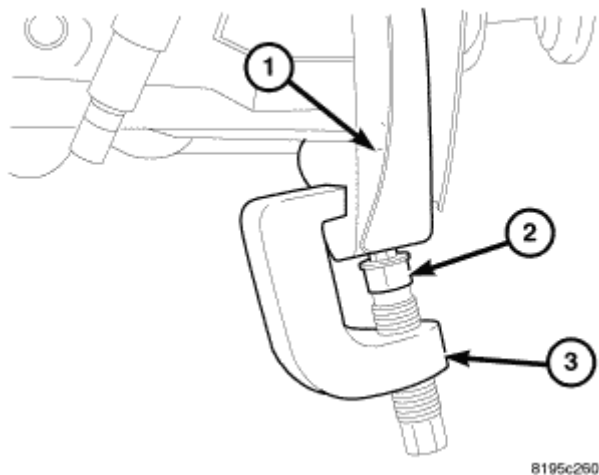


Fig. 29: Lower Ball Joint Separation
 Courtesy of CHRYSLER LLC

9. Remove the lower ball joint nut.
10. Separate the lower ball joint from the suspension arm using tool C-4150A (3).

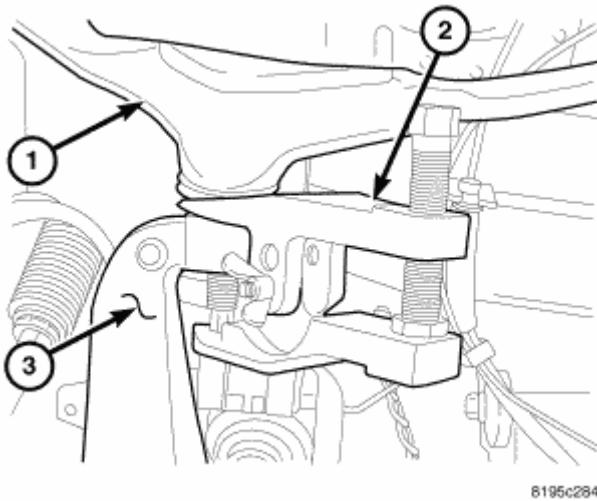


Fig. 30: Upper Ball Joint Separation
Courtesy of CHRYSLER LLC

11. Remove the upper ball joint nut.
12. Separate the upper ball joint from the knuckle using tool 9360 (2).

NOTE: **Inspect the seal side surface of the upper ball joint, lower ball joint & outer tie rod knuckle bosses. If any significant grooves or gouges are present (or heavily scratched) Replace the steering knuckle.**

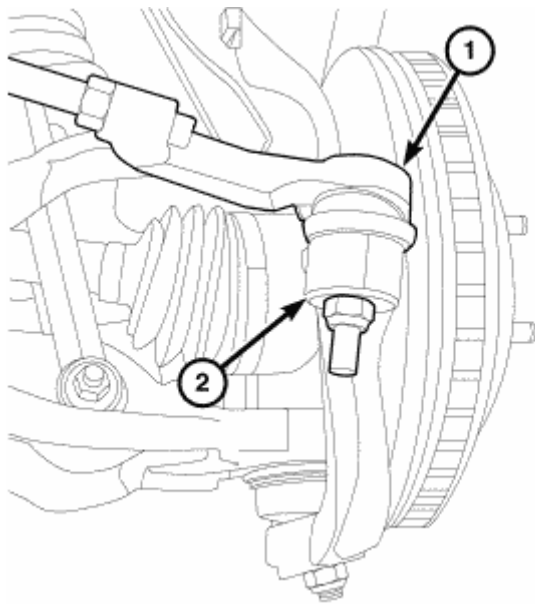
13. Remove the knuckle (3) from the vehicle.
14. Remove the hub/bearing. (if needed). See **REMOVAL**.

INSTALLATION

KNUCKLE

CAUTION: The ball joint stud taper must be **CLEAN** and **DRY** before installing into the knuckle. Clean the stud taper with mineral spirits to remove dirt and grease.

1. Install the hub/bearing. (if removed from the knuckle). See **INSTALLATION**.
2. Install the knuckle to the vehicle.
3. Install the upper ball joint nut. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.
4. Install the lower ball joint nut. Tighten the nut to 54 N.m (40 ft. lbs.) plus an additional 90° turn.



618a30ae

Fig. 31: Identifying Tie Rod End & Steering Knuckle
Courtesy of CHRYSLER LLC

5. Install the outer tie rod end (1) to the steering knuckle and install the nut (2). Tighten the nut (2) to 41 N.m (30 ft. lbs.) plus an additional 90° turn. Refer to **INSTALLATION** .
6. Install the axle shaft nut. Tighten the nut to 136 N.m (100 ft. lbs.) (if equipped with four wheel drive).
7. Install the wheel speed sensor. Refer to **INSTALLATION** .
8. Install the disc brake rotor. Refer to **INSTALLATION** .
9. Install the caliper adapter. Refer to **INSTALLATION** .
10. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
11. Perform a wheel alignment. See **STANDARD PROCEDURE**.

LOWER BALL JOINT

DIAGNOSIS AND TESTING

LOWER BALL JOINT

1. Raise the front of the vehicle. Place safety floor stands under both lower control arms as far outboard as possible. Lower the vehicle to allow the stands to support some or all of the vehicle weight.
2. Mount a dial indicator solidly to the topside of the lower control arm and then zero the dial indicator.
3. Position the indicator plunger against the bottom surface of the steering knuckle.

NOTE: **The dial indicator plunger must be perpendicular to the machined surface of the steering knuckle.**

4. Position a pry bar under the tire assembly. Pry upwards on the tire assembly.
5. If the travel exceeds 0.5 mm (0.020 in.), replace the lower ball joint. See **REMOVAL**.

REMOVAL

LOWER BALL JOINT

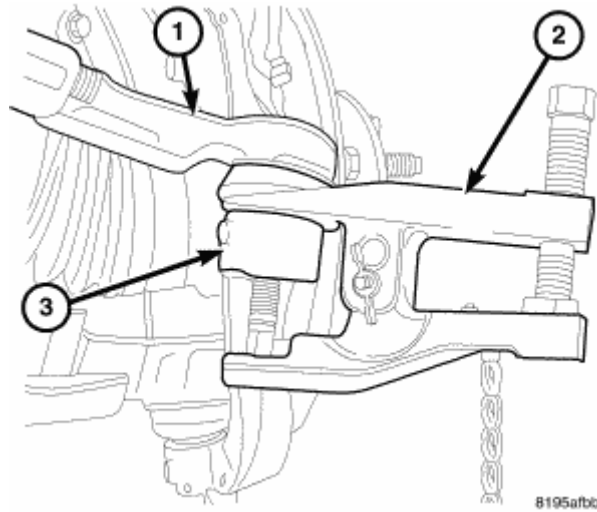


Fig. 32: Identifying Tie Rod, Steering Knuckle & Special Tool 9360
Courtesy of CHRYSLER LLC

1. Remove the tire and wheel assembly.
2. Remove the brake caliper and rotor. Refer to **REMOVAL** .
3. Separate the tie rod (1) from the steering knuckle (3) using special tool 9360 (2). Refer to **REMOVAL** .

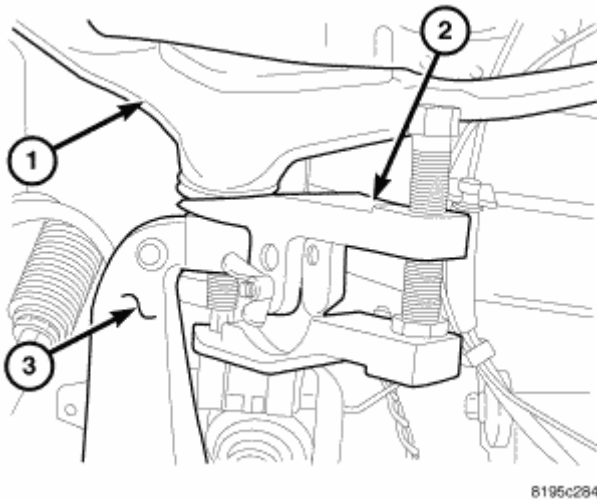
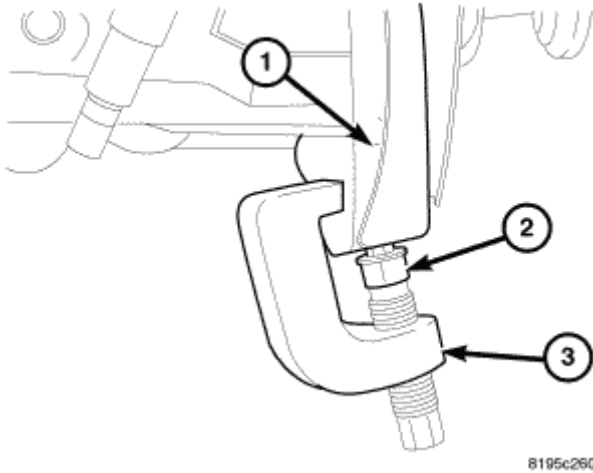


Fig. 33: Upper Ball Joint Separation
Courtesy of CHRYSLER LLC

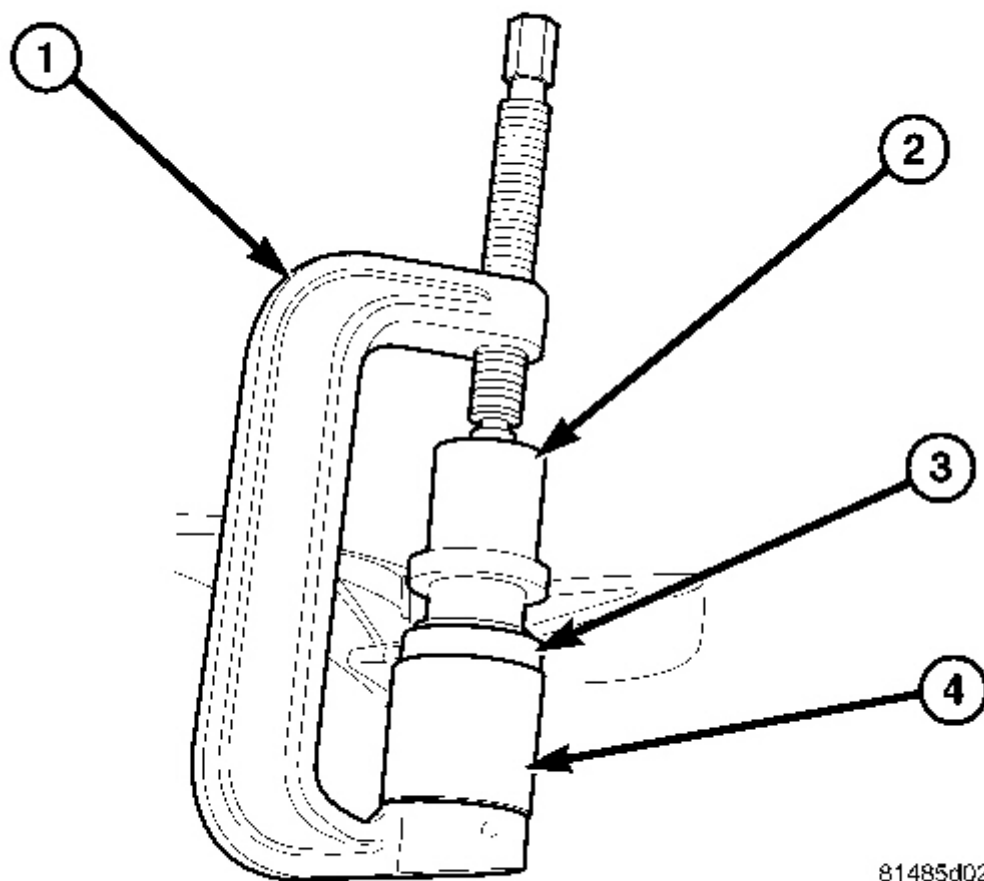
4. Separate the upper ball joint from the knuckle (3) using special tool 9360 (2).



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Fig. 34: Lower Ball Joint Separation
Courtesy of CHRYSLER LLC

5. Separate the lower ball joint (2) from the steering knuckle (1) using special tool 8677 (3).
6. Remove the steering knuckle. See **REMOVAL**.



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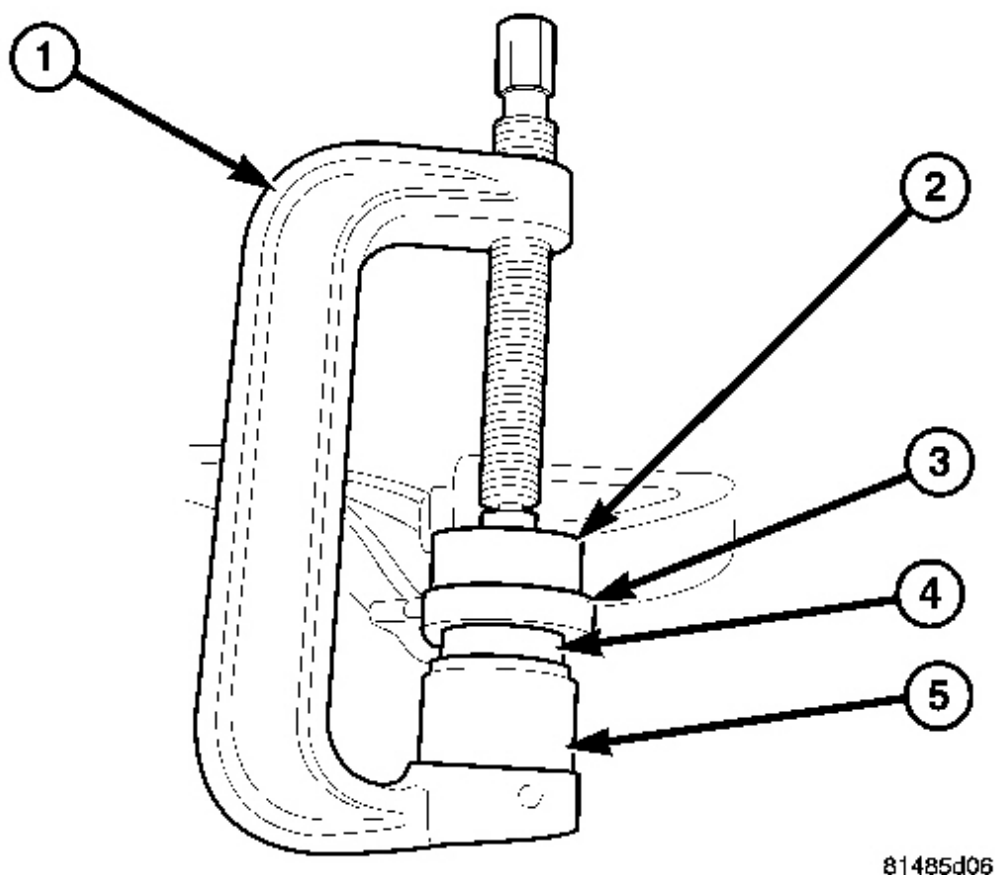
Fig. 35: Removing Lower Ball Joint
Courtesy of CHRYSLER LLC

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

7. Press the ball joint from the lower control arm (3) using special tools C-4212-F (PRESS) (1), C-4212-3 (Driver) (2) and 9654-3 (Receiver) (4).

INSTALLATION

LOWER BALL JOINT



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Fig. 36: Installing Lower Ball Joint
Courtesy of CHRYSLER LLC

- 1 - C-4212-F PRESS
- 2 - 9654-2 RECEIVER
- 3 - LOWER CONTROL ARM
- 4 - BALL JOINT
- 5 - 9654-1 DRIVER

NOTE: Extreme pressure lubrication must be used on the threaded portions of the tool. This will increase the longevity of the tool and insure proper operation during the removal and installation process.

1. Install the ball joint (4) into the control arm (3) and press in using special tools C-4212-F (press) (1),

9654-1 (Driver) (5) and 9654-2 (Receiver) (2).

2. Stake the ball joint flange in four evenly spaced places around the ball joint flange, using a chisel and hammer.
3. Install the steering knuckle. See **INSTALLATION**.
4. Install the tie rod end into the steering knuckle. Refer to **INSTALLATION**.
5. Install and tighten the halfshaft nut to 136 N.m (100 ft. lbs.). (If Equipped).
6. Install the brake caliper and rotor. Refer to **INSTALLATION**.
7. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE**.
8. Check the vehicle ride height. See **STANDARD PROCEDURE**.
9. Perform a wheel alignment. See **STANDARD PROCEDURE**.

LOWER CONTROL ARM

REMOVAL

LOWER CONTROL ARM

1. Raise and support the vehicle.
2. Remove the wheel and tire assembly.

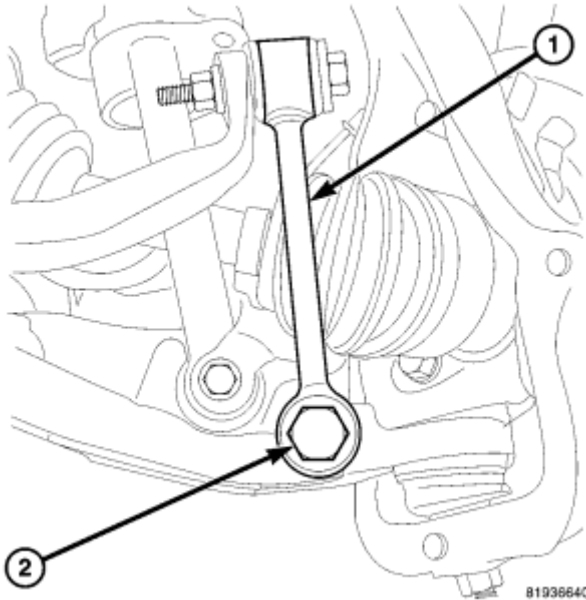


Fig. 37: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

3. Remove the stabilizer bar link (2). See **REMOVAL**.

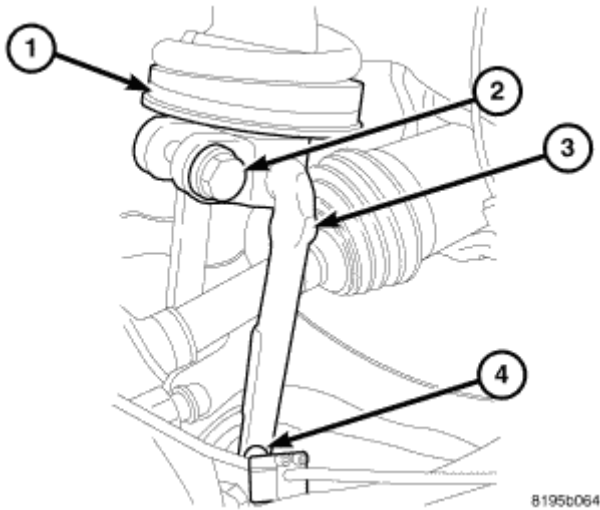


Fig. 38: Clevis Bracket
Courtesy of CHRYSLER LLC

4. Remove the shock absorber lower clevis bolt (4). See **REMOVAL**.

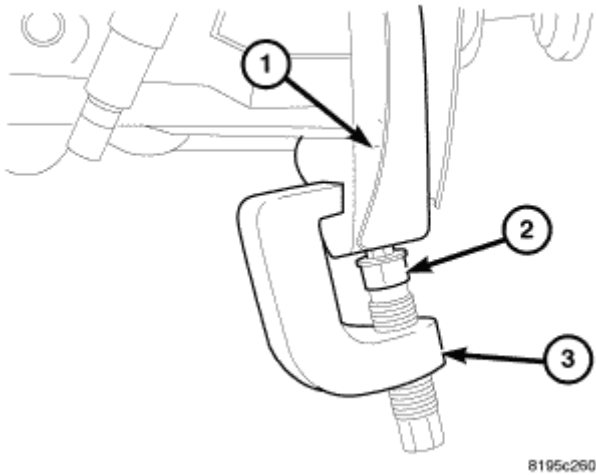


Fig. 39: Lower Ball Joint Separation
Courtesy of CHRYSLER LLC

5. Remove the lower ball joint nut (2). Separate ball joint from the steering knuckle (1) with Remover 8677 (3).

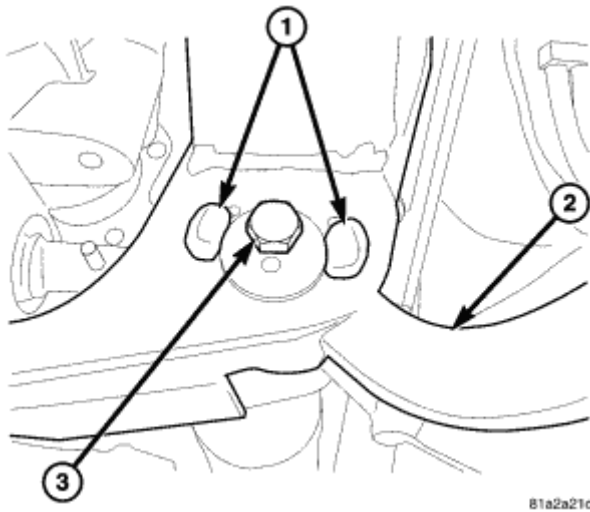


Fig. 40: Identifying Lower Control Arm, Control Arm Pivot Bolts & Rail Brackets
 Courtesy of CHRYSLER LLC

NOTE: Marking the lower control arm pivot bolts front and rear will aid in the assembly procedure.

6. Remove the control arm pivot bolts (3) and suspension arm from frame rail brackets (1).
7. Remove the lower control arm (2) from the vehicle.

INSTALLATION

LOWER CONTROL ARM

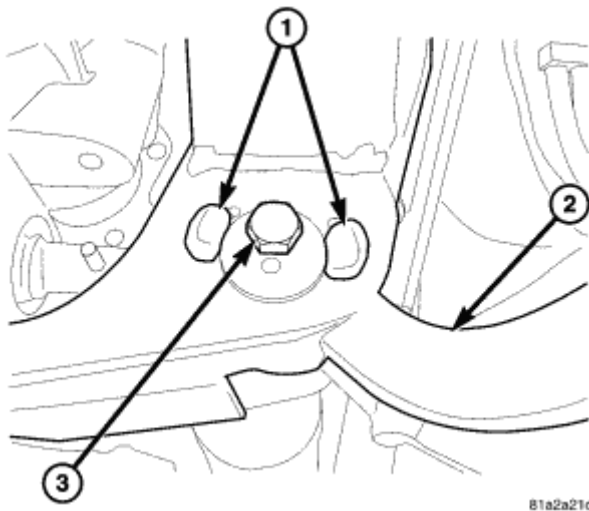


Fig. 41: Identifying Lower Control Arm, Control Arm Pivot Bolts & Rail Brackets
 Courtesy of CHRYSLER LLC

1. Position the lower control arm (2) at the frame rail brackets. Install the cam/pivot bolts (3) and nuts. Tighten the nuts finger-tight.

CAUTION: The ball joint stud taper must be **CLEAN** and **DRY** before installing into the knuckle. Clean the stud taper with mineral spirits to remove dirt and grease.

2. Install the ball joint into the steering knuckle, and tighten the nut to 54 N.m (40 ft. lbs.) plus an additional 90° turn.

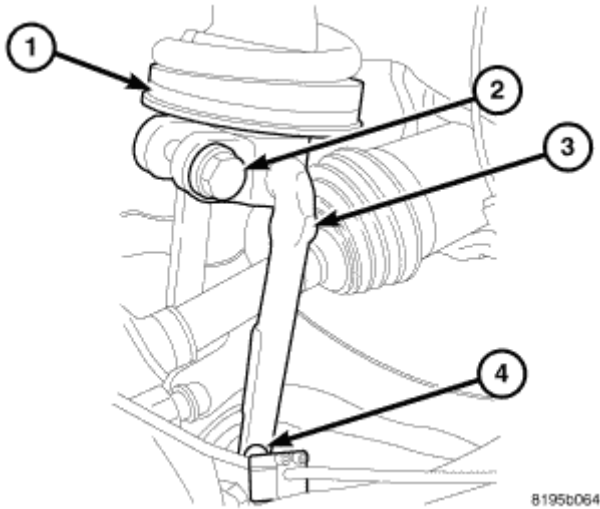


Fig. 42: Clevis Bracket
Courtesy of CHRYSLER LLC

3. Install shock absorber lower clevis bolt/nut (4). Tighten the nut to 150 N.m (110 ft. lbs.) **with full vehicle weight**.

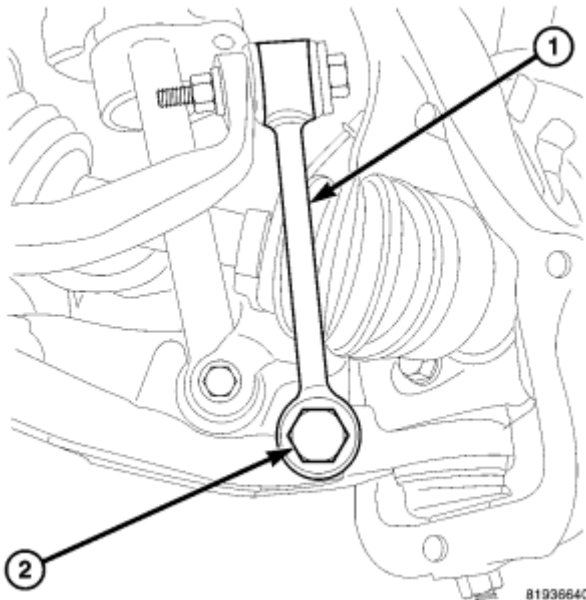


Fig. 43: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

4. Install the stabilizer bar link lower bolt (2) Tighten the bolt to 102 N.m (75 ft. lbs.) **with full vehicle weight**. . See INSTALLATION.

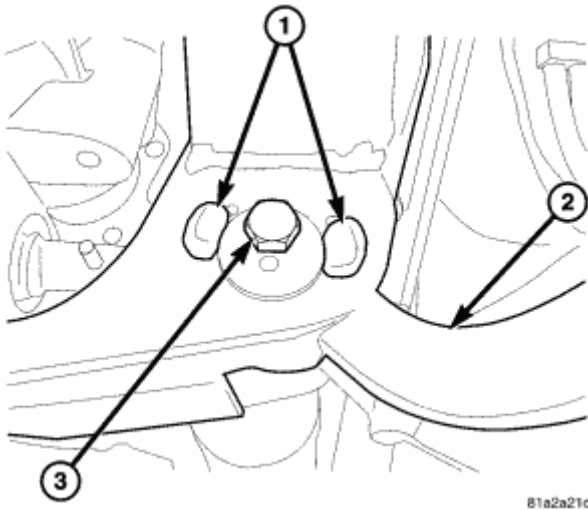


Fig. 44: Identifying Lower Control Arm, Control Arm Pivot Bolts & Rail Brackets
Courtesy of CHRYSLER LLC

5. Align the marks front and rear (1) at the cam/pivot bolts (3) and tighten the nuts. Tighten the nuts to 170 N.m (125 ft. lbs.) **with full vehicle weight**.
6. Install the wheel and tire assembly. Refer to STANDARD PROCEDURE .
7. Remove the support and lower the vehicle.
8. Perform a wheel alignment. See STANDARD PROCEDURE.

SHOCK

REMOVAL

SHOCK - LEFT SIDE

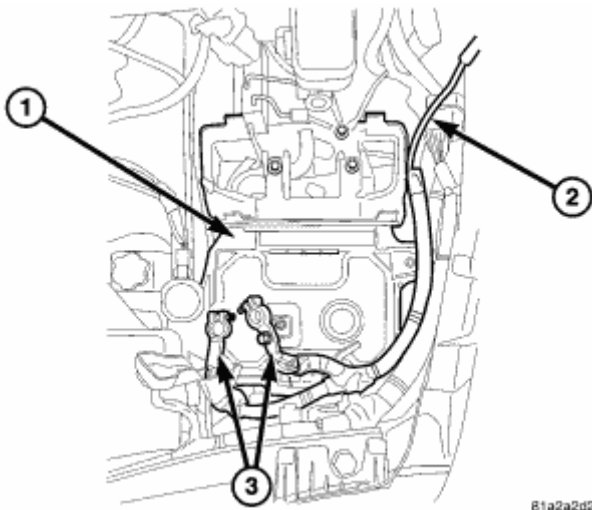


Fig. 45: Identifying Battery Tray, Power Center & Battery
Courtesy of CHRYSLER LLC

1. Disconnect the battery (3).
2. Remove the battery. Refer to **REMOVAL** .
3. Unclip the power center (2) and move it to the side out of the way to access the battery tray (1).
4. Remove the battery tray (1). Refer to **REMOVAL** .
5. Remove the four upper shock mounting nuts.
6. Raise and support the vehicle.
7. Remove the left tire and wheel assembly.
8. Remove the caliper and support. Refer to **REMOVAL** .

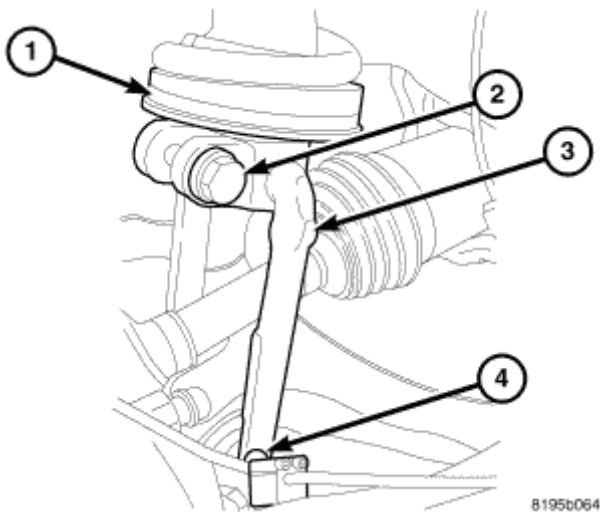


Fig. 46: Clevis Bracket
Courtesy of CHRYSLER LLC

9. Remove the lower bolt (4) at the lower control arm securing the clevis bracket (3).

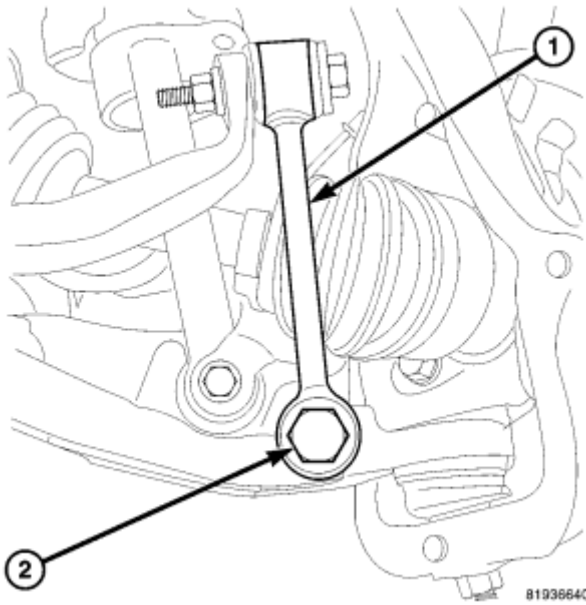


Fig. 47: Identifying Stabilizer Bar Link & Bolts
 Courtesy of CHRYSLER LLC

10. Remove the stabilizer link bolt (2) at the lower control arm. See **REMOVAL**.

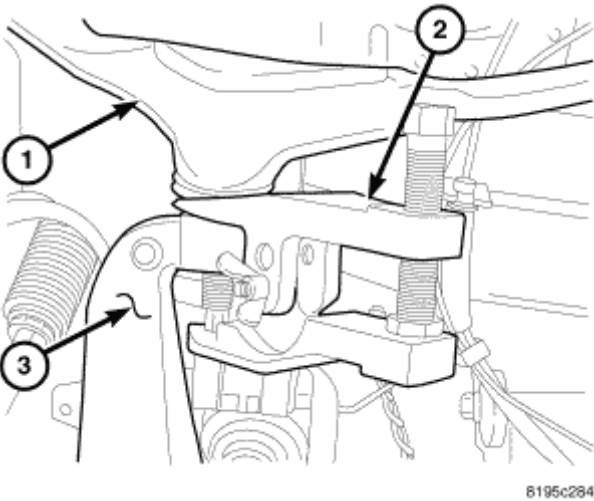


Fig. 48: Upper Ball Joint Separation
 Courtesy of CHRYSLER LLC

11. Remove the upper ball joint nut.
12. Separate the upper ball joint from the knuckle (3) using remover 9360 (2).

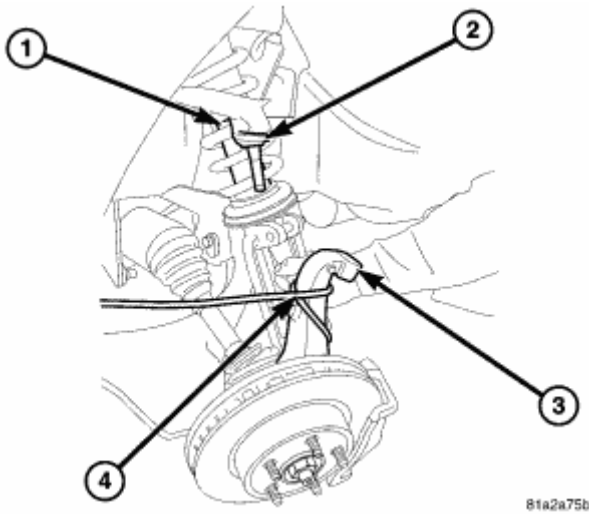


Fig. 49: Identifying Steering Knuckle, Remover 9360, Shock Assembly & Knuckle
 Courtesy of CHRYSLER LLC

13. Push downward on the steering knuckle (3) and support the knuckle (4) this will allow access to remove the shock.
14. Remove the shock assembly (1) from the vehicle.
15. Remove the spring from the shock (if needed). See **REMOVAL**.

SHOCK - RIGHT SIDE

1. Remove the air box. Refer to **REMOVAL** .
2. Remove the four upper shock mounting nuts.
3. Raise and support the vehicle.
4. Remove the right side tire assembly.
5. Remove the caliper and support. Refer to **REMOVAL** .

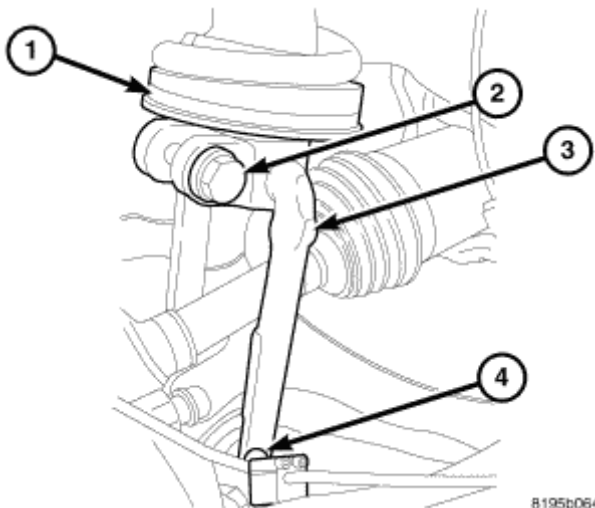


Fig. 50: Clevis Bracket

Courtesy of CHRYSLER LLC

6. Remove the lower bolt (4) at the lower control arm securing the clevis bracket (3).

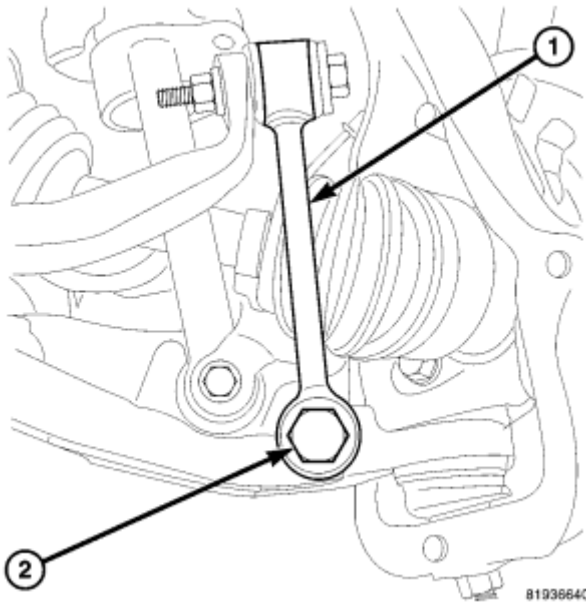


Fig. 51: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

7. Remove the stabilizer link bolt (2) at the lower control arm. See **REMOVAL**.

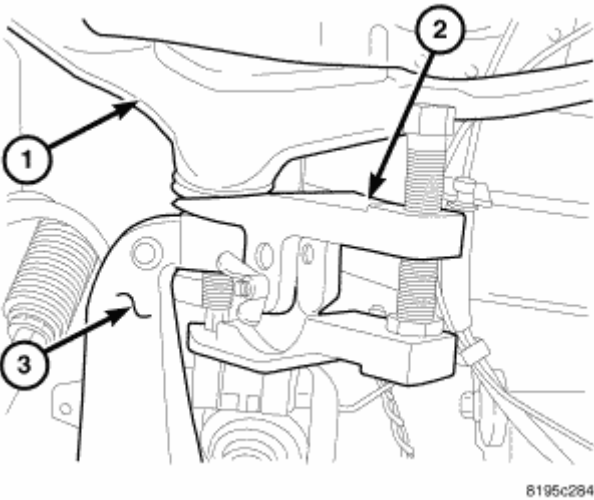


Fig. 52: Upper Ball Joint Separation
Courtesy of CHRYSLER LLC

8. Remove the upper ball joint nut.
9. Separate the upper ball joint from the knuckle (3) using remover 9360 (2).

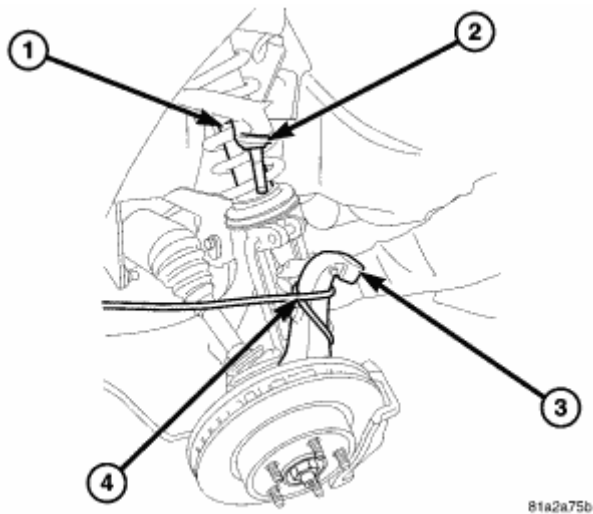


Fig. 53: Identifying Steering Knuckle, Remover 9360, Shock Assembly & Knuckle
 Courtesy of CHRYSLER LLC

10. Pull downward on the knuckle and support the knuckle (4) to allow access.
11. Remove the shock assembly (1) from the vehicle.
12. Remove the spring from the shock (if needed). See **REMOVAL**.

INSTALLATION

SHOCK - LEFT SIDE

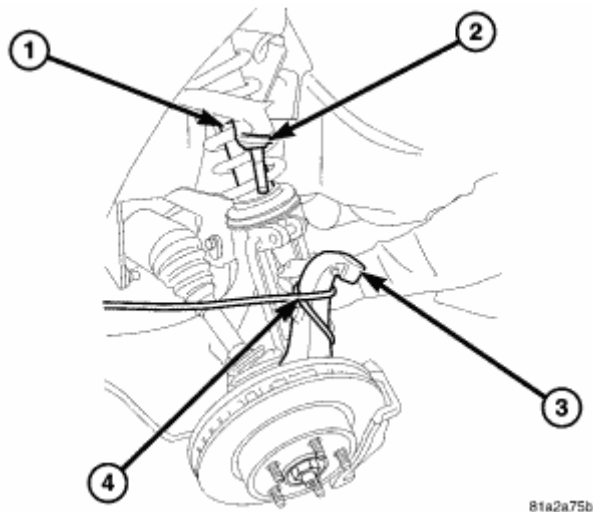


Fig. 54: Identifying Steering Knuckle, Remover 9360, Shock Assembly & Knuckle
 Courtesy of CHRYSLER LLC

1. Install the spring to the shock (if removed). See **INSTALLATION**.
2. Install the shock assembly (1) to the vehicle.
3. Install the four upper shock mounting nuts. Tighten the nuts to 108 N.m (80 ft. lbs.).

4. Raise the knuckle (3) into place and reconnect the upper ball joint nut. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.

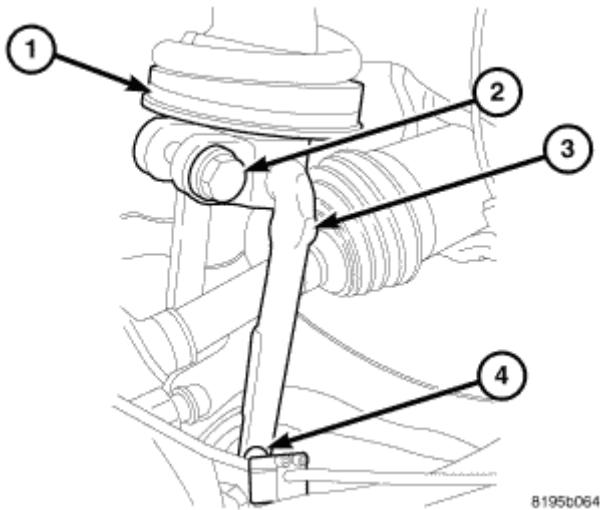


Fig. 55: Clevis Bracket
Courtesy of CHRYSLER LLC

5. Install the clevis bracket bolt (4) at the lower control arm. See **INSTALLATION**. Tighten the bolt to 150 N.m (110 ft. lbs.) **with full vehicle weight.** .
6. Install the caliper. Refer to **INSTALLATION** .

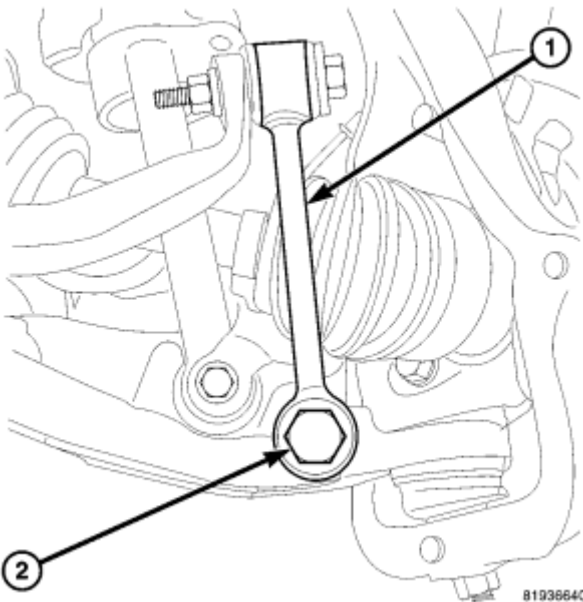


Fig. 56: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

7. Install the lower stabilizer link (1) at the lower control arm. Tighten the bolt (2) to 102 N.m (75 ft. lbs.) **with full vehicle weight.** . See **INSTALLATION**.

8. Install the left tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
9. Lower the vehicle.

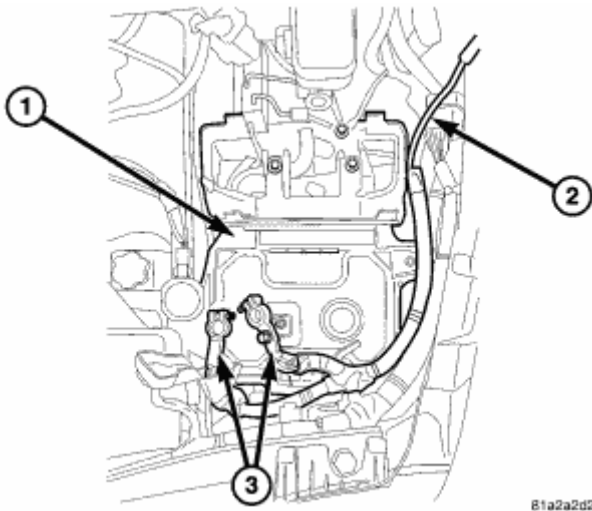


Fig. 57: Identifying Battery Tray, Power Center & Battery
Courtesy of CHRYSLER LLC

10. Install the battery tray (1). Refer to **INSTALLATION** .
11. Install the battery. Refer to **INSTALLATION** .
12. Reinstall the power center (2) back into place.
13. Reconnect the battery cables (3).

SHOCK - RIGHT SIDE

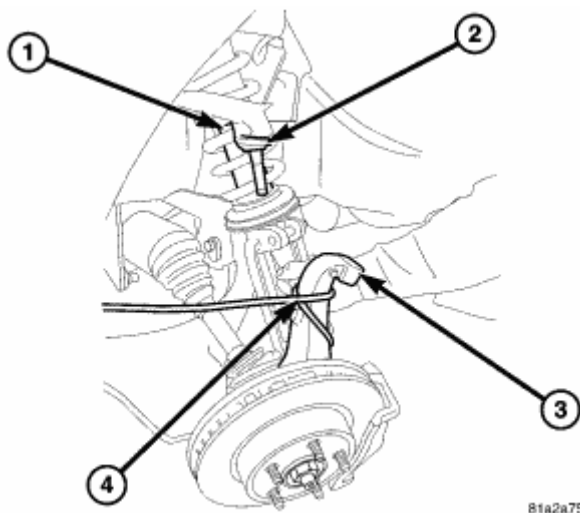


Fig. 58: Identifying Steering Knuckle, Remover 9360, Shock Assembly & Knuckle
Courtesy of CHRYSLER LLC

1. Install the spring to the shock (if removed). See **INSTALLATION**.

2. Install the shock assembly (1) to the vehicle.
3. Install the four upper shock mounting nuts. Tighten the nuts to 108 N.m (80 ft. lbs.).
4. Raise the knuckle (3) into place and reconnect the upper ball joint nut. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.

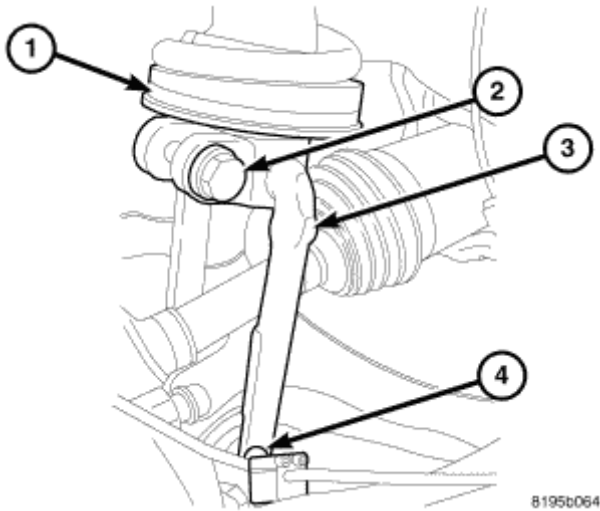


Fig. 59: Clevis Bracket
Courtesy of CHRYSLER LLC

5. Install the clevis bracket bolt (4) at the lower control arm. See **INSTALLATION**. Tighten the bolt to 150 N.m (110 ft. lbs.) **with full vehicle weight.** .

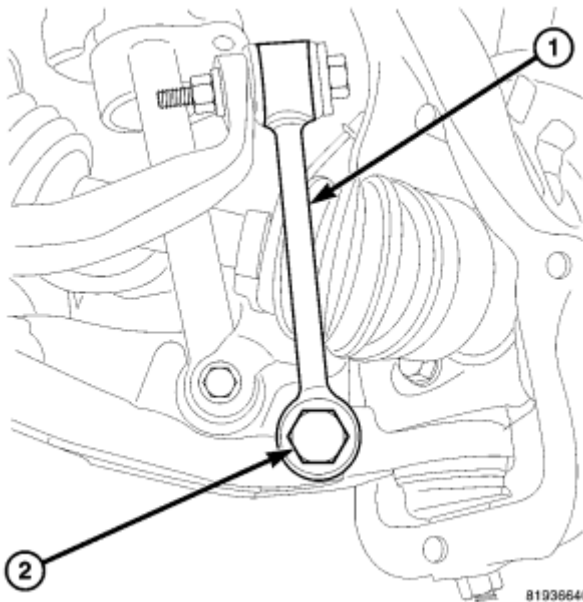


Fig. 60: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

6. Install the caliper. Refer to **INSTALLATION** .

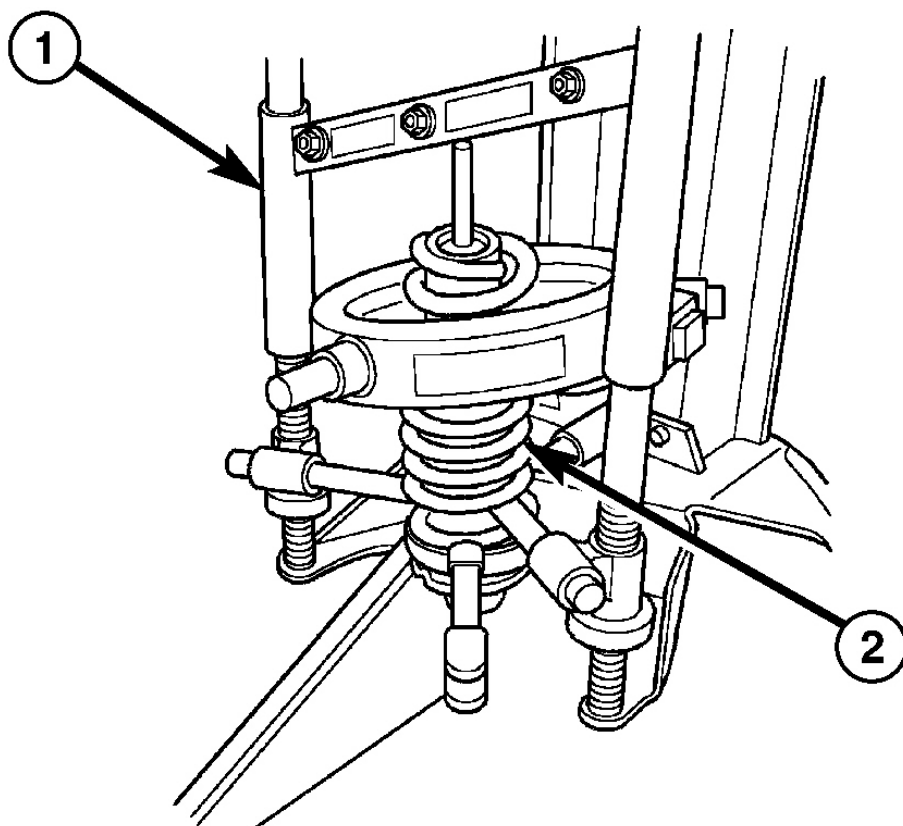
7. Install the lower stabilizer link bolt (2) at the lower control arm. Tighten the bolt to 102 N.m (75 ft. lbs.) **with full vehicle weight.** . See INSTALLATION.
8. Install the right tire and wheel assembly. Refer to STANDARD PROCEDURE .
9. Lower the vehicle.
10. Install the airbox. Refer to INSTALLATION .

SPRING

REMOVAL

SPRING

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the shock. Refer to the proper side shock removal procedure being worked on. See REMOVAL.



80c62e85

Fig. 61: Spring Compressor
Courtesy of CHRYSLER LLC

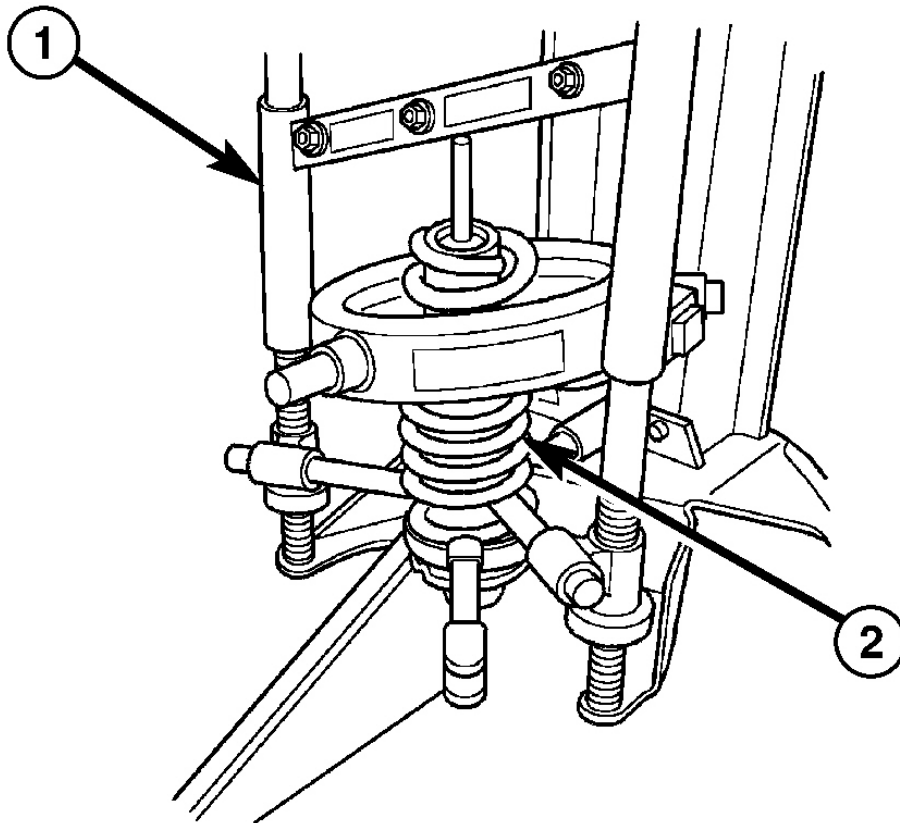
1 - SPRING COMPRESSOR

2 - SPRING

4. Secure the shock assembly into a Pentastar® Service Equipment W-7200 Spring compressor (1). See **Fig. 61**
5. Compress the spring (2).
6. Remove the shock mount nut.
7. Remove the shock from the spring compressor.
8. Transfer the necessary parts to the type of repair being done (Insulator, Spring, shock and mount).

INSTALLATION

SPRING



80c62e85

Fig. 62: Spring Compressor
Courtesy of CHRYSLER LLC

1 - SPRING COMPRESSOR

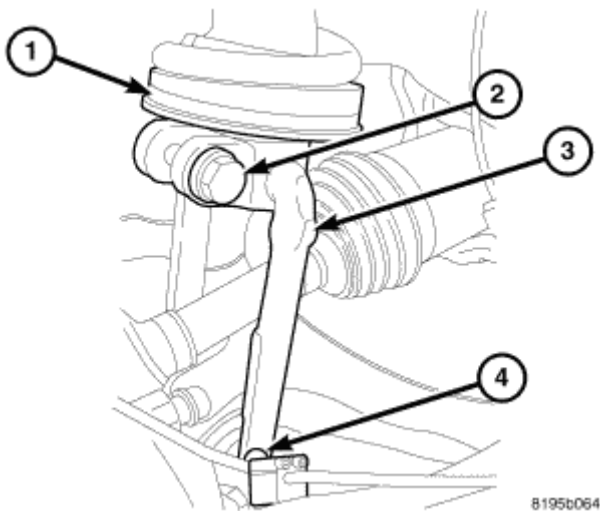
1. Install the shock to the spring (2) and spring compressor (1), After the transfer of the necessary parts to the type of repair being done (Insulator, Spring, shock and mount).
2. Install the shock mounting nut. Tighten the bolt to 41 N.m (30 ft. lbs.).
3. Loosen the compressed spring (2).
4. Remove the shock assembly from the spring compressor (1).
5. Install the shock to the vehicle. See **INSTALLATION**.
6. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE**.
7. Remove the support and lower the vehicle.

CLEVIS BRACKET

REMOVAL

CLEVIS BRACKET

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the disc brake rotor. Refer to **REMOVAL**.
4. Remove the wheel speed sensor. Refer to **REMOVAL**.



8195b064

Fig. 63: Clevis Bracket
Courtesy of CHRYSLER LLC

5. Remove the lower clevis bolt (4) at the lower control arm.
6. Remove the upper clevis bolt (2) at the shock.
7. Remove the lower stabilizer link bolt at the lower control arm.
8. Remove the upper ball joint nut.
9. Separate the upper ball joint from the knuckle using remover 9360.

10. Swing the knuckle downward to allow clearance to remove the clevis bracket (3).
11. Remove the clevis bracket (3) from the vehicle.

INSTALLATION

CLEVIS BRACKET

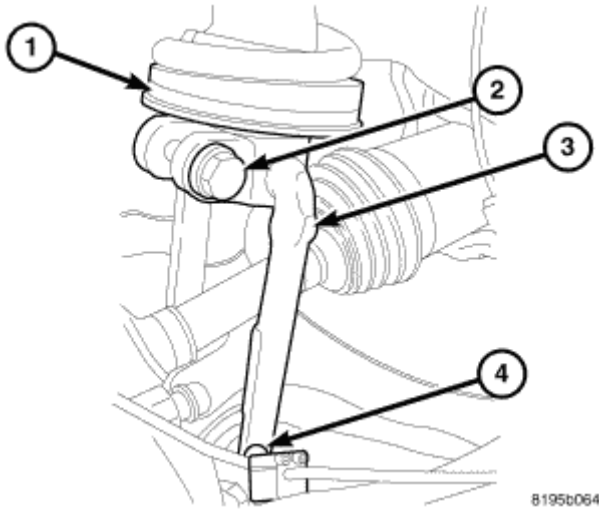


Fig. 64: Clevis Bracket
Courtesy of CHRYSLER LLC

1. Install the clevis bracket upper bolt (2) to the shock (1). Tighten the bolt (2) to 108 N.m (80 ft. lbs.).
2. Raise the knuckle to the upper ball joint.
3. Install the nut to the upper ball joint. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.
4. Install the clevis bracket lower bolt (4) to the lower control arm. Tighten the bolt (4) to 150 N.m (110 ft. lbs.) **with full vehicle weight.**
5. Install the lower stabilizer link bolt at the lower control arm. Tighten the bolt to 102 N.m (75 ft. lbs.) **with full vehicle weight.**
6. Install the wheel speed sensor. Refer to **INSTALLATION** .
7. Install the disc brake rotor. Refer to **INSTALLATION** .
8. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
9. Lower the vehicle.

STABILIZER BAR

REMOVAL

STABILIZER BAR

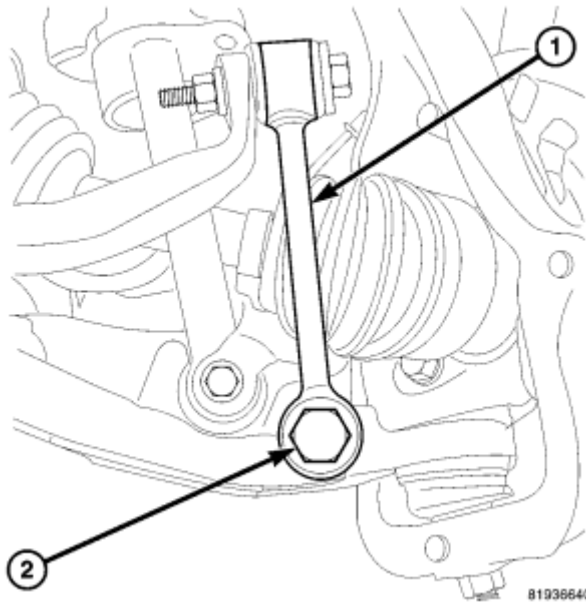


Fig. 65: Identifying Stabilizer Bar Link & Bolts
 Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the stabilizer link (1) bolts at the stabilizer bar.

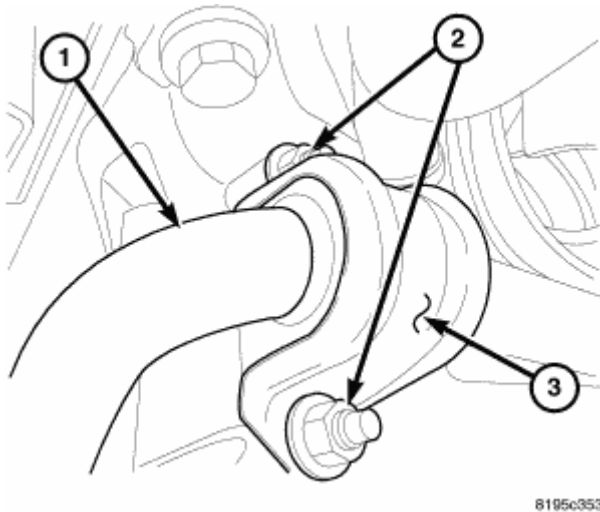


Fig. 66: Stabilizer Bar Bracket
 Courtesy of CHRYSLER LLC

4. Remove the stabilizer bushing bracket nuts (2).
5. Remove the stabilizer bar bushing brackets (3) from the frame.
6. Remove the stabilizer bar (1) from the vehicle.

INSTALLATION

STABILIZER BAR

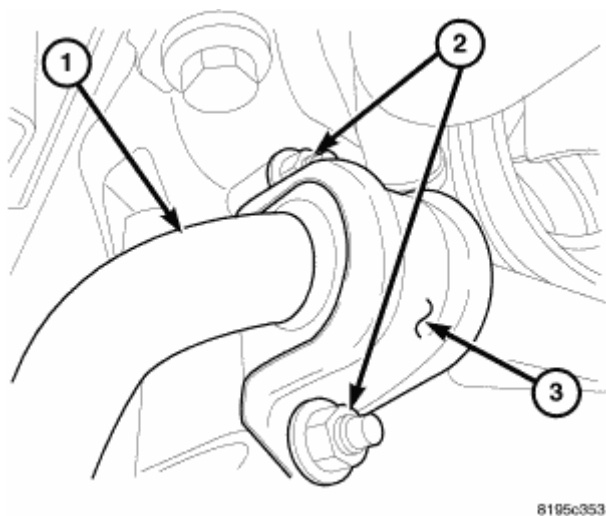


Fig. 67: Stabilizer Bar Bracket
Courtesy of CHRYSLER LLC

1. Install the stabilizer bar (1) to the vehicle.
2. Install the stabilizer bar bushing brackets (3). Tighten the nuts (2) to 149 N.m (110 ft. lbs.).

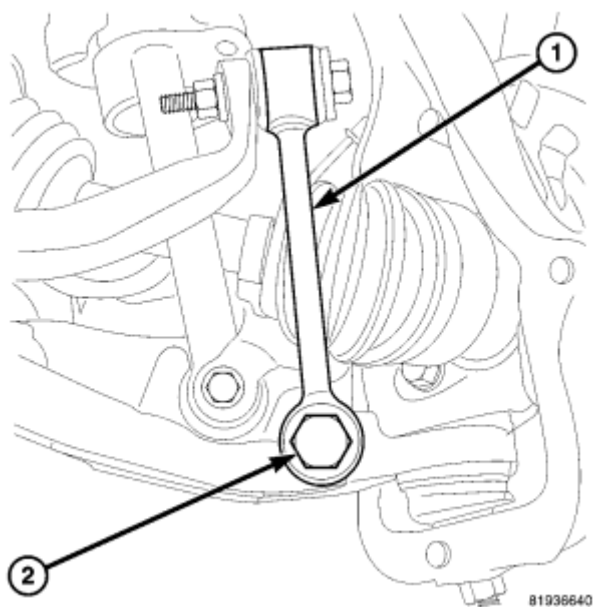


Fig. 68: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

3. Install the stabilizer link (1) bolts and bushings at the stabilizer bar. Tighten the bolt to 115 N.m (85 ft. lbs.) **with full vehicle weight.**
4. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE**.
5. Lower the vehicle.

STABILIZER LINK

REMOVAL

STABILIZER LINK

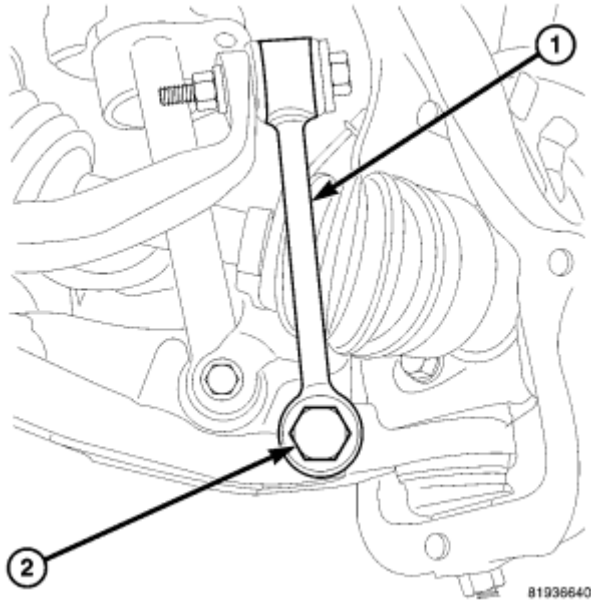


Fig. 69: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the tire and wheel assembly.
3. Remove the stabilizer link bolt (2) at the lower control arm.
4. Remove the stabilizer link bolt at the stabilizer bar.
5. Remove the stabilizer link (1).

INSTALLATION

STABILIZER LINK

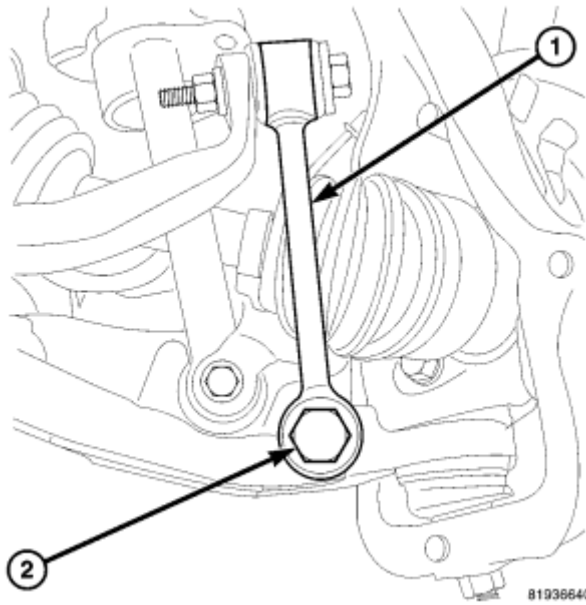


Fig. 70: Identifying Stabilizer Bar Link & Bolts
Courtesy of CHRYSLER LLC

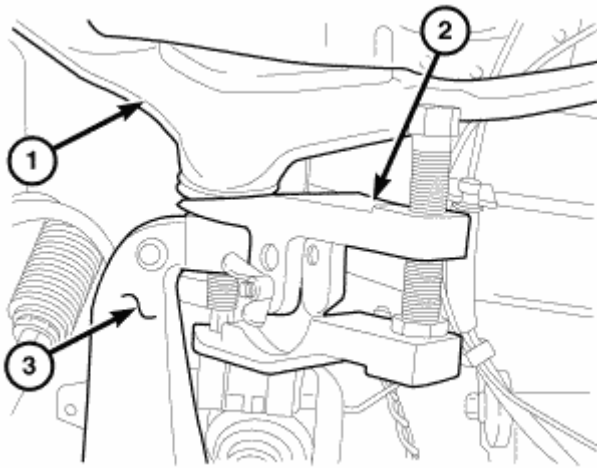
1. Install the stabilizer link (1).
2. Install the stabilizer link bolt at the stabilizer bar. Tighten the bolt to 115 N.m (85 ft. lbs.) **with full vehicle weight.**
3. Install the stabilizer link bolt (2) at the lower control arm. Tighten the bolt (2) to 102 N.m (75 ft. lbs.) **with full vehicle weight.**
4. Install the tire and wheel assembly. Refer to **STANDARD PROCEDURE** .

UPPER CONTROL ARM

REMOVAL

UPPER CONTROL ARM - LEFT

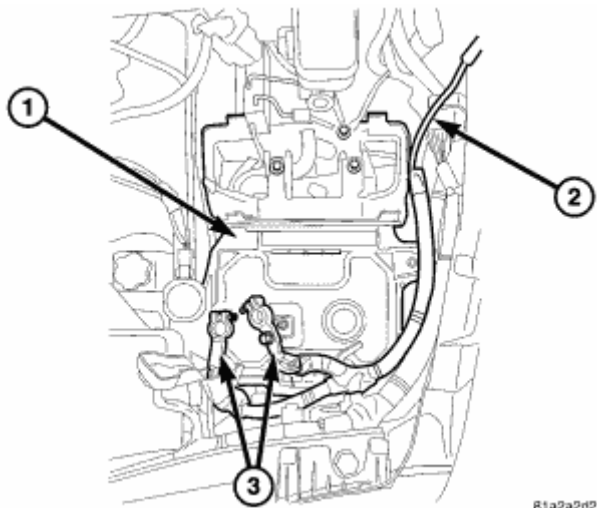
1. Raise and support the vehicle.
2. Remove the left side tire and wheel assembly.



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Fig. 71: Upper Ball Joint Separation
 Courtesy of CHRYSLER LLC

3. Remove the upper ball joint nut.
4. Separate the upper ball joint from the steering knuckle (3) using remover 9360 (2).



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Fig. 72: Identifying Battery Tray, Power Center & Battery
 Courtesy of CHRYSLER LLC

5. Lower the vehicle.
6. Remove the battery. Refer to **REMOVAL** .
7. Unclip the power center (2) and move it to the side out of the way.
8. Remove the battery tray (1). Refer to **REMOVAL** .

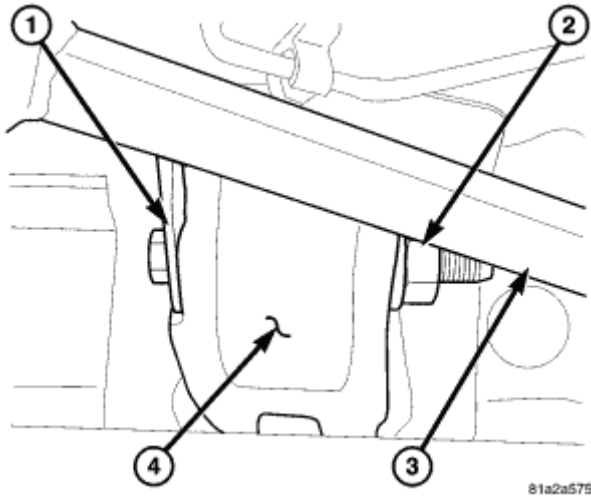


Fig. 73: Pivot Bolts
Courtesy of CHRYSLER LLC

9. Remove the upper control arm rear nut (2) by using a ratchet and extension under the steering shaft (3).
10. Remove the upper control arm front bolt.
11. Remove the upper control arm from the vehicle.

UPPER CONTROL ARM - RIGHT

1. Raise and support the vehicle.
2. Remove the right side tire and wheel assembly.
3. Remove the upper ball joint nut.

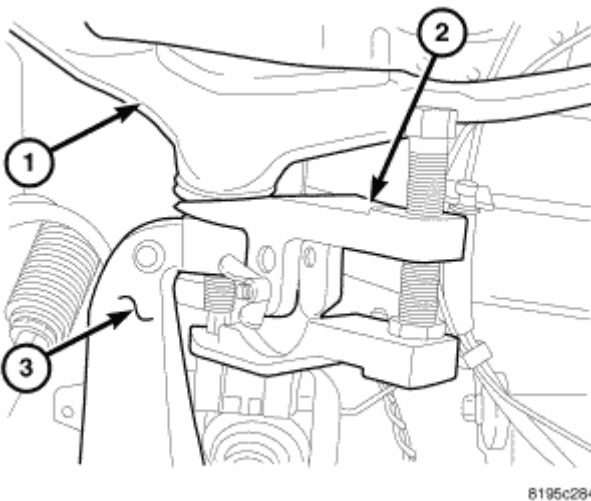


Fig. 74: Upper Ball Joint Separation
Courtesy of CHRYSLER LLC

4. Separate the upper ball joint from the steering knuckle (3) using remover 9360 (2).

5. Lower the vehicle.
6. Remove the air box assembly. Refer to **REMOVAL** .
7. Remove the upper control arm rear bolt/nut.
8. Remove the upper control arm front bolt/nut.
9. Remove the upper control arm from the vehicle.

INSTALLATION

UPPER CONTROL ARM - LEFT

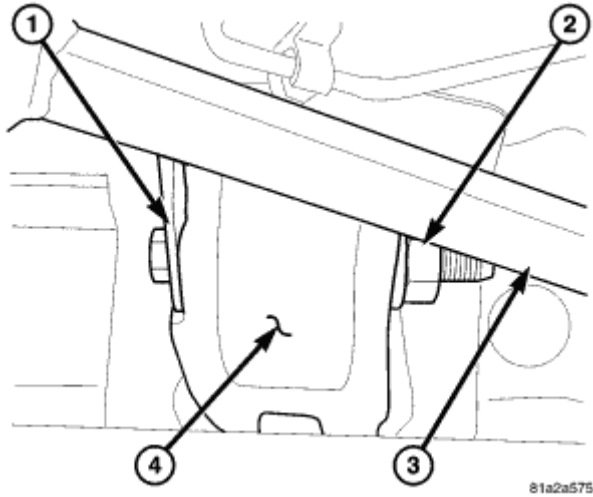


Fig. 75: Pivot Bolts

Courtesy of CHRYSLER LLC

1. Install the upper control arm to the vehicle.
2. Install the upper control arm front flag bolt (1). Tighten the nut (2) to 122 N.m (90 ft. lbs.) **with full vehicle weight.**
3. Install the upper control arm rear flag bolt. Tighten the nut to 122 N.m (90 ft. lbs.) **with full vehicle weight.**

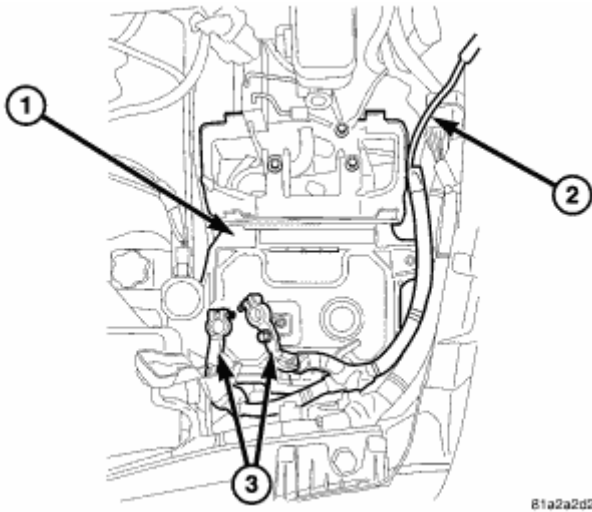


Fig. 76: Identifying Battery Tray, Power Center & Battery
Courtesy of CHRYSLER LLC

4. Install the battery tray (1). Refer to **INSTALLATION** .
5. Install the battery. Refer to **INSTALLATION** .
6. Reclip and mount the power center (2).
7. Install the upper ball joint nut. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.
8. Install the left side tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
9. Lower the vehicle.
10. Set the toe. See **STANDARD PROCEDURE**.

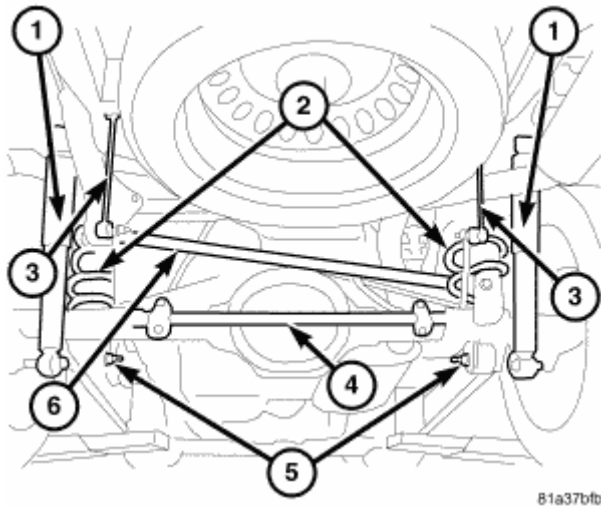
UPPER CONTROL ARM - RIGHT

1. Install the upper control arm to the vehicle.
2. Install the upper control arm front flag bolt. Tighten the nut to 122 N.m (90 ft. lbs.) **with full vehicle weight**.
3. Install the upper control arm rear flag bolt. Tighten the nut to 122 N.m (90 ft. lbs.) **with full vehicle weight**.
4. Install the air box. Refer to **INSTALLATION** .
5. Install the upper ball joint nut. Tighten the nut to 41 N.m (30 ft. lbs.) plus an additional 90° turn.
6. Install the right side tire and wheel assembly. Refer to **STANDARD PROCEDURE** .
7. Lower the vehicle.
8. Set the toe. See **STANDARD PROCEDURE**.

REAR

DESCRIPTION

REAR SUSPENSION



81a37bfb

Fig. 77: Rear Suspension Components
 Courtesy of CHRYSLER LLC

NOTE: Suspension components with rubber/urethane bushings should be tightened with the full weight of the vehicle at normal ride height. It is important to have the springs supporting the full weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort could be affected and premature bushing wear may occur.

The rear suspension is comprised of :

- Drive axle
- Shock absorbers (1)
- Coil springs (2)
- Lower suspension arms (5)
- Upper suspension arm
- Stabilizer bar (4)
- Stabilizer link (3)
- Track bar (6)

WARNING

REAR SUSPENSION

WARNING: Suspension components with rubber bushings must be tightened with the vehicle at normal ride height. It is important to have the springs supporting the weight of the vehicle when the fasteners are torqued. If springs are not at their normal ride position, vehicle ride comfort will be affected and cause premature bushing wear.

DIAGNOSIS AND TESTING

REAR SUSPENSION

CONDITION	POSSIBLE CAUSES	CORRECTION
VEHICLE INSTABILITY	1. Loose or worn wheel bearings. 2. Loose, worn or bent suspension components. 3. Tire pressure.	1. Replace wheel bearings. 2. Inspect, tighten or replace components as necessary. 3. Adjust tire pressure.
VEHICLE PULLS TO ONE SIDE	1. Weak or broken spring. 2. Alignment. 3. Tires. 4. Brakes.	1. Replace spring. 2. Align vehicle to specifications. 3. Replace tires. 4. Repair as necessary.
KNOCKING, RATTLING OR SQUEAKING	1. Worn shock bushings. 2. Loose shock mounting. 3. Shock valve. 4. Loose upper ball joint. 5. Loose, worn or bent suspension components.	1. Replace shock. 2. Tighten to specifications. 3. Replace shock. 4. Replace ball joint. 5. Inspect, tighten or replace components as necessary.
IMPROPER TRACKING	1. Loose, worn or bent suspension components. 2. Bent axle.	1. Inspect, tighten or replace components as necessary. 2. Replace axle.

SPECIFICATIONS

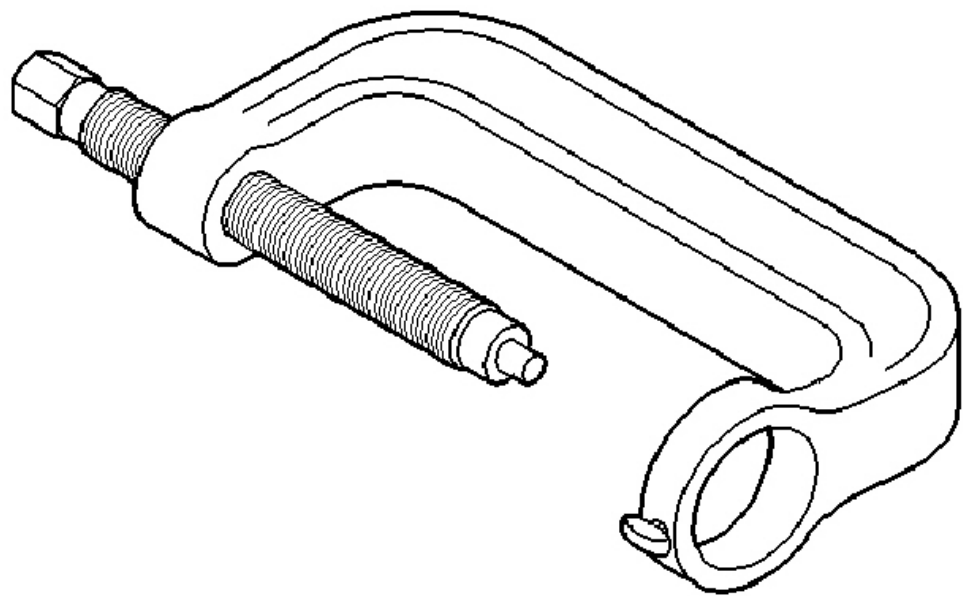
TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Shock Absorber Upper Bolt	108	80	-
Shock Absorber Lower Nut	115	85	-
Upper Control Arm to Body Nut	95	70	-
Upper Control Arm to Axle Nut	95	70	-
Lower Control Arm to Body Nut	163	120	-
Lower Control Arm to Axle Nut	203	150	-
Track Bar to Body Bracket Nut	183	135	-
Track Bar to Axle Bolt	176	130	-
Stabilizer Bar to Stabilizer Bar Link Nut	115	85	-

Stabilizer Bar Link to Body Bolt	102	75	-
Stabilizer Bar Pivot Bushing Retainer to Axle Bolt	47	35	-

SPECIAL TOOLS

SPECIAL TOOLS



c-4212f-8011d4af

Fig. 78: Ball Joint Press - C-4212F
Courtesy of CHRYSLER LLC

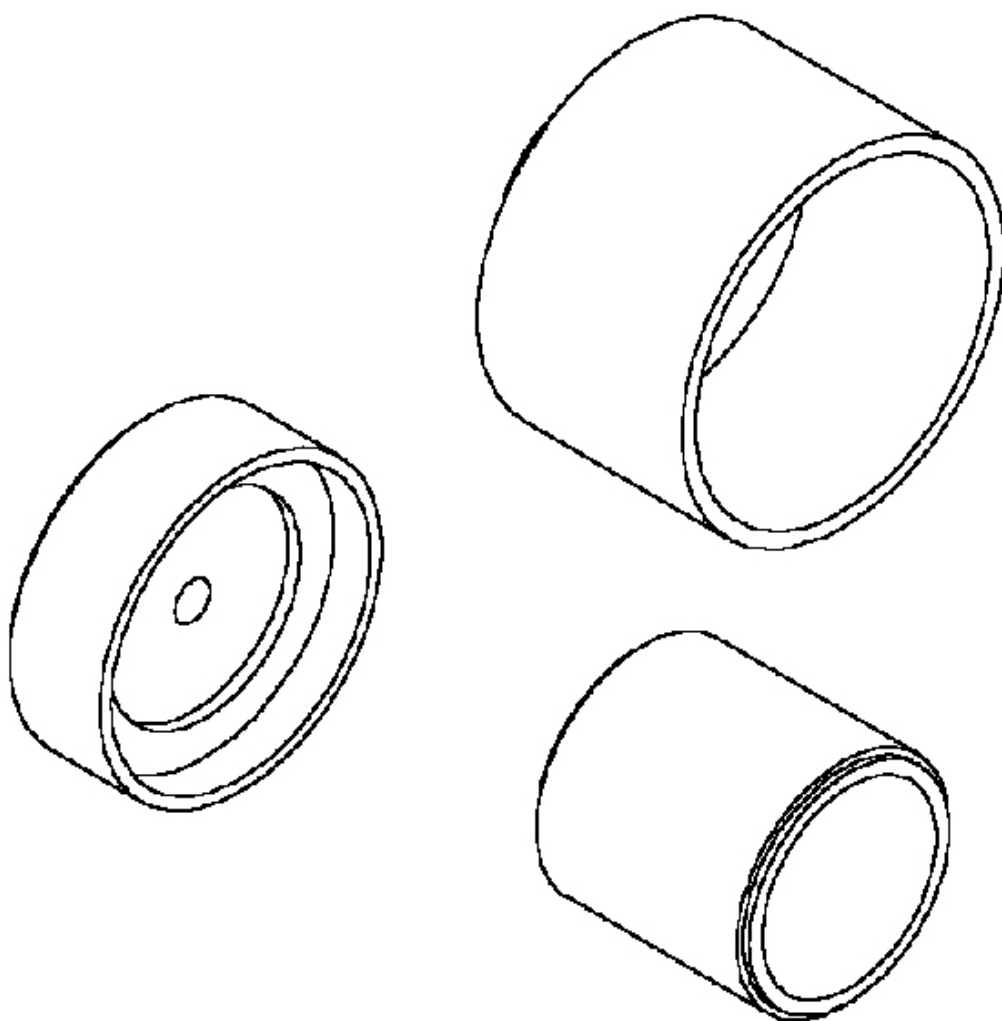


Fig. 79: Remover/Installer Rear Upper Ball Joint - 8861
Courtesy of CHRYSLER LLC

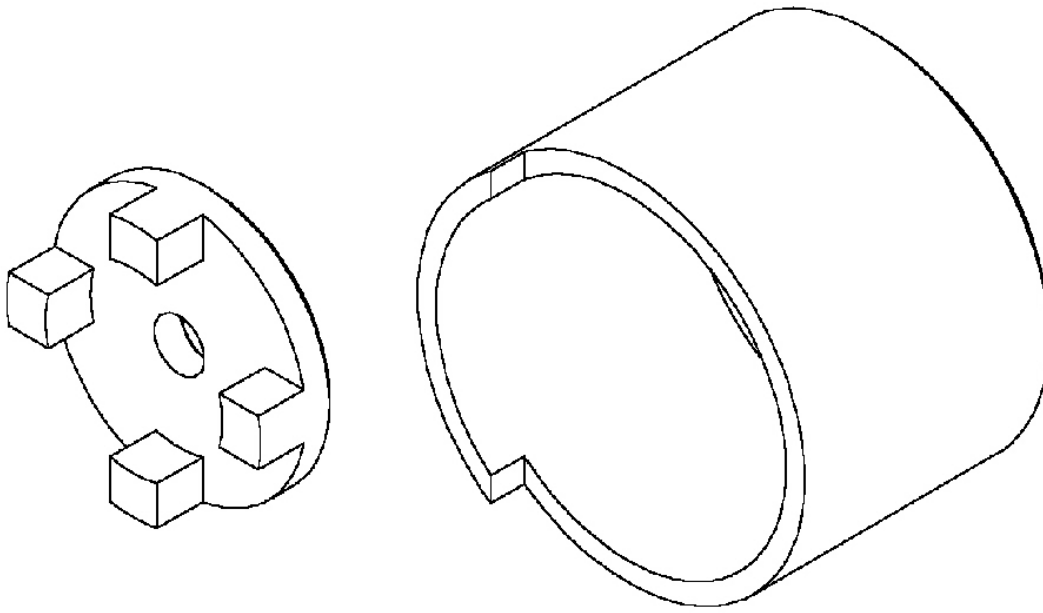


Fig. 80: Remover/Installer Rear Upper Control Arm Bushings 8860
Courtesy of CHRYSLER LLC

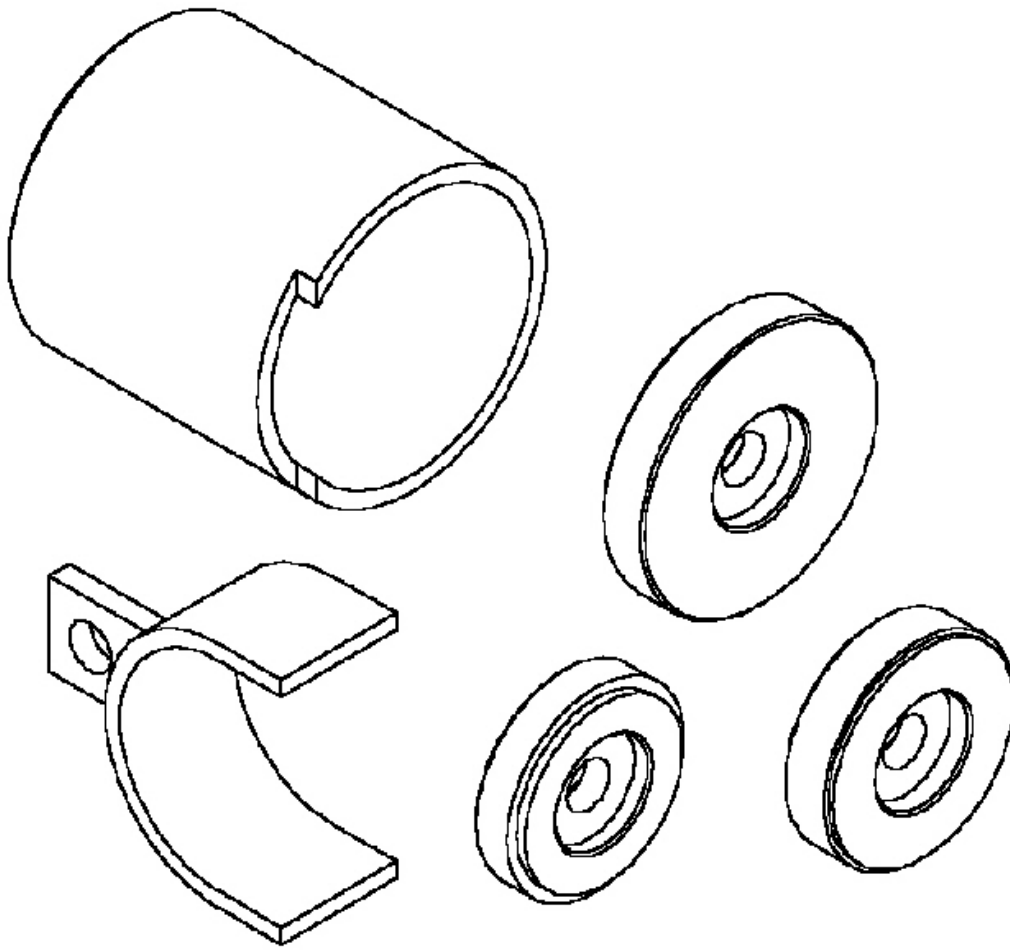


Fig. 81: Rear Lower Control Arm Bushing Remover/Installer - 8862
Courtesy of CHRYSLER LLC

BUSHINGS

REMOVAL

STABILIZER BAR BUSHINGS

1. Raise and support vehicle.
2. Remove the stabilizer bushing clamp.
3. Remove the bushing from the stabilizer bar.

INSTALLATION

STABILIZER BAR BUSHINGS

1. Install the bushing to the stabilizer bar.
2. Install the stabilizer bar bushing retainer clamp and bolts. Tighten the bolts to 47 N.m (35 ft. lbs.) **with full vehicle weight**.
3. Lower the vehicle.

SHOCK

DESCRIPTION

SHOCK ABSORBERS

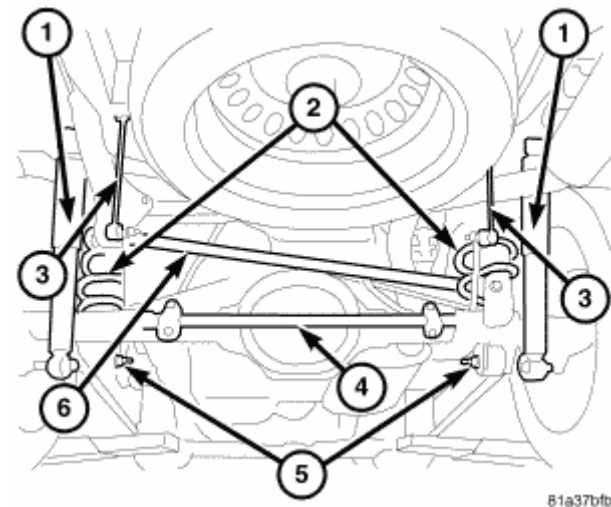


Fig. 82: Rear Suspension Components
Courtesy of CHRYSLER LLC

The top of the shock absorbers (1) are bolted to the body. The bottom of the shocks are bolted to the axle brackets. The standard shocks have conventional twin tube construction and are low pressure gas charged. Gas charging prevents cavitation during rough road operation.

OPERATION

SHOCK ABSORBERS

The shock absorbers dampen jounce and rebound motion of the vehicle over various road conditions and limit rebound suspension travel.

REMOVAL

SHOCK ABSORBER

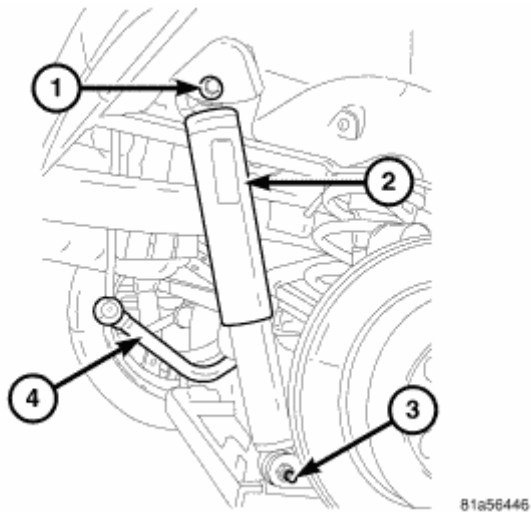


Fig. 83: Identifying Upper Bolt, Shock Absorber & Axle Bracket
 Courtesy of CHRYSLER LLC

1. Raise and support the vehicle. Position a hydraulic jack under the axle to support the axle.
2. Remove the upper bolt (1) from the frame bracket.
3. Remove the lower bolt and nut from the axle bracket (3). Remove the shock absorber (2).

INSTALLATION

SHOCK ABSORBER

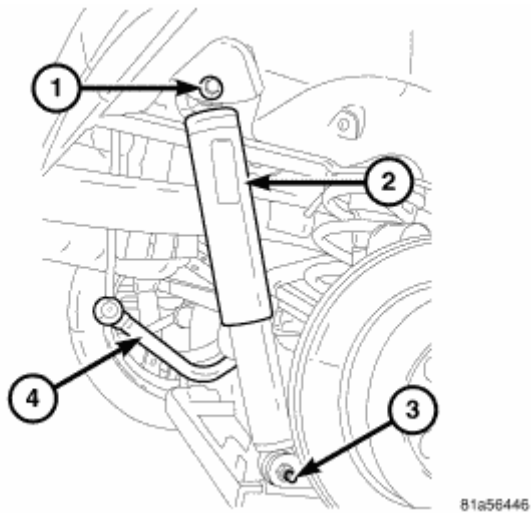


Fig. 84: Identifying Upper Bolt, Shock Absorber & Axle Bracket
 Courtesy of CHRYSLER LLC

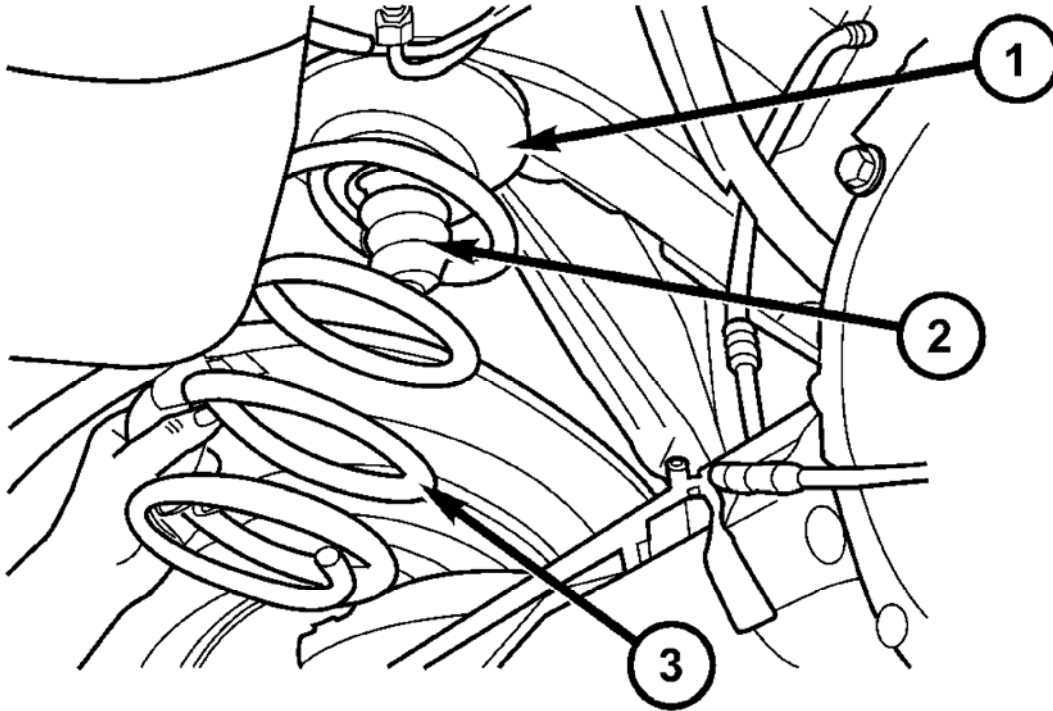
1. Install the shock absorber (2) in the frame bracket and install the bolt (1).
2. Install the shock absorber (2) in the axle bracket (3) and install the bolt.
3. Tighten the upper mounting bolt/nut to 108 N.m (80 ft. lbs.). Tighten the lower mounting bolt/nut to 115 N.m (85 ft. lbs.) **with full vehicle weight.**

4. Remove the supports and lower the vehicle.

SPRING

REMOVAL

COIL SPRING



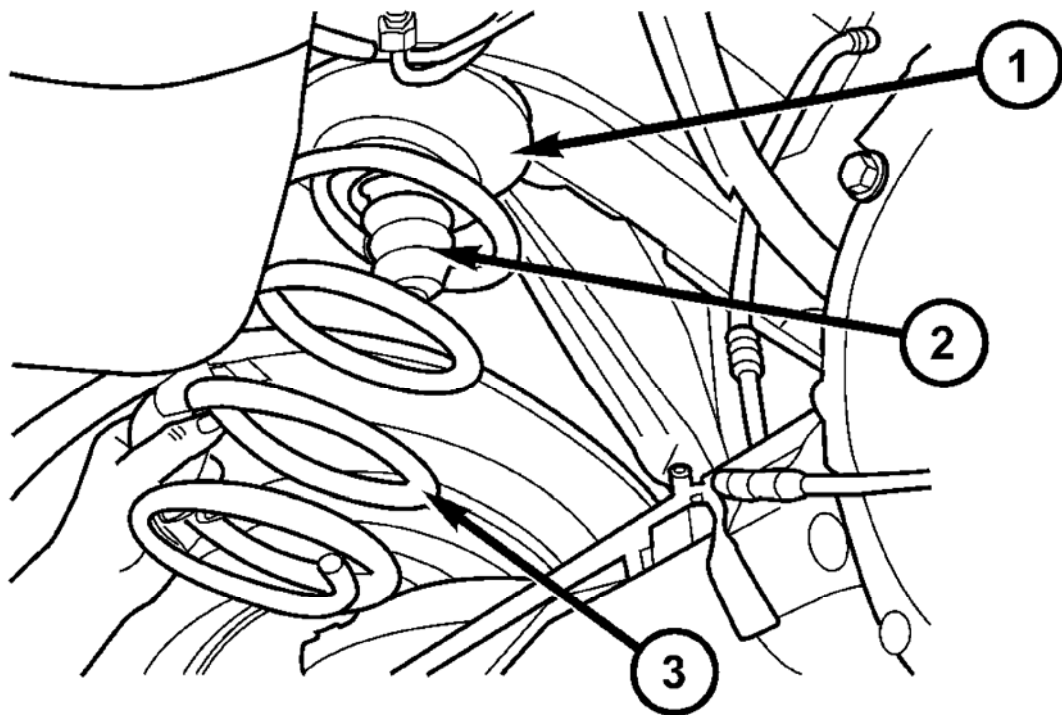
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Fig. 85: Coil Spring
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle. Position a hydraulic jack under the axle to support the axle.
2. Remove the shock absorber lower bolt from the axle bracket.
3. Lower the hydraulic jack and tilt the axle and remove the coil spring (3). See **Fig. 85**.
4. Remove and inspect the upper and lower spring isolators (1). See **Fig. 85**.

INSTALLATION

COIL SPRING



80c86f68

Fig. 86: Coil Spring
Courtesy of CHRYSLER LLC

1. Install the upper isolator (1). See **Fig. 85**.
2. Install the lower isolator. See **Fig. 85**.
3. Pull down on the axle and position the coil spring (3) in the lower isolator.

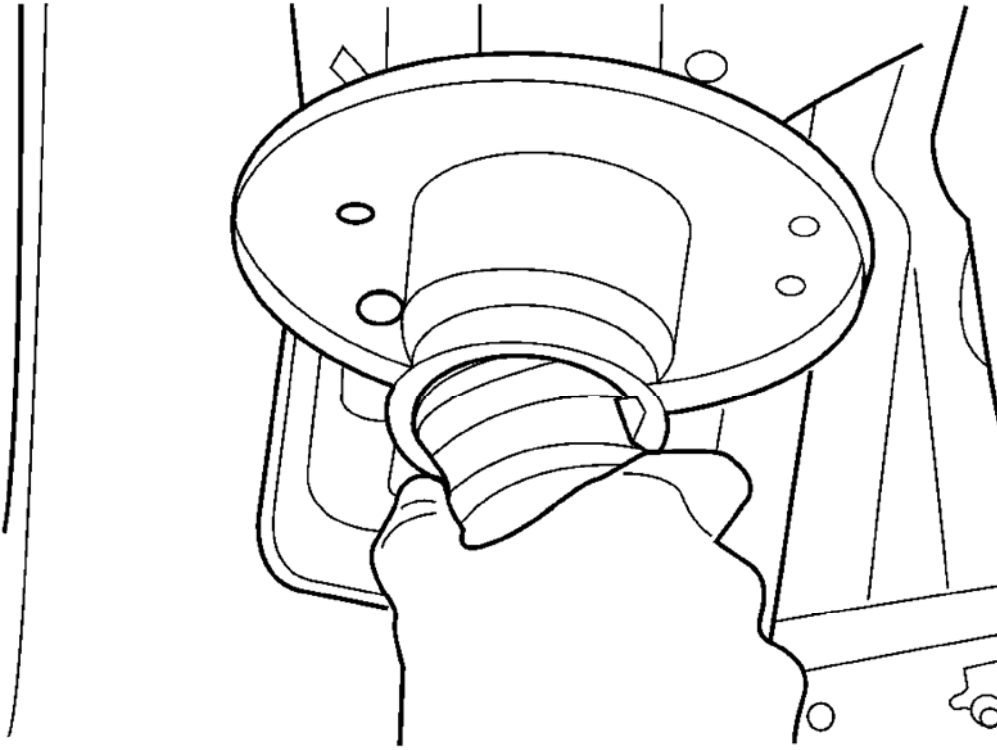
CAUTION: Ensure the spring is positioned on the lower isolator.

4. Raise the axle with the hydraulic jack.
5. Install the shock absorber to the axle bracket and tighten to 115 N.m (85 ft. lbs.).
6. Remove the supports and lower the vehicle.

JOUNCE BUMPER

REMOVAL

JOUNCE BUMPER



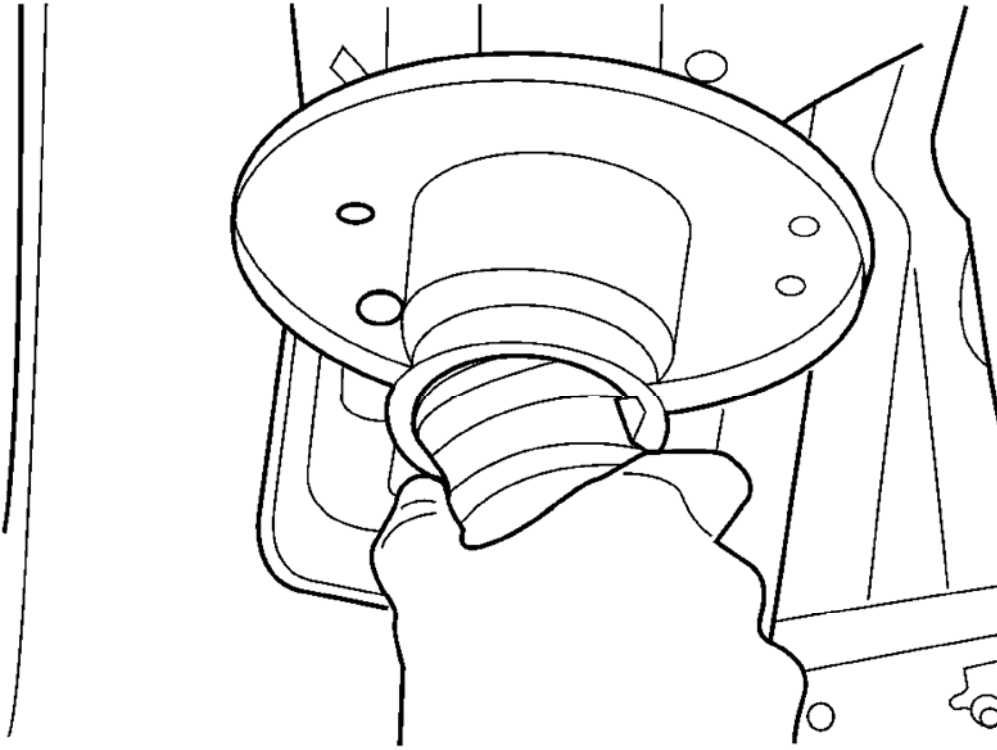
80c86f37

Fig. 87: Jounce Bumper
Courtesy of CHRYSLER LLC

1. Remove the shock. See **REMOVAL**.
2. Remove the coil spring. See **REMOVAL**.
3. Pull the jounce bumper downwards to remove. See **Fig. 87**

INSTALLATION

JOUNCE BUMPER



80c86f37

Fig. 88: Jounce Bumper
Courtesy of CHRYSLER LLC

1. Install the jounce bumper into the mount by twisting the bumper into place. See **Fig. 87**.
2. Install the coil spring. See **INSTALLATION**.
3. Install the shock. See **INSTALLATION**.

STABILIZER BAR

REMOVAL

STABILIZER BAR

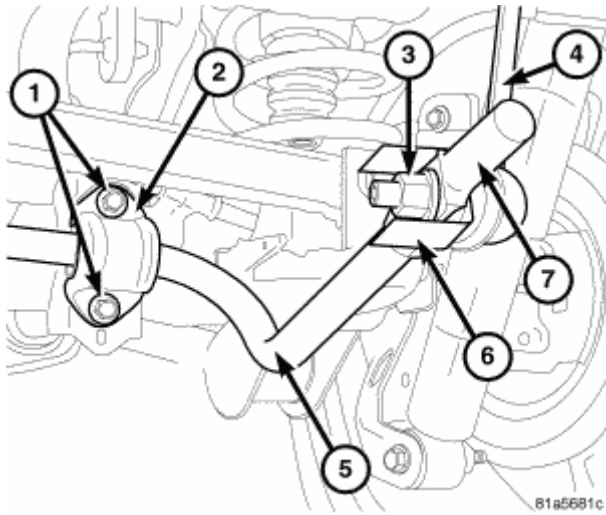


Fig. 89: Stab Bar & Link
 Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the stabilizer nut (3) at the bar (5).
3. Remove the stabilizer links (4) from the stabilizer bar (5).
4. Remove the stabilizer bar bolts (1) from the axle.
5. Remove the stabilizer bar (5).

INSTALLATION

STABILIZER BAR

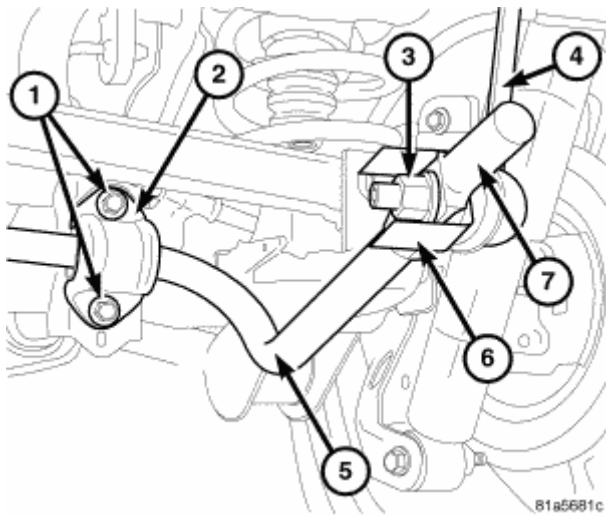


Fig. 90: Stab Bar & Link
 Courtesy of CHRYSLER LLC

1. Position the stabilizer bar (5) on the axle. Ensure the bar is centered with equal spacing on both sides. Tighten the bolts (1) to 47 N.m (35 ft. lbs.).

2. Install the stabilizer links (3) to the bar (5). Tighten the nuts (3) to 88 N.m (65 ft. lbs.) **with full vehicle weight**.
3. Remove support and lower the vehicle.

STABILIZER LINK

REMOVAL

STABILIZER LINK

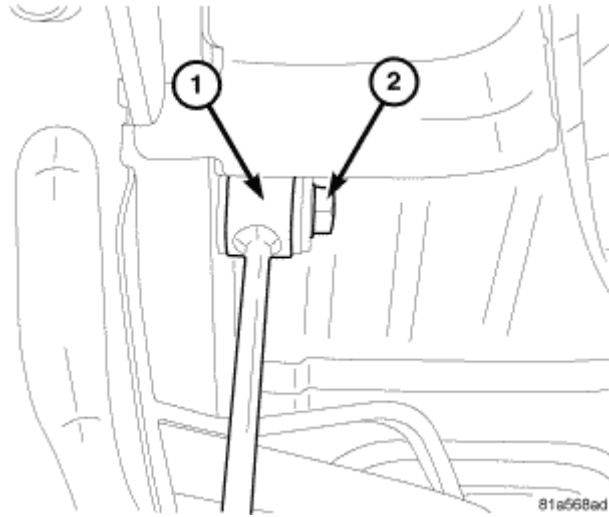


Fig. 91: Upper Stab Bolt
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Support the rear axle with a jack.
3. Remove the rear tire **right side only**.
4. Remove the upper link (2) bolt at the frame.

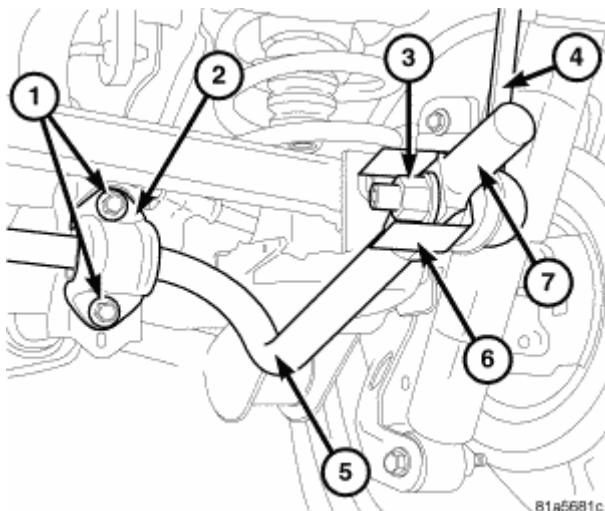


Fig. 92: Stab Bar & Link
Courtesy of CHRYSLER LLC

5. Remove the lower link nut (3) at the stabilizer bar (5).
6. Remove stabilizer link (4).

INSTALLATION

STABILIZER LINK

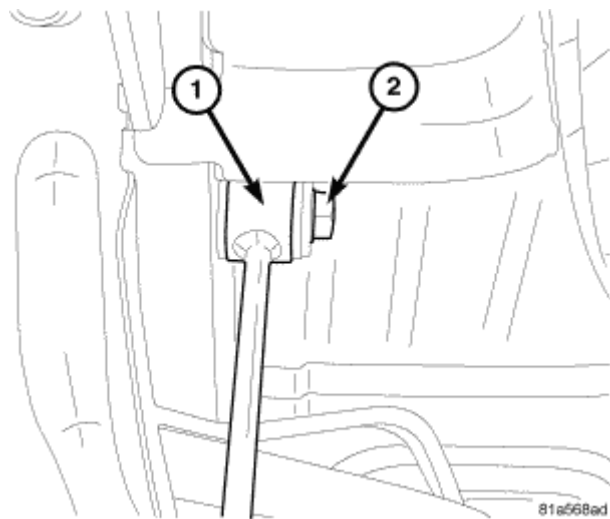


Fig. 93: Upper Stab Bolt
Courtesy of CHRYSLER LLC

1. Install the upper bolt (2) for the stabilizer link (1) to the frame and tighten to 102 N.m (75 ft. lbs.).

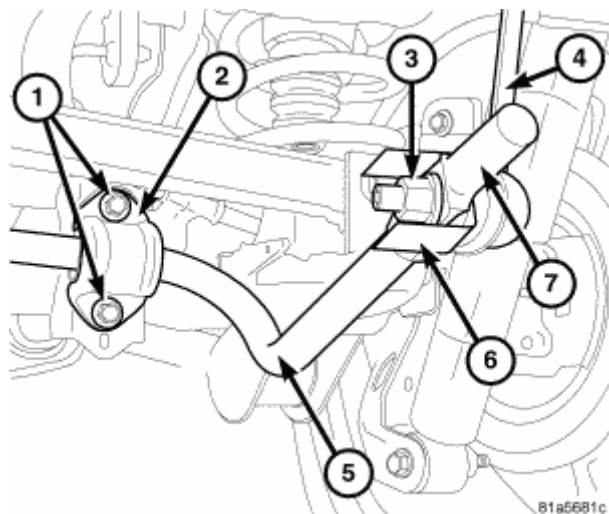


Fig. 94: Stab Bar & Link
Courtesy of CHRYSLER LLC

2. Install the stabilizer link (4) to the stabilizer bar (5).

3. Install the nut (3) and tighten to 115 N.m (85 ft. lbs.) **with full vehicle weight**.
4. Install the spare tire **right side only**.
5. Remove the jack and lower the vehicle.

MASS DAMPER

REMOVAL

MASS DAMPER

1. Raise and support the vehicle.
2. Support the rear axle with a jack.

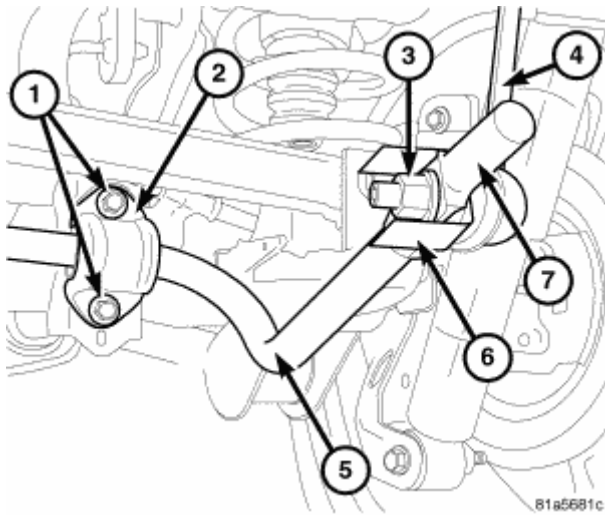
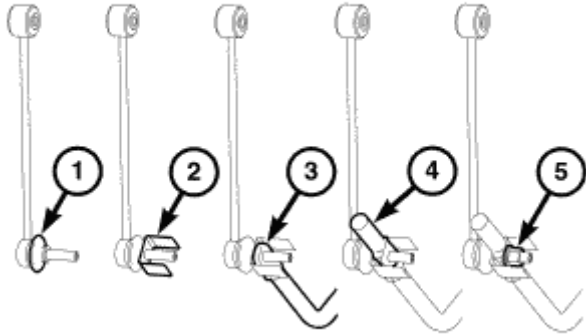


Fig. 95: Stab Bar & Link
Courtesy of CHRYSLER LLC

3. Remove the lower link nut (3) at the stabilizer bar (5).
4. Remove the mass damper (7).
5. Remove stabilizer bar (5) from the link (4).
6. Remove the retainer (6).

INSTALLATION

MASS DAMPER



81a8c95d

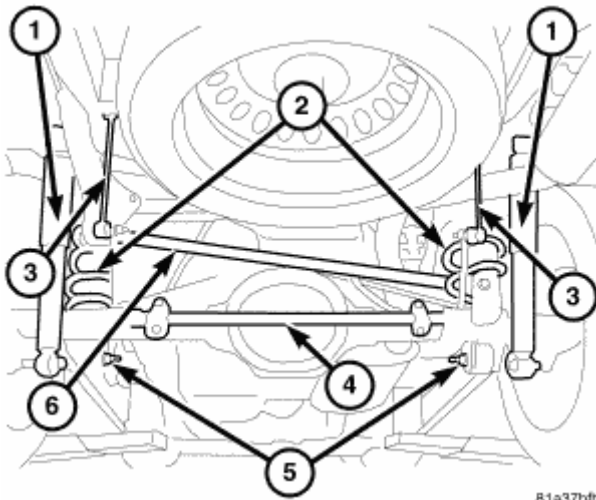
Fig. 96: Mass Damper
Courtesy of CHRYSLER LLC

1. Install the retainer (2) to the stabilizer link (1).
2. Install the stabilizer bar (3) over the retainer (2).
3. Install the mass damper (4) to the stabilizer link stud.
4. Install the nut (5) and tighten to 115 N.m (85 ft. lbs.) **with full vehicle weight**.
5. Remove the jack and lower the vehicle.

LOWER CONTROL ARM

DESCRIPTION

LOWER SUSPENSION ARMS AND BUSHINGS



81a37bfb

Fig. 97: Rear Suspension Components
Courtesy of CHRYSLER LLC

The lower suspension arms (5) are tubular steel and use a voided round bushing at the arm on the axle side. The body side uses a solid round bushing.

OPERATION

LOWER SUSPENSION ARMS AND BUSHINGS

The bushings provide isolation from the axle. The arms mount to the unibody frame rail bracket and the axle brackets. The arm and bushings provide location and react to loads.

REMOVAL

LOWER SUSPENSION ARM - LEFT SIDE

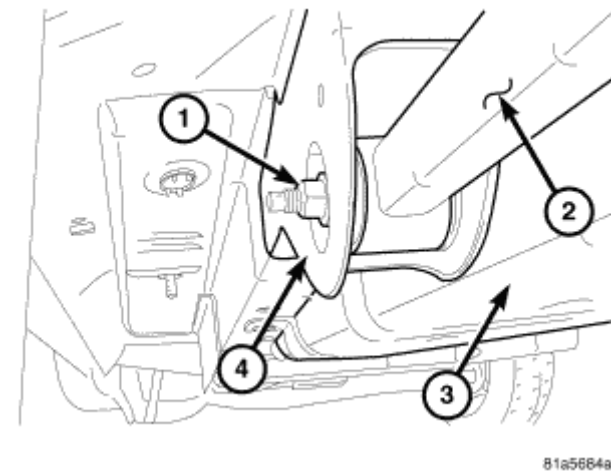
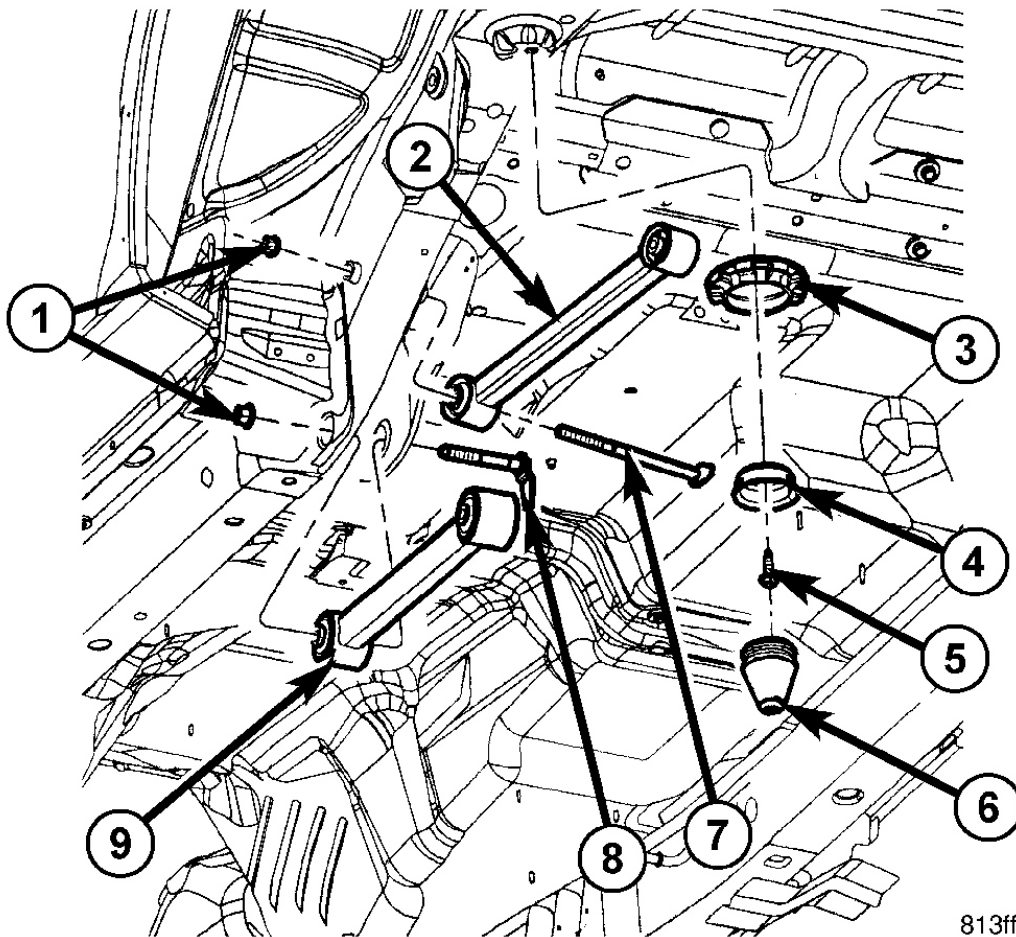


Fig. 98: Identifying Bolt/Nut, Lower Suspension Arm, Fuel Tank & Frame Rail
Courtesy of CHRYSLER LLC

1. Raise the vehicle and support the rear axle.
2. Remove the fuel tank (3). Refer to **REMOVAL** .
3. Remove the lower suspension arm nut and bolt from the axle bracket.
4. Remove the nut and bolt (1) from the frame rail (4) and remove the lower suspension arm (2).

LOWER SUSPENSION ARM - RIGHT SIDE

1. Raise the vehicle and support the rear axle.
2. Remove the lower suspension arm nut and bolt from the axle bracket.



813ff419

Fig. 99: Suspension Arms
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - NUT |
| 2 - UPPER SUSPENSION ARM |
| 3 - UPPER SPRING ISOLATOR |
| 4 - JOUNCE BUMPER RETAINER |
| 5 - BOLT |
| 6 - JOUNCE BUMPER |
| 7 - UPPER FLAG BOLT |
| 8 - LOWER FLAG BOLT |
| 9 - LOWER SUSPENSION ARM |

3. Remove the exhaust from the mid and rear hanger rubber isolators to allow the exhaust system to lower enough to remove the bolt at the frame rail.
4. Remove the nut (1) and bolt (8) from the frame rail and remove the lower suspension arm (9).

INSTALLATION

LOWER SUSPENSION ARM - LEFT SIDE

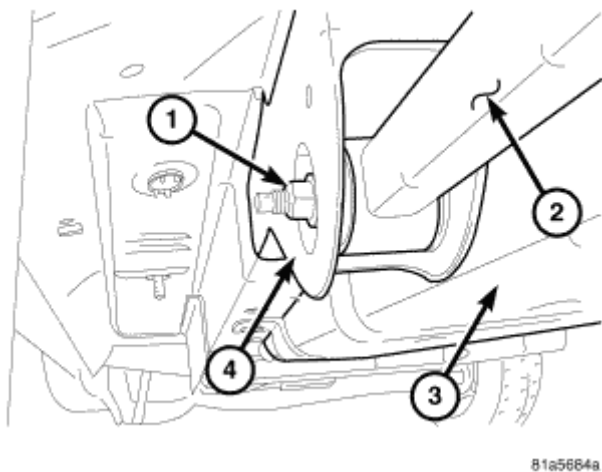


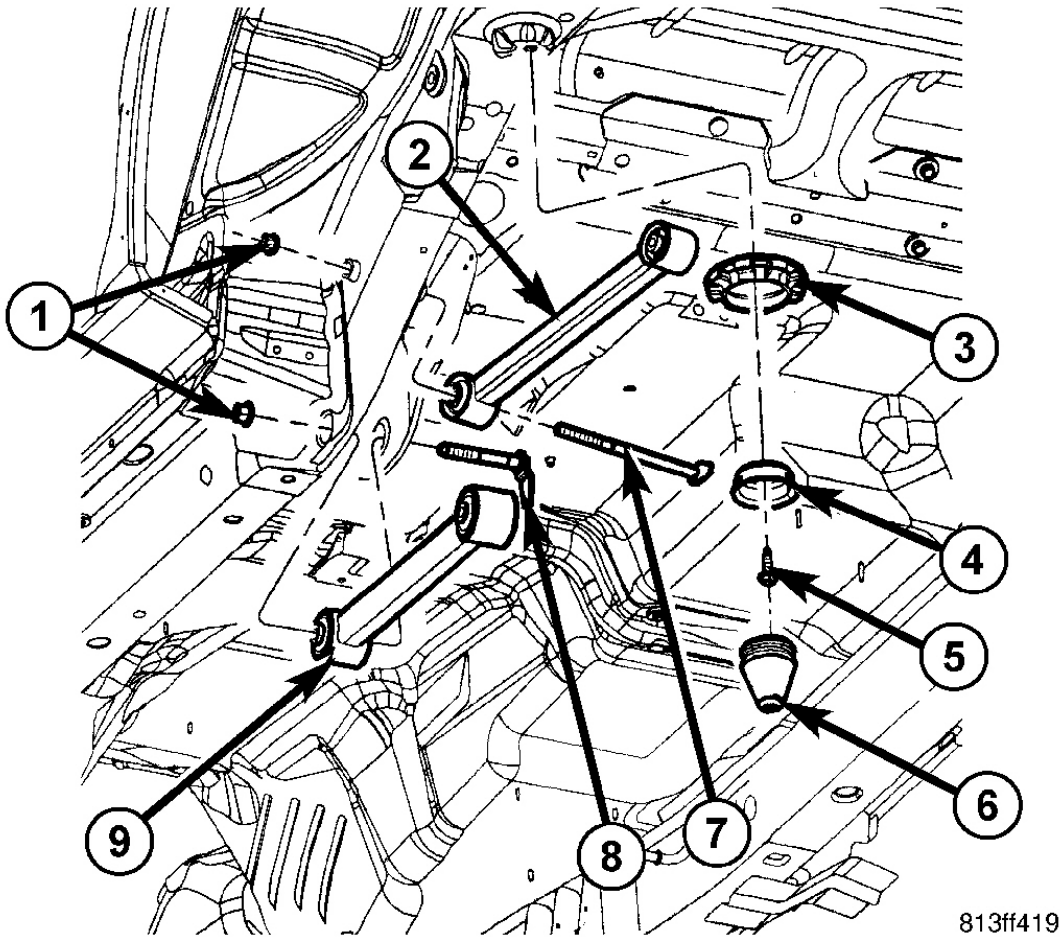
Fig. 100: Identifying Bolt/Nut, Lower Suspension Arm, Fuel Tank & Frame Rail
Courtesy of CHRYSLER LLC

NOTE: All torques should be done with vehicle on the ground with full vehicle weight.

1. Position the lower suspension arm (2) in the frame rail (4).
2. Install the frame rail bracket bolt and nut (1). Tighten to 163 N.m (120 ft. lbs.) **with full vehicle weight.**
3. Position the lower suspension arm in the axle bracket.
4. Install the axle bracket bolt and nut. Tighten to 203 N.m (150 ft. lbs.) **with full vehicle weight.**
5. Install the fuel tank. Refer to **INSTALLATION** .
6. Remove the supports and lower the vehicle.

LOWER SUSPENSION ARM - RIGHT SIDE

NOTE: All torques should be done with vehicle on the ground with full vehicle weight.



813ff419

Fig. 101: Suspension Arms
 Courtesy of CHRYSLER LLC

- 1 - NUT
- 2 - UPPER SUSPENSION ARM
- 3 - UPPER SPRING ISOLATOR
- 4 - JOUNCE BUMPER RETAINER
- 5 - BOLT
- 6 - JOUNCE BUMPER
- 7 - UPPER FLAG BOLT
- 8 - LOWER FLAG BOLT
- 9 - LOWER SUSPENSION ARM

1. Position the lower suspension arm (9) in the frame rail.
2. Install the frame rail bracket bolt (8) and nut (1). Tighten to 163 N.m (120 ft. lbs.) **with full vehicle weight.**

3. Install the exhaust back in the mid and rear hanger rubber isolators.
4. Position the lower suspension arm in the axle bracket.
5. Install the axle bracket bolt and nut. Tighten to 203 N.m (150 ft. lbs.) **with full vehicle weight**.
6. Remove the supports and lower the vehicle.

UPPER CONTROL ARM

DESCRIPTION

UPPER SUSPENSION ARM, BUSHINGS, AND BALL JOINT

The suspension arm uses bushings to isolate road noise. The suspension arm is bolted through bushings to a bracket at the body and axle.

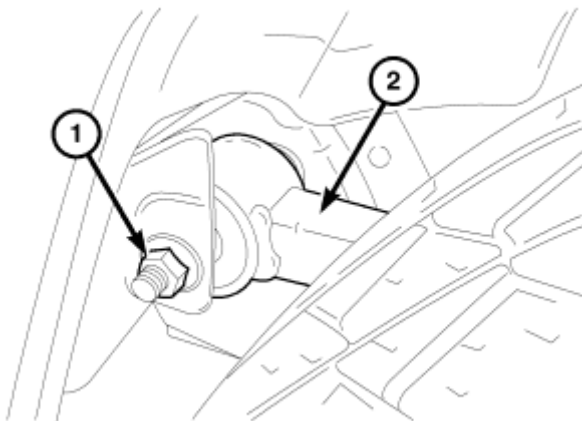
OPERATION

UPPER SUSPENSION ARM, BUSHINGS, AND BALL JOINT

The upper suspension arm provides fore/aft and lateral location of the rear axle. The suspension arm travel is limited through the use of jounce bumpers in compression and shock absorbers in rebound.

REMOVAL

UPPER SUSPENSION ARM - LEFT SIDE



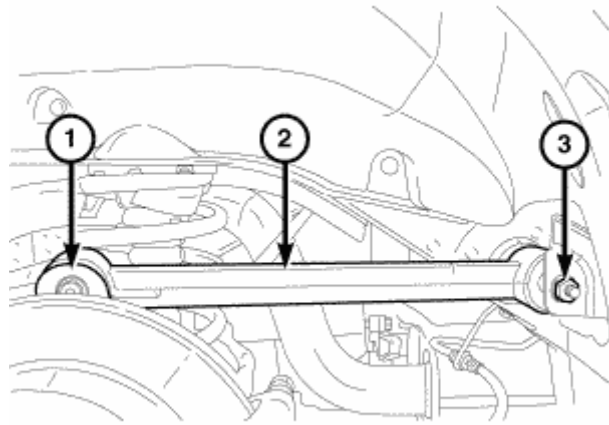
81a56807

Fig. 102: Identifying Nut/Bolt & Upper Suspension Arm
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Support the rear axle.
3. Lower the fuel tank in order to gain access to the bolt. Refer to **REMOVAL** .
4. Remove the upper suspension arm nut and bolt from the axle bracket.

5. Remove the nut and bolt (1) from the frame rail and remove the upper suspension arm (2).

UPPER SUSPENSION ARM - RIGHT SIDE



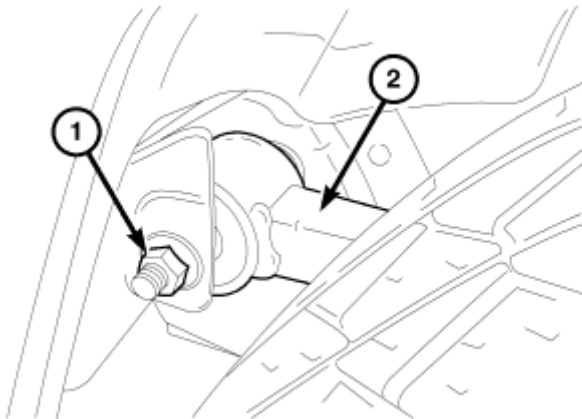
81a5629e

Fig. 103: Upper Suspension Arm
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Support the rear axle.
3. Remove the upper suspension arm nut and bolt (1) from the axle bracket.
4. Remove the nut (3) and flag bolt from the frame rail and remove the upper suspension arm (2).

INSTALLATION

UPPER SUSPENSION ARM - LEFT SIDE



81a56807

Fig. 104: Identifying Nut/Bolt & Upper Suspension Arm
Courtesy of CHRYSLER LLC

NOTE: All torques should be done with vehicle on the ground with full vehicle weight.

1. Position the upper suspension arm (2) in the frame rail bracket.
2. Install the mounting bolt and nut (1) Tighten to 95 N.m (70 ft. lbs.) **with full vehicle weight.**
3. Position the upper suspension arm in the axle bracket.
4. Install the mounting bolt and nut. Tighten to 115 N.m (85 ft. lbs.) **with full vehicle weight.**
5. Raise the fuel tank back into place and secure. Refer to INSTALLATION .
6. Remove the supports and lower the vehicle.

UPPER SUSPENSION ARM - RIGHT SIDE

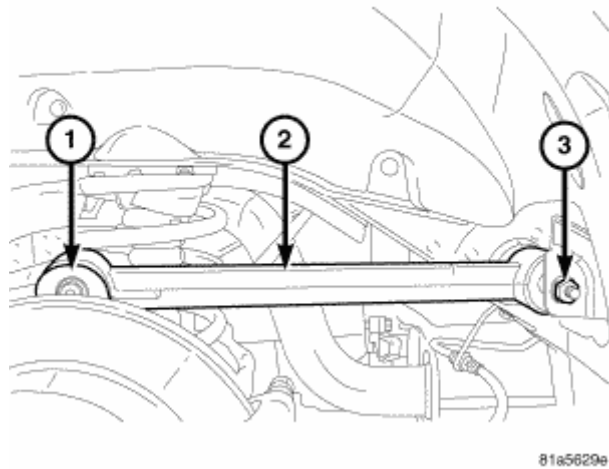


Fig. 105: Upper Suspension Arm
Courtesy of CHRYSLER LLC

NOTE: All torques should be done with vehicle on the ground with full vehicle weight.

1. Position the upper suspension arm (2) in the frame rail bracket.
2. Install the mounting flag bolt and nut (3). Tighten to 95 N.m (70 ft. lbs.) **with full vehicle weight.**
3. Position the upper suspension arm (2) in the axle bracket.
4. Install the mounting bolt and nut (1). Tighten to 115 N.m (85 ft. lbs.) **with full vehicle weight.**
5. Remove the supports and lower the vehicle.

TRACK BAR

REMOVAL

TRACK BAR

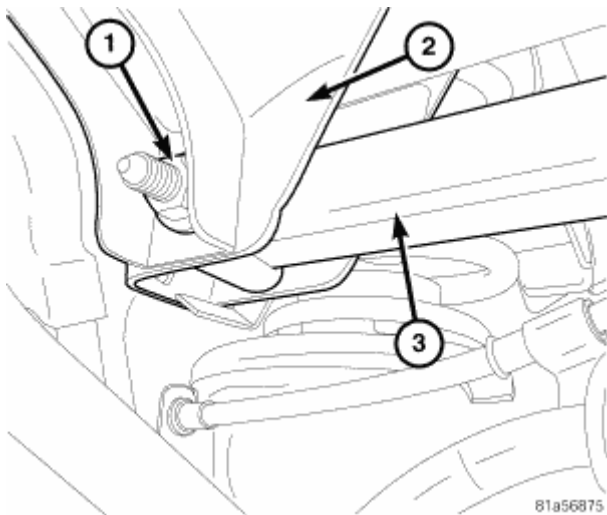


Fig. 106: Identifying Track Bar, Flag Bolt/Nut & Frame Bracket
 Courtesy of CHRYSLER LLC

1. Raise and support the vehicle. Position a hydraulic jack under the axle to support the axle.
2. Remove the track bar flag bolt and nut (1) from the frame bracket (2).

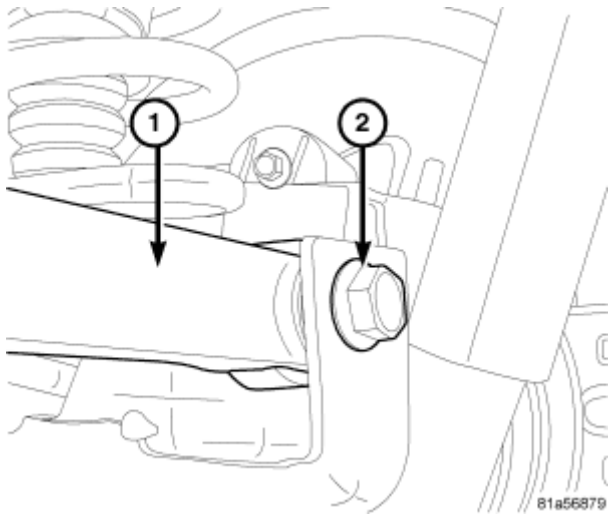


Fig. 107: Identifying Track Bar, Bolt/Nut & Axle Bracket
 Courtesy of CHRYSLER LLC

3. Remove the track bar bolt and nut (2) from the axle bracket (3).
4. Remove the track bar (1).

INSTALLATION

TRACK BAR

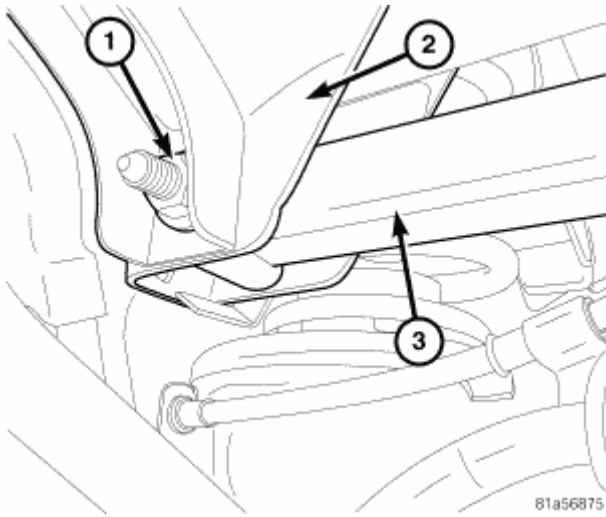


Fig. 108: Identifying Track Bar, Flag Bolt/Nut & Frame Bracket
 Courtesy of CHRYSLER LLC

1. Install the track bar (3) to the vehicle.
2. Install the track bar bolt and nut (1) in the frame bracket (2).

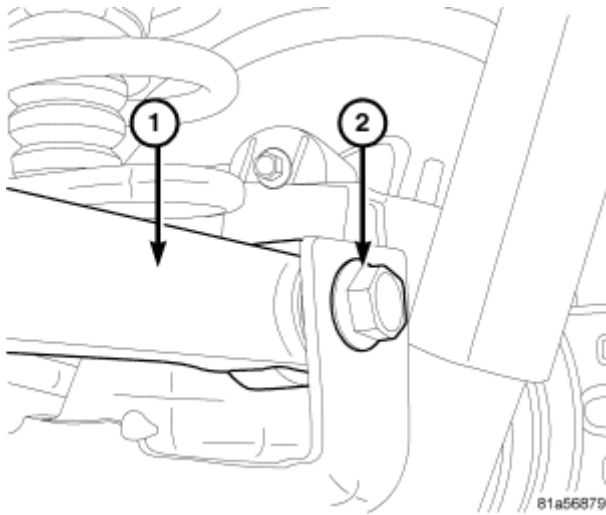


Fig. 109: Identifying Track Bar, Bolt/Nut & Axle Bracket
 Courtesy of CHRYSLER LLC

3. Install the track bar (1) into the axle bracket (3).
4. Install the track bar bolt and nut (2) in the axle bracket.
5. Remove the supports and lower the vehicle.
6. Tighten the body side mounting bolt/nut to 183 N.m (135 ft. lbs.). Tighten the axle side mounting bolt/nut to 176 N.m (130 ft. lbs.) **with full vehicle weight.**

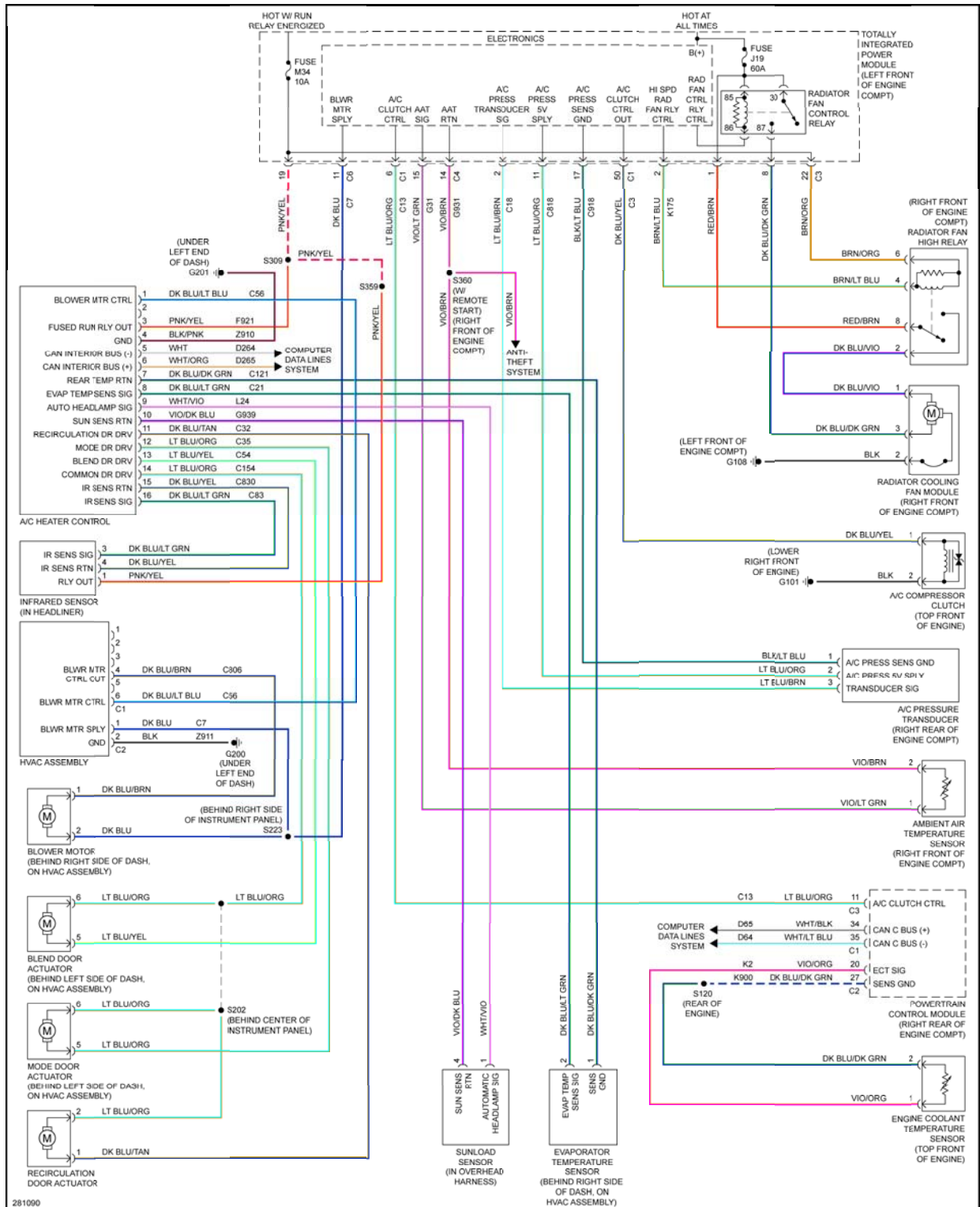


Fig. 1: Automatic A/C Circuit

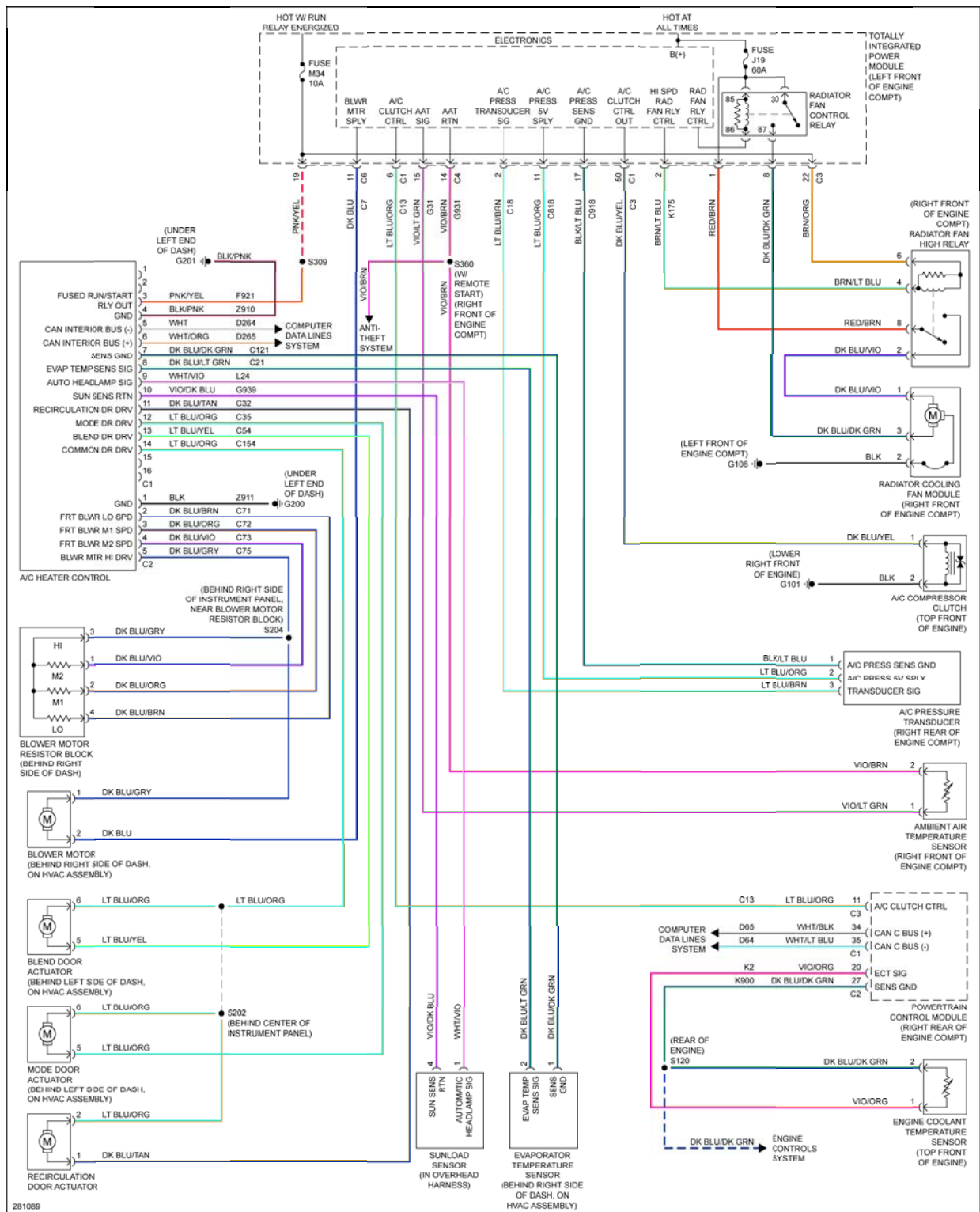


Fig. 2: Manual A/C Circuit

ANTI-LOCK BRAKES

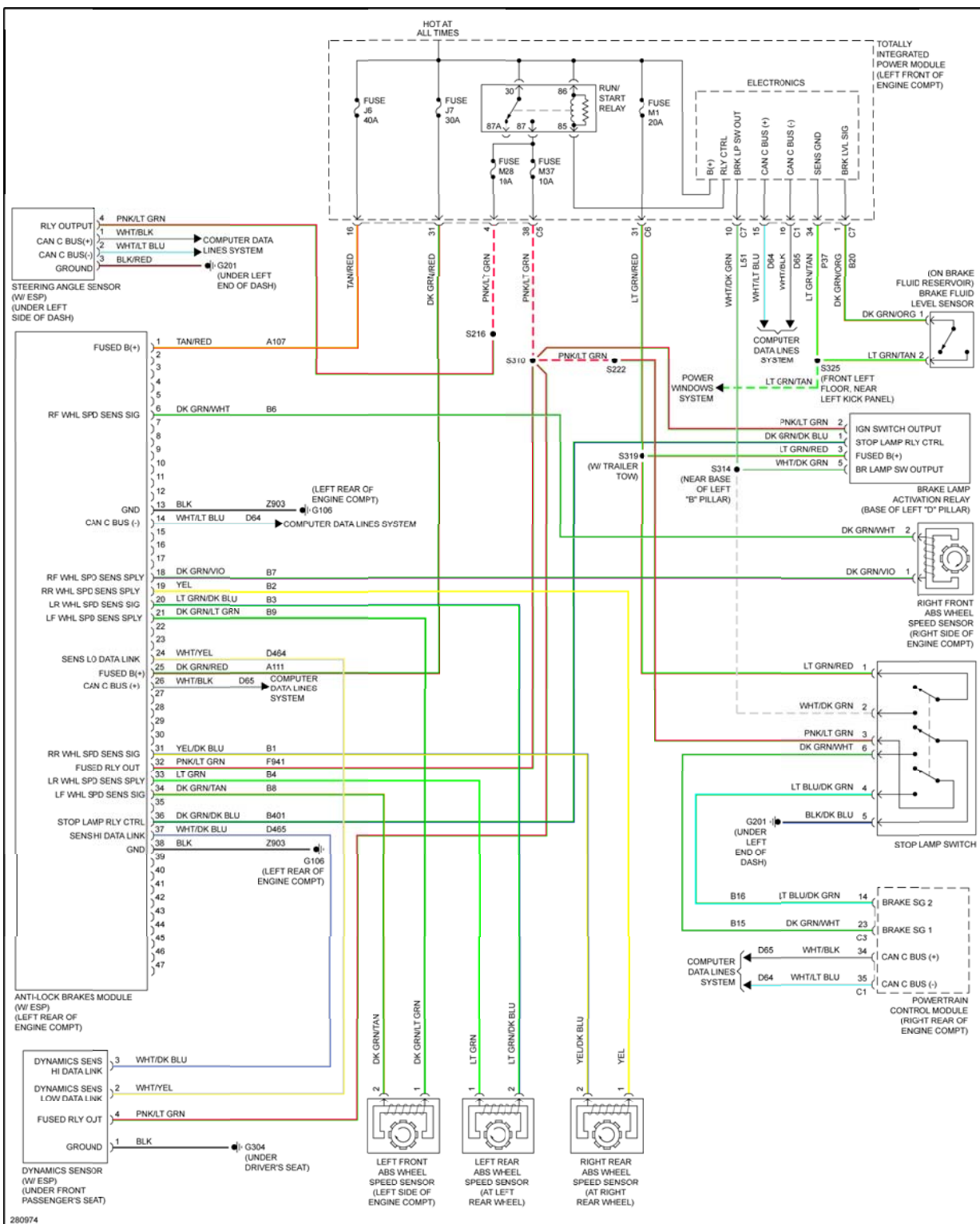


Fig. 3: Anti-lock Brakes Circuit

ANTI-THEFT

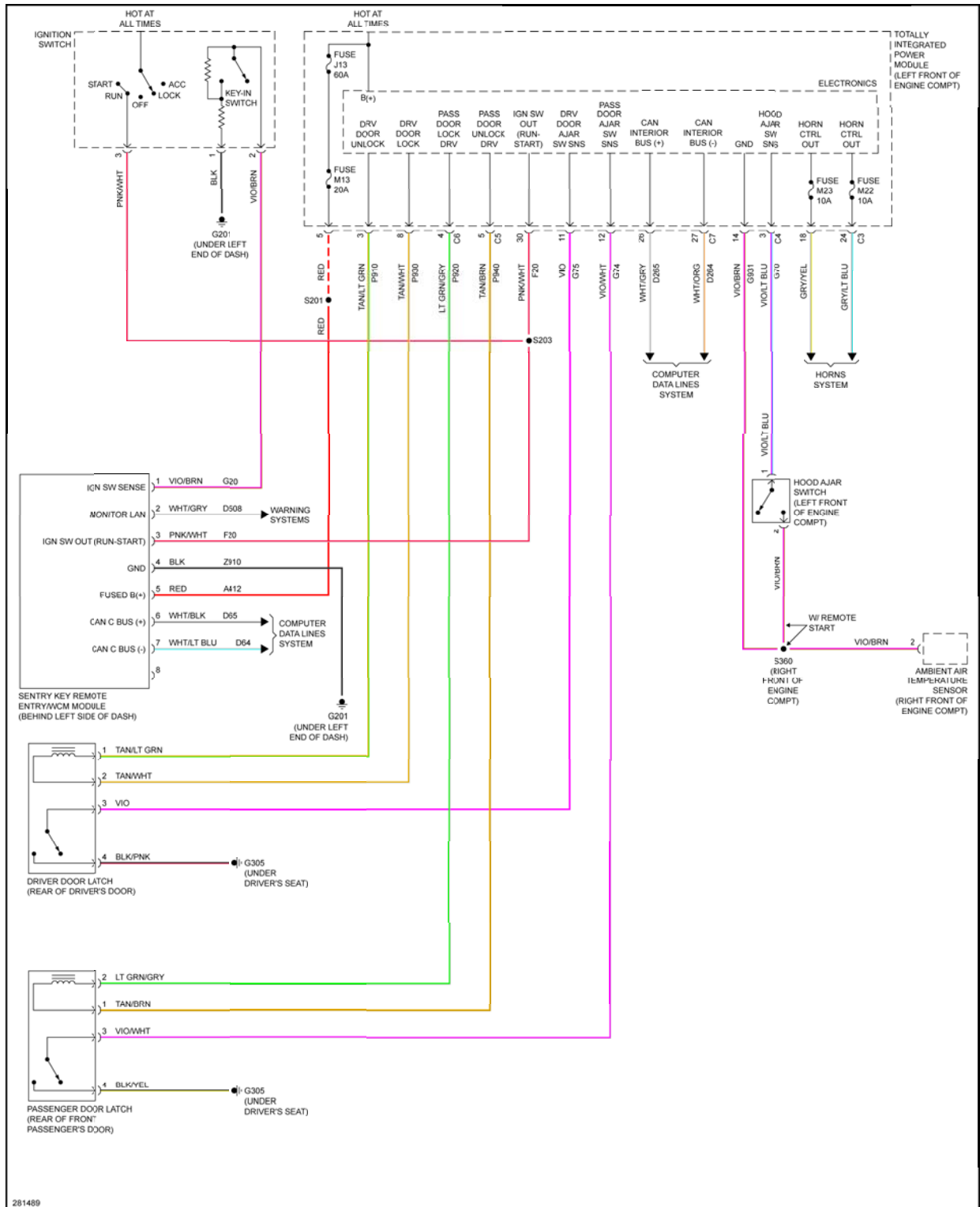


Fig. 4: Anti-theft Circuit (1 of 2)

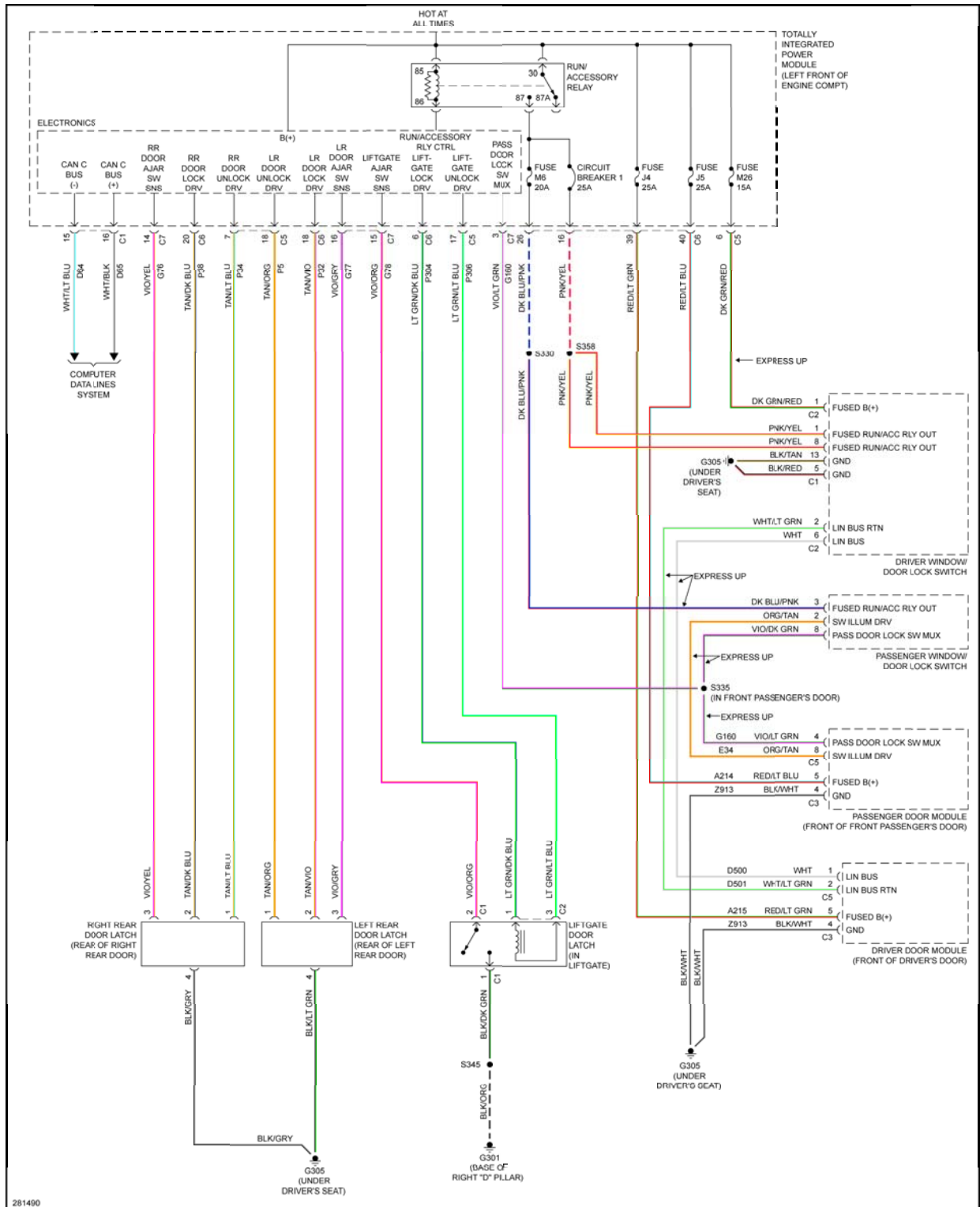


Fig. 5: Anti-theft Circuit (2 of 2)

BODY CONTROL MODULES



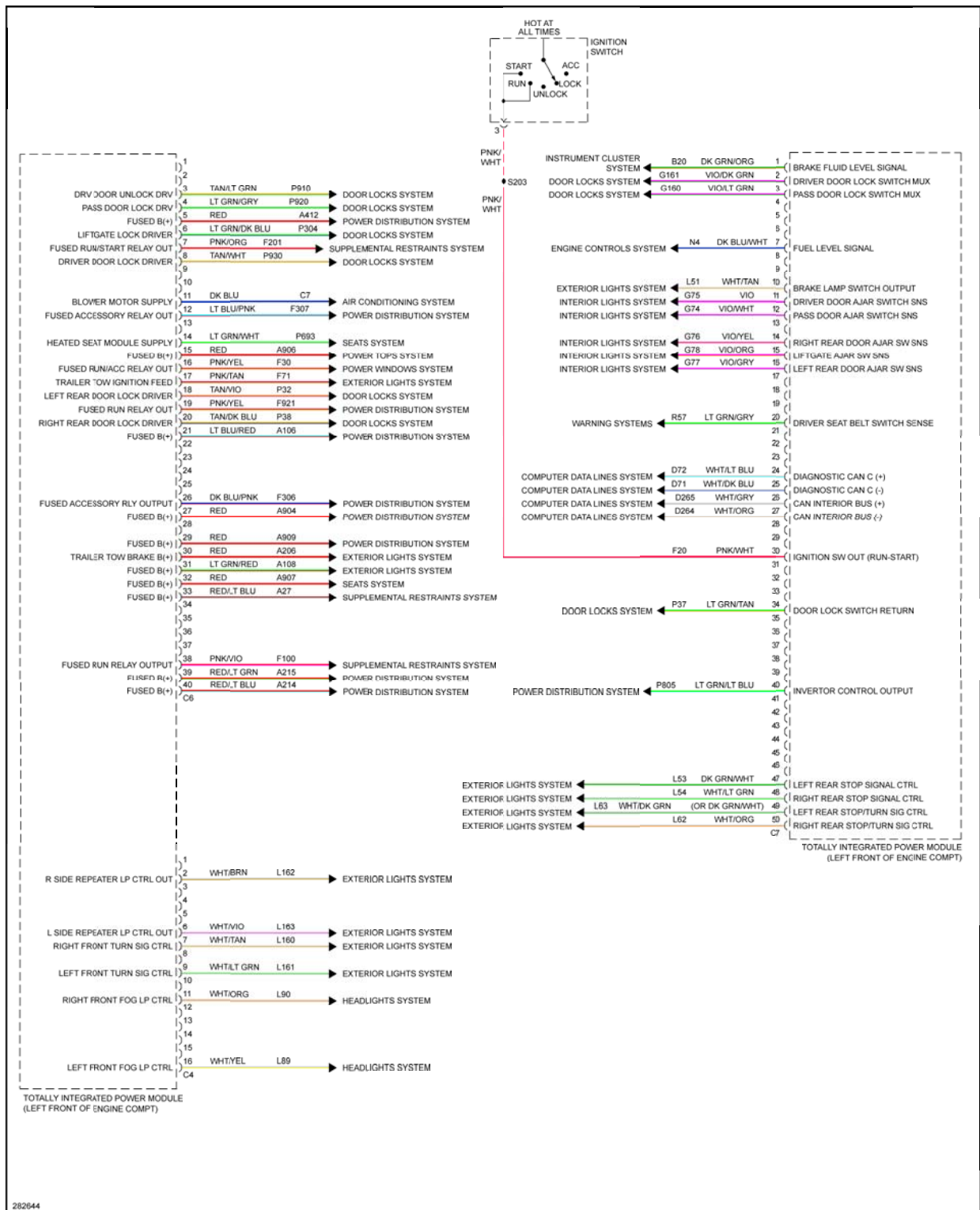


Fig. 7: Body Control Modules Circuit (2 of 2)

COMPUTER DATA LINES



Fig. 8: Computer Data Lines Circuit (1 of 2)

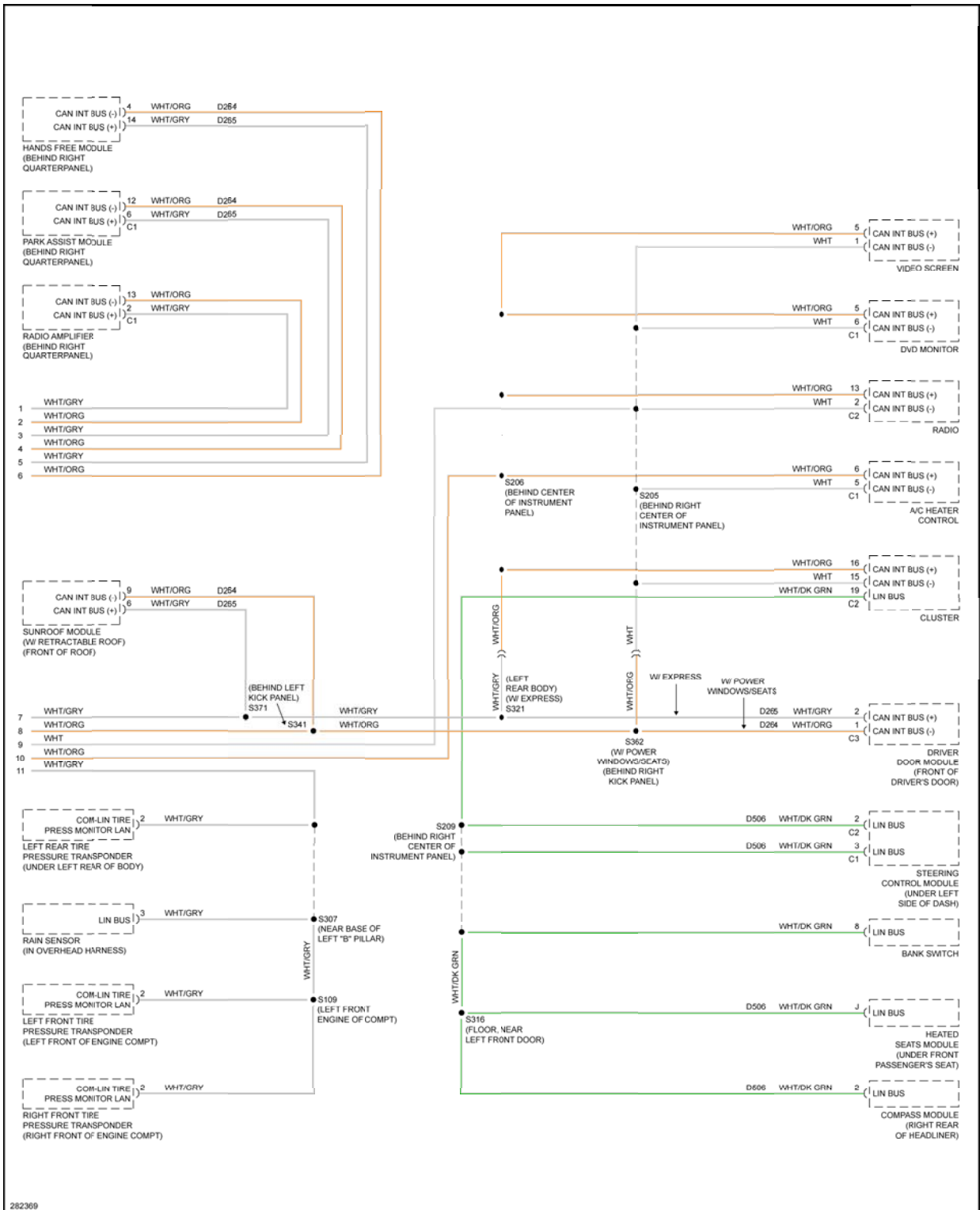
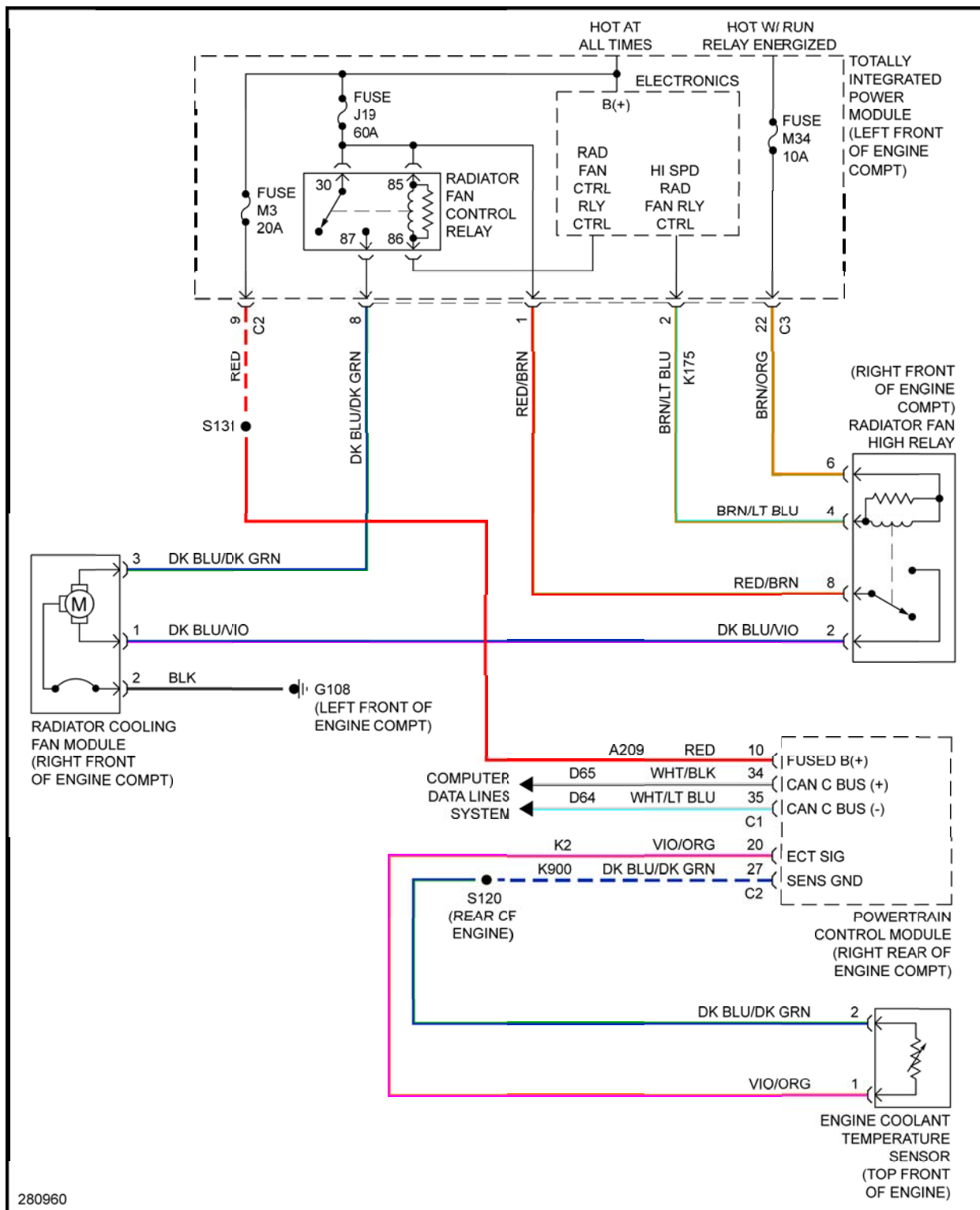


Fig. 9: Computer Data Lines Circuit (2 of 2)

COOLING FAN



280960

Fig. 10: Cooling Fan Circuit

CRUISE CONTROL

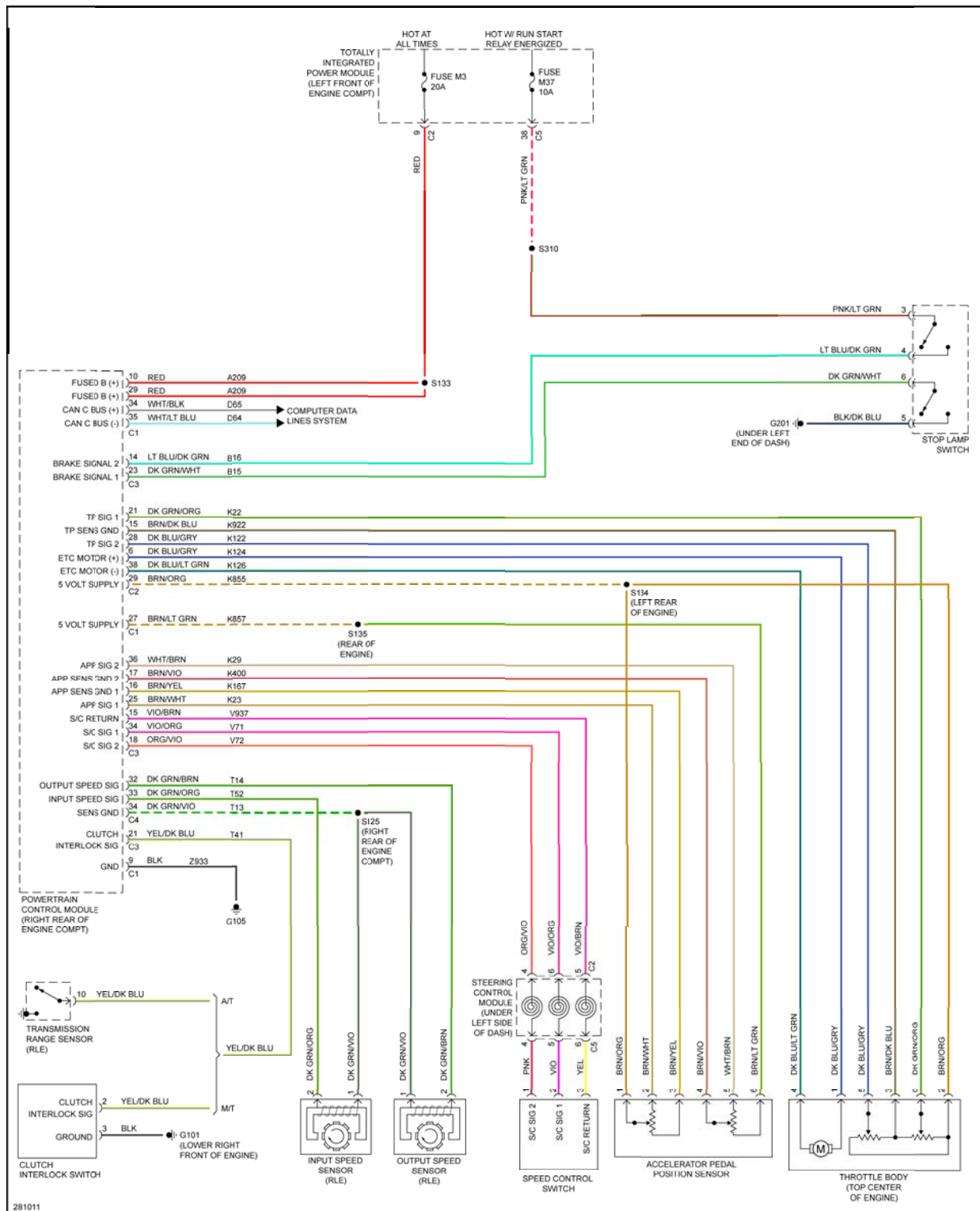


Fig. 11: Cruise Control Circuit

DEFOGGERS



ELECTRONIC POWER STEERING

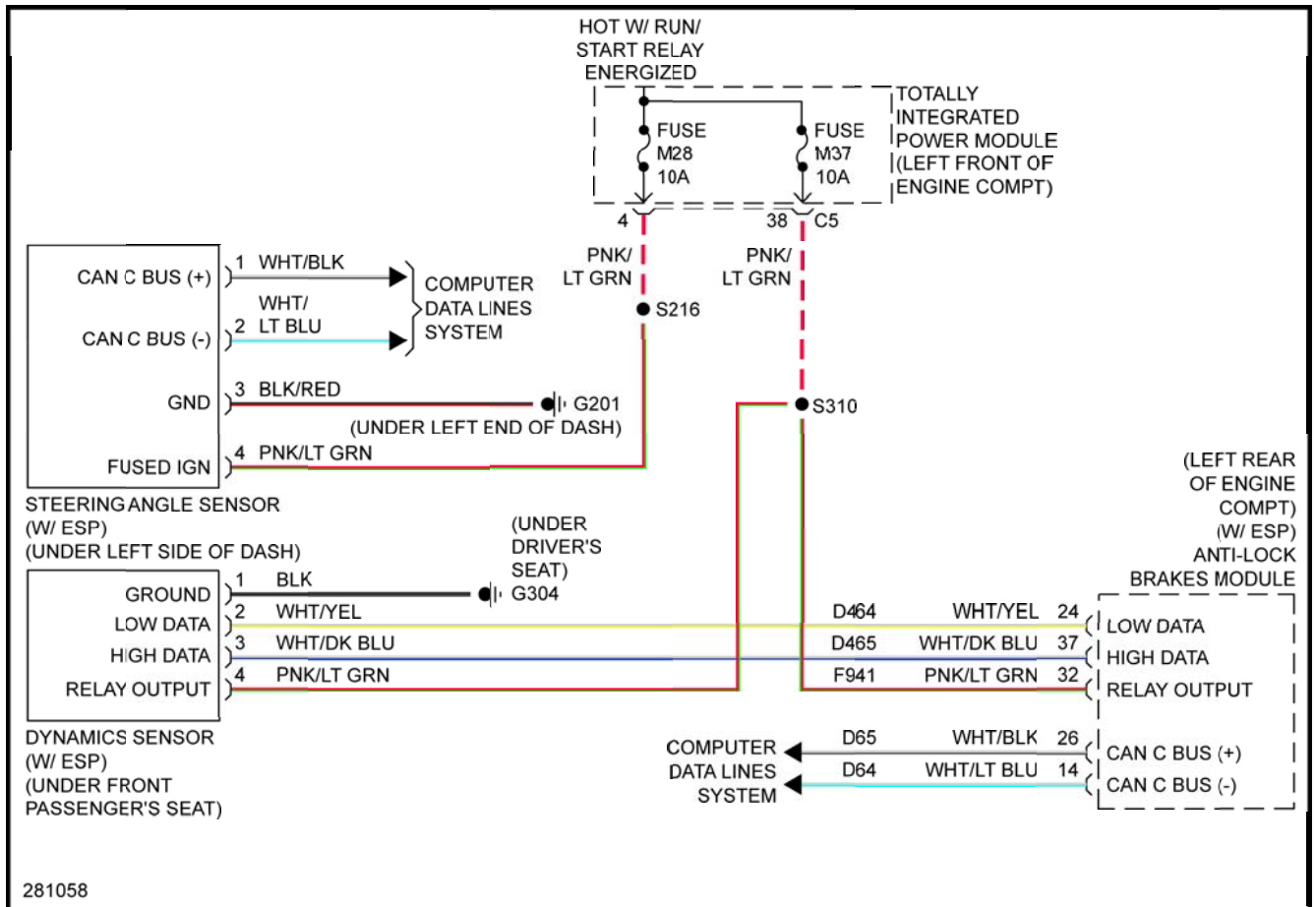


Fig. 13: Electronic Power Steering Circuit

ENGINE PERFORMANCE

3.7L

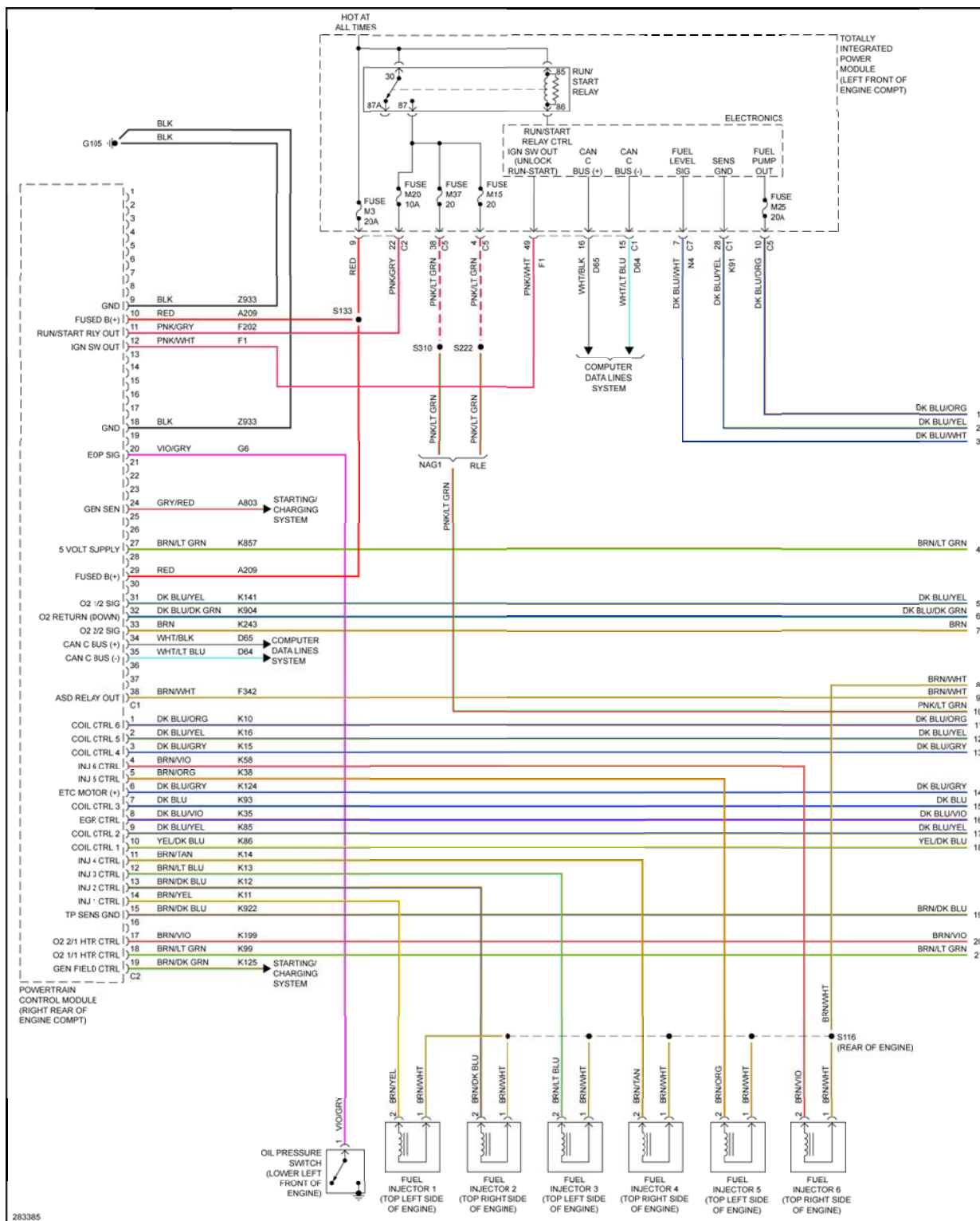


Fig. 14: 3.7L, Engine Performance Circuit (1 of 5)

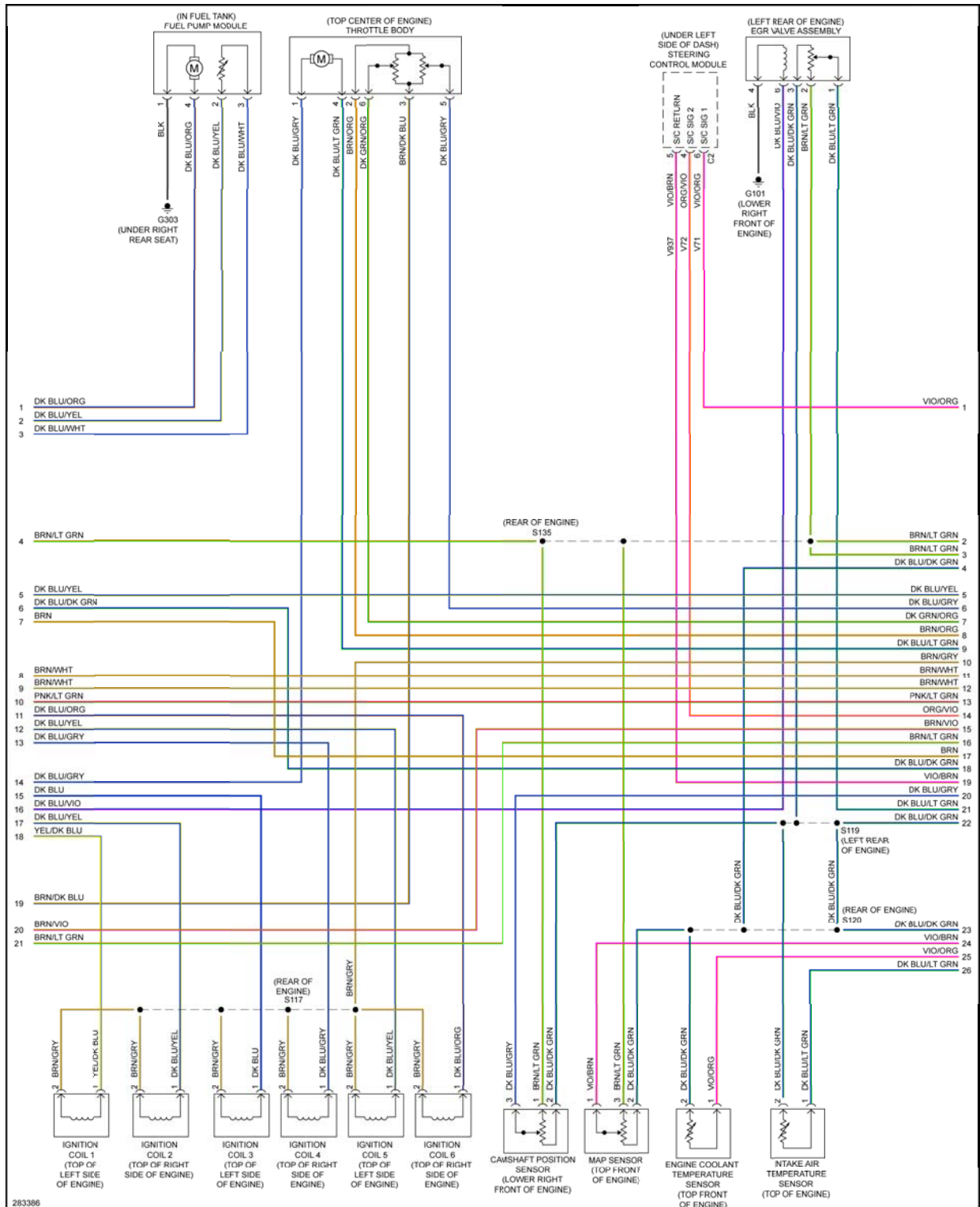


Fig. 15: 3.7L, Engine Performance Circuit (2 of 5)



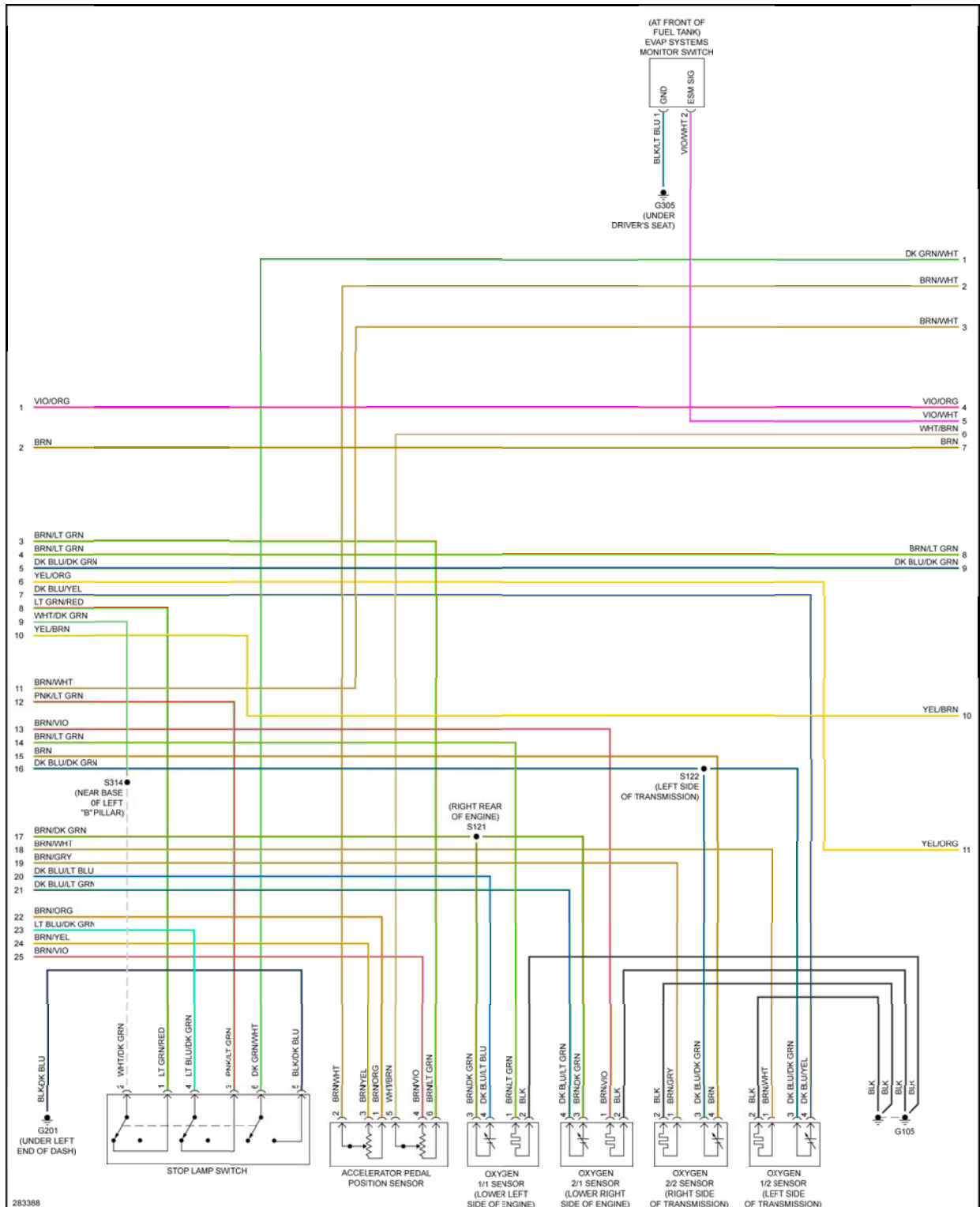


Fig. 17: 3.7L, Engine Performance Circuit (4 of 5)

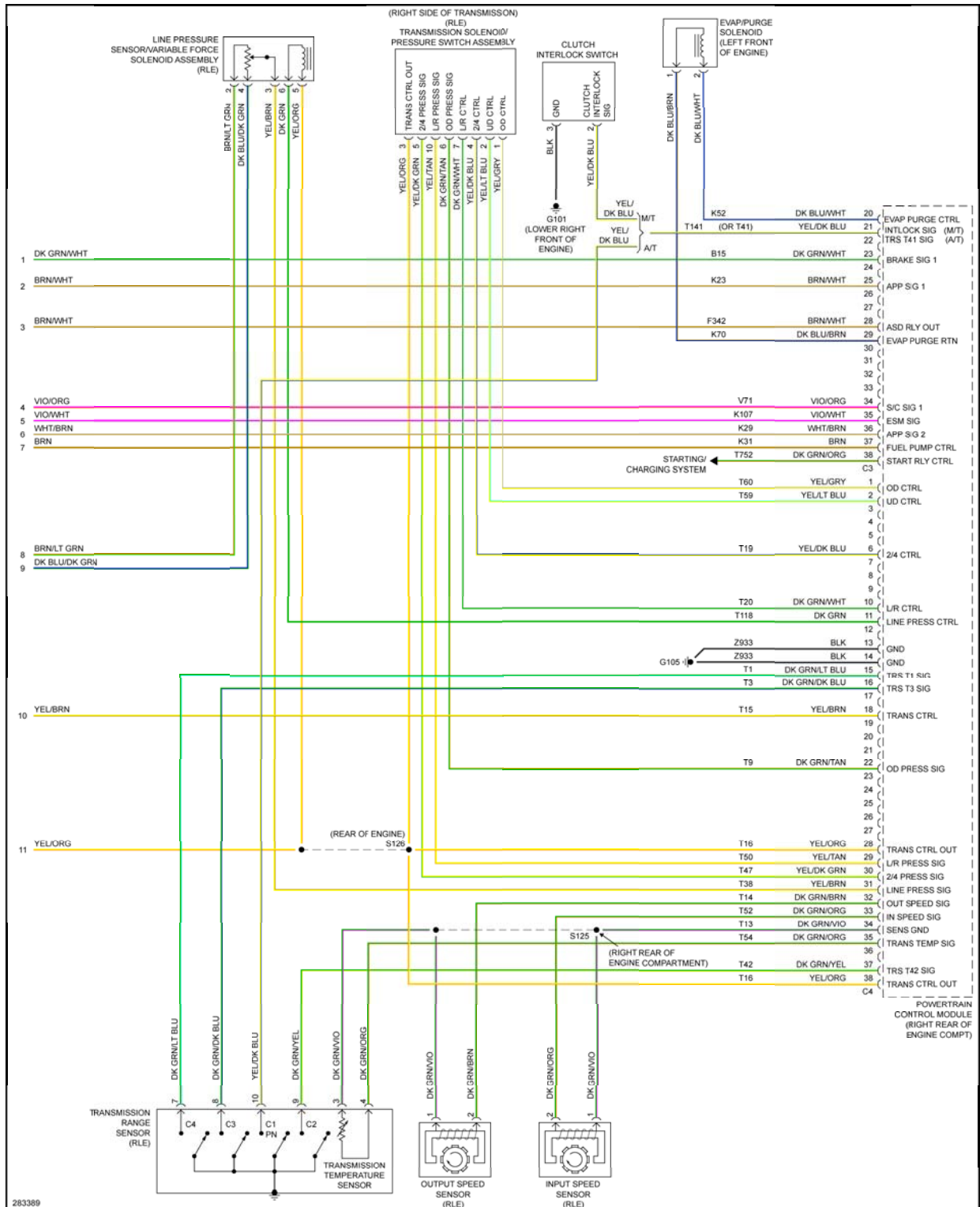


Fig. 18: 3.7L, Engine Performance Circuit (5 of 5)

EXTERIOR LIGHTS

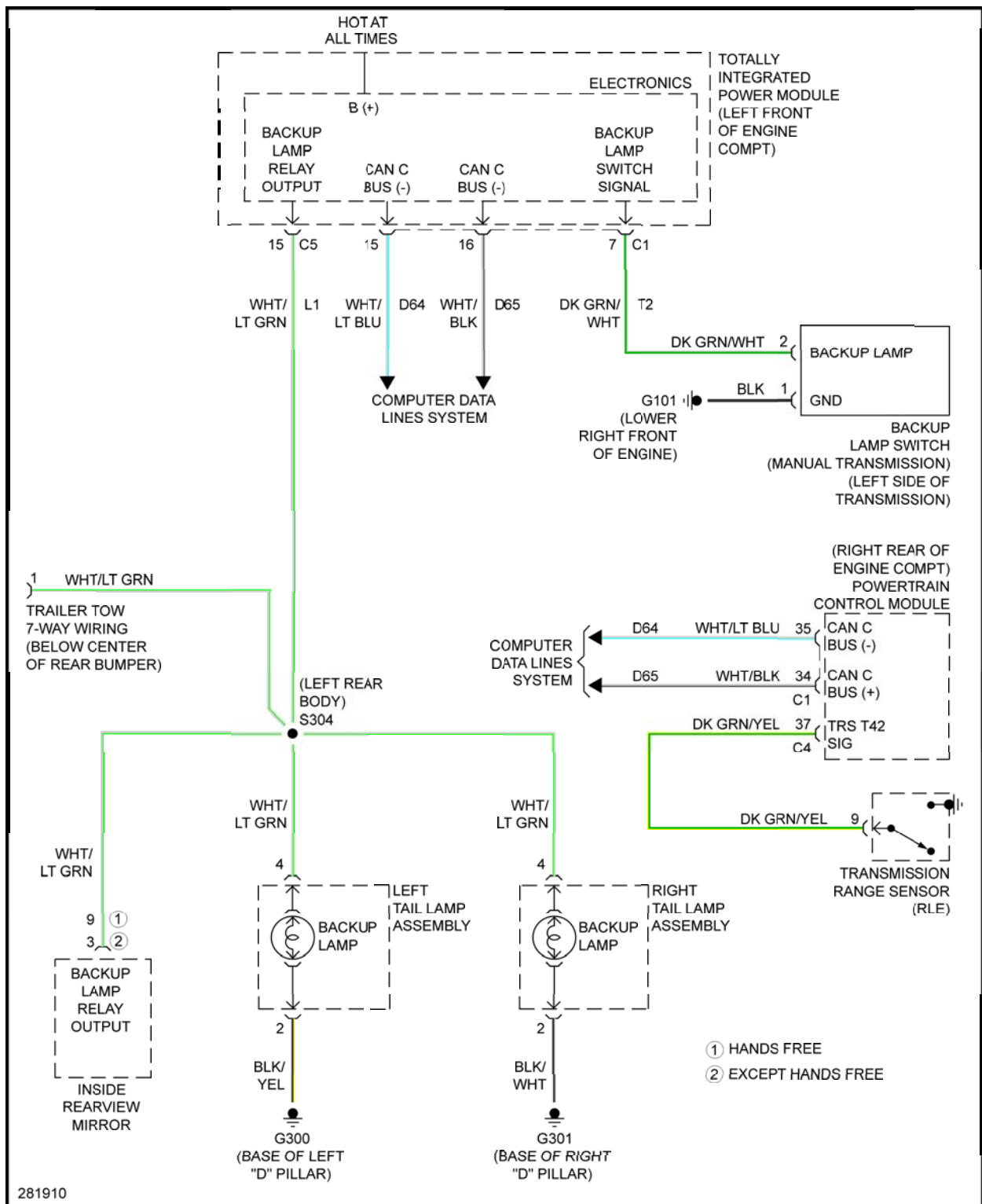


Fig. 19: Backup Lamps Circuit

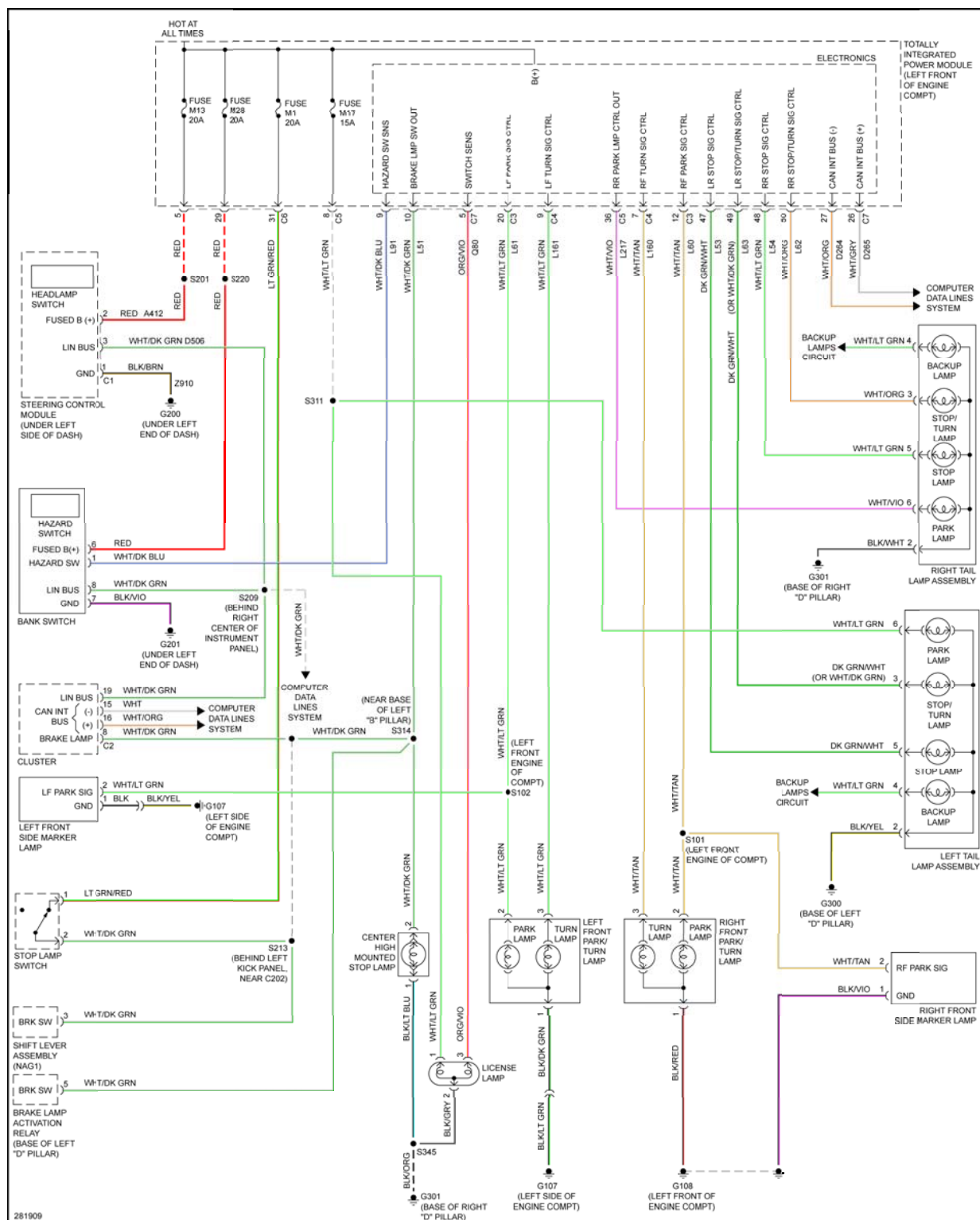
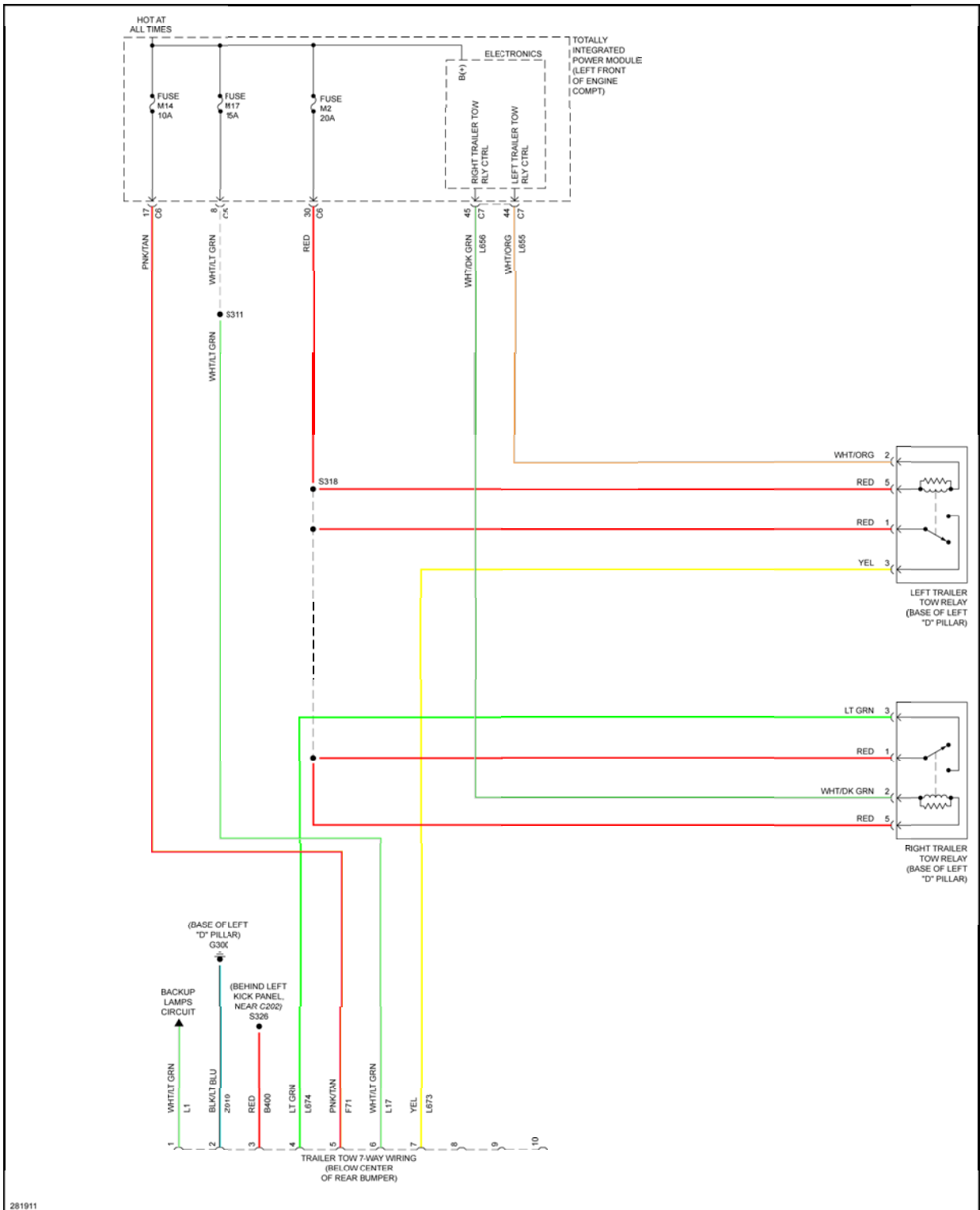


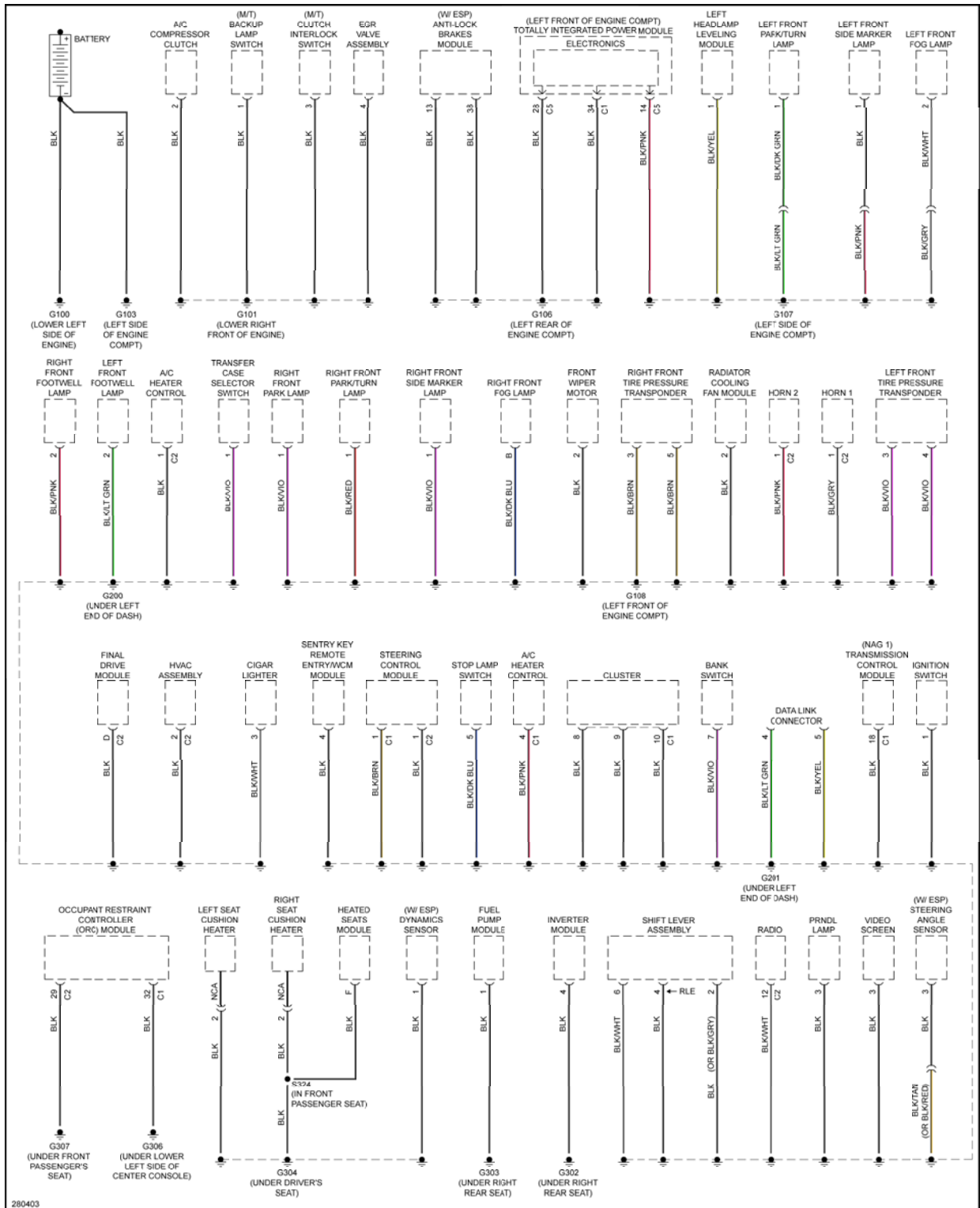
Fig. 20: Exterior Lamps Circuit



281911

Fig. 21: Trailer Tow Circuit

GROUND DISTRIBUTION



280403

Fig. 22: Ground Distribution Circuit (1 of 2)

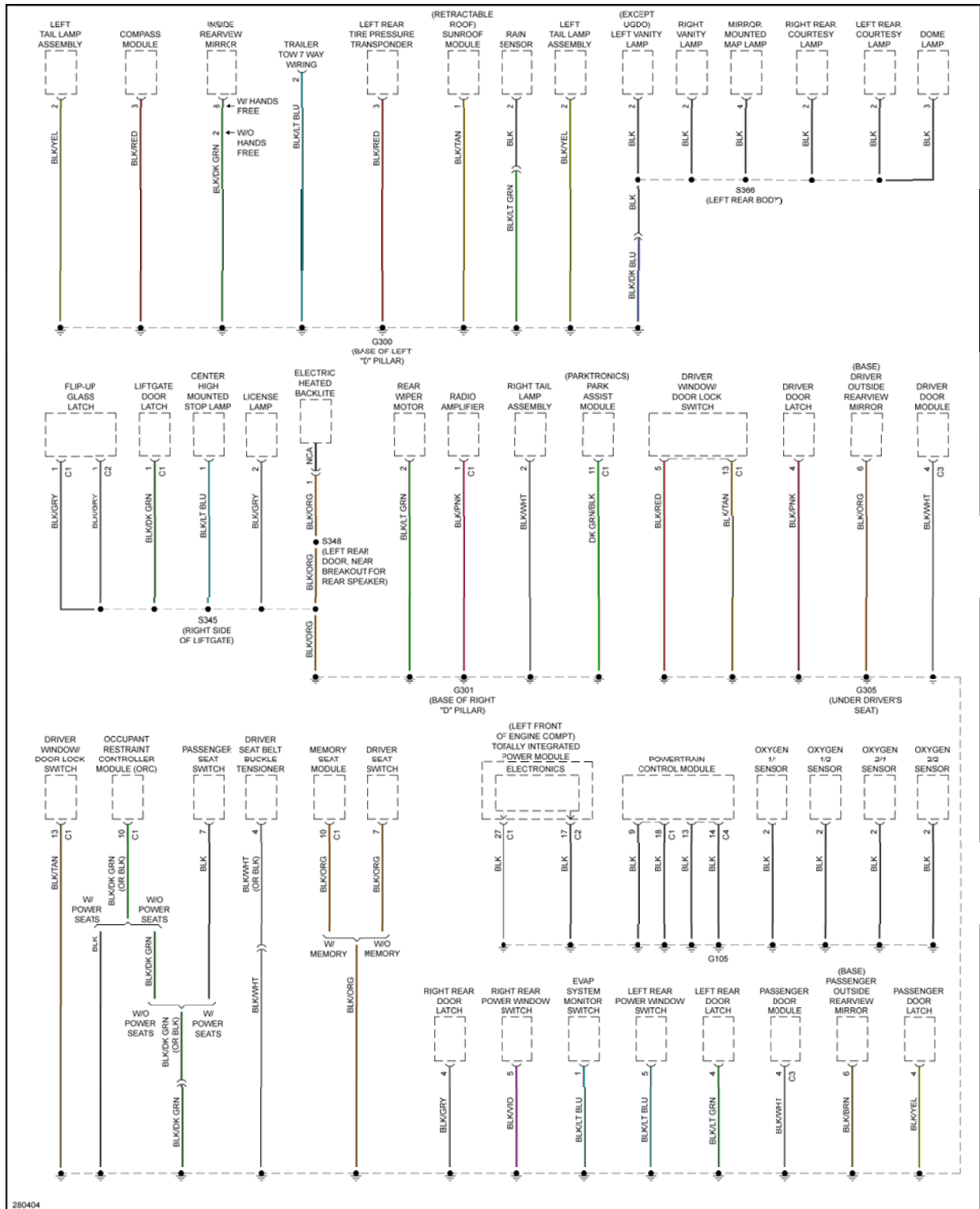


Fig. 23: Ground Distribution Circuit (2 of 2)

HEADLIGHTS

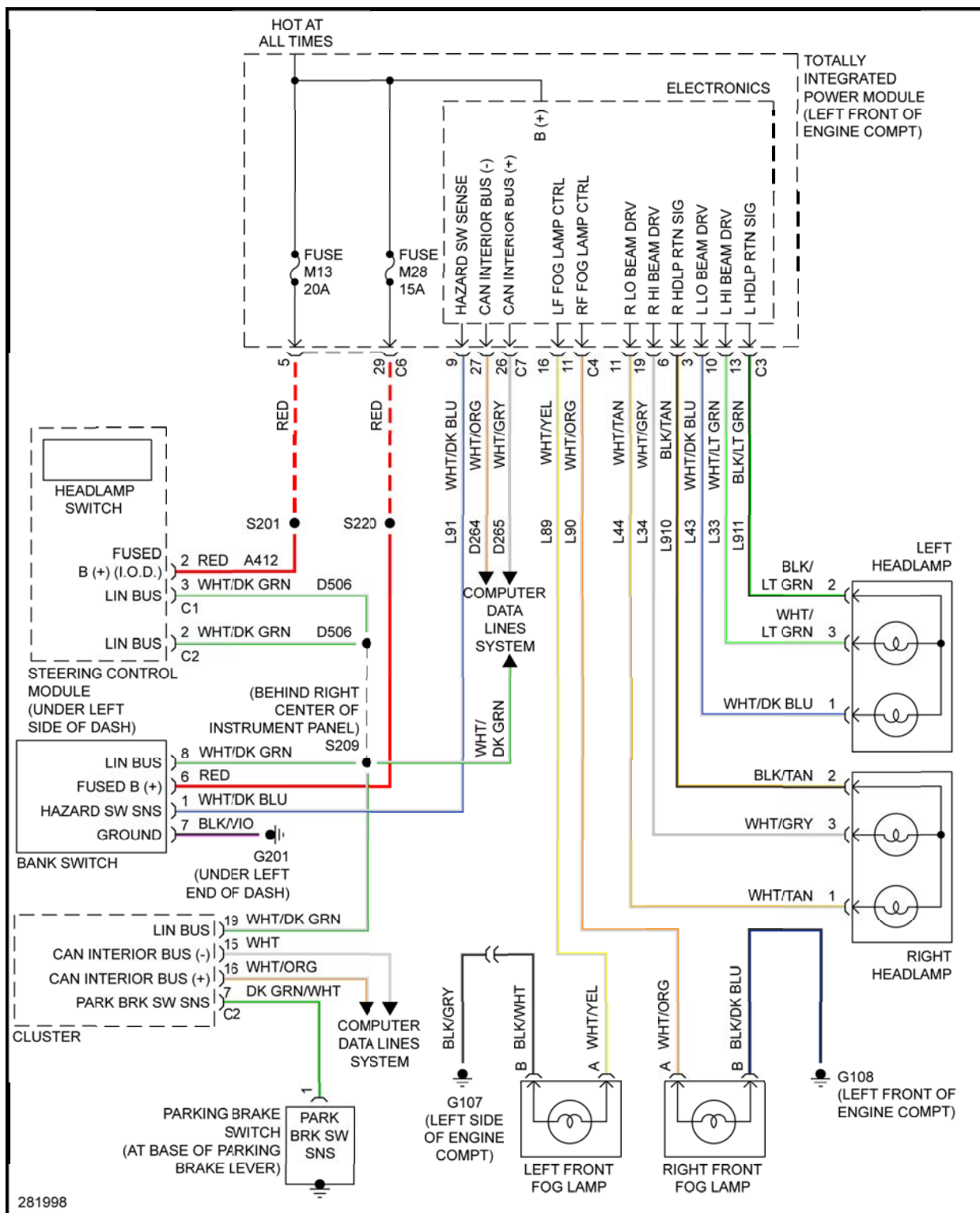


Fig. 24: Headlights Circuit

HORN

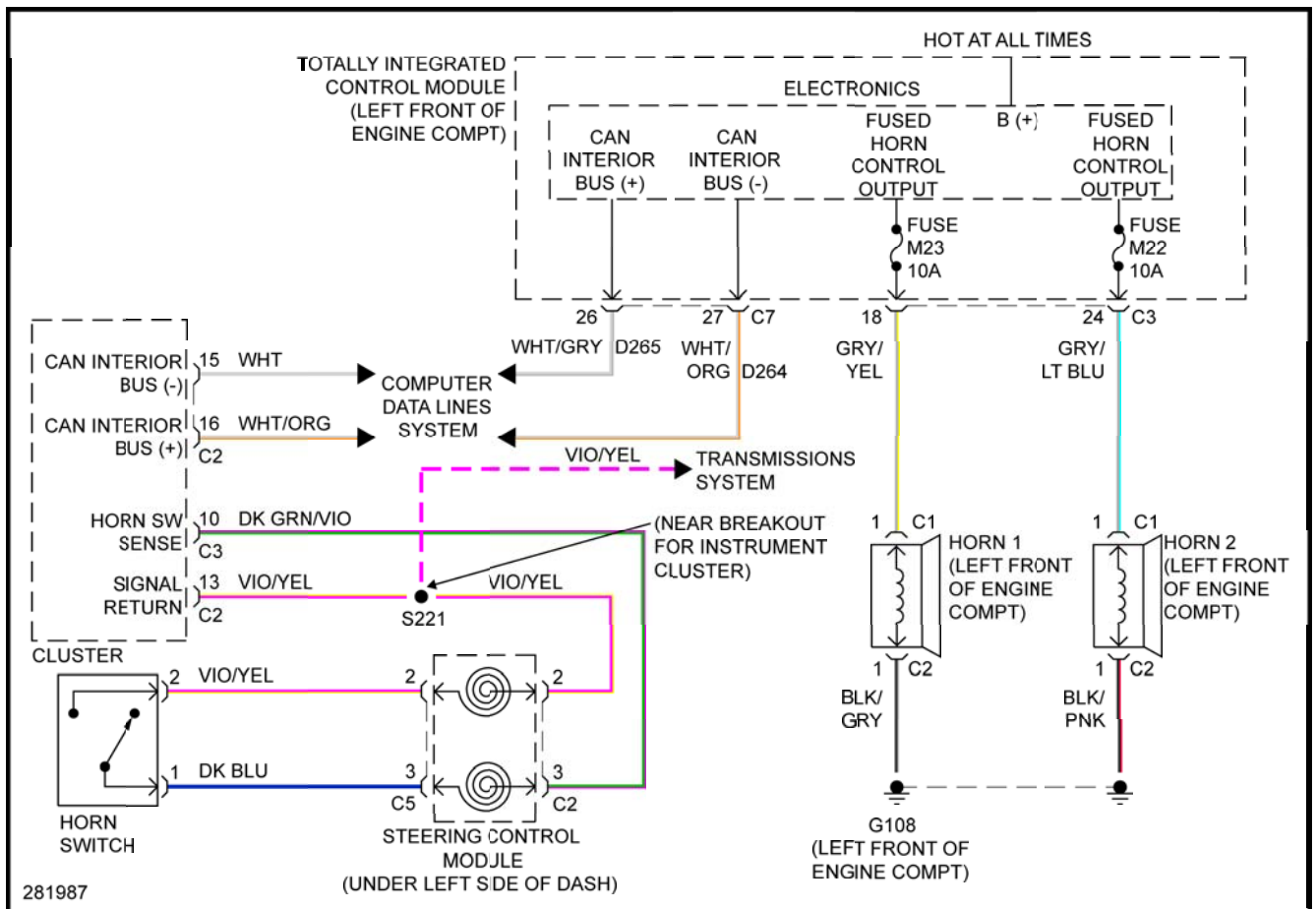


Fig. 25: Horn Circuit

INSTRUMENT CLUSTER

INTERIOR LIGHTS

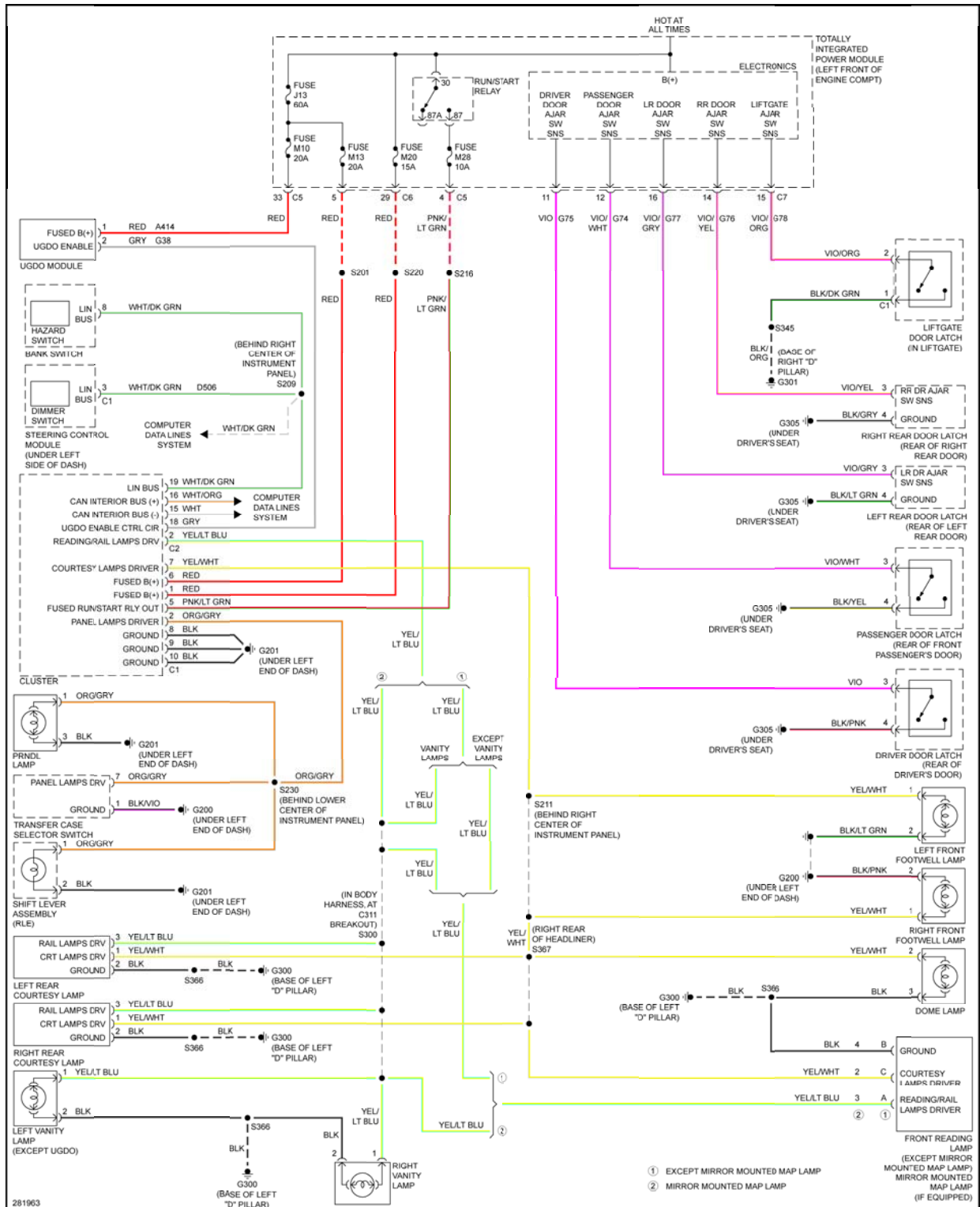
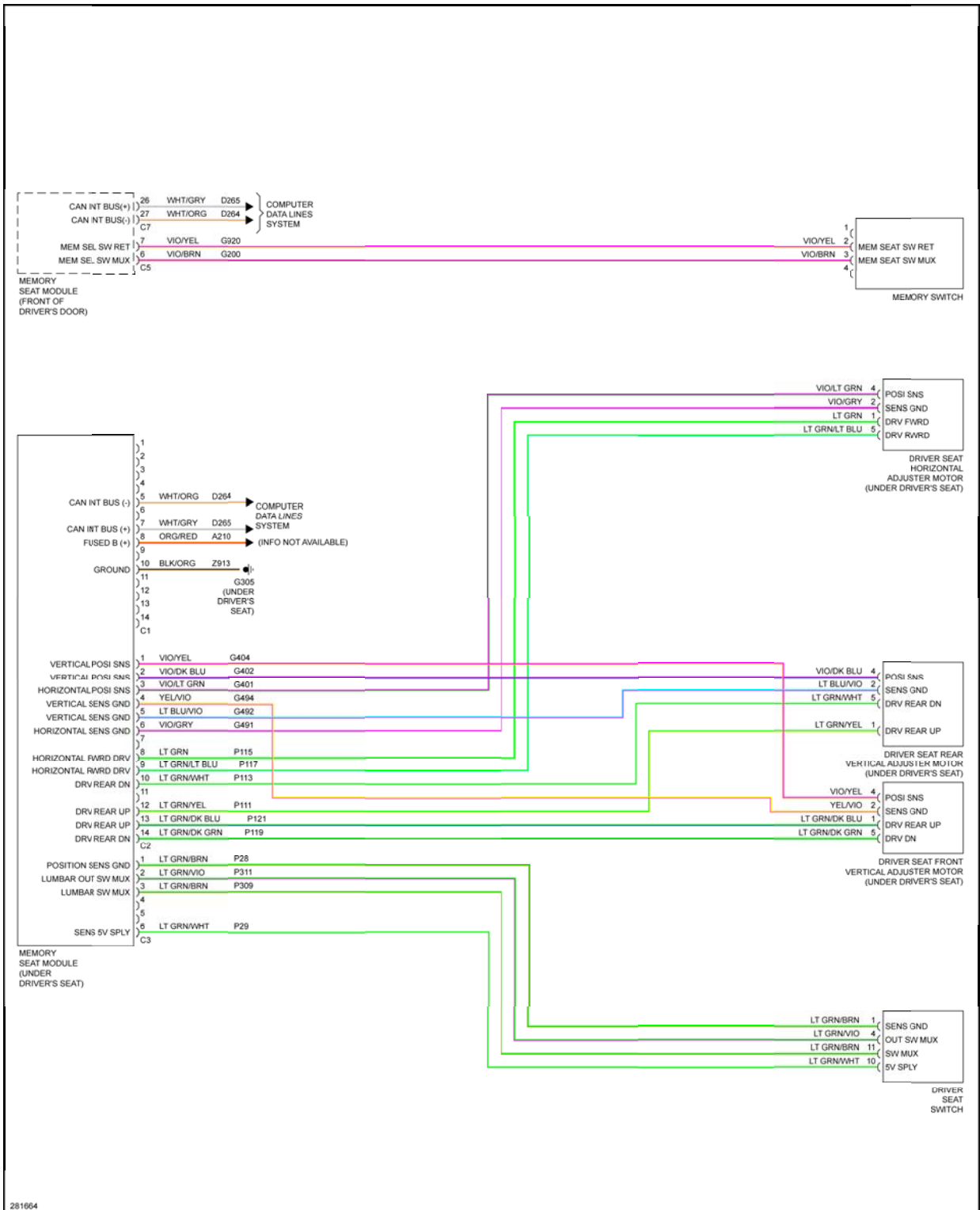


Fig. 27: Interior Lights Circuit

MEMORY SYSTEMS



281664

Fig. 28: Memory Systems Circuit

NAVIGATION

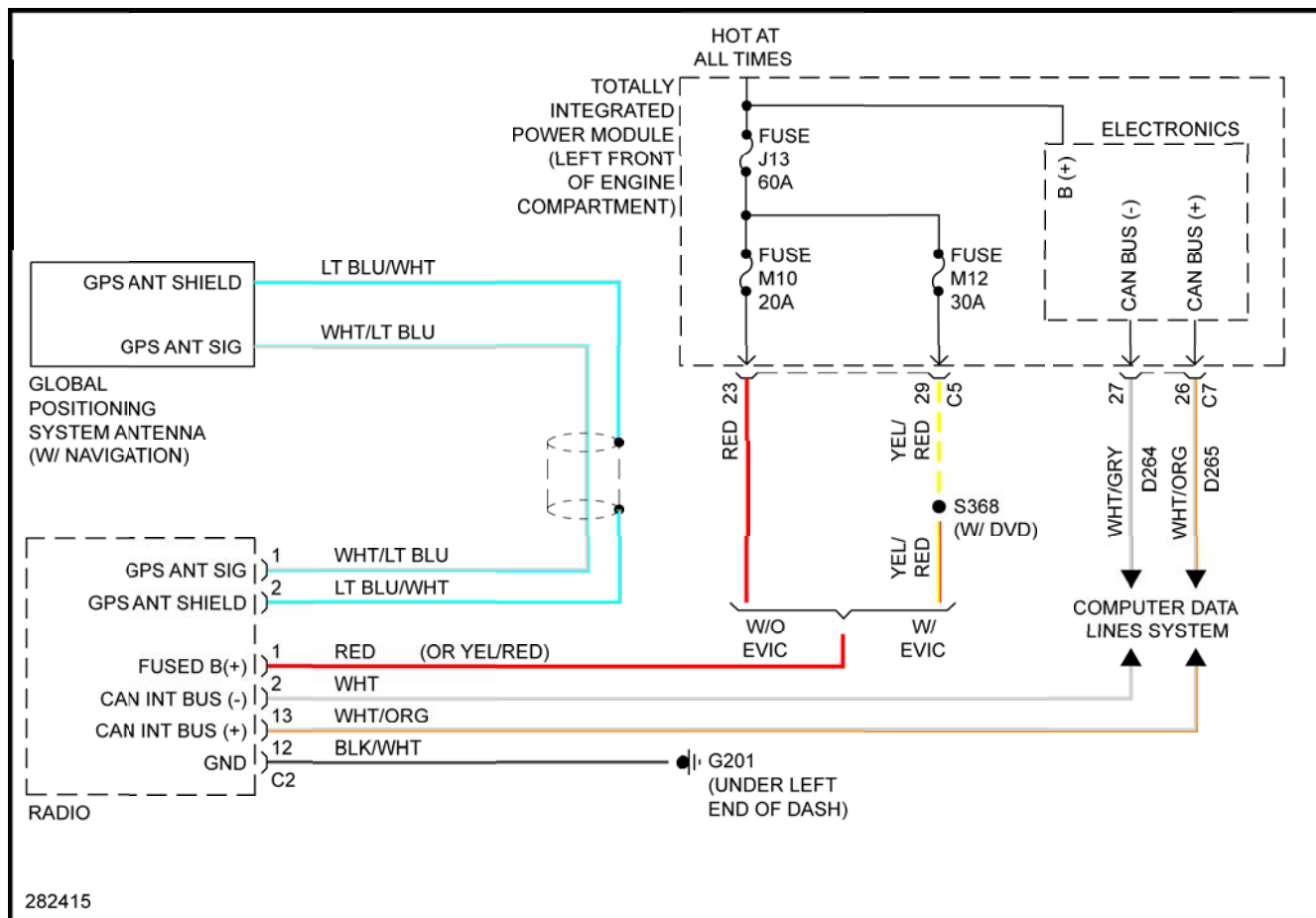


Fig. 29: Navigation Circuit

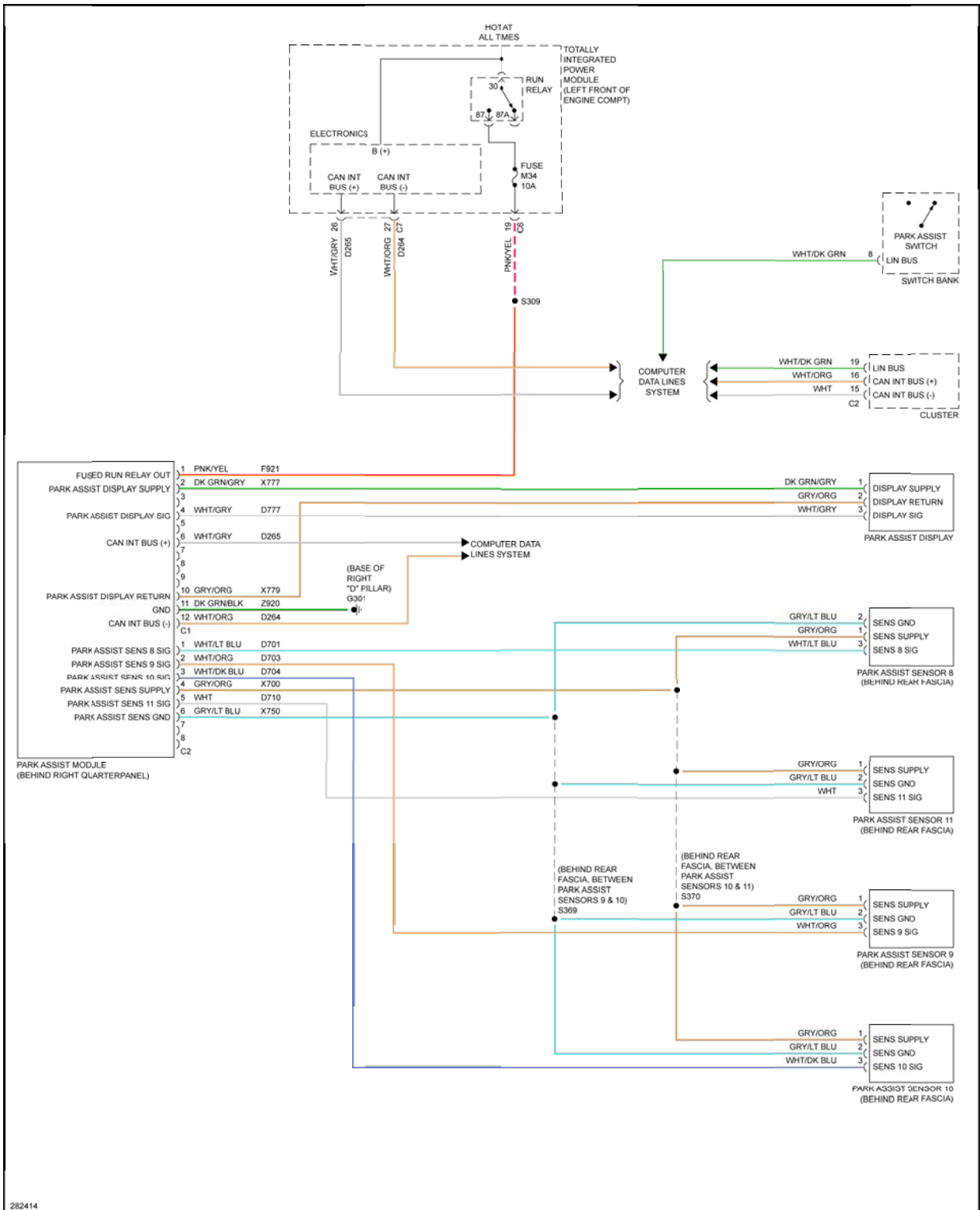
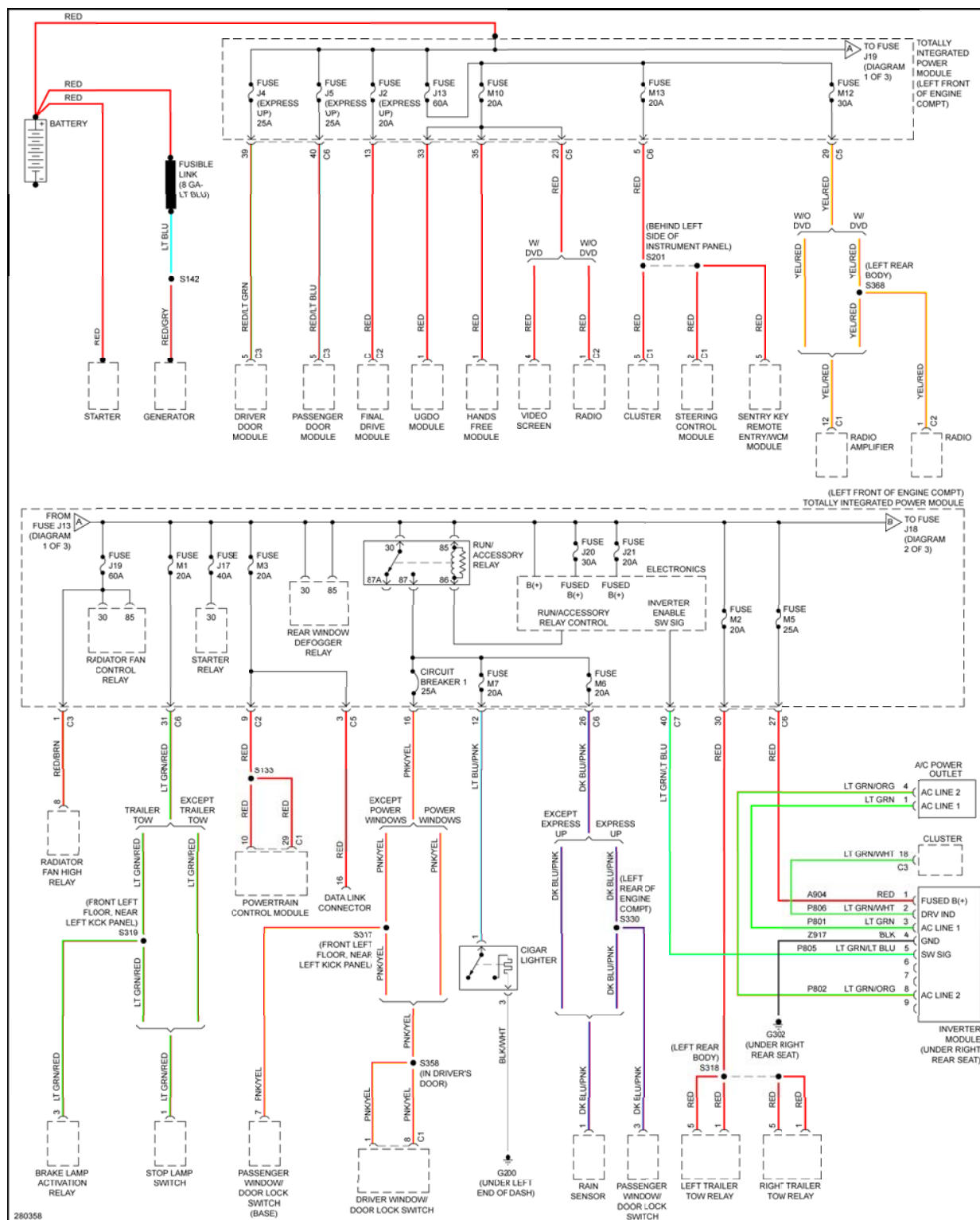


Fig. 30: Parking Assistant Circuit

POWER DISTRIBUTION







POWER DOOR LOCKS

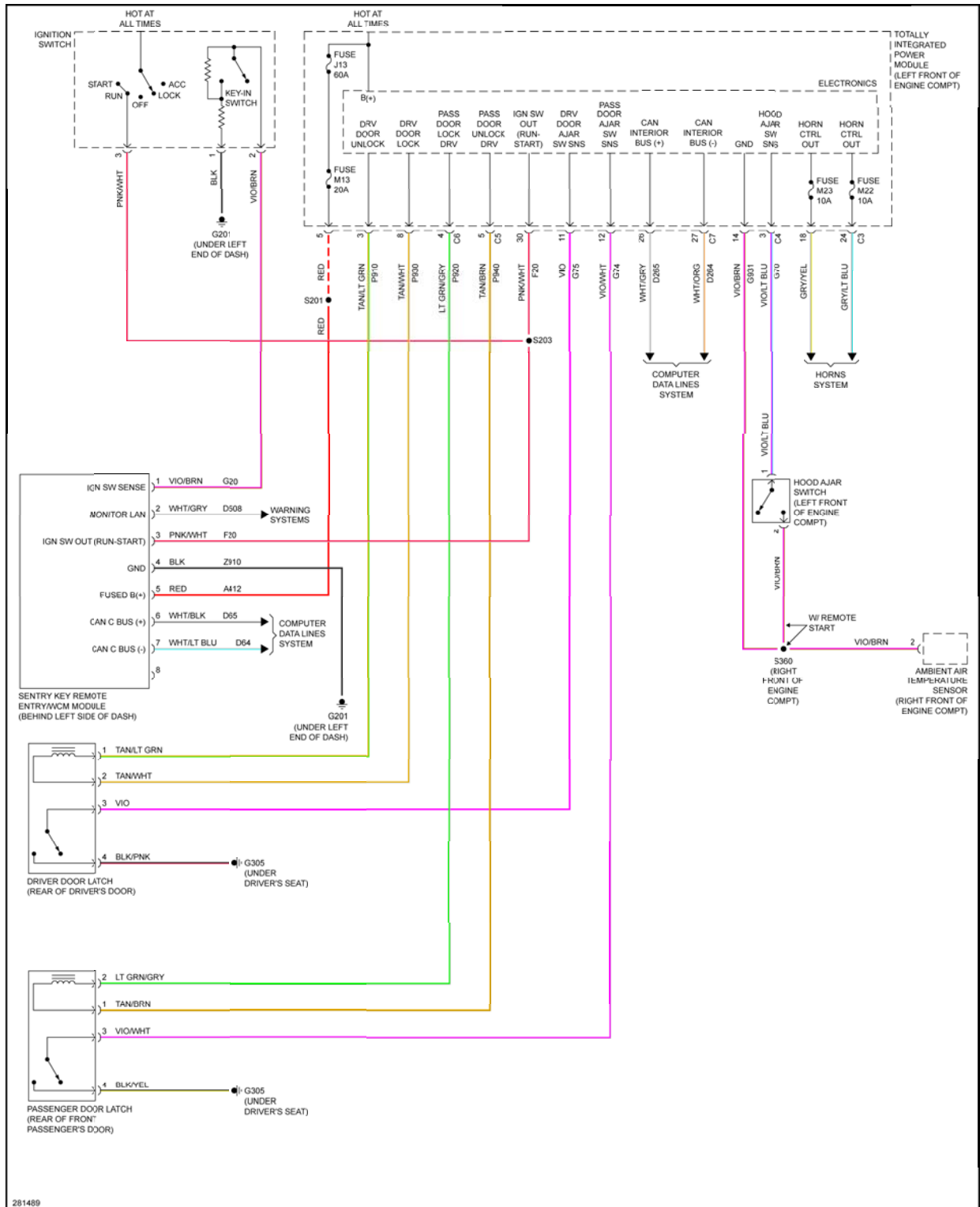


Fig. 34: Power Door Locks Circuit (1 of 2)

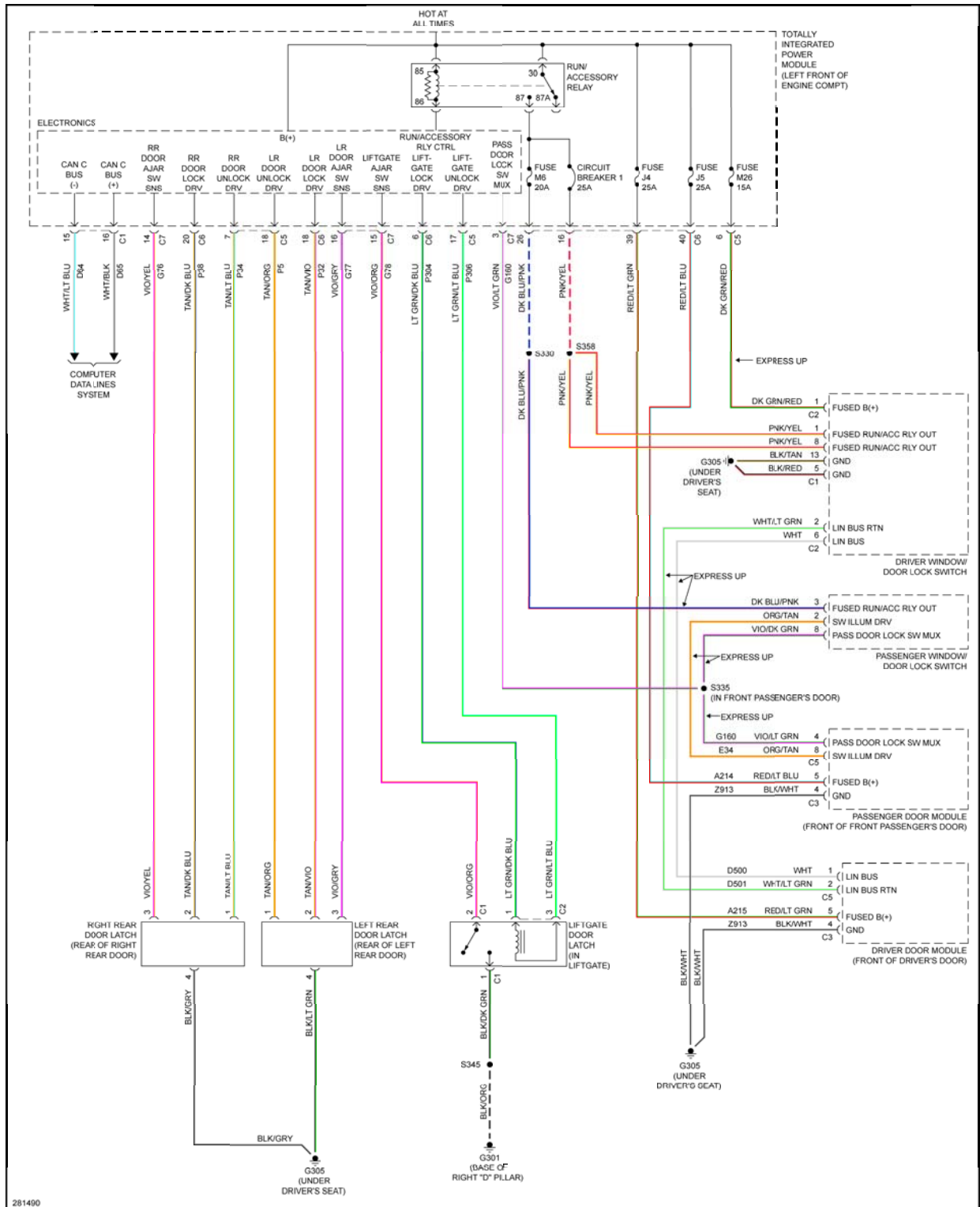
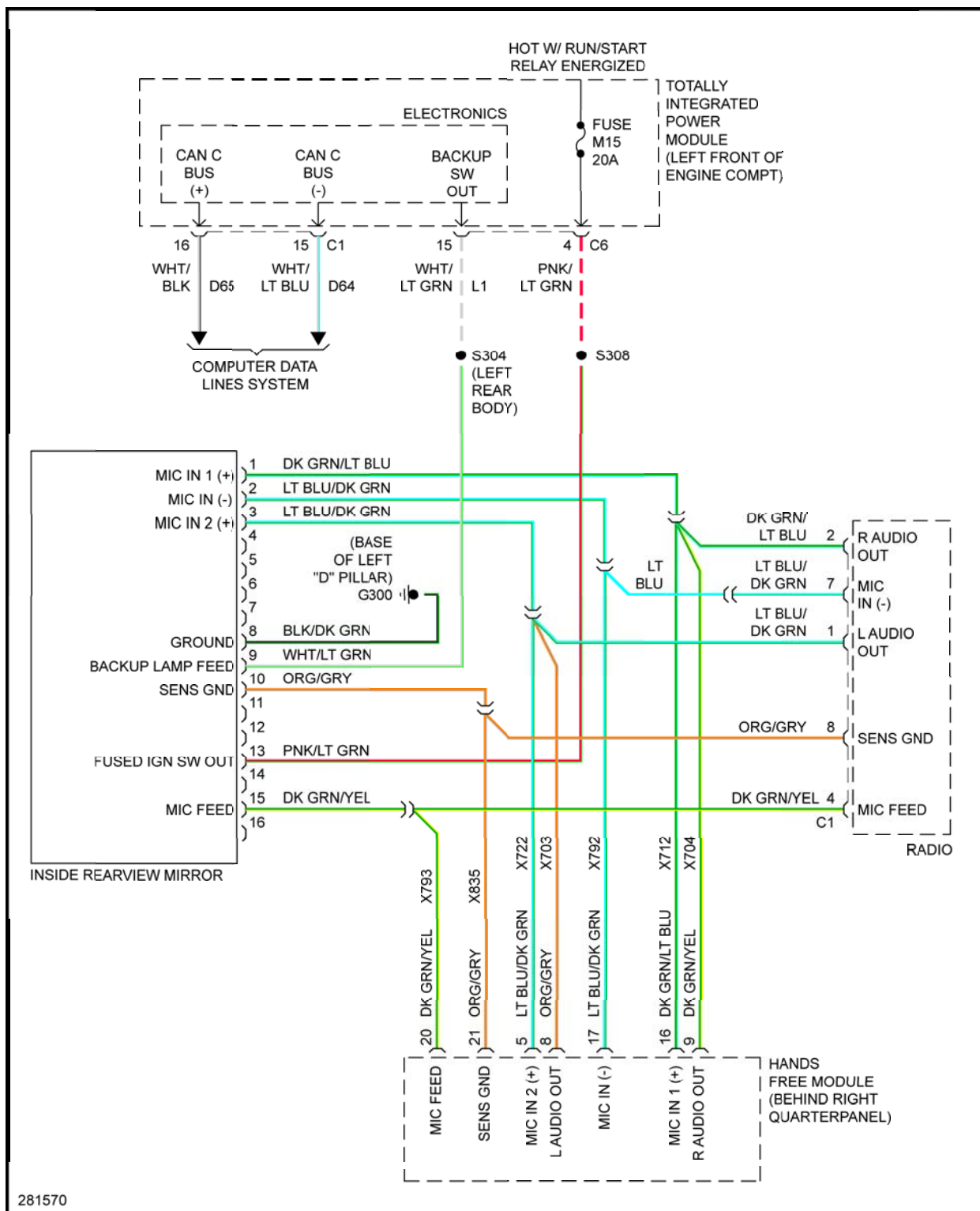


Fig. 35: Power Door Locks Circuit (2 of 2)

POWER MIRRORS



281570

Fig. 36: Automatic Day/Night Mirror Circuit, W/ Hands Free

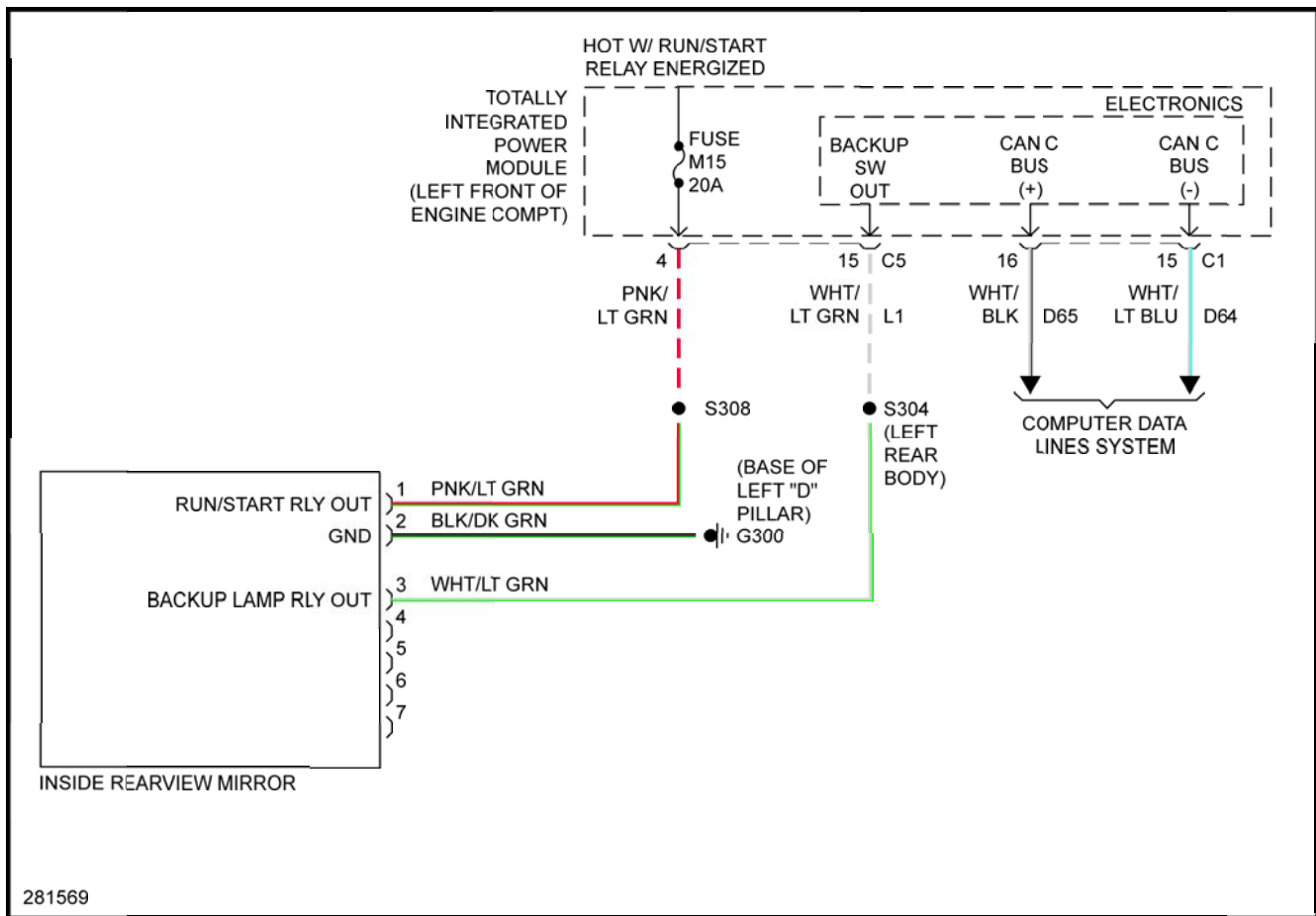


Fig. 37: Automatic Day/Night Mirror Circuit, W/O Hands Free

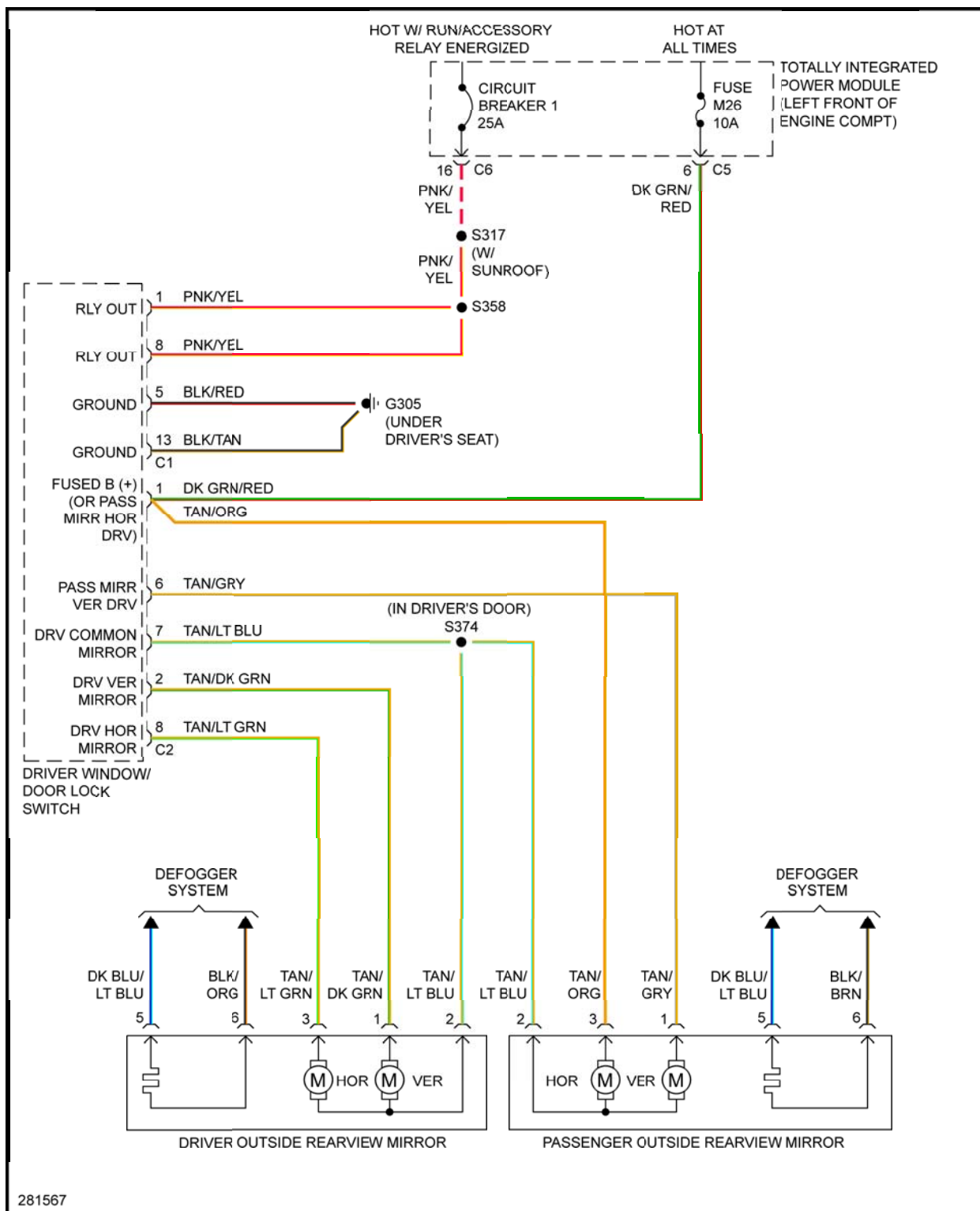


Fig. 38: Power Mirrors Circuit, Base

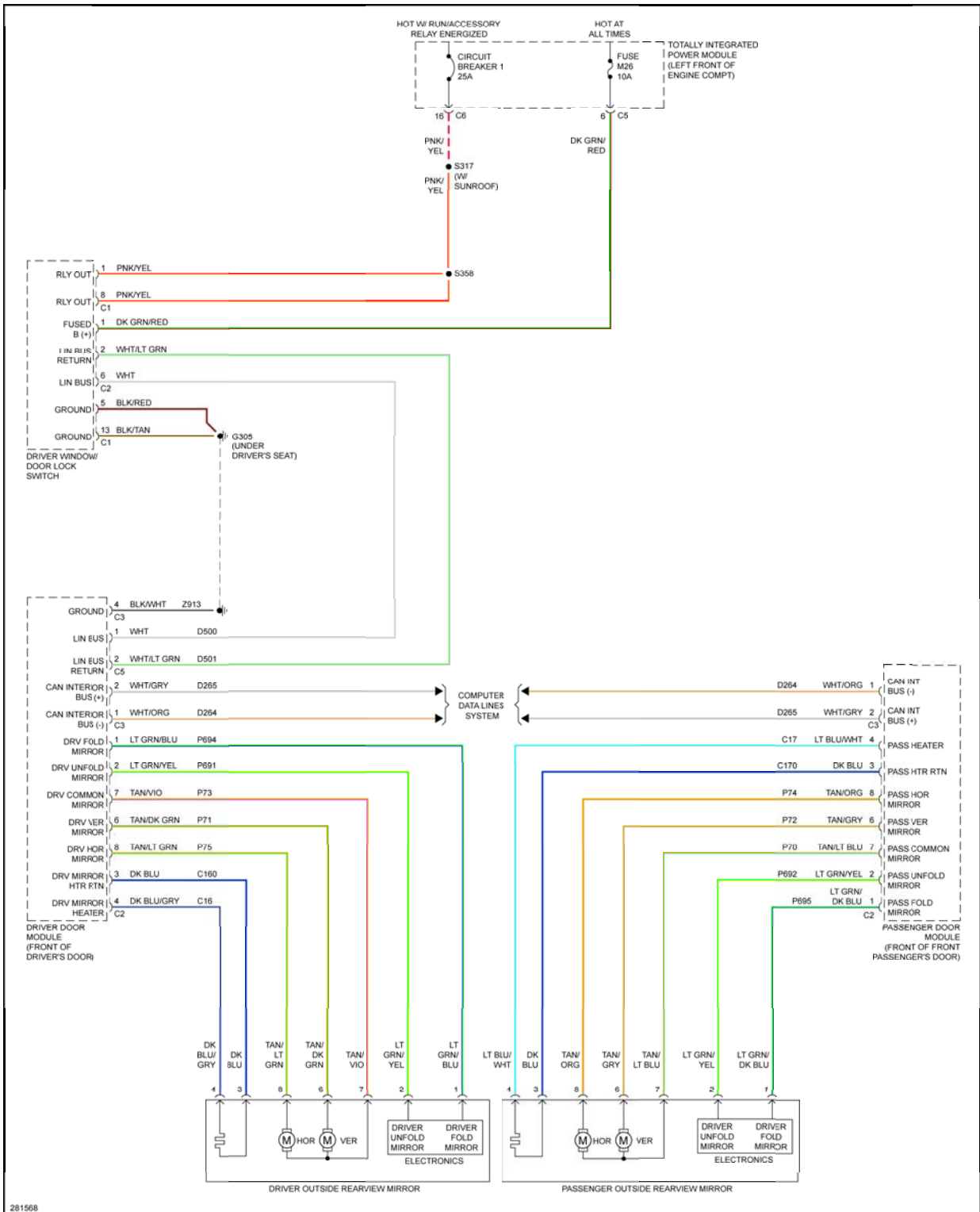


Fig. 39: Power Mirrors Circuit, Except Base

POWER SEATS

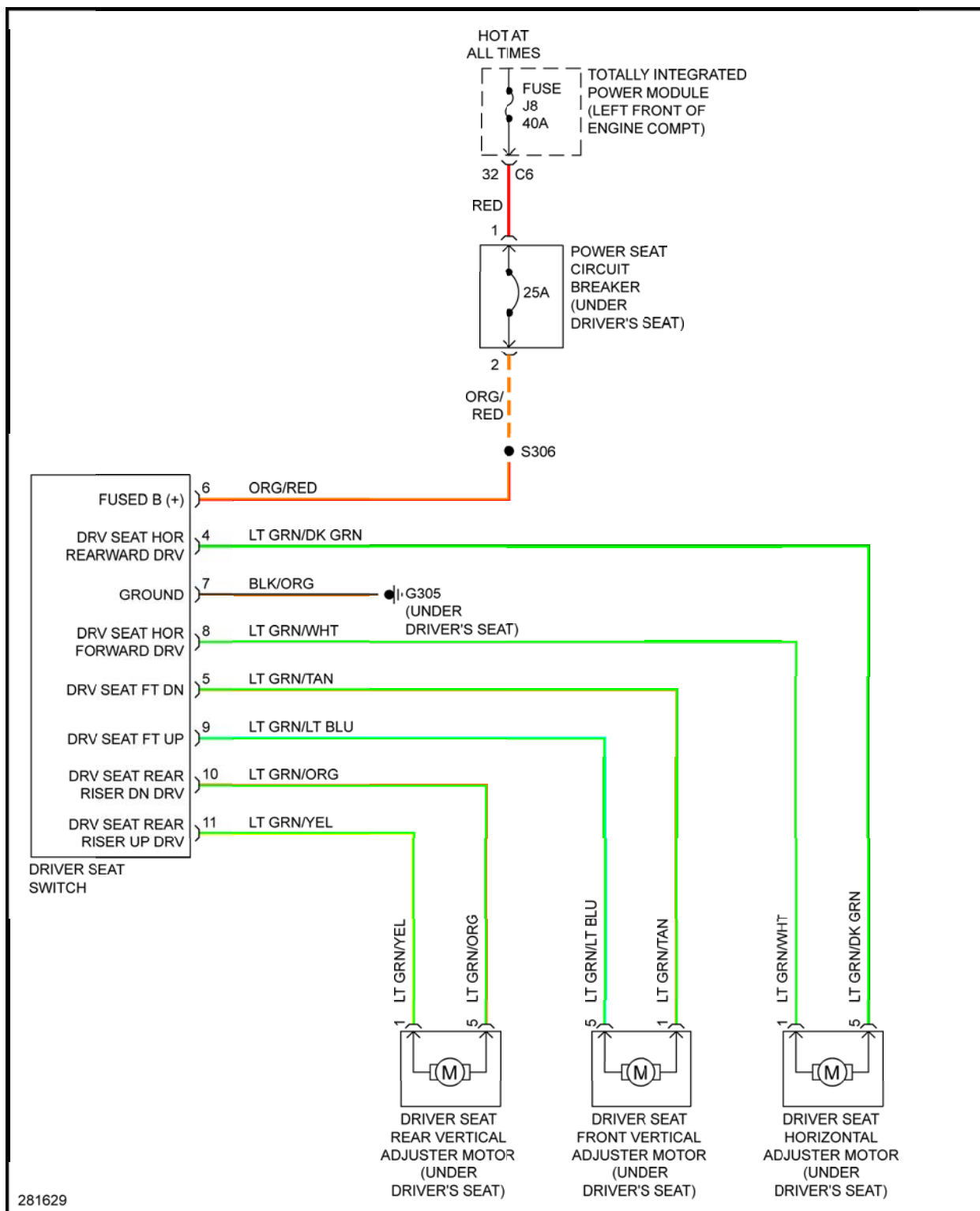


Fig. 40: Driver Power Seat Circuit

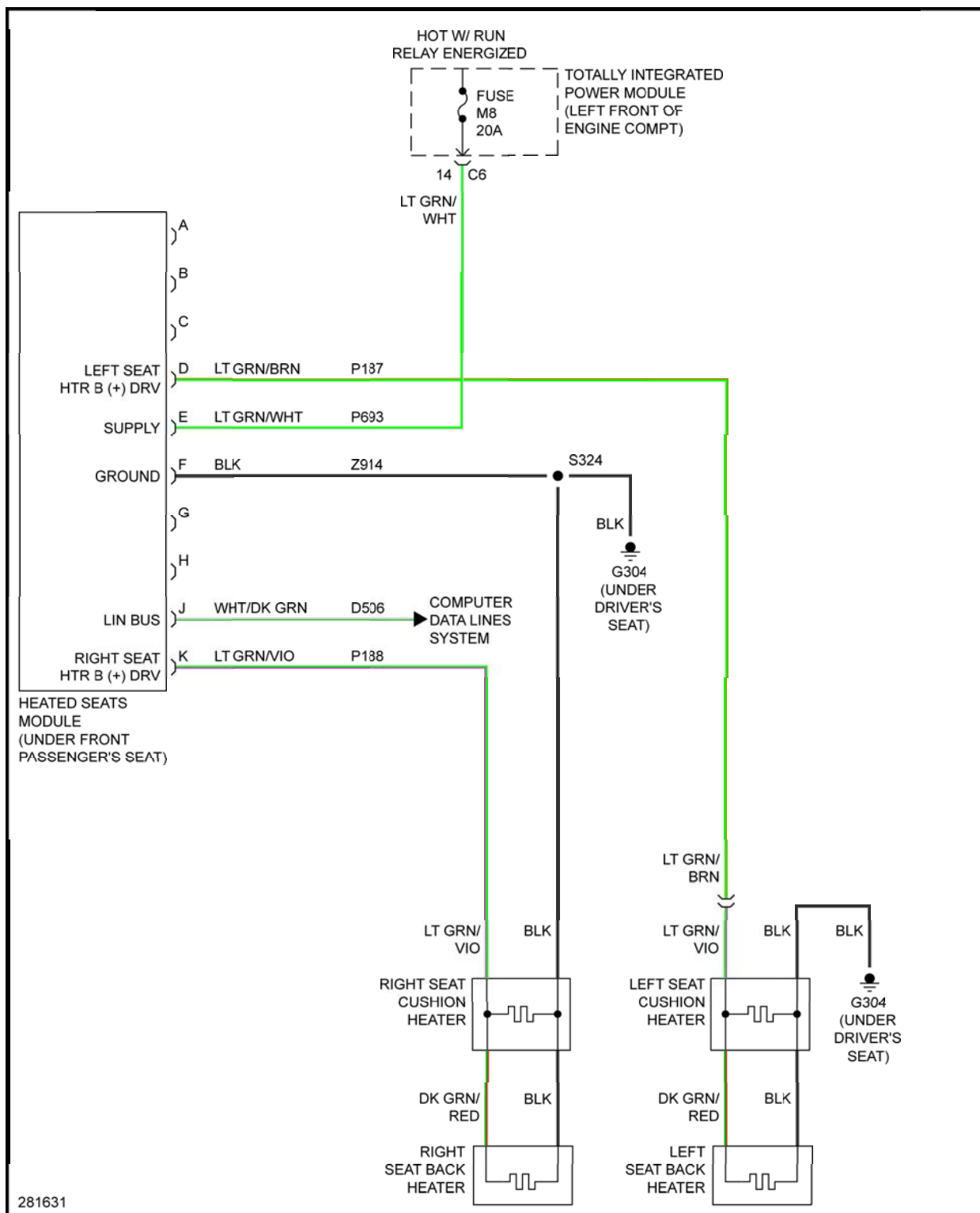


Fig. 41: Heated Seats Circuit

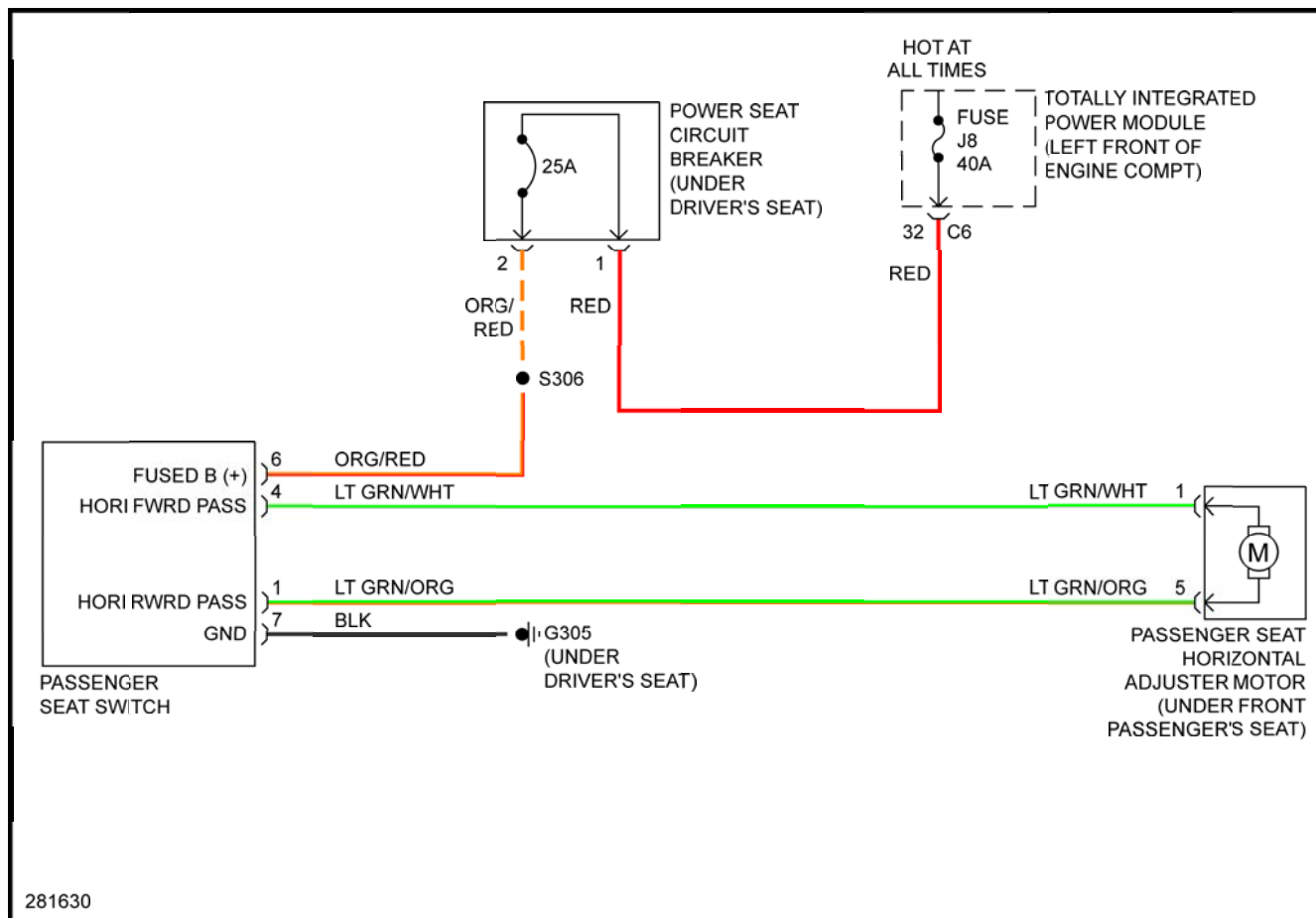
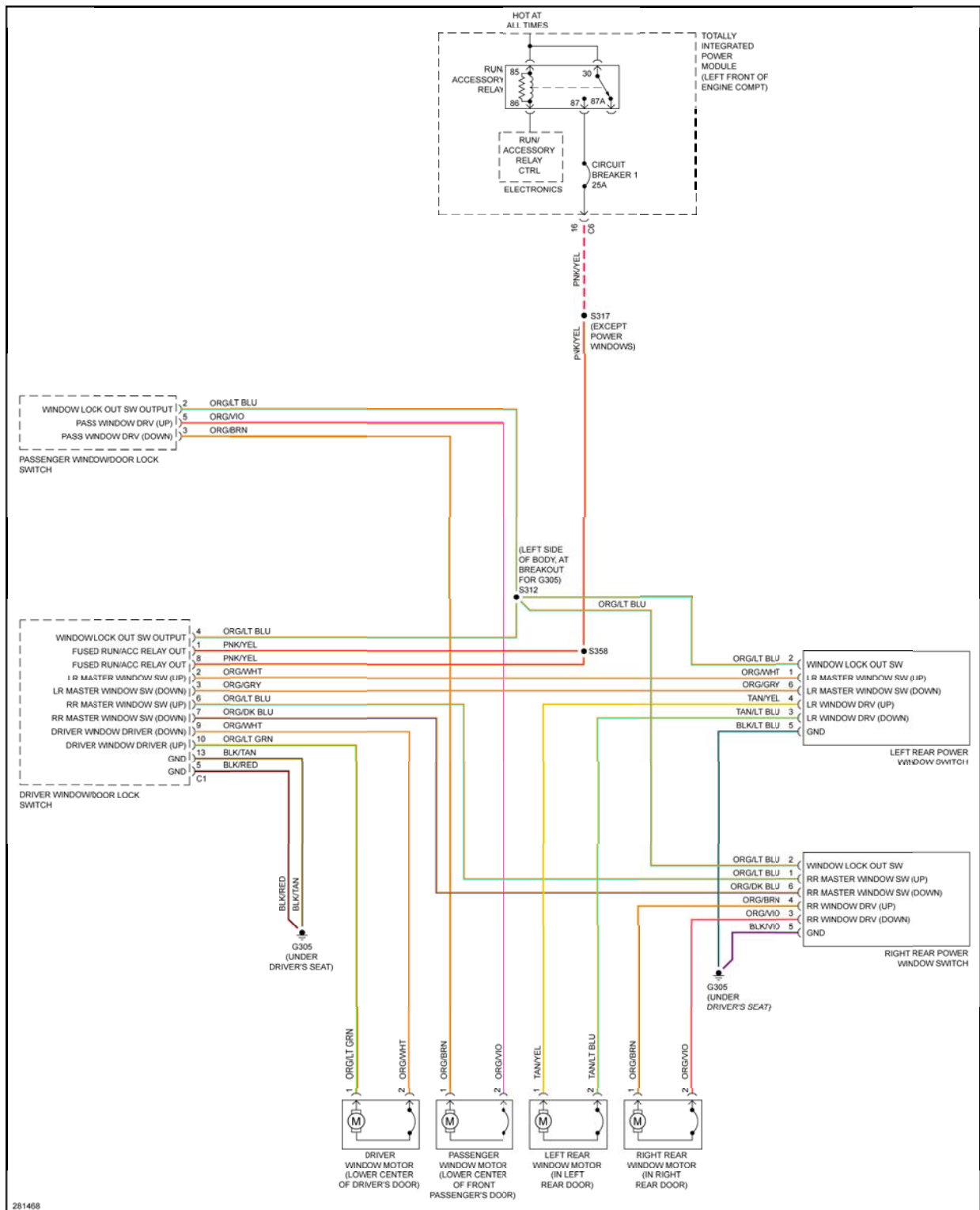


Fig. 42: Passenger Power Seat Circuit

POWER TOP/SUNROOF



POWER WINDOWS



281468

Fig. 44: Power Windows Circuit, Base

RADIO

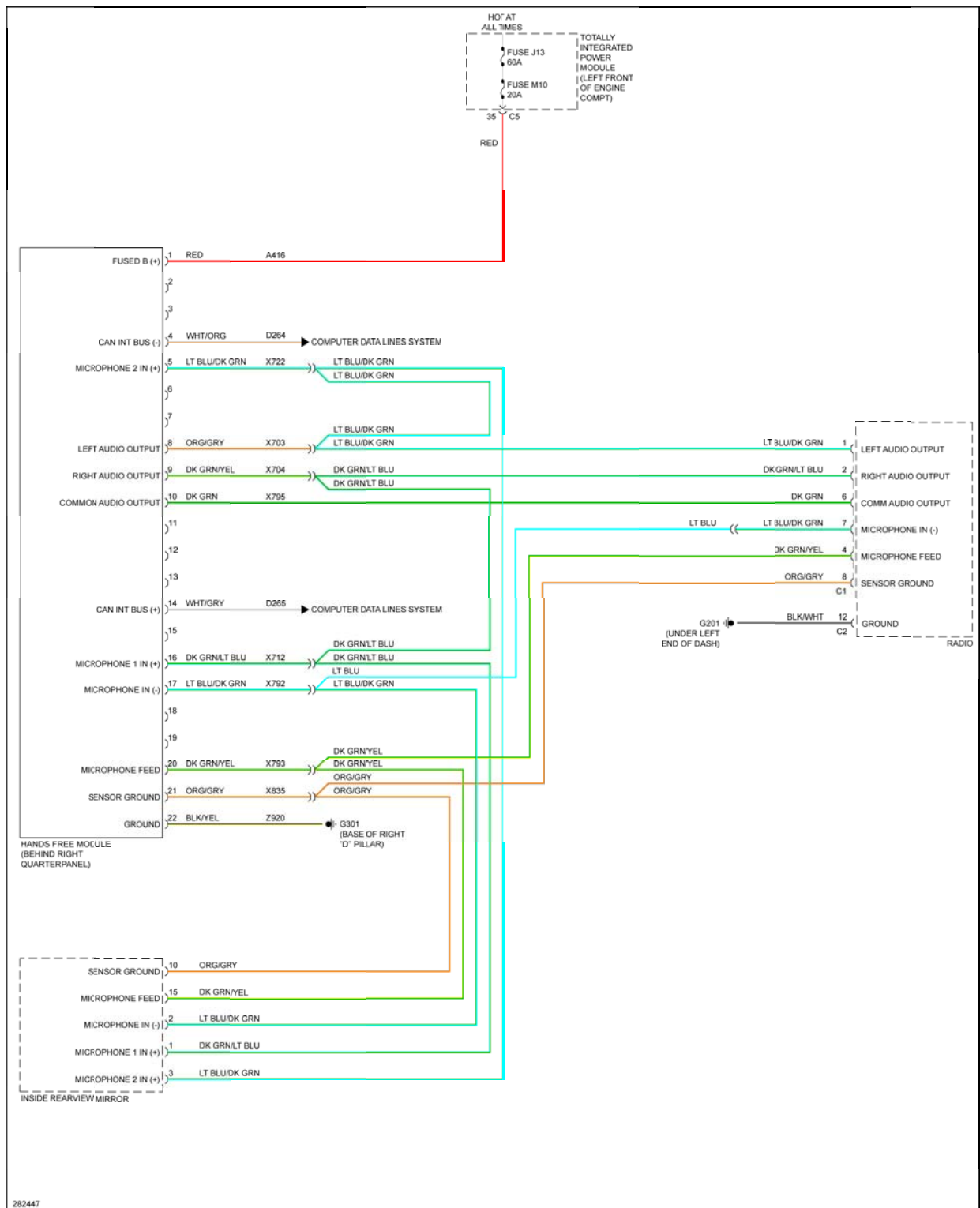


Fig. 46: Hands Free Module Circuit

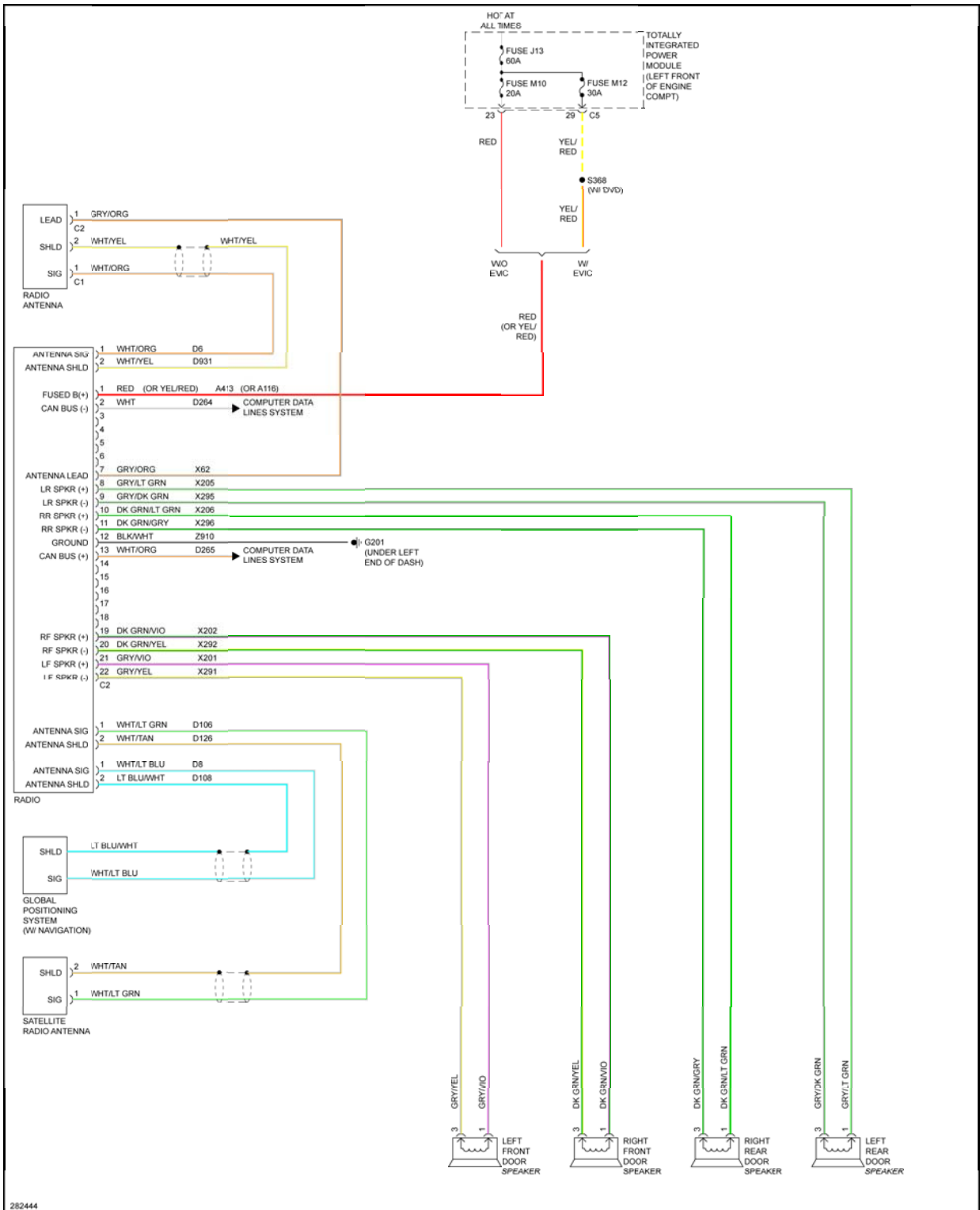
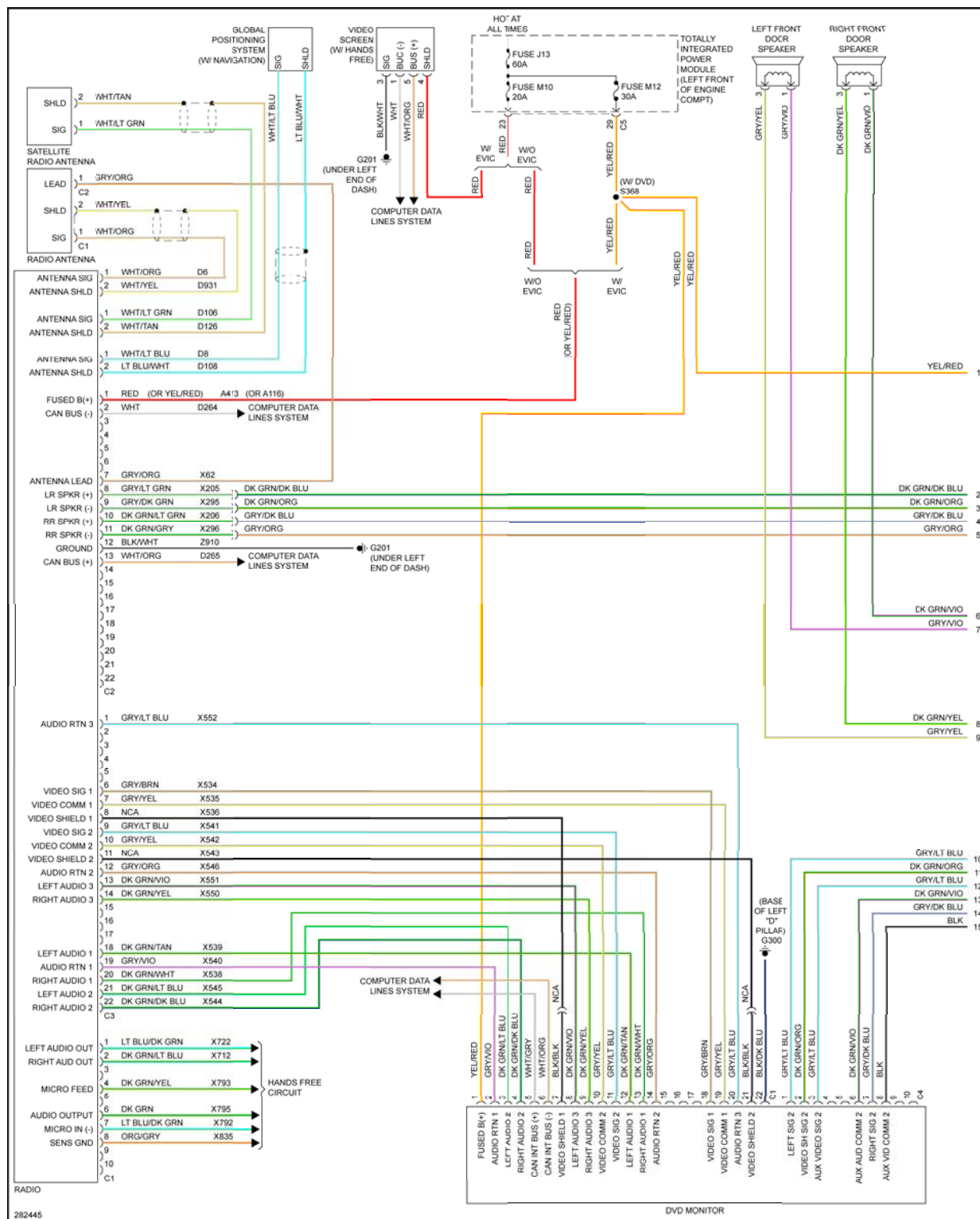


Fig. 47: Radio Circuit, Base



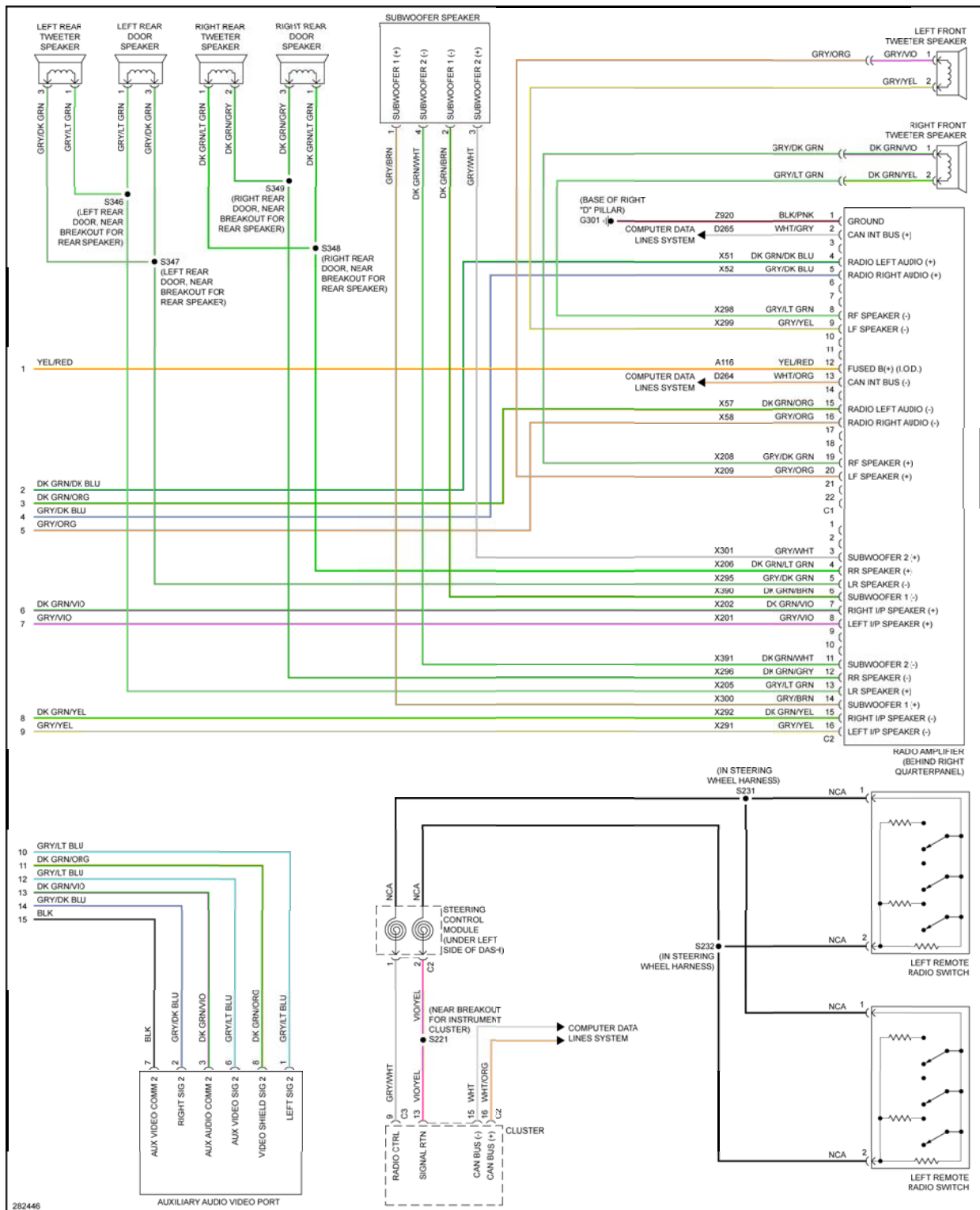


Fig. 49: Radio Circuit, Premium (2 of 2)

SHIFT INTERLOCK

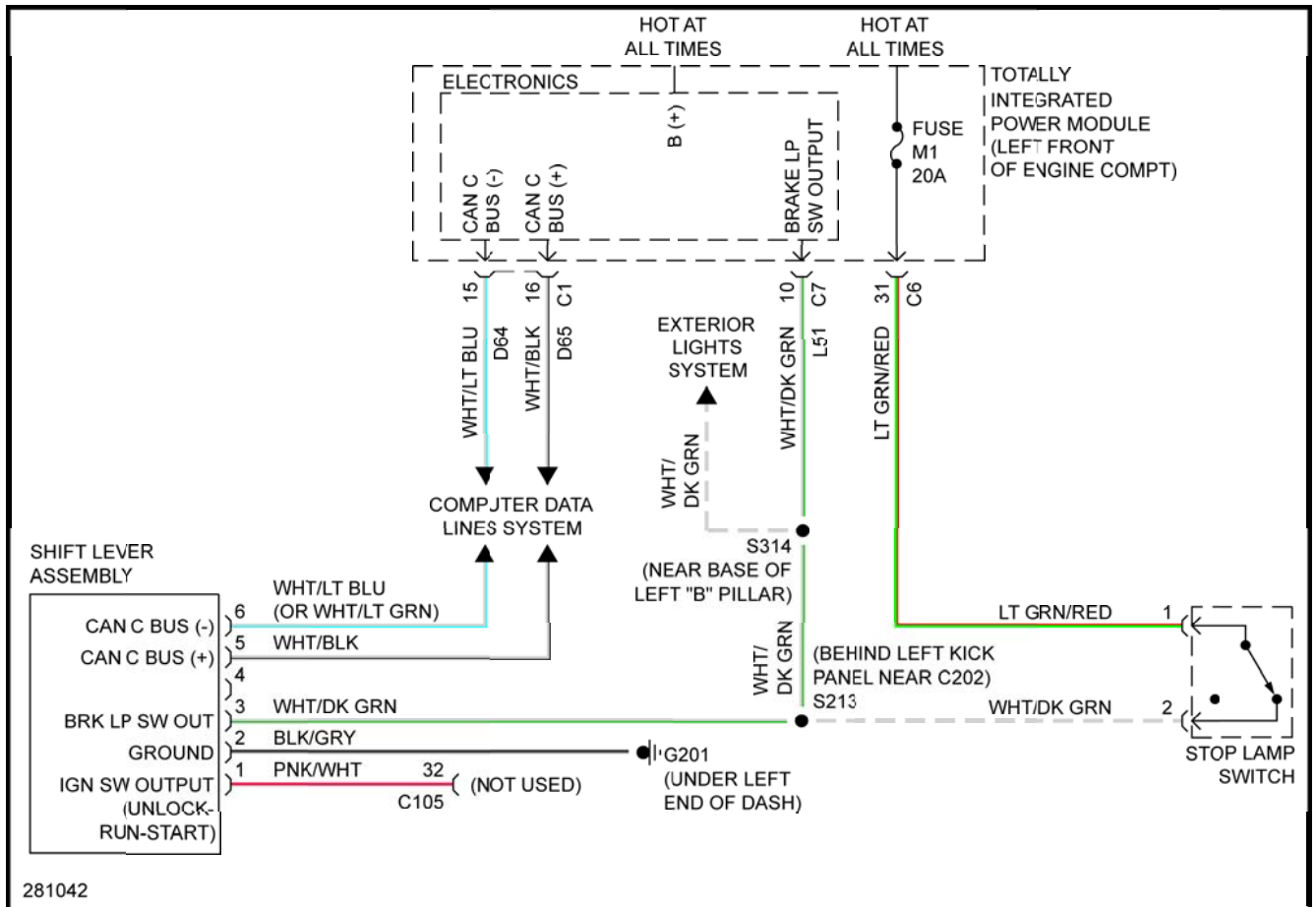


Fig. 50: Shift Interlock Circuit, W/ NAG1 Transmission

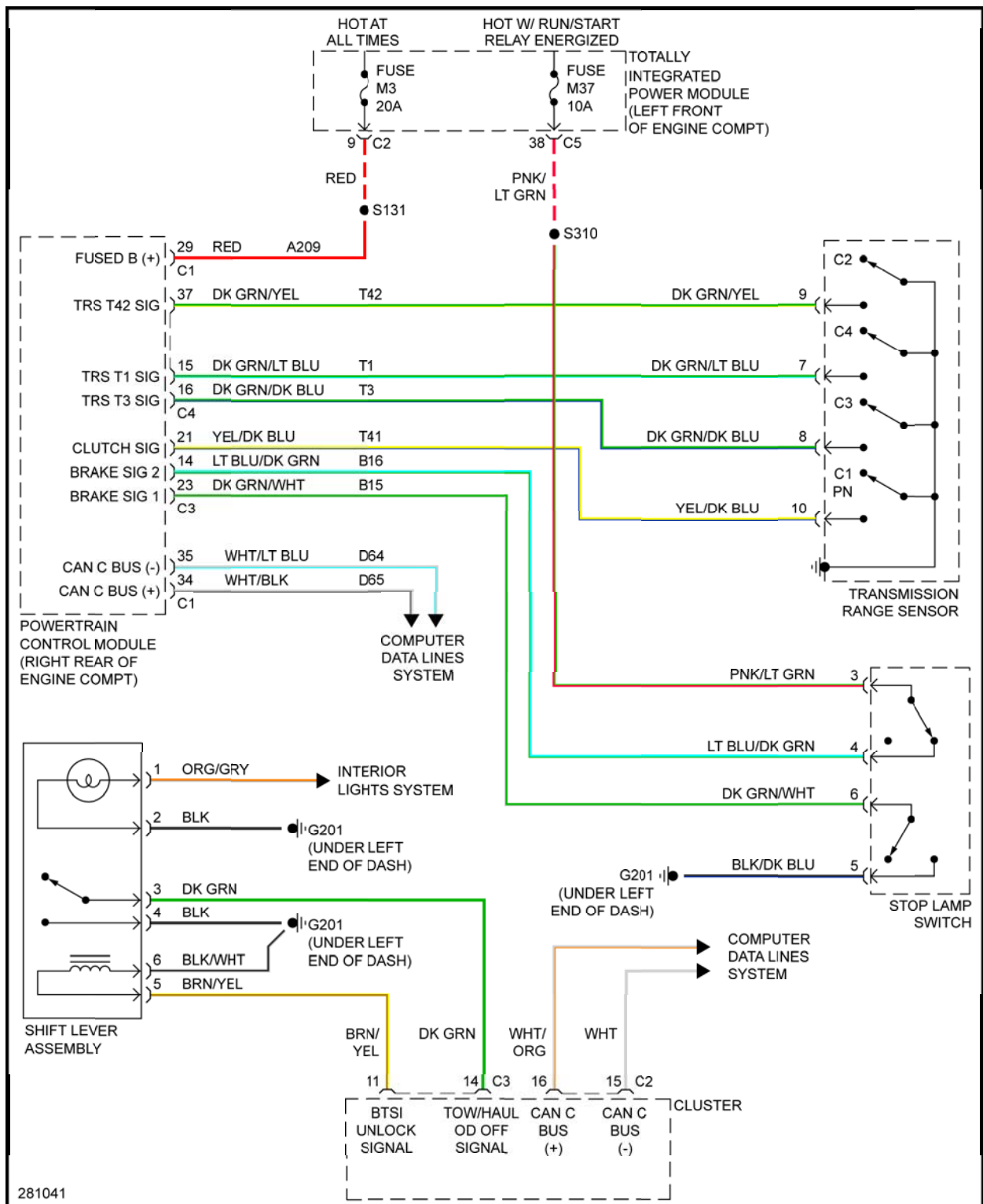


Fig. 51: Shift Interlock Circuit, W/ RLE Transmission

STARTING/CHARGING

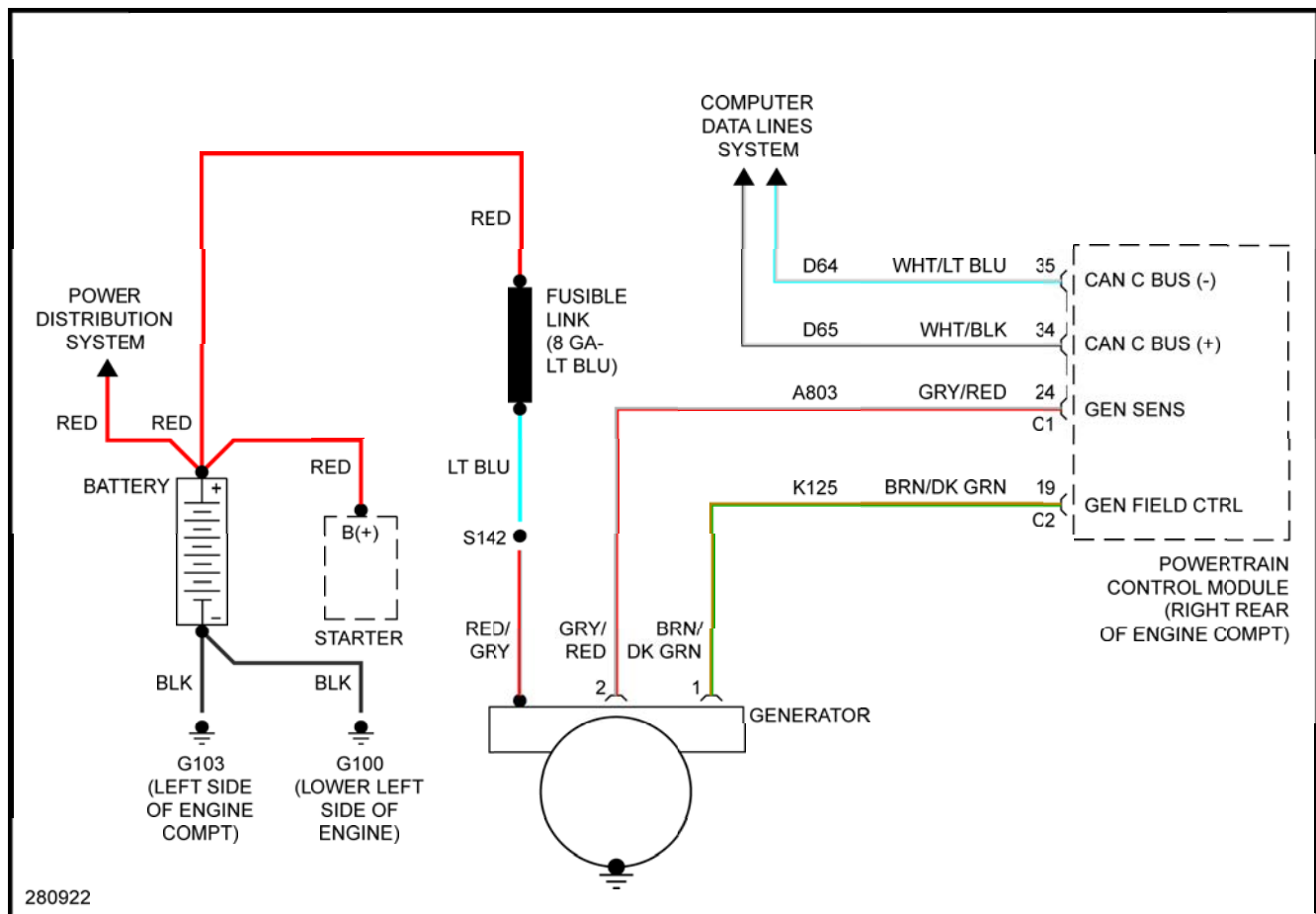


Fig. 52: Charging Circuit

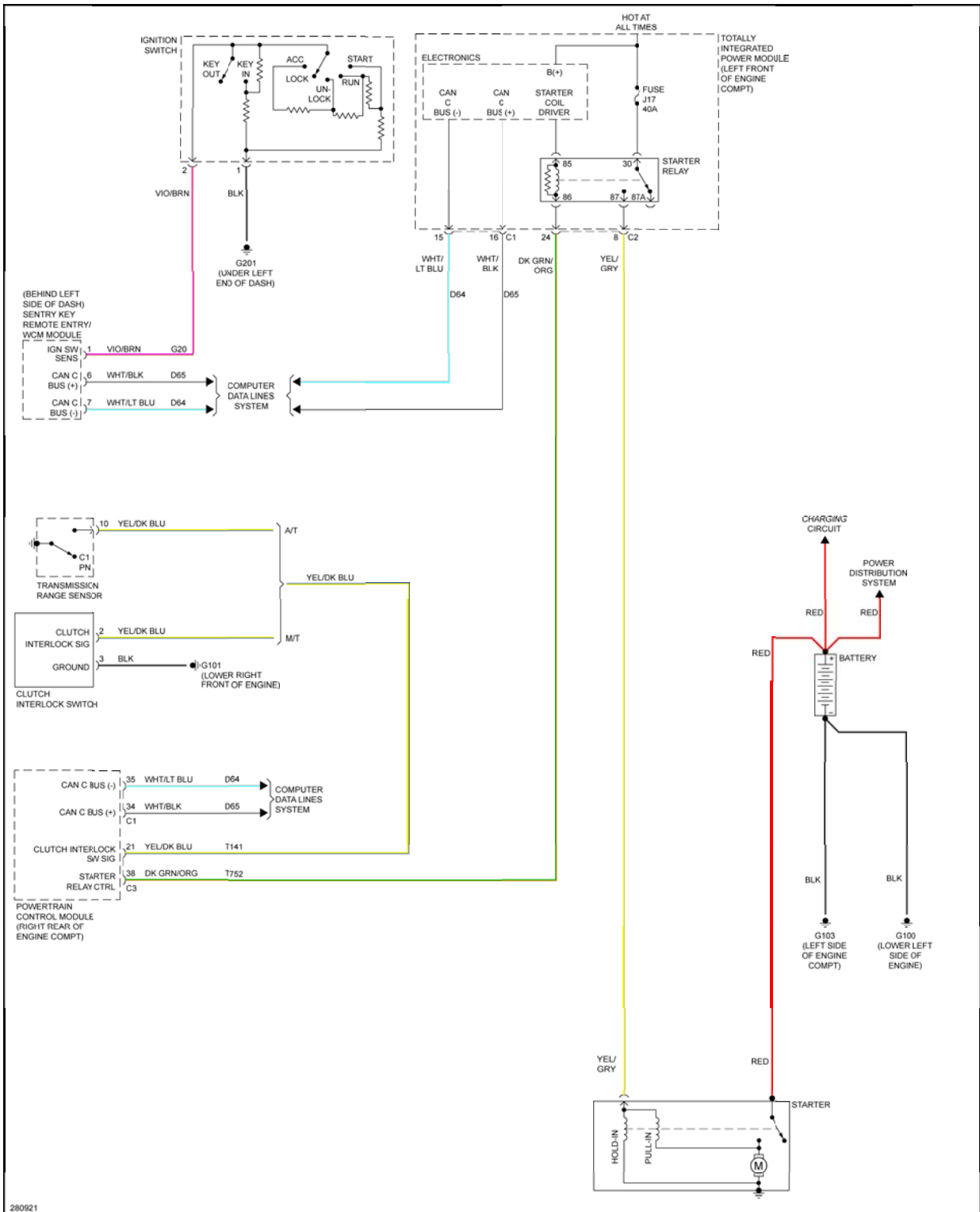


Fig. 53: Starting Circuit

SUPPLEMENTAL RESTRAINTS

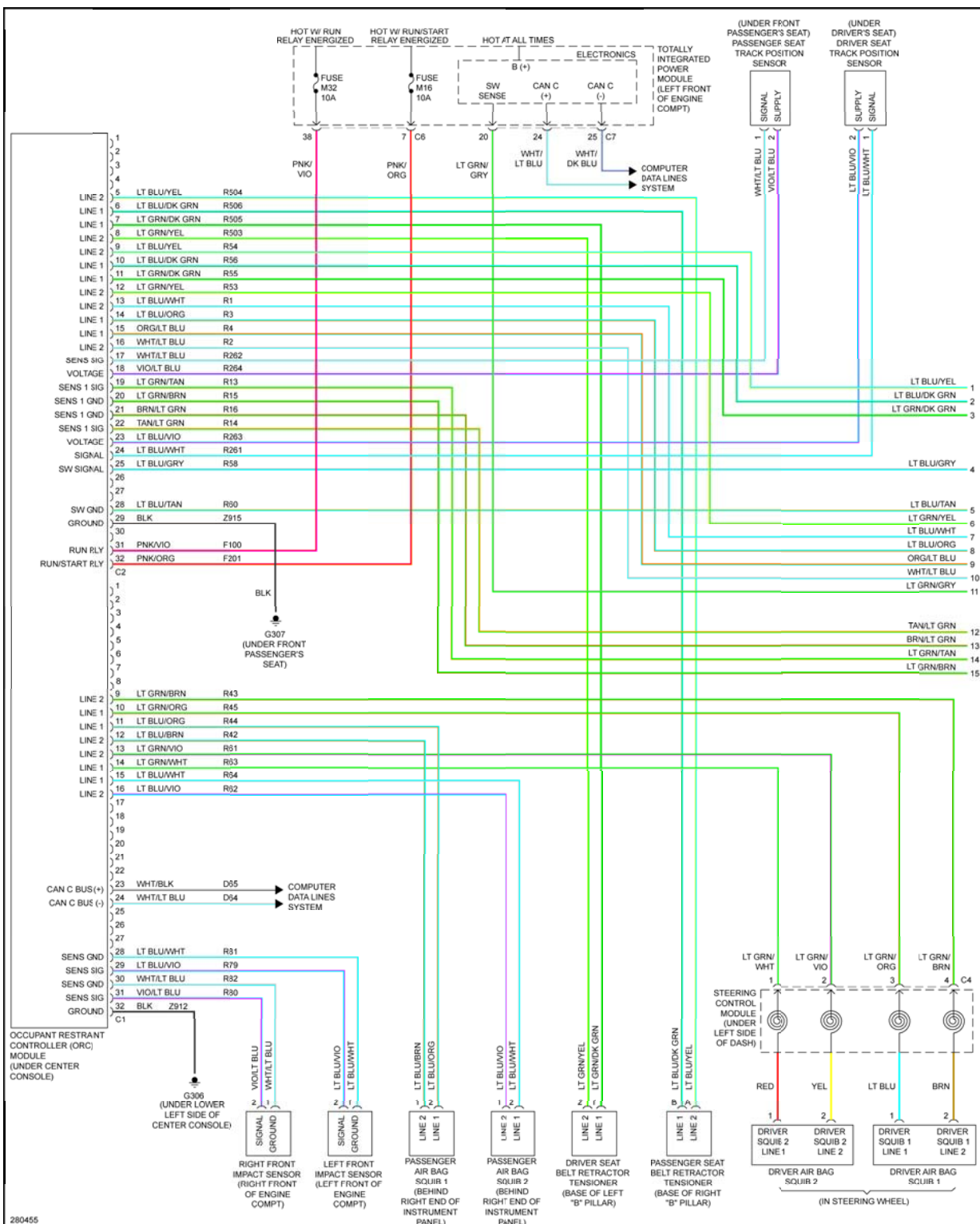


Fig. 5



Fig. 55: Supplemental Restraints Circuit (2 of 2)

TRANSMISSION

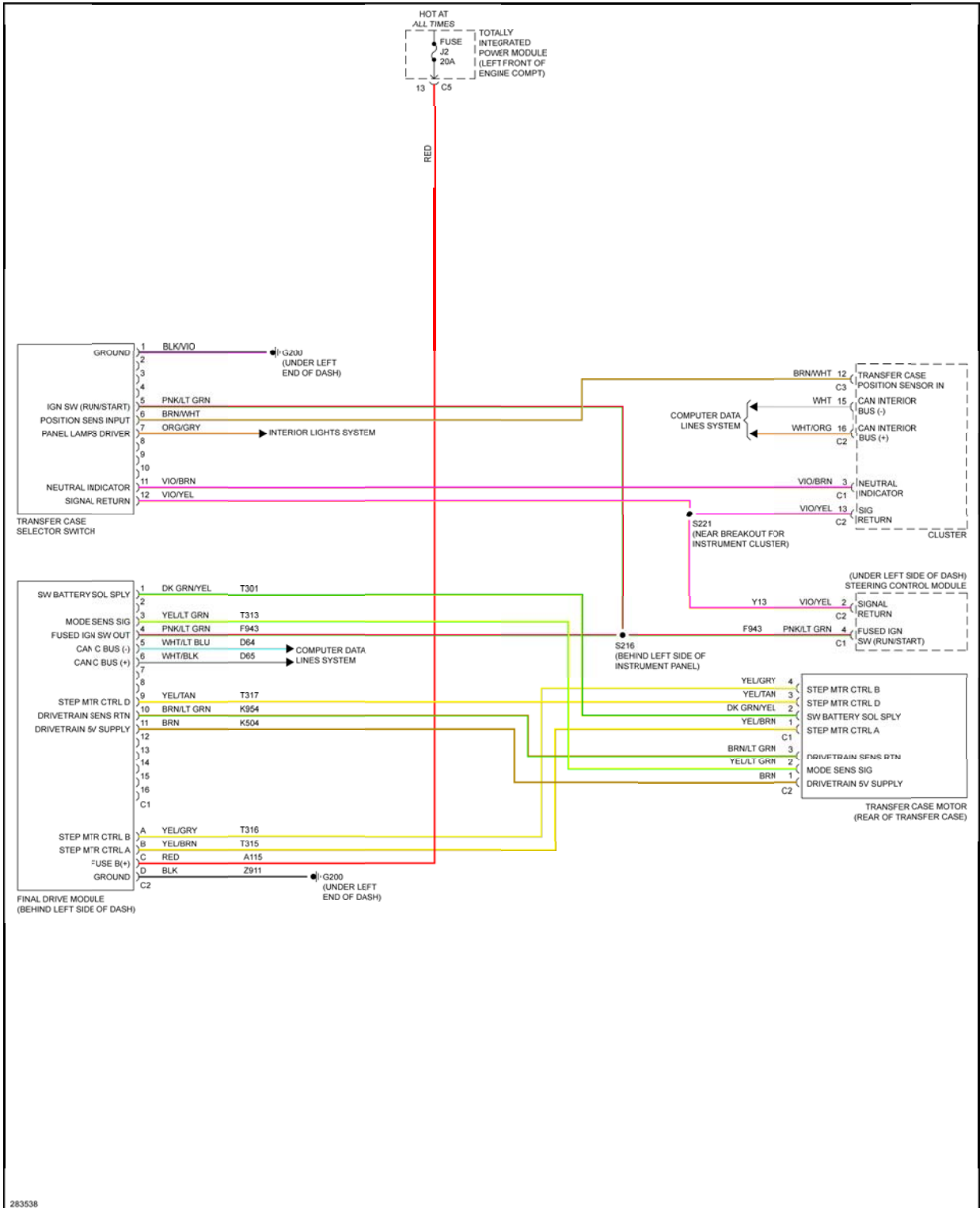
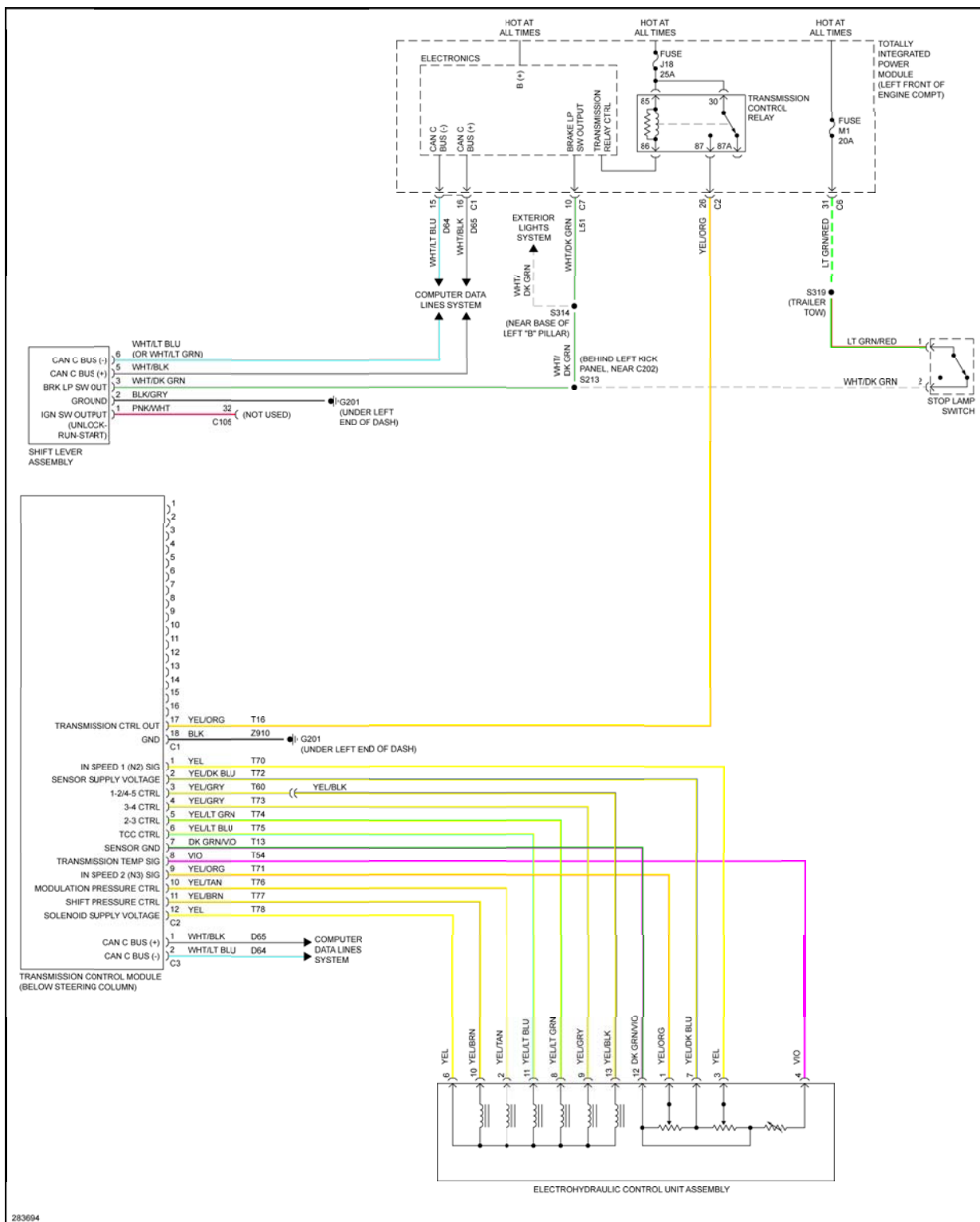


Fig. 56: 4WD Circuit



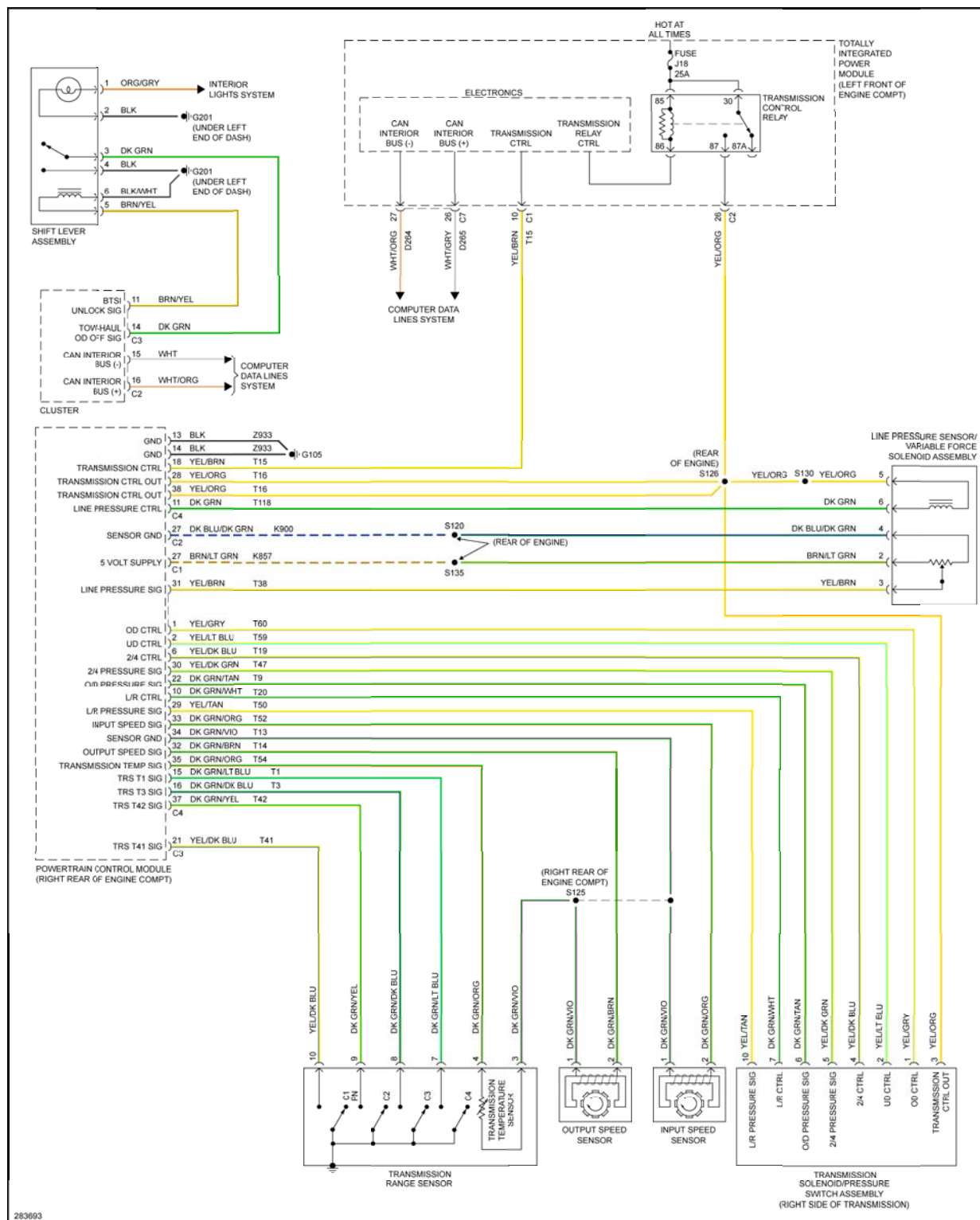


Fig. 58: A/T Circuit, RLE

WARNING SYSTEMS

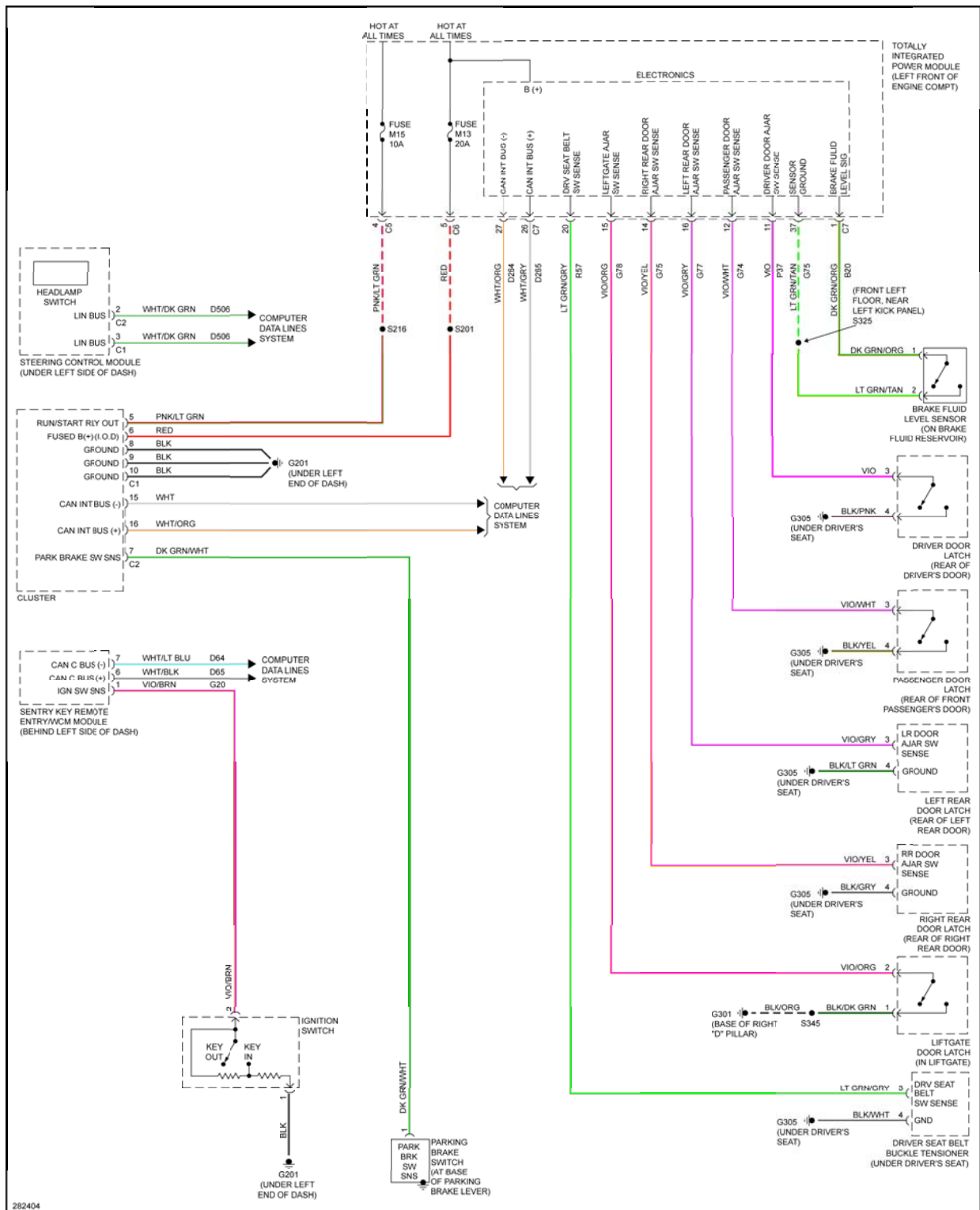


Fig. 59: Chime Circuit

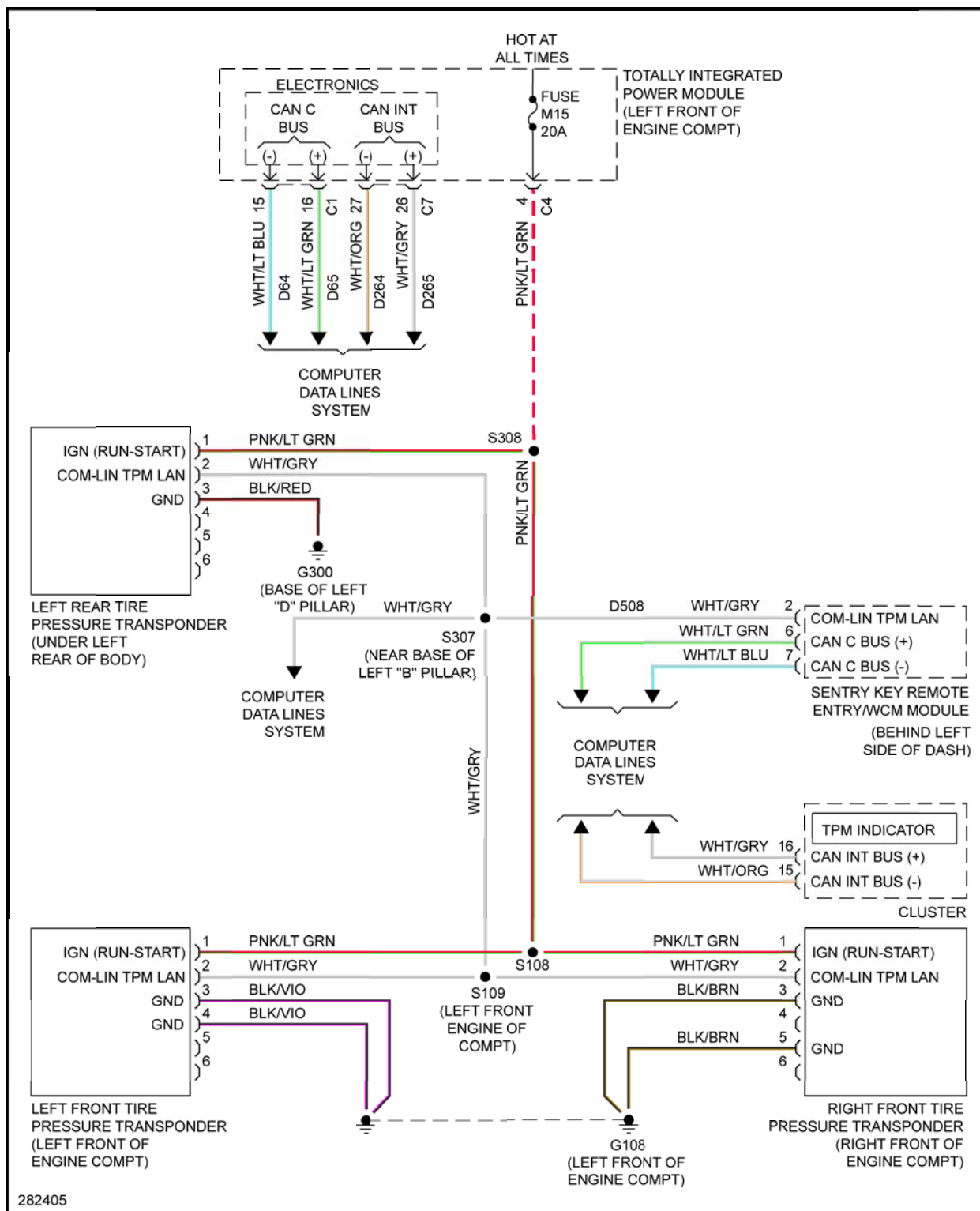
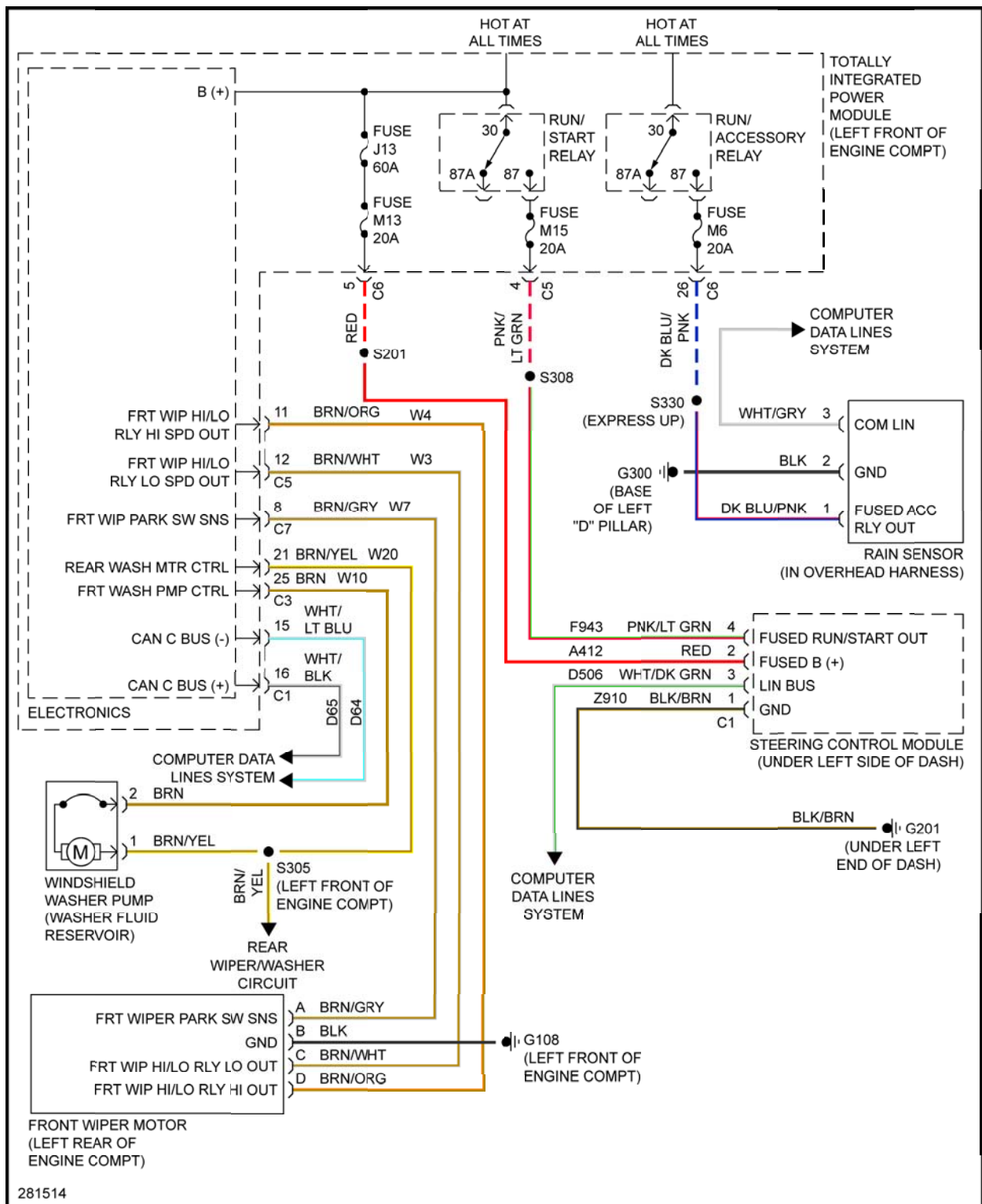


Fig. 60: Tire Pressure Monitoring Circuit

WIPER/WASHER



281514

Fig. 61: Front Wiper/Washer Circuit

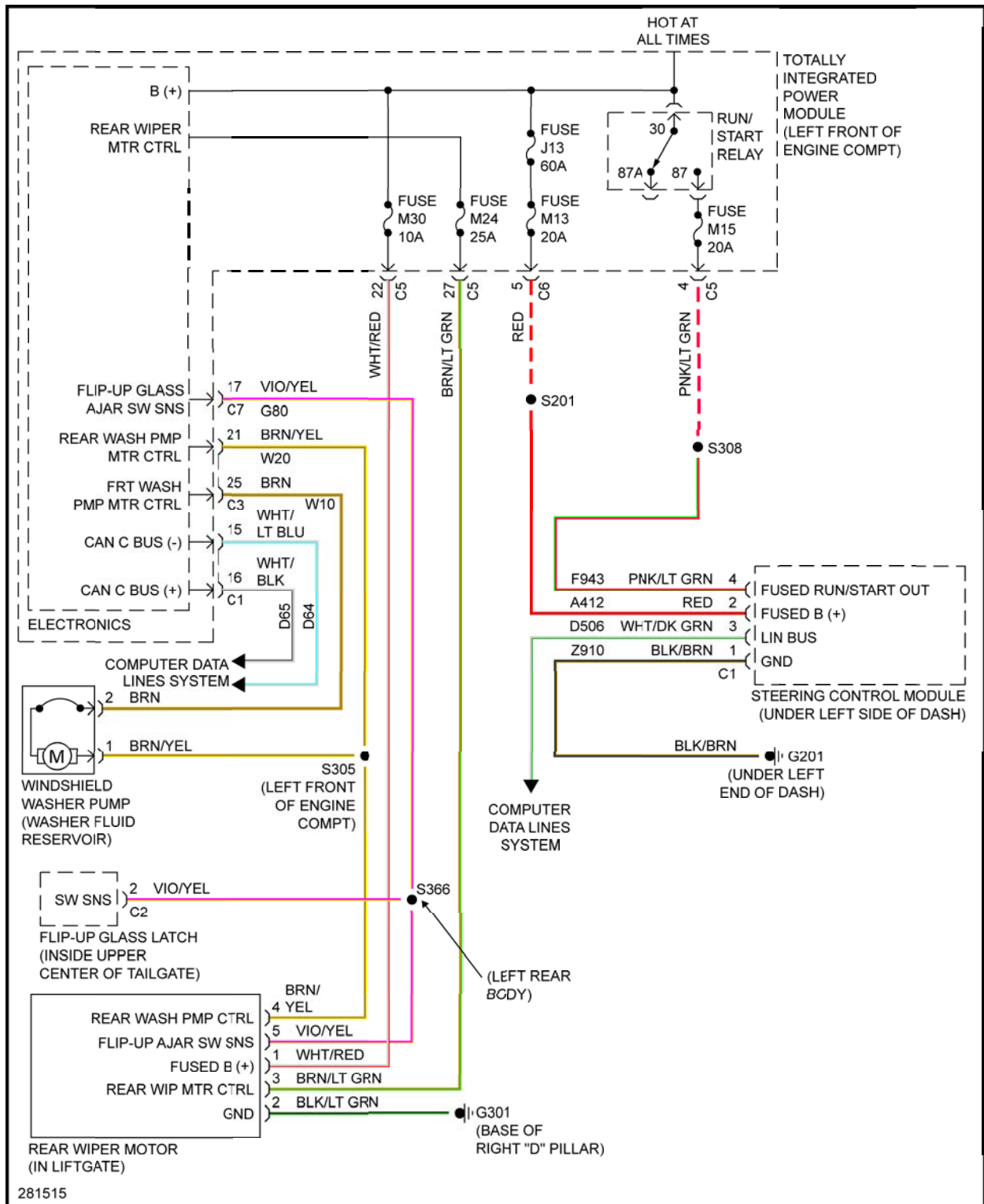


Fig. 62: Rear Wiper/Washer Circuit

2008 SUSPENSION

Tires/Wheels - Electrical Diagnosis - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>C0077</u>	LOW TIRE PRESSURE
<u>C1501</u>	TIRE PRESSURE SENSOR 1 INTERNAL
<u>C1502</u>	TIRE PRESSURE SENSOR 2 INTERNAL
<u>C1503</u>	TIRE PRESSURE SENSOR 3 INTERNAL
<u>C1504</u>	TIRE PRESSURE SENSOR 4 INTERNAL
<u>C1506</u>	LEFT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C1507</u>	RIGHT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C1508</u>	LEFT REAR TIRE PRESSURE TRIGGER MODULE PERFORMANCE
<u>C150A</u>	LEFT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C150B</u>	RIGHT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C150C</u>	LEFT REAR TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH
<u>C151D</u>	TIRE PRESSURE SENSOR LOCATION UNDETERMINED
<u>U1114</u>	LOST COMMUNICATION WITH LEFT FRONT TIRE PRESSURE TRIGGER MODULE
<u>U1115</u>	LOST COMMUNICATION WITH RIGHT FRONT TIRE PRESSURE TRIGGER MODULE
<u>U1116</u>	LOST COMMUNICATION WITH LEFT REAR TIRE PRESSURE TRIGGER MODULE

TIRE PRESSURE MONITORING - ELECTRICAL DIAGNOSIS

DIAGNOSIS AND TESTING

C0077-LOW TIRE PRESSURE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

A low pressure condition will exist when the tire pressure falls below or is equal to the low pressure threshold value as specified for the vehicle.

Possible Causes

Possible Causes
INTERMITTENT PERFORMANCE DTC INCORRECT TIRE PRESSURE TIRE PRESSURE SENSOR WCM (SKREEM)

Diagnostic Test

1. DTC STATUS

NOTE: If the incorrect Placard Values were programmed into the WCM/SKREEM, a DTC could be set. Before continuing with any TPM diagnostic test, using the scan tool, check that the correct Placard Values have been programmed in to the module.

NOTE: If the following conditions are present:

- Low Tire Pressure DTC
- Tire Pressure Sensor Internal DTC
- Spare Tire is not equipped with a Tire Pressure Sensor
- Spare Tire is currently on the vehicle

Repair the tire and place it back on the vehicle.

Test drive the vehicle.

Turn the ignition on.

Is the TPM telltale lamp/Low pressure EVIC message on at this time?

Yes

Go to 2.

No

Go to 5.

2. LOW TIRE PRESSURE

NOTE: The DTC can be caused by many different factors and might not be a sensor/transmitter or a WCM (SKREEM) fault. Interference from other elements will over power the sensor/transmitter RF frequency making erratic operation to the TPM system. Check the vehicle for aftermarket accessories that could compromise the RF frequency signal before diagnosing the TPM system.

NOTE: Seasonal temperature changes will affect tire pressure, and may have caused the tire pressure to fall below the low pressure warning threshold. Tire pressure should always be set based on cold inflation tire pressure (placard). This is defined as the tire pressure after a vehicle has not been driven for more then 3 hours, and in outside ambient temperatures.

Correct all tire pressure to the recommended specifications and wait 2 minutes.

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 m.p.h. (24 km/h).

Use a TPM-RKE Analyzer tool 9936 to scan each tire pressure sensor, and make sure the Sensor IDs matches what is programmed into the WCM. The Sensor Identifications are located under "Data Display" for the "WCM Wireless Control Module". If the sensor IDs does not match, following the programming steps outlined in the diagnostic scan tool for "Program Tire Sensor ID w/TPM Tool" under "Miscellaneous Functions" for the "WCM/Wireless Control Module" menu item.

NOTE: When scanning a sensor with a TPM-RKE Analyzer 9936 , replace the TPM sensor if the results show a "Damaged Accel", "Damaged Temp", or "Damaged Press".

Is the TPM telltale lamp/Low pressure EVIC message on at this time?

Yes

Go to 3.

No

Test Complete.

3. TIRE PRESSURE SENSOR

NOTE: Before continuing, ensure the tire is free from any leaks or damage that would cause a low tire pressure condition. If a problem is found, repair as necessary and retest.

With the scan tool, go under "Data Display" for the "WCM Wireless Control Module" and find the compensated tire pressure values. Located underneath each Sensor Identification locations. If any compensated tire pressure values are equal or lower then the Tire Low Pressure Threshold. The corresponding TPM sensor needs to be located and replaced.

NOTE: **The following tests are used to locate the Tire Pressure Sensor/Transmitter that is setting the low pressure fault. If the tires have been rotated, the Tire Pressure Sensor/Transmitter are no longer in sequence from the factory. Faults are linked to the sensor/transmitter IDs. You MUST locate the correct Tire Pressure Sensor/Transmitter that set the fault before continuing. Use one or more of the following methods below.**

METHOD 1: Use a TPM-RKE Analyzer tool 9936 to scan each tire pressure sensor. If a suspected sensor has been located, lower the tire pressure to 20 PSI, wait for 2 minutes, and check the scan tool for changes to any compensated tire pressure values.

If there was a pressure change to any compensated tire pressure values, check to make sure that the TPM-RKE Analyzer is set correctly, and repeat the process on each wheel on the vehicle until the faulty Sensor/Transmitter has been identified.

NOTE: **When scanning a sensor with a TPM-RKE Analyzer 9936 , replace the TPM sensor if the results show a "Damaged Accel", "Damaged Temp", or "Damaged Press".**

METHOD 2: Starting with the left front wheel, deflate the tire to 20 PSI, wait 2 minutes, and check the scan tool for changes to any compensated tire pressure values.

If there was a pressure change to any compensated tire pressure value, repeat this process on each wheel on the vehicle until the faulty Sensor/Transmitter has been identified.

Has the malfunctioning/faulty TPM sensor been located?

Yes

Replace the Tire Pressure sensor.
Perform **TPM VERIFICATION**.

No

Go To 4.

4. WIRELESS CONTROL MODULE

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

With the scan tool, read WCM/SKREEM DTC(s).

Drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time the system will learn the sensor IDs.

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate symptom.

Perform **TPM VERIFICATION**.

No

Repair is complete.

5. INTERMITTENT TIRE PRESSURE SENSOR DTC

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 m.p.h. (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Repair as necessary.

Perform **TPM VERIFICATION**.

No

Test complete.

C1501-TIRE PRESSURE SENSOR 1 INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Theory Of Operation

The tire pressure sensor actively monitors the air pressure and air temperature inside the tire, the sensor internal battery status, and the radial acceleration of the wheel. Each sensor has a unique ID code. The sensor transmits the data at regular intervals via an encoded signal to a receiver circuit located in the Wireless Control Module

(SKREEM).

Monitor Conditions

When Monitored:

With vehicle speed greater than 15 MPH (24 km/h).

Set Conditions

- Set Condition:

The WCM (SKREEM) will monitor the signals from the four active road tire sensors. A loss of signal error is detected when eight consecutive blocks of data are not received or cannot be accurately decoded within a maximum period of 10 minutes. An internal sensor hardware error condition will be set when an error in the accelerometer, pressure sensor, or temperature sensor is detected.

Possible Causes

Possible Causes
WRONG SENSOR TEMPORARY SPARE TIRE IN USE OUTSIDE INTERFERENCE TIRE PRESSURE SENSOR WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. DTC STATUS IS ACTIVE

NOTE: If the following conditions are present:

- Tire Pressure Sensor Internal DTC (Active)
- Spare Tire is not equipped with a Tire Pressure Sensor
- Spare Tire is currently on the vehicle

Repair the tire and place it back on the vehicle.

Test drive the vehicle.

If the DTC(s) reset continue with the diagnostic procedure.

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. TIRE PRESSURE SENSOR

NOTE: When working with vehicles equipped with the base tire pressure monitoring system the correct tire that set the fault must be identified. Following the below procedure will help in identifying the correct tire.

1. Set all tire pressures to the recommended specifications and recheck for fault/alert.

2. Turn the ignition on.

3. Starting with the left front wheel, deflate the tire to 20 PSI and wait 2 minutes. The fault will set once the pressure has reached 20 PSI within the 2 minute time frame.

4. If the TPM fault was detected and not associated to this Sensor/Transmitter, repeat the process until the faulty Sensor/Transmitter has been identified.

Once a fault/alert has set, it will establish the location of the tire pressure sensor/transmitter. Repeat steps until the applicable Tire Pressure Sensor/Transmitter has been located.

Turn the ignition off.

Replace the Tire Pressure Sensor in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE SENSOR DTC**

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the beginning of this test and perform the diagnostic procedure as necessary.

No

Test complete.

Perform **TPM VERIFICATION**.

C1502-TIRE PRESSURE SENSOR 2 INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The tire pressure sensor actively monitors the air pressure and air temperature inside the tire, the sensor internal battery status, and the radial acceleration of the wheel. Each sensor has a unique ID code. The sensor transmits the data at regular intervals via an encoded signal to a receiver circuit located in the Wireless Control Module

(SKREEM).

Monitor Conditions

When Monitored:

With vehicle speed greater than 15 MPH (24 km/h).

Set Conditions

- Set Condition:

The WCM (SKREEM) will monitor the signals from the four active road tire sensors. A loss of signal error is detected when eight consecutive blocks of data are not received or cannot be accurately decoded within a maximum period of 10 minutes. An internal sensor hardware error condition will be set when an error in the accelerometer, pressure sensor, or temperature sensor is detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE SENSOR INTERNAL DTC SPARE TIRE IN USE TIRE PRESSURE SENSOR WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. DTC STATUS IS ACTIVE

NOTE: If the following conditions are present:

- Tire Pressure Sensor Internal DTC (Active)
- Spare Tire is not equipped with a Tire Pressure Sensor
- Spare Tire is currently on the vehicle

Repair the tire and place it back on the vehicle.

Test drive the vehicle.

If the DTC(s) reset continue with the diagnostic procedure.

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. TIRE PRESSURE SENSOR

NOTE: When working with vehicles equipped with the base tire pressure monitoring system the correct tire that set the fault must be identified. Following the below procedure will help in identifying the correct tire.

1. Set all tire pressures to the recommended specifications and recheck for fault/alert.

2. Turn the ignition on.

3. Starting with the left front wheel, deflate the tire to 20 PSI and wait 2 minutes. The fault will set once the pressure has reached 20 PSI within the 2 minute time frame.

4. If the TPM fault was detected and not associated to this Sensor/Transmitter, repeat the process until the faulty Sensor/Transmitter has been identified.

Once a fault/alert has set, it will establish the location of the tire pressure sensor/transmitter. Repeat steps until the applicable Tire Pressure Sensor/Transmitter has been located.

Turn the ignition off.

Replace the Tire Pressure Sensor in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE SENSOR DTC**

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the beginning of this test and perform the diagnostic procedure as necessary.

No

Test complete.

Perform **TPM VERIFICATION**.

C1503-TIRE PRESSURE SENSOR 3 INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The tire pressure sensor actively monitors the air pressure and air temperature inside the tire, the sensor internal battery status, and the radial acceleration of the wheel. Each sensor has a unique ID code. The sensor transmits the data at regular intervals via an encoded signal to a receiver circuit located in the Wireless Control Module

(SKREEM).

Monitor Conditions

When Monitored:

With vehicle speed greater than 15 MPH (24 km/h).

Set Conditions

- Set Condition:

The WCM (SKREEM) will monitor the signals from the four active road tire sensors. A loss of signal error is detected when eight consecutive blocks of data are not received or cannot be accurately decoded within a maximum period of 10 minutes. An internal sensor hardware error condition will be set when an error in the accelerometer, pressure sensor, or temperature sensor is detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE SENSOR INTERNAL DTC SPARE TIRE IN USE TIRE PRESSURE SENSOR WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. DTC STATUS IS ACTIVE

NOTE: If the following conditions are present:

- Tire Pressure Sensor Internal DTC (Active)
- Spare Tire is not equipped with a Tire Pressure Sensor
- Spare Tire is currently on the vehicle

Repair the tire and place it back on the vehicle.

Test drive the vehicle.

If the DTC(s) reset continue with the diagnostic procedure.

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. TIRE PRESSURE SENSOR

NOTE: When working with vehicles equipped with the base tire pressure monitoring system the correct tire that set the fault must be identified. Following the below procedure will help in identifying the correct tire.

1. Set all tire pressures to the recommended specifications and recheck for fault/alert.

2. Turn the ignition on.

3. Starting with the left front wheel, deflate the tire to 20 PSI and wait 2 minutes. The fault will set once the pressure has reached 20 PSI within the 2 minute time frame.

4. If the TPM fault was detected and not associated to this Sensor/Transmitter, repeat the process until the faulty Sensor/Transmitter has been identified.

Once a fault/alert has set, it will establish the location of the tire pressure sensor/transmitter. Repeat steps until the applicable Tire Pressure Sensor/Transmitter has been located.

Turn the ignition off.

Replace the Tire Pressure Sensor in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE SENSOR DTC**

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the beginning of this test and perform the diagnostic procedure as necessary.

No

Test complete.

Perform **TPM VERIFICATION**.

C1504-TIRE PRESSURE SENSOR 4 INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The tire pressure sensor actively monitors the air pressure and air temperature inside the tire, the sensor internal battery status, and the radial acceleration of the wheel. Each sensor has a unique ID code. The sensor transmits the data at regular intervals via an encoded signal to a receiver circuit located in the Wireless Control Module

(SKREEM).

Monitor Conditions

When Monitored:

With vehicle speed greater than 15 m.p.h. (24 km/h).

Set Conditions

- Set Condition:

The WCM (SKREEM) will monitor the signals from the four active road tire sensors. A loss of signal error is detected when eight consecutive blocks of data are not received or cannot be accurately decoded within a maximum period of 10 minutes. An internal sensor hardware error condition will be set when an error in the accelerometer, pressure sensor, or temperature sensor is detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE SENSOR INTERNAL DTC SPARE TIRE IN USE TIRE PRESSURE SENSOR WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. DTC STATUS IS ACTIVE

NOTE: If the following conditions are present:

- Tire Pressure Sensor Internal DTC (Active)
- Spare Tire is not equipped with a Tire Pressure Sensor
- Spare Tire is currently on the vehicle

Repair the tire and place it back on the vehicle.

Test drive the vehicle.

If the DTC(s) reset continue with the diagnostic procedure.

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. TIRE PRESSURE SENSOR

NOTE: When working with vehicles equipped with the base tire pressure monitoring system the correct tire that set the fault must be identified. Following the below procedure will help in identifying the correct tire.

1. Set all tire pressures to the recommended specifications and recheck for fault/alert.

2. Turn the ignition on.

3. Starting with the left front wheel, deflate the tire to 20 PSI and wait 2 minutes. The fault will set once the pressure has reached 20 PSI within the 2 minute time frame.

4. If the TPM fault was detected and not associated to this Sensor/Transmitter, repeat the process until the faulty Sensor/Transmitter has been identified.

Once a fault/alert has set, it will establish the location of the tire pressure sensor/transmitter. Repeat steps until the applicable Tire Pressure Sensor/Transmitter has been located.

Turn the ignition off.

Replace the Tire Pressure Sensor in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 m.p.h.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE SENSOR DTC**

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the beginning of this test and perform the diagnostic procedure as necessary.

No

Test complete.

Perform **TPM VERIFICATION**.

C1506-LEFT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE

Circuit Schematic

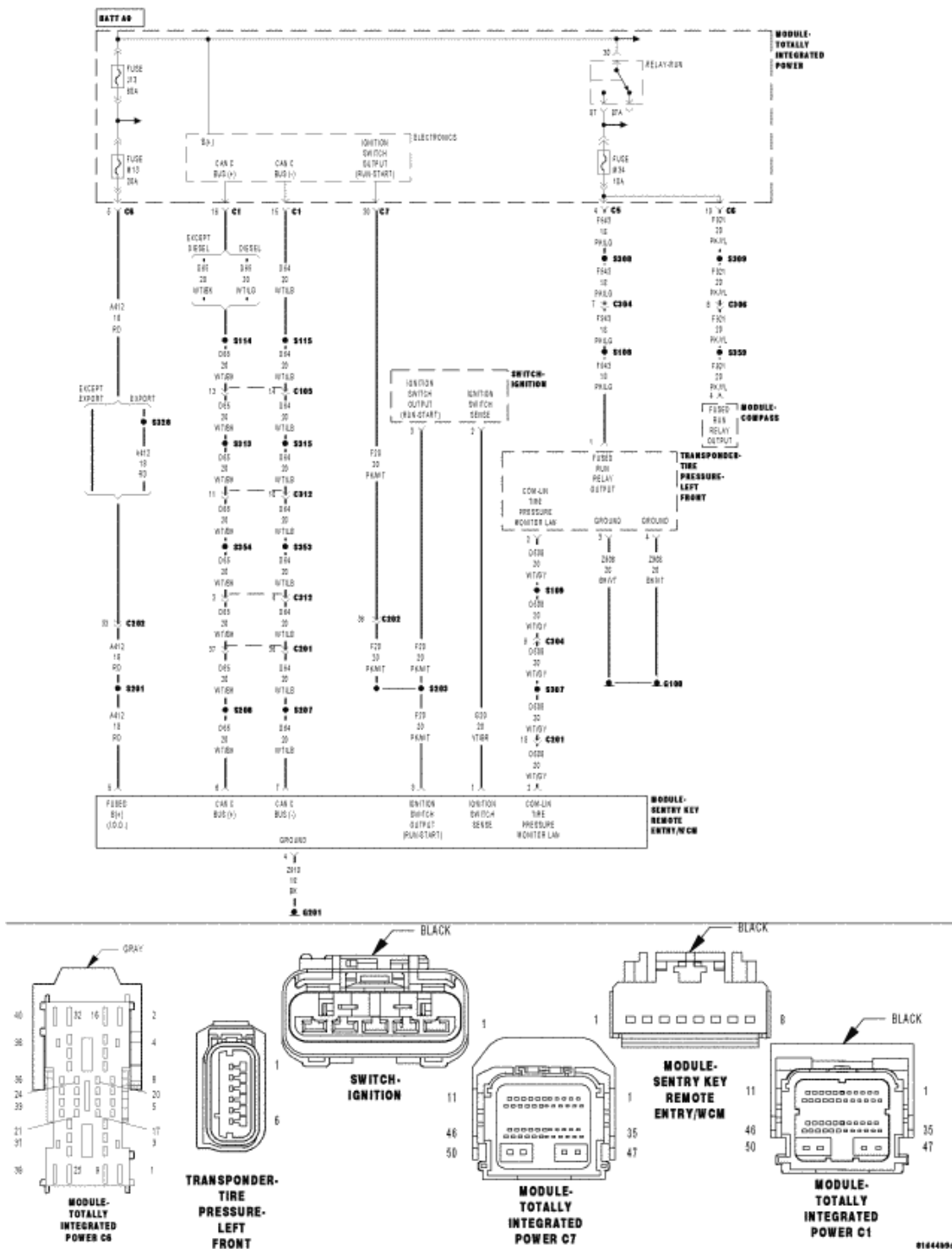


Fig. 1: Left Front Tire Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (TPM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a RF transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The WCM (TPM) will monitor the messages from each Tire Pressure Trigger Module over the LIN bus. If any of the messages are not received, or are received other than as expected, a DTC will set. When the condition is corrected, or is no longer detected, as acknowledged via a LIN bus message, the WCM will reset the appropriate trigger module fault status.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (TPM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (TPM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. **TIRE PRESSURE TRIGGER MODULE**

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (TPM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (TPM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (TPM)**

View repair.

Repair

Replace the Wireless Control Module (TPM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC**

The conditions necessary to set this DTC are not present at this time.

Using the wiring schematic as a guide, inspect the wiring and connectors relative to this circuit.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (TPM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (TPM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

No

Test complete.

Perform **TPM VERIFICATION**.

C1507-RIGHT FRONT TIRE PRESSURE TRIGGER MODULE PERFORMANCE

Circuit Schematic

Fig. 2: Right Front Tire Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (SKREEM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a RF transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:**

The WCM (SKREEM) will monitor the messages from each Tire Pressure Trigger Module over the LIN bus. If any of the messages are not received, or are received other than as expected, a DTC will set. When the condition is corrected, or is no longer detected, as acknowledged via a LIN bus message, the WCM will reset the appropriate trigger module fault status.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. **TIRE PRESSURE TRIGGER MODULE**

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC**

The conditions necessary to set this DTC are not present at this time.

Using the wiring schematic as a guide, inspect the wiring and connectors relative to this circuit.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

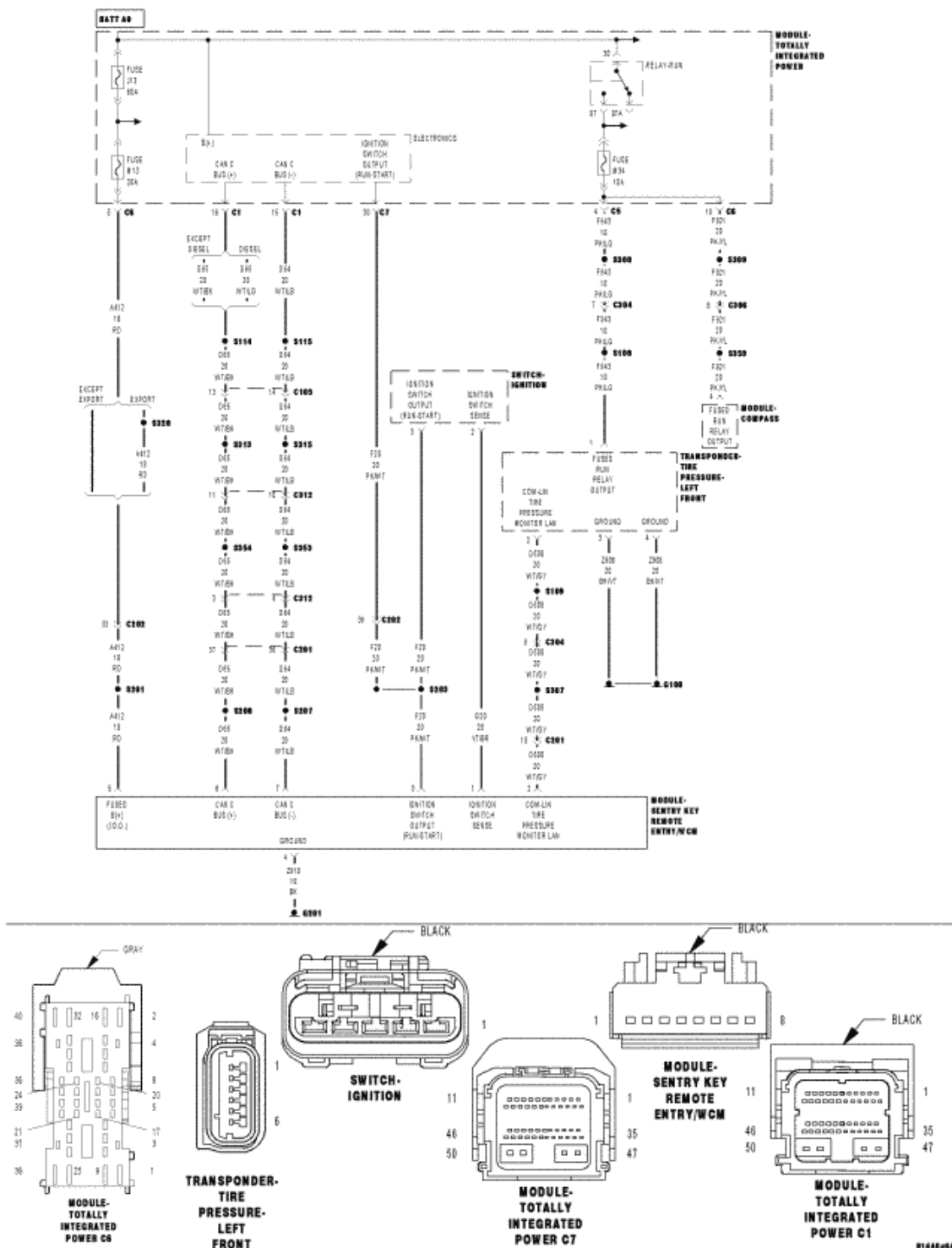
No

Test complete.

Perform **TPM VERIFICATION**.

C1508-LEFT REAR TIRE PRESSURE TRIGGER MODULE PERFORMANCE

Circuit Schematic



Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (SKREEM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a LR transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The WCM (SKREEM) will monitor the messages from each Tire Pressure Trigger Module over the LIN bus. If any of the messages are not received, or are received other than as expected, a DTC will set. When the condition is corrected, or is no longer detected, as acknowledged via a LIN bus message, the WCM will reset the appropriate trigger module fault status.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 4.

2. **TIRE PRESSURE TRIGGER MODULE**

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 3.

No

Test Complete.

Perform **TPM VERIFICATION**.

3. **WIRELESS CONTROL MODULE (SKREEM)**

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

4. **INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC**

The conditions necessary to set this DTC are not present at this time.

Using the wiring schematic as a guide, inspect the wiring and connectors relative to this circuit.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

No

Test complete.

Perform **TPM VERIFICATION**.

C150A-LEFT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH

Circuit Schematic

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (SKREEM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a RF transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The WCM receives a message from the Tire Pressure Trigger Module indicating that an over voltage condition has been detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE (Z907) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

NOTE: If a system or battery voltage high DTC is set in the Wireless Control Module (SKREEM) or in the PCM, repair the voltage DTC before continuing with this test.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 6.

2. **(F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE**

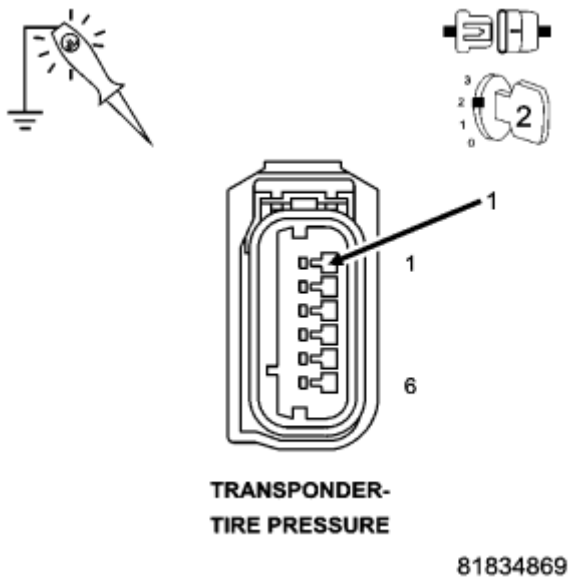


Fig. 5: Checking Fused Ignition Switch Output (Run) Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

3. **(Z907) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE**

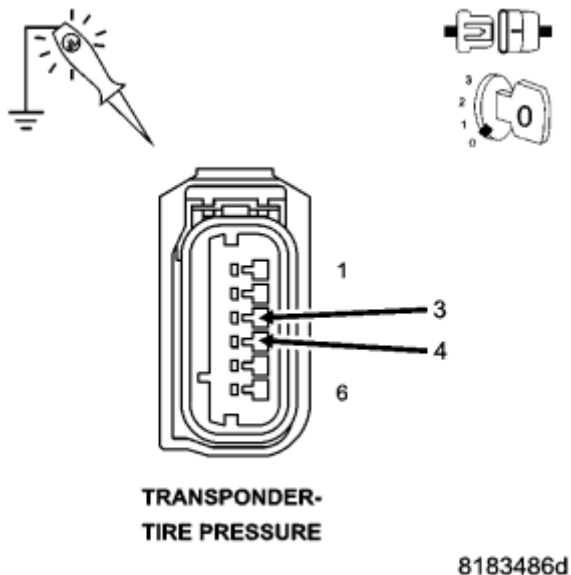


Fig. 6: Checking Ground Circuit(s) For Open Or High Resistance
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to 12 volts, check each of the (Z907) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 4.

No

Repair the (Z907) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. TIRE PRESSURE TRIGGER MODULE

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 5.

No

Test Complete.

Perform **TPM VERIFICATION**.

5. WIRELESS CONTROL MODULE (SKREEM)

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

6. INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

No

Test complete.

Perform **TPM VERIFICATION**.

C150B-RIGHT FRONT TIRE PRESSURE TRIGGER MODULE VOLTAGE HIGH

Circuit Schematic

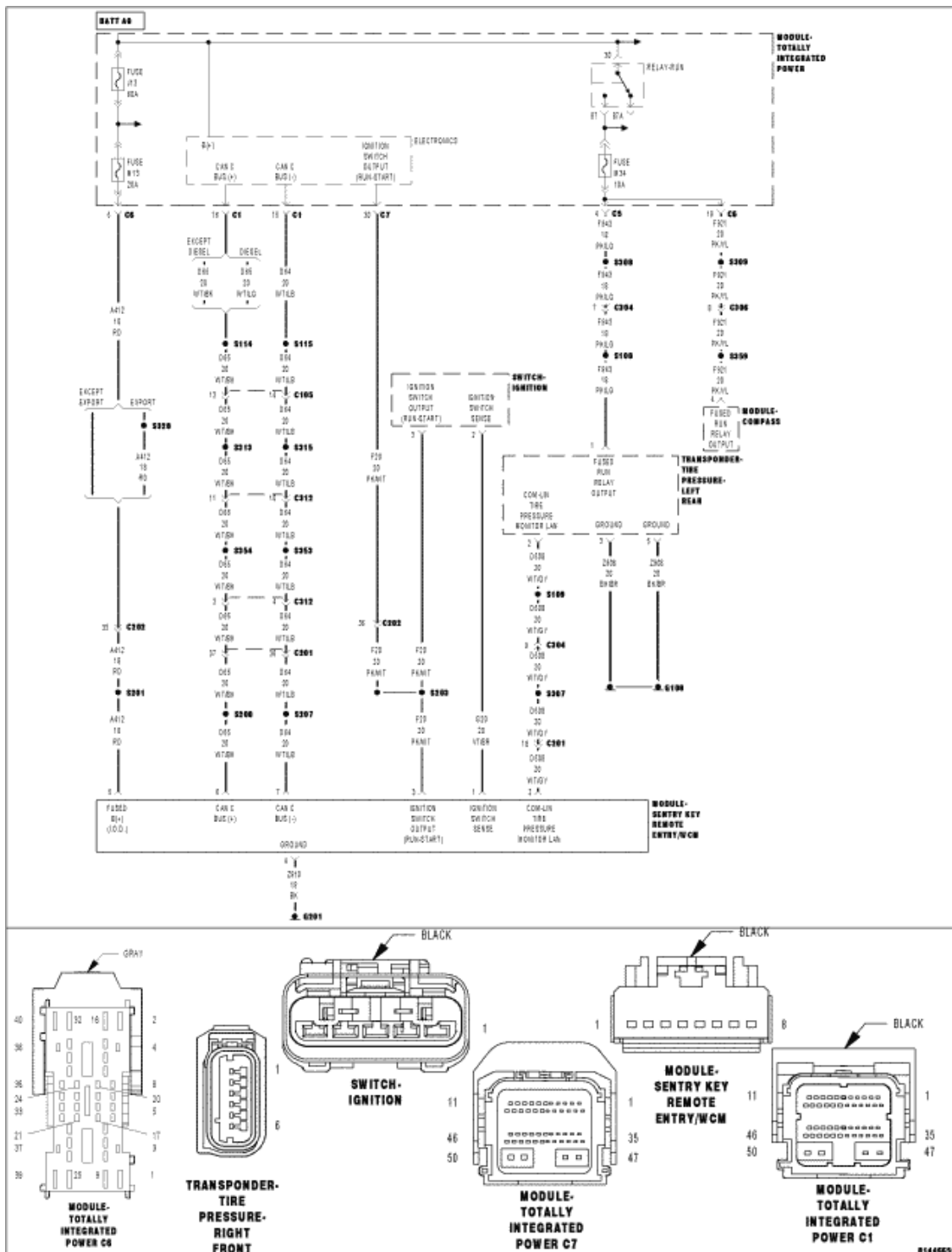


Fig. 7: Right Front Tire Pressure Sensor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (SKREEM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a RF transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- **Set Condition:**

The WCM receives a message from the Tire Pressure Trigger Module indicating that an over voltage condition has been detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE (Z908) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

NOTE: If a system or battery voltage high DTC is set in the Wireless Control Module (SKREEM) or in the PCM, repair the voltage DTC before continuing with this test.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 6.

2. **(F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE**

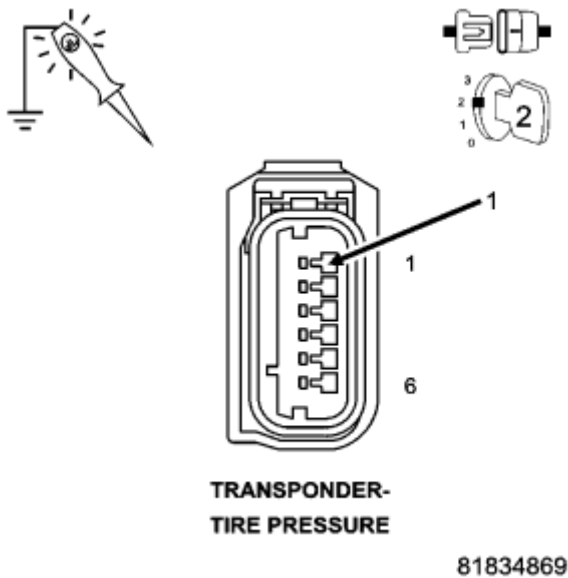


Fig. 8: Checking Fused Ignition Switch Output (Run) Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

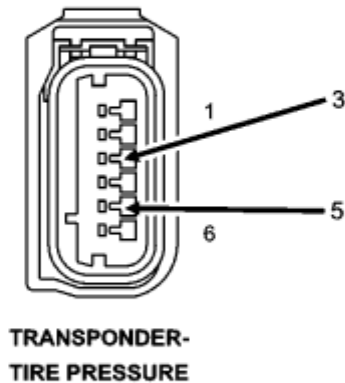
Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

3. **(Z908) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE**



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Fig. 9: Checking Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to 12 volts, check each of the (Z908) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 4.

No

Repair the (Z908) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. TIRE PRESSURE TRIGGER MODULE

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 5.

No

Test Complete.

Perform **TPM VERIFICATION**.

5. WIRELESS CONTROL MODULE (SKREEM)

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

6. INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

No

Test complete.

Perform **TPM VERIFICATION**.

Circuit Schematic



Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The Tire Pressure Trigger Module is used to automatically learn the location of each wheel sensor on the vehicle. The module is controlled and activated in sequence by the Wireless Control Module (SKREEM) over a LIN bus. When activated, the module will generate a 125 KHz signal of sufficient field strength to trigger the tire pressure sensor and force a RF transmission from the sensor.

Monitor Conditions

When Monitored:

Continuously.

Set Conditions

- Set Condition:**

The WCM receives a message from the Tire Pressure Trigger Module indicating that an over voltage condition has been detected.

Possible Causes

Possible Causes
INTERMITTENT TIRE PRESSURE TRIGGER MODULE PERFORMANCE DTC (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE (Z919) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE TIRE PRESSURE TRIGGER MODULE WIRELESS CONTROL MODULE (SKREEM)

Diagnostic Test

1. **DTC STATUS IS ACTIVE**

Turn the ignition on.

NOTE: If a system or battery voltage high DTC is set in the Wireless Control Module (SKREEM) or in the PCM, repair the voltage DTC before continuing with this test.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Is the DTC status Active at this time?

Yes

Go to 2.

No

Go to 6.

2. (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE

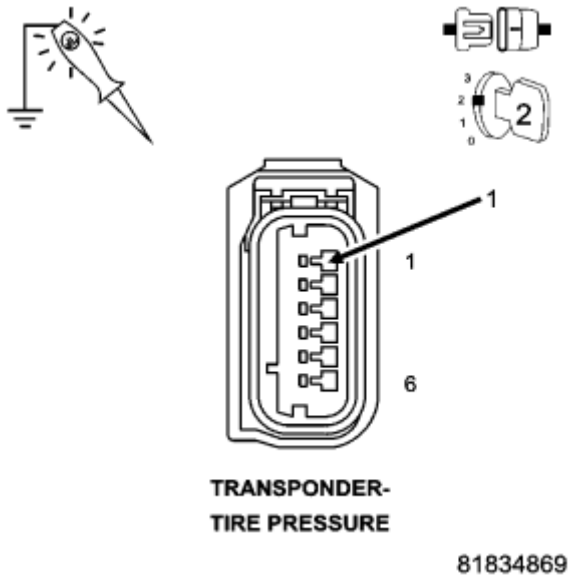


Fig. 11: Checking Fused Ignition Switch Output (Run) Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.
Perform **TPM VERIFICATION**.

3. (Z919) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE

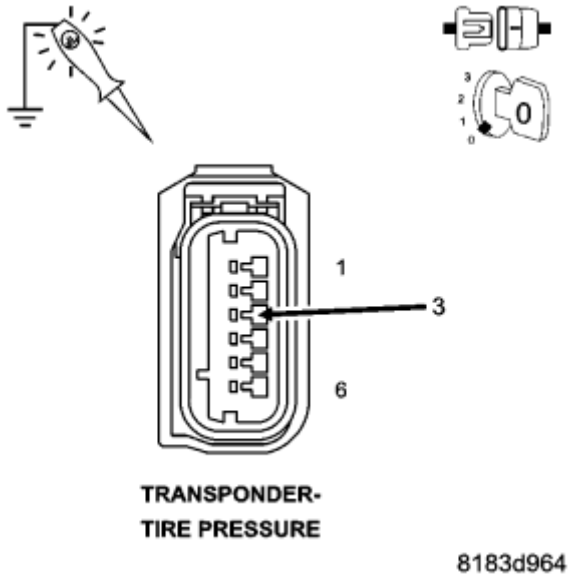


Fig. 12: Checking Each Of The (Z904) Ground Circuit(s)
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to 12 volts, check each of the (Z919) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 4.

No

Repair the (Z919) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. TIRE PRESSURE TRIGGER MODULE

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Go to 5.

No

Test Complete.

Perform **TPM VERIFICATION**.

5. WIRELESS CONTROL MODULE (SKREEM)

View repair.

Repair

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Perform **TPM VERIFICATION**.

6. INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC

The conditions necessary to set this DTC are not present at this time.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 MPH (24 km/h).

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Does the DTC reset or is the status Active for this DTC?

Yes

Return to the first step of this test and perform the diagnostic procedure.

No

Test complete.

Perform **TPM VERIFICATION**.

C151D-TIRE PRESSURE SENSOR LOCATION UNDETERMINED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

The vehicle sensor locate process occurs after the vehicle sits at zero speed for more than 19 min. The tire pressure monitor system will determine the sensor positions while driving at speeds above 15 MPH (24 Km/h). This process can take up to 10 min. to determine sensor positions.

Monitor Conditions

When Monitored:

During vehicle sensor locate process.

Set Conditions

- **Set Condition:**

Must fail vehicle sensor locate process 3 times in a row.

Possible Causes

Possible Causes
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE
FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE
GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE
(D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN
TIRE PRESSURE TRIGGER MODULE POWER AND GROUND
TPM SENSOR
WCM

Diagnostic Test

1. **OTHER DTC'S SET**

Repair all other DTC's first.

Is this DTC still active after all other DTC's repaired?

Yes

Go To 2.

No

Test Complete.

Perform **TPM VERIFICATION**.

2. **VERIFY DTC IS ACTIVE**

NOTE: **Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.**

Turn the ignition on.

With the scan tool, read and record WCM DTCs.

With the scan tool, erase WCM DTCs.

Cycle the ignition switch.

With the scan tool, read WCM DTCs.

Does this DTC reset?

Yes

Go To 3.

No

Perform the Stored Lost Communication test procedure. Refer to **DIAGNOSIS AND TESTING** .

Perform **BODY VERIFICATION TEST - VER 1** .

3. (D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN

Turn the ignition off.

Disconnect the Tire Pressure Trigger Module.

Disconnect the WCM.

With an ohmmeter measure the resistance of the (D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT.

Is the resistance below 5 Ohms?

Yes

Go To 4.

No

Repair or replace the open circuit.

Perform **TPM VERIFICATION**.

4. FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE

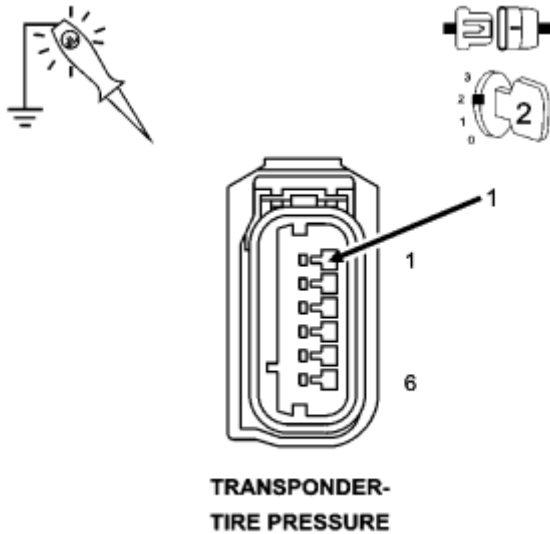


Fig. 13: Checking Fused Ignition Switch Output (Run) Circuit For Open Or High Resistance
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Tire Pressure Transponder harness connector.

Disconnect the Sentry Key Remote Entry Module harness connector.

Turn the ignition on.

Using a 12-volt test light connect to ground, check the Fused Ignition Switch Output (Run) circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

Go to 5.

No

Repair the Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

5. **GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE**

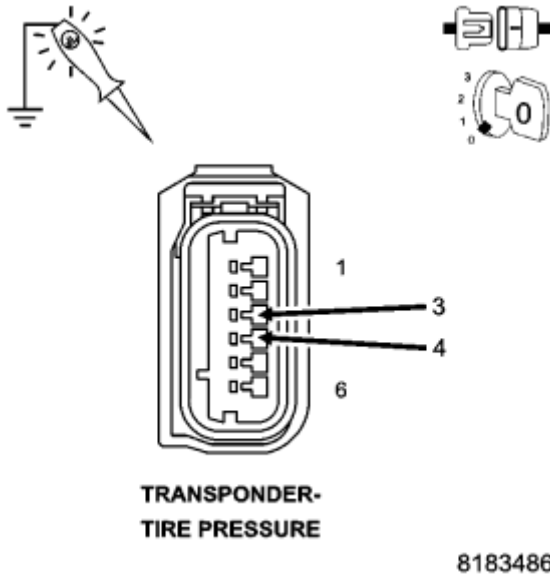


Fig. 14: Checking Ground Circuit(s) For Open Or High Resistance
 Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to battery voltage, probe each of the Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

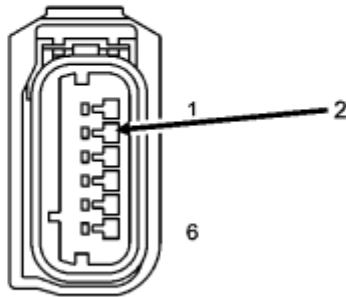
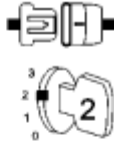
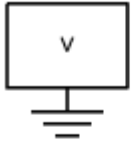
Go to 6.

No

Repair the Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

6. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE



**TRANSPONDER-
TIRE PRESSURE**

81834811

Fig. 15: Checking COM - LIN Tire Pressure Monitor LAN Circuit For Short To Voltage
Courtesy of CHRYSLER LLC

Turn the ignition on.

Measure the voltage of the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is there any voltage present?

Yes

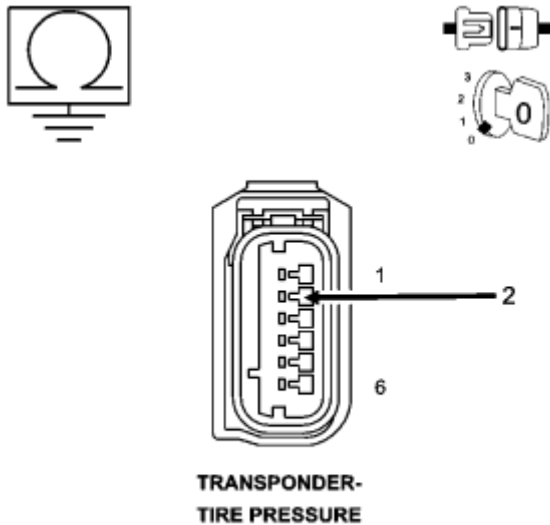
Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to voltage.

No

Go to 7.

Perform **TPM VERIFICATION**.

7. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND



8183481b

Fig. 16: Checking COM - LIN Tire Pressure Monitor LAN Circuit For Short To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to ground.
 Perform **TPM VERIFICATION**.

No

Go to 8.

8. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE

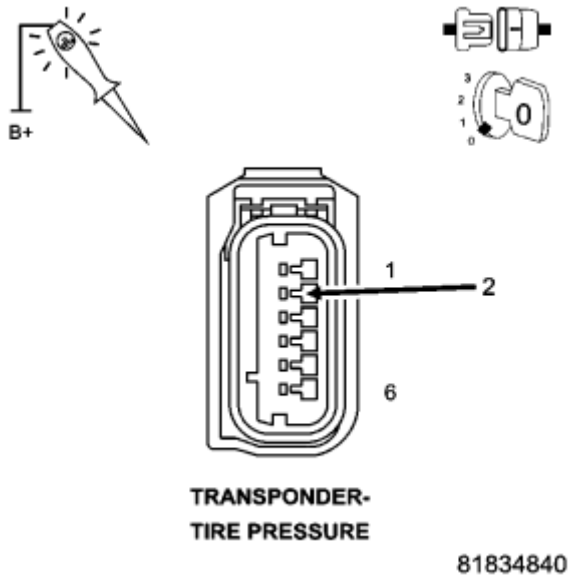


Fig. 17: Checking COM - LIN Tire Pressure Monitor LAN Circuit Open Or High Resistance
 Courtesy of CHRYSLER LLC

Use a jumper wire with one end connected to ground and the other to the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the Front Left Pressure Tire Transponder harness connector.

Using a 12-Volt test light connected to battery voltage, probe the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the TPM harness connector.

NOTE: The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.

Does the test light illuminate bright?

Yes

Go to 9.

No

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

9. POWER AND GROUND CIRCUIT OPEN

Turn the ignition on.

With a voltmeter measure the voltage between the power and ground circuit at the Trigger Module.

Is the voltage at least the same as battery voltage?

Yes

Go To 10.

No

Repair the open circuit.

Perform **TPM VERIFICATION**.

10. CHECK FOR ADDITIONAL TRIGGER MODULE COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the WCM?

Yes

Replace/update the WCM in accordance with the service information.

Perform **TPM VERIFICATION**.

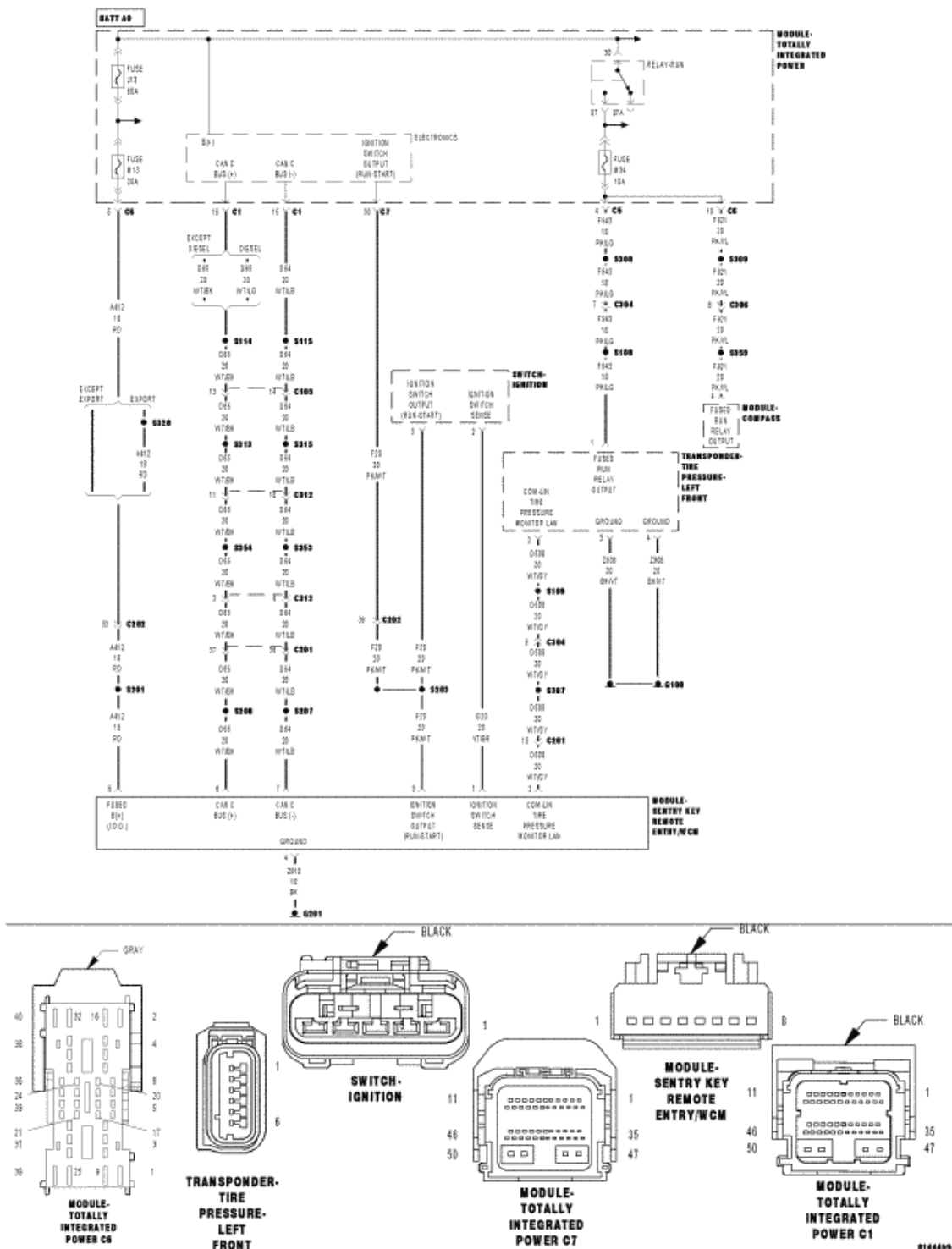
No

Replace the Tire pressure trigger Module in accordance with the service information.

Perform **TPM VERIFICATION**.

U1114-LOST COMMUNICATION WITH LEFT FRONT TIRE PRESSURE TRIGGER MODULE

Circuit Schematic



Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- Set Condition:**

If the WCM fails to receive bus messages from the Tire pressure trigger module for two consecutive counts of trigger module not responding to a communication check.

Possible Causes

Possible Causes
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE
(F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE
(Z907) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE
(D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN
TIRE PRESSURE TRIGGER MODULE POWER AND GROUND
WCM

Diagnostic Test

1. DTC STATUS

Ensure every trigger module connector is connected and WCM connected.

Turn the ignition on.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the "WCM" and follow the procedure.

NOTE: Three trigger modules are located in three of the four wheel wells on the vehicle to provide the WCM/SKREEM with the location of the tire pressure sensors on the vehicle. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor. The locations of the trigger modules can vary for each vehicle. Make sure the vehicle has trigger modules, and that are in the right locations. After every repair, the trigger module test routine must be rerun in order to verify the fix.

Did the Left Front Trigger Module have NO as a result?

Yes

Go To 2.

No

Repair intermittent condition.

2. (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE

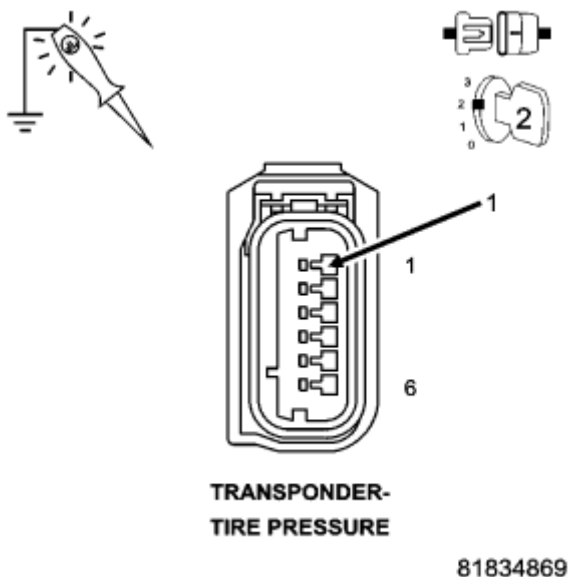


Fig. 19: Checking Fused Ignition Switch Output (Run) Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Tire Pressure Transponder harness connector.

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Is the test light illuminated and bright?

Yes

Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

3. (Z907) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE

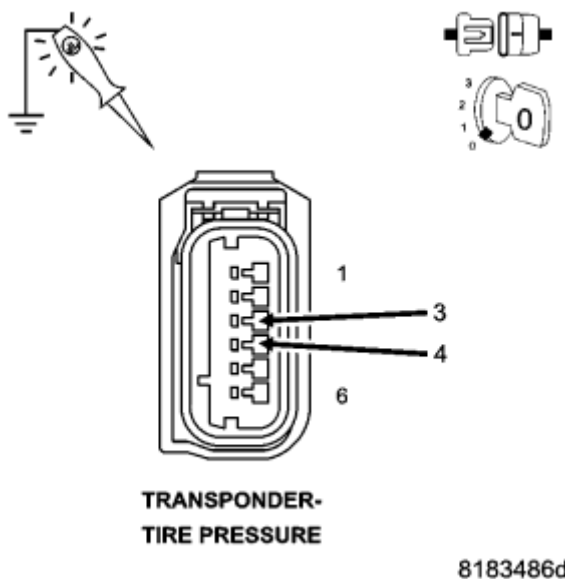


Fig. 20: Checking Ground Circuit(s) For Open Or High Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to battery voltage, probe each of the (Z907) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

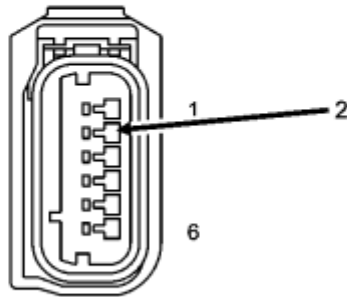
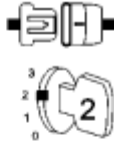
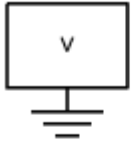
Go to 4.

No

Repair the (Z907) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE



**TRANSPONDER-
TIRE PRESSURE**

81834811

Fig. 21: Checking COM - LIN Tire Pressure Monitor LAN Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect both tire pressure transponder harness connectors.

Turn the ignition on.

Measure the voltage of the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is there any voltage present?

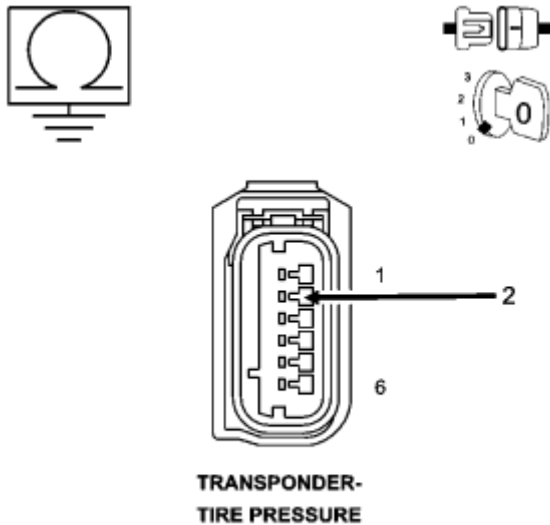
Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to voltage.
Perform **TPM VERIFICATION**.

No

Go to 5.

5. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND



8183481b

Fig. 22: Checking COM - LIN Tire Pressure Monitor LAN Circuit Short To Ground
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to ground.
 Perform **TPM VERIFICATION**.

No

Go to 6.

6. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE

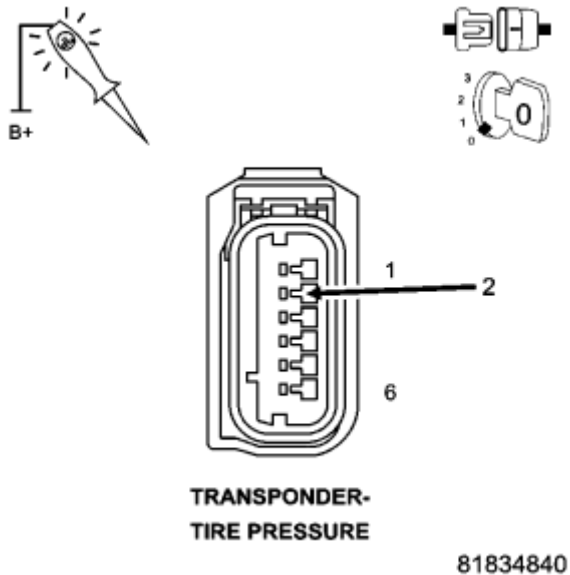


Fig. 23: Checking Fused Ignition Switch Output (Run) Circuit
 Courtesy of CHRYSLER LLC

Use a jumper wire with one end connected to ground and the other to the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the WCM/SKREEM harness connector.

Using a 12-Volt test light connected to battery voltage, probe the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the TPM harness connector.

NOTE: The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.

Does the test light illuminate bright?

Yes

Go to 7.

No

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

7. TIRE PRESSURE TRIGGER MODULE

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the

"WCM" and follow the procedure.

Did the Left Front Trigger Module have NO as a result?

Yes

Go To 8.

No

Go To 9.

8. WIRELESS CONTROL MODULE (SKREEM)

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time the system will learn the sensor IDs.

With the scan tool, read WCM/SKREEM DTC(s).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate DTC.

No

Repair complete.

Perform **TPM VERIFICATION**.

9. INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC

The conditions necessary to set this DTC are not present or has been corrected.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 m.p.h.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate DTC.

Perform **TPM VERIFICATION**.

No

Test complete.

Perform **TPM VERIFICATION**.

U1115-LOST COMMUNICATION WITH RIGHT FRONT TIRE PRESSURE TRIGGER MODULE

Circuit Schematic

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- Set Condition:**

If the WCM fails to receive bus messages from the Tire pressure trigger module for two consecutive counts of trigger module not responding to a communication check.

Possible Causes

Possible Causes
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE
(F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE
(Z908) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE
(D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN
TIRE PRESSURE TRIGGER MODULE POWER AND GROUND
WCM

Diagnostic Test

1. **DTC STATUS**

Ensure every trigger module connector is connected and WCM connected.

Turn the ignition on.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the "WCM" and follow the procedure.

NOTE: Three trigger modules are located in three of the four wheel wells on the vehicle to provide the WCM/SKREEM with the location of the tire pressure sensors on the vehicle. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor. The locations of the trigger modules can vary for each vehicle. Make sure the vehicle has trigger modules, and that are in the right locations. After every repair, the trigger module test routine must be rerun in order to verify the fix.

Did the Right Front Trigger Module have NO as a result?

Yes

Go To 2.

No

Repair intermittent condition.

2. (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE

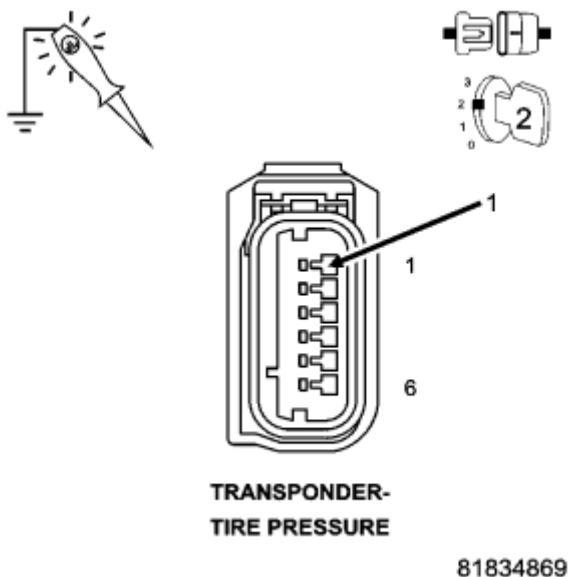


Fig. 25: Checking Fused Ignition Switch Output (Run) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Tire Pressure Transponder harness connector.

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

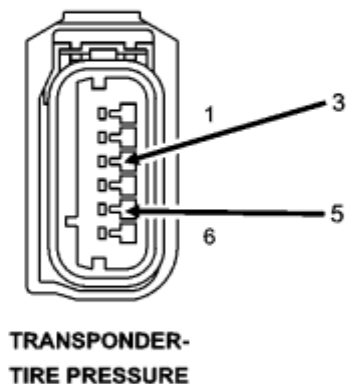
Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

3. **(Z908) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE**



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Fig. 26: Checking Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to battery voltage, probe each of the (Z908) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Does the test light illuminate brightly?

Yes

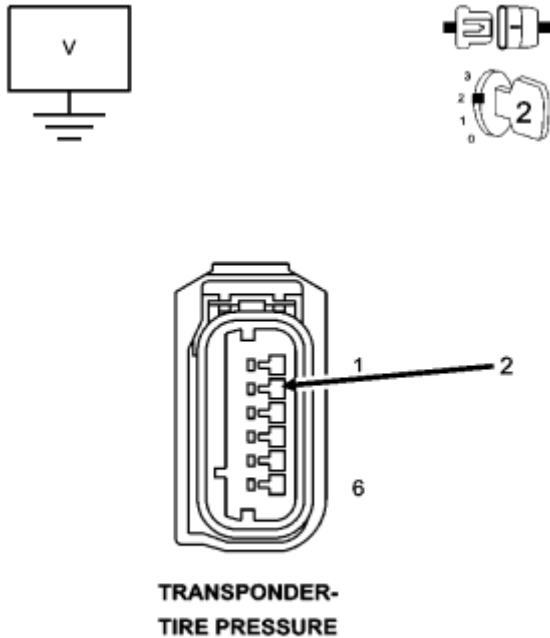
Go to 4.

No

Repair the (Z908) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. **(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE**



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Fig. 27: Checking Voltage Of COM - LIN Tire Pressure Monitor LAN Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect both tire pressure transponder harness connectors.

Turn the ignition on.

Measure the voltage of the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is there any voltage present?

Yes

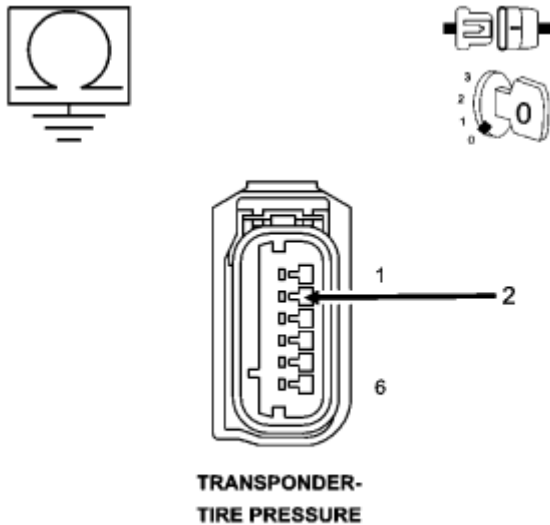
Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to voltage.

Perform **TPM VERIFICATION**.

No

Go to 5.

5. **(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND**



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Fig. 28: Checking Resistance Between Ground & COM - LIN Tire Pressure Monitor LAN Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to ground.
 Perform **TPM VERIFICATION**.

No

Go to 6.

6. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE

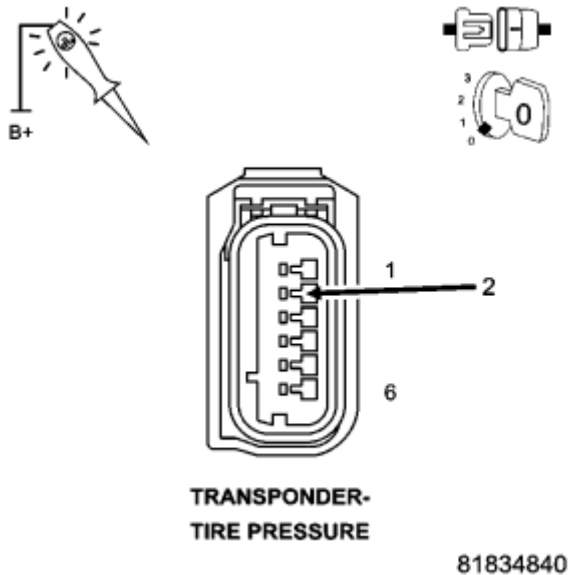


Fig. 29: Checking COM - LIN Tire Pressure Monitor LAN Circuit For Open Or High Resistance
 Courtesy of CHRYSLER LLC

Use a jumper wire with one end connected to ground and the other to the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the WCM/SKREEM harness connector.

Using a 12-Volt test light connected to battery voltage, probe the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the TPM harness connector.

NOTE: **The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.**

Does the test light illuminate bright?

Yes

Go to 7.

No

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

7. TIRE PRESSURE TRIGGER MODULE

Turn the ignition off.

Replace the appropriate Tire Pressure Trigger Module in accordance with the Service Information.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the

"WCM" and follow the procedure.

Did the Right Front Trigger Module have NO as a result?

Yes

Go To 8.

No

Go To 9.

8. WIRELESS CONTROL MODULE (SKREEM)

Replace the Wireless Control Module (SKREEM) in accordance with the Service Information.

Drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time the system will learn the sensor IDs.

With the scan tool, read WCM/SKREEM DTC(s).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate DTC.

No

Repair complete.

Perform **TPM VERIFICATION**.

9. INTERMITTENT TIRE PRESSURE TRIGGER MODULE DTC

The conditions necessary to set this DTC are not present or has been corrected.

Refer to any Technical Service Bulletins that may apply to this condition.

With the scan tool, clear DTCs in the Wireless Control Module (SKREEM).

Test Drive the vehicle for a minimum of 10 minutes with vehicle speed greater than 15 m.p.h.

With the scan tool, select View DTCs in the Wireless Control Module (SKREEM).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate DTC.

Perform **TPM VERIFICATION**.

No

Test complete.

Perform **TPM VERIFICATION**.

U1116-LOST COMMUNICATION WITH LEFT REAR TIRE PRESSURE TRIGGER MODULE

Circuit Schematic

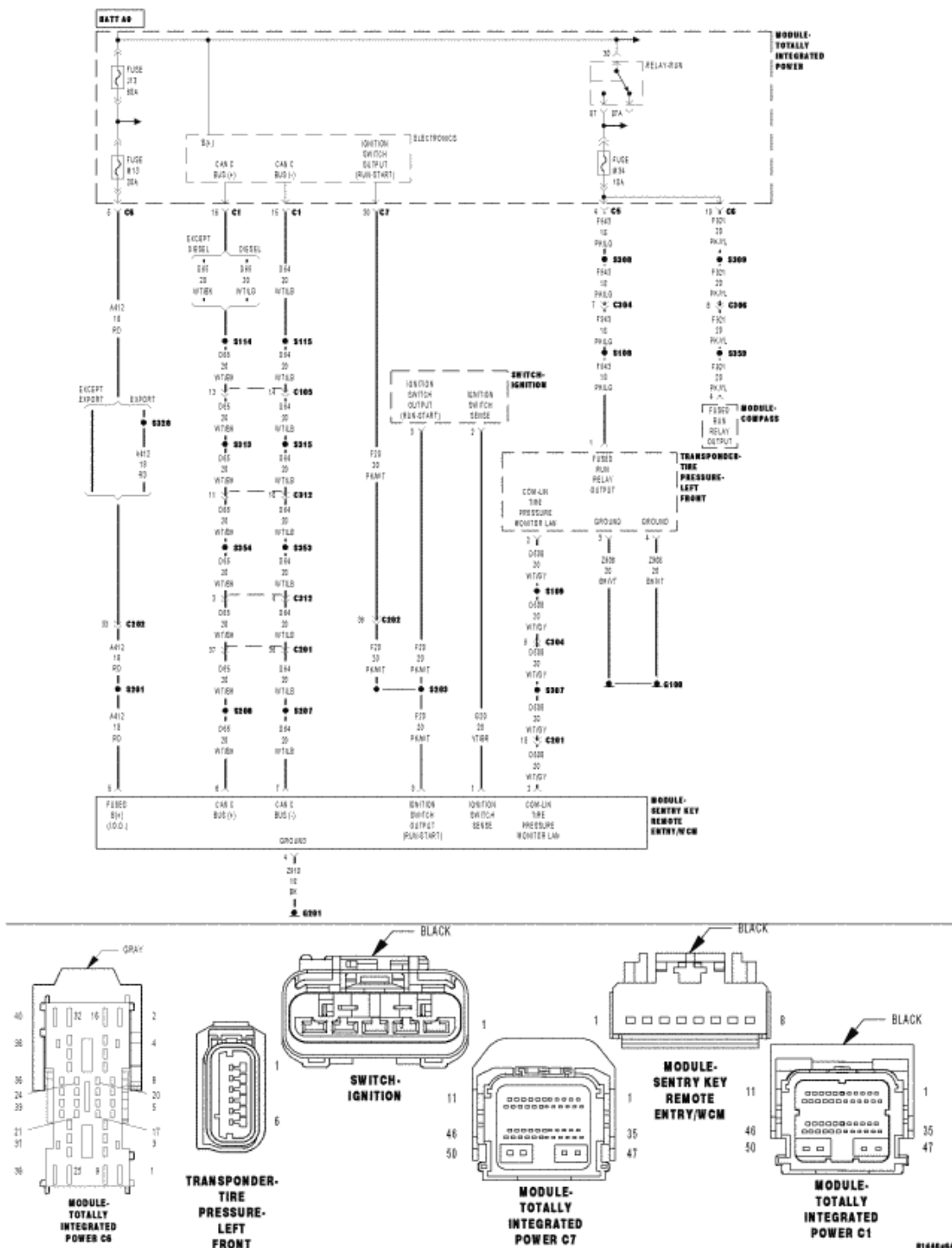


Fig. 30: Left Rear Tire Pressure Sensor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

- With the ignition on
- Battery voltage between 10 and 16 volts
- IOD fuse installed

Set Conditions

- Set Condition:

If the WCM fails to receive bus messages from the Tire pressure trigger module for two consecutive counts of trigger module not responding to a communication check.

Possible Causes

Possible Causes
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND
(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE
(F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE
(Z919) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE
(D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN
TIRE PRESSURE TRIGGER MODULE POWER AND GROUND
WCM

Diagnostic Test

1. DTC STATUS

Ensure every trigger module connector is connected.

Turn the ignition on.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the "WCM" and follow the procedure.

NOTE: Three trigger modules are located in three of the four wheel wells on the vehicle to provide the WCM/SKREEM with the location of the tire pressure sensors on the vehicle. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor. The locations of the trigger modules can vary for each vehicle. Make sure the vehicle has trigger modules, and that are in the right locations. After every repair, the trigger module test routine must be rerun in order to verify the fix.

Did the Left Rear Trigger Module have NO as a result?

Yes

Go To 2.

No

Repair intermittent condition.

2. (F943) FUSED IGNITION SWITCH OUTPUT (RUN) CIRCUIT OPEN OR HIGH RESISTANCE

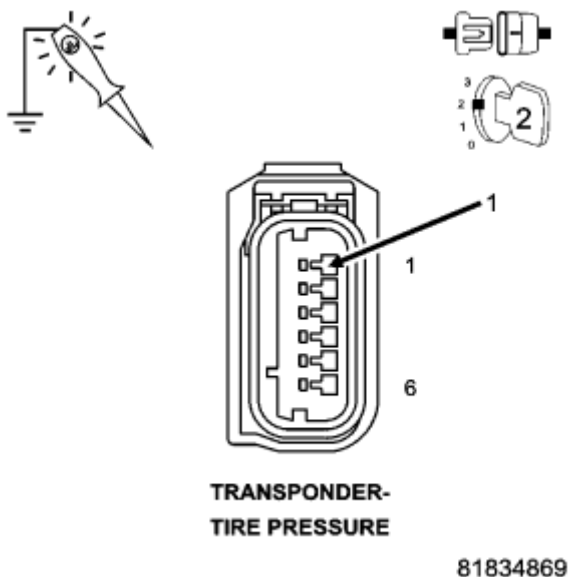


Fig. 31: Checking Fused Ignition Switch Output (Run) Circuit
Courtesy of CHRYSLER LLC

Turn the ignition on.

Using a 12-volt test light connect to ground, check the (F943) Fused Ignition Switch Output (Run) circuit.

NOTE: **The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.**

Is the test light illuminated and bright?

Yes

Go to 3.

No

Repair the (F943) Fused Ignition Switch Output (Run) circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

3. **(Z919) GROUND CIRCUIT(S) OPEN OR HIGH RESISTANCE**

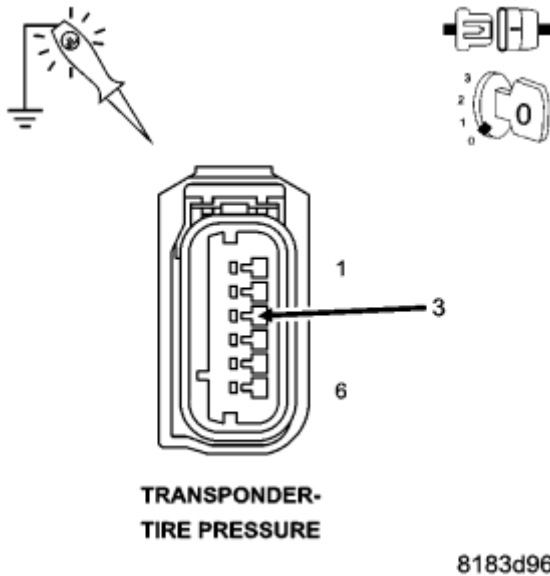


Fig. 32: Checking Ground Circuit For Open Or High Resistance
Courtesy of CHRYSLER LLC

Using a 12-volt test light connect to 12 volts, check each of the (Z919) Ground circuit(s).

NOTE: The test light should be illuminated and bright. Compare the brightness to that of a direct connection to the battery.

Is the test light illuminated and bright?

Yes

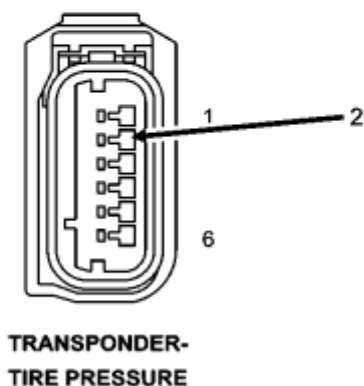
Go to 4.

No

Repair the (Z919) Ground circuit(s) for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

4. **(D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO VOLTAGE**



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Fig. 33: Checking Voltage Of COM - LIN Tire Pressure Monitor LAN Circuit
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect all three tire pressure transponder harness connectors.

Disconnect the Sentry Key Remote Entry Module harness connector.

Turn the ignition on.

Measure the voltage of the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is there any voltage present?

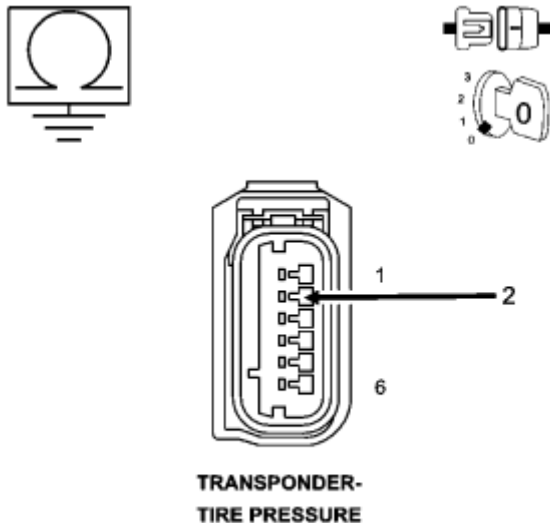
Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to voltage.
 Perform **TPM VERIFICATION**.

No

Go to 5.

5. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT SHORT TO GROUND



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Fig. 34: Checking Resistance Between Ground & COM - LIN Tire Pressure Monitor LAN Circuit
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Measure the resistance between ground and the (D508) COM - LIN Tire Pressure Monitor LAN circuit.

Is the resistance below 5.0 ohms?

Yes

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for a short to ground.
 Perform **TPM VERIFICATION**.

No

Go to 6.

6. (D508) COM - LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN OR HIGH RESISTANCE

Use a jumper wire with one end connected to ground and the other to the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the Front Left Pressure Tire Transponder harness connector.

Using a 12-Volt test light connected to battery voltage, probe the (D508) COM - LIN Tire Pressure Monitor LAN circuit in the SKREEM harness connector.

NOTE: **The test light should be illuminated and bright. Compared the brightness to that of a direct connection to the battery.**

Does the test light illuminate bright?

Yes

Go to 7.

No

Repair the (D508) COM - LIN Tire Pressure Monitor LAN circuit for an open circuit or high resistance.

Perform **TPM VERIFICATION**.

7. (D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT OPEN

Turn the ignition off.

Disconnect the Tire Pressure Trigger Module.

Disconnect the WCM.

With an ohmmeter measure the resistance of the (D508) COM-LIN TIRE PRESSURE MONITOR LAN CIRCUIT.

Is the resistance below 5 Ohms?

Yes

Go To 8.

No

Repair or replace the open circuit.

Perform **TPM VERIFICATION**.

8. POWER AND GROUND CIRCUIT OPEN

Turn the ignition on.

With a voltmeter measure the voltage between the power and ground circuit at the Trigger Module.

Is the voltage at least the same as battery voltage?

Yes

Go To 9.

No

Repair the open circuit.

Perform **TPM VERIFICATION**.

9. CHECK FOR ADDITIONAL TRIGGER MODULE COMMUNICATION RELATED DTCs

With the scan tool, select Network View and select Advanced.

Is there more than one module with active DTCs "Logged Against" the WCM?

Yes

Replace/update the WCM in accordance with the service information.

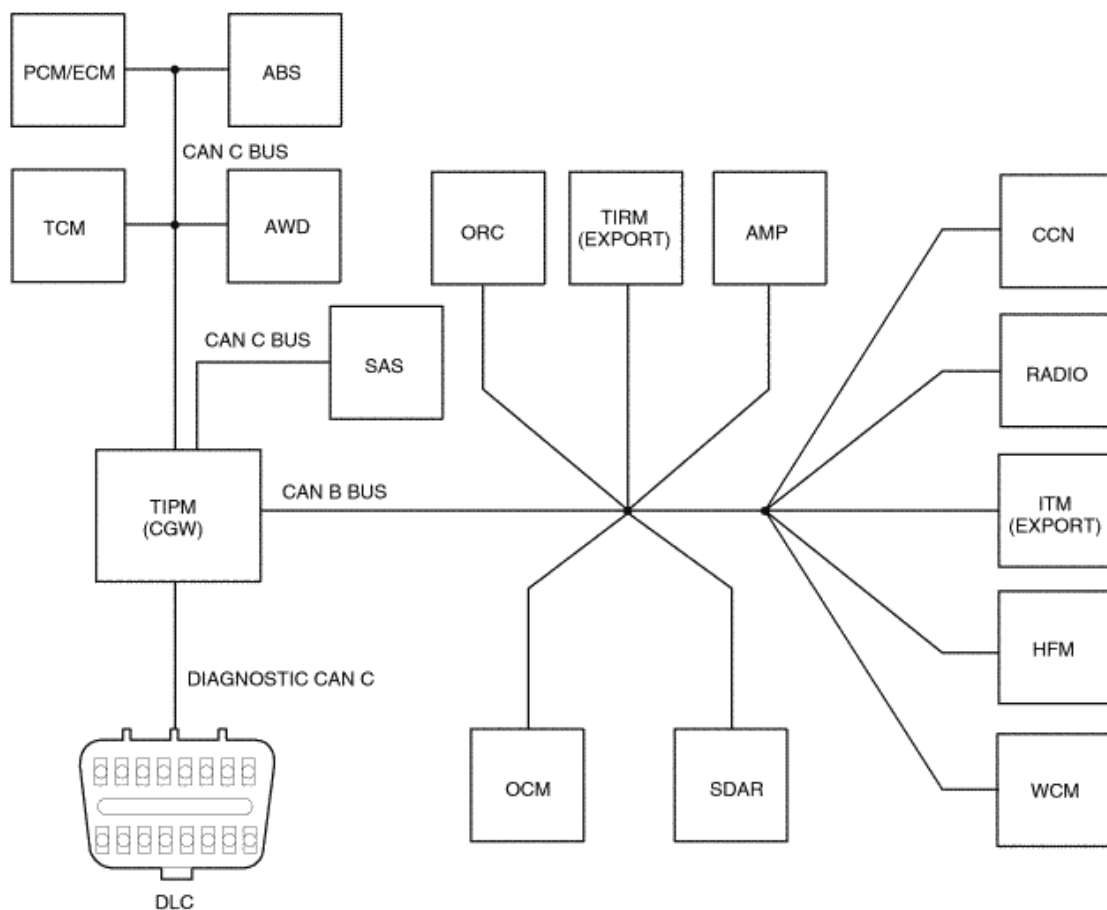
Perform **TPM VERIFICATION**.

No

Replace the Tire pressure trigger Module in accordance with the service information.

Perform **TPM VERIFICATION**.

***STORED LOST COMMUNICATION DTCS**



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Fig. 35: Stored Lost Communication DTC's
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Battery voltage between 10 and 16 volts.

IOD fuse installed.

TIPM is configured correctly.

Set Conditions

- **Set Condition:**

Bus messages not received for approximately 2 to 5 seconds.

Possible Causes

Possible Causes
CAN B BUS CIRCUITS OPEN OR SHORTED CAN C BUS CIRCUITS OPEN OR SHORTED DTCS RELATED TO BATTERY VOLTAGE, IGNITION, OR VIN MESSAGES TIPM NOT CONFIGURED CORRECTLY POWER OR GROUND FROM THE REPORTING MODULE MODULE THAT SET THIS DTC PREVIOUS SERVICE PERFORMED WITHIN THE LAST 100 KEY CYCLES (FUSE/RELAYS REMOVED, WIRING SERVICE, BATTERY DISCONNECT) LOW BATTERY/JUMP START CONDITION IOD FUSE WAS REMOVED DURING SHIPPING CHECK FOR RELATED TSB'S

Diagnostic Test

1. VERIFY DTC IS STORED

NOTE: Stored faults may indicate a customer perceived intermittent condition.

NOTE: Ensure the IOD fuse is installed and battery voltage is between 10 and 16 volts before proceeding.

NOTE: Check for any TSB(s) related to the condition. If a TSB applies, perform the procedure outlined in the TSB before continuing.

With the scan tool, read stored DTC's.

Is this DTC stored?

Yes

Go To step 2.

No

Diagnose the active DTC. Refer to **DIAGNOSTIC CODE INDEX** for a list of the symptoms.

2. CHECK THE ENVIRONMENTAL DATA

With the scan tool, read the loss of communication environmental data.

Does the loss of communication environmental odometer data match up to any of the previous service procedures listed in the possible causes or are there any stored CAN B or C hardware electrical, battery, ignition voltage, VIN missing/mismatch, TIPM configuration DTC's present with matching environmental data?

Yes

These DTC's may have been the result of other service procedures performed. Clear DTC's.

No

Go To step 3.

3. VERIFY INTERMITTENT LOST COMMUNICATION DTC - WIRING CONCERNS

Turn the ignition on.

With the scan tool, select Network View and select Advanced.

Is there more than one ECU with stored DTC's "Logged Against" the module and one or more lost communication DTC's stored in the offending module?

Yes

Verify if the vehicle was recently in for this type of service. Otherwise, visually inspect the related wiring harness for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals. Repair as necessary.

No

Go To step 4.

4. VERIFY INTERMITTENT LOST COMMUNICATION DTC - OFFENDING MODULE

Turn the ignition on.

With the scan tool, select Network View and select Advanced.

Is there more than one ECU with stored DTC's "Logged Against" the module and NO lost communication DTC's stored in the offending module?

Yes

Check for TSB(s) related to this offending module.

No

Go To step 5.

5. VERIFY INTERMITTENT LOST COMMUNICATION DTC - REPORTING MODULE

Turn the ignition on.

With the scan tool, select Network View and select Advanced.

Is there ONLY ONE ECU with stored DTC's "Logged Against" the module?

Yes

Check for TSB(s) related to the module that set this DTC.

No

Verify if the vehicle was recently in for this type of service. Otherwise, visually inspect the related wiring harness for chafed, pierced, pinched, and partially broken wires and the wiring harness connectors for broken, bent, pushed out, and corroded terminals. Repair as necessary.

STANDARD PROCEDURE

TPM VERIFICATION

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Diagnostic Test

1. TPM

Was the WCM/SKREEM replaced during the test procedure?

Yes

Go to step 2.

No

Go to step 3.

2. **WCM/SKREEM**

NOTE: When entering the PIN, care should be taken because the SKREEM will only allow three consecutive attempts to enter the correct PIN. If three consecutive incorrect PIN's are entered the SKREEM will Lock Out the scan tool. To exit Lock Mode, the ignition key must remain in the Run position for one hour. All accessories must be off. A battery charger connected to the battery during this time period is recommended.

1. Reconnect the previously removed and/or disconnected components and connectors.
2. Obtain the vehicle's unique Personal Identification Number (PIN) assigned to its original SKREEM. This number can be obtained from the vehicle invoice or from the Chrysler Customer Center (Phone 1-800-992-1997).
3. With the scan tool, select Miscellaneous Functions, WCM/Wireless Control Module. Then select the desired procedure and follow the display on the scan tool.
4. If the WCM/SKREEM was replaced, all the customer's keys must be programmed to the new module. Use the scan tool and the Program Key procedure
5. With the scan tool, erase all DTCs. Perform 5 ignition key cycles, leaving the key on for at least 90 seconds per cycle.
6. Drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time the system will learn the new sensor ID code and will clear any DTC(s) automatically.
7. With the scan tool, read WCM/SKREEM DTC(s).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate symptom.

No

Repair is complete.

3. **WIRE REPAIR**

Was the repair a wire repair?

Yes

Go To step 5.

No

Go To step 4.

4. **TIRE PRESSURE SENSOR/TIRE PRESSURE TRANSPONDER REPLACE**

1. Reconnect the previously removed and/or disconnected components and connectors.
2. If available, use a TPM-RKE Analyzer tool with the Scan Tool to program the WCM/SKREEM with the tire pressure sensors ID's on the vehicle, or perform step 3.
3. Drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time the system will learn the new sensor ID's.
4. With the scan tool, read TPM DTC(s).

Are there any DTC(s) present?

Yes

Repair not complete, refer to the appropriate symptom.

No

Repair is complete.

5. **WIRE REPAIR**

Ensure every trigger module connector is connected and WCM is connected.

Turn the ignition on.

With the scan tool, run the "Trigger Module Test Routine" under "Miscellaneous Functions" for the "WCM" and follow the procedure.

NOTE: Three trigger modules are located in three of the four wheel wells on the vehicle to provide the WCM/SKREEM with the location of the tire pressure sensors on the vehicle. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor. The locations of the trigger modules can vary for each vehicle. Make sure the vehicle has trigger modules, and that are in the right locations. After every repair, the trigger module test routine must be rerun in order to verify the fix.

Did any of the three Trigger Modules have NO as a result?

Yes

Return to the DTC test.

No

Repair complete.

2008 SUSPENSION

Tires/Wheels - Service Information - Liberty

DIAGNOSIS AND TESTING

TIRE AND WHEEL RUNOUT

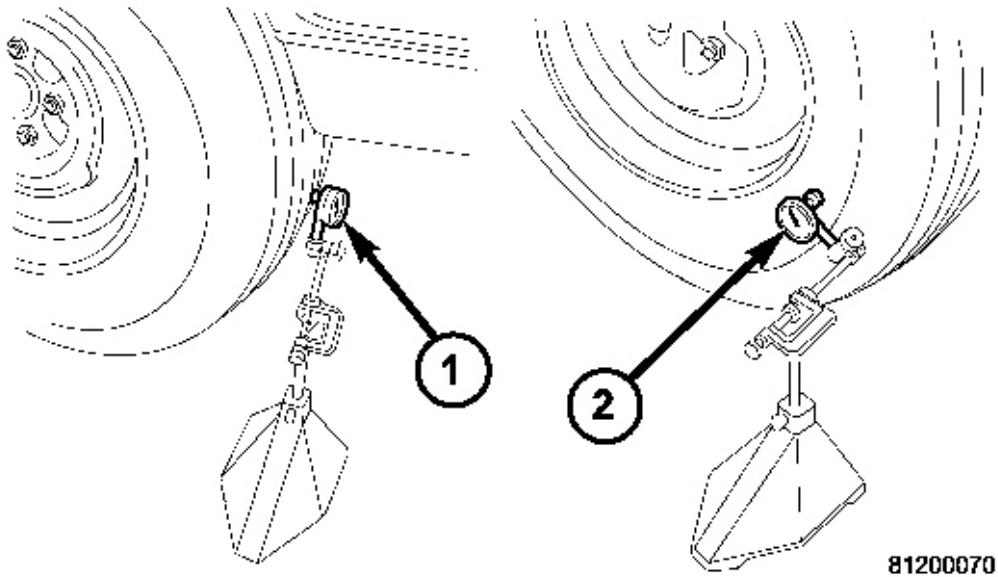
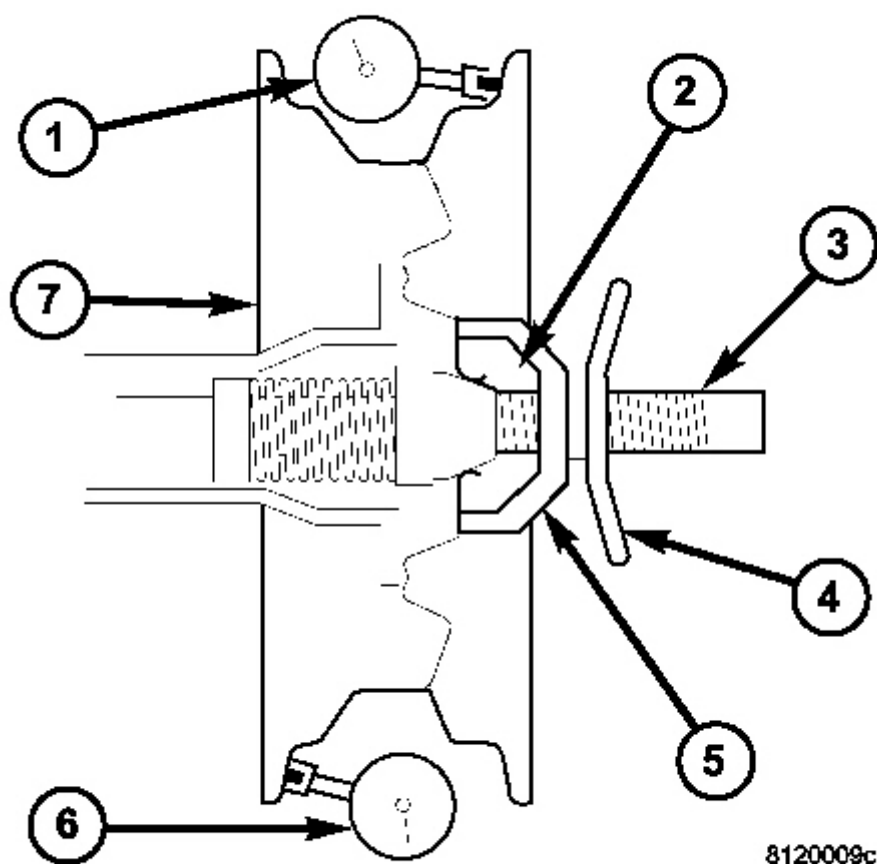


Fig. 1: Checking Radial Runout
Courtesy of CHRYSLER LLC

Radial runout is the difference between the high and low points on the tire or wheel.

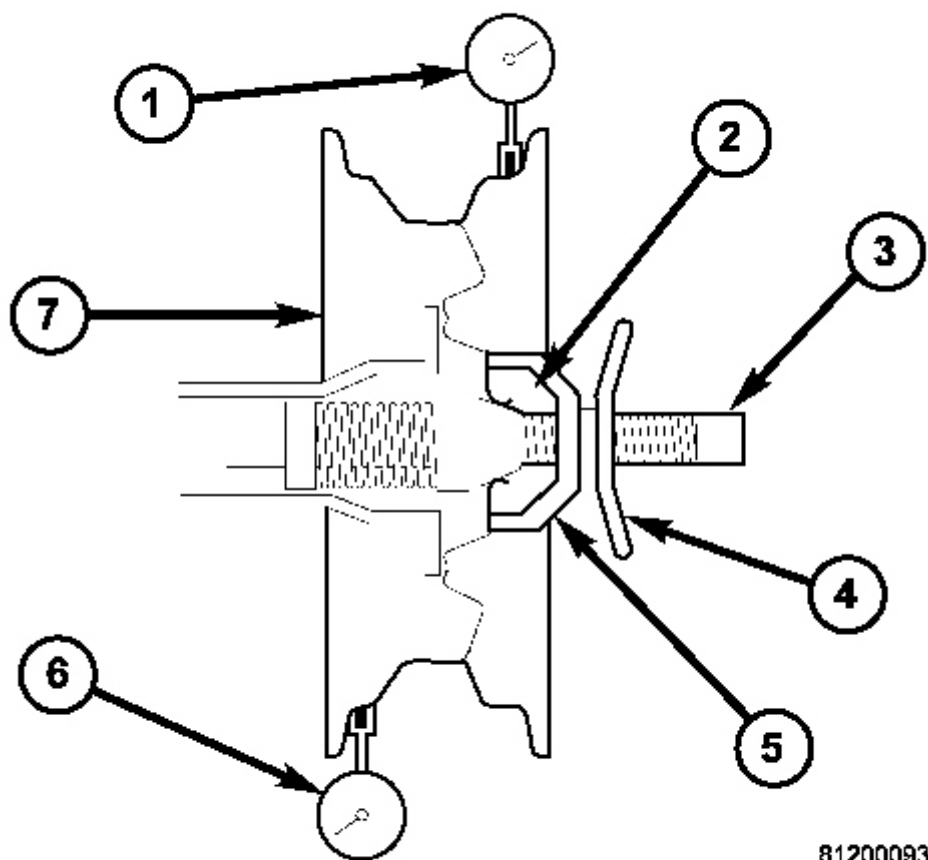


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Fig. 2: Checking Wheel Lateral Runout
Courtesy of CHRYSLER LLC

Lateral runout is the **wobble** of the tire or wheel.

Lateral runout of more than 2.0 mm (.080 inch) measured near the shoulder of the tire may cause the vehicle to shake.



81200093

Fig. 3: Checking Wheel Radial Runout
 Courtesy of CHRYSLER LLC

Radial runout of more than 1.5 mm (.060 inch) measured at the center line of the tread may cause the vehicle to shake.

Sometimes radial runout can be reduced. Relocate the wheel and tire assembly on the mounting studs (See METHOD 1). If this does not reduce runout to an acceptable level, the tire can be rotated on the wheel. (See **METHOD 2 (RELOCATE TIRE ON WHEEL)**).

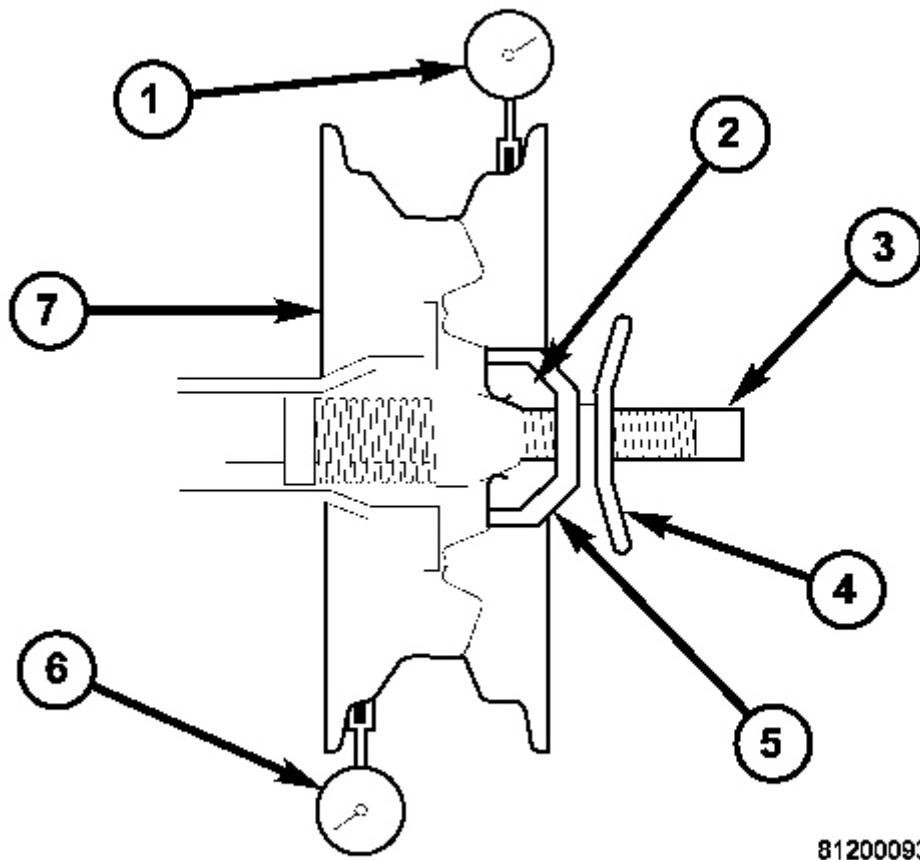
METHOD 1 (RELOCATE WHEEL ON HUB)

1. Drive vehicle 10-15 minutes at highway speed' to adequately warm tire to eliminate tire flat spotting from a parked position.
2. Check wheel bearings and adjust if adjustable or replace if necessary.

3. Check the wheel mounting surface.
4. Rotate wheel on the mounting, two studs over from the original position.
5. Tighten wheel nuts in a crossing pattern until all are properly torqued, to eliminate brake distortion.
6. Check radial runout. If still excessive, mark tire sidewall, wheel, and stud at point of maximum runout and proceed to Method 2.

METHOD 2 (RELOCATE TIRE ON WHEEL)

NOTE: Rotating the tire on wheel is particularly effective when there is runout in both tire and wheel.



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Fig. 4: Checking Wheel Radial Runout
Courtesy of CHRYSLER LLC

1. Remove tire from wheel and mount wheel on service dynamic balance machine.
2. Check the wheel radial runout.

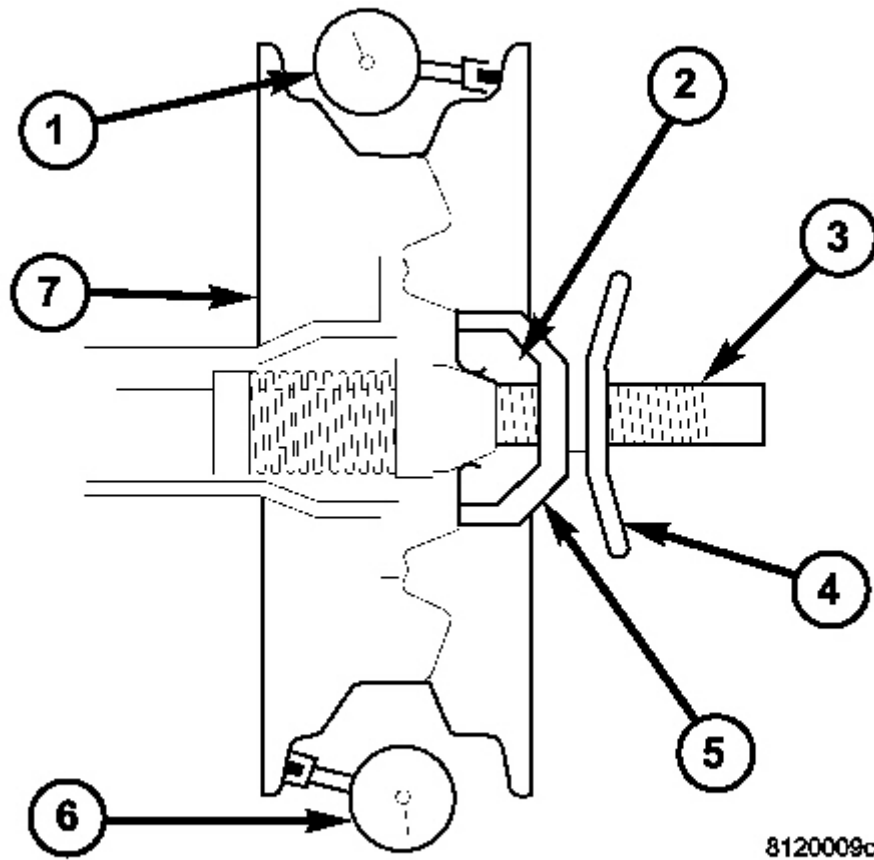


Fig. 5: Checking Wheel Lateral Runout
Courtesy of CHRYSLER LLC

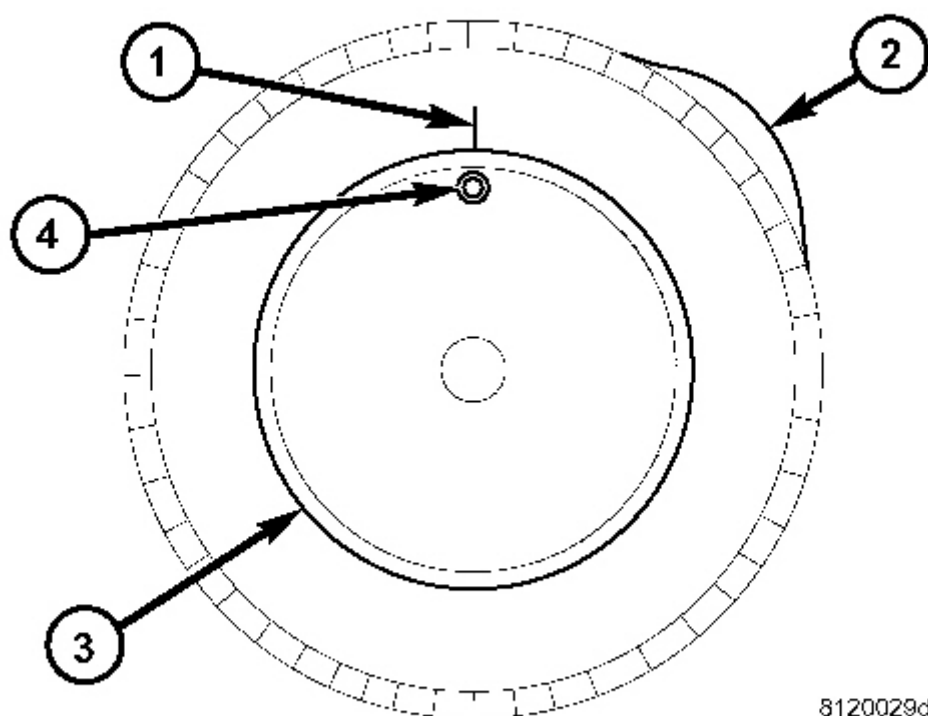
3. Check the wheel lateral runout.
STEEL WHEELS: Radial runout 0.6096 mm (0.024 in.), Lateral runout 0.762 mm (0.030 in.) (maximum)
ALUMINUM WHEELS: Radial runout 0.3556 mm (0.14 in.), Lateral runout 0.508 mm (0.020 in.) (maximum)
4. If point of greatest wheel lateral runout is near original chalk mark, remount tire 180 degrees. Recheck runout.

STANDARD PROCEDURE

MATCH MOUNTING

Wheels and tires that are mounted means that the high spot of the tire is matched to the low spot on the wheel rim. Each are marked with a bright colored temporary label on the outboard surface for alignment. The wheel is also marked permanently on the inside of the rim in the tire well. This permanent mark may be a paint dot or line, a permanent label or a stamped impression such as an X. An optional location mark is a small spherical indentation on the vertical face of the outboard flange on some non styled base steel wheels. The tire must be removed to locate the permanent mark on the inside of the wheel.

Before dismounting a tire from its wheel, a reference mark should be placed on the tire at the valve stem location. This reference will ensure that it is remounted in the original position on the wheel.



8120029d

Fig. 6: Marking Tire And Wheel To Indicate High Spot
Courtesy of CHRYSLER LLC

1. Remove the tire and wheel assembly from the vehicle and mount on a service dynamic balance machine.
2. Measure the total runout on the center of the tire tread rib (3) with a dial indicator. Record the indicator

reading. Mark the tire to indicate the high spot (2). Place a mark on the tire at the valve stem (4) location (1).

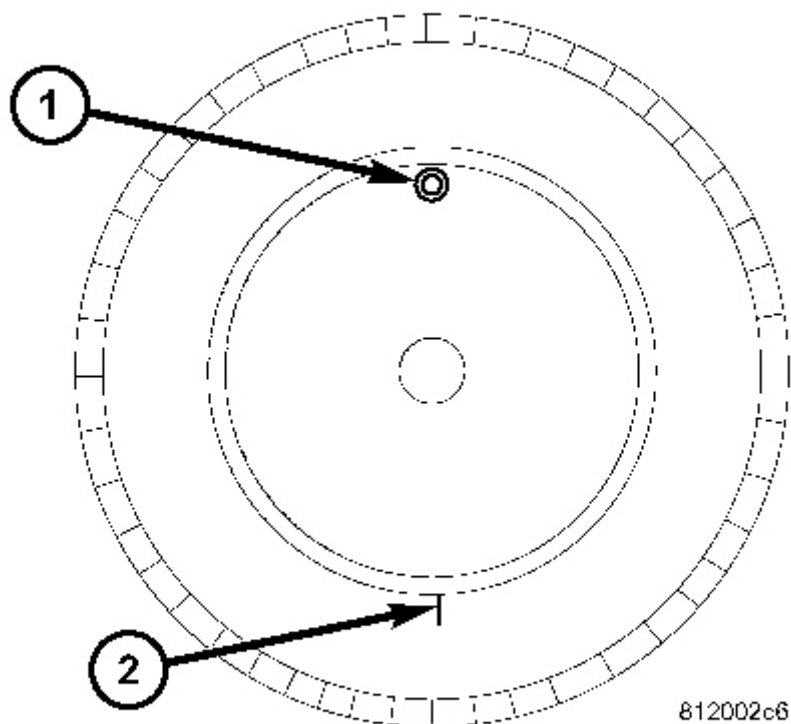


Fig. 7: Remounting Tire 180 Degrees on Rim
Courtesy of CHRYSLER LLC

3. Break down the tire and remount it 180 degrees on the rim (1)(2).
4. Measure the total indicator runout again. Mark the tire to indicate the high spot.

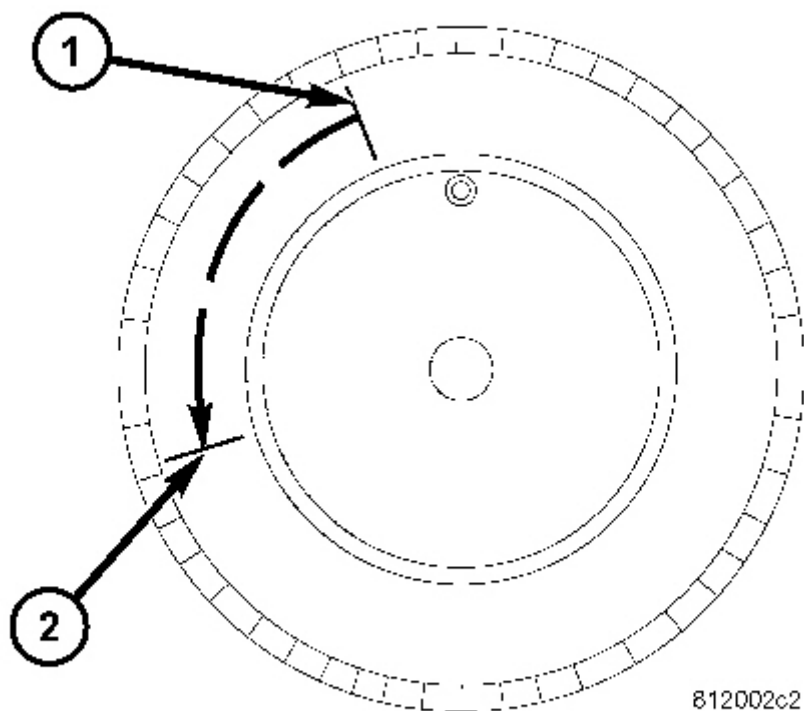


Fig. 8: Remounting Tire 90 Degrees on Rim
Courtesy of CHRYSLER LLC

5. If runout is still excessive, the following procedures must be done.

If the high spot is within 101.6 mm (4.0 in.) of the first spot and is still excessive, replace the tire.

If the high spot is within 101.6 mm (4.0 in.) of the first spot on the wheel, the wheel may be out of specifications.

If the high spot is NOT within 101.6 mm (4.0 in.) of either high spot, draw an arrow on the tread from second high spot (1) to first (2). Break down the tire and remount it 90 degrees on rim in that direction. This procedure will normally reduce the runout to an acceptable amount, if not replace the rim.

TIRE AND WHEEL BALANCE

It is recommended that a two plane service dynamic balancer be used when a tire and wheel assembly require balancing. Refer to balancer operation instructions for proper cone mounting procedures. Typically use front cone mounting method for steel wheels. For aluminum wheel use back cone mounting method without cone spring.

NOTE: Static should be used only when a two plane balancer is not available.

NOTE: Cast aluminum and forged aluminum wheels require coated balance weights and special alignment equipment.

Wheel balancing can be accomplished with either on or off vehicle equipment. When using on-vehicle balancing equipment, remove the opposite wheel/tire. Off-vehicle balancing is recommended.

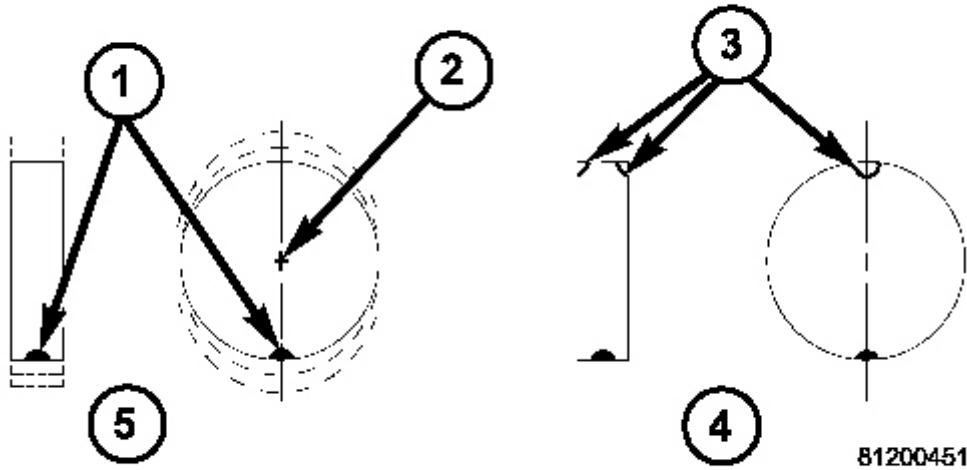


Fig. 9: Static Balancing
Courtesy of CHRYSLER LLC

NOTE: 20" wheels do not have an outer flange. Apply adhesive weights on midplane surface

For static balancing, find the location of the heavy spot (1) causing the imbalance (5). Counter balance wheel directly opposite the heavy spot. Determine weight required to counter balance the area of imbalance (4). Place half of this weight on the **inner** rim flange (3) and the other half on the **outer** rim flange (3).

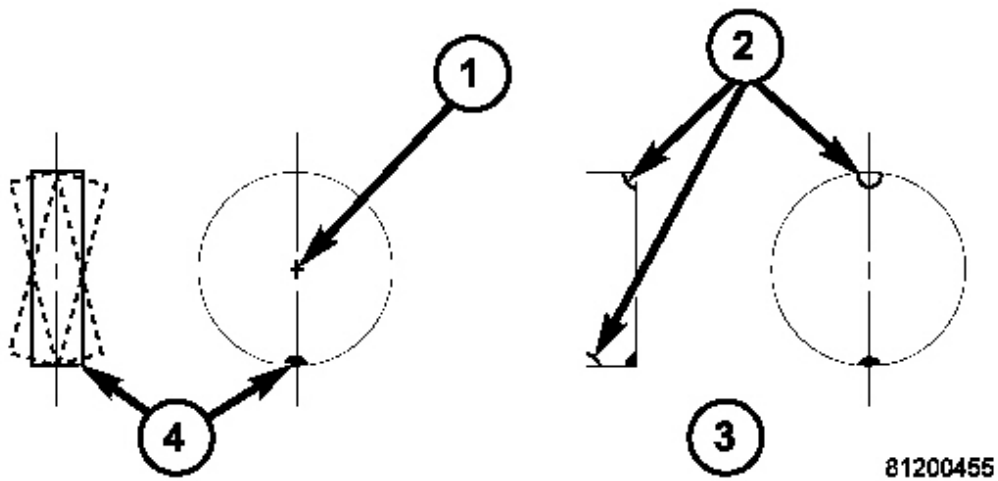


Fig. 10: Dynamic Balancing
 Courtesy of CHRYSLER LLC

For dynamic balancing (3), the balancing equipment is designed to locate the amount of weight to be applied to both the inner and outer rim flange (2).

TIRE ROTATION

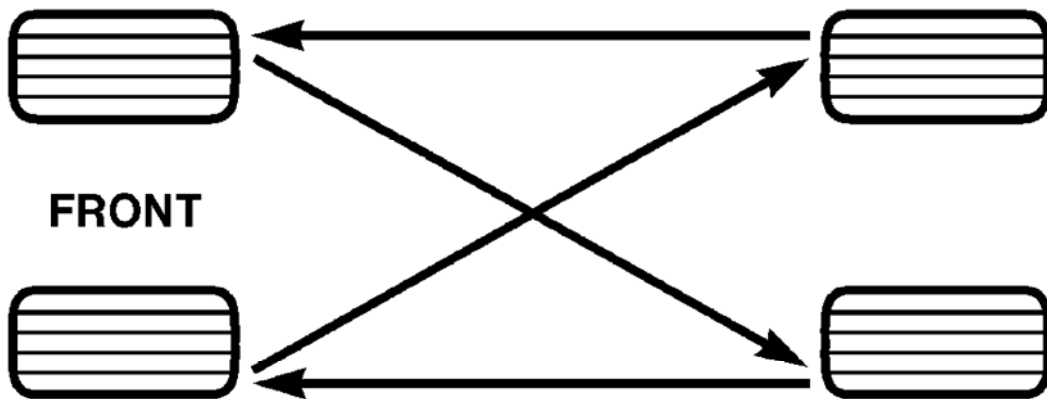


Fig. 11: Tire Rotation Pattern
Courtesy of CHRYSLER LLC

Tires on the front and rear operate at different loads and perform different steering, driving, and braking functions. For these reasons they wear at unequal rates and tend to develop irregular wear patterns. These effects can be reduced by rotating the tires at regular intervals. The benefits of tire rotation are:

- Increase tread life
- Maintain traction levels
- A smooth, quiet ride

The suggested method of tire rotation is shown in graphic. Other rotation methods can be used, but they will not provide all the tire longevity benefits.

SPECIFICATIONS

TORQUE CHART

CAUTION: DO NOT USE CHROME PLATED LUG NUTS WITH CHROME PLATED WHEELS.

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Wheel Lug Nut	136 ± 20	100 ± 15	-
Spare Tire Winch	39	28	250

TIRES

DESCRIPTION

FULL SIZE

The spare is a full usage wheel with a matching tire. It can be used within the (posted legal) speed limits or distance limitations as of the rest of the vehicles four tires. Refer to Owner's Manual for complete details.

RADIAL-PLY TIRES

Radial-ply tires improve handling, tread life and ride quality, and decrease rolling resistance.

Radial-ply tires must always be used in sets of four. Under no circumstances should they be used on the front only. They may be mixed with temporary spare tires when necessary. A maximum speed of 80 KPH (50 MPH) is recommended while a temporary spare is in use.

Radial-ply tires have the same load-carrying capacity as other types of tires of the same size. They also use the same recommended inflation pressures.

The use of oversized tires, either in the front or rear of the vehicle, can cause vehicle drive train failure. This could also cause inaccurate wheel speed signals when the vehicle is equipped with Anti-Lock Brakes.

The use of tires from different manufactures on the same vehicle is NOT recommended. The proper tire pressure should be maintained on all four tires.

REPLACEMENT TIRES

The original equipment tires provide a proper balance of many characteristics such as:

- Ride
- Noise
- Handling
- Durability
- Tread life
- Traction
- Rolling resistance
- Speed capability

It is recommended that tires equivalent to the original equipment tires be used when replacement is needed.

Failure to use equivalent replacement tires may adversely affect the safety and handling of the vehicle.

The use of oversize tires may cause interference with vehicle components. Under extremes of suspension and steering travel, interference with vehicle components may cause tire damage.

WARNING: Failure to equip the vehicle with tires having adequate speed capability can result in sudden tire failure.

SPARE / TEMPORARY TIRE

The temporary spare tire is designed for emergency use only. The original tire should be repaired or replaced at the first opportunity, then reinstalled. Do not exceed speeds of 80 KMH (50 MPH). when using the temporary spare tire. Refer to Owner's Manual for complete details.

TIRE INFLATION PRESSURES

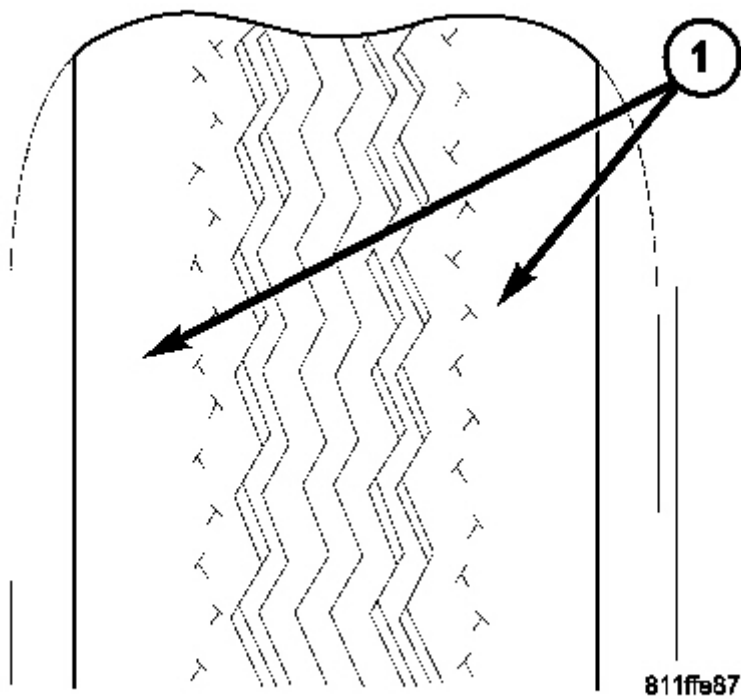


Fig. 12: Identifying Under Inflated Tire
Courtesy of CHRYSLER LLC

WARNING: Over or under inflated tires can affect vehicle handling and tread wear. This may cause the tire to fail suddenly, resulting in loss of vehicle control.

Under inflation will cause rapid shoulder wear (1), tire flexing, and possible tire failure.

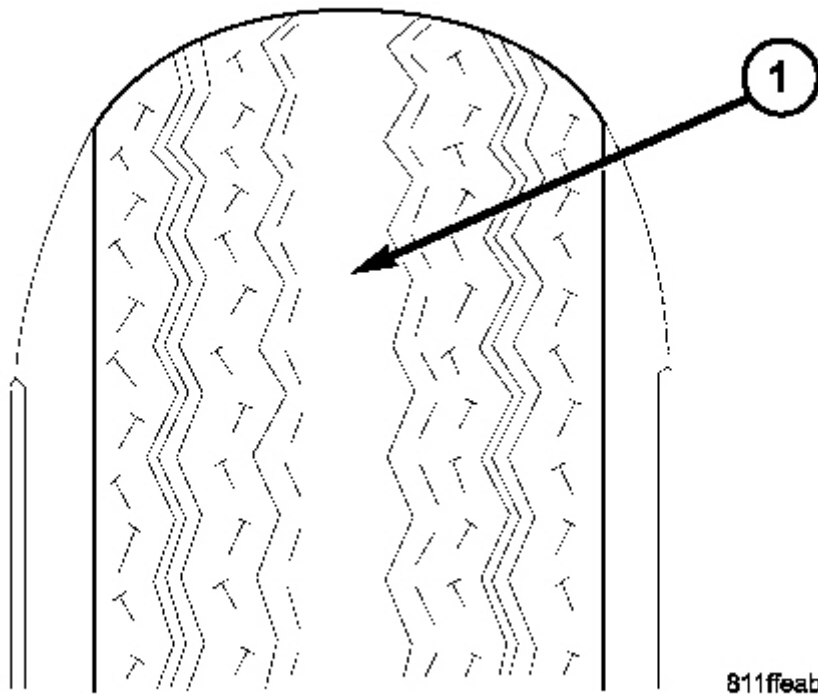


Fig. 13: Identifying Over Inflated Tire
Courtesy of CHRYSLER LLC

Over inflation will cause rapid center wear (1) reduction in the tire's ability to cushion shocks.

Improper inflation can cause:

- Uneven wear patterns
- Reduced tread life
- Reduced fuel economy
- Unsatisfactory ride
- Vehicle drift

For proper tire pressure specification refer to the tire label placard usually located on the drivers door latch pillar.

TIRE PRESSURE FOR HIGH SPEED

Refer to the Vehicles Owners Manual package.

TIRES

Tires are designed and engineered for each specific vehicle. They provide the best overall performance for normal operation. The ride and handling characteristics match the vehicle's requirements. With proper care they will give excellent reliability, traction, skid resistance, and tread life.

Driving habits have more effect on tire life than any other factor. Careful drivers will obtain in most cases, much greater mileage than severe use or careless drivers. A few of the driving habits which will shorten the life of any tire are:

- Rapid acceleration
- Severe brake applications
- High speed driving
- Excessive speeds on turns
- Striking curbs and other obstacles

Radial-ply tires are more prone to irregular tread wear. It is important to follow the tire rotation interval. See **STANDARD PROCEDURE**. This will help to achieve a greater tread life.

TIRE IDENTIFICATION

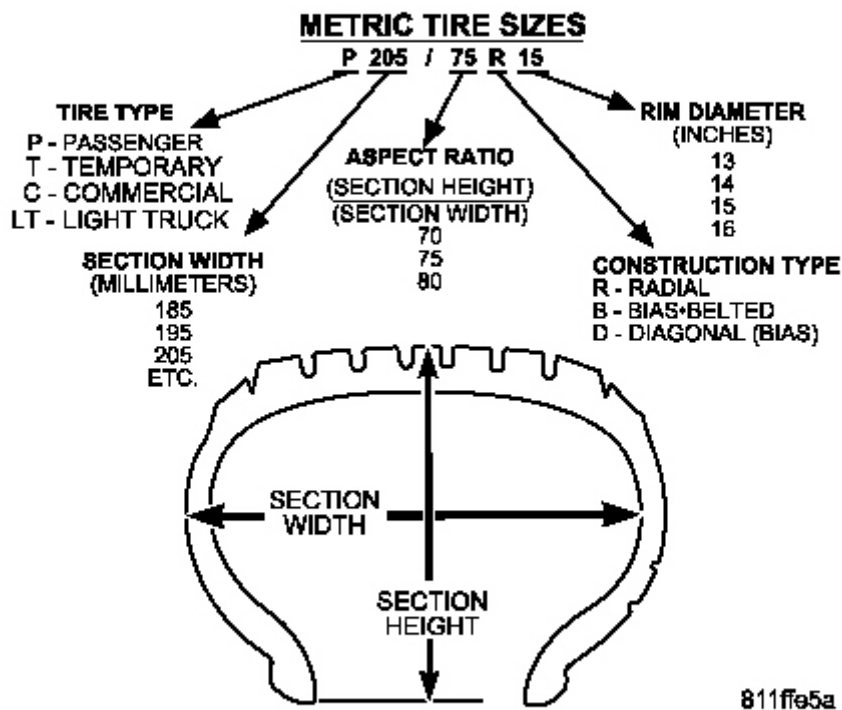


Fig. 14: Identifying Tire Identification Information
Courtesy of CHRYSLER LLC

Tire type, size, aspect ratio and speed rating are encoded in the letters and numbers imprinted on the side wall of the tire. Refer to the chart to decipher the tire identification code.

Performance tires have a speed rating letter after the aspect ratio number. The speed rating is not always printed on the tire sidewall. These ratings are:

- Q** up to 99 mph
- S** up to 112 mph
- T** up to 118 mph
- U** up to 124 mph
- H** up to 130 mph
- V** up to 149 mph
- W** (consult the tire manufacturer for the specific speed rating)
- Z** more than 149 mph (consult the tire manufacturer for the specific speed rating)

An All Season type tire will have either **M + S**, **M & S** or **M-S** (indicating mud and snow traction) imprinted on the side wall.

TIRE CHAINS

Tire snow chains may be used on **certain** models. Refer to the Owner's Manual for more information.

DIAGNOSIS AND TESTING

PRESSURE GAUGES

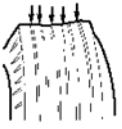
A quality air pressure gauge is recommended to check tire pressure. After checking the air pressure, replace valve cap finger tight.

TIRE NOISE OR VIBRATION

Radial-ply tires are sensitive to force impulses caused by improper mounting, vibration, wheel defects, or possibly tire imbalance.

To find out if tires are causing the noise or vibration, drive the vehicle over a smooth road at varying speeds. Note the noise level during acceleration and deceleration. The engine, differential and exhaust noises will change as speed varies, while the tire noise will usually remain constant.

TIRE WEAR PATTERNS

CONDITION	1. RAPID WEAR AT SHOULDERS	2. RAPID WEAR AT CENTER	CRACKED TREADS	WEAR ON ONE SIDE	FEATHERED EDGE	BALD SPOTS	SCALLOPED WEAR
EFFECT							
CAUSE	UNDER-INFLATION OR LACK OF ROTATION	OVER-INFLATION OR LACK OF ROTATION	UNDER-INFLATION OR EXCESSIVE SPEED*	EXCESSIVE CAMBER	INCORRECT TOE	UNBALANCED WHEEL OR TIRE DEFECT*	LACK OF ROTATION OF TIRES OR WORN OR OUT-OF-ALIGNMENT SUSPENSION.
CORRECTION	ADJUST PRESSURE TO SPECIFICATIONS WHEN TIRES ARE COOL ROTATE TIRES			ADJUST CAMBER TO SPECIFICATIONS	ADJUST TOE-IN TO SPECIFICATIONS	DYNAMIC OR STATIC BALANCE WHEELS	ROTATE TIRES AND INSPECT SUSPENSION

* HAVE TIRE INSPECTED FOR FUTURE USE.

Fig. 15: Identifying Tire Wear Patterns
Courtesy of CHRYSLER LLC

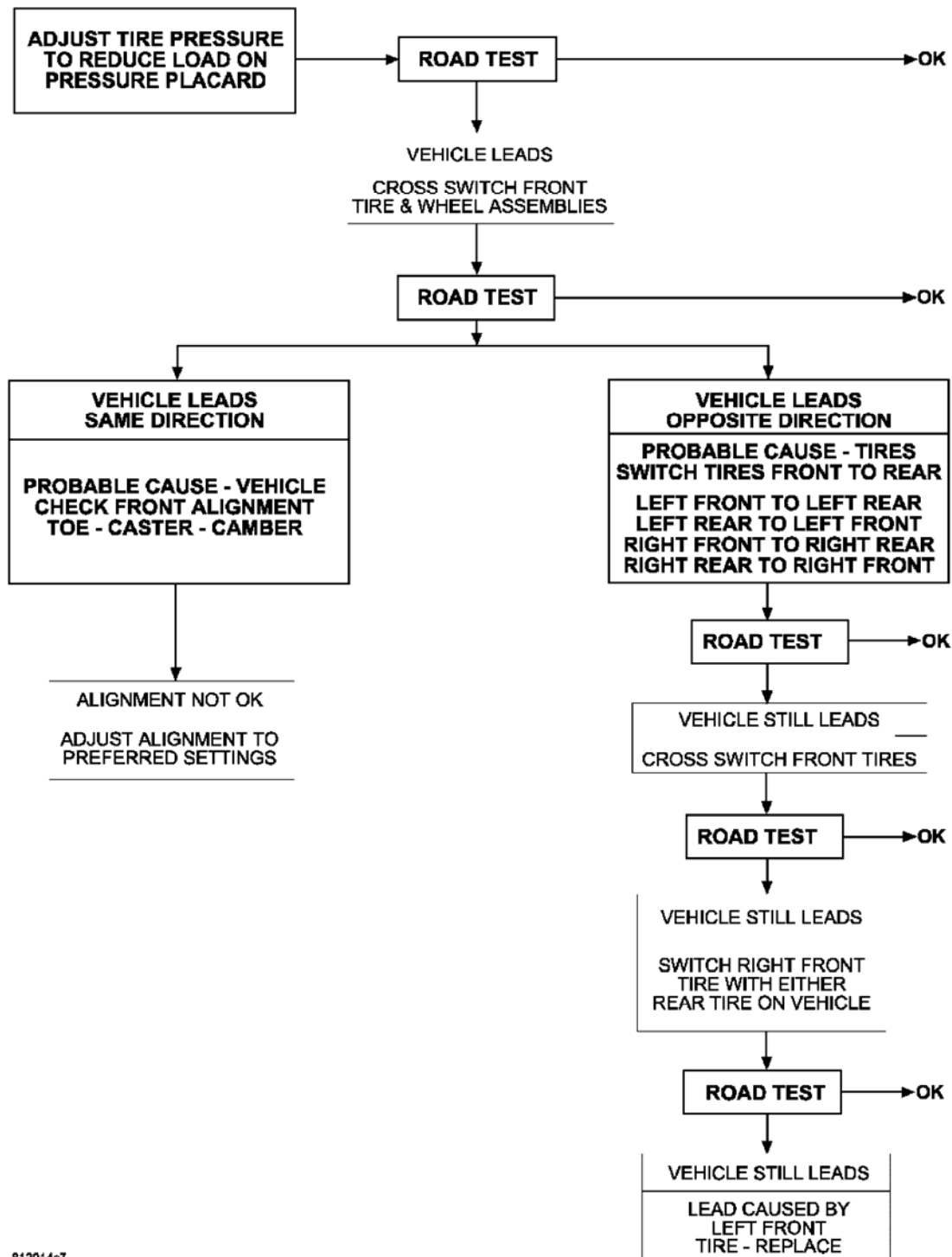
Under inflation will cause wear on the shoulders of tire. Over inflation will cause wear at the center of tire.

Excessive camber causes the tire to run at an angle to the road. One side of tread is then worn more than the other.

Excessive toe-in or toe-out causes wear on the tread edges and a feathered effect across the tread.

TIRE/VEHICLE LEAD

Use the following Vehicle Lead Diagnosis And Correction Chart to diagnose and correct a vehicle lead or drift problem.



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Fig. 16: Vehicle Lead Diagnosis & Correction Chart
Courtesy of CHRYSLER LLC

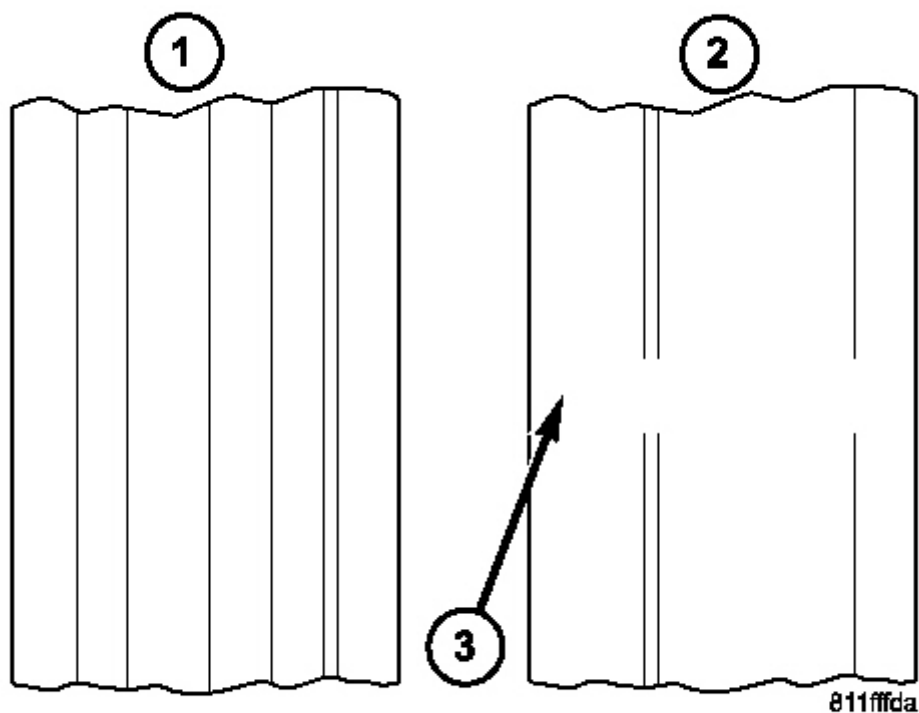


Fig. 17: Identifying Tread Wear Indicators
Courtesy of CHRYSLER LLC

Tread wear indicators (3) are molded into the bottom of the tread grooves. When tread depth is 1.6 mm (1/16 in.), the tread wear indicators (3) will appear as a 13 mm (1/2 in.) band.

Tire replacement is necessary when indicators appear in two or more grooves or if localized balding occurs.

STANDARD PROCEDURE

TIRE REPAIR AREA

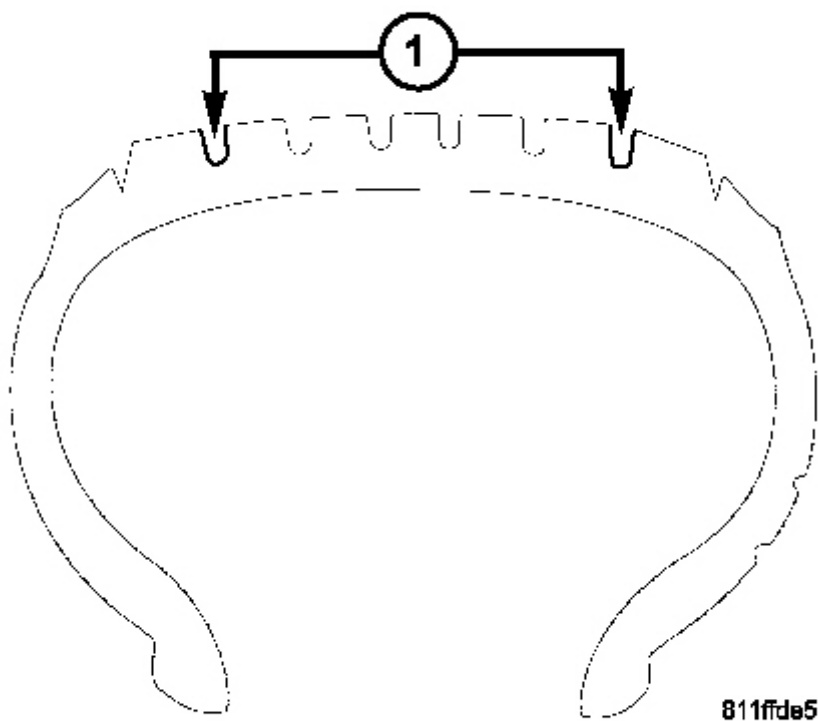


Fig. 18: Identifying Tire Repair Area
Courtesy of CHRYSLER LLC

For proper repairing, a radial tire must be removed from the wheel. Repairs should only be made if the defect, or puncture, is in the tread area (1). The tire should be replaced if the puncture is located in the sidewall.

Deflate tire completely before removing the tire from the wheel. Use lubrication such as a mild soap solution when dismounting or mounting tire. Use tools free of burrs or sharp edges which could damage the tire or wheel rim.

Before mounting tire on wheel, make sure all rust is removed from the rim bead and repaint if necessary.

Install wheel on vehicle, and tighten to proper torque specification.

CLEANING

TIRES

Remove the protective coating on the tires before delivery of a vehicle. This coating may cause deterioration of

the tires.

To remove the protective coating, apply warm water and let it soak for a few minutes. Afterwards, scrub the coating away with a soft bristle brush. Steam cleaning may also be used to remove the coating.

NOTE: **DO NOT use gasoline, mineral oil, oil-based solvent or a wire brush for cleaning.**

SPECIFICATIONS

TIRE SIZE

TIRE SIZE SPECIFICATIONS

DESCRIPTION	SPECIFICATION
TIRE SIZE	REVOLUTIONS PER MILE
P225/75R16	712
P235/70R16	721
P235/65R17	721
P235/60R18	722
P235/70R16 BUX	718
P235/65R17 BUX	715
P235/60R18 BUX	718
T175/90D17 TEMPORARY SPARE	709

SPARE TIRE WINCH

REMOVAL

SPARE TIRE

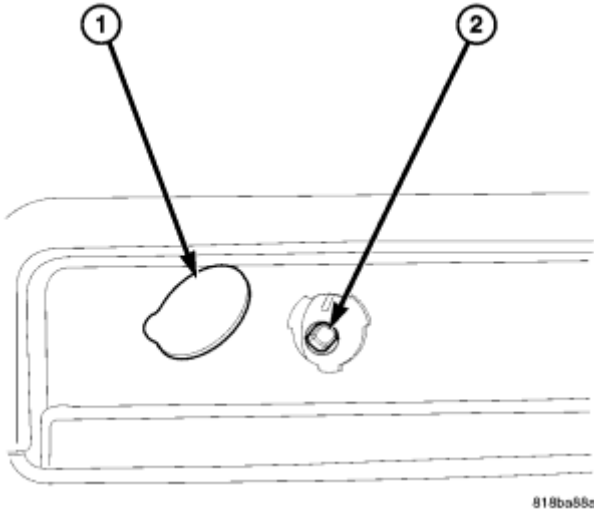
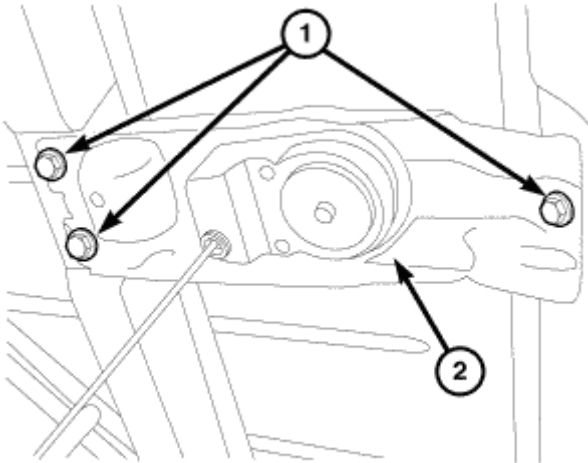


Fig. 19: Access Plug & Spare Tire Winch Turn Down

Courtesy of CHRYSLER LLC

1. Remove the access plug (1) to the spare tire winch turn down (2).
2. Remove the jack tools and use them to lower the spare tire.
3. Remove the spare tire.



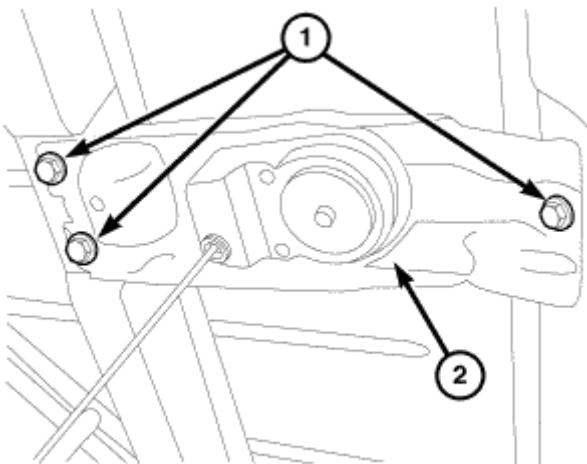
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Fig. 20: Spare Tire Winch & Mounting Bolts
Courtesy of CHRYSLER LLC

4. Remove the three bolts (1) for the spare tire winch (2).
5. Remove the spare tire winch (2).

INSTALLATION

SPARE TIRE



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Fig. 21: Spare Tire Winch & Mounting Bolts
Courtesy of CHRYSLER LLC

1. Install the spare tire winch (2) to the vehicle.
2. Install the three mounting bolts (1) securing the winch to the vehicle. Tighten to 39 N.m (28 ft. lbs).

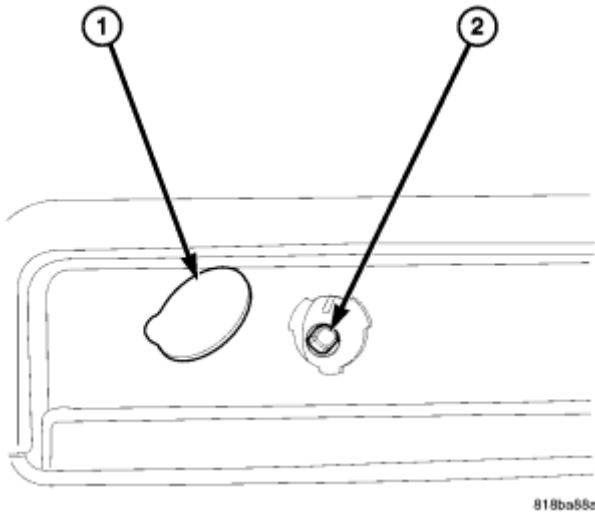


Fig. 22: Access Plug & Spare Tire Winch Turn Down
Courtesy of CHRYSLER LLC

3. Install the spare tire onto the winch.
4. Turn the winch (2) to raise the tire.
5. Install the plastic access (1) cover.

WHEELS

DESCRIPTION

WHEEL DESIGN

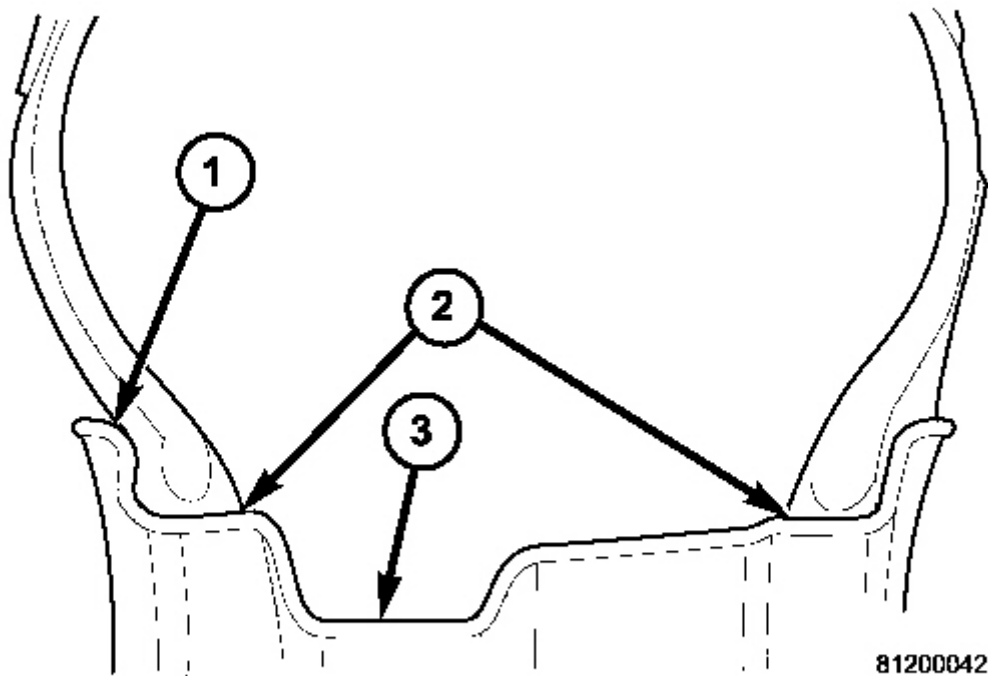


Fig. 23: Identifying Wheel/Rim Design
Courtesy of CHRYSLER LLC

The rim size is on the vehicle safety certification label located on the drivers door shut face. Original equipment wheels/rims are designed for operation up to the specified maximum vehicle capacity.

All models use stamped steel, cast aluminum or forged aluminum wheels. Every wheel has raised sections between the rim flanges (1) and rim drop well (3) called safety humps.

Initial inflation of the tire forces the bead over these raised sections. In case of rapid loss of air pressure, the raised sections help hold the tire on the wheel.

The wheel studs and nuts are designed for specific applications. All aluminum and some steel wheels have wheel stud nuts with an enlarged nose. This enlarged nose is necessary to ensure proper retention of the wheels. Do not use replacement studs or nuts with a different design or lesser quality.

DIAGNOSIS AND TESTING

WHEEL INSPECTION

Inspect wheels for:

Excessive run out

Dents or cracks

Damaged wheel lug nut holes

Air Leaks from any area or surface of the rim

NOTE: **Do not attempt to repair a wheel by hammering, heating or welding.**

If a wheel is damaged an original equipment replacement wheel should be used. When obtaining replacement wheels, they should be equivalent in load carrying capacity. The diameter, width, offset, pilot hole and bolt circle of the wheel should be the same as the original wheel.

WARNING: Failure to use equivalent replacement wheels may adversely affect the safety and handling of the vehicle. Used wheels are not recommended. The service history of the wheel may have included severe treatment or very high mileage. The rim could fail without warning.

WARNING: DaimlerChrysler corporation does not recommend that customers use "reconditioned" wheels (wheels that have been damaged and repaired) because they can result in a sudden catastrophic wheel failure which could cause loss of control and result in injury or death.

For Clarification:

Cosmetic refinishing for the purpose of repairing a superficial flaw is an acceptable procedure providing it is limited to paint or clear coat only, the wheel is not modified in any way, and there is no exposure to paint curing heat over 200 degrees Fahrenheit.

Damaged wheels are those which have been bent, broken, cracked or sustained some other physical damage which may have compromised the wheel structure

Repaired indicates that the wheel has been modified through bending, welding, heating, straightening, or material removal to rectify damage.

Re-plating of chrome plated wheels is not an acceptable procedure nor is chrome plating of original equipment painted or polished wheels, as this may alter mechanical properties and affect fatigue life.

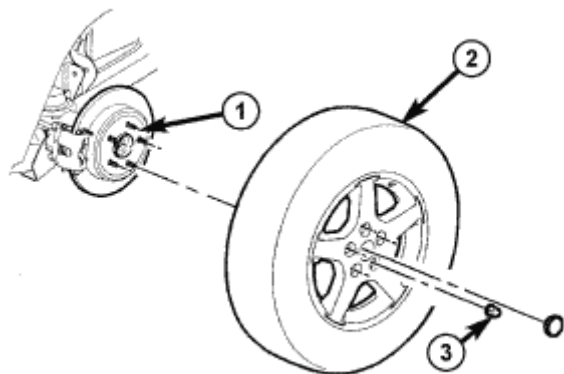
STANDARD PROCEDURE

WHEEL INSTALLATION

The wheel studs and nuts are designed for specific applications. They must be replaced with equivalent parts.

Do not use replacement parts of lesser quality or a substitute design. All aluminum and some steel wheels have wheel stud nuts which feature an enlarged nose. This enlarged nose is necessary to ensure proper retention of the aluminum wheels.

NOTE: Do not use chrome plated lug nuts with chrome plated wheels.

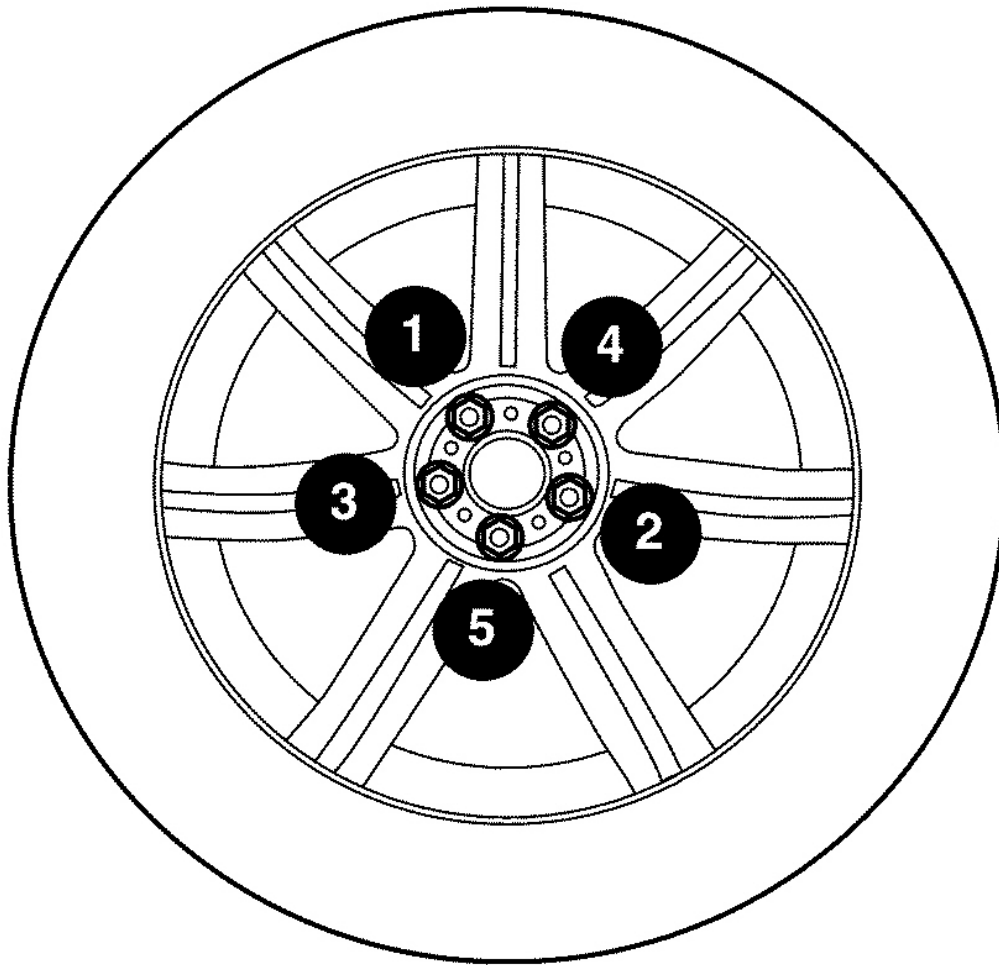


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Fig. 24: Removing/Installing Wheel
Courtesy of CHRYSLER LLC

Before installing the wheel, be sure to remove any build up of corrosion on the wheel mounting surfaces (1). Ensure wheels (2) are installed with good metal-to-metal contact. Improper installation could cause loosening of wheel nuts. This could affect the safety and handling of your vehicle.

To install the wheel (2), first position it properly on the mounting surface (1). All wheel nuts (3) should then be tightened just snug.



80fa8998

Fig. 25: Lug Nut Tightening Pattern
Courtesy of CHRYSLER LLC

Gradually tighten them in sequence to the proper torque specification. See **Fig. 25**. **Never use oil or grease on studs or nuts.**

WHEEL REPLACEMENT

The wheel studs and nuts are designed for specific applications. They must be replaced with equivalent parts. Do not use replacement parts of lesser quality or a substitute design. All aluminum and some steel wheels have wheel stud nuts which feature an enlarged nose. This enlarged nose is necessary to ensure proper retention of the aluminum wheels.

NOTE: Do not use chrome plated lug nuts with chrome plated wheels.

Before installing the wheel, be sure to remove any build up of corrosion on the wheel mounting surfaces. Ensure wheels are installed with good metal-to-metal contact. Improper installation could cause loosening of wheel nuts. This could affect the safety and handling of your vehicle.

To install the wheel, first position it properly on the mounting surface. All wheel nuts should then be tightened just snug. Gradually tighten them in sequence to the proper torque specification. **Never use oil or grease on studs or nuts.**

Wheels must be replaced if they have:

- Excessive runout
- Bent or dented
- Leak air through welds
- Have damaged bolt holes

Wheel repairs employing hammering, heating, or welding are not allowed.

Original equipment wheels are available through your dealer. Replacement wheels from any other source should be equivalent in:

- Load carrying capacity
- Diameter
- Pilot Bore Diameter
- Width
- Offset
- Mounting configuration

Failure to use equivalent replacement wheels may affect the safety and handling of your vehicle. Replacement with **used** wheels is not recommended. Their service history may have included severe treatment.

SPECIAL TOOLS

WHEELS

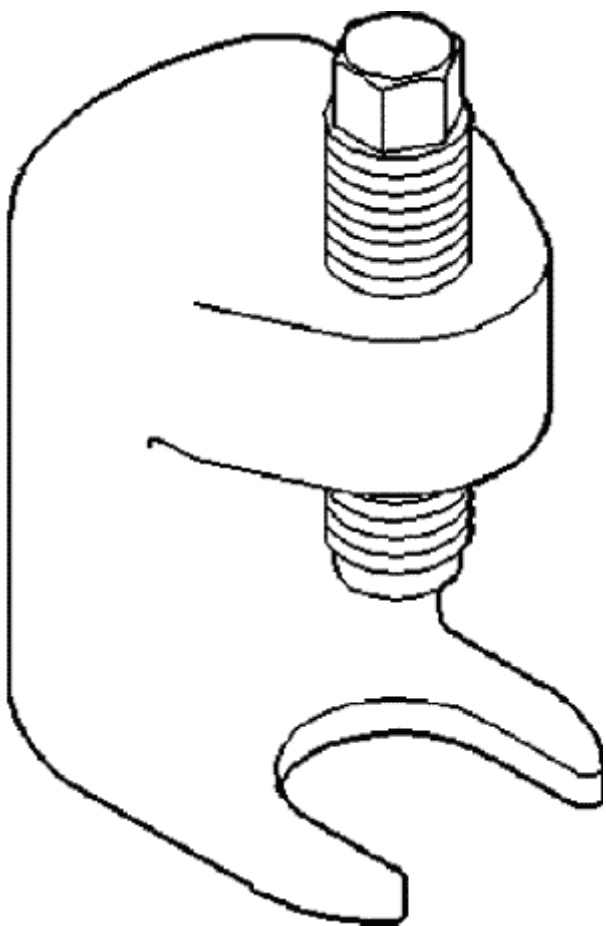


Fig. 26: Remover C-4150A
Courtesy of CHRYSLER LLC

STUDS

REMOVAL

FRONT WHEEL STUD

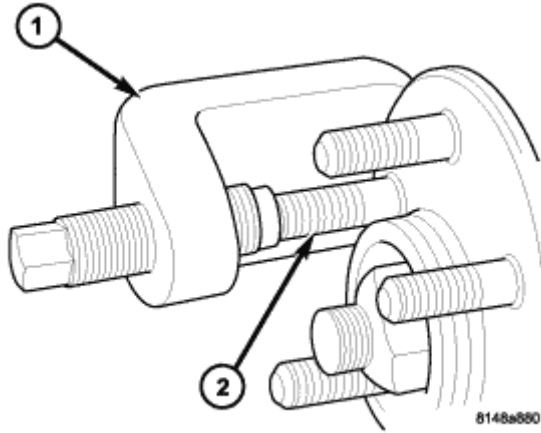


Fig. 27: Wheel Stud
Courtesy of CHRYSLER LLC

- | |
|--------------------------|
| 1 - C-4150-A
2 - STUD |
|--------------------------|

CAUTION: Do not use a hammer to remove wheel studs.

1. Raise and support vehicle.
2. Remove wheel and tire assembly.
3. Remove brake caliper, caliper adapter and rotor. Refer to **REMOVAL** .
4. Remove stud (2) from hub with Remover C-4150-A (1).

REAR WHEEL STUD

CAUTION: Do not use a hammer to remove wheel studs.

1. Raise and support vehicle.
2. Remove wheel and tire assembly.

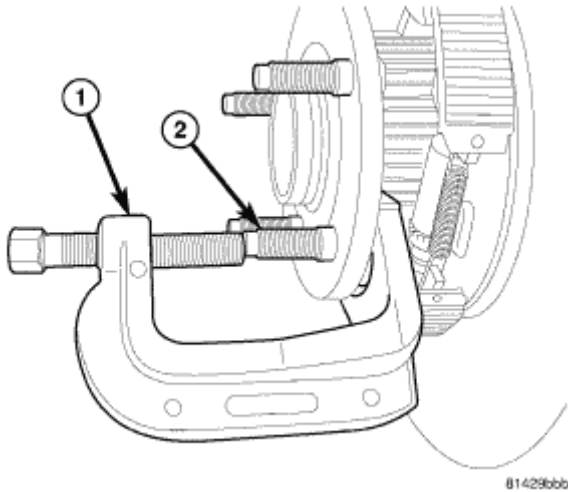


Fig. 28: Stud
Courtesy of CHRYSLER LLC

- | |
|-----------------------------------|
| 1 - SPECIAL TOOL 8677
2 - STUD |
|-----------------------------------|

3. Remove brake caliper and rotor. Refer to **REMOVAL** .
4. Remove stud (2) from hub with Remover 8677 (1).

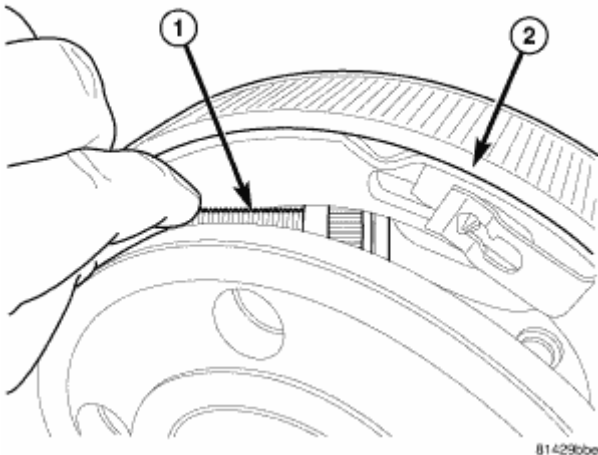


Fig. 29: Removing/Installing Wheel Stud
Courtesy of CHRYSLER LLC

- | |
|---------------------------------|
| 1 - STUD
2 - PARK BRAKE SHOE |
|---------------------------------|

5. Remove the stud (1) from between the hub/bearing and brake shoes (2)

INSTALLATION

FRONT WHEEL STUD

CAUTION: Do not use a hammer to remove wheel studs.

1. Install the new stud into the hub flange.
2. Install the three washers onto the stud, then install the lug nut with the flat side of the nut against the washers.
3. Tighten the lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.
4. Remove the lug nut and washers.
5. Install the brake rotor, caliper adapter, and caliper. Refer to **INSTALLATION**.
6. Install the wheel and tire assembly, use new lug nut on stud or studs that were replaced.
7. Remove the support and lower vehicle.

REAR WHEEL STUD

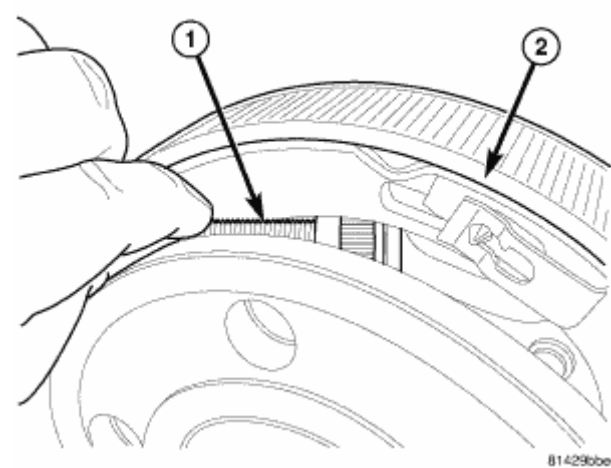


Fig. 30: Removing/Installing Wheel Stud
Courtesy of CHRYSLER LLC

- | |
|---------------------------------|
| 1 - STUD
2 - PARK BRAKE SHOE |
|---------------------------------|

1. Install the new stud (1) into the hub flange by rotating the stud (1) in between the hub/bearing and park brake shoes (2).
2. Install the three washers onto the stud, then install the lug nut with the flat side of the nut against the washers.
3. Tighten the lug nut until the stud is pulled into the hub flange. Verify that the stud is properly seated into the flange.
4. Remove the lug nut and washers.

5. Install the brake rotor and caliper. Refer to **INSTALLATION** .
6. Install the wheel and tire assembly, use new lug nut on stud or studs that were replaced.
7. Remove the support and lower vehicle.

TIRE PRESSURE MONITORING SYSTEM

DESCRIPTION

BASE TIRE PRESSURE MONITORING

This system will consist of Tire Pressure Monitoring (TPM) sensors attached to each wheel through the valve stem mounting hole, a Wireless Control Module (WCM) and a yellow TPM telltale lamp. A TPM sensor shall be installed in the spare wheel if the vehicle is equipped with a matching full size spare wheel and tire assembly.

PREMIUM - TIRE PRESSURE MONITORING

The system will consist of tire pressure monitoring sensors attached to each wheel through the valve stem mounting hole, a wireless control module (WCM), three wheel sensor transponders located in three of the four wheel wells (Left Front, Right Front, and Left Rear), a re-configurable dot matrix display module (EVIC), and a yellow telltale.

TIRE PRESSURE MONITORING

The Tire Pressure Monitoring (TPM) system monitors air pressure in the four road tires (excludes spare). Pressure in the spare tire is not monitored. The base system does not specify how many tires are low or where they are located. The premium system does so.

There are two types of TPM available for this vehicle, a base system and a premium system.

The Base TPM system consists of tire pressure monitoring sensors attached to each road wheel through the valve stem mounting hole, a central receiver module (WIN) and an indicator lamp.

The Premium TPM system consists of tire pressure monitoring sensors attached to each road wheel through the valve stem mounting hole, a wireless control module (WIN) three wheel sensor transponders located in three of the four wheel wells, an electronic display, and an indicator lamp.

The receiver circuit for the TPM system is integrated into the WIN for non remote start vehicles. **for factory installed remote start vehicles the antenna is external.** Commonly referred to as the Wireless Control Module (WCM), the WIN also includes the Ignition Node, the Remote Keyless Entry (RKE) receiver and the Sentry Key Immobilizer (SKIM) receiver. All receivers share a number of common components. The WIN decodes the RF signals transmitted by each of the vehicle's tire pressure sensors. The decoded information is used to determine if "warning" or "fault" conditions exist within the TPM system.

Upon detection of a warning or fault condition, the WIN will send a request to the module that controls the indicator lamp (and the text display if equipped with the Premium system) via the vehicle bus system to illuminate or flash the indicator lamp. Also, upon detection of a warning or fault condition, the electronic

display will send a request to sound the "chime". A chime will only be requested once per ignition cycle per warning or fault condition detected.

The WIN will store all warning and fault conditions, placard pressure values and low-pressure threshold values (lamp ON and OFF) in memory that can be accessed through diagnostic communication. If new sensors are introduced to the vehicle, the data stored for the sensor being replaced will be deleted.

The WIN will store all wheel sensor ID's and locations and faults in memory that can be accessed through diagnostic communication. All other data values transmitted from each active wheel sensor (not the spare tire) shall be stored in the WIN memory.

The WIN automatically learns and stores the sensors's ID while driving "within 10 minutes continuously above 15 mph (24 km/h)" after a sensor has been replaced. The learning sequence will initiate when the vehicle has been stopped for more than 20 minutes.

WIRELESS CONTROL MODULE (WCM)

The receiver circuit for the TPM system is integrated into the WCM for non-remote start vehicles. For factory installed remote start vehicles, the remote start antenna is external to the WCM. In addition to Tire Pressure Monitoring System (TPMS), The WCM can also include the Remote Keyless Entry (RKE) receiver, Remote Start (if equipped), and the Sentry Key Immobilizer (SKIM) receiver. All four receivers share a number of common components. The WCM decodes the RF signals transmitted by each of the vehicle's tire pressure sensors. The decoded information is used to determine if "warning" or "fault" conditions exist within the TPM system.

The WCM communicates with the module that controls the "TPM telltale lamp" and the text display (Premium system), via the vehicle bus system.

Upon detection of a warning or fault condition, the WCM will send a request to illuminate or flash the yellow TPM telltale. Also, upon detection of a warning or fault condition, the display module will send a request to sound the "chime". A chime will only be requested once per ignition cycle per warning or fault condition detected.

The WCM will store all warning and fault conditions, placard pressure values, low-pressure threshold values and low pressure threshold hysteresis values in memory that can be accessed through diagnostic communication. If new sensors are introduced to the vehicle, the data stored for the sensor being replaced will be deleted.

The WCM will store all wheel sensor ID's and locations and faults in memory that can be accessed through diagnostic communication. All other data values transmitted from each active wheel sensor (not the spare tire) shall be stored in the WCM memory.

The WCM automatically learns and stores the sensor's ID while driving "within 10 minutes continuously above 15 m.p.h. (24 Km/h)" after a sensor has been replaced. A new sensor ID can also be programmed directly into the WCM by using a RKE-TPM Analyzer in conjunction with a Scan Tool. Once the new sensor ID has been programmed, the RKE-TPM Analyzer can be used to update the TPMS by activating the sensor.

The learning sequence will initiate when the vehicle has been stopped for more then 20 minutes.

OPERATION

BASE - TIRE PRESSURE MONITORING

The tire pressure monitoring system (TPMS) is designed to operate without loss of function for all OEM tire construction for this vehicle. Tire Pressure Monitoring Sensors, mounted to each road wheel as part of the valve stem, transmit an RF signal indicating their individual pressure to a receiver located in the Wireless Control Module (WCM), commonly referred to as the Sentry Key Remote Entry Module (SKREEM). These transmissions occur approximately once every minute at speeds over 15 mph (24 km/h). Refer to **SENSOR - TIRE PRESSURE**. If the TPM system detects that the tire pressure in any road tire is going low, beyond the Low Pressure (lamp) ON threshold (see placard table under **TPM THRESHOLD PRESSURES**), the TPM system will continuously illuminate an indicator lamp. If a system fault is detected, the indicator lamp will flash on/off for 75 seconds and then remains on solid.

If the WCM detects a warning or fault condition at ignition key "on" it will wait ten seconds +/- 10 % before sending the first request to illuminate the yellow telltale. This will assure that the display module has concluded its bulb check period. The display module will request a chime once per ignition cycle for each "warning" or "fault" condition detected. A "warning" or "fault" condition will remain enabled until the problem causing the condition is corrected and removed/reset.

The WCM shall continuously monitor for the receipt of tire pressure RF message transmissions from the wheel sensors during both the ignition key "on" and key "off" cycles. The wheel sensor ID's and the location of each sensor (e.g. Tire 1, Tire 2 etc.) are stored in the WCM non-volatile memory during the initial Manufacturing Plant Process, or during a service procedure, as required. The recommended "placard pressure", "low-pressure threshold" and "Hysteresis Pressure Values" for the tires installed on the vehicle, are stored in the WCM non-volatile memory during the initial Manufacturing Plant Process, or during a service procedure, as required.

The TPM System will continue to warn the driver of low tire pressure as long as the condition exists, and will not turn off the indicator lamp until the tire pressure is at or above the Low Pressure (lamp) OFF threshold (see placard table under **TPM THRESHOLD PRESSURES**). The system will automatically update and the TPM warning lamp will extinguish once the updated tire pressures have been received.

The tire pressure will vary with temperature by about 1 psi (6.9 kPa) for every 12°F (6.5°C). This means that when the outside temperature decreases, the tire pressure will decrease. Tire pressure should always be set based on cold inflation tire pressure (placard pressure). This is defined as the tire pressure after a vehicle has not been driven for more than 3 hours - and in outside ambient temperature. The tire pressure will also increase as the vehicle is driven - this is normal and there should be no adjustment for this increased pressure. For a system fault, the system will return to normal once the WCM receives a valid transmission from that sensor location

PREMIUM TIRE PRESSURE MONITORING

The operation and lamp/chime strategy for a premium tire pressure monitoring system (TPMS) is the same as the base TPMS, but the premium TPMS can display text messages and a graphic display of the tire pressure on the information cluster. If a low pressure condition is detected, in addition to a chime and the indicator lamp turning ON, a low pressure text message indicating which tire is low will be displayed in the instrument cluster for 3 seconds. This text message will be followed by a graphic display of the pressure value(s) with the low tire (s) flashing. Once pressure in the suspect tire raises above the Low Pressure (lamp) OFF Threshold (see placard table under **TPM THRESHOLD PRESSURES**), the lamp will go out and the system returns to normal within

approximately two minutes time. If a system fault is detected, in addition to the flashing lamp, a "Service Tire Press.System" text message will be displayed in the instrument cluster, and the graphic display will have "- -" in place of the pressure value. The system will return to normal once the WCM receives a valid transmission from that sensor location

A Premium Tire Pressure Monitoring System (TPMS) determines the location of the tire pressure sensors by using transponders located in three of the four wheel wells on the vehicle. A fourth transponder is not necessary in the remaining wheel well due to the process of elimination theory. Once the system knows the location of the first three sensors, it assumes the location of the fourth tire pressure sensor, and update the graphic display when necessary. For more information, Refer to **TRANSPONDER** .

For both the premium and base TPMS, the recommended "Placard Pressure", "Low-pressure Threshold" and "Hysteresis Pressure Values" for the tires installed on the vehicle, are stored in the WCM non-volatile memory during the initial Manufacturing Plant Process, or during a service procedure, as required. To determine the pressure thresholds for a vehicle, refer to the Tire Inflation Pressure (Placard) Label, and then apply the placard pressure to the following table. The Low Pressure OFF Threshold is defined as the Low Pressure ON Threshold plus the Hysteresis Pressure Value.

TPM THRESHOLD PRESSURES

NOTE: **To determine the pressure thresholds for a vehicle, refer to the Tire Inflation Pressure (Placard) Label found on the Driver's B-Pillar, then apply the placard pressure to the following table.**

Placard Pressure (Cold) (PSI)	Low Pressure ON Threshold (PSI)	Low Pressure OFF Threshold (PSI)
28	22	26
29	23	27
30	24	28
31	25	29
32	25	29
33	26	30
34	27	31
35	28	32
36	29	33
37	29	34
38	30	35
39	31	36
40	32	37
41	33	38
42	34	39
43	35	40
44	36	41
45	36	41

46	37	43
47	38	44
48	38	45
49	39	45
50	40	47
51	41	48
55	44	52
60	48	57
65	52	62
70	56	67
75	60	72
80	64	77

DIAGNOSIS AND TESTING

TIRE PRESSURE MONITORING SYSTEM

NOTE: Tire pressure may increase from 2 to 6 psi (14 to 41 kPa) during normal driving conditions. Do NOT reduce this normal pressure build up.

NOTE: Tire pressure will vary with temperature by about 1 psi (6.9 kPa) for every 12 F (6.5 C). This means that when the outside temperature decreases, the tire pressure will also decrease. Tire pressure should always be set based on cold inflation tire pressure. For details, see DESCRIPTION.

When diagnosing a tire pressure issue, always check air pressure in the tires first with a known accurate air gauge. Adjust air pressure as necessary to that listed on the Tire Inflation Pressure Label (Placard) provided with the vehicle (usually applied to the driver's side B-pillar). After adjusting air pressure in a tire on the vehicle, allow approximately two minutes for the message or indicator lamp to go out.

Check the tire pressure indicator lamp in the instrument cluster. If the lamp is illuminating continuously, proceed as listed below. If the indicator lamp is flashing on/off for 75 seconds and then remains on solid, a system fault was detected. Refer to the appropriate diagnostic information.

If air pressure in any tire is low, inspect all the tires for leaks. A water "dunk tank" or other water test may be used to check for leaks around the sensor as long as any water at the valve core is removed once the procedure is completed. The water can be easily expelled from the core area by pushing in on the core for several seconds, allowing escaping air to drive out any moisture. Reinflate the tire as necessary. Always make sure the original valve stem cap is securely installed to keep moisture out of the sensor.

If the gauge-read pressure in the tires does not indicate a tire pressure issue, refer to the appropriate diagnostic information.

SPECIFICATIONS

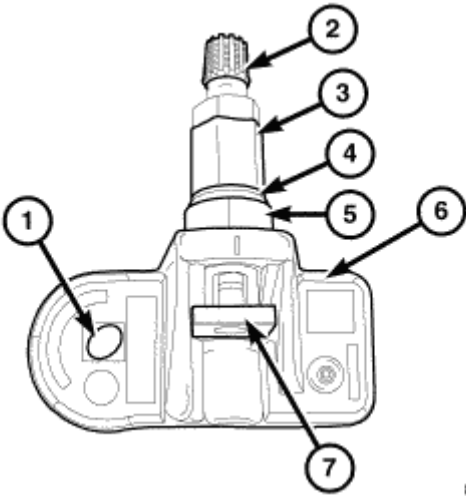
TORQUE SPECIFICATIONS CHART

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Tire Pressure Sensor/Transmitter Mounting Nut	6	-	53
Front Transponder	3	-	25
Rear Transponder	3	-	25

SENSOR

DESCRIPTION

SENSOR - TIRE PRESSURE



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Fig. 31: View Of Schrader Sensor
Courtesy of CHRYSLER LLC

- NOTE:

On vehicles equipped with Tire Pressure Monitoring System, one tire pressure sensor (6) is mounted to each wheel in place of the traditional tire valve stem. Each sensor has an internal battery that lasts up to 10 years. The battery is not serviceable. At the time of battery failure, the sensor must be replaced. The TPM system operates on a 315 or 433 MHz radio frequency. The 315 MHz sensors can be easily identified by a black sensor body, with (an oval insignia) (1). The 433 MHz sensors can be identified by a grey sensor body with an oval insignia.
- NOTE:

If replacing the WCM, the spare tire must be dismounted from its wheel to access and note the spare tire pressure sensor ID. Then follow the programming steps outlined in the diagnostic scan tool for "Learn Spare Tire Sensor ID" under Miscellaneous Functions for the WCM wireless control module menu item as appropriate. In addition, the placard pressure thresholds must be updated in the new WCM. Go to "Update Pressure Thresholds" under

Miscellaneous Functions for the WCM wireless control module and follow the procedure.

On vehicles equipped with Tire Pressure Monitoring System, one tire pressure sensor (6) is mounted to each wheel in place of the traditional tire valve stem. Each sensor has an internal battery that lasts up to 10 years. The battery is not serviceable. At the time of battery failure, the sensor must be replaced.

The TPM system operates on a 315 MHz radio frequency. The 315 MHz sensors can be easily identified by a black sensor body, with (an oval insignia) (1) and a grey valve cap (2).

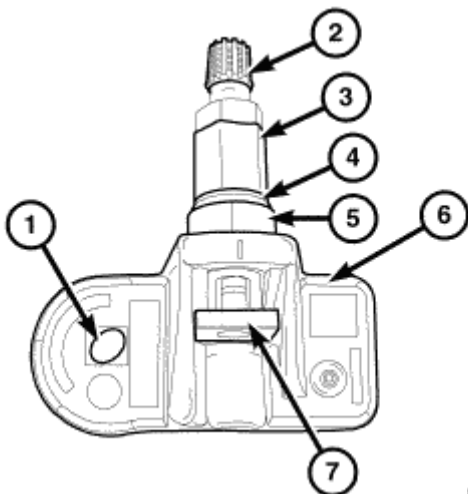
The Export TPM system operates on a 433 MHz radio frequency. The 433 MHz sensors can be easily identified by a gray sensor body (with an oval insignia) and a black valve cap (2).

CAUTION: Although 315 MHz and 433 MHz sensors are identical in size and shape, they are not interchangeable. Always make sure the correct sensor is being used.

NOTE: Domestic vehicles, use the 315 MHz TPM sensors with the BLACK sensor body. For Export vehicles, use the 433 MHz TPM sensors with the GREY sensor body. Although 315 MHz and 433 MHz sensors are identical in size and shape, they are not interchangeable. Always make sure the correct color sensor is being used. A RKE-TPM Analyzer can be used to determine the sensor's frequency without having to dismount the tire.

NOTE: If aftermarket wheels are installed and do not contain tire pressure sensors, the system will not function properly and the driver will be continuously notified of a system malfunction.

The TPM sensors are designed for original style factory wheels. **It is not recommended to install a tire pressure sensor in an aftermarket wheel. (This could cause sealing and system performance issues).**



8198b1ba

Fig. 32: View Of Schrader Sensor

Courtesy of CHRYSLER LLC

The serviceable components of the tire pressure sensor are:

Sensor-To-Wheel Seal (4)

Valve Stem Cap (2)

Valve Stem Core

Valve Stem Nut (3)

The valve stem caps and cores used are specifically designed for the tire pressure monitoring sensors. Although similar to standard valve stem caps and cores, they are different. The valve stem cap has a special seal inside to keep moisture and corrosion out. The valve stem core has a special nickel coating to protect from corrosion.

OPERATION

SENSOR - TIRE PRESSURE

The battery operated tire pressure sensor is both a transmitter and a receiver. The TPM sensor can be forced to transmit if using a special tool such as a TPM-RKE Analyzer, or from a transponder. Refer to **TRANSPONDER** The TPM-RKE Analyzer has the ability to change the sensor's operating mode and to diagnose a faulty TPM sensor. Using a TPM-RKE Analyzer can take up to a minute to force a transmission from a sensor. The TPM sensor can be in one of the following modes:

Sleep Mode - A new TPM sensor will be in this mode. If placed on the vehicle as a road tire, the TPM sensor will transmit once every 20 seconds when the vehicle is driven at speeds over 15 mph (24 km/h). If the vehicle is not moving, the sensor will only transmit on a pressure change greater than 1 psi (6.9 kPa). Driving the vehicle continuously at speeds over 15 mph (24 km/h) for more than 4 minutes will change the sensor state into 30 BLOCK MODE. The TPM sensor will not return to SLEEP MODE. Now, if the vehicle has been stopped for 20 minutes, the TPM sensor state will change to PARK MODE.

Park Mode - This is the correct operating mode when the vehicle is not moving. The sensor will transmit once every 13 hours to update the WCM, or will transmit on a 1 PSI delta change. The sensors will internally take a measurement of the tire pressure every minute to determine a change in tire pressure

30 Block Mode - If the vehicle has been stopped for more than 20 minutes, or if the sensor's operating mode was forced to Park Mode using a TPM-RKE Analyzer, the sensor's operating mode will transition from Park Mode to 30 Block Mode once the vehicle is driven over 15 mph. In this mode, the sensor will transmit once every 15 seconds when the vehicle is driven at speeds over 15 mph (24 km/h) for the first 30 transmissions. After about 8 minutes of continuous driving above 15 mph (24 km/h), the sensor's mode will change to Drive Mode

Drive Mode - In this mode, the sensor will transmit once every minute when the vehicle is driven at speeds over 15 mph (24 km/h). At any time that the vehicle speed drops below 15 mph, the sensor will not transmit. The sensor mode will still be in drive mode when the sensor reaches speeds over 15 mph (24 km/h). If the vehicle has been stationary for more than 20 minutes, the TPM sensor will change to PARK MODE.

Each sensor's (transmitter) broadcast is uniquely coded so that the wireless control module (WCM) can monitor the state of each of the sensors on the four rotating road wheels. The WCM can automatically learn and store

the sensor's ID while driving "within 10 minutes continuously above 15 m.p.h. (24 Km/h)" after a sensor has been replaced, The vehicle must be stationary for more then 20 minutes in order to initiate the learning sequence.

The sensor IDs can also be programmed using the TPM-RKE Analyzer Tool. Scan each TPM sensor at each road wheel, and store each Sensor ID in the correct location. (LEFT FRONT, LEFT REAR, RIGHT FRONT, and RIGHT REAR) Connect the TPM-RKE Analyzer Tool to the Scan Tool. Then follow the programming steps outlined in the diagnostic Scan Tool for "Program Tire Pressure Sensor ID w/ TPM Tool" under "MISC" for the "WCM/WIRELESS CONTROL MODULE".

CAUTION

SENSOR - TIRE PRESSURE

CAUTION: The TPMS has been optimized for the original equipment tires and wheels. TPMS pressures have been established for the tire size equipped on your vehicle. Undesirable system operation or sensor damage may result when using replacement equipment that is not of the same size, type, and/or style. After-market wheels can cause sensor damage. Do not use aftermarket tire sealants or balance beads if your vehicle is equipped with a TPMS, as damage to the sensors may result.

NOTE: After inspecting or adjusting the tire pressure always reinstall the valve stem cap. This will prevent moisture and dirt from entering the valve stem, which could damage the Tire Pressure Monitoring Sensor.

CAUTION: Tire pressure sensor valve stem caps and cores are specially designed for the sensors. Due to risk of corrosion, do not use a standard valve stem cap or core in a tire pressure sensor in place of the original equipment style sensor cap and core.

CAUTION: After inspecting or adjusting the tire pressure always reinstall the valve stem cap. This will prevent moisture and dirt from entering the valve stem, which could damage the Tire Pressure Monitoring Sensor.

CAUTION: Any time a sensor is to be reinstalled in a wheel, a new seal, cap and valve core must be installed on the stem to ensure air tight sealing.

NOTE: TPM thresholds have been established for the original tire size equipped on the vehicle. Use original size tires only to maintain system accuracy.

DIAGNOSIS AND TESTING

SENSOR - TIRE PRESSURE

NOTE: Tire pressure may increase from 14 to 41 kPa (2 to 6 psi) during normal driving conditions. Do NOT reduce this normal pressure build up.

Check the tire pressure yellow telltale in the instrument cluster. If the yellow telltale is illuminating continuously, proceed as listed below. If the yellow telltale is flashing on/off for 60 seconds, once every ten minutes, there is a system fault detected. Refer to the appropriate diagnostic information.

When diagnosing a tire pressure issue, always check air pressure in the tires first with a known accurate air gauge. Adjust air pressure as necessary to that listed on the Tire Inflation Pressure Label (Placard) provided with the vehicle (usually applied to the driver's side B-pillar). After adjusting air pressure in a tire, allow approximately two minutes for the message or yellow telltale to go out.

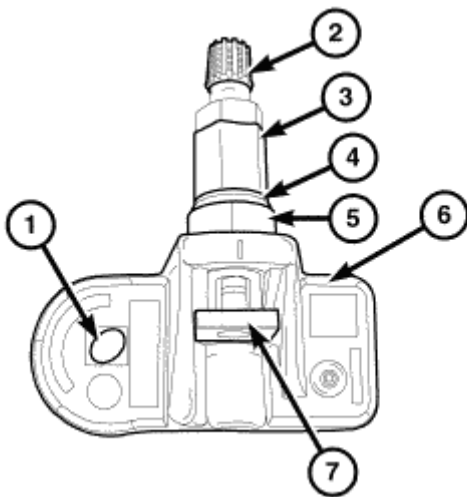
If air pressure in any tire is low, inspect **all** the tires for leaks. A water "dunk tank" or other water test may be used to check for a leak around the tire assembly and sensor as long as any water at the valve core is removed once the procedure is completed. The water can be easily expelled from the core area by pushing in on the core for several seconds, allowing escaping air to drive out any moisture. Reinflate the tire as necessary. Always make sure the original valve stem cap is securely installed to keep moisture out of the sensor.

If the gauge-read pressure in the tires does not indicate a tire pressure issue, refer to the appropriate diagnostic information.

REMOVAL

SENSOR - TIRE PRESSURE

1. Raise and support vehicle.
2. Remove the tire and wheel assembly. See STANDARD PROCEDURE.



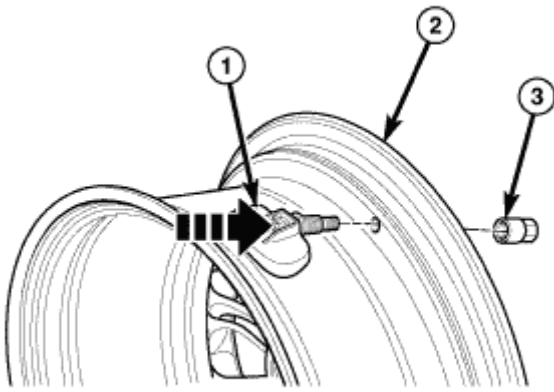
8198b1ba

Fig. 33: View Of Schrader Sensor
Courtesy of CHRYSLER LLC

CAUTION: The cap (2) used on this valve stem contains an O-ring seal to

prevent contamination and moisture from entering the valve stem. Retain this valve stem cap for reuse. Do not substitute a regular valve stem cap in its place.

CAUTION: The valve stem used on this vehicle is made of aluminum and the core is nickel plated brass. The original valve stem core must be reinstalled and not substituted with a valve stem core made of a different material. This is required to prevent corrosion in the valve stem caused by the different metals.



81499796

Fig. 34: Installing Sensor To Wheel
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - TIRE PRESSURE SENSOR
2 - WHEEL
3 - NUT (WITH WASHER) |
|--|

3. Let the air out of the tire.
4. Remove the nut (3).
5. Push the sensor into the tire (1) (so the sensor is loose inside the tire).
6. Remove the tire from the rim.
7. Retrieve the sensor (1) from the tire.

INSTALLATION

SENSOR - TIRE PRESSURE

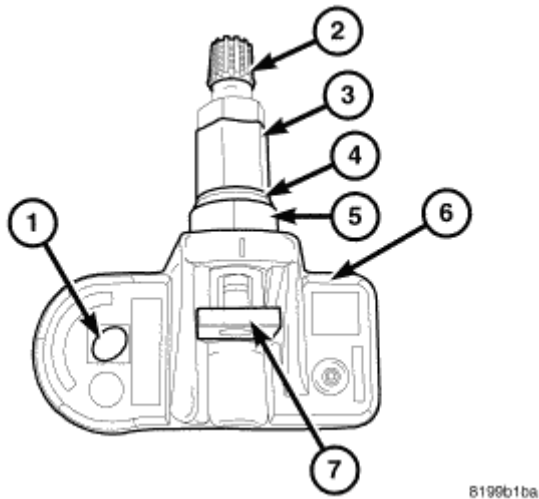


Fig. 35: View Of Schrader Sensor
 Courtesy of CHRYSLER LLC

- NOTE:** If replacing the spare tire pressure sensor, take the time now to write down the tire pressure sensor ID.
- NOTE:** Before reinstalling an existing tire pressure sensor (6), replace valve cap (2), nut (3), valve core and sensor seal (4) to ensure proper sealing.
- NOTE:** The notch/flat should be lined up together and facing towards the wheel during installation.

1. Wipe area clean around sensor/valve stem mounting hole in wheel. Make sure surface of wheel is not damaged.

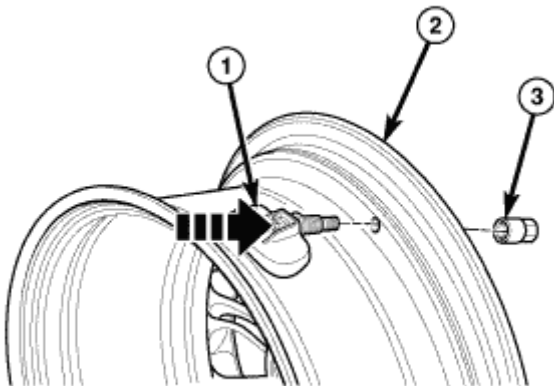


Fig. 36: Installing Sensor To Wheel
 Courtesy of CHRYSLER LLC

- | |
|--------------------------|
| 1 - TIRE PRESSURE SENSOR |
| 2 - WHEEL |
| 3 - NUT (WITH WASHER) |

2. Insert sensor (1) through wheel (2) as shown in graphic keeping pressure against rear of metal valve stem (See Arrow in illustration). Potted side of sensor is to be positioned toward wheel. Damage to the sensor may occur if the sensor is installed incorrectly.

NOTE: A flat on the seal seat is used to key the seat to the sensor housing. The notch/flat should be lined up together and facing towards the wheel during installation.

3. Install sensor nut (3) and hand tighten.

NOTE: Before tightening sensor nut, push downward on sensor housing (2) in an attempt to make it flush with interior contour of wheel (1).

4. While holding sensor in position, tighten sensor nut to 6 N.m (53 in. lbs.).

CAUTION: Over-tightening the sensor to as much as 10 N.m (88 in. lbs.) may result in sensor separation from the valve stem. Under this condition, the sensor may still function, however, the condition should be corrected immediately.

5. Mount tire on wheel following tire changer manufacturers instructions, paying special attention to the following to avoid damaging tire pressure sensor:

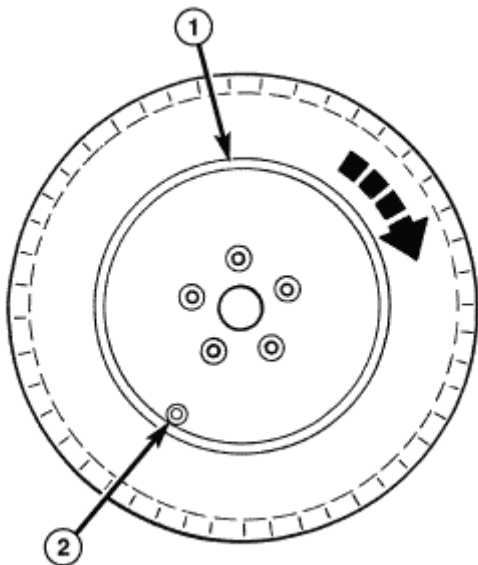


Fig. 37: Mounting Tire Using Rotating Wheel Machine
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - HEAD OF CHANGER LOCATED HERE
2 - VALVE STEM |
|--|

- Rotating Wheel Tire Changers- Once the wheel is mounted to the changer, position the sensor valve stem (2) approximately 180° from the head of the changer (located at 1) in a clockwise direction before rotating the wheel (also in a clockwise direction) to mount the tire. Use this procedure on both the upper and lower tire beads.

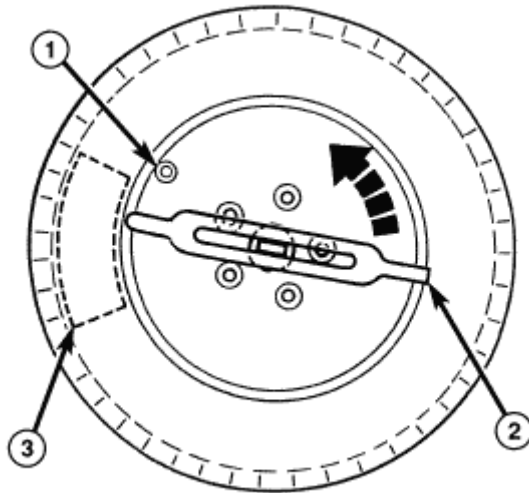


Fig. 38: Mounting Tire Using Rotating Tool Machine
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - VALVE STEM
2 - INSTALLATION END OF
MOUNTING/DISMOUNTING TOOL
3 - BEAD BREAKER (KEEP CLEAR OF SENSOR) |
|---|

- Rotating Tool Tire Changers - Position the wheel on the changer so that the sensor valve stem (1) is located approximately 180° clockwise from the installation end of the mounting/dismounting tool (2) once the tool is mounted for tire installation. Make sure the sensor is clear of the lower bead breaker area (3) to avoid damaging the sensor when the breaker rises. Rotate the tool (2) in a counterclockwise direction to mount the tire. Use this procedure on both the upper and lower tire beads.
- Adjust air pressure to that listed on Tire Inflation Pressure Label (Placard) provided with vehicle (usually applied to driver's side B-pillar). Make sure **original style** valve stem cap is securely installed to keep moisture out of sensor.
 - Install tire and wheel assembly on vehicle. See **STANDARD PROCEDURE**.
 - Lower vehicle.
 - If the vehicle has been stationary for more than 20 minutes, drive the vehicle for a minimum of 10 minutes while maintaining a continuous speed above 15 mph (24 km/h). During this time, the system will

learn the new sensor ID. A new sensor ID can also be programmed directly into the WCM by using a RKE-TPM Analyzer in conjunction with a Scan Tool. Once the new sensor ID has been programmed, the RKE-TPM Analyzer can be used to update the TPMS by activating the sensor.

NOTE: If a sensor cannot be trained, refer to appropriate diagnostic information.

TRANSPONDER

DESCRIPTION

TRANSPONDER - TIRE PRESSURE

A transponder is located in three of the four wheel wells of the vehicle to provide the WCM/SKREEM with the location of the tire pressure sensors on the vehicle. The transponders are located in the left front, right front and left rear wheel wells. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor is in the left rear tire.

OPERATION

TRANSPONDER - TIRE PRESSURE

Transponders located in three of the four wheel wells of the vehicle provide the Wireless Control Module (WCM) commonly referred to as the Sentry Key Remote Entry Module (SRKEEM) with the location of the tire pressure sensors on the vehicle. The transponders are located in the left front, right front and left rear wheel wells. A fourth transponder is not necessary in the remaining wheel well due to the process-of-elimination theory. Once the system knows the location of the first three sensors it assumes the location of the fourth tire pressure sensor is in the left rear tire.

REMOVAL

FRONT

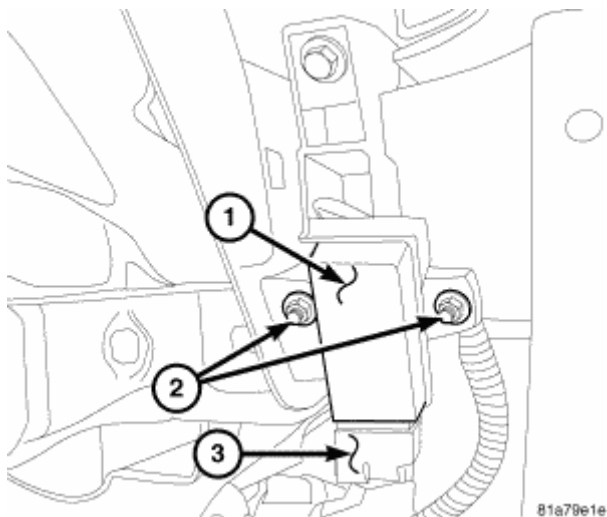


Fig. 39: Front Transponder

Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Remove the front part wheel well housing cover and pull it back toward the tire to gain access to the transponder.
3. Remove the mounting nuts (2) for the transponder (1) from the mounting bracket.
4. Disconnect the electrical connector (3) and remove the transponder (1) from the vehicle.

REAR

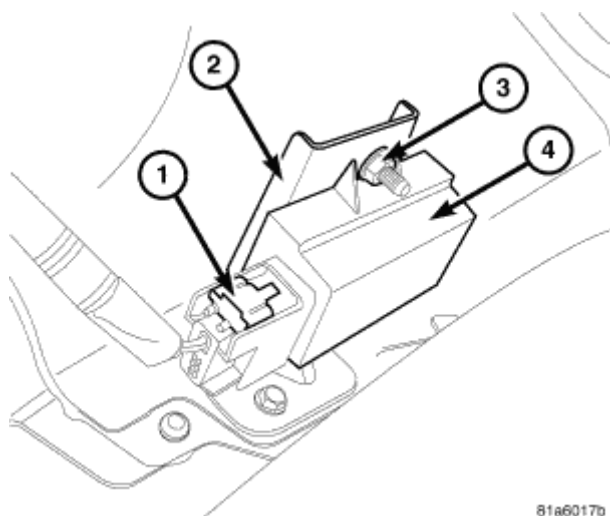


Fig. 40: REAR TRANSPONDER
Courtesy of CHRYSLER LLC

1. Raise and support the vehicle.
2. Disconnect the electrical connector (1).
3. Remove the mounting nuts (3) for the transponder (4).
4. Remove the transponder (4) from the bracket (2).

INSTALLATION

FRONT

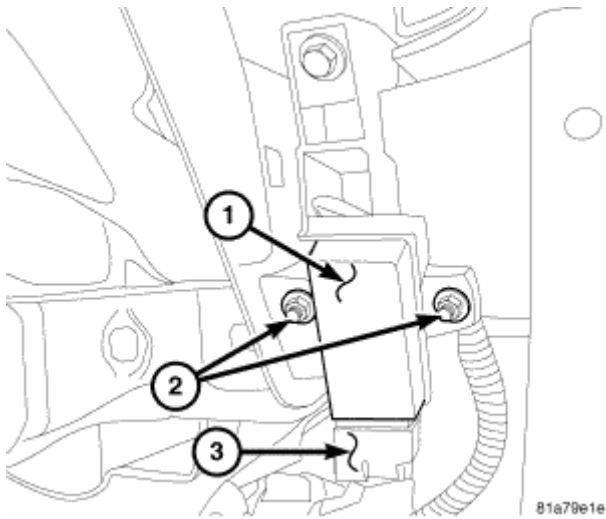


Fig. 41: Front Transponder
Courtesy of CHRYSLER LLC

1. Reconnect the electrical connector (3) to the transponder (1).
2. Install the transponder (1) to the mounting bracket and install the mounting nuts (2). Tighten nuts to 3 N.m (25 in. lbs.).
3. Install the front part of the wheel well housing cover.
4. Lower the vehicle.

REAR

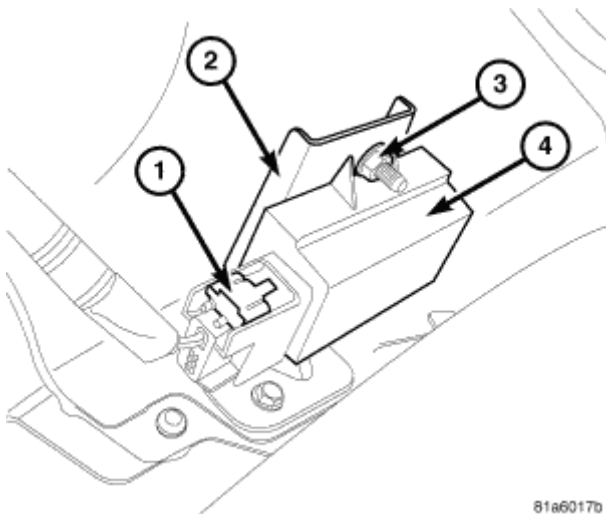


Fig. 42: REAR TRANSPONDER
Courtesy of CHRYSLER LLC

1. Install the transponder (4) to the bracket (2) and install the mounting nuts (3). Tighten to 3 N.m (25 in. lbs.).
2. Reconnect the electrical connector (1) to the transponder (4).
3. Lower the vehicle.

TRACTION CONTROL, 4WD, & AWD

Jeep - 1974-11

* PLEASE READ THIS FIRST *

Placing a non-compatible vehicle on a single-axle dynamometer could result in a safety hazard to technicians and damage to vehicle. Vehicles which use All-Wheel Drive (AWD) or traction control may not be clearly marked. Use common sense and take all necessary precautions when placing any vehicle on the dynamometer. Determine between full-time 4WD and All-Wheel Drive (AWD) for testing purposes. The following tables include information related to full-time 4WD and AWD vehicles, and how to disable the traction control system (if disengageable).

WARNING: DO NOT operate vehicle on a 2-wheel dynamometer if the DO NOT TEST column is marked.

JEEP

Application	FWD	RWD	Part Time 4WD	Full Time 4WD	AWD	TCS	Do Not Test
CJ5 & CJ7							
1974-86	...	...	...	X ⁽¹⁾	...	...	X
1980-86	...	...	X	...	...	...	...
Cherokee							
1979 (4WD)	...	...	...	X ⁽¹⁾	...	...	X
1974-83 (AWD)	...	...	...	...	X	...	X
1974-01 (4WD)	...	...	X ⁽²⁾	...	...	...	...
1985-01 (RWD)	...	X	...	...	...	...	...
Comanche							
1986-92	...	...	X ⁽²⁾	...	...	...	...
1986-92	...	...	...	X ⁽¹⁾	...	...	X
Commander							
2006-10 (AWD)	...	...	...	...	X	...	X
2006-10 (4WD)	...	...	X	...	...	X ⁽⁴⁾	...
2006-10 (RWD)	...	X	...	...	...	X ⁽³⁾	...
Compass							
2007-11 (AWD)	...	...	...	...	X	...	X

2007-11 (FWD)	X	...	...	...	...	X ⁽⁴⁾	...
Grand Cherokee							
1993-11 (AWD)	...	...	...	...	X	...	X
1993-03 (4WD)	...	...	X ⁽⁵⁾	...	...	...	...
2004-11	...	...	X ⁽⁵⁾	...	...	X ⁽⁴⁾	...
Grand Wagoneer							
1984-91 (Selec Trac)	...	...	X	...	...	...	...
1993 (Quadra Trac)	...	...	...	X ⁽¹⁾	...	...	X
Liberty							
2002-10 (AWD)	...	...	...		X	...	X
2004-05 (4WD)	...	...	X ⁽⁵⁾	...	...	...	...
2004-11 (4WD)	...	...	X ⁽⁵⁾	...	...	X ⁽⁴⁾	...
Patriot							
2007-11 (AWD)	...	...	...	...	X	...	X
2007-10 (FWD)	X	...	...	...	...	X ⁽⁴⁾	...
Scrambler							
1981-85	...	...	...	X ⁽¹⁾	...	...	X
Wagoneer							
1980-82 (4WD)	...	...	...	X ⁽¹⁾	...	...	X
1983-90 (4WD)	...	...	X	...	...	...	...
1980-90 (AWD)	...	...	...	...	X	...	X
Wrangler							
1987-07 (Ex.Unlimited)	...	...	X ⁽²⁾	...	...	...	...
2007 (Unlimited)	...	X	X ⁽⁵⁾	...	...	X ⁽⁴⁾	...
2008-11	...	X	X ⁽⁵⁾	...	...	X ⁽⁴⁾	...

(1) Cannot be shifted to 2WD.

(2) Shift transfer case lever into 2H position.

- (3) Press ESP control switch (button with sliding car icon) located on center of instrument panel. ESP/TCS indicator light will illuminate.
- (4) ESC Off (Partial ESC Mode): ESC Off switch is located in the center console. In "Partial Off" mode, the TCS portion of ESC, except for the limited slip feature, has been disabled and the "ESC Activation/Malfunction Indicator Light" will be illuminated. All other stability features of ESC function normally, with the exception of engine power reduction. "Partial Off" mode is intended to be used if the vehicle is in deep snow, sand, or gravel conditions and more wheel spin than ESC would normally allow is required to gain traction.
- (5) This vehicle has several types of 4WD option; Selec-Trac, Command-Trac, and Quadra Trac. All option types can be shifted into 2WD

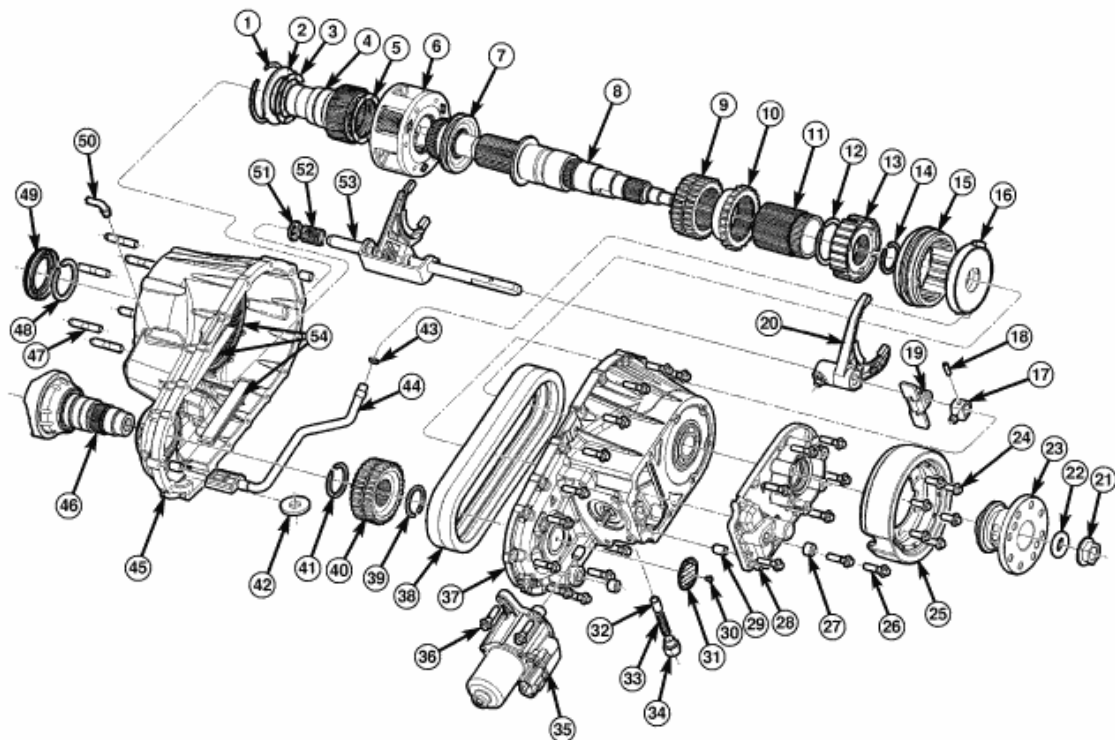
2008 TRANSFER CASE

MP1522 - Service Information - Liberty

MP1522 - SERVICE INFORMATION

DESCRIPTION

TRANSFER CASE - MP1522



81c169d

Fig. 1: MP1522 EXPLODED VIEW

Courtesy of CHRYSLER LLC

1 - PLANETARY SNAP RING

2 - LOCK PLATE

3 - THRUST WASHER

4 - INPUT GEAR (SHAFT)

19 - ANTI-ROTATION BRACKET

20 - SHIFT FORK

21 - FLANGE NUT

22 - O-RING SEAL

37 - REAR CASE

38 - DRIVE CHAINS

39 - SNAP RING

40 - DRIVEN SPROCKET

5 - TABBED THRUST WASHER	23 - REAR FLANGE	41 - SNAP RING
6 - PLANETARY GEAR	24 - DAMPER BOLTS	42 - MAGNET
7 - RANGE SLEEVE	25 - DAMPER (if equipped)	43 - OIL TUBE O-RING
8 - MAINSHAFT	26 - CASE BOLTS	44 - OIL TUBE
9 - DRIVE SPROCKET	27 - FILL PLUG	45 - FRONT CASE
10 - CLUTCH GEAR	28 - REAR COVER	46 - FRONT FLANGE
11 - HUB DRIVE SPROCKET	29 - DOWEL	47 - STUDS
12 - SNAP RING	30 - ID TAG SCREW	48 - SNAP RING
13 - SYNCHRONIZER HUB	31 - ID TAG	49 - INPUT SEAL
14 - SNAP RING	32 - SHIFT DETENT	50 - VENT TUBE
15 - SYNCHRONIZER SLEEVE	33 - SHIFT DETENT SPRING	51 - SPRING CUP
16 - OIL PUMP ASSEMBLY	34 - SHIFT DETENT BOLT	52 - SPRING
17 - SECTOR ROLLER	35 - SHIFT MOTOR	53 - SHIFT RAIL ASSEMBLY
18 - ROLL PIN	36 - BOLTS	54 - ANNULUS AND GUIDE RAILS

Command Trac® II with the new MP1522 two-speed, part-time four-wheel drive transfer case is the entry level four-wheel drive system. Functionally, the system performs the same way as other two-speed, part-time transfer cases. The most significant difference is electric shift, engaged with a console-mounted switch.

Command Trac® II is a part-time four-wheel drive system - 2WD High is the usual driving mode, with the front axle spinning freely and a power directed to the road rear wheels. Selecting 4WD High Lock, via the console-mounted switch, locks the front and rear driveshafts together; the two then rotate at the same and provide a 50

front/50 rear torque split. It is for use only on slippery or loose surfaces, such as snow or dirt. Driving on dry roads can result in driveline binding, resulting in undesirable driving dynamics and potential vehicle damage. It can be engaged at speeds under 55 MPH. A Neutral mode permits towing without having to disconnect the drive shafts. A pushpin button is provided to shift the transfer case into Neutral. For severe off-road situations, 4WD Low can be engaged at speeds of 2-3 MPH. The front and rear drive shafts are locked together, and a second gear set multiplies torque by 2.72:1, providing traditional Jeep capability.

The MP1522 transfer case provides the following benefits:

- Electric shift operation, with a console-mounted switch that replaces the shift lever typical of systems with mechanical linkage.

- Command Trac® II with smooth operation and improved NVH control compared to systems with mechanical linkage.

- Traditional 2WD, 4WD Lock, Neutral and 4WD Low operation modes, and shift-on-the-fly capability. 4WD Low operation mode provides an advantage over vehicles equipped with a single-speed all-wheel drive transfer case.

- Enhanced traction and stability provided by the Traction Control and Electronic Stability Program (ESP) working in tandem with four-wheel drive, including Hill Start Assist, Hill Descent Control and Trailer Sway Control.

- Maintenance-free.

OPERATING RANGES

Transfer case operating ranges are:

- Operating positions: 2WD - 4WD LOCK- N - 4WD LOW.

- 2WD - 2 Wheel Drive.

- 4WD LOCK- 4 High Part Time.

- N - Transfer case neutral for 4-wheel flat recreational towing.

- 4WD LOW- Low range (2.72:1) part time mode.

OPERATION

TRANSFER CASE - MP1522

Selecting 4WD High Lock, via the console-mounted switch, locks the front and rear driveshafts together; the two then rotate at the same and provide a 50 front/50 rear torque split. It is for use only on slippery or loose surfaces, such as snow or dirt. Driving on dry roads can result in driveline binding, resulting in undesirable driving dynamics and potential vehicle damage.

Command Trac® II is a part-time four-wheel drive system - 2WD High is the usual driving mode, with the front axle spinning freely and a power directed to the road rear wheels.

A Neutral mode permits towing without having to disconnect the drive shafts. A pushpin button is provided to shift the transfer case into Neutral.

For severe off-road situations, 4WD Low can be engaged at speeds of 2-3 MPH. The front and rear drive shafts are locked together, and a planetary gear set multiplies torque by 2.72:1, providing traditional Jeep capability.

DIAGNOSIS AND TESTING

TRANSFER CASE - MP1522

DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Transfer case difficult to shift or will not shift into desired range.	1) Transfer case electronically controlled shift system malfunction.	1) Verify proper operation per the appropriate diagnostic information.
	2) Insufficient or incorrect lubricant.	2) Drain and refill transfer case with the correct quantity of Mopar® ATF+4.
	3) Internal transfer case components binding, worn, or damaged.	3) Repair or replace components as necessary.
Transfer case noisy in all drive modes.	1) Insufficient or incorrect lubricant.	1) Drain and refill transfer case with the correct quantity of Mopar® ATF+4.
	2) Internal transfer case components binding, worn, or damaged.	2) Repair or replace components as necessary.
Transfer case noisy while in, or jumps out of, 4WD LOW.	1) Transfer case not completely engaged in 4WD LOW position.	1) While rolling 2-3 MPH and the transmission in NEUTRAL shift the transfer case to the 2WD or 4WD LOCK position, and then back into the 4WD LOW position.
	2) Range fork, input gear, or range sleeve damaged, inserts worn, or fork is binding on the shift rail.	2) Repair or replace components as necessary.
	3) Low range gear worn or damaged.	3) Repair or replace components as necessary.
Lubricant leaking from transfer case seals or vent.	1) Transfer case overfilled.	1) Drain lubricant to the correct level.
	2) Transfer case vent closed or restricted.	2) Clean or replace vent tube as necessary. Check for kink or restriction in vent tube hose.
	3) Transfer case seals damaged or installed incorrectly.	3) Replace suspect seals. Inspect and replace, if necessary, the seal slinger on the output flange associated with the damaged seal.

REMOVAL

TRANSFER CASE - MP1522

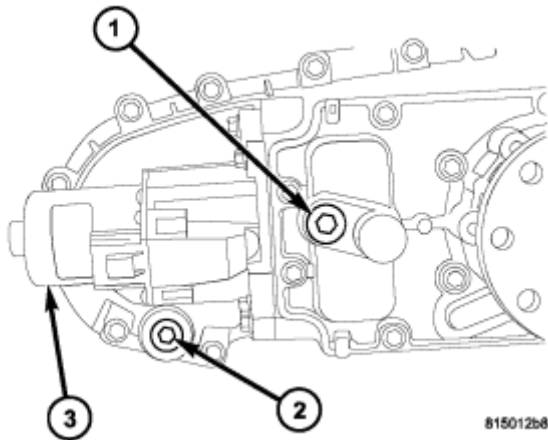


Fig. 2: Fill/Drain Plug And Shift Motor
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - FILL PLUG2 - DRAIN PLUG3 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY |
|---|

1. Shift transfer case into NEUTRAL.
2. Raise vehicle.
3. Remove transfer case drain plug (2) and drain transfer case lubricant.

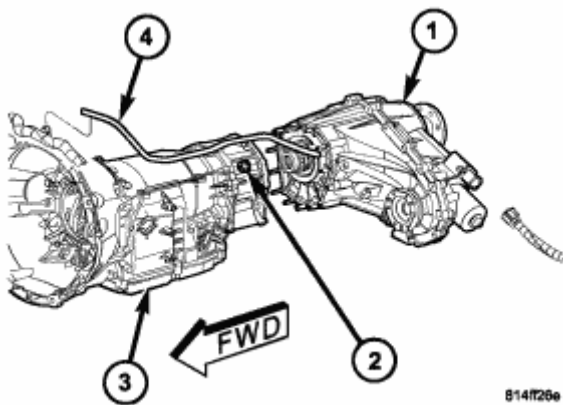


Fig. 3: REMOVE MP1522 TRANSFER CASE
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - TRANSFER CASE2 - NUTS3 - TRANSMISSION |
|---|

4 - TRANSFER CASE VENT TUBE

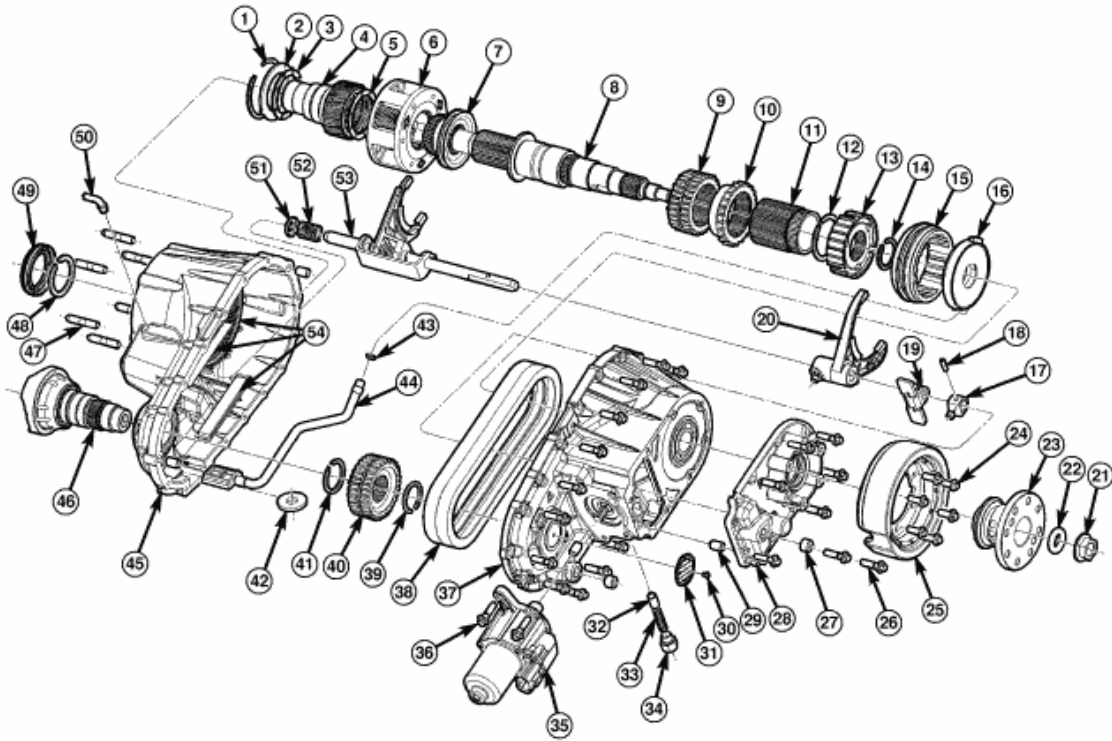
4. Support transmission (3) with jack stand.
5. Remove rear crossmember and skid plate, if equipped.
6. Remove rear support cushion.
7. Disconnect front propeller shaft from transfer case at companion flange. Remove rear propeller shaft from vehicle. Refer to **REMOVAL**.

CAUTION: Do not allow propshafts to hang at attached end. Damage to joint can result.

8. Disconnect the transfer case shift motor and mode sensor electrical harness connector.
9. Disconnect transfer case vent hose (4). See **Fig. 3**.
10. Support transfer case (1) with transmission jack.
11. Secure transfer case to jack with chains.
12. Remove nuts (2) attaching transfer case to transmission.
13. Pull transfer case and jack rearward to disengage transfer case.
14. Remove transfer case from under vehicle.

DISASSEMBLY

TRANSFER CASE - MP1522



81c169d

Fig. 4: MP1522 EXPLODED VIEW
Courtesy of CHRYSLER LLC

1 - PLANETARY SNAP RING	19 - ANTI-ROTATION BRACKET	37 - REAR CASE
2 - LOCK PLATE	20 - SHIFT FORK	38 - DRIVE CHAINS
3 - THRUST WASHER	21 - FLANGE NUT	39 - SNAP RING
4 - INPUT GEAR (SHAFT)	22 - O-RING SEAL	40 - DRIVEN SPROCKET
5 - TABBED THRUST WASHER	23 - REAR FLANGE	41 - SNAP RING
6 - PLANETARY GEAR	24 - DAMPER BOLTS	42 - MAGNET
7 - RANGE SLEEVE	25 - DAMPER (if equipped)	43 - OIL TUBE O-RING
8 - MAINSHAFT	26 - CASE	44 - OIL

9 - DRIVE SPROCKET

10 - CLUTCH GEAR

11 - HUB DRIVE SPROCKET

12 - SNAP RING

13 - SYNCHRONIZER HUB

14 - SNAP RING

15 - SYNCHRONIZER SLEEVE

16 - OIL PUMP ASSEMBLY

17 - SECTOR ROLLER

18 - ROLL PIN

BOLTS	TUBE
27 - FILL PLUG	45 - FRONT CASE
28 - REAR COVER	46 - FRONT FLANGE
29 - DOWEL	47 - STUDS
30 - ID TAG SCREW	48 - SNAP RING
31 - ID TAG	49 - INPUT SEAL
32 - SHIFT DETENT	50 - VENT TUBE
33 - SHIFT DETENT SPRING	51 - SPRING CUP
34 - SHIFT DETENT BOLT	52 - SPRING
35 - SHIFT MOTOR	53 - SHIFT RAIL ASSEMBLY
	54 - ANNULUS
36 - BOLTS	AND GUIDE RAILS

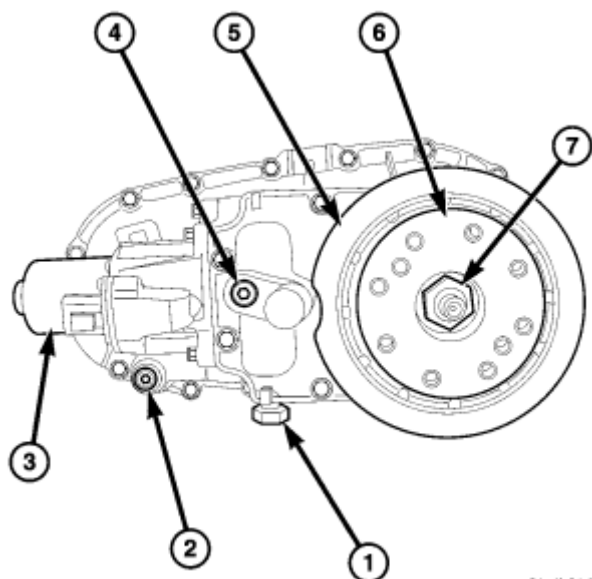
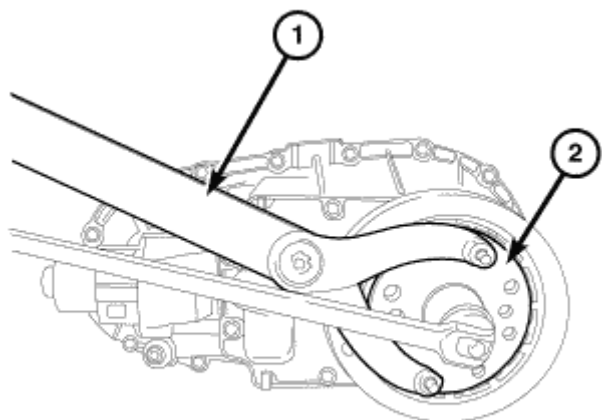


Fig. 5: MP1522 Transfer Case External Components

- | |
|-----------------------------|
| 1 - DETENT ASSEMBLY |
| 2 - DRAIN PLUG |
| 3 - SHIFT MOTOR/MODE SENSOR |
| 4 - FILL PLUG |
| 5 - DAMPER (if equipped) |
| 6 - REAR FLANGE |
| 7 - REAR FLANGE NUT |

1. Place the transfer case in a shallow pan and remove the fill (4) and drain (2) plugs to drain the remainder of the fluid.



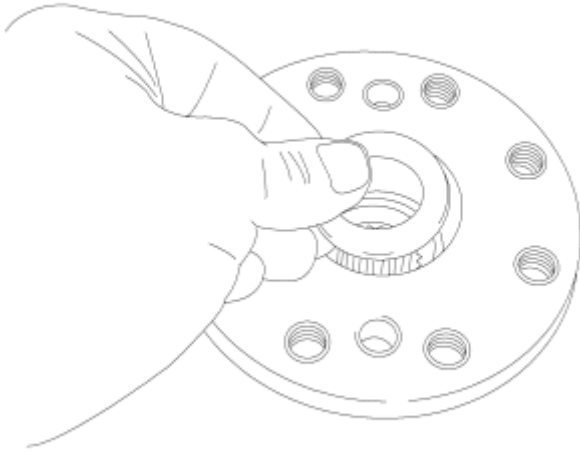
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Fig. 6: REAR OUTPUT FLANGE NUT

Courtesy of CHRYSLER LLC

- | |
|------------------------|
| 1 - HOLDER C-3281 |
| 2 - REAR OUTPUT FLANGE |

2. Using Holder C-3281 (1), remove the rear flange (2) nut.
3. Remove the rear output flange (2) from the main shaft. If necessary, use a suitable 2 or 3 jaw puller to remove the output flange.

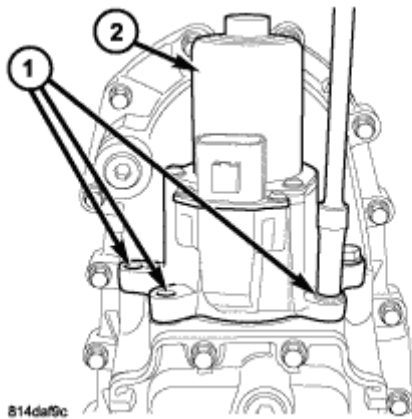


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Fig. 7: OUTPUT FLANGE O-RING
Courtesy of CHRYSLER LLC

1 - FLANGE O-RING
2 - REAR OUTPUT FLANGE

4. Remove the rear output flange o-ring from the rear output flange.



814da9c

Fig. 8: Remove Shift Motor Bolts
Courtesy of CHRYSLER LLC

1 - BOLTS
2 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY

5. Remove the bolts (1) holding the shift motor and mode sensor assembly (2) to the transfer case.

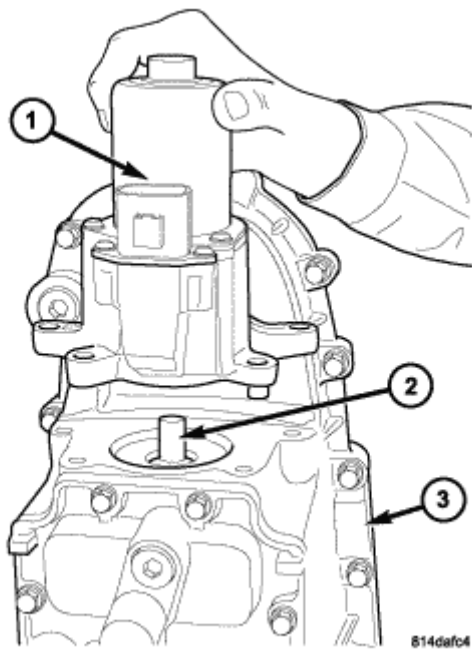


Fig. 9: Remove Shift Motor
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY
2 - SHIFT SECTOR
3 - TRANSFER CASE |
|---|

6. Remove the shift motor and mode sensor assembly (1) from the shift rail (2) and the transfer case (3).

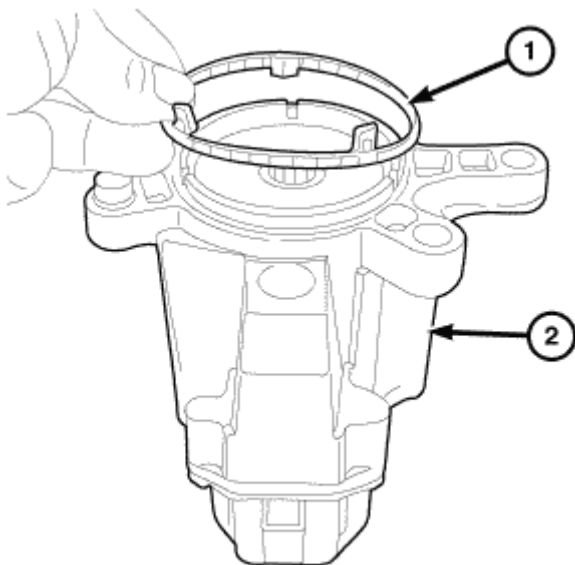
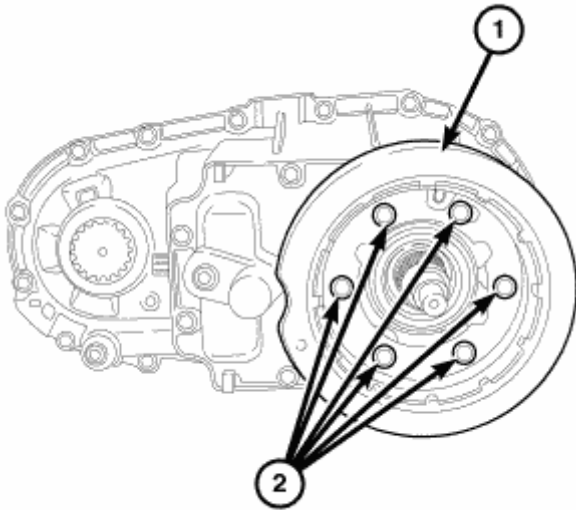


Fig. 10: SHIFT MOTOR SEAL RING
Courtesy of CHRYSLER LLC

1 - SEAL RING
2 - SHIFT MOTOR

7. Remove the seal ring (1) from the shift motor (2).

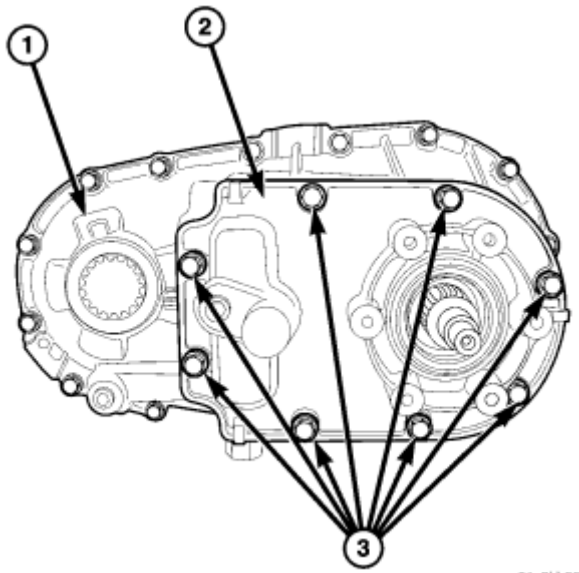


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Fig. 11: DAMPER
Courtesy of CHRYSLER LLC

1 - DAMPER
2 - BOLTS

8. Remove damper bolts (2) and damper (1), (if equipped).

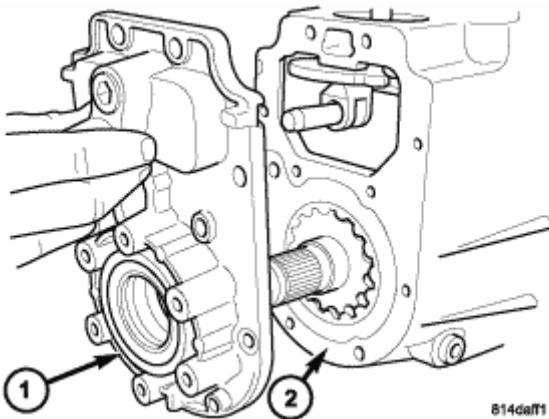


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Fig. 12: Rear Cover Bolts
 Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - REAR HOUSING |
| 2 - REAR COVER |
| 3 - REAR COVER BOLTS |

9. Remove the bolts (3) holding the rear cover (2) onto the rear housing (1).



814da1f1

Fig. 13: Removing Rear Cover
 Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - REAR COVER |
| 2 - REAR HOUSING |

NOTE: Use the pry slots provided and take care not to damage the sealing surface.

10. Remove the rear cover (1) from the rear housing (2).

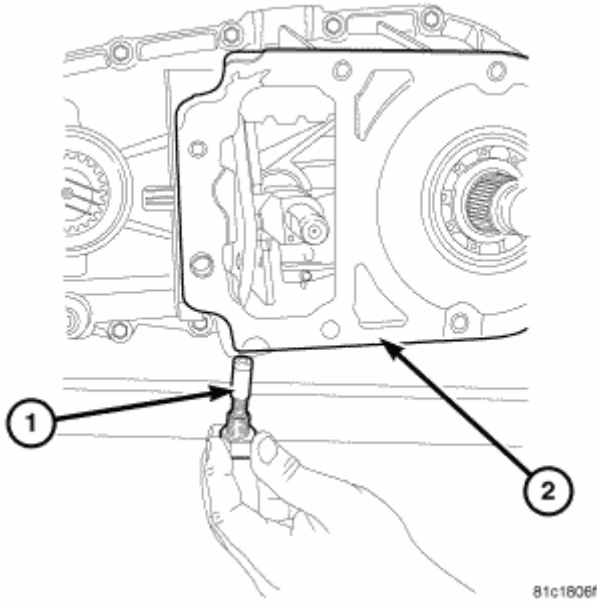


Fig. 14: DETENT ASSEMBLY
Courtesy of CHRYSLER LLC

1 - DETENT ASSEMBLY 2 - REAR CASE

11. Remove the detent assembly (1) from the rear housing (2).

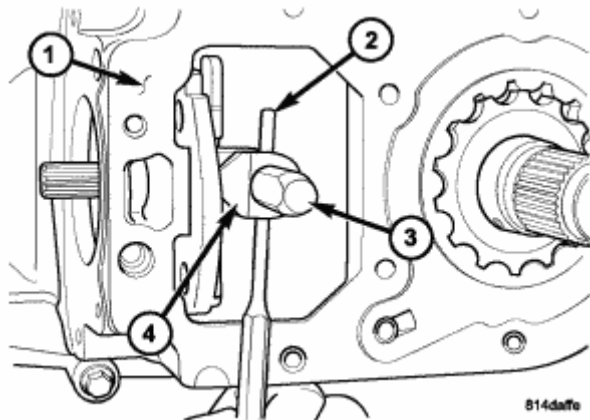


Fig. 15: Remove Sector Roller Roll-pin
Courtesy of CHRYSLER LLC

1 - REAR HOUSING 2 - ROLL-PIN 3 - SHIFT RAIL 4 - SECTOR ROLLER

NOTE: Rotate the sector downward to ease the removal of the roll-pin.

12. Using a suitable punch, remove the roll-pin (2) holding the sector roller (4) to the shift rail (3).

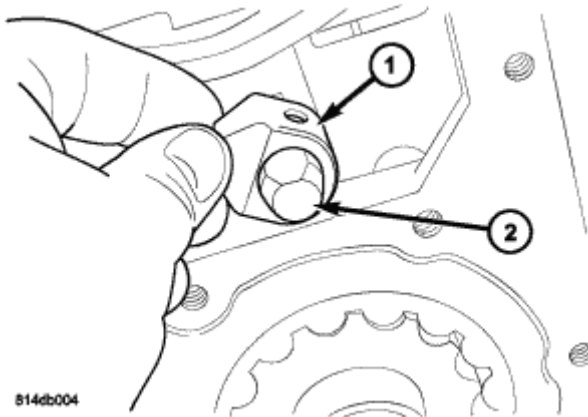


Fig. 16: Remove Sector Roller
Courtesy of CHRYSLER LLC

1 - SECTOR ROLLER 2 - SHIFT RAIL

13. Remove the sector roller (1) from the shift rail (2).

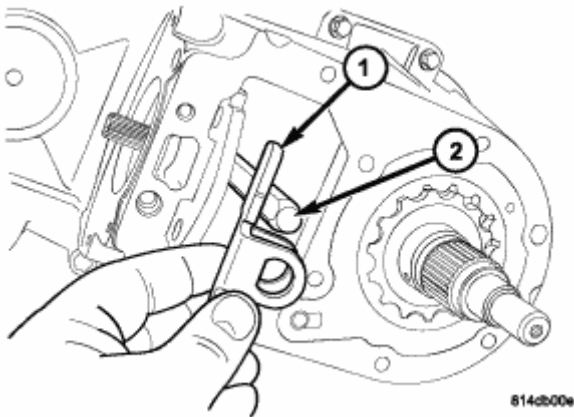


Fig. 17: Remove the Anti-Rotation Bracket
Courtesy of CHRYSLER LLC

1 - ANTI-ROTATION BRACKET 2 - SHIFT RAIL

14. Remove the anti-rotation bracket (1) from the shift rail (2).

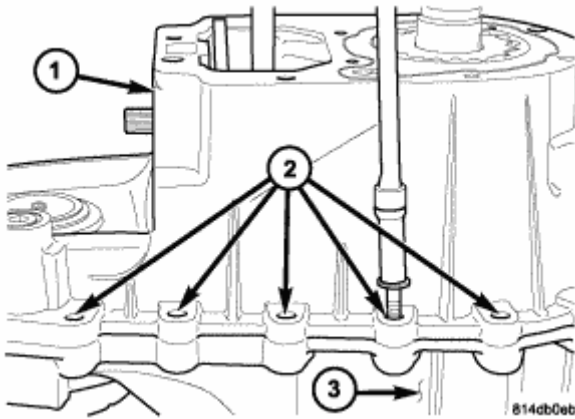


Fig. 18: Remove Rear Housing Bolts
 Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - REAR HOUSING
2 - BOLTS
3 - FRONT HOUSING |
|--|

15. Remove the bolts (2) holding the rear housing (1) to the front housing (3).

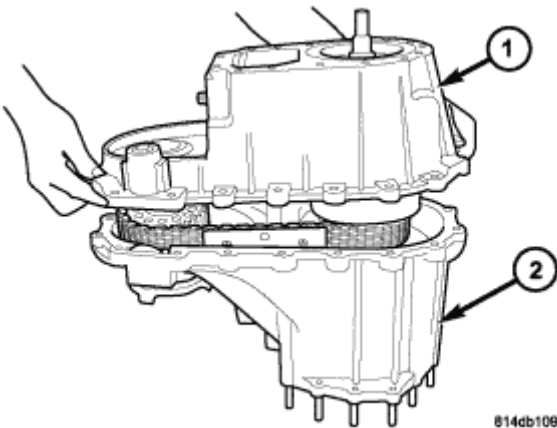


Fig. 19: Remove Rear Housing
 Courtesy of CHRYSLER LLC

- | |
|---------------------------------------|
| 1 - REAR HOUSING
2 - FRONT HOUSING |
|---------------------------------------|

NOTE: Some prying may be necessary to break the seal between the front and rear case. Use care to not damage the sealing surfaces.

16. Remove the rear housing (1) from the front housing (2).

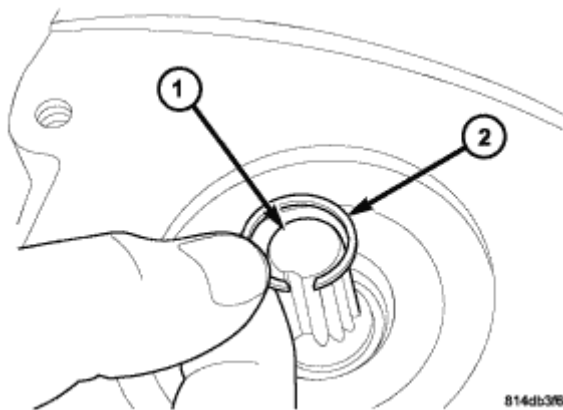


Fig. 20: Remove Sector Shaft Retaining Ring
 Courtesy of CHRYSLER LLC

1 - SHIFT SECTOR 2 - RETAINING RING
--

17. Remove the retaining ring (2) from the shift sector shaft (1).

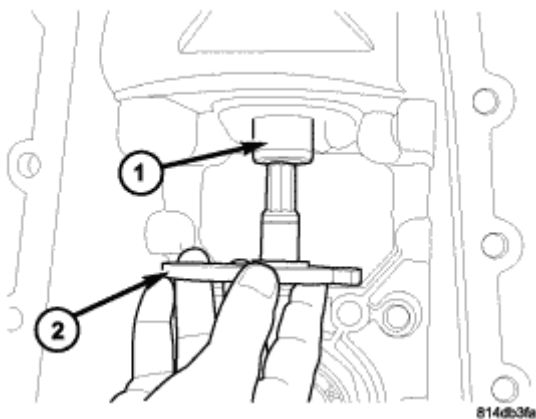
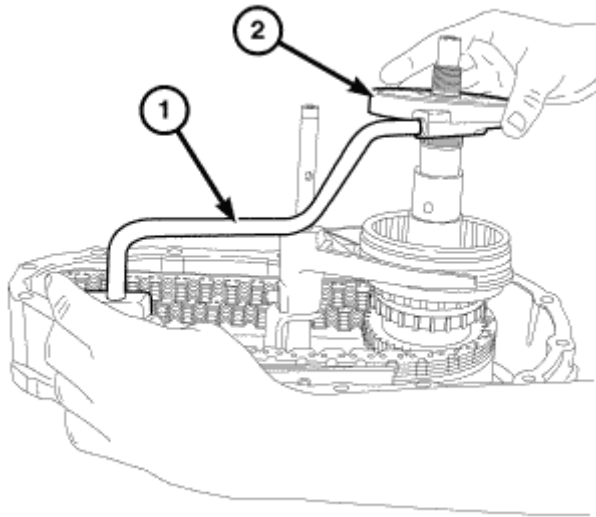


Fig. 21: Remove Sector Shaft
 Courtesy of CHRYSLER LLC

1 - FRONT HOUSING 2 - SHIFT SECTOR

18. Remove the sector shaft (2) from the rear housing (1).

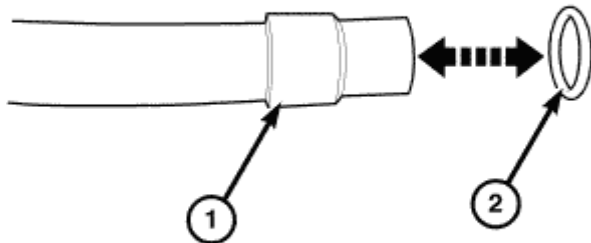


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Fig. 22: OIL PUMP ASSEMBLY
Courtesy of CHRYSLER LLC

1 - OIL PUMP TUBE
2 - OIL PUMP

19. Remove the oil pump (2) and oil pump tube (1) from the mainshaft.

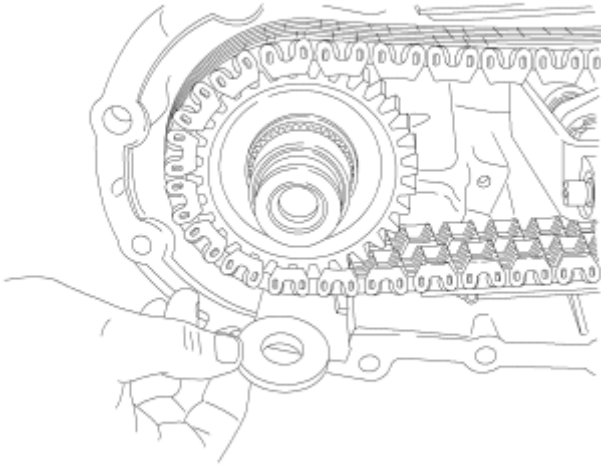


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Fig. 23: OIL TUBE O-RING
Courtesy of CHRYSLER LLC

1 - OIL TUBE
2 - O-RING SEAL

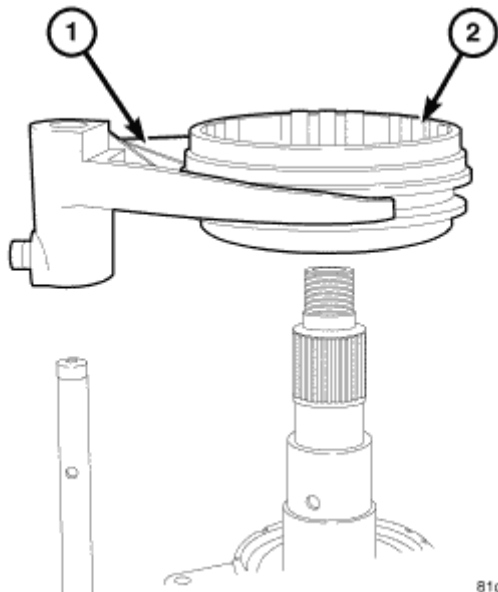
20. Remove the o-ring seal (2) from the oil tube (1).



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Fig. 24: MAGNET
Courtesy of CHRYSLER LLC

21. Remove the magnet.



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Fig. 25: SHIFT FORK AND SYNCHRONIZER SLEEVE
Courtesy of CHRYSLER LLC

1 - SHIFT FORK
2 - SYNCHRONIZER SLEEVE

22. Remove the shift fork (1) and synchronizer sleeve (2).

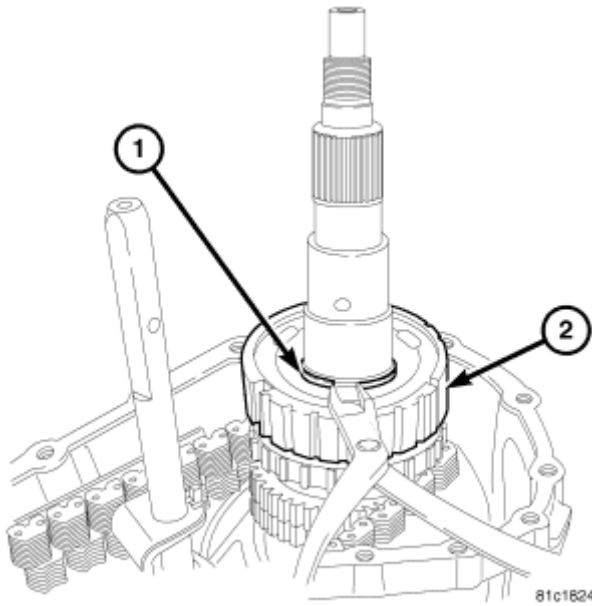


Fig. 26: SYNCHRONIZER HUB SNAP RING
Courtesy of CHRYSLER LLC

1 - SNAP RING
2 - SYNCHRONIZER HUB

23. Remove the synchronizer hub snap ring (1).

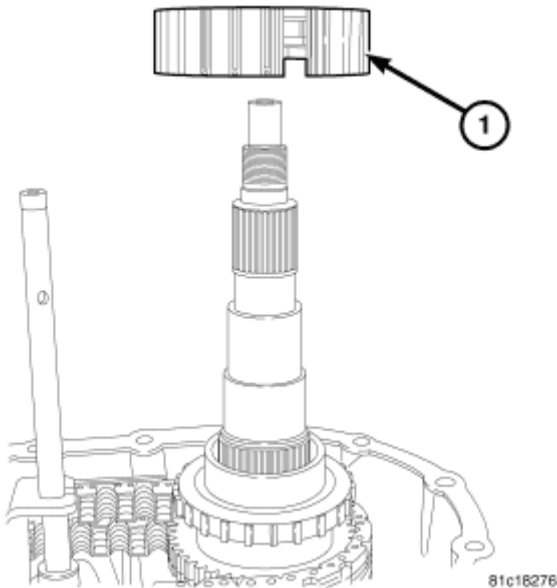


Fig. 27: SYNCHRONIZER HUB
Courtesy of CHRYSLER LLC

1 - SYNCHRONIZER HUB

24. Remove the synchronizer hub (1).

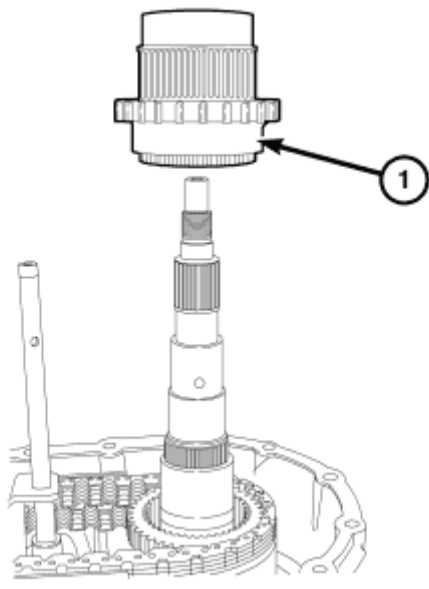


Fig. 28: HUB DRIVE AND CLUTCH GEAR ASSEMBLY
Courtesy of CHRYSLER LLC

1 - HUB DRIVE AND CLUTCH GEAR

25. Remove the hub drive and clutch gear (1).

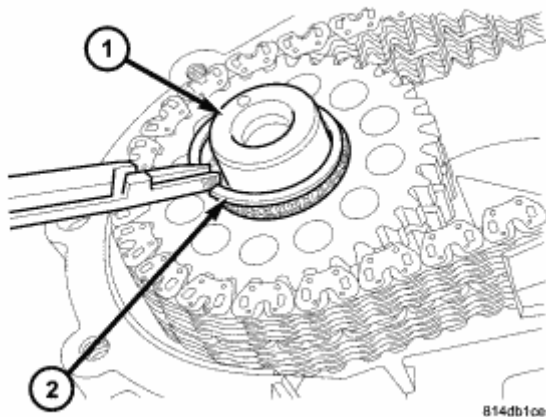


Fig. 29: Remove Front Drive Sprocket Retaining Ring
Courtesy of CHRYSLER LLC

- 1 - FRONT OUTPUT SHAFT
- 2 - RETAINING RING

26. Remove the front drive sprocket retaining ring (2) from the front output shaft (1).

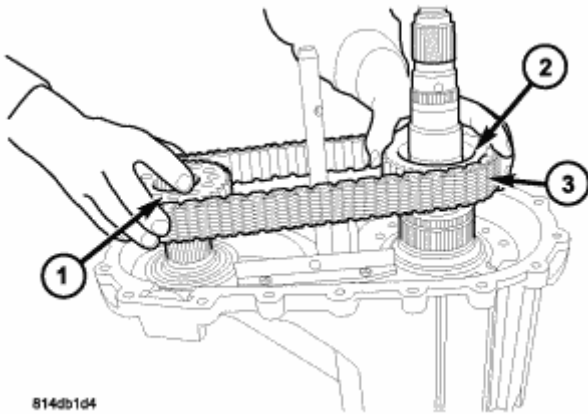


Fig. 30: Remove Front and Rear Drive Sprockets and Drive Chain
Courtesy of CHRYSLER LLC

- 1 - FRONT DRIVE SPROCKET
- 2 - MAINSHAFT DRIVE SPROCKET
- 3 - DRIVE CHAIN

27. Remove the front drive sprocket (1), mainshaft drive sprocket (2), and drive chain (3) as one.

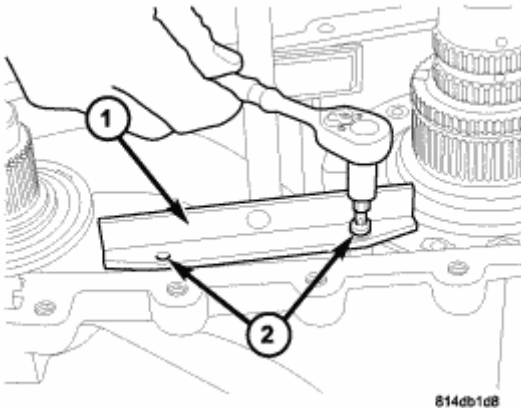


Fig. 31: Remove Chain Guide Bolts
Courtesy of CHRYSLER LLC

- 1 - CHAIN GUIDE RAIL
- 2 - SCREWS

28. Remove the screws (2) holding the both chain guide rails (1) to the front housing.

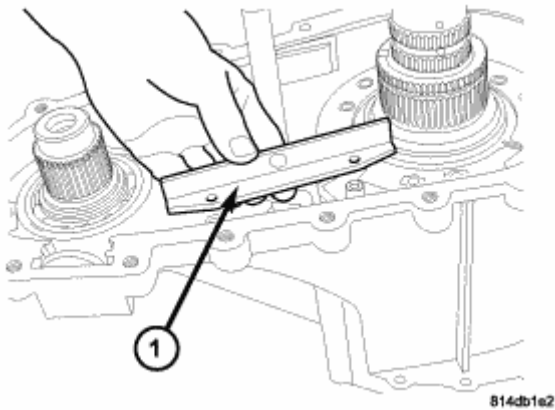


Fig. 32: Remove Chain Guide
Courtesy of CHRYSLER LLC

1 - DRIVE CHAIN GUIDE

29. Remove both drive chain guides (1) from the transfer case.

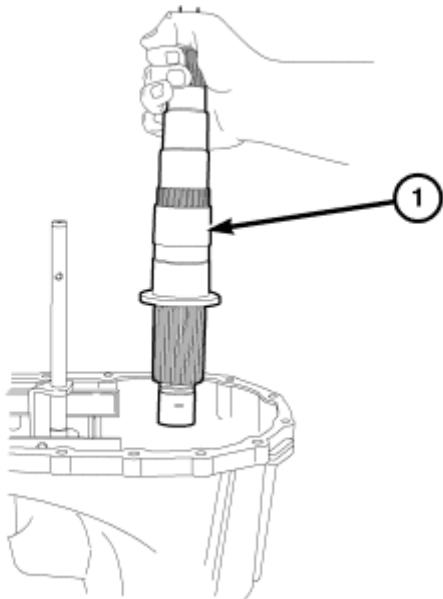
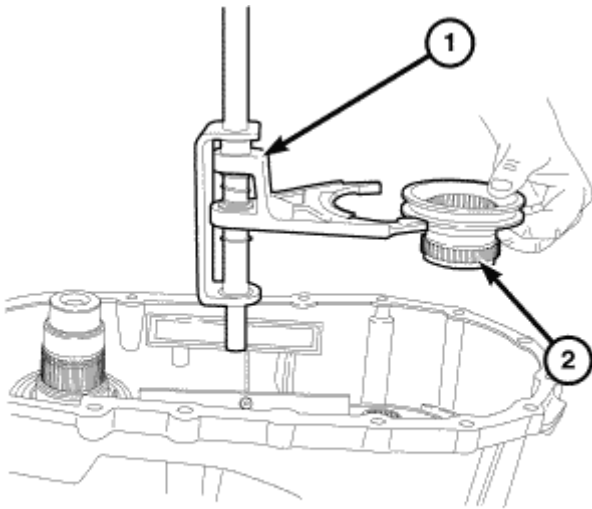


Fig. 33: MAIN SHAFT
Courtesy of CHRYSLER LLC

1 - MAIN SHAFT

30. Remove the mainshaft (1).

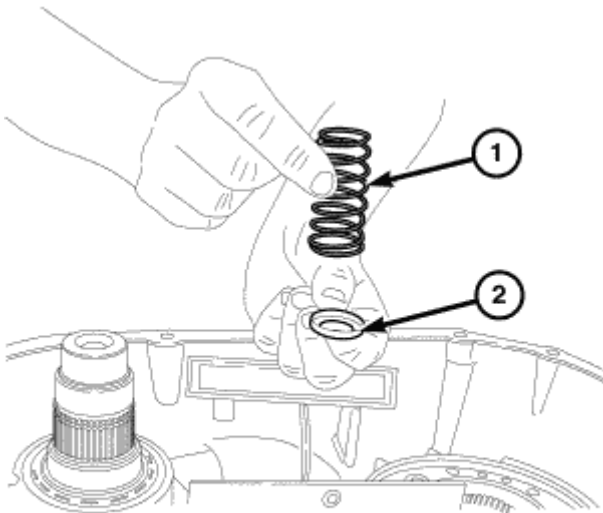


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Fig. 34: SHIFT RAIL AND RANGE SLEEVE
 Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - SHIFT RAIL |
| 2 - RANGE SLEEVE |

31. Remove the shift rail (1) and range sleeve (2).



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Fig. 35: SHIFT RAIL SPRING AND SEAT
 Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - SHIFT RAIL SPRING |
| 2 - SHIFT RAIL SPRING SEAT |

32. Remove the shift rail spring (1) and seat (2).

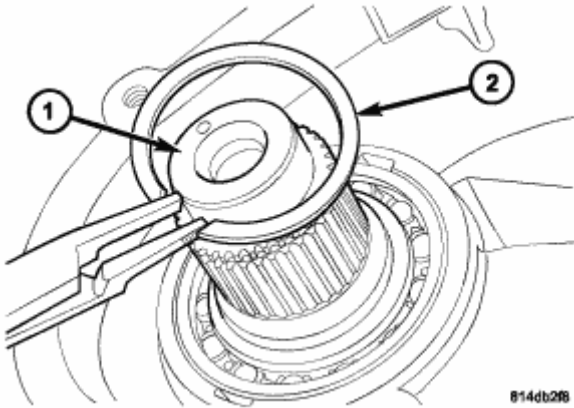


Fig. 36: Remove Front Output Shaft Retaining Ring
Courtesy of CHRYSLER LLC

1 - FRONT OUTPUT SHAFT
2 - RETAINING RING

33. Remove the retaining snap ring (2) from the front output shaft (1).

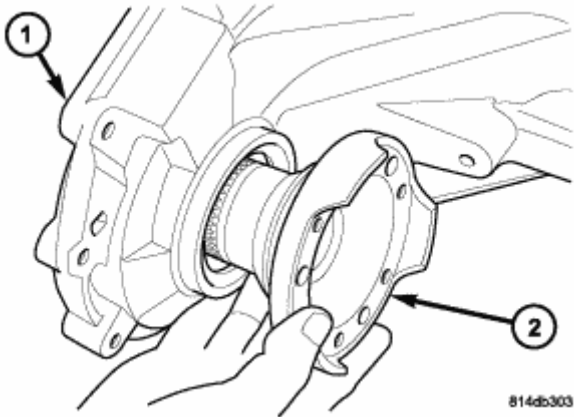
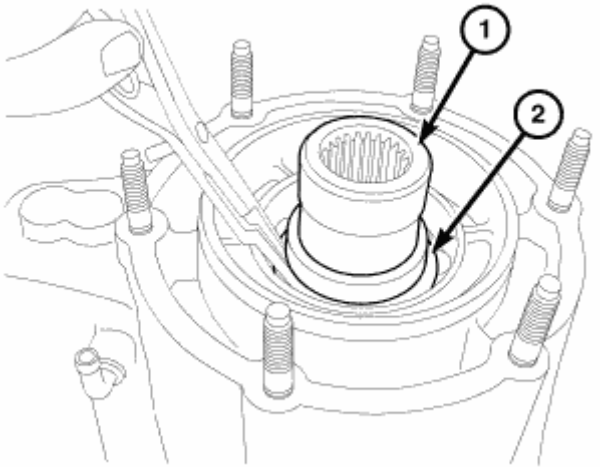


Fig. 37: Remove Front Output Shaft and Flange
Courtesy of CHRYSLER LLC

1 - FRONT HOUSING
2 - FRONT OUTPUT SHAFT

34. Remove the front output shaft (2) from the front housing (1) and the front output shaft front bearing.

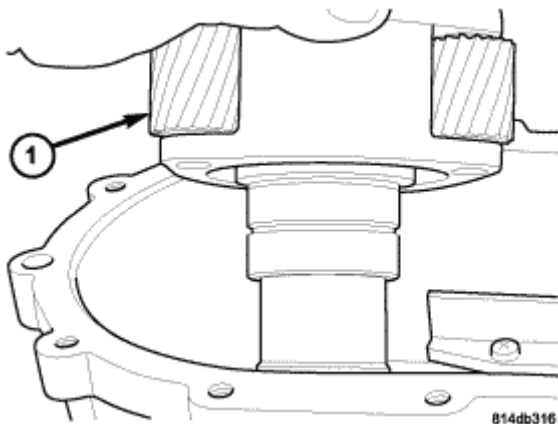


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Fig. 38: INPUT GEAR SNAP RING
 Courtesy of CHRYSLER LLC

1 - INPUT GEAR 2 - RETAINING RING

35. Remove the input shaft seal with a suitable pry tool or a screw mounted in a slide hammer.
36. Remove the retaining ring (2) holding the input gear (1) assembly into the front housing.



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Fig. 39: Remove Input Planetary Assembly
 Courtesy of CHRYSLER LLC

1 - INPUT PLANETARY GEAR ASSEMBLY

37. Remove the input planetary gear assembly (1) from the front housing.

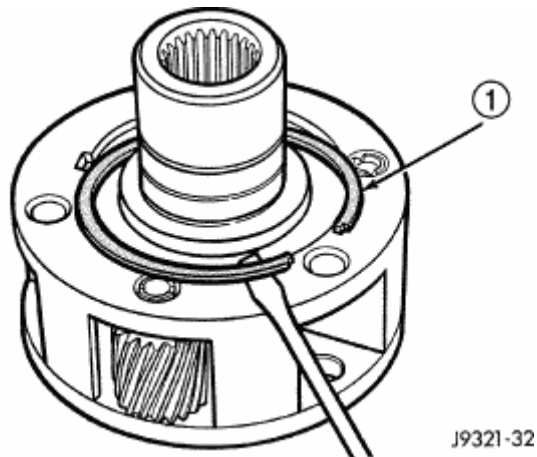


Fig. 40: Input Gear Snap-Ring Removal
 Courtesy of CHRYSLER LLC

1 - INPUT GEAR SNAP-RING

38. Remove the snap-ring (1) holding the input gear into the planetary gear.

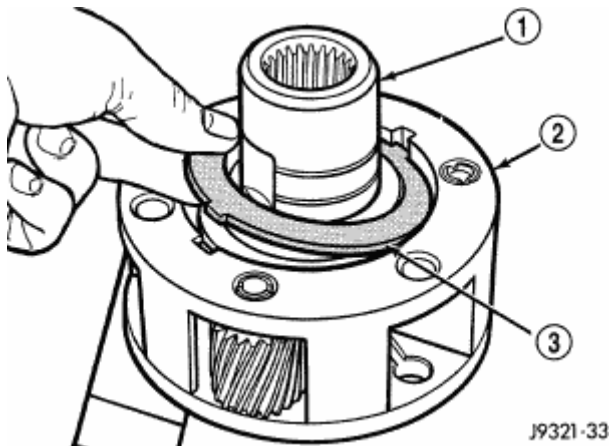


Fig. 41: Input Gear Retainer Removal
 Courtesy of CHRYSLER LLC

1 - INPUT GEAR
2 - PLANETARY GEAR
3 - RETAINER

39. Remove the input gear lock plate (3) from the planetary gear (2).

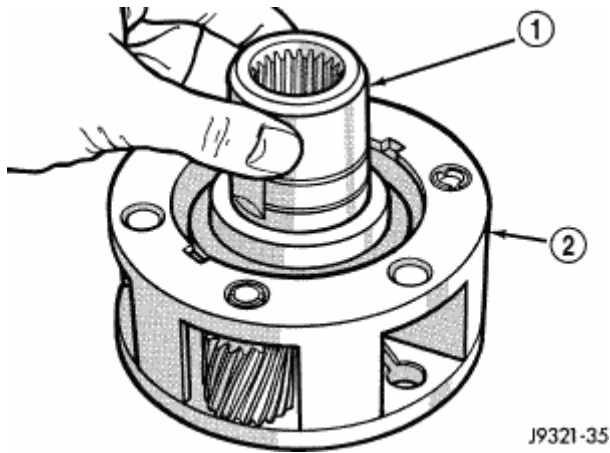


Fig. 42: Input Gear Removal
 Courtesy of CHRYSLER LLC

- | |
|--------------------------------------|
| 1 - INPUT GEAR
2 - LOW RANGE GEAR |
|--------------------------------------|

40. Remove the input gear (1) from the planetary gear (2).

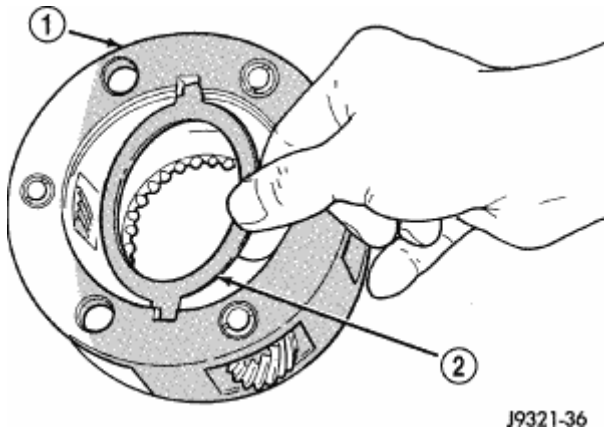


Fig. 43: Rear Tabbed Thrust Washer Removal
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - PLANETARY GEAR
2 - REAR TABBED THRUST WASHER |
|---|

41. Remove the rear tabbed thrust washer (1) from the planetary gear (2).

CLEANING

TRANSFER CASE

Clean the transfer case parts with a standard parts cleaning solvent. Remove all traces of sealer from the cases and retainers with a scraper and 3M™ all purpose cleaner. Use compressed air to remove solvent residue from

oil feed passages in the case halves, retainers, gears, and shafts.

INSPECTION

INSPECTION-TRANSFER CASE

Inspect the case for cracks, porous spots, worn bores, or damaged threads. Damaged threads can be repaired with Helicoil® thread inserts. However, the case will have to be replaced if it exhibits any type of damage or wear.

ASSEMBLY

TRANSFER CASE - MP1522

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

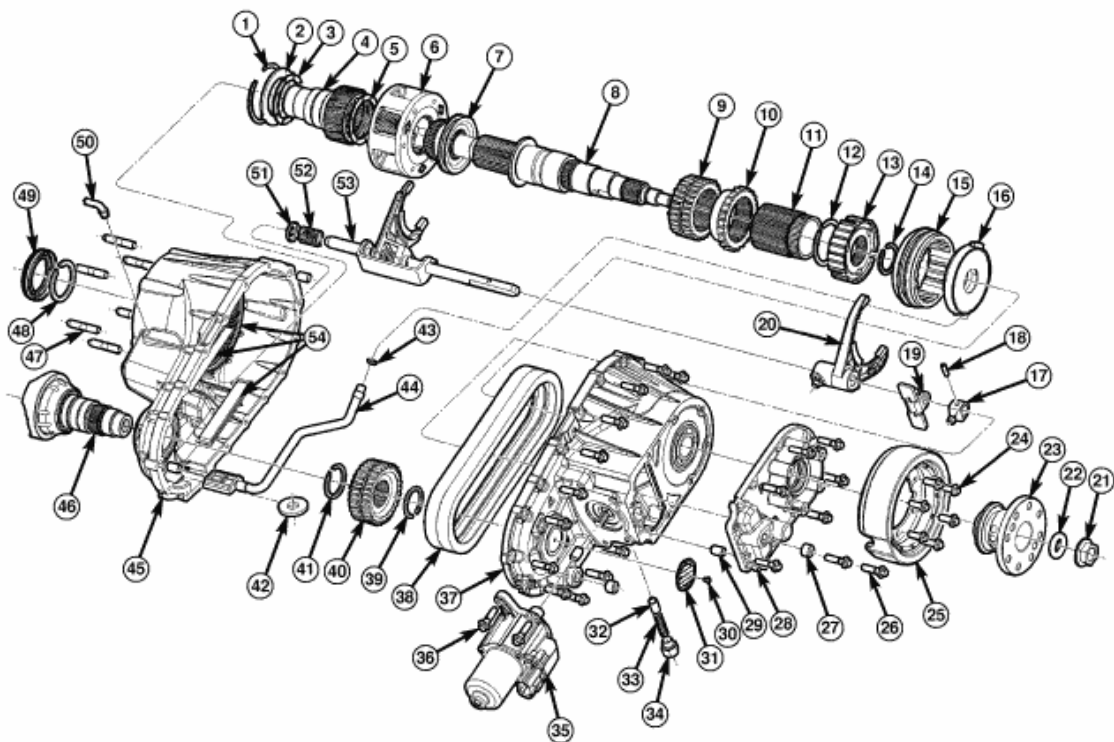


Fig. 44: MP1522 EXPLODED VIEW
Courtesy of CHRYSLER LLC

1 - PLANETARY SNAP RING	19 - ANTI-ROTATION BRACKET	37 - REAR CASE
2 - LOCK PLATE	20 - SHIFT FORK	38 - DRIVE CHAINS

3 - THRUST WASHER	21 - FLANGE NUT	39 - SNAP RING
4 - INPUT GEAR (SHAFT)	22 - O-RING SEAL	40 - DRIVEN SPROCKET
5 - TABBED THRUST WASHER	23 - REAR FLANGE	41 - SNAP RING
6 - PLANETARY GEAR	24 - DAMPER BOLTS	42 - MAGNET
7 - RANGE SLEEVE	25 - DAMPER (if equipped)	43 - OIL TUBE O-RING
8 - MAINSHAFT	26 - CASE BOLTS	44 - OIL TUBE
9 - DRIVE SPROCKET	27 - FILL PLUG	45 - FRONT CASE
10 - CLUTCH GEAR	28 - REAR COVER	46 - FRONT FLANGE
11 - HUB DRIVE SPROCKET	29 - DOWEL	47 - STUDS
12 - SNAP RING	30 - ID TAG SCREW	48 - SNAP RING
13 - SYNCHRONIZER HUB	31 - ID TAG	49 - INPUT SEAL
14 - SNAP RING	32 - SHIFT DETENT	50 - VENT TUBE
15 - SYNCHRONIZER SLEEVE	33 - SHIFT DETENT SPRING	51 - SPRING CUP
16 - OIL PUMP ASSEMBLY	34 - SHIFT DETENT BOLT	52 - SPRING
17 - SECTOR ROLLER	35 - SHIFT MOTOR	53 - SHIFT RAIL ASSEMBLY
18 - ROLL PIN	36 - BOLTS	54 - ANNULUS AND GUIDE RAILS

CAUTION: The bearing bores in various transfer case components contain oil feed

holes. Be certain the holes are not blocked. Failure to follow this caution may result in transfer case damage.

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

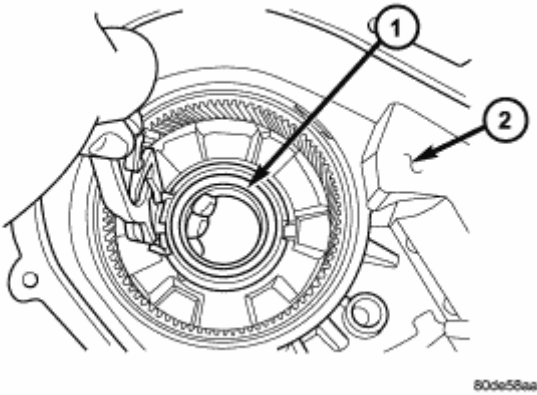


Fig. 45: Remove Input Gear Bearing
Courtesy of CHRYSLER LLC

1 - INPUT GEAR BEARING
2 - FRONT CASE

1. While holding the retaining ring tabs apart with suitable snap-ring pliers, remove the input shaft bearing (1) from the front case (2).
2. Transfer the retaining ring to the new housing, if necessary, and install the bearing into the front case.

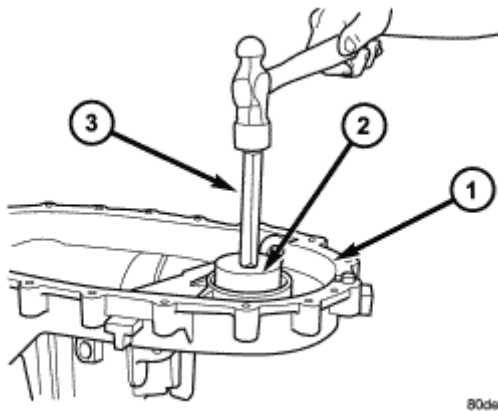


Fig. 46: Remove Front Output Shaft Bearing
Courtesy of CHRYSLER LLC

1 - FRONT CASE
2 - INSTALLER 6061 (INVERTED)
3 - HANDLE C-4171

3. Remove the front output shaft seal with a suitable pry tool or a screw mounted in a slide hammer.
4. Using inverted Installer 6061 and Handle C-4171, remove front output shaft bearing.
5. Start front output shaft bearing in case. Then seat bearing with Handle C-4171 (3) and inverted Installer 6061 (2).
6. Using Handle C-4171 (1) and Installer 6560 (2) install the front output shaft seal (3).

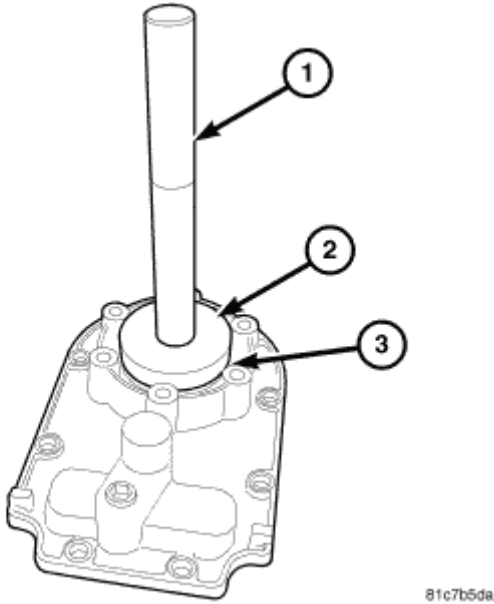
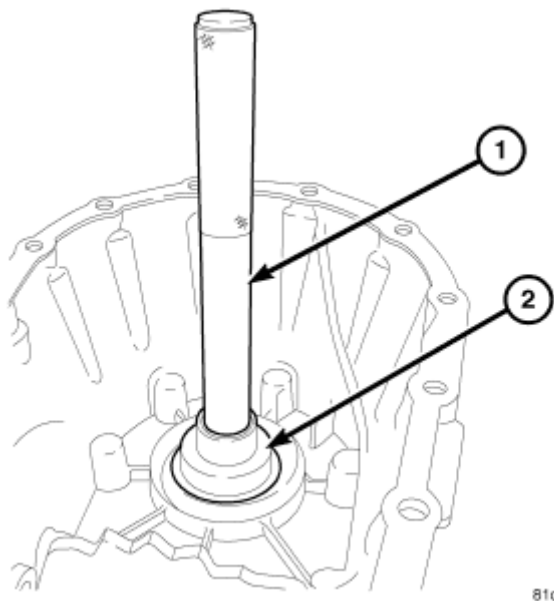


Fig. 47: REAR OUTPUT SHAFT SEAL
Courtesy of CHRYSLER LLC

1 - HANDLE C-4171
2 - INSTALLER C-4210
3 - REAR OUTPUT SHAFT SEAL

7. Remove the rear output shaft seal with a suitable pry tool or a screw mounted in a slide hammer.
8. Install a new rear output shaft seal (3) into the rear cover using handle C-4171 (1) and Installer C-4210 (2).

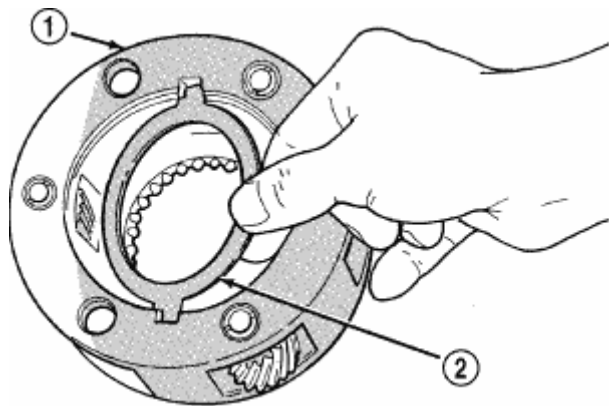


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Fig. 48: REMOVE REAR OUTPUT SHAFT BEARING
 Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - HANDLE C-4171 |
| 2 - INSTALLER 6436 (INVERTED) |

9. Remove the rear output shaft bearing from the rear case using inverted Installer 6436 (2) and Handle C-4171 (1).
10. Install the rear output shaft bearing into the rear case using inverted Remover/Installer 6436 (2) and Handle C-4171 (1).



J9321-36

Fig. 49: Rear Tabbed Thrust Washer Removal
 Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - PLANETARY GEAR |
| 2 - REAR TABBED THRUST WASHER |

NOTE: The tabbed side of the thrust washer faces upward.

11. Install the rear tabbed thrust washer (2) into the planetary gear (1).

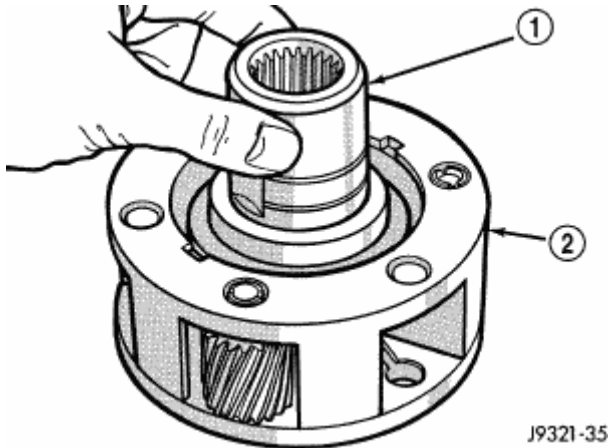


Fig. 50: Input Gear Removal
Courtesy of CHRYSLER LLC

1 - INPUT GEAR
2 - LOW RANGE GEAR

12. Install the input gear (1) into the planetary gear (2).

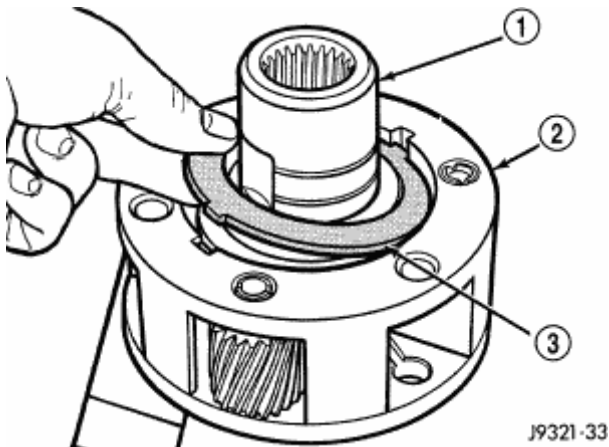


Fig. 51: Input Gear Retainer Removal
Courtesy of CHRYSLER LLC

1 - INPUT GEAR
2 - PLANETARY GEAR
3 - RETAINER

13. Install the input gear lock plate (3) onto the planetary gear (2) and install it into the planetary.

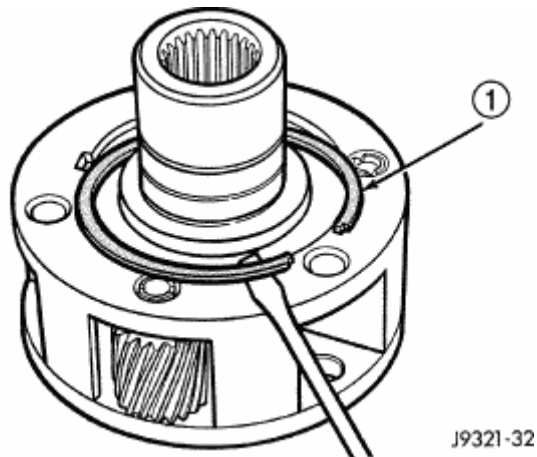


Fig. 52: Input Gear Snap-Ring Removal
 Courtesy of CHRYSLER LLC

1 - INPUT GEAR SNAP-RING

14. Install the snap-ring (1) to hold the input gear into the planetary gear.

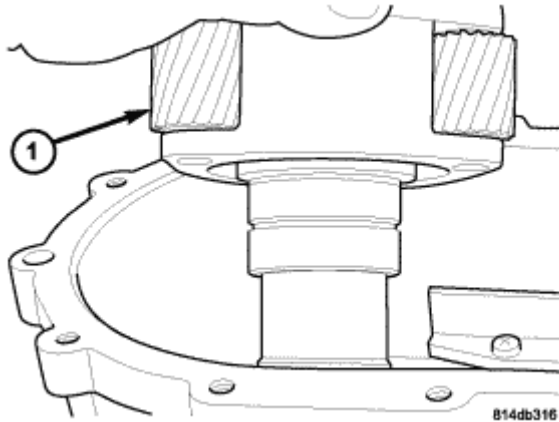
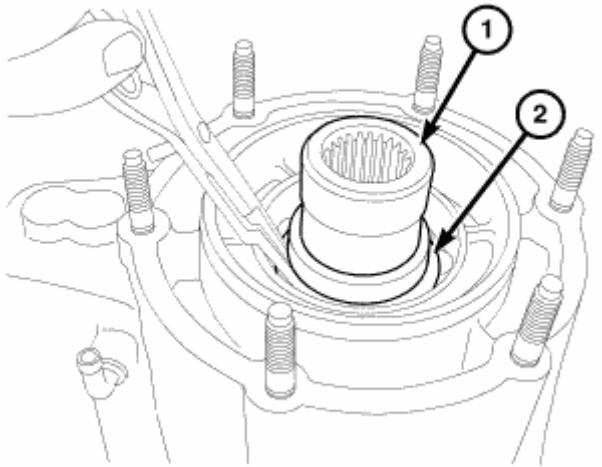


Fig. 53: Remove Input Planetary Assembly
 Courtesy of CHRYSLER LLC

1 - INPUT PLANETARY GEAR ASSEMBLY

15. Install the input planetary gear assembly (1) into the front housing.

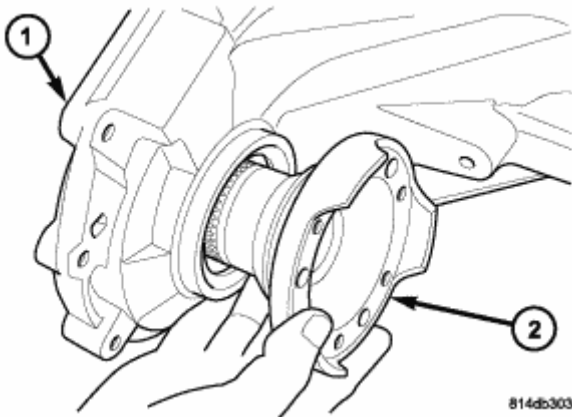


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Fig. 54: INPUT GEAR SNAP RING
 Courtesy of CHRYSLER LLC

1 - INPUT GEAR 2 - RETAINING RING

16. Install the retaining ring (2) holding the input planetary gear assembly into the front housing.
17. Install the new input shaft seal with Installer 9672 and Handle C-4171.



814db303

Fig. 55: Remove Front Output Shaft and Flange
 Courtesy of CHRYSLER LLC

1 - FRONT HOUSING 2 - FRONT OUTPUT SHAFT

18. Install a new front output shaft seal with Installer 6560.
19. Install the front output shaft (2) into the front housing (1) and the front output shaft front bearing.

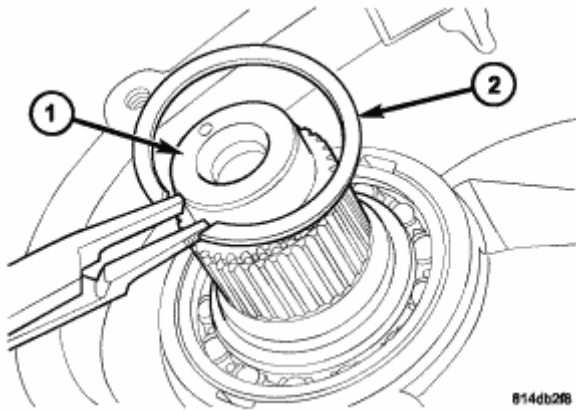


Fig. 56: Remove Front Output Shaft Retaining Ring
 Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - FRONT OUTPUT SHAFT
2 - RETAINING RING |
|--|

20. Install the retaining ring (2) onto the front output shaft (1).

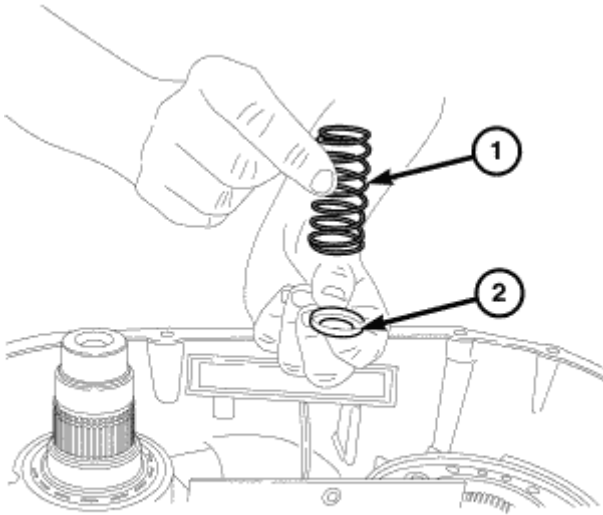
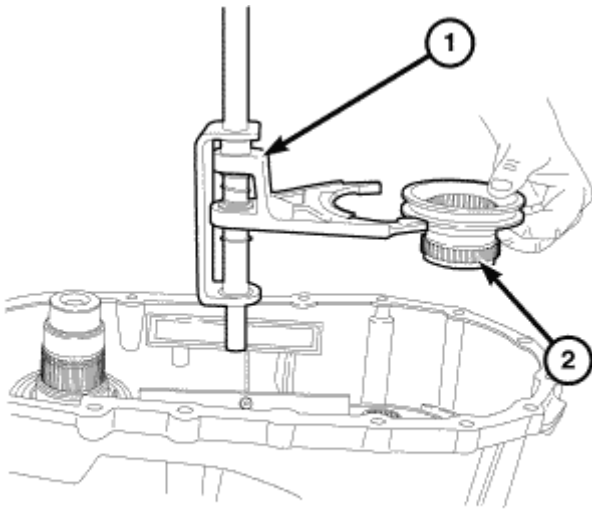


Fig. 57: SHIFT RAIL SPRING AND SEAT
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SHIFT RAIL SPRING
2 - SHIFT RAIL SPRING SEAT |
|---|

21. Install the shift rail spring cup (2) and shift rail spring (1).

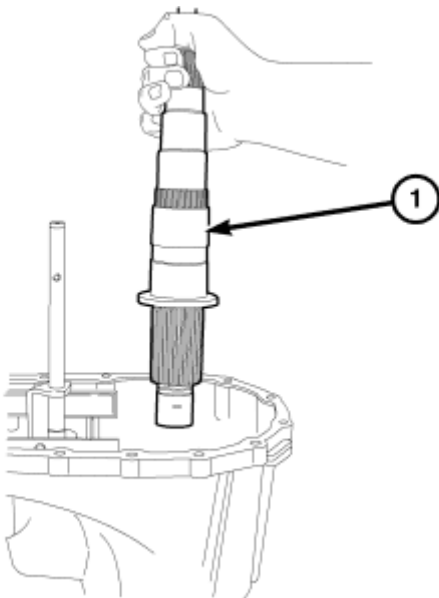


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Fig. 58: SHIFT RAIL AND RANGE SLEEVE
Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - SHIFT RAIL |
| 2 - RANGE SLEEVE |

22. Install the shift rail (1) and range sleeve (2).



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Fig. 59: MAIN SHAFT
Courtesy of CHRYSLER LLC

- | |
|----------------|
| 1 - MAIN SHAFT |
|----------------|

23. Install the mainshaft (1).

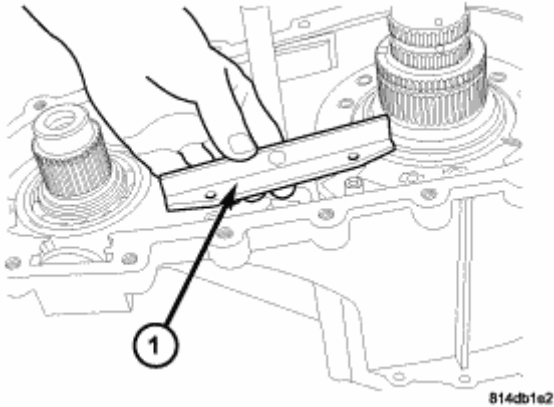


Fig. 60: Remove Chain Guide
Courtesy of CHRYSLER LLC

1 - DRIVE CHAIN GUIDE

24. Install the both drive chain guides (1) onto the transfer case.

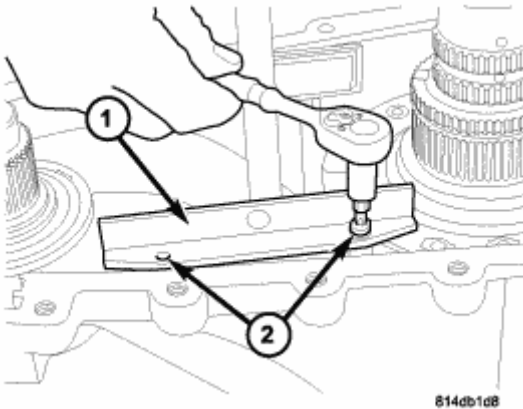


Fig. 61: Remove Chain Guide Bolts
Courtesy of CHRYSLER LLC

1 - CHAIN GUIDE RAIL
2 - SCREWS

25. Install the screws (2) to hold the chain guide rails (1) to the front housing. Tighten the screws to 5-8 N.m (44-71 in. lbs.).

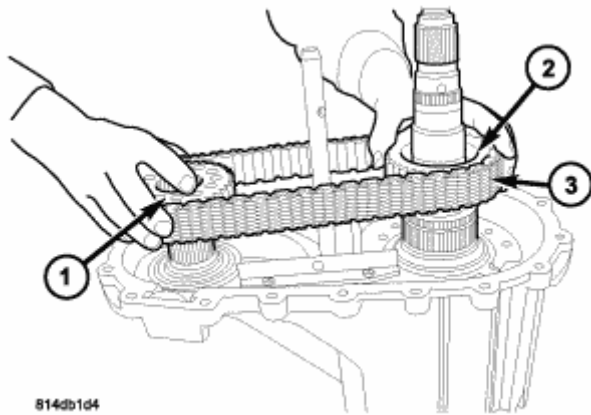


Fig. 62: Remove Front and Rear Drive Sprockets and Drive Chain
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - FRONT DRIVE SPROCKET
2 - MAINSHAFT DRIVE SPROCKET
3 - DRIVE CHAIN |
|---|

CAUTION: Be careful not to damage the ground surface of the mainshaft while installing the sprockets and drive chain. Failure to follow this caution may result in transfer case damage.

26. Install the front drive sprocket (1), mainshaft drive sprocket (2), and drive chain (3) as one.

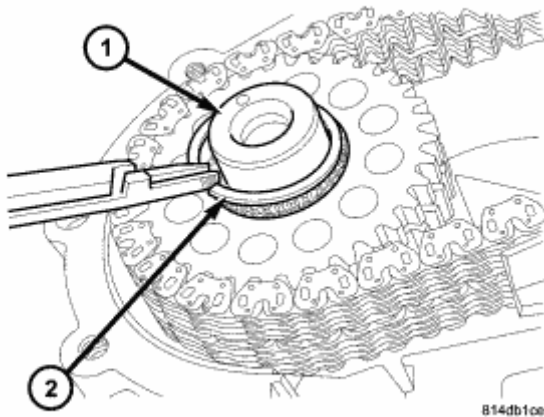


Fig. 63: Remove Front Drive Sprocket Retaining Ring
 Courtesy of CHRYSLER LLC

- | |
|------------------------|
| 1 - FRONT OUTPUT SHAFT |
|------------------------|

2 - RETAINING RING

27. Install the front drive sprocket retaining ring (2) onto the front output shaft (1).

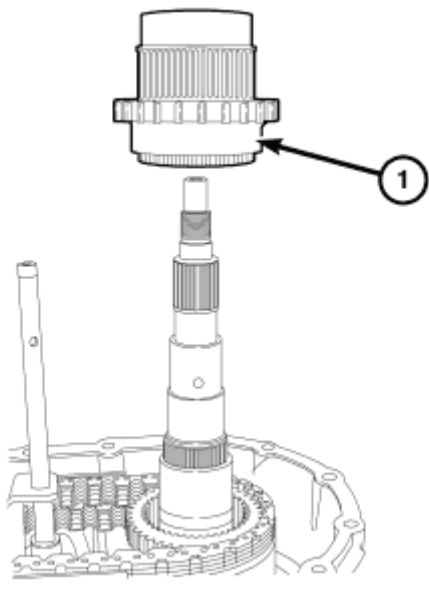


Fig. 64: HUB DRIVE AND CLUTCH GEAR ASSEMBLY
Courtesy of CHRYSLER LLC

1 - HUB DRIVE AND CLUTCH GEAR

28. Install the hub drive and clutch gear assembly (1) onto the mainshaft.

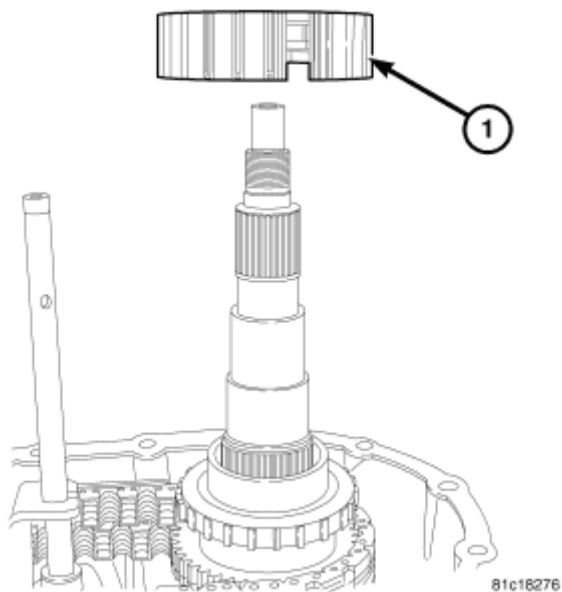


Fig. 65: SYNCHRONIZER HUB
Courtesy of CHRYSLER LLC

1 - SYNCHRONIZER HUB

29. Install the synchronizer hub (1) onto the mainshaft.

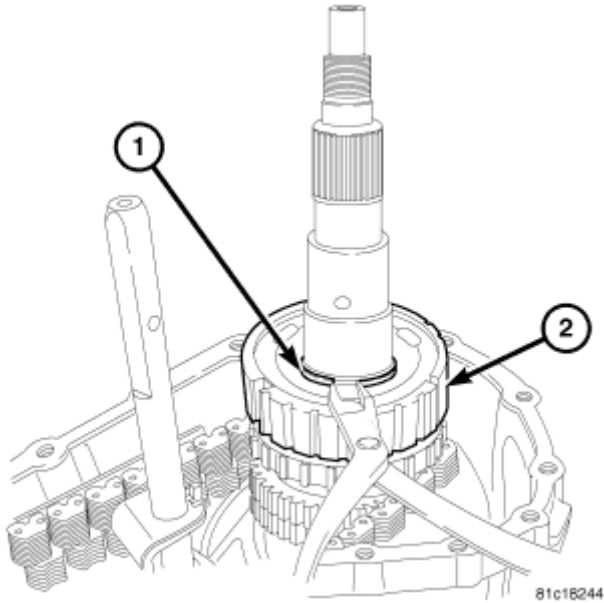


Fig. 66: SYNCHRONIZER HUB SNAP RING
Courtesy of CHRYSLER LLC

1 - SNAP RING

2 - SYNCHRONIZER HUB

30. Install the synchronizer hub snap ring (1) onto the mainshaft.

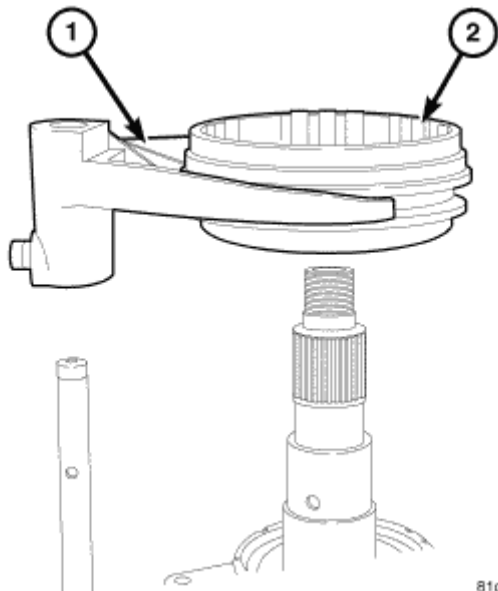
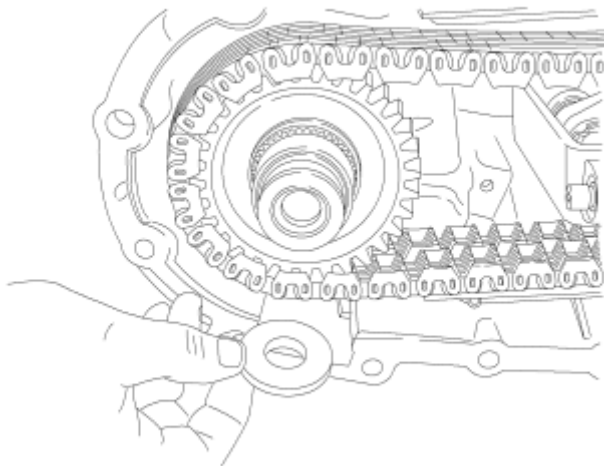


Fig. 67: SHIFT FORK AND SYNCHRONIZER SLEEVE

Courtesy of CHRYSLER LLC

- | |
|-------------------------|
| 1 - SHIFT FORK |
| 2 - SYNCHRONIZER SLEEVE |

31. Install the shift fork (1) and synchronizer sleeve (2) onto the shift rail and mainshaft.

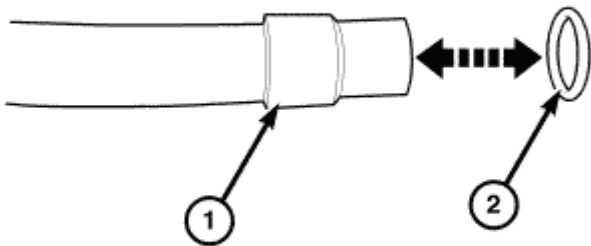


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Fig. 68: MAGNET

Courtesy of CHRYSLER LLC

32. Clean and install the magnet into the pocket.



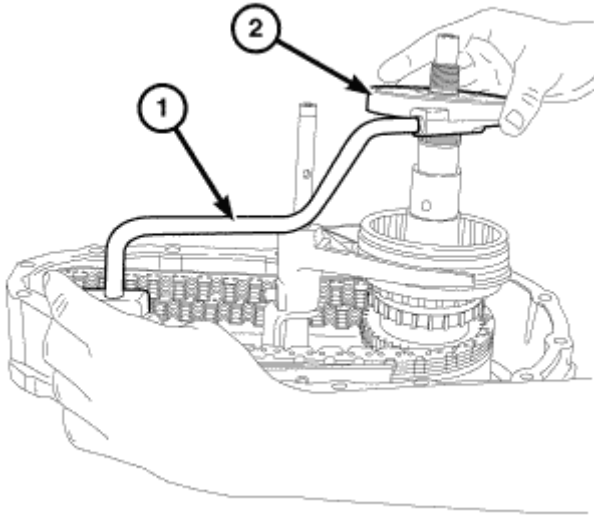
81c16188

Fig. 69: OIL TUBE O-RING

Courtesy of CHRYSLER LLC

- 1 - OIL TUBE
- 2 - O-RING SEAL

33. Install a **NEW** o-ring seal (2) onto the oil tube (1).

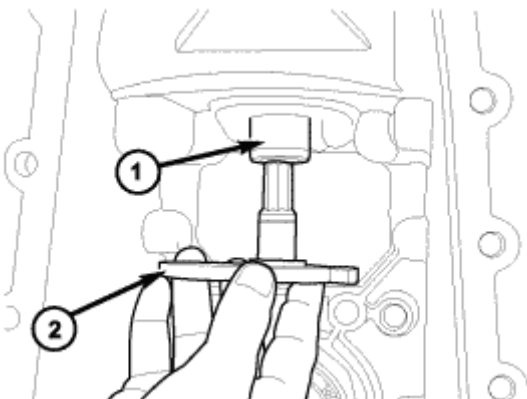


81c1617b

Fig. 70: OIL PUMP ASSEMBLY
Courtesy of CHRYSLER LLC

- 1 - OIL PUMP TUBE
- 2 - OIL PUMP

34. Lubricate the oil tube o-ring with MOPAR® ATF+4 and install the tube into the oil pump.
35. Install the oil pump (2) onto the mainshaft while installing the oil pump pick-up into the pocket in the case.



814db3fa

Fig. 71: Remove Sector Shaft
Courtesy of CHRYSLER LLC

1 - FRONT HOUSING
2 - SHIFT SECTOR

36. Install the sector shaft (2) into the rear housing (1).

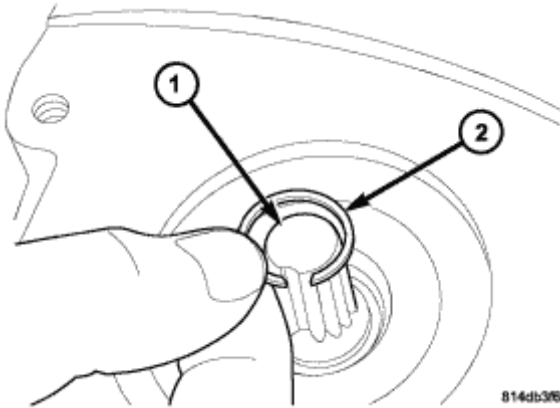


Fig. 72: Remove Sector Shaft Retaining Ring
Courtesy of CHRYSLER LLC

1 - SHIFT SECTOR
2 - RETAINING RING

37. Install the retaining ring (2) onto the shift sector shaft (1).

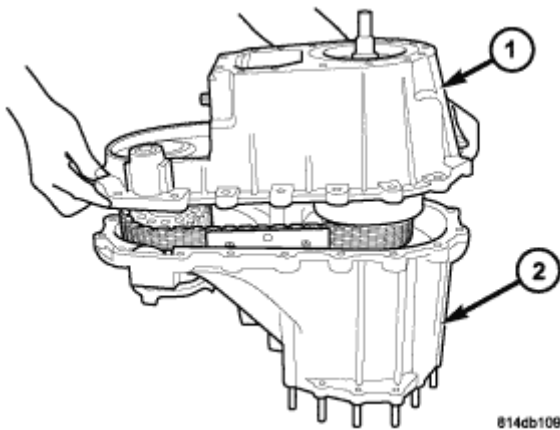


Fig. 73: Remove Rear Housing
Courtesy of CHRYSLER LLC

1 - REAR HOUSING
2 - FRONT HOUSING

38. Apply bead of Mopar® Gasket Maker, or equivalent, to mating surface of front case. Keep sealer bead width to maximum of 3 mm (0.125 inch). **Do not use excessive amount of sealer as excess will be displaced into case interior and potentially clog the oil pump screen.**
39. Install the rear housing (1) into the front housing (2).

NOTE: Use an alignment dowel (2) in the combination of the front (1) and the rear housing (3).

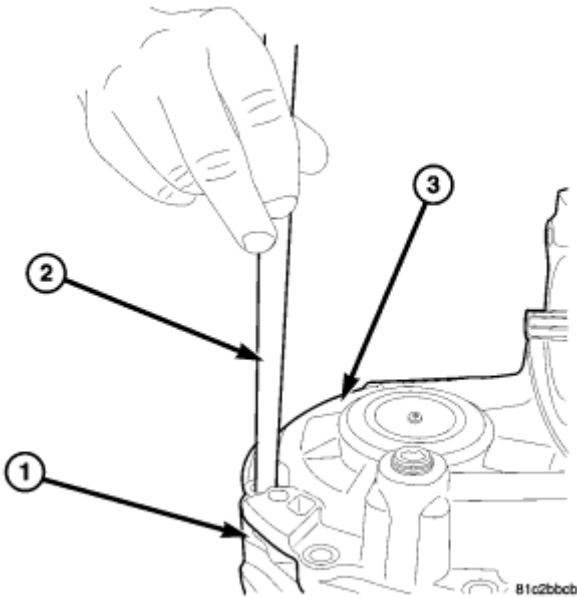


Fig. 74: ALIGNMENT DOWEL
Courtesy of CHRYSLER LLC

1 - FRONT CASE
2 - ALIGNMENT DOWEL
3 - REAR CASE

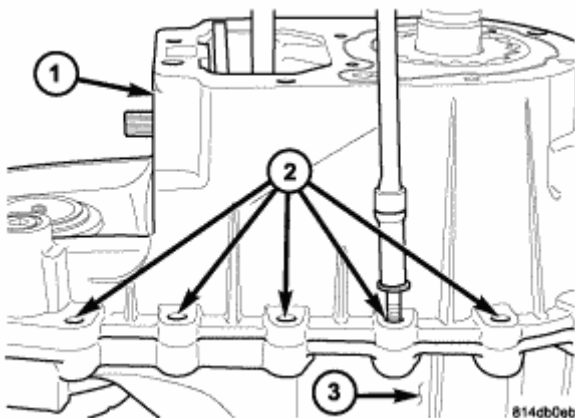


Fig. 75: Remove Rear Housing Bolts
Courtesy of CHRYSLER LLC

- 1 - REAR HOUSING
- 2 - BOLTS
- 3 - FRONT HOUSING

40. Install the bolts (2) to hold the rear housing (1) to the front housing (3). Tighten the bolts at the dowel locations first, then the remainder of the bolts in a crisscross pattern. Tighten the bolts to 27 N.m (20 ft. lbs.).

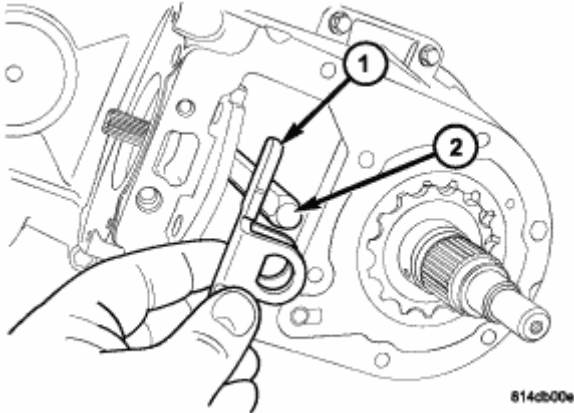


Fig. 76: Remove the Anti-Rotation Bracket
Courtesy of CHRYSLER LLC

- 1 - ANTI-ROTATION BRACKET
- 2 - SHIFT RAIL

41. Install the anti-rotation bracket (1) onto the shift rail (2).

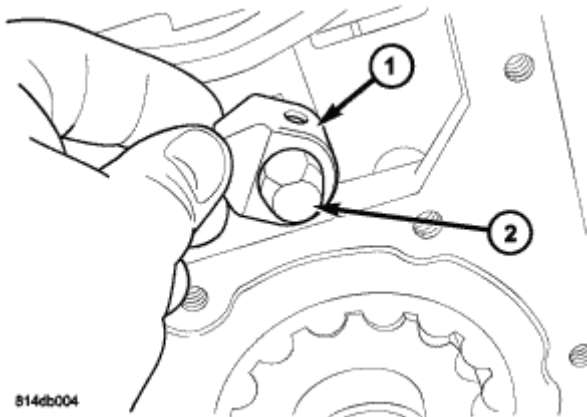


Fig. 77: Remove Sector Roller
Courtesy of CHRYSLER LLC

- 1 - SECTOR ROLLER
- 2 - SHIFT RAIL

42. Install the sector roller (1) onto the shift rail (2).
43. Using a suitable punch, align the holes in the sector roller with the hole in the shift rail and install the roll-pin to secure the sector roller to the shift rail.

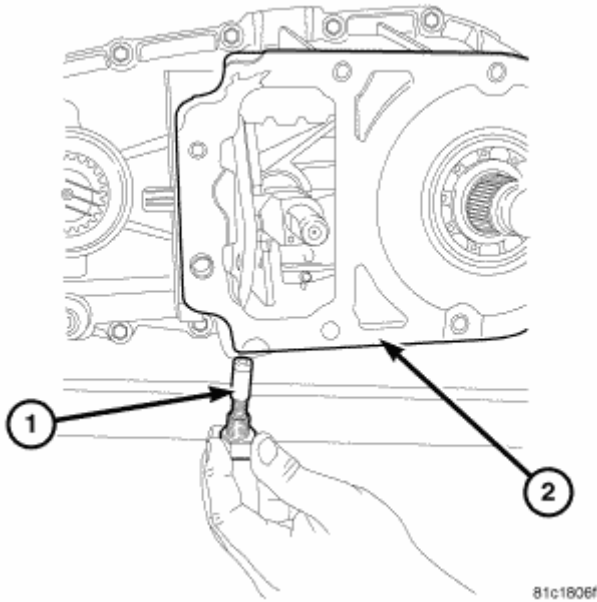


Fig. 78: DETENT ASSEMBLY
Courtesy of CHRYSLER LLC

1 - DETENT ASSEMBLY 2 - REAR CASE

44. Install the detent assembly (1) into the rear case (2). Tighten the bolt to 20 N.m (15 ft. lbs.).

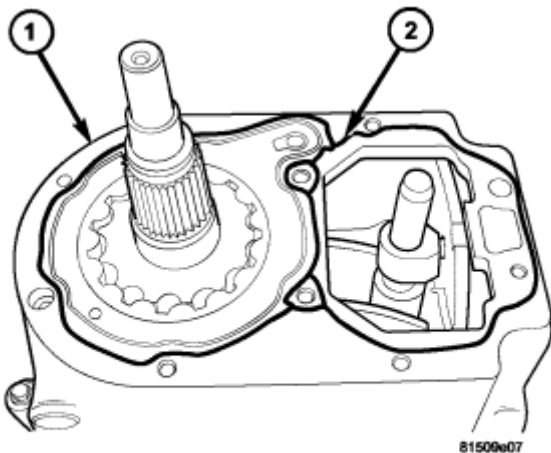


Fig. 79: Sealant Application Pattern

Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - REAR HOUSING |
| 2 - SEALANT |

45. Apply bead of Mopar® Gasket Maker, or equivalent, to mating surface of rear housing as shown in graphic (2). Keep sealer bead width to maximum of 3 mm (1/8 inch). **Do not use excessive amount of sealer as excess will be displaced into case interior and potentially clog the oil pump screen.**

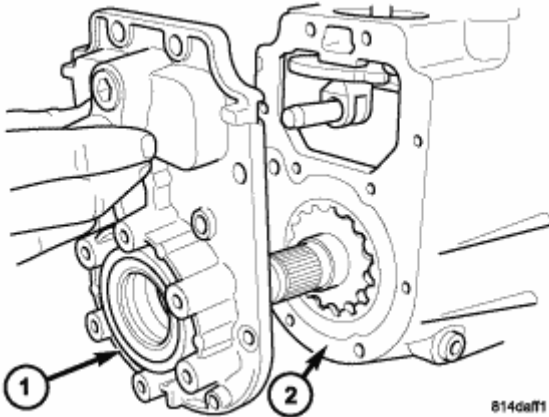


Fig. 80: Remove Rear Retainer
Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - REAR COVER |
| 2 - REAR HOUSING |

46. Install the rear cover (1) onto the rear housing (2).

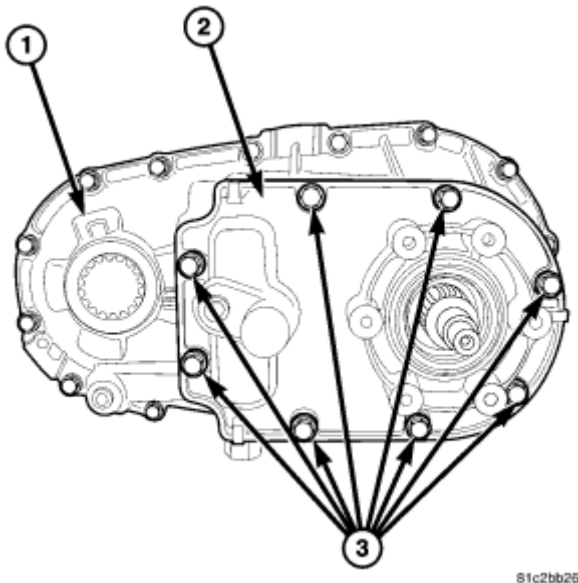
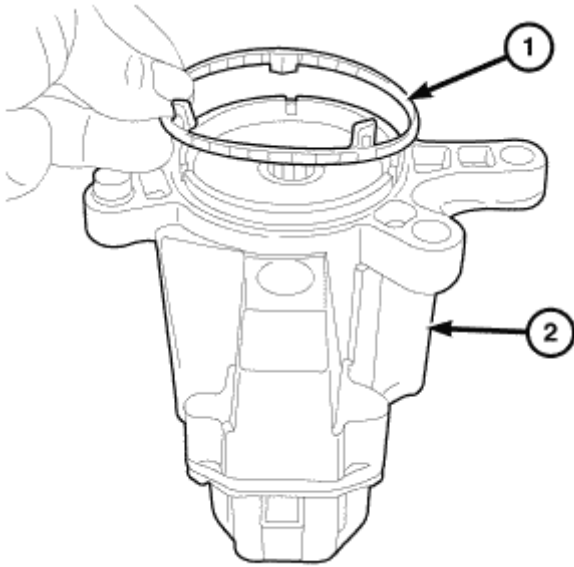


Fig. 81: Rear Cover Bolts

Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - REAR HOUSING |
| 2 - REAR COVER |
| 3 - REAR COVER BOLTS |

47. Install the bolts (3) holding the rear cover (2) onto the rear housing (1). Tighten the bolts at the dowel locations first, then the remainder of the bolts in a crisscross pattern. Tighten the bolts to 27 N.m (20 ft. lbs.).

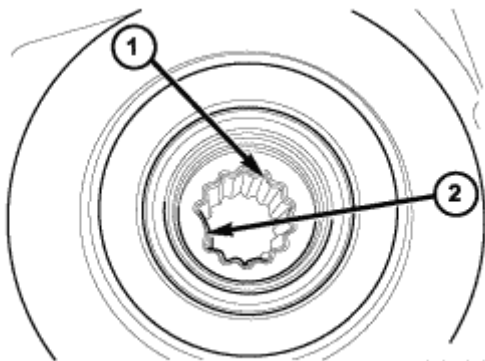


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Fig. 82: SHIFT MOTOR SEAL RING
Courtesy of CHRYSLER LLC

- | |
|-----------------|
| 1 - SEAL RING |
| 2 - SHIFT MOTOR |

48. Install the seal ring (1) onto the shift motor (2).



812b13d8

Fig. 83: Shift Motor Drive Splines
Courtesy of CHRYSLER LLC

NOTE: Verify that the missing tooth (2) in the shift motor drive spline (1) and the transfer case drive spline (1) missing tooth (2) are aligned. It may be necessary to manually shift the transfer case if the shift motor and transfer case shaft are not aligned.

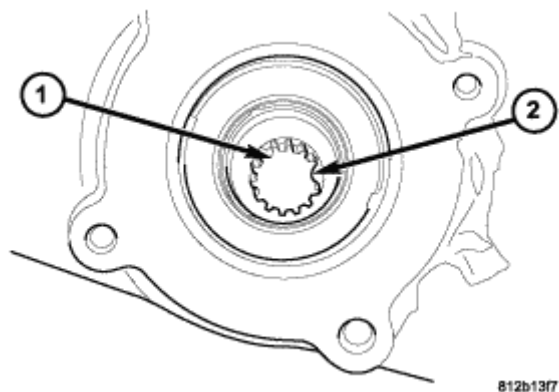


Fig. 84: Transfer Case Drive Splines
Courtesy of CHRYSLER LLC

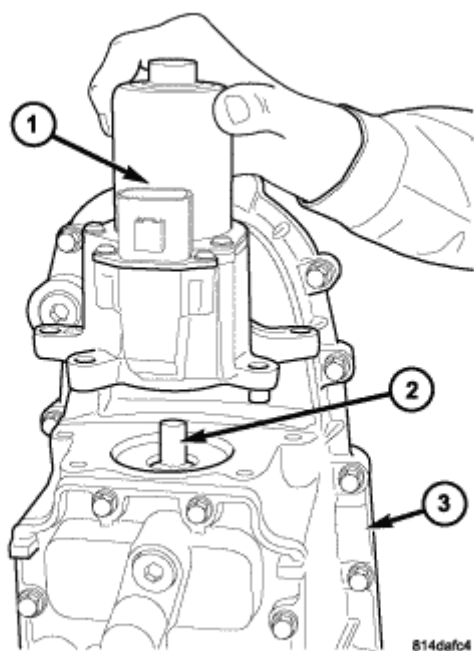
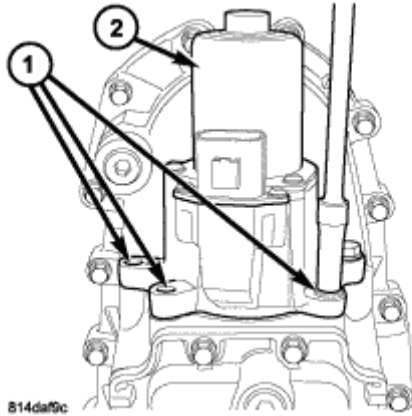


Fig. 85: Remove Shift Motor
Courtesy of CHRYSLER LLC

- 1 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY
- 2 - SHIFT SECTOR
- 3 - TRANSFER CASE

49. Install the shift motor and mode sensor assembly (1) onto the shift sector (2) and the transfer case (3).

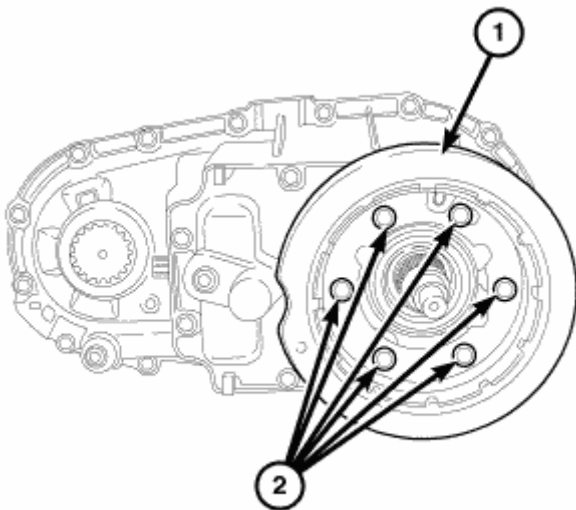


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Fig. 86: Remove Shift Motor Bolts
Courtesy of CHRYSLER LLC

- 1 - BOLTS
- 2 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY

50. Install the bolts (1) to hold the shift motor and mode sensor assembly (2) to the transfer case. Tighten the bolts to 27 N.m (20 ft. lbs.).

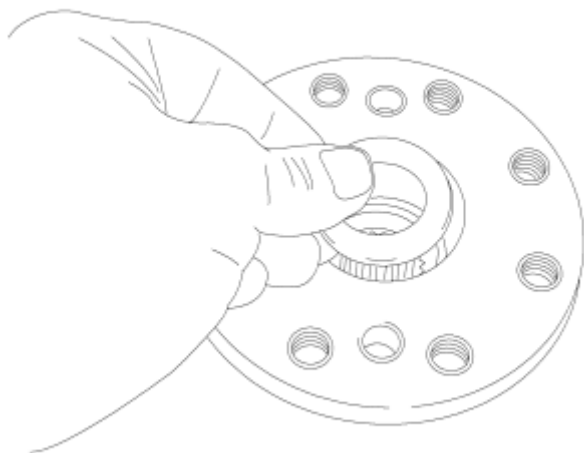


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Fig. 87: DAMPER
Courtesy of CHRYSLER LLC

- 1 - DAMPER
- 2 - BOLTS

51. Install the damper (1), (if equipped), and bolts (2) onto the case. Tighten the bolts to 27 N.m (20 ft. lbs.).

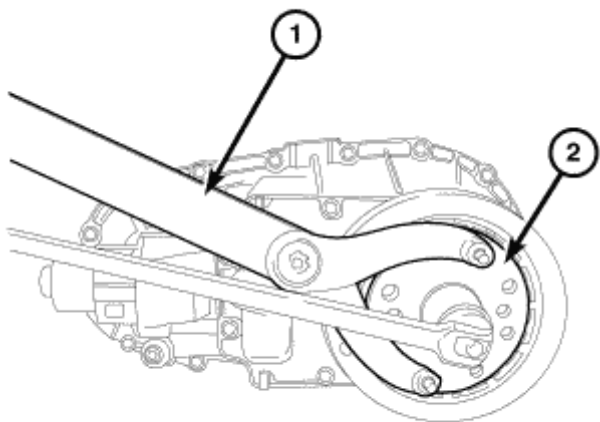


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Fig. 88: OUTPUT FLANGE O-RING
Courtesy of CHRYSLER LLC

- 1 - FLANGE O-RING
- 2 - REAR OUTPUT FLANGE

52. Install the o-ring into the rear output flange.



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Fig. 89: REAR OUTPUT FLANGE NUT
Courtesy of CHRYSLER LLC

- | |
|------------------------|
| 1 - HOLDER C-3281 |
| 2 - REAR OUTPUT FLANGE |

53. Install the rear output flange onto the main shaft.
54. Using Holder C-3281 (1), install the rear output flange (2) nut. Tighten the bolts to 122-176 N.m (90-130 ft. lbs.).

INSTALLATION

TRANSFER CASE - MP1522

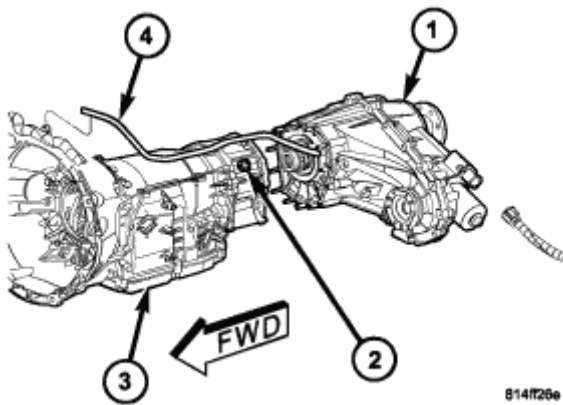


Fig. 90: Installing Transfer Case
Courtesy of CHRYSLER LLC

- | |
|-----------------------------|
| 1 - TRANSFER CASE |
| 2 - NUTS |
| 3 - TRANSMISSION |
| 4 - TRANSFER CASE VENT TUBE |

1. Mount transfer case (1) on a transmission jack. See **Fig. 90**.
2. Secure transfer case to jack with chains.
3. Position transfer case under vehicle.
4. Align transfer case (2) and transmission (3) shafts and install transfer case onto transmission.
5. Install and tighten transfer case attaching nuts (2) to 35 N.m (26 ft. lbs.) torque.
6. Connect the transfer case vent hose (4) to the transfer case.

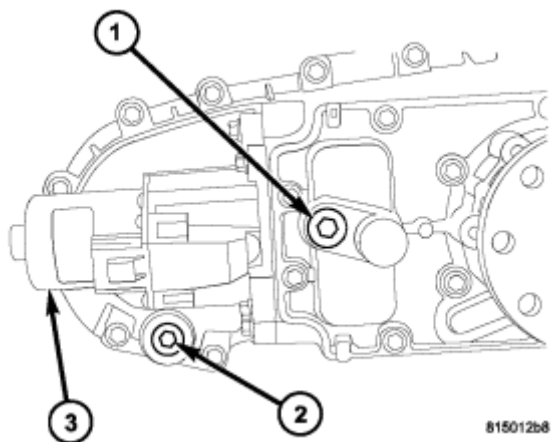


Fig. 91: Fill/Drain Plug And Shift Motor
Courtesy of CHRYSLER LLC

- 1 - FILL PLUG
 2 - DRAIN PLUG
 3 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY

7. Install rear support cushion.
8. Install rear crossmember and skid plate, if equipped.
9. Remove transmission jack and support stand.
10. Connect front propeller shaft and install rear propeller shaft. Refer to **INSTALLATION** .
11. Fill transfer case with correct fluid. Check transmission fluid level. Correct as necessary.
12. Install the transfer case fill plug (1). See **Fig. 91**. Tighten the plug to 20-34 N.m (15-25 ft. lbs.).
13. Connect the shift motor and mode sensor wiring connector.
14. Lower vehicle and verify transfer case shift operation.

SPECIFICATIONS

TRANSFER CASE - MP1522

MP1522 FLUID SPECIFICATIONS

TYPE	QUANTITY
ATF+4	1.80L (3.80 Pints)<--
<-- Fill to bottom edge of the fill plug hole.	

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Bolt, Crossmember	41-47	30-34	-
Bolt, Detent	20	15	-

Plugs, Drain/Fill	20-34	15-25	-
Bolts, Case Half	27	20	-
Bolts, Damper (if equipped)	27	20	-
Nut, Companion Flange	122-176	90-130	-
Bolts, Rear Cover	27	20	-
Nuts, T-case mount stud	35	26	-
Bolts, Shift Motor and Mode Sensor	27	20	-
Screws, Chain Guide	5-8	-	44-71

SPECIAL TOOLS

TRANSFER CASE - MP1522

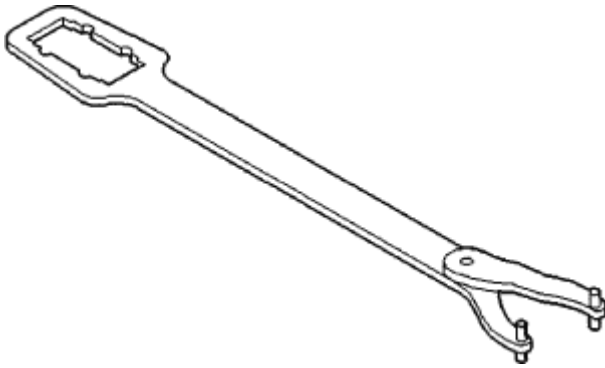


Fig. 92: Holder, Flange - C-3281
Courtesy of CHRYSLER LLC

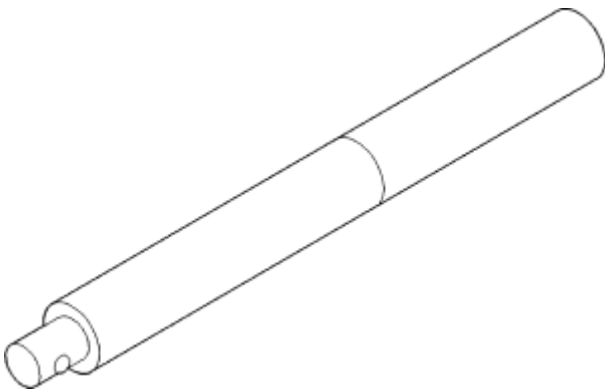


Fig. 93: Handle, Universal - C-4171
Courtesy of CHRYSLER LLC

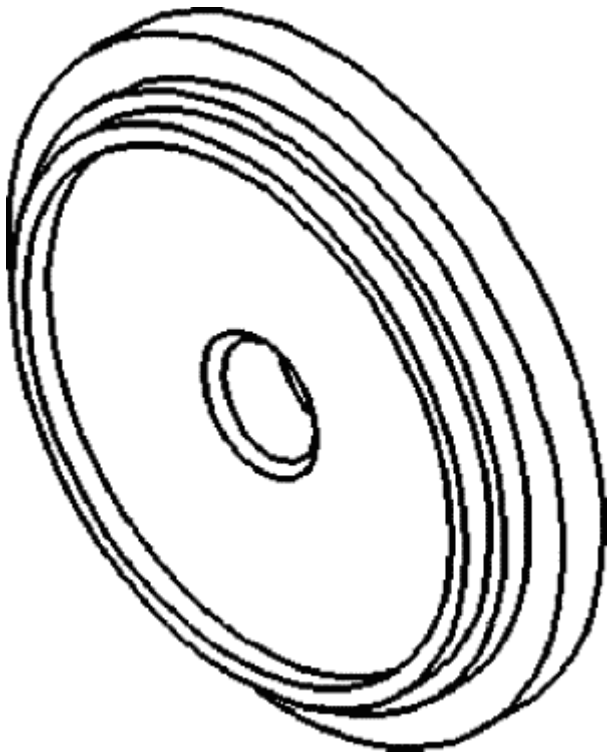


Fig. 94: Installer - 6436
Courtesy of CHRYSLER LLC

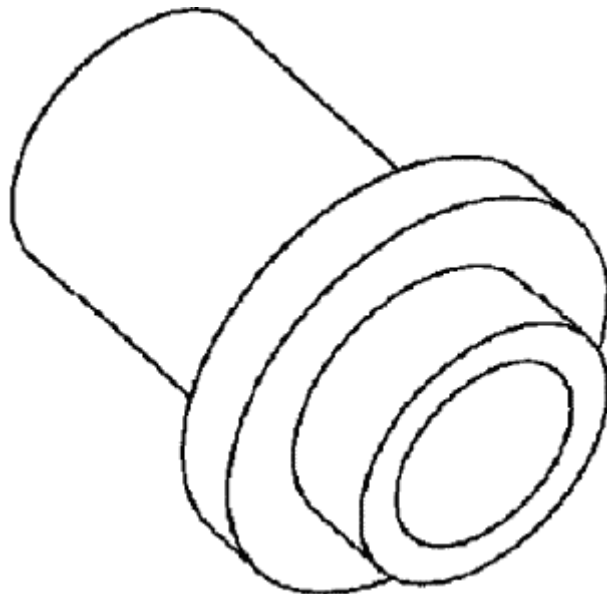


Fig. 95: Installer, Seal - 6560
Courtesy of CHRYSLER LLC

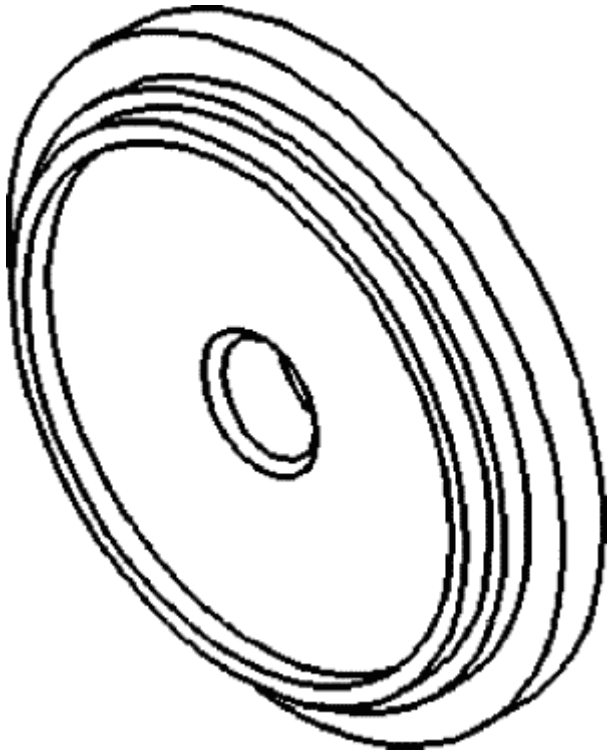


Fig. 96: Installer, Seal - 6061
Courtesy of CHRYSLER LLC

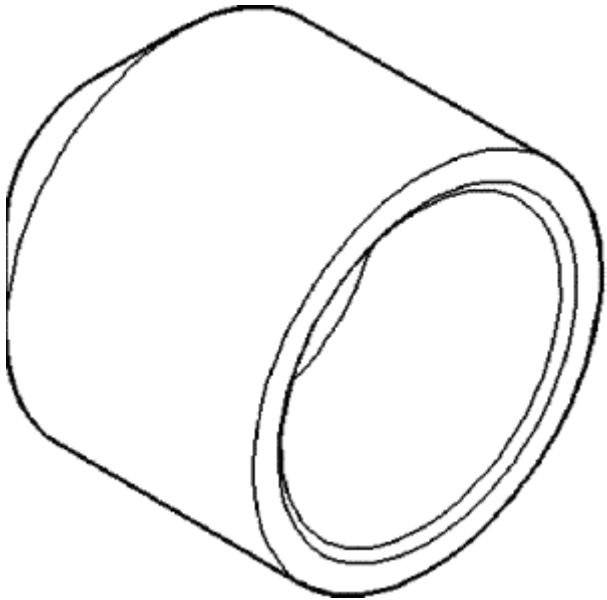


Fig. 97: Installer, Seal - 9672
Courtesy of CHRYSLER LLC

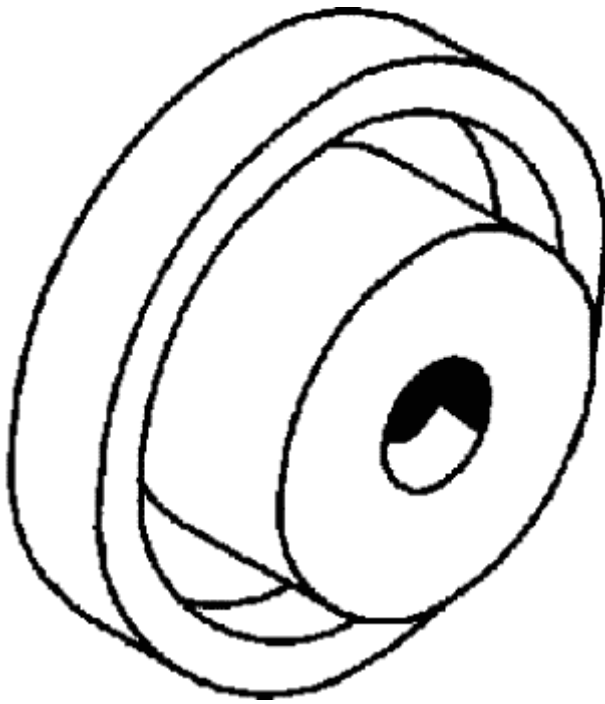
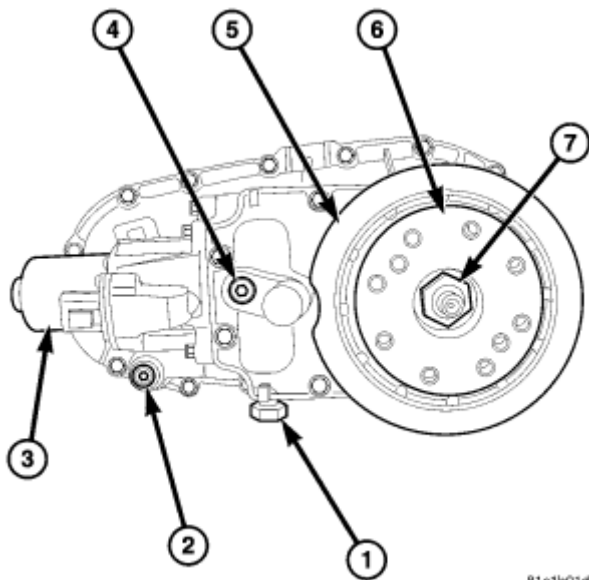


Fig. 98: Installer, Seal - C-4210
 Courtesy of CHRYSLER LLC

FLUID

STANDARD PROCEDURE

FLUID DRAIN/REFILL



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Fig. 99: MP1522 Transfer Case External Components
 Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - DETENT ASSEMBLY2 - DRAIN PLUG3 - SHIFT MOTOR/MODE SENSOR4 - FILL PLUG5 - DAMPER (if equipped)6 - REAR FLANGE7 - REAR FLANGE NUT |
|---|

The fill and drain plugs are both in the rear case.

1. Raise vehicle. Ensure that the vehicle is level on the hoist.
2. Position drain pan under transfer case.
3. Remove drain and fill plugs and drain lubricant completely.
4. Install drain plug. Tighten plug to 20-34 N.m (15-25 ft. lbs.).
5. Remove drain pan.
6. Fill transfer case to bottom edge of fill plug opening with MOPAR® ATF + 4.
7. Install and tighten fill plug to 20-34 N.m (15-25 ft. lbs.).
8. Lower vehicle.

SEAL-FRONT OUTPUT SHAFT

REMOVAL

FRONT OUTPUT SHAFT SEAL

The front output shaft seal and wear sleeve cannot be serviced in the vehicle. The transfer case must be disassembled to remove the front output shaft assembly and seal.

SEAL - INPUT SHAFT

REMOVAL

REMOVAL

1. Remove the transfer case from the vehicle. See **REMOVAL**.
2. Remove the input shaft seal with a suitable pry tool or a screw mounted in a slide hammer.

INSTALLATION

INSTALLATION

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

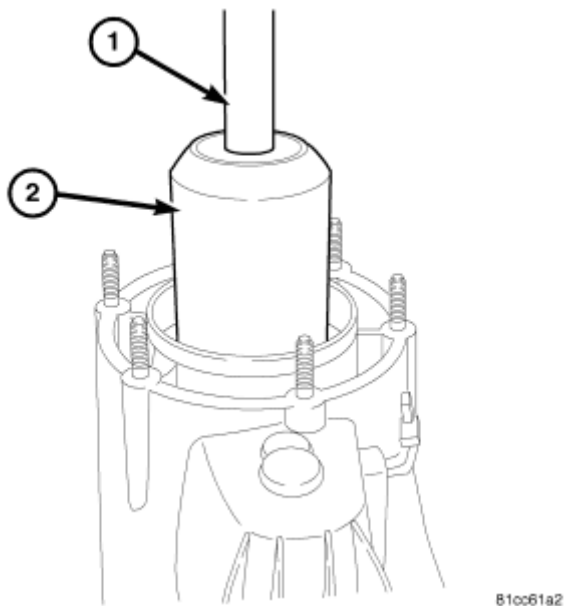


Fig. 100: INSTALL INPUT SHAFT SEAL
 Courtesy of CHRYSLER LLC

1 - HANDLE C-4171
 2 - INSTALLER 9672

1. Install the new input shaft seal with Installer 9672 and Handle C-4171.
2. Install the transfer case into the vehicle. See **REMOVAL**.
3. Check the transfer case fluid. See **STANDARD PROCEDURE**.

SEAL-REAR OUTPUT SHAFT

REMOVAL

REMOVAL

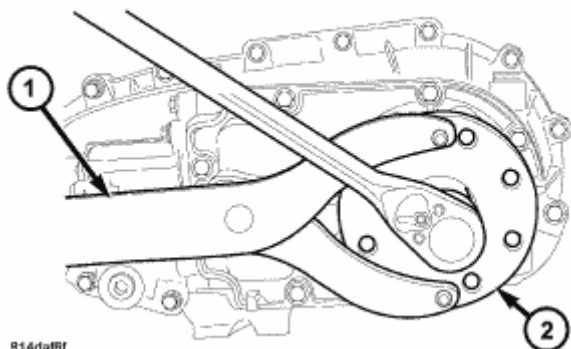
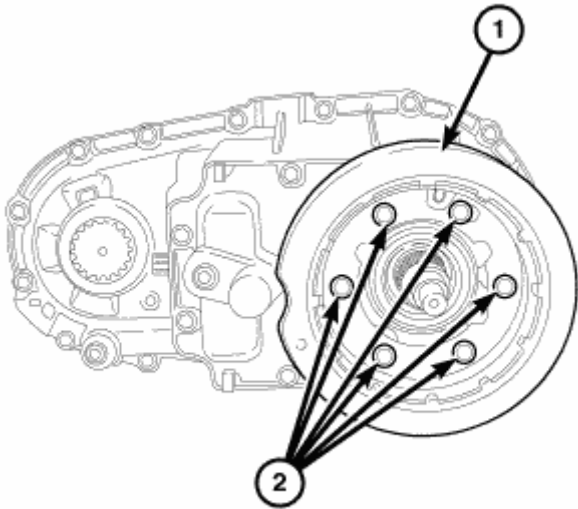


Fig. 101: Remove Rear Output Shaft Nut
 Courtesy of CHRYSLER LLC

1 - HOLDER C-3281

2 - REAR COMPANION FLANGE

1. Remove the rear propeller shaft. Refer to **REMOVAL** .
2. Using Holder C-3281 (1), remove the rear companion flange (2) nut.
3. Remove the rear output shaft flange from the output shaft. If necessary, use a suitable 2 or 3 jaw puller to remove the output shaft flange.



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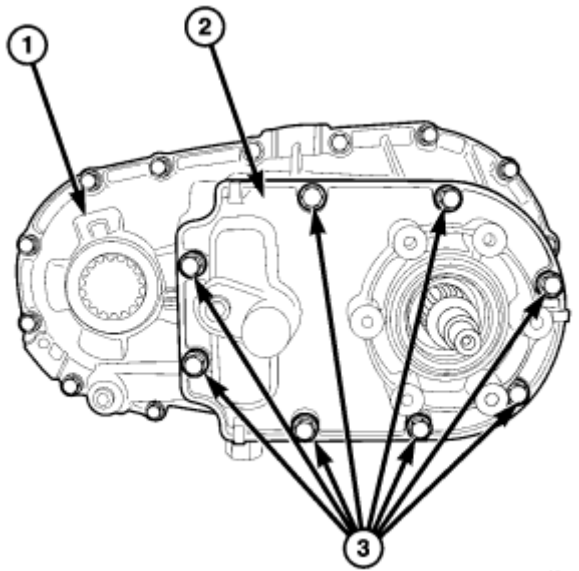
Fig. 102: DAMPER

Courtesy of CHRYSLER LLC

1 - DAMPER

2 - BOLTS

4. Remove the damper bolts (2) and damper (1), (if equipped).
5. Remove the rear output shaft seal with a suitable pry tool or a screw mounted in a slide hammer.



81c2bb25

Fig. 103: Rear Cover Bolts
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - REAR HOUSING |
| 2 - REAR COVER |
| 3 - REAR COVER BOLTS |

6. Remove the rear cover bolts (3) and the rear cover (2), from the rear transfer case housing (1).

INSTALLATION

INSTALLATION

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

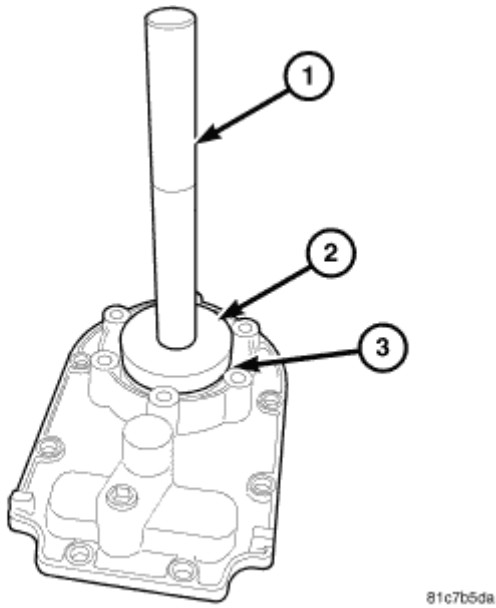


Fig. 104: REAR OUTPUT SHAFT SEAL
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - HANDLE C-4171
2 - INSTALLER C-4210
3 - REAR OUTPUT SHAFT SEAL |
|---|

1. Install a new rear output shaft seal (3) into the rear cover with Installer C-4210 (2) and handle C-4171 (1).

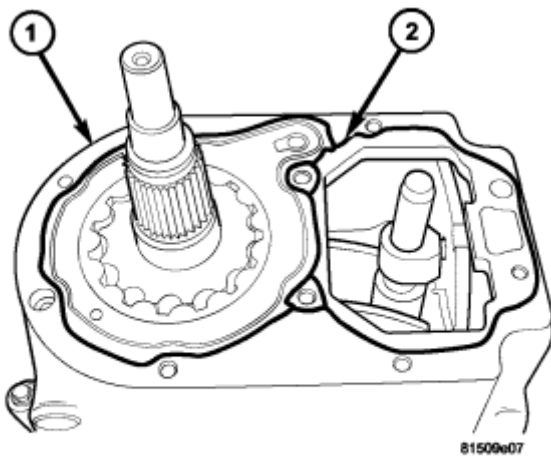


Fig. 105: Sealant Application Pattern
 Courtesy of CHRYSLER LLC

- | |
|------------------|
| 1 - REAR HOUSING |
|------------------|

2 - SEALANT

2. Apply bead of Mopar® Gasket Maker, or equivalent, to mating surface of rear housing as shown in graphic (2). Keep sealer bead width to maximum of 3 mm (1/8 inch). **Do not use excessive amount of sealer as excess could be displaced into the oil pump.**

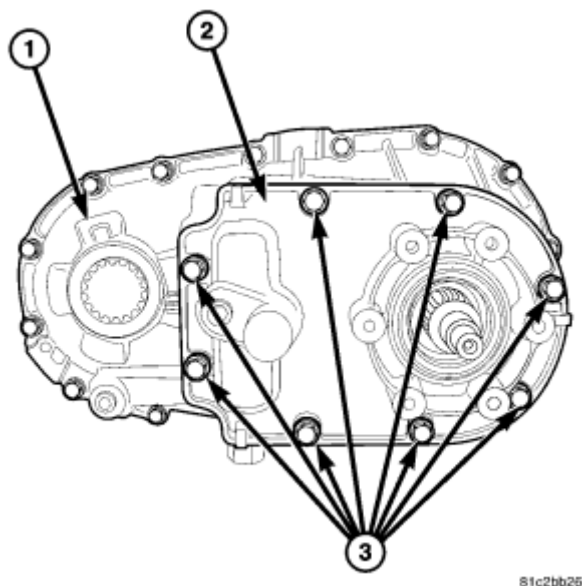
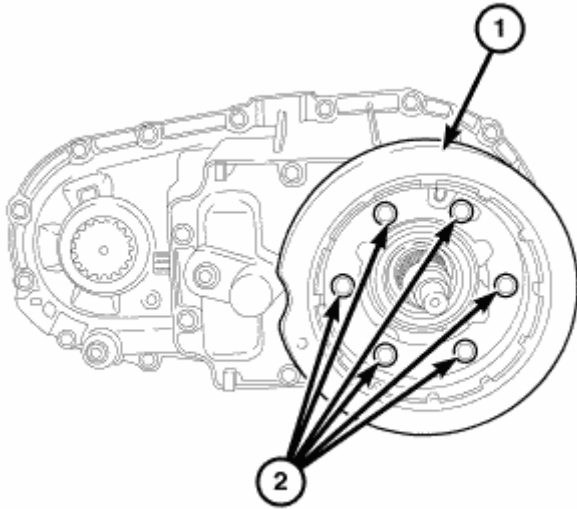


Fig. 106: Rear Cover Bolts
Courtesy of CHRYSLER LLC

- | |
|----------------------|
| 1 - REAR HOUSING |
| 2 - REAR COVER |
| 3 - REAR COVER BOLTS |

3. Install the bolts (3) holding the rear cover (2) onto the rear housing (1). Tighten the bolts at the dowel locations first, then the remainder of the bolts in a crisscross pattern. Tighten the bolts to 27 N.m (20 ft. lbs.).

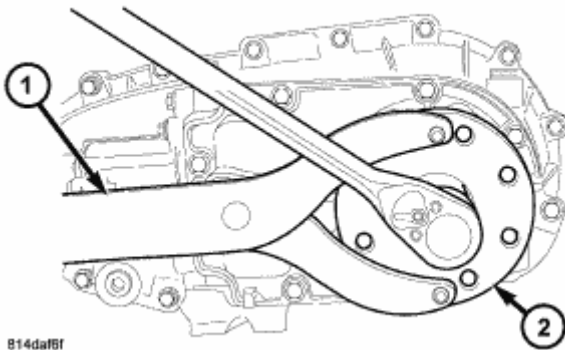


81c17fa1

Fig. 107: DAMPER
Courtesy of CHRYSLER LLC

1 - DAMPER
2 - BOLTS

4. Install the damper (1), (if equipped), and damper bolts (2) into the case. Tighten the damper bolts to 27 N.m (20 ft. lbs.).



814da18f

Fig. 108: Remove Rear Output Shaft Nut
Courtesy of CHRYSLER LLC

1 - HOLDER C-3281
2 - REAR COMPANION FLANGE

5. Install the rear output shaft flange onto the output shaft.
6. Using Holder C-3281 (1), install the rear companion flange (2) nut. Tighten the bolts to 122-176 N.m (90-

130 ft. lbs.).

7. Install the rear propeller shaft. Refer to **INSTALLATION** .

8. Check the transfer case fluid level. See **STANDARD PROCEDURE**. Correct as necessary.

SENSOR-MODE

DESCRIPTION

MODE SENSOR

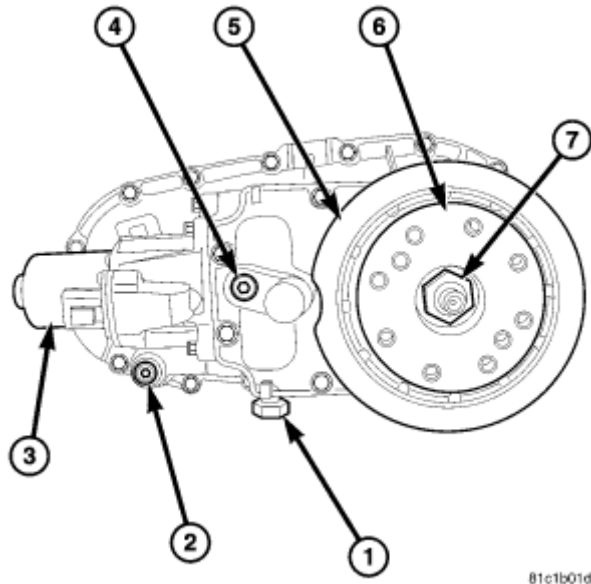


Fig. 109: MP1522 Transfer Case External Components
Courtesy of CHRYSLER LLC

- | |
|---|
| <ul style="list-style-type: none">1 - DETENT ASSEMBLY2 - DRAIN PLUG3 - SHIFT MOTOR/MODE SENSOR4 - FILL PLUG5 - DAMPER (if equipped)6 - REAR FLANGE7 - REAR FLANGE NUT |
|---|

The transfer case mode sensor, also known as "Encoder" (3) which is integrated into the shift motor assembly, provides the Drivetrain Control Module (DTCM) feedback about the position of the transfer case. The sensor consists of a linear analog position sensor that converts the motor output shaft position into a DC signal. The sensor may rotate a full 360 degrees. The DTCM must supply 5V DC ($\pm 2.5\%$) to the sensor whenever the DTCM is not in sleep mode and monitors the shift motor position. The sensor position is monitored when the ignition is in the RUN position and for TBD seconds after the ignition is shifted to the ACC position. The sensor is mechanically linked to the shaft of the cam which allows the transfer case to shift. The mode sensor will draw less than 30 mA of current during operation.

OPERATION

MODE SENSOR

NOTE: All the parameter voltages referred to in the following information are calibrated items in the controller software and are subject to change.

During normal vehicle operation, the DTCM monitors the mode sensor outputs at least every 2 milliseconds when the shift motor is stationary or active. The mode sensor position will be considered invalid by the DTCM if the voltage is greater than 3.51 V or if it is less than 1.52 V. The DTCM shall consider t-case position based on the MODE SENSOR VOLTAGES table listed below.

MODE SENSOR VOLTAGES

Transfer Case Position	Voltage
4WD LOW	3.298 - 3.440
Neutral	2.729 - 2.871
4WD Lock	2.159 - 2.301
2WD	1.599 - 1.741

SWITCH-TRANSFER CASE SELECTOR

DESCRIPTION

TRANSFER CASE SELECTOR SWITCH

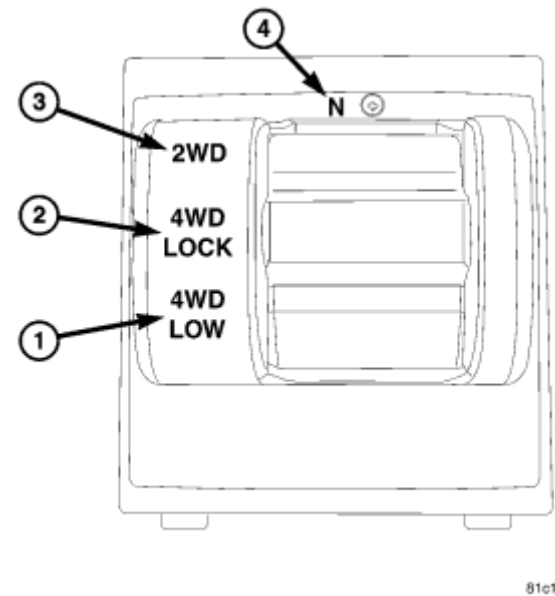


Fig. 110: PART-TIME 4WD ELECTRONIC TC SWITCH
Courtesy of CHRYSLER LLC

1 - 4WD LOW POSITION

- 2 - 4WD LOCK POSITION
- 3 - 2WD POSITION
- 4 - NEUTRAL POSITION

The selector switch assembly is mounted in the left side of the shifter assembly and consists of a momentary contact T-handle for shifts to and from 2WD, 4WD LOCK and 4WD LOW and a recessed push pin button for shifts into and out of NEUTRAL.

ASSEMBLY-SHIFT MOTOR/MODE SENSOR

DESCRIPTION

SHIFT MOTOR/MODE SENSOR ASSEMBLY

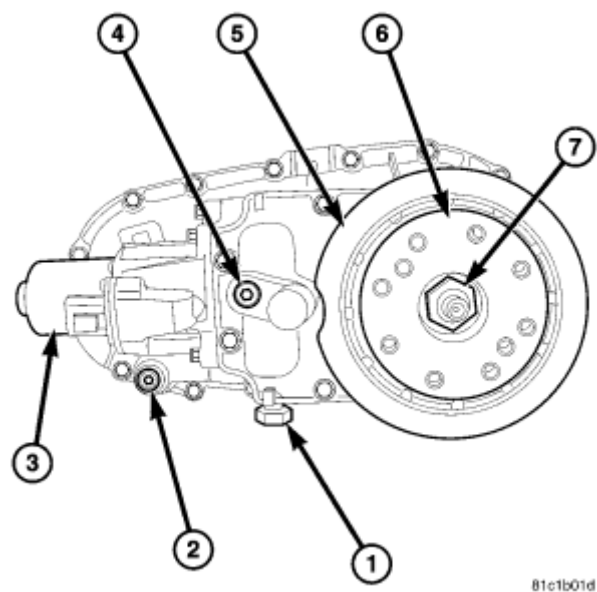


Fig. 111: MP1522 Transfer Case External Components
Courtesy of CHRYSLER LLC

- 1 - DETENT ASSEMBLY
- 2 - DRAIN PLUG
- 3 - SHIFT MOTOR/MODE SENSOR
- 4 - FILL PLUG
- 5 - DAMPER (if equipped)
- 6 - REAR FLANGE
- 7 - REAR FLANGE NUT

The shift motor (3) is an electromechanical device consisting of a DC permanent magnet motor, a gear train and an analog position sensor. The shift motors' overall function is to move and lock a gear that moves the range fork found in the transfer case. This allows the transfer case to be shifted electrically to multiple operating positions (4WD LOW, 4WD LOCK and 2WD). The operating current of the shift motor under stall conditions

is 30 amps maximum at 72° F with 13.5 volts, at the motor leads.

OPERATION

SHIFT MOTOR/MODE SENSOR ASSEMBLY

Shifting in the transfer case occurs when a Pulse Width Modulated (PWM) voltage is supplied to the shift motor by the Drivetrain Control Module (DTCM). A linear analog position sensor located inside the shift motor, provides the DTCM with the motors' angular, rotational position. With this information, the DTCM continuously knows the motors' position, and therefore allows it to accurately control the motors' operation, including voltage polarity which is used to control motor direction.

REMOVAL

SHIFT MOTOR/MODE SENSOR ASSEMBLY

NOTE: New shift motor assemblies are shipped in the **NEUTRAL** position. If a new shift motor assembly must be installed, it will be necessary to shift the transfer case to the **NEUTRAL** position prior to motor installation.

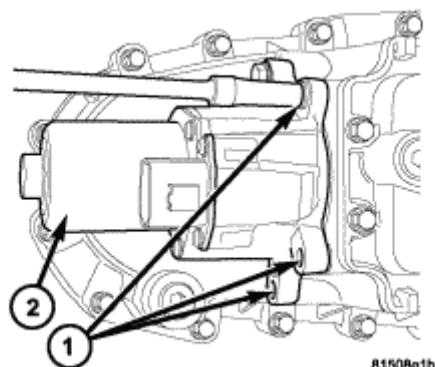


Fig. 112: Remove Shift Motor Bolts

Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - BOLTS |
| 2 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY |

1. Raise the vehicle on a suitable hoist.
2. Disengage the wiring connector from the shift motor and mode sensor assembly.
3. Remove the bolts (1) holding the shift motor and mode sensor assembly (2) onto the transfer case.

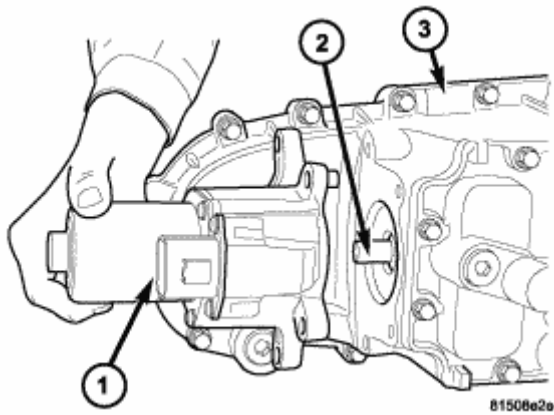


Fig. 113: Remove Shift Motor
 Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY
2 - SHIFT SECTOR
3 - TRANSFER CASE |
|---|

4. Separate the shift motor and mode sensor assembly (1) from the transfer case (3) and shift sector (2).

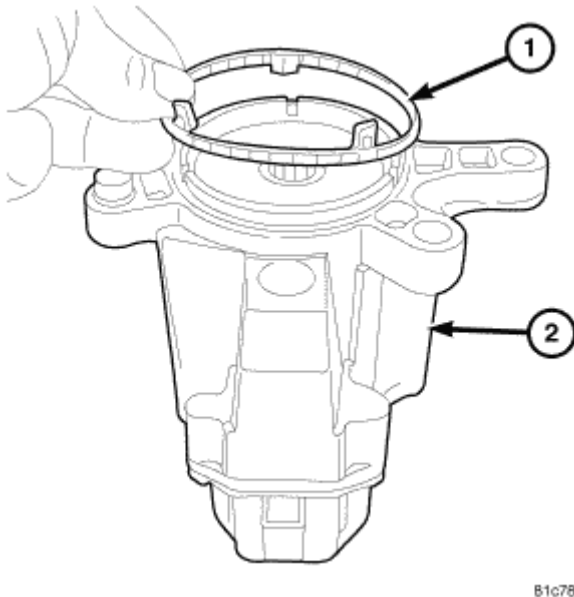


Fig. 114: SHIFT MOTOR SEAL RING
 Courtesy of CHRYSLER LLC

- | |
|----------------------------------|
| 1 - SEAL RING
2 - SHIFT MOTOR |
|----------------------------------|

5. Remove the seal ring (1) from the shift motor (2).

SHIFT MOTOR/MODE SENSOR ASSEMBLY

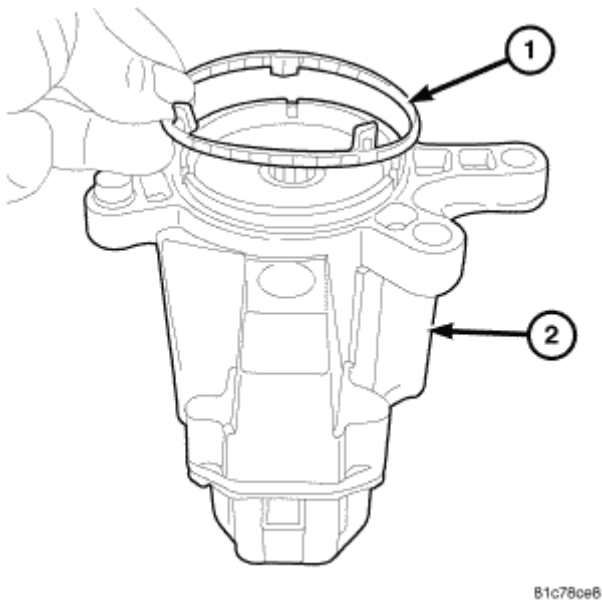


Fig. 115: SHIFT MOTOR SEAL RING
Courtesy of CHRYSLER LLC

- | |
|----------------------------------|
| 1 - SEAL RING
2 - SHIFT MOTOR |
|----------------------------------|

1. Install the seal ring (1) onto the shift motor (2).

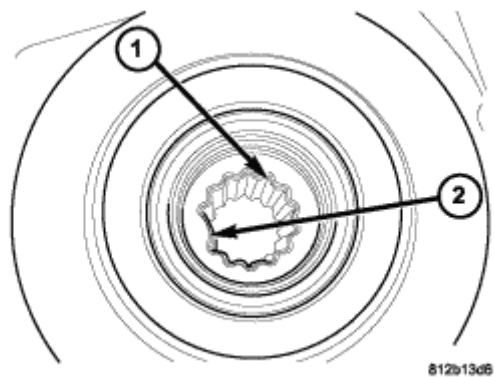


Fig. 116: Shift Motor Drive Splines
Courtesy of CHRYSLER LLC

2. Verify that the shift motor o-ring is clean and properly positioned inside the machined o-ring groove of the shift motor.

NOTE: Verify that the missing tooth (2) in the shift motor drive spline (1).

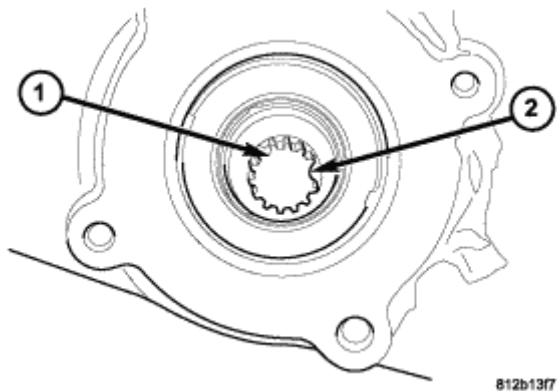


Fig. 117: Transfer Case Drive Splines
Courtesy of CHRYSLER LLC

NOTE: The transfer case drive spline (1) missing tooth (2) are aligned. It may be necessary to manually shift the transfer case if the shift motor and transfer case shaft are not aligned.

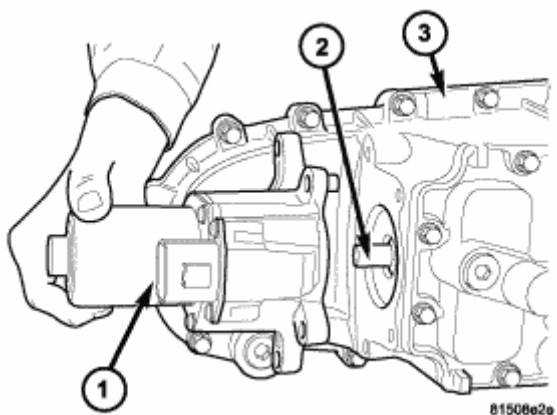


Fig. 118: Remove Shift Motor
Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY
2 - SHIFT SECTOR
3 - TRANSFER CASE |
|---|

3. Position the shift motor and mode sensor assembly (1) onto the transfer case (3) and shift sector (2).

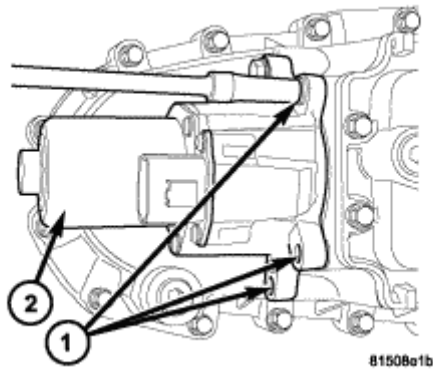


Fig. 119: Remove Shift Motor Bolts
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - BOLTS |
| 2 - SHIFT MOTOR AND MODE SENSOR ASSEMBLY |

4. Install the bolts (1) to hold the assembly (2) onto the transfer case. Tighten the bolts to 25-28 N.m (18.5-20.5 ft. lbs.).

CAUTION: If the original shift motor and mode sensor assembly bolts are reused, be sure to use Mopar® Lock & Seal or Loctite™ 242 to replenish the lock patch material originally found on the bolts

5. Engage the wiring connector to the shift motor and mode sensor assembly.
6. Lower vehicle and verify transfer case operation.

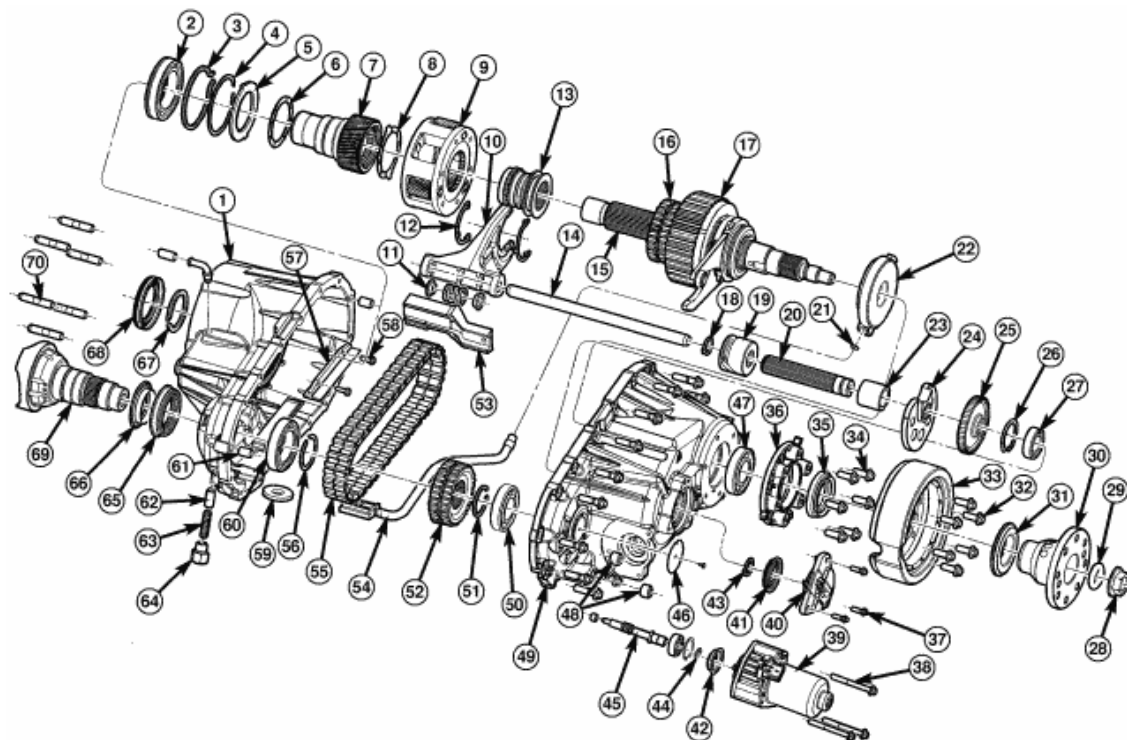
2008 TRANSFER CASE

MP3022 - Service Information - Liberty

MP3022 - SERVICE INFORMATION

DESCRIPTION

TRANSFER CASE - MP3022



8106068

Fig. 1: MP3022 EXPLODED VIEW

Courtesy of CHRYSLER LLC

1 - FRONT CASE

2 - INPUT BEARING

3 - INPUT BEARING HOUDINI RING

4 - CARRIER SNAP RING

25 - WORM
SHAFT
GEAR

26 - SHIFT
SHAFT
BEARING
SNAP RING

27 - SHIFT
SHAFT
BEARING

28 - FLANGE 52- OUTPUT

49 - REAR
CASE

50 - FRONT
OUTPUT
SHAFT CASE
BEARING

51- OUTPUT
SHAFT GEAR
SNAP RING

	NUT	SHAFT GEAR
5 - CARRIER LOCK PLATE	29 - FLANGE O-RING	53 - SHIFT BRACKET
6 - THRUST WASHER	30 - COMPANION FLANGE	54 - OIL PUMP TUBE
7 - INPUT GEAR (SHAFT)	31 - COMPANION FLANGE SLINGER	55 - DRIVE CHAINS
8 - TABBED THRUST WASHER	32 - DAMPER BOLTS (if equipped)	56 - FRONT OUTPUT SHAFT SNAP RING
9 - PLANETARY GEAR ASSEMBLY	33 - DAMPER (if equipped)	57 - CHAIN GUIDE RAILS
10 - SHIFT FORK	34 - REAR COVER BOLTS	58 - CHAIN GUIDE RAIL BOLTS
11 - SHIFT RAIL SPRING AND WASHERS	35 - OUTPUT SHAFT SEAL	59 - MAGNET
12 - SHIFT FORK PADS	36 - REAR COVER	60 - FRONT OUTPUT SHAFT BEARING
13 - RANGE SLEEVE	37 - ENCODER BOLTS	61 - ALIGNMENT DOWEL
14 - SHIFT RAIL	38 - SHIFT MOTOR BOLTS	62 - DETENT
15 - MAIN SHAFT CLUTCH ASSEMBLY	39 - SHIFT MOTOR	63 - DETENT SPRING
16 - DRIVE SPROCKET	40- SHIFT ENCODER	64 - DETENT BOLT
17 - CLUTCH ASSEMBLY	41- SHIFT SHAFT SEAL	65 - FRONT OUTPUT SHAFT SEAL
18 - SHIFT RAIL SNAP RING	42 - WORM SHAFT SEAL	66 - FRONT OUTPUT SHAFT SLINGER
19 - BARREL CAM	43 - SHIFT SHAFT SNAP RING	67 - INPUT SHAFT SNAP RING
	44 - WORM	

20 - SHIFT SHAFT	SHAFT BEARING CLIP	68 - INPUT SHAFT SEAL
21 - OIL TUBE O-RING	45 - WORM SHAFT, BEARING, SNAP RING AND E-CLIP	69 - FRONT OUTPUT SHAFT
22 - OIL PUMP	46 - ID TAG	70 - ATTACHMENT STUDS
23 - SHIFT SHAFT SPACER	47 - REAR OUTPUT SHAFT BEARING	-
24 - CLUTCH CAM	48 - FILL AND DRAIN PLUG	-

The Select-Trac® II is the MP3022 two-speed, on-demand, active four-wheel drive transfer case that provides optimum traction for a wide range of conditions, while maximizing driver convenience. When operating in 4WD Auto mode, this sophisticated system anticipates and prevents slip by redirecting torque as necessary, up to 100 percent to either the front or rear axle if needed.

For added traction capability when traversing steep grades, rough terrain or extremely poor traction surfaces, the transfer case includes a 4WD Low mode. This second speed gear multiplies engine torque 2.72 times and locks the clutch pack for maximum traction.

Electric shifting between 4WD AUTO and 4WD Low is effected with a console-mounted switch. A pushpin button is used to shift to Neutral mode.

The MP3022 transfer case provides the following benefits:

- Active, on-demand four-wheel drive requires no driver input.

- Instantly anticipates slip and preemptively redirects torque as needed.

- Vehicle stability under all conditions because torque is constantly being transferred.

- 4WD Low operation mode provides an advantage over vehicles equipped with a single-speed all-wheel drive transfer case.

- Electric shifting between 4WD Auto and 4WD Low provides smooth operation and improved NVH control compared to systems with mechanical linkage.

- Enhanced traction and stability provided by the Traction Control and Electronic Stability Program (ESP) working in tandem with four-wheel-drive.

- A robust design and sealing for reliability.

- Maintenance-free.

- A neutral mode permits flat towing.

OPERATING RANGES

Transfer case operating ranges are:

Operating positions: 2WD - 4WD Auto - N - 4WD Low.

2WD = 2 wheel drive.

4WD Auto = Electronically controlled wet clutch for torque biasing.

N = Transfer case neutral for 4-wheel flat recreational towing.

4WD Low = Low range (2.72:1) part time mode.

The 4WD Low range is for off road use only. It is not for use on hard surface roads unless the road surface is wet, slippery, or covered by ice and snow.

The low range reduction gear system is operative in 4WD Low range only. This range is for extra pulling power in off road situations. Low range reduction ratio is 2.72:1.

OPERATION

TRANSFER CASE

ACTIVE TRANSFER CASE CONTROLS

Controls for the MP3022 transfer case active clutch (torque biasing device) are located in the Final Drive Control Module (FDCM) and communicated on the Controller Area Network (CAN) C bus. The FDCM monitors multiple vehicle sensors to anticipate conditions which may result in wheel slip or reduced performance and preemptively adjusts torque split to front and rear axles as needed. The FDCM also compares wheel speeds at the front and rear axles to detect wheel slippage. A complete vehicle dynamics model, or algorithm, calculates slip at each tire for given vehicle-operating conditions. When wheel slip is detected, pressure applied to the transfer case clutch pack can be increased or decreased to apply increased torque to the axle with higher traction.

TRANSFER CASE MODES

The transfer case operates in active full-time four-wheel drive (4WD AUTO) unless the driver chooses 4WD Low, 2WD or Neutral.

ELECTRIC SHIFT MECHANISM

The electronically controlled wet clutch pack uses an electric motor to actuate an internal gear train, clutch cam, and low range barrel cam. The clutch cam actuates the clutch levers that apply normal force to the multi-disc wet clutch pack. The clutch discs are alternately splined to the front and rear drive shafts. When normal force is applied to this clutch pack, torque is transferred to equalize speed differences between front and rear axles.

Transfer of torque from one wheel to the other on an axle is accomplished by using Brake Traction Control. Under the right conditions the vehicle can be driven by just one wheel.

ELECTRONIC STABILITY PROGRAM (ESP)

Standard Electronic Stability Program (ESP) works with the four-wheel drive system to enhance traction and control through three new features: Hill Descent, Hill Start Assist and Trailer Sway Control.

DIAGNOSIS AND TESTING

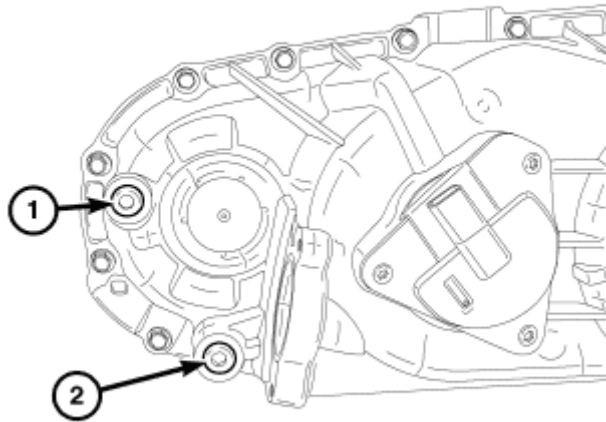
TRANSFER CASE - MP3022

DIAGNOSIS CHART

CONDITION	POSSIBLE CAUSE	CORRECTION
Transfer case difficult to shift or will not shift into desired range.	1) Transfer case electronically controlled shift system malfunction.	1) Verify proper operation per the appropriate diagnostic information.
	2) Insufficient or incorrect lubricant.	2) Drain and refill transfer case with the correct quantity of Mopar® ATF +4.
	3) Internal transfer case components binding, worn, or damaged.	3) Repair or replace components as necessary.
Transfer case noisy in all drive modes.	1) Insufficient or incorrect lubricant.	1) Drain and refill transfer case with the correct quantity of Mopar® ATF+4.
	2) Internal transfer case components binding, worn, or damaged.	2) Repair or replace components as necessary.
Transfer case noisy while in, or jumps out of, 4LO.	1) Transfer case not completely engaged in 4LOW position.	1) While rolling 2-3 MPH and the transmission in NEUTRAL shift the transfer case to the 4WD AUTO position, and then back into the 4LOW position.
	2) Range fork, input gear, or range sleeve damaged, inserts worn, or fork is binding on the shift rail.	2) Repair or replace components as necessary.
	3) Low range gear worn or damaged.	3) Repair or replace components as necessary.
Lubricant leaking from transfer case seals or vent.	1) Transfer case overfilled.	1) Drain lubricant to the correct level.
	2) Transfer case vent closed or restricted.	2) Clean or replace vent as necessary.
	3) Transfer case seals damaged or installed incorrectly.	3) Replace suspect seals. Inspect and replace, if necessary, the seal slinger on the output flange associated with the damaged seal.

REMOVAL

TRANSFER CASE - MP3022

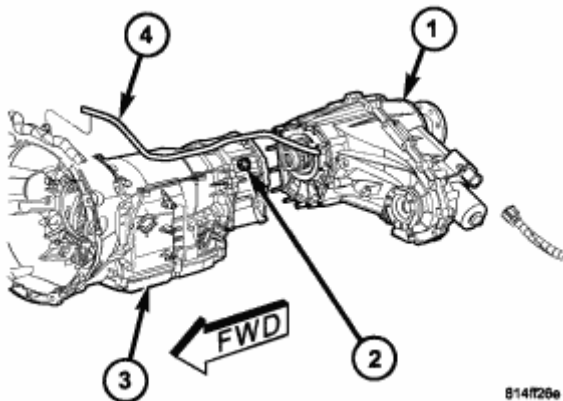


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Fig. 2: DRAIN AND FILL PLUGS
Courtesy of CHRYSLER LLC

- | |
|---------------------------------|
| 1 - FILL PLUG
2 - DRAIN PLUG |
|---------------------------------|

1. Shift transfer case into NEUTRAL.
2. Raise vehicle.
3. Remove transfer case fill plug (1) and drain plug (2) to drain transfer case lubricant.



814f26e

Fig. 3: REMOVE MP3022 TRANSFER CASE
Courtesy of CHRYSLER LLC

- | |
|-------------------------------|
| 1 - TRANSFER CASE
2 - NUTS |
|-------------------------------|

- | |
|---|
| 3 - TRANSMISSION
4 - TRANSFER CASE VENT TUBE |
|---|

4. Support transmission (3) with jack stand.
5. Remove rear crossmember and skid plate, if equipped.
6. Remove the rear support cushion.

CAUTION: Do not allow propeller shafts to hang at attached end. Damage to joint can result.

7. Disconnect front propeller shaft from transfer case at companion flange. Remove rear propeller shaft from vehicle. Refer to **REMOVAL** .
8. Disconnect the transfer case shift motor and mode sensor electrical connector.
9. Disconnect transfer case vent hose (4).
10. Support transfer case (1) with transmission jack.
11. Secure transfer case to jack with chains.
12. Remove nuts (2) attaching transfer case to transmission.
13. Pull transfer case and jack rearward to disengage transfer case.
14. Remove transfer case from under vehicle.

DISASSEMBLY

TRANSFER CASE - MP3022

NOTE: **If the transfer case assembly is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the Scan Tool.**

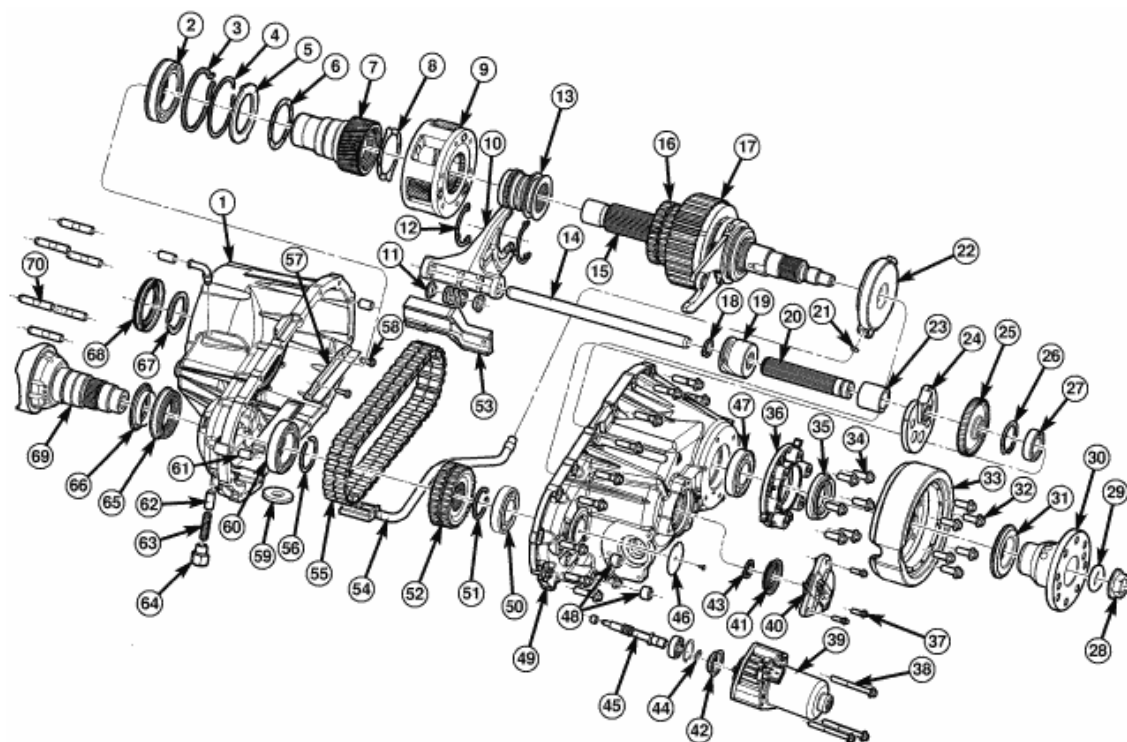


Fig. 4: MP3022 EXPLODED VIEW
 Courtesy of CHRYSLER LLC

1 - FRONT CASE	25 - WORM SHAFT GEAR	49 - REAR CASE
2 - INPUT BEARING	26 - SHIFT SHAFT BEARING SNAP RING	50 - FRONT OUTPUT SHAFT CASE BEARING
3 - INPUT BEARING HOUDINI RING	27 - SHIFT SHAFT BEARING	51 - OUTPUT SHAFT GEAR SNAP RING
4 - CARRIER SNAP RING	28 - FLANGE NUT	52 - OUTPUT SHAFT GEAR
5 - CARRIER LOCK PLATE	29 - FLANGE O-RING	53 - SHIFT BRACKET
6 - THRUST WASHER	30 - COMPANION FLANGE	54 - OIL PUMP TUBE
7 - INPUT GEAR (SHAFT)	31 - COMPANION FLANGE SLINGER	55 - DRIVE CHAINS

8 - TABBED THRUST WASHER	32 - DAMPER BOLTS (if equipped)	56 - FRONT OUTPUT SHAFT SNAP RING
9 - PLANETARY GEAR ASSEMBLY	33 - DAMPER (if equipped)	57 - CHAIN GUIDE RAILS
10 - SHIFT FORK	34 - REAR COVER BOLTS	58 - CHAIN GUIDE RAIL BOLTS
11 - SHIFT RAIL SPRING AND WASHERS	35 - OUTPUT SHAFT SEAL	59 - MAGNET
12 - SHIFT FORK PADS	36 - REAR COVER	60 - FRONT OUTPUT SHAFT BEARING
13 - RANGE SLEEVE	37 - ENCODER BOLTS	61 - ALIGNMENT DOWEL
14 - SHIFT RAIL	38 - SHIFT MOTOR BOLTS	62 - DETENT
15 - MAIN SHAFT CLUTCH ASSEMBLY	39 - SHIFT MOTOR	63 - DETENT SPRING
16 - DRIVE SPROCKET	40- SHIFT ENCODER	64 - DETENT BOLT
17 - CLUTCH ASSEMBLY	41- SHIFT SHAFT SEAL	65 - FRONT OUTPUT SHAFT SEAL
18 - SHIFT RAIL SNAP RING	42 - WORM SHAFT SEAL	66 - FRONT OUTPUT SHAFT SLINGER
19 - BARREL CAM	43 - SHIFT SHAFT SNAP RING	67 - INPUT SHAFT SNAP RING
20 - SHIFT SHAFT	44 - WORM SHAFT BEARING CLIP	68 - INPUT SHAFT SEAL
21 - OIL TUBE O-RING	45 - WORM SHAFT, BEARING, SNAP RING AND E-CLIP	69 - FRONT OUTPUT SHAFT
22 - OIL PUMP	46 - ID TAG	70 - ATTACHMENT

		STUDS
23 - SHIFT SHAFT SPACER	47 - REAR OUTPUT SHAFT BEARING	-
24 - CLUTCH CAM	48 - FILL AND DRAIN PLUG	-

1. Place the transfer case in a shallow pan and remove the fill and drain plugs to drain the remainder of the fluid.

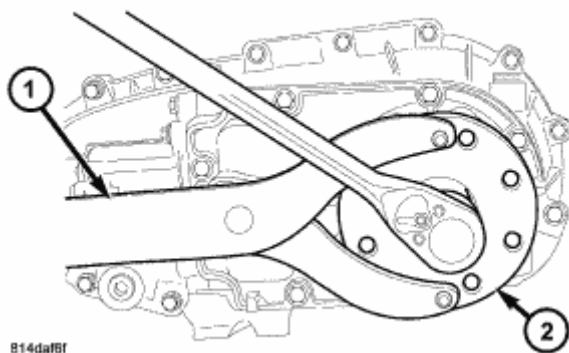
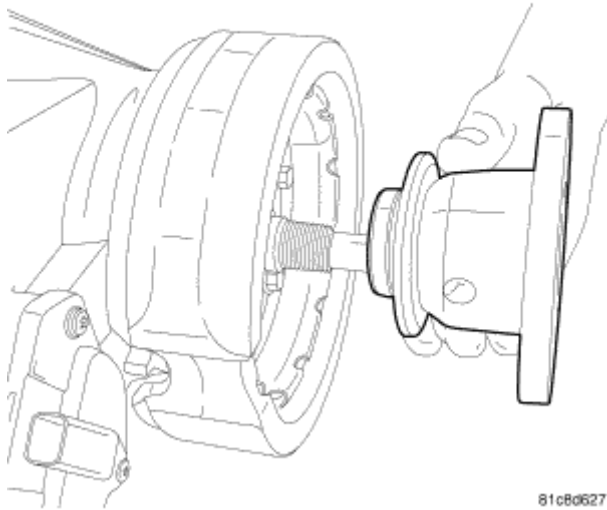


Fig. 5: Remove Rear Output Shaft Nut
Courtesy of CHRYSLER LLC

1 - HOLDER C-3281 2 - REAR COMPANION FLANGE
--

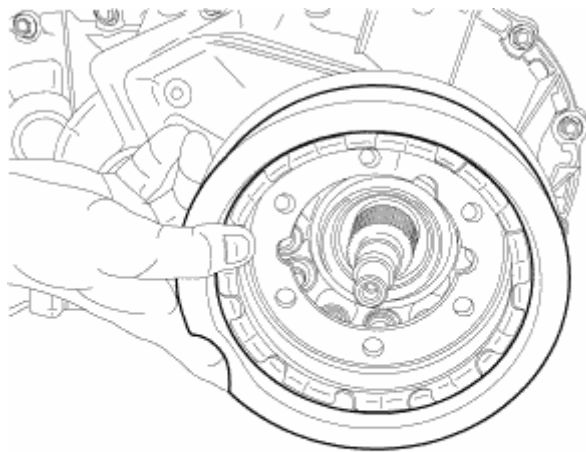
2. Using Holder C-3281 (1), remove the rear flange (2) nut.



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Fig. 6: COMPANION FLANGE
Courtesy of CHRYSLER LLC

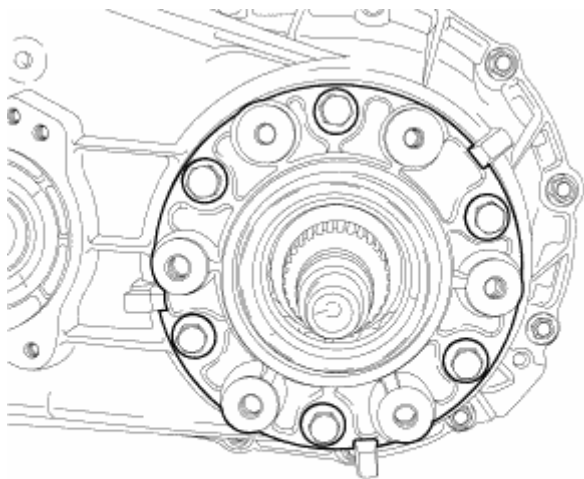
3. Remove the rear output flange from the main shaft. If necessary, use a suitable 2 or 3 jaw puller to remove the output flange.



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Fig. 7: DAMPER
Courtesy of CHRYSLER LLC

4. Remove the damper bolts and the damper from the transfer case, (if equipped).



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Fig. 8: REAR COVER
Courtesy of CHRYSLER LLC

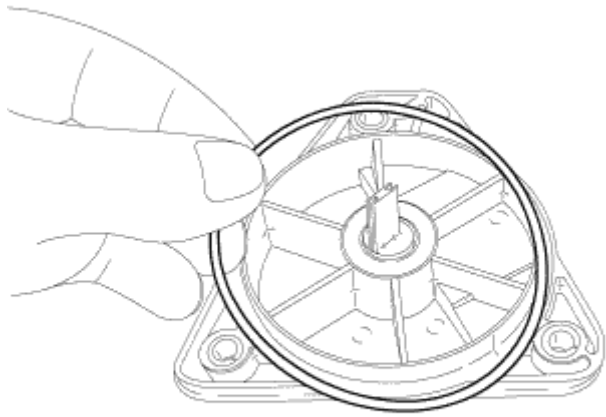
5. Remove the rear cover bolts and the rear cover from the transfer case.



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Fig. 9: ENCODER
Courtesy of CHRYSLER LLC

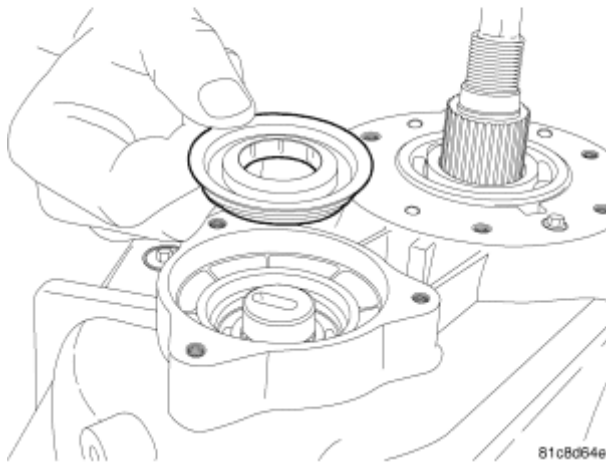
6. Remove encoder screws and the encoder from the transfer case.



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Fig. 10: ENCODER O-RING
Courtesy of CHRYSLER LLC

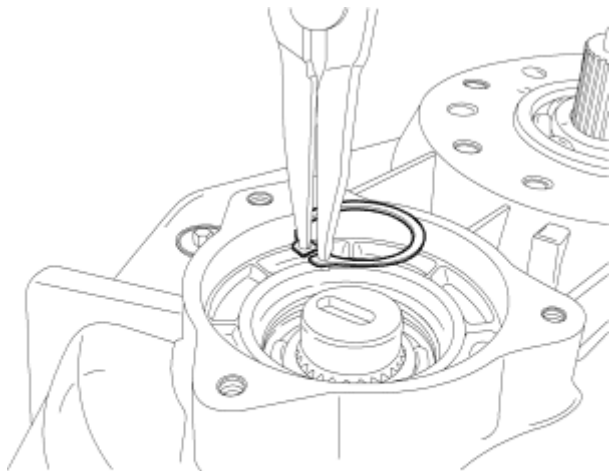
7. Remove o-ring from the encoder.



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Fig. 11: REMOVE ENCODER SEAL
Courtesy of CHRYSLER LLC

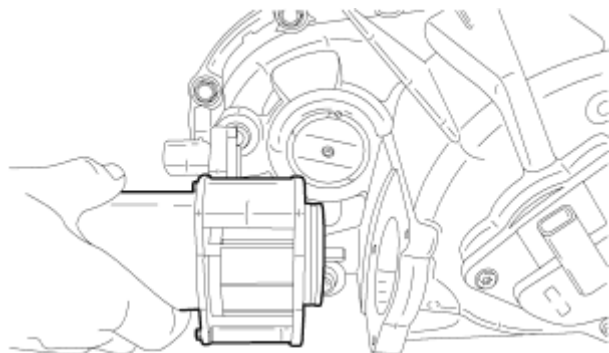
8. Using a suitable pry tool, remove the encoder seal from the transfer case.



81c8d66b

Fig. 12: SHIFT SHAFT SNAP RING
Courtesy of CHRYSLER LLC

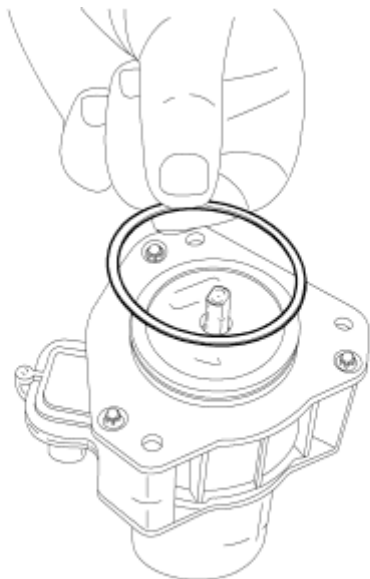
9. Remove the shift shaft snap ring from the transfer case.



81c8d717

Fig. 13: SHIFT MOTOR
Courtesy of CHRYSLER LLC

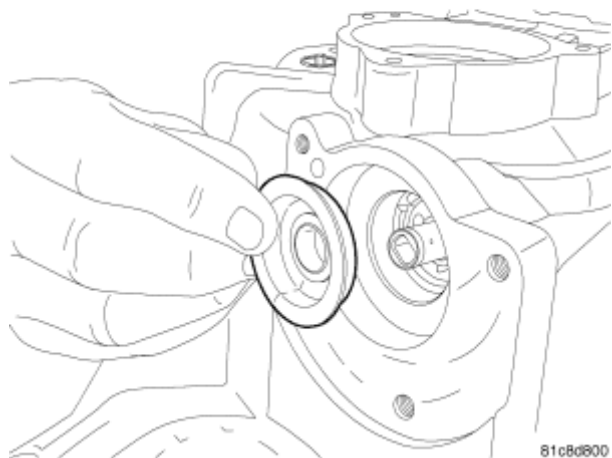
10. Remove shift motor bolts and the shift motor from the transfer case.



81c8d7fb

Fig. 14: SHIFT MOTOR O-RING
Courtesy of CHRYSLER LLC

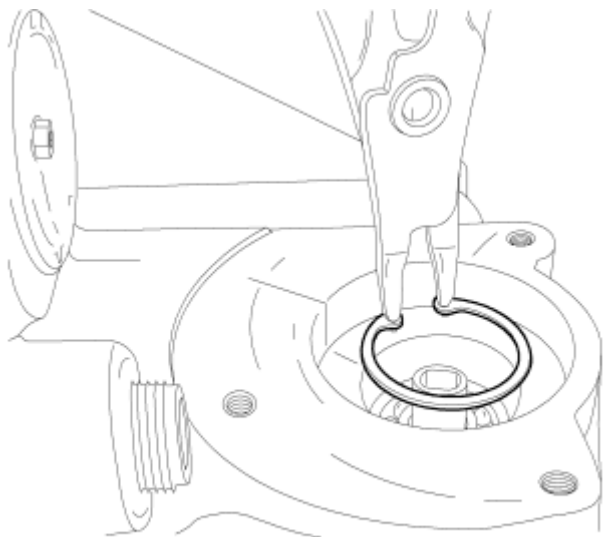
11. Remove the o-ring from the shift motor.



81c8d800

Fig. 15: REMOVE SHIFT MOTOR SEAL
Courtesy of CHRYSLER LLC

12. Using a suitable pry tool, remove shift motor seal from the transfer case.

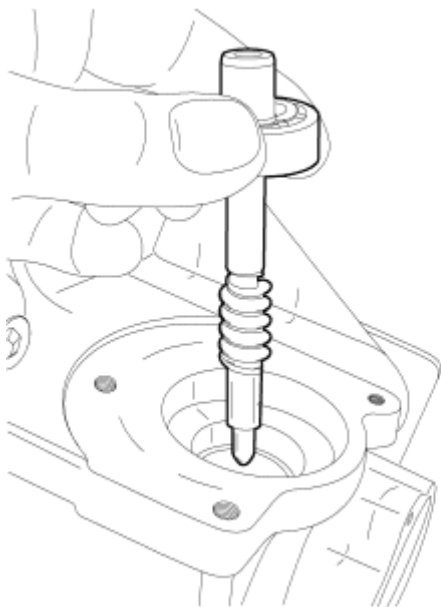


81cBd80a

Fig. 16: WORM SHAFT SNAP RING
Courtesy of CHRYSLER LLC

13. Remove the worm shaft snap ring from the transfer case.

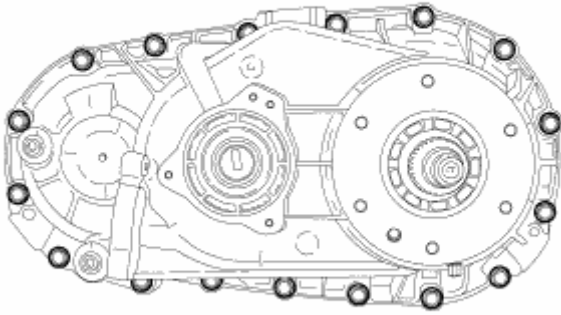
CAUTION: Carefully unthread (rotate clockwise) the worm shaft to remove it from the transfer case. Failure to follow this caution may result in parts damage.



81c6fb45

Fig. 17: WORM SHAFT
Courtesy of CHRYSLER LLC

14. Remove the worm shaft from the transfer case

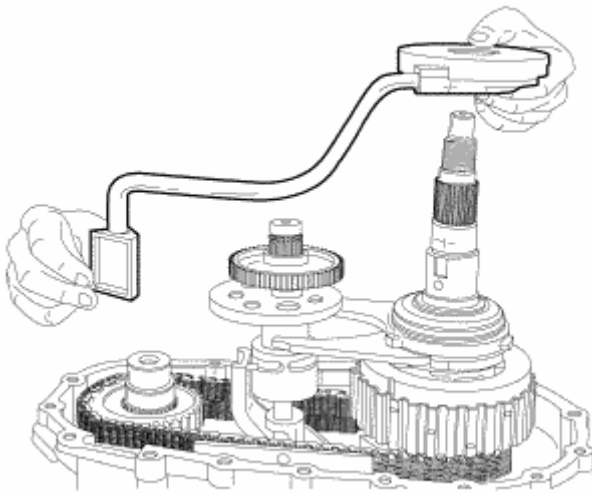


81c8d97e

Fig. 18: HOUSING BOLTS
Courtesy of CHRYSLER LLC

NOTE: Some prying may be necessary to break the seal between the front and rear case. Use care to not damage the sealing surfaces.

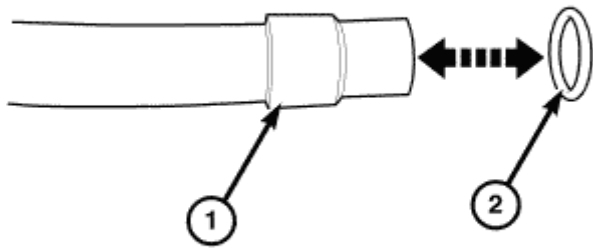
15. Remove the bolts retaining the rear housing to the front housing and separate the housings.



81c8d98c

Fig. 19: OIL PUMP ASSEMBLY
Courtesy of CHRYSLER LLC

16. Remove the oil pump assembly.

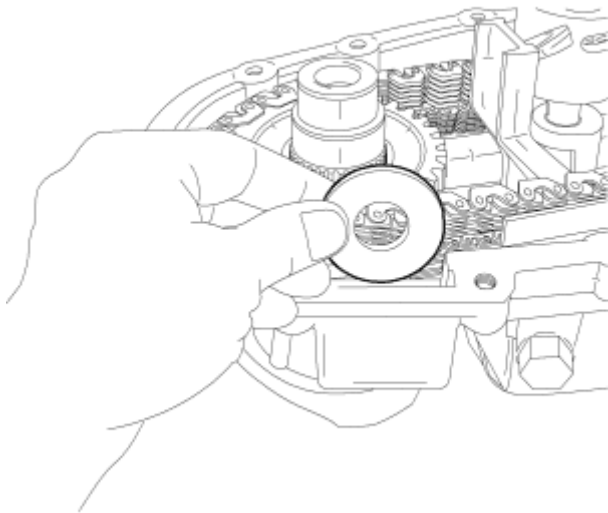


81c16188

Fig. 20: OIL TUBE O-RING
 Courtesy of CHRYSLER LLC

1 - OIL TUBE
2 - O-RING SEAL

17. Remove oil tube (1) from the oil pump and remove the o-ring (2).



81c8d9b0

Fig. 21: MAGNET
 Courtesy of CHRYSLER LLC

18. Remove the pick-up magnet from the magnet pocket.

NOTE: For ease of installation note the orientation of the worm shaft drive gear inner splines to the shift shaft outer splines.

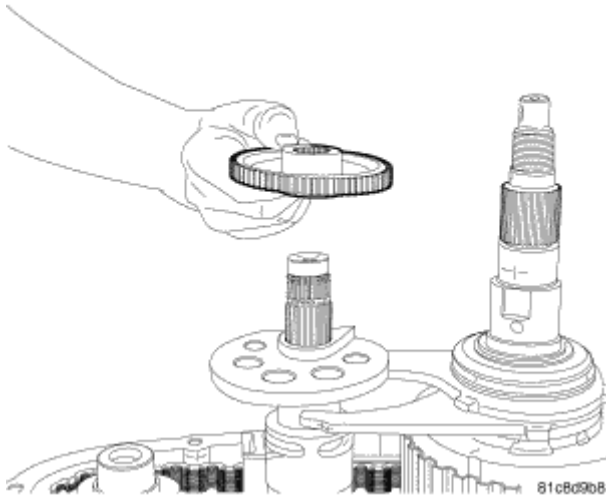


Fig. 22: WORM SHAFT DRIVE GEAR
Courtesy of CHRYSLER LLC

19. Remove the worm drive gear.

NOTE: For ease of installation note the orientation of the clutch cam inner splines to the shift shaft outer splines.

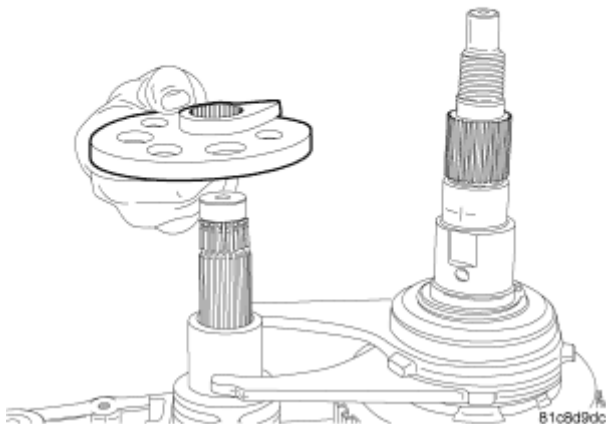
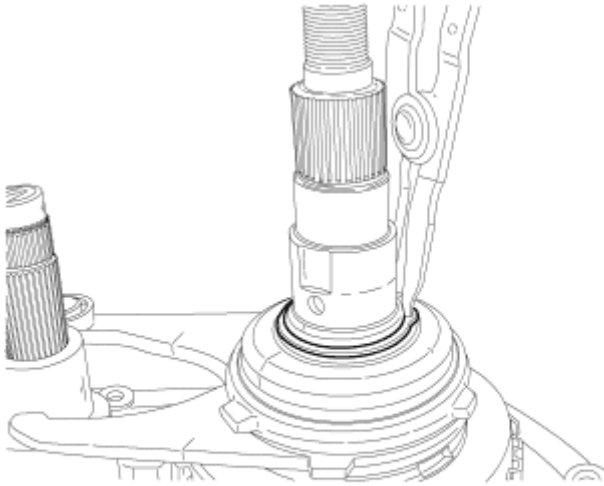


Fig. 23: CLUTCH CAM
Courtesy of CHRYSLER LLC

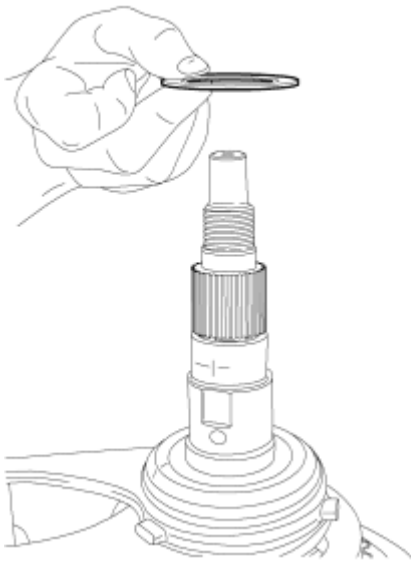
20. Remove the clutch cam.



81c8t16B

Fig. 24: CLUTCH UPPER SNAP RING
Courtesy of CHRYSLER LLC

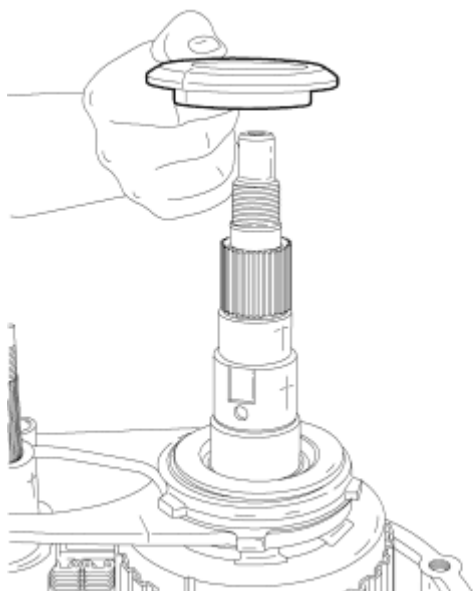
21. Remove the clutch upper snap ring.



81c8da49

Fig. 25: CLUTCH SHIM
Courtesy of CHRYSLER LLC

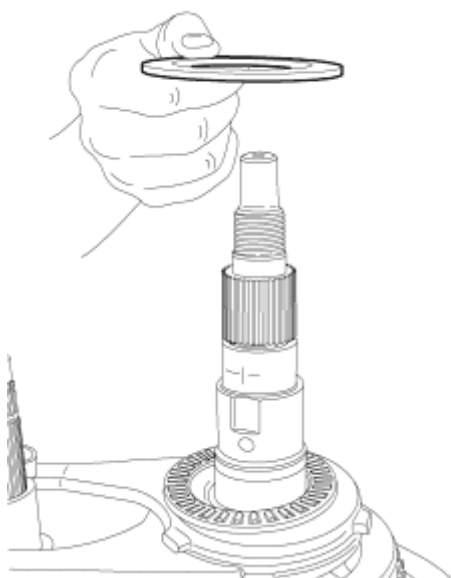
22. Remove the clutch shim.



81c8da4d

Fig. 26: THRUST COLLAR
Courtesy of CHRYSLER LLC

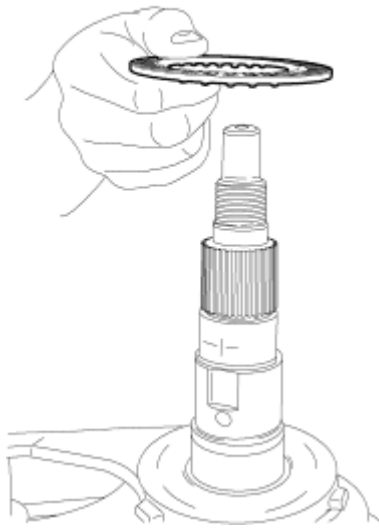
23. Remove the thrust collar.



81c8da7c

Fig. 27: UPPER BEARING RACE
Courtesy of CHRYSLER LLC

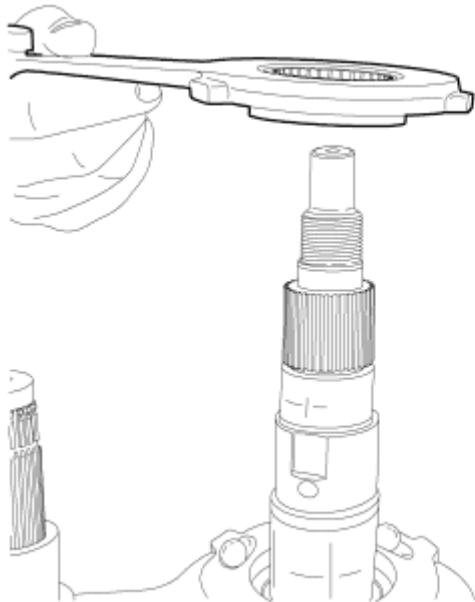
24. Remove the upper thrust bearing race.



81c8dab1

Fig. 28: UPPER BEARING
Courtesy of CHRYSLER LLC

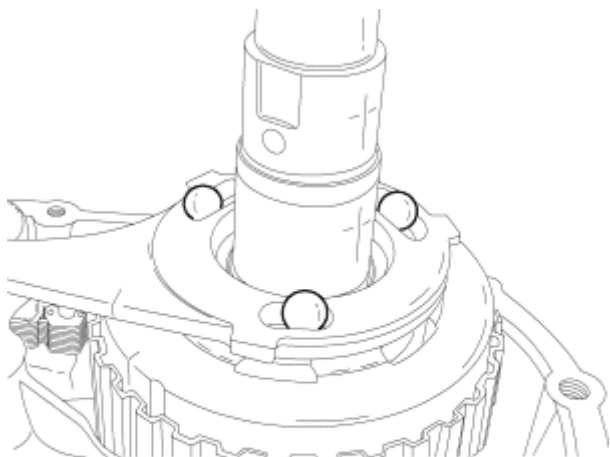
25. Remove the upper thrust bearing.



81c8dac2

Fig. 29: UPPER SHIFT LEVER
Courtesy of CHRYSLER LLC

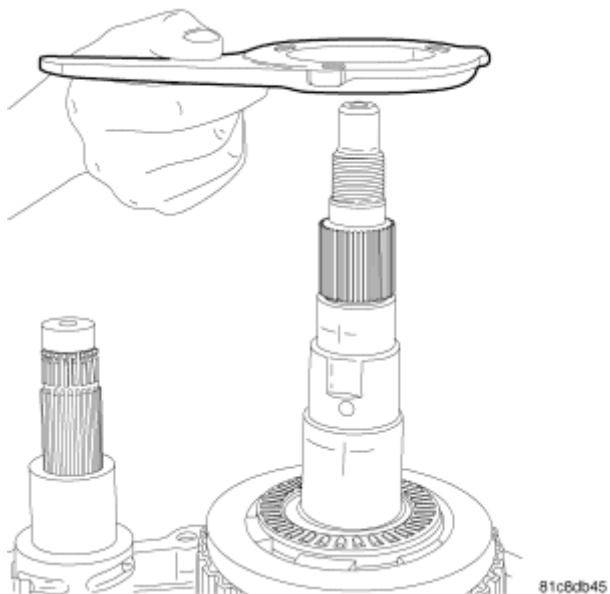
26. Remove the upper shift lever.



81c8db8c

Fig. 30: SHIFT LEVER BALLS
Courtesy of CHRYSLER LLC

27. Remove the shift lever balls.



81c8db45

Fig. 31: LOWER SHIFT LEVER
Courtesy of CHRYSLER LLC

28. Remove the lower shift lever.



Fig. 32: LOWER BEARING
Courtesy of CHRYSLER LLC

29. Remove the lower thrust bearing.

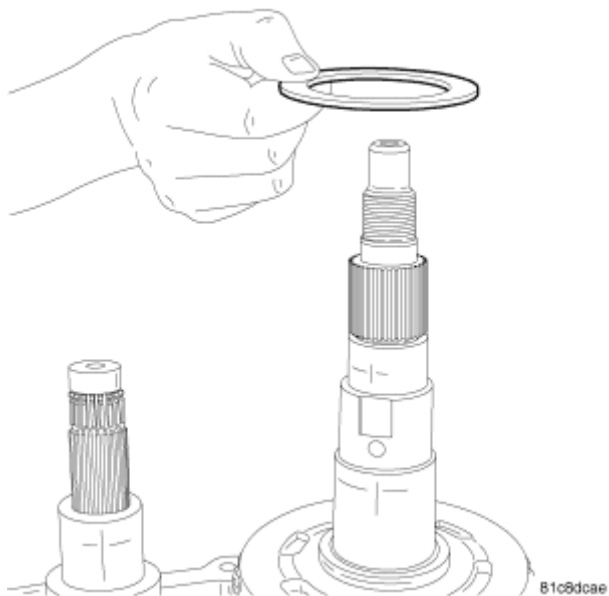


Fig. 33: LOWER RACE
Courtesy of CHRYSLER LLC

30. Remove the lower thrust bearing race.

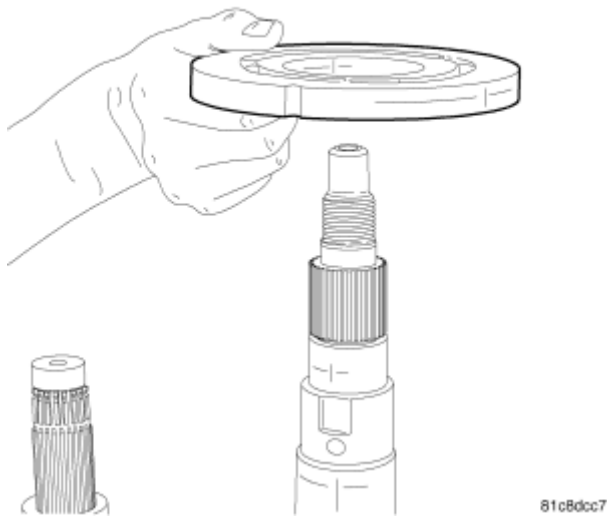


Fig. 34: CLUTCH REACTION PLATE
 Courtesy of CHRYSLER LLC

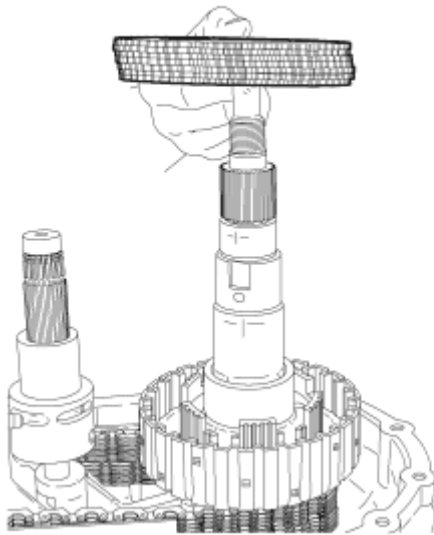
31. Remove the clutch apply piston.

NOTE: For ease of installation note the assembly orientation of the 4 identical springs.



Fig. 35: RETURN SPRING ASSEMBLY
 Courtesy of CHRYSLER LLC

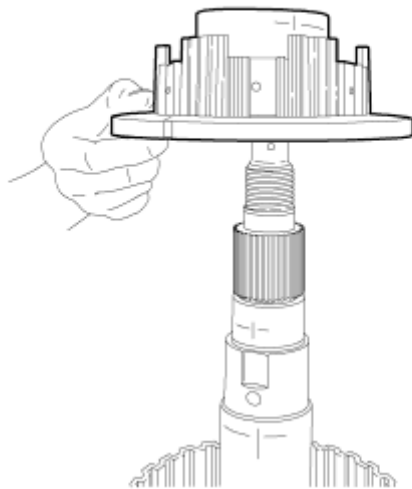
32. Remove the clutch return springs.



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Fig. 36: CLUTCH PACK
Courtesy of CHRYSLER LLC

33. Remove the clutch pack.



81cBe370

Fig. 37: CLUTCH INNER HUB
Courtesy of CHRYSLER LLC

34. Remove the inner clutch hub.

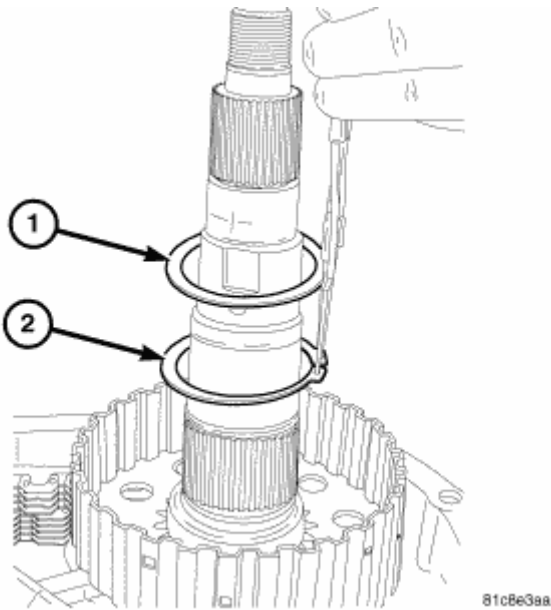


Fig. 38: CLUTCH HUB SNAP RING
 Courtesy of CHRYSLER LLC

35. Remove the clutch drum thrust washer (1) and snap ring (2).

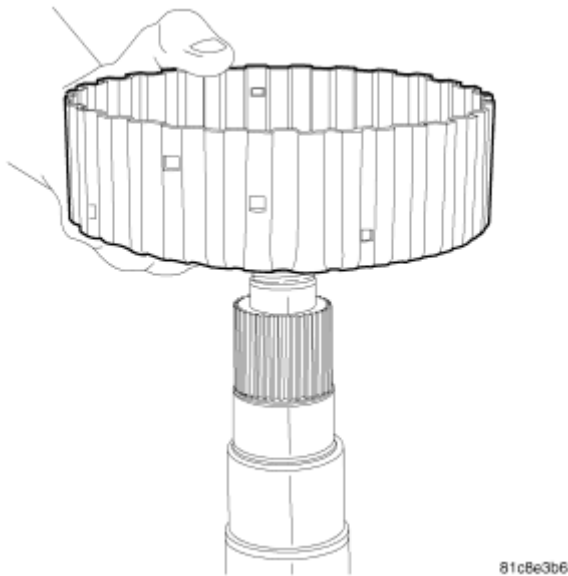
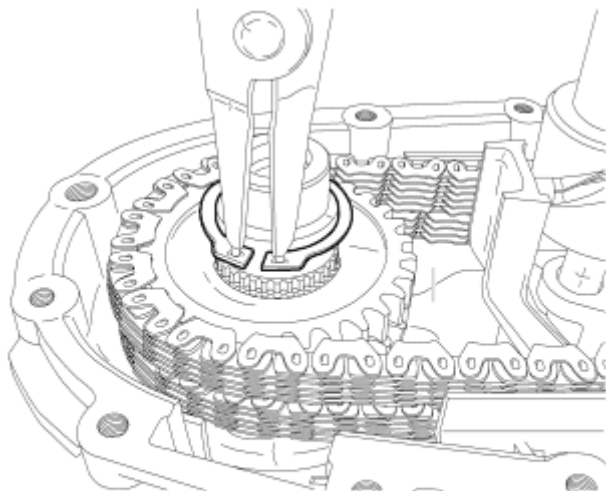


Fig. 39: CLUTCH DRUM
 Courtesy of CHRYSLER LLC

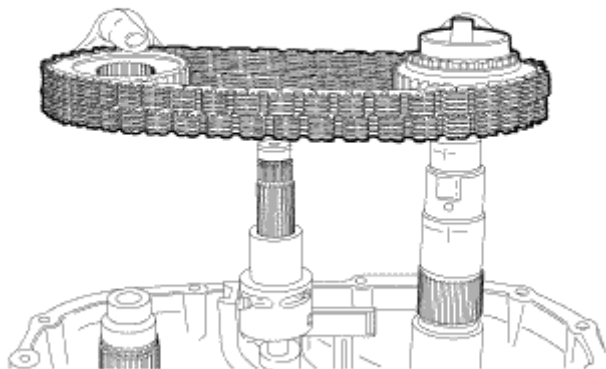
36. Remove the outer clutch drum from the mainshaft drive sprocket.



81cc540f

Fig. 40: FRONT DRIVE SPROCKET SNAP RING
Courtesy of CHRYSLER LLC

37. Remove the front drive sprocket snap ring.



81c8e3c7

Fig. 41: GEARS AND DRIVE CHAIN
Courtesy of CHRYSLER LLC

38. Remove the front drive sprocket, mainshaft drive sprocket and drive chains as one.

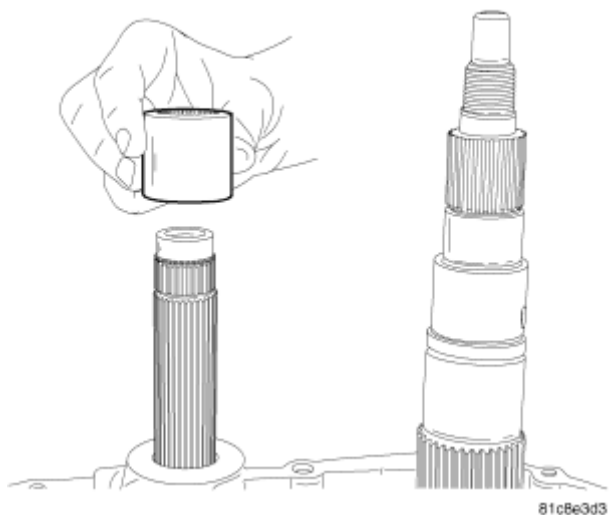


Fig. 42: SHIFT SHAFT SPACER
 Courtesy of CHRYSLER LLC

39. Remove the shift shaft spacer.

NOTE: For ease of installation note the orientation of the barrel cam inner splines to the shift shaft outer splines.

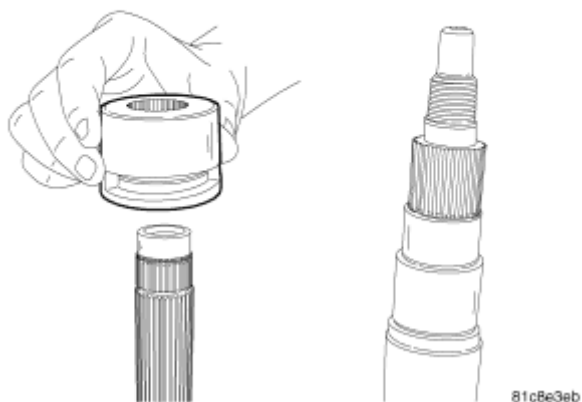


Fig. 43: BARREL CAM
 Courtesy of CHRYSLER LLC

40. Remove the barrel cam.

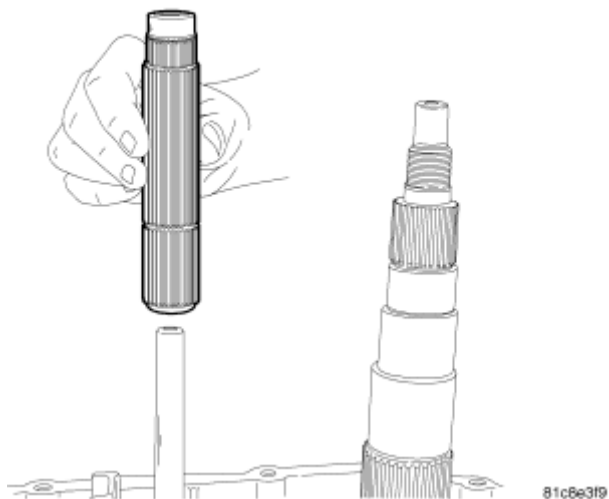


Fig. 44: SHIFT SHAFT
Courtesy of CHRYSLER LLC

41. Remove the shift shaft.

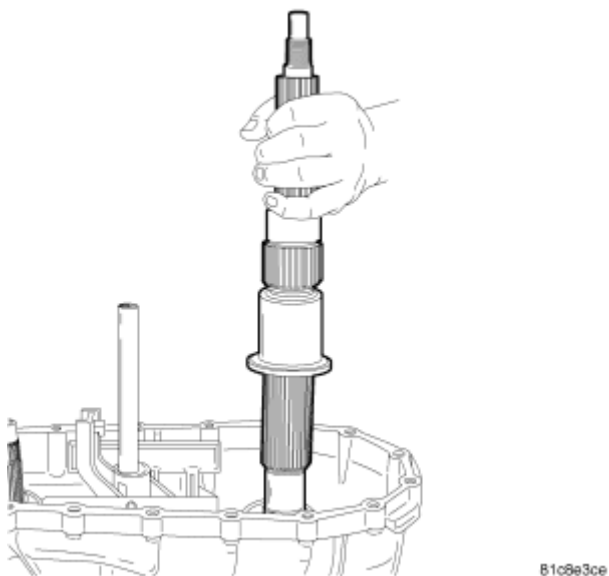
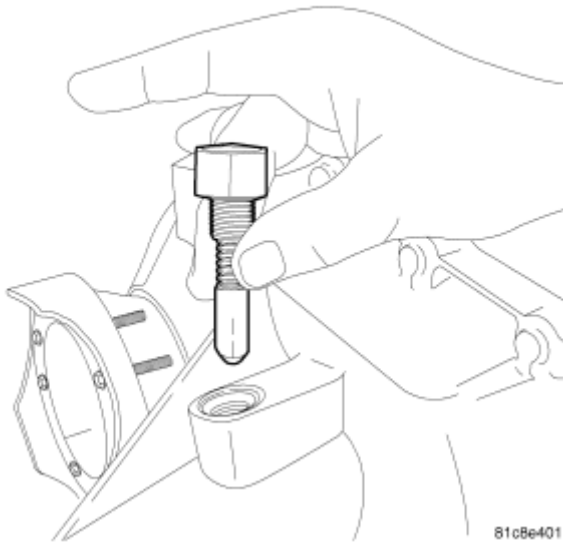


Fig. 45: MAIN SHAFT
Courtesy of CHRYSLER LLC

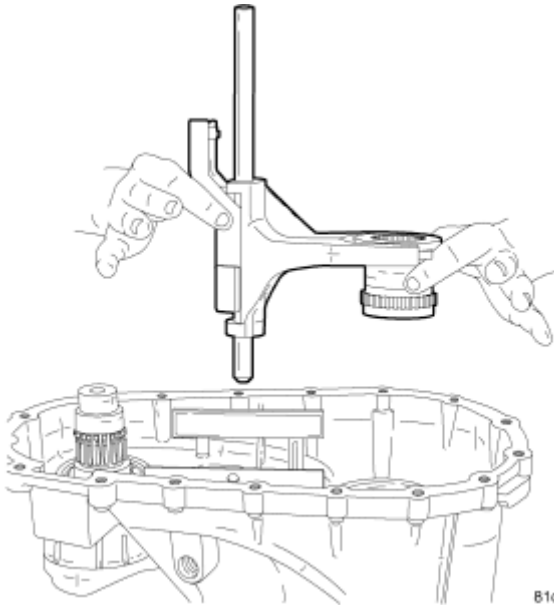
42. Remove the main shaft from the transfer case.



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Fig. 46: DETENT ASSEMBLY
Courtesy of CHRYSLER LLC

43. Remove the detent assembly.



81c8e41c

Fig. 47: SHIFT RAIL ASSEMBLY
Courtesy of CHRYSLER LLC

NOTE: For ease of assembly note the orientation of the shift fork to the shift rail.

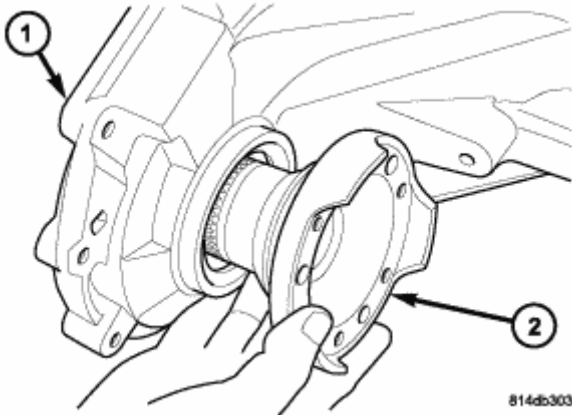
44. Remove the range shift rail assembly and range sleeve. Remove the rail, bracket, spring and washers from the shift fork.



81c8e45d

Fig. 48: FRONT OUTPUT SHAFT SNAP RING
 Courtesy of CHRYSLER LLC

45. Remove the retaining snap ring from the front output shaft.

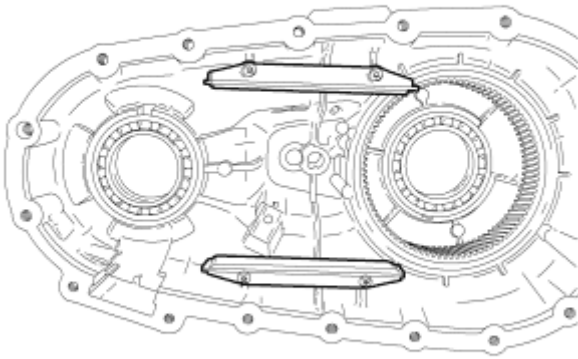


814db303

Fig. 49: Remove Front Output Shaft and Flange
 Courtesy of CHRYSLER LLC

1 - FRONT HOUSING 2 - FRONT OUTPUT SHAFT

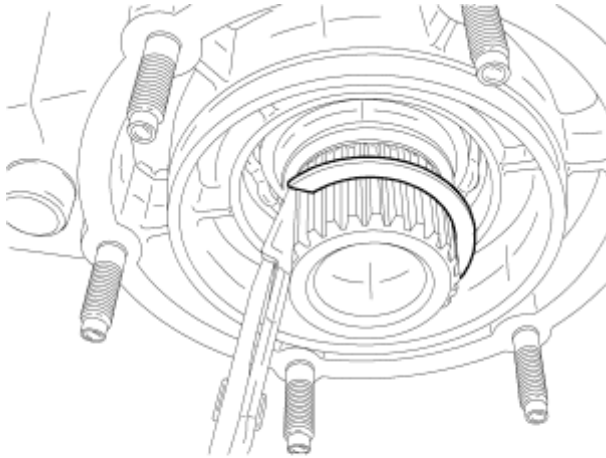
46. Remove the front output shaft (2) from the transfer case (1).



81cBe477

Fig. 50: GUIDE RAIL BOLTS
Courtesy of CHRYSLER LLC

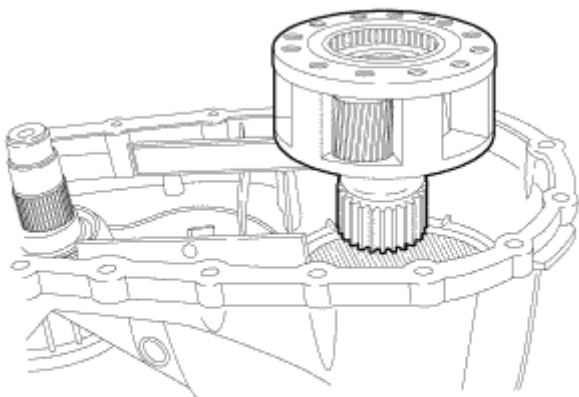
47. Remove the chain guide rail screws and the chain guide rails.



81cBe447

Fig. 51: INPUT SHAFT SNAP RING
Courtesy of CHRYSLER LLC

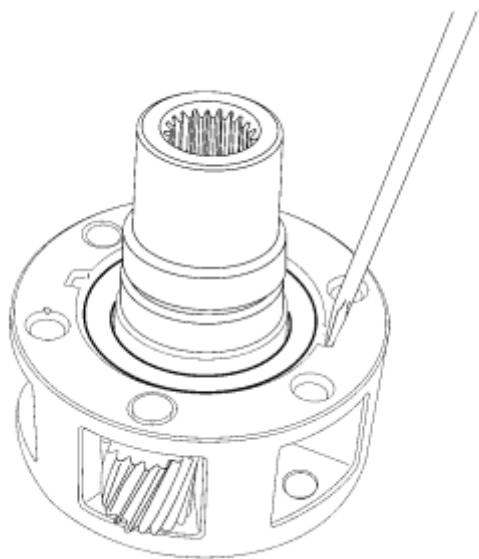
48. Using a suitable pry tool or a screw mounted in a slide hammer, remove the input gear seal. Remove the input gear snap ring.



81c8e44b

Fig. 52: INPUT PLANETARY GEAR ASSEMBLY
 Courtesy of CHRYSLER LLC

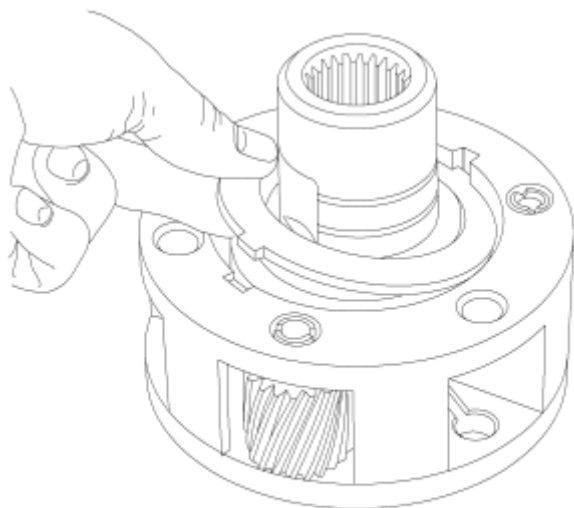
49. Remove the input planetary gear assembly from the front housing.



81c8b097

Fig. 53: LOW GEAR SNAP RING
 Courtesy of CHRYSLER LLC

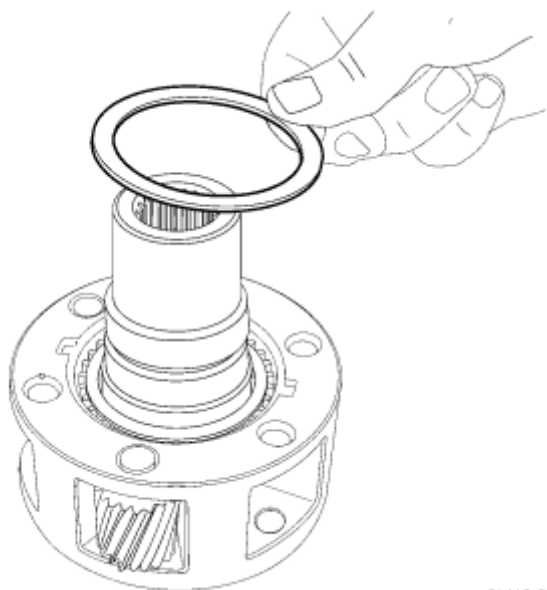
50. Remove the snap-ring holding the input gear into the planetary gear.



81d3611e

Fig. 54: Input Gear Retainer Removal
 Courtesy of CHRYSLER LLC

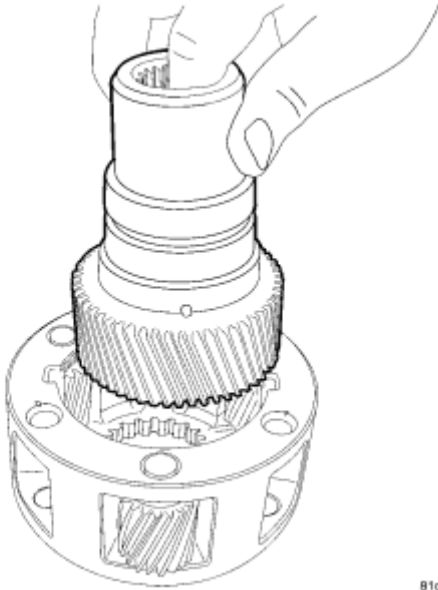
51. Remove the lock plate from the input and planetary gear assembly.



81cbb0a8

Fig. 55: LOW GEAR LOCK PLATE
 Courtesy of CHRYSLER LLC

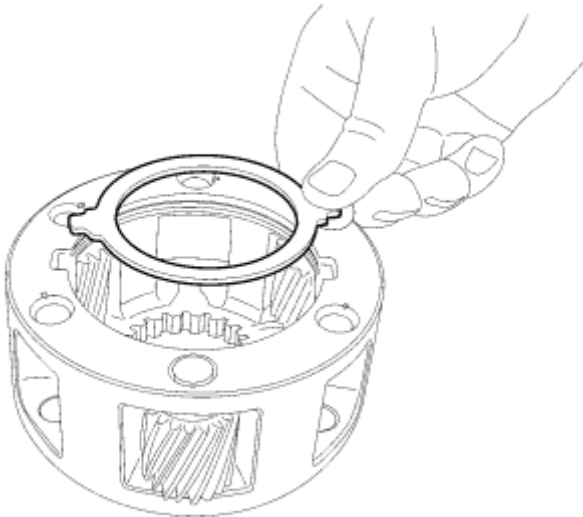
52. Remove the thrust washer from the input and planetary gear assembly.



81cbb0ac

Fig. 56: LOW GEAR
Courtesy of CHRYSLER LLC

53. Remove the input gear from the planetary gear.



81cbb0a4

Fig. 57: LOW GEAR TABBED THRUST WASHER
Courtesy of CHRYSLER LLC

54. Remove the tabbed thrust washer from the planetary gear.

CLEANING

TRANSFER CASE

Clean the transfer case parts with a standard parts cleaning solvent. Remove all traces of sealer from the cases and retainers with a scraper and 3M™ all purpose cleaner. Use compressed air to remove solvent residue from oil feed passages in the case halves, retainers, gears, and shafts.

INSPECTION

INSPECTION-TRANSFER CASE

Inspect the case for cracks, porous spots, worn bores, or damaged threads. Damaged threads can be repaired with Helicoil® thread inserts. However, the case will have to be replaced if it exhibits any type of damage or wear.

ASSEMBLY

TRANSFER CASE -MP3022

NOTE: If the transfer case assembly is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the Scan Tool.

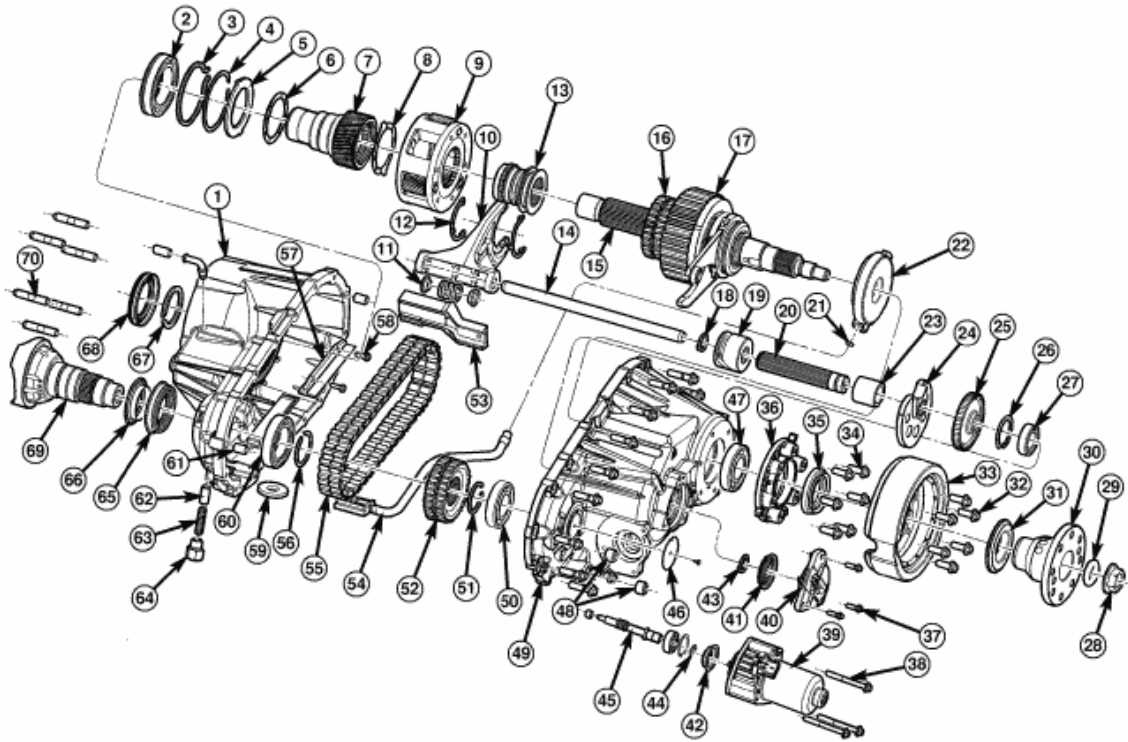


Fig. 58: MP3022 EXPLODED VIEW
Courtesy of CHRYSLER LLC

1 - FRONT CASE	25 - WORM SHAFT	49 - REAR
----------------	--------------------	-----------

2 - INPUT BEARING	GEAR	CASE
	26 - SHIFT SHAFT BEARING	50 - FRONT OUTPUT SHAFT CASE BEARING
3 - INPUT BEARING HOUDINI RING	27 - SHIFT SHAFT BEARING	51- OUTPUT SHAFT GEAR SNAP RING
4 - CARRIER SNAP RING	28 - FLANGE NUT	52- OUTPUT SHAFT GEAR
5 - CARRIER LOCK PLATE	29 - FLANGE O-RING	53 - SHIFT BRACKET
6 - THRUST WASHER	30 - COMPANION FLANGE	54 - OIL PUMP TUBE
7 - INPUT GEAR (SHAFT)	31 - COMPANION FLANGE SLINGER	55 - DRIVE CHAINS
8 - TABBED THRUST WASHER	32 - DAMPER BOLTS (if equipped)	56 - FRONT OUTPUT SHAFT SNAP RING
9 - PLANETARY GEAR ASSEMBLY	33 - DAMPER (if equipped)	57 - CHAIN GUIDE RAILS
10 - SHIFT FORK	34 - REAR COVER BOLTS	58 - CHAIN GUIDE RAIL BOLTS
11 - SHIFT RAIL SPRING AND WASHERS	35 - OUTPUT SHAFT SEAL	59 - MAGNET
12 - SHIFT FORK PADS	36 - REAR COVER	60 - FRONT OUTPUT SHAFT BEARING
13 - RANGE SLEEVE	37 - ENCODER BOLTS	61 - ALIGNMENT DOWEL
14 - SHIFT RAIL	38 - SHIFT MOTOR BOLTS	62 - DETENT
15 - MAIN SHAFT CLUTCH ASSEMBLY	39 - SHIFT MOTOR	63 - DETENT SPRING
16 - DRIVE SPROCKET	40- SHIFT ENCODER	64 - DETENT BOLT
17 - CLUTCH ASSEMBLY	41- SHIFT SHAFT SEAL	65 - FRONT OUTPUT

		SHAFT SEAL
		66 - FRONT
18 - SHIFT RAIL SNAP RING	42 - WORM	OUTPUT
	SHAFT SEAL	SHAFT
		SLINGER
19 - BARREL CAM	43 - SHIFT	67 - INPUT
	SHAFT SNAP	SHAFT SNAP
	RING	RING
20 - SHIFT SHAFT	44 - WORM	
	SHAFT	68 - INPUT
	BEARING	SHAFT SEAL
	CLIP	
21 - OIL TUBE O-RING	45 - WORM	
	SHAFT,	69 - FRONT
	BEARING,	OUTPUT
	SNAP RING	SHAFT
	AND E-CLIP	
22 - OIL PUMP	46 - ID TAG	70 -
		ATTACHMENT
		STUDS
23 - SHIFT SHAFT SPACER	47 - REAR	
	OUTPUT	-
	SHAFT	
	BEARING	
24 - CLUTCH CAM	48 - FILL	
	AND DRAIN	-
	PLUG	

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

CAUTION: The bearing bores in various transfer case components contain oil feed holes. Be certain the holes are not blocked. Failure to follow this caution may result in transfer case damage.

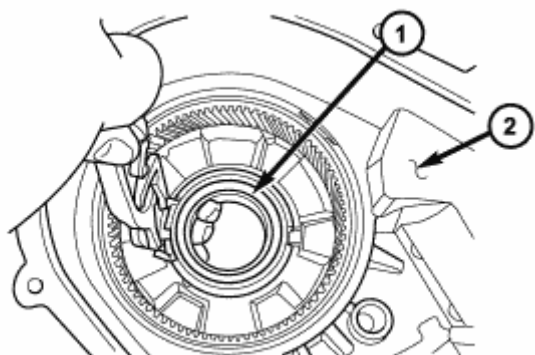


Fig. 59: Remove Input Gear Bearing
Courtesy of CHRYSLER LLC

1 - INPUT GEAR BEARING
2 - FRONT CASE

1. While holding the retaining ring tabs apart with suitable snap-ring pliers, remove the input shaft bearing (1) from the front case (2).
2. Transfer the retaining ring to the new housing, if necessary, and install the bearing into the front case.

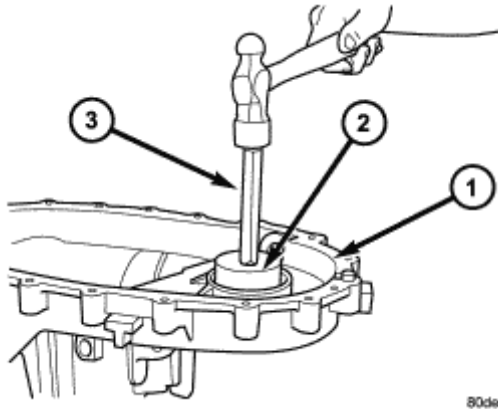


Fig. 60: Remove Front Output Shaft Bearing
Courtesy of CHRYSLER LLC

1 - FRONT CASE
2 - INSTALLER C-4210
3 - HANDLE C-4171

3. Using a suitable pry tool or a screw mounted in a slide hammer, remove the front output shaft seal.
4. Using Installer 6061 inverted, and Handle C-4171, remove front output shaft bearing.
5. Start front output shaft bearing in case. Then seat bearing with Handle C-4171 (3) and Installer C-4210 (2).
6. Install the front output shaft seal using Installer 6560.

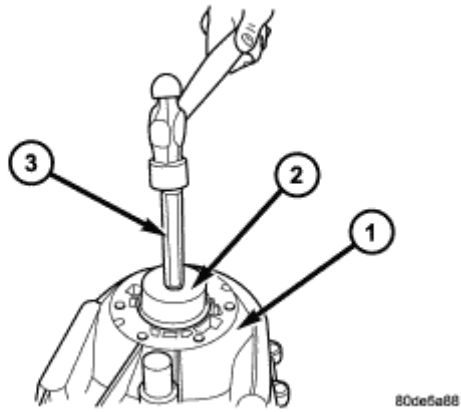


Fig. 61: Install Rear Output Shaft Bearing
 Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - REAR CASE
2 - REMOVER/INSTALLER C-4210
3 - HANDLE C-4171 |
|--|

7. Remove the rear output shaft bearing from the rear case using Installer 6436 (2) inverted and Handle C-4171 (3).
8. Install the rear output shaft bearing into the rear case using Remover/Installer C-4210 (2) inverted and Handle C-4171 (3).

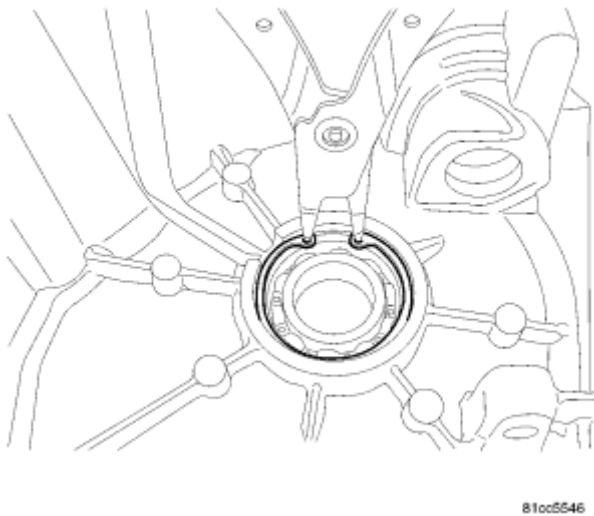
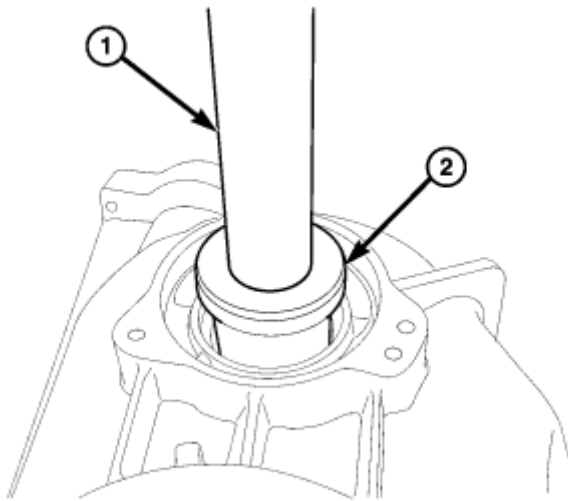


Fig. 62: SHIFT SHAFT BEARING SNAP RING
 Courtesy of CHRYSLER LLC

9. Remove shift shaft bearing snap ring.

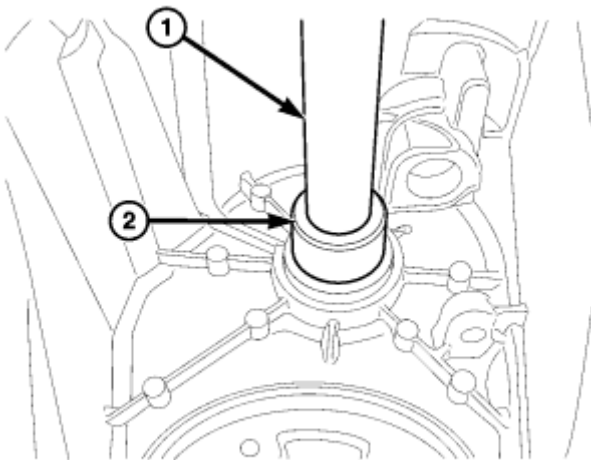


81cc554a

Fig. 63: SHIFT SHAFT BEARING REMOVAL
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - HANDLE C-4171 |
| 2 - INSTALLER/REMOVER 5066 |

10. Remove shift shaft bearing using Handle C-4171 (1) and Installer/Remove 5066 (2).

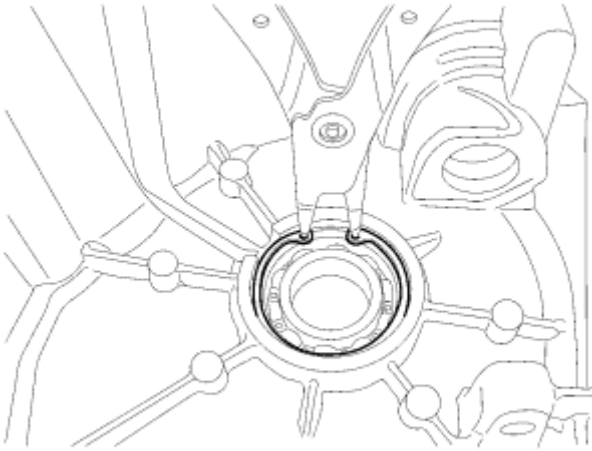


81cc554e

Fig. 64: SHIFT SHAFT BEARING INSTALLATION
Courtesy of CHRYSLER LLC

- | |
|----------------------------|
| 1 - HANDLE C4171 |
| 2 - INSTALLER/REMOVER 5066 |

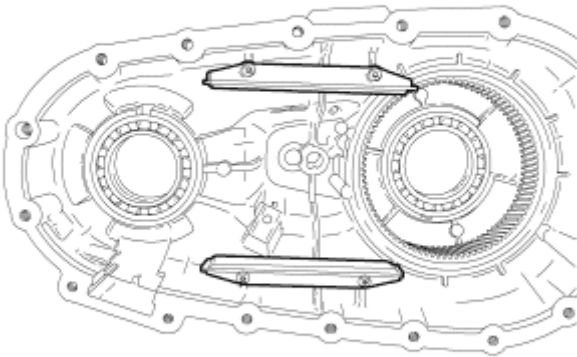
11. Install shift shaft bearing using Handle C-4171 and Installer/Remover 5066 inverted.



81cc5546

Fig. 65: SHIFT SHAFT BEARING SNAP RING
Courtesy of CHRYSLER LLC

12. Install shift shaft bearing snap ring.



81c8e477

Fig. 66: GUIDE RAIL BOLTS
Courtesy of CHRYSLER LLC

13. Install the guide rails and the guide rail bolts. Tighten the guide rail bolts to 5-8 N.m (44-71 in. lbs.).

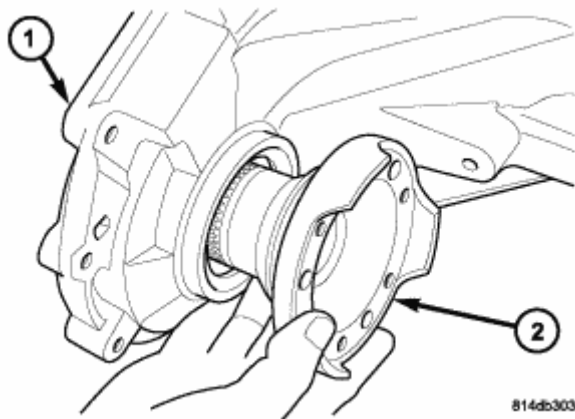


Fig. 67: Remove Front Output Shaft and Flange
Courtesy of CHRYSLER LLC

- | |
|------------------------|
| 1 - FRONT HOUSING |
| 2 - FRONT OUTPUT SHAFT |

14. Install the front output shaft flange (2) into the front housing (1).

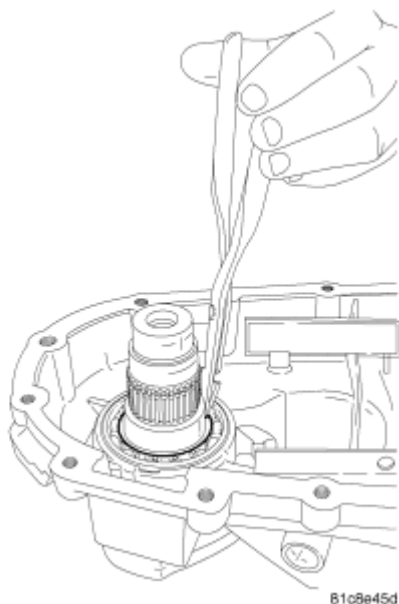
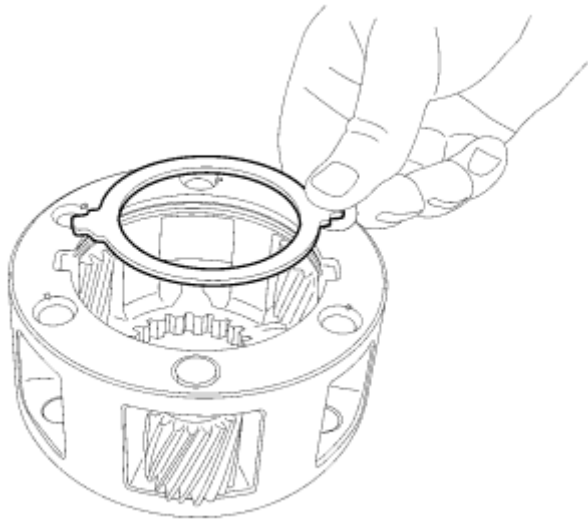


Fig. 68: FRONT OUTPUT SHAFT SNAP RING
Courtesy of CHRYSLER LLC

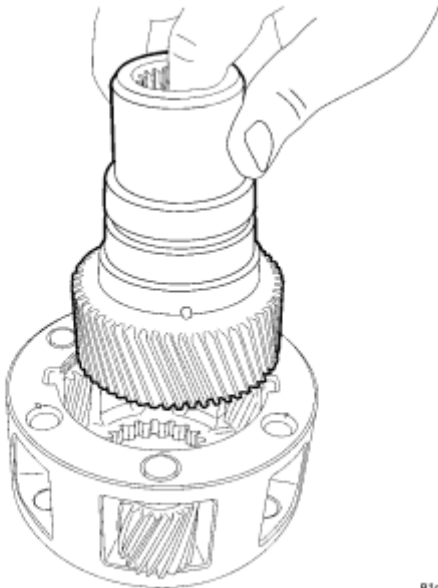
15. Install the front output shaft snap ring.



81cbb0a4

Fig. 69: PLANETARY TABBED THRUST WASHER
 Courtesy of CHRYSLER LLC

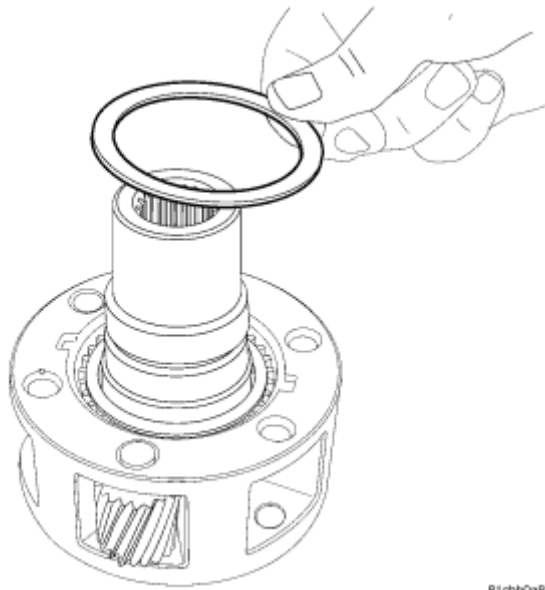
16. Install the bottom thrust tabbed washer into the planetary gear.



81cbb0ac

Fig. 70: INPUT GEAR
 Courtesy of CHRYSLER LLC

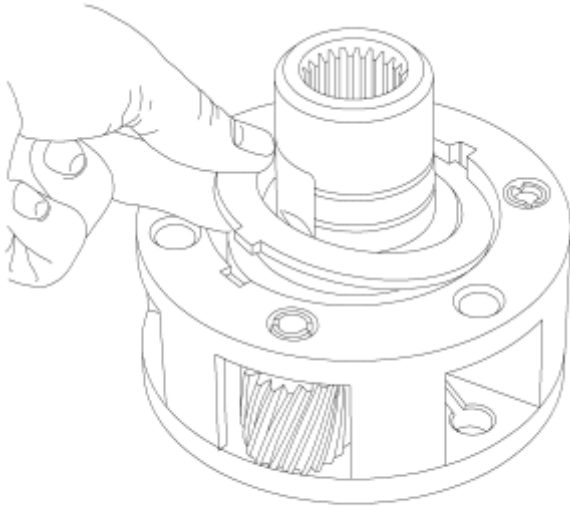
17. Install the input gear into the planetary gear.



81cbb0a8

Fig. 71: INPUT GEAR LOCK PLATE
 Courtesy of CHRYSLER LLC

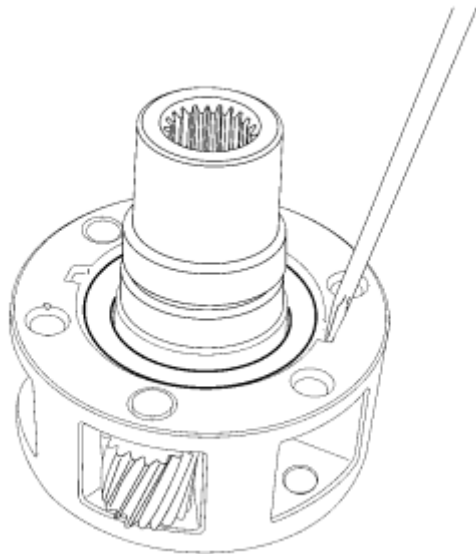
18. Install the thrust washer onto the input planetary gear assembly.



81d3611e

Fig. 72: Input Gear Retainer Removal
 Courtesy of CHRYSLER LLC

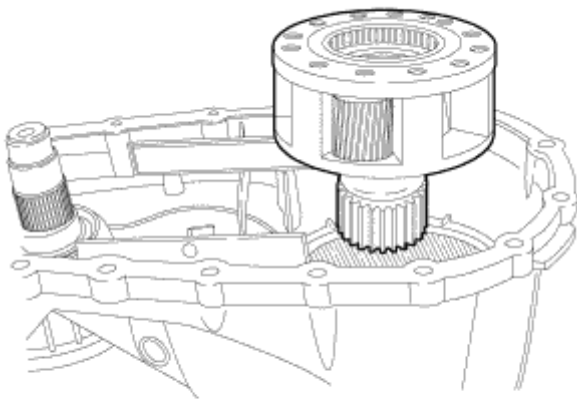
19. Install the lock plate onto the input planetary gear assembly.



81cbb097

Fig. 73: PLANETARY SNAP RING
Courtesy of CHRYSLER LLC

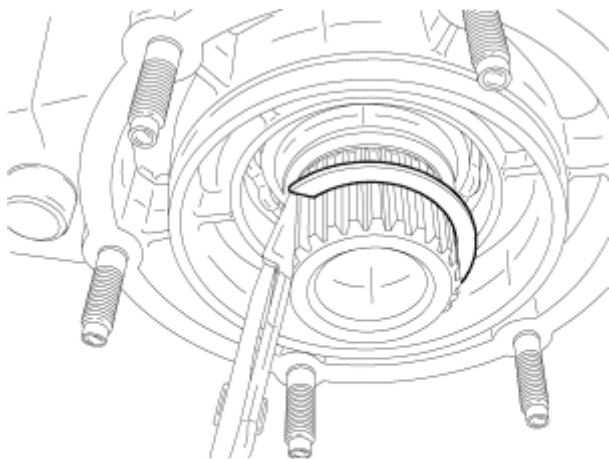
20. Install the snap ring into the input planetary gear assembly.



81c8e44b

Fig. 74: PLANETARY ASSEMBLY
Courtesy of CHRYSLER LLC

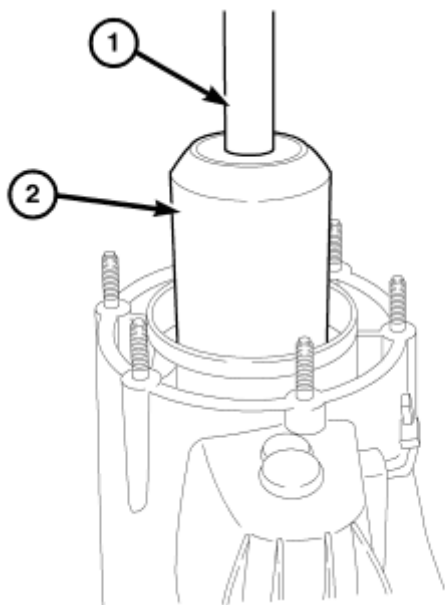
21. Install the input planetary gear assembly into the front housing.



81c8e447

Fig. 75: INPUT SHAFT SNAP RING
Courtesy of CHRYSLER LLC

22. Install the input gear snap ring.



81cc61a2

Fig. 76: INSTALL INPUT SHAFT SEAL
Courtesy of CHRYSLER LLC

- | |
|--------------------|
| 1 - HANDLE C-4171 |
| 2 - INSTALLER 9672 |

23. Using Installer 9672 (2) and Handle C-4171 (1), install a new input shaft seal.

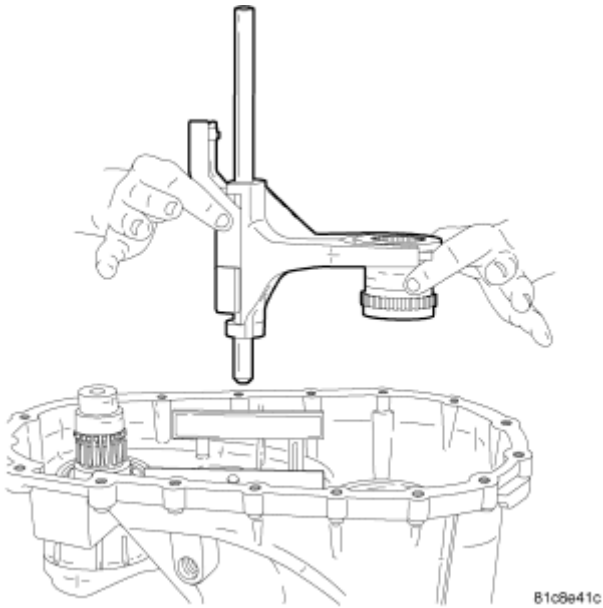


Fig. 77: SHIFT RAIL ASSEMBLY
 Courtesy of CHRYSLER LLC

24. Install the spring washers onto each side of the spring and install the spring assembly into the shift fork.
25. Install the shift bracket over the spring washers and onto the shift fork.
26. Install the range sleeve into the shift fork.
27. Install the range shift assembly and range sleeve.

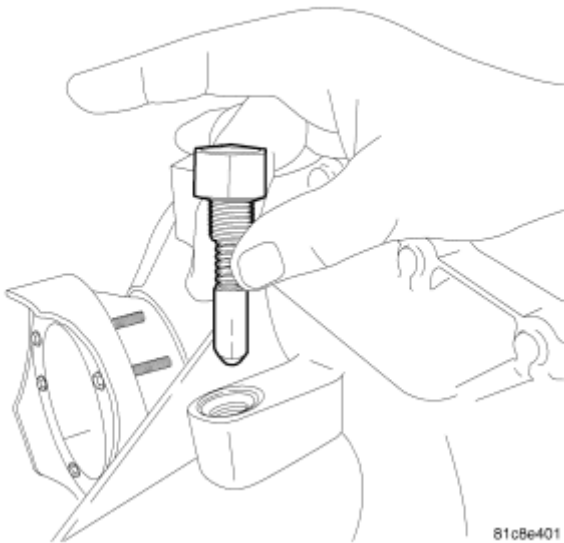
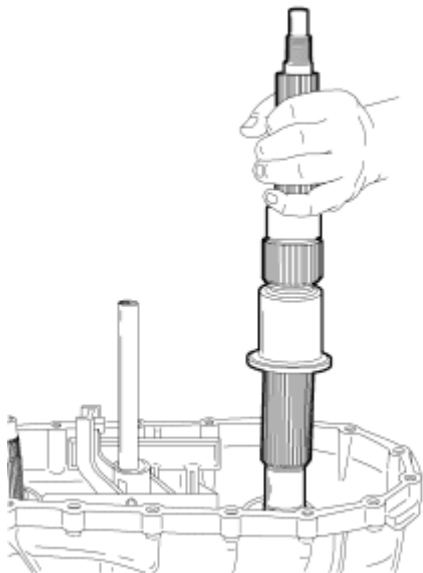


Fig. 78: DETENT ASSEMBLY
 Courtesy of CHRYSLER LLC

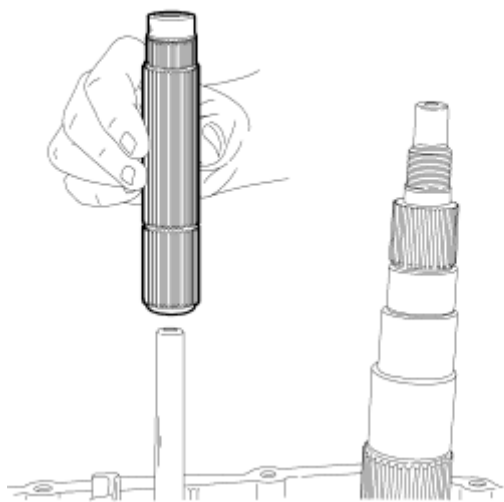
28. Install the detent assembly.



81c8e3ce

Fig. 79: MAIN SHAFT
Courtesy of CHRYSLER LLC

29. Install the mainshaft into the transfer case.



81c8e3f9

Fig. 80: SHIFT SHAFT
Courtesy of CHRYSLER LLC

30. Install the shift shaft.

NOTE: Before installing the barrel cam, note the orientation of the inner barrel cam splines to the outer splines on the shift shaft.

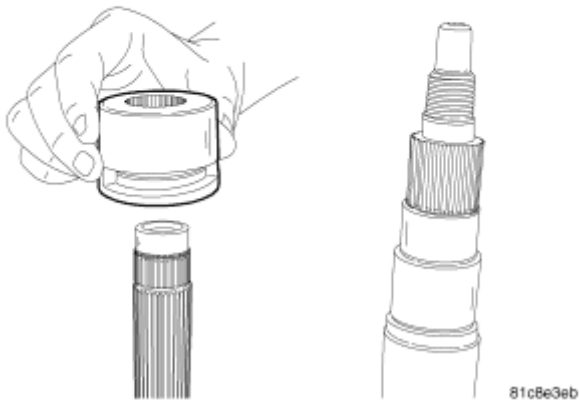


Fig. 81: BARREL CAM
Courtesy of CHRYSLER LLC

31. Install the barrel cam.

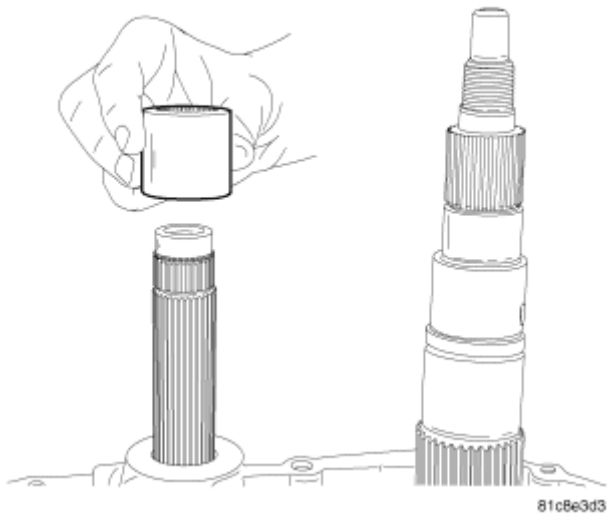
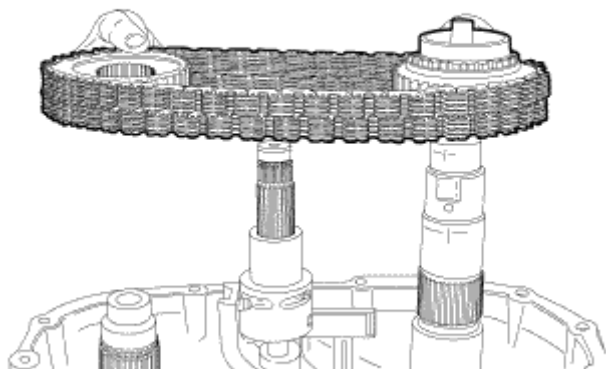


Fig. 82: SHIFT SHAFT SPACER
Courtesy of CHRYSLER LLC

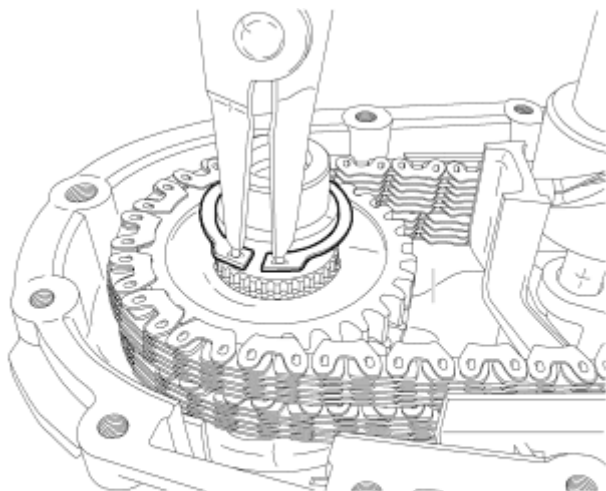
32. Install the shift shaft spacer.



B1c8e3c7

Fig. 83: GEARS AND DRIVE CHAIN
 Courtesy of CHRYSLER LLC

33. Install the front drive sprocket, mainshaft drive sprocket and drive chains as one.



B1cc540f

Fig. 84: FRONT DRIVE SPROCKET SNAP RING
 Courtesy of CHRYSLER LLC

34. Install the front drive sprocket snap ring.

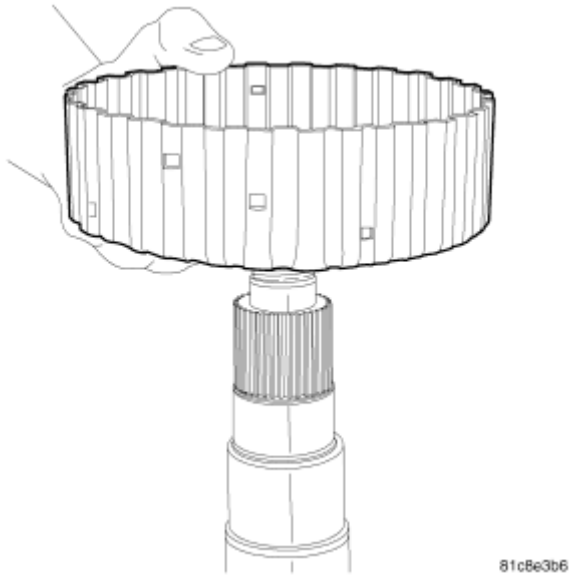


Fig. 85: CLUTCH DRUM
 Courtesy of CHRYSLER LLC

35. Install the outer clutch drum onto the mainshaft drive sprocket.

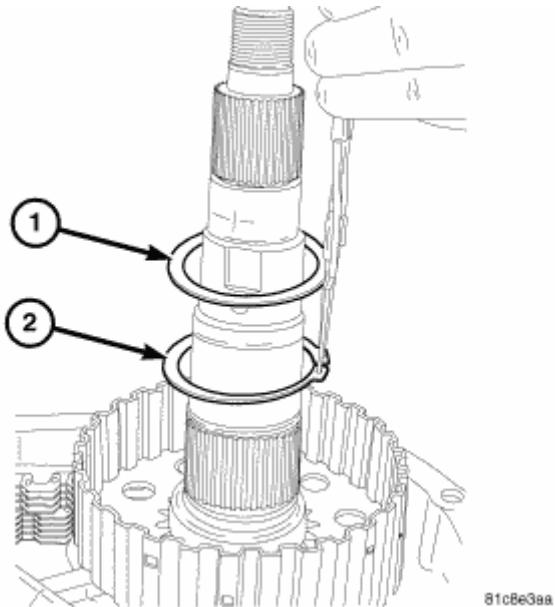
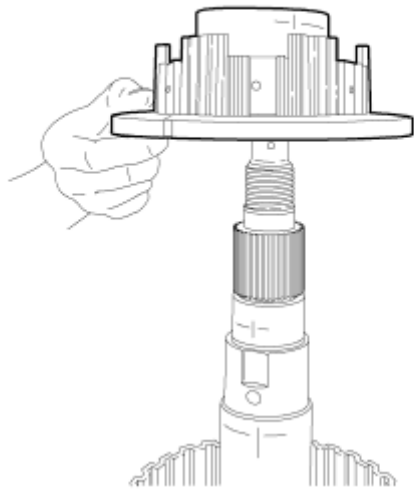


Fig. 86: CLUTCH HUB SNAP RING
 Courtesy of CHRYSLER LLC

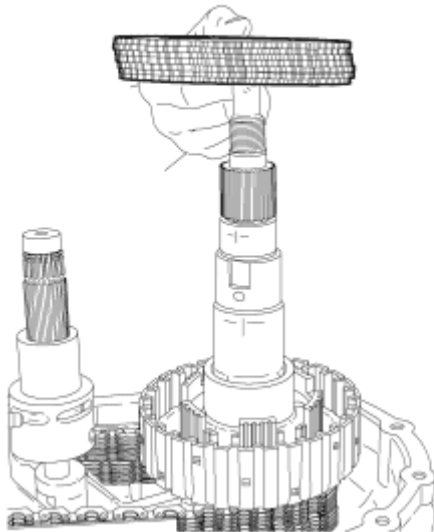
36. Install the clutch drum snap ring (2) and thrust washer (1).



81cBe370

Fig. 87: CLUTCH INNER HUB
Courtesy of CHRYSLER LLC

37. Install the inner clutch hub.



81cBe346

Fig. 88: CLUTCH PACK
Courtesy of CHRYSLER LLC

38. Starting with a friction disc and ending with a friction disc, install the clutch pack.

NOTE: The four identical springs must be installed in the orientation shown in illustration.



Fig. 89: RETURN SPRING ASSEMBLY
 Courtesy of CHRYSLER LLC

39. Install the clutch return springs.

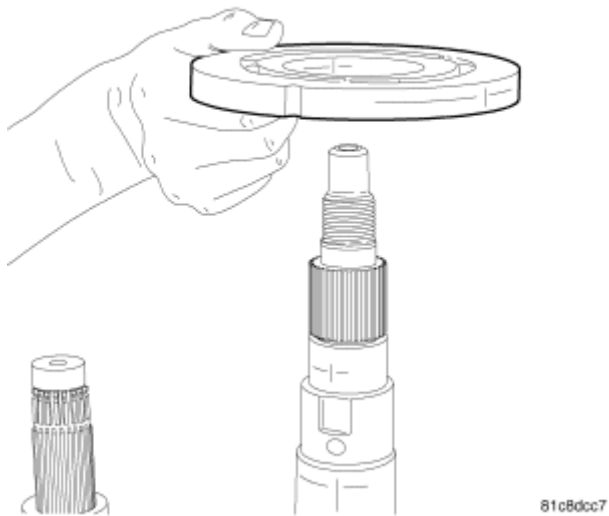


Fig. 90: CLUTCH REACTION PLATE
 Courtesy of CHRYSLER LLC

40. Install the clutch apply piston with the lettering up and the stepped face down.

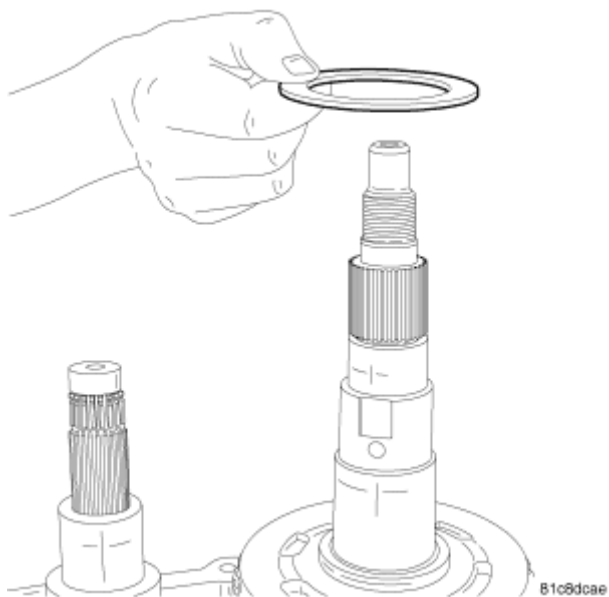


Fig. 91: LOWER RACE
Courtesy of CHRYSLER LLC

41. Install the lower bearing race with the race fitting into the groove in the reaction plate.



Fig. 92: LOWER BEARING
Courtesy of CHRYSLER LLC

42. Install the lower bearing.

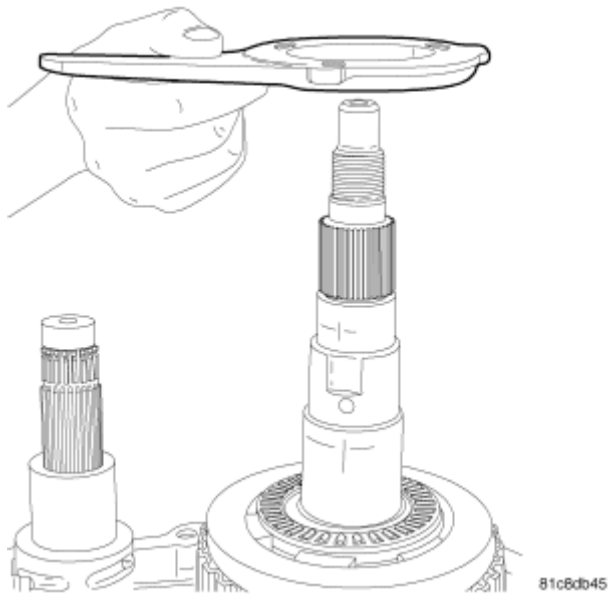


Fig. 93: LOWER SHIFT LEVER
 Courtesy of CHRYSLER LLC

43. Install the lower shift lever.

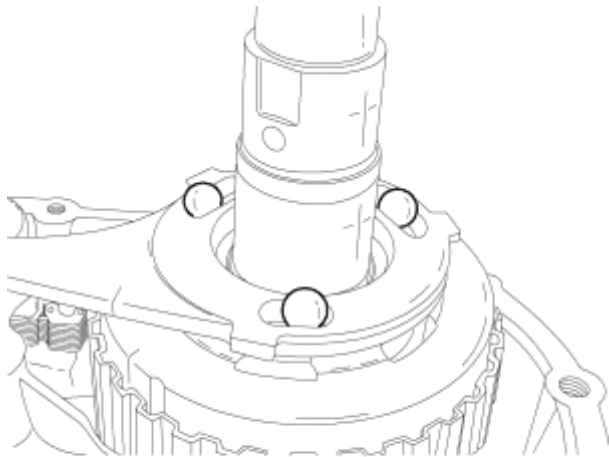
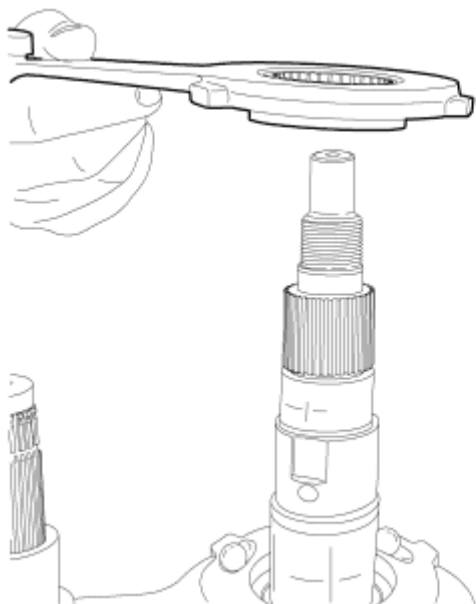


Fig. 94: SHIFT LEVER BALLS
 Courtesy of CHRYSLER LLC

44. Install the shift lever balls into their pockets.



81c8dac2

Fig. 95: UPPER SHIFT LEVER
Courtesy of CHRYSLER LLC

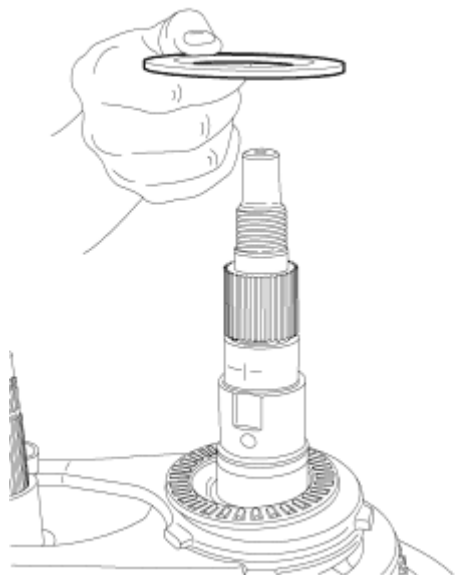
45. Install the upper shift lever.



81c8dab1

Fig. 96: UPPER BEARING
Courtesy of CHRYSLER LLC

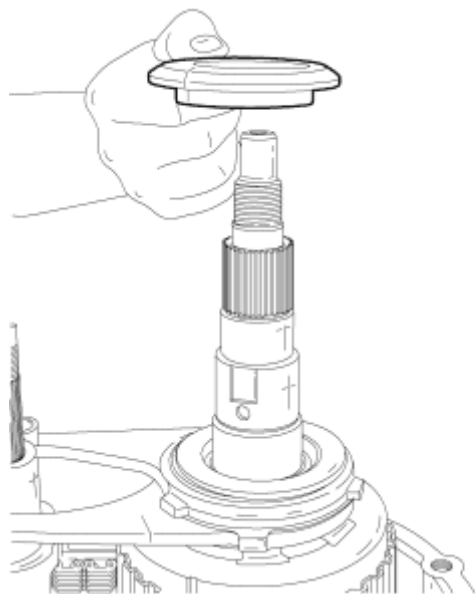
46. Install the upper thrust bearing.



81c8da7c

Fig. 97: UPPER BEARING RACE
Courtesy of CHRYSLER LLC

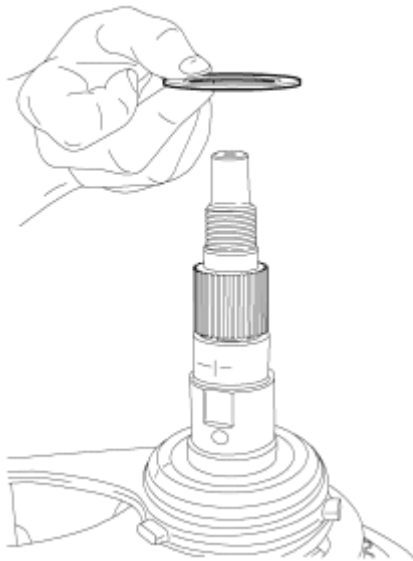
47. Install the upper bearing race.



81c8da4d

Fig. 98: THRUST COLLAR
Courtesy of CHRYSLER LLC

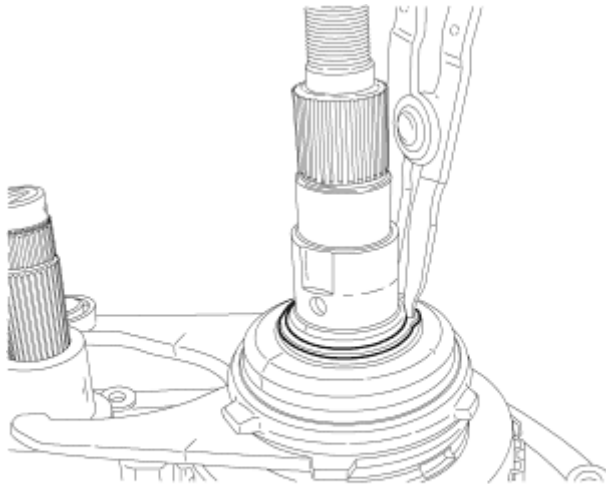
48. Install the thrust collar.



81cBda49

Fig. 99: CLUTCH SHIM
Courtesy of CHRYSLER LLC

49. Install the clutch shim.



81c8f166

Fig. 100: CLUTCH UPPER SNAP RING
Courtesy of CHRYSLER LLC

50. Install clutch upper snap ring.

NOTE: The clutch cam has the word "FRONT" stamped into. This identifies the orientation of the clutch cam to the front of the transfer case. Before installing the clutch cam, note the orientation of the clutch cam inner

splines to the outer splines on the shift shaft. Install it such that the roller falls into low point of clutch cam.

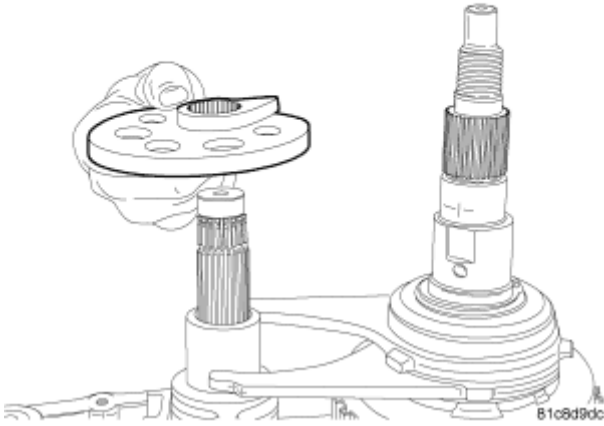


Fig. 101: CLUTCH CAM
Courtesy of CHRYSLER LLC

51. Install the clutch cam.

NOTE: Before installing the worm drive gear, note the orientation of the worm drive gear inner splines to the outer splines on the shift shaft.

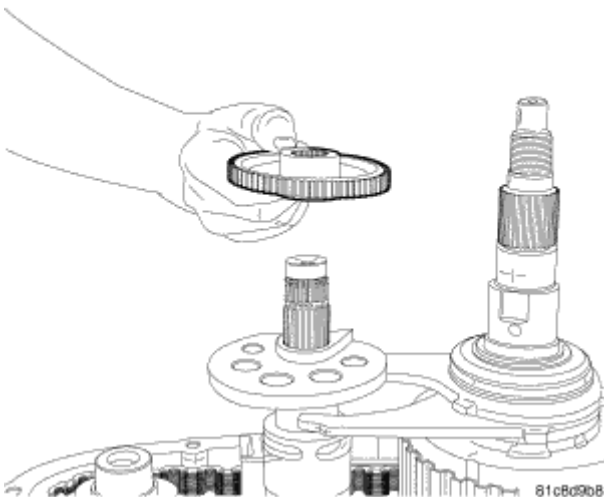
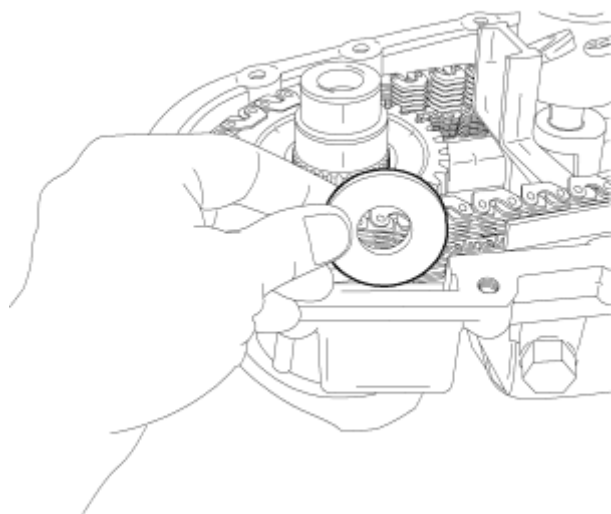


Fig. 102: WORM SHAFT DRIVE GEAR
Courtesy of CHRYSLER LLC

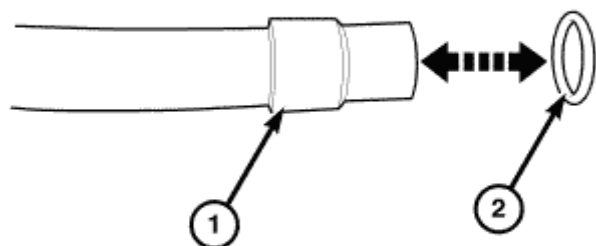
52. Install the worm drive gear.



81c80900

Fig. 103: MAGNET
Courtesy of CHRYSLER LLC

53. Install the magnet into the magnet pocket.

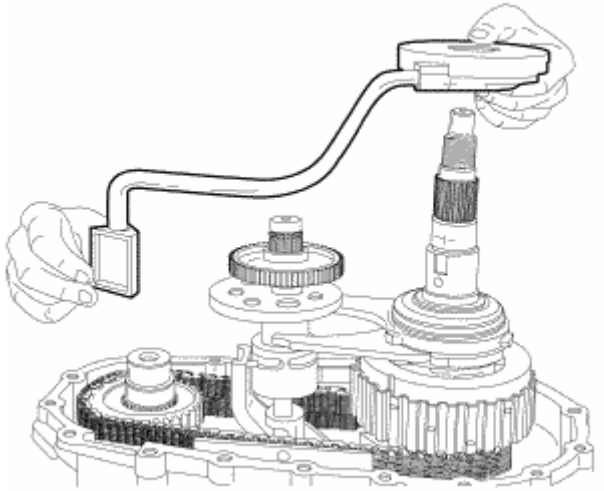


81c16186

Fig. 104: OIL TUBE O-RING
Courtesy of CHRYSLER LLC

1 - OIL TUBE
2 - O-RING SEAL

54. Install a new o-ring (2) onto the oil pump tube (1).

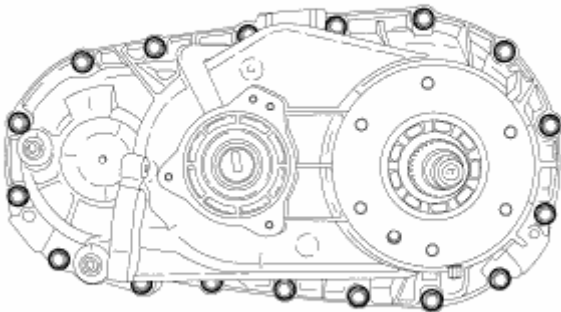


81c8d98c

Fig. 105: OIL PUMP ASSEMBLY

Courtesy of CHRYSLER LLC

55. Lubricate the oil tube o-ring with MOPAR® ATF+4 and install the tube into the oil pump.
56. Install the oil pump assembly.



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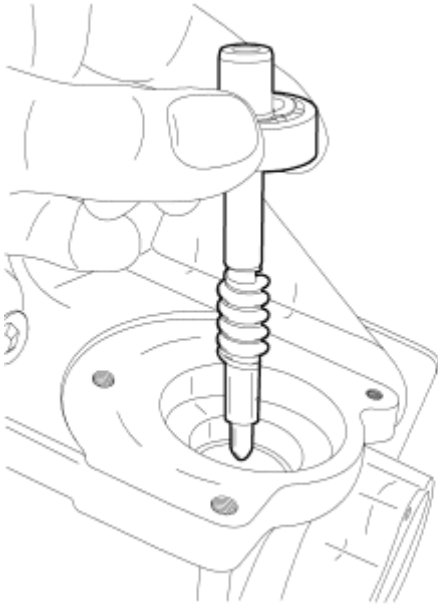
Fig. 106: HOUSING BOLTS

Courtesy of CHRYSLER LLC

NOTE: Do not use excessive amount of sealer as excess could be displaced into the oil pump. Keep sealer bead width to maximum of 3 mm (1/8 inch).

57. Apply bead of Mopar® Gasket Maker, or equivalent, to one of the mating surfaces of the front or rear housing.
58. Install the rear housing onto the front housing. Install the housing bolts. Tighten housing bolts in a crisscross pattern to 27 N.m (20 ft. lbs.).

CAUTION: Carefully align and thread (rotate counterclockwise) the worm shaft to install it into the transfer case. Failure to follow this caution may result in parts damage.

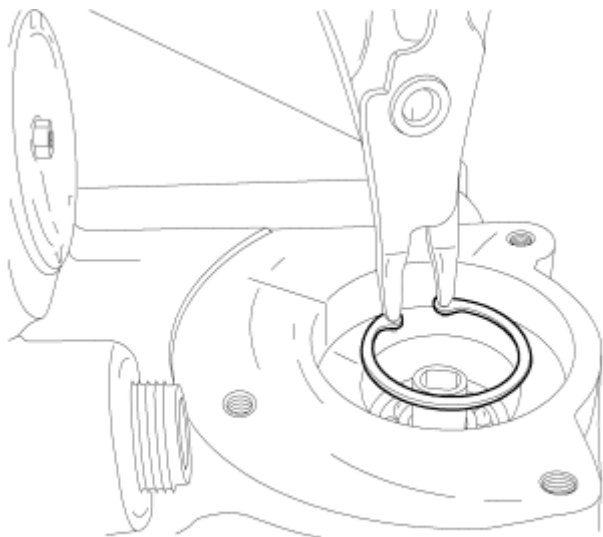


81c6fb45

Fig. 107: WORM SHAFT
Courtesy of CHRYSLER LLC

59. Install the worm shaft into the transfer case.

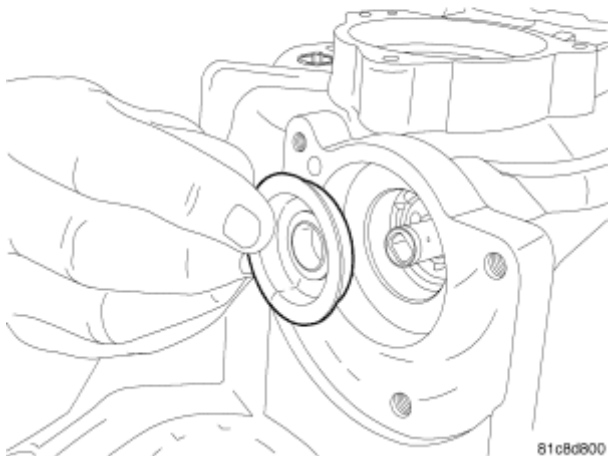
NOTE: It may be necessary to apply slight inward pressure on the worm shaft to seat the snap ring.



81cBd80a

Fig. 108: WORM SHAFT SNAP RING
Courtesy of CHRYSLER LLC

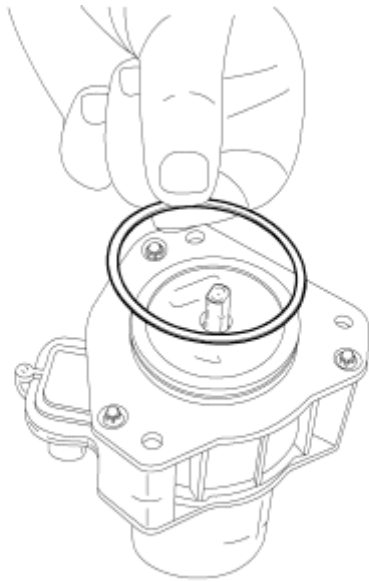
60. Install the worm shaft snap ring.



81cBd800

Fig. 109: REMOVE SHIFT MOTOR SEAL
Courtesy of CHRYSLER LLC

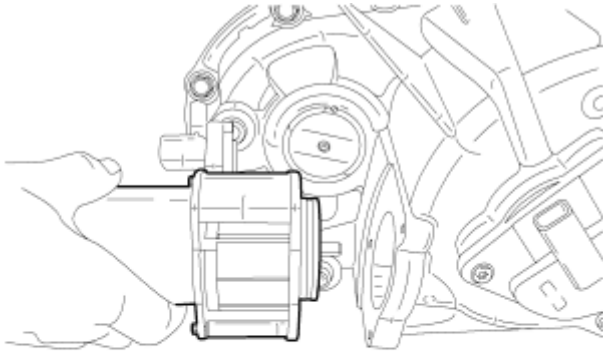
61. Using a suitable installer, install the shift motor seal.



81c8d7fb

Fig. 110: SHIFT MOTOR O-RING
Courtesy of CHRYSLER LLC

62. Install a new o-ring onto the shift motor.

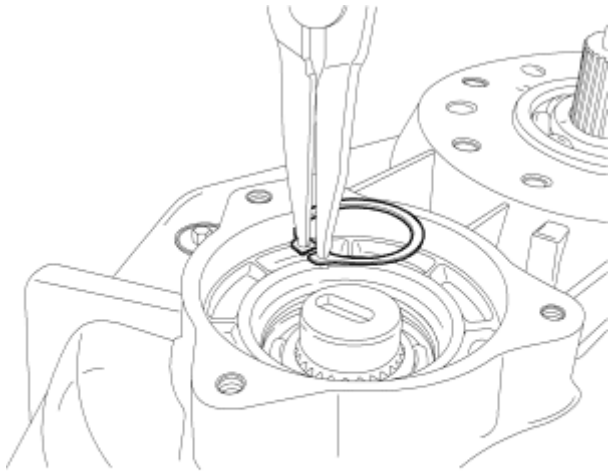


81c8d717

Fig. 111: SHIFT MOTOR
Courtesy of CHRYSLER LLC

NOTE: Note the orientation of the shift motor shaft to the worm gear shaft.

63. Install the shift motor onto the transfer case. Install the shift motor bolts. Tighten the shift motor bolts to 13 N.m (9 ft. lbs.).

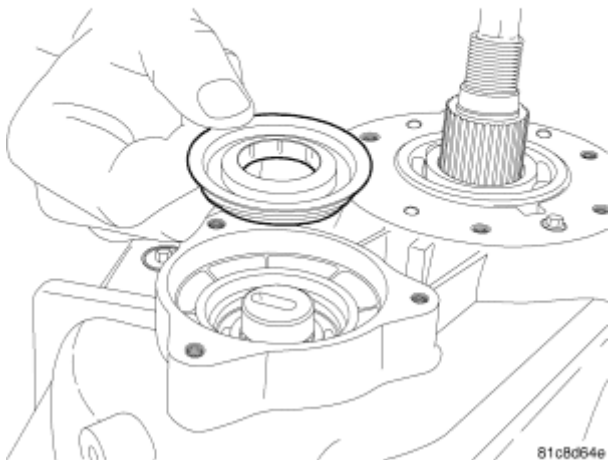


81c8d66b

Fig. 112: SHIFT SHAFT SNAP RING
 Courtesy of CHRYSLER LLC

NOTE: It may be necessary to pull out on the shift shaft to properly seat the shift shaft snap ring.

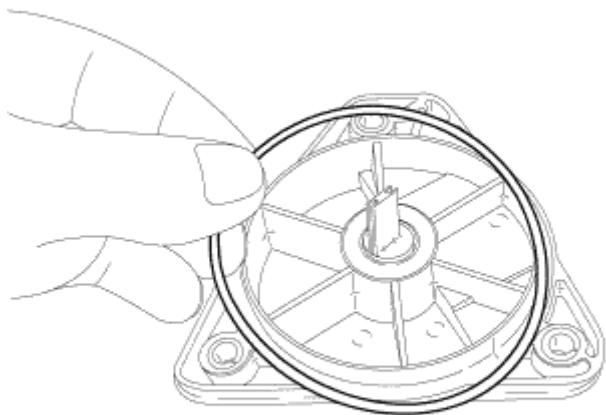
64. Install the shift shaft snap ring.



81c8d64e

Fig. 113: REMOVE ENCODER SEAL
 Courtesy of CHRYSLER LLC

65. Using a suitable installer, install the shift shaft seal.



81c8d644

Fig. 114: ENCODER O-RING
Courtesy of CHRYSLER LLC

66. Install a new o-ring onto the encoder.

NOTE: Before installing the encoder onto the transfer case, be certain to align the encoder shaft to the shift shaft and the dowel on the encoder to the hole in the case accordingly.

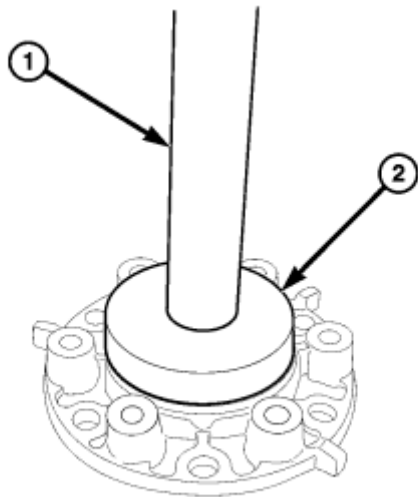


81c8d63c

Fig. 115: ENCODER
Courtesy of CHRYSLER LLC

67. Install the encoder onto the rear transfer case housing. Install the encoder screws. Tighten the screws to 5-

8 N.m (44-71 in. lbs.).



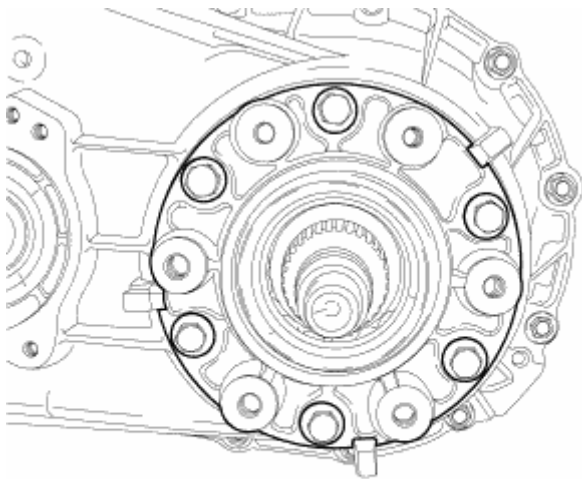
81cc54d8

Fig. 116: REAR COVER SEAL INSTALLATION
Courtesy of CHRYSLER LLC

1 - HANDLE C-4171

2 - INSTALLER/REMOVER C-4210

68. Using a suitable pry tool or a screw mounted in a slide hammer, remove the rear cover seal.
69. Using Installer C-4210 (2) and Handle C-4171 (1), install the rear cover seal.

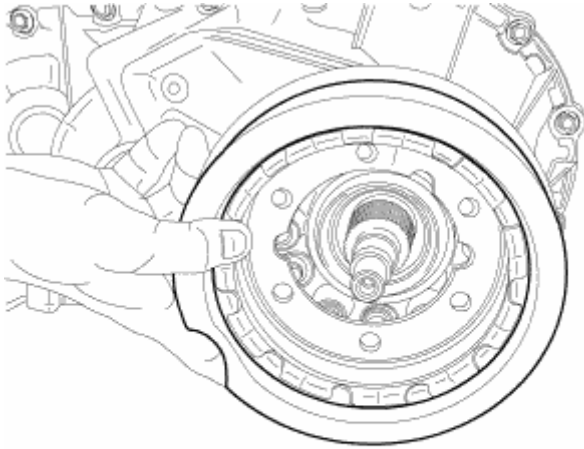


81c8d632

Fig. 117: REAR COVER
Courtesy of CHRYSLER LLC

NOTE: Do not use excessive amount of sealer as excess could be displaced into the oil pump. Keep sealer bead width to maximum of 3 mm (1/8 inch).

70. Apply bead of Mopar® Gasket Maker, or equivalent, to one of mating surfaces of the rear cover or rear housing. Align the tabs on the rear cover to the tabs on the rear housing and install the rear cover. Install the rear cover bolts. Tighten the rear cover bolts in a crisscross pattern to 27 N.m (20 ft. lbs.).

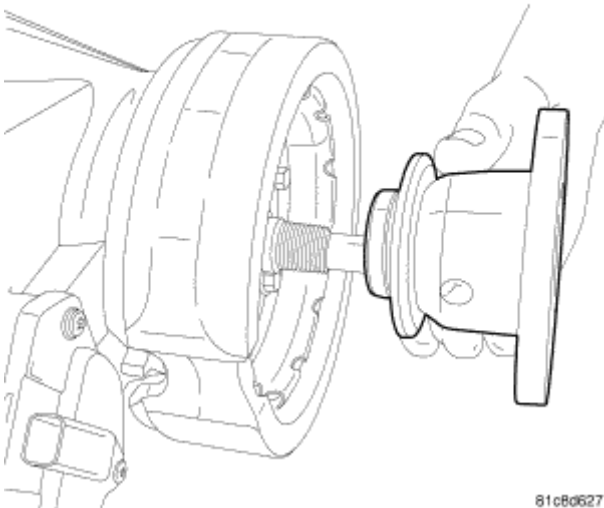


81cBd62b

Fig. 118: DAMPER

Courtesy of CHRYSLER LLC

71. Install the damper, (if equipped) and the damper bolts onto the transfer case. Tighten the damper bolts to 27 N.m (20 ft. lbs.).



81cBd627

Fig. 119: COMPANION FLANGE
Courtesy of CHRYSLER LLC

72. Install the companion flange onto the mainshaft.

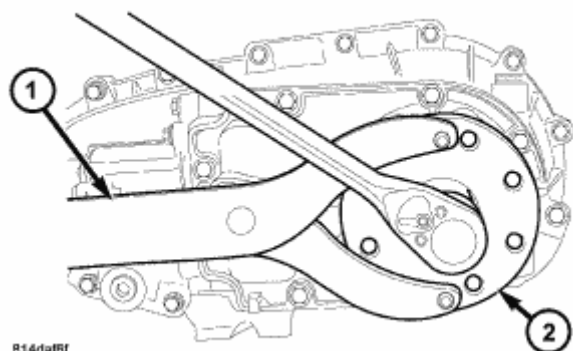


Fig. 120: Remove Rear Output Shaft Nut
Courtesy of CHRYSLER LLC

- | |
|---------------------------|
| 1 - HOLDER C-3281 |
| 2 - REAR COMPANION FLANGE |

73. Using Holder C-3281 (1), install the rear output flange (2) nut. Tighten the nut to 122-176 N.m (90-130 ft. lbs.).

INSTALLATION

TRANSFER CASE -MP3022

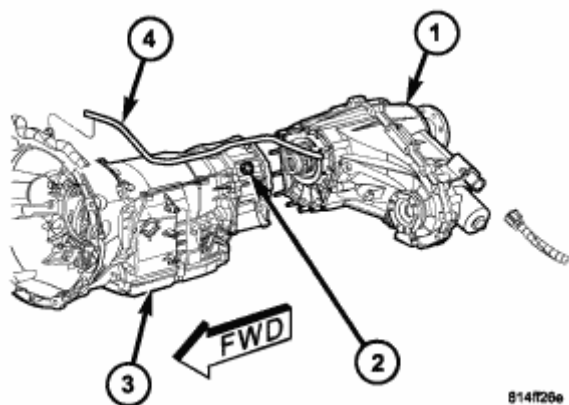


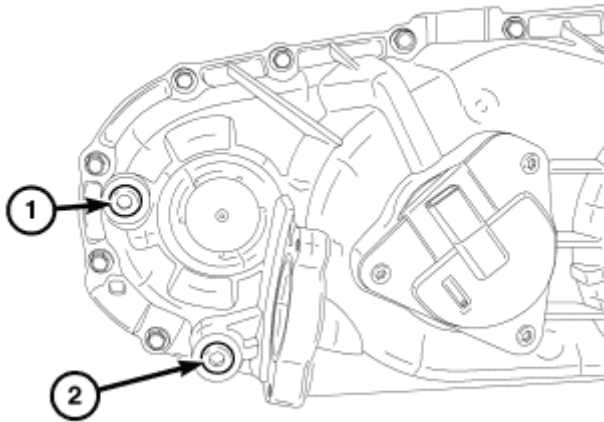
Fig. 121: Removing Transfer Case
Courtesy of CHRYSLER LLC

- | |
|-------------------|
| 1 - TRANSFER CASE |
| 2 - NUTS |

3 - TRANSMISSION

4 - TRANSFER CASE VENT TUBE

1. Mount transfer case (1) on a transmission jack.
2. Secure transfer case to jack with chains.
3. Position transfer case under vehicle.
4. Align transfer case (2) and transmission (3) shafts and install transfer case onto transmission.
5. Install and tighten transfer case attaching nuts (2) to 35 N.m (26 ft. lbs.) torque.
6. Connect the transfer case vent hose (4) to the transfer case.



81cc5220

Fig. 122: DRAIN AND FILL PLUGS

Courtesy of CHRYSLER LLC

1 - FILL PLUG
2 - DRAIN PLUG

7. Install the rear support cushion.
8. Install rear crossmember and skid plate, if equipped.
9. Remove transmission jack and support stand.
10. Connect front propeller shaft and install rear propeller shaft. Refer to **INSTALLATION** .
11. Install the transfer case drain plug (2). Tighten plug to 20-34 N.m (15-25 ft. lbs.)
12. Fill transfer case with correct fluid. See **STANDARD PROCEDURE**. Check transmission fluid level. Correct as necessary.
13. Install the transfer case fill plug (1). Tighten the plug to 20-34 N.m (15-25 ft. lbs.).
14. Connect the shift motor and encoder electrical connectors.
15. Lower vehicle and verify transfer case shift operation.

SPECIFICATIONS

TRANSFER CASE - MP3022

MP3022 FLUID SPECIFICATIONS

TYPE	QUANTITY
ATF+4	1.90L (4.01 Pints) <--
<-- Fill to bottom edge of the fill plug hole.	

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Bolt, Crossmember	41-47	30-34	-
Plug, Clutch Lever Rail (Detent)	20-34	15-25	-
Plugs, Drain/Fill	20-34	15-25	-
Bolts, Case Half	27	20	-
Nut, Companion Flange	122-176	90-130	-
Bolts, Rear Cover	27	20	-
Nuts, T-case mount stud	35	26	-
Bolts, Shift Motor	13	9	-
Screws, Chain Guide	5-8	-	44-71
Screws, Encoder	5-8	-	44-71
Bolts, Damper (if equipped)	27	20	-

SPECIAL TOOLS

TRANSFER CASE -MP3022

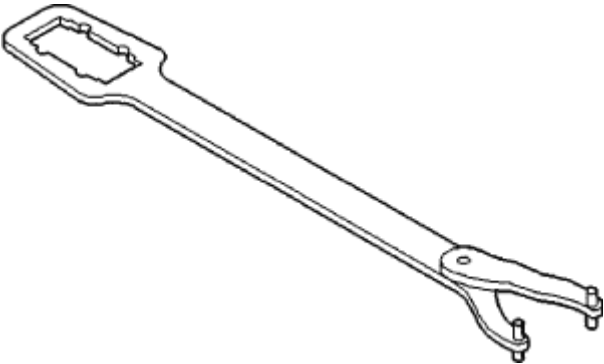


Fig. 123: Holder, Flange - C-3281
Courtesy of CHRYSLER LLC

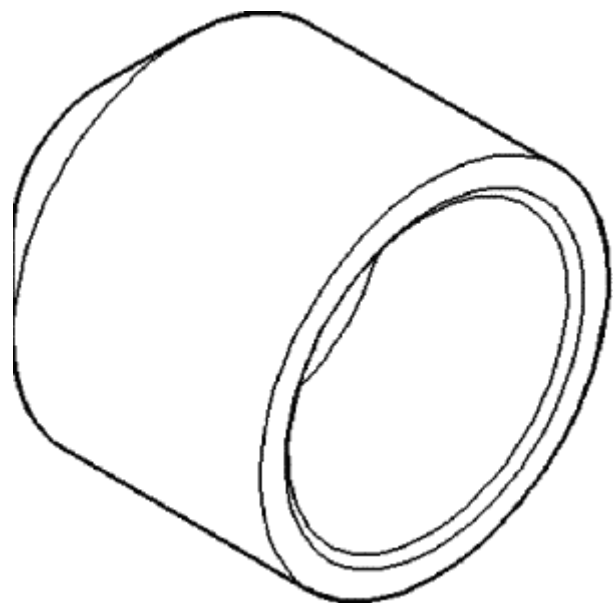


Fig. 124: Installer, Seal - C-3972A
Courtesy of CHRYSLER LLC

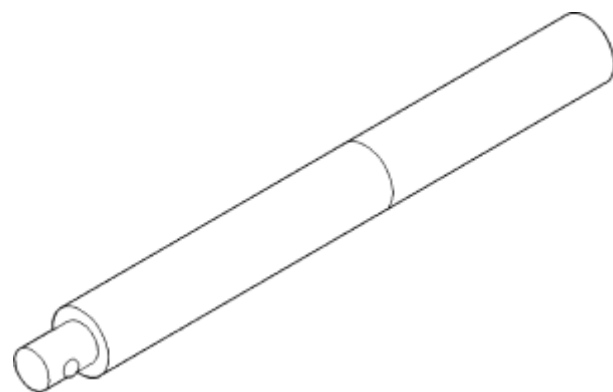


Fig. 125: Handle, Universal - C-4171
Courtesy of CHRYSLER LLC

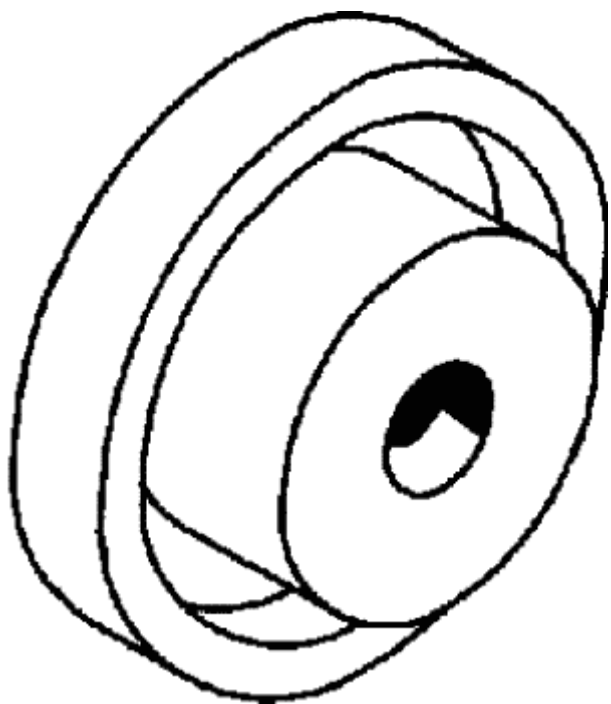


Fig. 126: Installer, Seal - C-4210
Courtesy of CHRYSLER LLC

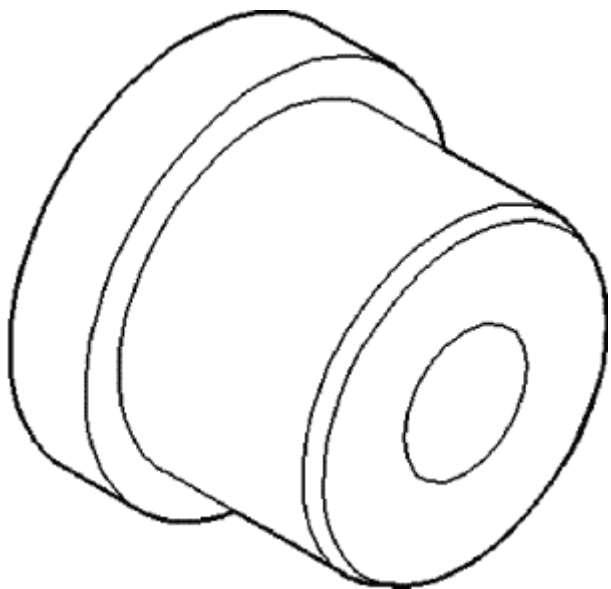


Fig. 127: Installer, Bushing - 5066
Courtesy of CHRYSLER LLC

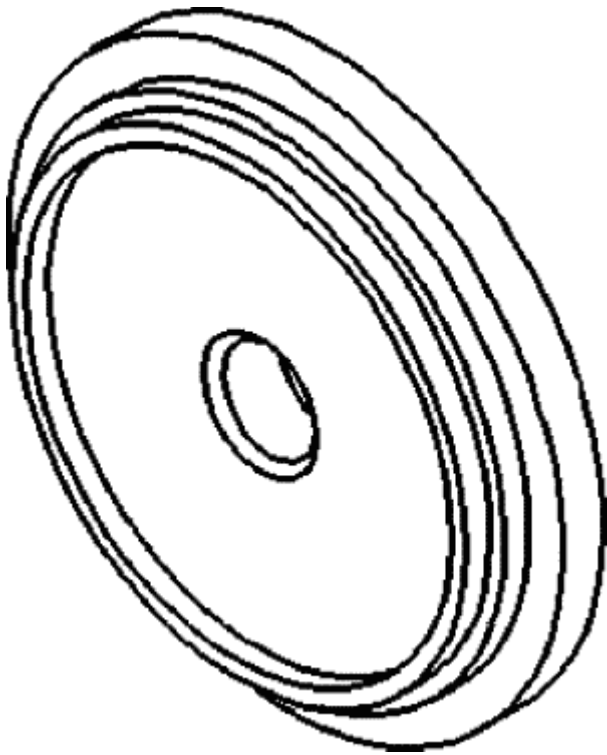


Fig. 128: Installer - 6436
Courtesy of CHRYSLER LLC

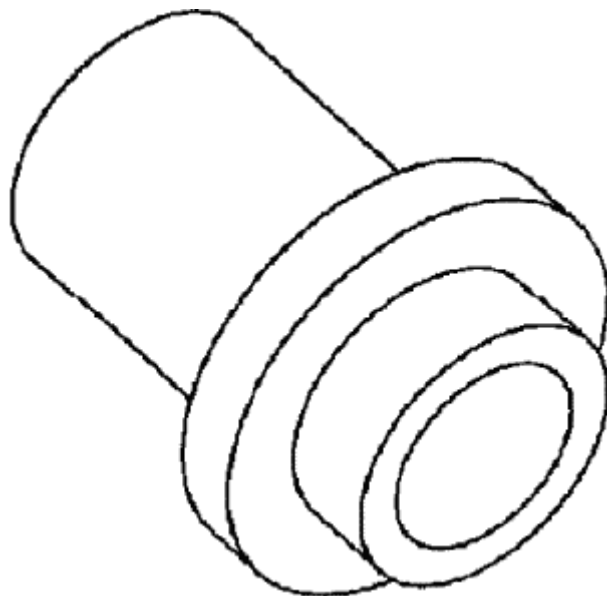


Fig. 129: Installer, Seal - 6560
Courtesy of CHRYSLER LLC

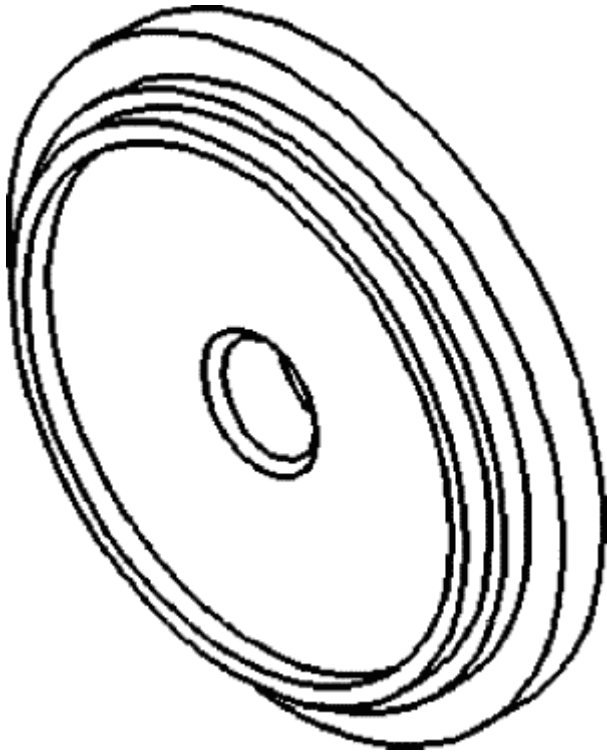


Fig. 130: Installer, Seal - 6061
Courtesy of CHRYSLER LLC

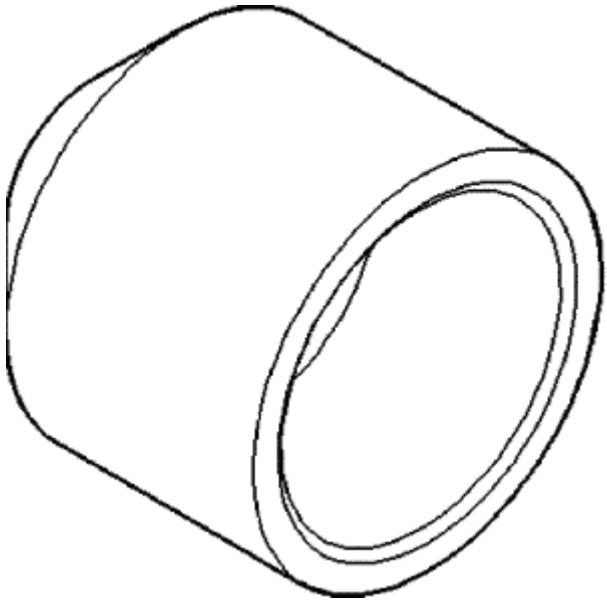


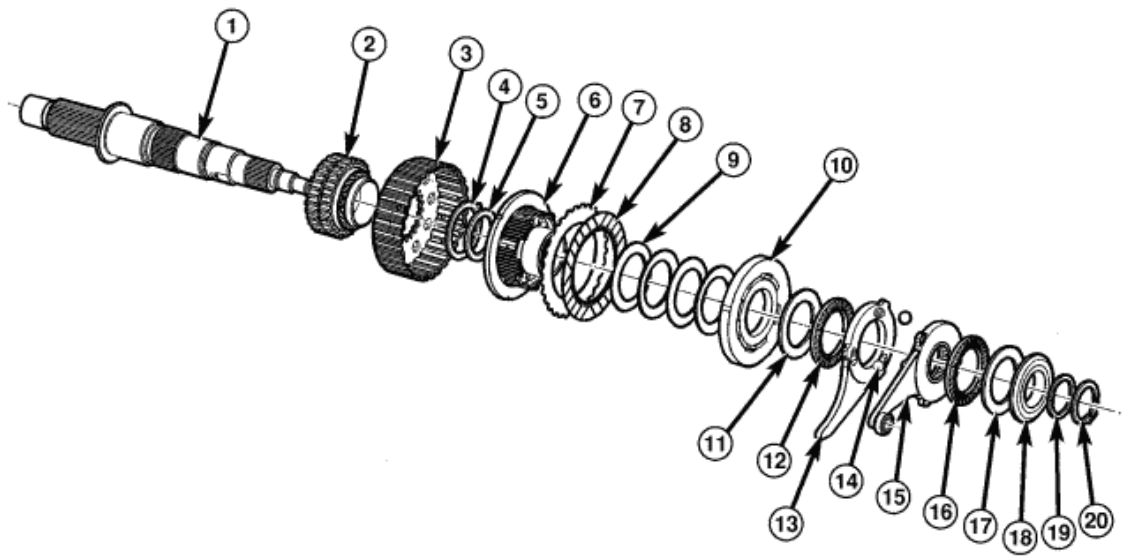
Fig. 131: Installer, Seal - 9672
Courtesy of CHRYSLER LLC

CLUTCH

DISASSEMBLY

CLUTCH PACK

NOTE: If the transfer case assembly is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the Scan Tool.

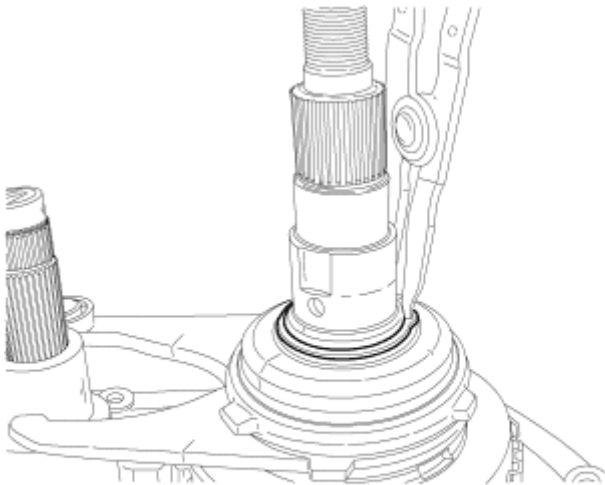


81c60b0f

Fig. 132: MP3022 MAINSHAFT AND CLUTCH ASSEMBLY
Courtesy of CHRYSLER LLC

1 - MAINSHAFT	11 - LOWER THRUST BEARING RACE
2 - DRIVE SPROCKET	12 - LOWER THRUST BEARING
3 - OUTER CLUTCH DRUM	13 - LOWER SHIFT LEVER
4 - SNAP RING	14 - SHIFT LEVER

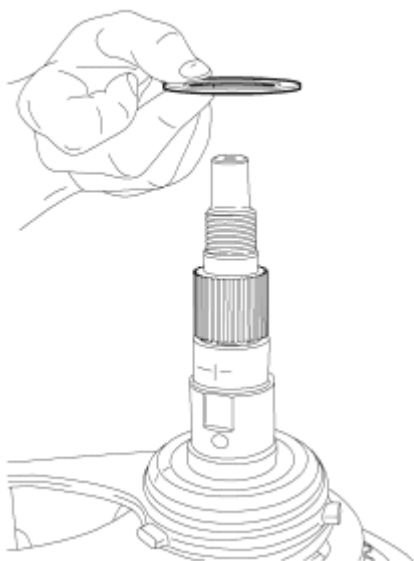
5 - THRUST WASHER	BALLS
6 - INNER CLUTCH HUB	15 - UPPER SHIFT LEVER
7 - CLUTCH REACTION PLATE (total of 7)	16 - UPPER THRUST BEARING
8 - CLUTCH FRICTION DISC (total of 8)	17 - UPPER THRUST BEARING RACE
9 - CLUTCH RETURN SPRINGS (total of 4)	18 - THRUST COLLAR
10 - CLUTCH APPLY PISTON	19 - CLUTCH SHIM
	20 - SNAP RING



81c61166

Fig. 133: CLUTCH UPPER SNAP RING
Courtesy of CHRYSLER LLC

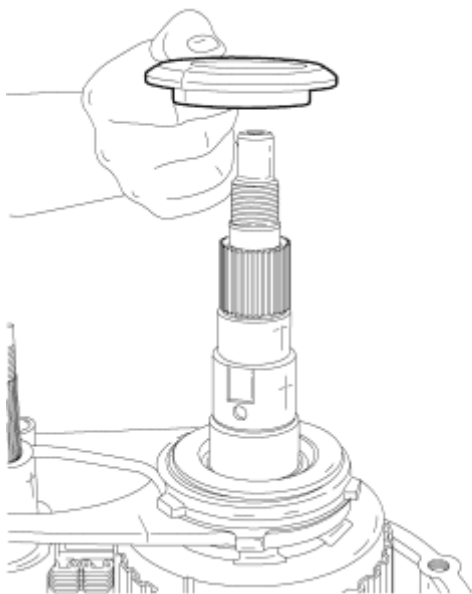
1. Remove the clutch upper snap ring.



81cBda49

Fig. 134: CLUTCH SHIM
Courtesy of CHRYSLER LLC

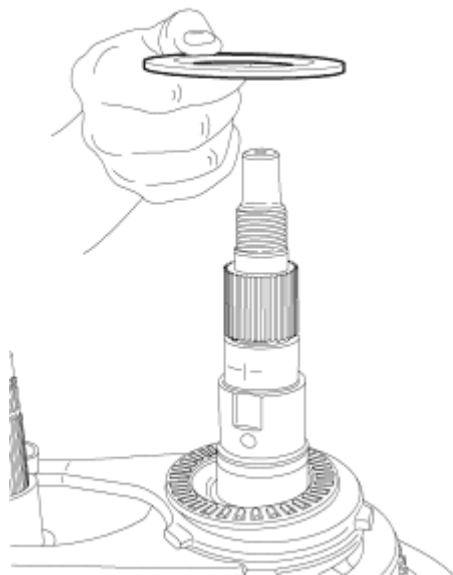
2. Remove the clutch shim.



81cBda4d

Fig. 135: THRUST COLLAR
Courtesy of CHRYSLER LLC

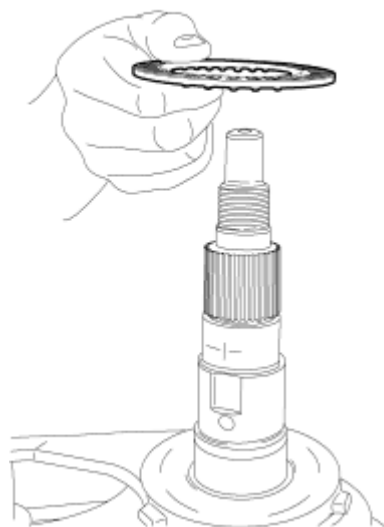
3. Remove the thrust collar.



81c8da7c

Fig. 136: UPPER BEARING RACE
Courtesy of CHRYSLER LLC

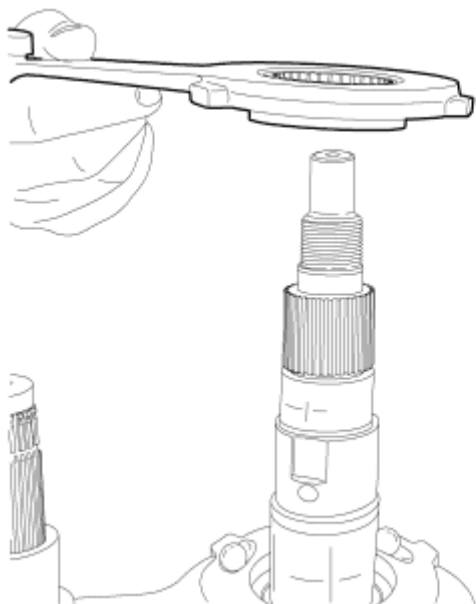
4. Remove the upper thrust bearing race.



81c8dab1

Fig. 137: UPPER BEARING
Courtesy of CHRYSLER LLC

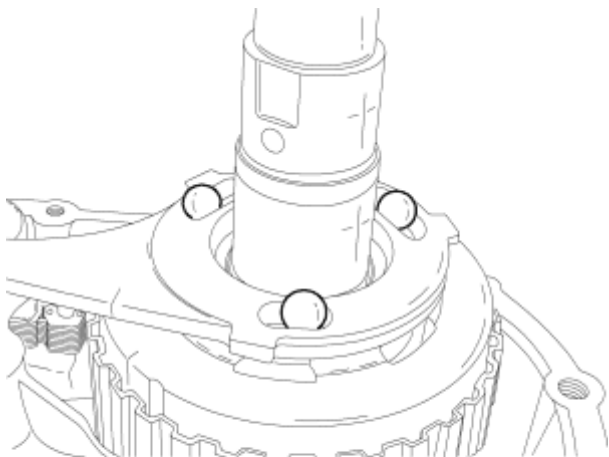
5. Remove the upper thrust bearing.



81c8dac2

Fig. 138: UPPER SHIFT LEVER
Courtesy of CHRYSLER LLC

6. Remove the upper shift lever.



81c8db8c

Fig. 139: SHIFT LEVER BALLS
Courtesy of CHRYSLER LLC

7. Remove the shift lever balls.

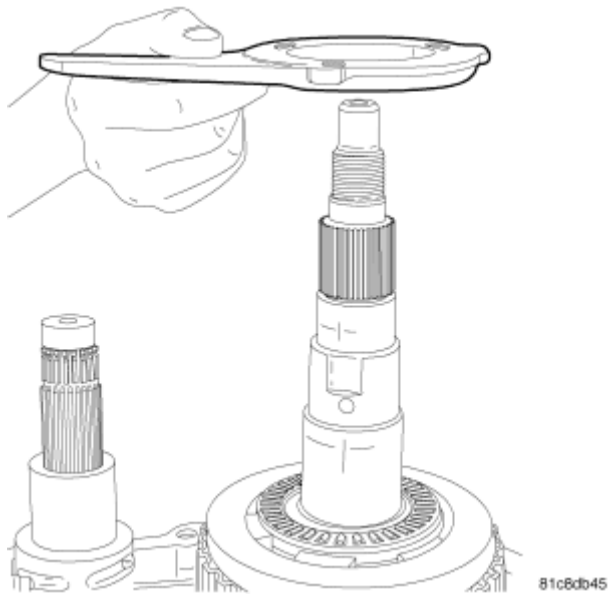


Fig. 140: LOWER SHIFT LEVER
Courtesy of CHRYSLER LLC

8. Remove the lower shift lever.



Fig. 141: LOWER BEARING
Courtesy of CHRYSLER LLC

9. Remove the lower thrust bearing.

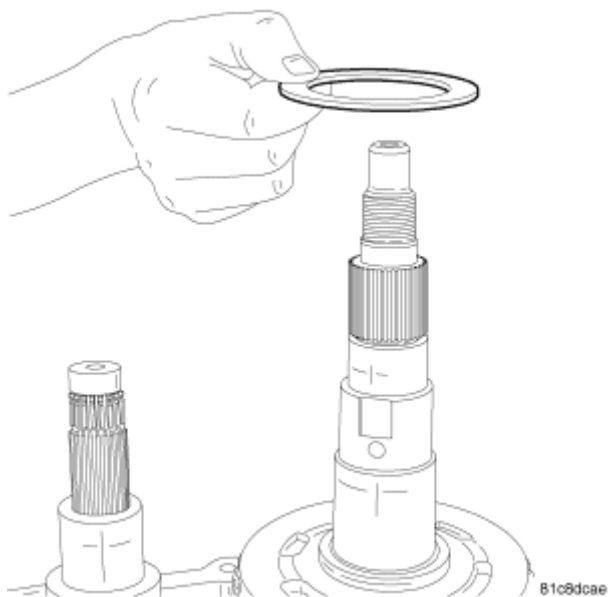


Fig. 142: LOWER RACE
 Courtesy of CHRYSLER LLC

10. Remove the lower bearing race.

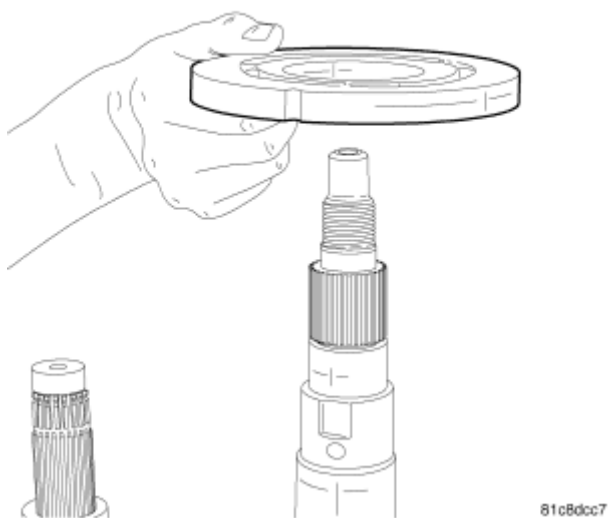


Fig. 143: CLUTCH APPLY PISTON
 Courtesy of CHRYSLER LLC

11. Remove the clutch apply piston.

NOTE: For ease of installation note the assembly orientation of the 4 identical springs.



Fig. 144: RETURN SPRING ASSEMBLY
 Courtesy of CHRYSLER LLC

12. Remove the clutch return springs.

NOTE: For ease of installation note the assembly configuration of the clutch plates and friction discs.

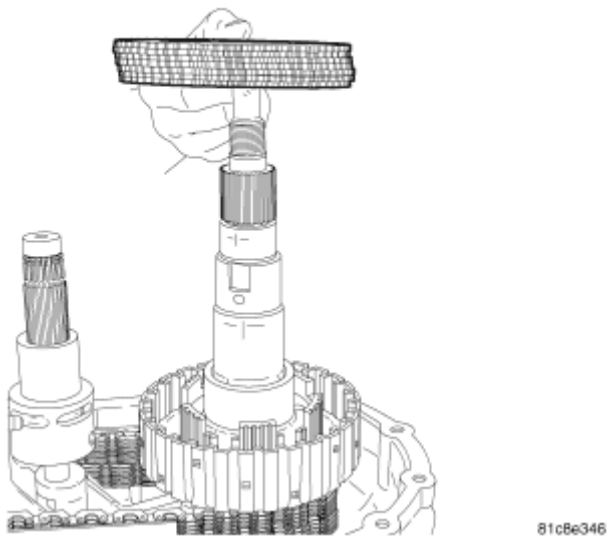


Fig. 145: CLUTCH PACK
 Courtesy of CHRYSLER LLC

13. Remove the clutch pack.

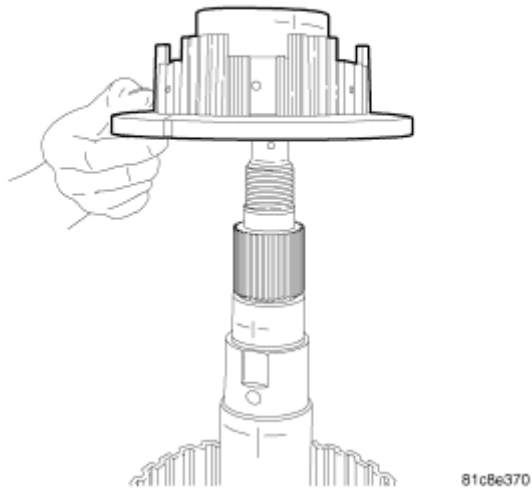


Fig. 146: CLUTCH INNER HUB
Courtesy of CHRYSLER LLC

14. Remove the inner clutch hub.

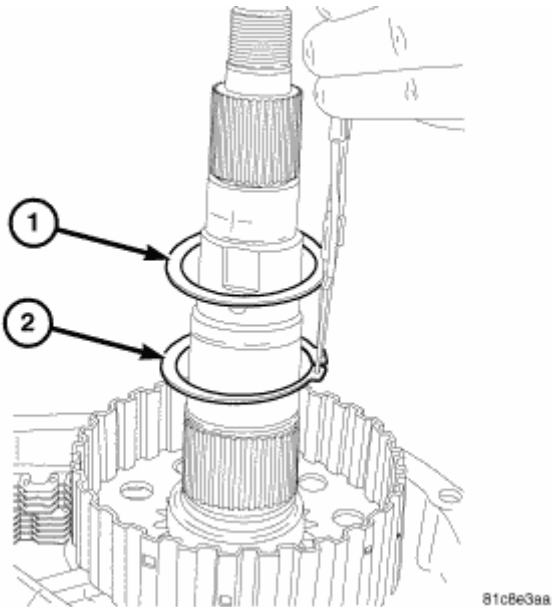
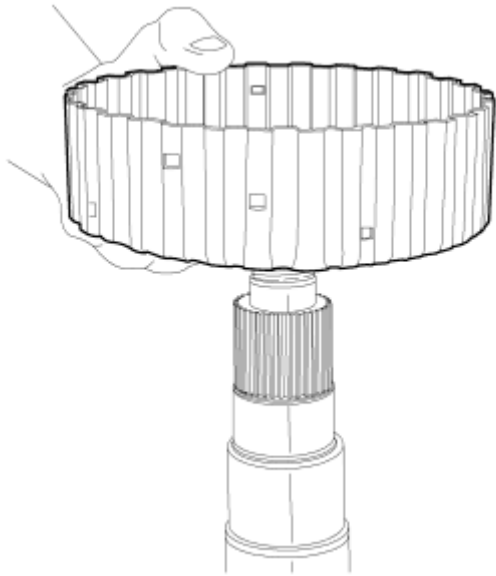


Fig. 147: CLUTCH HUB SNAP RING
Courtesy of CHRYSLER LLC

15. Remove the clutch hub thrust washer (1) and snap ring (2).



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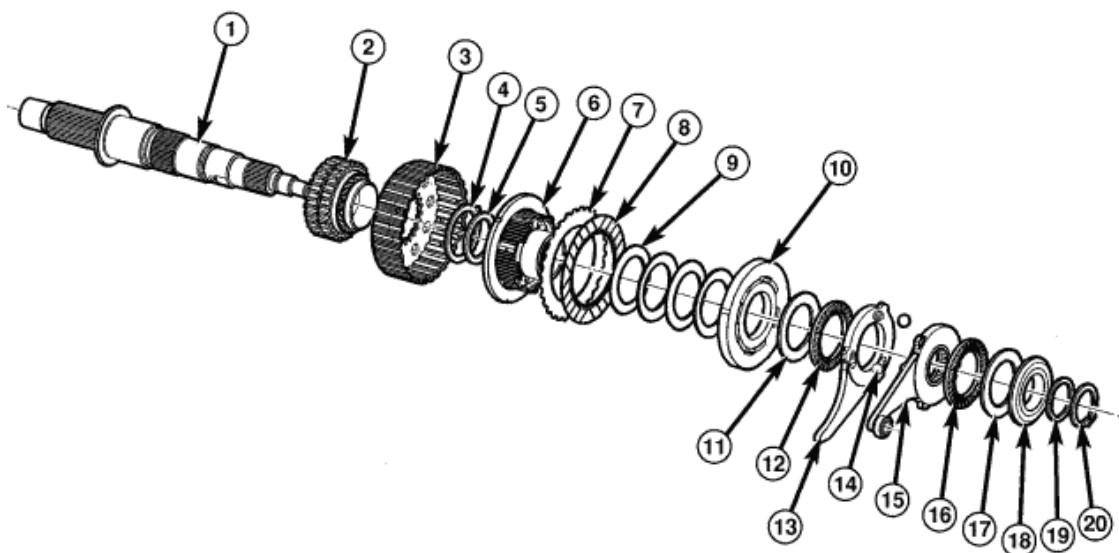
Fig. 148: CLUTCH HUB
Courtesy of CHRYSLER LLC

16. Remove the outer clutch drum from the main shaft and drive sprocket.

ASSEMBLY

CLUTCH PACK

NOTE: If the transfer case assembly is being reconditioned (clutch/seal replacement) or replaced, it is necessary to perform the Quick Learn Procedure using the Scan Tool.



81c60b01

Fig. 149: MP3022 CLUTCH PACK

Courtesy of CHRYSLER LLC

1 - MAINSHAFT

2 - DRIVE SPROCKET

3 - OUTER CLUTCH DRUM

4 - SNAP RING

5 - THRUST WASHER

11 - LOWER THRUST BEARING RACE

12 - LOWER THRUST BEARING

13 - LOWER SHIFT LEVER

14 - SHIFT LEVER BALLS

15 - UPPER SHIFT LEVER

16 -

6 - INNER CLUTCH HUB

7 - CLUTCH REACTION PLATE (total of 7)

8 - CLUTCH FRICTION DISC (total of 8)

9 - CLUTCH RETURN SPRINGS (total of 4)

10 - CLUTCH APPLY PISTON

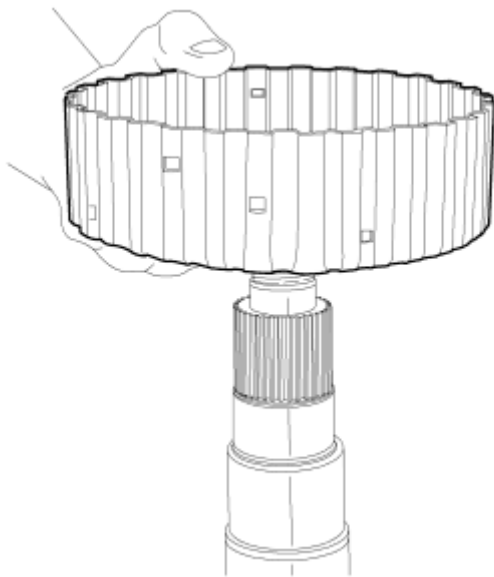
UPPER
THRUST
BEARING

17 -
UPPER
THRUST
BEARING
RACE

18 -
THRUST
COLLAR

19 -
CLUTCH
SHIM

20 - SNAP
RING



81c8e3b6

Fig. 150: CLUTCH HUB
Courtesy of CHRYSLER LLC

1. Install the outer clutch drum onto the main shaft and drive sprocket.

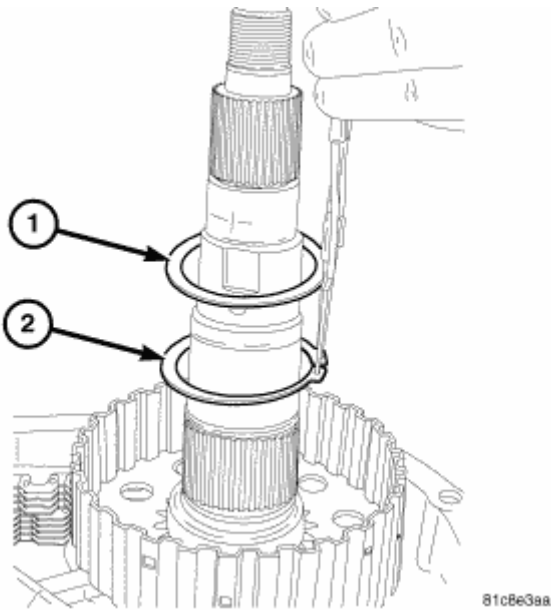


Fig. 151: CLUTCH HUB SNAP RING
Courtesy of CHRYSLER LLC

2. Install the clutch hub snap ring (2) and thrust washer (1).

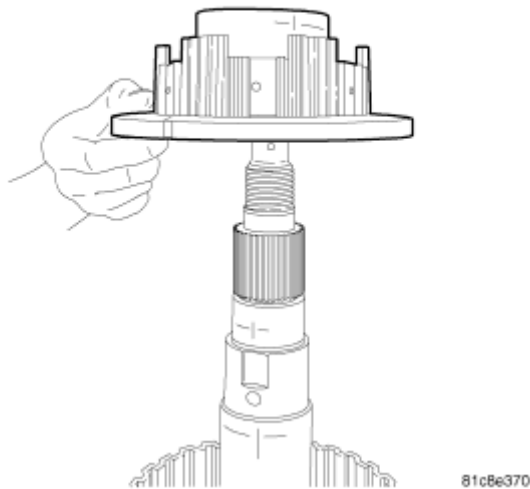
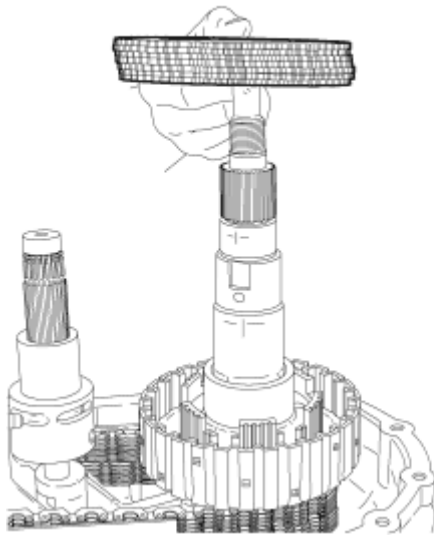


Fig. 152: CLUTCH INNER HUB
Courtesy of CHRYSLER LLC

3. Install the inner clutch hub.

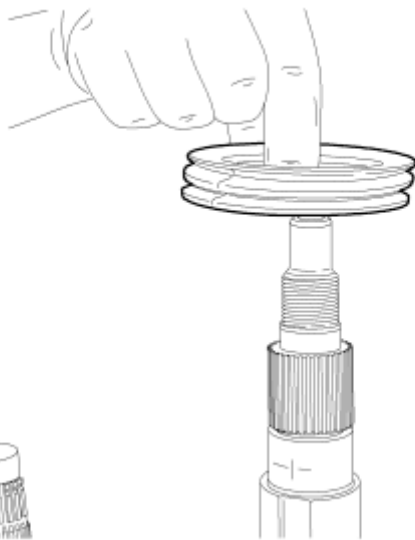


81cBe346

Fig. 153: CLUTCH PACK
 Courtesy of CHRYSLER LLC

4. Starting with friction disc and ending with a friction disc, install the clutch pack.

NOTE: **The four identical springs must be installed in the orientation shown in illustration.**



81cBdd30

Fig. 154: RETURN SPRING ASSEMBLY
 Courtesy of CHRYSLER LLC

5. Install the clutch return springs.

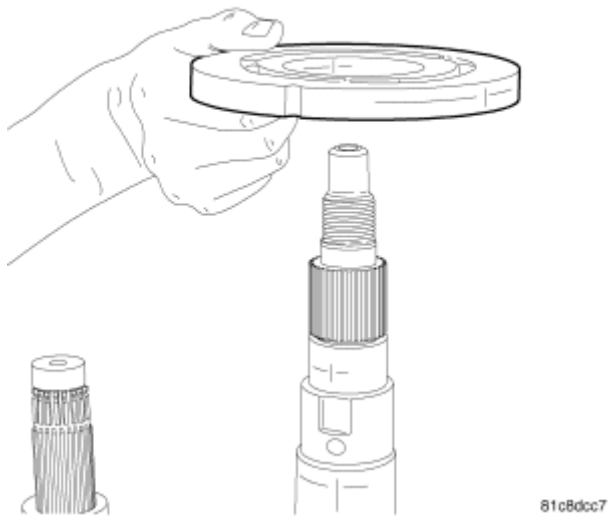


Fig. 155: CLUTCH REACTION PLATE
 Courtesy of CHRYSLER LLC

6. Install the clutch apply piston with the lettering up and the stepped face down.

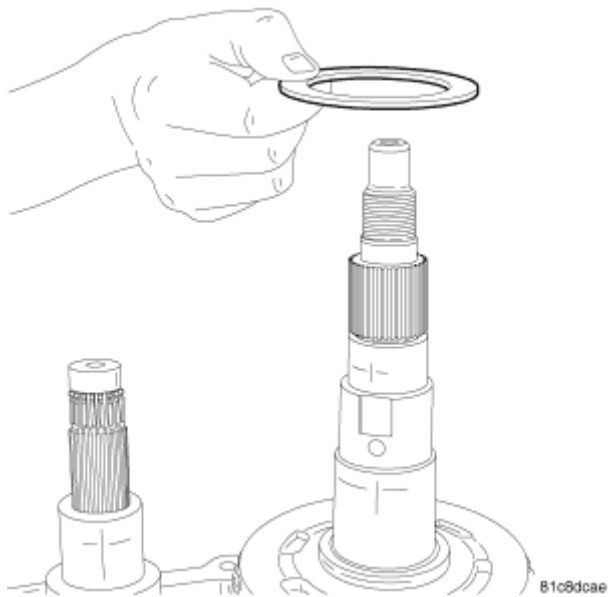


Fig. 156: LOWER RACE
 Courtesy of CHRYSLER LLC

7. Install the lower thrust bearing race.

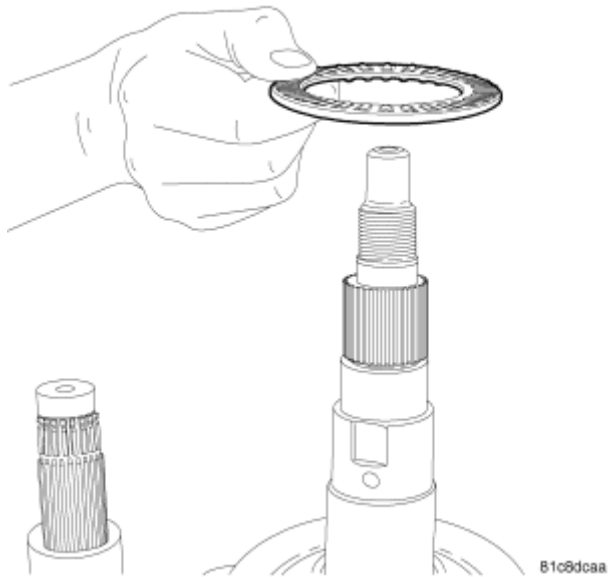


Fig. 157: LOWER BEARING
 Courtesy of CHRYSLER LLC

8. Install the lower thrust bearing.

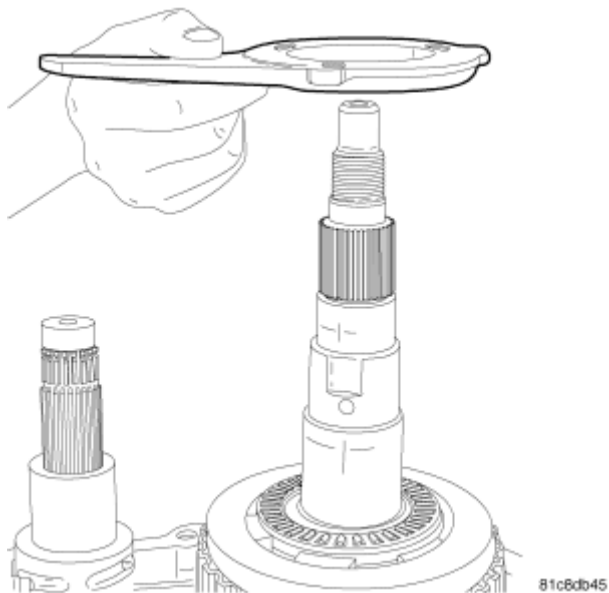
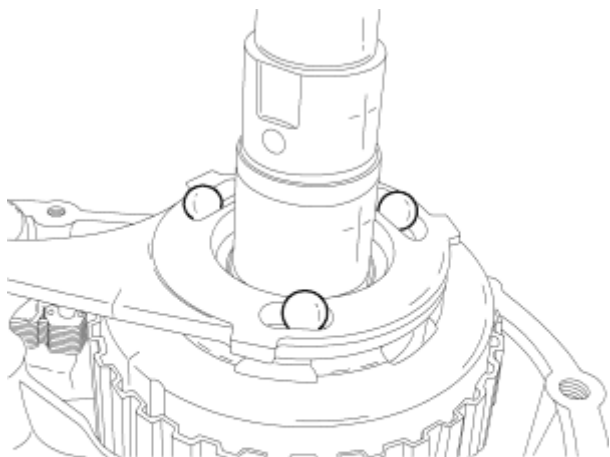


Fig. 158: LOWER SHIFT LEVER
 Courtesy of CHRYSLER LLC

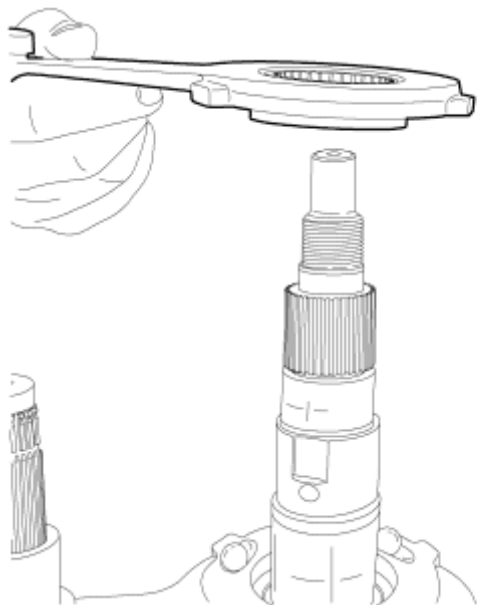
9. Install the lower shift lever.



81c8db8c

Fig. 159: SHIFT LEVER BALLS
 Courtesy of CHRYSLER LLC

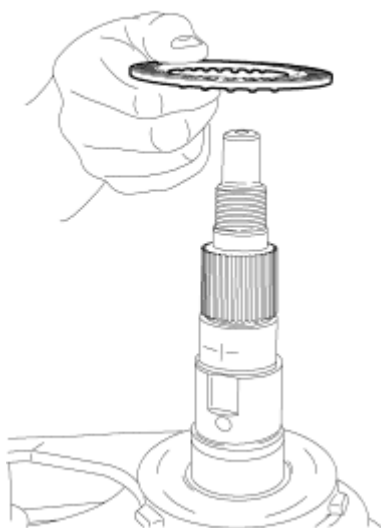
10. Install the shift lever balls into their pockets.



81c8dac2

Fig. 160: UPPER SHIFT LEVER
 Courtesy of CHRYSLER LLC

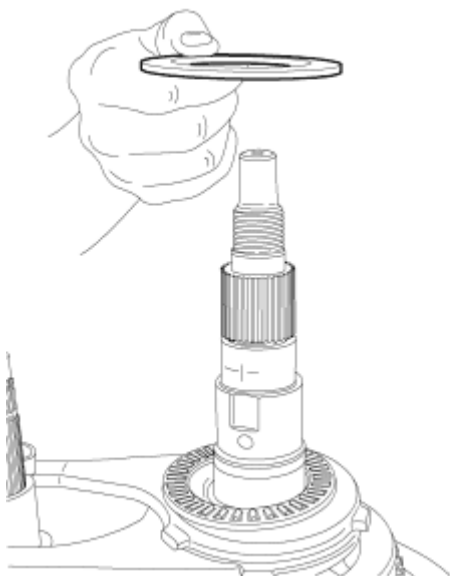
11. Install the upper shift lever.



81c8dab1

Fig. 161: UPPER BEARING
Courtesy of CHRYSLER LLC

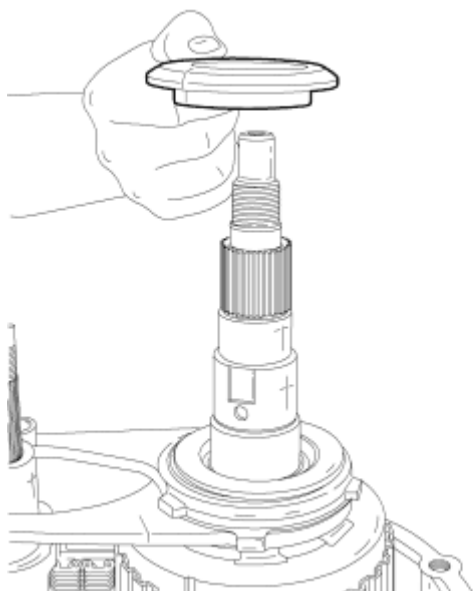
12. Install the upper thrust bearing.



81c8da7c

Fig. 162: UPPER BEARING RACE
Courtesy of CHRYSLER LLC

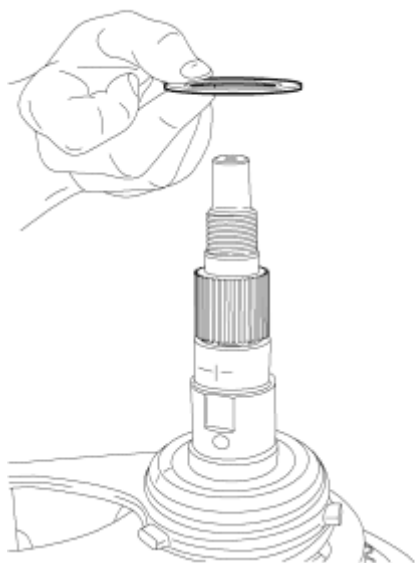
13. Install the upper thrust bearing race.



81c8da4d

Fig. 163: THRUST COLLAR
Courtesy of CHRYSLER LLC

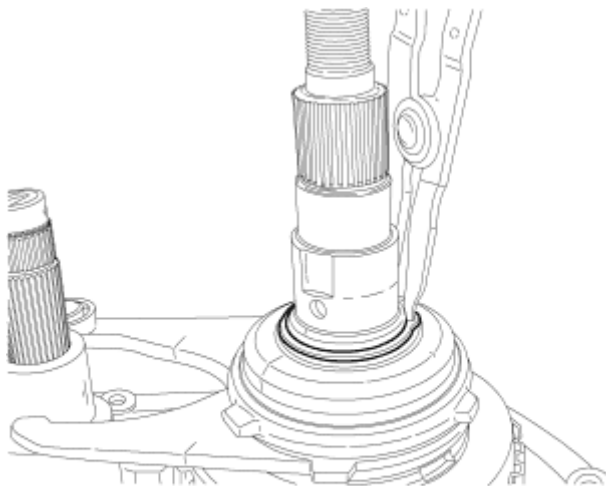
14. Install the thrust collar.



81c8da49

Fig. 164: CLUTCH SHIM
Courtesy of CHRYSLER LLC

15. Install the clutch shim.



81c6t66

Fig. 165: CLUTCH UPPER SNAP RING
 Courtesy of CHRYSLER LLC

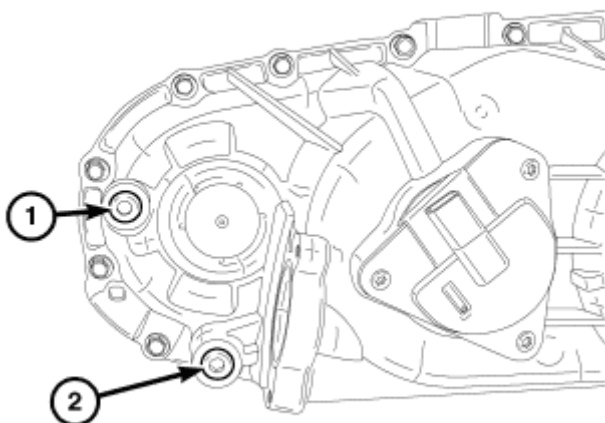
16. Install the clutch upper snap ring.

FLUID

STANDARD PROCEDURE

FLUID DRAIN/REFILL

The fill and drain plugs are both in the rear case.



81c5220

Fig. 166: DRAIN AND FILL PLUGS

- | |
|---------------------------------|
| 1 - FILL PLUG
2 - DRAIN PLUG |
|---------------------------------|

1. Raise vehicle. Ensure that the vehicle is level on the hoist.
2. Position drain pan under transfer case.
3. Remove fill plug (1) and drain plug (2) and drain lubricant completely.
4. Install drain plug (2). Tighten plug to 20-34 N.m (15-25 ft. lbs.).
5. Fill transfer case to bottom edge of fill plug opening with MOPAR® ATF+4
6. Install and tighten fill plug (1). Tighten plug to 20-34 N.m (15-25 ft. lbs.).
7. Lower vehicle.

SEAL-FRONT INPUT SHAFT-MP3022

REMOVAL

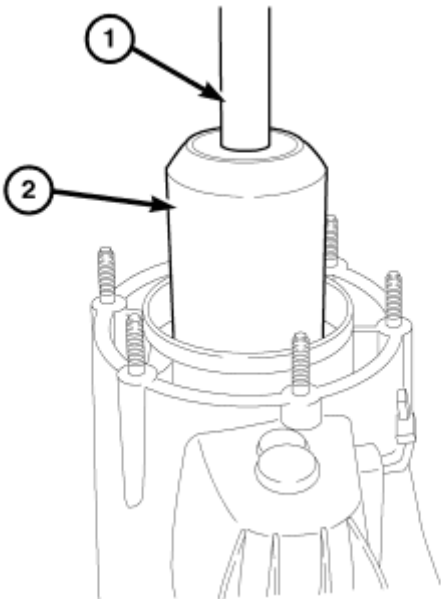
REMOVAL

1. Remove the transfer case from the vehicle. See **REMOVAL**.
2. Remove the front input shaft seal with a suitable pry tool or a screw mounted in a slide hammer.

INSTALLATION

INSTALLATION

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.



81cc61a2

Fig. 167: INSTALL INPUT SHAFT SEAL

Courtesy of CHRYSLER LLC

- | |
|---|
| 1 - HANDLE C-4171
2 - INSTALLER 9672 |
|---|

1. Using Driver handle C-4171 (1) and seal Installer 9672 (2) install the front input shaft seal.
2. Install the transfer case into the vehicle. See **INSTALLATION**.
3. Check the transfer case fluid. See **STANDARD PROCEDURE**. Correct as necessary.

SEAL-FRONT OUTPUT SHAFT

REMOVAL

FRONT OUTPUT SHAFT SEAL

The front output shaft seal and wear sleeve cannot be serviced in the vehicle. The transfer case must be disassembled to remove the front output shaft assembly and seal.

SEAL-REAR OUTPUT SHAFT

REMOVAL

TRANSFER CASE

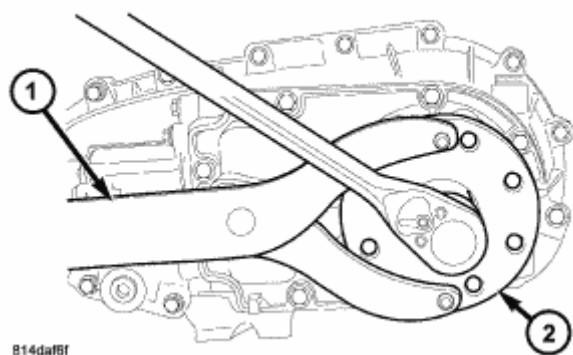
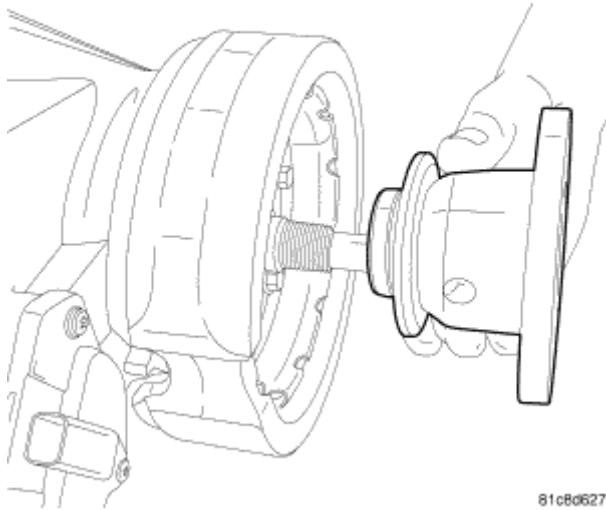


Fig. 168: Remove Rear Output Shaft Nut

Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - HOLDER C-3281
2 - REAR COMPANION FLANGE |
|--|

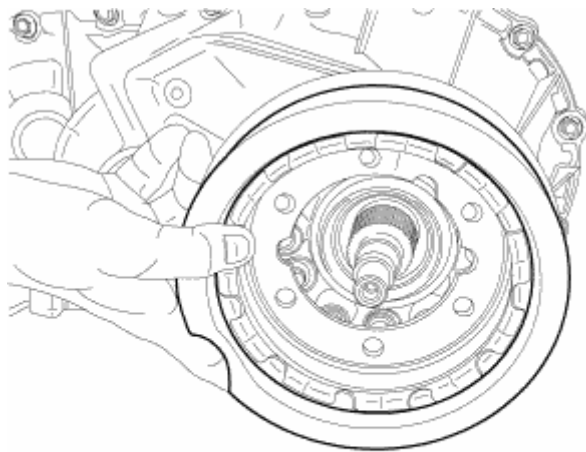
1. Remove the rear propeller shaft. Refer to **REMOVAL** .
2. Using Holder C-3281 (1), remove the rear companion flange (2) nut.



81cBd627

Fig. 169: COMPANION FLANGE
Courtesy of CHRYSLER LLC

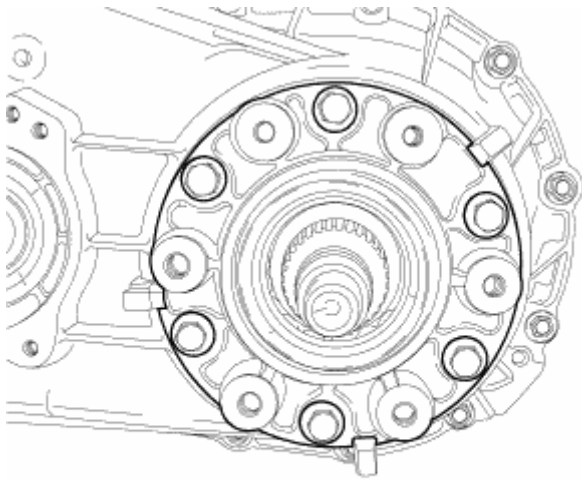
3. Remove the rear output shaft flange from the output shaft. If necessary, use a suitable 2 or 3 jaw puller to remove the output shaft flange.



81cBd62b

Fig. 170: DAMPER
Courtesy of CHRYSLER LLC

4. Remove the damper bolts and the damper from the transfer case, (if equipped).



81c8d632

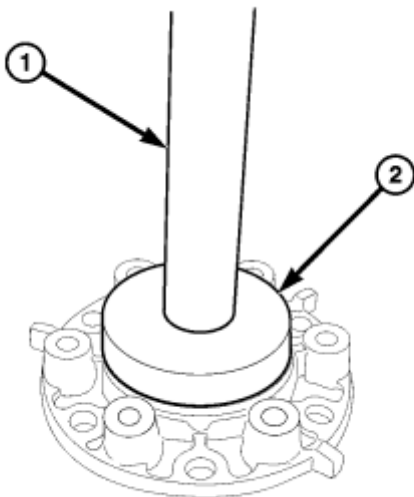
Fig. 171: REAR COVER
 Courtesy of CHRYSLER LLC

5. Remove the rear output shaft seal with a suitable pry tool or a screw mounted in a slide hammer.
6. Remove the rear cover bolts and the rear cover from the transfer case.

INSTALLATION

TRANSFER CASE

NOTE: Lubricate all seals with MOPAR® ATF+4 prior to installation.

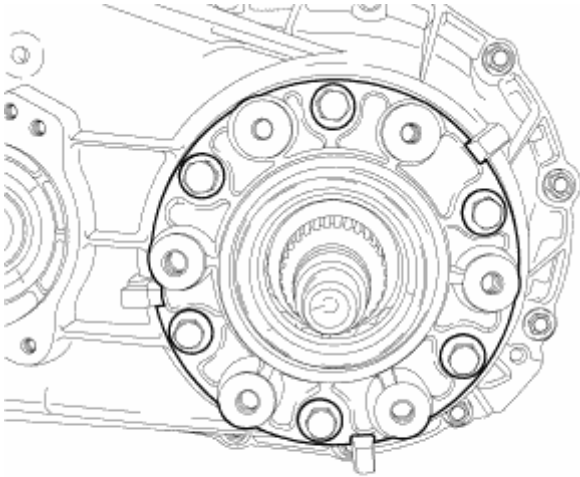


81ac54d6

Fig. 172: REAR COVER SEAL INSTALLATION

- | |
|---|
| 1 - HANDLE C-4171
2 - INSTALLER/REMOVER C-4210 |
|---|

1. Install a new rear output shaft seal into the rear cover with Driver Handle C-4171 and inverted Installer C-4210.



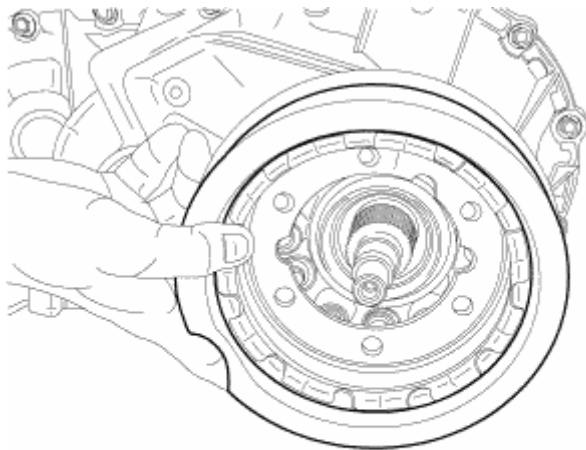
81c8d632

Fig. 173: REAR COVER

Courtesy of CHRYSLER LLC

NOTE: Do not use excessive amount of sealer as excess could be displaced into the oil pump. Keep sealer bead width to maximum of 3 mm (1/8 inch).

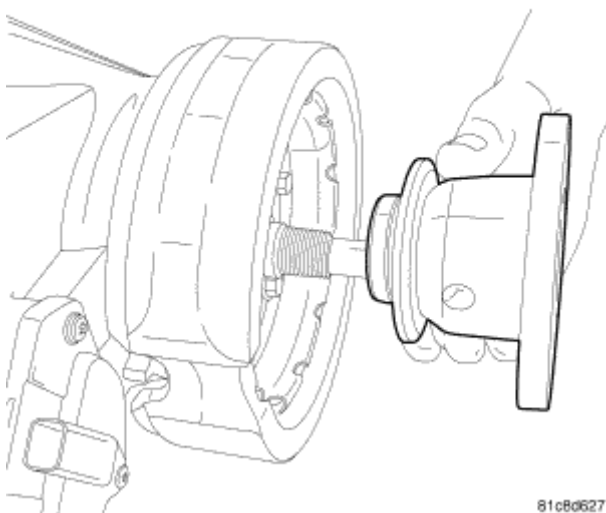
2. Apply bead of Mopar® Gasket Maker, or equivalent, to one of mating surfaces of the rear cover or rear transfer case housing. Install the rear cover being certain the tabs on the rear cover align with the tabs on the rear housing.
3. Install the rear cover bolts. Tighten the rear cover bolts in a crisscross pattern to 27 N.m (20 ft. lbs.).



81cBd62b

Fig. 174: DAMPER
Courtesy of CHRYSLER LLC

4. Install the damper, (if equipped), and the damper bolts onto the transfer case. Tighten the damper bolts to 27 N.m (20 ft. lbs.).



81cBd627

Fig. 175: COMPANION FLANGE
Courtesy of CHRYSLER LLC

5. Install the rear output shaft flange onto the output shaft.

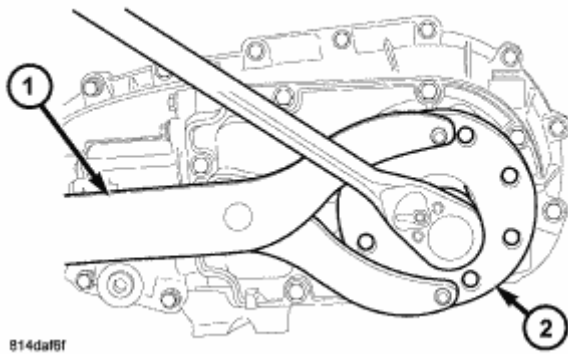


Fig. 176: Remove Rear Output Shaft Nut
 Courtesy of CHRYSLER LLC

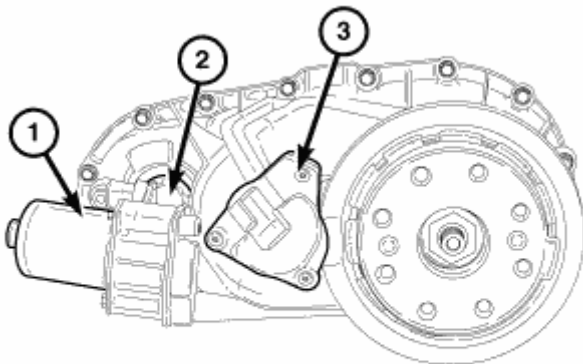
- | |
|--|
| 1 - HOLDER C-3281
2 - REAR COMPANION FLANGE |
|--|

6. Using Holder C-3281 (1), install the rear companion flange (2) nut. Tighten the nut to 122-176 N.m (90-130 ft. lbs.).
7. Install the rear propeller shaft. Refer to **INSTALLATION** .
8. Check the transfer case fluid level. See **STANDARD PROCEDURE**. Correct as necessary.

SENSOR-ENCODER

DESCRIPTION

MODE SENSOR



81ca20e1

Fig. 177: MP3022 TRANSFER CASE

- 1 - SHIFT MOTOR

2 - ID TAG

3 - ENCODER

The transfer case Encoder (3) provides the Final Drive Control Module (FDCM) feedback about the position of the transfer case. The sensor consists of a linear analog position sensor that converts the motor output shaft position into a DC signal. The sensor may rotate a full 360 degrees. The FDCM must supply 5VDC (+/- 0.5v) to the sensor whenever the FDCM is not in sleep mode and monitors the shift motor position. The sensor position is monitored when the ignition is in the RUN position and for 10 seconds after the ignition is shifted to the OFF position. The sensor is mechanically linked to the shaft of the cam which allows the transfer case to shift. The mode sensor will draw less than 20 mA of current during operation.

OPERATION

MODE SENSOR

During normal vehicle operation, the DTCM monitors the mode sensor outputs at least every 2 milliseconds when the shift motor is stationary or active. The mode sensor position will be considered invalid by the DTCM if the voltage is greater than 4.75 V or if it is less than 0.25 V.

NOTE: All the parameter voltages referred to in the following information are calibrated items in the controller software and are subject to change.

The DTCM shall consider Transfer Case position based on the MODE SENSOR VOLTAGES table listed below:

MODE SENSOR VOLTAGES

TRANSFER CASE POSITION	Voltage
4WD LOW	0.25 - 0.80
NEUTRAL	1.10 - 1.25
2H	1.45 - 2.00
4WD AUTO (ACTIVE)	2.00 - 4.75

REMOVAL

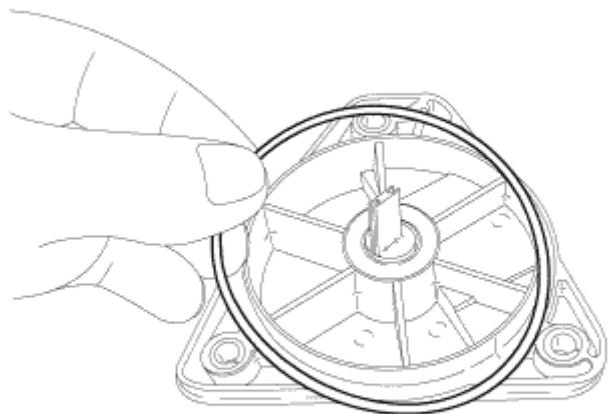
REMOVAL



81c8d63c

Fig. 178: ENCODER
Courtesy of CHRYSLER LLC

1. Remove the wiring harness electrical connector from the encoder.
2. Remove the screws securing the encoder to the rear transfer case housing.
3. Remove the encoder from the transfer case.



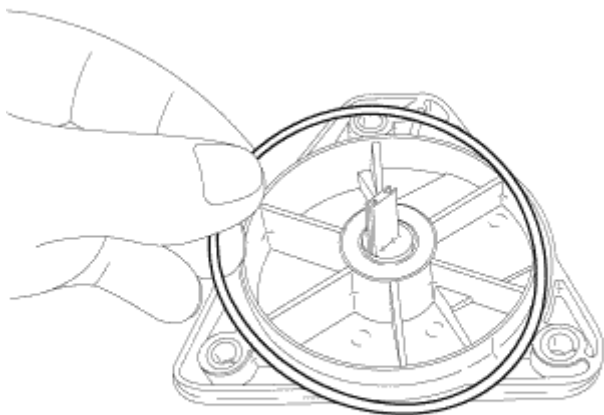
81c8d644

Fig. 179: ENCODER O-RING
Courtesy of CHRYSLER LLC

4. Remove the o-ring seal from the encoder.

INSTALLATION

INSTALLATION



81c8d644

Fig. 180: ENCODER O-RING
Courtesy of CHRYSLER LLC

1. Install a **NEW** o-ring seal onto the encoder.



81c8d63c

Fig. 181: ENCODER
Courtesy of CHRYSLER LLC

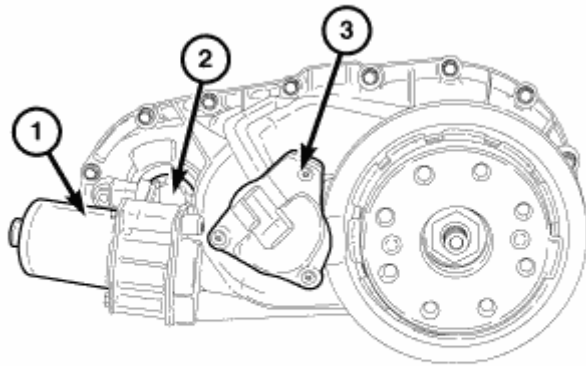
NOTE: Before installing the encoder onto the transfer case, be certain to align the encoder shaft to the shift shaft and the dowel on the encoder to the hole in the case accordingly.

2. Install the encoder onto the rear transfer case housing.
3. Install the encoder screws. Tighten the screws to 5-8 N.m (44-71 in. lbs.).
4. Install the electrical wiring harness connector onto the encoder.

ASSEMBLY-SHIFT MOTOR

DESCRIPTION

SHIFT MOTOR/MODE SENSOR ASSEMBLY



81ca20e1

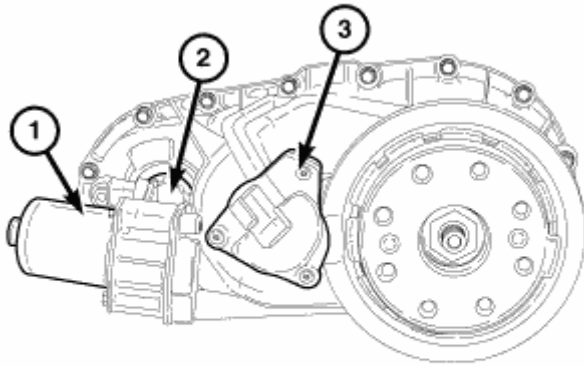
Fig. 182: MP3022 TRANSFER CASE
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - SHIFT MOTOR
2 - ID TAG
3 - ENCODER |
|--|

The shift motor (1) is an electromechanical device consisting of a DC permanent magnet motor and a position holding brake. The shift motors' overall function is to move and lock a gear that moves the range fork and clutch lever found in the transfer case. This allows the transfer case to be shifted electrically to multiple operating positions (4WD AUTO, 4WD LOW and 2WD). The operating current of the shift motor under stall conditions is 30 amps maximum at 72° F with 13.5 volts, at the motor leads.

OPERATION

OPERATION-SHIFT MOTOR



81ca20e1

Fig. 183: MP3022 TRANSFER CASE
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - SHIFT MOTOR
2 - ID TAG
3 - ENCODER |
|--|

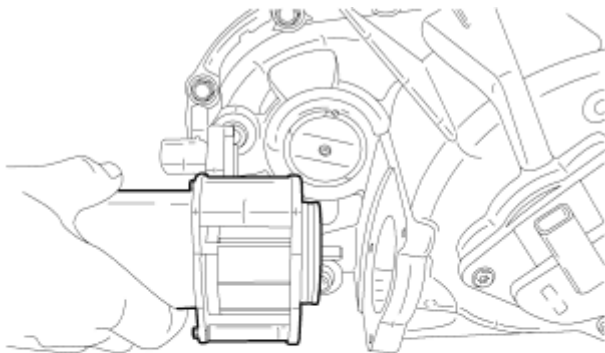
Shifting in the transfer case occurs when a Pulse Width Modulated (PWM) voltage is supplied to the shift motor (1) by the Final Drive Control Module (FDCM). A linear analog position sensor (Encoder) (3) located on the rear transfer case housing, provides the FDCM with the motors' angular, rotational position. With this information, the FDCM continuously knows the motors' position, and therefore allows it to accurately control the motors' operation, including voltage polarity which is used to control motor direction.

The electronically controlled wet clutch pack uses an electric motor to actuate an internal gear train, clutch cam, and low range barrel cam. The clutch cam actuates the clutch levers that apply normal force to the multi-disc wet clutch pack. The clutch disks are alternately splined to the front and rear outputs. When normal force is applied to this clutch pack, torque is transferred to equalize speed differences between front and rear axles.

REMOVAL

REMOVAL-SHIFT MOTOR

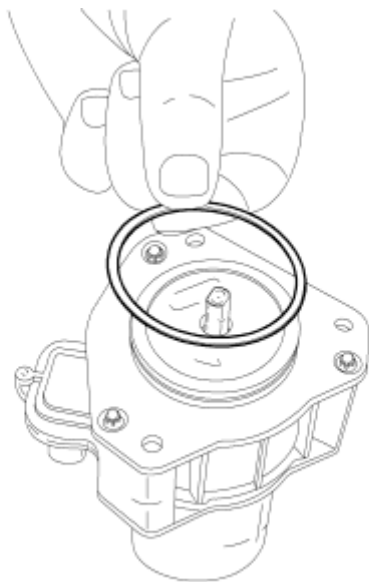
NOTE: New shift motor assemblies are shipped in the **NEUTRAL** position. If a new shift motor assembly must be installed, it will be necessary to shift the transfer case to the **NEUTRAL** position prior to motor installation.



81c8d717

Fig. 184: SHIFT MOTOR
Courtesy of CHRYSLER LLC

1. Disengage the wiring harness electrical connector from the shift motor.
2. Remove the bolts holding the shift motor onto the transfer case.
3. Remove the shift motor from the transfer case.



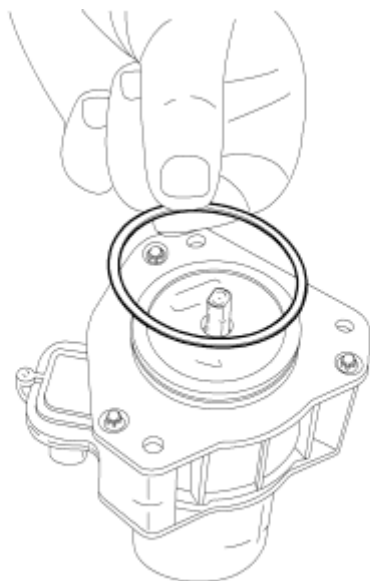
81c8d71b

Fig. 185: SHIFT MOTOR O-RING
Courtesy of CHRYSLER LLC

4. Remove the o-ring seal from the shift motor.

INSTALLATION

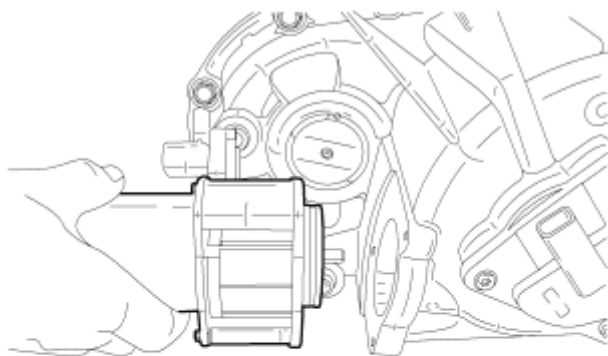
INSTALLATION-SHIFT MOTOR



81c8d7fb

Fig. 186: SHIFT MOTOR O-RING
Courtesy of CHRYSLER LLC

1. Install a **NEW** shift motor o-ring seal onto the shift motor.



81c8d7f7

Fig. 187: SHIFT MOTOR
Courtesy of CHRYSLER LLC

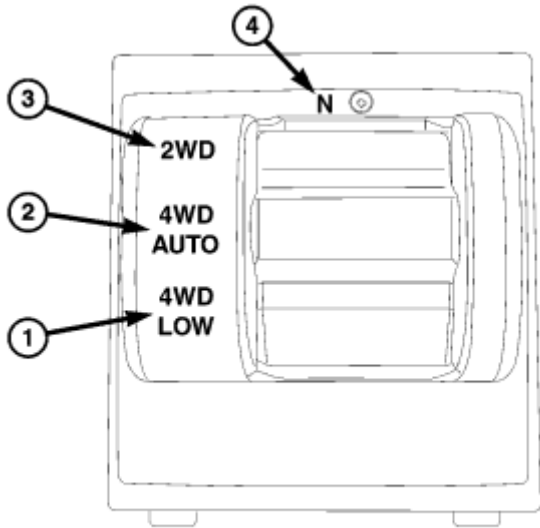
NOTE: Before installing the shift motor onto the transfer case, make certain that the shift motor shaft aligns with the transfer case worm shaft accordingly.

2. Install the shift motor onto the transfer case.
3. Install the shift motor bolts. Tighten the shift motor bolts to 13 N.m (9 ft. lbs.).
4. Install the electrical wiring harness connector onto the shift motor.

SWITCH-TRANSFER CASE SELECTOR

DESCRIPTION

TRANSFER CASE SELECTOR SWITCH



81cb396a

Fig. 188: MP3022 TRANSFER CASE SWITCH
Courtesy of CHRYSLER LLC

- | |
|---|
| <p>1 - 4WD LOW POSITION
2 - 4WD AUTO POSITION
3 - 2WD POSITION
4 - NEUTRAL POSITION</p> |
|---|

Electric shifting between 4WD Auto and 4WD Low is accomplished with a console-mounted switch. A pushpin button is used to shift to Neutral mode.

2008 ACCESSORIES AND EQUIPMENT

Vehicle Theft Security - Electrical Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

DTC	Description
<u>B1A20</u>	PRE-ARM TIMEOUT
<u>B1A24</u>	KEY NOT PROGRAMMED
<u>B1A25</u>	INVALID KEY
<u>B1A26</u>	MAXIMUM NUMBER OF KEYS PROGRAMMED
<u>B1A27</u>	SKREEM PROGRAMMING PERFORMANCE
<u>B1A28</u>	ECM MISMATCH WITH SKIM
<u>B1A29</u>	SKIM BASESTATION MISMATCH
<u>B1A37</u>	SECURITY TRANSMITTER SENSOR CIRCUIT LOW
<u>B1A38</u>	SECURITY TRANSMITTER SENSOR CIRCUIT HIGH
<u>B1A3A</u>	SECURITY RECEIVER SENSOR CIRCUIT LOW
<u>B1A3B</u>	SECURITY RECEIVER SENSOR CIRCUIT HIGH
<u>B1A3C</u>	INTERNAL SIREN BATTERY
<u>B1A3D</u>	SIREN BATTERY / LOSS OF POWER SUPPLY
<u>B1A3E</u>	SIREN/ITM MISMATCH
<u>B1A3F</u>	ITM ARMING SEQUENCE PERFORMANCE
<u>B1A41</u>	SECURITY TRANSMITTER SENSOR CIRCUIT OPEN
<u>B1A42</u>	SECURITY TRANSMITTER SENSOR CIRCUIT SHORTED TOGETHER
<u>B1A43</u>	SECURITY TRANSMITTER SENSOR RETURN CIRCUIT LOW
<u>B1A44</u>	SECURITY RECEIVER SENSOR CIRCUIT OPEN
<u>B1A45</u>	SECURITY RECEIVER SENSOR CIRCUIT SHORTED TOGETHER
<u>B1A46</u>	SECURITY RECEIVER SENSOR RETURN CIRCUIT LOW
<u>B1A47</u>	SECURITY TRANSMITTER/RECEIVER SENSOR RETURN CIRCUIT HIGH
<u>B210A</u>	SYSTEM VOLTAGE LOW (WCM)
<u>B210B</u>	SYSTEM VOLTAGE HIGH (WCM)
<u>B210D</u>	BATTERY VOLTAGE LOW (WCM)
<u>B210E</u>	BATTERY VOLTAGE HIGH (WCM)
<u>B2204</u>	ECU CONFIGURATION MISMATCH
<u>B2205</u>	ORIGINAL VIN MISSING/MISMATCH
<u>B2206</u>	CURRENT VIN MISSING/MISMATCH
<u>B2224</u>	SKREEM INTERNAL
<u>B2229</u>	SKREEM INTERNAL - SKIM IMMOBILIZER
<u>B222A</u>	VEHICLE LINE MISMATCH
<u>B223C</u>	INTRUSION TRANSCEIVER MODULE INTERNAL
<u>B2254</u>	COLUMN LOCK MODULE INTERNAL

<u>U0100</u>	LOST COMMUNICATION WITH ECM/PCM
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0141</u>	LOST COMMUNICATION WITH FRONT CONTROL MODULE
<u>U0155</u>	LOST COMMUNICATION WITH CLUSTER/CCN
<u>U0159</u>	LOST COMMUNICATION WITH PARK ASSIST MODULE
<u>U0164</u>	LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)
<u>U0187</u>	LOST COMMUNICATION WITH DVD PLAYER
<u>U0236</u>	NO RESPONSE WITH COLUMN LOCK MODULE
<u>U110D</u>	LOST COMMUNICATION WITH SECURITY SIREN
<u>U1416</u>	IMPLAUSIBLE SECURITY SIREN SIGNAL RECEIVED

VEHICLE THEFT SECURITY - ELECTRICAL DIAGNOSTICS

DIAGNOSIS AND TESTING

B1A20-PRE-ARM TIMEOUT

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- Set Condition:**

If the VTSS pre-arm sequence is interrupted within 16 seconds after securing the vehicle.

Possible Causes

Possible Causes
INTERMITTENT PROBLEM WITH FUSED (B+) TO CLUSTER
INTERMITTENT PROBLEM WITH CAN INTERIOR BUS CIRCUITS TO CLUSTER

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read ITM DTC(s).

Does the DTC reset?

Yes

Remove the Cluster and inspect the Fused B (+) and both CAN INTERIOR BUS circuits for spread terminals, corrosion or intermittent opens.

Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A24-KEY NOT PROGRAMMED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Possible Causes

Possible Causes
KEY NOT PROGRAMMED
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

- PROGRAM ALL OF THE IGNITION KEYS**

Turn the ignition on.

With the scan tool, attempt to program the key(s) into the SKREEM.

Was the programming of the key(s) successful?

Yes

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Replace the ignition key and attempt to program it into the SKREEM. If the DTC resets, replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

NOTE: **If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.**

Perform **SKREEM/SKIM VERIFICATION TEST**.

B1A25-INVALID KEY

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At ignition on and during Key Programming Mode.

Set Conditions

• **Set Condition:**

When the Sentry Key Remote Entry Module (SKREEM) does not receive a transponder response after 8 consecutive transponder read attempts within 2.0 seconds. When the key that is being used is programmed for a different vehicle.

Possible Causes

Possible Causes
KEY THAT HAS BEEN PREVIOUSLY PROGRAMMED FOR ANOTHER VEHICLE
MULTIPLE KEY OPERATION
IGNITION KEY

SENTRY KEY REMOTE ENTRY MODULE (SKREEM) INTERMITTENT WIRING HARNESS PROBLEM

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: Verify the key being used is the proper key for this vehicle and a blank key. If the key being programmed is not blank (one that has been programmed for another vehicle) this fault will set.

With the scan tool, read and record the SKREEM DTCs.

With the scan tool, erase the SKREEM DTCs

NOTE: Perform the following test several times to ensure the DTC is current.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on.

With the scan tool, read the SKREEM DTCs.

Does the scan tool display the DTC that was previously erased?

Yes

Go To 2.

No

Go To 6.

2. CHECKING FOR MULTIPLE KEYS

Are there multiple vehicle ignition keys available?

Yes

Go To 3.

No

Go To 4.

3. MULTIPLE KEY OPERATION

NOTE: Perform the following steps using one of the vehicle ignition keys. When finished, repeat the procedure using each of the other vehicle keys, one at a time.

With the scan tool, erase the SKREEM DTCs.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on

With the scan tool, read the SKREEM DTCs.

Is the DTC present for all ignition keys?

Yes

Replace and program the Sentry Key Remote Entry Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Replace the ignition key(s) that cause the SKIM DTC.

Perform **SKREEM/SKIM VERIFICATION TEST**.

4. REPROGRAM KEY

With the scan tool, attempt to reprogram the ignition key to the SKREEM.

With the scan tool, erase the SKREEM DTCs.

Wait 10 seconds.

Turn the ignition on.

With the scan tool, read the SKREEM DTCs.

Does the DTC set again?

Yes

Go To 5.

No

Test complete.

5. **PROGRAM NEW IGNITION KEY**

Replace the ignition key with a new key.

With the scan tool, program the new ignition key to the SKREEM.

With the scan tool, erase the SKREEM DTCs.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on.

With the scan tool, read the SKREEM DTCs.

Does the DTC set again?

Yes

Replace and program the Sentry Key Remote Entry Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Test complete.

6. **INTERMITTENT WIRING HARNESS PROBLEM**

Turn the ignition off.

NOTE: Check the following items:

- Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.
- Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.
- Refer to any Technical Service Bulletins (TSB) that may apply.

Were any problems found?

Yes

Repair wiring harness/connectors as necessary.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Test Complete.

B1A26-MAXIMUM NUMBER OF KEYS PROGRAMMED

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- Set Condition:**

When the maximum number of keys (8) have been programmed into the Sentry Key Remote Entry Module (SKREEM).

Possible Causes

Possible Causes
MAXIMUM AMOUNT OF KEY PROGRAMMED INTO SKREEM SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. REPROGRAM ALL IGNITION KEYS

- NOTE:**

This procedure will clear all the key information from the SKREEM. It is important to obtain all of the customer's ignition keys so they may be reprogrammed into the module.
- NOTE:**

If the total number of keys already programmed is equal to Eight and another Key is trying to be programmed, this fault is valid. Explain to the customer no more Keys are allowed to be programmed.

Turn the ignition on.

With the scan tool, clear all the key information in the SKREEM.

Program the all of the customer keys into the SKREEM (maximum eight).

Did the "Maximum Number of Keys Programmed" display again?

Yes

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

NOTE: **If this vehicle is equipped with a Steering Column Lock Module it must be replaced along with the SKREEM.**

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Programming of the keys was successful. Test complete.

Perform **SKREEM/SKIM VERIFICATION TEST**.

B1A27-SKREEM PROGRAMMING PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Possible Causes

Possible Causes
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

Turn the ignition on.

NOTE: **Before continuing, review and check for the following:**

- **Review the repair history of the vehicle.**
- **Ensure that the vehicle has the correct PCM and SKREEM installed**

by verifying the part numbers.

- **With the scan tool, ensure that the PCM and SKREEM are programmed correctly. Compare the PCM VIN to the SKREEM VIN and ensure the two VINs match.**

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

With the scan tool, read DTCs.

Does the DTC reset?

Yes

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

NOTE: **If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.**

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The DTC is not active at this time. Test complete.

B1A28-ECM MISMATCH WITH SKIM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At ignition on, after ignition on during any rolling code handshake that occurs with the PCM due to a SKIM or PCM reset.

Set Conditions

- **Set Condition:**

When a PCM/ECM STATUS message with a Valid Key status is not received by the SKIM within 3.5 seconds of transmitting the last Valid Key Code message to the PCM/ECM.

Possible Causes

Possible Causes
VERIFYING PCM VIN INTERMITTENT WIRING HARNESS PROBLEM PCM

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

With the scan tool, erase the SKREEM DTCs.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on and wait 2 minutes.

With the scan tool, read the SKREEM DTCs.

Does the scan tool display the DTC that was previously erased?

Yes

Go To 2.

No

Go To 4.

2. VERIFYING THE PCM VIN

Turn the ignition on.

With the scan tool, select Engine system from the main menu.

Display and record the Vehicle Identification Number.

NOTE: Ensure that a VIN has been programmed into the PCM. If a VIN is not displayed, attempt to program the PCM with the correct VIN before continuing.

Does the VIN recorded from the PCM match the VIN of the vehicle?

Yes

Go To 3.

No

Using the scan tool perform the PCM Replace procedure to update the VIN in the PCM.

Perform **SKREEM/SKIM VERIFICATION TEST**.

3. **REPLACE SKREEM AND CHECK DTC'S**

Turn the ignition off.

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

Turn the ignition on.

With the scan tool, display and clear all PCM and SKREEM DTC's.

Perform 5 ignition key cycles leaving the ignition key on for 90 seconds per cycle.

With the scan tool, check for SKREEM DTCs.

Does the scan tool display the same DTC?

Yes

Replace and program the Powertrain Control Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The repair is complete.

Perform **SKREEM/SKIM VERIFICATION TEST**.

4. **INTERMITTENT**

Turn the ignition off.

NOTE: Check for the following conditions:

- Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.
- Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.
- Refer to any Technical Service Bulletins (TSB) that may apply.

Were any problems found?

Yes

Repair wiring harness/connectors as necessary.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Test Complete.

B1A29-SKIM BASESTATION MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

At ignition on, after ignition on during any rolling code handshake that occurs with the PCM due to a SKIM/SKREEM or PCM reset.

Set Conditions

- **Set Condition:**

When a PCM STATUS message with a Valid Key status is not received by the SKIM within 3.5 seconds of transmitting the last Valid Key Code message to the PCM.

Possible Causes

Possible Causes
VERIFYING PCM VIN INTERMITTENT WIRING HARNESS PROBLEM PCM

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

With the scan tool, erase the SKREEM DTCs.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on and wait 2 minutes.

With the scan tool, read the SKREEM DTCs.

Does the scan tool display the DTC that was previously erased?

Yes

Go To 2.

No

Go To 4.

2. VERIFYING THE PCM VIN

Turn the ignition on.

With the scan tool, select Engine system from the main menu.

Display and record the Vehicle Identification Number.

NOTE: **Ensure that a VIN has been programmed into the PCM. If a VIN is not displayed, attempt to program the PCM with the correct VIN before continuing.**

Does the VIN recorded from the PCM match the VIN of the vehicle?

Yes

Go To 3.

No

Using the scan tool perform the PCM Replace procedure to update the VIN in the PCM.

Perform **SKREEM/SKIM VERIFICATION TEST**.

3. REPLACE SKREEM AND CHECK DTCS

Turn the ignition off.

Replace and program the Sentry Key Remote Entry Module in accordance with the Service Information.

Turn the ignition on.

With the scan tool, display and clear all PCM and SKREEM DTCs.

Perform 5 ignition key cycles leaving the ignition key on for 90 seconds per cycle.

With the scan tool, check for SKREEM DTCs.

Does the scan tool display the same DTC?

Yes

Using the scan tool perform the PCM Replace procedure to update the VIN in the PCM.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The repair is complete.
Perform **SKREEM/SKIM VERIFICATION TEST**.

4. INTERMITTENT

Turn the ignition off.

NOTE: Check for the following conditions:

- Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.
- Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.
- Refer to any Technical Service Bulletins (TSB) that may apply.

Were any problems found?

Yes

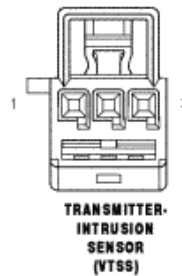
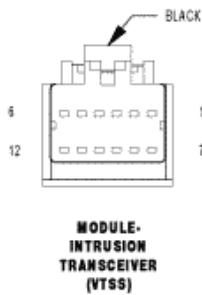
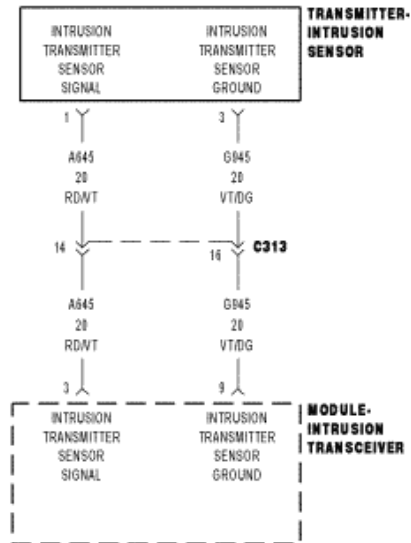
Repair wiring harness/connectors as necessary.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Test Complete.

B1A37-SECURITY TRANSMITTER SENSOR CIRCUIT LOW

Circuit Schematic



01929000

Fig. 1: Intrusion Transmitter Sensor Signal Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

- **Set Condition:**

If the current flow on the sensor signal circuit is above a specified range this DTC will set.

Possible Causes

Possible Causes
(A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT SHORTED TO GROUND INTRUSION SENSOR TRANSMITTER INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

Turn the ignition on and with the scan tool, read DTC's.

Does the scan tool display B1A37-SECURITY TRANSMITTER SENSOR CIRCUIT LOW ?

Yes

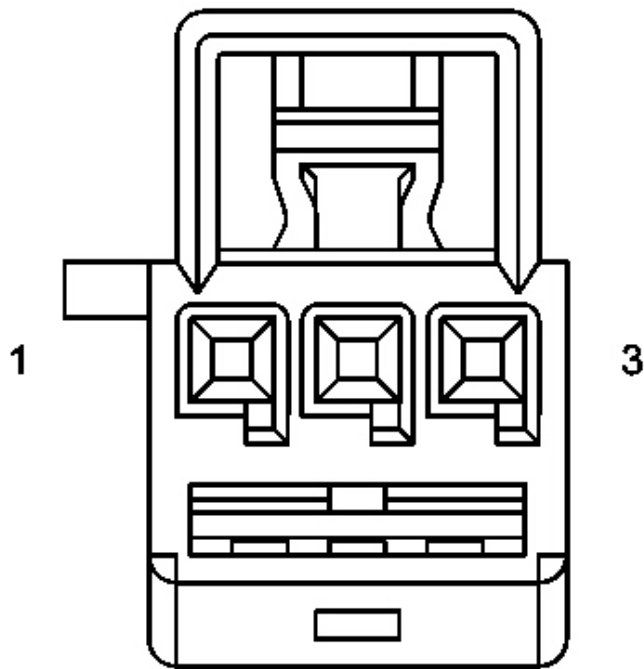
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **INTRUSION SENSOR TRANSMITTER**



**TRANSMITTER-
INTRUSION
SENSOR
(VTSS)**

815f27f2

Fig. 2: Checking Intrusion Sensor Transmitter Input
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transmitter connector.

Turn the ignition on and with the scan tool, erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display B1A41-SECURITY TRANSMITTER SENSOR CIRCUIT OPEN?

Yes

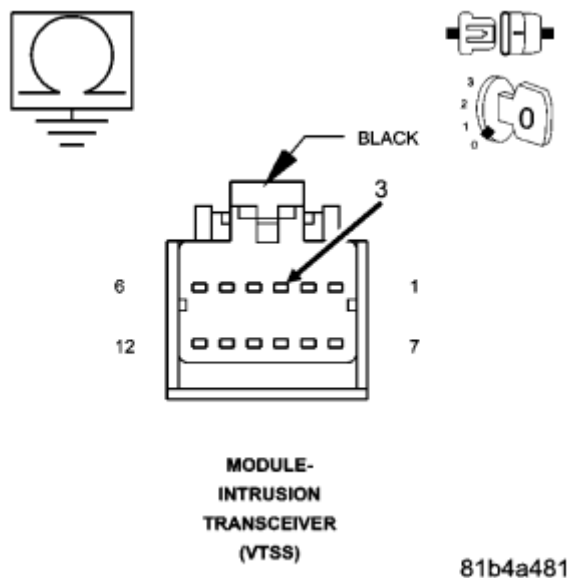
Replace the Intrusion Sensor Transmitter.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT SHORT TO GROUND



81b4a481

Fig. 3: Measuring Resistance Between Ground And (A645) Intrusion Transmitter Sensor Signal Circuit At Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between ground and the (A645) Intrusion Transmitter Sensor Signal circuit at the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (A645) Intrusion Transmitter Sensor Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

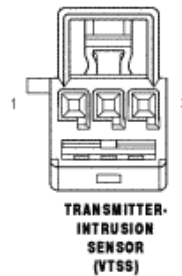
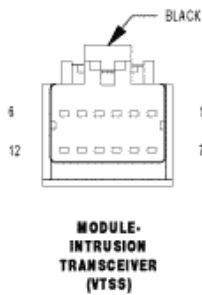
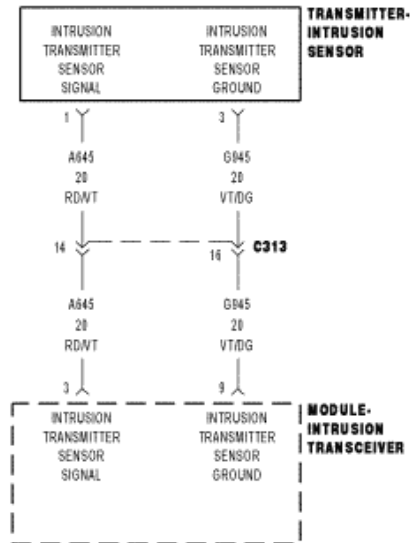
No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A38-SECURITY TRANSMITTER SENSOR CIRCUIT HIGH

Circuit Schematic



01929000

Fig. 4: Intrusion Transmitter Sensor Signal Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

- **Set Condition:**

If the current flow on the sensor signal circuit is above a specified range this DTC will set.

Possible Causes

Possible Causes
(A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

Turn the ignition on and with the scan tool, read DTC's.

Does the scan tool display B1A38-SECURITY TRANSMITTER SENSOR CIRCUIT HIGH ?

Yes

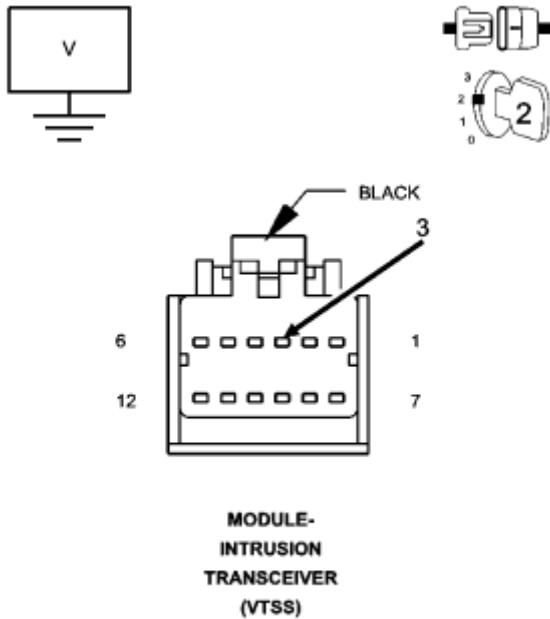
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE**



81b4e75b

Fig. 5: Measuring For Voltage Between Chassis Ground And (A645) Intrusion Transmitter Sensor Signal Circuit At Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transmitter connector

Disconnect the Intrusion Transceiver Module connector.

Turn the ignition on.

Measure for voltage between chassis ground and the (A645) Intrusion Transmitter Sensor Signal circuit at the Intrusion Transceiver Module connector.

Is there any voltage present?

Yes

Repair the (A645) Intrusion Transmitter Sensor Signal circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A3A-SECURITY RECEIVER SENSOR CIRCUIT LOW

Circuit Schematic

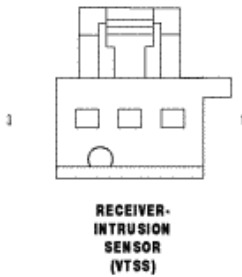
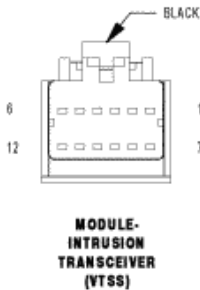
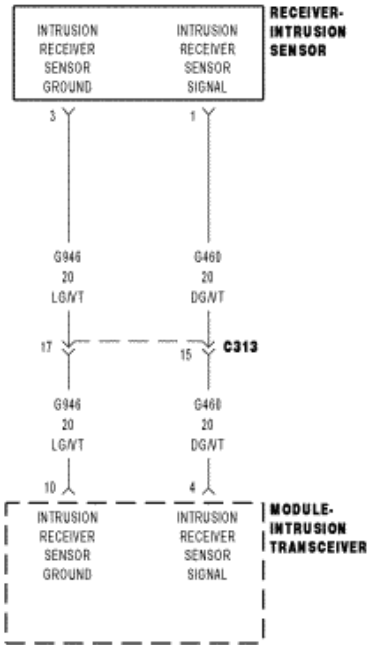


Fig. 6: Intrusion Receiver Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

• **Set Condition:**

If the current flow on the sensor signal circuit is above a specified range this DTC will set.

Possible Causes

Possible Causes
(G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT SHORTED TO GROUND INTRUSION SENSOR RECEIVER INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

Turn the ignition on and with the scan tool, read DTC's.

Does the scan tool display B1A3A-SECURITY RECEIVER SENSOR CIRCUIT LOW ?

Yes

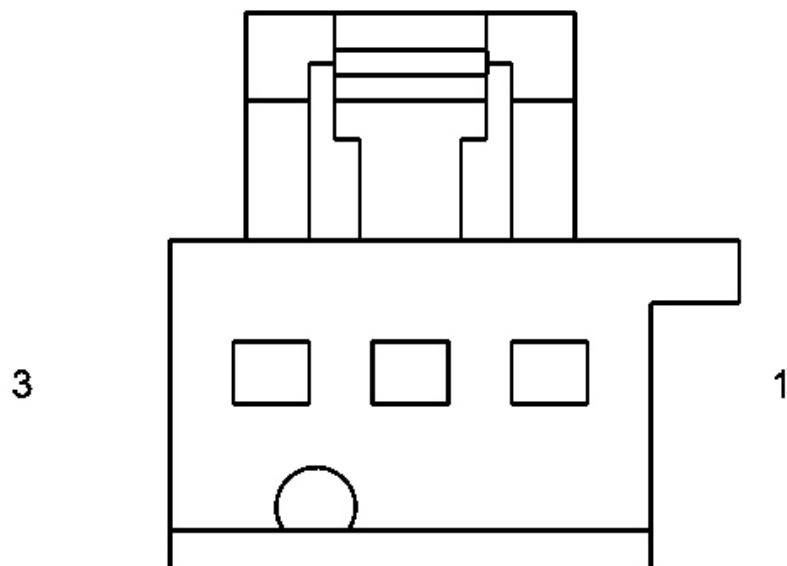
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. INTRUSION SENSOR RECEIVER



**RECEIVER-
INTRUSION
SENSOR
(VTSS)**

815f21f1

Fig. 7: Checking Sensor Receiver Input
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Receiver connector.

Turn the ignition on and with the scan tool, erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

With the scan tool, read DTC's.

Does the scan tool display B1A44-SECURITY RECEIVER SENSOR CIRCUIT OPEN?

Yes

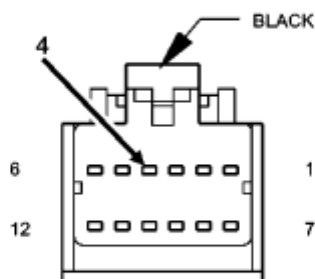
Replace the Intrusion Sensor Receiver.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. **CHECK THE (G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT SHORT TO GROUND**



MODULE-
INTRUSION
TRANSCIEVER
(VTSS)

81b544fc

Fig. 8: Measuring Resistance Between Ground And (G460) Intrusion Receiver Sensor Signal Circuit At Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between ground and the (G460) Intrusion Receiver Sensor Signal circuit at the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (G460) Intrusion Receiver Sensor Signal circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

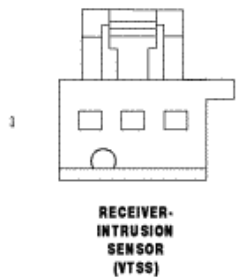
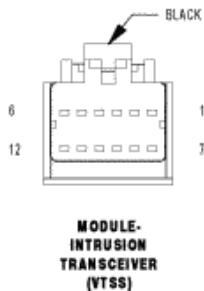
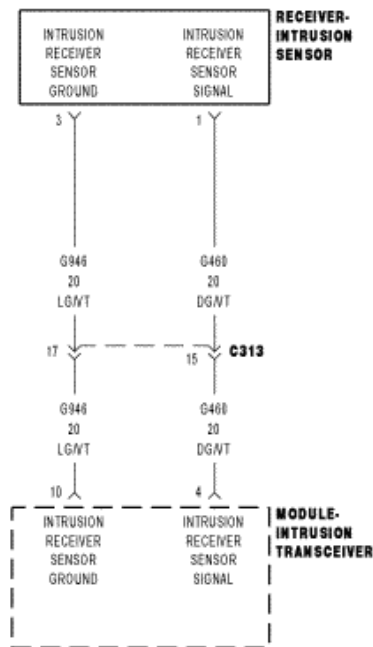
No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A3B-SECURITY RECEIVER SENSOR CIRCUIT HIGH

Circuit Schematic



01344096

Fig. 9: Intrusion Receiver Sensor Signal Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

- **Set Condition:**

If the current flow on the sensor signal circuit is above a specified range this DTC will set.

Possible Causes

Possible Causes
(G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT SHORTED TO VOLTAGE INTRUSION TRANSCIEVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait two minutes.

Disarm the VTSS turn the ignition on.

Turn the ignition on and with the scan tool, read DTC's.

Does the scan tool display B1A3B-SECURITY RECEIVER SENSOR CIRCUIT HIGH ?

Yes

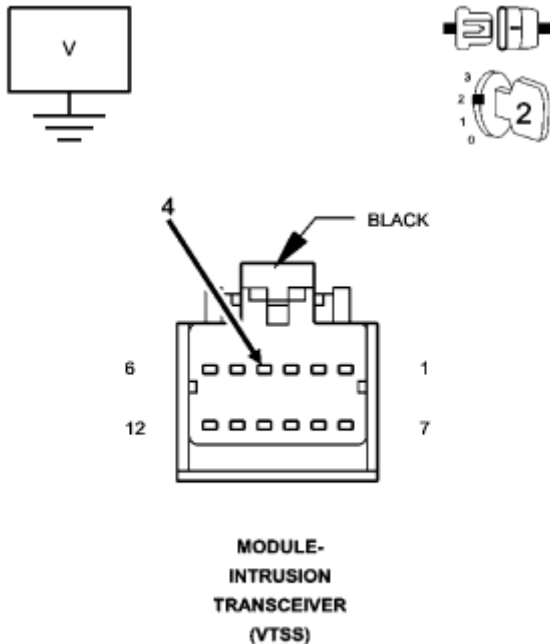
Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT SHORT TO VOLTAGE**



81b55694

Fig. 10: Measuring For Voltage Between Chassis Ground And (G460) Intrusion Receiver Sensor Signal Circuit At Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Receiver connector.

Disconnect the Intrusion Transceiver Module connector.

Measure for voltage between chassis ground and the (G460) Intrusion Receiver Sensor Signal circuit at the Intrusion Transceiver Module connector.

Is there any voltage present?

Yes

Repair the (G460) Intrusion Receiver Sensor Signal circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

Circuit Schematic

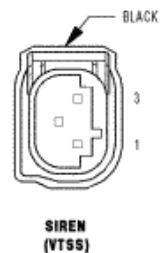
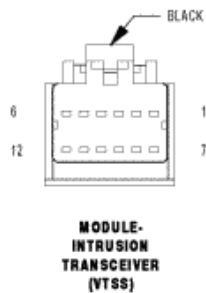
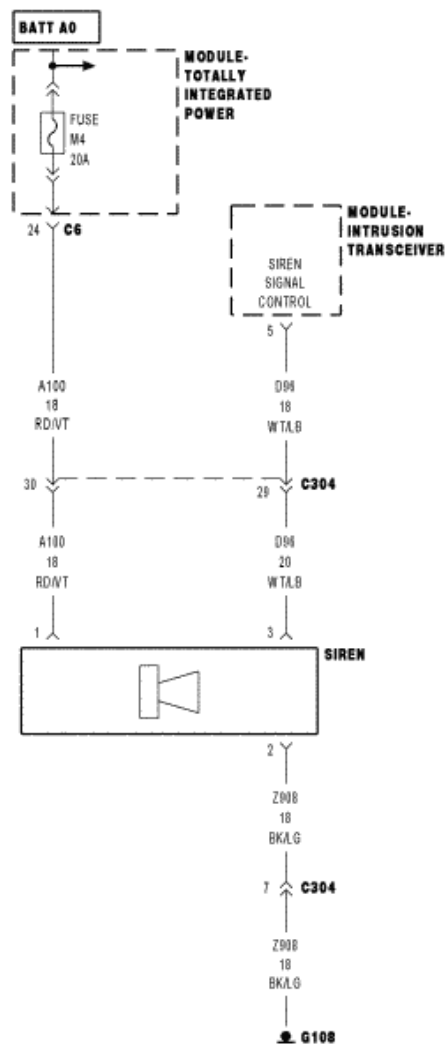


Fig. 11: Siren Signal Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

81658799

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the engine over 600 RPM.

Set Conditions

- **Set Condition:**

When the internal battery within the siren does not charge as expected, the ITM sets this code.

Possible Causes

Possible Causes
VEHICLE STORED WITH NO BATTERY VOLTAGE FOR EXTENDED PERIOD OF TIME SIREN

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Start the engine and allow it to idle for 2 minutes then turn the engine off.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 2.

No

DTC is not active at this time. Test complete.

2. **VEHICLE STORED WITH NO BATTERY VOLTAGE FOR EXTENDED PERIOD OF TIME**

NOTE: If the vehicle was allowed to sit with no battery voltage for an extended period of time the back up battery located in the siren may discharge and need to be recharged.

Was the vehicle battery power just restored after the vehicle was stored with no power for an extended period of time?

Yes

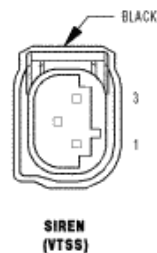
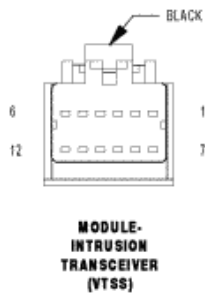
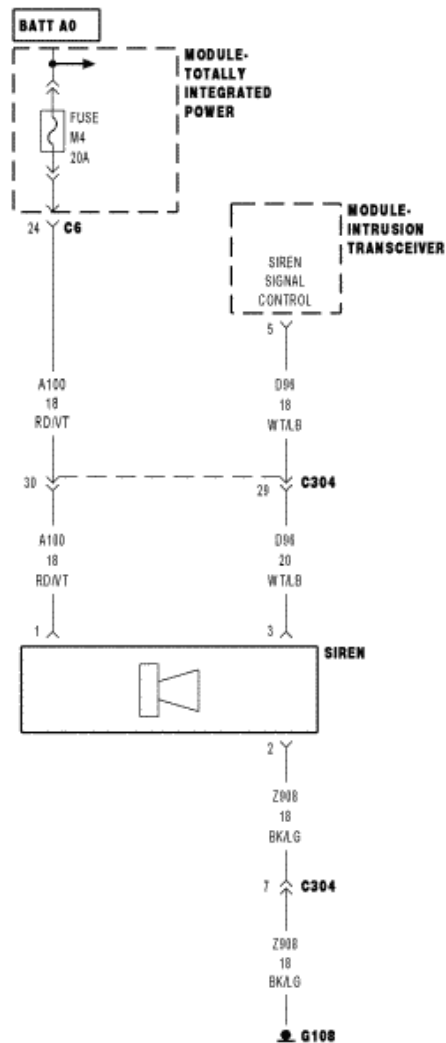
Allow the vehicle to sit with a fully charged battery for two hours then restart this procedure.

No

Replace the Siren the in accordance with the Service Information. Refer to **STANDARD PROCEDURE** .

B1A3D-SIREN BATTERY / LOSS OF POWER SUPPLY

Circuit Schematic



011556700

Fig. 12: Siren Signal Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously with the VTSS armed.

Set Conditions

- **Set Condition:**

If the ITM detects incorrect voltage at the siren this code will set.

Possible Causes

Possible Causes
HARNESS TAMPERING / INTERMITTENT CONDITION (A100) FUSED B(+) CIRCUIT (Z908) GROUND OPEN SIREN

Diagnostic Test

1. **INSPECT SIREN HARNESS**

Inspect the wiring harness to the siren for any signs of tampering or intermittent condition.

Were there any problems found?

Yes

Repair wiring as necessary.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 2.

2. **DETERMINING IF DTC IS CURRENT**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

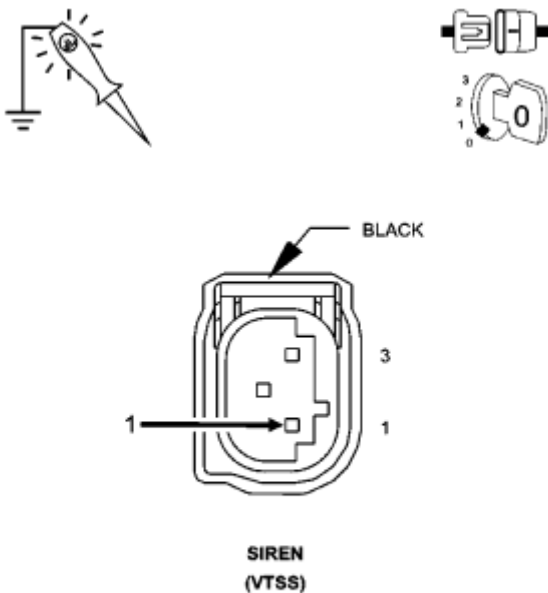
Go To 3.

No

DTC is not active at this time. Test complete.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (A100) FUSED B(+) CIRCUIT AT THE SIREN



81b5710d

Fig. 13: Using 12-Volt Test Light Connected To Ground To Check (A100) Fused B(+) Circuit At Siren Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Siren connector.

Using a 12-volt test light connected to ground, check the (A100) Fused B(+) circuit at the siren connector.

Does the test light illuminate brightly?

Yes

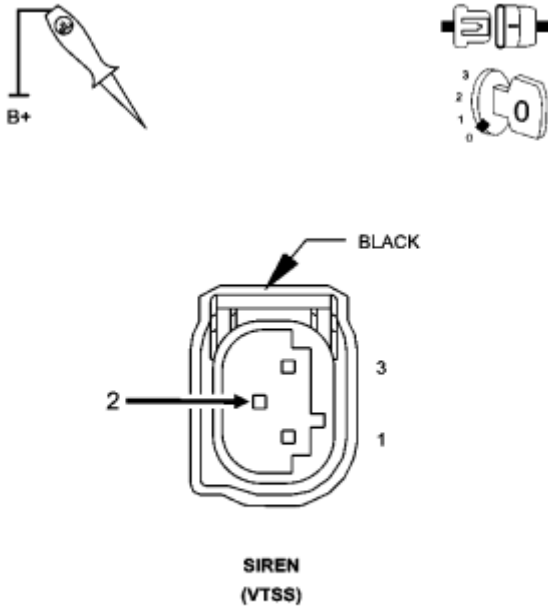
Go To 4.

No

Repair the (A100) Fused B(+) circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (Z908) GROUND CIRCUIT AT THE SIREN



81b57129

Fig. 14: Using 12-Volt Test Light Connected To 12-Volts To Check (Z908) Ground Circuit At Siren Connector

Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z908) Ground circuit at the siren connector.

Does the test light illuminate brightly?

Yes

Replace the Siren in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (Z908) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A3E-SIREN/ITM MISMATCH

Circuit Schematic

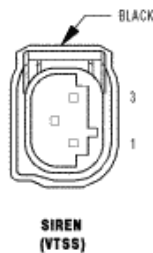
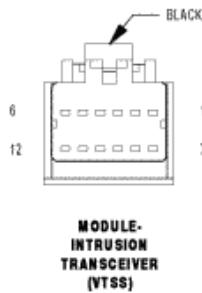
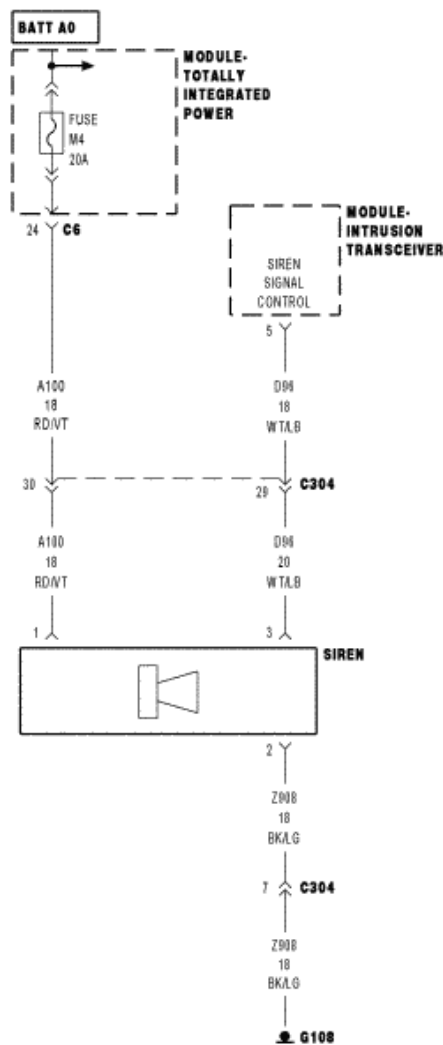


Fig. 15: Siren Signal Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

While the VTSS is armed.

Set Conditions

- **Set Condition:**

When the learned Siren information stored in the ITM does not match.

Possible Causes

Possible Causes
SIREN

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Inspect wiring from ITM to Siren for an intermittent open condition. Check connector terminals for back out, corrosion or loose terminal contact. If OK, Replace the Siren.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go to 2.

2. INTERMITTENT CONDITION

NOTE: Check for any of the follow conditions:

- Poor wire to terminal connection
- Corroded terminals
- Backed out or loose terminals
- Broken wire internal to the insulation

Were there any problems found?

Yes

Repair the wiring as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.

B1A3F-ITM ARMING SEQUENCE PERFORMANCE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

ITM arming process did not complete in a predetermined amount time.

Possible Causes

Possible Causes
INTERMITTENT CAN INTERIOR BUS COMMUNICATION SOFTWARE UPDATE FOR ITM OR TIPM

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: Diagnose any related Communication DTC(s) before continuing.

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read ITM DTC(s).

Does the DTC reset?

Yes

Check for and correct any CAN INTERIOR Bus DTC's set in the ITM or the TIPM. Also check for related software updates for the ITM and/or TIPM.

Perform **BODY VERIFICATION TEST - VER 1** .

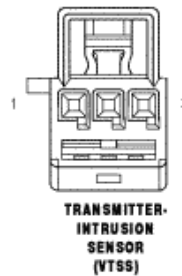
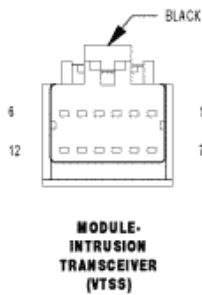
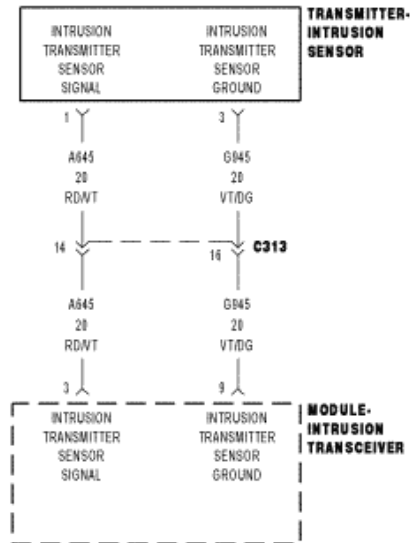
No

DTC is not active at this time. Test complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A41-SECURITY TRANSMITTER SENSOR CIRCUIT OPEN

Circuit Schematic



01939000

Fig. 16: Intrusion Transmitter Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

- **Set Condition:**

If the voltage current is below a specified range this DTC will set.

Possible Causes

Possible Causes
(A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT OPEN (G945) SENSOR GROUND CIRCUIT OPEN INTRUSION SENSOR TRANSMITTER OPEN/MISSING INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait one minute.

Disarm the VTSS turn the ignition on and wait one minute.

With the scan tool, read DTC's.

Does the scan tool display B1A41-SECURITY TRANSMITTER SENSOR CIRCUIT OPEN?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE (A645) INTRUSION TRANSMITTER SENSOR SIGNAL CIRCUIT VOLTAGE

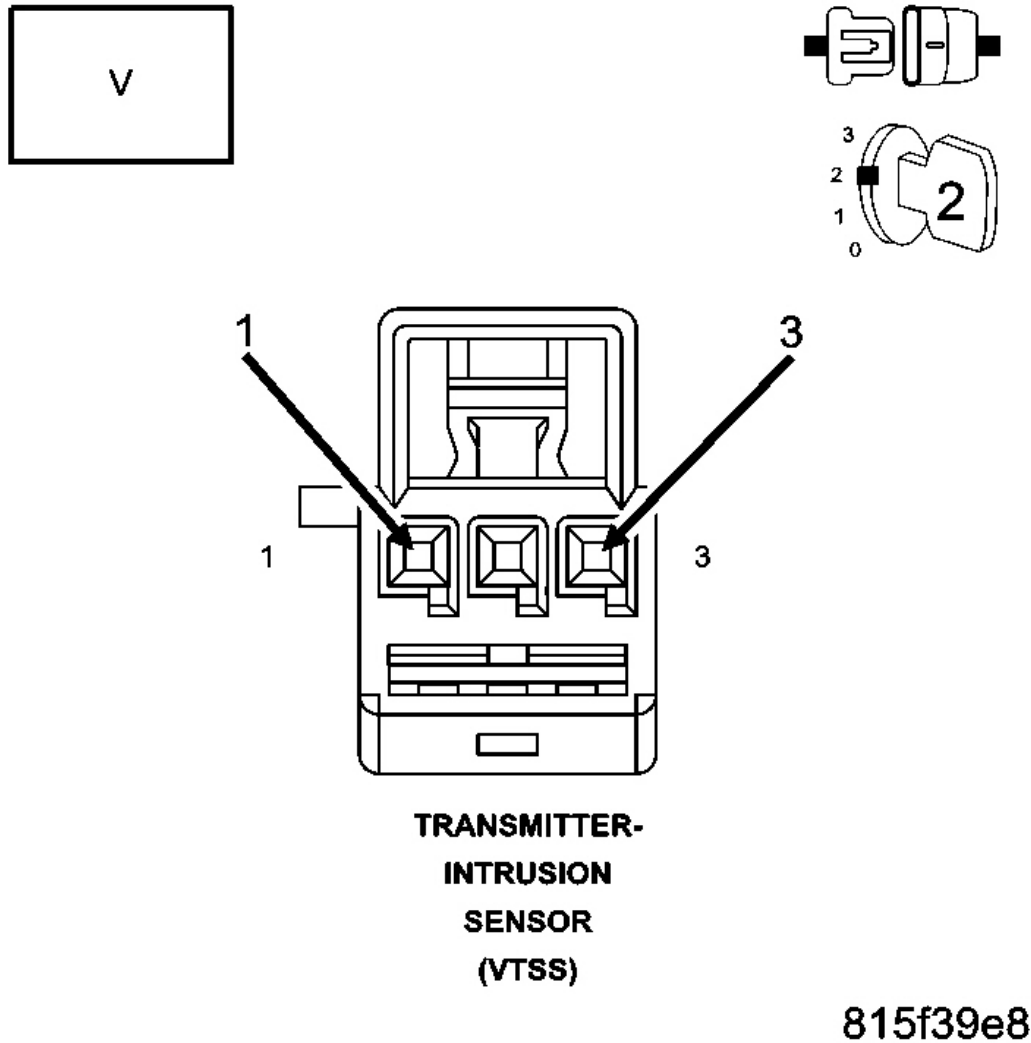


Fig. 17: Measuring Voltage Between (A645) Intrusion Sensor Signal Circuit And (G945) Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Disconnect the Intrusion Sensor Transmitter connector.

NOTE: Check connectors - Clean/repair as necessary.

Turn the ignition on.

With the scan tool actuate the Intrusion Sensor Transmitter.

Measure the voltage between (A645) Intrusion Sensor Signal circuit and (G945) Sensor Ground circuit.

Is the voltage above 10.0 volts

Yes

Go To 3.

No

Go To 4.

3. CHECK THE INTRUSION SENSOR TRANSMITTER

Turn the ignition off.

Install a known good Intrusion Sensor Transmitter.

Turn the ignition on.

With the scan tool erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait one minute.

Disarm the VTSS turn the ignition on and wait one minute.

With the scan tool, read DTC's.

Does the scan tool display B1A41-SECURITY TRANSMITTER SENSOR CIRCUIT OPEN?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the original Intrusion Sensor Transmitter.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (A645) INTRUSION TRANSMITTER SENSOR SIGNAL WIRE

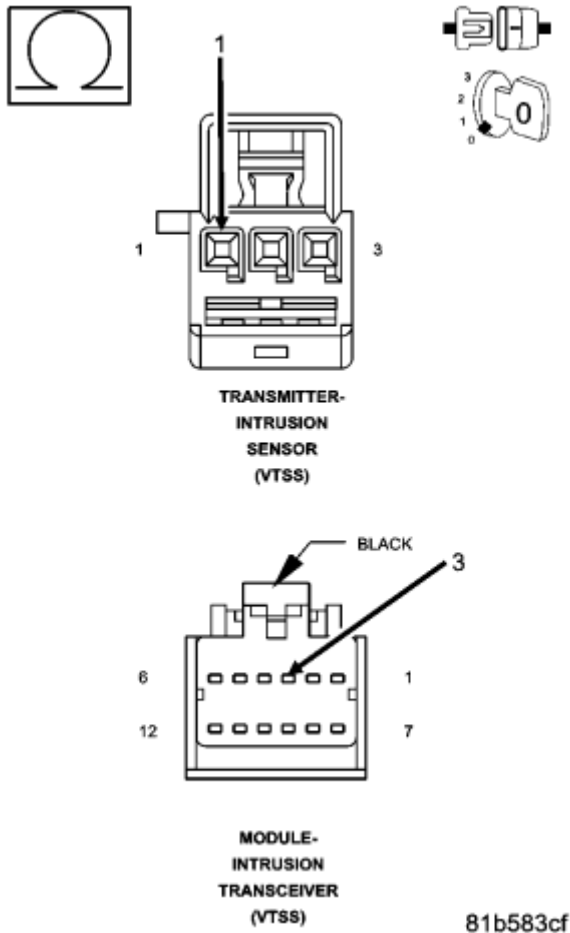


Fig. 18: Measuring Resistance Of (A645) Intrusion Transmitter Sensor Signal Circuit Between Intrusion Sensor Transmitter Connector And Intrusion Transceiver Module Connector
 Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance of the (A645) Intrusion Transmitter Sensor Signal circuit between the Intrusion Sensor Transmitter connector and the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (A645) Intrusion Transmitter Sensor Signal circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1**.

No

Go To 5.

5. **CHECK THE (G945) SENSOR GROUND WIRE FOR AN OPEN**

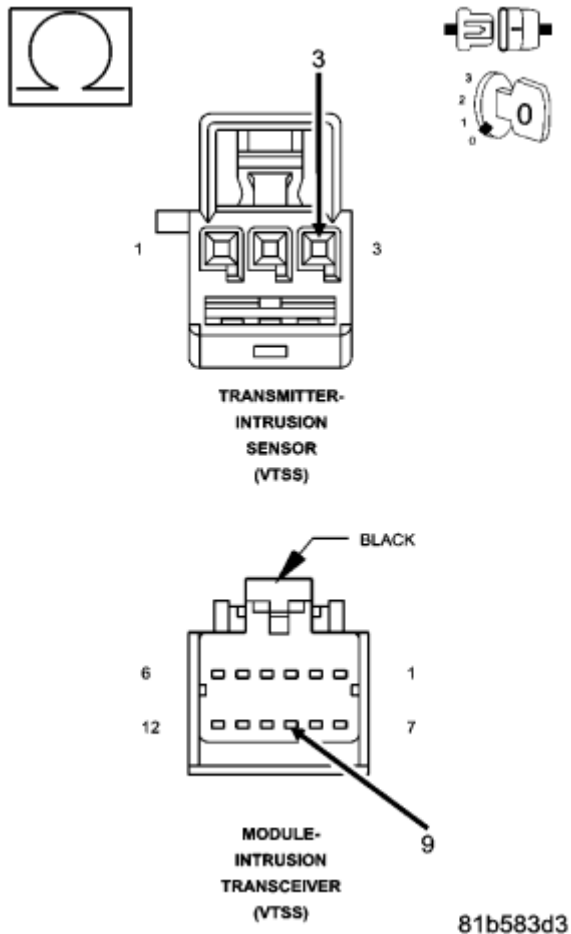


Fig. 19: Measuring Resistance Of (G945) Sensor Ground Circuit From Intrusion Sensor Transmitter Connector To Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Ensure Ignition off.

Measure the resistance of the (G945) Sensor Ground circuit from the Intrusion Sensor Transmitter connector to the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

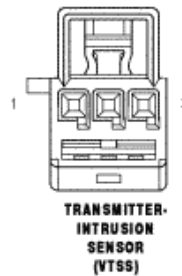
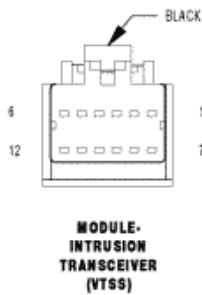
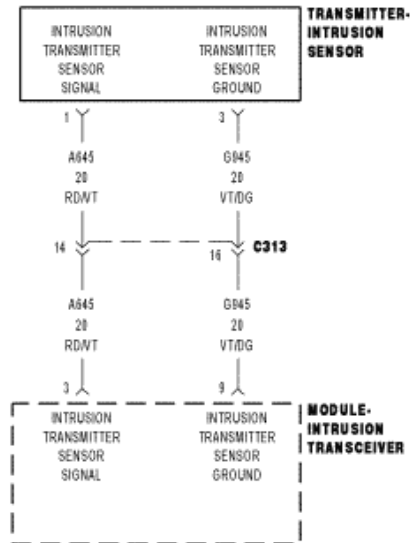
No

Repair the (G945) Sensor Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A42-SECURITY TRANSMITTER SENSOR CIRCUIT SHORTED TOGETHER

Circuit Schematic



01929000

Fig. 20: Intrusion Transmitter Sensor Signal Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

If the voltage current is below a specified range this DTC will set.

Possible Causes

Possible Causes
INTRUSION SENSOR TRANSMITTER (A645) INTRUSION TRANSMITTER SENSOR SIGNAL SHORTED TO (G945) SENSOR GROUND INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 2.

No

DTC is not active at this time. Test complete.
Perform **BODY VERIFICATION TEST - VER 1** .

2. INTRUSION SENSOR TRANSMITTER

Disconnect the Intrusion Sensor Transmitter connector.

NOTE: **Check connectors - Clean/repair as necessary.**

Connect a known good Intrusion Sensor Transmitter.

Turn the ignition on.

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

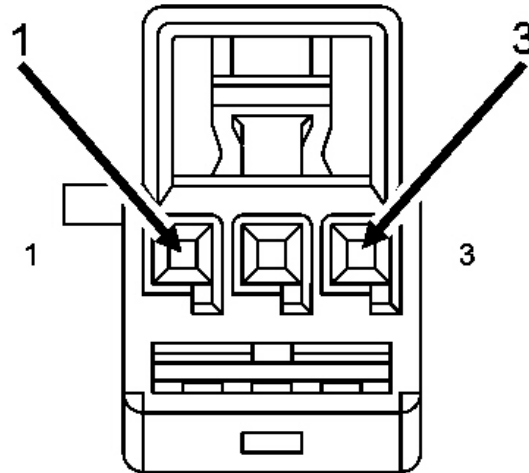
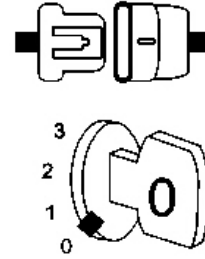
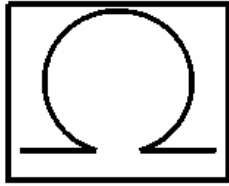
Go To 3.

No

Replace the original Intrusion Sensor Transmitter.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (A645) INTRUSION TRANSMITTER SENSOR SIGNAL WIRE FOR A SHORT TO (G945) SENSOR GROUND



**TRANSMITTER-
INTRUSION
SENSOR
(VTSS)**

815f6290

Fig. 21: Measuring Resistance Between (A645) Intrusion Transmitter Sensor Signal Circuit To (G945) Sensor Ground Circuit In Intrusion Sensor Transmitter Connector

Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transceiver connector.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between the (A645) Intrusion Transmitter Sensor Signal circuit to the (G945) Sensor Ground circuit in the Intrusion Sensor Transmitter connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (A645) Intrusion Transmitter Sensor Signal circuit for a short to the (G945) Sensor Ground circuit.

Perform **BODY VERIFICATION TEST - VER 1** .

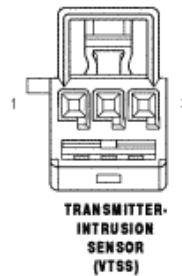
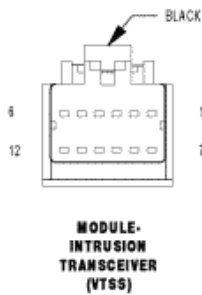
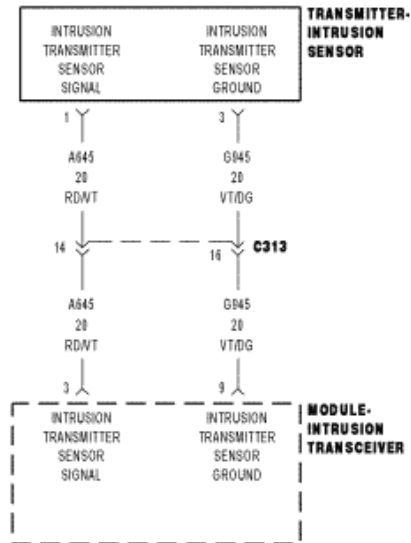
No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A43-SECURITY TRANSMITTER SENSOR RETURN CIRCUIT LOW

Circuit Schematic



01929000

Fig. 22: Intrusion Transmitter Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

The Intrusion Transceiver Module detects a short to ground condition on the sensor ground circuit.

Possible Causes

Possible Causes
INTRUSION SENSOR TRANSMITTER (G945) SENSOR GROUND CIRCUIT SHORTED TO GROUND
INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 2.

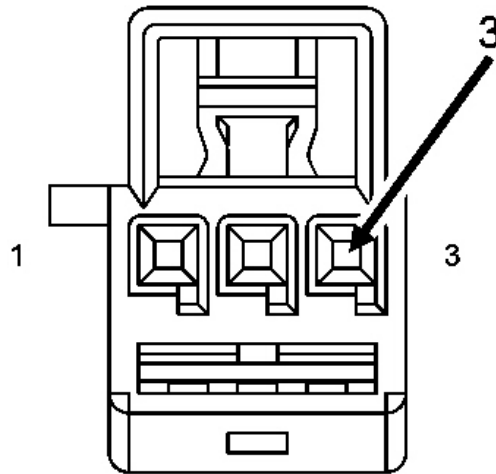
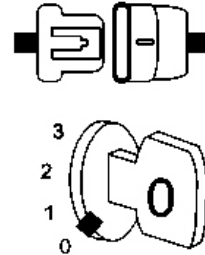
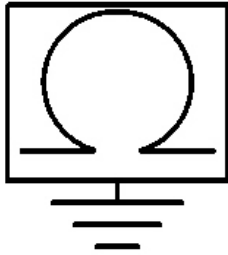
Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **CHECK THE (G945) SENSOR GROUND CIRCUIT SHORTED TO GROUND**



**TRANSMITTER-
INTRUSION
SENSOR
(VTSS)**

815f66fb

Fig. 23: Measuring Resistance Between Ground And (G945) Sensor Ground Circuit At Intrusion Sensor Transmitter Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transmitter connector.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between ground and the (G945) Sensor Ground circuit at the Intrusion Sensor Transmitter connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (G945) Sensor Ground circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

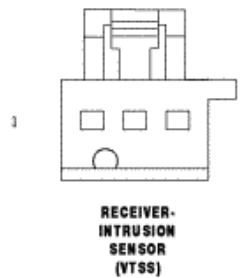
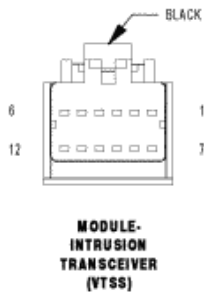
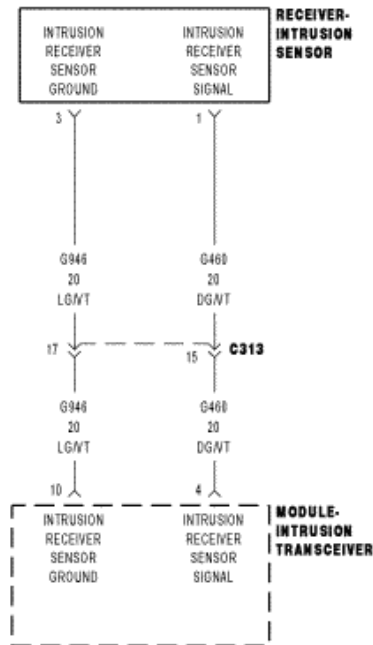
No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A44-SECURITY RECEIVER SENSOR CIRCUIT OPEN

Circuit Schematic



01344096

Fig. 24: Intrusion Receiver Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

When the VTSS is armed.

Set Conditions

- **Set Condition:**

If the voltage current is below a specified range this DTC will set.

Possible Causes

Possible Causes
(G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT OPEN
(G946) SENSOR GROUND CIRCUIT OPEN
INTRUSION SENSOR RECEIVER OPEN/MISSING
INTRUSION TRANSCEIVER MODULE

Diagnostic Test

1. **TEST FOR INTERMITTENT CONDITION**

Turn the ignition on.

With the scan tool, record and erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait one minute.

Disarm the VTSS turn the ignition on and wait one minute.

With the scan tool, read DTC's.

Does the scan tool display B1A44-SECURITY RECEIVER SENSOR CIRCUIT OPEN?

Yes

Go To 2.

No

The conditions that caused this code to set are not present at this time. Using the wiring diagram/schematic as a guide, inspect the wiring and connectors.

Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE (G460) INTRUSION RECEIVER SENSOR SIGNAL CIRCUIT VOLTAGE

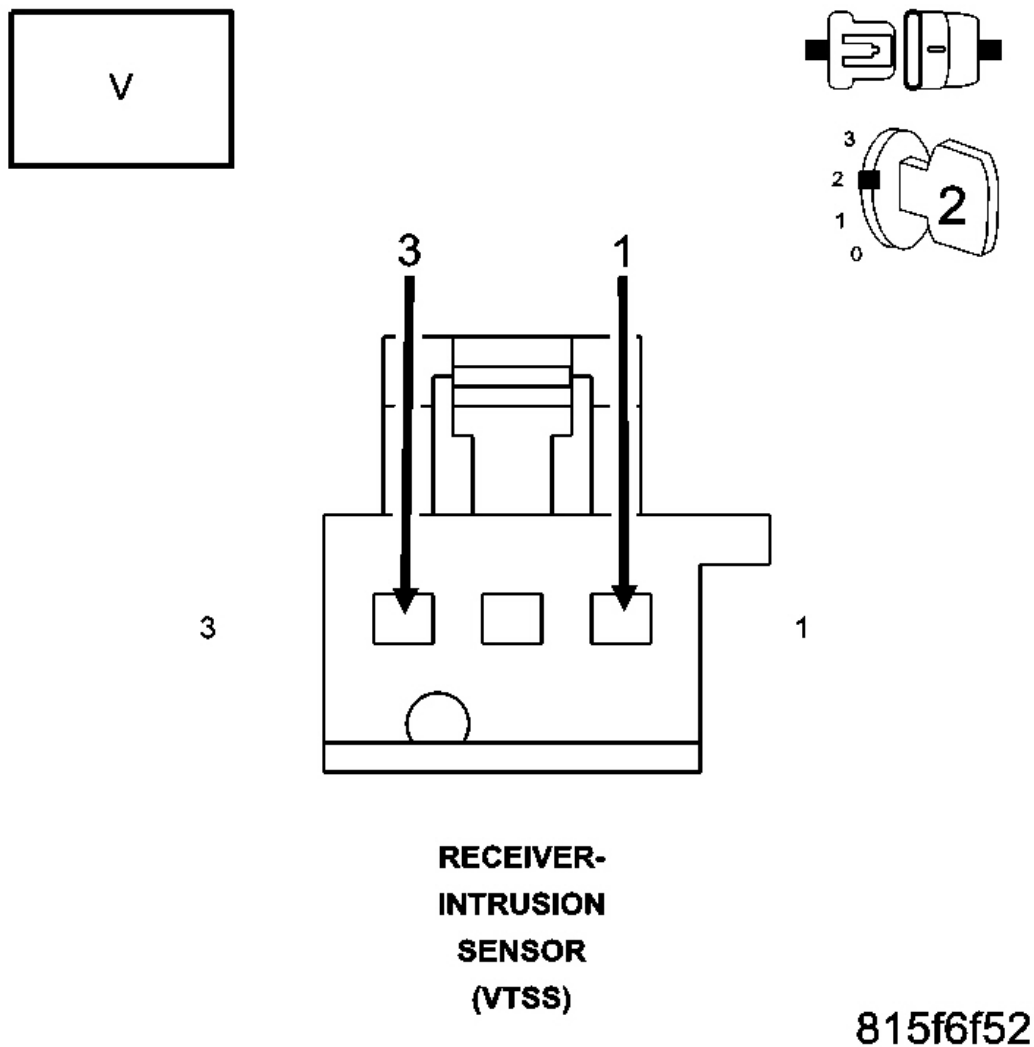


Fig. 25: Measuring Voltage Between (G460) Intrusion Receiver Sensor Signal Circuit And (G946) Sensor Ground Circuit
Courtesy of CHRYSLER LLC

Disconnect the Intrusion Sensor Receiver connector.

NOTE: Check connectors - Clean/repair as necessary.

Turn the ignition on.

With the scan tool actuate the Intrusion Sensor Receiver.

Measure the voltage between (G460) Intrusion Receiver Sensor Signal circuit and (G946) Sensor Ground circuit.

Is the voltage above 10.0 volts

Yes

Go To 3.

No

Go To 4.

3. CHECK THE INTRUSION SENSOR RECEIVER

Turn the ignition off.

Install a known good Intrusion Sensor Receiver.

Turn the ignition on.

With the scan tool erase DTC's.

Turn the ignition off and remove the key from the ignition.

Close all doors and arm the VTSS and wait one minute.

Disarm the VTSS turn the ignition on and wait one minute.

With the scan tool, read DTC's.

Does the scan tool display B1A44-SECURITY RECEIVER SENSOR CIRCUIT OPEN?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the original Intrusion Sensor Receiver.

Perform **BODY VERIFICATION TEST - VER 1** .

4. CHECK THE (G460) INTRUSION RECEIVER SENSOR SIGNAL WIRE

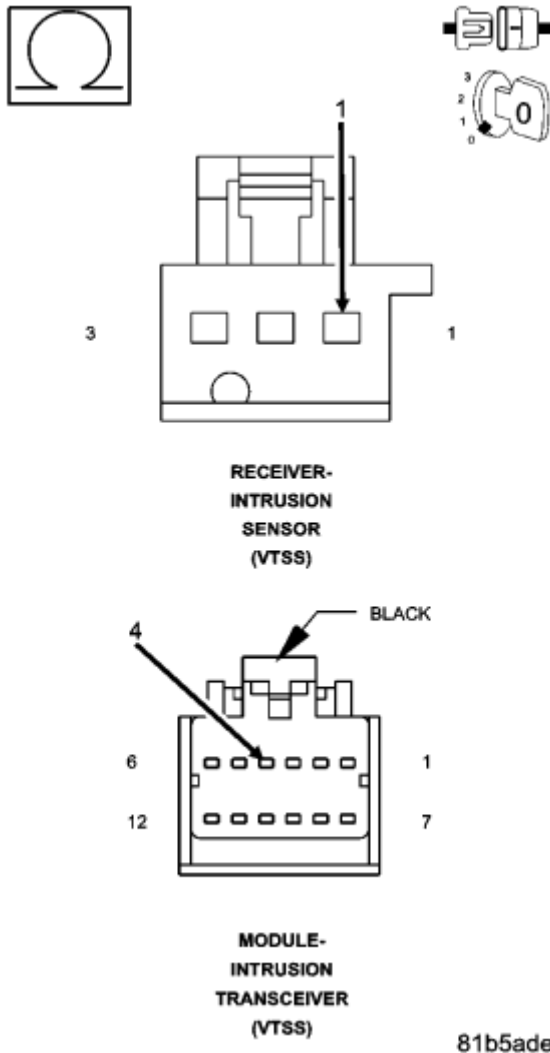


Fig. 26: Measuring Resistance Of (G460) Intrusion Receiver Sensor Signal Circuit Between Intrusion Sensor Receiver Connector And Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance of the (G460) Intrusion Receiver Sensor Signal circuit between the Intrusion Sensor Receiver connector and the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (G460) Intrusion Receiver Sensor Signal circuit for an open.

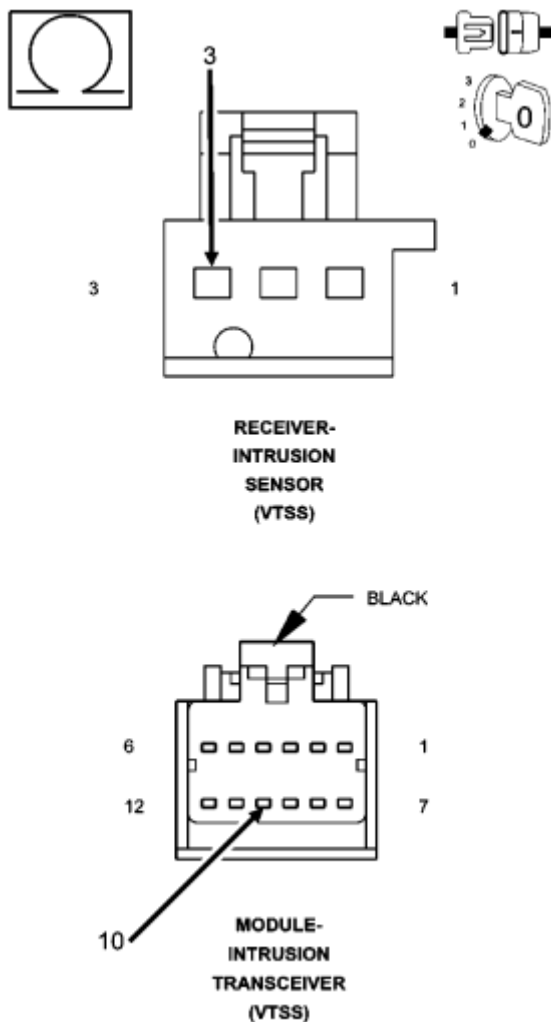
Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

Perform **BODY VERIFICATION TEST - VER 1**.

5. **CHECK THE (G946) SENSOR GROUND WIRE FOR AN OPEN**



81b5adf2

Fig. 27: Measuring Resistance Of (G946) Sensor Ground Circuit From Intrusion Sensor Receiver Connector To Intrusion Transceiver Module Connector
Courtesy of CHRYSLER LLC

Ensure Ignition is off.

Measure the resistance of the (G946) Sensor Ground circuit from the Intrusion Sensor Receiver connector to the Intrusion Transceiver Module connector.

Is the resistance below 5.0 ohms?

Yes

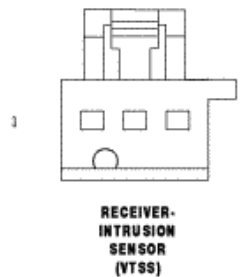
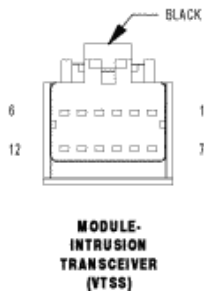
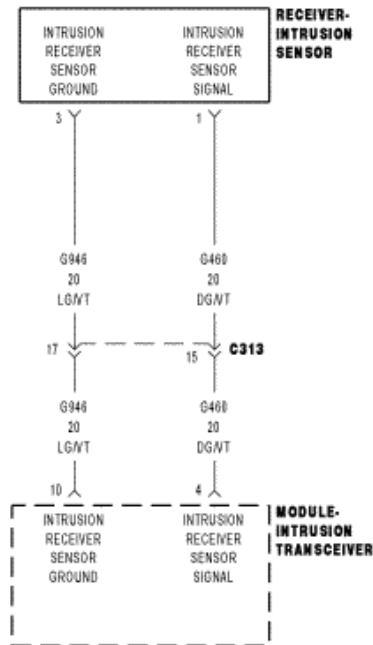
Replace the Intrusion Transceiver Module in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (G946) Sensor Ground circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

B1A45-SECURITY RECEIVER SENSOR CIRCUIT SHORTED TOGETHER

Circuit Schematic



01344006

Fig. 28: Intrusion Receiver Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

If the voltage current is below a specified range this DTC will set.

Possible Causes

Possible Causes
INTRUSION SENSOR RECEIVER (G460) INTRUSION RECEIVER SENSOR SIGNAL SHORTED TO (G946) SENSOR GROUND INTRUSION TRANSCIEVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 2.

No

DTC is not active at this time. Test complete.
Perform **BODY VERIFICATION TEST - VER 1** .

2. INTRUSION SENSOR RECEIVER

Disconnect the Intrusion Sensor Receiver connector.

NOTE: **Check connectors - Clean/repair as necessary.**

Connect a known good Intrusion Sensor Receiver.

Turn the ignition on.

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

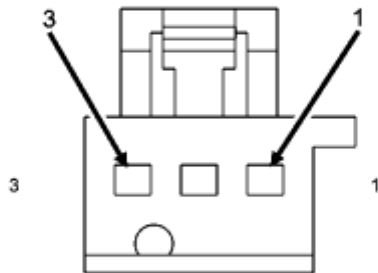
Go To 3.

No

Replace the original Intrusion Sensor Receiver.

Perform **BODY VERIFICATION TEST - VER 1** .

3. CHECK THE (G460) INTRUSION RECEIVER SENSOR SIGNAL WIRE FOR A SHORT TO (G946) SENSOR GROUND



RECEIVER-
INTRUSION
SENSOR
(VTSS)

81b5e687

Fig. 29: Measuring Resistance Between (G460) Intrusion Receiver Sensor Signal Circuit To (G946) Sensor Ground Circuit In Intrusion Sensor Receiver Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transceiver connector.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between the (G460) Intrusion Receiver Sensor Signal circuit to the (G946) Sensor Ground circuit in the Intrusion Sensor Receiver connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (G460) Intrusion Receiver Sensor Signal circuit for a short to the (G946) Sensor Ground circuit.

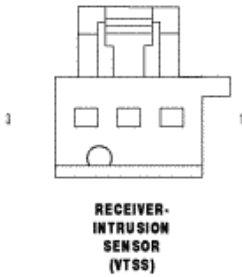
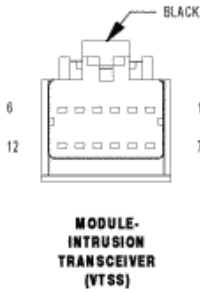
Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

Circuit Schematic



01344096

Fig. 30: Intrusion Receiver Sensor Signal Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

The Intrusion Transceiver Module detects a short to ground condition on the sensor ground circuit.

Possible Causes

Possible Causes
INTRUSION SENSOR RECEIVER (G946) SENSOR GROUND CIRCUIT SHORTED TO GROUND INTRUSION TRANSCIEVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

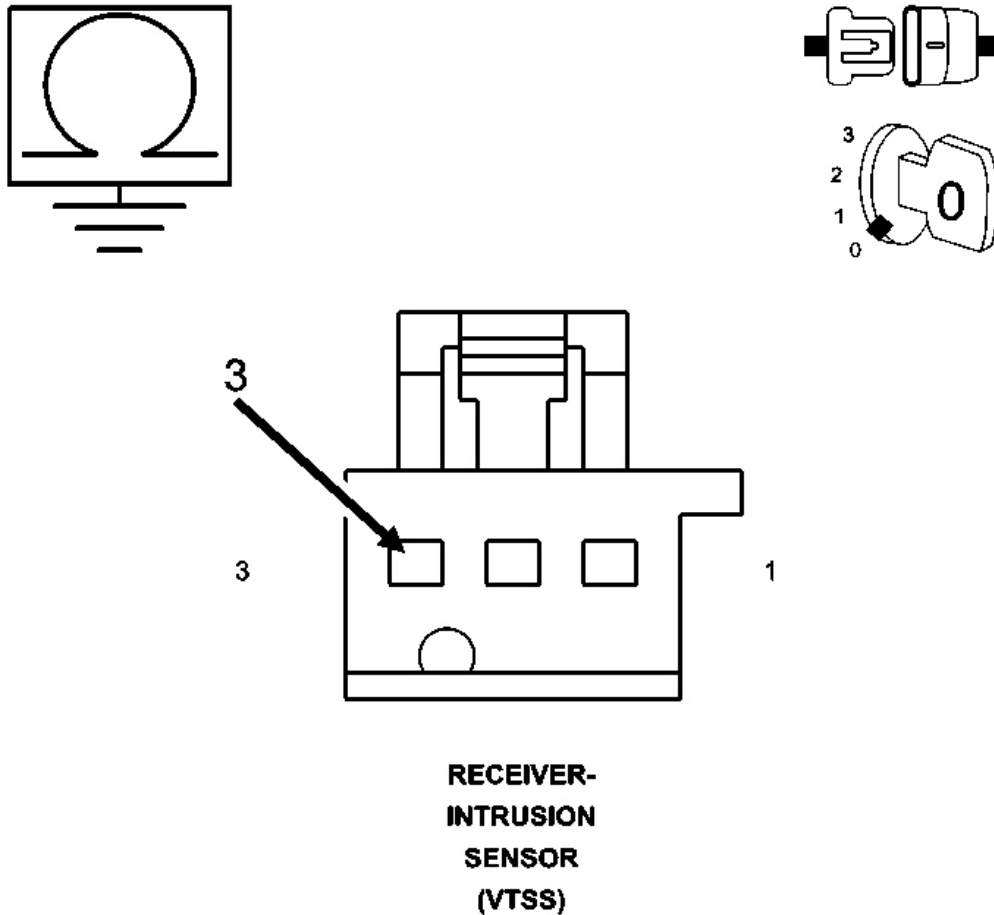
Go to 2.
Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.

Perform **BODY VERIFICATION TEST - VER 1**.

2. **CHECK THE (G946) SENSOR GROUND CIRCUIT SHORTED TO GROUND**



815f70da

Fig. 31: Measuring Resistance Between Ground And (G946) Sensor Ground Circuit At Intrusion Sensor Receiver Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Receiver connector.

Disconnect the Intrusion Transceiver Module connector.

Measure the resistance between ground and the (G946) Sensor Ground circuit at the Intrusion Sensor Receiver connector.

Is the resistance below 5.0 ohms?

Yes

Repair the (G946) Sensor Ground circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

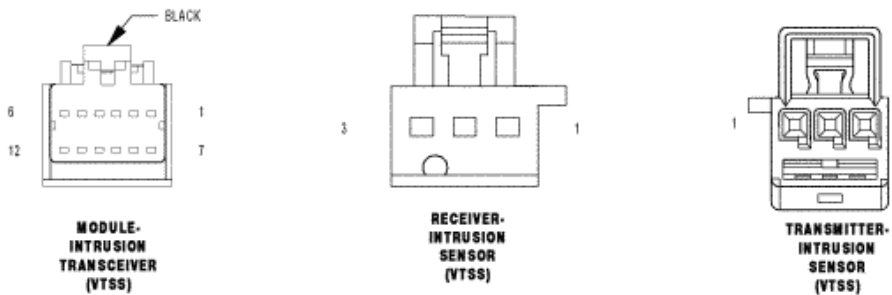
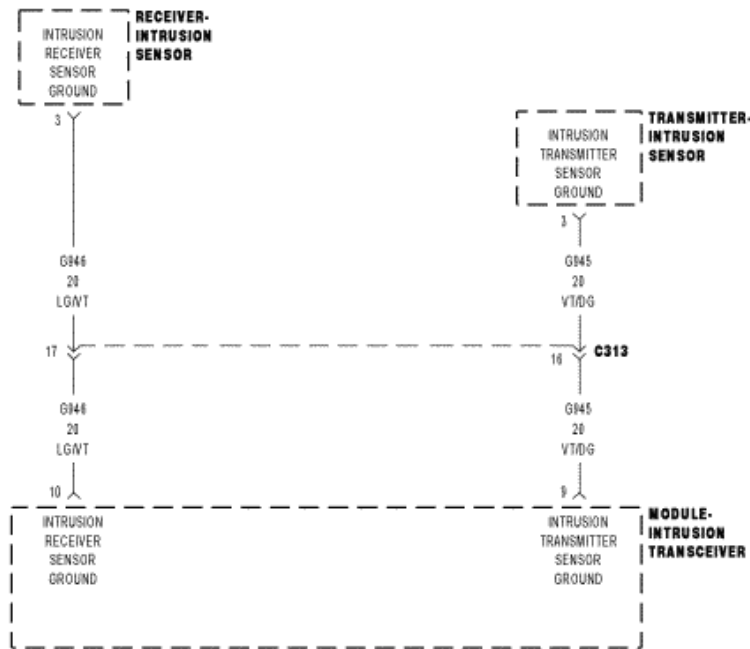
No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B1A47-SECURITY TRANSMITTER/RECEIVER SENSOR RETURN CIRCUIT HIGH

Circuit Schematic



01344ed0

Fig. 32: Security Transmitter/Receiver Sensor Return Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

During the VTSS pre-arm process.

Set Conditions

- **Set Condition:**

The Intrusion Transceiver Module detects a short to battery condition on the sensor ground circuit.

Possible Causes

Possible Causes
TRANSMITTER (G945) SENSOR GROUND CIRCUIT SHORTED TO BATTERY
RECEIVER (G946) SENSOR GROUND CIRCUIT SHORTED TO BATTERY
INTRUSION TRANSCIEVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

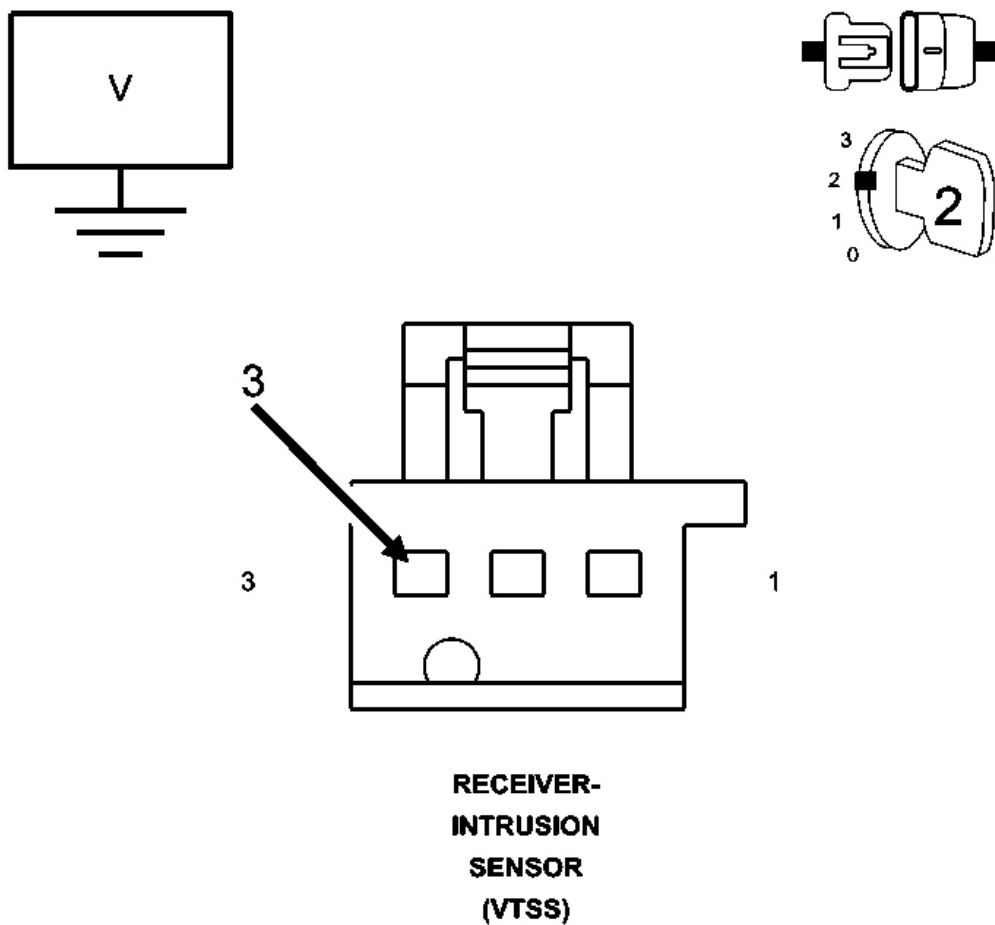
Yes

Go to 2.

No

DTC is not active at this time. Test complete.
Perform **BODY VERIFICATION TEST - VER 1** .

2. CHECK THE (G946) SENSOR GROUND CIRCUIT SHORT TO BATTERY



815fa5cf

Fig. 33: Measuring Voltage Of (G946) Sensor Ground Circuit In Intrusion Sensor Receiver Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Receiver connector.

Disconnect the Intrusion Transceiver Module connector.

Turn the ignition on.

Measure the voltage of the (G946) Sensor Ground circuit in the Intrusion Sensor Receiver connector.

Is there any voltage present?

Yes

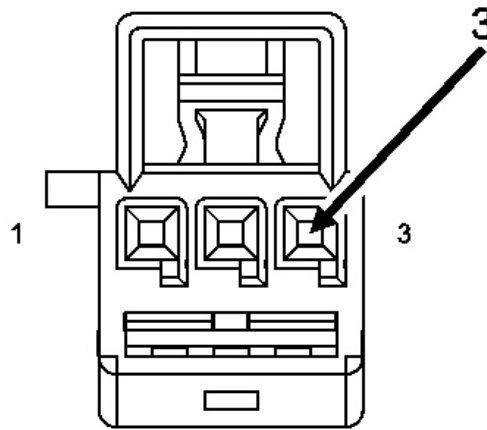
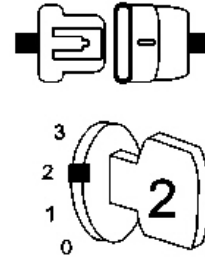
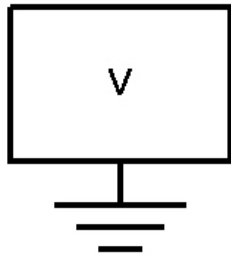
Repair the (G946) Sensor Ground circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3.

3. CHECK THE (G945) SENSOR GROUND CIRCUIT SHORT TO BATTERY



**TRANSMITTER-
INTRUSION
SENSOR
(VTSS)**

815fa564

Fig. 34: Measuring Voltage Of Sensor Ground Circuit In Intrusion Sensor Transmitter Connector
Courtesy of CHRYSLER LLC

Turn the ignition off.

Disconnect the Intrusion Sensor Transmitter connector.

Turn the ignition on.

Measure the voltage of the (G945) Sensor Ground circuit in the Intrusion Sensor Transmitter connector.

Is there any voltage present?

Yes

Repair the (G945) Sensor Ground circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

B210A-SYSTEM VOLTAGE LOW (WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition key in the run position.

Set Conditions

- **Set Condition:**

The Sentry Key Remote Entry Module (SKREEM) has detected the system voltage is below 9 volts.

Possible Causes

Possible Causes
FUSED IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT OPEN
FUSED (B+) CIRCUIT OPEN
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: **Diagnose any related Powertrain DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 3.

No

Go to 2.

2. INTERMITTENT CONDITION

NOTE: Check for any of the follow conditions:

- Poor wire to terminal connection
- Corroded terminals
- Backed out or loose terminals
- Broken wire internal to the insulation
- Dirty (partial) module ground

With the ignition on, wiggle the related wires.

Using a scan tool, read DTC(s).

Does the DTC reset?

Yes

Repair the wiring as necessary.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

DTC is not active at this time. Test complete.

3. FUSED IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT OPEN

NOTE: Check the related fuses to the Fused Ignition Switch Output (Run-Start) circuit. If the fuse is found to be open repair the circuit for a shorted condition.

Turn the ignition off.

Disconnect the SKREEM harness connector.

Turn the ignition on.

Using a 12 volt test light connected to ground, probe the Fused Ignition Switch Output (Run-Start) circuit in the SKREEM harness connector.

Does the test light illuminate brightly?

Yes

Go to 4.

No

Repair the Fused Ignition Switch Output (Run-Start) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST**.

4. FUSED (B+) CIRCUIT OPEN

Turn the ignition off.

Using a 12 volt test light connected to ground, probe the Fused (B+) circuit in the SKREEM harness connector.

Does the test light illuminate brightly?

Yes

Go to 5.

No

Repair the Fused (B+) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST**.

5. SKREEM

NOTE: Repeat the below procedure for both the Fused Ignition Switch Output (Run-Start) circuit and the Fused (B+) circuit.

NOTE: A dirty (partial) ground can cause abnormal conditions within a system. Ensure the module has a good ground before continuing.

Turn the ignition off.

Reconnect the SKREEM connector.

Back probe the Fused Ignition Switch Output (Run-Start) circuit and then the Fused (B+) circuit.

Start the engine.

Using the scan tool, view battery voltage under Data Display in the Engine category.

Compare the voltage on the scan tool to the voltage reading on the voltmeter.

Is the voltage on the scan tool equal to the voltmeter reading +/- .5 volt?

Yes

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Repair the circuit(s) that indicated the incorrect voltage.

Perform **SKREEM/SKIM VERIFICATION TEST**.

B210B-SYSTEM VOLTAGE HIGH (WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition key in the run position.

Set Conditions

• **Set Condition:**

The Sentry Key Remote Entry Module (SKREEM) has detected the system voltage above 16 volts.

Possible Causes

Possible Causes
FUSED IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: Diagnose any related Powertrain DTC(s) before continuing.

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Go To 3.

No

Go to 2.

2. INTERMITTENT CONDITION

NOTE: Check for any of the follow conditions:

- **Poor wire to terminal connection**
- **Corroded terminals**
- **Backed out or loose terminals**
- **Broken wire internal to the insulation**
- **Dirty (partial) module ground**

With the ignition on, wiggle the related wires.

Using a scan tool, read DTC(s).

Does the DTC reset?

Yes

Repair the wiring as necessary.

Perform **SKREEM/SKIM VERIFICATION TEST.**

No

DTC is not active at this time. Test complete.

3. FUSED IGNITION SWITCH OUTPUT (RUN-START) CIRCUIT SHORTED TO BATTERY

VOLTAGE

NOTE: **A dirty (partial) ground can cause abnormal conditions within a system. Ensure the module has a good ground before continuing.**

Turn the ignition off.

Disconnect the SKREEM harness connector.

Using a 12 volt test light connected to ground, probe the Fused Ignition Switch Output (Run-Start) circuit in the SKREEM harness connector.

Does the test light illuminate brightly?

Yes

Repair the Fused Ignition Switch Output (Run-Start) circuit for a short to voltage.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Replace and reprogram the SKREEM in accordance with the Service Information.
Perform **SKREEM/SKIM VERIFICATION TEST**.

B210D-BATTERY VOLTAGE LOW (WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition key in any position but run.

Set Conditions

- **Set Condition:**

The Sentry Key Remote Entry Module (SKREEM) has detected the Fused (B+) input voltage below 9 volts with the Key in any position except for RUN.

Possible Causes

Possible Causes
FUSED (B+) CIRCUIT OPEN

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

NOTE: Diagnose any related Powertrain DTC(s) before continuing.

With a scan tool, read and record DTCs.

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

Using the scan tool, select View DTCs.

Does the DTC reset?

Yes

Go To 3.

No

Go to 2.

2. INTERMITTENT CONDITION

NOTE: Check for any of the follow conditions:

- Poor wire to terminal connection
- Corroded terminals
- Backed out or loose terminals
- Broken wire internal to the insulation
- Dirty (partial) module ground

With the ignition on, wiggle the related wires.

Using a scan tool, View DTC(s).

Does the DTC reset?

Yes

Repair the wiring as necessary.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

DTC is not active at this time. Test complete.

3. **FUSED (B+) CIRCUIT OPEN**

NOTE: Check the related fuses to the Fused (B+) circuit. If the fuse is found to be open repair the circuit for a shorted condition.

Turn the ignition off.

Disconnect the SKREEM harness connector.

Turn the ignition on.

Using a 12 volt test light connected to ground, probe the Fused (B+) circuit in the SKREEM harness connector.

Does the test light illuminate brightly?

Yes

Go to 4.

No

Repair the Fused (B+) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST**.

4. **SKREEM**

NOTE: A dirty (partial) ground can cause abnormal conditions within a system. Ensure the module has a good ground before continuing.

Turn the ignition off.

Reconnect the SKREEM connector

Back probe the Fused (B+) circuit.

Start the engine.

Using the scan tool, view battery voltage under Data Display in the Engine category.

Compare the voltage on the scan tool to the voltage reading on the voltmeter.

Is the voltage on the scan tool equal to the voltmeter reading +/- .5 volt?

Yes

Replace and program the SKREEM in accordance with the Service Information.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Repair the Fused (B+) circuit for high resistances.
Perform **SKREEM/SKIM VERIFICATION TEST**.

B210E-BATTERY VOLTAGE HIGH (WCM)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition key in any position but run.

Set Conditions

- **Set Condition:**

The Sentry Key Remote Entry Module (SKREEM) has detected the Fused (B+) input voltage above 16 volts in all Key Positions except for RUN.

Possible Causes

Possible Causes
VEHICLE CHARGING SYSTEM
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

CAUTION: Diagnose and repair all Powertrain DTCs before continuing.

Turn the ignition on.

With the scan tool, record and erase the SKREEM DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

Using the scan tool, read the SKREEM DTCs.

Does the DTC reset?

Yes

Replace and program the SKREEM in accordance with the Service Information.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The DTC is not active at this time. Test complete.

B2204-ECU CONFIGURATION MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

• **Set Condition:**

The WCM receives different information than is configured within the module. Examples include Model Year, Country Code, Body Style, Platform, Remote Start, Sun Roof.

Possible Causes

Possible Causes
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

Turn the ignition on.

NOTE: Before continuing, review and check for the following:

- Review the repair history of the vehicle.
- Ensure that the vehicle has the correct PCM and SKREEM installed by verifying the part numbers.
- With the scan tool, ensure that the PCM and SKREEM are programmed correctly. Compare the PCM VIN to the SKREEM VIN and ensure the two VINs match.

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

With the scan tool, select View DTCs.

Does the DTC reset?

Yes

Replace and program the SKREEM in accordance with the Service Information.

NOTE: If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The DTC is not active at this time. Test complete.

B2205-ORIGINAL VIN MISSING/MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS**.

Monitor Conditions

When Monitored:

At ignition on, after ignition on during any rolling code handshake that occurs with the PCM due to a SKIM or PCM reset.

Set Conditions

• **Set Condition:**

A valid key is recognized but the programmed VIN does not match between the WCM and PCM/ECM.

Possible Causes

Possible Causes
VERIFYING PCM VIN INTERMITTENT WIRING HARNESS PROBLEM PCM

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

With the scan tool, erase the SKREEM DTCs.

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on and wait 2 minutes.

With the scan tool, read the SKREEM DTCs.

Does the scan tool display the DTC that was previously erased?

Yes

Go To 2.

No

Go To 4.

2. VERIFYING THE PCM VIN

Turn the ignition on.

With the scan tool, select Engine system from the main menu.

Display and record the Vehicle Identification Number.

NOTE: Ensure that a VIN has been programmed into the PCM. If a VIN is not displayed, attempt to program the PCM with the correct VIN before continuing.

Does the VIN recorded from the PCM match the VIN of the vehicle?

Yes

Go To 3.

No

Replace and program the Sentry Key Remote Entry Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

3. **REPLACE SKREEM AND CHECK DTC'S**

Turn the ignition off.

Replace and program the Sentry Key Remote Entry Module in accordance with the Service Information.

Turn the ignition on.

With the scan tool, display and clear all PCM and SKREEM DTC's.

Perform 5 ignition key cycles leaving the ignition key on for 90 seconds per cycle.

With the scan tool, check for SKREEM DTCs.

Does the scan tool display the same DTC?

Yes

Replace and program the Powertrain Control Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The repair is complete.

Perform **SKREEM/SKIM VERIFICATION TEST**.

4. **INTERMITTENT**

Turn the ignition off.

NOTE: Check for the following conditions:

- Visually inspect the related wiring harness. Look for any chafed, pierced, pinched, or partially broken wires.
- Visually inspect the related wiring harness connectors. Look for broken, bent, pushed out, or corroded terminals.
- Refer to any Technical Service Bulletins (TSB) that may apply.

Were any problems found?

Yes

Repair wiring harness/connectors as necessary.
Perform **SKREEM/SKIM VERIFICATION TEST**.

No

Test Complete.

B2206-CURRENT VIN MISSING/MISMATCH

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Anytime the ignition key is in the ON position.

Set Conditions

- **Set Condition:**

VIN stored in Intrusion Transceiver Module does not match the VIN stored in the Cluster.

Possible Causes

Possible Causes
INTRUSION TRANSCIEVER MODULE SWAPPED FROM DIFFERENT VEHICLE

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read ITM DTC(s).

Does the DTC reset?

Yes

Using the scan tool under Miscellaneous functions initialize the Intrusion Transceiver Module.
Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.
Perform **BODY VERIFICATION TEST - VER 1** .

B2224-SKREEM INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

Sentry Key Remote Entry Module (SKREEM) watchdog resets.

Possible Causes

Possible Causes
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

Turn the ignition on.

NOTE: Before continuing, review and check for the following:

- Review the repair history of the vehicle.
- Ensure that the vehicle has the correct PCM and SKREEM installed by verifying the part numbers.

- **With the scan tool, ensure that the PCM and SKREEM are programmed correctly. Compare the PCM VIN to the SKREEM VIN and ensure the two VINs match.**

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

With the scan tool, read DTCs.

Does the DTC reset?

Yes

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

NOTE: **If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.**

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The DTC is not active at this time. Test complete.

B2229-SKREEM INTERNAL - SKIM IMMOBILIZER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

When the Antenna diagnostic test fails.

Possible Causes

Possible Causes

Diagnostic Test

1. VERIFY THAT THE DTC IS ACTIVE

Turn the ignition on.

NOTE: Before continuing, review and check for the following:

- Review the repair history of the vehicle.
- Ensure that the vehicle has the correct PCM and SKREEM installed by verifying the part numbers.
- With the scan tool, ensure that the PCM and SKREEM are programmed correctly. Compare the PCM VIN to the SKREEM VIN and ensure the two VINs match.

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

With the scan tool, read DTCs.

Does the DTC reset?

Yes

Replace and program the Sentry Key Remote Entry Module (SKREEM) in accordance with the Service Information.

NOTE: If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.

Perform SKREEM/SKIM VERIFICATION TEST.

No

The DTC is not active at this time. Test complete.

B222A-VEHICLE LINE MISMATCH

Additional Wiring

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS.

Monitor Conditions

When Monitored:

Anytime the ignition key is in the ON position.

Set Conditions

- **Set Condition:**

If the Intrusion Transceiver Module is not configured.

Possible Causes

Possible Causes
INTRUSION TRANSCIEVER MODULE CONFIGURATION

Diagnostic Test

1. **CONFIGURE THE INTRUSION TRANSCIEVER MODULE**

Using the scan tool under miscellaneous functions perform the initialization procedure for the Intrusion Transceiver Module.

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read DTC(s).

Does the DTC reset?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Test complete.

Perform **BODY VERIFICATION TEST - VER 1** .

B223C-INTRUSION TRANSCIEVER MODULE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition on.

Set Conditions

- **Set Condition:**

Internal Intrusion Transceiver Module test failed.

Possible Causes

Possible Causes
INTRUSION TRANSCIVER MODULE

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read ITM DTC(s).

Does the DTC reset?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.
Perform **BODY VERIFICATION TEST - VER 1** .

B2254-COLUMN LOCK MODULE INTERNAL

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Ignition key in the run position.

Set Conditions

- **Set Condition:**

The alarm message fails three times.

Possible Causes

Possible Causes
SENTRY KEY REMOTE ENTRY MODULE (SKREEM)

Diagnostic Test

1. **VERIFY THAT THE DTC IS ACTIVE**

Turn the ignition on.

NOTE: Before continuing, review and check for the following:

- The battery voltage must be above 10 volts.
- Review the repair history of the vehicle.
- Ensure that the PCM and SKREEM are programmed correctly.
Compare the PCM VIN to the SKREEM VIN and ensure the two VINs match.

With the scan tool, clear DTCs.

Perform 5 ignition cycles, leaving the ignition switch on for a minimum of 90 seconds per cycle.

With the scan tool, read DTCs.

Is the DTC active?

Yes

Replace and program the SKREEM and Steering Column Lock Module in accordance with the Service Information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

No

The DTC is not active at this time. Test complete.

U0100-LOST COMMUNICATION WITH ECM/PCM

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure. Perform the No Response From ECM or PCM procedure.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0141-LOST COMMUNICATION WITH FRONT CONTROL MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0155-LOST COMMUNICATION WITH CLUSTER/CCN

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0159-LOST COMMUNICATION WITH PARK ASSIST MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0164-LOST COMMUNICATION WITH A/C HEATER CONTROL MODULE (HVAC)

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0187-LOST COMMUNICATION WITH DVD PLAYER

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Refer to **DIAGNOSIS AND TESTING** for the diagnostic test procedure.

U0236 - NO RESPONSE WITH COLUMN LOCK MODULE

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Possible Causes

Possible Causes
(A935) FUSED B(+) CIRCUIT OPEN (A306) FUSED B(+) CIRCUIT OPEN Z906 GROUND CIRCUIT OPEN (D508) COM-LIN (TPM) LAN CIRCUIT OPEN STEERING COLUMN-LOCK MODULE

Diagnostic Test

1. DETERMINING IF DTC IS CURRENT

With the scan tool, read and record the SKREEM DTCs.

With the scan tool, erase the SKREEM DTCs

NOTE: **Perform the following test several times to ensure the DTC is current.**

Turn the ignition off.

Wait 10 seconds.

Turn the ignition on.

With the scan tool, read the SKREEM DTCs.

Does the scan tool display the DTC that was previously erased?

Yes

Go To 2.

No

The conditions that set the DTC are no longer present. Inspect the wiring harness and related connectors for damage, pin push out or corrosion.

2. (A935) FUSED B(+) CIRCUIT OPEN

Turn the ignition off.

Disconnect the Steering Column-Lock Module harness connector.

Using a 12-volt test light connected to ground, probe the (A935) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

Go To 3.

No

Repair the (A935) Fused B(+) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST.**

3. (A306) FUSED B(+) CIRCUIT OPEN

Using a 12-volt test light connected to ground, probe the (A306) Fused B(+) circuit.

Does the test light illuminate brightly?

Yes

Go To 4.

No

Repair the (A306) Fused B(+) circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST.**

4. (Z906) GROUND CIRCUIT OPEN

Using a 12-volt test light connected to 12-volts, check the (Z906) Ground circuit.

Does the test light illuminate brightly?

Yes

Go To 5.

No

Repair the (Z906) Ground circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST**.

5. (D508) COM-LIN (TPM) LAN CIRCUIT OPEN

Disconnect the SKREEM/WCM harness connector.

Measure the resistance of the (D508) COM-LIN (TPM) LAN circuit between the SKREEM/WCM harness connector and the Steering Column-Lock Module connector.

Is resistance below 5.0 ohms?

Yes

Replace the Sentry Key Remote Entry Module/Steering Column-Lock Module in accordance with the service information.

Perform **SKREEM/SKIM VERIFICATION TEST**.

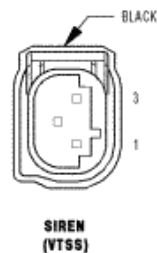
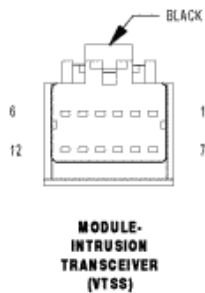
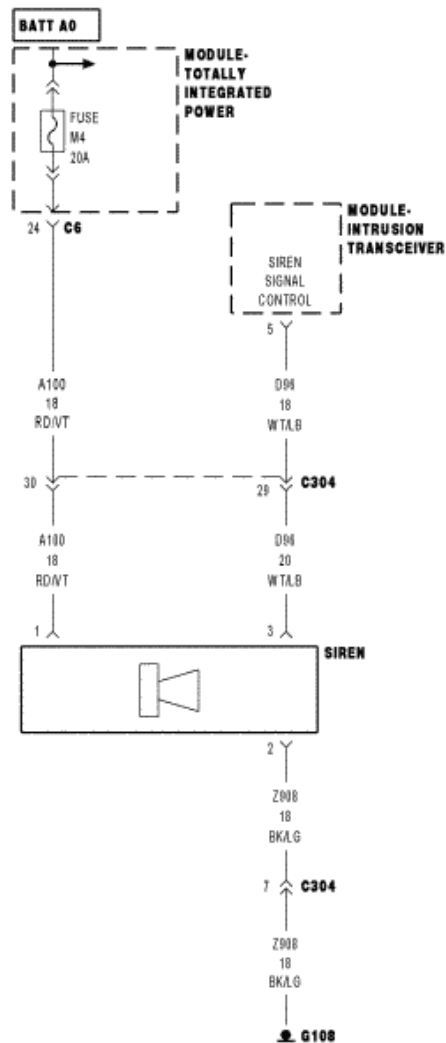
No

Repair the (D508) COM-LIN (TPM) LAN circuit for an open.

Perform **SKREEM/SKIM VERIFICATION TEST**.

U110D-LOST COMMUNICATION WITH SECURITY SIREN

Circuit Schematic



011556700

Fig. 35: Siren Signal Control Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Monitor Conditions

When Monitored:

Continuously while the VTSS is armed.

Set Conditions

- **Set Condition:**

If the Intrusion Transceiver Module does not receive messages from the Siren.

Possible Causes

Possible Causes
INTERMITTENT CONDITION (A100) FUSED B+ CIRCUIT OPEN (Z908) GROUND CIRCUIT OPEN (D96) SIREN SIGNAL CONTROL CIRCUIT SHORT TO BATTERY (D96) SIREN SIGNAL CONTROL CIRCUIT OPEN (D96) SIREN SIGNAL CONTROL CIRCUIT SHORT TO GROUND SIREN INTRUSION TRANSCIVER MODULE

Diagnostic Test

1. **INTERMITTENT DTC**

With the scan tool, erase the current Intrusion Transceiver Module DTC's.

Turn the ignition off.

Arm the VTSS and wait 1 minute.

Disarm the VTSS and turn the ignition on.

Does the scan tool display the same DTC?

Yes

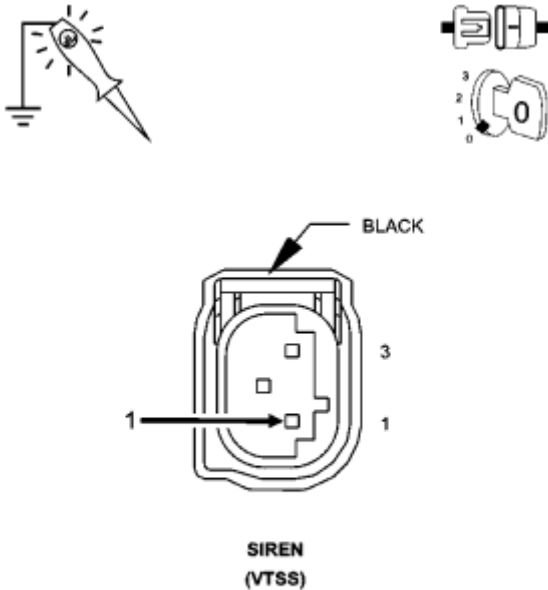
Go To 2.

No

The condition that caused this symptom is currently not present. Inspect the related wiring harness for a possible intermittent condition. Look for any chafed, pierced, pinched or partially broken wires.

Perform **BODY VERIFICATION TEST - VER 1** .

2. **(A100) FUSED B+ OPEN**



81b5710d

Fig. 36: Using 12-Volt Test Light Connected To Ground To Check (A100) Fused B(+) Circuit At Siren Connector

Courtesy of CHRYSLER LLC

Gain access to the VTSS Siren.

Disconnect the Siren connector.

Using a 12-volt test light connected to ground, check the (A100) Fused B(+) circuit in the Siren connector.

Does the test light illuminate brightly?

Yes

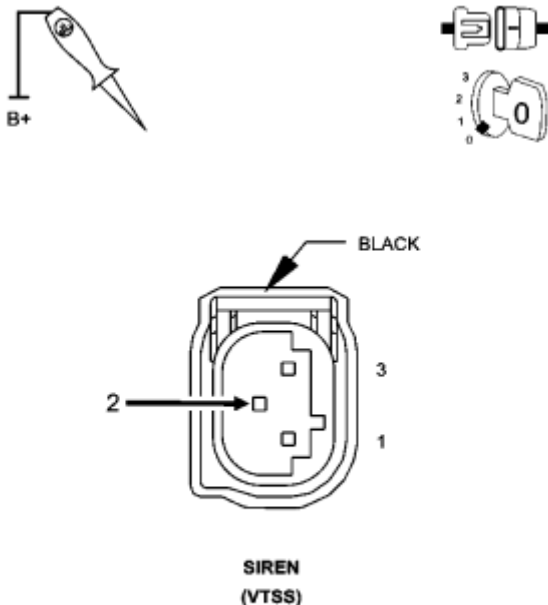
Go To 3.

No

Repair the (A100) Fused B+ circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

3. **(Z908) GROUND CIRCUIT OPEN**



81b57129

Fig. 37: Using 12-Volt Test Light Connected To 12-Volts To Check (Z908) Ground Circuit At Siren Connector
Courtesy of CHRYSLER LLC

Using a 12-volt test light connected to 12-volts, check the (Z908) Ground circuit at the siren connector.

Does the test light illuminate brightly?

Yes

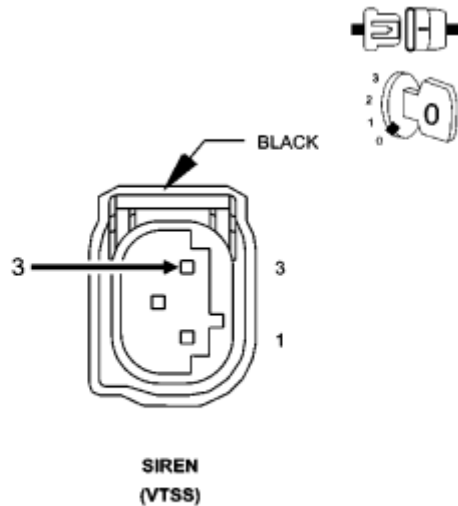
Go To 4.

No

Repair the (Z908) Ground circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4. FAULTY SIREN



81b5b679

Fig. 38: Using Scope Input Cable CH7058, Cable To Probe Adapter CH7062, And Red/Black Test Probes

Courtesy of CHRYSLER LLC

Use the DRBIII® and set up as follows:

Use the Scope input cable CH7058, Cable to Probe adapter CH7062, and the red and black test probes.

Connect the scope input cable to the channel one connector on the DRBIII®. Attach the red and black leads and the cable to probe adapter to the scope input cable.

Select DRBIII® Stand-alone.

Select lab scope.

Select Live.

Select 12 volt square wave.

Press F2 for Scope.

Press F2 and use the down arrow to set voltage range to 20 volts. Press F2 again when complete.

Disconnect the Siren connector.

Connect the black lead to the chassis ground. Connect the red lead to the (D96) Siren Signal Control circuit in the Siren connector.

Close all doors and arm the VTSS.

Observe the voltage displayed on the DRBIII® Lab Scope.

Is there a voltage square wave present 1 to 2 seconds?

Yes

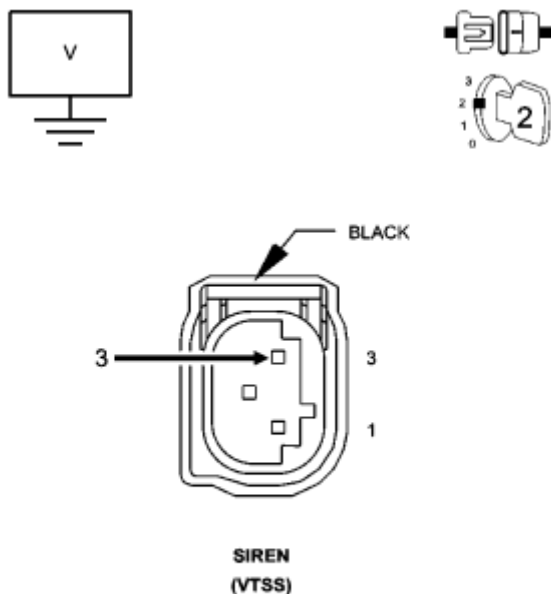
Connect a known good siren and try to reset the DTC. If the DTC does not reset the original siren needs to be replaced. If the DTC does reset replace the Intrusion Transceiver Module in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 5.

5. (D96) SIREN SIGNAL CONTROL CIRCUIT SHORT TO BATTERY



81b5b67d

Fig. 39: Measuring Voltage Of (D96) Siren Signal Control Circuit
Courtesy of CHRYSLER LLC

Disconnect the Siren harness connector.

Measure the voltage of the (D96) Siren Signal Control circuit.

Is there any voltage present?

Yes

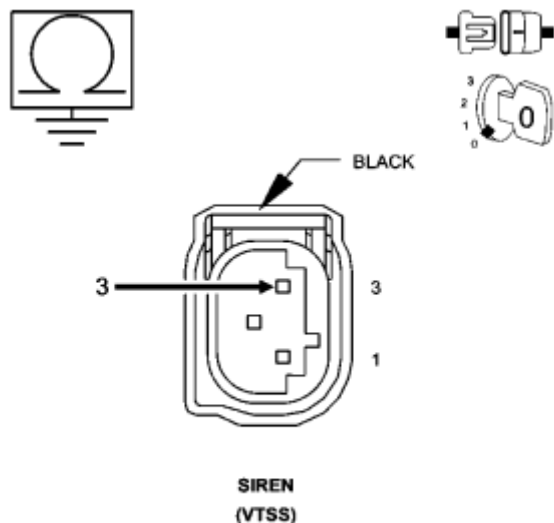
Repair the (D96) Siren Signal Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 6.

6. (D96) SIREN SIGNAL CONTROL CIRCUIT SHORT TO GROUND



81b5b682

Fig. 40: Measuring Resistance Between Ground And (D96) Siren Signal Control Circuit
Courtesy of CHRYSLER LLC

Disconnect the Siren harness connector.

Disconnect the Intrusion Transceiver Module harness connector.

Measure the resistance between ground and the (D96) Siren Signal Control circuit.

Is the resistance above 5.0 ohms?

Yes

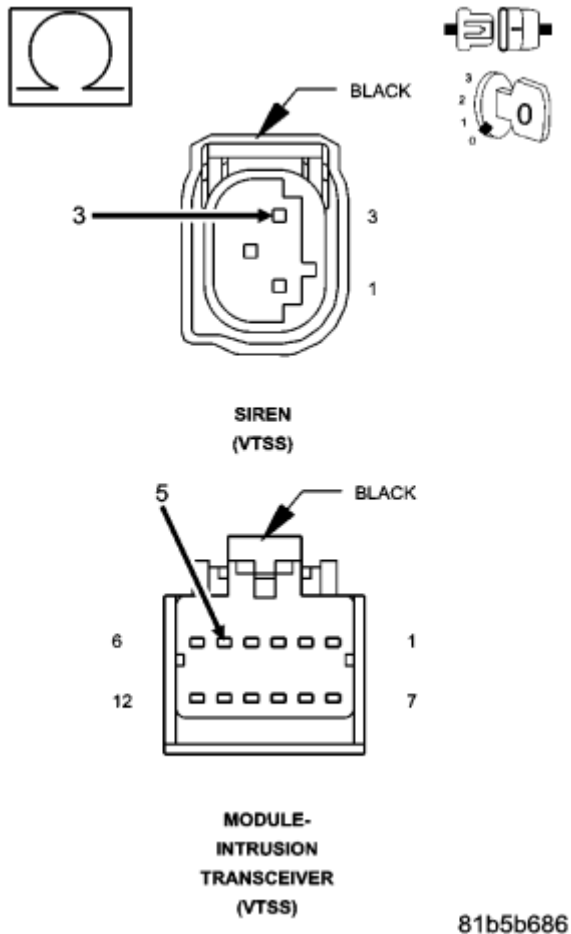
Go To 7.

No

Repair the (D96) Siren Signal Control circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

7. (D96) SIREN SIGNAL CONTROL CIRCUIT OPEN



81b5b686

Fig. 41: Measuring Resistance Of (D96) Siren Signal Control Circuit Between Intrusion Transceiver Module And Siren Connector
 Courtesy of CHRYSLER LLC

Disconnect the Intrusion Transceiver Module harness connector.

Measure the resistance of the (D96) Siren Signal Control circuit between the Intrusion Transceiver Module and the Siren connector.

Is the resistance below 5.0 ohms?

Yes

Replace the Intrusion Transceiver Module in accordance with the Service Information.
 Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (D96) Siren Signal Control circuit for an open.
 Perform **BODY VERIFICATION TEST - VER 1** .

U1416-IMPLAUSIBLE SECURITY SIREN SIGNAL RECEIVED

Additional Wiring

For complete wiring diagrams refer to SYSTEM WIRING DIAGRAMS .

Monitor Conditions

When Monitored:

While the VTSS is armed.

Set Conditions

- **Set Condition:**

When the learned Siren information stored in the ITM does not match.

Possible Causes

Possible Causes
INTERMITTENT CONDITION SIREN

Diagnostic Test

1. **DETERMINING IF DTC IS CURRENT**

NOTE: **Diagnose any related Communication DTC(s) before continuing.**

With a scan tool, read and record DTC(s).

With the scan tool, clear DTC(s).

Turn the ignition off and remove the key from the ignition.

Lock and close all doors to allow the VTSS to go from pre-arm to armed status and wait one minute.

Disarm the VTSS.

Using the scan tool, read ITM DTC(s).

Does the DTC reset?

Yes

Inspect wiring from ITM to Siren for an intermittent open condition. Check connector terminals for

push out, corrosion or loose terminal contact. If OK, replace the Siren.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go to 2.

2. INTERMITTENT CONDITION

NOTE: Check for any of the follow conditions:

- **Poor wire to terminal connection**
- **Corroded terminals**
- **Pushed out or loose terminals**
- **Broken wire internal to the insulation**

Were there any problems found?

Yes

Repair the wiring as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

No

DTC is not active at this time. Test complete.

STANDARD PROCEDURE

SKREEM/SKIM VERIFICATION TEST

Additional Wiring

For complete wiring diagrams refer to **SYSTEM WIRING DIAGRAMS** .

Diagnostic Test

1. SKREEM/SKIM VERIFICATION

NOTE: When entering the PIN, care should be taken because the SKREEM will only allow 3 consecutive attempts to enter the correct PIN. If 3 consecutive incorrect PIN's are entered the SKREEM will Lock Out the scan tool. To exit Lock Mode, the ignition key must remain in the Run position for 1 hour. All accessories must be off. A battery charger connected to the battery during this time period is recommended.

NOTE: On vehicles equipped with a premium Tire Pressure Monitoring (TPM) system, when the SKREEM and/or the spare tire pressure sensor is replaced with a new unit, a diagnostic scan tool **MUST** be used to run a routine that allows the SKREEM to be programmed with the ID number and location of the spare tire pressure sensor mounted in the wheel of the spare tire. Follow the programming steps outlined in the diagnostic scan tool for "Learn Spare Tire Sensor ID" under "Miscellaneous Functions" for the "WCM/Wireless Control Module" menu item as appropriate. In addition, if the SKREEM is replaced, the spare tire must be dismounted from its wheel to access and note the ID number on the spare tire pressure sensor so that the ID code for that sensor can be programmed into the new SKREEM.

1. Reconnect the previously disconnected components and connectors.
2. Obtain the vehicle's unique Personal Identification Number (PIN) assigned to its original SKREEM. This number can be obtained from the vehicle invoice or from the DaimlerChrysler Customer Center (Phone 1-800-992-1997).

NOTE: If the PCM and the SKREEM are replaced at the same time, program the PCM VIN into the PCM first.

NOTE: During PCM/ECM replacement, use the following steps to ensure transfer of the secret key information from the SKREEM to the new PCM. The PCM stores this information only. If the SKREEM ever needs to be replaced, the secret key information can be retrieved from the PCM and then transferred to the SKREEM for security use.

3. First replace the PCM/ECM with the original WCM still connected to the vehicle.
4. Using the appropriate service information program the new PCM/ECM. (This will ensure the Secret Key Transfer from the original WCM into the new PCM/ECM).
5. Now replace and program the WCM (if necessary). This will retain the Secret Key from the PCM/ECM back into the new WCM.
6. With the scan tool, select Miscellaneous Functions, WCM/Wireless Control Module. Then select the desired procedure and follow the display on the scan tool.
7. If the vehicle is equipped with Tire Pressure Monitoring System program the Placard Pressure Values into the WCM/SKREEM.
8. Ensure all the customer's keys have been programmed into the new module if necessary.
9. With the scan tool, erase all DTCs. Perform 5 ignition key cycles, leaving the key on for at least 90 seconds per cycle.
10. With the scan tool, read SKREEM DTC(s).

NOTE: If this vehicle is equipped with a Steering Column Lock Module, it must be replaced along with the SKREEM.

Are there any SKREEM DTC(s) present?

Yes

Repair not complete, refer to the appropriate symptom.

No

Repair is complete.

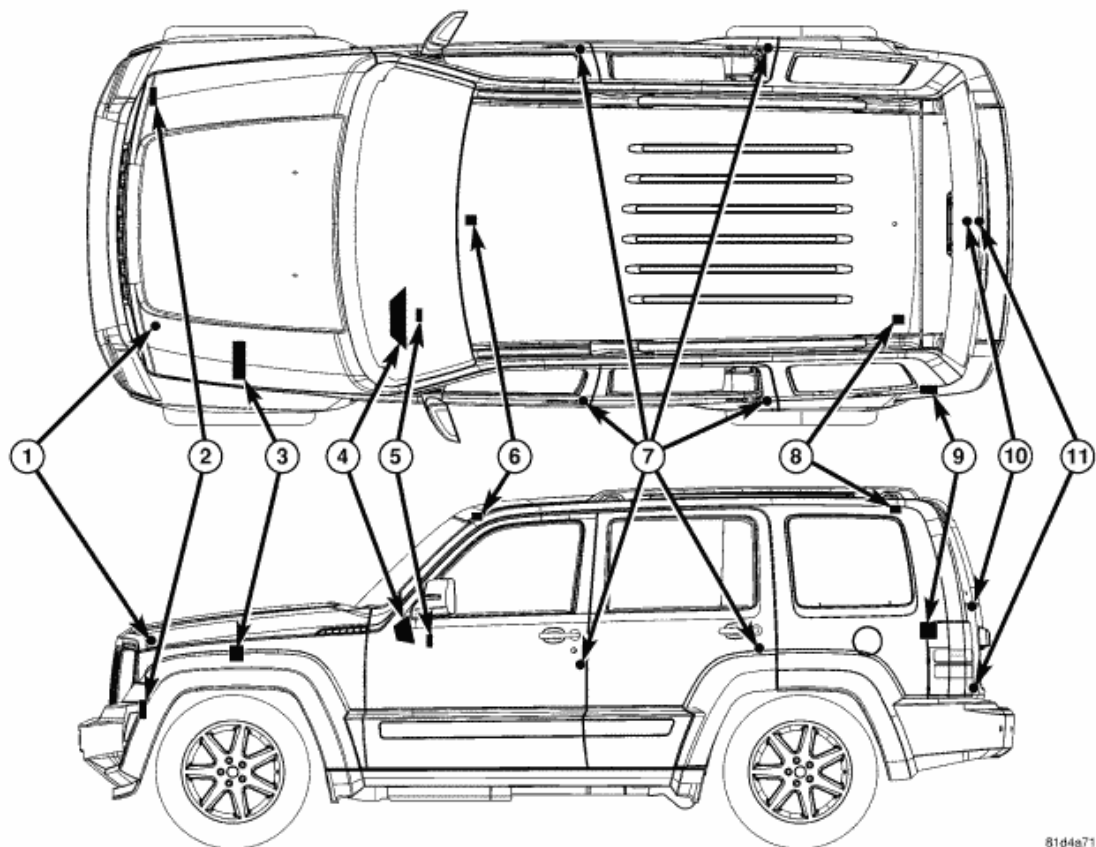
2008 ACCESSORIES AND EQUIPMENT

Vehicle Theft Security - Service Information - Liberty

VEHICLE THEFT SECURITY - SERVICE INFORMATION

DESCRIPTION

VEHICLE THEFT SECURITY SYSTEM



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Fig. 1: Vehicle Theft Security System
Courtesy of CHRYSLER LLC

The Vehicle Theft Security System (VTSS) is an available factory-installed feature on this vehicle. The VTSS is comprised of two primary subsystems: the optional Vehicle Theft Alarm (VTA) and the standard Sentry Key Immobilizer System (SKIS). The VTA is an active system that provides visual and audible responses as deterrents to and warnings of unauthorized vehicle tampering. The SKIS is a passive system that effectively immobilizes the vehicle against unauthorized operation. Following are paragraphs which describe the various components that are included in each of these subsystems of the VTSS.

Certain functions and features of the VTSS rely upon resources shared with or controlled by other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. Other modules that may affect VTSS operation are:

- **ElectroMechanical Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) provides security indicator control. Refer to **DESCRIPTION** .
- **Powertrain Control Module** - The Powertrain Control Module (PCM) provides the SKIS engine control logic.
- **Totally Integrated Power Module (3)** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. The TIPM monitors door, liftgate and hood ajar switch status and provides the VTA system logic. Refer to **DESCRIPTION** .

Except for the Sentry Key transponders, which rely upon Radio Frequency (RF) communication, hard wired circuitry connects the VTA and SKIS components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the SKIS components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

VEHICLE THEFT ALARM

The VTA is available in two different configurations for this vehicle: One configuration is designed for vehicles manufactured for sale in North America; while the other configuration is designed for vehicles manufactured for sale in markets outside of North America, also referred to as export markets within the context of this service information. In addition, the VTA for export is available in two versions: base and premium. All vehicles equipped with VTA are also equipped with the Remote Keyless Entry (RKE) system and the Sentry Key Immobilizer System (SKIS), regardless of their market destination.

The North American and export base version of the VTA system provides perimeter vehicle protection by monitoring the vehicle doors, the ignition switch, the liftgate, the liftgate flip-up glass and, for vehicles built for certain markets where it is required equipment, the hood. If unauthorized vehicle use or tampering is detected, these systems respond by pulsing the vehicle horn as an audible deterrent and flashing certain exterior lamps as a visual deterrent.

The export premium version of the VTA system is only available in vehicles manufactured for sale in certain export markets where it is required equipment. The export premium version of the VTA provides the same perimeter protection features as the base version, but adds interior vehicle intrusion protection. The export premium VTA also replaces the pulsing horn feature of the base version with an alarm siren as the audible deterrent, while retaining the flashing exterior lamps as the visual deterrent.

The VTA includes the following major components, which are described in further detail elsewhere in this service information:

- **Door Ajar Switches (7)** - A door ajar switch is integral to the door latch mechanism of each front and rear door. Refer to **DESCRIPTION** .
- **Flip-Up Glass Ajar Switch (10)** - A flip-up glass ajar switch is integral to the liftgate flip-up glass latch, located on the liftgate below the glass opening near the center. Refer to **DESCRIPTION** .

- **Hood Ajar Switch (1)** - A hood ajar switch is located on a bracket integral to the left side of the front end module carrier within the engine compartment of vehicles built for sale in certain export markets where it is required equipment.
- **Intrusion Module (9)** - An intrusion module is located on the left inner D-pillar in the passenger compartment of vehicles built for sale in certain export markets where it is required equipment.
- **Liftgate Ajar Switch (11)** - A liftgate ajar switch is integral to the latch for the liftgate in the vehicle. Refer to **DESCRIPTION**.
- **Security Indicator (4)** - A security indicator is integral to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). Refer to **DESCRIPTION**.
- **Siren (2)** - An alarm siren is located on the back of the front end module carrier in the engine compartment just below the inboard side of the right combination lamp housing of vehicles built for sale in certain export markets where it is required equipment.

SENTRY KEY IMMOBILIZER SYSTEM

The Sentry Key Immobilizer System (SKIS) is standard factory-installed equipment on this vehicle. The SKIS provides passive vehicle protection by preventing the engine from operating unless a valid electronically encoded key is detected in the ignition lock cylinder.

The SKIS includes the following major components, which are described in further detail elsewhere in this service information:

- **Security Indicator** - A security indicator is integral to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN). Refer to **DESCRIPTION**.
- **Sentry Key Remote Entry Module (5)** - The Sentry Key REMote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) is located on the right side of the steering column near the ignition lock cylinder housing and an integral molded plastic antenna ring circles the ignition lock cylinder like a halo. The SKREEM and its antenna are concealed beneath the shrouds on the steering column. See **DESCRIPTION**.
- **Sentry Key Transponder** - The Sentry Key transponder is contained within the Remote Keyless Entry (RKE) transmitter integral to the head of the ignition key. See **DESCRIPTION**.

OPERATION

VEHICLE THEFT SECURITY SYSTEM

The Vehicle Theft Security System (VTSS) is divided into two basic subsystems: Vehicle Theft Alarm (VTA) and Sentry Key Immobilizer System (SKIS). Following are paragraphs that briefly describe the operation of each of these two subsystems.

VEHICLE THEFT ALARM

The Totally Integrated Power Module (TIPM) is used on this vehicle to control and integrate many of the functions and features included in the Vehicle Theft Alarm (VTA). In the VTA system, the TIPM receives inputs indicating the status of the door ajar switches, the ignition switch, the liftgate ajar switch, the flip-up glass ajar switch and the power lock switches. In vehicles built for certain export markets where it is required,

the hood ajar switch provides a hard wired input to the TIPM and the intrusion module provides electronic message inputs to the TIPM over the Controller Area Network (CAN) data bus. The TIPM processes the information from all of these inputs, and sends electronic messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over the CAN data bus to control the security indicator as appropriate. The TIPM internally controls the output to the hazard warning lamps and sends a control output to energize or de-energize the horn relay as appropriate. On vehicles with an intrusion module, the horn output of the TIPM is replaced by an output of the siren module that is controlled by the intrusion module.

The hard wired circuits between components related to the VTA system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the VTA system or the electronic controls or communication between modules and devices that provide some features of the VTA system. The most reliable, efficient, and accurate means to diagnose the VTA system or the electronic controls and communication related to VTA system operation requires the use of a diagnostic scan tool. See the **Vehicle Theft Security System** menu item on the scan tool.

Following are paragraphs that briefly describe the operation of each of the VTA features.

ENABLING

The TIPM must have the VTA function electronically enabled in order for the VTA to perform as designed. The logic in the TIPM keeps its VTA function dormant until it is enabled using a diagnostic scan tool. The VTA function of the TIPM is enabled on vehicles equipped with the VTA option at the factory, but a service replacement TIPM must be VTA-enabled by the dealer using a diagnostic scan tool.

ARMING

Passive arming of the VTA occurs when the vehicle is exited with the key removed from the ignition switch, the headlamps are turned OFF, and the doors are locked while they are open using the power lock switch. Active arming occurs when the LOCK button on the Remote Keyless Entry (RKE) transmitter is depressed to lock the vehicle. For active arming to occur, the doors, the liftgate and the flip-up glass must be closed and the ignition switch must be in the OFF position when the RKE transmitter LOCK button is depressed. The power lock switch will not function if the key is in the ignition switch or the headlamps are turned ON with the driver side front door open.

Pre-arming of the VTA is initiated when a door, the liftgate or the flip-up glass is open when the vehicle is locked using a power door lock switch or when the RKE transmitter LOCK button is depressed. Pre-arming will not occur if the key is in the ignition switch or the headlamps are turned ON with the driver side front door open. When the VTA is pre-armed, the arming sequence is delayed until all of the doors, the liftgate and the flip-up glass have been closed. The VTA will remain in pre-armed mode for up to 16 seconds after all doors, the liftgate and the flip-up glass have been closed.

Once the VTA begins the passive or active arming sequence, the security indicator in the instrument cluster will flash rapidly for about 16 seconds. This indicates that VTA arming is in progress. If the ignition switch is turned

to the ON position, if a door, the liftgate or the flip-up glass is unlocked or opened by any means, or if the RKE PANIC button (if equipped) is depressed during the 16 second arming process, the security indicator will stop flashing and the arming process will abort. Once the arming sequence is successfully completed, the security indicator will flash at a slower rate, indicating that the VTA is armed.

On vehicles equipped with the hood ajar switch, the VTA arming sequence will occur regardless of whether the hood is open or closed, but the security indicator will illuminate solid and the underhood area will not be protected unless the hood is closed when the VTA arming sequence begins. Also, if the status of the hood ajar switch changes from open to closed during the 16 second arming process, the security indicator will switch from solid to flashing and the VTA arming sequence will abort. Once the arming process is successfully completed, the security indicator will flash at a slower rate, indicating that the VTA is armed.

DISARMING

For vehicles built for the North American market, passive disarming of the VTA occurs by inserting a valid Sentry Key Immobilizer System (SKIS) key into the ignition lock cylinder or by turning the ignition switch to the ON position. Active disarming of the VTA for all markets occurs when the vehicle is unlocked by depressing the UNLOCK button of the RKE transmitter. Once the alarm has been activated, either disarming method will also deactivate the alarm. Depressing the PANIC button (if equipped) on the RKE transmitter will **not** disarm the VTA.

POWER-UP MODE

When the armed VTA senses that the battery has been disconnected and reconnected, it enters its power-up mode. In the power-up mode, the alarm system remains armed following a battery failure or disconnect. If the VTA was armed prior to a battery disconnect or failure, the technician or vehicle operator will have to actively or passively disarm the alarm system after the battery is reconnected. The power-up mode will also apply if the battery goes dead while the system is armed and battery jump-starting is attempted. The VTA will be armed until the technician or vehicle operator has actively or passively disarmed the alarm system. If the VTA is in the disarmed mode prior to a battery disconnect or failure, it will remain disarmed after the battery is reconnected or replaced, or if jump-starting is attempted.

ALARM

The VTA alarm output varies by the version of the VTA with which the vehicle is equipped. In all cases, the alarm provides both visual and audible outputs; however, the time intervals of these outputs vary by the requirements of the market for which the vehicle is manufactured. In all cases, the visual output will be a flashing ON and OFF of the exterior lamps. For vehicles equipped with the North American or the export base version of the VTA, the audible output will be a pulsing of the horn. For vehicles with the export premium version of the VTA, the audible output will be a cycling of the alarm siren. The inputs that will trigger the alarm include the ignition switch, the door ajar switches, the liftgate ajar switch, the flip-up glass ajar switch and, in vehicles built for certain markets where they are required, the hood ajar switch and the intrusion module.

TAMPER ALERT

The VTA tamper alert feature will pulse the horn three times upon VTA disarming if the alarm was triggered and has since timed out. This feature alerts the vehicle operator that the VTA alarm was activated while the vehicle was unattended.

INTRUSION ALARM

The intrusion alarm is an exclusive feature of the export premium version of the VTA, which is only available in certain markets where it is required. When the VTA is armed, the intrusion module uses hard wired outputs to control an ultrasonic transmitter and receiver which allows the module to monitor the interior of the vehicle for movement. If motion is detected, the intrusion module sends an electronic message to the TIPM over the CAN data bus to invoke the visual alarm features, and sends an electronic message to the alarm siren in the engine compartment over a dedicated serial bus to invoke the audible alarm feature.

The motion detect feature of the intrusion module can be disabled by depressing the LOCK button on the RKE transmitter 3 times within 15 seconds during VTA arming, while the security indicator is still flashing rapidly. The VTA provides a single short siren chirp as an audible confirmation that the motion detect disable request has been received.

The intrusion module must be electronically enabled in order for the intrusion alarm to perform as designed. The intrusion alarm function of the intrusion module is enabled on vehicles equipped with this option at the factory, but a service replacement module must be configured and enabled by the dealer using a diagnostic scan tool. The intrusion module monitors the condition of the transmitter and receiver sensors as well as the siren, and will store fault information in the form of a Diagnostic Trouble Code (DTC) if a system malfunction is detected. The intrusion module may be diagnosed, and any stored DTC can be retrieved using a diagnostic scan tool.

SENTRY KEY IMMOBILIZER SYSTEM

The Sentry Key Immobilizer System (SKIS) is designed to provide passive protection against unauthorized vehicle use by disabling the engine after about two seconds of running whenever any method other than a valid Sentry Key is used to start the vehicle. The SKIS is considered a passive protection system because it is always active when the ignition system is energized and does not require any customer intervention. The SKIS uses Low Frequency (LF) Radio Frequency (RF) communication to obtain confirmation that the key in the ignition switch is a valid key for operating the vehicle. The microprocessor-based SKIS hardware and software also uses electronic messages to communicate with other electronic modules in the vehicle over the Controller Area Network (CAN) data bus. Refer to **OPERATION** .

Pre-programmed Sentry Key transponders are provided with the vehicle from the factory. Each Sentry Key REMote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) will recognize a maximum of eight Sentry Keys. If the customer would like additional keys other than those provided with the vehicle, they may be purchased from any authorized dealer. These additional keys must be programmed to the SKREEM in the vehicle in order for the system to recognize them as valid keys. This can be done by the dealer using a diagnostic scan tool or, if Customer Learn programming is an available SKIS feature in the market where the vehicle was purchased, the customer can program the additional keys, as long as at least two valid Sentry Keys are already available. See **STANDARD PROCEDURE**.

The SKREEM performs a self-test of the SKIS each time the ignition switch is turned to the ON position, and will store fault information in the form of a Diagnostic Trouble Code (DTC) if a system malfunction is detected. The SKREEM will also send an electronic message to the instrument cluster if a fault is detected, and the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) illuminates the security indicator as appropriate.

The hard wired circuits between components related to the SKIS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SKIS or the electronic controls or communication between other modules and devices that provide some features of the SKIS. The most reliable, efficient, and accurate means to diagnose the SKIS or the electronic controls and communication related to SKIS operation requires the use of a diagnostic scan tool.

DIAGNOSIS AND TESTING

VEHICLE THEFT SECURITY SYSTEM

The Vehicle Theft Security System (VTSS) is divided into two basic subsystems: Vehicle Theft Alarm (VTA) and Sentry Key Immobilizer System (SKIS). Following are the recommended procedures for diagnosis of each of these two subsystems.

VEHICLE THEFT ALARM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between components related to the VTA system may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the VTA system or the electronic controls or communication between other modules and devices that provide some features of the VTA system. The most reliable, efficient, and accurate means to diagnose the VTA system or the electronic controls and communication related to VTA system operation requires the use of a diagnostic scan tool. See the **Vehicle Theft Security System** menu item on the scan tool.

SENTRY KEY IMMOBILIZER SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component

diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

The hard wired circuits between components related to the SKIS may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SKIS or the electronic controls or communication between other modules and devices that provide some features of the SKIS. The most reliable, efficient, and accurate means to diagnose the SKIS or the electronic controls and communication related to SKIS operation requires the use of a diagnostic scan tool.

SENTRY KEY IMMOBILIZER SYSTEM DIAGNOSIS		
CONDITION	POSSIBLE CAUSES	CORRECTION
SECURITY INDICATOR FAILS TO LIGHT DURING BULB TEST	1. Ineffective Light-Emitting Diode (LED). 2. Ineffective fuse. 3. Ineffective ground circuit. 4. Ineffective battery feed circuit. 5. Ineffective ignition feed circuit.	1. Use a diagnostic scan tool to perform the instrument cluster actuator test. 2. Check the SKREEM/WCM fused B(+) fuse and the fused ignition switch output (run-start) fuse in the Totally Integrated Power Module (TIPM). Replace the fuses, if required. 3. Test and repair the open ground circuit at the connector for the SKREEM, if required. 4. Test and repair the open battery feed circuit at the connector for the SKREEM, if required. 5. Test and repair the open ignition feed circuit at the connector for the SKREEM, if required.
SECURITY INDICATOR FLASHES FOLLOWING BULB TEST	1. Invalid key in ignition switch lock cylinder. 2. Key-related fault.	1. Replace the key with a known valid key. 2. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis.
SECURITY INDICATOR LIGHTS SOLID FOLLOWING BULB TEST	1. SKIS system malfunction/fault detected. 2. SKIS system ineffective.	1. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis. 2. Use a diagnostic scan tool and the appropriate diagnostic information for further diagnosis.

STANDARD PROCEDURE

SENTRY KEY TRANSPONDER PROGRAMMING

All Sentry Keys included with the vehicle are pre-programmed to work with the Sentry Key Immobilizer System (SKIS) when it is shipped from the factory. The Sentry Key REMote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) may be programmed to recognize up to a total of eight Sentry Keys. When programming a blank Sentry Key transponder, the key must first be cut to match the ignition switch lock cylinder in the vehicle for which it will be used. Once the additional or new key has been cut, the SKREEM must be programmed to recognize it as a valid key. There are two possible methods to program the SKREEM to recognize a new or additional valid key, the Secured Access Method and the Customer Learn Method. Following are the details of these two programming methods.

SECURED ACCESS METHOD

The Secured Access method applies to all vehicles. This method requires the use of a diagnostic scan tool. This method will also require that you have access to the unique four-digit PIN code that was assigned to the original SKREEM. The PIN code **must** be used to enter the Secured Access Mode in the SKREEM. This PIN number may be obtained from the vehicle owner, from the original vehicle invoice, or from the DaimlerChrysler Customer Center. Refer to **STANDARD PROCEDURE** .

CUSTOMER LEARN METHOD

NOTE: **The Customer Learn feature is only available on domestic vehicles, or those vehicles which have a U.S. country code designator. This programming method also requires access to at least two valid Sentry Keys. If two valid Sentry Keys are not available, or if the vehicle does not have a U.S. country code designator, the Secured Access Method MUST be used to program new or additional valid keys to the SKREEM.**

The Customer Learn programming method procedures are as follows:

1. Obtain the blank Sentry Key(s) that are to be programmed as valid keys for the vehicle. Cut the blank key (s) to match the ignition switch lock cylinder mechanical key codes.
2. Insert one of the two valid Sentry Keys into the ignition switch and turn the ignition switch to the ON position.
3. After the ignition switch has been in the ON position for longer than 3 seconds, but no more than 15 seconds, cycle the ignition switch back to the OFF position. Replace the first valid Sentry Key in the ignition switch lock cylinder with the second valid Sentry Key and turn the ignition switch back to the ON position. The second valid Sentry Key must be inserted in the lock cylinder within 15 seconds of removing the first valid key.
4. About 10 seconds after the completion of step 3, the security indicator in the instrument cluster will start to flash and a single audible chime will sound to indicate that the system has entered the Customer Learn programming mode.
5. Within 60 seconds of entering the Customer Learn programming mode, turn the ignition switch to the OFF position, replace the valid Sentry Key with a blank Sentry Key transponder, and turn the ignition

switch back to the ON position.

6. About 10 seconds after the completion of step 5, a single audible chime will sound and the security indicator will stop flashing, stay ON solid for 3 seconds, then turn OFF to indicate that the blank Sentry Key has been successfully programmed. The SKIS will immediately exit the Customer Learn programming mode. After the ignition is cycled the vehicle may be started using the newly programmed valid Sentry Key.

Each of these steps must be repeated and completed in their entirety for each additional Sentry Key that is to be programmed. If the above steps are not completed in the given sequence, or within the allotted time, the SKIS will exit the Customer Learn programming mode and the programming will be unsuccessful. The SKREEM will also automatically exit the Customer Learn programming mode if it sees a non-blank Sentry Key transponder when it should see a blank, if it has already programmed 8 valid Sentry Keys, or if the ignition switch is turned to the OFF position for more than about 50 seconds.

NOTE: If an attempt is made to start the vehicle while in the Customer Learn mode (security indicator flashing), the SKIS will respond as though the vehicle were being started with an invalid key. In other words, the engine will stall after about two seconds of operation. No faults will be set.

NOTE: Once a Sentry Key has been programmed as a valid key to a vehicle, it cannot be programmed as a valid key for use on any other vehicle.

SKIS INITIALIZATION

The Sentry Key Immobilizer System (SKIS) must be initialized following a Sentry Key REmote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) replacement. SKIS initialization requires the use of a diagnostic scan tool. Initialization will also require that you have access to the unique four-digit PIN code that was assigned to the original SKREEM. The PIN code **must** be used to enter the Secured Access Mode in the SKREEM. This PIN number may be obtained from the vehicle owner, from the original vehicle invoice, or from the DaimlerChrysler Customer Center. Refer to **STANDARD PROCEDURE** .

NOTE: If a Powertrain Control Module (PCM) is replaced on a vehicle equipped with the Sentry Key Immobilizer System (SKIS), the unique Secret Key data must be transferred from the Sentry Key REmote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) to the new PCM using the appropriate programming procedure. This procedure also requires the use of a diagnostic scan tool and the unique four-digit PIN code to enter the Secured Access Mode in the SKREEM. Refer to the appropriate service and diagnostic information for the proper PCM replacement procedure.

SPECIFICATIONS

SPECIFICATIONS - VEHICLE THEFT/SECURITY SYSTEMS

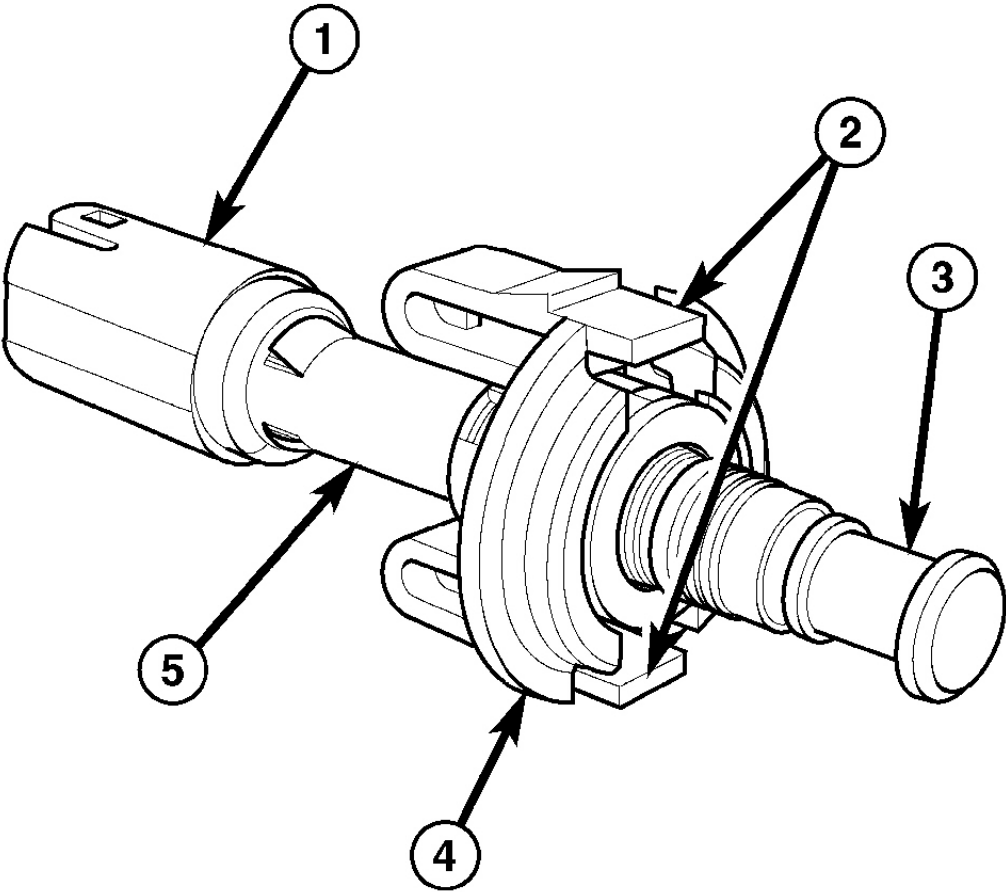
TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Steering Column Shroud Mounting Screws	2	-	20
Alarm Siren Mounting Screw	14	10	-

SWITCH-HOOD AJAR

DESCRIPTION

HOOD AJAR SWITCH



81428481

Fig. 2: Hood Ajar Switch
 Courtesy of CHRYSLER LLC

The hood ajar switch is a normally closed, single pole, spring-loaded plunger actuated switch. This switch has two unique versions that are used in two different applications. One switch is used only on vehicles equipped

with the Vehicle Theft Alarm (VTA) system for sale in certain export markets where protection of the underhood area is required equipment. The second switch is used only on domestic vehicles equipped with an optional remote starter system.

The molded plastic switch body (5) has an integral molded connector receptacle (1) on the lower end containing two terminal pins. The switch is connected to the vehicle electrical system through a dedicated take out of the engine compartment wire harness. Two integral latches (2) lock the switch into a keyed mounting hole in an a molded plastic cup-like adapter that, in turn snaps into a horizontal bracket that extends rearward from the top of the front end module carrier, to the left of center at the front of the engine compartment. The underside of the hood panel inner reinforcement actuates the switch plunger as the hood panel is closed.

The switch plunger (3) extends through a mounting collar (4) and a sleeve-like retainer ring on the upper end of the switch body. The retainer ring has a one time, self-adjustment feature that is activated after the switch is installed by closing the hood. The retainer ring is also color-coded to aid in identifying the switch application. A dark brown retainer ring identifies the underhood security switch application, while a white retainer ring identifies the remote starter system application.

An installed hood ajar switch cannot be readjusted or repaired. If the switch is damaged, ineffective, or requires readjustment, it must be replaced with a new unit.

OPERATION

HOOD AJAR SWITCH

The hood ajar switches are interchangeable physically, but not functionally. In each case, the hood ajar switch is a normally closed switch that is held open as the spring-loaded switch plunger is depressed by the inner hood panel reinforcement when the hood panel is closed and latched. When the hood is opened, the spring-loaded switch plunger extends from the switch body and the switch contacts are closed.

In the underhood security application (export vehicles only - dark brown retainer ring), the switch is connected in series between ground and the hood ajar switch sense input of the Totally Integrated Power Module (TIPM). The TIPM uses an internal resistor pull up to monitor the state of the hood ajar switch contacts.

In the remote starter system application (domestic vehicles only - white retainer ring) the switch has a 1 kilohm diagnostic resistor connected in parallel to the switch contacts between the two switch terminals. The switch is connected in series between an output of the TIPM and the hood ajar switch sense input of the TIPM. The TIPM continually monitors this circuit and will store a Diagnostic Trouble Code (DTC) for any fault that it detects.

The components of the switch self-adjustment feature include an integral stop on the shaft of the plunger and a ribbed, ratcheting sleeve-like retainer ring at the top of the switch body from which the plunger extends. With the switch mounting collar secured in its mounting hole, the plunger is depressed by the hood inner reinforcement as the hood is closed. As the plunger is depressed, the plunger stop contacts the top of the retainer ring and it is driven downward, ratcheting through the switch mounting collar until the hood is fully closed and latched. The ribs on the retainer ring are engaged within the mounting collar to maintain this adjusted position.

The hood ajar switch as well as the hard wired circuits between the switch and the TIPM may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove

conclusive in the diagnosis of the electronic controls or communication between modules and other devices related to hood ajar switch operation that provide some features of the export vehicle theft or domestic remote starter systems. The most reliable, efficient, and accurate means to diagnose the electronic controls and communication related to hood ajar switch operation requires the use of a diagnostic scan tool.

REMOVAL

HOOD AJAR SWITCH

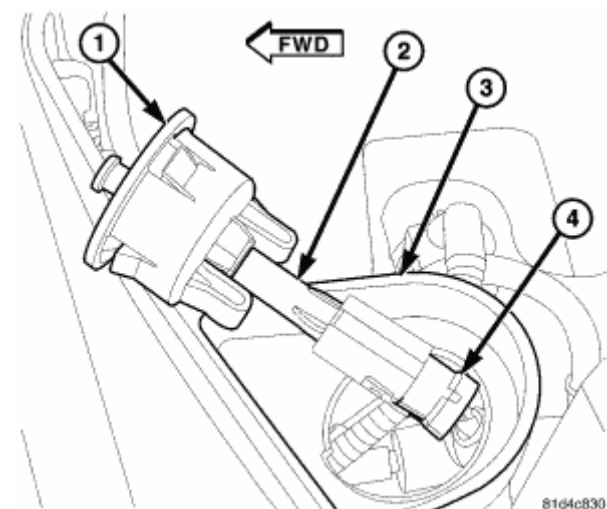


Fig. 3: Switch And Adapter
Courtesy of CHRYSLER LLC

1. Unlatch and open the hood.
2. Disconnect and isolate the battery negative cable.
3. From below the mounting tab of the front end module carrier (3) on the left side of the engine compartment, compress the sides of the adapter (1) far enough to push the hood ajar switch (2) and adapter up through the mounting tab.
4. Pull the switch and adapter up through the hole in the mounting tab far enough to access and disconnect the wire harness connector (4) from the switch connector receptacle.
5. From the bottom of the adapter, squeeze the two switch latch tabs together and push the switch up through the adapter.
6. Remove the hood ajar switch from the vehicle.

INSTALLATION

HOOD AJAR SWITCH

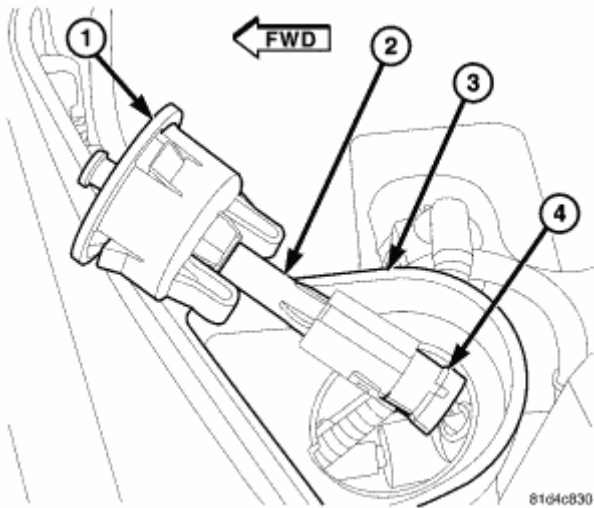


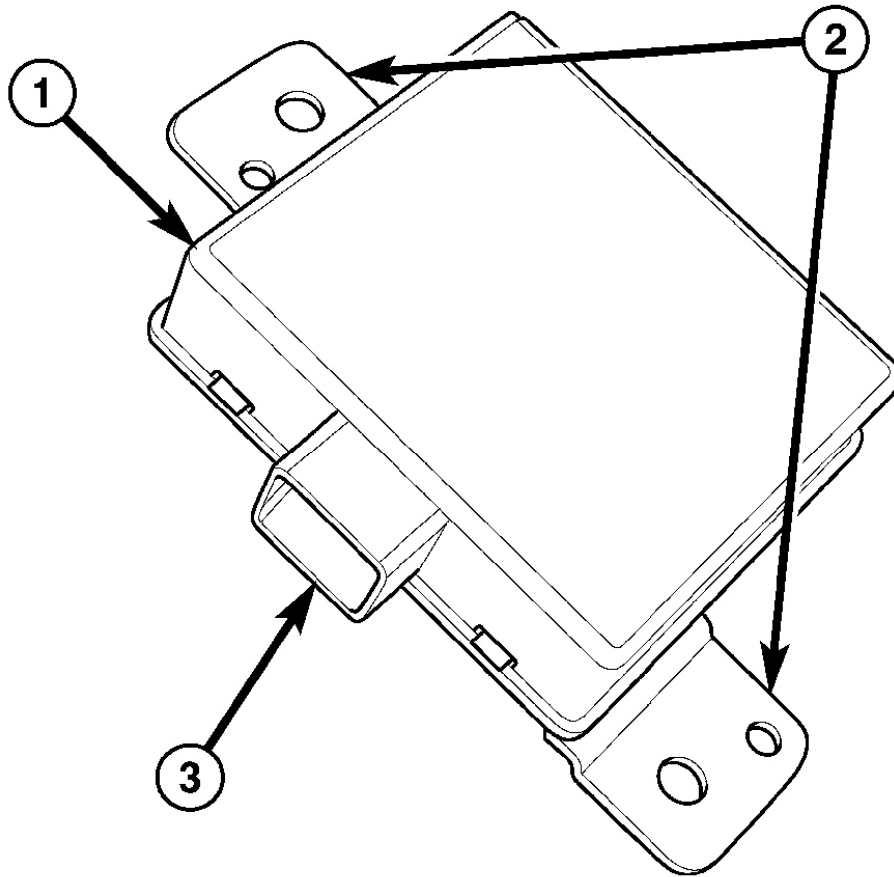
Fig. 4: Switch And Adapter
Courtesy of CHRYSLER LLC

1. Position the hood ajar switch (2) to the mounting hole in the adapter (1).
2. Press the switch down through the adapter mounting hole until the integral switch latch tabs lock it into place.
3. Pull the wire harness connector (4) up through the mounting tab of the front end module carrier mounting tab (3) and reconnect it to the switch connector receptacle.
4. Insert the switch and adapter into the mounting tab and press them downward until the adapter snaps into place.
5. Reconnect the battery negative cable.
6. Close and latch the hood.

INTRUSION MODULE

DESCRIPTION

INTRUSION MODULE



81598867

Fig. 5: Identifying Intrusion Module
Courtesy of CHRYSLER LLC

An intrusion module (1) is part of the premium version of the Vehicle Theft Alarm (VTA) in the Vehicle Theft Security System (VTSS). The premium version of the VTA is only available in vehicles built for certain markets, where the additional features offered by this system are required. The intrusion module is located in the passenger compartment. This unit is designed to work in conjunction with the intrusion sensor transmitter and intrusion sensor receiver to provide interior motion detection and serves as the interface between the Totally Integrated Power Module (TIPM), the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and the alarm siren.

The molded plastic intrusion module housing has two integral mounts (2) that are secured by two push-in plastic fasteners to the left inner D-pillar just below the belt line. The module is concealed beneath the quarter inner trim panel. Concealed within the molded plastic housing is the circuitry of the module, which includes a microprocessor. The module is connected through an integral connector receptacle (3) to the vehicle electrical system by a take out and connector of the body wire harness.

The intrusion module unit cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced.

OPERATION

INTRUSION MODULE

The microprocessor in the intrusion module contains the motion detection logic circuits and controls all of the features of the premium version of the Vehicle Theft Alarm (VTA). The module uses On-Board Diagnostics (OBD) and can communicate with other modules in the vehicle as well as with a diagnostic scan tool using the Controller Area Network (CAN) data bus. This method of communication is used by the module to communicate with the Totally Integrated Power Module (TIPM) and for diagnosis and testing through the 16-way data link connector located on the driver side lower edge of the instrument panel. The intrusion module also communicates with the alarm siren over a dedicated serial bus circuit.

The intrusion module microprocessor continuously monitors inputs from the intrusion sensor transmitter and receiver as well as inputs from the TIPM and the alarm siren module. The module energizes the intrusion sensor transmitter, which transmits ultrasonic signals into the vehicle cabin through a transmit transducer, then monitors the current draw of the transmitter to detect problems with the transmitter and transmitter circuits. The module also energizes the intrusion sensor receiver, which listens to the ultrasonic signals through a receive transducer as they bounce off of objects in the vehicle interior, then monitors the current draw of the receiver for data signals and to detect problems with the receiver and receiver circuits. If an object is moving in the interior, a detection circuit in the module senses this movement through the modulation of the returning data signals from the receiver.

If movement is detected while the VTA is armed, the intrusion module sends an electronic status message to the TIPM over the CAN data bus to flash the exterior lighting, and sends an electronic message to the alarm siren module over a dedicated serial bus line to sound the siren. When the TIPM detects a breach in the perimeter protection through a door, liftgate or hood ajar switch input, it flashes the exterior lighting and sends an electronic message to the intrusion module and the module sends an electronic message to the alarm siren module over a dedicated serial bus line to sound the siren.

The module also monitors message inputs from the alarm siren module for siren battery or siren input/output circuit tamper alerts, and for siren battery condition alerts, then sets active and stored Diagnostic Trouble Codes (DTC) for any monitored system faults it detects. An active fault only remains for the current ignition switch cycle, while a stored fault causes a DTC to be stored in memory by the intrusion module. If a fault does not recur for 50 ignition cycles, the module will automatically erase the stored DTC.

The intrusion module is connected to the vehicle electrical system through the body wire harness. The module receives battery current through a fuse in the TIPM, and receives ground through the body wire harness. These connections allow the module to remain operational, regardless of the ignition switch position.

The hard wired circuits of the intrusion module may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the intrusion module or the electronic controls or communication between modules and other devices that provide some features of the VTA. The most reliable, efficient, and accurate means to diagnose the intrusion module or the electronic controls and communication related to intrusion module operation requires the use of a diagnostic scan tool.

REMOVAL

INTRUSION MODULE

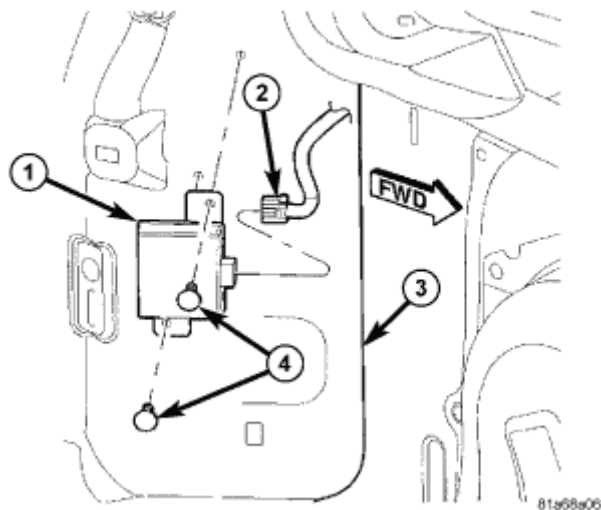


Fig. 6: Identifying Intrusion Module , Left Inner D-Pillar, Plastic Push-In Fasteners & Body Wire Harness

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Partially remove the trim from the inside of the left inner D-pillar (3). Refer to **REMOVAL** .
3. Disconnect the take out of the body wire harness (2) from the connector receptacle on the forward-facing side of the intrusion module (1).
4. Remove the two plastic push-in fasteners (4) that secure the module to the inner D-pillar.
5. Remove the module from the inner D-pillar.

INSTALLATION

INTRUSION MODULE

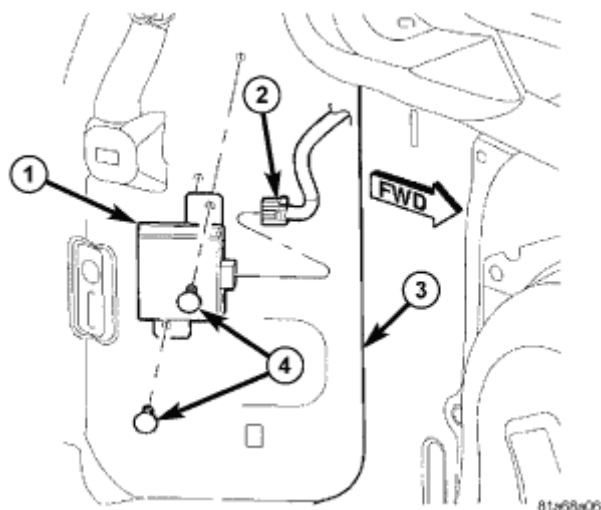


Fig. 7: Identifying Intrusion Module , Left Inner D-Pillar, Plastic Push-In Fasteners & Body Wire

Harness
Courtesy of CHRYSLER LLC

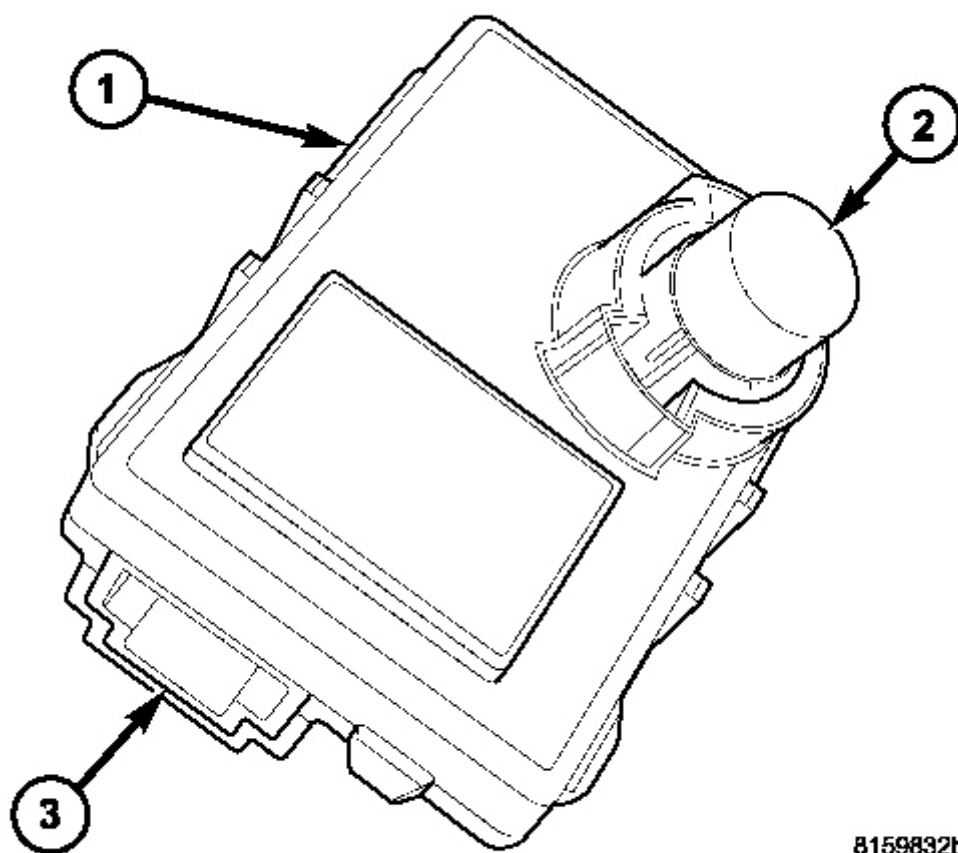
1. Position the intrusion module (1) onto the left inner D-pillar (3).
2. Install the two plastic push-in fasteners (4) that secure the module to the inner D-pillar.
3. Reconnect the take out of the body wire harness (2) to the connector receptacle on the forward-facing side of the module.
4. Reinstall the trim onto the inside of the left inner D-pillar. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

INTRUSION SENSOR

DESCRIPTION

INTRUSION SENSOR RECEIVER





8159832b

Fig. 8: Intrusion Sensor Receiver
Courtesy of CHRYSLER LLC

An intrusion sensor receiver (1) is part of the premium version of the Vehicle Theft Alarm (VTA) in the Vehicle Theft Security System (VTSS). The premium version of the VTA is only available in vehicles built for certain markets, where the additional features offered by this system are required. This unit is designed to work in conjunction with the intrusion sensor transmitter to provide interior motion detection inputs to the intrusion module, which serves as the interface between the Totally Integrated Power Module (TIPM), the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and the alarm siren.

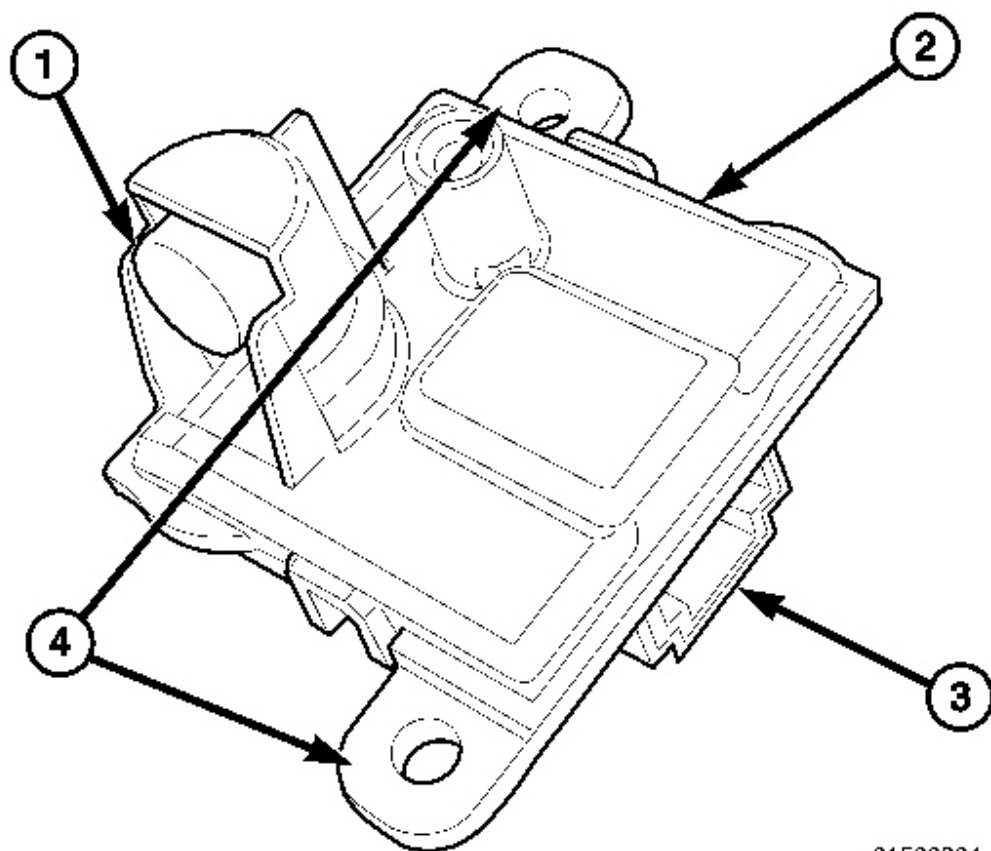
The receiver is located in the passenger compartment, where it is concealed above the headliner. A molded plastic mounting bracket with three integral latch features is secured to the right front corner of the mini-overhead console housing and engages three latch tabs integral to the receiver housing. The ultrasonic receiver transducer (2) is aimed through a small dedicated round opening in the right side of the overhead console forward of the reading lamps and is the only evidence of the receiver that is visible from the passenger

compartment.

Concealed within the molded plastic receiver housing is the circuitry of the receiver which includes the receive transducer. The receiver is connected through an integral connector receptacle (3) to the vehicle electrical system by a take out and connector of the overhead wire harness that is integral to the headliner.

The intrusion sensor receiver cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced. The receiver mounting bracket is serviced as a unit with the overhead console.

INTRUSION SENSOR TRANSMITTER



81596364

Fig. 9: Intrusion Sensor Transmitter
Courtesy of CHRYSLER LLC

An intrusion sensor transmitter (2) is part of the premium version of the Vehicle Theft Alarm (VTA) in the Vehicle Theft Security System (VTSS). The premium version of the VTA is only available in vehicles built for

certain markets, where the additional features offered by this system are required. This unit is designed to work in conjunction with the intrusion sensor receiver to provide interior motion detection inputs to the intrusion module, which serves as the interface between the Totally Integrated Power Module (TIPM), the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) and the alarm siren.

The transmitter is located in the passenger compartment, where it is concealed above the headliner. A molded plastic mounting bracket with two locating pins engages the holes in two locating tabs (4) integral to the transmitter housing and the housing is secured in place by two latch features integral to the bracket. Only a small dedicated molded plastic transducer trim bezel secured by a snap fit to the tubular ultrasonic transducer housing and extends vertically downward from the base of the transmitter housing is visible below the right rear corner of the headliner. The trim bezel has a small round opening that faces the front of the vehicle through which the transducer is aimed.

Concealed within the molded plastic transmitter housing is the circuitry of the transmitter which includes an ultrasonic transmit transducer (1). The transmitter is connected through an integral connector receptacle (3) to the vehicle electrical system by a take out and connector of the overhead wire harness that is integral to the headliner.

The intrusion sensor transmitter cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced. The transmitter mounting bracket is serviced as a unit with the headliner. The transducer trim bezel is available for separate service replacement.

OPERATION

INTRUSION SENSOR RECEIVER

The intrusion sensor receiver operates only when it is energized by the intrusion module. The receiver monitors ultrasonic signals generated in the vehicle cabin by the intrusion sensor transmitter through a receive transducer. The receiver listens to the ultrasonic signals as they bounce off of objects in the vehicle interior and provides input signals to the intrusion module. If an object is moving in the interior, a detection circuit in the intrusion module senses this movement through the modulation of the returning signals that occur due to the Doppler effect. The intrusion module monitors the current draw of the receiver circuits to determine the condition of the receiver and, if the draw is too high or too low, it will store a Diagnostic Trouble Code (DTC) for any fault that is detected.

The hard wired circuits for the intrusion sensor receiver may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the intrusion sensor receiver or the electronic controls and communication between other modules and devices that provide some features of the VTA system. The most reliable, efficient, and accurate means to diagnose the intrusion sensor receiver or the electronic controls and communication related to intrusion sensor receiver operation requires the use of a diagnostic scan tool.

INTRUSION SENSOR TRANSMITTER

The intrusion sensor transmitter operates only when it is energized by the intrusion module. The transmitter generates ultrasonic signals into the vehicle cabin through a transmit transducer. Then the intrusion sensor receiver listens to the returning signals as they bounce off of objects in the vehicle interior and provides input

signals to the intrusion module. If an object is moving in the interior, a detection circuit in the intrusion module senses this movement through the modulation of the returning signals that occur due to the Doppler effect. The intrusion module monitors the current draw of the transmitter circuits to determine the condition of the transmitter and, if the draw is too high or too low, it will store a Diagnostic Trouble Code (DTC) for any fault that is detected.

The hard wired circuits for the intrusion sensor transmitter may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the intrusion sensor transmitter or the electronic controls or communication between other modules and devices that provide some features of the VTA system. The most reliable, efficient, and accurate means to diagnose the intrusion sensor transmitter or the electronic controls and communication related to intrusion sensor transmitter operation requires the use of a diagnostic scan tool.

REMOVAL

INTRUSION SENSOR RECEIVER

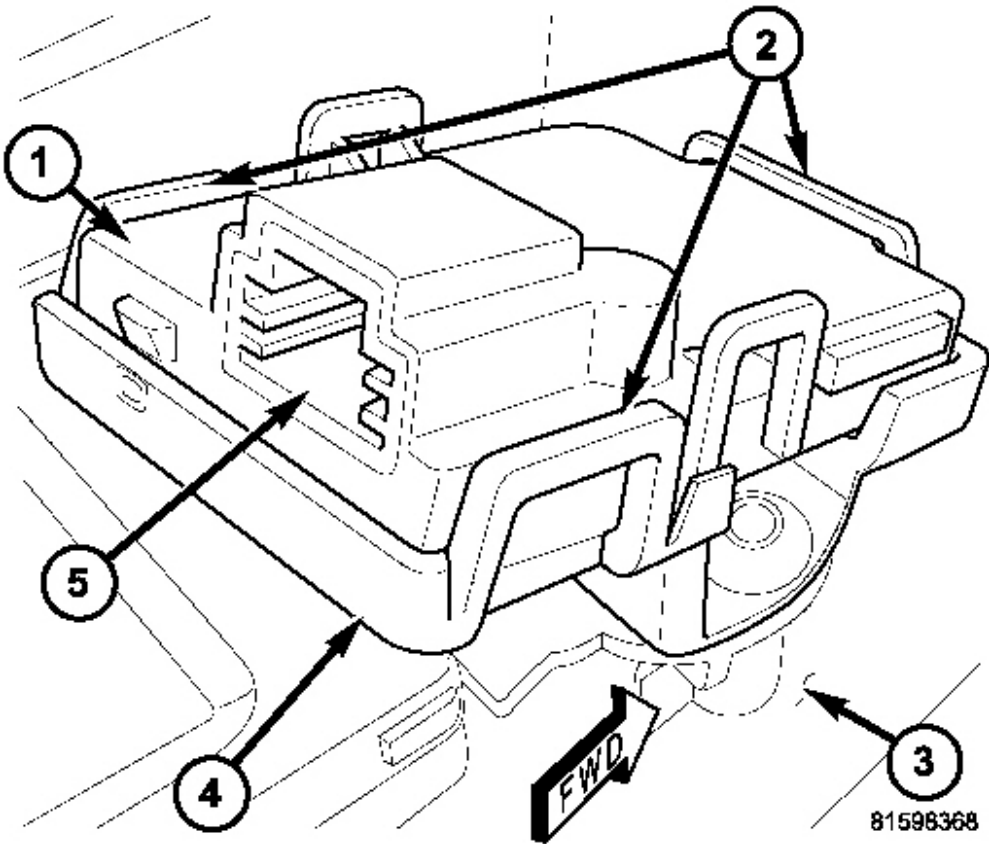


Fig. 10: Removing/Installing Intrusion Sensor Receiver
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the overhead console from the headliner. Refer to **REMOVAL** .
3. Locate the intrusion sensor receiver (1) in the mounting bracket (4) on the right front corner of the overhead console housing (3).
4. Disconnect the take out of the overhead wire harness from the connector receptacle (5) on the rearward end of the receiver housing.
5. Release the three latch features (2) of the mounting bracket and disengage the receiver from the bracket.

INTRUSION SENSOR TRANSMITTER

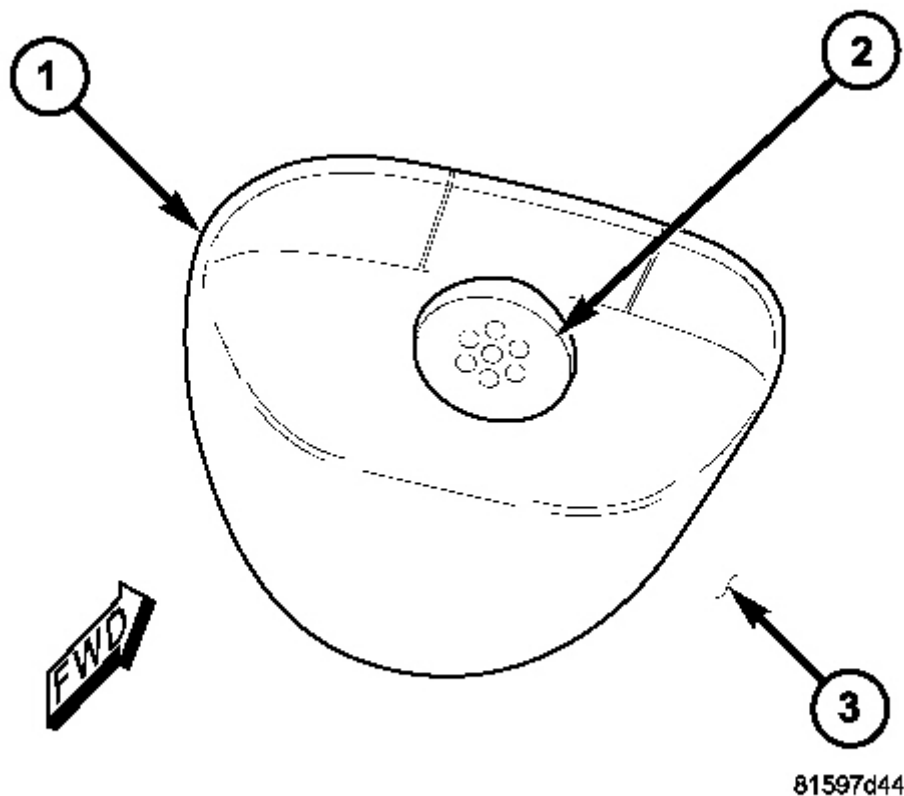


Fig. 11: Remove/Install Bezel
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Pull the bezel (1) straight down from the headliner (3) to unsnap it from the transducer housing (2) of the intrusion sensor transmitter. Be certain to take the appropriate precautions not to soil or damage the headliner.
3. Remove the trim from the upper liftgate opening. Refer to **REMOVAL** .
4. Partially remove the quarter trim panel from both upper D-pillars. Refer to **REMOVAL** .

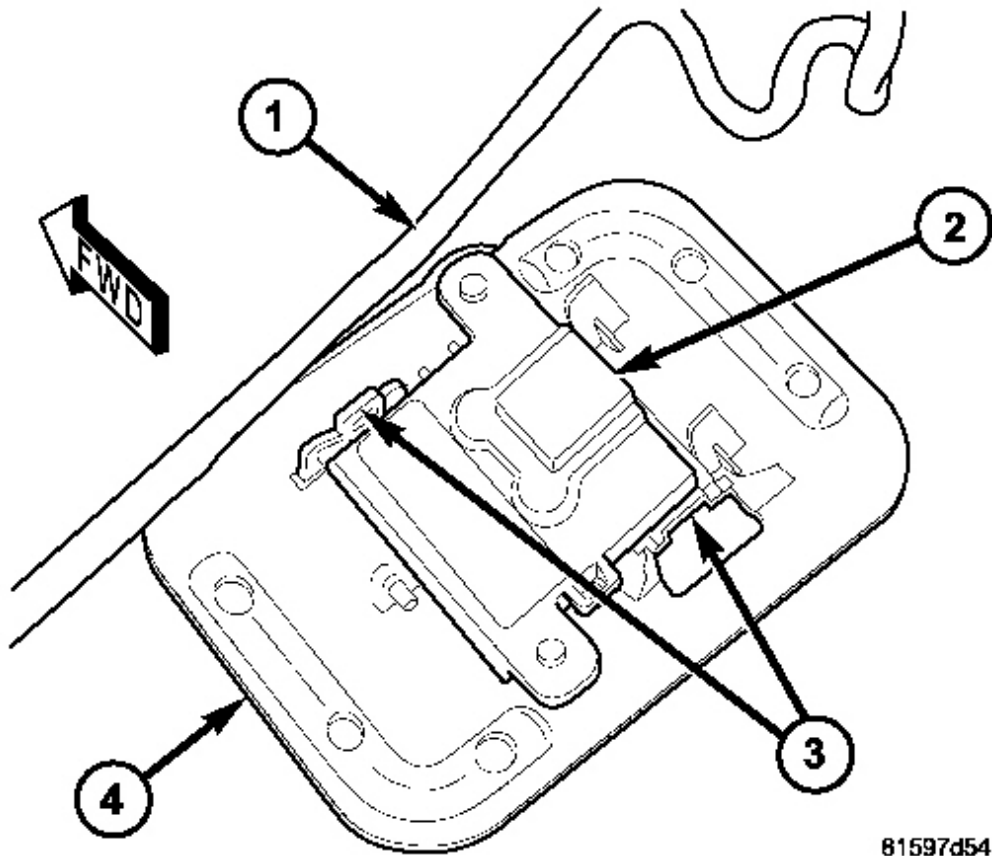


Fig. 12: Remove/Install Intrusion Sensor Transmitter
Courtesy of CHRYSLER LLC

5. Carefully pull down the right rear edge of the headliner (1) from the upper liftgate opening far enough to reach between the headliner and the roof panel to access the transmitter (2) and mounting bracket (4) on the headliner substrate.
6. Disconnect the take out of the overhead wire harness (1) from the connector receptacle on the right side

of the transmitter housing.

7. Release the two latch features (3) of the mounting bracket and disengage the transmitter from the locating pins of the bracket.
8. Remove the transmitter from between the headliner and the roof panel.

INSTALLATION

INTRUSION SENSOR RECEIVER

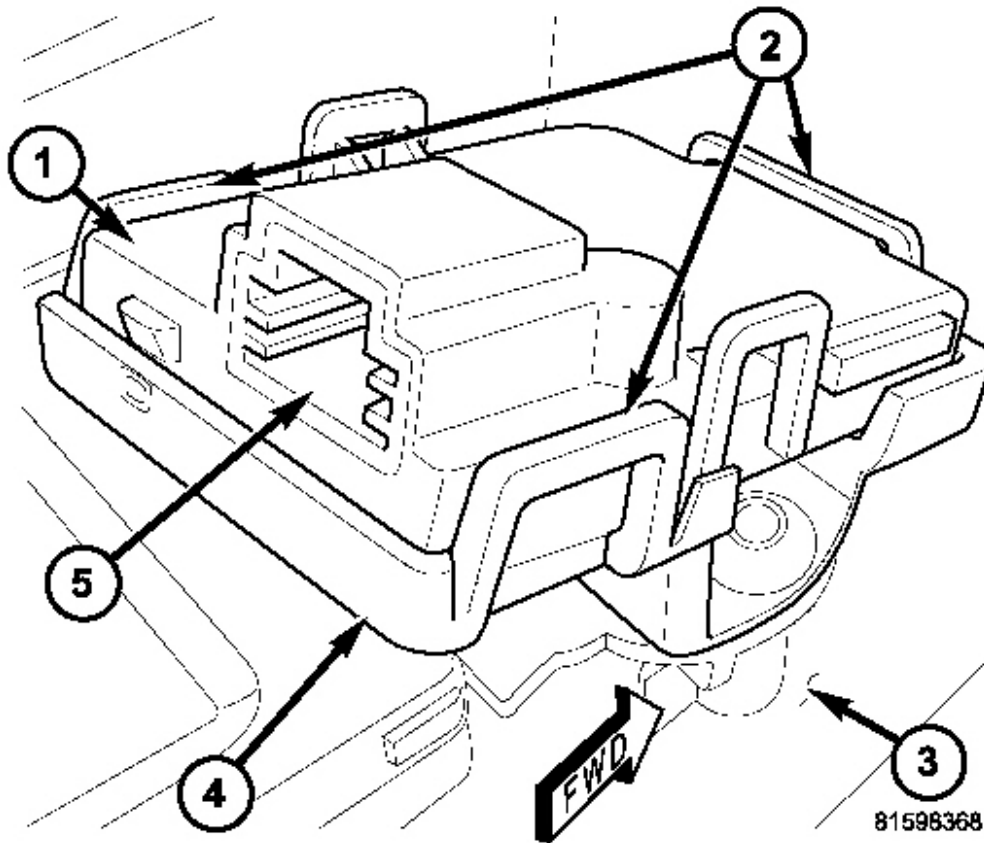


Fig. 13: Removing/Installing Intrusion Sensor Receiver
Courtesy of CHRYSLER LLC

1. Position the intrusion sensor receiver (1) to the mounting bracket (4) on the right front corner of the overhead console housing (3).
2. Press the receiver down until the three latch features (2) of the bracket are fully engaged.

3. Reconnect the take out of the overhead wire harness to the connector receptacle (5) on the rearward end of the receiver housing.
4. Reinstall the overhead console onto the headliner. Refer to **INSTALLATION**.
5. Reconnect the battery negative cable.

INTRUSION SENSOR TRANSMITTER

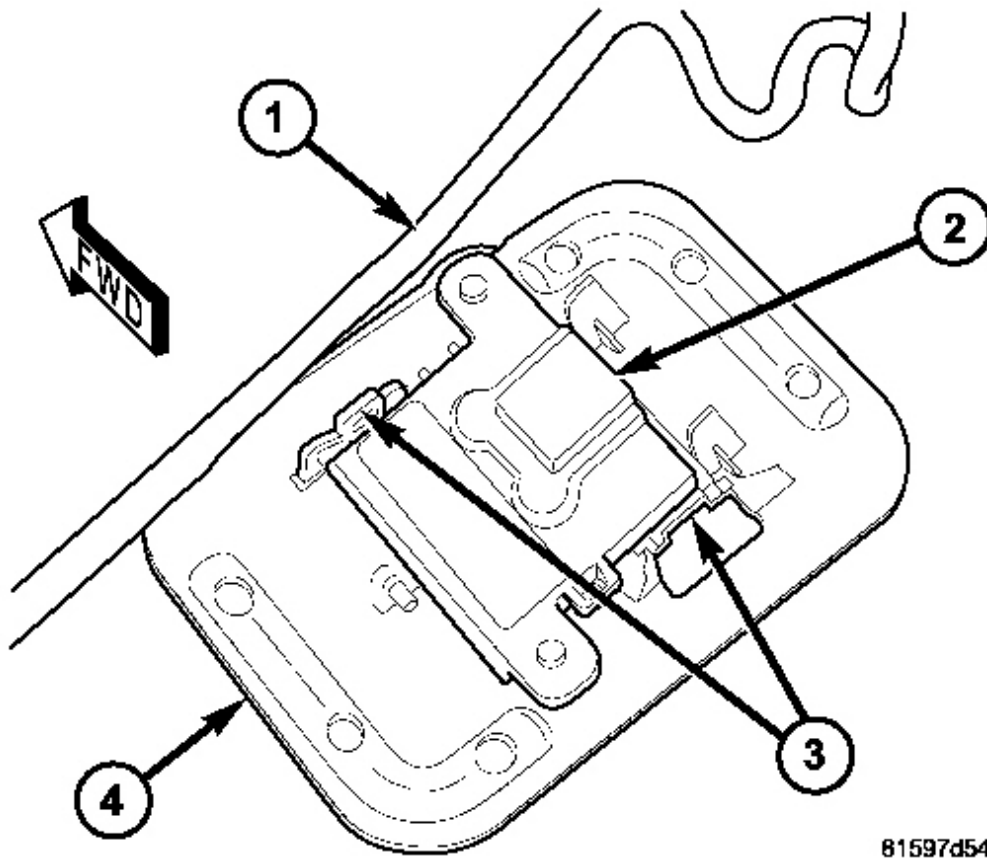


Fig. 14: Remove/Install Intrusion Sensor Transmitter
Courtesy of CHRYSLER LLC

1. Carefully pull down the right rear edge of the headliner from the upper liftgate opening far enough to reach between the headliner and the roof panel to position the intrusion sensor transmitter (2) over the locating pins of the mounting bracket (4) on the headliner substrate.
2. Press the transmitter down until the two latch features (3) of the mounting bracket are fully engaged.

3. Reconnect the take out of the overhead wire harness (1) to the connector receptacle on the right side of the transmitter housing.
4. Reinstall the quarter trim panel onto both upper D-pillars. Refer to **INSTALLATION** .
5. Reinstall the trim onto the upper liftgate opening. Refer to **INSTALLATION** .

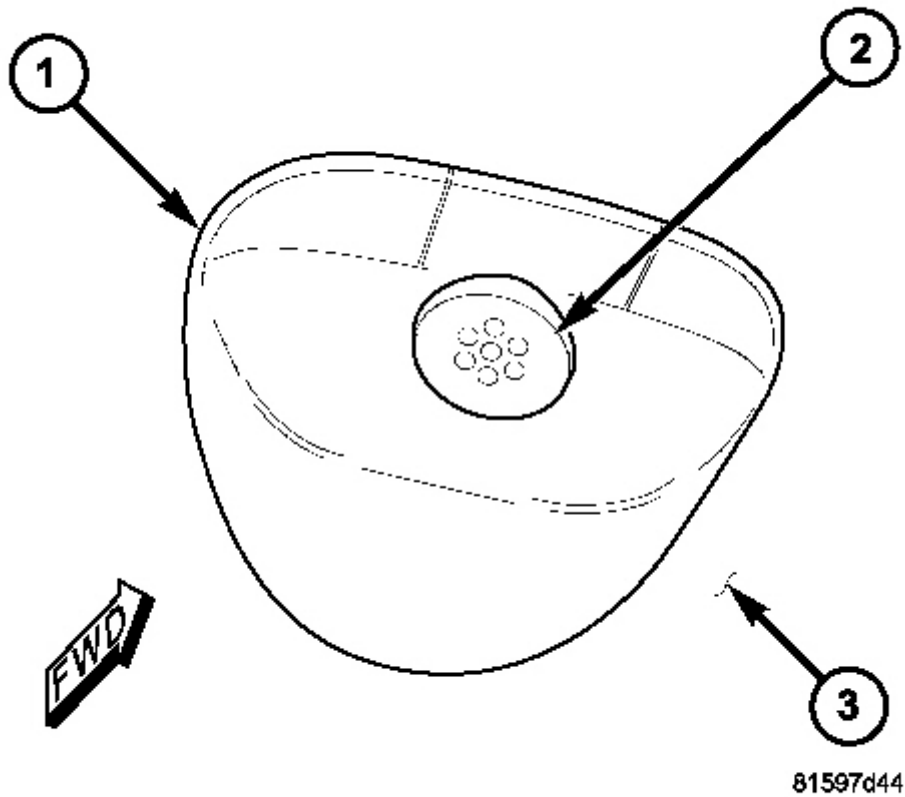


Fig. 15: Remove/Install Bezel
Courtesy of CHRYSLER LLC

6. Position the bezel (1) over the transducer housing (2) of the intrusion sensor transmitter and press it straight upward until it snaps into place against the headliner (3). Be certain to take the appropriate precautions not to soil or damage the headliner.
7. Reconnect the battery negative cable.

SENTRY KEY REMOTE ENTRY MODULE

DESCRIPTION

SENTRY KEY REMOTE ENTRY MODULE

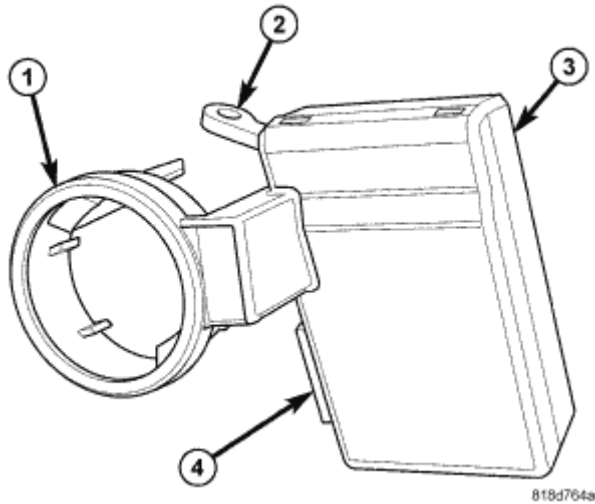


Fig. 16: Identifying Sentry Key Remote Entry Module
Courtesy of CHRYSLER LLC

The Sentry Key Remote Entry Module (SKREEM) (3) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) is the primary component of the Sentry Key Immobilizer System (SKIS). It is also the receiver for the Remote Keyless Entry (RKE) system and the Tire Pressure Monitor (TPM) system. The SKREEM is located on the right side of the steering column near the ignition lock cylinder housing and is concealed beneath the column shrouds. The molded black plastic housing for the SKREEM has an integral molded plastic halo-like antenna ring (1) that extends from one side. When the SKREEM is properly installed, the antenna ring is oriented around the circumference of the ignition lock cylinder housing.

A single integral connector receptacle (4) is located adjacent to the antenna ring on the SKREEM housing. An integral molded plastic mounting tab (2) on the SKREEM housing has a hole in the center through which a screw passes to secure the unit to the steering column lock housing. The SKREEM is connected to the vehicle electrical system through a single take out and connector of the instrument panel wire harness.

The SKREEM cannot be adjusted or repaired. If ineffective or damaged, the entire SKREEM unit must be replaced.

OPERATION

SENTRY KEY REMOTE ENTRY MODULE

The Sentry Key Remote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) contains a Radio Frequency (RF) transceiver and a microprocessor. The SKREEM transmits RF signals to, and receives RF signals from the Sentry Key transponder through a tuned antenna enclosed within the molded plastic antenna ring integral to the SKREEM housing. If this antenna ring is not mounted properly around the ignition lock cylinder housing, communication problems between the SKREEM and the transponder may arise. These communication problems will result in Sentry Key transponder-related faults.

The SKREEM also serves as the Remote Keyless Entry (RKE) RF receiver and, if the vehicle is so equipped, the receiver for the Tire Pressure Monitoring (TPM) system. Refer to **DESCRIPTION** for power locks, or **DESCRIPTION** for Tire Pressure Monitoring. The SKREEM communicates over the Controller Area Network (CAN) data bus with the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), the Powertrain Control Module (PCM), the Totally Integrated Power Module (TIPM) or the diagnostic scan tool.

The SKREEM and the PCM both use software that includes a rolling code algorithm strategy, which helps to reduce the possibility of unauthorized Sentry Key Immobilizer System (SKIS) disarming. The rolling code algorithm ensures security by preventing an override of the SKIS through the unauthorized substitution of the SKREEM or the PCM. However, the use of this strategy also means that replacement of either the SKREEM or the PCM units will require a system initialization procedure to restore system operation.

The SKREEM retains in memory the ID numbers of any Sentry Key transponder that is programmed into it. A maximum of eight Sentry Key transponders can be programmed into the SKREEM. For added system security, each SKREEM is programmed with a unique Secret Key code. This code is stored in memory, sent over the CAN data bus to the PCM, and is encoded to the transponder of every Sentry Key that is programmed into the SKREEM. Therefore, the Secret Key code is a common element that is found in every component of the SKIS.

Another security code, called a PIN, is used to gain access to the SKREEM Secured Access Mode. The Secured Access Mode is required during service to perform the SKIS initialization and Sentry Key transponder programming procedures. The SKREEM also stores the Vehicle Identification Number (VIN) in its memory, which it learns through a CAN data bus message from the PCM during SKIS initialization.

In the event that a SKREEM replacement is required, the Secret Key code can be transferred to the new SKREEM from the PCM using the diagnostic scan tool and the SKIS initialization procedure. Proper completion of the SKIS initialization will allow the existing Sentry Keys to be programmed into the new SKREEM so that new keys will not be required. In the event that the original Secret Key code cannot be recovered, SKREEM replacement will also require new Sentry Keys. The diagnostic scan tool will alert the technician during the SKIS initialization procedure if new Sentry Keys are required.

When the key is inserted into the ignition switch and when the ignition switch is turned to the ON position, the SKREEM transmits an RF signal to excite the transponder in the ignition key. The SKREEM then waits for an RF signal response from the transponder. If the response received identifies the key as valid, the SKREEM sends an electronic **valid key** message over the CAN data bus. If the response received identifies the key as invalid or if no response is received from the key transponder, the SKREEM sends an **invalid key** message. The PCM will enable or disable engine operation based upon the status of the SKREEM messages. It is important to note that the default condition in the PCM is an **invalid key** ; therefore, if no message is received from the SKREEM by the PCM, the engine will be disabled and the vehicle immobilized after two seconds of running.

The SKREEM also sends electronic **security indicator** request messages to the EMIC over the CAN data bus to tell the EMIC how to operate the security indicator. The **security indicator** request message from the SKREEM tells the EMIC to turn the indicator ON for about three seconds each time the ignition switch is turned to the ON position as a bulb test. After completion of the bulb test, the SKREEM sends **security indicator** request messages to the EMIC to turn the indicator OFF, turn the indicator ON, or to flash the indicator ON and OFF. If the security indicator flashes or stays ON solid after the bulb test, it signifies a SKIS fault. If the SKREEM detects a system malfunction or the SKIS has become ineffective, the security indicator will stay ON solid. If the SKREEM detects an invalid key or if a key transponder-related fault exists, the

security indicator will flash. If the vehicle is equipped with the Customer Learn transponder programming feature, the SKREEM will also send messages to the EMIC to flash the security indicator whenever the Customer Learn programming mode is being utilized. See **STANDARD PROCEDURE**.

The SKIS performs a self-test each time the ignition switch is turned to the ON position, and will store fault information in the form of a Diagnostic Trouble Code (DTC) in SKREEM memory if a system malfunction is detected. The hard wired circuits of the SKREEM may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the SKREEM or the electronic controls or communication between other modules and devices that provide some features of the SKIS. The most reliable, efficient, and accurate means to diagnose the SKREEM or the electronic controls and communication related to SKREEM operation requires the use of a diagnostic scan tool.

REMOVAL

SENTRY KEY REMOTE ENTRY MODULE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

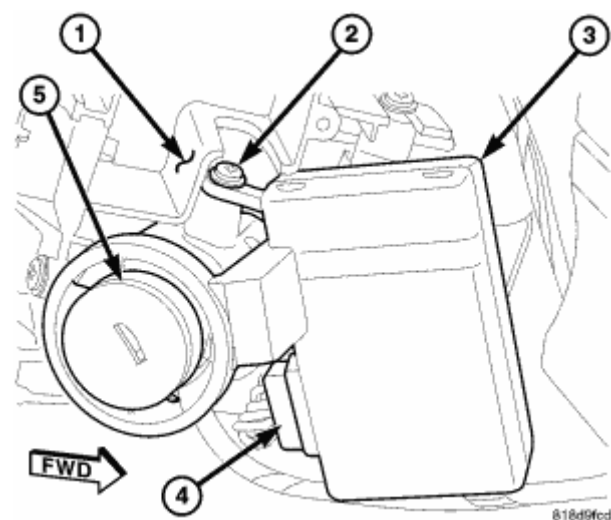


Fig. 17: Identifying Sentry Key Remote Entry Module
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove but do not disconnect the right multi-function switch from the integral mounting bracket (1) on the right side of the clockspring and position it so that the Sentry Key REmote Entry Module (SKREEM) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM)

mounting screw (2) may be accessed. Refer to **REMOVAL** .

3. Disconnect the instrument panel wire harness connector (4) from the SKREEM (3) connector receptacle.
4. Remove the screw that secures the SKREEM to the boss on the top of the ignition lock cylinder housing (5).
5. Disengage the SKREEM antenna ring from around the ignition lock housing and remove the SKREEM from the steering column.

INSTALLATION

SENTRY KEY REMOTE ENTRY MODULE

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

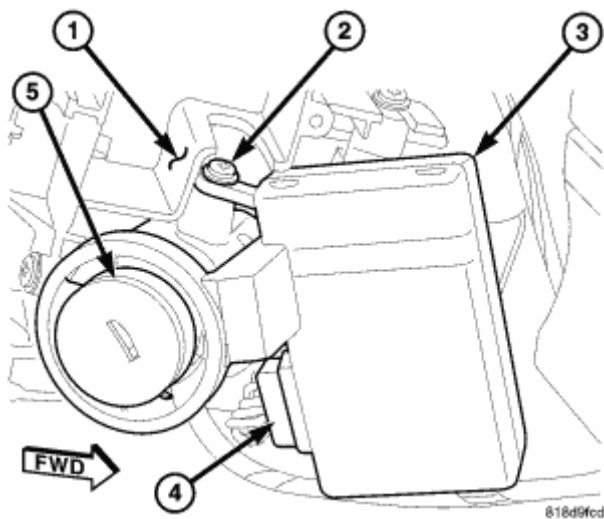


Fig. 18: Identifying Sentry Key Remote Entry Module
Courtesy of CHRYSLER LLC

1. Position the Sentry Key Remote Entry Module (SKREEM) (3) (also known as the Sentry Key Immobilizer Module/SKIM or the Wireless Control Module/WCM) onto the steering column ignition lock housing with the antenna ring oriented around the lock cylinder (5).
2. Install and tighten the screw (2) that secures the SKREEM mounting bracket to the boss on the top of the ignition lock housing. Tighten the screw to 2 N.m (20 in. lbs.).
3. Reconnect the instrument panel wire harness connector (4) to the SKREEM connector receptacle.
4. Reinstall the right multi-function switch onto the integral mounting bracket (1) on the right side of the

clockspring. Refer to **INSTALLATION** .

5. Reconnect the battery negative cable.

NOTE: On vehicles equipped with the Sentry Key Immobilizer System (SKIS), when the SKREEM is replaced with a new unit, a diagnostic scan tool **MUST** be used to initialize the new SKREEM and to program at least two Sentry Key transponders before the vehicle can be operated. See **STANDARD PROCEDURE**.

NOTE: On vehicles equipped with a Tire Pressure Monitoring (TPM) system and a full-sized matching spare tire and wheel assembly, when the SKREEM or the spare tire pressure sensor is replaced with a new unit, a diagnostic scan tool **MUST** be used to run a routine that allows the SKREEM to be programmed with the ID number and location of the spare tire pressure sensor mounted in the wheel of the spare tire. This may be done using a TPM-RKE Analyzer special tool by following the programming steps outlined in the diagnostic scan tool for Program Tire Sensor ID w/TPM Tool under Miscellaneous Functions for the WCM/Wireless Control Module menu item. If a TPM-RKE Analyzer special tool is not available, the spare tire must be dismounted from its wheel to access and note the ID number on the spare tire pressure sensor so that the ID code for that sensor can be programmed into the new SKREEM. Follow the programming steps outlined in the diagnostic scan tool for Learn Spare Tire Sensor ID also found under Miscellaneous Functions for the WCM/Wireless Control Module menu item. Refer to **INSTALLATION** .

SIREN

DESCRIPTION

SIREN

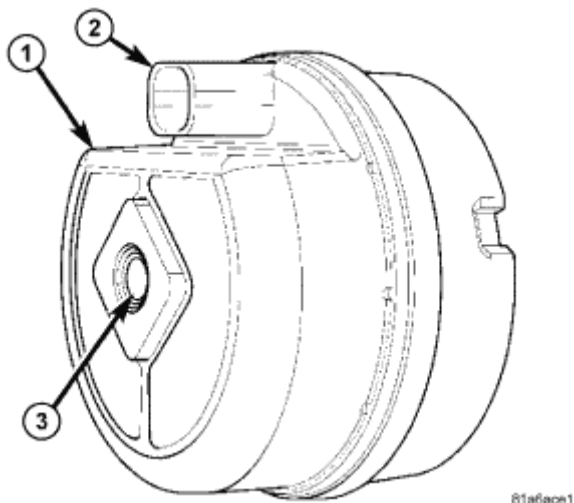


Fig. 19: Identifying Alarm Siren Module, Integral Connector Receptacle & Mounting Hole
Courtesy of CHRYSLER LLC

An alarm siren module (1) is part of the premium version of the Vehicle Theft Alarm (VTA) in the Vehicle Theft Security System (VTSS). The premium version of the VTA is only available in vehicles built for certain markets, where the additional features offered by this system are required. This unit is designed to provide the audible alert requirements for the premium VTA.

The alarm siren module consists of microprocessor-based electronic control circuitry, the siren, and a nickel metal hydride backup battery. All of the alarm module components are protected and sealed within a molded plastic housing. An integral connector receptacle (2) extends from the housing and connects the unit to the vehicle electrical system through a dedicated take out and connector of the front end module wire harness. The housing also has a threaded insert within a mounting hole (3) through which a screw secures it to the front end module carrier.

The siren is located on the engine compartment side of the front end module carrier, just behind the outboard side of the right front combination lamp unit housing. A single screw secures the siren module to a mounting tab of the front end module carrier.

The alarm siren module cannot be repaired or adjusted and, if ineffective or damaged, it must be replaced.

OPERATION

SIREN

The microprocessor within the alarm siren module provides the siren unit features and functions based upon internal programming and electronic **arm** and **disarm** messages received from the intrusion module over a dedicated serial bus communication circuit. The siren module receives battery voltage on a fused B(+) circuit through a fuse in the Totally Integrated Power Module (TIPM), and receives a path to ground through a ground circuit in the front end module wire harness. These connections allow the siren to remain operational, regardless of the ignition switch position.

When the premium version of the Vehicle Theft Alarm (VTA) is armed, the siren module continuously monitors electronic message inputs from the intrusion module to sound its internal siren. While armed, the siren also enters its auto-detect mode. While in the auto-detect mode, if the siren module detects that its power supply or communication circuits are being tampered with or have been sabotaged, it will sound an audible alarm and continue to operate through an on-board backup battery. If the siren module is in its disarmed mode when its power supply or communication circuits are interrupted, the siren will not sound.

The state of charge of the siren module backup battery is automatically maintained. The battery is trickle charged approximately 2 minutes during every hour of operation through the battery voltage and ground circuits to the siren module.

The siren will self-detect problems with its internal and external power supply and communication circuits, then send electronic messages indicating the problem to the intrusion module upon receiving an **arm** or **disarm** request message. The intrusion module will store a Diagnostic Trouble Code (DTC) for any detected alarm siren module fault. The DTC can then be retrieved with a diagnostic scan tool through the 16-way Data Link Connector (DLC) located under the driver side lower edge of the instrument panel over the Controller Area Network (CAN) data bus.

The hard wired inputs and outputs for the alarm siren module may be diagnosed using conventional diagnostic

tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the alarm siren module or the electronic controls or communication between other modules and devices that provide some features of the VTA system. The most reliable, efficient, and accurate means to diagnose the alarm siren module or the electronic controls and communication related to alarm siren module operation requires the use of a diagnostic scan tool.

REMOVAL

SIREN

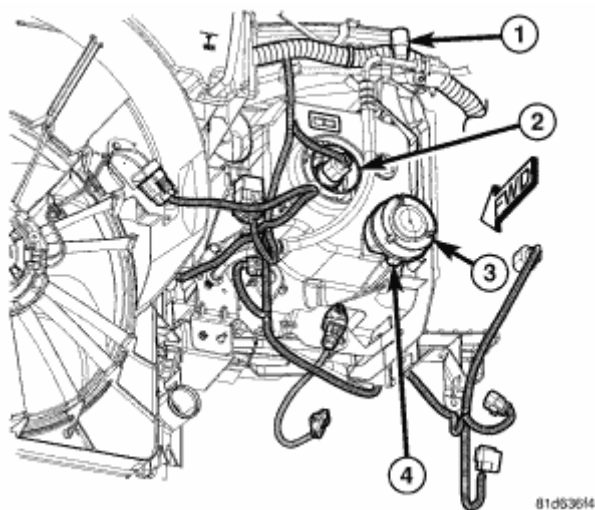


Fig. 20: Alarm Siren Module, Module Carrier, Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Locate the alarm siren module (3) on the engine compartment side of the front end module carrier (1), just below the outboard side of the right front combination lamp unit housing (2).
3. Disconnect the front end module wire harness connector from the connector receptacle (4) for the siren.
4. Remove the right front combination lamp unit from the front of the vehicle. Refer to **REMOVAL** .
5. From the front of the vehicle, remove the screw that secures the siren to the mounting tab of the front end module carrier located behind the right front combination lamp unit.
6. Remove the siren from the engine compartment side of the carrier.

INSTALLATION

SIREN

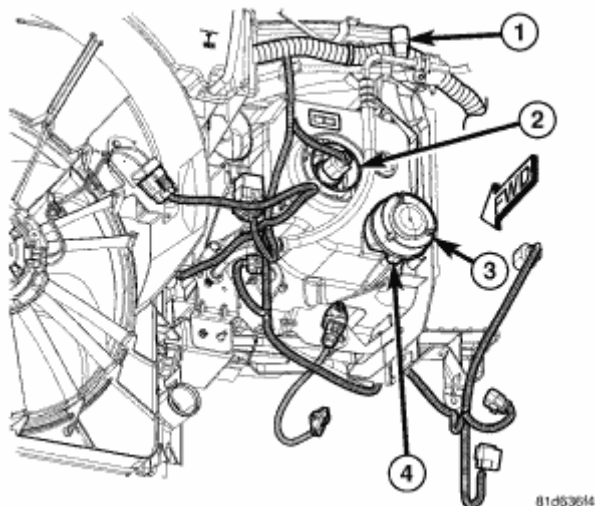


Fig. 21: Alarm Siren Module, Module Carrier, Lamp Unit Housing
Courtesy of CHRYSLER LLC

1. Position the alarm siren module (3) to the engine compartment side of the mounting tab of the front end module carrier (1) located behind the right front combination lamp unit (2).
2. From the front of the vehicle, install and tighten the screw that secures the siren to the carrier. Tighten the screw to 14 N.m (10 ft. lbs.).
3. Reinstall the right front combination lamp unit onto the front of the vehicle. Refer to **INSTALLATION**.
4. Reconnect the front end module wire harness connector to the connector receptacle (4) of the siren.
5. Reconnect the battery negative cable.

NOTE: If the alarm siren module has been replaced with a new unit, a diagnostic scan tool **MUST** be used to initialize and configure the new unit in the intrusion module before the Vehicle Theft Security System (VTSS) can operate as designed. Follow the programming steps outlined in the diagnostic scan tool for **INITIALIZE SIREN** under **MISCELLANEOUS FUNCTIONS** for the **INTRUSION TRANSCIEVER MODULE/ITM** menu item as appropriate.

TRANSPONDER KEY

DESCRIPTION

TRANSPONDER KEY

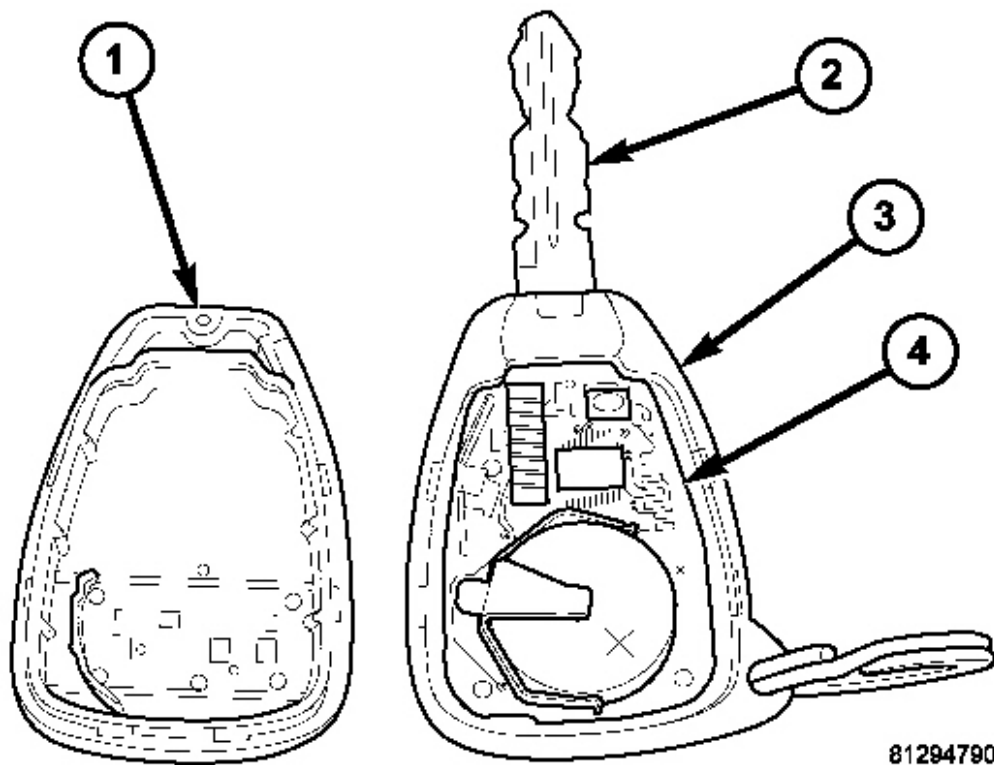


Fig. 22: Identifying Ignition Key SKIS Components
Courtesy of CHRYSLER LLC

Each ignition key (2) used in the Sentry Key Immobilizer System (SKIS) has a transponder chip included on the circuit board (4) beneath the cover (1) of the integral Remote Keyless Entry (RKE) transmitter (3). In addition to having to be cut to match the mechanical coding of the ignition lock cylinder and programmed for operation of the RKE system, each new Sentry Key has a unique transponder identification code that is permanently programmed into it by the manufacturer, and which must be programmed into the Sentry Key Remote Entry Module (SKREEM) (also known as the Wireless Control Module/WCM) to be recognized by the SKIS as a valid key.

The Sentry Key transponder cannot be adjusted or repaired. If ineffective or damaged, the entire key and RKE transmitter unit must be replaced.

OPERATION

TRANSPONDER KEY

When the ignition switch is turned to the ON position, the Sentry Key Remote Entry Module (SKREEM) (also

known as the Wireless Control Module/WCM) communicates through its antenna with the Sentry Key transponder using a Radio Frequency (RF) signal. The SKREEM then listens for a RF response from the transponder through the same antenna. The Sentry Key transponder chip is within the range of the SKREEM transceiver antenna ring when it is inserted into the ignition lock cylinder. The SKREEM determines whether a valid key is present in the ignition lock cylinder based upon the response from the transponder. If a valid key is detected, that fact is communicated by the SKREEM to the Powertrain Control Module (PCM) over the Controller Area Network (CAN) data bus, and the PCM allows the engine to continue running. If the PCM receives an **invalid key** message, or receives no message from the SKREEM over the CAN data bus, the engine will be disabled after about two seconds of operation. The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) will also respond to the **invalid key** message on the CAN data bus by flashing the security indicator ON and OFF.

Each Sentry Key has a unique transponder identification code permanently programmed into it by the manufacturer. Likewise, the SKREEM has a unique Secret Key code programmed into it by the manufacturer. When a Sentry Key is programmed into the memory of the SKREEM, the SKREEM stores the transponder identification code from the Sentry Key, and the Sentry Key learns the Secret Key code from the SKREEM. Once the Sentry Key learns the Secret Key code of the SKREEM, it is permanently stored in the memory of the transponder. Therefore, once a Sentry Key has been programmed to a particular vehicle, it cannot be used on any other vehicle. See **STANDARD PROCEDURE**.

The Sentry Key Immobilizer System (SKIS) performs a self-test each time the ignition switch is turned to the ON position, and will store key-related fault information in the form of a Diagnostic Trouble Code (DTC) in SKREEM memory if a Sentry Key transponder problem is detected. The Sentry Key transponder chip can be diagnosed, and any stored DTC can be retrieved using a diagnostic scan tool.

2008 ACCESSORIES AND EQUIPMENT

Wipers/Washers - Electrical/Diagnostics - Liberty

DIAGNOSTIC CODE INDEX

DIAGNOSTIC CODE INDEX

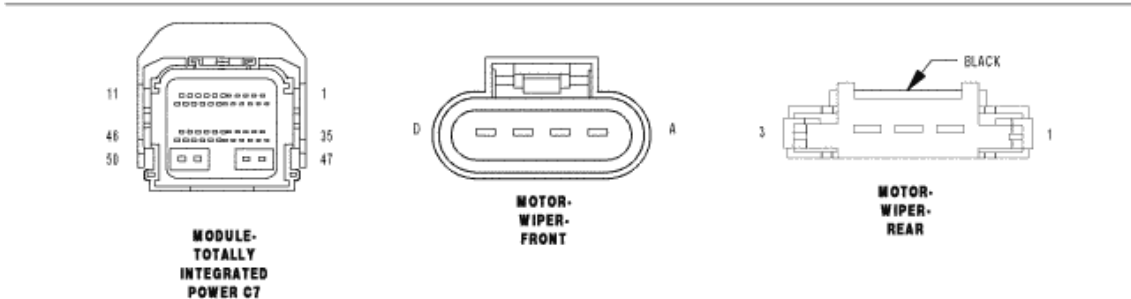
DTC	Description
<u>B2304</u>	WIPER PARK SWITCH INPUT CIRCUIT LOW
<u>B2305</u>	WIPER PARK SWITCH INPUT CIRCUIT HIGH
<u>B230D</u>	REAR WIPER PARK SWITCH INPUT CIRCUIT LOW (STUCK LOW)
<u>B230E</u>	REAR WIPER PARK SWITCH INPUT CIRCUIT HIGH (STUCK HIGH)
<u>B2324</u>	HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH

WIPERS/WASHERS - ELECTRICAL/DIAGNOSTICS

DIAGNOSIS AND TESTING

B2304-WIPER PARK SWITCH INPUT CIRCUIT LOW

Circuit Schematic



For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) detects a short to ground on the Wiper Park Switch Sense circuit.

Possible Causes

Possible Causes
(W7) WIPER PARK SWITCH SENSE CIRCUIT SHORT TO GROUND FRONT WIPER MOTOR TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1) INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Cycle the Wiper Switch on and off 3 times.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2) FRONT WIPER MOTOR.

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2) FRONT WIPER MOTOR

Turn the ignition off.

Disconnect the Front Wiper Motor harness connector.

Turn the ignition on.

Wait 30 seconds.

With the scan tool, read the Front Wiper Park Switch Sense.

Does the Front Wiper Park Switch Sense display: False?

Yes

Replace the Front Wiper Motor in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3).

3) CHECK (W7) WIPER PARK SWITCH SENSE CIRCUIT FOR A SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance between ground and the (W7) Wiper Park Sense Circuit.

Is the resistance above 10k ohms?

Yes

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

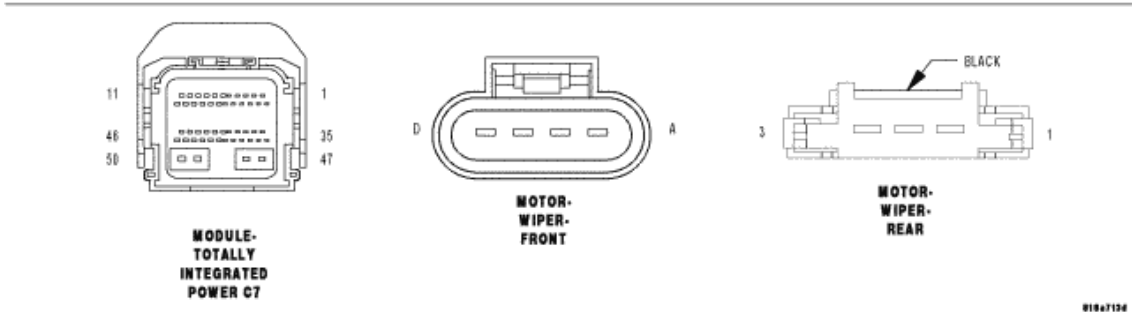
No

Repair the (W7) Wiper Park Switch Sense circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B2305-WIPER PARK SWITCH INPUT CIRCUIT HIGH

Circuit Schematic



For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) does not detect a change from High to Low voltage on the Wiper Park Switch Sense Circuit.

Possible Causes

Possible Causes
(W7) WIPER PARK SWITCH SENSE CIRCUIT OPEN
(W7) WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO VOLTAGE
FRONT WIPER MOTOR
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1) INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Cycle the Wiper Switch on and off 3 times.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2) (W7) WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Front Wiper Motor harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, probe the (W7) Wiper Park Switch Sense circuit.

Does the test light illuminate brightly?

Yes

Repair the (W7) Wiper Park Switch Sense circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3).

3) CHECK THE FRONT WIPER MOTOR

Connect a jumper wire between the (W7) Wiper Park Switch Sense circuit and ground.

With the scan tool, read the Front Wiper Park Switch Sense.

Does the Front Wiper Park Switch Sense display: True?

Yes

Replace the Front Wiper Motor in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4).

4) CHECK (W7) WIPER PARK SWITCH SENSE CIRCUIT FOR AN OPEN

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (W7) Wiper Park Switch Sense circuit between the Front Wiper Motor harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

Yes

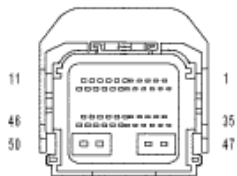
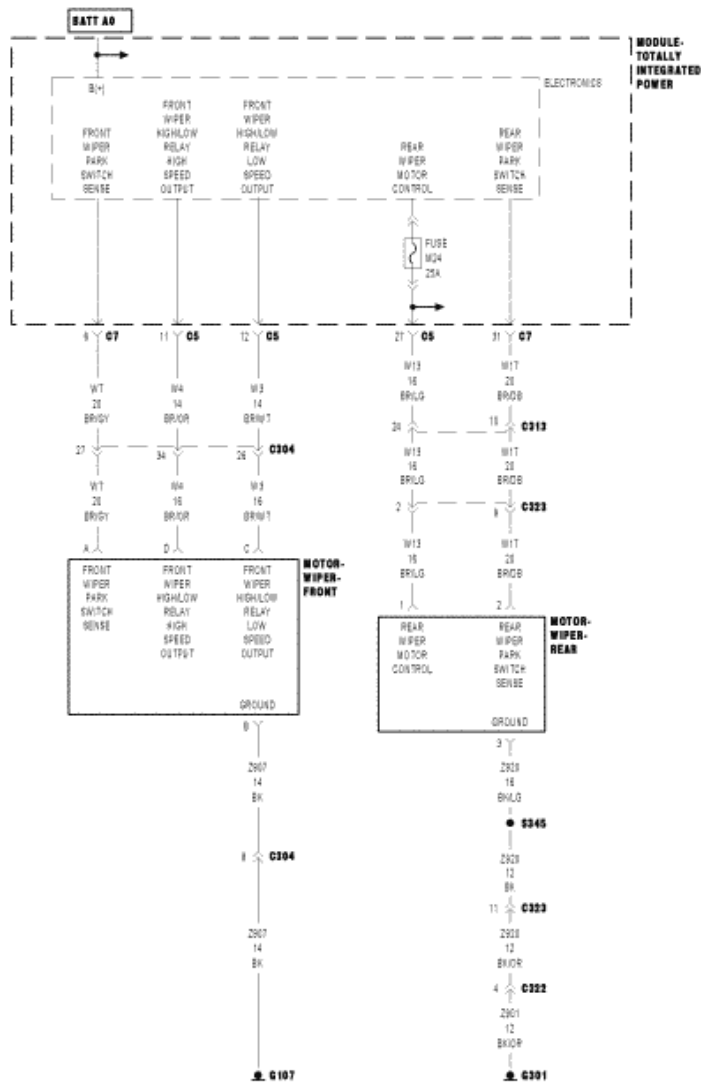
Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

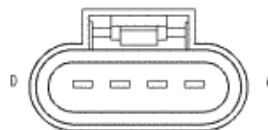
Repair the (W7) Wiper Park Switch Sense circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

B230D-REAR WIPER PARK SWITCH INPUT CIRCUIT LOW (STUCK LOW)

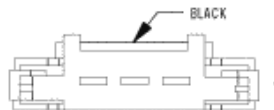
Circuit Schematic



MODULE-TOTALLY INTEGRATED POWER C7



MOTOR-WIPER-FRONT



MOTOR-WIPER-REAR

01967136

Fig. 3: Front & Rear Wiper Motor Circuit Schematic
Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) detects a short to ground on the Rear Wiper Park Switch Sense circuit.

Possible Causes

Possible Causes
(W17) REAR WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO GROUND REAR WIPER MOTOR TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1) INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Rear Wipers on then off.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2) REAR WIPER MOTOR

Turn the ignition off.

Disconnect the Rear Wiper Motor harness connector.

Turn the ignition on.

With the scan tool, read the Rear Wiper Park Switch Sense.

Does the Rear Wiper Park Switch Sense display: True?

Yes

Replace the Rear Wiper Motor in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3).

3) CHECK (W17) REAR WIPER PARK SWITCH SENSE CIRCUIT FOR A SHORT TO GROUND

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance between ground and the (W17) Rear Wiper Park Switch Sense Circuit.

Is the resistance above 10k ohms?

Yes

Replace the TIPM in accordance with the service information.

Perform **BODY VERIFICATION TEST - VER 1** .

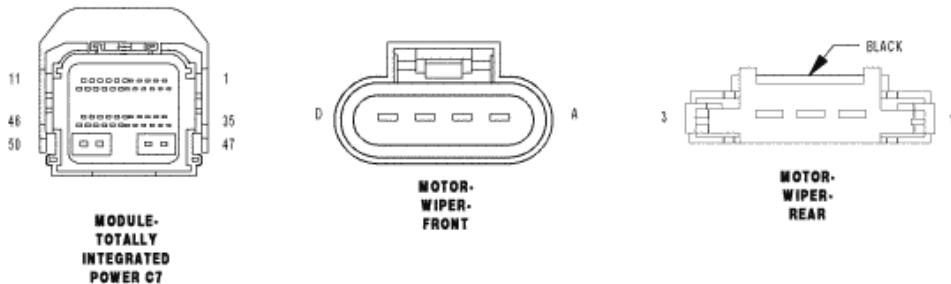
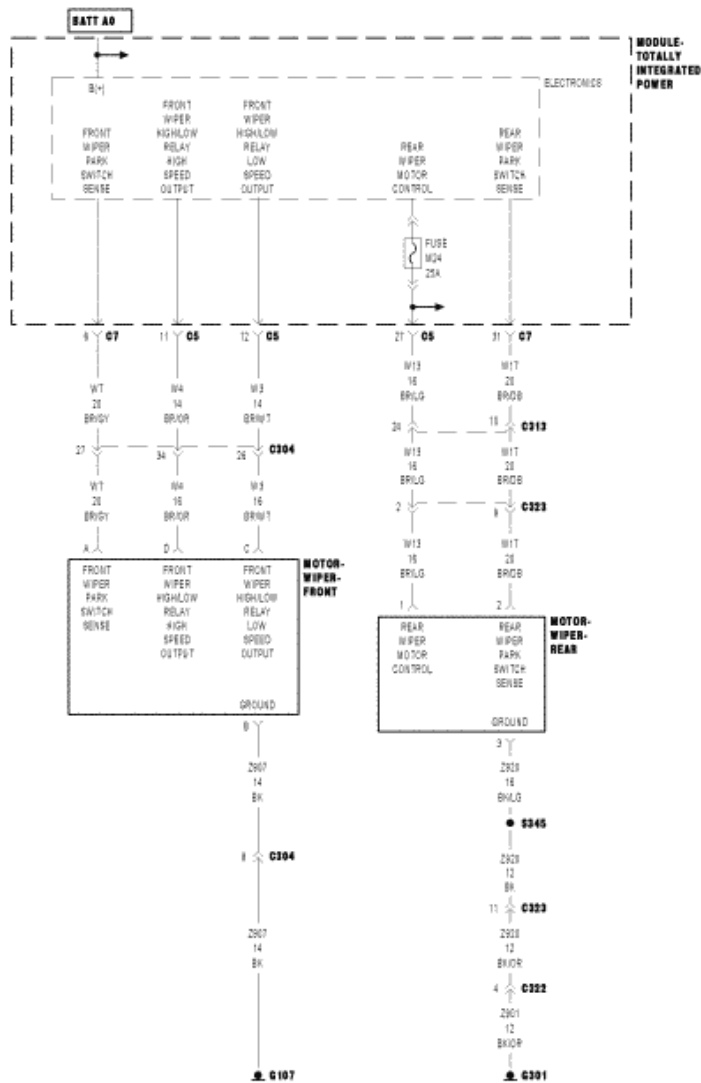
No

Repair the (W7) Wiper Park Switch Sense circuit for a short to ground.

Perform **BODY VERIFICATION TEST - VER 1** .

B230E-REAR WIPER PARK SWITCH INPUT CIRCUIT HIGH (STUCK HIGH)

Circuit Schematic



01967136

Fig. 4: Front & Rear Wiper Motor Circuit Schematic
 Courtesy of CHRYSLER LLC

Additional Wiring

For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the ignition on.

Set Conditions

- **Set Condition:**

The Totally Integrated Power Module (TIPM) does not detect a change from High to Low voltage on the Rear Wiper Park Switch Sense Circuit.

Possible Causes

Possible Causes
(W17) REAR WIPER PARK SWITCH SENSE CIRCUIT OPEN
(W17) REAR WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO VOLTAGE
REAR WIPER MOTOR
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1) INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Cycle the Wiper Switch on and off 3 times.

With the scan tool, read DTC's.

Does the scan tool display this DTC as active?

Yes

Go To 2).

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2) (W17) WIPER PARK SWITCH SENSE CIRCUIT SHORTED TO VOLTAGE

Turn the ignition off.

Disconnect the Rear Wiper Motor harness connector.

Turn the ignition on.

Using a 12-volt test light connected to ground, probe the (W17) Rear Wiper Park Switch Sense circuit.

Does the test light illuminate brightly?

Yes

Repair the (W17) Rear Wiper Park Switch Sense circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 3).

3) CHECK THE REAR WIPER MOTOR

Connect a jumper wire between the (W17) Rear Wiper Park Switch Sense circuit and ground.

With the scan tool, read the Rear Wiper Park Switch Sense.

Does the Rear Wiper Park Switch Sense display: True?

Yes

Replace the Rear Wiper Motor in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Go To 4).

4) (W17) REAR WIPER PARK SWITCH SENSE CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C7 harness connector.

Measure the resistance of the (W17) Rear Wiper Park Switch Sense circuit between the Rear Wiper Motor harness connector and the TIPM C7 harness connector.

Is the resistance below 10.0 ohms?

Yes

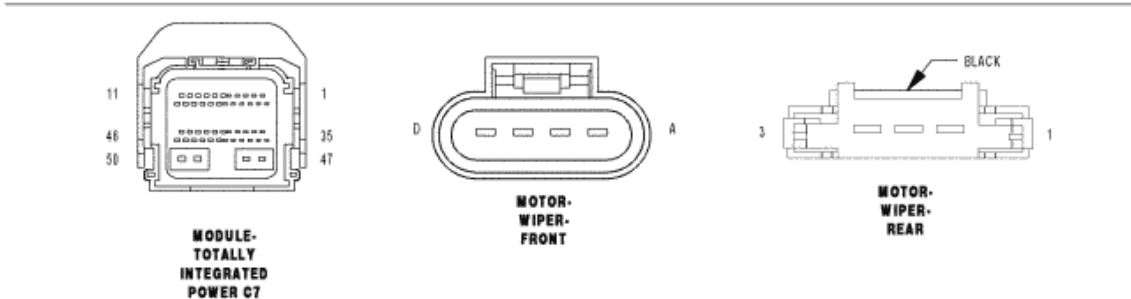
Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.
Perform **BODY VERIFICATION TEST - VER 1** .

No

Repair the (W17) Rear Wiper Park Switch Sense circuit for an open.
Perform **BODY VERIFICATION TEST - VER 1** .

B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH

Circuit Schematic



For complete wiring diagrams, refer to **SYSTEM WIRING DIAGRAMS** article.

Monitor Conditions

When Monitored:

With the Headlamp Washers activated.

Set Conditions

- **Set Condition:**

When the Totally Integrated Power Module (TIPM) detects an HIGH condition.

Possible Causes

Possible Causes
(W24) HEADLAMP WASHER RELAY CONTROL CIRCUIT OPEN
(W24) HEADLAMP WASHER RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE
(W23) HEADLAMP WASHER MOTOR CONTROL CIRCUIT OPEN
(W23) HEADLAMP WASHER MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE
HEADLAMP WASHER RELAY
TOTALLY INTEGRATED POWER MODULE

Diagnostic Test

1) INTERMITTENT CONDITION

Turn the ignition on.

With the scan tool, clear all DTC's.

Turn the Headlamp Washers on.

With the scan tool, read DTC's.

Does the scan tool display active: B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 2).

No

The condition that caused this symptom is currently not present. Check for an intermittent condition by inspecting the related wiring harness for chafed, pierced, pinched, and partially broken wires. Also, inspect the related connectors for broken, bent, pushed out, spread, corroded, or contaminated terminals. Repair as necessary.

Perform **BODY VERIFICATION TEST - VER 1** .

2) CHECK HEADLAMP WASHER RELAY

Turn the ignition off.

Remove the Headlamp Washer relay.

Turn the ignition on.

Turn the Headlamp Washers on.

With the scan tool, read DTC's.

Does the scan tool display active: B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 3).

No

Go To 5).

3) (W24) HEADLAMP WASHER RELAY CONTROL CIRCUIT OPEN

Turn the ignition off.

Disconnect the TIPM C3 harness connector.

Measure the resistance of the (W24) Headlamp Washer Relay Control circuit between the Headlamp Washer Relay connector and the TIPM C3 harness connector.

Is the resistance below 10.0 ohms?

Yes

Go To 4).

No

Repair the (W24) Headlamp Washer Relay Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

4) (W24) HEADLAMP WASHER RELAY CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (W24) Headlamp Washer Relay Control circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (W24) Headlamp Washer Relay Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Totally Integrated Power Module (TIPM) in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

5) HEADLAMP WASHER RELAY

Turn the ignition off.

Replace the Headlamp Washer relay with a known good relay.

Turn the ignition on.

Turn the Headlamp Washers on.

With the scan tool, read DTC's.

Does the scan tool display active: B2324-HEADLAMP WASHER MOTOR CONTROL CIRCUIT HIGH?

Yes

Go To 6).

No

Test Complete.

Perform **BODY VERIFICATION TEST - VER 1** .

6) (W23) HEADLAMP WASHER MOTOR CONTROL CIRCUIT OPEN

Turn the ignition off.

Remove the Headlamp Washer relay.

Disconnect the Headlamp Washer Motor harness connector.

Measure the resistance of the (W23) Headlamp Washer Motor Control circuit at the Headlamp Washer Motor harness connector and the Headlamp Washer Relay connector.

Is the resistance below 10.0 ohms?

Yes

Go To 7).

No

Repair the (W23) Headlamp Washer Motor Control circuit for an open.

Perform **BODY VERIFICATION TEST - VER 1** .

7) (W23) HEADLAMP WASHER MOTOR CONTROL CIRCUIT SHORTED TO VOLTAGE

Turn the ignition on.

Measure for voltage on the (W23) Headlamp Washer Motor Control circuit.

Is the voltage above 10.0 volts?

Yes

Repair the (W23) Headlamp Washer Motor Control circuit for a short to voltage.

Perform **BODY VERIFICATION TEST - VER 1** .

No

Replace the Headlamp Washer Motor in accordance with the Service Information.

Perform **BODY VERIFICATION TEST - VER 1** .

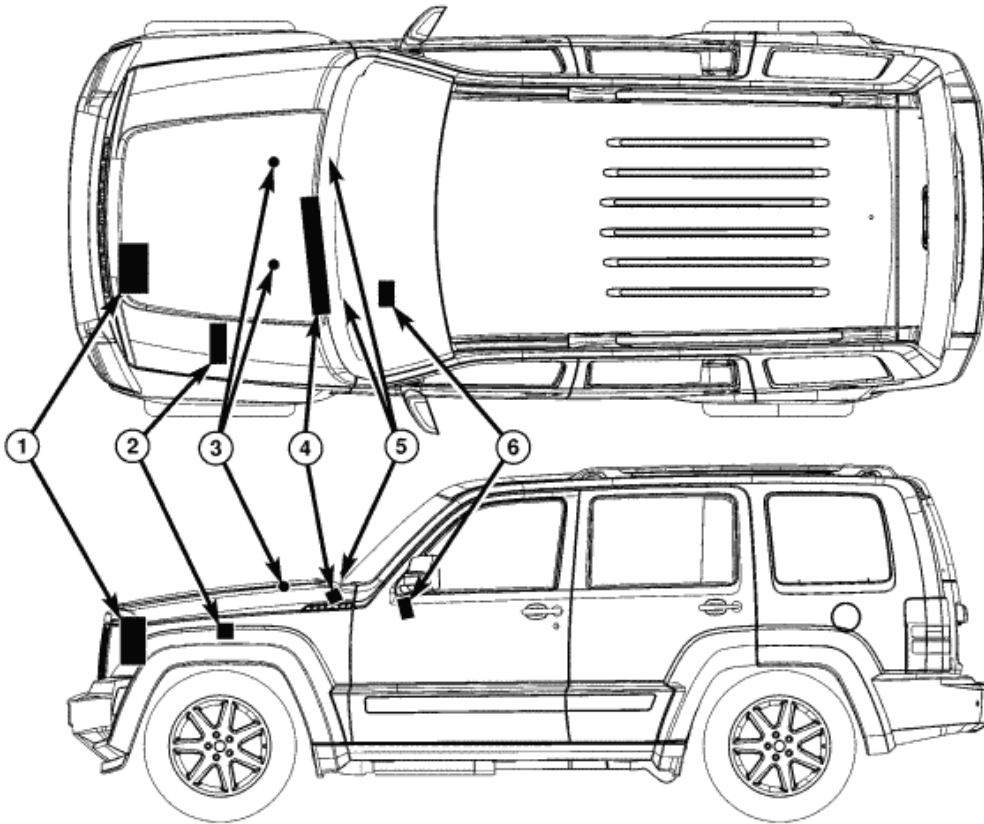
2008 ACCESSORIES AND EQUIPMENT

Wipers/Washers - Service Information - Liberty

WIPERS/WASHERS - SERVICE INFORMATION

DESCRIPTION

FRONT WIPER AND WASHER SYSTEM



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Fig. 1: Wiper And Washer System
Courtesy of CHRYSLER LLC

An electrically operated intermittent front wiper and washer system is standard factory-installed safety equipment on this vehicle. The wiper and washer system includes the following major components, which are described in further detail elsewhere in this service information:

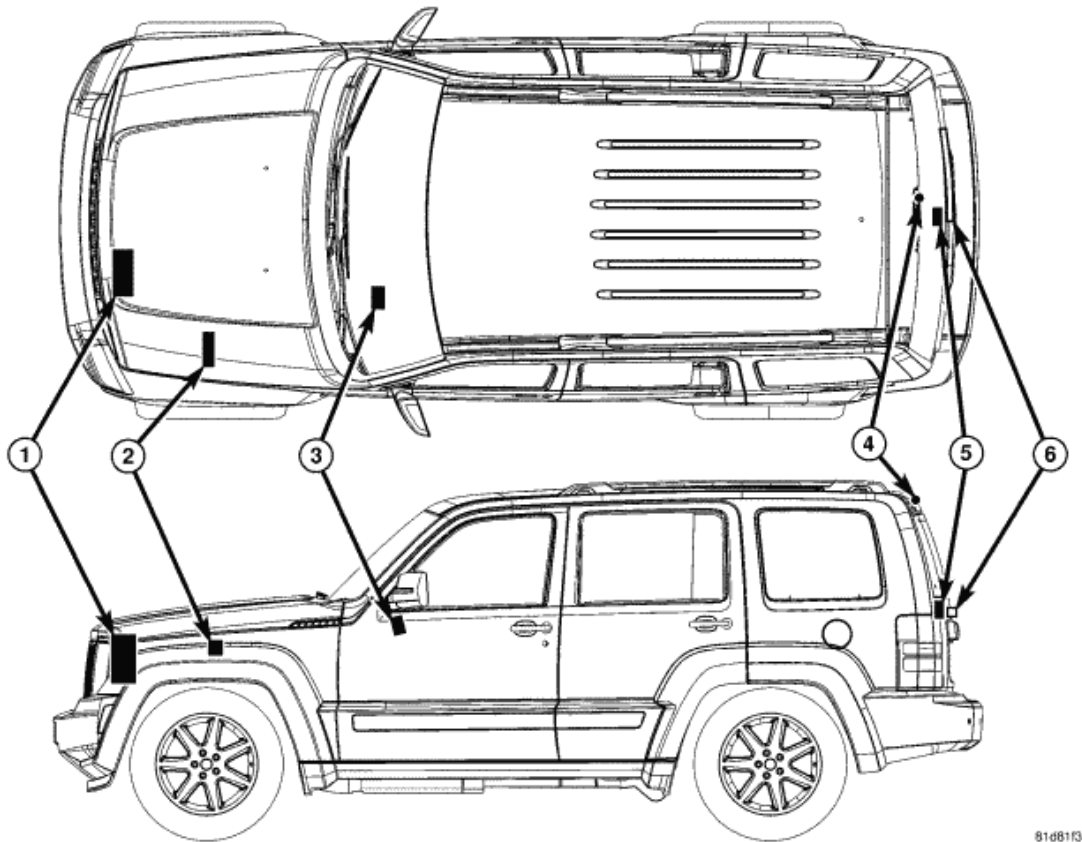
- **ElectroMechanical Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is located on the instrument panel directly in front of the driver. Refer to **DESCRIPTION** .
- **Front Washer Nozzle (3)** - Two fluidic front washer nozzles with integral check valves are secured by integral latch features to dedicated openings in the hood panel near the base of the windshield.
- **Front Washer Plumbing** - The plumbing for the washer system consists of rubber hoses and molded

rubber or plastic fittings. The plumbing is routed across the front of the engine compartment to the right side of the engine compartment from the washer reservoir on the left side of the cooling module, and through the cowl plenum panel to the underside of the hood panel and the washer nozzles.

- **Front Wiper Arms And Blades (5)** - The two front wiper arms are secured with nuts to the threaded ends of the two wiper pivot shafts, which extend through the cowl plenum cover/grille panel located near the base of the windshield. The two equal length front wiper blades are each secured to their equal length wiper arms with an integral latch, and are parked on the glass near the bottom of the windshield when the wiper system is not in operation.
- **Front Wiper Module (4)** - The wiper pivot shafts are the only visible components of the front wiper module. The remainder of the module is concealed within the cowl plenum area beneath the cowl plenum cover/grille panel. The wiper module includes the wiper module bracket, three rubber-isolated wiper module mounts, the wiper motor, the wiper motor crank arm, the two wiper drive links, and the two wiper pivots.
- **Right Multi-Function Switch (6)** - The right (wiper) multi-function switch and the left (lighting) multi-function switch are secured to brackets integral to the clockspring housing on the top of the steering column just below the steering wheel. The right multi-function switch is connected by a short jumper harness to the Steering Control Module (SCM), which is internal to the left multi-function switch housing. Only the switch control stalk extending from the right side of the steering column is visible, while the remainder of the switch is concealed beneath the steering column shrouds. The right multi-function switch is dedicated to providing all of the driver controls for both the front and rear wiper and washer systems.
- **Steering Control Module** - The Steering Control Module (SCM) is internal to the left multi-function switch housing, which is secured to a bracket integral to the left side of the clockspring housing on the top of the steering column just below the steering wheel. Only the left switch control stalk extending from the left side of the steering column is visible, while the remainder of the switch housing containing the SCM is concealed beneath the steering column shrouds. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module (2)** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. Refer to **DESCRIPTION** .
- **Washer Pump/Motor** - The reversible electric washer pump/motor unit is located in a dedicated hole on the lower outboard side of the washer reservoir, on the left side of the cooling module fan shroud. This single reversible washer pump/motor provides washer fluid to either the front or rear washer system plumbing, depending upon the direction of the pump motor rotation.
- **Washer Reservoir (1)** - The washer reservoir is integral to the coolant reserve bottle, which sits astride the fan shroud of the cooling module. The reservoir filler cap is accessed from the left front corner of the engine compartment.

Hard wired circuitry connects the front wiper and washer system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the front wiper and washer system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

REAR WIPER AND WASHER SYSTEM



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Fig. 2: Wiper And Washer System
 Courtesy of CHRYSLER LLC

An electrically operated fixed interval intermittent rear wiper and washer system is standard factory-installed equipment on this vehicle. The rear wiper and washer system includes the following major components, which are described in further detail elsewhere in this service information:

- **ElectroMechanical Instrument Cluster** - The ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) is located on the instrument panel directly in front of the driver. Refer to **DESCRIPTION**.
- **Rear Washer Nozzle (4)** - A fluidic rear washer nozzle is secured by integral latch features to a mounting hole on the right side of the Center High Mounted Stop Lamp (CHMSL) on the liftgate outer panel above the liftgate flip-up glass opening.
- **Rear Washer Plumbing** - The plumbing for the rear washer system consists of rubber hoses and molded rubber or plastic fittings. The plumbing is routed across the front of the engine compartment to the right side of the engine compartment from the washer pump and reservoir on the left side of the cooling module, and through the dash into the passenger compartment. Then it is routed up the right cowl side and A-pillar to the headliner, and above the headliner to the upper liftgate opening header, then through the upper inner liftgate panel to the rear washer nozzle.
- **Rear Wiper Arm And Blade (6)** - The single rear wiper arm is secured by a nut directly to the rear wiper motor output shaft, which extends through the center of the liftgate outer panel near the base of the liftgate flip-up glass. The rear wiper blade is secured to the rear wiper arm with an integral latch, and is parked off of the glass when the rear wiper system is not in operation.

- **Rear Wiper Arm Park Ramp** - The molded rubber rear wiper arm park ramp is secured with a screw to the liftgate outer panel to the right of the rear wiper motor output shaft. When the rear wiper system is not in operation, the rear wiper arm is parked off of the glass on this ramp so that it will not interfere with or be damaged by the liftgate flip-up glass operation.
- **Rear Wiper Motor (5)** - The rear wiper motor includes the motor bracket and three rubber-isolated mounting tabs. The wiper motor output shaft is the only visible component of the rear wiper motor. The remainder of the motor is concealed by the liftgate inner trim just below the liftgate glass opening.
- **Right Multi-Function Switch (3)** - The right (wiper) multi-function switch and the left (lighting) multi-function switch are secured to brackets integral to the clockspring housing, on the top of the steering column just below the steering wheel. The right multi-function switch is connected by a short jumper harness to the Steering Control Module (SCM), which is internal to the left multi-function switch housing. Only the switch control stalk extending from the right side of the steering column is visible, while the remainder of the switch is concealed beneath the steering column shrouds. The right multi-function switch is dedicated to providing all of the driver controls for both the front and rear wiper and washer systems.
- **Steering Control Module** - The Steering Control Module (SCM) is internal to the left multi-function switch housing, which is secured to a bracket integral to the left side of the clockspring housing on the top of the steering column just below the steering wheel. Only the left switch control stalk extending from the left side of the steering column is visible, while the remainder of the switch housing containing the SCM is concealed beneath the steering column shrouds. Refer to **DESCRIPTION** .
- **Totally Integrated Power Module (2)** - The Totally Integrated Power Module (TIPM) is located in the engine compartment, near the battery. Refer to **DESCRIPTION** .
- **Washer Pump/Motor** - The reversible electric washer pump/motor unit is located in a dedicated hole on the lower outboard side of the washer reservoir, on the left side of the cooling module fan shroud. This single reversible washer pump/motor provides washer fluid to either the front or rear washer system plumbing, depending upon the direction of the pump motor rotation.
- **Washer Reservoir (1)** - The washer reservoir is integral to the coolant reserve bottle, which sits astride the fan shroud of the cooling module. The reservoir filler cap is accessed from the left front corner of the engine compartment.

Hard wired circuitry connects the rear wiper and washer system components to the electrical system of the vehicle. These hard wired circuits are integral to several wire harnesses, which are routed throughout the vehicle and retained by many different methods. These circuits may be connected to each other, to the vehicle electrical system and to the rear wiper and washer system components through the use of a combination of soldered splices, splice block connectors, and many different types of wire harness terminal connectors and insulators. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, further details on wire harness routing and retention, as well as pin-out and location views for the various wire harness connectors, splices and grounds.

OPERATION

FRONT WIPER AND WASHER SYSTEM

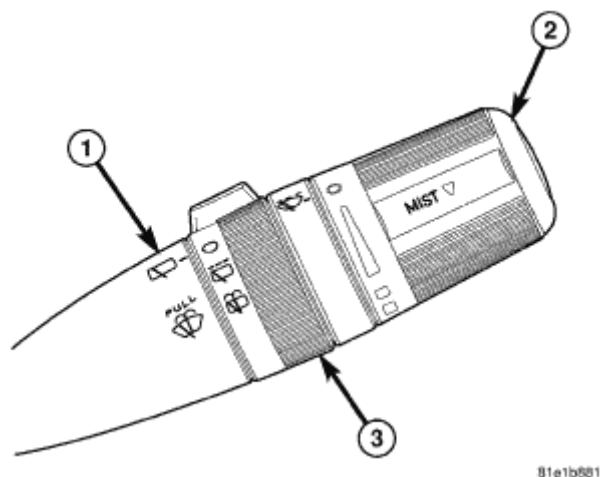


Fig. 3: Right (Wiper) Multi-Function Switch
 Courtesy of CHRYSLER LLC

The front wiper and washer system is designed to provide the vehicle operator with a convenient, safe, and reliable means of maintaining visibility through the windshield glass. The various components of this system are designed to convert electrical energy produced by the vehicle electrical system into the mechanical action of the wiper blades to wipe the outside surface of the glass, as well as into the hydraulic action of the washer system to apply washer fluid stored in an on-board reservoir to the area of the glass to be wiped. When combined, these components provide the means to effectively maintain clear visibility for the vehicle operator by removing excess accumulations of rain, snow, bugs, mud, or other minor debris from the outer surface of the windshield glass that might be encountered while driving the vehicle under numerous types of inclement operating conditions.

The vehicle operator initiates all front and rear wiper and washer system functions with the control stalk of the right (wiper) multi-function switch (1) that extends from the right side of the steering column, just below the steering wheel. Rotating the control knob (2) on the end of the control stalk, selects the OFF, DELAY, LOW, or HIGH front wiper system operating modes. In the DELAY mode, the control knob also allows the vehicle operator to select from one of five intermittent wipe delay intervals.

Pulling the control stalk rearward actuates the momentary front washer system switch, which selects the WASH and WIPE-AFTER-WASH modes, depending upon when and how long the switch is held closed. Pushing the control stalk downward actuates a momentary switch and selects the MIST mode, which cycles the wiper blades for as long as the switch is held closed then completes the current cycle and parks the blades at the base of the windshield after the switch is released.

The right multi-function switch provides hard wired analog and resistor multiplexed inputs to the Steering Control Module (SCM) internal to the left (lighting) multi-function switch housing for all of the wiper and washer system functions. The SCM then sends electronic **wiper** and **washer switch** status messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), over a Local Interface Network (LIN) data bus. The EMIC responds to the SCM inputs by sending electronic **wiper** and **washer system** request messages to the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus requesting the appropriate wiper and washer system operating modes.

Front wiper and washer system operation is completely controlled by the SCM, EMIC and TIPM logic circuits, and that logic will only allow these systems to operate when the ignition switch is in the ACCESSORY or ON positions. The TIPM uses intelligent, high current, self-protected high side switches to control wiper system operation by energizing or de-energizing the wiper motor low and high speed brushes. The TIPM uses an H-bridge circuit to control the operation of the reversible washer pump/motor unit. The right multi-function switch circuitry receives battery current and a clean ground output from the SCM, then provides analog and multiplexed inputs to the SCM to indicate the selected front wiper and front washer system mode.

The hard wired circuits and components of the front wiper and washer system may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper and washer system or the electronic controls and communication related to front wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

OPERATING MODES

Following are paragraphs that briefly describe the operation of each of the front wiper and washer system operating modes.

CONTINUOUS WIPE MODE

When the LOW position of the control knob on the control stalk of the right (wiper) multi-function switch is selected the SCM sends an electronic **wiper switch low** status message to the EMIC over the LIN data bus, the EMIC relays an electronic **wiper switch low** request message to the TIPM over the CAN data bus, then the TIPM directs battery current to the low speed brush of the wiper motor, causing the wipers to cycle at low speed.

When the HIGH position of the control knob is selected the SCM sends an electronic **wiper switch high** status message to the EMIC, the EMIC relays an electronic **wiper switch high** request message to the TIPM, then the TIPM directs battery current to the high speed brush of the wiper motor, causing the wipers to cycle at high speed.

When the OFF position of the multi-function switch control knob is selected, the SCM sends an electronic **wiper switch off** status message to the EMIC, the EMIC relays an electronic **wiper switch off** request message to the TIPM, then one of two events will occur. The event that occurs depends upon the position of the wiper blades on the windshield at the moment that the control knob OFF position is selected.

If the wiper blades are in the down position on the windshield when the OFF position is selected, the park switch that is integral to the wiper motor is closed to ground, which provides a hard wired park switch sense input to the TIPM. The TIPM then de-energizes the wiper motor and the wiper motor ceases to operate. If the wiper blades are not in the down position on the windshield at the moment the OFF position is selected, the park switch is an open circuit and the TIPM continues running the wiper motor at low speed until the wiper blades are in the down position on the windshield and the park switch input to the TIPM is again closed to ground.

INTERMITTENT WIPE MODE

When the control knob on the control stalk of the right (wiper) multi-function switch is moved to one of the five DELAY interval positions the SCM sends an electronic **wiper switch delay interval** status message to the EMIC, the EMIC relays an electronic **wiper switch delay interval** request message to the TIPM, then the TIPM electronic intermittent wipe logic circuit responds by calculating the correct length of time between wiper sweeps based upon the selected delay interval input.

The TIPM monitors the changing state of the wiper motor park switch through a hard wired park switch sense input. This input allows the TIPM to determine the proper intervals at which to energize and de-energize the wiper motor intermittently for one low speed cycle at a time.

The TIPM logic is also programmed to provide vehicle speed sensitivity to the selected intermittent wipe delay intervals. In order to provide this feature the TIPM monitors electronic **vehicle speed** messages from the Controller Antilock Brake (CAB) or the Powertrain Control Module (PCM) and doubles the selected delay interval whenever the vehicle speed is about 16 kilometers-per-hour (10 miles-per-hour) or less.

MIST WIPE MODE

When the control stalk of the right (wiper) multi-function switch is moved downward to the momentary MIST position, the SCM sends an electronic **wiper mist mode** status message to the EMIC, the EMIC relays an electronic **wiper mist mode** request message to the TIPM, then the TIPM energizes the low speed brush of the wiper motor for as long as the switch is held closed, then de-energizes the motor when the state of the switch changes to open, parking the wiper blades near the base of the windshield. The TIPM can operate the front wiper motor in this mode for only one low speed cycle at a time, or for an indefinite number of sequential low speed cycles, depending upon how long the switch is held closed.

WASH MODE

When the control stalk of the right (wiper) multi-function switch is pulled rearward to the front momentary WASH position for more than about one-half second with the wiper system operating, the SCM sends an electronic **washer switch** status message to the EMIC, the EMIC relays an electronic **washer switch** request message to the TIPM, then the TIPM directs battery current and ground to the washer pump/motor. This will cause the washer pump/motor to be energized in the front wash direction for as long as the switch is held closed (up to approximately 10 seconds) and to be de-energized when the control stalk is released.

When the control stalk is pulled rearward to the front momentary WASH position while the front wiper system is operating in one of the DELAY interval positions, the washer pump/motor operation is the same. However, the TIPM also overrides the selected delay interval and operates the front wiper motor in a continuous low speed mode for as long as the control stalk is held in the front momentary WASH position, then reverts to the selected delay interval several wipe cycles after the control stalk is released. If the WASH switch is held closed for more than approximately 10 seconds, the TIPM will suspend washer pump/motor operation until the control stalk is released for about 2 seconds and then cycled back to the WASH position.

WIPE-AFTER-WASH MODE

When the control stalk of the right (wiper) multi-function switch is pulled rearward to the front momentary WASH position for more than about one-half second while the wiper system is not operating, the SCM sends an electronic **washer switch** status message to the EMIC, the EMIC relays an electronic **washer switch** request message to the TIPM, and the TIPM directs battery current and ground to the washer pump/motor and energizes

the wiper motor in a continuous low speed mode for as long as the switch is held closed (up to approximately 10 seconds). When the control stalk is released, the TIPM de-energizes the washer pump/motor immediately, but allows the wiper motor to operate for two or three additional wipe cycles before it de-energizes the wiper motor and parks the wiper blades near the base of the windshield.

If the control stalk is held rearward for more than about 10 seconds, the TIPM will suspend washer pump/motor operation until the stalk is released for about 2 seconds and then cycled back to the WASH position; however, the wipers will continue to operate for as long as the switch is held closed. The TIPM monitors the changing state of the wiper motor park switch through a hard wired wiper park switch sense circuit input. This input allows the TIPM to count the number of wipe cycles that occur after the control stalk is released, and to determine the proper interval at which to de-energize the wiper motor to complete the WIPE-AFTER-WASH mode cycle.

REAR WIPER AND WASHER SYSTEM

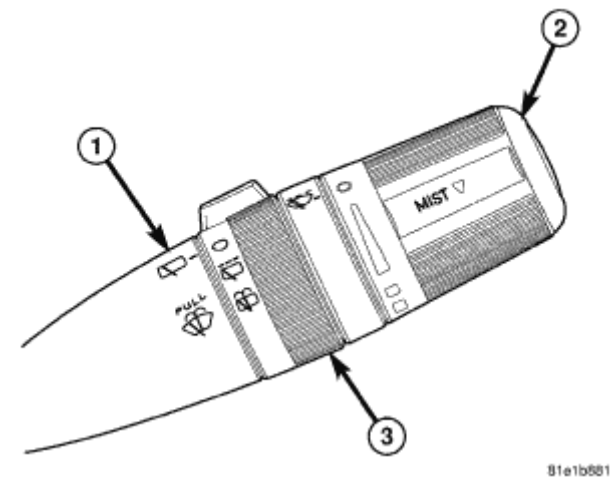


Fig. 4: Right (Wiper) Multi-Function Switch
Courtesy of CHRYSLER LLC

The rear wiper and washer system is designed to provide the vehicle operator with a convenient, safe, and reliable means of maintaining visibility through the liftgate flip-up glass. The various components of this system are designed to convert electrical energy produced by the vehicle electrical system into the mechanical action of the wiper blade to wipe the outside surface of the glass, as well as into the hydraulic action of the washer system to apply washer fluid stored in an on-board reservoir to the area of the glass to be wiped. When combined, these components provide the means to effectively maintain clear visibility for the vehicle operator by removing excess accumulations of rain, snow, bugs, mud, or other minor debris from the outer surface of the liftgate flip-up glass that might be encountered while driving the vehicle under numerous types of inclement operating conditions.

The vehicle operator initiates all front and rear wiper and washer system functions with the control stalk (1) of the right (wiper) multi-function switch that extends from the right side of the steering column, just below the steering wheel. Rotating the control sleeve (3) on the control stalk to the OFF or INTERMITTENT detent positions or the momentary WASH position selects the rear wiper and washer system operating modes.

The right multi-function switch provides hard wired analog and resistor multiplexed inputs to the Steering Control Module (SCM) integral to the left (lighting) multi-function switch for all of the wiper and washer system functions. The SCM then sends electronic **rear wiper/washer switch** status messages to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) over a Local Interface Network (LIN) data bus. The EMIC then sends electronic **rear wiper/washer switch** request messages to the Totally Integrated Power Module (TIPM) over the Controller Area Network (CAN) data bus requesting the appropriate rear wiper and washer system operating modes.

Rear wiper and washer system operation is completely controlled by the SCM, EMIC and TIPM logic circuits, and that logic will only allow these systems to operate when the ignition switch is in the ACCESSORY or ON positions, plus a delay after the ignition switch is turned to any other position long enough to allow the rear wiper motor to park the rear wiper blade off of the liftgate flip-up glass. The TIPM uses intelligent, high current, self-protected high side switches to control wiper system operation by energizing or de-energizing the rear wiper motor. The TIPM uses an H-bridge circuit to control the operation of the reversible washer pump/motor unit. The right multi-function switch circuitry receives a clean ground output from the SCM on a multi-function switch return circuit, then provides analog and resistor multiplexed inputs to the SCM to indicate the selected rear wiper and rear washer system mode.

The hard wired circuits and components of the rear wiper and washer system may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper and washer system or the electronic controls and communication related to rear wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

OPERATING MODES

Following are paragraphs that briefly describe the operation of each of the rear wiper and washer system operating modes.

INTERMITTENT WIPE MODE

When the INTERMITTENT WIPE position of the control sleeve on the control stalk of the right multi-function switch is selected, the SCM sends an electronic **rear wiper switch** status message to the EMIC over the LIN data bus, then the EMIC relays an electronic **rear wiper switch** request message to the TIPM over the CAN data bus, and the TIPM directs battery current to the rear wiper motor at fixed delay intervals to enable the rear wiper motor intermittent wipe mode.

WASH MODE

When the control sleeve of the right multi-function switch is rotated counterclockwise past the INTERMITTENT detent position to the momentary rear WASH position, the SCM sends an electronic **rear washer switch** status message to the EMIC over the LIN data bus, then the EMIC relays an electronic **rear washer switch** request message to the TIPM over the CAN data bus, and the TIPM directs battery current to the rear wiper motor and directs battery current and ground to the washer pump/motor unit. These outputs will cause the washer pump motor and the rear wiper motor to operate continuously for as long as the switch is held closed up to approximately 10 seconds. The washer pump is de-energized as soon as the control sleeve is

released, but the rear wiper motor continues to operate for two to three continuous cycles before reverting to the fixed delay interval operation. The TIPM uses a hard wired output from a park switch internal to the rear wiper motor as an additional logic input to monitor the position of the rear wiper blade on the glass and to control the number of continuous wiper sweeps following washer operation.

DIAGNOSIS AND TESTING

FRONT WIPER AND WASHER SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

If the front wiper motor operates, but the wipers do not move on the windshield, replace the ineffective front wiper module. If the washer pump/motor operates, but no washer fluid is dispensed on the glass; or, if the wipers operate, but chatter, lift, or do not clear the glass, clean and inspect the front wiper and washer system components as required. See CLEANING and INSPECTION.

The hard wired front wiper and washer system circuits and components may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper and washer system or the electronic controls and communication related to front wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

NOTE: The front wiper and washer switches are integral to the right multi-function switch. The right multi-function switch is hard wired to the left multi-function switch/Steering Control Module (SCM), which communicates with the ElectroMechanical Instrument Cluster (EMIC)/Cab Compartment Node (CCN) over the Local Interface Network (LIN) data bus. Before performing any of the following tests, determine whether the other functions of the right and left multi-function switch/SCM are operational. If only the right multi-function switch functions are inoperative, test and repair the right multi-function switch or the jumper harness between the right and left multi-function switches before attempting to repair the Front Wiper and Washer System. If both the right and left multi-function switch/SCM functions are ineffective, diagnose and repair

that problem before attempting to repair the Front Wiper and Washer System.

CONDITION	POSSIBLE CAUSES	CORRECTION
WIPER MOTOR DOES NOT OPERATE IN ANY SWITCH POSITION	1. Ineffective motor ground circuit. 2. Ineffective motor feed circuits. 3. Ineffective right multi-function switch. 4. Ineffective SCM inputs or outputs. 5. Ineffective EMIC (CCN) inputs or outputs. 6. Ineffective TIPM inputs or outputs. 7. Ineffective wiper motor.	1. Test and repair open wiper motor ground circuit if required. 2. Test and repair low speed and high speed feed circuits between TIPM and front wiper motor if required. 3. Test and replace ineffective right multi-function switch if required. 4. Use a diagnostic scan tool to test the SCM inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 7. Test and replace open or shorted wiper motor as required.
WIPERS DO NOT PARK CORRECTLY	1. Ineffective wiper motor park switch input circuit. 2. Ineffective TIPM inputs or outputs. 3. Ineffective wiper motor park switch.	1. Test and repair wiper park switch input circuit between TIPM and front wiper motor if required. 2. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 3. Test and replace ineffective wiper motor if required.
WIPER MOTOR OPERATES SLOWLY IN ALL SWITCH POSITIONS	1. Ineffective wiper motor. 2. Amperage draw too low. 3. Amperage draw too high.	1. Check amperage draw with linkage disconnected from wiper motor crank arm. Correct draw should be about 6 amperes. If incorrect, refer to the appropriate Possible Cause that follows: 2. Test and repair shorted low and high speed feed circuits if required. 3. With linkage disconnected from wiper motor crank arm check linkage and pivots for binding. If binding is detected, repair or replace front wiper module if required. If no linkage binding detected, replace the front wiper motor if required.
WIPERS RUN AT HIGH SPEED WITH SWITCH LOW SPEED SELECTED OR AT LOW SPEED WITH SWITCH	1. Ineffective motor feed circuit wiring.	1. Test and repair low speed and high speed feed circuits between TIPM and front wiper motor if required.

HIGH SPEED SELECTED		
WASHER PUMP DOES NOT OPERATE	1. Ineffective washer pump ground circuit. 2. Ineffective washer pump feed circuits. 3. Ineffective right multi-function switch. 4. Ineffective SCM inputs or outputs. 5. Ineffective EMIC (CCN) inputs or outputs. 6. Ineffective TIPM inputs or outputs. 7. Ineffective washer pump.	1. Test and repair open washer pump ground circuit if required. 2. Test and repair washer pump feed circuits between TIPM and washer pump if required. 3. Test and replace ineffective right multi-function switch if required. 4. Use a diagnostic scan tool to test the SCM inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 7. Test and replace open or shorted washer pump if required.

REAR WIPER AND WASHER SYSTEM

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

If the rear wiper motor operates, but the wiper motor output shaft does not move, replace the ineffective rear wiper motor. If the washer pump/motor operates, but no washer fluid is dispensed on the glass; or, if the wiper operates, but chatters, lifts, or does not clear the glass, clean and inspect the rear wiper and washer system components as required. See **CLEANING** and **INSPECTION**.

The hard wired rear wiper and washer system circuits and components may be diagnosed using conventional diagnostic tools and procedures. Refer to the appropriate wiring information. The wiring information includes wiring diagrams, proper wire and connector repair procedures, details of wire harness routing and retention, connector pin-out information and location views for the various wire harness connectors, splices and grounds.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper and washer system or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper and washer system or the electronic controls and communication related to rear wiper and washer system operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

NOTE: The rear wiper and washer switches are integral to the right multi-function switch. The right multi-function switch is hard wired to the left multi-function switch/Steering Control Module (SCM), which communicates with the ElectroMechanical Instrument Cluster (EMIC)/Cab Compartment Node (CCN) over the Local Interface Network (LIN) data bus. Before performing any of the following tests, determine whether the other functions of the right and left multi-function switch/SCM are operational. If only the right multi-function switch functions are inoperative, test and repair the right multi-function switch or the jumper harness between the right and left multi-function switches before attempting to repair the Rear Wiper and Washer System. If both the right and left multi-function switch/SCM functions are ineffective, diagnose and repair that problem before attempting to repair the Rear Wiper and Washer System.

CONDITION	POSSIBLE CAUSES	CORRECTION
WIPER MOTOR DOES NOT OPERATE IN ANY SWITCH POSITION	1. Ineffective motor ground circuit. 2. Ineffective motor feed circuits. 3. Ineffective right multi-function switch. 4. Ineffective SCM inputs or outputs. 5. Ineffective EMIC (CCN) inputs or outputs. 6. Ineffective TIPM inputs or outputs. 7. Ineffective wiper motor.	1. Test and repair open wiper motor ground circuit if required. 2. Test and repair motor feed circuit between TIPM and rear wiper motor if required. 3. Test and replace ineffective right multi-function switch if required. 4. Use a diagnostic scan tool to test the SCM inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 7. Test and replace open or shorted wiper motor if required.
WIPER DOES NOT PARK CORRECTLY	1. Ineffective wiper motor park switch input circuit. 2. Ineffective TIPM inputs or outputs. 3. Ineffective wiper motor park switch.	1. Test and repair wiper park switch input circuit between TIPM and front wiper motor if required. 2. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 3. Test and replace ineffective wiper motor if required.
WIPER MOTOR OPERATES SLOWLY	1. Ineffective wiper motor.	1. Check amperage draw with wiper arm disconnected from rear wiper motor output shaft. Correct draw should be about 6 amperes. If incorrect, refer to the appropriate Possible Cause that follows: 2. Test and repair shorted rear wiper

	2. Amperage draw too low. 3. Amperage draw too high.	motor signal and fused ignition switch output (run - accessory) circuits if required. 3. With wiper arm disconnected from wiper motor output shaft check for binding between output shaft and rubber grommet in liftgate. If binding is detected, lubricate or replace grommet if required. If no binding is detected, replace the wiper motor if required.
WASHER PUMP DOES NOT OPERATE	1. Ineffective washer pump ground circuit. 2. Ineffective washer pump feed circuits. 3. Ineffective right multi-function switch. 4. Ineffective SCM inputs or outputs. 5. Ineffective EMIC (CCN) inputs or outputs. 6. Ineffective TIPM inputs or outputs. 7. Ineffective washer pump.	1. Test and repair open washer pump ground circuit if required. 2. Test and repair washer pump feed circuits between TIPM and washer pump if required. 3. Test and replace ineffective right multi-function switch if required. 4. Use a diagnostic scan tool to test the SCM inputs and outputs. Refer to the appropriate diagnostic information. 5. Use a diagnostic scan tool to test the EMIC (CCN) inputs and outputs. Refer to the appropriate diagnostic information. 6. Use a diagnostic scan tool to test the TIPM inputs and outputs. Refer to the appropriate diagnostic information. 7. Test and replace open or shorted washer pump if required.

CLEANING

FRONT WIPER AND WASHER SYSTEM

WIPER SYSTEM

CAUTION: Protect the rubber squeegees of the wiper blades from any petroleum-based cleaners, solvents, or contaminants. These products can rapidly deteriorate the rubber squeegees.

The squeegees of wiper blades exposed to the elements for a long time tend to lose their wiping effectiveness. Periodic cleaning of the squeegees is suggested to remove any deposits of salt or road film. The wiper blades, arms, and windshield glass should only be cleaned using a sponge or soft cloth and windshield washer fluid, a mild detergent, or a non-abrasive cleaner. If the wiper blades continue to leave streaks, smears, hazing, or beading on the glass after thorough cleaning of the squeegees and the glass, the entire wiper blade assembly must be replaced.

WASHER SYSTEM

CAUTION: Never introduce petroleum-based cleaners, solvents, or contaminants into the washer system. These products can rapidly deteriorate the rubber seals and hoses of the washer system, as well as the rubber squeegees of the wiper blades.

CAUTION: Never use compressed air to flush the washer system plumbing. Compressed air pressures are too great for the washer system plumbing components and will result in further system damage. Never use sharp instruments to clear a plugged washer nozzle or damage to the nozzle orifice and improper nozzle spray patterns will result.

If the washer system is contaminated with foreign material, drain the washer reservoir by removing the washer pump/motor unit from the reservoir. Clean foreign material from the inside of the washer pump inlet filter screen and the washer reservoir using clean washer fluid, a mild detergent, or a non-abrasive cleaner. Flush foreign material from the washer system plumbing by first disconnecting the washer hose from the washer nozzle, then running the washer pump/motor to run clean washer fluid or water through the system. A plugged or restricted washer nozzle should be carefully back-flushed using compressed air. If the washer nozzle obstruction cannot be cleared, replace the washer nozzle.

REAR WIPER AND WASHER SYSTEM

WIPER SYSTEM

The squeegee of a wiper blade exposed to the elements for a long time tends to lose its wiping effectiveness. Periodic cleaning of the squeegee is suggested to remove any deposits of salt or road film. The wiper blade, arm, and liftgate glass should only be cleaned using a sponge or soft cloth and windshield washer fluid, a mild detergent, or a non-abrasive cleaner. If the wiper blade continues to leave streaks, smears, hazing, or beading on the glass after thorough cleaning of the squeegees and the glass, the entire wiper blade assembly must be replaced.

CAUTION: Protect the rubber squeegee of the wiper blade from any petroleum-based cleaners, solvents, or contaminants. These products can rapidly deteriorate the rubber squeegee.

WASHER SYSTEM

If the washer system is contaminated with foreign material, drain the washer reservoir by removing the washer pump/motor from the reservoir. Clean foreign material from the inside of the washer pump/motor inlet filter screen and the washer reservoir using clean washer fluid, a mild detergent, or a non-abrasive cleaner. Flush foreign material from the washer system plumbing by first disconnecting the washer hose from the rear washer nozzle, then running the washer pump/motor to run clean washer fluid or water through the system. A plugged or restricted rear washer nozzle should be carefully back-flushed using compressed air. If the washer nozzle obstruction cannot be cleared, replace the rear washer nozzle.

CAUTION: Never introduce petroleum-based cleaners, solvents, or contaminants into the washer system. These products can rapidly deteriorate the rubber seals and hoses of the washer system, as well as the rubber squeegee of

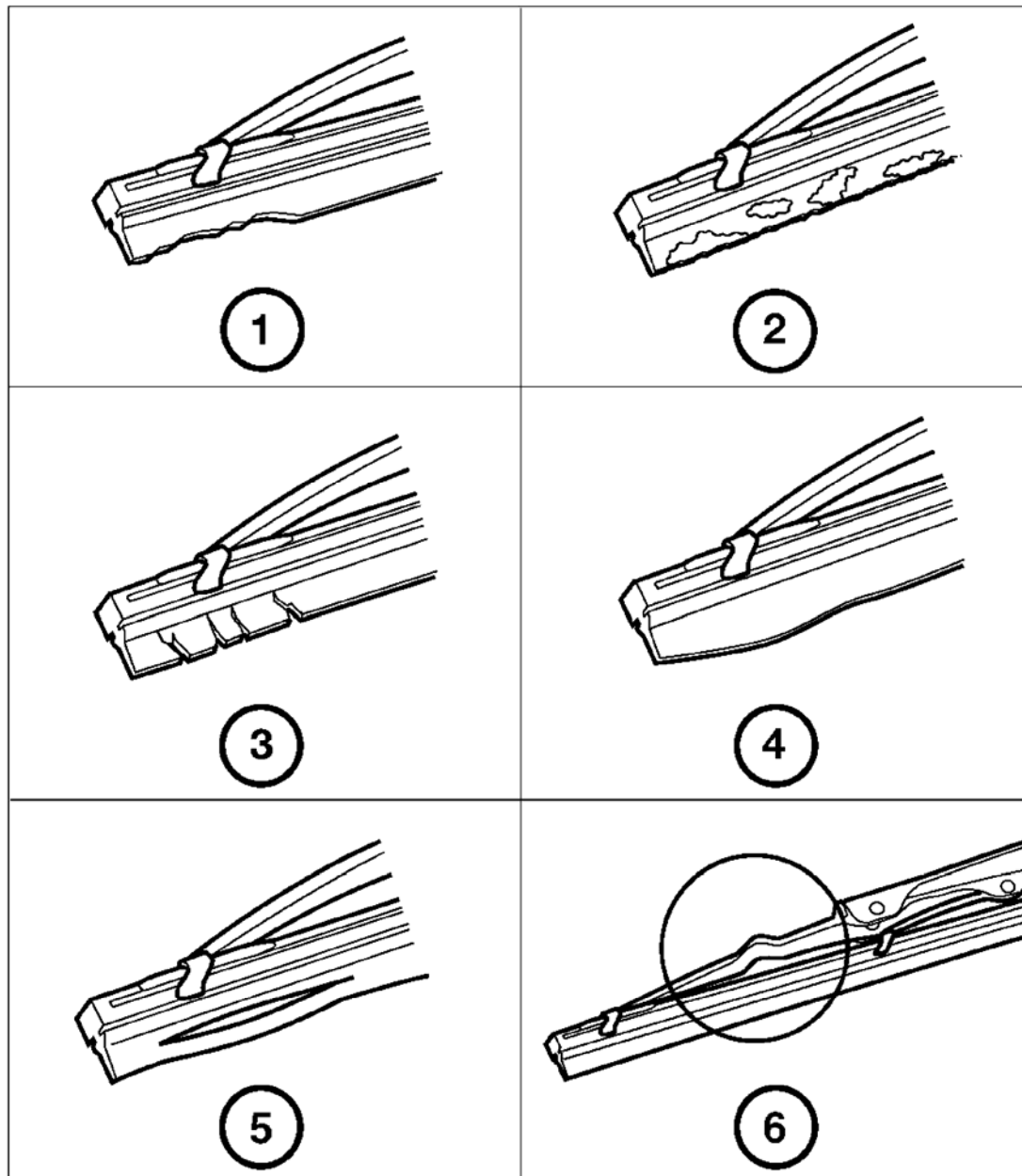
the wiper blade.

CAUTION: Never use compressed air to flush the washer system plumbing. Compressed air pressures are too great for the washer system plumbing components and will result in further system damage. Never use sharp instruments to clear a plugged washer nozzle or damage to the nozzle orifice and improper nozzle spray patterns will result.

INSPECTION

FRONT WIPER AND WASHER SYSTEM

WIPER SYSTEM



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Fig. 5: Inspecting Wiper Blades
Courtesy of CHRYSLER LLC

The wiper blades and wiper arms should be inspected periodically, not just when wiper performance problems are experienced. This inspection should include the following points:

1. Carefully inspect the wiper blades for any indications of worn or uneven edges (1), foreign material deposits (2), hardening or cracking (3), deformation or fatigue (4), or splitting (5). Inspect the wiper blade support components and the wiper arms for damage (6) or corrosion. If the wiper arms and blades are

contaminated with any foreign material, clean them and the glass as required. See **CLEANING**. If a wiper blade or arm is damaged, or if corrosion is evident, replace the affected wiper arm or blade with a new unit. Do not attempt to repair a wiper arm or blade that is damaged or corroded.

2. Carefully lift the wiper blade off of the glass. Note the action of the wiper arm hinge. The wiper arm should pivot freely at the hinge, but with no lateral looseness evident. If there is any binding evident in the wiper arm hinge, or if there is evident lateral play in the wiper arm hinge, replace the wiper arm.

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

3. Once proper hinge action of the wiper arm is confirmed, check the hinge for proper spring tension. Remove the wiper blade from the wiper arm. Either place a small postal scale between the blade end of the wiper arm and the glass, or carefully lift the blade end of the arm away from the glass using a small fish scale. On vehicles with unequal wiper arm lengths, be certain that measurements on both arms are taken at a point an equal distance from their wiper arm hinge pins. Compare the scale readings between the right and left wiper arms. Replace a wiper arm if it has comparatively lower spring tension, as evidenced by a lower scale reading.
4. After cleaning and inspecting the wiper components and the glass, if the wiper blade still fails to clear the glass without smearing, streaking, chattering, hazing, or beading, replace the wiper blade.

WASHER SYSTEM

The washer system components should be inspected periodically, not just when washer performance problems are experienced. This inspection should include the following points:

1. Check for ice or other foreign material in the washer reservoir. If contaminated, clean and flush the washer system. See **CLEANING**.
2. Inspect the washer plumbing for pinched, leaking, deteriorated, or incorrectly routed hoses and damaged or disconnected hose fittings. Replace damaged or deteriorated hoses and hose fittings. Leaking washer hoses can sometimes be repaired by cutting the hose at the leak and splicing it back together using an in-line connector fitting. Similarly, sections of deteriorated hose can be cut out and replaced by splicing in new sections of hose using in-line connector fittings. Whenever routing a washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts. Also, sharp bends that might pinch the washer hose must be avoided.

REAR WIPER AND WASHER SYSTEM

WIPER SYSTEM

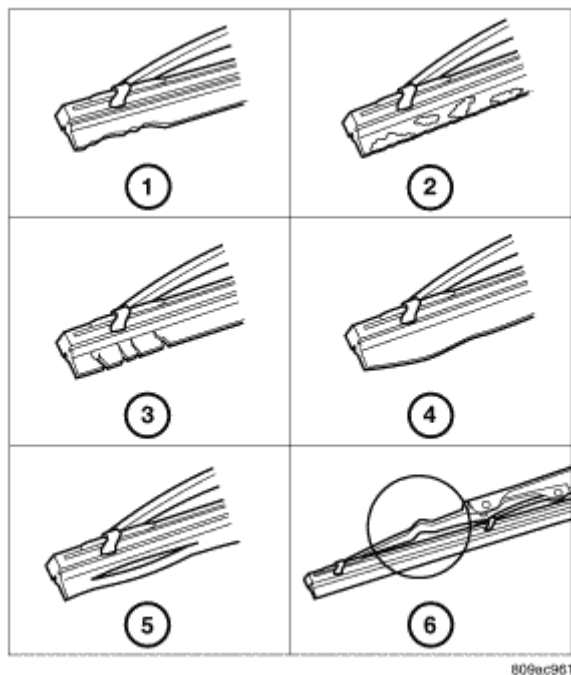


Fig. 6: Inspecting Wiper Blades
Courtesy of CHRYSLER LLC

The rear wiper blade and wiper arm should be inspected periodically, not just when wiper performance problems are experienced. This inspection should include the following points:

1. Carefully inspect the wiper blade for any indications of worn or uneven edges (1), foreign material deposits (2), hardening or cracking (3), deformation or fatigue (4), or splitting (5). Inspect the wiper blade support components and the wiper arm for damage (6). If the wiper arm and blade are contaminated with any foreign material, clean them and the glass as required. See **CLEANING**. If the wiper blade or arm is damaged, replace it with a new unit. Do not attempt to repair a wiper arm or blade that is damaged or corroded.
2. Carefully lift the wiper blade off of the glass. Note the action of the wiper arm hinge. The wiper arm should pivot freely at the hinge, but with no lateral looseness evident. If there is any binding evident in the wiper arm hinge, or there is evident lateral play in the wiper arm hinge, replace the wiper arm.

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

3. Once proper hinge action of the wiper arm is confirmed, check the hinge for proper spring tension. The spring tension of the wiper arm should be sufficient to cause the rubber squeegee to conform to the curvature of the glass. Replace a wiper arm if it has insufficient spring tension to maintain contact between the squeegee and the glass.
4. After cleaning and inspecting the wiper components and the glass, if the wiper blade still fails to clear the glass without smearing, streaking, chattering, hazing, or beading, replace the wiper blade.

The washer system components should be inspected periodically, not just when washer performance problems are experienced. This inspection should include the following points:

1. Check for ice or other foreign material in the washer reservoir. If contaminated, clean and flush the washer system. See **CLEANING**.
2. Inspect the washer plumbing for pinched, leaking, deteriorated, or incorrectly routed hoses and damaged or disconnected hose fittings. Replace damaged or deteriorated hoses and hose fittings. Leaking washer hoses can sometimes be repaired by cutting the hose at the leak and splicing it back together using an in-line connector fitting. Similarly, sections of deteriorated hose can be cut out and replaced by splicing in new sections of hose using in-line connector fittings. Whenever routing a washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts. Also, sharp bends that might pinch the washer hose must be avoided.

SPECIFICATIONS

SPECIFICATIONS - WIPER AND WASHER SYSTEMS

TORQUE SPECIFICATIONS

DESCRIPTION	N.m	Ft. Lbs.	In. Lbs.
Right Multi-Function Switch Mounting Screw	1	-	10
Front Wiper Arm Mounting Nuts	24	18	215
Rear Wiper Arm Mounting Nut	12	9	106
Rear Wiper Arm Park Ramp Mounting Nut	6.5	-	58
Front Wiper Module Mounting Screws	7.5	-	67
Front Wiper Module Mounting Nut	8	-	72
Rear Wiper Motor Bracket Mounting Screws	5.5	-	49

RIGHT MULTI-FUNCTION SWITCH

DESCRIPTION

RIGHT MULTI-FUNCTION SWITCH

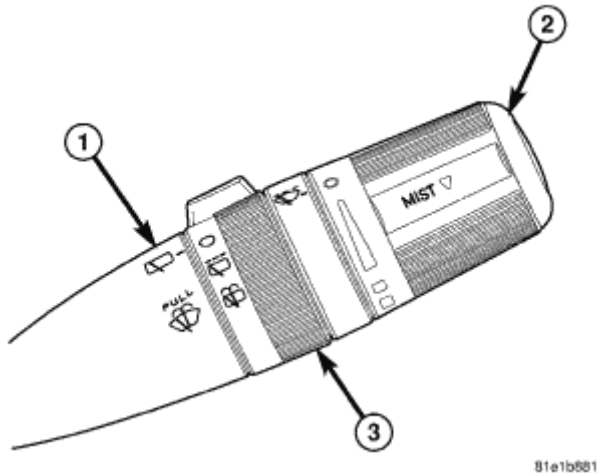


Fig. 7: Right (Wiper) Multi-Function Switch
 Courtesy of CHRYSLER LLC

The right (wiper) multi-function switch is located on the right side of the steering column, just below the steering wheel. This switch is the primary control for the front and rear wiper and washer systems. The only visible components of the switch are the control stalk (1), control knob (2) and control sleeve (3) that extend through the steering column shrouds on the right side of the column. The remainder of the switch including its mounting provisions and electrical connection are concealed beneath the shrouds.

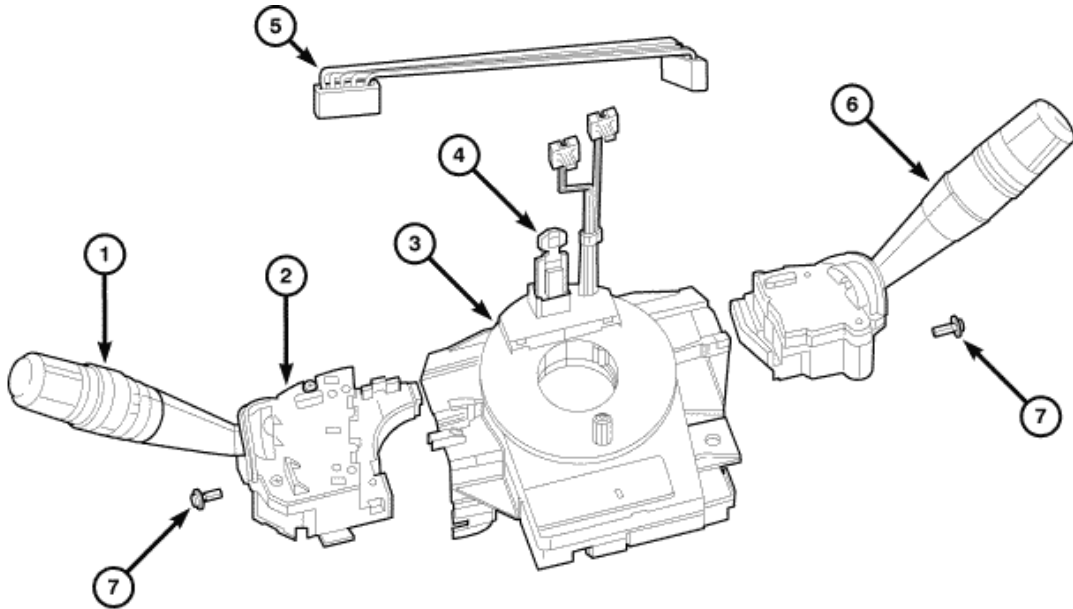


Fig. 8: Steering Control Module
 Courtesy of CHRYSLER LLC

The switch housing and controls (6) are constructed of molded black plastic. Each of the switch controls has white International Control and Display Symbol graphics applied to it, which clearly identify its many functions. A single screw (7) through a mounting tab integral to the back of the switch housing, and a slide tab integral to the bottom of the switch housing secure the switch to the mounting bracket integral to the

clockspring (3). A single connector receptacle containing seven terminal pins is integral to the inboard end of the switch housing and is connected by a jumper wire harness (5) directly to the Steering Control Module (SCM), which is internal to the housing (2) of the left multi-function switch (1).

The right (wiper) multi-function switch provides the vehicle operator with a control interface for the following wiper and washer system functions:

- **Continuous Front Wipers** - The right multi-function switch control knob provides detent switching for two continuous front wipe modes, low speed or high speed.
- **Intermittent Front Wipers** - The right multi-function switch control knob provides detent switching for the intermittent front wipe mode with five minor detent delay interval positions.
- **Front Wiper Mist Mode** - The right multi-function switch control stalk includes momentary switching of the front wiper motor low speed circuit to provide a mist mode features (sometimes referred to as pulse wipe), which allows the vehicle operator to momentarily operate the front wipers for one or more complete cycles.
- **Front Washer Mode** - The right multi-function switch control stalk provides momentary switching for control of the front washer system operation.
- **Intermittent Rear Wipe Mode** - The right multi-function switch control sleeve provides detent switching for a single fixed interval intermittent rear wiper mode.
- **Rear Washer Mode** - The right multi-function switch control sleeve provides two momentary switch positions for control of rear washer system operation.

The right multi-function switch cannot be adjusted or repaired. If any function of the switch is ineffective, or if the switch is damaged, the entire switch unit must be replaced. The clockspring (with the multi-function switch mounting bracket), the left multi-function switch (with the SCM), the right multi-function switch and the jumper wire harness are each available for separate service replacement.

OPERATION

RIGHT MULTI-FUNCTION SWITCH

The right (wiper) multi-function switch uses a combination of resistor multiplexing and conventional analog switching to control the many functions and features it provides. The switch receives a clean ground from the Steering Control Module (SCM), then provides resistor multiplexed and conventional analog return outputs to the SCM to indicate the selected switch positions. The SCM then sends electronic **switch status** messages over a Local Interface Network (LIN) data bus to the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN), and the EMIC relays electronic **wiper** and **washer switch** request messages over the Controller Area Network (CAN) data bus to other electronic modules in the vehicle.

If the SCM detects no inputs from the right multi-function switch, it transmits an electronic **Signal Not Available (SNA)** status message over the LIN data bus. The SNA status signals the EMIC to request other electronic modules to implement a fail-safe mode of operation for the front and rear wiper systems. The fail-safe mode will maintain the last selected front and rear wiper system operation for the remainder of the current ignition cycle, after which both wiper systems will default to OFF.

The right multi-function switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures. However, the most reliable, efficient and accurate means to

diagnose this component requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

Following are descriptions of how the right multi-function switch is operated to control the many front and rear wiper and washer system functions and features it provides:

- **Front Wiper Control** - The control knob on the end of the right multi-function switch control stalk is rotated to one of the two continuous wiper detents, to one of five intermittent wiper detents, or to the OFF position to select the front wiper mode. The SCM reads the input from the right multi-function switch and sends electronic **wiper switch** status messages over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Front Wiper Mist Mode** - The front wiper mist mode is requested when the right multi-function switch control stalk is depressed downward towards the floor to a momentary MIST position. The front wiper motor will continue to operate, one complete cycle at a time, for as long as the control stalk is held in this position. The SCM reads the resistor multiplexed input from the right multi-function switch and sends an electronic **wiper switch** status message over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Front Washer Control** - The right multi-function switch control stalk is pulled rearward towards the steering wheel to a momentary WASH position to activate the washer pump/motor in the front washer mode. The washer pump/motor will continue to operate for as long as the control stalk is held in this position. The SCM reads the resistor multiplexed input from the right multi-function switch and sends an electronic **washer switch** status message over the LIN data bus to the EMIC, which relays an electronic **washer switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Rear Wiper Control** - The rear wiper mode is selected when the right multi-function switch control sleeve is rotated to the fixed interval intermittent rear wipe detent position, or the OFF detent position. The SCM reads the input from the right multi-function switch and sends an electronic **wiper switch** status message over the LIN data bus to the EMIC, which relays an electronic **wiper switch** request message over the CAN data bus to other electronic modules in the vehicle.
- **Rear Washer Control** - The right multi-function switch control sleeve is rotated to one of two momentary WASH positions, either fully forward or fully rearward, to activate the washer pump/motor in the rear washer mode. The washer pump/motor will continue to operate in the rear washer mode until the control sleeve is released. The SCM reads the input from the right multi-function switch and sends an electronic **washer switch** status message over the LIN data bus to the EMIC, which relays an electronic **washer switch** request message over the CAN data bus to other electronic modules in the vehicle.

DIAGNOSIS AND TESTING

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to

disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

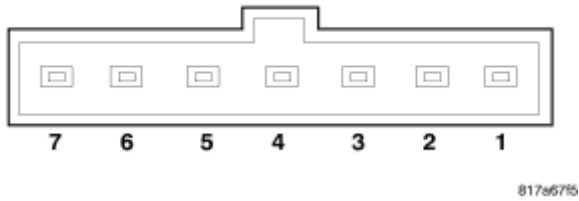


Fig. 9: Right Multi-Function Switch Connector
Courtesy of CHRYSLER LLC

The right multi-function switch as well as the hard wired inputs and outputs of the switch may be diagnosed using conventional diagnostic tools and procedures.

However, conventional diagnostic methods will not prove conclusive in the diagnosis of the Steering Control Module (SCM) or the electronic controls or communication between other modules and devices that provide some features of the front and rear wiper and washer systems. The most reliable, efficient and accurate means to diagnose the SCM or the electronic controls and communication related to SCM operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

1. Remove the right multi-function switch from the integral mounting bracket on the right side of the clockspring. See **REMOVAL**.
2. Using an ohmmeter, test the resistance between the terminals of the switch as shown in the three FUNCTION TESTS tables. For all functions except those of the control stalk the values should be either less than 100 ohms (switch CLOSED) or greater than 1 megohm (switch OPEN).

CONTROL STALK FUNCTION TESTS			
FUNCTION	PINS		RESISTANCE
	1	7	
Front Wash	X	X	10000 Ohms
Front Mist	X	X	5490 Ohms

CONTROL KNOB FUNCTION TESTS			
FUNCTION	BETWEEN PIN 7 (GROUND) AND PINS		
	4	5	6
Off	CLOSED	CLOSED	OPEN
Front Delay 1	CLOSED	CLOSED	CLOSED
Front Delay 2	CLOSED	OPEN	CLOSED
Front Delay 3	OPEN	OPEN	CLOSED
Front Delay 4	OPEN	CLOSED	CLOSED
Front Delay 5	OPEN	CLOSED	OPEN

Front Wiper Low	OPEN	OPEN	OPEN
Front Wiper High	CLOSED	OPEN	OPEN

CONTROL SLEEVE FUNCTION TESTS		
FUNCTION	BETWEEN PIN 7 (GROUND) AND PINS	
	2	3
Off	CLOSED	OPEN
Rear Wipe	CLOSED	CLOSED
Rear Wash	OPEN	CLOSED

- If the switch fails any of the tests, replace the ineffective right multi-function switch as required. If the switch tests okay, but the switch input to the Steering Control Module (SCM) remains incorrect, be certain to check for a short or open in the jumper harness between the right multi-function switch and the SCM.

REMOVAL

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

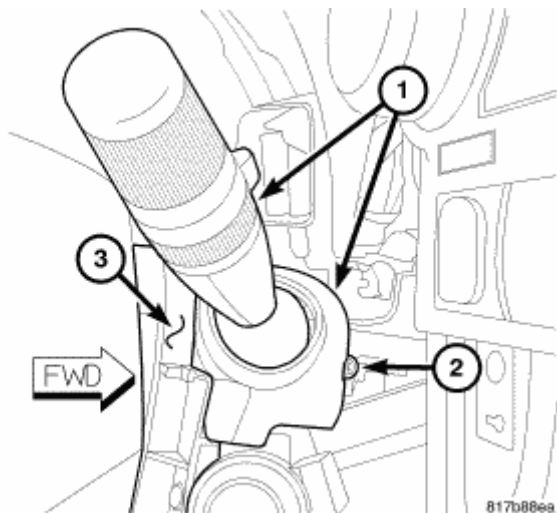


Fig. 10: Right Multi-Function Switch Remove/Install
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove both the upper and lower shrouds from the steering column. Refer to **REMOVAL** .
3. Remove the screw (2) that secures the right multi-function switch (1) to the mounting bracket integral to the right side of the clockspring (3) on the steering column.
4. Slide the switch away from the clockspring far enough to disengage the slide tabs on the switch housing from the channel formations in the mounting bracket.

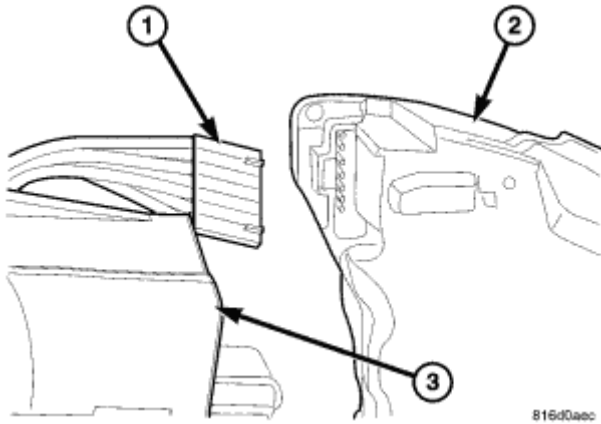


Fig. 11: Right Multi-Function Switch Harness Connector
Courtesy of CHRYSLER LLC

5. Disconnect the jumper wire harness connector (1) from the connector receptacle on the inboard end of the right multi-function switch (2).
6. Remove the switch from the clockspring (3).

INSTALLATION

RIGHT MULTI-FUNCTION SWITCH

WARNING: To avoid serious or fatal injury on vehicles equipped with airbags, disable the Supplemental Restraint System (SRS) before attempting any steering wheel, steering column, airbag, Occupant Classification System (OCS), seat belt tensioner, impact sensor, or instrument panel component diagnosis or service. Disconnect and isolate the battery negative (ground) cable, then wait two minutes for the system capacitor to discharge before performing further diagnosis or service. This is the only sure way to disable the SRS. Failure to take the proper precautions could result in accidental airbag deployment.

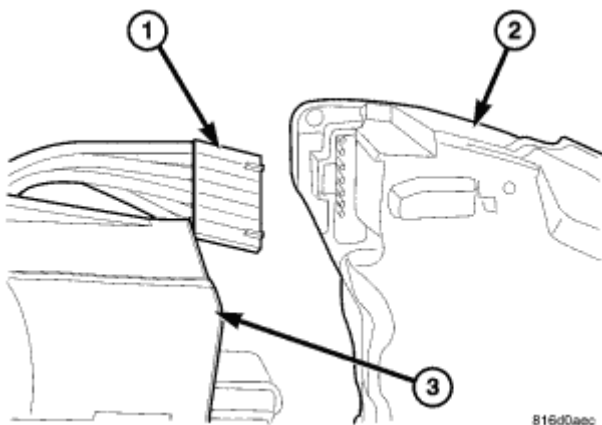


Fig. 12: Right Multi-Function Switch Harness Connector
 Courtesy of CHRYSLER LLC

1. Position the right multi-function switch (2) close enough to the mounting bracket (3) integral to the right side of the clockspring to reconnect the jumper wire harness connector (1) to the connector receptacle on the inboard side of the switch housing.
2. Align the slide tabs on the switch housing with the channel formations integral to the clockspring mounting bracket, then slide the switch into the bracket until it is firmly seated.

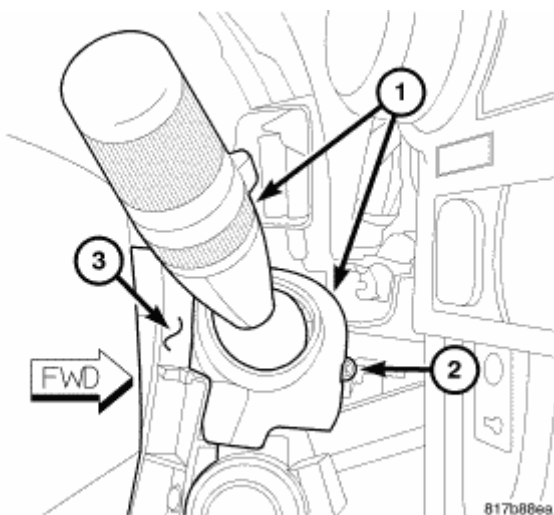


Fig. 13: Right Multi-Function Switch Remove/Install
 Courtesy of CHRYSLER LLC

3. Install and tighten the screw (2) that secures the mounting tab on the back of the right multi-function switch (1) to the mounting bracket on the clockspring (3). Tighten the screw to 1 N.m (10 in. lbs.).
4. Reinstall the upper and lower shrouds onto the steering column. Refer to **INSTALLATION** .
5. Reconnect the battery negative cable.

WASHER HOSES/TUBES

DESCRIPTION

FRONT WASHER PLUMBING

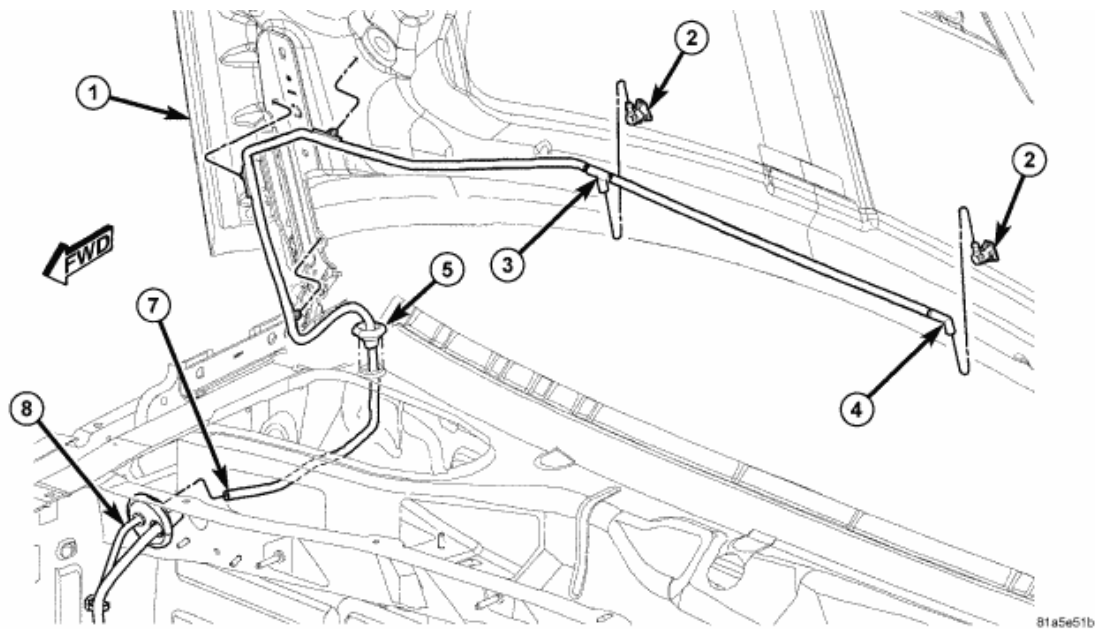


Fig. 14: Left-Hand Drive
Courtesy of CHRYSLER LLC

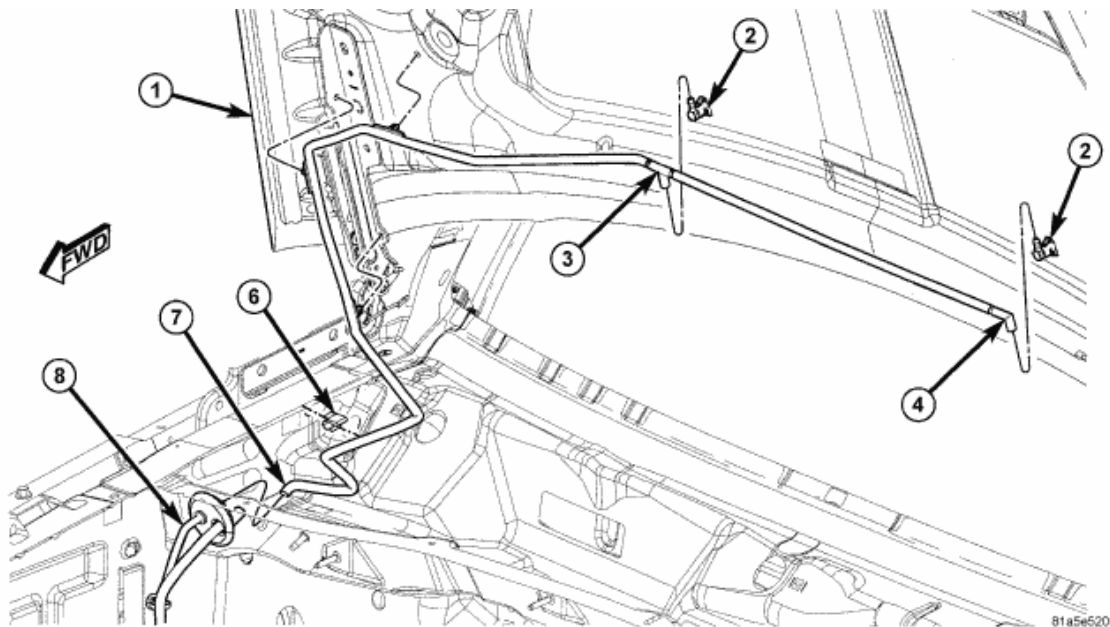


Fig. 15: Right-Hand Drive
Courtesy of CHRYSLER LLC

The front washer plumbing consists of a small diameter rubber hose (8) that is routed from the barbed outlet nipple of the reversible electric washer pump/motor unit on the washer reservoir on the left side of the engine compartment side by side with the rear washer hose and the front end module wiring across the cooling module at the front to the right side of the engine compartment. The front washer hose is then routed along with the front end module wiring across the top of the right front inner wheel house to the cowl plenum assembly where

they pass through a rubber grommet in the front of the plenum panel into the plenum area.

Within the plenum area, the front washer hose is connected by an in-line plastic connector to the hood washer hose (7). The hood hose is routed through a rubber grommet (5) on left-hand drive vehicles, or through a metal S-clip (6) on right-hand drive vehicles out of the plenum area toward the upper hinge bracket on the left side of the hood panel (1). Molded plastic routing clips and a metal S-clip secure the hoses to the upper hinge bracket and the left side of the inner hood reinforcement. The washer nozzle hose is then secured within the rear channel bracket for the hood silencer on the underside of the inner hood reinforcement cowl between the two front washer nozzles (2).

A molded rubber tee fitting (3) connects the hood washer hose to the right washer nozzle, while a molded rubber elbow (4) connects the hose to the left washer nozzle.

Washer hose is available for service only as roll stock, which must then be cut to length. The molded plastic or rubber washer hose fittings cannot be repaired. If these fittings are ineffective or damaged, they must be replaced.

REAR WASHER PLUMBING

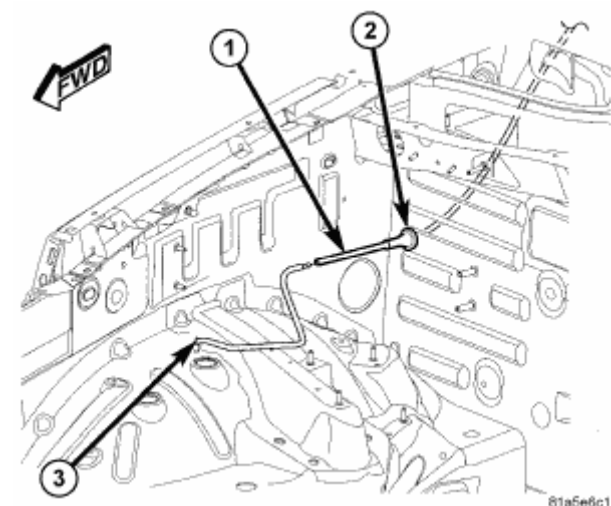


Fig. 16: Identifying Headliner Hose, Rubber Grommet & Small Diameter Rubber Hose
Courtesy of CHRYSLER LLC

The rear washer plumbing consists of small diameter rubber hose (3) that is routed from the barbed outlet nipple of the reversible electric washer pump/motor unit on the washer reservoir on the left side of the engine compartment side by side with the front washer hose and the front end module wiring across the cooling module at the front to the right side of the engine compartment. The rear washer hose is then routed along with the front end module wiring across the top of the right front inner wheel house to the dash panel, where an in-line plastic fitting connects the rear washer hose to the headliner hose (1), which passes into the passenger compartment through a rubber grommet (2).

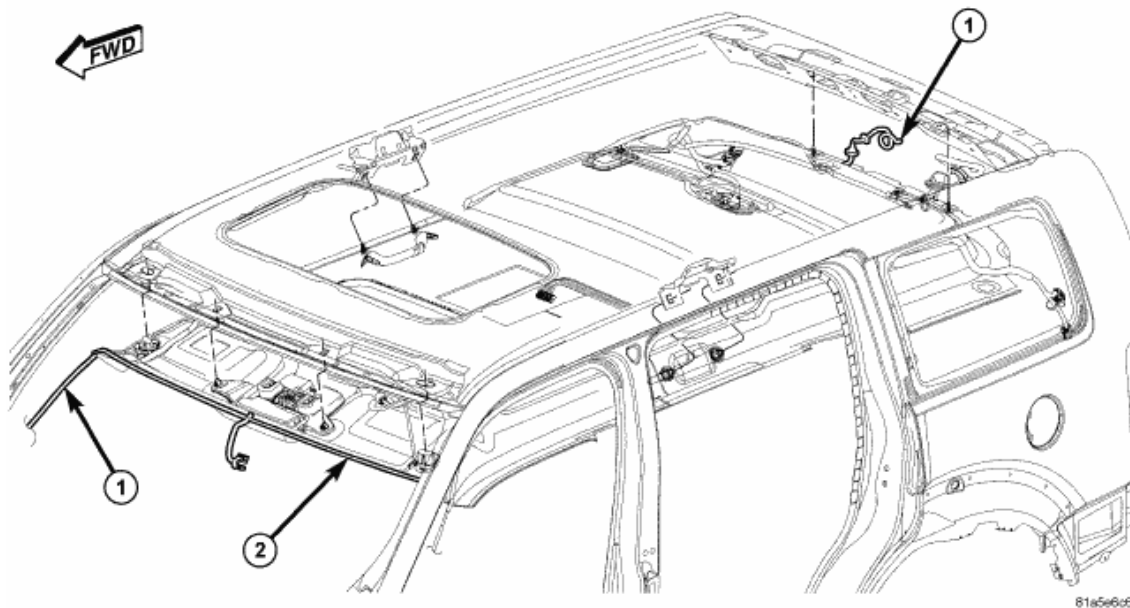


Fig. 17: Identifying Headliner & Headliner Hose
 Courtesy of CHRYSLER LLC

The headliner hose is routed below the instrument panel in the passenger compartment near the right cowl side inner panel and up the right A-pillar to the headliner (2). The headliner hose is glued to the headliner substrate and routed along the right roof side rail to the rear of the vehicle. At the rear of the vehicle, the headliner hose passes through rubber grommets and a hole at the rear portion of the roof rear inner header panel and the upper liftgate inner panel where it is connected to the rear washer nozzle in the Center High Mounted Stop Lamp (CHMSL).

The headliner washer hose is integral to the headliner unit and, if ineffective or damaged, the headliner unit must be replaced. However, the headliner hose can be cut and spliced with a plastic in-line connector fitting to facilitate headliner removal without the need to remove the instrument panel. Refer to **REMOVAL**.

Washer hose is available for service only as roll stock, which must then be cut to length. The molded plastic washer hose fittings cannot be repaired. If these fittings are ineffective or damaged, they must be replaced.

OPERATION

FRONT WASHER PLUMBING

Washer fluid in the washer reservoir is pressurized and fed by the washer pump/motor through the front washer system plumbing and fittings to the two front washer nozzles. Whenever routing the washer hose or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts; and, sharp bends that might pinch the hose must be avoided.

REAR WASHER PLUMBING

Washer fluid in the washer reservoir is pressurized and fed by the washer pump/motor through the rear washer system plumbing and fittings to the rear washer nozzle located in the Center High Mounted Stop Lamp (CHMSL) on the upper outer liftgate panel above the liftgate glass opening. Whenever routing the washer hose

or a wire harness containing a washer hose, it must be routed away from hot, sharp, or moving parts; and, sharp bends that might pinch the hose must be avoided.

WASHER NOZZLE

DESCRIPTION

FRONT WASHER NOZZLE

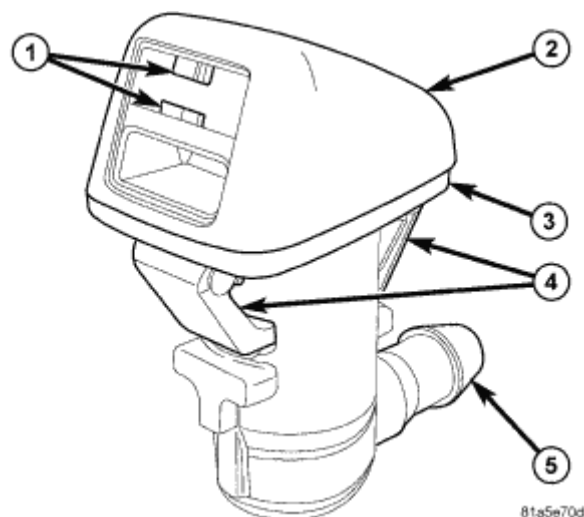


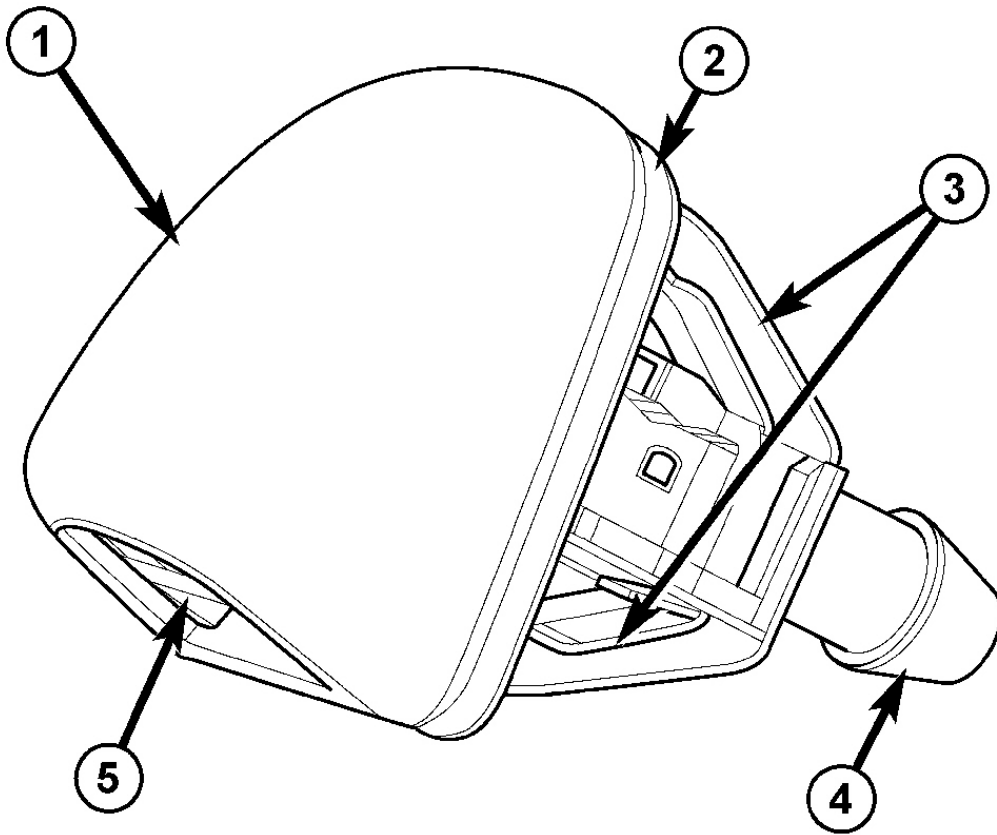
Fig. 18: Front Washer Nozzle
Courtesy of CHRYSLER LLC

The fluidic front washer nozzles (2) are constructed of molded plastic and include an integral check valve. Each nozzle has two integral latches (4) that secure them in dedicated holes in the hood panel near the base of the windshield. The domed upper surface of the washer nozzle is visible on the outside of the hood panel, and the dual nozzle orifices (1) are oriented towards the windshield glass.

An integral diaphragm type check valve is contained within the body of each nozzle. A rubber seal (3) seals the nozzle to the outer surface of the hood panel. The washer plumbing fitting (5) for the washer nozzle extends below the hood panel and is accessible from the engine compartment.

The front washer nozzles cannot be adjusted or repaired and, if ineffective or damaged, they must be replaced.

REAR WASHER NOZZLE



81590594

Fig. 19: Rear Washer Nozzle
Courtesy of CHRYSLER LLC

The fluidic rear washer nozzle (1) is constructed of molded plastic. The rear washer nozzle is secured by two integral latch features (3) within a mounting hole integral to the Center High-Mounted Stop Lamp (CHMSL) on the outer liftgate panel above the liftgate glass opening. The domed outer surface of the washer nozzle is visible on the exterior surface of the CHMSL lens, and the nozzle orifice (5) is oriented downward towards the liftgate glass.

A rubber gasket (2) seals the nozzle to the outer surface of the CHMSL lens. The washer plumbing fitting (4) for the washer nozzle extends behind the lamp and is concealed between the liftgate inner and outer panels.

The rear washer nozzle cannot be adjusted or repaired and, if ineffective or damaged, it must be replaced.

OPERATION

FRONT WASHER NOZZLE

The two front washer nozzles are designed to dispense washer fluid into the wiper pattern area on the outside of the windshield glass. Pressurized washer fluid is fed to each nozzle from the washer reservoir by the washer pump/motor unit through a single hose, which is attached to a barbed nipple on each washer nozzle below the inner hood panel. A fluidic matrix within the washer nozzle causes the pressurized washer fluid to be emitted from the nozzle orifice as an oscillating stream to more effectively cover a larger area of the glass to be cleaned.

The integral check valve in each nozzle prevents washer fluid from draining out of the washer supply hoses back to the washer reservoir. This drain-back would result in a lengthy delay after the washer switch is actuated until washer fluid was dispensed through the nozzles, because the washer pump would have to refill the washer plumbing from the reservoir to the nozzles. Such a drain-back condition could also result in water, dirt, or other outside contaminants being siphoned into the washer system through the washer nozzle orifice. This water could subsequently freeze and plug the nozzle, while other contaminants could interfere with proper nozzle operation and cause improper nozzle spray patterns. In addition, the check valve prevents washer fluid from siphoning through the washer nozzles after the washer pump stops operating.

When the washer pump pressurizes and pumps washer fluid from the reservoir through the washer plumbing, the fluid pressure unseats a diaphragm from over a sump well within the nozzle by overriding the spring pressure applied to it by a piston. With the diaphragm unseated, washer fluid is allowed to flow toward the nozzle orifice. When the washer pump stops operating, the spring pressure on the piston seats the diaphragm over the sump well in the nozzle and fluid flow in either direction within the washer plumbing is prevented.

REAR WASHER NOZZLE

The rear washer nozzle is designed to dispense washer fluid into the wiper pattern area on the outside of the rear flip-up glass. Pressurized washer fluid is fed to the nozzle from the washer reservoir by the washer pump/motor through a single hose, which is attached to a barbed nipple on the back of the rear washer nozzle. A fluidic matrix within the washer nozzle causes the pressurized washer fluid to be emitted from the nozzle orifice as an oscillating stream to more effectively cover a larger area of the glass to be cleaned.

REMOVAL

FRONT WASHER NOZZLE

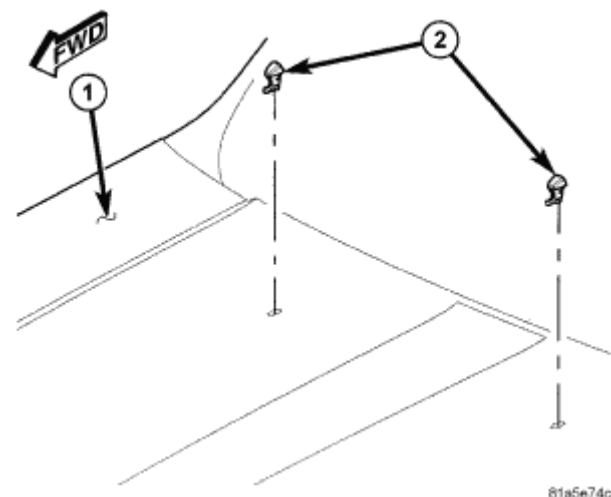


Fig. 20: Identifying Underside Of Hood & Front Washer Nozzle

Courtesy of CHRYSLER LLC

1. From the underside of the hood (1), remove the push-in retainers that secure the hood silencer pad to the inner hood reinforcement as necessary to access the front washer nozzle (2) hose connections.
2. Disconnect the hose from the barbed nipple of the front washer nozzle.
3. From the underside of the hood, release the integral latches of the front washer nozzle and push the nozzle out through the mounting hole toward the top side of the hood.
4. Remove the nozzle from the top of the hood panel.

REAR WASHER NOZZLE

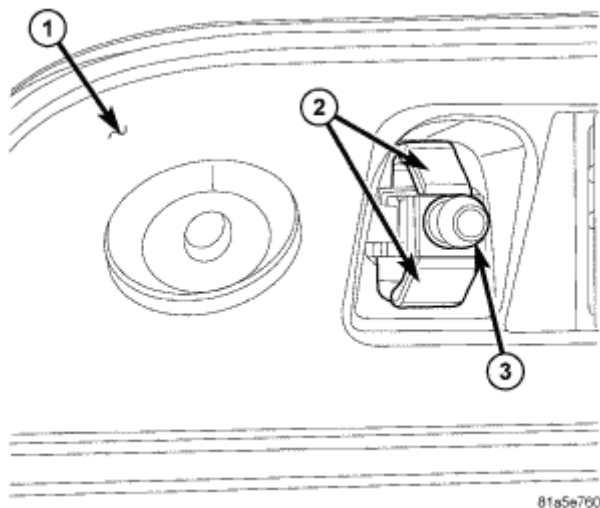


Fig. 21: Identifying Center High-Mounted Stop Lamp (CHMSL), Integral Latch Features & Barbed Nipple

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the Center High-Mounted Stop Lamp (CHMSL) (1) from the liftgate outer panel. Refer to **REMOVAL**.
3. Disconnect the rear washer supply hose from the barbed nipple (3) on the back of the rear washer nozzle.
4. From the back of the CHMSL housing, depress the two integral latch features (2) of the nozzle, and push the nozzle out through the face of the lamp lens.

INSTALLATION

FRONT WASHER NOZZLE

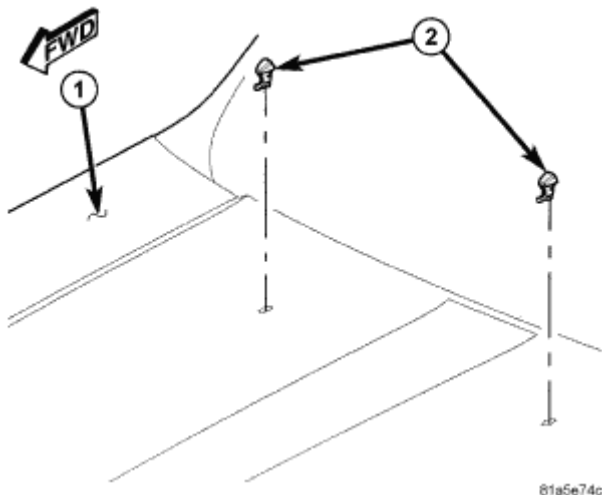


Fig. 22: Identifying Underside Of Hood & Front Washer Nozzle
 Courtesy of CHRYSLER LLC

1. Position the front washer nozzle (2) to the mounting hole on the outside of the hood panel (1).
2. Align the anti-rotation tab of the nozzle with the anti-rotation notch in the mounting hole.
3. Using hand pressure, push firmly and evenly on the top of the nozzle until the integral latches lock into place on the underside of the hood.
4. From the underside of the hood, reconnect the washer hose to the barbed nipple of the nozzle.
5. Reinstall the push-in retainers that secure the hood silencer pad to the inner hood reinforcement.

REAR WASHER NOZZLE

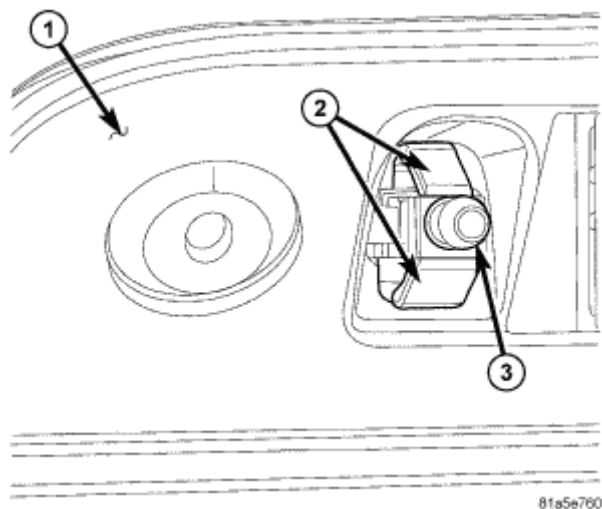


Fig. 23: Identifying Center High-Mounted Stop Lamp (CHMSL), Integral Latch Features & Barbed Nipple
 Courtesy of CHRYSLER LLC

1. Be certain that the rubber gasket is installed around the base of the rear washer nozzle and that it is in good condition.

2. Insert the nozzle nipple (3) through the mounting hole from the face of the Center High-Mounted Stop Lamp (CHMSL) lens (1) with the nozzle orifice oriented downward.
3. Using hand pressure, press the nozzle firmly and evenly into the mounting hole until both integral latch features (2) are fully engaged on the back of the CHMSL housing.
4. Reconnect the rear washer supply hose to the barbed nipple of the nozzle.
5. Reinstall the CHMSL onto the liftgate outer panel. Refer to **INSTALLATION** .
6. Reconnect the battery negative cable.

WASHER PUMP/MOTOR

DESCRIPTION

WASHER PUMP/MOTOR

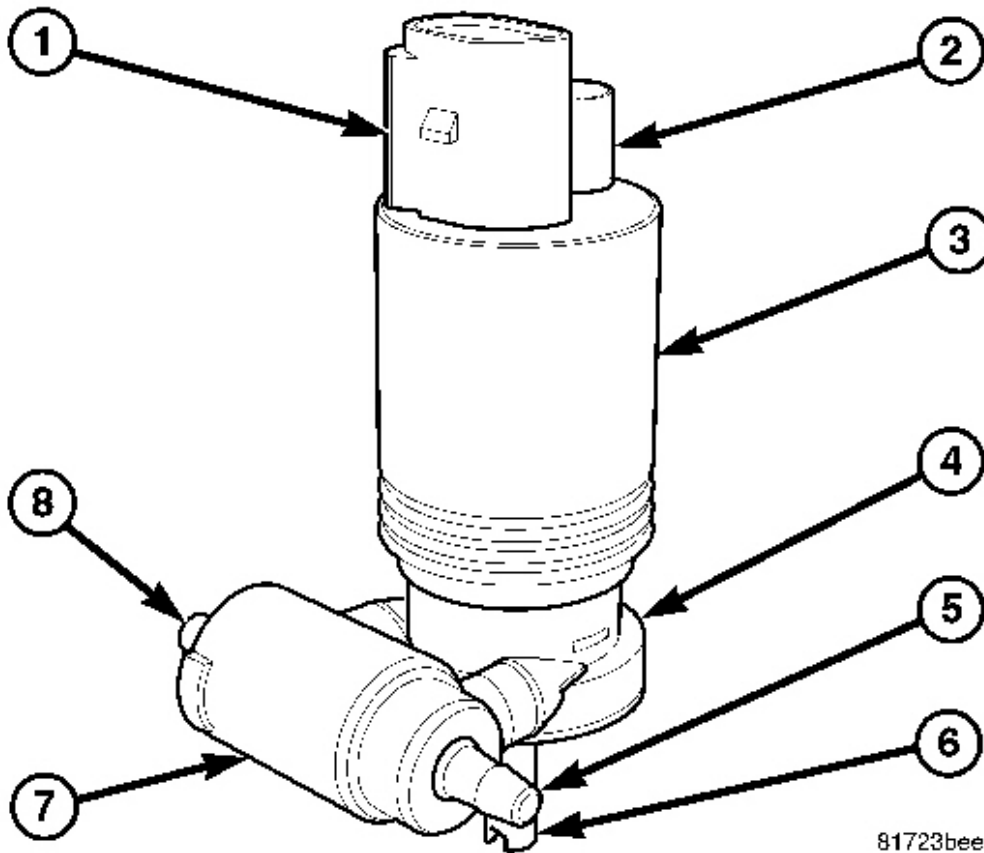


Fig. 24: Identifying Washer Pump/Motor Components

Courtesy of CHRYSLER LLC

The washer pump/motor unit is located on the top of a sump area on the left outboard side of the washer reservoir, which is integral to the coolant reserve bottle on the left side of the cooling module in the engine compartment. A small permanently lubricated and sealed reversible electric motor (3) is coupled to the rotor-type washer pump (4). The use of an integral valve body (7) allows the washer pump/motor unit to provide washer fluid to either the front or the rear washer systems, depending upon the direction of the motor/pump impeller rotation.

An inlet nipple (6) on the pump housing passes through a rubber grommet seal/filter screen installed in a dedicated mounting hole of the washer reservoir sump. The filter screen prevents most debris from entering the pump housing. When the pump is installed in the reservoir the front barbed outlet nipple (5) on the pump valve body housing connects the unit to the front washer hose, and the rear barbed outlet nipple (8) connects the unit to the rear washer hose. The letters **F** and **R** molded into the valve body housing adjacent to each nipple provide further clarification of the nipple assignments.

The washer pump/motor unit is retained on the reservoir by the interference fit between the pump inlet nipple and the grommet seal, which is a light press fit. The top of the washer pump is also secured to the washer reservoir by the use of a snap fit between the motor housing and a receptacle molded into the reservoir that allows for mounting of the washer pump without the use of fasteners. An integral connector receptacle (1) on the top of the motor housing connects the unit to the vehicle electrical system through a dedicated take out and connector of the headlamp and dash wire harness.

The washer pump/motor unit cannot be repaired. If ineffective or damaged, the entire washer pump/motor unit must be replaced.

OPERATION

WASHER PUMP/MOTOR

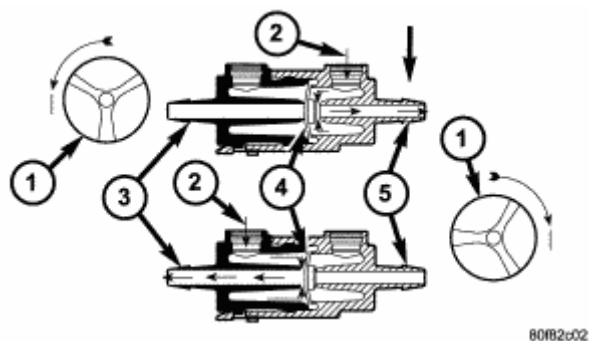


Fig. 25: Identifying Pump/Motor Operation
Courtesy of CHRYSLER LLC

The washer pump/motor unit features a reversible electric motor. The direction of the motor is controlled by hard wired outputs from the momentary front and rear washer switch circuitry contained within the right (wiper) control stalk of the multi-function switch. When battery current and ground are applied to the two pump motor terminals, the motor rotates in one direction. When the polarity of these connections is reversed, the motor rotates in the opposite direction.

When the pump motor is energized, the rotor-type pump pressurizes the washer fluid and forces it through one of the two pump outlet nipples, and into the front or rear washer plumbing. Washer fluid is drawn through the pump inlet nipple from the washer reservoir to the inlet port of the washer pump housing. An integral valve body is located in a housing on the outlet port side (2) of the pump housing. A diaphragm (4) in this valve body controls which washer system plumbing receives the washer fluid being pressurized by the pump. When the pump is not operating the diaphragm is biased to close all washer fluid flow in the rear washer system and, in this way it also performs the function of the rear washer system check valve.

When the pump impeller (1) rotates in the counterclockwise direction (viewed from the bottom), the biased diaphragm is sealing off the rear washer system outlet and nipple so the pressurized washer fluid is pushed out through the pump front outlet port and the front washer outlet nipple (5). When the pump impeller rotates in the clockwise direction (viewed from the bottom), pressurized washer fluid is pushed out through the pump rear outlet port and moves the diaphragm to open the rear washer outlet nipple and seal off the front washer outlet nipple, then the pressurized washer fluid is pushed out through the rear washer outlet nipple (3).

The washer pump/motor unit and the hard wired circuits between the motor and the multi-function switch may be diagnosed using conventional diagnostic tools and procedures.

REMOVAL

WASHER PUMP/MOTOR

NOTE: The washer pump/motor can be removed from the washer reservoir without removing the reservoir from the vehicle.

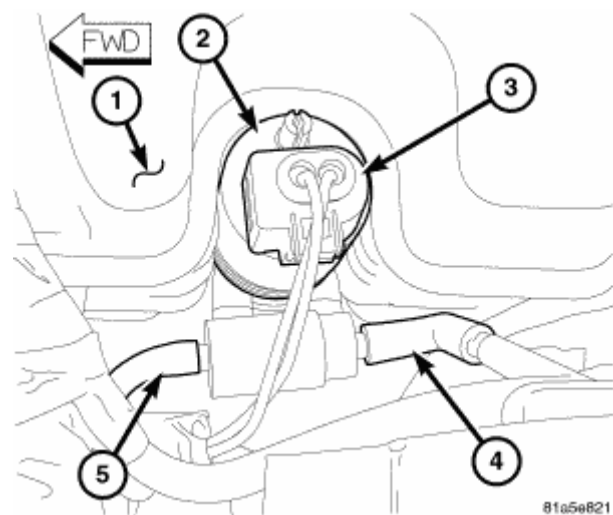


Fig. 26: Identifying Washer Reservoir, Motor Housing, Front End Module Wire Harness Connector & Washer Hoses

Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Siphon the washer fluid from the washer reservoir (1) on the left side of the cooling module in the engine compartment into a clean container for reuse.
3. Disconnect the front end module wire harness connector (3) from the washer pump/motor unit connector

receptacle on the top of the motor housing (2).

4. Disconnect the two washer hoses (4 and 5) from the two washer pump/motor unit outlet nipples.
5. Firmly grasp the top of the washer pump/motor housing and pull it lightly outward from the washer reservoir far enough to disengage the top of the motor from the receptacle in the reservoir. Care must be taken not to damage the reservoir.
6. Pull the washer pump/motor unit straight up and out of the washer reservoir far enough to disengage the inlet nipple from the rubber grommet seal/filter screen in the reservoir.
7. Remove the rubber grommet seal/filter screen for the washer pump from the pump mounting hole in the washer reservoir and discard.

INSTALLATION

WASHER PUMP/MOTOR

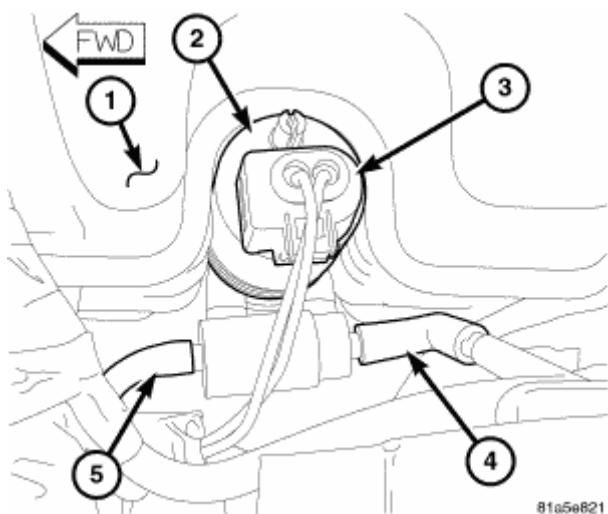


Fig. 27: Identifying Washer Reservoir, Motor Housing, Front End Module Wire Harness Connector & Washer Hoses

Courtesy of CHRYSLER LLC

1. Install a new rubber grommet seal/filter screen unit into the washer pump mounting hole in the washer reservoir (1). Always use a new rubber grommet seal/filter screen on the reservoir.
2. Position the inlet nipple of the washer pump (2) to the rubber grommet seal/filter screen in the washer reservoir.
3. Using hand pressure, press firmly and evenly downward on the washer pump/motor unit until the inlet nipple is fully seated in the rubber grommet seal/filter screen in the pump mounting hole of the reservoir.
4. Align the top of the washer pump/motor housing with the receptacle in the washer reservoir.
5. Using hand pressure, press firmly and evenly on the top of washer pump/motor unit until the motor housing snaps into the reservoir receptacle.
6. Reconnect the front (5) and rear (4) washer hoses to the two barbed pump outlet nipples.
7. Reconnect the front end module wire harness connector (3) for the washer pump/motor unit to the connector receptacle on the top of the motor housing.
8. Reconnect the battery negative cable.

9. Refill the washer reservoir with the washer fluid siphoned from the reservoir during the removal procedure.

WASHER RESERVOIR

DESCRIPTION

WASHER RESERVOIR

The molded translucent plastic washer fluid reservoir is integral to the engine coolant overflow bottle. This unit sits astride the top of the fan shroud at the front of the engine compartment, with the washer reservoir on the left side of the shroud and the coolant overflow bottle on the right. A single washer fluid reservoir is used for both the front and rear washer systems.

A bright yellow plastic filler cap with a rubber seal and an International Control and Display Symbol icon for **Windshield Washer** and the text **WASHER FLUID ONLY** molded into it snaps over the open end of the washer reservoir filler neck. The cap hinges on and is secured to a molded-in hook formation on the top of the reservoir just behind the filler neck when it is removed for inspecting or adjusting the fluid level in the reservoir.

There is a dedicated hole on the top of a sump area and an integral molded receptacle on the lower left facing side of the reservoir provided for the mounting of the washer/pump motor unit. These features allow for mounting of the washer pump/motor unit without the use of fasteners.

The washer reservoir is serviced only as a unit with the engine coolant reserve bottle. The washer reservoir cannot be repaired and, if ineffective or damaged, the coolant reserve bottle/washer reservoir unit must be replaced. The grommet seal/filter screen for the washer pump/motor unit and the filler cap are each available for individual service replacement.

OPERATION

WASHER RESERVOIR

The washer fluid reservoir provides a secure, on-vehicle storage location for a large reserve of washer fluid for operation of the front and rear washer systems. The washer reservoir filler neck provides a clearly marked and readily accessible point from which to add washer fluid to the reservoir. The washer/pump motor unit is located in a sump area near the bottom of the reservoir to be certain that washer fluid will be available to the pump as the fluid level in the reservoir becomes depleted. The washer pump/motor unit is mounted above the lowest position in the sump.

WIPER ARM

DESCRIPTION

FRONT WIPER ARM

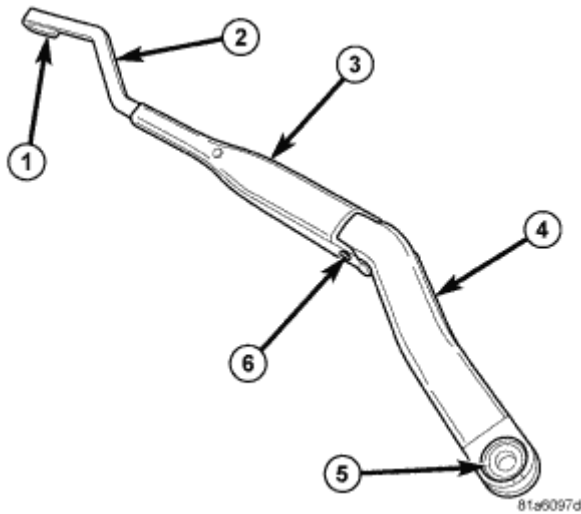


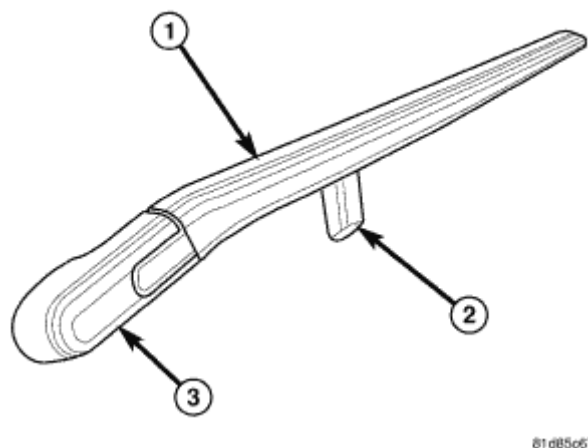
Fig. 28: Front Wiper Arm
Courtesy of CHRYSLER LLC

The front wiper arms are the rigid members located between the wiper pivots that protrude from the cowl plenum cover/grille panel near the base of the windshield and the wiper blades on the windshield glass. These wiper arms feature an over-center hinge that allows easy access to the windshield glass for cleaning. The wiper arm has a die cast metal pivot end (4) with a large tapered mounting hole (5) at one end. A molded black plastic cap fits over the wiper arm retaining nut to conceal the nut and this mounting hole following wiper arm installation.

The wide end of a tapered, stamped steel channel (3) hinges on and is secured with a hinge pin (6) to the blade end of the wiper arm pivot end. One end of a long, rigid, stamped steel strap (2) with a small hole near its pivot end is riveted and crimped within the narrow end of the stamped steel channel. The tip of the wiper blade end of this strap is bent back under itself to form a small hook (1). Concealed within the stamped steel channel, one end of a long tension spring is engaged with a wire hook on the underside of the die cast pivot end, while the other end of the spring is hooked through the small hole in the steel strap. The entire wiper arm has a satin black finish applied to all of its visible surfaces.

A wiper arm cannot be adjusted or repaired. If damaged or ineffective, the entire wiper arm unit must be replaced.

REAR WIPER ARM



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Fig. 29: Rear Wiper Arm
Courtesy of CHRYSLER LLC

The rear wiper arm (1) is the rigid member located between the rear wiper motor output shaft that protrudes through the liftgate outer panel below the center of the liftgate flip-up glass opening and the rear wiper blade. The wiper arm is constructed of molded black plastic. A hinged pivot end is a die cast metal piece with a tapered hole that receives the wiper motor output shaft and is secured to the output shaft by the arm retaining nut. The hinge has an over-center action to provide ease of service of the wiper blade. A molded plastic wiper arm support (2) is integral to the lower surface of the wiper arm and extends downward from the arm.

A molded black plastic nut cap (3) with integral snap features fits over the wiper arm pivot end to conceal the nut and mounting provisions following wiper arm installation. The wiper arm hinge and tension spring are concealed on the underside of the wide end of the arm, while an integral receptacle feature concealed on the underside of the narrow end of the wiper arm accepts the pivot pin of the rear wiper blade unit with a tight snap fit.

The rear wiper arm cannot be adjusted or repaired. If damaged or ineffective, the entire wiper arm unit must be replaced.

OPERATION

FRONT WIPER ARM

The front wiper arms are designed to mechanically transmit the motion from the wiper pivots to the wiper blades. The wiper arm must be properly indexed to the wiper pivot in order to maintain the proper wiper blade travel on the glass. The tapered mounting hole in the wiper arm pivot end interlocks with the serrations on the tapered outer circumference of the wiper pivot shaft, allowing positive engagement and finite adjustment of this connection.

The mounting nuts lock the wiper arms to the threaded studs of the wiper pivot shafts. The spring-loaded wiper arm hinge controls the down-force applied through the tip of the wiper arm to the wiper blade on the glass. The hook formation on the tip of the wiper arm provides a cradle for securing and latching the wiper blade pivot block to the wiper arm.

REAR WIPER ARM

The rear wiper arm is designed to mechanically transmit the motion from the rear wiper motor output shaft to the rear wiper blade. The wiper arm must be properly indexed to the motor output shaft in order to maintain the proper wiper blade travel on the glass. The wiper arm support is designed to lift and support the rear wiper arm and blade off of the glass when they are parked. This support and the park ramp on the liftgate outer panel below the glass upon which the support rests also provide an alignment reference to ensure accurate rear wiper arm installation.

The tapered hole in the wiper arm pivot end interlocks with the serrations on the outer circumference of the tapered motor output shaft, allowing positive engagement and finite adjustment of this connection. A hex nut secures the wiper arm pivot end to the threads on the rear wiper motor output shaft and the plastic cap snaps over this connection for a neat appearance. The spring-loaded wiper arm hinge controls the down-force applied through the tip of the wiper arm to the wiper blade on the glass. The latch formation on the underside of the wiper arm provides a cradle for securing and latching the wiper blade pivot pin to the wiper arm.

REMOVAL

FRONT WIPER ARM

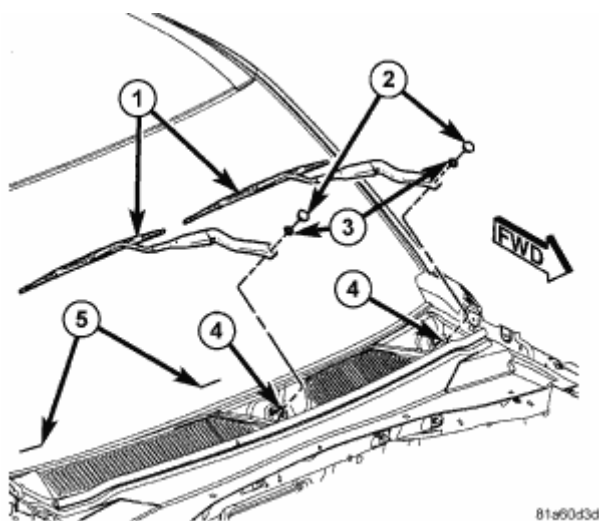
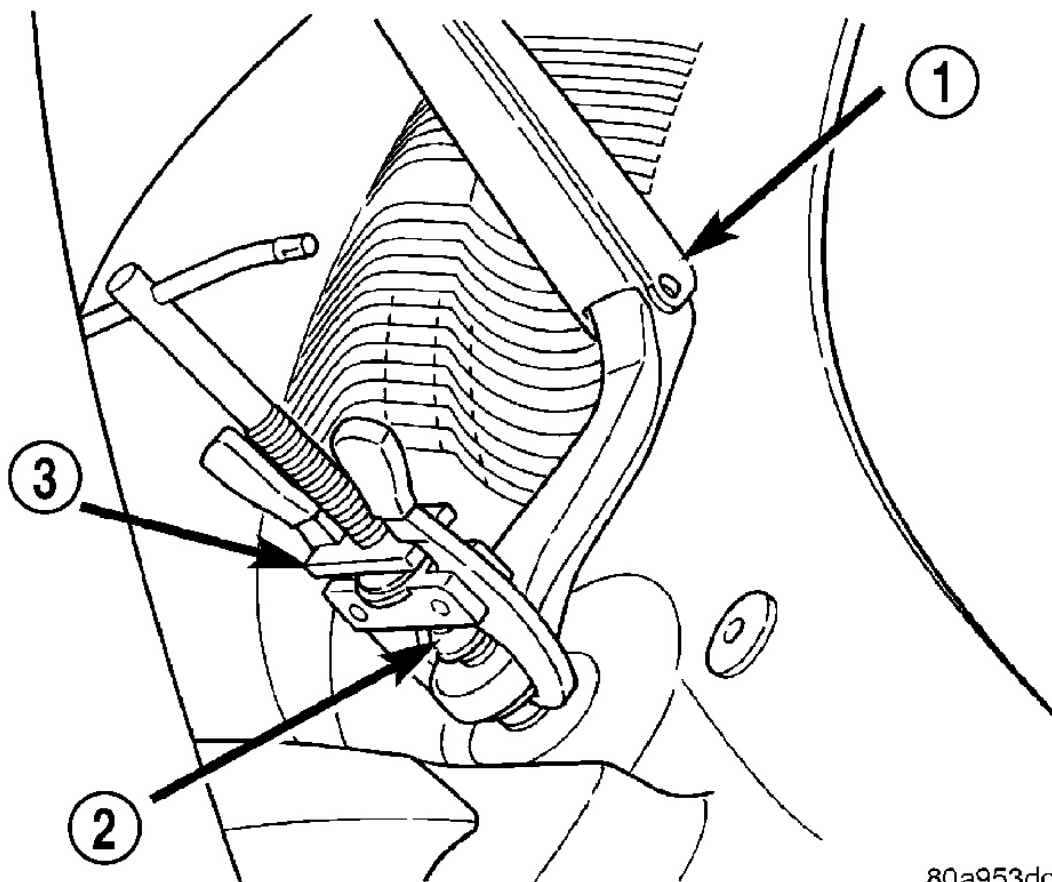


Fig. 30: Identifying Front Wiper Arms, Plastic Nut Cap, Nut & Wiper Alignment Lines
Courtesy of CHRYSLER LLC

1. Lift the front wiper arm (1) to its over-center position to hold the wiper blade off of the glass and relieve the spring tension on the wiper arm to pivot shaft connection.
2. Carefully pry the plastic nut cap (2) off of the pivot end of the wiper arm.
3. Remove the nut (3) that secures the wiper arm to the wiper pivot shaft (4).

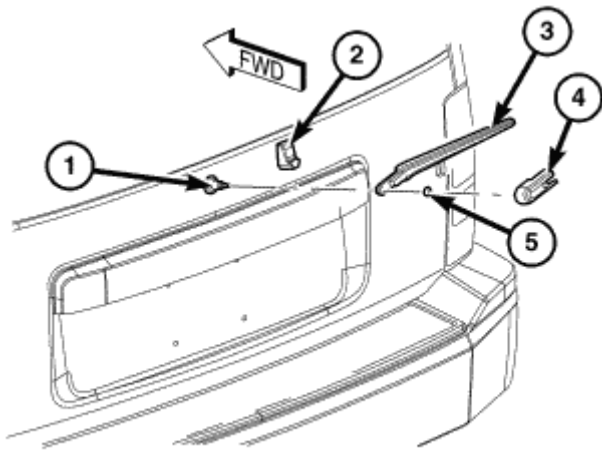


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Fig. 31: Disengaging Wiper Arm from Pivot Shaft
Courtesy of CHRYSLER LLC

4. If necessary, use a suitable battery terminal puller (3) to disengage the wiper arm (1) from the pivot shaft (2).
5. Remove the front wiper arm pivot end from the pivot shaft.

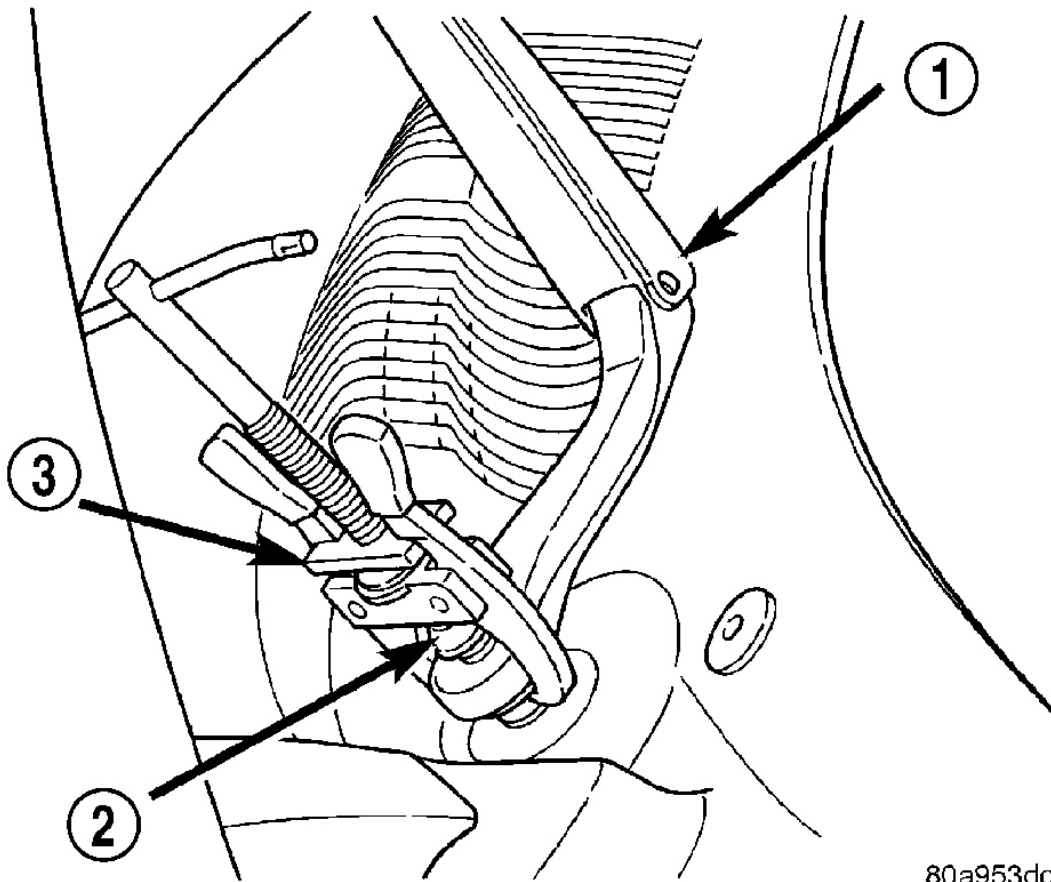
REAR WIPER ARM



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Fig. 32: Molded Plastic Nut Cap, Wiper Arm, Nut, Rear Wiper Motor Output Shaft
Courtesy of CHRYSLER LLC

1. Unsnap and remove the molded plastic nut cap (4) from the pivot end of the wiper arm (3).
2. Remove the nut (5) that secures the wiper arm to the rear wiper motor output shaft (1).



80a953dc

Fig. 33: Wiper Arm Puller - Typical
Courtesy of CHRYSLER LLC

3. Use a slight rocking action to disengage the rear wiper arm (1) pivot end from the output shaft (2) and remove the wiper arm. If necessary, a battery terminal puller (3) may be used to disengage the wiper arm from the output shaft splines.
4. Remove the rear wiper arm pivot end from the motor output shaft.

INSTALLATION

FRONT WIPER ARM

NOTE: Be certain that the wiper motor is in the park position before attempting to install the front wiper arms. Turn the ignition switch to the ON position and move the right (wiper) multi-function switch control knob to its OFF position. If the wiper pivots move, wait until they stop moving, then turn the ignition switch back to the OFF position. The front wiper motor is now in its park position.

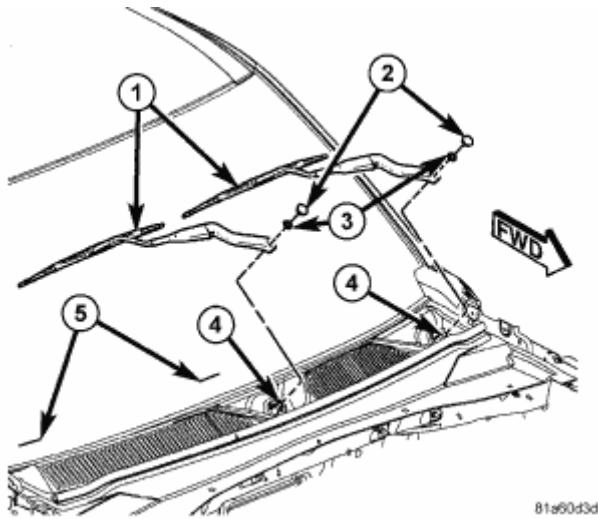
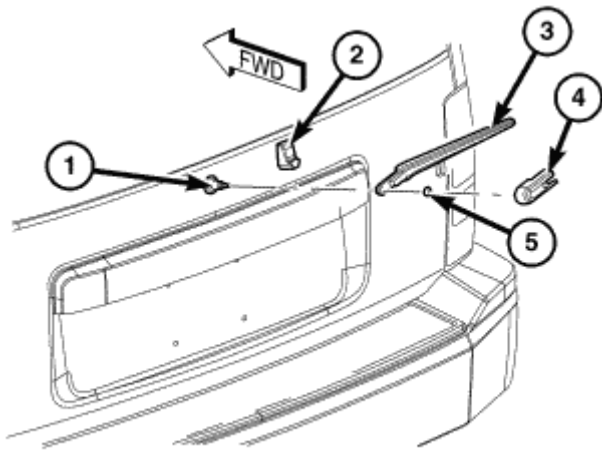


Fig. 34: Identifying Front Wiper Arms, Plastic Nut Cap, Nut & Wiper Alignment Lines
 Courtesy of CHRYSLER LLC

1. The front wiper arms (1) must be indexed to the pivot shafts with the front wiper motor in the park position to be properly installed. Position the wiper arm pivot ends onto the wiper pivot shafts (4) so that the tip of the wiper blade is aligned with the wiper alignment lines (5) located near the lower margin of the windshield glass.
2. Once the wiper blade is aligned, lift the wiper arm away from the windshield slightly to relieve the spring tension on the pivot end and push the pivot end of the wiper arm down firmly and evenly over the pivot shaft.
3. Install and tighten the nut (3) that secures the wiper arm to the pivot shaft. Tighten the nut to 24 N.m (18 ft. lbs.).
4. Wet the windshield glass, then operate the front wipers. Turn the front wipers OFF, then check for the correct wiper arm position and readjust as required.
5. Reinstall the plastic nut cap (2) onto the wiper arm pivot nut.

REAR WIPER ARM

NOTE: Be certain that the rear wiper motor is in the park position before attempting to install the rear wiper arm. Turn the ignition switch to the ON position and move the rear wiper switch to its OFF position. If the wiper motor output shaft moves, wait until it stops moving, then turn the ignition switch back to the OFF position. The wiper motor is now in its park position.



81d87ee2

Fig. 35: Molded Plastic Nut Cap, Wiper Arm, Nut, Rear Wiper Motor Output Shaft
Courtesy of CHRYSLER LLC

1. The rear wiper arm (3) must be indexed to the rear wiper motor output shaft (1) with the motor in the park position to be properly installed. Place the wiper arm onto the liftgate with the wiper arm support positioned on the park ramp (2) and the tapered mounting hole on the pivot end of the arm positioned over the rear wiper motor output shaft.
2. With the rear wiper arm properly indexed, push the tapered mounting hole on the pivot end of the wiper arm down over the output shaft.
3. Install and tighten the nut (5) that secures the rear wiper arm to the output shaft. Tighten the nut to 28 N.m (21 ft. lbs.).
4. Position and snap the molded plastic nut cap (4) over the nut on the pivot end of the rear wiper arm.
5. Wet the liftgate flip-up glass and operate the rear wiper. Turn the rear wiper switch to the OFF position, then check for correct wiper arm park position with the arm located off the glass and the arm support in the park ramp. Readjust as required.

WIPER ARM PARK RAMP

REMOVAL

WIPER ARM PARK RAMP

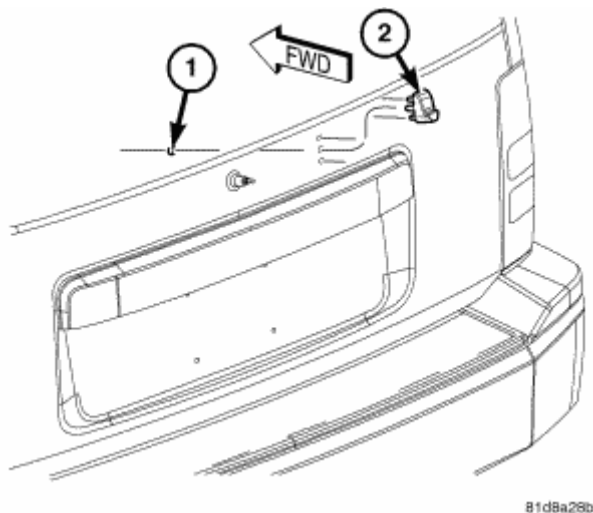


Fig. 36: Rear Wiper Arm Support
 Courtesy of CHRYSLER LLC

1. Disengage the rear wiper arm support from the wiper arm park ramp (2) on the right side of the liftgate just below the rear flip-up glass.
2. Lift the wiper arm and blade away from the liftgate until the wiper arm hinge is in its over-center position.
3. Remove the trim panel from the liftgate inner panel. Refer to **REMOVAL** .
4. Remove the nut (1) that secures the wiper arm park ramp to the liftgate outer panel.
5. Remove the wiper arm park ramp from the liftgate outer panel.

INSTALLATION

WIPER ARM PARK RAMP

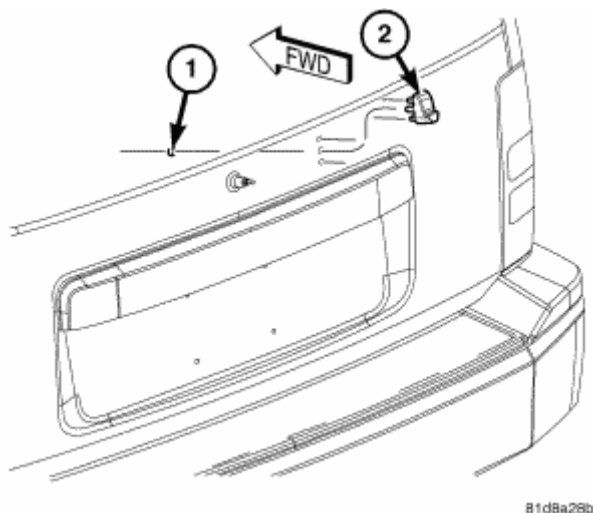


Fig. 37: Rear Wiper Arm Support
 Courtesy of CHRYSLER LLC

1. Position the wiper arm park ramp (2) onto the liftgate outer panel.
2. Install and tighten the nut (1) that secures the wiper arm park ramp to the liftgate outer panel. Tighten the nut to 6.5 N.m (58 in. lbs.).
3. Reinstall the trim panel onto the liftgate inner panel. Refer to **INSTALLATION** .
4. Lower the rear wiper arm and blade and place the wiper arm support onto the wiper arm park ramp.

WIPER BLADE

DESCRIPTION

FRONT WIPER BLADE

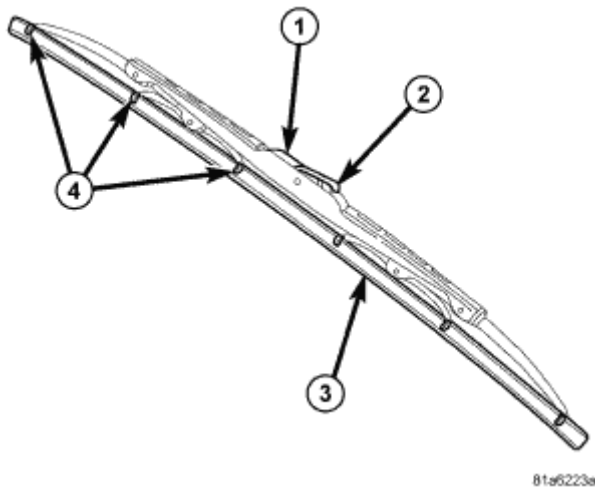


Fig. 38: Front Wiper Blade
 Courtesy of CHRYSLER LLC

Each front wiper blade is secured by an integral latching pivot block (2) to the hook formation on the tip of each wiper arm, and rests on the glass near the base of the windshield when the wipers are not in operation. The wiper blade consists of the following components:

- **Superstructure (1)** - The superstructure includes several stamped steel bridges and links with claw formations (4) that grip the wiper blade element. Also included in this unit is the latching, molded plastic pivot block that secures the superstructure to the wiper arm. On vehicles manufactured for export markets, the driver side front wiper blade has an additional molded black plastic airfoil secured to the superstructure, which is oriented toward the base of the windshield when the front wipers are in their parked position. All of the metal components of the wiper blade have a satin black finish applied.
- **Element (3)** - The wiper element or squeegee is the resilient rubber member of the wiper blade that contacts the glass.
- **Flexor** - The flexor is a rigid metal component running along the length of each side of the wiper element where it is gripped by the claws of the superstructure.

All vehicles have interchangeable windshield wiper blades with non-replaceable rubber elements (squeegees), except those export vehicles with an airfoil on the wiper blade superstructure. The blades are 47.50 centimeter

(18.70 inch) long. The wiper blades cannot be adjusted or repaired and, if ineffective, worn, or damaged the entire wiper blade unit must be replaced.

REAR WIPER BLADE

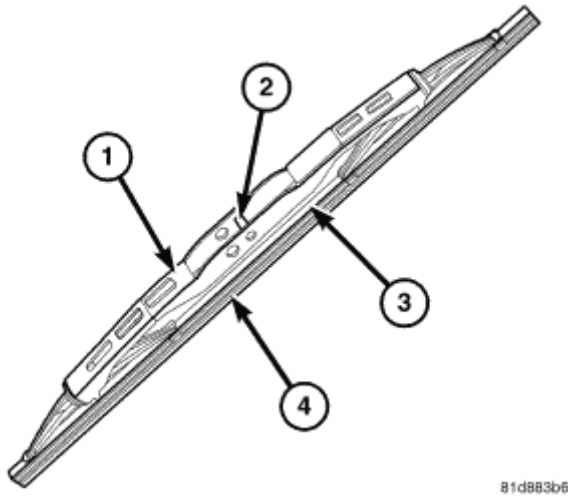


Fig. 39: Rear Wiper Blade
Courtesy of CHRYSLER LLC

The rear wiper blade is secured by an integral pivot pin (2) to the latch formations within the underside of the rear wiper arm, and rests off the glass on a park ramp on the liftgate near the base of the liftgate flip-up glass when the rear wiper system is not in operation. The rear wiper blade consists of the following components:

- **Superstructure (1)** - The superstructure includes a stamped steel bridge and links with claw formations that grip the wiper blade element. Also included in this unit is the pivot pin, which secures the superstructure to the wiper arm. All of the metal components of the wiper blade have a satin black finish applied.
- **Element (4)** - The wiper element or squeegee is the resilient rubber member of the wiper blade that contacts the glass.
- **Flexor (3)** - The flexor is a rigid metal component running along the length of each side of the wiper element where it is gripped by the claws of the superstructure.

The rear wiper blade is 30.45 centimeters (11.98 inches) long with a non-replaceable rubber element (squeegee). The wiper blade cannot be adjusted or repaired. If ineffective, worn or damaged the entire wiper blade unit must be replaced.

OPERATION

FRONT WIPER BLADE

The wiper blades are moved back and forth across the glass by the wiper arms when the wipers are being operated. The wiper blade superstructure is the flexible frame that grips the wiper blade element and evenly distributes the force of the spring-loaded wiper arm along the length of the element. The combination of the wiper arm force and the flexibility of the superstructure makes the element conform to and maintain proper

contact with the glass, even as the blade is moved over the varied curvature that may be encountered across the glass surface.

The wiper element flexor provides the claws of the blade superstructure with a rigid, yet flexible component on the element which can be gripped. The rubber element is designed to be stiff enough to maintain an even cleaning edge as it is drawn across the glass, yet resilient enough to conform to the glass surface and flip from one cleaning edge to the other each time the wiper blade changes directions. The airfoil used on the driver side wiper blade of vehicles manufactured for certain markets is designed to reduce the lifting effect caused by air moving over the vehicle at higher highway speeds.

REAR WIPER BLADE

The rear wiper blade is moved back and forth across the glass by the wiper arm when the rear wiper system is in operation. The wiper blade superstructure is the flexible frame that grips the wiper blade element and evenly distributes the force of the spring-loaded wiper arm along the length of the element. The combination of the wiper arm force and the flexibility of the superstructure makes the element conform to and maintain proper contact with the glass, even as the blade is moved over the varied curvature found across the glass surface.

The wiper element flexor provides the claws of the blade superstructure with a rigid, yet flexible component on the element which can be gripped. The rubber element is designed to be stiff enough to maintain an even cleaning edge as it is drawn across the glass, but resilient enough to conform to the glass surface and flip from one cleaning edge to the other each time the wiper blade changes directions.

REMOVAL

FRONT WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

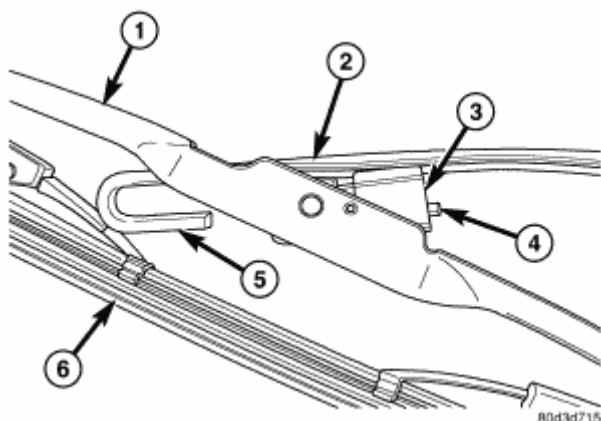


Fig. 40: Remove/Install Front Wiper Arm
Courtesy of CHRYSLER LLC

NOTE: The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) to raise the wiper blade and element (6) off of the glass, until the wiper arm hinge is in its over-center position.
2. To remove the blade from the arm, depress the latch release tab (4) on the pivot block (3) under the tip of the arm and slide the blade away from the tip towards the pivot end of the arm far enough to disengage the pivot block from the hook formation (5) on the end of the arm.
3. Extract the hook formation on the tip of the wiper arm through the opening in the wiper blade superstructure (1) just ahead of the pivot block.
4. Gently lower the tip of the wiper arm onto the glass.

REAR WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

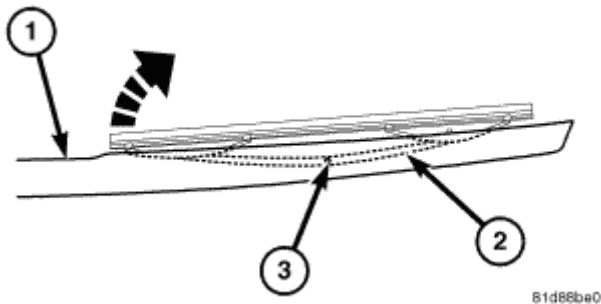


Fig. 41: Rear Wiper Arm Support
Courtesy of CHRYSLER LLC

1. Disengage the rear wiper arm support from the rear wiper arm park ramp on the right side of the liftgate just below the flip-up glass opening.
2. Lift the rear wiper arm (1) to the over-center hinge position, which will raise the wiper blade and element away from the liftgate and the flip-up glass.
3. To remove the blade (2) from the arm, swing the end of the wiper blade nearest to the wiper motor away from the wiper arm to its travel limit.
4. Now press the end of the wiper blade nearest to the wiper motor away from the wiper arm against its stop far enough to unsnap the wiper blade pivot pin (3) from the latch features on the underside of the wiper arm.

INSTALLATION

FRONT WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

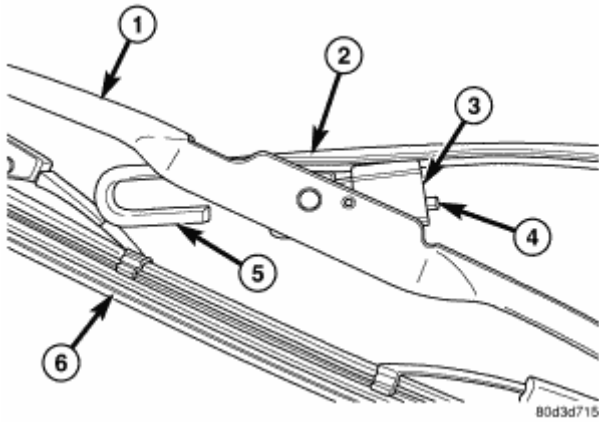


Fig. 42: Remove/Install Front Wiper Arm
 Courtesy of CHRYSLER LLC

NOTE: The notched end of the wiper element flexor should always be oriented towards the end of the wiper blade that is nearest to the wiper pivot.

1. Lift the wiper arm (2) off of the windshield glass, until the wiper arm hinge is in its over-center position.
2. Position the wiper blade near the hook formation (5) on the tip of the arm with the notched end of the wiper element flexor oriented towards the end of the wiper arm that is nearest to the wiper pivot.
3. Insert the hook formation on the tip of the arm through the opening in the blade superstructure (1) ahead of the pivot block (3) far enough to engage the pivot block into the hook.
4. Slide the pivot block up into the hook formation on the tip of the wiper arm until the latch release tab (4) snaps into its locked position. Latch engagement will be accompanied by an audible click.
5. Gently lower the wiper blade and element (6) onto the glass.

REAR WIPER BLADE

CAUTION: Do not allow the wiper arm to spring back against the glass without the wiper blade in place or the glass may be damaged.

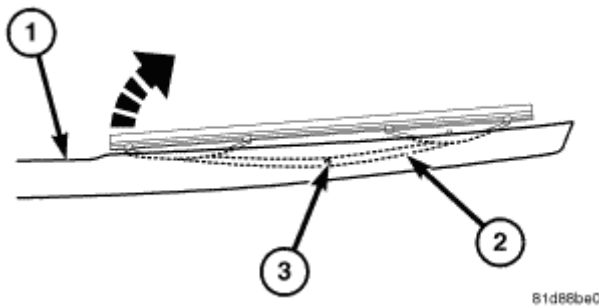


Fig. 43: Rear Wiper Blade
 Courtesy of CHRYSLER LLC

1. Position the rear wiper blade (2) under the rear wiper arm (1), aligning the pivot pin (3) near the center of

the blade superstructure with the latch features on the underside of the arm.

2. Squeeze the arm and blade together until the blade pivot pin snaps into the latch features of the arm.
3. Gently lower the wiper arm and place the arm support in the park ramp on the liftgate.

WIPER MODULE

DESCRIPTION

FRONT WIPER MODULE

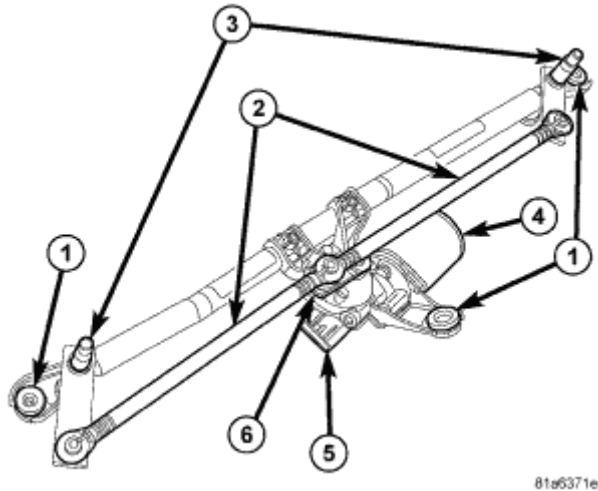


Fig. 44: Front Wiper Module Components
Courtesy of CHRYSLER LLC

The front wiper module is secured within the cowl plenum panel beneath the cowl plenum cover/grille panel. The ends of the wiper pivot shafts (3) protrude through dedicated openings in the cowl plenum cover/grille panel to drive the wiper arms and blades and are the only visible components of the front wiper module.

The front wiper module consists of the following major components:

- **Bracket** - The front wiper module bracket consists of a long tubular steel main member that has a die cast pivot bracket formation near each end where the two wiper pivots are secured. A die cast mounting bracket for the wiper motor (4) is secured with two screws near the center of the main member. Each of the two wiper pivot brackets secures the module to the cowl plenum with a screw through a rubber insulator (1), and a third rubber insulator on the motor bracket secures the module with a nut to a stud located in the bottom of the cowl plenum.
- **Crank Arm (6)** - The front wiper motor crank arm is a stamped steel unit with a hole on the driven end that is secured to the wiper motor output shaft with a nut, and has a ball stud secured to the drive end.
- **Linkage (2)** - Two tubular steel drive links connect the wiper motor crank arm to the wiper pivot lever arms. The right side drive link has a plastic socket-type bushing on each end. The left side drive link has a plastic socket-type bushing on one end, and a plastic sleeve-type bushing on the other end. The socket-type bushing on one end of each drive link is snap-fit over the ball stud on the lever arm of its respective pivot. The left side drive link sleeve-type bushing end is then fit over the motor crank arm ball stud, and

the other socket-type bushing of the right side drive link is snap-fit over the exposed end of the wiper motor crank arm ball stud.

- **Motor** - The front wiper motor is secured with two screws near the center of the main tubular member of the wiper module bracket, and through a rubber insulator to a stud in the bottom of the cowl plenum. An integral connector receptacle (5) connects the motor to the vehicle electrical system through a take out and connector of the front end module wire harness. A nut secures the wiper motor crank arm to the motor output shaft. The two-speed permanent magnet wiper motor features an integral transmission, an internal park switch, and an internal automatic resetting circuit breaker.
- **Pivots** - The two front wiper pivots are secured within the die cast pivot brackets on the outboard ends of the wiper module main member. The lever arms that extend from the center of the pivot shafts each have a ball stud on their end. The upper end of each pivot shaft where the wiper arms will be fastened each is tapered and serrated with a threaded stud formation at the tip. The lower ends of the pivot shafts are installed through lubricated bushings in the pivot brackets and are secured with snap rings.

The front wiper module cannot be adjusted or repaired. If any component of the module is ineffective or damaged, the entire front wiper module unit must be replaced.

OPERATION

FRONT WIPER MODULE

The front wiper module operation is controlled by the battery current inputs received by the wiper motor through the Totally Integrated Power Module (TIPM). The wiper motor speed is controlled by current flow to either the low speed or the high speed set of brushes. The park switch is a single pole, single throw, momentary switch within the wiper motor that is mechanically actuated by the wiper motor transmission components. The park switch alternately closes the wiper park switch sense circuit to ground or to battery current, depending upon the position of the wipers on the glass. This feature allows the motor to complete its current wipe cycle after the wiper system has been turned OFF, and to park the wiper blades in the lowest portion of the wipe pattern. The automatic resetting circuit breaker protects the motor from overloads.

The wiper motor crank arm, the two wiper linkage members and the two wiper pivots mechanically convert the rotary output of the wiper motor to the back and forth wiping motion of the wiper arms and blades on the glass.

The hard wired inputs and outputs of the front wiper motor may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the front wiper motor or the electronic controls or communication between other modules and devices that provide some features of the front wiper and washer system. The most reliable, efficient, and accurate means to diagnose the front wiper motor or the electronic controls and communication related to front wiper motor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

FRONT WIPER MODULE

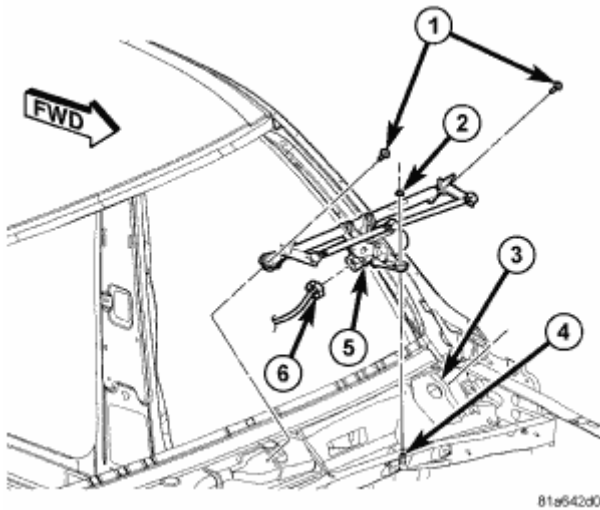


Fig. 45: Identifying Screws, Nut, Cowl Plenum, Weld Stud, Wiper Motor & Wire Harness Connector
 Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove both front wiper arms from the wiper pivots. See REMOVAL.
3. Remove the cowl plenum cover/grille panel from over the cowl plenum. Refer to REMOVAL.
4. Disconnect the wire harness connector (6) for the front wiper motor (5) from the motor connector receptacle.
5. Remove the two screws (1) that secure the ends of the front wiper module bracket to the cowl plenum (3).
6. Remove the nut (2) that secures the front wiper motor bracket rubber insulator to the weld stud (4) located on the bottom of the cowl plenum.
7. Remove the front wiper module from the cowl plenum as a unit.

INSTALLATION

FRONT WIPER MODULE

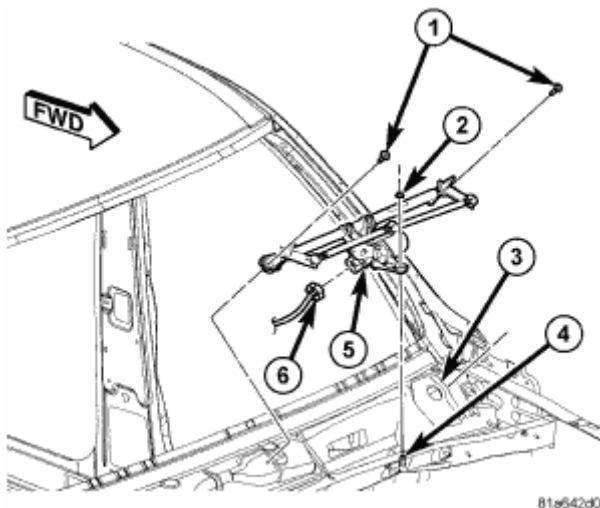


Fig. 46: Identifying Screws, Nut, Cowl Plenum, Weld Stud, Wiper Motor & Wire Harness Connector
Courtesy of CHRYSLER LLC

1. Position the front wiper module into the cowl plenum (3) as a unit.
2. Position the front wiper motor bracket rubber insulator over the weld stud (4) located on the bottom of the cowl plenum.
3. Loosely install the two screws (1) that secure the ends of the front wiper module bracket to the cowl plenum. Tighten the outboard screw, followed by the inboard screw. Tighten the screws to 8 N.m (72 in. lbs.).
4. Install and tighten the nut (2) that secures the front wiper motor bracket rubber insulator to the two weld stud on the bottom of the cowl plenum. Tighten the nut to 7.5 N.m (67 in. lbs.).
5. Reconnect the wire harness connector (6) for the front wiper motor (5) to the motor connector receptacle.
6. Reinstall the cowl plenum cover/grille panel over the cowl plenum. Refer to **INSTALLATION**.

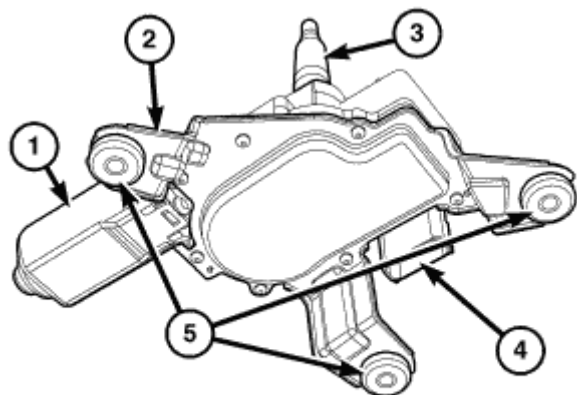
NOTE: Be certain to turn the ignition switch to the ON position, then turn the front wiper switch ON and OFF again to cycle the wiper motor and linkage to their natural park position before reinstalling the front wiper arms onto the wiper pivots.

7. Reinstall both front wiper arms onto the wiper pivots. See **INSTALLATION**.
8. Reconnect the battery negative cable.

WIPER MOTOR

DESCRIPTION

REAR WIPER MOTOR



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Fig. 47: Rear Wiper Motor
Courtesy of CHRYSLER LLC

The rear wiper motor (1) is concealed within the liftgate, below the liftgate flip-up glass and behind the liftgate inner trim panel. The end of the motor output shaft (3) that extends through the liftgate outer panel to drive the rear wiper arm and blade is the only visible component of the rear wiper motor. A rubber bezel and grommet is engaged within the output shaft hole of the liftgate outer panel and seals the output shaft where it passes through the panel. An integral connector receptacle (4) connects the rear wiper motor to the vehicle electrical system through a dedicated take out and connector of the liftgate wire harness. The rear wiper motor consists of the following major components:

- **Bracket (2)** - The rear wiper motor bracket consists of a stamped metal mounting plate for the wiper motor that is secured with screws to the wiper motor housing, and through three rubber isolators (5) to the liftgate inner panel.
- **Motor** - The single-speed permanent magnet rear wiper motor is secured with screws to the rear wiper motor bracket. The wiper motor includes an integral transmission, a motor output shaft, an automatic resetting circuit breaker, and the rear wiper motor park switch that provides a depressed park position to park the rear wiper blade off of the glass.

The rear wiper motor cannot be adjusted or repaired. If any component of the motor is ineffective or damaged, the entire rear wiper motor unit must be replaced. The motor output shaft bezel and grommet is available for individual service replacement.

OPERATION

REAR WIPER MOTOR

The rear wiper motor operation is controlled by the Totally Integrated Power Module (TIPM), which uses intelligent, high current, self-protected high side switches to control rear wiper system operation for energizing or de-energizing the rear wiper motor. The TIPM uses internal programming and electronic messages received over the Controller Area Network (CAN) data bus from the ElectroMechanical Instrument Cluster (EMIC) (also known as the Cab Compartment Node/CCN) to provide the appropriate rear wiper and washer system operating modes. The EMIC uses electronic messages received from the Steering Control Module (SCM) over a Local Interconnect Network (LIN) data bus to determine when to send electronic rear wiper system requests to the TIPM.

The rear wiper motor park switch is a single pole, single throw, momentary switch within the wiper motor that is mechanically actuated by the wiper motor transmission components. The park switch alternately closes and opens a path to ground for the rear wiper motor electronic control logic circuitry of the TIPM, depending upon the position of the rear wiper blade on the liftgate flip-up glass. This input allows the electronic logic circuits of the TIPM to control all of the electronic features of rear wiper motor operation and to keep the motor energized long enough to complete its current wipe cycle and park the wiper blade off of the glass after the wiper system or the ignition switch has been turned OFF. The TIPM also receives an external control input from the flip-up glass ajar switch sense circuit. If the TIPM senses that the flip-up glass is ajar, it will not allow the rear wiper motor to operate.

The rear wiper motor is grounded at all times through a take out in the body wire harness that is secured to a ground location in the passenger compartment. The automatic resetting circuit breaker protects the motor from overloads. The rear wiper motor transmission converts the rotary output of the wiper motor to the back and forth wiping motion of the rear wiper arm and blade on the liftgate flip-up glass.

The hard wired inputs and outputs of the rear wiper motor may be diagnosed using conventional diagnostic tools and procedures. However, conventional diagnostic methods will not prove conclusive in the diagnosis of the rear wiper motor or the electronic controls or communication between other modules and devices that provide some features of the rear wiper and washer system. The most reliable, efficient, and accurate means to diagnose the rear wiper motor or the electronic controls and communication related to rear wiper motor operation requires the use of a diagnostic scan tool. Refer to the appropriate diagnostic information.

REMOVAL

REAR WIPER MOTOR

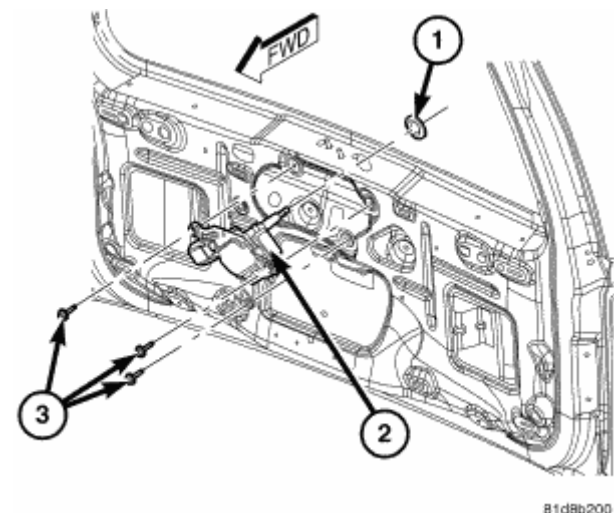


Fig. 48: Rear Wiper Motor Output Shaft
Courtesy of CHRYSLER LLC

1. Disconnect and isolate the battery negative cable.
2. Remove the rear wiper arm from the rear wiper motor output shaft. See **REMOVAL**.

NOTE: **The output shaft bezel and grommet (1) does not have to be removed to remove the rear wiper motor from the liftgate.**

3. Remove the trim panel from the liftgate inner panel (2). Refer to **REMOVAL**.
4. Disconnect the wire harness connector from the rear wiper motor (2).
5. Remove the three screws (3) that secure the motor mounting bracket to the liftgate inner panel.
6. Remove the motor from the liftgate.
7. Remove the bezel and rubber grommet (1) on the outer liftgate panel from the output shaft clearance hole.
Be certain to take proper precautions to protect the outer liftgate panel and its paint finish from damage during this procedure.

INSTALLATION

REAR WIPER MOTOR

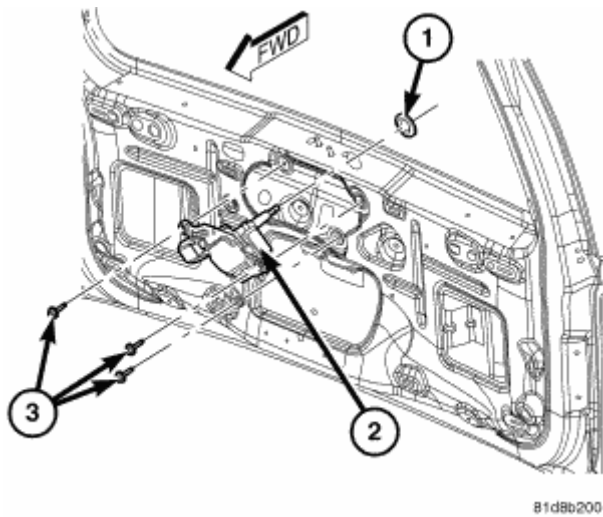


Fig. 49: Rear Wiper Motor Output Shaft
Courtesy of CHRYSLER LLC

1. If the output shaft bezel and grommet (1) were removed from the outside of the liftgate, install the rubber bezel and grommet into the rear wiper motor output shaft clearance hole of the liftgate outer panel.
2. Position the rear wiper motor and bracket unit (2) onto the liftgate inner panel as a unit.
3. Install and tighten the three screws (3) that secure the mounting bracket to the liftgate. Tighten the screws to 5.5 N.m (49 in. lbs.).
4. Reconnect the wire harness connector to the motor connector receptacle.
5. Reinstall the trim panel onto the liftgate inner panel. Refer to **INSTALLATION**.
6. Reinstall the rear wiper arm onto the output shaft. See **INSTALLATION**.
7. Reconnect the battery negative cable.

2008 ELECTRICAL

Wiring Diagram Information - Liberty

WIRING DIAGRAM INFORMATION

DESCRIPTION

CIRCUIT FUNCTIONS

All circuits in the diagrams use an alpha/numeric code to identify the wire and it's function. To identify which circuit code applies to a system, refer to the CIRCUIT IDENTIFICATION CODE CHART. This chart shows the main circuits only and does not show the secondary codes that may apply to some models.

CIRCUIT IDENTIFICATION CODE CHART

CIRCUIT	FUNCTION
A	BATTERY FEED
B	BRAKE CONTROLS
C	CLIMATE CONTROLS
D	DIAGNOSTIC CIRCUITS
E	DIMMING ILLUMINATION CIRCUITS
F	FUSED CIRCUITS
G	MONITORING CIRCUITS (GAUGES)
H	MULTIPLE
I	NOT USED
J	OPEN
K	POWERTRAIN CONTROL MODULE
L	EXTERIOR LIGHTING
M	INTERIOR LIGHTING
N	MULTIPLE
O	NOT USED
P	POWER OPTION (BATTERY FEED)
Q	POWER OPTIONS (IGNITION FEED)
R	PASSIVE RESTRAINT
S	SUSPENSION/STEERING
T	TRANSMISSION/TRANSAXLE/TRANSFER CASE
U	OPEN
V	SPEED CONTROL, WIPER/WASHER
W	WIPERS
X	AUDIO SYSTEMS
Y	TEMPORARY
Z	GROUND

CIRCUIT INFORMATION

Each wire shown in the diagrams contains a code which identifies the main circuit, a specific part of the main circuit, gage of wire, and color. An example would be **A 2 18 LB/YL** . This is a Battery Feed circuit, level two, eighteen gauge, light blue with a yellow tracer.

WIRE COLOR CODE CHART

COLOR CODE	COLOR
BL	BLUE
BK	BLACK
BR	BROWN
DB	DARK BLUE
DG	DARK GREEN
GY	GRAY
LB	LIGHT BLUE
LG	LIGHT GREEN
OR	ORANGE
PK	PINK
RD	RED
TN	TAN
VT	VIOLET
WT	WHITE
YL	YELLOW
*	WITH TRACER

CONNECTOR, GROUND AND SPLICE INFORMATION

CAUTION: Not all connectors are serviced. Some connectors are serviced only with a harness. A typical example might be the Supplemental Restraint System connectors. Always check parts availability before attempting a repair.

IDENTIFICATION

In-line connectors are identified by a number, as follows:

In-line connectors located in the engine compartment are C100 series numbers.

In-line connectors located in the instrument panel area are C200 series numbers.

In-line connectors located in the body are C300 series numbers.

Jumper harness connectors are C400 series numbers.

Grounds and ground connectors are identified with a "G" and follow the same series numbering as the in-line connectors.

Splices are identified with an "S" and follow the same series numbering as the in-line connectors. In addition, S001-S099 numbers are located in the engine compartment.

Component connectors are identified by the component name instead of a number. Multiple connectors on a component use a C1, C2, etc. identifier.

LOCATIONS

CONNECTOR/GROUND/SPLICE LOCATION article contains connector/ground/splice location illustrations. The illustrations contain the connector name (or number)/ground number/splice number and component identification. Connector/ground/splice location charts reference the figure numbers of the illustrations.

The abbreviation T/O is used in the component location section to indicate a point in which the wiring harness branches out to a component. The abbreviation N/S means Not Shown in the illustrations

HOW TO USE WIRING DIAGRAMS

DaimlerChrysler Corporation wiring diagrams are designed to provide information regarding the vehicles wiring content. In order to effectively use the wiring diagrams to diagnose and repair DaimlerChrysler Corporation vehicles, it is important to understand all of their features and characteristics.

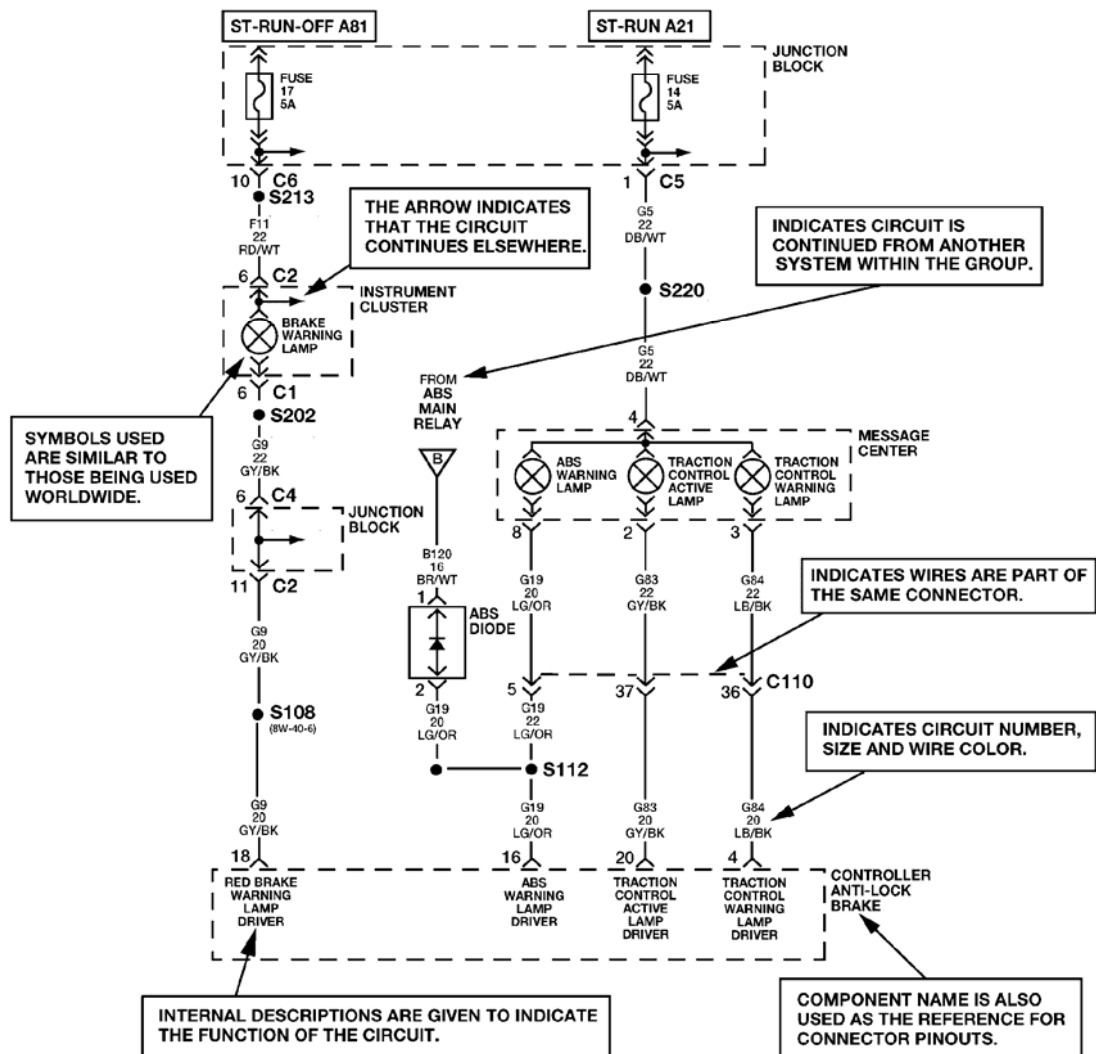
Diagrams are arranged such that the power (B+) side of the circuit is placed near the top of the diagram, and the ground (B-) side of the circuit is placed near the bottom of the diagram.

All switches, components, and modules are shown in the at rest position with the doors closed and the key removed from the ignition.

Components are shown two ways. A solid line around a component indicates that the component is complete. A dashed line around the component indicates that the component is being shown is not complete. Incomplete components have a reference number to indicate the location where the component is shown complete.

It is important to realize that no attempt is made on the diagrams to represent components and wiring as they appear on the vehicle. For example, a short piece of wire is treated the same as a long one. In addition, switches and other components are shown as simply as possible, with regard to function only.

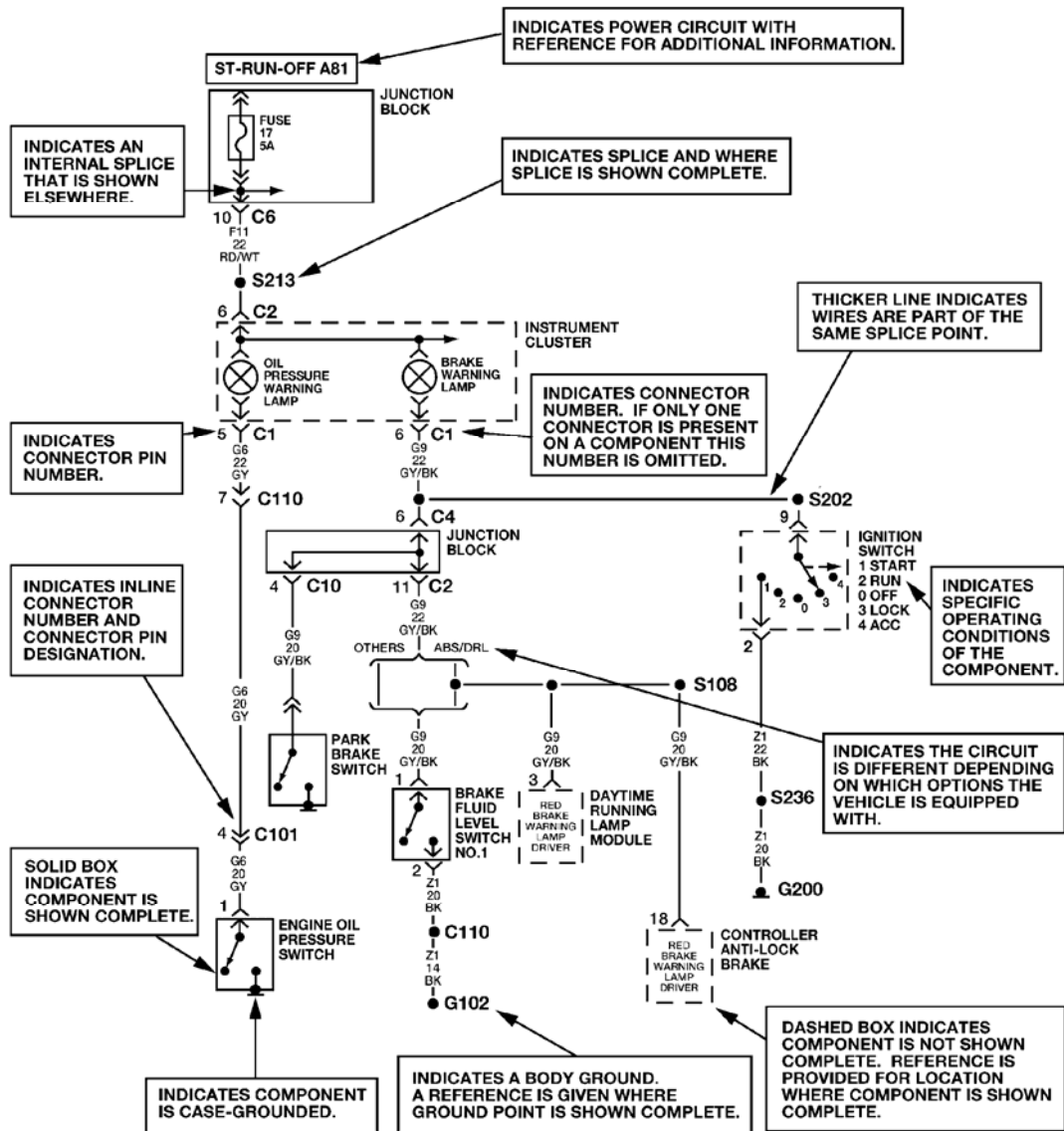
DIAGRAMS ARE ARRANGED WITH THE POWER B+ SIDE OF THE CIRCUIT NEAR THE TOP, AND THE GROUND SIDE OF THE CIRCUIT NEAR THE BOTTOM



The System shown here is an EXAMPLE ONLY. It does not represent the actual circuit shown in the WIRING DIAGRAM.

80c06d01

Fig. 1: WIRING DIAGRAM EXAMPLE 1
Courtesy of CHRYSLER LLC



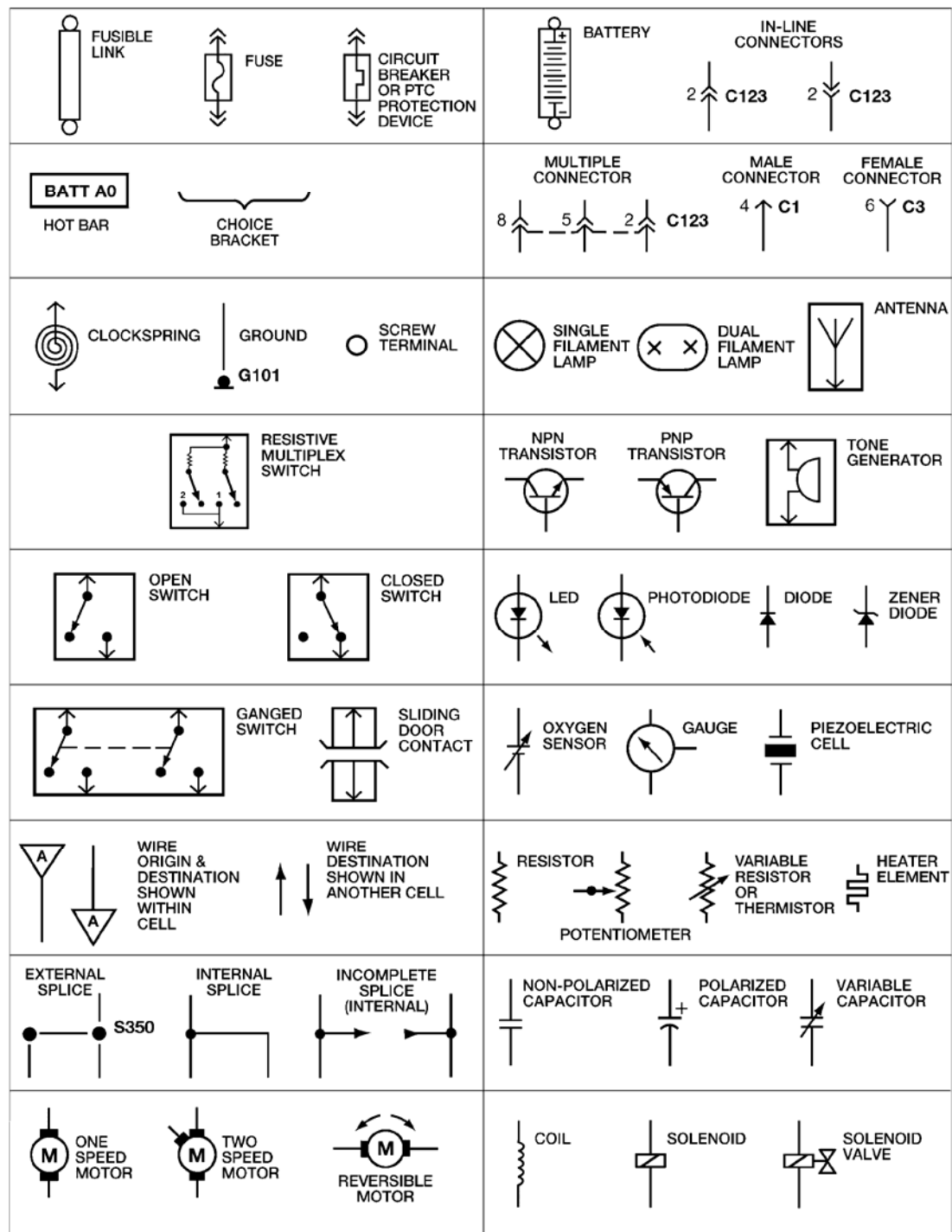
The System shown here is an **EXAMPLE ONLY**. It does not represent the actual circuit shown in the **WIRING DIAGRAM**

80:06d02

Fig. 2: WIRING DIAGRAM EXAMPLE 2
Courtesy of CHRYSLER LLC

SYMBOLS

International symbols are used throughout the wiring diagrams. These symbols are consistent with those being used around the world.



60910c8b

Fig. 3: Wiring Diagram Symbols
Courtesy of CHRYSLER LLC

TERMINOLOGY

This is a list of terms and definitions used in the wiring diagrams.

LHD

Left Hand Drive Vehicles

RHD

Right Hand Drive Vehicles

ATX

Automatic Transmissions-Front Wheel Drive

MTX

Manual Transmissions-Front Wheel Drive

AT

Automatic Transmissions-Rear Wheel Drive

MT

Manual Transmissions-Rear Wheel Drive

SOHC

Single Over Head Cam Engine

DOHC

Double Over Head Cam Engine

Export

Vehicles Built For Sale In Markets Other Than North America

Except Export

Vehicles Built For Sale In North America

SECTION IDENTIFICATION AND INFORMATION

The wiring diagrams are grouped into individual sections. If a component is most likely found in a particular group, it will be shown complete (all wires, connectors, and pins) within that group. For example, the Auto Shutdown Relay is most likely to be found in **BUZZERS, RELAYS & TIMERS** , so it is shown there

complete. It can, however, be shown partially in another group if it contains some associated wiring.

Splice diagrams in **CONNECTOR/GROUND/SPLICE LOCATION** article show the entire splice and provide references to other sections the splices serves. This service information only contains splice diagrams that are not shown in their entirety somewhere else in the wiring diagrams.

CONNECTOR PIN-OUTS shows each connector and the circuits involved with that connector. The connectors are identified using the name/number on the diagram.

WARNING

WARNINGS

WARNINGS provide information to prevent personal injury and vehicle damage. Below is a list of general warnings that should be followed any time a vehicle is being serviced.

WARNING: Always wear safety glasses for eye protection.

WARNING: Use safety stands anytime a procedure requires being under a vehicle.

WARNING: Be sure that the ignition switch always is in the off position, unless the procedure requires it to be on.

WARNING: Set the parking brake when working on any vehicle. An automatic transmission should be in park. A manual transmission should be in neutral.

WARNING: Operate the engine only in a well-ventilated area.

WARNING: Keep away from moving parts when the engine is running, especially the fan and belts.

WARNING: To prevent serious burns, avoid contact with hot parts such as the radiator, exhaust manifold(s), tail pipe, catalytic converter and muffler.

WARNING: Do not allow flame or sparks near the battery. Gases are always present in and around the battery.

WARNING: Always remove rings, watches, loose hanging jewelry and avoid loose

clothing.

DIAGNOSIS AND TESTING

WIRING HARNESS

TROUBLESHOOTING TOOLS

When diagnosing a problem in an electrical circuit there are several common tools necessary. These tools are listed and explained below.

Jumper Wire - This is a test wire used to connect two points of a circuit. It can be used to bypass an open in a circuit.

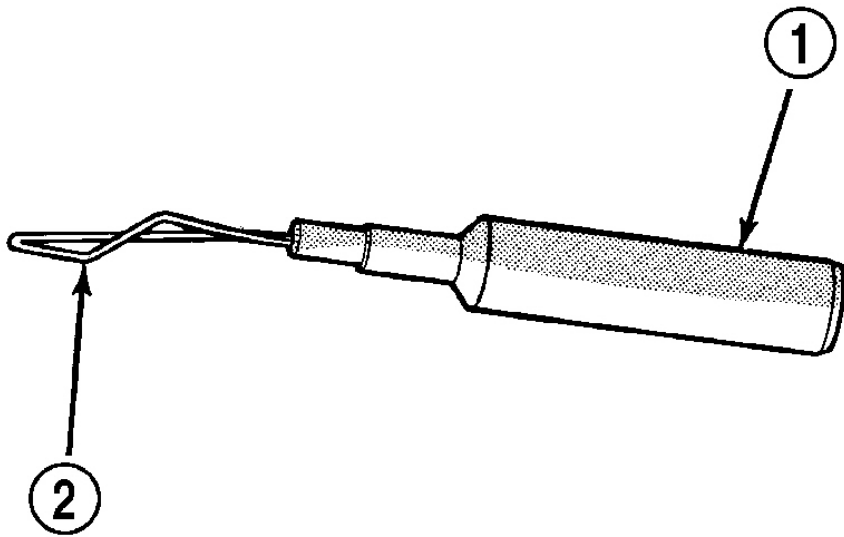
WARNING: Never use a jumper wire across a load, such as a motor, connected between a battery feed and ground.

Voltmeter - Used to check for voltage on a circuit. Always connect the black lead to a known good ground and the red lead to the positive side of the circuit.

CAUTION: Most of the electrical components used in today's vehicles are Solid State. When checking voltages in these circuits, use a meter with a 10 - megohm or greater impedance rating.

Ohmmeter - Used to check the resistance between two points of a circuit. Low or no resistance in a circuit means good continuity.

CAUTION: Most of the electrical components used in today's vehicles are Solid State. When checking resistance in these circuits use a meter with a 10 - megohm or greater impedance rating. In addition, make sure the power is disconnected from the circuit. Circuits that are powered up by the vehicle's electrical system can cause damage to the equipment and provide false readings.



948W-233

Fig. 4: Probing Tool
Courtesy of CHRYSLER LLC

- | |
|-----------------------|
| 1 - SPECIAL TOOL 6801 |
| 2 - PROBING END |

Probing Tools - These tools are used for probing terminals in connectors. Select the proper size tool from Special Tool Package 6807, and insert the probing end (2) into the terminal being tested. Use the other end of the tool (1) to insert the meter probe.

INTERMITTENT AND POOR CONNECTIONS

Most intermittent electrical problems are caused by faulty electrical connections or wiring. It is also possible for a sticking component or relay to cause a problem. Before condemning a component or wiring assembly, check the following items.

Connectors are fully seated

Spread terminals, or terminal push out

Terminals in the wiring assembly are fully seated into the connector/component and locked into position

Dirt or corrosion on the terminals. Any amount of corrosion or dirt could cause an intermittent problem

Damaged connector/component casing exposing the item to dirt or moisture

Wire insulation that has rubbed through causing a short to ground

Some or all of the wiring strands broken inside of the insulation

Wiring broken inside of the insulation

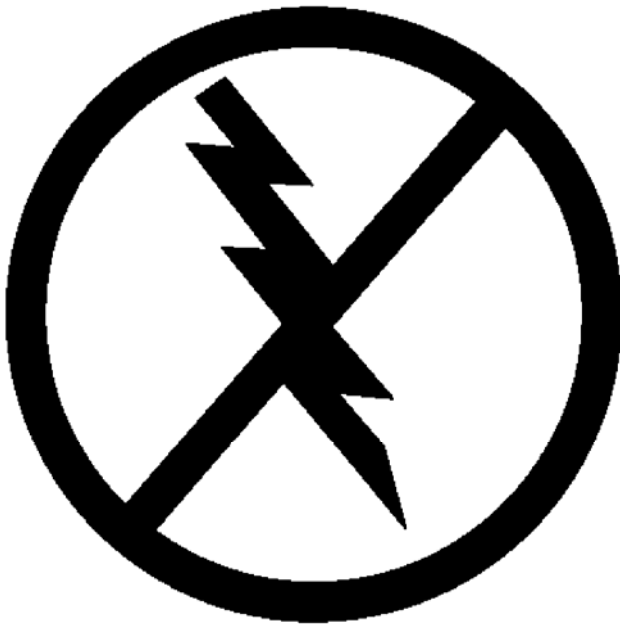
TROUBLESHOOTING WIRING PROBLEMS

When troubleshooting wiring problems there are six steps which can aid in the procedure. The steps are listed and explained below. Always check for non-factory items added to the vehicle before doing any diagnosis. If the vehicle is equipped with these items, disconnect them to verify these add-on items are not the cause of the problem.

1. Verify the problem.
2. Verify any related symptoms. Do this by performing operational checks on components that are in the same circuit. Refer to **SYSTEM WIRING DIAGRAMS** article.
3. Analyze the symptoms. Use the wiring diagrams to determine what the circuit is doing, where the problem most likely is occurring and where the diagnosis will continue.
4. Isolate the problem area.
5. Repair the problem area.
6. Verify the proper operation. For this step, check for proper operation of all items on the repaired circuit. Refer to the **SYSTEM WIRING DIAGRAMS** article.

STANDARD PROCEDURE

ELECTROSTATIC DISCHARGE (ESD) SENSITIVE DEVICES



80ce3d47

Fig. 5: Electrostatic Discharge Symbol

Courtesy of CHRYSLER LLC

All ESD sensitive components are solid state and a symbol is used to indicate this. When handling any component with this symbol, comply with the following procedures to reduce the possibility of electrostatic charge build up on the body and inadvertent discharge into the component. If it is not known whether the part is ESD sensitive, assume that it is.

1. Always touch a known good ground before handling the part. This should be repeated while handling the part and more frequently after sliding across a seat, sitting down from a standing position, or walking a distance.
2. Avoid touching electrical terminals of the part, unless instructed to do so by a written procedure.
3. When using a voltmeter, be sure to connect the ground lead first.
4. Do not remove the part from it's protective packing until it is time to install the part.
5. Before removing the part from it's package, ground the package to a known good ground on the vehicle.

TESTING FOR A SHORT TO GROUND

1. Remove the fuse and disconnect all items involved with the fuse.
2. Connect a test light or a voltmeter across the terminals of the fuse.
3. Starting at the fuse block, wiggle the wiring harness about six to eight inches apart and watch the voltmeter/test lamp.
4. If the voltmeter registers voltage or the test lamp glows, there is a short to ground in that general area of the wiring harness.

TESTING FOR A SHORT TO GROUND ON FUSES POWERING SEVERAL LOADS

1. Refer to **SYSTEM WIRING DIAGRAMS** article and disconnect or isolate all items on the suspected fused circuits.
2. Replace the blown fuse.
3. Supply power to the fuse by turning ON the ignition switch or reconnecting the battery.
4. Start connecting or energizing the items in the fuse circuit one at a time. When the fuse blows the circuit with the short to ground has been isolated.

TESTING FOR A VOLTAGE DROP

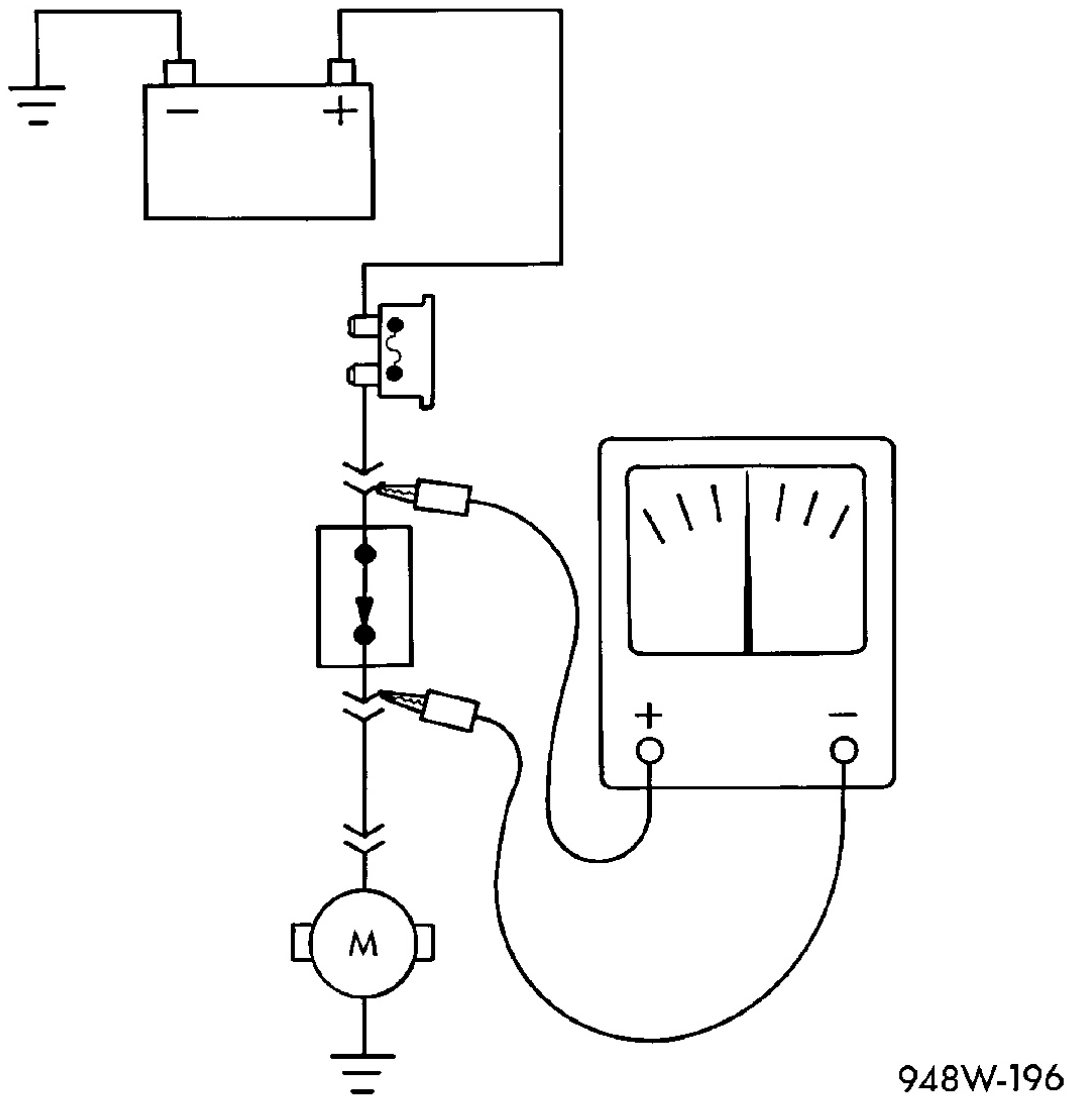
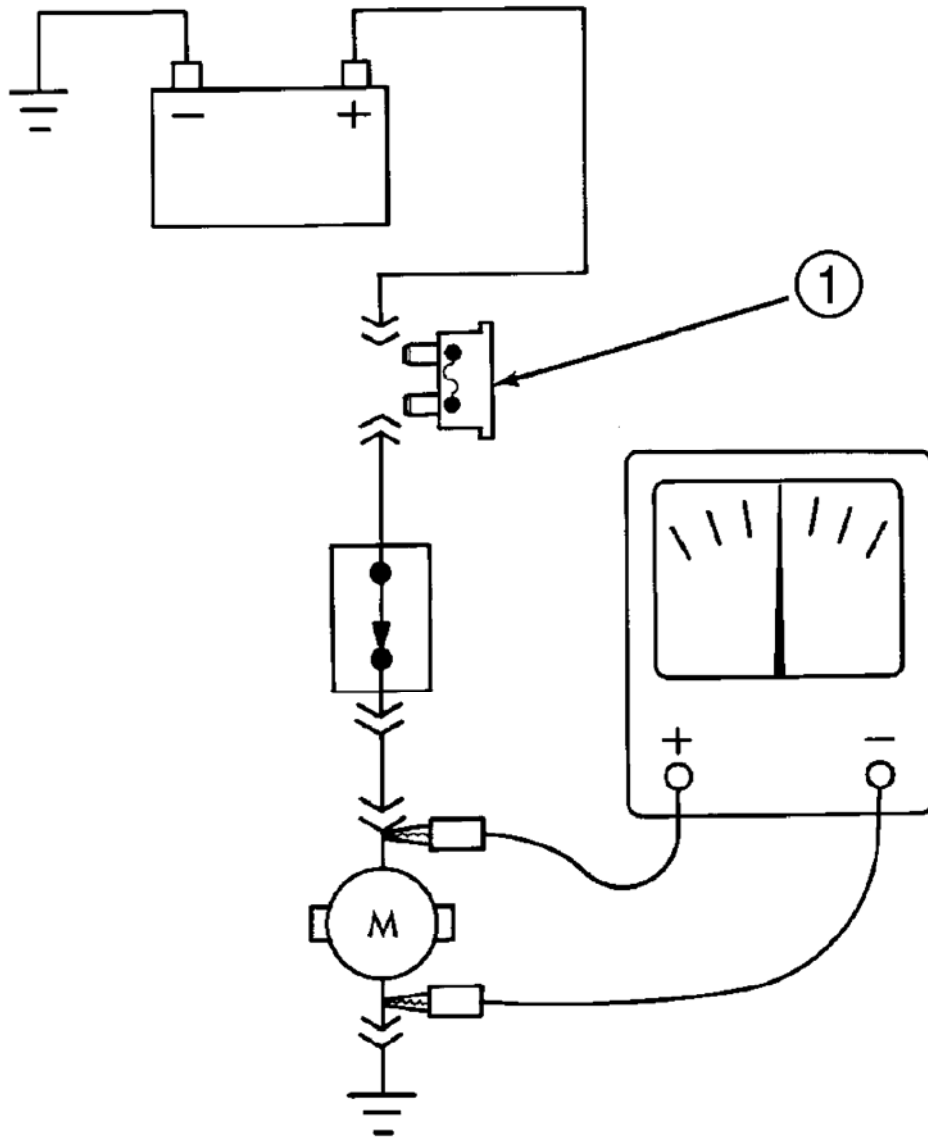


Fig. 6: Testing for Voltage Drop
Courtesy of CHRYSLER LLC

1. Connect the positive lead of the voltmeter to the side of the circuit closest to the battery.
2. Connect the other lead of the voltmeter to the other side of the switch, component or circuit.
3. Operate the item.
4. The voltmeter will show the difference in voltage between the two points.

TESTING FOR CONTINUITY



948W-195

Fig. 7: Testing for Continuity
Courtesy of CHRYSLER LLC

1 - FUSE REMOVED FROM CIRCUIT

1. Remove the fuse (1) for the circuit being checked or, disconnect the battery.
2. Connect one lead of the ohmmeter to one side of the circuit being tested
3. Connect the other lead to the other end of the circuit being tested. Low or no resistance means good continuity.

TESTING OF VOLTAGE POTENTIAL

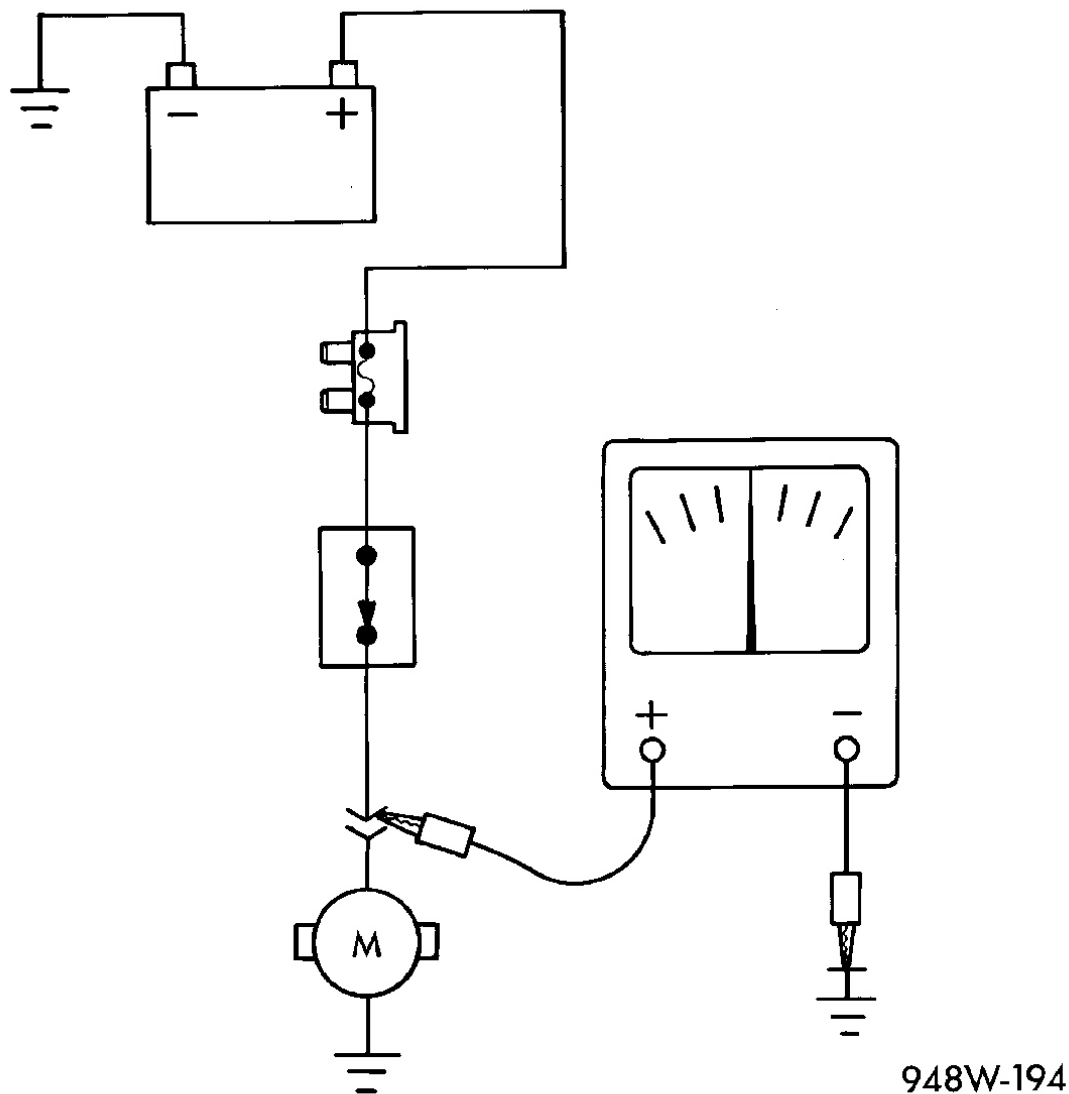


Fig. 8: Testing for Voltage
Courtesy of CHRYSLER LLC

1. Connect the ground lead of a voltmeter to a known good ground.
2. Connect the other lead of the voltmeter to the selected test point. The vehicle ignition may need to be turned ON to check voltage. Refer to the appropriate test procedure.

SPECIAL TOOLS

WIRING/TERMINAL

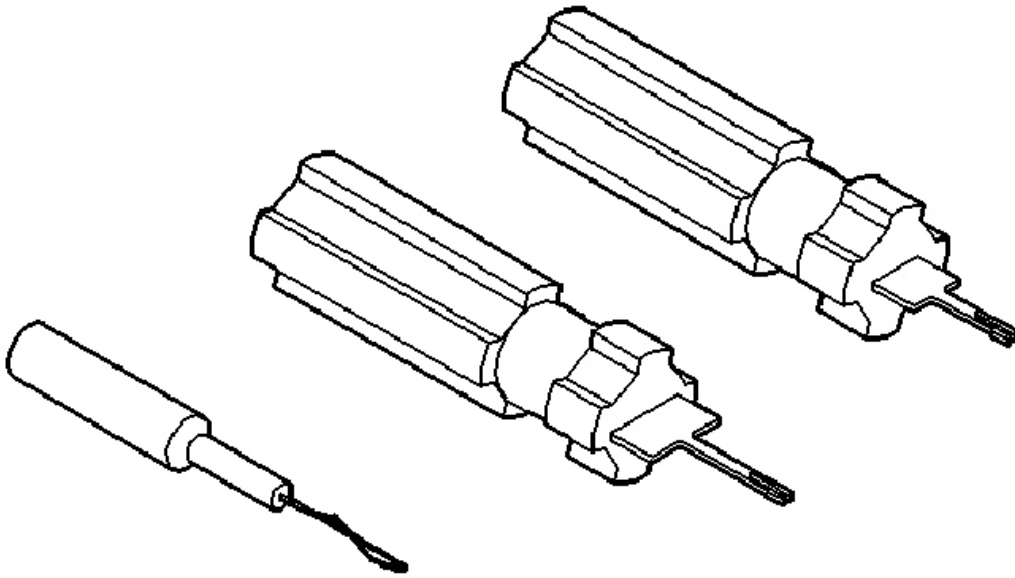


Fig. 9: Probing Tool Package 6807
Courtesy of CHRYSLER LLC

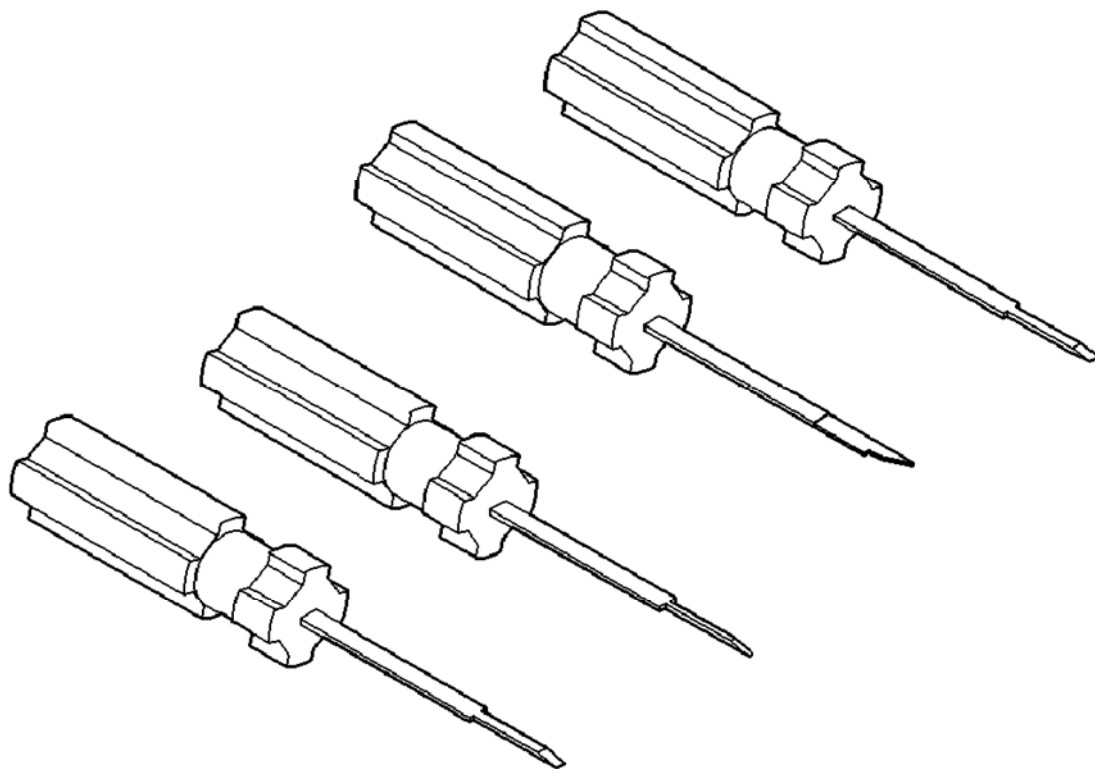
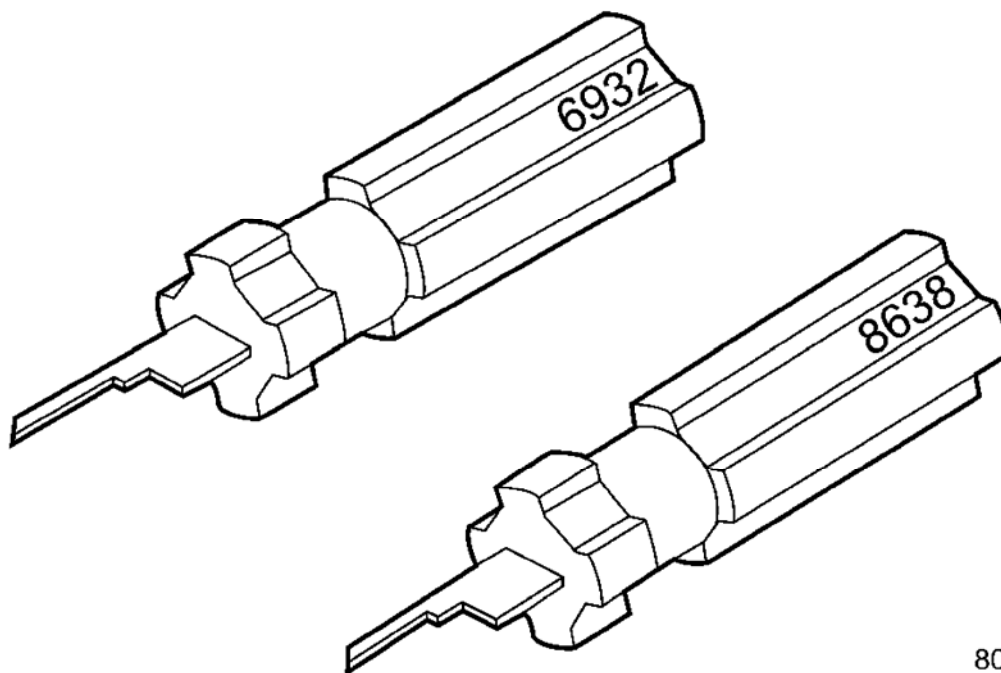


Fig. 10: Terminal Pick Tool Set 6680
Courtesy of CHRYSLER LLC



8091c8da

Fig. 11: Terminal Removing Tools 6932 & 8638
Courtesy of CHRYSLER LLC

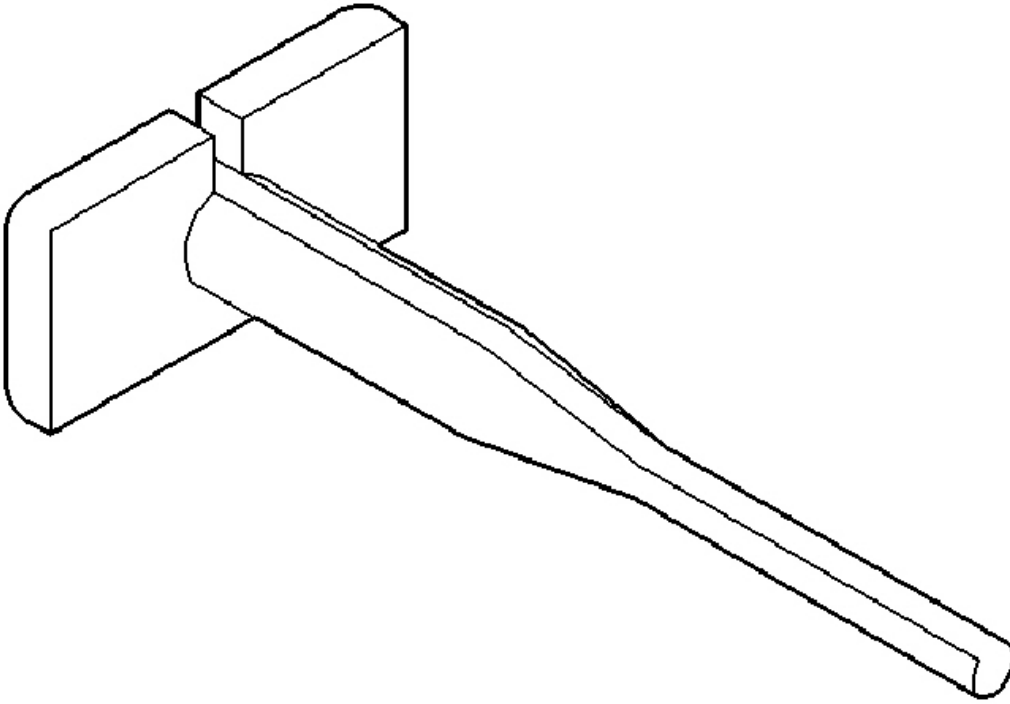
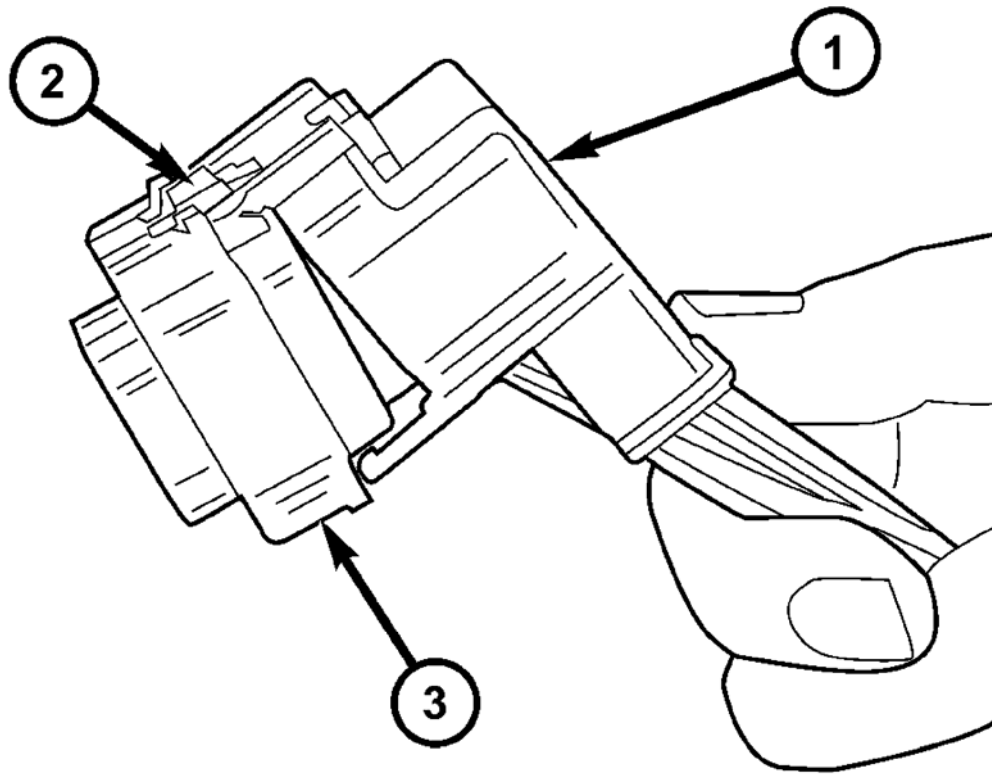


Fig. 12: Terminal Removing Tool 6934
Courtesy of CHRYSLER LLC

CONNECTOR

REMOVAL

CONNECTOR

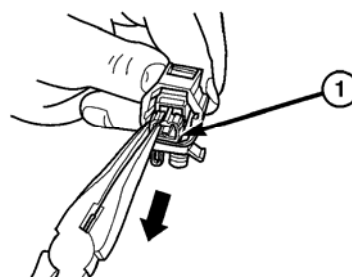
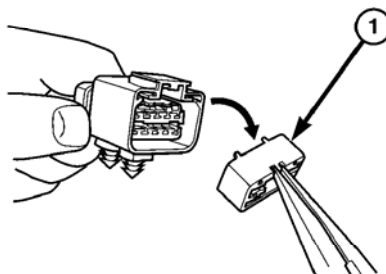
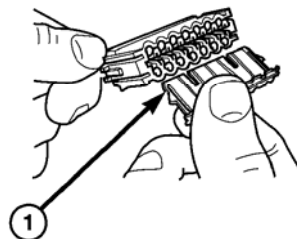
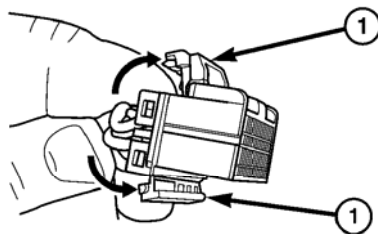
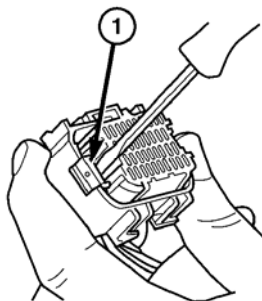
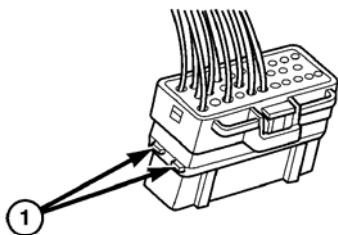
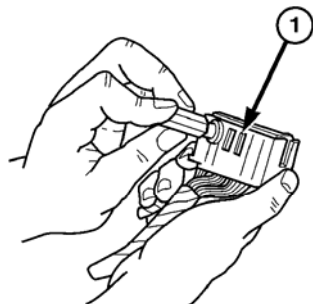
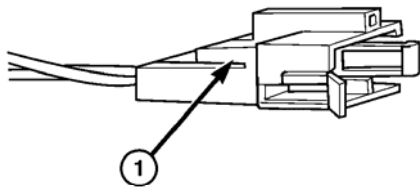


80c97bac

Fig. 13: Removing Dress Cover
Courtesy of CHRYSLER LLC

- | |
|--|
| 1 - DRESS COVER
2 - CONNECTOR LOCK
3 - CONNECTOR |
|--|

1. Disconnect battery.
2. Release Connector Lock (2).
3. Disconnect the connector (3) being repaired from its mating half/component.
4. Remove the dress cover (if applicable) (1).

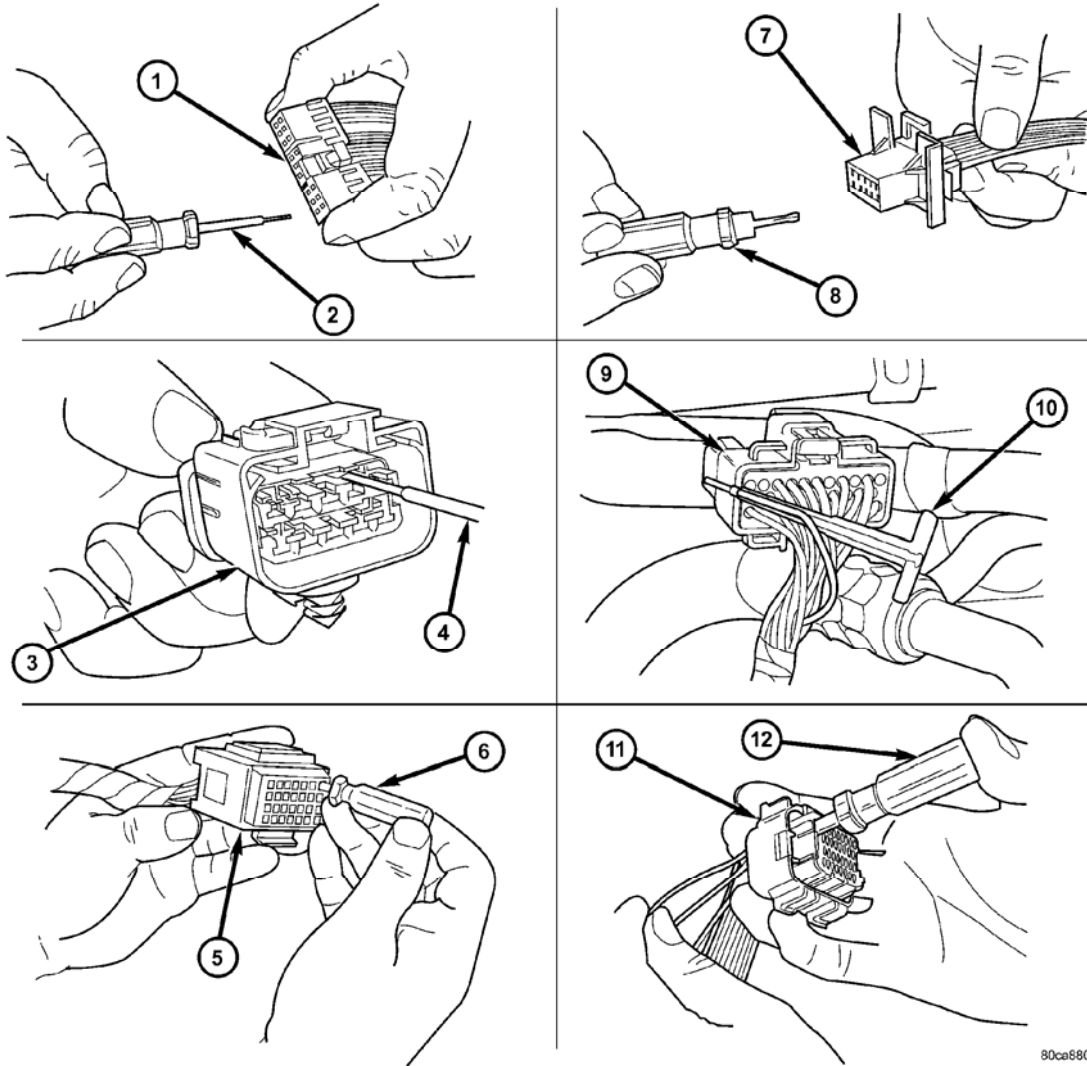


80ca8802

Fig. 14: Examples of Connector Secondary Terminal Locks
 Courtesy of CHRYSLER LLC

1 - Secondary Terminal Lock

5. Release the Secondary Terminal Lock, if required (1).



80ca6809

Fig. 15: Removing Terminal
Courtesy of CHRYSLER LLC

- 1 - TYPICAL CONNECTOR
- 2 - PICK FROM SPECIAL TOOL KIT 6680
- 3 - APEX CONNECTOR
- 4 - PICK FROM SPECIAL TOOL KIT 6680
- 5 - AUGAT CONNECTOR
- 6 - SPECIAL TOOL 6932
- 7 - MOLEX CONNECTOR
- 8 - SPECIAL TOOL 6742
- 9 - THOMAS AND BETTS CONNECTOR
- 10 - SPECIAL TOOL 6934
- 11 - TYCO CONNECTOR

6. Position the connector locking finger away from the terminal using the proper special tool. Pull on the wire to remove the terminal from the connector.

INSTALLATION

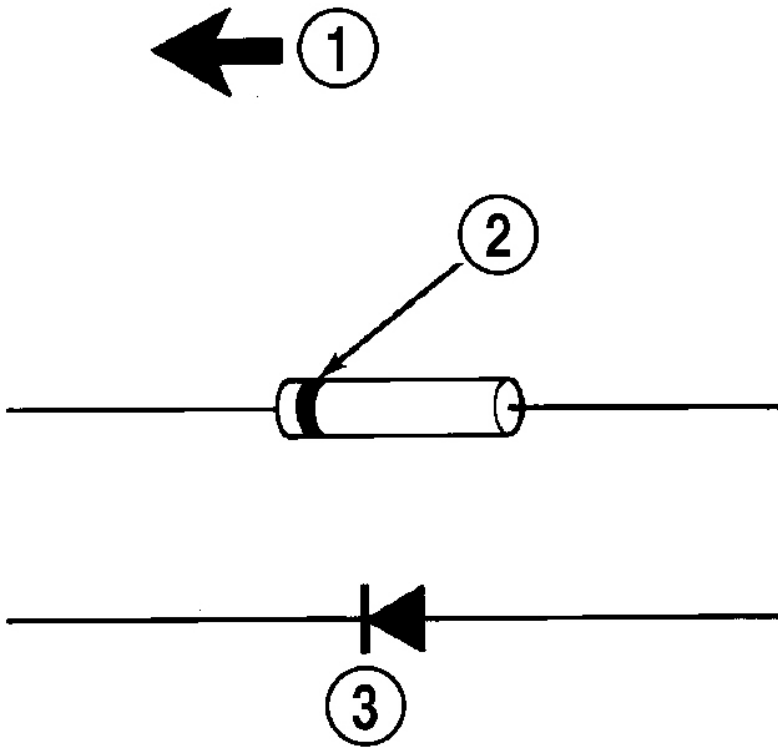
CONNECTOR

1. Insert the removed terminal in the same cavity on the repair connector.
2. Repeat steps for each terminal in the connector, being sure that all wires are inserted into the proper cavities. For additional connector pin-out identification, refer to **SYSTEM WIRING DIAGRAMS** article.
3. When the connector is re-assembled, the secondary terminal lock must be placed in the locked position to prevent terminal push out.
4. Replace dress cover (if applicable).
5. Connect connector to its mating half/component.
6. Connect battery and test all affected systems.

DIODE

REMOVAL

DIODE



948W-197

Fig. 16: Diode Identification
Courtesy of CHRYSLER LLC

1 - CURRENT FLOW
2 - BAND AROUND DIODE INDICATES CURRENT FLOW
3 - DIODE AS SHOWN IN THE DIAGRAMS

1. Disconnect the battery.
2. Locate the diode in the harness, and remove the protective covering.
3. Remove the diode from the harness, pay attention to the current flow direction (1) (2) (3).

INSTALLATION

DIODE

1. Remove the insulation from the wires in the harness. Only remove enough insulation to solder in the new

diode.

2. Install the new diode in the harness, making sure current flow is correct. If necessary, refer to the appropriate wiring diagram for current flow.
3. Solder the connection together using rosin core type solder only. **Do not use acid core solder.**
4. Tape the diode to the harness using electrical tape. Make sure the diode is completely sealed from the elements.
5. Reconnect the battery and test affected systems.

TERMINAL

REMOVAL

WIRE TERMINAL

1. Follow steps for removing terminals described in CONNECTOR **REMOVAL**.
2. Cut the wire 6 inches from the back of the connector.

INSTALLATION

WIRE TERMINAL

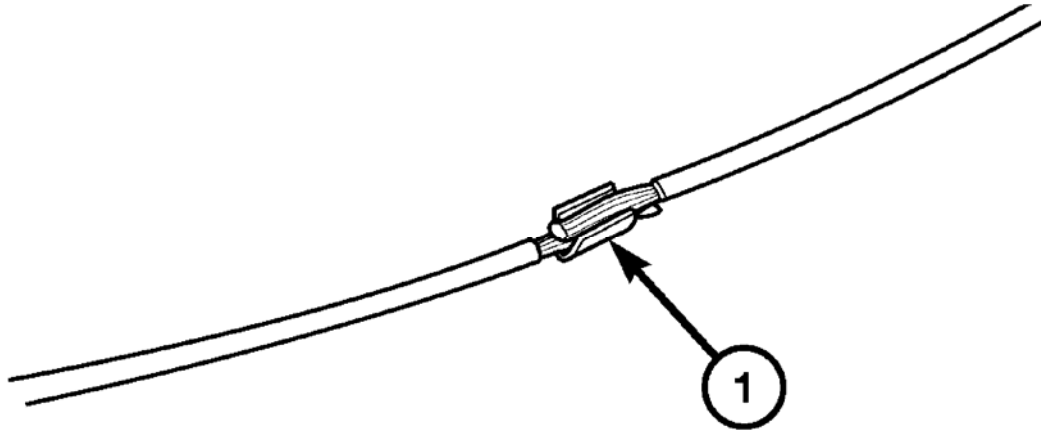
1. Select a wire from the terminal repair kit that best matches the color and gage of the wire being repaired.
2. Cut the repair wire to the proper length and remove one-half (1/2) inch of insulation.
3. Splice the repair wire to the wire harness (see wire splicing procedure). See **STANDARD PROCEDURE**.
4. Insert the repaired wire into the connector.
5. Install the connector locking wedge, if required, and reconnect the connector to its mating half/component.
6. Re-tape the wire harness starting at 1-1/2 inches behind the connector and 2 inches past the repair.
7. Connect battery and test all affected systems.

WIRE

STANDARD PROCEDURE

WIRE SPLICING

When splicing a wire, it is important that the correct gage be used as shown in the wiring diagrams.

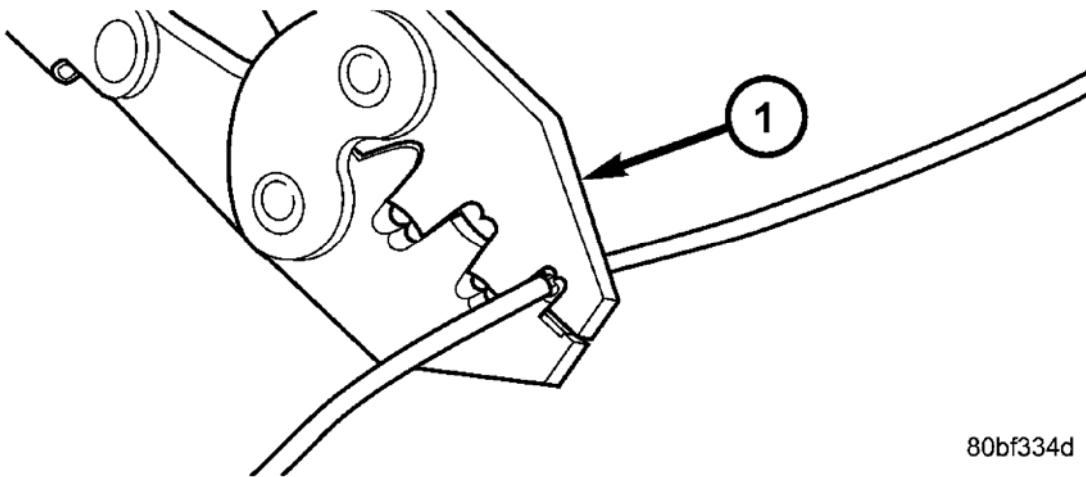


80c4f3f1

Fig. 17: Splice Band
Courtesy of CHRYSLER LLC

1 - SPLICE BAND

1. Remove one-half (1/2) inch of insulation from each wire that needs to be spliced.
2. Place a piece of adhesive lined heat shrink tubing on one side of the wire. Make sure the tubing will be long enough to cover and seal the entire repair area.
3. Place the strands of wire overlapping each other inside of the splice clip (1).



80bf334d

Fig. 18: Crimping Tool
Courtesy of CHRYSLER LLC

1 - CRIMPING TOOL

4. Using crimping tool (1), Mopar p/n 05019912AA, crimp the splice clip and wires together.

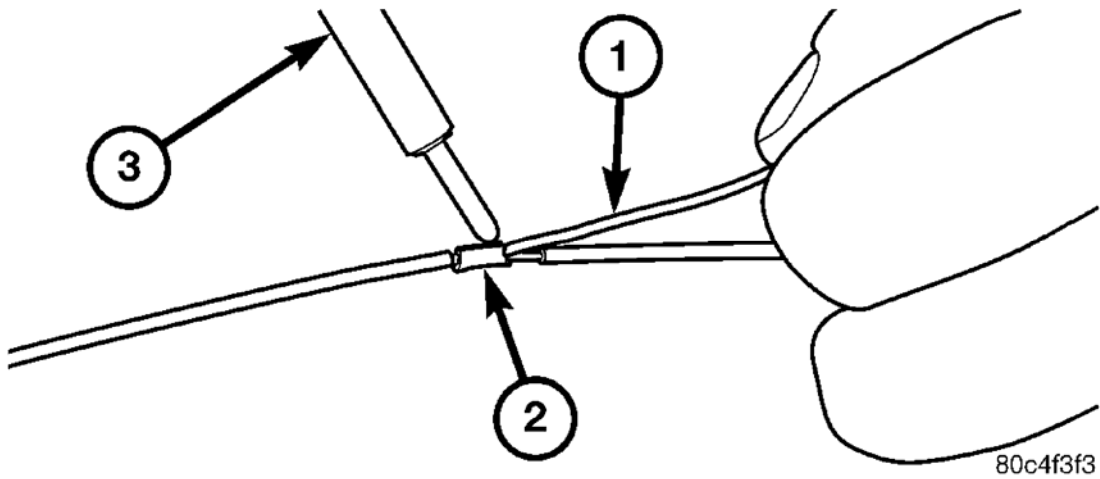


Fig. 19: Solder Splice
Courtesy of CHRYSLER LLC

1 - SOLDER
2 - SPLICE BAND
3 - SOLDERING IRON

5. Solder (3) the connection (2) together using rosin core type solder (1) only.

CAUTION: DO NOT USE ACID CORE SOLDER.

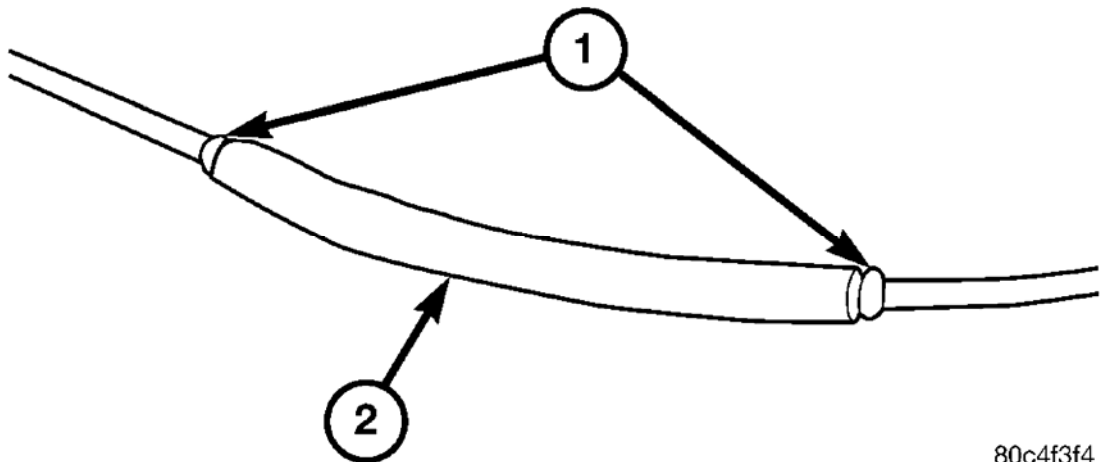


Fig. 20: Heat Shrink Tube

Courtesy of CHRYSLER LLC

1 - SEALANT 2 - HEAT SHRINK TUBE

6. Center the heat shrink tubing (2) over the joint and heat using a heat gun. Heat the joint until the tubing is tightly sealed and sealant (1) comes out of both ends of the tubing.