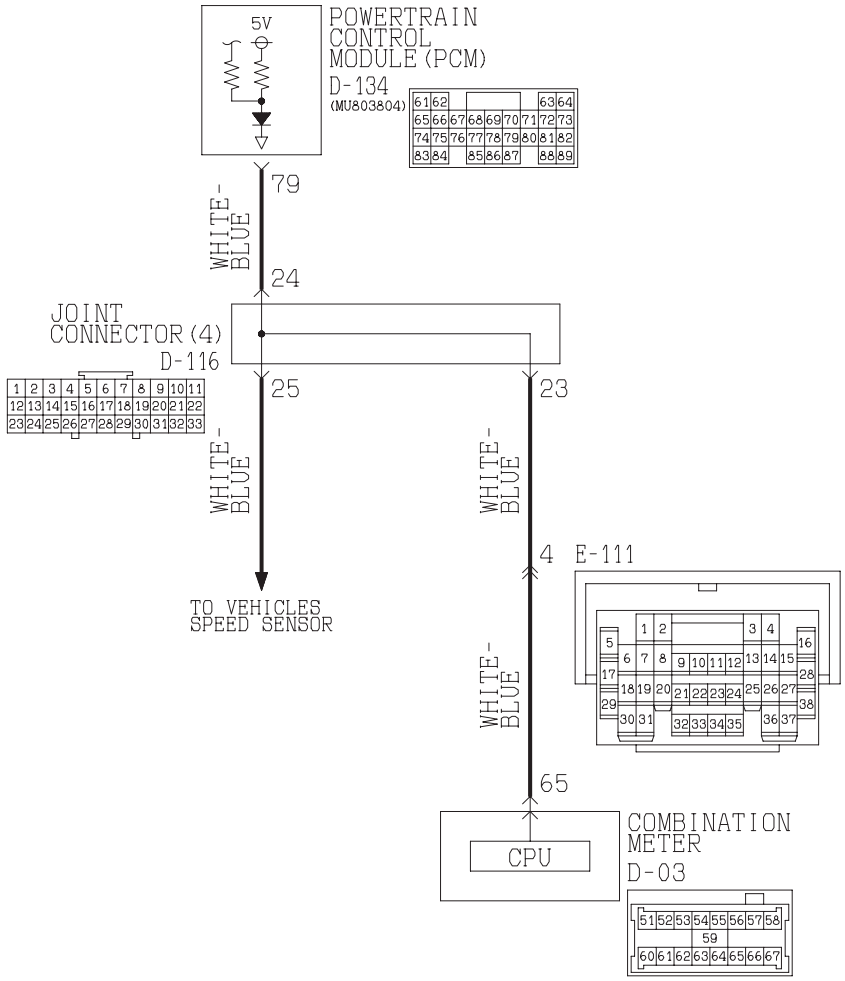
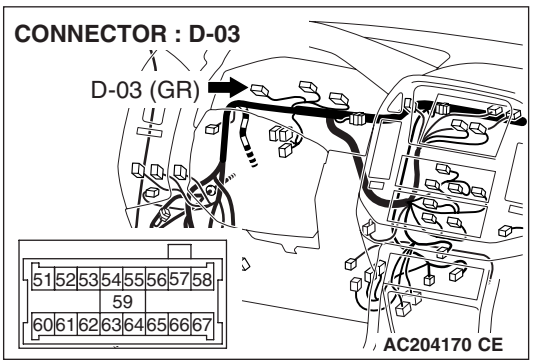
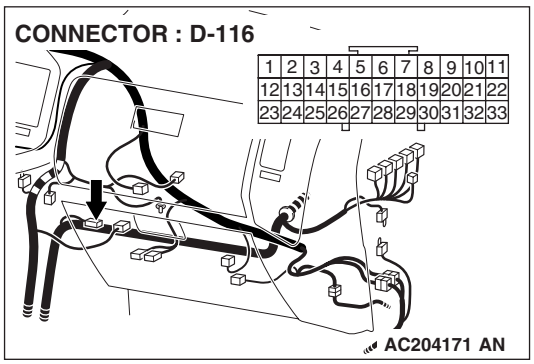
DTC 29 (P0500): Vehicle Speed Sensor System

Vehicle Speed Sensor System Circuit

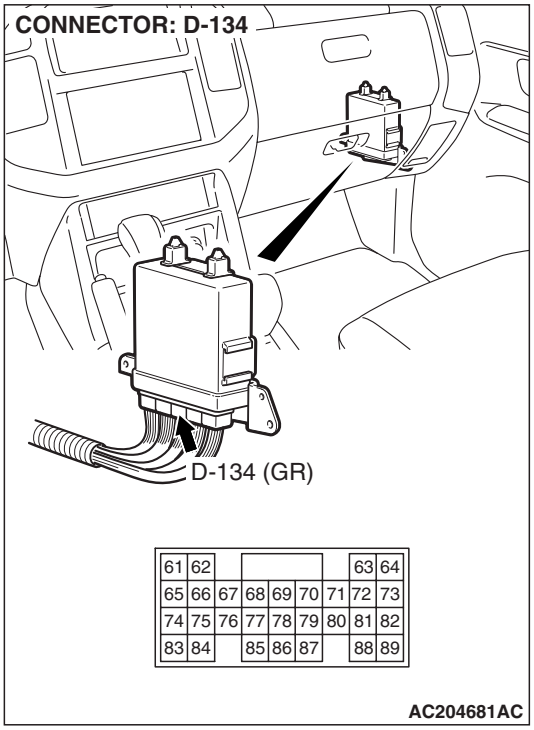


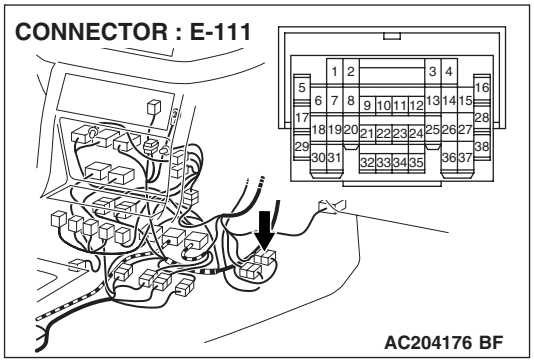
W3Q20M12AA
AC205193 AB





TSB Revision





CIRCUIT OPERATION

- 4.8 – 5.2 volts voltage is applied to the vehicle speed sensor from the PCM (terminal 79). The vehicle speed sensor generates a pulse signal when the output terminal is opened and ground.
- The PCM compares the vehicle speed sensor signal to input shaft and output shaft speed sensor signals.
- If the vehicle speed sensor becomes inoperative, the transmission will not shift normally.

DESCRIPTIONS OF MONITOR METHODS

If there is no detection pulse from vehicle speed sensor even when output shaft revolution equals or exceeds specified value, PCM judges that vehicle speed sensor has a failure.

MONITOR EXECUTION

Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

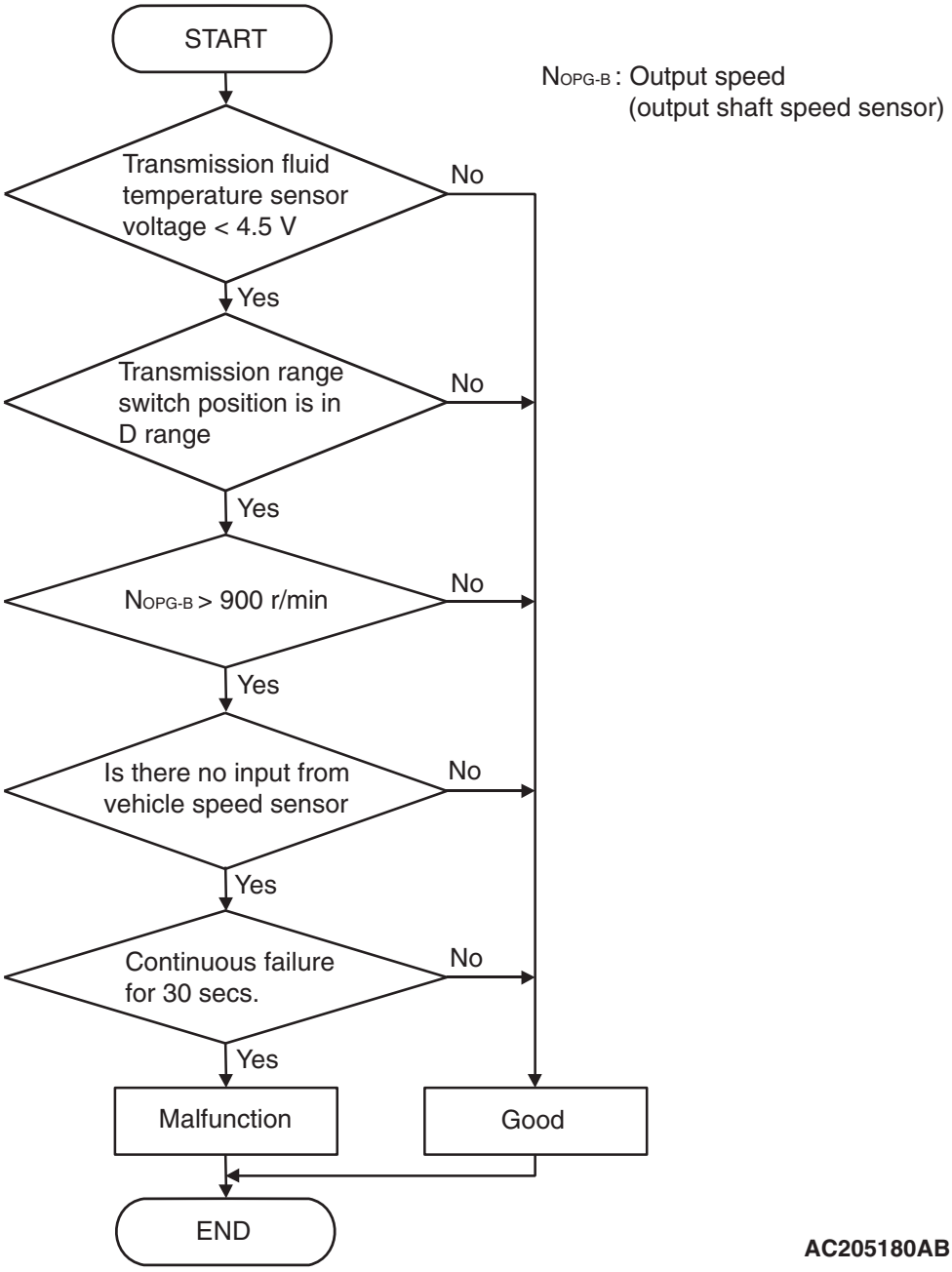
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC 23 (P0720): Output shaft speed sensor malfunction

Sensor (The sensor below is determined to be normal)

- Output shaft speed sensor

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Transmission range switch: D.
- Output speed: 900 r/min or more.

Judgement Criteria

- Vehicle speed: no signal change. (30 seconds)

OBD-II DRIVE CYCLE PATTERN

Start the engine, drive at 40 km/h (25 mph) or more continuously for one minute.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the vehicle speed sensor circuit
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Check the speedometer.

Q: Is the speedometer operating properly?

YES : Go to Step 2.

NO : Check the vehicle speed sensor. Refer to GROUP 54A, Combination Meters Assembly and Vehicle Speed Sensor P.54A-75.

STEP 2. Using scan tool MB991958, check data list item 29: Vehicle Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

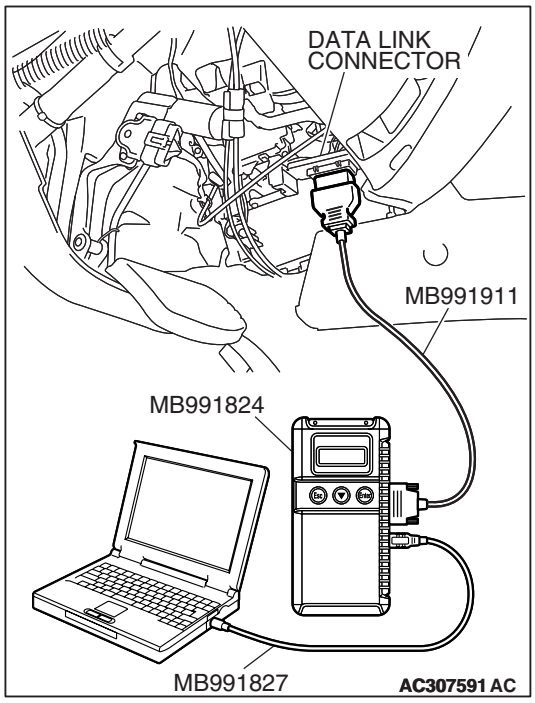
(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 29: Vehicle Speed Sensor.
  - Check that the speedometer and scan tool MB991958 display speed match when driving at a vehicle speed of 40 km/h (25 mph).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

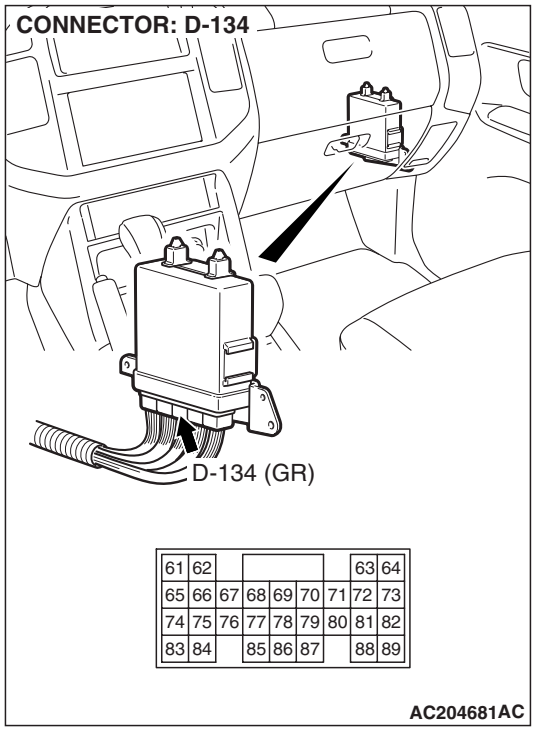
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

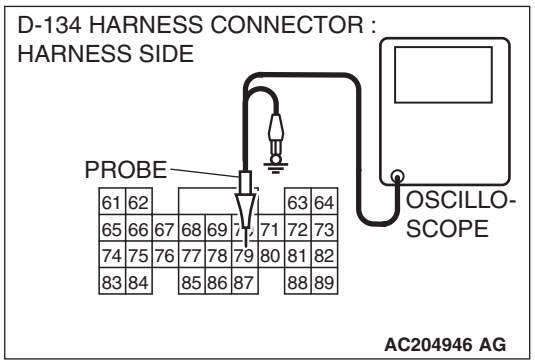
NO : Go to Step 3.



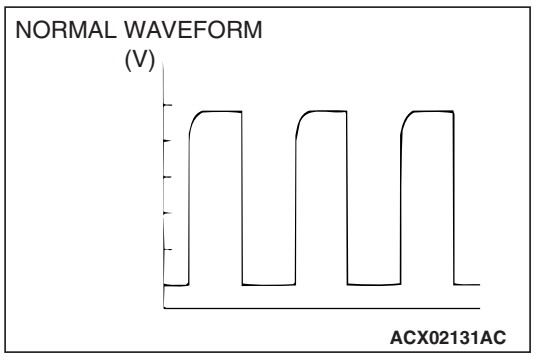
STEP 3. Using an oscilloscope, check the vehicle speed sensor waveform at PCM connector D-134 by backprobing.

(1) Do not disconnect connector D-134.





(2) Connect an oscilloscope probe to PCM connector D-134 terminal 79 by backprobing.
(3) Start the engine and drive the vehicle.



(4) Check the vehicle speed sensor waveform.
- The vehicle speed sensor waveform should show a pattern similar to the illustration when running the vehicle.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the waveform normal?

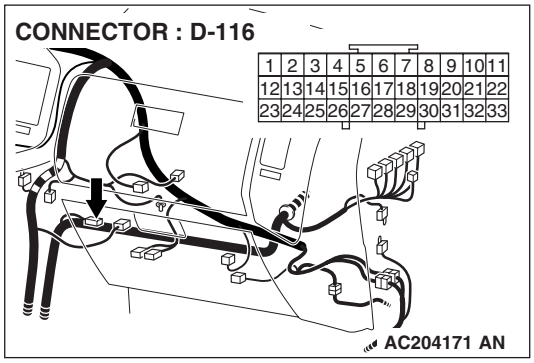
YES : Go to Step 6.
NO : Go to Step 4.

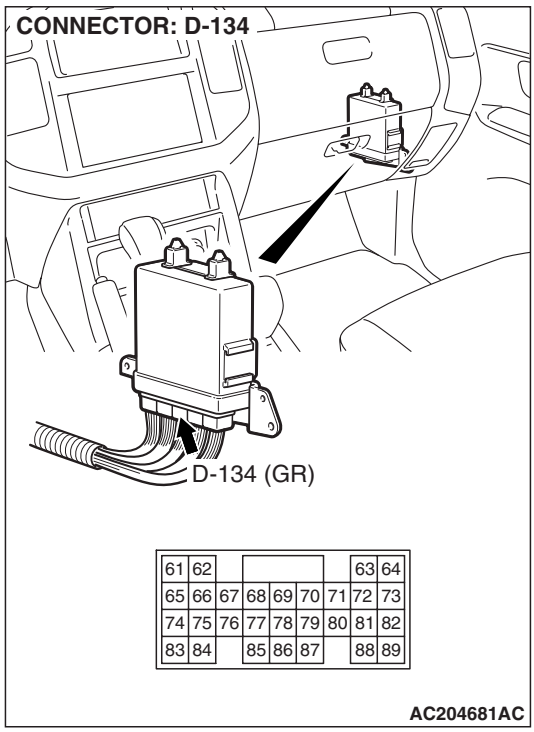
STEP 4. Check joint connector D-116, PCM connector D-134 and intermediate connector E-111 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

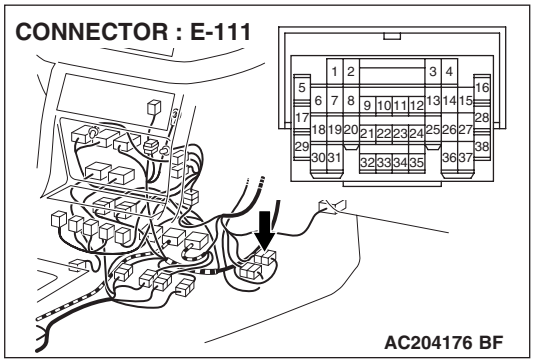
Q: Are the connectors and terminals in good condition?

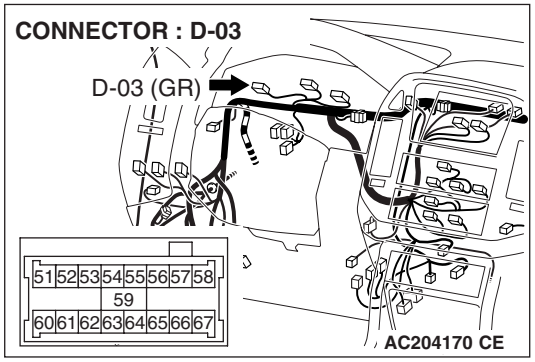
YES : Go to Step 5.

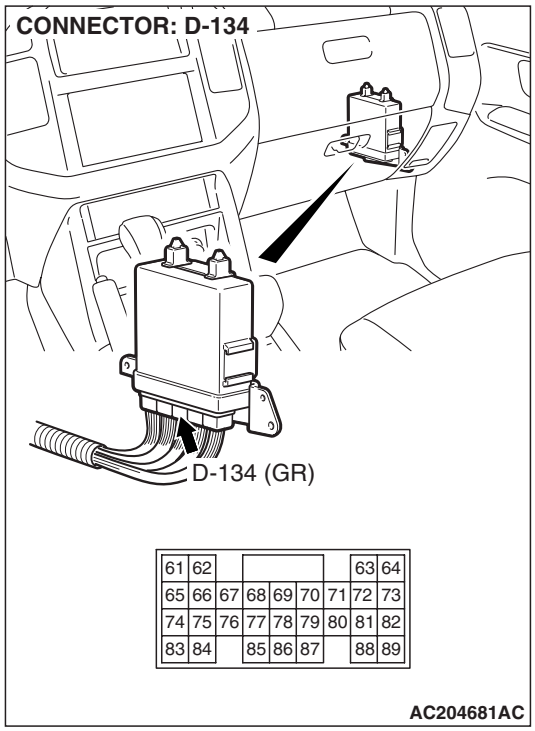
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.









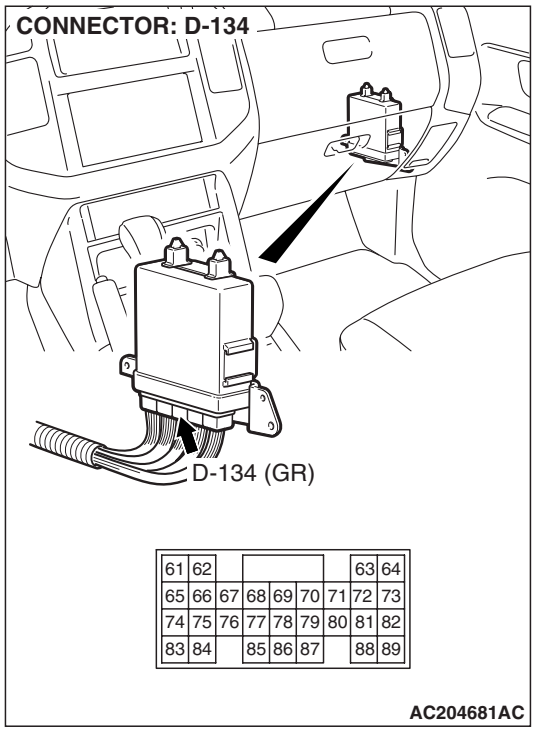


STEP 5. Check the harness for open circuit or short circuit to ground between combination meter connector D-03 terminal 65 and PCM connector D-134 terminal 79.

Q: Is the harness wire in good condition?

YES : Go to Step 7.

NO : Repair or replace the harness wire.

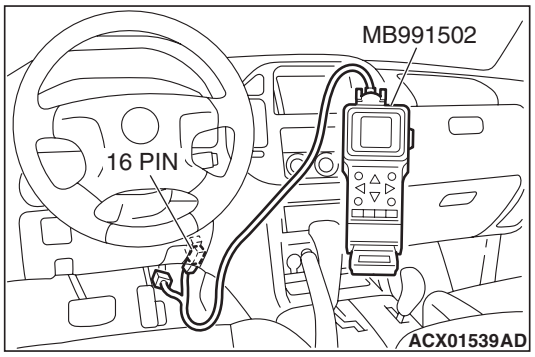


STEP 6. Check PCM connector D-134 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 7. Using scan tool MB991958, check data list item 29: Vehicle Speed Sensor.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 29: Vehicle Speed Sensor.
  - Check that the speedometer and scan tool MB991958 display speed match when driving at a vehicle speed of 40 km/h (25 mph).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

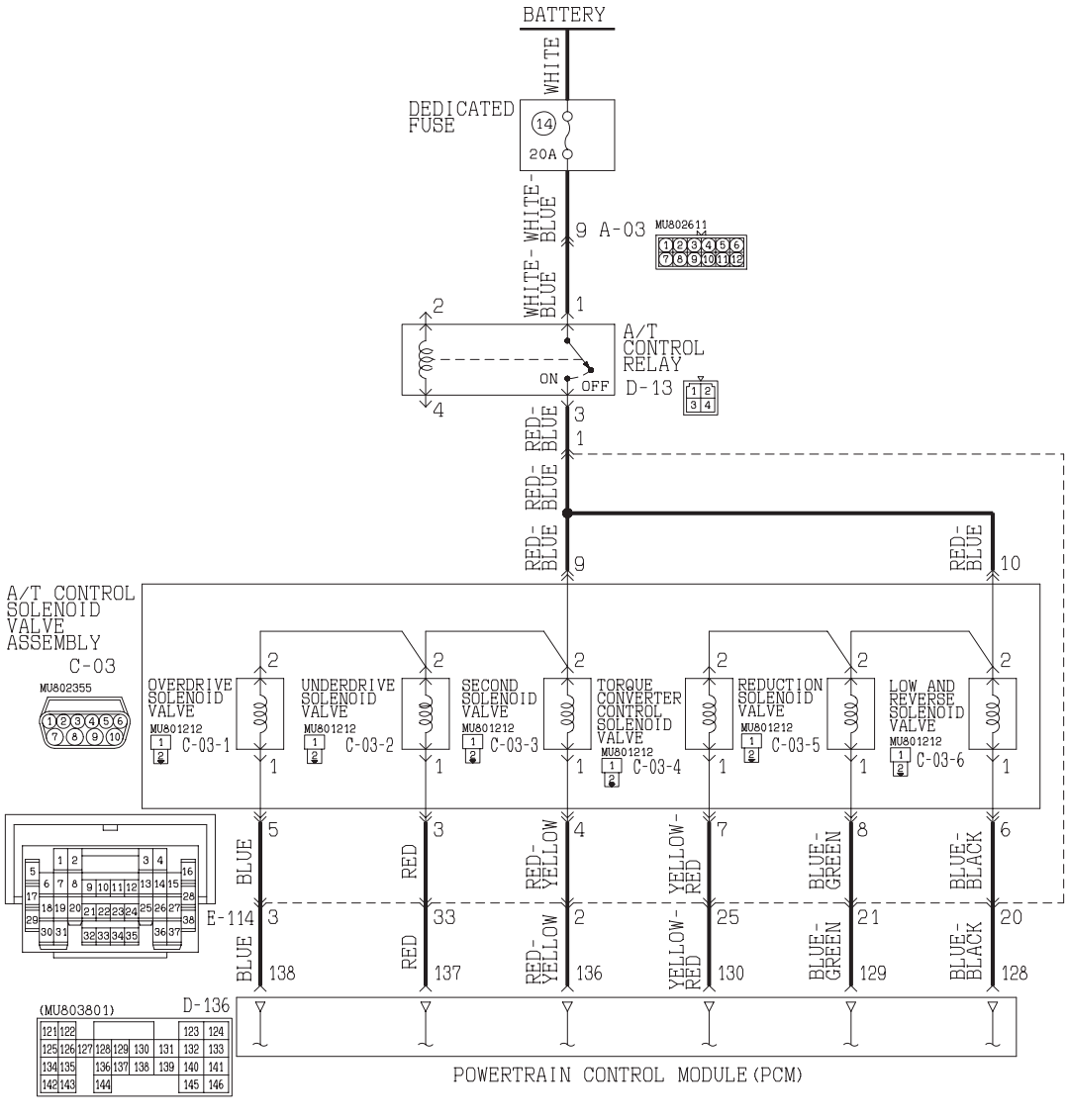
Q: Is the sensor operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.

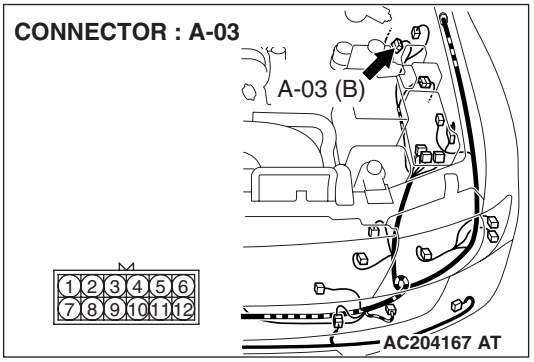
DTC 31 (P0753): Low-Reverse Solenoid Valve System

Solenoid Valve System Circuit



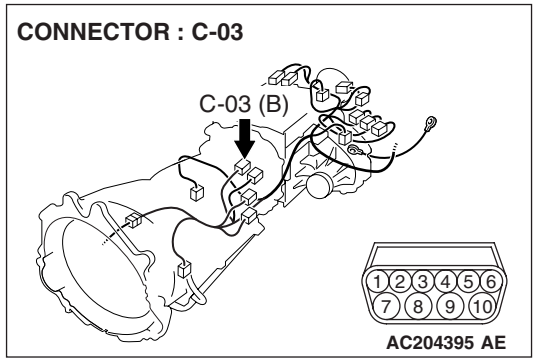
W3Q20M14AA
AC205195 AB

CONNECTOR : A-03



AC204167 AT

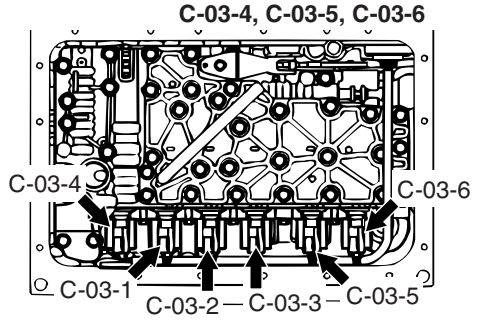
CONNECTOR : C-03



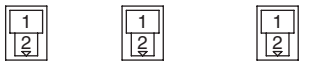
AC204395 AE

TSB Revision

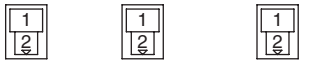
CONNECTORS : C-03-1, C-03-2, C-03-3
C-03-4, C-03-5, C-03-6



C-03-1 C-03-2 C-03-3

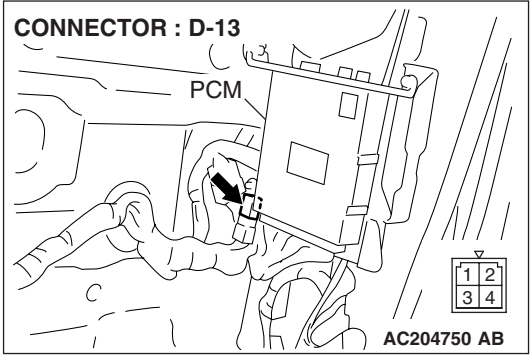


C-03-4 C-03-5 C-03-6



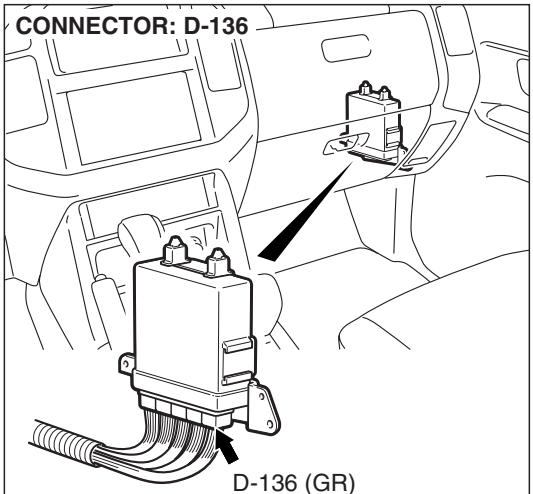
AC204749 AC

CONNECTOR : D-13



AC204750 AB

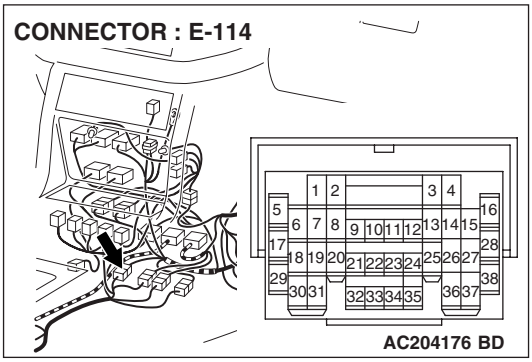
CONNECTOR: D-136



121	122					123	124	
125	126	127	128	129	130	131	132	133
134	135		136	137	138	139	140	141
142	143		144				145	146

AC204681AD

CONNECTOR : E-114



AC204176 BD

CIRCUIT OPERATION

- The A/T control relay supplies battery positive voltage to the solenoid valve assembly (terminals 9 and 10).
- The solenoid valve closes when energized (on), and opens when not energized (off). The PCM energizes the solenoid valve based on input data from sensors such as the APP Sensor, Transmission Range Switch, Stoplight Switch, Vehicle Speed Sensor, Input Shaft Speed Sensor, Output Shaft Speed Sensor, and Transmission Fluid Temperature Sensor.
- The PCM provides the ground to energize the solenoid. The amount of time that the circuit is grounded is displayed on scan tool MB991958 in percent.
- When the solenoid is energized or de-energized, fluid passes through the valve body and transmission passages to apply and release components.

DESCRIPTIONS OF MONITOR METHODS

If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that low-reverse solenoid has a failure.

MONITOR EXECUTION

Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

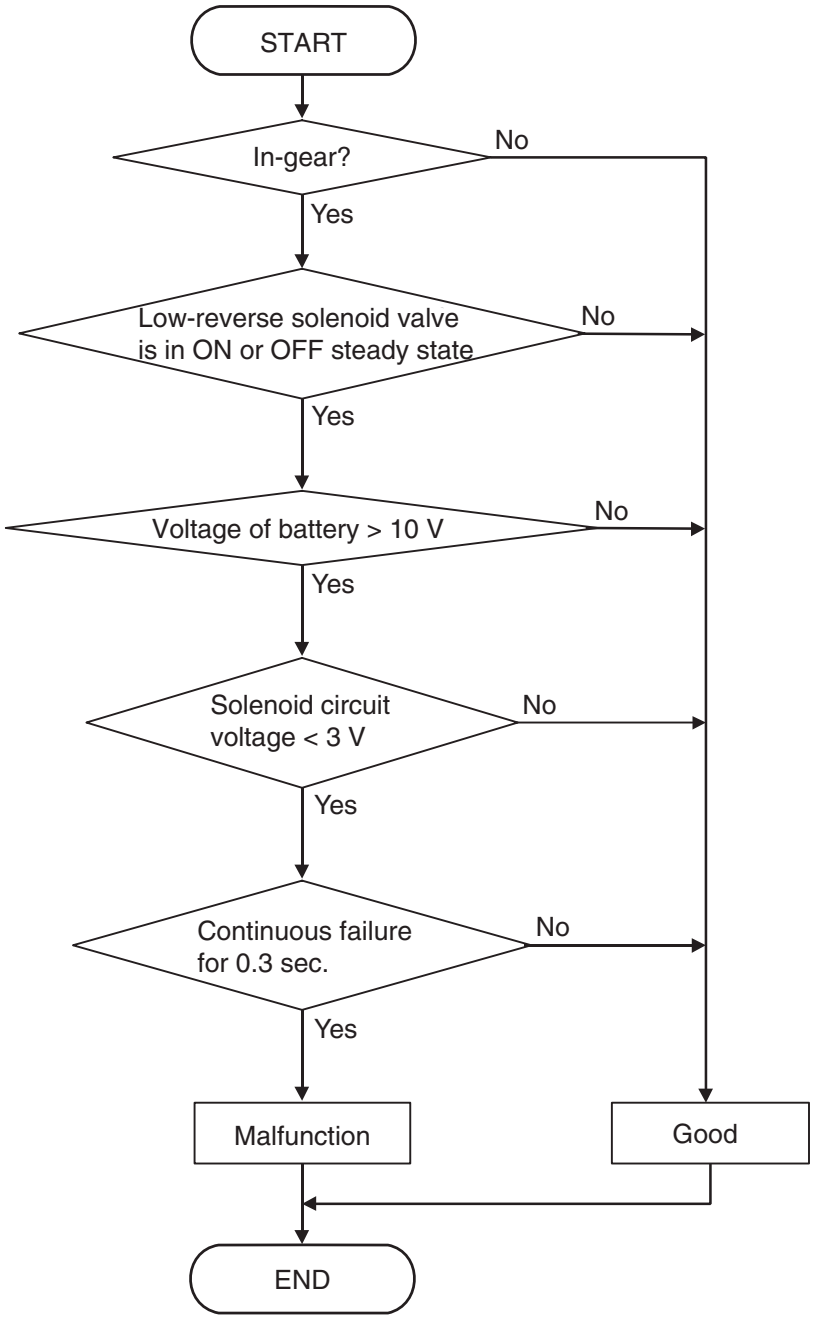
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



AC205281AB

DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 31 (P0753) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of low-reverse solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

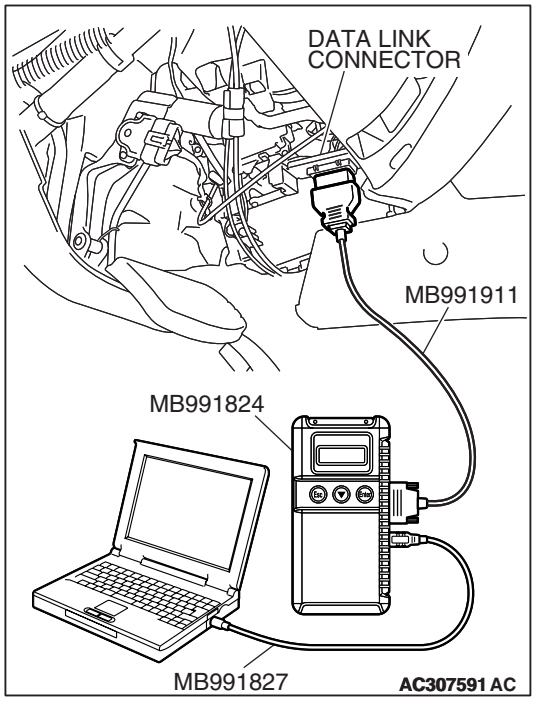
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 01: Low-Reverse Solenoid Valve.
  - An audible clicking or buzzing should be heard when the low-reverse solenoid valve is energized.

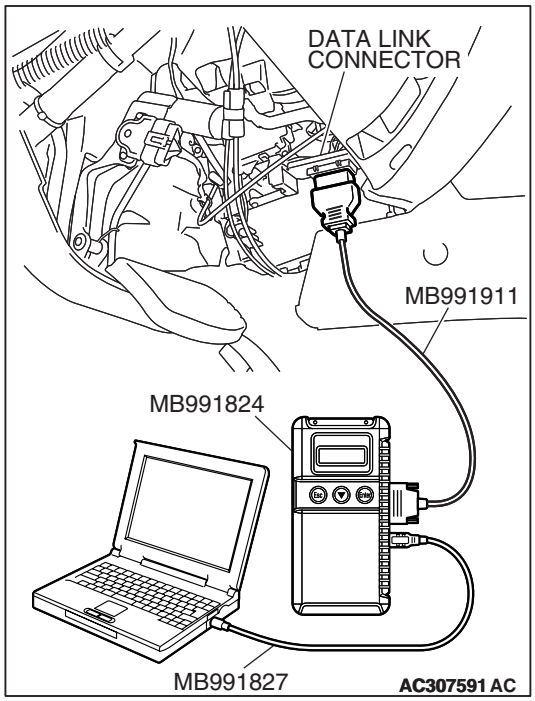
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.



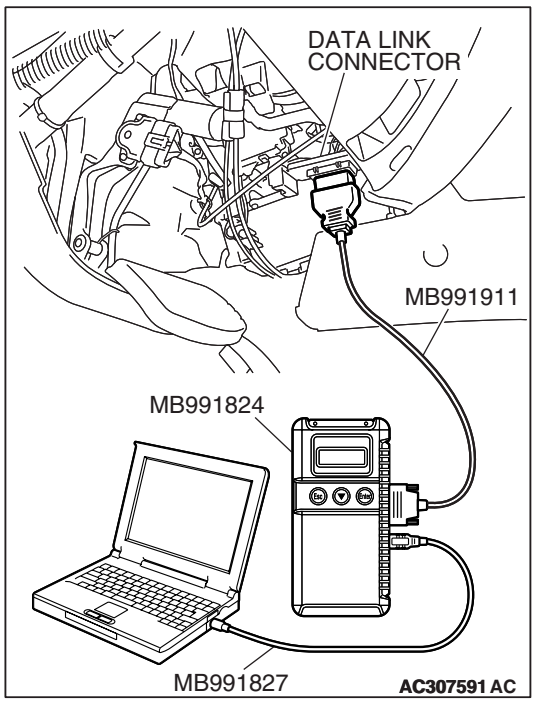


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

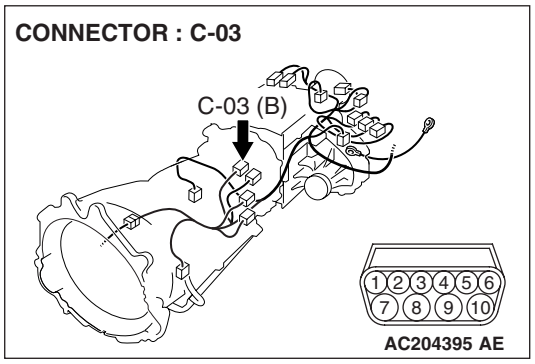
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

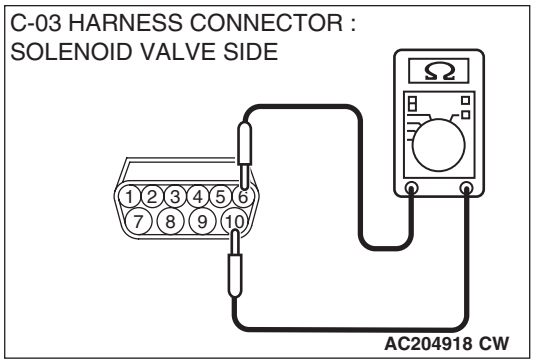
Q: Are DTC 35 and DTC 36 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the low-reverse solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 6 and 10.

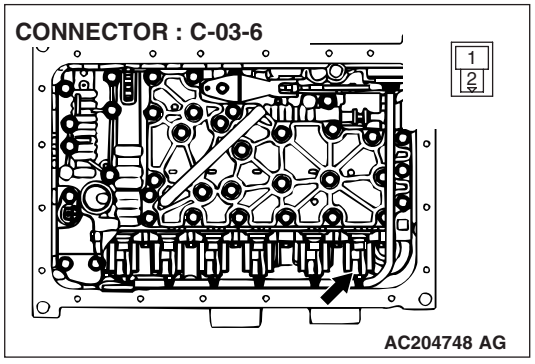
Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

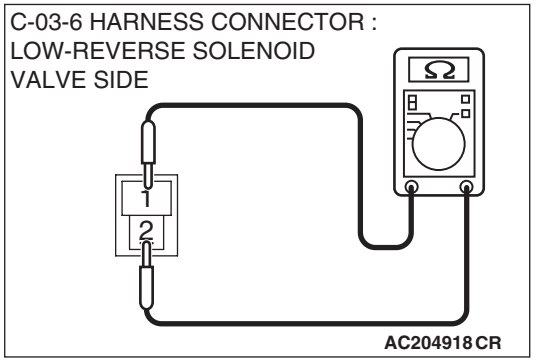
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the low-reverse solenoid valve connector C-03-6 inside the transmission.

(1) Disconnect solenoid valve connector C-03-6 and measure at the solenoid valve side.





(2) Measure the resistance between low-reverse solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

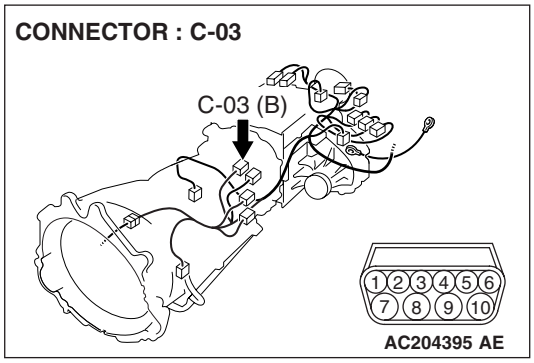
YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.
NO : Replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

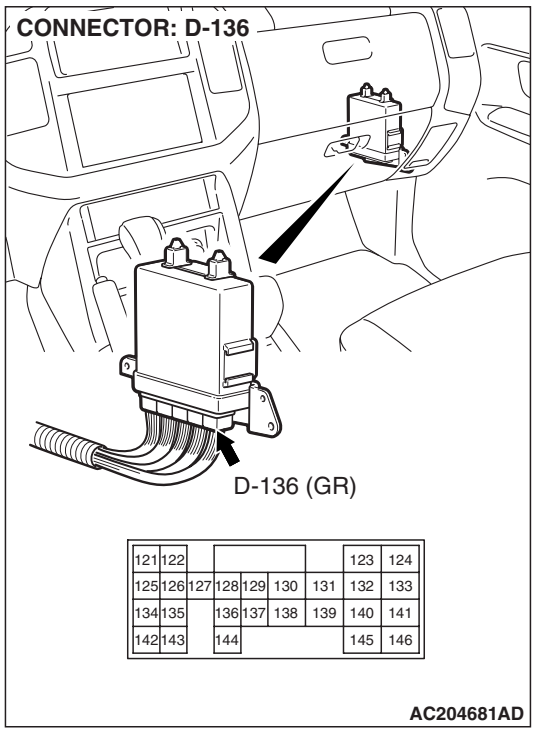
TSB Revision

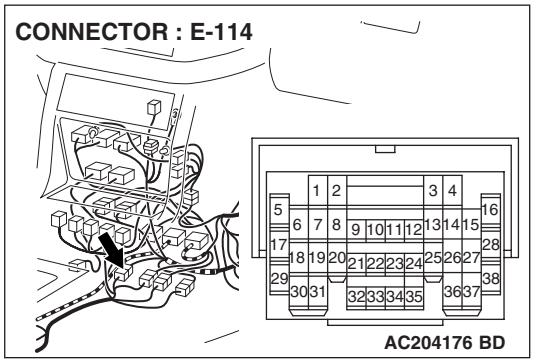
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





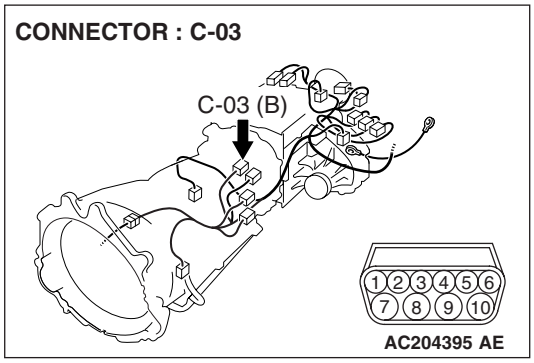


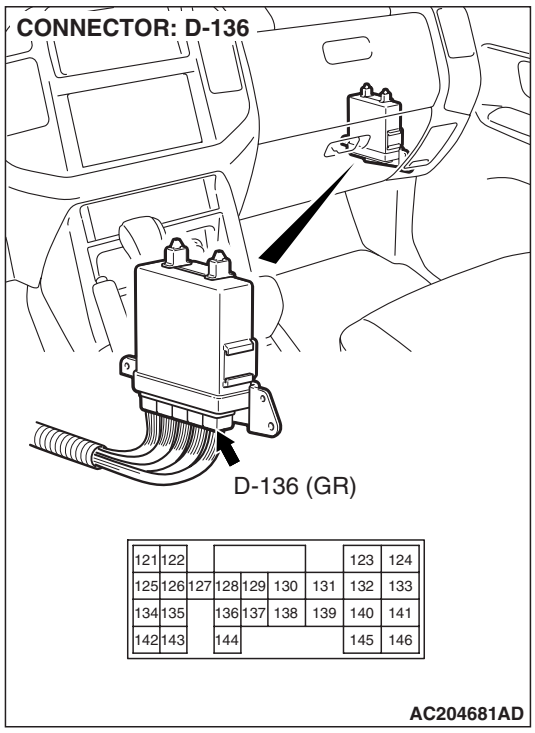
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 6 and PCM connector D-136 terminal 128.

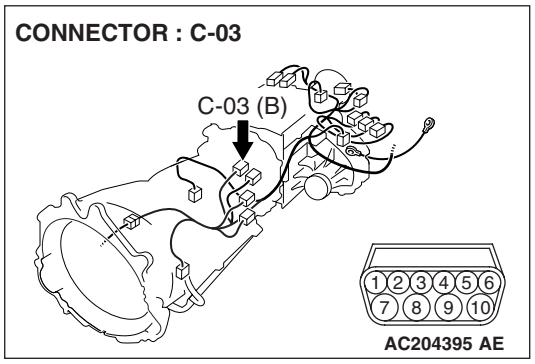
Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Repair or replace the harness wire.



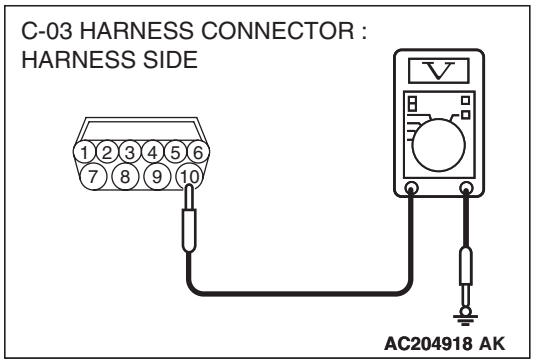




STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.

(1) Do not disconnect solenoid valve assembly harness connector C-03.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between harness connector C-03 terminal 10 and ground by backprobing.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.

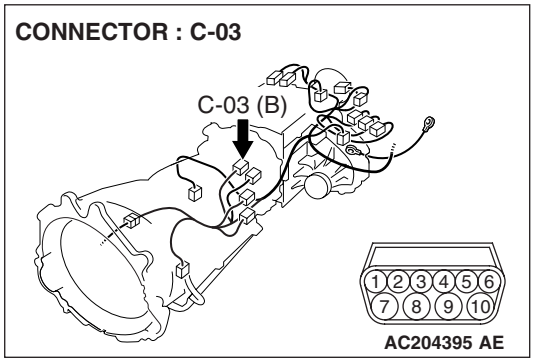
NO : Go to Step 9.

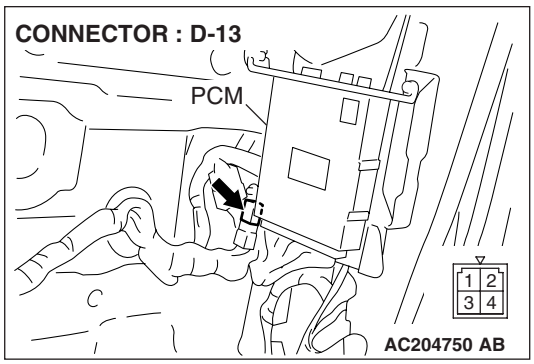
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

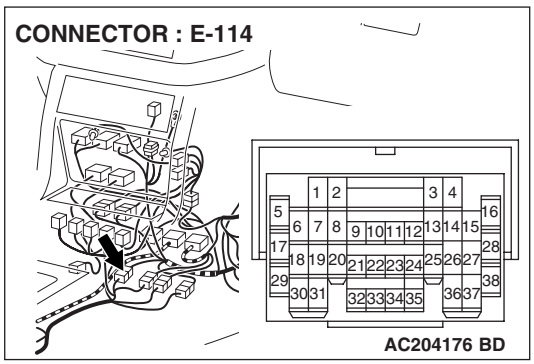
Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





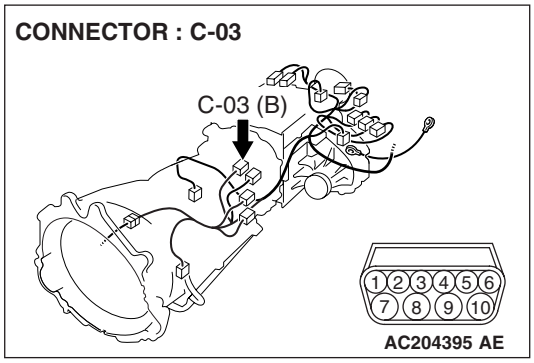


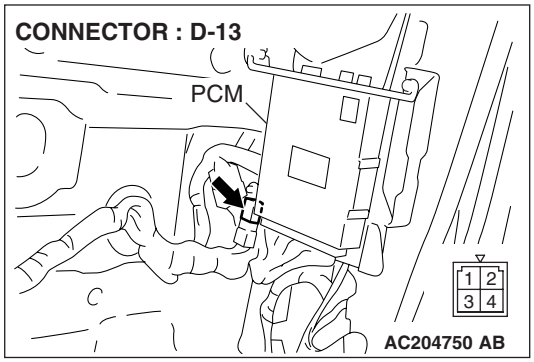
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 10 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.

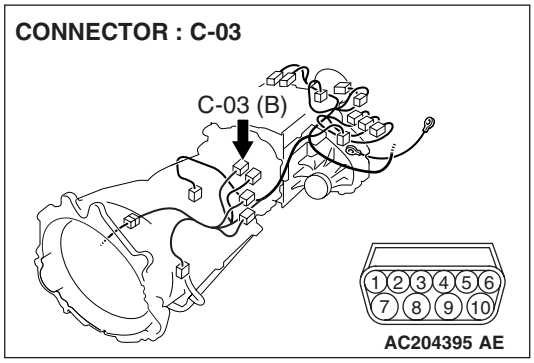


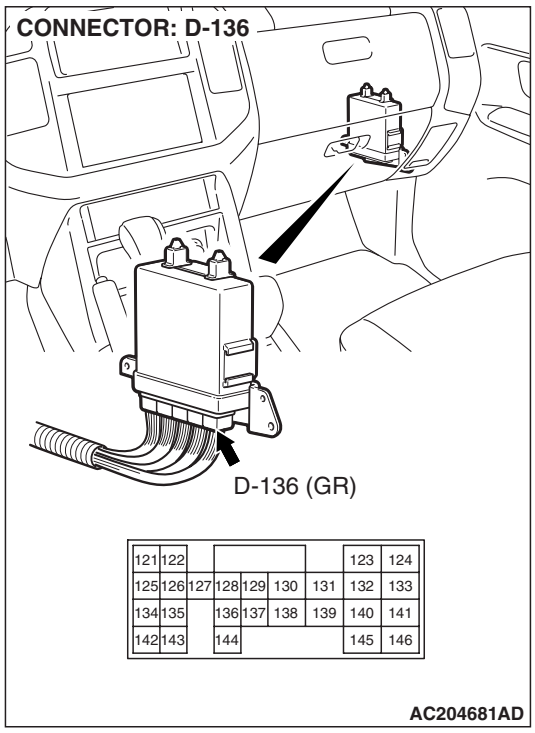


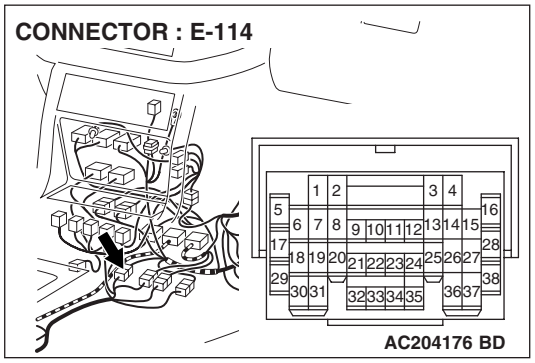
STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

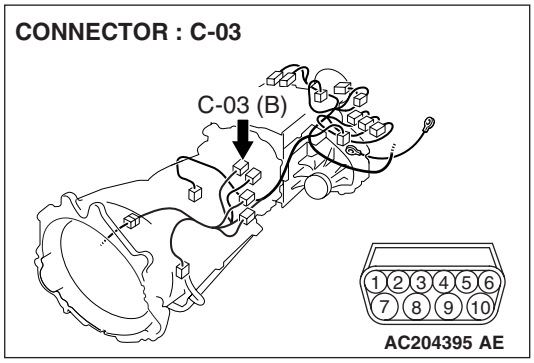
YES : Go to Step 12.

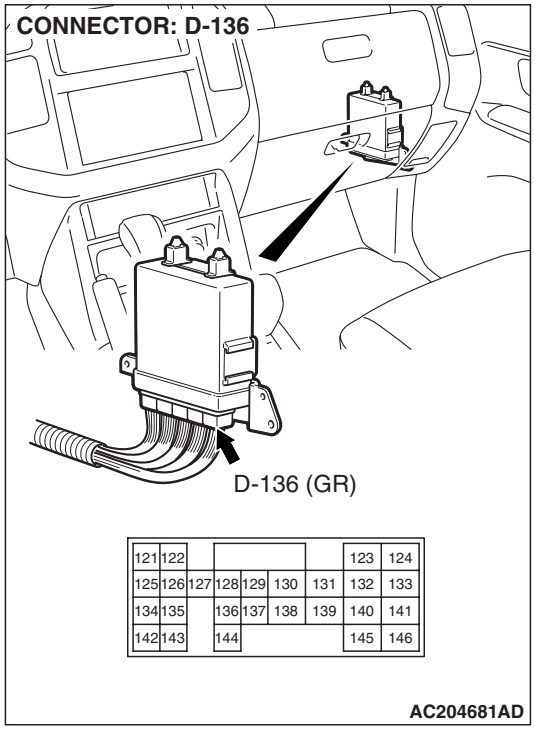
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7 and 8) and PCM connector D-136 (terminals 128, 129 and 130).

Q: Are the harness wires in good condition?

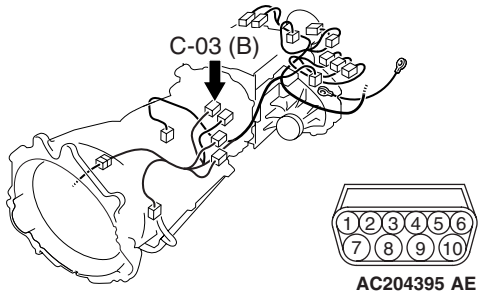
YES : Go to Step 13.

NO : Repair or replace the harness wire(s).

STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7, 8 and 10) and solenoid valve connectors C-03-4, C-03-5 and C-03-6.
Q: Is the harness wire in good condition?

YES : Replace the PCM.
NO : Replace the harness wire.

CONNECTOR : C-03



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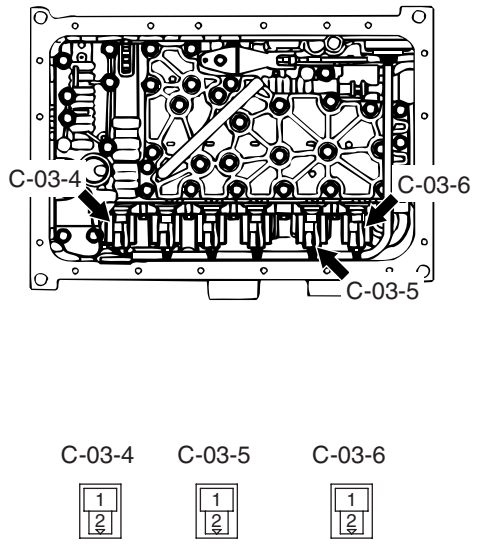
CONNECTORS : C-03-4, C-03-5, C-03-6



AC204749 AD

DTC 32 (P0758): Underdrive Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23A-178.

CIRCUIT OPERATION
Refer to P.23A-178.

DESCRIPTIONS OF MONITOR METHODS
If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that underdrive solenoid has a failure.

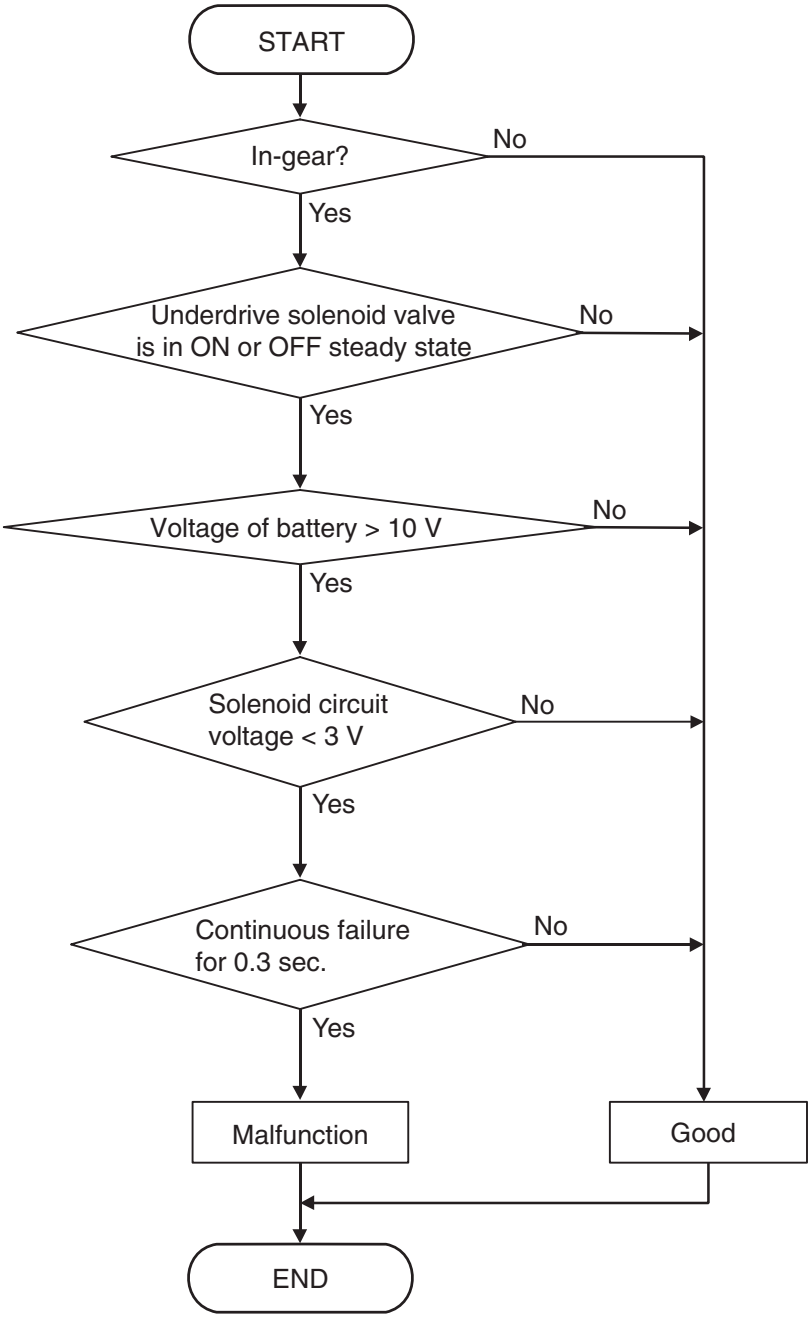
MONITOR EXECUTION
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Torque converter clutch solenoid
- Low-reverse solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 32 (P0758) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of underdrive solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

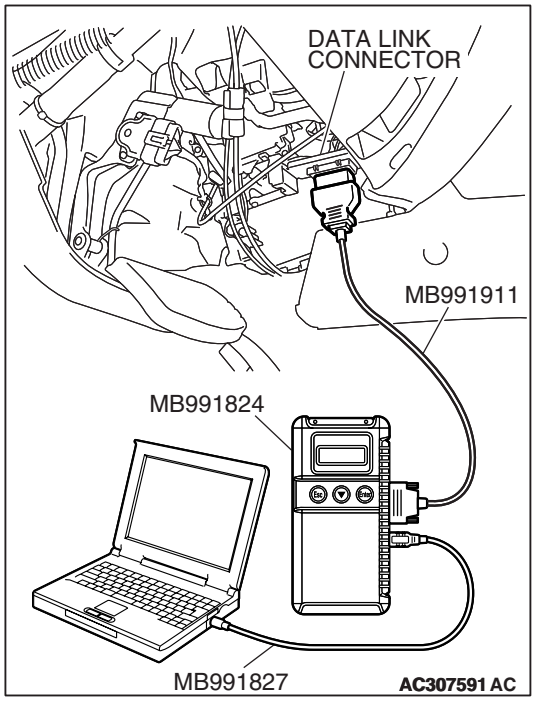
STEP 1. Using scan tool MB991958, check actuator test item 02: Underdrive Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 02: Underdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the underdrive solenoid valve is energized.

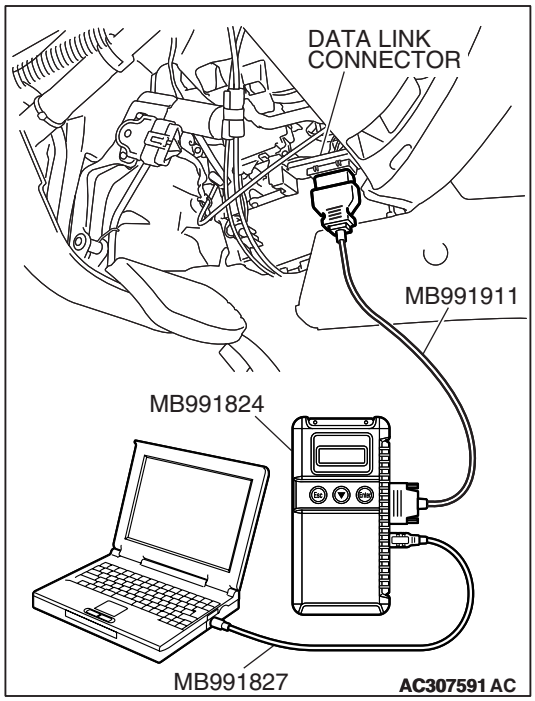
(4) Turn the ignition switch to the "LOCK" (OFF) position.



Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.

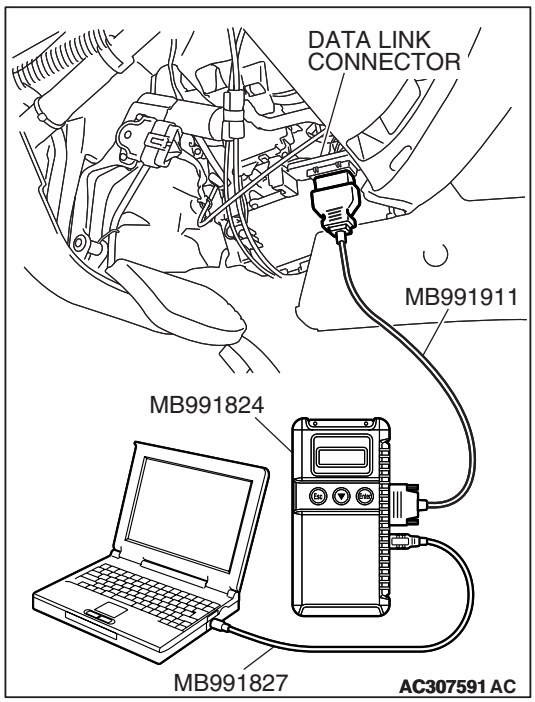


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

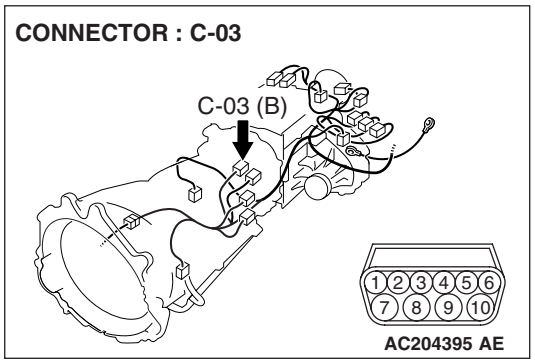
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

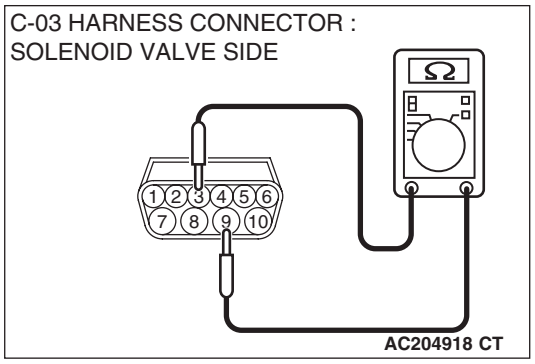
Q: Are DTC 33 and DTC 34 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the underdrive solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 3 and 9.

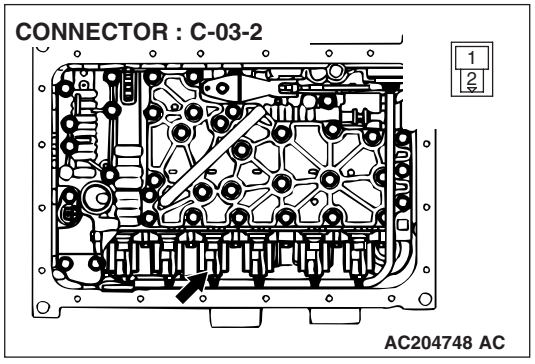
Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

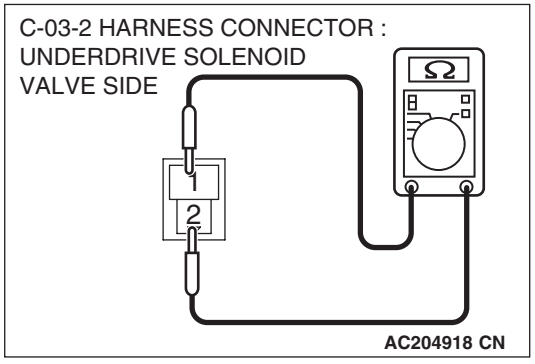
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the underdrive solenoid valve connector C-03-2 inside the transmission.

(1) Disconnect solenoid valve connector C-03-2 and measure at the solenoid valve side.





(2) Measure the resistance between underdrive solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

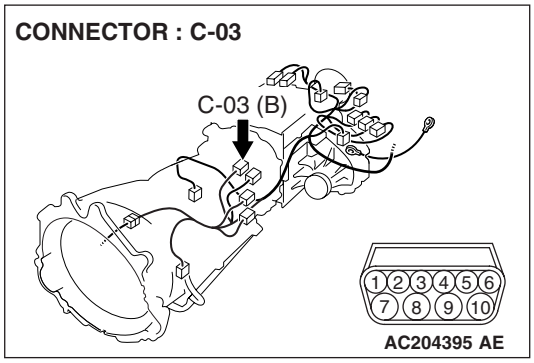
YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.
NO : Replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

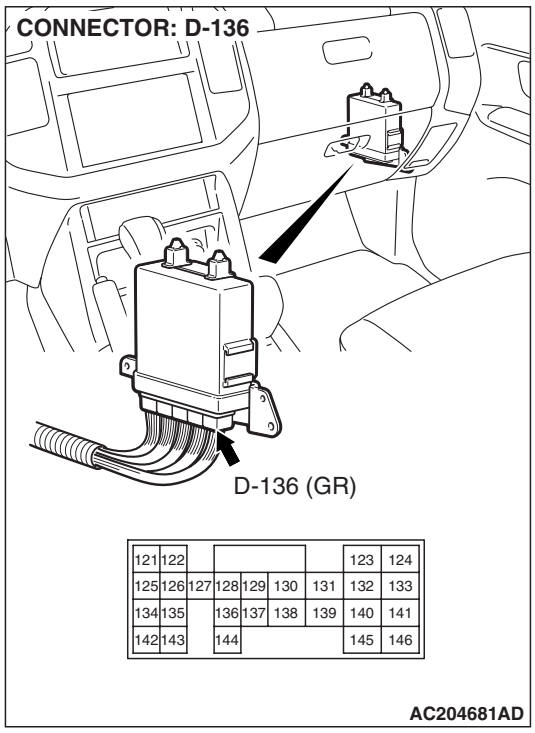
TSB Revision

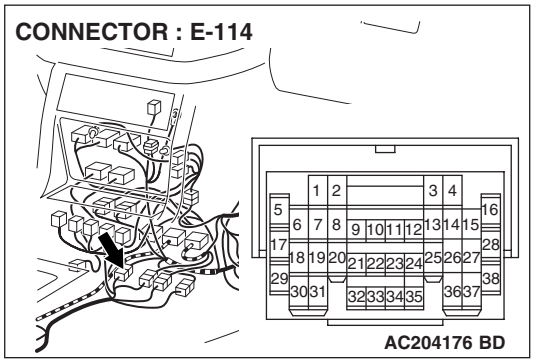
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





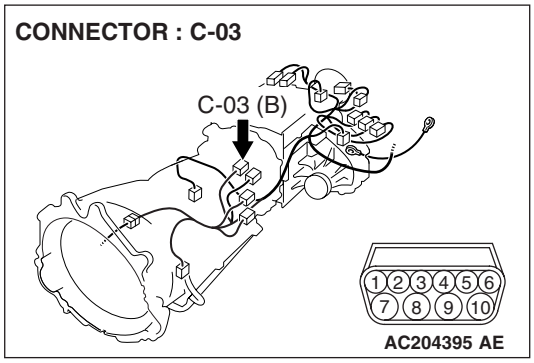


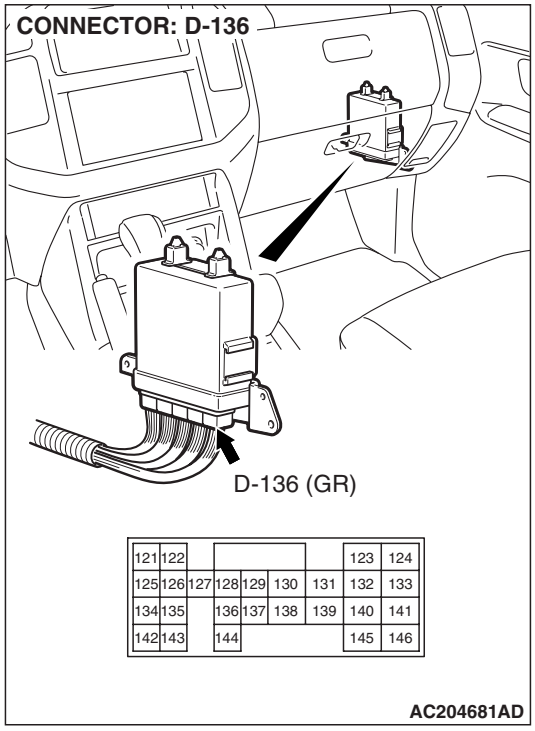
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 3 and PCM connector D-136 terminal 137.

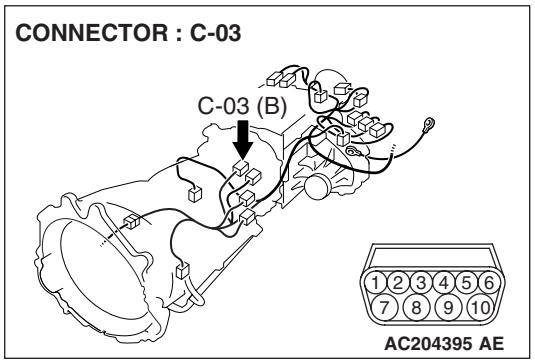
Q: Is the harness wire in good condition?

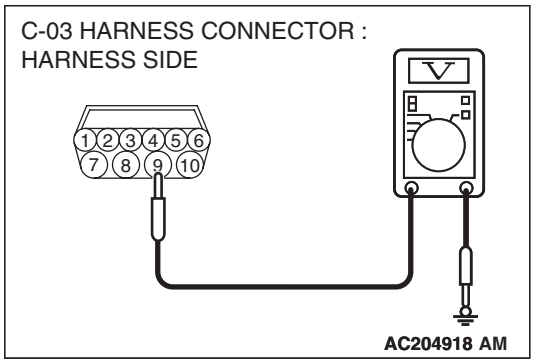
YES : Replace the PCM.

NO : Repair or replace the harness wire.









STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.

(1) Do not disconnect solenoid valve assembly harness connector C-03.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between harness connector C-03 terminal 9 and ground by backprobing.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

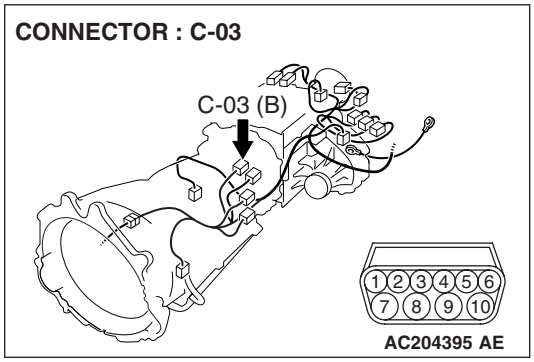
YES : Go to Step 11.
NO : Go to Step 9.

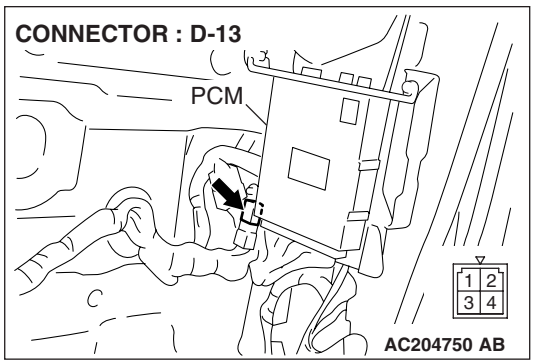
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

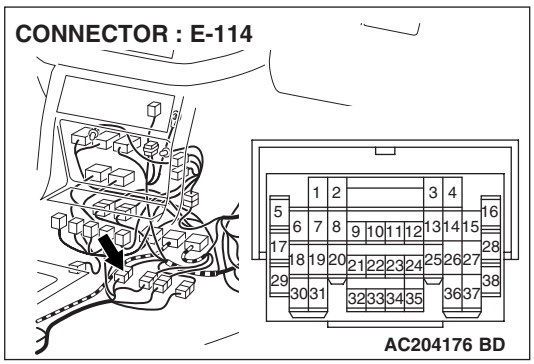
Q: Are the connectors and terminals in good condition?

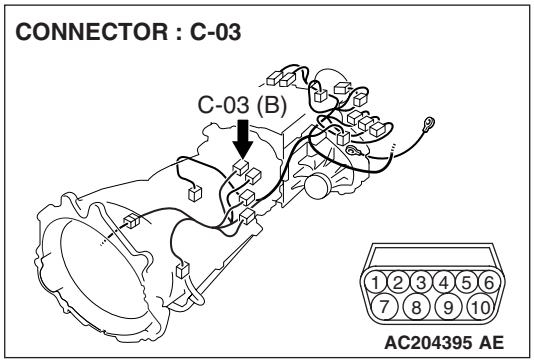
YES : Go to Step 10.

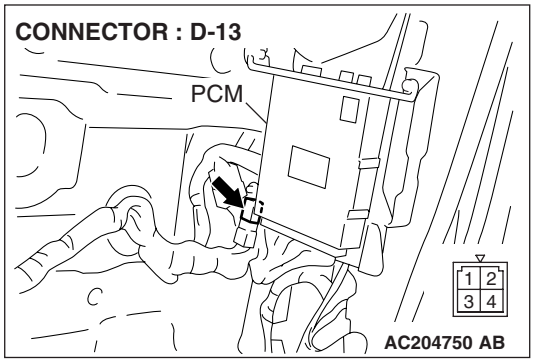
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 9 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

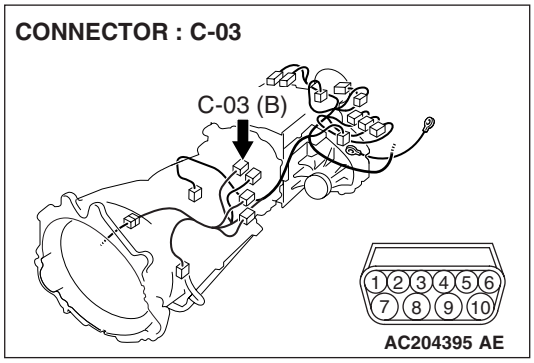
YES : Go to Step 11.

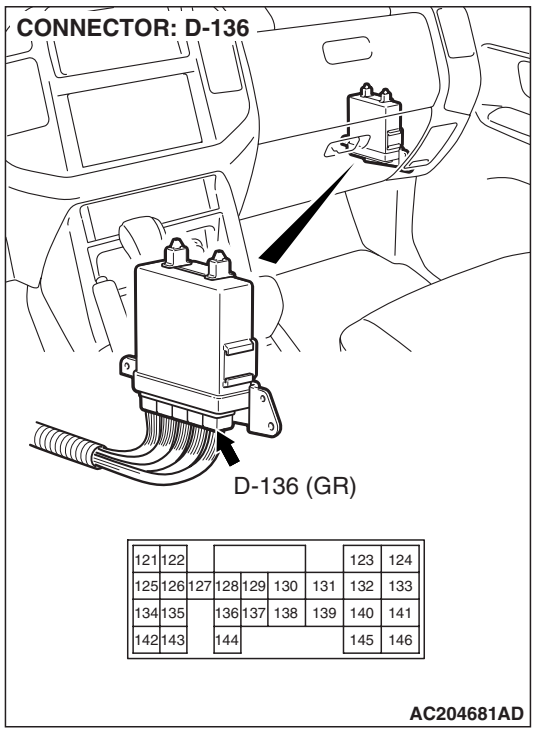
NO : Repair or replace the harness wire.

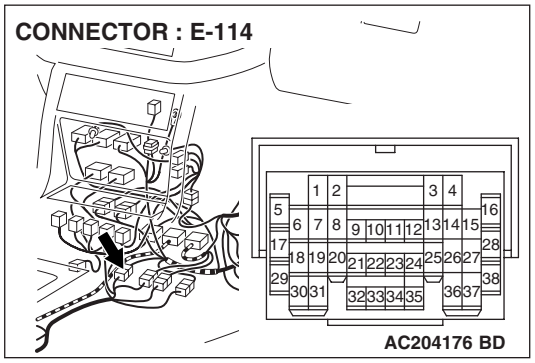
STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

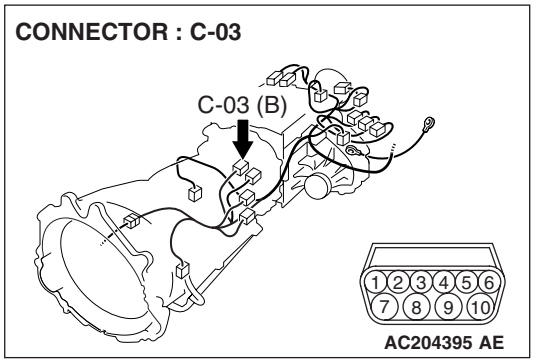
YES : Go to Step 12.

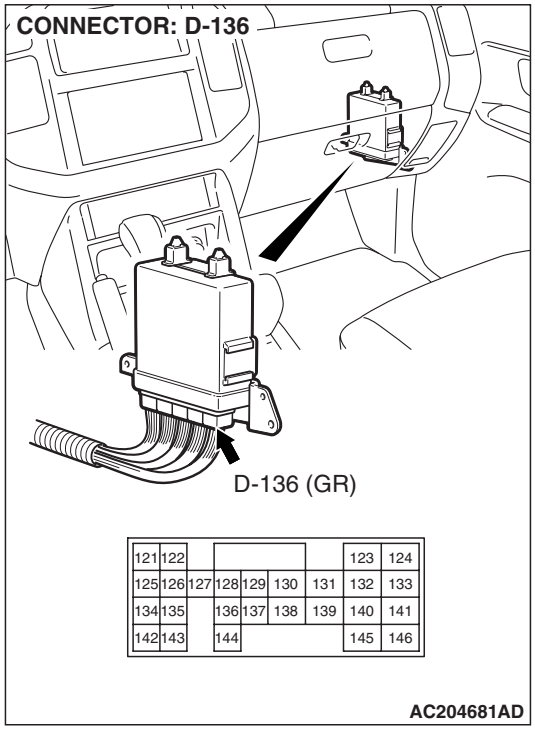
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4 and 5) and PCM connector D-136 (terminals 136, 137 and 138).

Q: Are the harness wires in good condition?

YES : Go to Step 13.

NO : Repair or replace the harness wire(s).

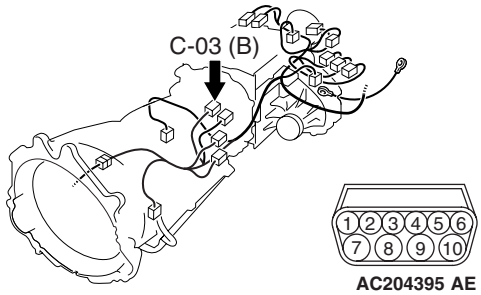
STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4, 5, and 9) and solenoid valve connectors C-03-1, C-03-2 and C-03-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Replace the harness wire.

CONNECTOR : C-03



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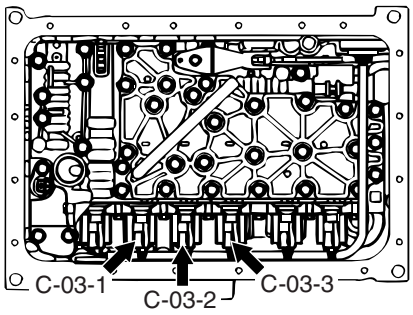
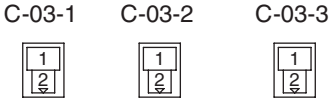
CONNECTORS : C-03-1, C-03-2, C-03-3





AC204749 AB

DTC 33 (P0763): Second Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23A-178.

CIRCUIT OPERATION
Refer to P.23A-178.

DESCRIPTIONS OF MONITOR METHODS
If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that second solenoid has a failure.

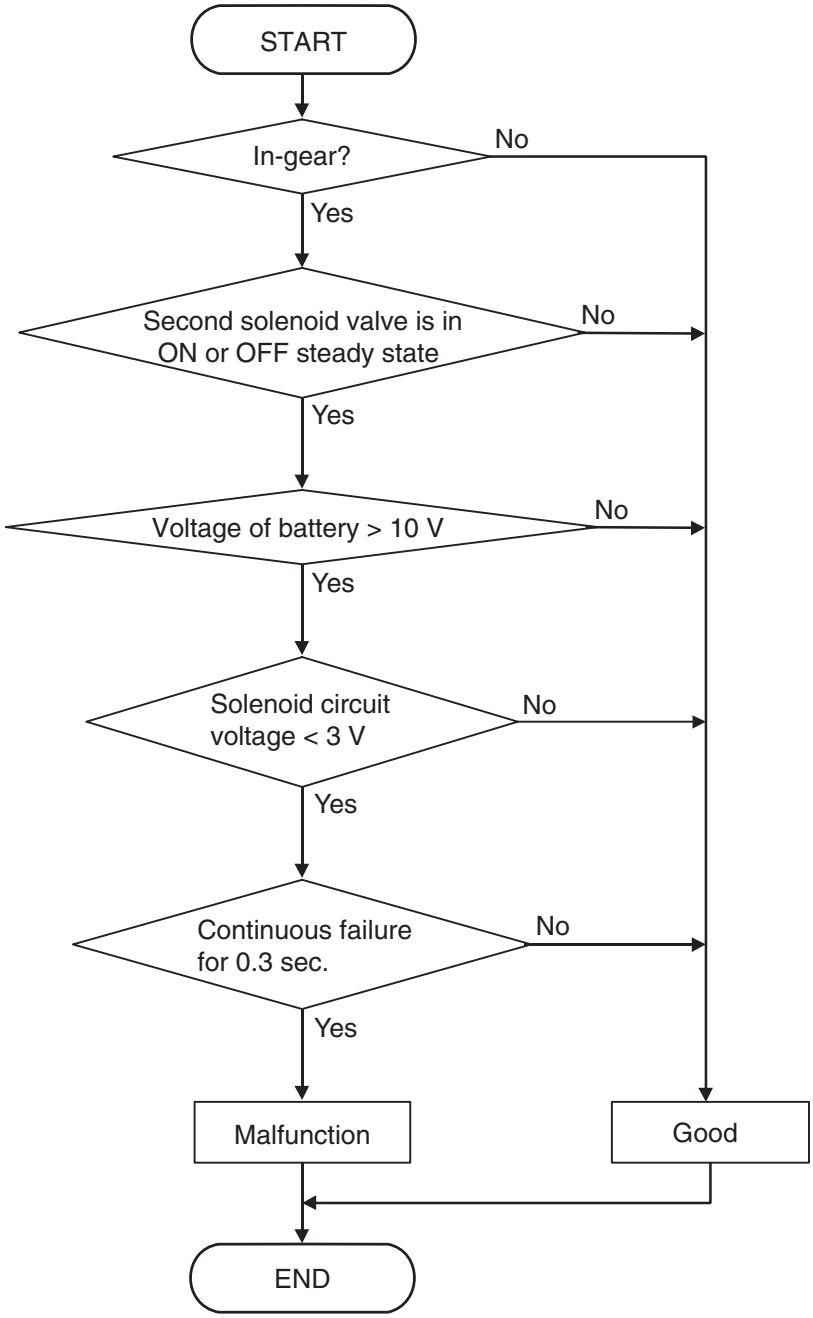
MONITOR EXECUTION
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 33 (P0763) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of second solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

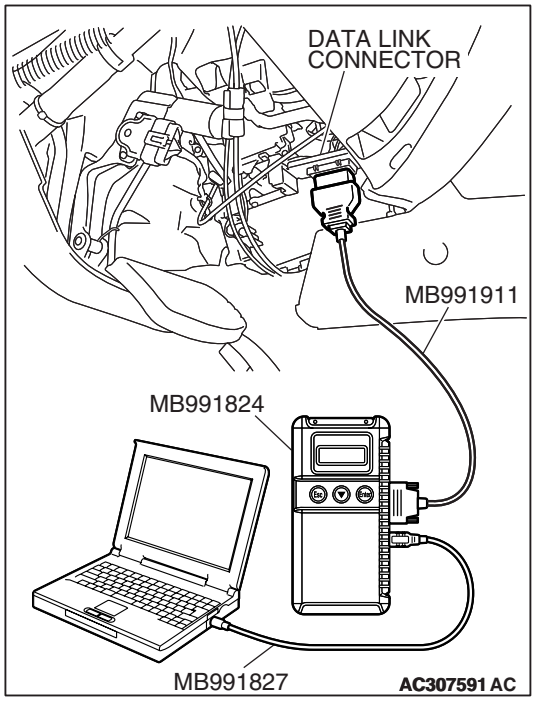
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 03: Second Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



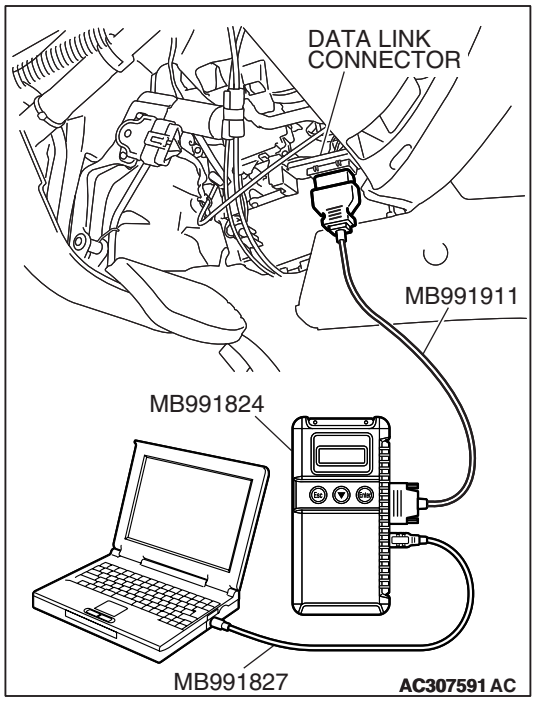
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 03: Second Solenoid Valve.
  - An audible clicking or buzzing should be heard when the second solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.

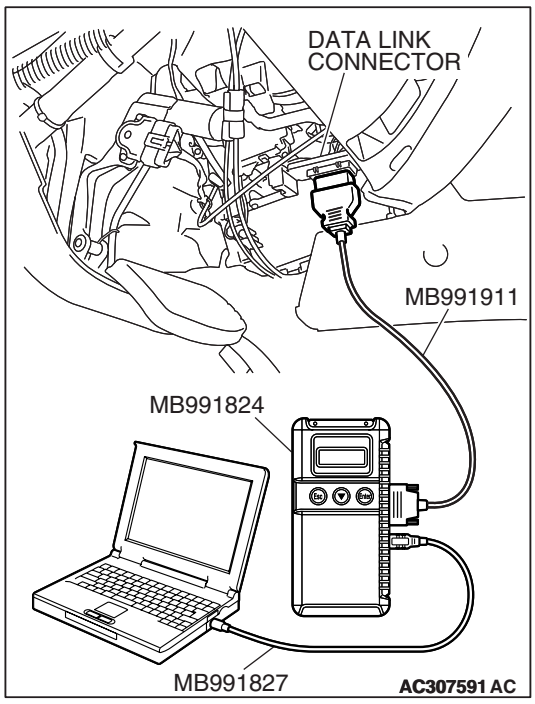


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

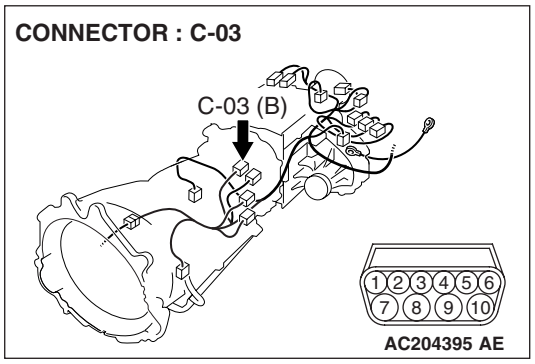
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

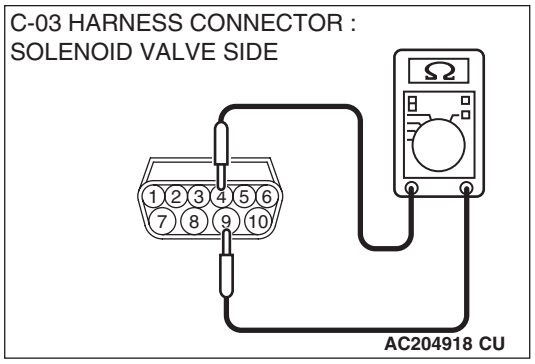
Q: Are DTC 32 and DTC 34 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the second solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 4 and 9.

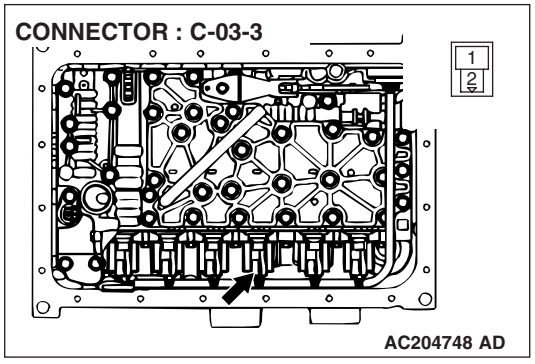
Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

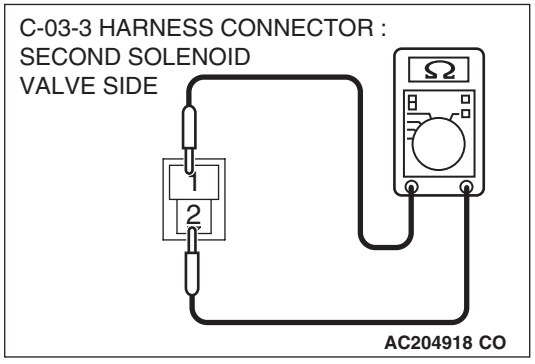
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the second solenoid valve connector C-03-3 inside the transmission.

(1) Disconnect solenoid valve connector C-03-3 and measure at the solenoid valve side.





(2) Measure the resistance between second solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

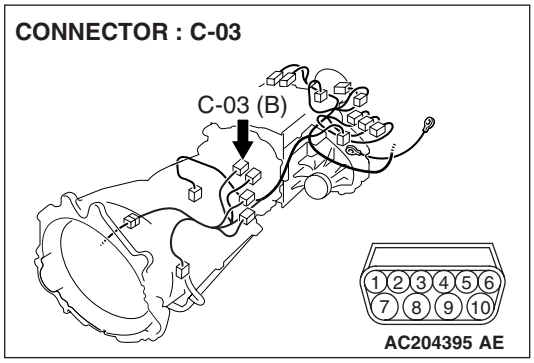
YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.
NO : Replace the second solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

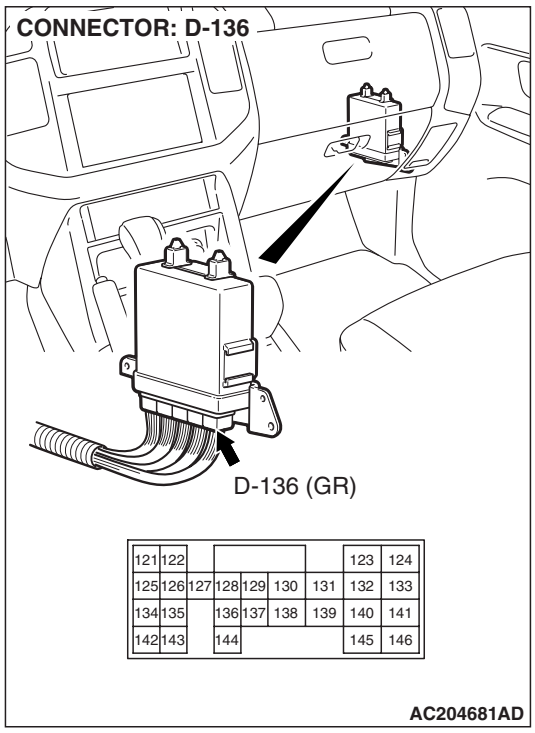
TSB Revision

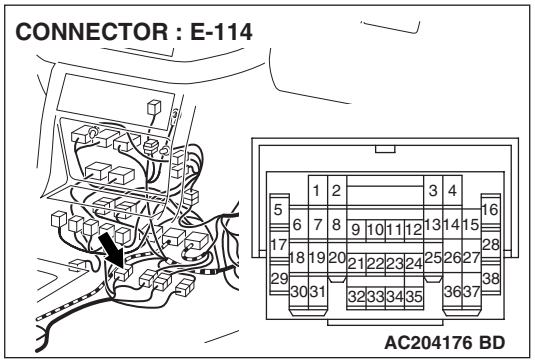
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





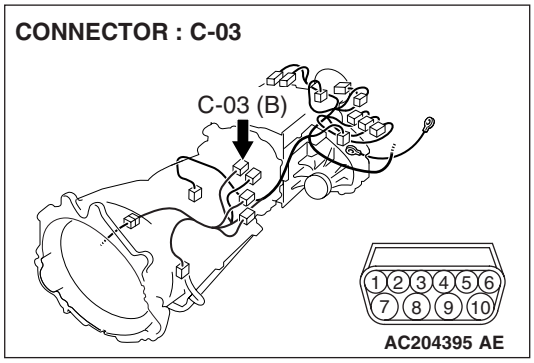


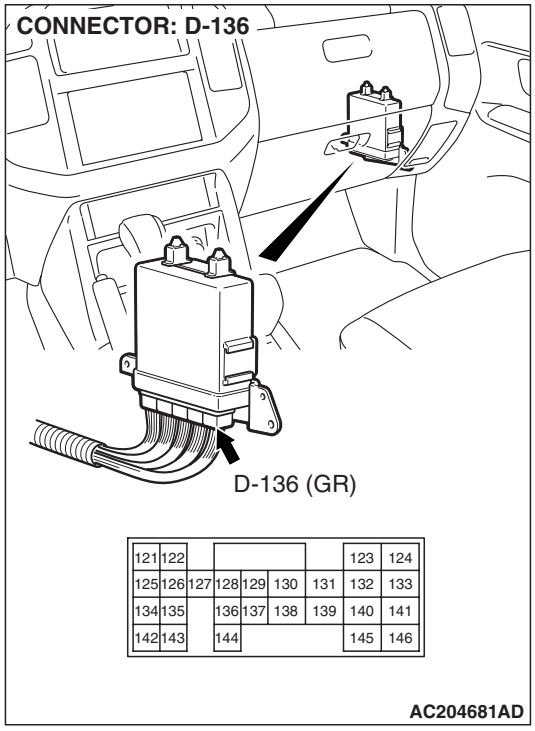
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 4 and PCM connector D-136 terminal 136.

Q: Is the harness wire in good condition?

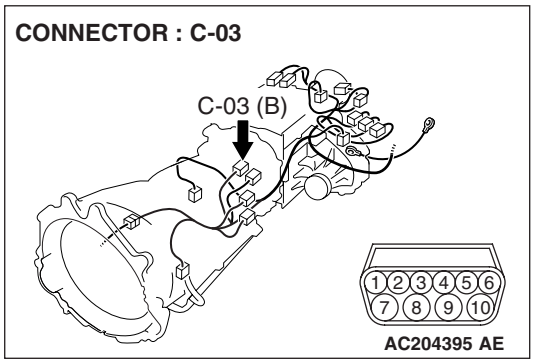
YES : Replace the PCM.

NO : Repair or replace the harness wire.

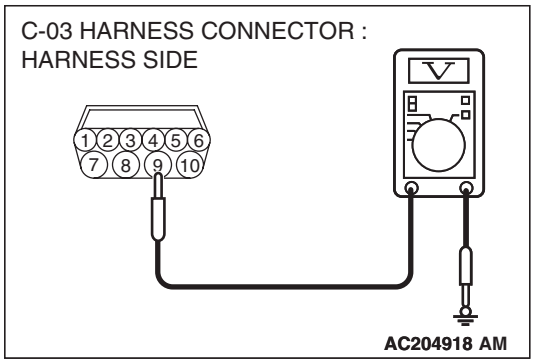




STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.



(1) Do not disconnect solenoid valve assembly harness connector C-03.
(2) Turn the ignition switch to the "ON" position.

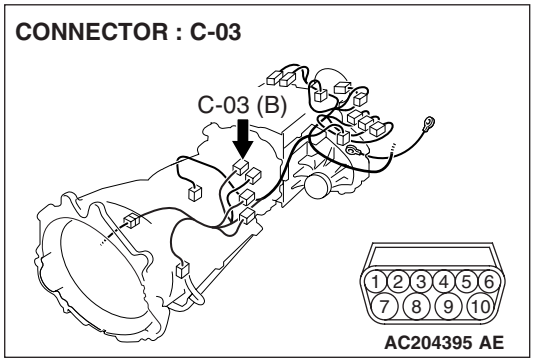


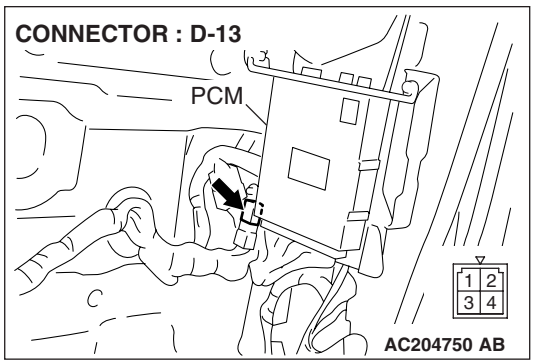
(3) Measure the voltage between harness connector C-03 terminal 9 and ground by backprobing.
- The voltage should equal battery positive voltage.

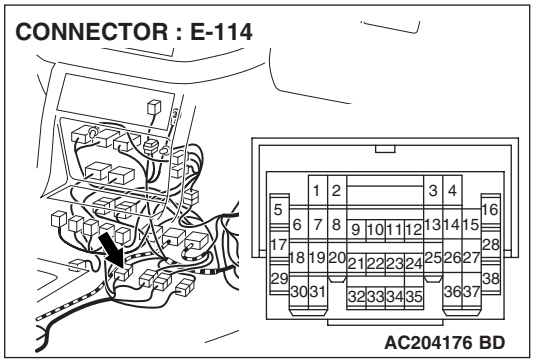
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.
NO : Go to Step 9.





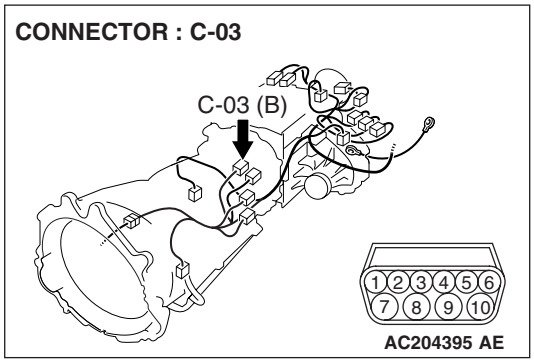


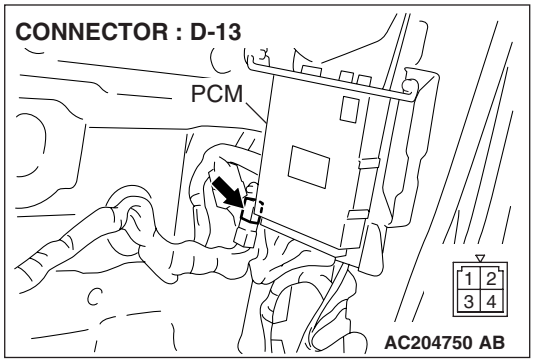
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 9 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

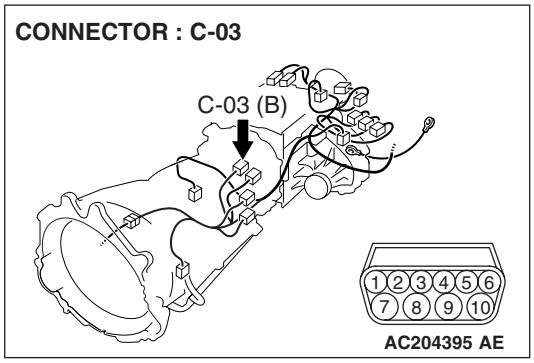
YES : Go to Step 11.

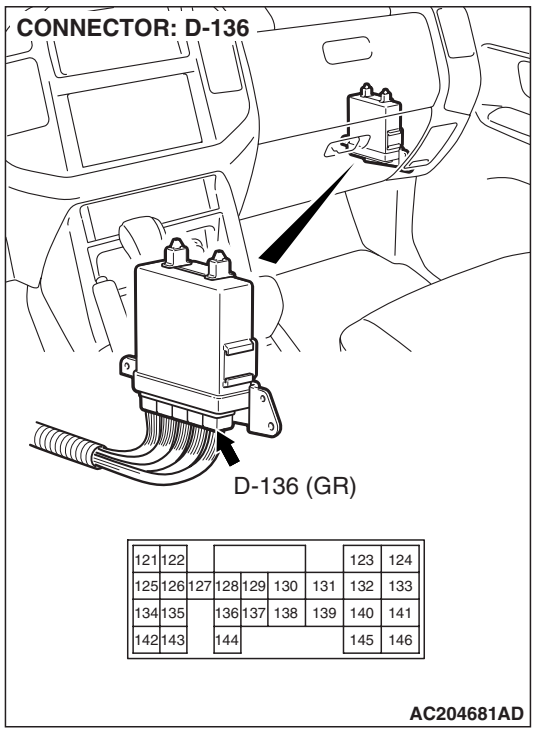
NO : Repair or replace the harness wire.

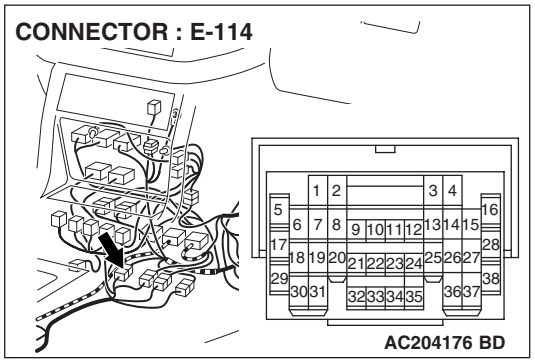
STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





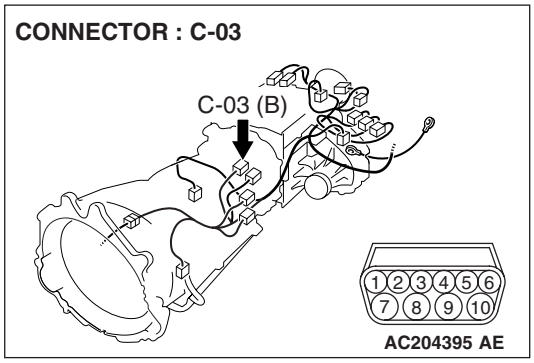


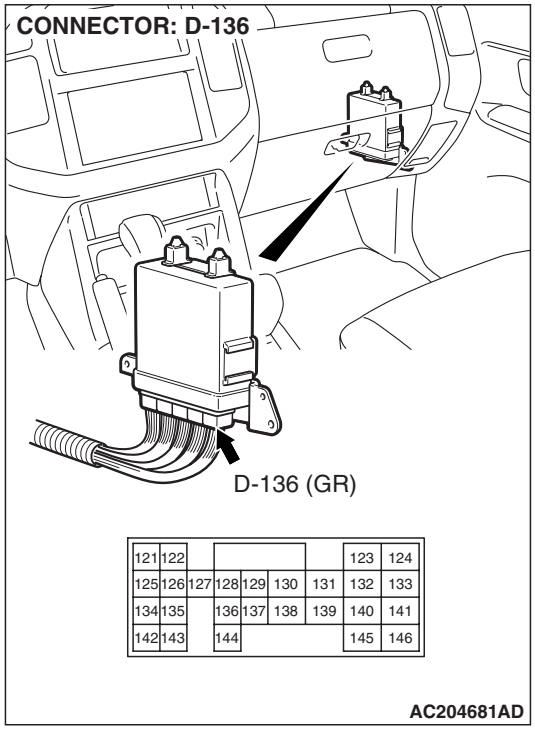
STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4 and 5) and PCM connector D-136 (terminals 136, 137 and 138).

Q: Are the harness wires in good condition?

YES : Go to Step 13.

NO : Repair or replace the harness wire(s).





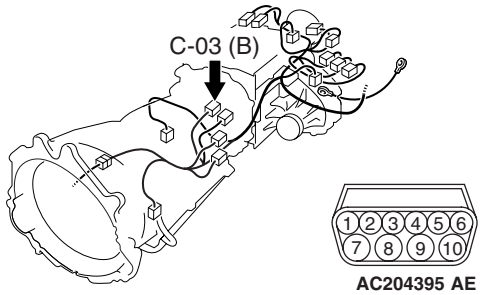
STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4, 5 and 9) and solenoid valve connectors C-03-1, C-03-2 and C-03-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

NO : Replace the harness wire.

CONNECTOR : C-03



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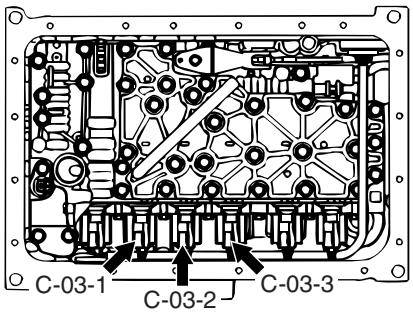
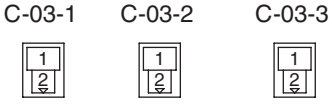
CONNECTORS : C-03-1, C-03-2, C-03-3





AC204749 AB

DTC 34 (P0768): Overdrive Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23A-178.

CIRCUIT OPERATION
Refer to P.23A-178.

DESCRIPTIONS OF MONITOR METHODS
If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that overdrive solenoid has a failure.

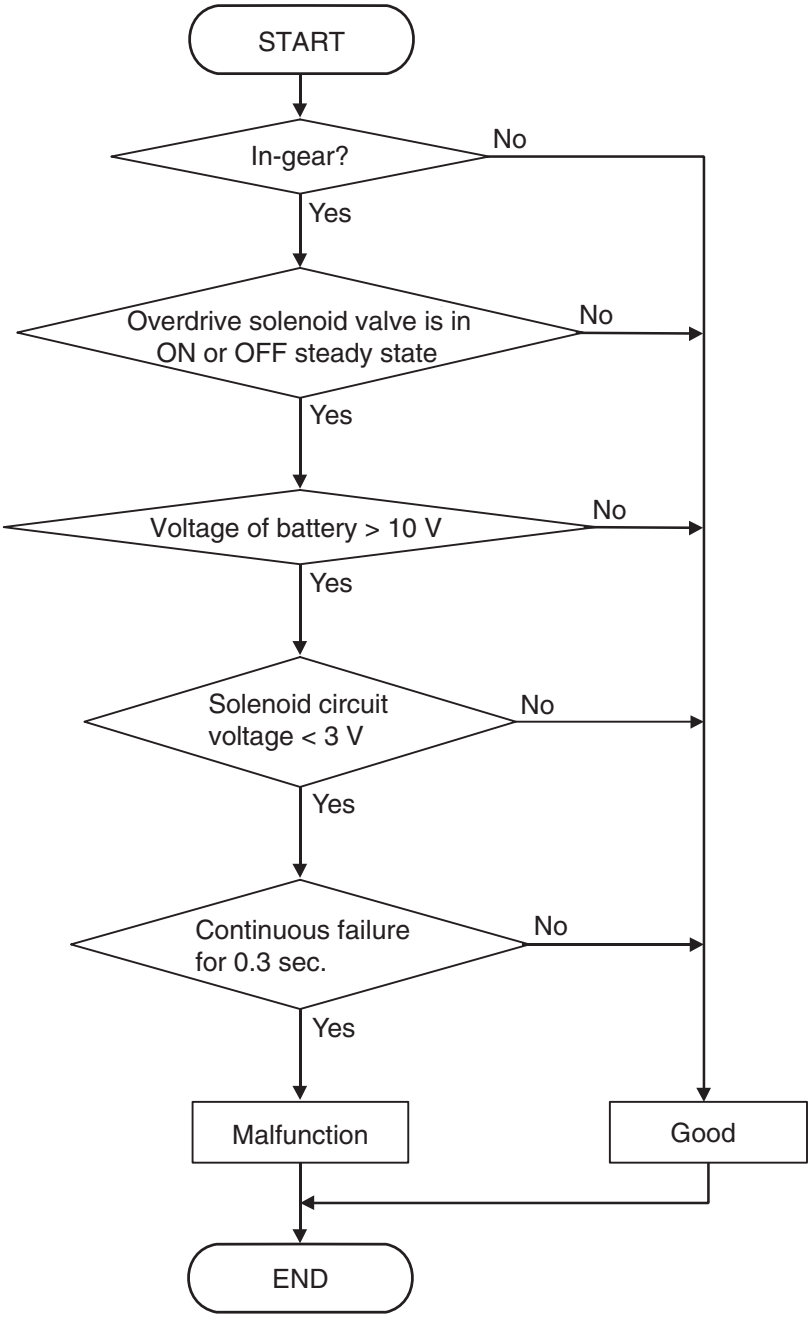
MONITOR EXECUTION
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 34 (P0768) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of overdrive solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 04: Overdrive Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

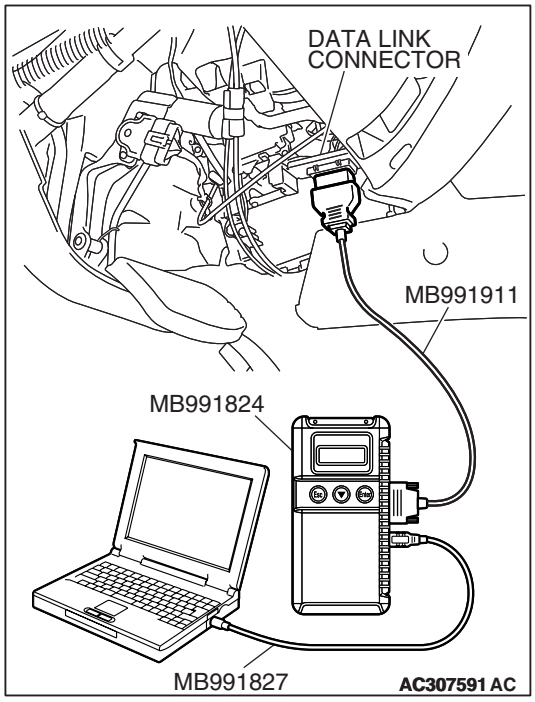
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 04: Overdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the overdrive solenoid valve is energized.

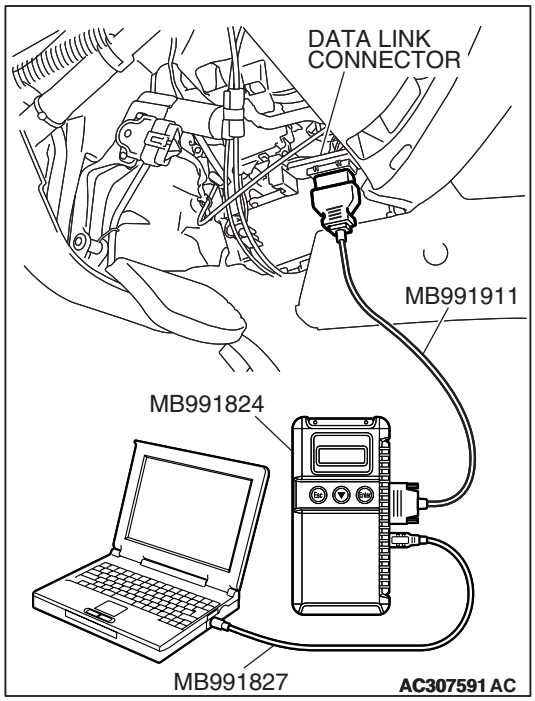
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.



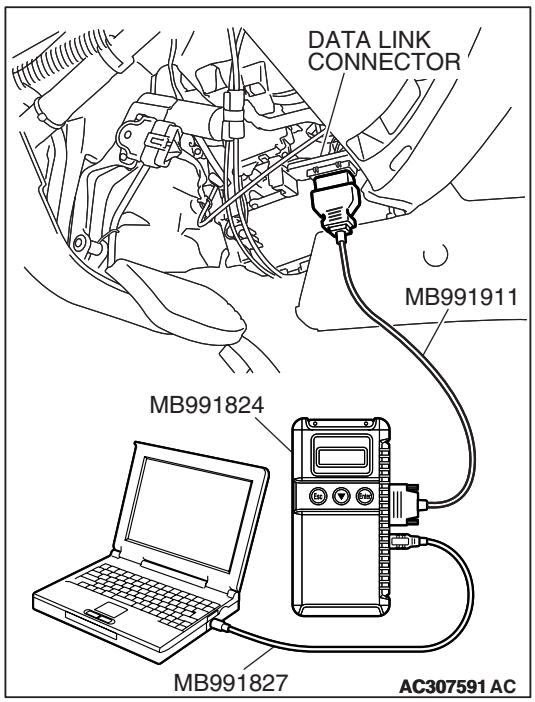


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

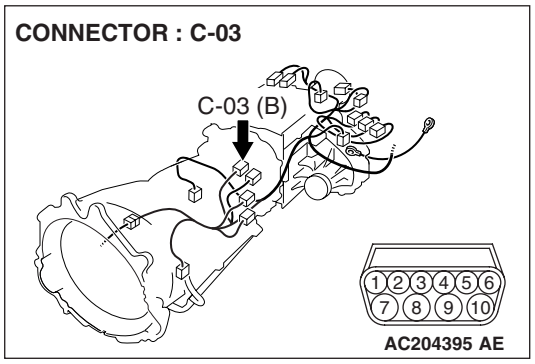
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

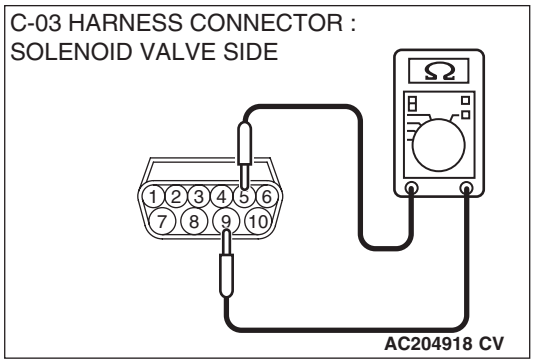
Q: Are DTC 32 and DTC 33 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the overdrive solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 5 and 9.

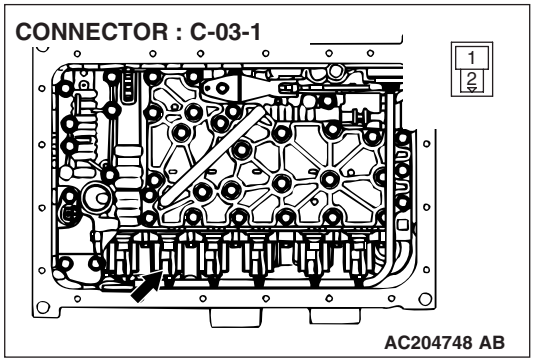
Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

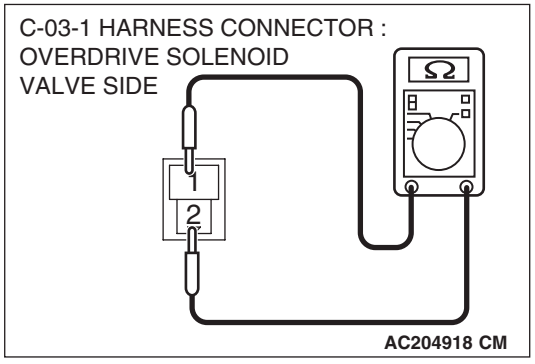
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the overdrive solenoid valve connector C-03-1 inside the transmission.

(1) Disconnect solenoid valve connector C-03-1and measure at the solenoid valve side.





(2) Measure the resistance between overdrive solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

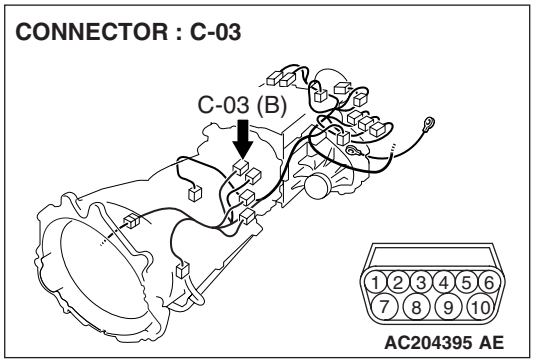
YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.
NO : Replace the overdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

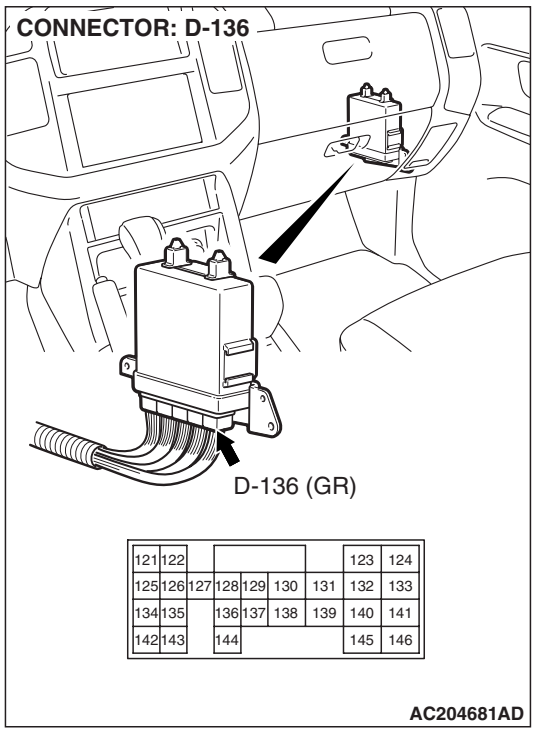
TSB Revision

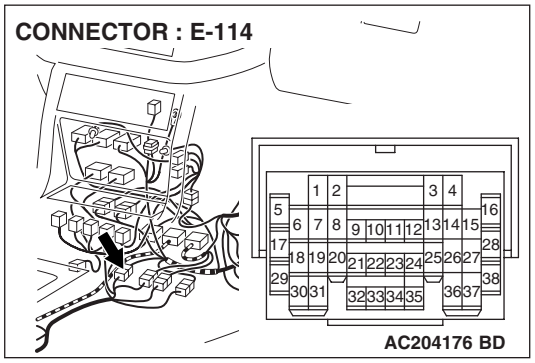
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





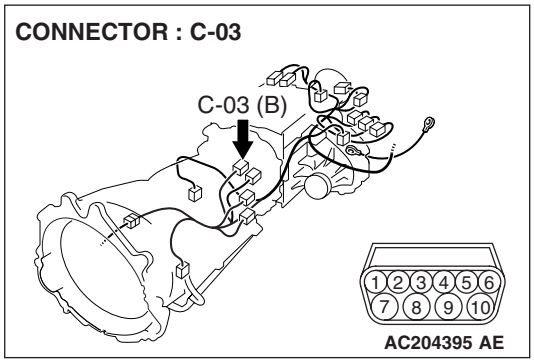


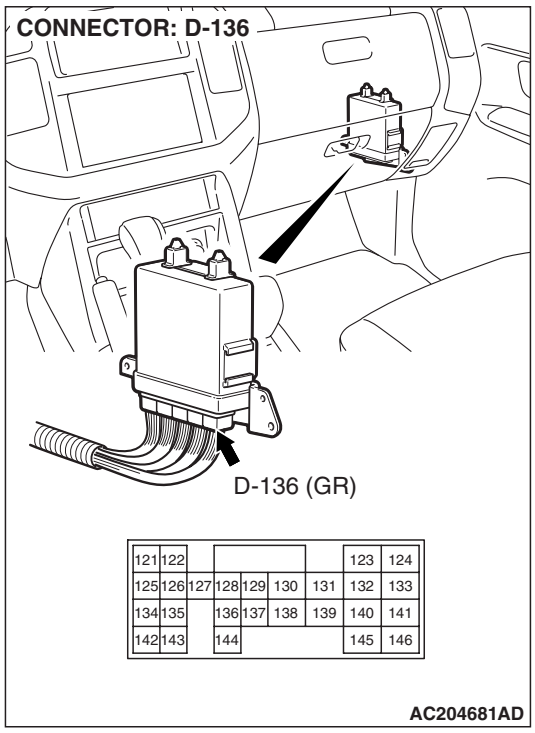
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 5 and PCM connector D-136 terminal 138.

Q: Is the harness wire in good condition?

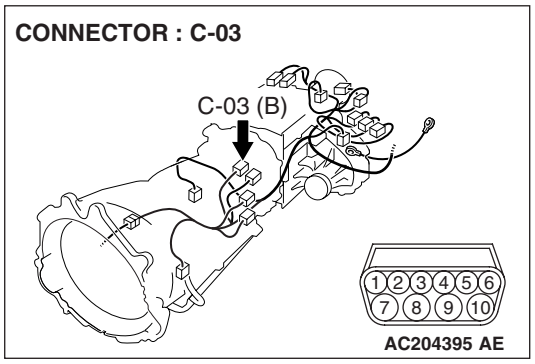
YES : Replace the PCM.

NO : Repair or replace the harness wire.

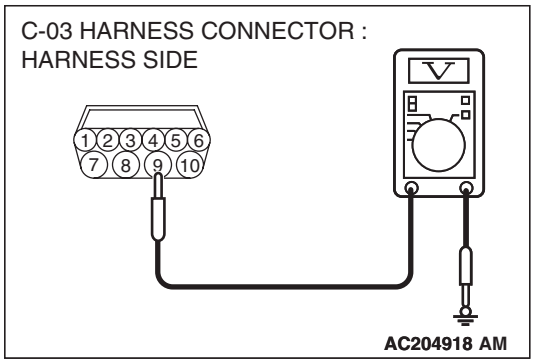




STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.



(1) Do not disconnect solenoid valve assembly harness connector C-03.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between harness connector C-03 terminal 9 and ground by backprobing.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

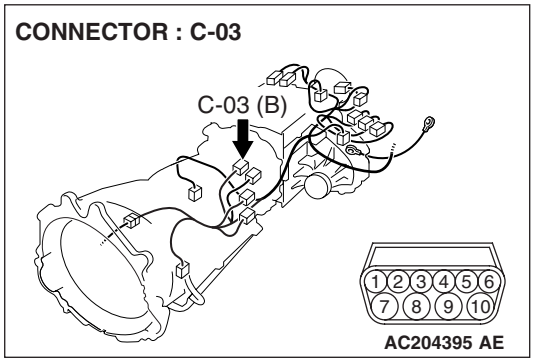
YES : Go to Step 11.
NO : Go to Step 9.

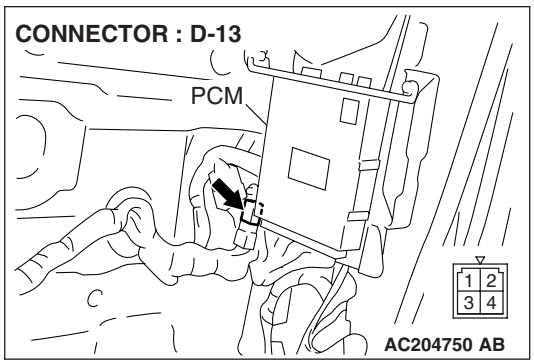
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

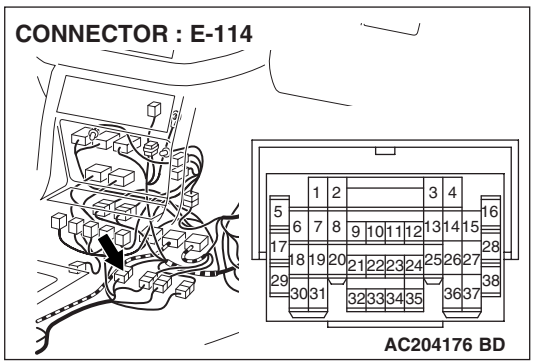
Q: Are the connectors and terminals in good condition?

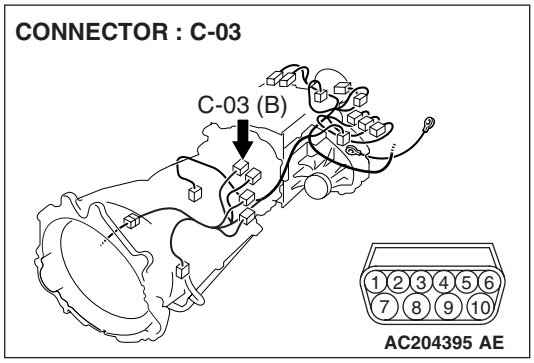
YES : Go to Step 10.

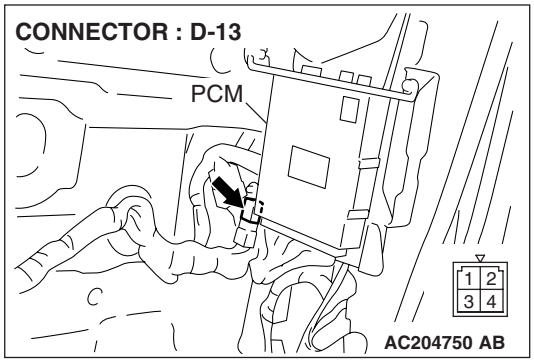
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 9 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

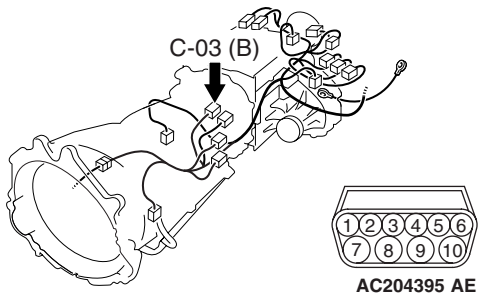
NO : Repair or replace the harness wire.

STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

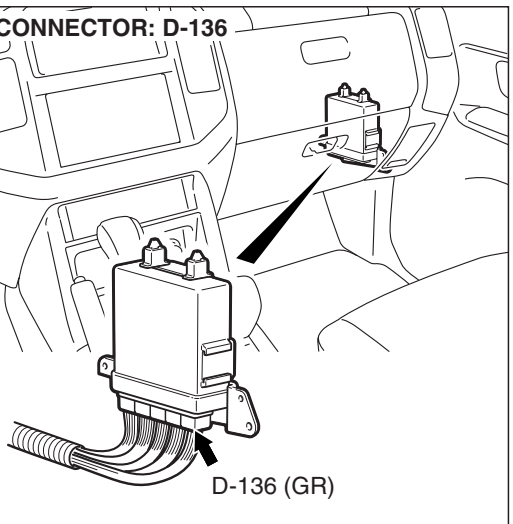
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR : C-03



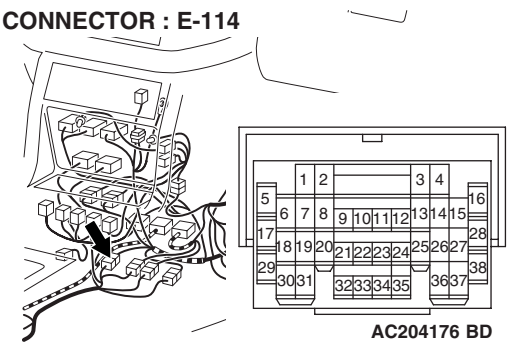
AC204395 AE

CONNECTOR: D-136



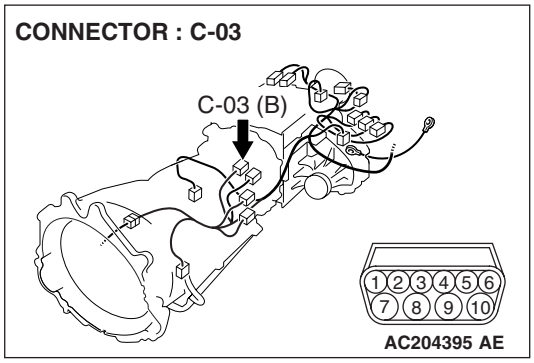
AC204681AD

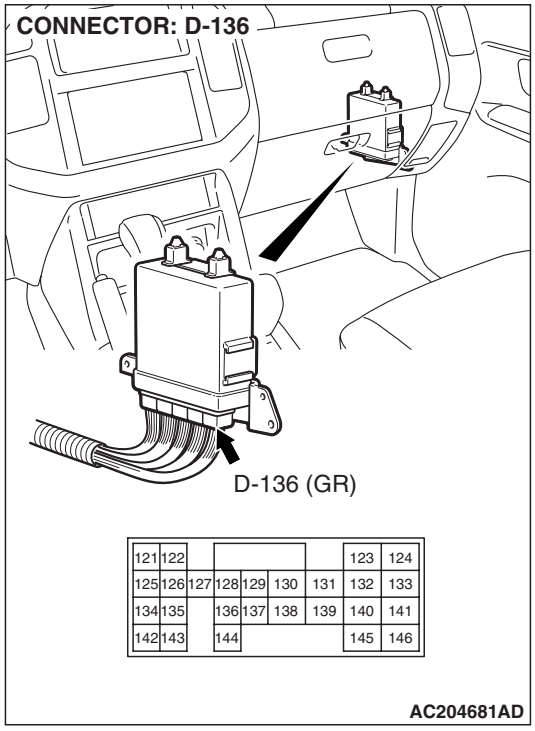
CONNECTOR : E-114



AC204176 BD

TSB Revision





STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4 and 5) and PCM connector D-136 (terminals 136, 137 and 138).

Q: Are the harness wires in good condition?

YES : Go to Step 13.

NO : Repair or replace the harness wire(s).

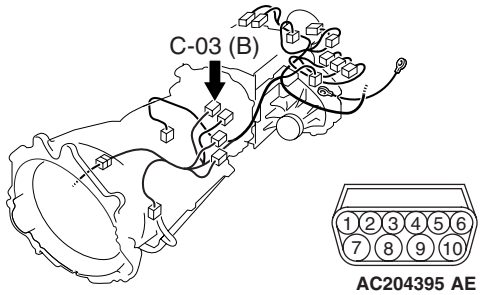
STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 3, 4, 5 and 9) and solenoid valve connectors C-03-1, C-03-2 and C-03-3.

Q: Is the harness wire in good condition?

YES : Replace the PCM.

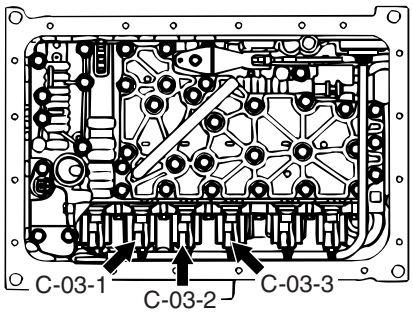
NO : Replace the harness wire.

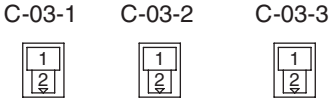
CONNECTOR : C-03



AC204395 AE

CONNECTORS : C-03-1, C-03-2, C-03-3





AC204749 AB

DTC 35 (P0773): Reduction Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23A-178.

CIRCUIT OPERATION
Refer to P.23A-178.

DESCRIPTIONS OF MONITOR METHODS
If solenoid terminal voltage is below specified value when shift control is not in progress, PCM judges that reduction solenoid has a failure.

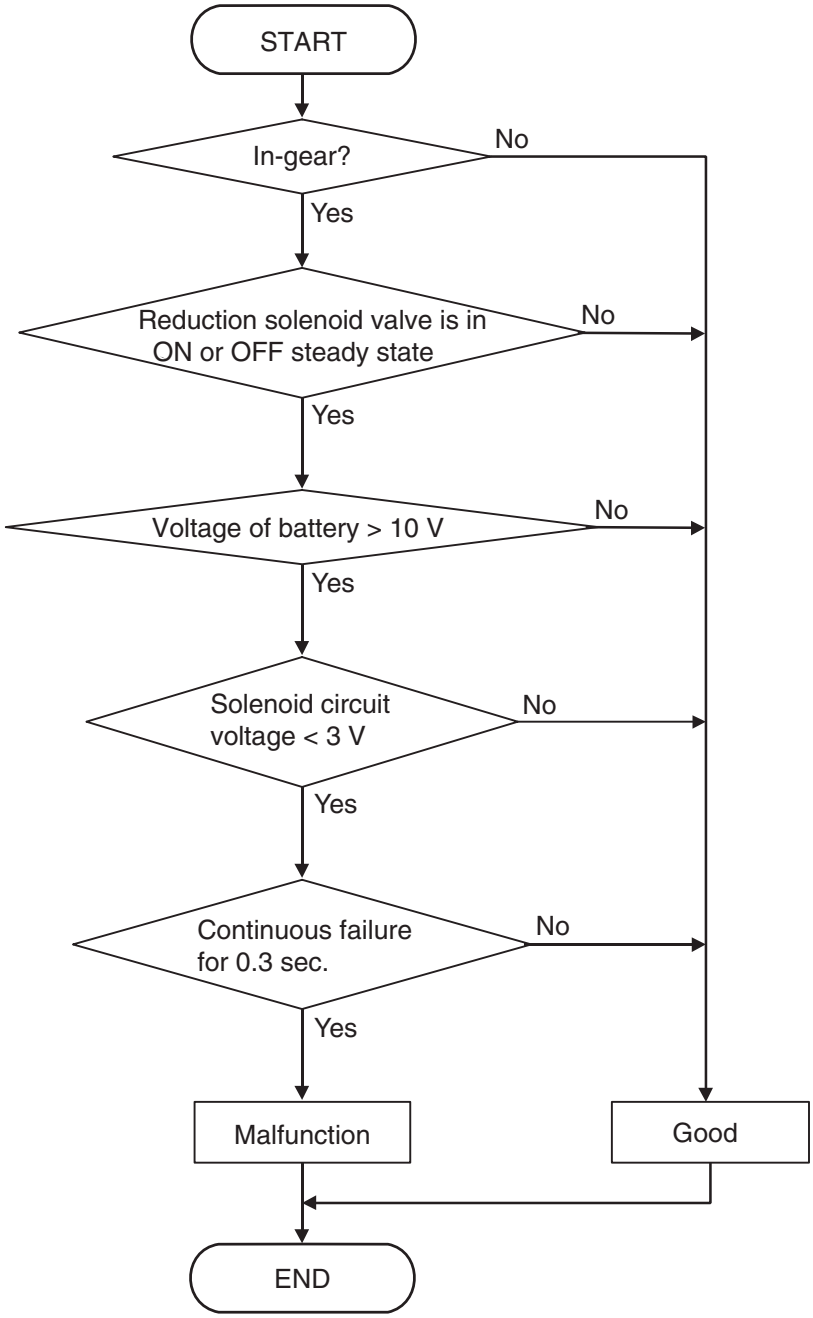
MONITOR EXECUTION
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Shift status: in-gear.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 35 (P0773) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of reduction solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 05: Reduction Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

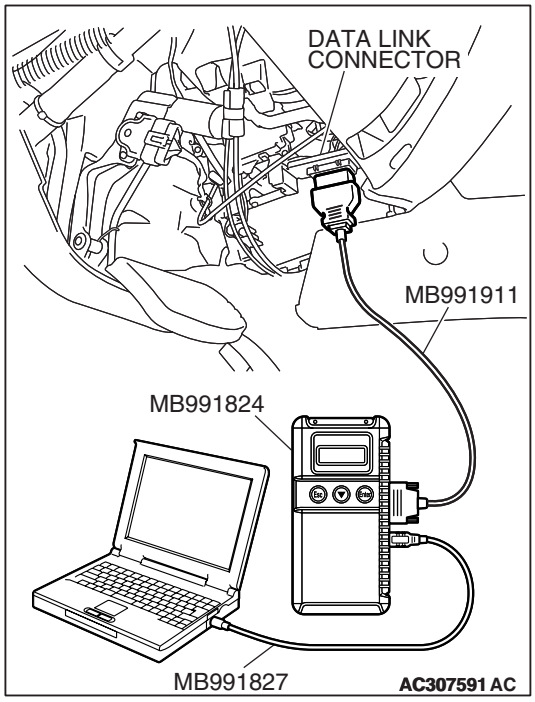
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
  - Item 05: Reduction Solenoid Valve.
    - An audible clicking or buzzing should be heard when the reduction solenoid valve is energized.

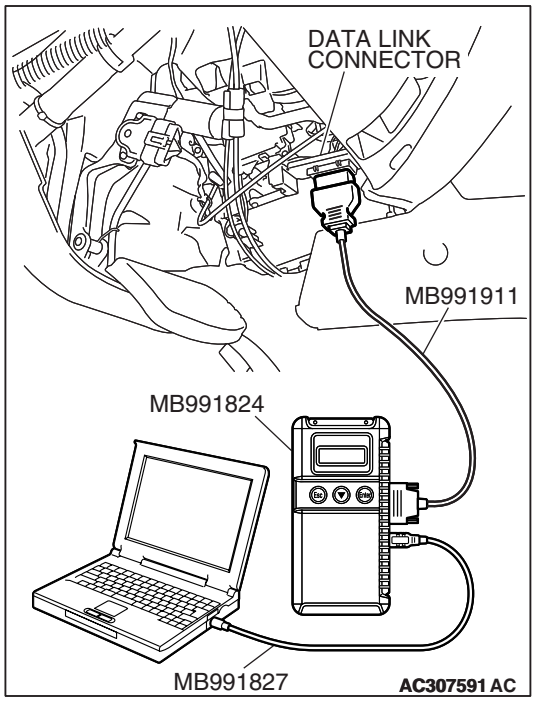
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.



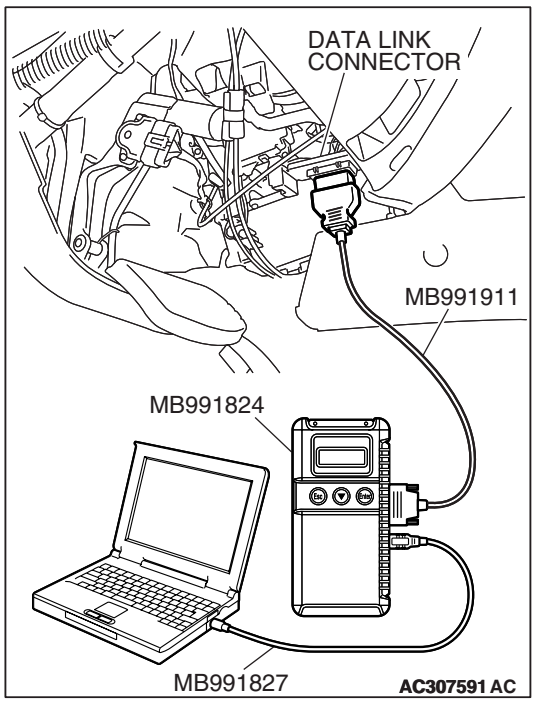


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

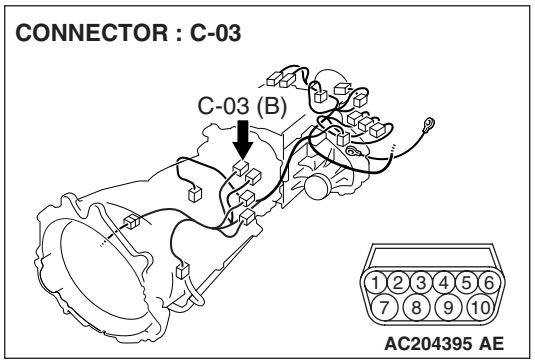
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

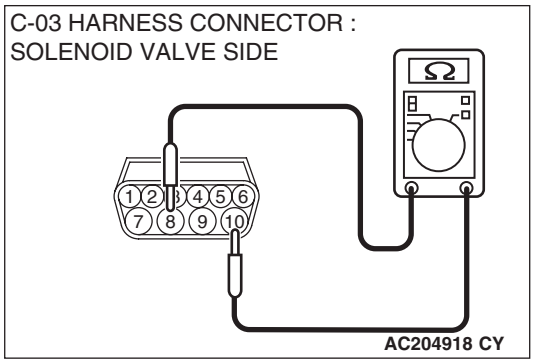
Q: Are DTC 31 and DTC 36 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the reduction solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 8 and 10.

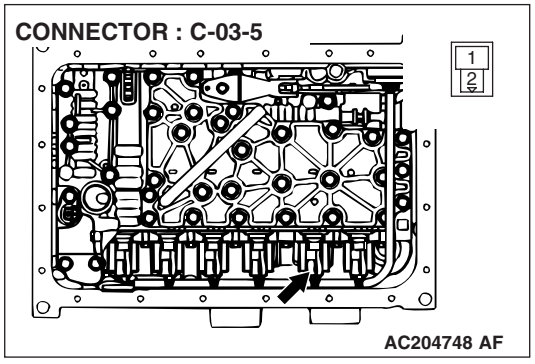
Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

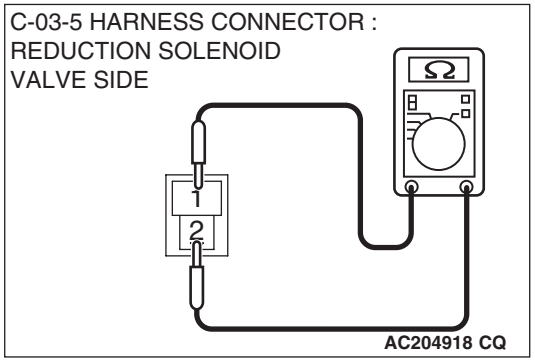
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

YES : Go to Step 6.
NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the reduction solenoid valve connector C-03-5 inside the transmission.

(1) Disconnect solenoid valve connector C-03-5 and measure at the solenoid valve side.





(2) Measure the resistance between reduction solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

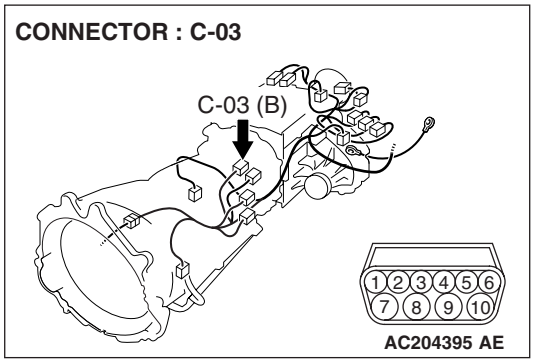
YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.
NO : Replace the reduction solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

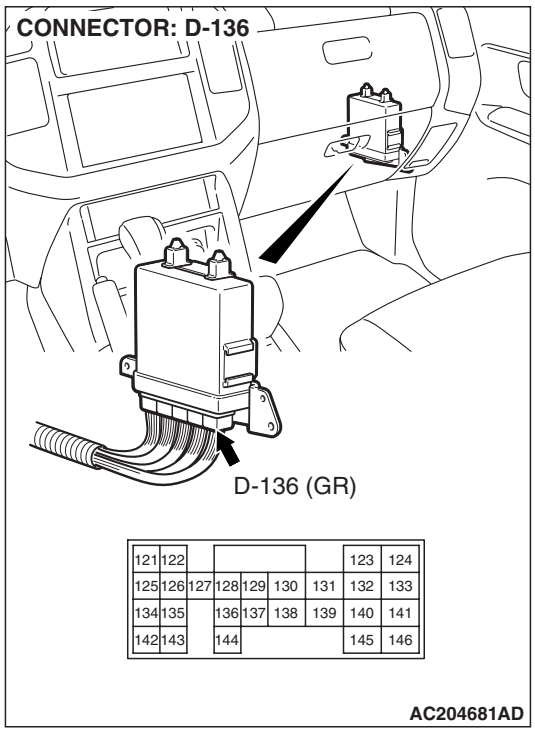
TSB Revision

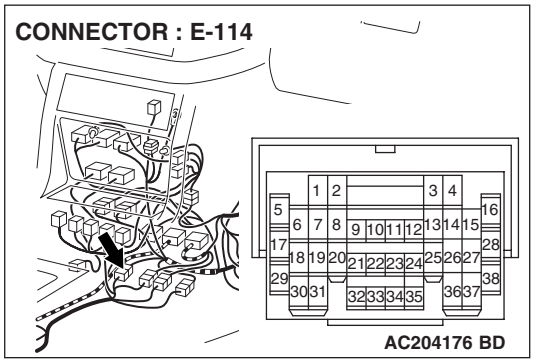
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





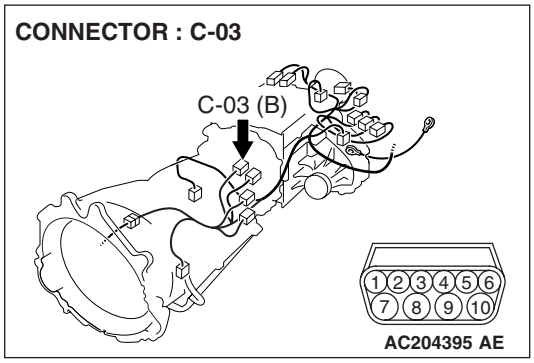


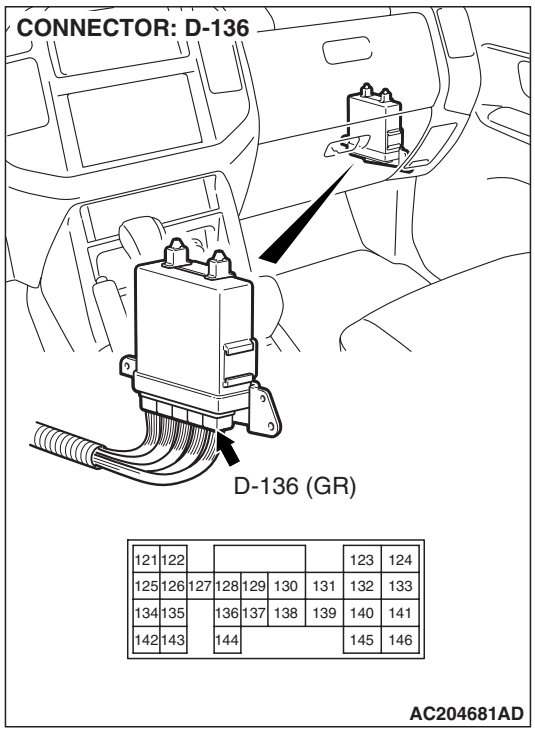
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 8 and PCM connector D-136 terminal 129.

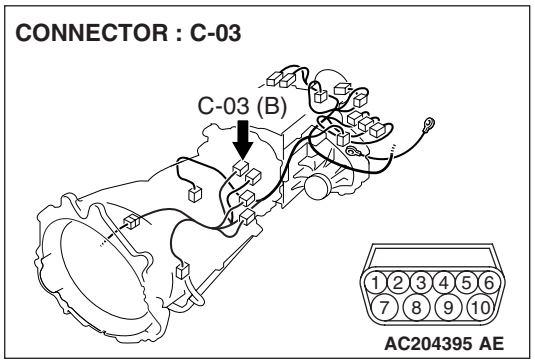
Q: Is the harness wire in good condition?

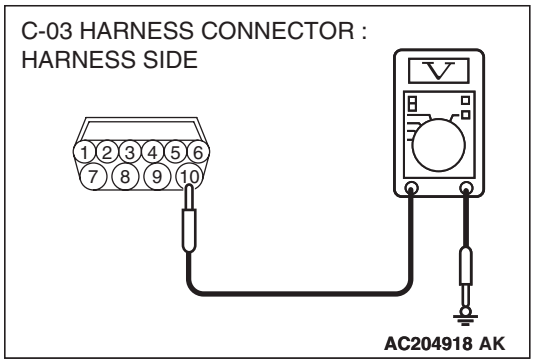
YES : Replace the PCM.

NO : Repair or replace the harness wire.









STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.

(1) Do not disconnect solenoid valve assembly harness connector C-03.
(2) Turn the ignition switch to the "ON" position.
(3) Measure the voltage between harness connector C-03 terminal 10 and ground by backprobing.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

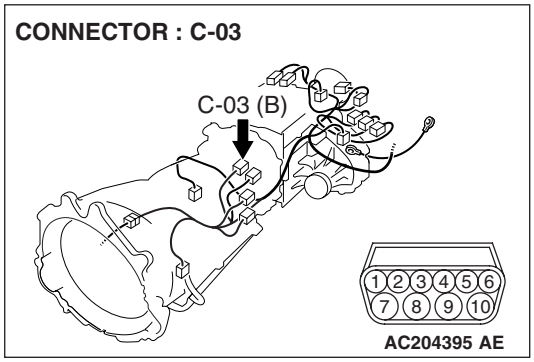
YES : Go to Step 11.
NO : Go to Step 9.

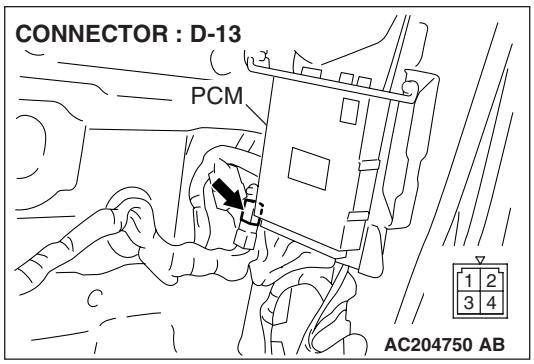
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

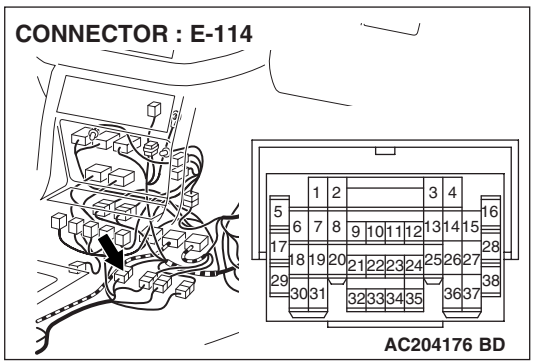
Q: Are the connectors and terminals in good condition?

YES : Go to Step 10.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





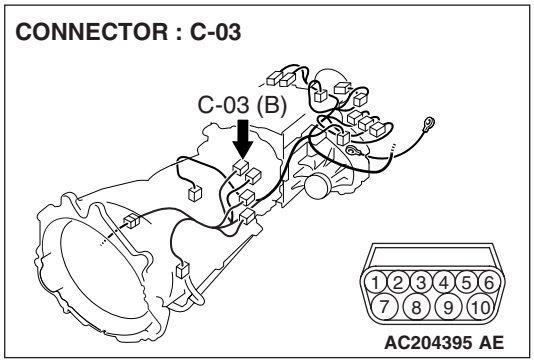


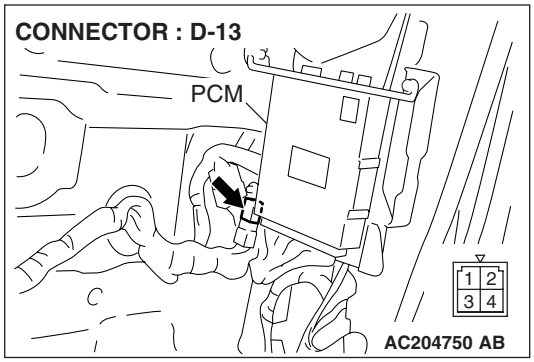
STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 10 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 11.

NO : Repair or replace the harness wire.

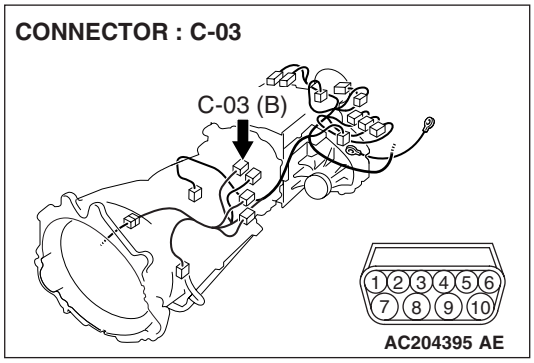


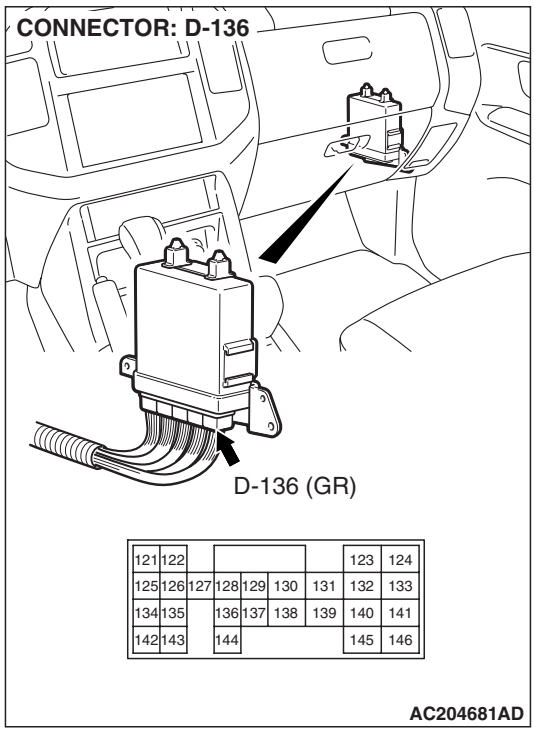


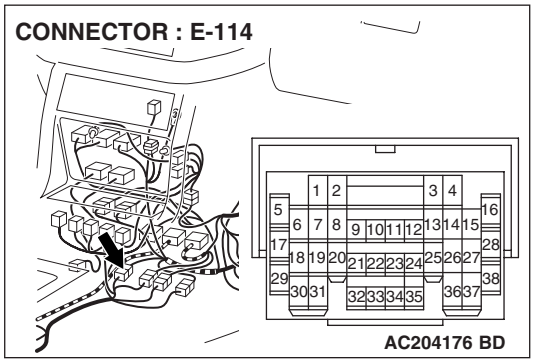
STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





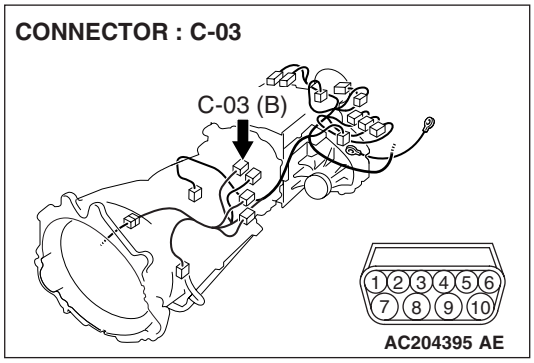


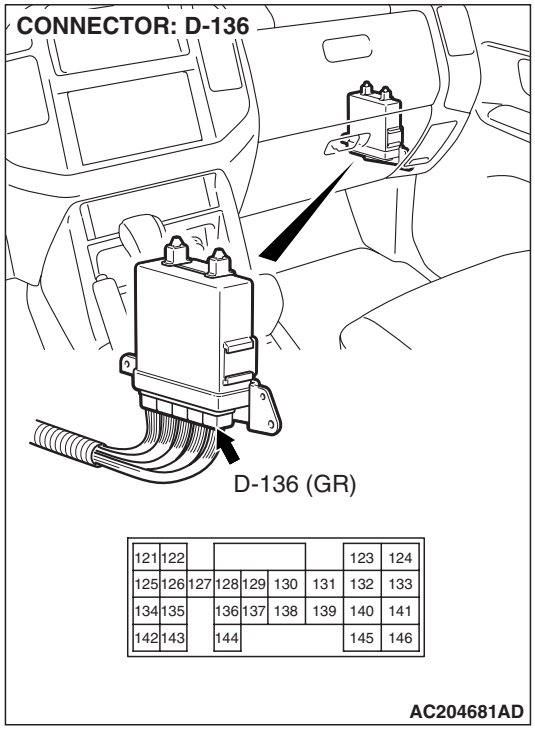
STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7 and 8) and PCM connector D-136 (terminals 128, 129 and 130).

Q: Are the harness wires in good condition?

YES : Go to Step 13.

NO : Repair or replace the harness wire(s).

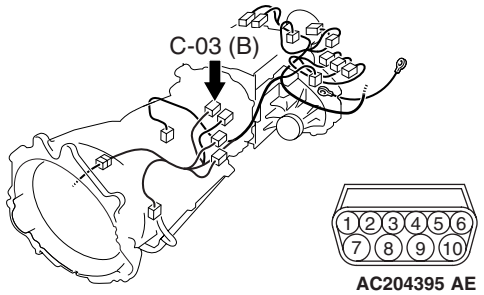




STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7, 8 and 10) and solenoid valve connectors C-03-4, C-03-5 and C-03-6.
Q: Is the harness wire in good condition?

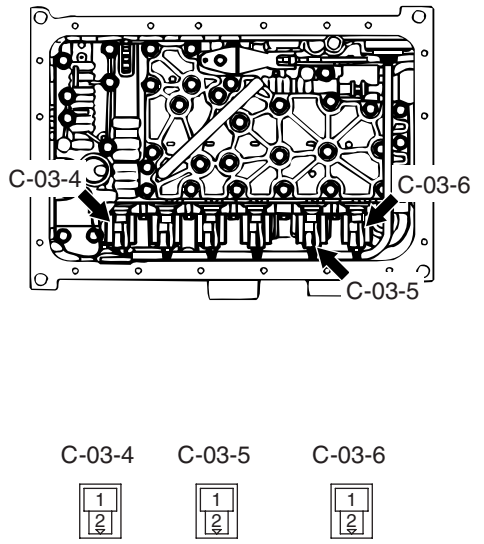
YES : Replace the PCM.
NO : Replace the harness wire.

CONNECTOR : C-03



AC204395 AE

CONNECTORS : C-03-4, C-03-5, C-03-6



AC204749 AD

DTC 36 (P0743): Torque Converter Clutch Solenoid Valve System

SOLENOID VALVE SYSTEM CIRCUIT
Refer to P.23A-178.

CIRCUIT OPERATION
Refer to P.23A-178.

DESCRIPTIONS OF MONITOR METHODS
If lock-up is not engaged, and solenoid terminal voltage is below specified value, PCM judges that torque converter clutch solenoid valve has a failure.

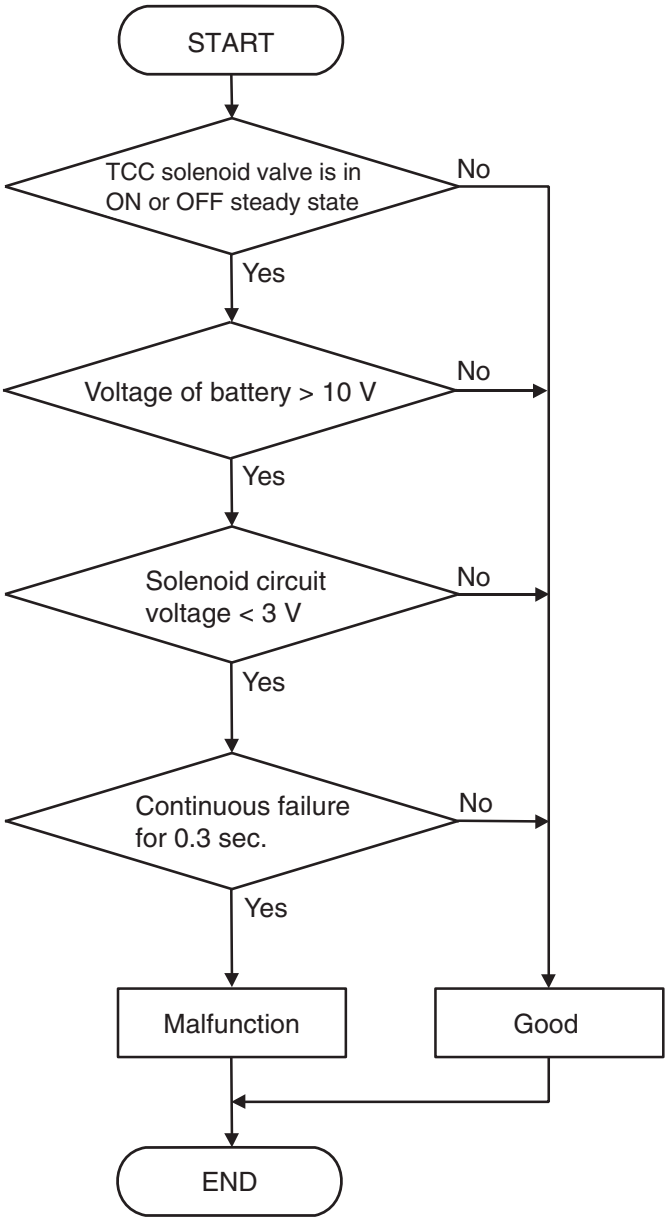
MONITOR EXECUTION
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



AC205240AC

DTC SET CONDITIONS

Check Conditions

- Solenoid status: either solid ON or OFF.
- Voltage of battery: 10 volts or more.

Judgement Criteria

- Solenoid voltage: 3 volts or less. (0.3 second)
- If DTC 36 (P0743) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of torque converter clutch solenoid valve
- Damaged harness, connector
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

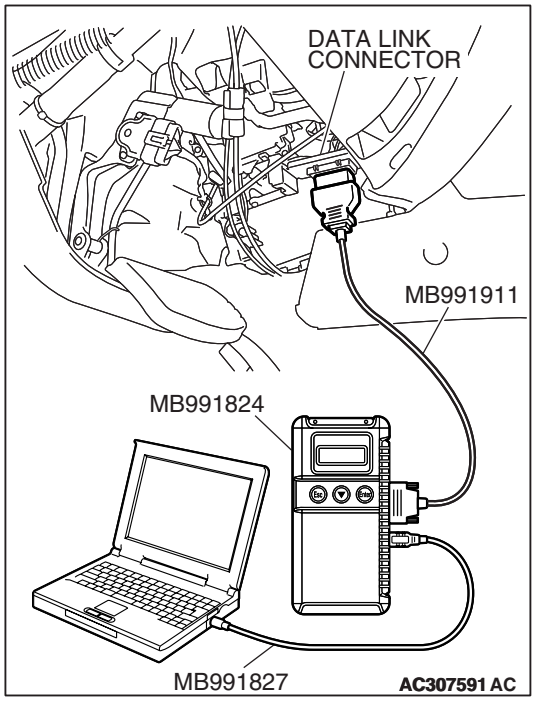
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 06: Torque Converter Clutch Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



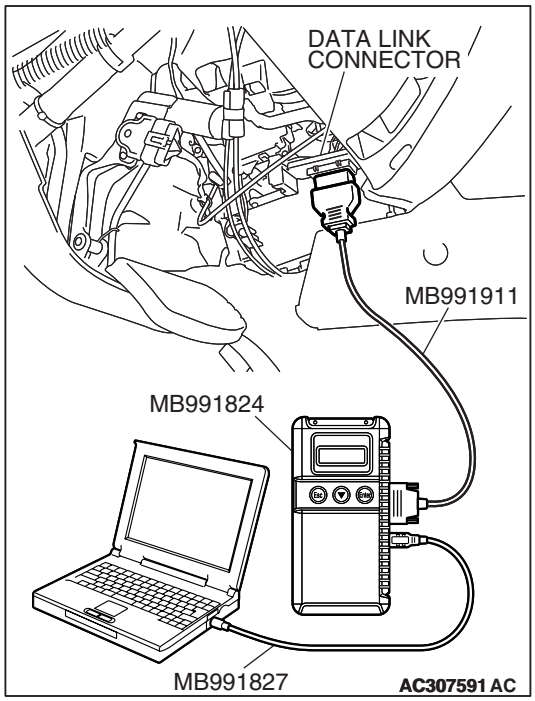
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 06: Torque Converter Clutch Solenoid Valve.
  - An audible clicking or buzzing should be heard when the torque converter clutch solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunctions P.00-13.

NO : Go to Step 2.

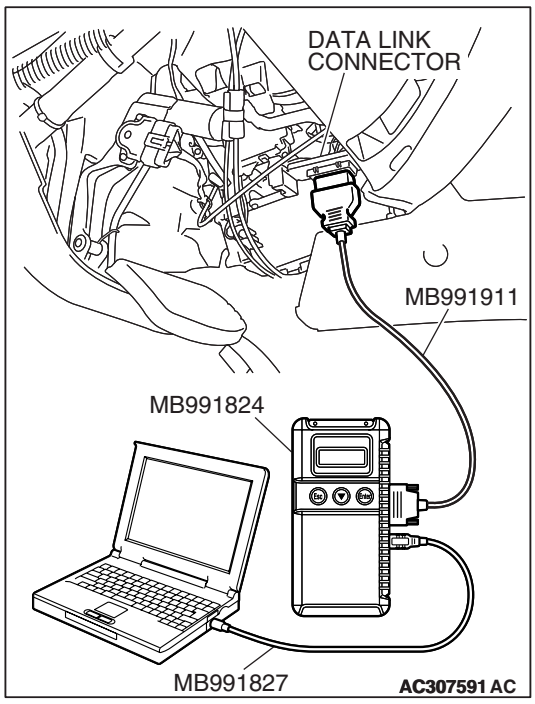


STEP 2. Using scan tool MB991958, read the A/T diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 54 set? (DTC 54 may be set along with multiple DTCs).

YES : Refer to P.23A-283 DTC 54: A/T Control Relay System.
NO : Go to Step 3.



STEP 3. Using scan tool MB991958, read the A/T diagnostic trouble code.

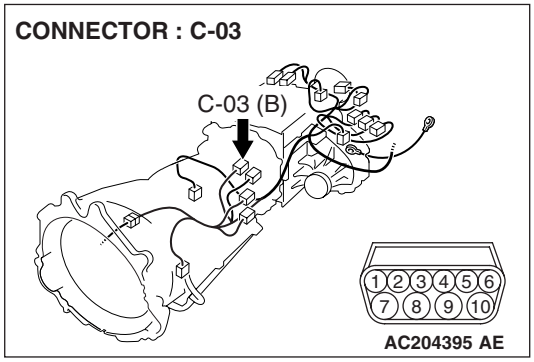
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

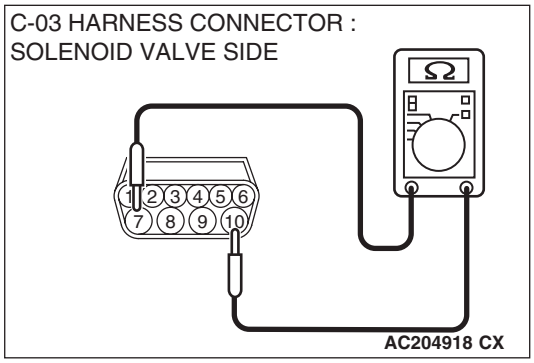
Q: Are DTC 31 and DTC 35 set? (Multiple DTCs may be set).

YES : Go to Step 8.
NO : Go to Step 4.

STEP 4. Measure the torque converter clutch solenoid valve resistance at A/T control solenoid valve assembly connector C-03.

(1) Disconnect connector C-03 and measure at the solenoid valve side.





(2) Measure the resistance between solenoid valve assembly connector C-03 terminals 7 and 10.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

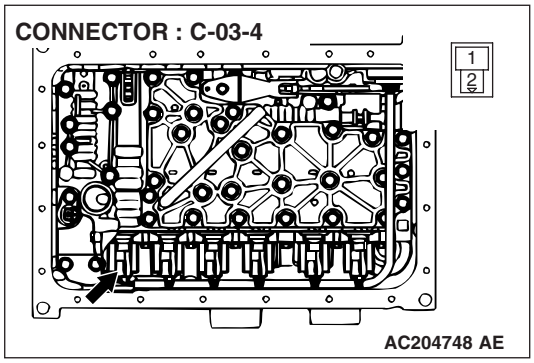
Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)]?

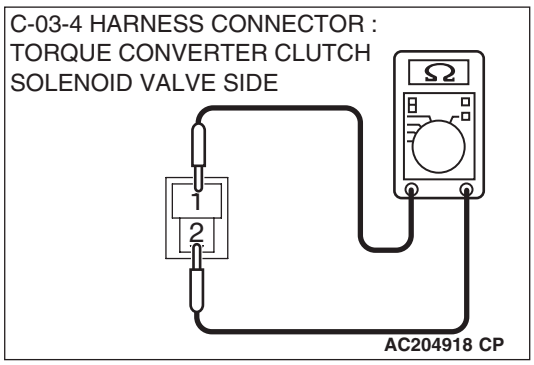
YES : Go to Step 6.

NO : Go to Step 5.

STEP 5. Measure the solenoid valve resistance at the torque converter clutch solenoid valve connector C-03-4 inside the transmission.

(1) Disconnect solenoid valve connector C-03-4 and measure at the solenoid valve side.





(2) Measure the resistance between torque converter clutch solenoid valve terminals 1 and 2.

Resistance value: 2.7 – 3.4 Ω [at 20°C (68°F)]

Q: Is the measured resistance 2.7 – 3.4 Ω [at 20°C (68°F)?

YES : Replace the harness wire between A/T control solenoid valve assembly connector C-03 and the solenoid valves.

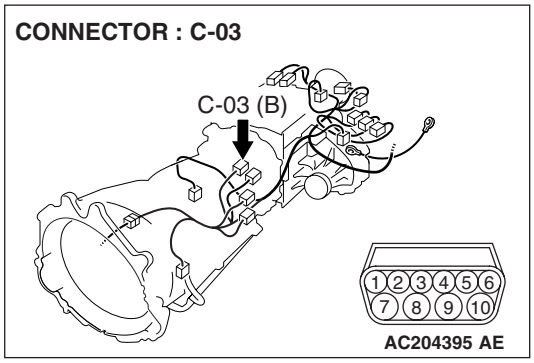
NO : Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63.

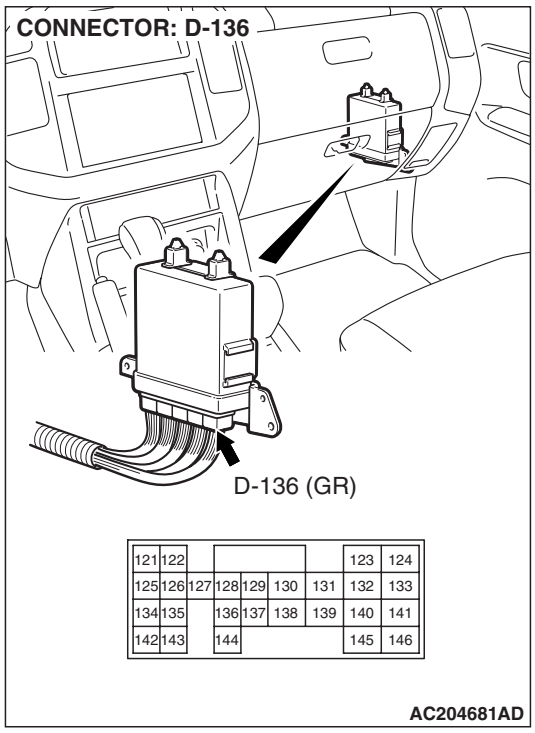
TSB Revision

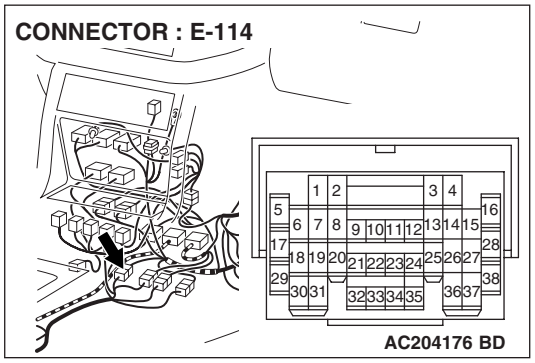
STEP 6. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 7.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





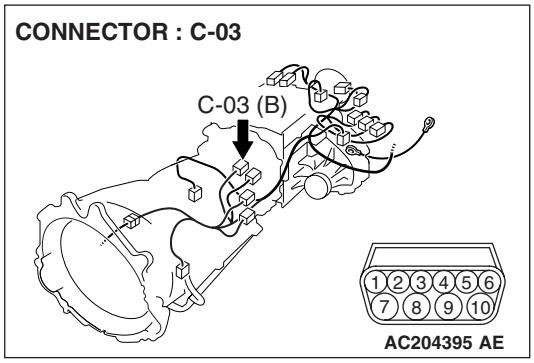


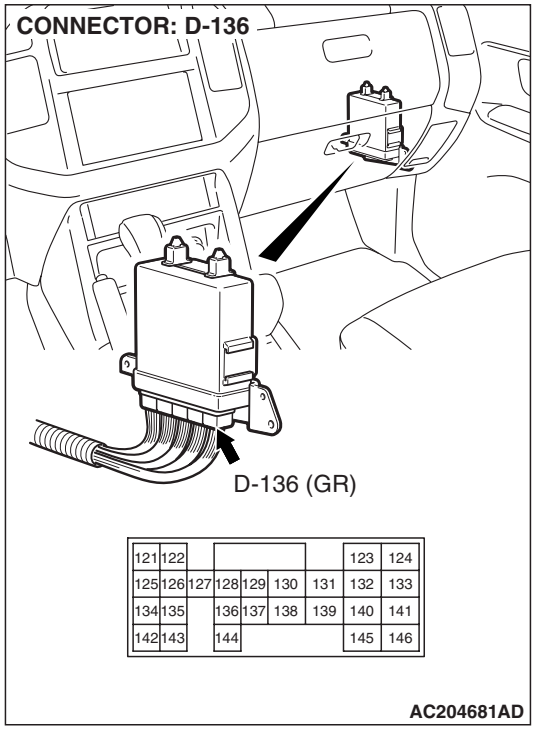
STEP 7. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 7 and PCM connector D-136 terminal 130.

Q: Is the harness wire in good condition?

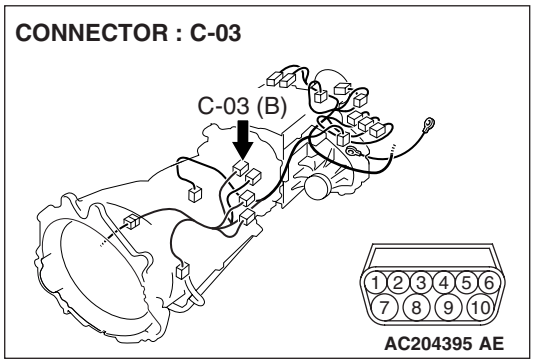
YES : Replace the PCM.

NO : Repair or replace the harness wire.

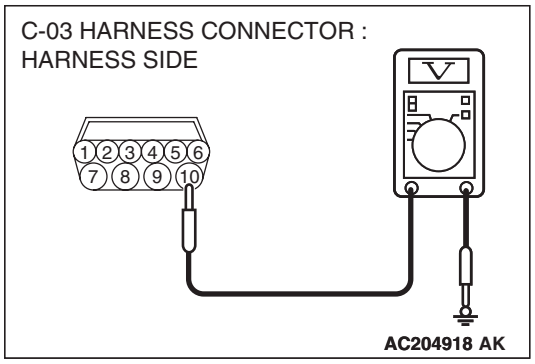




STEP 8. Measure the supply voltage at A/T control solenoid valve assembly connector C-03 by backprobing.



(1) Do not disconnect solenoid valve assembly harness connector C-03.
(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between harness connector C-03 terminal 10 and ground by backprobing.
- The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

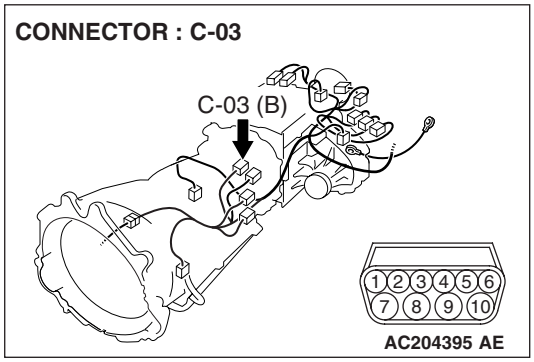
YES : Go to Step 11.
NO : Go to Step 9.

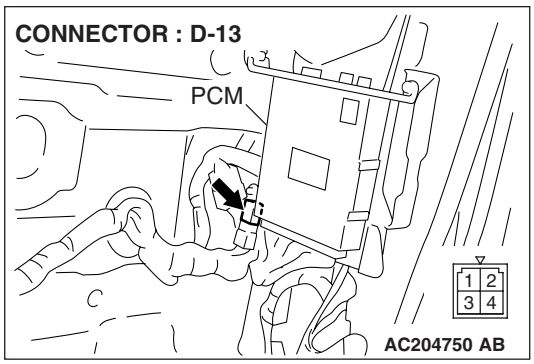
STEP 9. Check A/T control solenoid valve assembly connector C-03, A/T control relay connector D-13 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

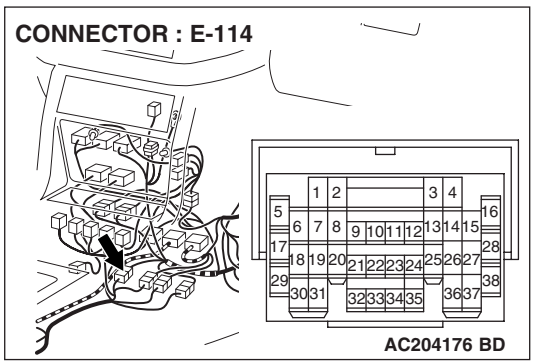
Q: Are the connectors and terminals in good condition?

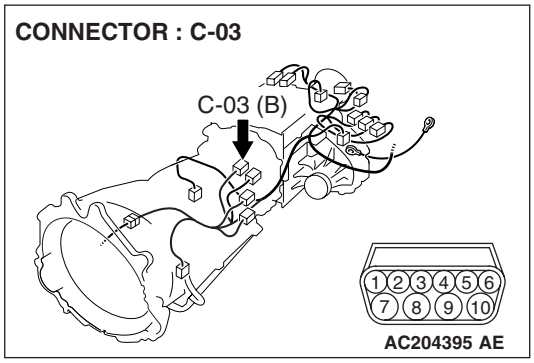
YES : Go to Step 10.

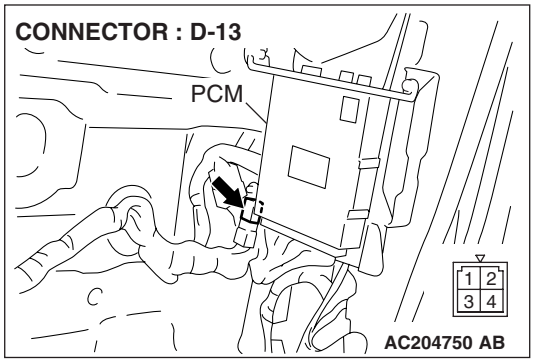
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 10. Check the harness for an open circuit or short circuit to ground between A/T control solenoid valve assembly connector C-03 terminal 10 and A/T control relay connector D-13 terminal 3.

Q: Is the harness wire in good condition?

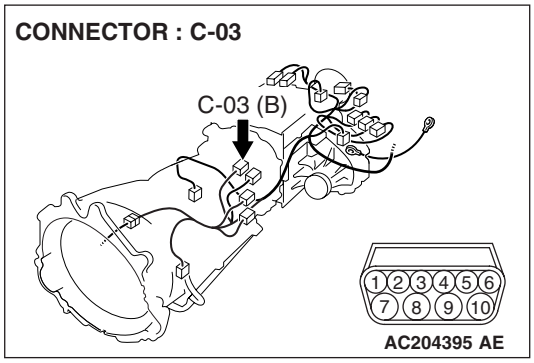
YES : Go to Step 11.

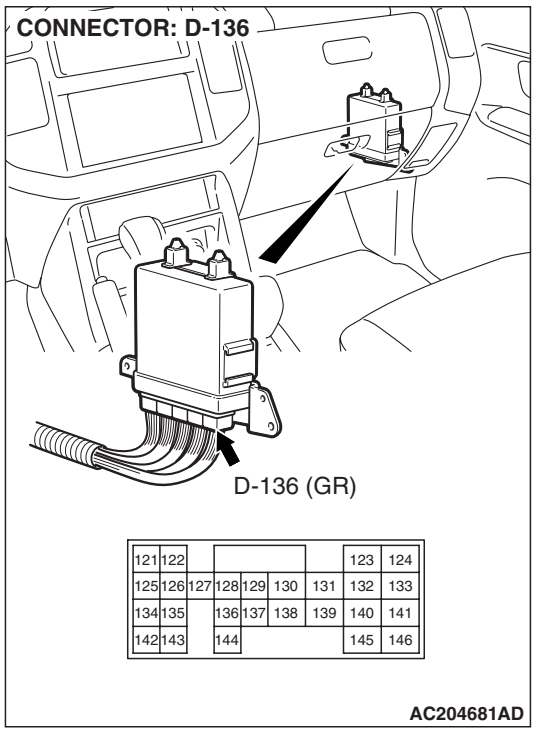
NO : Repair or replace the harness wire.

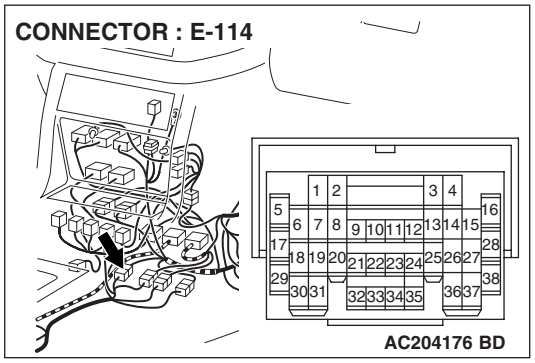
STEP 11. Check A/T control solenoid valve assembly connector C-03, PCM connector D-136 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

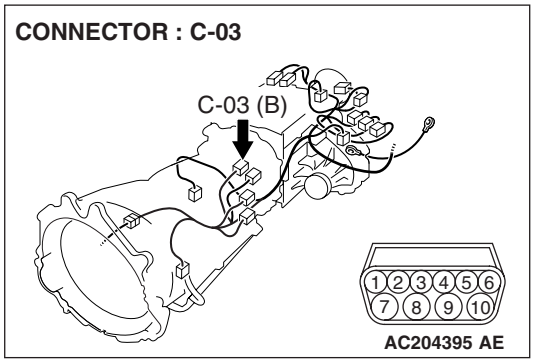
YES : Go to Step 12.

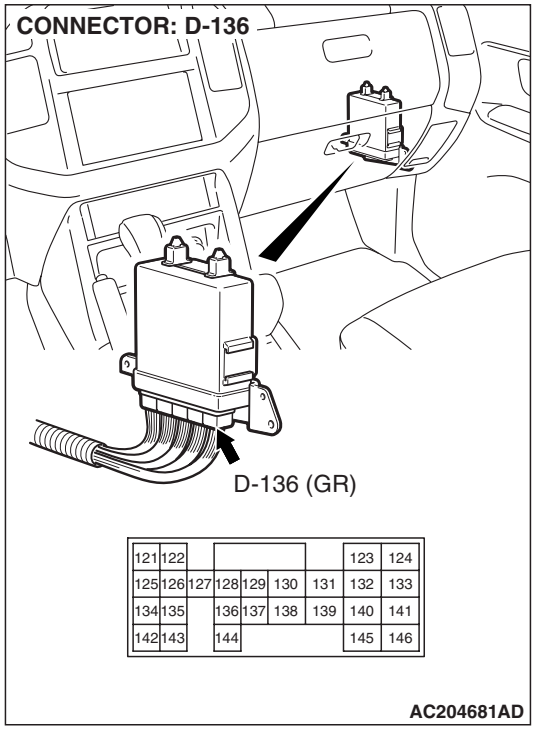
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 12. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7 and 8) and PCM connector D-136 (terminals 128, 129 and 130).

Q: Are the harness wires in good condition?

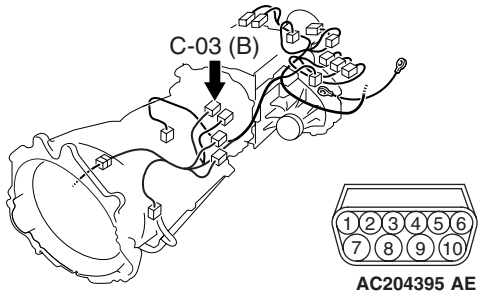
YES : Go to Step 13.

NO : Repair or replace the harness wire(s).

STEP 13. Check the harness for an open or short circuit to ground between A/T control solenoid valve assembly connector C-03 (terminals 6, 7, 8 and 10) and solenoid valve connectors C-03-4, C-03-5 and C-03-6.
Q: Is the harness wire in good condition?

YES : Replace the PCM.
NO : Replace the harness wire.

CONNECTOR : C-03



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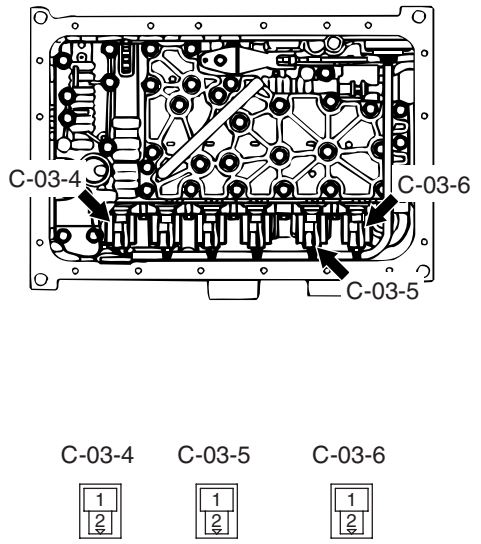
CONNECTORS : C-03-4, C-03-5, C-03-6



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DTC 41 (P0731): 1st Gear Incorrect Ratio
DTC 42 (P0732): 2nd Gear Incorrect Ratio
DTC 43 (P0733): 3rd Gear Incorrect Ratio
DTC 44 (P0734): 4th Gear Incorrect Ratio
DTC 45 (P0735): 5th Gear Incorrect Ratio
DTC 46 (P0736): Reverse Gear Incorrect Ratio

CIRCUIT OPERATION
- The input shaft speed sensor generates a pulsed signal of 0 ⇔ 5 volts. The pulsed signal frequency increases with an increase in the input shaft speed.
- The PCM (terminal 64) continuously monitors the input shaft speed signal.
- The output shaft speed sensor generates a pulsed signal of 0 ⇔ 5 volts. The pulsed signal frequency increases with an increase in the output shaft speed.
- The PCM (terminal 73) continuously monitors the output shaft speed signal.

DESCRIPTIONS OF MONITOR METHODS <DTC 41 (P0731)>
In 1st gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in 1st gear has occurred.

MONITOR EXECUTION <DTC 41 (P0731)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 41 (P0731)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

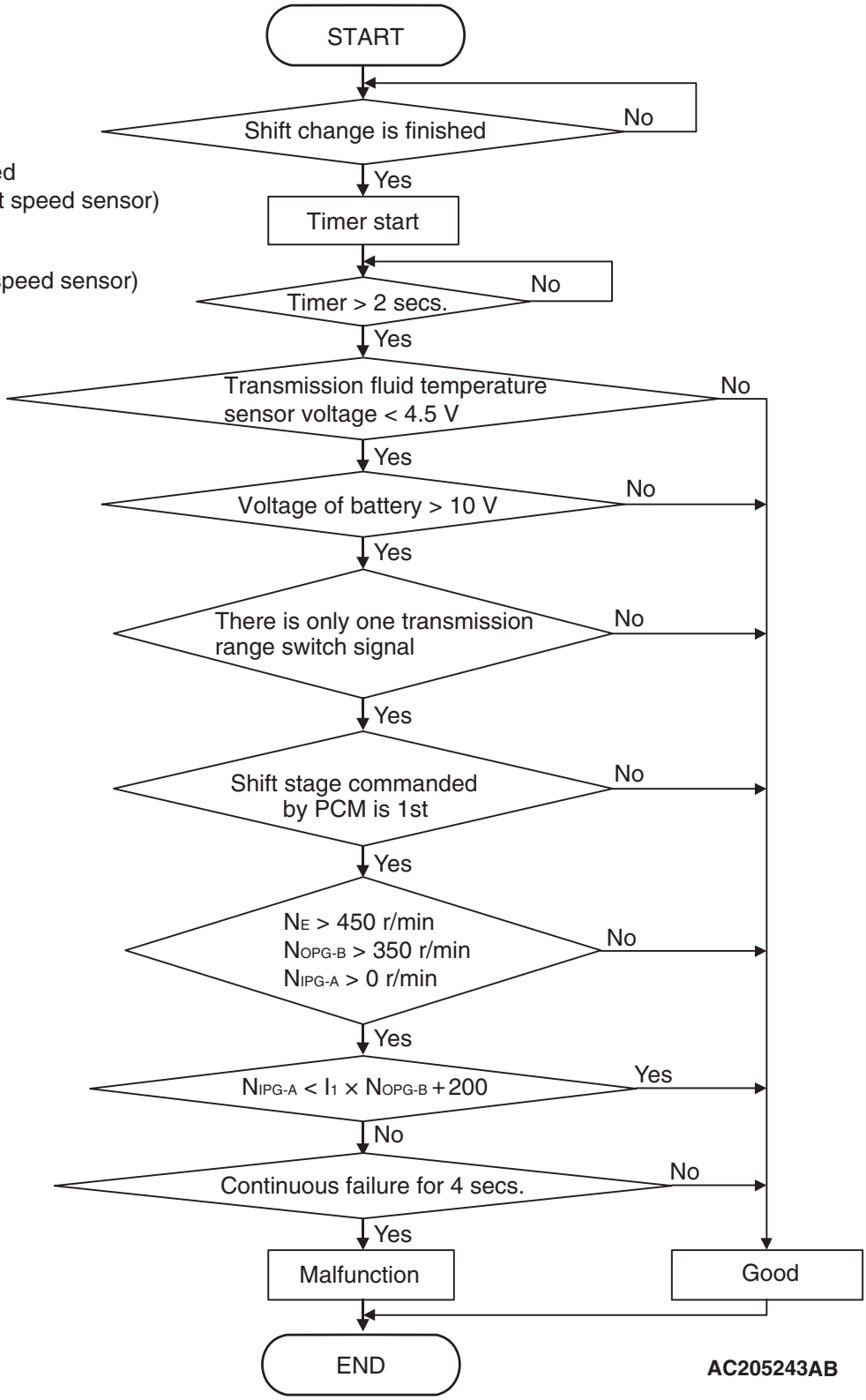
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 41 (P0731)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_1 : 1st gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 41 (P0731)>

Check Conditions
- Engine speed: 450 r/min or more.
- Output speed: 350 r/min or more.
- Shift stage: 1st gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 2 seconds or more.

DESCRIPTIONS OF MONITOR METHODS <DTC 42 (P0732)>
In 2nd gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in 2nd gear has occurred.

MONITOR EXECUTION <DTC 42 (P0732)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 42 (P0732)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction

Judgement Criteria
- Output speed: [(input speed - 200 r/min) / 1st gear ratio] or less. (4 seconds)
- If DTC 41 (P0731) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN <DTC 41 (P0731)>
Start the engine, and drive at 20 km/h (12 mph) or more for 10 seconds, with 1st gear fixed (1st gear in sport mode).

- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

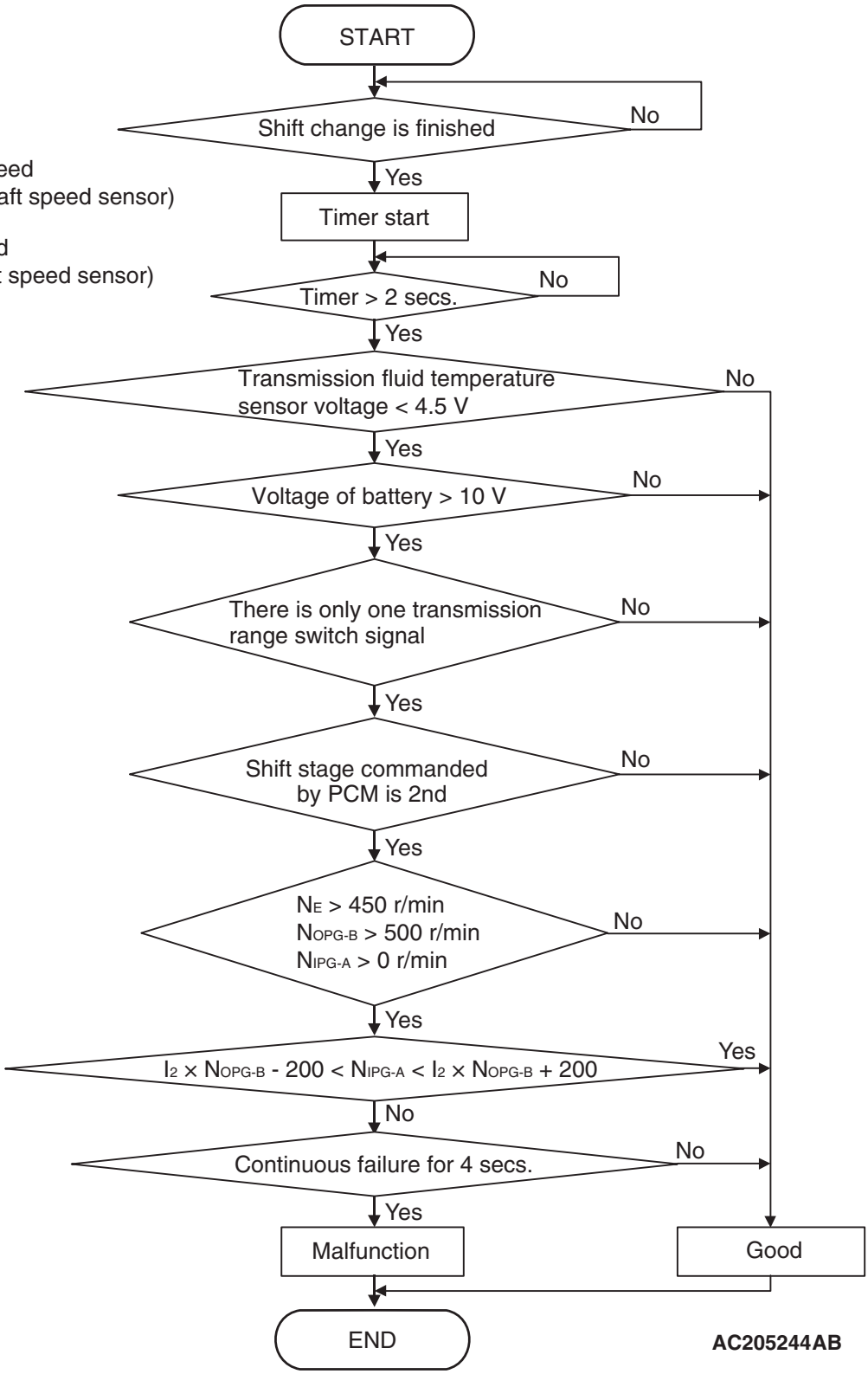
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 42 (P0732)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_2 : 2nd gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 42 (P0732)>

Check Conditions
- Engine speed: 450 r/min or more.
- Output speed: 500 r/min or more.
- Shift stage: 2nd gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 2 seconds or more.

DESCRIPTIONS OF MONITOR METHODS <DTC 43 (P0733)>
In 3rd gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in 3rd gear has occurred.

MONITOR EXECUTION <DTC 43 (P0733)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 43 (P0733)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction

Judgement Criteria
- Output speed: [(input speed + 200 r/min) / 2nd gear ratio] or more. (4 seconds)
- Output speed: [(input speed - 200 r/min) / 2nd gear ratio] or less. (4 seconds)
- If DTC 42 (P0732) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN <DTC 42 (P0732)>
Start the engine, and drive at 30 km/h (19 mph) or more for 10 seconds, with 2nd gear fixed (2nd gear in sport mode).

- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

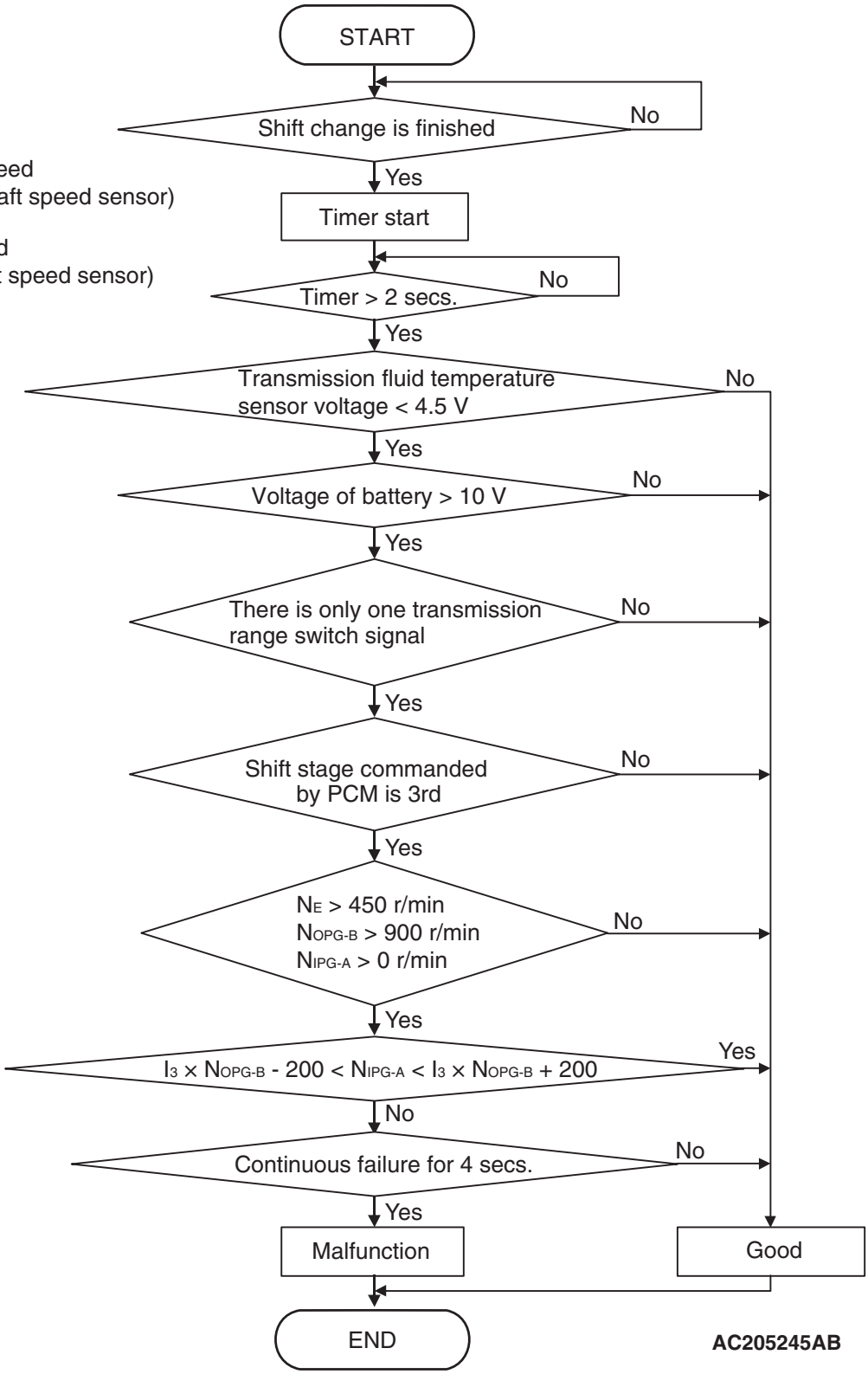
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 43 (P0733)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_3 : 3rd gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 43 (P0733)>

Check Conditions
- Engine speed: 450 r/min or more.
- Output speed: 900 r/min or more.
- Shift stage: 3rd gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 2 seconds or more.

DESCRIPTIONS OF MONITOR METHODS <DTC 44 (P0734)>
In 4th gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in 4th gear has occurred.

MONITOR EXECUTION <DTC 44 (P0734)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 44 (P0734)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction

Judgement Criteria
- Output speed: [(input speed + 200 r/min) / 3rd gear ratio] or more. (4 seconds)
- Output speed: [(input speed - 200 r/min) / 3rd gear ratio] or less. (4 seconds)
- If DTC 43 (P0733) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN <DTC 43 (P0733)>
Start the engine, and drive at 40 km/h (25 mph) or more for 10 seconds, with 3rd gear fixed (3rd gear in sport mode).

- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

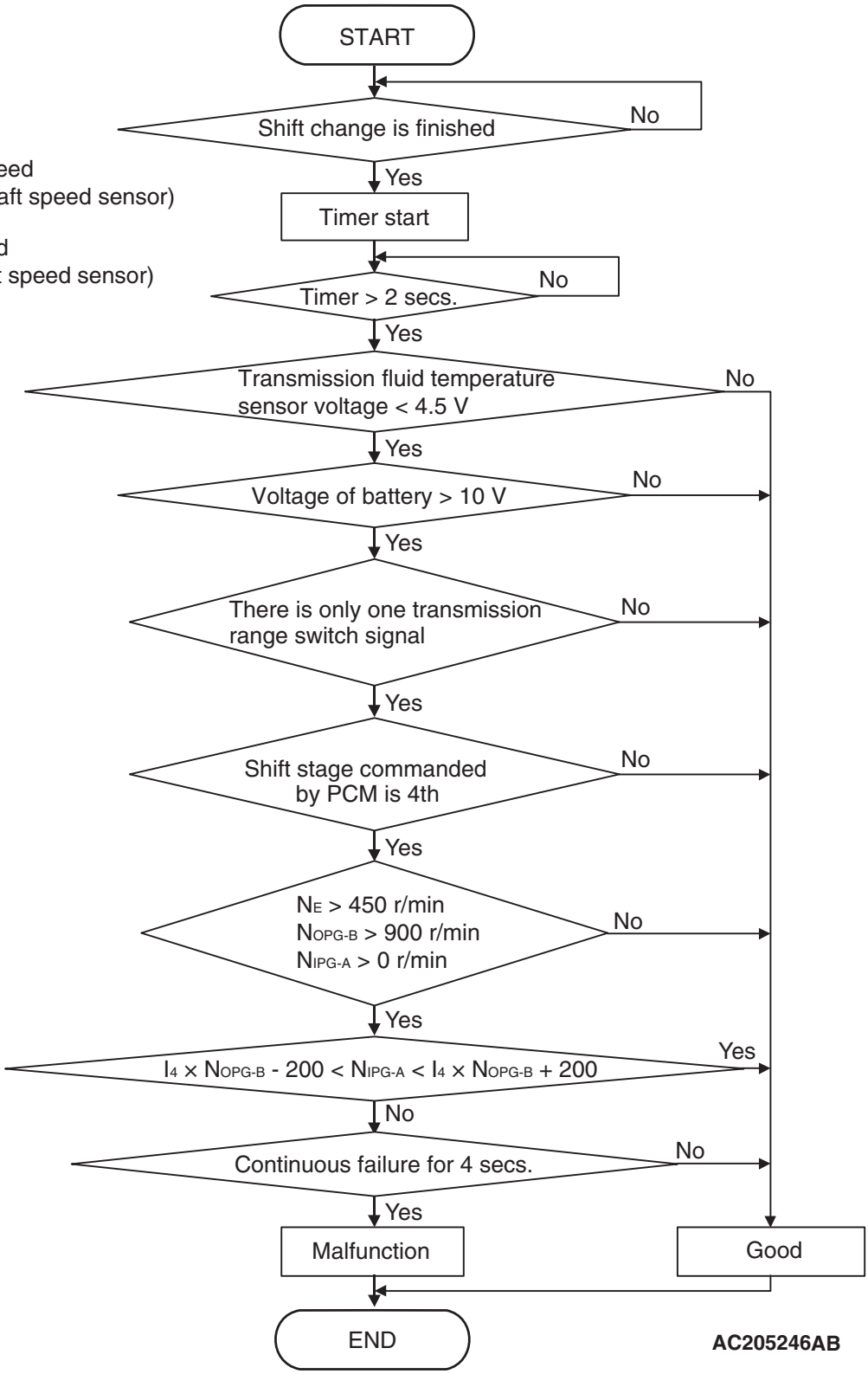
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 44 (P0734)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_4 : 4th gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 44 (P0734)>

Check Conditions
- Engine speed: 450 r/min or more.
- Output speed: 900 r/min or more.
- Shift stage: 4th gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 2 seconds or more.

DESCRIPTIONS OF MONITOR METHODS <DTC 45 (P0735)>
In 5th gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in 5th gear has occurred.

MONITOR EXECUTION <DTC 45 (P0735)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 45 (P0735)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction

Judgement Criteria
- Output speed: [(input speed + 200 r/min) / 4th gear ratio] or more. (4 seconds)
- Output speed: [(input speed - 200 r/min) / 4th gear ratio] or less. (4 seconds)
- If DTC 44 (P0734) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN <DTC 44 (P0734)>
Start the engine, and drive at 40 km/h (25 mph) or more for 10 seconds, with 4th gear fixed (4th gear in sport mode).

- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

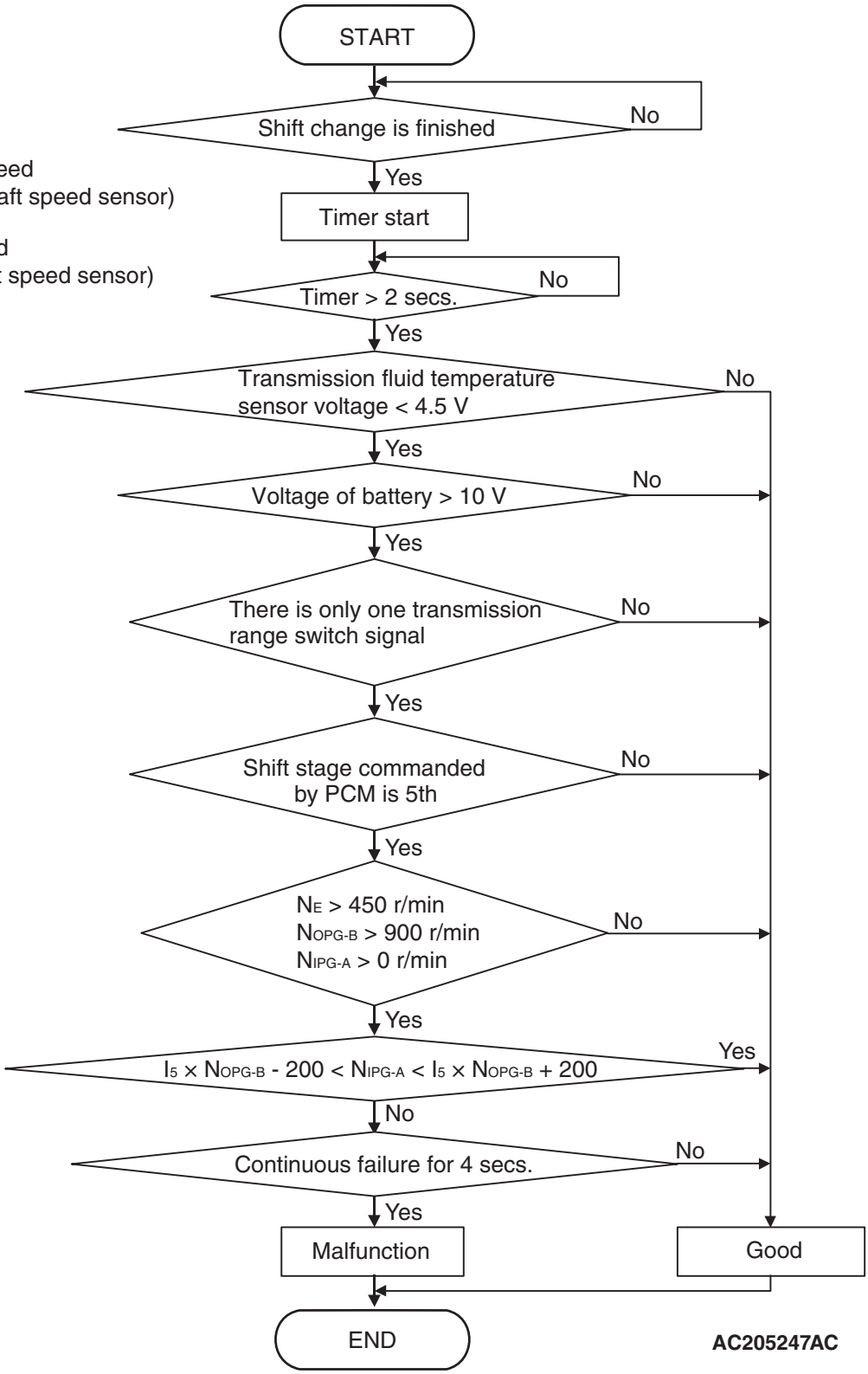
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 45 (P0735)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_5 : 5th gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 45 (P0735)>

Check Conditions
- Engine speed: 450 r/min or more.
- Output speed: 900 r/min or more.
- Shift stage: 5th gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 2 seconds or more.

Judgement Criteria
- Output speed: [(input speed + 200 r/min) / 5th gear ratio] or more. (4 seconds)
- Output speed: [(input speed - 200 r/min) / 5th gear ratio] or less. (4 seconds)
- If DTC 45 (P0735) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

DESCRIPTIONS OF MONITOR METHODS <DTC 46 (P0736)>
In reverse gear, if a difference between turbine revolution and that value calculated from output revolution equals or exceeds specified value, PCM judges that step-out in reverse gear has occurred.

MONITOR EXECUTION <DTC 46 (P0736)>
Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR) <DTC 46 (P0736)>

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)
- DTC 27, 28 (P0705): Transmission range switch malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 36 (P0743): Torque converter clutch solenoid malfunction

OBD-II DRIVE CYCLE PATTERN <DTC 45 (P0735)>
Start the engine, and drive at 40 km/h (25 mph) or more for 10 seconds, with 5th gear fixed (5th gear in sport mode).

- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)
- Input shaft speed sensor
- Output shaft speed sensor
- Transmission range switch
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

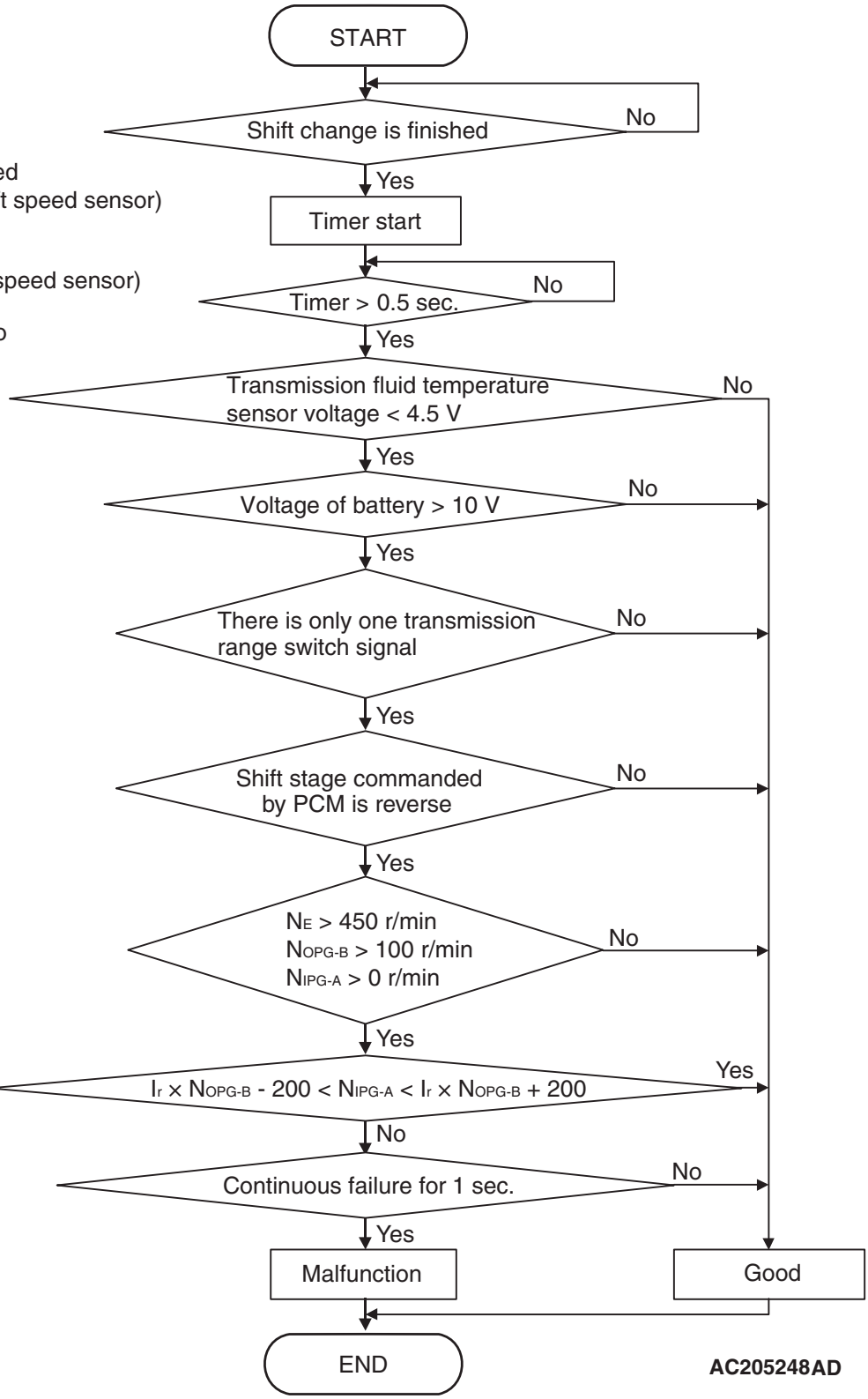
LOGIC FLOW CHARTS (Monitor Sequence) <DTC 46 (P0736)>

N_E : Engine speed

N_{OPG-B} : Output speed (output shaft speed sensor)

N_{IPG-A} : Input speed (input shaft speed sensor)

I_r : Reverse gear ratio



TSB Revision

DTC SET CONDITIONS <DTC 46 (P0736)>

Check Conditions

- Engine speed: 450 r/min or more.
- Output speed: 100 r/min or more.
- Shift stage: reverse gear.
- Input speed: more than 0 r/min.
- Transmission fluid temperature sensor voltage: 4.5 volts or less.
- Voltage of battery: 10 volts or more.
- Transmission range switch rationality: only one signal.
- Time after shift changing finish: 0.5 second or more.

Judgement Criteria

- Output speed: [(input speed + 200 r/min) / reverse gear ratio] or more. (1 second)
- Output speed: [(input speed - 200 r/min) / reverse gear ratio] or less. (1 second)
- If DTC 46 (P0736) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the input shaft speed sensor
- Malfunction of the output shaft speed sensor
- Malfunction of the PCM
- Malfunction of the reverse clutch retainer
- Malfunction of the direct planetary carrier
- Malfunction of the low-reverse brake system (DTC 41 or DTC 46)
- Malfunction of the underdrive clutch system (DTC 41, DTC 42, DTC 43 or DTC 44)

OBD-II DRIVE CYCLE PATTERN <DTC 46 (P0736)>

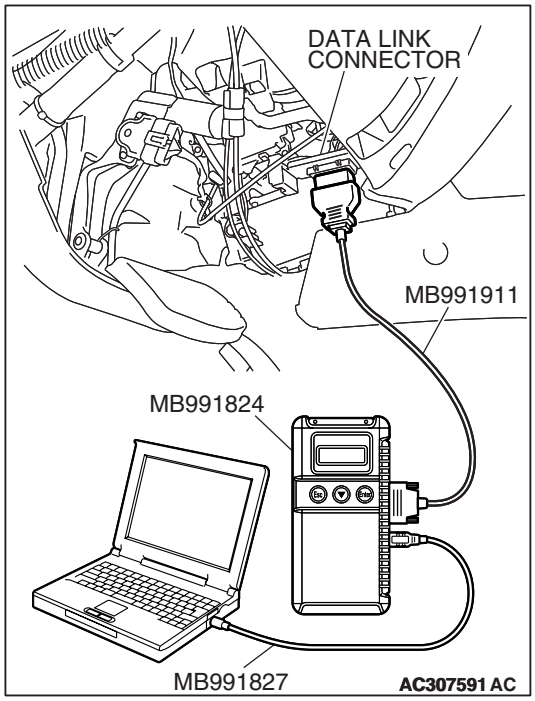
Start the engine, and drive in R range at 15 km/h (9 mph) or more for 10 seconds.

- Malfunction of the second brake system (DTC 42 or DTC 45)
- Malfunction of the overdrive clutch system (DTC 43, DTC 44 or DTC 45)
- Malfunction of the reverse clutch system (DTC 46)
- Malfunction of the direct clutch system (DTC 44 or DTC 45)
- Malfunction of the reduction brake system (DTC 41, DTC 42, DTC 43 or DTC 46)
- Electrical noise generated

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, read the A/T diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC set?

YES <DTC 22 set> : Refer to P.23A-72, DTC 22: Input Shaft Speed Sensor System.
YES <DTC 23 set> : Refer to P.23A-92, DTC 23: Output Shaft Speed Sensor System.
YES <DTC 31 set> : Refer to P.23A-178, DTC 31: Low-Reverse Solenoid Valve System.
YES <DTC 32 set> : Refer to P.23A-193, DTC 32: Underdrive Solenoid Valve System.
YES <DTC 33 set> : Refer to P.23A-206, DTC 33: Second Solenoid Valve System.
YES <DTC 34 set> : Refer to P.23A-219, DTC 34: Overdrive Solenoid Valve System.
YES <DTC 35 set> : Refer to P.23A-232, DTC 35: Reduction Solenoid Valve System.
NO : Go to Step 2.

STEP 2. Check the hydraulic pressure.

Each hydraulic pressure of the elements below, which DTCs indicate, should be within the standard value. P.23A-27.

- DTC 41: Underdrive clutch, low-reverse brake and reduction brake.
- DTC 42: Underdrive clutch, second brake and reduction brake.
- DTC 43: Underdrive clutch, overdrive clutch and reduction brake.
- DTC 44: Underdrive clutch, overdrive clutch and direct clutch.
- DTC 45: Overdrive clutch, direct clutch and second brake.
- DTC 46: Reverse clutch and low-reverse brake and reduction brake.

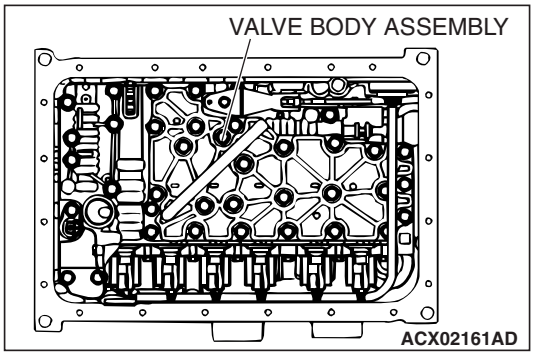
Q: Does the hydraulic pressures meet the standard value range?

YES : Go to Step 5.
NO <out of the range in one place> : Go to Step 4.
NO <out of the range in all places> : Go to Step 3.

STEP 3. Adjust the line pressure.
Adjust the line pressure. Refer to P.23A-42, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 4.



STEP 4. Disassemble and clean the valve body.
Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

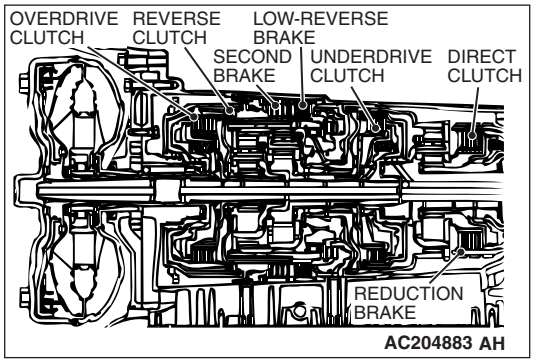
Q: Is the repair possible and the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 5. Replace the PCM.
(1) Replace the PCM.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Were any A/T DTCs set?

YES : Go to Step 6.
NO : The procedure is complete.



STEP 6. Overhaul the A/T.

(1) Replace the following parts.

- If DTC 41, 42, 43 or 44 are set individually or in a group, replace the underdrive clutch. Refer to GROUP 23B, Underdrive Clutch P.23B-59.
- If DTC 43, 44 or 45 are set individually or in a group, replace the overdrive clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch P.23B-50.
- If DTC 44 or 45 are set individually or in a group, replace the direct clutch. Refer to GROUP 23B, Direct Clutch P.23B-71.
- If DTC 46 is set individually or in a group, replace the reverse clutch. Refer to GROUP 23B, Reverse and Overdrive Clutch P.23B-50.
- If DTC 41 or 46 are set individually or in a group, replace the low-reverse brake. Refer to GROUP 23B, Transmission P.23B-14.
- If DTC 42 or 45 are set individually or in a group, replace the second brake. Refer to GROUP 23B, Transmission P.23B-14.
- If DTC 41, 42, 43 or 46 are set individually or in a group, replace the reduction brake. Refer to GROUP 23B, Transmission P.23B-14.
- If DTC 41 is set individually or in a group, replace the one-way clutch (OWC-L). Refer to GROUP 23B, Low Reverse Annulus Gear P.23B-55.
- If DTC 41, 42 or 43 are set individually or in a group, replace the one-way clutch (OWC-D). Refer to GROUP 23B, Output Shaft Support P.23B-74.

(2) Test drive the vehicle.

(3) Check for A/T diagnostic trouble code.

Q: Are any A/T DTCs set again?

YES : An A/T DTC may have set due to external radio frequency interference (RFI) possibly caused by cellular phone activity, or aftermarket components installed on the vehicle.

NO : The procedure is complete.

DTC 52 (P0741): Torque Converter Clutch System

DESCRIPTIONS OF MONITOR METHODS

At start of lock-up operation, if lock-up clutch cannot be engaged even when duty ratio of torque converter clutch solenoid remains 100% for more than specified time, PCM judges that torque converter clutch is stuck OFF.

MONITOR EXECUTION

Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

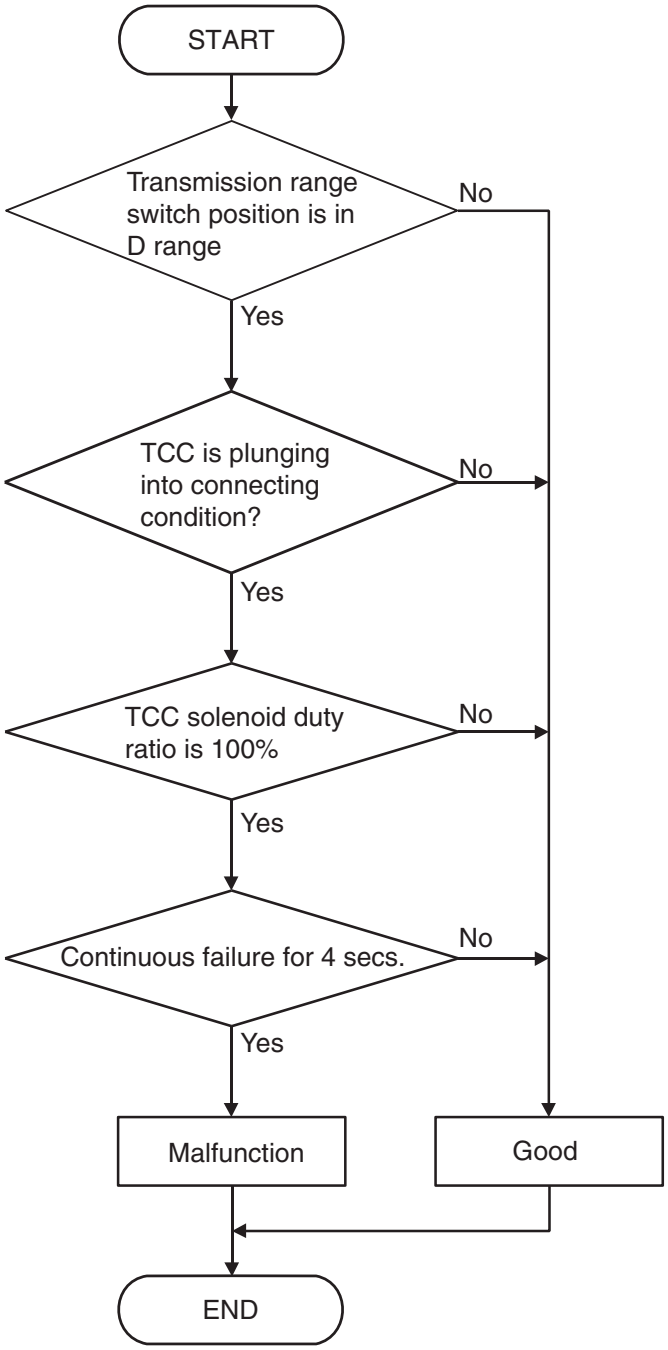
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC 21 (P0335): Crankshaft position sensor malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 53 (P0742): Torque converter clutch system malfunction (Stuck ON)
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction
- DTC 54 (P1751): A/T control relay malfunction

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Crankshaft position sensor
- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid
- A/T control relay

LOGIC FLOW CHARTS (Monitor Sequence)



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DTC SET CONDITIONS

Check Conditions

- Solenoid status: plunging into connecting condition.
- Transmission range switch position: D.

Judgement Criteria

- Time during 100% duty: 4 seconds or more.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and drive at 100 km/h (62 mph) for 10 seconds. Then stop the vehicle, and turn OFF the ignition switch. After that, restart the engine, and drive again at 100 km/h (62 mph) for 10 seconds.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the torque converter clutch solenoid valve
- Malfunction of the input shaft speed sensor
- Malfunction of the reverse clutch retainer
- Malfunction of the valve body
- Damaged harness or connector
- Malfunction of the PCM
- Malfunction of the torque converter

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, read the A/T diagnostic trouble code.

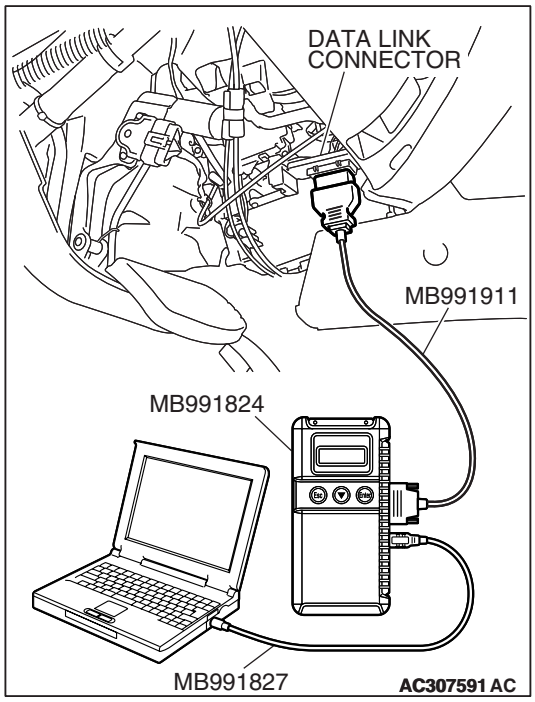
⚠ CAUTION

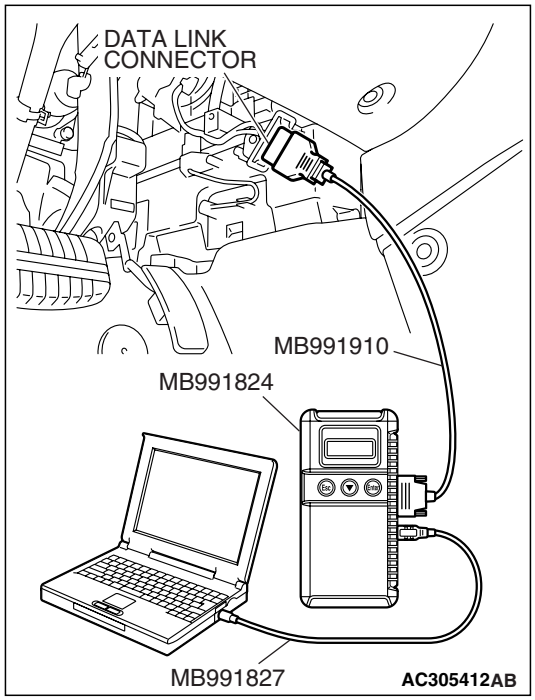
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 22 or 36 set?

YES <DTC 22 set> : Refer to P.23A-72, DTC 22: Input Shaft Speed Sensor System.
YES <DTC 36 set> : Refer to P.23A-245, DTC 36: Torque Converter Clutch Solenoid Valve System.
NO : Go to Step 2.





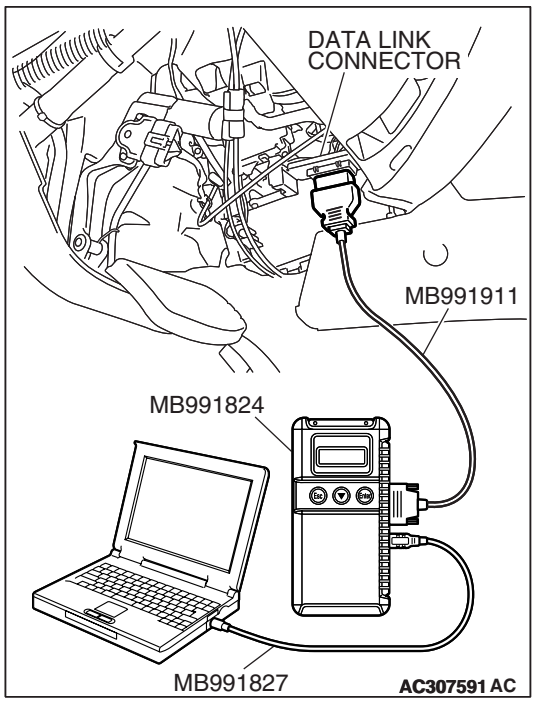
STEP 2. Using scan tool MB991958, check data list item 36: Torque Converter Clutch Solenoid Valve Duty%.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 36: Torque Converter Clutch Solenoid Valve Duty%.
  - When driving at constant speed of 80 km/h (50 mph), the display should be "70 – 99.6%" (Gear range: 4th gear).
  - When the accelerator pedal is released [at less than 50 km/h (31 mph)], the display should be "70 – 99.6% → 0%" (decreases gradually as the vehicle speed decreases) (Gear range: 4th gear).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 3.
NO : Go to Step 5.



STEP 3. Using scan tool MB991958, check data list item 52: Torque Converter Clutch Amount of Slippage.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

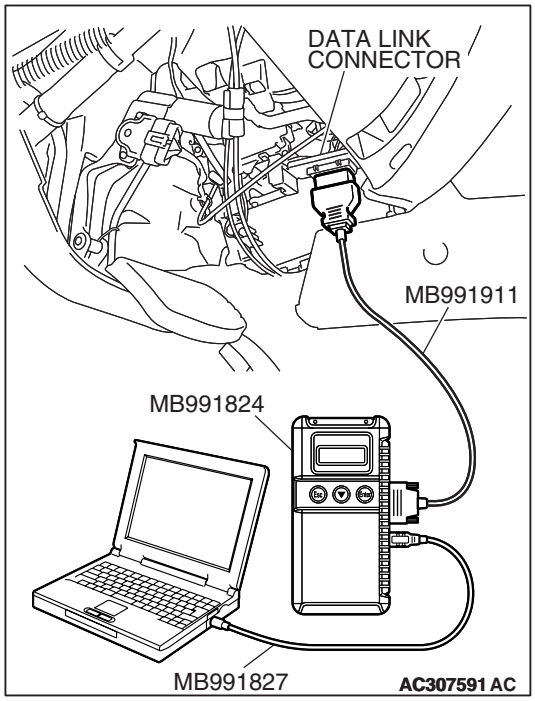
(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine. (Warming up engine)
(3) Set scan tool MB991958 to the data reading mode.
- Item 52: Torque Converter Clutch Amount of Slippage.
  - Driving at a constant speed of 80 km/h (50 mph), the display should be "–10 to 10 r/min."
  - If the accelerator pedal is released, the display on the scan tool changes (50 km/h (31 mph) and less).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the clutch operating properly?

YES : Go to Step 4.
NO : Go to Step 5.

TSB Revision



STEP 4. Using scan tool MB991958, read the A/T diagnostic trouble code.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 52 set?

YES : Replace the PCM.
NO : The procedure is complete.

STEP 5. Check the hydraulic pressure (for torque converter).

Measure the hydraulic pressure for torque converter. Check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 7.
NO : Go to Step 6.

STEP 6. Adjust line pressure.

Adjust line pressure. Refer to P.23A-42, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

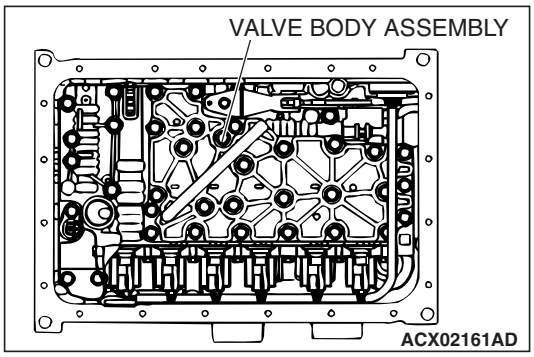
YES : The procedure is complete.
NO : Go to Step 8.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 8.

TSB Revision



STEP 8. Replace the valve body.

(1) Replace the valve body. Refer to GROUP 23B, Transmission P.23B-14.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is DTC 52 set?

YES : Replace the torque converter. Refer to P.23A-566, Transmission and Transfer Assembly.
NO : The procedure is complete.

DTC 53 (P0742): Torque Converter Clutch is Stuck On

DESCRIPTIONS OF MONITOR METHODS

With PCM signal for no lock-up engagement, if vehicle speed equals or exceeds specified value, accelerator is ON, and torque converter slip amount is below specified value, PCM judges that torque converter clutch is stuck ON.

MONITOR EXECUTION

Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

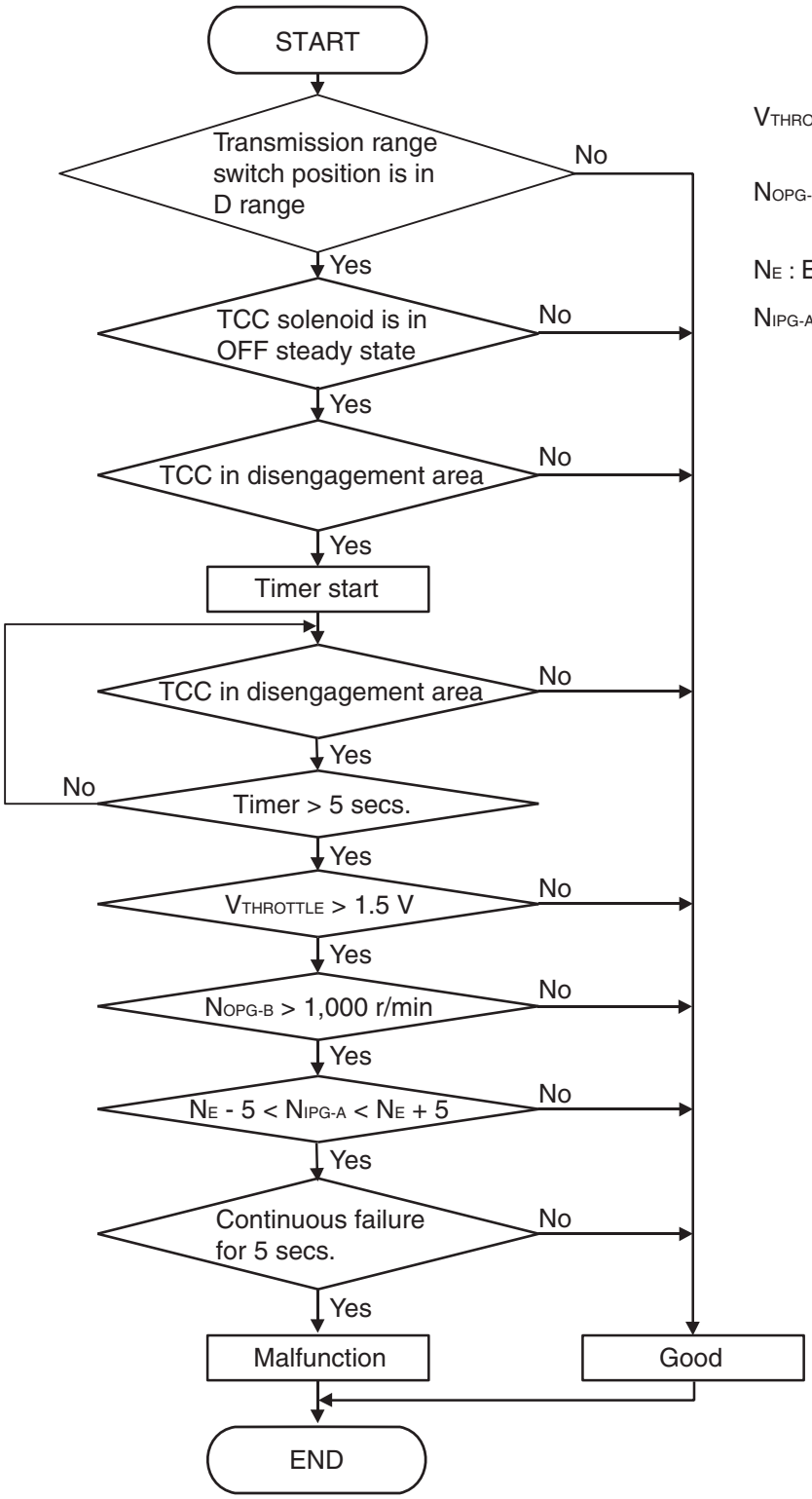
- DTC 21 (P0335): Crankshaft position sensor malfunction
- DTC 22 (P0715): Input shaft speed sensor malfunction
- DTC 23 (P0720): Output shaft speed sensor malfunction
- DTC 52 (P0741): Torque converter clutch system malfunction (Stuck OFF)
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- P0122: Throttle position sensor (main) malfunction (Low input)
- P0123: Throttle position sensor (main) malfunction (High input)
- P0222: Throttle position sensor (sub) malfunction (Low input)
- P0223: Throttle position sensor (sub) malfunction (High input)
- P2135: Throttle position sensor (main and sub) range/performance problem
- P0638: Throttle actuator control motor circuit range/performance problem
- P0642: Throttle position sensor power supply
- P1601: Communication malfunction (Between PCM and throttle actuator control module)
- P0606: PCM main prosessor malfunction
- P2108: Throttle actuator control module processor malfunction
- P2100: Throttle actuator control motor circuit (Open)
- P2101: Throttle actuator control motor magneto malfunction
- P2102: Throttle actuator control motor circuit (Shorted low)
- P2103: Throttle actuator control motor circuit (Shorted high)
- P2121: Accelerator pedal position sensor (main) circuit range/performance problem
- P2122: Accelerator pedal position sensor (main) circuit low input
- P2123: Accelerator pedal position sensor (main) circuit high input
- P2126: Accelerator pedal position sensor (sub) circuit range/performance problem
- P2127: Accelerator pedal position sensor (sub) circuit low input
- P2128: Accelerator pedal position sensor (sub) circuit high input
- P2138: Accelerator pedal position sensor (main and sub) range/performance problem

Sensor (The sensor below is determined to be normal)

- Input shaft speed sensor
- Output shaft speed sensor
- Crankshaft position sensor
- Torque converter clutch solenoid
- Throttle position sensor
- Accelerator pedal position sensor

TSB Revision

LOGIC FLOW CHARTS (Monitor Sequence)



$V_{THROTTLE}$: Throttle position sensor output voltage

N_{OPG-B} : Output speed (output shaft speed sensor)

N_E : Engine speed

N_{IPG-A} : Input speed (input shaft speed sensor)

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DTC SET CONDITIONS

Check Conditions

- Throttle position sensor voltage: 1.5 volts or more.
- Output speed: 1,000 r/min or more.
- Solenoid status: OFF.
- Transmission range switch position: D.
- Time after lock up clutch release: 5 seconds or more.

TSB Revision

Judgement Criteria

- Calculated slip (engine speed - input speed): 5 r/min or less. (5 seconds)
- Calculated slip (engine speed - input speed): -5 r/min or more. (5 seconds)

OBD-II DRIVE CYCLE PATTERN

Start the engine, and drive at 30 km/h (19 mph) for 30 seconds. Then stop the vehicle, and turn OFF the ignition switch. After that, restart the engine, and drive again at 30 km/h (19 mph) for 30 seconds.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the torque converter clutch solenoid valve
- Malfunction of the valve body
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, read the A/T diagnostic trouble code.

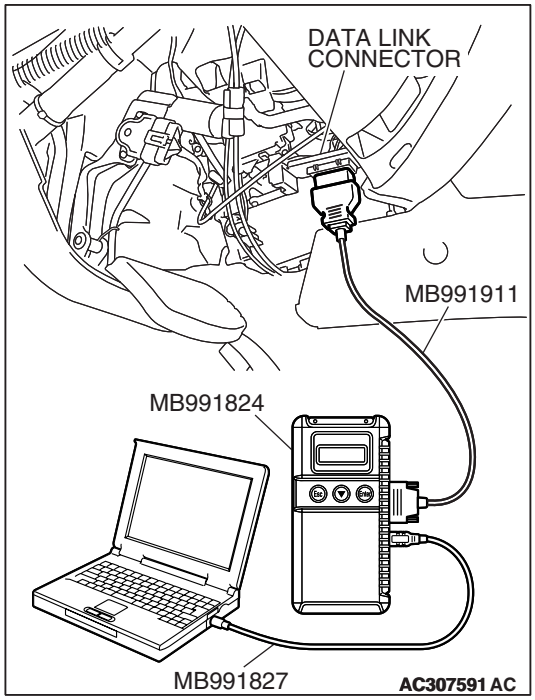
⚠ CAUTION

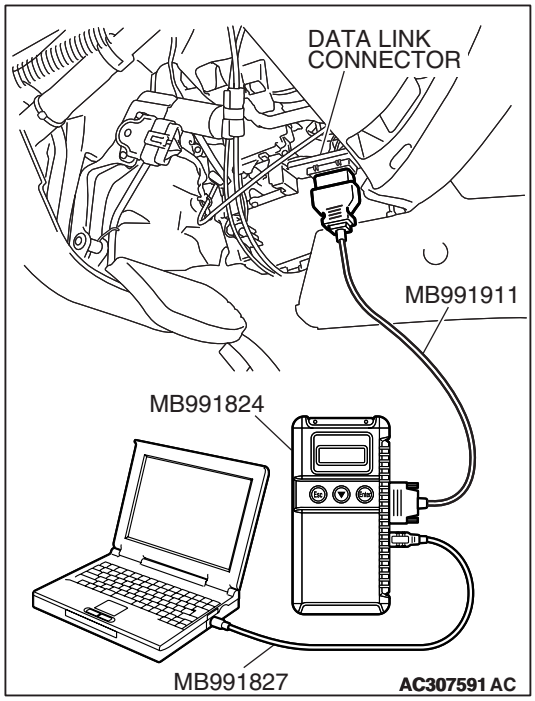
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 36 set?

YES : Refer to P.23A-245, DTC 36: Torque Converter Clutch Solenoid Valve System.
NO : Go to Step 2.





STEP 2. Using scan tool MB991958, check data list item 52: Amount of Torque Converter Clutch Slippage.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine. (Warming up engine)
(3) Set scan tool MB991958 to the data reading mode.
- Item 52: Torque Converter Clutch Amount of Slippage.
  - Driving at a constant speed of 80 km/h (50 mph), the display should be "−10 to 10 r/min."
  - If the accelerator pedal is released, the display on the scan tool changes (50 km/h (31 mph) and less).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the torque converter clutch slippage within the specified range?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points − How to Cope with Intermittent Malfunction P.00-13.

NO : Go to Step 3.

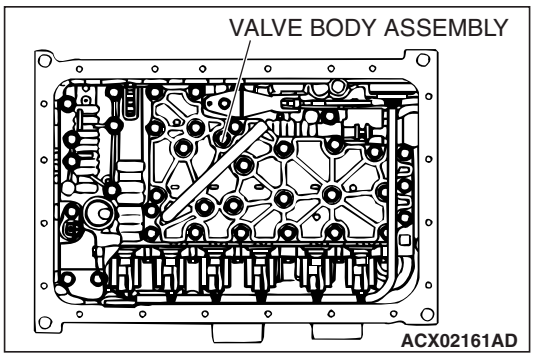
STEP 3. Replace the PCM.

(1) Replace the PCM.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is DTC 53 set?

YES : Go to Step 4.

NO : The procedure is complete.



STEP 4. Replace the valve body.

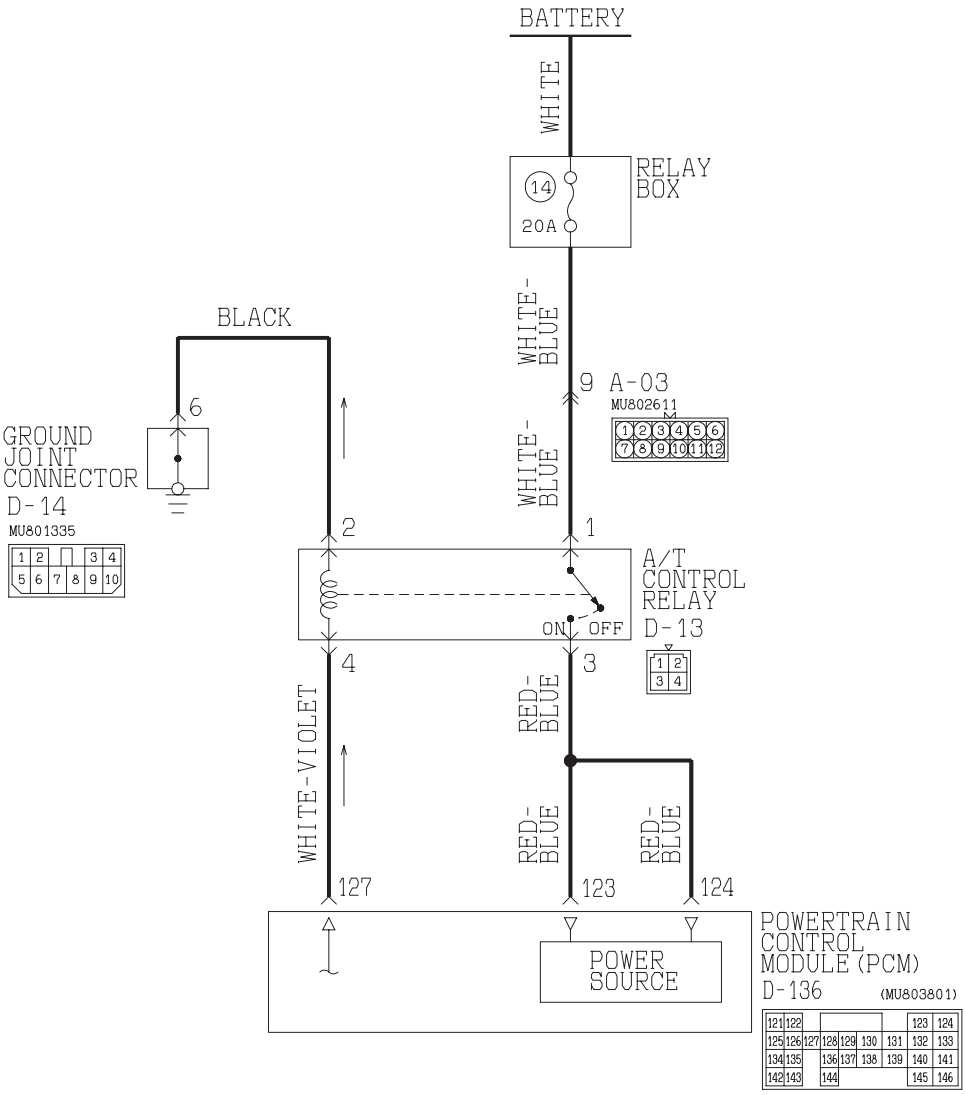
(1) Replace the valve body. Refer to GROUP 23B, Transmission P.23B-14.
(2) Test drive the vehicle.
(3) Check for A/T diagnostic trouble code.

Q: Is DTC 53 set?

YES : Replace the Torque Converter. Refer to P.23A-566, Transmission and Transfer Assembly .

NO : The procedure is complete.

DTC 54 (P1751): A/T Control Relay System



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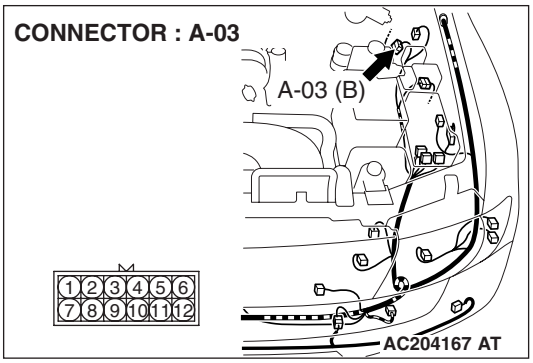

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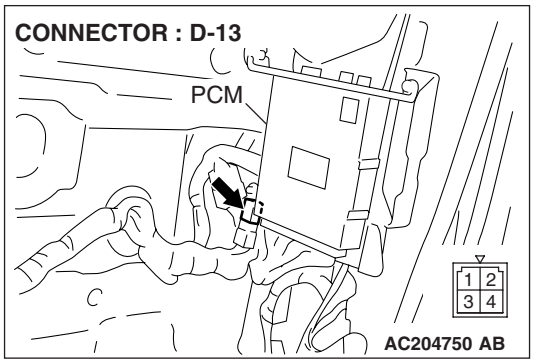

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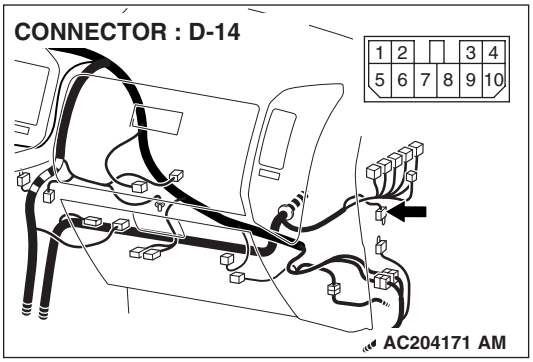
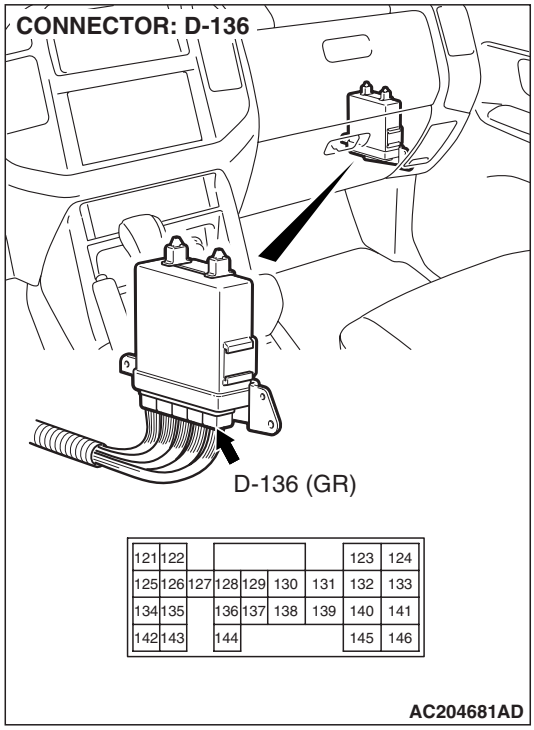
TSB Revision





CIRCUIT OPERATION

- A/T control relay (terminal 1) receives battery positive voltage through a battery.
- The PCM (terminal 127) applies voltage to energize the A/T control relay (terminal 4). With the A/T control relay energized, system voltage is applied to the PCM (terminals 123 and 124).

DESCRIPTIONS OF MONITOR METHODS

If relay output voltage is below specified value, PCM judges that A/T control relay has a failure.

MONITOR EXECUTION

Continuous

MONITOR EXECUTION CONDITIONS (OTHER MONITOR AND SENSOR)

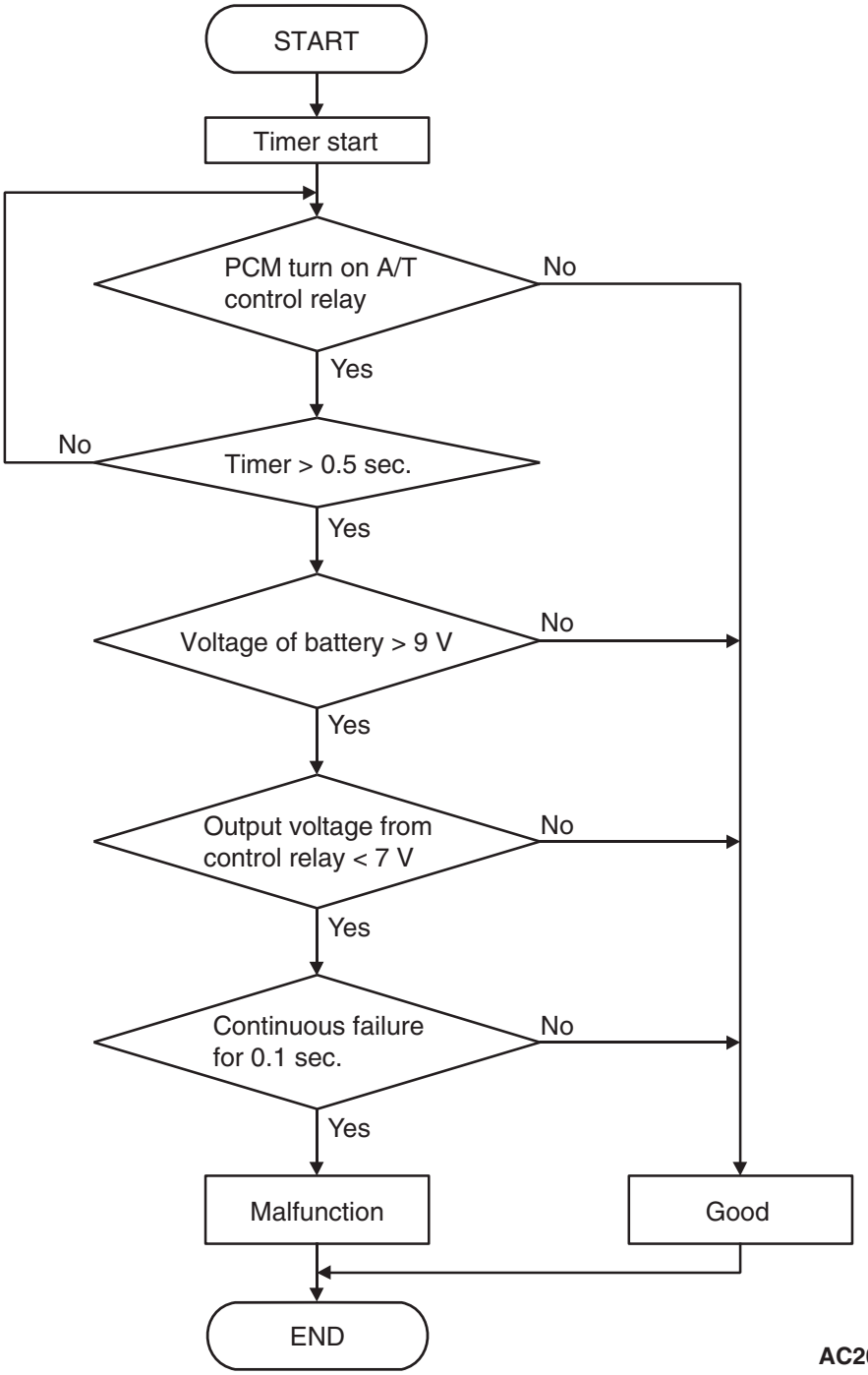
Other Monitor (There is no temporary DTC stored in memory for the item monitored below)

- DTC 41 (P0731): 1st gear incorrect ratio
- DTC 42 (P0732): 2nd gear incorrect ratio
- DTC 43 (P0733): 3rd gear incorrect ratio
- DTC 44 (P0734): 4th gear incorrect ratio
- DTC 45 (P0735): 5th gear incorrect ratio
- DTC 46 (P0736): Reverse gear incorrect ratio
- DTC 36 (P0743): Torque converter clutch solenoid malfunction
- DTC 31 (P0753): Low-reverse solenoid malfunction
- DTC 32 (P0758): Underdrive solenoid malfunction
- DTC 33 (P0763): Second solenoid malfunction
- DTC 34 (P0768): Overdrive solenoid malfunction
- DTC 35 (P0773): Reduction solenoid malfunction

Sensor (The sensor below is determined to be normal)

- Torque converter clutch solenoid
- Low-reverse solenoid
- Underdrive solenoid
- Second solenoid
- Overdrive solenoid
- Reduction solenoid

LOGIC FLOW CHARTS (Monitor Sequence)



DTC SET CONDITIONS (ENTRY CONDITIONS AND MALFUNCTION THRESHOLDS)

Check Conditions

- Voltage of battery: 9 volts or more.
- Time after PCM turns on A/T control relay: 0.5 second or more.

Judgement Criteria

- A/T control relay output voltage: 7 volts or less. (0.1 second)
- If DTC 54 (P1751) is set consecutively four times, the transmission is locked into 3rd gear as a fail-safe measure, and the "N" range light flashes once per second.

OBD-II DRIVE CYCLE PATTERN

Start the engine, and keep the vehicle stopped in P range for 5 seconds.

TSB Revision

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Malfunction of the A/T control relay
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check data list item 54: A/T Control Relay Output Voltage.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

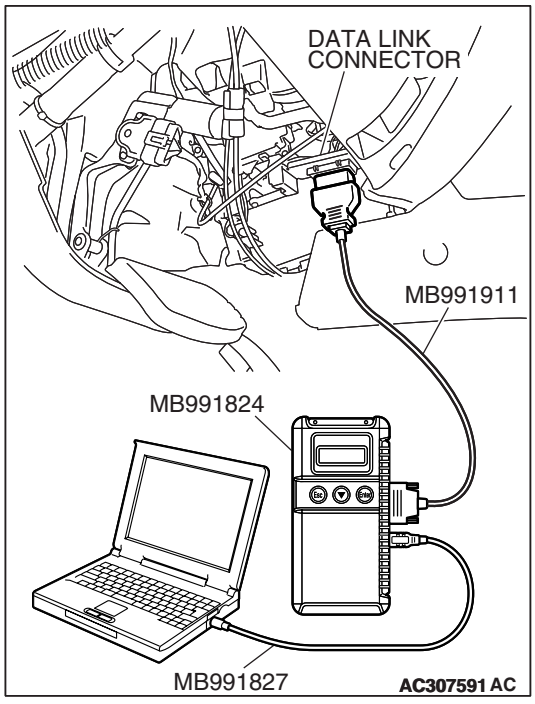
(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
  - Item 54: A/T Control Relay Output Voltage.
    - The voltage should equal battery positive voltage.

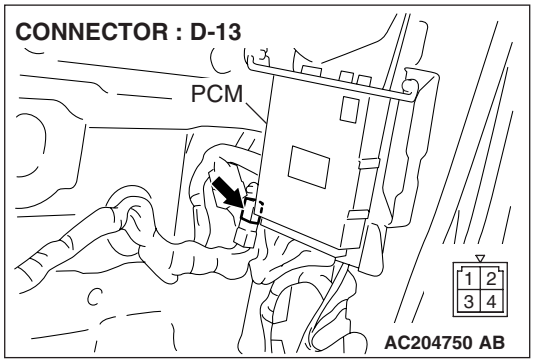
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage equal battery positive voltage?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

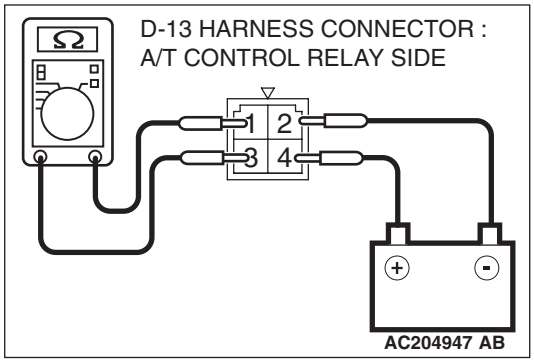
NO : Go to Step 2.





STEP 2. Check the A/T control relay.

(1) Remove the A/T control relay (A/T control relay connector D-13).



(2) Using jumper wires, connect terminal 2 to the negative battery terminal, and terminal 4 to the positive battery terminal.

(3) Measure the resistance between terminal 1 and 3 of the A/T control relay.

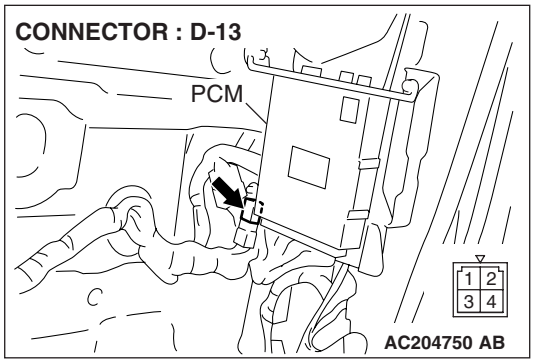
- The resistance should measure less than 2 ohms.
- Disconnect the jumper wires. The resistance between terminals 1 and 3 should measure over limits (open circuit).

Q: Is the measured resistance less than 2 ohms when the relay is energized, and open circuit when the relay is de-energized?

YES : Go to Step 3.

NO : Replace the A/T control relay.

STEP 3. Check A/T control relay connector D-13 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

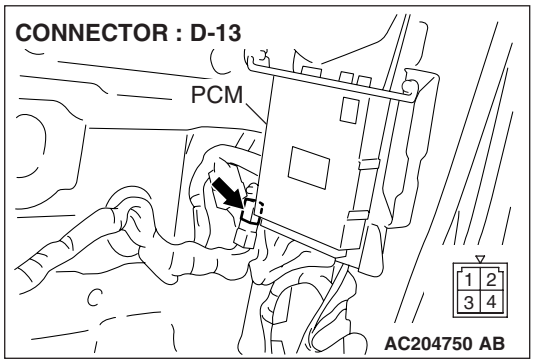


Q: Are the connector and terminals in good condition?

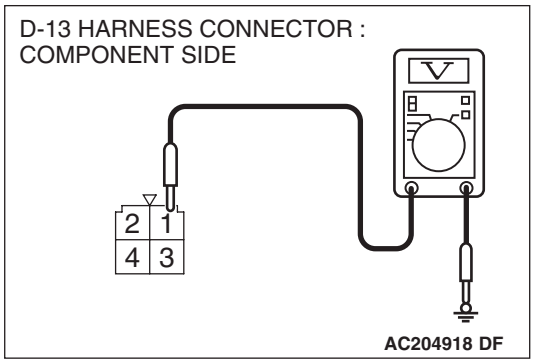
YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 4. Measure the supply voltage at A/T control relay connector D-13.



(1) Disconnect the A/T control relay and measure at the harness side.

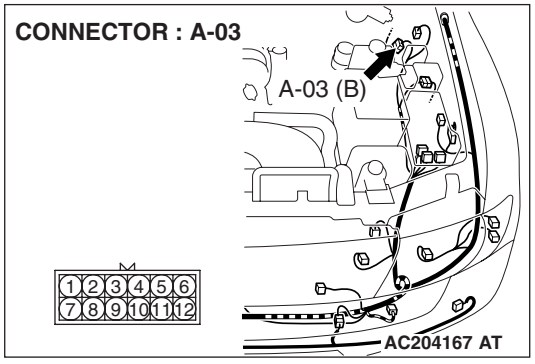


(2) Measure the voltage between terminal 1 and ground.
- The measured voltage should equal battery positive voltage.

Q: Is the measured voltage equal to battery positive voltage?

YES : Go to Step 7.
NO : Go to Step 5.

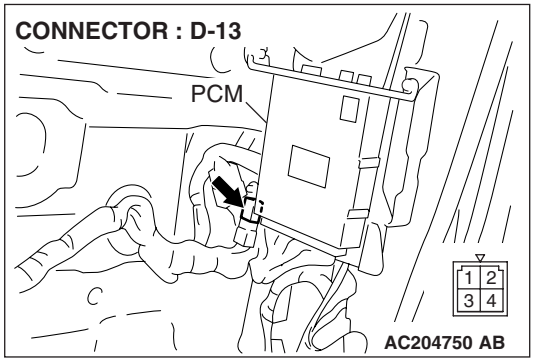
STEP 5. Check intermediate connector A-03 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are the connector and terminals in good condition?

YES : Go to Step 6.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Check the harness for open circuit or short circuit to ground between A/T control relay connector D-13 terminal 1 and battery.

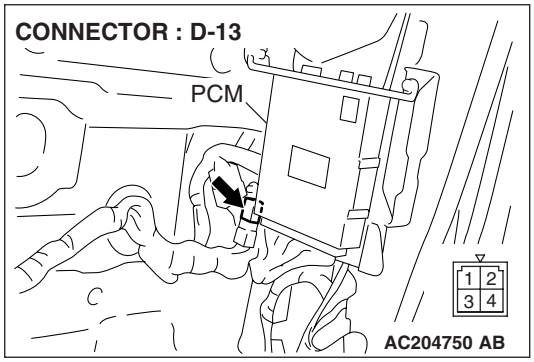


Q: Is the harness wire in good condition?

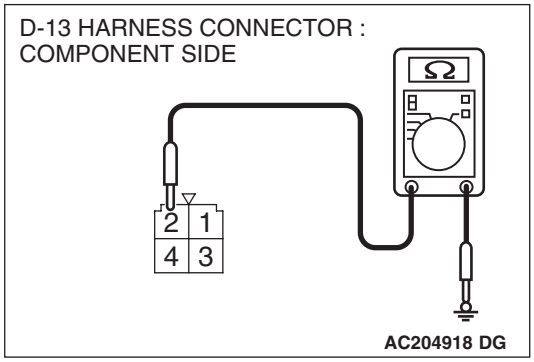
YES : Go to Step 19.

NO : Repair or replace the harness wire.

STEP 7. Measure the resistance at A/T control relay connector D-13.



(1) Disconnect the A/T control relay and measure at the harness side.

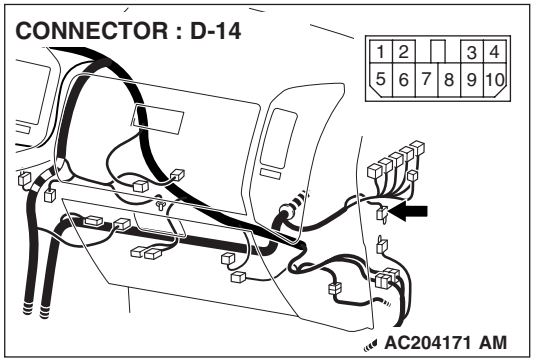


(2) Measure the resistance between terminal 2 and ground.
- The resistance should measure less than 2 ohms.

Q: Is the measured resistance less than 2 ohms?

YES : Go to Step 10.

NO : Go to Step 8.

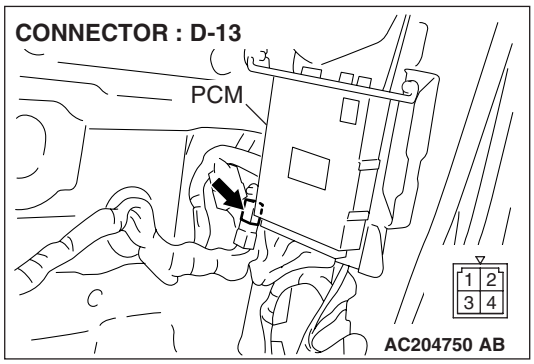


STEP 8. Check ground joint connector D-14 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 9.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

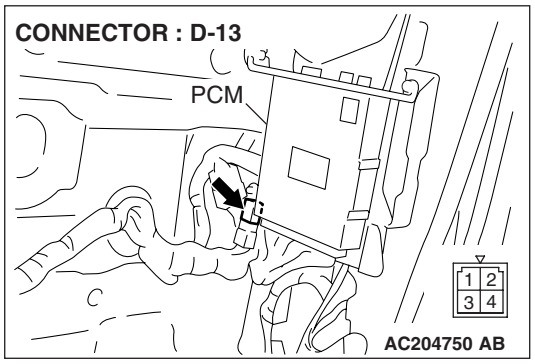


STEP 9. Check the harness for open circuit or damage between A/T control relay connector D-13 terminal 2 and ground.

Q: Is the harness wire in good condition?

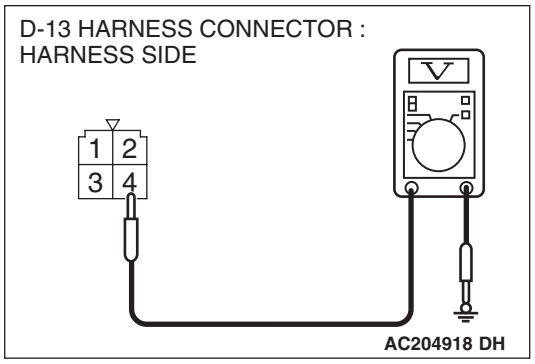
YES : Go to Step 19.

NO : Repair or replace the harness wire.



STEP 10. Measure the control voltage to A/T control relay connector D-13 by backprobing.

(1) Remove the A/T control relay.
(2) Do not disconnect the A/T control relay and measure at the connector side.
(3) Turn the ignition switch to the "ON" position.



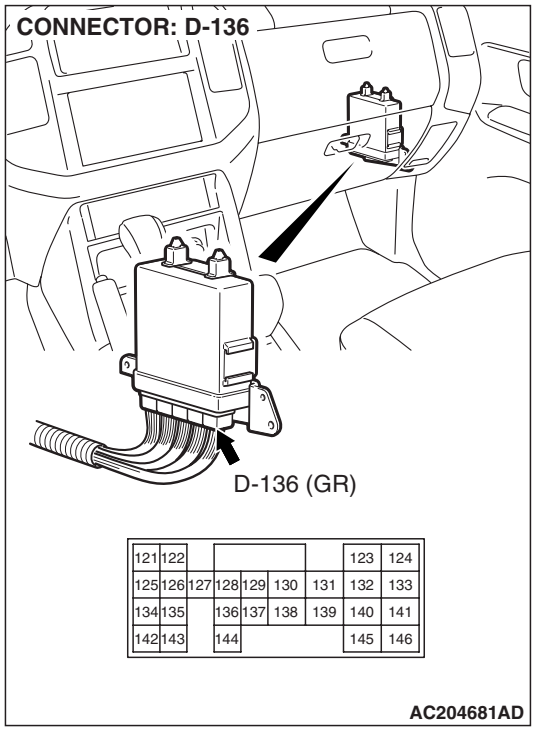
(4) Measure the voltage between terminal 4 and ground by backprobing.
- The measured voltage should equal battery positive voltage.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

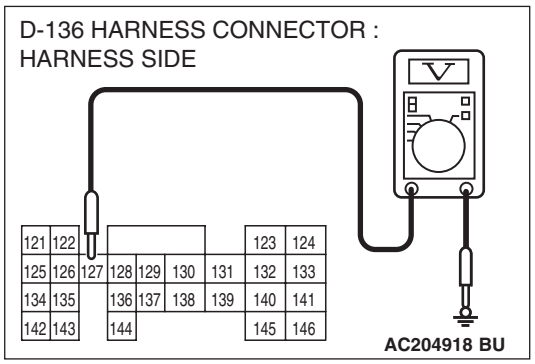
Q: Is the measured voltage equal to battery positive voltage?

YES : Go to Step 16.
NO : Go to Step 11.

STEP 11. Measure the supply voltage at PCM connector D-136 by backprobing.



(1) Do not disconnect connector D-136.
(2) Turn the ignition switch to the "ON" position.

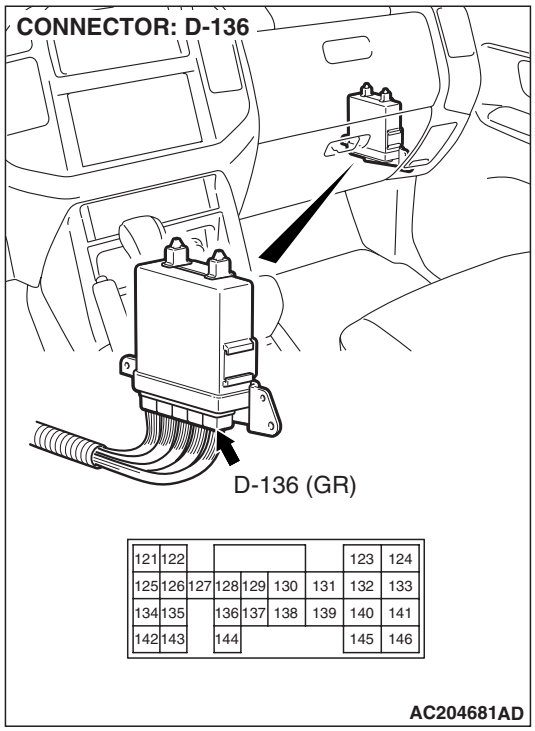


(3) Measure the voltage between terminal 127 and ground by backprobing.
- The measured voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage equal to battery positive voltage?

YES : Go to Step 12.
NO : Go to Step 14.

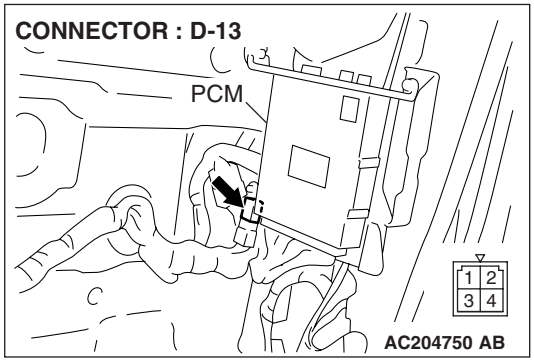


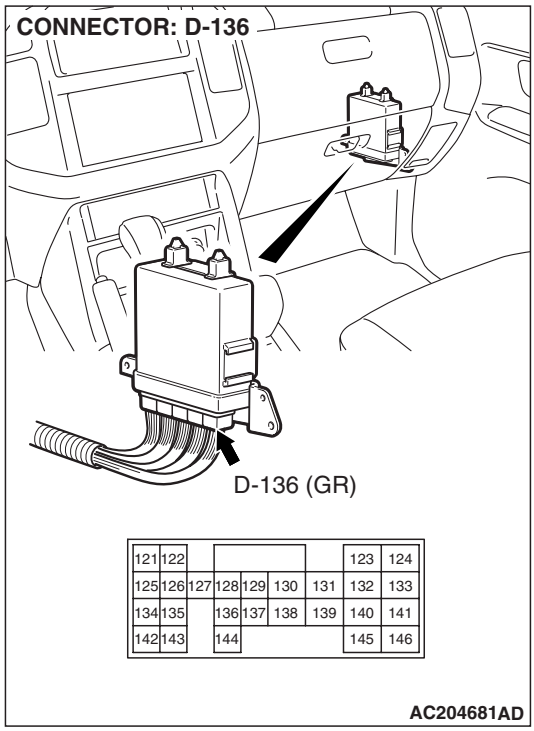
STEP 12. Check PCM connector D-136 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 13.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



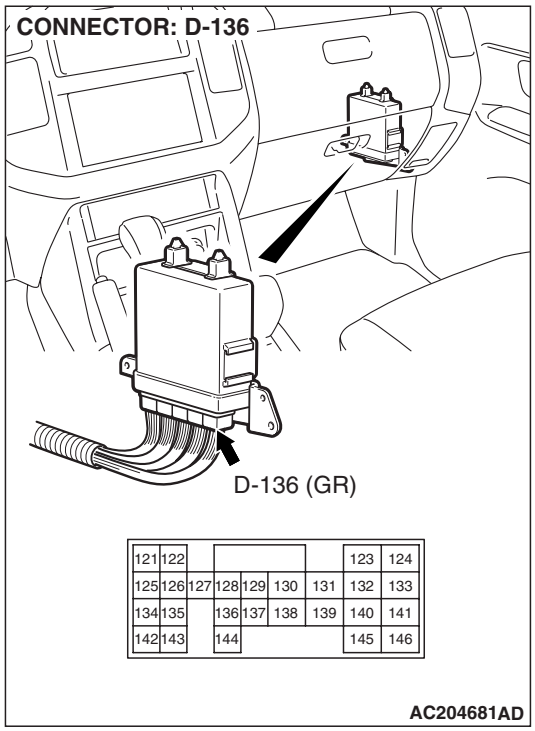


STEP 13. Check the harness for open circuit or damage between A/T control relay connector D-13 terminal 4 and PCM connector D-136 terminal 127.

Q: Is the harness wire in good condition?

YES : Go to Step 19.

NO : Repair or replace the harness wire.

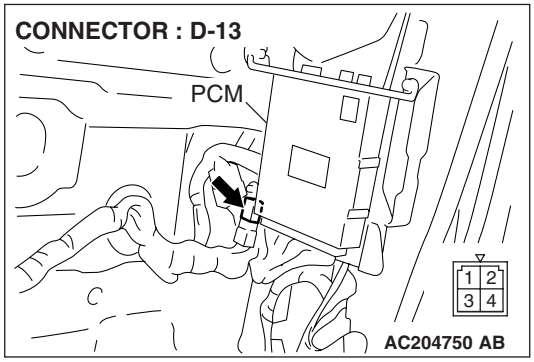


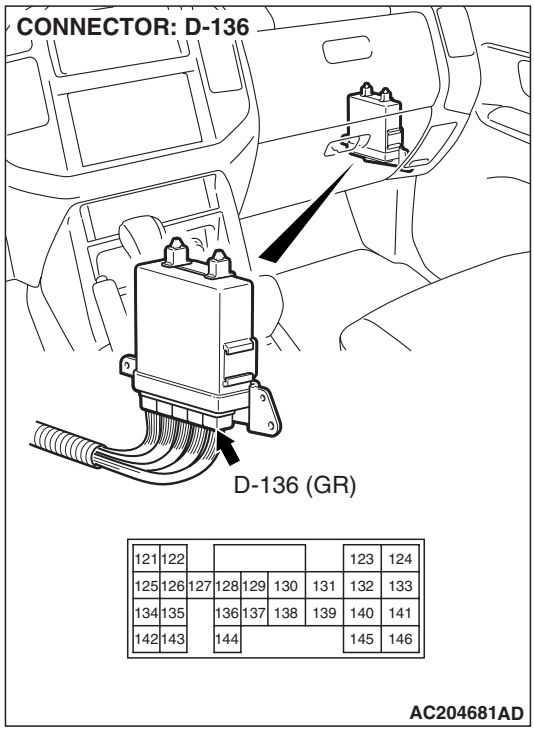
STEP 14. Check PCM connector D-136 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 15.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 15. Check for a short circuit to ground between A/T control relay connector D-13 terminal 4 and PCM connector D-136 terminal 127.

Q: Is the harness wire in good condition?

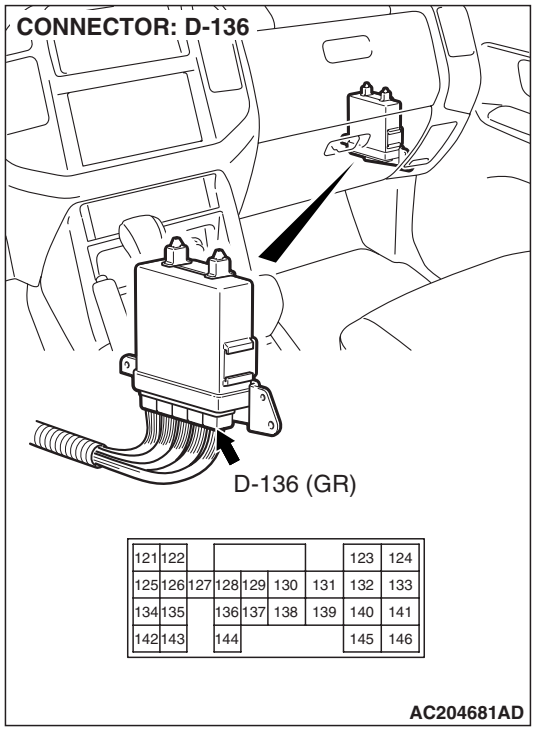
YES : Go to Step 19.

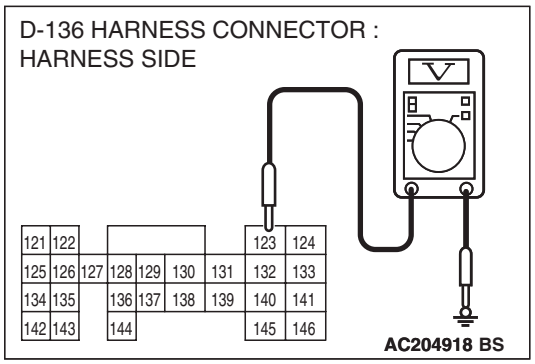
NO : Repair or replace the harness wire.

STEP 16. Measure the A/T control relay output voltage at PCM connector D-136 by backprobing.

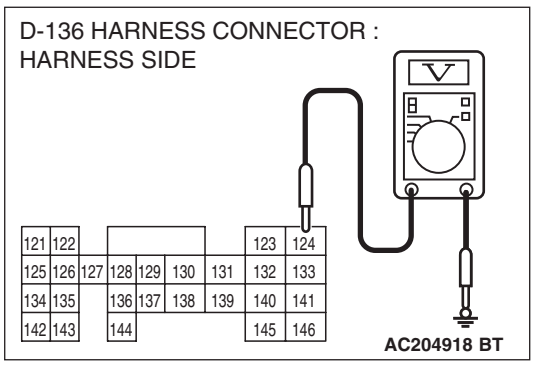
(1) Do not disconnect connector D-136.

(2) Turn the ignition switch to the "ON" position.





(3) Measure the voltage between terminal 123 and ground by backprobing.
- The measured voltage should equal battery positive voltage.



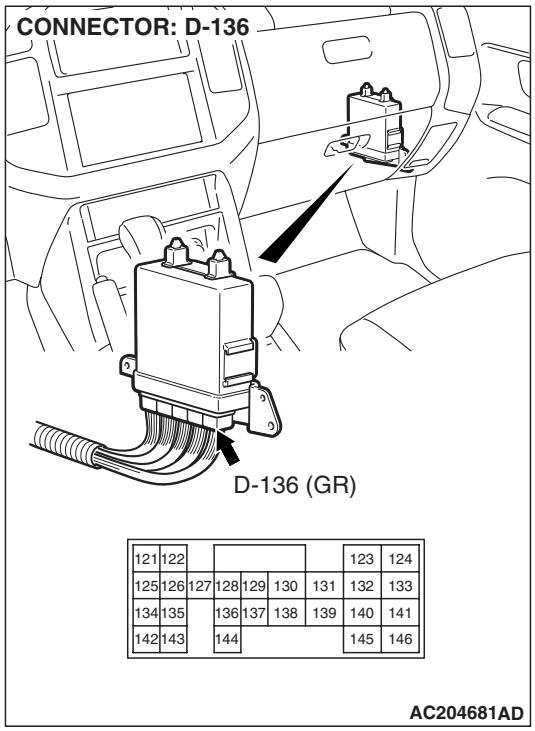
(4) Measure the voltage between terminal 124 and ground by backprobing.
- The measured voltage should equal battery positive voltage.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage equal to battery positive voltage between terminal 123 and ground, and between terminal 124 and ground?

YES : Go to Step 19.

NO : Go to Step 17.

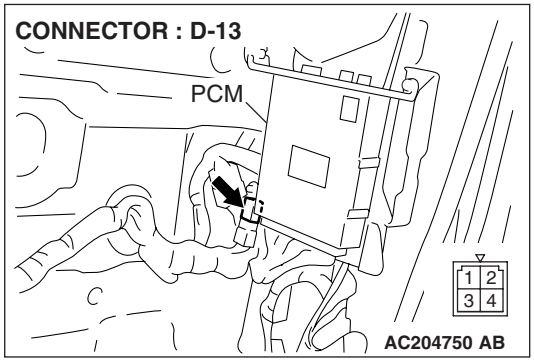


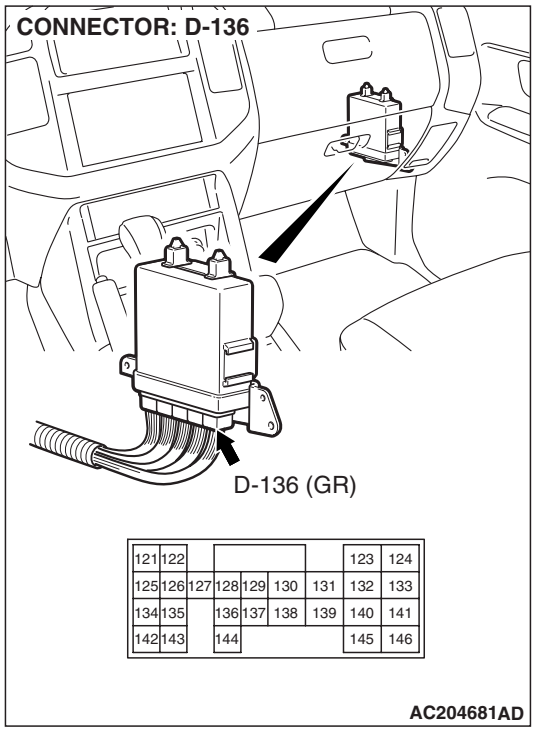
STEP 17. Check PCM connector D-136 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 18.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



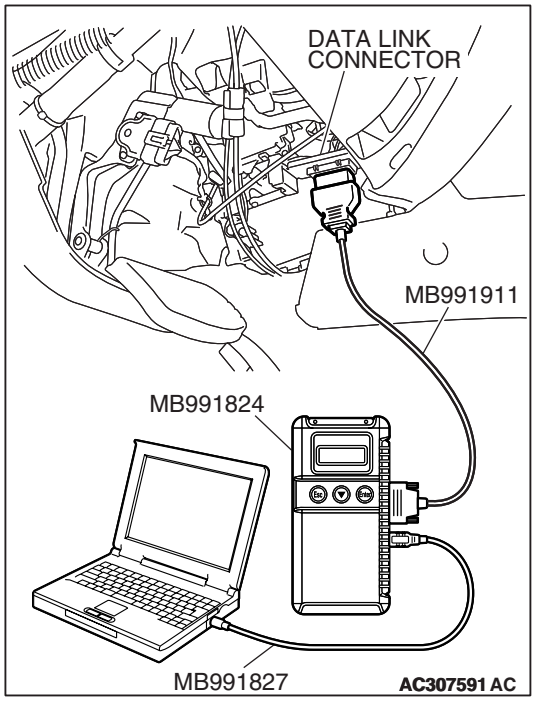


STEP 18. Check harness for open circuit or short circuit to ground between A/T control relay connector D-13 terminal 3 and PCM connector D-136 terminals 123, 124.

Q: Is the harness wire in good condition?

YES : Go to Step 19.

NO : Repair or replace the harness wire.



STEP 19. Using scan tool MB991958, check data list item 54: A/T control relay output Voltage.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 54: A/T Control Relay Output Voltage.
  - The voltage should equal battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

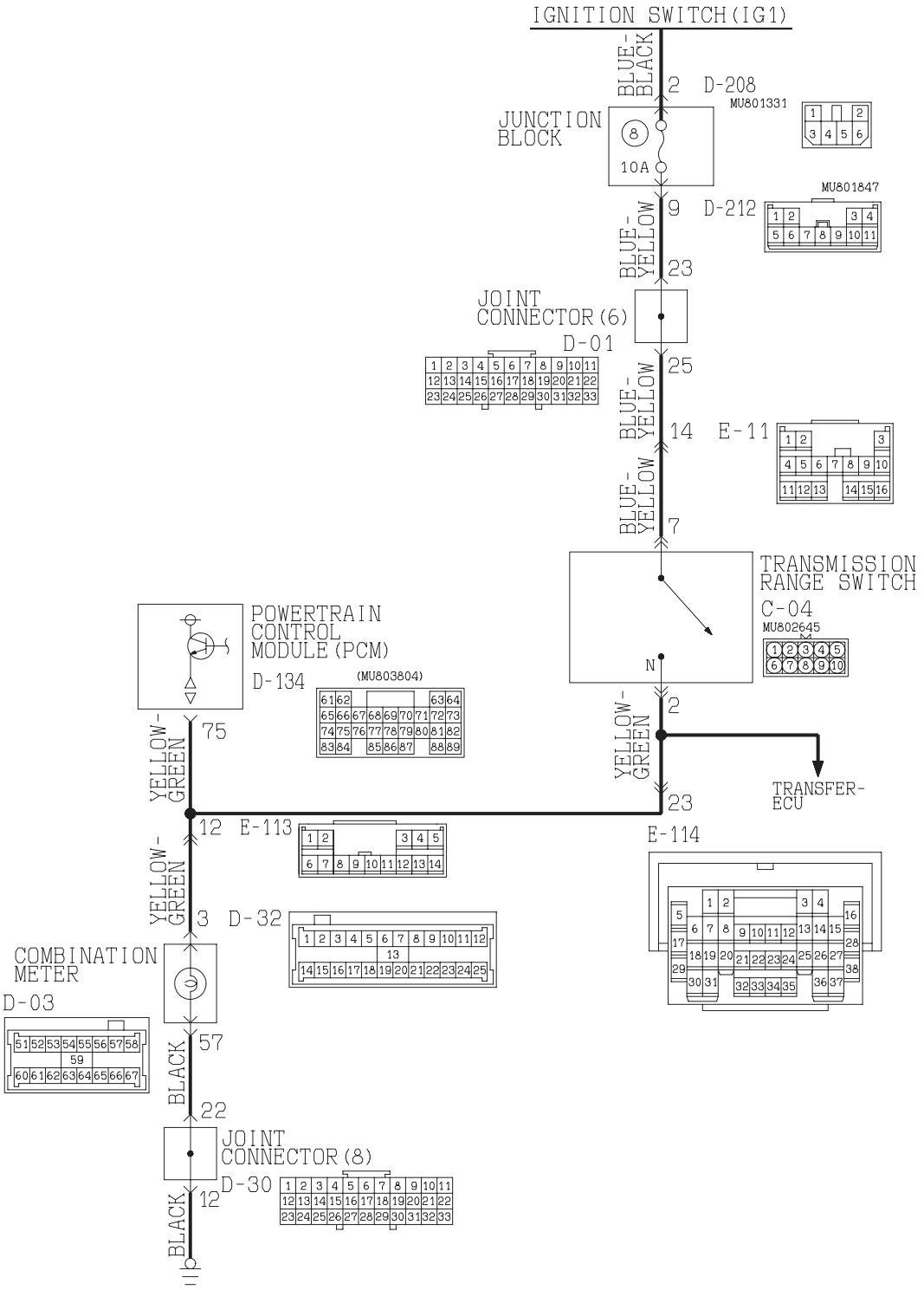
Q: Is the measured voltage equal to battery positive voltage?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.

DTC 56: "N" Range Light System

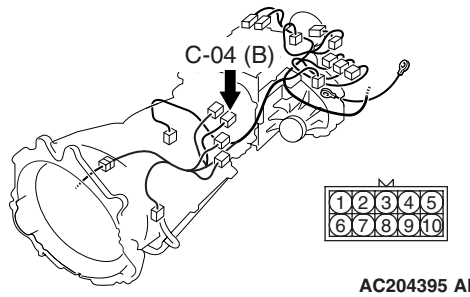
"N" Range Light System Circuit



W2Q01M04AA
AC100554AC

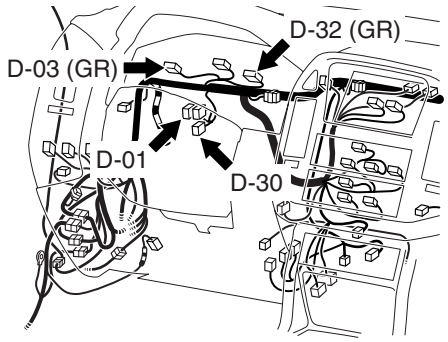
TSB Revision

CONNECTOR : C-04



AC204395 AF

CONNECTORS : D-01, D-03, D-30, D-32



D-01,D-30

1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

D-03

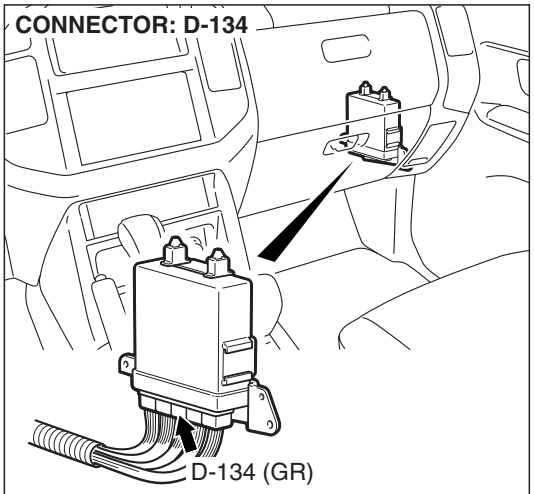
51	52	53	54	55	56	57	58	
				59				
60	61	62	63	64	65	66	67	

D-32

1	2	3	4	5	6	7	8	9	10	11	12	
						13						
14	15	16	17	18	19	20	21	22	23	24	25	

AC204188 AW

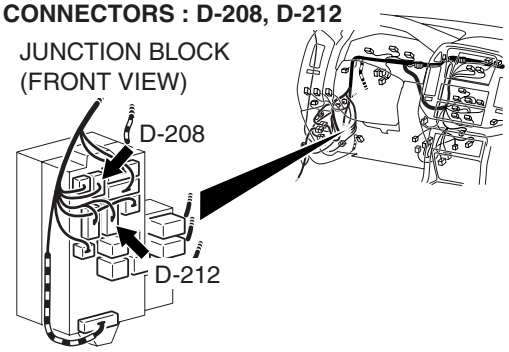
CONNECTOR: D-134



61	62						63	64	
65	66	67	68	69	70	71	72	73	
74	75	76	77	78	79	80	81	82	
83	84		85	86	87		88	89	

AC204681AC

CONNECTORS : D-208, D-212



D-208

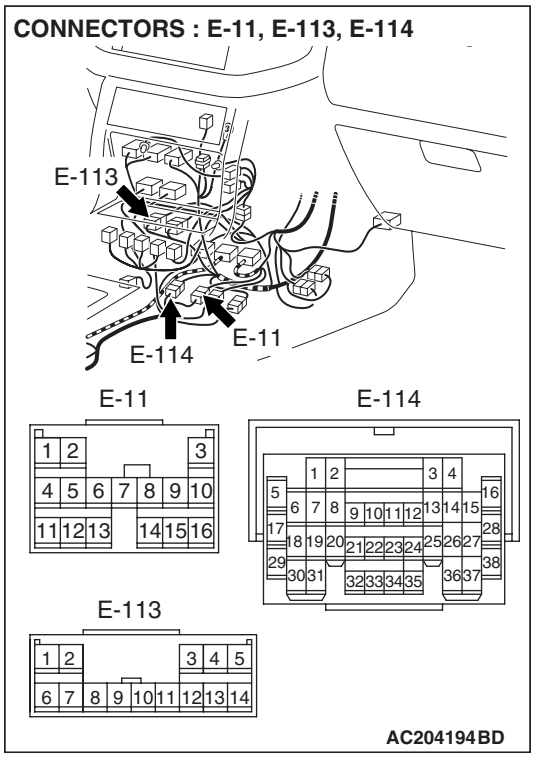
1			2
3	4	5	6

D-212

1	2						3	4
5	6	7	8	9	10	11		

AC204191AS

TSB Revision



CIRCUIT OPERATION

If a fail-safe is triggered while driving forward, the PCM flashes the "N" range light once per second (triggered fail-safe). The PCM does this by switching battery positive voltage to terminal 75.

DTC SET CONDITIONS

If the PCM detects a fail-safe condition, it will attempt to illuminate the "N" range light. The PCM sends a 12 volts pulse for 60 – 180 ms. If it does not detect a voltage drop during the pulse, it waits about 60 seconds and pulses 12 volts again for 60 – 180 ms. If the PCM does no detect the voltage drop before the ignition switch is turned the "LOCK" (OFF), the PCM will consider it as an short circuit of the "N" range light circuit and DTC 56 is set.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CODE TO BE SET ARE:)

- Defective "N" range light bulb
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Check the "N" range light bulb.

(1) Turn the ignition switch to the "ON" position.
(2) Move the selector lever to "N" position.
- The "N" range light in the combination meter illuminates.

(3) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Does the "N" range light illuminate?

YES : Go to Step 6.
NO : Go to Step 2.

STEP 2. Check the "N" range light bulb.

(1) Remove the combination meter. Refer to GROUP 54A, Chassis Electrical – Combination Meters Assembly and Vehicle Speed Sensor P.54A-74.
(2) Check the "N" range light bulb.

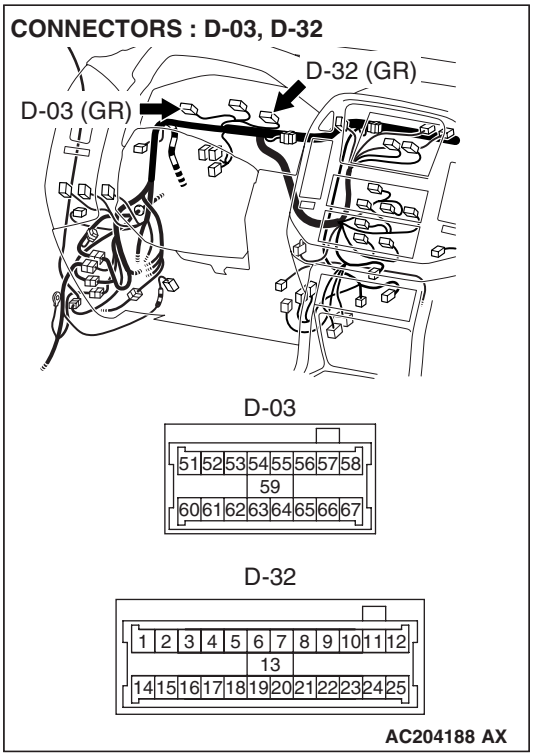
Q: Is the bulb in good condition?

YES : Go to Step 3.
NO : Replace the "N" range light bulb.

STEP 3. Check combination meter connectors D-03 and D-32 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

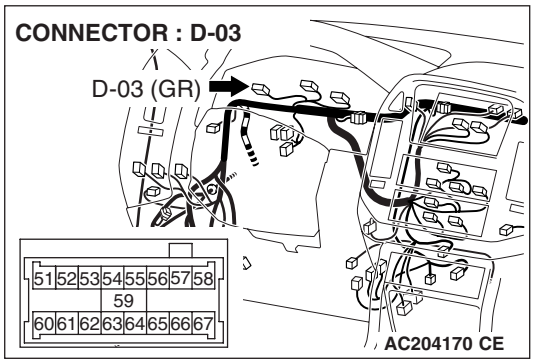
YES : Go to Step 4.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

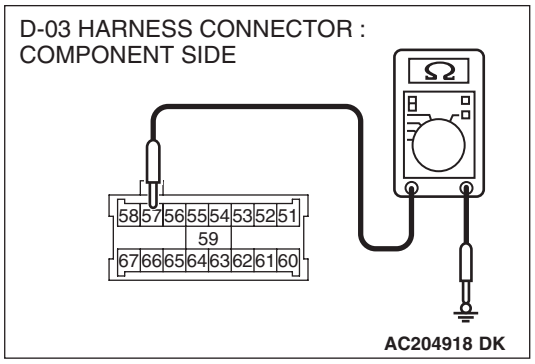


TSB Revision

STEP 4. Measure the resistance at combination meter connector D-03.

(1) Disconnect connector D-03 and measure at the harness side.





(2) Measure the resistance between terminal 57 and ground.
- The measured resistance should be less than 2 ohms.

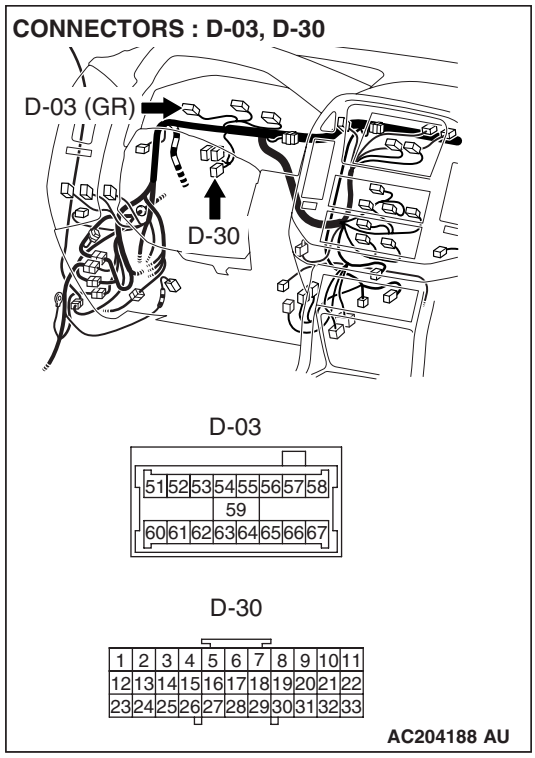
Q: Is the measured resistance less than 2 ohms?

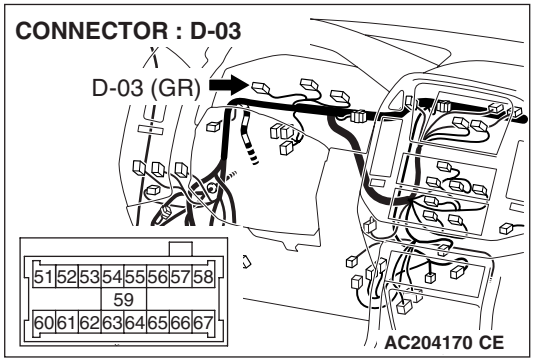
YES : Go to Step 7.
NO : Go to Step 5.

STEP 5. Check combination meter connector D-03 and joint connector D-30 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 6. Check the harness for open circuit or damage between combination meter connector D-03 terminal 57 and body ground.

Q: Is the harness wire in good condition?

YES : Go to Step 9.

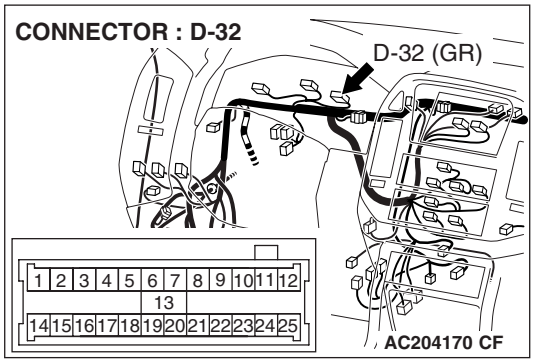
NO : Repair or replace the harness wire.

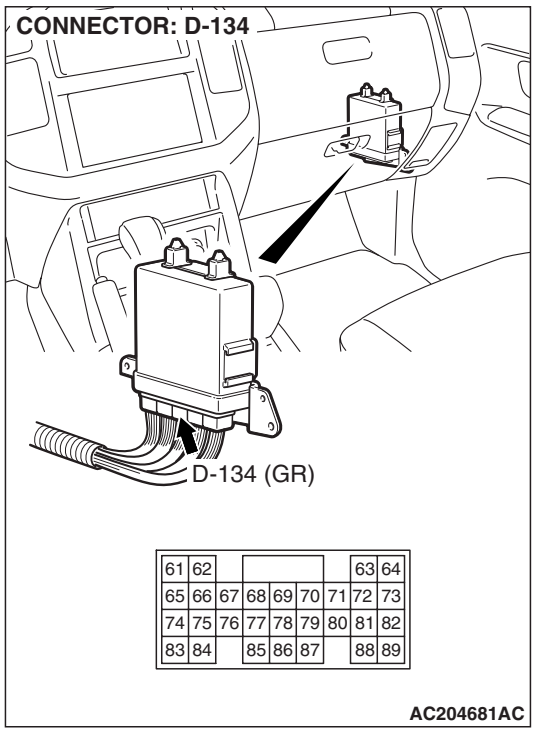
STEP 7. Check combination meter connector D-32, PCM connector D-134 and intermediate connectors E-113 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

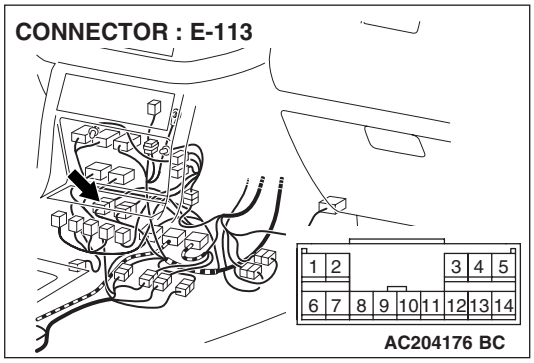
Q: Are the connectors and terminals in good condition?

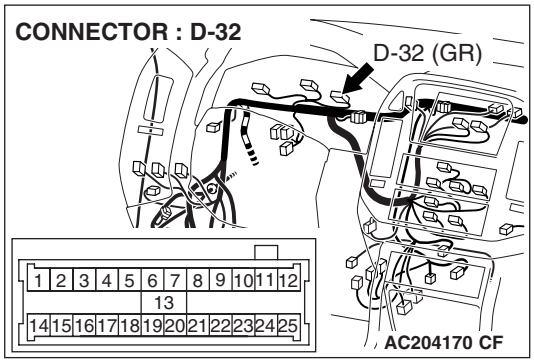
YES : Go to Step 8.

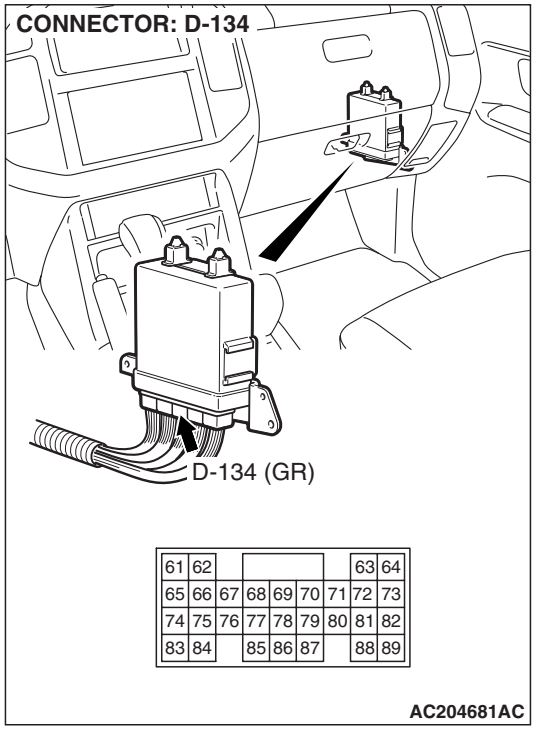
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.











STEP 8. Check the harness for open circuit, short circuit to ground and damage between combination meter connector D-32 terminal 3 and PCM connector D-134 terminal 75.

Q: Is the harness wire in good condition?

YES : Go to Step 9.

NO : Repair or replace the harness wire.

STEP 9. Using scan tool MB991958, read the A/T diagnostic trouble code.

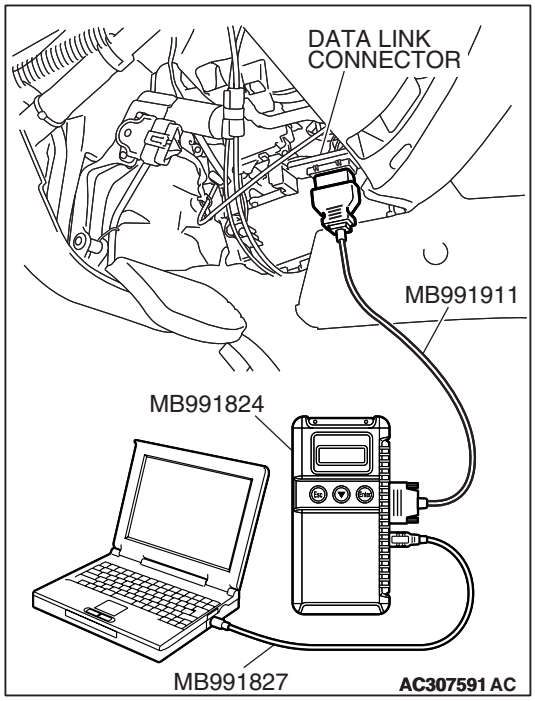
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is DTC 56 set?

YES : Replace the PCM.
NO : The procedure is complete.



SYMPTOM PROCEDURES <AUTOMATIC TRANSMISSION>

INSPECTION PROCEDURE 1: Engine does not Crank

COMMENT
If the engine does not crank when the selector lever is placed in the "P" or "N" position, the cause is probably a malfunction of transmission range switch system, transmission control cable assembly, engine system, torque converter or transmission oil pump.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the transmission range switch
- Malfunction of the transmission control cable assembly
- Malfunction of the engine system
- Malfunction of the torque converter
- Malfunction of the transmission oil pump
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, read the A/T diagnostic trouble code.

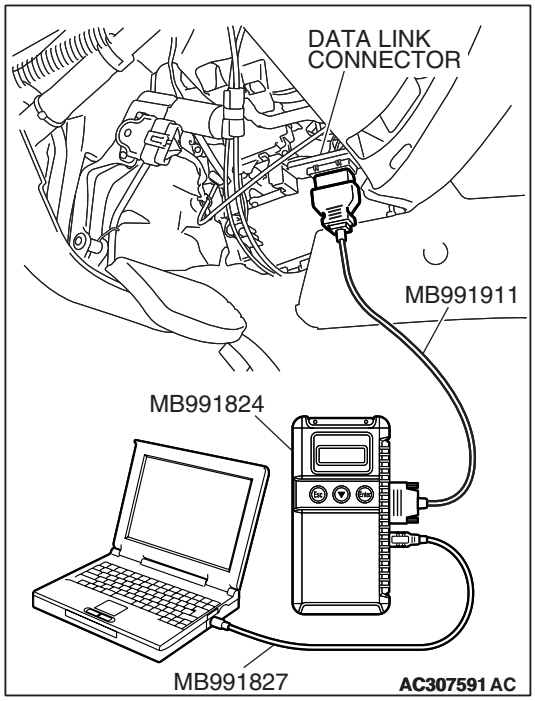
⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for A/T diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is A/T DTCs 27 or 28 set?

YES <DTC 27 set> : Refer to P.23A-122, DTC 27: Transmission Range Switch System (Open Circuit).
YES <DTC 28 set> : Refer to P.23A-151, DTC 28: Transmission Range Switch System (Short Circuit).
NO : Go to Step 2.

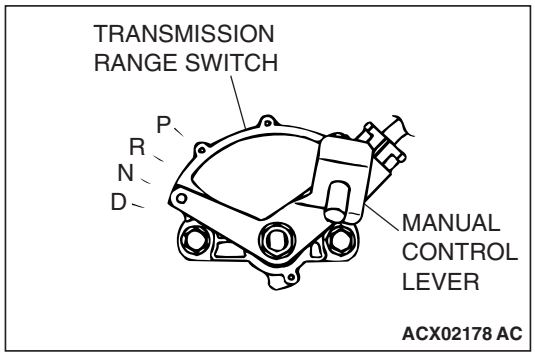


STEP 2. Check the transmission control cable assembly.

Move the selector lever to each position. The manual control lever position of the transmission range switch should match the transmission range.

Q: Is the manual control lever position correct?

YES : Go to Step 3.
NO : Repair the transmission control cable. Refer to P.23A-549, Transmission Range Switch and Control Cable Adjustment. Retest the system to verify the repair.

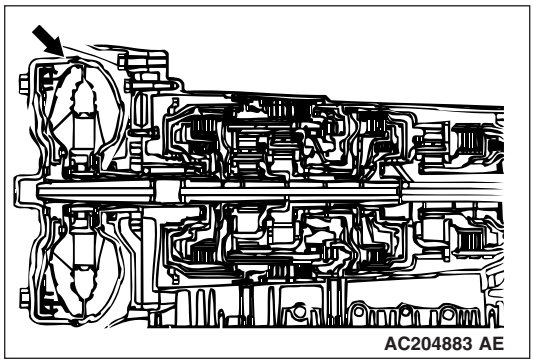


STEP 3. Check the engine.

Refer to GROUP 13A, Diagnosis – Trouble Symptom Chart – Starting P.13A-38.

Q: Is the inspection result good?

YES : Go to Step 4.
NO : Repair or replace the appropriate engine components.


AC204883 AE

STEP 4. Check the torque converter.

(1) Remove the transmission.

(2) Turn the torque converter and check for a binding or sticking condition. Check the ring gear for damaged or missing teeth.

NOTE: Since the torque converter drives the oil pump, turning the torque converter also checks for a binding oil pump. If either of these components are damaged the Transmission will need to be removed for inspection.

Q: Does the torque converter turn freely without any missing or damaged teeth?

YES : Go to Step 5.

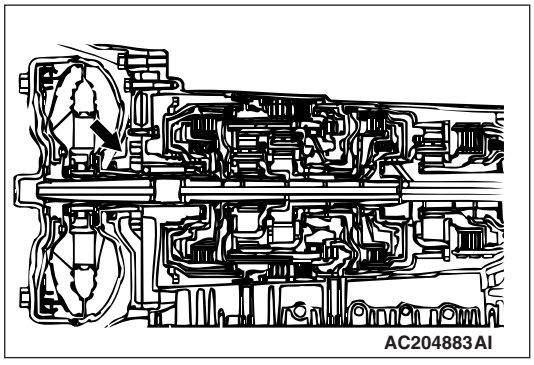
NO : Replace the torque converter.

STEP 5. Repair or replace the starter.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 6.


AC204883 AI

STEP 6. Check the transmission oil pump.

(1) Remove the transmission assembly.

(2) Check the transmission oil pump (incorrect installation, damage and etc.) and replace the transmission oil pump assembly if necessary (The transmission oil pump cannot be disassembly). Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Does the engine crank when the selector lever is placed in the "P" or "N" position?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 2: Does not Move Forward

COMMENT
If the engine is idling and the selector lever is shifted from "N" to "D" range and the vehicle does not drive forward then the cause is due to line pressure defect, under drive clutch or valve body malfunction.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Abnormal line pressure
- Malfunction of the underdrive solenoid valve
- Malfunction of the underdrive clutch
- Malfunction of the valve body
- Malfunction of the transmission oil pump
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 02: Underdrive Solenoid Valve.

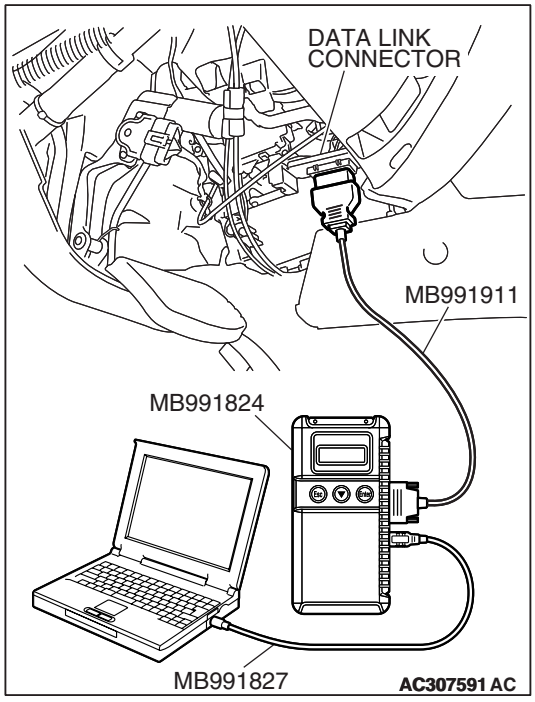
⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 02: Underdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the underdrive solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.



STEP 2. Check the hydraulic pressure.

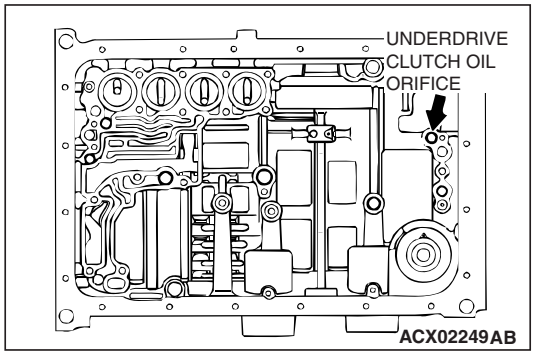
Shift the selector lever to the sport mode (1st gear) then measure the hydraulic pressure of each element in 1st speed to check and see if each respective hydraulic pressure is within the range of standard pressure. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 3.
NO : Go to Step 4.

STEP 3. Check the underdrive clutch system.

(1) Remove the valve body cover and valve body. Refer to P.23A-566, Transmission and Transfer Assembly and refer to GROUP 23B, Transmission P.23B-14.
(2) Blow 108 kPa (15 psi) compressed air into the underdrive clutch oil orifice of the transmission case, and check if the underdrive clutch piston moves and air pressure is maintained in that condition.

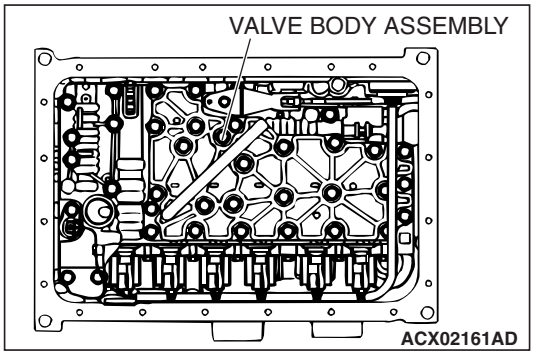


Q: Is the air pressure maintained?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

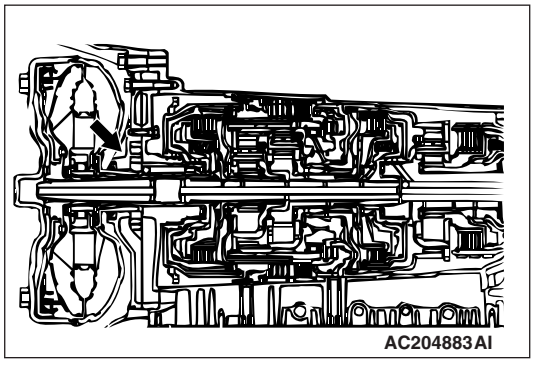


Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 5. Check the transmission oil pump.

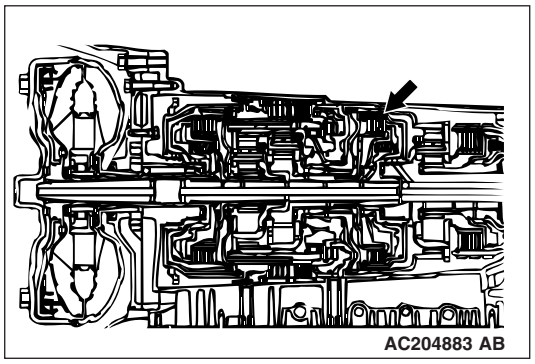
(1) Remove the transmission assembly.
(2) Check the transmission oil pump (incorrect installation, damage and etc.) and replace the transmission oil pump assembly if necessary (The transmission oil pump cannot be disassembly). Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.



Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 7.

TSB Revision


AC204883 AB

STEP 6. Check the underdrive clutch.

(1) Remove the transmission assembly.
(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Underdrive Clutch and Input Shaft P.23B-59. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 3: Does not Move Backward

COMMENT
If the vehicle does not move backward when the selector lever is shifted from "N" to "R" range while the engine is idling, the cause is probably abnormal pressure or a malfunction of the reverse clutch, low-reverse brake, or valve body.

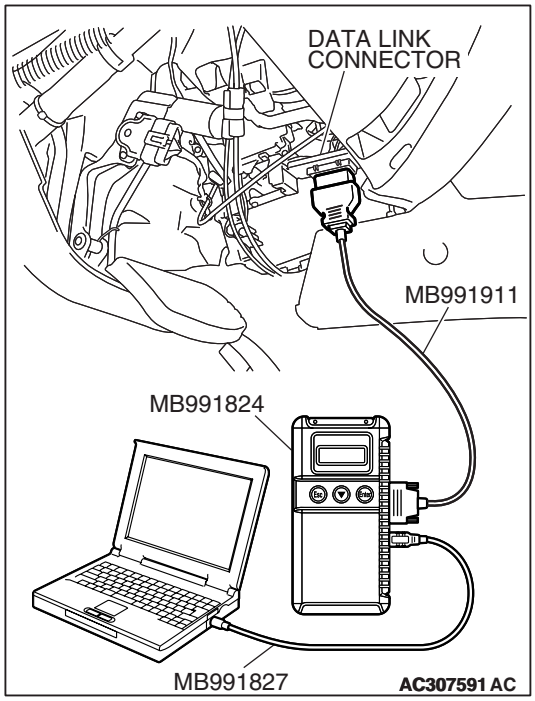
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Abnormal reverse clutch pressure
- Abnormal low-reverse brake pressure
- Malfunction of the low-reverse solenoid valve
- Malfunction of the reverse clutch
- Malfunction of the low-reverse brake
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 01: Low-Reverse Solenoid Valve.
  - An audible clicking or buzzing should be heard when the low-reverse solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.

STEP 2. Check the hydraulic pressure (for reverse clutch).

Measure the hydraulic pressure for reverse clutch when the selector lever is at the "R" range, and check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 3.
NO : Go to Step 5.

STEP 3. Check the hydraulic pressure (for low-reverse brake).

Measure the hydraulic pressure for low-reverse brake when the selector lever is at the "R" range, and check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

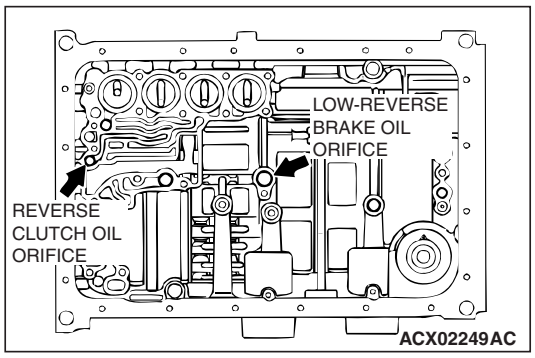
Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 5.

STEP 4. Check the reverse clutch system and low-reverse brake system.

(1) Remove the valve body cover and valve body. Refer to P.23A-566, Transmission and Transfer Assembly and refer to GROUP 23B, Transmission P.23B-14.

(2) Blow 108 kPa (15psi) compressed air into the reverse clutch oil orifice of the Transmission case. Then check if the reverse clutch piston moves and air pressures are maintained in that condition. Repeat for the low-reverse brake.

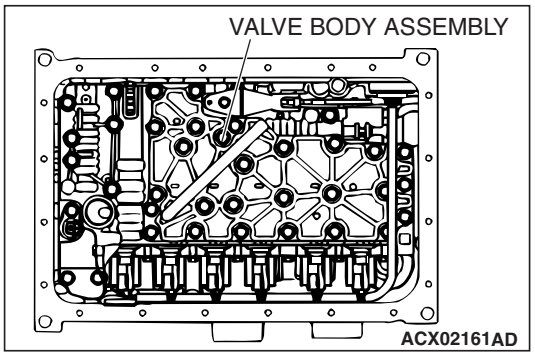


Q: Are the reverse clutch, low-reverse brake or both air pressures maintained?

YES : Go to Step 5.
NO : Go to Step 6.

STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

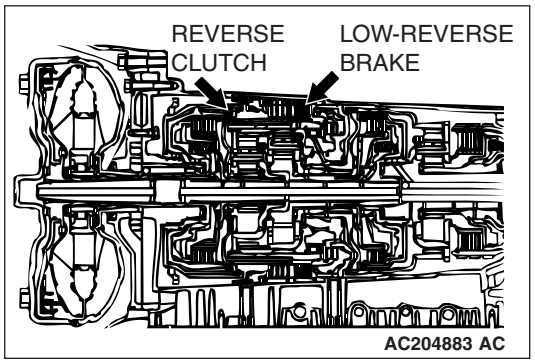


Q: Is the repair possible and the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 7.

STEP 6. Check the reverse clutch, low-reverse brake or both. Remove the Transmission.

Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transmission P.23B-14, Reverse and Overdrive Clutch P.23B-50. Then check the symptom.



Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

TSB Revision

INSPECTION PROCEDURE 4: Does not Move (Forward or Backward)

COMMENT
If the vehicle does not move forward or backward when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure, or a malfunction of the powertrain, transmission oil pump or valve body.

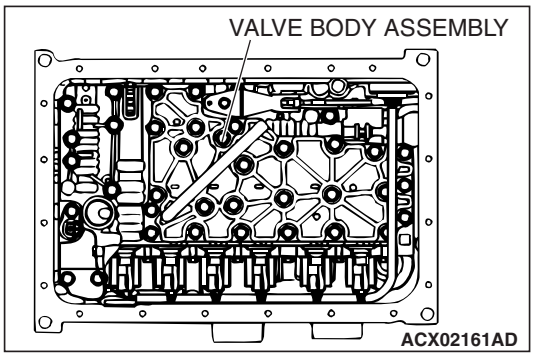
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Abnormal line pressure
- Malfunction of the power train
- Malfunction of the transmission oil pump
- Malfunction of the valve body
- Low transmission fluid level
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the hydraulic pressure.
Measure the hydraulic pressure of each element when the transmission is in 1st, 2nd or reverse. Check if each hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test. If some elements pressure are within the standard value and some are not, recheck the symptom.

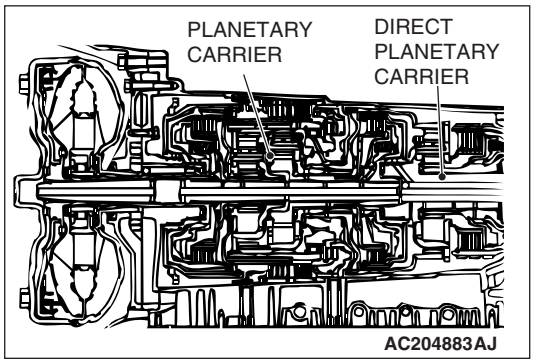
Q: Are all pressures within the standard value?
YES : Check transmission fluid level and condition. If not OK, repair or replace as necessary, then retest the system. If OK, go to Step 3.
NO : Go to Step 2.

STEP 2. Disassemble and clean the valve body.
Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then retest the system.

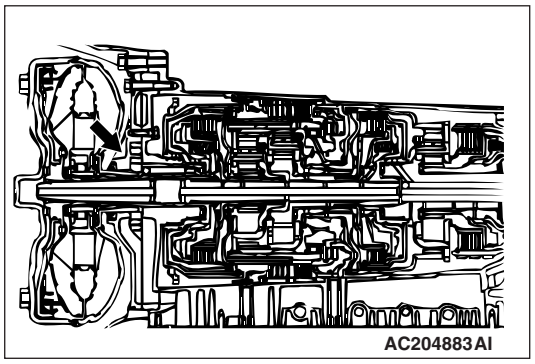


Q: Is the repair possible and the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 4.

STEP 3. Check the transmission power train components.
Disassemble the transmission and check the planetary carrier and output shaft, etc. Repair or replace the damaged parts. Refer to GROUP 23B, Transmission P.23B-14, Low-Reverse Annulus Gear P.23B-55. Then check the symptom.



Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 5.


AC204883AI

STEP 4. Check the transmission oil pump.
(1) Remove the transmission assembly.
(2) Check the transmission oil pump (incorrect installation, damage and etc.) and replace the transmission oil pump assembly if necessary (The transmission oil pump cannot be disassembly). Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 5.

STEP 5. Replace the PCM.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 5: Engine Stalls when Moving Selector Lever from "N" to "D" or "N" to "R"

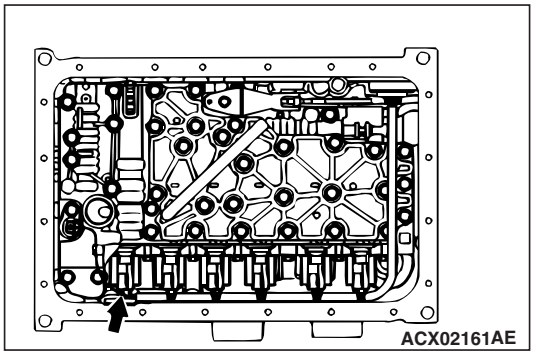
COMMENT
If the engine stalls when the selector lever is shifted from "N" to "D" or "R" range while the engine is idling, the cause is probably a malfunction of the engine system, torque converter clutch solenoid valve, valve body or torque converter (torque converter clutch malfunction).

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of the engine system
- Malfunction of the torque converter clutch solenoid
- Malfunction of the valve body
- Malfunction of the torque converter (Malfunction of the torque converter clutch)
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the engine system.
Refer to GROUP 13A, Diagnosis – Trouble Symptom Chart – When the engine is hot, it stalls at idle P.13A-38.

Q: Is the inspection result good?
YES : Go to Step 2.
NO : Repair or replace the engine components.

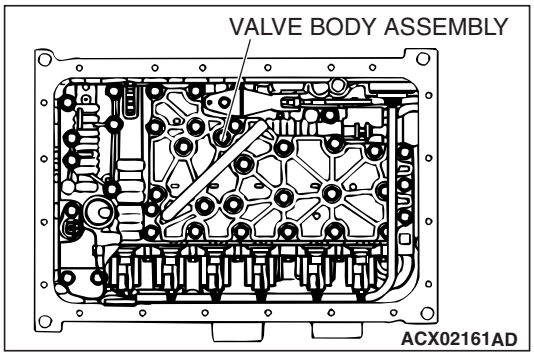

ACX02161AE

STEP 2. Replace the torque converter clutch solenoid valve.

Replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 3.



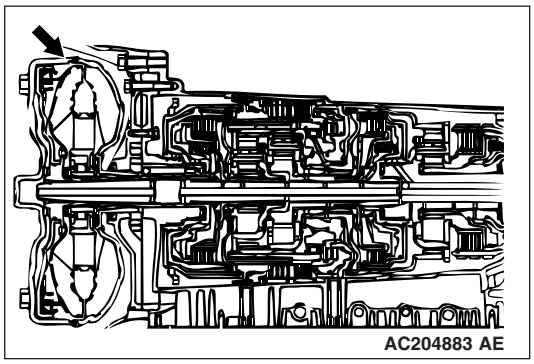
ACX02161AD

STEP 3. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the repair possible and the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 4.


AC204883 AE

STEP 4. Replace the torque converter assembly.

(1) Remove the transmission.
(2) Replace the torque converter assembly. Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 5.

STEP 5. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

TSB Revision

INSPECTION PROCEDURE 6: Shift Shock when Shifting from "N" to "D" and Long Delay

COMMENT
If abnormal shock or delay of two seconds or more occurs when the selector lever is shifted from "N" to "D" range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body or APP sensor.

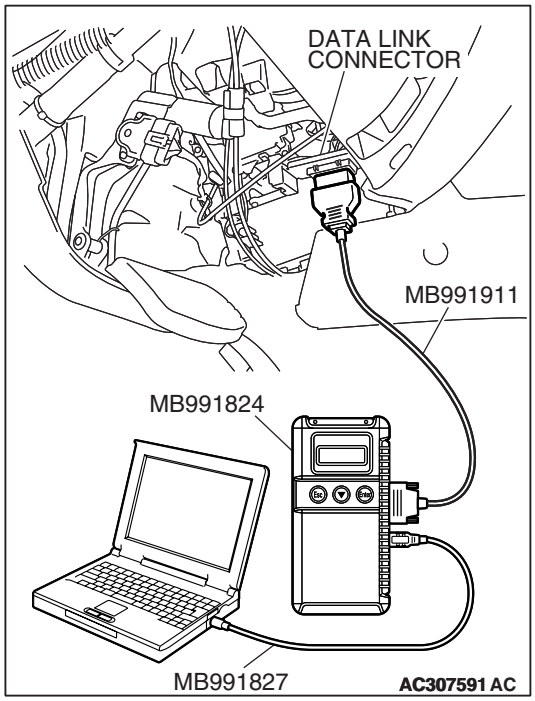
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Abnormal underdrive clutch pressure
- Malfunction of the underdrive solenoid valve
- Malfunction of the underdrive clutch
- Malfunction of the valve body
- Malfunction of the APP sensor
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test item 02: Underdrive Solenoid Valve.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 02: Underdrive Solenoid Valve.
  - An audible clicking or buzzing should be heard when the underdrive solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the underdrive solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.

STEP 2. Check when shift shock occurs.

Q: When does the shift shock occur?

When engaging from N to D : Go to Step 3.
When the vehicle starts moving : Go to Step 6.

STEP 3. Check the hydraulic pressure (for underdrive clutch).

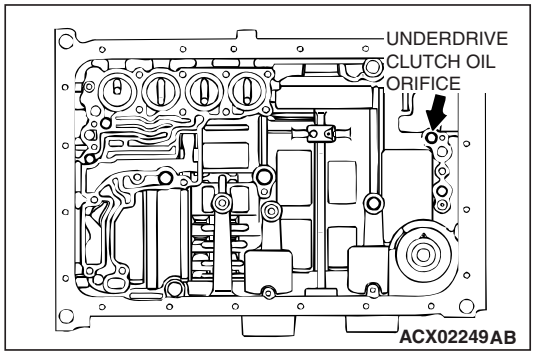
Measure the hydraulic pressure for underdrive clutch when the selector lever is shifted from "N" to "D" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 8.

STEP 4. Check the underdrive clutch system.

(1) Remove the valve body cover and valve body. Refer to P.23A-566, Transmission and Transfer Assembly and refer to GROUP 23B, Transmission P.23B-14.
(2) Blow 108 kPa (15 psi) compressed air into the underdrive clutch oil orifice of the transmission case, and check if the underdrive clutch piston moves and air pressure is maintained in that condition.

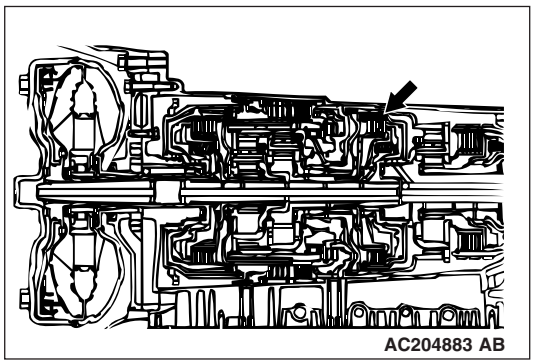


Q: Is the air pressure maintained?

YES : Go to Step 8.
NO : Go to Step 5.

STEP 5. Check the underdrive clutch.

(1) Remove the transmission assembly.
(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B P.23B-59, Underdrive Clutch. Then check the symptom.



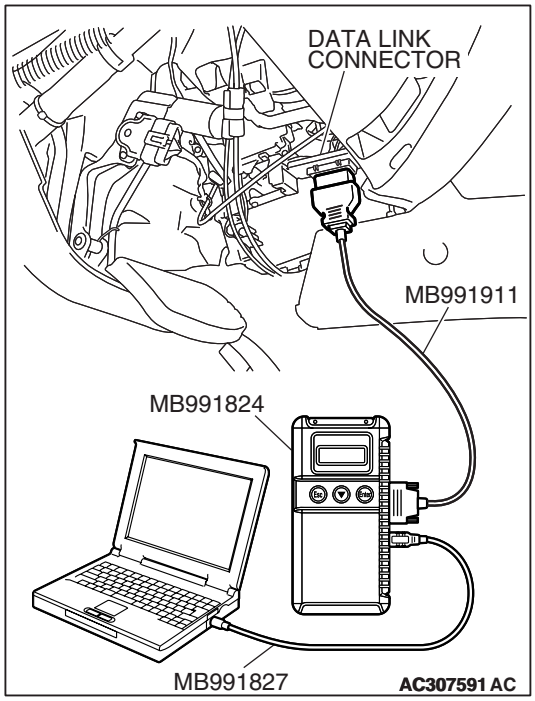
Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 9.

STEP 6. Check shift shock.

Q: Does shift shock occur?

YES : Go to Step 7.
NO : Go to Step 8.



STEP 7. Using scan tool MB991958, check data list item 11: TP Sensor.

⚠ CAUTION

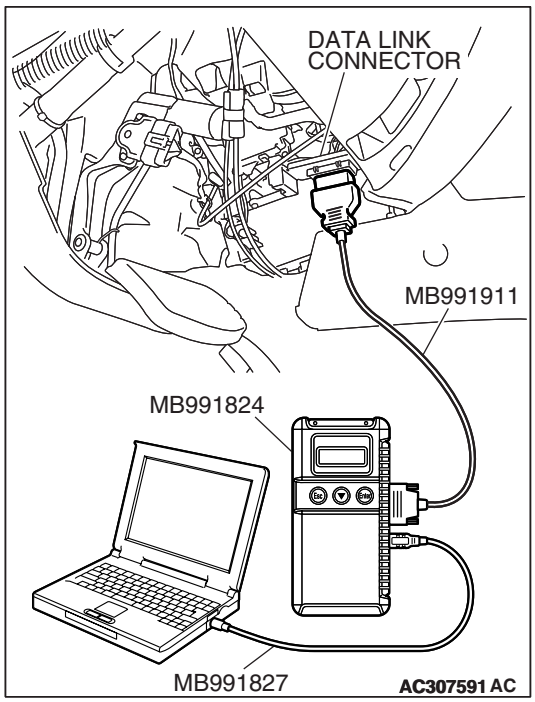
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 11: TP Sensor
  - With the throttle valve in the idle position, voltage should measure between 200 and 800 mV.
  - With the throttle valve in the full-open position, voltage should measure between 3,800 and 4,900 mV.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 200 and 800 mV at idle, and between 3,800 and 4,900 mV in the full-open position?

YES : Go to Step 9.
NO : Go to Step 8.



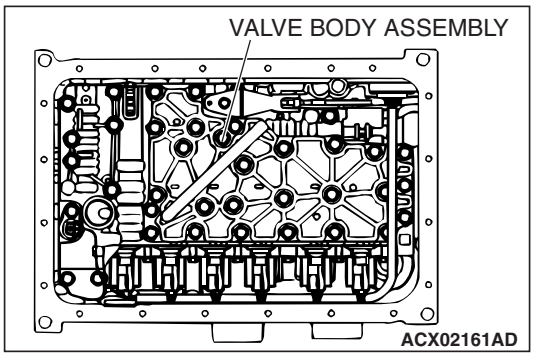
STEP 8. Using scan tool MB991958, read the MFI diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are MFI DTC Nos. of TP sensor system set?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart P.13A-33.
NO : Go to Step 10.

TSB Revision



STEP 9. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.

Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 10.

STEP 10. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 7: Shift Shock when Shifting from "N" to "R" and Long Delay

COMMENT

If abnormal shock or delay of two seconds or more occurs when the selector lever is shifted from "N" to "R" range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low-reverse brake pressure, or a malfunction of the reverse clutch, low-reverse brake, valve body or TP sensor.

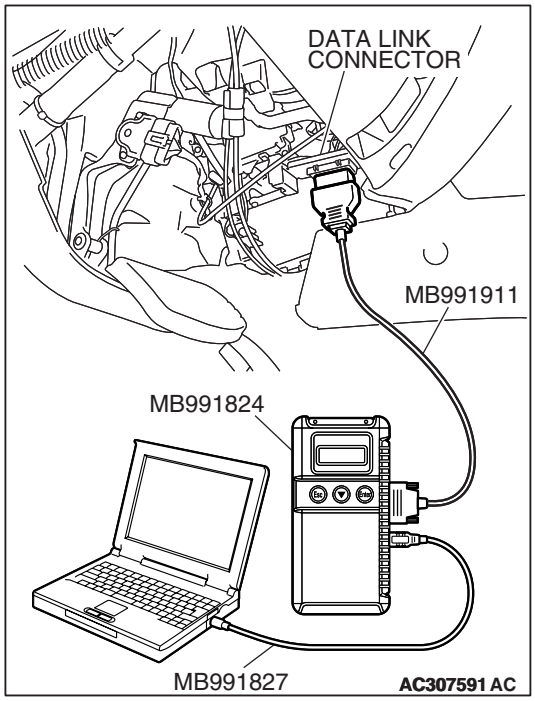
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Abnormal reverse clutch pressure
- Abnormal low-reverse brake pressure
- Malfunction of the low-reverse solenoid valve
- Malfunction of the reverse clutch
- Malfunction of the low-reverse brake
- Malfunction of the valve body
- Malfunction of the TP sensor
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check actuator test item 01: Low-Reverse Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 01: Low-Reverse Solenoid Valve.
  - An audible clicking or buzzing should be heard when the low-reverse solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the low-reverse solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.

STEP 2. Check when shift shock occurs.

Q: When does the shift shock occur?

When engaging from "N" to "R" : Go to Step 3.
When the vehicle starts moving : Go to Step 7.

STEP 3. Check the hydraulic pressure (for reverse clutch).

Measure the hydraulic pressure for reverse clutch when the selector lever is at the "R" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 9.

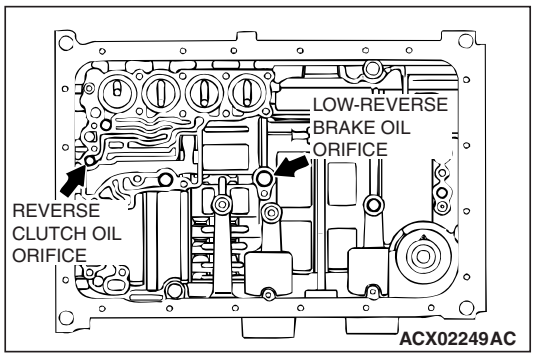
STEP 4. Check the hydraulic pressure (for low-reverse brake).

Measure the hydraulic pressure for low-reverse brake when the selector lever is at the "R" range. Check if the hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the hydraulic pressure within the standard value?

YES : Go to Step 5.
NO : Go to Step 9.

TSB Revision



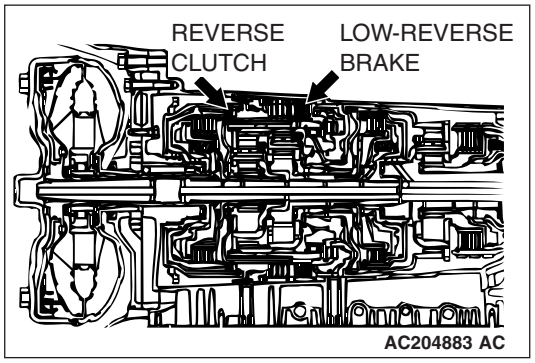
STEP 5. Check the reverse clutch system and low-reverse brake system.

(1) Remove the valve body cover and valve body. Refer to P.23A-566, Transmission and Transfer Assembly and refer to GROUP 23B, Transmission P.23B-14.

(2) Blow 108 kPa (15 psi) compressed air into the reverse clutch oil orifice of the transmission case, and check if the reverse clutch piston moves and air pressures are maintained in that condition. Repeat for the low-reverse brake.

Q: Are both air pressures maintained?

YES : Go to Step 6.
NO : Go to Step 9.



STEP 6. Check the reverse clutch and low-reverse brake.

(1) Remove the transmission assembly.

(2) Check the facing for seizure and the piston seal ring for damage and interference with the retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transmission P.23B-14, Reverse and Overdrive Clutch P.23B-50. Then retest the system.

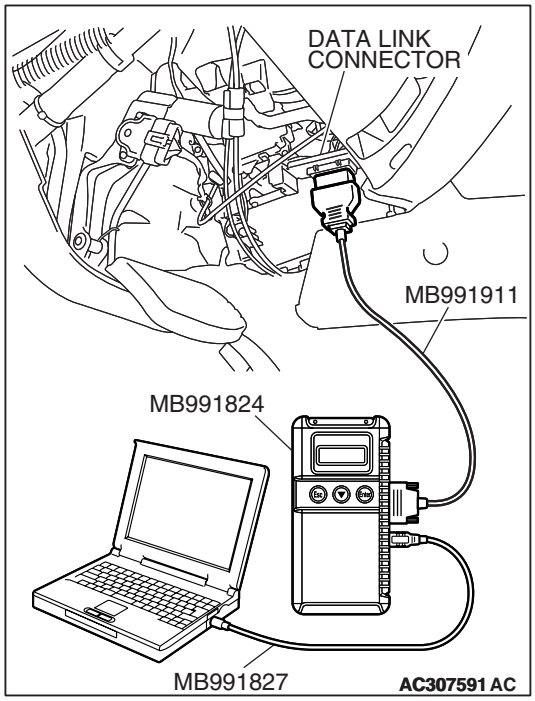
Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 11.

STEP 7. Check shift shock.

Q: Does shift shock occur sometimes?

YES : Go to Step 8.
NO : Go to Step 9.



STEP 8. Using scan tool MB991958, check data list item 11: TP Sensor.

⚠ CAUTION

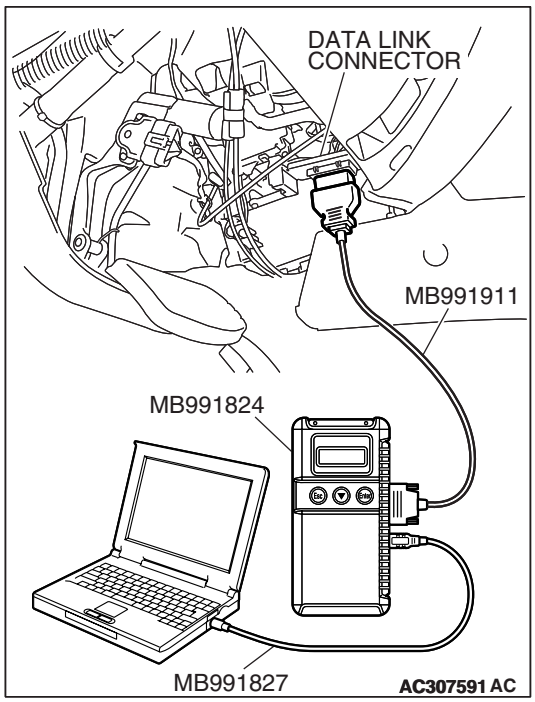
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 11: TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 200 and 800 mV.
  - With the throttle valve in the full-open position, voltage should measure between 3,800 and 4,900 mV.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 200 and 800 mV at idle, and between 3,800 and 4,900 mV in the full-open position?

YES : Go to Step 10.
NO : Go to Step 9.



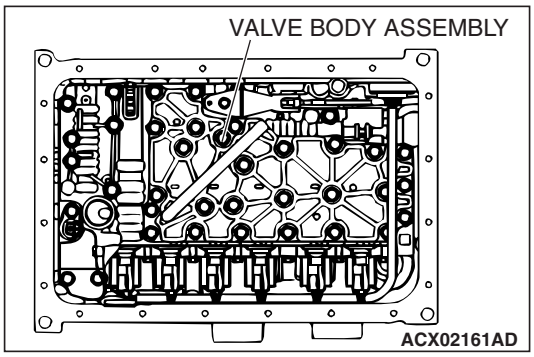
STEP 9. Using scan tool MB991958, read the MFI diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are MFI DTC Nos. of TP sensor system set?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart P.13A-33.
NO : Go to Step 11.

TSB Revision



STEP 10. Disassemble and clean the valve body.
Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 11.

STEP 11. Replace the PCM.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 8: Shift Shock when Shifting from "N" to "D," "N" to "R" and Long Delay

COMMENT
If abnormal shock or delay of two seconds or more occurs when the selector lever is moved from "N" to "D" range or from "N" to "R" range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the transmission oil pump or valve body.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Abnormal line pressure
- Malfunction of the transmission oil pump
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the hydraulic pressure.
(1) Measure the hydraulic pressure of each element when the transmission is in 1st, 2nd or reverse. Check if each hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.
(2) If some elements pressure are within the standard value and some are not, recheck the symptom.

Q: Are all hydraulic pressures within the standard value?
YES : Go to Step 3.
NO : Go to Step 2.

STEP 2. Adjust line pressure.
Adjust line pressure. Refer to P.23A-42, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 3.

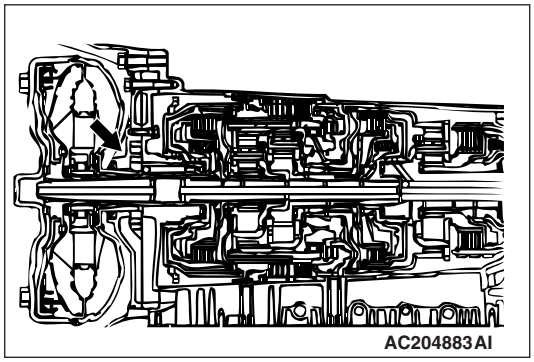
STEP 3. Check whether shift shocks occur.

Q: Do shift shocks occur?

YES <When engaging from "N" to "D" and "N" to "R"> : Go to Step 4.
YES <When the vehicle starts moving> : Go to Step 5.
NO : Diagnosis is complete.

STEP 4. Check the transmission oil pump.

(1) Remove the transmission assembly.
(2) Check the transmission oil pump (incorrect installation, damage and etc.) and replace the transmission oil pump assembly if necessary (The transmission oil pump cannot be disassembly). Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.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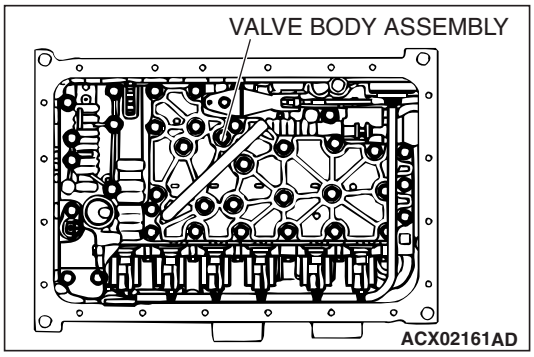
Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 5. Disassemble and clean the valve body.

Check the installation bolts for looseness and the O-ring, valves and valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63. Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.



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Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 9: Shift Shock and Slipping

COMMENT

If shift shock when driving is due to upshifting or downshifting and the transmission speed become higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, transmission oil pump, valve body or of a brake or clutch.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Abnormal line pressure
- Malfunction of each solenoid valve
- Malfunction of the transmission oil pump
- Malfunction of the valve body
- Malfunction of each brake or each clutch
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

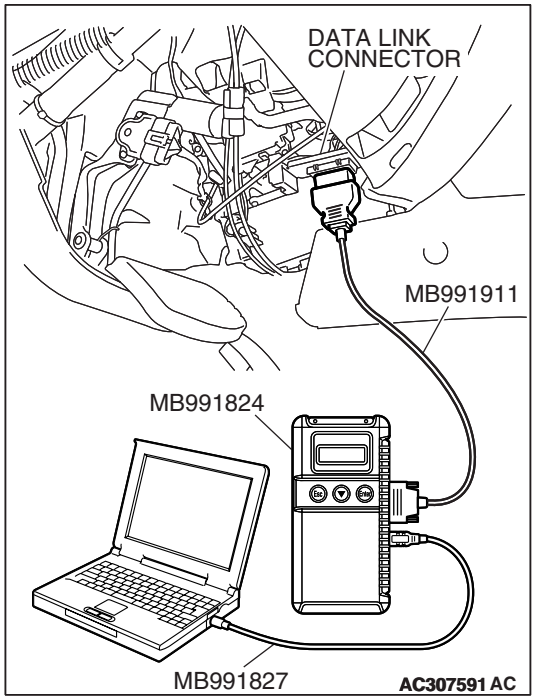
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check actuator test.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode for following items.
   a. Item 01: Low-reverse solenoid valve
   b. Item 02: Underdrive solenoid valve
   c. Item 03: Second solenoid valve
   d. Item 04: Overdrive solenoid valve
   e. Item 05: Reduction solenoid valve
      - An audible clicking or buzzing should be heard when the solenoid valves are energized.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are the solenoid valves operating properly?

YES : Go to Step 2.
NO : Repair or replace the solenoid valves. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.

STEP 2. Check the hydraulic pressure.

(1) Measure the hydraulic pressure of each element. Check if each hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.
(2) If some elements pressure are within the standard value and some are not, recheck the symptom.

Q: Are all hydraulic pressures within the standard value?

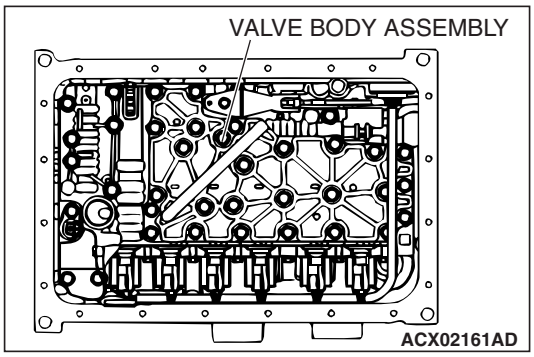
YES : Go to Step 6.
NO : Go to Step 3.

STEP 3. Adjust the line pressure.

Adjust the line pressure. Refer to P.23A-42, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 4.



STEP 4. Disassemble and clean the valve body.

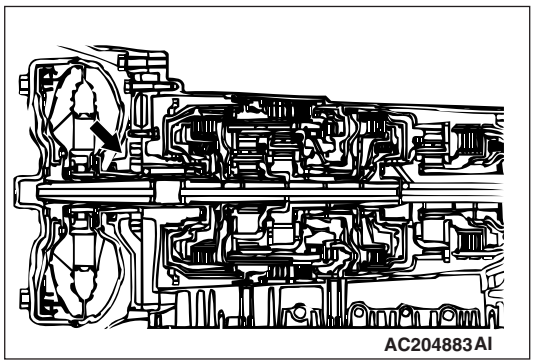
Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.

Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 5.



STEP 5. Check the transmission oil pump.

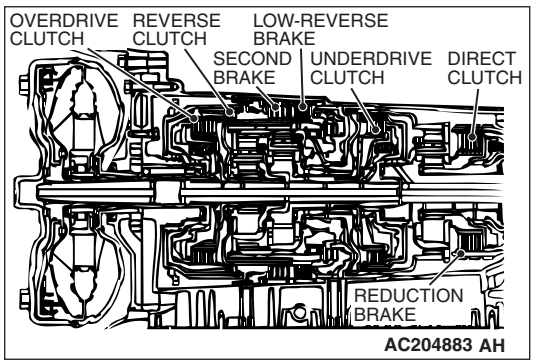
(1) Remove the transmission assembly.

(2) Check the transmission oil pump (incorrect installation, damage and etc.) and replace the transmission oil pump assembly if necessary (The transmission oil pump cannot be disassembly). Refer to GROUP 23B, Transmission P.23B-14. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 7.



STEP 6. Check each brake and clutch.

(1) Remove the transmission.

(2) Check the facing for seizure and piston seal ring for damage and interference with retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transmission P.23B-14, Underdrive Clutch P.23B-59, Reverse and Overdrive Clutches P.23B-50, Direct Clutch P.23B-71. Then check for the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 7.

STEP 7. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 10: Early or Late Shifting All Gears

COMMENT
If all shift points are early or late while driving, the cause is probably a malfunction of the output shaft speed sensor, TP sensor or a solenoid valve.

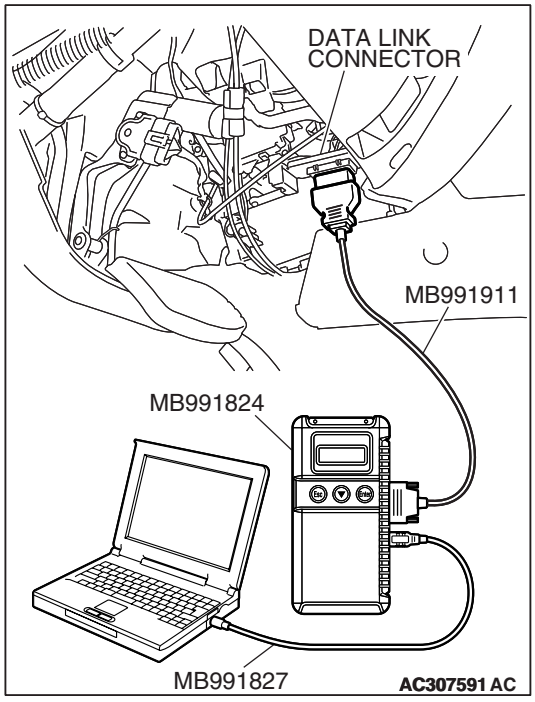
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of the output shaft speed sensor
- Malfunction of the TP sensor
- Malfunction of each solenoid valve
- Abnormal line pressure
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check data list item 23: Output Shaft Speed Sensor.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

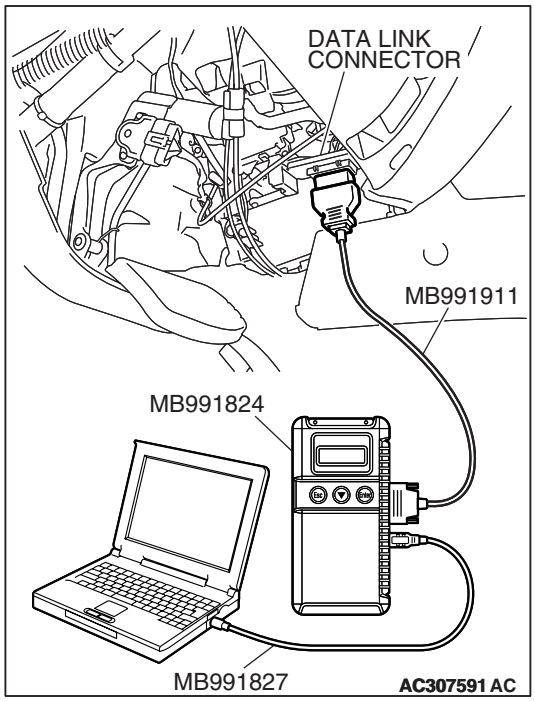


(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode.
- Item 23: Output Shaft Speed Sensor.
  - When driving at constant speed of 50 km/h (31 mph), the display should be "1,400 – 1,700 r/min" (Gear range: 4th gear).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the sensor operating properly?

YES : Go to Step 2.
NO : Refer to P.23A-92, DTC 23: Output shaft speed sensor system.



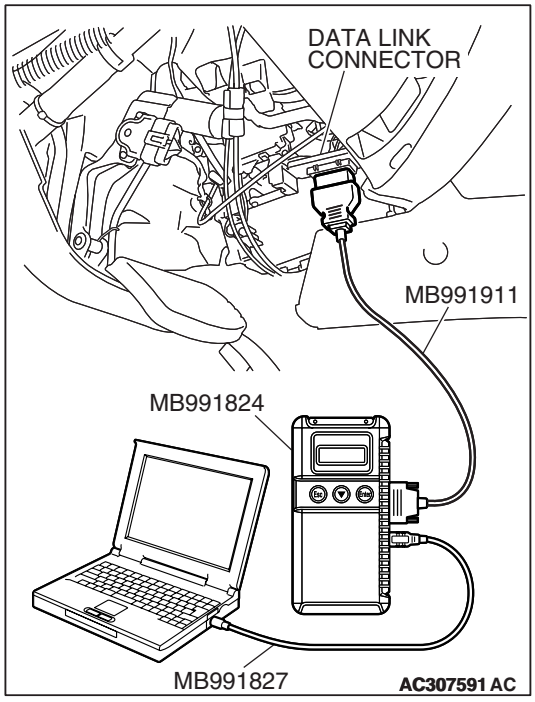
STEP 2. Using scan tool MB991958, check data list item 11: TP Sensor.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
- Item 11: TP Sensor.
  - With the throttle valve in the idle position, voltage should measure between 200 and 800 mV.
  - With the throttle valve in the full-open position, voltage should measure between 3,800 and 4,900 mV.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage between 200 and 800 mV at idle, and between 3,800 and 4,900 mV in the full-open position?

YES : Go to Step 4.
NO : Go to Step 3.

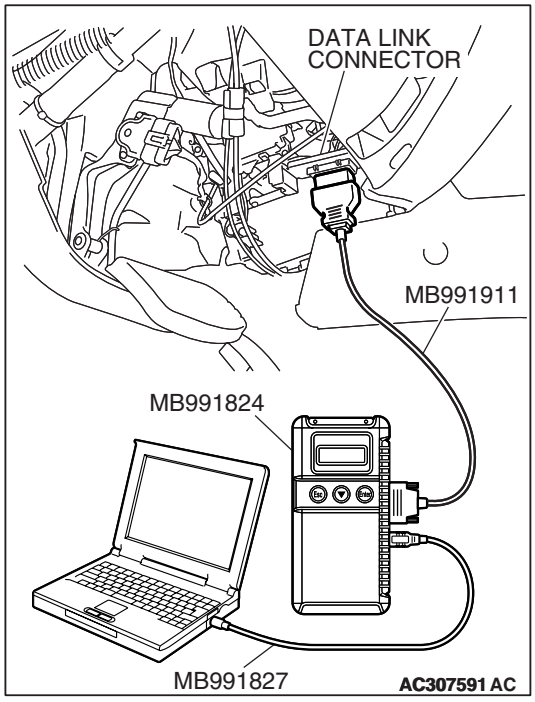


STEP 3. Using scan tool MB991958, read the MFI diagnostic trouble code.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check for MFI diagnostic trouble code.
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are MFI DTC Nos. of TP sensor system set?

YES : Refer to GROUP 13A, Diagnosis – Diagnostic Trouble Code Chart P.13A-33.
NO : Go to Step 8.



STEP 4. Using scan tool MB991958, check data list.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the data reading mode for following items.
  a. Item 31: Low-Reverse Solenoid Valve Duty Percent
  b. Item 32: Underdrive Solenoid Valve Duty Percent
  c. Item 33: Second Solenoid Valve Duty Percent
  d. Item 34: Overdrive Solenoid Valve Duty Percent
  e. Item 35: Reduction Solenoid Valve Duty Percent
    - Check that the values shown below are displayed when each data list item is entered.

DRIVING CONDITION	DATA LIST ITEM				
	31	32	33	34	35
Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%	0%	100%	100%	0%
Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%	0%	0%	100%	0%
Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%	0%	100%	0%	0%
Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%	0%	100%	0%	100%
Driving at constant speed of 70 km/h (44 mph) in 5th gear	100%	100%	0%	0%	100%

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Are the solenoid valves operating properly?

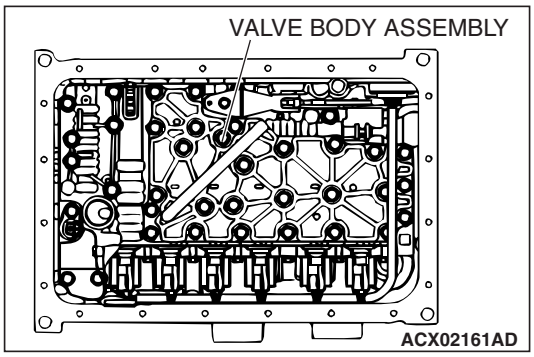
YES : Go to Step 5.
NO : Go to Step 7.

STEP 5. Adjust the line pressure.

Adjust the line pressure. Refer to P.23A-42, Line Pressure Adjustment. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.



STEP 6. Disassemble and clean the valve body.

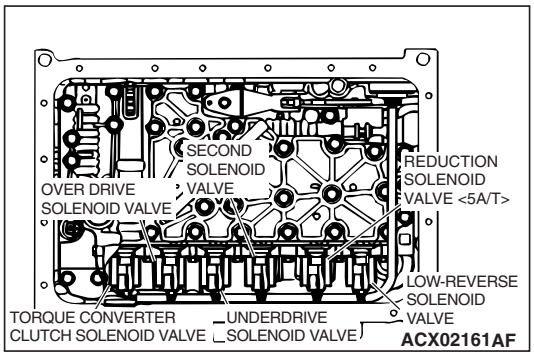
Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.

Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 8.



STEP 7. Replace each solenoid valve.

Replace the faulty solenoid valve with a new one.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Go to Step 8.

STEP 8. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.

NO : Start over at Step 1.

INSPECTION PROCEDURE 11: Early or Late Shifting in Some Gears

COMMENT

If some of the shift points are early or late when driving, the cause is probably a malfunction of the valve body, or it is due to the characteristics of the INVECS-II system but is not an abnormality.

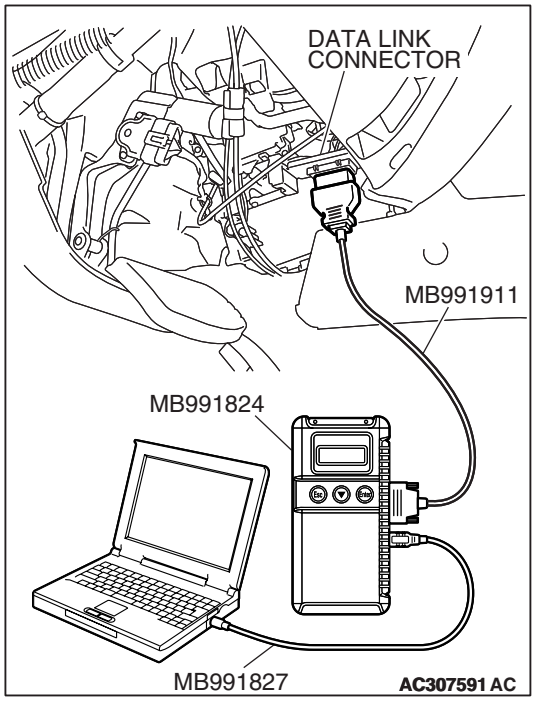
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check actuator test item 14: INVECS-II Cancel Command.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine.
(3) Set scan tool MB991958 to the actuator test mode.
- Item14: INVECS-II Cancel Command.
  - Drive the vehicle and confirm the gear shifting correspond to the standard shift line of the shift pattern diagram. Refer to P.23A-3.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

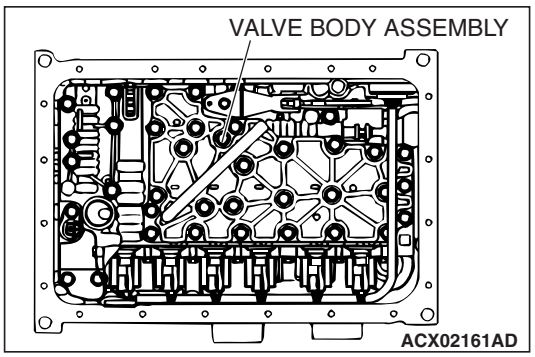
Q: Does the gear shifting correspond to the standard shift line of the shift pattern diagram?

YES : The symptom is due to characteristics of the INVECS-II system, but is not abnormal.
NO : Go to Step 2.

STEP 2. Check the shift points.

Q: Are the shift points early or late only when transmission fluid is -29°C (84°F) or less (early), or 125°C (257°F) or more (late)?

YES : The symptom is due to characteristics of the INVECS-II system, but is not abnormal.
NO : Go to Step 3.



STEP 3. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 4.

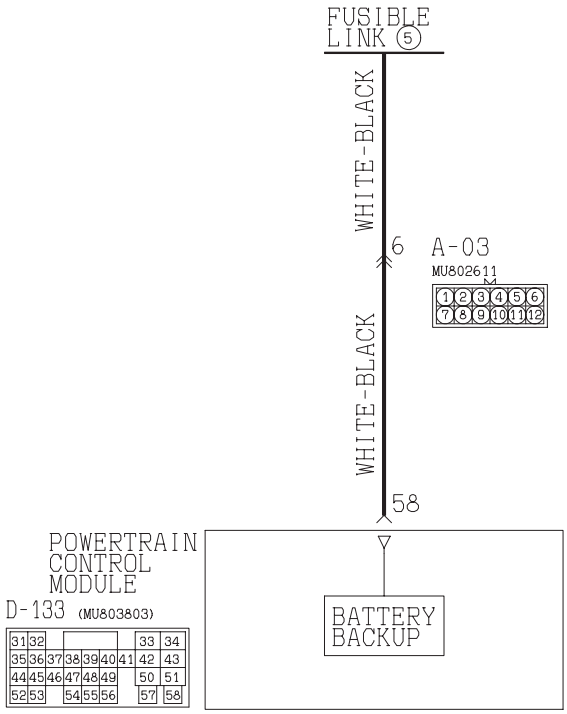
STEP 4. Replace the PCM.

Q: Is the symptom eliminated?

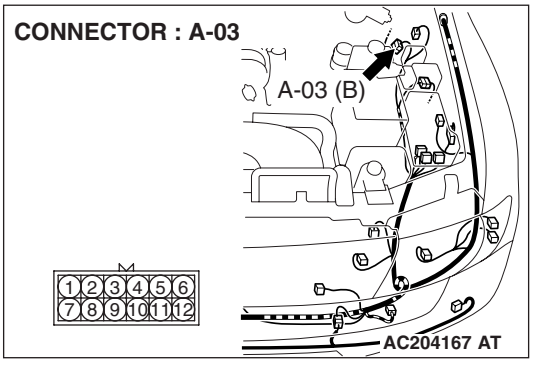
YES : The procedure is complete.
NO : Start over at Step 1.

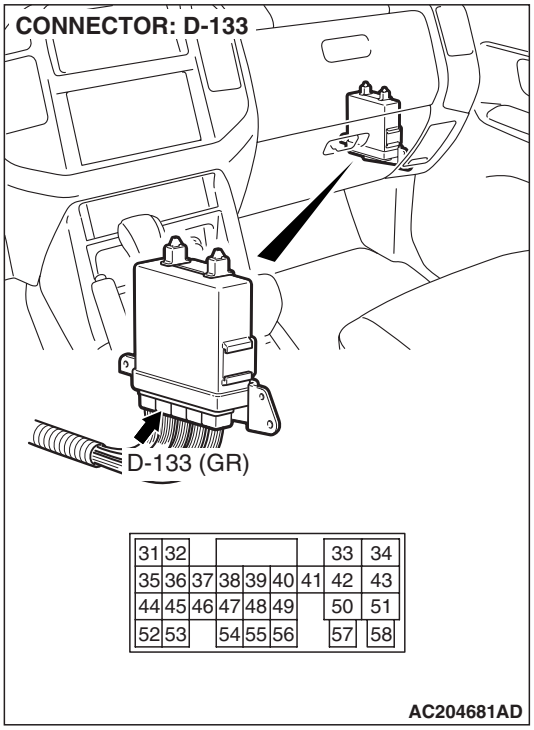
INSPECTION PROCEDURE 12: No Diagnostic Trouble Codes (Does not Shift)

Backup Power Supply Circuit



W3Q20M01AA
AC205198 AC





CIRCUIT OPERATION
PCM (terminal 58) receives battery positive voltage from the battery.

COMMENT
If shifting does not occur while driving and no diagnostic trouble codes are output, a malfunction of the transmission range switch, or PCM may exist.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of transmission range switch
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

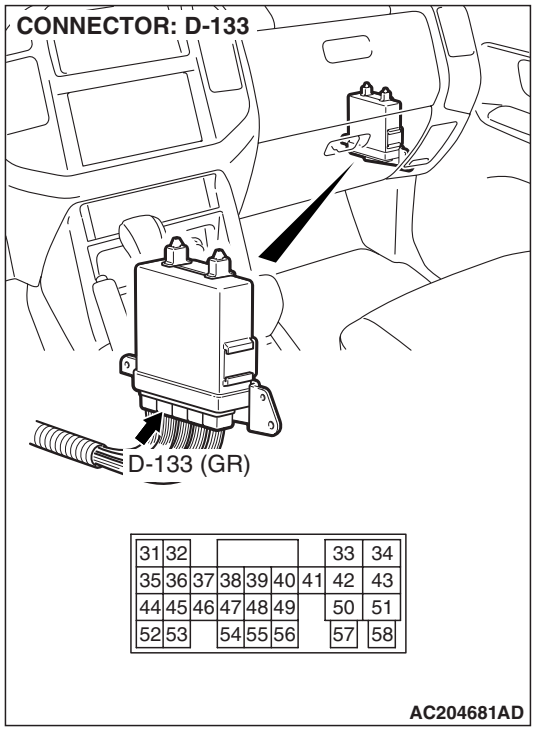
STEP 1. Check the vehicle acceleration.

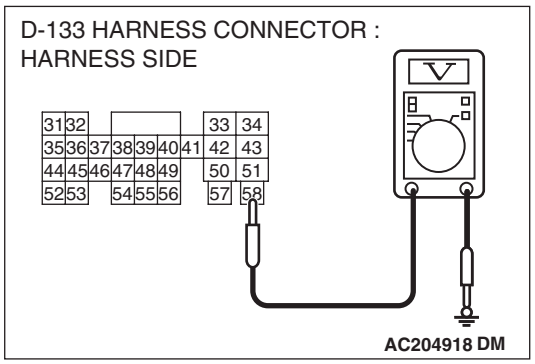
Q: Does the vehicle accelerate poorly (transmission stays in 3rd gear) when starting from a stop with the selector lever in "D" range?

YES : Go to Step 2.
NO : Go to Step 5.

STEP 2. Measure the backup power supply voltage at PCM connector D-133 by backprobing.

(1) Do not disconnect connector D-133.



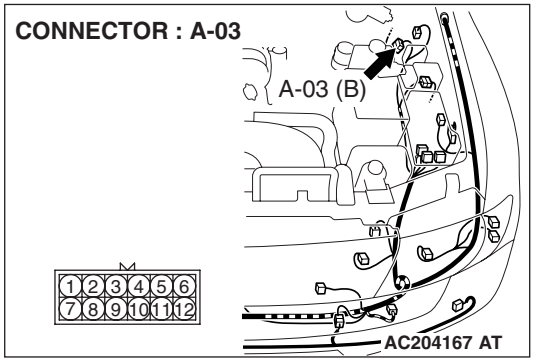


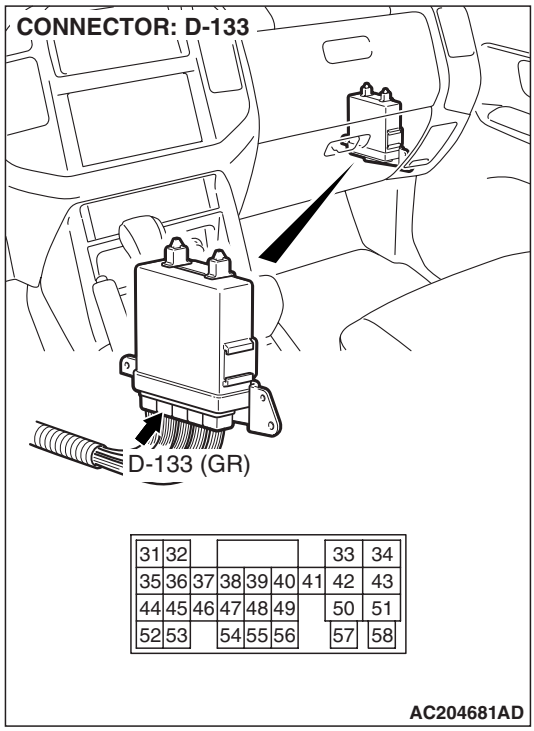
(2) Measure the voltage between terminal 58 and ground by backprobing.
- The voltage should measure battery positive voltage.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 5.

NO : Go to Step 3.

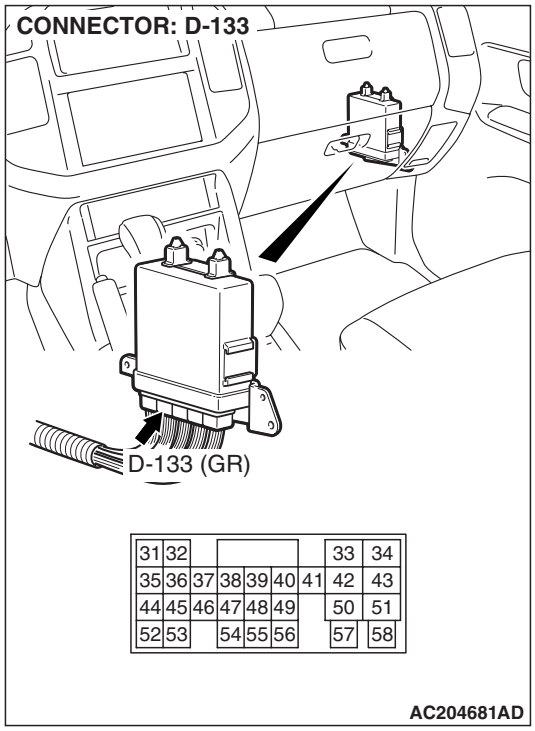




STEP 3. Check intermediate connector A-03 and PCM connector D-133 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2. Then retest the system.

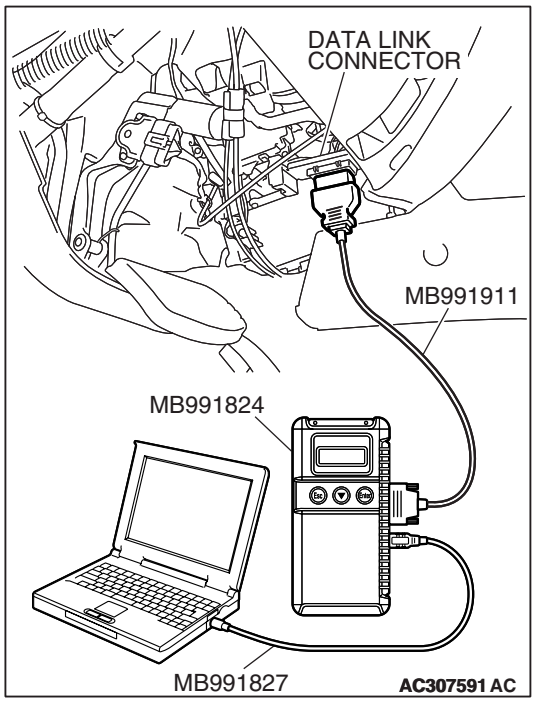


STEP 4. Check the harness for open circuit between PCM connector D-133 terminal 58 and fusible link.

Q: Is the harness wire in good condition?

YES : Go to Step 5.

NO : Repair or replace the harness wire.



STEP 5. Using scan tool MB991958, check data list item 61: Transmission Range Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.

(2) Turn the ignition switch to the "ON" position.

(3) Set scan tool MB991958 to the data reading mode.

- Item 61: Transmission Range Switch.
  - Move the selector lever to "P," "R," "N," "D" and sport mode positions and confirm that the selected transmission ranges match the positions shown on scan tool MB991958 (Sport mode is indicated as "D" on scan tool MB991958).

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : Check for the symptom. If the symptom is not eliminated, replace the PCM.

NO : Refer to P.23A-122, P.23A-151, DTCs 27, 28: Transmission Range Switch System.

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INSPECTION PROCEDURE 13: Poor Acceleration

COMMENT
If acceleration is poor when downshifting occurs while driving, a malfunction of the engine system or a brake or clutch may exist.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of the engine system
- Malfunction of the clutch system and brake system
- Malfunction of the PCM

DIAGNOSIS

STEP 1. Check the engine system.
Refer to GROUP 13A, Diagnosis – Symptom Chart – Poor Acceleration P.13A-946.

Q: Is the inspection result good?
YES : Go to Step 2.
NO : Repair or replace the engine component(s).

STEP 2. Check each brake and clutch.
Perform the torque converter stall test. Refer to P.23A-25, Torque Converter Stall Test. Then retest the system.

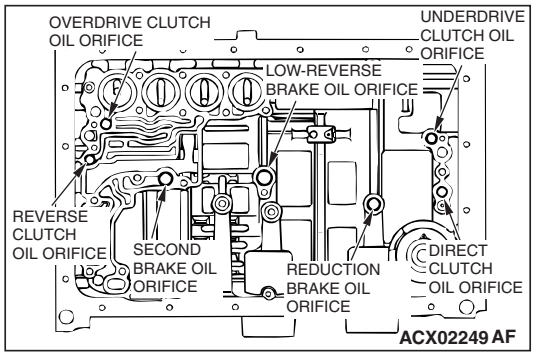
Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 3.

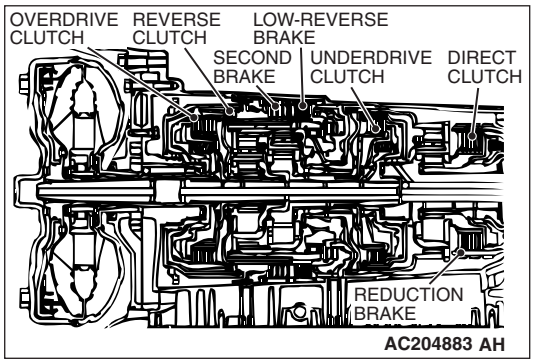
STEP 3. Perform the hydraulic pressure test.
Perform the hydraulic pressure test. Refer to P.23A-27, Hydraulic Pressure Test. Then retest the system.

Q: Is the symptom eliminated?
YES : The procedure is complete.
NO : Go to Step 4.

STEP 4. Check each brake system and clutch system.
(1) Remove the valve body cover and valve body. Refer to GROUP 23B, Transmission P.23B-14.
(2) Blow 108 kPa (15 psi) compressed air into the each brake oil orifice and clutch oil orifice of the transmission case, and check if each brake and each clutch piston move and air pressure is maintained.

Q: Is the air pressure maintained?
YES : The procedure is complete.
NO : Go to Step 5.





STEP 5. Check each brake system and clutch system.

(1) Remove the transmission.
(2) Check the facings for seizure and piston seal ring for damage and interference with retainer. Repair or replace the faulty parts. Refer to GROUP 23B, Transmission P.23B-14, Underdrive Clutch P.23B-59, Reverse and Overdrive Clutches P.23B-50, Direct Clutch P.23B-71. Then check for the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

INSPECTION PROCEDURE 14: Vibration

COMMENT
If vibration occurs when driving at constant speed or when accelerating in 4th gear, abnormal torque converter clutch pressure a malfunction of the engine system, torque converter clutch solenoid, torque converter or valve body may exist.

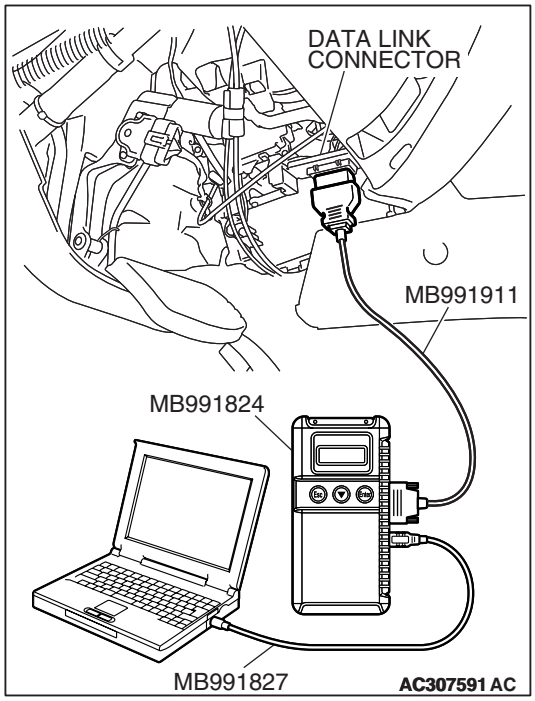
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Abnormal torque converter clutch pressure
- Malfunction of the engine system
- Malfunction of the torque converter clutch solenoid
- Malfunction of the torque converter
- Malfunction of the valve body
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check actuator test item 06: Torque Converter Clutch Solenoid Valve.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the actuator test mode.
- Item 06: Torque Converter Clutch Solenoid Valve.
  - An audible clicking or buzzing should be heard when the torque converter clutch solenoid valve is energized.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the solenoid valve operating properly?

YES : Go to Step 2.
NO : Repair or replace the torque converter clutch solenoid valve. Refer to GROUP 23B, Valve Body P.23B-63. Then confirm that the symptom is eliminated.

STEP 2. Check the vibration.

Q: Does the vibration occur when the transmission fluid temperature sensor connector has been disconnected?

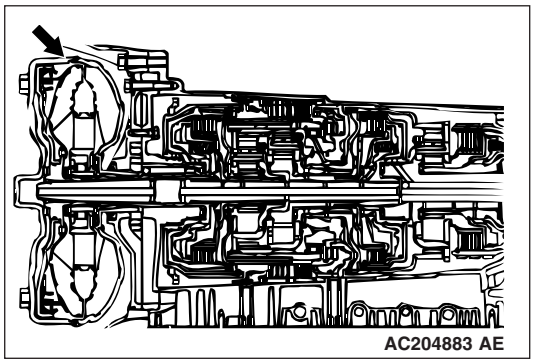
YES : Check the engine system. Refer to GROUP 13A, Diagnosis – Symptom Chart – Driving P.13A-38. If the inspection result is not good, diagnose, repair, and/or replace the engine component(s).
NO : Go to Step 3.

STEP 3. Check the torque converter hydraulic pressure.

Measure the torque converter hydraulic pressure. Then check if the torque converter hydraulic pressure is within the standard value. Refer to P.23A-27, Hydraulic Pressure Test.

Q: Is the torque converter hydraulic pressure within the standard value?

YES : Go to Step 4.
NO : Go to Step 5.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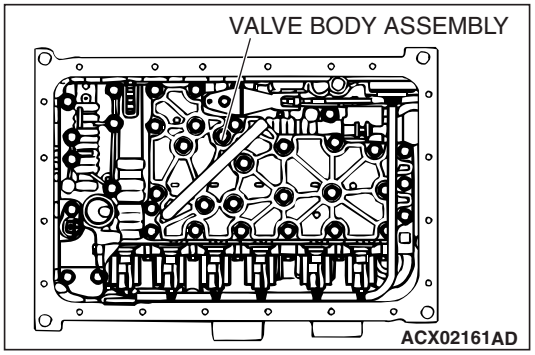
STEP 4. Replace the torque converter assembly.

(1) Remove the transmission.
(2) Replace the torque converter assembly. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.



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STEP 5. Disassemble and clean the valve body.

Check the O-ring installation bolts for looseness and the valve body for damage. Repair or replace the faulty parts. Refer to GROUP 23B, Valve Body P.23B-63.
Replace the valve body assembly if the damages are thought to be irreparable. Then check the symptom.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Go to Step 6.

STEP 6. Replace the PCM.

Q: Is the symptom eliminated?

YES : The procedure is complete.
NO : Start over at Step 1.

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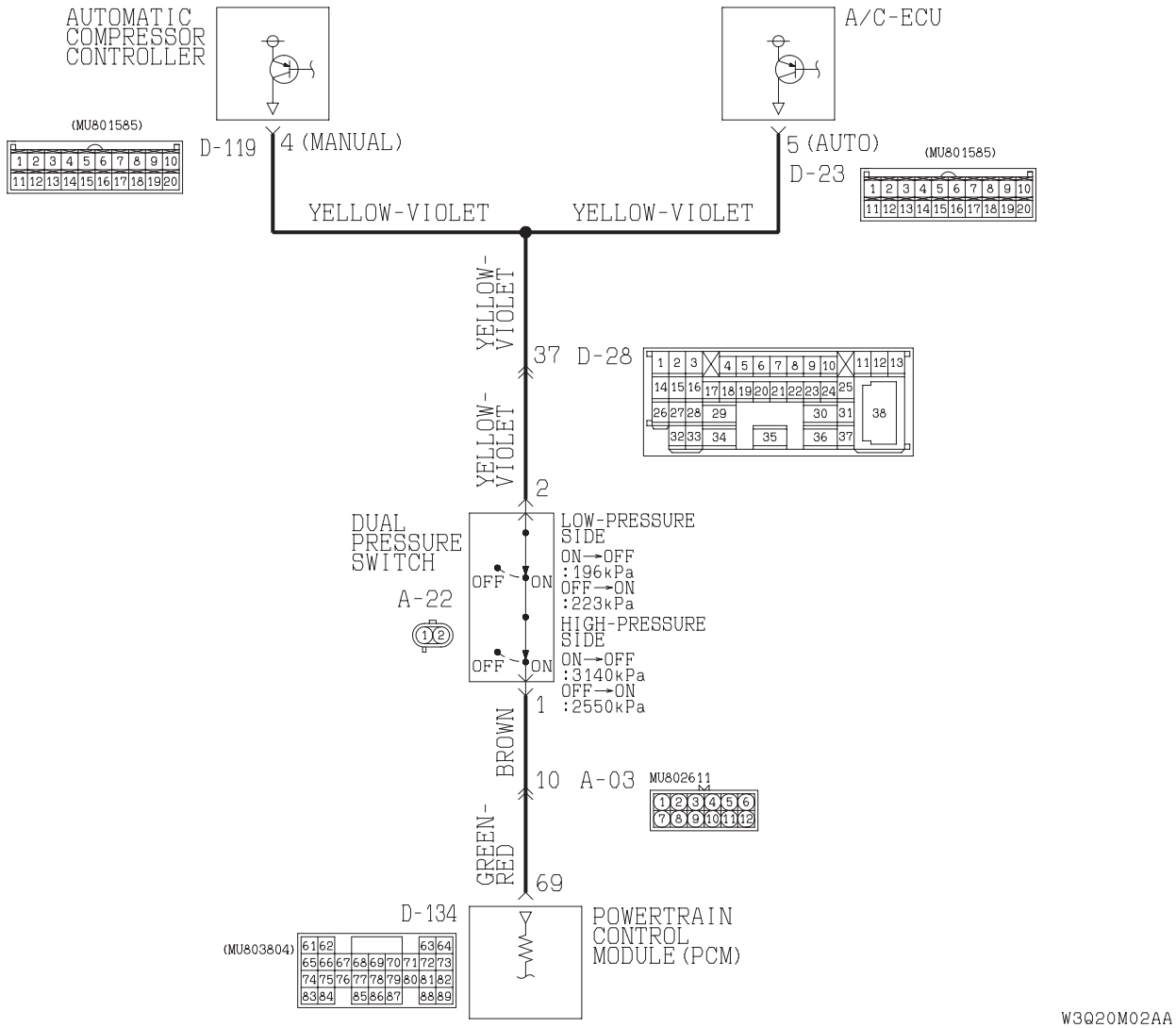
INSPECTION PROCEDURE 15: Vehicle Shifts Differently with A/C Engaged

Dual Pressure Switch System Circuit



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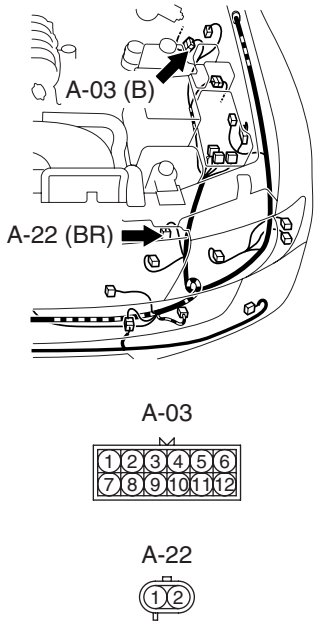
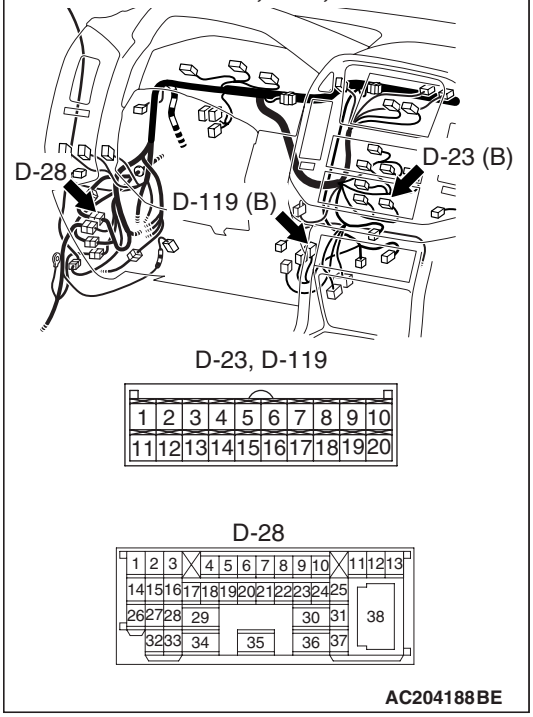
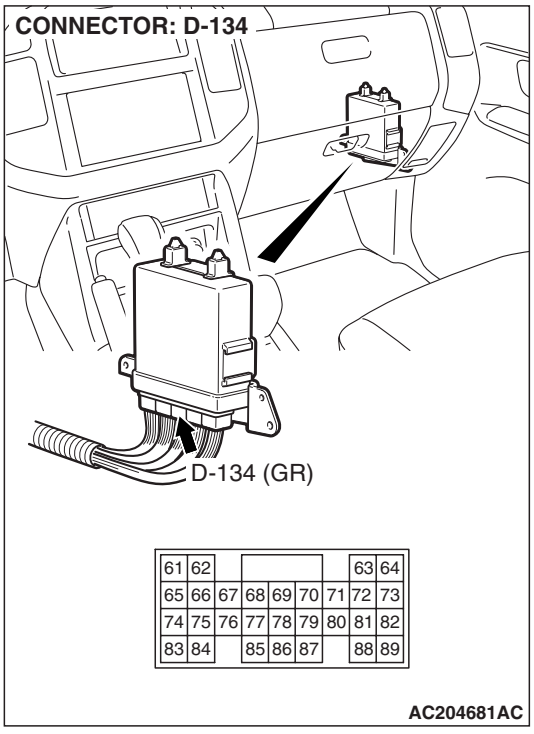
CONNECTORS : A-03, A-22



CONNECTORS : D-23, D-28, D-119



CONNECTOR: D-134



CIRCUIT OPERATION

- When the A/C is turned ON and the dual pressure switch is closed, PCM (terminal 69) receives battery voltage and then determines the A/C compressor has been signaled to engage.
- When the A/C compressor is engaged, the PCM increases line pressure and briefly delays shift points to compensate for the additional engine load.

COMMENT

The cause is probably a faulty dual pressure switch circuit or a defective PCM.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the dual pressure switch
- Damaged harness, connector
- Malfunction of A/C system
- Malfunction of the PCM

TSB Revision

DIAGNOSIS

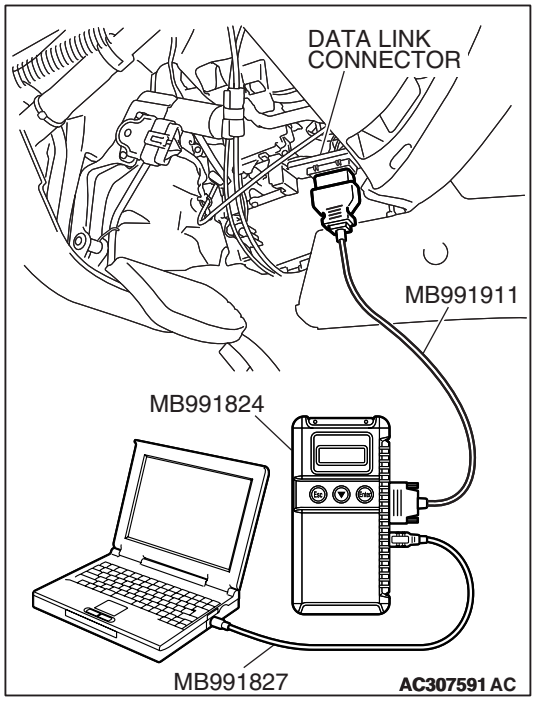
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check data list item 65: Dual Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991958 to data reading mode.
- Item 65: Dual Pressure Switch.
  - When the A/C is in operation, scan tool MB991958 display should be "ON."
  - When the A/C is not in operation, scan tool MB991958 display should be "OFF."

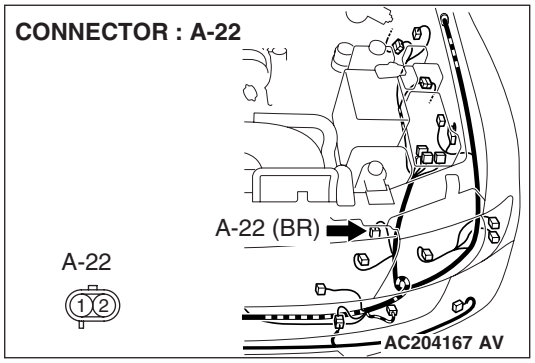
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Go to Step 2.

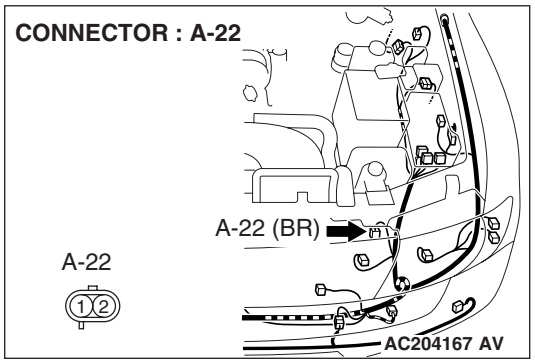
STEP 2. Check dual pressure switch connector A-22 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are the connector and terminals in good condition?

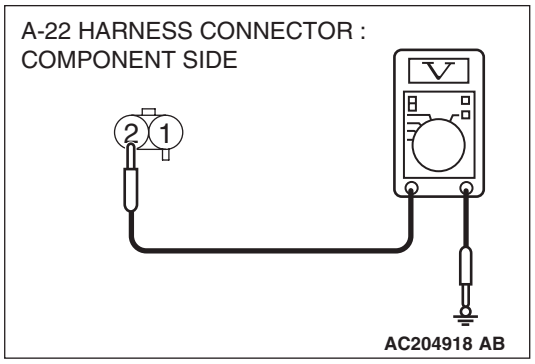
YES : Go to Step 3.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 3. Measure the power supply voltage at dual pressure switch connector A-22.

(1) Disconnect the connector A-22 and measure at the harness side.
(2) Start the engine and run at idle.
(3) Operate the A/C.



(4) Measure the voltage between terminal 2 and ground.
- The voltage should measure battery positive voltage.

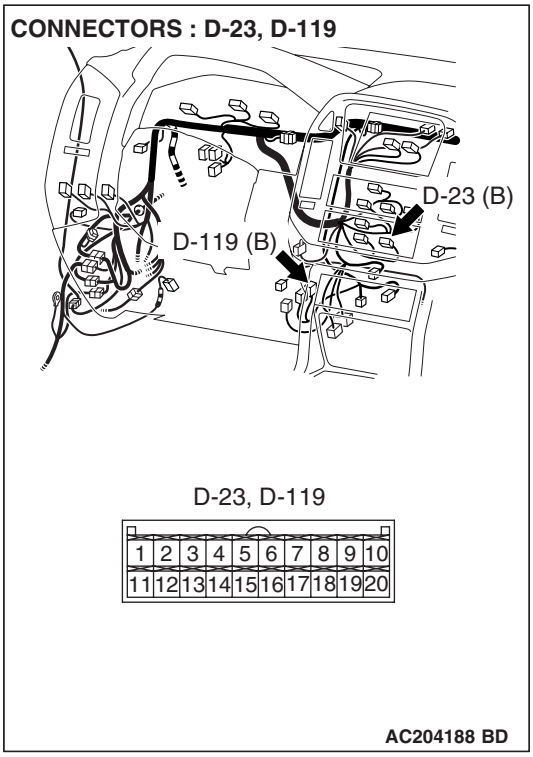
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Measure the power supply voltage at A/C-ECU connector D-23 <Vehicles with full automatic A/C> or automatic compressor controller connector D-119 <Vehicles with manual A/C> by backprobing.

(1) Do not disconnect connector D-23 <Vehicles with full automatic A/C> or D-119 <Vehicles with manual A/C>.
(2) Start the engine and run at idle.
(3) Operate the A/C.

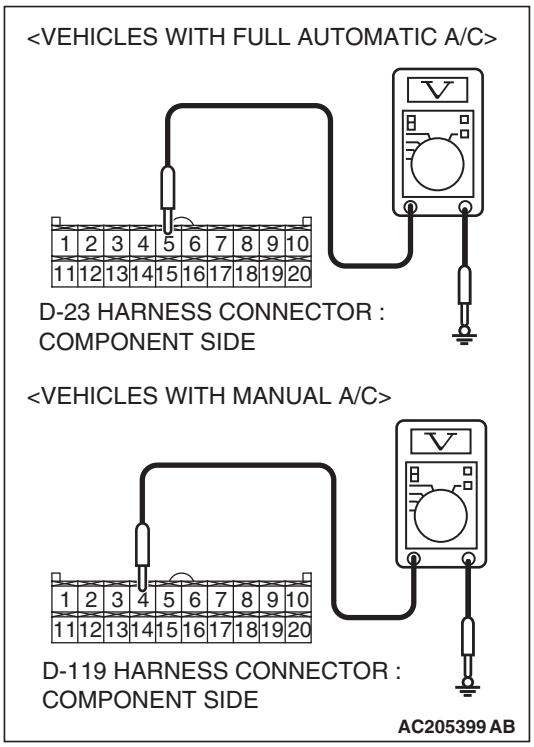


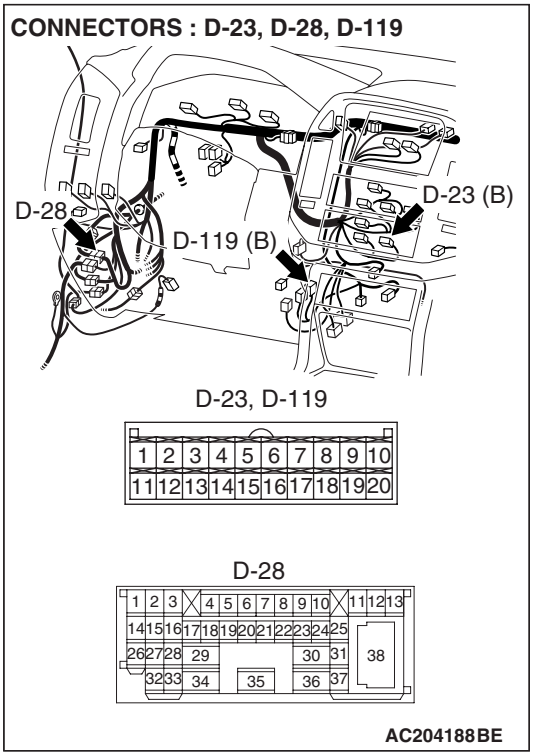
(4) Measure the voltage between A/C-ECU connector D-23 terminal 5 and ground by backprobing. <Vehicles with full automatic A/C>
Measure the voltage between automatic compressor controller connector D-119 terminal 4 and ground by backprobing. <Vehicles with manual A/C>
- The voltage should measure battery positive voltage.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 8.
NO : Go to Step 5.





STEP 5. Check intermediate connector D-28, A/C-ECU connector D-23 <Vehicles with full automatic A/C> and automatic compressor controller connector D-119 <Vehicles with manual A/C> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

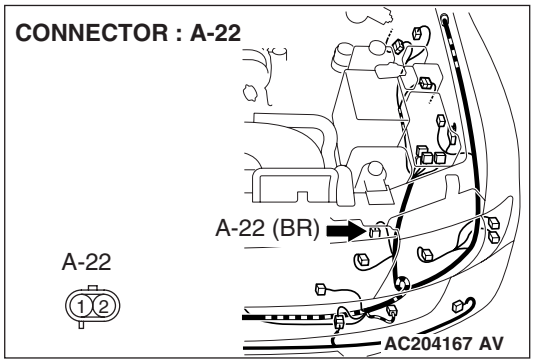
Q: Are the connectors and terminals in good condition?

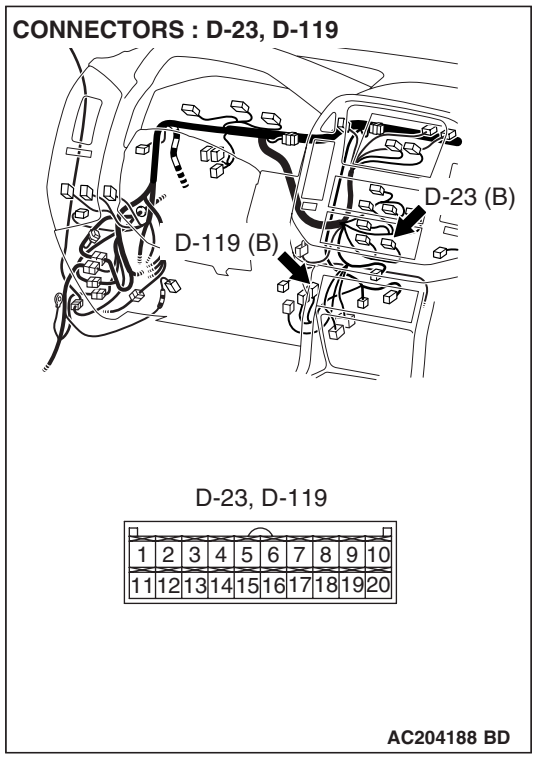
YES : Go to Step 6.

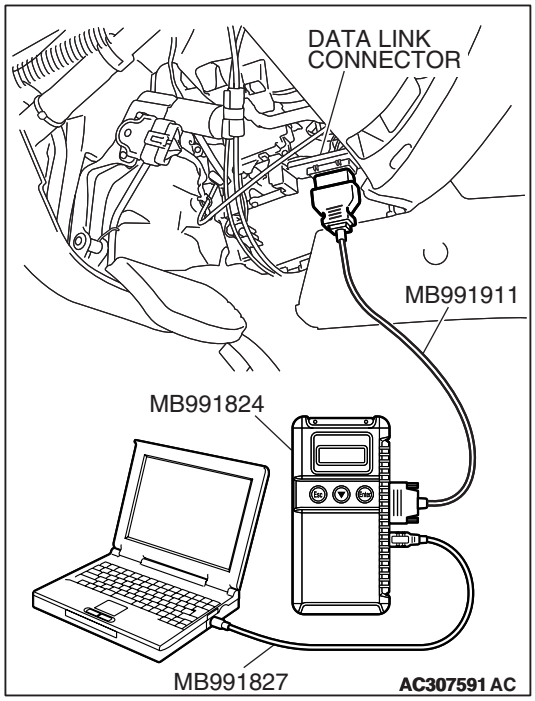
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

STEP 6. Check harness for short circuit to ground between dual pressure switch connector A-22 terminal 2 and A/C-ECU connector D-23 terminal 5 <Vehicles with full automatic A/C> or dual pressure switch connector A-22 terminal 2 and automatic compressor controller connector D-119 terminal 4 <Vehicles with manual A/C>.
Q: Is the harness wire in good condition?

YES : Go to Step 7.
NO : Repair or replace the harness wire.







STEP 7. Using scan tool MB991958, check data list item 65: Dual Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991958 to data reading mode.
- Item 65: Dual Pressure Switch.
  - When the A/C is in operation, scan tool MB991958 display should be "ON."
  - When the A/C is not in operation, scan tool MB991958 display should be "OFF."

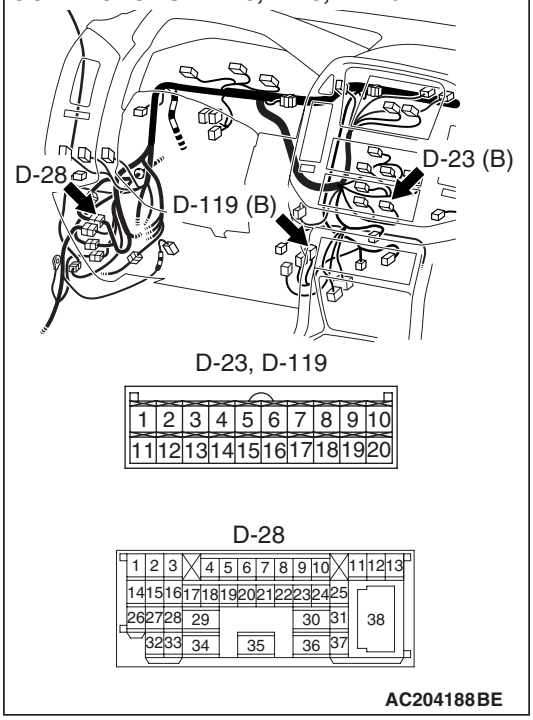
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Check the air conditioning system. Refer to GROUP 55, Troubleshooting Strategy P.55A-5.

CONNECTORS : D-23, D-28, D-119



STEP 8. Check intermediate connector D-28, A/C-ECU connector D-23 <Vehicles with full automatic A/C> and automatic compressor controller connector D-119 <Vehicles with manual A/C> for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

YES : Go to Step 9.

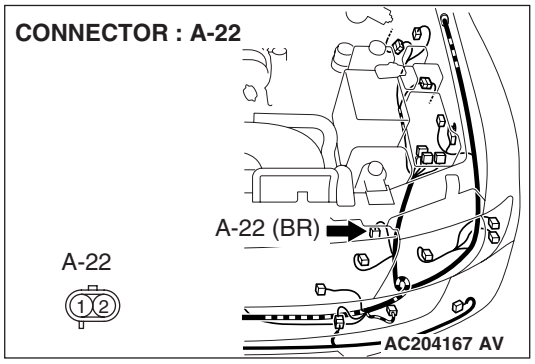
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

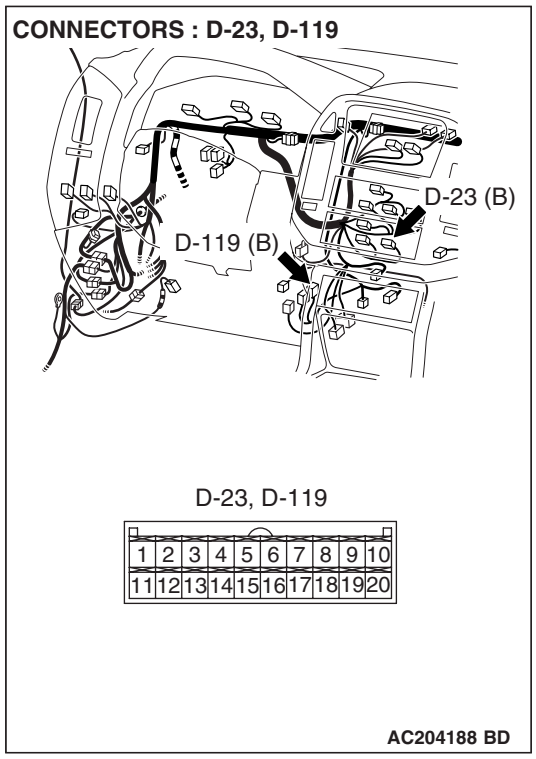
STEP 9. Check the harness for open circuit between dual pressure switch connector A-22 terminal 2 and A/C-ECU connector D-23 terminal 5 <Vehicles with full automatic A/C> or dual pressure switch connector A-22 terminal 2 and automatic compressor controller connector D-119 terminal 4 <Vehicles with manual A/C>.

Q: Is the harness wire in good condition?

YES : Go to Step 14.

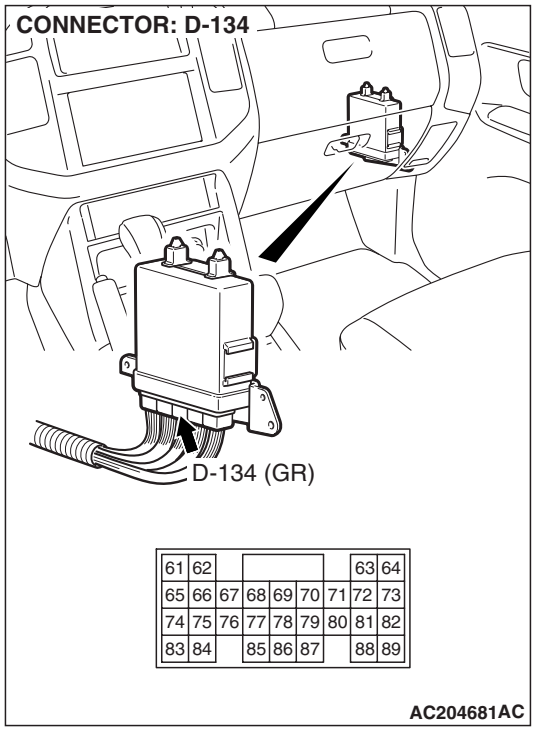
NO : Repair or replace the harness wire.

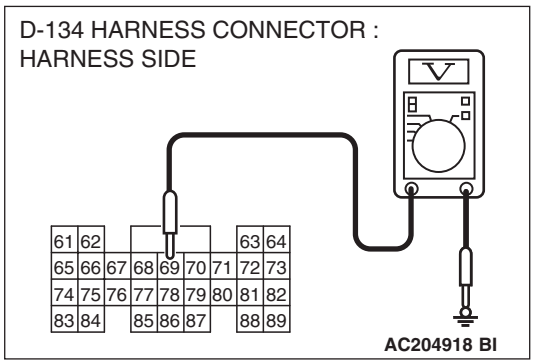




STEP 10. Measure the switch output voltage at PCM connector D-134 by backprobing.

(1) Do not disconnect connector D-134.
(2) Start the engine and run at idle.
(3) Operate the A/C.



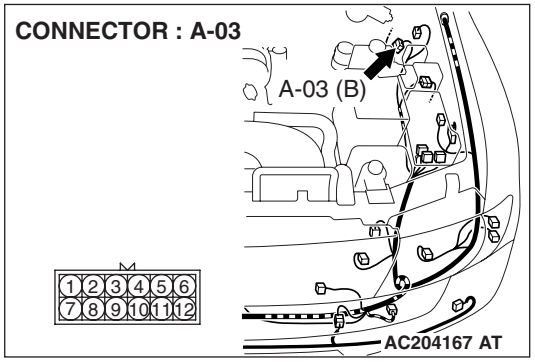


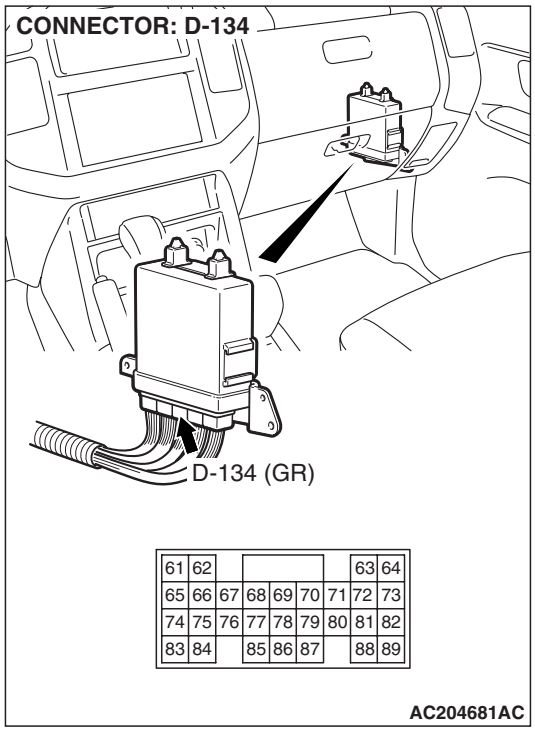
(4) Measure the voltage between terminal 69 and ground by backprobing.
- When the A/C is in operation, the voltage should measure battery positive voltage.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 15.
NO : Go to Step 11.

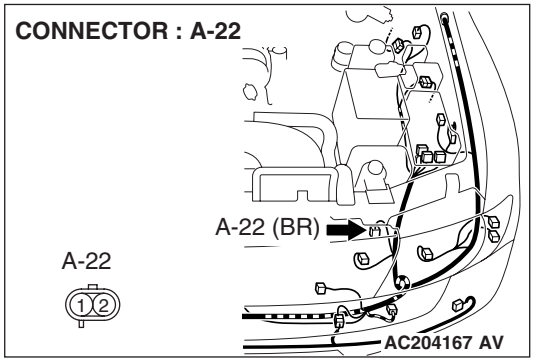


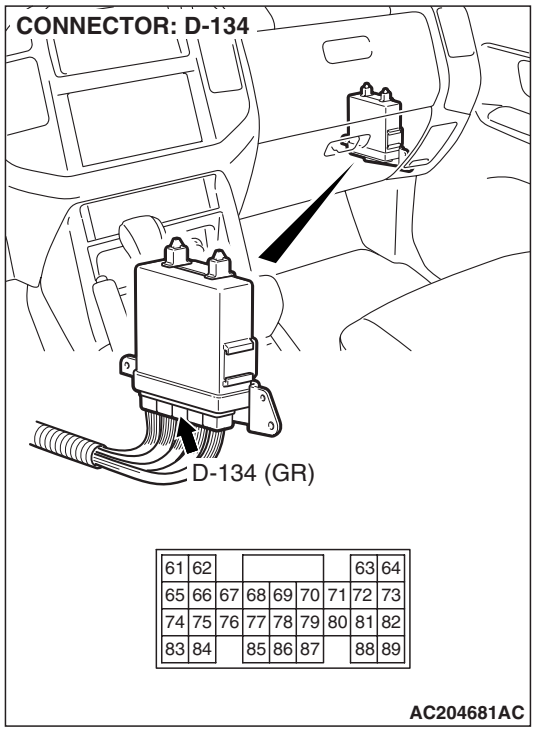


STEP 11. Check intermediate connector A-03 and PCM connector D-134 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 12.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 12. Check harness for open circuit or short circuit to ground between dual pressure switch connector A-22 terminal 1 and PCM connector D-134 terminal 69.

Q: Is the harness wire in good condition?

YES : Go to Step 13.

NO : Repair or replace the harness wire.

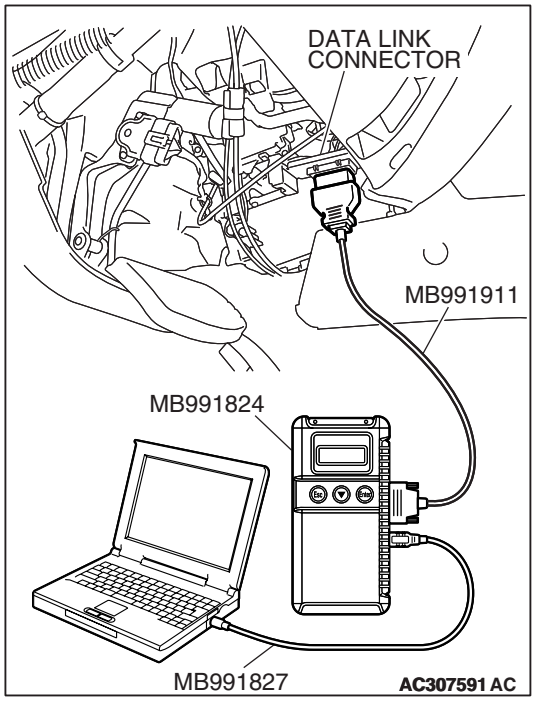
STEP 13. Check the dual pressure switch.

Refer to GROUP 55A, Dual Pressure Switch Check P.55A-115.

Q: Is the switch operating properly?

YES : Go to Step 14.

NO : Replace the dual pressure switch. Refer to GROUP 55A, Refrigerant Line P.55A-148.



STEP 14. Using scan tool MB991958, check data list item 65: Dual Pressure Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

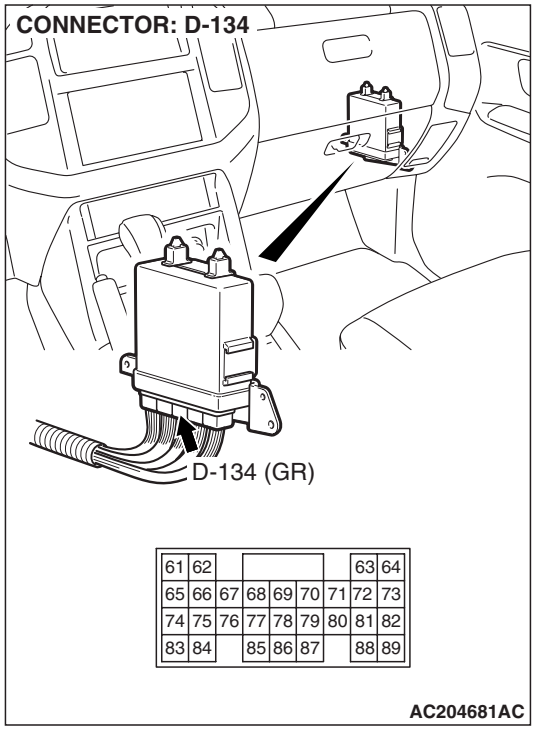
(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine and run at idle.
(3) Set scan tool MB991958 to data reading mode.
- Item65: Dual Pressure Switch.
  - When the A/C is in operation, scan tool MB991958 display should be "ON."
  - When the A/C is not in operation, scan tool MB991958 display should be "OFF."

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.



STEP 15. Check PCM connector D-134 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 14.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

TSB Revision

INSPECTION PROCEDURE 16: Transmission won't Downshift Under Load with Auto-cruise Engaged.

CIRCUIT OPERATION
The overdrive-off signals are created inside the PCM. When a malfunction of the auto-cruise control circuit occurs, the transmission may downshift harshly with the auto-cruise control engaged.

COMMENT
A malfunction may be present on the auto-cruise signal line or the PCM.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)
- Malfunction of the PCM

DIAGNOSIS

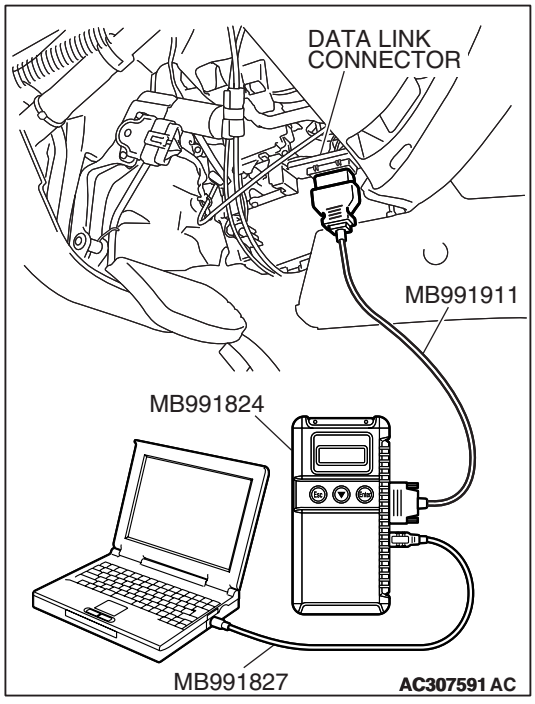
Required Special Tool:
- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check data list item 66: Overdrive Off Signal.

⚠ CAUTION
To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Start the engine and prepare to test drive the vehicle. (Operate the auto-cruise)
(3) Set scan tool MB991502 to data reading mode.
- Item 66: Overdrive Off Signal.
  - When driving at level road, the display should be "OFF."
  - When driving at uphill road, the display should be "ON."

(4) Turn the ignition switch to the "LOCK" (OFF) position.



Q: Is the PCM operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Go to Step 2.

STEP 2. Check the auto-cruise system.

Check the auto-cruise system. Refer to GROUP 17, Auto-cruise Control System Diagnostic Troubleshooting Strategy P.17-9.

Q: Is the auto-cruise system operating properly?

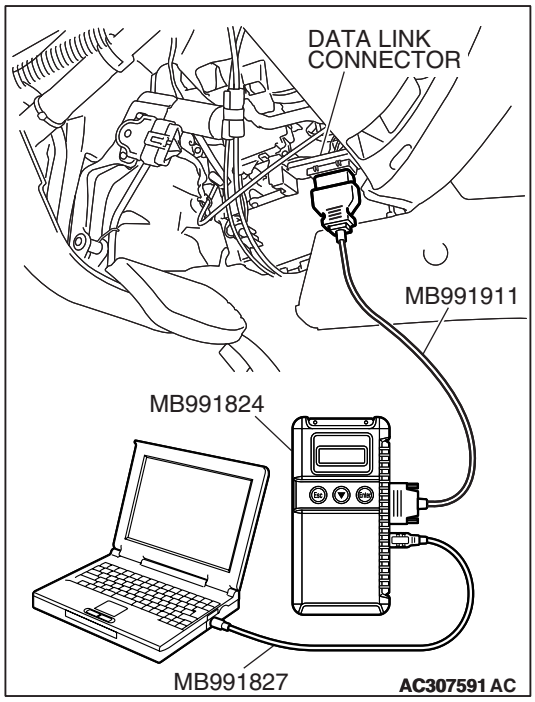
YES : Go to Step 3.

NO : Repair it, then check the symptom.

STEP 3. Using scan tool MB991958, check data list item 66: Overdrive Off Signal.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.

(2) Start the engine and prepare to test drive the vehicle. (Operate the auto-cruise)

(3) Set scan tool MB991502 to data reading mode.

- Item 66: Overdrive Off Signal.
  - When driving at level road, the display should be "OFF."
  - When driving at uphill road, the display should be "ON."

(4) Turn the ignition switch to the "LOCK" (OFF) position.

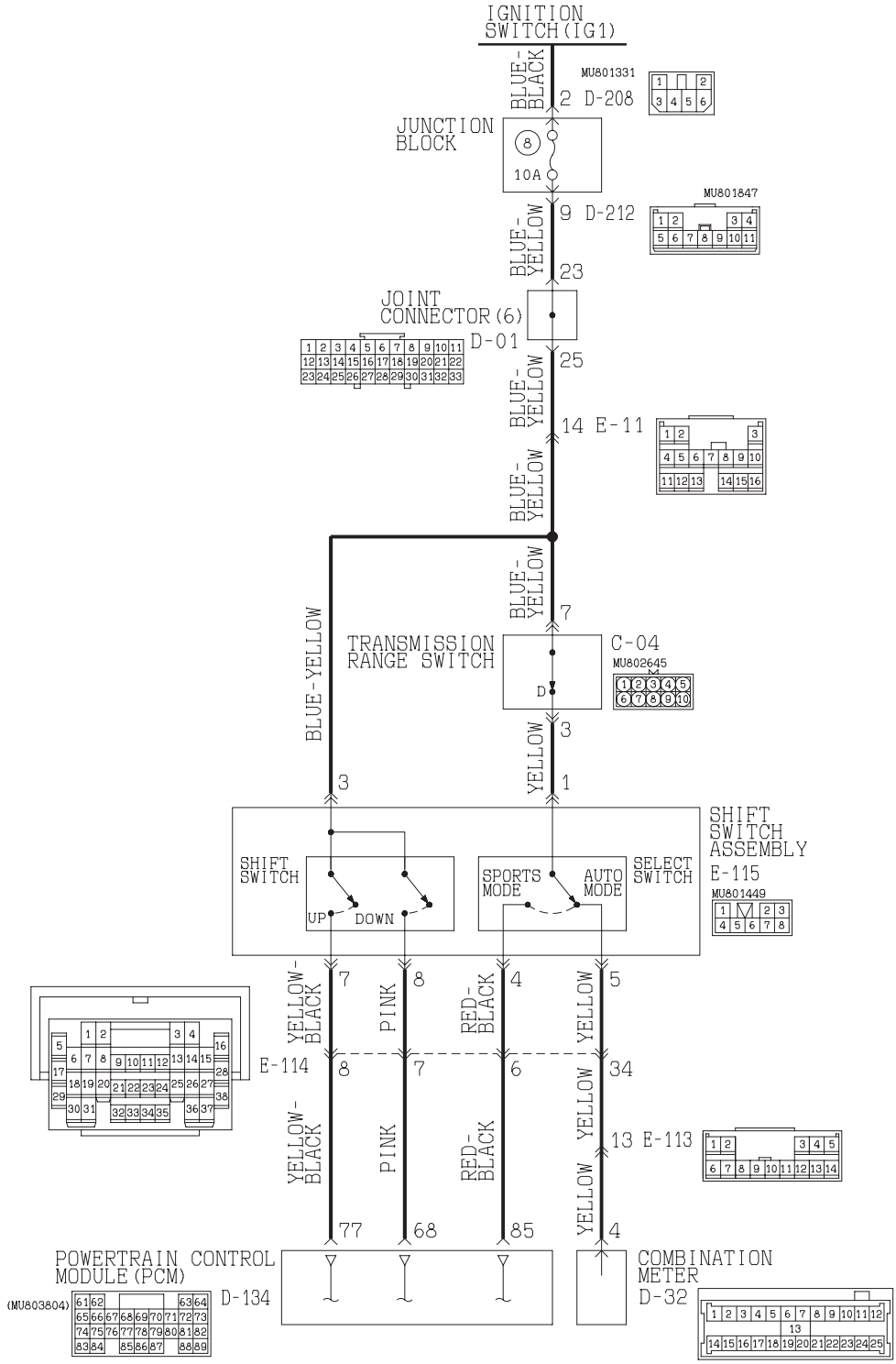
Q: Is the PCM operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.

INSPECTION PROCEDURE 17: Shift Switch Assembly System

Shift Switch Assembly System Circuit



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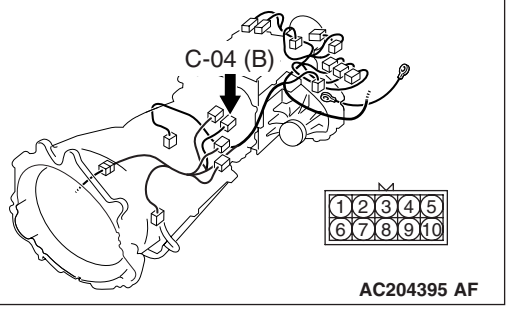
TSB Revision

CONNECTOR : C-04



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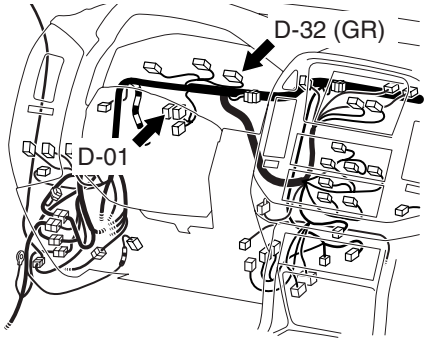
CONNECTORS : D-01, D-32



D-01

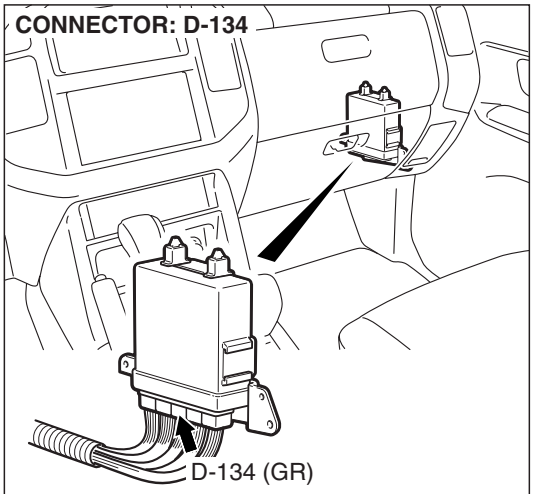
1	2	3	4	5	6	7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22
23	24	25	26	27	28	29	30	31	32	33

D-32

1	2	3	4	5	6	7	8	9	10	11	12	
						13						
14	15	16	17	18	19	20	21	22	23	24	25	

AC204188 CQ

CONNECTOR: D-134



61	62						63	64	
65	66	67	68	69	70	71	72	73	
74	75	76	77	78	79	80	81	82	
83	84		85	86	87		88	89	

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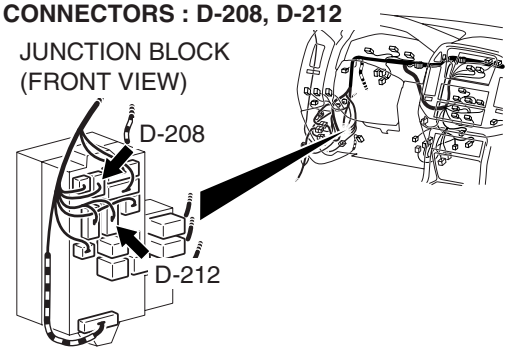
CONNECTORS : D-208, D-212



D-208

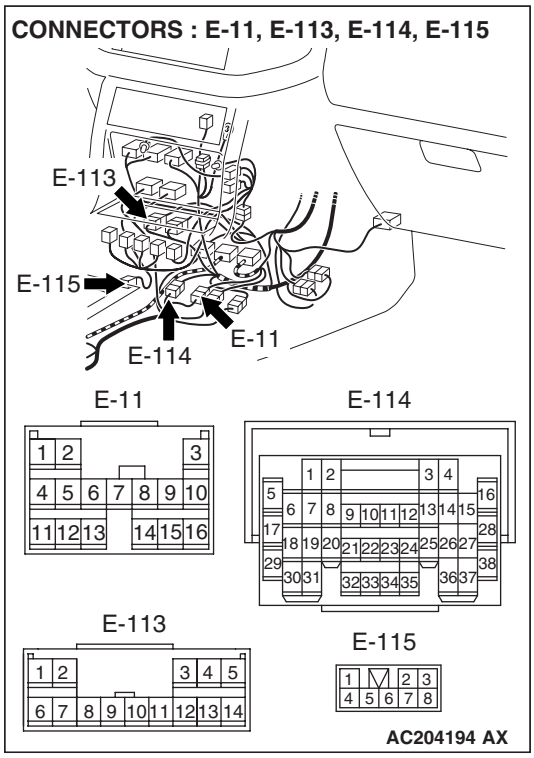
1			2
3	4	5	6

D-212

1	2						3	4
5	6	7	8	9	10	11		

AC204191AS

TSB Revision



CIRCUIT OPERATION

If the select switch of the shift switch assembly is set to the sport mode, battery positive voltage will be applied to the PCM (terminal 85). If the shift switch of the shift switch assembly is set to "UP" or "DOWN" position, battery positive voltage will be applied to the PCM (terminals 68 or 77).

COMMENT

The cause is probably a malfunction of the transmission range switch circuit, shift switch assembly circuit or a defective PCM.

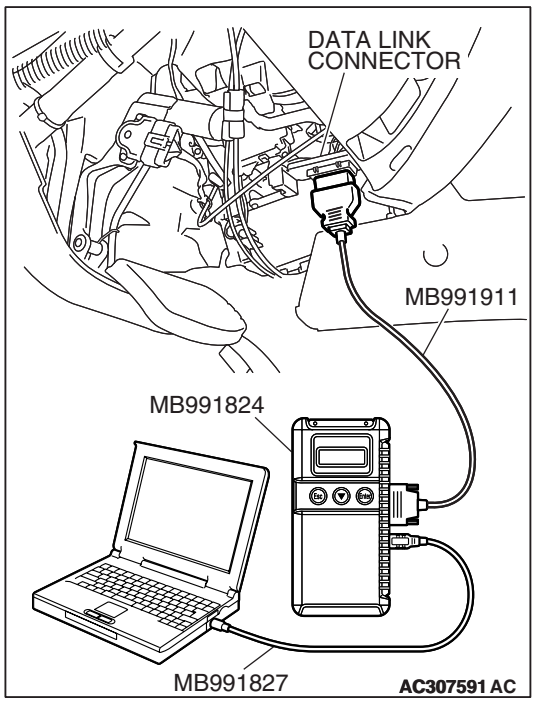
TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the transmission range switch
- Malfunction of the shift switch assembly select switch
- Malfunction of the shift switch assembly shift switch (Up)
- Malfunction of the shift switch assembly shift switch (Down)
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B



STEP 1. Using scan tool MB991958, check data list item 67: Select Switch, item 68: Shift Switch (Up), item 69: Shift Switch (Down).

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode for following items.
  a. item 67: Select Switch
  b. item 68: Shift Switch (Up)
  c. item 69: Shift Switch (Down)
    - The switches above are displayed, depending on the selector lever condition as shown in the table.

SELECTOR LEVER OPERATION	DATA LIST ITEM		
	67	68	69
D range	OFF	OFF	OFF
Sport mode	ON	OFF	OFF
Upshift and hold the selector lever	ON	ON	OFF
Downshift and hold the selector lever	ON	OFF	ON

(4) Turn the ignition switch to the "LOCK" (OFF) position.

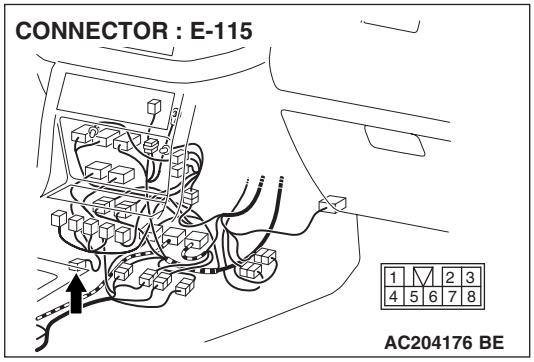
Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.
NO <If item 68 and item 69 both are NG> : Go to Step 2.
NO <If only item 67 is NG> : Go to Step 5.
NO <If only item 68 is NG> : Go to Step 15.
NO <If only item 69 is NG> : Go to Step 20.

STEP 2. Check the shift switch assembly.
Refer to P.23A-561, Transmission Control.

Q: Is the switch operating properly?

YES : Go to Step 3.
NO : Replace the shift switch assembly. Refer to P.23A-562, Transmission Control.

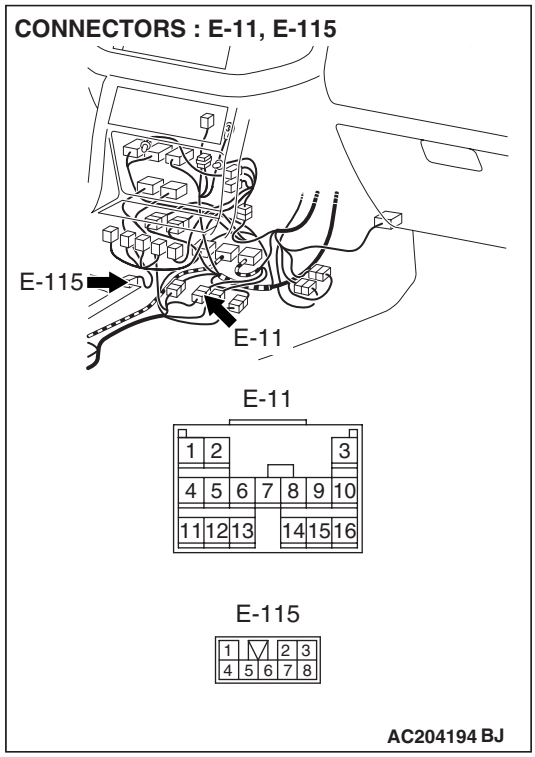


STEP 3. Check shift switch assembly connector E-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 4.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 4. Check harness for open circuit between intermediate connector E-11 terminal 14 and shift switch assembly connector E-115 terminal 3.

Q: Is the harness wire in good condition?

YES : Go to Step 25.

NO : Repair or replace the harness wire.

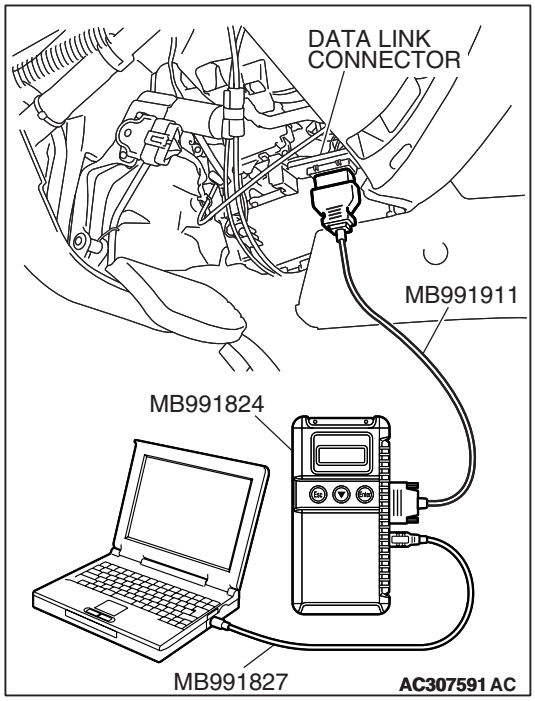
STEP 5. Using scan tool MB991958, check data list item 61: Transmission Range Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode.
- Item 61: Transmission Range Switch.
  - Scan tool MB991958 should display "D" when the transmission range is "D" range.

(4) Turn the ignition switch to the "LOCK" (OFF) position.



Q: Is the switch operating properly?

YES : Go to Step 6.
NO : Refer to P.23A-122, P.23A-151, DTCs 27, 28: Transmission Range Switch System.

STEP 6. Check the shift switch assembly.

Refer to P.23A-561, Transmission Control.

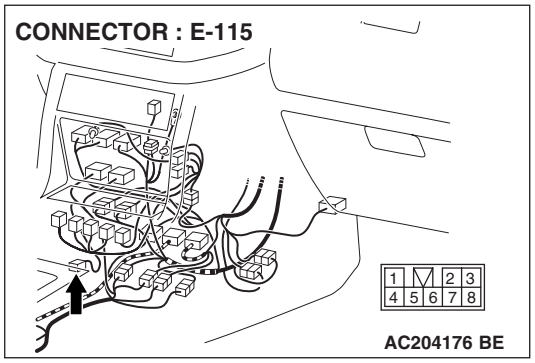
Q: Is the switch operating properly?

YES : Go to Step 7.
NO : Replace the shift switch assembly. Refer to P.23A-562, Transmission Control.

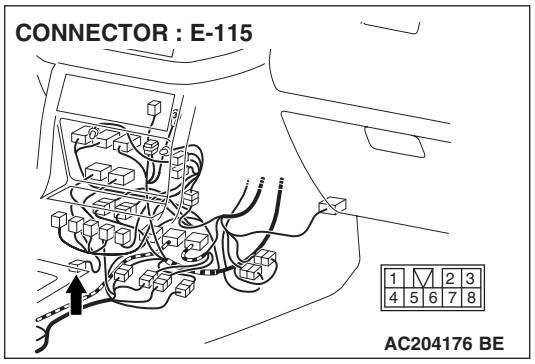
STEP 7. Check shift switch assembly connector E-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connectors and terminals in good condition?

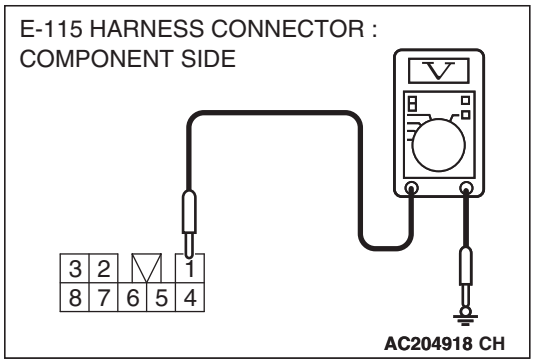
YES : Go to Step 8.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 8. Measure the power supply voltage at shift switch assembly connector E-115.



(1) Disconnect connector E-115 and measure at the harness side.
(2) Turn the ignition switch to the "ON" position.
(3) Transmission range should be "D" range.



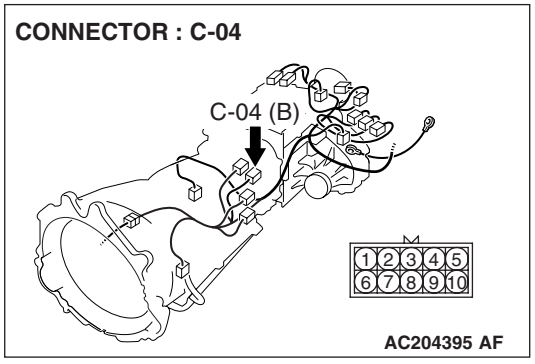
(4) Measure the voltage between terminal 1 and ground.
- The voltage should measure battery positive voltage.

(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 11.
NO : Go to Step 9.

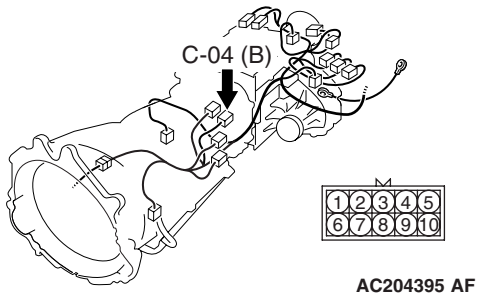
STEP 9. Check transmission range switch connector C-04 for loose, corroded or damaged terminals, or terminals pushed back in the connector.



Q: Are the connectors and terminals in good condition?

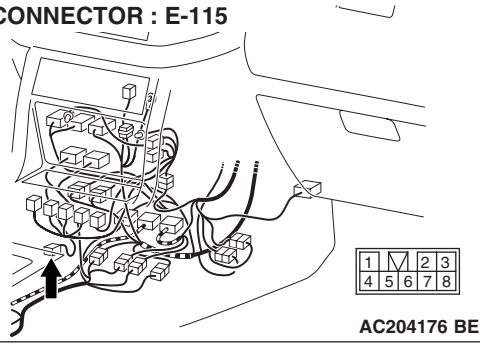
YES : Go to Step 10.
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

CONNECTOR : C-04



AC204395 AF

CONNECTOR : E-115



AC204176 BE

STEP 10. Check harness for open circuit between transmission range switch connector C-04 terminal 3 and shift switch assembly connector E-115 terminal 1.

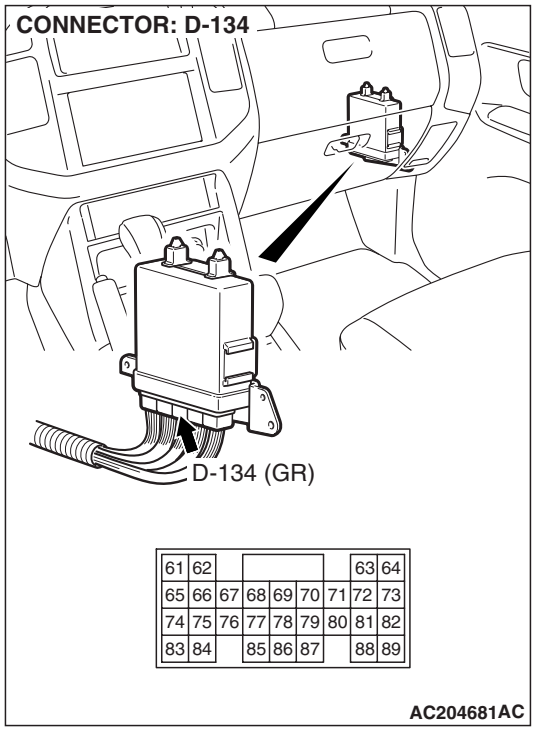
Q: Is the harness wire in good condition?

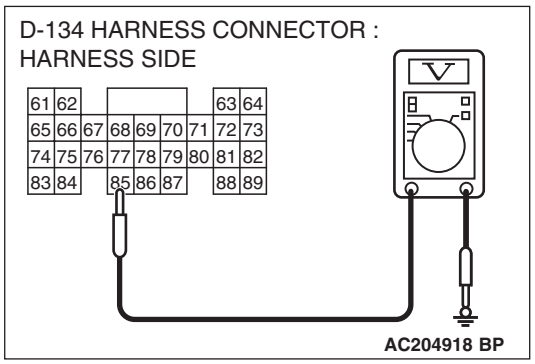
YES : Go to Step 25.

NO : Repair or replace the harness wire.

STEP 11. Measure the switch output voltage at PCM connector D-134 by backprobing.

(1) Do not disconnect connector D-134.
(2) Turn the ignition switch to the "ON" position.
(3) Transmission range should be sport mode.

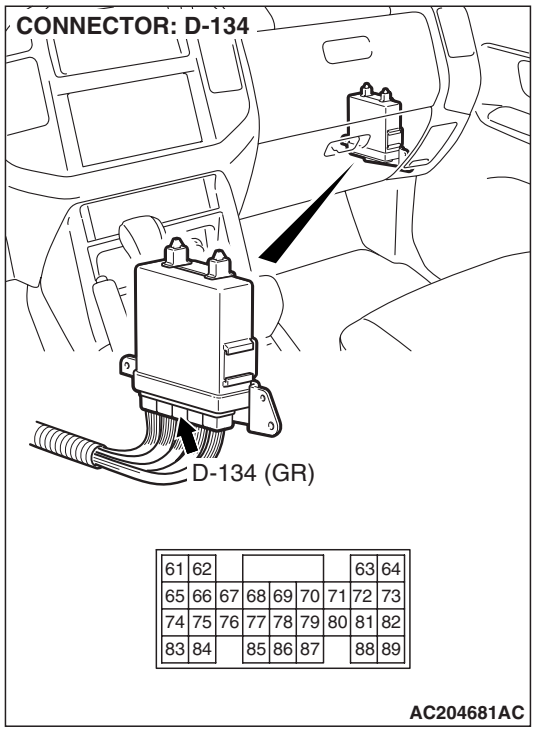


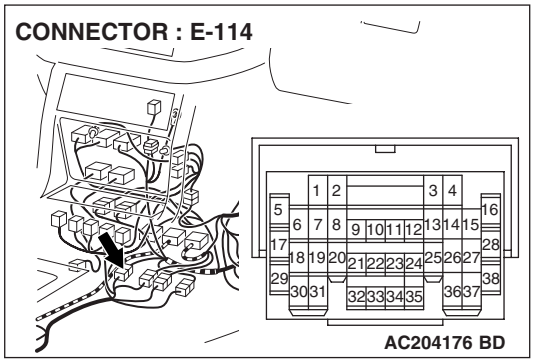


(4) Measure the voltage between terminal 85 and ground by backprobing.
  - The voltage should measure battery positive voltage.
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 14.
NO : Go to Step 12.





STEP 12. Check PCM connector D-134 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 13.

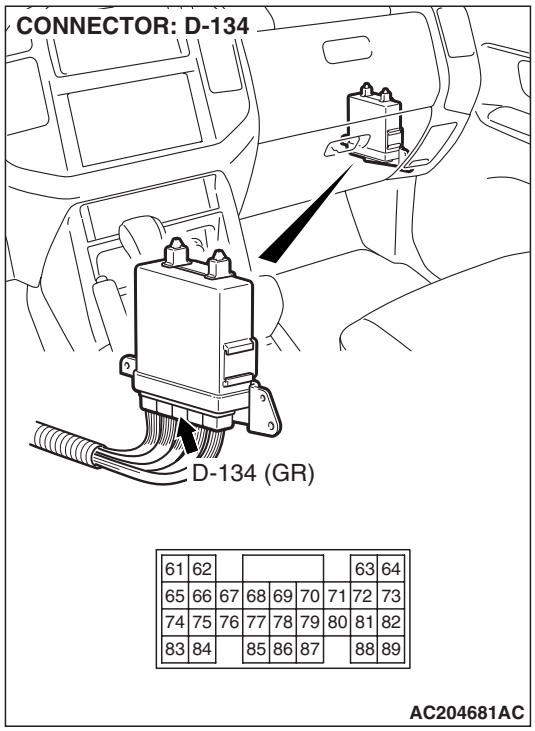
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

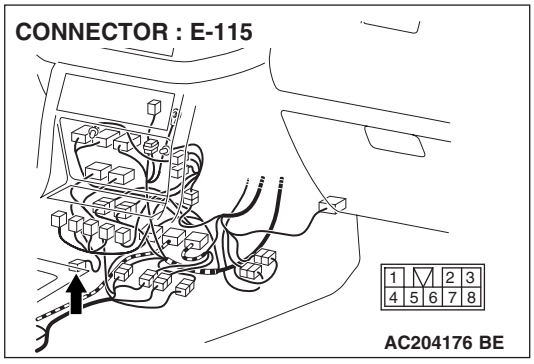
STEP 13. Check harness for open circuit or short circuit to ground between PCM connector D-134 terminal 85 and shift switch assembly connector E-115 terminal 4.

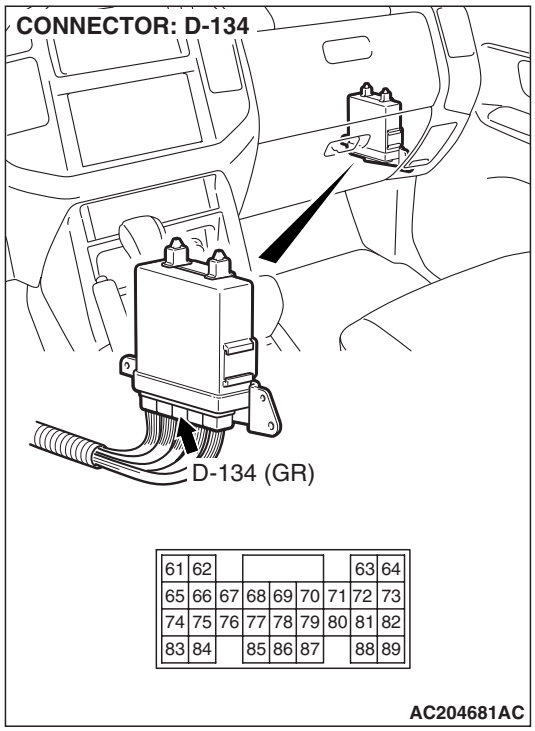
Q: Is the harness wire in good condition?

YES : Go to Step 25.

NO : Repair or replace the harness wire.







STEP 14. Check PCM connector D-134 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 25.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

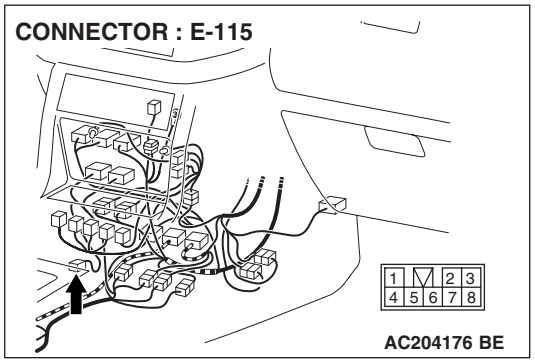
STEP 15. Check the shift switch assembly.

Refer to P.23A-561, Transmission Control.

Q: Is the switch operating properly?

YES : Go to Step 16.

NO : Replace the shift switch assembly. Refer to P.23A-562, Transmission Control.

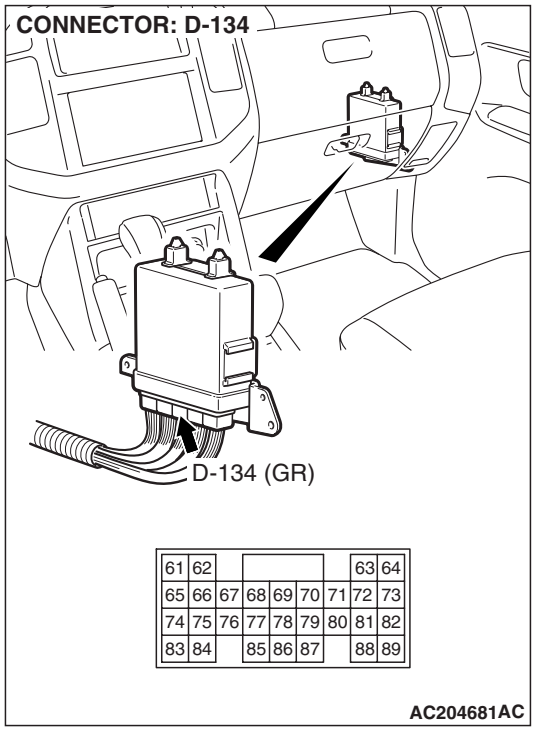


STEP 16. Check shift switch assembly connector E-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 17.

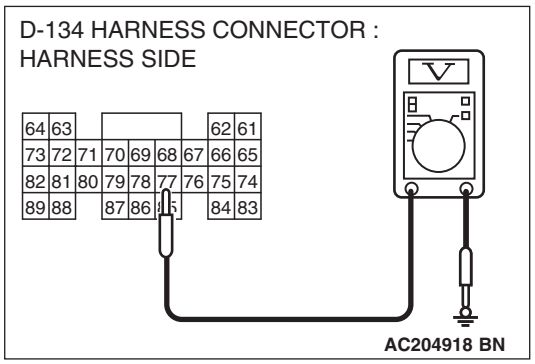
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 17. Measure the switch output voltage at PCM connector D-134.

(1) Disconnect connector D-134 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



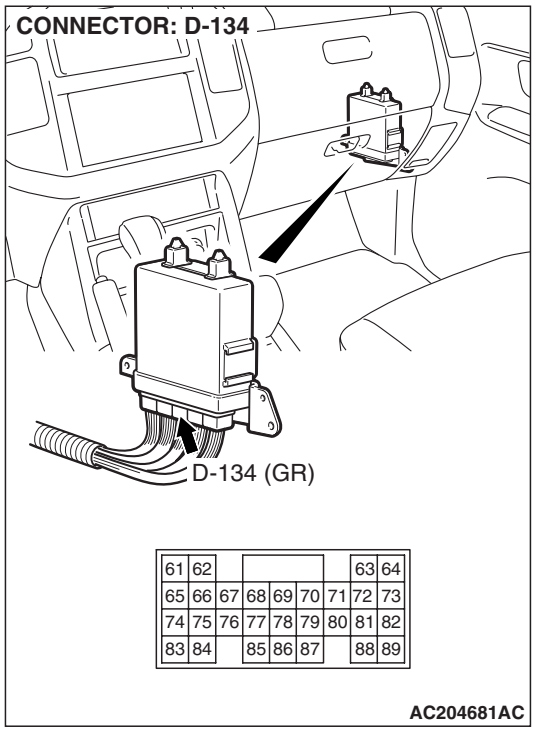
(3) Measure the voltage between terminal 77 and ground.
- The voltage should measure battery positive voltage when the selector lever is upshift and hold.

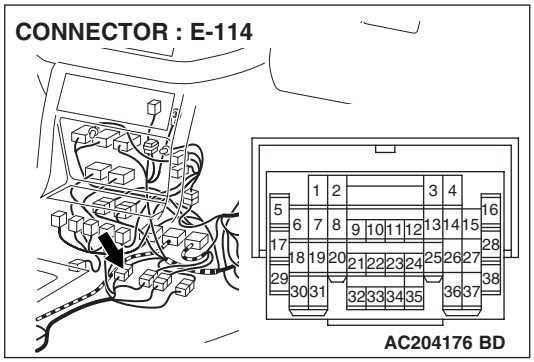
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 14.

NO : Go to Step 18.

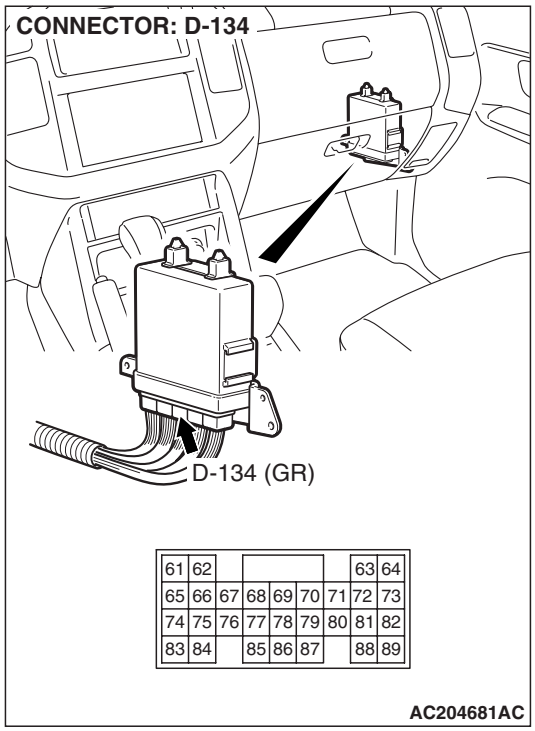


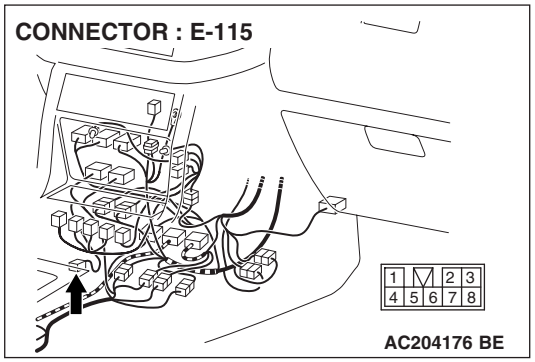


STEP 18. Check PCM connector D-134 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 19.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 19. Check harness for open circuit or short circuit to ground between PCM connector D-134 terminal 77 and shift switch assembly connector E-115 terminal 7.

Q: Is the harness wire in good condition?

YES : Go to Step 25.

NO : Repair or replace the harness wire.

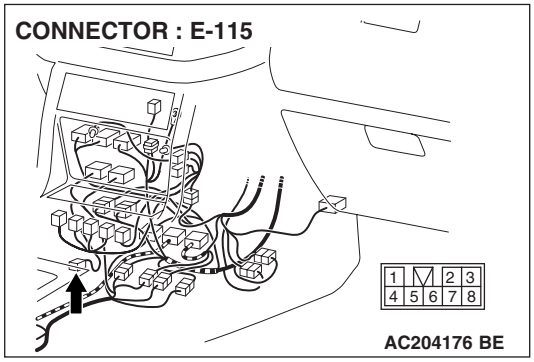
STEP 20. Check the shift switch assembly.

Refer to P.23A-561, Transmission Control.

Q: Is the switch operating properly?

YES : Go to Step 21.

NO : Replace the shift switch assembly. Refer to P.23A-562, Transmission Control.

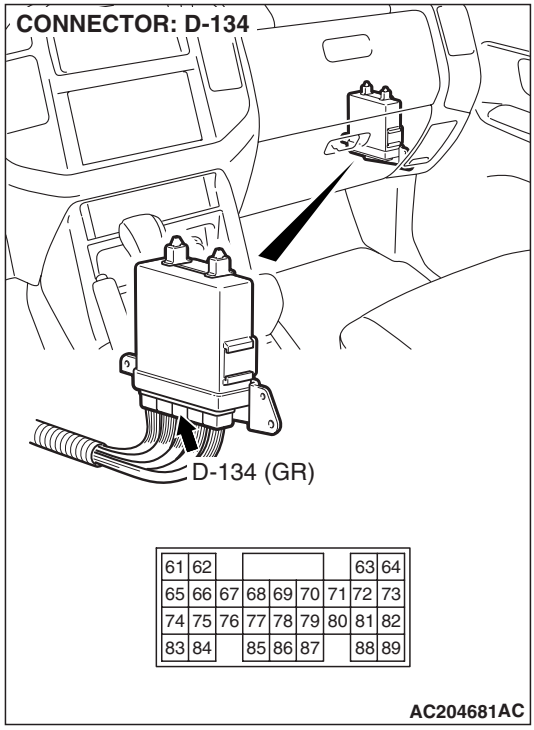


STEP 21. Check shift switch assembly connector E-115 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 22.

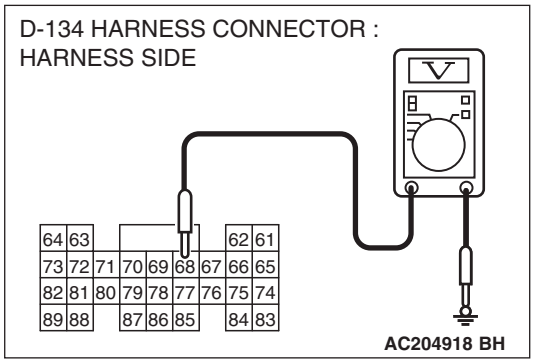
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 22. Measure the switch output voltage at PCM connector D-134.

(1) Disconnect connector D-134 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



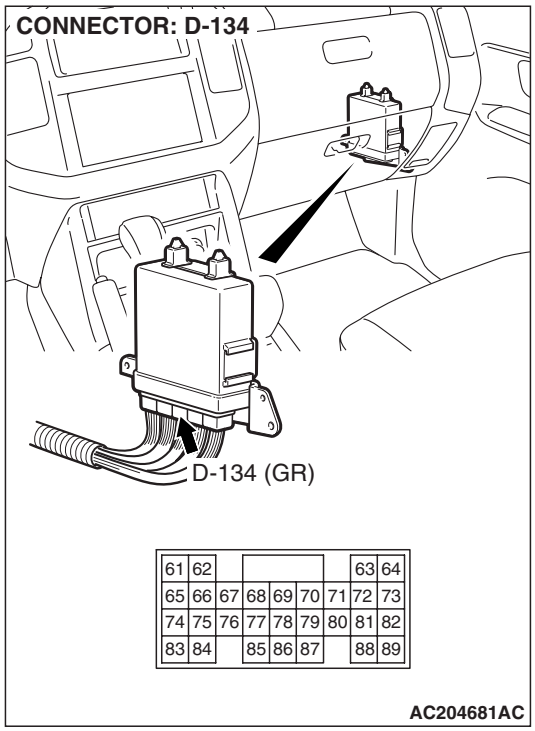
(3) Measure the voltage between terminal 68 and ground.
- The voltage should measure battery positive voltage when the selector lever is downshift and hold.

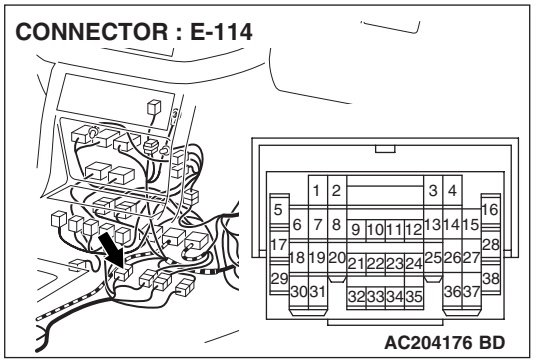
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 14.

NO : Go to Step 23.

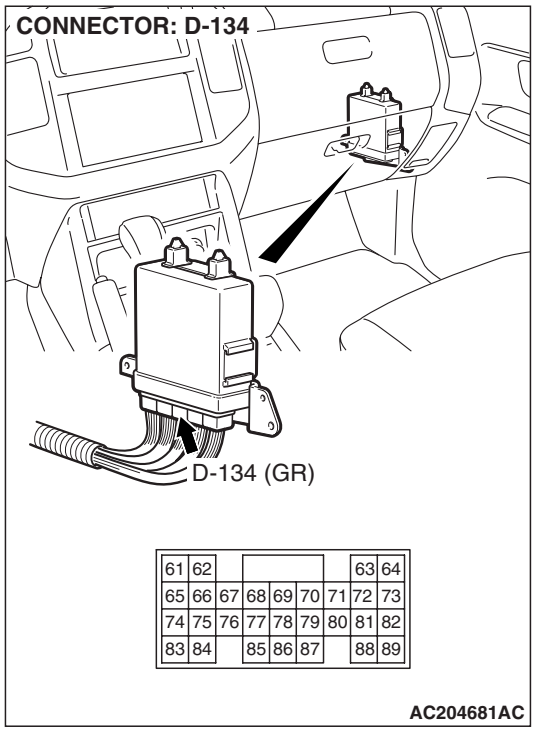


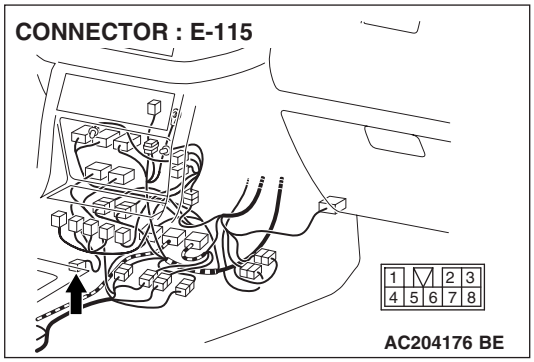


STEP 23. Check PCM connector D-134 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 24.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



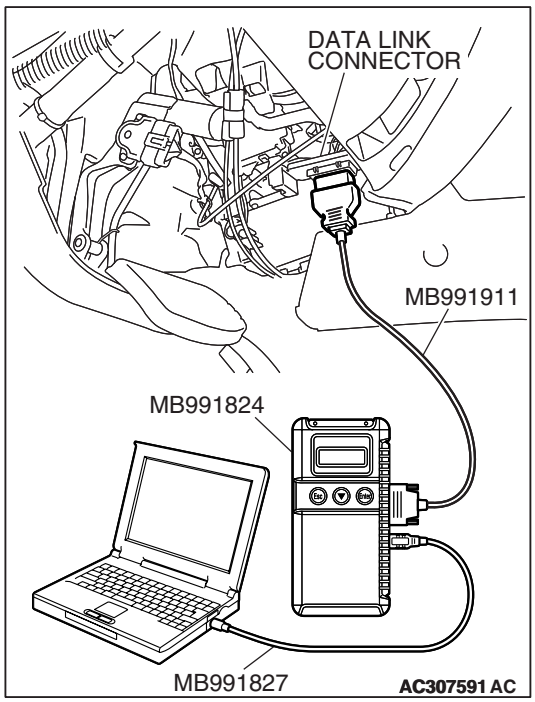


STEP 24. Check harness for open circuit or short circuit to ground between PCM connector D-134 terminal 68 and shift switch assembly connector E-115 terminal 8.

Q: Is the harness wire in good condition?

YES : Go to Step 25.

NO : Repair or replace the harness wire.



STEP 25. Using scan tool MB991958, check data list item 67: Select Switch, item 68: Shift Switch (Up), item 69: Shift Switch (Down).

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.

(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Check the following items in the data list.
   a. item 67: Select Switch
   b. item 68: Shift Switch (Up)
   c. item 69: Shift Switch (Down)
      - The switches above are displayed, depending on the selector lever condition as shown in the table.

SELECTOR LEVER OPERATION	DATA LIST ITEM		
	67	68	69
D range	OFF	OFF	OFF
Sport mode	ON	OFF	OFF
Upshift and hold the selector lever	ON	ON	OFF
Downshift and hold the selector lever	ON	OFF	ON

(4) Turn the ignition switch to the "LOCK" (OFF) position.

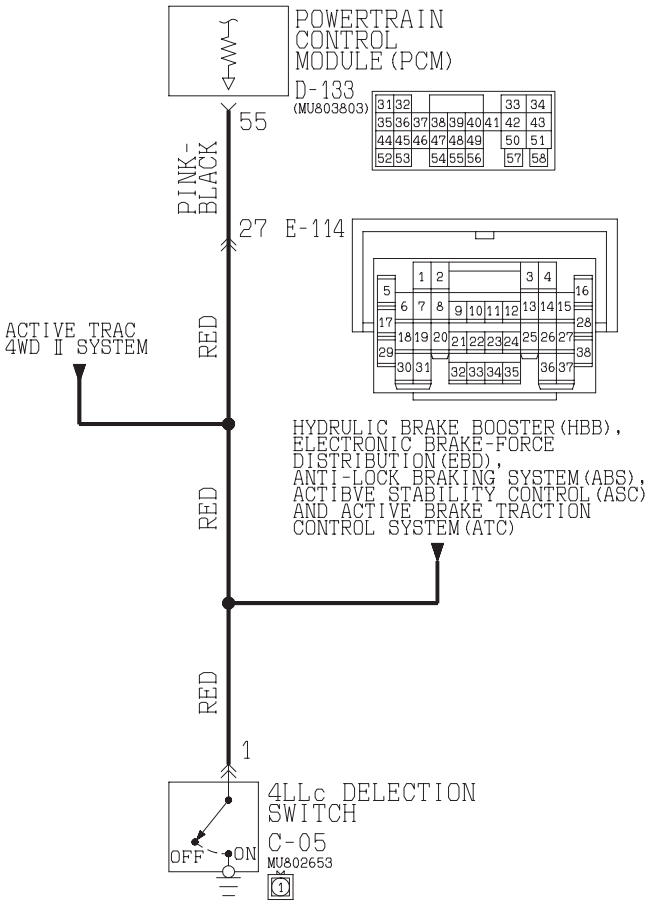
Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.

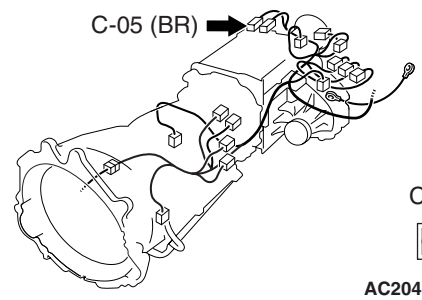
INSPECTION PROCEDURE 18: 4LLc Detection Switch System

4LLc Detection Switch System Circuit



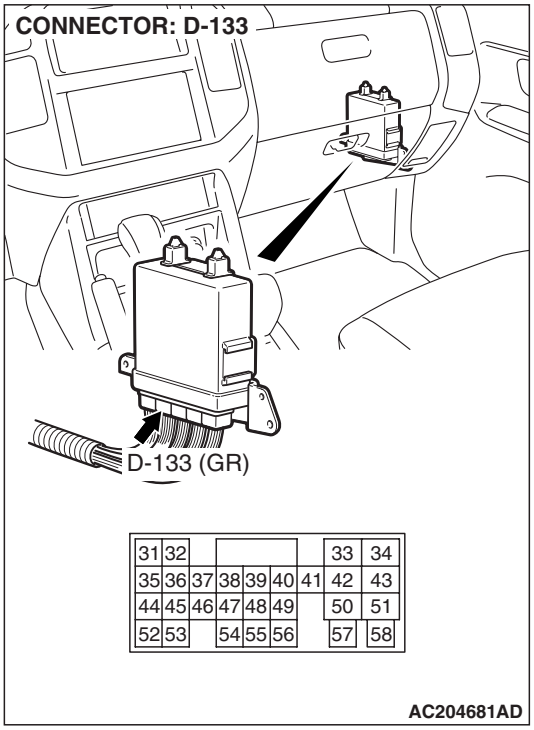
W3Q20M04AA
AC205257AB

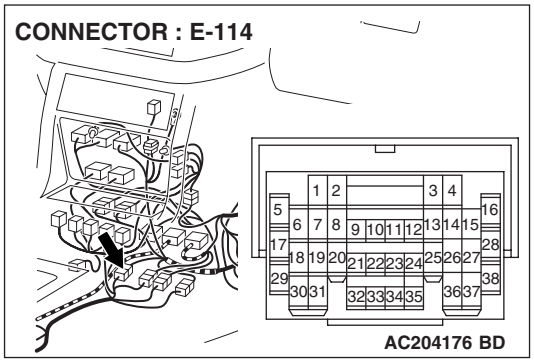
CONNECTOR : C-05



AC204395 AG

TSB Revision





CIRCUIT OPERATION

- A battery positive voltage is applied to the 4LLc detection switch output terminal (terminal 1) from the PCM (terminal 55) via the resistance in the unit.
- The 4LLc detection switch is grounded through the transfer case to the vehicle body.

COMMENT

If the transmission will not shift to 4th gear, or if it shifts to 4th gear when the transfer lever is in the "4LLc" position, the cause is probably a malfunction of the 4LLc detection switch.

TROUBLESHOOTING HINTS (THE MOST LIKELY CAUSES FOR THIS CASE:)

- Malfunction of the 4LLc detection switch
- Damaged harness, connector
- Malfunction of the PCM

DIAGNOSIS

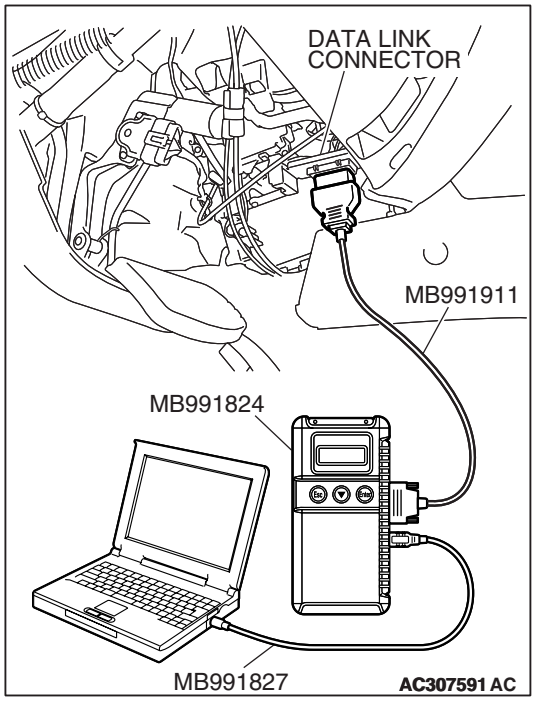
Required Special Tool:

- MB991958: Scan Tool (MUT-III Sub Assembly)
  - MB991824: V.C.I.
  - MB991827: MUT-III USB Cable
  - MB991911: MUT-III Main Harness B

STEP 1. Using scan tool MB991958, check data list item 75: 4LLc Detection Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to the data reading mode.
  - Item 75: 4LLc Detection Switch.
    - When the transfer shift lever position is 4LLc, scan tool MB991958 display should be "ON."
    - When the transfer shift lever position is other than 4LLc, scan tool MB991958 display should be "OFF."

(4) Turn the ignition switch to the "LOCK" (OFF) position.

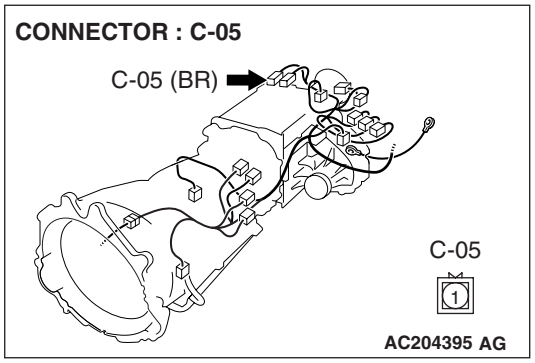
Q: Is the switch operating properly?

YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Go to Step 2.

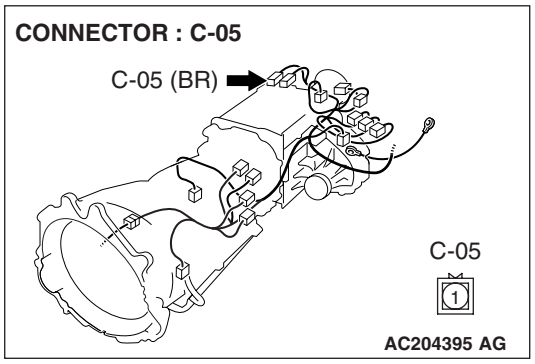
STEP 2. Check 4LLc detection switch connector C-05 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?



YES : Go to Step 3.

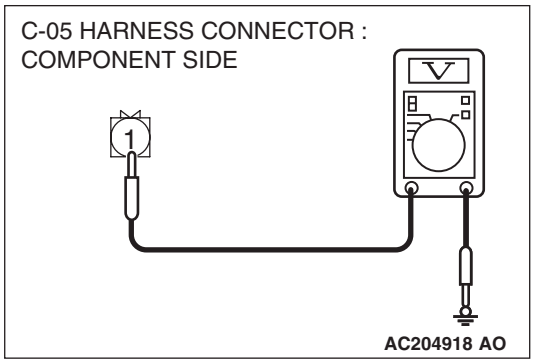
NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



STEP 3. Measure the switch output voltage at 4LLc detection switch connector C-05.

(1) Disconnect connector C-05 and measure at the harness side.

(2) Turn the ignition switch to the "ON" position.



(3) Measure the voltage between terminal 1 and ground.
- The voltage should measure battery positive voltage.

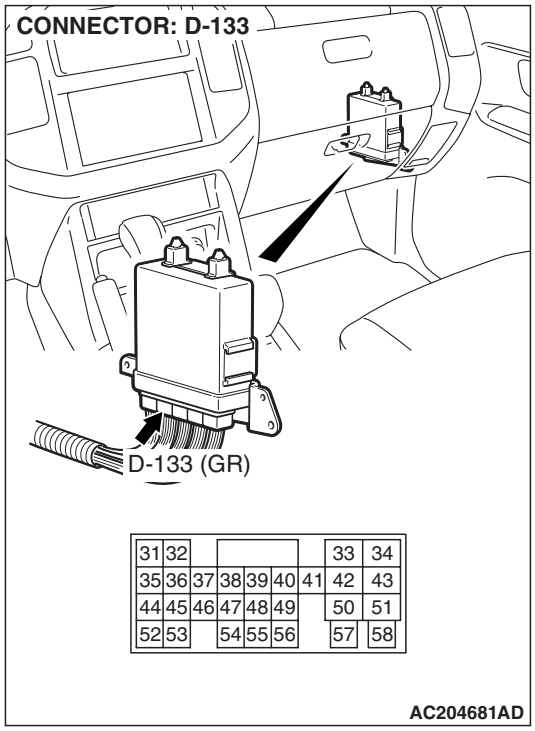
(4) Turn the ignition switch to the "LOCK" (OFF) position.

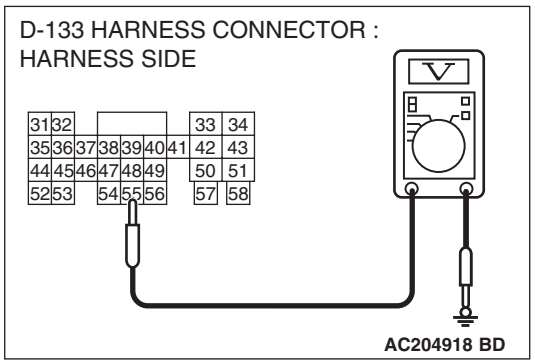
Q: Is the measured voltage battery positive voltage?

YES : Go to Step 10.
NO : Go to Step 4.

STEP 4. Measure the switch output voltage at PCM connector D-133 by backprobing.

(1) Do not disconnect connector D-133.
(2) Turn the ignition switch to the "ON" position.



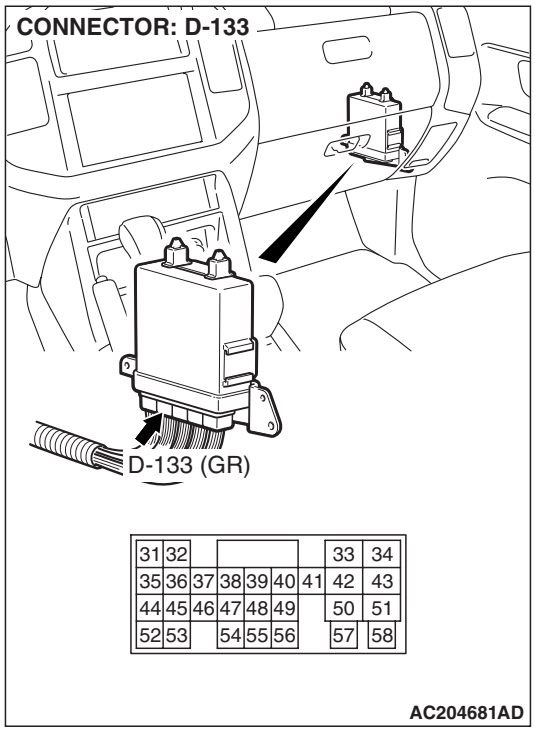


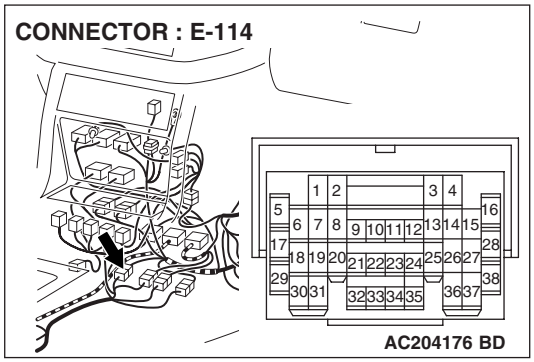
(3) Measure the voltage between terminal 55 and ground by backprobing.
- The voltage should measure battery positive voltage.

(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the measured voltage battery positive voltage?

YES : Go to Step 5.
NO : Go to Step 7.

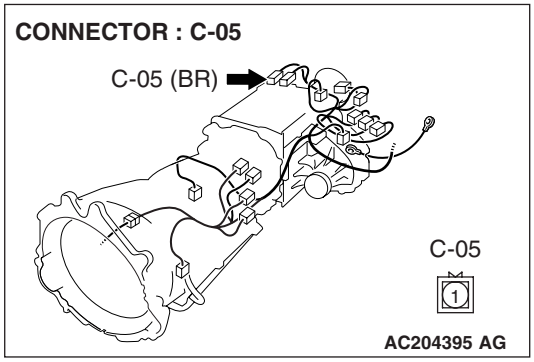


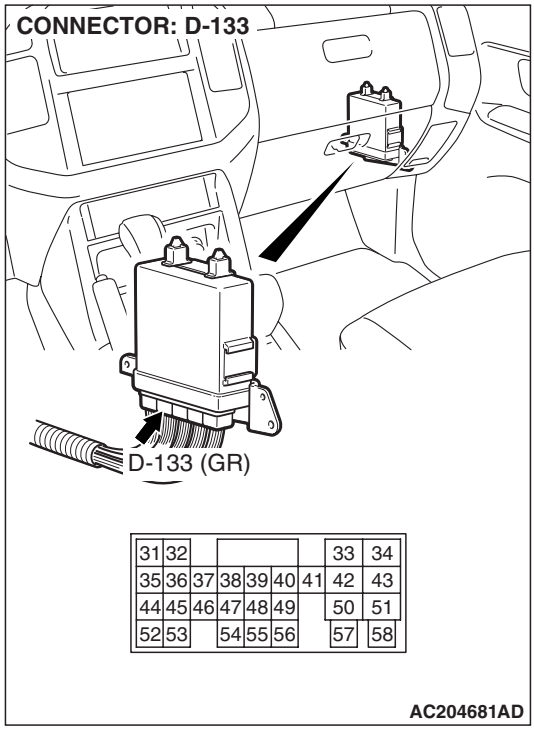


STEP 5. Check PCM connector D-133 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 6.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.



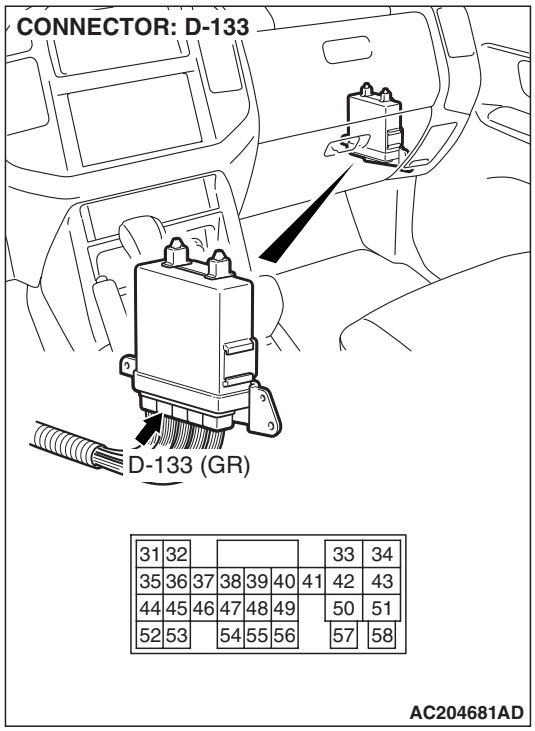


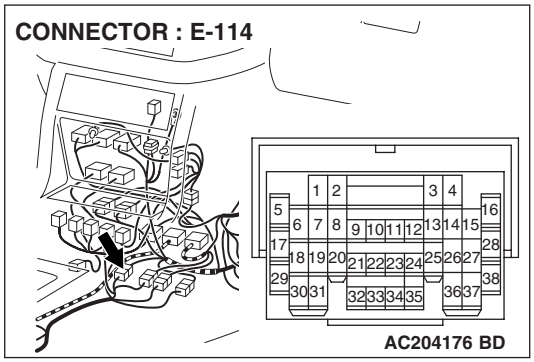
STEP 6. Check harness for open circuit between 4LLc detection switch connector C-05 terminal 1 and PCM connector D-133 terminal 55.

Q: Is the harness wire in good condition?

YES : Go to Step 9.

NO : Repair or replace the harness wire.

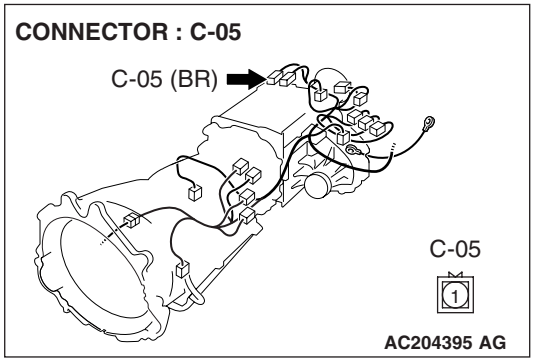


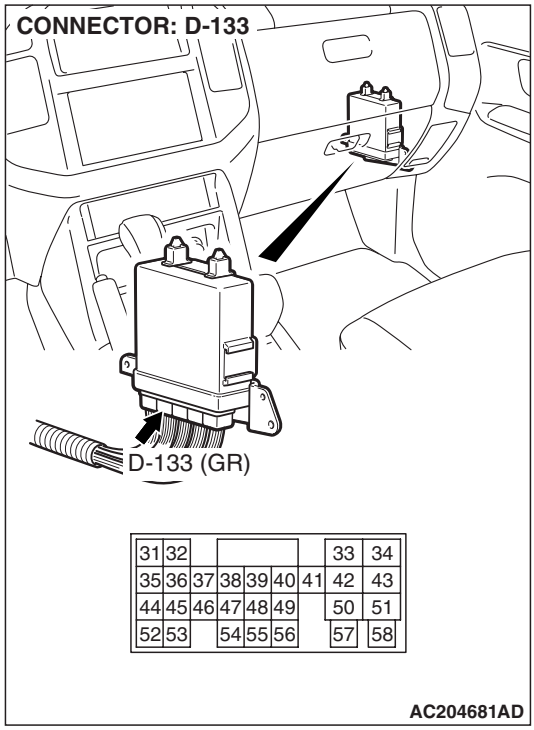


STEP 7. Check PCM connector D-133 and intermediate connector E-114 for loose, corroded or damaged terminals, or terminals pushed back in the connector.
Q: Are the connectors and terminals in good condition?

YES : Go to Step 8.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.





STEP 8. Check harness for short circuit to ground between 4LLc detection switch connector C-05 terminal 1 and PCM connector D-133 terminal 55.

Q: Is the harness wire in good condition?

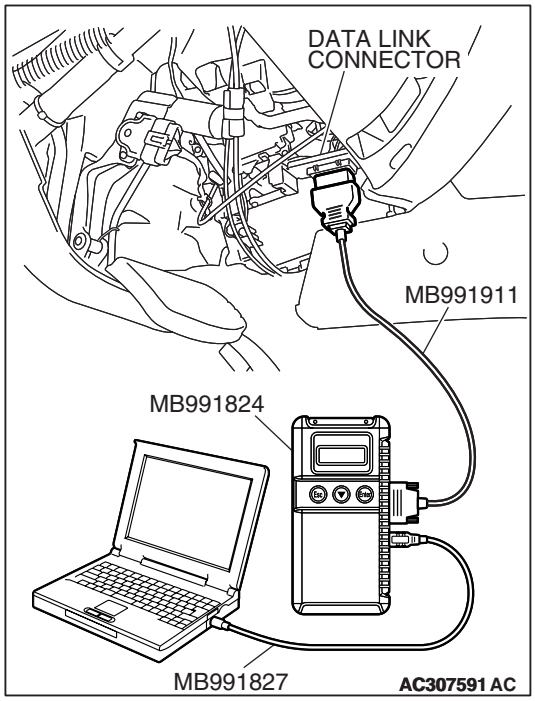
YES : Go to Step 9.

NO : Repair or replace the harness wire.

STEP 9. Using scan tool MB991958, check data list item 75: 4LLc Detection Switch.

⚠ CAUTION

To prevent damage to scan tool MB991958, always turn the ignition switch to the "LOCK" (OFF) position before connecting or disconnecting scan tool MB991958.



(1) Connect scan tool MB991958 to the data link connector.
(2) Turn the ignition switch to the "ON" position.
(3) Set scan tool MB991958 to data reading mode.
- Item 75: 4LLc Detection Switch.
  - When the transfer shift lever position is 4LLc, scan tool MB991958 display should be "ON."
  - When the transfer shift lever position is other than 4LLc, scan tool MB991958 display should be "OFF."

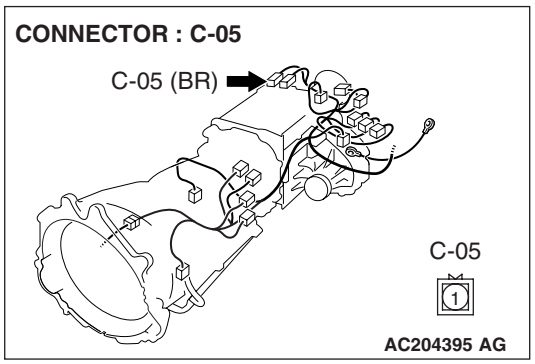
(4) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the switch operating properly?

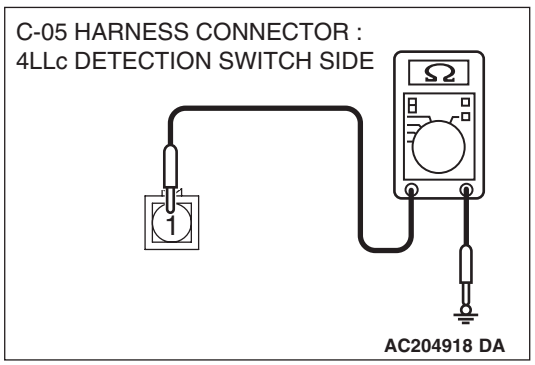
YES : It can be assumed that this malfunction is intermittent. Refer to GROUP 00, How to Use Troubleshooting/ Inspection Service Points – How to Cope with Intermittent Malfunction P.00-13.

NO : Replace the PCM.

STEP 10. Measure the resistance at 4LLc detection switch connector C-05.



(1) Disconnect connector C-05 and measure at the switch side.
(2) Turn the ignition switch to the "ON" position.
(3) Transmission range should be "N" range.



(4) Check for the continuity between terminal 1 and ground.
- When the transfer shift lever position is 4LLc there should measure less than 2 ohms.
- When the transfer shift lever position is other than 4LLc there should be open circuit.

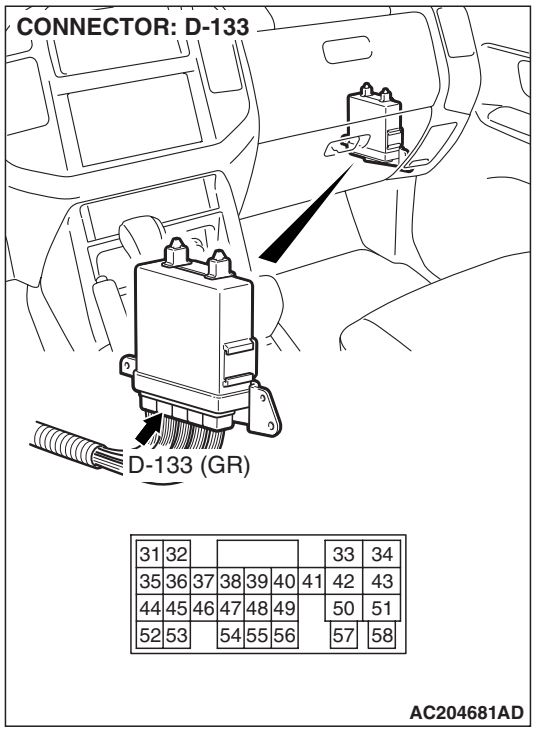
(5) Turn the ignition switch to the "LOCK" (OFF) position.

Q: Is the resistance 2 ohms?

YES : Go to Step 11.

NO : Replace the 4LLc detection switch. Refer to GROUP 23B, Transfer P.23B-75.

TSB Revision



STEP 11. Check PCM connector D-133 for loose, corroded or damaged terminals, or terminals pushed back in the connector.

Q: Are the connector and terminals in good condition?

YES : Go to Step 9.

NO : Repair or replace the damaged components. Refer to GROUP 00E, Harness Connector Inspection P.00E-2.

DATA LIST REFERENCE TABLE

M1231109100133

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
2ND SOL DUTY	33	Second solenoid valve duty %	Transmission range: Sport mode	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	100%
			Transmission range: Sport mode	Driving at constant speed of 30 km/h (19 mph) in 2nd gear	0%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear	100%
			Transmission range: Sport mode	Driving at constant speed of 70 km/h (44 mph) in 5th gear	0%
A/T CONT RLY	54	A/T control relay output voltage	Ignition switch: ON		Battery positive voltage
CKP SENSOR	21	Crankshaft position sensor	• Engine: Idling (after the worming up) • Transmission range: P	Accelerator pedal: Fully closed	600 – 900 r/min
				Accelerator pedal: Depressed	Gradually rises from the above value
DUAL PRESS SW	65	Dual pressure switch	• Engine: Idling • Transmission range: P, N	A/C switch: ON (While the A/C compressor is in operation)	ON
				A/C switch: OFF	OFF
ENGINE LOAD	57	Engine load (volumetric efficiency)	• Engine: Idling • Transmission range: N	Accelerator pedal: fully closed → depressed	Data changes
INV2 CONT.STP	40	INVECS-II cancel command	INVECS-II activated		ON
			INVECS-II not activated		OFF
ISS SENSOR	22	Input shaft speed sensor	Gear range: 4th gear	Driving at constant speed of 50 km/h (31 mph)	1,400 – 1,700 r/min
L/R SOL DUTY	31	Low-reverse solenoid valve duty %	Transmission range: Sport mode	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%
			Transmission range: Sport mode	Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 3rd gear	100%

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%
			Transmission range: Sport mode	Driving at constant speed of 70 km/h (44 mph) in 5th gear	0%
O/D SOL DUTY	34	Overdrive solenoid valve duty %	Transmission range: Sport mode	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	100%
			Transmission range: Sport mode	Driving at constant speed of 30 km/h (19 mph) in 2nd gear	100%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 3rd gear	0%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%
			Transmission range: Sport mode	Driving at constant speed of 70 km/h (44 mph) in 5th gear	0%
OD OFF SIGNAL	66	Overdrive off signal (Auto-cruise ECM signal)	While auto-cruise is engaged	Level road	OFF
				Uphill grade	ON
OSS SENSOR	23	Output shaft speed sensor	Gear range: 4th gear	Driving at constant speed of 50 km/h (31 mph)	1,400 – 1,700 r/min
TR SWITCH	61	Transmission range switch	Ignition switch: ON	Transmission range: P	P
				Transmission range: R	R
				Transmission range: N	N
				Transmission range: D	D
SELECT SW	67	Select switch	Ignition switch: ON	Transmission range: D	OFF
				Selector lever operation: Select sport mode	ON
				Selector lever operation: Upshift and hold the selector lever	ON

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
				Selector lever operation: Downshift and hold the selector lever	ON
SHIFT POS	63	Shift position	Transmission range: Sport mode	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	1st
			Transmission range: Sport mode	Driving at constant speed of 30 km/h (19 mph) in 2nd gear	2nd
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 3rd gear	3rd
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear	4th
			Transmission range: Sport mode	Driving at constant speed of 70 km/h (44 mph) in 5th gear	5th
			Transmission range: R	Driving at constant speed of 5 km/h (3.1 mph) in reverse gear	REV
			Transmission range: P or N		PN
SHIFT SW DOWN	69	Shift switch (Down)	Ignition switch: ON	Transmission range: D	OFF
				Selector lever operation: Select sport mode	OFF
				Selector lever operation: Upshift and hold the selector lever	OFF
				Selector lever operation: Downshift and hold the selector lever	ON
SHIFT SW UP	68	Shift switch (Up)	Ignition switch: ON	Transmission range: D	OFF
				Selector lever operation: Select sport mode	OFF
				Selector lever operation: Upshift and hold the selector lever	ON

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
				Selector lever operation: Downshift and hold the selector lever	OFF
STOPLIGHT SW	26	Stoplight switch	Ignition switch: ON	Brake pedal: Depressed	ON
				Brake pedal: Released	OFF
TCC SLIPPAGE	52	Torque converter clutch amount of slippage	• Warmed up • Transmission range: Sport mode • Driving at speed of 80 km/h (50 mph) in 4th gear	Driving at constant speed of 80 km/h (50 mph)	−10 to 10 r/min
				Release accelerator pedal (at less than 50 km/h (31 mph))	The value should fluctuate when the accelerator is released
TCC SOL DUTY	36	Torque converter clutch solenoid valve duty %	• Warmed up • Transmission range: Sport mode • Driving at speed of 80 km/h (50 mph) in 4th gear	Driving at constant speed of 80 km/h (50 mph)	70 – 99.6%
				Release accelerator pedal (at less than 50 km/h (31 mph))	70 – 99.6% → 0% Decreases gradually as the vehicle speed decreases
TF LOW DETECT	75	4LLc detection switch	• Ignition switch: ON • Transmission range: N	Transfer position: 4L Lc	ON
				Transfer position: Other than above	OFF
TP SENSOR	11	Throttle position sensor	• Ignition switch: ON • Engine: Stopped • Transmission range: P	Accelerator pedal: Fully closed	200 – 800 mV
				Accelerator pedal: Depressed	Gradually rises from the above value
				Accelerator pedal: Fully open	3,800 – 4,900 mV
TFT SENSOR	15	Transmission fluid temperature sensor	Warmed up	Drive for 15 minutes or more so that the transmission fluid temperature becomes 70 – 80°C (158 – 176°F)	Gradually rises to 70 – 80°C (158 – 176°F)
U/D SOL DUTY	32	Underdrive solenoid valve duty %	Transmission range: Sport mode	Driving at constant speed of 10 km/h (6.2 mph) in 1st gear	0%

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION
			Transmission range: Sport mode	Driving at constant speed of 30 km/h (19 mph) in 2nd gear	0%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 3rd gear	0%
			Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear	0%
			Transmission range: Sport mode	Driving at constant speed of 70 km/h (43 mph) in 5th gear	100%
VSS	29	Vehicle speed sensor	Transmission range: Sport mode	Idling with 1st gear (Vehicle stopped)	0 km/h (0 mph)
				Driving at constant speed of 50 km/h (31 mph)	50 km/h (31 mph)

ACTUATOR TEST REFERENCE TABLE

M1231101000110

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	TEST CONTENT	INSPECTION REQUIREMENT	NORMAL CONDITION
1st SIFT LMP	07	1st indicator light	Illuminate each indicator light for three to the signal from the scan tool MB991958 (MUT-III sub assembly)	• Ignition switch: ON • Transmission range: P • Engine: stopped • Throttle opening voltage: Less than one volt	Shift indicator light illuminates.
2nd SIFT LMP	08	2nd indicator light			
2ND SOL	03	Second solenoid valve	Drive the solenoid valve specified by scan tool MB991958 (MUT-III sub assembly) at 50% duty for five seconds. No other solenoid valve should be energized.		The solenoid should click when activated
3rd SIFT LMP	09	3rd indicator light	Illuminate each indicator light for three to the signal from the scan tool MB991958 (MUT-III sub assembly)		Shift indicator light illuminates.
4th SIFT LMP	10	4th indicator light			
5th SIFT LMP	11	5th indicator light			

MUT-III SCAN TOOL DISPLAY	ITEM NO.	INSPECTION ITEM	TEST CONTENT	INSPECTION REQUIREMENT	NORMAL CONDITION
A/T RELAY	12	A/T control relay	Actuator test in scope mode, data list No.54. Control relay is OFF for three seconds.		Data list No.54 • (1)During test: 0 V • (2) Normal: Battery positive voltage [12 V]
L/R SOL	01	Low-reverse solenoid valve	Drive the solenoid valve specified by scan tool MB991958 (MUT-III sub assembly) at 50% duty for five seconds. No other solenoid valve should be energized.		The solenoid should click when activated
O/D SOL	04	Overdrive solenoid valve			
RED SOL	05	Reduction solenoid valve			
TCC SOL	06	Torque converter clutch solenoid valve			
U/D SOL	02	Underdrive solenoid valve			

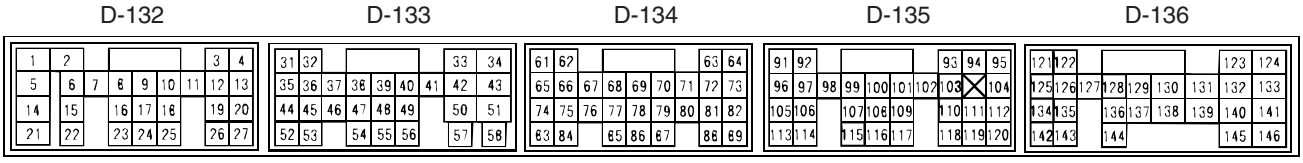
INVECS-II CANCEL COMMAND

M1231109300104

MUT-III SCAN TOOL DISPLAY	ITEM NO.	ITEM	CONTENT	REMARKS
Std. SIFT PATN	14	Standard shift pattern	Stops the INVECS-II control and shifts gears according to the standard shift pattern.	Use this function when performing procedure 8 in the road tests (Refer to P.23A-17). The INVECS-II cancel command will last until the ignition switch is turned from "ON" to "LOCK" (OFF) or vice versa.

PCM TERMINAL VOLTAGE REFERENCE CHART FOR TRANSMISSION

M1231101400130



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TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
39	Stoplight switch	Brake pedal: Depressed	Battery positive voltage
		Brake pedal: Released	1 V or less
55	4LLc detection switch	• Ignition switch: ON • Selector lever operation: N • Transfer position: 4LLc	1 V or less
		• Ignition switch: ON • Selector lever operation: N • Transfer position: Other than above	Battery positive voltage

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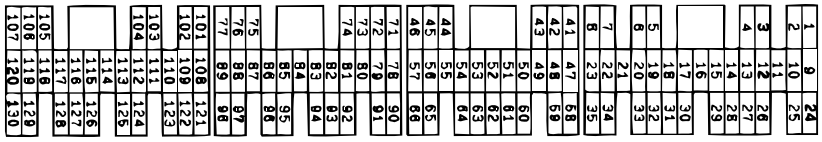
TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
64	Input shaft speed sensor	• Measure between terminals 88 and 64 with an oscilloscope. • Engine: 2,000 r/min • Gear range: 4th gear	Refer to P.23A-400, Inspection Procedure Using an Oscilloscope.
66	Transmission range switch: P	• Ignition switch: ON • Transmission range: P	Battery positive voltage
		• Ignition switch: ON • Transmission range: Other than above	1 V or less
67	Transmission range switch: R	• Ignition switch: ON • Transmission range: R	Battery positive voltage
		• Ignition switch: ON • Transmission range: Other than above	1 V or less
68	Shift switch (Down)	• Ignition switch: ON • Selector lever operation: Downshift and hold the selector lever	Battery positive voltage
		• Ignition switch: ON • Selector lever operation: Other than above	1 V or less
70	Crankshaft position sensor	Engine: Idling	1.5 – 2.5 V
73	Output shaft speed sensor	• Measure between terminals 88 and 73 with an oscilloscope. • Engine: 2,000 r/min • Gear range: 4th gear	Refer to P.23A-400, Inspection Procedure Using an Oscilloscope.
75	Transmission range switch: N	• Ignition switch: ON • Transmission range: N	Battery positive voltage
		• Ignition switch: ON • Transmission range: Other than above	1 V or less
76	Transmission range switch: D	• Ignition switch: ON • Transmission range: D	Battery positive voltage
		• Ignition switch: ON • Transmission range: Other than above	1 V or less
77	Shift switch (Up)	• Ignition switch: ON • Selector lever operation: Upshift and hold the selector lever	Battery positive voltage
		• Ignition switch: ON • Selector lever operation: Other than above	1 V or less
79	Vehicle speed sensor	• Measure between terminals 131 and 79 with an oscilloscope. • Engine: 2,000 r/min • Gear range: 4th gear	Refer to P.23A-400, Inspection Procedure Using an Oscilloscope.
85	Select switch	• Ignition switch: ON • Selector lever operation: Sport mode	Battery positive voltage

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
		• Ignition switch: ON • Selector lever operation: Other than above	1 V or less
119	Transmission fluid temperature sensor	• Ignition switch: ON • Transmission fluid temperature: 20°C (68°F)	3.8 – 4.0 V
		• Ignition switch: ON • Transmission fluid temperature: 40°C (104°F)	3.2 – 3.4 V
		• Ignition switch: ON • Transmission fluid temperature: 80°C (176°F)	1.7 – 1.9 V
121	Shift indicator light: 1st	• Engine: Idling • Gear range: 1st gear	Battery positive voltage
		• Engine: Idling • Gear range: Other than 1st gear	1 V or less
122	Shift indicator light: 5th	• Engine: Idling • Gear range: 5th gear	Battery positive voltage
		• Engine: Idling • Gear range: Other than 5th gear	1 V or less
123	Solenoid valve power supply	Ignition switch: LOCK (OFF)	1V or less
		Ignition switch: ON	Battery positive voltage
124	Solenoid valve power supply	Ignition switch: LOCK (OFF)	1V or less
		Ignition switch: ON	Battery positive voltage
125	Shift indicator light: 2nd	• Engine: Idling • Gear range: 2nd gear	Battery positive voltage
		• Engine: Idling • Gear range: Other than 2nd gear	1 V or less
127	A/T control relay	Ignition switch: ON	Battery positive voltage
128	Low-reverse solenoid valve	• Engine: Idling • Transmission range: P	Battery positive voltage
		• Engine: Idling • Gear range: 2nd gear	6 – 9 V
129	Reduction solenoid valve	• Engine: Idling • Transmission range: P	Battery positive voltage
		• Engine: Idling • Gear range: 5th gear	6 – 9 V
130	Torque converter clutch solenoid valve	• Engine: Idling • Gear range: 1st gear	Battery positive voltage
131	Ground	Always	1 V or less
134	Shift indicator light: 3rd	• Engine: Idling • Gear range: 3rd gear	Battery positive voltage

TERMINAL NO.	INSPECTION ITEMS	INSPECTION REQUIREMENT	NORMAL CONDITION
		• Engine: Idling • Gear range: Other than 3rd gear	1 V or less
135	Transmission fluid temperature warning light	Ignition switch: LOCK(OFF) → ON	1 V or less → Battery positive voltage (after several seconds have elapsed)
136	Second solenoid valve	• Engine: Idling • Gear range: 2nd gear	Battery positive voltage
		• Engine: Idling • Transmission range: P	6 – 9 V
137	Under drive solenoid valve	• Engine: Idling • Gear range: 1st gear	Battery positive voltage
		• Engine: Idling • Transmission range: P	6 – 9 V
138	Overdrive solenoid valve	• Engine: Idling • Gear range: 3rd gear	Battery positive voltage
		• Engine: Idling • Transmission range: P	6 – 9 V
139	Ground	Always	1 V or less
142	Shift indicator light: 4th	• Engine: Idling • Gear range: 4th gear	Battery positive voltage
		• Engine: Idling • Gear range: Other than 4th gear	1 V or less

PCM TERMINAL RESISTANCE AND CONTINUITY INSPECTION CHART

M1231109400112



ACX01978AC

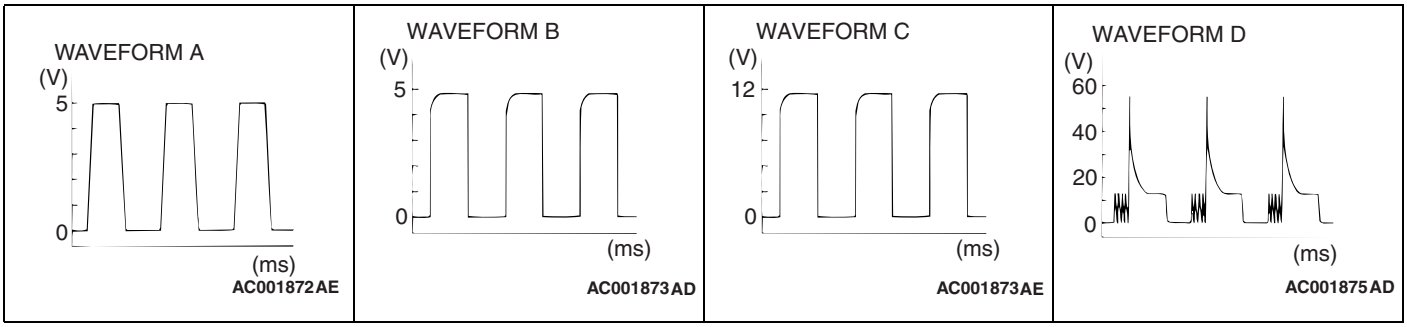
TERMINAL NO.	INSPECTION ITEM	NORMAL CONDITION (CHECK CONDITION)
57 – 124	Transmission fluid temperature sensor	16.7 – 20.5 kΩ [at 0°C (32°F)]
		7.3 – 8.9 kΩ [at 20°C (68°F)]
		3.4 – 4.2 kΩ [at 40°C (104°F)]
		1.9 – 2.2 kΩ [at 60°C (140°F)]
		1.0 – 1.2 kΩ [at 80°C (176°F)]
		0.57 – 0.69 kΩ [at 100°C (212°F)]

INSPECTION PROCEDURE USING AN OSCILLOSCOPE

M1231109500108

TERMINAL NO.	INSPECTION ITEM	INSPECTION REQUIREMENT		NORMAL CONDITION (WAVEFORM SAMPLE)
70	Crankshaft position sensor	Transmission range: N	Idling (Vehicle stopped)	Waveform A
64	Input shaft speed sensor	Transmission range: Sport mode	Driving at constant speed of 50 km/h (31 mph) in 4th gear (Engine: 1,500 – 2,000 r/min)	Waveform B
73	Output shaft speed sensor			
79	Vehicle speed sensor			Waveform C
128	Low-reverse solenoid valve	• Ignition switch: ON • Transmission range: P • Engine: Stopped • Throttle (Accelerator) opening angle: Less than 1 Volt	Force drive each solenoid valve (Actuator test)	Waveform D
137	Underdrive solenoid valve			
136	Second solenoid valve			
138	Overdrive solenoid valve			
129	Reduction solenoid valve			
130	Torque converter clutch control solenoid valve			

WAVEFORM SAMPLE



NEXT>>